BID DOCUMENTS AND SPECIFICATIONS FOR PN15H00033 BUILDING 46 MEDCOM RENOVATIONS, KALAELOA, OAHU, STATE OF HAWAI'I, DEPARTMENT OF DEFENSE, HAWAII ARMY NATIONAL GUARD JOB NO. CA-202505-C

ISSUED BY:
STATE OF HAWAII
DEPARTMENT OF DEFENSE
3949 DIAMOND HEAD ROAD,
HONOLULU, HAWAII 96816-4495
TELEPHONE: 808-369-3567

JULY 2026

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STATE OF HAWAI'I
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
3949 DIAMOND HEAD ROAD
HONOLULU, HAWAI'I 96816-4495

NOTICE TO BIDDERS – CONSTRUCTION

COMPETITIVE SEALED BIDDING (IFB) for "PN15H00033 Building 46 MEDCOM Renovations, Kalaeloa, Oahu, State of Hawai'i, Department of Defense, Hawaii Army National Guard, Job No. CA-202505-C" will be issued and awarded by the Department of Defense, Engineering Office via Hawai'i Electronic Procurement System (HIePRO). **All bids shall be submitted and uploaded through HIePRO prior to and no later than 2:00 P.M. HST on Thursday, September 17, 2026**. The record of each Bidder and their respective proposal shall be open to public inspection by request for copies of bids. Late bids will not be accepted after the due date and time or received in any other form than electronically through HIePRO.

Scope of Work is considered a full renovation of an existing 3-story CMU structure, which consists of, but is not limited to:
- Demolishing abandoned/obsolete plumbing on all three floors;
- Upgrading existing first floor restrooms and installing additional restrooms on second and third floors, including new showers and water bottle stations;
- Replacing all roof systems and roof hatches;
- Replacing all existing fixed partitions and ceilings in interior rooms and hallways;
- Replacing existing central station air handling units with new VRF systems,
- Replacing all existing HVAC ductwork and chilled water distribution systems;
- Replacing all electrical systems including panels, wiring, receptacles, and lighting; and
- Replacing all existing jalousie windows with fixed aluminum windows to match existing aluminum sliding windows.

Bids are estimated to be between $5,000,000 and $10,000,000.

A Site Visit/Pre-bid meeting will be held on August 20, 2026 at 11:00am. The address of the site is Building 46, 91-1152 Enterprise Ave., Kapolei, HI 96707. Contractors are to meet Mr. Cory Machida at the entrance to the guard shack at the corner of Shangri-La St. and Enterprise St. prior to 11:00am. Please email Mr. Machida at cory.h.machida@hawaii.gov or call at 808-754-6795 before 11:00am on August 19, 2026 to register for the site visit. If no answer, please leave your company information, attendees names and a contact number, you may assume that you are registered for the site visit. All interested bidders and sub-contractors are welcome, but not required to attend.

Bidders are advised that they should not wait until the last minute to submit their bid through HIePRO. Bidders are solely responsible for ensuring that their electronic submission through HIePRO is complete and all mandatory bid files are attached to their bid prior to the due date and time. The Engineering Office shall not be responsible for any delay or failure of any Bidder to submit any materials updated through the IFB process on a timely basis.

QUESTIONS AND REQUESTS FOR CLARIFICATION

Questions and Requests for Clarification regarding the Technical Specifications or any other aspect of the IFB must be submitted via HIePRO by **2:00 p.m. August 26, 2026**. Responses are scheduled to be posted by **September 4, 2026**. The Department of Defense, Engineering Office shall not be required to answer Questions or Requests for Clarification not submitted via HIePRO or received after the Questions and Requests for Clarification deadline.

Bidders are responsible for checking for any addenda for this project. The addenda will be posted on the HIePRO listing and at the State Department of Defense website at http://dod.hawaii.gov/hieng/

All documents can be downloaded from HIePRO or at the State Department of Defense website at http://dod.hawaii.gov/hieng/.

REQUIREMENT FOR CONTRACTORS LICENSING CLASSIFICATIONS

Due to the nature of the work contemplated Bidder must possess a valid State of Hawai'i Contractor's license in the appropriate classification.

General Engineering Contractors holding an 'A' license and General Building Contractors holding a 'B' license are reminded that due to the Hawai'i Supreme Court's January 28, 2002 decision in Okada Trucking Co., Ltd. v. Board of Water Supply, et al., 97 Haw. 450 (2002), they are prohibited from undertaking any work, solely or as part of a larger project, which would require the General Contractor to act as a specialty Contractor in any area in which the General Contractor has no license.

Bidders are solely responsible to review the project requirements, determine the appropriate licenses required, and ensure that they possess and that the Subcontractor(s) listed in their OFFER FORM possess the necessary specialty licenses to perform the work for this project.

PROJECT LABOR AGREEMENT

A Project Labor Agreement (PLA) will be required for any construction project in excess of one million five hundred thousand dollars ($1,500,000).

The Contractor who is awarded the project shall be required to submit to the Department of Defense, Engineering a complete, fully executed Agreement-To-Be-Bound within fourteen (14) calendar days of project award, or as soon thereafter as is practicable as determined by the Department. The Contractor must also obtain Letters of Assent from each subcontractor of whatever tier who may be employed on the project and submit copies of such Letters to the Department of Defense, Engineering within fourteen (14) calendar days of project award, or as soon thereafter as is practicable as determined by the Department. The required form of the Contractor's Agreement To Be Bound and the subcontractors' Letter of Assent may be found in the solicitation packet. Failure to timely submit any required Agreement-To-Be-Bound or any required Letter of Assent shall be cause for the State in its sole discretion to rescind the subject award and to award the project to: the responsive and responsible offerer with the next lowest bid price for solicitations made under HRS 103D-302; or the next highest ranked offerer satisfying all solicitation requirements for solicitations made under HRS 103D-303.

OFFER DEEMED FIRM/AUTHORITY TO SUBMIT OFFER

Submission of an electronic response to the State of Hawai'i constitutes and shall be deemed an offer to sell the specified goods and/or services to the State of Hawai'i at the price shown in the response and under the State's Terms and Conditions. The electronic response submitter certifies that he/she is authorized to sign the response for the submitting vendor and that the response is made without connection with any person, firm, or corporation making a response for the same goods and/or services and is in all respects fair and without collusion or fraud.

CAMPAIGN CONTRIBUTIONS BY STATE AND COUNTY CONTRACTORS PROHIBITED

If awarded a contract in response to this solicitation, offeror agrees to comply with HRS §11-355, which states that campaign contributions are prohibited from a State and County government contractor during the term of the contract if the contractor is paid with funds appropriated by the legislative body between the execution of the contract through the completion of the contract.

HAWAI'I PRODUCTS' PREFERENCE

In accordance with ACT 174, SLH 2022, effective June 27, 2022, Hawai'i Products Preference shall not apply to solicitations for public works construction. Therefore, the Hawai'i Products Preference shall not apply to this project.

Stephen F. Logan
Major General
Adjutant General

Posted on: July 31, 2026

FINAL DESIGN SUBMITTAL

REQUIREMENTS and SPECIFICATIONS
TO CONSTRUCT

BUILDING 46 MEDCOM RENOVATIONS
DoD JOB NO: CA-202505-D
TAX MAP KEY: 9-1-013 : 050
KALAELOA, OAHU, HAWAIʻI

FOR THE STATE OF HAWAIʻI

AND THE **DEPARTMENT OF DEFENSE**
HAWAI'I ARMY NATIONAL GUARD

May, 2026

Prime Consultant Discipline:	Engineering Partners, Inc.
Architectural:	Engineering Partners, Inc.
Civil:	Dempsey Pacific
Structural	Engineering Partners, Inc.
Mechanical/Electrical/Plumbing:	Engineering Partners, Inc.
Environmental:	EMET EnvironMETeo Services, Inc.
Certificate No.:	HIASB-1094
Expiration Date:	9/3/2026

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DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01100 - PROJECT REQUIREMENTS

PART 1 - GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Project consists of renovation the first to third floor's corridor and individual rooms. Work will include the reconfiguration of existing floor plans, replacement and upgrade of existing systems within the building, roofing work, hazardous material abatement, elevator work, and select improvements in the immediate vicinity of building entrances. 1. Project Location: Building 46, Enterprise Avenue, Kalaeloa, Hawai'i.

B. The Work consists of:

1. Replacing all existing flooring with ceramic tile at Unisex Restrooms.
2. Replacing all existing exterior doors.
3. Replacing all roof systems and roof hatches.
4. Replacing all existing fixed partitions and standard interior wood doors with metal frames.
5. Replacing existing traction geared elevator.
6. Replacing all existing bases with resilient bases at Corridor, Conference Room, Individual Rooms, Storage Rooms, Break Room, Copy Room and Break Room.
7. Removing all ceramic tiles, shower curbs and enclosures, and partitions; mirrors; water closets, lavatories, shower fixtures, and all associated plumbing elements in Restrooms; and lavatory counters within the existing Individual Rooms; leveling and refinishing the floor for Restrooms converted to Storage Rooms.
8. Removing and replacing existing plumbing system.
9. Providing new Restrooms on each floor.
10. Replacing existing control station Air Handling Unit.
11. Replacing at least three (3) existing HVAC Split Systems with Air Cooled Condensers.
12. Replacing all existing HVAC ductwork.
13. Replacing existing chilled water distribution systems.
14. Removing and replacing all fire extinguishers and fire extinguisher cabinets.
15. Replacing all ceiling access panels only in Corridors.
16. Modifying existing recently installed fire alarm system.
17. Replacing all existing lighting systems with energy efficient light fixtures to an approved lighting level.

18. Removing all existing jalousie windows with fixed aluminum windows to match existing aluminum sliding windows.

19. Painting all walls and ceilings.

20. Replacing electric panelboard main lugs, safety switch, and switchgear.

21. Providing or relocating electrical outlets.

22. Providing all necessary communication, video, and audio lines for functioning offices.

23. Providing window treatment.

24. Providing electronic controlled entry/exit at all exterior doors using Galaxy Control Systems or approved equal or better.

C. Perform operations and furnish equipment, fixtures, appliances, tools, materials, related items and labor necessary to execute, complete and deliver the Work as required by the Contract Documents.

D. The Division and Sections into which these specifications are divided shall not be considered an accurate or complete segregation of work by trades. This also applies to work specified within each section.

E. Contractor shall not alter the Drawings and Specification. If an error or discrepancy is found, notify the Project Manager.

F. Specifying of interface and coordination in the various specification sections is provided for information and convenience only. These requirements in the various sections shall complement the requirements of this Section.

1.02 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated and include incomplete sentences. Omission of words or phrases such as “the Contractor shall”, “as shown on the drawings”, “a”, “an”, and “the” are intentional. Omitted words and phrases shall be provided by inference to form complete sentences. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred, as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates. Where devices, or items, or parts thereof are referred to in the singular, it is intended that such reference shall apply to as many such devices, items or parts as are required to properly complete the Work.

2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
   a. The words “shall”, “shall be”, or “shall comply with”, depending on the context, are implied where a colon (:) is used within a sentence or phrase.

3. Abbreviations and Acronyms for Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale Research's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S.".

B. Terms
   1. Directed: Terms such as "directed", "requested", "authorized", "selected", "approved", "required", and "permitted" mean directed by Project Manager, requested by Project Manager, and similar phrases.

   2. Indicated: The term "indicated" refers to graphic representations, notes, or schedules on drawings or to other paragraphs or schedules in specifications and similar requirements in the Contract Documents. Terms such as "shown", "noted", "scheduled", and "specified" are used to help the user locate the reference.

   3. Furnish: The term "furnish" means to supply and deliver to project site, ready for unloading, unpacking, assembly, and similar operations.

   4. Install: The term "install" describes operations at project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

   5. Provide: The terms "provide" or "provides" means to furnish and install, complete and ready for the intended use.

   6. Submit: Terms such as "submit", "furnish", "provide", and "prepare" and similar phrases in the context of a submittal, means to submit to the Project Manager.

C. Industry Standards
   1. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

   2. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.

   3. Conflicting Requirements: If compliance with 2 or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Project Manager for a decision before proceeding.

1.03 CONTRACT

A. Refer to SECTION 00800 - SPECIAL CONDITIONS for other contract conditions.

B. Construction Window:
   1. Project Start Date: *January 1, 2027*
   2. Jobsite Completion Date *December 30, 2027*

C. Project Schedule:
   Schedule is presented for information and planning purposes. Dates and activities are subject to adjustments.

1.04 WORK SEQUENCE

A. The Work will be conducted in a single construction phase.

1.05 USE OF PREMISES AND WORK RESTRICTIONS

A. General: Contractor shall have full use of premises for construction operations, including use of project site, during construction period. Contractor's use of premises is limited only by State's right to perform work or to retain other Contractors on portions of the project site.

B. Contractor's use of premises is restricted as follows:

1. Construction Times and Schedule:
   a. Night, weekend and overtime work is allowed, at no additional cost to the government.

2. Site Access and Parking:
   a. Parking: Parking for the Contractor's employees (or Subcontractors) will be limited to the available areas within the designated Project Contract Limits or in areas designated by the Project Manager. Do not use parking stalls in regularly designated parking zones within the Facility grounds. Unauthorized vehicles parked in marked stalls and in any area outside of the designated project construction site will be subject to towing at the Contractor's expense.

   b. Maintain access to the Loading area through Project Contract Limits.

3. Sanitation:
   a. Use of facility toilet facilities will be as directed by the Project Manager. Facilities shall be kept clean. Abuse of this condition may result in the Contractor providing their own toilet facilities at no additional cost to the State.

4. Noise and Dust Control:
   a. In adjacent locations surrounding the project site, noise, dust and other disrupting activities, resulting from construction operations, are detrimental to the conduct of the Facility activities. Therefore, Contractor shall monitor its construction activities. Exercise precaution when using equipment and machinery to keep the noise and dust levels to a minimum.

   b. To reduce loud disruptive noise levels, ensure mufflers and other devices are provided on equipment, internal combustion engines and compressors.

   c. Overtime costs for the Contractor's employees and work force are the Contractor's responsibility.

5. Other Conditions:
   a. Arrange for construction debris and trash to be removed from project site weekly.

   b. Operate machinery and equipment with discretion and with minimum interference to driveways and walkways. Do not leave machinery and equipment unattended on roads and driveways.

   c. Store materials in the areas as designated by the Project Manager. Locate construction equipment, machinery, equipment and supplies within the Project Contract Limits.

   d. Keep access roads, to the project site free of dirt and debris. Provide, erect and maintain lights, barriers, signs, etc. when working on facility roads, driveways and

walkways to protect pedestrians and moped/bicycle riders. Obey facility traffic and safety regulations.

e. All smoking and vaping activities within construction limits on all Public Works construction sites, indoor or outdoor, are prohibited. Violations will be considered a contractual noncompliance by the general contractor.

D. Prohibition of Tobacco Products: Comply with the prohibition on introduction, possession and use of all tobacco products.

1.07 FUTURE WORK

A. It is not anticipated the State will award a future contract that depends on the Work under this contract.

1.08 MISCELLANEOUS PROVISIONS

A. Historical Archaeological Artifacts: All items having any apparent historical or archaeological interest discovered in the course of construction activities shall be carefully preserved. Should historic remains such as artifacts, burials, concentrations of shell or charcoal be encountered during the construction activities, work shall cease immediately in the adjacent vicinity of the find and the applicable site shall be protected from further damage. The Contractor shall immediately contact the Project Manager and the State Historic Preservation Division (SHPD) DLNR at (808) 692-8015. SHPD will assess the significance of the find and recommend an appropriate mitigation measure if necessary.

C. Dewatering:

1. Discharge from dewatering operations in building construction shall not be drained directly onto the street, gutter, into streams, or other bodies of water. In areas where a storm drainage has been installed, the discharge shall be conveyed to the nearest storm drain, by the use of pipes or other suitable means acceptable to the County. If necessary, the discharge shall be filtered or otherwise treated to comply with all applicable Federal, State, and Local regulations concerning water pollution prior to its release into waterways or local drainage systems.

2. In areas where there are no storm drainage systems, arrangements satisfactory to the County shall be made to dispose the discharge onto private properties.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION [Not Used]

3.01 PROJECT SCHEDULE is presented for information and planning purposes. Dates and activities are subject to adjustments.

NO	EVENT OR DESCRIPTION	REFERENCE OR DATE
1	Pre-Bid Meeting and Site Visit	Notice to Bidders
2	Clarifications or Questions Due	14 days before Offers are opened
3	Bid Opening	Notice to Bidders
4	Project Start Date	January 1, 2027
5	Project Completion Date	December 30, 2027

END OF SECTION 01100

SECTION 01230 - ALTERNATES

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes administrative and procedural requirements for alternates.

B. The description of alternates is not intended to give a detailed description of all additional or deductive work required by the alternate item(s), as only the principal features of such additional or deductive work are listed.

C. Should any one or all of the alternates become a part of the contract, the cost of all additional or deductive work required by the alternate item(s), even though not specifically mentioned herein, are included in the lump sum bid price.

1.02 DEFINITIONS

A. Alternate: An amount proposed by Bidders (Offerors) and stated on the Bid Form for certain work defined herein that may be added to or deducted from the Total Lump Sum Bid Price amount if State decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Total Lump Sum Bid Price.

1.03 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into the Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 SCHEDULE OF ALTERNATES

A. Alternate No. A-1 Additive: 1st floor architectural/structural demo and new work, all work not included in base bid.

B. Alternate No. A-2 Additive: 2nd floor architectural/structural demo and new work, all work not included in base bid.

C. Alternate No. A-3 Additive: 3rd floor architectural/structural demo and new work, all work not included in base bid.

D. Alternate No. A-4 Additive: Demolition of existing lighting and installation of new LED lighting and associated branch circuiting, overcurrent protection, and controls.

E. Alternate No. A-5 Additive: Electrical branch circuiting for receptacles and any other electrical work not associated with the above base bid and additive alternates.

F. Alternate No. A-6 Additive: Telecommunications.

G. Alternate No. A-7 Additive: Roof replacement.

H. Alternate No. A-8 Additive: Elevator replacement.

END OF SECTION 01230

SECTION 01310 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General project coordination procedures.

2. Project meetings.

1.02 PERFORMANCE AND COORDINATION

A. Contractor is in charge of the Work within the Project Contract Limits, and shall direct and schedule the Work. Include general supervision, management and control of the Work of this project, in addition to other areas more specifically noted throughout the Specifications. Final responsibility for performance, interface, and completion of the Work and the Project is the Contractor's.

B. The Contractor is responsible for jobsite Administration. Provide a competent superintendent on the job and provide an adequate staff to execute the Work. In addition, all workers shall dress appropriately and conduct themselves properly at all times. Loud abusive behavior, sexual harassment and misconduct will not be tolerated. Workers found in violation of the above shall be removed from the job site as directed by the Project Manager.

C. The State will hold the Contractor liable for all the acts of Subcontractors and shall deal only with the Prime Contractor in matters pertaining to other trades employed on the job.

D. Coordination: Provide project interface and coordination to properly and accurately bring together the several parts, components, systems, and assemblies as required to complete the Work pursuant to the GENERAL CONDITIONS and SPECIAL CONDITIONS.

1. Provide interface and coordination of all trades, crafts and subcontracts. Ensure and make correct and accurate connections of abutting, adjoining, overlapping, and related work. Provide anchors, fasteners, accessories, appurtenances, and incidental items needed to complete the Work, fully, and correctly in accordance with the Contract Documents.

2. Provide additional structural components, bracing, blocking, miscellaneous metal, backing, anchors, fasteners, and installation accessories required to properly anchor, fasten, or attach material, equipment, hardware, systems and assemblies to the structure.

3. Provide excavation, backfilling, trenching and drilling for trades to install their work.

4. Provide concrete foundations, pads, supports, bases, and grouting for trades as needed to install their work.

5. Provide caulking, sealing, and flashing as required to waterproof the building complete and as required to insulate the building thermally and acoustically. Include sealing, flashing, and related work as required to prevent moisture intrusion, air infiltration, and light leakage.

6. Equipment, appliances, fixtures, and systems requiring plumbing and mechanical services, rough-in, and connections, or other utilities and services shall be provided with such services, rough-in, and final connections.

7. Equipment, appliances, fixtures, hardware, and systems requiring electrical services shall be provided with such electrical services, including outlets, switches, overload protection, interlocks, panelboard space, disconnects, circuit breakers, and connections.

8. Materials, equipment, component parts, accessories, incidental items, connections, and services required to complete the Work which are not provided by Subcontractors shall be provided by the Contractor.

9. Coordination: Coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.

1.03 COOPERATION WITH OTHER CONTRACTORS

A. The State reserves the right at any time to contract for or otherwise perform other or additional work within the Project Contract Limits. The Contractor of this project shall to the extent ordered by the Project Manager, conduct its work so as not to interfere with or hinder the progress or completion of the work performed by the State or other Contractors.

1.04 COORDINATION WITH OTHER PRIME CONTRACTORS

A. Multiple prime Contractors performing work under separate agreements with the State may be present near the project location, adjacent to and abutting the Project Contract Limits. This Contractor shall coordinate activities, sequence of work, protective barriers and any and all areas of work interfacing with other Prime Contractor's work. Contractor shall provide a continuity of finishes, walks, landscape, etc. at abutting Contract Limits so no additional work will be required. Any damage to other Prime Contractor's Work committed by this Contractor (or its Subcontractor) shall be repaired promptly at no additional cost to the State.

B. Coordinate Subcontractors and keep them informed of any work from the other Projects that may affect the site or the Subcontractor's work. If the Contractor has any questions regarding its coordination responsibilities or needs clarification as to the impact in scheduling of its work and the work of other projects, this Contractor shall notify the Project Manager in writing.

C. Subject to approval by the Project Manager, this Contractor shall amend and schedule its work and operations to minimize disruptions to the work and operations of other projects.
   1. Relocate or remove and replace temporary barriers, fencing supports or bracing to allow work by others to proceed unimpeded. Do not remove required barriers supporting work until specified time or as approved by the Project Manager. This does not relieve the Contractor of the responsibility of proper coordination of the work. If directed by the Project Manager, leave in place any temporary barriers.

   2. Coordinate work that abuts or overlaps work of the other projects with the Project Manager and other Prime Contractors to mutual agreement so that work is 100 percent complete with continuity of all materials, systems and finishes.

   3. When directed by the Project Manager, provide access into the construction zone to allow the other project's Contractor(s) to perform their Work and work that must be interfaced.

   4. Contractor shall adjust and coordinate its Work and operations as required by the other projects as part of the Work of this contract without additional cost or delay to the State.

5. When directed by the Project Manager provide a combined Contractor's construction schedule.

D. Other Contracts: If known, they are listed in SECTION 01100 - PROJECT REQUIREMENTS.

1.05 SUBMITTALS

A. Photo Documentation: Prior to the start of jobsite work, the Contractor shall photo document the existing conditions at the site and file with the Project Manager one complete set of documents.

1.06 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences as directed by the Project Manager at the Contractor's field office, unless otherwise indicated.
   1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Project Manager of scheduled meeting dates and times.

   2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.

   3. Minutes: Contractor record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Project Manager, within 7 days of the meeting.

B. Preconstruction Conference: Project Manager shall schedule a preconstruction conference before the start of construction, at a time convenient to the Project Manager, but no later than 7 days before the Project start date or jobsite start date whichever is later. Conference will be held at the Project site or another convenient location. The Project Manager shall conduct the meeting to review responsibilities and personnel assignments.
   1. Attendees: Project Manager, and design consultants; Facility Users; Contractor and its superintendent; major Subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.

   2. Agenda: Discuss items of significance that could affect progress, including the following:
      a. Tentative construction schedule.

      b. Phasing.

      c. Critical work sequencing and coordination.

      d. Designation of responsible personnel.

      e. Use of the premises.

      f. Responsibility for temporary facilities and controls.

      g. Parking availability.

      h. Office, work, and storage areas.

      i. Equipment deliveries and priorities.

      j. First aid.

k. Security.

m. Progress cleaning.

n. Working hours.

C. Progress Meetings: Conduct progress meetings at monthly or other intervals as determined by the Project Manager. Coordinate dates of meetings with preparation of payment requests.

1. Attendees: In addition to Project Manager, each Contractor, Subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

b. Review present and future needs of each entity present, including the following:

1) Outstanding Requests for information (clarification).

2) Interface requirements.

3) Sequence of operations.

4) Status of outstanding submittals.

5) Deliveries.

6) Off-site fabrication.

7) Access.

8) Site utilization.

9) Temporary facilities and controls.

10) Work hours.

11) Hazards and risks.

12) Progress cleaning.

13) Quality and work standards.

14) Change Orders and Change Proposals.

15) Documentation of information for payment requests.

c. Corrective Action Plan: Contractor shall provide a plan of corrective action for any item which is delayed or expected to be delayed, then that item impacts the contractual dates.

3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
   a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01310

SECTION 01330 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. Comply with the GENERAL CONDITIONS “Shop Drawings and Other Submittals” section and “Material Samples” section.

B. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.

C. Related Sections include the following:

1. SECTION 01320 - CONSTRUCTION PROGRESS DOCUMENTATION for submitting schedules and reports, including Contractor’s Construction Schedule and the Submittals Schedule.

2. SECTION 01770 - CLOSEOUT PROCEDURES for submitting warranties, project record documents and operation and maintenance manuals.

1.02 SUBMITTAL PROCEDURES

A. Coordinate Work and Submittals: Contractor shall certify the submittals were reviewed and coordinated.

B. Submittal Certification: Provide in MS Word when submitting electronically. Project Manager will provide an electronic copy of the Submittal Certification. Provide a reproduction (or stamp) of the “Submittal Certification” and furnish the required information with all submittals. Include the certification on:

1. The title sheet of each shop drawing, or on

2. The cover sheet of submittals in 8-1/2 inch x 11-inch format, or on

3. One face of a cardstock tag (minimum size 3-inch x 6-inch) tied to each sample. On the sample tag, identify the sample to ensure sample can be matched to the tag if accidentally separated. The opposite face of the tag will be used by the Project Manager to receive, review, log stamp and include comments.

C. Variances: The Contractor shall request approval for a variance. Clearly note any proposed deviations or variances from the Specifications, Drawings, and other Contract Documents on the submittal and also in a separately written letter accompanying the submittal.

D. Submittal Certification Form (stamp or digital)

CONTRACTOR'S NAME: _____

PROJECT: _____

DAGS JOB NO: _____

As the General Contractor, we checked this submittal and we certify it is correct, complete, and in compliance with Contract Drawings and Specifications. All affected Contractors and suppliers are aware of, and will integrate this submittal into their own work.

SUBMITTAL NUMBER _____ DATE RECEIVED _____

REVISION NUMBER _____ DATE RECEIVED _____

SPECIFICATION SECTION NUMBER /PARAGRAPH NUMBER _____

DRAWING NUMBER _____

SUBCONTRACTOR'S NAME _____

SUPPLIER'S NAME _____

MANUFACTURER'S NAME _____

NOTE: DEVIATIONS FROM THE CONTRACT DOCUMENTS ARE PROPOSED AS FOLLOWS (Indicate "NONE" if there are no deviations)

_____

_____

_____

CERTIFIED BY	

Note: Form can be combined with Design Consultant's Review stamp. This is available from the Project Manager.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 SUBMITTAL REGISTER AND TRANSMITTAL FORM

A. Contractor shall use submittal register and transmittal forms as directed by the Project Manager.

B. The listing of required submittals within this Section is provided for the Contractor's convenience. Review the specification technical sections and prepare a comprehensive listing of required submittals. Furnish submittals to the Project Manager for review.

C. Contractor shall separate each submittal item by listing all submittals in the following groups with the items in each group sequentially listed by the specification section they come from:
   1. Administrative
   2. Data
   3. Tests
   4. Closing

D. Contractor shall separate all different types of data as separate line items all with the column requirements.

E. Contractor shall send monthly updates and reconciled copies electronically to the Project Manager and the Design Consultant in MS Word or MS Excel or other format as accepted by the Project Manager.

END OF SECTION 01330

Section No. – Title	Shop Drawings & Diagrams	Samples	Certificates (Material, Treatment,Applicator, etc.)	Product Data, Manufacturer's Technical Literatureand Brochures	MSDS Sheets	Calculations	Reports (Testing, Maintenance,Inspection, etc.)	Test Plan	O & M Manual	Equipment or Fixture Listing	Schedules (Project Installation)	Maintenance Service Contract	Field Posted As-Built Drawings	Others	Guaranty or Warranty	Manufacturer's Guaranty or Warranty (Greater than one year)
01100 - Project Requirements																
01230 - Alternates																
01310 - Project Management and Coordination											■			■		
01322 - Web Based Construction Management																
01330 - Submittal Procedures			■											■		
01400 - Quality Requirements														■		
01450 - Moisture Vapor and Alkalinity Testing							■							■		
01500 - Project Sign Layout																
01500 - Temporary Facilities and Controls							■							■		
01524 - Construction Waste Management														■		
01575 - Temporary Controls - Air Quality Requirements			■		■									■		
01700 - Execution Requirements														■		
01715 - Existing Conditions - Asbestos, Lead,																
01770 - Closeout Procedures		■							■			■	■	■		
02100 - Site Preparation														■		
02200 - Earthwork			■					■						■		
02920 - Lawns and Grasses												■				
03300 - Cast-In-Place Concrete	■		■	■			■							■		
03930 - Concrete Rehabilitation		■		■												
03931 - Crack Repairs by Epoxy Injection			■	■			■									
04810 - Unit Masonry Assemblies	■	■	■	■			■							■		
05400 - Cold formed Steel Framing	■		■	■		■								■		
05500 - Metal Fabrication	■			■												
06100 - Rough Carpentry			■													
06200 - Finish Carpentry			■		■											
06220 - Solid Surface Countertops	■	■		■												■
06311 - Preservative Treated Lumber			■												■	
06611 - Cast Polymer Shower Surrounds	■	■	■	■												■
06612 - Cast Polymer Shower Pans	■	■	■	■												■
07210 - Building Insulation				■	■											
07531 - Single-Ply TPO Membrane Roofing	■	■	■	■			■								■	■
07600 - Flashing and Sheet Metal															■	
07840 - Firestopping																

07920 - Sealants	■	■	■	■	■											
08210 - Wood Doors	■	■	■	■	■		■								■	■
08410 - Aluminum Entry Doors and Window Wall	■			■												■
08500 - Aluminum Windows	■	■	■	■			■		■							■
08710 - Finish Hardware	■	■	■	■							■					■
08800 - Glazing	■		■	■					■							■
09250 - Gypsum Wallboard		■		■												■
09310 - Ceramic Tile	■			■	■											
09510 - Acoustical Ceiling		■	■		■											■
09650 - Resilient Flooring	■	■		■												
09682 - Carpeting (Direct Glue-Down)		■		■	■				■							
09901 - Painting		■	■	■							■				■	
10161 - Solid Plastic Toilet Partitions and Urinal Screens	■		■	■												■
10200 - Metal Wall Louvers	■	■	■	■												
10400 - Identifying Devices	■	■		■												
10800 - Washroom Accessories				■												
13280 - Removal and Disposal of Asbestos-Containing Material	■	■		■	■			■						■		
13283 - Disturbance of Lead-Containing Material	■	■		■	■			■						■		
13288 - Testing-Air Monitoring																
14210 - Electric Traction Elevators	■			■					■			■				■
15000 - General Mechanical Requirements	■		■	■	■	■	■	■	■	■	■	■	■		■	■
15250 - Insulation of Mechanical Systems			■	■	■											
15400 - Plumbing System - Basic Materials and Methods	■			■	■		■	■	■	■			■		■	■
15410 - Cast Polymer Shower Pans	■	■		■												■
15450 - Plumbing Fixtures and Trim			■	■					■	■		■	■		■	■
15650 - High Efficiency Gas Domestic Water Heaters	■		■	■	■		■	■	■	■		■	■	■	■	■
15800 - Air Conditioning and Ventilation	■		■	■	■	■	■	■	■	■		■	■	■	■	■
15901 - Testing, Adjusting, and Balancing (Tab)							■	■			■		■	■		
15995 - Mechanical Systems Commissioning							■	■						■		
16010 - Basic Electrical Requirements																
16047 - Electrical Demolition																
16060 - Grounding & Bonding				■			■		■				■			
16073 - Hangers & Supports for Electrical Systems	■			■												
16075 - Electrical Identification				■										■		
16120 - Conductors & Cables				■			■									
16130 - Raceways & Boxes				■												

16140 - Wiring Devices				■					■							
16442 - Panelboards	■			■			■							■		
16511 - Interior Lighting	■	■	■	■			■								■	
16721 - Fire Alarm System	■		■										■	■		
17000 - Communications	■		■	■			■	■	■				■		■	

SECTION 01400 - QUALITY REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.

2. Specified tests, inspections, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with the Contract Document requirements.

3. Requirements of this section or by the Department or authorities having jurisdiction, do not limit the Contractor's responsibility to provide quality-control services.

1.02 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Project Manager.

C. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.04 SUBMITTALS

A. Reports: Prepare and submit certified written reports that include the following:

1. Date of issue.

2. Project title and number.

3. Name, address, and telephone number of testing agency.

4. Dates and locations of samples and tests or inspections.

5. Names of individuals making tests and inspections.

6. Description of the Work and test and inspection method.

7. Identification of product and Specification Section.

8. Complete test or inspection data.

9. Test and inspection results and an interpretation of test results.

10. Ambient conditions at time of sample taking and testing and inspecting.

11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.

12. Name and signature of laboratory inspector.

13. Recommendations on retesting and reinspecting.

D. Permits, Licenses, and Certificates: Submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.06 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

C. Inspection and Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E-548, and that specializes in types of tests and inspections to be performed.

1.07 QUALITY CONTROL

A. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.
   1. Engage qualified inspection or testing agencies to perform quality-control services, unless services are indicated as the Department’s responsibility.

   2. Notify Project Manager and the inspection or testing agencies at least hours in advance of time when Work that requires testing or inspecting will be performed.

   3. Submit certified written reports of each quality-control service.

   4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor’s responsibility.

   5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer’s Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.

D. Retesting and Reinspecting: Regardless of whether original tests or inspections were Contractor’s responsibility, provide quality-control services, including retesting and reinspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.

E. Testing Agency Responsibilities: Cooperate with the Department and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
   1. Notify the Project Manager and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

2. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.

3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.

4. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.

5. Do not perform any duties of Contractor.

F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
   1. Access to the Work.

   2. Incidental labor and facilities necessary to facilitate tests and inspections.

   3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.

   4. Facilities for storage and field-curing of test samples.

   5. Preliminary design mix proposed for use for material mixes that require control by testing agency.

   6. Security and protection for samples and for testing and inspecting equipment at Project site.

G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
   1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.19 RECORD (As-Builts) DRAWINGS

A. The Contractor is required to ensure the record drawings and jobsite record sets are kept current on a daily basis in accordance with Section 01770 – Closeout Procedures.

1.20 NOTIFICATION OF NON-COMPLIANCE

A. Contractor will be notified of any detected non-compliance items. Take immediate corrective action after receipt of such notice.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 REPAIR AND PROTECTION

A. General: On completion testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
   1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

3.02 DEPARTMENT'S AUTHORITY

A. Review and removal of Quality Control Personnel:

1. All Quality Control organization personnel are subject to review by Project Manager; and the Project Manager may interview any member of the Quality Control organization at any time in order to verify the submitted qualifications.

2. The Contractor is not entitled to any claim or cost increase or time extension due to rejection of work for any quality related issues.

END OF SECTION 01400

SECTION 01450 - MOISTURE VAPOR AND ALKALINITY TESTING

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes additional administrative and procedural requirements for quality assurance.

1.02 RELATED SECTIONS

A. SECTION 09650 - RESILIENT FLOORING

B. SECTION 09901 - PAINTING

1.03 REFERENCES

A. ASTM F 1869 - Standard Test Method for Measuring Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

B. ASTM F 710 - Standard Practice for Preparing Concrete Floors and Other Monolithic Floors to Receive Resilient Flooring.

1.04 SUBMITTALS

A Testing Agency qualifications.

B. Report all test results in chart form listing test dates, start/stop time, start/stop weight, weight gain in grams, moisture vapor emission value and alkalinity levels.

C. List test locations on chart and show same on 8-1/2 inch x 11-inch site map (when such map is made available to testing agency).

D. Deliver results for distribution to Project Manager and General Contractor. Furnish 3 copies to the Project Manager.

1.05 QUALITY ASSURANCE

A. Independent Testing Agency or Manufacturer's Approved Contractor
   1. Certified by Test Kit Manufacturer for product use.

   2. Other agency with verifiable experience.

B. Commercially produced Moisture Vapor Emission Test Kits
   1. Test dish including calcium chloride must be commercially packaged and delivered to test site in sealed factory wrapping.

   2. Test done from same source as dish.

   3. Test kit must comply with ASTM standards of size and weight.

C. Wide range pH paper, and distilled or de-ionized water.

1.06 ENVIRONMENTAL CONDITIONS

A. Testing shall take place after allowing concrete to dry for a minimum of 90 days. Testing to be scheduled no less than 1 nor more than 3 weeks prior to scheduled flooring installation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Calcium Chloride Test as manufactured by Vaprecision (800) 449-6194, or equal.

B. Alkalinity test paper as manufactured by Micro Essential Laboratory, or equal.

PART 3 - EXECUTION

3.01 QUANTIFICATION OF CONCRETE MOISTURE VAPOR EMISSION

A. Test concrete floors in accordance with ASTM F 1869.

B. The test site shall be maintained at the same temperature and humidity conditions as those anticipated during normal occupancy. These temperatures and humidity levels shall be maintained for 48 hours prior and during test period. If meeting this criteria is not possible, then minimum conditions shall be 75+ 10 degrees F and 50+ 10 percent relative humidity. When a building is not under HVAC control, a recording hygrometer or data logger shall be in place recording conditions during the test period. A transcript of this information must be included with the test report.

C. The number of vapor emission test sites is determined by the square footage of the facility. The minimum number of tests to be placed is equal to 3 in the first 1,000 square feet and one per each additional 1,000 square feet. For slabs on grade, locate additional tests adjacent to penetrations and through slab joints at the rate of one per 1,000 square feet.

D. Tests sites are to be cleaned of all adhesive residue, curing compounds, paints, sealers, floor coverings, and similar materials 24 hours prior to the placement of test kits.

E. Weigh test dish on site prior to start of test. Scale must report weight to 0.1 gram. Record weight and start time.

F. Expose Calcium Chloride and set dish on concrete surface.

G. Install test containment dome and allow test to proceed for 60 - 72 hours.

H. Retrieve test dish by carefully cutting through containment dome. Close and reseal test dish.

I. Weigh test dish on site recording weight and stop time.

J. Calculate and report results as “pounds of emission per 1,000 square feet per 24 hours”.

3.02 QUANTIFYING ALKALINITY LEVEL

A. Test concrete floors in accordance with ASTM F 710.

B. At each vapor emission test site, after removal of test containment dome, perform alkalinity test.
   1. Place several drops of water onto the concrete surface to form a puddle approximately one-inch in diameter.

   2. Allow the water to set for approximately 60 seconds.

   3. Dip the pH paper into the water and remove immediately, compare color to chart provided by paper supplier to determine alkalinity reading.

C. Record and report all results.

END OF SECTION 01450

SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SUMMARY

A. Requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.

B. Temporary utilities include but are not limited to the following:
   1. Sewers.
   2. Storm drainage.
   3. Water service and distribution.
   4. Sanitary facilities, including toilets, wash facilities, and drinking water facilities.
   5. Ventilation.
   6. Electric power service.
   7. Lighting.
   8. Telephone service.

C. Support facilities include, but are not limited to, the following:
   1. Project signs.
   2. Field offices.
   3. Storage and fabrication sheds.
   4. Trash, refuse disposal.
   5. Temporary roads and paving.
   6. Erosion controls and site drainage.

D. Security and protection facilities and measures include, but are not limited to, the following:
   1. Environmental protection.
   2. Stormwater control.
   3. Tree and plant protection.
   4. Site enclosure fence.
   5. Barricades, warning signs, and lights.
   6. Pest control.

E. Related Sections: Refer to Divisions 2 through 16 for other temporary requirements including ventilation, humidity requirements and products in those Sections.

1.02 USE CHARGES

A. General: Cost or use charges for temporary facilities are not chargeable to the State and shall be included in the Contract Price. Allow other entities to use temporary services and facilities without cost, including, but not limited to, the following:
   1. Other Contractors with agreements with the State working within the contract limits.
   2. Occupants of Project.
   3. Testing agencies.
   4. Project Manager and personnel of authorities having jurisdiction.

1.03 SUBMITTALS
A. Temporary Utility Reports: Submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.
   1. Landfill Disposal Receipts: Submit copies of receipts issued by a landfill facility. Include receipts with Contractor Daily Progress Report

1.04 QUALITY ASSURANCE
A. Standards: Comply with IBC Chapter 33, “Safeguards During Construction”, ANSI A10.6, NECA’s “Standard for Installing and Maintaining Temporary Electric Power at Construction Sites”, and NFPA 241, "Standard for Safeguarding Construction, Alteration, and Demolition Operations".

B. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with trade regulations and union jurisdictions.

C. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70, “National Electrical Code”.

D. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.05 PROJECT CONDITIONS
A. Temporary Utilities: At earliest feasible time, when acceptable to the Project Manager, change over from use of temporary service to use of permanent service.
   1. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Project Manager’s acceptance, regardless of previously assigned responsibilities.

B. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:
   1. Keep temporary services and facilities clean and neat.
   2. Relocate temporary services and facilities as required by progress of the Work.

1.06 PREPARATION AND PROTECTION
A. Protection of Property: Continually maintain adequate protection of the Work from damage and protect all property, including but not limited to buildings, equipment, furniture, grounds, vegetation, material, utility systems located at and adjoining the job site. Repair, replace or pay the expense to repair damages resulting from Contractor’s fault or negligence.

B. Before starting work to be applied to previously erected constructions, make a thorough and complete investigation of the recipient surfaces and determine their suitability to receive required additional construction and finishes. Make any repair that is required to

properly prepare surfaces, and coordinate the Work to provide a suitable surface to receive following Work.

C. Commencing work by any trade implies acceptance of existing conditions and surfaces as satisfactory for the application of subsequent work, and full responsibility for finished results and assumption of warranty obligations under the Contract.

D. Protect existing (including interiors) work to prevent damage by vandals or the elements. Provide temporary protection. Use curtains, barricades, or other appropriate methods. Take positive measures to prevent breakage of glass and damage to plastic, aluminum and other finishes.

E. Repairs and Replacements: Promptly replace and repair damages to the approval of the Project Manager. Additional time required to secure replacements and to make repairs does not justify a time extension.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Project Manager. Provide materials suitable for use intended.

B. Chain Link Fencing: Minimum 2 inch, 9-gage, galvanized steel, chain link fabric fencing; minimum 6-feet high with galvanized steel pipe posts; minimum 2 3/8 inch OD line posts and 2 7/8 inch OD corner and pull posts, with 1 5/8 inch OD top rails,

OR

C. Plastic Enclosure Fence: Industry standard 4-feet high plastic fencing with metal (or wood) post supports at 10-feet on center connected with a top and bottom 12-gauge soft annealed galvanized tie wires securely connected to posts. Posts shall be capable of resisting a lateral load of 100 pounds measured at the top of the post.

2.01 EQUIPMENT

A. Self Contained Combination Toilet and Urinal Units: Single occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material. One quarter of, or at least one unit(s) shall contain a handwash sink with potable water storage.

B. Drinking Water Fixtures: Drinking water fountains or containerized, tap dispenser, bottled water drinking water units, or water cooler dispensing water at 45 - 55 degree F available at project site including paper cup supply.

C. Electrical Outlets: Properly configured, NEMA polarized outlets to prevent insertion of 110 to 120 V plugs into higher voltage outlets; equipped with ground fault circuit interrupters, reset button, and pilot light.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
   1. Secure approval from Project Manager before modifications are made to the State Inspector's Field Office.

B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.02 TEMPORARY UTILITY INSTALLATION

A. General: Engage appropriate local utility company to install temporary service or connect to existing service where directed by the Project Manager. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations. General: Connect to existing service where directed by the Project Manager.
   1. Arrange with utility company, the Department, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

   2. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide trucked in services.

B. Storm Drainage: Drainage due to construction related activities into any storm drain and any major water runoff from the project site is generally prohibited. Drainage ditches, ponds or similar facilities capable of holding drainage water is recommended if possible. NPDES (National Pollutant Discharge Elimination System) permit is required for a project site one acre or more of land area (depending on configuration of a project site, it is possible that land area assumed to be less than one acre could be determined to be one acre or more and require a NPDES permit). Supporting documents such as Storm Water Pollution Control Plan, Spill Prevention and Response Plan, Storm Water Monitoring Plan, Best Management Practices Plan and other possible documents may be required for the permit application. The State Department of Health, Clean Water Branch should be contacted to determine all submission requirements for the permit application.

C. Sewer Drainage: The respective environmental departments regulating wastewater for each County should be contacted to obtain a wastewater discharge permit if there is any intention to discharge effluents into any existing sewer manhole or to make a piping connection into any existing sewer line, if allowed by the County. A construction permit application may also be required if the intent is to make a temporary piping connection into the existing sewer line if the initial permit application for the project and associated design documents submitted did not include these details. There are regulations to determine what effluents may or may not be allowed to be discharged into the existing sewer system with temporary filtration, separators or other devices determined to be acceptable.

D. Water Service: Make arrangements with the utility company for temporary use of water, and pay for all expenses. However, at the option of the Contractor, a temporary tap into the facility's existing water system is allowed, subject to the following conditions:
   1. Comply with the Department of Health's and County water provider's requirements when tapping into the existing water system.

   2. Reasonable amounts of water will be available without charge.

   3. Meter the tapped line and prior to water use, notify the Project Manager to observe an initial meter reading.

   4. Take monthly meter readings. Pay the State, on a monthly basis, for water used at the current rate per 1,000 gallons.

   5. Payments are to be by check, made payable to the "Director of Finance, State of Hawaii" and mailed as directed by the Project Manager:
      a. Checks shall be accompanied by the following information:
         1) Name of facility, Project Name and Title and DAGS Job No.

2) Contractor's name

3) Initial meter reading for the month and final meter reading for the month.

4) Volume of water used and the amount due in payment for that water

6. Upon completion of the project and just prior to removal of the water meter, notify the Project Manager to observe a final meter reading.

7. Should the Contractor at any time fail to comply with any or all of the above conditions, the Department may terminate the use of water. The Contractor shall remove the hookup within 48 hours of notification of such termination.

E. Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload protected disconnecting means, automatic ground fault interrupters, and main distribution switchgear. Use of State facilities electrical power services will be permitted as long as equipment is maintained in a condition acceptable to the Project Manager.

F. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment. Protect wiring, in conduits or other, measures when exposed to possible damage or traffic areas.

G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations and traffic conditions.

3.03 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access or where shown on Contract Drawings or as directed by the Project Manager.

2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion.

3. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to State.

B. Site Drainage:

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining property nor endanger permanent Work or temporary facilities.

2. Before connection and operation of permanent drainage piping system, provide temporary drainage where roofing or similar waterproof deck construction is completed.

C. Project Sign and Temporary Sign(s):

1. Provide and install project identification sign and other signs as listed. Sign designs are attached to Part 3 of this Section:
   a. Warning Sign

2. Install signs where directed by the Project Manager or where indicated to inform public and persons seeking entrance to the Project. Do not permit installation of unauthorized signs.

3. Provide temporary signs to provide directional information to constructional personnel and visitors.

4. Construct signs with durable materials, properly supported or mounted, and visible.

D. Trash, Refuse Disposal:
   1. Department of Health – Illegal Dumping Notice. See attachment to Part 3 of this section.
      a. This Notice to be printed out on 8.5x11" paper.

      b. This Notice to be posted at the job site field office and/or in locations visible to all contractors, subcontractors, suppliers, vendors, etc. throughout the duration of the project.

   2. Illegal Dumping of solid waste could subject the Contractor to fines and could lead to felony prosecution in accordance with Chapter 342H, HRS. For more information, see the following web site:
      http://www.hawaii.gov/health/environmental/waste/sw/pdf/Illdump.pdf

   3. Provide waste collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste.

   4. Do not burn debris or waste materials on the project site.

   5. Do not bury debris or waste material on the project site unless specifically allowed elsewhere in these specifications as backfill material.

   6. Haul unusable debris and waste material to an appropriate off site dump area.

   7. Water down debris and waste materials during loading operations or provide other measures to prevent dust or other airborne contaminants.

   8. Vacuum, wet mop, or damp sweep when cleaning rubbish and fines which can become airborne from floors or other paved areas. Do not dry sweep.

   9. Use enclosed chutes or containers to conveying debris from above the ground floor level.

   10. Clean up shall include the collection of all waste paper and wrapping materials, cans, bottles, construction waste materials and other objectionable materials, and removal as required. Frequency of clean up shall coincide with rubbish producing events.

E. Existing Stair Usage: Use of existing stairs will be permitted, as long as stairs are cleaned and maintained in a condition acceptable to State and User. At Substantial Completion, restore stairs to condition existing before initial use.

F. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If, despite such protection, stairs become damaged, restore damaged areas so no evidence remains of correction work.

3.04 ENVIRONMENTAL CONTROLS

A. General: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

B. Dust Control:

1. Prevent dust from becoming airborne at all times including non working hours, weekends and holidays in conformance with the State Department of Health, Administrative Rules, Title 11, Chapter 60.1 Air Pollution Control.

2. Contractor is responsible for and shall determine the method of dust control. Subject to the Contractor's choice, the use of water or environmentally friendly chemicals may be used over surfaces that create airborne dust.

3. Contractor is responsible for all damage claims due to their negligence to control dust.

C. Noise Control
1. Keep noise within acceptable levels at all times in conformance with the State Department of Health, Administrative Rules, Title 11, Chapter 46 Community Noise Control. Obtain and pay for the Community Noise Permit when construction equipment or other devices emit noise at levels exceeding the allowable limits.

2. Ensure mufflers and other devises are provided on equipment, internal combustion engines and compressors to reduce loud disruptive noise levels and maintain equipment to reduce noise to acceptable levels.

3. Unless specified elsewhere, do not start construction equipment that meet allowable noise limits prior to 6:45 A.M. or equipment exceeding allowable noise levels prior to 7:00 A.M.

D. Erosion Control
1.During grading operations, maintain the grade to prevent damage to adjoining property from water and eroding soil.

2. Install temporary berms, cut off ditches and other provisions needed for construction methods and operations. Should there be a question if the temporary measures are insufficient to prevent erosion, the Project Manager shall make the final determination.

3. Construct and maintain drainage outlets and silting basins where shown on the Drawings and when required to minimize erosion and pollution of waterways during construction.

E. Pest Control: Before demolition and excavation work begins, retain a local exterminator or pest control company to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests. Engage this pest control service to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.

3.05 VIOLATION OF ENVIRONMENTAL PROVISIONS

A. Violations of any of the above environmental control requirements or any other pollution control requirements; which may also be specified in the other Specifications sections, shall be resolved under the SUSPENSION and CORRECTIVE WORK Section of the GENERAL CONDITIONS.

3.06 BARRICADES AND ENCLOSURES

A. Barricades: Before construction operations begin, erect temporary construction barricade(s) to prevent unauthorized persons from entering the project area and to the extent required by the Project Manager.

1. Provide gates in sizes and at locations necessary to accommodate delivery vehicles and other construction operations.

2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Provide Project Manager with 2 sets of keys.

3. Paint and maintain the appearance of temporary construction barricade(s) throughout the duration of the Work. Maintenance includes painting over all graffiti promptly, subject to the satisfaction of the Project Manager. Before submitting a bid, the contractor is advised to carefully assess the risks for graffiti for the project, bid the project accordingly, and include all costs for repainting all graffiti in his bid. During the course of the project, the Project Manager may require additional barricades be provided for the safety of the public. Contractor shall erect the additional barricade(s) at its own expense.

4. Construction
   a. chain link, or

   b. plastic fencing

B. Security Enclosure and Lockup:
   1. Install substantial temporary enclosure around partially completed areas of construction.

   2. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.

C. Temporary Enclosures:
   1. Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

   2. Where cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.

D. Opening Protection
   1. Vertical Openings: Close openings with plywood or similar materials.

   2. Horizontal Openings: Close openings in floor or roof decks and horizontal surfaces with load bearing, wood framed construction.

   3. Where temporary wood or plywood enclosure exceeds 100 sq. ft. in area, use fire retardant treated material for framing and main sheathing.

E. Until fire protection needs are supplied by permanent facilities, install and maintain temporary fire protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
   1. Provide fire extinguishers, installed on walls on mounting brackets, visible and accessible from space being served, with sign mounted above.
      a. Field Offices: Class A stored pressure water type extinguishers.

      b. Other Locations: Class ABC dry chemical extinguishers or a combination of extinguishers of NFPA recommended classes for exposures.

      c. Locate fire extinguishers where convenient and effective for their intended purpose; provide not less than one extinguisher on each floor at or near each usable stairwell.

   2. Store combustible materials in containers in fire safe locations.

3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways, and other access routes for firefighting. Prohibit smoking in hazardous fire exposure areas.

4. Supervise welding operations, combustion type temporary heating units, and similar sources of fire ignition.

5. Permanent Fire Protection: At earliest feasible date in each area of Project, complete installation of permanent fire protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.

6. Develop and supervise an overall fire prevention and first aid fire protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

7. Provide hoses for fire protection of sufficient length to reach construction areas. Hang hoses with a warning sign stating that hoses are for fire protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

8. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.07 OPERATION, TERMINATION, AND REMOVAL

A. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by heat temperatures and similar elements.

B. Termination and Removal: Remove each temporary facility when need for its service has ended, or when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

C. Materials and facilities that constitute temporary facilities are the property of Contractor. The Department reserves the right to take possession of Project identification signs.

3.08 ATTACHMENTS

A. Dust Control Fence Drawings: Standard Detail for Dust Control Fence - DETAILS D and E/TG 01500.

B. Warning Sign: Requirements for Warning Sign.

C. Department of Health – Illegal Dumping Notice

END OF SECTION 01500

SECTION 01524 - CONSTRUCTION WASTE MANAGEMENT

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes administrative and procedural requirements for the following:

1. Salvaging nonhazardous demolition and construction waste.

2. Recycling nonhazardous demolition and construction waste.

3. Disposing of nonhazardous demolition and construction waste.

B. Related Sections include the following:

1. Division 1 Section "Temporary Facilities and Controls" for environmental-protection measures during construction, and location of waste containers at Project site.

C. The State's goal is to apply sound environmental principles in the design, construction and use of facilities. As part of the implementation of that goal, the Contractor shall:

1. Practice efficient waste management when sizing, cutting, and installing products and materials and

2. Use all reasonable means to divert construction and demolition waste from landfills and incinerators and to facilitate their recycling or reuse.

1.02 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.03 REFERENCES –

A. *A Contractor's Waste Management Guide: Best Management Practices and Tools for Job Site Recycling and Waste Reduction in Hawaii*, 1999. Request a copy from the State of Hawaii, Clean Hawaii Center (808) 587-3802 or download from www.hawaii.gov/dbedt/ert/cwmg/index.html.

B. *Minimizing Construction & Demolition Waste.* State of Hawaii, Department of Health guidance on construction and demolition (C&D) waste management and listing of

permitted C&D waste management facilities. Download from www.state.hi.us/health/eh/shwb/sw.

1.04 PERFORMANCE REQUIREMENTS

A. Salvage/Recycle Requirements: Contractor's requirement is to salvage and recycle as much nonhazardous demolition and construction waste as possible including the following materials:

1. Demolition Waste:
   a. Green waste.
   b. Asphaltic concrete paving
   c. Concrete.
   d. Concrete reinforcing steel.
   e. Brick.
   f. Concrete masonry units.
   g. Wood studs.
   h. Wood joists.
   i. Plywood and oriented strand board.
   j. Wood paneling.
   k. Wood trim.
   l. Structural and miscellaneous steel.
   m. Rough hardware.
   n. Roofing.
   o. Insulation.
   p. Doors and frames.
   q. Door hardware.
   r. Windows.
   s. Glazing.
   t. Metal studs.
   u. Gypsum board.
   v. Acoustical tile and panels.
   w. Carpet.
   x. Carpet pad.
   y. Demountable partitions.
   z. Equipment.

aa. Cabinets.

bb. Plumbing fixtures.

cc. Piping.

dd. Supports and hangers.

ee. Valves.

ff. Sprinklers.

gg. Mechanical equipment.

hh. Refrigerants.

ii. Electrical conduit.

jj. Copper wiring.

kk. Lighting fixtures.

ll. Lamps.

mm. Ballasts.

nn. Electrical devices.

oo. Switchgear and panelboards.

pp. Transformers.

2. Construction Waste:

a. Site-clearing waste (including Green Waste, Soil, Rock).

b. Masonry and CMU.

c. Lumber.

d. Wood sheet materials.

e. Wood trim.

f. Metals.

g. Roofing.

h. Insulation.

i. Carpet and pad.

j. Gypsum board.

k. Piping.

l. Electrical conduit.

m. Packaging: Regardless of salvage/recycle goal indicated above, salvage or recycle 100 percent of the following uncontaminated packaging materials:

1) Paper.

2) Cardboard.

3) Boxes.

4) Plastic sheet and film.

5) Polystyrene packaging.

6) Wood crates.

7) Plastic pails.

1.05 SUBMITTALS

A. Waste Management Plan: Submit 3 copies of plan within 30 days of date established for the Notice to Proceed.

B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit three copies of report. Include separate reports for demolition and construction waste. Failure to submit this report may render the Payment Application incomplete and delay payment. Include the following information(the Progress Reports may be submitted in a form similar to Table 2 of Appendix A):

1. Material category.

2. Generation point of waste.

3. Total quantity of waste in tons.

4. Quantity of waste salvaged, both estimated and actual in tons.

5. Quantity of waste recycled, both estimated and actual in tons.

6. Total quantity of waste recovered (salvaged plus recycled) in tons.

7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

8. Records (Donations, Sales, Recycling/Processing, Landfill/Incinerator) as described in the following paragraph)

C. Before request for Substantial Completion, submit:

1. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

D. Qualification Data: For Waste Management Coordinator and refrigerant recovery technician.

E. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.06 QUALITY ASSURANCE

A. Waste Management Coordinator Qualifications: Submit qualifications of individual designated as Waste Management Coordinator, including resume and past related projects.

B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

C. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

PART 2 - PRODUCTS

2.01 MATERIALS – Recycled-content, salvaged, or otherwise resource-efficient products are specified in appropriate sections.

PART 3 - EXECUTION

3.01 SALVAGING DEMOLITION WASTE

A. First consideration shall be given to salvage for reuse since little or no re-processing is necessary for this method, and less pollution is created when items are reused in their original form. Sale or donation of waste suitable for reuse shall be considered.

B. Salvaged Items for Reuse in the Work:
   1. Clean salvaged items.
   2. Pack or crate items after cleaning. Identify contents of containers.
   3. Store items in a secure area until installation.
   4. Protect items from damage during transport and storage.
   5. Items shall meet or exceed specification requirements.
   6. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

C. Salvaged Items for Sale and Donation: Sale not permitted on Project site. Labor for loading donated items is acceptable to local trade practices; union labor if applicable.

D. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.

E. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.

F. Metals: Separate metals by type.

G. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.

H. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.

I. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
   1. Separate suspension system, trim, and other metals from panels and tile and sort with other metals.

J. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
   1. Store clean, dry carpet and pad in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.

K. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather. Properly dispose of liquids.

L. Plumbing Fixtures: Separate by type and size.

M. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.

N. Lighting Fixtures: Separate lamps by type and protect from breakage.

O. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.

P. Conduit: Reduce conduit to straight lengths and store by type and size.

3.02 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Hazardous Materials:
   1. Materials separated for recycling must be clean: materials must not contain contaminants such as lead-based paint, asbestos, PCB’s, or Freon.

   2. Manage hazardous waste materials separately from recyclable materials.

C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
   1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
      a. Make sure bins are in convenient locations as close as possible to where material is being generated.

      b. Inspect containers and bins for contamination and remove contaminated materials if found.

   2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

   3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.

   4. Store components off the ground and protect from the weather.

   5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.03 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator currently permitted to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.

2. Remove and transport debris in a manner that will prevent spillage.

B. Burning: Do not burn waste materials.

C. Disposal: Transport waste materials off Owner's property and legally dispose of them at a permitted landfill.

END OF SECTION 01524

TABLE 1: WASTE IDENTIFICATION

Material	Est. Qty.	Est. tons *	Point of Generation	Comments/Assumptions

* Avg volume-to-weight conversions are:

Mixed waste	5.7 yds/ton
Wood	6.7 yds/ton
Cardboard	20 yds/ton
Drywall	4 yds/ton
Rubble	1.4 yds/ton

SECTION 01575 - TEMPORARY CONTROLS - AIR QUALITY REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. This section describes the steps that the Contractor shall perform to control odors or dusts generated by the equipment, materials, or actions of the construction process that may affect the quality of air to non-Contractor personnel.

1.02 REFERENCES

A. “Indoor Air Quality” published by the Sheetmetal and Air Conditioning Contractor’s National Association (SMACNA).

B. American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) standards as follows: 62; 55; 52; and 1.

C. “Indoor Air Quality in Public Buildings”, Volumes I and II, by Sheldon L, Handy RW, Hartwell TD, et al:, (Public Access Buildings Study).

D. National Particleboard Association (NPA) Standard for Formaldehyde Emission for Particleboard: NPA6.

1.03 DEFINITIONS

A. “A/C” (Air Cond.) means any or all of the equipment used to air condition a building or space.

B. “Air changes per hour” shall mean a number calculated by the maximum work area length in feet times the maximum work area width in feet times the maximum work area height in feet divided by 60 times the cubic feet per minute of air movement (L x W x H)/(60 x CFM).

C. “Odor” means something that can be detected by a person’s sense of smell whether objectionable or not to the person.

D. “Perceivable” means able to attain an awareness solely through the use of the human senses such as smell, sight, hearing, taste, and touch.

E. “VOC” means volatile organic compound, a compound containing a chemical constituent with a boiling point of less than 100 Deg C (volatile) and that contains carbon (organic).

F. “VOC emission rate” means the total amount of hydrocarbons emitted per area and unit of time as determined from the product and test method data supplied by the manufacturer or from data in the EPA Public Access Buildings Study.

1.04 SUBMITTALS

A. Submit a certification, which may be a copy of the product label or Material Safety Data Sheets (MSDS), of the VOC emission rate for all VOC containing products. MSDS sheets and labels are acceptable only if the VOC data is available and highlighted.

B. Submit VOC emission rates for all products containing any VOC compounds. Maintain a copy of the VOC certifications and emission rates (in a 3-ring binder) at the job site.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide temporary equipment including fans, blowers, tape, ducts, temporary wall materials and other similar items.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

A. If all particleboard products used in the Project meet NPA 6 Standard, and all other VOC-containing materials have certified VOC emission rates less than 100 micrograms/m²h, the requirements of PART 3 - EXECUTION are not required for VOC control.

B. Ensure the all work areas are isolated from those areas in which persons not employed by the Contractor will be present during construction, including those interconnected by air conditioning systems, adjacent buildings, and public areas.

1. Install isolation barriers so that odors and dust from the work areas are not perceivable in any surrounding occupied area, then remove the barriers before the final acceptance of the project; or

2. Provide local fresh and exhaust air that will be adequate to ensure odors and dust from the work areas are not perceivable in any surrounding occupied area. Meet the following minimum criteria:
   a. At least 4 air changes per hour continued from the start of any emission producing work until four hours after the conclusion of any emission producing work; and

   b. Exhaust the ventilating air to the outside of the building, at least 25 feet downwind of any opening to the building, surrounding buildings, or similar occupied areas, and at least 100 feet downwind of any building air supply intakes.

C. Upon notification by the Project Manager of an odor or dust complaint, immediately stop all odors and dust producing tasks, and then execute the requirements of subparagraph 3.01. B. 2. within 4 hours after Project Manager's notification.
   1. Compliance with subparagraph 3.01 B. 1. is not considered sufficient isolation in this instance.

   2. If the items in subparagraph 3.01 B. 2. were previously implemented without satisfactory results, increase the air changes to 8 per hour.

   3. The requirements in paragraph 3.01 D. may be performed in lieu of the requirements stated in paragraph 3.01 C. with prior permission from the Project Manager or shall be performed if requested by the Project Manager.

D. When the conditions described in subparagraphs 3.01 B. 1., 3.01 B. 2., or paragraph 3.01 C., are unable to maintain an air quality acceptable to 80 percent of the surrounding occupants, perform the following at no extra cost to the State:
   1. Immediately discontinue the use of the offending product(s) upon notification by the Project Manager;

   2. Perform the odor or dust generating task(s) during a non-occupied time such as evenings, weekends and holidays;

   3. Thoroughly clean any odor or dust affected area and equipment prior to occupancy; and

   4. Complete the odor or dust generating task(s) at least 16 hours prior to occupancy.

3.02 VENTILATION AFTER CONSTRUCTION

A. In all work areas of air conditioned new buildings perform a ventilation activity after construction has been completed but prior to occupancy according to the following:
   1. Notify the Project Manager prior to starting the work involved with these steps or immediately if any step cannot be successfully completed;

   2. Perform the normal start up procedures for all ventilation equipment;

   3. Inspect areas adjacent to air intakes for the existence of air containing odors and eliminate the cause of any odors before proceeding;

   4. Ensure that the air conditioning or ventilation outside make-up air dampers are operable, then set them to remain in the wide open position to provide for the maximum possible flow of outside air into the building;

   5. Set the mechanical cooling equipment such as chilled water and air conditioning compressors as appropriate to off so that the temperature will stay as high as possible;

   6. Open windows and doors (interior) for maximum ventilation of the work area. Use care to maintain security and to prevent infiltration of dirt, debris, dust, or impact on surrounding occupied areas. Maintain protection from the elements of weather, and site cleanliness;

   7. Turn on all of the available lights and heat producing equipment;

   8. Run all of the air handling units and ventilation fans continuously for 72 hours; and

   9. Continue the ventilation procedure beyond the 72 hours if the Project Manager determines it necessary. Provide additional exhaust fans if directed by the Project Manager. Ventilation beyond 72 hours is considered additional work provided the Contractor followed the steps required in this paragraph 3.02 A.

   10. When the Project Manager determines that the ventilation is sufficient, replace all air conditioning and ventilation air filters. Readjust the building's equipment to the design settings and perform the start up steps required after such adjustments are made.

B. In all work areas of a non-air conditioned new building, ventilate the building after completing construction and prior to occupancy. Perform ventilation as follows:
   1. Notify the Project Manager prior to starting the ventilation work or immediately if any step cannot be successfully completed;

   2. Inspect areas adjacent to portable fans for the existence of or potential air containing odors. Eliminate the cause of any odor or potential odor;

   3. Open windows and doors (interior and exterior) for maximum ventilation of the work area. Use care to maintain security and to prevent infiltration of dirt, debris, dust, or impact on surrounding occupied areas. Maintain protection from the elements of weather, and site cleanliness;

   4. Turn on all of the available lights and heat producing equipment;

   5. Ventilate the work area using portable supply and exhaust fans capable of providing one complete work area air change per hour for 72 hours; and

   6. Continue the ventilation procedure beyond the 72 hours if the Project Manager determines it necessary. Provide additional exhaust fans if directed by the Project

Manager. Ventilation beyond 72 hours is considered additional work provided the Contractor followed the steps required in this paragraph 3.02 B.

7. When the Project Manager determines that the ventilation is sufficient, remove the portable equipment.

C. In all work areas in an existing building, ventilate the building after completing construction and prior to occupancy. Perform ventilation as follows:
   1. Use the steps in paragraph 3.02 A. when the work area is air conditioned by air handling equipment that can be completely isolated from all air conditioning and ventilation systems supplying occupied areas;

   2. Otherwise, use the steps in paragraph 3.02 B.

END OF SECTION 01575

SECTION 01700 - EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes general procedural requirements governing execution of the Work including the following:

1. Construction layout. Field engineering and surveying.

2. General installation of products.

3. Progress cleaning.

4. Starting and adjusting.

5. Protection of installed construction.

6. Correction of the Work.

B. Related Sections

1. SECTION 01770 - CLOSEOUT PROCEDURES.

1.02 SUBMITTALS

A. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.03 NOTIFICATION

A. Contact the Project Manager and the Project Contact Person at least 3 working days prior to starting any onsite work.

1.04 PROJECT AND SITE CONDITIONS

A. Project Contract Limits (Contract Zone Limits) indicate only in general the limits of the work involved. Perform necessary and incidental work, which may fall outside of these demarcation lines. Confine construction activities within the Project Contract Limits and do not spread equipment and materials indiscriminately about the area.

B. Disruption of Utility Services: Prearrange work related to the temporary disconnection of electrical and other utility systems with the Project Contact Person listed in SECTION 00800 - SPECIAL CONDITIONS and the Project Manager. Unless a longer notification period is required elsewhere in the Contract Documents, notify the Project Manager at least 15 days in advance of any interruption of existing utility service. Time and duration of interruptions are subject to the Project Manager's approval. Keep the utility interruptions and duration to a minimum so as not to cause inconvenience or hardship to the facility. If temporary electrical or other utility systems hook-up is required, provide the necessary services. Pay for temporary services as part of the contract, unless specifically noted otherwise.

C. Contractor, Subcontractor(s) and their employees will not be allowed to park in zones assigned to Users or facility personnel. Subject to availability, the Project Manager may designate areas outside of the Contract Zone Limits to be used by the Contractor. Restore any lawn area damaged by construction activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 EXAMINING THE SITE

A. Contractor and Subcontractors are expected to visit the site and make due allowances for difficulties and contingencies to be encountered. Compare contract documents with work in place. Become familiar, with existing conditions, the conditions to be encountered in performing the Work, and the requirements of the drawings and specifications.

B. Verify construction lines, grades, dimensions and elevations indicated on the drawings before any clearing, excavation or construction begins. Bring any discrepancy to the attention of the Project Manager, and make any change in accordance with the Project Manager instruction.

C. Obtain all field measurements required for the accurate fabrication and installation of the Work included in this Contract. Verify governing dimensions and examine adjoining work on which the Contractor or Subcontractor's work is in any way dependent. Submit differences discovered during the verification work to the Project Manager for interpretations before proceeding with the associated work. Exact measurements are the Contractor's responsibility.

D. Furnish or obtain templates, patterns, and setting instructions as required for the installation of all Work. Verify dimensions in the field.

E. Contractor shall accept the site and the existing building(s) in the condition that exists at the time access is granted to begin the Work. Verify existing conditions and dimensions shown and other dimensions not indicated but necessary to accomplish the Work.

F. Locate all general reference points and take action to prevent their destruction. Lay out work and be responsible for lines, elevations and measurements and the work executed. Exercise precautions to verify figures and conditions shown on drawings before layout of work.

3.02 SITE UTILITIES AND TONING

A. Cooperate, coordinate and schedule work to maintain construction progress, and accommodate the operations and work of the owners of underground or overhead utility lines or other property in removing or altering the lines or providing new services.

B. Contact all the various utility companies before the start of the work to ascertain any existing utilities and to develop a full understanding of the utility requirements with respect to this Project. Furnish the Project Manager with evidence that the utility companies were contacted.

C. Should the Contractor discover the existence and location of utilities in the contract drawings are not correct, do not disturb the utilities and immediately notify the Project Manager.

D. Do not disturb or modify any utilities encountered, whether shown or not on the Contract Drawings, unless otherwise instructed in the drawings and specifications or as directed by the Project Manager. Repair and restore to pre-damaged condition any utilities or any other property damaged by construction activities.

E. Transfer to "Field Posted As-Built" drawings the location(s) and depth(s) of new and existing utilities that differ from the Contract Drawings. Locate by azimuth and distance and depth(s) from fixed referenced points.

F. Toning: Prior to the start of grading, or excavation or trenching work verify and confirm the presence, location and depth of existing underground utility lines in the area affected by the project, by "toning" or by other appropriate means acceptable to the Project Manager. The intent of this advanced toning is to afford the Project Manager an opportunity to identify utility lines that may or may not be shown on the drawings and issue a directive to address the existing conditions.

1. Perform toning using instruments specifically developed and designed for the detection of underground pipes and cable utilities.

2. Notify the Project Manager 48 hours in advance before toning operations. Provide information on the proposed toning method and other pertinent information.

G. Recording Toning Information: Upon completion of the toning operation, submit drawings that show the location and approximate depth of the existing and newly discovered utility lines. Identify the type of utility lines. Also, identify where utility lines indicated on the drawings are not shown in their approximate location or where new utility lines are found or pointed out in the field.

H. After ascertaining the exact location and depth of utilities within the project area, mark and protect the locations.
1. Acquaint personnel working near utilities with the type, size, location, depth of the utilities, and the consequences that might result from disturbances.

2. Do not start trenching or start similar operations until reasonable and appropriate precautions to protect the utilities are taken.

I. For newly identified utility lines, if directed by the Project Manager, manually excavate within 2-feet of the utility line to avoid damage. Under this directive, manual excavation is considered additional work.

J. Existing Irrigation Systems: Where work is located in areas with existing irrigation systems, Contractor shall test the existing systems and document all deficiencies prior to any work that may damage the existing systems.

3.03 FIELD MEASUREMENTS

A. Take field measurements to fit and install the Work properly. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress.

B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

C. Review of Contract Documents and Field Conditions: Submit a Request For Information (RFI) immediately upon discovery of the need for clarification of the Contract Documents. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.04 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to existing conditions. If discrepancies are discovered, notify the Project Manager promptly.

B. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.

3.05 FIELD ENGINEERING

A. Reference Points: Locate existing permanent or temporary benchmarks, control points and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
1. Do not change or relocate existing benchmarks or control points without the Project Manager's approval. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to the Project Manager before proceeding.

2. Replace lost or destroyed permanent benchmarks and control points promptly. Base all replacements on the original survey control points.

3.06 INSTALLATION

A. Install materials, items, fixtures required by the various Divisions and Sections of the Specifications in accordance with Contract Documents, by workers specially trained and skilled in performance of the particular type of work, to meet guarantee and regulatory agency requirements. Should the drawings or specifications be void of installation requirements, install the materials, items, and fixtures in accordance with the manufacturer's current specifications, recommendations, instructions and directions.

3.07 CUTTING AND PATCHING

A. Oversee cutting and patching of concrete, masonry, structural members and other materials where indicated on drawings and as required by job conditions. Unless noted elsewhere in the contract documents, do not cut or patch existing or new structural members without previously notifying the Project Manager.

B. Provide patch materials and workmanship of equal quality to that indicated on the drawings or specified for new work.

3.08 CLEANING

A. General: Clean the Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.

2. Do not hold waste more than 7 days unless approved otherwise by the Project Manager.

3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.

2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use only cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Cutting and Patching: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.

H. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

I. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

J. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

K. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.10 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.11 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer’s written instructions to provide proper temperature and relative humidity conditions.

3.12 CORRECTION OF THE WORK

A. Repair or replace defective construction. Restore damaged substrates and finishes. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair defective components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01700

SECTION 01715 - EXISTING CONDITIONS - ASBESTOS / LEAD / HAZARDOUS MATERIAL SURVEY

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes the results of the State's survey for Asbestos and Lead materials and is provided for the Contractor's information.

B. Related Sections include the following:

1. SECTION 13280 - REMOVAL AND DISPOSAL OF ASBESTOS-CONTAINING MATERIAL for requirements of all work which disturbs ASBESTOS.

2. SECTION 13283 - DISTURBANCE LEAD-CONTAINING MATERIAL for requirements of all work which disturbs LEAD.

3. SECTION 13288 - TESTING/AIR MONITORING for requirements of work specified.

1.02 ASBESTOS

A. The structure or structures to be renovated or modified under this contract were surveyed for the presence of asbestos containing building materials (ACBM), using 11-501 requirements. A copy of survey reports, are available from the State upon request.

1. The report(s) are available, even when no ACBM was found, for the Contractor's information. Review the attached report(s) for the basis on which the negative ACBM finding was made. Contractor may perform further surveys at its own expense, only if ACBM has not been previously surveyed in accordance with H.A.R. 11-501 (or H.A.R. 11-502 when applicable) requirements within the Contract limits and only with approval of the Project Manager. If ACBM is found, notify the Project Manager immediately. The State will reimburse the Contractor for the testing cost if ACBM is found. Contractor shall not test any suspect ACM previously tested.

2. If there is ACBM outside of the areas in which work will be performed, this ACBM shall not be disturbed in any way.

B. If applicable, notify employees, Subcontractors and all other persons engaged on the project of the presence of asbestos in the existing buildings in accordance with the requirements of 29 CFR 1926.1101.

C. In the event that work is required in any building or buildings on the site other than the one(s) designated within this project scope, request copies of the asbestos survey report(s) for such building(s) from the Project Manager. Based on the information contained in the additional survey(s), notify affected personnel per paragraph 1.02 B.

1.03 LEAD PAINT

A. Inform employees, Subcontractors and all other persons engaged in the project that contain lead paint is present in the existing building(s) and at the job site.

Conduct work in accordance with the requirements of Occupational Safety and Health Administration 29 CFR 1926.62 Lead.

B. All paint shall be considered to contain lead and treated as such until proven and/or confirmed to contain no lead.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 SURVEY attached

A. The report(s) listed below shall be used for informational purposes as it relates to the project limits as indicated in the Contract Plans and Specifications. **Information included in the reports which are not included within the project limits as indicated in the Contract Plans and Specifications shall not be included as part of the Contractor's work.**

1. Project Specific Asbestos and Lead Paint Survey Report, Building 46 MEDCOM Renovations, Hawaii Army National Guard Job No. 15H00033, 147 pages, dated November 5, 2025, prepared by EnvironMETeo Services, Inc.

END OF SECTION

EnvironMETeo Services, Inc.
Environmental / Industrial Health & Safety

Project Specific Asbestos and Lead Paint Survey Report

For:

Engineering Partners, Inc.

455 East Lanikaula Street

Hilo, Hawaii 96720

Facility Surveyed:

Building 46

1784 Shangrila Street

Kapolei, Hawaii 96707

Project:

Building 46 MEDCOM Renovations

Hawaii Army National Guard, Job No. 15H00033

Conducted by:

EnvironMETeo Services, Inc. (EMET)

94-520 Uke'e Street, Suite A

Waipahu, Hawaii 96797

Date of Report: November 5, 2025

EMET ID: 2504132

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Certification of Report

We certify that this report is based on a physical survey of EMET scope of work areas as impacted by this project at Kalaeloa Building 46, located at 1784 Shangrila Street, Kapolei, Hawaii. The survey included an inspection for asbestos-containing materials (ACM) and lead paint on surfaces/building components.

The survey was conducted by EnvironMETeo Services, Inc. (EMET) on September 17 and 22, 2025 and was limited to the following scope of work:

Asbestos/Lead Paint Investigation

1. Inspection, evaluation, and sample collection of suspect asbestos-containing materials by EPA-accredited inspectors in accordance with H.A.R. 11-501 from the following:

   Building 46

   - floors 1-3 areas impacted by new elevator
   - floors 1-3 walls scheduled for demolition

2. Lead paint inspection by EPA-accredited inspectors from the areas indicated in item 1.

The survey results are based on analyses of samples of suspect materials collected from visually and physically accessible areas/materials.

Bulk samples of suspect asbestos-containing materials taken during the survey were analyzed for asbestos content by a National Institute of Standards and Technology (NIST) accredited laboratory under the National Voluntary Laboratory Accreditation Program (NVLAP) for asbestos fiber analysis. Laboratory analyses performed by Polarized Light Microscopy (PLM) for asbestos identification are in accordance with U.S. Environmental Protection Agency (EPA) Test Method 600/R-93/116.

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Painted surfaces were tested for lead concentrations using an X-Ray Fluorescence (XRF) spectrum analyzer, a testing methodology approved by the EPA and the U.S. Department of Housing and Urban Development (HUD).

EMET makes no warranty and assumes no liability for the inappropriate use or misuse of this document.

Joseph Custino
Asbestos Building Inspector
Hawaii State Certification # HIASB-1094
Lead Based Paint Risk Assessor
Hawaii State Certification # PB-0667

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Summary

EnvironMETeo Services, Inc. (EMET) conducted a survey for asbestos-containing materials (ACM) and lead paint on surfaces/building components at Building 46, located at 1784 Shangrila Street, Kapolei, Hawaii, on September 17 and 22, 2025. Joseph Custino of EMET conducted the survey in accordance with Hawaii Administrative Rules (H.A.R) 11-501 and EMET's scope of work. The survey was requested and authorized by Keith Kanetani of Engineering Partners, Inc. and was performed in preparation for planned renovations.

This report is for informational purposes only and should only be used as such. This report is not a specification and should not be used as such.

Asbestos Summary

Asbestos was not detected in the samples collected for this survey.

Lead Paint Summary

Lead-based paint (LBP) was not detected on the painted surfaces/components.

Paints on the following surfaces contain lead in a concentration of less than 1.0 mg/cm^2. The paints on theses surfaces are lead-containing paint (LCP).

LCP

- white paint on concrete columns, 1st, 2nd, and 3rd floors
- white paint on concrete ceiling, 1st floor

Paint on testing combinations similar to those identified with LCP should also be treated as LCP.

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Some of the painted surfaces tested using the XRF analyzer may have paint with lead at concentrations below the instrument level of detection (0.01 mg/cm^2).

Workers disturbing paint which may cause exposure to airborne lead must abide by the OSHA Lead in Construction standard.

Asbestos-Containing Material

The State of Hawaii, OSHA, and EPA define ACM as any material containing more than one percent asbestos by area. This definition can be found in the following regulations:

- Hawaii Administrative Rules (HAR), Title 11, Department of Health, Chapter 501 (11-501), *Asbestos Requirements.*

- 29 CFR 1926.1101 Occupational Safety and Health Administration (OSHA), *Asbestos Standards for the Construction Industry.*

- EPA 40 CFR Part 61, Subpart M - National Emission Standards for Hazardous Air Pollutants (NESHAP), Final Rule revised July 20, 2004, *National Emission Standard for Asbestos.*

Asbestos Bulk Sampling

A total of 114 samples of suspect ACM were collected and analyzed. The samples were placed in plastic containers with a unique identification number assigned to each sample and entered on a field data sheet. The sample locations were indicated on the field drawings shown in Appendix B.

Samples were collected of the following observed suspect asbestos-containing material:

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1st Floor Suspect ACM

12" x 12" light gray w/gray streaks vinyl floor tile (VFT)	beige adhesive beneath 12" x 12" light gray w/gray streaks VFT
24” x 24” gray w/dark gray streaks VFT	adhesive beneath 24” x 24” gray w/dark gray streaks VFT
4" brown covebase	beige adhesive beneath 4" brown covebase
4" black covebase	beige adhesive beneath 4" black covebase
gray leveling compound	white grout
gray grout	black adhesive beneath gray grout
gypsum wallboard/mudjoint wall and ceiling system	white caulking at door frame
white caulking at plumbing fixture	-

2nd Floor Suspect ACM

12" x 12" light gray w/gray streaks VFT	beige adhesive beneath 12" x 12" light gray w/gray streaks VFT
24” x 24” gray w/gray streaks VFT	beige adhesive beneath 24” x 24” gray w/gray streaks VFT
4" black covebase	beige adhesive beneath 4" black covebase
4" brown covebase	beige adhesive beneath 4" brown covebase
gray leveling compound	gypsum wallboard/mudjoint wall system
white caulking at door frame	black caulking at window frame

3rd Floor Suspect ACM

12" x 12" light gray w/gray streaks VFT	beige adhesive beneath 12" x 12" light gray w/gray streaks VFT
24” x 24” gray w/gray streaks VFT	beige adhesive beneath 24” x 24” gray w/gray streaks VFT
4" black covebase	beige adhesive beneath 4" black covebase
4" brown covebase	beige adhesive beneath 4" brown covebase

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gray leveling compound	white caulking at door frame
black caulking at window frame	-

Asbestos Analyses

Bulk samples were analyzed for asbestos using Polarized Light Microscopy (PLM) for the identification of asbestos, in accordance with EPA Test Method 600/R-93/116. Laboratory analytical data sheets are provided in Appendix A.

Based on the visual inspection and laboratory results of the samples collected, ACM was not detected as a result of this survey.

Lead Paint

U.S. Department of Housing and Urban Development (HUD) *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing*, 2012 Edition, defines lead-based paint (LBP) as paint with a lead content greater than or equal to 1.0 milligrams per square centimeter (mg/cm^2). The concentration 1.0 mg/cm^2 is equivalent to 5000 parts per million (ppm) and 0.5 percent weight (% wt.). EPA regulation 40 CFR Part 745 *Lead-based Paint Activities* similarly defines LBP as stated in HUD regulations.

OSHA regulates any activity disturbing paint that contains lead (referred to as lead-containing paint or LCP), even if the lead content is below the EPA/HUD standard for lead-based paint.

XRF test results of painted surfaces equal to or greater than 1.0 mg/cm^2 are defined as LBP in accordance with EPA and HUD regulations.

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Lead Paint Sampling and Analyses

Painted surfaces were analyzed for lead using an XRF analyzer. A total of 56 analyses of painted surfaces/building components and calibrations were performed. A unique identification number was assigned to each test location and entered on a field data sheet. The ID number, location, description, and lead concentration of each sample is indicated in the XRF analyzer test results, which are provided in Appendix C.

Based on XRF test results, LBP was not detected on the surfaces/building components tested.

The paints on the following tested surfaces/building components are confirmed to contain lead in concentrations of less than 1.0 mg/cm^2. The paints on these surfaces are LCP. Testing combinations similar to those identified with LCP should also be treated as having LCP.

Some of the painted surfaces tested may have paint with lead at concentrations below the instrument level of detection (0.01 mg/cm^2). Workers disturbing paint which may cause airborne exposure to lead must abide by the OSHA Lead in Construction standard.

LCP Details

Location	Testing Combination Component/Substrate	Condition	Color
1st floor interior	column / concrete	intact	white
2nd floor interior	column / concrete	intact	white
2nd floor interior	ceiling / concrete	intact	white
3rd floor interior	column / concrete	intact	white

Painted surfaces may vary in paint type, color, and condition. Any damaged painted surfaces may vary significantly from area to area in terms of the condition and degree of

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damage. The results provide the lead content of all paint layers in a tested surface, as there may be more than one layer of paint on the tested surface.

Limitations

This hazardous materials survey was performed to identify suspect materials in areas scheduled for planned renovations. Original building plans and specifications and those for past renovations, if any, were not available for review.

Because of these limitations, the highly variable nature of building construction, and the limits to the survey as defined by EMET's scope of work, the potential remains for undiscovered hazardous materials.

This report is for informational purposes only and should only be used as such. This report is not a specification and should not be used as such.

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Appendix A

Asbestos Survey Report

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Building Information Sheet

Job Code /EMET ID	Client Name	Inspection date
2504132	Engineering Partners, Inc.	9/22/2025

Building Number	Building Name	No. of Floors Surveyed
46	BUILDING 46	3

Location

1784 Shangrila St.
Kapolei, HI 96707

No. of Other Levels Surveyed: 0

Building Construction Type

LOAD BEARING MASONRY

Structural Concrete with: Metal Decks, Flat Slab, Beam/Joist or Waffle Slabs; Structural Tees
Steel Frame
Wood Frame
Load Bearing Masonry

Building Use		% Floor Space
Use #1	MEDICAL OFFICES	100
Use #2		
Use #3		

Academic Classes, Administration Offices, Food Services, Dormitory, Mechanical Spaces, Gymnasium, Laboratory, Library, Residential or Other (Specify)

ACBM PRESENT?

NO

YES = PRESENT
NO = NOT PRESENT
ASM = ASSUMED

Inspector Identification

Name: Joseph Custino
State of HI Certification No. HIASB-1094
State of HI Certification Expiration Date: 9/3/2026
Building Inspector Certification Exp. Date: 11/25/2025

Specific areas surveyed

areas impacted by new elevator and demolition of interior walls

Inspector Comments

EMET's scope of work was limited to the areas listed above in Specific Areas Surveyed. This report is not a specification for the removal of asbestos-containing material and should not be used as such. Results of the presence or absence of asbestos are based on the survey and on analyses of the suspect materials encountered. Original building plans and specifications were not available for review. Therefore, because of these limitations and the highly variable nature of building construction, the potential remains for undiscovered ACM. EMET makes no warranty and assumes no liability for the inappropriate use or misuse of this document.

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Unified Homogeneous/Sample Area ACM - Space and Salient Cross Reference

Building ID and Name

46 | BUILDING 46

Building Location

1784 Shangrila St.
Kapolei, HI 96707

EMET ID

2504132

For the ACM - Space Identified as:

132-46-1

Inspection Date(s): 9/22/2025

Unified Sample Area	Homogeneous Sample Area or Salient Description	Comments	ACM Present			Material Type*			Response Action	Estimated Cost to Remove
			Suspected	Confirmed	Friable	T	DC	PD		
132-46-1A	12" X 12" LT. GRAY W/GRAY STREAKS VFT		YES	NO						
132-46-1B	BEIGE ADHESIVE BENEATH 12" X 12" LT. GRAY W/GRAY STREAKS VFT		YES	NO						
132-46-1C	GRAY LEVELING COMPOUND		YES	NO						
132-46-1D	4" BROWN COVEBASE		YES	NO						
132-46-1E	BEIGE ADHESIVE BENEATH 4" BROWN COVEBASE		YES	NO						
132-46-1F	WHITE CAULKING AT DOOR FRAME		YES	NO						

*** Refers to Material Type and Damage Conditions**

T = Material Type:	DC = Damage Condition:	PD = Potential Damage Condition:
S = Surfacing	ND = No Damage	NPD = No Potential Damage
M = Miscellaneous	D = Damaged	PD = ACBM w/ Potential Damage
T = Thermal Systems	SD = Significant Damage	PSD = Potential Significant Damage

**** Recommended Response Actions:**

1. Isolate area and restrict access. Remove or repair ASAP.
2. Continue Operations and Maintenance (O&M) program. Remove or repair ASAP or reduce potential for disturbance.

3-5. Repair, continue O&M. Lower number indicates higher priority if all repair cannot be done immediately.

6-7. Continue O&M. Take preventive measures to reduce disturbance. Number indicates priority for removal.

8. Continue O&M until major renovation or demolition requires removal under NESHAPS, or until hazard assessment factors change.

Note: An O&M program may include enclosure and encapsulation.

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Unified Homogeneous/Sample Area ACM - Space and Salient Cross Reference

Building ID and Name

46 | BUILDING 46

Building Location

1784 Shangrila St.
Kapolei, HI 96707

EMET ID

2504132

For the ACM - Space Identified as:

132-46-1

Inspection Date(s): 9/22/2025

Unified Sample Area	Homogeneous Sample Area or Salient Description	Comments	ACM Present			Material Type*			Response Action	Estimated Cost to Remove
			Suspected	Confirmed	Friable	T	DC	PD		
132-46-1G	24”X24” GRAY W/DK. GRAY STREAKS VFT		YES	NO						
132-46-1H	ADHESIVE BENEATH 24”X24” GRAY W/DK. GRAY STREAKS VFT		YES	NO						
132-46-1I	4" BLACK COVEBASE		YES	NO						
132-46-1J	BEIGE ADHESIVE BENEATH 4" BLACK COVEBASE		YES	NO						
132-46-1K	GRAY GROUT		YES	NO						
132-46-1L	BLACK ADHESIVE BENEATH GRAY GROUT		YES	NO						

*** Refers to Material Type and Damage Conditions**

T = Material Type:	DC = Damage Condition:	PD = Potential Damage Condition:
S = Surfacing	ND = No Damage	NPD = No Potential Damage
M = Miscellaneous	D = Damaged	PD = ACBM w/ Potential Damage
T = Thermal Systems	SD = Significant Damage	PSD = Potential Significant Damage

**** Recommended Response Actions:**

1. Isolate area and restrict access. Remove or repair ASAP.
2. Continue Operations and Maintenance (O&M) program. Remove or repair ASAP or reduce potential for disturbance.

3-5. Repair, continue O&M. Lower number indicates higher priority if all repair cannot be done immediately.

6-7. Continue O&M. Take preventive measures to reduce disturbance. Number indicates priority for removal.

8. Continue O&M until major renovation or demolition requires removal under NESHAPS, or until hazard assessment factors change.

Note: An O&M program may include enclosure and encapsulation.

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Unified Homogeneous/Sample Area ACM - Space and Salient Cross Reference

Building ID and Name

46 | BUILDING 46

For the ACM - Space Identified as:

132-46-1

Building Location

1784 Shangrila St.
Kapolei, HI 96707

EMET ID

2504132

Inspection Date(s): 9/22/2025

Unified Sample Area	Homogeneous Sample Area or Salient Description	Comments	ACM Present			Material Type*			Response Action	Estimated Cost to Remove
			Suspected	Confirmed	Friable	T	DC	PD		
132-46-1M	WHITE GROUT		YES	NO						
132-46-1N	GYPSUM WALLBOARD/MUDJOINT WALL AND CEILING SYSTEM		YES	NO						
132-46-1O	WHITE CAULKING AT PLUMBING FIXTURE		YES	NO						

*** Refers to Material Type and Damage Conditions**

T = Material Type:	DC = Damage Condition:	PD = Potential Damage Condition:
S = Surfacing	ND = No Damage	NPD = No Potential Damage
M = Miscellaneous	D = Damaged	PD = ACBM w/ Potential Damage
T = Thermal Systems	SD = Significant Damage	PSD = Potential Significant Damage

**** Recommended Response Actions:**

1. Isolate area and restrict access. Remove or repair ASAP.
2. Continue Operations and Maintenance (O&M) program. Remove or repair ASAP or reduce potential for disturbance.

3-5. Repair, continue O&M. Lower number indicates higher priority if all repair cannot be done immediately.

6-7. Continue O&M. Take preventive measures to reduce disturbance. Number indicates priority for removal.

8. Continue O&M until major renovation or demolition requires removal under NESHAPS, or until hazard assessment factors change.

Note: An O&M program may include enclosure and encapsulation.

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-1A	12" X 12" LT. GRAY W/GRAY STREAKS VFT	132-46-1A

Document Number:

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

12" X 12" LT. GRAY W/GRAY STREAKS VFT

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-1A1, 132-46-1A2, 132-46-1A3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-1A	12" X 12" LT. GRAY W/GRAY STREAKS VFT

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-1A1	0	12" X 12" LT. GRAY W/GRAY STREAKS VFT	See Sketch 132-46-1
132-46-1A2	0	12" X 12" LT. GRAY W/GRAY STREAKS VFT	See Sketch 132-46-1
132-46-1A3	0	12" X 12" LT. GRAY W/GRAY STREAKS VFT	See Sketch 132-46-1

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP®

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

NVLAP LAB CODE 101807-0

Approved Signatory:

Sample/Homogeneous Area: 132-46-1A Analysis Date: 9/25/2025 Report Date: 9/25/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-001	132-46-1A1	gray, white	Yes	No	-	-	misc. part.	
					-	-	100	
132-004	132-46-1A2	gray, white	Yes	No	-	-	misc. part.	
					-	-	100	
132-007	132-46-1A3	gray, white	Yes	No	-	-	misc. part.	
					-	-	100	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
State of Hawaii Asbestos Requirements mandates all samples to be collected by a certified Asbestos Inspector in accordance with § 11-501, 11-502, and 11-504. Results of samples collected by someone other than a certified Asbestos Inspector may be invalid.
Note: EPA, OSHA, and HIOSH define “asbestos-containing material” as any material or product which contains more than one percent asbestos.

*Laboratory test report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. *Laboratory test report relates only to items tested. *Asbestos fiber percentage is approximate - performed by visual observation only, unless otherwise indicated.	*This method is not reliable for analysis of tile or other materials when fiber size is less than 10 microns and/or below detection limit (appr. 1%) of current PLM techniques. *Samples analyzed as received by the laboratory, interpretation is responsibility of the client.

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Document Number	Unified Sample Area Number
132-46-1B	BEIGE ADHESIVE BENEATH 12" X 12" LT. GRAY W/GRAY STREAKS VFT		132-46-1B

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

BEIGE ADHESIVE BENEATH 12" X 12" LT. GRAY W/GRAY STREAKS VFT

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-1B1, 132-46-1B2, 132-46-1B3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-1B	BEIGE ADHESIVE BENEATH 12" X 12" LT. GRAY W/GRAY STREAKS VFT

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-1B1	0	BEIGE ADHESIVE BENEATH 12" X 12" LT. GRAY W/GRAY STREAKS VFT	See Sketch 132-46-1
132-46-1B2	0	BEIGE ADHESIVE BENEATH 12" X 12" LT. GRAY W/GRAY STREAKS VFT	See Sketch 132-46-1
132-46-1B3	0	BEIGE ADHESIVE BENEATH 12" X 12" LT. GRAY W/GRAY STREAKS VFT	See Sketch 132-46-1

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP®

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

NVLAP LAB CODE 101807-0

Approved Signatory:

Sample/Homogeneous Area: 132-46-1B Analysis Date: 9/25/2025 Report Date: 9/25/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-002	132-46-1B1	yellow	Yes	No	-	-	misc. part.	
					-	-	100	
132-005	132-46-1B2	yellow	Yes	No	-	-	misc. part.	
					-	-	100	
132-008	132-46-1B3	yellow	Yes	No	-	-	misc. part.	
					-	-	100	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
State of Hawaii Asbestos Requirements mandates all samples to be collected by a certified Asbestos Inspector in accordance with § 11-501, 11-502, and 11-504. Results of samples collected by someone other than a certified Asbestos Inspector may be invalid.
Note: EPA, OSHA, and HIOSH define “asbestos-containing material” as any material or product which contains more than one percent asbestos.

*Laboratory test report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. *Laboratory test report relates only to items tested. *Asbestos fiber percentage is approximate - performed by visual observation only, unless otherwise indicated.	*This method is not reliable for analysis of tile or other materials when fiber size is less than 10 microns and/or below detection limit (appr. 1%) of current PLM techniques. *Samples analyzed as received by the laboratory, interpretation is responsibility of the client.

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025
Document Number	**Material ID and Description**		**Unified Sample Area Number**
	132-46-1C	GRAY LEVELING COMPOUND	132-46-1C
	Drawing/Sketch Number		

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

GRAY LEVELING COMPOUND

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -
Visible	**Reachable**	**Texture**
- -	- -	- -
Barriers	**Ventilation** / **If Yes**	**Friable Surface**
- -	- - / - -	- - / - -
Air Movement	**Proximity to Repair Items**	**Activity**
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-1C1, 132-46-1C2, 132-46-1C3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-1C	GRAY LEVELING COMPOUND

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-1C1	0	GRAY LEVELING COMPOUND	See Sketch 132-46-1
132-46-1C2	0	GRAY LEVELING COMPOUND	See Sketch 132-46-1
132-46-1C3	0	GRAY LEVELING COMPOUND	See Sketch 132-46-1

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP®

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

NVLAP LAB CODE 101807-0

Approved Signatory:

Sample/Homogeneous Area: 132-46-1C Analysis Date: 9/25/2025 Report Date: 9/25/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-003	132-46-1C1	gray	Yes	No	-	celllulose	misc. part.	
					-	5	95	
132-006	132-46-1C2	gray	Yes	No	-	celllulose	misc. part.	
					-	5	95	
132-009	132-46-1C3	gray	Yes	No	-	celllulose	misc. part.	
					-	5	95	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
State of Hawaii Asbestos Requirements mandates all samples to be collected by a certified Asbestos Inspector in accordance with § 11-501, 11-502, and 11-504. Results of samples collected by someone other than a certified Asbestos Inspector may be invalid.
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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-1D	4" BROWN COVEBASE	132-46-1D

Document Number	Drawing/Sketch Number	

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

4" BROWN COVEBASE

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-1D1, 132-46-1D2, 132-46-1D3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-1D	4" BROWN COVEBASE

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-1D1	0	4" BROWN COVEBASE	See Sketch 132-46-1
132-46-1D2	0	4" BROWN COVEBASE	See Sketch 132-46-1
132-46-1D3	0	4" BROWN COVEBASE	See Sketch 132-46-1

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP LAB CODE 101807-0

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

Approved Signatory:

Sample/Homogeneous Area: 132-46-1D Analysis Date: 9/25/2025 Report Date: 9/25/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-010	132-46-1D1	brown	Yes	No	-	-	misc. part.	
					-	-	100	
132-012	132-46-1D2	brown	Yes	No	-	-	misc. part.	
					-	-	100	
132-014	132-46-1D3	brown	Yes	No	-	-	misc. part.	
					-	-	100	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-1E	BEIGE ADHESIVE BENEATH 4" BROWN COVEBASE	132-46-1E

Document Number:

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

BEIGE ADHESIVE BENEATH 4" BROWN COVEBASE

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-1E1, 132-46-1E2, 132-46-1E3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-1E	BEIGE ADHESIVE BENEATH 4" BROWN COVEBASE

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-1E1	0	BEIGE ADHESIVE BENEATH 4" BROWN COVEBASE	See Sketch 132-46-1
132-46-1E2	0	BEIGE ADHESIVE BENEATH 4" BROWN COVEBASE	See Sketch 132-46-1
132-46-1E3	0	BEIGE ADHESIVE BENEATH 4" BROWN COVEBASE	See Sketch 132-46-1

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP®

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

NVLAP LAB CODE 101807-0

Approved Signatory:

Sample/Homogeneous Area: 132-46-1E Analysis Date: 9/25/2025 Report Date: 9/25/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-011	132-46-1E1	beige	Yes	No	-	-	misc. part.	
					-	-	100	
132-013	132-46-1E2	beige	Yes	No	-	-	misc. part.	
					-	-	100	
132-015	132-46-1E3	beige	Yes	No	-	-	misc. part.	
					-	-	100	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
State of Hawaii Asbestos Requirements mandates all samples to be collected by a certified Asbestos Inspector in accordance with § 11-501, 11-502, and 11-504. Results of samples collected by someone other than a certified Asbestos Inspector may be invalid.
Note: EPA, OSHA, and HIOSH define “asbestos-containing material” as any material or product which contains more than one percent asbestos.

*Laboratory test report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. *Laboratory test report relates only to items tested. *Asbestos fiber percentage is approximate - performed by visual observation only, unless otherwise indicated.	*This method is not reliable for analysis of tile or other materials when fiber size is less than 10 microns and/or below detection limit (appr. 1%) of current PLM techniques. *Samples analyzed as received by the laboratory, interpretation is responsibility of the client.

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025
Material ID and Description			
Document Number	132-46-1F	WHITE CAULKING AT DOOR FRAME	Unified Sample Area Number
	Drawing/Sketch Number		
			132-46-1F

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

WHITE CAULKING AT DOOR FRAME

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -
Visible	**Reachable**	**Texture**
- -	- -	- -
Barriers	**Ventilation** / **If Yes**	**Friable Surface**
- -	- - / - -	- - / - -
Air Movement	**Proximity to Repair Items**	**Activity**
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-1F1, 132-46-1F2, 132-46-1F3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-1F	WHITE CAULKING AT DOOR FRAME

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-1F1	0	WHITE CAULKING AT DOOR FRAME	See Sketch 132-46-1
132-46-1F2	0	WHITE CAULKING AT DOOR FRAME	See Sketch 132-46-1
132-46-1F3	0	WHITE CAULKING AT DOOR FRAME	See Sketch 132-46-1

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP®

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

NVLAP LAB CODE 101807-0

Approved Signatory:

Sample/Homogeneous Area: 132-46-1F Analysis Date: 9/25/2025 Report Date: 9/25/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-016	132-46-1F1	white	Yes	No	-	-	misc. part.	
					-	-	100	
132-017	132-46-1F2	white	Yes	No	-	-	misc. part.	
					-	-	100	
132-018	132-46-1F3	white	Yes	No	-	-	misc. part.	
					-	-	100	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
State of Hawaii Asbestos Requirements mandates all samples to be collected by a certified Asbestos Inspector in accordance with § 11-501, 11-502, and 11-504. Results of samples collected by someone other than a certified Asbestos Inspector may be invalid.
Note: EPA, OSHA, and HIOSH define “asbestos-containing material” as any material or product which contains more than one percent asbestos.

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-1G	24”X24” GRAY W/DK. GRAY STREAKS VFT	132-46-1G

Document Number:

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

24”X24” GRAY W/DK. GRAY STREAKS VFT

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

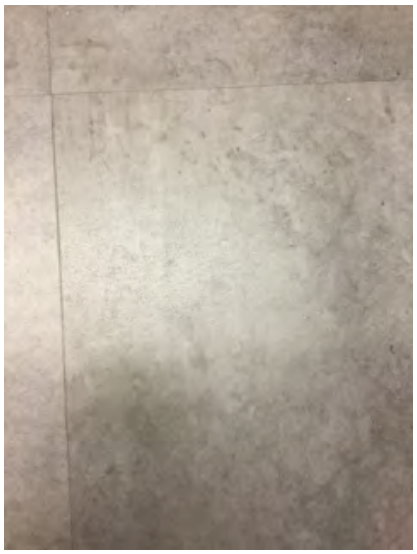
Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-1G1, 132-46-1G2, 132-46-1G3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH



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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-1G	24”X24” GRAY W/DK. GRAY STREAKS VFT

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-1G1	0	24”X24” GRAY W/DK. GRAY STREAKS VFT	See Sketch 132-46-1
132-46-1G2	0	24”X24” GRAY W/DK. GRAY STREAKS VFT	See Sketch 132-46-1
132-46-1G3	0	24”X24” GRAY W/DK. GRAY STREAKS VFT	See Sketch 132-46-1

Inspector’s Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP LAB CODE 101807-0

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

Approved Signatory:

Sample/Homogeneous Area: 132-46-1G Analysis Date: 9/26/2025 Report Date: 9/26/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-061	132-46-1G1	gray	Yes	No	-	-	misc. part.	
					-	-	100	
132-063	132-46-1G2	gray	Yes	No	-	-	misc. part.	
					-	-	100	
132-065	132-46-1G3	gray	Yes	No	-	-	misc. part.	
					-	-	100	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-1H	ADHESIVE BENEATH 24”X24” GRAY W/DK. GRAY STREAKS VFT	132-46-1H

Document Number	Drawing/Sketch Number	

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

ADHESIVE BENEATH 24”X24” GRAY W/DK. GRAY STREAKS VFT

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

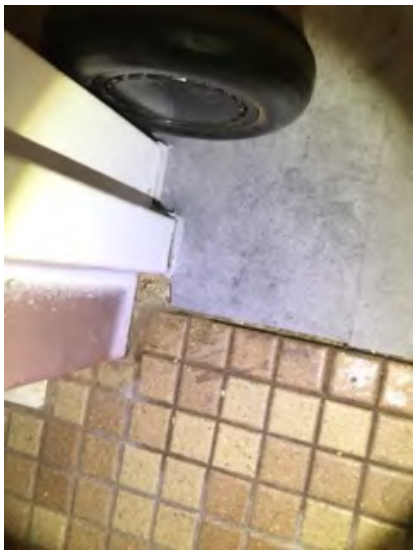
Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-1H1, 132-46-1H2, 132-46-1H3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH



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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-1H	ADHESIVE BENEATH 24”X24” GRAY W/DK. GRAY STREAKS VFT

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-1H1	0	ADHESIVE BENEATH 24”X24” GRAY W/DK. GRAY STREAKS VFT	See Sketch 132-46-1
132-46-1H2	0	ADHESIVE BENEATH 24”X24” GRAY W/DK. GRAY STREAKS VFT	See Sketch 132-46-1
132-46-1H3	0	ADHESIVE BENEATH 24”X24” GRAY W/DK. GRAY STREAKS VFT	See Sketch 132-46-1

Inspector’s Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP LAB CODE 101807-0

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

Approved Signatory:

Sample/Homogeneous Area: 132-46-1H Analysis Date: 9/26/2025 Report Date: 9/26/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-062	132-46-1H1	clear	Yes	No	-	-	misc. part.	
					-	-	100	
132-064	132-46-1H2	clear	Yes	No	-	-	misc. part.	
					-	-	100	
132-066	132-46-1H3	clear	Yes	No	-	-	misc. part.	
					-	-	100	

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Document Number	Unified Sample Area Number
132-46-1I	4" BLACK COVEBASE		132-46-1I

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

4" BLACK COVEBASE

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-1I1, 132-46-1I2, 132-46-1I3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-1I	4" BLACK COVEBASE

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-1I1	0	4" BLACK COVEBASE	See Sketch 132-46-1
132-46-1I2	0	4" BLACK COVEBASE	See Sketch 132-46-1
132-46-1I3	0	4" BLACK COVEBASE	See Sketch 132-46-1

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP LAB CODE 101807-0

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

Approved Signatory:

Sample/Homogeneous Area: 132-46-1I Analysis Date: 9/26/2025 Report Date: 9/26/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-067	132-46-1I1	black	Yes	No	-	-	misc. part.	
					-	-	100	
132-069	132-46-1I2	black	Yes	No	-	-	misc. part.	
					-	-	100	
132-071	132-46-1I3	black	Yes	No	-	-	misc. part.	
					-	-	100	

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-1J	BEIGE ADHESIVE BENEATH 4" BLACK COVEBASE	132-46-1J

Document Number:

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

BEIGE ADHESIVE BENEATH 4" BLACK COVEBASE

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

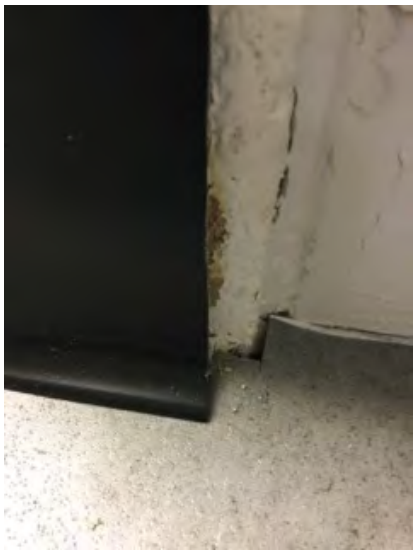
Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-1J1, 132-46-1J2, 132-46-1J3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH



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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-1J	BEIGE ADHESIVE BENEATH 4" BLACK COVEBASE

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-1J1	0	BEIGE ADHESIVE BENEATH 4" BLACK COVEBASE	See Sketch 132-46-1
132-46-1J2	0	BEIGE ADHESIVE BENEATH 4" BLACK COVEBASE	See Sketch 132-46-1
132-46-1J3	0	BEIGE ADHESIVE BENEATH 4" BLACK COVEBASE	See Sketch 132-46-1

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP®

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

NVLAP LAB CODE 101807-0

Approved Signatory:

Sample/Homogeneous Area: 132-46-1J Analysis Date: 9/26/2025 Report Date: 9/26/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-068	132-46-1J1	beige	Yes	No	-	-	misc. part.	
					-	-	100	
132-070	132-46-1J2	beige	Yes	No	-	-	misc. part.	
					-	-	100	
132-072	132-46-1J3	beige	Yes	No	-	-	misc. part.	
					-	-	100	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
State of Hawaii Asbestos Requirements mandates all samples to be collected by a certified Asbestos Inspector in accordance with § 11-501, 11-502, and 11-504. Results of samples collected by someone other than a certified Asbestos Inspector may be invalid.
Note: EPA, OSHA, and HIOSH define “asbestos-containing material” as any material or product which contains more than one percent asbestos.

*Laboratory test report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. *Laboratory test report relates only to items tested. *Asbestos fiber percentage is approximate - performed by visual observation only, unless otherwise indicated.	*This method is not reliable for analysis of tile or other materials when fiber size is less than 10 microns and/or below detection limit (appr. 1%) of current PLM techniques. *Samples analyzed as received by the laboratory, interpretation is responsibility of the client.

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Document Number	Unified Sample Area Number
132-46-1K	GRAY GROUT		132-46-1K

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

GRAY GROUT

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-1K1, 132-46-1K2, 132-46-1K3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-1K	GRAY GROUT

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-1K1	0	GRAY GROUT	See Sketch 132-46-1
132-46-1K2	0	GRAY GROUT	See Sketch 132-46-1
132-46-1K3	0	GRAY GROUT	See Sketch 132-46-1

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP LAB CODE 101807-0

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

Approved Signatory:

Sample/Homogeneous Area: 132-46-1K Analysis Date: 9/26/2025 Report Date: 9/26/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-073	132-46-1K1	gray, tan	Yes	No	-	-	misc. part.	
					-	-	100	
132-074	132-46-1K2	gray, tan	Yes	No	-	-	misc. part.	
					-	-	100	
132-075	132-46-1K3	gray, tan	Yes	No	-	-	misc. part.	
					-	-	100	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
State of Hawaii Asbestos Requirements mandates all samples to be collected by a certified Asbestos Inspector in accordance with § 11-501, 11-502, and 11-504. Results of samples collected by someone other than a certified Asbestos Inspector may be invalid.
Note: EPA, OSHA, and HIOSH define “asbestos-containing material” as any material or product which contains more than one percent asbestos.

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Document Number	Unified Sample Area Number
132-46-1L	BLACK ADHESIVE BENEATH GRAY GROUT		132-46-1L

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

BLACK ADHESIVE BENEATH GRAY GROUT

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-1L1, 132-46-1L2, 132-46-1L3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-1L	BLACK ADHESIVE BENEATH GRAY GROUT

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-1L1	0	BLACK ADHESIVE BENEATH GRAY GROUT	See Sketch 132-46-1
132-46-1L2	0	BLACK ADHESIVE BENEATH GRAY GROUT	See Sketch 132-46-1
132-46-1L3	0	BLACK ADHESIVE BENEATH GRAY GROUT	See Sketch 132-46-1

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP LAB CODE 101807-0

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

Approved Signatory:

Sample/Homogeneous Area: 132-46-1L Analysis Date: 9/26/2025 Report Date: 9/26/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-076	132-46-1L1	various	Yes	No	-	cellulose	misc. part.	
					-	3	97	
132-077	132-46-1L2	various	Yes	No	-	cellulose	misc. part.	
					-	3	97	
132-078	132-46-1L3	various	Yes	No	-	cellulose	misc. part.	
					-	3	97	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
State of Hawaii Asbestos Requirements mandates all samples to be collected by a certified Asbestos Inspector in accordance with § 11-501, 11-502, and 11-504. Results of samples collected by someone other than a certified Asbestos Inspector may be invalid.
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*Laboratory test report relates only to items tested.
*Asbestos fiber percentage is approximate - performed by visual observation only, unless otherwise indicated.

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*Samples analyzed as received by the laboratory, interpretation is responsibility of the client.

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-1M	WHITE GROUT	132-46-1M

Document Number	Drawing/Sketch Number	

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

WHITE GROUT

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-1M1, 132-46-1M2, 132-46-1M3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-1M	WHITE GROUT

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-1M1	0	WHITE GROUT	See Sketch 132-46-1
132-46-1M2	0	WHITE GROUT	See Sketch 132-46-1
132-46-1M3	0	WHITE GROUT	See Sketch 132-46-1

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP®

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

NVLAP LAB CODE 101807-0

Approved Signatory:

Sample/Homogeneous Area: 132-46-1M Analysis Date: 9/26/2025 Report Date: 9/26/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-079	132-46-1M1	white	Yes	No	-	-	misc. part.	
					-	-	100	
132-080	132-46-1M2	white	Yes	No	-	-	misc. part.	
					-	-	100	
132-081	132-46-1M3	white	Yes	No	-	-	misc. part.	
					-	-	100	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Document Number	Material ID and Description		Unified Sample Area Number
	132-46-1N	GYPSUM WALLBOARD/MUDJOINT WALL AND CEILING SYSTEM	132-46-1N

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

GYPSUM WALLBOARD/MUDJOINT WALL AND CEILING SYSTEM

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1	#2
Square Feet of Ceiling Materials	
Square Feet of Wall Materials	
Square Feet of Floor Surface	
Linear Feet of TSI	
Square Feet of Structural Steel Coatings (including over-spray)	
Square Feet of Other ACM	
Linear Feet of Other ACM	
Total square and/or linear feet of ACM in this Sample Space:	

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

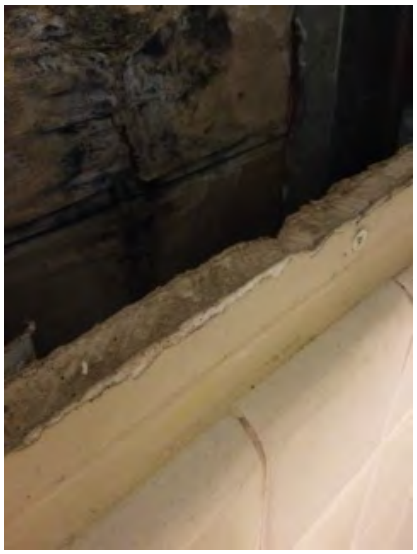
Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-1N1, 132-46-1N2, 132-46-1N3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH



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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-1N	GYPSUM WALLBOARD/MUDJOINT WALL AND CEILING SYSTEM

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-1N1	0	GYPSUM WALLBOARD/MUDJOINT WALL AND CEILING SYSTEM	See Sketch 132-46-1
132-46-1N2	0	GYPSUM WALLBOARD/MUDJOINT WALL AND CEILING SYSTEM	See Sketch 132-46-1
132-46-1N3	0	GYPSUM WALLBOARD/MUDJOINT WALL AND CEILING SYSTEM	See Sketch 132-46-1

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP®

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

NVLAP LAB CODE 101807-0

Approved Signatory:

Sample/Homogeneous Area: 132-46-1N Analysis Date: 9/26/2025 Report Date: 9/26/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-082	132-46-1N1	white, brown, green	Yes	No	-	cellulose, glass	misc. part.	
					-	12	88	
132-083	132-46-1N2	white, brown, green	Yes	No	-	cellulose, glass	misc. part.	
					-	12	88	
132-084	132-46-1N3	white, brown, green	Yes	No	-	cellulose, glass	misc. part.	
					-	12	88	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025
Material ID and Description			**Unified Sample Area Number**
Document Number	132-46-1O	WHITE CAULKING AT PLUMBING FIXTURE	132-46-1O
	Drawing/Sketch Number		

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

WHITE CAULKING AT PLUMBING FIXTURE

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -
Visible	**Reachable**	**Texture**
- -	- -	- -
Barriers	**Ventilation** / **If Yes**	**Friable Surface**
- -	- - / - -	- - / - -
Air Movement	**Proximity to Repair Items**	**Activity**
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-1O1, 132-46-1O2, 132-46-1O3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-1O	WHITE CAULKING AT PLUMBING FIXTURE

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-1O1	0	WHITE CAULKING AT PLUMBING FIXTURE	See Sketch 132-46-1
132-46-1O2	0	WHITE CAULKING AT PLUMBING FIXTURE	See Sketch 132-46-1
132-46-1O3	0	WHITE CAULKING AT PLUMBING FIXTURE	See Sketch 132-46-1

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP LAB CODE 101807-0

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

Approved Signatory:

Sample/Homogeneous Area: 132-46-1O Analysis Date: 9/26/2025 Report Date: 9/26/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-085	132-46-1O1	white	Yes	No	-	-	misc. part.	
					-	-	100	
132-086	132-46-1O2	white	Yes	No	-	-	misc. part.	
					-	-	100	
132-087	132-46-1O3	white	Yes	No	-	-	misc. part.	
					-	-	100	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
State of Hawaii Asbestos Requirements mandates all samples to be collected by a certified Asbestos Inspector in accordance with § 11-501, 11-502, and 11-504. Results of samples collected by someone other than a certified Asbestos Inspector may be invalid.
Note: EPA, OSHA, and HIOSH define “asbestos-containing material” as any material or product which contains more than one percent asbestos.

*Laboratory test report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. *Laboratory test report relates only to items tested. *Asbestos fiber percentage is approximate - performed by visual observation only, unless otherwise indicated.	*This method is not reliable for analysis of tile or other materials when fiber size is less than 10 microns and/or below detection limit (appr. 1%) of current PLM techniques. *Samples analyzed as received by the laboratory, interpretation is responsibility of the client.

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Unified Homogeneous/Sample Area ACM - Space and Salient Cross Reference

Building ID and Name

46 | BUILDING 46

Building Location

1784 Shangrila St.
Kapolei, HI 96707

EMET ID

2504132

For the ACM - Space Identified as:

132-46-2

Inspection Date(s): 9/22/2025

Unified Sample Area	Homogeneous Sample Area or Salient Description	Comments	ACM Present			Material Type*			Response Action	Estimated Cost to Remove
			Suspected	Confirmed	Friable	T	DC	PD		
132-46-2A	12" X 12" LT. GRAY W/GRAY STREAKS VFT		YES	NO						
132-46-2B	BEIGE ADHESIVE BENEATH 12" X 12" LT. GRAY W/GRAY STREAKS VFT		YES	NO						
132-46-2C	GRAY LEVELING COMPOUND		YES	NO						
132-46-2D	4" BROWN COVEBASE		YES	NO						
132-46-2E	BEIGE ADHESIVE BENEATH 4" BROWN COVEBASE		YES	NO						
132-46-2F	WHITE CAULKING AT DOOR FRAME		YES	NO						

*** Refers to Material Type and Damage Conditions**

T = Material Type:	DC = Damage Condition:	PD = Potential Damage Condition:
S = Surfacing	ND = No Damage	NPD = No Potential Damage
M = Miscellaneous	D = Damaged	PD = ACBM w/ Potential Damage
T = Thermal Systems	SD = Significant Damage	PSD = Potential Significant Damage

**** Recommended Response Actions:**

1. Isolate area and restrict access. Remove or repair ASAP.
2. Continue Operations and Maintenance (O&M) program. Remove or repair ASAP or reduce potential for disturbance.

3-5. Repair, continue O&M. Lower number indicates higher priority if all repair cannot be done immediately.

6-7. Continue O&M. Take preventive measures to reduce disturbance. Number indicates priority for removal.

8. Continue O&M until major renovation or demolition requires removal under NESHAPS, or until hazard assessment factors change.

Note: An O&M program may include enclosure and encapsulation.

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Unified Homogeneous/Sample Area ACM - Space and Salient Cross Reference

Building ID and Name

46 | BUILDING 46

Building Location

1784 Shangrila St.
Kapolei, HI 96707

EMET ID

2504132

For the ACM - Space Identified as:

132-46-2

Inspection Date(s): 9/22/2025

Unified Sample Area	Homogeneous Sample Area or Salient Description	Comments	ACM Present			Material Type*			Response Action	Estimated Cost to Remove
			Suspected	Confirmed	Friable	T	DC	PD		
132-46-2G	BLACK CAULKING AT WINDOW FRAME		YES	NO						
132-46-2H	24”X24” GRAY W/GRAY STREAKS VFT		YES	NO						
132-46-2I	BEIGE ADHESIVE BENEATH 24” X24” GRAY W/GRAY STREAKS VFT		YES	NO						
132-46-2J	4" BLACK COVEBASE		YES	NO						
132-46-2K	BEIGE ADHESIVE BENEATH 4" BLACK COVEBASE		YES	NO						
132-46-2L	GYPSUM WALLBOARD/MUDJOINT WALL SYSTEM		YES	NO						

*** Refers to Material Type and Damage Conditions**

T = Material Type:	DC = Damage Condition:	PD = Potential Damage Condition:
S = Surfacing	ND = No Damage	NPD = No Potential Damage
M = Miscellaneous	D = Damaged	PD = ACBM w/ Potential Damage
T = Thermal Systems	SD = Significant Damage	PSD = Potential Significant Damage

**** Recommended Response Actions:**

1. Isolate area and restrict access. Remove or repair ASAP.
2. Continue Operations and Maintenance (O&M) program. Remove or repair ASAP or reduce potential for disturbance.

3-5. Repair, continue O&M. Lower number indicates higher priority if all repair cannot be done immediately.

6-7. Continue O&M. Take preventive measures to reduce disturbance. Number indicates priority for removal.

8. Continue O&M until major renovation or demolition requires removal under NESHAPS, or until hazard assessment factors change.

Note: An O&M program may include enclosure and encapsulation.

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-2A	12" X 12" LT. GRAY W/GRAY STREAKS VFT	132-46-2A

Document Number:

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

12" X 12" LT. GRAY W/GRAY STREAKS VFT

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-2A1, 132-46-2A2, 132-46-2A3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-2A	12" X 12" LT. GRAY W/GRAY STREAKS VFT

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-2A1	0	12" X 12" LT. GRAY W/GRAY STREAKS VFT	See Sketch 132-46-2
132-46-2A2	0	12" X 12" LT. GRAY W/GRAY STREAKS VFT	See Sketch 132-46-2
132-46-2A3	0	12" X 12" LT. GRAY W/GRAY STREAKS VFT	See Sketch 132-46-2

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP®

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

NVLAP LAB CODE 101807-0

Approved Signatory:

Sample/Homogeneous Area: 132-46-2A Analysis Date: 9/25/2025 Report Date: 9/25/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-019	132-46-2A1	gray	Yes	No	-	-	misc. part.	
					-	-	100	
132-022	132-46-2A2	gray	Yes	No	-	-	misc. part.	
					-	-	100	
132-025	132-46-2A3	gray	Yes	No	-	-	misc. part.	
					-	-	100	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
State of Hawaii Asbestos Requirements mandates all samples to be collected by a certified Asbestos Inspector in accordance with § 11-501, 11-502, and 11-504. Results of samples collected by someone other than a certified Asbestos Inspector may be invalid.
Note: EPA, OSHA, and HIOSH define “asbestos-containing material” as any material or product which contains more than one percent asbestos.

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Document Number	Unified Sample Area Number
132-46-2B	BEIGE ADHESIVE BENEATH 12" X 12" LT. GRAY W/GRAY STREAKS VFT		132-46-2B

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

BEIGE ADHESIVE BENEATH 12" X 12" LT. GRAY W/GRAY STREAKS VFT

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-2B1, 132-46-2B2, 132-46-2B3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-2B	BEIGE ADHESIVE BENEATH 12" X 12" LT. GRAY W/GRAY STREAKS VFT

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-2B1	0	BEIGE ADHESIVE BENEATH 12" X 12" LT. GRAY W/GRAY STREAKS VFT	See Sketch 132-46-2
132-46-2B2	0	BEIGE ADHESIVE BENEATH 12" X 12" LT. GRAY W/GRAY STREAKS VFT	See Sketch 132-46-2
132-46-2B3	0	BEIGE ADHESIVE BENEATH 12" X 12" LT. GRAY W/GRAY STREAKS VFT	See Sketch 132-46-2

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP LAB CODE 101807-0

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

Approved Signatory:

Sample/Homogeneous Area: 132-46-2B Analysis Date: 9/25/2025 Report Date: 9/25/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-020	132-46-2B1	yellow	Yes	No	-	-	misc. part.	
					-	-	100	
132-023	132-46-2B2	yellow	Yes	No	-	-	misc. part.	
					-	-	100	
132-026	132-46-2B3	yellow	Yes	No	-	-	misc. part.	
					-	-	100	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
State of Hawaii Asbestos Requirements mandates all samples to be collected by a certified Asbestos Inspector in accordance with § 11-501, 11-502, and 11-504. Results of samples collected by someone other than a certified Asbestos Inspector may be invalid.
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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-2C	GRAY LEVELING COMPOUND	132-46-2C

Document Number	Drawing/Sketch Number	

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

GRAY LEVELING COMPOUND

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-2C1, 132-46-2C2, 132-46-2C3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-2C	GRAY LEVELING COMPOUND

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-2C1	0	GRAY LEVELING COMPOUND	See Sketch 132-46-2
132-46-2C2	0	GRAY LEVELING COMPOUND	See Sketch 132-46-2
132-46-2C3	0	GRAY LEVELING COMPOUND	See Sketch 132-46-2

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP®

Client: Engineering Partners, Inc.

Building: BUILDING 46

NVLAP LAB CODE 101807-0

Address: 455 East Lanikaula Street
Hilo, HI 96720

Address: 1784 Shangrila St.
Kapolei, HI 96707

Approved Signatory:

Sample/Homogeneous Area: 132-46-2C Analysis Date: 9/25/2025 Report Date: 9/25/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-021	132-46-2C1	gray	Yes	No	-	cellulose	misc. part.	
					-	3	97	
132-024	132-46-2C2	gray	Yes	No	-	cellulose	misc. part.	
					-	3	97	
132-027	132-46-2C3	gray	Yes	No	-	cellulose	misc. part.	
					-	3	97	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
State of Hawaii Asbestos Requirements mandates all samples to be collected by a certified Asbestos Inspector in accordance with § 11-501, 11-502, and 11-504. Results of samples collected by someone other than a certified Asbestos Inspector may be invalid.
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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Document Number	Unified Sample Area Number
132-46-2D	4" BROWN COVEBASE		132-46-2D

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

4" BROWN COVEBASE

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-2D1, 132-46-2D2, 132-46-2D3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-2D	4" BROWN COVEBASE

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-2D1	0	4" BROWN COVEBASE	See Sketch 132-46-2
132-46-2D2	0	4" BROWN COVEBASE	See Sketch 132-46-2
132-46-2D3	0	4" BROWN COVEBASE	See Sketch 132-46-2

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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Phone (808) 671-8383 Fax (808) 671-7979

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP LAB CODE 101807-0

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

Approved Signatory:

Sample/Homogeneous Area: 132-46-2D Analysis Date: 9/25/2025 Report Date: 9/25/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-028	132-46-2D1	brown	Yes	No	-	-	misc. part.	
					-	-	100	
132-030	132-46-2D2	brown	Yes	No	-	-	misc. part.	
					-	-	100	
132-032	132-46-2D3	brown	Yes	No	-	-	misc. part.	
					-	-	100	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
State of Hawaii Asbestos Requirements mandates all samples to be collected by a certified Asbestos Inspector in accordance with § 11-501, 11-502, and 11-504. Results of samples collected by someone other than a certified Asbestos Inspector may be invalid.
Note: EPA, OSHA, and HIOSH define “asbestos-containing material” as any material or product which contains more than one percent asbestos.

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-2E	BEIGE ADHESIVE BENEATH 4" BROWN COVEBASE	132-46-2E

Document Number	Drawing/Sketch Number	

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

BEIGE ADHESIVE BENEATH 4" BROWN COVEBASE

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-2E1, 132-46-2E2, 132-46-2E3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-2E	BEIGE ADHESIVE BENEATH 4" BROWN COVEBASE

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-2E1	0	BEIGE ADHESIVE BENEATH 4" BROWN COVEBASE	See Sketch 132-46-2
132-46-2E2	0	BEIGE ADHESIVE BENEATH 4" BROWN COVEBASE	See Sketch 132-46-2
132-46-2E3	0	BEIGE ADHESIVE BENEATH 4" BROWN COVEBASE	See Sketch 132-46-2

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP®

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

NVLAP LAB CODE 101807-0

Approved Signatory:

Sample/Homogeneous Area: 132-46-2E Analysis Date: 9/25/2025 Report Date: 9/25/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-029	132-46-2E1	beige	Yes	No	-	-	misc. part.	
					-	-	100	
132-031	132-46-2E2	beige	Yes	No	-	-	misc. part.	
					-	-	100	
132-033	132-46-2E3	beige	Yes	No	-	-	misc. part.	
					-	-	100	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
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Note: EPA, OSHA, and HIOSH define “asbestos-containing material” as any material or product which contains more than one percent asbestos.

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-2F	WHITE CAULKING AT DOOR FRAME	132-46-2F

Document Number:

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

WHITE CAULKING AT DOOR FRAME

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

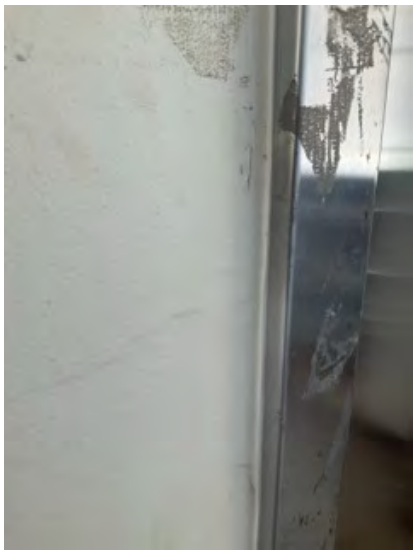
Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-2F1, 132-46-2F2, 132-46-2F3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH



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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-2F	WHITE CAULKING AT DOOR FRAME

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-2F1	0	WHITE CAULKING AT DOOR FRAME	See Sketch 132-46-2
132-46-2F2	0	WHITE CAULKING AT DOOR FRAME	See Sketch 132-46-2
132-46-2F3	0	WHITE CAULKING AT DOOR FRAME	See Sketch 132-46-2

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP LAB CODE 101807-0

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

Approved Signatory:

Sample/Homogeneous Area: 132-46-2F Analysis Date: 9/25/2025 Report Date: 9/25/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-034	132-46-2F1	white	Yes	No	-	-	misc. part.	
					-	-	100	
132-035	132-46-2F2	white	Yes	No	-	-	misc. part.	
					-	-	100	
132-036	132-46-2F3	white	Yes	No	-	-	misc. part.	
					-	-	100	

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Document Number	Unified Sample Area Number
132-46-2G	BLACK CAULKING AT WINDOW FRAME		132-46-2G

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

BLACK CAULKING AT WINDOW FRAME

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-2G1, 132-46-2G2, 132-46-2G3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-2G	BLACK CAULKING AT WINDOW FRAME

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-2G1	0	BLACK CAULKING AT WINDOW FRAME	See Sketch 132-46-2
132-46-2G2	0	BLACK CAULKING AT WINDOW FRAME	See Sketch 132-46-2
132-46-2G3	0	BLACK CAULKING AT WINDOW FRAME	See Sketch 132-46-2

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP LAB CODE 101807-0

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

Approved Signatory:

Sample/Homogeneous Area: 132-46-2G Analysis Date: 9/25/2025 Report Date: 9/25/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-037	132-46-2G1	black	Yes	No	-	-	misc. part.	
					-	-	100	
132-038	132-46-2G2	black	Yes	No	-	-	misc. part.	
					-	-	100	
132-039	132-46-2G3	black	Yes	No	-	-	misc. part.	
					-	-	100	

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-2H	24”X24” GRAY W/GRAY STREAKS VFT	132-46-2H

Document Number:

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

24”X24” GRAY W/GRAY STREAKS VFT

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-2H1, 132-46-2H2, 132-46-2H3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-2H	24”X24” GRAY W/GRAY STREAKS VFT

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-2H1	0	24”X24” GRAY W/GRAY STREAKS VFT	See Sketch 132-46-2
132-46-2H2	0	24”X24” GRAY W/GRAY STREAKS VFT	See Sketch 132-46-2
132-46-2H3	0	24”X24” GRAY W/GRAY STREAKS VFT	See Sketch 132-46-2

Inspector’s Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP®

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

NVLAP LAB CODE 101807-0

Approved Signatory:

Sample/Homogeneous Area: 132-46-2H Analysis Date: 9/26/2025 Report Date: 9/26/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-088	132-46-2H1	gray	Yes	No	-	-	misc. part.	
					-	-	100	
132-090	132-46-2H2	gray	Yes	No	-	-	misc. part.	
					-	-	100	
132-092	132-46-2H3	gray	Yes	No	-	-	misc. part.	
					-	-	100	

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-2I	BEIGE ADHESIVE BENEATH 24”X24” GRAY W/GRAY STREAKS VFT	132-46-2I

Document Number:

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

BEIGE ADHESIVE BENEATH 24”X24” GRAY W/GRAY STREAKS VFT

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-2I1, 132-46-2I2, 132-46-2I3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-2I	BEIGE ADHESIVE BENEATH 24”X24” GRAY W/GRAY STREAKS VFT

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-2I1	0	BEIGE ADHESIVE BENEATH 24”X24” GRAY W/GRAY STREAKS VFT	See Sketch 132-46-2
132-46-2I2	0	BEIGE ADHESIVE BENEATH 24”X24” GRAY W/GRAY STREAKS VFT	See Sketch 132-46-2
132-46-2I3	0	BEIGE ADHESIVE BENEATH 24”X24” GRAY W/GRAY STREAKS VFT	See Sketch 132-46-2

Inspector’s Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP LAB CODE 101807-0

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

Approved Signatory:

Sample/Homogeneous Area: 132-46-2I Analysis Date: 9/26/2025 Report Date: 9/26/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-089	132-46-2I1	gray	Yes	No	-	-	misc. part.	
					-	-	100	
132-091	132-46-2I2	gray	Yes	No	-	-	misc. part.	
					-	-	100	
132-093	132-46-2I3	gray	Yes	No	-	-	misc. part.	
					-	-	100	

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-2J	4" BLACK COVEBASE	132-46-2J

Document Number:

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

4" BLACK COVEBASE

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-2J1, 132-46-2J2, 132-46-2J3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-2J	4" BLACK COVEBASE

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-2J1	0	4" BLACK COVEBASE	See Sketch 132-46-2
132-46-2J2	0	4" BLACK COVEBASE	See Sketch 132-46-2
132-46-2J3	0	4" BLACK COVEBASE	See Sketch 132-46-2

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP LAB CODE 101807-0

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

Approved Signatory:

Sample/Homogeneous Area: 132-46-2J Analysis Date: 9/26/2025 Report Date: 9/26/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-094	132-46-2J1	black	Yes	No	-	-	misc. part.	
					-	-	100	
132-096	132-46-2J2	black	Yes	No	-	-	misc. part.	
					-	-	100	
132-098	132-46-2J3	black	Yes	No	-	-	misc. part.	
					-	-	100	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
State of Hawaii Asbestos Requirements mandates all samples to be collected by a certified Asbestos Inspector in accordance with § 11-501, 11-502, and 11-504. Results of samples collected by someone other than a certified Asbestos Inspector may be invalid.
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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-2K	BEIGE ADHESIVE BENEATH 4" BLACK COVEBASE	132-46-2K

Document Number	Drawing/Sketch Number	

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

BEIGE ADHESIVE BENEATH 4" BLACK COVEBASE

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-2K1, 132-46-2K2, 132-46-2K3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-2K	BEIGE ADHESIVE BENEATH 4" BLACK COVEBASE

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-2K1	0	BEIGE ADHESIVE BENEATH 4" BLACK COVEBASE	See Sketch 132-46-2
132-46-2K2	0	BEIGE ADHESIVE BENEATH 4" BLACK COVEBASE	See Sketch 132-46-2
132-46-2K3	0	BEIGE ADHESIVE BENEATH 4" BLACK COVEBASE	See Sketch 132-46-2

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP®

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

NVLAP LAB CODE 101807-0

Approved Signatory:

Sample/Homogeneous Area: 132-46-2K Analysis Date: 9/26/2025 Report Date: 9/26/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-095	132-46-2K1	beige	Yes	No	-	-	misc. part.	
					-	-	100	
132-097	132-46-2K2	beige	Yes	No	-	-	misc. part.	
					-	-	100	
132-099	132-46-2K3	beige	Yes	No	-	-	misc. part.	
					-	-	100	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
State of Hawaii Asbestos Requirements mandates all samples to be collected by a certified Asbestos Inspector in accordance with § 11-501, 11-502, and 11-504. Results of samples collected by someone other than a certified Asbestos Inspector may be invalid.
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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-2L	GYPSUM WALLBOARD/MUDJOINT WALL SYSTEM	132-46-2L

Document Number:

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

GYPSUM WALLBOARD/MUDJOINT WALL SYSTEM

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-2L1, 132-46-2L2, 132-46-2L3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-2L	GYPSUM WALLBOARD/MUDJOINT WALL SYSTEM

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-2L1	0	GYPSUM WALLBOARD/MUDJOINT WALL SYSTEM	See Sketch 132-46-2
132-46-2L2	0	GYPSUM WALLBOARD/MUDJOINT WALL SYSTEM	See Sketch 132-46-2
132-46-2L3	0	GYPSUM WALLBOARD/MUDJOINT WALL SYSTEM	See Sketch 132-46-2

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP®

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

NVLAP LAB CODE 101807-0

Approved Signatory:

Sample/Homogeneous Area: 132-46-2L Analysis Date: 9/26/2025 Report Date: 9/26/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-100	132-46-2L1	white, brown	Yes	No	-	cellulose, glass	misc. part.	
					-	12	88	
132-101	132-46-2L2	white, brown	Yes	No	-	cellulose, glass	misc. part.	
					-	12	88	
132-102	132-46-2L3	white, brown	Yes	No	-	cellulose, glass	misc. part.	
					-	12	88	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
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Unified Homogeneous/Sample Area ACM - Space and Salient Cross Reference

Building ID and Name

46 | BUILDING 46

Building Location

1784 Shangrila St.
Kapolei, HI 96707

EMET ID

2504132

For the ACM - Space Identified as:

132-46-3

Inspection Date(s): 9/22/2025

Unified Sample Area	Homogeneous Sample Area or Salient Description	Comments	ACM Present			Material Type*			Response Action	Estimated Cost to Remove
			Suspected	Confirmed	Friable	T	DC	PD		
132-46-3A	12" X 12" LT. GRAY W/GRAY STREAKS VFT		YES	NO						
132-46-3B	BEIGE ADHESIVE BENEATH 12" X 12" LT. GRAY W/GRAY STREAKS VFT		YES	NO						
132-46-3C	4" BROWN COVEBASE		YES	NO						
132-46-3D	BEIGE ADHESIVE BENEATH 4" BROWN COVEBASE		YES	NO						
132-46-3E	WHITE CAULKING AT DOOR FRAME		YES	NO						
132-46-3F	BLACK CAULKING AT WINDOW FRAME		YES	NO						

*** Refers to Material Type and Damage Conditions**

T = Material Type:	DC = Damage Condition:	PD = Potential Damage Condition:
S = Surfacing	ND = No Damage	NPD = No Potential Damage
M = Miscellaneous	D = Damaged	PD = ACBM w/ Potential Damage
T = Thermal Systems	SD = Significant Damage	PSD = Potential Significant Damage

**** Recommended Response Actions:**

1. Isolate area and restrict access. Remove or repair ASAP.
2. Continue Operations and Maintenance (O&M) program. Remove or repair ASAP or reduce potential for disturbance.

3-5. Repair, continue O&M. Lower number indicates higher priority if all repair cannot be done immediately.

6-7. Continue O&M. Take preventive measures to reduce disturbance. Number indicates priority for removal.

8. Continue O&M until major renovation or demolition requires removal under NESHAPS, or until hazard assessment factors change.

Note: An O&M program may include enclosure and encapsulation.

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Unified Homogeneous/Sample Area ACM - Space and Salient Cross Reference

Building ID and Name

46 | BUILDING 46

Building Location

1784 Shangrila St.
Kapolei, HI 96707

EMET ID

2504132

For the ACM - Space Identified as:

132-46-3

Inspection Date(s): 9/22/2025

Unified Sample Area	Homogeneous Sample Area or Salient Description	Comments	ACM Present			Material Type*			Response Action	Estimated Cost to Remove
			Suspected	Confirmed	Friable	T	DC	PD		
132-46-3G	GRAY LEVELING COMPOUND		YES	NO						
132-46-3H	24”X24” GRAY W/GRAY STREAKS VFT		YES	NO						
132-46-3I	BEIGE ADHESIVE BENEATH 24” X24” GRAY W/GRAY STREAKS VFT		YES	NO						
132-46-3J	4" BLACK COVEBASE		YES	NO						
132-46-3K	BEIGE ADHESIVE BENEATH 4" BLACK COVEBASE		YES	NO						

*** Refers to Material Type and Damage Conditions**

T = Material Type:	DC = Damage Condition:	PD = Potential Damage Condition:
S = Surfacing	ND = No Damage	NPD = No Potential Damage
M = Miscellaneous	D = Damaged	PD = ACBM w/ Potential Damage
T = Thermal Systems	SD = Significant Damage	PSD = Potential Significant Damage

**** Recommended Response Actions:**

1. Isolate area and restrict access. Remove or repair ASAP.
2. Continue Operations and Maintenance (O&M) program. Remove or repair ASAP or reduce potential for disturbance.

3-5. Repair, continue O&M. Lower number indicates higher priority if all repair cannot be done immediately.

6-7. Continue O&M. Take preventive measures to reduce disturbance. Number indicates priority for removal.

8. Continue O&M until major renovation or demolition requires removal under NESHAPS, or until hazard assessment factors change.

Note: An O&M program may include enclosure and encapsulation.

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-3A	12" X 12" LT. GRAY W/GRAY STREAKS VFT	132-46-3A

Document Number:

Drawing/Sketch Number:

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Unified Sample Area/Homogeneous Material

12" X 12" LT. GRAY W/GRAY STREAKS VFT

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-3A1, 132-46-3A2, 132-46-3A3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-3A	12" X 12" LT. GRAY W/GRAY STREAKS VFT

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-3A1	0	12" X 12" LT. GRAY W/GRAY STREAKS VFT	See Sketch 132-46-3
132-46-3A2	0	12" X 12" LT. GRAY W/GRAY STREAKS VFT	See Sketch 132-46-3
132-46-3A3	0	12" X 12" LT. GRAY W/GRAY STREAKS VFT	See Sketch 132-46-3

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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Phone (808) 671-8383 Fax (808) 671-7979

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP LAB CODE 101807-0

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

Approved Signatory:

Sample/Homogeneous Area: 132-46-3A Analysis Date: 9/25/2025 Report Date: 9/25/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-040	132-46-3A1	gray	Yes	No	-	-	misc. part.	
					-	-	100	
132-042	132-46-3A2	gray	Yes	No	-	-	misc. part.	
					-	-	100	
132-044	132-46-3A3	gray	Yes	No	-	-	misc. part.	
					-	-	100	

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-3B	BEIGE ADHESIVE BENEATH 12" X 12" LT. GRAY W/GRAY STREAKS VFT	132-46-3B

Document Number:

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

BEIGE ADHESIVE BENEATH 12" X 12" LT. GRAY W/GRAY STREAKS VFT

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-3B1, 132-46-3B2, 132-46-3B3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-3B	BEIGE ADHESIVE BENEATH 12" X 12" LT. GRAY W/GRAY STREAKS VFT

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-3B1	0	BEIGE ADHESIVE BENEATH 12" X 12" LT. GRAY W/GRAY STREAKS VFT	See Sketch 132-46-3
132-46-3B2	0	BEIGE ADHESIVE BENEATH 12" X 12" LT. GRAY W/GRAY STREAKS VFT	See Sketch 132-46-3
132-46-3B3	0	BEIGE ADHESIVE BENEATH 12" X 12" LT. GRAY W/GRAY STREAKS VFT	See Sketch 132-46-3

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP®

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

NVLAP LAB CODE 101807-0

Approved Signatory:

Sample/Homogeneous Area: 132-46-3B Analysis Date: 9/25/2025 Report Date: 9/25/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-041	132-46-3B1	beige	Yes	No	-	-	misc. part.	
					-	-	100	
132-043	132-46-3B2	beige	Yes	No	-	-	misc. part.	
					-	-	100	
132-045	132-46-3B3	beige	Yes	No	-	-	misc. part.	
					-	-	100	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
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Note: EPA, OSHA, and HIOSH define “asbestos-containing material” as any material or product which contains more than one percent asbestos.

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Document Number	Unified Sample Area Number
132-46-3C	4" BROWN COVEBASE		132-46-3C

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

4" BROWN COVEBASE

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-3C1, 132-46-3C2, 132-46-3C3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-3C	4" BROWN COVEBASE

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-3C1	0	4" BROWN COVEBASE	See Sketch 132-46-3
132-46-3C2	0	4" BROWN COVEBASE	See Sketch 132-46-3
132-46-3C3	0	4" BROWN COVEBASE	See Sketch 132-46-3

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP®

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

NVLAP LAB CODE 101807-0

Approved Signatory:

Sample/Homogeneous Area: 132-46-3C Analysis Date: 9/25/2025 Report Date: 9/25/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-046	132-46-3C1	brown	Yes	No	-	-	misc. part.	
					-	-	100	
132-048	132-46-3C2	brown	Yes	No	-	-	misc. part.	
					-	-	100	
132-050	132-46-3C3	brown	Yes	No	-	-	misc. part.	
					-	-	100	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-3D	BEIGE ADHESIVE BENEATH 4" BROWN COVEBASE	132-46-3D

Document Number	Drawing/Sketch Number	

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

BEIGE ADHESIVE BENEATH 4" BROWN COVEBASE

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-3D1, 132-46-3D2, 132-46-3D3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-3D	BEIGE ADHESIVE BENEATH 4" BROWN COVEBASE

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-3D1	0	BEIGE ADHESIVE BENEATH 4" BROWN COVEBASE	See Sketch 132-46-3
132-46-3D2	0	BEIGE ADHESIVE BENEATH 4" BROWN COVEBASE	See Sketch 132-46-3
132-46-3D3	0	BEIGE ADHESIVE BENEATH 4" BROWN COVEBASE	See Sketch 132-46-3

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP®

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

NVLAP LAB CODE 101807-0

Approved Signatory:

Sample/Homogeneous Area: 132-46-3D Analysis Date: 9/25/2025 Report Date: 9/25/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-047	132-46-3D1	beige	Yes	No	-	-	misc. part.	
					-	-	100	
132-049	132-46-3D2	beige	Yes	No	-	-	misc. part.	
					-	-	100	
132-051	132-46-3D3	beige	Yes	No	-	-	misc. part.	
					-	-	100	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
State of Hawaii Asbestos Requirements mandates all samples to be collected by a certified Asbestos Inspector in accordance with § 11-501, 11-502, and 11-504. Results of samples collected by someone other than a certified Asbestos Inspector may be invalid.
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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Document Number	Unified Sample Area Number
132-46-3E	WHITE CAULKING AT DOOR FRAME		132-46-3E

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

WHITE CAULKING AT DOOR FRAME

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1	#2
Square Feet of Ceiling Materials	
Square Feet of Wall Materials	
Square Feet of Floor Surface	
Linear Feet of TSI	
Square Feet of Structural Steel Coatings (including over-spray)	
Square Feet of Other ACM	
Linear Feet of Other ACM	
Total square and/or linear feet of ACM in this Sample Space:	

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-3E1, 132-46-3E2, 132-46-3E3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-3E	WHITE CAULKING AT DOOR FRAME

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-3E1	0	WHITE CAULKING AT DOOR FRAME	See Sketch 132-46-3
132-46-3E2	0	WHITE CAULKING AT DOOR FRAME	See Sketch 132-46-3
132-46-3E3	0	WHITE CAULKING AT DOOR FRAME	See Sketch 132-46-3

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP®

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

NVLAP LAB CODE 101807-0

Approved Signatory:

Sample/Homogeneous Area: 132-46-3E Analysis Date: 9/25/2025 Report Date: 9/25/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-052	132-46-3E1	white	Yes	No	-	-	misc. part.	
					-	-	100	
132-053	132-46-3E2	white	Yes	No	-	-	misc. part.	
					-	-	100	
132-054	132-46-3E3	white	Yes	No	-	-	misc. part.	
					-	-	100	

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-3F	BLACK CAULKING AT WINDOW FRAME	132-46-3F

Document Number:

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

BLACK CAULKING AT WINDOW FRAME

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-3F1, 132-46-3F2, 132-46-3F3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-3F	BLACK CAULKING AT WINDOW FRAME

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-3F1	0	BLACK CAULKING AT WINDOW FRAME	See Sketch 132-46-3
132-46-3F2	0	BLACK CAULKING AT WINDOW FRAME	See Sketch 132-46-3
132-46-3F3	0	BLACK CAULKING AT WINDOW FRAME	See Sketch 132-46-3

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP LAB CODE 101807-0

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

Approved Signatory:

Sample/Homogeneous Area: 132-46-3F Analysis Date: 9/25/2025 Report Date: 9/25/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-055	132-46-3F1	brown	Yes	No	-	-	misc. part.	
					-	-	100	
132-056	132-46-3F2	brown	Yes	No	-	-	misc. part.	
					-	-	100	
132-057	132-46-3F3	brown	Yes	No	-	-	misc. part.	
					-	-	100	

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025
Material ID and Description			
Document Number	132-46-3G	GRAY LEVELING COMPOUND	Unified Sample Area Number
	Drawing/Sketch Number		132-46-3G

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

GRAY LEVELING COMPOUND

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -
Visible	**Reachable**	**Texture**
- -	- -	- -
Barriers	**Ventilation** / **If Yes**	**Friable Surface**
- -	- - / - -	- - / - -
Air Movement	**Proximity to Repair Items**	**Activity**
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-3G1, 132-46-3G2, 132-46-3G3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-3G	GRAY LEVELING COMPOUND

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-3G1	0	GRAY LEVELING COMPOUND	See Sketch 132-46-3
132-46-3G2	0	GRAY LEVELING COMPOUND	See Sketch 132-46-3
132-46-3G3	0	GRAY LEVELING COMPOUND	See Sketch 132-46-3

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

EMET Services, Inc. 94-520 Uke`e Street, Suite A Waipahu, HI 96797
Phone (808) 671-8383 Fax (808) 671-7979

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP®

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

NVLAP LAB CODE 101807-0

Approved Signatory:

Sample/Homogeneous Area: 132-46-3G Analysis Date: 9/25/2025 Report Date: 9/25/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-058	132-46-3G1	white, brown	Yes	No	-	cellulose	misc. part.	
					-	5	95	
132-059	132-46-3G2	white, brown	Yes	No	-	cellulose	misc. part.	
					-	5	95	
132-060	132-46-3G3	white, brown	Yes	No	-	cellulose	misc. part.	
					-	5	95	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
State of Hawaii Asbestos Requirements mandates all samples to be collected by a certified Asbestos Inspector in accordance with § 11-501, 11-502, and 11-504. Results of samples collected by someone other than a certified Asbestos Inspector may be invalid.
Note: EPA, OSHA, and HIOSH define “asbestos-containing material” as any material or product which contains more than one percent asbestos.

*Laboratory test report may not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government. *Laboratory test report relates only to items tested. *Asbestos fiber percentage is approximate - performed by visual observation only, unless otherwise indicated.	*This method is not reliable for analysis of tile or other materials when fiber size is less than 10 microns and/or below detection limit (appr. 1%) of current PLM techniques. *Samples analyzed as received by the laboratory, interpretation is responsibility of the client.

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-3H	24”X24” GRAY W/GRAY STREAKS VFT	132-46-3H

Document Number:

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

24”X24” GRAY W/GRAY STREAKS VFT

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

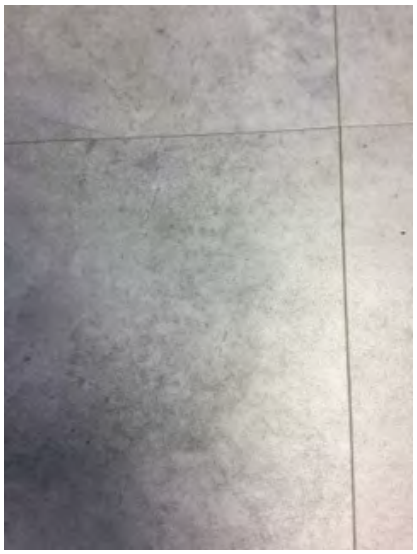
Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-3H1, 132-46-3H2, 132-46-3H3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH



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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-3H	24”X24” GRAY W/GRAY STREAKS VFT

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-3H1	0	24”X24” GRAY W/GRAY STREAKS VFT	See Sketch 132-46-3
132-46-3H2	0	24”X24” GRAY W/GRAY STREAKS VFT	See Sketch 132-46-3
132-46-3H3	0	24”X24” GRAY W/GRAY STREAKS VFT	See Sketch 132-46-3

Inspector’s Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP®

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

NVLAP LAB CODE 101807-0

Approved Signatory:

Sample/Homogeneous Area: 132-46-3H Analysis Date: 9/26/2025 Report Date: 9/26/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-103	132-46-3H1	gray	Yes	No	-	-	misc. part.	
					-	-	100	
132-105	132-46-3H2	gray	Yes	No	-	-	misc. part.	
					-	-	100	
132-107	132-46-3H3	gray	Yes	No	-	-	misc. part.	
					-	-	100	

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-3I	BEIGE ADHESIVE BENEATH 24”X24” GRAY W/GRAY STREAKS VFT	132-46-3I

Document Number:

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

BEIGE ADHESIVE BENEATH 24”X24” GRAY W/GRAY STREAKS VFT

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-3I1, 132-46-3I2, 132-46-3I3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-3I	BEIGE ADHESIVE BENEATH 24”X24” GRAY W/GRAY STREAKS VFT

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-3I1	0	BEIGE ADHESIVE BENEATH 24”X24” GRAY W/GRAY STREAKS VFT	See Sketch 132-46-3
132-46-3I2	0	BEIGE ADHESIVE BENEATH 24”X24” GRAY W/GRAY STREAKS VFT	See Sketch 132-46-3
132-46-3I3	0	BEIGE ADHESIVE BENEATH 24”X24” GRAY W/GRAY STREAKS VFT	See Sketch 132-46-3

Inspector’s Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP®

Client: Engineering Partners, Inc.

Building: BUILDING 46

NVLAP LAB CODE 101807-0

Address: 455 East Lanikaula Street
Hilo, HI 96720

Address: 1784 Shangrila St.
Kapolei, HI 96707

Approved Signatory:

Sample/Homogeneous Area: 132-46-3I Analysis Date: 9/26/2025 Report Date: 9/26/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-104	132-46-3I1	yellow, gray	Yes	No	-	cellulose	misc. part.	
					-	3	97	
132-106	132-46-3I2	yellow, gray	Yes	No	-	cellulose	misc. part.	
					-	3	97	
132-108	132-46-3I3	yellow, gray	Yes	No	-	cellulose	misc. part.	
					-	3	97	

Accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for the scope specific under Lab Code 101807-0.
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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-3J	4" BLACK COVEBASE	132-46-3J

Document Number:

Drawing/Sketch Number:

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

4" BLACK COVEBASE

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-3J1, 132-46-3J2, 132-46-3J3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-3J	4" BLACK COVEBASE

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-3J1	0	4" BLACK COVEBASE	See Sketch 132-46-3
132-46-3J2	0	4" BLACK COVEBASE	See Sketch 132-46-3
132-46-3J3	0	4" BLACK COVEBASE	See Sketch 132-46-3

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP LAB CODE 101807-0

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

Approved Signatory:

Sample/Homogeneous Area: 132-46-3J Analysis Date: 9/26/2025 Report Date: 9/26/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-109	132-46-3J1	black	Yes	No	-	-	misc. part.	
					-	-	100	
132-111	132-46-3J2	black	Yes	No	-	-	misc. part.	
					-	-	100	
132-113	132-46-3J3	black	Yes	No	-	-	misc. part.	
					-	-	100	

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Sample Area Report - Area Master

EMET ID	Building Number and Name		Inspection Date
2504132	46	BUILDING 46	9/22/2025

Material ID and Description		Unified Sample Area Number
132-46-3K	BEIGE ADHESIVE BENEATH 4" BLACK COVEBASE	132-46-3K

Document Number	Drawing/Sketch Number	

A Sample Area should contain material of one, and only one, composition or matrix. An exception can be made in the case of layered applications of materials, such as occurs with a Three Coat Plaster system, that generally matches the same physical locations. Special care must be taken while collecting samples of layered materials, to enable the analysis to discern the several matrices present. Such conditions should be described in detail on the Sample Notes form for the analyst.

Unified Sample Area/Homogeneous Material

BEIGE ADHESIVE BENEATH 4" BLACK COVEBASE

Location of Confirmed, Assumed, or New ACM within Building

See Sketch

SAMPLING STRATEGY DATA

Ceiling Height #1		#2	
Square Feet of Ceiling Materials			
Square Feet of Wall Materials			
Square Feet of Floor Surface			
Linear Feet of TSI			
Square Feet of Structural Steel Coatings (including over-spray)			
Square Feet of Other ACM			
Linear Feet of Other ACM			
Total square and/or linear feet of ACM in this Sample Space:			

RISK ASSESSMENT DETERMINATION

Physical Condition	Potential Damage	Water Damage
- -	- -	- -

Visible	Reachable	Texture
- -	- -	- -

Barriers	Ventilation	If Yes	Friable Surface	
- -	- -	- -	- -	- -

Air Movement	Proximity to Repair Items	Activity
- -	- -	- -

SAMPLE ANALYSIS SUMMARY SECTION

Total Number of Samples Collected	3
Samples Collected by	EMET
Sample Numbers	132-46-3K1, 132-46-3K2, 132-46-3K3
Total Number of Samples Analyzed	3
Samples Analyzed by	EMET
ASBESTOS-CONTAINING MATERIAL ?	**NO**
Number of Salient Designations:	

PHOTOGRAPH

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Sample Log and Notes

Building Number and Name		EMET ID
46	BUILDING 46	2504132

Sample Area/Lot Number and Name	
132-46-3K	BEIGE ADHESIVE BENEATH 4" BLACK COVEBASE

Sample Number	% Asbestos	Description of Sampled Material	Sample Location
132-46-3K1	0	BEIGE ADHESIVE BENEATH 4" BLACK COVEBASE	See Sketch 132-46-3
132-46-3K2	0	BEIGE ADHESIVE BENEATH 4" BLACK COVEBASE	See Sketch 132-46-3
132-46-3K3	0	BEIGE ADHESIVE BENEATH 4" BLACK COVEBASE	See Sketch 132-46-3

Inspector's Name	Signature	Date Samples Collected
Joseph Custino		9/22/2025

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LABORATORY REPORT

Asbestos Bulk Sample Analysis by Polarized Light Microscopy
in accordance with 40 CFR Part 763 Appendix E to Subpart E

NVLAP LAB CODE 101807-0

Client: Engineering Partners, Inc.

Address: 455 East Lanikaula Street
Hilo, HI 96720

Building: BUILDING 46

Address: 1784 Shangrila St.
Kapolei, HI 96707

Approved Signatory:

Sample/Homogeneous Area: 132-46-3K Analysis Date: 9/26/2025 Report Date: 9/26/2025

Lab ID	Sample ID	Color	Homogeneity	Asbestos Detected	Asbestos (Type) Area %	Fibrous Components Area %	Non-fibrous Components Area %	Comments
132-110	132-46-3K1	beige	Yes	No	-	-	misc. part.	
					-	-	100	
132-112	132-46-3K2	beige	Yes	No	-	-	misc. part.	
					-	-	100	
132-114	132-46-3K3	beige	Yes	No	-	-	misc. part.	
					-	-	100	

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Appendix B

Asbestos Survey Sample Locations Sketch

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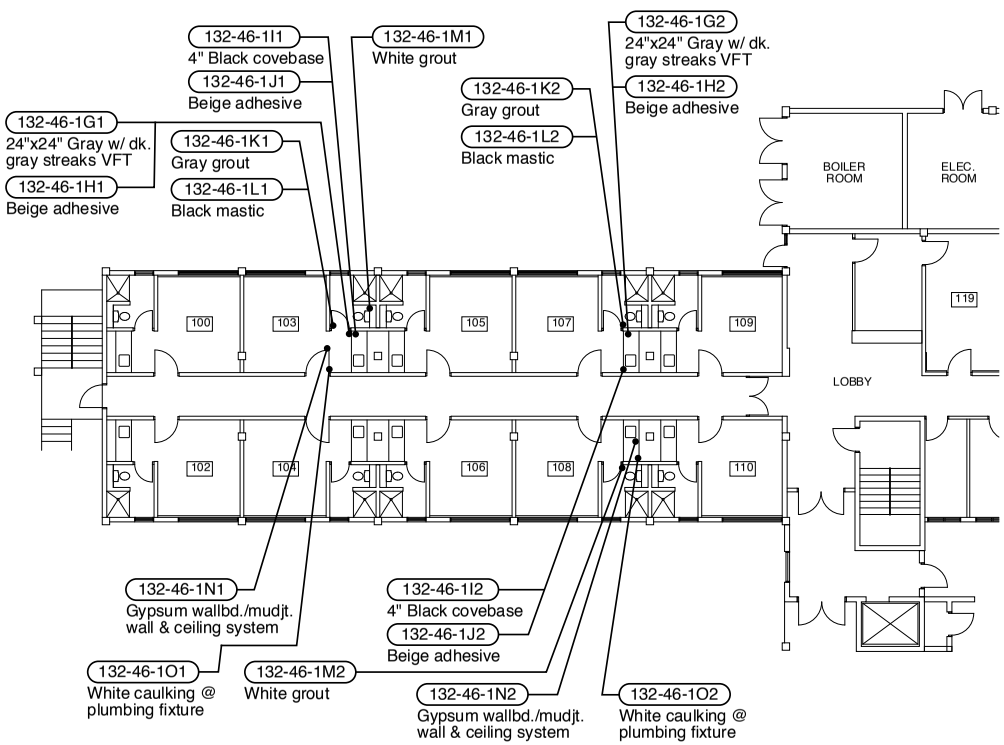
(808) 671-8383…Telephone emet@emetservices.com...E-mail

ASBESTOS SAMPLE LOCATION PLAN

BLDG #	NAME OF PROJECT SITE	ADDRESS	SKETCH #
46	HAWAII ARMY NATIONAL GUARD (KAPOLEI)	91-1110 ENTERPRISE AVENUE KAPOLEI, HI 96707	132-46-1 1 OF 2



LEGEND

ACM: SAMPLE #

NON-ACM: SAMPLE #

TRACES OF ACM: SAMPLE #

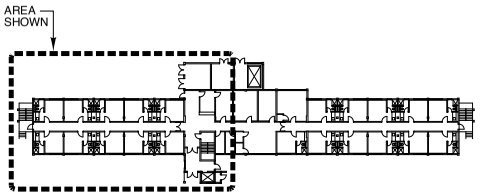
NORTH

ASBESTOS-CONTAINING MATERIALS (ACM)* :

NO ACM DETECTED IN AREAS SAMPLED

*ASBESTOS-CONTAINING MATERIAL (ACM) IS DEFINED AS ANY MATERIAL CONTAINING > 1 % ASBESTOS.

THIS SURVEY WAS LIMITED IN SCOPE TO SPECIFIC AREAS AFFECTED BY PLANNED RENOVATION ACTIVITIES ONLY; THEREFORE, THIS REPORT MAKES NO WARRANTY FOR AREAS OF THE BUILDING WHICH WERE NOT INCLUDED IN THE SCOPE OF THE SURVEY.



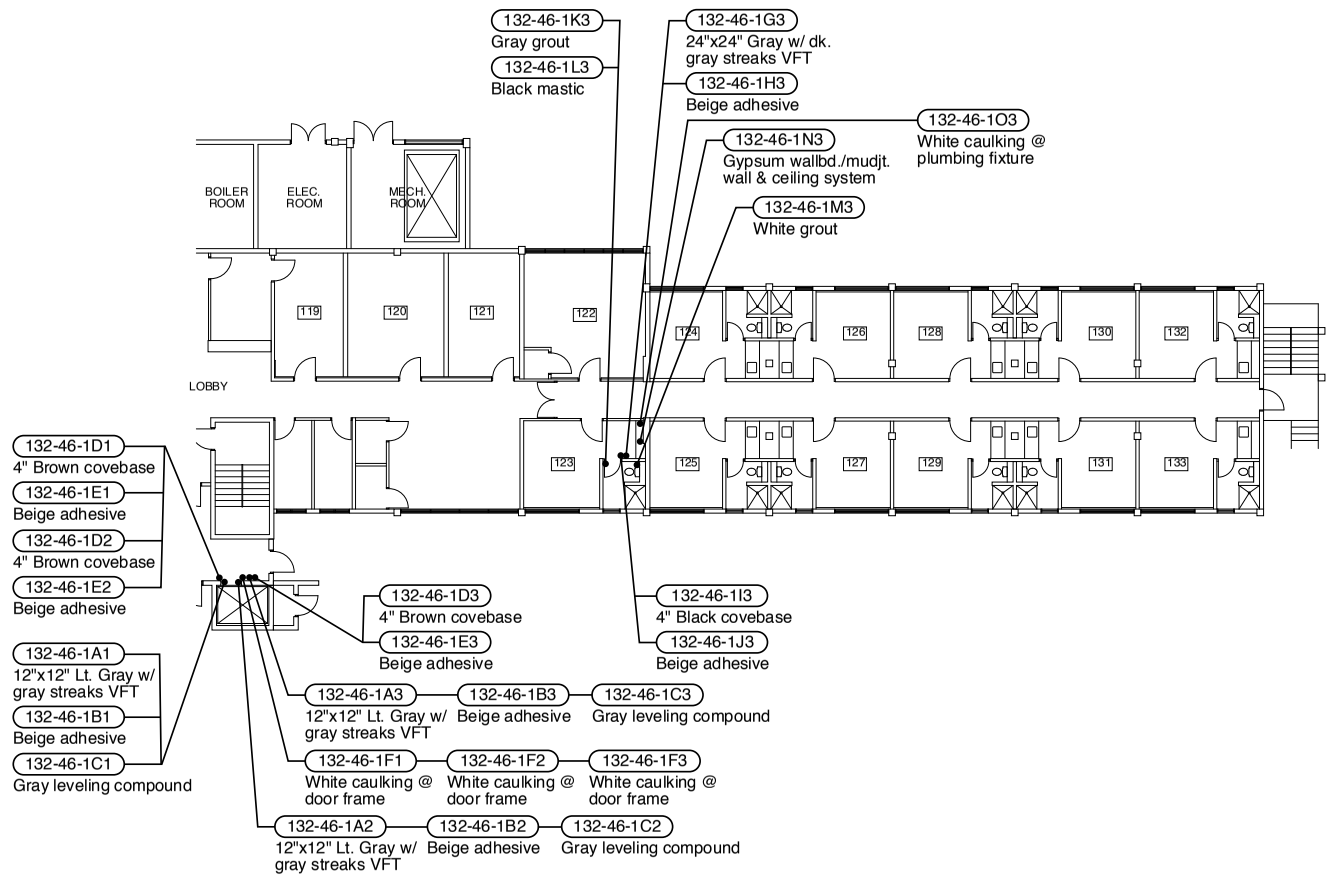
KEY PLAN: BUILDING "46" (FIRST FLOOR)

HAWAII ARMY NATIONAL GUARD (KAPOLEI)
BUILDING "46" - PARTIAL FIRST FLOOR PLAN
NOT TO SCALE

EMET I.D. #2504132

ASBESTOS SAMPLE LOCATION PLAN

BLDG #	NAME OF PROJECT SITE	ADDRESS	SKETCH #
46	HAWAII ARMY NATIONAL GUARD (KAPOLEI)	91-1110 ENTERPRISE AVENUE KAPOLEI, HI 96707	132-46-1 2 OF 2



HAWAII ARMY NATIONAL GUARD (KAPOLEI)
BUILDING "46" - PARTIAL FIRST FLOOR PLAN
NOT TO SCALE

LEGEND

ACM: ◄ SAMPLE #
NON-ACM: ◄ SAMPLE #
TRACES OF ACM: ◄ SAMPLE #

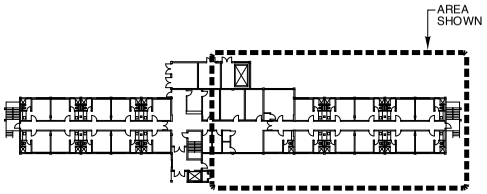
NORTH

ASBESTOS-CONTAINING MATERIALS (ACM)* :

NO ACM DETECTED IN AREAS SAMPLED

*ASBESTOS-CONTAINING MATERIAL (ACM) IS DEFINED AS ANY MATERIAL CONTAINING > 1 % ASBESTOS.

THIS SURVEY WAS LIMITED IN SCOPE TO SPECIFIC AREAS AFFECTED BY PLANNED RENOVATION ACTIVITIES ONLY; THEREFORE, THIS REPORT MAKES NO WARRANTY FOR AREAS OF THE BUILDING WHICH WERE NOT INCLUDED IN THE SCOPE OF THE SURVEY.



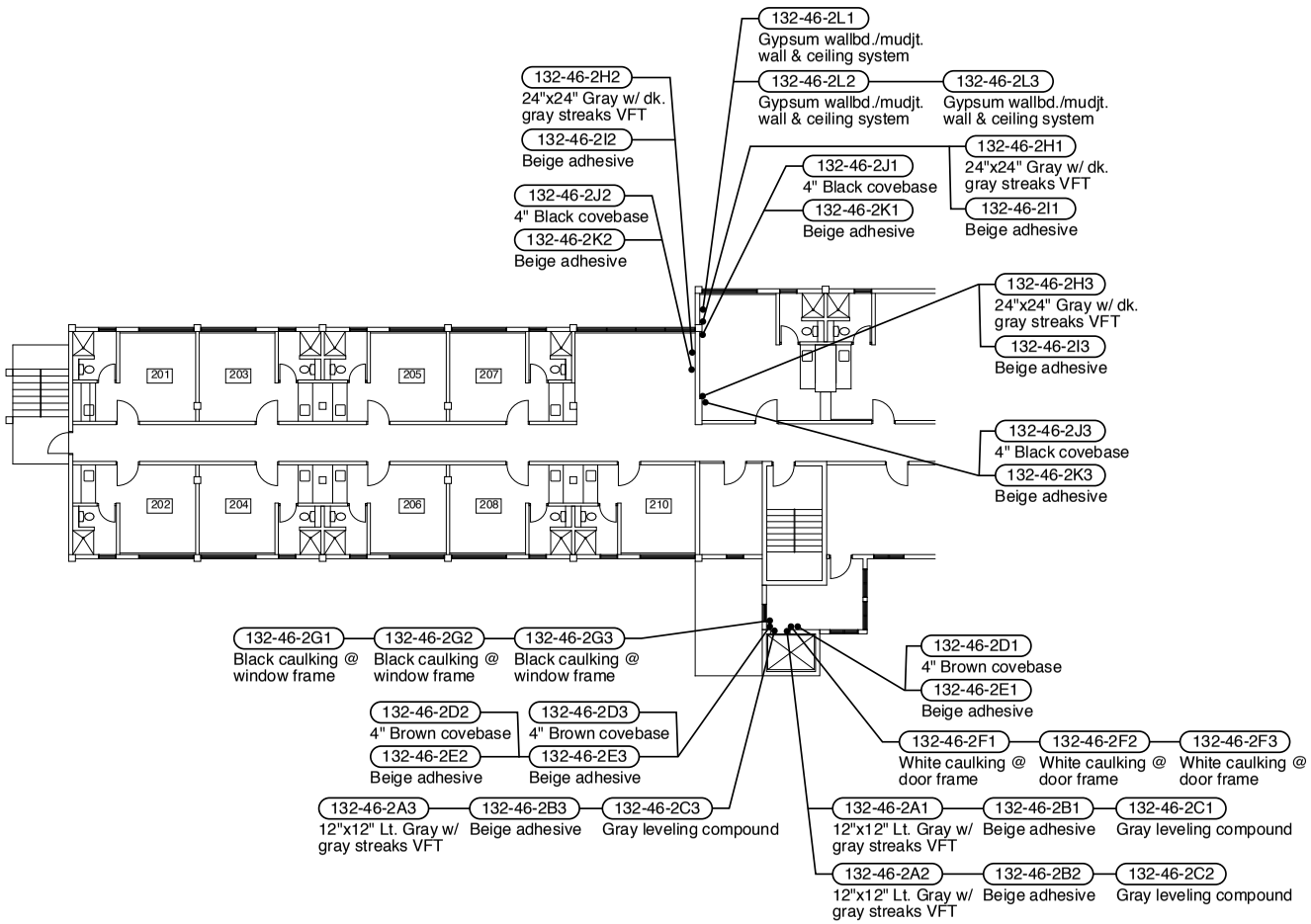
KEY PLAN: BUILDING "46" (FIRST FLOOR)

EMET I.D. #2504132

EnvironMETeo (EMET) Services, Inc. 94-520 Uke'e Street, Suite A Waipahu, Hawaii 96797 Phone: (808) 671-8383 Fax: (808) 671-7979

ASBESTOS SAMPLE LOCATION PLAN

BLDG #	NAME OF PROJECT SITE	ADDRESS	SKETCH #
46	HAWAII ARMY NATIONAL GUARD (KAPOLEI)	91-1110 ENTERPRISE AVENUE KAPOLEI, HI 96707	132-46-2 1 OF 1



HAWAII ARMY NATIONAL GUARD (KAPOLEI)
BUILDING "46" - PARTIAL SECOND FLOOR PLAN
NOT TO SCALE

LEGEND

ACM: SAMPLE #
NON-ACM: SAMPLE #
TRACES OF ACM: SAMPLE #

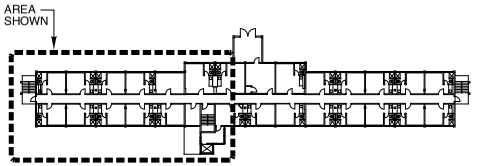
NORTH

ASBESTOS-CONTAINING MATERIALS (ACM)* :

NO ACM DETECTED IN AREAS SAMPLED

*ASBESTOS-CONTAINING MATERIAL (ACM) IS DEFINED AS ANY MATERIAL CONTAINING > 1 % ASBESTOS.

THIS SURVEY WAS LIMITED IN SCOPE TO SPECIFIC AREAS AFFECTED BY PLANNED RENOVATION ACTIVITIES ONLY; THEREFORE, THIS REPORT MAKES NO WARRANTY FOR AREAS OF THE BUILDING WHICH WERE NOT INCLUDED IN THE SCOPE OF THE SURVEY.



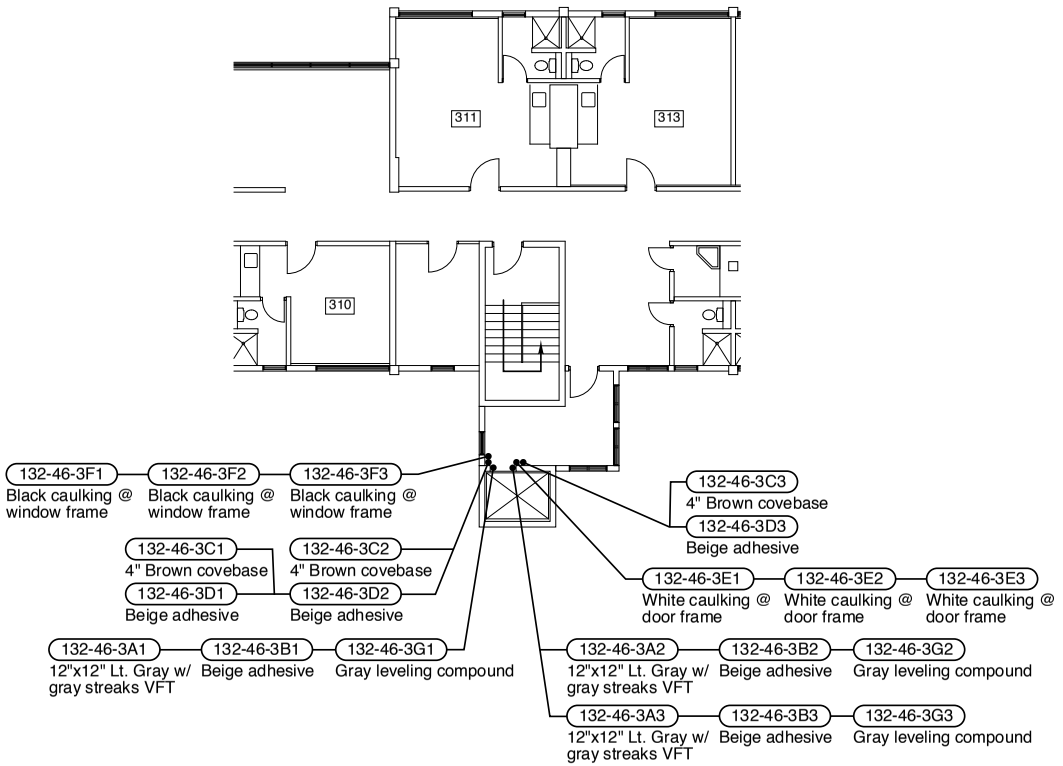
KEY PLAN: BUILDING "46" (SECOND FLOOR)

EMET I.D. #2504132

EnvironMETeo (EMET) Services, Inc. 94-520 Uke'e Street, Suite A Waipahu, Hawaii 96797 Phone: (808) 671-8383 Fax: (808) 671-7979

ASBESTOS SAMPLE LOCATION PLAN

BLDG #	NAME OF PROJECT SITE	ADDRESS	SKETCH #
46	HAWAII ARMY NATIONAL GUARD (KAPOLEI)	91-1110 ENTERPRISE AVENUE KAPOLEI, HI 96707	132-46-3 1 OF 2



HAWAII ARMY NATIONAL GUARD (KAPOLEI)
BUILDING "46" - PARTIAL THIRD FLOOR PLAN
NOT TO SCALE

LEGEND

ACM: SAMPLE #
NON-ACM: SAMPLE #
TRACES OF ACM: SAMPLE #

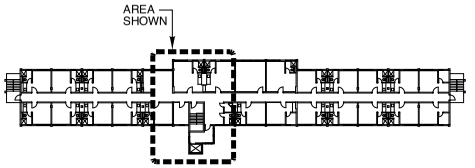
NORTH

ASBESTOS-CONTAINING MATERIALS (ACM)* :

NO ACM DETECTED IN AREAS SAMPLED

*ASBESTOS-CONTAINING MATERIAL (ACM) IS DEFINED AS ANY MATERIAL CONTAINING > 1 % ASBESTOS.

THIS SURVEY WAS LIMITED IN SCOPE TO SPECIFIC AREAS AFFECTED BY PLANNED RENOVATION ACTIVITIES ONLY; THEREFORE, THIS REPORT MAKES NO WARRANTY FOR AREAS OF THE BUILDING WHICH WERE NOT INCLUDED IN THE SCOPE OF THE SURVEY.



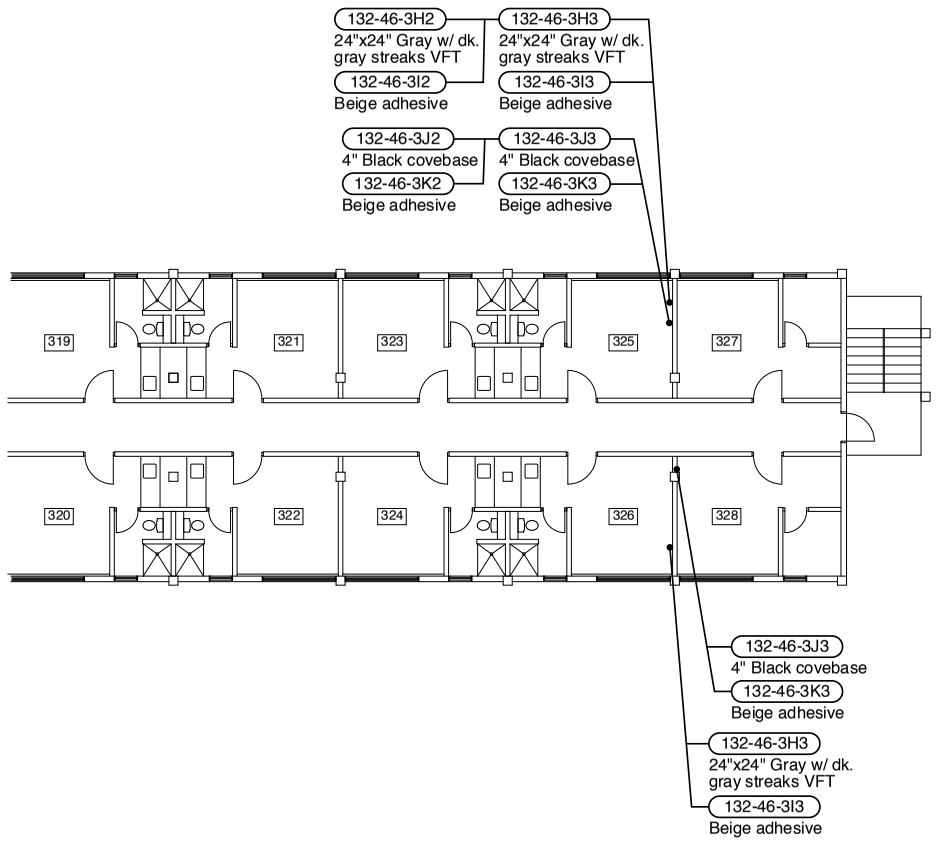
KEY PLAN: BUILDING "46" (THIRD FLOOR)

EMET I.D. #2504132

EnvironMETeo (EMET) Services, Inc. 94-520 Uke'e Street, Suite A Waipahu, Hawaii 96797 Phone: (808) 671-8383 Fax: (808) 671-7979

ASBESTOS SAMPLE LOCATION PLAN

BLDG #	NAME OF PROJECT SITE	ADDRESS	SKETCH #
46	HAWAII ARMY NATIONAL GUARD (KAPOLEI)	91-1110 ENTERPRISE AVENUE KAPOLEI, HI 96707	132-46-3 2 OF 2



LEGEND

ACM: SAMPLE #

NON-ACM: SAMPLE #

TRACES OF ACM: SAMPLE #

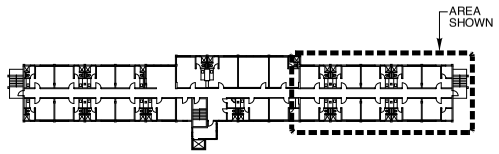
NORTH

ASBESTOS-CONTAINING MATERIALS (ACM)* :

NO ACM DETECTED IN AREAS SAMPLED

*ASBESTOS-CONTAINING MATERIAL (ACM) IS DEFINED AS ANY MATERIAL CONTAINING > 1 % ASBESTOS.

THIS SURVEY WAS LIMITED IN SCOPE TO SPECIFIC AREAS AFFECTED BY PLANNED RENOVATION ACTIVITIES ONLY; THEREFORE, THIS REPORT MAKES NO WARRANTY FOR AREAS OF THE BUILDING WHICH WERE NOT INCLUDED IN THE SCOPE OF THE SURVEY.



KEY PLAN: BUILDING "46" (THIRD FLOOR)

HAWAII ARMY NATIONAL GUARD (KAPOLEI)
BUILDING "46" - PARTIAL THIRD FLOOR PLAN
NOT TO SCALE

EMET I.D. #2504132

Appendix C

Lead Paint Test Results

EnvironMETeo (EMET) Services, Inc. Waipio Gentry Business Park 94-520 Uke'e Street, Suite A Waipahu, Hawaii, USA 96797-4200
(808) 671-8383…Telephone emet@emetservices.com...E-mail

Laboratory Report

Painted Surfaces Total Elemental Lead Analyses
by X-Ray Fluorescence

EMET ID: 2504132

Test Date: September 17, 2025

Building 46 MEDCOM Renovations
Hawaii Army National Guard
Job No. 15H00033

XRF#	Location	Side	Component	Substrate	Condition	Color	PbC (mg/cm²)	Lead-Based Paint	Confirmed Lead-Containing Paint
393	Calibration						1.00 ± 0.10		
394	Calibration						0.50 ± 0.10		
395	Calibration						0.90 ± 0.10		
396	3rd Floor	East	wall	concrete	intact	white	<LOD	no	no
397	3rd Floor	East	wall	CMU	intact	white	<LOD	no	no
398	3rd Floor	South	wall	CMU	intact	white	<LOD	no	no
399	3rd Floor		ceiling	concrete	intact	white	<LOD	no	no
400	2nd Floor	East	wall	concrete	intact	white	<LOD	no	no
401	2nd Floor	East	wall	CMU	intact	white	<LOD	no	no
402	2nd Floor	South	wall	CMU	intact	white	<LOD	no	no
403	1st Floor		ceiling	concrete	intact	white	<LOD	no	no
404	2nd Floor	East	wall	concrete	intact	white	<LOD	no	no
405	1st Floor	East	wall	CMU	intact	white	<LOD	no	no
406	1st Floor	East	wall	CMU	intact	white	<LOD	no	no
407	1st Floor		ceiling	concrete	intact	white	<LOD	no	no
408	1st Floor, Exterior	South	wall	CMU	intact	beige	<LOD	no	no
409	1st Floor, Exterior	South	wall	CMU	intact	brown	<LOD	no	no
410	1st Floor, Exterior	East	wall	CMU	intact	brown	<LOD	no	no
411	1st Floor, Exterior	East	conduit pipe	metal	fair	brown	<LOD	no	no
412	Elevator Machine Room	North	wall	CMU	intact	beige	<LOD	no	no
413	Elevator Machine Room	North	conduit pipe	metal	intact	beige	<LOD	no	no
414	Calibration						0.90 ± 0.10		
415	Calibration						1.00 ± 0.10		
416	Calibration						1.00 ± 0.10		

"**PbC**" column indicates the detected lead content in paint film in mg/cm² (milligrams per square centimeter).
<LOD = less than instrument level of detection, 0.01 mg/cm².

Lead-based paint (LBP) is defined as paint with a lead content greater than or equal to 1.0 milligrams per square centimeter (mg/cm²).

Occupational Safety and Health Administration (OSHA) regulates activities disturbing paint that contains any amount of lead (lead-containing paint or LCP), even if the content is below the HUD standard.

Serial #7798, Source Date 7/2021

EnvironMETeo (EMET) Services, Inc. Waipio Gentry Business Park 94-520 Uke'e Street, Suite A Waipahu, Hawaii, USA 96797-4200
(808) 671-8383...Telephone (808) 671-7979...Facsimile emet@emetservices.com...E-mail

Laboratory Report

Painted Surfaces Total Elemental Lead Analyses
by X-Ray Fluorescence

EMET ID: 2504132 **Test Date: September 22, 2025**

Building 46 MEDCOM Renovations
Hawaii Army National Guard
Job No. 15H00033

XRF#	Location	Side	Component	Substrate	Condition	Color	PbC (mg/cm²)	Lead-Based Paint	Confirmed Lead-Containing Paint
426	Calibration						0.70 ± 0.30		
427	Calibration						0.90 ± 0.10		
428	Calibration						0.90 ± 0.10		
429	1st Floor Rm. 103	North	wall	CMU	intact	white	<LOD	no	no
430	1st Floor Rm. 103	North	wall	CMU	intact	beige	<LOD	no	no
431	1st Floor Rm. 103	North	wall	gypboard	intact	white	<LOD	no	no
432	1st Floor Rm. 107	North	wall	CMU	intact	white	<LOD	no	no
433	1st Floor Rm. 107	North	wall	CMU	intact	beige	<LOD	no	no
434	NULL								
435	1st Floor Rm. 130	North	wall	CMU	intact	white	<LOD	no	no
436	1st Floor Rm. 130	North	column	concrete	intact	white	0.40 ± 0.10	no	yes
437	2nd Floor Rm. 211	South	wall	gypboard	intact	white	<LOD	no	no
438	2nd Floor Rm. 211	South	wall	concrete	intact	white	<LOD	no	no
439	2nd Floor Rm. 211	South	column	concrete	intact	white	0.18 ± 0.15	no	yes
440	2nd Floor Rm. 211		ceiling	concrete	intact	white	0.02 ± 0.98	no	yes
441	3rd Floor Rm. 325	North	wall	CMU	intact	beige	<LOD	no	no
442	3rd Floor Rm. 325	North	column	concrete	intact	beige	<LOD	no	no
443	3rd Floor Rm. 327	North	wall	CMU	intact	white	<LOD	no	no
444	3rd Floor Rm. 327	South	column	concrete	intact	white	0.07 ± 0.06	no	yes
445	3rd Floor Rm. 327		ceiling	concrete	intact	white	<LOD	no	no
446	3rd Floor Rm. 328		ceiling	concrete	intact	white	<LOD	no	no
447	Calibration						0.90 ± 0.10		
448	Calibration						0.90 ± 0.10		
449	Calibration						0.90 ± 0.10		

"**PbC**" column indicates the detected lead content in paint film in mg/cm² (milligrams per square centimeter).
<LOD = less than instrument level of detection, 0.01 mg/cm².

Lead-based paint (LBP) is defined as paint with a lead content greater than or equal to 1.0 milligrams per square centimeter (mg/cm²).

Occupational Safety and Health Administration (OSHA) regulates activities disturbing paint that contains any amount of lead (lead-containing paint or LCP), even if the content is below the HUD standard.

Serial #7798, Source Date 7/2021

EnvironMETeo (EMET) Services, Inc. Waipio Gentry Business Park 94-520 Uke'e Street, Suite A Waipahu, Hawaii, USA 96797-4200
(808) 671-8383...Telephone (808) 671-7979...Facsimile emet@emetservices.com...E-mail

Appendix D

Certifications

EnvironMETeo (EMET) Services, Inc. Waipio Gentry Business Park 94-520 Uke'e Street, Suite A Waipahu, Hawaii, USA 96797-4200
(808) 671-8383…Telephone emet@emetservices.com...E-mail

United States Department of Commerce
National Institute of Standards and Technology

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 101807-0

EnvironMETeo Services Inc.

Waipahu, HI

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Asbestos Fiber Analysis

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique on ISO/IEC 17025).

2024-07-01 through 2025-06-30

Effective Dates

For the National Voluntary Laboratory Accreditation Program

STATE OF HAWAI'I

DEPARTMENT OF HEALTH

Lead-Based Paint Activities Firm Certification

THIS IS TO CERTIFY THAT

EnvironMETeo Services, Inc.

has fulfilled the requirements of Chapter 11-41 Hawaii Administrative Rules and the Toxic Substance Control Act (TSCA) Section 402(a)(2), and has received certification as a firm pursuant to §11-41-4, HAR to conduct lead-based paint activities in Hawaii.

This certification is valid from the date of issuance and expires on **JUNE 19, 2027**.

Date of Issue: **APRIL 8, 2024**
Certification # **PBF-0024**

FOR DIRECTOR OF HEALTH

NON-TRANSFERABLE

REVOCABLE FOR CAUSE

STATE OF HAWAI'I
ASBESTOS CERTIFICATION

Custino
Joseph K.
EnvironMETeo Services, Inc.
HIASB-1094

Training Course Exp Dates

W	n/a	Worker
CS	n/a	Contractor/Supervisor
INS	11/25/25	Inspector
MP	n/a	Management Planner
PD	n/a	Project Designer
PM	09/10/26	Project Monitor

STATE EXP. DATE 9/3/2026

STATE OF HAWA'I
LEAD BASED PAINT ACTIVITIES CERTIFICATION

Expiration Dates:
Inspector: n/a
Supervisor: n/a
Risk Assesor: 10/16/2028
Project Designer: n/a
Worker: n/a

Custino
Joseph K.
EnvironMETeo Services, Inc.

Certification # PB-0667

End of Report

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SECTION 01770 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including the following:
   1. Project Record Documents.
   2. Operation and Maintenance Manuals.
   3. Warranties.
   4. Instruction for the State's personnel.

B. Related documents include the following:
   1. SECTION 01700 - EXECUTION REQUIREMENTS.

1.02 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting a Final Inspection to determine Substantial Completion, complete the following items in addition to requirements of Article 7 of the GENERAL CONDITIONS.
   1. Advise the Project Manager of pending insurance changeover requirements.
   2. Submit specific warranties, final certifications, and similar documents.
   3. Obtain and submit occupancy permits, operating certificates, and similar releases and access to services and utilities, unless waived by the Project Manager.
   4. Arrange to deliver tools, spare parts, extra materials, and similar items to a location designated by the Project Manager. Label with manufacturer's name and model number where applicable.
   5. Make final changeover of permanent locks and deliver keys to the Project Manager. Advise the State's personnel of changeover in security provisions.
   6. Complete startup testing of systems.
   7. Submit test, adjust, and balance records.
   8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
   9. Advise the Project Manager of changeover in other utilities.
   10. Submit changeover information related to the State's occupancy, use, operation, and maintenance.
   11. Complete final cleaning requirements, including touch up painting.
   12. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
   13. Submit the O&M Manual(s) for review.

1.03 FINAL COMPLETION

A. Preliminary Procedures: Within 10 days from the Project Acceptance Date, complete the following items in addition to requirements of GENERAL CONDITIONS Article 7 PROSECUTION AND PROGRESS:

1. Instruct the State's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training media materials.

1.04 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit 2 copies of any updated and action taken list. In addition to requirements of GENERAL CONDITIONS Article 7 PROSECUTION AND PROGRESS, include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.

2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

3. Include the following information at the top of each page:
   a. Project Name and Title.

   b. DAGS Job No.

   c. Date and page number.

   d. Name of Contractor.

1.05 PROJECT RECORD DOCUMENTS AND REQUIREMENTS

A. General:

1. Definition: "Project Record Documents", including Record Drawings, shall fulfill the requirements of "Field-Posted As-Built Drawings" listed in the GENERAL CONDITIONS.

2. Do not use Project Record Documents for daily construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Project Manager's reference during normal working hours and electronically. Maintain these documents as specified in paragraph entitled "Record Drawings" hereinafter.

3. The Designer, under contract with the State, will update the drawings to show all addendum, PCD, and sketch changes. The Project Manager will transmit these drawings (mylar or vellum) to the Contractor who will make all "red-line" corrections to these drawings to record the changes depicted on the Contractor's Field Posted Record ("As-Builts") by accepted drafting practices as approved by the Project Manager.

4. Where the recorded changes depicted on the Contractor's Field Posted Record ("As-Builts") are in the form of shop drawings, the Contractor shall provide those shop drawings electronically on the same sheet size as the drawings transmitted to the Contractor. The new drawing sheets shall be titled and numbered to conform to the construction drawings and clearly indicate what information they supercede in the actual construction drawings. For example a new drawing that replaces drawing M-3, could be numbered M3a.

5. The Contractor shall bring to the attention of the Project Manager any discrepancy between the changes made by the Designer and those depicted on addendum, PCD, and sketch changes. The Project Manager will resolve any conflicts.

6. Submit final Record Documents (Field Posted Record Drawings) before the Final Inspection Date and no later than the Contract Completion Date, unless the GENERAL CONDITIONS require otherwise.

7. The Contractor shall guarantee the accuracy of its final Record Documents. The State will hold the Contractor liable for costs the State incurs as a result of inaccuracies in the Contractor's Record Documents.

8. Prepare and submit [construction photographs and electronic files], damage or settlement surveys, property surveys, and similar final record information as required by the Project Manager.

9. Deliver tools, spare parts, extra materials, and similar items to a location designated by the Project Manager. Label with manufacturer's name and model number where applicable.

10. Submit pest-control final inspection report and warranty.

11. Submit Final, corrected O&M Manual(s).

12. Fill out NGB Form 1354.

B. Record Drawings:
   1. Maintain a duplicate full-size set as the Field Posted Record ("As-Builts") Drawings at the job site. Clearly and accurately record all deviations from alignments, elevations and dimensions, which are stipulated on the drawings and for changes directed by the Project Manager that deviate from the drawings.

   2. Record changes immediately after they are constructed in place and where applicable, refer to the authorizing document (Field Order, Change Order, or Contract Modification). Use red pencil to record changes. Make Field Posted Record Drawings available to the Project Manager at any time so that its clarity and accuracy can be monitored and can be countersigned for validity.
      a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.

      b. Accurately record information in an understandable drawing technique.

      c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

      d. Mark the contract drawings or the shop drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on contract drawings.

      e. Mark important additional information that was either shown schematically or omitted from original Drawings.

      f. Locate concealed building utilities by dimension from bench marks or permanent structures. Locate site utilities by dimensions, azimuth and lengths from bench marks or permanent structures.

      g. Note field order numbers, Change Order numbers, Contract Modification numbers, Alternate numbers, post-construction drawing numbers (PCD) and similar identification (RFI numbers) where applicable.

      h. The Contractor shall initial each deviation and each revision marking.

3. Use the final updated Contract Drawing set (including all addenda, PCD, and sketches) plus applicable shop drawings for making the final Field Posted Record Drawings submittal.

4. Certify drawing accuracy and completeness. Label and sign the record drawings or use digital electronic signature as approved by the Project Manager.

5. Label the title sheet and on all sheets in the margin space to the right of the sheet number, written from the bottom upward, with the title "FIELD POSTED RECORD DRAWINGS" and certification information as shown below. Provide a signature line and company name line for each subcontractor that will also certify the respective drawing. Adjust size to fit margin space.

   FIELD POSTED RECORD DRAWINGS Certified By: _____ Date: _____
   [Contractor's Company Name]

6. Revise the Drawing Index and label the set "FIELD POSTED RECORD DRAWINGS". Include the label "A COMPLETE SET CONTAINS [_____] SHEETS" in the margin at the bottom right corner of each sheet. Quantify the total number of sheets comprising the set.

7. If the Project Manager determines a drawing does not accurately record a deviation or omits relevant information, the State will correct any FIELD POSTED RECORD DRAWINGS sheet. Contractor will be charged for the State's cost to correct the error or omission.

8. Use the final Field Posted Record Drawings sheets and create one electronic version of the set. The set shall be recorded in Adobe Acrobat PDF (Portable Document Format). Create a single indexed, bookmarked PDF file of the entire set of drawings and upload electronically.

1.06 WARRANTIES

A. Submittal Time: Submit written manufacturer's warranties at request of the Project Manager for designated portions of the Work where commencement of warranties other than Project Acceptance date is indicated.

B. Partial Occupancy: Submit properly executed manufacturer's warranties within 45 days of completion of designated portions of the Work that are completed and occupied or used by the State during construction period by separate agreement with Contractor.

C. Organize manufacturer's warranty documents into an orderly sequence based on the table of contents of the Specifications.
   1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2 inch x 11-inch paper.

   2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer and prime contractor.

   3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES", Project Name and Title, DAGS Job Number, and name of Contractor.

   4. Use the final submittal of the warranties to create an electronic Adobe Acrobat PDF (Portable Document Format) version of the bound warranty documents files. Each

sheet shall be separately scanned, at 600 DPI or better into a PDF file, indexed, and uploaded electronically.

1.07 OPERATION AND MAINTENANCE MANUALS

A. Assemble complete set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual Specification Sections and as follows:
   1. Operation Data:
      a. Emergency instructions and procedures.
      b. System, subsystem, and equipment descriptions, including operating standards.
      c. Operating procedures, including startup, shutdown, seasonal, and weekend operations.
      d. Description of controls and sequence of operations.
      e. Piping diagrams.
   2. Maintenance Data:
      a. Manufacturer's information, Material Safety Data Sheets, and a list of spare parts.
      b. Name, address, and telephone number of installer or supplier.
      c. Maintenance procedures.
      d. Maintenance and service schedules for preventive and routine maintenance.
      e. Maintenance record forms.
      f. Sources of spare parts and maintenance materials.
      g. Copies of maintenance service agreements.
      h. Copies of warranties and bonds.

B. Use the following 3 paragraph headings, "Notes, Cautions and Warnings", to emphasize important and critical instructions and procedures. Place the words "Notes", "Cautions", or "Warnings" immediately before the applicable instructions or procedures. Notes, Cautions and Warnings are defined as follows:
   1. Note: highlights an essential operating or maintenance procedure, condition or statement.
   2. Caution: highlights an operating or maintenance procedure, practice, condition or statement which if not strictly observed, could result in damage to or destruction of equipment, loss of designed effectiveness, or health hazards to personnel.
   3. Warning: highlights an operating or maintenance procedure, practice, condition, or statement that if not strictly observed, could result in injury to or death of personnel.

C. Organize the Operation and Maintenance Manuals into suitable sets of manageable size. Bind and index data in heavy-duty, "D" type 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive

folded oversized sheets. Binder color shall be maroon, or if not available red. Identify each binder on front and spine with the printed title “OPERATION AND MAINTENANCE MANUAL”, Project Name and Title include building number when appropriate, DAGS Job Number, Prepared For*:* Hawaii Air National Guard*,* Prepared By*:* [Contractor] and Volume Number. Each binder is a single volume.

D. Electronic Format
   1. Provide all information (narratives, drawings and manual) in electronic PDF format and upload per SECTION 1322 – WEB BASED CONSTRUCTION MANAGEMENT. Provide Compact Disc (CD) or DVD if files are too large. Provide drawings and plans prepared for the O&M Manuals drawn electronically and saved as a PDF file. Name and index the files for ease of identification and updates.

   2. Provide the complete O&M Manual using Adobe Acrobat PDF (Portable Document Format) files. Each sheet shall be separately scanned into a PDF file, indexed, bookmarked, hyperlinked to the table of contents uploaded per SECTION 1322 – WEB BASED CONSTRUCTION MANAGEMENT. Scanned documents shall be scanned at 600 DPI or better. Indexes and bookmarks may be highlighted or colored text.

E. Pre-Final Submittal: Submit 1 printed set of Final Operation and Maintenance Manual, for review by the Project Manager, at least 5 days prior to scheduled final inspection. Manuals shall be marked as Pre-Final.

   1. Make any correction noted before submitting the final Operation and Maintenance Manuals.

   2. The set will be returned with comments. Additional review comments may include problems discovered during the O&M Manual’s review, site validation, and facility start up and will be provided to the Contractor after facility Project Acceptance Date.

F. Final Submittal: Use the final submittal of the manuals to create the electronic PDF file version of the bound Operation and Maintenance Manuals documents. Include the Submittal (100 percent) review comments along with a response to each item. Upload Final Submittal. Final printed manual and any disks shall be marked as Final and sent to the Project Manager.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.01 DEMONSTRATION AND TRAINING

A. Instruction: Instruct the State’s personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
   1. Provide instructors experienced in operation and maintenance procedures.

   2. Provide instruction at mutually accepted times.

   3. Schedule training with the State’s users, through the Project Manager with at least 7 days advanced notice.

   4. Coordinate instructors, including providing notification of dates, times, length of instruction, and course content.

B. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections. For each training module, develop a learning objective and teaching outline. Include instruction for the following:
   1. System design and operational philosophy.
   2. Review of documentation.
   3. Operations.
   4. Adjustments.
   5. Troubleshooting.
   6. Maintenance.
   7. Repair.

3.02 FINAL CLEANING

A. General: Provide final cleaning at the end of the project. In addition to requirements of Article 7 of the GENERAL CONDITIONS conduct cleaning and waste-removal operations to comply with local laws and ordinances and federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturers written instructions unless noted otherwise. Complete the following cleaning operations before requesting final inspection for entire Project or for a portion of Project:
   1. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
   2. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits resulting from construction activities.
   3. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
   4. Remove tools, construction equipment, machinery, and surplus material from Project site.
   5. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
   6. Remove debris and surface dust from limited access spaces, including: roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
   7. Sweep concrete floors broom clean in unoccupied spaces.
   8. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
   9. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials.

Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass surfaces, taking care not to scratch surfaces.

10. Floor Cleaning and Waxing: Prepare the floor tiles and remove wax finish. Apply 2 coats of sealer and 4 coats of wax to the floor and polish to smooth shiny finish per floor sealer and wax manufacturer's requirements. Use one of these 3 sealer products; Betco Floor Sealer, Hillyard Seal 341 Sealer, or SC Johnsons Over and Under Sealer and any one of these 3 wax products; Betco Hybrid 25, Hillyard North Star, or SC Johnsons Vectra. Contractor shall submit its proposed sealer and wax products for review and approval.
    a. Schedule preparation and waxing operations not more than one week prior to final inspection. Limit floor traffic on waxed floors until acceptance.

11. Remove labels that are not permanent.

12. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
    a. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

13. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

14. Replace parts subject to unusual operating conditions.

15. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

16. Replace disposable air filters and clean permanent air filters. Clean the exposed surfaces of diffusers, registers, and grills.

17. Clean ducts, blowers, and coils if units were operated without filters during construction.

18. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

19. Leave Project clean and ready for occupancy.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.

D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the State's property. Do not discharge volatile, harmful, or dangerous materials into drainage and sewer systems or onto State property. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01770

SECTION 02100 - SITE PREPARATION

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

The work to be performed under this section shall include clearing the premises of all obstacles and obstructions, the removal of which will be necessary for the proper reception, construction, execution and completion of the other work included in this contract.

1.02 RELATED DOCUMENTS

A. Hawaii Administrative Rules, Title 11, Chapter 60.1, Air Pollution Control, as amended with latest revisions and statues.

B. Hawaii Administrative Rules, Title 11, Chapter 58, Solid Waste Management Control, as amended with latest revisions and statues.

C. Revised Ordinances of Honolulu, Chapter 18A, as related to grading, soil erosion and sediment control; as amended with latest revisions and ordinances.

D. Rules Relating to Water Quality, Department of Planning and Permitting, City and County of Honolulu, August 16, 2017, as amended with latest revisions.

E. Standard Specifications for Public Works Construction, Department of Public Works, City & County of Honolulu and the Counties of Kauai, Maui and Hawaii; September 1986, as amended with latest revisions.

F. Storm Water Best Management Practice Manual for Construction Sites, Department of Environmental Services, City and County of Honolulu, November 2011, as amended with latest revisions.

1.03 QUALITY ASSURANCE

A. Provide sediment and erosion control measures on project site during construction as shown in the City and County of Honolulu's Storm Water Best Management Practice Manual for Construction Sites.

B. Comply with Erosion and Sediment Control Plan and maintain site BMPs and erosion control measures throughout construction. Provide regular inspection reports, pictures and information the ESCP Coordinator requires for confirming compliance with the City.

1.04 FIELD CONDITIONS

A. Adjust erosion control measures and site BMPs to fit site-specific requirements and adjust as necessary to accommodate phasing of work. Protect adjacent properties and waters at all times.

PART 2 – PRODUCTS

2.01 TEMPORARY DRAIN INLET PROTECTION

A. Place drain inlet inserts on all existing and newly constructed storm drain inlet structures that could receive runoff from the project site.

B. Provide "Dandy Sack" drain inlet filter by Dandy Products, or approved equal, for drain inlets.

C. Place catch basin filter socks at all existing and/or newly constructed catch basins that could receive runoff from the project site.

D. Provide “Dandy Curb, True Dam” sediment filter by Dandy Products, or approved equal, for catch basins.

E. Inspect all drain inlets and catch basins regularly and after a rain event, and clean and maintain as needed.

2.02 SILT FENCE OR FILTER SOCK

A. Provide silt fence or filter sock in all locations shown on plans that receive storm water runoff from the area to be graded and/or disturbed as part of the work.

B. For silt fence, provide posts and filter fabric to the minimum dimensions shown on the plans. Bury filter fabric into the ground a minimum 6” depth and 6” width to secure. Secured filter fabric and posts as needed to provide a stable silt fence throughout construction.

C. For filter sock, provide Biosock compost filter sock by Envirotech BioSolutions, or approved equal. Provide filter sock at diameter size shown in plans. Provide anchor stakes at sizes and minimum depths shown in plans (if shown), or if required to keep filter sock secured in place. Overlap filter socks to prevent gaps of protection along length of installation.

D. Inspect all silt fences or filter socks regularly and after a rain event, and clean and maintain as needed.

2.03 DUST CONTROL

A. Dust control to be applied to reduce dust emissions from the project site and/or to protect existing facilities onsite.

B. Contractor shall water during construction to control dust. Applied water shall be at rates needed to control dust from leaving the project site, but not saturated soils beyond workable limits. Do not allow water applied to run-off project site.

C. Fugitive dust and other solid waste disposal during grading activities shall meet requirements of Hawaii Administrative Rules, Title 11, Chapter 60.1, Air Pollution Control, and Chapter 58, Solid Waste Management Control.

D. Provide dust screen if required to control dust emissions from the project site, or if shown on plans.

2.04 SITE BMPS

A. Provide site Best Management Practices to keep project site clean and protect adjacent properties and waters for pollutants.

B. Provide BMPs shown in plans, as a minimum, and adjust to fit site specific conditions and construction phasing as needed. Contractor responsible to install and maintain all site BMPs and provide additional BMPs as needed if those lists shown in the plans and permits do not provide adequate protection for adjacent properties and waters.

PART 3 - EXECUTION

3.01 GENERAL

A. Maintenance of Traffic: The Contractor shall conduct operations with minimum interference to site parking lot and vehicle movements.

When necessary, the Contractor shall provide and erect barriers, etc., with special attention to protection of personnel.

B. Protection: Throughout the progress of the work protection shall be provided for all property and equipment, and temporary barricades shall be provided as necessary. Work shall be done

in accordance with the safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America, and the State of Hawaii's Occupational Safety and Health Standards, Rules and Regulations.

C. Fires: No burning of fires of any kind will be allowed.

D. Reference Points: Bench marks, etc., shall be carefully maintained, but if disturbed or destroyed, shall be replaced as directed, at the Contractor's expense.

E. Disposal: All materials resultant from operations under this Section shall become the property of the Contractor and shall be removed from the site. Loads of materials shall be trimmed to prevent droppings.

3.02 EXISTING UTILITY LINES

A. The existence of active underground utility lines within the construction area is not definitely known other than those indicated in their approximate locations on the Drawings. Should any unknown line be encountered during excavation, the Contractor shall immediately notify the Engineer of such discovery. The Engineer shall then investigate and issue instructions for the preservation or disposition of the unknown line. Authorization for extra work shall be issued by the Engineer only as he deems necessary.

3.03 CLEARING AND GRUBBING

A. The Contractor shall clear the premises of all obstacles and obstructions, the removal of which will be necessary for the proper reception, construction, execution and completion of other work included in this contract.

B. After clearing has been completed, the entire site shall be stripped of the organically contaminated near-surface soils to a minimum depth of 6 inches. Remove trees and roots to a minimum of 3 feet below existing ground level. Remove all large roots in excess of 2 inches in diameter, and backfill and compact the resulting depression. All debris accumulated from this operation shall be completely removed from the premises by the Contractor.

C. The Contractor shall protect from injury and damage all surrounding trees, plants, etc., and shall leave all in as good as condition as at present. Any damage to existing improvement shall be repaired or replaced by the Contractor to the satisfaction of the Engineer.

3.04 GRADING AND EARTHWORK

A. The Contractor shall provide site grading in accordance with City and County of Honolulu Grading Permit (if applicable). Contractor shall apply and pay for the grading permit before starting grading work.

B. Grading shall be in compliance with Revised Ordinances of Honolulu, Chapter 18A, as related to grading, soil erosion and sediment control; as amended with latest revisions and ordinances, along with the City Rules Relating to Water Quality.

C. Backfill shall be compacted to 90% minimum relative compaction in yard areas.

3.05 CLEAN UP OF PREMISES

A. Clean up and remove all debris accumulated from building operations from time-to-time as directed. Upon completion of the construction work and before final acceptance of the contract work, remove all surplus materials, equipment, scaffoldings, etc., and leave entire job site raked clean and neat to the satisfaction of the Engineer.

END OF SECTION 02100

SECTION 02200 – EARTHWORK

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

The work to be performed under this section shall include grading, compacting, finishing, construction, execution and completion of the general site grading work included in this contract.

1.02 WORK INCLUDED

A. This work shall include the construction of improvements shown, and the excavating, hauling, placing and compacting of suitable material obtained on-site, from borrow pits or from designated sites approved by the County to the finish grades and dimensions shown in the Construction Drawings and in accordance with these Specifications.
B. Furnish materials, labor and equipment required to accomplish all excavation, filling and grading as indicated on the drawings and specified herein.
C. The Contractor shall be responsible for examining the site and determine for himself the existing conditions.
D. Obvious conditions of the site existing on the date of the bid opening shall be accepted as part of the work, even though they may not be clearly indicated on the drawings and/or described herein or may vary there from.
E. All debris of any kind accumulated from clearing and earthwork shall be disposed of offsite. The Contractor shall make all necessary arrangements relative to the proposed disposal location.
F. The requirement in this section is applicable to all new construction areas and to future construction areas under this contract.

1.03 JOB CONDITIONS

A. Dust Control: Use all means necessary to control dust on and near the project site and all off-site borrow areas if such dust is caused by the Contractor's operations during performance of the work or if resulting from the condition in which the Contractor leaves the site. Thoroughly moisten all surfaces as required to prevent dust being a nuisance to the public, neighbors, and concurrent performance of other work on the site.

1.04 STANDARD CODES AND SPECIFICATIONS

The "Standard Details for Public Works Construction," September 1984 the "Standard Specifications for Public Works Construction," September 1986, of the Department of Public Works, Counties of Hawaii, and the “Department of Parks and Recreation Park Standard Details,” except as amended in the drawings and specifications herewith, shall govern the work.

1.05 PERMITS

A. The Contractor shall obtain and pay for necessary permits prior to the commencement of work.

B. The Contractor shall provide and pay for all special inspection services required for the project.

C. The Contractor shall provide and pay for all Erosion and Sediment Control Plan Coordinator services required.

1.06 CONSTRUCTION LINES, LEVELS AND GRADES

A. The Contractor shall verify all lines, levels, elevations and improvements indicated on the drawings prior to any clearing, excavation or construction.

B. At the Contractor's cost, all existing lines and grades shall be verified by a Surveyor licensed in the State of Hawaii before the start of any work.

C. The laying out of new lines, establishment of finish grades and staking out the entire work shall be done by a licensed Surveyor at the Contractor's cost. Contractor shall be solely responsible for the accuracy. Erect and maintain substantial batter boards showing construction lines and levels.

1.07 SUBMITTALS

A. Submit in accordance with Section 01330 – SUBMITTALS.

B. Submit certification from the material producer that the material supplied complies with the requirements of this specification.

C. Fill Testing and Quality Control: The Contractor shall retain and pay for the services of a geotechnical engineering firm to provide monitoring and testing services. The geotechnical engineer shall be a Civil Engineer, licensed in the State of Hawaii, and shall have practiced geotechnical engineering for at least ten (10) years.

D. The site preparation and site grading shall be continuously monitored and tested by the Contractor's geotechnical engineer. Intermittent density tests shall be performed on exposed subgrade, fills, and backfills to determine whether the specified levels of compaction are being consistently attained. The Contractor's geotechnical engineer shall compile the daily observations, test data, and test results into a weekly submittal to the City and County.

PART 2 – PRODUCTS

2.01 GENERAL

A. Approval Required: All fill material to be incorporated into the project shall be subject to approval by the Project Geotechnical Engineer. Notify the Project Geotechnical Engineer at least four working days in advance to schedule and coordinate soil testing.

B. Testing: The Contractor shall notify the Project Geotechnical Engineer of the location of the proposed borrow site and permit the Project Geotechnical Engineer to sample as necessary from the borrow area for the purpose of making acceptance tests to prove the quality of the material. If requested by the State, the Contractor shall employ an independent soils testing laboratory to determine the suitability of the borrow material, the results of which shall be submitted to the City. All costs associated with this testing will be borne by the Contractor. In case the material is rejected, the Contractor shall designate another borrow site. All borrow sites shall be approved by the Contracting Officer in writing.

2.02 ON-SITE FILL MATERIAL

A. Definition: Materials excavated from within the project limits but outside of the planned finish cross sections shall be considered on-site fill material.

B. All on-site material shall be soil or soil-rock mixture free of organic matter and deleterious substances.

2.03 IMPORTED GENERAL FILL MATERIAL

A. Definition: Materials outlined from borrow pits outside of the project limits shall be considered as imported borrow.

B. Borrow material shall meet the requirements specified and shall have an expansion value of 1 percent or less and a CBR value of 12 or greater per ASTM D1883.

2.04 SELECT BORROW FOR SUBBASE

A. Composition: Subbase course shall be crusher run waste, mudrock, coral, sand, or cinders free of organic matter California Bearing Ratio (CBR) of 25 percent.

B. Size: The material shall be well graded from coarse to fine.

2.05 SELECT GRANULAR MATERIAL

A. Composition: Non-expansive select granular material shall be crushed coral, mudrock, basalt or cinder sand. Material shall be well-graded from coarse to fine.

2.06 AGGREGATE BASE COURSE

A. Composition: Crushed basalt aggregates. Crushed coral aggregates not allowed.

B. Materials shall be in accordance with Section 31.2 of the referenced Standard Specifications, except as amended in drawings and specifications.

PART 3 – EXECUTION

3.01 GENERAL

A. Grading: Conform to City and County of Honolulu code requirements and all applicable provisions of the Hawaii Administrative Rules, Title 11, Chapter 55, Water Pollution Control and Chapter 54, Water Quality Standards.

B. Familiarization: Become thoroughly familiar with site, site conditions, and all portions of the work in this section.

C. All fills shall be tested by the Contractor. Test results shall be submitted to the Contracting Officer for acceptance.

3.02 TECHNICAL DEFINITIONS

A. Relative Compaction: Conform to ASTM 1557 test Procedures.

B. Optimum Moisture: Water content (percentage by dry weight) corresponding to the maximum dry density.

3.03 LAYING OUT

A. Preparation: In advance of setting line and grade stakes, clear subgrade area of vegetation, and debris. Dispose to the satisfaction of the Contracting Officer in accordance with SECTION 02100 - SITE PREPARATION.

B. Licensed Surveyor: Layout base lines, finish grades and stake out work to be done by a registered Surveyor licensed in the State of Hawaii.

C. Discrepancies: Discrepancies shall be resolved before proceeding.

3.04 SITE PREPARATION

A. Unsuitable Materials: Remove and dispose of all unsuitable materials, rocks and boulders greater than 3 inches in greatest dimension during the course of the grading operations off-site.

B. Clearing: Clear and grub vegetation, junk and other organic matter. Before placing general fill or embankment material, scarify subgrade to a depth of 6 inches and recompact to a minimum 95 percent. Clearing and grubbing project site in accordance with SECTION 02100 - SITE PREPARATION.

C. Soft and Yielding Areas: Over-excavate to expose firm material.

D. Sloped Areas: Key and bench to receive new fill. Recompact excavated material along with new material. Terrace ground with flatter slopes.

E. Over-Excavated Areas: Scarify over-excavated areas due to soft or yielding soils to a depth of about 6 inches, per ASTM D-1557.

3.05 PLACING GENERAL FILL

A. Description: Place fill material in all areas except for subbase course under paved areas, select granular fill material under building foundations and slab areas.

B. Suitable Materials: Construct fills with imported borrow conforming to specification in all areas except for subbase course under paved areas, select granular fill material under building foundations and slab areas.

C. Layers: Fill material in successive layers of uniform thickness. Construct layers in horizontal lifts not to exceed 6 inches.

D. Compacting Method: Compact fill with compacting equipment.

E. Moisture: Moisture in material shall be slightly above the optimum moisture. Dry material that is too wet.

F. Shrinkage Cracks: Shrinkage cracks noted after compaction shall be re-scarified and prepared to close all cracks.

G. Sloped Areas: Fill operations shall start at the lowest point and continue up in level horizontal compacted layers.

H. Fill Slopes: Construct fill slopes by overfilling and cutting back to the design slope to obtain a well compacted slope face.

I. Required Compaction: Moisture condition each lift to slightly above the optimum moisture and compact per ASTM D-1557.

J. Tolerance: Finished surface shall not vary more than 0.10 foot above or below grades and dimensions shown, except for concrete slab and walkway surfaces

which are required to be within acceptable slopes and meet ADA requirements where applicable.

3.06 PAVED AREAS

Place fill in areas designated to be paved with asphaltic concrete or Portland cement concrete.

A. Existing Ground to Bottom of Subbase Course: Place fill from the prepared existing surface to bottom of subbase course as required in subsection 3.05.

   a. Required Compaction: Scarify finished subgrade, moisture condition and compact per ASTM D-1557.

   b. Roll subgrade until material does not creep under the roller, finished smooth to grade and cross section. Costs of testing shall be paid by Contractor.

   c. Finished subgrade upon which select borrow for subbase is to be placed shall not vary more than 0.10 foot above or below theoretical grade, except for concrete slab and walkway surfaces which are required to be within acceptable slopes and meet ADA requirements where applicable.

B. Subbase Course:

   a. Spreading: Spread select borrow on accepted prepared subgrade to avoid segregation of particles. Spread materials in layers. For material for subbase course, see subsection 2.05.

   b. Rolling: Roll each layer of material until material does not creep under the roller before succeeding course of surfacing material is applied.

   c. Finish subbase course surface shall be rolled smooth to grade and cross section shown.

   d. Required Compaction: Compact finished subbase course per ASTM D1557.

   e. Tolerance: The finished subbase course shall not vary more than 0.05 foot above or below theoretical grade, except for concrete slab and walkway surfaces which are required to be within acceptable slopes and meet ADA requirements where applicable.

C. Filler: When directed spread filler material over surface of subbase course. Spreading shall be broomed, sprinkled with water, and rolled until entire surface is filled and bonded.

3.07 SELECT GRANULAR FILL

Place select granular fill under building foundations and slabs-on-grade in horizontal lifts, per ASTM D 1557.

3.08 AGGREGATE BASE COURSE FILL

A. Placing and Compacting: Place fill in areas designated to be paved where shown in the drawings.

   a. Spreading: Deliver base material and spread on acceptable prepared foundation by means of vehicles equipped with spreading devices. Spread material in uniform gradation. Remix segregated material until uniform.

   b. Material shall be spread longitudinally and only in such quantity to obtain the required thickness. No stock piling allowed. After watering and compacting, the completed base shall conform to the required grade and cross section.

   c. Lift Thickness: When the specified thickness of the base is 6 inches, construct base in one lift. When the thickness is greater than 6 inches, base shall be constructed in two or more equal lifts.

   d. Compacting: Compact base course until it does not creep or weave in front of the roller or compacting vehicle.

   e. Filler Material: When necessary, add filler material to the surface, spread in one or more uniform thin layers.

B. Rolling:

   a. Shaping: After spreading and blading, roll aggregate base course lightly to obtain initial compaction to bring out irregularities.

   b. Rolling Direction: All rolling shall be longitudinal and shall commence at the outer edges.

C. Tolerances:

   a. The finished surface shall be checked for accuracy with a 10-foot straightedge. If the surface at any point varies more than 1/4 inch from the lower edge of the straight-edge laid in any direction, it shall again be shaped and re-rolled. This process shall be repeated until the surface meets the required tolerance.

   b. The finished subgrade upon which the final wearing surface is placed shall not vary more than 0.05 foot above or below the theoretical grade, except for concrete slab and walkway surfaces which are required to be within acceptable slopes and meet ADA requirements where applicable.

3.09 PROTECTION

A. Traffic: Keep all unnecessary traffic off prepared subgrade.

B. Weathered subgrade: Should the prepared subgrade become soft, spongy, or yielding due to the weather or excessive sprinkling, remove and replace the soft material at no extra cost.

C. Soil exhibiting shrinkage cracks after compaction shall be re-scarified, moisture-conditioned and compacted.

D. Saturation and subsequent yielding of the exposed subgrade due to inclement weather and poor drainage shall require over-excavation of the soft areas and replacement with well compacted engineered fill at no added cost.

3.10 CLEAN UP

Upon completion of the work of this Section, immediately remove all debris and excess earth materials from the site.

END OF SECTION 02200

SECTION 02920 – LAWNS AND GRASSES

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes grass planted in areas indicated on the Drawings and as listed below:

1. All existing grassed areas that are damaged by construction operations.

2. Areas that are dug up for new walkway construction.

3. All site areas that are disturbed and graded.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Grass shall match the existing grass of the adjoining areas. At the option of the Contractor, grass planting may be by seeds (plain seeding or by hydro-mulching) or by sprigs.

1. Grass seeds shall be fresh, hulled, and meet the following requirements:

Pure Seed 95.0% minimum
Crop Seed 1.0% maximum
Weed 0.5% maximum
Inert Material 5.0% maximum
Germination 85.0% minimum

Grass seeds shall be delivered to the site in unopened, sealed containers, labeled with the brand name and percent purity. Labeling shall indicate that the seeds passed a certified germination test no more than 12 months prior to use.

2. Grass sprigs shall be healthy living runners and stolons, a minimum of 6 inches long with at least 3 nodes. After they are dug, they shall be covered and kept moist until planted.

B. Fertilizer shall be pelleted and shall consist of the following percentages by weight of active ingredients:

1. For first application:

Nitrogen 16%
Phosphate 16%
Potash 16%

2. For second application:

Nitrogen 16%
Phosphate 16%
Potash 16%

C. Mulch Materials

1. Mulch shall be specially processed fiber containing no growth or germination inhibiting factors. It shall be such that any addition and agitation in the hydraulic equipment with seed, fertilizer, water and other additives not detrimental to plant growth, the fibers will form a homogenous slurry. When hydraulically sprayed on the soil, the fibers shall form a blotter-like ground cover that readily absorbs water and allows infiltration to the underlying soil.

2. Stabilizing and water retaining agent for hydro-mulching option only shall be “Verdyol Super”, “Ecology Control M-Binder” or approved equal. Rate of application of “Verdyol Super” shall be 50 pounds per acre and that for “Ecology Control M-Binder” shall be 60 pounds per acre.

D. Water shall be potable.

PART 3 – EXECUTION

3.01 INSTALLATION AND WORKMANSHIP

A. Site Preparation

1. Leveling: Any undulations or irregularities in the surface resulting from tilling or other operations shall be leveled out before planting operations are begun.

B. Planting: The Contractor shall notify the Contracting Officer 2 days before planting of grass.

1. Immediately prior to planting operations, all planting areas shall be cleared of weeds, debris, rocks over ½-inch in diameter and clumps of earth that will not break up.

2. Option by grass seeding: If grass seeds are used, the following procedure shall be used (Note: Contractor shall exercise caution in seeding slopes where seeds may be washed away):

a. The grass seeds shall be broadcast uniformly by hand or by sowing equipment at the rate of 100 pounds per acre. Half the seeds shall be sown with the sower moving in one direction and the remainder shall be sown at right angles to the first direction.

b. The surface shall be raked to a smooth even plane while the seeds are simultaneously worked into the soil to a depth of about 1/2 inch.

c. The surface shall be smoothed and compacted by means of a culti-packer, roller or other similar equipment weighting 60 to 90 pounds per lineal foot of roller.

d. The planted area shall be watered sufficiently to provide water penetration to a depth of at least 2 inches and shall then be kept moist until roots are established.

3. Option by Grass Sprigging

a. Furrows shall be planted perpendicular to drainage aisles and parallel to contours on slopes and shall be spaced no more than 4 inches apart.

b. Fresh sprigs shall be planted in each furrow a maximum of 6 inches apart and covered with soil to a minimum depth of 2 inches.

c. The surface shall be smoothed and compacted by means of a culti-packer, roller or other similar equipment weighting 60 to 90 pounds per lineal foot of roller.

d. The planted areas shall be watered immediately after rolling in sufficient quantity to provide water penetration to a depth of at least 2 inches and shall be kept moist until roots are established.

e. The area shall be overseeded with annual type rye grass seeds at the rate of 25 pounds per acre.

4. Option by hydro-mulching of grass seed: This work shall consist of furnishing and applying grass seed, fertilizer, mulch and stabilizing and water retaining agent by hydro-mulching.

a. The seeds shall be applied at the minimum rate of 100 pounds per acre. Mulch shall be applied at a minimum rate of 1500 pounds per acre (31 pounds per 900 square feet). In every application, complete and uniform coverage of the soil shall be attained.

b. First application of fertilizer shall be included with mulch and seed.

c. The hydro-mulch equipment shall be capable of mixing all the necessary ingredients to a uniform mixture and to apply the slurry to provide uniform coverage. Seed, fertilizer, mulch mix and stabilizing and water retaining agent shall be applied in one operation by hydraulic equipment made specifically for this use. The equipment shall have a built-in agitation system with an operating capacity sufficient to keep the mix in uniform distribution until pumped from the tank. Distribution and discharge lines shall be large enough to prevent stoppage and shall be equipped with hydraulic discharge spray nozzles that provide a uniform distribution of the slurry.

d. Areas inaccessible to hydro-mulching application shall be seeded or hand sprigged and fertilized by approved hand methods.

e. Water shall be applied immediately following mulching and the planted area shall be kept moist until roots are established.

C. Application of fertilizer: The Contractor shall notify the Contracting Officer one day before application of fertilizer.

1. Fertilizer shall be distributed uniformly over the planted area.

2. The first application of fertilizer shall be applied at the rate of 300 pounds per acre about 2 weeks after grassing and shall be followed by watering. (First application of fertilizer if using hydro-mulch option shall be mixed with the seeded mulch.)

3. The second application of fertilizer shall be applied at the rate of 300 pounds per acre about 1 week before the end of the maintenance period and shall be followed by watering.

D. Maintenance

1. General: The Contractor shall be responsible for the proper care of the grassed areas. Maintenance shall include watering, weeding, mowing, repairing, regrassing and protection, and shall be required until the entire project is accepted, but in any event for a period not less than 60 days after planting of grass.

2. Watering: After planting of seeds or grass sprigs or mulching, the ground shall be watered as deemed necessary by the Contractor to establish a healthy growth. Watering shall be done in a manner that will prevent erosion due to the application of excessive quantities of water, and the watering equipment shall be of a type that will prevent damage to the finished surface.

3. Weeding: Weeds shall be uprooted and removed completely and in no case shall they be allowed to grow and propagate more seeds. Large holes caused by weeding shall be filled with screened soil and raked level.

4. Mowing: Grass shall be mowed to a height of 1 inch whenever the height of grass becomes 1-1/2 inch.

5. Repairing and Regrassing: When any portion of the surface becomes gullied or otherwise damaged and grass has failed to grow, such areas shall be repaired with screened soil and replanted with grass. Any area of one-foot square or more in which grass has failed to grow after 30 days of maintenance shall be regrassed.

6. Protection: The grassed areas shall be protected against traffic so that the grass establishes a healthy growth. Grassed areas damaged by traffic shall be replanted.

3.02 ACCEPTANCE OF GRASSING

A. At the time of acceptance, the grass shall have been well established and shall be given a final weeding and a final mowing to a height of 1 inch. If the maintenance period has expired before acceptance of the entire project, the Contractor shall continue to maintain the grass at no additional cost to the State, until acceptance of the entire project. If the maintenance period should extend beyond acceptance of the entire project, the Contractor shall continue to maintain the grass until the end of the specified period of time required for maintenance.

B. At the end of the maintenance period, should there appear areas where grass has failed to grow, such areas shall be replanted with grass, refertilized and maintained beyond the maintenance period at no additional cost to the State, until a healthy growth is established.

C. Acceptance of grassed areas at conclusion of maintenance period shall be conditioned upon 98% coverage of the overall area. Individual bare spots shall not exceed one square foot in area. Maintenance period for all planting shall be extended at no additional cost if grass planting does not meet this requirement.

END OF SECTION 02920

SECTION 03300 – CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.01 GENERAL CONDITIONS
A. As specified in Section 00700.

1.02 SUMMARY
A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
1. Concrete walls

2. All other concrete

1.03 DEFINITIONS
A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.04 ACTION SUBMITTALS
A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
1. Indicate amounts of mixing water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

1.04 INFORMATIONAL SUBMITTALS
A. Qualification Data: For Installer, manufacturer, and testing agency.

B. Welding certificates

C. Material Certificates: For each of the following, signed by manufacturers:
1. Cementitious materials.

2. Admixtures.

3. Steel reinforcement and accessories.

4. Curing compounds.

5. Floor and slab treatments.

6. Semirigid joint filler.

7. Joint-filler strips.

8. Repair materials.

9. Vapor Retarders

D. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
   1. Aggregates.

E. Field quality-control reports.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
   1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
   1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

   2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

E. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."

F. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
   1. ACI 301, "Specifications for Structural Concrete."

   2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

G. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.
   1. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

PART 2 - PRODUCTS

2.01 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
   1. Plywood, metal, or other approved panel materials.

B. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch minimum.

C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
   1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

D. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
   1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.

   2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.

2.02 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

B. Plain-Steel Wire: ASTM A 82, as drawn.

2.03 REINFORCEMENT ACCESSORIES

A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
   1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.04 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
   1. Portland Cement: ASTM C 150, Type I or Type II.

B. Pozzolans: Fly Ash – ASTM C 618, Class C or F.

C. Silica Fume: ASTM C 1240, amorphous silica.

D. Normal-Weight Aggregates: ASTM C 33, Class 3M coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
   1. Maximum Coarse-Aggregate Size: 3/4-inch nominal.

   2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

E. Water: ASTM C 94 and potable.

2.05 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
   1. Water-Reducing Admixture: ASTM C 494, Type A.
   2. Retarding Admixture: ASTM C 494, Type B.
   3. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
   4. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
   5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494, Type G.
   6. Plasticizing and Retarding Admixture: ASTM C 1017, Type II.

2.06 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
   1. VOC Content: Curing and sealing compounds shall have a VOC content of 200 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.07 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, aromatic polyurea with a Type A shore durometer hardness range of 90 to 95 per ASTM D 2240.

C. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements.

E. Reglets: Fabricate reglets of not less than 0.022-inch thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

F. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.08 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
   1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.

   2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.

   3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.

   4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.
   1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.

   2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.

   3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.

   4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

2.09 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
   1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

C. Admixtures: Use admixtures according to manufacturer's written instructions.
   1. Use water-reducing, high-range water-reducing, or plasticizing admixture in concrete, as required, for placement and workability.

   2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

   3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

   4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.10 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Concrete Walls: Proportion normal-weight concrete mixture as follows:
   1. Minimum Compressive Strength: 3000 psi at 28 days.

2. Maximum Water-Cementitious Materials Ratio: 0.50.

3. Slump Limit: 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.

4. Air Content: 3.5 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.

B. All Other Concrete: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: 3000 psi at 28 days.

2. Maximum Water-Cementitious Materials Ratio: 0.50.

3. Slump Limit: 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.

4. Air Content: 3.5 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.

2.11 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.12 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94, and furnish batch ticket information.
1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94. Mix concrete materials in appropriate drum-type batch machine mixer.
1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.

2. For mixer capacity larger than 1 cu. Yd., increase mixing time by 15 seconds for each additional 1 cu. yd.

3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.01 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
1. Class A, 1/8 inch for smooth-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
   1. Install keyways, reglets, recesses, and the like, for easy removal.

   2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.02 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

   2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

   3. Install dovetail anchor slots in concrete structures as indicated.

3.03 REMOVING AND REUSING FORMS

A. General: Formwork for sides of footings, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Contracting Officer.

3.04 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
   1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

3.05 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Contracting Officer.
   1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.

   2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.

   3. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least 1 inch of concrete thickness as follows:
   1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
   1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.

   2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Section 07920 – SEALANTS, are indicated.

   3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

3.06 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Contracting Officer.

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
   1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
   1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.

   2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

   3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
   1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.

   2. Maintain reinforcement in position on chairs during concrete placement.

   3. Screed slab surfaces with a straightedge and strike off to correct elevations.

   4. Slope surfaces uniformly to drains where required.

   5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

3.07 FINISHING FLOORS AND SLABS

A. Broom Finish: Apply a broom finish to exterior concrete platforms, sidewalks, steps, ramps, and elsewhere as indicated.
   1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Contracting Officer before application.

3.08 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

3.09 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive hot temperatures. Comply with ACI 301 for hot-weather protection during curing.

B. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

C. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

D. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
   1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
      a. Water.

      b. Continuous water-fog spray.

      c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

   2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
      a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.

      b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.

      c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.

   3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
      a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on the project.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.10 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
   1. Defer joint filling until concrete has aged at least six month(s). Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.11 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Contracting Officer. Remove and replace concrete that cannot be repaired and patched to Contracting Officer's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
   1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

   2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

   3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Contracting Officer.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
   1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.

   2. After concrete has cured at least 14 days, correct high areas by grinding.

3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.

4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.

5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.

6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Contracting Officer's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Contracting Officer's approval.

3.12 FIELD QUALITY CONTROL

A. Testing and Inspecting: Contracting Officer will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Inspections:
   1. Steel reinforcement placement.

   2. Headed bolts and studs.

   3. Verification of use of required design mixture.

   4. Concrete placement, including conveying and depositing.

   5. Curing procedures and maintenance of curing temperature.

   6. Verification of concrete strength before removal of shores and forms from beams and slabs.

C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.

2. Slump: ASTM C 143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 80 deg F and above, and one test for each composite sample.

5. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

6. Compression Test Specimens: ASTM C 31.
   a. Field-cured specimens in first subparagraph below may be required to verify adequacy of curing and protection of concrete, to verify strength for tilt-up concrete and post-tensioning concrete, or to verify strength for removal of shoring and reshoring in multistory construction. Revise number of test specimens if required.

   b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.

7. Compressive-Strength Tests: ASTM C 39; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
   a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.

   b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

9. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

10. Test results shall be reported in writing to Contracting Officer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

11. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Contracting Officer but will not be used as sole basis for approval or rejection of concrete.

12. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Contracting Officer. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Contracting Officer.

13. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

14. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

D. Measure floor and slab flatness and levelness according to ASTM E 1155 within 48 hours of finishing.

3.13 PROTECTION OF LIQUID FLOOR TREATMENTS

A. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

END OF SECTION 03300

SECTION 03930 - CONCRETE REHABILITATION

PART 1 - GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Crack Repairs by Epoxy Injection: Section 03931.

B. Sealants: Section 07920.

1.02 REFERENCES

A. Except as shown or specified, the Work of this Section shall conform to the requirements of International Concrete Repair Institute (ICRI).
   1. ICRI Guideline No. 03730 Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion.

1.03 UNIT PRICES FOR ADDED OR DEDUCTED WORK

A. Do not exceed the quantities of Work indicated by numeric units on the Drawings, except by Order on Contract. In order to avoid delay, notify the Director's Representative when the amount of completed Work approaches the quantity indicated.

B. If the installed quantity of Work is greater than the numeric units of Work indicated on the Drawings, the contract sum will be adjusted by an Order on Contract. If the installed quantity of Work is less than the numeric units of Work indicated on the Drawings, the contract sum will be adjusted via a Supplemental Agreement (BDC 134) at time of final payment at the following unit prices:
   1. Patching Concrete Surfaces with Type Rapid-Setting Cementitious Repair Mortar:
      a. Added patching @ $ 12.00 per square foot.

      b. Deducted patching @ $ 12.00 per square foot.

   2. Patching Concrete Surfaces with Type Polymer-Modified Repair Mortar:
      a. Added patching @ $ 15.00 per square foot.

      b. Deducted patching @ $ 15.00 per square foot.

C. The foregoing unit prices include overhead, profit, and all other expenses incidental to the Work. Include in the bid sum all additional costs in connection with quantity changes that are not compensated for at the given unit prices.

D. Quantities of Work shown on the drawing in numeric units are in addition to any other similar Work required under the Contract. Unit prices for additions and deductions are applicable only to the quantities of Work indicated in numeric units.

E. If the total amount of a change exceeds 20 percent of a quantity indicated on the Drawings, the adjustment of the contract sum for the quantity in excess of 20 percent will be made in accordance with the General Conditions.

1.04 SUBMITTALS

A. Product Data: Manufacturer's specifications and installation instructions for factory packaged products.

1.05 QUALITY ASSURANCE

A. Field Examples: Prior to performing the Work of this Section, prepare a sample panel, or a portion of existing concrete which is to be repaired, to represent each type of

rehabilitation work required. Approved samples will be used as quality standards for the Work. Maintain approved samples at the site until the Work is completed.

B. Material Container Labels: Material containers shall bear the manufacturer's label indicating manufacturer's name, trade name of product, lot number, shelf life of product, and mix ratio (if applicable).

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the site in original, sealed containers. Do not deliver materials that have exceeded shelf life limitation set forth by the manufacturer.

B. Comply with manufacturer's printed instructions for storing and handling materials.

1.07 PROJECT CONDITIONS

A. Environmental Requirements: Comply with the product manufacturer's printed limitations and instructions.

PART 2 - PRODUCTS

2.01 MATERIALS

A. The following brand names are specified to establish product generic type and standard of quality. Other comparable products in the manufacturer's same product series may be required to closely fit the particular job conditions. Use appropriate product for depth of patch and temperature at time of application. More than one product may be required for a particular type of patching mortar. When choice of color is available, select color to match adjoining concrete. A bonding agent/primer and/or sealer shall be used as recommended by the patching mortar manufacturer.

B. Cement/Acrylic/Latex Base Patching Mortars:

1. Type C-1 Patching Mortar: "Verticoat", by Euclid Chemical Company; "Thorite 400 Architectural" or "Emaco Rite" or "Emaco R300 CI" or "Emaco R350 CI" or "Emaco S88 CI" or "Emaco HBA Repair Mortar" by Master Builders/BASF Building Systems; "Gel Patch" by Sonneborn/ BASF Building Systems; "TPM 722" or "TPM 723" by General Polymers Corp.; "HB2 Repair Mortar or HBA Repair Mortar" by ThoRoc/ BASF Building Systems; "Patchwell" by Kaufman Products, Inc.; or "Masco Latex Cement" by Silpro Masonry Systems Inc.

2. Type C-2 Patching Mortar: "SikaTop 121 Plus", "SikaTop 122 Plus" or "SikaTop 111 Plus" by Sika Corp.; "Emaco 10-60", "Emaco R300 CI", "Emaco R310 CI" or "Emaco T415/T430" by Master Builders/ BASF Building Systems; "Super Can-Crete" by Anti Hydro Co.; "TPM 711" or "TPM 721" by General Polymers Corp.; "SD2 Repair Mortar" by ThoRoc/ BASF Building Systems; "Patchwell Kit", "Patchwell Kit D" or "K Tex 042" by Kaufman Products, Inc.; "Thincoat", "Concrete Coat" or "Thintop 100" by Euclid Chemical Company; or "Masco Latex Cement" by Silpro Masonry Systems Inc.

3. Type C-3 Patching Mortar: "Patchwell HB", "HiCap" or "DressUp" by Kaufman Products, Inc.; "Emaco S88" by Master Builders/BASF Building Systems; "SikaTop 123 Plus" or "SikaTop 144" by Sika Corp.; or "Verticoat Supreme" by Euclid Chemical Company.

C. Epoxy Base Patching Mortars:

1. Type E-1 Patching Mortar: 100 percent solids, low modulus, low viscosity, moisture insensitive, epoxy resin and aggregate system; "Sikadur 21 Lo-Mod LV" by Sika Corporation; "Concresive 1420", "Concresive NC Adhesive Gel" or "Masterflow MP"

by Master Builders /BASF Building Systems; “Flexocrete” by Dural International Corp.; “SurePoxy LMLV” or “SurePoxy LMLV, Class B” by Kaufman Products, Inc.; or “SRC 3577 LV” by General Polymers Corp.

2. Type E-2 Patching Mortar: 100 percent solids, low modulus, high viscosity, moisture insensitive, epoxy resin and aggregate system; “Sikadur 23 Lo-Mod Gel” by Sika Corporation; “Concresive Paste LPL”, “Concresive NC Adhesive Gel” or “Concresive 1420” by Master Builders/BASF Building Systems; “Flexocrete Gel” by Dural International Corp.; “A-H Epoxy Patch No. 122” by Anti Hydro Co.; “SurePoxy LM Gel” by Kaufman Products, Inc.; or “SRC 3577 Gel” by General Polymers Corp.

3. Type E-3 Patching Mortar: High modulus, medium/low viscosity, moisture insensitive, epoxy resin and aggregate system; “Sikadur 35” or “Sikadur 62” by Sika Corporation, “Concresive Liquid LPL” by Master Builders/BASF Building Systems; “Duralcrete” by Dural International Corp.; “SurePoxy HMLV, Class B” or “SurePoxy HMSLV” by Kaufman Products, Inc.; or “SRC 3575 LV” by General Polymers Corp.

4. Type E-4 Patching Mortar: High modulus, high viscosity, moisture insensitive, epoxy resin and aggregate system; “Sikadur 31 Hi-Mod Gel” or “Sikadur 31 Hi-Mod Gel SBA Slow Set” by Sika Corporation; “Concresive Paste LPL” or “Concresive 1490” by Master Builders/BASF Building Systems; “Duralcrete Gel” by Dural International Corp.; “SurePoxy HM Gel”, “SurePoxy 117”, “SurePoxy 116” or “SurePoxy HM Gel EPL” by Kaufman Products, Inc.; or “SRC 3575 Gel” by General Polymers Corp.

5. Aggregate: As recommended by the patching mortar manufacturer for the binder and application.

D. Rapid-hardening Cementitious Patching Mortar:
   1. Type R-1 Patching Mortar: “Roadpatch DOT” by Thoro/BASF Building Systems; “10-60 Rapid Mortar” or “10-61 Rapid Mortar” by ThoRoc/BASF Building Systems; “Durapatch” by L&M Construction Chemicals, Inc.; or “SikaSet Roadway Patch” by Sika Corp; “Durcrete” by Kaufman Products, Inc.; or “Emaco FS”, “Emaco 10-61”, “Emaco 10-61”, “Emaco T415”, “Emaco T430” or “Set 45” by Master Builders/ BASF Building Systems.

E. Rebar Coating: “ECB” by Conproco Corp.; or “Emaco P22” or “Emaco P24” by Master Builders/BASF Building Systems.

F. Cleaning Agent, Bonding Agent/Primer, Sealer/Topcoat: As recommended by the patching mortar manufacturer, including primer for the reinforcing steel and primer for the concrete substrate.

G. Concrete and Bonding Agent (for concrete): Normal weight cast-in-place concrete and adhesive bonding agent as specified in Section 03050 or 03300.

PART 3 - EXECUTION

3.01 PREPARATION

A. Protection: Cover or otherwise protect adjacent surfaces not being repaired.

B. Surface Preparation:
   1. Prepare surfaces to be repaired in accordance with the product manufacturer’s printed instructions and as specified.

2. Cut out and remove cracked, spalled, and disintegrated concrete. Cut back to sound concrete. Cut edges of patch perpendicular to surface of patch, unless otherwise recommended by mortar manufacturer. If steel reinforcing bars are exposed, chip concrete out from behind exposed length of bars as required for a minimum clearance around circumference of bar of 3/4 inch. In addition, cut a minimum one inch length of sound concrete away from each end of exposed length of reinforcing bars.

3. Clean exposed steel reinforcement; remove bits of concrete and loose rust. If reinforcement is bowed out toward surface of the concrete, bend reinforcement back from surface.

4. Remove paint, oils, grease, dirt, salt deposits, laitance and other contaminants from surfaces to be patched. Use cleaning agent where required.

5. Clean areas to be patched with oil-free air or water under pressure, except as otherwise recommended by the mortar manufacturer.

3.02 COATING REBAR

A. Coat reinforcing as soon as possible after completion of surface preparation.

B. Place reinforcement coating complying with manufacturers printed instructions.

3.03 PATCHING CONCRETE

A. Patch concrete as soon as possible after completion of surface preparation.

B. Mixing Patching Mortar: Comply with mortar manufacturer’s printed instructions. Proportion components and sizes of aggregate as recommended by mortar manufacturer for the particular job conditions.

Patch concrete in accordance with the product manufacturer’s printed instructions.

1. Coat contact surfaces of existing concrete and steel reinforcing with a bonding agent/primer as recommended in the product manufacturer’s instructions.

D. Bring patches out to the original surfaces in true planes. Finish patches to match texture of adjoining concrete as close as possible.

E. Cure patches in accordance with the product manufacturer’s printed instructions.

3.04 CLEANING

A. Clean up spatters and droppings.

3.05 PROTECTION

A. Protect mortar after placement in accordance with the product manufacturer’s printed instructions.

END OF SECTION 03930

SECTION 03931 - CRACK REPAIRS BY EPOXY INJECTION

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Structural repair of cracks in concrete by permanently rebonding the concrete with epoxy resin adhesive injected under pressure with special equipment.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Concrete Rehabilitation: Section 03930.

1.03 PERFORMANCE REQUIREMENTS

A. Seepage of water through cracks repaired under the Work of this Section will be regarded as defective Work subject to the one-year guarantee required by the General Conditions.

1.04 SUBMITTALS

A. Product Data: Manufacturer's printed specifications and installation instructions for epoxy adhesive and surface seal material.

B. Quality Control Submittals:
   1. Test Reports:
      a. Submit reports for tests specified under Source Quality Control.

      b. If requested, submit test reports for all specified characteristics and properties of the epoxy adhesive materials from an Independent Testing Laboratory.

   2. Certificates: Epoxy adhesive manufacturer's written certification that each batch of epoxy adhesive material shipped for this Project complies with the requirements of these specifications.

1.05 QUALITY ASSURANCE

A. Installer's Qualifications: Epoxy injection shall be performed by a firm that is licensed or approved by the epoxy adhesive manufacturer to perform such work. In addition, the person supervising the epoxy injection shall be experienced in epoxy injection and shall have been regularly employed for a minimum of five years by a company specializing in repairing cracks by epoxy injection.
   1. If requested, furnish to the Director the names and addresses of five similar projects for which the supervisor has supervised epoxy injection work.

B. Workers' Qualifications: Workers engaged in the Work of this Section shall have satisfactorily completed a program of instruction in the epoxy injection process. The instruction shall include this specific method of repairing cracks in concrete, the technical aspects of correct material use, and the operation, maintenance and checking of equipment.

C. Testing Agency: Tests for all specified characteristics and properties of the epoxy adhesive materials shall have been performed by a qualified Independent Testing Laboratory and copies of the test results shall be available. Tests indicated under Source Quality Control shall be performed by the adhesive manufacturer.

D. Source Quality Control: The following quality control tests shall be performed on each lot of epoxy adhesive materials supplied for this Project. Tests shall be conducted using the test methods indicated in Part 2.
   1. Resin viscosity at 77 degrees F and epoxide equivalent weight.

2. Hardener viscosity at 77 degrees F and amine value.

3. Combined components pot life at 77 degrees F.

4. Cured (for 7 days) adhesive ultimate tensile strength and tensile elongation at break; and slant shear strength for wet/wet concrete cured 3 days.

E. Material Container Labels: Material containers shall bear a manufacturer's label indicating manufacturer's name, trade name of product, lot number, shelf life of product, and mix ratio by volume.

F. Equipment for Injection: The injection equipment shall meter and mix the adhesive components, and inject the mixed adhesive into the cracks. Equipment shall be a portable, positive displacement type pump unit with interlock to insure exact ratio control of the two components at the nozzle. Unit shall have metering pumps, electrically or air powered, which will provide in-line metering and mixing of the adhesive components.
   1. Discharge Pressure: The injection equipment shall have automatic pressure control capable of discharging the mixed adhesive at any pre-set pressure up to 200 psi (within a tolerance of plus or minus 5 psi), and shall be equipped with a manual pressure control override.

   2. Ratio Tolerance: The injection equipment shall have the capability of maintaining the volume ratio for the adhesive, as prescribed by the manufacturer of the adhesive, within a tolerance of plus or minus 5 percent by volume at any discharge pressure up to 200 psi.

   3. Automatic Shut-Off Control: The injection equipment shall have sensors on both component reservoirs that will automatically stop the machine when only one component is being pumped to the mixing head.

1.06 DELIVERY AND STORAGE

A. Deliver materials to the site in original, sealed containers bearing manufacturer's label. Do not deliver materials which have exceeded shelf life limitation set forth by the manufacturer.

B. Comply with manufacturer's printed instructions for storing materials in original, sealed containers at a temperature between 32 degrees F and 90 degrees F.

1.07 PROJECT CONDITIONS

A. Environmental Requirements: Comply with manufacturer's recommendations for conditions under which materials can be applied.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Epoxy Adhesive: Two component, low viscosity, epoxy resin adhesive system containing 100 percent solids, with no solvents or non-reactive diluents, which meet the following characteristics and properties:
   1. Resin: Blend of epoxy resins.
      a. Viscosity at 40 + 3 degrees F, cps (Brookfield RVT Spindle No. 4 at 20 rpm): 6,000 - 8,000.

      b. Viscosity at 77 + 3 degrees F, cps (Brookfield RVT Spindle No. 2 at 20 rpm): 300 - 700.

      c. Epoxide Equivalent Weight (ASTM D 1652): 160 - 220.

d. Ash Content, percent (ASTM D 482): 1 maximum.

2. Hardener: Blend of amine curing agents.
   a. Viscosity at 40 + 3 degrees F, cps (Brookfield RVT Spindle No. 2 at 20 rpm): 700 - 1,400.

   b. Viscosity at 77 + 3 degrees F, cps (Brookfield RVT Spindle No. 2 at 20 rpm): 100 - 400.

   c. Amine Value, mg K0H/g (ASTM D 664): 490 - 560.

   d. Ash Content, percent (ASTM D 482): 1 maximum.

3. Pot Life of the Combined Components: When mixed in the ratio recommended by the manufacturer for use, material shall have pot life as follows:
   a. 60 g at 77 + 3 degrees F: 13 - 55 minutes.

4. Properties of the Cured Adhesive: When cured for 7 days at 77 + 3 degrees F, material shall have the following properties:
   a. Ultimate Tensile Strength, psi (ASTM D 638): 5,000 minimum.

   b. Tensile Elongation at Break, percent (ASTM D 638): 4 maximum.

   c. Flexural Strength, psi (ASTM D 790): 10,000 minimum.

   d. Compressive Yield Strength, psi (ASTM D 695): 10,000 minimum.

   e. Slant Shear Strength, psi (AASHTO T 237, 5,000 psi compressive strength concrete):
      1) Cured 3 days at 40 + 3 degrees F, wet/wet concrete: 3,500 minimum.

      2) Cured 7 days at 40 + 3 degrees F, wet/wet concrete: 4,000 minimum.

      3) Cured 1 day at 77 + 3 degrees F, dry/dry concrete: 5,000 minimum.

         NOTE: Minor modifications to the indicated test methods, which are standard industry procedures for testing epoxy adhesives, may be made. Test reports shall indicate such modifications.

B. Surface Seal: Material with adequate strength and adhesion to hold injection fittings firmly in place and to prevent leakage of epoxy adhesive during injection and removable without damaging or defacing structure being repaired.

C. Finishing Patching Materials: As required to match color, texture, and performance of adjoining surfaces as closely as practicable.

PART 3 – EXECUTION

3.01 PREPARATION

A. Clean cracks and adjacent surfaces free of loose material, dust, dirt, grease, oil, efflorescence, and other foreign matter in accordance with epoxy adhesive manufacturer’s printed instructions and as required for proper bonding of surface seal. Do not use acids or corrosives.

B. Establish entry ports along each crack spaced at intervals not less than the thickness of

the concrete member being repaired.

C. Apply surface seal material to the face of each crack between the entry ports as required to prevent escape of injected epoxy adhesive. For cracks all the way through the concrete member, apply surface seal to both faces of cracks where accessible. Allow sufficient time for the surface seal material to gain adequate strength before proceeding with epoxy injection.

D. If cracks extend into moving joints, plug or seal off the cracks at the joints.

3.02 EPOXY INJECTION

A. Set up and check injection equipment and material in accordance with the manufacturer's instructions and as specified. Do not thin epoxy adhesive.

B. Beginning at the lowest entry port in the crack, unless otherwise recommended by the installer because of the configuration of the crack, inject epoxy adhesive in the entry port until there is an appearance of adhesive at the next adjacent entry port. When epoxy adhesive travel is indicated at the next adjacent port, discontinue injection in the port, seal off the port, and resume injection in the next adjacent port. Continue this procedure until the crack has been injected full of epoxy adhesive for its entire length in one continuous operation. For horizontal cracks, proceed from one end of the crack to the other end in the same manner. Seal the last port, and allow the adhesive to cure.

C. If port to port travel of epoxy adhesive does not result after a reasonable amount of pumping, stop injecting adhesive. Report abnormal conditions (if any) immediately to the Director's Representative.

3.03 FINISHING

A. Remove surface seal and entry port fittings when epoxy adhesive has sufficiently cured to allow removal without disturbing the adhesive.

B. Fill the face of the crack out flush with the concrete surface plane with patching materials. Eliminate indentations and evidence of port fittings. Finish patches to match texture of adjoining concrete surface as closely as practicable.

3.04 FIELD QUALITY CONTROL

A. Furnish equipment necessary to perform field testing.

B. Pressure Test: The mixing head of the injection equipment shall be disconnected and the two supply lines shall be attached to a pressure check device. The pressure check device shall consist of two independently valved nozzles capable of controlling flow rate and pressure by opening or closing the valve. There shall be a pressure gauge capable of sensing the pressure build-up behind each valve. The valves on the pressure check device shall be closed and the injection equipment operated until the gauge pressure on each line reads 190 psi. The pumps shall be stopped and the gauge pressure shall not drop below 180 psi within 3 minutes.

C. Ratio Tests: The mixing head of the injection equipment shall be disconnected and the two adhesive components shall be pumped simultaneously through a ratio check device. The ratio check device shall consist of two independently valved nozzles capable of controlling back pressure by opening or closing the valve. There shall be a pressure gauge capable of sensing the back pressure behind each valve. The discharge pressure shall be adjusted to 180 psi for both adhesive components, and then the components shall be simultaneously discharged into separate calibrated containers. The amounts discharged into the containers during the same time period shall be compared to determine the volumes and the ratio of the components. The test shall be repeated with the discharge pressure adjusted to 0 psi for both adhesive components.

D. Frequency of Pressure and Ratio Tests: A pressure test and ratio tests shall be performed for each injection equipment unit at the beginning of each shift and after the meal break of each shift that the unit is used.
   1. Perform additional tests when directed by the Director's Representative.

E. Records of Tests: Record the date and results of all tests, and furnish a copy of the test records to the Director's Representative.

3.05 CLEANING

A. Remove adhesive runs and spills from existing surfaces by a method which will not deface the surfaces being cleaned.

END OF SECTION 03931

SECTION 04810 - UNIT MASONRY ASSEMBLIES

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes unit masonry assemblies consisting of the following:
   1. Concrete masonry units.
   2. Mortar and grout.
   3. Reinforcing steel.
   4. Masonry joint reinforcement.
   5. Ties and anchors.
   6. Miscellaneous masonry accessories.

1.02 DEFINITIONS

A. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.03 SUBMITTALS

A. Product Data: For each different masonry unit, strength classification, additive, accessory, and other manufactured product specified.
   1. Reinforcing steel: Certified mill test results or laboratory test results. Indicate bar size, yield strength, ultimate tensile strength, elongation and bend test. Provide chemical composition for rebars that are to be welded.

B. Shop Drawings: Show fabrication and installation details for the following:
   1. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, “Details and Detailing of Concrete Reinforcement.”

C. Samples for Initial Selection: For the following:
   1. Colored mortar samples showing the full range of colors available.

D. List of Materials Used in Constructing Sample Panels: List generic product names together with manufacturers, manufacturers’ product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.

E. Qualification Data: Specified in Section 01400 – Quality Requirements.

F. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:
   1. Each cement product required for mortar and grout, including name of manufacturer, brand, type, and weight slips at time of delivery.
   2. Grout mixes. Include description of type and proportions of ingredients to assure compliance with the compressive strength in UBC Table 21-D.
   3. Each material and grade indicated for reinforcing bars.
   4. Each type and size of joint reinforcement.

5. Each type and size of anchor, tie, and metal accessory.

G. Test Reports:
   1. Manufacturer's tests shall be in accordance with ASTM C140 for conformance with the requirements of ASTM C90.

H. Quality Control Inspection Documents: Provide one copy of the following industry documents for use by contracting officer.
   1. NCMA TEK 8-2A (1998): Removal of Stains from Concrete Masonry Walls.

1.04 QUALITY ASSURANCE

A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.
   1. Block plant shall maintain a quality control program to monitor and control block chloride ion content. Soluble chloride ion content should not exceed 0.30 per cent by volume of the cement material in the block, based on ACI 318-02 Table 4.4.1.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. Carefully stack and handle masonry units so as to prevent chipping, marring or cracking of corners, edges and faces.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.06 PROJECT CONDITIONS

A. Protection of Masonry: In rainy locations and conditions, cover tops of walls, projections and sills with waterproof sheeting to repel water.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.

C. Stain Prevention: Protect to prevent stain damage to mar final finish or finishing techniques. Prevent grout, mortar, and soil from staining the face of masonry to be left exposed, stained or painted.

D. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required.

1. When ambient temperature exceeds 90 deg F with a wind velocity greater than 8 mph, do not spread mortar beds more than 48 inches ahead of masonry. Set masonry units within one minute of spreading mortar.

PART 2 – PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. General: Provide shapes indicated and as follows:
   1. Provide special shapes for lintels, corners, jambs, sash, headers, bonding, and other special conditions.

   2. Provide square-edged units for outside corners, unless indicated as bullnose.

   3. Provide “H” blocks for below grade foundation walls and scheduled to be fully grouted.

B. Concrete Masonry Units: ASTM C-90 and as follows:
   1. Unit Compressive Strength: Provide load bearing units with minimum average net-area compressive strength of 1900 psi.

   2. Size (Width): Manufactured to the following dimensions within variations in dimensions only as permissible per ASTM C-90:
      a. 4 inches nominal; 3-5/8 inches actual.

      b. 6 inches nominal; 5-5/8 inches actual.

      c. 8 inches nominal; 7-5/8 inches actual.

      d. 10 inches nominal; 9-5/8 inches actual.

      e. 12 inches nominal; 11-5/8 inches actual.

2.02 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type II. Provide natural color or white cement as required to produce mortar color indicated.

B. Mortar Cement: UBC Standard 21-14 Type as scheduled in mix designs in Article 2.11.

C. Masonry Cement: UBC Standard 21-11. Type as scheduled in mix designs in Article 2.11.

D. Aggregate for Mortar: ASTM C 144.

E. Aggregate for Grout: ASTM C 404.

F. Plasticizer Additive:
   1. Acceptable for use in UBC Standard 21-14 Mortar Cement as a substitute for hydrated lime in masonry mortar.
      a. Powder Type: Proprietary pozzolanic mortar plasticizer.

      b. Liquid Type: Proprietary mixture of resins.

G. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortar.

H. Water for use in mixing Mortar and Grout: Potable and complying with ASTM C 94. Clean and free from injurious amounts of oils, acids alkalis, salts, organic materials or other substances that may be deleterious to both mortar and reinforcement.

2.03 REINFORCING STEEL

A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M; ASTM A 616/A 616M, including Supplement 1; or ASTM A 617/A 617M, deformed, Grade 60 unless otherwise indicated on the drawings or specified herein.

2.04 TIES AND ANCHORS, GENERAL

A. General: Provide ties and anchors, specified in subsequent articles, made from materials that comply with this Article, unless otherwise indicated.

B. Hot-Dip Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating.

C. Stainless-Steel Wire: ASTM A 580/A 580M, Type 316.

D. Stainless-Steel Sheet: ASTM A 666, Type 316.

2.05 MISCELLANEOUS ANCHORS

A. Unit Type Inserts in Concrete: Cast-iron or malleable-iron inserts of type and size indicated.

B. Dovetail Slots: Furnish dovetail slots with filler strips, of slot size indicated, fabricated from 0.0336-inch (20 gauge), galvanized steel sheet.

C. Anchor Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of diameter and length indicated and in the following configurations:
   1. Headed bolts.

   2. Non-headed bolts, bent in manner indicated.

D. Post-installed Anchors: Anchors as described below, with capability to sustain, without failure, load imposed within factors of safety indicated, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
   1. For Post-installed Anchors in Concrete: Capability to sustain, without failure, a load equal to four times the loads imposed.

2.06 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene, urethane or PVC.

B. Preformed Control-Joint Gaskets: Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
   1. Styrene-Butadiene-Rubber Compound: ASTM D 2000, Designation M2AA-805, or

2. PVC: ASTM D 2287, Type PVC-65406.

C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

D. Reinforcing Bar Positioners: Commercial plastic or wire units designed to fit into mortar bed joints spanning masonry unit cells with loops for holding reinforcing bars in center of cells. Units are formed from 0.142-inch or 0.187-inch steel wire, hot-dip galvanized after fabrication. Commercial plastic units are fabricated for the intended purpose.
   1. Provide units with either two loops or four loops as needed for number of bars indicated.

   2. Other suitable devices: Other suitable devices may be used, upon proper submittal to and approval by Contracting Officer.

E. Adhesive: Type recommended by insulation board manufacturer for application indicated.

2.07 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
   1. Do not use calcium chloride in mortar or grout.

B. Pre-blended, Dry Mortar Mix: Furnish dry mortar ingredients in the form of a pre-blended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to the job site.

C. Mortar for Unit Masonry:
   1. The proportioning of materials for mortar and grout shall be by volume and done in such manner that the specified proportions can be controlled and accurately maintained. Measure fine aggregate in a damp loose condition. Mix materials in a mechanical batch mixer for at least 3 minutes for mortar and 5 minutes for grout, but do not mix more than 10 minutes. Hand mixing is permitted only for small batches of 3 cubic feet or less.

   2. Prepare Mortar Mix Design 1 with sufficient water to provide a workable consistency. Use and place mortar within 1-1/2 hours after mixing.

   3. Prepare Mortar Mix Designs 2 through 5 strictly in accordance with the admixture manufacturer’s instructions. Place mortar within 2-1/2 hours after mixing. No materials which start to set shall be retempered.

D. Mortar Mix Designs: Mortar shall be freshly prepared and uniformly mixed in one of the following proportions unless directed otherwise by manufacturer of plasticizer additive:
   1. Mortar Mix 1;

Type M Mortar	
1 part	masonry cement
2-1/2 to 3 parts	mortar aggregate

   2. Mortar Mix 2;

Type M Mortar	
2 sacks	Portland cement
1/2 to 1 bag	powdered plasticizer additive (7 pound bag)
6 cu. ft.	mortar aggregate

3. Mortar Mix 3;
   Type M Mortar:

1 sack	Portland cement
3 ounces	liquid plasticizer additive
2-1/4 to 2-3/4 cu. ft.	mortar aggregate

4. Mortar Mix 4;
   Type S Mortar:

2 sacks	Portland cement
1 bag	powdered plasticizer additive (7 pound bag)
9 cu. ft.	mortar aggregate

5. Mortar Mix 5;
   Type S Mortar

1 sack	Portland cement
3 ounces	liquid plasticizer additive
2-1/2 to 3 cu. ft.	mortar aggregate

E. Grout for Unit Masonry: Sufficient water shall be used to produce a consistency just fluid enough for pouring or pumping without segregation. Grout shall be used and placed in final position within 90 minutes after mixing, but shall in no case be used after initial set has occurred. This time limitation is permitted to be waived, if the grout is of such slump that it can be placed without addition of water.
   1. Grout shall attain not less than 2,500 psi 28-day compressive strength per ASTM C 1019 unless noted otherwise on drawings.

   2. Use plasticizers additives for below grade foundation walls scheduled to be grouted to ensure full dispersal of mix.

F. Grout Mixes: conform to ASTM C476 for grout mixed on-site. Prepare and uniformly mix grout in the following proportion:
   1. Fine Grout

1 part	Portland cement
Fine Aggregate:	2-1/4 to 5 times the sum of the volumes of the cementitious materials

   2. Ready-mix Grout: Conform to ASTM C-476 for grout designed by ready-mix suppliers.

G. Pigmented Mortar: Select and proportion pigments with other ingredients to produce color required. Limit pigments to the following percentages of cement content by weight:
   1. For mineral-oxide pigments and portland cement-lime mortar, not more than 10 percent.

H. Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates combined with selected cementitious materials.
   1. Mix to match Contracting Officer’s sample.

I. Epoxy Pointing Mortar: Mix epoxy pointing mortar to comply with mortar manufacturer's directions.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
   1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance.

   2. Verify that floor levels, footing levels or foundations are within tolerances specified.

   3. Verify that reinforcing dowels are properly placed.

   4. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Before installation, examine rough-in and built-in construction to verify actual locations of piping connections.

3.02 INSTALLATION, GENERAL

A. General: All masonry units shall be clean and handled to protect and minimize chipping, spalling and cracking. All bed on which masonry is to be laid shall be clean.

B. Masonry units shall not be wetted prior to use. Units which have become wet shall be allowed to dry thoroughly before laying. If water is splashed on the block and a color difference does not occur (from the water) then the block units are too wet to be laid. (Source: Reinforced Concrete Masonry Construction Inspector's Handbook, Fourth Edition, paragraph 12.3.4)

C. Build chases and recesses to accommodate items specified in this Section and in other Sections of the Specifications.

D. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to the opening.

E. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide a continuous pattern and to fit adjoining construction. Where possible, use full-size units without cutting. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

F. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

3.03 CONSTRUCTION TOLERANCES

A. Comply with the tolerances in the national concrete masonry association Specification for Structures ACI 530-02/ASCE 6/TMS 602 as applicable to climate indigenous to Hawaii and as noted.

B. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/4-inch in 20 feet, nor 1/2-inch maximum.

C. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4-inch in 10 feet, nor 1/2-inch maximum.

D. For conspicuous horizontal lines, such as exposed lintels, sills, parapets, and reveals, do not vary from level by more than 1/4-inch in 20 feet, nor 1/2-inch maximum.

E. For exposed bed joints, do not vary from thickness indicated by more than plus or minus 1/8-inch, with a maximum thickness limited to 1/2-inch. Do not vary from bed-joint thickness of adjacent courses by more than 1/8-inch.

F. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8-inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8-inch.

3.04 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. When foundation is at specified levels, lay first course masonry units in a mortar bed not exceeding 3/4-inch thick. Bed webs of adjoining cells that contain reinforcement in mortar to prevent escape of grout.

C. Bond Pattern for Exposed Masonry: Lay exposed masonry in the following bond pattern; do not use units with less than nominal 4-inches horizontal face dimensions at corners or jambs.
   1. One-half running bond with vertical joint in each course centered on units in courses above and below unless otherwise indicated on Drawings.

   2. Stack bond.

   3. One-third running bond.

   4. As indicated on Drawings.

D. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inches horizontal face dimensions at corners or jambs.

E. Stopping and Resuming Work: In each course, rack back one-half-unit length for one-half running bond or one-third-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly if required, and remove loose masonry units and mortar before laying fresh masonry.

F. Built-in Work: As construction progresses, build in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.

G. Grout space between hollow-metal frames and masonry solidly with mortar, unless otherwise indicated.
   1. Grout mix: Use one of the following.
      a. One of the mortars mixed specified in Part 2 above.

      b. One of the grout mixes specified in Part 2 above.

   2. Gypsum board joint compound or other gypsum containing compounds are not permitted.

H. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.

I. Fill cores in hollow concrete masonry units with grout 24 inches under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated or directed.

3.05 MORTAR BEDDING AND JOINTING

A. Lay hollow masonry units as follows:
   1. With full mortar coverage on horizontal and vertical face shells.

   2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.

   3. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.

B. Lay horizontal-cell units with full bed joints, unless otherwise indicated. Keep drainage channels, if any, free of mortar. Form head joints with sufficient mortar so excess will be squeezed out as units are placed in position. Butter both sides of units to be placed, or butter one side of unit already in place and one side of unit to be placed.

C. Maintain joint thicknesses indicated, except for minor variations required to maintain bond alignment. If not indicated, lay walls with 1/4- to 3/8-inch thick joints.

D. Where epoxy-mortar pointed joints are indicated, rake out setting mortar to a uniform depth of 1/4-inch and point with epoxy mortar to comply with epoxy-mortar manufacturer's written instructions.

E. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than the joint thickness, unless otherwise indicated.

F. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint), unless otherwise indicated.

3.06 BONDING OF MASONRY

A. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, bond walls together as follows:
   1. Provide individual metal ties not more than 16 inches o.c.

   2. Provide continuity with masonry joint reinforcement by using prefabricated “T” units.

3.07 MASONRY JOINT REINFORCEMENT

A. General: Provide continuous masonry joint reinforcement as indicated. Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8-inch on exterior side of walls, 1/2-inch elsewhere. Lap reinforcement a minimum of six (6) inches.
   1. Space reinforcement not more than 16 inches o.c.

   2. Space reinforcement not more than 8 inches o.c. in foundation walls and parapet walls.

   3. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings.
      a. Reinforcement above is in addition to continuous reinforcement.

B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

C. Provide continuity at corners and wall intersections by using prefabricated “L” and “T” sections. Cut and bend reinforcing units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.08 ANCHORING MASONRY TO STRUCTURAL MEMBERS

A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:
   1. Provide an open space not less than 1-inch in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.

   2. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.

   3. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

3.09 CONTROL AND EXPANSION JOINTS

A. General: Install control and expansion joints in unit masonry where indicated. Build-in related items as masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.

B. Form control joints in concrete masonry as follows:
   1. Fit bond-breaker strips into hollow contour in ends of concrete masonry units on one side of control joint. Fill resultant core with grout and rake joints in exposed faces.

   2. Install preformed control-joint gaskets designed to fit standard sash block.

   3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar or rake joint.

   4. Install temporary foam-plastic filler in head joints and remove excess filler and seal joint when unit masonry is complete.

C. Form expansion joints as follows:
   1. Build flanges of metal expansion strips into masonry. Lap each joint 4 inches in direction of water flow. Seal joints below grade and at junctures with horizontal expansion joints, if any.

   2. Build flanges of factory-fabricated, expansion-joint units into masonry.

   3. Form open joint of width indicated, but not less than 3/8-inch for installation of sealant and backer rod specified in Joint Sealants section. Keep joint free and clear of mortar.

D. Build in horizontal, pressure-relieving joints where indicated; construct joints by either leaving an air space or inserting a compressible filler of width required for installing sealant and backer rod specified in Joint Sealants section.
   1. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry veneer and attached to structure behind masonry veneer.

3.10 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores to support reinforced masonry elements during construction.

1. Construct formwork to conform to shape, line, and dimensions shown. Make it tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.

2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements ACI 530 Sec 3.4/ASCE 6/TMS 602.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.
   1. Comply with requirements of ACI 530 Sec. 3.5/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

3.11 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

END OF SECTION 04810

SECTION 05400 – COLD FORMED STEEL FRAMING

PART 1 – GENERAL

1.01 SUMMARY

A. This Section includes the following:

1. Exterior and interior non-load-bearing wall framing.

2. Ceiling joist framing.

1.02 SUBMITTALS

A. The installer shall be responsible for submitting part or all of the following items, as required by the construction documents:

1. Manufacturers technical literature covering products.

2. Manufacturers certification of product compliance with codes and standards.

3. Structural framing calculations, as required.

4. Connection details, as required.

5. Shop drawings, as required.

6. Certification of calculations, connections and/or drawings by a registered professional engineer, as required.

1.03 QUALITY ASSURANCE

A. The structural framing and its installation shall meet the following standards:

B. American Iron and Steel Institute (AISI) “Specification For The Design of Cold-Formed Structural Members”, latest edition.

C. American Society for Testing and Materials (ASTM) Standard C-955 - Standard Specification for Load Bearing (Traverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Board and Metal Plaster Bases.

D. ASTM Standard C-1007 - Standard Specification for Installation of Load Bearing (Traverse and Axial) Steel Studs and Related Accessories.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. The cold-formed structural framing products shall be manufactured by the current members of the Steel Stud Manufacturers Association (SSMA). Manufacturers submitting published data showing their product values to be equal to those published by SSMA or the specialty product properties produced by the specific manufacturer.

2.02 MATERIALS

A. The cold-formed structural framing shall be manufactured from structural quality steel having minimum yield strength of 33 KSI, for all design thicknesses, or optional 50 KSI for

16GA (-54) and heavier members and have minimum protective coating equal to G-60 galvanized finish. The steel shall conform to one of the following ASTM Standards: ASTM A653, A875, A792 or A463.

B. Structural framing members shall conform to ASTM C955, have engineering properties calculated in conformance with the AISI “Specification For The Design Of Cold-Formed Steel Structural Members” and have minimum properties as published by SSMA.

C. All structural framing accessories shall be formed from structural quality steel with minimum yield strength of 33 KSI or as specified in the plan and have minimum protective coating equal to G-60 galvanized finish.

2.03 FASTENING

A. Steel Studs Structural framing members shall be properly spaced, plumbed, leveled, squared, fit properly against abutting members and held securely in place until permanently fastened. Wire tying of structural framing members is not permitted.

B. Fastening of structural framing members shall be accomplished by screws, power actuated fasteners, welding, or a combination of methods. The type, size, and spacing of the fasteners shall be as required by the contract documents or approved connection details.

C. Structural framing members may be fastened in a shop or in the field.

D. Structural framing members having protective coating removed by welding shall have the coating repaired, at the welds, by painting with a zinc rich primer.

2.04 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.

B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
   1. Supplementary framing.
   2. Bracing, bridging, and solid blocking.
   3. Web stiffeners.
   4. Anchor clips.
   5. End clips.
   6. Foundation clips.
   7. Gusset plates.
   8. Stud kickers, knee braces, and girts.
   9. Joist hangers and end closures.
   10. Hole reinforcing plates.
   11. Backer plates.

2.05 ANCHORS, CLIPS, AND FASTENERS

A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.

B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.

C. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.

E. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
   1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

F. Welding Electrodes: Comply with AWS standards.

2.06 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: SSPC-Paint 20, DOD-P-21035 or approved equal.

B. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.

C. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, and plasticizing and water-reducing agents, complying with ASTM C 1107, with fluid consistency and 30-minute working time.

D. Shims: Load bearing, high-density multimonomer plastic, nonleaching.

E. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

2.07 FABRICATION

A. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
   1. Fabricate framing assemblies using jigs or templates.

   2. Cut framing members by sawing or shearing; do not torch cut.

   3. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
      a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.

b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.

4. Fasten other materials to cold-formed metal framing by welding, bolting, or screw fastening, according to Shop Drawings.

B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.

C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
1. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.
1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Install load bearing shims or grout between the underside of wall bottom track or rim track and the top of foundation wall or slab at stud or joist locations to ensure a uniform bearing surface on supporting concrete or masonry construction.

3.03 INSTALLATION, GENERAL

A. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.

B. Install cold-formed metal framing according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.

C. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.
1. Cut framing members by sawing or shearing; do not torch cut.

2. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.

b. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.

D. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.

E. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and

permanent connections to framing are secured.

F. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.

G. Install insulation, specified in Section 07211 – Blanket Insulation and Section 07240 – Exterior Insulation and Finish Systems in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

H. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.

I. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
   1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.04 EXTERIOR AND INTERIOR NON-LOAD-BEARING WALL INSTALLATION

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.

B. Fasten both flanges of studs to top and bottom track, unless otherwise indicated. Space studs as follows:
   1. Stud Spacing: 16 inches min.

C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.

D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
   1. Install single-leg deflection tracks and anchor to building structure.

   2. Install double deep-leg deflection tracks and anchor outer track to building structure.

   3. Connect vertical deflection clips to bypassing and infill studs and anchor to building structure.

   4. Connect drift clips to cold formed metal framing and anchor to building structure.

E. Install horizontal bridging in wall studs, spaced in rows indicated on Shop Drawings but not more than 48 inches apart. Fasten at each stud intersection.
   1. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches of single deflection track. Install a combination of flat, taut, steel sheet straps of width and thickness indicated and stud or stud-track solid blocking of width and thickness matching studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
      a. Install solid blocking at 96-inch centers min.

   2. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges. Minimum size of flat steel strap, such as 1-1/2 by 0.0329 inch (38 by 0.84mm).

F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip

angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable wall-framing system.

3.05 CEILING JOIST INSTALLATION

A. Install perimeter joist track sized to match joists. Align and securely anchor or fasten track to supporting structure at corners, ends, and spacings indicated on Shop Drawings.

B. Install joists bearing on supporting frame, level, straight, and plumb; adjust to final position, brace, and reinforce. Fasten joists to both flanges of joist track. Revise minimum end bearing in first subparagraph below if joists bearing on flange of joist track are acceptable. Web stiffeners will usually be required to reinforce joist web.
   1. Install joists over supporting frame with a minimum end bearing of 1-1/2 inches.

   2. Reinforce ends and bearing points of joists with web stiffeners, end clips, joist hangers, steel clip angles, or steel-stud sections as indicated on Shop Drawings.

C. Space joists not more than 2 inches from abutting walls, and as follows:
   1. Joist Spacing: 16 inches minimum.

D. Frame openings with built-up joist headers consisting of joist and joist track, nesting joists, or another combination of connected joists if indicated.

E. Install joist reinforcement at interior supports with single, short length of joist section located directly over interior support, with lapped joists of equal length to joist reinforcement.
   1. Install web stiffeners to transfer axial loads of walls above.

F. Install bridging at intervals 96 inches minimum. Fasten bridging at each joist intersection as follows:
   1. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges. Minimum size of flat steel strap, such as 1-1/2 by 0.0329 inch (38 by 0.84mm).

G. Secure joists to load-bearing interior walls to prevent lateral movement of bottom flange.

H. Install miscellaneous joist framing and connections, including web stiffeners, closure pieces, clip angles, continuous angles, hold-down angles, anchors, and fasteners, to provide a complete and stable joist-framing assembly.

3.06 FIELD QUALITY CONTROL

A. Testing: Installer to engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Field and shop welds will be subject to testing and inspecting.

C. Testing agency will report test results promptly and in writing to Installer and Contracting Officer.

D. Remove and replace work where test results indicate that it does not comply with specified requirements.

E. Additional testing and inspecting, at Installer's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.07 REPAIRS AND PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05400

DIVISION 05 – METALS

SECTION 05500 - METAL FABRICATIONS

PART 1 – GENERAL

1.01 SUMMARY

A. Provide all miscellaneous metal fabrication work, including, but not limited to, the following:

1. Miscellaneous fabrications.

2. Furnish miscellaneous steel attachments, anchors, plates, angles, etc., to be set in concrete.

3. Include all anchors, angles, bolts, expansion shields for items in this section only, and other accessories shown in details and/or required for the complete installation of all work.

B. Related Work Described Elsewhere:

1. Painting under SECTION 09901 - PAINTING.

1.02 QUALITY ASSURANCE

A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrication might delay work.

B. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

B. Qualifications of Welders: Only welders certified in the arc welding process shall perform work in connection with the work in this section. Comply with AWS B3.0 for welding procedure and performance qualification.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01330 - SUBMITTAL PROCEDURES.

B. Manufacturer's Data: Submit manufacturers product data for all manufactured products. Include color charts for all materials exposed and requiring selection of finish color

C. Shop Drawings: Submit shop drawings for fabrication and erection of miscellaneous metal fabrications. Include plans, elevations and details of sections and connections. Show anchorage and accessory items. Provide templates for anchor and bolt installation by others. Where materials or fabrications are indicated to comply with certain requirements for design loadings include structural computations, material properties and other information needed for structural analysis. Indicate weld connections using standard AWS A2.0 welding symbols.

1.04 PRODUCT HANDLING

A. Protection: The Contractor shall use all means necessary to protect all materials before, during and after installation and to protect the installed work and materials of all other trades.

B. Replacement: In the event of damage, the Contractor shall immediately make all repairs and replacements necessary to the satisfaction of the Contracting Officer and at no additional cost to the State.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Structural Steel Shapes, Plates, and Bars: ASTM A 36/A 36M.

B. Electrodes for Welding: Comply with AWS Code. Use E70XX electrodes unless recommended otherwise for the specified metal.

C. Anchors and Fasteners: Where exposed, shall be of the same material, color, and finish as the metal to which applied.

1. Expansion Shields: Expansion anchors shall be carbon steel threaded studs with integral tapered cone expanders and segmented expansion collars. Provide anchors with electroplated zinc coating, length identification markings, and required nuts and washers. Expansion anchors shall be evaluated in accordance with ACI 355.2 Category 1 or 2 and shall be tested in accordance with ICC ES AC 193 for all mandatory and optional tests. Provide shields recessed not less than 2-1/2 inches into concrete or masonry, unless as directed by the manufacturer.

2. Lag Screws and Bolts: ANSI B18.2.1, type and grade best suited for the purpose.

3. Toggle Bolts: ANSI B18.2.1 and ANSI B18.5.

4. Machine Bolts and Anchor Bolts: ASTM A 307. High strength bolts shall conform to ASTM A 325.

5. Nuts: ASTM A 563, Grade A, hex style.

6. Washers: ASTM F 844.

7. Machine Screws: ASME B18.6.3.

8. Wood Screws: Flat head, carbon steel, ASME B18.6.1.

9. Metal Anchor Bolts, Straps, Hangers, Brackets and Other Inserts: Furnish to other trades the anchor bolts, straps, hangers, brackets and other inserts which are necessary for the final installation of work under this and other trades, where not specified to be furnished under the other sections of the specifications. This trade shall also furnish templates if required by others and shall check the installation of all bolts and inserts for accuracy. Anchor bolts and washers of same quality as bolt.

10. Finish: All fasteners shall be hot dip galvanized except as indicated or specified otherwise. Exterior fasteners shall be stainless steel. Fasteners associated with stainless steel fabrications shall be Type 316 stainless steel.

D. Shop Paint:

1. Metal Primer Paint: Fabricator's standard fast-curing, "universal" primer free from asbestos, lead, mercury, chromate, and cadmium, and compatible with finish paint systems.

2. Coordinate selection of metal primer with finish paint requirements specified in SECTION 09901 - PAINTING.

E. Galvanizing Repair Paint: SSPC - Paint 20.

F. Nonshrink Nonferrous Cementitious Grout: ASTM C 1107, Sonneborn "Sonogrout", Anti-Hydro Co. "Axpanacrete", Thoro System Products "Thorogrip", or approved equal non-metallic grout, premixed, specially manufactured for this purpose, with mix and setting characteristics as recommended by the manufacturer for the purpose intended. Use as fill for embedment of railing posts in floor sockets and for similar uses. Mix and place in strict accordance with manufacturer's instructions.

G. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12 but containing no asbestos fibers, or cold-applied asphalt emulsion complying with ASTM D 1187.

H. Brass Divider Strip: Polished, size as indicated.

2.02 FABRICATION

A. Workmanship:

1. Use materials of size and thickness shown or, if not shown, of required size and thickness to produce strength and durability in finished product. Work to dimensions shown or accepted on shop drawings, using proven details of fabrication and support. Use type of materials shown or specified for various components of work.

2. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32-inch unless otherwise shown. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

3. Provide for anchorage of type shown, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.

4. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware and similar items.

5. Provide weep holes or another means to drain entrapped water in hollow sections of members that are exposed to exterior or to moisture from condensation or other sources. Fill voids below weep level to assure utility of weep holes.

B. Welding shall be done by approved certified welders who have been previously qualified by tests. Welding shall be in accordance with AWS B3.0 "Welding Procedures and Performance Qualification, and AWS D1.1 for steel. Any welds which are found to be defective must be cut out and replaced. "Code for Arc and Gas Welding in Building Construction", latest edition, Sections II, III, and IV formulated by American Welding Society, shall be followed in design and execution of structural welding.

1. All welding of steel shall be done by electric-arc process with coated rods, not fluxed, so as to produce shielded arc, and shall comply with the requirements of above specified manual.

2. Surfaces, seams, or joints to be welded shall be free from rust, scale, grease, and other foreign material.

3. All welds shall be ground and pressed smooth and all weld flux, slag, and spatter shall be completely removed.

4. Connections not indicated shall be designed and provided by the Contractor and shall be made to conform with AISC Specification for Structural Steel Buildings. Develop full strength of members in all connections. One side connections will not be permitted.

5. Do not tack weld exposed connections.

6. Grind smooth visible welds in finished installation and clean welds immediately by chipping or wire brushing.

C. Galvanizing: Provide a zinc coating for those items shown or specified to be galvanized, as follows:

1. ASTM A 153/A 153M for galvanizing iron and steel hardware.

2. ASTM A 123/A 123M for galvanizing rolled, pressed and forged steel shapes, plates, bars and strip 1/8-inch thick and heavier; and for assembled steel products.

3. Provide minimum G90 coating designation.

D. Surface Preparation: Prepare ferrous metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:

1. Exteriors (SSPC Zone 1B): SSPC-SP6 "Commercial Blast Cleaning".

2. Interior (SSPC Zone 1A): SSPC-SP3 "Power Tool Cleaning".

E. Shop Painting:

1. Shop paint miscellaneous steel metal work, except galvanized surfaces and surfaces to be embedded into concrete, unless otherwise specified.

2. Immediately after surface preparation, brush or spray on primer in accordance with manufacturer's instructions, and at a rate to provide uniform dry film thickness of 2.0 mils for each coat. Use painting methods which will result in full coverage of joints, corners, edges and exposed surfaces.

F. Repair of Damaged Zinc-Coated Surfaces: ASTM A 780, Annexes A1, "Repair Using Zinc-Based Alloys," A2, "Repair Using Zinc-Rich Paints," or A3, "Repair Using Sprayed Zinc (Metallizing)."

G. Miscellaneous Framing and Supports:

1. Provide miscellaneous steel framing and supports as required to complete work.

2. Fabricate miscellaneous units to sizes, shapes and profiles shown or, if not shown, of required dimensions to receive adjacent other work to be retained by framing. Except as otherwise shown, fabricate from structural steel shapes and plates and steel bars. Cut, drill and tap units to receive hardware and similar items.

2.03 METAL FINISHES

A. Steel: Galvanized and treated for painting under SECTION 09901 - PAINTING unless indicated or specified otherwise.

2.04 ANCHORAGE, FASTENINGS, AND CONNECTIONS

A. Anchorage: Provide anchorage for fastening work securely in place. Set anchors in concrete as work progresses and space maximum 2 feet on centers, unless indicated otherwise. Sizes, kinds, and spacings of anchors not indicated or specified shall be as necessary for the purpose, as approved. Anchorage not otherwise specified or indicated includes slotted inserts, expansion shields, and powder-driven fasteners, when approved for concrete; toggle bolts and through bolts for masonry; machine and carriage bolts for steel; through bolts, lag bolts, and screws for wood. Provide inserts of suitable and approved types where required for support or anchorage of equipment and finish construction. Inserts shall be gray or malleable iron castings or galvanized steel unless indicated or specified otherwise. Slotted inserts shall be of types required to engage with anchors, except where specified otherwise.

B. Fastenings: Do not use wood plugs in any material. Use non-ferrous attachments for non-ferrous metal. Make exposed fastenings of compatible materials, generally matching in color and finish, and harmonizing with the material to which fastenings are applied. Conceal fastenings where practicable. Drill and punch to produce clean true lines and surfaces. Countersink metal work to receive hardware.

C. Threaded Connections: Make threaded connections up tight so that threads are entirely concealed. Make bolted work up tight and nick the threads or bush the stem to prevent loosening. Abutting bars shall be shouldered and headed, dowelled and pinned. Pass small bars through larger bars and pin. Rivet, bolt, and screw heads shall be flat and countersunk in exposed work and elsewhere as required. Machine removable members and fit and secure by means of screws or bolts of proper size and approved spacing.

D. Anchors and Connecting Members: Provide in concrete or masonry as the work progresses, to avoid unnecessary cutting and drilling. Cut, fit, and drill as necessary so materials are properly set in place and to permit engaging work to be properly installed.

E. Design Connections: AISC M011; where not shown or indicated otherwise, provide connections using common steel bolts. Provide necessary holes for securing work to building. Use lock washers under nuts.

F. Built-In Work: Form metal work built-in with concrete or masonry for anchorage, or provided with suitable anchoring devices as shown or as required. Furnish metal work in ample time for securing in place as work progresses.

G. Grouting: Grout metal fabrications and anchors in a manner that will assure filling of spaces and intimate contact of grouting materials with surface to be grouted. Place grout rapidly and continuously so to avoid cold joints and voids.

PART 3 – EXECUTION

3.01 PREPARATION

A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible, do not delay job progress; allow for trimming and fitting where taking field measurements before fabrication might delay work.

B. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, sleeves, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

3.02 INSTALLATION

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; including, toggle bolts, throughbolts, lag bolts, wood screws, and other connectors as required.

B. Cutting, Fitting and Placement: Perform cutting, drilling, and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels.

C. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth, and touch-up shop paint coat. Do not weld, cut, or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication and are intended for bolted or screwed field connections.

D. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of weld made, and methods in correcting welding work.

E. False Work: Provide guys, braces and false work for temporary support of parts of the work and remove when work is self-supporting.

3.03 MISCELLANEOUS METAL FABRICATIONS

A. The following fabricated assemblies are described in brief outline to indicate, in addition to the drawings, the general design and details desired. Standard products of manufacturers specializing in similar work will be considered insofar as they fulfill the requirements and do not violate governing codes for building and standards of good construction work. Hot dip galvanize steel components after fabrication in as large components as possible.

3.04 CLEAN UP

A. After installation, all surfaces shall be cleaned and ready to receive final treatment. All unused materials, tools and equipment shall be removed from the project site.

B. From time to time, and as directed by the Contracting Officer and at the completion of the work, all rubbish, debris, fines, etc., accumulated from the work of this section shall be removed from the project site and the area left neat and clean to the satisfaction of the Contracting Officer.

3.05 TOUCH UP

A. Galvanized Surfaces: Clean field welds, bolted connections and abraded areas and apply galvanizing repair paint to comply with ASTM A 780.

B. Touch-Up Painting: Immediately after erection, clean bolted connection and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.

END OF SECTION 05500

SECTION 06100 - ROUGH CARPENTRY

PART 1 – GENERAL

1.01 SUMMARY

Section includes all rough carpentry, complete, including framing, blocking, plates, nailers, strips, and rough hardware.

1.02 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTAL PROCEDURES.

B. Provide a certificate of treatment showing compliance with the specifications, and a certificate of dryness for all wood specified to be dried after treatment.

1.03 DELIVERY, STORAGE AND HANDLING

Delivery and Storage: Keep materials dry at all times. Protect against exposure to weather and contact with dry or wet surfaces. Stack lumber and plywood and provide air circulation within stacks.

1.04 QUALITY ASSURANCE

Grading Marks: Factory mark each piece of lumber and plywood with type, grade, mill, and grading agency identification; except omit marking from surfaces to be exposed with transparent finish or without finish.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Lumber, General: All lumber, timber and boards shall be Douglas Fir Larch dressed seasoned lumber, S4S, 15% maximum moisture content at time of dressing and pressure-preservative-treated, unless otherwise indicated.

1. The lumber shall be graded in accordance with the West Coast Lumber In-spection Bureau (WCLIB), “Standard No. 17, Grading Rules for Coastal Douglas Fir,” or Western Wood Products Association (WWPA), “Western Lumber Grading Rules.” Use the following grades or better:

a. 2-inches to 4-inches thick, 2-inches to 4-inches wide – Structural light framing No. 2

b. 2-inches to 4-inches thick, 5-inches – Structural Joists and Planks No. 1

c. Beams and Stringers – No. 1 Structural

d. Truss members - Select Structural

B. Nominal sizes are indicated, except as shown by detail dimensions. Provide actu-al sizes as required by PS 20, for moisture content specified for each use.

C. Plywood: Comply with U.S. Product Standard PS 1-74 for plywood, Group 1, Douglas Fir unless otherwise specified or noted. Use exterior grade only without visible patches or repairs on exposed sides. For roof sheathing use Structural II, C-D EXT-APA.

D. Glu-laminated members shall have the following minimum allowable unit stresses:

	GLB / Rosboro Big Beam	
Extreme Fiber in Bending	2400 psi	3000 psi
Horizontal Shear	165 psi	300 psi
Compression Perpendicular to Grain	450 psi	650 psi
Modulus of Elasticity	1,800,000 psi	2,100,000 psi

2.02 FASTENERS, CONNECTORS, ROUGH HARDWARE

A. Fasteners and Anchors: Provide size, type, material and finish as indicated and as necessary for the project requirements; and as recommended by applicable standards complying with ASTM, ANSI, or Federal Specifications for; nails, sta-ples, screws, bolts, nuts, washers and anchoring devices.

B. Metal Hangers and Framing Anchors: Provide metal hangers and framing an-chors of the size and type recommended by the manufacturer or as shown on the Drawings for each use including recommended nails or screw fasteners. Provide all fasteners and anchorages with hot-dip zinc coating, unless stainless steel finish is indicated.

C. General: All connector references and framing hardware shall be Simpson “Strong Tie” connectors or approved structural equivalent. Unless otherwise indi-cated or specified, rough hardware exposed to weather, or embedded in or in contact with exterior masonry or concrete, shall be hot-dipped galvanized com-plying with ASTM A153 and ASTM F2329.

1. Bolts, Nuts, Studs – ANSI B18.2.1, ANSI B18.5.2.1M, ANSI B18.5.2.2M, ANSI B18.2.2, ASTM A 687, hot dip galvanized, and stainless steel type 316 for exterior applications.

2. Expansion Shields – CID A-A-1924. Except as shown otherwise, maximum size of devices in Groups IV, V, VI and VII shall be 3/8 inch.

3. Lag Screws and Lag Bolts – ANSI B18.2.1, hot dip galvanized.

4. Wood Screws – ANSI B18.6.1, hot dip galvanized.

5. Wire Nails – ASTM F 1667, galvanized.

2.03 MISCELLANEOUS MATERIALS

A. Moisture Barrier: ASTM D 226, 40 pound felt. Keep wood surfaces from direct contact with cementitious and metal surfaces with a layer of felt.

B. Wood Glue: APA AFG-01 Waterproof, waterbase, and air cure type.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Discard units of materials with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.

1. Members shall meet the tolerance requirements of of IBC Section 2303.

2. Set carpentry work accurately to required levels and lines, with members plumb and true and accurately cut and fitted.

3. Securely attached carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards. Countersink nail heads on exposed carpentry work and fill holes.

4. Use common wire nails, except as otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; pre-drill as required.

B. Wood Grounds, Nailers and Blocking: Provide whenever shown and where re-quired for attachment of other work. Form to shapes as shown and cuts as re-quired for true line and level of work to be attached. Coordinate location with oth-er work involved. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise shown.

C. Wood Furring: Install plumb and level with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

D. Wood Framing, General: Provide framing members of sizes and on spacing shown, and frame openings as shown, or if not shown, comply with recommen-dations of "Manual for House Framing" of National Forest Products Association. Do not splice structural members between supports.

E. Anchor and nail as shown, and comply with "Recommended Nailing Schedule" of Manual for House Framing" and other recommendations of N.F.P.A.

F. Installation of Plywood: Comply with applicable recommendations contained in Form No. e 3304, "APA Design/Construction Guide -Residential and Commer-cial", for types of plywood products and applications indicated.

END OF SECTION 06100

SECTION 06200 – FINISH CARPENTRY

PART 1 – GENERAL

1.01 SUMMARY

A. Provide all finish carpentry work, complete, including, but not limited to, the following items.

1. All finish carpentry work, blocking, etc.

2. Wood trim.

3. Millwork.

4. Custom casework.

5. Rough hardware.

6. Install wood doors, finish hardware, built-in equipment, white-boards, tackboards and any other items specified to be installed under this section but furnished under other sections of these spec-ifications.

B. Related Work Specified Elsewhere:

1. Preservative treatment is specified under SECTION 06311 - WOOD TREATMENT.

2. Back priming of wood work is provided under SECTION 09900 - PAINTING.

1.02 QUALITY ASSURANCE

A. Grading Marks: Factory mark each piece of lumber and plywood with type, grade, mill, and grading agency identification. Certificate of inspec-tion and grading by a recognized agency may be submitted with each shipment in lieu of factory marking, at Contractor's option.

B. Qualifications of Manufacturer: Cabinets used in work of this section shall be produced by manufacturers or custom cabinet shops regularly en-gaged in manufacturing of similar items and with a minimum 5 year histo-ry of successful production acceptable to the Director.

C. Qualifications of Installers: Use adequate number of skilled workmen who are thoroughly trained and experienced in necessary crafts and who are completely familiar with specified requirements and methods needed for proper performance of work of this section.

D. VOC content of adhesives shall be less than the current VOC content lim-its of the South Coast Air Quality Management District Rule 1168, "Adhe-sive and Sealant Application".

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01330 - SUBMITTAL PROCEDURES.

B. Certificates: Provide a certificate of treatment showing compliance with the specifications, and a certificate of dryness for all wood specified to be dried after treatment.

C. Material Safety Data Sheet (MSDS): Submit MSDS for each material.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Protect finish carpentry materials during transit, delivery, storage and han-dling to prevent damage, soiling and deterioration.

B. Do not deliver finish carpentry materials, until painting, wet work, grinding and similar operations which could damage, soil or deteriorate woodwork have been completed in installation areas. If, due to unforeseen circum-stances, finish carpentry materials must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.

C. Store materials away from threat of termite or other insect infestation.

PART 2 – PRODUCTS

2.01 WOOD PRODUCT QUALITY STANDARDS

A. Softwood Lumber Standards: Comply with U.S. Department of Com-merce PS 20 and with applicable grading rules of the respective grading and inspection agency for the species and product indicated.

B. Hardwood Lumber Standard: Comply with National Hardwood Lumber Association (NHLA) rules.

C. Plywood Standards: Comply with U.S. Department of Commerce PS 1 for softwood plywood and PS 51 for hardwood plywood.

D. Architectural Woodwork Quality Standards: Comply with AWI Quality Standards, Guide Specifications and Quality Certification Program, latest edition or WIC Manual of Woodwork, latest edition.

2.02 MATERIALS

A. General:

1. Nominal sizes are indicated, except as shown by detailed dimen-sions. Provide dressed or worked and dressed lumber, as applica-ble, manufactured to the actual sizes as required by PS 20 or to actual sizes and pattern as shown, unless otherwise indicated.

2. Moisture Content of Softwood Lumber: Provide kiln-dried lumber having a moisture content from time of manufacture until time of installation not greater than values required by the applicable grad-ing rules of the respective grading and inspecting agency for the species and product indicated.

3. Moisture Content of Hardwood Lumber: Provide kiln-dried lumber having moisture content from time of manufacture until time of in-stallation within a range of 8% to 13% for individual pieces, and an average of 11°/o for the entire lot.

B. Finish Carpentry: Solid lumber shall be milled to profiles indicated of clear Douglas Fir for paint finish.

C. Miscellaneous Materials:

1. Fiber-cement Siding: to comply with ASTM C 1186 Type A Grade II. Factory primed.

2. Moisture Barrier: Air infiltration barrier and weather resistive mem-brane, ASTM E 96/E 63M when applied on exterior walls. "Tyvek" as manufactured by DuPont Co., Rufco-Wrap by Raven Indus-tries, Type-65 Standard Grade by Griffolyn Reinforced Vapor Bar-rier, Jumbo Tex by Fortifiber Corp., MOLD Blocker Housewrap by PRO Installer, or approved equal. Material shall be Class A tested in accordance with the procedures of ASTM E 84.

3. Fasteners and Anchorages: Provide nails, screws and other an-choring devices of the proper type, size, material and finish for ap-plication indicated to provide secure attachment, concealed where possible, and complying with ASTM F 547 and applicable ANSI standards. Provide all fasteners and anchorages with a hot-dipped zinc coating ASTM A 153/A 153M, Class C or D as applicable ex-cept that fasteners used with ACQ-C and ACQ-D, CBA-A, CA-B, and borate non-DOT type treated wood shall be G185 or stainless steel. Fasteners at wet areas shall be stainless steel.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Discard units of material which are unsound, warped, bowed, twisted, im-properly treated, not adequately seasoned or too small to fabricate work with minimum of joints or optimum jointing arrangements, or which are of defective manufacturer with respect to surfaces, sizes or patterns.

B. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8-inch in 8-feet for plumb and level countertops; and with 1/16-inch maximum offset in flush adjoining 1/8-inch maximum offsets in revealed adjoining surfaces.

C. Scribe and cut work to fit adjoining work, and refinish cut surfaces or re-pair damaged finish at cuts.

D. Standing and Running Trim: Install with minimum number of joints possi-ble, using full-length pieces (from maximum lengths of lumber available) to the greatest extent possible. Stagger joints in adjacent and related mem-bers. Cope at returns, miter at corners, to produce tight fitting joints with full surface contact throughout length of joint. Use scarf joints for end-to-end joints. Sand smooth for imperceptible joints.

E. Anchor finish carpentry work to anchorage devices or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and where prefinished matching fasteners heads are required, use fine finishing nail for exposed nailings, countersunk and filled flush with finished surface, and matching final finish where transparent finish is indicated.

F. Moisture Barrier: Install as recommended by the manufacturer.

G. Re-treat cut and penetrated lumber in accordance with SECTION 06070 - WOOD TREATMENT.

3.02 ADJUSTMENT, CLEANING, FINISHING AND PROTECTION

A. Repair damaged and defective work wherever possible to eliminate de-fects functionally and visually; where not possible to repair properly, re-place casework. Adjust joinery for uniform appearance.

B. Protection: Installer shall advise Contractor of procedures required to pro-tect architectural work during remainder of construction period to ensure that work will be without damage or deterioration at time of acceptance.

END OF SECTION 06200

SECTION 06220 - SOLID SURFACE COUNTERTOPS

PART 1 – GENERAL

1.01 SUMMARY

A. Furnish and install solid surface countertops and other items as indicated on the drawings.

1. Sink and other required cutouts.

2. All fillers and scribes required to complete assembly are also included.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. SECTION 06200 – FINISH CARPENTRY

B. Plumbing and Electrical items as specified under Mechanical and Electrical Sections of Work.

1.03 QUALITY ASSURANCE

A. Acceptable products shall be of the following manufacturers:

1. Avonite
2. Corian
3. Formica Solid Surfacing

B. Contractor shall field verify all dimensions prior to ordering materials.

1.04 SUBMITTALS

A. Shop Drawings: Submit shop drawings for countertops showing plans, elevations, and views, cross sections (where necessary), pipe spaces, with locations of sinks and service fixtures and all pertinent details to ensure a complete assembly. Include layout of units with relation to surrounding walls, doors, and other building components. Coordinate shop drawings with other work involved.

B. Product Data: Submit manufacturer's product data and installation instruction for each type of countertop material.

C. Color Samples: Submit physical samples and/or color cards of available finishes for countertop materials for selection by Project Manager.

1.05 WARRANTY

A. Manufacturer shall warrant all materials and workmanship of materials and products provided for a period of one year from date of final acceptance. Any defects due to the use of improper materials or workmanship (normal wear and tear, abuse or misuse excepted) occurring within that time shall be promptly rectified upon notification by the Project Manager of this condition and at no cost to the State.

1.06 PRODUCT HANDLING

A. Ship all units packaged in protective cartons and labeled for location in the project.

B. Store all materials in a dry ventilated place, protected from the weather, until ready for installation.

C. Protect finished surfaces from soiling and damage during handling and installation. Keep covered with polyethylene film or other protective covering.

PART 2 – PRODUCTS

2.01 COUNTERTOPS

A. Solid Surface Fabrications: Provide fabrications of cast, nonporous solid surfacing material composed of homogeneous bio polyester and acrylic hybrid resin with natural filler material. Material shall not be coated or laminated. Solid surfacing material thickness shall be as indicated. Superficial damage to a depth of 0.10-inch shall be repairable by sanding or polishing.

1. Performance Requirements:

a. Tensile strength: (ASTM D†638) 4100 psi minimum.
b. Hardness: (ASTM D†785) Barcol Impressor 55 minimum.
c. Flammability: (ASTM E†84) Class I/A, flame spread 10 maximum, smoke developed 25 maximum.
d. Thermal expansion: (ASTM D†696) .000023 in/in/F maximum.
e. Boiling water resistance: (NEMA LD3), No effect.
f. High temperature resistance: (NEMA LD3), No effect.
g. Liquid absorption: (ASTM D†570) 24 hours; .06% maximum.
h. Bacteria growth: ASTM G†22) No growth.
i. Sanitation: (National Sanitation Foundation (NSF)) Standard No. 51 rating.

2. Solid Surface Counter Tops

a. Size, Edge Thickness:
1) Maximum sheet size 36" x 144", Shape – custom, Edge Thickness, 1-1/2"

b. Edge Type: Overhangs cabinet
c. Edge Treatment: Double 1/8" radius
d. Backsplash and Sidesplash Options:
e. Attached coved backsplash and sidesplash
f. Front Aprons: Flush

B. Joint Adhesive: Provide two-part joint adhesive as recommended by the solid surface fabrication manufacturer to form a chemical bond

C. Sealant: Provide mildew resistant, silicone sealant as recommended by the solid surface fabrication manufacturer.

D. Heat Reflective Tape: Provide heat reflective tape as recommended by the solid surface fabrication manufacturer for use near heat sources.

E. Fabrication Requirements: Provide solid surface countertops in sizes and shapes indicated. Thickness shall be 1 inch unless otherwise noted.

1. Factory fabricate components to the greatest extent practicable and in accordance with approved shop Drawings.

2. Form joints between components using manufacturer's standard joint adhesive.

Joints shall be inconspicuous, nonporous, and reinforced with strips of solid surfacing material in accordance with the manufacturer's instructions.

3. Provide factory cutouts for mechanical and electrical items and accessories as indicated. Reinforce cutouts in accordance with approved shop drawing and the manufacturer's instructions.

4. Cut and finish component edges with clean returns. Edges and corners of solid surfacing fabrications shall be rounded with 1/8 inch minimum radius. Route radii and contours to template. Provide thickened edges using a minimum of two strips of solid surfacing material mounted to the underside of the fabrication perimeter in accordance with approved shop drawings and manufacturer's instructions. Defective and inaccurate work shall be rejected and repaired.

F. Color and pattern of solid surface countertop and sink to be selected by the Project Manager from manufacturer’s finish selection. Surface shall have a satin finish.

PART 3 – EXECUTION

3.01 INSTALLATION OF COUNTERTOPS

A. Assemble and install countertops complete with sinks and accessories at locations indicated.

1. Install components plumb and level scribed to adjacent finishes, in accordance with approved shop drawings and data.

2. Form field joints using manufacturer's recommended adhesive. Joints shall be inconspicuous and nonporous. Keep components and hands clean when forming joints. Seal joints using manufacturer's recommended sealant.

3. Keep countertop components and hands clean during installation. Remove excessive adhesive and sealants. Clean finished surfaces of all dirt and stains.

3.02 CLEANING AND PROTECTION

A. After installation is completed, all casework shall be thoroughly cleaned inside and out. Touch-up as required.

B. Repair or remove and replace defective work as directed by the Project Manager. Mis-cuts and cut-out patching shall not be acceptable and subject to rejection.

C. Protect countertop and casework from damage by other trades. If damage is incurred on protected areas by other trades, repair and/or replacement costs shall be borne by that subcontractor.

END OF SECTION 06220

SECTION 06311 PRESERVATIVE TREATED LUMBER

PART 1 GENERAL

1.01 GENERAL CONDITIONS

A. As specified in Section 00700.

1.02 SUBMITTALS

A. A Certificate of Treatment shall be issued to the Engineer showing compliance with these specifications, both as to kiln drying and type of treatment performed, including dip treatment.

B. The Contractor shall submit a written certification to the Engineer that all wood used and left in place on this job was treated in accordance with these specifications and that all cuts and penetrations made subsequent to the treatment were coated with preservatives in compliance with Sub section 3.04.

1.03 GUARANTY

A. The Contractor shall submit to the Engineer a written guaranty that he will replace all treated wood which is attacked by subterranean termites within a period of two years from the date of project acceptance up to a total cost of $5,000.00 as verified through a cost breakdown in accordance with Section 8.4(b) "Force Account Work" of the General Conditions or is attacked by dry wood termites or deteriorates due to dry rot within the first five years of the project acceptance date. The Surety shall not be held liable beyond two years of the project acceptance date.

PART 2 PRODUCTS

2.01 GENERAL

A. All wood treated with oil borne preservatives shall be kiln dried before treatment to an average moisture content of 12% to 15% per AWPA standards.

B. All wood treated with water borne preservatives (with the exception of Hi-Bor (SBX) treated wood) shall be air dried or kiln dried before treatment to an average moisture content of 28% or less per AWPA standards. Wood having a moisture content higher than 28% is acceptable when treating with Hi-Bor (SBX).

C. All wood shall be treated as noted below except all heart redwood.

D. Lumber shall be milled to finish size and shape prior to treating, and it shall be treated before assembly. Plywood may be treated in regular panel sizes.

2.02 MATERIALS

A. Asbestos Prohibition: No asbestos containing materials or equipment shall be used under this section. The Contractor shall ensure that all materials and equipment incorporated in the project are asbestos free.

B. Water Borne Preservatives shall be Wolman CCA, Osmose CCA, Supatimber CCA or Chemonite ACZA or Hi-Bor (SBX) in accordance with American Wood Preservers Association (AWPA) Standard P5. Preservatives shall be EPA registered.

C. Water Borne Preservatives used to coat end cuts and penetrations within CCA or ACZA treated wood shall be Wolman (R) Treat 00, Wolman (R) Clear or Osmose Special K 33 Preservative. Preservatives shall be EPA registered.

D. Water-Borne Preservatives used to coat end cuts and penetrations in HI-BOR (SBX) treated wood shall be Clear-Bor F.T. or an equivalent solution of 10% inorganic boron. The end coating solution must be approved and labeled by the Environmental Protection Agency and must be accepted by the State of Hawaii, Department of Agricultural Pesticide Division for this purpose. The treatment solution shall have a colorant added which will tint the wood surface to indicate treatment.

E. Oil Borne Preservatives shall be TRIB II (0.50% by weight chlorpyrifos, 0.75% by weight 3 iodo 2 propynyl butyl carbamate [IPBC]), Perma Clear 65 (Zinc Naphthenate and Permethrin) or DAP Inc. "Premium Woodlife" (for dip treatment only), manufactured to the manufacturer's quality control and EPA registered. The solvent used in formulating the preservative solution shall meet the requirements of AWPA hydrocarbon solvent Type C, Standard P9, Paragraph 3.1.

PART 3 EXECUTION

3.01 WOOD PRESERVATION WITH WATER BORNE PRESERVATIVES

A. Unless otherwise stipulated, all lumber and plywood shall be pressure treated.

B. Lumber and plywood, except as stipulated in Paragraphs 3.02 and 3.03 below, shall be treated with Wolman CCA, Osmose CCA or Supatimber CCA in accordance with American Wood Preservers Bureau Standards AWPB APPROVED (Hawaii Use only) or with Chemonite ACZA in accordance with American Wood Preservers Bureau Standards AWPB LP 2 or Hi-Bor (SBX), using the full cell pressure method in conformance with APWA Standard C1-93. Lumber and plywood treated with Hi-Bor (SBX) shall attain the following penetration and retention requirements:

1. Lumber

    a. Penetration requirement for lumber under 5 inch nominal thickness: 0.40 inch in heartwood and 90% in sapwood.

    b. Penetration requirement for lumber 5 inch nominal thickness and over: 0.50 inch in heartwood and 90% in sapwood.

    c. Retention requirement for lumber shall be a minimum of 1.50% weight/weight or 0.42 pounds per cu. ft. in an assay zone of 0.0 - 0.6 inches for lumber under 5 inches nominal thickness and 0.0 - 0.75 inches for lumber over 5 inches in nominal thickness.

2. Plywood

    a. Penetration requirement for plywood shall be identical to that noted in AWPA C9-90.

    b. Retention requirement for plywood shall be a minimum of 1.27% weight/weight or 0.40 pounds per cu. ft. through the full thickness.

C. All 1" and 2" lumber and all plywood shall be dried to a moisture content of 19% or less after treatment.

3.02 WOOD PRESERVATION BY PRESSURE TREATMENT WITH OIL BORNE PRESERVATIVES

A. Hardwood flooring and exposed lumber 1-1/2" (net thickness) and over that will be unpainted or receive a clear finish shall be unincised and pressure treated in accordance with the process specifications noted in the latest edition of AWPA Standard C 1, C-2 and C-9.

B. Treated wood shall attain the following net retention requirements:

1. TRIB II: 0.0175 lbs. of Chlorpyrifos per cu. ft. of wood, 0.035 lbs. of 3 Iodo 2 propynyl butyl carbamate per cu. ft. of wood.

2. Perma Clear 65: 0.06 lbs. of zinc as metal per cu. ft. of wood and 0.006 lbs. of Permethrin per cu. ft. of wood.

3.03 WOOD PRESERVATION BY DIP TREATMENT

A. All finish lumber under 1-1/2" net thickness (except hardwood flooring); doors (solid wood and solid-core flush wood doors); finish plywood; and mill work items, such as for cabinet work, shelving and similar wood work that will be exposed to view in the finished work shall be immersion treated for a minimum period of 15 minutes in any of the preservatives listed in Section 2.02 D. Oil Borne Preservatives above or in a solution of 1 quart chlopyrifos in 55 gallons of a 0.50% IPBC solution. Hollow-core flush wood doors shall be immersion treated for a period of 5-minutes.

B. Doors shall be treated after manufacture but, where applicable, before application of plastic laminate.

3.04 INSTALLATION

A. Wood shall be thoroughly dried and virtually odor free prior to installation.

B. Wherever it is necessary to end cut or penetrate into (such as by drilling or notching) treated wood on the job, all such cuts and penetrations shall be treated in accordance with AWPA Standard M4 84 using two heavy brush coats of a treating solution noted in the following schedule. Exception: Cuts and penetrations made in Hi-Bor (SBX) treated wood 2 inches or less in nominal thickness need not be field treated.

INITIAL WOOD TREATMENT	FIELD TREATMENT
Wolman CCA	Wolman (R) Treat 00
Osmose CCA	Osmose Special K 33 Preservative
Supatimber CCA	Wolman (R) Treat 00 or Osmose Special K 33 Preservative
Chemonite ACZA	Wolman (R) Treat 00
TRIB II	Wolman (R) Clear
Perma Clear 65	Perma Clear 65
Hi-Bor SBX	Clear-Bor F.T. (with colorant added)

C. Perma-Clear 65 and Hi-Bor (SBX) treated wood shall not be used in areas exposed to direct precipitation (e.g. exposed decking, trellises, fencing, etc.) unless painted or covered with a finish material.

END OF SECTION 06311

SECTION 06611 – CAST POLYMER SHOWER SURROUNDS

PART 1 - GENERAL

1.01 SUMMARY:

A. Section Includes:

1. Cast polymer tub or shower surrounds.

B. Related Requirements:

1. Division 01 – General Requirements: Administrative, procedural, and temporary work requirements.

2. SECTION 07920 – SEALANTS

3. SECTION 09250 – GYPSUM WALLBOARD

4. SECTION 22400 – PLUMBING FIXTURES

5. SECTION 22422 – CAST POLYMER SHOWER PANS

1.02 REFERENCES

A. ASTM International (ASTM)

ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 – SUBMITTAL PROCEDURES.

B. Pre-Construction Submittals:

1. Shop Drawings: Indicate surround locations, plans, elevations, dimensions, and relationship to adjacent construction.

2. Product Data: Manufacturer’s descriptive data including materials, finishes, and accessories.

3. Pattern Samples: 17 x 14-inch samples showing surround pattern, color, and finish.

C. Informational Submittals:

1. Certificate of Compliance: Certification from an independent testing laboratory that surrounds meet fire hazard classification requirements.

D. Closeout Submittals:

1. Maintenance Data: Recommended cleaning products and procedures.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Minimum five years experience in work of this Section.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver components in manufacturer’s original unopened containers.

B. Store materials in a clean, dry location protected from damage.

C. Do not remove packaging until just prior to installation.

1.06 WARRANTY

A. Provide manufacturer’s 10-year limited warranty against manufacturing defects.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design:

MPL Company.

B. Acceptable Manufacturers:

1. Mincy Marble Manufacturing
2. Belstone
3. Approved equal

2.02 MATERIALS

A. Shower Surround Panels:

1. Material: Cast polymer panels.
2. Fire Hazard Classification: Class A when tested in accordance with ASTM E84.
3. Color: Unless otherwise indicated, to be selected by the Contracting Officer from manufacturer’s full color range.
4. Finish: Gloss.
5. Panel Thickness: 1/4 inch to 3/8 inch depending on pattern.
6. Panel Style: 3 x 6 inch vertical subway pattern.
7. Panel Dimensions: As indicated on the Drawings.
8. Accessories:

a. Panel Trim Strips: 96-inch length, 1 x 3/4 inch.

b. Soap Dish: One per shower, 4-1/8 inch corner mount.

c. Threshold: As indicated on the Drawings.

2.03 ACCESSORIES

A. Adhesive:

Panel manufacturer's 100 percent silicone adhesive or other adhesive approved by panel manufacturer for bonding panels to drywall substrate.

B. Sealant:

Panel manufacturer's 100 percent silicone sealant for inside corners.
Color selected by the Contracting Officer.

C. Exterior Caulking:

Paintable silicone sealant for edges where panels meet painted drywall surfaces.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Install surrounds in accordance with manufacturer's instructions and approved shop drawings.

B. Cut panels to fit spaces with maximum 1/8-inch gaps.

1. Smooth cut edges using 80-grit sandpaper.

2. Trim inside corner edges carefully to maintain centered pattern on back wall.

C. Cut panels for plumbing fixtures and trim. Smooth cut edges with 80-grit sandpaper.

D. Cut trim pieces to fit panel dimensions.

E. Clean back of panels and substrate surfaces using acetone prior to installation.

F. Apply beads of 100 percent silicone adhesive to substrate.

G. Install panels and apply pressure over entire panel surface to ensure proper adhesion.

H. Brace panels until adhesive has set.

I. Apply 100 percent silicone sealant at all inside corners.

J. Apply paintable silicone sealant where panels meet painted surfaces.

K. Seal joint between bottom of shower surround panels and shower pan flange with mildew-resistant 100 percent silicone sealant in accordance with SECTION 07920 – SEALANTS. Tool sealant to form a continuous watertight joint.

3.02 CLEANING

A. Remove excess adhesive and foreign matter from panels and trim.

3.03 PROTECTION

A. Protect surrounds using non-staining coverings.

B. Do not remove protection until just prior to final cleaning.

END OF SECTION 06611

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

SECTION 07210 - BUILDING INSULATION

PART 1 - GENERAL

1.01 SUMMARY

A. The extent of building insulation work is shown on the drawings, by the generic name.

B. The types of building insulation specified in this section include, but are not limited to, the following:

1. Thermal and acoustical batt insulation for walls and partitions.

2. Thermal rigid insulation for roof at supported (deck) framing.

3. Reflective bubble foil insulation.

4. Thermal rigid insulation for exterior insulation finish system.

C. Related Work Specified in Other Sections:

1. SECTION 07531 – SINGLE PLY TPO MEMBRANE ROOFING.

2. SECTION 07600 – FLASHING AND SHEETMETAL

3. SECTION 07700 – ROOF ACCESSORIES.

1.02 QUALITY ASSURANCE

A. Thermal Resistivity: Where thermal resistivity properties of insulation materials are designated by "R"-values they represent the rate of heat flow through a homogenous material exactly 1-inch thick, measured by test method included in referenced material standard or otherwise indicated. They are expressed by the temperature difference in degrees F between the two exposed faces required to cause one BTU to flow through one square foot per hour at mean temperatures indicated.

B. Fire and Insurance Ratings: Provide insulation materials which are identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, per methods indicated below, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.

1. Surface Burning Characteristics: ASTM E 84.

2. Fire Resistance Ratings: ASTM E 119. 3. Combustion Characteristics: ASTM E 136.

3. ANSI/SPRI and FM rating for wind uplift as required to meet structural design criteria as indicated on drawings.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01330 - SUBMITTAL PROCEDURES.

B. Manufacturer's Data: Submit manufacturer's specifications and installation instructions for

types of insulation required. Include data substantiating that materials comply with specified requirements.

C. Material Safety Data Sheets (MSDS): Submit MSDS for each material.

1.04 SAFETY PRECAUTIONS

A. Respirators and Other Concerns: Comply with OSHA 29 CFR 1910.134, "Respiratory Protection", ASTM C 930, "Potential Health and Safety Concerns Associated with Thermal Insulation Materials and Accessories", and other Federal, State, and local regulations governing safety. Provide workers with dust/mist respirators, training in their use, and protective clothing as approved by the National Institute for Occupational Safety and Health (NIOSH)/Mine Safety and Health Administration (MSHA).

B. Open Flame: Do not use open flame around insulation materials.

C. Do not use unfaced insulation in exposed applications where there is potential for skin contact and irritation.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site in original sealed wrapping bearing manufacturer's name and brand designation, specification number, type, grade, R-value, and class. Store and handle to protect from damage. Do not allow insulation materials to become wet, soiled or crushed. Comply with manufacturer's recommendations for handling, storing, and protecting of materials before and during installation.

B. Storage: Inspect materials delivered to the site for damage; unload and store out of weather in manufacturer's original packaging. Store only in dry locations, not subject to open flames or sparks, and easily accessible for inspection and handling.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Thermal Rigid Insulation at Supported (Concrete or Wood Deck) Roof Below Single Ply TPO Membrane Roofing with Polyisocyanurate Board: ASTM C 1289 Type II, felt faced, or Type I, foil-faced, except minimum compressive strength shall be 20 pounds per square inch, R = 20 minimum.

B. Thermal Rigid Insulation for roof slope: Nominal 2.0 lb/ft3 (16 kg/m3) Expanded Polystyrene (EPS) insulation board in compliance with ASTM E 2430 and ASTM C 578 Type I requirements (Note: minimum required thickness is 1 inch and maximum allowable thickness is 12 inches when installed in accordance with ICC-ES ESR 1720.

2.02 ACCESSORIES

A. Accessories shall be approved by manufacturer and shall comply with ANSI/SPRI and FM requirements for wind uplift, as determined by structural design criteria indicated on drawings.

B. Adhesive: As recommended by the insulation manufacturer.

C. Mechanical Fasteners: Corrosion resistant fasteners as recommended by the insulation manufacturer.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General:

1. Comply with manufacturer's instructions for the particular conditions of installation in each case. If printed instructions are not available or do not apply to the project conditions, consult the manufacturer's technical representative for specified recommendations before proceeding with the work.

2. Extend roof and wall insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.

3. Apply a single layer of insulation of the required thickness, unless otherwise shown or required to make up the total thickness.

4. Insulation shall be installed after construction has advanced to a point that the installed insulation will not be damaged by remaining work. For thermal insulation the actual installed thickness shall provide the R-values shown or specified.

5. Space insulation from heat producing devices as recommended by the manufacturer, but not closer than 3-inches.

6. Electrical Wiring: Do not install insulation in a manner that would sandwich electrical wiring between two layers of insulation.

3.02 PROTECTION

A. Protect installed insulation and facing from harmful weather exposures and from possible physical abuses, where possible by nondelayed installation of concealing work or, where that is not possible, by temporary covering or enclosure.

END OF SECTION 07210

SECTION 07531 - SINGLE-PLY TPO MEMBRANE ROOFING

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes single-ply TPO membrane roofing system over concrete.

B. Type of roofing system specified in this section utilizing single-ply roofing membranes includes totally adhered system conforming to uplift requirements.

C. Single-ply roofing membrane includes white thermoplastic alloy (TPO).

D. Related Work Describe Elsewhere:

1. SECTION 07210 - BUILDING INSULATION

2. Coordinate installation of metal coping, flashing, counterflashing, etc. with SECTION 07600 - FLASHING AND SHEET METAL.

1.02 QUALITY ASSURANCE

A. The roofing operations shall be so coordinated with appurtenant work such as sheet metal work that roof surfacing operations once started shall be continuous to completion.

B. The Roofing Contractor shall be an approved and experienced applicator of the manufacturer whose roofing system that is proposed for application and the workers shall have been instructed by that roofing system manufacturer (or their technical representative or independent roofing auditor/inspector) in the proper application of the system.

C. Notify roofing system manufacturer in writing of need for manufacturer's warranty complying with this section's requirements prior to Contractor-Applicator¬Manufacturer Review.

1. Obtain manufacturer's written review of project details and specifications.

2. Submit samples and product data of materials not supplied by system manufacturer to manufacturer for written approval.

3. Comply with manufacturer's requirements for specified warranty, including field inspections by manufacturer's technical representative.

D. The Roofing System Manufacturer's Technical Representative and the independent roofing auditor/inspector (where applicable) shall be competent, thoroughly trained and experienced in the work and shall be completely familiar with the products, equipment and the specified requirements and methods needed for the proper installation of the insulation, roofing membrane, and flashings.

E. The Contractor, Roofer and the authorized Roofing System Manufacturer's Technical Representative and/or their independent roofing auditor/inspector shall attend a pre-construction conference to review preparation and installation procedures for the roofing system and the coordinating and scheduling required with related trades. They shall also inspect the roof surfaces at the following times:

1. Prior to the start of the roofing installation as noted under item entitled "INSPECTION

OF SURFACES" hereinbelow where required by the manufacturer to validate the warranty.

2. At the actual start of the roofing application.

3. At least once during the roofing application, unless the Roofing System Manufacturer requires additional inspections for warranty provisions.

4. At job completion.(Note: It shall be the responsibility of the Contractor to notify the Roofer, Manufacturer's Technical Representative or their independent roofing auditor/inspector (where applicable) and the Contracting Officer of the schedule of operations. Parties shall be notified at least 5 working days in advance to enable their attendance.)

F. Contractor-Applicator-Manufacturer Review: Review Drawings and Specifications with manufacturer's agent and applicator. Obtain manufacturer's written agreement that selected system is proper, compatible, and adequate for application shown and that conditions and details do not conflict with manufacturer's warranty.

G. Should the Manufacturer's warranty requirements necessitate different drawings and details, including the use of cover board which exceed the requirements of those shown or specified, provide shop drawings and field adjustments at no cost to the State.

H. Pre-Installation Meeting: The General Contractor, the authorized roofing and roofing adhesive manufacturers' representatives or their independent roofing inspectors shall attend a pre-installation meeting. Include other related trades, such as sheet metal contractor, as applicable. Confirm the required participants with the Contracting Officer. Notify participants at least five days prior to meeting. Intent of the meeting is to review the preparation and installation requirements for the roofing system and to coordinate and schedule the required work.

I. UL Listing: Provide labeled materials that have been tested and listed by UL in "Building Materials Directory" or by other nationally recognized testing laboratory for application indicated, with "Class A" or "Class B" rated materials/system for roof slopes shown.

J. ANSI/SPRI and FM Listing: Manufactured products standard with the manufacturer for adherence to substrate to meet structural design criteria indicated on drawings.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01330 - SUBMITTAL PROCEDURES.

B. Manufacturer's Data: Submit complete sets of the following information for the roofing system proposed for use. Submittals shall be marked-up as necessary to clearly identify the item being submitted and its conformance to the requirements of these specifications.

1. Manufacturer's material product data and Material Safety Data Sheets (MSDS) for the following items:

   a. TPO Sheet Membrane.
   b. TPO Sheet Membrane Flashing.
   c. Fasteners, of required length(s).
   d. Bonding Adhesive.

2. Detailed installation drawings and specifications for the proposed roofing system/assembly.

3. Test report from a nationally recognized testing laboratory (Warnock Hersey, Factory Mutual, or Underwriters Laboratories) indicating that the proposed roofing system has a fire classification rating of Class A or Class B. The test report shall also indicate the maximum roof slope permitted for the proposed assembly.

4. Where required, Factory Mutual or UL approval for the proposed roofing system.

5. All materials shall be as labeled or approved by one manufacturer.

C. Shop Drawings: Submit complete sets of shop drawings detailing all roofing conditions.

D. Certificates:

1. Prior to the start of any work, submit a signed certificate from the proposed roofing manufacturer stating that the roofer is a trained and authorized applicator of the assemblies and that the installation crew has been trained in the system's proper installation by the Manufacturer or the Technical Representative of the Manufacturer.

2. signed certificate from the proposed roofing manufacturer naming their technical representative and their independent roofing auditor/inspector (where applicable) and attesting that this person is both qualified and authorized to act on and make commitments in their behalf in respect to a complete roofing system.

3. Warranty Certificate: Submit sample of the Complete Roofing System Warranty from the manufacturer exhibiting conformance with item entitled "WARRANTIES" hereinbelow.

a. Note: Warranty shall not contain any exclusions for materials not furnished by the Manufacturer, exclusions for ponding, or any requirement for periodic inspections by the Contracting Officer.

E. Samples: Submit samples of finished roofing sheets for acceptance.

F. Inspection Reports: Submit detailed roofing inspection reports by the Manufacturer's Technical representative or their independent roofing auditor/inspector documenting each inspection, including pre and post warranty inspections.

G. Pre-roofing conference records.

H. Warranties as noted under item entitled "WARRANTIES" hereinbelow.

1.04 WARRANTIES

A. The warranty provisions and number of years for the warranty required by this article shall take precedence over the standard provisions in the GENERAL CONDITIONS.

B. Manufacturer's Warranty: Roofing manufacturer warranty without monetary limitation, in which roof manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within the specified warranty period. Failure includes roof leaks and materials and adhesion failure due to wind conditions.

C. Manufacturer's warranty includes roofing membranes and base flashings, roofing membrane accessories, fasteners, and other components of the roofing system.

1. Warranty Period: 15 years from the Project Acceptance Date.

2. Wind Conditions: Warranty shall cover basic wind speeds up to 105 mph, Exposure C and Importance Factor 1.0, as defined by the local Building Code in effect for the applicable building heights.

3. Warranty shall state the Manufacturer's acceptance that the roof was installed in accordance with the contract requirements and that the State's personnel were properly instructed in the maintenance procedures.

4. In the event of a failure, State, Contractor, Roofing Installer, and Manufacturer shall mutually agree and determine roof system failures and remedies.

5. The Surety will not be held liable beyond 2 years of the Project Acceptance Date.

D. Project Warranty: Submit Contractor's warranty covering work of this section, including all components of roof system such as roofing membrane, base flashing, roofing membrane accessories, and fasteners, for the following warranty period and conditions:

1. Warranty Period: Two years from the Project Acceptance Date.

2. Warranty shall cover repairs or replacement of damages to the building and its finishes due to leaks.

E. Warranty Roof Inspections: Conduct a yearly inspection with the State representative just prior to the first and second year anniversary of the Project Acceptance Date. The purpose of the inspections is to identify and correct deficiencies in all components of the roofing and flashing system.

1.05 PRODUCT HANDLING

A. Delivery of Materials: All roofing materials shall be delivered to the site in the original unbroken manufacturer's wrapping material and containers with the original labels thereon intact. If any unlabeled materials are to be used, a properly attested certificate from the manufacturer stating that such materials comply with the requirements of the Contract Documents shall be furnished to the Contracting Officer prior to installation.

B. Storage of Materials at Job Site:

1. Except when placed on roof decks immediately prior to installation, roofing materials shall be stored above the supporting surfaces, such as on pallets.

2. Roll goods and any other materials which either absorb or are adversely affected by moisture shall be kept dry. Wet materials and/or materials which appear to have been deteriorated after getting wet shall not be permitted to be used on the job and shall be promptly removed.

3. Materials containing solvents shall be stored in a dry, cool area with proper fire and safety precautions.

4. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing manufacturer. Protect stored liquid material from direct sunlight.

5. Roll goods shall be stored on end.

6. If stored on other than the ground, all materials shall be distributed so that their

resultant weight does not exceed the design live load on the deck (normally 20 pounds per square foot on roofs and 40 pounds per square foot on floors).

7. Store membrane in the original undisturbed plastic wrap in a cool, shaded area and cover with light-colored, breathable tarpaulins, in a manner to protect it from damage. Membrane that has been exposed to the elements for approximately 7 days must be prepared with Splice Wash prior to hot air welding.

1.06 CAUTIONS AND WARNINGS

A. Oil, grease, mineral solvents, or live steam may be deleterious to certain membrane materials. The Contractor shall apprise the Contracting Officer of and seek the advice of the roofing system manufacturer if such conditions are noted on the site.

B. Vapors from bonding adhesives and lap sealants may be harmful if breathed in. They may also be flammable. The Contractor shall consult container labels and material safety data sheets for specific information on the products being used.

C. Provide rubber gloves, goggles or face shields, rubber boots, protective clothing, and other protective items required or recommended by membrane manufacturer. Ensure that workers are instructed in use of protective items and safety procedures.

PART 2 - PRODUCTS

2.01 GENERAL

A. Performance: Provide roofing materials recognized to be of generic type indicated and tested to show compliance with indicated performances, or provide other similar materials certified in writing by manufacturer to be equal to, or better than, materials specified in every significant respect, and acceptable to the Contracting Officer.

B. Compatibility: Provide products that are recommended by manufacturers to be fully compatible with indicated substrates, or provide separation materials as required to eliminate contact between incompatible materials.

2.02 TPO MEMBRANE

A. General: Thermoplastic alloy formed into uniform, flexible sheets conforming to ASTM D 6878.

1. Scrim reinforced.

2. Thickness: 60 mils, nominal.

3. Exposed Face Color: White.

B. Fully Adhered TPO Membrane: Manufacturer's standard installation.

C. Available Manufacturer: Firestone UltraPly TPO, Carlisle Sure-Weld, GAF Everguard, GenFlex, JohnsManville Ultraguard, Mulehide, or approved equal.

2.03 AUXILIARY MATERIALS

A. General: Furnish auxiliary materials recommended by roofing system manufacturer for intended use and compatible with TPO roofing.

B. Bonding Adhesive: Manufacturer's standard bonding adhesive.

C. Sealers and Sealants: As recommended by the manufacturer.

D. Metal Termination Bars: Manufacturer's standard aluminum bars, approximately 1-inch wide, roll formed and prepunched.

E. Fasteners and Plates: Factory-coated steel fasteners and metal or plastic discs of appropriate type and lengths, designed for fastening system components to substrates as approved by Factory Mutual as a component of the roofing system, and acceptable to roofing system manufacturer. Exposed fasteners shall be stainless steel.

F. Miscellaneous Accessories: Provide preformed inside and outside corner sheet flashings, and other accessories recommended by roofing system manufacturer for intended use. Provide products which are recommended by membrane manufacturer to be fully compatible with indicated substrates, or provide separation materials as required to eliminate contact between incompatible materials.

G. Pourable Sealer: Two-component, solvent free, polyurethane based sealant as furnished by membrane manufacturer to fill and seal pipe penetrations; to create a temporary seal of membrane to substrate when work is interrupted.

H. Recovery Board: ½ inch thick glass mat, water resistant gypsum substrate, meeting ASTM C 1177/C 1177M, Dens-Deck Prime or approved equal. Products made with Cellulose may be submitted for approval, provided that products have passed termite testing by a recognized lab conducting such test.

PART 3 - EXECUTION

3.01 INSPECTION OF SURFACES

A. Before the work under this section is started, the Roofer, together with the Manufacturer's Technical Representative or their independent roofing auditor/inspector (where applicable) and the Contractor shall meet with the Contracting Officer at the job-site to examine all surfaces on which roofing will be placed and all adjoining work which will affect or be affected by the roofing work. All unacceptable areas and/or conditions such as those listed in item entitled "APPLICATION" hereinbelow shall be corrected by the contractor and verified and accepted by the Roofer and the Manufacturer's Technical Representative or their independent roofing auditor/inspector prior to start of the work.

B. Fill Voids: All surface voids, of the immediate substrate, greater than 1/4-inch wide shall be properly filled with an acceptable fill material.

3.02 APPLICATION

A. General:

1. Workmanship: The Roofer shall have a responsible foreman on the job during roofing operations who shall ensure that all work is done in accordance with the plans and specifications.

2. No roofing shall be installed during precipitation and shall not be started in the event there is a possibility of precipitation during application.

3. No roofing shall be started in the absence of the Contracting Officer or their representative. The Contractor shall call the Contracting Officer to give at least one

day (24 hours minimum) advance notice of the starting of roofing operations.

4. The application of roofing shall be as specified or as shown in the plans.

5. Absolutely no roofing shall be applied to damp surfaces or before the deck and the work in connection therewith have met the following conditions:

    a. Concrete decks shall be cured (minimum 7 days) and dry, smooth, free from loose materials, properly graded to outlets, and swept clean. All sharp projections and lumpy places shall have been removed.

    b. Adjoining work, such as metal edging, counterflashing, etc., shall either be in place, ready for the Roofer to work in, or shall be available for installation by others, as applicable. This work shall be coordinated so that the total roofing system will be watertight.

    c. Fill in and build up all potential ponding areas of substrate as recommended by the manufacturer to provide positive drainage.

6. Phased construction of insulation and single ply roofing (roofing purposely interrupted for a period to permit other work and trafficking over the membrane) shall not be permitted.

    a. The complete roofing membrane shall be installed up to the line of termination (but allowing for required lapping) at the end of the day's work.

    b. At the end of the day's work, the loose edge of the incomplete roofing membrane shall be sealed using manufacturer's recommended temporary sealant to seal all incomplete edges against intrusion of water.

    c. When work is resumed, the membrane sealed edge shall be pulled free and the membrane trimmed and removed where the temporary seal was applied before continuing installation of the roofing system.

B. Adhered Sheet Installation:

1. Install TPO sheet membrane over areas to receive roofing according to roof systems manufacturer's written instructions. Unroll sheets and allow to relax for a minimum of 30 minutes.

2. Start installation in the presence of roofing system manufacturer's technical representative.

3. Accurately align sheets and maintain uniform side and end laps of minimum dimensions required by the roofing systems manufacturer. Stagger end laps.

4. Apply bonding adhesive to substrate and underside of sheet, at rate required by manufacturer and allow to partially dry. Do not apply bonding adhesive to splice area of the sheet.

5. Mechanically or adhesively fasten sheets securely at terminations and perimeter of roofing.

6. Roll out and position subsequent field membrane sheets in the same manner, overlapping the sides of the adjoining sheets 6-inches as marked on the top side of the membrane and overlapping the ends of adjoining sheets a minimum of 3-inches.

Heat weld lap to previously anchored panel prior to fastening in place.

7. Clean both faces of splice areas where required and hot air weld laps according to manufacturer's written instructions to ensure a watertight seam installation. Membrane left exposed for more than 12 hours shall be cleaned prior to any welding activity.

C. Membrane Welding:

1. Horizontal Field Splices: All field splices on the horizontal surface (including flashing) shall be completed using an automatic heat welder wherever possible that has been designed for hot air welding of thermoplastic membranes.

2. Vertical Field Splices: Hand held welders shall be used only on vertical welds or where an automatic welder is not practical or cannot be used.

3. Equipment and Test Splice Requirements: The air intake, temperature and speed of the machine shall be adjusted to provide proper seam strength. An ample power supply must be provided to all heat welding equipment. A generator, which is dedicated to the heat welding equipment, shall be used on all installations. When weather conditions vary, adjustments to the welding machine shall be made. This shall be done using spare material before beginning the finished product sheet. In addition, there shall be destructive tests performed daily and at the beginning and every time there is an interruption in the welding process (i.e. power failure, welder shut down, job site conditions change and after lunch). There shall be periodic checks (including at the start of each day) to verify good peel strength.

4. Seam Width Requirements: Seams made with the automatic welder shall be a minimum of 1-1/2 inches wide. Seams made with hand welders must be a minimum of 2-inches wide. Use silicone hand rollers to assure proper mating of surfaces as hand heat welding proceeds.

5. Seam Inspection: Probe all completed welds using a slotted screwdriver or dull cotter pin puller type tool to verify seam integrity daily. Do not probe welds until they have had time to cool. Any welds found to be insufficiently welded shall be repaired on a daily basis.

6. T-Joint Patches: T-joint patches shall be installed at all intersections of field seams.

7. Cut Edge Sealing: All cut edges with scrim exposed shall be sealed with UltraPly TPO Cut Edge Sealant or UltraPly TPO General Purpose Sealant or equal as recommended by the manufacturer.

8. Solvent welding is not acceptable.

D. Flashing Installation:

1. Install sheet flashings and preformed flashing accessories and fasten to substrates in accordance with roof system manufacturer's written instructions.

2. Terminate and seal top of sheet flashings and mechanically anchor to substrate with fasteners and fastening plates spaced at 12 inches on center or through termination bars, as detailed.

3.03 INSTALLATION OF ADJOINING WORK

A. All adjoining work (such as vent pipe premolded flashing boot, premolded inside and outside sheet flashing corners, etc.) shall be as specified or recommended by the manufacturer, or as shown in the plans.

B. Metal Flashing: Metal flashing shall be installed, anchored and sealed as specified herein, as detailed in the plans or, if a manufactured system is used, as instructed by the manufacturer. Sealant material and application shall be as specified in SECTION 07920 - SEALANTS.

C. Metal Counter-Flashing at Vertical Surfaces: Metal counter-flashing shall be installed, anchored and sealed as specified herein, as detailed in the plans or, if a manufactured system is used, as instructed by the manufacturer. Sealant material and application shall be as specified in SECTION 07920 - SEALANTS.

3.04 FIELD QUALITY CONTROL

A. Final Roof Inspection: Arrange for roofing system manufacturer's authorized representative to inspect roofing installation on completion and submit report to the Contracting Officer. Notify the Contracting Officer 48 hours in advance of the date and time of inspection.

B. Correct deficiencies in or remove roofing that does not comply with requirements, repair substrates, reinstall roofing, and repair sheet flashings to a condition free of damage and deterioration at the time of Substantial Completion and according to warranty requirements.

C. Test substrates adequate holding power before roofing is started. A fastener of the type proposed to be used shall be driven and pulled out. No roofing shall commence until a minimum resistance of 50 pounds has been attained.

3.05 PROTECTION AND CLEANING

A. Protection:

1. Any work or materials damaged during the handling of roofing materials shall be restored to their original (undamaged) condition or replaced.

2. The work of other trades shall not be marred or injured. Daubed or splashed surfaces shall be removed and the surface or finish restored to its original finish and appearance.

3. Protective coverings shall be installed at all pavement and exposed building walls as necessary to prevent the marring of existing surfaces.

4. Protection shall remain in place for the duration of the roofing work.

5. Contractor shall have on hand at the roof appropriate weather protection materials to protect the substrate during inclement weather.

6. Upon completion of roofing (including associated work), institute appropriate procedures for surveillance and protection of roofing during remainder of construction period. At end of construction period, or at a time when remaining construction will in no way affect or endanger roofing, make a final inspection of roofing and prepare a written report to the Contracting Officer describing nature and extent of deterioration or damage found.

7. Repair or replace (as required) deteriorated or defective work found at time of final inspection to a condition free of damage and deterioration at time of Substantial Completion and in accordance with requirements of specified warranty.

B. Cleaning:

1. Debris from roofing work shall be removed from the premises and disposed of at the end of each working day and upon completion of the work to the satisfaction of the Contracting Officer. The roof shall be left in good, clean condition.

2. Roof drains and overflow roof drains shall be cleaned out and all blockages shall be removed prior to acceptance of the project.

END OF SECTION 07531

SECTION 07600 - FLASHING AND SHEET METAL

PART 1 - GENERAL

1.01 SUMMARY

A. Provide all labor, materials and equipment necessary to fabricate and install flashing, counterflashing, metal edging, gutters and downspouts, and other related work as shown on drawings and as specified herein.

B. Related Work Described Elsewhere:

1. Coordinate installation of sheet metal work with SECTION 07531 - SINGLE PLY TPO MEMBRANE ROOFING.

2. Sealants are specified under SECTION 07920 - SEALANTS.

1.02 SUBMITTALS

A. Submit in accordance with SECTION 01330 - SUBMITTAL PROCEDURES.

B. Manufacturer's Data: Submit manufacturer's product data on all manufactured items.

C. Shop Drawings: Submit shop drawings with reference made to detail numbers on the contract drawings to the Contracting Officer for approval. Contract drawings are general in nature. Furnish additional details for all the similar and unusual conditions necessary to fabricate the flashing and sheet metal work. Shop drawings shall show all fasteners and relationship to adjacent work. No fabrication will be permitted before approval is secured. Tracing or reproducing drawing details is unacceptable.

D. Certificates: Submit manufacturer's certificates or written certification by an engineer registered in the State of Hawaii that edge securement for low-slope roofing and copings, conform with ANSI/SPRI ES-1.

E. Samples: Submit 3 samples of prefinished metal finishes to match colors as indicated or scheduled.

F. Warranty: Submit warranty as stipulated in item entitled "WARRANTY" hereinbelow.

1.03 QUALITY ASSURANCE

A. All sheet metal fabrications shall conform to State and local codes, SMACNA (latest edition) and industry standards.

B. All roof penetrations shall be installed weathertight in such a manner to maintain integrity of the roofing.

C. Fastening and cleating shall withstand all positive and negative wind pressures as indicated for various locations of building as indicated.

D. ANSI/SPRI ES-1-98 Test Method RE-3: Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems (current edition). The coping system shall be tested simultaneously on horizontal and vertical surfaces and shall exceed horizontal and vertical design wind pressure as calculated in accord with the ANSI/SPRI ES-1-98 Test RE-3. Use the current edition of ANSI/SPRI ES-1 Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.

1.04 STORAGE AND HANDLING

A. All materials shall be stored in such a manner as to afford adequate protection.

B. Damaged materials shall not be used and shall be removed from the site.

1.05 WARRANTY

A. The warranty provisions and number of years for the warrantee by this article shall take precedence over the standard provisions in the GENERAL CONDITIONS.

B. Project Warranty: Submit Contractor's warranty, signed jointly by Installer covering work of this section, including all components of flashing system such as panels, base flashing, roofing accessories, fasteners, curbs, collar flashing, and other products, for the following warranty period and conditions:

1. Warranty Period: Two years from the Project Acceptance Date.

2. Warranty shall cover repairs or replacement of damages to the building and its finishes due to leaks.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Galvanized Steel: Minimum 24 gauge galvanized sheet metal, ASTM A 653/A 653M, G90 hot-dip galvanized, mill phosphatized where indicated for painting.

B. Copper: 16 oz.

C. Nails and Fasteners: Use the same metal or a metal compatible with the item. Use stainless steel fasteners to fasten dissimilar metals.

D. Splash Blocks: Splash blocks of 12-inch wide x 16-inch long x 4-inch deep size shall be formed with depressions in top surface to drain away from building and shall be reinforced as standard with the manufacturer. Block shall be equal to Concrete Creations of Hawaii - Splash Block or approved equal.

E. Underlayment: ASTM D 226, Type I (No. 15), asbestos-free, asphalt saturated roofing felt.

F. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12 but containing no asbestos fibers, or cold-applied asphalt emulsion complying with ASTM D 1187.

PART 3 - EXECUTION

3.01 INSTALLATION AND WORKMANSHIP

A. Surface to which sheet metal is to be applied shall be even, smooth, sound, thoroughly clean and dry, and free from defects that might affect the application. Report any unsatisfactory surfaces to the Contracting Officer. In the absence of such a report, the Contractor shall be held responsible for the finished product.

B. All accessories or other items essential for the completeness of the sheet metal

installation, though not specifically indicated on the drawings or specified, shall be provided. All such items unless otherwise indicated on the drawings or specified, shall be of the same kind of materials as the item to be applied. Nails, screws, rivets, and bolts shall be of the type best suited for the purpose intended and shall be of a composition that is compatible with the metal to which it will contact.

C. Except as otherwise indicated on the drawings or specified, the workmanship of sheet metal work, method of forming joints, anchoring, cleating, provisions for expansion, etc., shall conform to the standards details and recommendations of the Sheet Metal and Air Conditioning Contractors National Association's "Architectural Sheet Metal Manual", and shall be subject to the approval of the Contracting Officer. Exposed edges shall be folded back neatly to form a minimum 1/2-inch hem on the concealed side. Fabricate for waterproof and weather-resistant performance, with expansion provisions for running work, sufficient to permanently prevent leakage, damage, or deterioration of the work.

D. Seams: Straight and uniform in width and height with no sealants showing on the face.

1. Flat-lock Seams: Finish not less than 3/4-inch wide.

2. Lap Seams: Finish soldered seams not less than one-inch wide. Overlap seams not soldered, not less than 3-inches.

3. Loose-lock Expansion Seams: Not less than 3-inches wide, and shall provide minimum one-inch movement within the joint. Joint shall be completely filled with exterior sealant, applied at not less than 1/8-inch thick bed.

4. Flat Seams: Make seams in the direction of the flow.

E. All sheet metal work shall be watertight and wind-tight in compliance with the purpose intended for the items indicated on the drawings or specified herein. Sheet metal shall be held firmly in place and shall not rattle.

F. Cleating: Cleats for sheet metal work shall be provided where required, continuous, unless otherwise indicated on the drawings. Cleats shall be of the same material and weight as the metal being installed. Hook cleating with 3/4-inch minimum hem on concealed side of flashing.

G. Protection from Contact of Dissimilar Materials: Surfaces in contact with dissimilar metal shall be painted with heavy-bodied bituminous paint or shall be separated by means of moisture-proof building felts.

3.02 PROTECTION

A. Protect all sheet metal work until final acceptance of the building.

3.03 CLEAN UP

A. Clean all exposed sheet metal work at completion of installation. Grease and oil films, handling marks, contamination from steel wool, fittings and drilling debris shall be removed, and the work scrubbed clean. All exposed metal surfaces shall be free of dents, creases, waves, scratch marks, and solder or weld marks.

B. At completion of the work, clean up and remove all rubbish and debris from the premises which resulted from this work.

END OF SECTION 07600

SECTION 07840 – FIRESTOPPING

PART 1 - GENERAL

1.01 SUMMARY

A. Firestopping shall consist of furnishing and installing tested and listed firestop systems, a combination of materials or devices to form an effective barrier against the spread of flame, smoke and gases, and maintain the integrity of fire resistance rated walls, partitions, floors, and ceiling-floor assemblies, including through-penetrations and construction joints and gaps. Through-penetrations include the annular space around pipes, tubes, conduit, wires, cables and vents. Construction joints include those used to accommodate expansion, contraction, wind, or seismic movement; firestopping material shall not interfere with the required movement of the joint.

1.02 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTAL PROCEDURE.

B. Manufacturer's Data: Submit copies of manufacturer's product data and specifications for type of sealant required. Data shall indicate product characteristics, typical uses, performance and limitation criteria, shelf life, and test data.

C. Shop Drawings: Submit detail drawings, including manufacturer's typical details conforming to UL Fire Resistance Directory or other details certified by another nationally recognized testing laboratory, installation instructions or UL listing details for a firestopping assembly in lieu of fire-test data or report. For those firestop applications for which no UL tested system is available through a manufacturer, a manufacturer's engineering judgement, derived from similar UL system designs or other tests, shall be submitted for review and approval prior to installation. Submittal shall indicate the firestopping material to be provided for each type of application. When more than a total of 5 penetrations and/or construction joints are to receive firestopping, provide drawings that indicate location, "F" and "T" ratings, and type of application.

D. Material Safety Data Sheets (MSDS): Submit MSDS for each firestop product.

E. UL Tested Systems: Submit drawings showing typical installation details for the methods of installation. Indicate which firestop materials will be used and thickness for different hourly ratings and steel thickness.

F. Engineering Judgments: Submit manufacturer's drawings for all non-standard applications where no UL tested system exists. All drawings must indicate the "Tested" UL system upon which the judgment is based so as to assess the relevance of the judgment to some known performance.

G. Installation Procedures: Submit manufacturer's installation procedures for each type of product.

H. Approved Applicator: Submit document from manufacturer wherein manufacturer recognizes the installer as qualified and submit a list of past projects to demonstrate experience and capability to perform intended work.

I. Color Samples: Submit sets of color finish samples of sealants that will be exposed in finish spaces.

J. Upon completion, installer shall provide written certification and report that materials were

installed in accordance with the manufacturer's installation instructions and details and by UL number.

1.03 QUALITY ASSURANCE

A. Workmanship: The Contractor shall engage an experienced Installer who is:

1. FM Research approved in accordance with FM AS 4991, "Approval of Firestop Contractors", or

2. Certified, licensed, or otherwise qualified by the firestopping manufacturer as having the necessary staff, training, and a minimum of three (3) years' experience in the installation of manufacturer's products per specified requirements. A manufacturer's willingness to sell its firestopping products to the Contractor or to an installer engaged by the Contractor does not in itself confer qualification on the buyer. The Installer shall have been trained by a direct representative of the manufacturer (not distributor or agent) in the proper selection and installation procedures.

B. Regulatory Requirements:

1. Firestop systems shall be installed in all openings and around all penetrating elements or devices as required by these Contract Documents, and as required by applicable design, building and construction codes, subject to the interpretation of the authority having jurisdiction.

2. Firestop materials shall have the approval of the authority having jurisdiction

C. Certification:

1. The performance of the firestop designs shall have been demonstrated by third party testing in accordance with the applicable reference standards. Evidence of third-party acceptance shall include labeling or listing by an acceptable agency.

2. Manufactured assemblies and material formulations shall be prepared under a third party monitored Quality Control Program, e.g., U.L. Follow up Service.

3. Contractor shall certify compliance with the provisions of this section.

4. Provide third party inspection of installed firestopping under field quality control.

D. Finish: Exposed surfaces of the firestop shall be finished to the standard of the adjacent faces of the partition being penetrated.

E. Compatibility: Firestop materials and installations shall be compatible and tested for a complete, UL listed firestopping system.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in the original unopened packages or containers showing name of the manufacturer and the brand name. Store materials off the ground and protect from damage and exposure to elements. Remove damaged and deteriorated materials from the site.

B. All firestop materials shall be installed prior to expiration of shelf life.

PART 2 - PRODUCTS

2.01 FIRESTOPPING

A. Materials: Provide asbestos-free firestopping material capable of maintaining an effective barrier against flame, gases, and temperature. Provide non-combustible firestopping that is non-toxic to human beings during installation or during fire conditions. Devices and equipment for firestopping service shall be listed in the UL Fire Resistance Directory or FM P7825a "Approval Guide Fire Protection" and approved for use with applicable construction, and penetrating items.

B. Fire Hazard Classification: Material shall have a flame spread of 25 or less, a smoke developed rating of 50 or less, and a fuel contribution of 50 or less when tested in accordance with the procedures of ASTM E 84, "Surface Burning Characteristics of Building Materials", UL 723, "Surface Burning Characteristics of Building Materials", or UL listed and accepted.

C. Fire Resistance and Hose Stream Tests: Firestopping materials shall be rated "F" and "T" in accordance with ASTM E 814, "Fire Tests of Through-Penetration Fire Stops", or UL 1479, "Fire Tests of Through-Penetration Firestops", except that the "T" rating may be based on thermocouples placed one-inch from a penetrating item in lieu of direct attachment to penetrating items. Rating periods shall conform to the following: Time-rated wall or ceiling assemblies shall be rated at minimum one and two hour unless rated otherwise, but not less than the construction in which they occur.

D. Nontoxicity: Firestopping materials shall be non-toxic to human beings during installation and during fire conditions.

E. Construction Joints and Gaps: Construction joints and gaps shall be provided with firestopping materials and systems that have been tested in accordance with ASTM E 119, "Fire Tests of Building Construction and Materials", ASTM E 1966, "Fire-Resistive Joint Systems", or UL 2079, "Tests for Fire Resistance of Building Joint Systems", to meet the required fire resistance rating. Systems installed at construction joints shall meet the cycling requirements of ASTM E 1399, "Cyclic Movement and Measuring the Minimum and Maximum Joint Widths of Architectural Joint Systems", or UL 2079.

PART 3 - EXECUTION

3.01 FIRESTOPPING LOCATIONS

A. Provide firestopping in the following locations, including but not limited to:

1. Around duct, cable, conduit, piping and their supports that penetrate through time-rated assemblies.

2. Around openings between surfaces of time-rated assemblies.

3. Around openings and penetrations in enclosures with time-rated fire doors.

4. Other locations required and/or indicated to complete fire rated assembly.

3.02 PREPARATION

A. Coordination: The specified work shall be coordinated with other trades. Firestopping materials, at penetrations of pipes and ducts, shall be applied prior to insulating, unless insulation meets requirements specified for firestopping. Firestopping materials at building joints and construction gaps shall be applied prior to completion of enclosing

walls or assemblies. Cast-in-place firestop devices shall be located and installed in place before concrete placement. Pipe, conduit or cable bundles shall be installed through cast-in-place device after concrete placement but before area is concealed or made inaccessible.

B. Surface Preparation: Remove dirt, grease, oil, loose materials, rust, or other substances that may affect proper fitting or the required fire resistance from surfaces in contact with firestopping materials, unless otherwise directed by the manufacturer's instructions.

C. Verify that environmental conditions are safe and suitable for installation of firestopping products.

D. Verify that all pipe, conduit, cable, and other items which penetrate fire-rated construction have been permanently installed prior to installation of firestopping.

3.03 INSTALLATION

A. Firestopping material shall completely fill void spaces regardless of geometric configuration, subject to tolerance established by the manufacturer. Firestopping systems for filling floor voids 4-inches or more in any direction shall be capable of supporting the same load as the floor is designed to support or shall be protected by a permanent barrier to prevent loading or traffic in the firestopped area. Firestopping shall be installed in accordance with manufacturer's written instructions.

1. Filling of Voids: Completely fill voids at the surface; the depth of the material shall be as approved by UL.

2. Insulated Pipes and Ducts: Thermal insulation shall be cut and removed where pipes or ducts pass through firestopping, unless insulation meets requirements specified for firestopping. Thermal insulation shall be replaced with a material having equal thermal insulating and firestopping characteristics.

3. Electrical and Data Cables or Conduits: Firestopping at penetrations shall comply with the requirements of NFPA 70, "National Electrical Code" and be sealed with re-enterable firestopping materials that do not cure over time. Firestopping shall be modular devices, containing built-in self-sealing intumescent inserts. Firestopping devices shall allow for cable moves, adds, or changes without the need to remove or replace any firestop materials.

4. When required to properly contain firestopping materials within openings, damming or packing materials may be utilized. Combustible damming material must be removed after appropriate curing. Non-combustible damming materials may be left as a permanent component of the firestop system.

5. Provide firestopping manufacturer’s labeling for all firestopping installation locations.

3.04 FIELD QUALITY CONTROL

A. Contractor shall inspect and approve all firestopping installations.

B. To ensure proper installation, firestopped areas shall not be covered or enclosed until inspection is complete and approval has been received.

C. Submit written reports indicating locations of and types of penetrations and types of firestopping used at each location; type shall be recorded by UL listed printed numbers.

3.05 CLEAN UP

A. Remove spilled and excess materials adjacent to firestopping without damaging adjacent surfaces.

B. Leave finished work in neat, clean condition with no evidence of spill-overs or damage to adjacent surfaces.

END OF SECTION 07840

SECTION 07920 - SEALANTS

PART 1 - GENERAL

1.01 SUMMARY

A. Completely close with sealant all joints indicated or specified to be sealed to a watertight condition.

B. Related Work Described Elsewhere:

1. Roofing sealant is provided under SECTION 07531 – SINGLE PLY TPO MEMBRANE ROOFING.

1.02 SUBMITTALS

A. Submit in accordance with SECTION 01330 - SUBMITTAL PROCEDURES.

B. Manufacturer's Data: Submit copies of manufacturer's product data and specifications for type of sealant required, to the Contracting Officer for approval.

C. Material Safety Data Sheets (MSDS): Submit MSDS for each sealant product.

D. Color Samples: Submit sets of color finish samples of sealants.

E. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.

2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

F. Warranty: Submit warranty as stipulated in item entitled "WARRANTY" hereinbelow.

1.03 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this Project.

B. Source Limitations: Obtain each type of sealant through one source from a single manufacturer.

C. Preconstruction Compatibility and Adhesion Testing: Submit to sealant manufacturers, for testing samples of materials that will contact or affect sealants. Use manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain optimum adhesion of sealants to joint substrates. Testing will not be required if joint-sealant manufacturers submit joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

D. Stain-Test Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

1.04 PRODUCT HANDLING

A. Delivery: Deliver sealants to the jobsite in sealed containers labeled to show the designated name, formula, or specification number, lot number, color, date of manufacture, shelf life, curing time, manufacturer's directions, and name of manufacturer.

B. Storage: Carefully handle and store all materials to prevent inclusion of foreign materials. Remove from project site all damaged and deteriorated materials and materials exceeding shelf life.

C. All sealant materials shall be handled in accordance with the manufacturer's specifications and installed prior to expiration of shelf life.

1.05 WARRANTY

A. Provide a 2-year written warranty against leaks, air infiltration, cracks, and other failures of the installation and materials.

B. Repair of sealants to seal leaks caused by faulty materials or workmanship;

C. Repair or replace damage to the building or its finishes, equipment or furniture when occasioned by such leaks.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General: Provide sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

B. VOC Content and Interior Sealants and Sealant Primers: Comply with the following limits when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Sealants: Not more than 250 g/L.
2. Sealant Primers for Nonporous Substrates: Not more than 250 g/L.
3. Sealant Primers for Porous Substrates: Not more than 775 g/L.

C. Sealants:

1. At Exterior and Interior Vertical and Overhead Moving Joints: One-part polyurethane-based sealant, conforming to ASTM C 920, Type S, Grade NS, Class 25, Use NT. Provide one of the following, or approved equal:

   a. Dymonic; Tremco, Inc.
   b. Chem-Calk 900; Bostik Construction Products Div.
   c. Sikaflex 1 a; Sika Corp.
   d. Dynatrol I; Pecora Corp.
   e. NP-1; Sonneborn.

2. At Interior Vertical and Overhead Non-Moving Joints: Non-Elastomeric Sealant; acrylic-emulsion type, conforming to ASTM C 834. Provide one of the following, or approved equal:
   a. AC-20 Acrylic Latex: Pecora Corp.
   b. Tremco Acrylic Latex 834; Tremco, Inc.

c. Chem-Calk 600; Bostik Construction Products Div.
d. Sonolac; Sonneborn.

3. Silicone Sealant: At Perimeter of All Plumbing Fixtures and Fittings: One- part mildew-resistant silicone sealant conforming to ASTM C 920, Type S, Grade NS, Class 25, Use NT, formulated with fungicide; intended for sealing interior joints with non-porous substrates. For use in kitchens and food preparation areas provide sealant complying with FDA requirements. Provide one of the following, or approved equal:

a. Dow Corning 786; Dow Corning Corp.
b. SCS 1700 Sanitary; General Electric Co.
c. Tremsil 600 White; Tremco, Inc.
d. Omni Plus; Sonneborn.
e. 898 or 893, No. 345; Pecora Corp.
f. Concealed Joints: Non-drying, non-hardening, non-skinning, non¬staining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.

1) BA-98; Pecora Corp.
2) Tremco Acoustical Sealant; Tremco.
3) Pro-Series SC-170; Ohio Sealants.

D. Primer for Sealants: Non-staining, as recommended by the sealant manufacturer.

E. Sealant Backer Rod: Compressible rod stock of polyethylene foam, polyethylene-jacketed polyurethane foam, butyl rubber foam, neoprene foam or other flexible, permanent, durable, nonabsorptive material as recommended for compatibility with sealant by the sealant manufacturer to control the joint depth for sealant placement, to break bond of sealant at bottom of joint, to form optimum shape of sealant bead on back side, and to provide a highly compressible backer which will minimize the possibility of sealant extrusion when joint is compressed. Do not use oakum or other types of absorptive materials as backstops.

F. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer.

G. Masking Tape: Non-staining, nonabsorbent type compatible with joint sealants and to surfaces adjacent to joints.

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

A. Comply with manufacturer's printed instructions except where more stringent requirements are shown or specified, and except where manufacturer's technical representative directs otherwise.

3.02 EXAMINATION

A. Examine joint widths, surfaces, and backing, and their anchorage to the structure, and conditions under which joint sealer work is to be performed, and notify Contractor in writing of conditions detrimental to proper completion of the work and performance of sealers. Do not proceed with joint sealer work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.03 JOINT PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealers to comply with recommendations of joint sealer manufacturers and the following requirements:

1. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealer, including dust; paints, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer; oil; grease; waterproofing; water repellants; water; and surface dirt.

2. Clean concrete, masonry, unglazed surfaces of ceramic tile and similar porous joint substrate surfaces, by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealers. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.

3. Remove laitance and form release agents from concrete.

4. Steel Surfaces in Contact with Sealant: Scrape and wirebrush to remove loose mill scale. Remove dirt, oil, or grease by solvent cleaning, and wipe surfaces with clean cloths.

5. Clean metal, glass, glazed surfaces of ceramic tile, and other nonporous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealers.

6. Do not permit solvents to air dry. Wipe surfaces free of solvent using clean, dry white cloth or white lintless paper.

B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealer manufacturer based on preconstruction joint sealer-substrate tests or prior experience. Apply primer to comply with joint sealer manufacturer's recommendations. Confine primers to areas of joint sealer bond, do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

D. Examine joint size and correct to achieve depth ratio of 1/2 of joint width with a minimum width and depth of 1/4-inch, maximum width of 1-inch unless specifically allowed otherwise by the sealant manufacturer.

3.04 INSTALLATION OF JOINT SEALERS

A. General: Comply with joint sealer manufacturers' printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

B. Weather Conditions: Do not proceed with installation of sealants under adverse weather conditions. Proceed with the work only when weather conditions are favorable for proper cure and development of high early bond strength.

C. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications and conditions indicated.

D. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

E. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:

1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths which allow optimum sealant movement capability.

a. Do not leave gaps between ends of joint fillers.
b. Do not stretch, twist, puncture, or tear joint fillers.
c. Remove absorbent joint fillers which have become wet prior to sealant application and replace with dry material.

2. Install bond breaker tape between sealants and joint fillers, compression seals, or back of joints where adhesion of sealant to surfaces at back of joints would result in sealant failure.

3. Install compressible seals serving as sealant backings to comply with requirements indicated above for joint fillers.

F. Primer: Immediately prior to application of the sealant, clean out all loose particles from joints. Where recommended by sealant manufacturer, apply primer to joints in concrete, masonry units, wood, and other porous surfaces in accordance with compound manufacturer's instructions. Do not apply primer to exposed finish surfaces.

G. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross- sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.

H. Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

1. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

2. Provide flush joint configuration per Figure 5B in ASTM C 1193, where indicated.

3.05 CLEAN UP

A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealers and of products in which joints occur.

3.06 PROTECTION

A. Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealers immediately and reseal joints with new materials to produce joint sealer installations with repaired areas indistinguishable from original work.

END OF SECTION 07920

DIVISION 08 – WINDOWS AND DOORS

SECTION 08210 – WOOD DOORS

PART 1 - GENERAL

1.01 SUMMARY:

A. Extent and location of each type of wood door are indicated on the Drawings and Door Schedules.

B. Types of doors required include solid core flush wood doors with painted veneer faces.

C. Related Work Specified Elsewhere:

1. Preservative treatment is specified in SECTION 06311 – PRESERVATIVE TREATED LUMBER.

2. Door hardware is provided under SECTION 08710 – FINISH HARDWARE. Door manufacturer shall review and certify that the finish hardware schedule conforms with the doors being furnished.

3. Painting of doors is specified in SECTION 09900 – PAINTING.

1.02 SUBMITTALS

A. Submit in accordance with SECTION 01300 – SUBMITTAL PROCEDURES.

B. Manufacturer's Data:
Submit manufacturer's technical data for each door type including:

1. Core construction

2. Edge construction

3. Louvers

4. Opening trims

A. Shop Drawings:
Submit shop drawings indicating:

1. Location and size of each door

2. Door swing

3. Stile and rail dimensions

4. Veneer type

5. Elevations of each door type

6. Construction details

7. Louvers and cutouts

8. Hardware blocking locations

9. Fire ratings where applicable

B. Warranty:
Submit manufacturer's warranty as specified under Warranty article.

1.03 QUALITY ASSURANCE

A. WDMA Quality Standard
ANSI/WDMA I.S.-1A "Wood Flush Doors".

B. WDMA Quality Marking
Mark each door with the WDMA Wood Door Certification Hallmark certifying compliance with ANSI/WDMA I.S.-1A. Manufacturers not participating in the WDMA Hallmark Program may submit a certification of compliance.

C. Wood Smoke Barrier Doors

Provide doors identical in materials and construction to non-smoke barrier doors where assemblies must comply with ICC IBC Section 407.

D. Factory Sealing
Seal all six sides of each door at factory using manufacturer's standard sealer.

E. Single Manufacturer

Provide doors of similar finish from one manufacturer.

F. Shop Finishing
Doors shall be shop finished to reduce jobsite odor.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Protect doors during delivery, storage, and handling in accordance with:

1. ANSI/WDMA I.S.-1A Section G-20

2. Manufacturer's recommendations

B. Identify each door with opening numbers corresponding to shop drawings using removable or concealed markings.

C. Do not walk on stacked doors or stack materials on top of them.

D. Do not drag doors across one another.

E. For doors not factory finished, seal all four edges immediately after delivery.

F. Store doors in a location protected from termite or insect infestation.

G. Cut plastic wrapping after delivery to allow doors to acclimatize once protected from weather.

1.05 PROJECT CONDITIONS

A. Conditioning:
Do not deliver or install doors until temperature and humidity conditions are stabilized and maintained during storage and installation.
Comply with AWI Section 100-S-3 – Moisture Content.

1.06 WARRANTY

A. General: Warranties shall be in addition to, and not a limitation of, other rights the County may have under the Contract Documents.

B. Door Manufacturer's Warranty: Submit written agreement on door manufacturer's standard form signed by Manufacturer, Installer and Contractor, agreeing to repair or replace defective doors which have warped (bow, cup or twist) or that show telegraphing of core construction in face veneers, or do not conform to tolerance limitations of referenced quality standards. Where door manufacturer's warranty is voided by local preservative treatment, warranty shall be by the Contractor.

1. Warranty shall be in effect during following minimum period of time after date of Substantial Completion, unless longer warranty is standard with the manufacturer.

2. Solid Core Interior Doors: Two years.

C. Contractor Responsibilities:
Replace or refinish doors where Contractor’s work voids manufacturer warranty.

PART 2 – PRODUCTS

2.01 FLUSH SOLID CORE WOOD DOORS

A. Solid Core Doors for Opaque (Paint) Finish:

1. Faces: Mahogany or other closed-grain hardwood at manufacturer’s option.
2. Grade: NWWDA Standard.
3. Construction: SLC-5 or SLC-7 glued block core (5- or 7-ply).

2.02 FABRICATION

A. Fabricate doors to sizes indicated allowing for job-site fitting.
Stile edge bands for doors receiving natural finish shall be hardwood compatible with face veneer.
Finger joints shall not be visible. Where used, locate under hardware.

B. Adhesives:
Adhesives shall comply with WDMA I.S.-1A Type II Bond requirements for interior doors.
Adhesives for transparent finishes shall be non-staining.
Adhesives shall contain no formaldehyde.

C. Finish Hardware:
Locate hardware in accordance with:

1. DHI-WDHS-3

2. ADA Section 404.2.7

3. Door frame shop drawings

4. DHI A115-W Series

5. Hardware templates

2.03 PRESERVATIVE TREATMENT

A. Treat all solid core doors at factory with water-repellent preservative after manufacture in accordance with WDMA I.S.-4 – Water Repellent Preservative Non-Pressure Treatment for Millwork and SECTION 06311 – PRESERVATIVE TREATED LUMBER.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine installed frames prior to hanging doors.

1. Verify frames comply with required type, size, location, and swing.

2. Verify frames are installed with plumb jambs and level heads.

3. Reject doors with defects that cannot be repaired to match new doors as approved by the Contracting Officer.

4. Doors warped more than 1/4 inch when measured per ANSI/WDMA I.S.-1A shall be rejected.

B. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Hardware Installation:

See SECTION 08710 – FINISH HARDWARE.

B. Manufacturer Instructions:

1. Install doors in accordance with manufacturer instructions and WDMA standards.

2. Install smoke barrier doors in assemblies complying with ICC IBC Section 407.

B. Job-Fit Doors:

Align and fit doors with uniform clearances.
Seal cut surfaces after fitting and machining.

1. Clearances for Non-Rated Doors:

a. 1/8 inch at jambs and heads
b. 1/2 inch at bottom above finished floor
c. 3/8 inch above thresholds unless noted otherwise

2. Bevel non-rated doors 1/8 inch in 2 inches at hinge and lock edges.

C. Prefit Doors:

Fit doors to frames to maintain uniform clearances.

3.03 ADJUSTING AND PROTECTION

A. Operation:
Rehang or replace doors that bind or fail to operate freely.
Replace doors that are warped, twisted, or out of plane.

B. Protection:
Protect doors during construction as recommended by manufacturer to ensure doors are undamaged at Substantial Completion.

END OF SECTION 08210

SECTION 08410 – ALUMINUM ENTRY DOORS AND WINDOW WALL

PART 1 – GENERAL

1.01 SUMMARY

A. Extent of aluminum entrances, exterior lightshelf and window wall work are shown on the drawings.

B. Related Work Specified in Other Sections:

1. Internal steel reinforcement is specified under SECTION 05500 - METAL FABRICATIONS.

2. Sealants shall be exterior type for moving joints as specified in SECTION 07920 - SEALANTS

3. Lock cylinders for entrance doors are provided under SECTION 08710 - FINISH HARDWARE.

4. Glazing requirements for entrance doors and window wall, including entrances specified to be factory glazed, are included in SECTION 08800 - GLAZING

1.02 SUBMITTALS

A. Submit in accordance with SECTION 01330 - SUBMITTAL PROCEDURES.

B. Manufacturer's Data: Submit complete manufacturer's technical literature, including full description of all materials and hardware, including weather resistance data.

C. Shop Drawings: Submit complete shop drawings to the Contracting Officer for approval. Shop drawings shall include large scale detail sections of every typical composite member. Also show method of anchorage, joint systems, expansion provisions, glazing details, hardware and its attachment and other pertinent details, and indicate all materials and finishes. Do not fabricate prior to acceptance.

D. Samples: Submit 3 samples of required finish. Submit samples of finishes, including hardware to the Contracting Officer for acceptance.

E. Test Reports: Where manufacturer's data does not clearly indicate conformance with performance requirements submit test reports from an independent laboratory certifying performance requirements of all exterior systems.

F. Certification: Supply certification by the manufacturer that the entry doors and window wall, including finish, conform to specifications.

G. Warranty: Submit warranty as stipulated in item entitled "WARRANTY" hereinbelow.

H. Maintenance Manual: Submit 3 maintenance manuals for each type of aluminum door, hardware, and finish.

1.03 QUALITY ASSURANCE

A. Standards: Comply with the applicable provisions of "Metal Curtain Wall, Window, Storefront, and Entrance Guide Specifications Manual" of the Architectural Aluminum Manufacturers Association (AAMA).

B. Manufacturer: Provide systems produced by a firm with at least 5 years of experience in the fabrication of aluminum entrance doors and window wall, of the types required for this project.

C. Perform work in accordance ADA Standards for Accessible Design/ ICC A117.1, and NFPA 101 as applicable.

D. To establish quality and type, the following specifications are based on products manufactured by Kawneer Company Inc. Similar products of Peerless Products Inc., Arcadia, Architectural Products, Oldcastle Glass, United States Aluminum, Corp., and Vistawall and other manufacturers as approved, will be considered provided they meet the design criteria, profiles, and specifications, and when submitted for substitution approval in accordance with GENERAL CONDITIONS.

1.04 WARRANTY

A. Provide a written warranty from the manufacturer or his authorized representative and countersigned by the Contractor, that the completed work will not be defective in workmanship, materials or installation (including watertightness of the entire application) for a period of 2 years from the date of final acceptance and that repair or replacement of any defective work will be done promptly. This warranty does not extend to defects caused by unusual abuse.

1.05 PERFORMANCE REQUIREMENTS

A. Submit evidence of compliance to the following minimum requirements.

1. Thermal Movement: Fabricate exterior components from manufacturer's stock systems which have been designed to provide for expansion and contraction resulting from ambient temperature range of 120 degrees F.

2. Wind Loading: Fabricate exterior components from manufacturer's stock systems which have been tested at 1.5 times design load in accordance with ASTM E 330 "Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference" to withstand wind velocity of 105 mph, Exposure C in accordance with current ICC IBC and ASCE 7, partially endorsed condition, no terrain effects with a deflection of not more than 1/175 times the length of the member. Provide internal reinforcement if required to withstand all design loads.

3. Weather Resistance: Fabricate exterior window wall components from manufacturer's stock systems which have been tested to demonstrate permanent resistance to leakages as follows with test pressure differential of 10% of design loading (excluding operable door edges).

a. Air Infiltration: Not more than 0.06 cfm per square foot, tested in accordance with ASTM E 283, "Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen".

b. Water Infiltration: No uncontrolled water penetration, tested in accordance with ASTM E 331 at 8 psf.

c. Uniform Load: A static air design load of 20 psf shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no

deflection in excess of L/175 of the span of any framing member. At a structural test load equal to 1.5 times the specified design load, no glass breakage of permanent set in the framing members in excess of 0.2% of their clear spans shall occur.

4. Seismic Load: As indicated.

B. Field Measurement: Wherever possible, take field measurements prior to preparation of shop drawings and fabrication, to ensure proper fitting of work. However, proceed with fabrication and coordinate installation tolerances as necessary when field measurements might delay work.

1.06 PROTECTIVE COVERING

A. Prior to shipment from the factory, finished surfaces of aluminum shall receive a protective covering. Covering shall not chip, peel, or flake due to temperature or weather, and shall protect against discoloration and surface damage from transportation, storage, and construction activities. Covering shall be readily removable without affecting the finish. Covering shall be either adhesive paper, waterproof tape, or strippable plastic.

1.07 DELIVERY AND STORAGE

A. Materials delivered to the jobsite shall be inspected for damage, and shall be unloaded with a minimum of handling. Use care in handling entry doors and window wall during transportation and at the jobsite. Store entry doors and window wall and components out of contact with the ground, under a weathertight covering, so as to prevent bending, warping, or otherwise damaging the materials. Entry doors and window wall shall not be covered with tarps, polyethylene film, or similar coverings. Provide care and handling conforming to AAMA CW-10, "Care and Handling of Architectural Aluminum from Shop to Site".

B. Damaged entry doors and window wall shall be repaired to an "as new" condition as approved. If materials cannot be repaired, provide a new unit.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Aluminum Extrusions: ASTM B 221 or ASTM B 221M, 6063-T5 or T6 alloy and temper.

B. Break Shape Panels: ASTM B 209, minimum 0.090-inch thick aluminum sheet arranged as shown and detailed for concealed fasteners, finished to match adjacent aluminum doors and window wall.

C. Aluminum Bars and Rods: ASTM B 211.

2.02 ALUMINUM DOORS AND WINDOW WALL

A. Aluminum Entrance Doors:

1. Exterior doors shall be equal to Kawneer 350 medium stile Tuffline doors with integral 7/8-inch true muntins arranged as shown, 2-inches thick with major portions of the door members 0.188-inch thick and glazing moldings 0.050- inch thick. Door corner construction shall consist of a mechanical clip, 2 plug welds per clip, 2 fillet welds per corner. Doors shall be certified to meet a corner test load. Test reports must

accompany submittal for approval.

a. Test shall consist of a standard door corner assembly with side rail dimension of 24-inches long, and top rail of 12-inches long.

b. Anchor top rail assembly to bench so that corner protrudes 3-inches beyond bench edge.

c. Anchor lever arm positively to side rail at a point 19-inches from inside edge of top rail and begin to load weights.

d. Test section shall withstand a load of 300 pounds before reaching a point of failure, which shall be considered lever arm rotation in excess of 45 degrees.

2. Entry Door Hardware: Each door that is an element of an accessible route shall comply with Americans with Disabilities Act Accessibility Guidelines Section 4.13. Hardware shall conform to applicable ANSI/BHMA A156 series standard and be equal to the following:

a. Pivots: 1 pair heavy duty off-set type.

b. Intermediate Pivot: Rixon M-19 or approved equal.

c. Exit Device: Dor-O-Matic 1990 concealed rod panic hardware or approved equal and Panic Guard continuous security astragal.

d. Deadlock: Adams-Rite 1850A or approved equal.

e. Pull: C09, 1-inch round pulls, anodized or approved equal conforming to ADA Standards for Accessible Design/ ICC A117.1

f. Closer: SAM II concealed overhead door closer or approved equal (maximum opening force 8.5 pounds) conforming to ADA Standards for Accessible Design/ ICC A117.1

g. Threshold: Extruded aluminum, one piece per door opening, with ribbed surface not to exceed 1/2-inch height conforming to ADA Standards for Accessible Design/ ICC A117.1

h. Weatherstripping: As specified.

i. Remaining Hardware: Remaining hardware is provided under SECTION 08710 - FINISH HARDWARE.

B. Window Wall (Fixed Glass) System and Door Frames: Nominal 1-3/4 inch wide x 4-1/2 inch deep frame size with 0.050-inch thick glazing stops, arranged as shown and detailed with EPDM rubber glazing gaskets. Extruded aluminum sill shall be supplied at all openings to maintain water performance standards. Equal to Kawneer "Trifab VG 450" System.

C. Fasteners: All exposed fasteners shall be stainless steel. Perimeter anchors shall be stainless steel or galvanized steel. Exposed fasteners shall match finish of adjoining material.

D. Weatherstripping: Weatherstripping shall be continuous silicone-treated wool pile type, or a type recommended by the door manufacturer, stile mounted, and shall be provided on

head and jamb of exterior door frames. Weatherstripping for bottom of doors shall be as shown. Weatherstripping shall be easily replaced without special tools, and shall be adjustable at meeting stiles of pairs of doors.

2.03 FINISH

A. All exposed aluminum surfaces shall be free of scratches and other blemishes. Provide medium bronze finish conforming to Aluminum Association Standard AA DAF-45, "Designation System for Aluminum Finishes" AA-M12-C22-A42/A44, Architectural Class I, (0.7 mil of greater) and AAMA 611, "Anodized Architectural Aluminum", for all exposed surfaces, including fasteners and hardware.

B. Exterior aluminum light shelf panel and outrigger finish shall be a 70% fluoropolymer based coating conforming to AAMA 2605 requirements for all exposed surfaces, including fasteners and hardware.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions. Verify openings are sized to receive entry door and window wall units and sill plate is level in accordance with manufacturer's acceptable tolerances. Verify field measurements for entry door and window wall installation.

3.02 PREPARATION

A. Adjacent Surfaces Protection: Protect adjacent work areas and finish surfaces from damage during product installation.

3.03 INSTALLATION

A. Install component parts level, plumb and true to line with uniform joints. Do not use defective parts (warped, twisted, bowed, dented or abraded). Secure to structure with non-staining non-corrosive shims, anchors, fasteners, spacers and fillers. Provide structural galvanized steel vertical stiffener members where required by height or design conditions. Use care in erection so as not to mar, abrade or stain finished surfaces. Where aluminum is to be placed in contact with steel, concrete, concrete block and other dissimilar surfaces, back paint the aluminum before erection with an acceptable bituminous paint.

B. Anchors: Anchors of the sizes and shapes required shall be provided for securing aluminum frames to adjacent construction. Anchors shall be placed near top and bottom of each jamb and at intermediate points not more than 25-inches apart. Transom bars shall be anchored at ends, and mullions shall be anchored at head and sill. The bottom of each frame shall be anchored to the rough floor construction with 3/32-inch thick stainless steel angle clips secured to the back of each jamb and to floor construction. Door frames free of window wall system shall be reinforced and securely anchored to floor construction.

C. Doors shall be accurately hung with proper clearances.

D. Seal frames with an elastomeric sealant in color to match frames, making a neat fully weatherproof job complying with requirements of SECTION 07920 - SEALANTS.

E. Set metal thresholds for exterior doors in full bed of butyl rubber, polyisobutylene mastic sealant, or preformed butyl-polyisobutylene sealant tape as specified under SECTION 07920 - SEALANTS.

F. Anchor exterior light shelf as required by manufacturer and to meet or exceed wind loads specified.

G. Dissimilar Materials: Provide separation of aluminum materials and other corrodible surfaces from sources of corrosion or electrolytic action contact points by complying with AAMA 101, Appendix, titled "Dissimilar Materials".

3.04 PROTECTION

A. After installation, protect by masking or other acceptable covering all exposed parts of the work from damage by grinding and polishing machines and/or by cement, acid or other harmful substances.

B. Initiate and maintain all protection and other precautions required to ensure that doors and window wall units will be without damage or deterioration (other than normal weathering) at time of acceptance.

3.05 ADJUST AND CLEAN

A. Adjust doors and hardware to provide tight fit at contact points and at weatherstripping, for smooth operations and weathertight closure. Adjust closers to operate noiselessly and evenly and to conform to ADA Standards for Accessible Design/ ICC A117.1.

B. Clean and maintain aluminum surfaces in accordance with AAMA 609, "Cleaning and Maintenance of Architectural Anodized Aluminum".

C. Clean surfaces promptly after installation, exercising care to avoid damage to protective finishes. Remove temporary coverings and protection from adjacent surfaces. Remove excess glazing and sealant compounds, dirt and other substances. Lubricate hardware and moving parts. Repair or replace damaged installed materials.

D. After completion of all other work in the vicinity of the aluminum doors and window wall, remove all masking and/or other covering used to protect the work and thoroughly clean the aluminum surfaces with plain water or a commercial product as recommended by the manufacturer. Do not use abrasive cleaning agents.

END OF SECTION 08410

SECTION 08500 - ALUMINUM WINDOWS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes aluminum windows, including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of window units.

Types of aluminum windows include:

1. Series 8225TL Thermal Windows
2. Fixed Window
3. 2-1/4" frame depth, with 0.125" wall thickness
4. AW-PG100-FW

B. Related Sections:

Section 07920 Sealants

1.02 DEFINITIONS

A. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufactures Association (AAMA) – AAMA Glossary (AAMA AG).

1.03 PERFORMANCE REQUIREMENTS

A. General Performance: Aluminum-framed window system shall withstand the effects of the following performance requirements without failure due to defective manufac-ture, fabrication, installation, or other defects in construction.

B. Window System Performance Requirements:

1. Provide aluminum windows of performance indicated that comply with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS)
   a. Performance Class and Grade: AW-PG100-FW

2. Air Infiltration: The test specimen shall be tested in accordance with ASTM E 283 at a minimum window size of 60" x 99" (1524 x 2515 mm). The air infiltra-tion rate shall not exceed 0.10 cfm/ft2 at a static air pressure differential of 6.24 psf (300 Pa).

3. Water Resistance: The test specimen shall be tested in accordance with ASTM E 547 and ASTM E 331 at a minimum window size of 60" x 99" (1524 x 2515 mm). There shall be no leakage as defined in the test method at a static air pressure differential of 12 psf (574 Pa).

4. Uniform Load Deflection: A minimum static air pressure difference of 100 psf (4788 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member.

5. Uniform Load Structural Test: A minimum static air pressure difference of 150 psf (7182 Pa) shall be applied in the positive and negative direction in ac-cordance with ASTM E 330. The unit shall be evaluated after each load.

6. Component Testing: Window components shall be tested in accordance with

procedures described in AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS).

7. Energy Efficiency:

   a. Thermal Transmittance Test (U-Factor): When tested in accordance with AAMA 1503, the conductive thermal transmittance (U-Factor) shall not be more than .58 BTU/hr/sf/°F per AAMA 507 or NFRC100 when using project specified glass.

8. Condensation Resistance Test (CRF): When tested in accordance with AAMA 1503 with clear glass, the condensation resistance factor (CRF) shall not be less than (CRFf 59) frame and (CRFg 57) glass.

9. Forced Entry Resistance: All windows shall conform to ASTM F588, Grade 10.

10. Sound Performance: When tested in accordance with ASTM E 90, the STC shall not be less than (34) and OITC not less than (28) based on 1" (25.4 mm) IG with 1/2" (12.7 mm) air space.

11. Thermal Barrier Tests: Testing shall be in general accordance with AAMA 505 Dry Shrinkage and Composite Thermal Cycling test procedure, AAMA TIR-A8, Structural Performance of Composite Thermal Barrier systems.

C. Environmental Product Declarations (EPD): Shall have a Type III product specific EPD created from a Product Category Rule specific to North America.

1.04 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

   1. Recycled Content:

      a. Provide documentation that aluminum has a minimum of 50% mixed pre- and post-consumer recycled content with a sample document illustrating project specific information that will be provided after product shipment.

      b. Once product has shipped, provide project specific recycled content in-formation, including:

         1) Indicate recycled content; indicate percentage of pre- and post-consumer recycled content per unit of product.
         2) Indicate relative dollar value of recycled content product to total dollar value of product included in project.
         3) Indicate location recovery of recycled content.
         4) Indicate location of manufacturing facility.

B. Shop Drawings: Include plans, elevations, sections, details, hardware, attachments to other work, operational clearances and installation details.

C. Samples for Initial Selection: For units with factory-applied color finishes includ-ing samples of hardware and accessories involving color selection.

D. Samples for Verification: For aluminum windows and components required.

E. Product Schedule: For aluminum windows. Use same designations indicated on Drawings.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type, class, grade, and size of aluminum win-dow. Test results based on use of downsized test units will not be accepted.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: An installer which has had successful experiences with installation of the same or similar units required for this project and other projects of similar size and scope.

B. Manufacturer Qualifications: A manufacturer capable of fabricating aluminum windows that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.

C. Source Limitations: Obtain aluminum windows through one source from a single manufacturer.

D. Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum windows and are based on the specific system indicated. Refer to Di-vision 01 Section “Product Requirements.” Do not modify size and dimensional re-quirements.

1. Do not modify intended aesthetic effects, as judged solely by Architect, ex-cept with Architect's approval. If modifications are proposed, submit compre-hensive explanatory data to Architect for review.

1.06 PROJECT CONDITIONS

A. Field Measurements: Verify aluminum window openings by field measurements before fabrication and indicate measurements on Shop Drawings.

1.07 WARRANTY

A. Manufacturer’s Warranty: Submit, for Owner’s acceptance, manufacturer’s standard warranty.

1. Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event lat-er than six months from date of shipment by manufacturer.

B. Insulating Glass: Warranted to be free from defects (excluding breakage) for a period of five (5) years.

PART 2- PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design Product:

1. For design reference only, Kawneer Company Inc.

2. Series 8225TL Thermal Windows – Fixed, sliding, awning, large Missile Impact Rated.

3. 2-1/4" (57.2 mm) frame depth, with 0.125" (3.2 mm) wall thickness

4. AW-PG100-FW

B. Subject to compliance with requirements, provide comparable products of the following:

1. Manufacturer: US Aluminum, Arcadia Inc., Fleetwood Aluminum Inc.

C. Substitutions: Refer to Substitutions Section for procedures and submission requirements.

1. Product Literature and Drawings: Submit product literature and drawings mod-ified to suit specific project requirements and job conditions.

2. Certificates: Submit certificate(s) certifying substitute manufacturer (1) attest-ing to adherence to specification requirements for window system perfor-mance criteria, and (2) has been engaged in the design, manufacturer and fab-rication of aluminum windows for a period of not less than ten (10) years. (Company Name)

3. Test Reports: Submit test reports verifying compliance with each test require-ment required by the project.

4. Samples: Provide samples of typical product sections and finish samples in manufacturer's standard sizes.

2.02 MATERIALS

A. Aluminum Extrusions: Alloy and temper recommended by glazed aluminum curtain wall and storefront system manufacturer for strength, corrosion resistance, and application of required finish, and complying with ASTM B 221: 6063-T6, 6105-T5, or 6061-T6 alloy and temper. Wall thickness at any location for the main frame to be not less than 0.070" (1.78 mm).

1. Recycled Content: Shall have a minimum of 50% mixed pre- and post-consumer recycled content.

a. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
b. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
c. Indicate location recovery of recycled content.

B. Thermal Barrier: The thermal barrier shall be Kawneer IsoLock™ with a nominal 3/8" (9.5 mm) separation consisting of a two-part, chemically curing high density polyurethane which is mechanically and adhesively bonded to the aluminum.

C. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim, hardware, anchors, and other components.

D. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.

E. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.

F. Sealant: For sealants required within fabricated windows, provide window manufacturer's standard, permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

2.03 WINDOW SYSTEM

A. Series 8225TL Thermal Windows – Fixed, Sliding and Awning.

2.04 GLAZING

A. Glass and Glazing Materials: Refer to Division 08 Section “Glazing” for glass units and glazing requirements applicable to glazed aluminum window units.

B. Glazing System: Glazing method shall be a wet/dry type in accordance with manufacturer’s standards. Exterior glazing shall be silicone back bedding sealant. Interior glazing shall be snap-in type glazing beads with an interior gasket in accordance with AAMA 702 or ASTM C864.

2.05 FABRICATION

A. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:

1. Profiles that are sharp, straight, and free of defects or deformations.

2. Accurately fit joints; make joints flush, hairline and weatherproof.

3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.

4. Physical and thermal isolation of glazing from framing members.

5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.

6. Provisions for field replacement of glazing.

7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

B. Window Frame Joinery: Screw-spline, factory-sealed frame and corner joints.

C. Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.

D. Fabricate aluminum windows that are re-glazable without dismantling framing.

E. Mullions: Provide mullions and cover plates as shown, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated. Provide mullions and cover plates capable of withstanding design loads of window units.

F. Sub frames: Provide sub frames with anchors for window units as shown, of profile and dimensions indicated but not less than 0.093" (2.4 mm) thick extruded aluminum. Miter or

cope corners and join with concealed mechanical joint fasteners. Finish to match window units. Provide sub frames capable of withstanding design loads of window units.

G. Factory-Glazed Fabrication: Glaze aluminum windows in the factory where practical and possible for applications indicated. Comply with requirements in Division 08 Section “Glazing” and with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS).

H. Glazing Stops: Provide snap-on glazing stops coordinated with Division 08 Section “Glazing” and glazing system indicated. Provide glazing stops to match frame.

2.06 ALUMINUM FINISHES

A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

B. Factory Finishing

1. Kawneer Permanodic™ AA-M10C21A31, AAMA 611, Architectural Class II Clear Anodic Coating. Color #17 Clear.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine openings, substrates, structural support, anchorage, and conditions, with In-staller present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight window installation.

1. Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.

2. Proceed with installation only after unsatisfactory conditions have been cor-rected.

3.02 INSTALLATION

A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for in-stalling windows, hardware, accessories, and other components.

B. Install aluminum framed window system level, plumb, square, true to line, with-out distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.

C. Set sill members in bed of sealant or with gaskets, as indicated, for weather tight construction.

D. Install aluminum framed window system and components to drain condensa-tion, water penetrating joints, and moisture migrating within system to the exte-rior.

E. Separate aluminum from dissimilar materials to prevent corrosion or electrolytic action at points of contact.

3.03 ADJUSTING, CLEANING AND PROTECTION

A. Adjust operating sashes, screens, hardware, and accessories for a tight fit at contact points and weather stripping for smooth operation and weather tight closure. Lubricate hardware and moving parts.

B. Clean aluminum surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.

C. Clean glass immediately after installing windows. Comply with manufacturer's written recommendations for final cleaning and maintenance. Remove nonper-manent labels, and clean surfaces.

D. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

E. Protect window surfaces from contact with contaminating substances resulting from construction operations. In addition, monitor window surfaces adjacent to and below exterior concrete and masonry surfaces during construction for pres-ence of dirt, scum, alkaline deposits, stains, or other contaminants. If contami-nating substances do contact window surfaces, remove contaminants immedi-ately according to manufacturer's written recommendations.

END OF SECTION 08500

SECTION 08710 – FINISH HARDWARE

PART 1 – GENERAL

1.01 SUMMARY

A. Provide all finishing hardware required for all doors and cabinet work, complete as specified.

B. It is the intent of this Specification to cover in general the class and char-acter of all finish hardware required.

C. the hardware list specified has been made for the convenience of the Contractor and covers in general the necessary hardware for doors, casework, etc., but all other doors, etc., shown on the Drawings and not covered by the general characterization shall be fitted with appropriate hardware of the same standards as the hardware described throughout these specifications. Contractor shall furnish hardware schedule as speci-fied.

D. Suppliers proposing substitutes of equivalent products of other than the manufacturers named shall submit schedules listing the product and man-ufacturer specified and the product and manufacturer of proposed substi-tute. This schedule shall be submitted in accordance with the GENERAL CONDITIONS.

E. Related Work Described Elsewhere:

1. Coordinate the work with other directly affected sections involving manufacturer or fabrication of internal reinforcement for door hardware.

1.02 SUBMITTALS

A. Submit in accordance with SECTION 01330 - SUBMITTAL PROCEDURES.

B. Door Hardware Schedule: Furnish copies of the schedule of hardware in compliance with specifications and Drawings. Schedule format shall be vertical type as listed in DHI document "Sequence and Format for the Hardware Schedule". List each opening using same door numbers as shown and hardware to be applied. State materials finish, and manufac-turer's number for each item. Required types are listed. Double space en-tries and number and date each page. Include the following information:

1. Identification number, location, hand, fire rating and material of each door and frame.

2. Type, style, function, size, quantity and finish of each door hard-ware item.

3. Complete designations of every item required for each door open-ing including name and manufacturer.

4. Fastenings and other pertinent information.

5. Location of each door hardware set, cross referenced to the Draw-ings, both on floor plans and in door schedules.

6. Explanation of abbreviations, symbols, and codes contained in the schedule.

7. Mounting locations for door hardware.

8. Door and frame sizes and materials

9. List of related door devices specified in other Sections for each door and frame.

C. Manufacturer's Data: Submit manufacturer's descriptive literature along with schedule.

D. Keying Schedule: Submit a keying schedule prepared by or under the su-pervision of the Architectural Hardware Consultant detailing final keying instructions for locks for approval by the Director; using keying nomencla-ture as listed in DHI document "Keying Terminology". Door designation listed in the Keying Schedule shall be same as those used on Drawings and Hardware Schedule. Include schematic keying diagram. Keying of locks shall be as directed by the Director.

E. Tools and Maintenance Instructions: Furnish a complete set of special wrenches, tools, maintenance instructions applicable to each different or special hardware component, but not less than the number supplied with the finish hardware materials.

F. Certification: After completion and inspection by hardware supplier or manufacturer's representative of all construction work, certify on an ap-proved form, that all items of finish hardware have been adjusted and are working properly and factory assembly of all locks and cylinders as well as master keying of all locks and cylinders.

G. Warranty: Submit written warranty as specified in paragraph entitled "WARRANTY" herein below.

1.03 QUALITY ASSURANCE

A. Perform work in accordance with current ICC IBC, as amended, NFPA 80 for fire doors, and NFPA 101 for exit doors as applicable. Required hard-ware shall bear the label of Underwriters Laboratories, Inc. and be listed in the current UL Building Materials Directory or labeled and listed by another testing laboratory acceptable to the Director.

B. Manufacturer: Company specializing in manufacturing the Products speci-fied in this section with minimum 3 years documented experience. Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer.

C. Hardware Supplier: Company specializing in architectural finish hardware.

D. Hardware Supplier Personnel: Employ an experienced Architectural Hardware Consultant (AHC), or Director accepted equal, who is available at reasonable times during the course of the Work, to the Director and Contractor for consultation about Project's hardware requirements, to veri-fy specified hardware with door function and hardware finishes, and to es-tablish keying system.

F. Manufacturer's Warranty Response Time: Complete repair or replace-ment within 36 hours after being notified by the user. If repair at the site is not possible because the exact make and model replacement is not avail-able within the specified response time, a temporary substitute of equal quality shall be provided within the specified response time. If a temporary replacement is provided, the permanent repair/replacement response time will be extended to 7 calendar days.

1.04 REGULATORY REQUIREMENTS

A. Conform to applicable code for accessibility and requirements applicable to fire rated doors and frames.

B. Definition: "Door Hardware" includes items known commercially as finish hardware which

are required for swing and sliding doors, except special types of unique and non-matching hardware specified in same Section as door and door frame.

1.05 DELIVERY, STORAGE AND HANDLING

A. Delivery, store, protect and handle products to prevent damage of any kind and to maintain security to site.

B. Inventory hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.

C. Deliver individually packaged hardware items at proper times to proper lo-cations (shop or project site) for installation.

D. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

E. Deliver permanent keys as directed by Director.

F. Provide secure lock-up for hardware delivered to project but not yet in-stalled. Control handling and installation of hardware items which are not immediately replaceable, so that completion of the Work will not be de-layed by hardware losses, both before and after installation.

1.06 WARRANTY

A. Locks shall have a minimum 5 year manufacturer's warranty.

B. Door closers shall have a minimum 10 year manufacturer's warranty. Ex-terior door closers shall have warranty against failure due to high wind conditions (50 mph or less).

C. Panic exit devices shall have a minimum 5 year manufacturer's warranty.

D. The Surety shall not be liable for manufacturer's warranty beyond 1 year of the project acceptance date.

F. Procedure for providing manufacturer warranty is described in General Conditions, Contractor shall complete the manufacturer's forms in the name of the Department and submit such forms to the manufacturer with-in such time as required to validate the warranty/guaranty and submit the forms to the Director.

1.07 PROJECT RECORD DOCUMENTS

A. Record actual locations of installed cylinders and their master key code.

1.08 OPERATION AND MAINTENANCE DATA

A. Include data on operating hardware, lubrication requirements, and inspec-tion procedures related to preventative maintenance.

B. The manufacturer's representative shall instruct the User's staff on the hardware's maintenance procedures (type of lubricant needed and fre-quency of maintenance).

PART 2 – PRODUCTS

2.01 SCHEDULED HARDWARE

A. Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in HARDWARE GROUPS at end of this Section. Products are identified by using proprie-tary catalog numbers, and are used to establish quality and function of products desired.

B. Product numbers indicated in the HARDWARE GROUPS are those of the manufacturers listed and are used to establish the quality of products in-tended.

C. Products listed hereinafter are pre-approved as equals to those products listed in the HARDWARE GROUPS.

2.02 MATERIALS AND FABRICATION

A. Hand of Door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and opera-tion of indicated door.

B. Base Metals: Produce hardware units of basic metal and forming method specified, using manufacturer's standard metal alloy, composition, temper and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units by applicable ANSI A156 se-ries standard for each type hardware item and with ANSI A156.18 for fin-ish designations indicated.

C. Fasteners: Provide hardware manufactured to conform to published tem-plates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated. Fasteners exposed to the weather shall be non-ferrous metal or stainless steel.

D. Furnish appropriate screws for installation, with each hardware item. Pro-vide Phillips flat head screws except as otherwise indicated. Finish ex-posed screws to match hardware finish. If exposed in surfaces of other work, to match finish of such other work as closely as possible, including prepared-for-paint finish in surfaces to receive painted finish.

E. Provide concealed fasteners for hardware units which are exposed when door is closed, except to the extent no standard units of the type specified are available with concealed fasteners. Do not use through bolts for instal-lation where bolt head or nut on opposite face is exposed in other work, except where it is not feasible to adequately reinforce the Work. In such cases, provide sleeves for each through bolt or use sex screw fasteners.

F. Expansion shields in concrete or masonry shall fill the depth and diameter of drilled holes.

G. Bring to the attention of the Director any discrepancy between the Hard-ware Groups and door schedule prior to ordering.

2.03 HINGES

A. General: Hinges shall conform to ANSI/BHMA A156.1, Grade 1 as a certi-fied product by BHMA and the requirements of this specification.

1. The following hinges will be considered equal subject to project conditions:

a. Hager:
Type 1: BB1279
Type 2: BB1191
Type 3: BB1168
Type 4: BB1199

b. McKinney:
Type 1: TA2714
Type 2: TA2314
Type 3: T4A3786
Type 4: T4A3386

c. Stanley:
Type 1: FBB179
Type 2: FBB191
Type 3: FBB168
Type 4: FBB199

2. Hinge Application Requirements:

a. Exterior Outswing Doors: Type 4 x NRP.
b. Exterior Inswing Doors and Vestibule Doors: Type 3 or 4.
c. Interior Doors With Closers: Type 1 or 3.
d. Interior Doors Over 36 Inches Wide. Type 4.
e. Interior Doors 36 Inches or Less Without Closer: Type 1.

B. Templates: Except for hinges to be installed entirely (both leaves) into wood doors and frames, provide only template producing units.

C. Screws: Furnish Phillips flat head or wood screws for installation of units into wood. Finish screw heads to match surface of hinges.

D. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:

1. Nonferrous Hinges: Stainless steel pins.

2. Exterior, Out-swing Doors: Non-removable pins (NRP).

3. Interior Doors: Nonrising pins.

4. Tips: Flat button and matching plug, finished to match leaves.

5. Oil impregnated or ball bearing hinges are acceptable products.

E. Number of Hinges: Provide number of hinges indicated but not less than 3 hinges for door leaf for doors 90-inches or less in height and one additional hinge for each 30-inches of additional height.

F. Size of hinges shall be as follows:

Door Thickness/Width	Hinge Height	Hinge Width
1-3/4 inches to 36-inches	4-1/2 inches	
1-3/4 inches over 36-inches	5-inches	
1-3/4 inches over 48-inches	5-inches	4-1/2 inches extra heavy ball bearing
4-1/2 inches	extra heavy ball bearing	
4-1/2 inches	extra heavy ball bearing	

Note: Hinge width shall be of sufficient size to clear frame and trim when door swings 180 degrees.

2.04 LOCK CYLINDERS AND KEYING

A. Existing Schlage key system shall be verified by contractor. All locks shall be an extension of this system. All work shall be in compliance with re-quirements of this Section. Cylinders and cores shall have 6 pin tumblers unless scheduled otherwise.

B. Provide the number of individual keys equal to not less than 4 times the number of cylinders provided. The number of keys cut to each key cut shall be as directed by the Director. All remaining keys shall be blanks. All locks shall be master keyed and Grandmaster keyed to a single lock sys-tem. During period of construction, all locks shall be operated by a special construction master key. Regular day and master keys are to be retained by the Contractor so they cannot be obtained or duplicated by unauthor-ized persons. All keys shall be stamped "DO NOT DUPLICATE" at the point of manufacture. The special construction master key shall become inoperative when regular keys are turned over to the Director. Proper certi-fication of factory assembly of all locks and cylinders and master keying of all locks and cylinders shall be furnished by the Contractor prior to final acceptance of this portion of the work. Certificate shall then be given to the Director. Provide 10 construction master keys, 6 grand master keys, and 6 master keys per set.

C. Removable Core Locks: This project shall require that all locks be provid-ed with removable core locks and construction removable cores. Provide 4 control keys for removable cores and 10 percent but not less than 4 ex-tra cores for the Director's use.

D. Upon acceptance of the project, the Contractor shall arrange for tempo-rary keys, obtained from custodian if further access is required.

2.05 LOCKS, LATCHES AND BOLTS

A. General: Mortise locks and latches shall conform to ANSI/BHMA A156.13, Series 1000, Grade 1 unless Grade 2 is listed; bored locks and latches shall conform to ANSI/BHMA A156.2, Series 4000, Grade 1 unless Grade 2 is listed; auxiliary locks shall conform to ANSI/BHMA A156.5, Grade 1; bolts shall conform to ANSI/BHMA A156.16, Grade 1; ADA/ABA 404.2.7 and the requirements of this specification.

1. The following mortise locksets and deadbolts will be considered equal:

a. Best 38H series, 40H Series.
b. Sargent 4800 series, 8200 series.
c. Schlage L400 series, L9000 series.

2. The following cylindrical locksets and deadbolts will be considered equal:

a. Best 93K series, 83T Series.
b. Sargent 10 series, 480 series.
c. Sargent 11 series, 480 series.
d. Schlage "ND" series, B600 series.

B. Mortise locksets shall be manufactured in a single sized case formed from 12 gauge minimum steel. The case shall be closed on all sides and back. The lockset shall have a field-adjustable, beveled armored front, with a 0.125-inch minimum thickness.

C. Mortise locksets shall have freewheeling or breakaway vandal resistant design outside levers on all exterior doors. The freewheeling lever design shall allow the lever to swing freely up to 70 degrees, when the door is locked.

D. Strikes: Provide manufacturer's standard wrought box strike for each latch of lock bolt, with lip extended to protect frame, finish matching hardware set. Provide dustproof recessed

floor strikes for foot bolts, except where special threshold construction provides non-recessed strike for bolts.

E. Lock Throw:

1. Provide 3/4-inch minimum throw of latch and one-inch minimum for deadbolt.

2. Flush Bolt Heads: Minimum of 1/2-inch diameter rods of brass, bronze or stainless steel, with minimum 12-inches long rod for doors up to 7-feet in height; minimum 42-inches long rod for doors up to 9-feet 6-inches in height.

F. Provide locksets, latches, and cylinders equal in all respects to those spec-ified in the Hardware Groups.

2.06 CLOSERS AND DOOR CONTROL DEVICES

A. General: Closers shall conform to ANSI/BHMA A156.4, Series CO2000, Grade 1, with features necessary for the particular application, UL10C listed for fire rated doors, ADA/ABA 404.2.7, and the requirements of this specification.

1. The following closers will be considered equal for heavy use on ex-terior doors:

a. Corbin Russwin DC6000 series.
b. Doromatic SC71 series.
c. LCN 4041 Series, 4011/4111 Series.
d. Norton 7500 series.
e. Sargent 351 Series, 281 Series.

2. The following closers will be considered equal for medium use on interior doors:

a. Corbin Russwin DC3000 series.
b. Doromatic SC81 series
c. LCN 1461 series.
d. Norton 8501 series.
e. Sargent 1431 series.

B. Size of Units: Provide non-sized closers, adjustable to meet maximum opening force requirements of ADA. Comply with manufacturer's recom-mendations for size of door control unit, depending upon size of door, ex-posure to weather, and anticipated frequency of use. Where parallel arm closers are installed, provide closer unit one size larger than recommend-ed for use with standard arms.

C. Closers shall have adjustment operating valves for closing speed, latching speed, and backcheck control as a standard feature.

D. Provide parallel arm or regular arm closer as required to mount closer on door face least exposed to public traffic.

E. Provide drop plates, brackets, or adapters for arms as required to suit de-tails or conditions.

F. Closer covers shall be rectangular, full cover type, high impact non-corrosive, and flame retardant.

G. Closer shall not require removal for adjustments to be made.

H. Provide hold-open arms where indicated.

2.07 FLAT GOODS

A. General: Flat goods shall conform to ANSI/BHMA A156.6 and the types listed in the HARDWARE GROUPS.

1. The products of the following manufacturers will be considered equal subject to project conditions:

a. Baldwin Hardware Corporation
b. Burns Manufacturing Incorporated
c. Hager Companies
d. Ives Hardware
e. Rockwood Manufacturing Company
f. Trimco

B. Door plates for single doors shall be 2-inches less than door width. Door plates for double doors shall be 1-inch less than door width. Height of plate shall be as listed but 1-inch less than bottom rail for panel doors.

2.08 STOPS AND HOLDERS

A. General: Stops and holders shall conform to ANSI/BHMA A156.16 and the types listed in the HARDWARE GROUPS.

1. The products of the following manufacturers will be considered equal subject to project conditions:

a. Architectural Builders Hardware MFG., Inc.
b. Baldwin Hardware Corporation
c. Burns Manufacturing Incorporated
d. Hager Companies
e. Ives Hardware
f. Trimco

2.09 THRESHOLDS

A. General: Thresholds shall conform to ANSI/BHMA A156.21, except at restroom, shower room, and janitor’s room locations. Provide marble thresholds at these locations. Thresholds shall comply with applicable accessibility requirements in accordance with ADA 404.3.3.

Provide size, thickness, and profile as listed in the hardware groups

1. The products of the following manufacturers will be considered equal subject to project conditions:

a. Hager Companies
b. National Guard Products
c. Pemko Manufacturing Co.
d. Reese Enterprises
e. Zero International

2.10 WEATHERSTRIPPING AND GASKETING

A. General: Weather-stripping and smoke gasketing shall conform to ANSI A156.22 and the types listed in the HARDWARE GROUPS.

1. The products of the following weatherstripping and gasketing man-ufacturers will be considered equal subject to project conditions:

a. Hager Companies
b. National Guard Products
c. Pemko Manufacturing Co.
d. Reese Enterprises
e. Zero International

2.11 FINISHES

A. Finishes: Identified in schedule at end of Section.

1. Designations used are those listed in ANSI/BHMA A156.18 "Mate-rials and Finishes", including coordination with traditional U.S. fin-ishes shown by certain manufacturers for their products.

2. If no BHMA finish is established, match specified product.

B. Provide matching finishes for hardware units at each door or opening to greatest extent possible, except as otherwise indicated. Reduce differ-ences in color and textures as much as commercially possible where base metal or metal forming process is different for individual units of hardware exposed at same door or opening.

C. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness and other qualities complying with manufacturer's standards, but in no case less than specified for applicable units of hard-ware by referenced standards.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Pre-Installation Meeting: Before start of work under this contract, the Con-tractor, hardware installer, hardware manufacturer's representative or supplier, the Director, and a user representative shall meet to review the keying system, hardware installation instructions, and installation condi-tions.

B. Verify that doors and frames are ready to receive Work and dimensions are as indicated.

3.02 INSTALLATION

A. Install each hardware item in compliance with manufacturer's instructions and recommendations.

B. Mount hardware units at height indicated in the Door and Hardware Insti-tute's Recommended Locations for Builders Hardware for Standard Steel Doors and Frames, except:

1. As otherwise indicated or as required to comply with governing regulations.

2. Mount deadbolt (if any) centerline not more than 5-inches above latchset handle centerline.

C. Wherever cutting and fitting is required to install hardware onto or into sur-faces which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protection with finishing work. Do not install surface mounted items until finishes have been completed on the substrate.

D. Set units level, plumb and true to line and location. Adjust and reinforce at-tachment substrate as necessary for proper installation and operation.

E. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

F. Set metal thresholds for exterior doors in full bed of butyl rubber, polyiso-butylene mastic sealant, or preformed butyl-polyisobutylene sealant tape as specified under SECTION 07920 - SEALANTS.

G. Fit face of all mortise parts snug and flush.

H. Operating parts shall move freely and smoothly without binding, sticking or excessive clearance.

I. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

J. Install with manufacturer's fasteners conforming to requirements of this section or those required for substrate. Expansion shields securing hard-ware such as door stops/holders to concrete or solid grouted masonry substrates shall completely fill the depth and diameter of the drilled holes. Shimming of the shields or using of plastic shields is not acceptable.

K. Protect hardware from damage or marring of finish during construction. Use strippable coatings, removable tapes or other approved means.

L. Ensure that hardware displays no evidence of finish paint after building cleanup with exception of prime coated hardware installed for finish paint-ing. The Contractor may achieve this by sequencing installation, removing after fittings and reinstalling after painting is completed, providing protec-tion, cleaning original hardware finish, or other approved means.

M. Latch and Bolt: Install latch and bolt to automatically engage in keeper, whether activated by closer or manual push. In no case shall additional manual pressure be required to engage latch or bolt in keeper.

N. Closers:

1. Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.

2. Carefully adjust closers to operate noiselessly and evenly.

3. Have manufacturer's representative regulate closers prior to Direc-tor's acceptance of building.

3.03 FIELD QUALITY CONTROL

A. If requested by the Director, the Certified Architectural Hardware Consult-ant from door hardware supplier or manufacturer's representative shall in-spect installation and certify that hardware and installation has been fur-nished and installed in accordance with

manufacturer's instructions and as specified at no additional cost to the Director.

3.04 ADJUST AND CLEAN

A. Adjust and check each operating item of hardware and each door, to en-sure proper operation or function of every unit. Replace items which can-not be adjusted to operate freely and smoothly as intended for application made.

B. Clean adjacent surface soiled by hardware installation.

C. Final Adjustment:

1. Clean operating items as necessary to restore proper function and finish of hardware and doors.

2. Adjust door control devices to compensate for final operation of ventilating equipment.

3. Lubricate bearings surface of moving parts and adjust latching and holding devices for proper function.

4. Test keys in every lock for proper operation and conformance with keying system.

3.05 MANUFACTURER LIST

CATEGORY		VENDOR NAME	MFG
ELECTRICAL HINGE	BY	McKINNEY PRODUCTS COMPANY	MCK
HINGE	BY	McKINNEY PRODUCTS COMPANY	MCK
AUTO. DOOR BOTTOM	BY	PEMKO MANUFACTURING CO.	PEM
DOOR BOTTOM	BY	PEMKO MANUFACTURING CO.	PEM
DOOR GASKETING	BY	PEMKO MANUFACTURING CO.	PEM
OVERLAPPING ASTRAGAL	BY	PEMKO MANUFACTURING CO.	PEM
SPLIT ADJ ASTRAGAL	BY	PEMKO MANUFACTURING CO.	PEM
THRESHOLD	BY	PEMKO MANUFACTURING CO.	PEM
AUTOMATIC FLUSH BOLT	BY	ROCKWOOD MANUFACTURING CO.	ROC
COORDINATOR	BY	ROCKWOOD MANUFACTURING CO.	ROC
DUST PROOF STRIKE	BY	ROCKWOOD MANUFACTURING CO.	ROC
FLUSH BOLT	BY	ROCKWOOD MANUFACTURING CO.	ROC
KICKPLATE	BY	ROCKWOOD MANUFACTURING CO.	ROC
PULL PLATE	BY	ROCKWOOD MANUFACTURING CO.	ROC
PUSH PLATE	BY	ROCKWOOD MANUFACTURING CO.	ROC
WALL OR FLOOR STOP	BY	ROCKWOOD MANUFACTURING CO.	ROC
WALL STOP	BY	ROCKWOOD MANUFACTURING CO.	ROC
WALL STOP (CONCAVE)	BY	ROCKWOOD MANUFACTURING CO.	ROC
WALL STOP (CONVEX)	BY	ROCKWOOD MANUFACTURING CO.	ROC
CLASSROOM LOCK	BY	SARGENT MANUFACTURING COMPANY	SAR
CONCEALED O.H.STOP	BY	SARGENT MANUFACTURING COMPANY	SAR
DOOR CLOSER	BY	SARGENT MANUFACTURING COMPANY	SAR
DORMITORY LOCK	BY	SARGENT MANUFACTURING COMPANY	SAR
ELEC RIM EXIT DEVICE	BY	SARGENT MANUFACTURING COMPANY	SAR
ENTRY LOCK	BY	SARGENT MANUFACTURING COMPANY	SAR
MORTISE CYLINDER	BY	SARGENT MANUFACTURING COMPANY	SAR
PASSAGE SET	BY	SARGENT MANUFACTURING COMPANY	SAR
PRIVACY SET	BY	SARGENT MANUFACTURING COMPANY	SAR
RIM EXIT DEVICE	BY	SARGENT MANUFACTURING COMPANY	SAR
STOREROOM LOCK	BY	SARGENT MANUFACTURING COMPANY	SAR
SURFACE O.H. STOP	BY	SARGENT MANUFACTURING COMPANY	SAR

3.06 HARDWARE GROUPS

A. Abbreviations:

ARR: ARROW LOCK COMPANY
MCK: McKINNEY PRODUCTS COMPANY
PEM: PEMKO MANUFACTURING
ROC: ROCKWOOD MANUFACTURING
SAR: SARGENT MANUFACTURING COMPANY

HW GROUP - 001

1.0	EA	MORTISE CYLINDER	41 US32D (CONTRACTOR TO VERIFY CYLINDER TYPE, CAM, QTY & FINISH REQUIRED) KEY AS DIRECTED. BALANCE OF HARDWARE BY DOOR MANUFACTURER ACCESS CONTROL BY SECURITY CONTRACTOR. WIRING BY ELECTRICAL CONTRACTOR.	SAR

HW GROUP – 002

ALL HARDWARE BY DOOR MANUFACTURER.

HW GROUP – 003

2.0	EA	HINGE	TA2314 4.5 X 4.5 US32D-NRP	MCK
1.0	EA	ELECTRICAL HINGE	QC8-TA2314 4.5 X 4.5 US32D	MCK
1.0	EA	ELEC RIM EXIT DEVICE	55-8876 ETL US32D (WS/HC AS REQ'D) (12- FIRE RATED WHERE REQUIRED) KEY AS DIRECTED.	SAR
1.0	EA	DOOR CLOSER	351CPS EN	SAR
1.0	EA	THRESHOLD	158A	PEM
1.0	EA	DOOR GASKETING	S88BL	PEM
1.0	EA	DOOR BOTTOM	210AV	PEM

ACCESS CONTROL BY SECURITY CONTRACTOR.
WIRING BY ELECTRICAL CONTRACTOR.

HW GROUP – 004

3.0	EA	HINGE	TA2314 4.5 X 4.5 US32D-NRP	MCK
1.0	EA	RIM EXIT DEVICE	8843 ETL US32D (WS/HC WHERE REQ'D) KEY AS DIRECTED.	SAR
1.0	EA	DOOR CLOSER	351 CPS EN	SAR
1.0	EA	THRESHOLD	158A	PEM
1.0	EA	DOOR GASKETING	S88BL	PEM
1.0	EA	DOOR BOTTOM	210AV	PEM

HW GROUP – 005

3.0	EA	HINGE	TA2314 4.5 X 4.5 US32D-NRP	MCK
1.0	EA	STOREROOM LOCK	8204 FEL US26D KEY AS DIRECTED.	WBS
1.0	EA	DOOR CLOSER	351CPS EN	SAR
1.0	EA	THRESHOLD	158A	PEM
1.0	EA	DOOR GASKETING	S88BL	PEM

1.0	EA	DOOR BOTTOM	210AV	PEM

HW GROUP – 006

6.0	EA	HINGE	TA2314 4.5 X 4.5 US32D-NRP	MCK
2.0	EA	FLUSH BOLT	555 (556WS 626 WHERE REQ'D)	ROC
1.0	EA	DUST PROOF STRIKE	570 626	ROC
1.0	EA	DORMITORY LOCK	23-8225 FEL US26D WBS KEY AS DIRECTED.	SAR
1.0	EA	DOOR CLOSER	351CPS EN	SAR
1.0	EA	SURFACE O.H. STOP	598S US26D (32-5/8" - 39-1/8")	SAR
1.0	EA	THRESHOLD	158A	PEM
1.0	EA	DOOR GASKETING	S88BL	PEM
1.0	EA	DOOR BOTTOM	345AV	PEM
1.0	EA	OVERLAPPING ASTRAGAL	355CS	PEM

HW GROUP – 007

3.0	EA	HINGE	TA2714 4.5 X 4.5 US26D	MCK
1.0	EA	RIM EXIT DEVICE	12-8815 ETL US32D	SAR
1.0		DOOR CLOSER	1431 CPS EN	SAR
1.0		THRESHOLD	158A	PEM
1.0		DOOR GASKETING	S88BL	PEM
1.0		AUTO. DOOR BOTTOM	420APKL	PEM

HW GROUP – 008

3.0	EA	HINGE	TA2714 4.5 X 4.5 US26D	MCK
1.0	EA	RIM EXIT DEVICE	12-8815 ETL US32D	SAR
1.0	EA	DOOR CLOSER	1431 O EN	SAR
1.0	EA	WALL STOP (CONVEX)	406 626	ROC
1.0	EA	THRESHOLD	158A	PEM
1.0	EA	DOOR GASKETING	S88BL	PEM
1.0	EA	AUTO. DOOR BOTTOM	420APKL	PEM

HW GROUP – 009

3.0	EA	HINGE	TA2714 4.5 X 4.5 US26D	MCK
1.0	EA	ENTRY LOCK	10XG24 LL US26D WBS KEY AS DIRECTED.	SAR
1.0	EA	DOOR CLOSER	1431 O EN	SAR
1.0	EA	WALL STOP (CONCAVE)	409 626	ROC
1.0	EA	DOOR GASKETING	S88BL	PEM
1.0	EA	AUTO. DOOR BOTTOM	420APKL	PEM

HW GROUP – 010

3.0	EA	HINGE	TA2714 4.5 X 4.5 US26D	MCK
1.0	EA	ENTRY LOCK	10XG24 LL US26D WBS KEY AS DIRECTED.	SAR
1.0	EA	DOOR CLOSER	1431 O EN	SAR
1.0	EA	CONCEALED O.H.STOP	1538 S US26D (32-5/8"- 40")	SAR
1.0	EA	DOOR GASKETING	S88BL PEM	
1.0	EA	AUTO DOOR BOTTOM	420APKL	PEM

HW GROUP – 011

3.0 EA HINGE	TA2714 4.5 X 4.5 US26D	MCK
1.0 EA ENTRY LOCK	10XG24 LL US26D WBS KEY AS DIRECTED.	SAR
1.0 EA DOOR CLOSER	1431 O EN (TOP JAMB AT 320A)	SAR
1.0 EA WALL STOP	406 / 409 626 AS REQUIRED	ROC
1.0 EA DOOR GASKETING	S88BL MARBLE THRESHOLD BY OTHER SECTION.	PEM

HW GROUP – 012

3.0 EA HINGE	TA2714 4.5 X 4.5 US26D	MCK
1.0 EA STOREROOM LOCK	10XG04 LL US26D WBS KEY AS DIRECTED.	SAR
1.0 EA DOOR CLOSER	1431 O EN	SAR
1.0 EA WALL OR FLOOR STOP	406 / 441H 626 AS REQUIRED	ROC

HW GROUP – 013

3.0 EA HINGE	TA2714 4.5 X 4.5 US26D	MCK
1.0 EA STOREROOM LOCK	10XG04 LL US26D WBS KEY AS DIRECTED.	SAR
1.0 EA DOOR CLOSER	1431 O EN	SAR
1.0 EA WALL STOP	(CONVEX) 406 626	ROC
1.0 EA DOOR GASKETING	S88BL	PEM
1.0 EA AUTO. DOOR BOTTOM	420APKL	PEM

HW GROUP – 014

3.0 EA HINGE	TA2714 4.5 X 4.5 US26D	MCK
1.0 EA STOREROOM LOCK	10XG04 LL US26D WBS KEY AS DIRECTED.	SAR
1.0 EA DOOR CLOSER	1431 O EN	SAR
1.0 EA WALL OR FLOOR STOP	406 / 441H 626 AS REQUIRED	ROC
1.0 EA THRESHOLD	158A	PEM
1.0 EA DOOR GASKETING	S88BL	PEM
1.0 EA AUTO. DOOR BOTTOM	420APKL	PEM

HW GROUP – 015

3.0 EA HINGE	TA2714 4.5 X 4.5 US26D	MCK
1.0 EA CLASSROOM LOCK	10XG37 LL US26D WBS KEY AS DIRECTED.	SAR
1.0 EA DOOR CLOSER	1431 O EN	SAR
1.0 EA WALL OR FLOOR STOP	406 / 441H 626 AS REQUIRED	ROC
1.0 EA DOOR GASKETING	S88BL	PEM
1.0 EA AUTO. DOOR BOTTOM	420APKL	PEM

HW GROUP - 016

3.0 EA HINGE	TA2714 4.5 X 4.5 US26D	MCK
1.0 EA CLASSROOM LOCK	10XG37 LL US26D WBS KEY AS DIRECTED.	SAR
1.0 EA DOOR CLOSER	1431 O EN	SAR
1.0 EA CONCEALED O.H.STOP	1538 S US26D (32-5/8" - 40")	SAR
1.0 EA DOOR GASKETING	S88BL	PEM
1.0 EA AUTO. DOOR BOTTOM	420APKL	PEM

HW GROUP - 017

3.0 EA	HINGE	TA2714 4.5 X 4.5 US26D	MCK
1.0 EA	CLASSROOM LOCK	10XG37 LL US26D WBS KEY AS DIRECTED.	SAR
1.0 EA	DOOR CLOSER	1431 O EN	SAR
1.0 EA	WALL STOP (CONVEX)	406 626	ROC

HW GROUP – 018

6.0 EA	HINGE	TA2714 4.5 X 4.5 US26D	MCK
1.0 EA	AUTOMATIC FLUSH BOLT	2848 626 WITH BOTTOM FIRE BOLT	ROC
1.0 EA	CLASSROOM LOCK	10XG37 LL US26D WBS KEY AS DIRECTED.	SAR
1.0 EA	COORDINATOR	1700 628	ROC
2.0 EA	DOOR CLOSER	1431 O EN	SAR
2.0 EA	WALL OR FLOOR STOP	406 / 441H 626 AS REQUIRED	ROC
1.0 EA	DOOR GASKETING	S88BL	PEM
2.0 EA	AUTO. DOOR BOTTOM	420APKL	PEM
1.0 EA	SPLIT ADJ ASTRAGAL	351C/351CP PER DETAIL	PEM

HW GROUP - 019

3.0 EA	HINGE	TA2714 4.5 X 4.5 US26D	MCK
1.0 EA	CLASSROOM LOCK	10XG37 LL US26D WBS KEY AS DIRECTED.	SAR
1.0 EA	DOOR CLOSER	1431 O EN	SAR
1.0 EA	KICKPLATE	K1050 10" X 2" LDW 630 B4E CSK	ROC
1.0 EA	WALL OR FLOOR STOP	406 / 441H 626 AS REQUIRED	ROC
1.0 EA	DOOR GASKETING	S88BL MARBLE THRESHOLD BY OTHER SECTION.	PEM

HW GROUP - 020

3.0 EA	HINGE	TA2714 4.5 X 4.5 US26D	MCK
1.0 EA	CLASSROOM LOCK	10XG37 LL US26D WBS KEY AS DIRECTED.	SAR
1.0 EA	DOOR CLOSER	1431 O EN	SAR
1.0 EA	KICKPLATE	K1050 10" X 2" LDW 630 B4E CSK	ROC
1.0 EA	CONCEALED O.H.STOP	1538 S US26D (32-5/8" - 40")	SAR
1.0 EA	DOOR GASKETING	S88BL MARBLE THRESHOLD BY OTHER SECTION.	PEM

HW GROUP - 021

3.0 EA	HINGE	TA2714 4.5 X 4.5 US26D	MCK
1.0 EA	PULL PLATE	110 X 70C 630	ROC
1.0 EA	PUSH PLATE	70C-RKW 630	ROC
1.0 EA	DOOR CLOSER	1431 O EN	SAR
1.0 EA	WALL STOP (CONVEX)	406 626	ROC

HW GROUP - 022

3.0 EA	HINGE	TA2714 4.5 X 4.5 US26D	MCK
1.0 EA	PRIVACY SET	V54-8265 LNL US26D WBS	SAR
1.0 EA	DOOR CLOSER	1431 O EN	SAR
1.0 EA	WALL OR FLOOR STOP	406 / 441H 626 AS REQUIRED	ROC
1.0 EA	DOOR GASKETING	S88BL	PEM
1.0 EA	AUTO. DOOR BOTTOM	420APKL	PEM

HW GROUP - 023

3.0 EA HINGE	TA2714	4.5 X
4.5 US26D	MCK	
1.0 EA PASSAGE SET	10XU15 LL US26D WBS	SAR
1.0 EA DOOR CLOSER	1431 CPS EN	SAR
1.0 EA DOOR GASKETING	S88BL	PEM
1.0 EA AUTO. DOOR BOTTOM	420APKL	PEM

HW GROUP - 024

3.0 EA HINGE	TA2714 4.5 X 4.5 US26D	MCK
1.0 EA ENTRY	LOCK 10XG24 LL US26D WBS KEY AS DIRECTED.	SAR
1.0 EA DOOR CLOSER	1431 O EN	SAR
1.0 EA WALL STOP (CONVEX)	406 626	ROC

HW GROUP - 025

3.0 EA HINGE	TA2714 4.5 X 4.5 US26D	MCK
1.0 EA ENTRY LOCK	10XG24 LL US26D WBS KEY AS DIRECTED.	SAR
1.0 EA DOOR CLOSER	1431 O EN	SAR
1.0 EA WALL OR FLOOR STOP	406 / 441H 626 AS REQUIRED	ROC
1.0 EA THRESHOLD	158A	PEM
1.0 EA DOOR GASKETING	S88BL	PEM
1.0 EA AUTO. DOOR BOTTOM	420APKL	PEM

END OF SECTION 08710

SECTION 08800 - GLAZING

PART 1 - GENERAL

1.01 SUMMARY

A. Provide all glass and glazing materials to complete all glazing work as shown and as specified herein.

B. Related Work Described Elsewhere:

1. Framed mirrors at toilet rooms are provided under SECTION 10800 - TOILET ACCESSORIES.

1.02 QUALITY ASSURANCE

A. Glass Standards: All glass, except as noted otherwise, shall comply with ASTM C 1036, "Flat Glass". Tempered glass shall comply with ASTM C 1048, "Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass". Laminated glass shall comply with ASTM C 1172, "Laminated Architectural Flat Glass".

B. Safety Glass Standard: All glass indicated on the drawings or as required to be safety glass shall meet all the requirements of the "Safety Standard for Archi-tectural Glazing Material", 16 CFR Part 1201 dated January 6, 1977 of the Consumer Product Safety Commission or ANSI Z97.1, "Safety Performance Specifications and Methods of Test for Safety Glazing Materials Used in Build-ings", as applicable.

C. Exterior glass thickness shall be as indicated but no less than required to with-stand a 80 mph and windloading pressure (positive and negative), as indicated for various locations of building, acting normal to pane of glass as calculated in accordance with the Exposure C, and ASTM E 1300, "Determining Load Re-sistance of Glass in Buildings", and ASTM E 330, "Structural Performance of Ex-terior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pres-sure Difference".

D. Limit glass deflection to 1/200 flexure limit of glass with full recovery of glaz-ing materials.

E. Tinted Glass: Where tinted glass is scheduled, thickness shall be uniform within spaces or building elevation for uniform appearance.

F. Sealants for glazing shall conform to AAMA 800, "Voluntary Specifications and Test Methods for Sealants" and AAMA 850, "Fenestration Sealant Guide Man-ual".

G. Fire Rated Safety Glass:

1. Fire Protective Rated Glass: Each lite shall bear permanent, nonremovable label of UL certifying it for use in tested and rated fire protective assemblies.

2. Fire Protective Glazing Products for Door Assemblies: Products identical to those tested per ASTM E 152, labeled and listed by UL or WHI or other certification agency acceptable to authorities having jurisdiction.

3. National Fire Protection Association (NFPA):

a. NFPA 80: Fire Doors and Windows.
b. NFPA 252 – Fire Tests of Door Assemblies.
c. NFPA 257 – Fire Tests of Window Assemblies.

4. Underwriters Laboratories, Inc. (UL):

    a. UL 9 – Fire Tests of Window Assemblies.
    b. UL 10B – Fire Tests of Door Assemblies.
    c. UL 10C – Positive Pressure Fire Tests of Door Assemblies.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01330 - SUBMITTAL PROCEDURES.

B. Manufacturer's Data: Submit copies of manufacturer's product specifica-tions, and instructions for handling, storing, installing, cleaning, and protect-ing each type of glass and glazing material. Provide data indicating structural and physical characteristics of each type of glass and glazing.

C. Samples: Submit 3 each 4-inch x 4-inch samples of each type and thickness of glass and glazing for acceptance prior to ordering.

D. Installation Specifications: Submit manufacturer's and referenced glass and glazing manual, etc. for installation of field installed glazing.

E. Warranty: Submit warranty as stipulated in item entitled "WARRANTY FOR INSULATED GLASS UNITS" hereinbelow.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to the site in unopened containers, labeled plainly with manufac-turers' names and brands. Store glass and setting materials in safe, dry locations and do not unpack until needed for installation.

B. Comply with manufacturer's instructions for shipping, handling, storing and protecting glass and glazing materials. Exercise exceptional care to prevent edge damage to glass.

1.05 LABELING

A. Each piece of glass shall be of domestic manufacture and label, except as noted otherwise, showing the name of the manufacturer and the grade or quality there-of. The labels shall be intact before and after installations. When glass is not cut to size by the manufacturer, and is furnished unlabeled from local stock, the Contractor shall submit an affidavit stating the quality, thickness, type and manu-facturer of the glass furnished.

B. All safety glass shall bear a marking as specified in ANSI 297.1 on each separate glass panel that shall remain visible after installation.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Provide ventilation to prevent condensation of moisture on glazing work during installation. Do not perform glazing work during damp or rainy weather.

1.07 WARRANTY FOR INSULATED GLASS UNITS

A. Warrant insulation glass units against development of material obstruction to vi-sion (such as dust or film formation on the inner glass surfaces) caused by fail-ure of the hermetic seal, other than through glass breakage, for a 5-year period following

acceptance of the work. Provide new units for any units failing to comply with terms of this warranty within 45 working days after receipt of no-tice from the State. The Surety shall not be liable beyond 2 years of the project acceptance date.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Glass: All glass products shall be of the quality as manufactured by PPG Indus-tries, Inc., Pilkington LOF, ASG Industries, CE Glass Company, Globe Amerada Glass Co., Guardian Industries, Interpane Glass Co., Sierracin/Sylmar, Viracon, Inc., or approved equal.

1. Float Glass, Clear: Type I, Class 1, Quality q3, 1/4-inch thick, unless indicated or required otherwise.

2. Float Glass, Clear, Tempered, (Safety Glass): Kind FT (fully tempered), Condition A, Type I, Class 1, Quality q3, 1/4-inch thick unless indicated or required otherwise.

3. Float Glass, Tinted, Tempered (Safety Glass): Kind FT (fully tempered), Condition A, Type I, Class 3, Quality q3, 1/4-inch thick unless indicated otherwise, light green tint, 1/4-inch thickness.

4. Laminated Glass (Safety Glass): Two pieces of Type I, Class 1 or 3 as ap-plicable, Quality q3 glass laminated together with a clear 0.030-inch thick minimum polyvinyl butyral interlayer under pressure or alternatives such as resin laminates conforming to requirements of 16 CFR 1201 or ASTM C 1172. Total thickness shall be not less than nominal 1/4-inch.

5. Insulated Glazing: Insulating glass shall be Class A preassembled units of du-al-seal construction consisting of two lites of glass (light green exterior and clear interior) as specified with low-e coating on surface No. 2, separated by a spacer with desiccant and dehydrated space conforming to ASTM E 773, "Accelerated Weathering of Sealed Insulating Glass Units". The insulating glass units shall be free of parallax or optical distortions. Dimensional toler-ances shall be as specified in the Insulating Glass Manufacturers Alliance (IGMA) TR-1220, "Commercial Insulating Glass Dimensional Tolerances". Air space shall be 1/2-inch with argon gas.

6. Provide the following minimum performance level: Visible Light Transmittance of minimum 40% Solar Heat Gain Coefficient of 0.24 U-Value of 0.57

7. Fire-rated Glass: ceramic clear and wireless glazing material with fire rating to meet time rating as specified with hose stream test.

    a. Fire Rated: 3/16” thick or as required by glass manufacturer to meet rating as scheulded for use in clerestory windows or borrowed lites; standard grade.

    b. Fire/Impact Rated: ¾” thick laminated with film listed for use in impact safety-rated locations such as doors, transoms and borrowed lites; premium grade.

B. Glazing Compounds - Sealant for Exterior Glazing: One-Part silicone, medium modulus, non-sag, equal to Dow Corning No. 795, "Silglaze-II 2800", by General Electric Corp., or "Spectrum 2" by Tremco, Inc., Pecora 895NST, or approved equal as recommended by the glass manufacturers.

C. Glazing Tape For Interior Glazing: Preformed butyl-polyisobutylene glazing tape. Provide

one of the following, or approved equal:

1. "Chem-Tape 401; Bostick Construction Products Div.

2. "Extru-Seal"; Pecora Corp.

3. "Tremco 440 Tape"; Tremco, Inc.

D. Miscellaneous Glazing Materials:

1. Cleaners, Primers and Sealers: Of type recommended by sealant manufacturer.

2. Setting Blocks: Neoprene or EPDM, 80-90 Shore A durometer hardness.

3. Spacers: Neoprene or EPDM, 50-60 Shore A durometer hardness.

2.02 FABRICATION

A. Fabricate glass to sizes required to comply with wind loads for glazed openings indicated with edge clearances, bite and tolerances complying with recommen-dations of product manufacturer and referenced glazing standard as required to comply with system performance requirements.

PART 3 - EXECUTION

3.01 GENERAL

A. Perform all glazing in strict accordance with applicable provisions of the "Glaz-ing Manual" and "Sealant Manual" published by the Glass Association of North America (GANA).

B. Verify that openings for glazing are correctly sized, within tolerance, and glazing channels or recesses are clean, free of obstructions, and ready to receive glaz-ing.

C. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

D. Insulated glass shall be installed in accordance with manufacturer's instructions and IGMA TM-3000, "Glazing Guidelines for Sealed Insulating Glass Units", and as herein specified.

E. All interior glazing shall be clear unless indicated otherwise.

3.02 INSTALLATION

A. Glass shall be set true and tight by skilled glaziers. Glazing compound shall be neatly and cleanly run with corners carefully made, using putty knife for all work. Glazing stops shall be carefully handled and accurately secured in place.

B. Install setting blocks of proper size in sill rabbet, located one quarter of glass width from each corner, but with edge nearest corner not closer than 6-inches from corner, unless otherwise required. Set blocks in thin course of sealant which is acceptable for heel bead use.

C. Provide spacers inside and out, of correct size and spacing to preserve required face clearances, for glass sizes larger than 50 united inches (length plus height), except

where gaskets or glazing tapes with continuous spacer rods are used for glazing. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than fi-nal compressed thickness of tape.

D. Provide edge blocking to comply with requirements of referenced glazing standard, except where otherwise required by glass unit manufacturer.

E. Set units of glass in each series with uniformity of draw, bow and similar characteristics.

F. Provide compressible filler rods or equivalent back-up material, as recommended by sealant and glass manufacturers, to prevent sealant from extruding into glass channel weep systems and from adhering to joints back surface as well as to con-trol depth of sealant for optimum performance, unless otherwise indicated.

G. Force sealants into glazing channels to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces.

H. Tool exposed surfaces of sealants to provide a substantial "wash" away from glass. Install pressurized tapes and gaskets to protrude slightly out of channel, so as to eliminate dirt and moisture pockets.

I. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when installation is subjected to movement.

J. Miter cut wedge-shaped gaskets at corners and install gaskets in manner recom-mended by gasket manufacture to prevent pull away at corners; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

K. Glass where secured by glazing stops, shall unless shown on drawings or speci-fied herein, be set in full bed of glazing compound. Then force glazing stop into glazing compound on both sides and strikeoff flush.

L. Glass where required or recommended by glass frame manufacturer shall be set in extruded vinyl or neoprene glazing strips provided by others and shall be installed in strict accordance with manufacturer's instructions.

M. Clear glass shall be used for interior glazing.

N. Laminated Glass: Conform to manufacturers recommendations for edge clearance, type of sealant and tape, and method of installation.

O. Sheet glass shall be cut and set with the visible lines or waves horizontal.

P. Insulating Glass Units: Do not grind, nip, or cut edges or corners of units after the units have left the factory. Springing, forcing, or twisting of units during setting will not be permitted. Handle units so as not to strike frames or other objects. Installation shall conform to applicable recommendations of IGMA TM- 3000.

3.03 PROTECTION AND REPLACEMENT

A. All glass shall be immediately protected against damage. Glazed openings shall be identified with suitable warning tapes, cloth or paper flags, or other acceptable method that will not damage glazing or surrounding materials. At completion of work, all imperfect glass which cannot be properly cleaned shall be replaced in kind. All broken, chipped,

abraded, cracked or otherwise damaged glass must be replaced subject to the acceptance of the Contracting Officer.

3.04 CLEANING AND WASHING

A. At the completion of construction, this Contractor shall clean and wash all of the glass provided by him, removing all labels, dirt, putty stains, paint, etc., and shall leave the glass perfectly cleaned and polished.

END OF SECTION 08800

SECTION 09250 – GYPSUM WALLBOARD

PART 1 – GENERAL

1.01 SUMMARY

A. Complete all gypsum wallboard work as indicated or required by the draw-ings and as specified herein. Work shall include, but not be limited to, the following:

1. Gypsum wallboard on metal framing and furring.

2. Cementitious backer board on metal framing and furring.

B. Related Work Described Elsewhere:

1. SECTION 05400 – COLD FORMED STEEL FRAMING

2. SECTION 07920 - SEALANTS

1.02 QUALITY ASSURANCE

A. Fire Resistive Design: The construction shall comply with the applicable provisions of the International Building Code, including all local amend-ments thereto and shall have been tested according to ASTM E 119 by an independent testing and inspecting agency acceptable to the authorities having jurisdiction. Installation and materials shall be in strict accordance with the above-mentioned code. The Fire Resistant Design shall be as in-dicated from UL's "Fire Resistance Directory", FM's "Approval Guide, Building Products", GA-600 "Fire Resistance Design Manual", or as listed otherwise.

B. Industry Standard: Comply with applicable requirements of GA 216 "Ap-plication and Finishing of Gypsum Board" and GA 214, "Recommended Specification: Levels of Gypsum Board Finish" by the Gypsum Associa-tion, except where more detailed or more stringent requirements are indi-cated, including the recommendations of the manufacturer.

C. Transverse Loading: The non-load bearing wood framing shall be capable of carrying a transverse load of 5 psf without exceeding the allowable stress or a deflection of U360. Increase stud size, decrease stud spacing, or provide hidden from view lateral bracing to comply with these require-ments at no additional cost to the County.

D. Gypsum Board Terminology: Refer to ASTM C 11, "Terminology Relating to Gypsum and Related Building Materials and Systems", for definition of terms for gypsum board assemblies not defined in this section or in refer-enced standards.

E. VOC content of adhesives shall be less than the current VOC content lim-its of the South Coast Air Quality Management District Rule 1168, "Adhe-sive and Sealant Application".

F. Impact Resistance: ASTM C 1629 - Standard Classification for Abuse Resistant Nondecorated Interior Gypsum Panel Products.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 013000 - SUBMITTAL PROCEDURES.

B. Manufacturer's Data: Material description and manufacturer's recom-mended installation procedures for each material.

C. Shop Drawings: Submit shop drawings indicating fabrications and location of control and expansion joints, including plans, elevations, sections, de-tails, and attachment to adjoining work. Submit setting drawings for back-ing plates and anchors.

D. Material Safety Data Sheets (MSDS): Submit MSDS for each product.

1.04 PRODUCT HANDLING

A. Deliver gypsum wallboard materials in sealed containers and bundles, fully identified with manufacturer's name, brand, type and grade; store in a dry well-ventilated space, protected from the weather, under cover and off the ground. Stack gypsum panels flat to prevent sagging. Joint materials shall be stored in accordance with manufacturer's printed instructions. Dam-aged or deteriorated materials shall be removed from jobsite.

B. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

1.05 SAFETY PRECAUTIONS

A. Respirators and Other Concerns: Comply with OSHA 29 CFR 1910.134, "Respiratory Protection", ASTM C 930, "Potential Health and Safety Con-cerns Associated with Thermal Insulation Materials and Accessories", and other Federal, State, and local regulations governing safety. Provide workers with dust/mist respirators, training in their use, and protective clothing as approved by the National Institute for Occupational Safety and Health (NIOSH)/Mine Safety and Health Administration (MSHA) when in-stalling insulation or sanding joint compound.

B. Open Flame: Do not allow open flames or sources of ignition during instal-lation of blanket insulation.

PART 2 – PRODUCTS

2.01 MATERIALS

A. General: Provide panels in maximum lengths and widths available that will minimize joints and correspond with the applicable support system.

B. Gypsum Wallboard: ASTM C 1396/C 1396M “Gypsum Board”, 1/2-inch thick, tapered edge type, 48-inches wide, regular type (non-fire-rated); ASTM C 1396/C 1396M "Gypsum Board", 5/8-inch thick, tapered edge type, 48-inches wide, Type "X" (Special Fire Retard-ant).

C. Water Resistant Board: ASTM C 1396/C 1396M, Type "WR-X" (Special Fire Retardant) water-resistant backing board, 5/8-inch thick unless indicated otherwise, with tapered edges, 48-inches wide, unless indicated otherwise (for walls only).

D. Cementitious Backer Board (CBU): ASTM C1325 “Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units”, 1/4-inch, 1/2-inch, or 5/8-inch thick, glass fiber mesh-reinforced cement board, non-combustible, moisture- and mold-resistant, for tile substrate applications.

E. Non-Asbestos Fiber-Cement Backer Board: ASTM C1288 “Fiber-Cement Interior Substrate Sheets”, 1/4-inch, 3/8-inch, or 1/2-inch thick, non-asbestos, cellulose fiber-reinforced cement board, moisture-resistant, for tile backing and wet area applications.

F. Glass Mat Gypsum Board:ASTM C1177/C1177M “Glass Mat Gypsum Substrate”, 1/2-inch or 5/8-inch thick, fiberglass mat-faced, moisture- and mold-resistant, 48-inches wide, exterior sheathing or interior mold-resistant type.

G. Fiber-Mat Reinforced Cementitious Backer Unit:ASTM C1325 “Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units”, 1/4-inch, 1/2-inch, or 5/8-inch thick, fiber-mat reinforced cementitious board, high-impact, water-durable, non-combustible, for interior wet areas and tile backing.

H. Wallboard Fasteners: ASTM C 1002 "Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs", standard bugle head self-drilling, self-tapping corrosive-resistant drywall screws. Screws used in fire-resistive rated construction shall be of type approved for use by governing building code. Screws for structural studs shall conform to ASTM C 954 "Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033-inch (0.84 mm) to 0.112-inch (2.84 mm) in Thickness". Fasteners for cementitious backer board shall have a poly-mer coating.

I. Reinforced Tape and Cement: ASTM C 475/C 475M "Joint Compound and Joint Tape for Finishing Gypsum Board", materials for treating joints and fastener heads shall be as manufactured or recommended by the Manufacturer of the wallboard used. Provide "setting" type joint com-pound and fiberglass tape that is unaffected by humidity for water resistant board.

J. Non-Load Bearing Studs: See SECTION 061000 – ROUGH CARPENTRY

K. Ceiling Support Materials and Systems:

1. General: Size ceiling support components to comply with ASTM C 754 "Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products" unless indicated otherwise.

2. Direct Suspension Systems: Manufacturer's standard zinc-coated or painted steel system of furring runners, furring tees, and acces-sories designed for concealed support of gypsum drywall ceilings; of proper type for use intended.

   a. System Manufacturer: Equal to one of the following:
      Armstrong World Industries, Inc.
      Chicago Metallic Corp.
      USG Interiors, Inc.

3. Wire for Hangers and Ties: ASTM A 641/A 641M "Zinc-Coated (Galvanized) Carbon Steel Wire", Class 1 zinc coating, soft temper, 8 gauge for hangers supporting up to 12.5 square feet and 6 gauge where supporting up to 16 square feet and 18 gauge for ties.

I. Wallboard Accessories: ASTM C 1047 "Accessories for Gypsum Wall-board and Gypsum Veneer Base", Vinyl Corp., Plastic Components Inc., Vinyl Tech or approved equal.

1. Standard Corner Bead: Vinyl Corp. Corner Bead CB 125 at all outside corners of wall, ceiling, and soffit as indicated.

2. Casing Trim: Vinyl Corp. "L" Bead SB 50 or 58, "J" Bead MJB 50 or 58, as applicable, or approved equal as indicated.

3. Control Joint: Vinyl Corp. CJV 16 or approved equal.

4. Other Accessories: As indicated or necessary for complete instal-lation.

5. All accessories shall be vinyl, PVC, or approved equal.

J. Joint Treatment Materials: ASTM C 475/C 475M; type recommended by manufacturer for the application indicated, except as otherwise noted. Per-forated tape, and joint and topping compound, or "all-purpose" compound.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine substrates to which drywall construction attaches or abuts, preset hollow metal frames, and structural framing, with Installer present, for compliance with requirements for installation tolerances and other condi-tions affecting performance of drywall construction. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. General: Comply with ASTM C 840 "Application and Finishing of Gypsum Board", Gypsum Association GA 216 and ASTM C 754 as applicable to the type of substrate and drywall support system indicated.

B. Tolerances:

1. Maximum variation of finish surface from true flatness shall be 1/8-inch in 10-feet in any direction unless specified otherwise.

2. Maximum variation of plumbness of wall shall be 1/8-inch in 10-feet of height.

3. Maximum variation from true position shall be 1/8-inch.

C. Ceiling Support Suspension Systems:

1. Secure hangers to structural support by connecting directly to structure where possible, otherwise connect to inserts, clips or oth-er anchorage devices or fasteners as indicated. Ensure that struc-tural anchorage provisions have been installed to receive ceiling anchors in a manner that will develop their full strength and at spacing required to support ceiling.

2. Coordinate installation of ceiling suspension systems with installa-tion of overhead structure to ensure that inserts and other provi-sions for anchorages to building structure have been installed to re-ceive ceiling hangers at spacing required to support ceilings and that hangers will develop their full strength.

3. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting struc-tural or ceiling suspension system. Splay hangers only where re-quired to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

4. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hang-ers required to support standard suspension system members, in-stall supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by

referenced standards.

5. Secure hangers to structure, including intermediate framing mem-bers, by attaching to inserts, eyescrews, or other devices and fas-teners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or other-wise fail.

6. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eyescrews, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause them to deteriorate or otherwise fail.

7. Sway brace ceiling to conform to the applicable seismic load and uplift, applicable requirements of ASTM E 580/E 580M, "Applica-tion of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint", and the manufactur-er's recommendations.

8. Space main runners 4-feet on center and space hangers 4-feet on center along runners, except as otherwise shown.

9. Level main runners to a tolerance of 1/8-inch in 12-feet, measured both lengthwise on each runner and transversely between parallel runners.

10. Wire-tie or clip furring members to main runners and to other struc-tural supports as indicated or as recommended by the manufactur-er.

11. Direct-hung Metal Support System: Attach perimeter wall track or angle wherever support system meets vertical surfaces. Mechani-cally join support members to each other and butt-cut to fit into wall track.

12. Space furring member 16-inches on center, except as otherwise indicated.

13. Install auxiliary framing at termination of drywall work, and at open-ings for light fixtures and similar work, as required for support of both the drywall construction and other work indicated for support thereon.

14. Do not connect or suspend steel framing from ducts, pipes or con-duit.

15. Do not attach hangers to steel deck tabs.

16. Do not attach hangers to steel deck unless otherwise indicated. At-tach hangers to structural members. Locations and manner of se-curing hangers shall conform to criteria indicated for structural el-ements.

17. Keep hangers and braces 2-inches clear of ducts, pipes and con-duits.

D. Framing:

1. See SECTION 061000 – ROUGH CARPENTRY

2. Install supplementary framing, blocking and bracing to support fix-tures, equipment services, heavy trim, furnishings and similar work which cannot be adequately supported on gypsum board alone to comply with details indicated and with recommendations of gyp-sum board manufacturer, or if none available, with "Gypsum Con-struction Handbook" published by United States Gypsum Co.

3. Frame openings other than door openings in same manner as re-quired for door

openings; and install framing below sills of openings to match framing required above door heads.

4. Install each framing and furring member so that fastening surface does not vary more than 1/8-inch from plane of faces of adjacent framing.

5. Seal sills for sound rated partitions with continuous beads of acous-tical sealant along each face prior to installation of gypsum board.

E. Gypsum Wallboard, General:

1. Locate exposed end-butt joints as far from center of walls and ceil-ings as possible.

2. Install exposed gypsum board with face side out. Do not install im-perfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16-inch open space between boards. Do not force into place.

3. Locate either edge or end joints over supports, except in horizontal applications or where intermediate supports or gypsum board back-blocking is provided behind end joints. Position boards so that both tapered edge joints abut, and mill-cut or field-cut end joints abut. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of par-titions. Do not make joints other than control joints at corners of framed openings.

4. Attach gypsum panels to studs so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

5. Attach gypsum board to framing and blocking as required for addi-tional support at openings and cutouts.

6. Cover both faces of stud partition framing with gypsum board in concealed spaces (above ceilings, etc.), except in chase walls which are properly braced internally. Except where concealed ap-plication is required for sound, fire, air or smoke ratings, coverage may be accomplished with scraps of not less than 8 square foot area, and may be limited to not less than 75 percent of full cover-age.

7. Isolate perimeter of non-load-bearing drywall partitions at structural abutments. Provide 1/4-inch to 3/8-inch space and trim edge with J-type semi-finishing edge trim. Seal joints with acoustical sealant. Do not fasten drywall directly to stud system.

8. Space fasteners in gypsum boards in accordance with referenced standards and manufacturer's recommendations, except as other-wise indicated.

9. Install insulation at framing as indicated after cover material has been installed on one side of cavity. Size insulation to width of members spacing. Press friction fit insulation between members as recommended by the insulation manufacturer. When unfaced insulation is used and the stud depth is larger than the insulation thickness, install wire or metal straps to hold insulation in place.

F. Methods of Gypsum Wallboard Application:

1. On ceilings, apply gypsum board prior to wall/partition board appli-cation, to greatest extent possible and at right angle to framing, un-less otherwise indicated.

2. Install ceiling board panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger

abutting end joints of adjacent panels not less than one framing member.

3. Single-Layer Application:

   a. On partitions/walls higher than 8'-1", apply gypsum board ver-tically (parallel), unless otherwise indicated, and provide sheet lengths which will minimize end joints.

   b. On partitions/walls 8'-1" or less in height apply gypsum board horizontally (perpendicular); use maximum length sheets pos-sible to minimize end joints.

4. Single-Layer Fastening Method: Apply gypsum boards to supports by fastening with screws, spaced not to exceed 16-inch centers for walls and 12-inch centers for ceilings.

5. Gypsum wallboard construction for fire rated and acoustical rated assemblies shall be in accordance with the design number indicat-ed or if not indicated in accordance with the International Building Code.

G. Installation of Trim Accessories:

1. General: Where feasible, use the same fasteners to anchor trim accessory flanges as required to fasten gypsum board to the sup-ports. Otherwise, attach trim in accordance with manufacturer's in-structions and recommendations.

2. Install corner beads at external corners.

3. Install edge trim whenever edge of gypsum board would otherwise be exposed or semi-exposed. Provide type with face flange to re-ceive joint compound except where semi-finishing type is indicat-ed. Install L-type trim where work is tightly abutted to other work, and install special kerf-type where other work is kerfed to receive long leg of L-type trim. Install U-type trim where edge is exposed, revealed, gasketed, or sealant-filled (including expansion joints).

4. Install J or LC-type semi-finishing trim where indicated.

5. Install control joints where indicated or necessary in large ceiling and wall expanses. Use door header to ceiling or floor to ceiling in long partitions and wall furring runs and from wall to wall in large ceiling areas. Where joint will be conspicuous, obtain approval pri-or to installation.

H. Drywall Texture: Smooth finish, to match existing.

3.03 DRYWALL FINISHING

A. General: Apply treatment at gypsum board joints (both directions), flanges of trim accessories, penetrations, fasteners heads, surface defects and elsewhere in accordance with ASTM C 840 and Gypsum Association GA 216 and GA 214 as required to prepare work for decoration. Prefill open joints, rounded or beveled edges, and damaged surfaces using type of compound recommended by manufacturer.

1. Apply joint tape at joints between gypsum boards, except where a trim accessory is indicated that does not require tape.

2. Apply joint compound in 3 coats (not including prefill of openings in base), and sand between last 2 coats and after last coat. Fastener heads, dents, gouges, and cut-outs

shall be filled with joint com-pound and sanded.

3. Accessories at exposed joints, edges, corners, openings, and simi-lar locations shall be taped, floated with joint compound, and sand-ed in accordance with manufacturer's instructions and MSDS to produce surfaces ready for gypsum board finishes.

4. Treatment for water-resistant gypsum wallboard shall be as rec-ommended by the gypsum wallboard manufacturer.

B. Finish interior gypsum wallboard by applying the following levels of gyp-sum board finish in accordance with GA-214.

1. Level 1: For ceiling plenum areas and other concealed areas.

2. Level 2: Where wall panels form substrates for rigid sheet vinyl.

3. Level 3: For wall surfaces to receive heavy-duty wallcoverings.

4. Level 4: For ceiling surfaces to receive flat paint.

5. Level 5: For wall surfaces to receive semi-gloss enamel.

6. Where Level 5 gypsum board finish is indicated, embed tape in joint compound and apply first, fill (second), and finish (third) coats of joint compound over joints, angles, fastener heads, and acces-sories; and apply a thin, uniform skim coat of joint compound over entire surface. For skim coat, use joint compound specified for third coat, or a product specially formulated for this purpose and acceptable to gypsum board manufacturer. Touch up and sand between coats and after last coat as needed to produce a surface free of visual defects, tool marks, and ridges and ready for decora-tion.

7. For Level 4 gypsum board finish, embed tape in joint compound and apply first, fill (second), and finish (third) coats of joint com-pound over joints, angles, fastener heads, and accessories. Touch up and sand between coats and after last coat as needed to pro-duce a surface free of visual defects and ready for decoration.

8. Where Level 3 gypsum board finish is indicated, embed tape in joint compound and apply first and fill (second) coats of joint com-pound.

9. Where Level 2 gypsum board finish is indicated, embed tape in joint compound and apply first coat of joint compound.

10. Where Level 1 gypsum board finish is indicated, embed tape in joint compound.

3.04 BACKING PLATES AND ANCHORS

A. Backing plates and anchors or blocking which are to be attached to studs or furring for anchoring items and work indicated on the drawings or specified in other sections shall be installed and secured. Plates and anchors shall be welded or fastened in place in accordance with approved setting drawings.

3.05 CLEANING AND REPAIRING

A. After installation and before painting, correct surface damage and defects. Leave surface clean and smooth, satisfactory to the painter. No painting shall be done over gypsum board work until the joints are thoroughly dry. Joints and fastenings are to be invisible after

painting.

B. Remove all drywall materials from electrical boxes, hardware, fixtures, floor-ing, and similar items and surfaces not intended to receive drywall materials.

END OF SECTION 09250

SECTION 09310 – CERAMIC TILE

PART 1 – GENERAL

1.01 SUMMARY

A. Complete all tile, accessories, and related work as indicated or required by drawings and as specified herein.

B. Related Work Described Elsewhere:

1. CMU under SECTION 04220 – CONCRETE UNIT MASONRY.

2. Sealants are specified under SECTION 07920 - SEALANTS.

1.02 SUBMITTALS

A. Manufacturer's Data: Submit manufacturer's technical information and in-stallation instructions for selected tile, grout, waterproofing and sealer ma-terials.

B. Material Safety Data Sheets (MSDS): Submit MSDS for each product.

C. Samples: Submit 4 each samples of various tiles and accessories required to the Contracting Officer for approval and for color and pattern selection. Identify samples as to grade and manufacturer. Submit samples of select-ed tile in color required, not less than 12-inch square, mounted on plywood or hardboard backing, with selected colored grout.

D. Certificate: Before installation of tile, submit to the Contracting Officer the Standard Form of Master Grade Certificate signed by the Contractor and Manufacturer, stating grade and kind of tile. Deliver all packages of tile to the job in sealed cartons bearing grade seals in compliance with ANSI A137.1.

E. Warranties: Warranty for a minimum of 2 years against defects resulting from the use of defective or inferior materials, equipment or workmanship.

F. Installation Specifications: Submit manufacturer's installation specifica-tions.

1.03 REFERENCES

A. ANSI A108.1B, 1999 - Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex Portland Cement Mortar

B. ANSI A118.7, 1999 - Polymer Modified Cement Grouts

1.04 DELIVERY, STORAGE AND HANDLING

A. Protect tile, mortar materials and accessories during storage and construc-tion against moisture, soiling, staining, and physical damage.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Porcelain Ceramic Tiles: Standard grade, complying with ANSI A137.1. The Contractor shall submit test reports, from an independent la-boratory, indicating conformance of the tile to ANSI A137.1 upon request by the Contracting Officer.

1. Ceramic Wall Tile and Trims: Dust-pressed, white non-vitreous body, 5/16-inch thick, unless indicated otherwise, with cushion or semi-cushion edges, in bright and matte glazed finish and accent colors and finishes as indicated.

2. Trim Units: Provide all trim shapes as detailed and/or as required. Top of wainscot shall be rounded with full bullnose cap. Provide other shapes such as curbs, beads, shoes, round out corners and square in corners, etc. to achieve a neat complete installation.

3. Ceramic Floor Tile: Dust-pressed, dense vitreous body, 5/16-inch thick, unless indicated otherwise, with square or cushioned edges, in matte or textured slip-resistant finish and colors as indicated.

4. Trim Units: Provide all trim shapes as required for floor applications, including base tiles, cove base, and matching trim accessories. Provide threshold pieces, reducers, and transition strips at changes in flooring materials. Include preformed inside and outside corners and other accessories as necessary to achieve a complete and neat installation.

B. Setting Materials:

1. Cement: Portland cement, ASTM C 150, Type I.

2. Waterproof Admixture: Approved integral waterproof admixture.

3. Sand: ASTM C 144.

4. Hydrated Lime: ASTM C 206, Type S or ASTM C 207, Type S.

5. Water: Fresh, clean and potable.

6. Reinforcing Wire Mesh: ASTM A 185/A 185M, 2 x 2 - 16/16, gal-vanized welded wire fabric.

7. Latex-Portland Cement Mortar: ANSI A118.4, with manufacturer's standard dry polymer additive.

C. Pointing Grout for Ceramic Tile: Chemical resistant, water cleanable, tile setting and grouting epoxy, ANSI A118.3.

D. Factory Blending: For tile exhibiting color variations within the ranges se-lected during sample submittals, blend tile in factory and package accord-ingly so that tile units taken from one package show the same range in colors as those taken from other packages and match approved samples.

E. Sealant: Water-based, silicone type water repellent suitable for interior and exterior use. For use at unglazed or paver tile only.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and areas where tile will be installed for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.

1. Verify that substrates for setting tile are firm, dry, clean, and free from oil or waxy films and curing compounds.

2. Verify that installation of grounds, anchors, recessed frames, elec-trical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.

3. Verify that waterproof membrane installed under SECTION 07110 - MEMBRANE WATERPROOFING is watertight and in a condition to receive mortar bed. Remove temporary protective layer and all debris that remain on top of the membrane.

B. Report unsatisfactory conditions to the Contractor for corrective measures; send copy of report to the Contracting Officer. Do not proceed with installation until unsatisfactory conditions have been corrected. Pro-ceeding with tile work will imply acceptance of the substrate condition by the ceramic tile contractor. Wall substrate must be plumb to within toler-ances specified in SECTION 09250 - GYPSUM WALLBOARD and in complete alignment.

3.02 INSTALLATION, GENERAL

A. ANSI Tile Installation Standard: Comply with parts of ANSI 108 series of tile installation standards included under "American National Standard Specifications for the Installation of Ceramic Tile" that apply to type of set-ting and grouting materials and methods indicated.

B. TCA Installation Guidelines: TCA "Handbook for Ceramic Tile Installation"; comply with TCA installation methods indicated.

C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abut-ting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so that plates, col-lars, or covers overlap tile.

D. Jointing Pattern: Unless otherwise shown, lay tile in grid pattern. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths un-less otherwise shown. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so that extent of each sheet is not apparent in finished work.

E. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated during installation of setting materials, mortar beds, and tile. Do not saw cut joints after installation of tiles. Locate joints in tile surfaces directly above joints in concrete substrates. Expansion joints shall conform to TCA Installation Method EJ171.

F. Grout: Grouts shall comply with ANSI A108.10.

G. Allow tiles to set a minimum of 48 hours prior to grouting. The grout shall be forced into the joints to the full depth. Take special care not to scratch glazed tile during this operation. Remove surplus grout before it has hard-ened and leave the face of the tile clean. Keep expansion and control joints free of grout.

H. Sound tiles after setting to ensure proper bonding. Hollow sounding tiles shall be replaced.

3.03 WALL TILE INSTALLATION METHODS

A. Install types of tile designated for wall application to comply with require-ments indicated

below for setting-bed methods, TCA installation methods related to subsurface wall conditions, and grout types:

1. Latex-Portland Cement Mortar: ANSI A108.5.

    a. Concrete Masonry: TCA Installation Method W202.

2. Grout: epoxy cement.

3.04 CLEANING AND PROTECTION

A. Cleaning: Upon completion of placement and grouting, clean all tile sur-faces so they are free of foreign matter.

    1. Remove grout residue from tile as soon as possible. Clean in ac-cordance with applicable ANSI installation procedure.

    2. Unglazed tile may be cleaned with acid solutions only when permit-ted by tile and grout manufacturer's printed instructions, but no sooner than 14 days after installation. Protect metal surfaces, cast iron, and vitreous plumbing fixtures from effects of acid cleaning. Flush surface with clean water before and after cleaning.

    3. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to tile and grout manu-facturer. Trap and remove coating to prevent it from clogging drains.

B. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, and otherwise defective tile work.

C. Provide final protection and maintain conditions in a manner acceptable to manufacturer and installer that ensures that tile is without damage or dete-rioration at time of Substantial Completion.

    1. When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls. Protect in-stalled tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.

    2. Protect tiled corners and external angles with board corner strips in areas used as passageways by workers.

D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION 09310

SECTION 09510 – ACOUSTICAL CEILING

PART 1 - GENERAL

1.01 SUMMARY:

A. Furnish and install suspended lay-in acoustical ceiling systems as indicated on Drawings and specified herein.

B. Related Work Specified Elsewhere:

1. SECTION 07920 – SEALANTS for acoustical sealants.

2. DIVISION 23 – MECHANICAL for coordination of mechanical items.

3. DIVISION 26 – ELECTRICAL for coordination of electrical items.

1.02 SUBMITTALS

A. Manufacturer's Data: Submit technical product data and installation instructions for suspension systems and lay-in panels, demonstrating compliance with project requirements.

B. Shop Drawings: Show all system components including:

1. Suspension system and furring

2. Jointing methods

3. Anchoring and fastening

4. Mechanical and electrical penetrations

5. Splicing of main and cross runners

6. Seismic restraint details

C. Samples: Submit 3 samples of each type of acoustical unit, edge molding, and suspension runner.

D. Receipt of Delivery: Provide three copies signed by the user’s representative attesting to delivery of extra lay-in panels (see Part 3.04).

1.03 DESIGN CRITERIA

A. Ceiling Attenuation Class (CAC): Determined per CISCA AMA1-II and reported per ASTM E 413 for 16-frequency data.

B. Sound Absorption (NRC): Tested per ASTM C 423.

A. Seismic Restraint: Install per ASTM E 580/E 580M.

1.04 DELIVERY AND STORAGE

A. Deliver acoustical units in manufacturer’s original unopened containers with brand name and type clearly marked.

B. Store in dry, watertight enclosures. Acclimate units for 24 hours in installation environment prior to installation.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Acoustical Ceiling Tile Units: Comply with ASTM E 1264. Basis of Design:

1. Armstrong World Industries, Inc.
2. Accepted equals approved by Contracting Officer: USG Interiors Inc., Celotex Corporation

B. Composition Lay-In Panels – ATC 1:

1. Type III, non-asbestos mineral composition, factory-applied white washable finish
2. Class A, flame spread ≤ 25
3. Scored 2x2 pattern, CEK
4. NRC ≥ 0.65
5. CAC ≥ 35
6. LR ≥ 0.85
7. Nominal size: 24 x 48 in.
8. Beveled tegular edge, lay-in
9. Humidity resistant
10. Design: Armstrong Cirrus Second Look II, No. 513, or approved equal

C. Composition Lay-In Panels – ATC 2:

1. Type XX, high-density mineral, factory-applied white scrubbable finish
2. Class A, flame spread ≤ 25
3. Scored 2x2 pattern, G
4. NRC ≥ 0.65
5. CAC ≥ 40
6. LR ≥ 0.85
7. Nominal size: 24 x 48 in.
8. Square edge, lay-in
9. Moisture and 100% humidity resistant
10. Mold and mildew resistant
11. Design: Armstrong Ceramaguard Unperforated, No. 605, or approved equal

2.02 SUSPENSION SYSTEM

A. Exposed Grid: ASTM C 635, 15/16-inch standard width, intermediate duty main runners, aluminum or steel, factory-applied white baked enamel.

B. Hanger Wires: ASTM A 641/A 641M, Class 1, 12-gauge galvanized steel.

C. Fasteners: Rust-resistant, per manufacturer recommendations. Include wall or edge moldings.

PART 3 – EXECUTION

3.01 PREPARATION

A. Examine surfaces and conditions affecting installation. Report deficiencies to Contracting

Officer. Start of work constitutes acceptance of conditions.

3.02 INSTALLATION

A. Install per manufacturer’s instructions and layout on Drawings.

B. Suspended Ceilings: ASTM C 636/C 636M and ASTM E 580/E 580M:

1. Hangers spaced 4 ft on centers; provide extra hangers near beams, ducts, columns, grilles, and penetrations.

2. Keep main runners clear of abutting walls; provide minimum two main runners per span.

3. Edges of ceiling tiles in close contact with metal supports, true alignment. Minimize units <1/2 width. Use hold-down clips for tiles <1 psf or vertical panels.

4. Install wall/edge molding; miter corners or use corner caps.

5. Ceiling tolerance: flat/level within 1/8 in per 10 ft.

6. Apply continuous ribbon of acoustical sealant along vertical leg of wall/edge molding.

7. Paint exposed cut edges to match tile finish.

3.03 CLEANING AND REJECTION

A. Avoid damaging or soiling units. Replace damaged units.

B. Cause for rejection includes:

1. Crooked or open joints

2. Soiled tiles

3. Fractures, cracks, corner chips

4. Color variation

5. Loose or fallen tiles

6. Warped tiles

7. Damage from leaks

3.04 EXTRA LAY-IN PANELS

A. Provide minimum 1% extra lay-in panels of each type and color.

END OF SECTION 09510

SECTION 09650 – RESILIENT FLOORING

PART 1 – GENERAL

1.01 SUMMARY

A. Extent of resilient flooring is shown on the drawings and schedules and indicated by requirements of this section.

1.02 RELATED WORK

B. SECTION 01450 - MOISTURE VAPOR AND ALKALINITY TEST

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTAL PROCEDURE.

B. Manufacturer's Data: Submit manufacturer's technical data and installation instructions for resilient flooring, wax, and accessories.

C. Samples: Submit samples of all flooring, bases, and accessories to the Director and for color and/or pattern selection.

D. Maintenance Instructions: Submit manufacturer's recommended cleaning and maintenance practices for resilient flooring and accessories.

E. Material Safety Data Sheets (MSDS): Submit MSDS for adhesives, patching and leveling compounds, and sealers.

1.04 QUALITY ASSURANCE

A. Right of Rejection: The Director shall have the right to reject all work that is not in compliance with the plans and specifications. Rejected work shall be redone at no cost.

B. It may sometimes be desirable to apply the mastic for the floor tiles the day before the actual laying of the tiles. If the Contractor decides to do so, care must be taken to prevent particles of rubbish to settle on the adhesive and cause a bumpy appearance on the tiles.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in good condition to job site in manufacturer's original unopened containers bearing name and brand of the manufacturer, color identification, and handling and storage instructions.

B. Store materials in clean, dry, enclosed space protected from weather, and maintained at a temperature between 65 degrees F and 100 degrees F.

C. Observe ventilation and safety procedures specified in the MSDS.

1.06 PROJECT CONDITIONS

A. Perform Moisture Vapor and Alkalinity Testing according to Section 014500 –MOISTURE VAPOR AND ALKALINITY TEST prior to installation of flooring. Perform all corrective measures to the satisfaction of the Project Manager and flooring manufacturer’s requirements for flooring installation..

B. Maintain temperature in spaces to receive flooring and accessories between 65 degrees F and 85 degrees F for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. Properly cure and dry concrete to eliminate vapor emissions that may affect the long term performance of the adhesives and installation. Install flooring after building air conditioning, dehumidifiers, etc. have operated to reduce moisture or provide approved sealer.

C. Install flooring and accessories after other finishing operations, including painting, have been completed. Close spaces to traffic during installation of the flooring.

PART 2- PRODUCTS

2.01 MATERIALS

A. Luxury Vinyl Tile (LVT): Luxury vinyl tile shall conform to ASTM F 1700 “Solid Vinyl Floor Tile”, Class III, Type B (printed film vinyl tile), with a minimum wear layer of 20 mils, smooth or embossed surface, with polyurethane or UV-cured urethane finish, 2.5 mm thick, unless indicated otherwise. Provide slip-resistant surface with a minimum coefficient of friction as recommended for commercial applications..Tile quality shall be equal to Armstrong Flooring, Mannington, Tarkett, Shaw Floors, or approved equal.

B. Resilient Wall Base: Base shall conform to ASTM F 1861, "Resilient Wall Base", Type TS or TP, rubber, Group 1 or 2, 4-inch high, topset type, 1/8-inch thick with a smooth exposed surface and a textured building surface on the unexposed face. Provide Style B, cove type, at vinyl composition tile floors and Style A, straight edge, at carpet floors. Provide preformed outside corners. The rubber material shall be free from offensive odor and its color shall be uniform throughout the thickness of the base. Base shall be equal to Burke Mercer Flooring Products Cove Base and Carpet Base, Johnsonite, Roppe, Mannington, Azrock, Armstrong, Tarkett, or approved equal.

C. Adhesives:

1. Flooring adhesives shall be brush-on, roll-on, or trowel-on water-resistant type, as recommended by the manufacturer for the specified materials used. Do not use adhesive not intended for its purpose. Material shall be cream colored, latex-resin formula that dries to a clear film. Adhesives shall be solvent free, low odor, no ammonia and non-flammable in wet state. Do not use adhesive not intended for its purpose. Provide material equal to Henry 430 Tile Adhesive, clear thin spread or approved equal. Provide specialty adhesives for elevated slab moisture vapor transmission where required by slab conditions.

2. Base adhesive shall be acrylic latex water-resistant type, as recommended by the manufacturer for the specific materials used. Material shall be white, solvent free with zero VOC content, low odor, no ammonia and nonflammable in wet state. Do not use adhesive not intended for its purpose. Provide material equal to Henry 595 White Acrylic Cove Base Adhesive, Acrylic Latex Bright White Color or approved equal.

3. VOC content shall be less than the current VOC content limits of the South Coast Air Quality Management District Rule 1168, "Adhesive and Sealant Application"

D. Patching and Leveling Compounds: Patching and leveling compounds shall be latex-modified, Portland cement based formulation unless otherwise required by the flooring manufacturer for the applications indicated. Gypsum based compounds shall not be used.

E. Edging: Edging shall be beveled vinyl strip, one-inch wide, same thickness as flooring,

color to match flooring as selected by the Director. Metal edge strips shall not be used.

F. Sealer and Wax: Provide sealer and wax as approved by tile manufacturer.

PART 3 – EXECUTION

3.01 INSPECTION

A. Flooring installer shall examine substrates where resilient flooring will be installed for compliance with the flooring manufacturer's requirements. Inspect subfloors to determine that surfaces are smooth, free of cracks, holes, ridges, and other defects that might impair durability or appearance of flooring.

B. Report conditions contrary to contract requirements which would prevent a proper installation.

C. Do not proceed with installation until unsatisfactory conditions have been corrected.

D. Failure to call attention to any defects or imperfections will be construed as acceptance and approval of subfloor. Installation indicates acceptance of substrates with regard to conditions existing at time of installation.

3.02 PREPARATION OF SUBFLOORS

A. General: Comply with the flooring material manufacturer's installation instructions for the preparation of substrates to receive resilient flooring.

B. Unless otherwise required by the flooring manufacturer, the subfloor shall be broomed, damp mopped and scrubbed until it is free from dust, dirt, grease or other foreign material. It shall also be scraped to make surface smooth and level. Ensure that concrete is free of curing compounds and sealers.

C. Defects such as ridges, holes, and cracks shall be repaired and leveled as part of this contract.

D. Concrete subfloor shall be prepared to comply with ASTM F 710, "Preparing Concrete Floors to Receive Resilient Flooring" and shall be free of materials that may interfere with adhesive bond and shall be clean, dry and smooth before flooring is laid. Fill all cracks, holes, and depressions with patching and leveling compound as approved by the flooring manufacturer. Cut out and fill all cracks 1/16-inch wide and wider with crack filler.

E. If flooring is laid on defective subfloors, such flooring shall be removed and replaced at Contractor's expense.

3.03 PROJECT CONDITIONS

A. Flooring materials and the spaces to receive flooring materials shall be conditioned in accordance with the flooring manufacturer's recommendation and instructions.

B. Provide adequate ventilation to remove moisture and fumes from the areas where flooring is being installed.

3.04 INSTALLATION OF MATERIALS

A. See drawings for locations and types of flooring required. Flooring and base shall continue, respectively under and behind removable and/or portable cabinets, cases, etc.

Flooring shall continue into closets where floor of closets and adjacent floor are at same level. Installation shall not begin until work of other trades, including painting, has been completed.

B. All work shall be done by experienced tradesmen in strict accordance with recommended specifications of the respective manufacturer. Where not contrary to manufacturer's recommendations, adhesive shall be applied with a notched trowel in a thin and even coat. Flooring shall be laid with tight joints in true alignment both ways. Flooring shall be cut to fit accurately at joining with other materials and at vertical surfaces. The underside of the flooring shall be heated if necessary to obtain satisfactory bond to the subfloor. Changes in floor level shall conform to ADA Section 303.

C. Adhesives: Apply adhesives in accordance with the adhesive manufacturer's printed directions, unless specified or directed otherwise. Smoking, the use of open flames and other immediate sources of ignition are strictly prohibited in the area where solvent-containing adhesives are being used or spread. Post conspicuous signs reading "NO SMOKING OR OPEN FLAME" in the area of spread adhesive.

D. Tiles: Tiles shall be laid symmetrically about the center lines of the room in both directions, starting at the center of the room and working toward the wall so that border tiles shall not be less than half the width of the field tiles. Pattern shall be as indicated and approved by the Director. Pattern (grain) of tile shall run in one direction as directed by the Director. Edging shall be installed with contact adhesive at all marginal edges of flooring not stopped by raised thresholds or other vertical surfaces. Edge tile shall be cut, fitted, and scribed to walls after field flooring has been installed.

E. Resilient Base: Resilient base shall be applied on thoroughly-dried walls with base adhesive only. Because of the thermoplastic character of base, care shall be taken not to stretch it during installation since it will shrink and leave a gap at joints. The top and bottom edges shall be in firm contact with the wall and floor. Premolded exterior corners shall be used unless otherwise approved by the Director.

F. Corners are formed on job, the legs from corner shall not be less than 12-inches long. Otherwise, the resilient base shall be continuous around corners. On masonry and similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Prohibit traffic on finished floor for 24 hours after installation.

3.05 CLEANING AND PROTECTION

A. Spots of adhesive shall be removed immediately as work progresses. Clean flooring as recommended in accordance with manufacturer's printed maintenance instructions. Floor shall not be washed or waxed until the adhesive has completely set (48 hours minimum), and in no case until after the minimum length time recommended by the manufacturer has elapsed. During this period there shall be no furniture or other heavy traffic movement on the floor. The flooring shall be cleaned with a neutral cleaner as recommended by the manufacturer and then damp mopped with clear water. Flooding of the floor is not permitted.

B. Except for flooring designated as "no-wax" or "never wax" by manufacturer, apply (two) 2 coats of approved non-slip wax with a clean lambs wool mop when the floor is dry to protect flooring until substantial completion in accordance with cleaning and maintenance instructions. Each coat shall be buffed thoroughly when dry with weighted rotary electric floor polishing machine.

C. Slip Resistance: Finished floor shall have a static coefficient of friction of 0.6 for accessible routes, 0.8 for ramps and not less than 0.5 for other areas in accordance with ADA Section 302.

D. Clean bases, but do not polish them.

E. From the time of laying until acceptance, flooring shall be protected from damage as recommended by the flooring manufacturer. Flooring which becomes damaged, loose, broken, or curled and wall base which is not tight to wall or securely adhered shall be removed and replaced.

END OF SECTION 09650

SECTION 09901 - PAINTING

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes surface preparation and field painting of exposed exterior and interior items and surfaces.

1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Contracting Officer will select from standard colors and finishes available.

1. Interior and Exterior surfaces scheduled to be finished and/or as noted on drawings.

2. Non Ferrous metals, plated or factory finished items specifically noted to be painted or when such items occur as accessories and appurtenance to surfaces required to be painted.

3. Pipes, conduit, ducts, support apparatus and other exposed mechanical and electrical items in areas to be painted. Exterior mechanical and electrical equipment and items on the roof or building exterior.

C. Surfaces not to be finished, unless otherwise indicated.

1. Concrete floors, paving, walks, stairs and pre-finished/pre-stained/textured concrete. Other concrete surfaces scheduled not to be painted.

2. Exterior finish system surfaces.

3. Finish hardware.

4. Glass, plastic laminate, and ceramic tile.

5. Acoustical ceilings.

6. Flooring and floor coverings.

7. Plumbing and lighting fixtures, and electrical device plates.

D. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1. Prefinished items include the following factory-finished components:

a. Architectural woodwork.
b. Finished mechanical and electrical equipment.
c. Light fixtures.

2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:

a. Furred areas.
b. Ceiling plenums.
c. Pipe spaces.
d. Duct shafts.
e. Elevator shafts.

3. Finished metal surfaces include the following:
   a. Anodized aluminum.
   b. Stainless steel.
   c. Chromium plate.
   d. Copper and copper alloys.
   e. Bronze and brass.

4. Operating parts include moving parts of operating equipment and the following:
   a. Hinges unless otherwise indicated.
   b. Valve and damper operators.
   c. Linkages.
   d. Sensing devices.
   e. Motor and fan shafts.

5. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

1.02 RELATED SECTIONS

A. SECTION 05500 – METAL FABRICATIONS: For factory primed items, metal hardware and miscellaneous metals.

B. SECTION 06100 – ROUGH CARPENTRY: For painting of wood beams and miscellaneous framing and metal hardware.

C. SECTION 09200 – LATH AND PLASTER

D. DIVISION 15 - MECHANICAL and DIVISION 16 - ELECTRICAL, painting of identification markings for mechanical and electrical equipment and apparatus.

1.03 REFERENCES

A. ASTM D16 - Definition of terms relating to Paint, Varnish, Lacquer and Related Products.

B. ASTM D2016 - Test Method for Moisture Content of Wood.

C. MPI (Master Painter's Institute) - Approved Product List.

D. PCDA (Painting and Decorating Contractors of America - Painting - Architectural Specification Manual.

E. PCA (Portland Cement Association) - Painting Concrete.

F. SSPC (The Society for Protective Coatings - Steel Structures Painting Manual)

1.04 DEFINITIONS

A. General: Standard coating terms defined in ASTM D 16 apply to this Section.

1.05 SUBMITTALS

A. Submit in accordance with SECTION 01330 - SUBMITTAL PROCEDURES.

B. Product Data:

1. Materials List: Provide an inclusive list of required patching and coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.

a. For products with premixed colors, provide manufacturer's standard color chips for selection by Contracting Officer.

2. Manufacturer's Information: Provide data on all listed materials, including:

a. Thinning and mixing instructions
b. Application instructions and required mil film thicknesses.
c. Manufacturer's Material Safety Data Sheets.

C. Certifications: Provide a letter certifying paints and coatings are free of asbestos, lead, zinc-chromate, strontium chromate, cadmium, and mercury and mercury compounds. Provide a letter certifying the amounts of mildewcide added by both the paint manufacturer and paint supplier. Provide a letter certifying that abrasive blast media are free of crystalline silica.

D. Schedule of Finishes: Provide finish schedule including paint spread rates required to achieve final dry film thickness indicated in the schedule.

E. Schedule of Operations: Provide a work schedule showing sequence of operation and installation dates.

F. Samples:

1. Submit color and finish samples, at manufacturers normal paint chip size illustrating range of colors and textures available for each surface finishing product scheduled.

2. After color and finish sample are returned, submit paint finish samples, 8.5" x 11" in size illustrating selected colors and textures for each selection. Divide sample in horizontal strips showing prime and overlapping second and finish coats. Show coat tinting. Prepare transparent finish samples on same material as that on which coating will be applied. Identify each sample.

G. Manufacturer's Instructions: Indicate special surface preparation procedures, and substrate conditions requiring special attention. Refer to Section 3.01.

H. Samples for Initial Selection: For each type of finish-coat material indicated.

1. After color selection, Contracting Officer will furnish color chips for surfaces to be coated.

2. Submit 3 samples on the following substrates for Contracting Officer's review of color and texture only:

a. Concrete: 4-inch- square. Samples for each color and finish.

b. Concrete Unit Masonry: 4-by-8-inch Samples of masonry, with mortar joint in the center, for each finish and color.
c. Painted Wood: 8-inch-square. Samples for each color and material on hardboard.
d. Stained or Natural Wood: 4-by-8-inch. Samples of natural or stained wood finish on representative surfaces to match species as specified.

I. Provide a Comprehensive Spray Plan when airless spraying is proposed.

J. Qualification Data: For Applicator.

K. Delivery Receipts: Provide 3 copies of the delivery receipt, signed by the user's representative, attesting to delivery of extra paint as required under 1.09

1.06 QUALITY ASSURANCE

A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

B. Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.

1. Exception: Alkali resistant primers if compatible with the intermediate coat paint products.

C. Provide a Comprehensive Spray Plan when airless spraying is proposed. to include:

1. Documentation that the individual spray applicator(s) on the project have completed an approved "Spray Applicator Certification Program" conducted by the Painting Industry of Hawaii. The certification program shall include material and equipment selection, use and maintenance, hands-on application and safety training.

2. Proposed overspray protection methods.

3. Paint Manufacturer's spray application instructions and recommendations for products to be used.

4. Proposed schedule to shut-down and covering existing air-conditioning and ventilation equipment and existing air intake, return and diffuser grilles.

1.07 REGULATORY REQUIREMENTS

A. Comply with State OSHL (Occupational Safety and Health Law) and pollution control regulations of the State Department of Health and EPA.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:

1. Product name or title of material.

2. Product description (generic classification or binder type).

3. Manufacturer's brand name and lot number and date of manufacture.

4. Contents by volume, for pigment and vehicle constituents.

5. Thinning instructions.

6. Application instructions and coverage.

7. Color name and number.

8. VOC content.

B. Storage

1. Non-flammable Materials: Store materials not in use in tightly covered containers in a well-ventilated area. Maintain storage containers in a clean condition, free of foreign materials and residue.

2. Flammable Materials:

a. Store in such a manner as to prevent damage. No paint material, empty cans, paint brushes and rollers may be stored in the building(s). Store these items in separate storage facilities away from the building(s). Contractor may furnish a separate job site storage structure, if the structure complies with the requirements of the local Fire Department. Keep the storage area clean. Lock any storage structures when not in use or when no visual supervision is possible.

b. All rejected materials shall be removed from the job site immediately.

1.09 PROJECT CONDITIONS

A. Do not apply materials when surfaces and ambient temperatures are outside the ranges required by the paint product manufacturer. Do not apply exterior coatings during rain or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

B. Protect public, pedestrians and tenants from injury. Provided, erect and maintain safety barricades around scaffolds, hoists and where construction operations create hazardous conditions.

C. Completed Work: Provide necessary protection for wet paint surfaces.

D. Protective Covering and Enclosures: Provide and install clean sanitary drop cloth or plastic sheets to protect furniture, equipment, floor and other areas that are not scheduled for treatment. Remove any paint applied to surfaces not scheduled for treatment.

E. Fire Safety: Contractor and its employees shall not to smoke in the vicinity of the paint storage area. Exercise precautions against fire at all times and remove waste rags, plastic (polyester sheets), empty cans, etc. from the site at the end of each day.

F. Where airless spraying is used, ensure that protective enclosures are erected to prevent the escape of overspray from the work area.

G. Safeguarding Property: Safeguard the work and also the property of the State and other individuals in the vicinity of Contractor's work. Make good on any damages and for losses to work or property caused by Contractor or its employee's negligence. Where damaged

property cannot be cleaned and restored to its original condition (i.e. prior to being damaged) replace it with a new product of equal quality. No prorating or use of "used" products will be permitted.

1. For painting and spray painting operation, assume that cars will not be temporarily relocated from parking areas during the painting operations.

2. Paint overspray shall not carry more than 5 lineal feet beyond the building eave line nor within 10 lineal feet of pedestrians or property and surfaces not scheduled to be painted. Immediately cease spray painting when overspray carries beyond these specified limits. Do not continue until protective barriers are erected to properly contain the overspray and damages caused by the overspray have been corrected.

3. The Contractor shall be assessed $300.00 for each incidence of property or personal damage caused by overspray until such time that a satisfactory settlement has been agreed upon by the damaged party and corrective action has been completed. All corrective action shall be settled within 24 hours from the time the damage is discovered. Should the Contractor fail to take corrective action in a timely and expeditious manner, the Contracting Officer shall contact the Contractor's Insurance company to seek resolution on the matter.

1.10 EXTRA MATERIALS

A. Provide extra paint in each of the different colors, types and surface textures of exterior and interior paint to the user upon completion of the project. Paint shall be in unopened one gallon containers and labeled with color, type, texture, room locations, and date in addition to manufacturer's label.

1. Provide 5 gallons of each color for paint used over large areas, such as the exterior of the building and in several rooms.

2. Provide 1 gallon of each color for all other areas.

1.11 WARRANTY

A. Provide a two year guarantee that the work performed under this section conforms to the contract requirements and is free of any defect of material or workmanship.

PART 2 - PRODUCTS

2.01 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Mildewcide: Except for metal primers, provide primer and finish coats with suitable chemical mildewcide to the maximum amount of mildewcide per gallon of paint permitted by the mildewcide manufacturer without adversely affecting the quality of the paint, but not less than one ounce per gallon.

C. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

1. Proprietary Names: Use of manufacturer's proprietary product names in the color schedule to designate colors or materials, is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed products to be used.

2. Equivalency: Equivalent products to the specified products are listed in the Master Painter's Institute's "Architectural Painting Specification Manual."

3. Substitution: Requests for substitution of a product or product if a manufacturer is not on the "Approved Product List" will be evaluated for equivalency based on product test results per the test criteria of the Master Painter's Institute.

D. Colors: All colors to match existing adjacent colors or as scheduled or as selected by the Contracting Officer.

E. Hazard Materials: Do not use paint or paint products containing asbestos, lead, mercury and mercury compounds, zinc chromates, strontium-chromate, and cadmium. Do not use abrasive blast media that contain crystalline silica.

2.02 MISCELLANEOUS MATERIALS

A. Provide patching and repair materials compatible with paint finishes and substrates. Use weather resistant materials for exterior surfaces and surfaces exposed to moisture.

B. Accessories

1. General: Provide other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.

Thinners: Thinning of paint shall be done using material recommended by the manufacturer. Mix proprietary products according to manufacturer's requirements. Do not use compound thinner, mineral oil, kerosene, refined linseed oil, or gasoline for thinning.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application. Comply with procedures specified in PDCA P4.

1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.

a. Ensure that concrete and masonry surfaces are cured and dried to meet paint manufacturer's recommendations.

2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

1. Notify Contracting Officer about anticipated problems when using the materials specified over substrates primed by others.

3.02 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.

    1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove dust, oil and grease before cleaning.

    1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation: Clean, patch, caulk, and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.

    1. Provide barrier coats over incompatible primers or remove and reprime.

    2. Remove from surfaces to be repainted all foreign matter such as nails, screws, staples, tape and gum.

    3. Remove all loose, blistered, scaled, crazed or chalky finish to an existing tight and firm finish.

    4. Remove mildew as noted in PREPARATION Article.

    5. Spot prime areas where bare wood, concrete, masonry, plaster, fill, seal or patched material is exposed with the specified primer and feather out onto adjacent paint.

    6. Wash all surfaces with a solution of tri-sodium phosphate and water or other appropriate solution to remove any accumulated film of wax, oil, grease, smoke, dust, dirt, chalking or other foreign matter which would impair the bond of, or bleed through the new paint finish. After washing, rinse the surface with potable water and allow to thoroughly dry. Rinsing may be performed by high pressure water washing as noted in PREPARATION Article.

        a. Surfaces shall dry a minimum of 24 hours before the application of primers. For wood surfaces drying shall continue until the moisture content of the wood is less than 15 percent. For concrete and concrete masonry surfaces test for alkali and moisture.

    7. Lightly sand the surface where existing finish remains tight and firm. Where the paint has been removed, sand the edges of scarred areas to a smooth feathered edge.

    8. Fill holes (nail, tack, staple, and other similar items), cracks, open joints and other imperfections with appropriate compound and allow to set (door and trim included). Seal all openings which will permit the entrance of water. Sealing compounds shall be compatible with the substrate, primer and paint. Apply and allow sealants to set in accordance with the manufacturer's recommendations.

D. Surface Preparation Cementitious Materials: Prepare concrete, concrete unit masonry, cement plaster surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.

1. Use abrasive blast-cleaning methods if recommended by paint manufacturer.

2. Determine alkalinity and moisture content of surfaces by performing appropriate tests. Submit test results to Contracting Officer for review.

    a. Prior to painting, concrete and masonry surfaces shall be allowed to cure and dry in accordance with the paint manufacturer's instructions and recommendations.

    b. Efflorescence and laitance shall be removed from the surface.

    c. Prior to paint application, interior and exterior concrete and masonry (including grout joints) scheduled to receive paint shall be tested to determine the alkalinity level of the surface. Testing shall be performed in strict accordance with the test kit manufacturer's instructions. Submit test results to the Contracting Officer.

    d. Where the alkalinity level exceeds the pH level limit of the primer take one of the following three remedies at no additional cost to the State:

        1) If new concrete or masonry, wait until alkaline level has dropped below the limit.

        2) Substitute a primer that is able to resist the measured alkalinity and that is compatible with the paint finish. Alkyd based primers and top-coats or epoxy ester primers shall not be used. Submit the substitute primer to the Contracting Officer for review and acceptance.

        3) Neutralize the surface in accordance with the primer manufacturer's instructions to reduce the alkaline level. However, acid washing is not permitted where the surface has been finished with a cementitious coating.

E. Surface Preparation Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.

1. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.

2. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.

3. If transparent finish is required, backprime with spar varnish.

4. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on back side.

5. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.

F. Surface Preparation of Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

G. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.

1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.

2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.

3. Use only thinners approved by paint manufacturer and only within recommended limits.

H. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.03 APPLICATION

A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.

1. Paint colors, surface treatments, and finishes are indicated.

2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.

3. Provide finish coats that are compatible with primers used.

4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.

5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only unless otherwise noted.

6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.

7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.

8. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.

9. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.

10. Sand lightly between each succeeding enamel or varnish coat.

11. Ensure primers are top coated within the times required by the paint manufacturers. Top coats not applied within the recoating window may be rejected.

B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.

2. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

3. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.

4. Be aware of the requirements for, and restrictions on, spray painting contained in PROJECT CONDITIONS Paragraph.

C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.

1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.

2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.

3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.

D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.

E. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.

F. Mechanical items to be painted include, but are not limited to, the following:

1. Uninsulated metal piping.

2. Uninsulated plastic piping.

3. Pipe hangers and supports.

4. Tanks that do not have factory-applied final finishes.

5. Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and

outlets.

6. Duct, equipment, and pipe insulation having "all-service jacket" or other paintable jacket material.

7. Mechanical equipment that is indicated to have a factory-primed finish for field painting.

G. Electrical items to be painted include, but are not limited to, the following:

1. Switchgear.

2. Panelboards.

3. Electrical equipment that is indicated to have a factory-primed finish for field painting.

H. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.

I. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

J. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

K. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.

1. Provide satin finish for final coats.

L. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.04 FIELD QUALITY CONTROL TESTING

A. Inspection and Approvals: Obtain written approval upon completion of each phase of work (phases of work are: surface preparation and spot prime, prime, first finish coat, second finish coat) before proceeding into the next phase or work. For any particular area of work that deviates from the submitted work schedule, notify the Contracting Officer one day (24 hours minimum) in advance when completing any phase of work. Provide access to areas to be inspected.

1. Failure to obtain approval of any phase of work for a work area may result in redoing the operation at no cost to the State.

2. Right of Rejection: Non conforming work will be rejected by the Contracting Officer. Remove rejected material from the job site immediately. Redo rejected work at no cost to the State.

B. Thickness Testing: The Contracting Officer will require all paints and their applied

thickness tested determine compliance with the Contract Documents. The State will select a laboratory, and the cost of testing shall be borne by the Contractor.

1. Where the required paint thickness is deficient, provide additional coats to the affected surface(s) to meet the required paint thickness.

2. Tests shall be paid by Contractor.

C. Moisture Testing: Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:

1. Plaster and Gypsum Wallboard: 12 percent.

2. Concrete and Concrete Unit Masonry: 12 percent.

3. Interior Wood: 15 percent, measured in accordance with ASTM D2016.

D. Alkalinity Testing: Measure pH Level of surface to be painted. Notify Contracting Officer if alkalinity level is below the maximum permitted by the paint or primer manufacturer.

1. Tests shall be paid by Contractor.

E. Adhesion Testing:

1. Provide adhesion testing per ASTM D3759 Test B (x scratch peel test):
   a. Test after each scheduled paint coat.
   b. Should test fail, remove paint, prepare surface, then recoat and test again.

2. Testing shall be performed by a NACE certified inspector favorably reviewed by the State. The cost of testing shall be borne by the Contractor.

3. Tests shall be paid by Contractor.

3.05 CLEANING

A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.

1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.06 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Contracting Officer.

B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.

1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.07 EXTERIOR PAINT SCHEDULE

A. Concrete:

1. Acrylic Finish: Two finish coats over a primer.

a. Primer: Exterior concrete and masonry Devoe DR1502 Wonder-Shield primer: MPI-6; 1.5 -2.0 mils DFT.
b. Finish Coats: Exterior acrylic paint. Devoe DR18XX, MPI-11; 1.5 mils DFT
c. Finish Coat Gloss Level: semi-gloss.

B. Wood: Provide the following finish systems over exterior wood surfaces:

1. Acrylic-Enamel Finish: Two finish coats over a primer.

a. Primer: Exterior Wood. Devoe DR1502 Wonder-Shield primer: MPI-6; 1.5 -2.0 mils DFT.
b. Finish Coats: Exterior acrylic paint. Devoe DR18XX, MPI-11; 1.5 mils DFT.
c. Finish Coat Gloss Level: semi-gloss.

C. Ferrous Metal: Provide the following finish systems over exterior ferrous metal. Primer is not required on shop-primed items.

1. Acrylic Finish: Two finish coats over a rust-inhibitive primer.

a. Primer: Exterior ferrous-metal primer. Devoe Coatings Devguard 4160, MPI-79; 2.0 mils DFT.
b. Finish Coat: Exterior acrylic paint. Devoe Coatings Devflex 4208 , MPI¬164; 1.5 mils DFT.
c. Finish Coat Gloss Level: full gloss.

D. Zinc-Coated Metal: Provide the following finish systems over exterior zinc-coated metal surfaces:

1. Acrylic Finish: Two finish coats over a galvanized metal primer.

a. Primer: Exterior galvanized metal primer. Devoe Coatings Devguard 4160, MPI-135; 2.0 mils DFT.
b. Finish Coat: Exterior acrylic paint. Devoe Coatings Devflex 4208, MPI¬164; 1.5 mils DFT.
c. Finish Coat Gloss Level: full gloss.

E. Aluminum - Roof Fan Housings, Roof Jacks:

1. Acrylic Finish: Two finish coats over a galvanized metal primer.

a. Primer: Exterior galvanized metal primer. Devguard 4160, MPI-135 Primer; 2.0 mils DFT.
b. Finish Coat: Exterior acrylic paint. MPI-164; Devoe Coatings Devflex 4208, 1.5 mils DFT.
c. Finish Coat Gloss Level: full gloss.

3.08 INTERIOR PAINT SCHEDULE

A. Concrete and Masonry (Other Than Concrete Unit Masonry): Provide the following paint systems over interior concrete and brick masonry substrates:

1. Acrylic Finish: Two finish coats over a primer.

    a. Primer: Interior concrete and masonry primer. Devoe DR50801 High Hide Primer, MPI-50; 1.5-2.0 mils DFT.
    b. Finish Coats: Interior acrylic paint. Fuller O'Brien FOB214-XX, MPI-54; 1.5 mils DFT.
    c. Finish Coat Gloss Level: semi-gloss.

B. Gypsum Board: Provide the following finish systems over interior gypsum board surfaces:

1. Acrylic Finish: Two finish coats over a primer.

    a. Primer: Interior gypsum board primer. Devoe DR50801 High Hide Primer, MPI-50; 1.5 mils DFT.
    b. Finish Coats: Interior acrylic paint. Fuller O'Brien FOB214-XX, MPI-54; 1.5 mils DFT.
    c. Finish Coat Gloss Level: semi-gloss.

C. Wood: Provide the following paint finish systems over new interior wood surfaces:

1. Acrylic-Enamel Finish: Two finish coats over a primer.

    a. Primer: Interior wood primer for acrylic-enamel and semigloss alkyd-enamel finishes. Devoe DR51801 Kilstain WB, MPI-39; 1.5 mils DFT.
    b. Finish Coats: Interior acrylic enamel. Fuller O'Brien FOB214-XX, MPI-54; 1.5 mils DFT.
    c. Finish Coat Gloss Level: semi-gloss.

D. Ferrous Metal: Provide the following finish systems over ferrous metal:

1. Acrylic Finish: Two finish coats over a primer.

    a. Primer: Interior ferrous-metal primer. Devoe Coatings Devguard 4160, MPI-79; 2.0 mils DFT.
    b. Finish Coats: Interior acrylic paint. Devoe Coatings Devflex 4208, MPI¬164; 1.5 mils DFT.
    c. Finish Coat Gloss Level: full-gloss.

E. Zinc-Coated Metal: Provide the following finish systems over interior zinc-coated metal surfaces:

1. Acrylic Finish: Two finish coats over a primer.

    a. Primer: Interior zinc-coated metal primer. Devoe Coatings Devguard 4160, MPI-135; 2.0 mils DFT.
    b. Finish Coats: Interior acrylic paint. Fuller O'Brien FOB214-)0K, MPI-541; 1.5 mils DFT.
    c. Finish Coat Gloss Level: semi-gloss.

3.09 INTERIOR STAIN AND NATURAL-FINISH WOODWORK SCHEDULE

A. Waterborne Stain Satin-Varnish Finish:

1. Two finish coats of waterborne clear satin varnish over a sealer coat and waterborne interior wood stain.

a. Filler Coat: Open-grain wood filler. N/A; mils DFT.
b. Stain Coat: Interior wood stain. Devoe PenchromeDF2XX Stain, MPI-90.
c. Sealer Coat: Clear sanding sealer. Devoe Penchrome DF411 Waterborne Clear, MPI-130; 1.5 mils DFT.
d. Finish Coats: Interior waterborne clear gloss varnish. Devoe Penchrome DF411 Waterborne Clear, MPI-130; 1.5 mils DFT.
e. Finish Coat Gloss Level: semi-gloss.

Provide the above finish systems over interior natural finish door surfaces (Doors shall be shop finished to reduce jobsite odor).

END OF SECTION 09901

SECTION 10161 – SOLID PLASTIC TOILET PARTITIONS AND URINAL SCREENS

PART 1 - GENERAL

1.01 SUMMARY:

A. This section includes floor- and wall-anchored solid plastic toilet compartment doors, partitions, stiles, pilasters, and urinal screens.

B. Related Work Described Elsewhere:

1. SECTION 10800 – TOILET ACCESSORIES (grab bars, tissue dispensers, etc.)

C. Products shall be solid plastic (HDPE or equivalent); laminate or phenolic partitions are not included.

1.02 REFERENCES

A. Standards incorporated by reference:

1. Americans with Disabilities Act (ADA) Accessibility Guidelines

2. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.

B. Shop Drawings: Include layout, elevations, partition heights, hardware, anchoring, and clearances.

C. Product Data: Color samples, hardware specifications, and material certificates.

D. Certification: Submit manufacturer’s certificate confirming materials meet or exceed specified requirements.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Minimum 2 years experience installing solid plastic toilet partitions.

B. Accessibility: Comply with ADA requirements (Sections 404, 604, 308, 309).

C. Single-Source Requirement: To the greatest extent possible, provide products from a single manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in original, sealed packaging labeled with manufacturer and brand.

B. Store in dry, protected area; handle carefully to prevent damage.

1.06 WARRANTY

A. Panels, doors, and stiles: 25-year limited warranty against breakage, corrosion,

delamination, and factory defects.

B. Hardware: 1-year warranty against defects in materials and workmanship.

PART 2 – PRODUCTS

2.01 MATERIALS AND CONSTRUCTION

A. General: Solid plastic partitions shall be high-pressure polymer resin forming a single, non-absorbent section with color through the thickness.

B. Exposed surfaces shall be smooth, stain, chemical, graffiti-resistant, and waterproof.

C. Edges: Machined radius between 1/16-inch and 1/4-inch.

D. Doors: Minimum 1-inch thick, with clear width at accessible stalls ≥32 inches.

E. Partitions, Stiles, and Pilasters: Minimum 1-inch thick; pilasters with adjustable floor anchors, leveling devices, studs, and locking nuts.

F. Headrails (overhead-braced compartments): Anodized aluminum alloy with end-caps, anti-grip design, or manufacturer standard.

G. Urinal Screens: Solid plastic, minimum 1-inch thick, wall-hung or floor-mounted.

2.02 HARDWARE AND FITTINGS

A. Materials: Satin-finish Type 316 stainless steel or anodized aluminum. Chrome-plated brass not desired.

B. Door Hinges: Cam-action, adjustable; stainless steel pintles; self-lubricating bushings; anodized aluminum or satin stainless steel housings.

C. Latches: Easy to operate with one hand, operable from outside in emergencies.

D. Door Pulls / Grab Bars: 18 inches, ADA-compliant, mounted on hinge side.

E. Coat Hook/Door Bumper: One per door; mounted at 54 inches (outswing) or 48 inches (inswing) above finish floor.

F. Shoes: Minimum 3-inch trim at floor.

G. Hardware Fasteners: Theft-resistant stainless steel through-bolts or machine screws in factory-installed steel inserts.

2.03 BACKER PLATES, SHIMS, AND BLOCKING

A. Provide galvanized steel or stainless steel backer plates at stud wall anchors.

B. Provide shims, blocking, or transition material for recessed wall surfaces (tile to gypsum board).

PART 3 – EXECUTION

3.01 INSPECTION

A. Installer, Contractor, and Contracting Officer shall examine installation areas.

B. Correct unsuitable conditions before beginning work.

3.02 INSTALLATION

A. Erect partitions, doors, stiles, pilasters, and screens per manufacturer instructions.

B. Ensure units are level, plumb, and true to line.

C. Provide uniform clearances:

1. 1/2-inch maximum between stiles/pilasters and partitions.

2. 1-inch maximum between stiles/pilasters/partitions and walls.

3. 3/16-inch maximum between stiles/pilasters and doors.

A. Anchorage:

1. Concrete or masonry (grouted) – bolts with lead or steel expansion shields.

2. Masonry (ungrouted) or gypsum board – toggle bolts.

E. Shim brackets at recessed wall transitions.

F. Adjust hardware and lubricate moving parts for smooth operation.

3.03 PROTECTION AND CLEANING

A. Protect work of other trades from damage.

B. Clean surfaces with manufacturer-approved cleaners.

C. Repair and restore adjacent surfaces damaged during installation.

D. Remove debris and leave areas clean and neat.

END OF SECTION 10161

DIVISION 10 – SPECIALTIES

SECTION 10200 - METAL WALL LOUVERS

PART 1 – GENERAL

1.01 SUMMARY

A. Provide wall louvers where scheduled and as specified herein.

1.02 QUALITY ASSURANCE

A. Performance Requirements: Where louvers are indicated to comply with specific performance requirements or are specified by model number, provide units whose performance ratings have been determined in compliance with Air Movement and Control Association (AMCA) Standard 500 and equal to the units specified.

B. Thermal Movement: Fabricate exterior components from manufacturer's stock systems which have been designed to provide for expansion and contraction resulting from ambient temperature range of 120 degrees F.

C. Wind Loading: Fabricate exterior components from manufacturer's stock systems which have been tested in accordance with ASTM E 330 to withstand wind velocity in accordance with current ICC IBC.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 013000 - SUBMITTAL PROCEDURES.

B. Manufacturer's Data: Submit copies of manufacturer's product specifications and installation instructions along with shop drawings.

C. Shop Drawings: Submit shop drawings for fabrication and erection. Include plans, elevations, sections, large scale details, materials and thicknesses, and anchorages.

D. Certificates: Submit certificates indicating conformance with performance ratings.

E. Samples: Submit samples of color and finish for factory finished louvers.

1.04 DELIVERY, STORAGE AND PROTECTION

A. Deliver, store and handle products to avoid any distortion or damage due to moisture, physical abuse or other cause. Louvers shall be free from nicks, scratches, and blemishes. Replace defective or damaged materials with new.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Extruded Aluminum: Aluminum extrusions shall conform with ASTM B 221, 6063-T5 or T52 alloy and temper.

B. Fasteners: Fasteners shall be stainless steel. Do not use metals which are corrosive or incompatible with materials joined.

1. Use types, gauges, and lengths to suit unit installation conditions.

2. Use Phillips flat-head machine screws for exposed fasteners, unless otherwise indicated.

C. Anchors and Inserts: Of type, size, and material required for type of loading and installation indicated. Use hardened aluminum or stainless steel anchors and inserts for exterior installations and elsewhere as required for corrosion resistance, Use toothed steel or expansion bolt devices for drilled-in-place anchors.

D. Bituminous Paint: SSPC-Paint 12 (cold-applied asphalt mastic).

2.02 FABRICATION, GENERAL

A. General: Fabricate louvers to comply with requirements indicated for design, dimensions, materials, joinery, and performance with respect to water penetration, strength, durability, and uniform appearance.

B. Size:

1. Fabricate louvers in concrete and masonry walls to outside dimensions indicated, with allowance of 1/4-inch on all sides for sealant joints.

2. Verify sizes with final HVAC shop drawings, including detail dimensions of ductwork, dampers or other fittings abutting louvers.

C. Field Measurements: Verify size, location and placement of louver units prior to fabrication.

D. Preassemble louvers in shop to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

E. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.

F. Fabricate frames, including integral sills, to fit in openings of size indicated with allowances made for fabrication and installation tolerances of louvers, adjoining construction, and perimeter sealant joints.

G. Include supports, anchorages, and accessories required for complete assembly.

H. Provide vertical mullions of type and at spacings indicated but not further apart than recommended by manufacturer for wind exposure specified. Where vertical mullions are not indicated, provide concealed interior stiffeners, blade braces, and increased blade thickness to conform to windloading specified. Where individual units are joined, provide mullion covers at exterior and interior to match frames.

I. Join frame members to one another and to fixed louver blades as follows, unless otherwise indicated, or size of louver assembly makes bolted connections between frame members necessary: With fillet welds, concealed from view; or mechanical fasteners; or a combination of these methods; as standard with louver manufacturer.

2.03 FIXED WALL LOUVERS

A. For convenience and to establish standards of quality and design, the following items are

manufactured by Construction Specialties, Inc. Equal products, accepted by the Project Manager, of the following manufacturers will be accepted:

1. Airolite Co.
2. Greenheck
3. Industrial Louvers, Inc.
4. Ruskin Manufacturing
5. Approved equal

B. Fixed Blade Louvers: Frames and louver blades fabricated from metal of kind and in form specified below; complying with the following requirements:

1. Storm Resistant Louver: Construction Specialties Model RS-5300, 5-inch deep, with 0.0674-inch blade and 0.081-inch frame.

2.04 EXTERIOR ALUMINUM SILL

A. Provide 0.050-inch thick sill flashing of same material and finish as louvers where indicated on the drawings.

2.05 LOUVER SCREENS

A. General: Provide each exterior wall louver with louver screens complying with the following requirements.

1. Screen Location for Fixed Louvers: Interior face, unless otherwise indicated.
2. Combination Bird/Insect Screening: 18 x 16, type 316 stainless steel mesh.
3. Screening can be combined into one frame as approved by manufacturer.

B. Secure screens to louver frames with stainless steel machine screws, spaced at each corner and at 12-inch on center between.

C. Louver Screen Frames: Fabricate screen frames with mitered corners to louver sizes indicated and to comply with the following requirements:

1. Metal: Same kind and form of metal as indicated for louver frames to which screens are attached.
2. Finish: Same finish as louver frames to which louver screens are attached.
3. Type: Rewireable frames with a driven spline or insert for securing screen mesh.

2.06 FINISHES

A. All exposed aluminum surfaces shall be free of scratches and other blemishes. Pre-clean surfaces and provide a conversion coating and provide exposed surfaces of aluminum with a two coat fluoropolymer coating system containing at least 70 percent by weight polyvinylidene fluoride, PVF2 resin, factory-applied, oven baked conforming to AAMA 2605, "Superior Performing Organic Coatings on Aluminum Extrusions and Panels", with a total dry film thickness of not less than 1.2 mils. Color shall be as indicated or as selected by the Project Manager from manufacturer's standard colors.

PART 3 – EXECUTION

3.01 PREPARATION

A. Coordinate setting drawings, diagrams, templates, instructions and directions for installation of anchorages which are to be embedded in concrete construction.

Coordinate delivery of such items to project site.

3.02 INSTALLATION

A. Louvers shall be installed in accordance with manufacturer's directions, approved shop drawings and as shown. Provide all necessary fastenings and anchors required for a complete installation. Units shall be installed plumb, level and in proper alignment with adjacent work.

B. Locate and place louver units plumb, level, and in proper alignment with adjacent work.

C. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.

D. Form closely fitted joints with exposed connections accurately located and secured.

E. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated. Provide closed cell PVC compression gaskets between jambs and sill frame and surrounding construction.

F. Repair finishes damaged by cutting, welding, soldering, and grinding operations required for fitting and jointing. Restore finishes so there is no evidence of corrective work. Return items which cannot be refinished in field to shop, make required alterations and refinish entire unit, or provide new units.

G. Protect galvanized and nonferrous metal surfaces from corrosion or galvanic action by application of a heavy coating of bituminous paint on surfaces which will be in contact with concrete or dissimilar metals.

3.03 ADJUSTING AND PROTECTION

A. Protect louvers from damage of any kind during construction period, including use of temporary protective coverings where needed and approved by louver manufacturer. Remove protective covering at time of Substantial Completion.

B. Restore louvers damaged during installation and construction period, so that no evidence remains of correction work. If results of restoration are unsuccessful, as judged by the Project Manager, remove damaged units and replace with new units.

C. Touch-up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

3.04 CLEANING

A. Periodically clean exposed surfaces of louvers which are not protected by temporary covering, to remove fingerprints and soil during construction period; do not let soil accumulate until final cleaning.

B. Before final inspection, clean exposed surfaces with water and with a mild soap or detergent not harmful to finishes.

END OF SECTION 10200

SECTION 10400 – IDENTIFYING DEVICES

PART 1 - GENERAL

1.01 SUMMARY:

A. Provide all signage as shown and specified herein, including the following:

1. Metal Signs

2. International Symbol of Accessibility (ISA)

B. Sign Locations: As indicated and scheduled.

1.02 SUBMITTALS

A. Submit in accordance with SECTION 01330 – SUBMITTAL PROCEDURES.

B. Manufacturer's Data: Include construction details, materials, dimensions of components, profiles, and finishes for each sign type.

C. Shop Drawings: Provide shop drawings for fabrication and erection of signs. Include:

1. Plans, elevations, large-scale sections.

2. Anchors, grounds, reinforcement, accessories, layout, installation details.

3. Message list for each sign, with large-scale details of wording and layout.

4. Setting drawings, templates, and directions for anchors installed as part of other work.

5. Full-size spacing templates for individually mounted dimensional letters and numbers.

D. Samples: Provide for initial selection and verification:

1. 6-inch sections of extrusions or 4-inch squares of sheet or plate for each finish type/color.

2. Full-size metal sample panels showing graphic image process, colors, and finishes. Acceptable samples will be returned and may be used in the work.

1.03 QUALITY ASSURANCE

A. Single-Source Responsibility: Obtain each type of sign from one manufacturer.

1.04 ACCESSIBILITY COMPLIANCE

A. Signs shall comply with the ADA Standards for Accessible Design and ICC A117.1 for mounting heights, finish, Braille characters, and type characteristics. Refer to DCAB Interpretive Opinions for clarification.

1.05 FONT STANDARDS

A. All text shall use Helvetica Neue – 55 Roman unless otherwise approved by the Contracting Officer.

B. Maintain consistent letter height, spacing, and alignment per drawings and ADA legibility requirements.

1.06 PROJECT CONDITIONS

A. Field Measurements: Take field measurements prior to shop drawings and fabrication. Record on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delays.

PART 2 – PRODUCTS

2.01 MATERIALS

A. General Requirements: Character proportion, color contrast, symbol depth, letter height, Grade II Braille, location, and mounting heights shall comply withADA Standards for Accessible Design/ ICC A117.1, and HRS 103-50. Typeface is Sans-serif,(e.g., Helvetica or Arial equivalent.

B. Anchors and Inserts: Use nonferrous or hot-dipped galvanized anchors and inserts for corrosion resistance. Use toothed steel or lead expansion bolts for drilled-in-place anchors. Furnish inserts for concrete or masonry work as required.

2.02 SIGNS

A. Aluminum signs:

1. Anodized die-stamped aluminum (approx. 3/32-inch thick) or cast aluminum (approx. 1/4-inch thick).

2. Baked-on enamel background finish.

3. Raised letters, symbols; individually cast letters not permitted.

4. One-way, tamper-proof fasteners finished to match background.

B. Acrylic signs:· Acrylic panel (cast PMMA), minimum 1/4-inch thick; clear, matte, or frosted finish as indicated.

1. Subsurface (second-surface) graphics or digitally printed/vinyl-applied graphics on back face, protected by acrylic face; high-contrast colors complying with accessibility requirements.

2. Raised letters, symbols. The room description, unless it is a permanent space such , may be provided by a printed paper insert behind clear acrylic that can be easily and inexpensively replaced as the room function and/or occupants change

3. Mounting: Concealed standoffs, spacers, or adhesive system; stainless steel or aluminum hardware with satin or brushed finish to match design intent.

B. Manufacturers:

1. A.R.K. Ramos Architectural Signage Systems

2. ASE, Inc.

3. Brandy

4. Matthews Bronze

5. Supersine Company

6. Approved equal

2.03 INTERNATIONAL SYMBOL OF ACCESSIBILITY (ISA)

A. Provide ISA in conformance with the ADA Standards for Accessible Design Section 4.30.7 and locations shown on drawings. See DCAB Interpretive Opinions.

2.04 MISCELLANEOUS METAL MESSAGE SIGNS

A. Shape, color, dimensions, symbols, wording, and lettering as shown on drawings.

B. Minimum 0.063-inch white aluminum sheet, conforming to ASTM B 209, alloy/temper 6061-T6.

C. Message silk-screened on face.

D. One-way tamper-proof stainless steel fasteners.

2.05 FINISHES

For colors and surface textures, match indicated selections or Director-approved manufacturer standards.

For metal Finishes, comply with NAAMM Metal Finishes Manual.

PART 3 – EXECUTION

3.01 INSTALLATION

A. General:

1. Install per manufacturer instructions and approved shop drawings.

2. Locate units as indicated; comply with mounting methods.

3. Install level, plumb, and at indicated height. Ensure surfaces free from distortion, per ADA Standards for Accessible Design and ICC A117.1.

B. Metal Signs:

1. Attach to walls/doors using one-way, tamper-proof fasteners.

Provide shields as required. Adhesives or double-stick tape not permitted.

C. Acrylic Signs:

1. Attach to walls using double-coated, closed-cell vinyl foam tape with high-strength acrylic pressure-sensitive adhesive.
2.

3.02 CLEANING AND PROTECTION

A. Clean soiled surfaces per manufacturer instructions at completion.

B. Protect units until acceptance by the Contracting Officer. Remove all tools, debris, and surplus materials.

END OF SECTION 10400

SECTION 10800 – WASHROOM ACCESSORIES

PART 1 - GENERAL

1.01 SUMMARY:

A. Furnish and install washroom accessories complete with mounting devices and related accessories as indicated on the Drawings.

B. Work includes, but is not limited to:

1. Toilet paper holders
2. Grab bars
3. Paper towel dispensers
4. Soap dispensers
5. Mirrors
6. Shower accessories including seats, curtain rods, and hooks
7. Other accessories indicated on the Drawings

C. Related Work Specified Elsewhere:

1. SECTION 01300 – SUBMITTAL PROCEDURES
2. SECTION 07920 – SEALANTS
3. SECTION 09250 – GYPSUM WALLBOARD

1.02 QUALITY ASSURANCE

A. Inserts and Anchorages:

1. Furnish inserts and anchoring devices required for proper installation of washroom accessories.
2. Provide setting drawings, templates, instructions, and directions for installation of anchorage devices.
3. Coordinate delivery with other trades to prevent delay.

B. Structural Requirements:
Fasteners and mounting devices shall meet or exceed accessibility requirements of the ADA Standards for Accessible Design and ICC A117.1.

C. Products:

1. Provide products of the same manufacturer for each type of accessory wherever possible.
2. Provide accessories of consistent design and finish in the same area.

3. Manufacturer labels or stamped names on exposed surfaces will not be permitted unless specified.

4. Provide locks where required or where standard with manufacturer. One key shall operate all locks of the same brand. Provide minimum four keys.

A. Accessibility:
Install accessories in accessible washrooms in accordance with the ADA Standards for Accessible Design and ICC A117.1, whether located in an accessible stall or accessible by all users.

B. Drawings:
Drawings may be diagrammatic. Accessories shown for one stall or room shall be repeated in similar stalls or rooms unless noted otherwise.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 – SUBMITTAL PROCEDURES.

B. Manufacturer's Data:
Submit manufacturer specifications and installation instructions for each washroom accessory.

C. Accessory Schedule:
Submit schedule identifying accessory type, quantity, installation location by room

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver accessories in manufacturer's original packaging.

B. Store materials in clean, dry areas protected from moisture, damage, and vandalism.

C. Do not install damaged products.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Stainless Steel:
AISI Type 302/304, satin finish unless otherwise specified.

B. Galvanized Steel Mounting Devices:
Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.

2.02 MANUFACTURERS

A. Acceptable Manufacturers:

1. Bradley Corporation – Washroom Accessories Division
2. McKinney Parker Products Co.
3. Approved equal

2.03 WASHROOM ACCESSORIES

A. Refer to Drawings for installation locations.

B. Provide the following accessories or approved equal:

1. Toilet Paper Holder (TPH)
   Bobrick B-2888, surface-mounted stainless steel, satin finish, multi-roll.
   Provide one per compartment.

2. Water Closet Stall Grab Bars (GB)
   Bobrick B-6806 Series with concealed mounting and snap flange covers.
   1-1/2 inch outside diameter stainless steel grab bar with satin gripping finish.
   Provide sizes indicated.
   Provide manufacturer metal backer plates 2562 Series and mounting kits compliant with ADA/ABA Section 609.8.

3. Shower Stall Grab Bars (GB)
   Bobrick B-58616 Series with concealed mounting and snap flange covers.
   1-1/2 inch outside diameter stainless steel grab bar with satin gripping surface.
   Provide sizes indicated and manufacturer mounting kits appropriate for substrate.

4. Paper Towel Dispenser (PTD)
   Bobrick B-262, surface-mounted.
   Capacity:
   a. 400 C-fold towels or 525 multi-fold towels

5. Toilet Seat Cover Dispenser
   Bobrick B-221, surface-mounted.
   Capacity: 250 single or half-fold seat covers.

6. Framed Mirror
   Bobrick B-165 Series with stainless steel angle frame.
   Size as indicated on Drawings.

7. Wall Mounted Soap Dispenser (SD)
   Bobrick B-2112, wall-mounted, vandal-resistant.
   Capacity: 40 fluid ounces.

8. Shower Seat
   Bobrick B-5181, folding type 33-inch wide seat, solid phenolic, water-resistant, reversible left or right installation
   Frame and mounting brackets: Type 304 stainless steel
   Minimum load capacity: 360 lbs

9. Soap Dish
   Inpro DSCRSDPL, large diamond corner soap dish.

10. Shower Curtain Rod and Curtain
    Rod: Bobrick B-6047, 18-gauge stainless steel.
    Hooks: Bobrick B-204-1, stainless steel.
    Curtain: Bobrick B-204-3, 70-inch.

11. Robe Hook
    Bobrick B-7672, double contoured stainless steel hook.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine installation areas prior to installation.

B. Verify wall blocking and concealed backer plates are properly installed.

C. Notify the Contracting Officer in writing of conditions that would prevent proper installation.

D. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Install accessories in accordance with manufacturer instructions and locations shown on Drawings.

B. Use concealed fasteners wherever possible.

C. Provide anchors, bolts, backer plates, and fasteners necessary for secure installation.

D. Concealed mounting devices shall be fabricated from the same material as the accessory or from galvanized steel.

D. Exposed fasteners shall match accessory finish.

F. Provide theft-resistant fasteners where possible.

G. Secure accessories firmly to walls and partitions according to manufacturer recommendations and substrate type.

H. Where accessories occur across uneven surfaces (such as between tile wainscot and painted wall above), provide spacers or fillers to eliminate voids and ensure flush installation.

3.03 CLEANING

A. Clean exposed surfaces in accordance with manufacturer recommendations.

B. Restore damaged finishes or replace defective accessories to the satisfaction of the Contracting Officer.

END OF SECTION 10800

DIVISION 13 - SPECIAL CONSTRUCTION

SECTION 13280 - REMOVAL AND DISPOSAL OF ASBESTOS-CONTAINING MATERIAL

PART 1 - GENERAL

1.01 SUMMARY

A. Removal and disposal of asbestos-containing material prior to planned renovation activities.

1.02 PRELIMINARY

A. In performing this asbestos abatement project, all possible safeguards, precautions, and protective measures should be utilized to prevent exposure of any individual to asbestos fibers.

1.03 PATENTED DEVICES, MATERIALS AND PROCESSES

A. The Contractor's use of any patented devices, materials or process in the performance of the work under this contract is governed by the General Conditions as amended.

1.04 WORK SPECIFIED IN THIS SECTION

A. Contractor is responsible for coordinating all work within this Section with contract drawings, contract specifications, and contract documents.

B. All asbestos-containing material (ACM) as identified in SECTION 01715 - EXISTING CONDITIONS - ASBESTOS/ LEAD / HAZARDOUS MATERIAL SURVEY, and/or any asbestos survey report included as part of the contract documents, and which will be impacted/disturbed by planned renovation activity described in the Contract Documents are included as part of the asbestos related work under this Section even if not identified in this Section.

C. Furnish all labor, materials, and equipment necessary to carry out the safe removal of asbestos-containing material in compliance with all applicable laws and regulations, including all incidental and pertinent operations to safely complete this project.

D. Contractor shall treat all asbestos-containing homogeneous area(s) within the project limits as ACM and is included as work under this Section as required to safely complete this project.

E. Homogeneous area(s) that is/are known to be ACM shall be treated as ACM throughout the project limits and is/are included as work under this Section as required to safely complete this project.

F. Suspect ACM not previously tested or identified shall be treated as ACM unless proven otherwise.

G. Contractor shall not conduct any testing unless authorized by the Contracting Officer. The Contractor shall be responsible for all cost associated with additional asbestos testing.

H. Contractor shall not test any suspect ACM previously tested.

I. The asbestos work shall generally include the removal and disposal, as asbestos-containing material, of the following:
   1. Entire roof system (including but not limited to, insulation, caulking, sealants, mastic, waterproofing, etc.) to structural substrate and as required to safely complete this project. Previous testing by the Owner has determined that the roof system contains asbestos.

K. Post-removal encapsulation work shall include the coating of all surfaces in the asbestos regulated area as well as on other surfaces designated on the plans and specifications.

L. Cleaning shall include all work within the complex affected by the removal project.

   In general, the principal items of work shall be as follows:
   1. Protection of all on-site personnel and visitors.

   2. Preparation of work area.

   3. Removal and disposal of asbestos-containing material as specified.

   4. Encapsulation of surfaces noted.

   5. Cleaning.

   6. Removal of temporary plastic coverings.

M. Changes to SECTION 13280 - REMOVAL AND DISPOSAL OF ASBESTOS-CONTAINING MATERIAL of the specifications are not permitted except by the Certified Asbestos Project Designer who designed the project.

N. All work specified in this Section shall be performed by individual(s) who are State of Hawaii - Department of Health certified and registered asbestos workers and/or supervisors. All training and registration must be current and each individual must possess current and valid asbestos ID at all times at the project site. Individuals without a current asbestos ID card onsite shall not be permitted to perform any work relating to this Section.

1.05 COORDINATION WITH OTHER SECTIONS

A. Prior to commencement of work, an annotated description of all existing damaged and missing items shall be submitted to the Contracting Officer. It will be the Contractor's responsibility to repair and/or replace to the Contracting Officer's satisfaction all items identified as damaged and/or missing that cannot be proven to have been in this condition prior to the start of this project.

1.06 SUBMITTALS

A. Submit in accordance with SECTION 01330 - SUBMITTAL PROCEDURES. Submittals shall be submitted in the order listed herein. Failure to do so will result in automatic rejection of submittals. All submittals shall be made to the Contracting Officer no later than 10 consecutive calendar days from award date unless specified otherwise.

B. Certificates: Furnish Contractor certification that the Contractor is experienced with the EPA and OSHA regulations related to asbestos, application, removal, disposal and treatment.

C. Schedules: Detailed asbestos work schedule of actual start and completion dates for each phase of the asbestos removal work and other work specified. The schedule shall be formulated on a day/week basis and include working hours. The schedule shall be updated weekly and 6 copies submitted to the Contracting Officer.

D. Others: Prior to commencement of work but no later than 20 working days before commencement of any on-site project activity, send a written "courtesy" notification" of the proposed asbestos abatement work with copies to the Contracting Officer and to the following agency:

State Department of Health. Indoor and Radiological Health Branch. Asbestos Section, 99-945 Halawa Valley Street, Aiea, Hawaii, 96701.

E. Others: Submit 6 copies of all permits and arrangements for transportation and disposal of asbestos-containing or contaminated materials.

F. Manufacturer's Data: Submit 6 copies of manufacturer's specifications, installation instructions and field test procedures for each material, and all equipment related to asbestos handling and abatement, including other data as may be required to show compliance with these specifications and proposed uses. Indicate the application rate for encapsulant as specified herein. Indicate by transmittal form that a copy of each installation instruction has been distributed to the installer.

G. SDS Sheet(s): Liquid sanders, encapsulants and any other materials brought on-site that are considered as hazardous materials under 29 CFR 1910.1200, shall include Safety Data Sheets.

H. Samples: Submit samples of the following items for approval prior to ordering materials:
   1. Asbestos Encapsulant(s): Six copies of manufacturer's literature including all laboratory data, SDS, and application instructions.

   2. Plastic Sheeting: Three 8-1/2- by 11-inch pieces of each thickness and type with labels indicating actual mil thickness.

   3. Surfactant: Six copies of manufacturer's literature including all laboratory data, SDS, mixing and application instructions.

4. Tapes and Adhesives: Six copies of manufacturer's literature including all laboratory data.

5. Warning Labels and Signs: Six copies of examples of all required signage.

6. Protective Clothing: Six copies of manufacturer's literature on all protective clothing and one sample of each item.

7. Respirator Equipment: Six copies of manufacturer's literature on all respirator equipment.

I. Shop Drawings and Diagrams: Submit to the Contracting Officer 6 copies of shop drawings with the following items as a minimum:
   1. Name and resume of Contractor's onsite Competent Person responsible for compliance with all Federal, State and Local regulations and plans and specifications. No work shall be performed unless the designated Competent Person is onsite.

   2. Descriptions of any equipment to be employed not discussed in this Section.

   3. Project specific work procedures (detailed plan of work procedures and methods) to be employed for this project.

   4. Location of decontamination area near or adjacent to the regulated work area.

J. Certificates: Furnish employee certification that employees have had instructions on the dangers of asbestos exposure, on respirator use, and decontamination, from an EPA approved training facility, as required by AHERA Regulation 40 CFR 763, Appendix C to Subpart E, April 30, 1987 and Asbestos Model Accreditation Plan (MAP), and Hawaii Administrative Rules, Chapter 11-501, 11-502, 11-503, and 11-504.

K. Submit to the Contracting Officer documentation that each and every individual, including foremen, supervisors, other company personnel or agents, and any other individual who may be exposed to airborne asbestos fibers, who may be responsible for any aspects of abatement activities, or who is allowed or permitted to enter areas where such exposure may occur, has had instruction on the hazards and health effects of asbestos exposure. Also submit to the Contracting Officer documentation that personnel stated above have had instructions on the nature of the activities and operations which create a risk of asbestos exposure and the necessary protective steps, on use and fitting of respirators (in accordance with qualitative procedures as detailed in OSHA 1926.1101, Qualitative and Quantitative Fit Testing).Procedures, on protective dress, on use of showers, on entry and exit from the work areas under normal and emergency conditions, on all aspects of work procedures and protective measures, and on all provisions of OSHA 1926.1101, and that each and every employee understands this instruction. This documentation shall be an outlined format of the instruction and shall be signed by all employees to be engaged on this project and by all individuals before being allowed within the project site and must include an acknowledgment and an assumption of the potential risk of exposure by that individual and a release of liability of the State, Consultant, and

Contracting Officer for any such exposure. The Contractor shall be responsible for keeping the documentation up to date and subsequent submittals to the Contracting Officer before any additional employee or individual, not currently on this list, is allowed within the project site.

L. Others: Submit to the Contracting Officer documentation from a physician that all employees or agents who may be exposed to airborne asbestos have been provided with an opportunity to be medically monitored to determine whether they are physically capable of working while wearing the respirator required without suffering adverse health effects. In addition, documentation that all individuals permitted within the project site have received medical monitoring or had such monitoring made available to them as required in OSHA 1926.1101. The Contractor must be aware of and provide information to the examining physician about unusual conditions in the work place environment (e.g. high temperatures, humidity, chemical contaminants) that may impact on the employee's ability to perform work activities. The Contractor shall keep and make available to all affected individuals a record and the results of such examinations.

M. Others: Submit to the Contracting Officer a copy of the Contractor's medical surveillance program prepared in accordance with all applicable laws, and all medical examination documentation for all employees to be used on this project.

N. Others: Submit to the Contracting Officer a copy of the Contractor's respiratory protection program prepared in accordance with all applicable laws. The Contractor shall also submit fit test data on all employees to be used on this project.

O. Others: Submit to the Contracting Officer a copy of the Contractor's hazard communication program prepared in accordance with all applicable laws.

P. Others: Submit to the Contracting Officer a copy of the Contractor's site emergency action plan prepared in accordance with all applicable laws.

Q. Product Data: Submit manufacturer's certification that vacuums conform to ANSI Z9.2-79.

R. Product Data: Submit notarized certifications that respirators meet all requirements of NIOSH and EPA. Document NIOSH approval of all respiratory protective devices utilized on site. Include manufacturer's certification of HEPA filtration capabilities for all cartridges and filters.

S. Other: When rental equipment is to be used in abatement areas or to transport asbestos-contaminated waste, a written notification concerning intended use of the rental equipment must be provided to the rental agency with a copy submitted to the Contracting Officer.

T. Other: Maintain a log of all personnel other than the Contractor's employees and agents who enter the work area while asbestos abatement operations are in progress until after final clearance is received that the work area is asbestos free. The log shall contain the following information as a minimum and certified copies shall be submitted to the Contracting Officer weekly:
   1. Date of visit.

2. Visitor's name, employer, business address, and telephone number.

3. Time of entry and exit from work area.

4. Purpose of visit.

5. Type of protective clothing and respirator worn.

6. Certificate of release signed and filed with the Contractor.

U. Other: Maintain a daily log documenting the dates and times of, but not limited to, the following items:
   1. Meetings; purpose, attendees, brief discussion.

   2. Visitations; authorized and unauthorized at the job site.

   3. Special or unusual events, i.e., equipment failures, accidents.

   4. Air monitoring tests and test results.

   5. Documentation of Contractor's completion of the following:
      a. Inspection of work area preparation prior to start of removal and daily thereafter.

      b. Progress of the work.

      c. Contractor's inspections prior to encapsulation of the substrate from which such materials have been removed.

      d. Removal of waste materials from work area.

      e. Decontamination of equipment (list items).

      f. Contractor's daily inspection for visual dust and debris.

      g. Daily certification by the Contractor’s onsite competent person that all work has been performed in accordance with all applicable laws, specifications and approved work plan.

V. Other: Submit copies of all transport manifests, trip tickets and disposal receipts for all asbestos-containing waste materials removed from the work area.

W. Other: Submit name, address and telephone number of air monitoring testing laboratory selected for OSHA sample analyses and reporting of airborne fiber concentrations along with evidence that the air monitoring testing laboratory is a successful participant in the Proficiency Analytical Testing (PAT) program.

1.07 PRODUCT HANDLING

A. Delivery and Storage of Materials: Deliver materials to the site in original packages, containers or bags fully identified with manufacturer's name, brand and lot number. Store materials in a dry well-ventilated space, under cover, off

the ground and away from surfaces subject to dampness or condensation as approved by the Contracting Officer. Material that becomes contaminated with asbestos shall be disposed of in accordance with applicable regulations. Replacement materials shall be stored outside the contaminated work area until abatement is completed.

1.08 PROTECTION

A. Site Security: The work area is to be restricted only to authorized, trained, and protected personnel. These may include the Contractor's employees, employees of Subcontractors, the Contracting Officer and his representatives, State and local inspectors, responding emergency personnel and any other designated individuals. A list of authorized personnel shall be established prior to job start.
   1. Entry to the work area by unauthorized individuals shall not be permitted without the express approval of the Contracting Officer and any such entry shall be reported immediately to the Contracting Officer by the Contractor.

   2. A Visitor's Log shall be maintained.

   3. The Contractor shall have control, subject to approval of the Contracting Officer, of security in the work area and in proximity of Contractor's equipment and materials.

B. Site Protection and Safety: As a minimum, follow the requirements of EPA, HIOSH (State of Hawaii), OSHA and NIOSH. Take all necessary precaution to ensure there is no asbestos contamination to those areas not included in the work schedule.

C. Protective Covering: The Contractor shall provide and install additional protective covering to protect the project on an "as required" or "upon request" by the Contracting Officer basis. Protective covering shall be clean plastic sheets.

D. Safeguarding of Property: The Contractor shall take whatever steps necessary to safeguard his work and also the property of the State and other individuals in the vicinity of his work area during the execution of this Contract. He shall be responsible for and make good on any and all damages by his employees' negligence. Do not load structure with weight that will endanger the structure.

E. Completed Work: The Contractor shall provide all necessary protection for surfaces encapsulated under this section.

1.09 ABBREVIATIONS

A. ANSI: American National Standards Institute, Inc.

B. CFR: Code of Federal Regulations.

C. HIOSH: Hawaii Occupational Safety and Health, Department of Labor and Industrial Relations, State of Hawaii.

D. EPA: U.S. Environmental Protection Agency.

E. NESHAPS: National Emission Standards for Hazardous Air Pollutants.

F. MAP: Asbestos Model Accreditation Plan.

G. NIOSH: National Institute for Occupational Safety and Health.

H. OSHA: Occupational Safety and Health Administration.

1.10 GENERAL REQUIREMENTS

A. Furnish Contractor certification, within 10 consecutive calendar days from award, that the Contractor is experienced with the EPA and OSHA regulations related to asbestos, application, removal, disposal, and treatment.

B. Furnish employee certification, within 10 consecutive calendar days from award, that employees have had instructions on the dangers of asbestos exposure, on respirator use and decontamination, from an EPA approved training facility, as required by AHERA Regulation 40 CFR 763, Appendix C to Subpart E, April 30, 1987 and asbestos Model Accreditation Plan (MAP), and Hawaii Administrative Rules, Chapter 11-501, 11-502, 11-503 and 11-504.

C. Contractor shall examine and have at all times in his possession at his office (one copy) and in view and readily available at each jobsite (one copy) a current issue of the following publications:

1. Title 29, Code of Federal Regulations, Part 1926.1101 Construction Industry, Occupational Safety and Health Administration (OSHA), U.S. Department of Labor.

2. State of Hawaii: Occupational Safety and Health Standards, Title 12, Subtitle 8, Part 1.

3. State of Hawaii: Occupational Safety and Health Standards, Title 12, Chapter 203 - Hazard Communication.

4. Title 40, Code of Federal Regulations, Part 61, Subparts A and M, National Emission Standards for Hazardous Air Pollutants, U.S. Environmental Protection Agency (EPA).

5. Guidance for Controlling Asbestos-Containing Materials in Buildings (purple book), U.S. Environmental Protection Agency (EPA).

6. Title 34, Code of Federal Regulations, Part 231, Appendix C, Procedures for Containing and Removing Building Materials Containing Asbestos, EPA.

7. ANSI Z88.2-80 Practice for Respiratory Protection.

8. EPA, Final Response to the Asbestos Hazard Emergency Response Act (AHERA), 40 CFR, Part 763, Subpart E.

9. EPA, Model Accreditation Plan, 40 CFR Part 763 Subpart E, Appendix C.

10. State of Hawaii, Asbestos Requirements, Title 11, Chapters 501 through 504.

11. Project plans and specifications and approved Work Plan.

D. The Contractor shall comply with the above requirements and any applicable State and City and County regulations. Where conflict or any inconsistency among requirements, this specification exists, and approved work plan exists the more stringent requirements shall apply. Ignorance of the above requirements and any applicable State and City and County regulations resulting in additional cost to the Contractor shall not be paid by State.

E. All regulations shall govern over these specifications, except that any more stringent specification (including approved work plan) or specification providing greater protection against asbestos exposure, injury, loss or liability shall control to the extent permitted by regulation. Any question regarding conflict or inconsistency between specifications and/or regulations should be directed to the Contracting Officer.

F. The Contractor shall give, at a minimum of 10 working days' notification to the Contracting Officer's Designated Person (Air Monitoring Consultant) prior to the start of any asbestos related work.

G. The Contractor shall not begin with any work without the Contracting Officer's Inspector/Air Monitoring Consultant present onsite.

H. WHENEVER APPROVAL OF THE CONTRACTING OFFICER IS REQUIRED PRIOR TO PROCEEDING WITH OTHER WORK, THE FOLLOWING SHALL BE COMPLIED WITH:
   1. The Contractor shall allow the Contracting Officer 24 hours from notification to respond to the request for inspection.

   2. The Contractor shall designate one person (either a foreman or superintendent) who will be authorized to request inspections. The name of the designated person shall be submitted in writing to the Contracting Officer prior to commencing with the work. Requests from any other person will not be considered an official request.

   3. The designated person, when requesting inspection, shall provide the following information:
      a. Name of caller.

      b. Building and rooms to be inspected.

      c. Work phase of inspection, as specified.

1.11 DEFINITIONS

A. Abatement: Procedure to control fiber release from asbestos-containing building materials.
   1. Removal: All herein specified procedures necessary to remove asbestos-containing materials from an area and disposal of the material at an approved site in an acceptable manner.

   2. Post-Removal Surface Encapsulation: Procedures necessary to coat surfaces from which asbestos-containing materials have been removed and where designated on the drawings to control any residual fiber release.

B. Air Monitoring: The process of measuring the fiber content of a specific, known volume of air in a period of time.

C. Amended Water: Water to which a surfactant has been added to reduce water surface tension and thereby provide a more rapid penetration.

D. Authorized Visitor: The Contracting Officer, his representatives, air monitoring personnel, or a representative of any regulatory or other agency having jurisdiction over the project.

E. Holding Area: A secure area used for the storage of double bagged asbestos-containing material before removal from the project site to an approved disposal site.

F. Fixed Object: A unit of equipment or furniture in the work area which cannot be removed from the work area without dismantling.

G. Friable Asbestos: Asbestos-containing material which can be crumbled to dust, when dry, under hand pressure.

H. HEPA Filter: A High Efficiency Particulate Air filter capable of trapping and retaining 99.97 percent of monodispersed particles 0.3 micrometers or greater in diameter.

I. HEPA Vacuum Equipment: Vacuuming equipment that utilizes a High Efficiency Particulate Air (HEPA) filter.

J. Post-Removal Encapsulation: A liquid material which can be applied to surfaces from which asbestos-containing material has been removed to control the possible release of residual fibers, either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components (penetrating encapsulant).

K. Surfactant: A chemical-wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Plastic Sheeting: Minimum thickness of 6-mil polyethylene film.

B. Plastic Bags: Minimum thickness 6-mil polyethylene film labeled as specified hereinafter.

C. Tapes: Tape shall be capable of sealing joints of adjacent sheets of polyethylene and for attaching polyethylene sheets to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including the use of amended water.

D. Adhesives: Adhesives shall be capable of sealing joints of adjacent sheets of polyethylene and for attachment of polyethylene sheet to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions.

E. Asbestos Encapsulant: Encapsulant shall be non-flammable with a Class A fire classification. Encapsulant shall be odorless when dry, and compatible with materials applied by others (separate contract). All references to application at strengths below full strength shall be as approved by the product manufacturer for the intended use.

F. Warning Labels and Signs: As required by OSHA regulation 29 CFR 1926.1101. Permanent signage for access panels and areas with encapsulated asbestos-containing materials shall be as specified hereinafter. Signage shall be as approved by the Contracting Officer.

G. Protective Clothing: As specified hereinafter. The Contractor is cautioned that during the summer and fall, there is usually a tremendous shortage of coveralls due to the consumption of these items by mainland Contractors for summer abatement projects. The Contractor shall have all the required sets of coveralls required for this project on island prior to the start of work. There will be no time extension for the unavailability of coveralls or related equipment.

H. Other Materials: Provide all other materials, which may be required to properly prepare and complete this project.

2.02 TOOLS AND EQUIPMENT

A. General: Provide and fabricate suitable tools for the asbestos abatement procedures.

B. Water Sprayer: Airless or a pressure sprayer for amended water application as applicable.

C. HEPA Vacuum: High Efficiency Particulate Air (HEPA) vacuum.

D. Air Purifying Unit: Air filtration system equipped with HEPA filter.

E. Paint/Encapsulant Sprayer: Airless type.
   1. Scaffolding and Shoring: As required to accomplish the work and meet all applicable safety regulations.

   2. No power-driven tools or equipment shall be permitted for removal of asbestos-containing materials.

F. Other tools and equipment as necessary.

2.03 PERSONNEL PROTECTION REQUIREMENTS

A. The Contractor acknowledges he alone is responsible for instruction and enforcement of personnel protection requirements and that these specifications provide only a minimum acceptable standard.

B. The Contractor acknowledges that all person(s) within the regulated work area shall not remove respiratory protection. Any person(s) observed removing respiratory protection within the regulated area on more than one occasion will not be permitted to continue any work on the project.

C. Provide workers with personally-issued and marked respiratory equipment approved by NIOSH.
   1. Initial cleaning and work area preparation shall be performed in half mask dual cartridge negative pressure respirators approved for asbestos.
   2. All removal work related to the removal and bagging of asbestos material shall be performed in air purifying respirators equipped with cartridges approved for asbestos.

D. Loading and Unloading of Double-Bags at the Project Site and Landfill: Half-face dual-cartridge respirators equipped with cartridges NIOSH approved for asbestos.

E. Other: Should any condition, for any reason, be encountered where the exposure level exceeds the action levels provided by the Contracting Officer, the Contractor shall stop work and determine the causes of the excessive levels. Should the action level continue to be exceeded, the Contractor shall stop work. Work will not be resumed until approval is received from the Contracting Officer.

F. Beards: Bearded persons will not be permitted in the regulated work area.

G. Provide workers with sufficient sets of disposable protective full-body clothing consisting of material impenetrable by asbestos fibers and of the proper size for each individual to accommodate movement without tearing. Clothing shall consist of full-body coveralls, footwear, gloves, and headgear. Provide hard hats as required by applicable safety regulations. Disposable clothing shall be disposed of as asbestos-contaminated waste.

H. Protective clothing shall be worn by all personnel within the work area from the start of the removal through post-removal encapsulation work, until the Contractor has received acceptance of the asbestos-containing material removal and post-removal encapsulation work.

I. All persons conducting any work within the regulated work area shall remain fully suited (dressed) with protective clothing at all times. Any persons(s) observed partially suited while conducting work within the regulated area on more than one occasion will be required to be removed from performing any work on the project.

J. No visitors shall be allowed in work areas, except as authorized by the Contracting Officer and specified herein. Provide authorized visitors with suitable respirators with fresh cartridges. Provide authorized visitors with suitable disposable protective full-body clothing consisting of material impenetrable by asbestos fibers and of the proper size for each individual to accommodate movement without tearing. Such clothing shall consist of full-body coverall, footwear, gloves and headgear, including hard hat when required and insulated rubber boots or equal.

K. The Contractor shall include in his Bid the expense of a total of 4 changes of clothing and respirators per day for each day of asbestos abatement work for visitor's use. The quantity shall accumulate and may be used at any time during asbestos abatement work at the discretion of the Contracting Officer.

L. All electrical systems used for asbestos abatement operations shall as a minimum be protected with "Ground Fault Circuit Interrupters" selected and installed in strict accordance with the manufacturer's instructions, the National Electric Code and all other pertinent codes. All GFCI inside the regulated work area must be of waterproof type.

M. Additional safety equipment (e.g., hard hats meeting the requirements of ANSI Z89.1-1981, eye protection meeting the requirements of ANSI Z87.1-1979, safety shoes meeting the requirements of ANSI Z41.1-1967, disposable PVC gloves), as necessary, shall be provided to all workers and authorized visitors.

PART 3 - EXECUTION

3.01 WORK AREA PREPARATION

A. Work by the Asbestos Abatement Contractor for roof related work: Step 1
   1. Posting of Caution Signs: Post caution signs in and around the work area to comply with 29 CFR 1926.1101 and all other Federal, State and local requirements. Signs shall be posted at a distance sufficiently far enough away from the work area to permit a person to read the sign and take the necessary protective measures to avoid exposure.

   2. Critical Seals (Barriers): Seal all windows, doors, and openings to the regulated work area with plastic sheeting. Plastic sheeting is to remain in place for the duration of the asbestos abatement or until specified by the Contracting Officer or Project Designer.

   3. Inspect the Building Openings: At the beginning of each work day, the Contractor shall inspect and ensure that all doors, windows and other openings of affected building(s) and adjacent buildings are closed and/or sealed prior to the start of any work.

B. Work by the Asbestos Abatement Contractor: Step 2
   1. Temporary utility services are also generally specified under the General Specifications. Requirements specified herein amplify the General Specifications as they apply to the asbestos abatement operations.

   2. Temporary Electricity and Lighting:
      a. Existing electrical service to the building may be used for temporary electrical power during abatement and replacement work; however, the electrical power to the work areas will be shut down during abatement.

      b. The Contractor shall verify the location(s) of available electrical service outside the work areas and shall tie into the existing system at a location approved by the Contracting Officer.

c. Install circuit and branch wiring, with area distribution boxes located so that power is available throughout the project by use of power cords.

3. Temporary Water:
   a. Existing domestic water service to the building may be used for temporary water during construction. Location of tie-in shall be approved by the Contracting Officer.

   b. Install branch piping with taps as necessary throughout the construction area.

4. Temporary Sanitation Facilities:
   a. Existing toilet facilities may be used by the Contractor's personnel during asbestos abatement work. Personnel must be in a decontaminated state before using temporary toilet facility.

   b. Maintain toilet facility in a clean and sanitary condition in compliance with applicable codes and ordinances.

5. Temporary Fire Protection:
   a. Provide and maintain temporary fire protection equipment during the asbestos abatement operations.

   b. Equipment shall be of the appropriate type to fight fires associated with the existing building materials and those materials used during the construction operations.

C. Work by the Asbestos Abatement Contractor: Step 3
   1. Cover All Roof Penetrations: Cover all roof opening penetrations with a single layer of 10-mil polyethylene sheeting or 2 layers of 6-mil polyethylene sheeting.

D. Work by the Asbestos Abatement Contractor: Step 4
   1. AFTER STEP 3 IS COMPLETED, NOTIFY THE CONTRACTING OFFICER AND GET HIS APPROVAL PRIOR TO PROCEEDING WITH REMOVAL WORK AS SPECIFIED HEREINAFTER.

   2. Commencement of work shall not start until:
      a. Pre-abatement submissions, notifications, postings and permits have been provided and are satisfactory to the Contracting Officer.

      b. All equipment for abatement, clean-up and disposal are on hand.

      c. All worker training (and certification) is completed.

      d. Contractor receives written permission from the Contracting Officer to commence abatement.

3.02 ASBESTOS FIBER CONCENTRATIONS IN THE WORK AREA

A. The maximum permissible exposure to airborne concentrations of asbestos fibers within the work area shall be 0.05 fiber per cubic centimeter (f/cc) of air. The work shall stop whenever these limits are exceeded and the Contractor

shall remedy the condition prior to commencing the work. The expenses resulting from the delays shall be the Contractor's responsibility and shall not be paid by the State.

3.03 PRIOR TO ASBESTOS REMOVAL

A. Install critical barriers (seals) at all openings within the work area.

B. Inspect the Building Openings: At the beginning of each work day, the Contractor shall inspect and ensure that all doors, windows and other openings of affected building(s) and adjacent buildings are closed and/or sealed prior to the start of any work.

3.04 REMOVAL OF ASBESTOS-CONTAINING MATERIAL

A. The Contractor shall stop all work if there is the possibility of rain or high winds for roof related work. The Contractor shall be responsible for any and all damages due to his negligence.

B. Continuously throughout the work shift and at the end of the day the Contractor perform a visual inspection and clean up any and all visible debris resulting from his work inside and outside of the building.

C. The Contractor at all times shall utilize "wet methods" when removing, bagging and disposing of asbestos materials. The asbestos material shall be sprayed with amended water containing a wetting agent (surfactant). The use of amended water must be strictly controlled so as not to over saturate the material. A fine "mist" spray of the amended water shall be applied in small sections to reduce fiber release preceding the removal of material. Saturate the material sufficiently to wet it to the substrate without causing excessive dripping or delamination of the material. Spray the asbestos material repeatedly during the removal operations to maintain a wet condition and to minimize asbestos fiber dispersion. Mechanical means/methods of removal shall not be permitted.

D. The Contractor shall spray encapsulant on surfaces where asbestos material was removed.

E. The asbestos-containing material shall be removed in small sections. Before beginning the next section, the material shall be packed while still moist into individual sealable leak tight double plastic bags, sealed airtight, and gently lowered to the ground. “Burrito” style wrapping of debris is not permitted. No removed material, whether bagged or unbagged, shall be allowed to fall to the ground.

F. At the end of each work shift and during the work shift the Contractor shall immediately clean up any visible debris on the roof (where applicable), at ground level, inside and around the regulated work area, and inside of the building resulting from the work. All debris must be immediately cleaned up and bagged accordingly.

G. Maintain roof in watertight condition during the course of the project. Do not leave substrate exposed during non-working hours. As a result of failure to adhere to this requirement, the Contractor shall repair any damage to the satisfaction of the Contracting Officer, at no cost to the State.

H. It shall be the responsibility of the Contractor to verify the quantity and complexity of the material and satisfy himself as to the total work and/or effort to remove said material as required to safely complete this project.

I. Protect the existing building substrates and components from damage from tools and equipment used during asbestos removal and encapsulation procedures. Damage to the buildings as a result of the Contractor's negligence will require the Contractor to repair the damage at no cost to the State.

J. All work specified in this Section shall be performed by individuals who are State of Hawaii - Department of Health certified and registered. All training and registration must be current and each individual must possess current and valid asbestos ID at all times at the project site. Individuals without a current asbestos ID card onsite shall not be permitted to perform any work relating to this Section.

3.05 DECONTAMINATION PROCEDURES

A. Exiting Work Area: Require all Workers to adhere to the following personal decontamination procedures whenever they leave the work area or at the end of work shift.

1. Before leaving the regulated work area, require the worker to remove the first or outer layer of disposable coveralls. Disposable coveralls are placed in a bag for disposal with other contaminated material. Respiratory protection should not be removed at this time.

2. The worker then proceeds to a designated area, ground level, and then removes the second set of disposable coveralls. Disposable coveralls are placed in a bag for disposal with other contaminated material. Only after leaving the designated area, respiratory protection may be removed.

3.06 DISPOSAL OF ASBESTOS-CONTAINING MATERIAL AND ASBESTOS-CONTAMINATED WASTE (SOLID AND/OR LIQUID)

A. As the work progresses and waste is generated, the Contractor shall transport all waste generated each day to the authorized disposal site, unless specifically approved by the Contracting Officer to delay the disposal operation. Transport all waste to the pre-designated disposal site in accordance with EPA regulations.

B. The Contractor shall pay the waste disposal charge for use of the landfills. All expenses for landfills (including, but not limited to, any additional testing, special handling, labeling and coordination required by the landfills) shall be the complete responsibility of the Contractor. The Contractor shall provide the required advance notice of all deliveries to the landfill(s). Delivery time shall be as directed by the landfill operator.

C. Asbestos-containing material, asbestos contaminated material and PPE shall be double-bagged in leak tight bags with OSHA label referenced in these specifications. Label shall state:

DANGER
CONTAINS ASBESTOS FIBERS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
DO NOT BREATHE DUST
AVOID CREATING DUST

D. Asbestos-containing material waste material to be transported off the facility site, shall be labeled with the name of the wastes generator and the location at which the waste was generated, as prescribed by EPA regulation 40CFR61.150 (NESHAP). Additionally, label bags in accordance with OSHA requirement 29 CFR 1926.1101.

E. Vehicles used for transporting waste to the disposal sites shall have a completely enclosed, lockable storage compartment. Storage compartments shall be plasticized and sealed with a minimum of one layer of 6-mil polyethylene sheeting on the sides and top, and 2 layers of 6-mil polyethylene on the floor (bed). If allowed by OSHA, waste materials, except those with sharp edges (metal lath, screws, nails, metal suspension system, etc.), properly double-bagged or wrapped may be transported to the disposal site without being placed in drums if the transporting vehicle is prepared as specified above in addition to any more stringent requirements by OSHA. The compartments shall be thoroughly wet-cleaned and/or HEPA vacuumed following the disposal of each load at the disposal sites at an approved location with electrical power as required. At the conclusion of the asbestos abatement, or before transport vehicles are used for other purposes, the polyethylene sheeting shall be properly removed and disposed of as contaminated waste. After this has been accomplished, compartments shall once again be wet cleaned and HEPA vacuumed in order to eliminate all debris.

F. The Contractor shall mark vehicles used to transport asbestos-containing waste material during the loading and unloading of waste so that signs are visible, and displayed in such a manner and location that a person can easily read the legend.
   1. The legend shall state:

DANGER
ASBESTOS DUST HAZARD
CANCER AND LUNG DISEASE HAZARD
Authorized Personnel Only

   2. Additionally, the legend shall conform to the NESHAP requirement specified in 40 CFR Part 61.149(d)(1)(iii).

G. Workers unloading bags at the disposal sites shall be dressed in full-body protective clothing and dual-cartridge respirators.

H. Waste disposal manifest forms shall be properly completed to assure custody and disposal of all asbestos-containing material and asbestos-contaminated waste at approved disposal sites. Forms shall be kept on file as directed by the Contracting Officer with copies submitted to the Contracting Officer the next working day after each trip.

I. NOTE: IT IS THE CONTRACTOR'S RESPONSIBILITY TO ASSURE THAT ANY LANDFILL USED FOR DISPOSAL OF ASBESTOS-CONTAINING OR ASBESTOS-CONTAMINATED WASTE IS APPROVED FOR THAT PURPOSE.

J. Bags must be placed in the hole for burial. Dumping of bags from the containers will not be allowed. However, if a bag is torn and if acceptable by the landfill, the entire container may be buried.

K. Liquid waste shall not be disposed into the sanitary sewer system, filtered or unfiltered, without appropriate City and County permit(s).

L. The Contractor shall pay the waste disposal charge for use of the landfills. All expenses for landfills shall be the complete responsibility of the Contractor. The Contractor shall provide the required advance notice of all deliveries to the landfill(s). Delivery time shall be as directed by the landfill operator.

3.07 CLEANING OF THE WORK AREA

A. Should the Contractor fail to commence work to clean-up and make the work area asbestos free within one working day after the clean-up has been requested by the State, the Contracting Officer may without further notice and without termination of contract, do the clean-up and deduct the cost thereof from the contract price.

B. Surfaces to be encapsulated shall be wet-wiped and/or HEPA vacuumed just prior to the application of encapsulant.

C. Post-removal encapsulation of affected areas shall begin as specified hereinafter when approved by the Contracting Officer.

3.08 POST-REMOVAL ENCAPSULATION OF AFFECTED AREAS

A. An approved encapsulant diluted to a maximum of 1/3 strength of the manufacturer's normal application rate for the intended substrate shall be applied using airless spray equipment to all areas of the project where asbestos-containing materials have been removed.

3.09 FINAL CLEAN-UP

A. Remove signage required by the asbestos removal and encapsulation work. Signage applicable to job site safety and the performance of the remaining portions of the work shall remain as applicable.

B. Completely remove all temporary materials. Clean and repair damage caused by temporary installations or use of temporary facilities. Restore existing facilities to their original condition as approved by the Contracting Officer.

Employee Release Form
(Sample)

Employee Name:

_____

Employee Address:

_____

Employee Telephone No.:

_____

Name of Training Center, Certificate Number and Expiration Date:

_____

Classification of Worker:

_____

Have you had in the past or present, any respiratory problems?

Yes _____ No _____

Have you worked in the past with asbestos or fiberglass type materials?

Yes _____ No _____

The project you will be working on involves the use of asbestos and the removal of the asbestos from the building. Asbestos is considered a health hazard.

The company is supplying all necessary safety clothing and working conditions required and necessary for your protection from asbestos hazard.

You shall be instructed at the commencement of the job on the required use of safety equipment, clothing, working conditions, and procedures. These must be rigidly adhered to. Smoking is not permitted in the work areas. Disregarding of safety instructions shall result in instant dismissal.

I acknowledge that safety instructions have been given to me by the company at my work commencement and I am thoroughly conversant with them and I have answered the above questions truthfully.

Signed (Employee) Date

_____ _____

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

PROJECT NAME: _____ DATE:_____

PROJECT ADDRESS: _____

_____

CONTRACTORS NAME: _____

WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAS BEEN LINKED WITH VARIOUS TYPES OF CANCER. IF YOU SMOKE AND INHALE ASBESTOS FIBERS THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS GREATER THAN THAT OF THE NON-SMOKING PUBLIC.

Your employer's contract with the Owner for the above project requires that: You be supplied with the proper respirator and be trained in its use. You be trained in safe work practices and in the use of the equipment found on the job. You receive a medical examination. These things are to have been done at no cost to you.

RESPIRATORY PROTECTION: You must have been trained in the proper use of respirators, and informed of the type respirator to be used on the above referenced project. you must be given a copy of the written respiratory protection manual issued but your employer. You must be equipped at no cost with the respirator to be used on the above project.

TRAINING COURSE: You must have been trained in the dangers inherent in handling asbestos and breathing asbestos dust and in proper work procedures and personal and area protective measures. The topics covered in the course must have included the following:

Physical characteristics of asbestos
Health hazards associated with asbestos
Respiratory protection
Use of protective equipment
Pressure Differential Systems
Work practices including hand on or on-job training
Personal decontamination procedures
Air monitoring, personal and area

MEDICAL EXAMINATION: You must have had a medical examination within the past 12 months at no cost to you. This examination must have included: health history, pulmonary function tests and may have included an evaluation of a chest x-ray.

By signing this document, you are acknowledging only that the Owner of the building you are about to work in has advised you of your rights to training and protection relative to your employer, the Contractor.

Signature_____ Social Security Number_____

Printed Name_____ Witness _____

END OF SECTION

SECTION 13283 - DISTURBANCE OF LEAD-CONTAINING MATERIAL

PART 1 - GENERAL

1.01 SUMMARY

A. Disturbance of materials containing lead during planned renovation activities.

B. Disturbance of materials containing lead during planned demolition activities.

C. All paint shall be considered to be lead-based paint until proven otherwise.

D. All paint shall be considered to contain lead until proven or confirmed that no lead is present.

E. Lead painted testing did not confirm the absence of lead in painted surfaces tested.

1.02 DESCRIPTION OF WORK

A. Whenever lead paint (lead-containing or lead-based) or lead material is being disturbed, this Section shall take precedence over others.

B. The preparation and treatment of existing paint with lead (lead-containing or lead-based) material on various surfaces. Lead paint (lead-containing or lead-based) removal work shall be selective and only where existing paint (lead-containing or lead-based) is peeling, blistering, flaking, delaminating, chalky, in poor condition, not adhering to the existing substrate and/or fails adhesion testing.

C. Contractor shall coordinate work in this Section with contract drawings and documents to determine where painted surfaces, regardless of condition, are going to be disturbed to complete work required.

D. Contractor shall coordinate work in this Section with contract drawings and documents to determine where painted surfaces (lead-containing or lead-based), regardless of condition, are going to be disturbed and are required to be completely removed (deleading) to structural substrate to complete work required.

E. Demolition of surfaces and/or components containing lead and/or lead paint (lead-containing or lead-based).

F. All preparation of lead paint (lead-containing or lead-based) shall be identified in advance so that the preparation/treatment of surfaces will be one continuous operation.

G. Contractor is responsible for coordinating all work within this Section with contract drawings, contract specifications, and contract documents.

H. This section is being implemented so that the planned work can be accomplished in a safe manner.

1.03 WORK SPECIFIED IN THIS SECTION

A. Furnish all labor, materials and equipment necessary to carry out the safe preparation and treatment of lead-containing paint in compliance with all applicable laws and regulations from all surfaces, including all incidental and pertinent operations to safely complete this project.

1.04 COORDINATION WITH OTHER SECTIONS

A. It will be the Contractor's responsibility to repair and/or replace, to the State's satisfaction, all items identified as damaged and/or missing in connection with this work that cannot be proven to have been in this condition prior to the commencement of this project. It is the Contractor's responsibility to bring to the attention of the Contracting Officer, any discrepancies in the plans and specifications prior to starting any work.

1.05 CONTRACTOR USE OF PREMISES

A. General: The Contractor shall cooperate fully with the State, during the project execution to minimize conflicts.

B. Pollution Control: The Contractor shall not contaminate the air, water, soil or other items with hazardous materials such as cleaning solutions, lead-containing paint debris and waste, etc. The Contractor shall immediately clean the contaminated area and dispose of the waste at his own expense if determined by the Contracting Officer to be contaminated. The Contracting Officer shall have the authority to immediately stop the work and order the Contractor to clean the contaminated site.

C. Use of the Site:
   1. Confine operations at the site to the areas permitted under the Contract. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the work while at the project site.

   2. Do not unreasonably encumber the site with materials or equipment. Confine stock-piling of materials and location of storage to the areas authorized by the Contracting Officer.

1.06 COMMENCEMENT OF WORK

A. The Contractor shall not commence work unless the following requirements have been met. These requirements must be met each time work that calls for the disturbance of lead-containing paint is to begin in a new work area.

B. Submittals: All pre-treatment submittals, notifications, posting and permits have been provided and are satisfactory to the Contracting Officer.

C. Equipment: All equipment for preparation, clean-up and disposal are on hand.

1.07 SUBMITTALS

A. Submit in accordance with SECTION 01330 - SUBMITTAL PROCEDURES.

B. Submittals shall be submitted in the order listed herein. Failure to do so will result in automatic rejection of submittals.

C. General: All submittals shall be made to the Contracting Officer no later than 10 consecutive calendar days from award date unless specified otherwise.

D. Schedule of Work: Contractor shall submit detailed lead-based and/or lead-containing paint disturbance schedule. Project schedule shall indicate the actual start and completion dates for each phase of the work.

E. Shop Drawing and Diagram: Contractor shall submit the following.
   1. Name of Contractor's onsite Competent Person responsible for compliance with all Federal, State and Local regulations and plans and specifications.

   2. Preparation of the work area.

   3. Any personal protective equipment including respiratory protection and protective clothing approved by the Contracting Officer.

   4. Employees who will participate in the project, including delineation of experience, training, and assigned responsibilities during the project.

   5. Decontamination procedures for the personnel, work area and equipment.

   6. Work methods and procedures to be used during the removal of loose, peeling, flaking, chalky and/or blistering paint and during demolition of surfaces containing lead paint including methods to suppress dust emissions during the disturbance of lead-based and/or lead-containing paint.

   7. Required air monitoring procedures and sampling protocols when the likelihood of airborne exposure of lead-containing dust and fumes are probable.

   8. Procedures for handling and transporting waste materials.

   9. Procedures for final decontamination and clean-up.

   10. A sequence of work and performance schedule in coordination with other trades.

   11. Emergency procedures.

F. Product Data: The Contractor shall submit samples or product data sheet for approval. Product data sheet items shall include manufacturer's name, trade name, catalog number, size, specification reference, applicable federal and military specification references, and all other information necessary to establish contract compliance.

G. SDS Sheet: Liquid sanders, encapsulants and any other materials brought on-site that are considered as hazardous materials under 29 CFR 1910.1200, shall include Safety Data Sheets.

H. Other: The Contracting Officer with the Contractor may inspect the work area wherein all associated activities will occur and submit a statement signed by both, agreeing on building and fixture condition prior to the commencement of work.

I. Certificate - Documentation for Instruction:
   1. Submit documentation satisfactory to the Contracting Officer that the Contractor's employees, including foreman, supervisors and any other company personnel or agents who may be exposed to airborne lead dust or who may be responsible for any aspects of lead-containing paint removal activities, have received training in accordance with OSHA lead in construction standard for all workers disturbing lead-containing paint.

   2. Submit to the Contracting Officer, a written respiratory protection program meeting the requirements of 29 CFR 1910.134 (b) (d) (e) and (f), documentation that all employees using respirators have received the training specified in this Section and documentation of respirator fit-testing for all Contractor employees and agents who must wear negative pressure respirators.

J. Other - Documentation from Physician: The Contractor shall submit documentation from a physician that all employees or agents who may be exposed to airborne lead-containing dust or fumes have been medically monitored to determine whether they are physically capable of working while wearing the respirator required without suffering adverse health effects. In addition, the Contractor shall document that his personnel have received medical monitoring as required by 29 CFR 1926.62.
   1. Before exposure to lead dust or fumes, the Contractor will provide workers with a comprehensive medical examination as required Federal Register/Volume 55, No. 189; and 29 CFR 1926.62 or whichever is stricter for the operation being performed. This examination will not be required if adequate records show the employees have been examined as required by the aforementioned regulations within the last year.

   2. The Contractor shall provide information to the examining physician about unusual conditions in the work place environment that may impact on the employee's ability to perform work activities; a copy of 29 CFR 1910.1025; Federal Register/Volume 55, No. 189; a description of the affected employee's duties as they relate to the employee' s exposure; the employee's representative exposure level or anticipated exposure level; and description of any personal protective and respiratory equipment used or to be used; and information from previous medical examinations of the affected employee that is not otherwise available to the examining physician.

1.08 GENERAL REQUIREMENTS

A. The work specified herein shall include the preparation of work area, preparation and/or other special treatment procedures, demolition, and transportation and disposal procedures as required of lead-containing materials by persons trained, knowledgeable and qualified in the techniques of handling and disposing of lead-containing and lead-contaminated materials, and the subsequent cleaning of contaminated areas. This work shall be performed in compliance with all applicable federal, state and local regulations.

B. The Contractor shall submit documentation within 10 consecutive calendar days of award, that employees have had instructions on the dangers of lead exposure on respirator use and decontamination.

C. The Contractor shall give, at a minimum, 10 working days notification to the State's Inspector/Air Monitoring Consultant prior to the start of any lead paint related work.

D. The Contractor shall not begin with any work without the State's Inspector/Air Monitoring Consultant present onsite.

E. Applicable Standards and Guidelines: All work under this contract, and any other trade work conducted with the project, shall be performed in strict accordance with all applicable federal, state and local regulations, standards and codes governing lead-containing paint preparation, removal, disposal, treatment, transportation and disposal of lead materials.
   1. The most recent edition of any relevant regulation, standard, document code shall be in effect.

   2. The Contractor shall have copies of all standards, regulations, codes and other applicable documents available at the work site in an area assigned to the Contractor throughout the execution of this project.

F. Specific Statutory and Regulatory Requirements:
   1. Office of Public and Indian Housing, Department of Housing and Urban Development: Lead Paint Guidelines dated June 1995.

   2. Title 29 Code of Federal Regulations Part 1926.62, Safety and Health Standards (Lead Exposure in Construction, May 1993).

   3. Title 29 Code of Federal Regulations Part 1910.134, Respiratory Protection.

   4. Title 40 Code of Federal Regulations Part 261, Identification and Listing of Hazardous Waste.

   5. Title 40 Code of Federal Regulations Part 262, Standards Applicable to Generators of Hazardous Waste.

   6. Title 40 Code of Federal Regulations Part 263, Regulations Hazardous Waste Transporters.

   7. Federal Register/Vol. 54, No. 131; Tuesday, July 11, 1989. Department of Labor, Occupational Safety and Health Administration; 29 CFR Parts 1910, 1915, 1917 and 1918; Occupational Exposure to Lead; Statement of Reasons; Final Rule.

G. Alternative Procedures:
   1. Requests for Alternative Procedures: Procedures described in this specification are to be used at all times. However, if specified procedures cannot be used, a request must be made in writing to the Contracting Officer providing details of the problem encountered and recommended alternatives.

2. Requirements for Alternative Procedures: Alternative procedures shall provide equivalent or greater protection than the procedures that they replace.

3. Approval of Alternative Procedures: Any alternative procedure must be approved in writing by the Contracting Officer before implementation.

1.09 DEFINITIONS

A. Abatement: Procedure to control lead dust release from lead-containing paint.

B. Removal: All herein specified procedures necessary to remove lead paint that is peeling, blistering, flaking, chalky, delaminating, in poor condition, not adhering to the existing substrate, fails adhesion testing, going to be disturbed in an acceptable manner and/or the removal of all paint regardless of condition to structural substrate.

C. Action Level (AL): Employee exposure averaged over an 8-hour period, without regard to the use of respirators, to a particular airborne concentration. OSHA requirements become effective at this level. Lead: 30 micrograms/cubic meter.

D. Air Monitoring: The process of measuring the content of a specific, known, volume of air in a stated period of time. NIOSH Method 7082 or 7702 shall be used to determine airborne lead concentration.

E. Authorized Visitor: The Contracting Officer, their representatives, air monitoring personnel, or representative of any regulatory or other agency having jurisdiction over the project.

F. Contaminated Area: An area where unwanted toxic or harmful substances have been introduced.

G. Fixed Object: A unit of equipment or furniture in the area which cannot be removed from the work area without dismantling.

H. HEPA Filter: A High Efficiency Particulate Air filter capable of trapping and retaining 99.97 percent of particulate greater than 0.3 micron in length.

I. HEPA Vacuum Equipment: Vacuuming equipment that utilizes a High Efficiency Particulate Air (HEPA) filter.

J. Holding Area: A secure area used for the storage of properly contained lead-containing material before removal from the project site to an approved disposal site.

K. Lead: Metallic lead, all inorganic lead compounds, and inorganic lead soaps. Excluded are all other organic lead compounds.

L. Lead-based Paint: Paint or other surface coatings that contain lead equal to or in excess of one milligram per square centimeter or 0.5% by weight.

M. Lead-Containing Paint: Lead-containing paint, lead-based paint and/or paint containing any amount of lead.

N. Lead Control Area: An Area where lead-containing paint removal, treatment and preparation operations are performed which is isolated by physical boundaries to prevent unauthorized entry of personnel and to prevent the spread of lead dust, paint chips or debris.

O. Lead Paint: Lead-containing paint, lead-based paint and/or paint containing any amount of lead present.

P. Permissible Exposure Limit (PEL): The employer shall ensure that no employee is exposed to concentrations greater than the PEL as determined from an 8-hour time weighted average. Lead: 50 micrograms/cubic meter.

Q. Personal Monitoring: Sampling of lead paint dust concentrations within the breathing zone of an employee to determine the 8-hour time weighted average. The samples shall be representative of the employee's work tasks. The breathing zone shall be considered an area within 12 inches of the nose or mouth of an employee.

R. Plasticizing: Procedures necessary to use polyethylene sheeting, adhesives and (or) taping.

1.10 ABBREVIATIONS

A. ANSI - American National Standards Institute, Inc.

B. CFR - Code of Federal Regulations

C. EPA - U.S. Environmental Protection Agency

D. HIOSH - Department of Occupational Safety and Health, Department of Labor and Industrial Relations, State of Hawaii

E. NIOSH - National Institute for Occupational Safety and Health

F. OSHA - Occupational Safety and Health Administration

G. NESHAPS - National Emissions Standards for Hazardous Air Pollutants

H. LBP - Lead-based Paint

PART 2 - PRODUCTS

2.01 MATERIALS

A. Plastic Sheeting: Minimum thickness is 6-mil polyethylene film.

B. Tapes: Tape shall be capable of sealing joints of adjacent sheets of polyethylene and for attaching polyethylene sheets to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including the use of amended water. Silver cloth duct tape, minimum 2 inches wide; red or orange tape, minimum 2 inches wide for exit arrows.

C. Adhesives: Adhesives shall be capable of sealing joints of adjacent sheets of polyethylene and for attachment of dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water.

D. Warning Labels and Signs: As required by OSHA regulation 29 CFR 1926.62 and CFR. 55 No. 189 and as approved by the Contracting Officer.

E. Protective Clothing: The Contractor shall have all the required sets of coveralls required for this project prior to the start of work. There will be no time extension for the unavailability of coveralls or related equipment.

F. Liquid Sanders: Product shall be specifically designed for the preparation of paint where dry sanding is not allowed or not appropriate. Liquid sanders are not to be used to remove paint.

G. Other Materials: Provide all other materials which may be required to prepare properly and complete this project.

2.02 TOOLS AND EQUIPMENT

A. General: Provide and fabricate suitable tools for the lead treatment/preparation procedures.

B. Other tools and equipment as necessary to accomplish the specified work.

2.03 PERSONNEL PROTECTION REQUIREMENTS

A. The Contractor acknowledges that he alone is responsible for the instruction and for enforcing personnel protection requirements, and that these specifications provide only a minimum acceptable standard. If other potentially hazardous materials are used, the Contractor shall comply with all applicable regulations that exist for that particular hazardous material and to ensure worker safety and health.

B. Respiratory Protection: The Contractor shall provide all respiratory protection to workers in accordance with the submitted written respiratory protection program, which includes all items in 29CFR1910.134(b)(l-II).

C. Protective Clothing:

1. Clothing: The Contractor shall provide clothing including head, hands, foot and full body protection consisting of material impenetrable by bulk material in sufficient quantities and adequate size for all workers, and Authorized Visitors. Disposable or reusable clothing are acceptable, however, disposable clothing shall be disposed of in accordance with all federal, state and local regulations.

2. Miscellaneous Safety Equipment: The Contractor shall provide hard hats (meeting the requirements of ANSI Standard Z89.1-1981), protective eyewear (meeting the requirements of ANSI Standard Z87.1-1979), and disposable gloves to all workers. Safety shoes (meeting the requirements of ANSI Standard Z41.1-1987) may be required for some activities.

3. Footwear: The Contractor shall require appropriate footwear for all workers.

PART 3 - EXECUTION

3.01 POTENTIAL LEAD HAZARD

A. The disturbance or dislocation of lead-based and/or lead-containing materials may cause lead-containing dust to be released into the atmosphere, thereby creating a potential health hazard to workmen, building occupants, and neighboring residences. Apprise all workers supervisory personnel, subcontractors and consultants who will be at the job site of the seriousness of the hazard and of proper work procedures which must be followed.

B. Where in the performance of the work, workers, supervisory personnel, subcontractors or consultants may encounter, disturb, or otherwise function in the immediate vicinity of any identified lead-containing materials, take appropriate continuous measures as necessary to protect all building occupants from the potential hazard of exposure to respirable airborne lead dust and ingestible lead-containing materials. Such measures shall include at the minimum, the procedures and methods described herein, and compliance with regulations of applicable federal, state and local agencies.

3.02 LEAD-CONTAINING MATERIAL

A. Lead-based paint was not detected at the painted surface locations tested. Lead-containing paint was detected at some of the painted surface locations tested. Lead painted components may be present, as the lead concentration of some painted surface locations tested were below lead paint analyzer level of detection of 0.01mg/cm^2.

1. This Section applies to lead-containing painted components that will be disturbed during surface preparation and treatment, demolition, and other activities and as described herein. It does not apply to painted components that do not contain lead, or lead-containing paint that will not be disturbed in any manner during the work to be performed under this contract. The Contracting Officer shall have the authority to require special engineering controls described under this Section of any lead painted components that are disturbed.

3.03 WORK AREA PREPARATION

A. Posting of Caution Signs: The Contractor shall post caution signs in accordance with OSHA regulations at any location and approaches to a location where airborne concentrations of lead may exceed ambient background levels. The Contractor shall post signs at a distance sufficiently far enough away from the work area to permit an employee to read the sign and take the necessary protective measures to avoid exposure. Additional signs may need to be posted following construction of work place barriers.

B. Isolation Barriers: Isolation barriers shall be installed in accordance with the Contractor's approved work plan wherever it is necessary to protect the public, employees of the facility and non-working personnel from leaded dust. The isolation barriers shall provide sufficient protection from contaminating the exterior of the work area.

C. Inspect the Building Openings: At the beginning of each work day, the Contractor shall inspect and ensure that all doors, windows and other openings of affected building(s) and all surrounding buildings are closed or sealed.

3.04 LEAD PAINT TREATMENT/PREPARATION PROCEDURES

A. General:

1. Provide temporary utilities, security, safety, worker protection, clean-up and disposal of waste materials as described in this section and elsewhere in these specifications.

2. Isolating the Work Area: The Contractor shall isolate work area, with barricades and signs to prevent un-authorized persons from entering into the work area.

3. The Contractor shall post signs at a distance sufficiently far enough away from the work area to permit an employee to read the sign and take the necessary protective measures to avoid exposure. Additional signs may need to be posted following construction of work place barriers.

4. The Contractor shall at all times suppress dust emissions while disturbing any material containing lead paint. No visible emission will be permitted.

5. Re-establishment of the work area shall only occur when clean-up procedures have been completed, all repairs necessitated by paint treatment activities have been performed, no visible lead paint debris is present and all work has been documented to the satisfaction of the Contracting Officer and/or it’s representative. Any variation from this shall be at the Contracting Officer’s discretion.

6. Ground contamination of lead-containing paint and other paint preparatory materials shall be cleaned before leaving the premises.

7. If the Contractor's operation results in lead levels in the soil, near or adjacent to the work area, which exceeds 200 parts per million in play areas and in non-play areas, the Contractor shall pay for any State coordinated remediation and testing to clean up the soil to a lower lead concentration.

B. Paint Removal: Paint removal shall only be allowed in locations where paint is peeling, blistering, flaking, chalky, not adhering to the existing substrate, and/or fails adhesion testing.

C. Paint Stripping:

1. Work included under this sub-section includes the furnishing of all labor, materials and equipment required to remove lead-containing paint by scraping and/or brushing after the paint has been softened by the application of a chemical stripping agent.

2. Chemical removers shall contain no methylene chloride products. Chemical removers shall be compatible with, and not harmful to the substrate to which they are applied. Chemical removers used for interior surfaces shall not raise or discolor the surface being abated.

3. Chemical stripping agent neutralizers may be used on exterior surfaces only. Neutralizers shall be compatible with and not harmful to the substrate that they are applied to. Neutralizers shall be compatible with the stripping agent that has been applied to the surface substrate.

4. Chemical stripping agents and neutralizers shall be applied in accordance with the recommendations of the manufacturer. Care must be taken to adhere to all SDS, health/safety code and other specification section requirements. Stripping agents shall not be allowed to penetrate wood or other fibrous substrates.

5. Apply paint strippers in accordance with the manufacturer's printed instructions by spray equipment or trowel to a minimum thickness of 1/8 inch. Cover past with fibrous rubbing gently to remove air and pierce remaining air bubbles with knife. Leave on for period of not less than 24 hours or longer according to test patch findings.

6. Neutralize Area: Rinse off the residue with water into an approved collection-filtration system and neutralize the area in accordance with the manufacturer's recommendations.

7. Protective Clothing: All workers shall be protected by rubber or polyethylene full body coverage suits, boots, gloves, face shield and protective head gear. Avoid contact with eyes and skin.

D. Abrasive Removers Machine Sander:
   1. Work included under this sub-section includes the furnishing of all labor, materials, and equipment required to remove lead paint by machine sanding using a HEPA filtered vacuum system, as called out in these specifications.

   2. Sanders shall be of the dual action, rotary action, orbital or straight line system type, capable of being fitted with a HEPA dust pick-up system.

   3. Wet sanding shall be conducted by hand or pneumatic driven sanders. Electric powered sanders shall not be used for wet sanding.

   4. Dry sanding shall only be done on flat surfaces which allow the HEPA dust collection system come into tight contact with the surface being sanded. Surfaces to be sanded shall be wide enough to allow maximum efficiency of the HEPA dust collection system.

   5. All lead-containing paint shall be removed down to the bare substrate surface. In cases that some pigment may remain embedded in wood grain and similar porous substrate, care shall be taken to avoid damage to the substrate with the sanding machine. If the pigment cannot be removed without damaging the substrate, the Contractor shall notify the Contracting Officer for further instructions.

E. Paint Preparation:
   1. Work included under this Sub-Section includes the furnishing of all labor, materials and equipment required to prepare lead-containing painted components by non-abrasive or wet abrasive techniques.

2. Application:
   a. Protective clothing shall be worn at all times during the work. Tyvek suits or coveralls shall be worn with protective shoes and gloves.

   b. Plastic drop cloths shall cover the floor and other areas not being repainted.

   c. Remove from surface to be repainted all foreign matter such as tape and gum.

   d. Where existing finish remains clean, tight and firm, prepare surface by using a commercial paint preparation solution (liquid sandpaper) or wet sandpaper to remove the glossy coat.

   e. Completely wipe or wash all surfaces with mineral spirits, T.S.P. (tri-sodium phosphate), or other appropriate solution as required to remove any accumulated film of wax, oil, grease, smoke, dust, dirt, chalky or other foreign matter which would impair bond of, or bleed through new finish.

   f. Immediately, spot prime with specified primer, areas where bare metal is exposed.

   g. Dispose of waste, gloves, suits, plastic, and disposable equipment in accordance with 40 CFR 261 and specifications herein.

3. Ground contamination of lead-containing paint and other paint preparatory materials shall be cleaned before leaving the premises.

3.05 LEAD PAINT - DEMOLITION PROCEDURES

A. General:
   1. Provide temporary utilities, security, safety, worker protection, clean-up and disposal of waste materials as described in this Section and elsewhere in these specifications.

   2. Isolating the Work Area: The Contractor shall isolate work area, with barricades and signs to prevent un-authorized persons from entering into the work area.

   3. The Contractor shall post signs at a distance sufficiently far enough away from the work area to permit an employee to read the sign and take the necessary protective measures to avoid exposure. Additional signs may need to be posted following construction of work place barriers.

   4. The Contractor shall at all times suppress dust emission while disturbing any material containing lead paint. No visible emission will be permitted.

5. Re-establishment of the work area shall only occur when clean-up procedures have been completed, all repairs necessitated by paint treatment activities have been performed, no visible lead paint debris is present and all work has been documented to the satisfaction of the Contracting Officer and/or it's representative. Any variation from this shall be at the Contracting Officer's discretion.

6. Ground contamination of lead-based and/or lead-containing paint and other paint preparatory/demolition materials shall be cleaned before leaving the premises.

7. If the Contractor's operation results in lead levels in the soil, near or adjacent to the work area, which exceeds 200 parts per million in play areas and in non-play areas, the Contractor shall pay for any State coordinated remediation and testing to clean up the soil to a lower lead concentration.

3.06 STORAGE AND DISPOSAL REQUIREMENTS

A. Storage Requirements: The Contractor shall store Non-Hazardous and Hazardous Waste Material within the Contractor's trailer or secured storage area.
   1. Bagged Waste Material: If bagged waste material is to be stored, the Contractor shall use dumpsters for this purpose. The dumpsters shall have doors and tops that can be closed and locked to prevent vandalism, wind dispersion of lead dust, or other disturbance of the bagged debris. The Contractor shall not store unbagged lead-containing waste, liquid waste or non-lead-containing waste in these dumpsters. The Contractor also shall ensure that the bags in the dumpsters are not damaged. The Contractor shall post warning signs on the dumpsters as specified in OSHA requirement 29 CFR 1926.62.

   2. Drummed Waste Material: If waste material is to be stored in drums, the Contractor shall use a secured storage area for this purpose. This storage area shall have doors that can be closed and locked to prevent vandalism. The Contractor shall only store waste material contained in drums or dumpsters in the secured area. The Contractor shall ensure that the drums in this secured storage area is not damaged. The Contractor shall post warning signs outside the secured storage area as specified in the OSHA requirement 29 CFR 1926.62.

   3. Dumpster Waste Material: If waste material is to be stored in dumpster, the Contractor shall use a secured storage area for this purpose. Dumpster shall have doors that can be closed and locked to prevent vandalism. The Contractor shall only store non-hazardous waste material in the dumpster(s). The Contractor shall ensure that the dumpsters are not damaged. The Contractor shall post warning signs outside the secured storage area as required by OSHA, DOT and any other applicable Federal, State and Local regulations.

B. Waste Disposal and Landfill Requirements:
   1. Representative sample(s), of paint chip debris and demolition debris, shall be submitted for hazardous/special/regulated waste determination (characterization) as required by the landfill and all applicable regulations. All testing and any other associated costs related to hazardous/special/regulated

waste determination shall be paid for by the Contractor. If results are below the EPA limit(s) and characterized as a non-hazardous waste, the materials shall be disposed of at a landfill approved for such purposes. The Contractor shall submit to the Contracting Officer, documentation that the waste material removed from the work area has been accepted by the landfill owner.

2. If waste characterization or other required landfill testing result(s) of the demolition and/or paint chip debris are above EPA limits or landfill limits the materials shall be disposed of at an approved facility for receiving hazardous, regulated or special waste materials. The Contractor shall be responsible for all disposal costs including all transportation fees. The Contractor shall submit to the Contracting Officer, documentation that the waste material removed from the work area has been accepted by the hazardous materials approved landfill owner.

C. Disposal of Non-Hazardous Lead-Containing Waste:
   1. Notifying Landfill Operator: If required by the landfill or its agents, the Contractor shall advise the landfill operator with sufficient time prior to transportation of the quantity of material to be delivered.

   2. Unloading: Upon reaching the landfill, the Contractor's trucks are to approach the dump location as close as possible for unloading the Lead-Containing Waste Material.
      a. The Contractor shall inspect containers as they are unloaded at the disposal site. Material in damaged containers shall be repacked in empty containers, as necessary.

      b. The Contractor shall carefully place waste Containers on the ground at the disposal site, not push or throw the containers out of the trucks.

   3. Clean-up Procedures:
      a. If containers are broken or damaged, the Contractor shall leave the containers in the truck and clean the entire truck and its contents using HEPA vacuums and wet cleaning methods, until no visible residue is observed.

      b. Following the removal of all contaminated waste, the Contractor shall decontaminate the truck cargo area using HEPA Vacuums and/or wet cleaning methods until no visible residue is observed. Polyethylene sheeting shall be removed and discarded as lead-contaminated waste material, along with contaminated cleaning materials and protective clothing, in containers at the disposal site.

D. Recycling of Non-Hazardous Lead-Containing Waste:
   1. The Contractor is responsible for all cost relating to materials with lead painted surfaces to be recycled. It is the responsibility of the Contractor to determine which materials may or may not be recycled.

   2. The Contractor is to perform all testing, at his own cost, to ensure the material to be recycled may be accepted and recycled in accordance the recyclers permit conditions.

3. It the material cannot be recycled, the Contractor shall be responsible for the proper disposal of the debris at his own cost.

3.07 TESTING/AIR MONITORING

A. Contractor Responsibilities:

1. The Contractor shall provide the personal monitoring and necessary records for all of the Contractor's employees as required by OSHA (29 CFR 1926.62), and all other applicable law.

2. Area air/dust monitoring and testing which becomes necessary in order to follow up on work by the Contractor that has been rejected as not conforming to the requirements shall be the responsibility of the Contractor. The full cost of additional monitoring and testing shall be borne by the Contractor, and shall be deducted from the final contract payment in the event of working double shifts to meet deadlines, working longer hours than stated in the accepted proposal, for working beyond the scheduled completion date, violating regulations, not conforming to specifications and plans, or for failing clearance test requirements.

END OF SECTION

SECTION 13288 - TESTING/AIR MONITORING

PART 1 - GENERAL

1.01 SUMMARY

A. Project/air monitoring requirements during asbestos and lead disturbance related activities.

1.02 ASBESTOS/LEAD PAINT PROJECT MONITORING BY CONTRACTING OFFICER

A. Daily project air monitoring and testing shall be supplied by the Contracting Officer for the purpose of:
   1. Verifying compliance with the specifications listed in SECTION 13280 - REMOVAL AND DISPOSAL OF ASBESTOS-CONTAINING MATERIAL.

   2. Verifying compliance with the specifications listed in SECTION 13283 - LEAD-CONTAINING PAINT CONTROL MEASURES.

   3. Insuring that the State’s legally required documentation is collected;

   4. Providing engineering control during the project.

1.03 COORDINATION WITH OTHER SECTIONS

A. The testing/air monitoring requirements included in the scope of work for any testing/air monitoring consultants or inspectors, and all applicable Federal, State, and local regulations shall be coordinated with this section.

PART 2 - PRODUCTS

Not applicable to this section.

PART 3 - EXECUTION

3.01 ASBESTOS/LEAD PAINT DISTURBANCE CONTRACTOR RESPONSIBILITIES

A. The Contractor shall be responsible for providing employee exposure monitoring and maintaining necessary records for all of the Contractor's employees as required by OSHA, Hawaii State Law and all other applicable law.

B. The Contractor shall obtain the legally required reports for air monitoring as part of the contract.

C. Monitoring information developed by the Inspector's activities while under the contract with the State shall be for the use of the Contracting Officer. The information will be available and offered to the Contractor when developed, but not thereafter, and shall not waive the Contractor's obligations stated elsewhere in this section.

D. Air monitoring and testing which becomes necessary in order to follow up on work by the Contractor which is rejected as not conforming to the requirements shall be the responsibility of the Contracting Officer. However, the full cost of such additional monitoring and testing shall be borne by the Contractor, and shall paid directly to the State's Air Monitoring Consultant no later than prior to the final contract payment.

E. Employee exposure (OSHA) air monitoring that is part of the Inspector's (Testing/Air Monitoring Consultant) scope of work shall be accommodated by the Contractor and shall not be assumed to be the monitoring required of the Contractor by law or regulation.

F. The Contractor shall contact in writing, the State's Air Monitoring Consultant and DOE Construction Management within 10 days of Award.

G. The Contractor shall give, at a minimum, 10 working days notification to the State's Inspector/Air Monitoring Consultant prior to the start of any asbestos and lead paint disturbance related work.

3.02 TESTING/AIR MONITORING INSPECTOR (AIR MONITORING CONSULTANT)

A. The Inspector (Testing/Air Monitoring Consultant) will insure that the applicable specifications are being followed using the methods and requirements of the applicable scope of work.

B. The Inspector (Testing/Air Monitoring Consultant) shall have the authority to instigate engineering control measures during the project and stop work if deemed necessary.

C. Ambient air monitoring shall be performed to detect airborne fibers concentrations inside and outside the work area for the duration of the project.

D. Ambient air monitoring shall be performed to detect airborne lead concentrations inside and outside the work area for the duration of the project.

E. Environmental air monitoring shall be performed by the Inspector/Air Monitoring Consultant. Payment to the Inspector/Air Monitoring Consultant shall be by the State. Any testing initiated by the Contractor shall be paid for by the Contractor and shall be included in the contract amount.

F. Throughout the entire disturbance and cleaning operations, project monitoring shall be conducted to ensure that the Contractor is complying with this specification, EPA, OSHA and any applicable State and local government regulations.

END OF SECTION

SECTION - 14210 ELECTRIC TRACTION ELEVATORS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Electric Traction Elevators.

B. Products Supplied but Not Installed Under this Section:

1. Hoist Beam

2. Pit Ladder

3. Inserts mounted in block walls for rail attachments

C. Work Supplied Under Other Sections:

1. Temporary lighting, including temporary lighting in hoistway for machine space with switch located in hoistway on the strike jamb side of top landing door.

2. Main line disconnects for each elevator.

a. One fused three phase permanent power in building electrical distribution room

3. Hoistway ventilation shall be in accordance with local and national building code requirements.

4. Guide Rail Support shall be structurally adequate to extend from pit floor to top of hoistway, with spans in accordance with requirements of authority having jurisdiction and final layouts.

5. Removable barricades at all hoistway openings, in compliance with OSHA 29 CFR 1926.502 in addition to any local code requirements.

6. Lifeline attachments capable of withstanding 5000 lb load in accordance with OSHA 29 CFR 1926.502. Provide a minimum of 2 at the top, front of each hoistway.

7. Pit lighting: Fixture with switch and guards. Provide illumination level equal to or greater than that required by ASME A17.1/CSA B44 2000, or applicable version.

8. Control space lighting with switch. Coordinate switch with lighting for machine space as allowable by code.

D. Related sections:

1. SECTION 015000 – TEMPORARY FACILITY AND CONTROLS

2. SECTION 033000 - CAST-IN-PLACE CONCRETE

3. SECTION 042000 - UNIT MASONRY

4. SECTION 055000 - METAL FABRICATIONS

5. SECTION 071600 - CEMENTITIOUS WATERPROOFING

6. Section 230000 - Heating, Ventilating, and Air Conditioning
7. Section 260000 – Electrical
8. Section 263000 - Electric Power Generating and Storing Equipment
9. Section 273000 - Voice Communications
10. Section 283100 - Fire Detection and Alarm
11. Section 310000 – Earthwork

E. Industry and government standards:

1. ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities
2. ADA 2010 Standards for Accessible Design
3. ANSI/NFPA 70, National Electrical Code
4. ANSI/NFPA 80, Standard for Fire Doors and Fire Windows
5. ASME/ANSI A17.1, Safety Code for Elevators and Escalators.
6. CAN/CSA C22.1, Canadian Electrical Code
7. CAN/CSA-B44, Safety Code for Elevators and Escalators

1.02 DESCRIPTION OF ELEVATOR

A. Elevator Equipment: KONE MonoSpace® 500 DX gearless traction elevator

B. Equipment Control: KCM831

C. Drive: Non Regenerative

D. Quantity of Elevators: 1 Elevator

E. Landings: 3

F. Openings: 3 Front Openings, 0 Back Openings

G. Travel: 20’ 0”

H. Rated Capacity: 2,000 lb

I. Rated Speed: 150 FPM

J. Clear Inside Dimensions: (W x D) 5' 9" x 4' 1/2"

K. Cab Height: 8'

L. Clear height under suspended ceiling: 7'-6"

M. Entrance Width and Type: 36" and Right Opening

N. Entrance Height: 7'-0"

O. Main Power Supply: 208 V Volts + 5%, three-phase

P. Operation: Simplex

Q. Machine Location: Inside the hoistway mounted on car guide rail

R. Control Space Location: Remote room

S. Elevator Equipment shall conform to the requirements of seismic zone: Seismic

T. Maintenance Service Period: 12 Months

1.03 PERFORMANCE REQUIREMENTS

A. Car Performance

1. Car Speed ± 5% of contract speed under any loading condition or direction of travel.

2. Car Capacity: Safely lower, stop and hold (per code) up to 125% of rated load.

B. System Performance

1. Vertical Vibration (maximum): 15 mg ISO187338/ISO 8041 system pk-pk

2. Horizontal Vibration (maximum): 12 mg ISO187338/ISO 8041 system pk-pk

3. Jerk Rate (maximum): 1.3 ft/s3

4. Acceleration (maximum): 1.3 ft/s2

5. In Car Noise: 55 dB(A) Maximum

6. Leveling Accuracy: ±0.2 inches

7. Starts per hour (maximum): 240

1.4 SUBMITTALS

A. Comply with Section 01 33 00 - Submittal Procedures.

B. Product Data: Submit manufacturer's product literature for each proposed system.

1. Cab design, dimensions and layout.

2. Layout, finishes, and accessories and available options.

3. Controls, signals and operating system.

4. Color selection charts for cab and entrances.

C. Shop Drawings:

1. Clearances and travel of car.

2. Clear inside hoistway and pit dimensions.

3. Location and layout of equipment and signals.

4. Car, guide rails, buffers and other components in hoistway.

5. Maximum rail bracket spacing.

6. Maximum loads imposed on building structure.

7. Hoist beam requirements.

8. Location and sizes of access doors.

9. Location and details of hoistway door and frames.

10. Electrical characteristics and connection requirements.

D. Operation and maintenance data:

1. Provide manufacturer's standard maintenance and operation manual.

E. Diagnostic Tools

1. Prior to seeking final acceptance for the completed project as specified by the Contract Documents, the Elevator Contractor shall deliver to the Owner any specialized tool(s) that may be required to perform diagnostic evaluations, adjustments, and/or parametric software changes and/or test and inspections on any piece of control or monitoring equipment installed.

   This shall include any specialized tool(s) required for monitoring, inspection and/or maintenance where the means of suspension other than conventional wire ropes are furnished and installed by the Elevator Contractor. Any and all such tool(s) shall become property of the Owner. Any diagnostic tool provided to the Owner by the Elevator Contractor shall be configured to perform all levels of diagnostics, systems adjustment and parametric software changes which are available to the Elevator Contractor.

   In those cases where diagnostic tools provided to the Owner require periodic recalibration/or re-initiation, the Elevator Contractor shall perform such tasks at no additional cost to the Owner for a period equal to the term of the maintenance agreement from the date of final acceptance of the competed project During those intervals in which the Owner might find it necessary to surrender a diagnostic tool for re-calibration, re-initiation, or repair, the Elevator Contractor shall provide a temporary replacement for the tool at no additional cost to the Owner.

   The Elevator Contractor shall deliver to the Owner, printed instructions for the proper use of any tool that may be necessary to perform diagnostic evaluations, system adjustment, and/or parametric software changes on any unit of microprocessor-based elevator control equipment and means of suspension other than standard elevator steel cables furnished and install by the Elevator Contractor.

   Accompanying the printed instructions shall be any and all access codes, password, or other proprietary information that is necessary to interface with the microprocessor-control equipment.

1.5 QUALITY ASSURANCE

A. Manufacturer: Minimum of fifteen years' experience in the fabrication, installation and service of elevators of the type and performance of the specified. The manufacturer shall have a documented quality assurance program.

B. Installer: The equipment manufacturer shall install the elevator.

C. Inspection and Testing: In accordance with requirements of local jurisdiction, obtain required permits, inspections and tests.

1.6 DELIVERY, STORAGE AND HANDLING

A. If the construction site is not prepared to receive the elevator equipment at the agreed ship date, the General Contractor shall be responsible for the cost of storage at an approved facility. Additional labor costs for double handling will be the responsibility of the General Contractor.

B. Delivered elevator materials shall be stored in a protected environment in accordance with manufacturer recommendations. A minimum storage area of 10 feet by 20 feet is required adjacent to the hoistway.

1.7 WARRANTY

A. Provide manufacturer warranty for a period of one year. The warranty period is to begin upon final acceptance of the Contract. Warranty covers defects in materials and workmanship. Damage due to ordinary use, vandalism, improper or insufficient maintenance, misuse, or neglect do not constitute defective material or workmanship.

1.8 MAINTENANCE SERVICE

A. The elevator manufacturer shall provide maintenance service consisting of regular examinations and adjustments of the elevator equipment for a period of 12 Months after date of final acceptance.

Predictive maintenance shall be included for the full maintenance period. This service must be capable of using AI-based analytics to identify potential equipment issues and notifying the elevator provider via an internet connection.

Replacement parts shall be produced by the original equipment manufacturer.

B. Maintenance service to be performed during regular working hours of regular working days and shall include emergency call back service during regular working hours.

C. Maintenance service shall not include adjustments, repairs or replacement of parts due to negligence, misuse, abuse or accidents.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Provide AC gearless machine room-less elevator systems subject to compliance with the design and performance requirements of this specification. Elevator manufacturers may include but are not limited to one of the following:

1. Basis of Design: KONE MonoSpace® 500 DX traction elevators by KONE Inc. (www.kone.us).

2. Other acceptable machine room-less products: manufacturer with minimum 15 years experience in manufacturing, installing, and servicing elevators of the type required for the project.

2.02 EQUIPMENT: CONTROL COMPONENTS AND CONTROL SPACE

A. Controller: Provide microcomputer-based control system to perform all functions.

1. All high voltage (110V or above) contact points inside the controller cabinet shall be protected from accidental contact in a situation where the controller doors are open.

2. Controller shall be separated into two distinct halves, Motor Drive side and Control side. High voltage motor power conductors shall be routed and physically segregated from the rest of the controller.

3. Provide a serial cardrack and main CPU board containing a non- erasable EPROM and operating system firmware.

4. Variable field parameters and adjustments shall be contained in a non- volatile memory module.

B. Drive: Provide Variable Voltage Variable Frequency AC drive system to develop high starting torque with low starting current.

2.03 EQUIPMENT: HOISTWAY COMPONENTS

A. Machine: AC gearless machine, with permanent magnet synchronous motor, direct current electro-mechanical disc brakes and integral traction drive sheave, mounted to the car guide rail at the top of the hoistway

B. Hoisting: Elevator must utilize traditional steel hoist cables that do not require a monitoring device.

C. Governor: Friction type over-speed governor rated for the duty of the elevator specified.

D. Buffers, Car and Counterweight: Polyurethane buffer.

E. Hoistway Operating Devices:

1. Emergency stop switch in the pit

2. Terminal stopping switches.

3. Emergency stop switch on the machine

F. Positioning System: System consisting of magnets and proximity switches.

G. Guide Rails and Attachments: Steel rails with brackets and fasteners.

2.04 EQUIPMENT: HOISTWAY ENTRANCES

A. Hoistway Entrances

1. Sills: Re-use existing

2. Entrance Frames and Doors: Re-use existing

3. Fire Rating: Entrance and doors shall be UL fire-rated for 1-1/2 hour.

4. Entrance Finish: Re-use existing

5. Entrance Markings Jamb Plates: Provide standard entrance jamb tactile markings on both jambs, at all floors. Plate Mounting: Refer to manufacturer drawings.

2.05 EQUIPMENT: CAR COMPONENTS

A. Car Frame: Provide car frame with adequate bracing to support the platform and car enclosure.

B. Car Safeties: Device will be provided and mounted under the car platform, securely bolted to the Car Frame. The safety will be actuated by a centrifugal governor mounted at the top of the hoistway. The Safety is designed to operate in case the car attains excessive descending speed.

C. Platform: Platform shall be all steel construction.

D. Car Guides: Provide guide-shoes mounted to top and bottom of both car and counterweight frame. Each guide-shoe assembly shall be arranged to maintain constant contact on the rail surfaces. Provide retainers in areas with Seismic design requirements.

E. Car Wall Finish:

1. Side Walls: 304 Brushed Stainless Steel (4SS)

2. Rear Wall: 441 Brushed Stainless Steel (4SS)

3. Car front, Door and Skirting: Brushed Stainless Steel

4. Ceiling: Round, LED spotlights

5. Handrails: Brushed Stainless Steel

a. Rails to be located on Side Walls of car enclosure.

6. Sills: Aluminum extruded.

F. Flooring: By others. (Not to exceed 12lb/sqft and 1 1/4" finished depth.)

G. Emergency Car Signals

1. Emergency Siren: Siren mounted on top of cab that is activated when the alarm button in the car operating panel is engaged. Siren shall have rated sound pressure level of 80 dB(A) at a distance of three feet from device. Siren shall respond with a delay of not more than one second after activation of alarm button.

2. Emergency Car Lighting: Provide emergency power unit employing a 12- volt sealed rechargeable battery and totally static circuits shall illuminate the elevator car and provide current to the alarm bell in the event of building power failure.

3. Emergency Exit Contact: An electrical contact shall be provided on the car-top exit.

H. Ventilation: Fan

2.06 EQUIPMENT: SIGNAL DEVICES AND FIXTURES

A. Car Operating Panel: Provide car operating panel with all push buttons, key switches, and message indicators for elevator operation. Fixture finish to be Brushed Stainless Steel

1. Main Flush mounted car operating panel shall contain a bank of round, mechanical, illuminated buttons marked to correspond to landings served, emergency call button, door open button, door close button, and key switches for lights, inspection, and exhaust fan. Buttons have Amber Dot Matrix illumination (halo). All buttons to have raised text and Braille marking on left hand side. The car operating display panel shall be Amber Dot Matrix. All texts, when illuminated, shall be Amber Dot Matrix. The car operating panel shall have a Brushed Stainless Steel finish.

2. Additional features of car operating panel shall include:

a. Car Position Indicator within operating panel Brushed Stainless Steel

b. Elevator Data Plate marked with elevator capacity and car number on car top.

c. Help buttons with raised markings.

d. In car stop switch per local code.

e. Call Cancel Button.

B. Hall Fixtures: Wall mounted hall fixtures shall be provided with necessary push buttons and key switches for elevator operation. Wall mounted hall fixtures shall have a Brushed Stainless Steel finish.

1. Vandal Resistant hall fixtures shall feature round, mechanical, buttons in applied mount face frame. Hall fixtures shall correspond to options available from that landing. Buttons shall be in a vertically mounted fixture.

C. Car Lantern and Chime: A directional lantern visible from the corridor shall be provided in the car entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel, and a chime will sound. The chime will sound once for up and twice for down. The car riding lantern face plate shall have a Brushed Stainless Steel finish.

D. Combination Hall Position Indicator and Hall Lantern located at Lobby. Hall lanterns and hall indicators shall feature Amber illumination, all numbers will be Dot Matrix display.

2.07 EQUIPMENT: ELEVATOR OPERATION AND CONTROLLER

A. Elevator Operation

1. Simplex Collective Operation: Using a microprocessor-based controller, operation shall be automatic by means of the car and hall buttons. If all calls in the system have been answered, the car shall park at the last landing served.

2. Zoned Car Parking.

3. Relative System Response Dispatching.

B. Standard Operating Features to include:

1. Full Collective Operation

2. Fan and Light Control.

3. Load Weighing Bypass.

4. Ascending Car Uncontrolled Movement Protection

5. Top of Car Inspection Station.

C. Additional Operating Features to include:

1. Emergency Battery Power Supply

a. When the main line power is lost for longer than 5 seconds the emergency battery power supply provides power automatically to the elevator controller. The elevator will rise or lower to the first available landing, open the doors, and shut down. The elevator will return to service upon the return of normal main line power. An auxiliary contact on the main line disconnect and shunt trip breaker (if required) shall be provided by others.

2. Emergency Video Communication, if required by code. The video display screen will come with multi-media content during the warranty maintenance period.

D. Elevator Control System for Inspections and Emergency

1. Provide devices within controller to run the elevator in inspection operation.

2. Provide devices on car top to run the elevator in inspection operation.

3. Provide within controller an emergency stop switch to disconnect power from the brake and prevents motor from running.

4. Provide the means from the controller to mechanically lift and control the elevator brake to safely bring car to nearest available landing when power is interrupted.

5. Provide the means from the controller to reset the governor over speed switch and also trip the governor.

6. Provide the means from the controller to reset the emergency brake when set because of an unintended car movement or ascending car over speed.

7. Provide the means for the control to reset elevator earthquake operation.

2.08 EQUIPMENT: DOOR OPERATOR AND CONTROL

A. Door Operator: A closed loop permanent magnet VVVF high-performance door operator shall be provided to open and close the car and hoistway doors simultaneously. Door movement shall be cushioned at both limits of travel. Electro-mechanical interlock shall be

provided at each hoistway entrance to prevent operation of the elevator unless all doors are closed and locked. An electric contact shall be provided on the car at each car entrance to prevent the operation of the elevator unless the car door is closed.

B. The door operator shall be arranged so that, in case of interruption or failure of electric power, the doors can be readily opened by hand from within the car, in accordance with applicable code. Emergency devices and keys for opening doors from the landing shall be provided as required by local code.

C. Doors shall open automatically when the car has arrived at or is leveling at the respective landings. Doors shall close after a predetermined time interval or immediately upon pressing of a car button. A door open button shall be provided in the car. Momentary pressing of this button shall reopen the doors and reset the time interval.

D. Door hangers and tracks shall be provided for each car and hoistway door. Tracks shall be contoured to match the hanger sheaves. The hangers shall be designed for power operation with provisions for vertical and lateral adjustment. Hanger sheaves shall have polyurethane tires and pre-lubricated sealed-for-life bearings.

E. Electronic Door Safety Device. The elevator car shall be equipped with an electronic protective device extending the full height of the car. When activated, this sensor shall prevent the doors from closing or cause them to stop and reopen if they are in the process of closing. The doors shall remain open as long as the flow of traffic continues and shall close shortly after the last person passes through the door opening.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Field measure and examine substrates, supports, and other conditions under which elevator work is to be performed.

B. Do not proceed with work until unsatisfactory conditions are corrected.

C. Prior to start of work, verify hoistway is in accordance with shop drawings. Dimensional tolerance of hoistway from shop drawings: -0 inches +2 inches. Do not begin work of this section until dimensions are within tolerances.

D. Prior to start of work, verify projections greater than two inches (four inches if ASME A17.1/CSA B44 2000 applies) must be beveled not less than 75 degrees from horizontal.

E. Prior to start of work, verify landings have been prepared for entrance sill installation. Traditional sill angle or concrete sill support shall not be required.

F. Prior to start of work, verify elevator pit has been constructed in accordance with requirements, is dry and reinforced to sustain vertical forces, as indicated in approved submittal. Verify that sumps or sump pumps located within pit will not interfere with installed elevator equipment.

G. Prior to start of work, verify control space has been constructed in accordance with requirements, with access coordinated with elevator shop drawings, including sleeves and penetrations.

H. Verify installation of GFCI protected 20-amp in pit and adjacent to each signal control cabinet in control space.

3.02 PREPARATION

A. Coordinate installation of anchors, bearing plates, brackets and other related accessories.

3.03 INSTALLATION

A. Install equipment, guides, controls, car and accessories in accordance with manufacturer installation methods and recommended practices.

B. Properly locate guide rails and related supports at locations in accordance with manufacturer's recommendations and approved shop drawings. Anchor to building structure using isolation system to minimize transmission of vibration to structure.

C. All hoistway frames shall be securely fastened to fixing angles mounted in the hoistway. Coordinate installation of sills and frames with other trades.

D. Lubricate operating system components in accordance with manufacturer recommendations.

E. Perform final adjustments, and necessary service prior to final acceptance.

3.04 CONSTRUCTION

A. Interface with Other Work:

1. Guide rail brackets attached to steel shall be installed prior to application of fireproofing.

2. Coordinate construction of entrance walls with installation of door frames and sills. Maintain front wall opening until elevator equipment has been installed.

3. Ensure adequate support for entrance attachment points at all landings.

4. Coordinate wall openings for hall push buttons, signal fixtures and sleeves. Each elevator requires sleeves within the hoistway wall.

5. Coordinate emergency power transfer switch and power change pending signals as required for termination at the primary elevator signal control cabinet in each group.

6. Coordinate interface of elevators and fire alarm system.

7. Coordinate interface of dedicated telephone line.

3.05 TESTING AND INSPECTIONS

A. Perform recommended and required testing in accordance with authority having jurisdiction

B. Obtain required permits and provide originals to Owner's Representative.

3.06 DEMONSTRATION

A. Prior to final acceptance, instruct Owner's Representative on the proper function and required daily maintenance of elevators. Instruct personnel on emergency procedures.

DIVISION 15 - MECHANICAL

SECTION 15000 - GENERAL MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. As specified in Section 00700.

1.02 GENERAL REQUIREMENTS

A. These general mechanical requirements govern work specified under all sections of Division 15 MECHANICAL.

B. The Contractor shall furnish all labor, materials, tools and equipment and perform all work and services necessary for a complete and properly operating mechanical equipment and systems, as shown on drawings and as specified, in accordance with provisions of the Contract Documents and completely coordinated with work of all other trades.

C. The Contractor shall completely examine the Contract Documents and shall report to the Contracting Officer any error, inconsistency or omission he discovers.

D. Furnish and install all supplementary or miscellaneous items, details, appurtenances and devices incidental to or necessary for a sound, secure and complete mechanical system where work required is not specifically indicated.

E. Drawings and specifications shall be taken together. Provide work specified and not indicated or work indicated and not specified as though mentioned in both.

F. The Contractor shall warrant that all materials and equipment furnished under this Contract will be new and that all work will be of good quality, free from faults and defects and in conformance with Contract Documents for a guaranteed period of one year after the date of acceptance as specified.

G. The Contractor shall maintain at the site one (1) copy of all Drawings, Specifications, Addenda, approved Shop Drawings, Change Orders and other modifications, in good order and marked (in red) to record all changes made during construction. These shall be made available to the Contracting Officer.

H. The Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by its operations. At the completion of the work, he shall remove all its waste materials and rubbish from and about the project as well as all its tools, construction equipment, machinery and surplus materials and shall clean all new equipment and accessories.

I. The Contractor shall give the Contracting Officer timely notice of its readiness for testing any work including the data arranged so the Contracting Officer may observe such testing. The Contractor shall bear all cost of such tests.

J. The Contracting Officer shall have the right to accept or reject material, equipment, and/or workmanship and determine when the Contractor has complied with the contract documents.

K. Contractor shall review drawings and specifications by all other divisions.

1.03 INSPECTION OF SITE

A. The Contractor shall visit the site and examine the conditions affecting its work before submitting its proposal. The submission of the proposal shall be considered evidence that the Contractor has visited the site and no extra payments will be allowed to the Contractor on account of extra work made necessary by its failure to visit the site. If there are any questions or discrepancies in the design, the Contractor shall bring it to the attention of the Contracting Officer before submitting its proposal.

1.04 SUBMITTALS

A. Submit electronic PDF files of shop drawings, manufacturer's data and certificates for equipment, materials and finish and pertinent details for each system and have them approved before procurement, fabrication or delivery of the items and equipment to the job site. Should the Contractor proceed with ordering or installing products prior to submittal review, all costs required to modify or replace such products shall be borne by the Contractor. Partial submittals will not be acceptable and will be returned without review. Submittals shall include the manufacturer's name, trade name, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and paragraph reference, applicable industry and technical society publication references and other information necessary to establish contract compliance of each item the Contractor proposed to furnish.

1. Shop Drawings: Drawings shall be a minimum of 24 inches by 36 inches in size, except as specified otherwise. Drawings shall include floor plans, sectional views, wiring diagrams and installation details of equipment; and equipment spaces identifying and indicating proposed location, layout and arrangement of items of ductwork, equipment, control panels, accessories, piping and other items that must be shown to assure a coordinated installation. Wiring diagrams shall identify circuit terminals and indicate the internal wiring for each item of equipment and interconnection between each type of equipment. Drawings shall indicate adequate clearance for operation, maintenance and replacement of operating equipment devices. If equipment is disapproved, drawings shall be revised to show acceptable equipment and be resubmitted.
    a. The Contractor shall review, stamp with its approval and submit, all Shop Drawings required by the Contract Documents or subsequently by the Contracting Officer as covered by modifications. At the time of submission, the Contractor shall inform the Contracting Officer in writing of any deviation in the Shop Drawings from the requirements of the Contract Documents. By approving and submitting Shop Drawings, the Contractor certifies that he has determined and verified all field measurements and obstructions, field construction criteria, materials, catalog numbers and similar data, that he has checked and coordinated each Shop Drawing with the requirements of the work and of the Contract Documents and that all equipment fits within designated spaces.

    b. Provide Shop Drawings prior to installation of equipment, ductwork, etc.

    c. All costs to changes required to work done prior to Contracting Officer's review of Shop Drawings shall be incurred by the Contractor and shall be at no additional cost to the State.

2. Manufacturer's Data: Submittals for each manufactured item shall be manufacturer's descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves and catalog cuts.

3. Standards Compliance: When materials or equipment must conform to the standards of organizations such as the American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturers Association (NEMA) and Underwriters Laboratories (UL), proof of such conformance shall be submitted to the Contracting Officer for approval. If an organization uses a

label or listing to indicate compliance with a particular standard, the label or listing will be acceptable evidence, unless otherwise specified in the individual sections. In lieu of the label or listing, the Contractor shall submit a certificate from an independent testing organization, which is competent to perform acceptable test and is approved by the Contracting Officer. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item conforms to the specified organization's standard. For materials and equipment whose compliance with organizational standards or specifications is not regulated by an organization using its own listing or label as proof of compliance, a certificate of compliance from the manufacturer shall be submitted for approval. The certificate shall identify the manufacturer, the product and the referenced standard and shall simply state that the manufacturer certifies that the product conforms to all requirements of the project specification and of the referenced standards listed.

4. Certified Test Reports: Before delivery of materials and equipment, certified copies of all test reports specified in the individual section shall be submitted for approval.

5. Certificates of Conformance or Compliance: Submit certification from the manufacturer attesting that materials and equipment to be furnished for this project comply with the requirements of this specification and of the reference publications. Pre-printed certifications will not be acceptable; certifications shall be in the original. The certification shall not contain statements that could be interpreted to imply that the product does not meet all requirements specified, such as "as good as"; "achieve the same end use and result as materials formulated in accordance with the referenced publication", "equal or exceed the service and performance of the specified material". The certification shall simply state that the product conforms to the requirements specified.

6. "Field Posted As-Built" Drawings: Keep at the job site a complete, accurate record of all approved deviations from the contract drawings, shop drawings and specifications. Keep these changes on prints of the drawings affected and turn over one (1) set to the Contracting Officer at the completion of the project.

7. Balancing Report and Maintenance Manuals: After installation, the new system shall be tested, balanced and adjusted by an NEBB Certified Testing and Balancing Company. Contractor to submit 4 sets of certification, certification shall be current at time of testing and balancing. Submit 4 copies of the balancing report, and operating and maintenance manuals for approval before final inspection.

8. Operation and Maintenance Manual

    a. Submit electronic PDF copies of the Operating and Maintenance Manual on all equipment and the system as a whole. The manual shall identify project name and number, contractor, consultant, date and all equipment provided, It shall include the equipment manufacturer's name, model and serial number, tag no., capacity, quantity of units, their location and area (room) served and shall include the manufacturer's operation and maintenance manuals including control and wiring diagrams and source of service and replacement parts. When standard manufactures' brochures are used, adequately indicate (highlight, arrow, etc.) the project related information and delete (X or cross-out) the non applicable information.

    b. Distribution of submittal:

    c. Electronic PDF copies: User and Contracting Officer

9. Maintenance Service Contract

    a. The Maintenance Service Contract shall be submitted along with the Operations and Maintenance Manual on/or before the Project Acceptance Date. Refer to Part 3 Paragraph titled “Two Year Guarantee and Maintenance Service Contract” for additional information.

    b. Note to Contractor: Equipment specified shall have either replacement parts which are locally stocked and an in-state service organization able to provide the necessary repair and maintenance service.

    c. Distribution of Submittal:

        1) (7) Copies: State

10. Commissioning Plan.

1.05 LAWS, REGULATIONS AND CODES

A. All work shall be in accordance with government laws, ordinances, rules and regulations and orders.

B. The following shall govern where applicable; the Plumbing Code of the County of Hawaii, the Building Code of the County of Hawaii, State of Hawaii Department of Health Regulations, U.S. Department of H.E.W., Applicable National Fire Protection Association Standards, OSHA, Rules and Regulations, County of Hawaii Energy Code and all other codes and standards referenced in these specifications. Where requirements differ in these code and standards, the more stringent shall apply.

1.06 TRADE NAME

A. Mentioning of a trade name in the plans and specifications indicates that the Manufacturer is acceptable to the Contracting Officer. However, certain specified construction and details may not be regularly included in the manufacturer's catalogued product. The Mechanical Contractor shall provide the material or equipment complete as specified.

1.07 PERMITS AND INSPECTIONS

A. Applications for permits will be done by the contractor; the Contractor shall pay for all necessary licenses, permits and fees.

B. The Mechanical Contractor shall apply and pay for all necessary inspections required by any public authority having jurisdiction.

1.08 DISCREPANCIES

A. The Drawings and Specifications are intended to be cooperative. Any materials, equipment or system related to this section and exhibited on the Architectural, Structural, Electrical or Mechanical Drawings but not mentioned in the Specifications are to be executed to the intent and meaning thereof, as if it were both mentioned in the Specifications and set forth on the Drawings.

B. In case of differences between the Drawings and Specifications, the Specifications shall govern first, and then the Drawings. Large scale details shall take precedence over small scale Drawings as to the shape and details of construction. Specifications shall govern as to materials.

C. Drawings and Specifications are intended to be fully cooperative and to agree, but should any discrepancy or apparent difference occur between Drawings and Specifications or

should error occur in the work of others affecting the work, the Contractors shall notify the Contracting Officer at once. If the Contractor proceeds with the work affected without instructions from the Contracting Officer, he shall make good any resultant damage or defect. All interpretations of Drawings and specifications shall be clarified by the Contracting Officer.

1.09 WORKMANSHIP AND MATERIALS

A. Workmanship shall be of the best quality and none but competent mechanics skilled in their trades shall be employed. The Contractor shall furnish the services of an experienced superintendent, who will be constantly in charge of the erection of the work, until completed and accepted.

B. Unless otherwise hereinafter specified, each article of its kind shall be the standard product of a single manufacturer.

C. Whenever the words "or approved equal" or other words of similar intent or meaning are used, implying that judgment is to be exercised, it is understood that it is the judgment of the Contracting Officer that is referred to.

D. The Contracting Officer shall have the right to accept or reject material, equipment and/or workmanship and determine when the Contractor has complied with the requirements herein specified.

E. All manufactured materials shall be delivered and stored in their original containers. Equipment shall be clearly marked or stamped with the manufacturer's name and rating. Equipment and materials shall be carefully handled, properly stored and adequately protected to prevent damage before and during installation, in accordance with the manufacturer's recommendations and as approved by the Contracting Officer. Damaged or defective items, in the opinion of the Contracting Officer, shall be replaced.

F. Reference to standards is intended to be the latest revision of the standard specified.

1.10 MANUFACTURER'S RECOMMENDATIONS

A. Equipment installed under this Division of the Specifications shall be installed according to manufacturer's recommendations, unless otherwise shown on the drawings or herein specified. Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the Contracting Officer, prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause of rejection of the material.

1.11 OPENINGS, CUTTING AND REPAIRING

A. The Mechanical Contractor shall cooperate with the work to be done under other sections in providing information as to openings required in walls and slabs for all piping including sleeves where required.

B. Any drilling or cutting required for the performance of work under this Section shall be the responsibility of this Contractor and the cost shall be borne by him.

C. Holes in Concrete: The Mechanical Contractor shall pay all costs for cutting holes. All holes through existing concrete shall be either core drilled or saw cut. All holes required shall have the approval of the Contracting Officer prior to cutting and drilling.

D. It shall be the responsibility of this Contractor to ascertain that all openings are properly located.

E. Repair joints, cracks, holes, surface irregularities and other minor defects as a result of relocated or new mechanical work. See Division 1 for patching and repair requirements.

1.12 ELECTRICAL WORK

A. All power wiring, including final hook-up to all mechanical equipment will be provided. Control devices required on the power wiring shall be provided by the Mechanical Contractor, to be wired by the Electrical Contractor. The Mechanical Contractor shall coordinate with the Electrical Contractor to ensure proper power to all specified mechanical equipment.

B. The Mechanical Contractor shall furnish all starters for installation by the Electrical Contractor. The Mechanical Contractor shall turn over these items to the Electrical Contractor at the site after receipt of notice from the Electrical Contractor that he is ready to install said items.

PART 2 - PRODUCTS

2.01 MATERIALS

A. As specified in all sections of Division 15 - Mechanical.

B. Provide components and equipment that are "standard products" of a manufacturer regularly engaged in the manufacturing of products that are of a similar material, design and workmanship. "Standard products" is defined as being in satisfactory commercial or industrial use for 2 years before bid opening, including applications of components and equipment under similar circumstances and of similar size, satisfactorily completed by a product that is sold on the commercial market through advertisements, manufacturers' catalogs, or brochures. Where two or more items of the same class of equipment are required, these items shall be products of a single manufacturer, however, the component parts of the items need not be the products of the same manufacturer. Each item of equipment shall have the manufacturer's name, address, model number and serial number on the nameplate.

2.02 SALT CORROSION PROTECTION

A. Provide salt corrosion protection for all air-cooled condensing units, fan coil units, supply and exhaust fans and housings. All coils shall be coated with Blygold PoluAl XT and all housings and fans shall be coated with PSX 700, or approved equal.

2.03 CIRCUIT BOARD PROTECTION

A. Provide protective coating for all outdoor unit circuit boards, use Circuit Shield™ or approved equal.

B. Provide coating using a process to ensure a uniform dry film thickness of 10-36 µm (0.4-1.4 mils) and meets 5B rating for crosshatch adhesion per ASTM D3359. Corrosion durability shall be confirmed through testing to no less than 2,500 hours salt spray resistance per DIN 53167 (ASTM B117) using aluminum test coupons. Dielectric Withstanding Voltage test shall pass at 1500 volts/mil thickness.

2.04 SUBSTITUTIONS

A. The material, products and equipment described in these specifications establish a standard of required function, quality, dimension, capacity, and appearance to be met by any proposed substitution.

B. Specific product listings in these specifications shall not preclude alternate product selections of comparable or superior quality. The Contractor may make reasonable substitutions, provided that these are submitted to the Contracting Officer for acceptance prior to bid in accordance with Division 1 Specifications. The Contractor shall be

responsible for design changes to accommodate the substituted product, at no additional costs to the State.

PART 3 - EXECUTION

3.01 EQUIPMENT

A. Mechanical Equipment, Fixtures and Accessories
   1. All mechanical equipment, accessories, plumbing fixtures and plumbing accessories shall be purchased by a Hawaii based manufacturer's representative who is factory authorized to furnish these items in the State of Hawaii. The manufacturer's representative shall be knowledgeable in the operation and functioning of the items furnished by him and must meet the following conditions:
      a. The manufacturer's representative shall furnish recommendations on the installation and operation of the items furnished in a capacity conforming to that of the actual manufacturer.

      b. The manufacturer's representative shall stock a reasonable amount of replacement parts locally.

      c. The manufacturer's representative shall have the ability to provide warranty replacement parts for equipment in a timely fashion to reduce the down time of equipment.

B. Maintenance Service Contractor
   1. The maintenance service contractor shall have a local office, staffed with competent and qualified field service personnel. The personnel shall be certified by the manufacturer to perform service and maintenance tasks on all equipment in accordance with the one year maintenance service contract and the terms and conditions of all equipment manufacturers' warranties and recommendations. Field service personnel shall be fully capable of providing technical assistance instruction, routine maintenance and emergency maintenance service on all system equipment components.

C. Trouble Calls: Emergency service and repairs required between regular service calls shall be rendered within 24 hours after the Contractor is notified, non-work days excluded.
   1. The Contractor shall call the State, the next working day after being notified of the problem and report the status of repairs.

D. Manufacturer's Representative
   1. Air conditioning equipment to be considered for bid purposes shall be purchased from a manufacturer's sales and service representative located in the State of Hawaii that has locally stocked spare parts and support of a service organization within the State of Hawaii which has serviced manufacturer's unit of comparable type, size and capacity as those specified. The manufacturer must have other units of comparable type, size and capacity installed and operating satisfactorily in the State of Hawaii for a minimum of two years prior to bid opening. The Contractor shall provide a list of locations in Hawaii with addresses and telephone numbers when requested by the Contracting Officer.

E. Mechanical Equipment
   1. The mechanical equipment supplier shall maintain a local support office within the State of Hawaii, staffed with factory trained representatives or staff, capable of providing instruction on operation and installation of all system components.

   2. The control system supplier shall maintain a local support office within the State of

Hawaii, staffed with factory trained representatives or staff, capable of providing instruction on operation, installation and trouble shooting of all system components.

3. Provide competent and qualified manufacturer's factory-trained and certified field service personnel on-site to be responsible for execution of all diagnostic testing in accordance with equipment manufacturer's installation and start-up certification requirements and warranty terms and conditions.

4. The Contractor shall provide manufacturer's representative and/or service technicians for any field modifications to equipment. The Contractor shall ensure that any modifications to equipment will not invalidate the manufacturer's warranties.

3.02 PIPING IDENTIFICATION

A. Identification of all pipe lines shall be by means of colored, waterproof, all temperature, self-adhering labels and directional arrow.

B. At Contractor's option, each and every system may be identified by painting with contrasting colors, using 3/4" high minimum stencil letters. Painting shall be done by the Mechanical Contractor.

C. All exposed pipes, whether insulated or not shall be identified. Labels may be omitted from piping where the use is obvious, due to its connection to equipment and where the appearance would be objectionable in finished rooms, as approved by the Contracting Officer.

D. Identification labels shall be placed as follows:
   1. Near each valve and branch connection.

   2. Wherever piping merges or disappears from view from the floor of the room in which it is installed.

   3. Labels shall not be more than 50 feet apart.

3.03 FIELD TEST

A. The Mechanical Contractor shall perform all tests of the installed work and shall provide all services, labor, equipment, materials and instruments needed for the tests. During pressure tests, all items in the system to be tested, not designed for test pressures shall be removed or isolated from the system and shall be reconnected or unblocked after tests are completed. Should operating tests require the presence of manufacturers' representatives, the Mechanical Contractor shall cooperate with them and shall place at their disposal all assistance, materials and services required to perform such test. The Mechanical Contractor shall certify in writing that all work has passed all required tests.

3.04 POSTED OPERATING INSTRUCTION

A. Furnish approved operating instructions for each principal item of equipment for the use of the operation and maintenance personnel. The operating instructions shall include wiring diagrams, control diagrams and control sequence for each principal item of equipment. Operating instruction shall be printed or engraved and shall be framed under glass or in approved laminated plastic and posted where directed by the Contracting Officer. Operating instructions shall be attached to or posted adjacent to each principal item of equipment including start up, procedure in the event of equipment failure and other items of instruction as recommended by the manufacturer of each item of equipment. Operating instructions exposed to the weather shall be made of weather-resistant materials or shall be suitably enclosed to be weather protected. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

3.05 INSTRUCTION TO MAINTENANCE PERSONNEL

A. The Contractor shall furnish the services of competent instructors who will give full instruction to the designated personnel in the adjustment, operation and maintenance, including pertinent safety requirements, of the equipment or system specified. Each instructor shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given during the first regular work week after the equipment or system has been accepted and turned over to the State for regular operation. When significant changes or modifications in the equipment or systems are made under the term of the contract, additional instruction shall be provided to acquaint the operating personnel with the changes or modifications.

3.06 SAFETY REQUIREMENTS

A. Belts, pulleys, chains, gears, couplings, projecting setscrews, keys and other rotating parts located so that any person can come in close proximity thereto shall be fully enclosed or properly guarded. High temperature equipment and piping so located as to endanger personnel or create a fire hazard shall be properly guarded or covered with insulation of a type as specified herein. Items such as catwalks, ladders and guardrails shall be provided where required for safe operation and maintenance of equipment.

3.07 INSPECTIONS

A. All work and materials are subject to field observation at any and all times by the Contracting Officer.

B. Contractor shall notify the Contracting Officer a minimum of two days prior to testing any piping or ducting systems which must be witnessed and approved before they are covered up or enclosed. Should the Contractor fail to notify the Contracting Officer at the times prescribed, it shall then be the Contractor's responsibility to make duct work accessible, expose any concealed lines, or demonstrate the acceptability of any part of the system. Any extra cost caused by the removal of such work shall be borne by the Contractor.

C. If the Contracting Officer finds any material or work not conforming to these Specifications, Contractor within three days of being notified shall remove said materials from the premises and replace with approved material, at no cost to the State.

3.08 FINAL INSPECTION

A. Final inspection shall be requested by the Contractor only after submittal of all required certificates. No final inspection will be made until all moving parts of equipment are properly guarded, all controls and safety devices tested and operative, all painting required done and the site cleaned up.

3.09 TWO YEAR GUARANTEE AND MAINTENANCE SERVICE CONTRACT

A. In addition to the Guaranty on material and workmanship, the installer shall submit the Maintenance Service Contract, countersigned by the Contractor, that will validate said Guaranty.

B. The following shall be incorporated into the project specifications where ventilation and/or air conditioning systems are provided. In addition to the Guarantee of materials and workmanship, the Contractor shall submit six (6) copies of the Maintenance Service Contract, countersigned by the Contractor, that will validate the guaranty. Submit electronic and hard copies. Submit hard copies to the Contracting Officer. For submittals, see Section 01322 Web Based Construction Management, and Section 01330 Submittal Procedures.
   1. The Guarantee and Maintenance Service shall extend for a period of two years commencing after 30 consecutive days of trouble-free operation after the Project

Acceptance Date, and shall include all labor, materials, equipment and parts necessary to service the complete system, in accordance with the attached Schedule of Maintenance Service and manufacturer's recommendations, on a periodic basis, so as to assure proper operation and function of the system. All costs for the periodic maintenance, including emergency calls, shall be borne by the Contractor. This Maintenance period and the Guarantee period shall run concurrently (same start and end dates).

2. The maintenance of the HVAC systems shall start within one month of equipment start-up and continue through the end of the Guarantee and Maintenance Period.

3. The maintenance service provided shall satisfy all requirements to keep the Guarantee valid. Any disruption in the maintenance service or any maintenance issue shall not excuse the contractor's responsibilities under the Guarantee.

C. Should the contractor default on the maintenance service contract, missing services shall be completed, and the warranty period shall also be extended to match the revised maintenance service period. Missing services shall include all corrections, certifications, and reporting.

D. Trouble-free operation is defined as a non-disabling condition or a non-recurring failure or disruption and the following:
   1. The system shall be free of all discrepancies, contamination and debris which require correction in excess of those described for the monthly service which is included in the Schedule of Maintenance.

   2. The system is maintaining operational conditions and other parameters measured during acceptance tests.

E. Maintenance service contractor shall have a local office, staffed with competent and qualified manufacturer's factory trained and certified field service personnel and stocked with full inventory of replacement repair parts, to perform specified service and maintenance tasks on all equipment in accordance with the Maintenance Service Contract and terms and conditions of all equipment manufacturers' warranties and recommendations. Field service personnel shall be fully capable of providing technical assistance instruction, routine maintenance, and emergency maintenance service on all system equipment components.

F. The Installer shall include a listing of the following items along with the Maintenance Service Contract:
   1. Name of the servicing contractor.

   2. Mechanical system project acceptance date.

   3. Service contract expiration date.

   4. Monthly inspection schedule for the maintenance period.

   5. Itemized listing of the equipment covered under the service contract, including a description of the equipment identified, its serial number(s) and manufacturer's name(s).

3.10 SCHEDULE OF MAINTENANCE SERVICE

A. All services performed by the Contractor shall include applicable items listed but shall not be limited to the following maintenance tasks. Certify performance of each periodic maintenance service (Monthly, Bi-Monthly, Quarterly, Semiannual, Annual, etc., as

applicable). Correct and report all discrepancies for each periodic maintenance service. Submit certifications, reports, special reports etc. in writing for each periodic maintenance service, for each unit; electronic and hard copies. Submit hard copies to the Contracting Officer.

1. Ducted Fan Coil Units
    a. Bi-Monthly Service
        1) Clean and clear all drip pans and flush all related condensate drain lines with nitrogen. (Contractor may be liable for water damage due to clogged drains). Install pan tablets if necessary to control algae.

        2) Change all disposable air filters with matching MERV rating at least once every two months or sooner if needed. Use Farr or approved equal.

        3) Wash permanent type filters with an approved detergent and spray coat with an approved filter treatment solution. Replace deteriorated permanent type filters which cannot be cleaned.

        4) Lubricate and oil all fan and motor bearings and connections of dampers and vanes.

        5) Check all drives for wear; adjust belt tension. Replace belt as required.

        6) Operate equipment to check for proper operation, unusual noise, and vibration; adjust or repair all equipment and controls as required; clean up all equipment.

        7) Check UV light fixtures and elements (where applicable); repair/replace items as required to keep system operating properly.

        8) Check time clock for proper operation and time settings.

        9) Certify performance of monthly services and that all discrepancies are reported and corrected.

    b. Quarterly Service:
        1) Where present, check calibration and proper operation of CO2 monitor and sensor, recalibrate as necessary.

    c. Annual Service:
        1) Adjust alignment of bearings and sheaves; lubricate fan and motor bearings. Replace worn or noisy bearings and sheaves.

        2) Clean cooling coils of dirt accumulation using water washer, steam, or surfactant chemical coil cleaner (alkaline or acidic cleaners not allowed) as necessary.

        3) Clean coils without Ultraviolet lights semiannually (twice each year).

        4) Check pressure and temperature differential across cooling coils and log air and water readings. Clean drains.

        5) Remove, wash, and reinstall all supply and return air grilles, registers and diffusers and fresh air intake grilles and dampers and repair or replace deteriorated bird/insect screens.

6) Clean all fan wheels and interior and exterior of equipment housings.

7) Secure all loose housing, seal leaks and prime and touch-up paint with matching color after cleaning all rust.

8) Check and calibrate all electric temperature controls.

9) Replace any UV light elements that have not been replaced since the last annual service.

10) Check condition of insulation; repair/re-insulate properly & immediately, including any time disturbing of insulation is required to perform work, or upon discovery or notification.

11) Certify performance of annual service and correct and report all discrepancies.

B. Air Cooled Condensing Units
   1. Monthly Service
      a. Check and record refrigerant compressor suction and discharge and oil pressures.

      b. Visual check for refrigerant and oil leakage; correct or repair as required. Check vibration isolator mounts. Record unusual noise and vibration, and record suction, discharge and oil pressures in maintenance logbook and correct and report all deficiencies.

      c. Check compressor, fan and motor bearings for abnormal temperature and unusual noise; lubricate and/or replace as required.

      d. Check refrigerant sight glass; change filter/drier if moisture indicated (DX system). Check compressor oil level and add or replace oil as required.

      e. Check air-cooled condenser fans, sheaves, belts; tension, adjust, or replace as required.

      f. Adjust alignment of bearings and sheaves for fans, motors, and compressors; replace worn or noisy bearings or sheaves.

      g. Note and run system operation through complete operating cycle and adjust for proper operation.

   2. Quarterly Service
      a. Check operation of freezestat and oil failure switch; record settings.

      b. Clean condenser coils with water washer, steam, or surfactant chemical coil cleaner (alkaline or acidic cleaners not allowed) (air-cooled).

   3. Annual Services
      a. Check compressor coupling alignment; lubricate or replace noisy bearings.

      b. Have compressor crankcase oil analyzed and submit written report, including oil test results. Clean or replace strainer; replace oil filter; change oil if recommended by analysis and per manufacturer’s recommendations.

c. Check refrigerant; replace refrigerant filter-drier.

d. Test and check system response at various cooling load conditions for proper operation, record settings. Test operate control switches, compressor unloading, safeties, capacity, and temperature controls; calibrate to proper settings and record settings. Adjust as required.

e. Check and clean all unit housings (inside, outside and components), seal leaks and remove rust from exterior components and prime and touch up paint with matching color immediately upon discovery or notification.

f. Check condition of insulation; repair/re-insulate properly & immediately, including any time disturbing of insulation is required to perform work, or upon discovery or notification.

g. Megger (electrical test to measure wire insulation resistance, i.e. condition) compressor motor and submit written report of readings; check starter relay and control contacts and electrical connections for tightness.

C. Ductless Split DX and VRF Air Conditioners
   1. Quarterly Service
      a. Clean evaporator and condenser coils with water washer, steam, or surfactant chemical coil cleaner (alkaline or acidic cleaners not allowed); wash unit to remove dirt, oil and debris from fan assembly and chassis.

      b. Clean condensate pan and flush drain line.

      c. Lubricate compressor and fan motor bearings.

      d. Check system refrigerant charge.

      e. Clean, wash or furnish and install new filters as required.

      f. Run and check cooling operation and controls through complete cycle; record temperature and setting when compressor cuts in.

D. Ventilation Fans (Exhaust and Supply)
   1. Quarterly Service
      a. Check motor-controlled and back-draft dampers for proper operation; lubricate linkage for free movement.

      b. Lubricate fan motors and bearings.

      c. Check belt wear and tension; adjust or replace as needed.

      d. Check sheaves for wear, replace as needed.

      e. Check fan collar, bearings and shaft for wear, repair or replace as needed.

      f. Remove and wash intake grille.

      g. Certify performance of quarterly fan maintenance service and correct and report all discrepancies.

      h. Replace air filters where installed with matching MERV rating at least once every

two months or sooner if needed. Use Farr or approved equal.

2. Semi-Annual Service (Twice Each Year)
   a. Check and clean fan wheels and housings of dust, dirt, and grease.

   b. Remove where possible, wash, and reinstall all intake, exhaust, and supply: grilles, registers, louvers and dampers. Repair or replace deteriorated bird/insect screens.

   c. Certify performance of semi-annual fan maintenance service and correct and report all discrepancies

E. Temperature Controls
   1. Quarterly Service
      a. Check control devices for proper operation, sticking stems, and calibration; repair/replace weak or broken springs and all other parts.

      b. Check automatic dampers for tightness in closing, bent blades and defective linkage; lubricate connections for free movement and repair as required.

      c. Adjust thermostat to maintain 72 degrees F room temperature.

      d. Certify performance of quarterly maintenance service and that all discrepancies are reported and corrected.

      e. Notify Contracting Officer of any dangerous conditions, improper storage of furniture, material and supplies which impacts your work within rooms and enclosures, including vandalism.

F. Pumps
   1. Quarterly Service
      a. Lubricate and check pump and motor bearings for abnormal temperature and unusual noise or vibration and repair as needed.

      b. Check packing glands and seals for excessive leakage. Adjust, tighten or replace as required.

      c. Certify performance of quarterly service and correct and report all discrepancies.

   2. Semi-Annual Service
      a. Remove and clean strainer for all condenser water pumps after tower cleaning.

      b. Check and blow down strainer for all chilled water pumps after tower cleaning. Remove and clean strainer if excessive debris is noted.

      c. Check condition of insulation, reinsulated as necessary.

      d. Log suction and discharge pressures.

      e. Clean and remove all dust and foreign matter. Clean all rust spots and scratches and touch up paint with matching color.
         1) Check motor coupling for alignment; mounting bolts are secure.

         2) Certify performance of semi-annual service and correct and report all discrepancies.

G. Valves And Water Lines, Equipment and Supports
   1. Annual:
      a. The Contractor shall exercise all equipment shut-off valves annually for proper operation and tightness.

      b. Wire brush, prime and paint rust from pipe, equipment and support surface to prevent further rusting.

      c. Certify that all discrepancies are reported and corrected.

H. Cleaning Of Mechanical Equipment Rooms or Enclosures
   1. Monthly
      a. Vacuum or wipe clean all equipment surfaces and all related appurtenance.

      b. Vacuum clean or sweep complete floor and platform areas. DO NOT wet floor and platform area where there is no waterproofing.

      c. Wet wash complete floor area with tap water where allowed. Remove all used, deteriorated, replaced, discarded parts and related debris.
         1) CAUTION: DO NOT splash water onto the electrical and mechanical equipment.

      d. REMOVE ALL used, deteriorated, replaced, discarded parts, oil and other liquids not being used, and related debris.

      e. Notify the Contracting Officer of any dangerous conditions, improper storage of furniture, materials and supplies which impacts your work within rooms and enclosures, including vandalism.

I. Work Schedule: All maintenance work shall be performed between the hours of 7:30 a.m. and 4:00 p.m. on normal working days, Monday through Friday, excluding Holidays.

J. Trouble Calls: Emergency service and repairs required between regular service calls shall be rendered within 24 hours after the Contractor is notified, non-work days excluded.
   1. As emergency/repair jobs are being completed, the Contractor must notify the Contracting Officer daily by E-mail of the status of repairs and estimated completion times, until repairs have been completed.

K. Maintenance Report
   1. Submit to the Contracting Officer a Service Maintenance Report using the form found at the end of this section. This form shall include the following:
      a. Date maintenance service was performed.

      b. The name of the mechanic who performed said maintenance.

      c. The type and cost (labor, materials, parts and equipment) of repair work performed on the unit, if any.

      d. Documents and other data pertaining to the maintenance performed.

      e. It will be the responsibility of the Contractor to maintain the report/ checklist by recording the above noted data after each scheduled maintenance and emergency repairs, and have the checklist available for inspection at the building site.

f. The report shall be sufficiently detailed to properly reflect the past maintenance history of the equipment. Reports shall be certified by a representative of the facility being served and shall be submitted to the Contracting Officer at the completion of the service contract.

3.11 CLEANUP AND WORK PRACTICES

A. The Contractor shall keep the job site free of debris, litter, discarded parts, etc. and shall clean all oil drippings during the daily progress of work. The Contractor shall remove all tools, parts and equipment from the service areas upon completion of the work.

B. The Contractor shall exercise caution during the progress of its maintenance and repair work to prevent damage to the ceilings, roofing and other building structure. The Contractor shall restore all damages, caused by its negligence, to its original condition at its own expense.

3.12 SPECIAL REPORTS

A. Prior to commencement with the work on the contract, the Contractor shall submit his periodic (Monthly, Bi-Monthly, Quarterly, Semiannual, Annual, etc., as applicable) inspection schedule for the period of the contract.

B. The Contractor shall also maintain a separate book, record, documents, and other evidence pertaining to the maintenance, repair and costs of each air conditioning system at the various buildings to the extent and in such detail as will properly and adequately reflect the past maintenance history and cost (labor, materials, parts and equipment). The Contractor shall also submit an annual updated inventory of equipment, by building floor and location during the contract period.

3.13 SAFETY PRECAUTIONS

A. The Contractor is not to perform maintenance and repair work until all switches are deenergized, locked, and tagged. The Contractor shall comply with all applicable safety regulations promulgated by OSHA, EPA, and other governmental agencies.

SERVICE MAINTENANCE REPORT

DATE:_____ SHEET NO:_____

1. Name of Facility and Location:_____

2. Submitted By:_____

3. Date of Service Call: _____

4. Name of Person(s) Making Call: _____

5. Time In_____: Time Out_____: At Site

6. Person(s) Contacted:_____

7. Nature of Service Call: (Routine Maintenance or Emergency, Explain)

_____

_____

8. Equipment Readings and Maintenance Performed:
(List all items serviced: Identify – 8a, 8b, 8c, ..., etc.)

_____

_____

_____

_____

END OF SECTION 15000

SECTION 15250 - INSULATION OF MECHANICAL SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 GENERAL REQUIREMENTS

A. SECTION 15000 – GENERAL MECHANICAL REQUIREMENTS, with the additions and modifications specified herein, applies to this section.

1. Manufacturer's Stamp or Label: Every package or standard container of insulation, jackets, cements, adhesives and coatings delivered to the project site for use must have the manufacturer's stamp or label attached giving name of manufacturer, brand and description of material. Insulation packages and containers shall be marked "asbestos-free".

2. Fire Resistance: Insulation, adhesives, vapor-barrier materials and other accessories, except as specified herein, shall be noncombustible. The materials shall have a flame-spread rating not more than 25 and a smoke-developed rating not more than 50 in accordance with NFPA 255, ASTM E 84-80 or UL 723.

a. Materials Tests: Test factory-applied materials assembled. Field-applied materials may be tested individually. Use no fugitive or corrosive treatments to impart flame resistance. UL label or satisfactory certified test report from an approved testing laboratory will be required to indicate that fire hazard ratings for materials proposed for use do not exceed those specified. Flame-proofing treatments subject to deterioration due to effects of moisture or high humidity are not acceptable.

b. Materials Exempt from Fire-Resistant Rating:
1) Nylon anchors

2) Treated wood inserts

B. Insulation of mechanical systems shall conform to the IECC (current edition).

1.03 SUBMITTALS

A. The items for which the submittal requirements of SECTION 15000 - GENERAL MECHANICAL REQUIREMENTS, apply are as follows:

1. Manufacturer's Data:

a. Insulation

b. Jackets

c. Vapor-barrier materials

d. Accessory-materials

2. Standards Compliance: Standards compliance labels are required on each container or package:

a. Insulation

b. Jackets

c. Vapor-barrier materials

d. Accessory materials

1.04 DEFINITIONS

A. Finished Spaces: Habitation or occupancy spaces where rough surfaces are plastered, paneled or otherwise treated to provide a pleasing appearance.

B. Unfinished Spaces: Storage or work areas where appearance is not a factor, unexcavated spaces, crawl spaces, etc.

C. Concealed Spaces: Spaces between a ceiling and floor construction above or between double walls or furred-in areas; pipe and duct shafts, etc.

D. Exposed: Open to view inside the building. For example, pipe run through a room and not covered by other construction, is exposed.

E. Fugitive Treatments: Treatment of materials subject to deterioration due to aging, moisture, high humidity, oxygen, ozone and heat. Fugitive means entrapped materials that can cause deterioration e.g., solvents, water vapor, etc.

F. Outside: Open to view beyond the exterior side of walls, above the roof and unexcavated or crawl spaces, above or beneath pier floors, in tunnels or exposed on all sides in trenches connected or not connected to an exterior portion of a building.

1.05 PIPING REQUIRING INSULATION

A. Refrigerant Piping and Accessories

B. Cold Water Piping and Accessories

C. Hot Water Piping and Accessories

D. Condensate Drain Piping and Accessories

PART 2 - PRODUCTS

2.01 MATERIALS

A. Asbestos Prohibition: No asbestos containing materials or equipment shall be used under this section. The Contractor shall ensure that all materials and equipment incorporated in this project are asbestos free.

2.02 PIPING AND PIPE ACCESSORIES INSULATION

A. Insulation exterior shall be cleanable, grease resistant, non-flaking and non-peeling. Pipe insulation shall conform to the referenced publications and the specified temperature ranges and densities in pounds per cubic foot (pcf). Insulation for fittings and flanges shall be pre-molded, pre-cut or job-fabricated insulation of the same thickness and conductivity as used on adjacent piping. See Table 1 for insulation thickness requirements.

1. Refrigerant Piping and Accessories: All refrigerant piping shall be insulated with AP/Armaflex closed cell insulation, provide with Pittsburgh Corning Pittwrap jacketing and finish with Johns Manville, Zeston 2000 PVC Jacket, 0.20 mils thick, or approved equal.

2. Interior Cold Water Piping and Accessories: All interior cold water piping shall be insulated with Rubatex or equal. Minimum 3/4" thickness.

3. Interior Hot Water Piping and Accessories: hot water piping shall be insulated with fiberglass insulation with insulation jacket.

4. Exterior Hot Water Piping and Accessories: hot water piping shall be insulated with Pittsburgh Corning Foamglass insulation and finish with Johns Manville, Zeston 2000 PVC Jacket, 0.2 mils thick, or approved equal.

5. Condensate Drain Piping and Accessories: All interior condensate drain piping shall be insulated with Rubatex or equal.

2.03 DUCT INSULATION

A. Interior ductwork: All interior supply air and return duct work shall be wrapped with duct wrap with vapor barrier rated greater than or equal to R-6 for ducts and plenums located in unconditioned spaces
   1. Owens Corning, Johns Manville, Kanuf Insulation or accepted equivalent, fiberglass duct wrap with Foil-Scrim-Kraft facing.

B. Exterior ductwork: All exterior supply air and return duct work shall be wrapped with rigid board insulation with sheet metal jacketing/cladding for weatherproof protection. The outdoor mounted exterior duct rigid insulation shall be greater than or equal to R-8 for ducts and plenums.

C. All air devices shall be fully insulated such that no metal portions of the diffuser are exposed in unconditioned areas. Provide molded fiberglass insulation diffuser blanket for 24”x24” lay-in modules. Diffuser blanket shall have foil back vapor barrier with 6.0 R-value.

2.04 INSULATION JACKETS

A. Vapor-Barrier Material: Material shall be resistant to flame and moisture penetration and not support mold growth. Provide vapor-barrier material on insulation in exposed locations with a white surface suitable for painting without sizing. Perm rating of .01.

2.05 ADHESIVES, SEALANTS AND COMPOUNDS

A. Shall be compatible with materials to which applied and suitable for the service.
   1. Vapor-Barrier and Jacket Adhesive: Fire resistant type. Foster Products or approved equal.

   2. Lagging Adhesive: Fire resistant type. Foster Products or approved equal.

   3. Mineral Fiber Insulation Cement: ASTM C 195, thermal conductivity 0.85 max. at 200 degrees F mean when tested per ASTM C 177.

   4. Bedding Compound and Joint Sealer: Fire resistant type. Foster Products or approved equal.

   5. Vapor-Barrier Coating: Fire resistant type. Perm rating of .05. Foster Products or approved equal.

2.06 ACCESSORIES

A. Staples: Corrosion-resistant outside-clinch type.

B. Anchor Pins: Provide anchor pins and speed washers recommended by the insulation manufacturer.

C. Glass Cloth and Tape: Textile Glass.

D. Vapor-Barrier Material Tape: Pressure-Sensitive adhesive backed. Arno or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install insulation system in accordance with manufacturer's recommendations using tradesman skilled in this trade and approved by the insulation manufacturer. Provide insulation products with a composite (insulation, jacket and adhesive) fire and smoke hazard rating as tested under ASTM E84, NFPA 255 and UL 723, not exceeding a flame spread of 25 and smoke developed of 50.

B. Pipe Insulation Thickness: Insulation thickness shall conform to Table 1 and IECC (current edition).

Fluid operating Temperature Range and Usage (degree F)	Insulation Conductivity		Nominal Pipe or tube size (inches)				
	Conductivity (BTU* in)/ (h*ft^2*degree F)	Mean Rating Temperature, (degree F)	< 1	1 to < 1.5	1.5 to < 4	4 to <8	<=8
>350	0.32-0.34	250	4.5	5.0	5.0	5.0	5.0
251-350	0.29-0.32	200	3.0	4.0	4.5	4.5	4.5
201-250	0.27-0.30	150	2.5	2.5	2.5	3.0	3.0
141-200	0.25-0.29	125	1.5	1.5	2.0	2.0	2.0
105-140	0.21-0.28	100	1.0	1.0	1.5	1.5	1.5
40-80	0.21-0.27	75	1.0	1.0	1.0	1.0	1.0
<40	0.20-0.26	50	1.0	1.0	1.0	1.0	1.5

Table 1.

1. For insulation outside the stated conductivity range, the minimum thickness (T) shall be determined as follows:
   a. T = r [(1 + t/r)*K/k-1] where:
      1) T= minimum insulation thickness

      2) r= actual outside radius of pipe

      3) t= insulation thickness listed in the table for applicable fluid temperature and pipe size

      4) K= conductivity of alternate material at mean rating temperature indicated for the applicable fluid temperature (Btu* in/h*ft^2* degree F)

      5) k= the upper value of the conductivity range listed in the table for the applicable fluid temperature.

C. Piping requiring insulation shall be insulated continuously through clamping, supports, and sleeving with the insulation thickness and specifications per Table 1 and IECC (current edition).

D. Expansion Clearances: At points where pipe will move during expansion and contraction (expansion joints, Z-bends, expansion loops and ells), clearances between the pipe and encased insulation shall be sized to permit full pipe movement without cracking or damaging insulation and jacket.

E. Duct work and Duct work Accessories: Provide field-applied insulation to exterior of supply ducts, return ducts, and casings of HVAC units. Ensure full range of motion of equipment actuators. Modify insulation to avoid obstruction with valve handles, safety relief, and other such items. Install insulation with jackets drawn tight and cement down on longitudinal and end laps. Do not use scrap pieces where a full length section will fit.

3.02 FIELD INSPECTION

A. Visually inspect to ensure that materials used conform with specifications. Inspect installation progressively for compliance with requirements.

3.03 ONE YEAR GUARANTEE

A. The Contractor shall warrant that all materials and equipment furnished under this section will be new and that all work will be of good quality, free from faults and defects and in conformance with Contract Documents for a guaranteed period of one year after the date of acceptance as specified.

END OF SECTION 15250

SECTION 15400 – PLUMBING SYSTEM; BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. As specified in Section 01001.

1.02 SUMMARY

A. Section 15000 - GENERAL MECHANICAL REQUIREMENTS, applies to this section with the additions and modifications specified herein.

1.03 WORK SPECIFIED IN THIS SECTION

A. All materials, labor and equipment necessary for complete and operating interior plumbing system within 5 feet of the building line, including complete sanitary and potable water piping.

1.04 STANDARDS AND CODES

A. Installation shall conform to all applicable provisions of the latest editions of the following, as well as to specific standards listed elsewhere in these Specifications.

1. Uniform Plumbing, 2012 Code with The County of Hawaii Amendments.

2. American Society for Testing and Materials (ASTM):

(a) A74 92	Cast Iron Soil Pipe and Fittings
(b) A53-90	(Rev. B) pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
(c) B88 92	Seamless Copper Water Tube

3. American National Standards Institute (ANSI):

(a) B16.18 84	Cast Bronze Solder Joint Pressure Fittings
(b) B16.23 92	Cast Copper Alloy Solder Joint Drainage Fittings -DWV
(c) Z21.22-86	(Addendum 1990) Relief Valves and Automatic Gas Shutoff Devises for Hot Water Supply Systems

1.05 SUBMITTALS

A. Submit in accordance with Section 01300 - SUBMITTAL PROCEDURES.

B. As indicated in Section 15000 - GENERAL MECHANICAL REQUIREMENTS.

C. Certificate of compliance by the test laboratory analyzing the water samples following the pipeline disinfection and flushing.

D. Guarantee: Provide written guarantee for all plumbing work as described in Section 15000 - GENERAL MECHANICAL REQUIREMENTS.

E. Record Drawings: Provide "as-built" record drawings for all plumbing work as described in Section 15000 - GENERAL MECHANICAL REQUIREMENTS.

PART 2 - PRODUCTS

2.01 SUBSTITUTIONS

A. Substitutions for products specified with equivalent models shall be submitted for acceptance in accordance with Section 15000 - GENERAL MECHANICAL REQUIREMENTS of these Specifications.

2.02 PIPING MATERIALS

A. Soil, Waste and All Vent Piping: Schedule 40 drain, waste and vent pipe shall be Rocky Mountain Colby Pipe Company PVC DWV Cellular Core manufactured to ASTM F-891 and certified by a recognized listing agency, or, Rocky Mountain Colby Pipe Company ABS DWV Cellular Core manufactured to ASTM F-628 and certified by a recognized listing agency. PVC joints shall be made-up with Weld-On PVC 705 medium bodied, fast setting, PVC cement and suitable primer. ABS joints shall be made-up with Weld-On ABS 733 medium bodied, fast setting, ABS cement or approved equal.

B. Potable Water:
   1. Water Lines Above Grade: Copper Type L, hard temper, with wrought copper or cast bronze fittings made up with 95-5 solder. All copper piping in walls and thru floors shall be provided with IPS Weld-On Pipe Insulators at all wood contact with the copper piping or approved equal.

   2. Water Lines Below Grade: Copper Type K, soft temper, with silver solder brazed joints or approved equal. .

C. Gas piping:
   1. Gas Piping: Schedule 40 galvanized steel with galvanized malleable iron screwed fittings. Joints made up with approved lubricant for LPG Service or teflon tape. Gas connector, refrigerant quality soft temper copper tubing, 3/8 inch O.D. underground gas piping shall be black iron with X-tru coat corrosion protection.

   2. Gas Shut-Off Valves: Bronze ball valve, two-piece body, bronze trim, lever handle, and labeled “Gas”. AGA approved or approved equal.

2.03 VALVES

A. General: Model and number listed in these specifications are the basis for type and quality. Pressure ratings indicated are "working steam pressure" (WSP).

B. Gate Valves: 1/2 inches and smaller: bronze body, 125 psig, non-rising stem Nibco 113 or approved equal. Valves shall be suited for installation in a concrete valve box.

C. Pressure Reducing Valves: Watts U5-Z3 or approved equal.

D. Pressure Relief Valve: Shall be Watts, Wilkins or Spence.

E. Ball Valves/Balancing Valves: Nibco S-FP-600 brass ball valves, provide with locking lever for balancing valves or approved equal.

F. Check Valve: Horizontal Swing, 200 psi CWP. Nibco S-413-Y-LF or approved equal.

G. Hose Bibs: Arrow or approved equal. provide with vacuum breaker and loose key. Provide snubber at each hose bib.

2.04 UNIONS

A. Copper: bronze body, 200 psig.
   1. For pipes 2 inches and smaller use ground joint

   2. For pipes 2-1/2 inches and larger use flanged face.

B. Dielectric Unions shall separate all ferrous and nonferrous metals in all piping systems. Unions shall match those above, except that of metal-to-metal contact shall be avoided. Where flanges are used, the bolts shall be electrically insulated from the body of the flange.

2.05 WATER HAMMER ARRESTOR

A. Souix Chief 650 series HydraRester. Copper material, lead free or approved equal.

2.06 ROUGH IN PIPING SPECIALTIES

A. Floor Cleanouts (FCO): Smith Fig. 4028 Duco cast iron body, round top, bronze plug, taper thread, inside caulk outlet or approved equal.

B. Wall Clean Out (WCO): Smith Fig. 4472 Cast Bronze taper thread plug with stainless steel cover and screw or approved equal.

C. Clean Out to Grade (COTG): Smith or approved equal, Cast Bronze taper thread plug with brass cover and 12-inch concrete collar or approved equal..

D. Floor Drains (FD): Zurn FD-2340-P, PVC Body, medium-duty adjustable floor drain, with 1/2-inch trap primer connection, or approved equal.

E. Trap Seal Primer Valve: Bronze body automatic trap primer with integral vacuum breaker, solder female union connection, Zurn Z-1022 and access door or approved equal.

F. Air Gap Fitting: Watts 909 air gap fitting or approved equal.

G. Backflow Preventor: Watts series 957 Reduced pressure zone assembly or approved equal..

2.07 ESCUTCHEONS

A. Brass body, chrome plated finish. Provide sizes sufficient to cover pipe openings through the floor, wall, or ceiling. Escutcheons shall be secured in place by either spring clips or setscrews.

2.08 PIPE SLEEVES

A. Schedule 40 galvanized steel pipe sleeves in concrete, 18 gauge galvanized sheet metal sleeves in other construction. Sleeves shall be sized to provide a minimum of 1/4" clearance around bare or insulated piping or as otherwise required by Code.

2.09 PIPE HANGERS AND SUPPORTS

A. General: Elcen, Fee and Mason, Globe, Grinnell, Superstrut, and Unistrut are approved. Fee and Mason figure numbers indicate type and quality. Provide concrete insert at all pre-stressed planks for pipe and equipment installation and coordinate with pre-stressed plank contractor.

B. For Uninsulated Copper Tubing: Fee and Mason No. 307, 364, or 365 or approved equal.

C. For Insulated Copper Tubing: Fee and Mason No. 800 or approved equal.

D. Riser Clamps: Black steel, Fee and Mason No. 241. Copper coated, Fee and Mason No. 368 or approved equal..

E. Hanger Spacing:

Pipe	Maximum Spacing
Copper tubing, 1 1/2" and smaller	6 feet
Copper tubing, 2" and larger	10 feet
Cast iron soil pipe	At each joint and at intervals not to exceed 8 feet.

F. Hanger Rods: Continuous threaded rod conforming to ASTM A 107. Eye rods shall be Fee and Mason Figure No. 228 and 228 WL or approved equal.

G. . Sizes shall be as follows:

Pipe Size	Rod Size
½" to 2"	3/8"
2 1/2" to 3"	1/2"
4" to 6"	5/8"

2.10 PLUMBING FIXTURES AND TRIM

A. Section 15450 PLUMBING FIXTURES AND TRIM.

PART 3 - EXECUTION

3.01 WORKMANSHIP AND COORDINATION

A. All work shall be of the highest standard. Poor workmanship will be rejected by the Contracting Officer and shall be replaced at no additional cost to the State.

B. Coordinate this work with schedules of other trades, specifically sanitary and water lines below concrete slabs or concealed in walls. Set all required inserts and sleeves.

C. Lay out piping to insure a neat and orderly arrangement, with vertical lines plumb.

D. Carefully handle all exposed piping to avoid tool marking. Handle polished fittings with extra care so tool marks do not show.

3.02 PIPING INSTALLATION

A. Roughing In:

1. Proceed with the rough in work as rapidly as general construction will permit and have all the roughing in stubbed out and tested before any finished work is in place.

2. Fit all piping to follow the building structural elements as closely as possible.

B. General Installation Guidelines: Inspect all pipes fully inside and out for defects. Ream out ends of pipe and remove all burrs. Water lines shall be protected during construction to prevent contamination of interior surfaces.

C. Do not close up before pipe inspection and accepted by the Contracting Officer.

D. Provide pipe sleeves where pipes pass through concrete masonry below grade. Fill annular space within sleeves with 3-hour rated, UL accepted fireproof caulking. Flash around base of pipes penetrating the roof. Penetrations shall not leak even under the heaviest rainfall conditions.

E. Slope sanitary piping not less than ¼-inch per foot of horizontal, unless otherwise indicated on drawings. Grade vent pipes to expel water.

F. Protect copper tubing from coming in contact with dissimilar metal with dielectric union. Wrap underground copper lines with 3 layers of plastic tape.

G. All piping shall be properly and safely supported. Support soil stacks at their bases and at each floor with metal clamps.

H. Install unions at all equipment and system specialties, whether specifically shown on the drawings or not.

I. Apply pipe insulation in accordance with of the National Insulation Contractors Association (NICA). Insulate all fittings and valve bodies, and cover to match straight pipe sections, or use pre-formed PVC insulation covers. All hot water lines shall be insulated with one inch thick fiberglass insulation.

3.03 EQUIPMENT SUBSTITUTIONS ACCEPTANCE

A. Do not commence with installation until proposed equipment substitution submittals are accepted by the Contracting Officer.

3.04 FIXTURE INSTALLATION

A. Set all plumbing fixtures in an accepted workmanlike manner. Point up edges against wall with accepted caulking.

B. Flanges at wall penetrations shall be flush against wall and shall not spin when rotated by hand.

C. Adjust equipment and plumbing fixtures and trim to operate properly and clean all fixtures just prior to final inspection.

3.05 DISINFECTION OF WATER LINES

A. Flush out water lines to remove foreign matter. After flush water runs clear, disinfect the lines with chlorine in accordance with AWWA Standard C601, pertaining to methods, concentrations, and contact times. Flush out until residual is reduced to 0.3 parts per million. Submit a certificate of completion for this work from a contractor experienced and licensed to do disinfecting work.

B. Obtain 2 water samples from selected points and submit them to a licensed laboratory for bacteriological testing. Water shall meet Federal water purity standards. Submit the laboratory report or a certification of satisfactory completion of disinfection. All costs of testing shall be borne by the Contractor.

3.06 TEST AND ACCEPTANCE INSPECTIONS

A. Test all new plumbing lines in accordance with methods described in the Plumbing Code. Repair all leaks and repeat the test until all lines are leak free.

B. Contractor shall arrange for inspections by the County and conduct required tests in the presence of the Contracting Officer or for the Contracting Officer.

C. Tests shall be repeated as necessary to satisfy the Contracting Officer, or such tests shall be made by the Contracting Officer and charged to the Contractor.

END OF SECTION 15400

SECTION 15410 – CAST POLYMER SHOWER PANS

PART 1 - GENERAL

1.01 SUMMARY:

A. Section includes Cultured marble shower pans.

B. Work includes:

1. Cast polymer shower pans
2. Integral curbs and thresholds
3. Slip-resistant floor finish
4. Sealant joints between pan and wall surround

C. Related Work Specified Elsewhere:

1. SECTION 01300 – SUBMITTAL PROCEDURES
2. SECTION 06611 – CAST POLYMER SHOWER SURROUNDS
3. SECTION 07920 – SEALANTS
4. SECTION 15400 – PLUMBING FIXTURES

1.02 SUBMITTALS

A. Submit in accordance with SECTION 01300 – SUBMITTAL PROCEDURES.

B. Product Data: Submit manufacturer's technical data including material composition, dimensions slip resistance characteristics, installation instructions

A. Shop Drawings: Submit drawings showing, pan dimensions, drain location, threshold height, installation clearances

A. Samples:
Submit manufacturer's standard color samples for selection by the Contracting Officer.

1.03 QUALITY ASSURANCE

A. Manufacturer Qualifications:
Manufacturer shall specialize in fabrication of cast polymer bathing fixtures with a minimum five years documented experience.

B. Standards:
Provide products complying with applicable requirements of:

1. ANSI Z124.2 – Plastic Shower Receptors
2. ASTM D256 – Impact Resistance
3. ASTM D638 – Tensile Strength

C. Slip Resistance:
Shower pan floor shall have a factory-applied slip-resistant textured surface.

D. Single Source:

Provide shower pans from a single manufacturer to ensure uniformity of color, texture, and performance.

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver shower pans in manufacturer’s original packaging.

B. Protect units during handling to prevent cracking, chipping, or surface damage.

C. Store units in a clean, dry location protected from sunlight and construction traffic.

1.05 WARRANTY

A. Provide manufacturer's standard written warranty for shower pans.

B. Warranty period shall be not less than one year from date of Substantial Completion.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Contract Documents are based on products by MPL Company.

B. Acceptable products from Mincy Marble Mfg and Belstone or approved equal.

2.02 MATERIALS

A. Shower Pans:

1. Material: Cast Polymer, one piece.

2. Coefficient of friction: Minimum 0.40, tested to ASTM F462.

3. Trench drain test: Meet requirements of CSA B45.5-11/IAPMO Z124-11

4. Standard drain test: Meet requirements of CSA B45.5-11/IAPMO Z124-11.

5. Color: Unless otherwise indicated, to be selected by Director from manufacturer’s full color

6. Pan style: Center, 36 x 36 inches and 72 x 34 inches.

2.03 ACCESSORIES

A. Adhesive: Type recommended by shower pan manufacturer.

B. Joint Sealer: Type recommended by shower pan manufacturer.

C. Thin-Set Mortar: Type recommended by shower pan manufacturer.

2.04 THIN SET MORTAR

A. Thin-Set Mortar: Mix as approved by the manufacturer and in accordance with manufacturer's instructions.

B. Dimensions: As indicated on Drawings.

C. Concrete Curb: Cast-in-place; height as indicated.

D. Waterproofing: Apply continuous waterproofing membrane over shower floor, up walls, and fully over curb, including top and both sides.Coordinate interface between shower pan and waterproofing system to ensure watertight installation

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that framing, subfloor, and plumbing rough-ins are properly installed and located prior to installation of shower pans.

B. Verify subfloor is level within 1/8 inch in 4 feet.

C. Notify the Contracting Officer in writing of conditions that would prevent proper installation.

D. Do not proceed with installation until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Install shower pans in accordance with manufacturer's instructions and approved Shop Drawings.

B. Dry fit pans before attaching drain:

1. Check the level and make any required adjustments.

2. Check drain location and size.

3. Remove base and install drain assembly into pan.

C. Apply thin-set mortar using 1/4 x 1/4-inch notched trowel, in sufficient amount to fill voids and fully support pan.

D. Place pan onto shims and mortar bed.

E. Place protection onto pan, then stand on base to firmly set base into mortar bed.

F. Allow mortar bed to cure.

G. Ensure that wall substrate is held 1 inch above pan flange.

3.03 CLEANING

A. Clean pans of excess joint sealer, adhesive, and foreign matter.

3.04 PROTECTION

A. Protect pans from damage using non-staining coverings. Do not remove until just prior to final cleaning.

END OF SECTION 15410

SECTION 15450 – PLUMBING FIXTURES AND TRIM

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. Section includes: plumbing fixtures and trims.

1.02 RELATED SECTIONS

A. SECTION 15400 - Plumbing System: covering water piping and waste piping, sanitary systems and drains, and plumbing installation

PART 2 - PRODUCTS

2.01 WATER CLOSET (WC-1)

A. Kohler Model K-PR96057-T4HS Highcliff Ultra Toilet with Mach Tripoint flushometer, Vitreous china, 1.28 gallon flush. Elongated bowl design, 16-5/8" high, 1-1/2" top spud, bowl shall have 2-1/8" passageway. Touchless toilet flushometer, HES-powered 1.28 gpf, polished chrome finish, battery operated, 1" I.P.S. screwdriver Bak-Chek angle stop. Adjustable tail piece. Or approved equal.

B. Beneke Model 523 SS NCH heavy duty solid plastic seat for elongated bowl, with self-sustaining feature and check hinges. Or approved equal.

C. ProFlo Model No. PFWRWH heavy duty wax bowl ring with horn. Or approved equal.

D. PASCO Model No. 184 ¼” x 3-1/2” heavy S.S. closet bolt sets. Or approved equal.

E. Fixtures and installation shall conform to ADAAG Section 604: Water Closets.

2.02 WATER CLOSET (WC-2)

A. Kohler Model K-PR96053-T5D Wellcomme Ultra Toilet with Mach Tripoint flushometer, Vitreous china, 1.28 gallon flush. Elongated bowl design, 15-3/16" high, 1-1/2" top spud, bowl shall have 2-1/8" passageway. Touchless toilet flushometer, HES-powered 1.28 gpf, polished chrome finish, battery operated, 1" I.P.S. screwdriver Bak-Chek angle stop. Adjustable tail piece. Or approved equal.

B. Beneke Model 523 SS NCH heavy duty solid plastic seat for elongated bowl, with self-sustaining feature and check hinges. Or approved equal.

C. ProFlo Model No. PFWRWH heavy duty wax bowl ring with horn. Or approved equal.

D. PASCO Model No. 184 ¼” x 3-1/2” heavy S.S. closet bolt sets. Or approved equal.

2.03 URINAL (UR)

A. Kohler K-PR5016-T2DS-NA Dexter Wall Mounted Urinal with Mach Tripoint touchless DC flushometer, vitreous china, 3/4" top spud, 0.5 gallon per flush. Or approved equal.

B. Fixtures and installation shall conform to ADAAG Section 605 Urinals.

2.04 LAVATORY (L-1)

A. Kohler K-2032 Greenwich Wall Mounted Lavatory, vitreous china, three hole drilling, drilled for concealed arm carrier. Or approved equal.

B. Symmons S-20-2-OFG single lever lavatory faucet with off-set grid strainer. Polished Chrome finish. Or approved equal.

C. Kohler K-8999 P-Trap with 1-1/4" inlet and 1-1/2" outlet with slip joint and cleanout plug. Or approved equal.

D. Brass Craft SCR 3912-A angle stop with riser. Or approved equal.

E. Brass Craft 649SS stainless steel escutcheon. Or approved equal.

F. J.R. Smith Series 700 floor mounted lavatory carrier. Or approved equal.

G. ProFlo Model No. PF202WH Lavatory Guard ADA conforming, wheelchair accessible lavatory under sink protective pipe cover. Or approved equal.

H. Fixtures and installation to conform to ADAAG Section 606 Lavatories and Sinks.

2.05 SINK (S-1)

A. Kohler K-2027 Greenwich Wall Mounted Lavatory, vitreous china, three hole drilling, drilled for concealed arm carrier. Or approved equal.

B. Symmons S-20-2-OFG single lever lavatory faucet with off-set grid strainer. Polished Chrome finish. Or approved equal.

C. Kohler K-8999 P-Trap with 1-1/4" inlet and 1-1/2" outlet with slip joint and cleanout plug. Or approved equal.

D. Brass Craft SCR 3912-A angle stop with riser. Or approved equal.

E. Brass Craft 649SS stainless steel escutcheon. Or approved equal.

F. J.R. Smith Series 700 floor mounted lavatory carrier. Or approved equal.

G. ProFlo Model No. PF202WH Lavatory Guard ADA conforming, wheelchair accessible lavatory under sink protective pipe cover.

2.06 SINK (S-2)

A. Elkay model LRAD171660 Lustertone classic stainless steel, 17”x16”x6” single bowl drop-in sink. 18 gauge 304 stainless steel, satin finish. Two hole punching. Or approved equal.

B. Elkay model LK406AT10L2 4” centerset exposed deck faucet with 10” arc tube spoput 2” lever handles. 1.5 gpm flow rate. Chrome-plated brass. Or approved equal.

C. Elklay model LKAD35 offset sink strainer. Or approved equal.

D. Dearborn No. 705-GBN P-Trap. Or approved equal.

E. Brass Craft SCR3912-A loose key angle stop and riser. Or approved equal.

F. Truebro Lav Guard ADA conforming, wheelchair accessible lavatory under sink protective pipe cover. Or approved equal.

G. Irad

2.07 SHOWER (SH-1)

A. Symmons Safetymix model 1-25-FSB -X-2.0-B48-L/HS. Pressure balancing mixing valve with lever handles and adjustable stop screw to limit handle turn. 5 foot flexible metal hose, inline vacuum breaker, wall connection and flange. 48” slide bar. Integral service stops. 2.0 gpm flow rate. Chrome finish. Or approved equal.

B. Symmons ADACHS Hand Shower. Single mode hand shower featuring non-positive shut off button. 2.0 gpm flow rate. Chrome finish. Or approved equal.

C. Smith Fig. 2010C Duco cast iron body with flashing collar, 6” round adjustable nickel bronze strainers, secured square hole grate, vandal proof screws. Or approved equal.

D. Fixtures and installation to conform to ADAAG Section 608 Shower Compartments.

2.08 EMERGENCY EYE WASH / SHOWER (EW/S)

A. Flood Shower/Eye Wash (FS/EW): chrome-plated brass stay-open ball valve equipped with stainless steel ball and stem which requires less than 5lbs push force to operate, and wheel chair accessibility. Or approved equal.

B. Haws Model 8309wc AXION MSR Combination Shower and Eye Wash. Or approved equal.

C. 11” round stainless steel bowl. Or approved equal.

D. Inverted directional laminar flow. 3.7 gpm.. Or approved equal.

E. ABS plastic showerhead with 20 gpm flow control, chrome-plated brass stay-open ball valve equipped with stainless steel ball and stem which requires less than 5lbs push force to operate, and wheel chair accessibility. Or approved equal.

F. Schedule 40 hot-dipped galvanized steel pipe and fittings, powder-coated cast-iron 9” diameter floor flange, yellow plastic pop-off dust cover for eyewash head, self-adhesive high visibility safety green and bright yellow stripes, universal sign, and 1-1/4″ NPT supply. Or approved equal.

2.09 MOP SINK (MS)

A. Fiat Model MSB-3624 Molded Stone mop service basin. The unit shall have 10" walls with not less than 1"wide shoulders. The factory installed drain body shall be stainless steel. A combination dome strainer and lint basket made from stainless steel shall be included. Or approved equal.

B. Fiat Model 830-AA chrome plated service faucet with vacuum breaker, integral stops, adjustable wall brace, pail hook and 3/4" hose thread on spout. Or approved equal.

C. Fiat Model 832-AA 30" long flexible heavy duty 5/8" rubber hose, cloth reinforced, with 3/4" brass coupling at one end. Bracket is 5" long x 3" wide. 18 ga. 302 stainless steel with rubber grip. Or approved equal.

2.10 ELECTRIIC WATER COOLER (EWC)

A. Elkay model LZSTL8WSSK Self-contained, vandal-resistant Bi-Level electric water cooler with bottle filling station that shall deliver 8.0 gallons per hour of water at 50 degrees Fahrenheit cooled from 80 degrees Fahrenheit inlet water and 90 degrees Fahrenheit ambient. Front vandal-resistant push button activation with less than 5 lbs of force. One-piece, vandal-resistant, water-efficient bubbler which operates on 20-105 psi supply line pressure. Unit shall include front access stream height adjustment. Bottle filling unit shall include an auto 20-second shut-off timer. Unit shall include Green Ticker displaying count of plastic bottles saved from waste. Bottle filler shall provide 1.1-1.5 gallons per minute flow rate with laminar flow to minimize splashing. Unit shall be constructed of 14 gauge stainless steel with integral basin. Venting shall include protective screening. Cooling system shall include insulated, tube on stainless steel evaporate tank, R134a refrigerant and calibrated capillary tube for refrigerant control. Shall include adjustable, accessible thermostat. Furnish with Elkay LKAPREZL Accessory Apron. Shall comply with ANSI 117.1 and American with Disabilities Act for both children and adult frontal approach. The manufacturer shall certify the unit to meet the requirements of NSF/ANSI 61, Safe Drinking Water Act and be UL Listed. Or approved equal.

B. 1-1/2 inch x1-1/2 inch Brass tubular P-Trap. Brass nuts and ground joints. 20 gauge. Or approved equal.

C. 1/4 turn angle ball stop and riser with loose key. Compression x Compression. Or approved equal.

D. Fixtures and installation shall conform to ADAAG Section 602 Drinking Fountains.

PART 3 - EXECUTION

3.01 EQUIPMENT SUBMITTAL APPROVAL

A. Do not commence with installation until proposed equipment submittals are approved.

3.02 FIXTURE INSTALLATION

A. Set all plumbing fixtures in an approved workmanlike manner. Point up edges against wall with approved caulking.

B. Flanges at wall penetrations shall be flush against wall and shall not spin when rotated by hand.

C. Adjust equipment and plumbing fixtures and trim to operate properly and clean all fixtures just prior to final inspection.

END OF SECTION 15450

SECTION 15650 – HIGH EFFICIENCY GAS DOMESTIC WATER HEATERS

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. As specified in Section 01001.

1.02 SUMMARY

A. This Section includes packaged, factory-fabricated and assembled, gas-fired, high efficiency condensing domestic water heaters, trim and accessories for generating hot potable water.

1.03 SUBMITTALS

A. Product Data: Include performance data, operating characteristics, furnished specialties and accessories.

B. Pressure Drop Curve: Submit pressure drop curve for flows ranging from 0 GPM to maximum value of water heater.

C. Shop Drawings: For water heaters, water heater trim and accessories, include:
   1. Elevations, sections, details
   2. Wiring Diagrams for power

D. Operation and Maintenance Data: Data to be included in water heater emergency, operation and maintenance manuals.

E. Warranty: Standard warranty specified in this Section.

F. Made in America Certification

G. Other Informational Submittals.
   1. ASME Stamp Certification and Report

1.04 QUALITY ASSURANCE

A. ASME Compliance: Condensing water heaters must be constructed in accordance with ASME Water heater and Pressure Vessel Code, Section IV (HLW) Potable Water Heaters.

B. ETL Compliance. Condensing water heaters must be tested for compliance with ETL, "Commercial-Industrial Gas Heating Equipment." Condensing water heaters shall be listed and labeled by a testing agency acceptable to authorities having jurisdiction.

C. CO Emission Standards. When installed and operated in accordance with manufacturer’s instructions.

1.05 COORDINATION

A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement and formwork requirements are specified in Division 03.

1.06 WARRANTY

A. Standard Warranty: Water heaters shall include manufacturer's standard form in which manufacturer agrees to repair or replace components of water heaters that fail in materials or workmanship within specified warranty period.
   1. Warranty Period for Condensing Water heaters:
      (a) The heat exchanger coil shall carry a 10 year from commissioning, non-prorated, limited warranty against any failure due to waterside corrosion, mechanical defects, or workmanship. The heat exchanger coil shall carry a 10 year from

shipment, non-prorated, limited warranty against any failure due to condensate corrosion, thermal stress, mechanical defects, or workmanship.

(b) Manufacturer labeled control panels are conditionally warranted against failure for Two (2) years from commissioning.

(c) All other components, including the electronic igniter and electrode, are conditionally guaranteed against any failure for 24 months from commissioning.

(d) Optional extended service for manufacturer to provide factory monitoring of water heater performance and parts via wi-fi or 3G/4G hub. Factory prognostics and predictive maintenance in the optional service

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

C. Basis-of-Design Product: Subject to compliance with requirements, provide Intellihot Model IQ1501; or a comparable product by one of the following:
   1. AERCO
   2. Lochinvar
   3. PVI

2.02 CONSTRUCTION

A. General: The water heating plant shall have a recovery of 337 GPH, at a 70 oF temperature rise. Each water heater shall be ETL Listed; ASME Section IV (HLW) coded and stamped and shall incorporate a negative Pressure gas valve on each exchanger capable of full fire operation at of 2.5” WC of Gas pressure. Each unit shall achieve a minimum turn down 7:1 per 199,951 BTU of input. The total water content in the system shall be less than 2 Gallons per199,950 BTU/hr of input. System shall consist of a quantity of 3 Water Heaters Model: iN199A

B. Description: Water heater shall be direct fired, fully condensing, water-tube design. Power burner shall have full modulation. The minimum firing rate shall not exceed 30,000 BTU/HR input. Water heaters that have an input greater than 30,000 BTU/Hr at minimum fire will not be considered equal. The water heater shall have the capability of discharging into a positive pressure vent. Water heater thermal efficiency shall increase with decreasing load (output), while maintaining set point. Water heater shall have an operational set point capability of 100 ºF to 190 ºF and shall maintain the outlet temperature within an accuracy of +/- 4 oF during load changes of up to 30% rated capacity. Water heater shall be factory-fabricated, factory-assembled and factory-tested, water-tube condensing water heater with heat exchanger sealed pressure-tight, built on a steel base, including a sealed insulated sheet metal enclosure that acts as combustion-air intake plenum with a built in serviceable air filter

C. Heat Exchanger: The heat exchanger shall be constructed with 316L stainless steel helical water tube, fully floating with no welded joints in the exchanger. The exchanger will have a single-pass unitary design (no separate primary and secondary heat exchanger). The water tubes shall be 0.75” ID, with no less than 0.0472” wall thickness.

The heat exchanger shall be ASME Sect IV (HLW) stamped for a working pressure not less than 160 psig.

D. Modulating Air/Fuel Valve and Burner: The water heater burner shall be capable of a - 50 to 1 turndown ratio of the firing rate without loss of combustion efficiency or staging of gas valves. The burner shall be stainless fiber mesh covering a stainless steel body with spark ignition and flame rectification. All burner material exposed to the combustion zone shall be of stainless steel construction. There shall be no moving parts within the burner itself. A modulating air/fuel valve shall meter the air and fuel input. A variable frequency drive (VFD), controlled pre-mix blower shall be used to ensure the optimum mixing of air and fuel between the air/fuel valve and the burner.

E. The exhaust manifold shall be of polypropylene with 6” diameter flue connection.

F. Ignition: Ignition shall be via spark ignition with 100 percent main-valve shutoff and dual electronic flame supervision.

2.03 CONTROLS

A. Refer to Division 15.

B. The water heater control system shall be a Masterless Cascading design with no-master - slave designation. The entire system shall have built-in usage optimization routine.

C. The control panel shall consist of one individual circuit. The circuit boards shall include:
   1. A Digital touch display to indicate temperature and status
   2. A CPU board housing all control functions
   3. Each board shall be individually field replaceable.

D. The combustion safeguard/flame monitoring system shall use spark ignition and a rectification-type flame sensor.

E. The unit shall have a selectable exhaust temperature limit suitable for venting with PVC or CPVC/Polypropylene/Stainless Steel (AL29-4C).

F. The controls shall annunciate water heater and sensor status and include extensive self-diagnostic capabilities.
   1. Set point High Limit: Set point high limit allows for a selectable maximum water heater outlet temperature and acts as temperature limiting governor. Setpoint limit is based on a closed loop function that automatically limits firing rate to maintain outlet temperature.

G. The water heater control system shall incorporate the following additional features for enhanced external system interface:
   1. Temperature set point
   2. High Exhaust temp monitor and control. Turn down the Gas valve until the exhaust temp is kept below selected material (PVC, CPVC).
   3. Cascading via RS232
   4. Error Code Display / Error Code History
      (a) Blower Fault
      (b) Blocked Flue Fault
      (c) Ignition Failure

(d) Temp Sensor Short

(e) Temp Sensor Wiring Fault

(f) Flue Temp Fault

(g) Heat Exchanger Temp Fault

(h) Cascading Fault

(i) Water Valve Fault

(j) Pump Fault

(k) Software Fault

5. Monitor and access to daily, weekly, monthly water usages data.

6. Monitor inlet/outlet temperatures, flow rates, flue gas temperatures, combustion rates via onboard touchscreen and via IoT app.

H. Water Heater Management: the water heater control system shall incorporate onboard multi-unit sequencing logic that would allow Masterless Cascading (Not Lead/Lag) functionality & sequencing between multiple water heaters operating in parallel and must have the following capabilities:

1. Efficiently sequence 2 up to 24 (6,000,000 Btu) heat exchangers on the same system to meet the load requirement.

2. Individual heat exchanger logic to enable accurate temperature control.

3. Operate one motorized valve per heat exchanger as an element of the load sequencing, Valves shall close with decreased load as heaters turn off, minimum of one (depending upon Mode selection) must always stay open for recirculation.

4. Automatically rotate Start/Stop amongst the heat exchangers in the chain based upon an internal calculation of run hours, water through put, burner starts and stops and length of time each burner has been firing. Sequencing is not based upon next in line (Lead/Lag), it is based upon the most logical (least used) heat exchanger in an effort to equalize unit run hours.

5. Automatic bump-less transfer of sequencing in case of heat exchanger failure. All systems must be able to fail all but one heat exchanger in any order or for any reason and the last will continue to operate.

6. Each heat exchanger will default to individual control upon failure of the sequencing chain.

7. Automatic isolation of heat exchanger module from water circuit in case of failure and prevention of cold water from exiting the system

8. Masterless control, change any parameter in any one of the units and all the rest in the series will automatically adjust to the most recent parameter change.

2.04 ELECTRICAL POWER

A. Controllers, Electrical Devices and Wiring: Electrical devices and connections are specified in Division 16 sections.

B. Single-Point Field Power Connection: Factory-installed and factory-wired switches, motor controllers, transformers and other electrical devices shall provide a single-point field power connection to the water heater.

C. Electrical Characteristics:
   1. Voltage: 120 V
   2. Phase: Single
   3. Frequency: 60 Hz
   4. Full-Load Current 5 Amps or less per 250,000 BTU of heat input

2.05 CONDENSATE

A. Condensate traps, manufactured from only non-corrosive materials.

B. Smart condensate neutralizer with capability of monitoring pH levels through included IoT app. Smart Neutralizer to also include:
   1. Monitor water temperatures
   2. CO detection, flue gas detection, water leak detection of boiler room w/ audible/visual alarms and alerts via app.
   3. Water flow recording/monitoring
   4. View history of above parameters via app.

2.06 VENTING

A. The exhaust vent must be PVC, CPVC, Polypropylene, Stainless Steel (AL29-4C) compatible with positive pressure, condensing flue gas service.

B. The minimum exhaust vent duct size for each water heater is six-inch diameter.

C. Combustion-Air Intake: Water heaters shall be capable of drawing combustion air from the outdoors via a metal or PVC duct connected between the water heater and the outdoors.

D. The minimum sealed combustion air duct size for each water heater is 6” diameter.

E. Common Vent and Common Combustion Air up to 4 units. Consult manufacturer for common vent and combustion air sizing.

2.07 SOURCE QUALITY CONTROL

A. Burner and Hydrostatic Test: Factory adjust burner to eliminate excess oxygen, carbon dioxide, oxides of nitrogen emissions and carbon monoxide in flue gas, and to achieve combustion efficiency.

B. Live-fire Test and inspect factory-assembled water heaters, before shipping.

C. Allow Owner access to source quality-control testing of water heaters.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Before water heater installation, examine roughing-in for concrete equipment bases, anchor-bolt sizes and locations. Examine piping and electrical connections to verify actual locations, sizes and other conditions affecting water heater performance, maintenance and operations.

1. Final water heater locations indicated on Drawings are approximate. Determine exact locations before roughing-in for piping and electrical connections.

B. Examine mechanical spaces for suitable conditions where water heaters will be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 WATER HEATER INSTALLATION

A. Install water heaters level on concrete bases. Concrete base is specified in Division 15 and concrete materials and installation requirements are specified in Division 03.

B. Install gas-fired water heaters in accordance with
1. Local, states, provincial and national codes, laws, regulations, and ordinances.

2. National Fuel Gas Code, ANSI Z223.1/NFPA 54 – latest edition.

3. National Electrical Code, ANSI/NFPA 70 - latest edition.

4. Canada only: CAN/CGA B149 Installation Code and CSA C22.1 CEC Part 1.

5. Manufacturer's installation instructions, including required service clearances and venting guidelines.

C. Assemble and install water heater trim.

D. Install electrical devices furnished with water heater but not specified to be factory mounted.

E. Install control wiring to field-mounted electrical devices.

3.03 CONNECTIONS

A. Piping installation requirements are specified in other Division 15 sections. Drawings indicate general arrangement of piping, fittings and specialties.

B. Install piping adjacent to water heater to permit service and maintenance.

C. Install piping from equipment drain connection to nearest floor drain. Piping shall be at least full size of connection. Provide an isolation valve if required.

D. Connect gas piping to water heater gas valve with unions. Piping shall be at least full size of gas train connection. Provide a reducer if required.

E. Connect hot-water piping to supply and return water heater tappings with shutoff valve and union or flange at each connection.

F. Multiple heaters shall be piped such that all cold water entering the system will go through the heat exchanger first. A series of approved piping installation examples are shown in the installation and maintenance manuals provided with the unit. Each water heater shall have individual isolation valves for servicing and a hot water hose connection for start-up and field testing.

G. Install piping from safety relief valves to nearest floor drain.

H. Water heater Venting
1. Install flue venting kit and combustion-air intake.

2. Connect venting full size to water heater connections.

I. Ground equipment according to Division 16.

J. Connect wiring according to Division 16.

3.04 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections

1. Installation and Startup Test: Perform installation and startup checks according to manufacturer's written instructions.

2. Leak Test: Perform hydrostatic test. Repair leaks and retest until no leaks exist.

3. Operational Test: Start units to confirm proper motor rotation and unit operation. Adjust air-fuel ratio and combustion, if necessary.

4. Controls and Safeties: Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

(a) Check and adjust initial operating set points and high- and low-limit safety set points of fuel supply, water level and water temperature.

(b) Set field-adjustable switches and circuit-breaker trip ranges as indicated.

C. Remove and replace malfunctioning units and retest as specified above.

D. Occupancy Adjustments: When requested within 2 months of date of Substantial Completion, provide on-site assistance adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other than normal occupancy hours for this purpose.

E. Performance Tests

1. The water heater manufacturer is expected to provide partial load thermal efficiency curves. These thermal efficiency curves must include at least three separate curves at various BTU input levels. If these curves are not available, it is the responsibility of the water heater manufacturer to complete the following performance tests:

(a) Engage a factory-authorized service representative to inspect component assemblies and equipment installations, including connections, and to conduct performance testing.

(b) Water heaters shall comply with performance requirements indicated, as determined by field performance tests. Adjust, modify, or replace equipment to comply.

(c) Perform field performance tests to determine capacity and efficiency of water heaters.

(i) Test for full capacity.

(ii) Test for water heater efficiency at [low fire, 20, 40, 60, 80, 100, 80, 60, 40 and 20] percent of full capacity. Determine efficiency at each test point.

2. Repeat tests until results comply with requirements indicated.

3. Provide analysis equipment required to determine performance.

4. Provide temporary equipment and system modifications necessary to dissipate the heat produced during tests if building systems are not adequate.

5. Notify the Contracting Officer in advance of test dates.

6. Document test results in a report and submit to the Contracting Officer

END OF SECTION 15650

SECTION 15800 - AIR CONDITIONING AND VENTILATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Section 15000 - General Mechanical Requirements applies to this section with the additions and modifications specified herein.

1.02 WORK SPECIFIED IN THIS SECTION

A. Provide complete and operating air conditioning and ventilating system. "Provide" shall mean "furnish and install" when used herein.
   1. Electrical: Provide all temperature, pressure, flow, and indicating controls for this work. Mount control devices and provide control wiring and conduit. Furnish motor starters for equipment under this section.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. Electrical: Mounting of starters and providing of fused or non-fused disconnect switches, circuit protection, power wiring conduit are under DIVISION 16 ELECTRICAL.

B. Excavation, trenching, and backfilling are under DIVISION 2 SITE-WORK.

C. Concrete bases and supports are under DIVISION 3 CONCRETE.

D. Painting of this work is under DIVISION 9 FINISHES, unless otherwise indicated hereinafter.

1.04 QUALITY ASSURANCE

A. Comply with all the requirements of the County of Hawaii and State of Hawaii.

B. Obtain and pay for all fees, permits, licenses, assessments, and inspections required for this work.

C. Unless specified under the General Provisions of the approved Construction contract, substitutions of another manufacturer's product for equipment specified hereinafter and for items with "or equal" after the brand name requires written permission by the Contracting Officer substitution deadline. No substitution will be considered after the bid opening.

D. Comply with the recommendations and requirements of the Codes and Standards listed hereinafter in addition to detailed requirements of this specification.
   1. American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE):
      a. Handbook, Applications - (Current Edition)

      b. Handbook, Systems and Equipment – (Current Edition)

      c. Safety Standard for Refrigeration Systems – (Current Edition)

      d. 62.1 Standards for Ventilation and Indoor Air Quality - 2016

   2. National Fire Protection Association (NFPA) Standards (Current Editions):
      a. Air Conditioning and Ventilating Systems

b. Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations

c. National Electric Code

3. Air Conditioning, Heating, and Refrigeration Institute (AHRI) Standards (Current Editions):
   a. Forced-Circulation Air Cooling and Heating Coils.

   b. Sound Rating of Ducted Air Moving and Conditioning Equipment

4. Air Moving and Control Association (AMCA) Standards (Current Editions):
   a. Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating

   b. Reverberant Room Method for Sound Testing of Fans

5. American Society of Mechanical Engineers (ASME) (Current Edition):
   a. Boiler and Pressure Vessel Code

6. Sheet Metal and Air Conditioning Contractors National Association (SMACNA):
   a. Duct Construction Standards – Metal and Flexible, 1995.

7. Hawai'i State Department of Health (Current Editions):
   a. Title 11, Chapter 39 – Air Conditioning and Ventilation

8. International Building Code, with County of Hawai'i Amendments – 2021

9. International Energy Conservation Code (IECC), with County of Hawai'i Amendments - 2021

1.05 SUBMITTALS

A. Submit under provisions of SECTION 01330- SUBMITTAL PROCEDURES.
   1. Equipment Submittals: Before beginning work, submit for review manufacturer certified literature showing ratings and dimensions of equipment and of a list indicating all materials and items that are of a different manufacturer or model than those specified. Include equipment wiring diagrams.

   2. Shop Drawings: After review of equipment, before beginning of work, submit for review and approval dimensioned installation shop drawings to scale showing details where space requirement presents problems; proposed departures from the Contract Documents due to field conditions, requirements for concrete work, access panels, inserts in slabs, and openings in structure.
      a. For any changes required to work done prior to Contracting Officer's review of Shop Drawings, costs to remedy the changes shall be incurred by the Contractor and shall be at no additional cost to the State.

   3. System Drawings and Schedules: Include the following:
      a. Direct digital control (DDC) and/or control panels physical layout and schematics.

      b. One-line schematics and system flow diagrams showing the location of all control devices. Provide points list for each DDC controller, including tag, point type, system name, object name, expanded ID, controller type, address, cable destination, terminal ID, panel, reference drawing, and cable number.

c. Details of connections to power sources, including grounding.

d. Details of surge protection device installations.

e. Sequences of operation.

f. Complete diagrams of the related pneumatic and electric controls, including a written description of control sequences.

g. User interface (UI) functional outline. Include each display screen to be provided, data to be displayed, and links to other screens. The outline level hierarchy shall be:
   1) Site.

   2) Building.

   3) Floor.

   4) System.

h. Control Damper and Valve Schedules: Include code number, failure position, pipe or duct size, valve or damper size, damper seal, blade and bearing type, valve body configuration, CV, flow, pressure drop and close-off pressure.

i. Prototype graphics for review prior to implementation of the full graphics package.

4. As-Built Drawings: Record changes from the contract drawings of all concealed piping, duct work and equipment. Indicate location of isolating valves, dampers, and items requiring maintenance or inspection. Submit as-built drawings in accordance with Section 01300-Submittals.

5. Operation and Maintenance Manuals: Furnish operating and maintenance manuals on all equipment and the system as a whole and in accordance with Section 15000 - General Mechanical Requirements.

6. Certificates: The State will have the right to require a written certificate, dated and signed by a responsible employee of the Contractor, evidencing the performance of any portion of the work, or any testing; as a condition precedent to the acceptance of any work or the result of any test. Whenever a regulatory agency performs inspections or tests of any portion of the work, a certificate shall be furnished by the Contractor that the inspection or test was satisfactorily passed.

7. Commissioning Submittals:
   a. Commissioning Plan

   b. Test Checklists and Report Forms.

   c. Certificates of Readiness

   d. Test and Inspection Reports

   e. Corrective Action Documents

   f. Commissioning Report

g. System Manual

1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Furnish new equipment, material, and accessories bearing the manufacturer's identification. Coordinate deliveries to avoid interferences or construction delays. Protect products during delivery, storage, installation and the remainder of the construction period after installation.

1.07 GUARANTEE

A. All work in this section shall be guaranteed for a period of one year from the date of acceptance of the work as a whole by the State and as indicated in Section 15000. Correction of undue noise or vibration is included in the guarantee.

B. Normal maintenance requirements are not included in this guarantee. Should any equipment or material fail within this period, the Contractor shall be responsible for any damage to any part of the premises caused by leaks in piping or equipment for a period of one year after final acceptance of the work as a whole by the State.

PART 2 - PRODUCTS

2.01 GENERAL

A. Asbestos Prohibition: No asbestos containing materials or equipment shall be used under this section. The Contractor shall ensure that all materials and equipment incorporated in the project as asbestos-free.

2.02 EQUIPMENT

A. Capacities and characteristics of equipment are indicated on the drawings. See electrical drawings for all voltage and phase requirements of all equipment furnished under this work. Provide combination magnetic across-the-line starter and circuit breaker for each motor of mechanical equipment unless the equipment is factory wired to a single power connection or unless otherwise indicated herein-after. Provide NEMA 4X weatherproof starters with fiberglass enclosure for the outdoor installation. Provide vibration isolators as indicated hereinafter.

EQUIPMENT	ISOLATOR DESCRIPTION	MINIMUM STATIC DEFLECTION
Air Handling Units Spring Isolators	Vertically Restrained	1.00”
Air Cooled Condensing Units	Vertically Restrained Spring Isolators	1.00”
Exhaust Fan Hangers	Vertical Spring Isolator	1.00”

B. *Isolator mounting location shall be in accordance with manufacturer's dimensioned drawings. Isolators shall be sized to provide specified static deflection from manufacturer's published loading information at each mounting point, based on operating weight.

2.03 SALT CORROSION PROTECTION

A. Provide salt corrosion protection for all outdoor mounted supply/exhaust fans and equipment housings. All outdoor mounted equipment coils shall be coated with Blygold PoluAL XT or approved equal. All outdoor mounted housings (interior and exterior) and supply/exhaust fans shall be coated with PSX 700 or approved equal.

2.04 CIRCUIT BOARD PROTECTION

A. Provide protective coating for all outdoor unit circuit boards, use Circuit Shield or approved equal intended to prevent short circuiting from geckos, rodents, etc.

B. Provide coating using a process to ensure a uniform dry film thickness of 10-36 microns (0.4-1.4 mils) and meets 5B rating for crosshatch adhesion per ASTM D3359. Corrosion durability shall be confirmed through testing to no less than 2,500 hours salt spray resistance per DIN 53167 (ASTM B117) using aluminum test coupons. Dielectric Withstanding Voltage test shall pass at 1500 volts/mil thickness.

2.05 A2L CLASS REFRIGERANT REQUIREMENTS

A. This project shall utilize Class A2L refrigerants to accommodate the environmental regulations set forth by the United States Environmental Protection Agency. This facility shall be provided with refrigerant R-454B or approved equal.

B. Contractor shall be responsible for the complete installation of the HVAC system with the use of class A2L refrigerants in accordance with the requirements of ASHRAE 15 2024, UL 60335-2, NFPA 70, International Building Code, and all other requirements of the AHJ.

C. The Contractor shall be responsible to coordinate with all other trades that slightly flammable refrigerant will be installed. The mechanical contractor is responsible to review all other discipline plans to determine the need of protection for refrigerant piping.

D. Contractor shall be responsible for the volume calculation and determining the effective dispersal volume for each room serviced by the HVAC system in accordance with the requirements of ASHRAE 15 and as required by the manufacturer.

E. All refrigerant shall be new refrigerant specified by the equipment manufacturer, the use of recovered or recycled refrigerant shall not be permitted.

F. Refrigerant detection system shall be provided in accordance with the manufacturer’s requirements.

G. Integral refrigerant detection shall be provided per the manufacturer’s direction and as noted below.

1. Ducted HVAC systems with a releasable refrigerant charge more than 4.0 lbs and with any duct opening less than 5.9' above the finished floor.

2. Ducted HVAC systems where spaces connected to the supply air duct are used as the dispersal floor area to calculate volume per ASHRAE 15 section 7.2.

3. Refrigeration systems installed where the occupancy classification is institutional occupancy

H. Refrigerant detection shall comply with the following:

1. Utilize a set point, nonadjustable in the field, to generate an output signal to initiate mitigation actions.

2. Field re-calibration of the refrigerant detection system shall not be permitted.

3. Be capable of detecting the presence of a specified refrigerant corresponding to the refrigerant designation of the refrigerant contained in the refrigeration system.

4. Have access for replacement of refrigerant detection system components.

5. Have self-diagnostics to determine operational status of the sensing element.

6. Upon failure of a self-diagnostic check, energize air circulation fans of the equipment.

7. Where required per ASHRAE 15 section 7.6.4, and upon failure of a self-diagnostic check, activate the mechanical ventilation system serving the space or connected spaces.

8. Generate an output signal in not more than 30 seconds when exposed to a refrigerant concentration of 25% LFL (+0%,-1%)

I. Mitigation actions shall be completed with no more than 15 seconds upon receiving an output signal from the refrigerant detection system and shall be maintained for at least five (5) minutes after output signal has reset.

J. Open-flame-producing devices shall not be permanently installed in the ductwork that serves the space.

K. Unclassified electrical devices shall not be located within the ductwork that serves the space.

L. All mechanical ventilation used for refrigeration mitigation shall comply with ASHRAE 15 section 7.6.4 or shall be listed and installed in accordance with UL 60335-2-40 / CSA C22.2 no. 60335-2-40.

M. Pressure relief devices shall be provided in accordance with ASHRAE 15 and as required by the manufacturer.

N. The installation of piping containing class A2L refrigerant shall meet all the requirements of ASHRAE 9.12.1 and as specified in other design documents. Additionally, where piping is installed in studs, joists, rafters, or similar member spaces and located less than 1.5 in from the nearest edge of the member, shall be continuously protected by shield plates. Protective steel shield plates having a minimum thickness of 0.0575 inches shall cover the area of the tube and shall extend a minimum of 2 in beyond the outside edge of the tube.

O. Shaft ventilation shall be required in accordance with ASHRAE 15 section 9.12.2.2.

P. Contractor shall provide the following labels:

1. A label indicating a flammable refrigerant is used shall be placed adjacent to service ports and other locations where service involving components containing refrigerant is performed, as specified by the product listing.

2. Refrigerant piping shall be labeled with "WARNING---RISK OF FIRE. FLAMMABLE REFRIGERANT" in areas other than the room or space where the refrigerant equipment is located. The piping shall be labeled in accordance with ANSI/ASME A13.1 in intervals of not less than 20' with a minimum letter height of 0.5 in.

2.06 EMERGENCY SAFETY SHUT OFF MULTI-VALVE BOX

A. Provide A2L refrigerant systems with emergency safety shut off valves as required by ASHRAE 15, by manufacturer, or as noted on plans.

B. Fast acting valves shall be automatically controlled by and integrated into the VRF system's refrigerant detection system.

C. The leakage rating shall be in compliance with the latest ASHRAE 15.

D. Provide enclosure with exhaust vent port. System shall integrate external exhaust fan into refrigerant detection system's sequence of operations to activate during a refrigerant leakage event.

E. Coordinate electrical requirements based on manufacturer's requirements.

F. Ports shall be extended for direct brazing.

G. Factory built-in Refrigerant Detection Sensors (RDS) to continuously monitor and respond to potential refrigerant leaks within or in proximity to the unit.

H. Shut-off valve at each outlet port to enable isolation of the downstream refrigerant circuit upon leak detection.

I. Exhaust and inlet air duct connections, with factory built-in motorized dampers, to ventilate the SVB enclosure as required based on project application and regulatory needs. Dampers and wiring can be relocated in the field, and block-off plates are included for unused openings.

J. Contact output signal for external exhaust fan upon leak detection to create negative pressure at the SVB for ventilation.

K. A2L Refrigerant check plug terminals for optional integration with third-party devices. These terminals can be used to trigger alarms, activate external ventilation, or initiate other responses in the event of refrigerant leak detection. A2L leak management, including error code handling, is managed natively by the VRF system.

L. Emergency power supply stores electrical charge in capacitors to ensure shutoff valves closes automatically in the event of power outage.

M. Release mitigation function that conducts individual port pump-down operation when leak is detected at a connected indoor unit, prior to closing off the shut-off valve for that port.

N. Meets ETRS requirements, ensuring superior system integrity, leak prevention, and compliance with A2L safety standards.

2.07 AIR COOLED CONDENSING UNIT

A. General:

1. Outdoor unit components shall be coated PSX 700 or approved to protect components from premature corrosion due to a seacoast environment. Coating shall be applied to components and shall meet the following minimum requirements:

a. PSX 700 coating or approved equal on External Panels

b. PSX 700 coating or approved equal on External Panel Base, Support Plate and Compressor Cover

c. Blygold PoluAl XT or approved equal Anti-Corrosion, Hydrophilic coating on heat exchanger fins

d. Anti-Humidification paint coating and gecko proof paint coating on printed circuit boards

2. Factory-assembled, single piece air-cooled outdoor unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, and the multiple inverter-driven twin rotary compressors.

3. The maximum sound pressure rating for a single module shall not exceed 64 dBA sound pressure in cooling and 65 dBA in heating and for multiple modular systems the sound pressure numbers should not exceed 68 dBA and 69 dBA. Sound pressure ratings are measured at a distance of 3 ft out and 4 ½ ft up from the side of the outdoor unit.

4. The outdoor unit shall include an oversized accumulator and a liquid tank for proper heating performance while allowing the indoor unit PMV (pulse modulating valve) metering device to shut off completely when a zone is satisfied.

5. The outdoor unit shall be protected by a high-pressure switch, high-pressure sensor, low-pressure sensor, fusible plug, PC board, and inverter overload protector.

6. The outdoor unit shall be capable of operating in cooling mode down to 14F ambient air temperature and down to -13 F wet bulb ambient air temperature in heating.

7. The outdoor unit shall include a total oil management system that balances oil between compressors within a module, replenishes compressor oil to the compressors in a module from the oil separator if required, and allows oil and refrigerant to move between multiple modular units if required, even if one of the units is not running.

B. Unit Cabinet:
1. Unit cabinet shall be constructed of pre-coated steel, finished on both inside and outside.

2. Unit access panels shall be removable with minimal screws and shall provide full access to the compressors, fan, and control components.

3. Compressors shall be isolated in a compartment and have an acoustic wrap to assure quiet operation.

4. The outdoor unit control panel shall include a sliding window to access adjustable controls and an LED display for setup and diagnostics.

5. Unit cabinet shall be capable of withstanding 500-hour salt spray test per Federal Test Standard No. 141 (method 6061).

C. Fans:

1. Outdoor fan shall discharge air vertically and be driven by a DC inverter variable speed motor with 64 steps that is capable of running down to 60 rpm.

2. Outdoor fan motor shall be totally-enclosed with permanently-lubricated bearings.

3. Motor shall be protected by internal thermal overload protection.

4. Fan blade shall be non-metallic and shall be statically and dynamically balanced.

5. Outdoor fan shall be protected by a raised non metallic protective grille.

D. Compressors:
1. Each outdoor unit module shall be equipped with two inverter-driven twin rotary compressors with full range control to an accuracy of □0.1 Hz.

2. Compressor shall be totally enclosed in the machine compartment.

3. Compressors shall be equipped with factory mounted crankcase heaters.

4. Internal overloads shall protect the compressor from over-temperature operation.

5. Motor shall be suitable for operation in an R-410A refrigerant atmosphere.

6. Compressor assembly shall be installed on rubber vibration isolators.

7. To maximize compressor reliability, multiple compressors within a module shall be started and operated in variable patterns to ensure equal run time on all compressors.

8. To ensure maximum efficiency throughout the system operation range, no compressor is required to run at maximum speed under any condition.

E. Outdoor Coil:
1. Coil shall be constructed of aluminum fins mechanically bonded to seamless copper tubes, which are cleaned, dehydrated, and sealed.

2. The coil configuration shall be 4-sided and fully separated from the machine compartment for more effective heat transfer and sound isolation.

3. The coil fins shall have a factory-applied corrosion resistant blue-fin finish.

F. Controls and Safeties: Operating controls and safeties shall be factory selected, assembled, and tested. The minimum control functions shall include the following:
1. Controls:
a. Compressor speed to match the refrigerant flow and capacity with the system requirements.

b. Outdoor fan motor speed for higher efficiency and lower sound.

c. Oil control for improved system reliability and comfort

d. Pulse modulating valve control for precise control of the refrigerant distribution and accurate capacity management to avoid starving any units.

e. Control of compressor staging to maximize reliability and minimum run time on all compressors.

f. Module control of compressor operation, compressor speed, and outdoor heat exchanger surface to maximize efficiency and sound level and reliability across the entire operating range of the system.

g. Control of the outdoor heat exchanger surface (main vs sub heat exchangers) for maximum efficiency and comfort.

2. Safeties: The following safety devices shall be part of the condensing unit:
   a. High-pressure switch

   b. Fuses

   c. Crankcase heater

   d. Fusible plug

   e. Overcurrent relay for the compressor

   f. Thermal protectors for compressor and fan motor

   g. Compressor time delay

   h. Oil recovery system

   i. Oil level sensor

   j. Overcurrent sensor

   k. Compressor suction and discharge temperature sensor

   l. Compressor suction and discharge pressure sensor

G. Electrical Requirements:
   1. All sizes shall utilize 208/230-3-60 or 460-3-60 (V-Ph-Hz) field power supply.

   2. Multiple systems shall have separate field power supply to each module.

   3. Two-core, standard, shielded low voltage cable shall be required for communication between outdoor and indoor unit.

   4. All power and control wiring must be installed per NEC and all local electrical codes.

H. Refrigerant Piping and Line Lengths:
   1. Piping connections shall be from the front or the bottom of the unit. The unit shall be capable of operating with maximum connected refrigerant line lengths up to 3281 (ft) actual based on total system capacity and refrigerant amount.

   2. The outdoor unit shall have the ability to operate with a maximum height of 230 ft between the outdoor and the lowest indoor unit.

3. The maximum distance between the outdoor unit and the furthest fan coil shall not exceed 623 ft actual or 771 ft equivalent. No line size changes or oil traps shall be required.

4. The system shall be capable of operating when the height difference between the upper and the lower fan coil is 131 ft.

I. Auxiliary Refrigerant Components:
1. All field-supplied copper tubing connecting the outdoor unit to the indoor unit shall use factory-supplied branching kits consisting of either Y joints or headers to ensure even refrigerant flow.

2. To ensure piping flexibility, the system shall allow having Y joints or headers downstream of another header.

3. When combining multiple modules, and in order to maximize efficiency and comfort, a 3/8-in. oil balance line shall be used to allow the flow oil and refrigerant between the two units, even when one of the units is not running.

2.08 DUCTED FAN COIL UNIT

A. General:
1. Indoor, direct-expansion ducted fan coil. Unit shall be complete with a coil, fan driven by DC inverter motor, PMV (pulse modulating valve), piping connectors, electrical controls, microprocessor control system, integral temperature sensing, condensate lift mechanism with a lift capability of 24.3in, and hanging brackets.

B. Unit Cabinet:
1. Cabinet shall be constructed of zinc-coated steel. The unit shall be capable of being configured for either bottom or rear return. The cabinet shall have a knockout for fresh air intake.

C. Fans:
1. The fan shall be of the multi-blade type with its performance designed to match the coil performance. The fan shall be statically and dynamically balanced to ensure low noise and vibration and capable of up to 0.8in. wg external static pressure.

D. Coil:
1. Coil shall be copper tube with aluminum fins and galvanized steel tube sheets. Fins shall be bonded to the tubes by mechanical expansion and specially coated for enhanced wettability. A drip pan under the coil shall have a factory-installed condensate lift mechanism with a lift capacity of 24.3” and drain connection for hose attachment to remove condensate.

E. Motors:
1. Motors shall be totally enclosed, permanently lubricated ball bearing with inherent overload protection. Fan motors shall be inverter controlled variable speed.

F. Controls:
1. The system shall be microprocessor-controlled to maintain precise room temperature and minimum power consumption. The controls system shall employ a genetic algorithm for temperature control.

2. Any of the following user interface accessories shall be compatible with the unit.
a. Wired Remote Controller
1) Wired remote controller shall communicate over two-core shielded wire up to 1640 ft. It shall be capable of controlling groups of up to 8 indoor units. It

shall be able to operate as a primary or secondary controller when two remote controllers are connected to a single indoor unit or group. The system shall be able to be configured so that the return air (TA) can be sensed at the unit, at the remote controller or through a remote sensor. The local controller shall minimally be able to control On-OFF, set point, mode, and be able to display system generated error codes.

b. Central Controller
   1) Central controller shall communicate over two-core shielded wire up to 6500 ft and use existing indoor – outdoor communication protocol to communicate. A single central controller shall be capable of controlling up to 256 indoor units individually with capability to program multiple schedules. It shall be able to create 2 indoor unit line-ups with 128 units on each line. It shall provide weekly, special day and operational scheduling feature. During schedule operation, user can set the power status (ON/OFF), operation mode, temperature setup, and remote-control operation, restricted / allowed, return back and ventilation operation. It shall provide a web interface for remote monitoring, control, and scheduling. It shall be capable of monitoring energy consumption for each tenant and generate monthly KW usage reports. In addition, an optional digital I/O interface shall provide alarm, fire and locking signals.

G. Building Management Systems
   1. The system shall be able to be controlled by BACnet protocols either directly or through an external gateway.

   2. BACnet and LonWorks shall be able to control:
      a. ON / OFF

      b. operation mode

      c. fan speed

      d. louver

      e. set temperature

      f. permit / prohibit local operation

   3. BACnet and LonWorks shall be able to monitor:
      a. ON / OFF

      b. operation mode

      c. fan speed

      d. louver

      e. set temperature

      f. permit / prohibit local operation

      g. room temperature

      h. error status

i. error code

4. The unit shall have the following functions as a minimum:
   a. Selectable automatic restart. After power failure the system will restart at the same operating conditions as before the failure.

   b. Temperature-sensing controls shall sense return air temperature at the unit or at the remote control

   c. Indoor coil freeze protection in both cooling and heating (reversing valve failure) modes.

   d. Dehumidification (Dry) mode shall provide increased latent removal through total system modulation.

   e. Fan-only operation to provide room air circulation when no cooling is required.

   f. Fan speed control shall be user-selectable: high, medium, low, or microprocessor determined (Auto) based on the differential between the room temperature and the set point during all modes of operations.

   g. Indoor coil high temperature protection shall be provided to detect excessive indoor discharge temperature in heating.

   h. Cold blow prevention in heating.

   i. Adjustable compensation for air stratification in heating.

H. Filters:
   1. The unit shall be supplied with filter.

I. Electrical Requirements:
   1. Indoor units are 208/230-1-60 (V-Ph-Hz).

2.09 4-WAY CEILING CASSETTE

A. General:
   1. Indoor, direct-expansion, low profile (10.1 in.), compact (22.6 x 22.6 in.) in-ceiling fan coil. Unit shall be complete with a coil, fan driven by DC inverter motor, PMV (pulse modulating valve), piping connectors, electrical controls, microprocessor control system, integral temperature sensing, condensate pump with a lift capability of 25.0in and hanging brackets.

B. Unit Cabinet:
   1. Cabinet shall be constructed of zinc-coated steel. Fully insulated discharge and inlet grilles shall be attractively styled, high-impact non- metallic material. The inlet grille shall have hinges and can be opened to obtain access to the cleanable filters and fan motor.

C. Fans:
   1. Fan shall be centrifugal direct-drive blower type with air intake in the center of the unit and discharge at the perimeter. Automatic, motor-driven vertical air louver shall be provided standard and shall be adjustable for 2, 3 or 4-way discharge.

   2. Air louver operation shall provide three user selectable modes.

D. Coil:
   1. Coil shall be copper tube with aluminum fins and galvanized steel tube sheets. Fins shall be bonded to the tubes by mechanical expansion and specially coated for enhanced wettability. A drip pan under the coil shall have a factory-installed condensate lift mechanism with a lift capacity of 25” and drain connection for hose attachment to remove condensate.

E. Motors:
   1. Motors shall be totally enclosed, permanently lubricated ball bearing with inherent overload protection. Fan motors shall be inverter controlled variable speed.

F. Controls:
   1. The system shall be microprocessor controlled to maintain precise room temperature and minimum power consumption. The controls system shall employ a genetic algorithm for temperature control.

   2. Wired Remote Controller
      a. Wired remote controller shall communicate over two-core shielded wire up to 1640 ft. It shall be capable of controlling groups of up to 8 indoor units. It shall be able to operate as a primary or secondary controller when two remote controllers are connected to a single indoor unit or group. The system shall be able to be configured so that the return air (TA) can be sensed at the unit, at the remote controller or through a remote sensor. The local controller shall minimally be able to control On-OFF, set point, mode, and be able to display system generated error codes.

   3. Central Controller
      a. Central controller shall communicate over two-core shielded wire up to 6500 ft and use existing indoor – outdoor communication protocol to communicate. A single central controller shall be capable of controlling up to 256 indoor units individually with capability to program multiple schedules. It shall be able to create 2 indoor unit line-ups with 128 units on each line. It shall provide weekly, special day and operational scheduling feature. During schedule operation, user can set the power status (ON/OFF), operation mode, temperature setup, and remote-control operation, restricted / allowed, return back and ventilation operation. It shall provide a web interface for remote monitoring, control, and scheduling. It shall be capable of monitoring energy consumption for each tenant and generate monthly KW usage reports. In addition, an optional digital I/O interface shall provide alarm, fire and locking signals.

   4. Building Management Systems
      a. The system shall be able to be controlled by BACnet protocols either directly or through an external gateway.

      b. BACnet and LonWorks shall be able to control:
         1) ON / OFF

         2) operation mode

         3) fan speed

         4) louver

         5) set temperature

         6) permit / prohibit local operation

c. BACnet and LonWorks shall be able to monitor:
   1) ON / OFF
   2) operation mode
   3) fan speed
   4) louver
   5) set temperature
   6) permit / prohibit local operation
   7) room temperature
   8) error status
      a) error code

5. The unit shall have the following functions as a minimum:
   a. Selectable automatic restart. After power failure the system will restart at the same operating conditions as before the failure.
   b. Temperature-sensing controls shall sense return air temperature at the unit or at the remote control
   c. Indoor coil freeze protection in both cooling and heating (reversing valve failure) modes.
   d. Automatic air sweep control to provide multiple operating modes of the air sweep louvers.
   e. Dehumidification (Dry) mode shall provide increased latent removal through total system modulation.
   f. Fan-only operation to provide room air circulation when no cooling is required.
   g. Fan speed control shall be user-selectable: high, medium, low, or microprocessor determined (Auto) based on the differential between the room temperature and the set point during all modes of operations.
   h. Indoor coil high temperature protection shall be provided to detect excessive indoor discharge temperature in heating.
   i. Cold blow prevention in heating.
   j. Adjustable compensation for air stratification in heating.

G. Filters:
   1. Unit shall have factory-supplied resin net (cleanable) type filters. The return air filter material shall have the following characteristics:
      a. Odorless
      b. Temperature resistant to 185 F
      c. Humidity resistant up to 95% RH

H. Electrical Requirements:
   1. Indoor units are 208/230-1-60 (V-Ph-Hz).

I. Special Accessories:
   1. Ceiling panel (grille) – required for proper operation of the unit

2.10 INDOOR WALL MOUNTED FAN COIL WITH OUTDOOR CONDENSING UNIT MINI-SPLIT

A. Indoor unit

   1. General:

      a. Indoor, direct-expansion, wall-mounted fan coil. Unit shall be complete with coil, fan, fan motor, piping connectors, electrical controls, microprocessor control system, and integral temperature sensing. Unit shall be furnished with integral wall mounting bracket and mounting hardware.

   2. Unit Cabinet:

      a. Cabinet discharge and inlet grilles shall be attractively styled, high-impact non-metallic material.

   3. Fans:

      a. Fan shall be tangential direct-drive blower type with air intake at the top of the unit and discharge at the bottom front. Automatic, motor-driven vertical air sweep shall be provided standard.

      b. Vertical air sweep operation shall be user selectable using the remote control and the horizontal air direction may be set manually.

   4. Coil:

      a. Coil shall be copper tube with aluminum fins and galvanized steel tube sheets. Fins shall be bonded to the tubes by mechanical expansion and specially coated for enhanced wet-ability. A drip pan under the coil shall have a factory installed drain connection (on both ends) for hose attachment to remove condensate.

   5. Motors:

      a. Motors shall be totally enclosed, permanently lubricated ball bearing with inherent overload protection. Fan motors shall be inverter controlled variable speed.

   6. Controls:

   7. Controls shall consist of a microprocessor-based control system which shall control space temperature, determine optimum fan speed, run self-diagnostics, provide save mode and self-cleaning. The temperature control range shall be from 62°F to 86°F.

   8. User interface with the unit shall be accomplished through an accessory wired or wireless remote control (can be configured for °F or °C). The wired remote control shall be capable of running system diagnostics (displays operating conditions of the system)

9. The unit shall have the following functions as a minimum:

    a. Selectable automatic restart, after power failure the system will restart at the same operating conditions as before the failure.

    b. A timer function to provide a minimum 24-hour timer cycle for system Auto Start/Stop.

    c. Temperature-sensing controls shall sense return air temperature at the unit or at the remote control

    d. Indoor coil freeze protection in both cooling and heating (reversing valve failure) modes.

    e. Automatic air sweep control to provide multiple operating modes of the air sweep louvers.

    f. Dehumidification mode shall provide increased latent removal through total system modulation.

    g. Fan-only operation to provide room air circulation when no cooling is required.

    h. Diagnostics shall provide continuous checks of unit operation and warn of malfunctions. Error messages shall be displayed at the unit or the remote control.

    i. Fan speed control shall be user-selectable: high, medium, low, or microprocessor determined based on the differential between the room temperature and the set point during all modes of operations.

    j. Automatic changeover control shall include an adjustable dead band to prevent rapid mode cycling between heating and cooling.

    k. Indoor coil high temperature protection shall be provided to detect excessive indoor discharge temperature in heating.

    l. Cold blow prevention in heating.

    m. Adjustable compensation for air stratification in heating.

10. Filters:

    a. Unit shall have factory-supplied cleanable filters, with adjustable filter cleaning reminder on wired remote control

11. Electrical Requirements:

    a. Indoor units are 208/230-1-60 and are powered from the outdoor unit.

12. Special Features (Accessories):

    a. User Interface can be accomplished with:

        1) Wired remote control (programmable) shall be capable of controlling from 1 to 8 daisy-chained units.

b. Condensate pump and installation kit.

B. Outdoor unit

1. General:

a. Factory assembled, single piece, air-cooled outdoor unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, and the compressor.

2. Unit Cabinet:

a. Unit cabinet shall be constructed of pre-coated steel, finished on both inside and outside. The cabinet shall be provided with corrosion coatings specified in this section.

b. Unit access panels shall be removable with minimal screws and shall provide full access to the compressor, fan, and control components.

c. Compressor shall be isolated and have an acoustic wrap to assure quiet operation.

d. Compressor compartment shall be isolated to allow performing diagnostics while the system is running.

3. Fans:

a. Outdoor fan(s) shall be direct-drive propeller type, and shall discharge air horizontally. Fans shall draw air through the outdoor coil.

b. Outdoor fan motor(s) shall be totally-enclosed, inverter driven with permanently-lubricated ball bearings. Motor shall be protected by internal thermal overload protection.

c. Shaft shall have inherent corrosion resistance.

d. Fan blades shall be non-metallic and shall be statically and dynamically balanced.

e. Outdoor fan openings shall be equipped with non-metallic protective grille over fan.

4. Compressor:

a. Compressor shall be fully hermetic, inverter driven, twin cylinder rotary type.

b. Compressor shall be equipped with oil system, operating oil charge, and motor. Internal overloads shall protect the compressor from over-temperature operation.

c. Motor shall be suitable for operation in an R-454B refrigerant or approved equal.

d. Compressor assembly shall be installed on rubber vibration isolators.

e. Compressors shall be available in inverter driven capacities from 18,000 Btu/hr to 42,000 Btu/hr.

5. Outdoor Coil:

    a. Coil shall be constructed of aluminum fins mechanically bonded to seamless copper tubes, which are cleaned, dehydrated, and sealed.

6. Refrigeration Components:

    a. Refrigerant circuit components shall include brass liquid line and suction line service valves, service gage port connections with Schrader type fittings, accumulator and reversing valve.

7. Controls and Safeties:

    a. Operating controls and safeties shall be factory selected, assembled, and tested. The minimum control functions shall include the following:

        1) Controls:

            a) A time delay sequence is provided in the inverter control.

            b) Automatic outdoor-fan motor speed control.

        2) Safeties:

            a) Diagnostics provided by inverter control.

            b) Compressor motor current and temperature protection.

            c) Outdoor fan failure protection (High Pressure Switch).

            d) Low pressure protection.

            e) Fusible plug to vent refrigerant safely in case of a fire.

8. Electrical Requirements:

    a. All sizes shall utilize 208/230-1-60 field power supply.

    b. Outdoor unit provides power to the indoor fan coil.

    c. Two way low voltage communication between outdoor and indoor unit.

    d. All power and control wiring must be installed per NEC and all local electrical codes.

9. Refrigerant Line Lengths:

    a. The unit shall be capable of maximum line lengths from 165 to 245 ft. The maximum vertical lift or drop is 100 ft.

10. Special Features:

    a. Crankcase oil temperature regulation by inverter control.

    b. User activated refrigerant pump down cycle.

c. Outdoor fan can be controlled to accommodate minimum external static pressure change (sizes 300, 360,420)

2.11 CEILING MOUNTED EXHAUST FANS

A. Ceiling mounted exhaust fans shall be of the centrifugal direct drive type. The fan housing shall be constructed of heavy-gauge galvanized steel. The housing interior shall be lined with 1/2 inch (13 mm) acoustical insulation. The outlet duct collar shall include a a spring loaded aluminum backdraft damper. Outlet shall be adaptable for horizontal or vertical discharge. The grille shall be constructed of aluminum. Grilles shall be non-yellowing. The access for wiring shall be external. The motor disconnect shall be internal and of the plug-in type. The motor shall be mounted on vibration isolators. The fan wheel shall be of the forward-curved centrifugal type and dynamically balanced. All fans shall bear the AMCA Certified Ratings program AMCA Sound and Air Performance seal and shall be UL/cUL Listed.

2.12 CENTRIFUGAL IN-LINE EXHAUST FANS

A. General
   1. Base fan performance at standard conditions (density 0.075 Lb/ft3)
   2. Ceiling mounted applications
   3. Maximum operating temperatures is 130 Fahrenheit (54.4 Celsius)
   4. Fans are UL/cUL listed 507 - Electric Fans
   5. Each fan shall bear a permanently affixed manufacture's nameplate containing the model number and individual serial number

B. Wheel:
   1. Forward curved centrifugal wheel
   2. Constructed of galvanized steel or calcium carbonate filled polypropylene
   3. Statically and dynamically balanced in accordance to AMCA Standard 204-05

C. Motors:
   1. Motor enclosures shall be open driproof (ODP), opening in the frame body and or end brackets
   2. Motors are permanently lubricated sleeve bearing type to match with the fan load and furnished at the specific voltage and phase
   3. Motor shall be mounted on vibration isolators and be accessible for maintenance
   4. Compatible for use with speed controls
   5. Thermal overload protection

D. Housing:
   1. Constructed of heavy gauge galvanized steel
   2. Interior shall be lined with 0.5 inches of acoustical insulation
   3. Profile as low as 10 ½ inches

E. Spring Loaded Aluminum Backdraft Damper:
   1. Prevents air from entering back into the building when fan is off

   2. Eliminates rattling or unwanted backdrafts

F. Outlet:
   1. Field rotatable from horizontal to vertical discharge

   2. Duct collar shall include an aluminum backdraft damper

G. Grille:
   1. Types: Aluminum

H. External Electrical Access:
   1. Eliminates removing the motor pack which saves time on installation

I. Mounting Brackets:
   1. Fully adjustable for multiple installation conditions

J. Access Panel:
   1. Once installed shall have easy access to internal components

K. Vibration Kit:
   1. Includes prepunched hole for ease of installation and shall have all hardware to mount one unit.

2.13 CENTRAL VRF COTNROLLER

A. Seamless integration of HVAC systems with all Home Automation/BMS controllers

B. Perform analysis on the HVAC data for service purposes and energy management. Enabled on any existing device by activation string.

C. Compatibility with all VRV/VRF HVAC brands

D. Multi-brand simultaneous support

E. Interfaces via RS232 (ASCII), RS485 (MODBUS RTU according to EIA/TIA-485 standard), Ethernet (ASCII &MODBUS IP) for all HVAC brands

F. Full control & monitoring of HVAC indoor units operation

G. Color LCD with Touch Screen for control and system management

H. "All On" / "All Off" capability using external signal (e.g. for fire alarm systems)

I. Configurable GPIO

J. Remote access by PC (www.CoolRemote.net). Supported by operating systems: Windows, IOS, Android Compatible

   1. Cloud integration capable(Confirm with State)

   2. HVAC systems diagnostics

2.14 CEILING EXHAUST FAN

A. Ceiling mounted exhaust fans shall be of the centrifugal direct drive type. The fan housing shall be constructed of heavy-gauge galvanized steel. The housing interior shall be lined with 1/2 inch (13 mm) acoustical insulation. The outlet duct collar shall include a polypropylene backdraft damper on SP-A50 - 90 and a spring loaded aluminum backdraft damper on SP-A110 and larger. Outlet shall be adaptable for horizontal or vertical discharge. The designer grille for sizes SP-A50 through SP-A390 shall be constructed of high-impact polystyrene and for sizes SP-A410 through SP-A1550, the grille shall be constructed of aluminum. Grilles shall be non-yellowing. The access for wiring shall be external. The motor disconnect shall be internal and of the plug-in type. The motor shall be mounted on vibration isolators. The fan wheel shall be of the forward-curved centrifugal type and dynamically balanced. All fans shall bear the AMCA Certified Ratings program AMCA Sound and Air Performance seal and shall be UL/cUL Listed.

2.15 SECONDARY DRAIN PAN

A. Provide secondary drain pans to all air handlers, fan coils, evaporative coolers mounted above a ceiling or where damage to any building components will occur as a result of overflow from the equipment drain pan or stoppage in the condensate drain piping. The secondary drain pan shall have a minimum depth of 3 inches, shall be not less than 3 inches larger than the unit dimensions in width and length and shall be constructed of corrosion-resistant material.

2.16 DRAIN PAN WATER SWITCH

A. Provide electronic water switch in all secondary drain pans and where indicated on drawings. Switch shall sense the presence of water and shut down associated equipment upon moisture detection. Switch shall be configured as fail-safe, and be rated for capacity of 250V, 5 amps (max). Switch shall be provided by the mechanical contractor and wired by the electrical contractor. Wire per manufacturer’s instructions, test switch after performance verification of air conditioning system to ensure proper operation.

2.17 REFRIGERANT PIPING, FITTINGS AND ACCESSORIES

A. Dimensions and material requirements for pipe, pipe fittings and components shall conform to ASHRAE 15 and ANSI B31.5 and shall be compatible with fluids used and capable of withstanding the pressures and temperatures of the service. Pipe, tubing and components used for refrigerant service shall be cleaned, sealed, capped or plugged prior to shipment from the manufacturer’s plant.
   1. Steel Pipe and Fittings: Seamless ASTM A53 and seamless ASTM A106 Schedule 40 black steel pipe, grade A and B. Fittings and joints shall conform to requirements of ASHRAE 15 and ANSI B31.5 except that threaded pipe joints shall not be used.

   2. Copper Pipe and Fittings: Seamless copper tubing, hard drawn, Type K for underground or unexposed use, Type L for exposed aboveground use, ASTM B 88, dehydrated and sealed. Fittings for copper tubing shall be wrought copper, bracing or solder-joint type, ANSI B16.22. Flare, soft copper tubing shall be annealed ASTM B280 and may be used only in nominal sizes smaller than one inch for connection to equipment and no larger than 1-3/8 inches outside diameter for other connections. Flanges shall be of bronze, ANSI B16.24.

   3. Brazing Materials: AWS A5.8 brazing filler metal type Bag-5 with AWS Type 3 flux, except type BcuP-5 or BcuP-6 may be used for brazing copper to copper joints.

   4. Soldering Materials: ASTM B 32, Grade Sb5, tin-antimony alloy (lead-free). Soldering flux shall consist of petroleum base impregnated with zinc and ammonium chlorides.

   5. Gasket: ASTM D2000, fluorinated elastomers compatible in form with grooves in the flange faces.

6. Flexible Connector: Flexible section shall consist of rubber, tetrafluoroethylene resin, corrosion resistant steel, bronze, monel, or galvanized steel. The material used and the configuration shall be suitable for pressure, vacuum, temperature and circulating medium. The flexible section shall have welding, soldering or socket-weld ends and shall be suitable for the service intended. The flexible section shall be reinforced with metal retaining rings, with built in braided wire reinforcement and restriction bolts or with braid cover suitable for the service intended. Provide flexible connectors throughout refrigeration system piping where piping connects to resilient mounted equipment (i.e. air cooled condensing unit and air handling unit).

2.18 REFRIGERANT PIPING VALVES

A. Provide valves designed, manufactured and tested specifically for refrigerant service. Internal parts shall be removable for inspection or replacement without applying heat or breaking pipe connections. Valves shall open when turned counterclockwise. Threaded ends shall not be used, except as specified herein.
   1. Globe and Angle Valves: Forged brass, bronze alloy, forged steel, steel alloy or ductile iron body with packed stem and seal cap. Packers type with hand wheels and forged brass or bronze alloy bodies with brazing ends may be used in sizes up to and including 7/8 inch outside diameter. Valves 1-1/4 inches and larger shall be tongue and groove flanged and shall have bolted bonnets. Valves one inch and smaller shall have brazed or soldered ends. Refrigerant valves shall be of the back-seating type making it possible to pre-pack the valves under pressure without removal from the line.

   2. Refrigerant Ball Valves: Henry or approved equal, diaphragm packers valves with solder-joint connection. Provide isolation refrigerant ball valves for the supply and return refrigerant piping at each indoor unit when there is more than one indoor unit connected to the outdoor unit.

   3. Thermostatic Expansion Valves: Thermostatic Expansion Valves (Direct Operated): Diaphragm and spring-loaded type with external equalizers, bulb and tubing, and external superheat adjustment with seal cap. Provide with external removable strainer. Power assemblies and valve cage assemblies shall be removable and replaceable without breaking valve connections. Provide valve size and superheat adjustment as recommended by the manufacturer. Valves shall be tested and rated in accordance with ASHRAE 17 and ARI 750 for capacities up to the equipment rated capacities. Valves shall have brass, bronze or steel alloy bodies with stainless steel or non-corrosive nonferrous internal parts. Valves shall have brazing type connections.

   4. Thermostatic Expansion Valves (Pilot-Operated): Valve arrangements may be used on larger systems where direct operated valve capacity is exceeded, and as recommended by the valve manufacturer.

B. Safety Relief Valves: Provide bodies of forged brass with nonferrous, corrosion resistant internal working parts or high strength, cast iron bodies conforming to ASTM A126, Grade B with corrosion resistant internal working parts. Brass Bodies shall have brazing connections. Cast iron body valves shall have flanged connections. Set valves in accordance with ASHRAE 15.

2.19 REFRIGERANT STRAINER

A. Provide strainers of non-ferrous, single basket type with brass or steel bodies. Direction of flow shall be permanently indicated on strainer body. Screen cover shall be flanged and bolted for pipe sizes one inch and larger. For smaller sizes, the cover may be flanged and bolted or threaded. Strainer body shall be constructed to provide adequate capacity for entrapped foreign materials without causing an excessive pressure drop.

Free area of screen shall not be less than five times the cross sectional area of strainer inlet pipe. Provide screen mesh size of not less than 80 mesh for liquid refrigerant lines up to one inch in outside diameter and screen mesh sizes of not less than 60 mesh for line sizes over one inch in outside diameter. Provide screen mesh sizes of not more than 40 mesh for refrigerant suction lines. Strainer screens shall be reinforced with 8 or 10 wire mesh screen. Strainer may be an integral part of the expansion valves. For brass strainer and screen cover joints, braze with silver brass alloy in conformance with AWS A5.8.

2.20 FILTER DRIER

A. Driers 50 cubic inches and larger shall be the cartridge refillable type, provided with a valved bypass of the same size as the liquid line. Drier body shall be of brass or steel, provided with means for holding the desiccant securely in place and distributing the liquid refrigerant evenly through the desiccant. Drier shall be capable of withstanding a service pressure of 450 psig. Driers may be of the combination drier indicator type.

2.21 MOISTURE INDICATOR

A. Indicating material shall register moisture by varying degrees of color change, based on 100 degree Fahrenheit and a moisture content in the range of 55 to 290 particles per million in R-410A refrigerant, 75 degree Fahrenheit and a moisture content in the range of 120 to 500 particles per million in R-454BA refrigerant, based on 75 degree Fahrenheit and a moisture content in the range of 125 to 500 particles per million in R-32 refrigerant . Indicators shall be a brass or bronze or heavily copper plated steel fitting, with the indicator material located under a bull's-eye. Indicators shall be rated for a working pressure of 450 psig.

2.22 SIGHT GLASS

A. Provide double-port, see-through type with two bull's-eye and cover caps of nonferrous material, unless combined as a part of the moisture indicator. Sight glass indicators shall be capable of withstanding a test pressure of 450 psig without damage. Sight glass body shall be forged brass or bronze with fittings as specified for refrigerant piping.

2.23 CONDENSATE DRAIN PIPING

A. Condensate drain piping shall be Schedule 80 PVC pipe and drainage pattern fittings with solvent welded joints. Provide seal trap at connection to unit and size according to system static pressure. Provide cleanouts at every change in direction of the condensate piping. All interior condensate drain piping shall be insulated per Section 15250 – Insulation of Mechanical System.

2.24 DUCT WORK AND ASSOCIATED SHEET METAL WORK

A. All low velocity ducts shall be galvanized steel with gages and construction in accordance with SMACNA Duct Construction Standards – 2005. Use of duct board will not be approved.

B. All high velocity ducts shall be galvanized steel with gages and construction in accordance with SMACNA Duct Construction Standards – 2005. Use of duct board will not be approved.

C. Splitter damper shall be adjustable with locking quadrant.

D. Flexible connections shall be U/L approved neoprene-coated glass fabric cloth.

E. Flexible duct shall be U/L labeled with one-inch thick fiberglass insulation and externally insulated.

F. All sheet metal duct work shall be sealed at all joints and made airtight by applying an approved sealant compound around all joints per the manufacturer's recommendations.

2.25 AIR DISTRIBUTION DEVICES

A. All aluminum construction for face plates, frames and grilles:

1. Ceiling Diffusers: All aluminum construction, square surface-mounted. Provide lay-in diffuser where indicated on plan. Titus TDC-AA or approved equal.

2. Return Air Registers: All aluminum construction, square surface-mounted with opposed-blade volume damper. Provide lay-in register where indicated on plan. Titus 350FL-AA or approved equal.

3. Volume Dampers: All aluminum construction with locking device. Contractor shall provide access doors at all volume damper locations to provide for adjustments during balancing of the air conditioning system. Where installed in fire rated assemblies, access doors shall be rated to preserve the fire rating of the assembly. Ruskins or equal.

4. Exhaust Registers/Wall Registers: All aluminum construction, surface-mounted with opposed-blade volume damper. Titus 350 or approved equal.

5. Storm-Proof Louver: Ruskins or equal, all aluminum construction with drainable blades and insect screen. Paint to match the adjacent finish.

6. Backdraft Dampers: All aluminum construction, counter weighted and field adjusted to provide positive seal against reverse flow or air conditioned air. Ruskins or approved equal.

7. Dryer Wall Cap: 4-inch diameter with metal duct connector and weighted plastic hood. Wall cap shall not include backdraft damper or birdscreen, Broan or approved equal.

2.26 LOW PROFILE ROOF CAPS

A. Greenheck or equal, low profile roof cap, all aluminum construction, paint to match roof, insect screen. Sizing shall be as recommended by the manufacturer based on supply or exhaust air and the volume of air moving through the device.

2.27 ACCESS PANELS

A. Access Doors and Panels for Finished Ceilings and Walls: Access doors and panels shall be Milcor Type "M", or to suit structure as required, or equal, with 14 gauge steel doors, 16 gauge steel frames. Access doors for rated wall or ceiling shall be U.L. labeled at same fire rating. Doors furnished with concealed hinges, flush common key-operated cylinder locks and factory prime coated. Doors flush with finished surfaces. Access doors in tile and toilet room walls with brushed chrome finish. Access doors shall be provided where shown and/or where required for access to any operable device furnished under this Section 15800. Doors shall not be less than 18" x 18" unless otherwise shown or in limited space. Access doors shall be furnished by this Section and installed by other Sections. Removable ceiling access tiles shall be furnished and installed under another Section. This Section shall be responsible for locations and number of tiles, panels, and doors required.

2.28 SEISMIC RESTRAINED SPRING ISOLATOR

A. Spring isolators shall be seismic control restrained spring isolators. Springs shall be restrained using a housing engineered to limit both lateral and vertical movement of the supported equipment during an earthquake without degrading the vibration isolation of the spring during normal equipment operating conditions.

B. Vibration isolators shall incorporate a steel housing and snubbing grommet system designed to limit motion to approximately 0.2 in. (5 mm) in any direction and to prevent any direct metal-to-metal contact between the supported member and the fixed housing. The restraining system shall be designed to withstand a force equivalent to 1.0 g in any lateral or vertical direction without yield or failure. Where the capacity of the anchorage hardware in concrete is inadequate for the required seismic loadings, an adapter plate to allow the addition of more or larger anchors will be fitted to fulfill these requirements. In addition to the primary isolation spring, the load path will include a minimum 0.25 in. (6mm) thick neoprene pad.

C. To facilitate servicing, the isolator will be designed in such a way that it can be removed without the requirement to lift or otherwise disturb the supported equipment.

2.29 FIRE DAMPERS

A. Fabrication:
   1. Fire Rating: UL 555 classified and labeled as a 1-1/2 hour fire damper.

   2. Air Flow Rating: UL approved for dual directional air flow.

   3. Frame: 5 inches x minimum 16 gage (127 x minimum 1.6 mm) roll formed, galvanized steel hat-shaped channel, reinforced at corners. Structurally equivalent to 13 gage (2.3 mm) U-channel.

   4. Blades:
      a. Style: Single skin with 3 longitudinal grooves.

      b. Action: Opposed, spring closure upon fusible link release.

      c. Orientation: Horizontal.

      d. Material: Minimum 16 gage (1.6 mm) thickness, galvanized steel.

      e. Width: Maximum 6 inches (152 mm).

   5. Bearings: Self-lubricating stainless steel sleeve, turning in extruded hole in frame.

   6. Linkage: Concealed in frame.

   7. Axles: Minimum 1/2 inch (13 mm) diameter plated steel, hex-shaped, mechanically attached to blade.

   8. Mounting: Vertical

   9. Temperature Release Device:
      a. Fusible link, 165 degrees F (74 degrees C).

   10. Finish: Mill galvanized.

   11. Assembly: Factory assemble damper and accessories and furnish as a single unit conforming to UL 555.

B. Performance Data:
   1. Temperature Qualified: Damper qualified in accordance with UL 555 as a 1-1/2 hour fire damper.

2. Capacity: Demonstrate capacity of damper to close in HVAC system operating conditions.
   a. Maximum Pressure: 4 inches w.g. (1 kPa).

   b. Maximum Air Velocity: 2,000 feet per minute (610 m/min).

3. Pressure Drop: Maximum 0.2 inches w.g. (0.05 kPa) at 2,000 feet per minute (610 m/min) through 24 x 24 inch (610 x 610 mm) damper.

2.30 COMBINATION FIRE SMOKE DAMPER

A. Combination fire/smoke dampers meeting or exceeding the following specifications shall be furnished and installed at locations shown on plans or as described in schedules. Dampers shall meet the requirements of NFPA90A, 92A and 92B and shall be classified for use for fire resistance ratings of less than 3 hours, in accordance with UL555. Dampers shall further be classified as Smoke Dampers in accordance with the latest version of UL555S. The leakage rating in accordance with UL555S shall be Leakage Class 3.1

B. Controlled closure device (heat-actuated) shall be rated for 165°F.

C. In addition to the leakage ratings already specified, the dampers shall be AMCA licensed for Air Performance and shall bear the AMCA Certified Ratings Seal. Also, the dampers and their actuators shall be qualified in accordance with UL555S to elevated temperature of 250°F (121 °C) or 350°F (177°C) depending upon the actuator. Appropriate electric actuators shall be installed by the damper manufacturer at time of damper fabrication. Electric actuators shall have been energized hold open tested for a period of at least 1 year with no spring return failures. Each damper shall be rated for leakage and airflow in either direction through the damper.

D. Each combination fire/smoke damper shall be equipped with a "controlled closure" quick detect heat-actuated release device to prevent duct and HVAC component damage. Instantaneous damper closure is unacceptable.

E. Damper frame (when size permits) shall be constructed using the UniFrame Design Concept (UDC) and shall be minimum 16 (1.6) gauge galvanized steel formed into a structural hat channel reinforced at corners. Damper blades shall be single skin galvanized steel 16 (1.6) gauge minimum with three longitudinal grooves for reinforcement. Bearings shall be stainless steel sleeve turning in an extruded hole in the frame. Jamb seals shall be stainless steel compression type. Each damper shall be supplied with a factory mounted sleeve of 20" (508) minimum length.

F. Provide with integrated zero velocity duct smoke detector.

PART 3 - EXECUTION

3.01 PREPARATION

A. Visit the work-site and become fully aware of all existing conditions. Investigate the Contract Documents and make proper provisions to avoid interferences or construction delays. Determine the exact route of each duct and pipe.

B. Make offsets and changes in shape or direction required to maintain proper headroom and pitch or to accommodate the structure and the work of other trades. When changing the shape of duct work, provide ducts having the same friction loss as the size of the duct shown on the Contract Documents. Furnish other trades with information to properly locate and size openings in the structure required for the work under this Section. Furnish anchor bolts, sleeves, inserts and supports required for the work under this

section. Provide access panels for concealed items provided under this section that require maintenance, adjustment or inspection. Where installed in fire rated assemblies, access doors shall be rated to preserve the fire rating of the assembly.

3.02 INSTALLATION REQUIREMENTS

A. Perform work using personnel skilled in the trade involved. Provide competent supervision. Furnish new equipment, materials and accessories bearing the manufacturer's identification and conforming to the recognized commercial standards. Provide OSHA approved guard all around exposed moving machinery parts and around high-temperature equipment and materials. When exposed to weather, provide a protective enclosure around electrical equipment, controls and other items that are not satisfactorily protected. No piping, electrical conduit, ceiling supports or similar items shall be supported from air conditioning equipment or duct work.

3.03 EQUIPMENT INSTALLATION

A. Install equipment in the space allotted with sufficient clearance for proper operation and maintenance, and with sufficient head clearance according to the building code. Where equipment differs in arrangement or connections from those shown, provide all required changes in piping, supports and appurtenances. Provide equipment accessories necessary for proper operation and support. Concrete equipment bases and supports are under DIVISION 3 CONCRETE. Direct trade providing concrete in the proper locations, dimensions, load carrying capacity and anchor bolt locations. Concrete pads shall be not less than 6 inches above adjacent surfaces and shall extend 6 inches beyond the base of the equipment. Provide vibration isolators for all mechanical equipment as indicated hereinbefore. Secure floor-mount isolators to base and to equipment. Provide concrete inserts at all pre-stressed planks for hanger rods and coordinate with pre-stressed plank contractor for insert location.

3.04 REFRIGERANT PIPING SYSTEM

A. Install piping system in accordance with ANSI Standard B9.1 and B31.5 and with ASHRAE recommendations. Provide three 90-degree elbows with a minimum of ten pipe diameters of straight pipe between the compressor and the first support point. At each support point on refrigerant piping. At each support point on refrigerant piping, install Elcen 227 pipe isolator. Provide a liquid refrigerant receiver, two pressure valves mounted in Henry three-way dual shut-off valve with discharge capacity and pressure rating in accordance with ANSI B9.1. Provide a replaceable-core type filter dryer piped in parallel, each rated at ARI Standard 710 conditions for the entire system capacity at 2 psi pressure drop. Provide shut-off valves on each side of each drier. Provide a charging valve ahead of the filter driers and a moisture indicating sight glass after the driers. Provide complete charge of refrigerant and oil for the system.

B. Quality Control: Prior to initial operation examine and inspect piping systems for conformance to plans and specifications and ASME.ANSI B31.5. Equipment, material, or work rejected because of defects or non-conformance with plans, specifications, and ANSI Codes for pressure piping shall be corrected as directed by the Contracting Officer.

C. Tests: After completion of piping installation and prior to initial operation, conduct tests on piping system. Furnish materials and equipment required for tests. Correct defects disclosed by the test. Perform test after installation and prior to acceptance in the presence of the Contracting Officer and subject to his approval.
   1. Refrigerant Piping System Test: Test system for tightness after installation and before insulation is applied. Temporarily remove controls and other equipment that may be damaged by test pressure or make inoperative before tests are made and plug, or cap openings. Correct threaded, soldered, or brazed joints that leak by remaking joints. Repair welded joints that leak by cutting out faulty weld affected section and re-welding joint renewing section of pipe. Test charging, evacuation, and

initial charging are not necessary for fully pre-charged refrigeration machinery. Provide leak testing of connections and add only enough additional refrigerant to obtain full charge.

2. Test Pressures: Refrigerant system test pressures for tightness shall not be less than test pressures specified in ANSI/ASHRAE 15 or ASME/ANSI B31.5.

3. Charging System for Test: Charge low and high pressure side of system with a dry, inert gas, such as nitrogen or anhydrous carbon dioxide using a small amount of refrigerant gas to act as a tracer. Use a pressure limiting or reducing valve with pressure gage on high pressure gas tank to limit the pressure in system to the specified test pressure for the respective refrigerant.

4. Leakage Test: With system charged to desired pressure, tightly shutoff gas supply and hold the system for 30 minutes, during which time there shall be no loss of pressure. If a pressure drop, not attributable to temperature changes, occurs during this period, check entire system with a halide torch or an electronic leak detector. When leaks are found, make repairs and provide another 30-minute period at test pressure. Testing and repair shall continue until there is no loss of pressure.

5. Evacuation: After completion of leak testing of refrigerant system, remove all air and moisture from system with a high vacuum pump. Pump shall be capable of reducing absolute pressure in system to a point where any water present in lines will vaporize at a temperature appreciably below ambient temperature and will be withdrawn from system. Before conducting evacuation test, inspect vacuum pump oil for purity and provide new oil charge if existing charge is contaminated. Evacuate system to a maximum absolute pressure of 0.020 inches of Mercury (500 microns) or lower. During evacuation, ambient temperature shall not drop below 35 degrees F. Use pressure gages for measurement of pressure. Upon achieving evacuation of system, valve off vacuum pump from system for a period of at least 12 hours. Consider system tight and dry and free of air, if absolute pressure has not increased by more than 0.002 inches of mercury (50 microns) at the expiration of this period. Repeat pressure test if pressure rise exceeds 0.02 inches of mercury, indicating a leak in system or presence of moisture. If no leaks are found, resume evacuation test and continue until dryness of system is achieved. When a satisfactory vacuum has been obtained, break vacuum by introducing vapor (no liquid) and subsequently seal off system.

D. Charging: Provide initial charge of refrigerant. Charge by connecting drums of refrigerant to system charging connection, to feed liquid refrigerant into low side of system where it will be evaporated. Note gross and net weights of drum, and place drum on a scale to determine when empty. Loosely connect charging connection to system connection, so that initial flow of refrigerant will expel air from connection, and then tighten loose joint. When system vacuum has been broken by refrigerant, start and operate compressor while charging continues. Exercise the following procedures and precautions during charging operation:
   1. Place refrigerant condensing system in operation.

   2. Place fluid circulation system of water coolers or evaporator fans of a direct expansion system in operation.

   3. Do not permit compressor discharge pressure from becoming sequence.

3.05 CONDENSATE DRAIN PIPING SYSTEM

A. Slope lines at 1/4-inch per foot unless otherwise directed. Provide a water seal with water column one inch greater than the total static pressure of the fan in inches of water.

Terminate condensate drain over nearest plumbing drain when not otherwise indicated. See insulation specified in Section 15250 Insulation of Mechanical Systems.

3.06 PIPING SYSTEM SUPPORTS

A. Pipe Supports: Factory-fabricated by Elcen, Fee and Mason, Grinnell, or Unistrut. Provide concrete inserts, beam clamps, channel framing, hanger rods and accessories required for proper pipe support. Ramset or explosive type anchors are not permitted. Support copper pipe at maximum spacing of 6 feet for pipes 1-1/2 inches and smaller. Support vertical piping with hanger at base of riser and with pipe clamp at each floor. At each support point on insulated piping, provide pipe insulation around pipe with 18-gage sheet metal jacket each two pipe diameters in length.

3.07 SHEET METAL DUCT WORK

A. Construct in accordance with the SMACNA Duct Manual for Low Velocity Systems, 4th edition. Provide curved elbows with inside radius equal to the duct width. At Contractor's option, 90-degree elbows may be square with factory-fabricated airfoil turning vanes. Provide factory-fabricated adjustable air extractors in straight branch duct tap-ins or use radius tap-ins. provide adjustable air extractors at supply air registers and diffuser tap-ins. Provide splitter dampers at all splits in the duct runs constructed in accordance with Plate 29, Fig. A of SMACNA Duct Manual. Provide dampers where indicated with opposed blades and locking quadrant. Provide flexible duct connections at inlet and outlet of all air moving devices. Seal watertight all duct work exposed to weather, and cross-break to shed water. Provide stiffeners as required to assure no water puddling.
   1. Contractor is to provide volume dampers at all duct locations for proper balancing of the HVAC system and as indicated on the drawings. All volume dampers are to be made accessible for adjustment. Provide access doors as required. Where installed in fire rated assemblies, access doors shall be rated to preserve the fire rating of the assembly.

3.08 ELECTRICAL

A. Conform to the requirements of ANSI, CI, National Electrical Code, and to the requirements of DIVISION 16 ELECTRICAL of these specifications. Obtain equipment manufacturer's control wiring diagrams for the equipment furnished. Prepare a control and interlock wiring diagram for the complete system. Indicate terminal connection points to factory-wired equipment. Submit control diagram for review. Furnish motor starters for all electrically driven air conditioning and ventilating equipment, complete with circuit breaker, one overload relay per phase, 120-volt control circuit and horsepower rating. Provide NEMA 4X weatherproof starter with fiberglass enclosure for outdoor equipment.

3.09 BALANCE, ADJUST AND TEST

A. See Section 15901 – Testing, Adjusting, and Balancing (TAB).

3.10 COMMISSIONING

A. See Section 15995 - Mechanical Systems Commissioning.

3.11 CLEAN-UP

A. Cleanup the work provided under this section. Touch up with matching paint all damaged factory finishes.

3.12 PAINTING AND IDENTIFYING

A. The items furnished under this section are to be painted and identified under DIVISION 9 FINISHES. Do not paint over nameplates or other identifying labels.
   1. Paint exposed black iron work including pipe, fittings, iron body valves, pipe hangers, etc. with two coats of oil-base enamel paint.

2. Provide snap-around pipe markers, Westline or equal on all exposed piping. Black letters shall indicate the service and an arrow shall indicate the direction of flow. Markers shall be provided where pipes enter and leave each area and at not over 30 foot intervals within an area. Background color shall be yellow. Width of color band, size of legend letters, and position of legend shall conform to the requirements of ANSI A13.1, Scheme for the Identification of Piping System.

3. Painting of exposed bare metal surfaces in finished areas shall be provided herein if it is not specified under DIVISION 9 FINISHES. Included in this work shall be bare metal register, louvers, access panels for mechanical equipment, control covers and thermostat covers, duct work, piping, hangers, etc. Refer to architectural finishing schedule for finish required. Prepare surface as required for oil-base enamel paint. Provide two final coats matching adjoining surface finish.

3.13 INSTRUCTIONS

A. Instruct the State in the proper operation and maintenance of the system. Review the maintenance manuals with the State. Post starting and stopping instructions and control diagram adjacent to equipment, mounted in frame with glass cover plate. Submit a list of manufacturer's warranties for the equipment furnished.

3.14 CERTIFICATES

A. The Contracting Officer shall have the right to require a written certificate, dated and signed by a responsible employee of the Contractor, evidencing the performance of any portion of the work, or any testing as a condition precedent to the acceptance of any work or the results of any test. Wherever a governmental authority performs inspections or tests of any portion of the work, a certificate shall be provided by the Contractor that the inspection or test was satisfactorily passed.

END OF SECTION 15800

SECTION 15901 – TESTING, ADJUSTING AND BALANCING (TAB)

PART 1 - GENERAL

1.01 GENERAL CONDITIONS
- A. As specified in Division 1 sections.

1.02 SCOPE
- A. Procure the services of an independent contractor qualified in TAB as defined the ASHRAE Handbook - HVAC Application. The TAB work shall include the following:
  1. Air conditioning equipment.
     a. Ducts, duct outlets and duct inlets. Transfer ducts, openings, grilles and registers. Pipes, coils, and valves. Electrical measurements. Controls and control components. Sound and vibration measurements.

1.03 RELATED WORK SPECIFIED ELSEWHERE
- A. Division 16 – ELECTRICAL

- B. Section 15800 - AIR CONDITIONING AND VENTILATION

1.04 GENERAL REQUIREMENTS
- A. It is the intent of the plans and specifications to provide a complete installation. Should there be omissions or discrepancies in the plans and specifications such as dampers, gauges, and sensors that will inhibit the proper TAB process, the Contractor shall call the attention of the Contracting Officer to such omissions and discrepancies in advance of the date of bid opening so that the necessary corrections can be made. Otherwise the Contractor shall furnish and install the omissions or discrepancies as if the same were specified and provided for. A test report shall be provided at the completion of each phase.
  1. Standards: All work shall be done in accordance with applicable ordinances and codes of the County of Hawaii and in accordance with State Department of Health regulations.

  2. Work shall comply with applicable regulations of the State of Hawaii, National Fire Protection association (NFPA) Pamphlet No. 90A, and American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Standard 111.
     a. Applicable standard published by the National Environmental Balancing Bureau (NEBB) and/or the Associated Air Balance Council (AABC).

     b. Contractor shall obtain all permits, licenses and certificates and pay for all fees.

  3. Drawings and Specifications: The drawings and specifications are intended to cover the complete installation of systems to function as described. The omission of reference to any necessary item of labor or material shall not relieve the Contractor from providing such labor or material. Drawings do not attempt to show exact details of piping and ductwork.
     a. Contract Drawings: Mechanical plans are essentially diagrammatic, showing locations of ducts, and other mechanical equipment. Where locations are not dimensioned, they are approximate, Contractor shall study existing conditions and plan his work in the most logical manner.

     b. Shop Drawings: As soon as practical, obtain a set of shop drawings and data submittals including the automatic control diagrams that have been reviewed by the Contracting Officer. Refer to section 15800, and coordinate with the Contractor to obtain all pertinent information on the mechanical systems.

1.05 DEFINITIONS

A. Accuracy: The accuracy of an instrument is the capability of that instrument to indicate the true value of a measured quantity.

B. Adjusting: Adjusting is the varying of system flows by partially closing balancing devices, such as dampers and valves, and varying fan speeds to achieve optimum system operating conditions within design and installation limitations.

C. AHJ: The local governing Authority Having Jurisdiction over the installation.

D. Balancing: Balancing is the methodical proportioning of air and hydronic flows through the system mains, branches, and terminal devices using acceptable procedures to achieve the specified airflow or hydronic flow within testing and design limitations.

E. Calibrate: The act of comparing an instrument of unknown accuracy with a standard of known accuracy to detect, correlate, report, or eliminate by adjustment any variation in the accuracy of the tested instrument.

F. Conformed Contract Documents: Current and complete documents.

G. Deficiency: Deficiency is considered any circumstance that adversely affects the specified balance of a device or system.

H. Environmental Systems: Environmental Systems are systems that primarily use a combination of mechanical equipment, airflow, water flow and electrical energy to provide heating, ventilating, air conditioning, humidification, and dehumidification for the purpose of human comfort or process control of temperature and humidity.

I. May: The word may is used to indicate a course of action that is permissible as determined by the NEBB/AABC Firm.

J. NEBB/AABC Certified TAB Firm: A NEBB/AABC Certified TAB Firm is a firm that has met and maintains all the requirements of the National Environmental Balancing Bureau for firm certification in Testing, Adjusting, and Balancing and is currently certified by NEBB/AABC. A NEBB/AABC Certified TAB Firm shall employ at least one NEBB/AABC Qualified TAB Supervisor in a full time management position.

K. NEBB/AABC Certified TAB Report: The data presented in a NEBB/AABC Certified TAB Report accurately represents system measurements obtained in accordance with the current edition of the NEBB/AABC Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems. A NEBB/AABC Certified TAB Report does not necessarily guarantee that systems included are balanced to design flows. Any variances from design quantities, which exceed NEBB/AABC tolerances or contract document tolerances, are noted in the test-adjust-balance report project summary.

L. NEBB/AABC Qualified TAB Supervisor: A NEBB/AABC Qualified TAB Supervisor is a full time employee of the firm in a management position who has successfully passed the supervisor level written and practical qualification examinations and maintains the Supervisor re-qualification requirements of NEBB/AABC.

M. NEBB/AABC Qualified TAB Technician: A NEBB/AABC Qualified TAB Technician is a full time employee of the firm who has met the technician level experience requirements of NEBB/AABC and has successfully passed the technician level written and practical qualification examinations. A NEBB/AABC Qualified TAB Technician shall be supervised by a NEBB/AABC Qualified TAB Supervisor. (Supervision is not intended to infer

constant oversight. A NEBB/AABC Qualified TAB Technician is capable of performing assigned tasks with periodic supervision.)

N. Precision: Precision is the ability of an instrument to produce repeatable readings of the same quantity under the same conditions. The precision of an instrument refers to its ability to produce a tightly grouped set of values around the mean value of the measured quantity.

O. Procedure: A Procedure is defined as a specific set of tasks to be accomplished to achieve the defined result.

P. Range: Range is the upper and lower limits of an instrument's ability to measure the value of a quantity for which the instrument is calibrated.

Q. Resolution: Resolution is the smallest change in a measured variable that an instrument can detect.

R. Shaft Pressurization System: A type of smoke-control system that is intended to positively pressurize stair and / or elevator shafts with outdoor air by using fans to keep smoke from contaminating the shafts during an alarm condition.

S. Shall: The word shall is used to indicate mandatory requirements strictly to be followed in order to conform to the standard and procedures and from which no deviation is permitted. Note: In the event unique circumstances prevent a required action from being fulfilled, a notation shall be included in the TAB report explaining the exception. For example, such notation could be one of the following: Not Available, Not Applicable, or Not Accessible. The simple notation "N/A" is not allowed.

T. Should: The word should is used to indicate that a certain course of action is preferred but not necessarily required.

U. Smoke-Control System: An engineered system that uses fans to produce airflow and pressure differences across barriers to limit smoke movement.

V. Smoke-Control Zone: A space within a building that is enclosed by smoke barriers and is a part of a zoned smoke-control system.

W. Stair Pressurization System: A type of smoke-control system that is intended to positively pressurize stair towers with outdoor air by using fans to keep smoke from contaminating the stair towers during an alarm condition.

X. System Effect: A phenomenon that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.

Y. TAB Technician: A TAB Technician is an employee of a NEBB/AABC Certified TAB firm who assists a NEBB/AABC Qualified TAB Supervisor and / or a NEBB/AABC Qualified TAB Technician by performing TAB work in the field. (Supervision is not intended to infer constant oversight. A TAB Technician may be capable of performing assigned tasks without direct, full time supervision.)

Z. Terminal: A point where the controlled medium, such as fluid or energy, enters or leaves the distribution system

AA. Testing: Testing is the use of specialized and calibrated instruments to measure temperatures, pressures, rotational speeds, electrical characteristics, velocities, and air and hydronic quantities for an evaluation of flow conditions.

BB. Testing, Adjusting, and Balancing (TAB): TAB is a systematic process or service applied to heating, ventilating and air-conditioning (HVAC) systems and other environmental systems to achieve and document air and hydronic flow rates. The standards and procedures for providing these services are referred to as “Testing, Adjusting, and Balancing” and are described in this document.

1.06 TAB FIRM QUALIFICATIONS

A. The TAB Firm shall be NEBB/AABC Certified in Testing, Adjusting and Balancing of Air and Hydronic Systems.

1.07 SUBMITTALS

A. Within 15 days after the "Notice to Proceed", the independent air balance agency shall submit 3 copies of documentation to confirm compliance with the following:
   1. The completion of five(s) project of similar size and scope of this project.

   2. The agency is a certified firm by the NEBB or the AABC and employs one or more qualified supervisor(s) as defined by the NEBB or AABC.

   3. All instruments and equipment used by the agency is accurately calibrated in accordance with the requirements of NEBB or AABC.

   4. Specimen copies of each of the report forms proposed for use on this project.

B. At least 60 days prior to starting field work, submit 3 copies of:
   1. Shop drawings clearly showing the equipment, air devices and associated apparatus related to the report forms. Limit one entry to one line of the report form.

   2. A set of report forms filled out as to the design values and the installed equipment pressure drops, the required CFM for air terminals, and design parameters to be used in the TAB process.

   3. A complete list of instruments proposed to be used organized in appropriate categories, with data sheets for each. Show:
      a. Manufacturer and model number.

      b. Description and use when needed to further identify the instrument.

      c. Size or capacity range.

      d. Latest calibration date.

   4. Certified Reports: Submit final TAB reports on approved forms with certification by the Testing Engineer that the methods used and the results are as specified.

   5. Contracting Officer will review submittals for compliance with contract documents, and will return one set marked to indicate:
      a. Discrepancies noted between data shown and contract documents.

      b. Additional, or more accurate, instruments required. Requests for re-calibration of specific instruments.

      c. Provide preliminary summary of any findings or deficiencies no later than one week after TAB has been completed to the Contracting Officer. Provide final TAB report no later than 30 days after completion of TAB. Project Final Acceptable date shall not start until the final TAB report has been approved by the Contracting Officer.

1.08 GUARANTEE

A. Testing agency shall include an extended warranty of 90 days, after completion of test and balance work, during which time the Contracting Officer at his discretion may request a recheck, or resetting of any outlet or supply air fan, as listed in test report. The testing agency shall provide technicians to assist the Contracting Officer in making tests he may require during this period of time.

1.09 CONTRACTOR RESPONSIBILITY TO TAB AGENCY

A. Provide the NEBB/AABC Certified TAB Firm with a conformed set of contract documents (drawings, specifications, and approved submittals), including all current approved change orders / contract modifications.

B. Develop a project schedule with the input of the NEBB/AABC Certified TAB Firm that coordinates the work of other disciplines and provides adequate time in the construction process to allow successful completion of the TAB work.

C. Notify the NEBB/AABC Certified TAB Firm of schedule changes.

D. Ensure that the building enclosure is complete, including but not limited to, all structural components, windows and doors installed, door hardware complete, ceilings complete, stair, elevator and mechanical shafts complete, roof systems complete, all plenums sealed, etc.

E. Ensure that all necessary mechanical work is complete. This includes, but is not limited to, duct leakage testing and hydrostatic testing. The piping systems should be flushed, filled, vented, and chemically treated. The duct systems and equipment have been cleaned.

F. Complete the installation of permanent electrical power systems serving the HVAC equipment and systems. Such systems shall be properly installed in accordance with all applicable codes to ensure the safety of all construction personnel.

G. Complete the installation of all HVAC equipment and systems to ensure safe operation.

H. Perform the start up of all HVAC equipment and systems in accordance with the manufacturer’s recommendations.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 JOB CONDITIONS & COORDINATION

A. Prior to start of testing, adjusting and balancing, verify that the required "Job Conditions" are met:

1. Systems installation is complete and in full operation.

2. Outside conditions are within a reasonable range relative to design conditions.

3. Lights are turned "on" when lighting is included in the cooling load.

4. Special equipment such as computers, laboratory equipment, and electronic equipment are in full operation.

B. Coordination:

1. Coordinate services with the work of the various trades to ensure rapid completion of the services.

2. Promptly report to the Contractor and Contracting Officer any deficiencies noted during performance of services to allow immediate corrective action.

3.02 AIR BALANCING INSTRUMENTS

A. Alnor velometer with probes and Alnor pitot tube.

B. Rotating vane anemometer.

C. ASHRAE Standard pitot tubes constructed of stainless steel, 1/16-inch O.D., lengths 18 inches, 36 inches, Dwyer Model 160 or equal.

D. Magnehelic differential air pressure gauges. 0 to 0.5 inch, 0 to 1.0 inch and 0 to 5.0 inches water pressure ranges, each arranged as a portable unit for use with a standard pitot tube. Dwyer Series 2000 or equal.

E. Combination included vertical portable manometer, range 0 to 5.0 inches water. Dwyer No. 400 or equal.

F. Portable type hook gauge. Range 0 to 23 inches water. Dwyer No. 1425 or equal.

G. Portable flexible U-tube manometer with magnetic mounting clips. Range 18 inches. 0 to 18 inches water. Dwyer No. 1215-20 or equal.

3.03 SYSTEM PERFORMANCE MEASURING INSTRUMENTS

A. Insert thermometers, with graduations at 0.5 Fahrenheit. for air and 0.1 Fahrenheit. for water.

B. Sling psychrometer.

C. Tachometer, automatic type.

D. Clamp-on type voltameter with minimum ranges: 0/600v on three scales; 0/800 amp on five scales.

E. Records: 7-day chart, portable type for temperature and humidity.

3.04 PROCEDURES FOR TESTING, ADJUSTING, AND BALANCING NEW AND EXISTING SYSTEMS

A. Perform TAB of existing systems to the extent indicated by the contract documents and the current edition of the NEBB/AABC TAB Standards.

B. Procedures:
   1. Air systems: Test and Balance system in accordance with SMACNA manual for the Balancing and Adjustment of Air Distribution Systems.

   2. Preliminary:
      a. Size, type and manufacturer of air terminals and all tested equipment shall be identified and listed.

      b. Manufacturer's ratings on all equipment shall be used to make required calculations unless field test shows ratings to be impractical.
   3. Central System:

      a. Test and adjust air handling unit fans and exhaust fan RPM to design requirements within the limits of mechanical equipment provided.

b. Test and record motor voltage and running amperes.

c. Record motor name, plate date and starter ratings.

d. Make pitot tube traverse of main supply duct and return ducts and obtain design CFM at fans with air conditioning space fully loaded.

e. Test and record system static pressure, suction and discharge.

f. Test and adjust system for design recirculated air quantity, CFM.

g. Test and adjust system for design outside air quantity, CFM and record entering air temperatures (DB/WB cooling).

h. Test and record leaving air temperatures (DB/WB cooling) from cooling coil. Balance the air systems such that the volume damper of the farthest air device in the supply air duct system is 100% open.

i. Provide and replace necessary fan pulleys and belts to meet the air balancing requirements.

4. Automatic Control System:
   a. In cooperation with the control manufacturer's representative, set and adjust automatically operated devices to achieve required sequence of operations.

   b. Testing organization shall verify all controls for proper calibration and list those controls requiring adjustment by control system installer.

5. Submission of Reports: Fill in test results on approved report forms.
   a. Submit three certified copies of required test reports to the States Representative for approval.

6. Duct Leakage Testing:
   a. Provide duct leakage testing for all ducts and plenums designed to operate at static pressures equal to or greater than 3 inch water gauge in accordance with SMACNA HVAC Air Duct Leakage Test manual.

   b. The duct leakage testing shall prove the ducts and plenums have a rate of air leakage (CL) less than or equal to 4.0 in accordance with IECC 2021 Equation 4-8. CL=F/(P^0.65) [IECC 2021 Equation 4-8] F = The measured leakage rate in CFM per 100 square feet of duct surface P = The static pressure of the test.

3.05 ACCEPTANCE CRITERIA

A. The systems will be considered balanced in accordance with NEBB/AABC TAB Standards when the following conditions are satisfied:
   1. All measured airflow and hydronic flow quantities are within ± 10 percent of the design quantities unless there are reasons beyond the control of the NEBB/AABC Certified TAB Firm.

   2. Deficiencies shall be noted in the TAB report.

   3. There is at least one direct path with fully open dampers from the fan to an air inlet or outlet. Additionally, if a system contains branch dampers, there will be at least one wide-open path downstream of every adjusted branch damper.

4. There is at least one direct path with fully open balancing valves from the pump discharge balancing valve (if present) to a terminal device. Additionally, if a system contains branch balancing valves, there will be at least one wide open path downstream of every adjusted branch balancing valve.

3.06 REPORTING

A. Provide appropriate deficiency information to the construction team as TAB work progresses.

B. Deficiency information shall be sufficient to facilitate contractor's dispatch of appropriate personnel to resolve items noted prior to final TAB work.

3.07 FINAL REPORT

A. The final report shall be in accordance with the requirements of the current edition of the NEBB/AABC TAB Standards.

END OF SECTION 15901

SECTION 15995 - MECHANICAL SYSTEMS COMMISSIONING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 DESCRIPTION

A. Commissioning. Commissioning is a systematic process of ensuring that all building systems perform interactively according to the design intent and the State's operational needs. Commissioning during the construction phase is intended to achieve the following specific objectives according to the Contract Documents:

1. Verify that applicable equipment and systems are installed according to the manufacturer's recommendations and to industry accepted minimum standards and that they receive adequate operational checkout by installing contractors.

2. Verify and document proper performance of equipment and systems.

3. Verify that Systems/O&M documentation is complete.

4. Verify that the State's operating personnel are adequately trained

B. The systems to be commissioned include: chillers, pumps, building automation systems, and related controls.

C. Commissioning requires the participation of Division 15 and 16 contractors to ensure that all systems are operating in a manner consistent with the Contract Documents. Division 15 contractors shall be familiar with all parts of the commissioning plan issued by the CA (Commissioning Authority) and shall execute all commissioning responsibilities assigned to them in the Contract Documents.

D. Commissioning Team. The members of the commissioning team consist of the Commissioning Authority (CA), the designated representative of the State, the General Contractor (GC or Contractor), the architect, the design engineers (particularly the mechanical engineer), the Mechanical Contractor (MC), the Electrical Contractor (EC), the TAB representative, the Controls Contractor (CC), any other installing subcontractors or suppliers of equipment. The State's building or plant operator/engineer is also a member of the commissioning team.

1.03 COMMISSIONING AUTHORITY

A. The Commissioning Authority shall be selected by the General Contractor. The commissioning agent is not required to be a third party licensed professional and may be associated with the GC or MC. At minimum the individual designated as the CA should be experienced in the commissioning of mechanical and electrical systems of the type installed in this project. Experience in construction processes, direct digital control systems, test and balance procedures is recommended.

1.04 COMMISSIONING PLAN

A. Commissioning Plan. The commissioning plan provides guidance in the execution of the commissioning process. Just after the initial commissioning scoping meeting the CA will provide the plan, which will continue to evolve and expand as the project progresses. These specifications shall take precedence over the Commissioning Plan.

B. Commissioning Process. The following narrative provides a brief overview of the typical commissioning tasks during construction and the general order in which they occur.

1. Commissioning during construction begins with a scoping meeting conducted by the CA where the commissioning process is reviewed with the commissioning team members.

2. Additional meetings will be required throughout construction, scheduled by the CA with necessary parties attending, to plan, scope, coordinate, schedule future activities and resolve problems.

3. Equipment documentation is submitted to the CA during normal submittals, including detailed start-up procedures.

4. The CA works with the subcontractors and equipment suppliers in developing startup plans and startup documentation formats, including pre-functional checklists to be completed, during the startup process.

5. In general, the checkout and performance verification proceeds from simple to complex; from component level to equipment to systems and intersystem levels with pre-functional checklists being completed before functional testing.

6. The Subcontractors, under their own direction, execute and document the pre-functional checklists and perform startup and initial checkout. The CA documents that the checklists and startup were completed according to the approved plans. This may include the CA witnessing start-up of selected equipment.

7. The Subcontractors develop specific equipment and system functional performance test procedures. The CA assists and reviews the procedures.

8. The procedures are executed by the Subcontractors, under the direction of, and documented by the CA.

9. Items of non-compliance in material, installation or setup are corrected at the Subcontractor’s expense and the system retested.

10. The CA reviews the O&M documentation for completeness.

11. Commissioning is completed before Substantial Completion.

12. The CA reviews, pre-approves and coordinates the training provided by the Contractor and verifies that it was completed.

13. Deferred testing is conducted, as specified or required.

1.05 SUBMITTALS

A. GC shall provide the following submittals to the Director:

1. Commissioning Plan

2. Commissioning Schedule

3. Document Request Log

4. Commissioning RFIs

5. Commissioning Field Reports

6. Design Team Issues Log

7. Contractor Commissioning Issues Log

8. Pre-Functional Checklists

9. Functional Performance Tests

10. Final Commissioning Report
    a. Start-up and initial checkout plans

    b. Filled out start-up, initial checkout, pre-functional, and functional checklists

    c. Training plans

    d. Records of training

    e. Results of functional performance tests.

    f. Disposition of deficiencies found during testing, including details of corrective measures used or proposed.

    g. Functional performance test procedures used during the commissioning process including measurable criteria for test acceptance, provided herein for repeatability.

B. The CA will provide appropriate contractors with a specific request for the type of submittal documentation the CA requires to facilitate the commissioning work. These requests will be integrated into the normal submittal process and protocol of the construction team. At minimum, the request will include the manufacturer and model number, the manufacturer's printed installation and detailed start-up procedures, full sequences of operation, O&M data, performance data, any performance test procedures, and control drawings. In addition, the installation and checkout materials that are actually shipped inside the equipment and the actual field checkout sheet forms to be used by the factory or field technicians shall be submitted to the Commissioning Agent. All documentation requested by the CA will be included by the Contractor in their O&M manual contributions.

C. The Commissioning Agent will review and approve submittals related to the commissioned equipment for conformance to the Contract Documents as it relates to the commissioning process, to the functional performance of the equipment and adequacy for developing test procedures. CA shall review submittals and provide comments prior to State submittal review. This review is intended primarily to aid in the development of functional testing procedures and only secondarily to verify compliance with equipment specifications. The Commissioning Agent will notify the appropriate persons as requested, of items missing or areas that are not in conformance with Contract Documents and which require resubmission.

D. The CA may request additional design narrative from the A/E and Controls Contractor, depending on the completeness of the design intent documentation and sequences provided with the Specifications.

E. These submittals to the CA do not constitute compliance for O&M manual documentation. The O&M manuals are the responsibility of the Contractor, though the CA will review them.

1.06 RESPONSIBILITIES

A. General Contractor (GC):

1. Select/designate an individual to function as the CA, facilitate the coordination of the commissioning work by the CA, and with the CA ensure that commissioning activities are being scheduled into the master schedule.

2. Include the cost of commissioning in the contract price.

3. Furnish a copy of all construction documents, addenda, change orders and approved submittals and shop drawings related to commissioned equipment to the CA.

4. In each purchase order or subcontract written, include requirements for submittal data, O&M data, commissioning tasks and training.

5. Ensure that all Contractor execute their commissioning responsibilities according to the Contract Documents and schedule.

6. A representative shall attend a commissioning scoping meeting and other necessary meetings scheduled by the CA to facilitate the commissioning process.

7. Coordinate the training of State personnel.

8. Prepare O&M manuals and systems manuals, according to the Contract Documents, including clarifying and updating the original sequences of operation to as-built conditions.

9. Be proactive in seeing that commissioning processes are executed and that the CA has the scheduling information needed to efficiently execute the commissioning process.

B. Warranty Period
   1. Ensure that Subcontractors execute seasonal or deferred functional performance testing, witnessed by the CA, according to the specifications.

   2. Ensure that Contractor correct deficiencies and make necessary adjustments to O&M manuals and as-built drawings for applicable issues identified in any seasonal testing.

C. Mechanical, Controls Contractors:
   1. The commissioning responsibilities applicable to each of the mechanical, and controls contractors of Division 15 are as follows (all references apply to commissioned equipment only):
      a. Construction and Acceptance Phases
         1) Include the cost of commissioning in the contract price.

         2) In each purchase order or subcontract written, include requirements for submittal data, commissioning documentation, Systems/O&M data and training.

         3) Attend a commissioning scoping meeting and other meetings necessary to facilitate the Commissioning process.

         4) Contractors shall provide the CA with normal cut sheets and shop drawing submittals of commissioned equipment.

         5) Provide additional requested documentation, prior to normal O&M manual submittals, to the CA for development of start-up and functional testing procedures.

a) Typically this will include detailed manufacturer installation and start-up, operating, troubleshooting and maintenance procedures, fan and pump curves, full factory testing reports, if any, and full warranty information, including all responsibilities of the State to keep the warranty in force clearly identified. In addition, the installation, start-up and checkout materials that are actually shipped inside the equipment and the actual field checkout sheet forms to be used by the factory or field technicians shall be submitted to the Commissioning Agent.

b) The Commissioning Agent may request further documentation necessary for the commissioning process.

6) Provide a copy of the O&M manuals and submittals of commissioned equipment, through normal channels, to the CA for review and approval.

7) Contractors shall assist (along with the design engineers) in clarifying the operation and control of commissioned equipment in areas where the specifications, control drawings or equipment documentation is not sufficient for writing detailed testing procedures.

8) Preparing the specific functional performance test procedures with the assistance of the CA. Contractor shall review test procedures to ensure feasibility, safety and equipment protection and provide necessary written alarm limits to be used during the tests.

9) Develop a full start-up and initial checkout plan using manufacturer's start-up procedures for all commissioned equipment. Submit to CA for review and approval prior to startup.

10) During the startup and initial checkout process, execute the mechanical-related portions of the pre-functional checklists for all commissioned equipment.

11) Perform and clearly document all completed startup and system operational checkout procedures, providing a copy to the CA.

12) Address current A/E punch list items before functional testing. Air and water TAB shall be completed with discrepancies and problems remedied before functional testing of the respective air- or water-related systems.

13) Provide skilled technicians to execute starting of equipment and to execute the functional performance tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem solving.

14) Perform functional performance testing under the direction of the CA for specified equipment. Assist the CA in interpreting the monitoring data, as necessary.

15) Correct deficiencies (differences between specified and observed performance) as interpreted by the A/E and retest the equipment.

16) Prepare O&M manuals according to the Contract Documents, including clarifying and updating the original sequences of operation to as-built conditions.

17) Prepare redline as-built drawings for all drawings and final as-builts for contractor- generated coordination drawings.

18) Provide training of the State's operating personnel as specified.

19) Coordinate with equipment manufacturers to determine specific requirements to maintain the validity of the warranty.

b. Warranty Period
   1) Execute seasonal or deferred functional performance testing, witnessed by the CA, according to the specifications.

   2) Correct deficiencies and make necessary adjustments to O&M manuals and as-built drawings for applicable issues identified in any seasonal testing.

D. Mechanical Contractor:
   1. The responsibilities of the HVAC mechanical contractor, during construction and acceptance phases in addition to those listed in (A) are:
      a. Provide startup for all HVAC equipment, except for the building automation control system.

      b. Assist and cooperate with the TAB contractor and CA by:
         1) Putting all HVAC equipment and systems into operation and continuing the operation during each working day of TAB and commissioning, as required.

         2) Including cost of sheaves and belts that may be required by TAB.

         3) Providing temperature and pressure taps in piping and equipment according to the Construction Documents for TAB and commissioning testing. Verify locations for taps with the CA before installation.

      c. Install a P/T plug at each water sensor, which is an input point to the control system and at each coil and heat exchanger (chiller, boiler, etc.).

      d. Prepare a schedule for Division 15 pipe system testing, flushing and cleaning, equipment start-up and TAB start and completion for use by the CA. Update the schedule as appropriate.

      e. Be proactive in seeing that commissioning processes are executed and that the CA has the scheduling information needed to efficiently execute the commissioning process.

E. Controls Contractor (CC):
   1. The commissioning responsibilities of the controls contractor, during construction and acceptance phases in addition to those listed in (A) are:
      a. Sequences of Operation Submittals. The Controls Contractor's submittals of control drawings shall include complete detailed sequences of operation for each piece of equipment, regardless of the completeness and clarity of the sequences in the specifications. They shall include:
         1) An overview narrative of the system (1 or 2 paragraphs) generally describing its purpose, components and function.

         2) All interactions and interlocks with other systems.

3) Detailed delineation of control between any packaged controls and the building automation system, listing what points the BAS monitors only and what BAS points are control points and are adjustable.

4) Written sequences of control for packaged controlled equipment. (Equipment manufacturers' stock sequences may be included, but will generally require additional narrative).

5) Start-up sequences.

6) Warm-up mode sequences.

7) Normal operating mode sequences.

8) Unoccupied mode sequences.

9) Shutdown sequences.

10) Capacity control sequences and equipment staging.

11) Temperature and pressure control: setbacks, setups, resets, etc.

12) Detailed sequences for all control strategies, e.g., optimum start/stop, staging, optimization, demand limiting, etc.

13) Effects of power or equipment failure with all standby component functions.

14) Sequences for all alarms and emergency shut downs.

15) Seasonal operational differences and recommendations.

16) Initial and recommended values for all adjustable settings, setpoints and parameters that are typically set or adjusted by operating staff; and any other control settings or fixed values, delays, etc. that will be useful during testing and operating the equipment.

17) All sequences shall be written in small statements, each with a number for reference. For a given system, numbers will not repeat for different sequence sections, unless the sections are numbered.

b. Control Drawings Submittal
1) The control drawings shall have a key to all abbreviations.

2) The control drawings shall contain graphic schematic depictions of the systems and each component.

3) The schematics will include the system and component layout of any equipment that the control system monitors, enables or controls, even if the equipment is primarily controlled by packaged or integral controls.

4) Provide a full points list with at least the following included for each point:
a) Controlled system

b) Point abbreviation

c) Point description

d) Display unit

e) Control point or setpoint (Yes / No)

f) Monitoring point (Yes / No)

g) Intermediate point (Yes / No)

h) Calculated point (Yes / No) Key:
    a. Point Description: DB temp, airflow, etc.

    b. Control or Setpoint: Point that controls equipment and can have its setpoint changed (OSA, SAT, etc.)

    c. Intermediate Point: Point whose value is used to make a calculation which then controls equipment (space temperatures that are averaged to a virtual point to control reset).

    d. Monitoring Point: Point that does not control or contribute to the control of equipment, but is used for operation, maintenance, or performance verification.

    e. Calculated Point: “Virtual” point generated from calculations of other point values.

    f. The Controls Contractor shall keep the CA informed of all changes to this list during programming and setup.

i) An updated as-built version of the control drawings and sequences of operation shall be included in the final controls O&M manual submittal.

j) Assist and cooperate with the TAB contractor in the following manner:
    a. Meet with the TAB contractor prior to beginning TAB and review the TAB plan to determine the capabilities of the control system toward completing TAB. Provide the TAB any needed unique instruments for setting terminal unit boxes and instruct TAB in their use (handheld control system interface for use around the building during TAB, etc.).

    b. Have all required pre-functional checklists, calibrations, startup and selected functional tests of the system completed and approved by the CA prior to TAB.

    c. Provide a qualified technician to operate the controls to assist the TAB contractor in performing TAB, or provide sufficient training for TAB to operate the system without assistance.

k) Assist and cooperate with the CA in the following manner:
    a. Execute the functional testing of the controls system as specified for the controls contractor.

    b. Assist in the functional testing of all equipment specified.

l) The controls contractor shall prepare a written plan indicating in a step-by-step manner, the procedures that will be followed to test, checkout and adjust the control system prior to functional performance testing, according to the process. At minimum, the plan shall include for each type of equipment controlled by the automatic controls:
    a. System name.
    b. List of devices.
    c. Step-by-step procedures for testing each controller after installation, including:
        i. Process of verifying proper hardware and wiring installation.
        ii. Process of downloading programs to local controllers and verifying that they are addressed correctly.
        iii. Process of performing operational checks of each controlled component.
        iv. Plan and process for calibrating valve and damper actuators and all sensors.
        v. A description of the expected field adjustments for transmitters, controllers and control actuators should control responses fall outside of expected values.
    d. A copy of the log and field checkout sheets that will document the process. This log must include a place for initial and final read values during calibration of each point and clearly indicate when a sensor or controller has “passed” and is operating within the contract parameters.
    e. A description of the instrumentation required for testing.
    f. Indicate what tests on what systems should be completed prior to TAB using the control system for TAB work. Coordinate with the CA and TAB contractor for this determination.

m) Provide a signed and dated certification to the CA and State or GC upon completion of the checkout of each controlled device, equipment and system prior to functional testing for each piece of equipment or system, that all system programming is complete as to all respects of the Contract Documents, except functional testing requirements.

n) Beyond the control points necessary to execute all documented control sequences, provide monitoring, control and virtual points as specified.

o) List and clearly identify on the as-built piping drawings the locations of all static and differential pressure sensors.

F. TAB Contractor:
    1. The duties of the TAB contractor, in addition to those listed in (A), are as follows:

a. Submit the outline of the TAB plan and approach for each system and component to the CA prior to starting the TAB. This plan will be developed after the TAB has some familiarity with the control system. The submitted plan will include:
   1) Reviewed the construction documents and the systems to sufficiently understand the design intent for each system.

   2) All field checkout sheets and logs to be used that list each piece of equipment to be tested, adjusted and balanced with the data cells to be gathered for each.

   3) Detailed step-by-step procedures for TAB work for each system and issue.

   4) Plan for formal deficiency reports (scope, frequency and distribution) and final report.

2. Submit reports of discrepancies, deficient or uncompleted work by others, contract interpretation requests and lists of completed tests to the CA as required.

3. Communicate to the controls contractor all setpoint and parameter changes made or problems and discrepancies identified during TAB, which affect the control system setup and operation.

4. Provide a draft TAB report to the CA. The report should follow the latest reporting recommendations by AABC or NEBB.

5. Provide the CA with any requested data, gathered, but not shown on the draft reports. Provide final TAB reports in the number required.

G. Equipment Suppliers:
1. Provide all requested submittal data, including detailed start-up procedures and specific responsibilities of the State to keep warranties in force.

2. Assist in equipment testing per agreements with Subs.

3. Include all special tools and instruments (only available from vendor, specific to a piece of equipment) required for testing equipment according to these Contract Documents in the base bid price to the Contractor, except for stand-alone data logging equipment that may be used by the CA.

4. Provide information requested by CA regarding equipment sequence of operation and testing procedures.

5. Provide test procedures for equipment installed by Contractor.

H. Commissioning Agent (CA):
1. The CA is not responsible for design concept, design criteria, compliance with codes, design or general construction scheduling, cost estimating, or construction management. The CA may assist with problem-solving non-conformance or deficiencies, but ultimately that responsibility resides with the general contractor and the A/E. The primary role of the CA is to develop and coordinate the execution of a commissioning plan, testing plan, observe and document performance— that systems are functioning in accordance with the documented design intent and in accordance with the Contract Documents. The Contractors will provide all tools or the use of tools to start, checkout and functionally test equipment and systems.

2. Coordinates and directs the commissioning activities in a logical, sequential and efficient manner using consistent protocols and forms, centralized documentation, clear and regular communications and consultations with all necessary parties, frequently updated timelines and schedules and technical expertise.

3. Coordinate the commissioning work and, with the GC, ensure that commissioning activities are being scheduled into the master schedule.

4. Revise, as necessary, Commissioning Plan—Construction Phase.

5. Plan and conduct a commissioning scoping meeting.

6. Request and review additional information required to perform commissioning tasks, including O&M materials, contractor start-up and checkout procedures.

7. Before startup, gather and review the current control sequences and interlocks and work with contractors and design engineers until sufficient clarity has been obtained, in writing, to be able to write detailed testing procedures.

8. Review normal Contractor submittals applicable to systems being commissioned for compliance with commissioning needs, along with A/E reviews.

9. Assist in the development of pre-functional tests and checklists.

10. Assist in the development of an enhanced start-up and initial systems checkout plan with Subcontractors.

11. Perform site visits, as necessary, to observe component and system installations. Attend selected planning and job-site meetings to obtain information on construction progress. Review construction meeting minutes for revisions/substitutions relating to the commissioning process. Assist in resolving any discrepancies.

12. Witness all or part of the HVAC piping test and flushing procedure, sufficient to be confident that proper procedures were followed. Document this testing and include the documentation in O&M manuals. Notify Director of any deficiencies in results or procedures.

13. Approve pre-functional tests and checklist completion by reviewing pre-functional checklist reports and by selected site observation and spot-checking.

14. Approve systems startup by reviewing start-up reports and by selected site observation.

15. With necessary assistance and review from installing contractors, review the functional performance test procedures for equipment and systems. This may include energy management control system trending, or manual functional testing.

16. Analyze any functional performance trend logs and monitoring data to verify performance.

17. Coordinate, witness and approve manual functional performance tests performed by installing contractors. Coordinate retesting as necessary until satisfactory performance is achieved.

18. Review equipment warranties to ensure that the State’s responsibilities are clearly defined.

19. Oversee and approve the training of the State's operating personnel.

20. Compile and maintain a commissioning record and building systems book(s).

21. Review and approve the preparation of the O&M and Systems manuals.

22. Provide a final commissioning report.

I. Warranty Period
1. Coordinate and supervise required seasonal or deferred testing and deficiency corrections.

2. Return to the site at 6-months for Controls Contractor training III session.

3. Return to the site at 10 months into the 12-month warranty period and review with facility staff the current building operation and the condition of outstanding issues related to the original and seasonal commissioning. Also interview facility staff and identify problems or concerns they have operating the building as originally intended. Make suggestions for improvements and for recording these changes in the O&M manuals. Identify areas that may come under warranty or under the original construction contract. Assist facility staff in developing reports, documents and requests for services to remedy outstanding problems.

1.07 SCHEDULING
1. The CA will work with the GC according to established protocols to schedule the commissioning activities. The CA will provide sufficient notice to the State and GC for scheduling commissioning activities. The GC will integrate all commissioning activities into the master schedule. All parties will address scheduling problems and make necessary notifications in a timely manner in order to expedite the commissioning process.

PART 2 - PRODUCTS

2.01 TEST EQUIPMENT
A. All standard testing equipment required to perform startup and initial checkout and required functional performance testing shall be provided by the Division contractor for the equipment being tested. For example, the mechanical contractor of Division 15 shall ultimately be responsible for all standard testing equipment for the HVAC system and controls system in Division 15, except for equipment specific to and used by TAB in their commissioning responsibilities.

B. Special equipment, tools and instruments (only available from vendor, specific to a piece of equipment) required for testing equipment, according to these Contract Documents shall be included in the base bid price to the Contractor and left on site.

C. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified in these specifications. If not otherwise noted, the following minimum requirements apply: Temperature sensors and digital thermometers shall have a certified calibration within the past year and a resolution of + or - 0.5°F. Pressure sensors shall have an accuracy of + or - 2.0% of the value range being measured (not full range of meter) and have been calibrated within the last year. All equipment shall be calibrated according to the manufacturer's recommended intervals and when dropped or damaged. Calibration tags shall be affixed or certificates readily available.

PART 3 - EXECUTION

3.01 MEETINGS

A. Scoping Meeting:
   1. Within 90 days of commencement of construction, the CA will schedule, plan and conduct a commissioning scoping meeting with the entire commissioning team in attendance. Meeting minutes will be distributed to all parties by the GC. Information gathered from this meeting will allow the CA to revise the Commissioning Plan to its "final" version, which will also be distributed to all parties.

B. Miscellaneous Meetings:
   1. Other meetings will be planned and conducted by the CA as construction progresses. These meetings will cover coordination, deficiency resolution and planning issues with particular Subs. The CA will plan these meetings and will minimize unnecessary time being spent by Contractor.

3.02 REPORTING

A. The CA will regularly communicate with all members of the commissioning team, keeping them apprised of commissioning progress and scheduling changes through memos, progress reports, etc.

B. Testing or review approvals and non-conformance and deficiency reports are made regularly with the review and testing as described in later sections.

C. A final summary report by the CA will be provided focusing on evaluating commissioning process issues and identifying areas where the process could be improved. All acquired documentation, logs, minutes, reports, deficiency lists, communications, findings, unresolved issues, etc., will be compiled in appendices and provided with the summary report. Pre-functional checklists, functional tests and monitoring reports will not be part of the final report, but will be stored in the Commissioning Record in the O&M manuals.

3.03 START-UP, PRE-FUNCTIONAL CHECKLISTS AND INITIAL CHECKOUT

A. The following procedures apply to all equipment to be commissioned. Some systems that are not comprised so much of actual dynamic machinery may have very simplified PCs and startup.

B. General. Pre-functional checklists are important to ensure that the equipment and systems are hooked up and operational. It ensures that functional performance testing (in-depth system checkout) may proceed without unnecessary delays. Each piece of equipment receives full pre-functional checkout. No sampling strategies are used. The pre-functional testing for a given system must be successfully completed prior to formal functional performance testing of equipment or subsystems of the given system.

C. Start-up and Initial Checkout Plan. The CA shall assist the commissioning team members responsible for startup of any equipment in developing detailed start-up plans for all equipment. The primary role of the CA in this process is to ensure that there is written documentation that each of the manufacturer-recommended procedures have been completed. Parties responsible for pre-functional checklists and startup are identified in the commissioning scoping meeting and in the checklist forms. Parties responsible for executing functional performance tests are identified in the testing requirements.
   1. The checklists indicate required procedures to be executed as part of startup and initial checkout of the systems and the party responsible for their execution.

   2. The Contractor determines which trade is responsible for executing and documenting each of the line item tasks and notes that trade on the form. Each form may have more than one trade responsible for its execution.

3. The Contractor responsible for the purchase of the equipment develops the full start-up plan by combining (or adding to) the CA's checklists with the manufacturer's detailed start-up and checkout procedures from the O&M manual and the normally used field checkout sheets. The plan will include checklists and procedures with specific boxes or lines for recording and documenting the checking and inspections of each procedure and a summary statement with a signature block at the end of the plan.

4. The full start-up plan could consist of something as simple as:
   a. The pre-functional checklists developed jointly by the CA and the Contractor.

   b. The manufacturer's standard written start-up procedures copied from the installation manuals with check boxes by each procedure and a signature block added by hand at the end.

   c. The manufacturer's normally used field checkout sheets.

5. The Contractor submits the full startup plan to the CA for review and approval.

6. The CA reviews and approves the procedures and the format for documenting them, noting any procedures that need to be added.

7. The full start-up procedures and the approval form may be provided to the State for review and approval, depending on management protocol.

D. Sensor Calibration:
   1. Calibration of all sensors shall be included as part of the pre-functional checklists performed by the Contractors, according to the following procedures:

   2. Sensors Without Transmitters—Standard Application. Make a reading with a calibrated test instrument within 6 inches of the site sensor. Verify that the sensor reading (via the permanent thermostat, gage or building automation system (BAS)) is within the tolerances in the table below of the instrument-measured value. If not, install offset in BAS, calibrate or replace sensor.

Sensor	Required Tolerance (+/-)	Sensor	Required Tolerance (+/-)
AHU wet bulb or dew point	1.0F	Flow rates, air	10% of design
Outside air, space air, coil air temps	1.0F	Pressures, air, water, and gas	5% of design
Watt-hour, voltage, and amperage	2%		

E. Execution of Pre-functional Checklists and Startup:

1. Four weeks prior to startup, the GC, Subs, and vendors schedule startup and checkout with CA. The performance of the pre-functional checklists, startup and checkout are directed and executed by the Contractor or vendor. When checking off pre-functional checklists, signatures may be required of other Contractor for verification of completion of their work.

2. The CA shall observe, at minimum, the procedures for each piece of primary equipment, unless there are multiple units, (in which case a sampling strategy may be used as approved).

3. For lower-level components of equipment, (e.g., VAV boxes, sensors, controllers), the CA shall observe a sampling of the pre-functional and start-up procedures. The sampling procedures are identified in the commissioning plan.

4. The Contractor and vendors shall execute startup and provide the CA with a signed and dated copy of the completed start-up and pre-functional tests and checklists.

5. Only individuals that have direct knowledge and witnessed that a line item task on the pre-functional checklist was actually performed shall initial or check that item off. It is not acceptable for supervisors to fill out these forms if they have not witnessed the test.

F. Deficiencies, Non-Conformance and Approval in Checklists and Startup:
1. The Contractor shall clearly list any outstanding items of the initial start-up and pre-functional procedures that were not completed successfully, at the bottom of the procedures form or on an attached sheet. The procedures form and any outstanding deficiencies are provided to the CA within two days of test completion.

2. The CA reviews the report and submits either a non-compliance report or an approval form to the GC. The CA shall work with the Contractor and vendors to correct and retest deficiencies or uncompleted items. The CA will involve the GC and others as necessary. The installing Contractor or vendors shall correct all areas that are deficient or incomplete in the checklists and tests in a timely manner, and shall notify the CA as soon as outstanding items have been corrected and resubmit an updated start-up report and a Statement of Correction on the original non-compliance report. When satisfactorily completed, the CA recommends approval of the execution of the checklists and startup of each system using a standard form.

3.04 FUNCTIONAL TESTING

A. This sub-section applies to all commissioning functional testing for all divisions.

B. Objectives and Scope:
1. The objective of functional testing is to demonstrate that each system is operating according to the documented design intent and Contract Documents. Functional testing facilitates bringing the systems from a state of substantial completion to full dynamic operation. Additionally, during the testing process, areas of deficient performance are identified and corrected, improving the operation and functioning of the systems. In general, each system should be operated through all modes of operation (seasonal, occupied, unoccupied, warm-up, cool-down, part- and full-load) where there is a specified system response. Verifying each sequence in the sequences of operation is required. Proper responses to such modes and conditions as power failure, freeze condition, no flow, equipment failure, etc. shall also be tested.

C. Development of Test Procedures:

1. Before test procedures are written, the CA shall obtain all requested documentation and a current list of change orders affecting equipment or systems, including an updated points list, program code, control sequences and parameters. The CA shall assist the contractor in developing specific test procedures and forms to verify and document proper operation of each piece of equipment and system. Each Sub or vendor responsible to execute a test, shall provide assistance to the CA in developing the procedures review (answering questions about equipment, operation, sequences, etc.). Prior to execution, the Contractor shall review the tests for feasibility, safety, equipment and warranty protection. The CA shall submit the tests to the A/E for review. The purpose of any given specific test is to verify and document compliance with the stated criteria of acceptance given on the test form.

D. Test Methods:
   1. Functional testing and verification may be achieved by manual testing (persons manipulate the equipment and observe performance) or by monitoring the performance and analyzing the results using the control system's trend log capabilities or by stand- alone data loggers. The CA will determine which method is most appropriate for tests that do not have a method specified.

   2. Simulated Conditions. Simulating conditions (not by an overwritten value) shall be allowed, though timing the testing to experience actual conditions is encouraged wherever practical.

   3. Altering Set points. Rather than overwriting sensor values, and when simulating conditions is difficult, altering set points to test a sequence is acceptable. For example, to see the AC compressor lockout work at an outside air temperature below 55F, when the outside air temperature is above 55F, temporarily change the lockout setpoint to be 2F above the current outside air temperature.

   4. Setup. Each function and test shall be performed under conditions that simulate actual conditions as close as is practically possible. The Contractor executing the test shall provide all necessary materials, system modifications, etc. to produce the necessary flows, pressures, temperatures, etc. necessary to execute the test according to the specified conditions. At completion of the test, the Contractor shall return all affected building equipment and systems, due to these temporary modifications, to their pre-test condition.

E. Coordination and Scheduling:
   1. The Contractor shall provide sufficient notice to the CA regarding their completion schedule for the pre-functional checklists and startup of all equipment and systems. The CA will schedule functional tests through the GC and affected Subcontractors. The CA shall direct, witness and document the functional testing of all equipment and systems. The Contractor shall execute the tests. In general, functional testing is conducted after pre-functional testing and startup has been satisfactorily completed. The control system is sufficiently tested and approved by the CA before it is used for TAB or to verify performance of other components or systems. The air balancing and water balancing is completed and debugged before functional testing of air- related or water-related equipment or systems. Testing proceeds from components to subsystems to systems. When the proper performance of all interacting individual systems has been achieved, the interface or coordinated responses between systems is checked.

   2. The Contractor and CA shall notify the State (5) working days in advance of any potential shutdown or testing of equipment, that may impact building occupants.

3.05 DOCUMENTATION, NON-CONFORMANCE AND APPROVAL OF TESTS

A. Documentation:
   1. The CA shall witness and document the results of all functional tests using the specific procedural forms developed for that purpose. Prior to testing, these forms are provided to the GC for review. The CA will include the filled out forms in the Commissioning Report.

B. Non-Conformance:
   1. The CA will record the results of the functional test on the procedure or test form. All deficiencies or non-conformance issues shall be noted and reported on a standard non- compliance form.

   2. Corrections of minor deficiencies identified may be made during the tests at the discretion of the CA. In such cases the deficiency and resolution will be documented on the procedure form.

   3. Every effort will be made to expedite the testing process and minimize unnecessary delays, while not compromising the integrity of the procedures.

   4. As tests progress and a deficiency is identified, the CA discusses the issue with the Contractor.
      a. When there is no dispute on the deficiency and the Sub accepts responsibility to correct it:
         1) The CA documents the deficiency and the Sub's response and intentions and they go on to another test or sequence.

      b. If there is a dispute about a deficiency, regarding whether it is a deficiency or who is responsible:
         1) The deficiency shall be documented on the non-compliance form with the Sub's response and a copy given to the GC and to the Subcontractor representative assumed to be responsible.

         2) Resolutions are made at the lowest management level possible. Other parties are brought into the discussions as needed. Final interpretive authority is with the A/E. Final acceptance authority is with the Director.

      c. The CA documents the resolution process.

      d. Once the interpretation and resolution have been decided, the appropriate party corrects the deficiency, signs the statement of correction on the non- compliance form and provides it to the CA. The CA reschedules the test and the test is repeated until satisfactory performance is achieved.

   5. Cost of Retesting:
      a. The cost to retest a pre-functional or functional test for a deficiency shall be the Contractor's responsibility.

   6. The Contractor shall respond in writing to the CA at least as often as commissioning meetings are being scheduled concerning the status of each apparent outstanding discrepancy identified during commissioning. Discussion shall cover explanations of any disagreements and proposals for their resolution.

   7. The CA retains the original non-conformance forms until the end of the project.

C. Approval:

1. The CA notes each satisfactorily demonstrated function on the test form. The CA recommends acceptance of each test using a standard form. The Director gives final approval on each test using the same form, providing a signed copy to the CA and the Contractor.

3.06 SYSTEMS AND OPERATION AND MAINTENANCE (O&M) MANUALS

A. The following System/O&M manual requirements do not replace O&M manual documentation requirements elsewhere in these specifications.

B. Contractor shall compile and prepare documentation for all equipment and systems covered in Division 15 and deliver this documentation to the GC for inclusion in the O&M manuals, according to this section, prior to the training of State personnel.

C. The CA shall receive a copy of the Systems/O&M manuals for review.

D. Special Control System O&M Manual Requirements. In addition to documentation that may be specified elsewhere, the controls contractor shall compile and organize at minimum the following data on the control system in labeled 3-ring binders with indexed tabs.

1. Three copies of the controls training manuals in a separate manual from the O&M manuals.

2. Operation and Maintenance Manuals containing:
   a. Specific instructions on how to perform and apply all functions, features, modes, etc. mentioned in the controls training sections of this specification and other features of this system. These instructions shall be step-by-step. Indexes and clear tables of contents shall be included. The detailed technical manual for programming and customizing control loops and algorithms shall be included if required in the controls specification section.

   b. Full as-built set of control drawings.

   c. Full as-built sequence of operations for each piece of equipment.

   d. Full points list. In addition to the updated points list required in the original submittal.

   e. Full print out of all schedules and set points after testing and acceptance of the system.

   f. Full as-built print out of software program as required.

   g. Electronic copy on disk of the entire program for this facility.

   h. Marking of all system sensors and thermostats on the as-built floor plan and mechanical drawings with their control system designations.

   i. Maintenance instructions, including sensor calibration requirements and methods by sensor type, etc.

   j. Control equipment component submittals, parts lists, etc.

   k. Warranty requirements.

   l. Copies of all checkout tests and calibrations performed by the Contractor (not commissioning tests).

3. The manual shall be organized and subdivided with permanently labeled tabs for each of the following data in the given order:
    a. Sequences of operation

    b. Control drawings

    c. Points lists

    d. Controller / module data

    e. Thermostats and timers

    f. Sensors and DP switches

    g. Valves and valve actuators

    h. Dampers and damper actuators

    i. Program setups (software program printouts)

4. Field checkout sheets and trend logs should be provided to the CA for inclusion in the Commissioning Record Book.

E. Review and Approvals. Review of the commissioning related sections of the Systems/O&M manuals shall be made by the A/E and by the CA.

3.07 TRAINING OF PERSONNEL

A. The GC shall be responsible for training coordination and scheduling and ultimately to ensure that training is completed.

B. The CA shall be responsible for overseeing and approving the content and adequacy of the training of State personnel for commissioned equipment.

C. Mechanical Contractor:
1. The mechanical contractor shall have the following training responsibilities:

    a. Provide the CA with a training plan two weeks before the planned training.

    b. Provide designated State personnel with comprehensive orientation and training in the understanding of the systems and the operation and maintenance of each piece of HVAC equipment including, but not limited to, pumps, chillers, controls, etc.

    c. Training shall normally start with classroom sessions followed by hands-on training on each piece of equipment, which shall illustrate the various modes of operation, including startup, shutdown, fire/smoke alarm, power failure, etc.

    d. During any demonstration, should the system fail to perform in accordance with the requirements of the O&M manual or sequence of operations, the system will be repaired or adjusted as necessary and the demonstration repeated.

e. The appropriate trade or manufacturer's representative shall provide the instructions on each major piece of equipment. This person may be the start-up technician for the piece of equipment, the installing contractor or manufacturer's representative. Practical building operating expertise as well as in-depth knowledge of all modes of operation of the specific piece of equipment are required. More than one party may be required to execute the training.

f. The controls contractor shall attend sessions other than the controls training, as requested, to discuss the interaction of the controls system as it relates to the equipment being discussed.

g. The training sessions shall follow the outline in the Table of Contents of the operation and maintenance manual and illustrate whenever possible the use of the O&M manuals for reference.

h. Training shall include:
   1) Use of the printed installation, operation and maintenance instruction material included in the O&M manuals.

   2) A review of the written Systems/O&M instructions emphasizing safe and proper operating requirements, preventative maintenance, special tools needed and spare parts inventory suggestions. The training shall include start-up, operation in all modes possible, shutdown, seasonal changeover and any emergency procedures.

   3) Discussion of relevant health and safety issues and concerns.

   4) Discussion of warranties and guarantees.

   5) Common troubleshooting problems and solutions.

   6) Explanatory information included in the O&M manuals and the location of all plans and manuals in the facility.

   7) Discussion of any peculiarities of equipment installation or operation.

   8) Classroom sessions shall include the use of overhead projections, slides, and video/audio-taped material as might be appropriate.

i. Hands-on training shall include start-up, operation in all modes possible, including manual, shutdown and any emergency procedures and preventative maintenance for all pieces of equipment.

j. The mechanical contractor shall fully explain and demonstrate the operation, function and overrides of any local packaged controls, not controlled by the central control system.

k. Duration of Training. The mechanical contractor shall provide training on each piece of equipment according to the requirements of the preceding specification sections. Training shall be provided as deemed acceptable by the Director.

D. Controls Contractor:
   1. The controls contractor shall have the following training responsibilities:
      a. Provide the CA with a training plan four weeks before the planned training.

b. The controls contractor shall provide designated State personnel training on the control system in this facility. The intent is to clearly and completely instruct the State on all the capabilities of the control system.

c. Training manuals. The standard operating manual for the system and any special training manuals will be provided for each trainee, with three extra copies left for the O&M manuals. In addition, copies of the system technical manual will be demonstrated during training and three copies submitted with the O&M manuals. Manuals shall include detailed description of the subject matter for each session. The manuals will cover all control sequences and have a definitions section that fully describes all relevant words used in the manuals and in all software displays. Copies of audiovisuals shall be delivered to the Director.

d. The training will be tailored to the needs and skill-level of the trainees.

e. The trainers shall be knowledgeable on the system and its use in buildings. The Director shall approve the instructor prior to scheduling the training.

f. During any demonstration, should the system fail to perform in accordance with the requirements of the O&M manual or sequence of operations, the system will be repaired or adjusted as necessary and the demonstration repeated.

g. The controls contractor shall attend sessions other than the controls training, as requested, to discuss the interaction of the controls system as it relates to the equipment being discussed.

h. There shall be three training sessions:
   1) Training I. Control System. This training may be held on-site or in the supplier's facility. If held off- site, the training may occur prior to final completion of the system installation. Upon completion, each student, using appropriate documentation, should be able to perform elementary operations and describe general hardware architecture and functionality of the system.

   2) Training II. Building Systems. The second session shall be held on-site after the completion of system commissioning. The session shall include instruction on:
      a) Specific hardware configuration of installed systems in this building and specific instruction for operating the installed system.

      b) Security levels, alarms, system start-up, shut-down, power outage and restart routines, changing set points and alarms and other typical changed parameters, overrides, freeze protection, manual operation of equipment, optional control strategies that can be considered, energy savings strategies and set points that if changed will adversely affect energy consumption, energy accounting, procedures for obtaining vendor assistance, etc.

      c) All trending and monitoring features (values, change of state, totalization, etc.), including setting up, executing, downloading, viewing both tabular and graphically and printing trends. Trainees will actually set-up trends in the presence of the trainer.

      d) Every screen shall be completely discussed, allowing time for questions.

      e) Use of keypad or plug-in laptop computer at the zone level.

f) Use of remote access to the system via phone lines or networks if included.

g) Setting up and changing an air terminal unit controller.

3) Training III. The third training will be conducted on-site six months after occupancy. The session will be structured to address specific topics that trainees need to discuss and to answer questions concerning operation of the system.

E. TAB:
1. The TAB contractor shall have the following training responsibilities:
a. TAB shall meet with facility staff after completion of TAB and instruct them on the following:
1) Go over the final TAB report, explaining the layout and meanings of each data type.

2) Discuss any outstanding deficient items in control or design that may affect the proper delivery of water.

3) Identify and discuss any equipment that are close to or are not meeting their design capacity.

4) Discuss any temporary settings and steps to finalize them for any areas that are not finished.

5) Other salient information that may be useful for facility operations, relative to TAB.

3.08 WRITTEN WORK PRODUCTS

A. Written work products of Contractors will consist of the start-up and initial checkout plan described and the filled out start-up, initial checkout, pre-functional, and functional checklists, training plans and records of training. These work products will be supplied to the CA to be included in the final commissioning report.

END OF SECTION 15995

SECTION 16010 – BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of contract, including general and supplementary conditions and division-1 specification sections, apply to work of this section.

1.02 SUMMARY

A. This section specifies the basic requirements for the electrical installations and includes requirements common to more than one section of DIVISION 16. It expands and supplements the requirements specified in sections of DIVISION 1.

B. Standards of the organizations listed below but referred to in the various sections by basic designation only, form a part of this specification to the extent indicated by the reference thereto:

1. American Society for Testing and Materials (ASTM).
2. National Fire Protection Association (NFPA).
3. American National Standards Institute (ANSI).
4. Illuminating Engineering Society (IES).
5. Institute of Electrical and Electronics Engineers (IEEE).
6. Insulated Cable Engineers Association ICEA).
7. National Electrical Manufacturers Association (NEMA).
8. National Electrical Contractors' Association (NECA).
9. Underwriters Laboratories, Inc. (UL).
10. Factory Mutual (FM).
11. Federal Specifications (FS).
12. National Electrical Code (NEC).
13. ANSI TIA/EIA Telecommunication Building Wiring Standards.

C. References shall mean to the latest edition of the standard or those currently adopted by the local jurisdiction.

D. Conform to local ordinances and codes.

1.03 QUALITY ASSURANCE

A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected. Contractor shall coordinate with the appropriate supplier, vendor, or subcontractor regarding the exact and specific rough-in requirements for equipment actually supplied.

B. Conduits, junction boxes, wireway, etc. required for low voltage/telecommunications, cabling shall be coordinated with telecommunications cabling divisions prior to rough-in.

1.04 ELECTRICAL INSTALLATIONS

A. Coordinate electrical equipment and materials installation with other building components.

B. Verify all dimensions by field measurement. Do not scale drawings.

C. Arrange for chases, slots, and openings in other building components to allow for electrical installations.

D. Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the work. Give particular attention to large equipment requiring positioning prior closing-in the building.

E. Coordinate the access panel requirements with General Contractor to accommodate the installation of electrical equipment and materials.

F. Where mounting heights are not detailed or dimensioned, install electrical services and overhead equipment to provide the maximum headroom possible.

G. Install electrical equipment to facilitate maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.

H. Coordinate the installation of electrical materials and equipment above ceilings with suspension system, mechanical equipment and systems, and structural components.

I. Contractor shall review Mechanical, Structural, and Architectural drawings prior to bid.

J. Final connections to equipment shall be per manufacturer's approved wiring diagrams, details and instructions. It shall be the Contractor's responsibility to provide materials and equipment compatible with equipment actually supplied.

K. Work shall be performed in a workmanlike manner to the satisfaction of the Contracting Officer.

L. Contractor shall verify and coordinate exact location of equipment to be furnished by others prior to rough-in.

M. Contractor shall be responsible for replacing equipment which is damage due to incorrect field wiring provided under this section or factory wiring in equipment provided under this division.

N. Contractors shall visit site prior to bid and verify that conditions are as indicated. Contractor shall include in his bid, costs required to make his work meet existing conditions.

O. Proposed substitutions of electrical equipment or request for "or equal" or approved equal" listing shall be submitted in accordance with DIVISION 1 Specifications. Refer to specifications for additional information.

P. Wire termination provisions for panelboards, circuit breakers, safety switches and all other electrical apparatus shall be listed as suitable for 75 degree C.

Q. Systems shall be complete, operable and ready for continuous operations. Lights, switches, receptacles, motors, etc., shall be connected and operable.

R. Electrical equipment shall be located to maintain clear and level clearances outlined in NEC 110-26. Panelboards, disconnects, switches, breakers, etc. shall be located to comply with NEC 110-26(a). Where the clearances outlined in NEC 110-26 cannot be obtained, the Contractor shall notify the engineer prior to performing any rough-in.

S. Maintain separation between telecommunication conduits and electrical feeders, electronic ballasts, transformers, etc. to minimize electromagnetic compatibility issues.

T. Telecommunications horizontal cabling conduit runs that exceed 100 feet shall be provided with junction boxes for every 100 feet or fraction thereof in excess of 100 feet.

U. Contractor shall coordinate horizontal telecommunications cabling routing to ensure TIA/EIA distance standards are not exceeded; in effect, 90 meters/295 feet from TR termination to outlet termination.

V. Contractor shall not exceed two (2) 90 degree elbows in telecommunications conduit runs. If more than two (2) 90 degree turns are required, pullboxes shall be provided for every 180 degrees of bend.

W. Contractor shall review telecommunications and other low voltage drawings and provide all raceway, conduit, cable tray, etc. as required. Ladder tray within the Telecommunications Room (TR)shall be furnished and installed by the low voltage cabling Contractor.

1.05 ELECTRICAL SUBMITTALS

A. Refer to the Conditions of the Contract (General and Supplementary) and DIVISION 1 Specifications for submittal definitions, requirements, and procedures.

B. Data shall be submitted at one time as PDF file format and indexed as scheduled below. Partial submittals will not be accepted.
   1. 16060 – Grounding and Bonding
   2. 16073 – Hangers and Supports for Electrical Systems
   3. 16075 – Electrical Identification
   4. 16120 – Conductors and Cables
   5. 16130 – Raceways and Boxes
   6. 16140 – Wiring Devices
   7. 16442 – Panelboards
   8. 16511 – Interior Lighting
   9. 16721 – Fire Alarm System

C. Submit shop drawings and product data grouped to include complete submittals of related systems, products and accessories in a single submittal.

D. Identify products requiring color selections by Contracting Officer or State.

E. Identify products for use on project.

1.06 PRODUCT OPTIONS AND SUBSTITUTIONS

A. Substitutions requirements shall be per DIVISION 1 SPECIFICATIONS.

1.07 PRODUCT LISTING

A. Prepare listing of major electrical equipment and materials for the project.

B. Submit this listing as a part of the submittal requirement specified in the DIVISION 1 Specifications.

1.08 NAMEPLATE DATA

A. Provide permanent operational data nameplate on each item of power operated equipment, indicating, manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data. Locate nameplates in an accessible location.

1.09 DELIVERY, STORAGE AND HANDLING

A. Deliver products to project properly identified with names, model numbers, types, compliance labels and similar information needed for distinct identification; adequately packaged and protected to prevent damage during shipment, storage and handling.

B. Store equipment and materials at the site, unless off-site storage is authorized in writing. Contractor shall protect stored equipment and materials from damage and theft.

C. Coordinate deliveries of electrical materials and equipment to minimize construction congestion. Limit each shipment of materials and equipment to the items and quantities needed for the smooth and efficient flow of installations.

1.10 RECORD DOCUMENTS

A. Refer to the DIVISION 1 Specifications for closeout requirements. The following paragraphs supplement the requirements of DIVISION 1.

B. Mark drawings to indicate revisions to conduit size and location both exterior and interior, actual equipment locations, dimensioned to column lines; concealed equipment, dimensioned to column lines; distribution and branch electrical circuitry; fuse and circuit breaker size and arrangement support and hanger details; Change Orders; Addendums; concealed control system devices.

C. Mark specifications to indicate approved substitutions; Change Orders; Addendums and equipment and materials used.

1.11 OPERATION AND MAINTENANCE DATA

A. Refer to DIVISION 1 Specifications for procedures and requirements for preparation and submittal of maintenance manuals.

B. In addition to the information required by Division 1 for Maintenance Data, include the following information.

C. Description of function, normal operating characteristics and limitations, performance curves, engineering data tests, and complete nomenclature and commercial numbers of all replaceable parts.

1. Manufacturer's printed operating procedures to include start-up, break-in, routine and normal operating instructions; regulation, control, stopping, shut-down and emergency instructions and summer and winter operating instructions.

2. Maintenance procedures for routine preventative maintenance and troubleshooting,

disassembly, repair and reassembly; aligning and adjusting instructions.

3. Servicing instructions and lubrication charts and schedules.

1.12 WARRANTIES

A. Refer to the DIVISION 1 Specifications for procedures and submittal requirements for warranties. Refer to individual equipment specifications for warranty requirements.

B. Compile and assemble the warranties specified in Division 16, into a separated set of PDF files tabulated and indexed for easy reference.

C. Provide complete warranty information for each item to include product or equipment to include date of beginning of warranty or bond; duration of warranty or bond; and names, addresses and telephone numbers and procedures for filing a claim and obtaining warranty services.

1.13 CLEANING

A. Refer to the DIVISION 1 Specifications for final cleaning general requirements.

END OF SECTION 16010

SECTION 16047- ELECTRICAL DEMOLITION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and DIVISION 1 Specification Sections, apply to work specified in this section.

1.02 SUMMARY

A. The extent of general building demolition work is shown on the drawings. Coordinate the required electrical work with the general demolition.

B. Demolition includes removal of existing electrical devices, equipment and accessories as identified on electrical drawings or otherwise associated with work listed on drawings under other Divisions. Contractor shall include costs for removal of electrical components associated with all aspects of project whether or not specifically listed on electrical drawings.

C. The State shall have the option of retaining any items removed. The Contractor shall deliver these items to the State's designated storage area. Any items not retained by the State shall be disposed of off-site by the Contractor.

1.03 JOB CONDITIONS

A. Condition of Structures: The State assumes no responsibility for actual condition of structures to be demolished.

B. Conditions of the structure existing at time of inspection for bidding purposes will be maintained by State in so far as practicable. However, variations within structure may occur by State's removal and salvage operations prior to start of demolition work. The drawings are schematic and provided as an aid in bidding. The Contractor shall visit the site and determine the actual conditions prior to bidding.

C. Partial Removal: Items of salvageable value to Contractor may be removed from structure as work progresses. Salvaged items must be transported from site as they are removed. Storage or sale of removed items on site will not be permitted.

D. Traffic: Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, walks, occupied areas, and other adjacent occupied or used facilities.

E. Protections: Ensure safe passage of persons around or through area of demolition. Conduct operations to prevent injury to adjacent buildings, structures, other facilities, and persons.

F. Install temporary electrical services, lighting, etc. as required by the State or authorities having jurisdiction.

G. Damages: Promptly repair damages caused to adjacent facilities by demolition operations at no cost to State.

H. Utility Services: Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations. Allow no interruption in service unless coordinated with State at least 72 hours in advance.

I. Do not interrupt existing utilities serving occupied or used facilities, except when

authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

J. Contractor will disconnect and seal utilities serving each structure to be demolished, or interior area to be demolished, prior to start of demolition work.

K. If Contractor is required to disconnect utility services or other services to an occupied area, the Contractor shall provide temporary or alternative service to that area.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.01 DEMOLITION

A. Remove all branch and feeder conduit and wire back to panelboards.

B. Where walls, ceilings, or floors are to remain, remove devices and wire. Provide blank cover plate at outlet box.

C. All items shown to remain active shall be furnished with necessary accessible junction boxes and all conduit and wire as required to maintain circuit continuity.

D. All outlet boxes which must be removed due to demolition but which must remain active in order to maintain circuit continuity shall be relocated into ceilings or walls and shall be accessible.

E. All material fixtures and equipment to be reused shall be removed and stored on site. Before reinstallation, all items are to be cleaned, tested, and prepared for re-use. Fixtures shall be re-lamped and new ballasts installed.

3.02 DISPOSAL OF DEMOLISHED MATERIAL

A. General: Remove from site debris, rubbish, and other materials resulting from demolition operations. Apply all fees related to removal and pumping.

B. Remove and dispose of interior demolition debris only.

C. Burning of removed materials from demolished structures will not be permitted on site.

D. Transport materials removed from demolished structures and dispose of offsite.

END OF SECTION 16047

SECTION 16060- GROUNDING AND BONDING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and DIVISION 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes methods and materials for grounding systems and equipment grounding requirements specified in this section ay be supplemented by special requirements of section described in other sections.

1.03 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Other Informational Submittals: Plans showing dimensioned as-built locations of grounding features Including the following:
   1. Ground rods.

C. Field quality-control test reports.

D. Operation and Maintenance Data: For grounding to include the following in emergency, operation, and maintenance manuals:
   1. Instructions for periodic testing and inspection of grounding features based on NFPA 70B.
      a. Tests shall be to determine if ground resistance or impedance values remain within specified maximums, and instructions shall recommend corrective action if they do not.

      b. Include recommended testing intervals.

1.04 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.01 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Equipment Grounding Conductors: Insulated with green-colored insulation.

C. Isolated Ground Conductors: Insulated with green-colored insulation with yellow stripe. On feeders with isolated ground, use colored tape, alternating bands of green and yellow tape to provide a minimum of three bands of green and two bands of yellow.

D. Grounding Electrode Conductors: Stranded cable.

E. Underground Conductors: Bare, tinned, stranded, unless otherwise indicated.

F. Bare Copper Conductors:

1. Solid Conductors: ASTM B 3.

2. Stranded Conductors: ASTM B 8.

3. Tinned Conductors: ASTM B 33.

4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch (6 mm) in diameter.

5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.

6. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.

7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.

G. Grounding Bus: Rectangular bars of annealed copper, 1/4 by 2 inches (6 by 50 mm) in cross section, unless otherwise indicated; with insulators.

2.02 CONNECTORS

A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.

B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.
   1. Pipe Connectors: Clamp type, sized for pipe.

C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.03 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad/steel 5/8 inches in diameter by 120 inches (16 by 3000 mm) in length.

PART 3 - EXECUTION

3.01 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger, unless otherwise indicated.

B. Underground Grounding Conductors: Install bare copper conductor, size per drawings.

C. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.

D. Grounding Bus: Install in electrical and telephone equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
   1. Install bus on insulated spacers 1 inch (25 mm), minimum, from wall 18 inches (450 mm) above finished floor, unless otherwise indicated.

   2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, down to specified height above floor, and connect to **horizontal bus.**

E. Conductor Terminations and Connections:
   1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.

   2. Underground Connections: Welded connectors, except at test wells and as otherwise indicated.

   3. Connections to Ground Rods at Test Wells: Bolted connectors.

   4. Connections to Structural Steel: Welded connectors.

3.02 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
   1. Feeders and branch circuits.

   2. Lighting circuits.

   3. Receptacle circuits.

   4. Single-phase motor and appliance branch circuits.

   5. Three-phase motor and appliance branch circuits.

   6. Flexible raceway runs.

   7. Armored and metal-clad cable runs.

   8. Busway Supply Circuits: Install insulated equipment grounding conductor from grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.

   9. Computer and Rack-Mounted Electronic Equipment Circuits: Install insulated equipment grounding conductor in branch-circuit runs from equipment-area power panels and power-distribution units.

C. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.

D. Water Heater: Install a separate insulated equipment grounding conductor to each electric water heater. Bond conductor to heater units, piping, connected equipment, and components.

E. Signal and Communication Equipment: For telephone, alarm, voice and data, and other communication equipment, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
   1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-2-by-12-inch (6-by-50-by-300-mm) grounding bus.

   2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

F. Metal Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a

separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.03 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Common Ground Bonding with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.

C. Ground Rods: Drive rods until tops are a minimum of 2 inches (50 mm) below finished floor or final grade, unless otherwise indicated.
   1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating, if any.

   2. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.

D. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
   1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.

   2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.

   3. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.

E. Grounding and Bonding for Piping:
   1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes, using a bolted clamp connector or by bolting a lug-type connector to a pipe flange, using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.

   2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.

   3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

F. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install bonding jumper to bond across flexible duct connections to achieve continuity.

G. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet (18 m)

apart or as indicated on the electrical drawings.

3.04 FIELD QUALITY CONTROL

A. Test completed grounding system at service disconnect enclosure grounding terminal, and at all grounding electrodes. Make tests at electrodes before any conductors are connected.

B. Measure ground resistance not less than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.

C. Report measured ground resistance. If resistance exceeds 25 ohms, provide supplemental ground if required to comply with NEC 250.53(A)(2). All costs to achieve required ground resistance shall be included in the contractor's bid.

3.05 GRADING AND PLANTING

A. Restore surface features, including vegetation, at areas disturbed by Work of this Section. Re-establish original grades, unless otherwise indicated. If sod has been removed, replace it as soon as possible after backfilling is completed. Restore areas disturbed by trenching, storing of dirt, cable laying, and other activities to their original condition. Include application of topsoil, fertilizer, lime, seed, sod, sprig and mulch. Restore disturbed paving as indicated.

END OF SECTION 16060

SECTION 16073 – HANGERS & SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:
   1. Hangers and supports for electrical equipment and systems.
   2. Construction requirements for concrete bases.

1.03 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. IMC: Intermediate metal conduit.

C. RMC: Rigid metal conduit.

1.04 SUBMITTALS

A. Product Data: For the following:
   1. Steel slotted support systems.

B. Shop Drawings: Signed and sealed by a qualified professional engineer. Show fabrication and installation details and include calculations for the following:
   1. Trapeze hangers. Include Product Data for components.

   2. Steel slotted channel systems. Include Product Data for components.

   3. Equipment supports.

1.05 COORDINATION

A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 3.

B. Coordinate installation of roof curbs, equipment supports, and roof penetrations. These items are specified in Division 7.

PART 2 - PRODUCTS

2.01 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Allied Tube & Conduit.

      b. Cooper B-Line, Inc.; a division of Cooper Industries.

      c. ERICO International Corporation.

      d. GS Metals Corp.

      e. Thomas & Betts Corporation.

f. Unistrut; Tyco International, Ltd.

g. Wesanco, Inc.

2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.

3. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.

4. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.

5. Channel Dimensions: Selected for applicable load criteria.

B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.

C. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

E. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

F. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

b. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1) Hilti Inc.

2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.

3) MKT Fastening, LLC.

4) Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.

2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

b. Manufacturers: Subject to compliance with requirements, provide products by

one of the following:
1) Cooper B-Line, Inc.; a division of Cooper Industries.

2) Empire Tool and Manufacturing Co., Inc.

3) Hilti Inc.

4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.

5) MKT Fastening, LLC.

3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.

4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.

5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.

6. Toggle Bolts: All-steel springhead type.

7. Hanger Rods: Threaded steel.

PART 3 - EXECUTION

3.01 APPLICATION

A. Comply with NECA 1, NECA 101 and manufacturer's instructions for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.

B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter.

C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
1. Secure raceways and cables to these supports with two-bolt conduit clamps, single-bolt conduit clamps or single-bolt conduit clamps using spring friction action for retention in support channel.

D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch (38-mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

E. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports. Do not attach raceway to ceiling support wires or other piping systems.

3.02 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT may be supported by openings through structure members, as permitted in NFPA 70.

C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
   1. To Wood: Fasten with lag screws or through bolts.

   2. To New Concrete: Bolt to pre-set concrete inserts or expansion anchors.

   3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners or pre-set concrete inserts on solid masonry units.

   4. To Existing Concrete: Expansion anchor fasteners.

   5. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts, Beam clamps (MSS Type 19, 21, 23, 25, or 27), complying with MSS SP-69.

   6. To Light Steel: Sheet metal screws.

   7. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements.

E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

F. Install surface-mounted cabinets and panelboards with minimum of four anchors.

G. In wet and damp locations use steel channel supports to stand cabinets and panelboards one inch off wall.

H. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.

I. Do not fasten supports to pipes, ducts, mechanical equipment, and conduit.

J. Do not use power-actuated anchors.

K. Obtain permission from State before drilling or cutting structural members.

3.03 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Comply with installation requirements in Division 5 Section "Metal Fabrications" for site-fabricated metal supports.

B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

C. Field Welding: Comply with AWS D1.1/D1.1M.

D. Fabricate supports from structural steel or steel channel. Rigidly weld members or use

hexagon head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.

3.04 CONCRETE BASES

A. Construct concrete bases of dimensions indicated but not less than 4 inches (100 mm) larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.

B. Use 4500-psi (31.0-MPa) 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Division 3 Section "Cast-in-Place Concrete.

C. Anchor equipment to concrete base.
   1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

   2. Install anchor bolts to elevations required for proper attachment to supported equipment.

   3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.05 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
   1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).

B. Touchup: Comply with requirements in Division 9 painting Sections for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.

C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.06 FIRESTOPPING

A. Apply firestopping to cable and raceway penetrations of fire-rated floor and wall assemblies to achieve fire-resistance rating of the assembly. Firestopping materials and installation requirements are specified in Division 7.

3.07 DEMOLITION

A. Protect existing electrical equipment and installations indicated to remain. If damaged or disturbed in the course of the Work, remove damaged portions and install new products of equal capacity, quality, and functionality.

B. All abandoned wiring shall be removed in its entirety in accordance with the locally amended National Electrical Code, NFPA 70.

C. Accessible Work: Remove exposed electrical equipment and installations, indicated to be demolished, in their entirety.

D. Abandoned Work: Cut and remove buried raceway, indicated to be abandoned in place, 2 inches below the surface of adjacent construction. Cap raceways and patch surface to match existing finish.

E. Remove demolished material from Project site.

F. Remove, store, clean, reinstall, reconnect, and make operational components indicated for relocation.

END OF SECTION 16073

SECTION 16075 - ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Identification for raceway

2. Identification for conductors and communication and control cable.

3. Underground-line warning tape.

4. Warning labels and signs.

5. Instruction signs.

6. Equipment identification labels.

7. Miscellaneous identification products.

1.03 SUBMITTALS

A. Product Data: For each electrical identification product indicated.

B. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.

1.04 QUALITY ASSURANCE

A. Comply with ANSI A13.1 and ANSI C2.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.145.

1.05 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in the Contract Documents, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual, and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.01 RACEWAY IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of

color field for each raceway and cable size.

B. Color for Printed Legend:
   1. Power Circuits: Black letters on an orange field.

   2. Legend: Indicate system or service and voltage, if applicable.

C. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

D. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

E. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inches (50 mm) long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

F. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches (50 mm) wide; compounded for outdoor use.

2.02 CONDUCTOR AND COMMUNICATION AND CONTROL CABLE IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide.

B. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

C. Aluminum Wraparound Marker Labels: Cut from 0.014-inch- (0.35-mm-) thick aluminum sheet, with stamped, embossed, or scribed legend, and fitted with tabs and matching slots for permanently securing around wire or cable jacket or around groups of conductors.

D. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch (50 by 50 by 1.3 mm), with stamped legend, punched for use with self-locking nylon tie fastener.

2.03 UNDERGROUND-LINE WARNING TAPE

A. Description: Permanent, bright-colored, continuous-printed, polyethylene tape.
   1. Not less than 6 inches (150 mm) wide by 4 mils (0.102 mm) thick.

   2. Compounded for permanent direct-burial service.

   3. Embedded continuous metallic strip or core.

   4. Printed legend shall indicate type of underground line.

2.04 WARNING LABELS AND SIGNS

A. Safety Signs: Comply with NFPA 70 and 29 CFR 1910.145.

B. Baked-Enamel Warning Signs for Interior Use: Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application. 1/4-inch (6.4-mm) grommets in corners for mounting.

C. Metal-Backed, Butyrate Warning Signs for Exterior Use: Weather-resistant, nonfading,

preprinted, cellulose-acetate butyrate signs with 0.0396-inch (1-mm) galvanized-steel backing; and with colors, legend, and size required for application. 1/4-inch (6.4-mm) grommets in corners for mounting.

D. Warning label and sign shall include, but are not limited to, the following legends:
   1. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES (915 MM)."

2.05 INSTRUCTION SIGNS

A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch (1.6 mm) thick for signs up to 20 sq. in. (129 sq. cm) and 1/8 inch (3.2 mm) thick for larger sizes.
   1. Engraved legend with white letters on black face for normal power. White letters on red face for emergency power.

   2. Punched or drilled for mechanical fasteners.

2.06 EQUIPMENT IDENTIFICATION LABELS

A. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on black face for normal power. White letters on red face for emergency power. Minimum letter height shall be 3/8 inch (10 mm).

2.07 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Cable Ties: Fungus-inert, self-extinguishing, 1-piece, self-locking, Type 6/6 nylon cable ties.
   1. Minimum Width: 3/16 inch (5 mm).

   2. Tensile Strength: 50 lb (22.6 kg), minimum.

   3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).

   4. Color: According to color-coding.

B. Paint: Paint materials and application requirements are specified in Division 9 painting Sections. Select primer and finish coats applicable to the materials to be painted.

C. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.01 APPLICATION

A. Raceways and Duct Banks More Than 600 V Concealed within Buildings: 4-inch- (100-mm) wide black stripes on 10-inch (250-mm) centers over orange background that extends full length of raceway or duct and is 12 inches (300 mm) wide. Stencil legend "DANGER CONCEALED HIGH VOLTAGE WIRING" with 3-inch (75-mm) high black letters on 20-inch (500-mm) centers. Stop stripes at legends. Apply to the following finished surfaces:
   1. Floor surface directly above conduits running beneath and within 12 inches (300 mm) of a floor that is in contact with earth or is framed above unexcavated space.

   2. Wall surfaces directly external to raceways concealed within wall.

   3. Accessible surfaces of concrete envelope around raceways in vertical shafts, exposed in the building, or concealed above suspended ceilings.

B. Accessible Raceways, 600 V or Less, for Service, Feeder, and Branch Circuits More Than: Identify with orange self-adhesive vinyl label, paint, or self-adhesive vinyl tape applied in bands.

C. Accessible Raceways of Auxiliary Systems: Identify the following systems with color-coded, self-adhesive vinyl tape applied in bands or paint:
   1. Color coding for raceways shall be as follows:

Color Service	Band	Minimum Band Width
Security and/or Access Control System	Purple	2”
Telephone	Black	2”
Power	Yellow	2”
Life Safety/Fire Alarm	White	2”
Fiber Optic	Orange	2”

D. Power-Circuit Conductor Identification: For primary and secondary conductors in vaults, pull and junction boxes, manholes, and handholes use color-coding conductor tape and write-on tags. Identify source and circuit number of each set of conductors. For single conductor cables, identify phase in addition to the above.

E. Branch-Circuit Conductor Identification: Where there are conductors for more than three branch circuits in same junction or pull box, use color-coding conductor tape. Identify each ungrounded conductor according to source and circuit number.

F. Conductors to Be Extended in the Future: Attach write-on tags to conductors and list source and circuit number.

G. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, signal, sound, intercommunications, voice, and data connections.
   1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.

   2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.

   3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and Operation and Maintenance Manual.

H. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.

I. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Comply with 29 CFR 1910.145 and apply baked-enamel warning signs. Identify system voltage with black letters on an orange background. Apply to exterior of door, cover, or other access.
   1. Equipment with Multiple Power or Control Sources: Apply to door or cover of equipment including, but not limited to, the following:
      a. Power transfer switches.

      b. Controls with external control power connections.

   2. Equipment Requiring Workspace Clearance According to NFPA 70: Unless otherwise indicated, apply to door or cover of equipment but not on flush panelboards and similar equipment in finished spaces.

J. Instruction Signs:
   1. Operating Instructions: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.

   2. Emergency Operating Instructions: Install instruction signs with white legend on a red background with minimum 3/8-inch- (10-mm-) high letters for emergency instructions at equipment used for power transfer load shedding.

K. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.
   1. Labeling Instructions:
      a. Indoor Equipment: Engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch (13-mm) high letters on 1-1/2-inch (38-mm) high label; where 2 lines of text are required, use labels 2 inches (50 mm) high.

      b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.

      c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.

   2. Equipment to Be Labeled:
      a. Panelboards, electrical cabinets, and enclosures.

      b. Access doors and panels for concealed electrical items.

      c. Electrical switchboards.

      d. Disconnect switches.

      e. Enclosed circuit breakers.

      f. Contactors.

      g. Uninterruptible power supply equipment.

3.02 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

E. Attach non-adhesive signs and plastic labels with screws and auxiliary hardware appropriate to the location and substrate.

F. System Identification Color Banding for Raceways and Cables: Each color band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (7.6-m) maximum intervals in congested areas.

G. Color-Coding for Phase and Voltage Level Identification, 600 V and Less: Use the colors listed below for ungrounded service, feeder, and branch-circuit conductors.
   1. Color shall be factory applied or, for sizes larger than No. 10 AWG, field applied.

   2. Colors for 208/120-V Circuits:
      a. Phase A: Black.

      b. Phase B: Red.

      c. Phase C: Blue.

      d. Neutral: White

      e. Ground: Green

   3. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches (150 mm) from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

H. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 12 inches (150 to 200 mm) below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches (400 mm) overall.

I. Painted Identification: Prepare surface and apply paint according to Division 9 painting Sections.

END OF SECTION 16075

SECTION 16120 - CONDUCTORS & CABLES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Building wires and cables rated 600 V and less.

2. Connectors, splices, and terminations rated 600 V and less.

1.03 DEFINITIONS

A. EPDM: Ethylene-propylene-diene terpolymer rubber.

B. NBR: Acrylonitrile-butadiene rubber.

1.04 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Field quality-control test reports.

1.05 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.01 CONDUCTORS AND CABLES

A. Conductors shall be annealed copper with conductivity of no less than 98% pure copper.

B. Aluminum conductors are not permitted.

C. Copper Conductors: Comply with NEMA WC 70.

D. Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN XHHW and SO.

2.02 CONNECTORS AND SPLICES

A. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

PART 3 - EXECUTION

3.01 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger, except as indicated below.

1. Use standard conductors for control circuits.

2. Use conductor not smaller than 14 AWG for control circuits.

3. Use 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet (25 m).

4. Use 10 AWG conductors for 20 ampere, 277 volt branch circuits longer than 200 feet (160 m).

B. Branch Circuits: Copper. Minimum size #12 AWG; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.02 CONDUCTOR INSULATION APPLICATIONS AND WIRING METHODS

A. Service Entrance: Type THHN-THWN, single conductors in raceway Type XHHW, single conductors in raceway.

B. Exposed Feeders: Type THHN-THWN, single conductors in raceway.

C. Feeders Concealed in Ceilings, Walls, Partitions, below raised floors and Crawlspaces: Type THHN-THWN, single conductors in raceway

D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway.

E. Exposed Branch Circuits, Including in Crawlspaces: Type THHN-THWN, single conductors in raceway or MC Cable in sizes #6 AWG and smaller.

F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN single conductors in raceway.

G. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway in sizes #6 and smaller (in concrete slabs only).

H. Branch Circuits Installed below Raised Flooring: Type THHN-THWN, single conductors in raceway in sizes #6 AWG and smaller.

I. Class 1 Control Circuits: Type THHN-THWN, in raceway.

J. Class 2 Control Circuits: Type THHN-THWN, in raceway

3.03 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

D. Support cables according to Division 16 Section "Hangers and Supports for Electrical Systems."

E. Identify and color-code conductors and cables according to Division 16 Section "Electrical Identification."

F. Feeders and Branch Circuits Larger than 6 AWG: Copper, stranded conductor, 600 volt insulation, THHN/THWN, or XHHW. With the exception of motor feeders, 600 volt

aluminum wire in sizes 1/0 and larger may be substituted for copper feeders if ampacity is equal or greater than copper and voltage drop is equal to or less than copper.

G. Use no wire smaller than 12 AWG for power and lighting circuits, and no wire smaller than 16 AWG for control wiring.

H. Utilize 10 AWG conductor for 20 ampere, 120 volt branch circuit homeruns longer than 75 feet (23m), and for 20 ampere, 277 volt branch circuit homeruns longer than 200 feet (61m).

3.04 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches (150 mm) of slack.

3.05 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

3.06 FIELD QUALITY CONTROL

A. Tests and Inspections:
   1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors, for compliance with requirements.

   2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

B. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 16120

SECTION 16130 - RACEWAYS AND BOXES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

1.03 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. FMC: Flexible metal conduit.

C. IMC: Intermediate metal conduit.

D. LFMC: Liquidtight flexible metal conduit.

E. RGSC: Rigid galvanized steel conduit.

F. RNC: Rigid nonmetallic conduit.

1.04 SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

1.05 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.01 METAL CONDUIT AND TUBING

A. Rigid Steel Conduit: ANSI C80.1.

B. IMC: ANSI C80.6.

C. EMT: ANSI C80.3.

D. FMC: Zinc-coated steel.

E. LFMC: Flexible steel conduit with PVC jacket.

F. Fittings for Conduit (Including all Types and Flexible and Liquidtight), EMT, and Cable: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.
   1. Fittings for EMT: Steel compression type. Use of die cast fittings is not permitted.

G. Joint Compound for Rigid Steel Conduit or IMC: Listed for use in cable connector

assemblies, and compounded for use to lubricate and protect threaded raceway joints from corrosion and enhance their conductivity.

2.02 NONMETALLIC CONDUIT AND TUBING

A. RNC: NEMA TC 2, Type EPC-40-PVC, unless otherwise indicated.

B. Fittings for ENT and RNC: NEMA TC 3; match to conduit or tubing type and material.

2.03 METAL WIREWAYS

A. Description: Sheet metal sized and shaped as indicated, NEMA 250, Type 1, unless otherwise indicated.

B. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

C. Wireway Covers: Screw-cover type or Flanged-and-gasketed type as required.

D. Finish: Manufacturer's standard enamel finish.

2.04 BOXES, ENCLOSURES, AND CABINETS

A. Sheet Metal Outlet and Device Boxes: NEMA OS 1.

B. Cast-Metal Outlet and Device Boxes: NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.

C. Metal Floor Boxes: Cast or sheet metal, fully adjustable, rectangular.

D. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

E. Cast-Metal Access, Pull, and Junction Boxes: NEMA FB 1, galvanized, cast iron with gasketed cover.

F. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous-hinge cover with flush latch, unless otherwise indicated.
   1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

G. Cabinets:
   1. NEMA 250, Type 1, galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.

   2. Hinged door in front cover with flush latch and concealed hinge.

   3. Key latch to match panelboards.

   4. Metal barriers to separate wiring of different systems and voltage.

   5. Accessory feet where required for freestanding equipment.

2.05 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

A. Description: Comply with SCTE 77.
   1. Configuration: Units shall be designed for flush burial and have closed bottom, unless otherwise indicated.

   2. Cover: Weatherproof, secured by tamper-resistant locking devices and having

structural load rating consistent with enclosure.

3. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.

4. Cover Legend: Molded lettering, for each service.

5. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.

6. Handholes 24 inches wide by 36 inches long (300 mm wide by 600 mm long) and larger shall have inserts for cable racks and pulling-in irons installed before concrete is poured.

B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel or fiberglass or a combination of the two.
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

3. Basis-of-Design Product: Subject to compliance with requirements, provide Jensen Precast or a comparable product by one of the following:
a. Armorcast Products Company.

b. Carson Industries LLC.

c. CDR Systems Corporation.

d. NewBasis.

2.06 SLEEVES FOR RACEWAYS
A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

C. Sleeves for Rectangular Openings: Galvanized sheet steel with minimum 0.052- or 0.138-inch (1.3- or 3.5-mm) thickness as indicated and of length to suit application.

D. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 7 Section "Through-Penetration Firestop Systems."

PART 3 - EXECUTION

3.01 RACEWAY APPLICATION
A. Outdoors: Apply raceway products as specified below, unless otherwise indicated:
1. Exposed Conduit: Rigid galvanized steel conduit or IMC.

2. Concealed Conduit, Aboveground: Rigid galvanized steel conduit, IMC, or EMT.

3. Underground Conduit: RNC, Type EPC-80 PVC, direct buried.

4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.

5. Boxes and Enclosures, Aboveground: NEMA 250, Type 4X.

6. Application of Handholes and Boxes for Underground Wiring:
   a. Handholes and Pull Boxes in Driveway, Parking Lot, and Off-Roadway Locations, Subject to Occasional, Nondeliberate Loading by Heavy Vehicles: Polymer concrete, SCTE 77, Tier 15 structural load rating.

   b. Handholes and Pull Boxes in Sidewalk and Similar Applications with a Safety Factor for Nondeliberate Loading by Vehicles: Polymer-concrete units SCTE 77, Tier 8 structural load rating.

   c. Handholes and Pull Boxes Subject to Light-Duty Pedestrian Traffic Only: Fiberglass-reinforced polyester resin, structurally tested according to SCTE 77 with 3000-lbf (13 345-N) vertical loading.

B. Comply with the following indoor applications, unless otherwise indicated:
   1. Exposed, Not Subject to Physical Damage: EMT.

   2. Exposed, Not Subject to Severe Physical Damage: EMT.

   3. Exposed and Subject to Physical Damage: Rigid galvanized steel conduit. Includes raceways in the following locations:
      a. Loading dock.

      b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.

   4. Concealed in Ceilings and Interior Walls and Partitions: EMT.

   5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.

   6. Damp or Wet Locations: Rigid galvanized steel conduit, IMC, or Sch 80 PVC where allowed by code or local jurisdiction.

   7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4X, stainless steel in damp or wet locations.

C. Minimum Raceway Size: 3/4-inch (24-mm) trade size for homeruns and conduits below grade or slab on grade.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.
   1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.

E. All conduits larger than 1” shall be furnished with grounding type busing with equipment grounding conductor solidly connected at both ends.

3.02 INSTALLATION

A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter. Raceway and boxes located as shown on Drawings, and at other locations where required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements.

Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway as required to complete wiring system. Sizes shall meet or exceed NEC requirements. Raceway routing is shown for reference only. Route as required for a complete raceway system.

B. Where wiring devices are shown to be installed at existing wall locations, provide flush mount wiring devices with raceways concealed inside existing walls unless otherwise noted. Provide all work required to repair and patch existing wall as required for installation of new raceways and wiring devices.

C. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

D. Complete raceway installation before starting conductor installation.

E. Arrange stub-ups so curved portions of bends are not visible above the finished slab.

F. Install no more than the equivalent of three 90-degree bends in any conduit run between boxes except for communications conduits. Provide no more than the equivalent of two (2) 90 degree bends between boxes.

G. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated except as follows:
   1. Mechanical, Electrical, Telecommunications and elevator machine rooms.

   2. Any variance shall be obtained from the Contracting Officer.

H. Raceways Embedded in Slabs above grade:
   1. Run conduit larger than 1-inch (27-mm) trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.

   2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.

I. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

J. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.

K. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire.

L. Raceways for Optical Fiber and Communications Cable: Install raceways, metallic and nonmetallic, rigid and flexible, as follows:
   1. 3/4-Inch (19-mm) Trade Size: Install raceways in maximum lengths of 50 feet (15 m).

   2. 1-Inch (25-mm) Trade Size and Larger: Install raceways in maximum lengths of 75 feet (23 m).

   3. Install with a maximum of two 90-degree bends or equivalent for each length of raceway unless Drawings show stricter requirements. Separate lengths with pull or junction boxes or terminations at distribution frames or cabinets where necessary to

comply with these requirements.

4. Telecommunications conduit 90 degree elbows shall be provided with six (6) time outside diameter radius for 2-inch and smaller, 10 times outside diameter for greater than 2-inch trade sizes.

M. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
   1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.

   2. Where otherwise required by NFPA 70.

N. Route raceways, concealed or exposed parallel and perpendicular to walls and building structural components.

O. Flexible Conduit Connections: Use maximum of 72 inches (1830 mm) of flexible conduit for recessed and semi-recessed lighting fixtures, maximum 36 inches (915 mm) for connection to equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
   1. Use LFMC in damp or wet locations.

P. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.

Q. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation.

R. Cut conduit square using saw or pipecutter; de-burr cut ends.

S. Bring conduit to shoulder of fittings; fasten securely.

T. Use conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.

U. Use conduit bodies to make sharp changes in direction, as around beams. Use hydraulic one-shot bender to fabricate bends in metal conduit larger than 2-inch (50mm) trade size.

3.03 BOX APPLICATIONS

A. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall.

B. Set wall mounted boxes at elevations to accommodate mounting heights indicated. Comply with ADA where required.

C. Adjust box location up to 10 feet (3m) prior to rough-in if required to accommodate intended purpose.

D. Orient boxes to accommodate wiring devices oriented as specified in Section 16140.

E. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.

F. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches

(150mm) from ceiling access panel or from removable recessed luminaire.

G. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.

H. Do not install flush mounting box back-to-back in walls; provide minimum 6 inches (150 mm) separation. Provide minimum 24 inches (600 mm) separation in acoustic and fire rated walls.

I. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.

J. Use stamped steel bridges to fasten flush mounting outlet box between studs.

K. Use adjustable steel channel fasteners for hung ceiling outlet box.

L. Do not fasten boxes to ceiling support wires or other piping systems.

M. Support boxes independently of conduit.

N. Use gang box where more than one device is mounted together. Do not use sectional box.

O. Use gang box with plaster right for single device outlets.

P. Do not use boxes smaller than 4-inches square.

3.04 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Division 2 Section "Earthwork" for pipe less than 6 inches (150 mm) in nominal diameter.

2. Install backfill as specified in Division 2 Section "Earthwork."

3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches (300 mm) of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Division 2 Section "Earthwork."

4. Install manufactured Schedule 80 conduit elbows and risers for transitions from below grade or slab on grade to above grade.
   a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches (75 mm) of concrete.

5. Conduits located in areas subject to vehicular traffic, such as driveways, parking lots, fire access lanes, etc. shall be concrete encased.
   a. Concrete jacket shall be 2500 PSI compressive strength in 28 days.

   b. Provide a minimum of 3” of concrete on all sides of conduit.

   c. Provide 1-1/2” separation between ducts of same system and 3” between ducts of different systems.

6. All underground service entrance conduits shall be installed, inspected, and approved by the local utility. Coordinate all requirements with the latest edition of the utility service installation manual.

3.05 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.

B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch (12.5-mm) sieve to No. 4 (4.75-mm) sieve and compacted to same density as adjacent undisturbed earth.

C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch (25 mm) above finished grade.

D. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables, but short enough to preserve adequate working clearances in the enclosure.

E. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.06 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 7.

B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.

C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

D. Rectangular Sleeve Minimum Metal Thickness:
   1. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and no side greater than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).

   2. For sleeve cross-section rectangle perimeter equal to, or greater than, 50 inches (1270 mm) and 1 or more sides equal to, or greater than, 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

E. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.

F. Cut sleeves to length for mounting flush with both surfaces of walls.

G. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level.

H. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway unless sleeve seal is to be installed or unless seismic criteria require different clearance.

I. Seal space outside of sleeves with grout for penetrations of concrete and masonry and with approved joint compound for gypsum board assemblies.

J. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway, using joint sealant appropriate for size, depth, and location of joint. Refer to Division 7.

K. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway penetrations. Install sleeves and seal with firestop materials. Comply with Division 7.

L. Roof-Penetration Sleeves: Seal penetration of individual raceways with flexible, boot-type flashing units applied in coordination with roofing work.

M. Aboveground, Exterior-Wall Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

N. Underground, Exterior-Wall Penetrations: Install cast-iron "wall pipes" for sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between raceway and sleeve for installing mechanical sleeve seals.

3.07 SLEEVE-SEAL INSTALLATION

A. Install to seal underground, exterior wall penetrations.

B. Use type and number of sealing elements recommended by manufacturer for raceway material and size. Position raceway in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.08 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 7.

3.09 PROTECTION

A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.
   1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

   2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

B. Use suitable caps to protect installed conduit against entrance of dirt and moisture.

END OF SECTION 16130

SECTION 16140 - WIRING DEVICES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Receptacles, receptacles with integral GFCI, and associated device plates.

2. Receptacles with integral surge suppression units.

3. Wall-box motion sensors.

4. Snap switches and wall-box dimmers.

5. Wall-switch and exterior occupancy sensors.

6. Pendant cord-connector devices.

7. Cord and plug sets.

8. Floor service outlets, poke-through assemblies.

1.03 DEFINITIONS

A. EMI: Electromagnetic interference.

B. GFCI: Ground-fault circuit interrupter.

C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

D. RFI: Radio-frequency interference.

E. TVSS: Transient voltage surge suppressor.

1.04 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing label warnings and instruction manuals that include labeling conditions.

1.05 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of wiring device and associated wall plate through one source from a single manufacturer. Insofar as they are available, obtain all wiring devices and associated wall plates from a single manufacturer and one source.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with NFPA 70.

1.06 COORDINATION

A. Receptacles for State-Furnished Equipment: Match plug configurations.

1. Cord and Plug Sets: Match equipment requirements.

PART 2 - PRODUCTS

2.01 STRAIGHT BLADE RECEPTACLES

A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, and UL 498.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Cooper; 6350 (single), 6352 (duplex).

      b. Hubbell; HBL2162 (duplex).

      c. Leviton; 16341 (single), 16362 (duplex).

      d. Pass & Seymour; 26361 (single), 26362 (duplex).

B. All receptacles in all patient care areas, rooms and public areas shall be listed as complying with UL 498 Supplement SC, hospital grade receptacle. Device face shall have green dot hospital grade mark.

2.02 GFCI RECEPTACLES

A. General Description: Straight blade, non-feed-through type. Comply with NEMA WD 1, NEMA WD 6, UL 498, and UL 943, Class A, and include indicator light that is lighted when device is tripped.

B. Duplex GFCI Convenience Receptacles, 125 V, 20 A:
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Cooper; GF20.

      b. Pass & Seymour; 2084.

      c. Leviton; 8898-HG

2.03 PENDANT CORD-CONNECTOR DEVICES

A. Description: Matching, locking-type plug and receptacle body connector; NEMA WD 6 configurations L5-20P and L5-20R, heavy-duty grade.
   1. Body: Nylon with screw-open cable-gripping jaws and provision for attaching external cable grip.

   2. External Cable Grip: Woven wire-mesh type made of high-strength galvanized-steel wire strand, matched to cable diameter, and with attachment provision designed for corresponding connector.

2.04 CORD AND PLUG SETS

A. Description: Match voltage and current ratings and number of conductors to requirements of equipment being connected.
   1. Cord: Rubber-insulated, stranded-copper conductors, with Type SOW-A jacket; with green-insulated grounding conductor and equipment-rating ampacity plus a minimum of 30 percent.

   2. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

2.05 SNAP SWITCHES

A. Comply with NEMA WD 1 and UL 20.

B. Switches, 120/277 V, 20 A:
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Cooper; DECB120 (single pole), DECB220 (two pole), DECB320 (three way), DECB420 (four way).

      b. Hubbell; 2121 (single pole), 2122 (two pole), 2123 (three way), 2124 (four way).

      c. Leviton; 5621 (single pole), 5622 (two pole), 5623 (three way), 5624 (four way).

      d. Pass & Seymour; 2621 (single pole), 2622 (two pole), 2623 (three way), 2624 (four way).

   2. Pass & Seymour; PS20AC1-PLR for 120 V.
      a. Description: Single pole, with neon-lighted handle, illuminated when switch is "ON."

2.06 WALL-BOX DIMMERS

A. Dimmer Switches: Modular, full-wave, solid-state units with integral, quiet on-off switches, with audible frequency and EMI/RFI suppression filters.

B. Control: Continuously adjustable slider; with single-pole or three-way switching. Comply with UL 1472.

2.07 OCCUPANCY SENSORS

A. Long-Range Wall-Switch Sensors:
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Hubbell; ATD1600WRP.

      b. Leviton; ODW12-MRW.

      c. Watt Stopper (The); DT-200.

   2. Description: Dual technology, with both passive-infrared- and ultrasonic-type sensing, 120/277 V, adjustable time delay up to 30 minutes, 110-degree field of view, and a minimum coverage area of 1200 sq. ft. (111 sq. m).

B. Ceiling Mount Sensors:
   1. Self adjusting

   2. Time setting – Automatic adjustable from 30 sec-30min.

   3. Test Mode – 6sec with auto exit programming

   4. Coverage from 500 to 2000 sq. ft.

   5. Ambient light recognition – prevents turning on when the room is adequately lit by natural light.

   6. Light sensor – 20 to 3,000 lux

   7. Mounting Height – 8 to 12 ft

   8. Warranty – 5 yr

2.08 WALL PLATES

A. Single and combination types to match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.

2. Material for Finished Spaces: Satin-finished stainless steel, 0.04-inch- (1-mm-) thick,

3. Material for Damp Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in "wet locations."

B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with type 3R weather-resistant, die-cast aluminum with lockable cover.

2.09 FLOOR SERVICE

A. Type: Modular, flush-type, dual-service units suitable for wiring method used.

B. Compartments: Barrier separates power from voice and data communication cabling.

C. Service Plate: Rectangular solid brass with satin finish.

D. Power Receptacle: NEMA WD 6 configuration 5-20R, gray finish, unless otherwise indicated.

E. Voice and Data Communication Outlet: Openings for modular cable jacks.

2.10 POKE-THROUGH ASSEMBLIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Hubbell Incorporated; Wiring Device-Kellems.

2. Pass & Seymour/Legrand; Wiring Devices & Accessories.

3. Square D/ Schneider Electric.

4. Thomas & Betts Corporation.

5. Wiremold Company (The).

B. Description: Factory-fabricated and -wired assembly of below-floor junction box with multichanneled, through-floor raceway/firestop unit and detachable matching floor service outlet assembly.
1. Service Outlet Assembly: Flush type with two simplex receptacles and space for two RJ-45 jacks.

2. Size: Selected to fit cored holes in floor and matched to floor thickness.

3. Fire Rating: Unit is listed and labeled for fire rating of floor-ceiling assembly.

4. Closure Plug: Arranged to close unused cored openings and reestablish fire rating of floor.

5. Wiring Raceways and Compartments: For a minimum of four No. 12 AWG conductors and a minimum of four, 4-pair, Category 5e voice and data communication cables.

2.11 FINISHES

A. Color: Wiring device catalog numbers in Section Text do not designate device color.
1. Wiring Devices Connected to Normal Power System: As selected by Architect, unless otherwise indicated or required by NFPA 70 or device listing.

2. Wiring Devices Connected to Emergency Power System: Red.

3. TVSS Devices: Blue.

PART 3 - PRODUCTS

3.01 INSTALLATION

A. Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise noted.

B. Coordination with Other Trades:
   1. Take steps to insure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of the boxes.

   2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.

   3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.

   4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:
   1. Do not strip insulation from conductors until just before they are spliced or terminated on devices.

   2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.

   3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.

   4. Existing Conductors:
      a. Cut back and pigtail, or replace all damaged conductors.

      b. Straighten conductors that remain and remove corrosion and foreign matter.

      c. Pigtailing existing conductors is permitted provided the outlet box is large enough.

D. Device Installation:
   1. Replace all devices that have been in temporary use during construction or that show signs that they were installed before building finishing operations were complete.

   2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.

   3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.

   4. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.

5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.

6. Use a torque screwdriver when a torque is recommended or required by the manufacturer.

7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.

8. Tighten unused terminal screws on the device.

9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.

10. Mounting heights shall be as follows unless noted:
    a. Receptacles: 18” A.F.F. measured to bottom.

    b. Switches: 44” A.F.F. measured to bottom.

E. Receptacle Orientation:
1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the left.

2. Install hospital-grade receptacles in patient-care areas with the ground pin or neutral blade at the top.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Dimmers:
1. Install dimmers within terms of their listing.

2. Verify that dimmers used for fan speed control are listed for that application.

3. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device listing conditions in the written instructions.

H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

I. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.02 IDENTIFICATION
A. Comply with Division 16 Section "Electrical Identification."
1. Receptacles: Identify panelboard and circuit number from which served on back of device plate.

3.03 FIELD QUALITY CONTROL
A. Perform tests and inspections and prepare test reports.
1. Test Instruments: Use instruments that comply with UL 1436.

2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated LED indicators of measurement.

B. Tests for Convenience Receptacles:
   1. Line Voltage: Acceptable range is 105 to 132 V.

   2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is not acceptable.

   3. Ground Impedance: Values of up to 2 ohms are acceptable.

   4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.

   5. Using the test plug, verify that the device and its outlet box are securely mounted.

   6. The tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

END OF SECTION 16140

SECTION 16442 - PANELBOARDS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:
   1. Distribution panelboards.
   2. Lighting and appliance branch-circuit panelboards.

1.03 DEFINITIONS

A. EMI: Electromagnetic interference.

B. GFCI: Ground-fault circuit interrupter.

C. RMS: Root mean square.

D. SPDT: Single pole, double throw.

1.04 SUBMITTALS

A. Product Data: For each type of panelboard, overcurrent protective device, transient voltage suppression device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Wiring Diagrams: Power, signal, and control wiring.

C. Field quality-control test reports including the following:
   1. Test procedures used.
   2. Test results that comply with requirements.
   3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

D. Panelboard Schedules: For installation in panelboards.

E. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 1, include the following:
   1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
   2. Time-current curves, including selectable ranges for each type of overcurrent protective device.

1.05 PROJECT CONDITIONS

A. Environmental Limitations: Rate equipment for continuous operation under the following conditions, unless otherwise indicated:
   1. Ambient Temperature: Not exceeding 140 deg F (60 deg C).

2. Altitude: Not exceeding 2500 feet (above sea level).

1.06 COORDINATION

A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, and encumbrances to workspace clearance requirements.

1.07 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Keys: Six spares for each type of panelboard cabinet lock.

PART 2 - PRODUCTS

2.01 MANUFACTURED UNITS

A. Enclosures: Flush- and surface-mounted cabinets. NEMA PB 1, Type 1.
   1. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.

   2. Gutter Extension and Barrier: Same gage and finish as panelboard enclosure; integral with enclosure body. Arrange to isolate individual panel sections.

   3. Finish: Manufacturer's standard enamel finish over corrosion-resistant treatment or primer coat.

   4. Directory Card: With transparent protective cover, mounted in metal frame, inside panelboard door.

B. Phase and Ground Buses:
   1. Material: Hard-drawn copper, 98 percent conductivity or aluminum alloy.

   2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors; bonded to box.

C. Conductor Connectors: Suitable for use with conductor material.
   1. Main and Neutral Lugs: Mechanical type.

   2. Ground Lugs and Bus Configured Terminators: Compression type.

2.02 PANELBOARD SHORT-CIRCUIT RATING

A. Fully rated to interrupt symmetrical short-circuit current available at terminals. The use of series rated devices is not acceptable unless noted otherwise on the drawings.

2.03 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

B. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

2.04 OVERCURRENT PROTECTIVE DEVICES

A. Molded-Case Circuit Breaker: UL 489, with minimum integrated short circuit rating: 10,000 amperes rms symmetrical for 208 volt panelboards; 14,000 amperes rms symmetrical for 480 volt panelboards, or higher as required to exceed available fault currents.
   1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level

overloads, and instantaneous magnetic trip element for short circuits.

2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.

3. GFCI Circuit Breakers: Single- and two-pole configurations with 5-mA trip sensitivity.

4. Provide SWD listed breakers for lighting currents and HACE for air conditioning currents

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install panelboards and accessories according to NEMA PB 1.1.

B. Comply with mounting and anchoring requirements specified in Division 16 Section “Hangers and Supports per Electrical Systems”.

C. Mount top of trim 74 inches (1880 mm) above finished floor, unless otherwise indicated.

D. Mount plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish.

E. Install overcurrent protective devices and controllers.

F. Set field-adjustable switches and circuit-breaker trip ranges.

G. Install filler plates in unused spaces.

H. Stub four 1-inch (27-GRC) empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future.

I. Arrange conductors in gutters into groups and bundle and wrap with wire ties.

1.02 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 16 Section "Electrical Identification."

B. Create a directory to indicate installed circuit loads. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.

C. Panelboard Nameplates: Label each panelboard with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.

1.03 FIELD QUALITY CONTROL

A. Prepare for acceptance tests as follows:
   1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.

   2. Test continuity of each circuit.

1.04 CLEANING

A. On completion of installation, inspect interior of panelboards. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.

END OF SECTION 16442

SECTION 16511 - INTERIOR LIGHTING

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes the following:

1. Interior lighting fixtures, lamps, and ballasts.

2. Emergency lighting units.

3. Exit signs.

4. Lighting fixture supports.

B. Related Sections include the following:

1. Division 16 Section "Wiring Devices" for manual wall-box dimmers for incandescent lamps.

1.02 DEFINITIONS

A. BF: Ballast factor.

B. CRI: Color-rendering index.

C. CU: Coefficient of utilization.

D. HID: High-intensity discharge.

E. LER: Luminaire efficacy rating.

F. Luminaire: Complete lighting fixture, including ballast housing if provided.

G. RCR: Room cavity ratio.

1.03 SUBMITTALS

A. Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on features, accessories, finishes, and the following:

1. Physical description of lighting fixture including dimensions.

2. Emergency lighting units including battery and charger.

3. Ballast.

4. Energy-efficiency data.

5. Life, output, and energy-efficiency data for lamps.

6. Photometric data, in IESNA format, based on laboratory tests of each lighting fixture type, outfitted with lamps, ballasts, and accessories identical to those indicated for the lighting fixture as applied in this Project.

a. For indicated fixtures, photometric data shall be certified by a qualified independent testing agency. Photometric data for remaining fixtures shall be certified by the manufacturer.

b. Photometric data shall be certified by a manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program (NVLAP) for Energy Efficient Lighting Products.

B. Shop Drawings: Show details of nonstandard or custom lighting fixtures. Indicate dimensions, weights, methods of field assembly, components, features, and accessories.
   1. Wiring Diagrams: Power wiring.

   2. Where battery powered egress lighting equipment is identified on the drawings, provide photometric report drawings indicating point by point on a 2' grid emergency egress lighting levels at the floor. Battery powered equipment shall be of sufficient capacities to provide code required emergency egress lighting levels.

C. Color selections: Colors shall be as indicated on the drawings or as selected from the manufacturers standard color chart.

D. Sample for verification: Provide product samples when requested.

E. Product Certificates: For each type of ballast for bi-level and dimmer-controlled fixtures, signed by product manufacturer.

F. Qualification Data: For agencies providing photometric data for lighting fixtures.

G. Field quality-control test reports.

H. Functional test reports per 2018 IECC C408.3.

I. Operation and Maintenance Data: For lighting equipment and fixtures to include in emergency, operation, and maintenance manuals.

J. Warranties: Special warranties specified in this Section.

1.04 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with NFPA 70.

D. FMG Compliance: Lighting fixtures for hazardous locations shall be listed and labeled for indicated class and division of hazard by FMG.

1.05 COORDINATION

A. Coordinate layout and installation of lighting fixtures and suspension system with other construction that penetrates ceilings or is supported by them, including HVAC equipment, fire-suppression system, and partition assemblies.

1.06 WARRANTY

A. Special Warranty for Ballasts: Manufacturer's standard form in which ballast manufacturer agrees to repair or replace ballasts that fail in materials or workmanship within specified warranty period.
   1. Warranty Period for Electronic Ballasts: Five years from date of Substantial Completion.

   2. Warranty Period for Electromagnetic Ballasts: Three years from date of Substantial Completion.

1.07 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Lamps: 10 for every 100 of each type and rating installed. Furnish at least one of each type.

   2. Plastic Diffusers and Lenses: 1 for every 100 of each type and rating installed. Furnish at least one of each type.

   3. Ballasts: 1 for every 100 of each type and rating installed. Furnish at least one of each type.

   4. Globes and Guards: 1 for every 20 of each type and rating installed. Furnish at least one of each type.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Acuity

   2. Cooper

   3. Hubbell

   4. Philips Lighting Group

   5. HE Williams, Inc

   6. LSI Industries

   7. DCO Lighting

   8. GE Lighting

   9. Juno Lighting Group

   10. Ballasts
      a. Advance

      b. Sylvania

      c. Lutron

2.02 LIGHTING FIXTURES AND COMPONENTS, GENERAL REQUIREMENTS

A. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.

B. Metal Parts: Free of burrs and sharp corners and edges.

C. Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.

D. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to

prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.

E. Reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated:
   1. White Surfaces: 85 percent.

   2. Specular Surfaces: 83 percent.

   3. Diffusing Specular Surfaces: 75 percent.

   4. Laminated Silver Metallized Film: 90 percent.

F. Plastic Diffusers, Covers, and Globes:
   1. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
      a. Lens Thickness: At least 0.125 inch (3.175 mm) minimum unless different thickness is indicated.

      b. UV stabilized.

   2. Glass: Annealed crystal glass, unless otherwise indicated.

G. Electromagnetic-Interference Filters: Factory installed to suppress conducted electromagnetic-interference as required by MIL-STD-461E. Fabricate lighting fixtures with one filter on each ballast indicated to require a filter.

2.03 EXIT SIGNS

A. Description: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction.

B. Internally Lighted Signs:
   1. Lamps for AC Operation: LEDs, 50,000 hours minimum rated lamp life.

2.04 LED EXIT LIGHT FIXTURES

A. Exit light fixtures shall meet applicable requirements of NFPA and UL.

B. Housing and door shall be die-cast aluminum.

C. For general purpose exit light fixtures, door frame shall be hinged, with latch. For vandal-resistant exit light fixtures, door frame shall be secured with tamper-resistant screws.

D. Finish shall be satin or fine-grain brushed aluminum.

E. There shall be no radioactive material used in the fixtures.

F. Fixtures:
   1. Inscription panels shall be cast or stamped aluminum a minimum of 2.25 mm (0.090 inch) thick, stenciled with 150 mm (6 inch) high letters, baked with red color stable plastic or fiberglass. Lamps shall be luminous Light Emitting Diodes (LED) mounted in center of letters on red color stable plastic or fiberglass.
   2. Double-Faced Fixtures: Provide double-faced fixtures where required or as shown on drawings.

   3. Directional Arrows: Provide directional arrows as part of the inscription panel where required or as shown on drawings. Directional arrows shall be the "chevron-type" of

similar size and width as the letters and meet the requirements of NFPA 101.

G. Voltage: Multi-voltage (120 – 277V).

2.05 LED LIGHT FIXTURES

A. General:
   1. LED light fixtures shall be in accordance with IES, NFPA, UL, as shown on the drawings, and as specified.

   2. LED light fixtures shall be Reduction of Hazardous Substances (RoHS)-compliant.

   3. LED drivers shall include the following features unless otherwise indicated:
      a. Minimum efficiency: 85% at full load.

      b. Minimum Operating Ambient Temperature: -20˚ C. (-4˚ F.)

      c. Input Voltage: 120 - 277V (±10%) at 60 Hz.

      d. Integral short circuit, open circuit, and overload protection.

      e. Power Factor: ≥ 0.95.

      f. Total Harmonic Distortion: ≤ 20%.

      g. Comply with FCC 47 CFR Part 15.

   4. LED modules shall include the following features unless otherwise indicated:
      a. Comply with IES LM-79 and LM-80 requirements.

      b. Minimum CRI 80 and color temperature 3500˚ K unless otherwise specified in LIGHTING FIXTURE SCHEDULE.

      c. Minimum Rated Life: 50,000 hours per IES L70.

      d. Light output lumens as indicated in the LIGHTING FIXTURE SCHEDULE.

B. LED Downlights:
   1. Housing, LED driver, and LED module shall be products of the same manufacturer.

C. LED Troffers:
   1. LED drivers, modules, and reflector shall be accessible, serviceable, and replaceable from below the ceiling.

   2. Housing, LED driver, and LED module shall be products of the same manufacturer.

2.06 LIGHTING FIXTURE SUPPORT COMPONENTS

A. Comply with Division 16 Section "Hangers and Supports for Electrical Systems" for channel- and angle-iron supports and nonmetallic channel and angle supports.

B. Single-Stem Hangers: 1/2-inch (13-mm) steel tubing with swivel ball fittings and ceiling canopy. Finish same as fixture.

C. Twin-Stem Hangers: Two, 1/2-inch (13-mm) steel tubes with single canopy designed to mount a single fixture. Finish same as fixture.

D. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gauge (2.68 mm).

E. Wires for Humid Spaces: ASTM A 580/A 580M, Composition 302 or 304, annealed stainless steel, 12 gauge (2.68 mm).

F. Rod Hangers: 3/16-inch (5-mm) minimum diameter, cadmium-plated, threaded steel rod.

G. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

PART 3 - PRODUCTS

3.01 INSTALLATION

A. Lighting fixtures: Set level, plumb, and square with ceilings and walls. Install lamps in each fixture.

B. Support for Lighting Fixtures in or on Grid-Type Suspended Ceilings: Use grid as a support element.
   1. Install a minimum of two ceiling support system rods or wires for each fixture. Locate not more than 6 inches (150 mm) from lighting fixture corners.

   2. Support Clips: Fasten to lighting fixtures and to ceiling grid members at or near each fixture corner with clips that are UL listed for the application.

   3. Fixtures of Sizes Less Than Ceiling Grid: Install as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch (20-mm) metal channels spanning and secured to ceiling tees.

   4. Install at least one independent support rod or wire from structure to a tab on lighting fixture. Wire or rod shall have breaking strength of the weight of fixture at a safety factor of 3.

C. Suspended Lighting Fixture Support:
   1. Pendants and Rods: Where longer than 48 inches (1200 mm), brace to limit swinging.

   2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.

   3. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of fixture chassis, including one at each end.

D. Adjust aimable lighting fixtures as directed by the architect/lighting contractor.

E. Connect wiring according to Division 16 Section "Conductors and Cables."

F. Fixtures indicated a dual switched on the drawings shall be furnished with ballasts and wiring configurations appropriate for the switching indicated.

G. Provide unswitched hot to all battery power equipment and battery powered exit fixtures.

3.02 FIELD QUALITY CONTROL

A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.

B. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

C. Perform commissioning and functional performance of lighting systems in accordance with 2018 IECC C408.3. Submit report and certification of compliance for each functional test identified.

END OF SECTION 16511

SECTION 16721 - FIRE ALARM SYSTEM

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. As specified in Section 00700.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.03 REQUIREMENTS

A. Integration of existing components into an existing addressable, intelligent, UL listed fire alarm system in full accordance with Local, State and federal requirements for the use and occupancy indicated in the Contract Documents whether or not specifically identified herein.

1.04 DESCRIPTION

A. Furnish and install all conduit, wire, outlet boxes, junction boxes, terminal equipment, and accessories to install a zoned, non-coded continuous ringing, battery standby, supervised fire alarm system. The system shall be UL certified and shall meet requirements of NFPA 72.

B. The equipment specified in this section shall be compatible with the existing manufacturer present at the facility.

C. Include with submittals a bill of material, battery calculations, a list of approved conductors, riser diagram, zone listing, permit review by the authority having jurisdiction, and proof of compliance with the fire alarm installer's license as required. Increase the quantity and power of notification appliances as necessary to comply with the spacing, line of sight and intensity requirements identified by the most stringent of code or of the code officials' requirements.

D. This section includes the integration of existing components into the existing fire alarm system. It shall include, but not be limited to, alarm initiating devices, alarm notification appliances, auxiliary control devices, annunciators, auto-dial connection to central station monitoring service, and wiring as shown on the drawings and specified herein.

E. The fire alarm system shall comply with requirements of NFPA Standard No. 72 for protected premises signaling systems except as modified and supplemented by this specification. The system shall be electrically supervised and monitor the integrity of all conductors.

1.05 SCOPE:

A. Basic Performance:

1. Alarm, trouble and supervisory signals from all intelligent reporting devices shall be encoded onto an NFPA Style 7 (Class A) signaling line circuit.

2. Initiation device circuits shall be wired Class B (NFPA Style B).

3. Indicating appliance circuits shall be wired NFPA Style Y (Class B).

4. Digitized electronic signals shall employ check digits or multiple polling.

5. A single ground or open on the system Signaling Line Circuit shall not cause system malfunction, loss of operating power or the ability to report an alarm.

6. Alarm signals arriving at the main FACP shall not be lost following a power failure (or outage) until the alarm signal is processed and recorded.

1.06 BASIC SYSTEM FUNCTIONAL OPERATION

A. When a fire alarm condition is detected and reported by one of the system initiating devices or appliances, the following functions shall immediately occur:
   1. The System Alarm LED shall flash.

   2. A local piezo electric signal in the control panel shall sound.

   3. The 80 character LCD display shall indicate all information associated with the Fire Alarm condition, including the type of alarm point and its location within the protected premises.

   4. All system output programs assigned via control by event equations to be activated by the particular point in alarm shall be executed, and the associated System Outputs (alarm indicating appliances and/or relays) shall be activated.

1.07 SUBMITTALS

A. Shop Drawings:
   1. Sufficient information, clearly presented, shall be included to determine compliance with drawings and specifications.

   2. Include manufacturer's name(s), model numbers, ratings, power requirements, equipment layout, device arrangement, riser diagram, complete wiring diagrams indicating the size, type, and number of cabling and conduit layouts.

   3. Equipment layout, including the locations and addresses and model numbers of existing Fire Alarm Control Panel (FACP), power supplies and all initiating devices and indicating appliances. The Contract Document form the basis for shop drawings and devices/appliances indicated may not fulfill all requirements of the code authority requirements. Shop drawings are to indicate additional features as necessary to fulfill all requirements of code authorities as a requirement under the Contract. Provide any additional devices/appliances as directed by any Authority Having Jurisdiction.

   4. Battery calculations for battery backup of system during AC power failure.

B. Software Modifications:
   1. Provide all hardware, software, programming tools and documentation necessary to modify the fire alarm system on site. Modification includes addition and deletion of devices, circuits, zones and changes to system operation and custom label changes for devices or zones. The system structure and software shall place no limit on the type or extent of software modifications on-site. Modification of software shall not require powerdown of the system or loss of system fire protection while modifications are being made.

C. Certifications:
   1. Together with the shop drawing submittal, submit a certification from the major equipment manufacturer indicating that the proposed supervisor of installation and the proposed performer of contract maintenance is certified by the equipment manufacturer. Include names and addresses in the certification and a copy of Contractor’s Underwriters’ Laboratory (UL) Certificate of Compliance.

1.08 APPLICABLE SPECIFICATIONS

A. The specifications, standards and requirements of the governing bodies listed below form a part of this specification. The installed system shall fully comply with the requirements

of these standards, codes and governing bodies. References listed below are intended to comply with the most recent versions or those currently adopted by the local jurisdiction.

1. National Fire Protection Association (NFPA):
   a. No. 5000 Building Construction and Safety Code

   b. No. 70 National Electrical Code (NEC)

   c. No. 72 National Fire Alarm Code

   d. No. 101 Life Safety Code

2. Underwriters Laboratories Inc. (UL):
   a. No. 268 Smoke Detectors for Fire Protective Signaling Systems

   b. No. 864 Control Units for Fire Protective Signaling Systems

   c. No. 268A Smoke Detectors for Duct Applications.

   d. No. 521 Heat Detectors for Fire Protective Signaling Systems

   e. No. 464 Audible Signaling Appliances.

   f. No. 38 Manually Actuated Signaling Boxes.

   g. No. 1971 Visual Indicating Appliances.

3. Local and State Building Codes

4. All requirements of the Authority Having Jurisdiction (AHJ).

1.09 APPROVALS

A. The system shall have proper listing and/or approval from the following nationally recognized agencies:
   1. UL Underwriters Laboratories Inc.

   2. FM Factory Mutual.

PART 2 - PRODUCTS

2.01 EQUIPMENT AND MATERIAL, GENERAL:

A. All equipment and components shall be new, and the manufacturer's current model. The materials, appliances, equipment and devices shall be tested and listed by a nationally recognized approvals agency for use as part of a protected premises protective signaling (fire alarm) system.

B. All equipment and components shall be installed in strict compliance with manufacturers' recommendations. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc., before beginning system installation.

C. All Equipment shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place (e.g., detectors shall not be supported solely by suspended ceilings). Fasteners and supports shall be adequate to support the required load.

2.02 CONDUIT AND WIRE

A. Conduit:

1. All wiring shall be concealed in conduit.

2. Conduit shall be in accordance with The National Electrical Code (NEC), local and county requirements.

3. Vertical risers through the building and all wiring in exposed locations shall be installed in raceway. Conduit fill shall not exceed 40 percent of interior cross sectional area where three or more cables are contained within a single conduit.

4. Cable must be separated from any open conductors of Power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, as per NEC.

5. Wiring for 24 volt control, alarm notification, emergency communication and similar power-limited auxiliary functions may be run in the same conduit as initiating and signaling line circuits. All circuits shall be provided with transient suppression devices and the system shall be designed to permit simultaneous operation of all circuits without interference or loss of signals.

6. Conduit shall not enter the Fire Alarm Control Panel, or any other remotely mounted Control Panel equipment or backboxes, except where conduit entry is specified by the FACP manufacturer.

7. Conduit shall be 1/2 inch (19.1 mm) minimum, and shall be properly supported.

B. Wire:
   1. All fire alarm system wiring shall be new.

   2. Wiring shall be in accordance with local, state and national codes and as recommended by the manufacturer of the fire alarm system. Number and size of conductors shall be as recommended by the fire alarm system manufacturer. Label all conductors using adhesive number la-bels which correspond with shop drawings. Label at origin, at termination point and at any junction boxes.

   3. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.

   4. Wiring used for the multiplex communication loop shall be twisted and shielded and installed in conduit except for the aerial drops. The system shall permit use of IDC and IAC wiring in the same conduit with the communication loop.

   5. All field wiring shall be completely supervised.

   6. All wiring shall be color coded as follows:
      a. Gray and White: Initiating Circuits

      b. Brown and Orange: Signal Devices

      c. Blue and Yellow: Multiplex Communications

C. Terminal Boxes, Junction Boxes and Cabinets:
   1. All boxes and cabinets shall be UL listed for their use and purpose.

D. Initiating circuits shall be arranged to serve like categories (manual, smoke, water flow). Mixed category circuitry shall not be permitted except on signaling line circuits connected to intelligent reporting devices. In all applications the horn shall be capable of being

silenced while the visual appliances remain activated.

2.03 SYSTEM COMPONENTS

A. Fire Alarm Audio/Visual Signaling Device
   1. Electronic Horn/Strobe shall operate on 24 VDC nominal, and shall be UL listed for indoor or outdoor use.

   2. Electronic Horn shall be field programmable without the use of special tools, to provide slow whoop, continuous, or interrupted tones with an output sound level of at least 87 dBA measured at 10 feet from the device.

   3. The Strobe shall meet the following criteria:
      a. The maximum pulse duration shall be 2/10ths of one second.

      b. The intensity shall be a minimum of 15 candela or as indicated/required to meet the scheduled intensity in NFPA 72 for the room size indicated.

      c. The flash rate shall be as required by NFPA 72, ANSI A-117.8 and ADA.

      d. The appliance bottom shall be placed 80 in above the highest floor level within the space, or its top 6" below the ceiling, whichever is the lower.

      e. Shall be flush mounted in general location shown on plans. Surface mounting may be allowed, if approved by the Engineer, in existing installations with walls that lack interior accessible cavities.

   4. Provide UL-listed weather resistant backbox for exterior mounting as shown on plans

B. Horn/Strobes:
   1. Operate on 24 VDC

   2. Have two selectable tone options of temporal 3 and non-temporal continuous pattern.

   3. Have at least 2 audibility options

   4. Maximum Pulse Duration: 0.2 second.

   5. Strobe Intensity: UL 1971.

   6. Flash Rate: UL 1971.

   7. Strobe Candela Rating: Determine by positioning selector switch on back of device.

C. Addressable Manual Stations
   1. Addressable Manual Stations shall be provided to connect to the Fire Alarm Control Panel Signaling Line Circuit (SLC) Loops.

   2. The Manual Station shall, on command from the Control Panel, send data to the panel representing the state of the manual switch. Manual Fire Alarm Stations shall use a key operated test-reset lock, and shall be designed so that after actual Emergency Operation, they cannot be restored to normal use except by the use of a key. Locks shall be coded to the County's standard.

   3. All operated stations shall have a positive, visual indication of operation that cannot be reset without the use of a key.

4. Manual Stations shall be constructed of die-cast aluminum with clearly visible operating instructions provided on the cover. The word FIRE shall appear on the front of the stations in raised letters, 1.75 inches or larger. Non-metallic stations will not be accepted. Stations that are not as rugged as these will not be acceptable. Each manual station shall be installed with a separate clear plastic cover with battery powered high frequency alarm that is sounded when the outer cover is lifted.

5. Stations shall be suitable for surface mounting, or semiflush mounting as shown on the plans, and shall be installed not less than 42 inches, nor more than 48 inches above the finished floor to the top most operable portion of control.

6. The Manual Station shall provide address-setting means using switches.

D. Intelligent Photoelectric Type Smoke Detectors (with base and with relay/LED remote indicator for duct smoke detector):
   1. Smoke Detectors shall be Intelligent and Addressable, and shall connect with two wires to one of the Fire Alarm Control Panel Signaling Line Circuits.

   2. The detectors shall be listed to UL standard 268. The detectors shall each contain a locking screw to discourage unauthorized removal of the head from the base.

   3. The detectors shall have 30-mesh insect screens and have completely closed backs to minimize entry of air turbulence and dust. The electronics within the unit shall be completely shielded to protect against false alarms from EMI and RFI. The detector heads shall be easily disassembled for cleaning.

   4. The detectors shall be suitable for use in a duct housing and shall include a twist-lock base. A duct housing and appropriate length sensing tubes are required at all duct smoke detector locations. Provide multiple detectors as necessary to properly monitor the duct. Refer to DIV15 drawings as necessary and notify DIV15 of all installation requirements associated with proper mounting of the duct detectors.

   5. The detectors shall contain a red LED that shall pulse to indicate power on and glow continuously to indicate alarm.

   6. The detectors shall provide a test means whereby they will simulate an alarm condition and report that condition to the control panel. Such a test may be initiated at the detector itself, by activating a magnetic switch, or may be activated remotely on command from the control panel.

   7. The detectors shall provide address-setting means on the detector head using switches. They shall also store an internal identifying code that the control panel shall use to identify the type of detector.

   8. The detectors shall provide dual alarm and power LEDs. Both LEDs shall flash under normal conditions. Both LEDs may be placed into steady illumination by the control panel, indicating that an alarm condition has been detected. An output connection shall also be provided in the base with connection to an external remote alarm LED located in a common corridor when the detector is concealed above ceilings or is located where the LEDs are not clearly visible.

   9. The detector sensitivity shall be set through the Fire Alarm Control Panel, and shall be adjustable in the field through the field programming of the system. Sensitivity may be automatically adjusted to the panel on a time-of-day basis.

   10. Using software in the FACP, the detectors shall automatically compensate for dust

accumulation and other slow environmental changes that may affect their performance. The detectors shall be listed by UL as meeting the calibrated sensitivity test requirements of NFPA Standard 72.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Installation shall be in accordance with the NEC, NFPA 72, local and state codes, as recommended by the equipment manufacturer in addition to all requirements shown on the drawings.

B. All conduit, junction boxes, conduit supports and hangers shall be concealed in finished areas and may be exposed in unfinished areas. Outlet, Junction and Pull Boxes to be a minimum of 4”x4”x2-1/8” and shall be mounted to the building structure or surface as in accordance with NEC. The suspended ceiling or its support wires are not recognized, nor accepted as part of the building’s structure

C. All fire detection and alarm system devices, control panels and remote annunciators shall be flush mounted when located in finished areas and may be surface mounted when located in unfinished areas. Smoke detectors shall not be installed prior to the system programming and test period. If construction is ongoing during this period, measures shall be taken to protect smoke detectors from contamination and physical damage.

D. Wiring shall not share raceways or penetrations with any of the building's electrical, mechanical, communication or control systems. Wiring in exposed areas shall be installed in specified raceways. Use of the existing conduit system is unacceptable, unless stated elsewhere in these documents or attached plans. All interior wiring installed above suspended ceilings may be in code approved plenum type cable as required by code and supported by an approved bridle ring. EMT conduit nipples are required at cable penetrations of all walls and floors slabs. Seal in and around conduits and cabling with an approved smoke/fire caulk, in full accordance with the manufacturers’ recommendations to prevent passage of smoke or fire.

E. Alarm Conductor Identification. All cables leaving the Fire Control Panel (FACT) shall be numbered and identified as required by NEC by the use of 3M Scot-chore STD adhesive numbers or approved equal. These cables shall be identified individually at their origin, at each junction box, termination block and at their termination at the device or appliance. Each cable run shall be numbered consistently throughout each run of cable.

F. Install ceiling mounted smoke detectors above the FACT, at all remote power supplies, at all doors with electric hold open devices, at all countertop rolling fire shutters.

G. Vandal resistant, ADA approved guards that are acceptable to the Authorities Having Jurisdiction are required over all indicating appliances in public restrooms, gyms, locker rooms, dressing rooms. Vandal resistant audible alarm covers are required over all pull stations providing a high frequency local alert alarm when the cover is lifted Safety Technologies STI-1100 or Engineer approved equal.

3.02 TEST

A. Provide the service of a competent, factory-trained engineer or technician authorized by the manufacturer of the fire alarm equipment to technically supervise and participate during all of the adjustments and tests for the system.
   1. Before energizing the cables and wires, check for correct connections and test for short circuits, ground faults, continuity, and insulation.

   2. Open initiating device circuits and verify that the trouble signal actuates.

3. Open and short signaling line circuits and verify that the trouble signal actuates.

4. Open and short indicating appliance circuits and verify that trouble signal actuates.

5. Ground all circuits and verify response of trouble signals.

6. Check presence and audibility of tone at all alarm notification devices.

7. Check installation, supervision, and operation of all intelligent smoke detectors using the Walk Test.

8. Each of the alarm conditions that the system is required to detect should be introduced on the system. Verify the proper receipt and the proper processing of the signal at the FACT and the correct activation of the control points.

9. When the system is equipped with optional features, the manufacturer's manual should be consulted to determine the proper testing procedures. This is intended to address such items as verifying controls performed by individually addressed or grouped devices, sensitivity monitoring, verification functionality and similar.

3.03 FINAL INSPECTION

A. Prior to requesting a Final Inspection by fire and code officials, the contractor shall accomplish an initial visual inspection and system test in accordance with the NFPA 72.

B. Furnish “as-built” copies of the fire alarm system. All deficiencies must be corrected prior to acceptance by the County.

C. Final acceptance of the fire alarm system requires the written approval of the County of Oahu Fire Department.

3.04 SITE DOCUMENTATION:

A. Furnish a set of as-built fire alarm plans. Maintain a set of approved prints at the job site exclusively for recording the routing of all cables, conduits and deviations from the approved submittal drawings which are necessary because of job conditions. Mark deviations with *a RED* pencil so that they may be easily identified. All deviations from the approved submittal drawings shall be made a part of the final As-built drawings. The as-built plans shall include the location and address of every device and shall indicate the address and type of device. The drawings may be as small as 1/32" scale if the text and devices are easily legible. A sample drawing shall be submitted to the Contracting Officer’s representative for approval.

END OF SECTION 16721

SECTION 17000 – COMMUNICATIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Specifications throughout all Divisions of the Project Manual are directly applicable to this Section, and this Section is directly applicable to them, including but not limited to the following:

1. Section 16120 - Low Voltage Electrical Power Conductors & Cables.

2. Section 17150 - Communications Horizontal Cabling.

1.02 SUMMARY

A. This section includes general communications design requirements, administration topics, and installation for communications systems.

1.03 REFERENCE STANDARDS

A. The latest published edition of a reference shall be applicable to this Project unless identified by a specific edition date.

B. All reference amendments adopted prior to the effective date of this Contract shall be applicable to this Project.

C. The publications listed below form a part of this specification. The publications are referred to in the text by basic designation only.

D. Specific reference in specifications to codes, rules, regulations, standards, manufacturer's instructions, or requirements of regulatory agencies shall mean reference to the latest printed edition of each in effect at the date of contract.

E. Conflicts

1. Drawings and specifications are to be used in conjunction with one another and to supplement one another. In general the specifications determine the nature and quality of the materials and tests, and the drawings establish the quantities, details, and give characteristics of performance that should be adhered to in the installation of the communications system components.

2. If there is an apparent conflict between the drawings and specifications, or between specification sections, the items with the greater quantity or quality shall be estimated and installed.

3. Clarification with the Project Coordinator about these items shall be made prior to the ordering and installation.

F. Codes and Standards (Most recent editions with addenda/TSB, etc.). All materials, installation and workmanship shall comply with the applicable requirements and standards addressed within the following references:

1. ANSI/TIA/EIA-568-C, Commercial Building Telecommunications Wiring Standard.
   a. ANSI/TIA-568-C.0, "Generic Telecommunications Cabling for Customer Premises", published 2009.

   b. ANSI/TIA-568-C.1,"Commercial Building Telecommunications Cabling Standard", published 2009.

   c. ANSI/TIA-568-C.2,"Balanced Twisted-Pair Telecommunication Cabling and Components Standard", published 2009.

d. ANSI/TIA-568-C.3,"Optical Fiber Cabling Components Standard", published 2008, errata issued in October, 2008.

2. ANSI/TIA-569-B Commercial Building Standard for Telecommunications Pathways and Spaces.

3. ANSI/TIA-606-A Administration Standard for Commercial Telecommunications Infrastructure.

4. ANSI-J-STD-607-A Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications.

5. ANSI/TIA-758-A, Customer-Owned Outside Plant Telecommunications Infrastructure Standard.

6. ANSI/TIA – 1179 Healthcare Facility Telecommunications Infrastructure Standard.

7. BICSI: Comply with the most current editions of the following BICSI manuals:
   a. BICSI - Telecommunications Distribution Methods Manual

   b. BICSI – Installation Transport Systems Information Manual.

   c. BICSI – Network Design Reference Design Manual.

   d. BICSI – Outside Plant Design Reference Manual.

   e. BICSI – Wireless Design Reference Manual.

   f. BICSI -Electronic Safety and Security Design Reference Manual.

   g. Infocomm/BICSI – AV Design Reference Manual.

8. Underwriters Laboratories (UL) Cable Certification and Follow-Up Program.

9. National Electrical Manufacturers Association (NEMA).

10. American Society for Testing Materials (ASTM).

11. National Electrical Code (NEC) with applicable edition year.

12. National Electrical Safety Code (NESC) with applicable edition year.

13. Institute of Electrical and Electronic Engineers (IEEE).

14. UL Testing Bulletin.

15. Building Industry Consulting Services International (BICSI) Information Transport Systems Methods Manual (ITSMM).

16. Local, county, state and federal regulations and codes in effect as of date of installation.

17. Equipment of foreign manufacture must meet U.S. codes and standards. It shall be indicated in the proposal the components that may be of foreign manufacture, if any, and the country of origin.

1.04 MEASUREMENT PROCEDURES

A. Refer to Drawings and general provisions of the Contract, as specified in Section 00700.

B. The Contractor shall:
   1. Verify dimensions in areas of installation by field measurements before fabrication and indicate measurements and scale on shop drawings.

   2. Coordinate fabrication schedule with construction progress to avoid delaying the work.

   3. Where field measurements cannot be made without delaying the work, establish dimensions and coordinate with the General Contractor.

   4. When approved, proceed with fabricating units without field measurements.

   5. Coordinate supports, adjacent construction, and fixture locations to ensure actual dimensions correspond to established dimensions.

1.05 DEFINITIONS

A. Abbreviations
   1. BET: Building Entrance Terminal

   2. BD: Building Distributor also referred as MDF

   3. C/W: Complete With

   4. CBC: Coupled Bonding Conductor

   5. CFCI: Customer Furnished Customer Installed

   6. E.E: Electrical Engineer

   7. EMI: Electromagnetic Interference

   8. FD: Floor Distributor also referred as HC

   9. GE: Ground Equalizer

   10. HC: Horizontal Cross-Connect (IDF)

   11. IC: Intermediate Cross-Connect

   12. IDC: Insulation Displacement Connector

   13. IDR: Intermediate Distribution Room

   14. I/O: Information Outlet or Work Area Information Outlet

   15. LAN: Local Area Network

   16. MC: Main Cross-Connect

   17. MDR: Main Distribution Room

   18. N/A: Not Applicable

   19. NIC: Not In Contract

   20. OFCI: Project Coordinator Furnished Contractor Installed

   21. OFOI: Project Coordinator Furnished Project Coordinator Installed

22. OTDR: Optical Time Domain Reflectometer

23. RCDD: Registered Communications Distribution Designer

24. RFI: Radio Frequency Interference

25. TBB: Telecommunications Bonding Backbone

26. TBC: Telecommunications Bonding Conductor

27. TBD: To Be Determined

28. TGB: Telecommunications Ground Bus Bar

29. TMBC: Telecommunications Main Bonding Conductor

30. TMGB: Telecommunications Main Grounding Bus Bar

31. TR: Telecommunications Room

32. UON: Unless Otherwise Noted

33. UTP: Unshielded Twisted Pair

34. WA: Work Area

1.06 SUBMITTALS

A. Refer to Section 01300 – Submittal Procedures.

B. The Contractor shall provide a copy of the Certified Test Data Sheet, available from the delivering distribution warehouse for either a full run or cut piece from the Master Reel of the fiber cable to be installed

C. The Certified Test Data Sheet shall include the Master Reel number, cable description, a passing test result with details, test equipment description, date certified, and a certificate of compliance stamp, and shall be included in the O&M Manual as a component of the final deliverables submittal package.

D. The Contractor shall provide the appropriate documentation from the certifying manufacturer showing the project is registered and qualified for the System Assurance Warranty. All subsequent work shall be in accordance with approved submittals.

E. Product Certificates shall be signed by manufacturers of cables, connectors, and terminal equipment certifying that products furnished comply with requirements.

F. Contractor shall submit the required Field Test Reports in the format and media specified, upon completion of testing the installed system.

G. Contractor shall deliver manufacturer’s signed long-term Warranty of installed cabling system to include all components that comprise the complete cabling system. Delivery to be effected within two weeks of the time of final punch list review. Failure of any component to pass system component tests shall be promptly corrected, repaired or replaced to meet standards compliance. Contractor shall coordinate with manufacturer for warranty paperwork and procedures prior to the start of the project.

H. Cable Testing Plan
   1. Provide a complete and detailed test plan for approval of the cabling system specified herein, including a complete list of test equipment for copper and fiber optic

components and accessories prior to beginning cable testing. The following minimal items shall be submitted for review:

a. All testing methods that clearly describes procedures and methods.

b. Product data for test equipment

c. Certifications and qualifications of all persons conducting the testing.

d. Calibration certificates indicating that equipment calibration meets National Institute of Standards and Technology (NIST) standards and has been calibrated at least once in the previous year of the testing date.

e. Examples of test reports, including all graphs, tables, and charts necessary for display of testing results.

2. Include validation, and testing. Project Coordinator will require that the telecommunications cabling system installed by the Contractor be fully certified to meet all necessary requirements to be compliant with referenced IEEE and TIA specifications and vendor's warranty.

3. Will determine the source/cause of test failure readings and correct malfunctioning component and/or workmanship within each channel or permanent link and retest to demonstrate compliance until corrected failure produces a passing result.

I. Cable Testing Reports. The Contractor shall submit cable test reports as follows:

1. Submit certified test reports of Contractor-performed tests.

a. The tests shall clearly demonstrate that the media and its components fully comply with the requirements specified herein.

b. Three (3) set(s) of electronic and hardcopy versions of test reports shall be submitted together and clearly identified with cable identification.

c. Cable inventory data shall be submitted for all fiber, copper, and coaxial cabling and termination equipment. Submit data electronically on CD-ROM, listing products furnished, including:

1) Manufacturer's name.

2) Manufacturer's part numbers.

3) Cable numbers.

4) Location and riser assignments.

5) Product Data.

2. Equipment and materials shall be standard products of a manufacturer regularly engaged in the manufacture of telecommunications cabling products and shall be the manufacturer's latest standard design in satisfactory use for at least one year prior to bid opening.

J. Shop Drawings

1. Submit catalogue cut-sheets that include manufacturer, trade name, and complete model number for each product specified. Model number shall be handwritten, marked with an arrow or underlined to indicate exact selection.

2. Identify applicable specification section reference for each product performance for each component specified for approval prior to purchase and installation.

3. Submit for approval diagrams showing room layouts, rack layouts (including elevations), riser layouts, etc.

K. Samples
1. For workstation outlet connectors, jack assemblies, housings and faceplates for color selection and evaluation of technical specifications and requirements. Confirm with Project Coordinator for color before purchasing materials. Face plates shall match electrical face plates in color and material type.

L. Qualifications
1. The Contractor shall provide the appropriate documentation to comply with the requirements described in SECTION 1.07- QUALITY ASSURANCE, included with, and at the time of, bid submittal.

M. Closeout Submittals (As-built Drawings)
1. Refer to Division 1- General Requirements for requirements. The following paragraphs supplement the requirements of Division 1.

2. The As-Built drawings shall incorporate all changes made to the building identified in, but not limited to, addendum, change notices, site instructions or deviations resulting from site conditions.
a. Clearly identify any resubmitted drawing sheets, documents or cut sheets either by using a color to highlight or cloud around resubmitted information.

b. Provide dimensioned plan and elevation views of networking components, showing:
1) All communications data/voice outlet locations complete with outlet/cable labeling.

2) Cable routing paths of communications cables to identified infrastructure pathways.

3) All rack and cabinet locations and labeling there of.

4) One-line diagram of equipment/device interconnecting data/voice cabling of the data and voice systems.

5) Standard or typical installation details of installations unique to Project Coordinator’s requirements.

6) Graphic symbols and component identification on detail drawing shall conform to the latest ANSI/TIA 568-C, ANSI/TIA 569-B, ANSI/TIA 606-A and ANSI/NECA/BICSI 607-A conventions.

1.07 QUALITY ASSURANCE
A. Refer to the Conditions of the Contract, as specified in Section 00700.

1.08 DELIVERY, STORAGE, AND HANDLING
A. Refer to the Conditions of the Contract, as specified in Section 00700.

B. Deliver products to project properly identified with names, model numbers, types, compliance labels and similar information needed for distinct identification; adequately packaged and protected to prevent damage during shipment, storage and handling.

C. Contractor shall protect stored equipment and materials from damage and theft.

D. Coordinate deliveries of electrical materials and equipment to minimize construction congestion. Limit each shipment of materials and equipment to the items and quantities

needed for the smooth and efficient flow of installations.

1.09 WARRANTY

A. Refer to the Division 1- General Requirements for procedures and submittal requirements for warranties. Refer to individual equipment specifications for warranty requirements.

B. Compile and assemble the warranties specified in Division 16, into a separated set of vinyl covered, three ring binders, tabulated and indexed for easy reference.

C. For each product or equipment provide complete warranty information for each item to include date of beginning of warranty or bond; duration of warranty or bond; and names, addresses and telephone numbers and procedures for filing a claim and obtaining warranty services.

1.10 MAINTENANCE

A. Refer to Division 1- General Requirements for procedures and requirements for preparation and submittal of maintenance manuals.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Identification (Labeling) System:
   1. Brady
   2. Dymo
   3. Hellerman-Tyton
   4. Acceptable alternate

B. Fire-Stop Systems
   1. STI EZ-Path
   2. Hilti
   3. Spec-Seal
   4. 3M
   5. Acceptable alternate

PART 3 - EXECUTION

3.01 INSTALLERS

A. Submit written proof that the following experience requirements are being met:

B. The Contractor shall be a Certified Installer and be able to provide the twenty (20) year premium Cabling System warranty covering products, performance and applications assurance for cabling systems designed and installed by them, and adhere to the industry standard engineering, installation and testing procedures and utilize the authorized manufacturer components and distribution channels in provisioning this project.

C. Provide and pay for all labor, supervision, tools, equipment, test equipment, tests and services to provide and install a complete inside and outside plant fiber and copper infrastructure system. Pay all required sales, gross receipts, and other taxes.

D. All members of the installation team shall be certified by the Structured Cabling System Assurance Warranty provider as having completed the necessary training to complete their part of the installation and are capable of performing an installation that falls under manufacturer's guidelines necessary to obtain the Manufacturer's System Assurance Warranty.

E. Resumes of the entire team shall be provided along with documentation of completed training courses.

F. A BICSI RCDD shall supervise and approve all on-site work as a recognized member of the Contractor's installation team. All installation team members must demonstrate knowledge and compliance with all BICSI, TIA, UL, and NEC methods, standards and codes.

3.02 EXAMINATION

A. Field Measurements. Verify dimensions in areas of installation by field measurements before fabrication and indicate measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the work.

B. Established Dimensions. Where field measurements cannot be made without delaying the work, establish dimensions and proceed with fabricating units without field measurements. Coordinate supports, adjacent construction, and fixture locations to ensure actual dimensions correspond to established dimensions.

3.03 PREPARATION

A. Contractor's on-site RCDD supervisor shall review, approve and stamp all shop drawings, coordination drawings As Built Drawings and submittal documents.

B. Pre-installation inspection
   1. The Contractor shall visually inspect all cables, cable reels, and shipping cartons to detect possible cable damage incurred during shipping and transport. Visibly damaged goods are not acceptable and shall be replaced by the contractor at no additional cost to the Project Coordinator.

3.04 INSTALLATION

A. General
   1. Contractor shall install work following specifications, drawings, manufacturer's instructions and approved submittal data.

   2. Allowable Cable Bend Radius And Pull Tension:
      a. In general, communications cable cannot tolerate sharp bends or excessive pull tension during installation. Refer to cable manufacturer's bend radius recommendations for the maximum allowable limits.

      b. After installation, exposed cable and other surfaces must be cleaned free of lubricant residue. Use only lubricants specifically designed for cable installation.

B. Pull Strings
   1. Horizontal Cable
      a. The Contractor shall
         1) Provide pull strings in all new conduits, including all conduits with cable installed as part of this contract.

         2) Pull string shall have a rated average breaking strength of 200 pounds.

         3) Data and video cables can be pulled in tandem with pull strings. During pulling sessions, pull strings must move freely to prevent cable jacket/cable damage.

C. Color and cable type designations for UTP and F/UTP cable
   1. Security (IP-CCTV): CAT6 UTP, Red

D. Conduit Fill
   1. Reference manufacturer's Design Installation Guidelines manual.

E. Firestop Procedures
   1. Contractor shall
      a. Install and seal penetrations (conduit, sleeves, slots, chases) into or through fire-rated barriers created by or made for or on the behalf of the Contractor to prevent the passage of smoke, fire, toxic gas, or water through the penetrations.
         1) All through penetrations in a fire rated surface require a sleeve, regardless of penetration diameter or penetrating cable count.

         2) The installation of fire rated membrane penetrations shall meet UL requirement, IBC Membrane Penetration requirement and master specification 26 05 33 Raceways, Cable Trays, and Boxes. “Ring and string” method, directed by the Project Coordinator, can only be used in non-fire-rated partitions.

      b. Provide approved fire-resistant materials to restore originally-designed fire-ratings to all wall, floor, and ceiling penetrations used in the distribution and installation for communications cabling system. Coordinate firestopping procedures and materials with General Contractor. Following the pathway of others through compliant and non-compliant penetrations does not remove the requirement to maintain code-compliant firestopping.

      c. Provide and install, intumescent mechanical systems in floor chases in an approved fashion in all openings.

      d. Provide and install , firestop in an approved manner in all openings where there are penetrations through walls.

      e. Shall supply Project Coordinator with training manuals with instructions on methods of adding or removing cabling to/from firestopped sleeves and chases.

      f. Provide manufacturer recommended material for rated protection for any given barrier.

      g. Shall laminate and permanently affix adjacent to chases the following information:
         1) Manufacturer of firestop system.

         2) Date of installation/repair.

         3) Part and model numbers of system and all components.

         4) Name and phone numbers of local distributor and manufacturer’s corporate headquarters.

      h. Solutions and shop drawings/submittals for firestop materials and systems shall be presented to the General Contractor for written approval of materials/systems prior to purchase and installation.

      i. Materials shall be installed per manufacturer instructions, be UL-listed for intended use, and meet NEC and locals codes for fire stopping measures.

      j. The material chosen shall be distinctively colored to be clearly distinguishable

from other materials, adhere to itself, and maintain the characteristics for which it is designed to allow for the removal and/or addition of communication cables without the necessity of drilling holes in the material.

k. The firestopping material shall maintain/establish the fire-rated integrity of the wall/barrier that has been penetrated.

F. Labeling
1. Cable Labels. Self-adhesive vinyl or vinyl-cloth wraparound tape markers, machine printed with alphanumeric cable designations.

2. Flat-surface labels. Self-adhesive vinyl or vinyl-cloth labels, machine printed with alphanumeric cable designations

3. Contractor shall:
a. Provide transparent plastic label holders, and 4-pair marked colored labels.

b. Install colored labels according to the type of field as per ANSI/TIA 606-A color code designations.

4. Use the color-code guidelines for voice, data, cross-connect, riser, and backbone fields as provided by the Project Coordinator. Otherwise, use the ANSI/TIA 606-A designation strip color-code guidelines for voice, data, cross-connect, riser, and backbone fields. The color-code guidelines are as follows:

G. All materials shall be UL- and/or ETL-approved and labeled in accordance with NEC for all products where labeling service normally applies.

H. Materials and equipment requiring UL 94, 149 or 1863 listing shall be so labeled. Modification of products that nullifies UL labels is not permitted.

I. The installed systems shall not generate nor be susceptible to any harmful electromagnetic emission, radiation, or induction that degrades, or obstructs any equipment.

J. All material and equipment as provided should be the standard Commercial-Off-The-Shelf (COTS) products of a manufacturer engaged in the manufacturing of such products. All shall be typical commercial designs that comply with the requirements specified. All material and equipment shall be readily available through manufacturers and/or distributors.

K. All equipment shall be standard catalogued items of the manufacturer and shall be supplied complete with any optional items required for proper installation.

L. Coordinate the features of materials and equipment so they form an integrated system. Match components and interconnections for optimum future performance and backward compatibility.

M. Expansion Capability. Unless otherwise indicated, provide spare positions in patch panels, cross connects, and terminal strips, and space in cable pathways and backboard layouts to accommodate 20% future increase in campus distribution and active workstations.

N. Backward Compatibility. The provided solution shall be backward compatible with lower category ratings such that if higher category components are used with lower category components, the basic link and channel measures shall meet or exceed the lower channel’s specified parameters.

O. Component Compliance. The provided solution's components shall each meet the minimum transmission specifications listed herein such that no individual component will be less than specifications for permanent link and channel, regardless of the fact that tests for link and channel ultimately meet required specifications.

P. In the event of a breach of the representations and warranties contained herein, the Contractor, at their own expense, shall take all measures necessary to make the cabling system work and comply with the applicable manufacturer written technical recommendations and standards.

Q. Site Tests
   1. Upon completion of the communications infrastructure systems, including all pathways and grounding, the Contractor shall test the system.
      a. Cables and termination modules shall be affixed, mounted or installed to the designed/specified permanent location prior to testing.

      b. Any removal and reinstallation of any component in a circuit, including faceplates, shall require retesting of that circuit and any other disturbed or affected circuits.

      c. Cable/jack shall be affixed, mounted or installed to the designed/specified permanent location prior to testing. Any removal and reinstallation of any component in the circuit shall require retesting of that circuit.

      d. Approved instruments, apparatus, services, and qualified personnel shall be utilized.

      e. If tests fail, Contractor shall correct as required to produce a legitimate passing test.

      f. Manipulation of tester parameters on a failing test in order to achieve a passing test is unacceptable.

      g. If the Contractor is found to have manipulated any failing test result for any reason (without written notice and approval of the Project Coordinator), the Contractor shall be required to employ a Third-Party Testing Agent selected by the Project Coordinator to retest the complete cable plant and shall be required to pay all costs associated with this retesting.

   2. These specifications will be strictly enforced. The Contractor must verify that the requirements of the specifications are fully met through testing with an approved tester (rated for testing the cable type in use), and documentation as specified below. This includes confirmation of requirements by demonstration, testing and inspection. Demonstration shall be provided at final walk-through in soft copy and printed test data.

   3. Notification of the likelihood of a cable exceeding standardized lengths must be made prior to installation of the cable. Without contractor's prior written notice and written approval by the Project Coordinator, testing that shows some or all pairs of cable not meeting specifications, shall be replaced at Contractor's expense (including respective connectors).

   4. With the Project Coordinator's written approval, the over-length cable(s) shall be excluded from requirements to pass standardized tests and shall be explicitly identified.

   5. Testing is still required for non-compliant cabling. The tests shall be for wire-mapping, opens, cable-pair shorts, and shorts-to-ground. The test results must be within

acceptable tolerances and shall be submitted with the Project Coordinator's acceptance document.

3.05 CLEANING

A. Refer to Division 1 - General Requirements for final cleaning requirements.

END OF SECTION 17000

SECTION 17150 – COMMUNICATIONS HORIZONTAL CABLING

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. As specified in Section 00700.

1.02 RELATED DOCUMENTS

A. Specifications throughout all Divisions of the Project Manual are directly applicable to this Section, and this Section is directly applicable to them, including but not limited to the following:
   1. Section 17000 – Communications.

1.03 SUMMARY

A. Section Includes
   1. This section includes the horizontal cabling portion of a structured cabling system (SCS) including:
      a. Optical fiber.

      b. Copper cabling.

      c. Termination and patch cables.

B. Provide all horizontal cabling, terminating hardware, adapters, and cross-connecting hardware necessary to interconnect all system equipment including equipment located in communications rooms.

1.04 REFERENCES

A. The publications listed below form a part of this specification. The publications are referred to in the text by basic designation only.

B. Specific reference in specifications to codes, rules, regulations, standards, manufacturer's instructions, or requirements of regulatory agencies shall mean the latest printed edition of each in effect at the date of contract unless the document is shown dated.

C. Conflicts
   1. Refer to section 17000.

D. Codes and Standards
   1. ANSI/TIA-568-C Commercial Building Telecommunications Wiring Standard.

   2. ANSI/TIA-569-B Commercial Building Standard for Telecommunications Pathways and Spaces.

   3. ANSI/TIA-606-A Administration Standard for Commercial Telecommunications Infrastructure.

   4. ANSI/TIA-607-A Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications.

   5. ANSI/TIA-758-A Customer-Owned Outside Plant Telecommunications Infrastructure Standard.

   6. ANSI/TIA-1179 Healthcare Facility Telecommunications Infrastructure Standard.

   7. National Electrical Code (NEC), based upon year approval by local codes or AHJ.

8. Building Industry Consulting Services International (BICSI) Telecommunications Distribution Methods Manual (TDMM), current edition.

9. Local, county, state and federal regulations and codes in effect as of date of purchase.

10. Equipment of foreign manufacture must meet U.S. codes and standards. It shall be indicated in the proposal the components that may be of foreign manufacture, if any, and the country of origin.

1.05 SUBMITTALS

A. Refer to Section 01300.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Refer to sections 17000.

B. Storage temperature range: -40°F to 149°F (-40°C to 65°C).

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Horizontal Category 6 UTP Cable Plenum-rated and/or Indoor/Outdoor Rated
   1. OPTICAL CABLE CORPORATION (OCC).

   2. Approved alternate.

B. Information outlet components
   1. OPTICAL CABLE CORPORATION (OCC).

   2. Category 6 Jack.

   3. Approved alternate.

C. 48-Port Patch Panels
   1. OPTICAL CABLE CORPORATION (OCC).

   2. Approved alternate.

D. Wall and Rack Mount 110 Termination Blocks
   1. OPTICAL CABLE CORPORATION (OCC).

   2. Approved alternate.

E. Faceplate for wall-mount telephones
   1. OPTICAL CABLE CORPORATION (OCC).

   2. Approved alternate.

F. Fiber Horizontal Cable Plenum-rated
   1. OPTICAL CABLE CORPORATION (OCC).

   2. Approved alternate.

G. Fiber Connectors, (LC)
   1. OPTICAL CABLE CORPORATION (OCC).

   2. Project Coordinator- approved alternate.

H. Fiber Termination Shelves and Cabinets (Rack-Mountable)
   1. OPTICAL CABLE CORPORATION (OCC).

   2. Project Coordinator- approved alternate.

I. Fiber Distribution Cabinet (Wall –Mounted)
   1. OPTICAL CABLE CORPORATION (OCC).

   2. Approved alternate.

J. Fiber adapter panels (6-port)
   1. OPTICAL CABLE CORPORATION (OCC).

   2. Approved alternate.

K. Patch Cords, Copper
   1. OPTICAL CABLE CORPORATION (OCC).

   2. Approved alternate.

L. Fiber Duplex Patch Cables (Type LC SMF)
   1. OPTICAL CABLE CORPORATION (OCC).

   2. Approved alternate.

M. Labeling
   1. Refer to section 17000.

N. Fire stopping
   1. Refer to section 17000.

2.02 HORIZONTAL CABLING

A. Recognized cabling for providing the signal medium from the work area to the communications room shall include the following:
   1. Four-pair Category 6 UTP cable.

   2. Four-pair Category 6A UTP cable.

   3. 8 µm single-mode optical fiber.

B. Category 6 UTP Cable Requirements: High performance Category 6 UTP shall adhere to the following:
   1. 23/24 AWG solid bare copper.

   2. Cable jacket shall comply with NEC Article 800 for use as a plenum cable and shall be UL and c (UL) Listed Type CMP (communications multipurpose plenum).

   3. Cable shall terminate on an eight-pin modular jack at each outlet. All horizontal cabling shall meet or exceed the ANSI/EIA/TIA-568-C.2 Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted Pair Cabling Components.

   4. Cables shall be marked as UL verified with a minimum of Category 6 rating.

   5. The cable shall support Voice, Analog Base band Video/Audio, Fax, Modem, Switched-56, T-1, ISDN, RS-232, RS-422, RS-485, 10BASE-T Ethernet, Token Ring, 100Mbps TP-PMD, 100BASE-T Ethernet, 155 Mbps ATM, AES/EBU Digital Audio,

270 Mbps Digital Video, 622 Mbps 64-CAP ATM and emerging high-bandwidth applications, including 1 Gbps Ethernet, gigabit ATM, as well as all 77 channels (550 MHz) of analog broadband video.

6. The maximum horizontal cable length for Category 6 copper cable from the termination of the cable in the communications room to the outlet is 295 feet.

7. Cable run in underground conduits, PVC conduits under the floor level, or in other outdoor raceways shall be Indoor/Outdoor rated.

8. Cable shall be specified to 250 MHz and shall meet the manufacturer's guaranteed electrical performance and physical specifications.

C. Cabling Method:
   1. The Contractor shall:
      a. Provide cabling in accessible spaces, cable tray, (surface and/or enclosed raceway), conduits, and/or J-Hook cable support system. Within consoles, racks, cabinets, desks, and counters, in accessible ceilings spaces and in gypsum board partitions where open cable method may be used. Use UL or ETL listed plenum rated cable in all spaces.

      b. Conceal raceway and cabling except in unfinished spaces as is practical.

      c. Utilize conduits/cable tray as indicated on the drawings.

      d. Route data and voice cables separately in a neat and orderly fashion. No cable ties or wraps shall be used to secure the cables in the runway outside of the communications rooms. Hook and loop fasteners shall be used for any final cable securing needed. Fasteners shall be rated for the area they are used in, (Plenum as required).

      e. Examine pathway elements intended for cable.

      f. Check raceways and other elements for compliance with space allocations, installation tolerances, debris, hazards to cable installation, and other conditions affecting installation. Proceed with installation only after unsatisfactory conditions have been corrected.

D. Application of Media
   1. Horizontal cabling
      a. The Contractor shall
         1) Install cable using techniques, practices, and methods that are consistent with specified data cabling and the installed components and that ensure specified performance levels of completed and linked signal paths, end to end.

         2) Install cables in continuous lengths from communications outlet to specified patch panels for data and termination blocks for voice.

         3) Terminate horizontal voice cables into termination blocks without damaging twisted pairs or jacket.

         4) Terminate horizontal data cables onto 8P8C modular patch panels without damaging twisted pairs or jacket.

         5) Pull cables in smooth and regular motions using methods that prevent cable kinking.

6) If necessary use approved cable pulling lubricant.

7) Keep all items protected before and after installation with dust and moisture proof barrier materials/envelopes. If wiring is terminated on patch panels, data, voice jacks prior to painting, carpet installation, and general finish clean up, these jacks shall be placed in a protective envelope to ensure dust, debris, moisture, and other foreign material do not settle onto jacks' contacts. Envelope will be removed on final trim out after other trades have completed their finish work. It shall be the Contractor's responsibility to ensure the integrity of these protective measures throughout the life/installation of the project.

8) Do not bind cables tightly together with tie or other wraps. Wraps shall slip loosely around cables. Use Velcro wraps instead of cables ties for all bundling in the communications rooms.

9) Pull cables simultaneously if more than one is being installed in the same raceway/pathway.

10) Use pulling means; including fish tape, cable, rope, and basket weave wire/cable grips that will not damage media or raceway.

11) Install open cabling parallel and perpendicular to surfaces or structural members following surface contours where possible.

12) Do not bend cable greater than a bend radius of 1.00 inch.

b. Cable bundles brought into the communications rooms shall be routed and dressed in such a manner that prior to termination the cables are not subject to damage and misuse such as installers walking on the bundles that are lying on the floor. Cable pulling force shall not exceed 25 pounds of pulling tension or cable manufacturer's recommended pulling tensions.

c. When exiting runway and/or conduit via a means to ensure support of the cable, shall thereafter be supported with approved materials, and space supporting hardware to maintain performance characteristics, or as listed below.

E. Separation of Wires and Cabling Installation Practices
1. The Contractor shall
a. Comply with NEC / TIA rules for separating unshielded copper communication and data-processing equipment cables from potential EMI sources, including electrical power lines and equipment.

b. Maintain a minimum spacing of 18 inches from electrical feeders and/or branch circuit wiring.

c. Maintain a minimum spacing of 12 inches from auxiliary systems cabling.

d. Maintain a 1-inch separation where UTP cables must pass perpendicularly to electrical, plumbing, or other wiring, conduit, or piping systems. Use non-conduit bushings, if necessary to maintain separation, which allow for the addition of a reasonable number of cables in the future.

e. Maintain communications pathways away from electrical apparatus such as motor driven equipment and transformers, minimum separation distance of 10-feet is recommended.

f. Provide all necessary installation materials, hardware, tools and equipment to

perform insulation displacement type terminations at all data outlets, patch panels, and voice termination materials.

g. Dress and terminate horizontal cables in consistent consecutive order.

h. Arrange cables on patch panels and voice termination hardware in ascending order of room numbers and outlet numbers within rooms.

i. Provide a 3-foot 6-inch service loop for horizontal cables at I/O's. Locate service loop above or below I/O were vertical cable run transitions to horizontal run.

j. Maintain twists in cable pairs to within .5-inch of termination.

k. Group all specialty cables such as the pay phone cables, elevator line, etc which do not have their own termination hardware, in one group, clearly labeled as to cable number and function, in the last positions on the horizontal cabling blocks in each communications room.

l. Limit cable-bending radius for fiber optic cable to 20 times the cable diameter during installation, and 15 times the cable diameter after installation. Follow manufacturer's requirements for copper cable bending radius.

m. Do not leave cables on the floor unprotected or cable bundles hanging from the ceilings. Coil them up in a temporary manner and protect them from damage.

n. Start numbering at the left of the main door to the room and continue in a clockwise direction around the room.

o. The cables within the room will be terminated starting with the cables located to the left of the main door to the room and continue around the room in a clockwise direction.

2. Fiber Optic Cable Installation

a. Fiber optic cable shall be installed in inner duct from near end termination point to far end termination point. Only UL-approved plenum-rated inner duct shall be installed in all plenum areas. Metallic conduit may be used in lieu of inner duct in plenum-rated ceilings if it is bonded and grounded correctly.

b. Only technicians-trained and certified by the product manufacturer shall perform terminations. Terminations shall be made in a controlled environment. Cables may be assembled off -site, although testing must be completed with the cable in its final installed condition. Test optical fiber on the reel for distance and continuity verification before installation.

2.03 TERMINATION HARDWARE

A. Station Hardware

1. Flush mount jacks shall be mounted in a faceplate with back box.

2. Outlets shall not be mounted on temporary, movable, or removable surfaces, doors, or access hatches without prior Project Coordinator approval.

3. 8P8C Jack Pin Assignments - Pin connections for voice and data information outlets and patch panels shall match T-568B termination standard under the EIA/TIA 568- A code.

4. Pin assignments at all voice and data panels or connecting blocks shall match pin assignments at the information outlets.

5. Copper patch panels shall be rated to match installed cable plant.

6. Horizontal copper cables shall be terminated in eight position/eight conductor (8P8C) modular patch panels with no distinction between voice and data.

7. All Modular jack panels shall be wired to T-568B unless requested otherwise by Project Coordinator.

B. Work area outlets
   1. 8P8C non-keyed modular outlets for applications up to 1 Gbps and ANSI/TIA/EIA-568-C compliant for the specified transmission requirements.

   2. Part of the UL LAN Certification and Follow-up Program.

   3. Universal eight-position jack pin/pair assignments.

   4. Blue in color for data outlets, white in color for voice outlets, orange in color for Wireless Access Point (WAP) outlets, and green in color for Security (CCTV, ACS, IDS) outlets.

C. Outlet Faceplates:
   1. Match electrical outlets in color and material type.

   2. Four-position with blanks inserted in unused ports.

2.04 PATCH CABLES
A. Multi-mode Optical Fiber.

B. CAT 6 Copper.

2.05 IDENTIFICATION (LABELING) SYSTEM
A. Refer to sections 17000.

PART 3 - EXECUTION

3.01 EXAMINATION
A. Verify the following before proceeding:
   1. Conduits, cable trays and pull boxes are properly installed.

   2. Plywood backboards in communications rooms are properly installed.

   3. Grounding system is properly installed.

   4. All high-pair count copper cables are routed properly and attached.

   5. All optical fiber links are terminated and tested.

   6. All backbone cabling service loops are installed and protected.

   7. Liquid-carrying pipes are not installed in or above voice and data system communications rooms. Do not proceed with installation in affected areas until removed.

3.02 INSTALLATION
A. All installation shall be done in conformance with ANSI/TIA/EIA-568-C standards, BICSI methods, industry standards and manufacturer's installation guidelines. The Contractor shall ensure that the maximum pulling tensions of the specified distribution cables are not

exceeded and cable bends maintain the proper radius during the placement of the facilities. Failure to follow the appropriate guidelines shall require the Contractor to provide in a timely fashion the additional material and labor necessary to properly rectify the situation. This shall also apply to any and all damages sustained to the cables by the Contractor during the implementation.

B. The Contractor shall
   1. Provide shall provide a 3-foot service loop above the access ceiling or cable trays unless specified otherwise. All service loops shall be a minimum of 18 inches in diameter and be accessible for maintenance.

   2. Coordinate loop placement and orientation with the Project Coordinator. This allows for future changes or expansion without installing new cables.

C. Cabling between communications rooms and workstation locations shall be made as individual “home runs”. No intermediate punch down blocks or splices may be installed or utilized between the communications rooms and the information outlets at the workstation location.

D. All cable must be handled with care during installation so as not to change performance specifications. Factory twists of each individual pair must be maintained up to the connection points at both ends of the cable. There shall never be more than .5 inches of unsheathed Category 6 UTP cable at either the wiring closet or the workstation termination locations.

E. All cabling and associated hardware shall be placed so as to make efficient use of available space. All cabling and associated hardware shall be placed so as not to impair equipment's efficient use of their full capacity.

F. Exposed Cable
   1. All station cabling shall be installed inside walls or ceiling spaces whenever possible.

   2. Exposed station cable will only be run where indicated on the drawings and will only be allowed when no other options exist. Project Coordinator must approve all exceptions.

G. All cabling placed above drop ceilings must be supported by cable tray, saddle bags or conduit. The Contractor shall permanently affix cable supports to the building structure or substrates and provide attachment hardware and anchors designed for the structure to which attached and are suitably sized to sustain the weight of the cables to be supported. Attaching cable to pipes or other mechanical items is not permitted. Communication cables shall be routed so as to provide a minimum of 18 inches spacing whenever possible from light fixtures, sources of heat and EMI sources. Cabling shall not be attached to ceiling grid wires. Multiple cables are to be dressed every 5 feet to 7 feet. Maximum cable sag between cable hooks is 3”-6”. Plastic/nylon tie-wraps are not allowed to permanently secure cables inside the Telecommunications Rooms. (See Section 16073 Hangers and Supports for Communications Systems).

H. In the Telecommunications Room (TR), cables shall be combed and dressed with Velcro ties in a manner as to prevent twists, “braiding” and crossed cables in the cable bundle from the telecommunication room entrance to the termination point at the rear of the patch panel. Behind the patch panel, the cable bundle shall be attached to the rear cable support bar, and shall drop out each cable in a neat, cascading manner to prevent crossed and/or interwoven cables to each patch panel port termination point.

I. Identification - The Contractor shall
   1. Label cable terminations on designation strips.

2. Label all cable at each terminating point.

3. Label each port of the work area outlet.

4. Cable identification numbers shall not be duplicated.

5. Labeling convention to be coordinated with Project Coordinator.

6. Label data patch panels and voice blocks in the communications rooms to match those on the corresponding voice and data outlets. The font shall be at least .125-inch in height.

7. Where a wireless access point is installed above an acoustical ceiling, label the ceiling grid frame below the access point, displaying the data port number and, if applicable, the access point identification number. Coordinate with the Project Coordinator for all access point identification information.

8. All labels shall correspond to as-built drawings and to final test reports.

9. Coordinate with Project Coordinator for specifications on labeling of all hardware, cabling, and related equipment prior to any testing.

10. Label each distribution rack, block and other terminating equipment unit and field within that unit within 4 inches from the block or patch panel termination. Keep labels in a neat and orderly lineup.

11. Label each connector and each discrete unit of cable-terminating and connecting hardware within connector fields, in wiring closets and equipment rooms. Where similar jacks and plugs are used for both communication and data-processing equipment, use a different color for jacks and plugs of each service.

12. Post the cable schedule in a prominent location in each wiring closet and equipment room. List incoming and outgoing cables and their designations, origins, and destinations.

13. Provide electronic copy of final comprehensive schedules for project in software and format selected by Project Coordinator.

J. Documentation
1. All cable inventory data documentation shall be submitted in format coordinated with and approved by Project Coordinator so that data can be incorporated into existing databases.

2. Documentation shall include cable identification number, source and destination, type of cable, length of cable and number of pairs or fibers.

3. Complete cross connect documentation is required. It shall include detailed documentation of each pair of all copper backbone cable and strand of fiber.

3.03 POST-INSTALLATION TESTING FOR CATEGORY 6 CABLE

A. Contractor shall test each Category 6 cable and each fiber strand of every optical fiber cable prior to acceptance.

B. Contractor shall supply all of the required test equipment used to conduct acceptance tests.

C. Contractor shall submit acceptance documentation as defined below. No cabling installa-

tion is considered complete until test results have been completed, submitted and approved.

D. Standards Compliance and Test Requirements
   1. Category 6 Copper Backbone Cabling shall meet ANSI/TIA-568-C.2 Category 6 Horizontal cabling requirements.

   2. Optical fiber shall meet ANSI/TIA-568-C.3 Optical Fiber Cabling Components Standard requirements.

E. Cable Test Documentation
   1. Cable test documentation shall be submitted in hard copy and electronic formats. If proprietary software is used, disk or CD shall contain any necessary software application required to view test results. If the results are delivered in a standard format like Excel, Access, CSV files, etc., software to read these files is not required. Electronic reports shall be accompanied by a Certificate signed by an authorized representative of the Contractor warranting the truth and accuracy of the electronic report. Certificate shall reference traceable circuit numbers that match the electronic record.

   2. Each test record shall contain the cable ID as follows: “MEDIA TYPE – SOURCE ROOM – DESTINATION ROOM – STRAND/PAIR #”, e.g. MM-MC-HC23-001.

   3. Copper: Test reports shall include the following information for each cabling element:
      a. Wire map results that indicate that 100% of the cabling has been tested for shorts, opens, miss-wires, splits, polarity reversals, transpositions, presence of AC voltage and end-to-end connectivity.

      b. Length, propagation delay, and delay skew relative to the relevant limit. Any individual test that fails the relevant performance specification shall be marked as a FAIL.

      c. For Category 6 cabling: Attenuation, NEXT, PSNEXT, Return Loss, ELFEXT, and PSELFEXT data that indicate the worst case result, the frequency at which it occurs, the limit at that point, and the margin. These tests shall be performed in a swept frequency manner from 1 MHz to highest relevant frequency, using a swept frequency interval that is consistent with TIA and ISO requirements. Information shall be provided for all pairs or pair combinations and in both directions when required by the appropriate standards. Any individual test that fails the relevant performance specification shall be marked as a FAIL. Test shall also include mutual capacitance and characteristic impedance.

      d. Cable manufacturer, cable model number/type, and NVP.

      e. Tester manufacturer, model, serial number, hardware version, and software version.

      f. Cable ID and project name.

      g. Auto-test specification used.

      h. Overall pass/fail indication.

      i. Date of test.

      j. Name of Technician Performing Testing.

F. Cable Test Equipment

1. Test equipment used under this contract shall be from manufacturers that have a minimum of 5 years experience in producing field test equipment. Manufacturers shall be ISO 9001 certified.
   a. Copper: Fluke DTX Cable Analyzer or submitted and Project Coordinator-approved equivalent.

   b. Fiber Optic: Fluke DTX Cable Analyzer or submitted and Project Coordinator-approved equivalent.

2. Test equipment for Category 6 UTP shall be UL-verified to meet Level III accuracy as specified in ANSI/TIA/EIA-568-C. The cable installers shall have a copy of this reference in their possession and be familiar with the contents.

3. Test equipment for multimode fiber cabling shall meet the requirements of ANSI/TIA/EIA-526-14-A. The light source shall meet the launch requirements of ANSI/EIA/TIA-455-50B, Method A. The cable installers shall have a copy of these references in their possession and be familiar with the contents.

4. Test equipment for single mode fiber cabling shall meet the requirements of ANSI/TIA/EIA-526-7-1998: Optical Power Loss Measurements of Installed Single Mode Fiber Cable Plant-OFSTP-7.

5. The test instrument shall be within the calibration period recommended by the manufacturer.

6. Test instruments shall have the latest software and firmware installed.

7. All test tools of a given type shall be from the same manufacturer, and have compatible electronic results output.

8. Test adapter cables shall be approved by the manufacturer of the test equipment. Adapters from other sources are not acceptable.

9. All test tools of a given type shall be from the same manufacturer, and have compatible electronic results output.

10. Test adapter cables must be replaced after 1000 tests to ensure accuracy.

11. Test equipment must have a dynamic range of at least 100 dB to minimize measurement uncertainty.

12. Test equipment must be capable of storing full frequency sweep data for all tests and printing color graphical reports for all swept measurements.

13. Test equipment must include S-Band time domain diagnostics for NEXT and return loss (TDNXT and TDRL) for accurate and efficient troubleshooting.

14. Test equipment must be capable of running individual NEXT, return loss, etc measurements in addition to auto tests. Individual tests increase productivity when diagnosing faults.

15. Test equipment must include S-Band time domain diagnostics for NEXT and return loss (TDNXT and TDRL) for accurate and efficient troubleshooting.

16. Test equipment must be capable of running individual NEXT, return loss, etc measurements in addition to auto tests. Individual tests increase productivity when diagnosing faults.

17. Test equipment must include a library of cable types, sorted by major manufacturer.

18. Test equipment must store at least 1000 Category 6 auto tests in internal memory.

19. Test equipment must be able to internally group auto tests and cables in project folders for good records management.

20. Test equipment must include DSP technology for support of advanced measurements.

21. Test equipment must make swept frequency measurements in compliance with TIA standards.

22. The measurement reference plane of the test equipment shall start immediately at the output of the test equipment interface connector. There shall not be a time domain dead zone of any distance that excludes any part of the link from the measurement.

3.04 POST-INSTALLATION TESTING FOR OPTICAL FIBER: TESTING SHALL BE PERFORMED ON ALL FIBERS IN THE COMPLETED END-TO-END SYSTEM.

A. Power Meter and Source Loss Reports: Testing shall consist of a bi-directional, dual wave length end to end test. The system loss measurements shall be provided at 850 and 1300 nanometers for multi-mode fibers and 1310 and 1550 for single mode fibers.

B. Optical Time Domain Reflectometer (OTDR) Reports: Testing shall consist of a bi-directional end to end OTDR trace performed per TIA/EIA 455-61. The system loss measurements shall be provided at 850 and 1300 nanometers for multi-mode fibers and 1310 and 1550 for single mode fibers.

C. The acceptable link attenuation for a multimode horizontal optical fiber cabling system is based on the maximum distance of 295 feet.

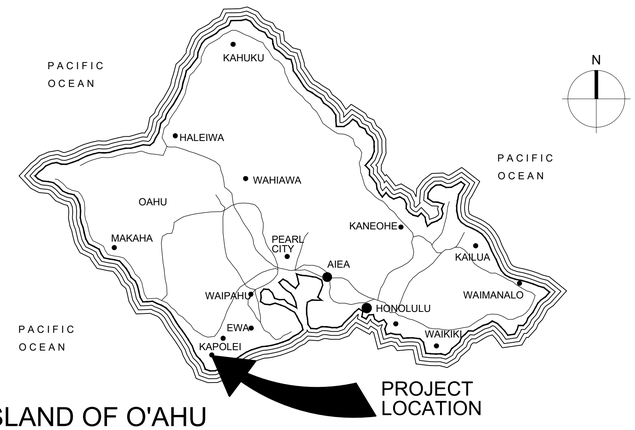
D. The horizontal link may be tested using a fixed upper limit for attenuation of 2.0 dB. This value is based on the loss of two connector pairs, one pair at the telecommunications outlet/connector and one pair at the horizontal cross-connect, plus 295 feet of optical fiber cable.

E. A horizontal link in a network with a consolidation point may be tested using a fixed upper limit for attenuation of 2.75 dB.

END OF SECTION 17150

BUILDING 46
MEDCOM RENOVATIONS

91-1152 Enterprise Ave,
Kapolei, Hawaii 96707
TMK : 9 - 1 -013 : 050
State Job No. CA-202505-D
For
THE STATE OF HAWAI'I
DEPARTMENT OF DEFENSE
HAWAI'I ARMY NATIONAL GUARD



ISLAND OF O'AHU

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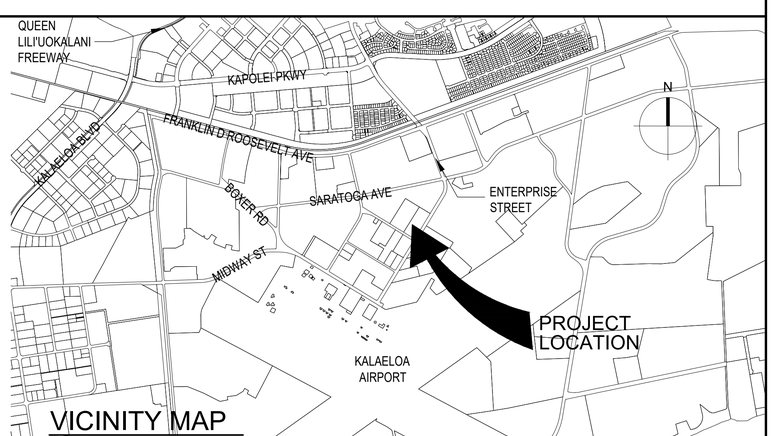

VICINITY MAP

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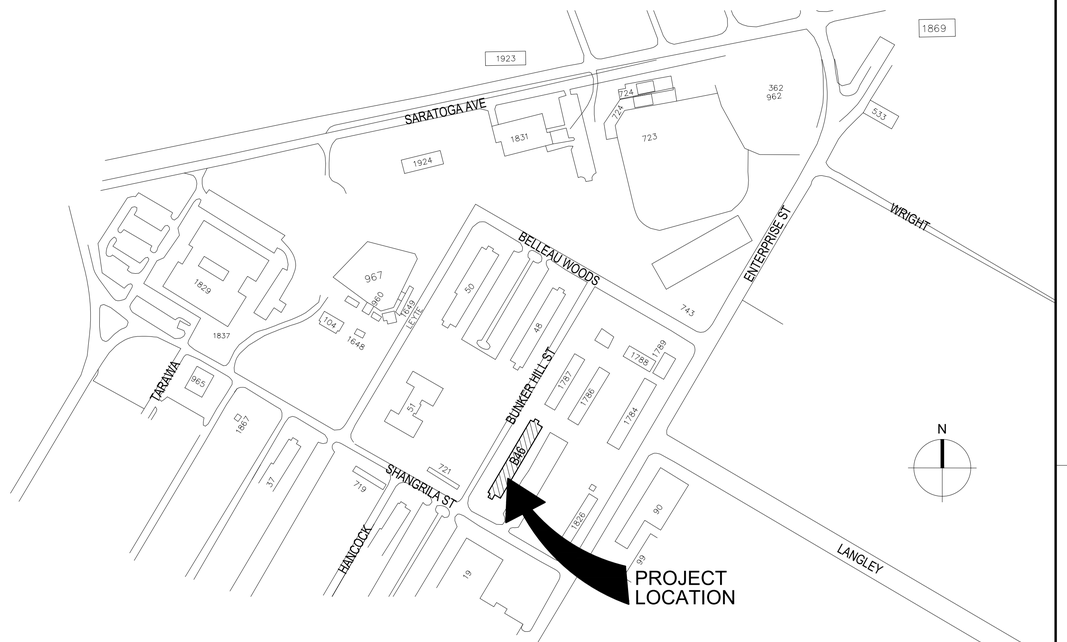

PROJECT SITE DETAIL MAP

NO SCALE:

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ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING

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REV. NO	DESCRIPTION	DATE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ISLAND OF OAHU, VICINITY MAP, PROJECT SITE DETAIL MAP

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HAWAII JOB NO. FEDERAL: PH1SH000033 STATE: CA-202505-D	DRAWING NO.
BF	YWF		T-001
DRAWN BY: APY AU	APPROVED BY:	DATE: JUNE 2026	SHEET: 1 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 8:20 am
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219.	M-304A	ROOF FLOOR - EXISTING/ NEW AIR CONDITIONING AND VENTILATION PLAN
220.	M-304B	ROOF FLOOR - EXISTING/ NEW AIR CONDITIONING AND VENTILATION PLAN
221.	M-304C	ROOF FLOOR - EXISTING/ NEW AIR CONDITIONING AND VENTILATION PLAN
		ELECTRICAL
222.	E-001	ELECTRICAL SPECIFICATIONS, SYMBOLS, & ABBREVIATIONS
223.	E-101	OVERALL EXISTING/DEMOLITION ELECTRICAL SITE PLAN
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225.	E-103	OVERALL EXISTING/DEMOLITION/ NEW SITE PLAN
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232.	E-207	EXISTING/ DEMOLITION FIRE ALARM PLAN – FIRST FLOOR
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234.	E-209	EXISTING/ DEMOLITION FIRE ALARM PLAN – THIRD FLOOR
235.	E-301A	EXISTING/ NEW POWER PLAN – FIRST FLOOR
236.	E-301B	EXISTING/ NEW POWER PLAN – FIRST FLOOR
237.	E-301C	EXISTING/ NEW POWER PLAN – FIRST FLOOR
238.	E-302A	EXISTING/ NEW POWER PLAN – SECOND FLOOR
239.	E-302B	EXISTING/ NEW POWER PLAN – SECOND FLOOR
240.	E-302C	EXISTING/ NEW POWER PLAN – SECOND FLOOR
241.	E-303A	EXISTING/ NEW POWER PLAN – THIRD FLOOR
242.	E-303B	EXISTING/ NEW POWER PLAN – THIRD FLOOR
243.	E-303C	EXISTING/ NEW POWER PLAN – THIRD FLOOR
244.	E-304A	NEW MECHANICAL POWER PLAN – FIRST FLOOR
245.	E-305A	NEW MECHANICAL POWER PLAN – SECOND FLOOR
246.	E-306A	NEW MECHANICAL POWER PLAN – THIRD FLOOR
247.	E-401A	EXISTING/ NEW LIGHTING PLAN – FIRST FLOOR
248.	E-401B	EXISTING/ NEW LIGHTING PLAN – FIRST FLOOR
249.	E-401C	EXISTING/ NEW LIGHTING PLAN – FIRST FLOOR
250.	E-402A	EXISTING/ NEW LIGHTING PLAN – SECOND FLOOR
251.	E-402B	EXISTING/ NEW LIGHTING PLAN – SECOND FLOOR
252.	E-402C	EXISTING/ NEW LIGHTING PLAN – SECOND FLOOR
253.	E-403A	EXISTING/ NEW LIGHTING PLAN – THIRD FLOOR
254.	E-403B	EXISTING/ NEW LIGHTING PLAN – THIRD FLOOR
255.	E-403C	EXISTING/ NEW LIGHTING PLAN – THIRD FLOOR
256.	E-501A	EXISTING/ NEW FIRE ALARM PLAN – FIRST FLOOR
257.	E-501B	EXISTING/ NEW FIRE ALARM PLAN – FIRST FLOOR
258.	E-501C	EXISTING/ NEW FIRE ALARM PLAN – FIRST FLOOR
259.	E-502A	EXISTING/ NEW FIRE ALARM PLAN – SECOND FLOOR
260.	E-502B	EXISTING/ NEW FIRE ALARM PLAN – SECOND FLOOR
261.	E-502C	EXISTING/ NEW FIRE ALARM PLAN – SECOND FLOOR
262.	E-503A	EXISTING/ NEW FIRE ALARM PLAN – THIRD FLOOR
263.	E-503B	EXISTING/ NEW FIRE ALARM PLAN – THIRD FLOOR
264.	E-503C	EXISTING/ NEW FIRE ALARM PLAN – THIRD FLOOR
265.	E-504A	EXISTING/ NEW TELECOM PLAN – FIRST FLOOR
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268.	E-601	DEMOLITION SINGLE LINE DIAGRAM
269.	E-602	NEW SINGLE LINE DIAGRAM
270.	E-603	FIRE RISER DIAGRAM
271.	E-604	TELECOM DIAGRAM
272.	E-605	DETAILS
273.	E-606	DETAILS
274.	E-607	ELECTRICAL SCHEDULES, DIAGRAMS, & METER ELEVATION
275.	E-608	ELECTRICAL SCHEDULES
276.	E-609	ELECTRICAL SCHEDULES

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DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

DRAWING INDEX

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO, FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. T-002
DRAWN BY: AP/ AU	APPROVED BY:	DATE	SHEET 2
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

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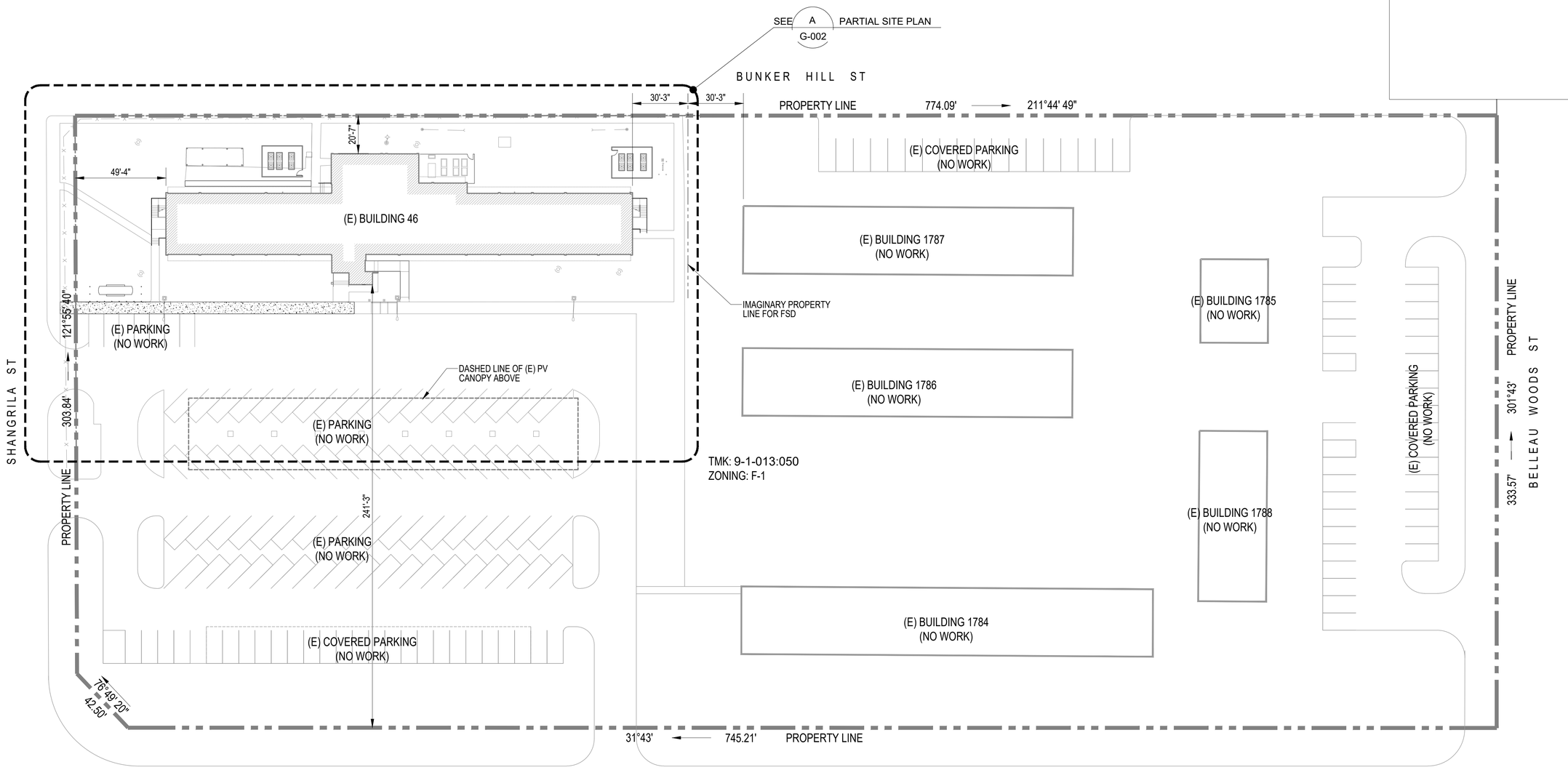

A OVERALL SITE PLAN
SCALE: 1" = 30' 0 30' 60'

NORTH
TRUE N

NOTES FOR ADDITIVE ALTERNATE WORK:

ADDITIVE ALTERNATE #1:

ALL INTERIOR WALL AND CEILING FINISH (I.E. – REPAINTING, WALL COVERING, ETC.) INDICATED TO BE APPLIED TO EXISTING WALL AND CEILING SURFACES SHALL BE EXCLUDED FROM BASE BID AND INCLUDED AS ADDITIVE ALTERNATE. THIS EXCLUDES ANY NEW WALL SURFACES OR ANY EXISTING WALL OR CEILING FINISH SUBJECT TO SELECTIVE DEMOLITION AND REPAIR NECESSARY TO COMPLETE NEW WORK.

ADDITIVE ALTERNATE #2:
ALL DEMOLITION AND NEW WORK TO REPLACE EXISTING INTERIOR DOOR OPENINGS, COMPLETE, INCLUDING DOOR HARDWARE, PATCHING EXISTING WALLS.

BASE BID INCLUDES ALL DEMOLITION OF EXISTING DOOR OPENINGS AND WALLS WHERE DOORS ARE RELOCATED OR PROVIDED IN NEW OPENINGS.

ADDITIVE ALTERNATE #4:
ALL DEMOLITION AND NEW WORK TO REPLACE EXISTING ROOFING SYSTEM.

BASE BID TO INCLUDE WORK FOR NEW DUCTWORK/CURBS/VENT PIPING AND PATCHING AND CAPPING EXISTING DUCTWORK/CURBS/ VENT PIPING ON EXISTING ROOFING.

ADDITIVE ALTERNATE #6

ALL DEMOLITION AND NEW WORK TO REPLACE EXISTING ELEVATOR SYSTEM, COMPLETE, INCLUDING ELEVATOR CAB, DOORS, HOIST MACHINE AND DRIVE, CONTROLLER, CABLES AND COUNTERWEIGHTS, SAFETY SYSTEMS, SIGNAL EQUIPMENT

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STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

OVERALL SITE PLAN

ENGINEERING PARTNERS		HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. G-001
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: AP	APPROVED BY:	DATE JUNE 2026	SHEET 3 OF 276 SHTS
SCALE: AS NOTED			

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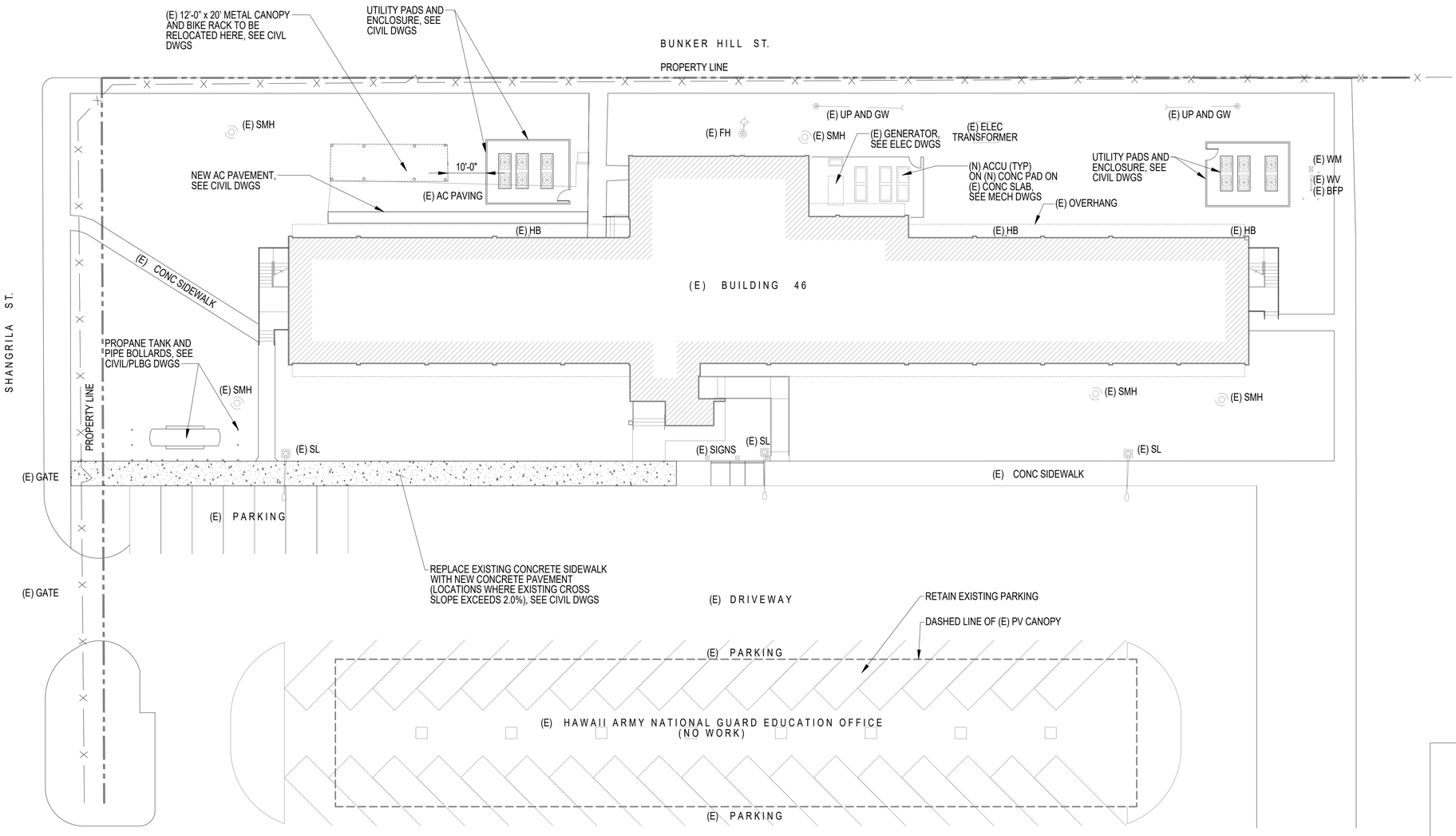

A PARTIAL SITE PLAN
SCALE: 1/16" = 1'-0"
0 16' 32'

NORTH
TRUE N

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

PARTIAL SITE PLAN

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ZONING:

Basis of Analysis:
Hawaii County Code - Chapter 25

Scope of Work
Refurbish existing office building

Owner Name
United States of America

Building Location Address
91-1152 Enterprise Ave
Kalaeloa, Kapolei
Honolulu, Hawaii 96707

Tax Map Key
9-1-013:050

State Land Use District
Urban

Flood Zone
D

Zoning
F-1 Federal/Military

PARKING ANALYSIS

OFF-STREET PARKING REQUIREMENTS (Honolulu (LUO) 2021 Table 21-6.1 Minimum Off-Street Parking Ratios)

Use	Parking Ratio	Required Number of Parking Spaces
Commercial 1	1 for each 500 sf of gross floor area 28,693 sf	57.38 = 58
Total Number of Parking Spaces Provided in Existing		72

PARKING FOR PERSONS WITH DISABILITIES

Number of Parking Spaces	Number of Accessible Parking Spaces Required (ADA 2010 Table 208.2)	Number of Accessible Parking Spaces Required (IBC)
51 - 75	2	3
Total Number of Accessible Parking Spaces Provided in Existing		3

OFF-STREET LOADING REQUIREMENTS (Honolulu (LUO) 2021 Table 21-6.5 Minimum Required Number of Loading Spaces)

User/Category	Loading Space Requirements
Offices 20,000- 50,000 sf	1
Total Number of Loading Spaces Provided in Existing	1 - 12' X 35' loading space

BUILDING CODE ANALYSIS:

Basis of Analysis:
IBC International Building Code 2024 Edition
IEBC International Existing Building Code 2024 Edition
NFPA 101 Life Safety Code 2024 Edition
UFC 1-200-01 (Change 4, December 17, 2021) Unified Facilities Criteria Fire Protection Engineering for Facilities
IECC International Energy Conservation Code 2021 Edition
American with Disabilities Act Accessibility Guidelines (2010 ADAAG)

HEIGHT/AREA/CONSTRUCTION
Occupancy Classification
Building 46 is an existing office building.

BUILDING OCCUPANCY GROUPS:

NFPA OCCUPANCY	IBC GROUP
EXISTING BUSINESS	B - BUSINESS

Building analyzed as single occupancy and no separation of occupancy required.

BUILDING CONSTRUCTION
Construction Type : IIB

Area
Allowable : 34,500 sf* per story
Actual
First Floor : 9,962 sf
Second Floor : 9,373 sf
Third Floor : 9,358 sf
Total : 28,693 sf

*ALLOWABLE AREA FOR A SINGLE OCCUPANCY BUILDING DUE TO FRONTAGE
25% MINIMUM PERCENTAGE OF PERIMETER SHOULD BE FRONTING A STREET OR PUBLIC WAY (IBC SEC 506.3.1)
BUILDING PERIMETER = 659'
659' x 0.25 = 164.75'

EQUATION 5-2 : Aa = At + (NS x If)
where:

At = 23,000

NS = 23,000

If = 0.50 (IBC Table 506.3.3 Frontage Increase Factor)
use 0.50 frontage increase factor- 50% of perimeter has an open space of 30' or greater

Aa = At + (Ns x If)
Aa = 23,000 + (23,000 x 0.50)
Aa = 23,000 + (11,500)
Aa = 34,500 sf
Building Height
Allowable : 55'- 0"
Actual : 34'- 0"

Number of Stories
Allowable : 3
Actual : 3

Fire Resistive Requirements
(IBC table 601)
Type IIB (nonsprinklered) construction

Building Element Description	Rating
Structural Frame	0 hour
Bearing walls	
Exterior	0 hour
Interior	0 hour
Nonbearing walls and partition	
Interior	0 hour
Floor construction	
Including supporting beam and joists	0 hour
Roof construction	
Including supporting beam and hoists	0 hour

The generator and transformer requires fire separation.

Fire Resistance of Exterior Walls
(IBC table 705.5)

Occupancy Group	Type of Construction	Fire Separation	Fire Resistance Rating
Group B - Existing	IIB	X > 30	0 hour

Minimum roof class
(IBC table 1505):
Class A or B for Type IIB building

Automatic Sprinkler System
(IBC Section 903)
Not Required

IEBC Classification
(IEBC Chapter 8)
Level 2 Alteration

MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES IBC TABLE 2902.1

MINIMUM PLUMBING FACILITIES (IBC TABLE 2902.1)									
Classification	Occupant Load	Water Closets or Urinals		Lavatories		Drinking Fountains	Service Sink	REMARKS
		Required		Required		Required	Required	
Business	OL of First Floor = 112 Male = 56 Female = 56	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50	3 for Male 3 for Female	1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 80	2 for Male 2 for Female	1 + 1 ADA	1	
	OL of Second Floor = 108 Male = 54 Female = 54	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 51	3 for Male 3 for Female	1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 81	2 for Male 2 for Female		1	
	OL of Third Floor = 96 Male = 48 Female = 48	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 52	2 for Male 2 for Female	1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 82	2 for Male 2 for Female		1	

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SIGNATURE

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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

CODE ANALYSIS

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO.
BF	YWF		GI-001
DRAWN BY:	APPROVED BY:	DATE	SHEET
AP		JUNE 2026	5 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ~~~

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LIFE SAFETY/EGRESS:

Basis of Analysis:

NFPA 70E, Standard for Electrical Safety in the Workplace 2024 Edition
NFPA 1, Fire Code 2024 Edition
NFPA 101, Life Safety Code 2024 Edition
UFC 3-600-01, Unified Facilities Criteria Fire Protection Engineering for Facilities, Change 6, May 6, 2021
NFPA 13, Standard Installation of Sprinkler Systems 2025 Edition
NFPA 10, Standard for Portable Fire Extinguishers 2022 Edition

OCCUPANT LOAD (NFPA 101 TABLE 7.3.1.2

OCCUPANT LOAD FACTORS:

BUSINESS USE		
business	:	150 sf per person
collaboration rooms > 450 ft in area	:	15 sf per person
collaboration rooms < 450 ft in area	:	30 sf per person
laboratory	:	50 sf per person
lockers	:	50 sf per person
ASSEMBLY (ACCESSORY)		
less concentrated use without fixed seating	:	15 sf per person
concentrated use without fixed seating	:	7 sf per person
STORAGE USE (ACCESSORY)		
in other than storage and mercantile occupancies	:	500 sf per person

EGRESS WIDTHS
Refer to Life Safety Floor Plans

Fire Alarm System
(NFPA 101 Section 39.3.4.1 (2))
Required - The Existing Business Occupancy is subject to 100 or more occupants above or below the level of exit discharge

Exit Signs
(NFPA 101 Section 39.2.10)
Required - Means of egress shall have signs in accordance with NFPA 101 Section 7.10.

Fire Extinguishers
(NFPA 101 Section 39.3.5)
Occupancy Group
B Required - Portable fire extinguishers shall be provided in every business occupancy in accordance with NFPA 101 Section 9.9
See Life Safety Floor Plans for location.

CITY AND COUNTY OF HONOLULU
REVISED ORDINANCES OF HONOLULU 2021
CHAPTER 16B

To the best of my knowledge, this project's design substantially conforms to the Building Energy Conservation Code for:

____x____ Building Component Systems
_____ Electrical Component Systems
_____ Mechanical Component Systems

Signature: _____ Date: 2026-04-10
Name: Yen Wen Fang
Title: Structural Engineer
License No.: 9361-S

BRIAN F. FUNAI
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No. AR-7698
HAWAII, U.S.A.

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STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

CODE ANALYSIS, IECC

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. GI-002
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 6 OF 276 SHTS
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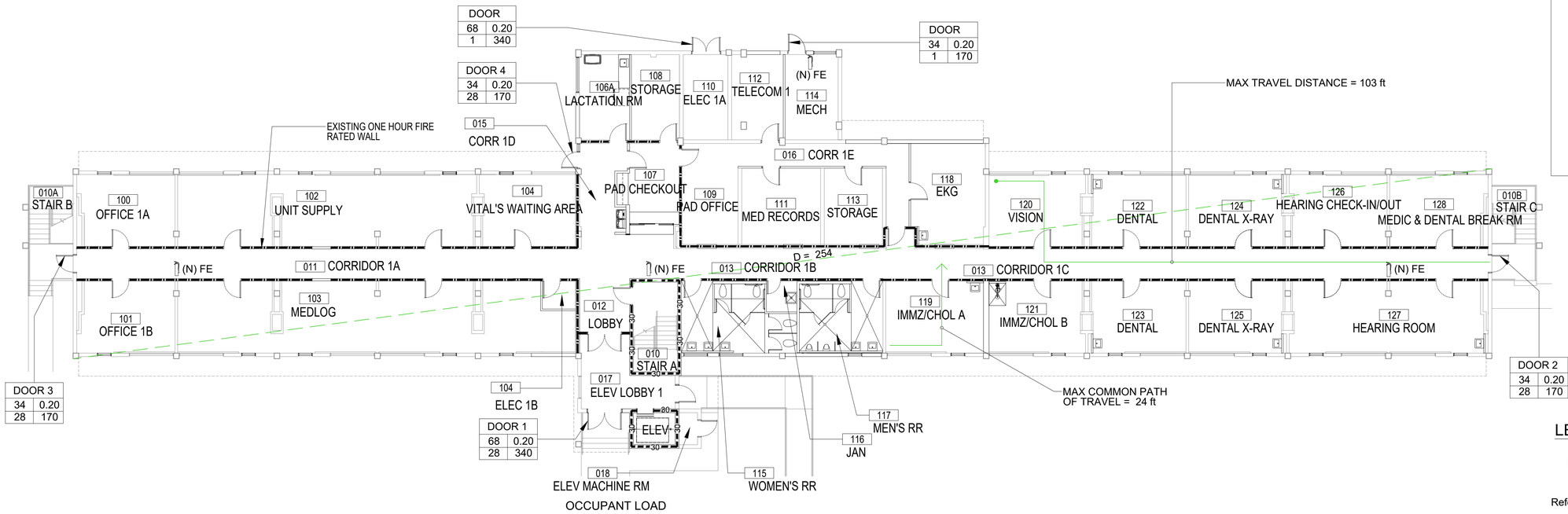

OCCUPANT LOAD

Room No.	Room Name	Occupancy (IBC 2024)	Occupancy (NFPA 101 2024)	Use or Function (NFPA 101 2024)	Floor Area (Gross or net	Occupant Load Factor (NFPA Table 7.3.1.2)		Total Occupant Load	Total Occupant Load Rounded Up	Required Exits	Provided Exits
FIRST FLOOR											
010	STAIR A	-	-	-	-	-	-	-	-	-	-
010A	STAIR B	-	-	-	-	-	-	-	-	-	-
010B	STAIR C	-	-	-	-	-	-	-	-	-	-
011	CORRIDOR 1A	-	-	-	478	-	-	-	-	-	-
012	LOBBY	B	Existing Business	accessory assembly, concentrated use without fixed seating	232	15	net	15.47	16	-	-
013	CORRIDOR 1B	-	-	-	205	-	-	-	-	-	-
014	CORRIDOR 1C	-	-	-	589	-	-	-	-	-	-
015	CORRIDOR 1D	-	-	-	122	-	-	-	-	-	-
016	CORRIDOR 1E	-	-	-	210	-	-	-	-	-	-
017	ELEVATOR LOBBY	B	Existing Business	accessory assembly less concentrated use without fixed seating	165	7	net	23.57	24	-	-
018	ELEVATOR MACHINE ROOM*	B	Existing Business	accessory storage	19	500	gross	0.04	1	-	-
100	OFFICE 1A	B	Existing Business	-	213	150	gross	1.42	2	-	-
101	OFFICE 1B	B	Existing Business	concentrated business use	213	150	gross	1.42	2	-	-
102	UNIT SUPPLY	B	Existing Business	accessory storage	658	500	gross	1.32	2	1	2
103	MEDLOG	B	Existing Business	concentrated business use	839	150	gross	5.59	6	1	2
104	VITALS/WAITING AREA	B	Existing Business	accessory assembly, concentrated use without fixed seating	216	15	net	14.40	15	1	1
105	ELEC 1B	B	Existing Business	accessory storage	30	500	gross	0.06	1	1	1
106	LACTATION ROOM	B	Existing Business	concentrated business use	71	150	gross	0.47	1	1	2
107	PAD CHECK-OUT	B	Existing Business	concentrated business use	140	150	gross	0.93	1	1	2
108	STORAGE	B	Existing Business	accessory storage	131	500	gross	0.26	1	1	1
109	PAD OFFICE	B	Existing Business	concentrated business use	139	150	gross	0.93	1	1	1
110	ELEC 1A*	B	Existing Business	concentrated business use	110	150	gross	0.73	1	1	1
111	MED RECORDS	B	Existing Business	accessory storage	193	500	gross	0.39	1	1	1
112	TELECOM 1	B	Existing Business	accessory storage	141	500	gross	0.28	1	1	1
113	STORAGE	B	Existing Business	accessory storage	142	500	gross	0.28	-	1	1
114	MECHANICAL*	B	Existing Business	accessory storage	144	500	gross	0.29	-	1	1
115	WOMEN'S RESTROOM	-	-	-	228	-	-	-	-	-	-
116	JAN	B	Existing Business	accessory storage	34	500	gross	0.07	1	1	1
117	MEN'S RESTROOM	-	-	-	180	-	-	-	-	-	-
118	EKG	B	Existing Business	concentrated business use	237	150	gross	1.58	2	1	1
119	IMMZ/CHOL A	B	Existing Business	concentrated business use	224	150	gross	1.49	2	1	1
120	VISION	B	Existing Business	concentrated business use	213	150	gross	1.42	2	1	1
121	IMMZ/CHOL B	B	Existing Business	concentrated business use	213	150	gross	1.42	2	1	1
122	DENTAL	B	Existing Business	concentrated business use	217	150	gross	1.45	2	1	1
123	DENTAL	B	Existing Business	concentrated business use	216	150	gross	1.44	2	1	1
124	DENTAL XRAY	B	Existing Business	concentrated business use	216	150	gross	1.44	2	1	1
125	DENTAL XRAY	B	Existing Business	concentrated business use	216	150	gross	1.44	2	1	1
126	HEARING CHECK IN/OUT	B	Existing Business	concentrated business use	217	150	gross	1.45	2	1	1
127	HEARING ROOM	B	Existing Business	concentrated business use	435	150	gross	2.90	3	1	1
128	MEDIC AND DENTAL BREAK ROOM	B	Existing Business	accessory assembly, concentrated use without fixed seating	214	15	net	14.27	15	1	1
* - rooms with separate exits						OL of First Floor			110		

LEGEND

100 — Room number
LOBBY — Room name

Refer to Occupant Load Table for Occupancy Groups.

FE

IBC Section 906
Fire extinguisher Occupancy Group B (moderate-hazard occupancy)
2a, 10-b:c
11,250 maximum square footage per floor, 75 feet maximum travel distance to extinguisher per floor

DOOR 1
36 0.20
90 180

- Egress Component Door or Stair No.
- Egress Factor (Inch/Occupant)
- Calculated Egress Capacity
- Egress Width in Inches
- Egress Load

30 — 30 MINUTE FIRE RATED WALL

ONE HOUR FIRE RATED WALL

Separation of Means of Egress
Exit Access Corridors (NFPA 101 Section 7.1.3.1
Exception 1 - Not Required
Corridor with 1-hour fire resistance rating provided in Existing Corridors have fire rated walls in existing

Egress Width
(NFPA Table 7.3.3.1 Capacity Factors) (NFPA 101 Section 7.2.1.2.3.2)
Door Width:
110 OL of First Floor x 0.20 = 22.00" = In existing buildings, the existing
22.00/4 Egress Doors = 5.50" door leaf width shall be not less than 28".

Actual Minimum Existing Egress Door Width = 34"

Door Width for rooms with separate exits:
1 OL of Elec 1A x 0.20 = 0.20" = 60" minimum clear width (existing)
1 OL of Mechanical x 0.20 = 0.20" = 36" minimum clear width (existing)
1 OL of Elevator Machine Rm x 0.20 = 0.20" = 34" minimum clear width (existing)

Travel Distance to Exits
(NFPA 101 Section 39.2.6)
Travel distance to exits shall not exceed 200 ft from any point in a building.

Common Path of Travel
(NFPA 101 Section 39.2.5.2.2)
Common path of travel shall not exceed 100 ft.

Dead-end Corridors
(NFPA 101 Section 39.2.5.3)
Dead-end corridors shall not exceed 50 ft.

A FIRST FLOOR LIFE SAFETY FLOOR PLAN
SCALE: 3/32" = 1'-0" 0 8' 16' 24'

NORTH
TRUE N

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

FIRST FLOOR FLOOR LIFE SAFETY PLAN

ENGINEERING PARTNERS
DESIGNED BY: BF
CHECKED BY: YWF
DRAWN BY: AP
APPROVED BY:
SCALE: AS NOTED
HAWAII JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D
DATE: JUNE 2026
DRAWING NO. GI-003
SHEET 7 OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 8:33 am
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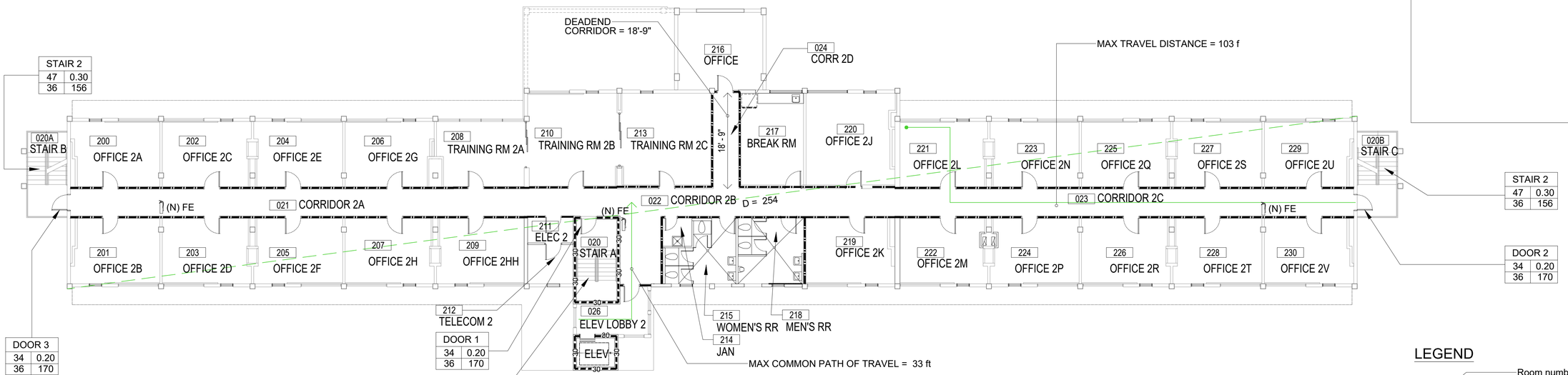

OCCUPANT LOAD

Room No.	Room Name	Occupancy (IBC 2024)	Occupancy (NFPA 101 2024)	Use or Function (NFPA 101 2024)	Floor Area (Gross or net	Occupant Load Factor (NFPA Table 7.3.1.2)		Total Occupancy	Total Occupancy Rounded Up	Required Exits	Provided Exits
SECOND FLOOR											
020	STAIR A	-	-	-	-	-	-	-	-	-	-
020A	STAIR B	-	-	-	-	-	-	-	-	-	-
020B	STAIR C	-	-	-	-	-	-	-	-	-	-
021	CORRIDOR 2A	-	-	-	482	-	-	-	-	-	-
022	CORRIDOR 2B	-	-	-	369	-	-	-	-	-	-
023	CORRIDOR 2C	-	-	-	471	-	-	-	-	-	-
024	CORRIDOR 2D	-	-	-	94	-	-	-	-	-	-
025	ELEVATOR LOBBY 2	B	Existing Business	accessory assembly, less concentrated use without fixed seating	102	7	net	14.57	15	-	-
200	OFFICE 2A	B	Existing Business	concentrated business use	214	150	gross	1.43	2	-	-
201	OFFICE 2B	B	Existing Business	concentrated business use	213	150	gross	1.42	2	1	1
202	OFFICE 2C	B	Existing Business	concentrated business use	217	150	gross	1.45	2	1	1
203	OFFICE 2D	B	Existing Business	concentrated business use	216	150	gross	1.44	2	1	1
204	OFFICE 2E	B	Existing Business	concentrated business use	217	150	gross	1.45	2	1	1
205	OFFICE 2F	B	Existing Business	concentrated business use	216	150	gross	1.44	2	1	1
206	OFFICE 2G	B	Existing Business	concentrated business use	212	150	gross	1.41	2	1	1
207	OFFICE 2H	B	Existing Business	concentrated business use	216	150	gross	1.44	2	1	1
208	TRAINING ROOM 2A	B	Existing Business	collaboration rooms/ spaces < 450 sf in area	215	30	net	7.17	8	1	1
209	OFFICE 2I	B	Existing Business	concentrated business use	213	150	gross	1.42	2	1	1
210	TRAINING ROOM 2B	B	Existing Business	collaboration rooms/ spaces < 450 sf in area	325	30	net	10.83	11	1	1
211	ELEC 2	B	Existing Business	accessory storage	45	500	gross	0.09	1	1	1
212	TELECOM 2	B	Existing Business	accessory storage	70	500	gross	0.14	1	1	1
213	TRAINING ROOM 2C	B	Existing Business	collaboration rooms/ spaces < 450 sf in area	321	30	net	10.70	11	1	1
214	JAN	B	Existing Business	accessory storage	17	30	gross	0.57	1	1	1
215	WOMEN'S RESTROOM	-	-	-	145	-	-	-	-	-	-
216	OFFICE	B	Existing Business	concentrated business use	254	150	gross	1.69	2	-	-
217	BREAK ROOM	B	Existing Business	accessory assembly, concentrated use without fixed seating	225	15	net	15.00	15	1	1
218	MEN'S RESTROOM	-	-	-	157	-	-	-	-	-	-
219	OFFICE 2K	B	Existing Business	concentrated business use	213	150	gross	1.42	2	-	-
220	OFFICE 2J	B	Existing Business	concentrated business use	304	150	gross	2.03	3	-	-
221	OFFICE 2L	B	Existing Business	concentrated business use	213	150	gross	1.42	2	1	1
222	OFFICE 2M	B	Existing Business	concentrated business use	213	150	gross	1.42	2	1	1
223	OFFICE 2N	B	Existing Business	concentrated business use	217	150	gross	1.45	2	1	1
224	OFFICE 2P	B	Existing Business	concentrated business use	216	150	gross	1.44	2	1	1
225	OFFICE 2Q	B	Existing Business	concentrated business use	216	150	gross	1.44	2	1	1
226	OFFICE 2R	B	Existing Business	concentrated business use	216	150	gross	1.44	2	1	1
227	OFFICE 2S	B	Existing Business	concentrated business use	216	150	gross	1.44	2	1	1
228	OFFICE 2T	B	Existing Business	concentrated business use	216	150	gross	1.44	2	1	1
229	OFFICE 2U	B	Existing Business	concentrated business use	213	150	gross	1.42	2	1	1
230	OFFICE 2V	B	Existing Business	concentrated business use	213	150	gross	1.42	2	1	1
								OL of Second Floor	108		

LEGEND

100 — Room number
LOBBY — Room name

Refer to Occupant Load Table for Occupancy Groups.

FE

IBC Section 906
Fire extinguisher Occupancy Group B (moderate-hazard occupancy)
2a, 10-b:c
11,250 maximum square footage per floor, 75 feet maximum travel distance to extinguisher per floor

DOOR 1
36 0.20
90 180

- Egress Component Door or Stair No.
- Egress Factor (Inch/Occupant)
- Calculated Egress Capacity
- Egress Width in Inches
- Egress Load

30 — 30 MINUTE FIRE RATED WALL

ONE HOUR FIRE RATED WALL

Separation of Means of Egress
Exit Access Corridors (NFPA 101 Section 7.1.3.1
Exception 1 - Not Required
Corridor with 1-hour fire resistance rating provided in Existing
Corridors have fire rated walls in existing

Egress Width
(NFPA Table 7.3.3.1 Capacity Factors) (NFPA 101 Section 7.2.1.2.3.2)
Door Width:
108 OL of Second Floor x 0.20 = 21.60"
22.40/3 Egress Doors = 7.20"
= In existing buildings, the existing door leaf width shall be not less than 28".

Actual Minimum Existing Egress Door Width = 34"

Egress Stair Width:
(NFPA Table 7.3.3.1 Capacity Factors) (NFPA 101 Table 7.2.2.2.1.1 (b)) Existing Stairs
108 OL x 0.30 = 32.40" = 36" Minimum width clear of all obstructions, except projections not more than 4½" at or below handrail height on each side

33.60"/3 Egress = 11.20"

Actual Minimum Existing Egress Stair Width = 47"

Travel Distance to Exits
(NFPA 101 Section 39.2.6)
Travel distance to exits shall not exceed 200 ft from any point in a building.

Common Path of Travel
(NFPA 101 Section 39.2.5.2.2)
Common path of travel shall not exceed 100 ft.

Dead-end Corridors
(NFPA 101 Section 39.2.5.3)
Dead-end corridors shall not exceed 50 ft.

A SECOND FLOOR LIFE SAFETY FLOOR PLAN
SCALE: 3/32" = 1'-0" 0 8' 16' 24'

NORTH TRUE N

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

SECOND FLOOR FLOOR LIFE SAFETY PLAN

ENGINEERING PARTNERS
DESIGNED BY: BF
CHECKED BY: YWF
DRAWN BY: AP
APPROVED BY:
SCALE: AS NOTED
HAWAII JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D
DATE: JUNE 2026
DRAWING NO. GI-004
SHEET 8 OF 276 SHTS

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

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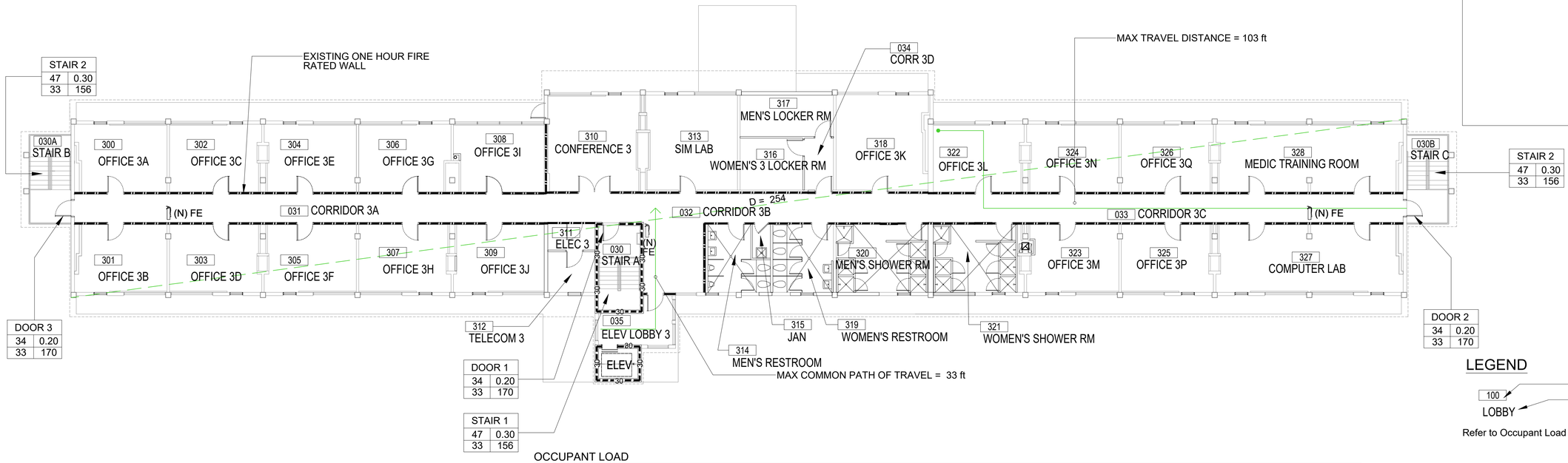

LEGEND

100 — Room number
LOBBY — Room name

Refer to Occupant Load Table for Occupancy Groups.

FE — IBC Section 906
Fire extinguisher Occupancy
Group B (moderate-hazard occupancy)
2a, 10-b:c
11,250 maximum square footage per floor, 75 feet maximum travel distance to extinguisher per floor

DOOR 1
36 0.20
90 180

- Egress Component Door or Stair No.
- Egress Factor (Inch/Occupant)
- Calculated Egress Capacity
- Egress Width in Inches
- Egress Load

30 — 30 MINUTE FIRE RATED WALL

ONE HOUR FIRE RATED WALL

OCCUPANT LOAD

THIRD FLOOR											
030	STAIR A	-	-	-	-	-	-	-	-	-	-
030A	STAIR B	-	-	-	-	-	-	-	-	-	-
030B	STAIR C	-	-	-	-	-	-	-	-	-	-
031	CORRIDOR 3A	-	-	-	472	-	-	-	-	-	-
032	CORRIDOR 3B	-	-	-	394	-	-	-	-	-	-
033	CORRIDOR 3C	-	-	-	472	-	-	-	-	-	-
034	CORRIDOR 3D	-	-	-	54	-	-	-	-	-	-
035	VESTIBULE	B	Existing Business	accessory assembly, concentrated use without fixed seating	150	15	net	10.00	-	-	-
036	ELEVATOR LOBBY 3	B	Existing Business	accessory assembly, less concentrated use without fixed seating	102	7	net	14.57	15	1	1
300	OFFICE 3A	B	Existing Business	concentrated business use	214	150	gross	1.43	2	1	1
301	OFFICE 3B	B	Existing Business	concentrated business use	213	150	gross	1.42	2	1	1
302	OFFICE 3C	B	Existing Business	concentrated business use	217	150	gross	1.45	2	1	1
303	OFFICE 3D	B	Existing Business	concentrated business use	216	150	gross	1.44	2	1	1
304	OFFICE 3E	B	Existing Business	concentrated business use	217	150	gross	1.45	2	1	1
305	OFFICE 3F	B	Existing Business	concentrated business use	216	150	gross	1.44	2	1	1
306	OFFICE 3G	B	Existing Business	concentrated business use	217	150	gross	1.45	2	1	1
307	OFFICE 3H	B	Existing Business	concentrated business use	216	150	gross	1.44	2	-	-
308	OFFICE 3I	B	Existing Business	concentrated business use	211	150	gross	1.41	2	1	1
309	OFFICE 3J	B	Existing Business	concentrated business use	213	150	gross	1.42	2	1	1
310	CONFERENCE 3	B	Existing Business	collaboration rooms/ spaces < 451 sf in area	310	30	net	10.33	11	1	1
311	ELEC 3	B	Existing Business	accessory storage	45	500	gross	0.09	1	1	1
312	TELECOM 3	B	Existing Business	accessory storage	70	500	gross	0.14	1	-	-
313	SIM LAB	B	Existing Business	laboratory	307	50	gross	6.14	7	1	2
314	MEN'S RESTROOM	-	-	-	130	-	-	-	-	-	-
315	JAN	B	Existing Business	accessory storage	22	500	gross	0.04	1	1	1
316	WOMEN'S LOCKER ROOM	B	Existing Business	lockers	118	50	gross	2.36	3	1	1
317	WOMEN'S LOCKER ROOM	B	Existing Business	lockers	139	50	gross	2.78	3	2	2
318	OFFICE 3K	B	Existing Business	concentrated business use	304	150	gross	2.03	3	1	1
319	WOMEN'S RESTROOM	-	-	-	207	-	-	-	-	-	-
320	MEN'S SHOWER ROOM	-	-	-	221	-	-	-	-	-	-
321	WOMEN'S RESTROOM	-	-	-	148	-	-	-	-	-	-
322	OFFICE 3L	B	Existing Business	concentrated business use	213	150	gross	1.42	2	1	1
323	OFFICE 3M	B	Existing Business	concentrated business use	217	150	gross	1.45	2	1	1
324	OFFICE 3N	B	Existing Business	concentrated business use	217	150	gross	1.45	2	1	1
325	OFFICE 3P	B	Existing Business	concentrated business use	216	150	gross	1.44	2	1	1
326	OFFICE 3Q	B	Existing Business	concentrated business use	216	150	gross	1.44	2	1	1
327	COMPUTER LAB	B	Existing Business	laboratory	434	50	net	8.68	9	1	2
328	MEDIC TRAINING ROOM	B	Existing Business	collaboration rooms/ spaces < 451 sf in area	440	30	net	14.67	15	1	2
							OL of Third Floor		99		

Separation of Means of Egress
Exit Access Corridors (NFPA 101 Section 7.1.3.1
Exception 1 - Not Required
Corridor with 1-hour fire resistance rating provided in Existing Corridors have fire rated walls in existing

Egress Width
(NFPA Table 7.3.3.1 Capacity Factors)
Door Width:
99 OL of Second Floor x 0.20 = 19.80"
19.80/3 Egress Doors = 6.60"

Actual Minimum Existing Egress Door Width = 34"

(NFPA 101 Section 7.2.1.2.3.2)
= In existing buildings, the existing door leaf width shall be not less than 28".

Egress Stair Width:
(NFPA Table 7.3.3.1 Capacity Factors)
99 OL x 0.30 = 29.70"

29.70"/3 Egress = 9.90"

Actual Minimum Existing Egress Stair Width = 47"

(NFPA 101 Table 7.2.2.2.1.1 (b)) Existing Stairs = 36" Minimum width clear of all obstructions, except projections not more than 4½" at or below handrail height on each side

Travel Distance to Exits
(NFPA 101 Section 39.2.6)
Travel distance to exits shall not exceed 200 ft from any point in a building.

Common Path of Travel
(NFPA 101 Section 39.2.5.2.2)
Common path of travel shall not exceed 100 ft.

Dead-end Corridors
(NFPA 101 Section 39.2.5.3)
Dead-end corridors shall not exceed 50 ft.

A — THIRD FLOOR LIFE SAFETY FLOOR PLAN
SCALE: 3/32" = 1'-0" 0 8' 16' 24'

NORTH TRUE N

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

THIRD FLOOR FLOOR LIFE SAFETY PLAN

ENGINEERING PARTNERS		HMPNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. GI-005
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 9 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ----

OF _____ DRAWER _____ FOLDER _____

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CONSTRUCTION NOTES:

1. ALL APPLICABLE CONSTRUCTION WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1986, AND STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1984, AS AMENDED OF THE DEPARTMENT OF PUBLIC WORKS (DPW), CITY & COUNTY OF HONOLULU AND THE COUNTIES OF KAUAI, MAUI, AND HAWAII.

2. THE UNDERGROUND PIPES, CABLES OR DUCT LINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.

3. NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION OPERATION SO AS TO CAUSE FALLING ROCK, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW INTO EXISTING STATE DRAINAGE SYSTEMS, OR ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATIONS OCCUR, THE CONTRACTOR MAY BE CITED AND THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS NECESSARY.

4. THE GENERAL CONTRACTOR OF THE PROJECT SHALL BE RESPONSIBLE FOR CONFORMANCE WITH APPLICABLE PROVISIONS OF THE HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 54, "WATER QUALITY STANDARDS." AND TITLE 11, CHAPTER 55, "WATER POLLUTION CONTROL", AS WELL AS CHAPTER 14 OF THE REVISED ORDINANCES OF HONOLULU, AS AMENDED. BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED AT ALL TIMES DURING CONSTRUCTION.

   THE DEVELOPER/OWNER OF THE PROJECT SHALL OBTAIN NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT COVERAGE(S) FOR THE FOLLOWING:

   I. STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES THAT DISTURB ONE (1) ACRE OR MORE, AND
   II. DISCHARGES OF HYDROTESTING EFFLUENT, DEWATERING EFFLUENT, AND WELL DRILLING EFFLUENT TO STATE WATERS.

   IN ACCORDANCE WITH STATE LAW, ALL DISCHARGES RELATED TO PROJECT CONSTRUCTION OR OPERATIONS ARE REQUIRED TO COMPLY WITH STATE WATER QUALITY STANDARDS (HAWAII ADMINISTRATIVE RULES, CHAPTER 11-54). BEST MANAGEMENT PRACTICES SHALL BE USED TO MINIMIZE OR PREVENT THE DISCHARGE OF SEDIMENT, DEBRIS, AND OTHER POLLUTANTS TO STATE WATERS. PERMIT COVERAGE IS AVAILABLE FOR THE DEPARTMENT OF HEALTH, CLEAN WATER BRANCH AT HTTP://HEALTH.HAWAII.GOV/CWB. THE OWNER/DEVELOPER IS RESPONSIBLE FOR OBTAINING OTHER FEDERAL, STATE, OR LOCAL AUTHORIZATIONS AS REQUIRED BY LAW.

5. PURSUANT TO CHAPTER 6E, HRS, IN THE EVENT ANY ARTIFACTS OR HUMAN REMAINS ARE UNCOVERED DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL IMMEDIATELY SUSPEND WORK AND NOTIFY THE HONOLULU POLICE DEPARTMENT, THE STATE DEPARTMENT OF LAND AND NATURAL RESOURCES-HISTORIC PRESERVATION DIVISION (692-8015).

6. PLEASE BE AWARE THAT THERE ARE EXISTING PETROLEUM HYDROCARBON CONTAMINATION IMPACTED SOIL/GROUNDWATER UNDERNEATH THE PAVED CONTAINER YARD IN THIS AREA. THE PROJECT OWNER IS RESPONSIBLE FOR RETAINING A QUALIFIED ENVIRONMENTAL PROFESSIONAL TO OVERSEE THE EXCAVATION AND MANAGE AND DISPOSE OF CONTAMINATED MEDIA PROPERLY. UPON DISCOVERY OF CONTAMINATED UNDERGROUND SOIL/GROUNDWATER, PLEASE NOTIFY THE STATE OF HAWAII DEPARMENT OF HEALTH (HDOH) HAZARD EVALUATION AND EMERGENCY RESPONSE (HEER) OFFICE AND IWILEI DISTRICT PARTICIPATING PARTIES, LCC (IDPP) AT (808) 753-8699 IMMEDIATELY. THE PROJECT OWNER AND CONTRACTOR SHALL WORK AND COORDINATE WITH HDOH HEER OFFICE AND PREPARE/SUBMIT A COPY OF CONSTRUCTION-ENVIRONMENTAL HAZARD MANAGEMENT PLAN (C-EHMP) OR SIMILAR DOCUMENT TO THIS OFFICE FOR APPROVAL PRIOR TO START OF ANY ON-SITE ACTIVITY. THE PROJECT OWNER AND THEIR CONTRACTOR SHALL FOLLOW THE APPROVED (SITE-SPECIFIC) C-EHMP OR SIMILAR DOCUMENT AND ITS ADDENDUM PROPERLY THROUGHOUT THE PROJECT AND FOLLOW HDOH'S APPLICABLE GUIDANCE ACCORDINGLY. A COPY OF SUCH DOCUMENT SHALL BE KEPT ON-SITE AT ALL TIMES.

7. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHENEVER CONSTRUCTION CROSSES OR IN CLOSE PROXIMITY OF UNDERGROUND LINES (INCLUDING BUT NOT LIMITED TO ELECTRIC UNDERGROUND LINES, FUEL OIL PIPELINES, ETC.). FOR VERIFICATION OF UNDERGROUND LINES, THE CONTRACTOR SHALL CALL THE HAWAII ONE-CALL-CENTER AT 866-423-7287 MINIMUM OF FIVE (5) WORKING DAYS IN ADVANCE.

GRADING NOTES:

1. ALL GRADING WORK SHALL BE DONE IN ACCORDANCE WITH CHAPTER 18A, ARTICLES 1, 2, 3 AND 4, AS RELATED TO GRADING, SOIL EROSION AND SEDIMENT CONTROL OF THE REVISED ORDINANCES OF HONOLULU, 2021, AS AMENDED.

2. NO CONTRACTOR SHALL PERFORM ANY GRADING OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATIONS OCCUR, THE CONTRACTOR MAY BE CITED AND THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS NECESSARY.

3. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS CONTAINED IN THE HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 60.1, "AIR POLLUTION CONTROL".

4. THE UNDERGROUND PIPES, CABLES OR DUCT LINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.

5. ADEQUATE PROVISIONS SHALL BE MADE TO PREVENT SURFACE WATERS FROM DAMAGING THE CUT FACE OF AN EXCAVATION OR THE SLOPED SURFACES OF A FILL. FURTHERMORE, ADEQUATE PROVISIONS SHALL BE MADE TO PREVENT SEDIMENT-LADEN RUNOFF FROM LEAVING THE SITE.

6. ALL SLOPES AND EXPOSED AREAS SHALL BE SODDED, PLANTED OR HAVE PERMANENT GRAVEL LANDSCAPING (3" THICK WITH 3/4" TO 1-1/2" DIAMETER AGGREGATE) OR PAVEMENTS AS SOON AS FINAL GRADES HAVE BEEN ESTABLISHED. PLANTING SHALL NOT BE DELAYED UNTIL ALL GRADING WORK HAS BEEN COMPLETED, GRADING TO FINAL GRADE SHALL BE CONTINUOUS, AND ANY AREA WITHIN WHICH WORK HAS BEEN INTERRUPTED OR DELAYED SHALL BE PLANTED.

7. FILLS ON SLOPES STEEPER THAN 5:1 SHALL BE KEYED.

8. THE CITY SHALL BE INFORMED OF THE LOCATION OF THE BORROW/DISPOSAL SITE FOR THE PROJECT WHEN THE APPLICATION FOR A GRADING PERMIT IS MADE. THE BORROW/DISPOSAL SITE MUST ALSO FULFILL THE REQUIREMENTS OF THE GRADING ORDINANCE.

9. NO GRADING WORK SHALL BE DONE ON SATURDAYS, SUNDAYS AND HOLIDAYS AT ANY TIME WITHOUT PRIOR NOTICE TO THE DIRECTOR, D.P.P., PROVIDED SUCH GRADING WORK IS ALSO IN CONFORMANCE WITH THE COMMUNITY NOISE CONTROL STANDARDS CONTAINED IN THE HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 46, "COMMUNITY NOISE CONTROL".

10. THE LIMITS OF THE AREA TO BE GRADED SHALL BE FLAGGED BEFORE THE COMMENCEMENT OF THE GRADING WORK.

11. THE GENERAL CONTRACTOR OF THE PROJECT SHALL BE RESPONSIBLE FOR CONFORMANCE WITH APPLICABLE PROVISIONS OF THE HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 54, "WATER QUALITY STANDARDS." AND TITLE 11, CHAPTER 55, "WATER POLLUTION CONTROL", AS WELL AS CHAPTER 18A OF THE REVISED ORDINANCES OF HONOLULU, AS AMENDED. BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED AT ALL TIMES DURING CONSTRUCTION.

    THE DEVELOPER/OWNER OF THE PROJECT SHALL OBTAIN NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT COVERAGE(S) FOR THE FOLLOWING:

    I. STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES THAT DISTURB ONE (1) ACRE OR MORE, AND
    II. DISCHARGES OF HYDROTESTING EFFLUENT, DEWATERING EFFLUENT, AND WELL DRILLING EFFLUENT TO STATE WATERS.

    IN ACCORDANCE WITH STATE LAW, ALL DISCHARGES RELATED TO PROJECT CONSTRUCTION OR OPERATIONS ARE REQUIRED TO COMPLY WITH STATE WATER QUALITY STANDARDS (HAWAII ADMINISTRATIVE RULES, CHAPTER 11-54). BEST MANAGEMENT PRACTICES SHALL BE USED TO MINIMIZE OR PREVENT THE DISCHARGE OF SEDIMENT, DEBRIS, AND OTHER POLLUTANTS TO STATE WATERS. PERMIT COVERAGE IS AVAILABLE FOR THE DEPARTMENT OF HEALTH, CLEAN WATER BRANCH AT HTTP://HEALTH.HAWAII.GOV/CWB. THE OWNER/DEVELOPER IS RESPONSIBLE FOR OBTAINING OTHER FEDERAL, STATE, OR LOCAL AUTHORIZATIONS AS REQUIRED BY LAW.

12. WHERE APPLICABLE AND FEASIBLE THE MEASURES TO CONTROL EROSION AND OTHER POLLUTANTS SHALL BE IN PLACE BEFORE ANY EARTH MOVING PHASE OF THE GRADING IS INITIATED.

13. TEMPORARY EROSION CONTROLS SHALL NOT BE REMOVED BEFORE PERMANENT EROSION CONTROLS ARE IN-PLACE AND ESTABLISHED.

14. TEMPORARY EROSION CONTROL PROCEDURES SHALL BE SUBMITTED FOR APPROVAL PRIOR TO APPLICATION FOR GRADING PERMIT.

15. IF THE GRADING WORK INVOLVES CONTAMINATED SOIL, THEN ALL GRADING WORK SHALL BE DONE IN CONFORMANCE WITH APPLICABLE STATE AND FEDERAL REQUIREMENTS.

16. FOR NON-CITY PROJECTS, THE CONTRACTOR SHALL NOTIFY THE CIVIL ENGINEERING BRANCH, D.P.P. AT 768-8084 TO ARRANGE FOR INSPECTIONAL SERVICES AND SUBMIT TWO (2) SETS OF APPROVED CONSTRUCTION PLANS SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION WORK. FOR CITY PROJECTS, THE CONTRACTOR SHALL COORDINATE INSPECTIONAL SERVICES WITH THE RESPONSIBLE CITY AGENCY.

17. PURSUANT TO CHAPTER 6E, HRS, IN THE EVENT ANY ARTIFACTS OR HUMAN REMAINS ARE UNCOVERED DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL IMMEDIATELY SUSPEND WORK AND NOTIFY THE HONOLULU POLICE DEPARTMENT, THE STATE DEPARTMENT OF LAND AND NATURAL RESOURCES-HISTORIC PRESERVATION DIVISION (692-8015). IN ADDITION, FOR NON-CITY PROJECTS, THE CONTRACTOR SHALL INFORM THE CIVIL ENGINEERING BRANCH, D.P.P. (768-8084), AND FOR CITY PROJECTS, NOTIFY THE RESPONSIBLE CITY AGENCY.

18. FOR ALL PROJECTS, WHICH WILL DISTURB ONE (1) ACRE OR MORE OF LAND, THE CONTRACTOR SHALL NOT START CONSTRUCTION UNTIL A NOTICE OF GENERAL PERMIT COVERAGE (NGPC) IS RECEIVED FROM THE DEPARTMENT OF HEALTH, STATE OF HAWAII, AND HAS SATISFIED ANY OTHER APPLICABLE REQUIREMENTS OF THE NPDES PERMIT PROGRAM. ALSO, FOR NON-CITY AND NON-GOVERNMENTAL PROJECTS, THE CONTRACTOR SHALL PROVIDE A WRITTEN COPY OF THE NPGC TO THE PERMITTING AND INSPECTION SECTION, CIVIL ENGINEERING BRANCH, D.P.P., AT LEAST SEVEN (7) CALENDAR DAYS BEFORE THE START OF THE CONSTRUCTION. FOR CITY OR OTHER GOVERNMENTAL PROJECTS, THE CONTRACTOR SHOULD PROVIDE A WRITTEN COPY OF THE NGPC TO THE APPROPRIATE CITY DEPARTMENT OR GOVERNMENTAL AGENCY PER THEIR REQUIREMENTS.

19. ALL GRADING AND CONSTRUCTION WORK SHALL IMPLEMENT MEASURES TO ENSURE THAT THE DISCHARGE OF POLLUTANTS FROM THE CONSTRUCTION SITE WILL BE REDUCED TO THE MAXIMUM EXTENT PRACTICABLE AND WILL NOT CAUSE OR CONTRIBUTE TO AN EXCEEDANCE OF WATER QUALITY STANDARDS.

20. NON-COMPLIANCE TO ANY OF THE ABOVE REQUIREMENTS SHALL MEAN IMMEDIATE SUSPENSION OF ALL WORK, AND REMEDIAL WORK SHALL COMMENCE IMMEDIATELY. ALL COSTS INCURRED SHALL BE BILLED TO THE VIOLATOR. FURTHERMORE, VIOLATORS SHALL BE SUBJECTED TO ADMINISTRATIVE, CIVIL AND/OR CRIMINAL PENALTIES.

21. FOR BENCHMARK, SEE SHEET C102.

ABBREVIATIONS:

AC, A/C	ASPHALTIC CONCRETE
ADA	AMERICANS WITH DISABILITIES ACT
APP, APPROX	APPROXIMATE
ARV	AIR RELIEF VALVE
ATB	ASPHALT TREATED BASE
BC	BOTTOM OF CURB / BOLT CIRCLE
BDC	BOTTOM OF DROP CURB
BFP	BACKFLOW PREVENTER
BLK(S)	BLOCK(S)
BLDG	BUILDING
BOT.	BOTTOM
BRC	BOTTOM OF ROLLED CURB
BW	BOTTOM OF WALL
℄	CENTERLINE
CB	CATCH BASIN
CCH	CITY AND COUNTY OF HONOLULU
CFS/CFS	CUBIC FEET PER SECOND
CL	CLASS
CLF	CHAIN LINK FENCE
CLR	CLEARANCE
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
COTG	CLEANOUT TO GRADE
CONC	CONCRETE
CONN	CONNECTION
CORP	CORPORATION
CP	CONTROL POINT
CPLG.	COUPLING
CRM	CEMENT RUBBLE MASONRY
CU	CUBIC
CY	CUBIC YARDS
D	DRAIN, DIAMETER
DEFL	DEFLECTION
DET	DETAIL
DI	DUCTILE IRON, DRAIN INLET, DROP INLET
DIA.	DIAMETER
DMH	DRAIN MANHOLE
DRWY/DW	DRIVEWAY
E	EAST, ELECTRIC
EA	EACH
EAC	EDGE AC PAVEMENT
EG	EXISTING GROUND
EL, ELEV	ELEVATION
EMH	ELECTRIC MANHOLE
EVC	END VERTICAL CURVE
EOH	ELECTRICAL OVERHEAD
EP	ELECTRICAL POLE
EW	EACH WAY
EXIST, EX	EXIST, EXISTING
FHWA	FEDERAL HIGHWAY ADMINISTRATION
FL	FLOOD LINE
FPS	FEET PER SECOND
FT	FEET
GD	GROUND
GP	GUY POLE
GV	GATE VALVE
GUY	GUY WIRE
GW	GUY WIRE
HB	HOSE BIB
HD	HEAD
HGL	HYDRAULIC GRADE LINE
HT, H	HEIGHT
HN	HEAD NUT
HT WALL	HOLLOW TILE WALL
HP	HIGH POINT
HORIZ/HOR	HORIZONTAL
HR	HOUR
HDPE	HIGH DENSITY POLYETHYLENE
ICV	IRRIGATION CONTROL VALVE
IE	INVERT ELEVATION
IN	INCHES
INV	INVERT
IPT	INTERNAL PIPE THREAD
I.D.	INNER DIAMETER
JKT	JACKET
LG	LONG
LN	LOCKNUT
LW	LOCK WASHER
MB	MAIL BOX
MON	MONUMENT
O/H	OVERHEAD
PAVT	PAVEMENT
POC	POINT OF CONNECTION
PROF	PROFILE
PROP.	PROPOSED
PSI	POUND PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
S	SEWER, SLOPE, SPREAD
SDMH	STORM DRAIN MANHOLE
SF	SQUARE FOOT
SHT	SHEET
SL	STREET LIGHT
SLB	STREET LIGHT BOX
SMH	SEWER MANHOLE
SYMM	SYMMETRICAL
SST/SS	STAINLESS STEEL
ST	STREET
STA	STATION
STD	STANDARD
STRUCT	STRUCTURAL
SQ	SQUARE
TC	TOP OF CURB
TDC	TOP OF DROP CURB
TEMP	TEMPERATURE
THK	THICK
TMH	TELEPHONE MANHOLE
TP	TELEPHONE POLE
TRC	TOP OF ROLLED CURB
TREE- (D= DIAMETER OF TRUNK) (H= HEIGHT) (S= SPREAD)	
TSB	TRAFFIC SYSTEM BOX
TSL	TRAFFIC SYSTEM LIGHT
TS	TOP STEM
TV	TOP VERTICAL
TW	TOP OF WALL
TYP	TYPICAL
UC	UNDERGROUND CABLE
UE	UNDERGROUND ELECTRICAL
UP	UTILITY POLE
UT	UNDERGROUND TELEPHONE
VB	VALVE BOX
VC	VERTICAL CURVE
VH	VALVE HANDLE
V, VERT	VERTICAL
W	WATER, WEST
W/	WITH
WL	WATERLINE
W.L.	WATER LEVEL
WM	WATER METER
WMH	WATER MANHOLE
WV	WATER VALVE
WVHH	WATER VALVE HAND HOLE
WWF	WELDED WIRE FABRIC

LEGEND:

—— - - ——	PROPERTY LINE
-----S6-----	PROPOSED SEWERLINE
— —D6— —	PROPOSED DRAINLINE
——W6——	PROPOSED WATERLINE
——5——	PROPOSED CONTOUR MAJOR
——6——	PROPOSED CONTOUR MINOR
····30····	EXIST. CONTOUR MAJOR
····21····	EXIST. CONTOUR MINOR
—— x — x ——	SILT FENCE
—— —— ——	LIMITS OF GRADING
_O_	SIGN
⊡	CONE
⊗	POLICE
25.05	SPOT ELEVATION (PROPOSED)
25.05±	SPOT ELEVATION (EXIST.)
—— W8 ———	EXIST. WATERLINE W/ SIZE
---- S8 -----	EXIST. SEWERLINE W/ SIZE
--- D12 ---	EXIST. DRAINAGE LINE W/ SIZE
—— G ——	EXIST. GASLINE
~→ ~→	EXIST. SURFACE FLOW
→ →	PROPOSED SURFACE FLOW

REV NO	DESCRIPTION	DATE

TY J. DEMPSEY
LICENSED PROFESSIONAL ENGINEER
No. 12058-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

APRIL 30, 2028
EXPIRATION DATE OF THE LICENSE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA , KAPOLEI, OAHU, HAWAII

NOTES, LEGEND & ABBREVIATIONS

ENGINEERING PARTNERS

DESIGNED BY: KA	CHECKED BY: TD	HAWAII JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. C-001
DRAWN BY: KA	APPROVED BY:	DATE: JUNE 2026	SHEET 10 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

EROSION PREVENTION & SEDIMENT CONTROL NOTES:

1. THE CONTRACTOR SHALL FOLLOW THE GUIDELINES IN THE CITY AND COUNTY OF HONOLULU'S "RULES RELATING TO WATER QUALITY".
2. SEE SHEET C101 FOR EROSION AND SEDIMENT CONTROL PLAN.
3. THE OWNER OF THE PROPERTY OR AUTHORIZED AGENT SHALL DESIGNATE A PERSON RESPONSIBLE FOR IMPLEMENTING THE EROSION AND SEDIMENT CONTROL PLAN AT THE PROJECT SITE (ESCP COORDINATOR) PRIOR TO PERMIT ISSUANCE USING THE FORM PROVIDED AS APPENDIX A OF THE RULES RELATING TO WATER QUALITY TO THE DEPARTMENT OF PLANNING AND PERMITTING AT TIME OF OBTAINING THE PERMIT.
4. THE CONTRACTOR SHALL DEVELOP A PROJECT SCHEDULE ESTABLISHING THE SEQUENCE OF WORK. LAND DISTURBING ACTIVITIES, IMPLEMENTATION OF BMPS, SCHEDULED INSPECTIONS AND MAINTENANCE OF THE BMPS, AND REMOVAL OF THE TEMPORARY BMPS SHALL BE INCLUDED IN THE PROJECT SCHEDULE. THE SCHEDULED START DATE SHALL BE SUBMITTED TO THE DIRECTOR IN WRITING AT LEAST 2 WEEKS PRIOR TO COMMENCING WORK.
5. MEASURES TO CONTROL EROSION AND OTHER POLLUTANTS SHALL BE IN PLACE BEFORE ANY EARTHWORK IS INITIATED.
6. TEMPORARY STABILIZATION. TEMPORARY STABILIZATION IS REQUIRED ON DISTURBED AREAS WHICH ARE AT FINAL GRADE OR WHEN THE DISTURBED AREA WILL NOT BE WORKED FOR 14 CONSECUTIVE DAYS OR MORE.
7. PERMANENT STABILIZATION. ALL DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED USING VEGETATIVE COVERING, PAVEMENT, OR EQUIVALENT, PRIOR TO REMOVING EROSION AND SEDIMENT MEASURES. TRAPPED SEDIMENT AND AREAS OF DISTURBED SOIL WHICH RESULT FROM THE REMOVAL OF THE TEMPORARY MEASURES SHALL BE IMMEDIATELY AND PERMANENTLY STABILIZED.
8. PRESERVE EXISTING VEGETATION. CLEARLY MARK THE EXISTING VEGETATIVE AREAS TO BE PRESERVED WITH FLAGS OR TEMPORARY FENCING. WHERE TEMPORARY FENCING IS USED, FENCING MUST BE ADEQUATELY SUPPORTED BY POSTS AND MAINTAINED IN AN UPRIGHT POSITION.
9. MINIMIZE SOIL COMPACTION. AREAS WHERE FINAL VEGETATIVE STABILIZATION OR INFILTRATION PRACTICES WILL BE INSTALLED SHALL BE PROTECTED FROM EXCESSIVE COMPACTION DURING CONSTRUCTION. VEHICLE AND EQUIPMENT USE SHALL BE RESTRICTED OR TECHNIQUES TO CONDITION THE SOILS TO SUPPORT VEGETATION SHALL BE IMPLEMENTED IN THE AREAS THAT HAVE BEEN COMPACTED AND ARE DESIGNATED TO REMAIN VEGETATIVE OR POST-CONSTRUCTION INFILTRATION AREAS. CLEARLY MARK THE AREAS TO BE AVOIDED WITH FLAGS OR TEMPORARY FENCING. WHERE TEMPORARY FENCING IS USED, FENCING MUST BE ADEQUATELY SUPPORTED BY POSTS AND MAINTAINED IN AN UPRIGHT POSITION.
10. PERIMETER CONTROLS. PERIMETER CONTROLS ARE REQUIRED DOWN SLOPE OF ALL DISTURBED AREAS. MAINTAIN DOWNSTREAM VEGETATED BUFFER AREA.
11. INLET PROTECTION
    - ALL STORM DRAIN INLETS ONSITE AND THOSE OFFSITE WHICH MAY RECEIVE RUNOFF FROM THE SITE SHALL USE AN INLET PROTECTION DEVICE UNLESS THEY ARE DIRECTED TO A SEDIMENT BASIN.
    - SEDIMENT LEVELS MAY NOT EXCEED ONE THIRD OF THE HEIGHT OF A SEDIMENT BARRIER OR INLET PROTECTION DEVICE AT ANY POINT ALONG THE LENGTH OF THE SEDIMENT BARRIER OR THE INLET PROTECTION DEVICE.
    - SEDIMENT BARRIERS AND INLET PROTECTION DEVICES MUST BE UNCLOGGED AND CLEANED WHEN PERFORMANCE IS COMPROMISED.
    - TORN, WEATHERED OR SAGGING SEDIMENT BARRIERS OR INLET PROTECTION DEVICES MUST BE REPAIRED OR REPLACED IMMEDIATELY.
12. TRACKING CONTROL. MINIMIZE SEDIMENT TRACK-OUT ONTO OFF-SITE STREETS, OTHER PAVED AREAS, AND SIDEWALKS FROM VEHICLES EXITING THE CONSTRUCTION SITE BY RESTRICTING VEHICLE TRAFFIC TO PROPERLY DESIGNATED AREAS AND USING ADDITIONAL CONTROLS TO REMOVED SEDIMENT FROM VEHICLE TIRES PRIOR TO EXITING THE SITE. VEHICULAR PARKING AND MOVEMENTS ON PROJECT SITES MUST BE CONFINED TO PAVED SURFACED OR PREDEFINED PARKING AREAS AND VEHICLE PATHS, WHICH SHALL BE MARKED WITH FLAGS OR BOUNDARY FENCING. ALL POLLUTANTS AND MATERIALS THAT ARE DROPPED, WASHED, TRACKED, SPILLED, OR OTHERWISE DISCHARGED FROM A PROJECT SITE TO OFF-SITE STREETS, OTHER PAVED AREAS, SIDEWALKS OR THE MS4 MUST BE CLEANED USING DRY METHODS SUCH AS SWEEPING OR VACUUMING. WASHING POLLUTANTS AND MATERIALS THAT ARE DISCHARGED FROM THE PROJECT SITE TO THE MS4 INTO DRAIN INLETS OR CATCH BASINS IS PROHIBITED UNLESS THE MATERIAL IS SEDIMENT AND THE INLETS ARE DIRECTED TO A SEDIMENT BASIN OR SEDIMENT TRAP.
13. BEST MANAGEMENT PRACTICES (BMPS) SHALL NOT BE REMOVED UNTIL FINAL STABILIZATION IS COMPLETE FOR THAT PHASE.
14. REFER TO CITY AND COUNTY OF HONOLULU BEST MANAGEMENT PRACTICES MANUAL - CONSTRUCTION, FOR MORE INFORMATION ON BMPS.
15. THE FOLLOWING BMPS WERE DETERMINED TO BE NOT APPLICABLE BASED ON THE SPECIFIC SITE CONDITIONS. AS CONSTRUCTION PROGRESSES, REVISIONS MAY BE NECESSARY AND WILL BE PROVIDED TO DPP INSPECTORS. A BRIEF EXPLANATION OF WHY EACH OMITTED BMP IS NOT NECESSARY OR IMPRACTICABLE FOR THE PROJECT HAS BEEN PROVIDED UNDER SEPARATE DOCUMENTATION TO DPP.
    - DEWATERING PRACTICES ARE NOT APPLICABLE
    - DIVERSION BMPS TO DIVERT RUNOFF FROM UPSTREAM AREAS AROUND DISTURBED AREAS OF THE SITE ARE NOT APPLICABLE
    - VELOCITY DISSIPATION DEVICES ARE NOT APPLICABLE

EROSION & SEDIMENT CONTROL PLAN SCHEDULE:

1. INSTALL STABILIZED CONSTRUCTION ENTRANCES, PERIMETER CONTROLS, AND TEMPORARY FENCING FOR PROTECTED AREAS, CLEARING AND GRUBBING AS NECESSARY FOR THE INSTALLATION OF THESE BMPS.
2. COMMENCE SITE GRADING ACTIVITIES.
3. RELOCATE, RECONSTRUCT AND MAINTAIN BMPS AS NEEDED TO KEEP THEM EFFECTIVE AT ALL TIMES. INITIATE TEMPORARY STABILIZATION IMMEDIATELY ONCE GRADING IS COMPLETED IN EACH AREA OF WORK.
4. PROCEED WITH CONSTRUCTION WITH LEAST POSSIBLE DISTURBANCE OF VEGETATIVE AREAS AND TEMPORARY STRUCTURES.
5. PLANT PERMANENT GROUND COVER ACCORDING TO THE LANDSCAPING PLAN OR GRAVEL AGGREGATE SURFACING ON THE ACCESS AND EQUIPMENT PAD AREAS AS SOON AS POSSIBLE.
6. REMOVE OR DISMANTLE TEMPORARY EROSION CONTROL STRUCTURES AFTER FULL ESTABLISHMENT OF PERMANENT VEGETATIVE COVER.
7. PRACTICE GOOD HOUSEKEEPING MEASURES THROUGH THE DURATION OF CONSTRUCTION.
8. INSPECTIONS WILL BE PERFORMED MONTHLY.

RAIN RESPONSE PLAN:

1. THE FOLLOWING WILL BE PERFORMED WHEN HEAVY RAINS, TROPICAL STORM OR HURRICANE IS IMMINENT OR IS FORECASTED IN THE NEXT 48 HOURS:
2. TEMPORARY SUSPENSION OF ACTIVE CONSTRUCTION.
3. INSPECT STABILIZED CONSTRUCTION ENTRANCE AND ALL TEMPORARY FENCING, PERIMETER CONTROLS, AND INLET PROTECTION DEVICES, AND MAINTAIN AS NEEDED. REINSTALL ANY PERIMETER CONTROLS THAT WERE REMOVED DUE TO ACTIVE WORK IN THE AREA. IF A SEVERE STORM IS EXPECTED, REMOVE INLET PROTECTION DEVICE TO PREVENT FLOODING ON SURROUNDING STREETS.
4. COVER OR RELOCATE MATERIAL STOCKPILES AND LIQUID MATERIAL CONTAINERS TO AVOID CONTACT WITH RAINWATER.
5. PLACE SPILL PANS OR OIL-ONLY SPILL PADS UNDER CONSTRUCTION VEHICLES TO PREVENT RUNOFF FROM CONTACTING ANY SPILLED PETROLEUM PRODUCTS. PROPERTY DISPOSE OF ANY ACCUMULATED OILY WATER AFTER THE RAIN EVENT.
6. RE-INSPECT AFTER THE APPROACHING HEAVY RAINS, TROPICAL STORM OR HURRICANE AND REPLACE OR MAINTAIN BMPS AS NEEDED.

GOOD HOUSEKEEPING BMPS:

1. BMP AND SITE MAINTENANCE SHALL INCLUDE:

   FILTER SOCKS

   CONTRACTOR TO MAINTAIN EROSION CONTROL PROVISIONS THROUGHOUT ALL PHASES OF CONSTRUCTION WORK, AND ADJUST THE LOCATIONS AND CONFIGURATIONS OF SITE BMPS AS REQUIRED TO ACCOMMODATE THE WORK INVOLVED.
2. DURING CONSTRUCTION, PREVENTATIVE MEASURES SHALL BE USED TO CONTROL FORESEEABLE DUST, EROSION OR SEDIMENTATION PROBLEMS WHICH MAY ARISE AS THE JOB PROGRESSES.
3. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH. DUST CONTROL SHOULD BE APPLIED TO REDUCE DUST EMISSIONS. CONTRACTOR SHALL WATER DURING CONSTRUCTION TO CONTROL DUST.
4. STREET SWEEPING AND VACUUMING. ALL POLLUTANTS DISCHARGED FROM CONSTRUCTION SITE TO OFF-SITE AREAS MUST BE SWEPT OR VACUUMED EACH DAY BEFORE LEAVING THE JOB SITE.
5. MATERIALS DELIVERY, STORAGE AND USE MANAGEMENT. PREVENT, REDUCE, OR ELIMINATE THE DISCHARGE OF POLLUTANTS FROM MATERIAL DELIVERY, STORAGE, AND USE TO THE STORM WATER SYSTEM OR WATERCOURSES BY MINIMIZING THE STORAGE OF HAZARDOUS MATERIALS ONSITE, STORING MATERIALS IN A DESIGNATED AREA, INSTALLING SECONDARY CONTAINMENT. CONSTRUCTION MATERIALS, WASTE, TOXIC AND HAZARDOUS SUBSTANCES, STOCKPILES AND OTHER SOURCES OF POLLUTION SHALL NOT BE STORED IN BUFFER AREAS, NEAR AREAS OF CONCENTRATED FLOW, OR AREAS ABUTTING THE MS4, RECEIVING WATERS, OR DRAINAGE IMPROVEMENTS THAT DISCHARGE OFF-SITE. PRIMARY AND SECONDARY CONTAINMENT CONTROLS AND COVERS SHALL BE IMPLEMENTED TO THE MAXIMUM EXTENT PRACTICABLE.
6. SPILL PREVENTION AND CONTROL. CREATE AND IMPLEMENT SPILL PREVENTION AND RESPONSE PLANS TO ELIMINATE AND MINIMIZE THE DISCHARGE OF POLLUTANTS TO THE MS4 AND RECEIVING WATERS FROM LEAKS AND SPILLS BY REDUCING THE CHANCE FOR SPILLS, ABSORBING, CONTAINING, AND CLEANING UP SPILLS AND PROPERLY DISPOSING OF SPILL MATERIALS. AT A MINIMUM, ALL PROJECTS SHALL CLEANUP ALL LEAKS AND SPILLS IMMEDIATELY.
7. HAZARDOUS MATERIALS. PREVENT OR REDUCE THE DISCHARGE OF POLLUTANTS TO STORM WATER FROM HAZARDOUS WASTE THROUGH PROPER MATERIAL USE AND WASTE DISPOSAL. IN THE EVENT THAT HAZARDOUS MATERIALS ARE DISCHARGED TO THE MS4, THE PROPERTY OWNER OR ESCP COORDINATOR SHALL IMMEDIATELY NOTIFY THE DEPARTMENT OF FACILITIES MAINTENANCE, HONOLULU FIRE DEPARTMENT, AND HONOLULU POLICE DEPARTMENT OF THE DISCHARGE BY TELEPHONE. A WRITTEN REPORT DESCRIBING THE POLLUTANTS THAT WERE DISCHARGES, THE REASONS FOR THE DISCHARGE, AND THE MEASURES THAT HAVE BEEN TAKEN OR WILL BE TAKEN TO PREVENT A REOCCURRENCE OF THE DISCHARGE SHALL BE SUBMITTED TO THE DIRECTOR NO LESS THAN 3 DAYS AFTER NOTIFICATION BY PHONE.
8. NON-HAZARDOUS MATERIALS. IN THE EVENT THE NON-HAZARDOUS MATERIALS ARE DISCHARGED TO THE MS4, THE PROPERTY OWNER OR ESCP COORDINATOR SHALL NOTIFY THE CITY DEPARTMENT OF FACILITIES MAINTENANCE BY TELEPHONE NO LATER THAN THE NEXT BUSINESS DAY. A WRITTEN REPORT DESCRIBING THE POLLUTANTS THAT WERE DISCHARGES, THE REASONS FOR THE DISCHARGE, AND THE MEASURES THAT HAVE BEEN TAKEN OR WILL BE TAKEN TO PREVENT A REOCCURRENCE OF THE DISCHARGE SHALL BE SUBMITTED TO THE DIRECTOR NO LESS THAN 3 DAYS AFTER NOTIFICATION BY PHONE.
9. VEHICLE AND EQUIPMENT CLEANING. ELIMINATE AND MINIMIZE THE DISCHARGE OF POLLUTANTS TO STORM WATER FROM VEHICLES AND EQUIPMENT CLEANING OPERATIONS BY USING OFF-SITE FACILITIES WHEN FEASIBLE, WASHING IN DESIGNATED, CONTAINED AREAS ONLY, AND ELIMINATING DISCHARGE TO THE STORM DRAIN SYSTEM BY EVAPORATING AND/OR TREATING WASH WATER, AS APPROPRIATE OR INFILTRATING WASH WATER FOR EXTERIOR CLEANING ACTIVITIES THAT USE WATER ONLY.
10. VEHICLE AND EQUIPMENT FUELING. PREVENT FUEL SPILLS AND LEAKS BY USING OFF-SITE FACILITIES, FUELING ONLY IN DESIGNATED AREAS, ENCLOSING OR COVERING STORED FUELS, AND IMPLEMENTING SPILL CONTROLS SUCH AS SECONDARY CONTAINMENT AND ACTIVE MEASURES USING SPILL RESPONSE KITS.
11. VEHICLE AND EQUIPMENT MAINTENANCE. ELIMINATE AND MINIMIZE THE DISCHARGE OF POLLUTANTS TO STORM WATER FROM VEHICLE AND EQUIPMENT MAINTENANCE OPERATIONS BY USING OFF-SITE FACILITIES WHEN FEASIBLE, PERFORMING WORK IN DESIGNATED AREAS ONLY, USING SPILL PADS UNDER VEHICLES AND EQUIPMENT, CHECKING FOR LEAKS AND SPILLS, AND CONTAINING AND CLEANING UP SPILLS IMMEDIATELY.
12. SOLID WASTE MANAGEMENT. PREVENT OR REDUCE DISCHARGE OF POLLUTANTS TO THE LAND, GROUNDWATER, AND IN STORM WATER FROM SOLID WASTE OR CONSTRUCTION AND DEMOLITION WASTE BY PROVIDING DESIGNED WASTE COLLECTION AREAS, COLLECT SITE TRASH DAILY, AND ENSURING THE CONSTRUCTION WASTE IS COLLECTED, REMOVED, AND DISPOSED OF ONLY AT AUTHORIZED DISPOSAL AREAS.
13. SANITARY/SEPTIC WASTE MANAGEMENT. TEMPORARY AND PORTABLE SANITARY AND SEPTIC WASTE SYSTEMS SHALL BE MOUNTED OR STAKED IN, WELL-MAINTAINED AND SCHEDULED FOR REGULAR WASTE DISPOSAL AND SERVICING. SOURCES OF SANITARY AND/OR SEPTIC WASTE SHALL NOT BE STORED NEAR THE MS4 OR RECEIVING WATERS.
14. STOCKPILE MANAGEMENT. STOCKPILES SHALL NOT BE LOCATED IN DRAINAGE WAYS, WITHIN 50 FEET FROM AREAS OF CONCENTRATED FLOWS, AND ARE NOT ALLOWED IN THE CITY RIGHT-OF-WAY. SEDIMENT BARRIERS OR SILT FENCES SHALL BE USED AROUND THE BASE OF ALL STOCKPILES. STOCKPILES SHALL NOT EXCEED 15 FEET IN HEIGHT. STOCKPILES GREATER THAN 15 FEET IN HEIGHT SHALL REQUIRE 8 FOOT WIDE BENCHING IN ACCORDANCE WITH ROH CHAPTER 18A, ARTICLE 3. STOCKPILES MUST BE COVERED WITH PLASTIC SHEETING OR A COMPARABLE MATERIAL IF THEY WILL NO BE ACTIVELY USED WITHIN 7 DAYS.
15. LIQUID WASTE MANAGEMENT. LIQUID WASTE SHALL BE CONTAINED IN A CONTROLLED AREA SUCH AS A HOLDING PIT, SEDIMENT BASIN, ROLL-OFF BIN, OR PORTABLE TANK OF SUFFICIENT VOLUME AND TO CONTAIN THE LIQUID WASTES GENERATED. CONTAINMENT AREAS OR DEVICES MUST BE IMPERMEABLE AND LEAK FREE AND SHOULD NOT BE LOCATED WHERE ACCIDENTAL RELEASE OF THE CONTAINED LIQUID CAN DISCHARGE TO WATER BODIES, CHANNELS, OR STORM DRAINS.
16. CONCRETE WASTE MANAGEMENT. PREVENT OR REDUCE THE DISCHARGE OF POLLUTANTS TO STORM WATER FROM CONCRETE WASTE BY CONDUCTING WASHOUT OFF-SITE OF PERFORMING ONSITE WASHOUT IN A DESIGNATED AREA CONSTRUCTED AND MAINTAINED IN SUFFICIENT QUANTITY AND SIZE TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS. PLASTIC LINING MATERIAL SHOULD BE A MINIMUM OF 10 MILLIMETER POLYETHYLENE SHEETING AND SHOULD BE FREE OF HOLES, TEARS, OR OTHER DEFECTS THAT COMPROMISE THE IMPERMEABILITY OF THE MATERIAL. CONTAINMENT AREAS OR DEVICES SHOULD NOT BE LOCATED WHERE ACCIDENTAL RELEASE OF THE CONTAINED LIQUID CAN DISCHARGE TO WATER BODIES, CHANNELS, OR STORM DRAINS. WASHOUT FACILITIES MUST BE CLEANED, OR NEW FACILITIES MUST BE CONSTRUCTED AND READY FOR USE ONCE THE WASHOUT IS 75 PERCENT FULL. ONCE CONCRETE WASTES ARE WASHED IN THE DESIGNATED AREA AND ALLOWED TO HARDEN, THE CONCRETE SHOULD BE BROKEN UP, REMOVED, AND DISPOSED OF AS SOLID WASTES.
17. CONTAMINATED SOIL MANAGEMENT. AT MINIMUM, CONTAIN CONTAMINATED SOIL BY SURROUNDING WITH IMPERMEABLE LINED BERMS OR COVER EXPOSED CONTAMINATED MATERIAL WITH PLASTIC SHEETING. CONTAMINATED SOIL SHOULD BE DISPOSED OF PROPERLY IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS.

ESCP INSPECTION NOTES:

1. AT LEAST TWO WEEKS BEFORE THE BEGINNING CONSTRUCTION, THE CONTRACTOR OR THE PERSON IN CHARGE OF CONSTRUCTION SHALL NOTIFY THE STORM WATER INSPECTOR LISTED ON THE BUILDING PERMIT.
2. AFTER INSTALLING THE CONSTRUCTION BMPS AND MOBILIZING ANY CONSTRUCTION APPARATUS IN ACCORDANCE WITH THE APPROVED ESCP (OR APPENDIX B - ESCP FOR SMALL PROJECT TEMPLATE), THE CONTRACTOR OR THE PERSON IN CHARGE OF CONSTRUCTION SHALL CONTACT THE ESCP COORDINATOR LISTED ON THE BUILDING PERMIT, FOR A PRECONSTRUCTION INSPECTION.
3. THE ESCP COORDINATOR SHALL SUBMIT THE PRECONSTRUCTION INSPECTION CHECKLIST TO THE STORM WATER INSPECTOR (EMAIL TO DPP.NPDES@HONOLULU.GOV) CONFIRMING THE BMPS AND GOOD HOUSE KEEPING MEASURES ARE IN COMPLIANCE, BEFORE THE START OF CONSTRUCTION.

PUBLIC HEALTH, SAFETY, AND CONVENIENCE NOTES:

1. THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF THE PUBLIC HEALTH AND SAFETY AND ENVIRONMENTAL QUALITY.
2. THE CONTRACTOR, AT HIS OWN EXPENSE SHALL KEEP THE PROJECT AND ITS SURROUNDING AREAS FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH.
3. NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION ACTIVITY SO AS TO CAUSE FALLING ROCK, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATIONS OCCUR, THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS NECESSARY.
4. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE AND SAFETY OF THE PUBLIC. THE CONTRACTOR SHALL APPLY FOR A CONSTRUCTION PERMIT WITH A NOISE POLLUTION CONTROL PLAN.

REV NO	DESCRIPTION	DATE

TY J. DEMPSEY — LICENSED PROFESSIONAL ENGINEER — No. 12058-C — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

APRIL 30, 2028
EXPIRATION DATE OF THE LICENSE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA , KAPOLEI, OAHU, HAWAII

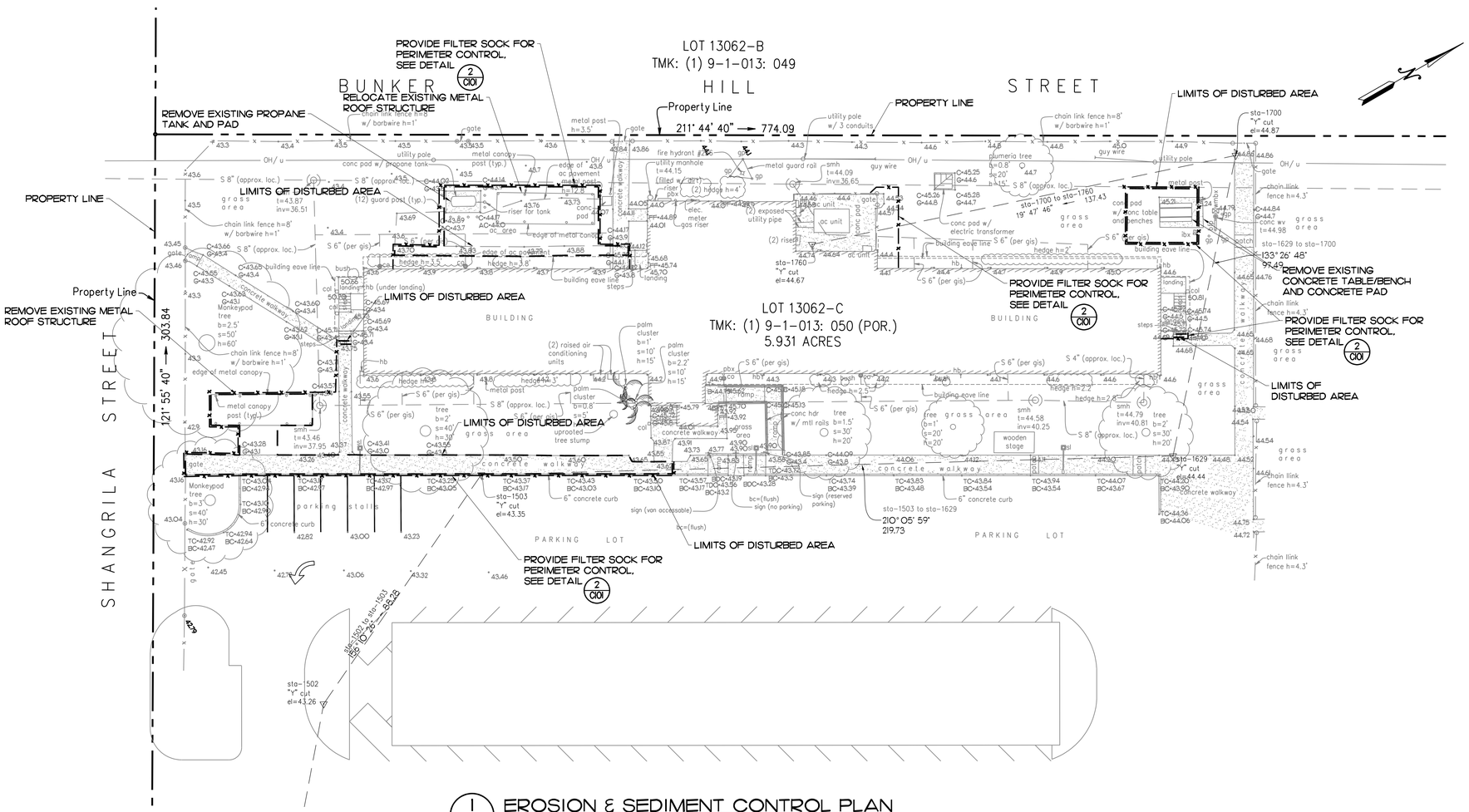
ESCP NOTES

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HAWAII JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. C-002
KA	TD		
DRAWN BY: KA	APPROVED BY:	DATE: JUNE 2026	SHEET 11 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

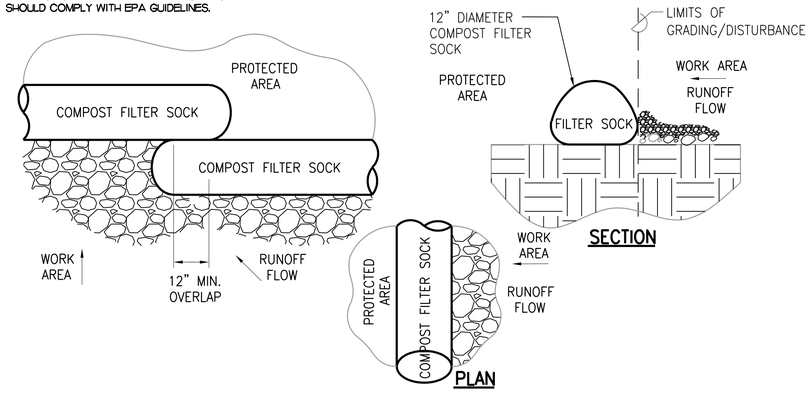


1 / C101 EROSION & SEDIMENT CONTROL PLAN

SCALE: 1" = 20'

COMPOST FILTER SOCK NOTE:

COMPOST SHALL NOT CONTAIN BIOSOLIDS AND SHOULD COMPLY WITH EPA GUIDELINES.



2 / C101 DETAIL - COMPOST FILTER SOCK

NOT TO SCALE

LEGEND:

- PROPERTY LINE
- FILTER SOCK
- DUST SCREEN
- EXIST. CONTOUR MAJOR (10)
- EXIST. CONTOUR MINOR (2)
- LIMITS OF GRADING & DISTURBED AREA
- EXIST. SURFACE FLOW

PRE-CONSTRUCTION BMPs:

1. VEHICLE TRACKING CONTROL.
2. FILTER SOCKS.

DURING CONSTRUCTION BMPs:

1. TEMPORARY STABILIZATION.
2. WIND EROSION CONTROL.
3. MATERIAL DELIVERY AND STORAGE.
4. MATERIAL USE.
5. STOCKPILE MANAGEMENT.
6. SPILL PREVENTION AND CONTROL.
7. SOLID WASTE MANAGEMENT.
8. HAZARDOUS WASTE MANAGEMENT.
9. CONCRETE WASTE MANAGEMENT.
10. SANITARY/SEPTIC WASTE MANAGEMENT.

POST-CONSTRUCTION BMPs:

1. PERMANENT STABILIZATION (LANDSCAPING & PAVEMENTS).

GRAPHICAL SCALE:

10' 0 10' 20' 30'

SCALE: 1"=10'

TY J. DEMPSEY
LICENSED PROFESSIONAL ENGINEER
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HAWAII, U.S.A.

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APRIL 30, 2028
EXPIRATION DATE OF THE LICENSE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA , KAPOLEI, OAHU, HAWAII

EROSION & SEDIMENT CONTROL PLAN

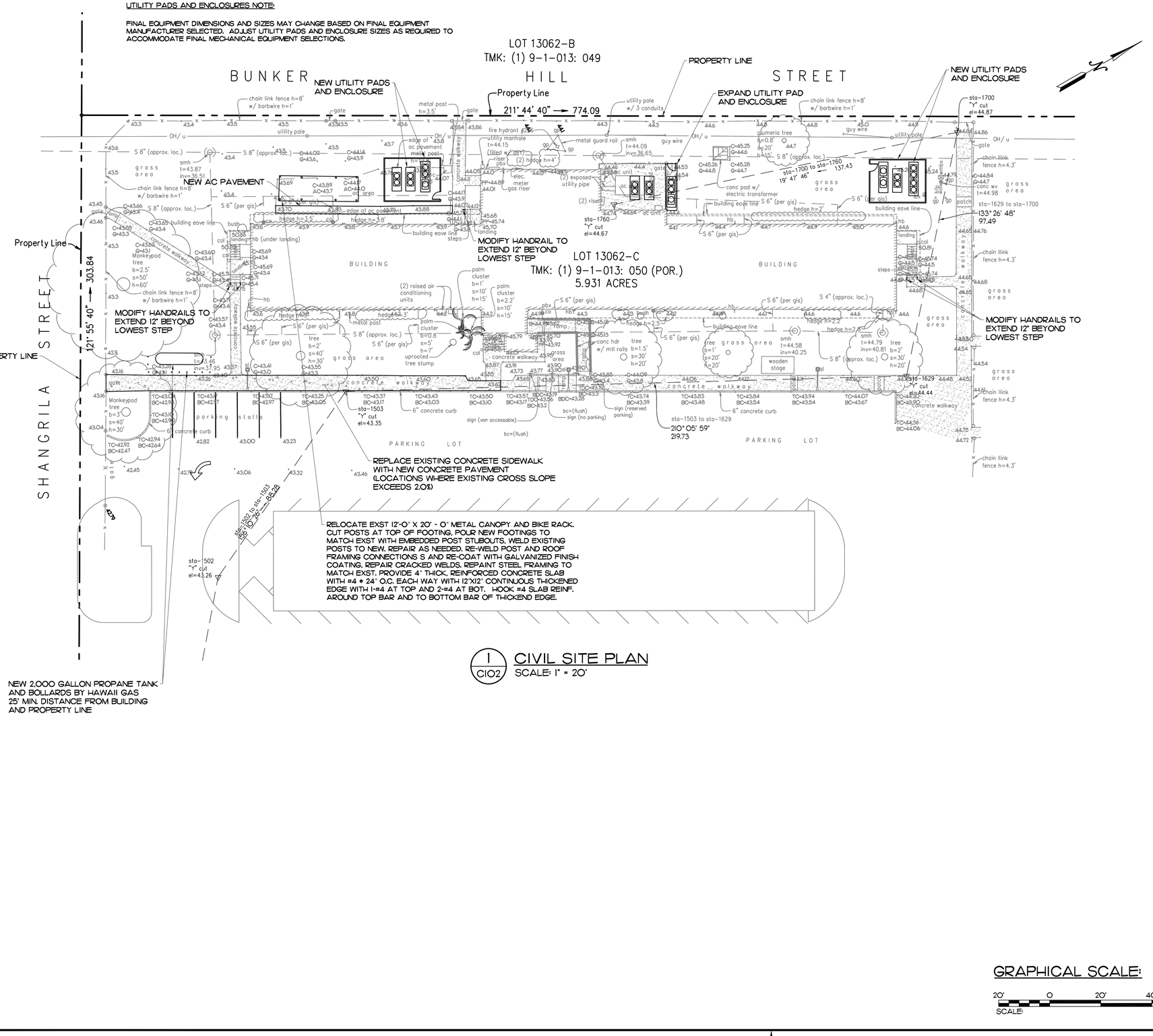
ENGINEERING PARTNERS		HAWAII JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. C-101
DESIGNED BY: KA	CHECKED BY: TD		
DRAWN BY: KA	APPROVED BY:	DATE: JUNE 2026	SHEET 12 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

UTILITY PADS AND ENCLOSURES NOTE:

FINAL EQUIPMENT DIMENSIONS AND SIZES MAY CHANGE BASED ON FINAL EQUIPMENT MANUFACTURER SELECTED. ADJUST UTILITY PADS AND ENCLOSURE SIZES AS REQUIRED TO ACCOMMODATE FINAL MECHANICAL EQUIPMENT SELECTIONS.



1 / C102 CIVIL SITE PLAN
SCALE: 1" = 20'

GRAPHICAL SCALE:
20' 0 20' 40' 60'
SCALE: 1"=20'

REV NO	DESCRIPTION	DATE

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HAWAII, U.S.A.

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DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA , KAPOLEI, OAHU, HAWAII

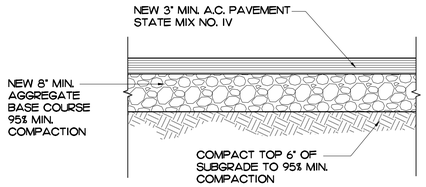
CIVIL SITE PLAN

ENGINEERING PARTNERS

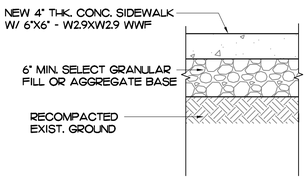
DESIGNED BY:	CHECKED BY:	HAWAII JOB NO. FEDERAL:	DRAWING NO.
KA	TD	PN15H00033	C-102
DRAWN BY:	APPROVED BY:	STATE: CA-202505-D	
KA		DATE	SHEET
SCALE: AS NOTED		JUNE 2026	13 OF 276 SHTS

DATE ISSUED: ---

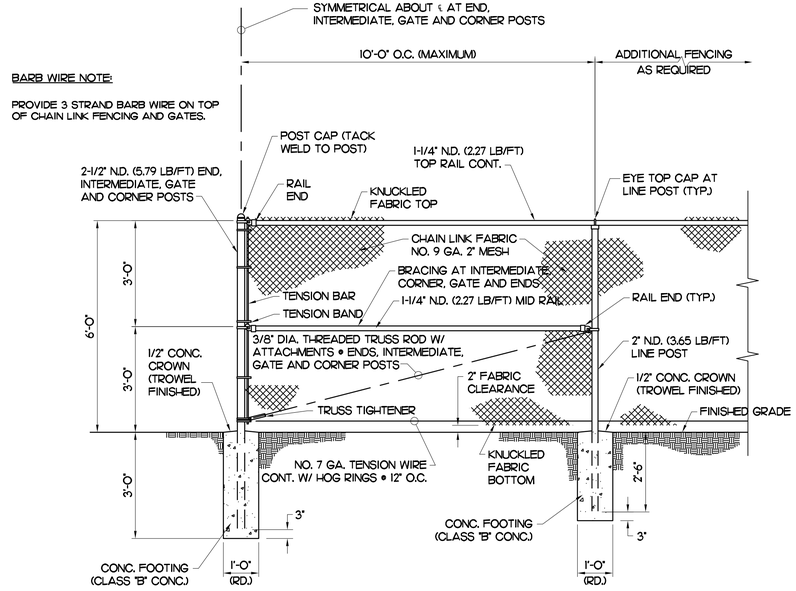
OF _____ DRAWER _____ FOLDER _____



1 / C201 A.C. PAVEMENT DETAIL
NOT TO SCALE



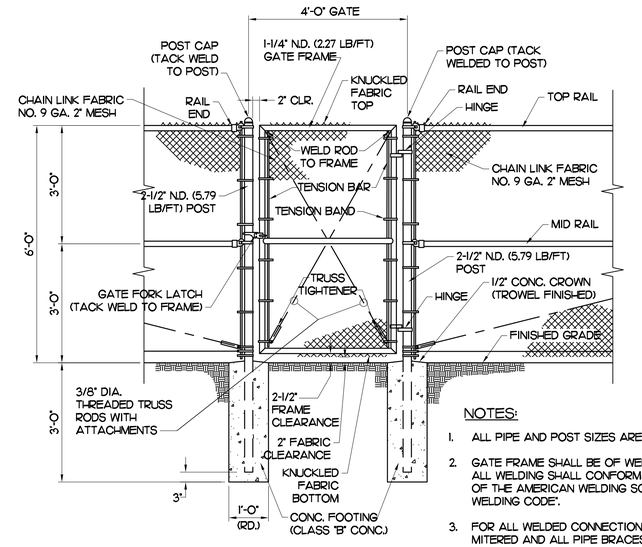
2 / C201 WALKWAY DETAIL
NOT TO SCALE



NOTES:

1. ALL PIPE AND POST SIZES ARE NOMINAL DIAMETER (N.D.).
2. CHAIN LINK FABRIC, PIPES, FITTING, FASTENERS, TRUSS ROD, POSTS, HOG RINGS AND TENSION WIRE SHALL BE HOT-DIP GALVANIZED.
3. CHAIN LINK FABRIC SHALL BE CONTINUOUS AND FASTENED TO END, INTERMEDIATE, GATE AND CORNER POSTS BY TENSION BARS WITH TENSION BANDS EVENLY SPACED AT 15" O.C. (MAX.).
4. WIRE FASTENINGS SHALL BE NO. 12 GAUGE GALVANIZED TIE WIRE.
5. CHAIN LINK FABRIC SHALL BE FASTENED TO LINE POSTS WITH WIRE FASTENINGS EVENLY SPACED AT 12" O.C. (MAX.).
6. CHAIN LINK FABRIC SHALL BE FASTENED TO HORIZONTAL RAILS WITH WIRE FASTENINGS EVENLY SPACED AT 12" O.C. (MAX.).
7. ALL WIRE FASTENING ENDS SHALL BE WRAPPED AROUND CHAIN LINK A MINIMUM OF TWO COMPLETE TURNS. (HOOKING OF WIRE ENDS SHALL NOT BE PERMITTED).
8. CHAIN LINK FABRIC SHALL BE FASTENED TO TRUSS ROD AND TENSION WIRE WITH NO. 9 GAUGE HOG RINGS AT 12" O.C.
9. NO SPLICING SHALL BE ALLOWED ON ALL STRAIGHT-RUN PIPES.
10. TOP AND BOTTOM SELVAGES OF CHAIN LINK FABRIC SHALL BE KNUCKLED.
11. INSTALL INTERMEDIATE POST AT 200' MAX. INTERVALS.
12. ALL FIELD WELDS AND DAMAGED GALVANIZED SURFACES SHALL BE PAINTED WITH TWO COATS OF Z.R.C. COLD GALVANIZING COMPOUND.
13. ALL FENCE POSTS SHALL BE INSTALLED EVENLY SPACED.

3 / C201 UTILITY ENCLOSURE 6' CHAIN LINK FENCE DETAIL
NOT TO SCALE



BARB WIRE NOTE:

PROVIDE 3 STRAND BARB WIRE ON TOP OF CHAIN LINK FENCING AND GATES.

NOTES:

1. ALL PIPE AND POST SIZES ARE NOMINAL DIAMETER (N.D.).
2. GATE FRAME SHALL BE OF WELDED PIPE CONSTRUCTION. ALL WELDING SHALL CONFORM TO THE SPECIFICATIONS OF THE AMERICAN WELDING SOCIETY "STRUCTURAL WELDING CODE".
3. FOR ALL WELDED CONNECTIONS CORNERS SHALL BE MITERED AND ALL PIPE BRACES PROPERLY COPED.
4. ALL WELDED CONNECTIONS SHALL BE PAINTED WITH TWO COATS OF Z.R.C. COLD GALVANIZING COMPOUND.
5. GATE HINGES SHALL BE TACK WELDED TO GATE POSTS AND FRAMES.
6. CHAIN LINK FABRIC, PIPES, FITTINGS, FASTENERS, TRUSS, ROD, POST AND HOG RINGS SHALL BE HOT-DIP GALVANIZED.
7. WIRE FASTENINGS SHALL BE NO. 12 GAUGE GALVANIZED TIE WIRE.
8. CHAIN LINK FABRIC SHALL BE CONTINUOUS AND FASTENED TO SIDE FRAME PIPES BY TENSION BARS WITH TENSION BANDS EVENLY SPACED AT 15' O.C. (MAX.).

4 / C201 UTILITY ENCLOSURE CHAIN LINK GATE DETAIL
NOT TO SCALE

REV NO	DESCRIPTION	DATE

TY J. DEMPSEY
LICENSED PROFESSIONAL ENGINEER
No. 12058-C
HAWAII, U.S.A.

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APRIL 30, 2028
EXPIRATION DATE OF THE LICENSE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA , KAPOLEI, OAHU, HAWAII

DETAILS

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HAWRG JOB NO. FEDERAL:	DRAWING NO.
KA	TD	PN15H00033 STATE: CA-202505-D	C-201
DRAWN BY: KA	APPROVED BY:	DATE	SHEET 14
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

STRUCTURAL GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE 2021 INTERNATIONAL BUILDING CODE AS AMENDED BY THE COUNTY OF HAWAI'I.

2. STRUCTURAL DRAWINGS REPRESENT THE FINISHED STRUCTURE, AND DO NOT SPECIFY THE MEANS AND METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEANS NECESSARY TO PROTECT THE STRUCTURE, AND ANY ADJACENT NEW OR EXISTING STRUCTURES DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO BRACING AND SHORING FOR LOADS ACTING ON THE STRUCTURE DURING CONSTRUCTION. OBSERVATION BY THE STRUCTURAL ENGINEER DURING CONSTRUCTION WILL NOT INCLUDE INSPECTION OF AFOREMENTIONED BRACING AND SHORING.

3. EXISTING CONDITIONS ARE SHOWN TO THE BEST OF OUR KNOWLEDGE. DISCREPANCIES SHALL PROMPTLY BE REPORTED TO THE ENGINEER AND BE RESOLVED BEFORE PROCEEDING WITH THE WORK.

4. PRIOR TO COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL UTILITIES, WHICH MAY BE AFFECTED BY ITS WORK. INTERFERENCES WITH THE STRUCTURE SHALL PROMPTLY BE REPORTED TO THE ENGINEER AND BE RESOLVED BEFORE PROCEEDING WITH THE WORK.

5. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR COORDINATING THE WORK OF ALL TRADES AND VERIFYING ALL DIMENSIONS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ALL STRUCTURAL DISCREPANCIES, AND THESE DISCREPANCIES SHALL BE RESOLVED PRIOR TO PROCEEDING WITH THE WORK.

6. SHOULD A DISCREPANCY OCCUR ON THE DRAWINGS BETWEEN ANY PROJECT SPECIAL NOTES/SPECIAL DETAILS, AND THE TYPICAL SPECS/TYPICAL DETAILS, SAID SPECIAL NOTES/SPECIAL DETAILS SHALL TAKE PRECEDENCE. DETAILS NOTED AS TYPICAL SHALL APPLY IN ALL CONDITIONS UNLESS SPECIFICALLY SHOWN OR NOTED.

7. SEE ARCHITECTURAL, ELECTRICAL AND MECHANICAL DRAWINGS FOR DIMENSIONS AND LOCATIONS OF OPENINGS SHOWN ON THE STRUCTURAL DRAWINGS.

8. PENETRATIONS AND OPENINGS WITH ANY DIMENSION GREATER THAN 2" THAT ARE NOT SHOWN ON THE STRUCTURAL DRAWINGS ARE PROHIBITED UNLESS APPROVED IN WRITING BY THE STRUCTURAL ENGINEER. NO PENETRATION SHALL BE ALLOWED THROUGH ANY STRUCTURAL MEMBER WITHOUT THE APPROVAL OF THE ENGINEER.

9. ANY CONSTRUCTION MATERIAL THAT IS TEMPORARILY PLACED ON FLOOR AND/OR ROOF FRAMING SHALL BE DISTRIBUTED OVER THE FRAMING SYSTEM SUCH THAT THE CONSTRUCTION LOAD DOES NOT EXCEED THE LOAD THAT THE FRAMING SYSTEM WAS DESIGNED FOR.

10. DESIGN CRITERIA -

A. DESIGN LIVE LOADS	
1. ROOF	= 20 PSF
2. FLOOR	= 100 PSF
B. DESIGN DEAD LOADS (ADDITIONAL TO SELF WEIGHT)	
1. FINISH @ ROOF	= 7 PSF
2. MECHANICAL & ELECTRICAL @ ROOF	= 3 PSF
3. FINISH @ FLOOR	= 7 PSF
4. MECHANICAL & ELECTRICAL @ FLOOR	= 3 PSF
C. WIND	
BASIC WIND SPEED	133 MPH
Veff - ASD	105 MPH
RISK CATEGORY	II
EXPOSURE CATEGORY	B
PRIMARY FRAME DESIGN METHOD	METHOD 2 (ANALYTICAL)
BUILDING CLASSIFICATION	ENCLOSED
D. SEISMIC	
OCCUPANCY CATEGORY	II
SITE CLASS	D
Sds	0.440 g
Sd1	0.226 g
SEISMIC DESIGN CATEGORY	C
IMPORTANCE FACTOR, Ie	1.0

11. SHOP DRAWINGS REQUIRED BY THE SPECIFICATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO FABRICATION OF ANY STRUCTURAL COMPONENTS. THE CONTRACTOR SHALL DETAIL ALL MEMBERS AND CONNECTIONS NOT SHOWN BUT WHICH ARE REQUIRED AND SHALL SUBMIT THEM FOR REVIEW. COST OF THESE MEMBERS AND CONNECTIONS SHALL BE INCLUDED IN THE CONTRACTOR'S BID PRICE.

12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF THE ADJACENT PROPERTIES, STRUCTURES, STREETS AND UTILITIES DURING THE CONSTRUCTION PERIOD.

13. THE GENERAL CONTRACTOR AND ITS SUBCONTRACTORS MUST SUBMIT IN WRITING ANY REQUESTS FOR MODIFICATIONS TO THE PLANS AND SPECIFICATIONS.

FOUNDATION NOTES

1. THE FOUNDATION DESIGN WAS BASED ON THE ASSUMPTIONS PRESENTED BELOW IN THE ABSENCE OF A SOILS REPORT:

ALLOWABLE SOIL BEARING PRESSURE	= 1500 PSF
ALLOWABLE PASSIVE EARTH RESISTANCE	= 150 PCF
FRICTIONAL RESISTANCE	= 0.4 X DEAD LOAD

2. FOOTING BACKFILL AND UTILITY TRENCH BACKFILL WITHIN THE BUILDING AREA SHALL BE MECHANICALLY COMPACTED IN LAYERS. FLOODING IS PROHIBITED.

3. CONTRACTOR SHALL PROVIDE FOR DE-WATERING OF EXCAVATIONS FROM EITHER SURFACE WATER, GROUND WATER, OR SEEPAGE.

4. PRIOR TO COMMENCING WITH GRADING OPERATIONS, THE GROUND SURFACE MUST BE PREPARED AS FOLLOWS: THE SITE SHALL BE STRIPPED OF ALL VEGETATION, DEBRIS, BOULDERS, RUBBISH, AND OTHER ORGANIC AND DELETERIOUS MATERIALS. VEGETATION SHALL BE REMOVED TO A MINIMUM DEPTH OF SIX INCHES. THE ROOT BALLS OF TREES SHALL BE REMOVED IN THEIR ENTIRETY WITHIN THE BUILDING PAD.

5. THE CONTRACTOR SHALL EXCAVATE A MINIMUM OF 4 EXPLORATION POTHOLES TO A DEPTH OF 4 FEET DEEP AT 4 CORNERS OF THE BUILDING PAD. THE CONTRACTOR SHALL DETERMINE AND REPORT BACK TO THE ENGINEER IF THE BUILDING PAD LOCATION IS ON NATIVE UNDISTURBED GROUND OR A PREVIOUSLY FILLED AREA.

6. IF THE CONTRACTOR DISCOVERS UNCOMPACTED FILL OR UNSUITABLE MATERIAL IN THE POTHOLE EXCAVATION, ALL UNCOMPACTED FILL AND/OR UNSUITABLE MATERIAL WITHIN THE BUILDING PAD SHALL BE REMOVED AND BACKFILLED WITH SUITABLE STRUCTURAL FILL.

7. UNSUITABLE MATERIALS ARE ORGANIC MATTERS I.E. GREEN WASTE, BAGASSE, ROOTS, STUMPS, CONSTRUCTION LUMBER, RUBBISH I.E. PLASTIC, METAL, DOMESTIC AND CONSTRUCTION WASTE, UNPROCESSED CONCRETE PARTICLES LARGER THAN 3 INCH DIAMETER, NATIVE VOLCANIC ASH SOIL AND CINDERS, MUCK, MUD AND ANY HAZARDOUS MATERIAL I.E. ASBESTOS, CONTAMINATED SOIL.

8. ALL BUILDING FOUNDATION AND SLAB SHALL BEAR ON FIRM SUBGRADE I.E. SOLID BASALT ROCK OR SCARIFIED AND RE-COMPACTED NATIVE FRACTURED ROCK OR GRANULAR MATERIAL. ALL UNSUITABLE MATERIAL BENEATH FOOTINGS SHALL BE EXCAVATED AND BACKFILLED WITH COMPACTED STRUCTURAL FILL. ALL COMPACTION EFFORT FOR BUILDING PAD SHALL BE MINIMUM 95% COMPACTION.

9. WHERE COMPACTION TEST OF A SOIL/ROCK TYPE IS NOT PRACTICAL, THE SUBGRADE SHALL BE COMPACTED TO UNYIELDING CONDITION WITH A NARROW TRACK D-8 DOZER OR EQUIVALENT SIZE COMPACTOR.

10. LIMITS OF BUILDING PAD IS DEFINED AS MINIMUM 3 FEET FROM THE MOST OUTER EDGE OF THE BUILDING FOUNDATION. THIS OUTER MOST FOUNDATION EDGE SHALL BE MINIMUM 5 FEET FROM THE FACE OF A SLOPE STEEPER THAN 5H TO 1V. DEEPEN THE FOUNDATION AS NECESSARY TO ACHIEVE THIS DISTANCE.

11. WHERE ROCK-SOIL (VOLCANIC ASH) MIX IS FOUND TO HAVE SOIL CONTENT MORE THAN 30% BY VOLUME, THE ENTIRE BUILDING PAD SHALL BE OVER-EXCAVATED 2 FEET BELOW THE FOOTINGS AND SLAB, LAY DOWN MIRAFI HP 370 GEOTEXTILE AND BACKFILL WITH 3" MINUS COMPACTED STRUCTURAL FILL.

12. WHERE DEEP ASH SOIL IS PRESENT (COMMONLY FOUND IN NORTH OF ALENAIO STREAM IN HILO, NORTH HILO AND HAMAKUA AREA), SPECIAL SUBGRADE TREATMENT OR DEEP FOUNDATION SYSTEM WILL BE REQUIRED. CONTRACTOR SHALL PROVIDE THE OWNER PRICING OPTIONS FOR THE FOLLOWING TREATMENT OPTIONS:

    A. 16-INCH DIAMETER X 20' DEEP DRILLED PIERS: (6)-#5 VERTICAL WITH #2 SPIRAL TIES @ 3" PITCH, MINIMUM 3000 PSI CONCRETE USING TREMIE METHOD. USE 15'X15' DRILLED PIER GRID SPACING.

    B. MICRO PILE DRILLED 2 FOOT INTO BEDROCK ACHIEVING MINIMUM WORKING LOAD OF 25,000 LB PER MICRO PILE. FIELD PULL TEST TO VERIFY CAPACITY REQUIRED. USE 15'X15' MICRO PILE GRID SPACING.

    C. HELICAL PILE ACHIEVING MINIMUM WORKING LOAD OF 25,000 LB PER HELICAL PILE. FIELD PULL TEST TO VERIFY CAPACITY REQUIRED. HOT DIPPED GALVANIZED HELICAL PILE INSTALLED WITH CEMENT SLURRY. USE 15'X15' HELICAL PILE GRID SPACING.

    D. OVEREXCAVATE ENTIRE BUILDING PAD 5 FEET DEEP, LAY DOWN MIRAFI HP 370 GEOTEXTILE, AND BACKFILL WITH 3" MINUS COMPACTED STRUCTURAL FILL.

ANCHORS

1. REINFORCING OR THREADED RODS DRILLED AND EXPOXIED INTO EXISTING CONCRETE AS DETAILED ON THE DRAWINGS SHALL BE ONE OF THE FOLLOWING OR APPROVED EQUIVALENT:

A. SIMPSON 'SET-3G'	ICC REPORT ESR-4057/4844
B. HILTI 'RE-500 SD'	ICC REPORT ESR-2322
C. DEWALT 'PURE 110+'	ICC REPORT ESR-3298

2. INSTALLATION OF EPOXIED DOWELS SHALL FOLLOW THE STRICT RECOMMENDATIONS OF THE MANUFACTURER AND THE APPLICABLE ICC REPORT AND HAVE A MINIMUM OF 9 DIAMETERS EMBEDMENT.

3. INSTALLATION SHALL FOLLOW THE STRICT RECOMMENDATIONS OF THE MANUFACTURER AND THE APPLICABLE ICC ER REPORT. CONTRACTOR SHALL HAVE APPROPRIATE ICC ER REPORT ON-SITE DURING ALL INSTALLATIONS.

4. ANY ENGINEERING DESIGN PROVIDED BY CONTRACTOR OR OTHERS SHALL BE SUBMITTED FOR REVIEW BY THE INSURED AND REGISTERED STRUCTURAL ENGINEER WITH CONTINUOUS FIVE YEARS OF EXPERIENCE IN THE TYPE OF DESIGN SUBMITTED.

CONCRETE NOTES

1. ALL CONCRETE UNLESS OTHERWISE NOTED SHALL BE REGULAR WEIGHT HARD ROCK TYPE (150#/CU.FT.).

2. ALL PHASES OF WORK PERTAINING TO THE CONCRETE CONSTRUCTION SHALL CONFORM TO THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318-19) WITH MODIFICATIONS AS NOTED IN THE DRAWINGS OR SPECIFICATIONS.

3. SCHEDULE OF STRUCTURAL CONCRETE 28-DAY STRENGTH AND TYPES:

LOCATION OF STRUCTURE	STRENGTH
CONCRETE WALLS	3000 PSI
ALL OTHER CONCRETE	3000 PSI

4. PORTLAND CEMENT SHALL CONFORM TO ASTM C-150 TYPE II.

5. AGGREGATE FOR HARDROCK CONCRETE SHALL CONFORM TO ALL REQUIREMENTS AND TESTS OF ASTM C-33 AND PROJECT SPECIFICATIONS.

6. CONCRETE MIXES SHALL BE DESIGNED BY A QUALIFIED TESTING LABORATORY AND SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR HIS REVIEW 2 WEEKS PRIOR TO POUR.

7. CONCRETE MIXING OPERATION, ETC. SHALL CONFORM TO ASTM C-94.

8. PLACEMENT OF CONCRETE SHALL CONFORM TO ACI STANDARD 301 AND PROJECT SPECIFICATIONS.

9. UNLESS OTHERWISE NOTED ON THE PLANS, MINIMUM CLEAR COVERAGE OF NEW CONCRETE OVER OUTER REINFORCING BARS SHALL BE AS FOLLOWS:
    A. CONCRETE POURED DIRECTLY AGAINST EARTH.....3" CLEAR TO REINFORCING
    B. WALL FACES:
        EXPOSED TO EARTH WITH FORMED SURFACES OR EXPOSED TO WEATHER.....1-1/2" CLEAR FOR #5 BAR & SMALLER
        2" CLEAR FOR #6 BARS & LARGER
        INTERIOR FACES.....3/4 CLEAR
    C. BEAMS AND COLUMNS:
        NOT EXPOSED TO EARTH OR WEATHER.....1-1/2" CLEAR TO STIRRUPS & TIES
        FORMED AND EXPOSED TO EARTH OR WEATHER.....1 1/2" CLEAR TO STIRRUPS & TIES
        STRUCTURAL SLABS.....1" CLEAR AT TOP AND BOTTOM

10. ALL REINFORCING BARS, ANCHOR BOLTS AND OTHER CONCRETE INSERTS SHALL BE WELL SECURED IN POSITION PRIOR TO PLACING CONCRETE.

11. PROJECTING CORNERS OF BEAMS, WALLS, COLUMNS, EQUIPMENT PADS, ETC., SHALL BE FORMED WITH 3/4" CHAMFER, UNLESS OTHERWISE NOTED ON ARCHITECTURAL DRAWINGS.

12. PROVIDE SLEEVES FOR PLUMBING AND ELECTRICAL OPENINGS IN CONCRETE BEFORE PLACING. DO NOT CUT ANY REINFORCING WHICH MAY CONFLICT. CORING IN CONCRETE IS NOT PERMITTED EXCEPT AS SHOWN. NOTIFY THE STRUCTURAL ENGINEER IN ADVANCE OF CONDITIONS NOT SHOWN ON THE DRAWINGS.

13. CONDUIT OR PIPE SIZE (O.D.) THAT IS BURIED IN ANY CONCRETE SLABS SHALL NOT EXCEED 25 PERCENT OF SLAB THICKNESS AND SHALL BE PLACED BETWEEN THE TOP AND BOTTOM REINFORCING UNLESS SPECIFICALLY DETAILED OTHERWISE. CONCENTRATIONS OF CONDUITS OR PIPES SHALL BE AVOIDED EXCEPT WHERE DETAILED OPENINGS ARE PROVIDED.

14. DO NOT USE CONCRETE ADMIXTURES CONTAINING CHLORIDE OR CHLORIDE SALTS.

15. ALL ROUGHENED SURFACES IN CONCRETE SHALL BE MADE WITH A MINIMUM AMPLITUDE OF 1/4"

16. NO ADDITIONAL WATER IS ALLOWED IN THE CONCRETE MIX AT THE SITE.

17. READY-MIX CONCRETE SUPPLIER SHALL INCLUDE WATER REDUCER, RETARDER, SUPERPLASTICIZER AND/OR OTHER CONCRETE ADMIXTURES TO ACHIEVE THE SPECIFICATION AND WORKABILITY AT THE JOB SITE.

18. CONTRACTOR AND READY-MIX CONCRETE SUPPLIER SHALL FOLLOW THE ADMIXTURE MANUFACTURERS' RECOMMENDATIONS FOR MIXING, DOSAGE, HANDLING, PROCESSING OF THE ADMIXTURES AND FRESH CONCRETE.

BASE BID

1. AIR CONDITIONING SYSTEM IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO ALL FAN COILS, EXTERIOR CONDENSING UNITS, CONTROLS, CONCRETE PADS, TESTING/ADJUSTING/BALANCING, INSULATION, REFRIGERANT PIPING, CONDENSATE PIPING, AND ASSOCIATED ELECTRICAL WORK.
2. PLUMBING SYSTEM IN ITS ENTIRETY, INCLUDING ALL DEMOLITION WORK, NEW WASTE/VENT PIPING, NEW HOT WATER PIPING, WATER HEATERS, AND PROPANE SYSTEM. INCLUDE ALL TRENCHING, FLOOR SLAB REPAIR NECESSARY TO INSTALL NEW WASTE LINES. INCLUDE ARCHITECTURAL WORK FOR ANY NEW FRAMED WALLS AND CEILING, WALL, OR FLOOR FINISHES NECESSARY TO SUPPORT INSTALLATION OF PLUMBING FIXTURES.
3. ELECTRICAL INFRASTRUCTURE, INCLUDING ALL EXTERIOR SERVICE ENTRY INTO THE BUILDING, NEW METERING SWITCHBOARD, PANELBOARDS, AND FEEDERS.
4. ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL WORK OCCURRING WITHIN SELECT ROOMS AS INDICATED ON DRAWINGS.

REINFORCING STEEL NOTES

1. ALL REINFORCING STEEL SHALL BE DETAILED AND PLACED IN CONFORMANCE WITH THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318-19), THE CRSI "MANUAL OF STANDARD PRACTICE," AND THE "ACI DETAILING MANUAL (SP-66) AS MODIFIED BY THE PROJECT DRAWINGS AND SPECIFICATIONS.

2. REINFORCING BARS SHALL CONFORM TO ASTM A-615 GRADE 60 REQUIREMENTS.

3. ANCHOR BOLTS, DOWELS AND OTHER EMBEDDED ITEMS ARE TO BE SECURELY TIED IN PLACE BEFORE CONCRETE IS POURED.

4. ALL REINFORCING BAR BENDS SHALL BE MADE COLD.

5. REINFORCING SPLICES SHALL BE MADE ONLY WHERE INDICATED ON THE DRAWINGS.

6. DOWELS BETWEEN FOOTING AND WALL OR COLUMNS SHALL BE THE SAME GRADE, SIZE, SPACING, AND NUMBER AS THE VERTICAL REINFORCING RESPECTIVELY, U.O.N.

7. WELDING OF REINF. STEEL IS NOT PERMITTED UNLESS OTHERWISE SHOWN ON THE DRAWINGS.

8. CONTRACTOR SHALL SUBMIT REINFORCING BAR LAYOUTS AND DETAILS FOR ARCHITECT'S REVIEW PRIOR TO FABRICATION. FABRICATE FROM REVIEWED DRAWINGS ONLY.

9. REINFORCING BARS SHALL BE AS LONG AS PRACTICABLE AND AS DETAILED AND SHALL BE LAPPED AT SPLICES AND CORNERS NOT LESS THAN 32 BAR DIAMETER (24" MINIMUM), UNLESS OTHERWISE SHOWN. STAGGER HORIZ. WALL BAR SPLICES. IN GENERAL, BAR SPLICES SHALL BE MADE AT POINTS OF MINIMUM STRESS. IN BEAMS AND SLABS, SPLICE TOP BARS AT MID-SPAN, BOTTOM BARS OVER SUPPORTS, UNLESS OTHERWISE SHOWN.

10. EMBEDDED METAL COMPONENTS MADE UP OF ALLOYS THAT ARE DIS-SIMILAR TO THAT OF THE REINF. STEEL SHALL NOT BE ATTACHED DIRECTLY TO REINFORCING. MEASURES SHALL BE TAKEN TO ELECTR. ISOLATE SAID COMPONENTS FROM ANY REINFORCING TO PREVENT CATHODIC EFFECTS.

ADDITIVE ALTERNATES

1. 1ST FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
2. 2ND FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
3. 3RD FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
4. DEMOLITION OF EXISTING LIGHTING AND INSTALLATION OF NEW LED LIGHTING AND ASSOCIATED BRANCH CIRCUITING, OVERCURRENT PROTECTION, AND CONTROLS.
5. ELECTRICAL BRANCH CIRCUITING FOR RECEPTACLES AND ANY OTHER ELECTRICAL WORK NOT ASSOCIATED WITH THE ABOVE BASE BID AND ADDITIVE ALTERNATES.
6. TELECOMMUNICATIONS WORK.
7. ROOF REPLACEMENT.
8. ELEVATOR REPLACEMENT.

REV. NO	DESCRIPTION	DATE

YEN WEN FANG
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 9361-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

STRUCTURAL GENERAL NOTES

ENGINEERING PARTNERS

DESIGNED BY: KKC	CHECKED BY: MAF	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. S-001
DRAWN BY: KKC	APPROVED BY: YWF	DATE: JUNE 2026	SHEET 15 OF 276 SHTS.
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~

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CONCRETE MASONRY NOTES

1. ALL CONCRETE MASONRY UNITS (CMU) SHALL CONFORM TO ASTM C90, LATEST EDITION, WITH COMPRESSIVE STRENGTH OF 1,900 PSI.
2. MORTAR SHALL BE PROPORTIONED AS NECESSARY TO CONFORM TO THE REQUIREMENTS OF TMS 602 (ASTM C270) FOR TYPE M OR S MORTAR.
3. GROUT SHALL CONFORM TO ASTM C476 AND HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2,500 PSI AT 28 DAYS. ALL CELLS TO BE FILLED WITH GROUT.
4. THE MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF THE MASONRY WALL ASSEMBLAGE AT 28 DAYS (f'm) SHALL BE 1500 PSI.
5. BEFORE BLOCK IS PLACED ON CONCRETE, THOROUGHLY CLEAN CONCRETE OF ALL LAITANCE AND ALL LOOSE MATERIAL. ROUGHEN AS IN A CONSTRUCTION JOINT.
6. PLACE ALL HORIZONTAL BARS IN BOND BEAM UNITS. WHEN 2 BARS ARE USED, STAGGER LAPS A MINIMUM OF 5'-0". VERTICAL REINFORCING SHALL BE HELD IN POSITION AT TOP AND BOTTOM AND AT INTERVAL NOT EXCEEDING 200 BAR DIAMETERS. TIE LAP SPLICE TO DOWEL BAR, IF REBAR POSITIONER IS NOT USED NEAR THE DOWEL.
7. ALL EMBEDDED ITEMS (BOLTS, ETC.) SHALL BE SECURED IN PLACE PRIOR TO GROUTING. PROVIDE A MINIMUM OF 1" GROUT AROUND ALL BOLTS IN MASONRY.
8. CLEAN ALL CELLS AND BOND BEAMS OF EXCESSIVE MORTAR PROTRUSIONS AND OTHER DEBRIS BEFORE GROUTING.
9. MAXIMUM GROUT POUR WITHOUT CLEANOUT IS 5'-4" IN BLOCK WALL. WHEN GROUT POUR IS MORE THAN 5'-4" HIGH, CLEANOUTS SHALL BE AT EVERY VERTICAL BAR BUT NOT MORE THAN 32" O.C. THE THICKNESS OF GROUT BETWEEN BLOCK AND REINFORCING STEEL SHALL NOT BE LESS THAN 1/2", AND BETWEEN PARALLEL BARS NOT LESS THAN 3/4".
10. WHEN GROUTING IS STOPPED FOR A PERIOD OF ONE HOUR OR LONGER, FORM HORIZONTAL CONSTRUCTION JOINTS BY STOPPING THE GROUT POUR 1.5 INCHES MINIMUM BELOW THE UPPER-MOST UNIT, EXCEPT AT TOP OF WALL. LOCATE CONSTRUCTION JOINTS SO AS NOT TO IMPAIR THE STRENGTH OF THE STRUCTURE AND TO MINIMIZE SHRINKAGE STRESSES.
11. WHEN SHOWN ON THE DRAWING, CONTROL JOINTS SHALL BE PLACED NOT LESS THAN 24" FROM A BEARING PLATE OR JAMB OF AN OPENING. PLACE BOND BEAM REINFORCING CONTINUOUS THROUGH EXPANSION AND CONTROL JOINTS, WRAPPING BARS WITH 1/8" THICK BOND BREAKING TAP 24" ON BOTH SIDES OF JOINT. DO NOT SPLICE BOND BEAM REINFORCING WITHIN 6'-0" OF AN EXPANSION OR CONTROL JOINT. LOCATION OF CONTROL JOINTS SHOULD BE COORDINATED WITH THE ENGINEER.
12. WALLS SHALL BE CONSTRUCTED IN CONVENTIONAL RUNNING BOND, U.O.N,

STRUCTURAL STEEL NOTES

1. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE "AISC SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
2. ALL STRUCTURAL STEEL SHALL CONFORM TO THE ASTM DESIGNATIONS AS NOTED BELOW:

   A. CHANNELS AND ANGLES: ASTM A36
   B. FLAT/BENT PLATES: ASTM A36
3. ANCHOR RODS SHALL CONFORM TO ASTM F-1554, GRADE 36 EXCEPT AS NOTED.
4. MACHINE BOLTS SHALL CONFORM TO ASTM A307, GRADE 36 EXCEPT AS NOTED.
5. BOLTS USED IN STRUCTURAL STEEL CONNECTIONS SHALL CONFORM TO ASTM A325 OR A490 AS NOTED. BOLT HOLES IN STEEL SHALL BE 1/16" LARGER DIAMETER THAN NOMINAL SIZE OR BOLT USED, EXCEPT AS NOTED.
6. ALL WELDS SHALL BE IN CONFORMITY WITH THE STRUCTURAL WELDING CODE AWS D1.1 OF THE AMERICAN WELDING SOCIETY. SEE SPECIFICATIONS.
7. WELD ELECTRODES SHALL BE E7015, E7016 OR E7018 LOW HYDROGEN ELECTRODES ONLY. CONSULT WITH MANUFACTURER FOR PROPER ELECTRODE SELECTION. ALL WELDS SHALL CONFORM TO PROPER PRE-HEAT AND HEAT TREATMENT AS RECOMMENDED BY THE AFOREMENTIONED REFERENCES AND THE ELECTRODE MANUFACTURER.
8. ALL JOINTS SHALL DEVELOP THE FULL STRENGTH (COMPLETE PENETRATION AISC PREQUALIFIED JOINTS) OF THE CONNECTING MEMBERS AND FULLY WELDED, UNLESS OTHERWISE SHOWN.
9. ALL MATERIAL SHALL BE SHOP PAINTED, AFTER HOT DIP GALVANIZING AS REF'D.
10. ALL EXPOSED STRUCTURAL STEEL AND MISCELLANEOUS METAL SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.
11. ALL OPEN ENDS OF STRUCTURAL TUBING OR PIPE SHALL BE CLOSED WITH SEAL WELDED 1/4 INCH PLATE.
12. ALL COMPLETE JOINT PENETRATION WELDS SHALL BE UT TESTED PER AWS.
13. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS PREPARED UNDER SUPERVISION OF A REGISTERED STRUCTURAL ENGINEER, INCLUDING COMPLETE DETAILS AND SCHEDULES FOR FABRICATION AND ASSEMBLY OF STRUCTURAL STEEL AND ALL OTHER MATERIALS SPECIFIED IN THESE DRAWINGS. SHOP DRAWINGS TO BE SUBMITTED FOR REVIEW PRIOR TO FABRICATION. FABRICATE FROM REVIEWED DRAWINGS ONLY.

ABBREVIATIONS

A.B.	ANCHOR BOLT	MANUF.	MANUFACTURER
ALT.	ALTERNATE	MAX.	MAXIMUM
APPROX.	APPROXIMATE	M.B.	MACHINE BOLT
ARCH.	ARCHITECTURAL	MECH.	MECHANICAL
(B)	BOTTOM (REINFORCEMENT)	MIN.	MINIMUM
BLDG.	BUILDING	MISC.	MISCELLANEOUS
BM.	BEAM	N.I.C.	NOT IN CONTRACT
B.O.F.	BOTTOM OF FOOTING	NO. OR #	NUMBER
BOT.	BOTTOM	N.T.S.	NOT TO SCALE
C.I.P.	CAST-IN-PLACE	O.C	ON CENTER
CL.	CENTERLINE	O.D.	OUTSIDE DIAMETER (DIMENSION)
CLR.	CLEAR(ANCE)	O.F.	OUTSIDE FACE
CMU	CONCRETE MASONRY UNIT	O.H.	OPPOSITE HAND
COL.	COLUMN	MAX.	OPENING
CONC.	CONCRETE	OPP.	OPPOSITE
CONN.	CONNECTION	PEMB	PRE ENGINEERED METAL BUILDING
CJP	COMPLETE JOINT PENETRATION	PJP	PARTIAL JOINT PENTRATION
CONSTR.	CONSTRUCTION	PL.	PLATE
CONT.	CONTINUOUS	PLWD.	PLYWOOD
CRM	CUT ROCK MASONRY	PREFAB.	PREFABRICATION/PREFABRICATED
DBL.	DOUBLE	PT.	POINT
DET.	DETAIL	REF.	REFERENCE
DIA.	DIAMETER	R.O.	ROUGH OPENING
DIM.	DIMENSION	R.	RADIUS
DWG.	DRAWING	REINF.	REINFORCEMENT
EA.	EACH	REQ.	REQUIRED/REQUIREMENT(S)
E.F.	EACH FACE	SCHED.	SCHEDULE
E.J.	EXPANSION JOINT	SECT.	SECTION
EL.	ELEVATION	SHT.	SHEET
EQ.	EQUAL	SIM.	SIMILAR
EQUIPT.	EQUIPMENT	SL.	SLOPE
E.S.	EACH SIDE	S.O.G.	SLAB-ON-GRADE
E.W.	EACH WAY	SPEC.	SPECIFICATION
EXP.	EXPANSION	SQ.	SQUARE
EXT.	EXTERIOR	SST.	STAINLESS STEEL
EXIST.	EXISTING	STD.	STANDARD
FDTN.	FOUNDATION	STIFF.	STIFFENER
FLR.	FLOOR	STRUCT.	STRUCTURAL
F.O.C.	FACE OF CONCRETE	SYM.	SYMBOL
FIN.	FINISH	(T)	TOP (REINFORCEMENT)
FIN. FLR.	FINISH FLOOR	T & B	TOP AND BOTTOM
FT.	FOOT OR FEET	T & G	TONGUE AND GROOVE
FTG.	FOOTING	THRU	THROUGH
GA.	GAUGE	T.O.C.	TOP OF CURB
GALV.	GALVANIZED	T.O.F.	TOP OF FOOTING
GLB	GLU-LAMINATED BEAM	T.O.S.	TOP OF SLAB, TOP OF STEEL
(H)	HORIZONTAL (REINFORCEMENT)	T.O.W.	TOP OF WALL
HK.	HOOK	TRANSV.	TRANSVERSE
HORIZ.	HORIZONTAL	TYP.	TYPICAL
I.D.	INSIDE DIAMETER (DIMENSION)	U.O.N.	UNLESS OTHERWISE NOTED
INFO.	INFORMATION	VERT.	VERTICAL
INT.	INTERIOR	W/	WITH
INTERM.	INTERMEDIATE	WD.	WOOD
JT.	JOINT	W.W.M.	WELDED WIRE MESH
LLV.	LONG LEG VERTICAL	NOTE: NOT ALL ABBREVIATIONS ARE NECESSARILY USED	
LLH.	LONG LEG HORIZONTAL		
LONG.	LONGITUDINAL		

DEMOLITION, REMOVAL, & RELOCATION WORK NOTES

1. THE CONSTRUCTION DRAWINGS INDICATE THE GENERAL EXTENT OF REQUIRED DEMOLITION AND REMOVAL WORK. SEE ARCHITECTURAL, PLUMBING AND ELECTRICAL DRAWINGS FOR DEMOLITION DRAWINGS.
2. THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS (PRIOR TO BID) TO DETERMINE THE EXTENT OF ALL REQUIRED DEMOLITION WORK. THE REMOVAL OR DEMOLITION OF MATERIALS, ACCESSORIES, FIXTURES, ETC., SHALL BE COMPLETE AND INCLUDE ALL RELATED ITEMS TO THE EXTENT THAT FUTURE CONSTRUCTION CAN BE PERFORMED AND COMPLETED WITHOUT ADDITIONAL COST TO THE OWNER.
3. ALL NECESSARY PRECAUTIONS SHALL BE TAKEN TO INSURE AGAINST DAMAGE TO EXISTING ITEMS AND FEATURES REMAINING IN PLACE.
4. THE CONTRACTOR SHALL REMOVE EXISTING ITEMS AS DEEMED NECESSARY SO THAT FUTURE WORK CAN BE PERFORMED AND ALSO, SO THAT ANY EXISTING ITEM IS NOT DAMAGED WHEN FUTURE WORK IS PERFORMED. THE CONTRACTOR SHALL ALSO INSTALL ANY OR ALL OF THE ITEMS, PATCH AND RESTORE SURROUNDING SURFACES AS REQUIRED AS PART OF THE WORK ACCEPTABLE TO THE ARCHITECT.
5. LOCATION OF UNDERGROUND UTILITIES AND PIPES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS OF THE EXISTING UTILITIES AND SHALL BE RESPONSIBLE FOR ANY DAMAGES TO THEM. ANY PORTION OF THE EXISTING UTILITIES THAT MUST BE REMOVED OR OTHERWISE DISTURBED TO ACCOMPLISH THIS WORK CALLED FOR ON THE PLANS SHALL BE RECONSTRUCTED, REPLACED OR RESTORED TO THE ORIGINAL CONDITION AT THE CONTRACTOR'S OWN EXPENSE.

SPECIAL INSPECTION NOTES

1. CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT SPECIAL INSPECTION OF PORTIONS OF THE WORK, AS REQUIRED BY THE BUILDING CODE OF THE COUNTY OF HAWAI'I, BE MADE AT THE APPROPRIATE TIME. THE CONTRACTOR MUST COORDINATE, SCHEDULE, AND FACILITATE THE WORK OF THE SPECIAL INSPECTOR; AND ENSURE THE SPECIAL INSPECTION WORK IS COMPLETED WHEN REQUIRED. CONTRACTOR MUST GIVE THE SPECIAL INSPECTOR A MINIMUM OF 48 HOUR WORKING DAY NOTICE OF WHEN AND WHERE THE SPECIAL INSPECTION IS REQUIRED. CONTRACTOR MUST PROVIDE ACCESS FOR THE SPECIAL INSPECTOR, INCLUDING LADDERS, SCAFFOLDING, FALL PROTECTION, MAN LIFT, ETC. CONTRACTOR MUST CORRECT DEFECTIVE WORK AT NO ADDITIONAL COST TO THE CONTRACTING OFFICER, AND PAY FOR RE-INSPECTION BY SPECIAL INSPECTOR.
2. THE FOLLOWING IS A SUMMARY OF THE SPECIAL INSPECTION REQUIREMENTS:

HIGH STRENGTH STEEL BOLTS	NO, PER IBC 1705.2
WELDING	NO, PER IBC 1705.2
CONCRETE REINFORCING STEEL & FORMWORK	YES, PER IBC TABLE 1705.3
ANCHOR BOLTS (RODS) IN CONCRETE	YES, PER IBC TABLE 1705.3
CONCRETE POUR	YES, PER IBC TABLE 1705.3
CONCRETE CYLINDER TEST	YES, PER IBC TABLE 1705.3
CONCRETE MASONRY	YES, PER IBC 1705.4
SOILS	NO, CONTROLLED FILL IS LESS THAN 12" THICK
SEISMIC RESISTANCE -SHEARWALLS	YES, PER IBC 1705.13 PERIODIC
PERIODIC SPECIAL CASES:	YES, EPOXY ANCHORS & DOWELS

CONCRETE REPAIR NOTES

1. PUBLIC HEALTH AND CONVENIENCE
   A. THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF THE PUBLIC HEALTH, SAFETY AND ENVIRONMENTAL QUALITY.
   B. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT SITE AND ITS SURROUNDING AREAS FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH. THE STATE MAY REQUIRE SUPPLEMENTARY MEASURES AS NECESSARY.
   C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE JOB IN A NEAT AND SAFE CONDITION. ALL WORK SHALL BE PERFORMED WITHIN THE LIMITS OF WORK AREAS AND SHALL BE COORDINATED WITH THE OWNER. DELIVERY OF MATERIALS SHALL BE COORDINATED TO MINIMIZE DISRUPTION OF EXISTING OPERATION. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROL OF NOISE, DEBRIS AND AIRBORNE DUST, AND TO PREVENT DISRUPTION OF EXISTING OPERATIONS. CONTRACTOR TO PROVIDE BARRIERS TO PREVENT PUBLIC ENTRY, AND TO PROTECT THE WORK AND EXISTING FACILITIES FROM CONSTRUCTION OPERATIONS. REMOVE WHEN NO LONGER REQUIRED, OR AT THE COMPLETION OF WORK.
2. BONDING AGENT AND REINFORCING ANTI-CORROSION COATING
   A. BONDING AGENT AND REINFORCING ANTI-CORROSION COATING SHALL BE EPOXY-MODIFIED, CEMENTITIOUS MATERIAL THAT SERVES BOTH AS A BONDING AGENT FOR THE REPAIR MORTAR AND AN ANTI-CORROSION COATING FOR REINFORCING.
   B. THE REINFORCING STEEL SHALL RECEIVE TWO (2) COATS AT 20 MILS EACH, TOTAL OF 40 MILS. THE CONCRETE SURFACE SHALL RECEIVE ONE (1) COAT AT 20 MILS.
   C. FOLLOW MANUFACTURER'S SPECIFICATIONS FOR RECOMMENDED TIME BETWEEN APPLICATION OF BONDING AGENT AND PATCHING MORTAR.
   D. THE MINIMUM BOND STRENGTH PROVIDED BY THE BONDING AGENT SHALL BE 3,000 PSI AFTER 14 DAYS (ASTM C882).
3. REPAIR MORTAR
   A. REPAIR MORTAR SHALL BE POLYMER-MODIFIED CEMENT MORTAR, HAVE A HIGH ABRASION RESISTANCE AND SHALL BE SUITABLE FOR HORIZONTAL, VERTICAL AND OVERHEAD SURFACES.
   B. THE MINIMUM BOND STRENGTH PROVIDED BY THE PATCHING MORTAR SHALL BE 4,000 PSI AFTER 28 DAYS (ASTM C882).
   C. REFER TO MANUFACTURER'S SPECIFICATIONS FOR PREPARATION AND APPLICATION GUIDANCE.
   D. REPAIR MORTAR AND BONDING AGENT/REINFORCEMENT PROTECTIONS SHALL BE SUPPLIED BY THE SAME MANUFACTURER AND SHALL BE FULLY COMPATIBLE WITH EACH OTHER.
4. LOCATIONS AND QUANTITIES OF CONCRETE DEFICIENCIES ARE SHOWN TO PROVIDE A ROUGH ESTIMATE OF THE EXTENT AND TYPE OF REPAIR THAT EXISTS. THE CONTRACTOR SHALL DO A VISUAL INSPECTION AND SOUNDING OF ALL CONCRETE SURFACES AND NOTIFY THE OWNER OF ANY ADDITIONAL DEFICIENCIES, SUCH AS CRACKS AND SPALLS, NOT SHOWN. SUCH DEFICIENCIES SHALL BE REPAIRED AS APPROVED BY THE OWNER.
5. THE CONTRACTOR SHALL RESTORE TO THEIR ORIGINAL CONDITION OR BETTER ALL IMPROVEMENTS DAMAGED AS A RESULT OF THE REPAIR WORK.
6. ALL REPAIR WORK SHALL MATCH ADJACENT SURFACES IN COLOR, TEXTURE AND ARCHITECTURAL DESIGN.

REV. NO	DESCRIPTION	DATE

YEN WEN FANG
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 9361-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

DEPARTMENT OF DEFENSE
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BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

STRUCTURAL GENERAL NOTES AND ABBREVIATIONS

ENGINEERING PARTNERS		HIARNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. S-002
DESIGNED BY: KKC	CHECKED BY: MAF		
DRAWN BY: KKC	APPROVED BY: YWF	DATE JUNE 2026	SHEET 16 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

06/02/2026 7:50 pm
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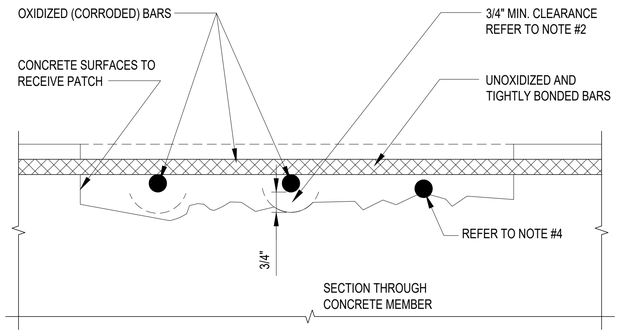
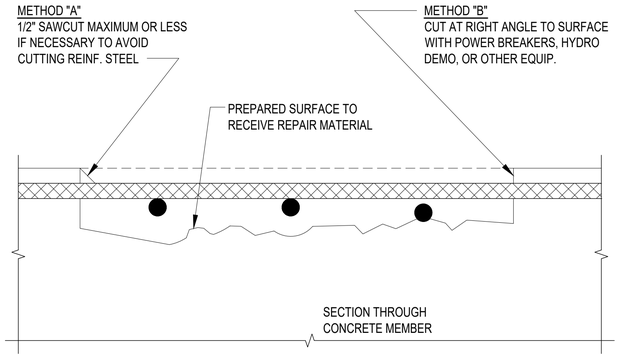




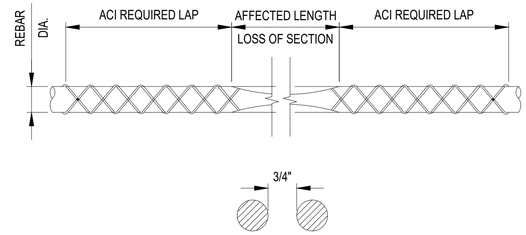
NOTES:

1. REMOVE LOOSE OR DELAMINATED CONCRETE ABOVE OXIDIZED REINFORCING STEEL. ONCE INITIAL REMOVAL IS MADE, PROCEED WITH UNDERCUTTING OF EXPOSED OXIDIZED (CORRODED) BARS. UNDERCUTTING WILL PROVIDE CLEARANCE FOR UNDER BAR CLEANING FULL BAR CIRCUMFERENCE BONDING TO SURROUNDING CONCRETE, AND WILL SECURE PATCH STRUCTURALLY.
2. PROVIDE MINIMUM 3/4" CLEARANCE BETWEEN EXPOSED REBAR AND SURROUNDING CONCRETE OR 1/4" LARGER THAN LARGEST AGGREGATE IN REPAIR MORTAR, WHICHEVER IS GREATER.
3. EXTEND CONCRETE REMOVAL ALONG BARS TO LOCATIONS ALONG BAR FREE OF BOND INHIBITING CORROSION AND WHERE BAR IS WELL BONDED TO SURROUNDING CONCRETE.
4. IF UNOXIDIZED REINFORCING STEEL IS EXPOSED DURING UNDERCUTTING PROCESS, TAKE CARE NOT TO DAMAGE BARS BOND TO SURROUDING CONCRETE. IF BOND BETWEEN BAR AND CONCRETE IS BROKEN, UNDERCUTTING OF BAR IS REQUIRED.
5. SECURE REINFORCEMENT WHICH IS LOOSE IN PLACE BY TYING TO OTHER SECURED BARS OR BY OTHER APPROVED METHODS.
6. CAUTION: BEFORE STARTING REBAR REMOVAL, REVIEW EFFECT OF REMOVAL ON STRUCTURAL INTEGRITY. PROVIDE SHORING OF MEMBER AT NO ADDTIONAL COST.
7. AT EDGE LOCATIONS, PROVIDE EITHER METHOD "A" OR METHOD "B" RIGHT ANGLE CUTS. AVOID FEATHER EDGES. FOR SHOTCRETE REPAIRS REFER TO ACI 506 EDGE PREPARATION GUIDELINES. KEEP PATCH CONFIGURATIONS AS SIMPLE AS POSSIBLE. FOR EXAMPLE:

8. AFTER REMOVALS AND EDGE CONDITIONING ARE COMPLETE, REMOVE BOND INHIBITING MATERIALS (DIRT, CONCRETE SLURRY, LOOSELY BONDED AGGREGATES), BY USING HAND TOOLS TO ENSURE THAT SURFACE IS FREE FROM LOOSE AGGREGATE, OR THAT ADDITIONAL DELAMINATIONS ARE NOT PRESENT. ABRASIVE BLASTING AND HIGH PRESSURE WATERBLASTING ARE PROHIBITED FOR THIS PROJECT.
9. IF HYDRODEMOLITION IS USED, REMOVE CEMENT AND PARTICULATE SLURRY FROM PREPARED SURFACES BEFORE SLURRY HARDENS. MEASURES MUST BE TAKEN TO PREVENT ALL WATER AND DEBRIS FROM ENTERING THE HARBOR OR OTHER RECEIVING WATERS.

2 TYPICAL EDGE AND SURFACE CONDITIONING DETAIL

NO SCALE



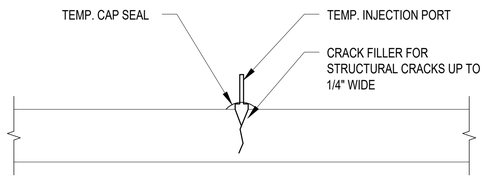
NOTES:

1. IF REBAR HAS LOST MORE THAN 25% OF ITS CROSS SECTION (20% IF 2 OR MORE CONSECUTIVE PARALLEL BARS ARE AFFECTED), CONSULT THE ENGINEER.
2. IF REPAIRS ARE REQUIRED TO REINFORCING STEEL USE ONE OF THE FOLLOWING REBAR METHODS:
   A. COMPLETE BAR REPLACEMENT SEE DETAIL 3/S-003 OR
   B. ADDITION OF SUPPLEMENTAL REBAR OVER AFFECTED SECTION, NEW BAR MAY BE MECHANICALLY SPLICED TO OLD BAR OR PLACED PARALLEL TO APPROXIMATELY 3/4" FROM EXISTING BAR.
   C. NEW REBAR SHALL MATCH SIZE OF EXISTING.
3. LAP LENGTH SHALL BE DETERMINED IN ACCORDANCE WITH ACI 318, ALSO REFER TO CRSI MANUAL

1 TYP. REPAIR OF REINF. STEEL DET.

NO SCALE

- APPLICABLE TO HORIZONTAL, VERTICAL AND OVERHEAD LOCATIONS.
- FOR CRACKS THAT REQUIRE CLEANING AND/OR REPAIR OF REINFORCING STEEL, REFER TO DETAILS 1, 2 AND 3 ON THIS SHEET.

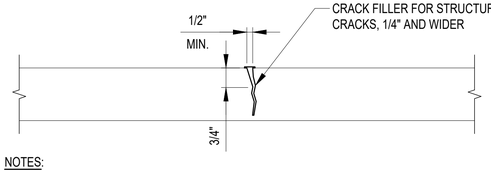


NOTES:

1. PRIOR TO APPLICATION OF EPOXY, CRACKS AND ADJACENT SURFACES SHALL BE CLEANED OF DIRT, DUST, OIL, PAINT AND OTHER MATERIALS THAT MAY AFFECT EPOXY BONDING.
2. PRESSURE INJECTION EPOXY CRACK FILLER ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
3. FOR HORIZONTAL AND VERTICAL SURFACES.
4. THIS DETAIL IS APPLICABLE FOR BOTH CONCRETE AND CMU WALLS

5 TYP. STRUCTURAL PRESSURE INJECTION CRACK REPAIR DETAIL

NO SCALE

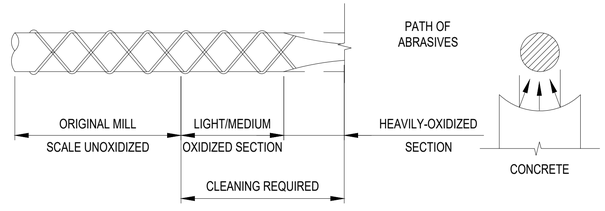


NOTES:

1. GRIND OR ROUTE CRACK TO A 1/2" MIN. WIDTH AND 3/4" MIN. DEPTH.
2. PRIOR TO APPLICATION OF EPOXY, CRACKS AND ADJACENT SURFACES SHALL BE CLEANED OF DIRT, DUST, OIL, PAINT AND OTHER MATERIALS THAT MAY AFFECT EPOXY BONDING.
3. APPLY EPOXY FILLER MATERIAL ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
4. FOR USE ON HORIZONTAL AND VERTICAL SURFACES.
5. THIS DETAIL IS APPLICABLE FOR BOTH CONCRETE AND CMU WALLS
6. THE FOLLOWING CRACKS SEALANT SHALL BE USED
   A. OVERHEAD INJECTION CRACK SEALANT
      I. SIMPSON STRONG TIE-CRACK-PAC INJECTION EPOXY
      II. SIKA SIKADUR CRACK REPAIR KIT
   B. NON-OVERHEAD CRACK SEALANT
      I. SIMPSON STRONG TIE SET-3G EPOXY
      II. UNITEX PRO-POXY 300 FAST GEL EPOXY

4 STRUCTURAL AND NON-STRUCTURAL NOTCH & SEAL CRACK REPAIR DETAIL

NO SCALE



NOTE:

REMOVE HEAVY OXIDES AND SCALE FROM BAR TO PROMOTE MAXIMUM BOND OF REPLACEMENT MATERIAL. ABRASIVE BLASTING AND HIGH PRESSURE WATERBLASTING ARE PROHIBITED FOR THIS PROJECT. HAND TOOLS SHALL BE USED TO CLEAN SURFACES. IF A PROTECTIVE COATING IS BEING APPLIED TO THE BAR SURFACE FOLLOW COATING MANUFACTURER'S RECOMMENDATIONS FOR SURFACE PREPARATION.

3 TYP. CLEANING OF REINF. STEEL DET.

NO SCALE

YEN WEN FANG
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 9361-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

DETAILS

ENGINEERING PARTNERS		HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. S-003
DESIGNED BY: KKC	CHECKED BY: MAF		
DRAWN BY: KKC	APPROVED BY: YWF	DATE JUNE 2026	SHEET 17 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 7:51 pm
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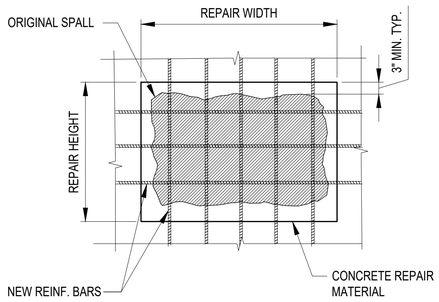
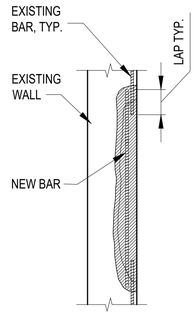


WALL ELEVATION



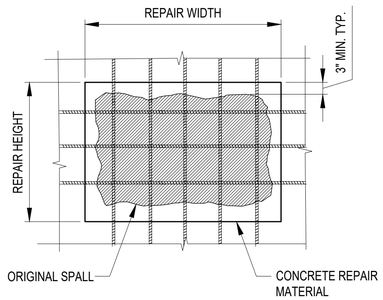
WALL SECTION

NOTES:

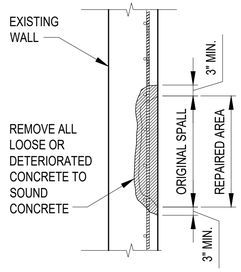
1. BOTH SPALLS AND DELAMINATIONS ARE CALLED OUT AS SPALLS ON THE PLANS. NO DISTINCTION IS MADE SINCE REPAIRS ARE THE SAME.
2. USE THIS REPAIR DETAIL WHERE DAMAGED OR CORRODED REINFORCING BARS ARE REQUIRED TO BE REPLACED.
3. PROVIDE REINFORCING BARS TO MATCH SIZE, LOCATION AND SPACING OF EXISTING BARS.
4. CLEAN REBAR PER DETAIL 3/S-003
5. FOR EDGE AND SURFACE CONDITIONING SEE DETAIL 2/S-003

4 TYPICAL CONCRETE SPALL REPAIR DETAIL W/ REBAR PLACEMENT DETAIL

NO SCALE



WALL ELEVATION



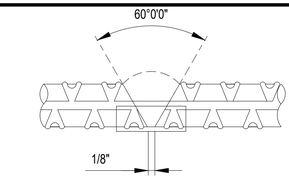
WALL SECTION

NOTES:

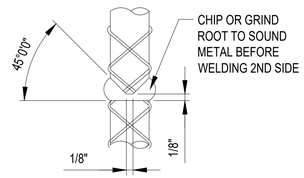
1. BOTH SPALLS AND DELAMINATIONS ARE CALLED OUT AS SPALLS ON THE PLANS. NO DISTINCTION IS MADE SINCE REPAIRS ARE THE SAME.
2. USE THIS REPAIR DETAIL WHERE DAMAGED OR CORRODED REINFORCING BARS ARE NOT REQUIRED TO BE REPLACED.
3. CLEAN REBAR PER DETAIL 3/S-003
4. FOR EDGE AND SURFACE CONDITIONING SEE DETAIL 2/S-003

5 TYPICAL CONCRETE SPALL REPAIR DETAIL WITHOUT REBAR PLACEMENT DETAIL

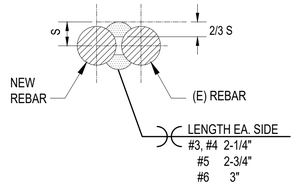
NO SCALE



CADWELL T-SERIES MAY BE SUBSTITUTED FOR HORIZONTAL WELD SPLICE



CADWELL C-SERIES MAY BE SUBSTITUTED FOR VERTICAL WELD SPLICE



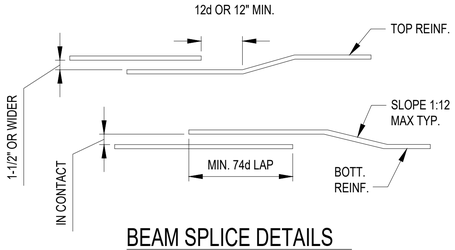
WELDED LAP SPLICE

NOTES:

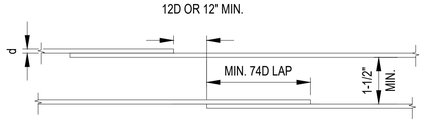
1. A PRE-QUALIFICATION TENSION TEST SHALL BE MADE BY AN APPROVED TESTING LABORATORY ON SAMPLES OF EVERY SIZE BAR BEING WELDED.
2. MATERIALS, CONDITIONS AND WELDING PROCEDURES UTILIZED SHALL COMPLY WITH THE CURRENT APPLICABLE BUILDING CODE AND THE REQUIREMENTS OF THE GOVERNING INSPECTION AGENCY.
3. ALL COSTS INCURRED FOR OBTAINING APPROVALS SHALL BE BORNE BY THE GENERAL CONTRACTOR.

1 TYP. WELDED REINFORCED BARS & LAP SPLICE DET.

NO SCALE

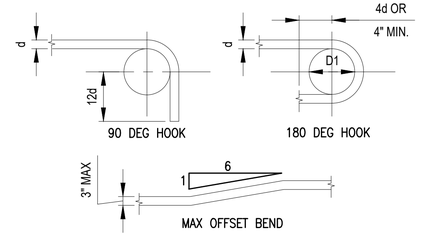


BEAM SPLICE DETAILS

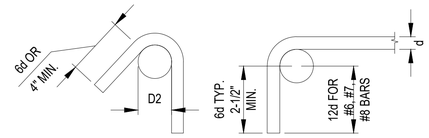


VERTICAL BARS

BAR DIA	MIN D2	MIN D1
#3	1–1/2"	2–1/4"
#4	2"	3"
#5	2–1/2"	3–3/4"
#6	4–1/2"	4–1/2"
#7	5–1/4"	5–1/4"
#8	6"	6"
#9		9–1/2"
#10		10–3/4"
#11		12"



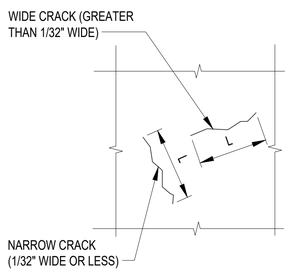
PRINCIPAL REINFORCING



HORIZONTAL BARS

2 TYPICAL REINFORCING BARS BENDS & LAPS DETAILS

NO SCALE



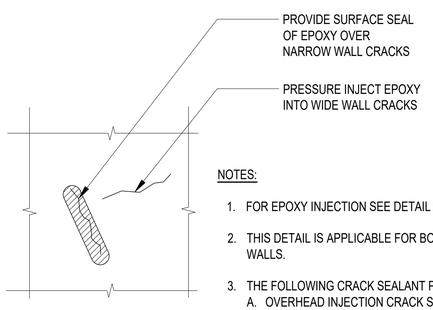
ELEVATION

NOTES:

1. SIZE SHOWN ON PLANS = L.
2. THIS DETAIL IS APPLICABLE FOR BOTH CONCRETE AND CMU WALLS

6 CONC. CRACK EXIST. CONDITION DET.

NO SCALE



WALL ELEVATION

NOTES:

1. FOR EPOXY INJECTION SEE DETAIL 5/S-003
2. THIS DETAIL IS APPLICABLE FOR BOTH CONCRETE AND CMU WALLS.
3. THE FOLLOWING CRACK SEALANT PRODUCTS SHALL BE USED.
   A. OVERHEAD INJECTION CRACK SEALANT
      I. SIMPSON STRONG TIE-CRACK-PAC INJECTION EPOXY
      II. SIKA SIKADUR CRACK REPAIR KIT.
   B. NON-OVERHEAD CRACK SEALANT
      I. SIMPSON STRONG TIE- SET-3G EPOXY
      II. UNITEX PRO-POXY 300 FAST GEL EPOXY.

3 TYPICAL WALL CRACK REPAIR DETAIL

NO SCALE

YEN WEN FANG
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Exp. 04/30/28
No. 9361-S
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

DETAILS

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HAARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. S-004
KKC	MAF		
DRAWN BY: KKC	APPROVED BY: YWF	DATE JUNE 2026	SHEET 18 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 7:51 pm
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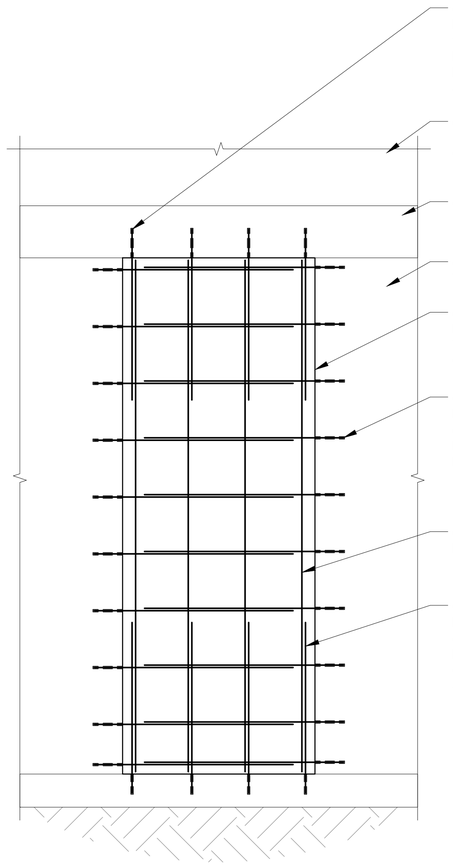
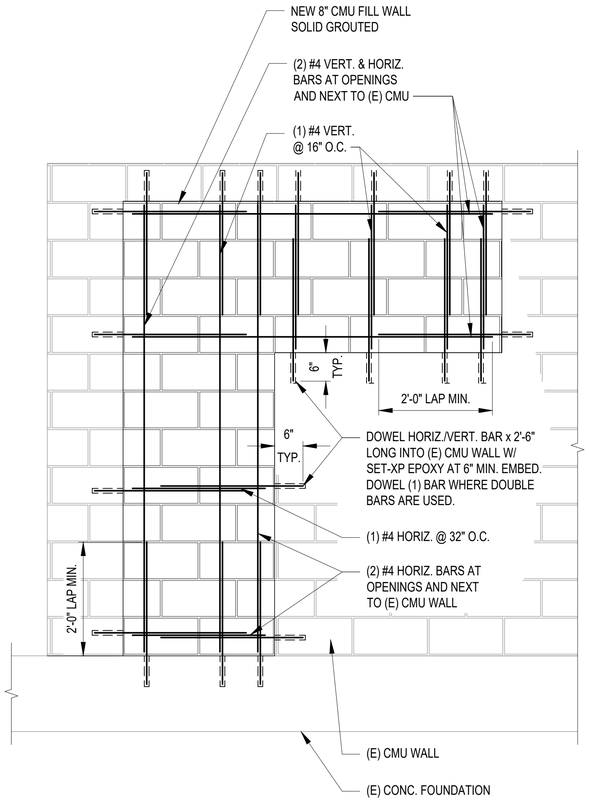
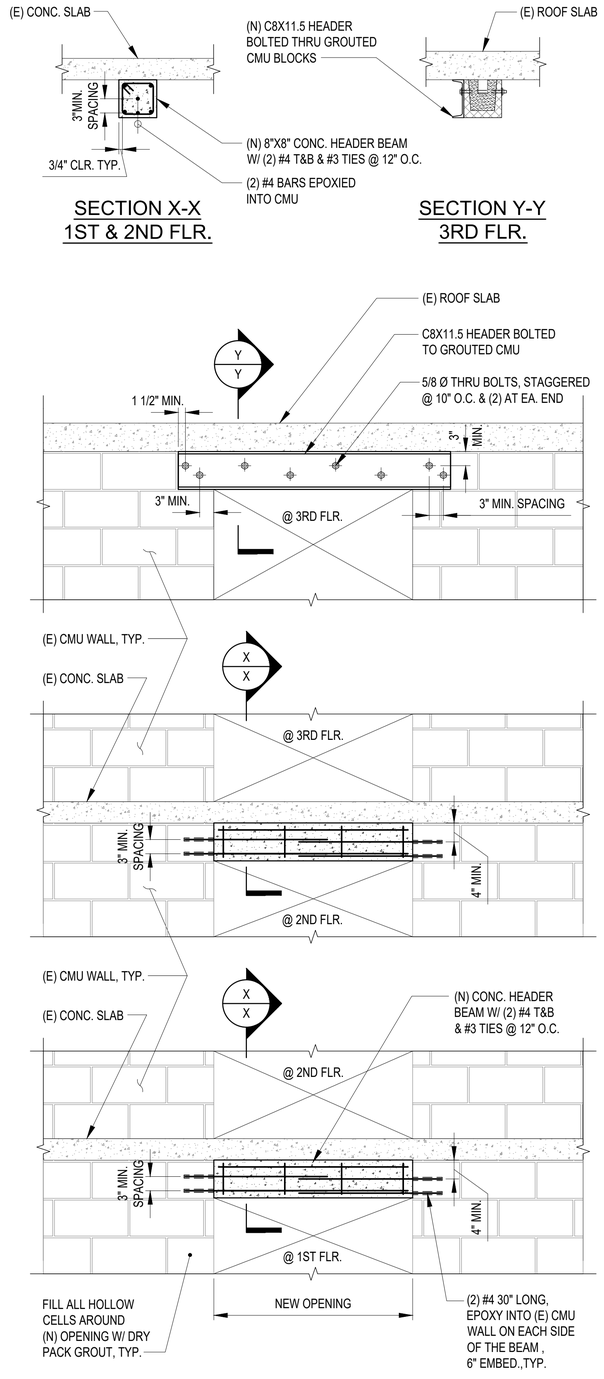


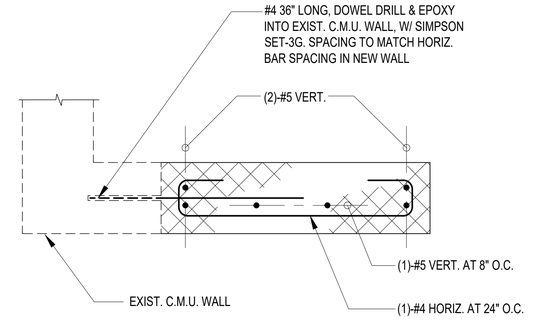
4 CONC. WALL INFILL DETAIL
NO SCALE



3 CMU WALL INFILL DETAIL
NO SCALE



2 CONC. HEADER AT (N) OPENING
NO SCALE



PLAN VIEW

1 CMU WALL TO (E) CMU WALL DETAIL
NO SCALE

REV. NO	DESCRIPTION	DATE

YEN WEN FANG
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 9361-S
HAWAII, U.S.A.

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SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

DETAILS

ENGINEERING PARTNERS		HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. S-005
DESIGNED BY: KKC	CHECKED BY: MAF		
DRAWN BY: KKC	APPROVED BY: YWF	DATE JUNE 2026	SHEET 19 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

06/02/2026 7:51 pm
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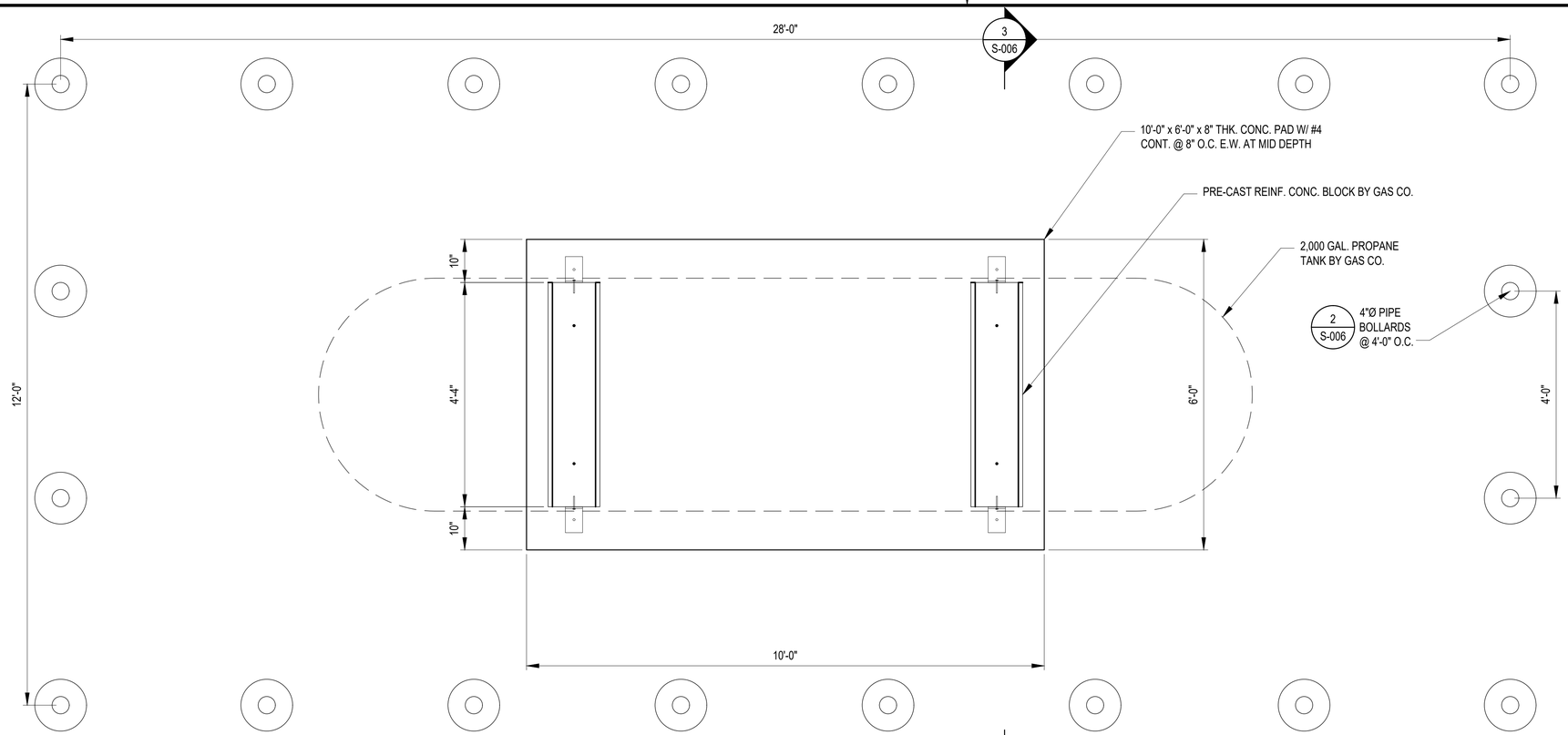
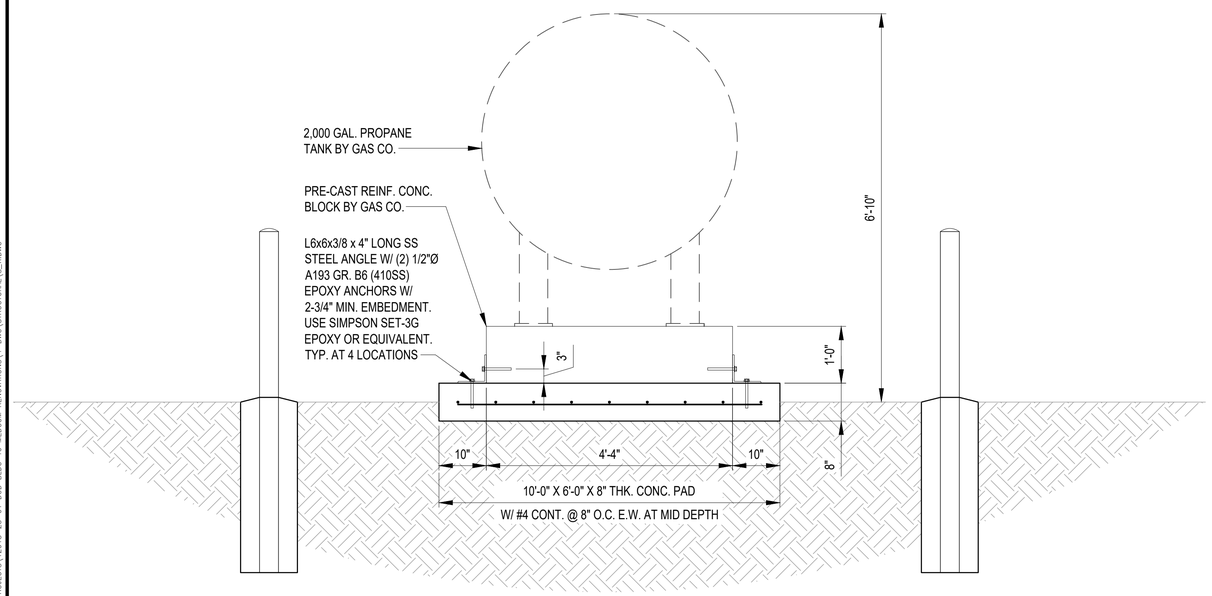


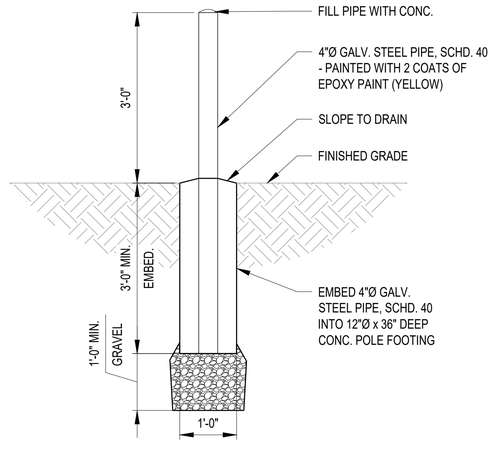
1 PROPANE TANK PLAN

NO SCALE



3 TYPICAL SECTION

NO SCALE



2 BOLLARD DETAIL

NO SCALE

BASE BID

1. AIR CONDITIONING SYSTEM IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO ALL FAN COILS, EXTERIOR CONDENSING UNITS, CONTROLS, CONCRETE PADS, TESTING/ADJUSTING/BALANCING, INSULATION, REFRIGERANT PIPING, CONDENSATE PIPING, AND ASSOCIATED ELECTRICAL WORK.
2. PLUMBING SYSTEM IN ITS ENTIRETY, INCLUDING ALL DEMOLITION WORK, NEW WASTE/VENT PIPING, NEW HOT WATER PIPING, WATER HEATERS, AND PROPANE SYSTEM. INCLUDE ALL TRENCHING, FLOOR SLAB REPAIR NECESSARY TO INSTALL NEW WASTE LINES. INCLUDE ARCHITECTURAL WORK FOR ANY NEW FRAMED WALLS AND CEILING, WALL, OR FLOOR FINISHES NECESSARY TO SUPPORT INSTALLATION OF PLUMBING FIXTURES.
3. ELECTRICAL INFRASTRUCTURE, INCLUDING ALL EXTERIOR SERVICE ENTRY INTO THE BUILDING, NEW METERING SWITCHBOARD, PANELBOARDS, AND FEEDERS.
4. ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL WORK OCCURRING WITHIN SELECT ROOMS AS INDICATED ON DRAWINGS.

ADDITIVE ALTERNATES

1. 1ST FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
2. 2ND FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
3. 3RD FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
4. DEMOLITION OF EXISTING LIGHTING AND INSTALLATION OF NEW LED LIGHTING AND ASSOCIATED BRANCH CIRCUITING, OVERCURRENT PROTECTION, AND CONTROLS.
5. ELECTRICAL BRANCH CIRCUITING FOR RECEPTACLES AND ANY OTHER ELECTRICAL WORK NOT ASSOCIATED WITH THE ABOVE BASE BID AND ADDITIVE ALTERNATES.
6. TELECOMMUNICATIONS WORK.
7. ROOF REPLACEMENT.
8. ELEVATOR REPLACEMENT.

NOTICE OF ADDITIVE ALTERNATES:

1. UNLESS OTHERWISE NOTED, ALL WORK IDENTIFIED ON DRAWINGS IS TO BE INCLUDED UNDER ADDITIVE ALTERNATE. REFER TO COVER SHEET AND DIVISION 1 SPECIFICATIONS FOR DESCRIPTION OF WORK. REVIEW ALL DISCIPLINE DRAWINGS TO ENSURE ALL REQUIRED WORK SCOPE.
2. ALL WORK ON THIS SHEET IS INCLUDED IN THE BASE BID.

YEN WEN FANG
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 9361-S
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

DETAILS

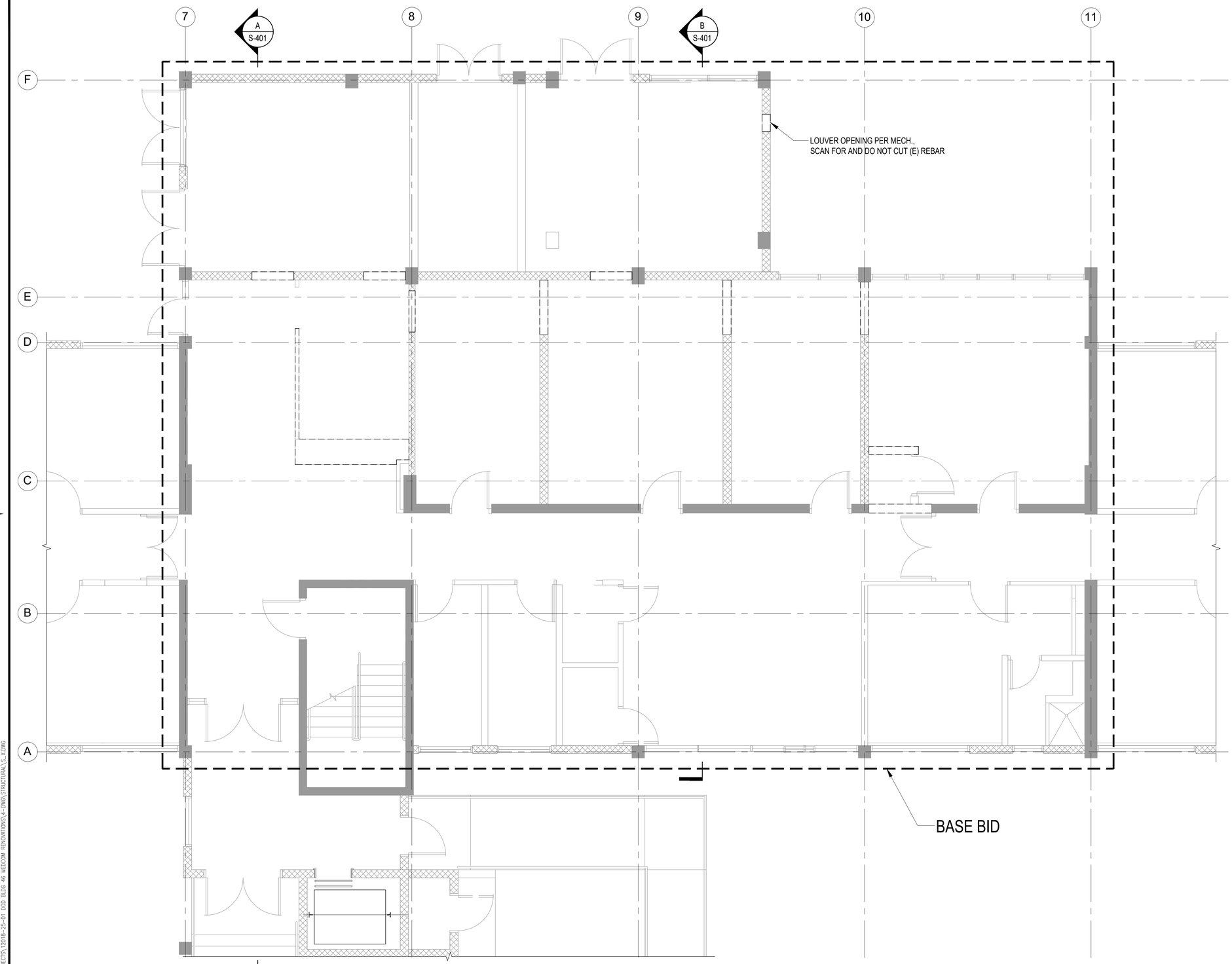
ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. S-006
KKC	MAF		
DRAWN BY: KKC	APPROVED BY: YWF	DATE JUNE 2026	SHEET 20 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 7:51 am
M:\ECO PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWGS\STRUCTURAL\S_X.DWG

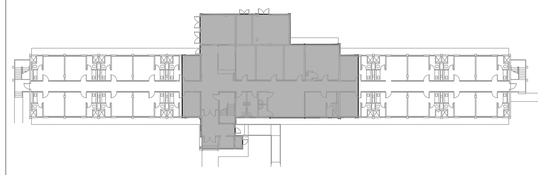


LEGEND:

- DEMOLISH (E) CMU/CONC. WALL
- EXISTING NON-BEARING, NON-SHEAR CFS PARTITION WALL
- EXISTING CMU WALL
- EXISTING CONC. WALL
- EXISTING CONC. COLUMN

NOTICE OF ADDITIVE ALTERNATES:

1. UNLESS OTHERWISE NOTED, ALL WORK IDENTIFIED ON DRAWINGS IS TO BE INCLUDED UNDER ADDITIVE ALTERNATE. REFER TO COVER SHEET AND DIVISION 1 SPECIFICATIONS FOR DESCRIPTION OF WORK. REVIEW ALL DISCIPLINE DRAWINGS TO ENSURE ALL REQUIRED WORK SCOPE.
2. ALL WORK ON THIS SHEET BETWEEN GRIDS 7 AND 11 IS INCLUDED IN THE BASE BID.



KEYPLAN

A EXISTING/DEMO PARTIAL FIRST FLOOR STRUCTURAL PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N

REV. NO	DESCRIPTION	DATE

YEN WEN FANG
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 9361-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/DEMO PARTIAL FIRST FLOOR STRUCTURAL PLAN

ENGINEERING PARTNERS		HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. S-101
DESIGNED BY: KKC	CHECKED BY: MAF		
DRAWN BY: KKC	APPROVED BY: YWF	DATE: JUNE 2026	SHEET 21 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 7:51 pm
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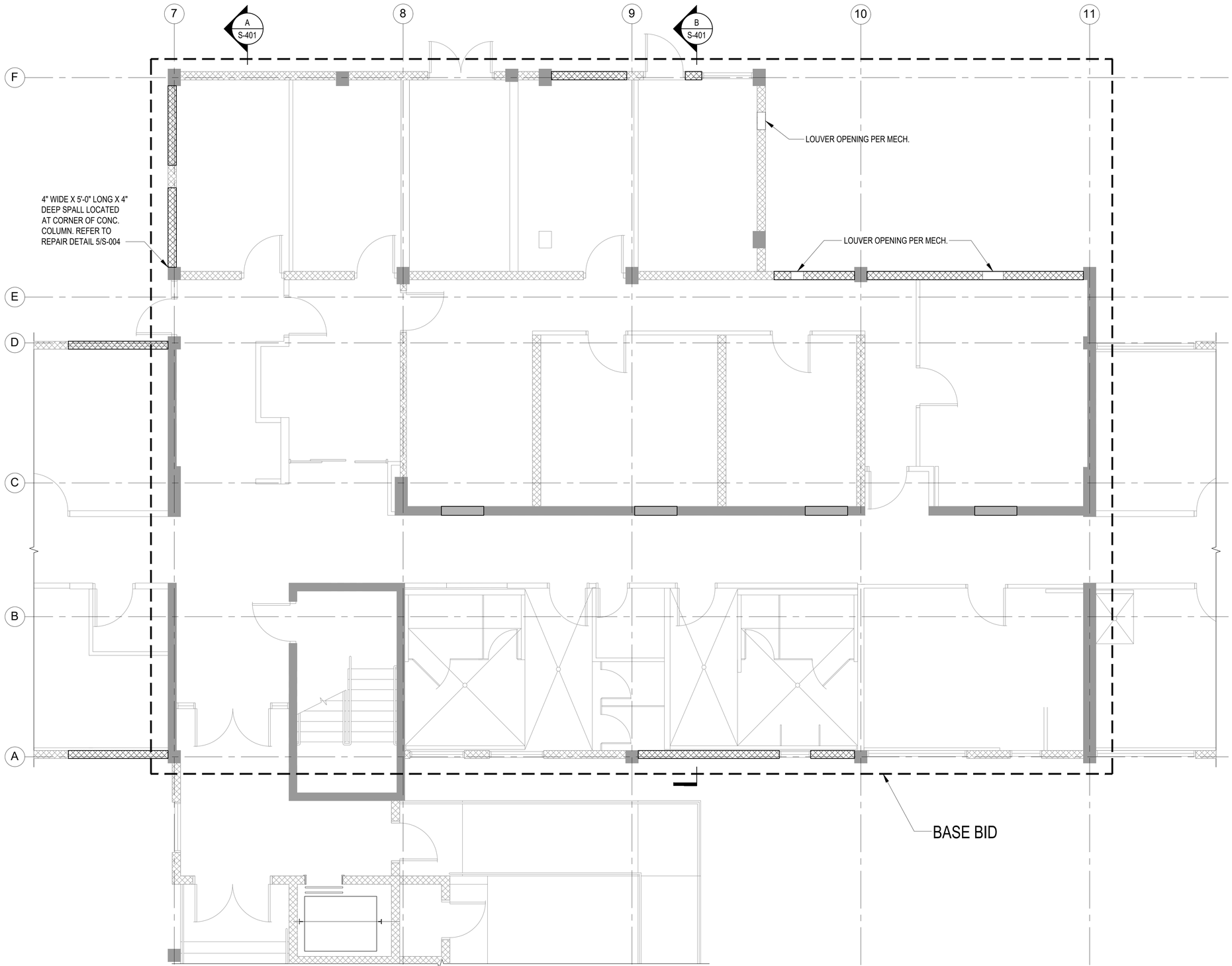


A EXISTING/NEW PARTIAL FIRST FLOOR STRUCTURAL PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

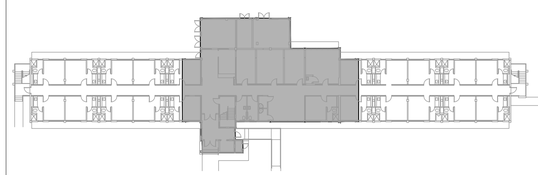
NORTH TRUE N

LEGEND:

- NEW 8" CMU WALL INFILL
- NEW 8" CONC. WALL INFILL
- NEW NON-BEARING, NON-SHEAR CFS PARTITION WALL
- EXISTING NON-BEARING, NON-SHEAR CFS PARTITION WALL
- EXISTING 8" CMU WALL
- EXISTING 8" CONC. WALL
- EXISTING CONC. COLUMN

NOTICE OF ADDITIVE ALTERNATES:

1. UNLESS OTHERWISE NOTED, ALL WORK IDENTIFIED ON DRAWINGS IS TO BE INCLUDED UNDER ADDITIVE ALTERNATE. REFER TO COVER SHEET AND DIVISION 1 SPECIFICATIONS FOR DESCRIPTION OF WORK. REVIEW ALL DISCIPLINE DRAWINGS TO ENSURE ALL REQUIRED WORK SCOPE.
2. ALL WORK ON THIS SHEET BETWEEN GRIDS 7 AND 11 IS INCLUDED IN THE BASE BID.



KEYPLAN

REV. NO	DESCRIPTION	DATE

YEN WEN FANG
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 9361-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW PARTIAL FIRST FLOOR STRUCTURAL PLAN

ENGINEERING PARTNERS		HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. S-102
DESIGNED BY: KKC	CHECKED BY: MAF		
DRAWN BY: KKC	APPROVED BY: YWF	DATE JUNE 2026	SHEET 22 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 7:51 am
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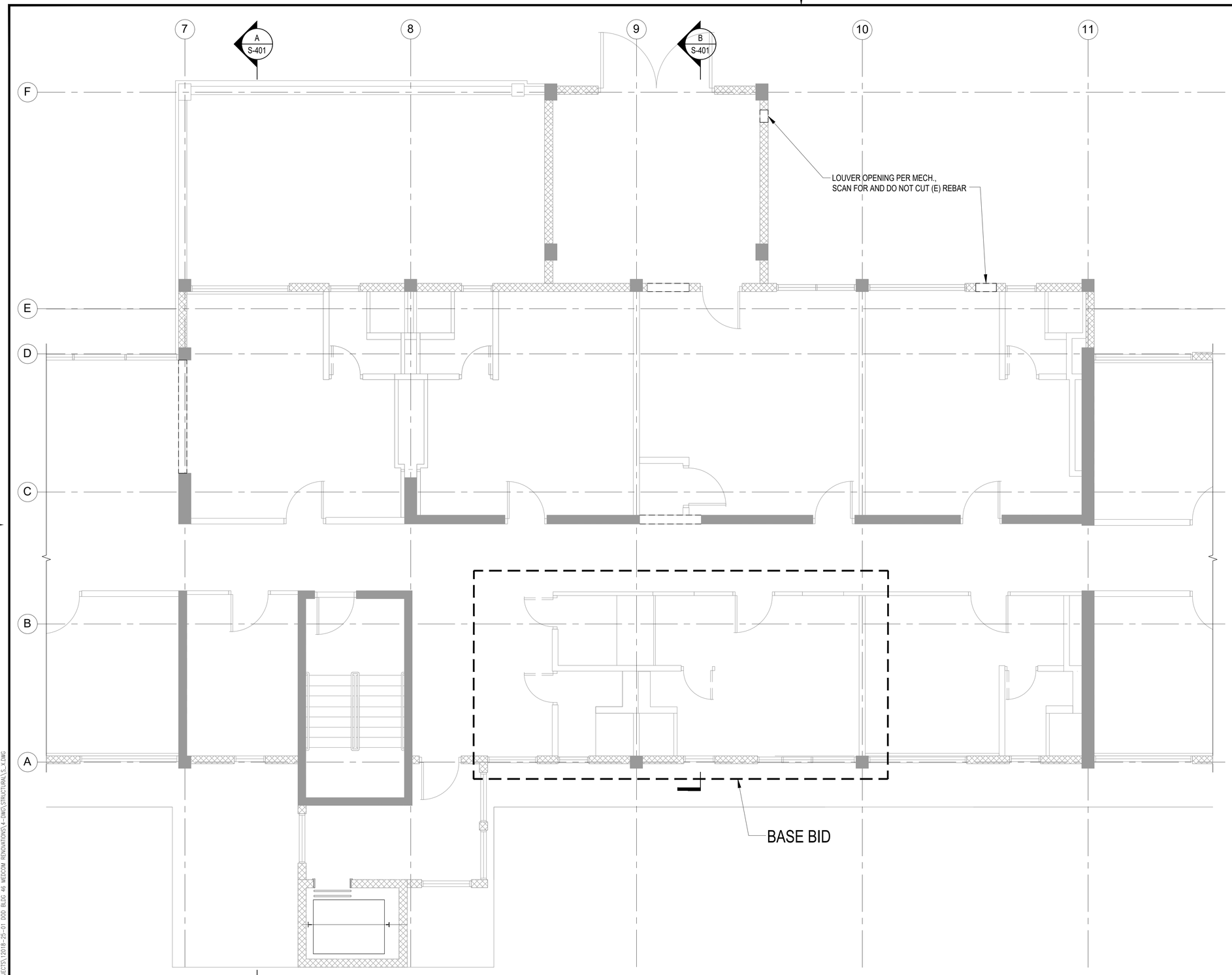


A EXISTING/DEMO PARTIAL SECOND FLOOR STRUCTURAL PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

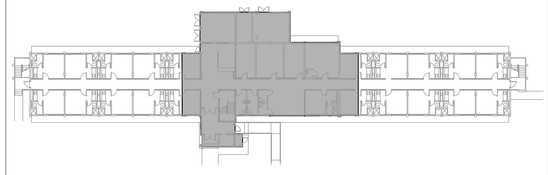
NORTH TRUE N

LEGEND:

- DEMOLISH (E) CMU/CONC. WALL
- EXISTING NON-BEARING, NON-SHEAR CFS PARTITION WALL
- EXISTING 8" CMU WALL
- EXISTING 8" CONC. WALL
- EXISTING CONC. COLUMN

NOTICE OF ADDITIVE ALTERNATES:

1. UNLESS OTHERWISE NOTED, ALL WORK IDENTIFIED ON DRAWINGS IS TO BE INCLUDED UNDER ADDITIVE ALTERNATE. REFER TO COVER SHEET AND DIVISION 1 SPECIFICATIONS FOR DESCRIPTION OF WORK. REVIEW ALL DISCIPLINE DRAWINGS TO ENSURE ALL REQUIRED WORK SCOPE.
2. BASE BID WORK OCCURS AT THE TWO RESTROOMS.



KEYPLAN

REV. NO	DESCRIPTION	DATE

YEN WEN FANG
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 9361-S
HAWAII, U.S.A.

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SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/DEMO PARTIAL SECOND FLOOR STRUCTURAL PLAN

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. S-201
DESIGNED BY: KKC	CHECKED BY: MAF		
DRAWN BY: KKC	APPROVED BY: YWF	DATE JUNE 2026	SHEET 23 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

06/02/2026 7:51 am
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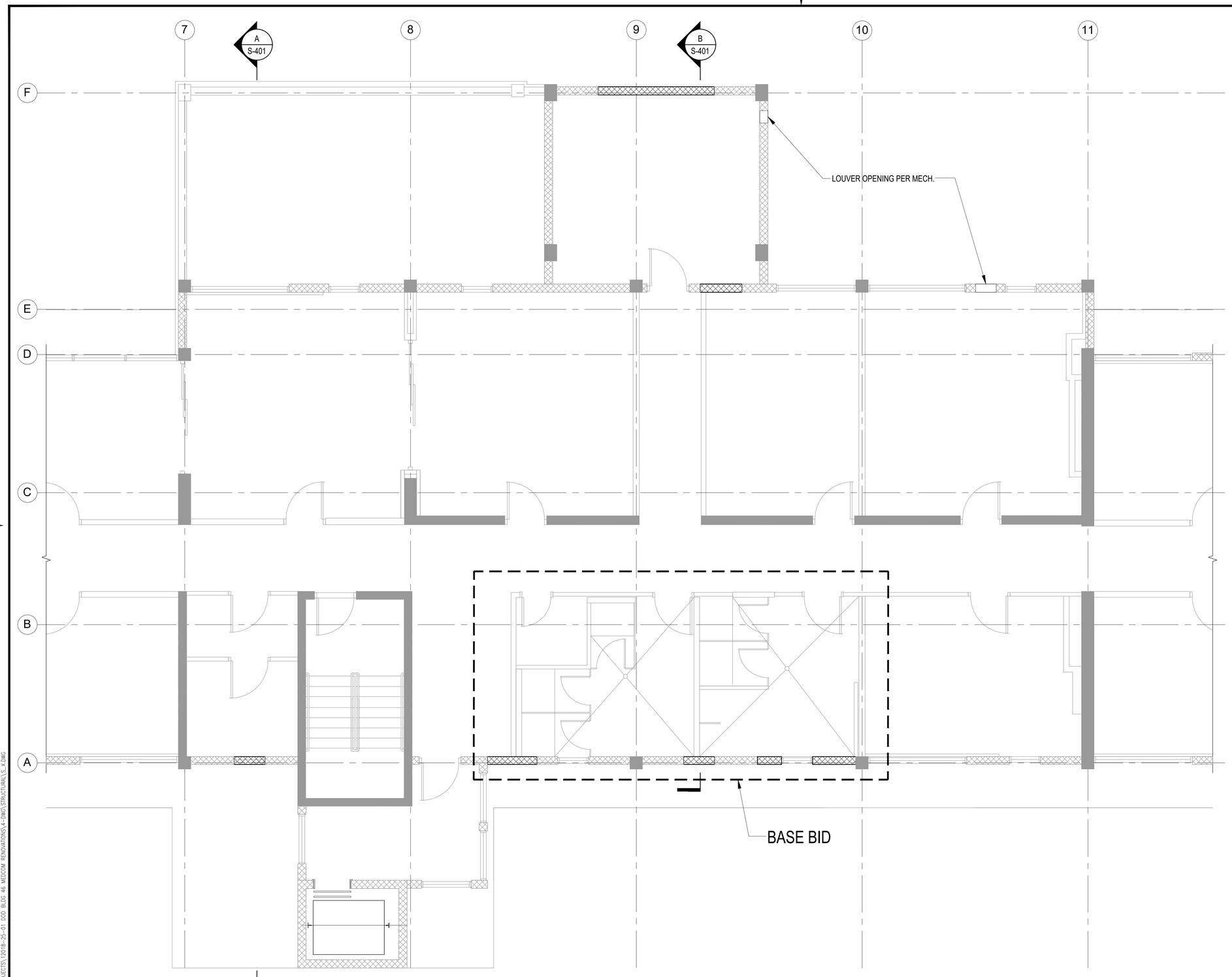
DATE ISSUED: ---



A EXISTING/NEW PARTIAL SECOND FLOOR STRUCTURAL PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N

LEGEND:

- NEW 8" CMU WALL INFILL
- NEW 8" CONC. WALL INFILL
- NEW NON-BEARING, NON-SHEAR CFS PARTITION WALL
- EXISTING NON-BEARING, NON-SHEAR CFS PARTITION WALL
- EXISTING 8" CMU WALL
- EXISTING 8" CONC. WALL
- EXISTING CONC. COLUMN

NOTICE OF ADDITIVE ALTERNATES:

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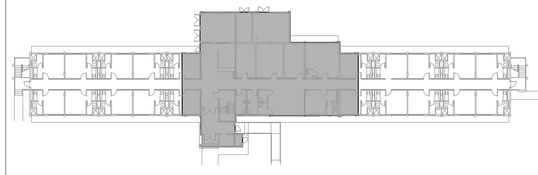
2. BASE BID WORK OCCURS AT THE TWO RESTROOMS.



KEYPLAN

REV. NO	DESCRIPTION	DATE

YEN WEN FANG
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 9361-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW PARTIAL SECOND FLOOR STRUCTURAL PLAN

ENGINEERING PARTNERS		HAPNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. S-202
DESIGNED BY: KKC	CHECKED BY: MAF		
DRAWN BY: KKC	APPROVED BY: YWF	DATE JUNE 2026	SHEET 24 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 7:51 pm
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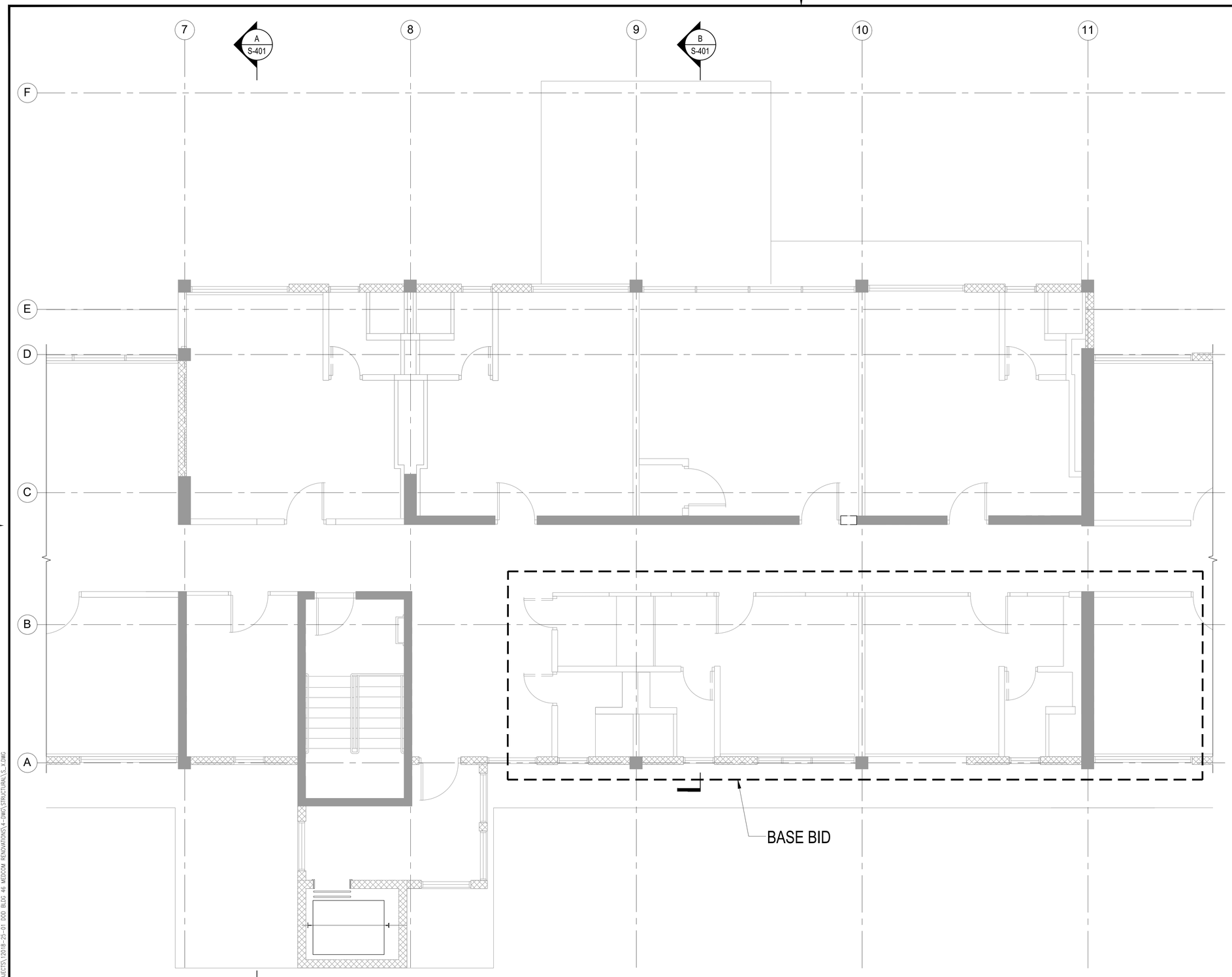

LEGEND:

- DEMOLISH (E) CMU/CONC. WALL
- EXISTING NON-BEARING, NON-SHEAR CFS PARTITION WALL
- EXISTING 8" CMU WALL
- EXISTING 8" CONC. WALL
- EXISTING CONC. COLUMN

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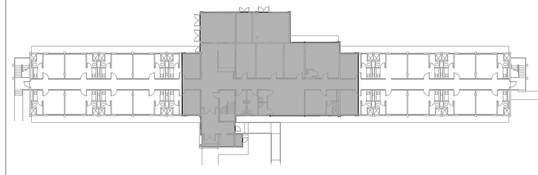
2. BASE BID WORK OCCURS AT THE TWO RESTROOMS AND SHOWERS.



KEYPLAN

REV. NO	DESCRIPTION	DATE

YEN WEN FANG
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Exp. 04/30/28
No. 9361-S
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SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/DEMO PARTIAL THIRD FLOOR STRUCTURAL PLAN

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. S-301
DESIGNED BY: KKC	CHECKED BY: MAF		
DRAWN BY: KKC	APPROVED BY: YWF	DATE JUNE 2026	SHEET 25 OF 276 SHTS
SCALE: AS NOTED			

A EXISTING/DEMO PARTIAL THIRD FLOOR STRUCTURAL PLAN
SCALE: 1/4" = 1'-0"

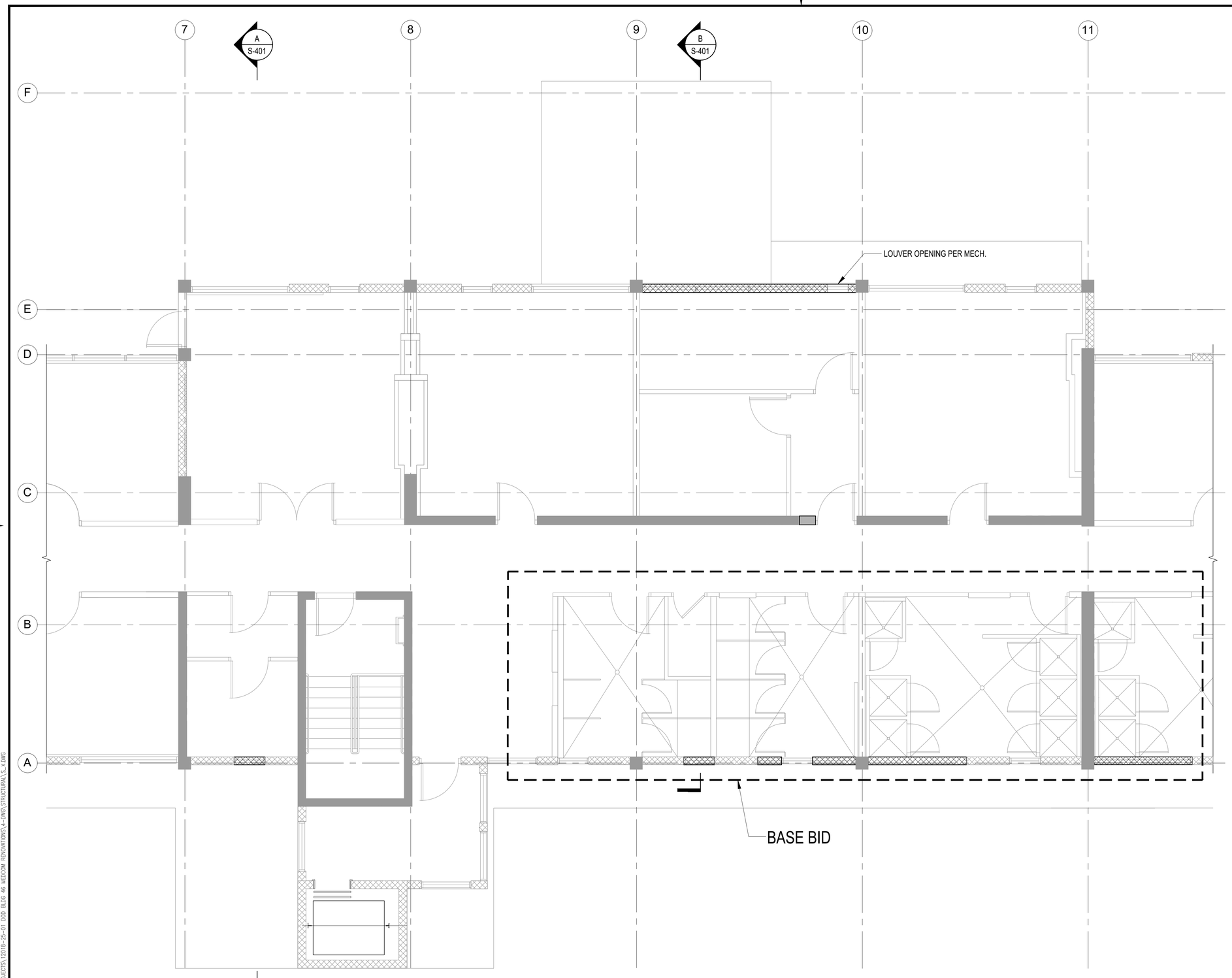
0 4' 8'

NORTH TRUE N

06/02/2026 7:51 am
M:\CO PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWGS\STRUCTURAL\S_X.DWG

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____



A EXISTING/NEW PARTIAL THIRD FLOOR STRUCTURAL PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N

LEGEND:

- NEW 8" CMU WALL INFILL
- NEW 8" CONC. WALL INFILL
- NEW NON-BEARING, NON-SHEAR CFS PARTITION WALL
- EXISTING NON-BEARING, NON-SHEAR CFS PARTITION WALL
- EXISTING 8" CMU WALL
- EXISTING 8" CONC. WALL
- EXISTING CONC. COLUMN

NOTICE OF ADDITIVE ALTERNATES:

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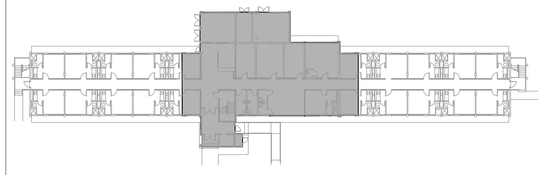
2. BASE BID WORK OCCURS AT THE TWO RESTROOMS AND SHOWERS.



KEYPLAN

REV. NO	DESCRIPTION	DATE

YEN WEN FANG
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 9361-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW PARTIAL THIRD FLOOR STRUCTURAL PLAN

ENGINEERING PARTNERS		HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. S-302
DESIGNED BY: KKC	CHECKED BY: MAF		
DRAWN BY: KKC	APPROVED BY: YWF	DATE JUNE 2026	SHEET 26 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 7:51 am
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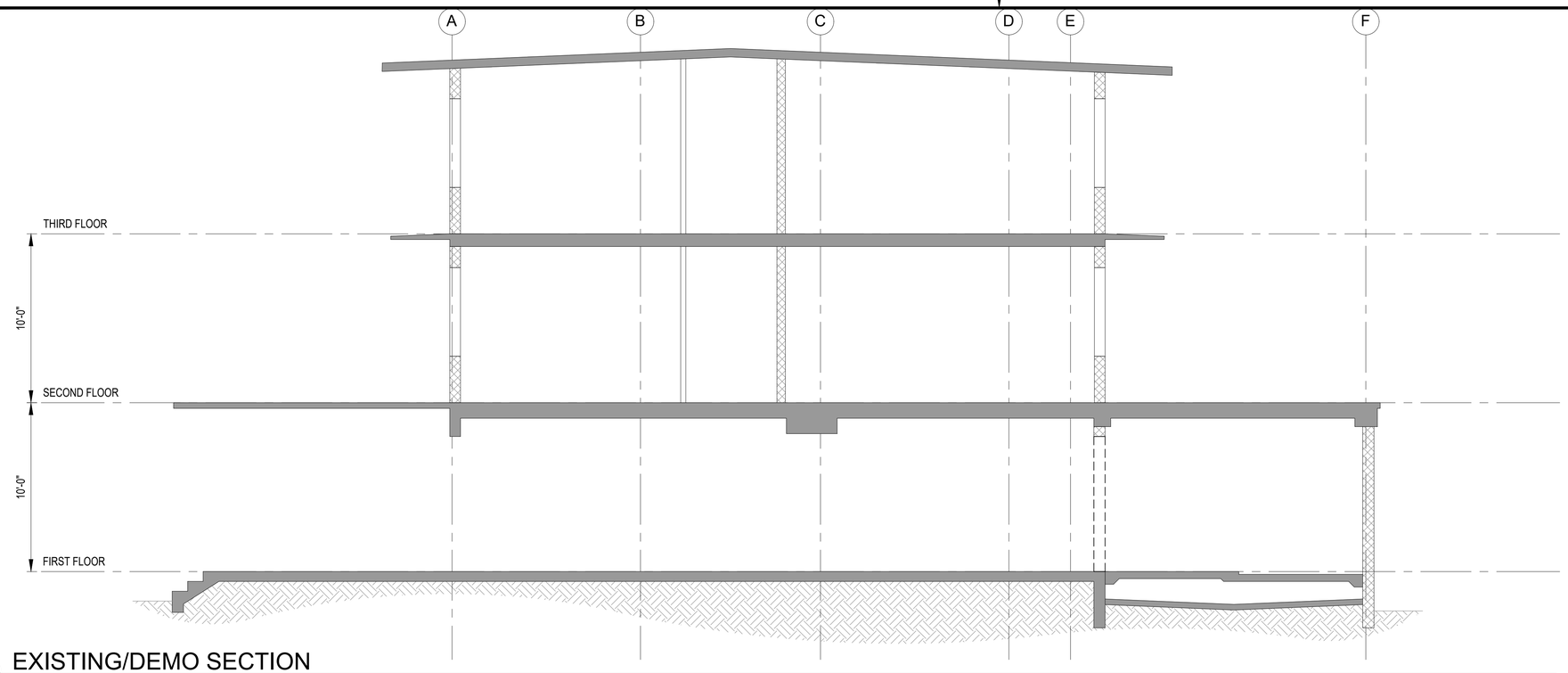
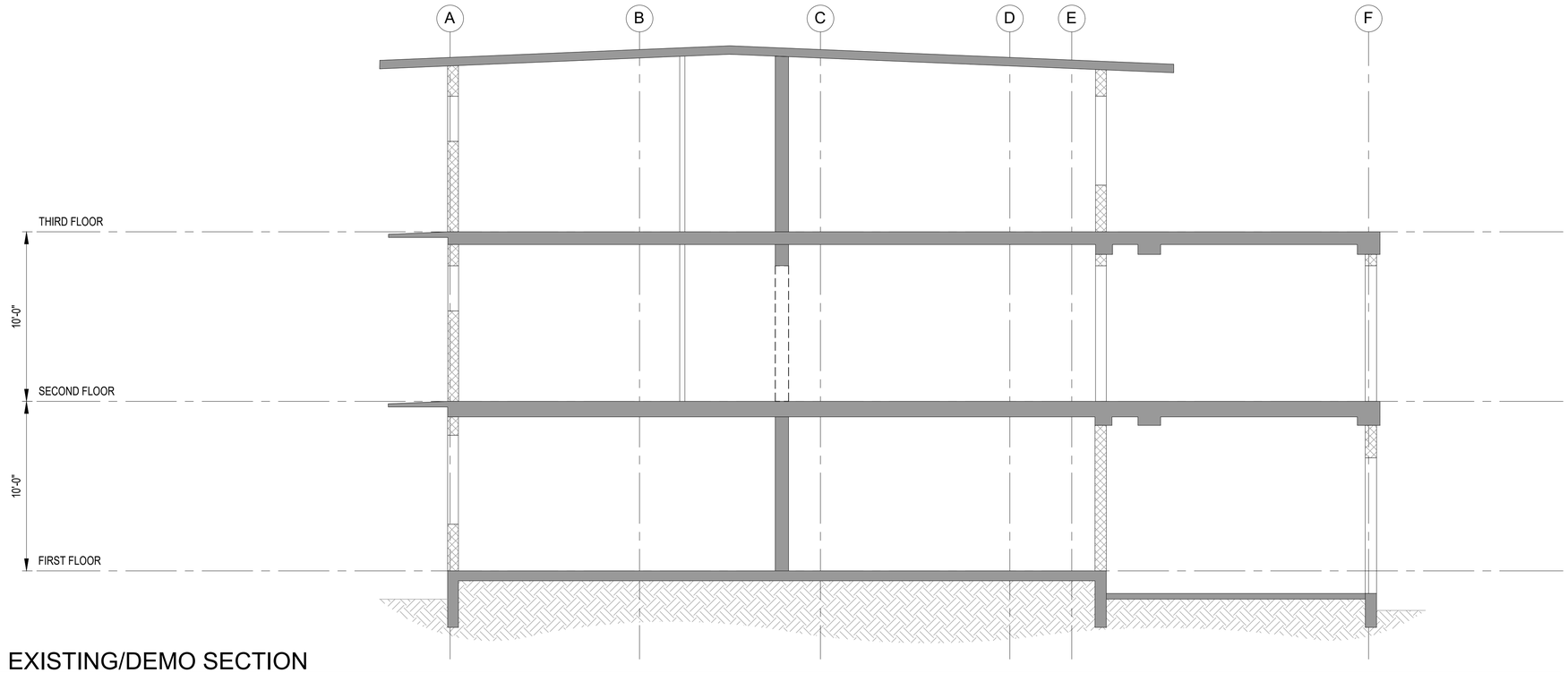


A EXISTING/DEMO SECTION

SCALE: 1/4" = 1'-0"

0 4' 8'



B EXISTING/DEMO SECTION

SCALE: 1/4" = 1'-0"

0 4' 8'

YEN WEN FANG
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 9361-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/DEMO SECTIONS

ENGINEERING PARTNERS

DESIGNED BY: KKC	CHECKED BY: MAF	HIARNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. S-401
DRAWN BY: KKC	APPROVED BY: YWF	DATE JUNE 2026	SHEET 27 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~

06/02/2026 7:51 pm
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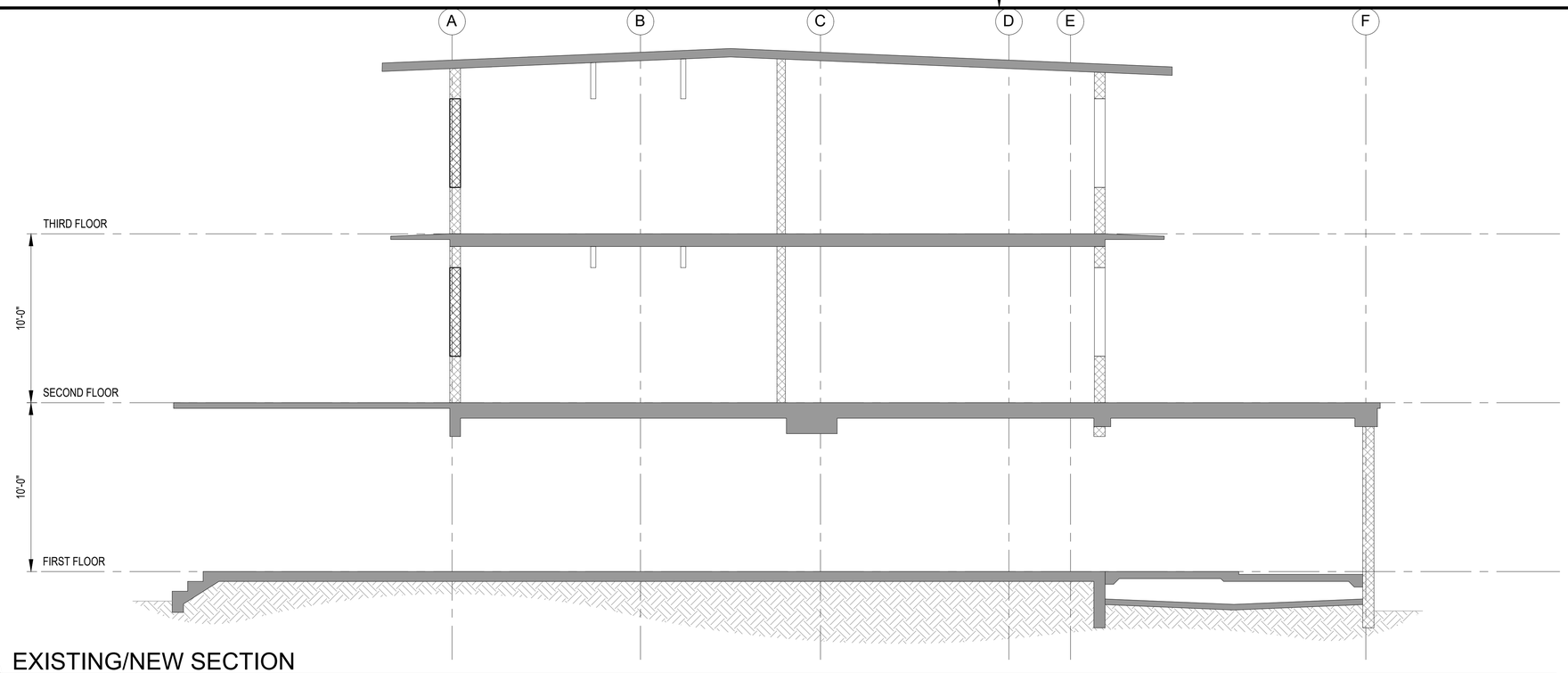
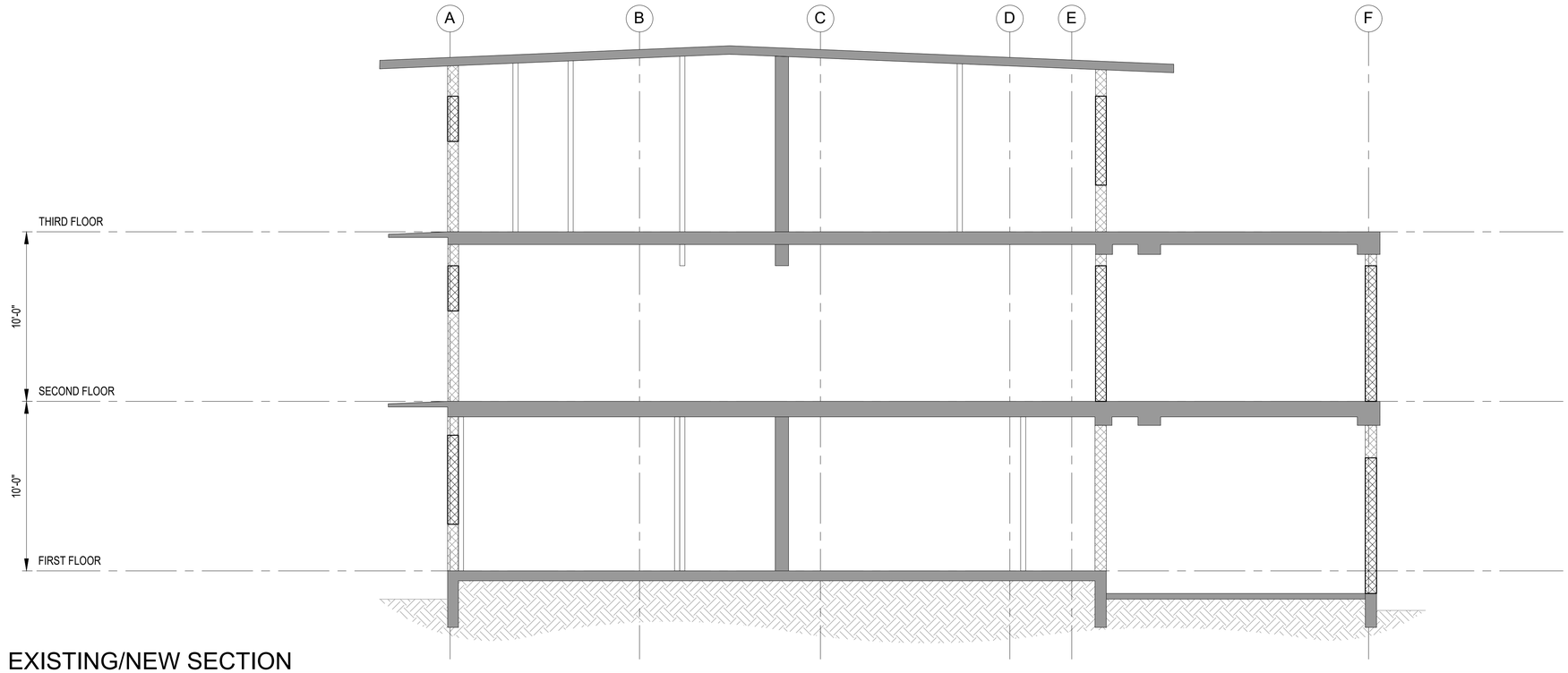


A EXISTING/NEW SECTION

SCALE: 1/4" = 1'-0"



B EXISTING/NEW SECTION

SCALE: 1/4" = 1'-0"

YEN WEN FANG
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 9361-S
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW SECTIONS

ENGINEERING PARTNERS

DESIGNED BY: KKC	CHECKED BY: MAF	HIARNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. S-402
DRAWN BY: KKC	APPROVED BY: YWF	DATE: JUNE 2026	SHEET 28 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 7:51 am
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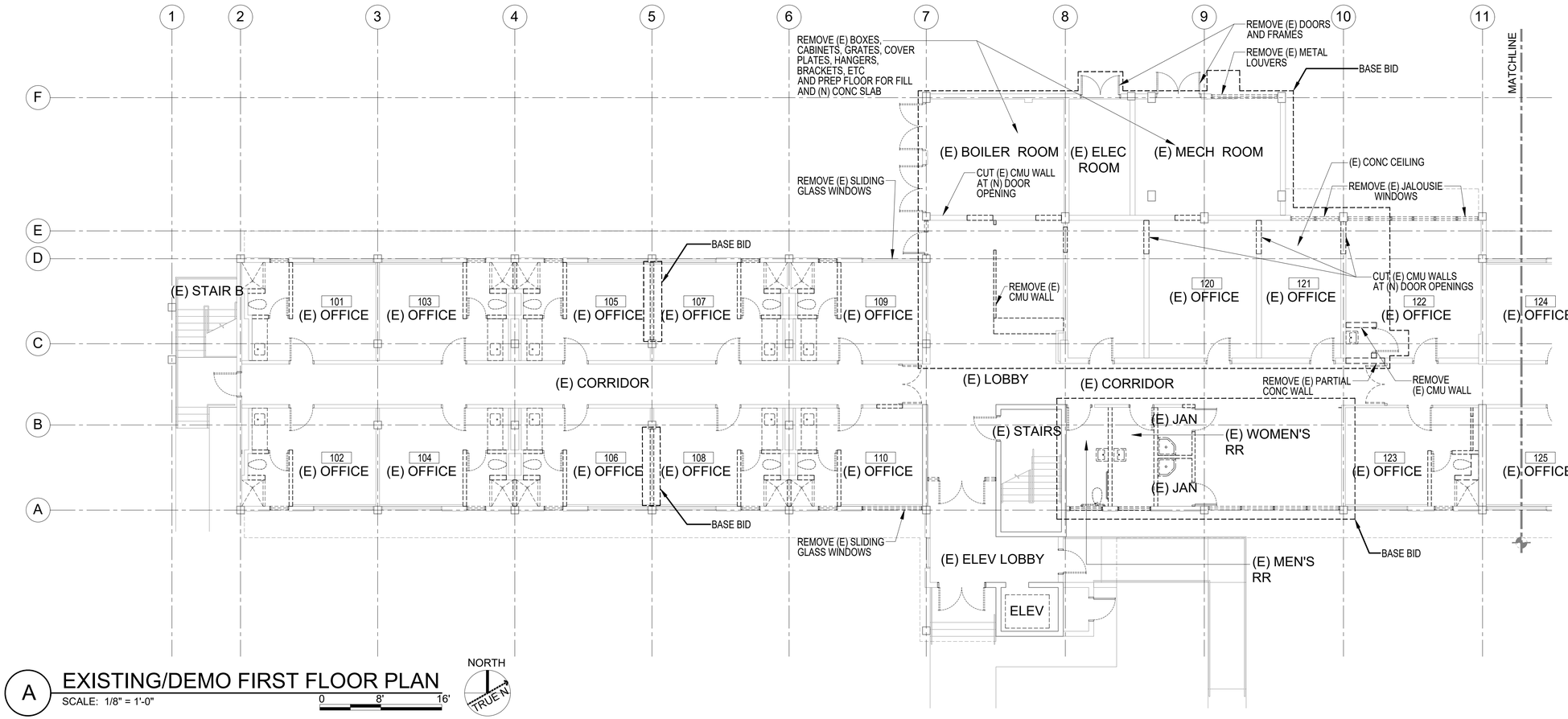


A EXISTING/DEMO FIRST FLOOR PLAN

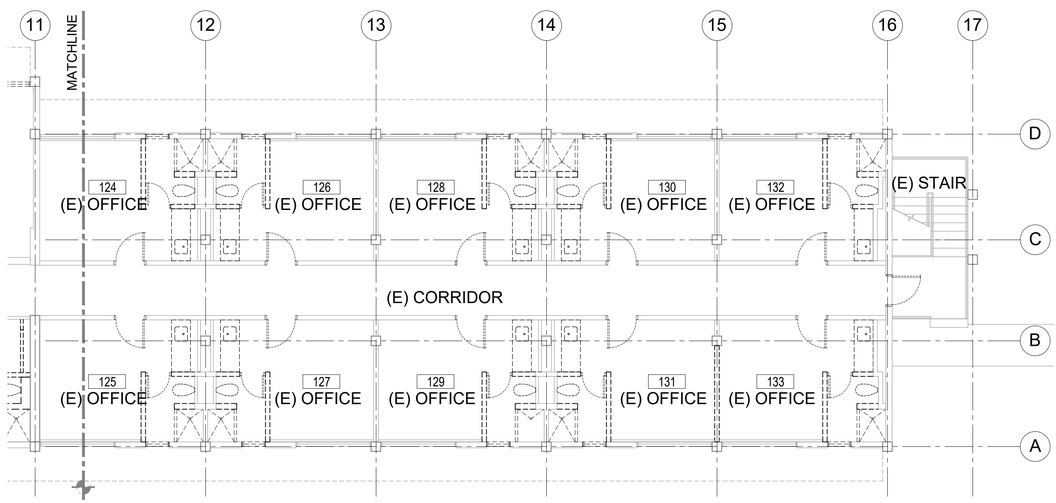
SCALE: 1/8" = 1'-0" 0 8' 16'

NORTH TRUE N

NOTICE OF ADDITIVE ALTERNATES:

UNLESS OTHERWISE NOTED, ALL WORK IDENTIFIED ON DRAWINGS IS TO BE INCLUDED UNDER ADDITIVE ALTERNATE. REFER TO COVER SHEET AND DIVISION 1 SPECIFICATIONS FOR DESCRIPTION OF WORK. REVIEW ALL DISCIPLINE DRAWINGS TO ENSURE ALL REQUIRED WORK SCOPE.

1. 1ST FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
2. 2ND FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
3. 3RD FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
4. DEMOLITION OF EXISTING LIGHTING AND INSTALLATION OF NEW LED LIGHTING AND ASSOCIATED BRANCH CIRCUITING, OVERCURRENT PROTECTION, AND SWITCHES.
5. ELECTRICAL BRANCH CIRCUITING FOR RECEPTACLES AND ANY OTHER ELECTRICAL WORK NOT ASSOCIATED WITH THE ABOVE BASE BID AND ADDITIVE ALTERNATES.
6. TELECOMMUNICATIONS
7. ROOF REPLACEMENT
8. ELEVATOR REPLACEMENT



B EXISTING/DEMO FIRST FLOOR PLAN

SCALE: 1/8" = 1'-0" 0 8' 16'

NORTH TRUE N

LEGEND

EXISTING

- (E) COLUMNS
- E) WALLS
- (E) WINDOWS
- (E) DOORS
- (E) PLUMBING FIXTURES

DEMO

- REMOVE (E) WALLS
- REMOVE (E) WINDOWS
- REMOVE (E) DOORS AND FRAMES
- REMOVE (E) PLUMBING FIXTURES:
- REMOVE (E) SINK AND COUNTER
- REMOVE (E) SHOWER STALL

REV. NO	DESCRIPTION	DATE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/DEMO FIRST FLOOR PLAN

ENGINEERING PARTNERS		HNARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. AD-101
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: AP	APPROVED BY:	DATE JUNE 2026	SHEET 29 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05.07.2026 8:42 am
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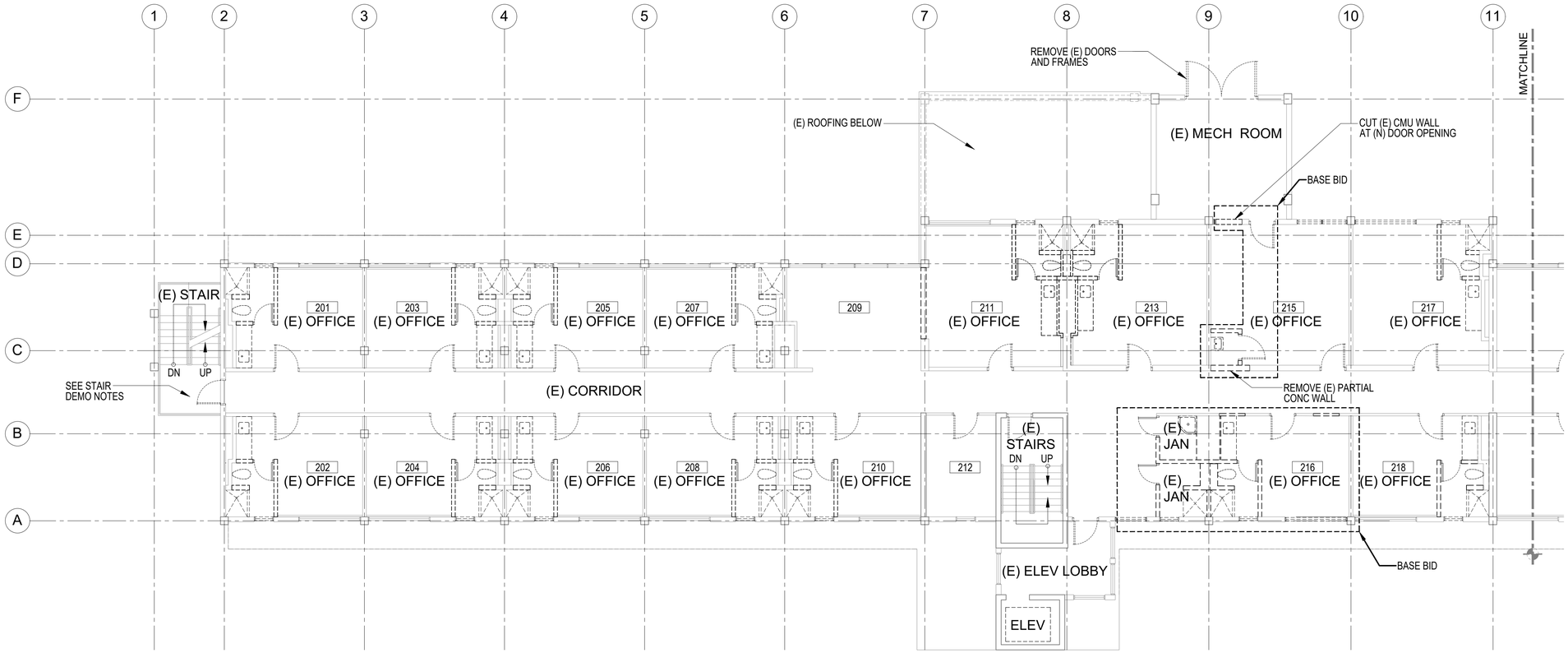

A EXISTING/DEMO SECOND FLOOR PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'

NORTH TRUE N

LEGEND

EXISTING

- (E) COLUMNS
- E) WALLS
- (E) WINDOWS
- (E) DOORS
- (E) PLUMBING FIXTURES

DEMO

- REMOVE (E) WALLS
- REMOVE (E) WINDOWS
- REMOVE (E) DOORS AND FRAMES
- REMOVE (E) PLUMBING FIXTURES:
- REMOVE (E) SINK AND COUNTER
- REMOVE (E) SHOWER STALL

NOTICE OF ADDITIVE ALTERNATES:

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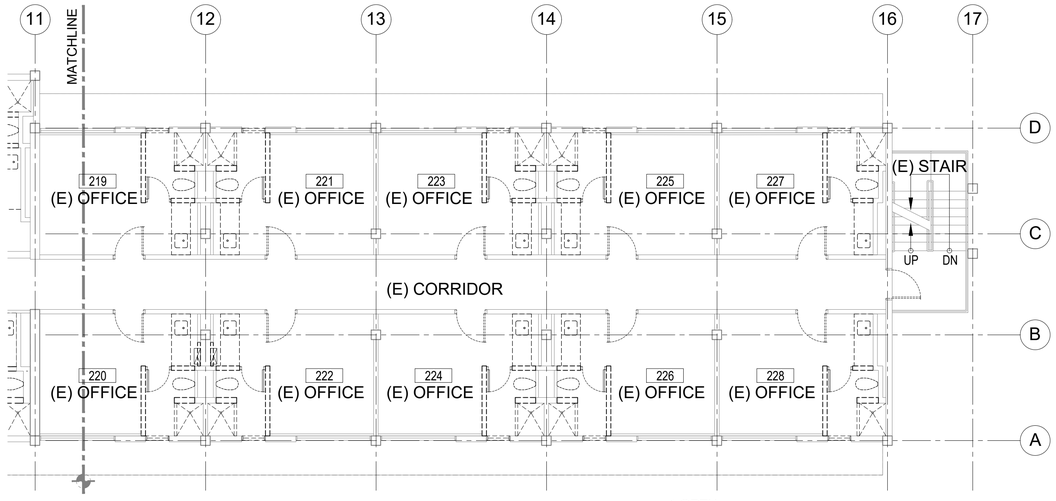
5. ELECTRICAL BRANCH CIRCUITING FOR RECEPTACLES AND ANY OTHER ELECTRICAL WORK NOT ASSOCIATED WITH THE ABOVE BASE BID AND ADDITIVE ALTERNATES.
6. TELECOMMUNICATIONS
7. ROOF REPLACEMENT
8. ELEVATOR REPLACEMENT



B EXISTING/DEMO SECOND FLOOR PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'

NORTH TRUE N

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/DEMO SECOND FLOOR PLAN

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN:FSH00033 STATE: CA-202505-D	DRAWING NO. AD-102
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: CSL	APPROVED BY:	DATE: JUNE 2026	SHEET 30 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~

05/07/2026 8:43 am
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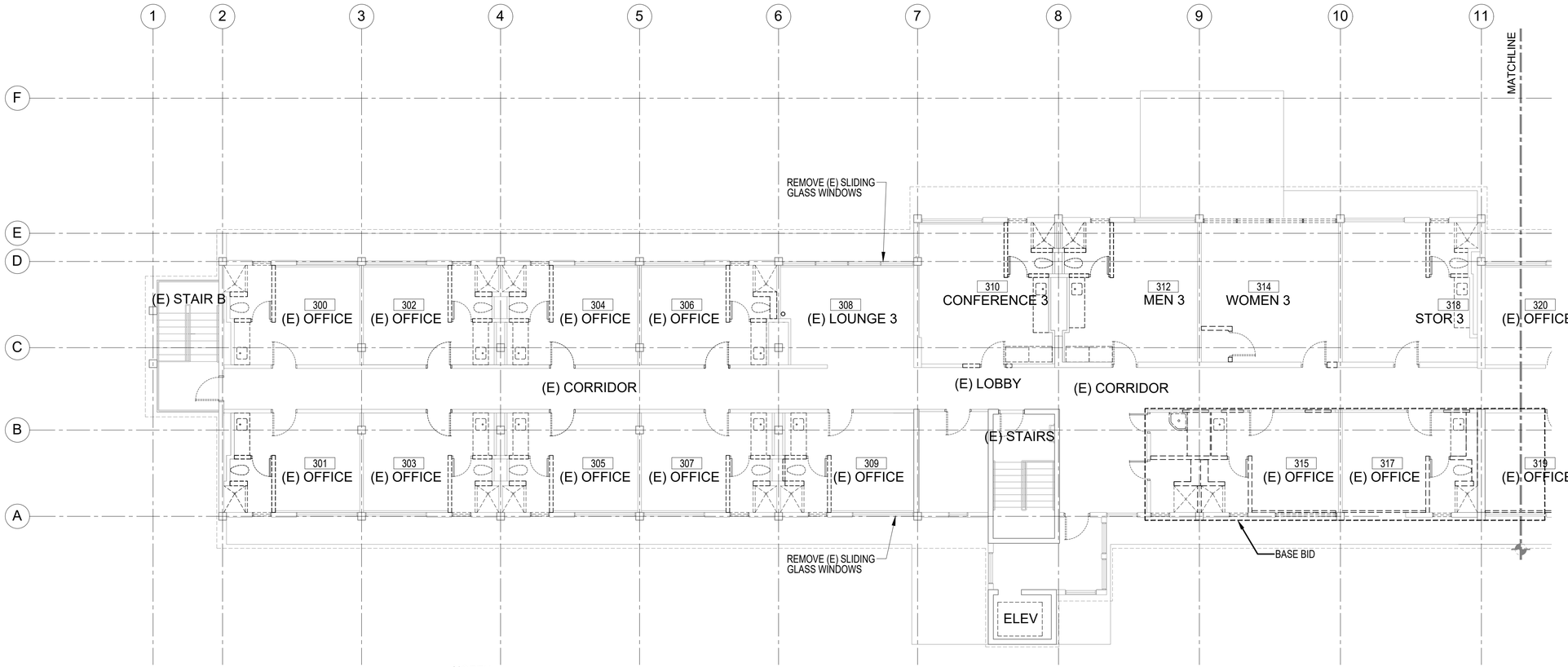

A EXISTING/DEMO THIRD FLOOR PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'

NORTH TRUE N

NOTICE OF ADDITIVE ALTERNATES:

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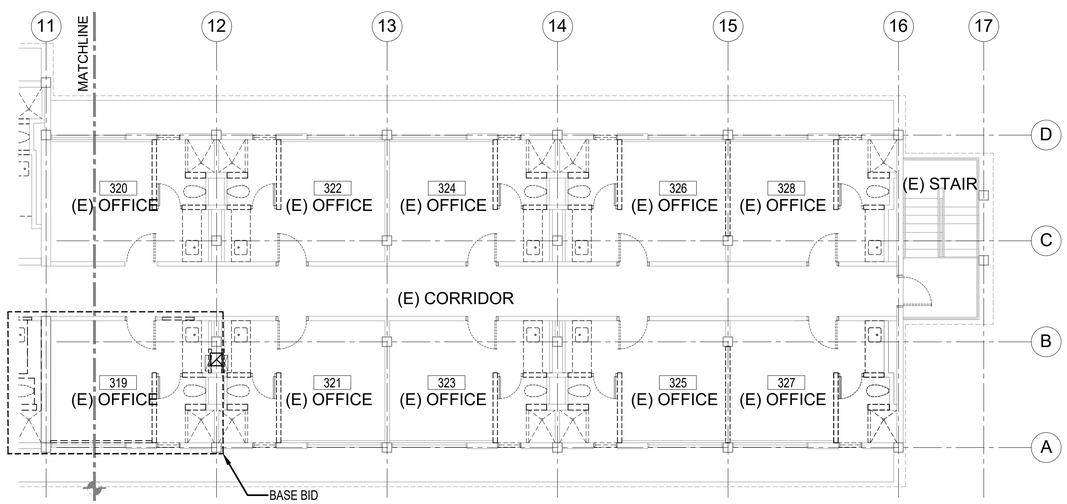
6. TELECOMMUNICATIONS
7. ROOF REPLACEMENT
8. ELEVATOR REPLACEMENT



B EXISTING/DEMO THIRD FLOOR PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'

NORTH TRUE N

LEGEND

EXISTING

- (E) COLUMNS
- E) WALLS
- (E) WINDOWS
- (E) DOORS
- (E) PLUMBING FIXTURES

DEMO

- REMOVE (E) WALLS
- REMOVE (E) WINDOWS
- REMOVE (E) DOORS AND FRAMES
- REMOVE (E) PLUMBING FIXTURES:
- REMOVE (E) SINK AND COUNTER
- REMOVE (E) SHOWER STALL

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/DEMO THIRD FLOOR PLAN

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. AD-103
DRAWN BY: CMS	APPROVED BY:	DATE: JUNE 2026	SHEET 31 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~~

05.07.2026 8:49 am
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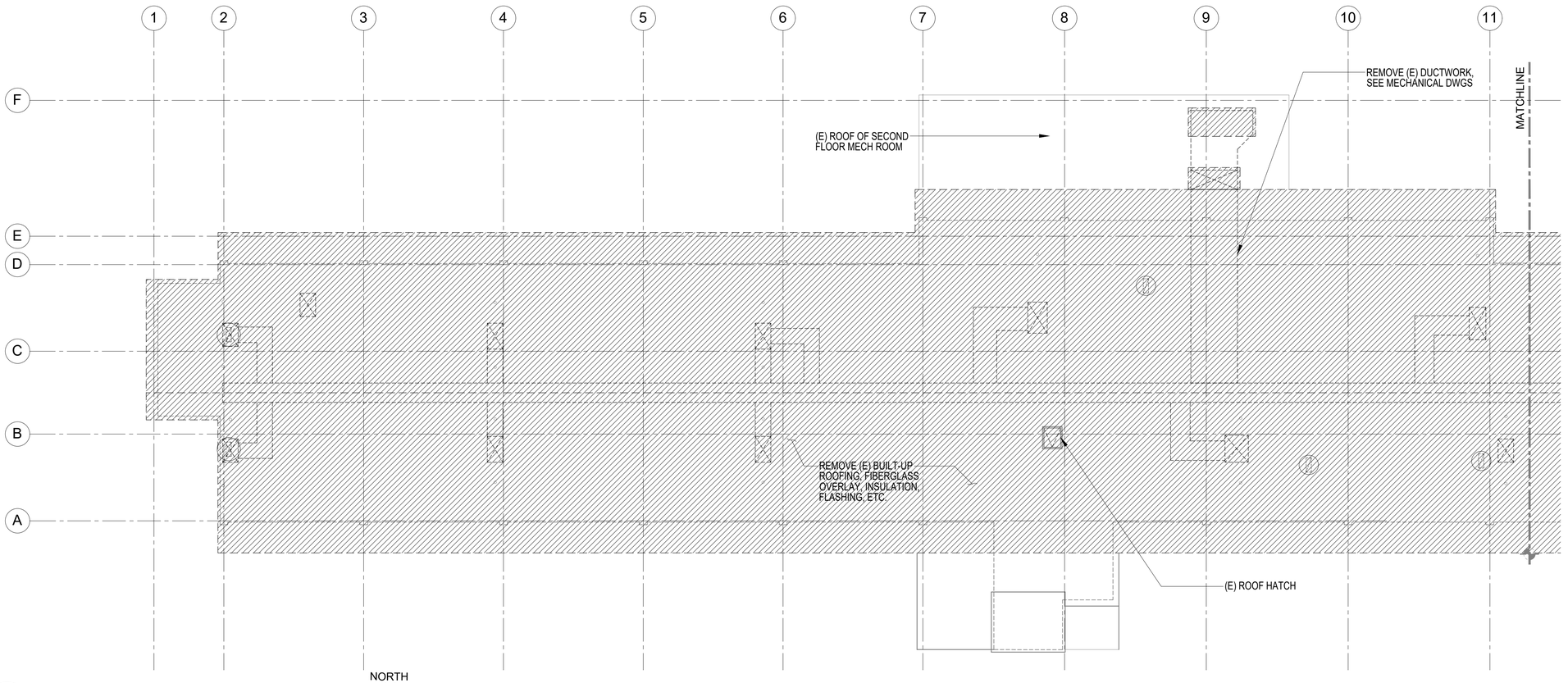
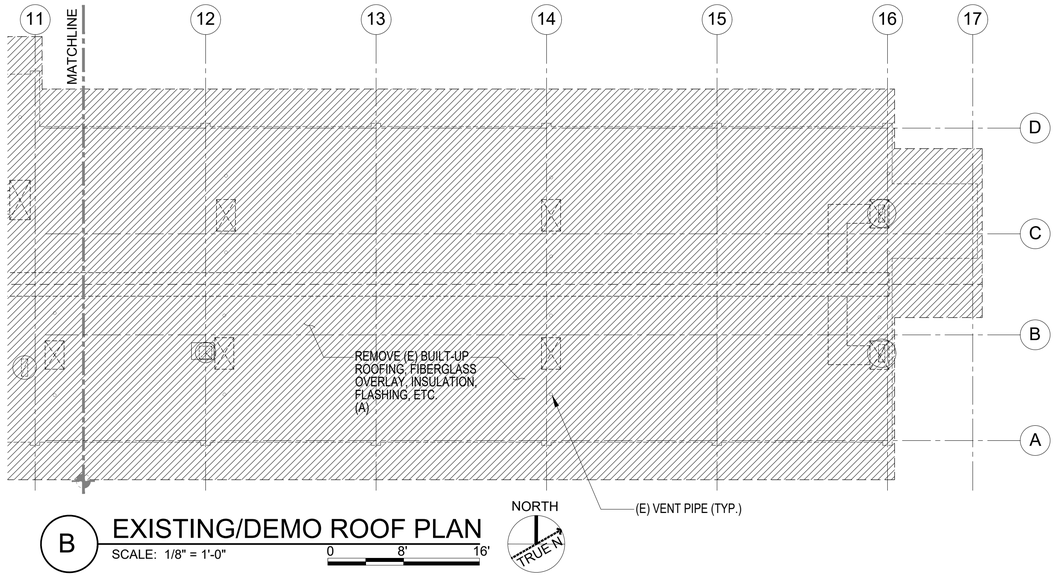


A EXISTING/DEMO ROOF PLAN

SCALE: 1/8" = 1'-0"

NORTH TRUE N



B EXISTING/DEMO ROOF PLAN

SCALE: 1/8" = 1'-0"

NORTH TRUE N

NOTICE OF ADDITIVE ALTERNATES:

UNLESS OTHERWISE NOTED, ALL WORK IDENTIFIED ON DRAWINGS IS TO BE INCLUDED UNDER ADDITIVE ALTERNATE. REFER TO SHEET G-001 AND DIVISION 1 SPECIFICATIONS FOR DESCRIPTION OF WORK. REVIEW ALL DISCIPLINE DRAWINGS TO ENSURE ALL REQUIRED WORK SCOPE.

ADDITIVE ALTERNATE #4:
ALL DEMOLITION AND NEW WORK TO REPLACE EXISTING ROOFING SYSTEM.

BASE BID TO INCLUDE WORK FOR NEW DUCTWORK/CURBS/VENT PIPING AND PATCHING AND CAPPING EXISTING DUCTWORK/CURBS/ VENT PIPING ON EXISTING ROOFING.

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/DEMO ROOF PLAN

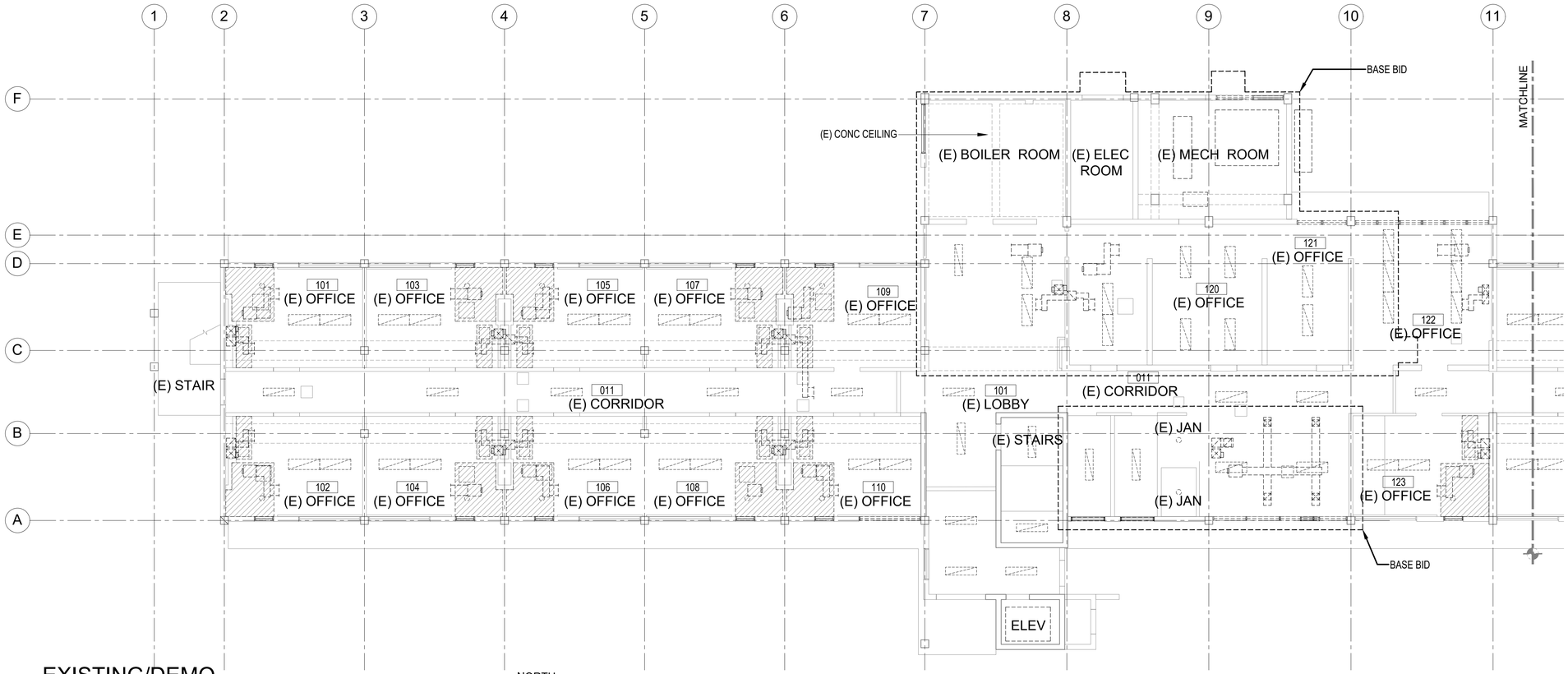
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. AD-104
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 32 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ____

05/28/2026 6:59 pm
C:\USERS\PC_3\TEAM MANILA DROPBOX\FP| DROPBOX~PROJECTS\01_ACTIVE_PROJECTS\2018-25-01 B46_MEDCOM_RENOVATIONS\4~DWG\ARCH\AD~104.DWG



A EXISTING/DEMO FIRST FLOOR REFLECTED CEILING PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'

NORTH TRUE N

NOTICE OF ADDITIVE ALTERNATES:

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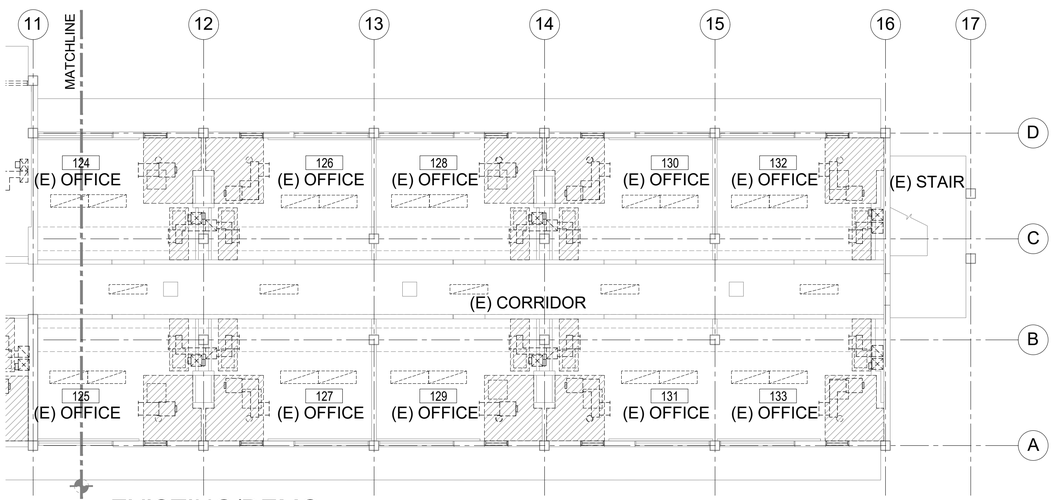
7. ROOF REPLACEMENT
8. ELEVATOR REPLACEMENT



B EXISTING/DEMO FIRST FLOOR REFLECTED CEILING PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'

NORTH TRUE N

LEGEND

EXISTING

- (E) GYP BD CEILING TO REMAIN
- (E) CEILING ACCESS PANEL TO REMAIN

DEMO

- REMOVE (E) CEILING
- REMOVE (E) ACCESS PANELS
- REMOVE (E) LIGHTING FIXTURES, SEE ELEC DWGS
- REMOVE (E) AC SYSTEM COMPONENTS AND EQUIPMENT, SEE MECH DWGS

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/DEMO FIRST FLOOR REFLECTED CEILING PLAN

ENGINEERING PARTNERS		HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. AD-105
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: AP	APPROVED BY:	DATE JUNE 2026	SHEET 33 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 8:52 am
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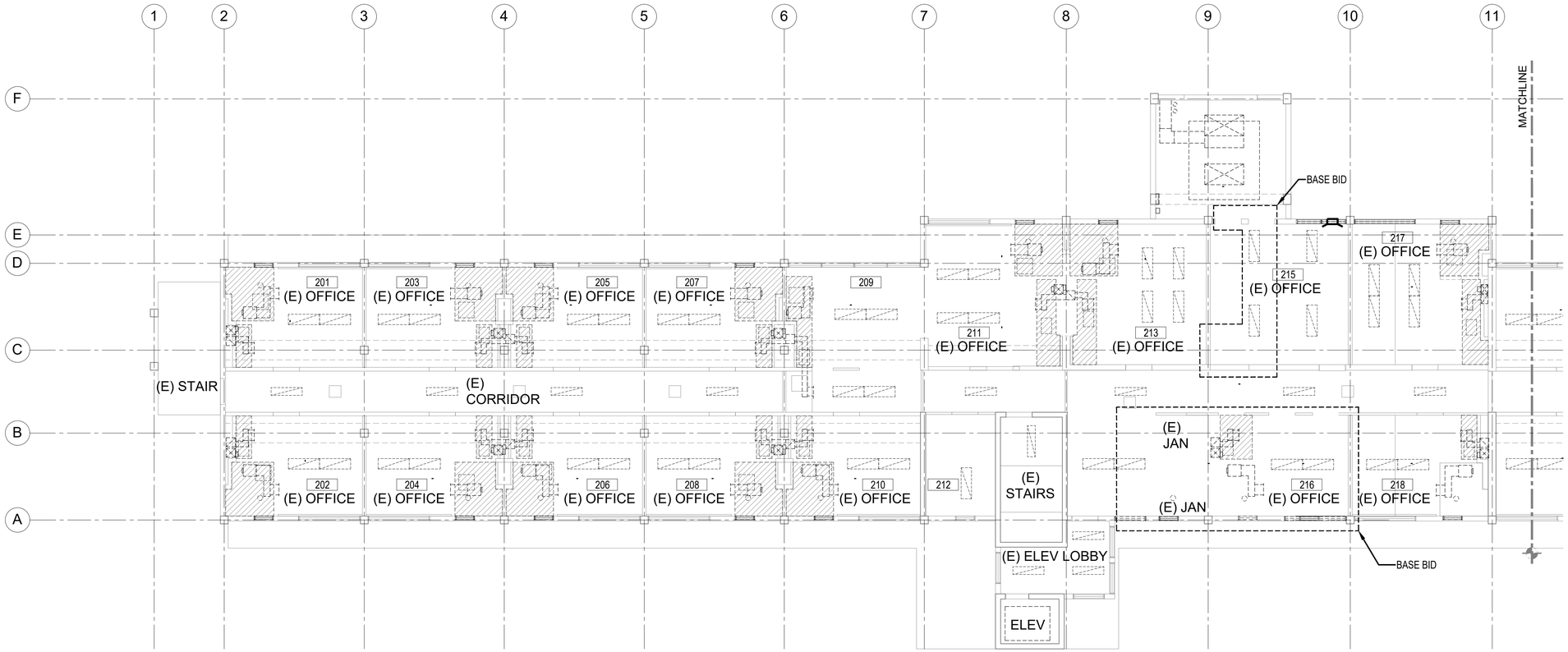

A EXISTING/DEMO SECOND FLOOR REFLECTED CEILING PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'

NORTH TRUE N

NOTICE OF ADDITIVE ALTERNATES:

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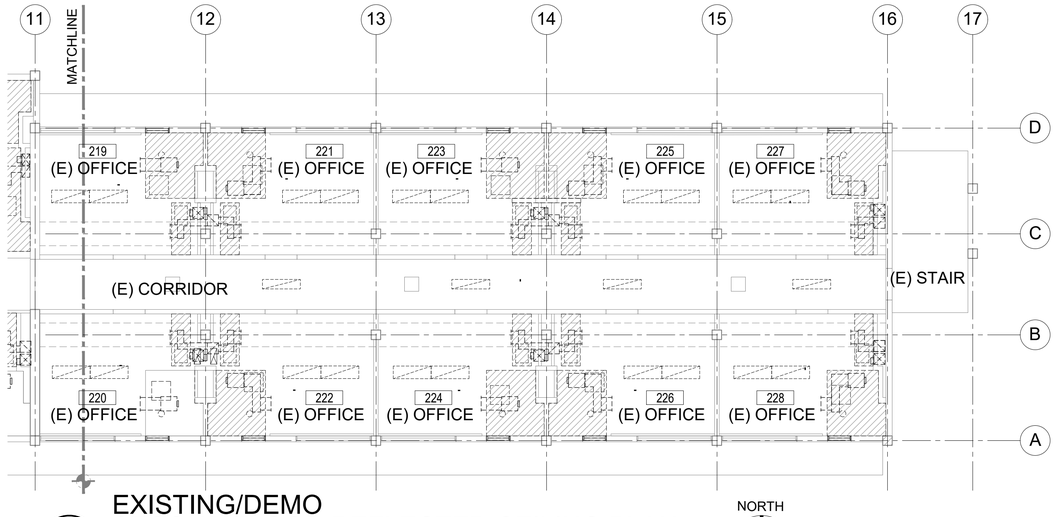
8. ELEVATOR REPLACEMENT



B EXISTING/DEMO SECOND FLOOR REFLECTED CEILING PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'

NORTH TRUE N

LEGEND

EXISTING

- (E) GYP BD CEILING TO REMAIN
- (E) CEILING ACCESS PANEL TO REMAIN

DEMO

- REMOVE (E) CEILING
- REMOVE (E) ACCESS PANELS
- REMOVE (E) LIGHTING FIXTURES, SEE ELEC DWGS
- REMOVE (E) AC SYSTEM COMPONENTS AND EQUIPMENT, SEE MECH DWGS

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/DEMO SECOND FLOOR REFLECTED CEILING PLAN

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HAWAII JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. AD-106
DRAWN BY: CSL/AP	APPROVED BY:	DATE: JUNE 2026	SHEET 34 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~

05/07/2026 8:54 am
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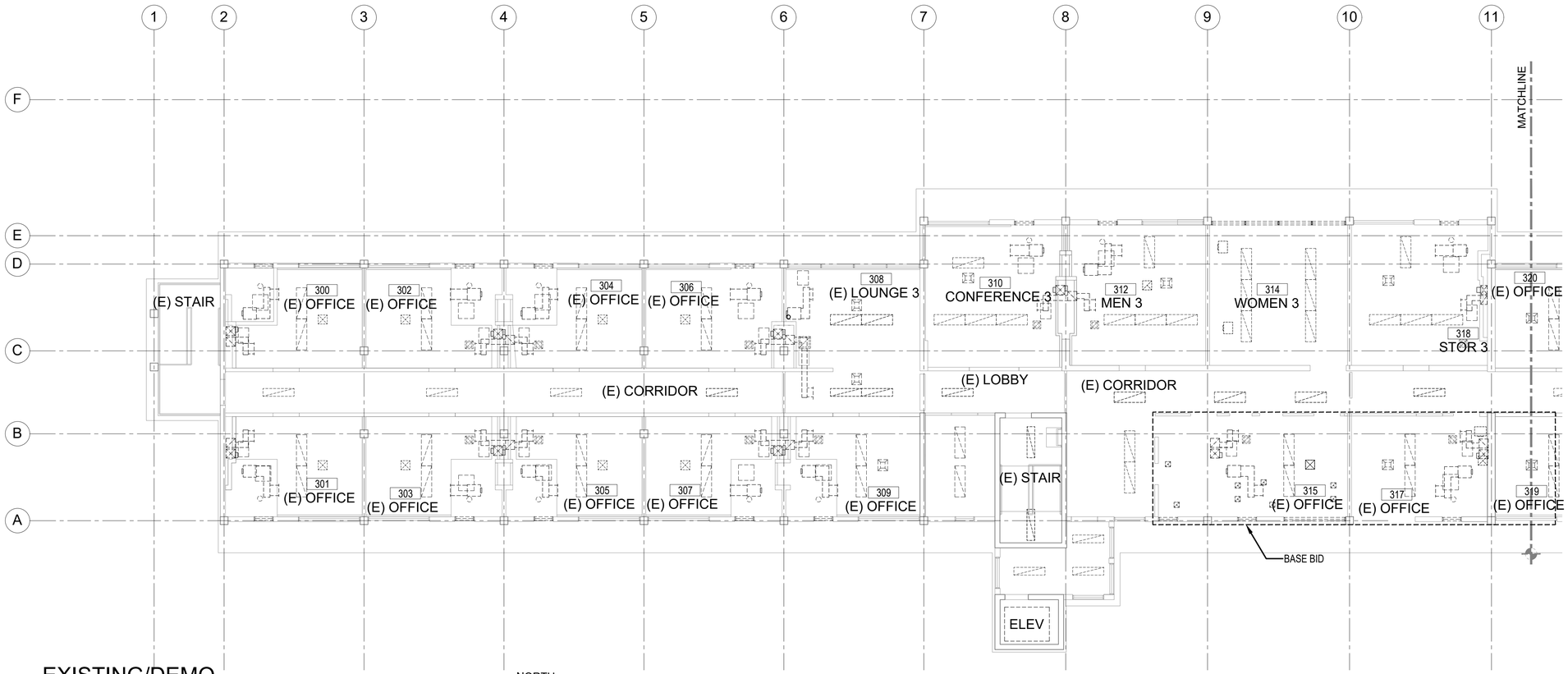

A EXISTING/DEMO THIRD FLOOR REFLECTED CEILING PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'

NORTH TRUE N

NOTICE OF ADDITIVE ALTERNATES:

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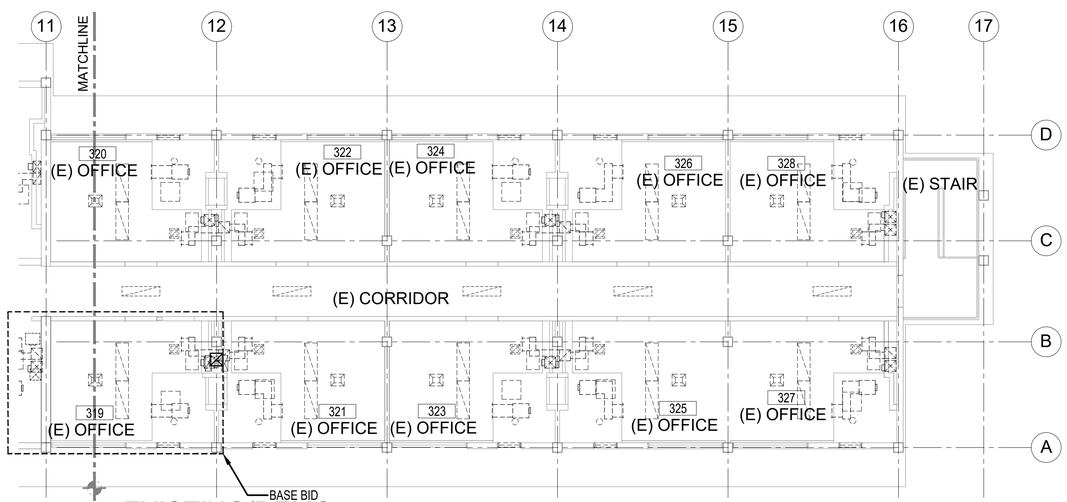

B EXISTING/DEMO THIRD FLOOR REFLECTED CEILING PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'

NORTH TRUE N

LEGEND

EXISTING

- (E) GYP BD CEILING TO REMAIN
- (E) CEILING ACCESS PANEL TO REMAIN

DEMO

- REMOVE (E) CEILING
- REMOVE (E) ACCESS PANELS
- REMOVE (E) LIGHTING FIXTURES, SEE ELEC DWGS
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LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

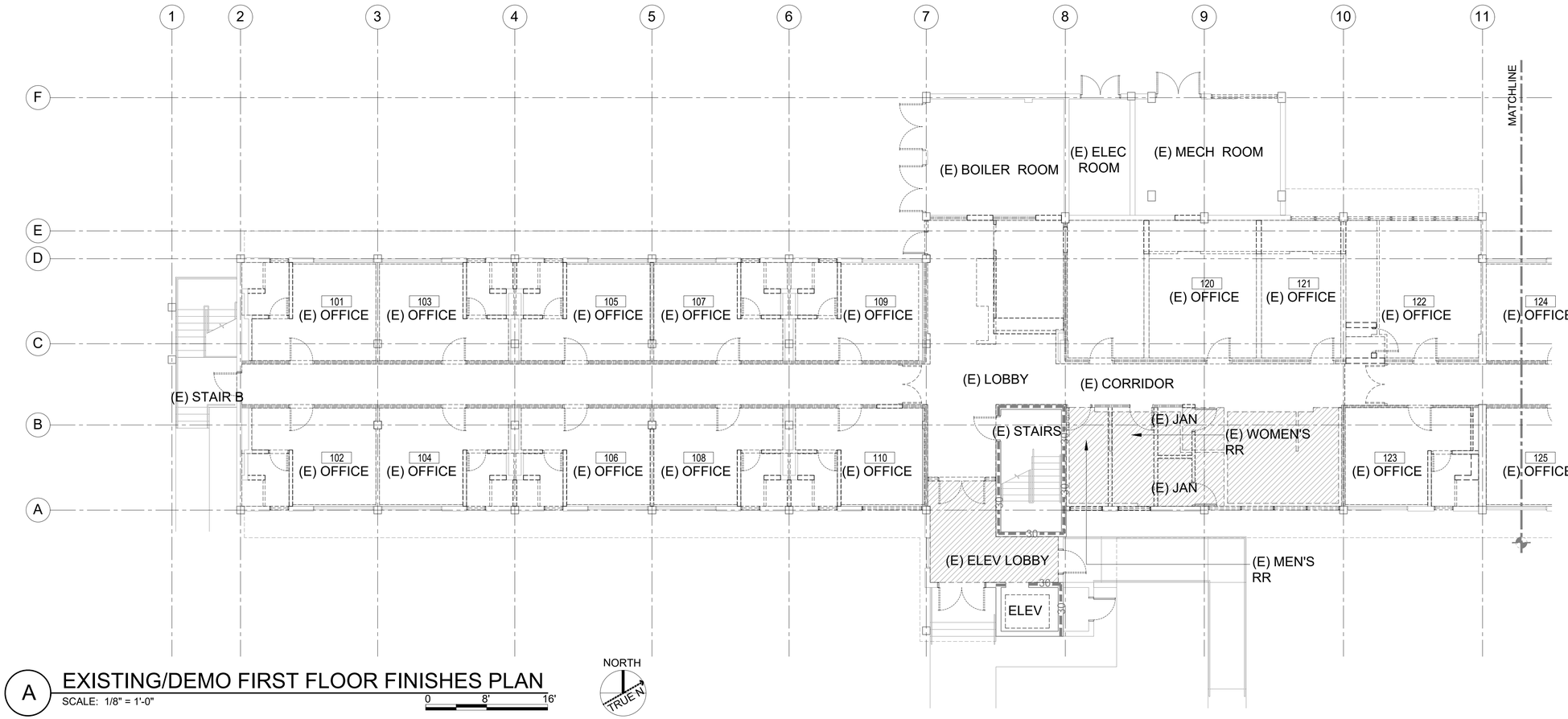
EXISTING/DEMO THIRD FLOOR REFLECTED CEILING PLAN

ENGINEERING PARTNERS		HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. AD-107
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: CMS/AP	APPROVED BY:	DATE JUNE 2026	SHEET 35 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ----

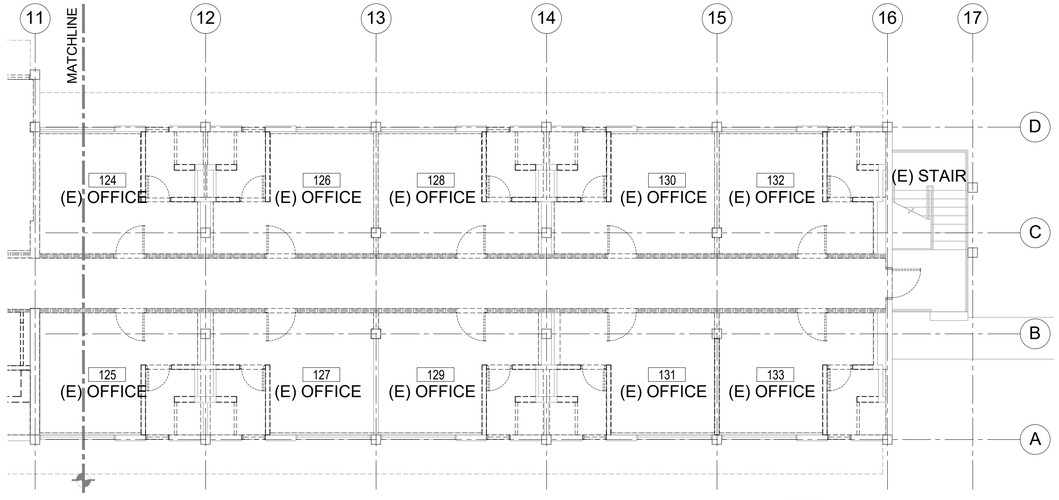
05/07/2026 8:55 am
C:\USERS\PC_3\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01 ACTIVE PROJECTS\12018-25-01 B46 MEDCOM RENOVATIONS\4-DWG\ARCH\AD-107.DWG



A EXISTING/DEMO FIRST FLOOR FINISHES PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'



B EXISTING/DEMO FIRST FLOOR FINISHES PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'

LEGEND

DEMO

REMOVE (E) FLOORING

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/DEMO FIRST FLOOR FINISHES PLAN

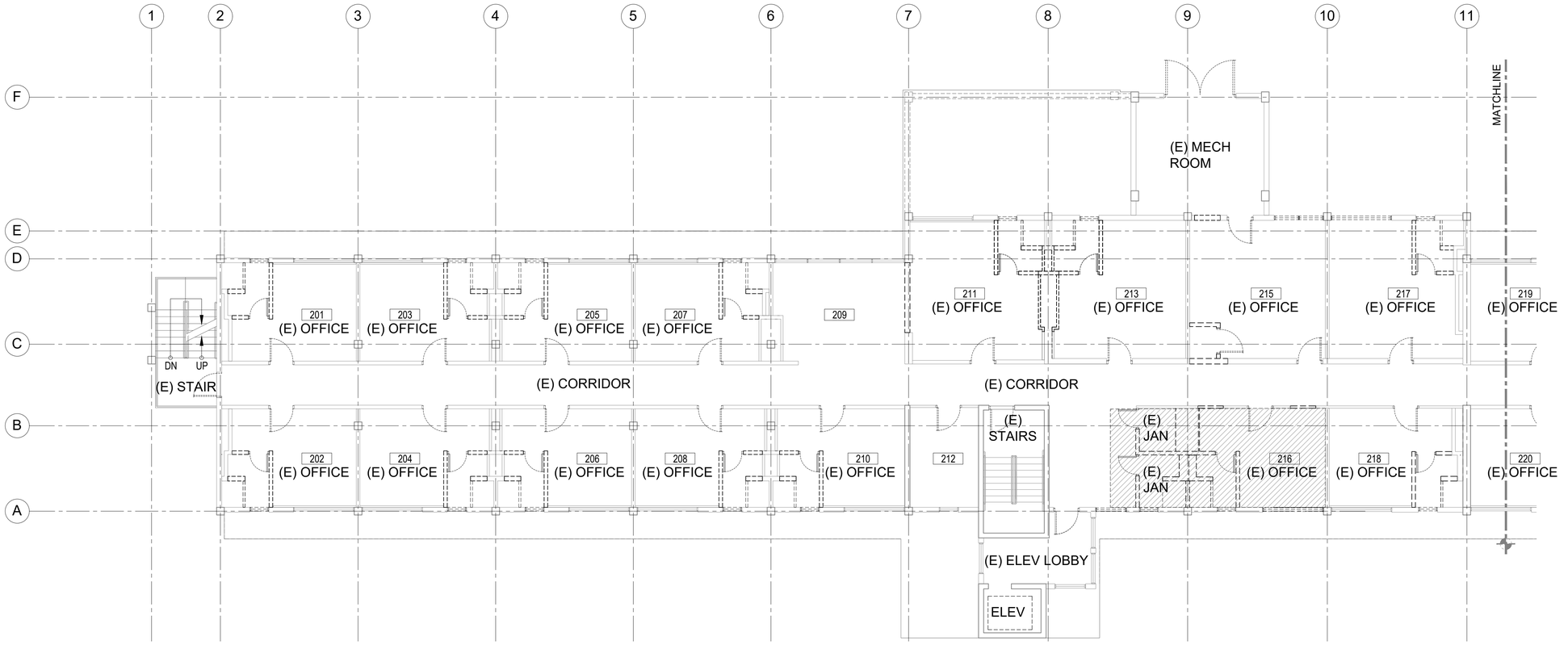
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HAWNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. AD-108
DRAWN BY: AP	APPROVED BY:	DATE	SHEET 36 OF 276 SHTS
SCALE: AS NOTED		JUNE 2026	

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

05/07/2026 8:55 am
C:\USERS\PC_3\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\2018-25-01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\AD-108.DWG



A EXISTING/DEMO SECOND FLOOR FINISHES PLAN

SCALE: 1/8" = 1'-0"

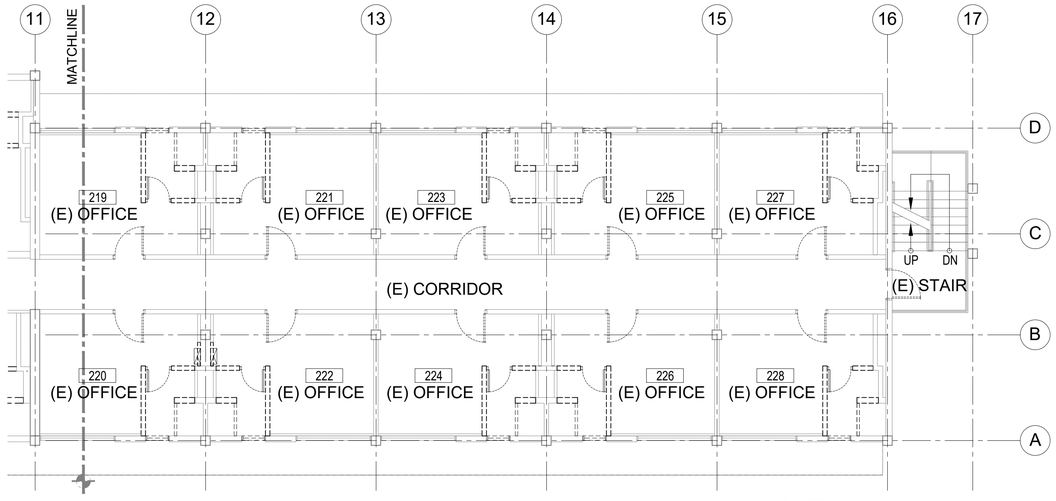
0 8' 16'

NORTH TRUE N

LEGEND

DEMO

REMOVE (E) FLOORING



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SCALE: 1/8" = 1'-0"

0 8' 16'

NORTH TRUE N

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/DEMO SECOND FLOOR FINISHES PLAN

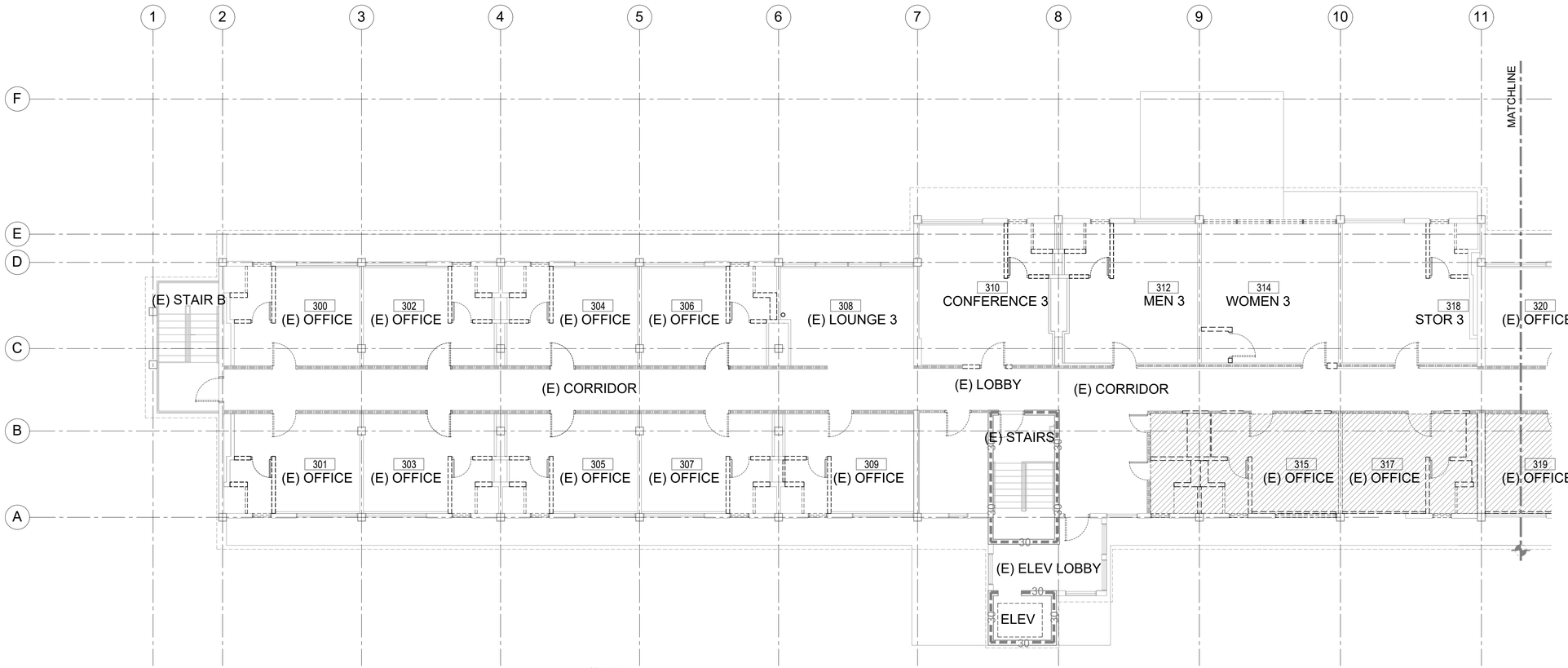
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO. FEDERAL: PN:15H00033 STATE: CA-202505-D	DRAWING NO. AD-109
DRAWN BY: CSL	APPROVED BY:	DATE: JUNE 2026	SHEET 37 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~

05/07/2026 8:58 pm
C:\USERS\PC.31\TEAM MANILA DROPBOX\EPI DROPBOX--PROJECTS\01_ACTIVE_PROJECTS\12018--25--01 846_MEDCOM_RENOVATIONS\4-DWG\ARCH\AD--109.DWG

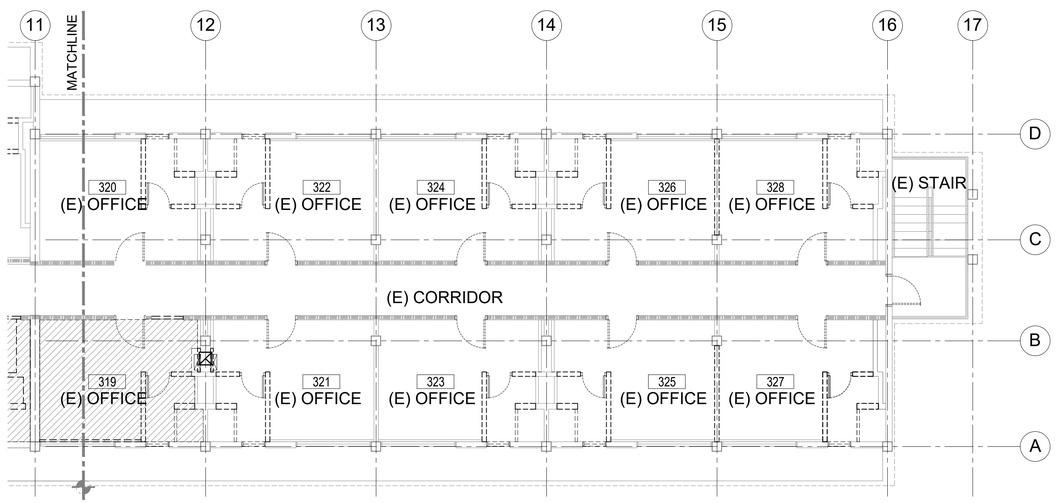


A EXISTING/DEMO THIRD FLOOR FINISHES PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'

NORTH TRUE N



B EXISTING/DEMO THIRD FLOOR FINISHES PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'

NORTH TRUE N

LEGEND

DEMO

REMOVE (E) FLOORING

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MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/DEMO THIRD FLOOR FINISHES PLAN

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HAPNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. AD-110
DRAWN BY: CMS	APPROVED BY:	DATE JUNE 2026	SHEET 38 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

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05.07.2026 8:58 am
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ARCHITECTURAL ABBREVIATIONS

&	and
@	at
°	degree
#	pound / number

A

A/C	Air Conditioning
AB	Anchor Bolt
ABV	Above
AC	Asphaltic Concrete
ACC	Accessible
ACOUST	Acoustical
AD	Area Drain / Access Door
ADD	Addendum
ADH	Adhesive
ADJ	Adjustable
ADJA	Adjacent
AF	Access Floor
AFF	Above Finished Floor
AGGR	Aggregate
AHU	Air Handling Unit
ALUM	Aluminum
ALT	Alter or Alternate
AP	Access Panel
APPROX	Approximate
ARCH	Architectural
ASPH	Asphalt
AT	Acoustic Tile
ATT	Attach / Attached / Attachment

B

B/S	Both Side
BD	Board
BITUM	Bituminous
BLDG	Building
BLK	Block
BLKG	Blocking
BM	Beam
BOT	Bottom
BR	Bedroom
BRG	Bearing
BRKT	Bracket
BRS	Bras
BSMT	Basement
BTMN	Between
BUR	Built-up Roofing

C

C	Chord / Compact
CAB	Cabinet
CBB	Cementitious Backer Board
CCJ	Crack Control Joint
CD	Ceiling Diffuser
CEM	Cement
CER	Ceramic
CFC	Contractor Furnished Contractor Installed
CG	Corner Guard
CHAN	Channel
CHWR	Chilled Water Return
CHWS	Chilled Water Supply
CI	Cast Iron
CIP	Cast In Place
CJ	Control Joint
CK	Caulking
CL	Centerline / Clearance / Class / Closet
CLG	Ceiling
CLR	Clear
CLS	Closure
CM	Centimeter
CMU	Concrete Masonry Unit
CNTR	Counter
CO	Cleanout / Cased Opening
COL	Column
COMP	Compacted / Compartment
CONC	Concrete
COND	Condition
CONN	Connection
CONSTR	Construction
CONT	Continuous
CONTR	Contractor
COOR	Coordinate
COP	Cooper
CORR	Corridor / Corrugate
COTG	Clean Out to Grade
CP	Carpet
CR	Corrosion Resistance / Closet Rod / Curtain Rod
CRM	Concrete Rubble Masonry
CT	Ceramic Tile
CTR	Center / Counter
CTSK	Countersunk
CUST	Custodian
CW	Cold Water
CWR	Cold Water Return
CYL	Cylinder

D

D	Penny (nails) / Deep / Depth / Dryer
DA	Double Acting
DBL	Double
DD	Deck Drain
DEPT	Department
DET	Detail
DF	Drinking Fountain
DIA	Diameter
DIAG	Diagonal
DIM	Dimension
DISP	Dispenser
DN	Down
DO	Door Opening
DOJ	Department of Justice
DR	Door / Drain / Dining Room
DS	Downspout
DSP	Dry Standpipe
DW	Dishwasher
DWG	Drawings
DWR	Drawer

E

E	East
EA	Each
EAR	Exhaust Air Register
EC	Electrometric Coating / Exposed Construction
EF	Exhaust Fan
EFS	Exterior Finish System
EGCB	Exterior Gypsum Ceiling Board
EGSB	Exterior Gypsum Sheathing Board
EIFS	Exterior Insulation & Finish System
EJ	Expansion Joint
EL	Elevation
ELAS	Elastomeric
ELEC	Electrical
ELEV	Elevator
EMER	Emergency
ENCL	Enclosure
ENG	Engineer / Engineering
EOS	Edge of Slab
EP	Electric Panel
EPDM	Ethylene Propylene Diene Monomer
EQ	Equal
EQPT	Equipment
EW	Each Way
EWC	Electric Water Cooler
EXH	Exhaust
EXIST	Existing
EXP	Expansion
EXPO	Exposed
EXT	Exterior

F

F	Female
FA	Fire Alarm
FAB	Fabricate
FAM	Fluid Applied Membrane
FAST	Fastener
FB	Flat Bar
FCO	Floor Clean Out
FD	Fire Damaged / Fire Damper / Floor Drain
FDN	Foundation
FE	Fire Extinguisher
FEC	Fire Extinguisher Cabinet
FF&E	Furniture, Fixture & Equipment
FFS	Finish Floor Separation
FGL	Fiberglass
FH	Flat Head / Fire Hose
FHC	Fire Hose Cabinet
FIN	Finish / Finished
FIXT	Fixture
FLASH	Flashing
FLDG	Folding
FLG	Flooring
FLR	Floor
FLUOR	Fluorescent
FND	Foundation / Feminine Napkin Disposal
FNV	Feminine Napkin Vendor
FO	Face of ...
FOC	Face of Concrete
FOF	Face of Finish
FOM	Face of Masonry
FOS	Face of Slab / Face of Studs
FOW	Face of Wall
FR	Frame / Front
FRG	Fiber Reinforced Gypsum
FRMG	Framing
FRP	Fiberglass Reinforced Polyester
FRT	Fire Retardant Treated Wood
FRZ	Freezer
FS	Floor Sink / Full Size
FT	Foot / Feet
FTD	Facial Tissue Dispenser
FTG	Footing
FURR	Furring / Furred
FUT	Future

G

G	Gas / Girder / Gutter
GA	Gage
GAL	Gallon
GALV	Galvanized
GB	Grab Bar
GC	General Contractor
GEN	Generator
GFI	Ground Fault Interrupter
GFRC	Glass Fiber Reinforced Concrete
GKT	Gasket / Gasketing
GL	Glass
GLU-LAM	Glued Laminated Wood
GND	Ground
GYP	Gypsum

H

HB	Hose Bibb
HC	Hollow Core
HCP	Handicapped
HD	Head
HDR	Header
HDWD	Hardwood
HDWE	Hardware
HGR	Hanger
HGT	Height
HM	Hollow Metal
HP	Heat Pump
HORIZ	Horizontal
HS	Hand Sink
HTR	Heater
HVAC	Heating, Ventilation and Air Conditioning
HW	Hot Water
HWR	Hot Water Return

I

ID	Inside Diameter (dimension)
IN	Inch
INCL	Included / Inclusive / Including
INSUL	Insulation
INT	Interior
INV	Invert
IRR	Irrigation

J

JAL	Jalousie
JAN	Janitor
JB	Junction Box
JST	Joist
JT	Joint

K

KD	Knock Down
KIT	Kitchen
KO	Knock Out

L

L	Length / Long
LAB	Laboratory
LAM	Laminate / Laminated
LAV	Lavatory
LB	Pound
LF	Lineal Foot
LIQ	Liquor
LKR	Locker
LOC	Location
LT	Laundry Tray
LTG	Lighting
LVR	Louver
LWC	Light Weight Concrete

M

M	Male
MATL	Material
MAX	Maximum
MB	Machine Bolt
MBH	Mop Broom Holder
MBS	Metal Building System
MC	Medicine Cabinet
MECH	Mechanical
MEMB	Membrane
MET	Metal
MEZZ	Mezzanine
MFR	Manufacture / Manufacturer
MH	Manhole
MIN	Minimum
MIR	Mirror
MISC	Miscellaneous
MLDG	Molding / Moulding
MM	Millimeter
MO	Masonry Opening
MOD	Modular
MOV	Movable
MR	Moisture Resistant
MTD	Mounted
MTG	Mounting

N

N	North
NIC	Not in Contract
NL	Night Light
NO	Number
NOM	Nominal
NP	Not Permitted
NS	No Scale
NTS	Not To Scale

O

O	Oven
OC	On Center
OCC	Occupancy
OA	Overall
OAG	Outside Air Grille
OBS	Obscure
OD	Outside Diameter (dimension)
OFIC	Owner Furnished Contractor Installed
OFD	Overflow Drain
OFF	Office
OFOI	Owner Furnished Owner Installed
OPNG	Opening
OPP	Opposite
OPQ	Opaque
OPR	Operable
OVHD	Overhead

P

PASS	Passage
PC	Piece / Post Contract
PCA	Post Contract Architectural
PD	Planter Drain
PERIM	Perimeter
PH	Penthouse
PIP	Poured In Place
PKG	Parking
PL	Plan / Plate / Property Line
PLAM	Plastic Laminate
PLAS	Plaster
PLBG	Plumbing
PLYWD	Plywood
PMB	Pre-Engineered Metal Building
PNL	Panel
PPT	Pressure Preservative Treated
PR	Pair
PRBP	Pressure Reducing Back Flow Preventer
PRCST	Precast
PREFAB	Prefabricate
PREP	Preparation
PROP	Property
PRV	Pressure Relief Valve
PSF	Pounds Per Square Foot
PT	Paint / Point
PTD	Paper Towel Dispenser
PTDR	Paper Towel Dispenser & Receptacle
PTN	Partition
PTR	Paper Towel Receptacle
PVC	Polyvinyl Chloride
PVMT	Pavement

Q

QT	Quarry Tile

R

R	Radius / Riser
RB	Resilient Base
RCP	Reflected Ceiling Plan
RD	Roof Drain
REBAR	Reinforcing Bar
RECEPT	Receptionist
REF	Reference
REFL	Reflected / Reflector
REFR	Refrigerator
REINF	Reinforced / Reinforcing
REM	Remove / Removable
REQ	Required
RESIL	Resilient
REST	Restroom
RET	Retaining / Return
REV	Revised / Revision
RF	Resilient Flooring / Roof
RFG	Roofing
RGTR	Register
RH	Robe Hook / Round Head
RLG	Railing
RM	Room
RO	Rough Opening
RWC	Recessed Waste Receptacle
RWD	Redwood
RWL	Rain Water Leader

S

S	South
SA	Single Acting
SC	Scale / Solid Core
SCHED	Schedule
SCP	Scupper
SCR	Screen / Shower Curtain Rod
SD	Smoke Detector / Soap Dispenser / Shower Drain
SECT	Section
SF	Square Feet
SH	Shelf
SHR	Shower
SHT	Sheet
SHTG	Sheathing
SIM	Similar
SL	Slope
SLDG	Sliding
SLNT	Sealant
SM	Square Meter
SMS	Sheet Metal Screw
SMH	Sewer Man Hole
SND	Sanitary Napkin Dispenser
SNR	Sanitary Napkin Receptacle
SP	Solid Plastic
SPC	Spacer
SPEC	Specification
SPKR	Speaker
SPRK	Sprinkler
SQ	Square
SSK	Service Dink
SST	Stainless Steel
ST	Stone
STA	Station
STD	Standard
STL	Steel
STOR	Storage
STR	Straight / Strainer / Starter
STRL	Structural
STRUC	Structure
SUSP	Suspended
SVC	Service
SW	Switch
SYM	Symmetrical

T

T	Tinted / Tread
T&G	Tongue and Groove
T/S	Tub / Shower
TACKBD	Tackboard
TB	Tower Bar
TD	Trench Drain
TEL	Telephone
TEMP	Tempered/ Temporary
TER	Terrazzo
TFMR	Transformer
HK	Thick / Thickness
THR	Threshold
TLT	Toilet
TO	Top of ...
TOC	Top of Curb
TOF	Top of Floor
TOP	Top of Plate / Top of Pavement
TOS	Top of Slab
TOW	Top of Wall
TPB	Telephone Power Board
TPD	Toilet Paper Dispenser
TPH	Toilet Paper Holder
TRAN	Transition
TRANS	Transparent
TS	Towel Shelf
TSCD	Toilet Seat Cover Dispenser
TU	Towel Unit
TV	Television
TYP	Typical

U

UC	Undercut
UL	Underwriters Laboratories, Inc / Unlimited
UNF	Unfinished
UON	Unless Otherwise Noted
UP	Uuholstered Panels
UR	Urinal

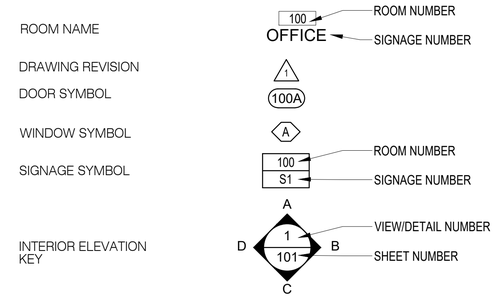
V

VAL	Valance
VAR	Varies
VB	Vapor Barrier
VCT	Vinyl Composition Tile
VERT	Vertical
VEST	Vestibule
VLV	Valve
VOL	Volume
VP	Veneer Plaster
VTR	Vent Through Roof

W

W	Washer / West / Wide / Width
W/'	With
W/O	Without
WC	Wallcovering / Water Closet
WD	Wood
WDP	Wood Paneling
WDW	Window
WGL	Wire Glass
WH	Water Heater
WO	Where Occurs / Window Opening
WP	Waterproof / Weatherproof
WPM	Waterproof Membrane
WS	Wood Screw
WR	Water Resistant
WRB	Wardrobe
WSCT	Wainscot
WSP	Wet Stand Pipe
WT	Weight / Watertable / Watertight
WWF	Welded Wire Fabric

BUILDING REFERENCE SYMBOLS



BASE BID

1. AIR CONDITIONING SYSTEM IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO ALL FAN COILS, EXTERIOR CONDENSING UNITS, CONTROLS, CONCRETE PADS,TESTING/ADJUSTING/BALANCING, INSULATION,REFRIGERANT PIPING, AND CONDENSATE PIPING.
2. PLUMBING SYSTEM IN ITS ENTIRETY, INCLUDING ALL DEMOLITION WORK, NEW WASTE/VENT PIPING, NEW HOT WATER PIPING, WATER HEATERS, AND PROPANE SYSTEM. INCLUDE ALL TRENCHING, FLOOR SLAB REPAIR NECESSARY TO INSTALL NEW WASTE LINES. INCLUDE ARCHITECTURAL WORK FOR ANY NEW FRAMED WALLS AND CEILING, WALL, OR FLOOR FINISHES NECESSARY TO SUPPORT INSTALLATION OF PLUMBING FIXTURES.
3. ELECTRICAL INFRASTRUCTURE, INCLUDING ALL EXTERIOR SERVICE ENTRY INTO THE BUILDING, NEW METERING SWITCHBOARD, PANELBOARDS, AND FEEDERS.
4. ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL WORK OCCURRING WITHIN SELECT ROOMS AS INDICATED ON DRAWINGS.

ADDITIVE ALTERNATES

1. 1ST FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
2. 2ND FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
3. 3RD FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
4. DEMOLITION OF EXISTING LIGHTING AND INSTALLATION OF NEW LED LIGHTING AND ASSOCIATED BRANCH CIRCUITING, OVERCURRENT PROTECTION, AND SWITCHES.
5. ELECTRICAL BRANCH CIRCUITING FOR RECEPTACLES AND ANY OTHER ELECTRICAL WORK NOT ASSOCIATED WITH THE ABOVE BASE BID AND ADDITIVE ALTERNATES.
6. TELECOMMUNICATIONS
7. ROOF REPLACEMENT
8. ELEVATOR REPLACEMENT

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KALAELOA, KAPOLEI, OAHU, HAWAI'I

ARCHITECTURAL ABBREVIATIONS AND SYMBOLS

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-001
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 39 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

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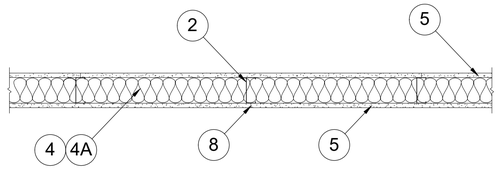
BXUV - Fire Resistance Ratings - ANSI/UL 263 Certified for United States
BXUV7 - Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada

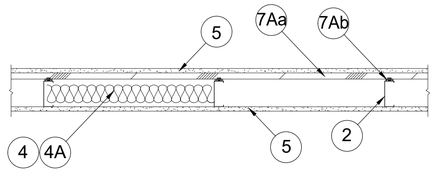
Design No. U419

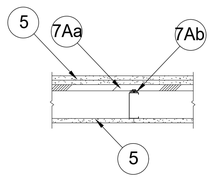
August 8, 2025

Nonbearing Wall Rating -1 Hr

* Indicates such products must bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.







1. Floor and Ceiling Runners — (Not Shown) — For use with Item 2 — Channel shaped, fabricated from min 25 MSG corrosion-protected steel, min depth to accommodate stud size, with min 1-1/4 in. long legs, attached to floor and ceiling with fasteners 24 in. OC max.

1A. Framing Members* — Floor and Ceiling Runner — Not Shown — In lieu of Item 1 — For use with Item 2B, proprietary channel shaped runners, 3-5/8 in. deep attached to floor and ceiling with fasteners 24 in. OC max.

CEMCO, LLC — Viper25™ Track

CRACO MFG INC — SmartTrack25™

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper25™ Track

IMPERIAL MANUFACTURING GROUP INC — Viper25™ Track

1B. Framing Members* — Floor and Ceiling Runner — Not Shown — In lieu of Item 1 — For use with Item 2C, proprietary channel shaped runners, 1-1/4 in. wide by 3-5/8 in. deep fabricated from min 0.018 in. thick galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

CEMCO, LLC — Viper20™ Track

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper20™ Track

IMPERIAL MANUFACTURING GROUP INC — Viper20™ Track

1C. Framing Members* — Floor and Ceiling Runners — (Not Shown) — In lieu of Item 1 — Channel shaped, attached to floor and ceiling with fasteners 24 in. OC. max.

ALLSTEEL & GYPSUM PRODUCTS INC — Type SUPREME D24/30EQD and Type SUPREME D20

CONSOLIDATED FABRICATORS CORP, BUILDING PRODUCTS DIV — Type SUPREME D24/30EQD and Type SUPREME D20

QUAIL RUN BUILDING MATERIALS INC — Type SUPREME D24/30EQD and Type SUPREME D20

SCAFCO STEEL STUD MANUFACTURING CO — Type SUPREME D24/30EQD and Type SUPREME D20

STEEL CONSTRUCTION SYSTEMS INC — Type SUPREME D24/30EQD and Type SUPREME D20

TELLING INDUSTRIES L L C — Type SUPREME D24/30EQD and Type SUPREME D20

UNITED METAL PRODUCTS INC — Type SUPREME D24/30EQD and Type SUPREME D20

1D. Floor and Ceiling Runners — (Not Shown) — For use with Item 2A — Channel shaped, fabricated from min 20 MSG corrosion-protected or galv steel, min depth to accommodate stud size, with min 1 in. long legs, attached to floor and ceiling with fasteners spaced max 24 in. OC.
1E. Framing Members* — Floor and Ceiling Runners — (Not Shown, As an alternate to Item 1) — For use with Items 2E, 5F or 5G or 5I only, channel shaped, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, attached to floor and ceiling with fasteners 24 in. OC. max.

CLARKDIETRICH BUILDING SYSTEMS — CD ProTRAK

DMFCWBS L L C — ProTRAK

MBA METAL FRAMING — ProTRAK

RAM SALES L L C — Ram ProTRAK

STEEL STRUCTURAL PRODUCTS L L C — Tri-S ProTRAK

1F. Framing Members* — Floor and Ceiling Runner — Not Shown — In lieu of Item 1 — For use with Item 2F, proprietary channel shaped runners, minimum width to accommodate stud size, with 1- 1/8 in. long legs fabricated from min 0.015 in. (min bare metal thickness) galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.
SUPER STUD BUILDING PRODUCTS — The Edge
1G. Framing Members* — Floor and Ceiling Runner — For use with Item 2G, proprietary channel shaped runners, minimum width to accommodate stud size attached to floor and ceiling with fasteners 24 in. OC max.

STUDCO BUILDING SYSTEMS — CROCSTUD Track

1H. Floor and Ceiling Runners — (Not Shown) — Channel shaped, fabricated from min 0.02 in. galv steel, min width to accommodate stud size, with min 1 in. long legs, for use with studs specified below and fabricated from min 0.018 in. galv steel or thicker, attached to floor and ceiling with fasteners spaced max 24 in. OC.

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper20™ Track VT100

IMPERIAL MANUFACTURING GROUP INC — Viper20™ Track VT100

1I. Framing Members* — Floor and Ceiling Runners — (Not Shown, As an alternate to Item 1) — For use with Items 2H, channel shaped, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, attached to floor and ceiling with fasteners 24 in. OC. max.

TELLING INDUSTRIES L L C — TRUE-TRACK™

1J. Framing Members* — Floor and Ceiling Runner — Not Shown — In lieu of Item 1 — For use with Item 2I, proprietary channel shaped runners, 3-5/8 in. deep attached to floor and ceiling with fasteners 24 in. OC max.
1K. Framing Members* — Floor and Ceiling Runner — Not Shown — In lieu of Item 1 — For use with Item 2J, proprietary channel shaped runners, 1-1/4 in. wide by 3-5/8 in. deep fabricated from min 0.018 in. thick galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.
1L. Framing Members* — Floor and Ceiling Runner — Not Shown — In lieu of Item 1 — For use with Item 2N, proprietary channel shaped runners, 1-1/4 in. wide by min. 3-1/2 in. deep fabricated from min 0.018 in. thick galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

RESCUE METAL FRAMING, L L C — AlphaTRAK

1M. Framing Members* — Floor and Ceiling Runners — Not Shown — As an alternate to Item 1 — For use with Item 2O, proprietary channel shaped runners, min width to accommodate stud size, galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

RONDO BUILDING SERVICES PTY LTD — Rondo Wall Track

1N. Framing Members* — Floor and Ceiling Runners — Not Shown — As an alternate to Item 1 — For use with Item 2P, proprietary channel shaped runners, min width to accommodate stud size, galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

OEG BUILDING MATERIALS — OEG Track

1O. Framing Members* — Floor and Ceiling Runner — Not Shown — In lieu of Item 1 — For use with Item 2Q, proprietary channel shaped runners, min width to accommodate stud size, fabricated from min. 25 MSG (0.018 in. min. bare metal thickness), attached to floor and ceiling with fasteners spaced 24 in. OC max.

CEMCO, LLC — Viper X Track

1P. Framing Members* — Floor and Ceiling Runner — (Not Shown — Alternate to Item 1) — For use with Item 2R, channel shaped runners pre-equipped with proprietary attachment clips. Min. 3-5/8 in. wide. Legs of top runners minimum 3-1/4 in. wide. Legs of bottom runners minimum 1-1/2 in. wide. Runners attached to floor and ceiling with fasteners 24 in. OC max.

HYPERFRAME INC - Hypertrack

1Q. Framing Members* — Floor and Ceiling Runner — Not Shown — In lieu of Item 1 — For use with Item 2S , proprietary channel shaped runners, min width to accommodate stud size, fabricated from min. 20 EQ/22 mils. (min. 0.0221 in. thick) galvanized steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

JJC INTERNATIONAL DISTRIBUTORS — Non-structural Tracks 3-5/8″ and 6″.

PREME D20

1R. Framing Members* — Floor and Ceiling Runner — Not Shown — In lieu of Item 1 — For use with Item 2T, proprietary channel shaped runners ,min width to accommodate stud size, fabricated from min. 25 MSG (0.018 in. min. bare metal thickness), attached to floor and ceiling with fasteners spaced 24 in. OC max

IRONLINE METALS LLC — Bantam Track.

2. Steel Studs — Channel shaped, fabricated from min 25 MSG corrosion-protected steel, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.

2A. Steel Studs — (As an alternate to Item 2, For use with Items 5B, 5E, 5H, 5J or Type ULIX) — Channel shaped, fabricated from min 20 MSG corrosion-protected or galv steel, 3-1/2 in. min depth, spaced a max of 16 in. OC. Studs friction-fit into floor and ceiling runners. Studs to be cut 5/8 to 3/4 in. less than assembly height.

2B. Framing Members* - Steel Studs — (As an alternate to Item 2, For use with Items 5C, 5I or Type ULIX) — Proprietary channel shaped studs, 3-5/8 in. deep spaced a max of 24 in. OC. Studs to be cut 3/4 in less than the assembly height and installed with a 1/2 in. gap between the end of the stud and track at the bottom of the wall. For direct attachment of gypsum board only.
CEMCO, LLC — Viper25™

CRACO MFG INC — SmartStud25™

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper25™

IMPERIAL MANUFACTURING GROUP INC — Viper25™

2C. Framing Members* — Steel Studs — Not Shown — In lieu of Item 2 — proprietary channel shaped steel studs, min depth as indicated under Item 5, spaced a max if 24 in. OC, fabricated from min 0.018 in. thick galv steel. Studs cut 3/8 in. to 3/4 in. less in lengths than assembly heights.

CEMCO, LLC — Viper20™

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper20™

IMPERIAL MANUFACTURING GROUP INC — Viper20™

2D. Framing Members* — Steel Studs — In lieu of Item 2 — Channel shaped studs, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height.

ALLSTEEL & GYPSUM PRODUCTS INC — Type SUPREME D24/30EQD and Type SUPREME D20

CONSOLIDATED FABRICATORS CORP, BUILDING PRODUCTS DIV — Type SUPREME D24/30EQD and Type SUPREME D20

QUAIL RUN BUILDING MATERIALS INC — Type SUPREME D24/30EQD and Type SUPREME D20

SCAFCO STEEL STUD MANUFACTURING CO — Type SUPREME D24/30EQD and Type SUPREME D20

STEEL CONSTRUCTION SYSTEMS INC — Type SUPREME D24/30EQD and Type SUPREME D20

TELLING INDUSTRIES L L C — Type SUPREME D24/30EQD and Type SUPREME D20

UNITED METAL PRODUCTS INC — Type SUPREME D24/30EQD and Type SU2E. Framing Members* — Steel Studs — (Not Shown, As an alternate to Item 2) — For use with Items 5F or 5G or 5I or Type ULIX only, channel shaped studs, min depth as indicated under Item 5F, 5G or 5I, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height.

CLARKDIETRICH BUILDING SYSTEMS — CD ProSTUD

DMFCWBS L L C — ProSTUD

MBA METAL FRAMING — ProSTUD

RAM SALES L L C — Ram ProSTUD

STEEL STRUCTURAL PRODUCTS L L C — Tri-S ProSTUD

2F. Framing Members* — Steel Studs — Not Shown — In lieu of Item 2 — proprietary channel shaped steel studs, minimum width indicated under Item 5, 1-1/4 in. deep fabricated from min 0.015 in. (min bare metal thickness) galvanized steel. Studs 3/8 in. to 3/4 in. less in lengths than assembly heights.

A

DESIGN UL System No.U419
1 Hr Fire Rated Wall-Non-Load Bearing

NO SCALE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

FIRE RATED WALL DETAILS - DRYWALL

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HAARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-002
DRAWN BY: AU	APPROVED BY:	DATE: JUNE 2026	SHEET 40 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

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SUPER STUD BUILDING PRODUCTS — The Edge

2G. Framing Members* — Steel Studs — Not Shown — In lieu of Item 2 — proprietary channel shaped studs, minimum width indicated under Item 5, Studs to be cut 3/8 to 3/4 in less than the assembly height.

STUDCO BUILDING SYSTEMS — CROCSTUD

2H. Framing Members* — Steel Studs — (Not Shown, As an alternate to Item 2) — Fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height.

TELLING INDUSTRIES L L C — TRUE-STUD™

2I. Framing Members* — Steel Studs

2J. Framing Members* — Metal Studs — Not Shown — In lieu of Item 2 — proprietary channel shaped steel studs, min depth as indicated under Item 5, spaced a max if 24 in. OC, fabricated from min 0.018 in. thick galv steel. Studs cut 3/8 in. to 3/4 in. less in lengths than assembly heights

2K. Framing Members* — Steel Studs — As an alternate to Item 2 — For use with Item 1, channel shaped studs, fabricated from min 25 MSG corrosion-protected steel, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.

EB METAL INC — NITROSTUD

2L. Framing Members* — Steel Studs — As an alternate to Item 2 — For use with Item 1, channel shaped studs, fabricated from min 25 MSG corrosion-protected steel, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.

OLMAR SUPPLY INC — PRIMESTUD

2M. Framing Members* — Steel Studs — As an alternate to Item 2 — For use with Item 1, channel shaped studs, fabricated from min 25 MSG corrosion-protected steel, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.

MARINO/WARE, DIV OF WARE INDUSTRIES INC — StudRite™

2N. Framing Members*— Steel Studs — As an alternate to Item 2 — proprietary channel shaped steel studs, min depth 3-1/2 in. and as indicated under Item 5, spaced a max of 24 in. OC, fabricated from min 0.018 in. thick galv steel. Studs cut 3/8 in. to 3/4 in. less in length than assembly height.

RESCUE METAL FRAMING, L L C — AlphaSTUD

2O. Framing Members* — Steel Studs — As an alternate to Item 2 — proprietary channel shaped steel studs, min width as indicated under Item 5, galv steel. Studs to be cut 3/8 to 3/4 in. less in lengths than assembly height. Spaced 24 in. OC max.

RONDO BUILDING SERVICES PTY LTD — Rondo Lipped Wall Stud

2P. Framing Members* — Steel Studs — As an alternate to Item 2 — proprietary channel shaped steel studs, min width as indicated under Item 5, min 25 MSG galv steel. Studs to be cut 3/8 to 3/4 in. less in lengths than assembly height. Spaced 24 in. OC max.

OEG BUILDING MATERIALS — OEG Stud

2Q. Framing Members* — Steel Studs — Not Shown — In lieu of Item 2 — For use with Item 1O, proprietary channel shaped steel studs, min depth as indicated under Item 5, spaced a max of 24 in. OC, fabricated from min 25 MSG (0.018 in. min. bare metal thickness). Studs cut 3/8 in. to 3/4 in. less in lengths than assembly heights.

CEMCO, LLC — Viper X

2R. Framing Members* — Steel Studs — (Not Shown — Alternate to Item 2, For use with Item 1P) — Channel shaped steel studs with attachment clips at top and bottom, min 3-5/8 in. depth, spaced a max of 24 in. OC. Studs clipped into floor and ceiling runners (Item 1P). Max 2-3/8 in. extension reveal from top of stud to inside of ceiling runner.

HYPERFRAME INC— Hyperstud

2S. Framing Members* — Steel Studs — Not Shown — In lieu of Item 2 — For use with Item 1Q, proprietary channel shaped steel studs, min depth as indicated under Item 5, spaced a max of 24 in. OC, fabricated from min. 20 EQ/22 mils. (min. 0.0221 in. thick) galvanized steel. Studs cut 3/8 in. to 3/4 in. less in lengths than assembly heights.

JJC INTERNATIONAL DISTRIBUTORS — Non-structural Studs 3-5/8" and 6".

2T. Framing Members* — Steel Studs — Not Shown — In lieu of Item 2 — For use with Item 1R, proprietary channel shaped steelstuds, min depth as indicated under Item 5, spaced a max of 24 in. OC, fabricated from min 25 MSG (0.018 in. min. bare metal thickness). Studs cut 3/8 in. to 3/4 in. less in lengths than assembly heights.

IRONLINE METALS LLC — Bantam Stud.

3. Wood Structural Panel Sheathing — (Optional, For use with Item 5 Only) — (Not Shown) — 4 ft wide, 7/16 in. thick oriented strand board (OSB) or 15/32 in. thick structural 1 sheathing (plywood) complying with DOC PS1 or PS2, or APA Standard PRP-108, manufactured with exterior glue, applied horizontally or vertically to the steel studs. Vertical joints centered on studs, and staggered one stud space from wallboard joints. Attached to studs with flat-head self-drilling tapping screws with a min. head diam. of 0.292 in. at maximum 6 in. OC. in the perimeter and 12 in. OC. in the field. When used, gypsum panels attached over OSB or plywood panels and fastener lengths for gypsum panels increased by min. 1/2 in.

4. Batts and Blankets* — (Required as indicated under Item 5) — Mineral wool batts, friction fitted between studs and runners. Min nom thickness as indicated under Item 5.

See Batts and Blankets (BKNV or BZJZ) Categories for names of Classified companies.

4A. Batts and Blankets* — (Optional – as an alternate to item 4) — Placed in stud cavities, any glass fiber or mineral wool insulation bearing the UL Classification Marking as to Surface Burning Characteristics and/or Fire Resistance.

See Batts and Blankets (BKNV or BZJZ) Categories for names of Classified companies.

A DESIGN UL System No.U419 (Cont.) 1 Hr Fire Rated Wall-Non-Load Bearing

NO SCALE

4B. Fiber, Sprayed* — (Optional – as an alternate for items 4 or 4A, for use with Type ULIX) Where insulation is required - Spray applied granulated mineral fiber material. The fiber is applied with adhesive at a minimum density of 4.0 pcf to completely fill the wall cavity in accordance with the application instructions supplied with the product. See Fiber, Sprayed (CCAZ).

AMERICAN ROCKWOOL MANUFACTURING, LLC — Type Rockwool Premium Plus

4C. Foamed Plastic* — (As an alternate for items 4, 4A or 4B, for use with Item 5K) — Spray applied, foamed plastic insulation, at any thickness from partial fill to completely filling stud cavity, for 2 hour rated assemblies only. When foamed plastic is used, minimum stud depth must be 3-1/2 in. with minimum 20 MSG steel thickness.

CARLISLE SPRAY FOAM INSULATION — Types SealTite ONE, SealTite Pro Closed Cell (CC), SealTite Pro Open Cell (OC), SealTite Pro OCX, SealTite Pro No Trim 21, SealTite Pro One Zero, Foamsulate Closed Cell, Foamsulate OCX, Foamsulate 70, and Foamsulate HFO.

4D. Foamed Plastic* — (As an alternate for items 4, 4A or 4B, for use with Item 5K) — Spray applied, foamed plastic insulation, at any thickness from partial fill to completely filling stud cavity, for up to 2 hour rated assemblies only. When foamed plastic is used, minimum stud depth must be 3-1/2 in. with minimum 20 MSG steel thickness.

BASF CORP - Enertite® NM, Enertite® G, FE178®, Spraytite® 178, Spraytite® 81206, Walltite® 200, Walltite® US, Walltite® US-N, Walltite HP+, FE137®, FE158®, Spraytite® 158, Spraytite® SP, Spraytite® 81205, Walltite® MAX, Walltite® LWP, Walltite® Plus, Walltite® One, and Enertite® Max

4E. Foamed Plastic* — (As an alternate to Item 4 for use with Item 5L) — Spray applied, foamed plastic insulation, at any thickness from partial fill to completely filling stud cavity, for up to 2 hour rated assemblies only. When foamed plastic is used, minimum stud depth must be 3-1/2 in. with minimum 20 MSG steel thickness.

BASF CORP - Walltite® v.5

5. Gypsum Board* — Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Vertical joints in adjacent layers (multilayer systems) staggered one stud cavity. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of studs need not be staggered. Horizontal edge joints and horizontal butt joints in adjacent layers (multilayer systems) staggered a min of 12 in. Horizontal edge joints and horizontal butt joints in adjacent layers (multilayer systems) with Type ULIX need not be staggered. The thickness and number of layers for the 1 hr rating are as follows:

Gypsum Board Protection on Each Side of Wall

Rating, Hr	Min Stud Depth, in. Items 2, 2C, 2D, 2F, 2G, 2O	No. of Layers & Thkns of Panel	Min Thkns of Insulation (Item 4)
1	3-1/2	1 layer, 5/8 in. thick	Optional

CGC INC — 1/2 in. thick Type C, IP-X2 or IPC-AR; WRC, 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULIX, WRX or WRC; 3/4 in. thick Types IP-X3 or ULTRACODE

THE SIAM GYPSUM INDUSTRY (SONGKHLA) CO — 1/2 in. thick Type C and 5/8 in. thick Type SCX

UNITED STATES GYPSUM CO — 1/2 in. thick Type C, IP-X2, IPC-AR or WRC; 5/8 in. thick Type SCX, SGX, SHX, ULIX, WRX, IP-X1, AR, C, WRC, FRX-G, IP-AR, IP-X2, IPC-AR; 3/4 in. thick Types IP-X3 or ULTRACODE

USG BORAL DRYWALL SFZ LLC — 1/2 in. Type C; 5/8 in. Types C, SCX, SGX, ULTRACODE

USG MEXICO S A DE C V — 1/2 in. thick Type C, IP-X2, IPC-AR or WRC; 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRX, WRC or; 3/4 in. thick Types IP-X3 or ULTRACODE

When Item 7B, Steel Framing Members*, is used, Nonbearing Wall Rating is limited to 1 Hr. Min. stud depth is 3-1/2 in., min. thickness of insulation (Item 4) is 3 in., and two layers of gypsum board panels (1/2 in. or 5/8 in. thick) must be attached to furring channels as described in Item 6. One layer of gypsum board panels (1/2 in. or 5/8 in. thick) attached to opposite side of stud without furring channels as described in Item 6.

5A. Gypsum Board* — (As an alternate to Item 5) — 5/8 in. thick, 24 to 54 in. wide, applied horizontally as the outer layer to one side of the assembly. Secured as described in Item 6.

CGC INC — Type SHX.

UNITED STATES GYPSUM CO — Type FRX-G, SHX.

USG MEXICO S A DE C V — Type SHX.

5B. Gypsum Board* — (Not Shown) — As an alternate to Item 5 when used as the base layer on one or both sides of wall when 5/8 in or 3/4 in. thick products are specified. For direct attachment only to steel studs Item 2A, (not to be used with Item 3) — Nom 5/8 in. or 3/4 in. may be used as alternate to all 5/8 in. or 3/4 in. shown in Item 5, Wallboard Protection on Each Side of Wall table. Nom 5/8 in. or 3/4 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Gypsum board secured to 20 MSG steel studs Item 2A with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. To be used with Lead Batten Strips (see Item 11) or Lead Discs or Tabs (see Item 12).

RAY-BAR ENGINEERING CORP — Type RB-LBG

5C. Gypsum Board* — (For Use With Item 2B) — Rating Limited to 1 Hour. 5/8 in. thick, 48 in. wide, Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally. (Vertical Application) - The gypsum board is to be installed on each side of the studs with 1 in. long Type S coated steel screws spaced 8 in. OC starting 4 in. from the edge of the board at the vertical edges and 12 in. OC starting 6 in. from the edge of the board at the center of each board. Gypsum boards are to be secured to the top and bottom track with screws spaced 8 in. OC starting 4 in. from the board edge. Fasteners must not penetrate through both the stud and the track at the same time. Vertical joints are to be centered over studs and staggered one stud cavity on opposite sides of studs. (Horizontal Application) - The gypsum board is to be installed on each side of the studs with 1 in. long Type S coated steel screws spaced 8 in. OC starting 4 in. from the edge of the board at the vertical edges and 12 in. OC starting 6 in. from the edge of the board at the center of each board. Gypsum boards are to be secured to the top and bottom track with screws spaced 8 in. OC starting 4 in. from the board edge. Fasteners must not penetrate through both the stud and the track at the same time. All horizontal joints are to be backed as outlined under section VI of Volume 1 in the Fire Resistive Directory.

CGC INC — Type SCX, ULIX.

THE SIAM GYPSUM INDUSTRY (SONGKHLA) CO — Type SCX

UNITED STATES GYPSUM CO — Type SCX, SGX, ULIX.

USG BORAL DRYWALL SFZ LLC — Type SCX

USG MEXICO S A DE C V — Type SCX

5D. Gypsum Board* — (As an alternate to Item 5) — 5/8 in. thick, 48 in. wide, applied vertically or horizontally. Secured as described in Item 6. For use with Items 1 and 2 only.

CGC INC — Type USGX

UNITED STATES GYPSUM CO — Type USGX

USG BORAL DRYWALL SFZ LLC — Type USGX

USG MEXICO S A DE C V — Type USGX

5E. Gypsum Board* — (Not Shown) — (As an alternate to Item 5 when used as the base layer on one or both sides of wall when 1/2 in. or 5/8 in thick products are specified, For direct attachment only to steel studs Item 2A, not to be used with Item 3). Nominal 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 (or No. 6 by 1-1/4 in. long bugle head fine driller) steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field.

NEW ENGLAND LEAD BURNING CO INC, DBA NELCO — Nelco

5F. Gypsum Board* — (As an alternate to Item 5) — For use with Items 1E and 2E and limited to 1 Hour Rating only, Gypsum panels with beveled, square or tapered edges, applied vertically, and fastened to the steel studs with 1 in. long Type S screws spaced 8 in. OC along vertical and bottom edges and 12 in. OC in the field. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Steel stud depth must be a minimum 3-5/8 in.

THE SIAM GYPSUM INDUSTRY (SONGKHLA) CO — Type SCX

UNITED STATES GYPSUM CO — 5/8 in. thick Type SCX, SGX, ULIX

USG BORAL DRYWALL SFZ LLC — 5/8 in. thick Type SCX, SGX

5G. Gypsum Board* — (As an alternate to Item 5) — For use with Items 1E and 2E only, Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally, as specified in the table below and fastened to the steel studs as described in Item 6. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Vertical joints in adjacent layers (multilayer systems) staggered one stud cavity. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of studs need not be staggered. Horizontal edge joints and horizontal butt joints in adjacent layers (multilayer systems) staggered a min of 12 in.

CGC INC — 1/2 in. thick Type C, IP-X2 or IPC-AR;, 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULIX or 3/4 in. thick Types IP-X3 or ULTRACODE

THE SIAM GYPSUM INDUSTRY (SONGKHLA) CO — 1/2 in. thick Types C and 5/8 in. thick SCX

UNITED STATES GYPSUM CO — 1/2 in. thick Type C, IP-X2, IPC-AR or; 5/8 in. thick Type SCX, SGX, SHX, IP-X1, AR, C, , FRX-G, IP-AR, IP-X2, IPC-AR, ULIX; 3/4 in. thick Types IP-X3 or ULTRACODE

USG BORAL DRYWALL SFZ LLC — 1/2 in. Type C; 5/8 in. Types C, SCX, SGX, ULTRACODE

USG MEXICO S A DE C V — 1/2 in. thick Type C, IP-X2, IPC-AR or; 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, or; 3/4 in. thick Types IP-X3 or ULTRACODE

REV. NO	DESCRIPTION	DATE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

FIRE RATED WALL DETAILS - DRYWALL

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-003
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 41 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

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5H. Gypsum Board* — (Not Shown) — (As an alternate to Item 5 when used as the base layer on one or both sides of wall when 5/8 or 3/4 in thick products are specified. For direct attachment only to steel studs Item 2A, (not to be used with Item 3) - Nom 5/8 or 3/4 in. may be used as alternate to all 5/8 or 3/4 in. shown in Item 5, Wallboard Protection on Each Side of Wall table. Nom 5/8 or 3/4 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over 20 MSG steel studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. Gypsum board secured to 20 MSG steel studs Item 2B with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. For Joint Compound see Item 5. To be used with Lead Batten Strips (see Item 11A) or Lead Discs (see Item 12A).

MAYCO INDUSTRIES INC — Type X-Ray Shielded Gypsum

5I. Gypsum Board* — (As an alternate to Item 5) — Nom. 5/8 in. thick gypsum panels with beveled, square or tapered edges installed as described in Item 5. Steel stud minimum depth must be as indicated in Item 5.
CGC INC — Type ULIX, ULX

UNITED STATES GYPSUM CO — Type ULIX, ULX

USG MEXICO S A DE C V — Type ULX

5J. Gypsum Board* — (Not Shown) — (As an alternate to Item 5 when used as the base layer on one or both sides of wall when 1/2 in. or 5/8 in thick products are specified, For direct attachment only to steel studs Item 2A, not to be used with Item 3). Nom 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws gypsum panel steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations. Lead batten strips, min 2 in. wide, max 8 ft long with a max thickness of 0.14 in. placed on the face of studs and attached to the stud with construction adhesive and two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead discs, nominal 3/8 in. diam by max 0.085 in. thick. Compression fitted or adhered over the screw heads. Lead batten strips and discs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C".

RADIATION PROTECTION PRODUCTS INC — Type RPP - Lead Lined Drywall

5K. Gypsum Board* — (As an alternate to Item 5 when Foam Plastic insulation (Items 4C or 4D) is used) -— Any 5/8 in. thick, 4 ft. wide, Gypsum Board listed in Item 5 above. Applied vertically with vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Gypsum panels secured to studs with 1-1/4 in. long Type S steel screws spaced 8 in. OC at perimeter and in the field. For 2 layer assemblies outer layer will be attached to studs over inner layer with the 1-7/8 in. long steel screws spaced 8 in. OC.

5L. Gypsum Board* — (As an alternate to Item 5 when Foam Plastic insulation (Items 4E) is used) -— Any 5/8 in. thick, 4 ft. wide, Gypsum Board listed in Item 5 above. Additional layer of Gypsum Board is required to what is shown in Item 5 above. Applied vertically with vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. For 2 layer assemblies inner layer attached to studs with 1-1/4 in. long Type S steel screws spaced 8 in. OC, outer layer will be attached to studs over inner layer with the 1-7/8 in. long steel screws spaced 8 in. OC. For 3 layer assemblies inner layers installed as described in the 2 layer system above, third layer attached to studs over inner layers with 2-5/8 in. long steel screws spaced 8 in. OC.

6. Fasteners — (Not Shown) — For use with Items 2 and 2F - Type S or S-12 steel screws used to attach panels to studs (Item 2) or furring channels (Item 7). Single layer systems: 1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 8 in. OC when panels are applied horizontally, or 8 in. OC along vertical and bottom edges and 12 in. OC in the field when panels are applied vertically. Single layer system with Type ULIX: 1 in. long, spaced 12 in. OC in the field and perimeter, when panels are applied horizontally or vertically. Two layer systems: First layer- 1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels or 2-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC with screws offset 8 in. from first layer. Three-layer systems: First layer- 1 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Third layer- 2-1/4 in. long for 1/2 in., 5/8 in. thick panels or 2-5/8 in. long for 5/8 in. thick panels, spaced 12 in. OC. Screws offset min 6 in. from layer below. Four-layer systems: First layer- 1 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Third layer- 2-1/4 in. long for 1/2 in. thick panels or 2-5/8 in. long for 5/8 in. thick panels, spaced 24 in. OC. Fourth layer- 2-5/8 in. long for 1/2 in. thick panels or 3 in. long for 5/8 in. thick panels, spaced 12 in. OC. Screws offset min 6 in. from layer below.

7. Furring Channels — (Optional, Not Shown, for single or double layer systems) — Resilient furring channels fabricated from min 25 MSG corrosion-protected steel, spaced vertically a max of 24 in. OC. Flange portion attached to each intersecting stud with 1/2 in. long Type S-12 steel screws. Not for use with Items 5B, 5E, 5H, or 5J.

7A. Framing Members* — (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 7, furring channels and Steel Framing Members as described below:

a. Furring Channels — Formed of No. 25 MSG galv steel. 2-9/16 in. or 2-23/32 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in Item 6. Not for use with Items 5B, 5E, 5H, or 5J.

b. Steel Framing Members* — Used to attach furring channels (Item 7Aa) to studs (Item 2). Clips spaced max. 48 in. OC. RSIC-1 and RSIC-1 (2.75) clips secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center grommet. RSIC-V and RSIC-V (2.75) clips secured to studs with No. 8 x 9/16 in. minimum self-drilling, S-12 steel screw through the center hole. Furring channels are friction fitted into clips. RSIC-1 and RSIC-V clips for use with 2-9/16 in. wide furring channels. RSIC-1 (2.75) and RSIC-V (2.75) clips for use with 2-23/32 in. wide furring channels.

PAC INTERNATIONAL L L C — Types RSIC-1, RSIC-V, RSIC-1 (2.75), RSIC-V (2.75).

7B. Framing Members* — (Optional, Not Shown) — As an alternate to Item 7, for single or double layer systems, furring channels and Steel Framing Members on only one side of studs as described below:

a. Furring Channels — Formed of No. 25 MSG galv steel, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Batts and Blankets placed in stud cavity as described in Item 5. Two layers of gypsum board attached to furring channels as described in Item 5. Not for use with Item 6. Not for use with Items 5B, 5E, 5H, or 5J.

b. Steel Framing Members* — Used to attach furring channels (Item 7Ba) to one side of studs (Item 2) only. Clips spaced 48 in. OC., and secured to studs with two No. 8 x 2-1/2 in. coarse drywall screws, one through the hole at each end of the clip. Furring channels are friction fitted into clips.

KINETICS NOISE CONTROL INC — Type Isomax

7C. Framing Members* — (Not Shown) — (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 7, furring channels and Steel Framing Members as described below:

a. Furring Channels — Formed of No. 25 MSG galv steel. 2-3/8 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in Item 6. Not for use with Items 5B, 5E, 5H, or 5J.

b. Steel Framing Members* — Used to attach furring channels (Item 7Ca) to studs (Item 2). Clips spaced max. 48 in. OC. GENIECLIPS secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center grommet. Furring channels are friction fitted into clips.

PLITEQ INC — Type GENIECLIP

7D. Steel Framing Members* — (Optional on one or both sides, not shown, for single or double layer systems) — Furring channels and Steel Framing Members as described below:

a. Furring Channels — Formed of No. 25 MSG galv steel. Spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in Item 6. Not for use with Items 5B, 5E, 5H, or 5J.

b. Steel Framing Members* — Used to attach furring channels (Item 7Da) to studs. Clips spaced 48 in. OC., and secured to studs with 2 in. coarse drywall screw with 1 in. diam washer through the center hole. Furring channels are friction fitted into clips

STUDCO BUILDING SYSTEMS — RESILMOUNT Sound Isolation Clips - Type A237 or A237R

7E. Steel Framing Members* — (Optional on one or both sides, not shown, for single or double layer systems) — Furring channels and Steel Framing Members as described below:

a. Furring Channels — Formed of No. 25 MSG galv steel. Spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item 7Eb.Gypsum board attached to furring channels as described in Item 6. Not for use with Items 5B, 5E, 5H, or 5J.

b. Steel Framing Members* — Used to attach furring channels (Item 7Ea) to studs. Clips spaced 48 in. OC., and secured to studs with No. 8 x 2-1/2 in. coarse drywall screw through the center hole. Furring channels are friction fitted into clips.

REGUPOL AMERICA — Type SonusClip

7F. Steel Framing Members* — (Optional on one or both sides, not shown, for single or double layer systems) — Resilient channels and Steel Framing Members as described below:

a. Resilient Channels — Formed of No. 25 MSG galv steel, spaced 24 in. OC, and perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels overlapped 6 in. and secured in place with two No. 8 15 x 1/2 in. Philips Modified Truss screws spaced 2-1/2 in. from the center of the overlap. Gypsum board attached to resilient channels as described in Item 6. Not for use with Items 5B, 5E, 5H, or 5J.

b. Steel Framing Members* — Used to attach resilient channels (Item 7Fa) to studs. Clips spaced 48 in. OC., and secured to studs with No. 8 x 2-1/2 in. coarse drywall screw through the center hole. Resilient channels are secured to clips with one No. 10 x 1/2 in. pan-head self-drilling screw.

KEENE BUILDING PRODUCTS CO INC — Type RC+ Assurance Clip

7G. Framing Members* — (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 7, furring channels and Steel Framing Members as described below:

a. Furring Channels — Formed of No. 25 MSG galv steel. 2-23/32 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in Item 6. Not for use with Items 5B, 5E, 5H, or 5J.

b. Steel Framing Members* — Used to attach furring channels (Item 7Ga) to studs (Item 2). Clips spaced max. 48 in. OC. Clips secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center hole. Furring channels are friction fitted into clips.

CLARKDIETRICH BUILDING SYSTEMS — Type ClarkDietrich Sound Clip

7H. Framing Members* — (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 7, furring channels and Steel Framing Members as described below:

a. Furring Channels — Formed of No. 25 MSG galv steel. 2-23/32 in. wide by 7/8 in. deep, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. As an alternate, ends of adjoining channels may be overlapped 6 in. and secured together with two self-tapping #6 framing screws, min. 7/16 in. long at the midpoint of the overlap, with one screw on each flange of the channel. Gypsum board attached to furring channels as described in Item 6. Not for use with Items 5B, 5E, 5H, or 5J.

b. Steel Framing Members* —Used to attach furring channels (Item 7Ha) to studs. Clips spaced 48 in. OC. staggered on adjacent furring channels and secured to studs with one No. 8 x 2-1/2 in. screw and washer through the center hole. Furring channels are friction fitted into clips.

ISOTECH INDUSTRIES INC. — Type ISOSTUD

8. Joint Tape and Compound — Vinyl or casein, dry or premixed joint compound applied in two coats to joints and screw heads of outer layers. Paper tape, nom 2 in. wide, embedded in first layer of compound over all joints of outer layer panels. Paper tape and joint compound may be omitted when gypsum panels are supplied with a square edge.

9. Siding, Brick or Stucco — (Optional, Not Shown) — Aluminum, vinyl or steel siding, brick veneer or stucco, meeting the requirements of local code agencies, installed over gypsum panels. Brick veneer attached to studs with corrugated metal wall ties attached to each stud with steel screws, not more than each sixth course of brick.

10. Caulking and Sealants* — (Optional, Not Shown) — A bead of acoustical sealant applied around the partition perimeter for sound control.

UNITED STATES GYPSUM CO — Type AS

11. Lead Batten Strips — (Not Shown, For Use With Item 5B) — Lead batten strips, min 1-1/2 in. wide, max 10 ft long with a max thickness of 0.125 in. Strips placed on the interior face of studs and attached from the exterior face of the stud with two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead batten strips to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead batten strips required behind vertical joints of lead backed gypsum wallboard (Item 5B) and optional at remaining stud locations. Required behind vertical joints.

11A. Lead Batten Strips — (Not Shown, For Use With Item 5H) — Lead batten strips, 2 in. wide, max 10 ft long with a max thickness of 0.140 in. Strips placed on the face of studs and attached to the stud with two min. 1 in. long min. Type S-8 pan head steel screws, one at the top of the strip and one at the bottom of the strip or with one min. 1 in. long min. Type S-8 pan head steel screw at the top of the strip. Lead batten strips to have a purity of 99.5% meeting the Federal specification QQ-L-201f, Grades "B, C or D". Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations.

12. Lead Discs or Tabs — (Not Shown, For Use With Item 5B) — Used in lieu of or in addition to the lead batten strips (Item 11) or optional at other locations - Max 3/4 in. diam by max 0.125 in. thick lead discs compression fitted or adhered over steel screw heads or max 1/2 in. by 1-1/4 in. by max 0.125 in. thick lead tabs placed on gypsum boards (Item 5B) underneath screw locations prior to the installation of the screws. Lead discs or tabs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C".

12A. Lead Discs — (Not Shown, for use with Item 5H) — Max 5/16 in. diam by max 0.140 in. thick lead discs compression fitted or adhered over steel screw heads. Lead discs to have a purity of 99.5% meeting the Federal Specification QQ-L-201f, Grades "B, C or D".

13. Lead Batten Strips — (Not Shown, For Use With Item 5E) — Lead batten strips, 2 in. wide, max 10 ft long with a max thickness of 0.142 in. Strips placed on the face of studs and attached to the stud with two min. 1 in. long min. Type S-8 pan head steel screws, one at the top of the strip and one at the bottom of the strip or with one min. 1 in. long min. Type S-8 pan head steel screw at the top of the strip. Lead batten strips to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead batten strips required behind vertical joints of lead backed gypsum wallboard (Item 5E) and optional at remaining stud locations.

14. Lead Tabs — (Not Shown, For Use With Item 5E) — 2 in. wide, 5 in. long with a max thickness of 0.142 in. Tabs friction-fit around front face of stud, the stud folded back flange, and the back face of the stud. Tabs required at each location where a screw (that secures the gypsum boards, Item 5E) will penetrate the steel stud. Lead tabs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead tabs may be held in place with standard adhesive tape if necessary.

15. Barrier Mesh — (Optional, Not Shown) - Attached to steel studs on one or both sides of the wall using Barrier Mesh Clips spaced at maximum 12 inches on center vertically, using a flat head type screw penetrating through the steel at least 3/8 of an inch. For Steel Studs less than 0.033 inches in thickness, use self-piercing screws. For Steel Studs equal to or greater than 0.033 inches in thickness, use steel drill screws (self-tapping). Gypsum Board (Item 5) to be installed directly over the Barrier Mesh using prescribed screw patterns with lengths increased by a minimum 1/8 in. Barrier Mesh may be installed with the long dimension of the diamond pattern positioned vertically or horizontally. Barrier Mesh joints may occur as butt joints at the framing members and secured using the Barrier Mesh Clips or occur in between framing members as overlapping joints secured using 18 SWG wire ties spaced a maximum 12 in. on center.

CLARKDIETRICH BUILDING SYSTEMS — Barrier Mesh, Barrier Mesh Clips

* Indicates such products must bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

A DESIGN UL System No.U419 (Cont.)
1 Hr Fire Rated Wall-Non-Load Bearing
NO SCALE

REV NO	DESCRIPTION	DATE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

FIRE RATED WALL DETAILS - DRYWALL

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-004
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 42 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: - - -

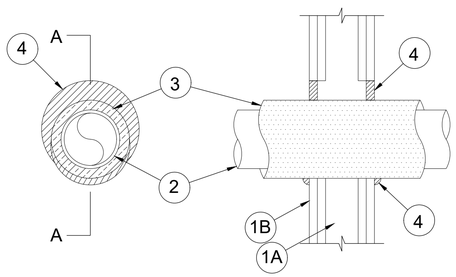
05-07-2026 9:00 am
C:\USERS\PC_3\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01 ACTIVE PROJECTS\2018-25-01 846 MEDCOM RENOVATIONS\4-DWG\ARCH\A-002.DWG

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. W-L-5028

January 27, 2015

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings - 1 and 2 Hr (See Item 1)	F Ratings - 1 and 2 Hr (See Item 1)
T Rating - 0, 3/4 and 1 Hr (See Item 3)	FT Rating - 0, 3/4 and 1 Hr (See Item 3)
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Ratings - 1 and 2 Hr (See Item 1)
L Rating At 400 F - Less Than 1 CFM/sq ft	FTH Ratings - 0, 3/4 and 1 Hr (See Item 3)
	L Rating at Ambient - Less Than 1 CFM/sq ft
	L Rating at 204°C - Less Than 1 CFM/sq ft



Section A-A

1. Wall Assembly — The 1 or 2 hr fire-rated gypsum board/stud wall assembly must be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and must include the following construction features:

A. Studs — Wall framing must consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC.

B. Gypsum Board* — 5/8 in. (16 mm) thick, 4 ft (1219 mm) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation must be as specified in the individual Wall and Partition Design. Max diam of opening is 7-1/2 in. (191 mm).
The hourly F and FH Ratings of the firestop system are equal to the hourly fire rating of the wall assembly in which it is installed.

2. Through Penetrants — One mettalic pipe or tubing to be centered within the firestop system. Pipe or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes or tubing may be used:

A. Steel Pipe — Nom 4 in. (102 mm) diam (or smaller) Schedule 40 (or heavier) steel pipe.
B. Copper Tubing — Nom 2 in. (51 mm) diam (or smaller) Type L (or heavier) copper tubing.
C. Copper Pipe — Nom 2 in. (51 mm) diam (or smaller) Regular (or heavier) copper pipe.

3. Tube Insulation — Plastic+ — Min 1/2 in. (13 mm) to max 1 in. (25 mm) thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC)) flexible foam furnished in the form of tubing. An annular space of min 0 in. (point contact) to max 1-1/2 in. (38 mm) is required within the firestop system. The T, FT and FTH Ratings are 1 hr when the 1 in. (25 mm) thick tube insulation is used and 3/4 hr when the 3/4 in. (19 mm) thick tube insulation is used. When tube insulation thickness is less than 3/4 in. (19 mm), the T, FT and FTH Ratings are 0 Hr.
See Plastics+ (QMFZ2) category in the Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation material meeting the above specifications and having a UL 94 Flammability Classification of 94-5VA may be used.

4. Fill, Void or Cavity Material* — Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with both surfaces of wall. At the point contact location between pipe covering and gypsum board, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe covering/gypsum board interface on both surfaces of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX Intumescent Sealant

*Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

A FIRESTOP UL System No. W-L-1049
NO SCALE

REV NO	DESCRIPTION	DATE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

FIRESTOPPING DETAILS - DRYWALL

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HMRNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. A-005
DRAWN BY: AP/ AU	APPROVED BY:	DATE: JUNE 2026	SHEET 43 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

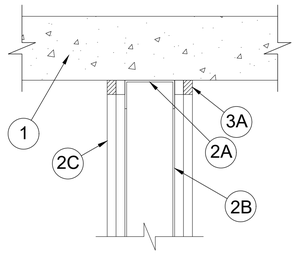
05/07/2026 9:00 am
C:\USERS\PC_3\TEAM MANILA DROPBOX\EP\ DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\2018-25-01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-002.DWG

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 2079 and CAN/ULC S115

System No. HW-D-0931

May 16, 2025

ANSI/UL 2079	CAN/ULC S115
Assembly Ratings - 1 and 2 Hr (See Item 2)	F Ratings - 1 and 2 Hr (See Item 2)
Nominal Joint Width - 1 In	FT Ratings - 1 and 2 Hr (See Item 2)
Class II Movement Capabilities - 18.75% Compression or Extension	FH Ratings - 1 and 2 Hr (See Item 2)
	FTH Rating - 1 and 2 Hr (See Item 2)
L Rating At Ambient - Less Than 1 CFM/lin ft	Nominal Joint Width - 1 in
L Rating At 400 °F - Less Than 1 CFM/lin ft	Class II Movement Capabilities - 18.75% Compression or Extension
	L Rating at Ambient - Less Than 1.55 L/S/lin m
	L Rating at 400°F - Less Than 1.55 L/S/lin m



1. Floor Assembly —Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) structural. Floor may also be constructed of any 6 in. (152 mm) thick UL Classified hollow-core Precast Concrete Units*.
See Precast Concrete Units category in the Fire Resistance Directory for names of manufactures.

2. Wall Assembly —The 1 or 2 h fire rated gypsum board/steel stud wall assembly must be constructed of the materials and in the manner specified in the individual U400, V400 or W400 Series Wall and Partition Design in the UL Fire Resistance Directory and must include the following construction features:

A. Steel Floor and Ceiling Runners —Floor and ceiling runners of wall assembly must consist of min No. 25 gauge galv steel channels sized to accommodate steel studs (Item 2B). Flange height of ceiling runner must be min 1/4 in. (6 mm) greater than max extended joint width. Ceiling runner secured with masonry anchors or steel fasteners spaced 24 in. (610 mm) OC.

B. Studs —Steel studs to be min 3-1/2 in. (89 mm) wide. Studs cut 1/2 to 3/4 in. (13 to 19 mm) less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting in ceiling runner without attachment. Stud spacing not to exceed 24 in. (610 mm) OC.

C. Gypsum Board* — For 1 hr assembly, one layer of min 1/2 in. (13 mm) thick Type C gypsum board is required in the individual Wall and Partition Design. For 2 hr assembly, two layers of min 1/2 in. (13 mm) thick Type C gypsum board is required in the individual Wall and Partition Design. Wall to be constructed as specified in the individual U400, V400 or W400 Series Design in the UL Fire Resistance Directory, except that a max 1 in. (25 mm) gap must be maintained between the top of gypsum board and bottom of concrete floor. The screws attaching the gypsum board to the studs at the top of the first layer must be located 4 in. (102 mm) below the floor. The screws attaching the second layer to the steel studs must be installed into the studs 3-1/2 in. (89 mm) below the floor.
The hourly fire rating of the joint system is equal to the hourly rating of the wall.

3. Joint System — Max separation between bottom of floor and top of gypsum board at time of installation of joint system is 1 in. (25 mm). The joint system is designed to accommodate a max 18.75 percent compression or extension from its installed width. The joint system consists of the following:

A. Fill, Void or Cavity Material* - Sealant —Min 1/2 in. (13 mm) thickness of fill material installed on each side of the wall between the of the gypsum board and the bottom of the concrete floor, flush with each surface of the wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP606 Flexible Firestop Sealant.

B. Forming Material —(Optional, Not Shown) – In 2 hr rated walls, mineral wool insulation, fiberglass batt insulation or polyurethane/polyethylene foam backer rod to be recessed from both surfaces of the 2 hr fire rated wall to accommodate the required thickness of fill material (Item 3A).

* Indicates such products must bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

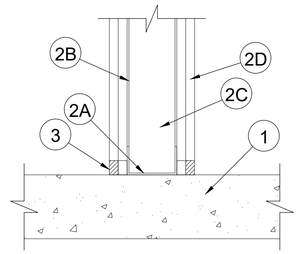
A
Top of Wall Joint
UL System No. HW-D-0931
NO SCALE

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 2079 and CAN/ULC S115

System No. BW-S-0068

April 2, 2024

ANSI/UL 2079	CAN/ULC S115
Assembly Ratings - 1 and 2 Hr (See Item 2)	F Ratings - 1 and 2 Hr (See Item 2)
Nominal Joint Width - 3/4 In (See Item 2)	FT Ratings - 1 and 2 Hr (See Item 2)
L Rating At Ambient - Less Than 1 CFM/lin ft	FH Ratings - 1 and 2 Hr (See Item 2)
L Rating At 400 °F - Less Than 1 CFM/lin ft	FTH Rating - 1 and 2 Hr (See Item 2)
	Nominal Joint Width - 19 mm (See Item 2)
	L Rating at Ambient - Less Than 1.55 L/S/m
	L Rating at 204°C - Less Than 1.55 L/S/m



1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) structural concrete. Floor may also be constructed of any 6 in. (152 mm) thick UL Classified hollow-core Precast Concrete Units*.
See Precast Concrete Units category in the Fire Resistance Directory for names of manufactures.

1A — (Not Shown, Alternate) The fire-rated fluted steel floor unit/concrete floor assembly must be constructed of the materials and in the manner described in the individual D700 or D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory and must include the following construction features:

A. Steel Floor and Form Units* — Max 3 in. (76 mm) deep galv steel fluted units.
B. Concrete — Min 2-1/2 in. (64 mm) thick reinforced concrete, as measured from the top plane of the floor units.

2. Wall Assembly — The 1 or 2 hr fire-rated gypsum board/steel stud wall assembly must be constructed of the materials and in the manner specified in the individual U400, V400 or W400 Series Wall in the UL Fire Resistance Directory. In addition, the wall may incorporate a head-of-wall joint system as specified in the HW series Joint Systems in the UL Fire Resistance Directory. The wall must include the following construction features:

A. Steel Floor Runners — Floor runners of wall assembly must consist of min No. 25 gauge galv steel channels sized to accommodate steel studs (Item 2B). Floor runners to be provided with 1-1/4 in. (32 mm) flanges. Runners secured with steel fasteners spaced 24 in. (610 mm) OC.

B. Studs — Steel studs to be min 3-1/2 in. (89 mm) wide. Studs cut 1/2 to 3/4 in. (13 to 20 mm) less in length than assembly height with bottom nesting in, resting on and fastened to floor runner with sheet metal screws. Stud spacing not to exceed 24 in. (610 mm) OC.

C. Batts and Blankets* — (Not shown, optional) Any glass fiber insulation bearing the UL Classification Marking as to fire resistance or surface burning characteristics, of a width and thickness to completely fill stud cavity. Insulation batts friction fit to completely fill all stud cavities.

See Batts and Blankets (BZJZ) category in the Fire Resistance Directory for names of manufacturers

D. Gypsum Board* — One or two layers of 5/8 in. (16 mm) thick gypsum board for 1 and 2 hr rated assemblies, respectively. Wall to be constructed as specified in the individual U400, V400 or W400 Series Design in the UL Fire Resistance Directory, except that a max 3/4 (19 mm) gap must be maintained between the bottom of gypsum board and top of concrete floor.

The hourly fire rating of the joint system is equal to the hourly fire rating of the wall.

3. Bottom Track Seal — CFS-BTS is secured to steel floor runner with adhesive backing and resting tight to the top of the concrete floor assembly prior to the installation of gypsum board. Product to be compressed 1/2 in. at seam location by compressing each side evenly prior to installation of gypsum board.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CFS-BTS 5/8 in. Bottom Track Seal (for use in 1 hr system) CFS-BTS 1-1/4 in. Bottom Track Seal (for use in 2 hr system)

* Indicates such products must bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

B
Bottom of Wall Joint
UL System No. BW-S-0068
NO SCALE

REV NO	DESCRIPTION	DATE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

TOP AND BOTTOW OF WALL JOINT DETAILS - DRYWALL

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HARNG JOB NO. FEDERAL: PN1:5H00033 STATE: CA-202505-D	DRAWING NO. A-006
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 44 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

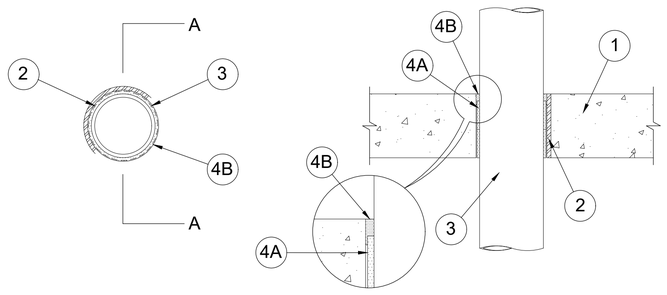
DATE ISSUED: ~~~

05/07/2026 9:00 am
C:\USERS\PC_31\TEAM MANILA DROPBOX\EPI DROPBOX--PROJECTS\01_ACTIVE_PROJECTS\2018--25--01 R46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-002.DWG

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 1479 (ASTM E814) and CAN/ULC S115

System No. C-AJ-2282
October 11, 2021

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating - 2 Hr	F Rating - 2 Hr
T Rating - 1 Hr	FT Rating - 1 Hr
L Rating At Ambient - Less Than 1 CFM/sq ft	FH Rating - 2 Hr
L Rating At 400° F - Less Than 1 CFM/sq ft	FTH Rating - 1 Hr
W Rating - Class 1 (See Item 4B)	L Rating at Ambient - Less Than 5.1 L/S/m2
	L Rating at 204°C - Less Than 5.1 L/S/m2



1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete floor or min 5 in. (127 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete wall. Floor may also be constructed of min 6 in. (152 mm) thick hollow core UL Classified Precast Concrete Uits*. Wall may also be constructed of any UL Classified Concrete Blocks*. Max dia of opening is 5 in. (127 mm).

See Precast Concrete Units (CFTV) or Concrete Blocks (CAZT) categories in the Fire Resistance Directory for names of manufacturers.

2. Steel Sleeve - (Optional) - Nom 5 in. (127mm) dia (or smaller) Schedule 10 (or heavier) steel pipe or nom 5 in. (127 mm) dia (or smaller) No.26 GA (0.022 in. or 0.56 mm thick) sheet metal sleeve with square flange spot welded to the sleeve at approx mid-height and sized to be a min of 2 in. (51 mm) larger than the sleeve dia cast or grouted into floor or wall assembly, flush with loor or wall surfaces.

2A. Nonmetallic Sleeve — (Optional) - Nom 5 in. (127 mm) dia (or smaller) polyvinyl chloride (PVC) sleeve cast into floor at time of concrete placement.

2B. Sheet Metal Sleeve - (Optional) - No.26 GA (0.022 in. or 0.56 mm thick) galvanized steel sleve friction-fit in floor or wall assembly, flush with both sides of floor or wall. Longitudinal seam to overlap a min 1 in. (25 mm). The friction-fit sleeve is required is required for flooring using Precast Concrete Units.

3. Through Penetrant - One nonmetallic pipe, conduit or tube to be centered within the firestop system. The annular space between the pipe or conduit and the periphery of the opening must be nom $\frac{1}{4}$ in. (6 mm). Pipe to be rigidly supported on both sides of the floor or wall assembly.The following types and sizes of nonmetallic pipes, conduits and tubes may be used:

A. Polyvinyl Chloride (PVC) Pipe - Nom 4 in. (102 mm) dia (or smaller) Schedule 40 cellular or solid core polyvinyl chloride (PVC) pipe for use in vented (drain, waste or vent) or closed (process or supply) piping systems.

B. Chlorinated Polyvinyl Chloride (CPVC) Pipe - Nom 4 in. (102 mm) dia (or smaller) SDR 13.5 chlorinated polyvinyl chloride (CPVC) pipe for use in closed (process or supply) piping systems.

C. Rigid Nonmetallic Conduit+ - Nom 4 in. (102 mm) dia (or smaller) Schedule 40 PVC conduit installed in accordance with the National Electrical Code (NFPA No. 70).

D. Electrical Nonmetallic Tubing+ - Nom 2 in. (51 mm) dia (or smaller) PVC tubin installed in accordance with the National Electrical Code (NFPA No. 70).

A THROUGH PENETRATION
FIRESTOP UL System No. C-AJ-2282
NO SCALE

E. Acrylonitrile Butadiene Styrene (ABS) - Pipe Nom 4 in. (102 mm) dia (or smaller) Schedule 40 cellular or solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

When floor assembly is Precast Concrete Units, only nom 3 in. (76 mm) and nom 4 in. (102 mm) pipes or conduits are acceptable.

4. Firestop System - The firestopn system must consist of the following:

A. Fill, Void or Cavity Material* - Wrap Strip - Nom 1/8 in. (3.2 mm) or 3/16 in. (4.8 mm) thick intumescent material faced on both sides with a plastic film, supplied in 2 in. (51 mm) wide strips. For nom 2-1/2 in. (64 mm) through 4 in. (102 mm) dia through penetrants, two stacks of wrap strip, each consisting of one wrap strip layer are individually wrapped around the through penetrant with the ends butted and held in place with a layer of aluminum foil tape. For nom 2 in. (51 mm) dia or smaller through penetrants, one layer of wrap strip wrapped around through penetrant with the ends butted and held in place with a layer of aluminum foil tape. For nom 2-1/2 in. (64 mm) through 4 in. (102 mm) dia through penetrants, the wrap strips are installed such that the bottom edge is flush with the bottom surface of the floor. For nom 2 in. (51 mm) dia through penetrants, the wrap strips are installed such that the bottom edge is recessed 2 in. (51 mm) from the bottom of the floor. In walls, the wrap strips are installed with the exposed edges recessed 1/2 in. (13 mm) from each surface.

SPECIFIED TECHNOLOGIES INC - SpecSeal BLU Wrap Strip or SpecSeal BLU2 Wrap Strip.

A1. Fill, Void, or Cavity Material* - Wrap Strip - As an alternate to Item 4A, nom 1/8 in. (3.2 mm) thick intumescent material faced on both sides with a plastic film sized to fit the OD of the pipe. See table for min width of intumescent wrap strip. The wrap strip is continuously wrapped around the outer circumference of the pipe once and slid into the annular space and held in place with one layer of aluminum foil tape. For nom 3 in. (76 mm) and 4 in. (102 mm) dia through penetants, the wrap strips are installed such that the bottom edge is flush with the botoom surface of the floor. For nom 2 in. (51 mm) dia through penetrants, the wrap strips are installed such that the bottom edge is recessed 2 in. (51 mm) from the bottom of the floor. In walls, the wrap strips are installed with the exposed edges recessed 1/2 in. (13 mm) from each surface.

Nom Pipe Dia, In. (mm)	Wrap Strip	Wrap Strip Width, In (mm)
2 (51)	BLU 220	1-1/2 (38)
3 (76)	BLU 230	3 (76)
4 (102)	BLU 240	4 (102)

SPECIFIED TECHNOLOGIES INC - SpecSeal BLU220, BLU 230, or BLU240 Wrap Strip

B. Fill, Void or Cavity Material* - Sealant - In floors, min 1/2 in. (13 mm) thickness of fill material applied within the annulus on top surface of loor. In walls, min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with each surface of the wall. When required as specified in Item 4A, min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with both surfaces of floor. As an option in floors, generous bead of sealant applied to cover lead edge of wrap strip and to fill annular space between the wrap strip and the concrete.

SPECIFIED TECHNOLOGIES INC - sPECsEAL Series SSS Sealant, SpecSeal LCI Sealant or SpecSeal SIL300 Sealant for floors or walls and SpecSeal SIL300SL Sealant for floors only.

W Ratings apply when min 1/2 in. (13 mm) thickness of SpecSeal SIL300 Sealant or SpecSeal SIL300SL Sealant is applied flush with top surface of floor.

*Indicates such products must bear the UL or cULCertification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

REV. NO	DESCRIPTION	DATE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

FIRESTOPPING DETAILS - CONCRETE/CMU WALLS

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-007
BF	YWF		
DRAWN BY: AP	APPROVED BY:	DATE	SHEET 45
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

DATE ISSUED: ---

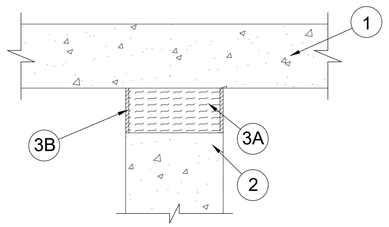
OF _____ DRAWER _____ FOLDER _____

05/07/2026 9:01 am
C:\USERS\PC_3\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01 ACTIVE PROJECTS\12018-25-01 846 MEDCOM RENOVATIONS\4-DWG\ARCH\A-002.DWG

Classified by
Underwriters Laboratories, Inc.
to ANSI/UL 2079 and CAN/ULC S115

System No. HW-D-1008
December 20,2013

ANSI/UL 2079	CAN/ULC S115
Assembly Ratings - 3 Hr	F Ratings - 3 Hr
Nominal Joint Width - 3-1/2 In	FT Ratings - 3 Hr
Class II Movement Capabilities - 14% Compression or Extension	FH Ratings - 3 Hr
	FTH Ratings - 3 Hr
	Nominal Joint Width - 3-1/2 In
	Class II Movement Capabilities - 14% Compression or Extension



1. Floor Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) structural concrete.

2. Wall Assembly — Min 4-3/4 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) structural concrete. Wall may also be constructed of any UL Classified Concrete Blocks*.

See Concrete Blocks (CATZ) category in the Fire Resistance Directory for names of manufacturers.

3. Joint System — Max separation between bottom of floor and top of wall (at time of installation of joint system is 3-1/2 in. (89 mm). The joint system is designed to accommodate a max 14 percent in compression or extension from its installed width. The joint system consists of the following:

A. Forming Material - Min 4 pcf (64kg/m) mineral wool batt insulation installed in joint opening as a permanent form. Pieces of batt cut to min width of 4-1/4 in. (108 mm) and installed edge-first into joint opening, parallel with joint direction, such that batt sections are compressed min 42 percent in thickness and that the compressed batt sections are recessed from both surfaces of the wall to accommodate the required thickness of fill material. Adjoining lengths of batt to be tightly-butted with butted seams spaced min 24 in. (610 mm) apart along the length of the joint.

A1. Forming Material (as an alternate to item 3A) - Min 6 pcf (96 kg/m) ceramic blanket insulation installed in joint as a permanent form. Pieces of batt cut to min width of 4-1/4 in. (108 mm) and installed edge-first into joint opening, parallel with joint direction, such that batt sections are compressed min 50 percent in thickness and that the compressed batt sections are recessed from both surfaces of the wall to accommodate the required thickness of fill material. Adjoining lengths of batt to be tightly-butted with seams spaced min 24 in. (610 mm) apart along the length of the joint.

B. Fil, Void or Cavity Material* — Sealant — Min $\frac{1}{4}$ in. (6 mm) thickness of fill material applied within the joint, flush with both surfaces of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP601s Elastomeric Firestop Sealant or CFS-S SIL GG Sealant

* Indicates such products must bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

A

Top of Wall Joint
UL System No. HW-D-1008

NO SCALE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

TOP OF WALL JOINT DETAILS - CONCRETE/CMU WALL

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-008
BF	YWF		
DRAWN BY:	APPROVED BY:	DATE	SHEET
AP/AU		JUNE 2026	46
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ----

05/07/2026 9:01 am
C:\USERS\PC_3\TEAM MANILA DROPBOX\EP\ DROPBOX--PROJECTS\01_ACTIVE_PROJECTS\12018--25--01 B46_MEDCOM_RENOVATIONS\4--DWG\ARCH\A--002.DWG

NOTICE OF ADDITIVE ALTERNATES:

UNLESS OTHERWISE NOTED, ALL WORK IDENTIFIED ON DRAWINGS IS TO BE INCLUDED UNDER ADDITIVE ALTERNATE. REFER TO SHEET G-001 AND DIVISION 1 SPECIFICATIONS FOR DESCRIPTION OF WORK. REVIEW ALL DISCIPLINE DRAWINGS TO ENSURE ALL REQUIRED WORK SCOPE.

1. 1ST FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
2. 2ND FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
3. 3RD FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
4. DEMOLITION OF EXISTING LIGHTING AND INSTALLATION OF NEW LED LIGHTING AND ASSOCIATED BRANCH CIRCUITING, OVERCURRENT PROTECTION, AND SWITCHES.
5. ELECTRICAL BRANCH CIRCUITING FOR RECEPTACLES AND ANY OTHER ELECTRICAL WORK NOT ASSOCIATED WITH THE ABOVE BASE BID AND ADDITIVE ALTERNATES.
6. TELECOMMUNICATIONS
7. ROOF REPLACEMENT
8. ELEVATOR REPLACEMENT

MATCHLINE
PARTIAL PLAN A
PARTIAL PLAN B
7

1 2 3 4 5 6

E D C B A

(E) EAVE ABOVE

A A-301

B-C A-202 / A D B C 2 A-404

100 OFFICE 1A 213 SF — A D B C 3 A-403

102 UNIT SUPPLY 658 SF

BASE BID

104 VITALS/WAITING AREA 216 SF — A D B C 2 A-405

(E) COLUMN (TYP.)

A A-201

UP

010A STAIR B

011A

30" X 48" AREA OF RESCUE

(E) CONC LANDING AND STEPS

100A 100 S1 / 101 S2

102A 102 S3 / 103 S5

A D C 1 A-401

011 CORRIDOR 1A 478 SF

ONE-HOUR FIRE RATED WALL

102 S4 / 103 S6

102B 103B

104A 104 S7

105A 105 ELEC 1B 30 SF

101A 103A

101 OFFICE 1B 213 SF — A D B C 1 A-404

103 MEDLOG 839 SF

BASE BID

(E) SIDEWALK

MATCHLINE SEE SHT A-101B

TO INFILL CMU AT FORMER WINDOW OPENING AS PER STRL

(E) EAVE ABOVE

A D B C 1 A-405 / B-C A201

LEGEND

EXISTING

- (E) COLUMNS
- (E) WALLS
- (E) WINDOWS
- (E) DOORS
- (E) ONE HOUR FIRE-RATED WALLS
- 30 (E) 30 MINUTE FIRE-RATED WALLS

NEW

- CMU WALL INFILL AS PER STRL
- CONC WALL INFILL AS PER STRL
- ONE HOUR FIRE-RATED RC WALL AS STRL DWGS, FOR FIRE-RATED WALL, FIRESTOPPING, TOP OF WALL JOINT DETAILS, SEE SHEETS A-006-A-007
- MET STUD WALL
- ONE HOUR FIRE-RATED MET STUD WALL; FOR FIRE-RATED WALL FIRESTOPPING, TOP AND BOTTOM OF WALL JOINT DETAILS SEE SHEETS A-002-A-005
- WINDOWS
- DOORS

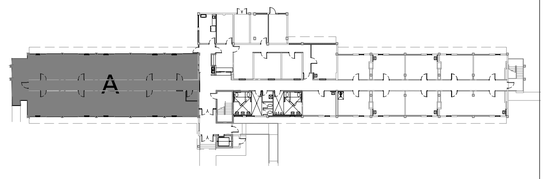
A EXISTING/NEW PARTIAL FIRST FLOOR PLAN

SCALE: 1/4" = 1'-0" 0 4' 8'

NORTH TRUE N

A D B C INTERIOR ELEVATION KEY

KEYPLAN



BRIAN F. FUNAI LICENSED PROFESSIONAL ARCHITECT Exp. 04/30/28 No. AR-7698 HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW PARTIAL FIRST FLOOR PLAN

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-101A
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: AP/AU	APPROVED BY:	DATE	SHEET 47
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE: ISSUED: ---

05/28/2026 6:47 pm
C:\USERS\PC 3\TEAM MANILA DROPBOX\EP1 DROPBOX--PROJECTS\01 ACTIVE_PROJECTS\2018--25--01 R46_MEDCOM RENOVATIONS\4--DWG\ARCH\A--101.DWG

NOTICE OF ADDITIVE ALTERNATES:

UNLESS OTHERWISE NOTED, ALL WORK IDENTIFIED ON DRAWINGS IS TO BE INCLUDED UNDER ADDITIVE ALTERNATE. REFER TO SHEET G-001 AND DIVISION 1 SPECIFICATIONS FOR DESCRIPTION OF WORK. REVIEW ALL DISCIPLINE DRAWINGS TO ENSURE ALL REQUIRED WORK SCOPE.

1. 1ST FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
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4. DEMOLITION OF EXISTING LIGHTING AND INSTALLATION OF NEW LED LIGHTING AND ASSOCIATED BRANCH CIRCUITING, OVERCURRENT PROTECTION, AND SWITCHES.
5. ELECTRICAL BRANCH CIRCUITING FOR RECEPTACLES AND ANY OTHER ELECTRICAL WORK NOT ASSOCIATED WITH THE ABOVE BASE BID AND ADDITIVE ALTERNATES.
6. TELECOMMUNICATIONS
7. ROOF REPLACEMENT
8. ELEVATOR REPLACEMENT

LEGEND

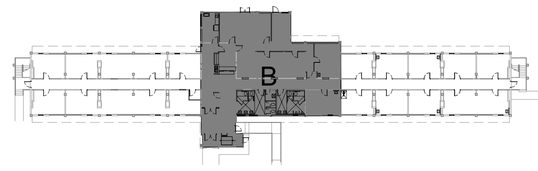
EXISTING

- (E) COLUMNS
- (E) WALLS
- (E) WINDOWS
- (E) DOORS
- (E) ONE HOUR FIRE-RATED WALLS
- 30 (E) 30 MINUTE FIRE-RATED WALLS

NEW

- CMU WALL INFILL AS PER STRL
- CONC WALL INFILL AS PER STRL
- ONE HOUR FIRE-RATED RC WALL AS STRL DWGS, FOR FIRE-RATED WALL, FIRESTOPPING, TOP OF WALL JOINT DETAILS, SEE SHEETS A-006-A-007
- MET STUD WALL
- ONE HOUR FIRE-RATED MET STUD WALL; FOR FIRE-RATED WALL FIRESTOPPING, TOP AND BOTTOM OF WALL JOINT DETAILS SEE SHEETS A-002-A-005
- WINDOWS
- DOORS

KEYPLAN



REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW PARTIAL FIRST FLOOR PLAN

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

ENGINEERING PARTNERS		HMRNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-101B
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: AP/AU	APPROVED BY:	DATE: JUNE 2026	SHEET 48 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ----

OF _____ DRAWER _____ FOLDER _____

05/30/2026 7:34 pm
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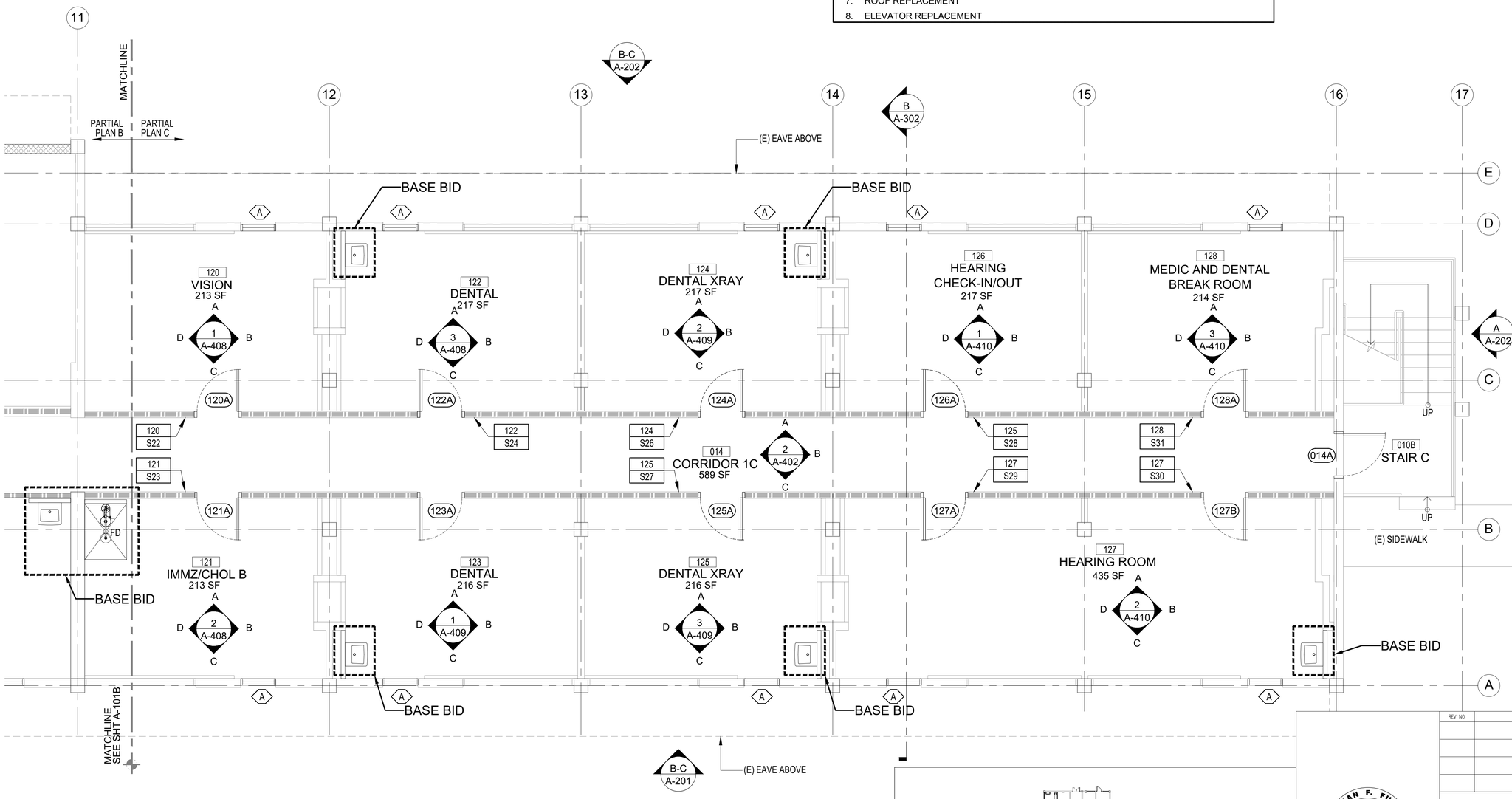
2. 2ND FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
3. 3RD FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
4. DEMOLITION OF EXISTING LIGHTING AND INSTALLATION OF NEW LED LIGHTING AND ASSOCIATED BRANCH CIRCUITING, OVERCURRENT PROTECTION, AND SWITCHES.
5. ELECTRICAL BRANCH CIRCUITING FOR RECEPTACLES AND ANY OTHER ELECTRICAL WORK NOT ASSOCIATED WITH THE ABOVE BASE BID AND ADDITIVE ALTERNATES.
6. TELECOMMUNICATIONS
7. ROOF REPLACEMENT
8. ELEVATOR REPLACEMENT



LEGEND

EXISTING

- (E) COLUMNS
- (E) WALLS
- (E) WINDOWS
- (E) DOORS
- (E) ONE HOUR FIRE-RATED WALLS
- 30 (E) 30 MINUTE FIRE-RATED WALLS

NEW

- CMU WALL INFILL AS PER STRL
- CONC WALL INFILL AS PER STRL
- ONE HOUR FIRE-RATED RC WALL AS STRL DWGS, FOR FIRE-RATED WALL, FIRESTOPPING, TOP OF WALL JOINT DETAILS, SEE SHEETS A-006-A-007
- MET STUD WALL
- ONE HOUR FIRE-RATED MET STUD WALL; FOR FIRE-RATED WALL FIRESTOPPING, TOP AND BOTTOM OF WALL JOINT DETAILS SEE SHEETS A-002-A-005
- WINDOWS
- DOORS

A EXISTING/NEW PARTIAL FIRST FLOOR PLAN

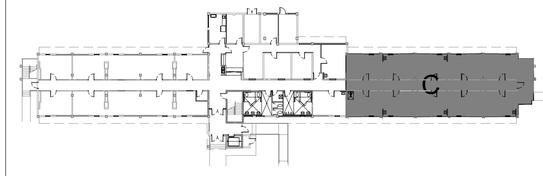
SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N

INTERIOR ELEVATION KEY

KEYPLAN



BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW PARTIAL FIRST FLOOR PLAN

ENGINEERING PARTNERS		HAWG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-101C
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: AP/AU	APPROVED BY:	DATE: JUNE 2026	SHEET 49 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/28/2026 6:48 pm
C:\USERS\PC_1\TEAM MANILA DROPBOX\EPI DROPBOX--PROJECTS\01 ACTIVE PROJECTS\2018--25--01 846 MEDCOM RENOVATIONS\4--BIM\0_ARCH\A-101.DWG

NOTICE OF ADDITIVE ALTERNATES:

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2. 2ND FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
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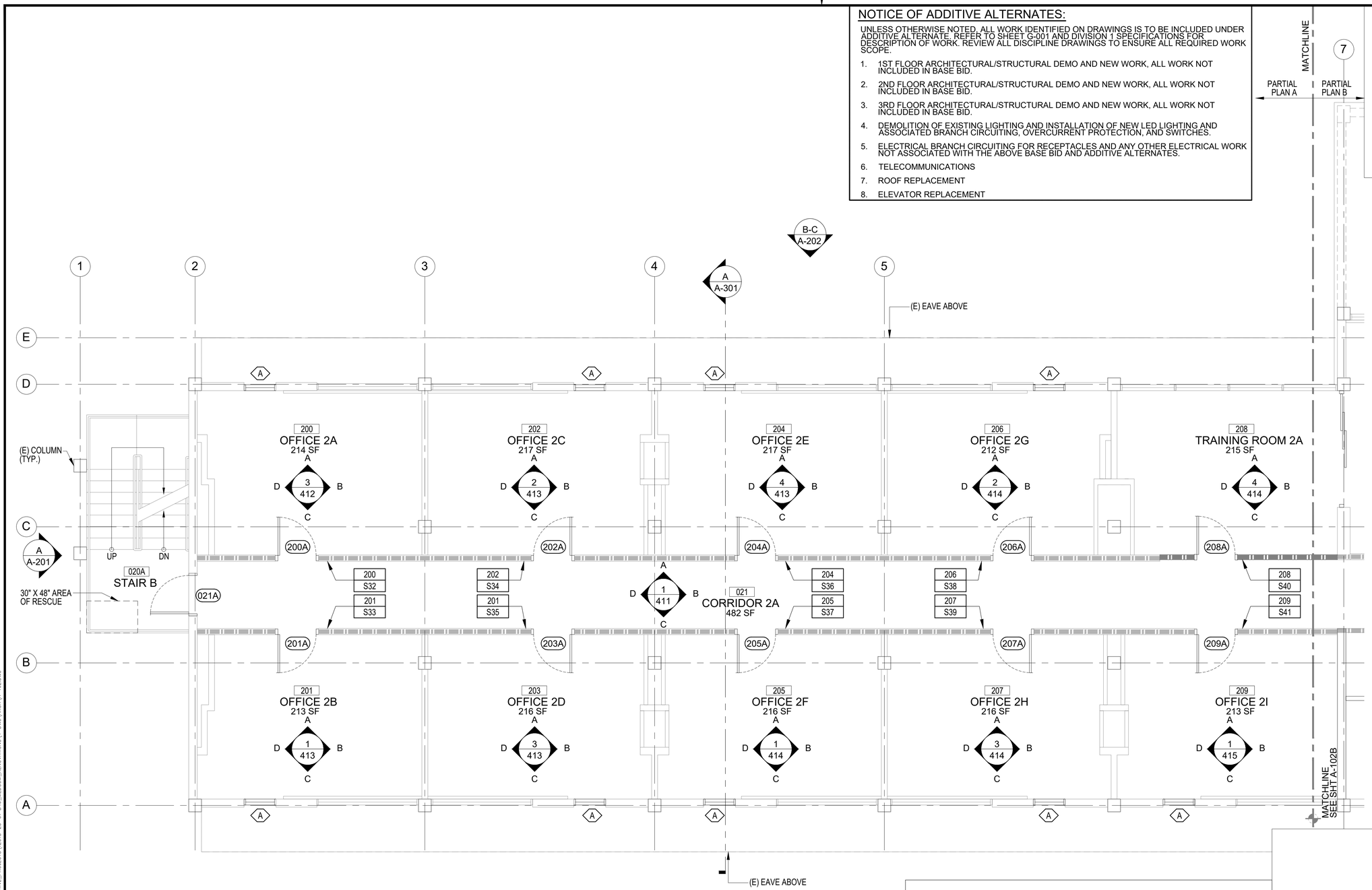
5. ELECTRICAL BRANCH CIRCUITING FOR RECEPTACLES AND ANY OTHER ELECTRICAL WORK NOT ASSOCIATED WITH THE ABOVE BASE BID AND ADDITIVE ALTERNATES.
6. TELECOMMUNICATIONS
7. ROOF REPLACEMENT
8. ELEVATOR REPLACEMENT



LEGEND

EXISTING

- (E) COLUMNS
- (E) WALLS
- (E) WINDOWS
- (E) DOORS
- (E) ONE HOUR FIRE-RATED WALLS
- 30 (E) 30 MINUTE FIRE-RATED WALLS

NEW

- CMU WALL INFILL AS PER STRL
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- ONE HOUR FIRE-RATED RC WALL AS STRL DWGS, FOR FIRE-RATED WALL, FIRESTOPPING, TOP OF WALL JOINT DETAILS, SEE SHEETS A-006-A-007
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- WINDOWS
- DOORS

A EXISTING/NEW PARTIAL SECOND FLOOR PLAN

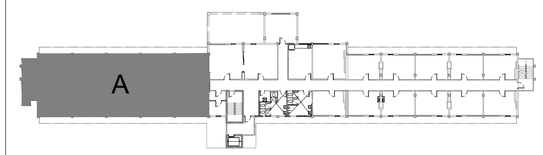
SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH (TRUE N)

INTERIOR ELEVATION KEY

KEYPLAN



BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
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HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW PARTIAL SECOND FLOOR PLAN

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO, FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. A-102A
DRAWN BY: CSL/AU	APPROVED BY:	DATE	SHEET 50
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/28/2026 6:49 pm
C:\USERS\PC_3\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\2018--25--01 R46_MEDCOM_RENOVATIONS\4--DWG\ARCH\A--102.DWG

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6. TELECOMMUNICATIONS
7. ROOF REPLACEMENT
8. ELEVATOR REPLACEMENT

LEGEND

EXISTING

- (E) COLUMNS
- (E) WALLS
- (E) WINDOWS
- (E) DOORS
- (E) ONE HOUR FIRE-RATED WALLS
- 30 (E) 30 MINUTE FIRE-RATED WALLS

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- MET STUD WALL
- ONE HOUR FIRE-RATED MET STUD WALL; FOR FIRE-RATED WALL FIRESTOPPING, TOP AND BOTTOM OF WALL JOINT DETAILS SEE SHEETS A-002-A-005
- WINDOWS
- DOORS

MATCHLINE
PARTIAL PLAN A
PARTIAL PLAN B
TO INFILL CMU AT FORMER DOOR OPENING AS PER STRL
216 OFFICE 254 SF
BASE BID
PARTIAL PLAN B
PARTIAL PLAN C
MATCHLINE
210 TRAINING ROOM 2B 325 SF
213 TRAINING ROOM 2C 321 SF
024 CORRIDOR 2D 94 SF
217 BREAK ROOM 225 SF
220 OFFICE 2K 304 SF
210B
210C
216A
213 S48
REF
2'-0"
9'-0"
210A
213A
217A
220A
210 42
213 S45
214 S46
215 S47
217 S49
218 S50
219 S51
022 CORRIDOR 2B
211 S43
211A
211 ELEC 2 45 SF
212 S44
212A
020 STAIR A 128 SF
DN
UP
022A
214A
214 JAN 32 SF
215A
218A
219A
215 WOMEN'S RESTROOM 145 SF
218 MEN'S RESTROOM 157 SF
219 OFFICE 2J 213 SF
8'-0"
212 TELECOM 2 70 SF
025 S63
025A
025 ELEV LOBBY 2 102 SF
ELEV
TO INFILL CMU AT FORMER WINDOW OPENINGS AS STRL
TO INFILL CMU AT FORMER WINDOW OPENINGS AS PER STRL
(E) EAVE ABOVE
BASE BID
B-C A201
SEE B A-111 ENLARGED FLOOR PLAN
MATCHLINE SEE SHT A-102C
MATCHLINE SEE SHT A-102A
SEE 2 A-1001 ENLARGED FLOOR PLAN

A EXISTING/NEW PARTIAL SECOND FLOOR PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH (TRUE N)

INTERIOR ELEVATION KEY

B

KEYPLAN

REV. NO	DESCRIPTION	DATE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7696
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW PARTIAL SECOND FLOOR PLAN

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-102B
DRAWN BY: CSU,AU	APPROVED BY:	DATE: JUNE 2026	SHEET 51 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/28/2026 6:50 pm
C:\USERS\PC_3\TEAM MANUA DROPBOX\LEPI DROPBOX--PROJECTS\01 ACTIVE_PROJECTS\2018--25--01 B46_MEDCOM_RENOVATIONS\4--DWG\ARCH\A--102.DWG

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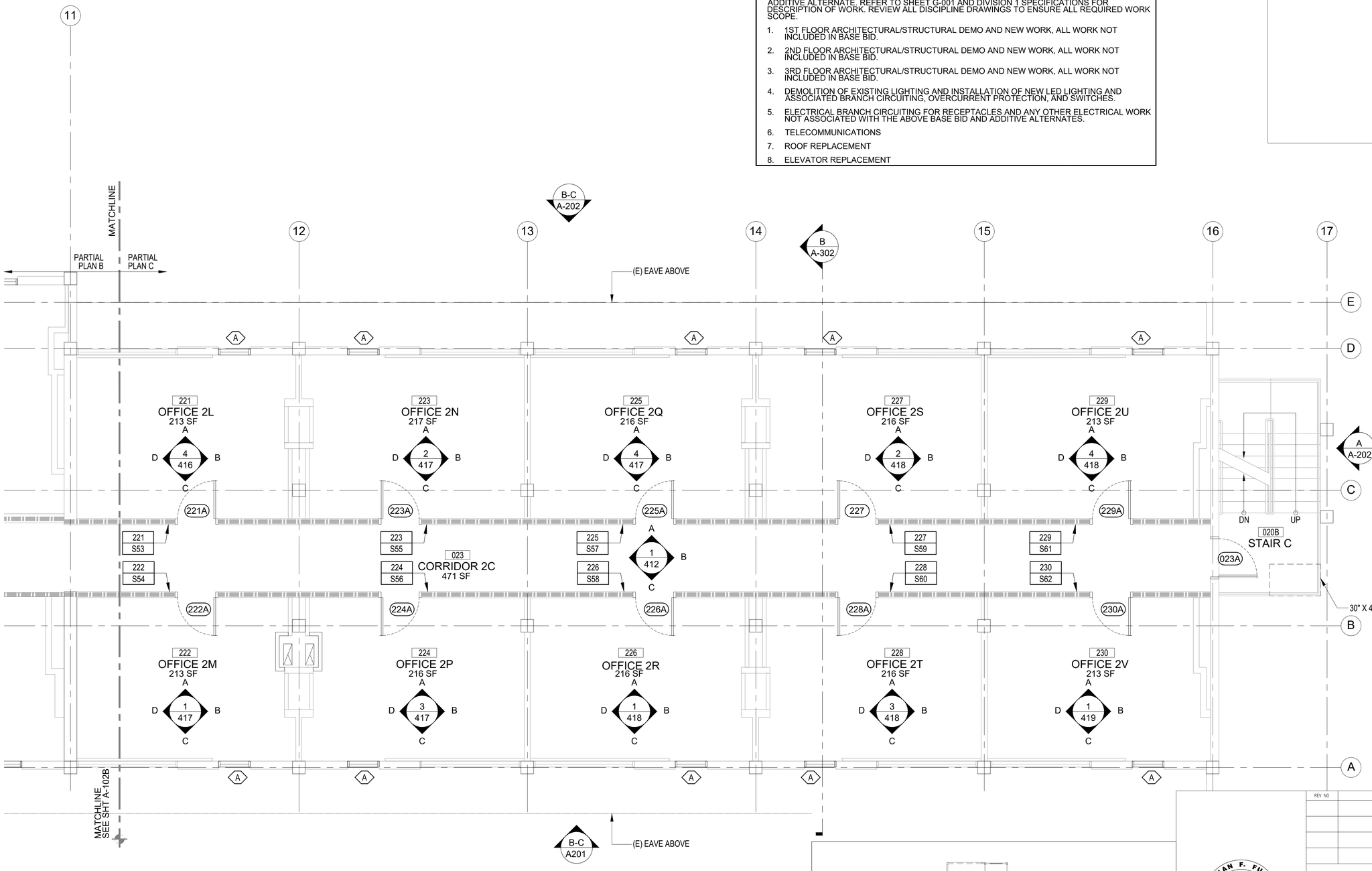
8. ELEVATOR REPLACEMENT



LEGEND

EXISTING

- (E) COLUMNS
- (E) WALLS
- (E) WINDOWS
- (E) DOORS
- (E) ONE HOUR FIRE-RATED WALLS
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- ONE HOUR FIRE-RATED MET STUD WALL; FOR FIRE-RATED WALL FIRESTOPPING, TOP AND BOTTOM OF WALL JOINT DETAILS SEE SHEETS A-002-A-005
- WINDOWS
- DOORS

A EXISTING/NEW PARTIAL SECOND FLOOR PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N

A D B C INTERIOR ELEVATION KEY

KEYPLAN

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW PARTIAL SECOND FLOOR PLAN

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-102C
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: CSUAU	APPROVED BY:	DATE: JUNE 2026	SHEET 52 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/28/2026 6:59 pm
C:\USERS\PC 31\TEAM MANILA DROPBOX\EPI DROPBOX--PROJECTS\01_ACTIVE_PROJECTS\12018--25--01 846_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-102.DWG

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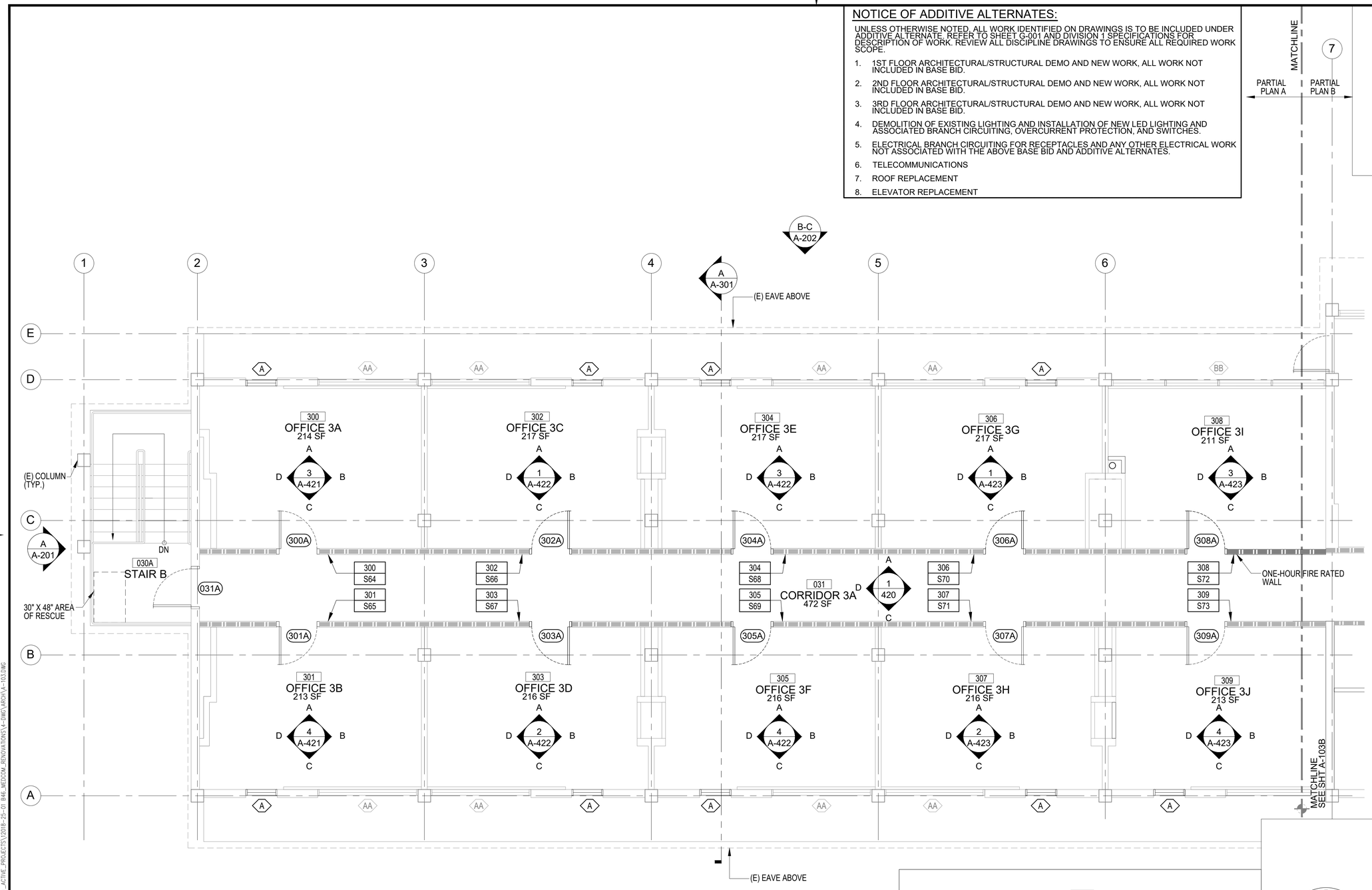
8. ELEVATOR REPLACEMENT



LEGEND

EXISTING

- (E) COLUMNS
- (E) WALLS
- (E) WINDOWS
- (E) DOORS
- (E) ONE HOUR FIRE-RATED WALLS
- 30 (E) 30 MINUTE FIRE-RATED WALLS

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- ONE HOUR FIRE-RATED MET STUD WALL; FOR FIRE-RATED WALL FIRESTOPPING, TOP AND BOTTOM OF WALL JOINT DETAILS SEE SHEETS A-002-A-005
- WINDOWS
- DOORS

A EXISTING/NEW PARTIAL THIRD FLOOR PLAN

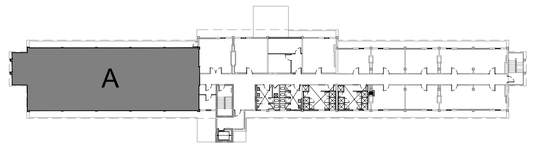
SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N

INTERIOR ELEVATION KEY

KEYPLAN



BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW PARTIAL THIRD FLOOR PLAN

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HARNG JOB NO, FEDERAL: PH15H00033 STATE: CA-202505-D	DRAWING NO. A-103A
DRAWN BY: CMS/AU	APPROVED BY:	DATE JUNE 2026	SHEET 53 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/28/2026 6:52 pm
C:\USERS\PC_3\TEAM MANILA DROPBOX\EPI DROPBOX~PROJECTS\01_ACTIVE_PROJECTS\12018-25--01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-103.DWG

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8. ELEVATOR REPLACEMENT

LEGEND

EXISTING

- (E) COLUMNS
- (E) WALLS
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- (E) DOORS
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- MET STUD WALL
- ONE HOUR FIRE-RATED MET STUD WALL; FOR FIRE-RATED WALL FIRESTOPPING, TOP AND BOTTOM OF WALL JOINT DETAILS SEE SHEETS A-002-A-005
- WINDOWS
- DOORS

MATCHLINE
PARTIAL PLAN A
PARTIAL PLAN B
PARTIAL PLAN C
SEE SHT A-101A
SEE SHT A-103C
B A-301
B-C A-202
A A-302
B-C A-201
7
8
9
10
11
E
D
C
B
A
AA
310 CONFERENCE 3 310 SF
311 ELEC 3 45 SF
312 TELECOM 3 70 SF
313 SIM LAB 307 SF
314 MEN'S RESTROOM 130 SF
315 JAN 22 SF
316 WOMEN'S LOCKER ROOM 118 SF
317 MEN'S LOCKER ROOM 139 SF
318 OFFICE 3K 304 SF
319 WOMEN'S RESTROOM 148 SF
320 MEN'S SHOWER RM 221 SF
030 STAIR A 128 SF
032 CORRIDOR 3B 394 SF
034 CORR 3D 54 SF
035 VESTIBULE 150 SF
036 ELEVATOR LOBBY 3 102 SF
ELEV
DN
TO INFILL CMU AT FORMER WINDOW OPENINGS AS PER STRL
ONE-HOUR FIRE RATED WALL AT FORMER DOOR OPENING
ONE-HOUR FIRE RATED WALL AT FORMER DOOR OPENINGS
6" INFILL CMU AT FORMER WINDOW OPENINGS
TO INFILL CMU AT FORMER WINDOW OPENINGS AS PER STRL
TO INFILL CMU AT FORMER WINDOW OPENINGS AS PER STRL
(E) EAVE ABOVE
BASE BID
SEE 3 A-1001 ENLARGED FLOOR PLAN
A-420
A-421
A-424
A-425
A-431
A-1030
S74 S75 S76 S77 S79 S80 S81 S82 S83 S84 S65
B1
CC
30
4'-4"

A EXISTING/NEW PARTIAL THIRD FLOOR PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N

INTERIOR ELEVATION KEY

B

KEYPLAN

REV. NO	DESCRIPTION	DATE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW PARTIAL THIRD FLOOR PLAN

ENGINEERING PARTNERS		HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-103B
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: CMS/AU	APPROVED BY:	DATE: JUNE 2026	SHEET 54 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/28/2026 6:52 pm
C:\USERS\YPC.A\TEAM MANILA DROPBOX\EPI DROPBOX--PROJECTS\01 ACTIVE PROJECTS\2018--25--01 846 MEDCOM RENOVATIONS\4--BIM\ARCH\A--103.DWG

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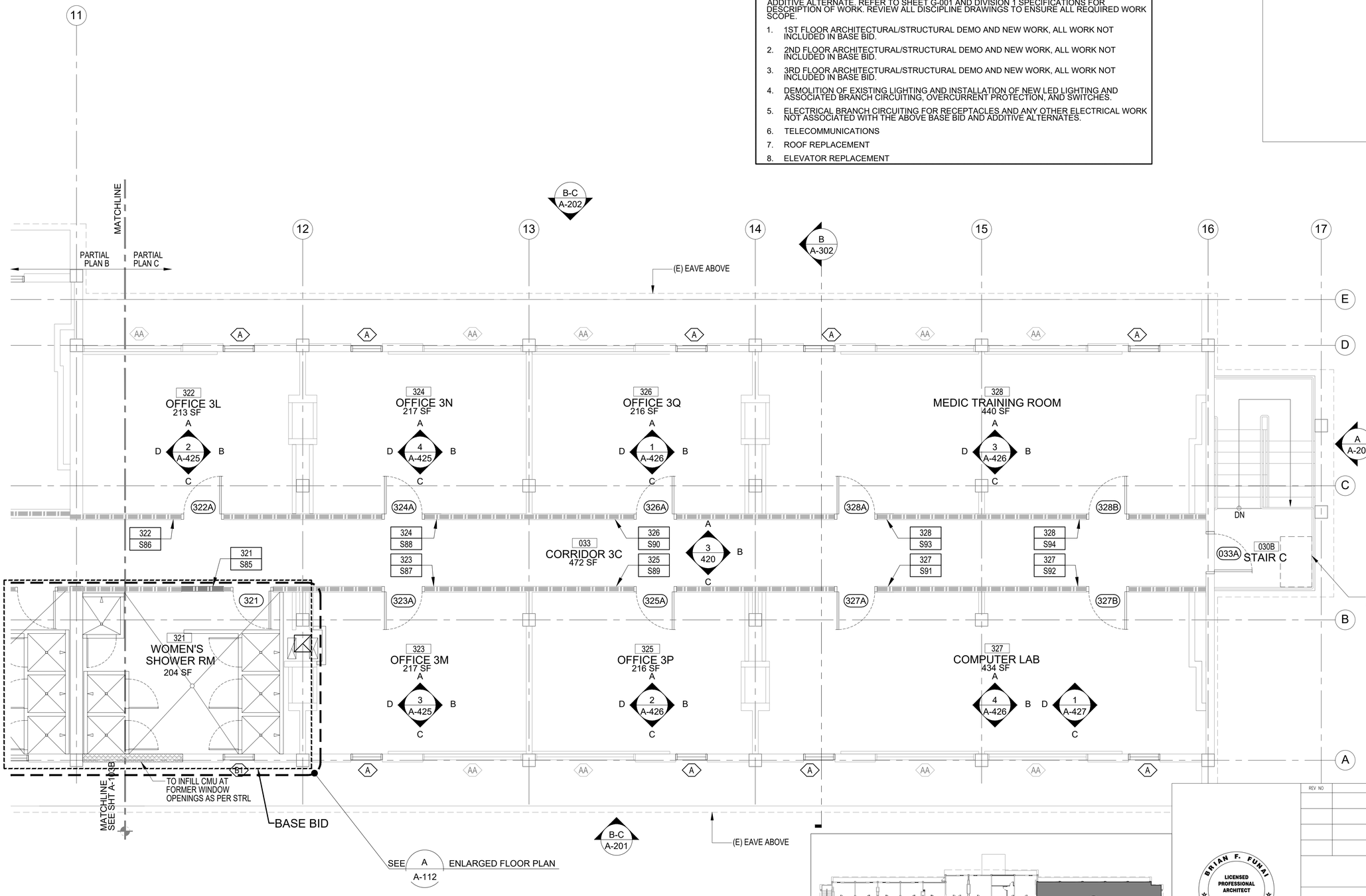

LEGEND

EXISTING

- (E) COLUMNS
- (E) WALLS
- (E) WINDOWS
- (E) DOORS
- (E) ONE HOUR FIRE-RATED WALLS
- 30 (E) 30 MINUTE FIRE-RATED WALLS

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- ONE HOUR FIRE-RATED RC WALL AS STRL DWGS, FOR FIRE-RATED WALL, FIRESTOPPING, TOP OF WALL JOINT DETAILS, SEE SHEETS A-006-A-007
- MET STUD WALL
- ONE HOUR FIRE-RATED MET STUD WALL; FOR FIRE-RATED WALL FIRESTOPPING, TOP AND BOTTOM OF WALL JOINT DETAILS SEE SHEETS A-002-A-005
- WINDOWS
- DOORS

A EXISTING/NEW PARTIAL THIRD FLOOR PLAN

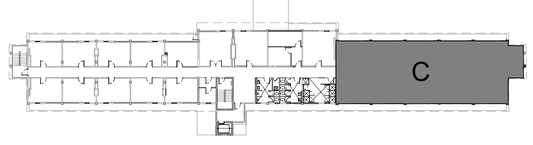
SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N

INTERIOR ELEVATION KEY

KEYPLAN



REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW PARTIAL THIRD FLOOR PLAN

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HAWNG JOB NO. FEDERAL:	DRAWING NO.
BF	YWF	PN15H00033 STATE: CA-202505-D	A-103C
DRAWN BY: CMS/AU	APPROVED BY:	DATE	SHEET 55
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/28/2026 6:52 pm
C:\USERS\PC 31\TEAM MANILA DROPBOX\EPI DROPBOX--PROJECTS\01 ACTIVE PROJECTS\12018--25--01 846_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-103.DWG

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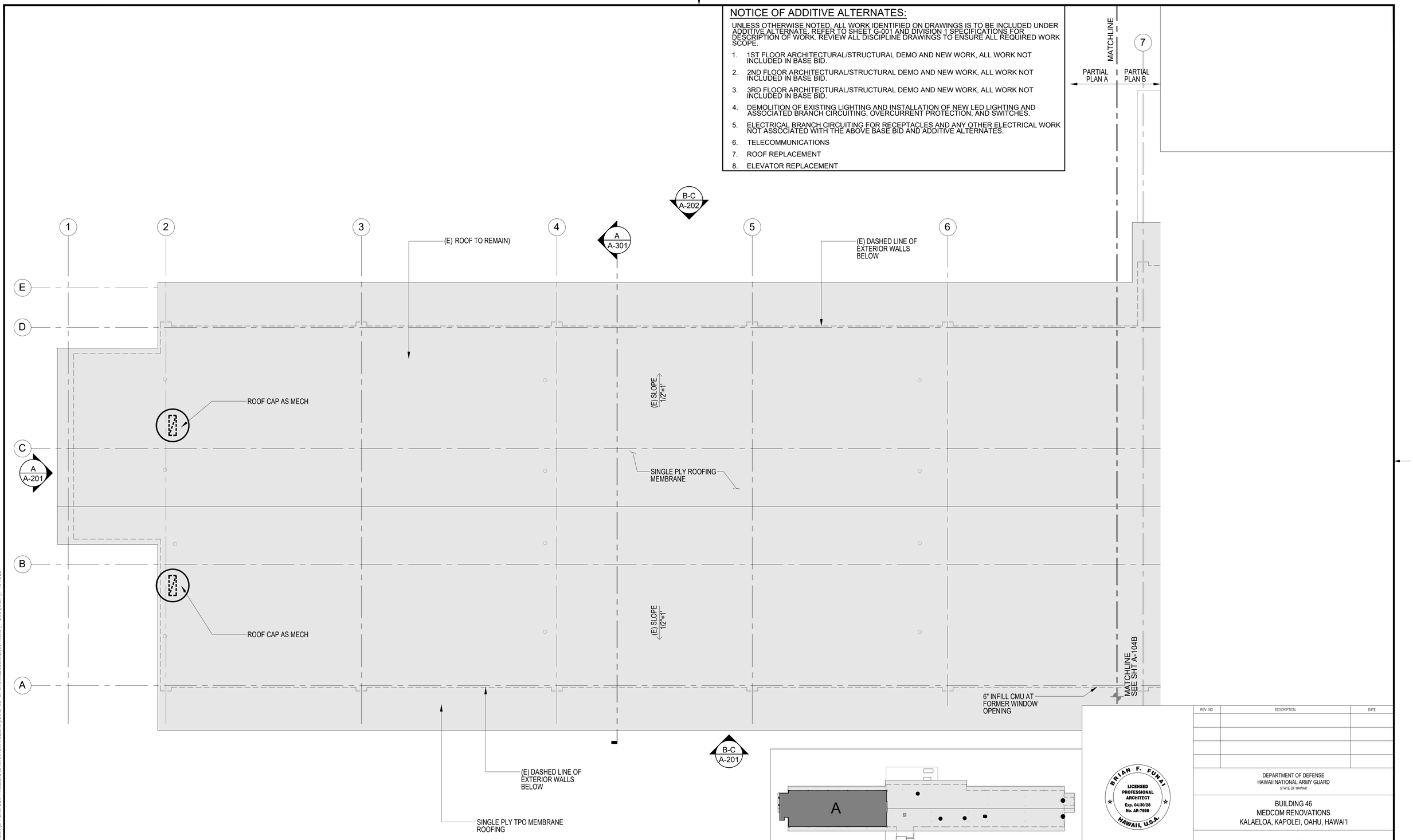
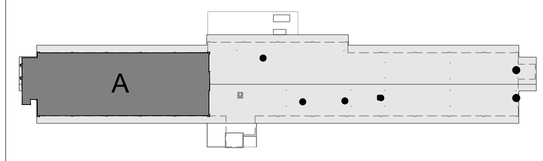
6. TELECOMMUNICATIONS
7. ROOF REPLACEMENT
8. ELEVATOR REPLACEMENT



A EXISTING/NEW PARTIAL ROOF PLAN

SCALE: 1/4" = 1'-0" 0 4' 8'

NORTH TRUE N



KEYPLAN

BRIAN F. FUNAI LICENSED PROFESSIONAL ARCHITECT Exp. 04/30/28 No. AR-7698 HAWAII, U.S.A.

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DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW PARTIAL ROOF PLAN

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO, FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-104A
DRAWN BY: AP	APPROVED BY:	DATE	SHEET 56
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/28/2026 6:53 pm
C:\USERS\PC_3\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\2018-25-01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-104.DWG

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6. TELECOMMUNICATIONS
7. ROOF REPLACEMENT
8. ELEVATOR REPLACEMENT

MATCHLINE
PARTIAL PLAN A
PARTIAL PLAN B
7
8
9
10
11
B A-301
B-C A-202
A A-302
(E) ROOF OF SECOND FLOOR MECH ROOM
SINGLE PLY TPO MEMBRANE ROOFING
SHEET METAL CAP AT FORMER DUCT PENETRATIONS (TYP.)
(E) DASHED LINE OF EXTERIOR WALLS BELOW
MATCHLINE
E
D
C
B
A
ROOF CAP AS MECH
(E) SLOPE 1/2"=1'
SINGLE PLY ROOFING MEMBRANE
ROOF CAP AS MECH
(E) SLOPE 1/2"=1'
(E) DASHED LINE OF EXTERIOR WALLS BELOW
(E) ROOF SCUTTLE
B-C A-201
SINGLE PLY TPO MEMBRANE ROOFING
MATCHLINE SEE SHT A-104C
MATCHLINE SEE SHT A-104A

A EXISTING/NEW PARTIAL ROOF PLAN
SCALE: 1/4" = 1'-0"
0 4' 8'
NORTH TRUE N

B

KEYPLAN

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW PARTIAL ROOF PLAN

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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ENGINEERING PARTNERS		HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-104B
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 57 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/28/2026 6:54 pm
C:\USERS\PC 3\TEAM MANILA DROPBOX\EPI DROPBOX--PROJECTS\01_ACTIVE_PROJECTS\2018--25--01 B46_MEDCOM_RENOVATIONS\4--DWG\ARCH\A--104.DWG

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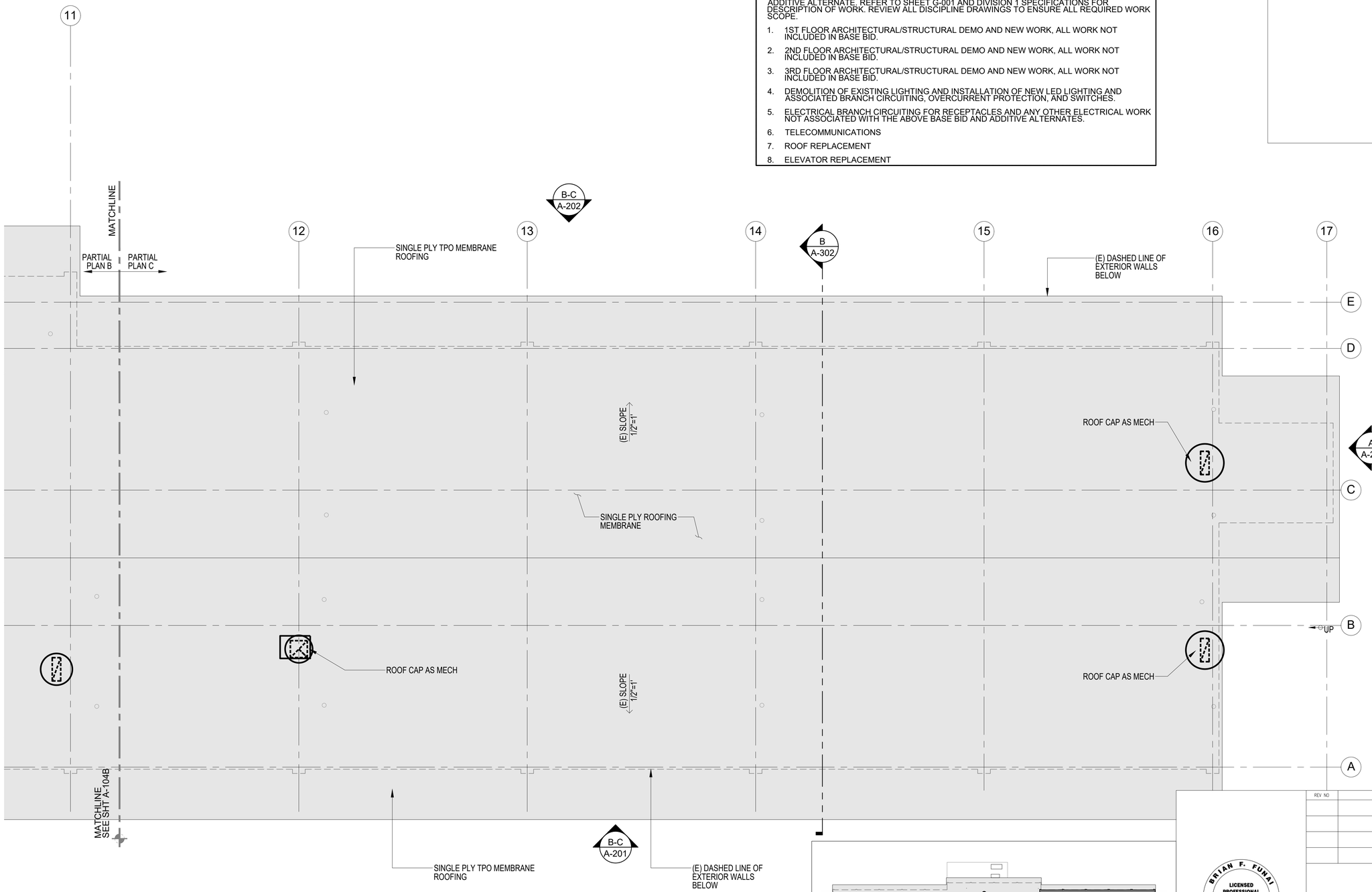
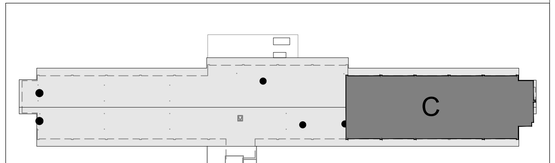
7. ROOF REPLACEMENT
8. ELEVATOR REPLACEMENT



A EXISTING/NEW PARTIAL ROOF PLAN

SCALE: 1/4" = 1'-0" 0 4' 8'

NORTH TRUE N



KEYPLAN

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW PARTIAL ROOF PLAN

ENGINEERING PARTNERS		HIARNG JOB NO. FEDERAL: PN1:SH00033 STATE: CA-202505-D	DRAWING NO. A-104C
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 58 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~

05/28/2026 6:54 pm
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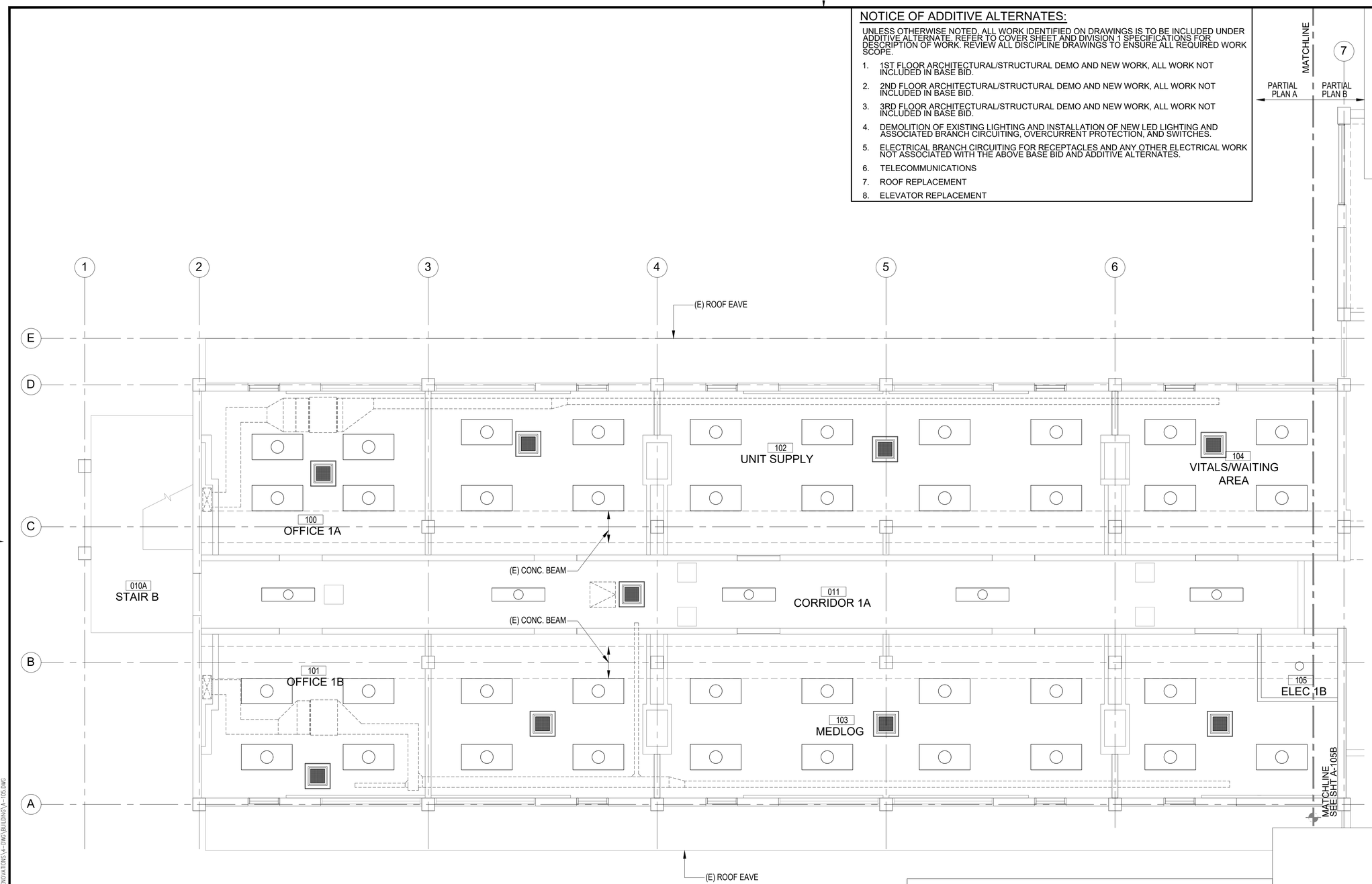

LEGEND

EXISTING

- (E) GYP BD CEILING TO REMAIN
- (E) CEILING ACCESS PANEL TO REMAIN
- (E) LIGHTING FIXTURES TO REMAIN

NEW

- ACCESS PANEL, SEE MECH DWGS
- REPLACE DAMAGED GYPSUM CEILING/PROVIDE GYPSUM CEILING IN PLACE OF DEMOLISHED WALLS, ALIGNED WITH EXISTING CEILING GRID
- LIGHTING FIXTURES, SEE ELEC DWGS
- EXHAUST FAN, SEE MECH DWGS
- FC UNIT, CEILING CASSETTE, SEE MECH DWGS
- AC SYSTEM COMPONENTS, SEE MECH DWGS

A EXISTING/NEW FIRST FLOOR FIRST FLOOR REFLECTED CEILING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH (TRUE N)

KEYPLAN

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW FIRST FLOOR REFLECTED CEILING PLAN

ENGINEERING PARTNERS		HNARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-105A
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: AP	APPROVED BY:	DATE JUNE 2026	SHEET 59 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ----

06/04/2026 1:33 pm
M:\ED PROJECTS\2025 PROJECTS\2018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\BUILDING\A-105.DWG

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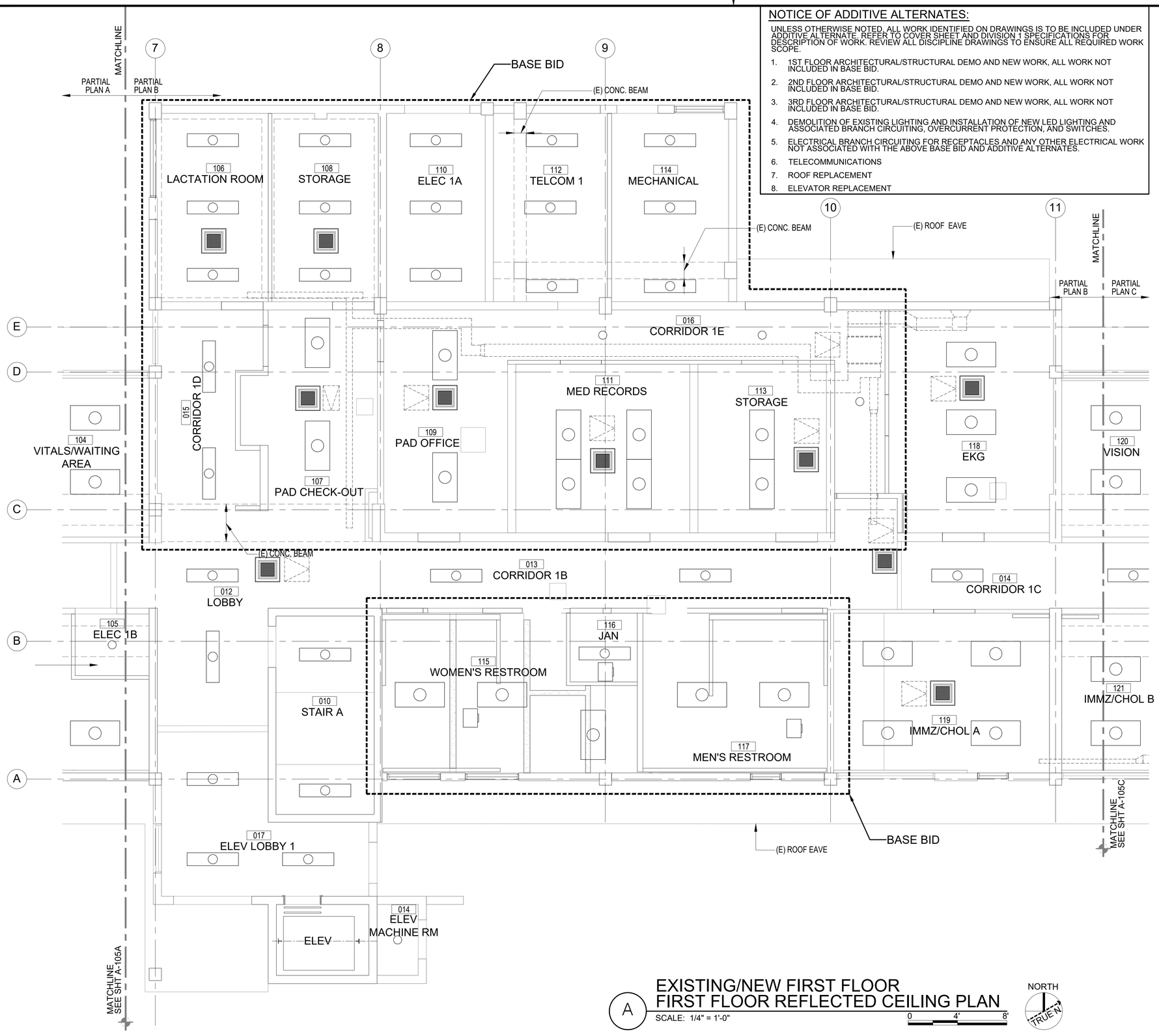

A EXISTING/NEW FIRST FLOOR FIRST FLOOR REFLECTED CEILING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N

LEGEND

EXISTING

- (E) GYP BD CEILING TO REMAIN
- (E) CEILING ACCESS PANEL TO REMAIN
- (E) LIGHTING FIXTURES TO REMAIN

NEW

- ACCESS PANEL, SEE MECH DWGS
- REPLACE DAMAGED GYPSUM CEILING/PROVIDE GYPSUM CEILING IN PLACE OF DEMOLISHED WALLS, ALIGNED WITH EXISTING CEILING GRID
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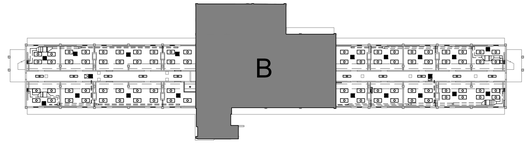
- AC SYSTEM COMPONENTS, SEE MECH DWGS



KEYPLAN

REV NO	DESCRIPTION	DATE

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Exp. 04/30/28
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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW FIRST FLOOR REFLECTED CEILING PLAN

ENGINEERING PARTNERS		HNARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-105B
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 60 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/04/2026 1:32 pm
M:\ED PROJECTS\2025 PROJECTS\12018--25--01 DOD BLDG 46 MEDCOM RENOVATIONS\A-DWG\BUILDING\A--105.DWG

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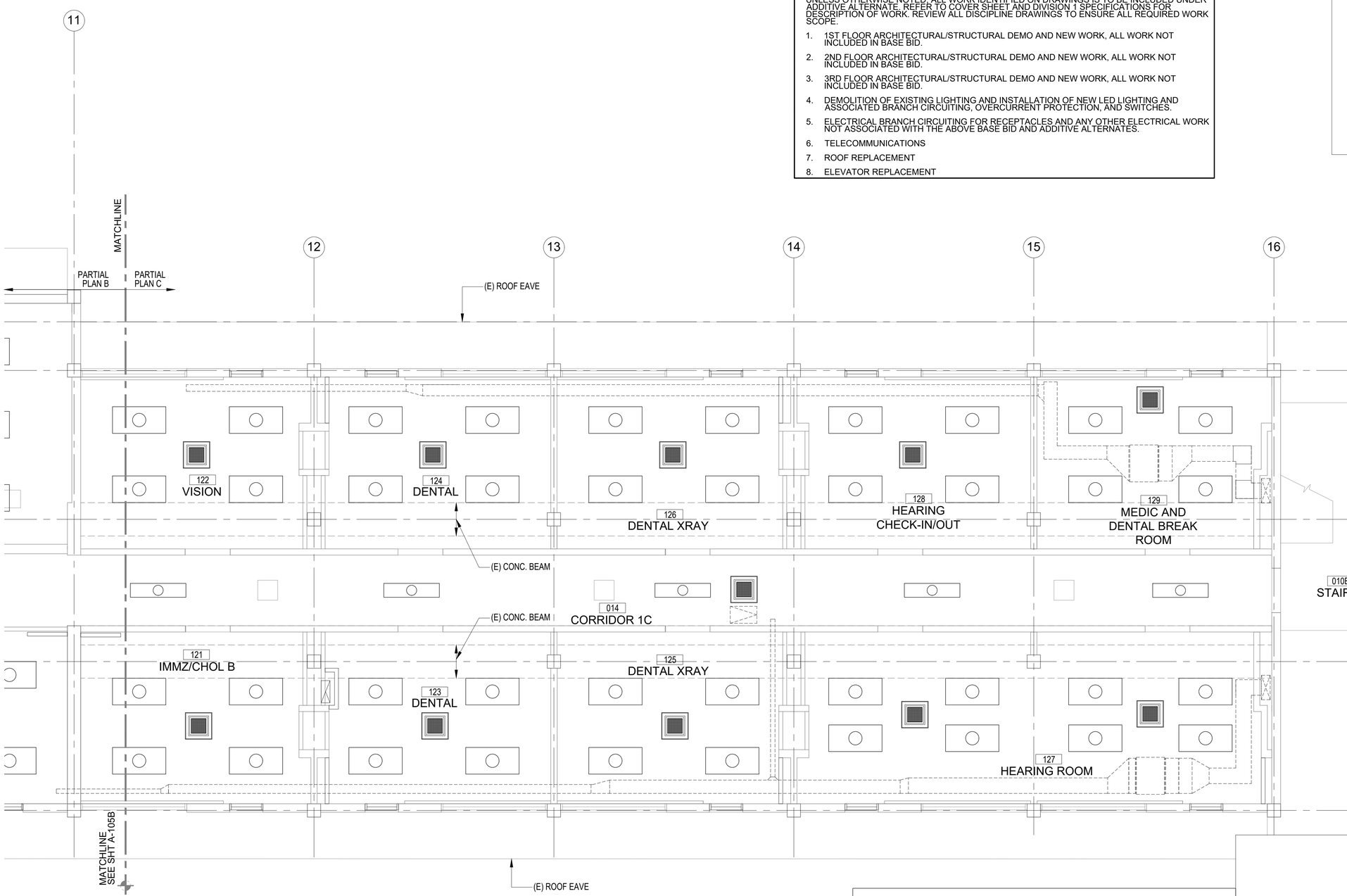

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- AC SYSTEM COMPONENTS, SEE MECH DWGS

A EXISTING/NEW FIRST FLOOR FIRST FLOOR REFLECTED CEILING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH (TRUE N)

KEYPLAN

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW FIRST FLOOR REFLECTED CEILING PLAN

ENGINEERING PARTNERS		HNARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-105C
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: AP	APPROVED BY:	DATE JUNE 2026	SHEET 61 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ----

06/04/2026 1:33 pm
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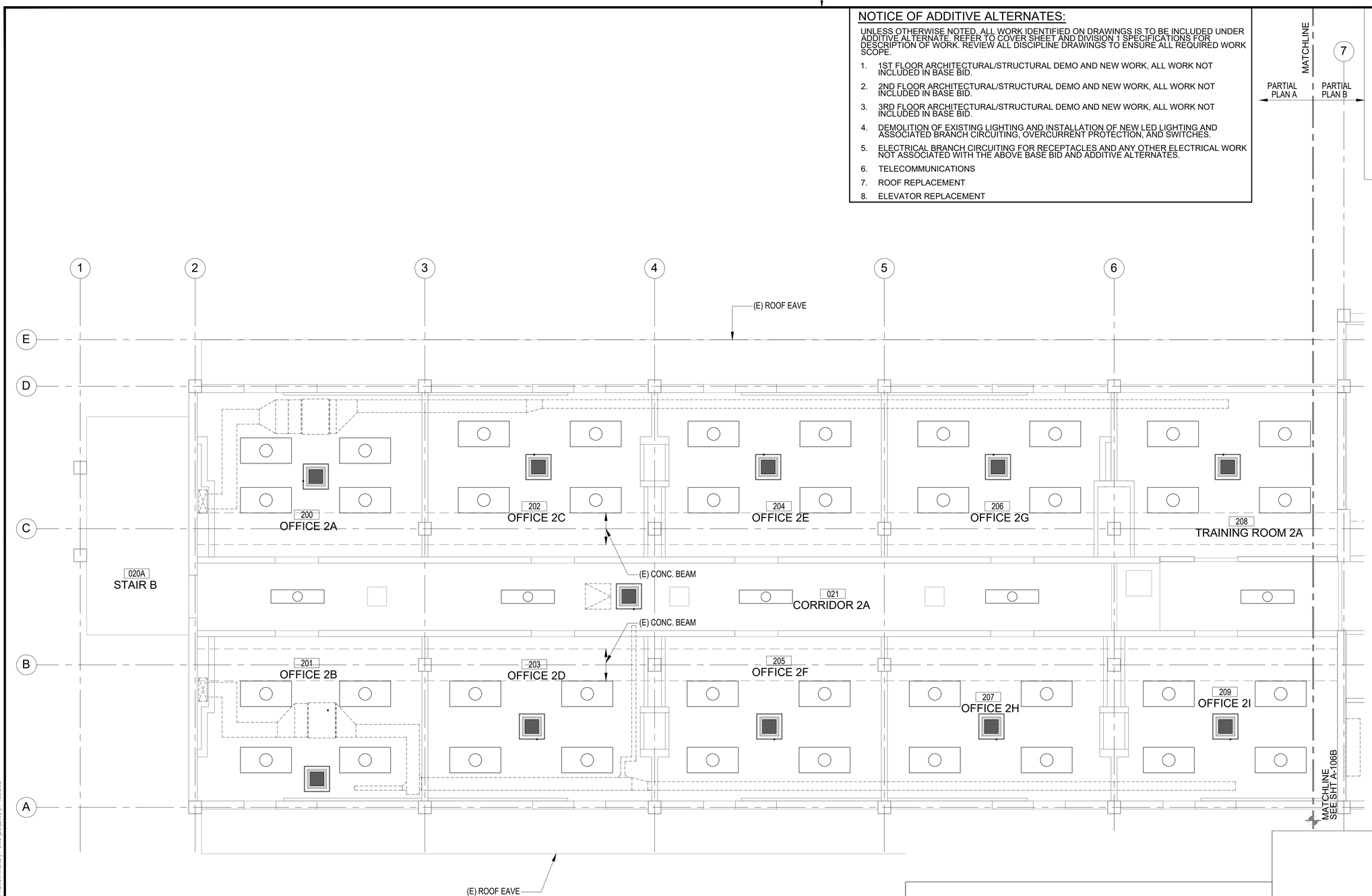

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- (E) CEILING ACCESS PANEL TO REMAIN
- (E) LIGHTING FIXTURES TO REMAIN

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- AC SYSTEM COMPONENTS, SEE MECH DWGS

A EXISTING/NEW SECOND FLOOR REFLECTED CEILING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N

KEYPLAN

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Exp. 04/30/28
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STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW SECOND FLOOR REFLECTED CEILING PLAN

ENGINEERING PARTNERS		HWRNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-106A
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: CSL/AU	APPROVED BY:	DATE JUNE 2026	SHEET 62 OF 276 SHTS
SCALE:			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ----

06/04/2026 1:33 pm
M:\ED PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\BUILDING\A-106.DWG

NOTICE OF ADDITIVE ALTERNATES:

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4. DEMOLITION OF EXISTING LIGHTING AND INSTALLATION OF NEW LED LIGHTING AND ASSOCIATED BRANCH CIRCUITING, OVERCURRENT PROTECTION, AND SWITCHES.
5. ELECTRICAL BRANCH CIRCUITING FOR RECEPTACLES AND ANY OTHER ELECTRICAL WORK NOT ASSOCIATED WITH THE ABOVE BASE BID AND ADDITIVE ALTERNATES.
6. TELECOMMUNICATIONS
7. ROOF REPLACEMENT
8. ELEVATOR REPLACEMENT

MATCHLINE
PARTIAL PLAN A
PARTIAL PLAN B
7
8
9
10
11
MATCHLINE
PARTIAL PLAN B
PARTIAL PLAN C
E
D
C
B
A
216 OFFICE
(E) CONC BEAM
BASE BID
210 TRAINING ROOM 2B
213 TRAINING ROOM 2C
024 CORRIDOR 2D
217 BREAK ROOM
220 OFFICE 2K
EXPOSED (E) CONC BEAM
(E) CONC BEAM HEADER
022 CORRIDOR 2B
211 ELEC 2
020 STAIR A
214 JAN
212 TELECOM 2
215 WOMEN'S RESTROOM
218 MEN'S RESTROOM
219 OFFICE 2J
025 ELEV LOBBY 2
ELEV
(E) ROOF EAVE
BASE BID
MATCHLINE SEE SHT A-106A
MATCHLINE SEE SHT A-106C

A EXISTING/NEW SECOND FLOOR REFLECTED CEILING PLAN
SCALE: 1/4" = 1'-0"
0 4' 8'

NORTH
TRUE N

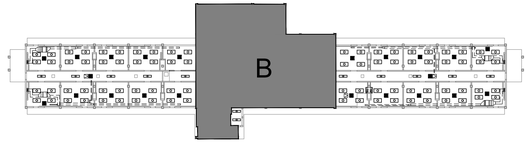
LEGEND

EXISTING

- (E) GYP BD CEILING TO REMAIN
- (E) CEILING ACCESS PANEL TO REMAIN
- (E) LIGHTING FIXTURES TO REMAIN

NEW

- ACCESS PANEL, SEE MECH DWGS
- REPLACE DAMAGED GYPSUM CEILING/PROVIDE GYPSUM CEILING IN PLACE OF DEMOLISHED WALLS, ALIGNED WITH EXISTING CEILING GRID
- LIGHTING FIXTURES, SEE ELEC DWGS
- EXHAUST FAN, SEE MECH DWGS
- FC UNIT, CEILING CASSETTE, SEE MECH DWGS
- AC SYSTEM COMPONENTS, SEE MECH DWGS



KEYPLAN

REV. NO	DESCRIPTION	DATE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW SECOND FLOOR REFLECTED CEILING PLAN

ENGINEERING PARTNERS		HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-106B
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: CSU/AU	APPROVED BY:	DATE: JUNE 2026	SHEET 63 OF 276 SHTS
SCALE:			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/04/2026 1:32 pm
M:\ED PROJECTS\2025 PROJECTS\12018--25--01 DOD BLDG 46 MEDCOM RENOVATIONS\4--DWG\BUILDING\A--106.DWG

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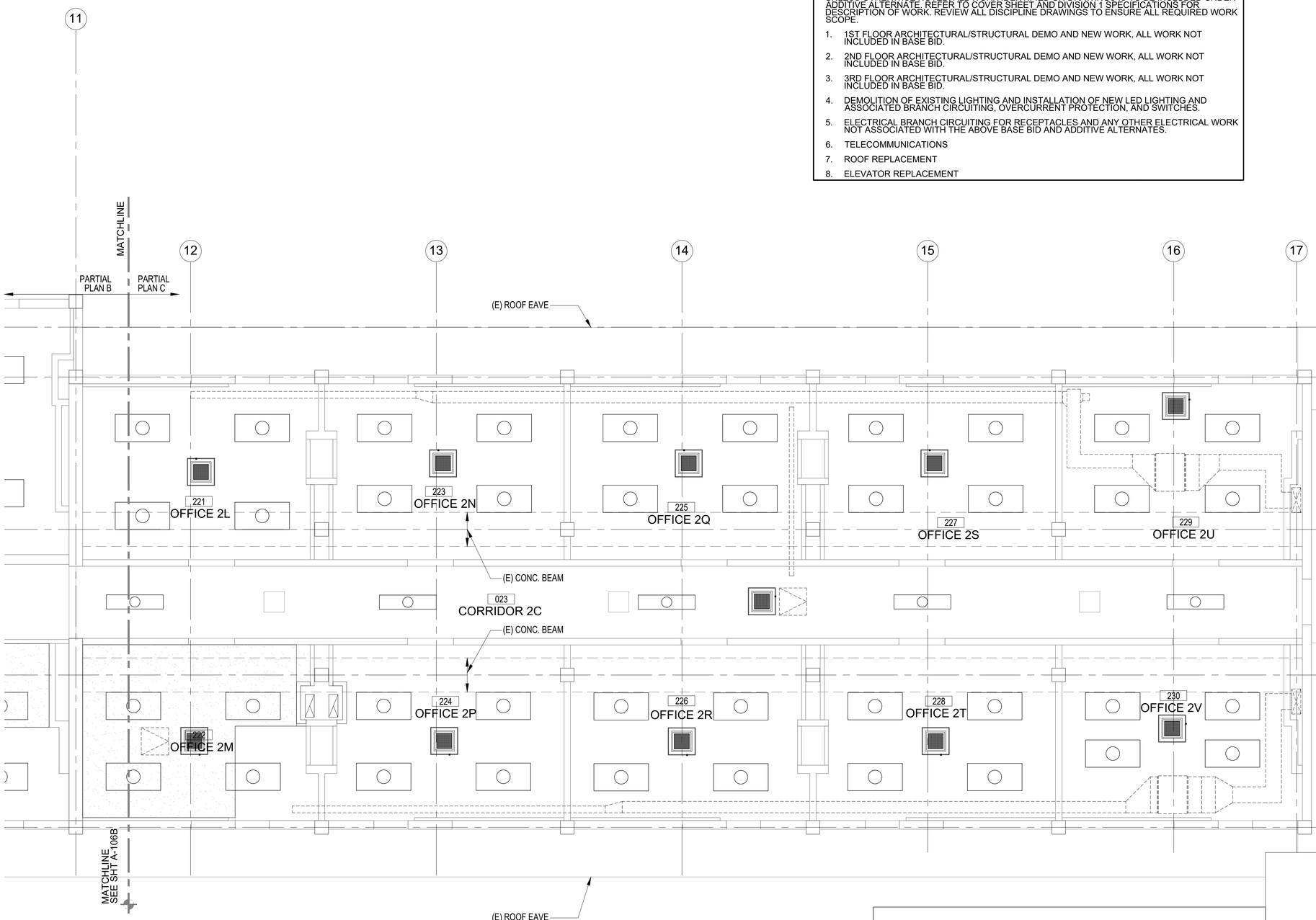
6. TELECOMMUNICATIONS
7. ROOF REPLACEMENT
8. ELEVATOR REPLACEMENT



LEGEND

EXISTING

- (E) GYP BD CEILING TO REMAIN
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A EXISTING/NEW SECOND FLOOR REFLECTED CEILING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH (TRUE N)

KEYPLAN

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW SECOND FLOOR REFLECTED CEILING PLAN

ENGINEERING PARTNERS		HWARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-106C
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: CSL/AU	APPROVED BY:	DATE JUNE 2026	SHEET 64 OF 276 SHTS
SCALE:			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ----

06/04/2026 1:33 pm
M:\ED PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\BUILDING\A-106.DWG

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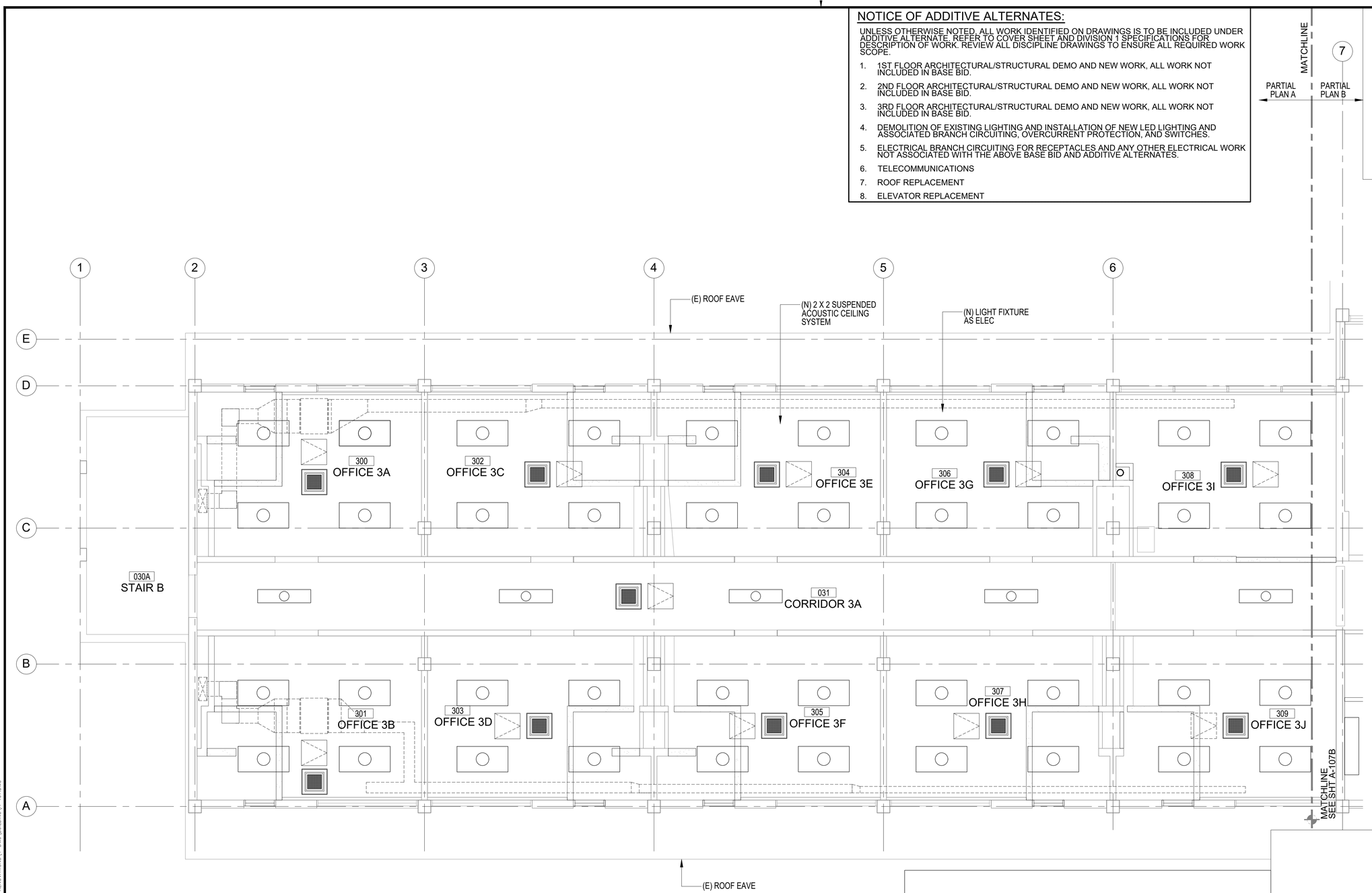

LEGEND

EXISTING

- (E) GYP BD CEILING TO REMAIN
- (E) CEILING ACCESS PANEL TO REMAIN
- (E) LIGHTING FIXTURES TO REMAIN

NEW

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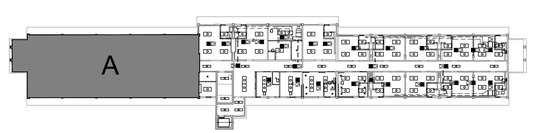
A EXISTING/NEW THIRD FLOOR THIRD FLOOR REFLECTED CEILING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH (TRUE N)



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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW THIRD FLOOR REFLECTED CEILING PLAN

ENGINEERING PARTNERS		HAWRG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-107A
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: CMS/AP	APPROVED BY:	DATE JUNE 2026	SHEET 65 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ----

06/04/2026 1:33 pm
M:\ED PROJECTS\2025 PROJECTS\2018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\BUILDING\A-107.DWG

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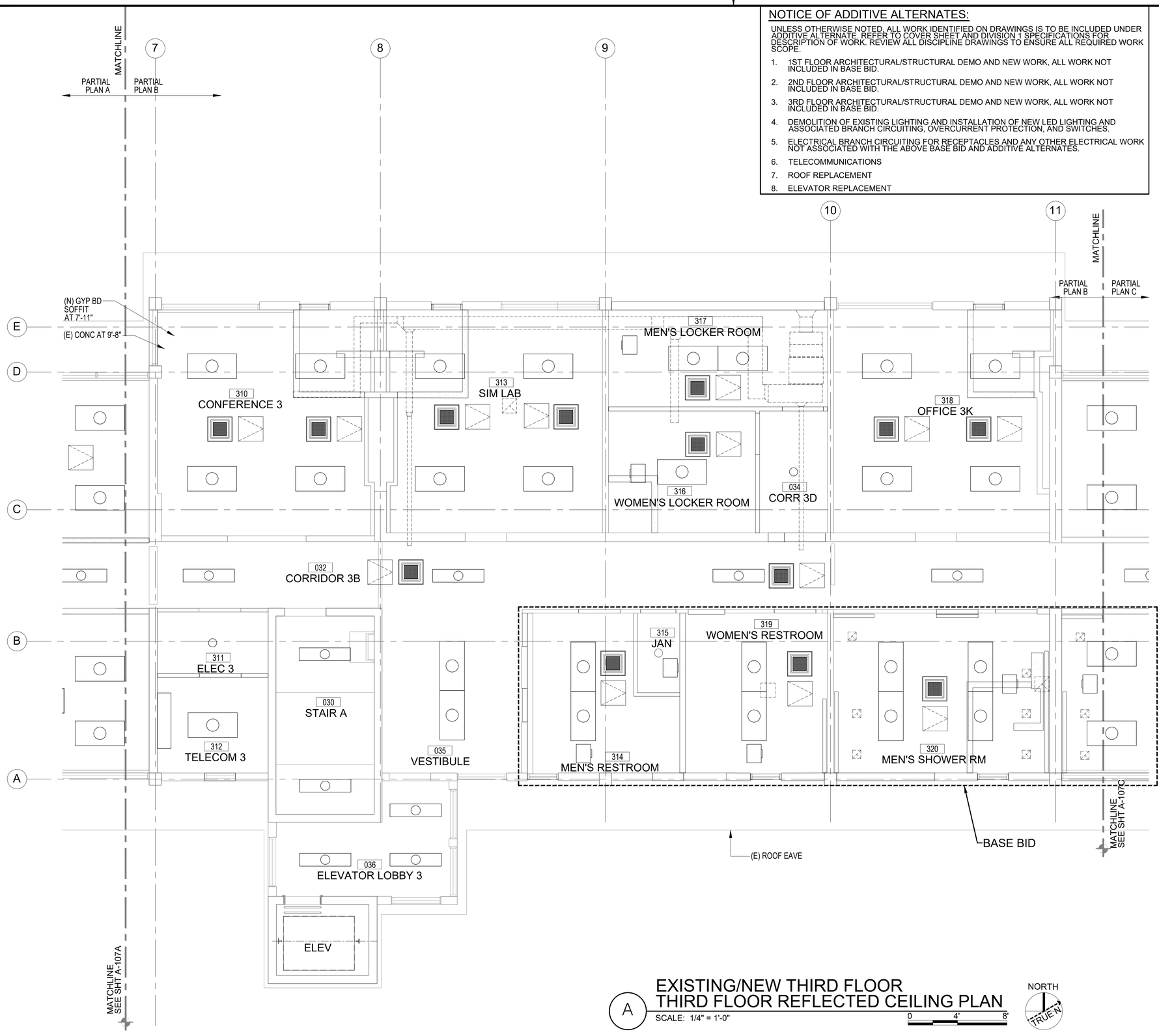

A EXISTING/NEW THIRD FLOOR THIRD FLOOR REFLECTED CEILING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N

LEGEND

EXISTING

- (E) GYP BD CEILING TO REMAIN
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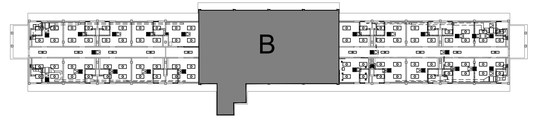

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BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW THIRD FLOOR REFLECTED CEILING PLAN

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-107B
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: CMS/AP	APPROVED BY:	DATE: JUNE 2026	SHEET 66 OF 276 SHTS
SCALE: AS NOTED			

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M:\ED PROJECTS\2025 PROJECTS\12018--25--01 DOD BLDG 46 MEDCOM RENOVATIONS\4--DWG\BUILDING\A--107.DWG

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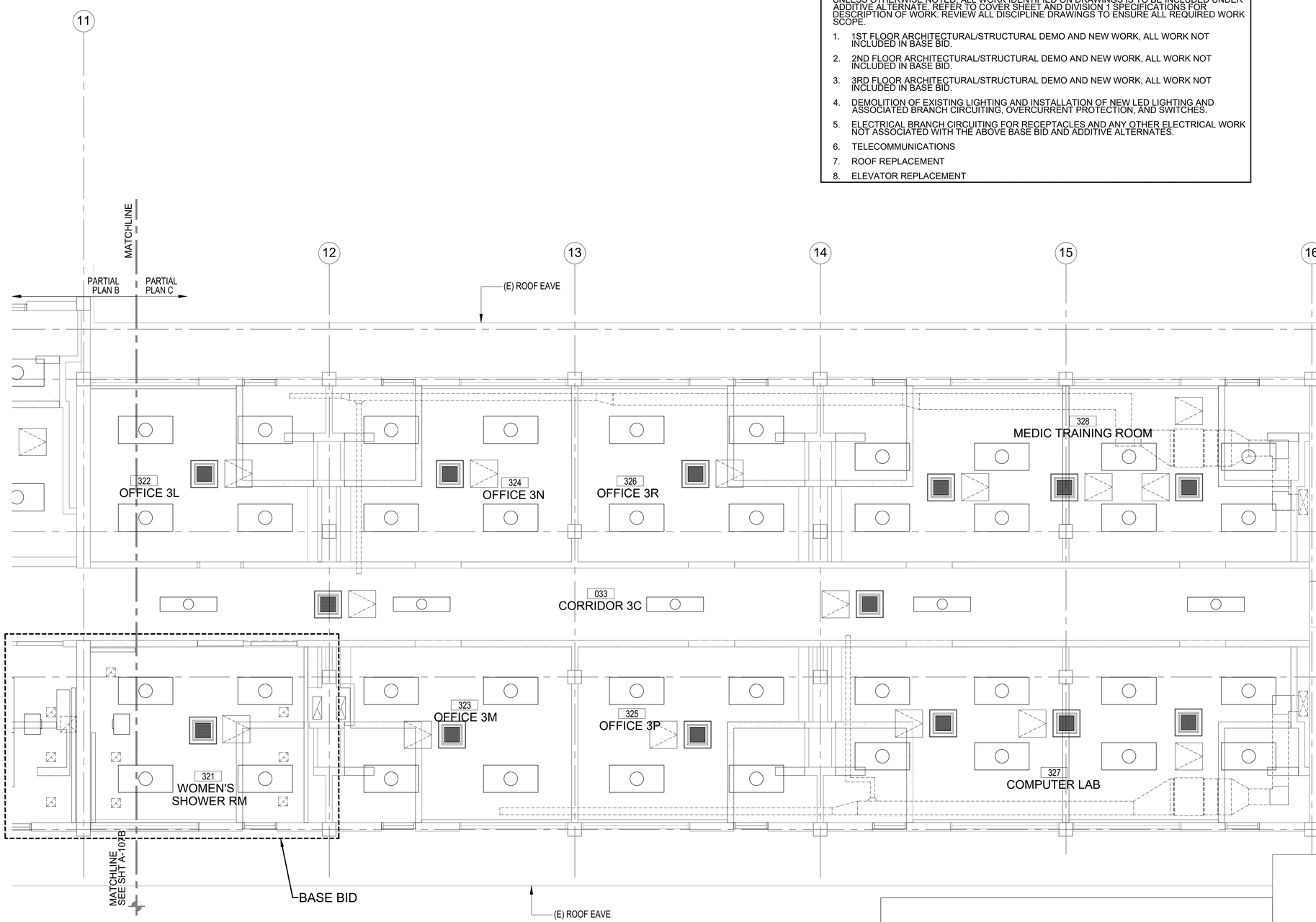

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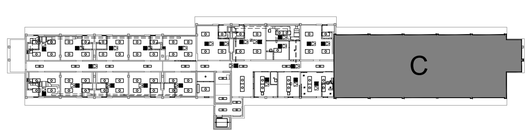
A EXISTING/NEW THIRD FLOOR THIRD FLOOR REFLECTED CEILING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH (TRUE N)



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STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

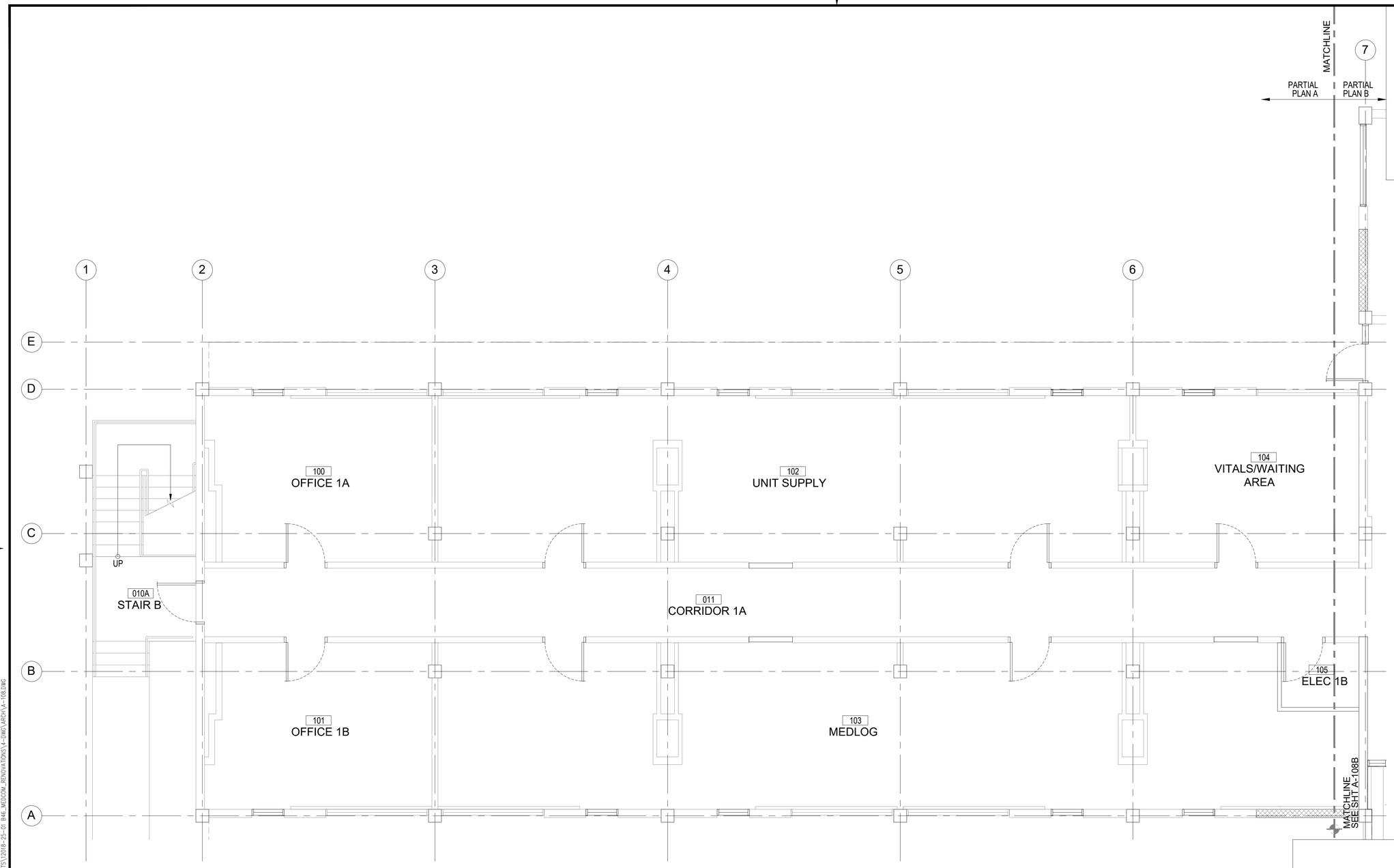
EXISTING/NEW THIRD FLOOR REFLECTED CEILING PLAN

ENGINEERING PARTNERS		HNARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-107C
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: CMS/AP	APPROVED BY:	DATE JUNE 2026	SHEET 67
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ----

06/04/2026 3:34 pm
M:\ED PROJECTS\2025 PROJECTS\2018-25-01 D0D BLDG 46 MEDCOM RENOVATIONS\4-DWG\BUILDING\A-107.DWG



LEGEND

NEW

LUXURY VINYL TILES

CERAMIC TILES

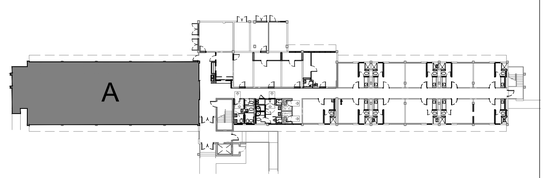
A EXISTING/NEW PARTIAL FIRST FLOOR FINISHES PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH

TRUE N



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STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW FIRST FLOOR FINISHES PLAN

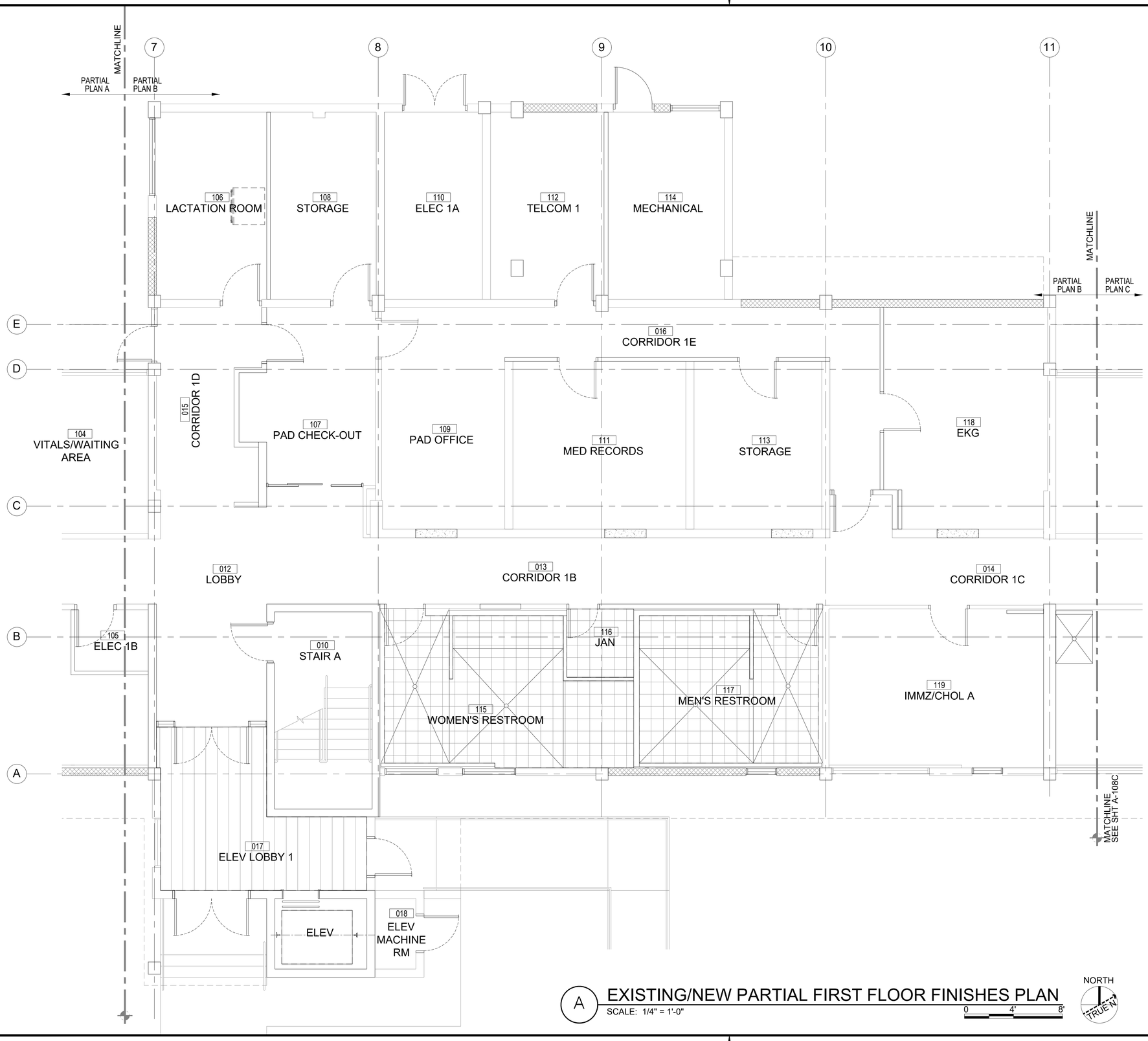
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO, FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. A-108A
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 68 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:27 pm
C:\USERS\PC_31\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\2018-25-01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-108.DWG



A EXISTING/NEW PARTIAL FIRST FLOOR FINISHES PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

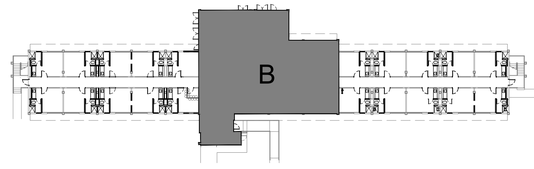
NORTH TRUE N

LEGEND

NEW

LUXURY VINYL TILES

CERAMIC TILES



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STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW FIRST FLOOR FINISHES PLAN

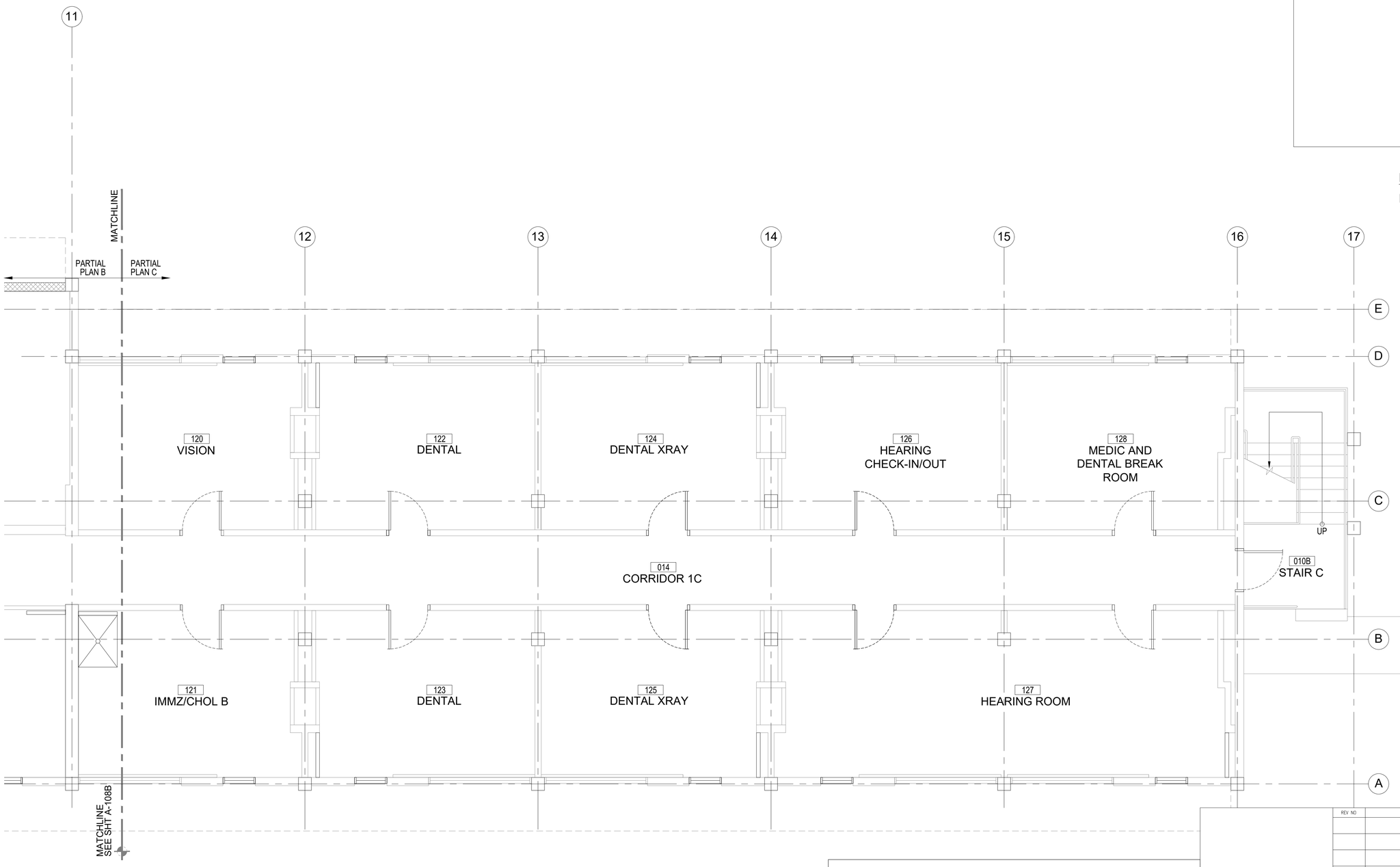
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HARNG JOB NO. FEDERAL: PH15H000033 STATE: CA-202505-D	DRAWING NO. A-108B
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 69 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:27 am
C:\USERS\PC_3\TEAM JANILA DROPBOX\EPI DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\2018-25--01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-108.DWG



LEGEND

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LUXURY VINYL TILES

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KEYPLAN

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SCALE: 1/4" = 1'-0"

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EXISTING/NEW FIRST FLOOR FINISHES PLAN

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DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO, FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. A-108C
DRAWN BY: AP	APPROVED BY:	DATE JUNE 2026	SHEET 70 OF 276 SHTS
SCALE: AS NOTED			

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DATE ISSUED: ---

05/07/2026 10:27 am
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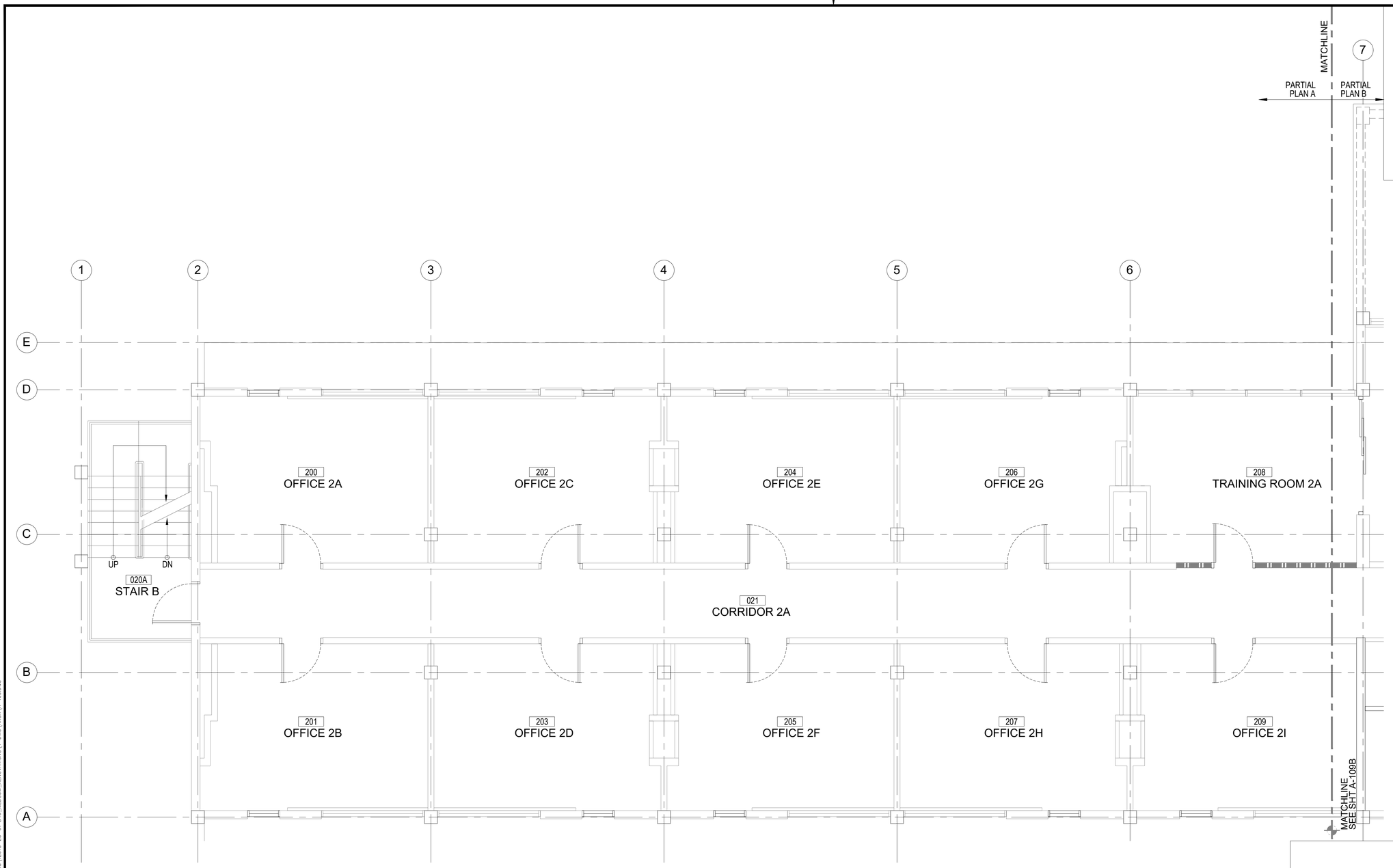

LEGEND

NEW

CERAMIC TILES

A EXISTING/NEW PARTIAL SECOND FLOOR FINISHES PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH

TRUE N

KEYPLAN

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW SECOND FLOOR FINISHES PLAN

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO. FEDERAL: PN1:SH00033 STATE: CA-202505-D	DRAWING NO. A-109A
DRAWN BY: CSL	APPROVED BY:	DATE: JUNE 2026	SHEET 71 OF 276 SHTS.
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~

05/07/2026 10:27 am
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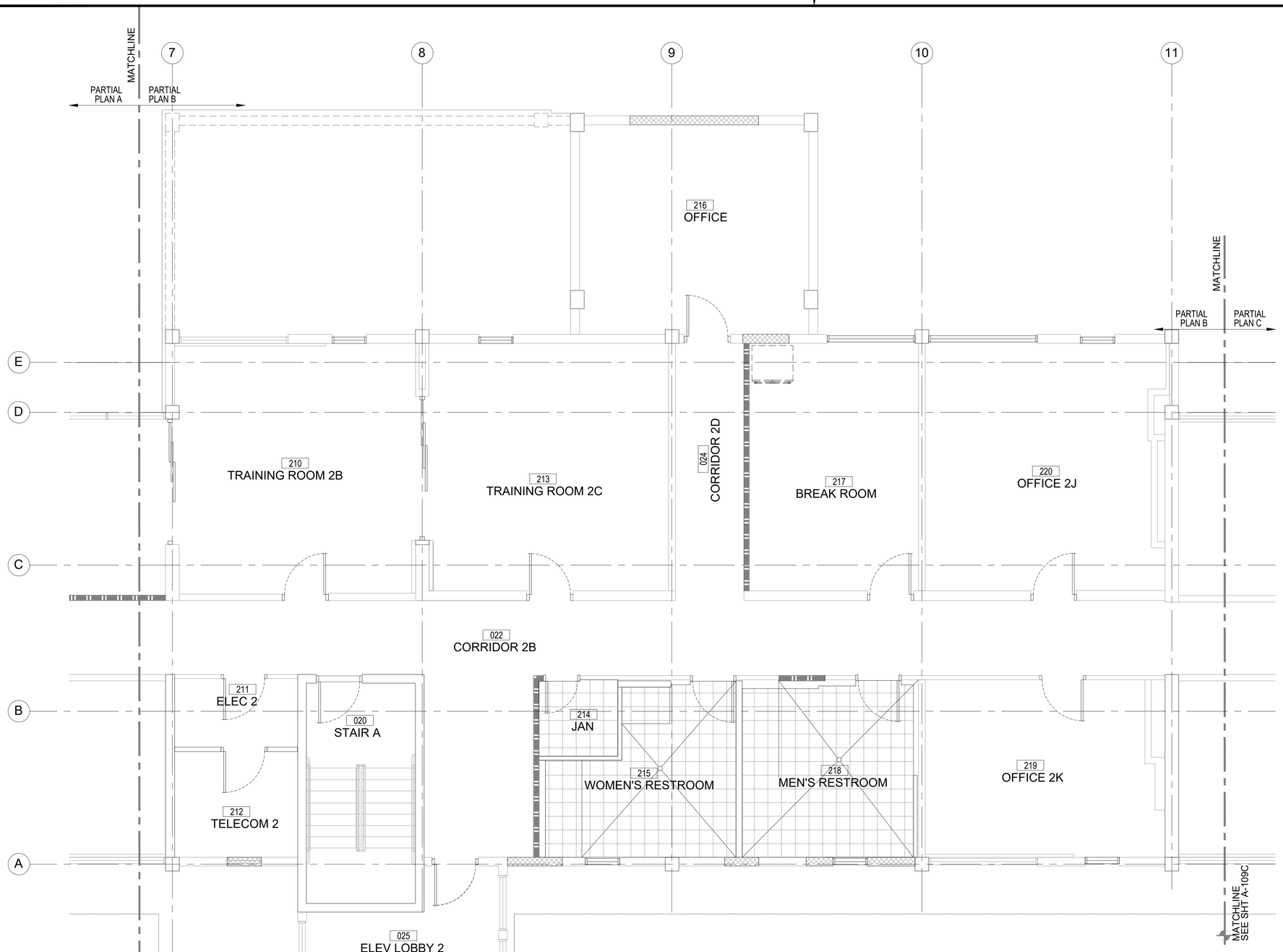


A EXISTING/NEW PARTIAL SECOND FLOOR FINISHES PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

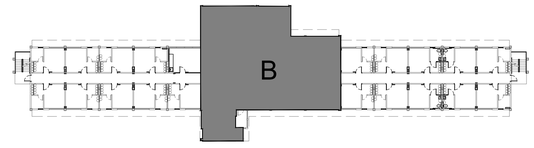
NORTH

TRUE N

LEGEND

NEW

CERAMIC TILES



KEYPLAN

REV. NO	DESCRIPTION	DATE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW SECOND FLOOR FINISHES PLAN

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HARNG JOB NO. FEDERAL: PN1SH000033 STATE: CA-202505-D	DRAWING NO. A-109B
DRAWN BY: CSL	APPROVED BY:	DATE	SHEET 72 OF 276 SHTS
SCALE: AS NOTED		JUNE 2026	

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:27 pm
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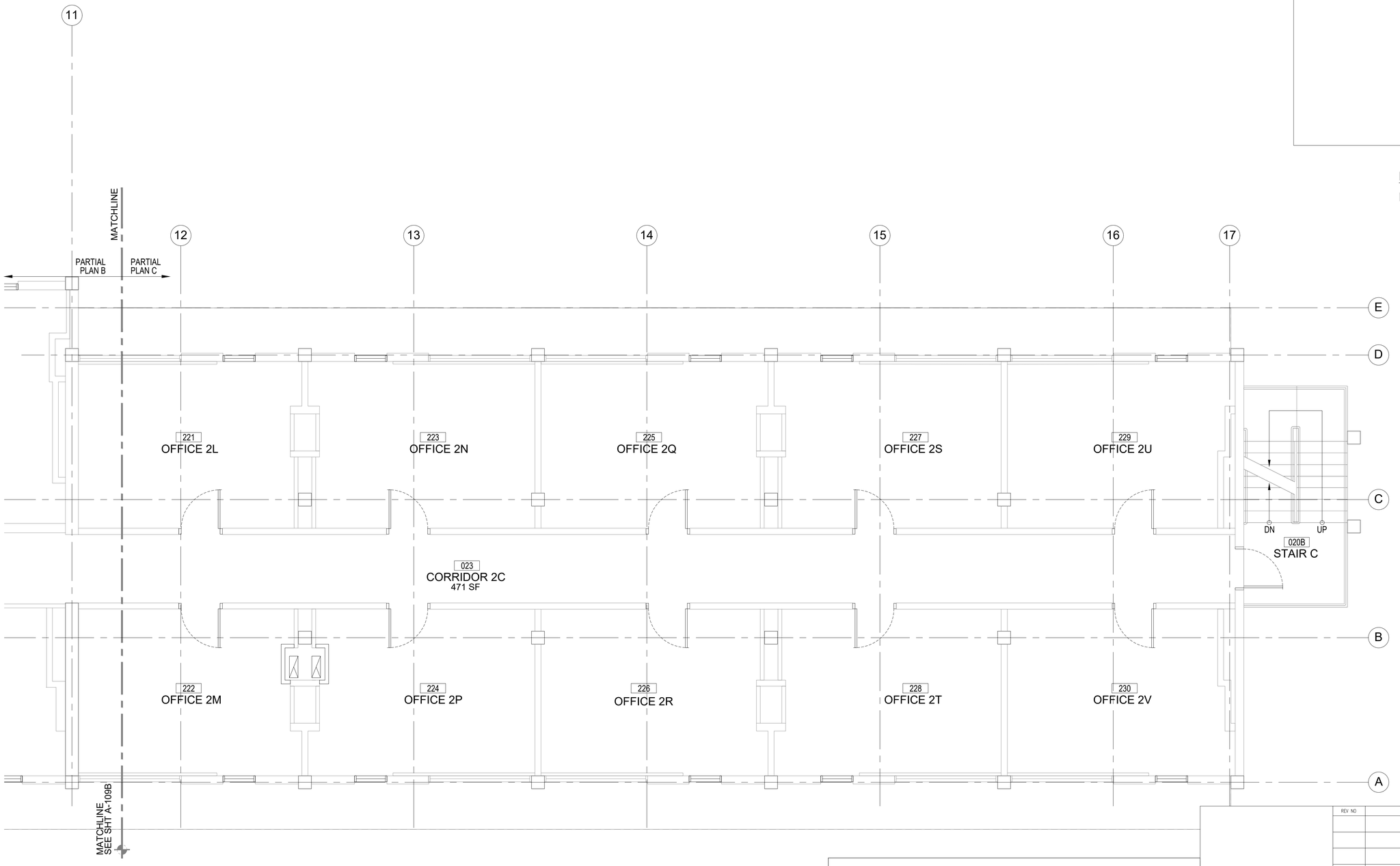

LEGEND

NEW

CERAMIC TILES

A EXISTING/NEW PARTIAL SECOND FLOOR FINISHES PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH

TRUE N

KEYPLAN

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
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HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW SECOND FLOOR FINISHES PLAN

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HAWAII JOB NO. FEDERAL:	DRAWING NO.
BF	YWF	PN15H00033	A-109C
DRAWN BY:	APPROVED BY:	STATE: CA-202505-D	
CSL		DATE	SHEET
SCALE: AS NOTED		JUNE 2026	73 OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:28 am
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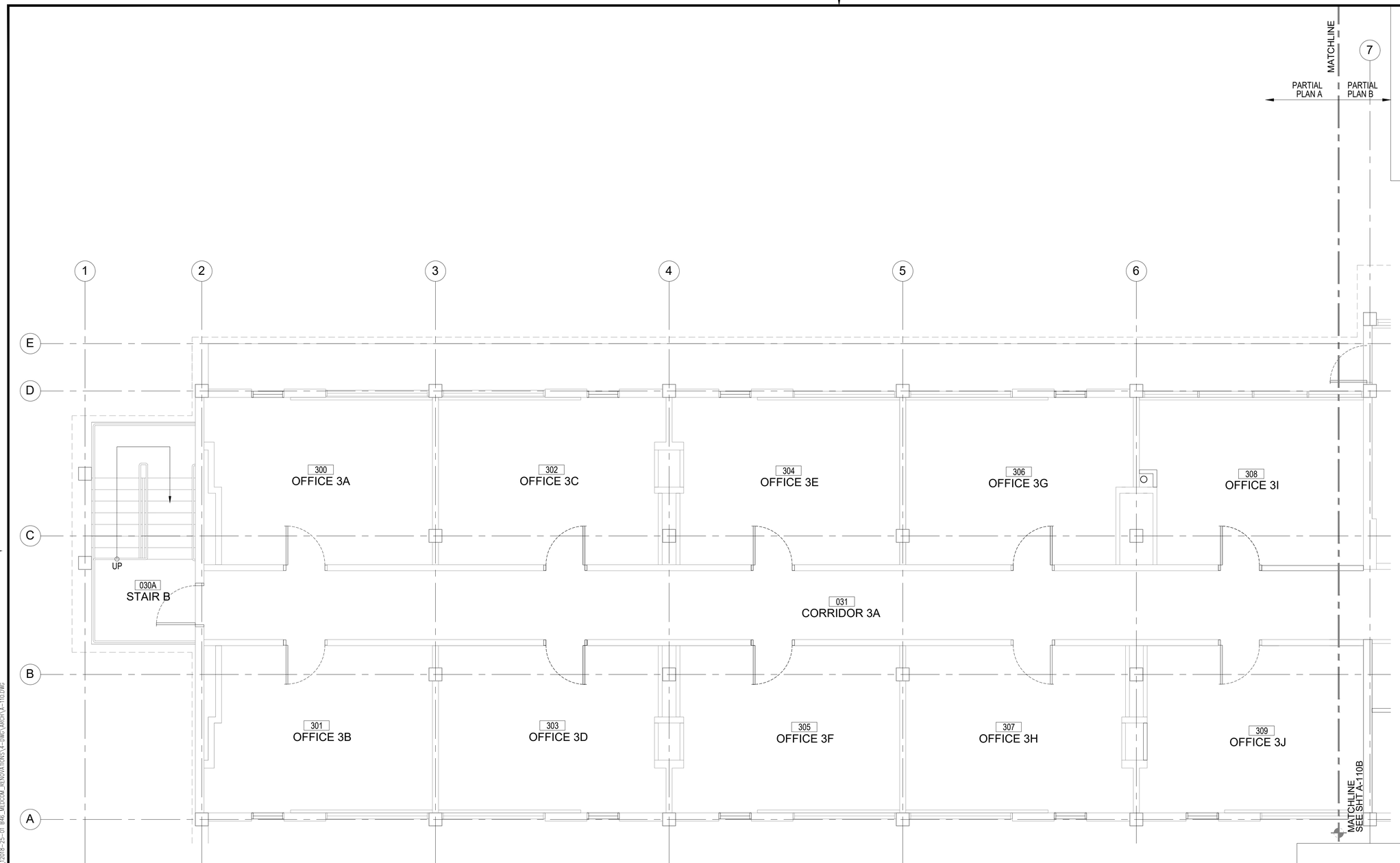


LEGEND

NEW

CERAMIC TILES

SHOWER PANS

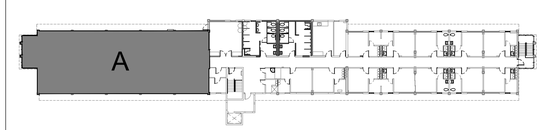
A EXISTING/NEW PARTIAL THIRD FLOOR FINISHES PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH

TRUE N



KEYPLAN

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LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW THIRD FLOOR FINISHES PLAN

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO. FEDERAL: PN1:SH00033 STATE: CA-202505-D	DRAWING NO. A-110A
DRAWN BY: CMS	APPROVED BY:	DATE: JUNE 2026	SHEET 74 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~

05/07/2026 10:28 am
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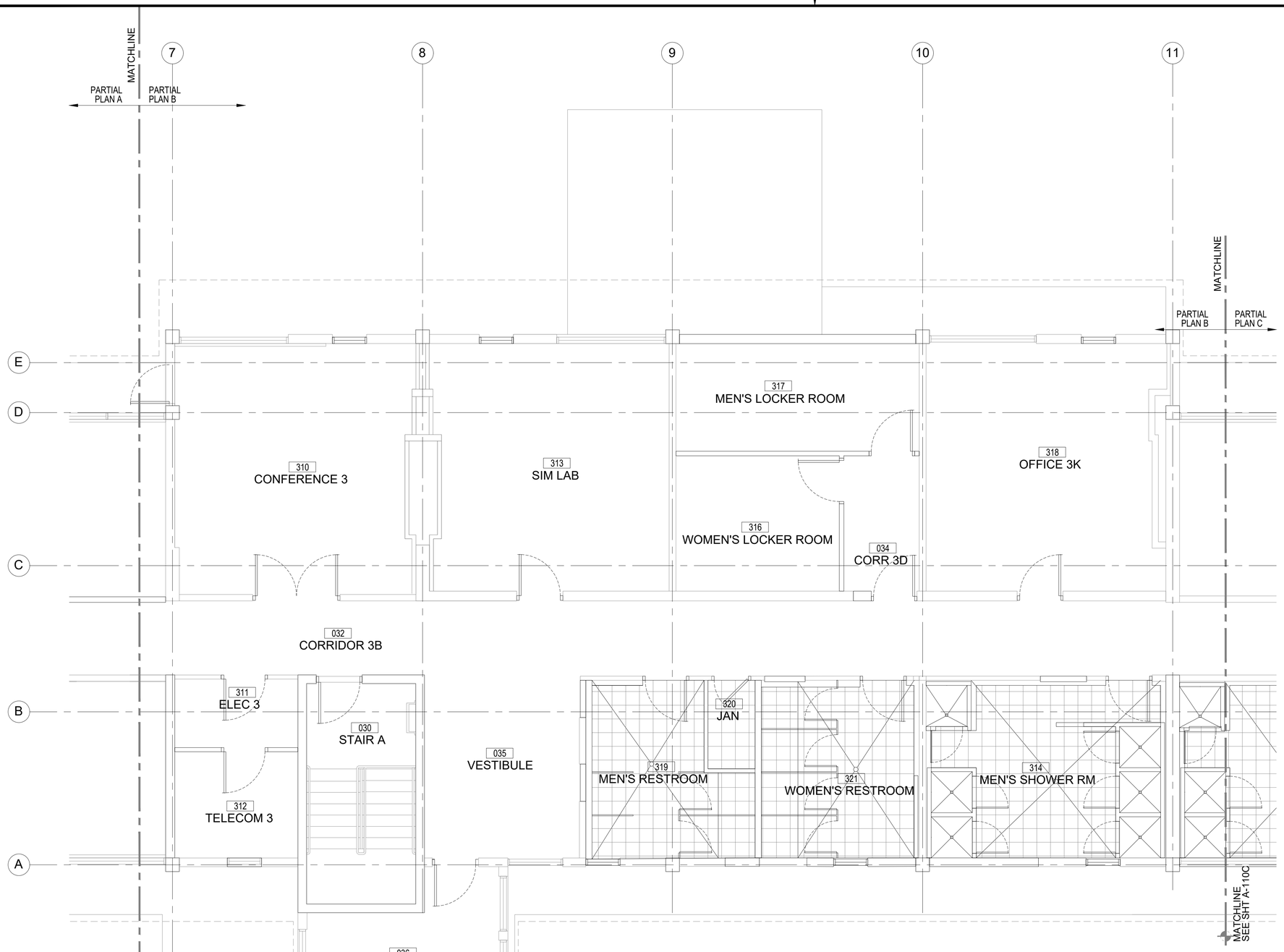
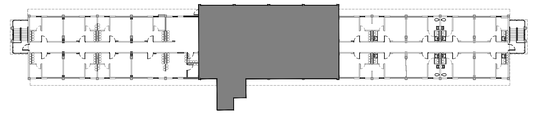


LEGEND

NEW

CERAMIC TILES

SHOWER PANS



KEYPLAN

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW THIRD FLOOR FINISHES PLAN

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN1SH000033 STATE: CA-202505-D	DRAWING NO. A-110B
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: CMS	APPROVED BY:	DATE JUNE 2026	SHEET 75 OF 276 SHTS
SCALE: AS NOTED			

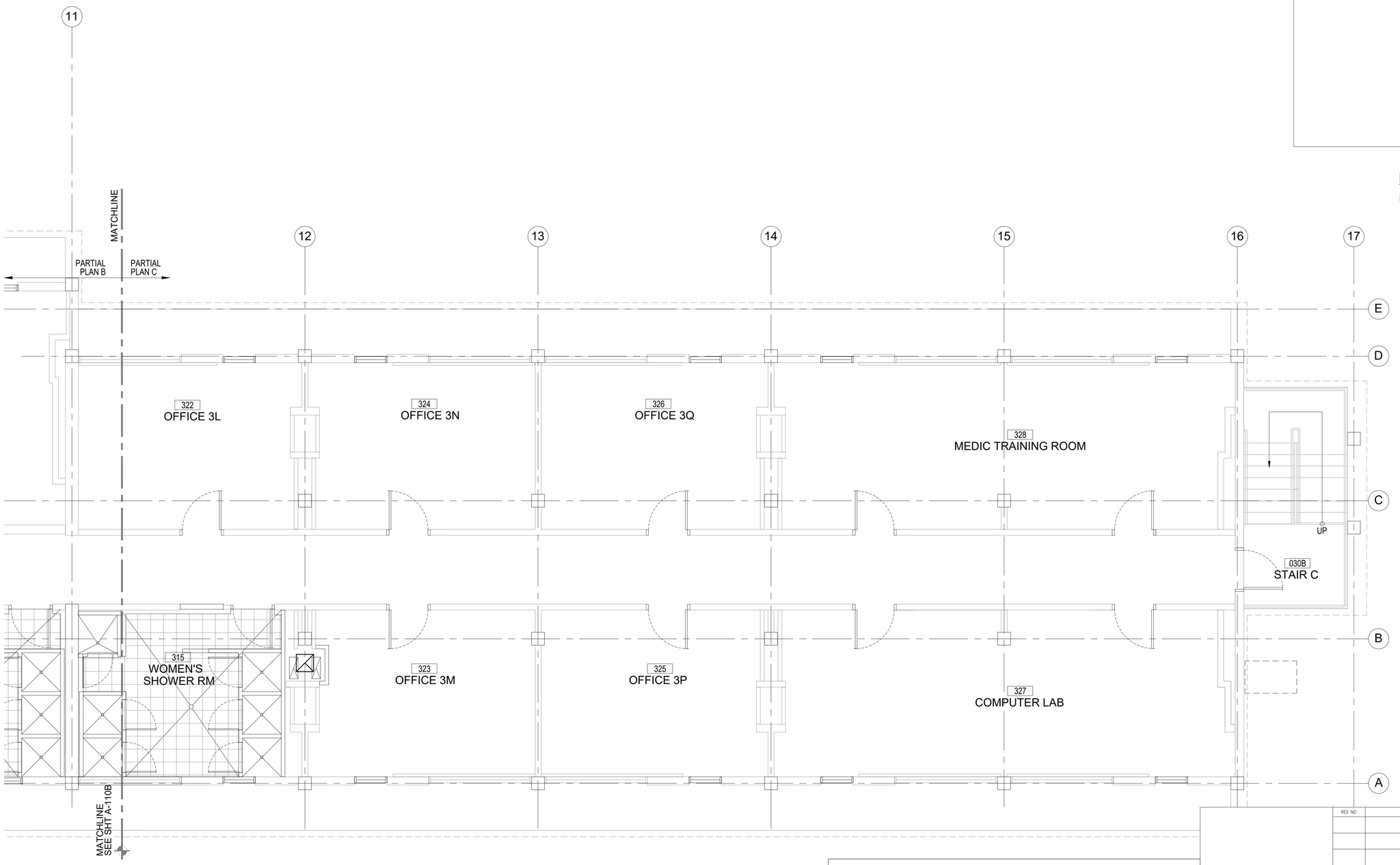
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

A EXISTING/NEW PARTIAL THIRD FLOOR FINISHES PLAN
SCALE: 1/4" = 1'-0"
0 4' 8'

NORTH
TRUE N

05/07/2026 10:28 pm
C:\USERS\PC_3\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\2018-25-01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-110.DWG



LEGEND

NEW

CERAMIC TILES

SHOWER PANS

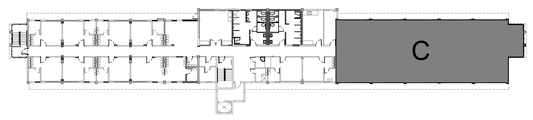
A EXISTING/NEW PARTIAL THIRD FLOOR FINISHES PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH

TRUE N



KEYPLAN

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW THIRD FLOOR FINISHES PLAN

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HARNG JOB NO, FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. A-110C
DRAWN BY: CMS	APPROVED BY:	DATE JUNE 2026	SHEET 76 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

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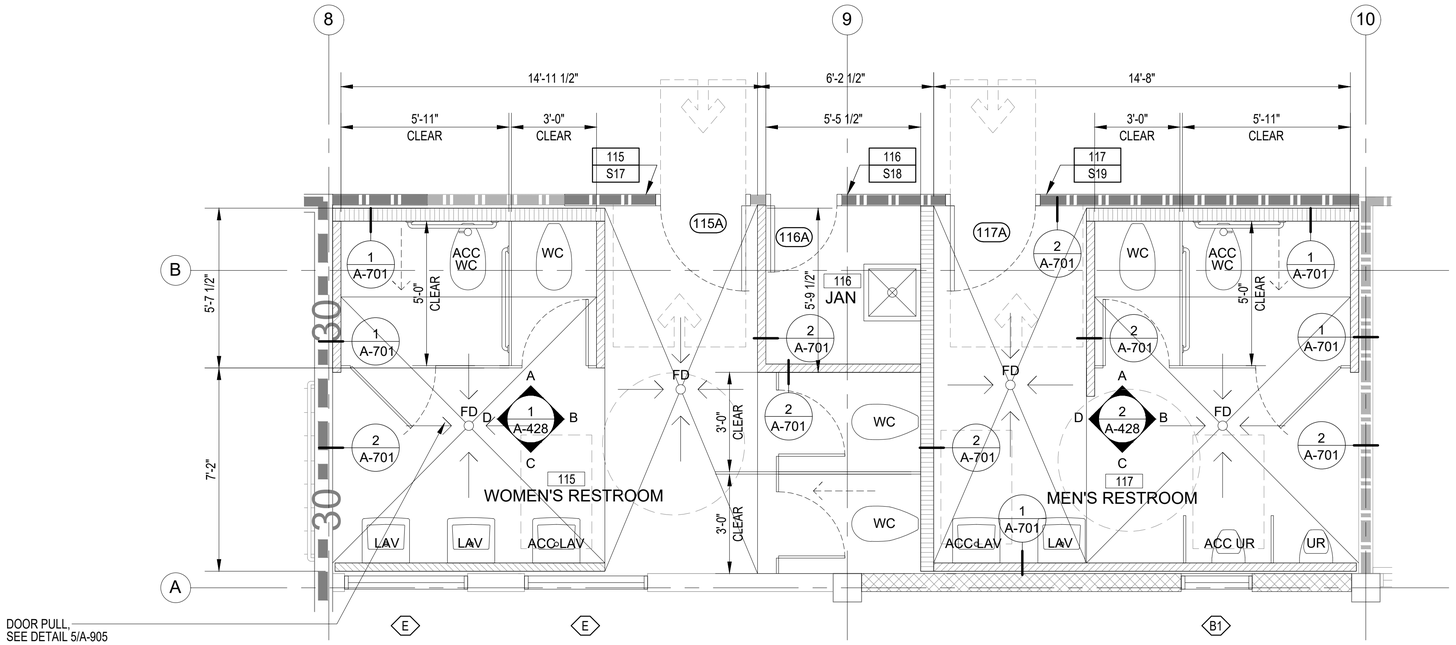
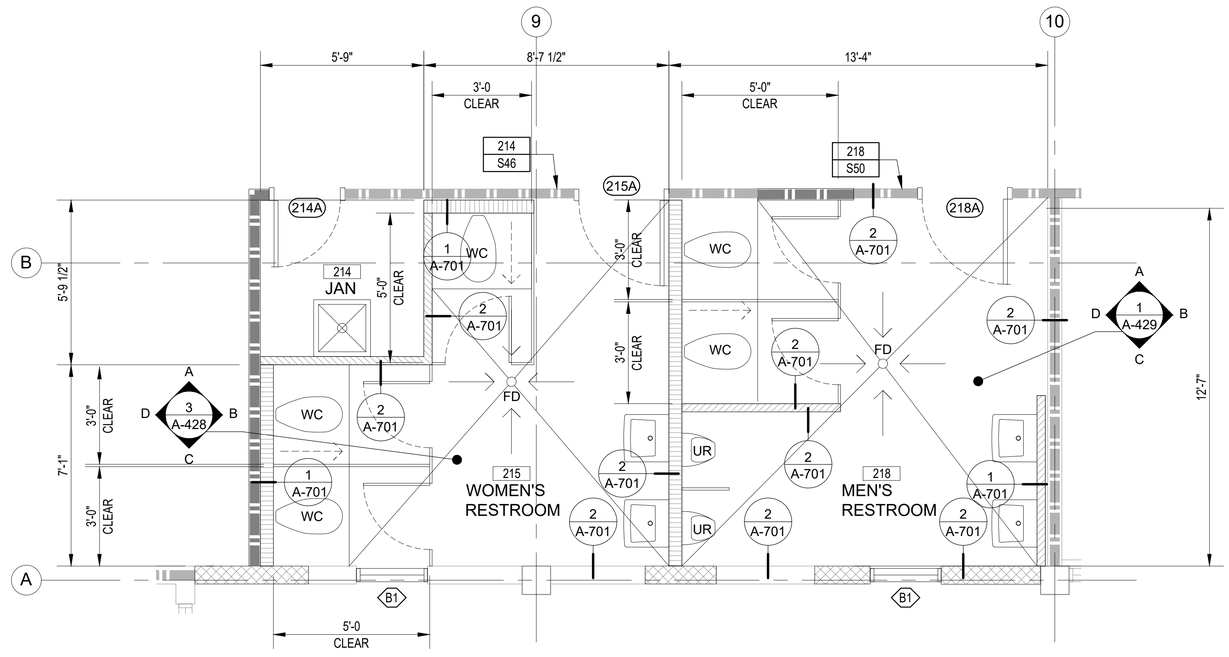


A ENLARGED RESTROOM FLOOR PLAN - FIRST FLOOR

SCALE: 3/8" = 1'-0"

0 2' 4' 6'



B ENLARGED RESTROOM FLOOR PLAN - SECOND FLOOR

SCALE: 3/8" = 1'-0"

0 2' 4' 6'

LEGEND

EXISTING

- (E) COLUMNS
- (E) WALLS
- (E) WINDOWS
- (E) DOORS
- (E) ONE HOUR FIRE-RATED WALLS
- 30 (E) 30 MINUTE FIRE-RATED WALLS

NEW

- CMU WALL
- 3-1/2" MET STUD WALL
- 5-1/2" MET STUD WALL
- WINDOWS
- DOORS
- ONE HOUR FIRE-RATED WALLS
- 1/48 MAX SLOPE (2%)
- 1/96 MAX SLOPE (1%)

REV. NO	DESCRIPTION	DATE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ENLARGED RESTROOM FLOOR PLANS - FIRST AND SECOND FLOOR

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HAWAII JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-111
BF	YWF		
DRAWN BY: APY	APPROVED BY:	DATE: JUNE 2026	SHEET 77 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/03/2026 12:17 am
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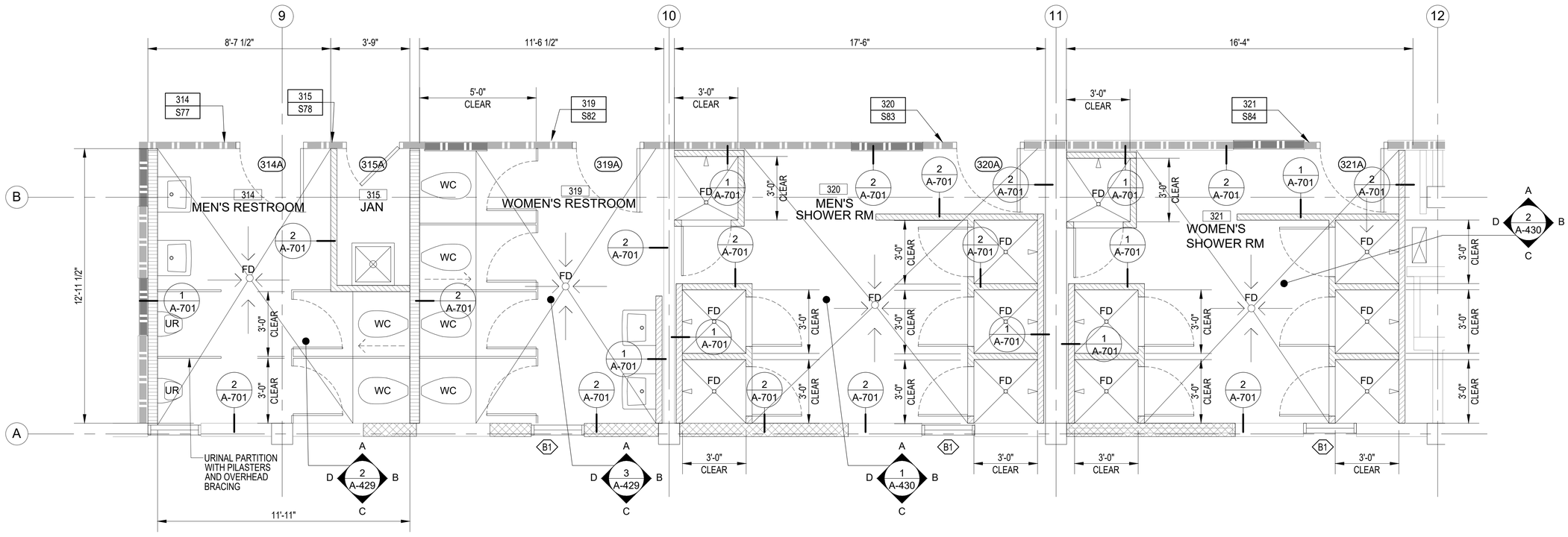
LEGEND

EXISTING

- (E) COLUMNS
- (E) WALLS
- (E) WINDOWS
- (E) DOORS
- (E) ONE HOUR FIRE-RATED WALLS
- 30 (E) 30 MINUTE FIRE-RATED WALLS

NEW

- CMU WALL
- 3-1/2" MET STUD WALL
- 5-1/2" MET STUD WALL
- WINDOWS
- DOORS
- ONE HOUR FIRE-RATED WALLS
- 1/48 MAX SLOPE (2%)
- 1/96 MAX SLOPE (1%)



A ENLARGED RESTROOM FLOOR PLAN - THIRD FLOOR

SCALE: 3/8" = 1'-0"

0 2' 4' 6'

REV NO	DESCRIPTION	DATE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ENLARGED RESTROOM FLOOR PLAN - THIRD FLOOR

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-112
DRAWN BY: AP/	APPROVED BY:	DATE JUNE 2026	SHEET 78 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

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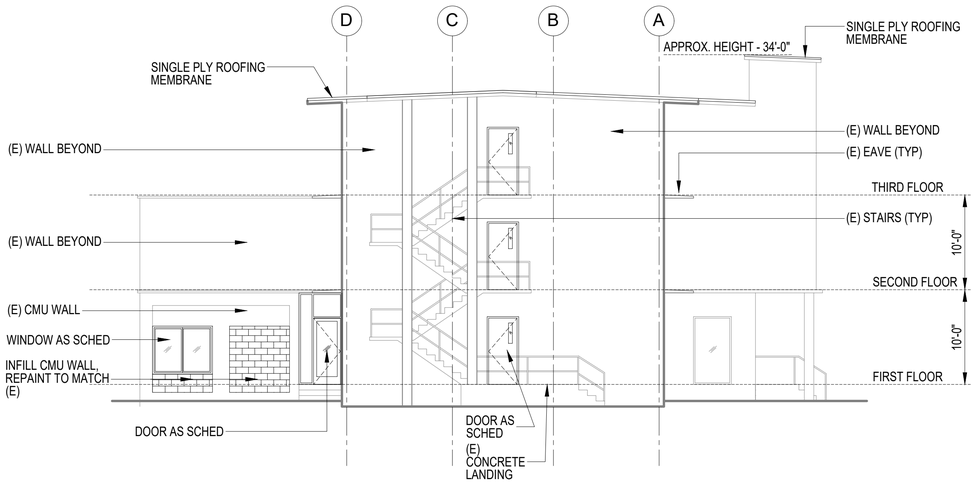
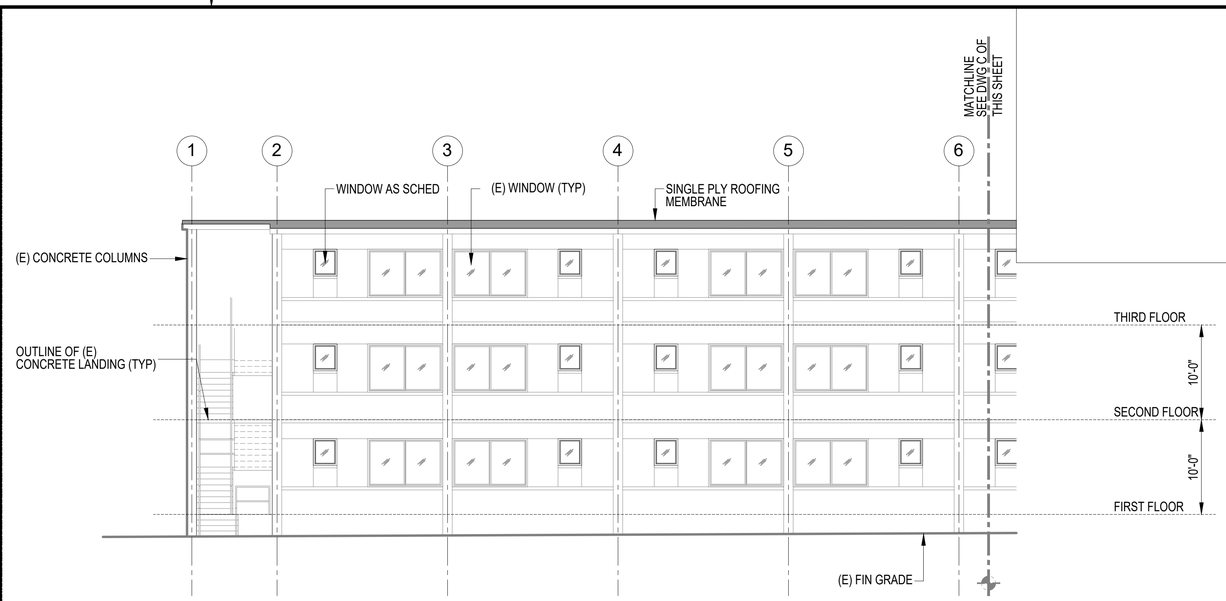


A SOUTH EXTERIOR ELEVATION

SCALE: 1/8" = 1'-0"

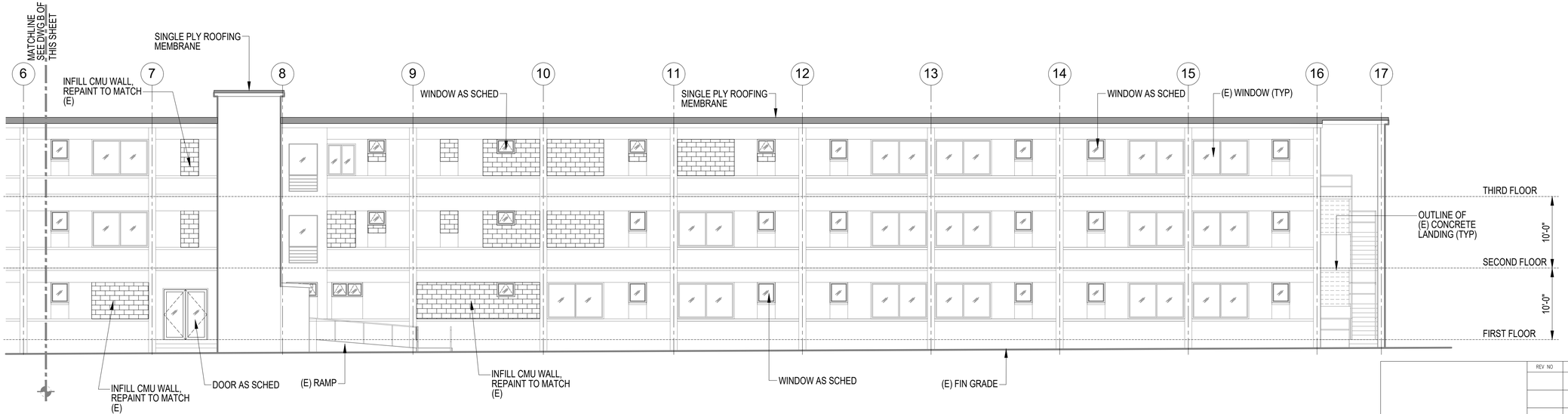
0 8' 16'



B PARTIAL EAST EXTERIOR ELEVATION

SCALE: 1/8" = 1'-0"

0 8' 16'



C PARTIAL EAST EXTERIOR ELEVATION

SCALE: 1/8" = 1'-0"

0 8' 16'

REV. NO	DESCRIPTION	DATE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW EXTERIOR ELEVATIONS

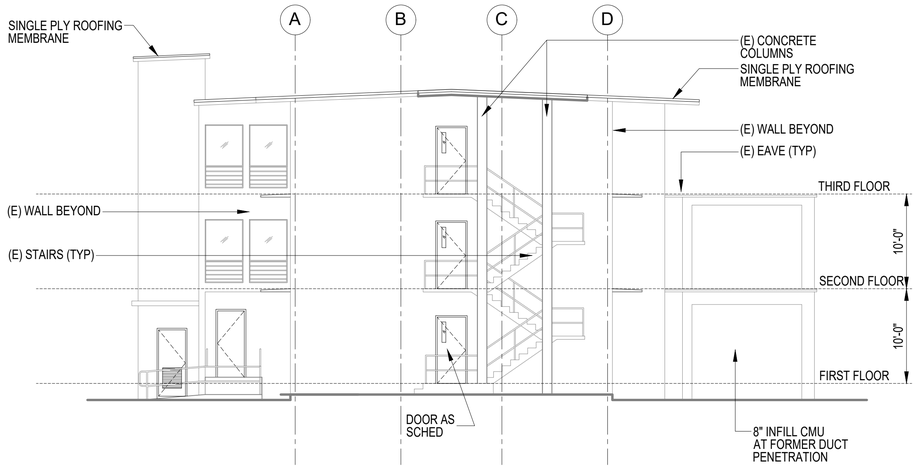
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-201
DRAWN BY: MD/AP	APPROVED BY:	DATE JUNE 2026	SHEET 79 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

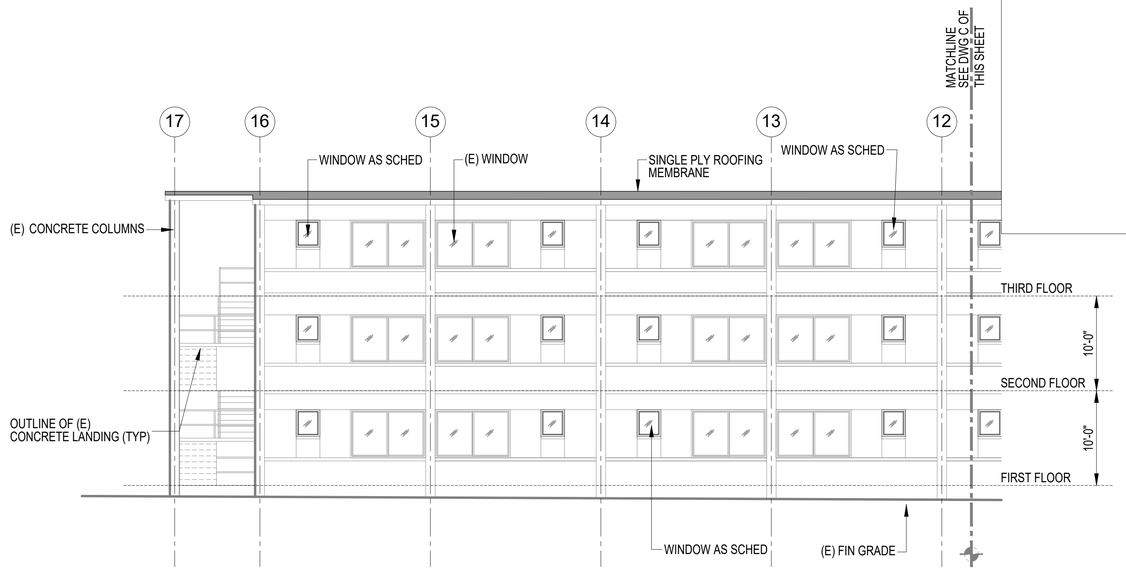
DATE ISSUED: ---

05/07/2026 10:29 am
C:\USERS\PC_3\TEAM MANILA DROPBOX\FP| DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\2018-25-01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-201-A-202.DWG



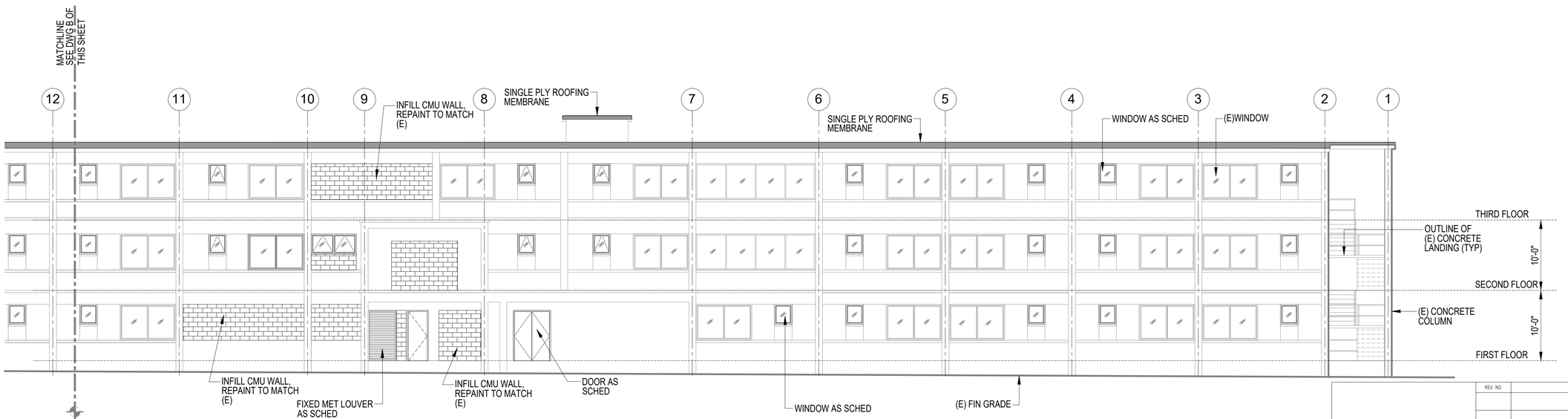
A NORTH EXTERIOR ELEVATION

SCALE: 1/8" = 1'-0" 0 8' 16'



B PARTIAL WEST EXTERIOR ELEVATION

SCALE: 1/8" = 1'-0" 0 8' 16'



C PARTIAL WEST EXTERIOR ELEVATION

SCALE: 1/8" = 1'-0" 0 8' 16'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW EXTERIOR ELEVATIONS

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN1-SH400033 STATE: CA-202505-D	DRAWING NO. A-202
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: MD/AP	APPROVED BY:	DATE: JUNE 2026	SHEET: 80 OF 276 SHTS
SCALE: AS NOTED			

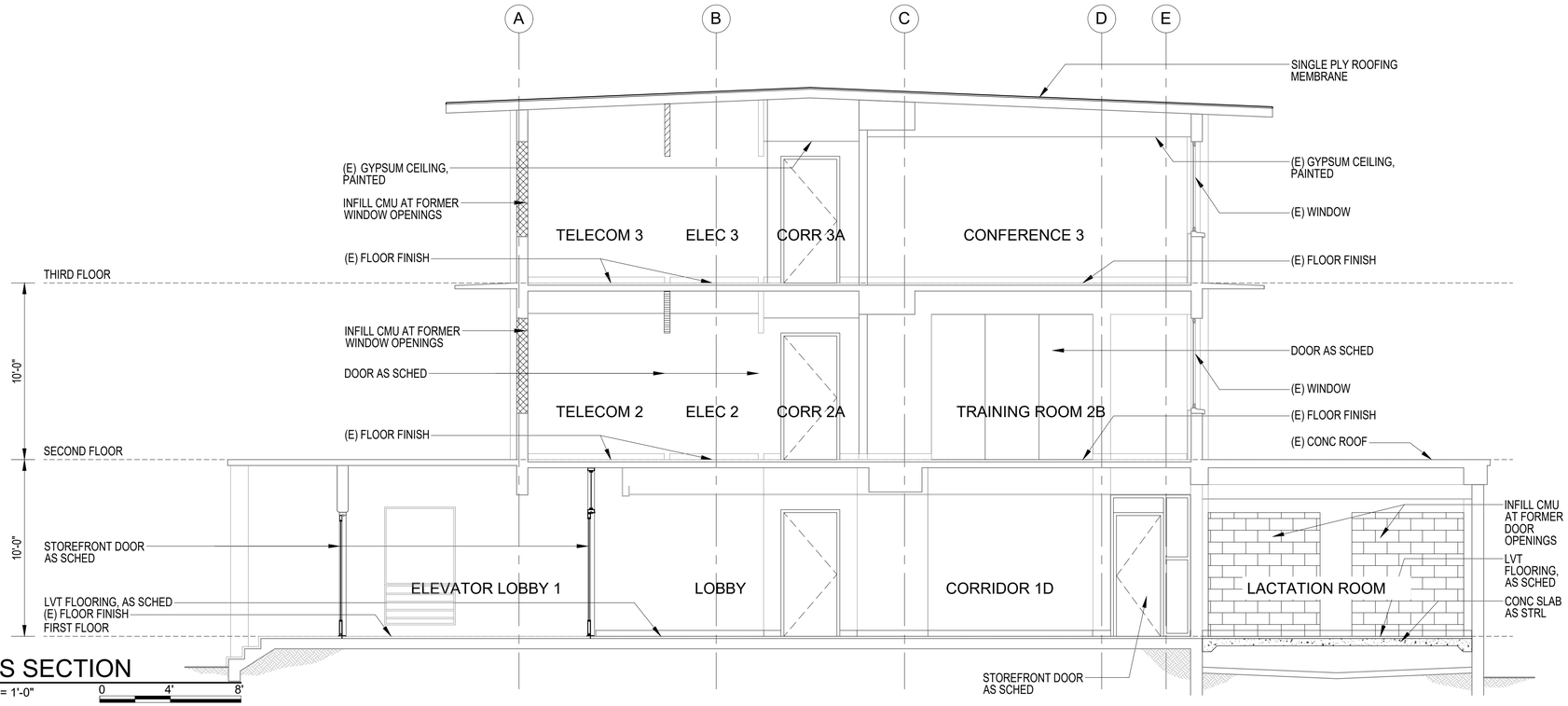
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:30 am
C:\USERS\PC_3\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\2018-25-01 B46 MEDCOM_RENOVATIONS\4-DWG\ARCH\A-201-A-202.DWG

A CROSS SECTION

SCALE: 1/4" = 1'-0" 0 4' 8'



B CROSS SECTION

SCALE: 1/4" = 1'-0" 0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

CROSS SECTIONS

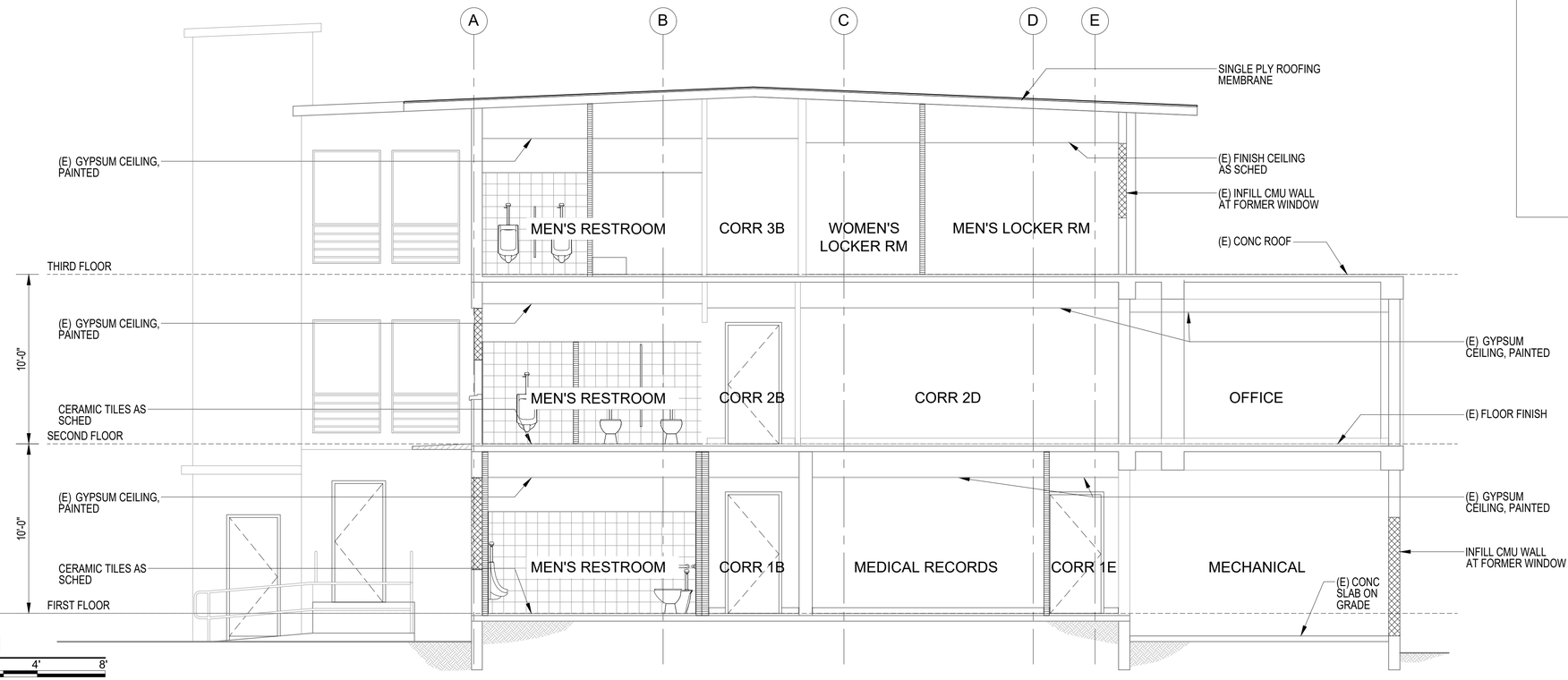
ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HI#PN: JOB NO. FEDERAL:	DRAWING NO.
BF	YWF	PN15H00033 STATE: CA-202505-D	A-301
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET: 81 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

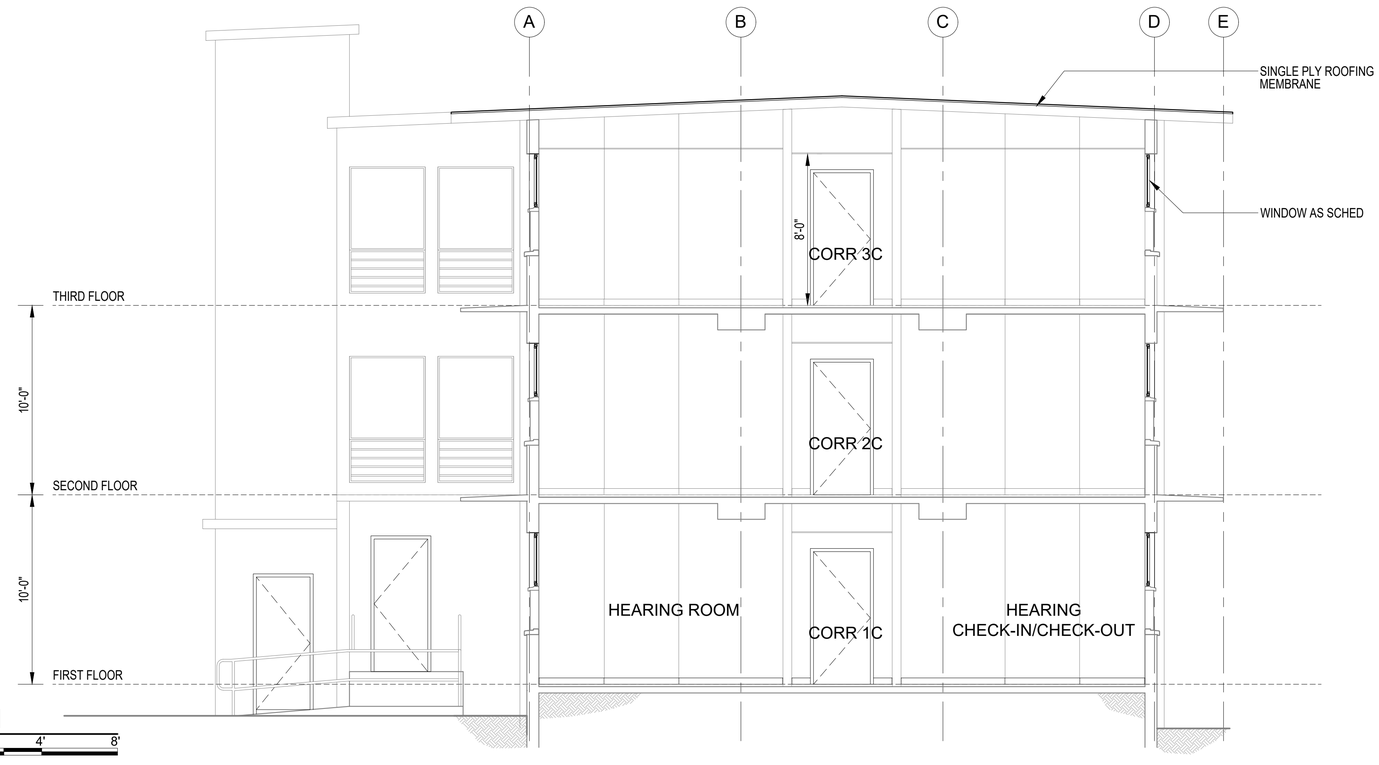
DATE ISSUED: ---

05/07/2026 10:30 am
C:\USERS\PC_3\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01 ACTIVE PROJECTS\12018-25-01 846 MEDCOM RENOVATIONS\4-DWG\ARCH\A-301.DWG



A CROSS SECTION

SCALE: 1/4" = 1'-0" 0 4' 8'



B CROSS SECTION

SCALE: 1/4" = 1'-0" 0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

CROSS SECTIONS

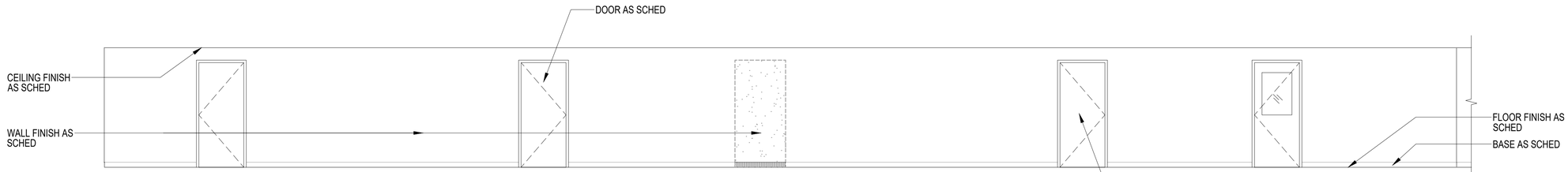
ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HAARNG JOB NO, FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-302
BF	YWF		
DRAWN BY: AP	APPROVED BY:	DATE JUNE 2026	SHEET 82
SCALE: AS NOTED			OF 276 SHTS

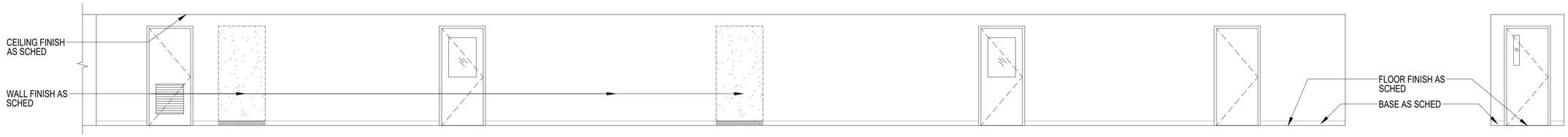
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:31 am
C:\USERS\YP_3\TEAM MANILA_DROPBOX\YP_DROPBOX~PROJECTS\01_ACTIVE_PROJECTS\12018~25~01 846_MEDCOM_RENOVATIONS\4~DWG\ARCH\A~301.DWG



ELEVATION A

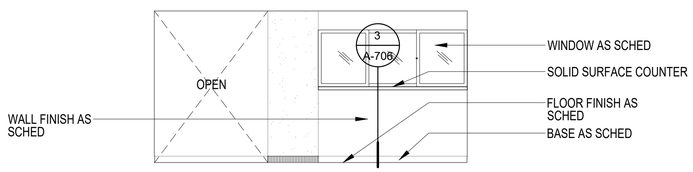


ELEVATION C

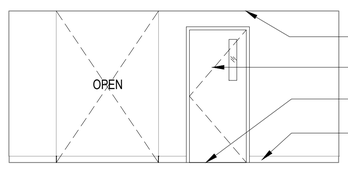
ELEVATION D

1 011 CORRIDOR 1A INTERIOR ELEVATIONS

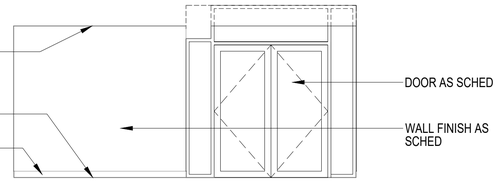
SCALE: 1/4" = 1'-0" 0 4' 8'



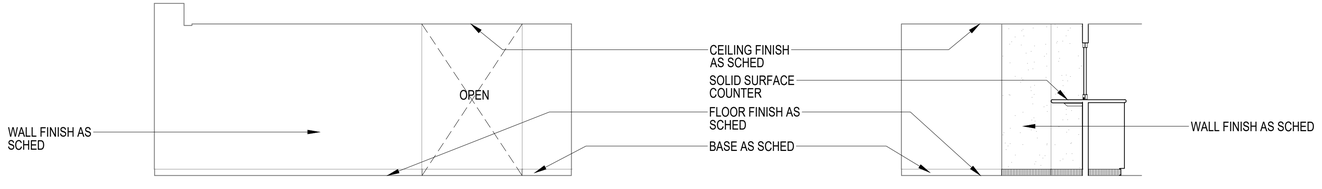
ELEVATION A



ELEVATION B



ELEVATION C



ELEVATION D

ELEVATION D1

2 012 LOBBY INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

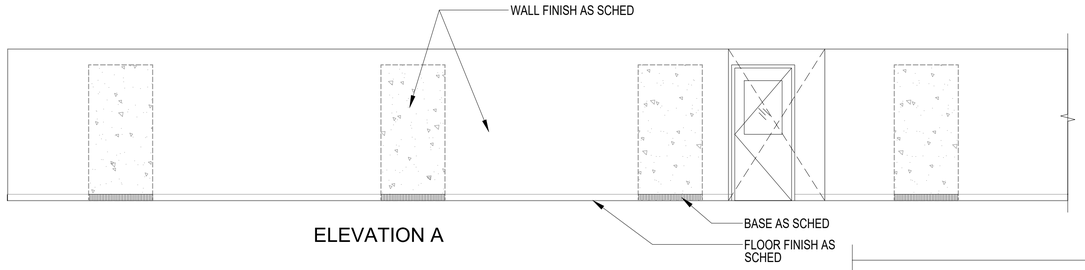
INTERIOR ELEVATIONS - FIRST FLOOR

ENGINEERING PARTNERS		HAWAII JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-401
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 83 OF 276 SHTS
SCALE: AS NOTED			

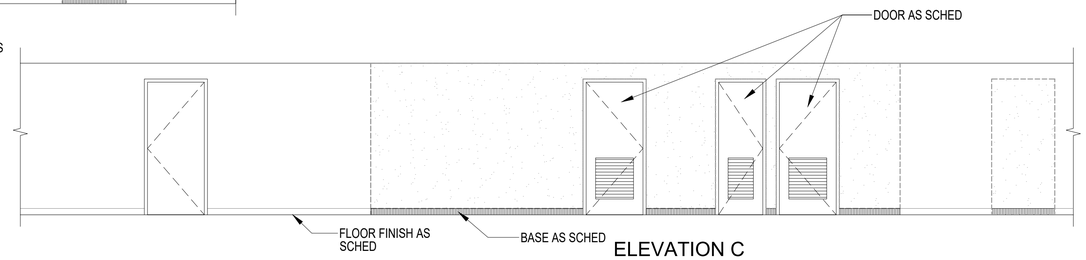
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:31 am
C:\USERS\PC_3\TEAM MANILA_DROPBOX\EPI_DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\12018-25-01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-401.DWG



ELEVATION A

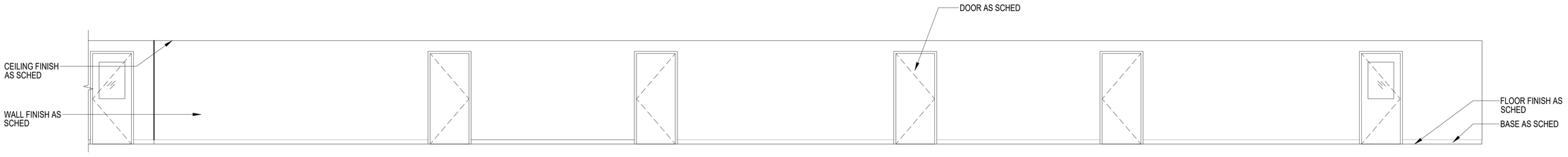


ELEVATION C

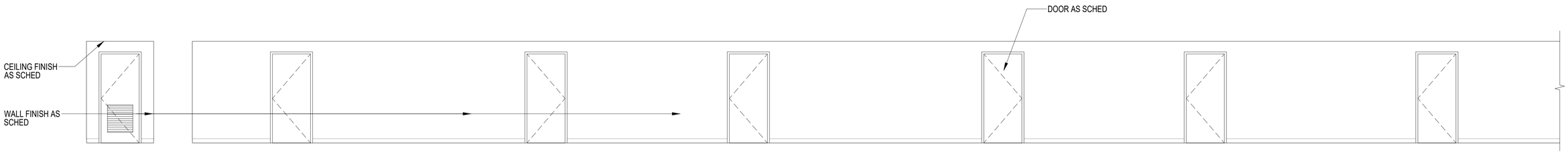
1 013 CORRIDOR 1B INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'



ELEVATION A



ELEVATION B

ELEVATION C

2 014 CORRIDOR 1C INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - FIRST FLOOR

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-402
DRAWN BY: AP	APPROVED BY:	DATE	SHEET 84
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/03/2026 12:33 am
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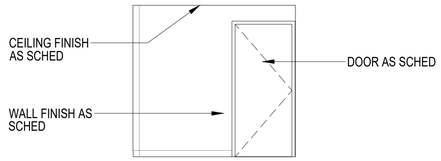
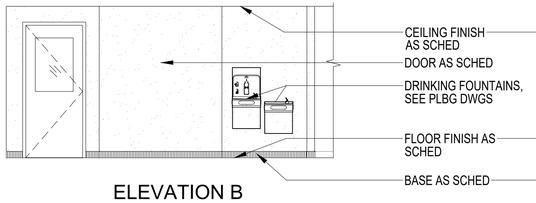
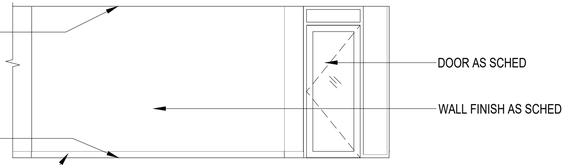


ELEVATION A



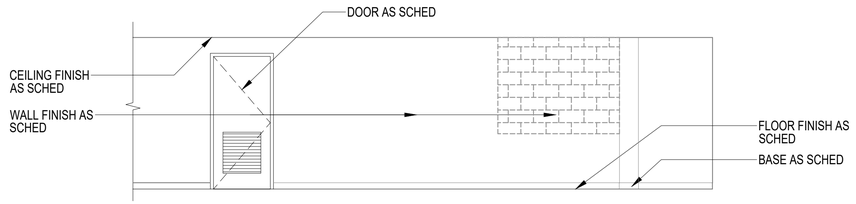
ELEVATION B



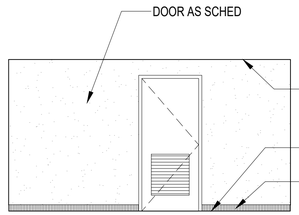
ELEVATION D

1 015 CORRIDOR 1D INTERIOR ELEVATIONS

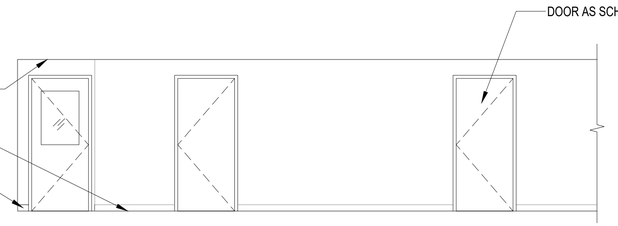
SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A



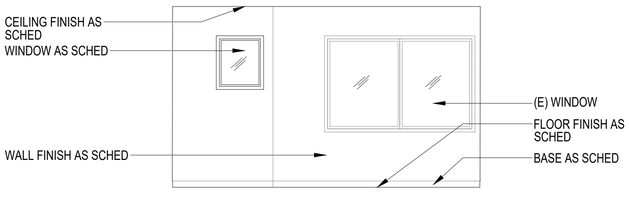
ELEVATION B



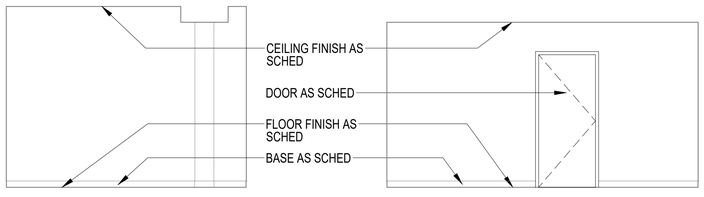
ELEVATION C

2 016 CORRIDOR 1E INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

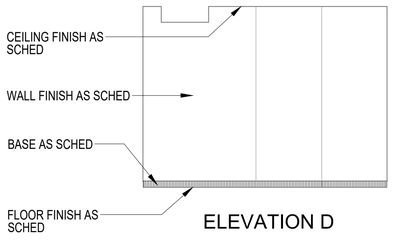


ELEVATION A



ELEVATION B

ELEVATION C



ELEVATION D

3 100 OFFICE 1A INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - FIRST FLOOR

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-403
DRAWN BY: AP	APPROVED BY:	DATE	SHEET 85
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:32 am
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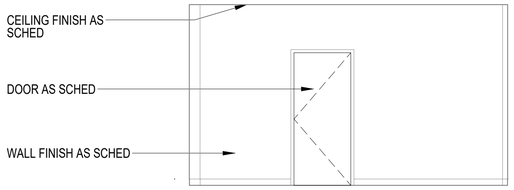
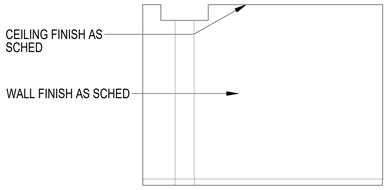
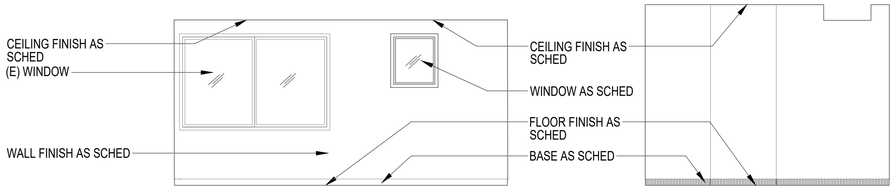


ELEVATION A



ELEVATION B



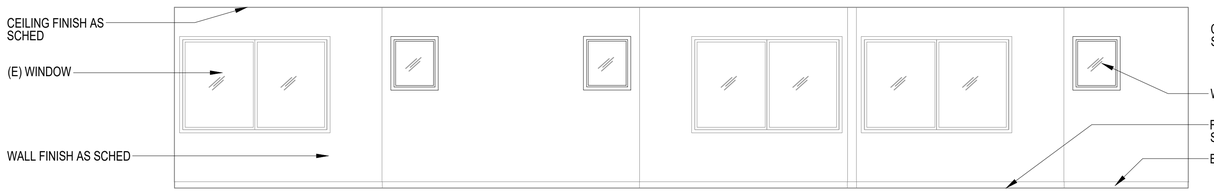
ELEVATION C

ELEVATION D

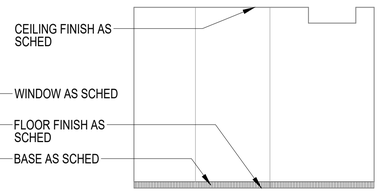
1 101 OFFICE 1B INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

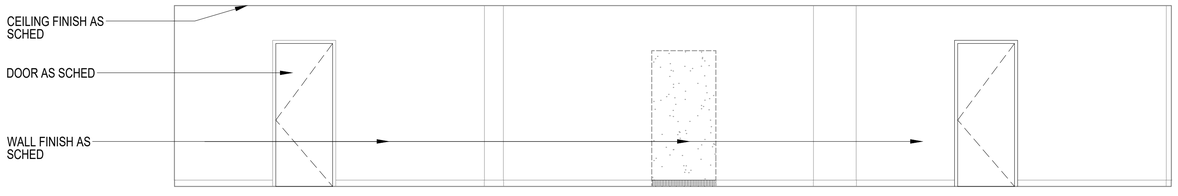
0 4' 8'



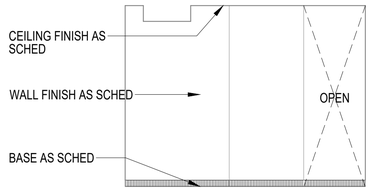
ELEVATION A



ELEVATION B



ELEVATION C



ELEVATION D

2 102 UNIT SUPPLY INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - FIRST FLOOR

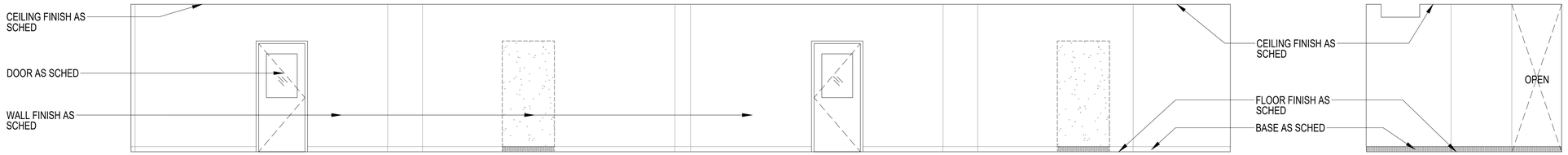
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HAWAII JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-404
DRAWN BY: AP	APPROVED BY:	DATE JUNE 2026	SHEET 86 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

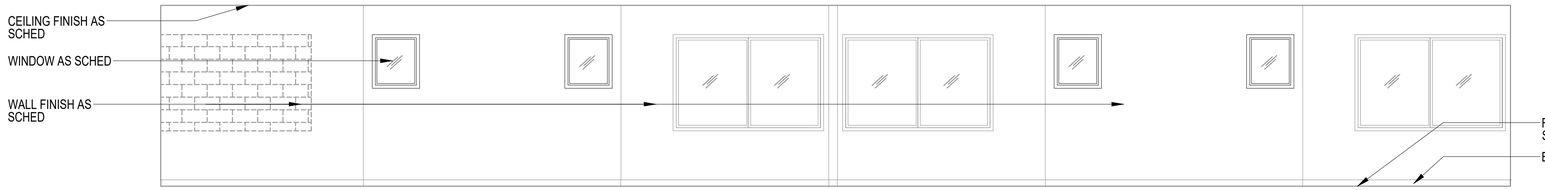
DATE ISSUED: ~~~

05/07/2026 10:32 am
C:\USERS\PC_3\TEAM MANILA DROPBOX\EP| DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\2018-25-01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-401.DWG

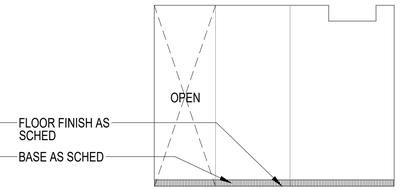


ELEVATION A

ELEVATION B



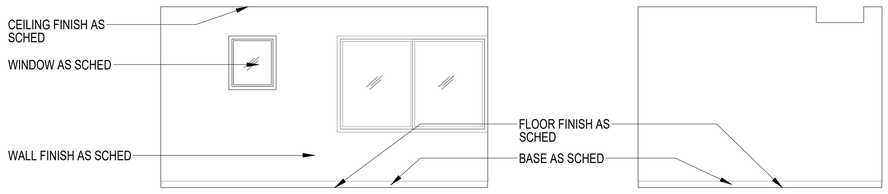
ELEVATION C



ELEVATION D

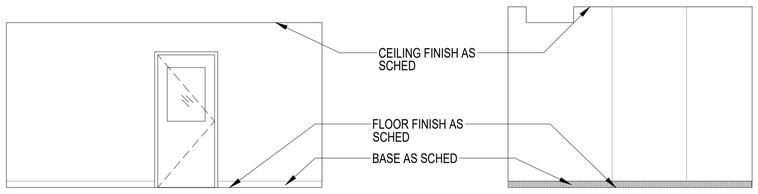
1 103 MEDLOG INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A

ELEVATION B



ELEVATION C

ELEVATION D

2 104 VITALS/WAITING AREA

SCALE: 1/4" = 1'-0" 0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - FIRST FLOOR

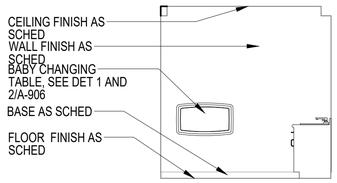
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HI&PNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-405
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 87 OF 276 SHTS
SCALE: AS NOTED			

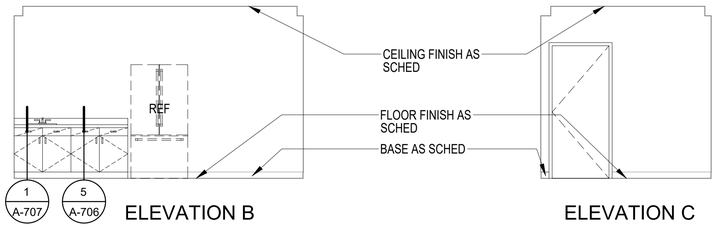
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:32 am
C:\USERS\PC_3\TEAM MANILA DROPBOX\EPI DROPBOX--PROJECTS\01_ACTIVE_PROJECTS\12018--25--01 B46_MEDCOM_RENOVATIONS\4--DWG\ARCH\A--401.DWG

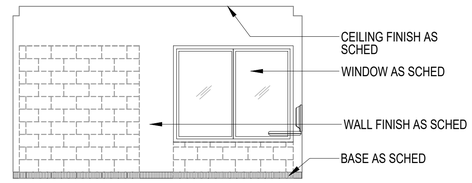


ELEVATION A



ELEVATION B

ELEVATION C

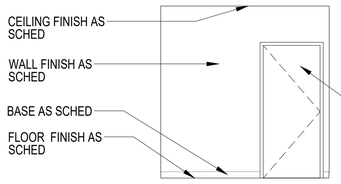


ELEVATION D

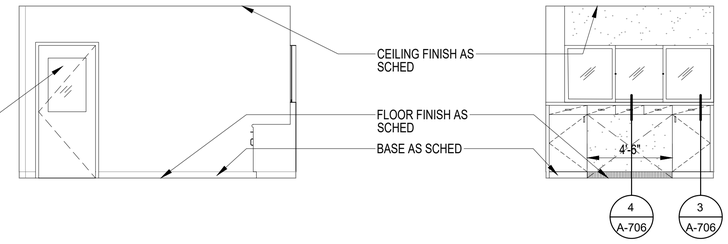
1 106 LACTATION ROOM INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'

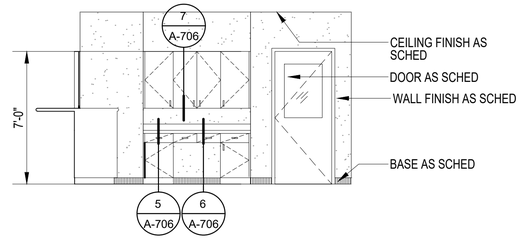


ELEVATION A



ELEVATION B

ELEVATION C

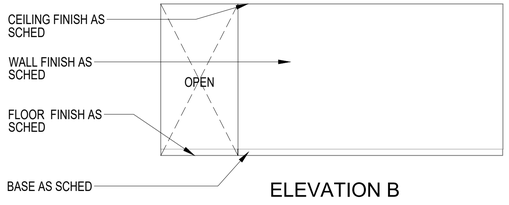


ELEVATION D

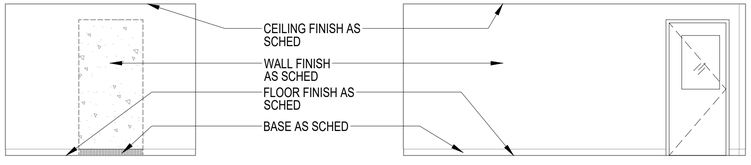
2 107 PAD CHECK-OUT INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'



ELEVATION B



ELEVATION C

ELEVATION D

3 109 PAD OFFICE INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - FIRST FLOOR

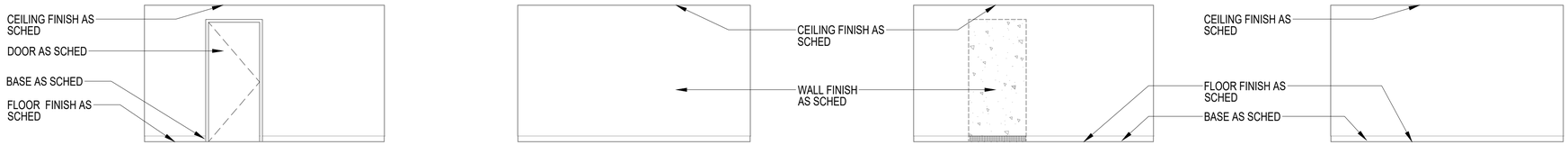
ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-406
BF	YWF		
DRAWN BY: AP	APPROVED BY:	DATE	SHEET 88
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

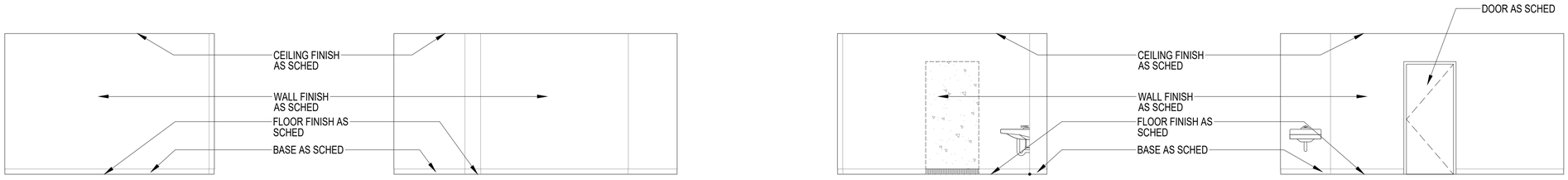
05/07/2026 10:32 am
C:\USERS\YP_3\TEAM MANILA_DROPBOX\YP_DROPBOX\PROJECTS\01_ACTIVE_PROJECTS\12018-25-01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-401.DWG



ELEVATION A | ELEVATION B | ELEVATION C | ELEVATION D

1 111 MED RECORDS INTERIOR ELEVATIONS

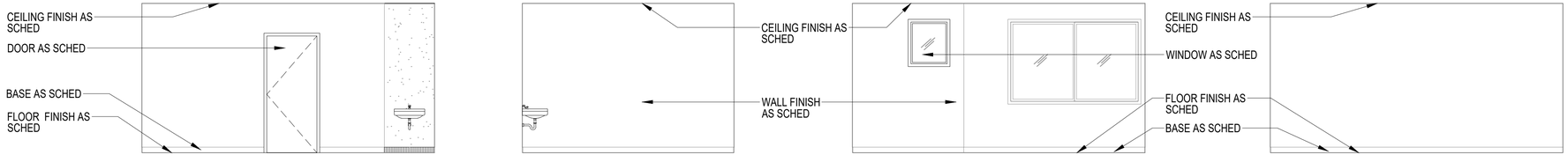
SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A | ELEVATION B | ELEVATION C | ELEVATION D

2 118 EKG INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A | ELEVATION B | ELEVATION C | ELEVATION D

3 119 IMMZ/CHOL A INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - FIRST FLOOR

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-407
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 89 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:32 am
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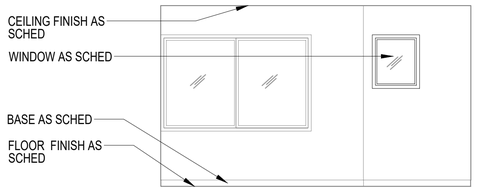
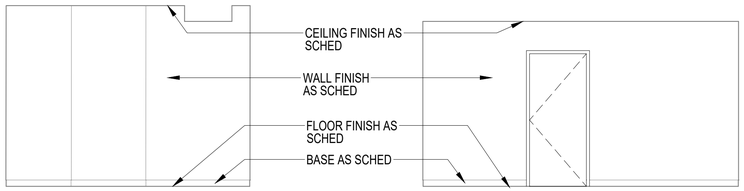
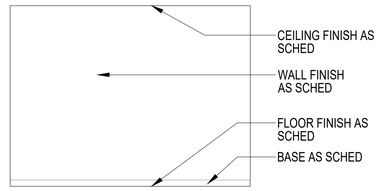


ELEVATION A



ELEVATION B

ELEVATION C

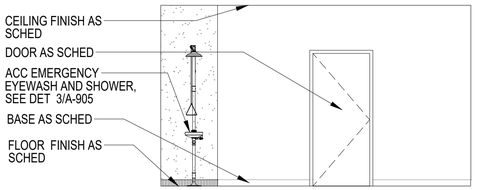


ELEVATION D

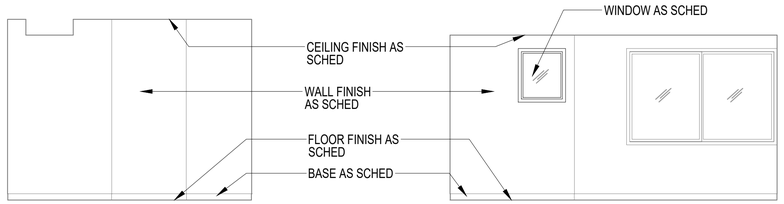
2 120 VISION INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'

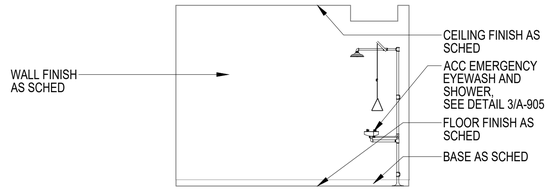


ELEVATION A



ELEVATION B

ELEVATION C

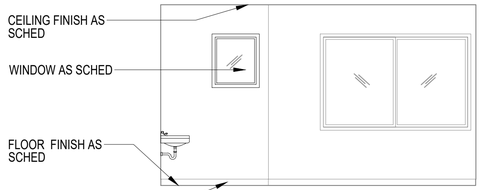


ELEVATION D

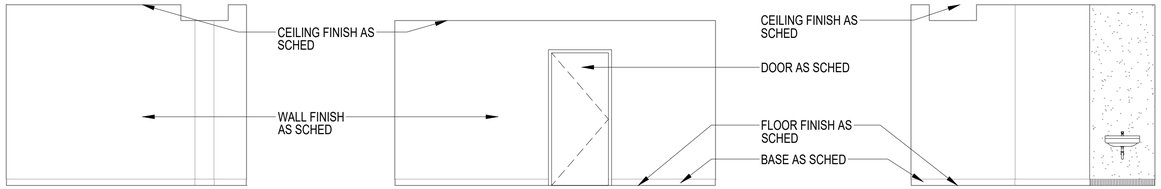
3 121 IMMZ/CHOL B INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'



ELEVATION A



ELEVATION B

ELEVATION C

ELEVATION D

3 122 DENTAL INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'

BRIAN F. FUNAI
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Exp. 04/30/28
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HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - FIRST FLOOR

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HAPRG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-408
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 90
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:32 am
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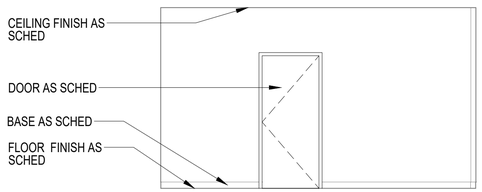
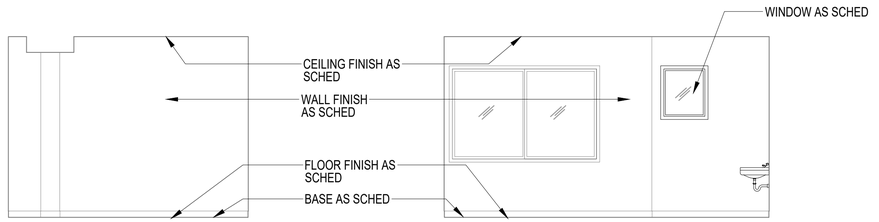
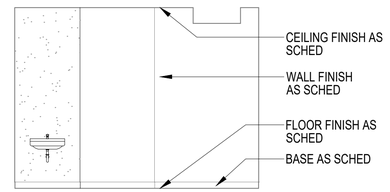


ELEVATION A



ELEVATION B

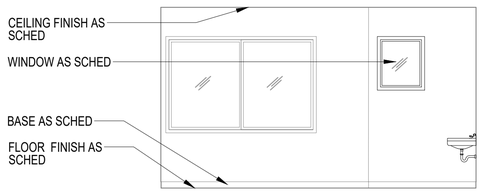
ELEVATION C



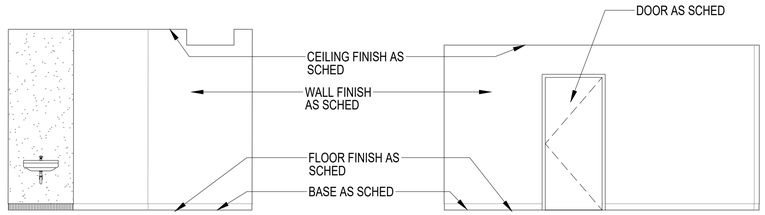
ELEVATION D

1 123 DENTAL INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

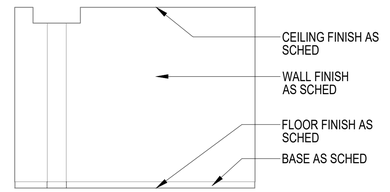


ELEVATION A



ELEVATION B

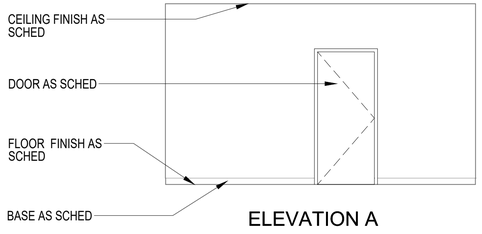
ELEVATION C



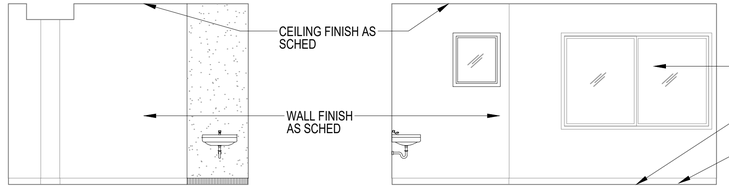
ELEVATION D

2 124 DENTAL XRAY INTERIOR ELEVATIONS

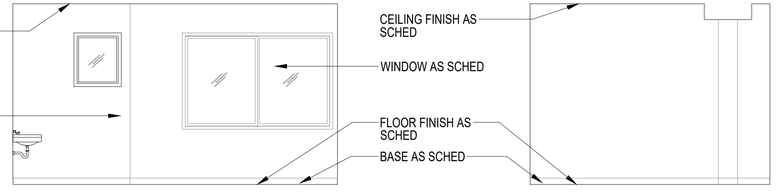
SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A



ELEVATION B



ELEVATION C

ELEVATION D

3 125 DENTAL XRAY INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

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Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - FIRST FLOOR

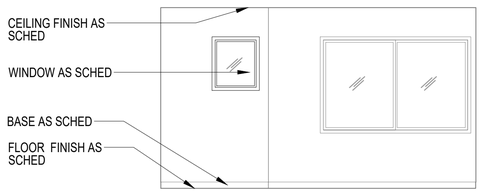
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-409
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 91 OF 276 SHTS
SCALE: AS NOTED			

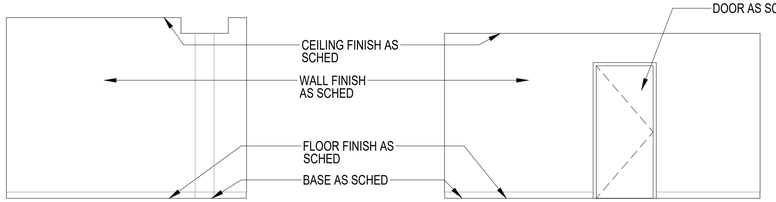
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05-07-2026 10:33 am
C:\USERS\PC_3\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01 ACTIVE_PROJECTS\2018-25-01 846_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-401.DWG

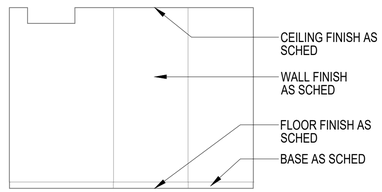


ELEVATION A



ELEVATION B

ELEVATION C

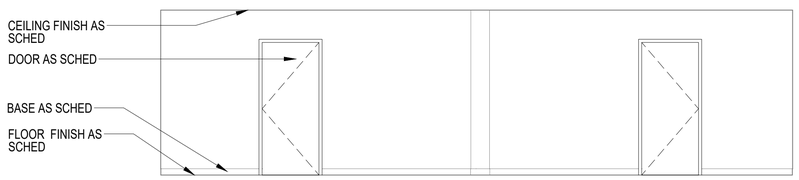


ELEVATION D

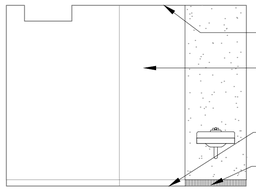
1 126 HEARING CHECK-IN/OUT INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'

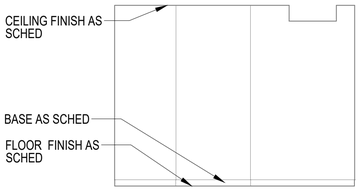


ELEVATION A



ELEVATION B

ELEVATION C

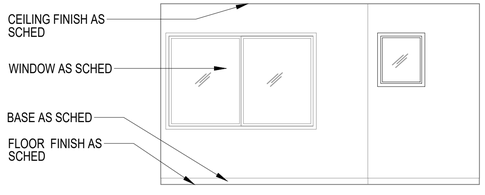


ELEVATION D

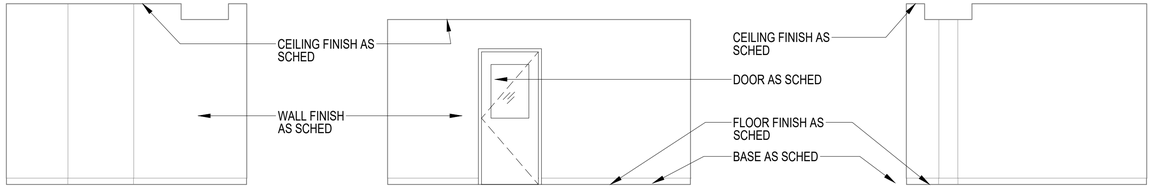
2 127 HEARING ROOM INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'



ELEVATION A



ELEVATION B

ELEVATION C

ELEVATION D

3 128 MEDIC AND DENTAL BREAK ROOM INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - FIRST FLOOR

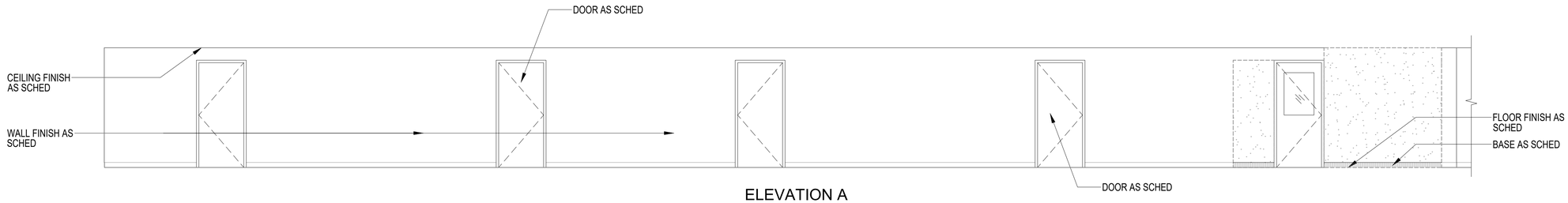
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-410
DRAWN BY: AP	APPROVED BY:	DATE	SHEET 92
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

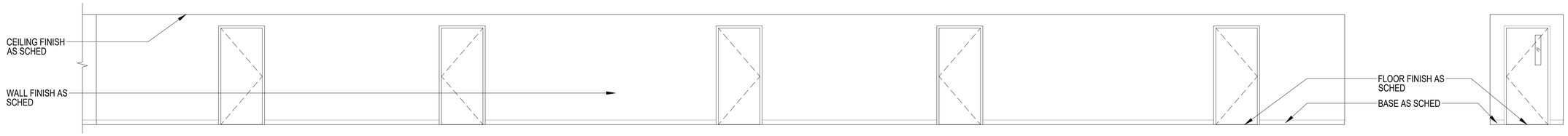
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05.07.2026 10:13 am
C:\USERS\PC_3\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01 ACTIVE_PROJECTS\2018-25-01 846_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-401.DWG



ELEVATION A

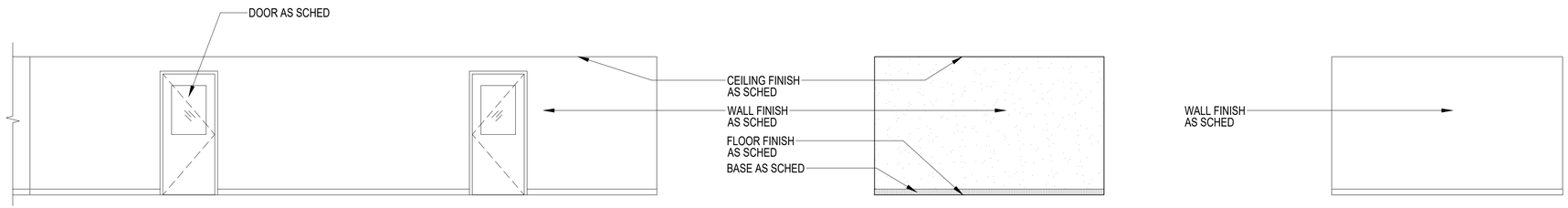


ELEVATION C

ELEVATION D

1 021 CORRIDOR 2A INTERIOR ELEVATIONS

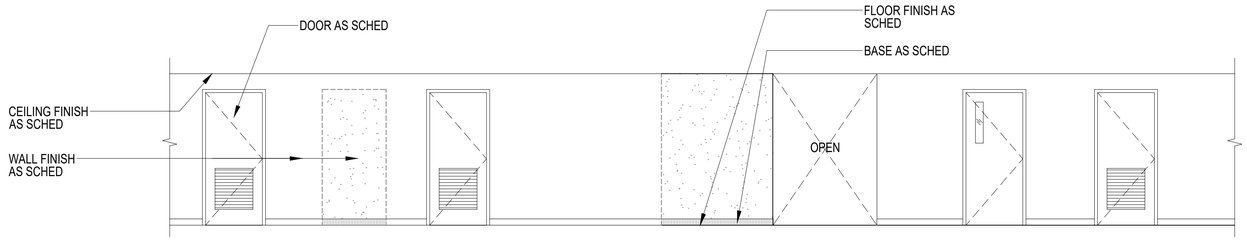
SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A

ELEVATION B

ELEVATION D



ELEVATION C

2 022 CORRIDOR 2B INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

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BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - SECOND FLOOR

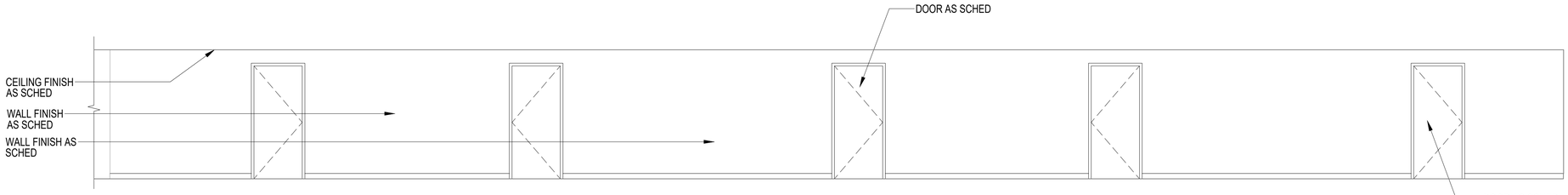
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO, FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-411
DRAWN BY: AU	APPROVED BY:	DATE: JUNE 2026	SHEET 93 OF 276 SHTS
SCALE: AS NOTED			

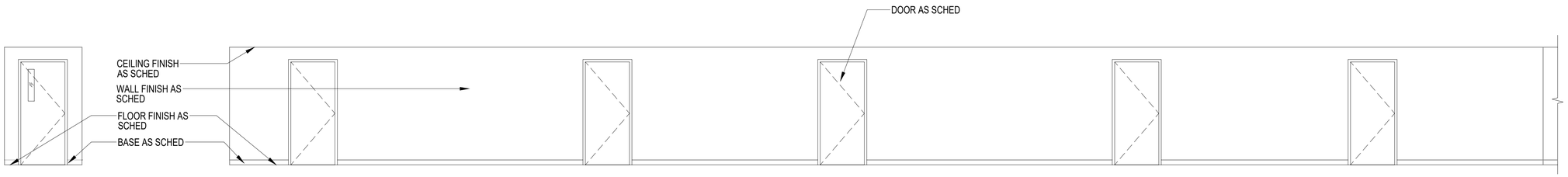
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:34 am
C:\USERS\PC_3\TEAM MANILA_DROPBOX\PI_DROPBOX\PROJECTS\01_ACTIVE_PROJECTS\12018-25-01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-411.DWG



ELEVATION A

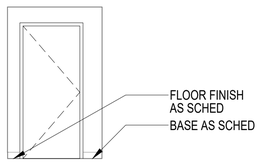


ELEVATION B

ELEVATION C

1 023 CORRIDOR 2C INTERIOR ELEVATIONS

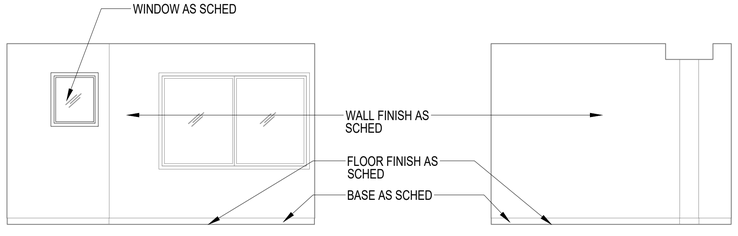
SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A

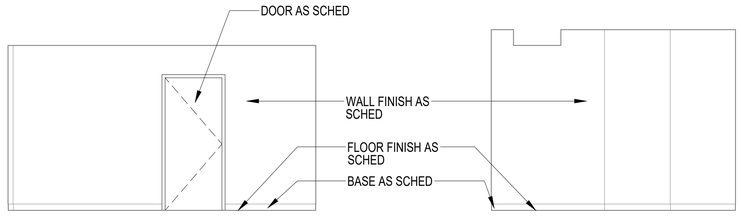
2 024 CORRIDOR 2D INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A

ELEVATION B



ELEVATION C

ELEVATION D

3 200 OFFICE 2A INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - SECOND FLOOR

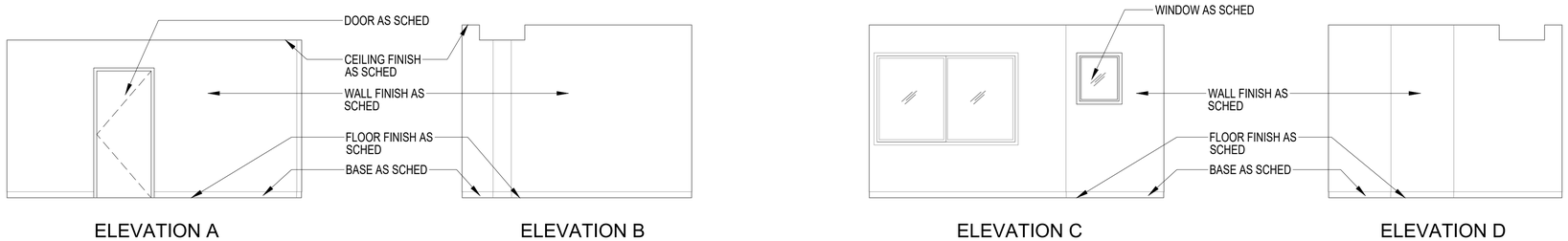
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-412
DRAWN BY: AU	APPROVED BY:	DATE: JUNE 2026	SHEET 94 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

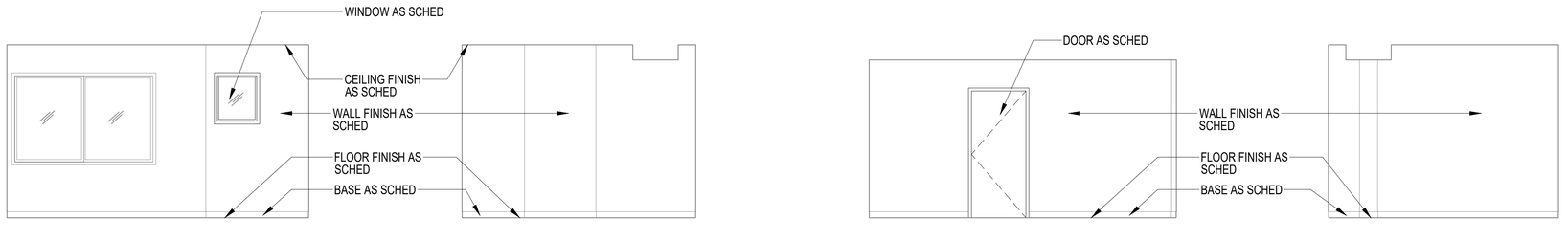
05/07/2026 10:34 am
C:\USERS\PC.3\TEAM MANILA_DROPBOX\PI_DROPBOX--PROJECTS\01_ACTIVE_PROJECTS\12018--25--01 846_MEDCOM_RENOVATIONS\4--DWG\ARCH\A--411.DWG



ELEVATION A ELEVATION B ELEVATION C ELEVATION D

1 201 OFFICE 2B INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A ELEVATION B ELEVATION C ELEVATION D

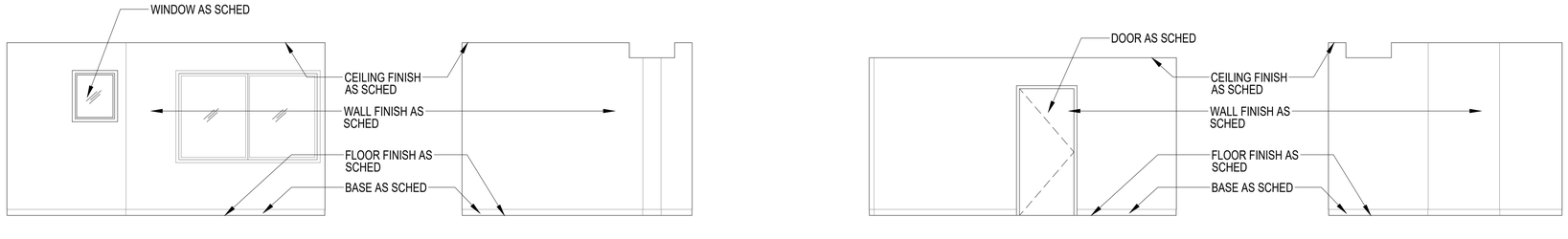
2 202 OFFICE 2C INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

ELEVATION A ELEVATION B ELEVATION C ELEVATION D

3 203 OFFICE 2D INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A ELEVATION B ELEVATION C ELEVATION D

4 204 OFFICE 2E INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - SECOND FLOOR

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-413
DRAWN BY: AU	APPROVED BY:	DATE: JUNE 2026	SHEET 95 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:34 am
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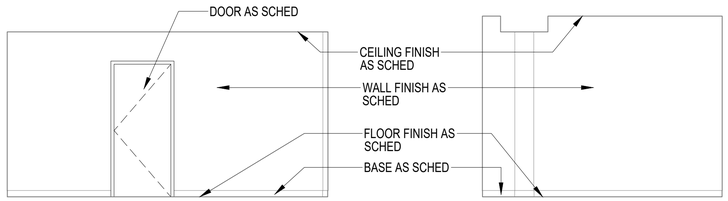
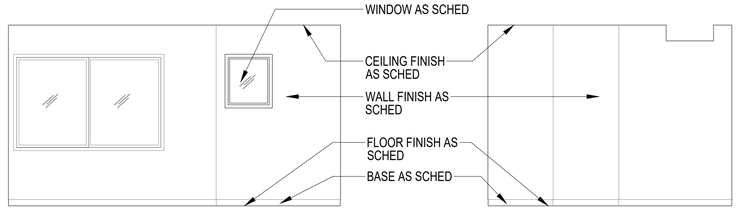


ELEVATION A

ELEVATION B

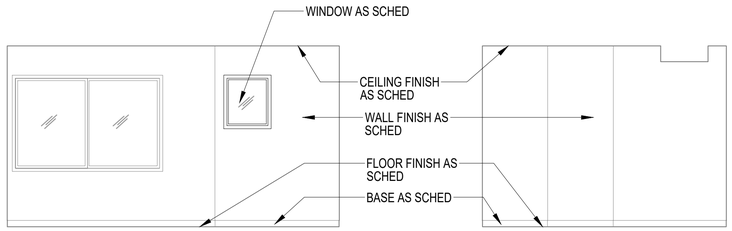


ELEVATION C

ELEVATION D

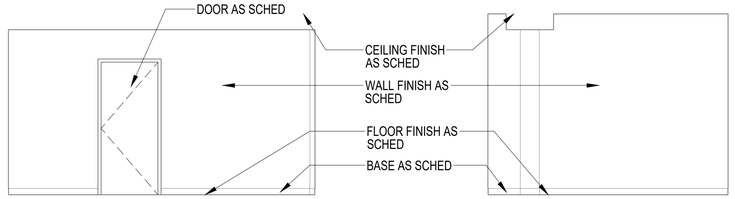
1 205 OFFICE 2F INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A

ELEVATION B

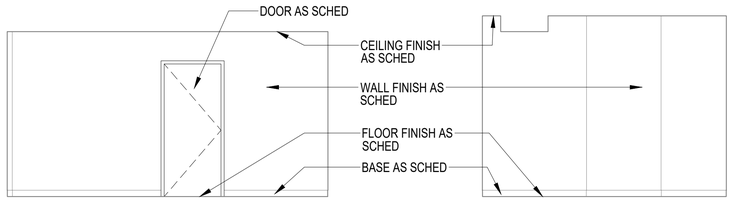


ELEVATION C

ELEVATION D

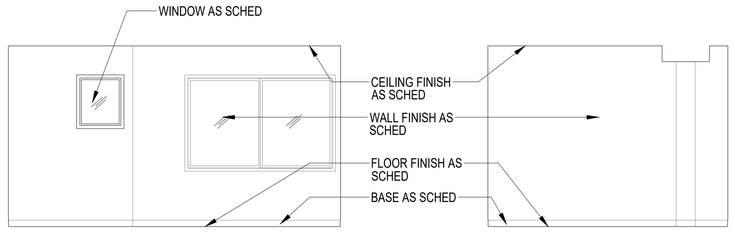
2 206 OFFICE 2G INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A

ELEVATION B

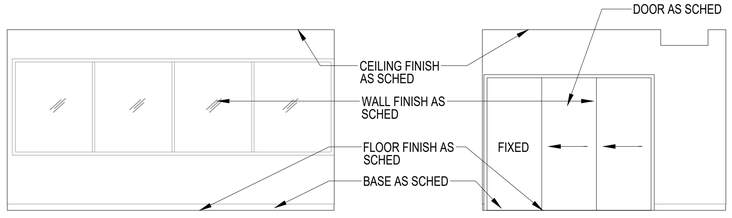


ELEVATION C

ELEVATION D

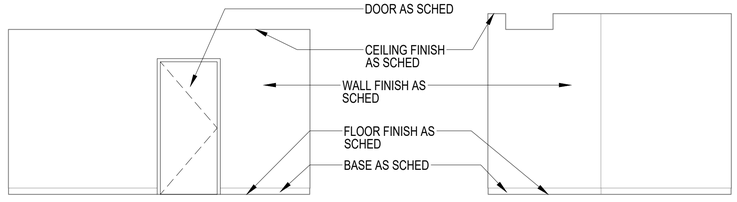
3 207 OFFICE 2H INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A

ELEVATION B



ELEVATION C

ELEVATION D

4 208 TRAINING ROOM 2A INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

REV. NO	DESCRIPTION	DATE

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BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - SECOND FLOOR

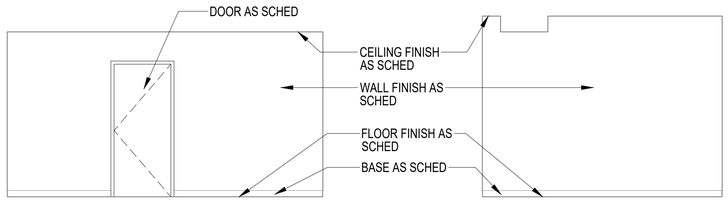
ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HAPPO JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-414
BF	YWF		
DRAWN BY: AU	APPROVED BY:	DATE: JUNE 2026	SHEET 96 OF 276 SHTS
SCALE: AS NOTED			

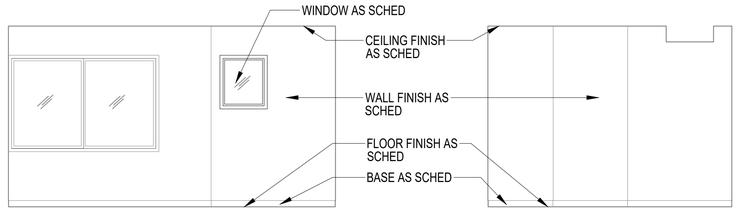
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:34 am
C:\USERS\PC.3\TEAM MANILA_DROPBOX\EP_DROPBOX\PROJECTS\01_ACTIVE_PROJECTS\12018-25-01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-411.DWG



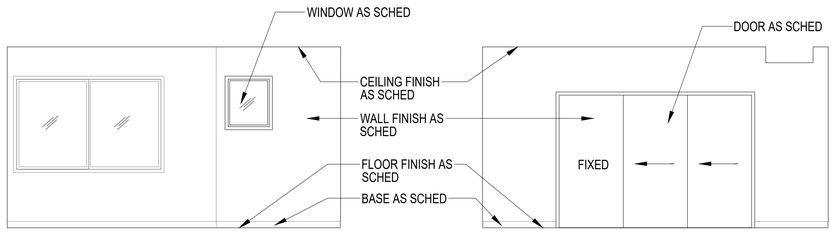
ELEVATION A ELEVATION B



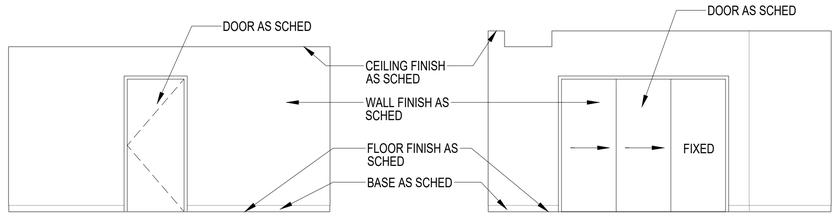
ELEVATION C ELEVATION D

1 209 OFFICE 2I INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



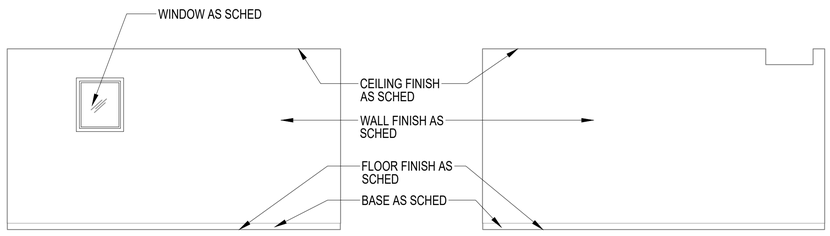
ELEVATION A ELEVATION B



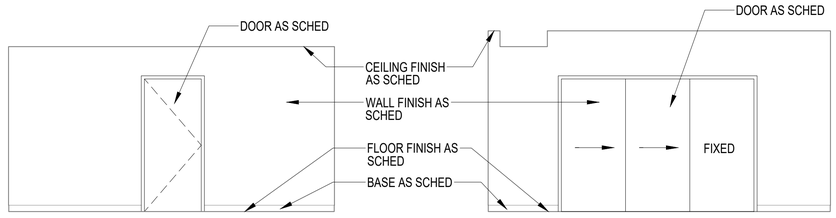
ELEVATION C ELEVATION D

2 210 TRAINING ROOM 2B INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A ELEVATION B



ELEVATION C ELEVATION D

3 213 TRAINING ROOM 2C INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - SECOND FLOOR

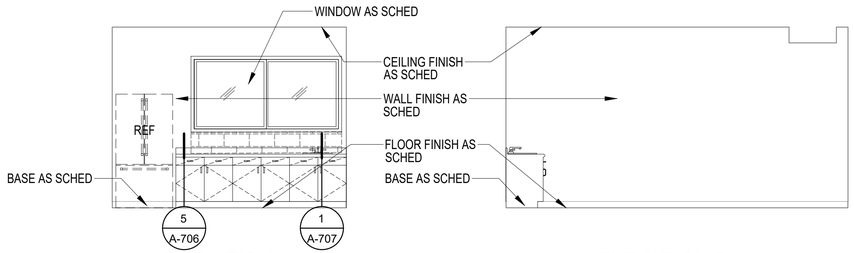
ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HAPRG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-415
BF	YWF		
DRAWN BY: AU	APPROVED BY:	DATE JUNE 2026	SHEET 97 OF 276 SHTS
SCALE: AS NOTED			

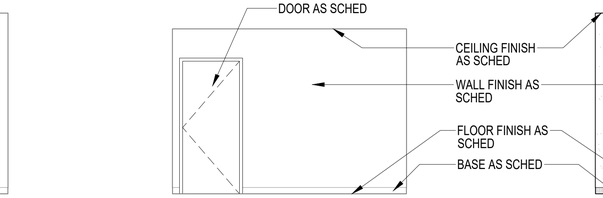
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:34 am
C:\USERS\PC_3\TEAM MANILA_DROPBOX\PI_DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\12018--25--01 B46_MEDCOM_RENOVATIONS\4--DWG\ARCH\A-411.DWG

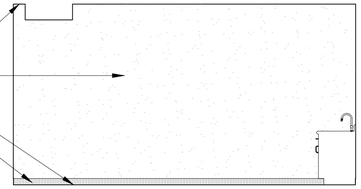


ELEVATION A



ELEVATION B

ELEVATION C

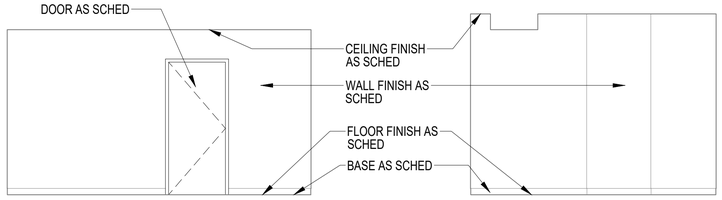


ELEVATION D

1 217 BREAK ROOM INTERIOR ELEVATIONS

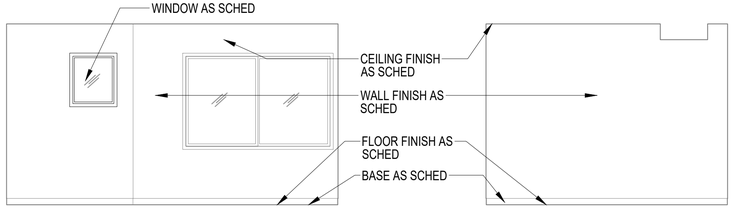
SCALE: 1/4" = 1'-0"

0 4' 8'



ELEVATION A

ELEVATION B



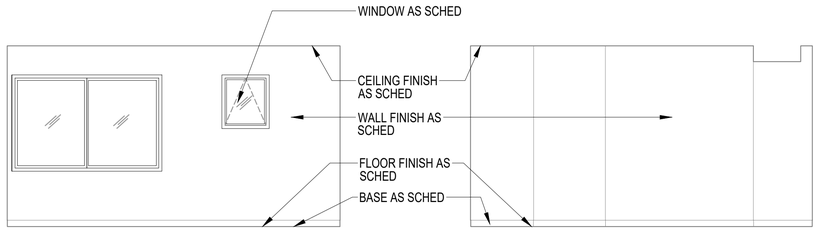
ELEVATION C

ELEVATION D

2 219 OFFICE 2J INTERIOR ELEVATIONS

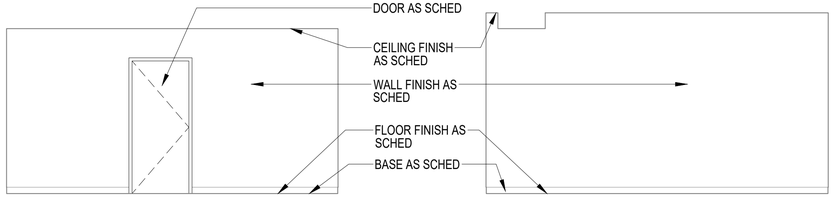
SCALE: 1/4" = 1'-0"

0 4' 8'



ELEVATION A

ELEVATION B



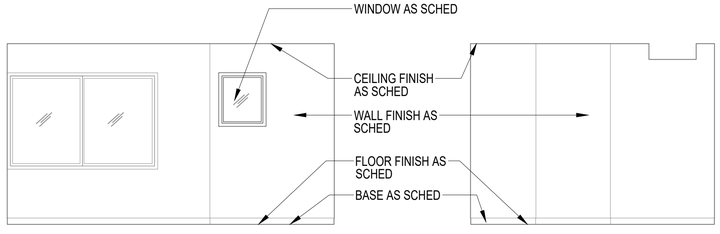
ELEVATION C

ELEVATION D

3 220 OFFICE 2K INTERIOR ELEVATIONS

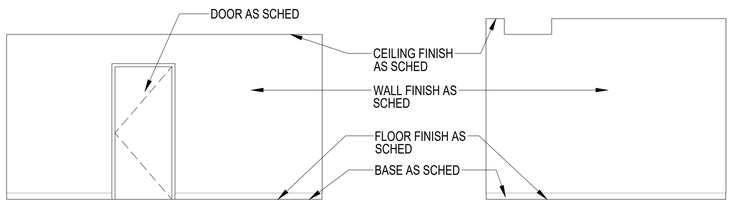
SCALE: 1/4" = 1'-0"

0 4' 8'



ELEVATION A

ELEVATION B



ELEVATION C

ELEVATION D

4 221 OFFICE 2L INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - SECOND FLOOR

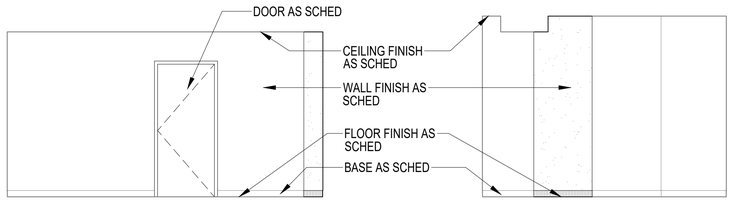
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HAPRG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-416
DRAWN BY: AU	APPROVED BY:	DATE: JUNE 2026	SHEET 98 OF 276 SHTS
SCALE: AS NOTED			

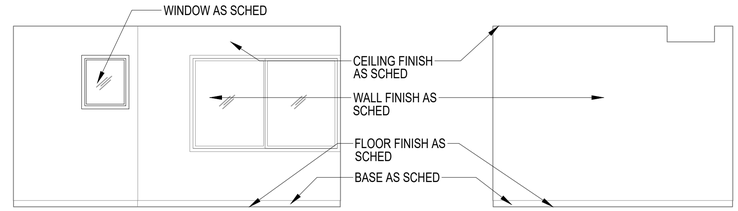
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:35 pm
C:\USERS\PC_3\TEAM MANUA_DROPBOX\EPI_DROPBOX--PROJECTS\01_ACTIVE_PROJECTS\12018--25--01 B46_MEDCOM_RENOVATIONS\4--DWG\ARCH\A--411.DWG



ELEVATION A



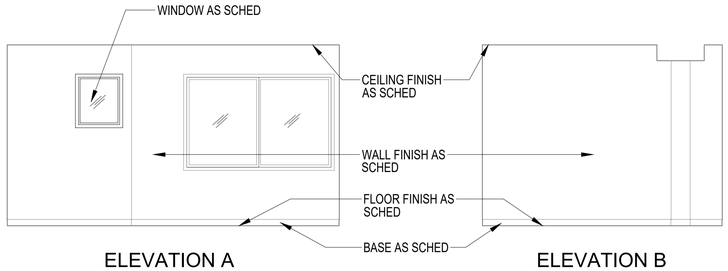
ELEVATION B

ELEVATION C

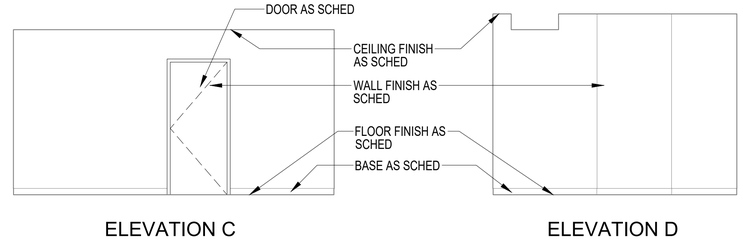
ELEVATION D

1 222 OFFICE 2M INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A



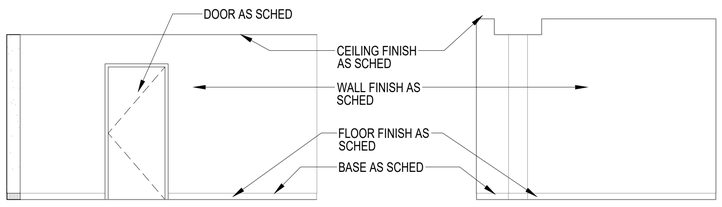
ELEVATION B

ELEVATION C

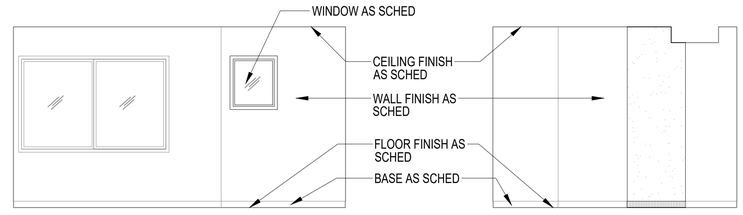
ELEVATION D

2 223 OFFICE 2N INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A



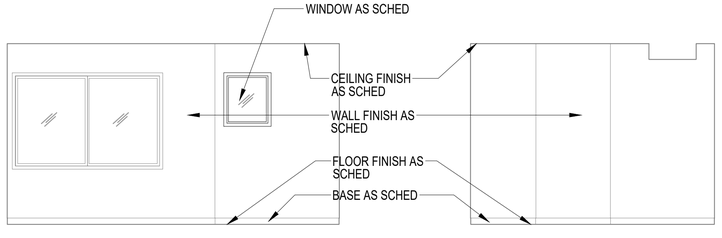
ELEVATION B

ELEVATION C

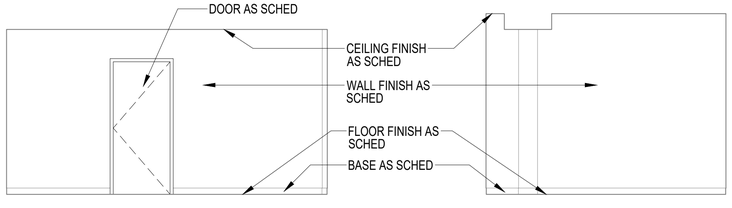
ELEVATION D

3 224 OFFICE 2P INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A



ELEVATION B

ELEVATION C

ELEVATION D

4 225 OFFICE 2Q INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

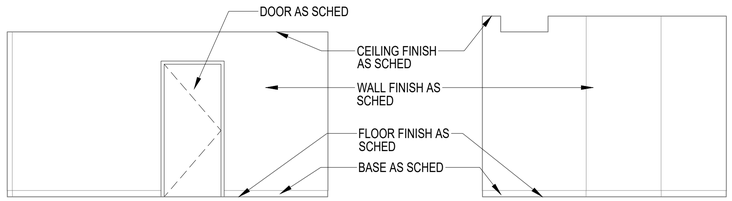
INTERIOR ELEVATIONS - SECOND FLOOR

ENGINEERING PARTNERS		HAARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-417
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: AU	APPROVED BY:	DATE: APRIL 2026	SHEET 99 OF 276 SHTS
SCALE: AS NOTED			

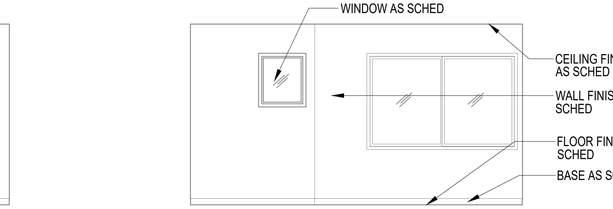
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:35 pm
C:\USERS\PC_3\TEAM MANILA DROPBOX\EPI DROPBOX--PROJECTS\01 ACTIVE PROJECTS\12018--25--01 B46 MEDCOM RENOVATIONS\4--DWG\ARCH\A--411.DWG

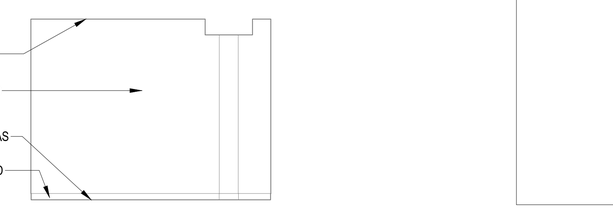


ELEVATION A



ELEVATION B

ELEVATION C

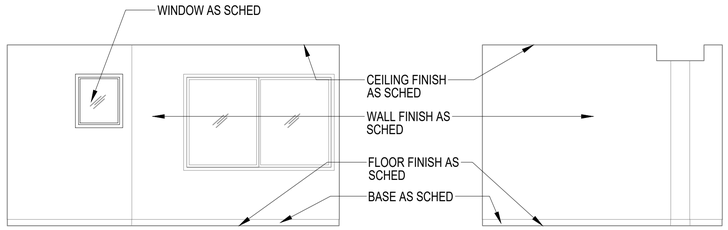


ELEVATION D

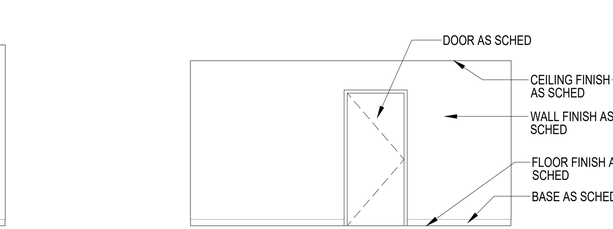
1 226 OFFICE 2R NTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'

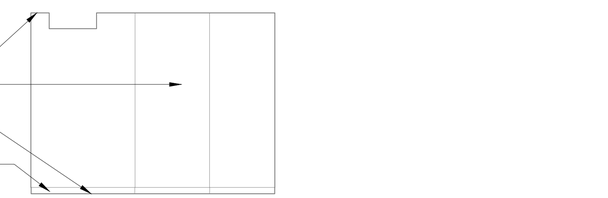


ELEVATION A



ELEVATION B

ELEVATION C

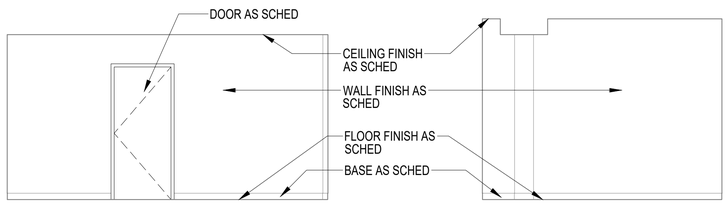


ELEVATION D

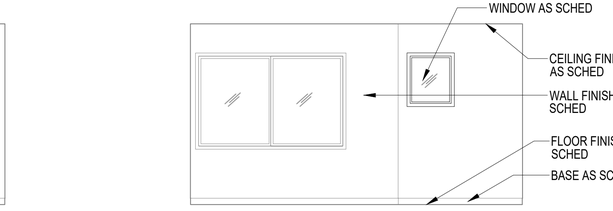
2 227 OFFICE 2S INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'

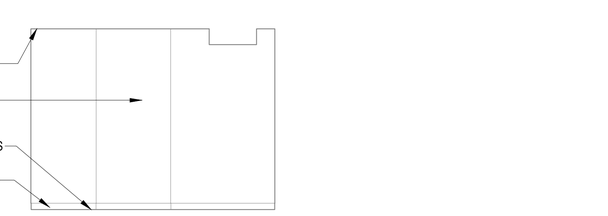


ELEVATION A



ELEVATION B

ELEVATION C

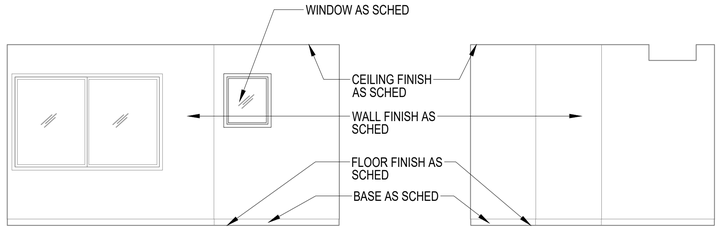


ELEVATION D

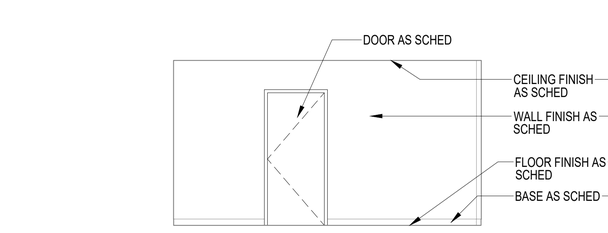
3 228 OFFICE 2T INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'



ELEVATION A



ELEVATION B

ELEVATION C

ELEVATION D

4 229 OFFICE 2U INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - SECOND FLOOR

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-418
DRAWN BY: AU	APPROVED BY:	DATE: JUNE 2026	SHEET 100
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:35 pm
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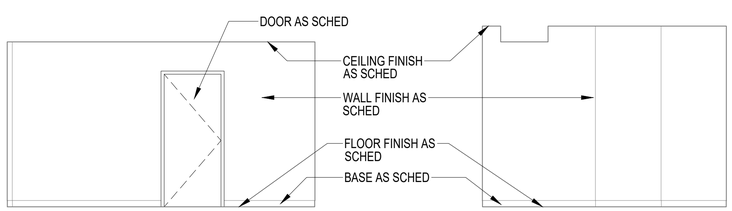
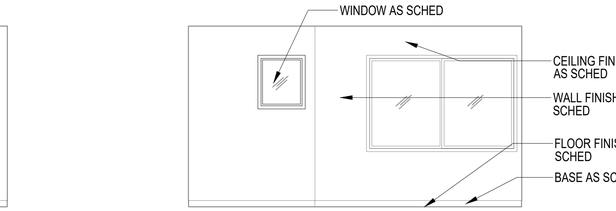
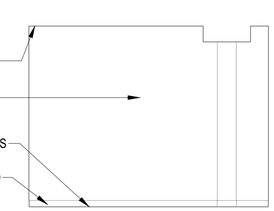


ELEVATION A



ELEVATION B

ELEVATION C



ELEVATION D

1 230 OFFICE 2V NTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

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SIGNATURE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - SECOND FLOOR

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-419
BF	YWF		
DRAWN BY: AU	APPROVED BY:	DATE: JUNE 2026	SHEET 101 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:35 pm
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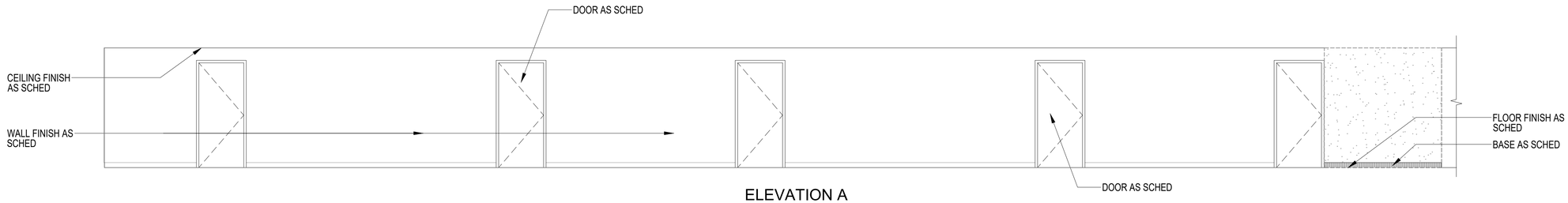
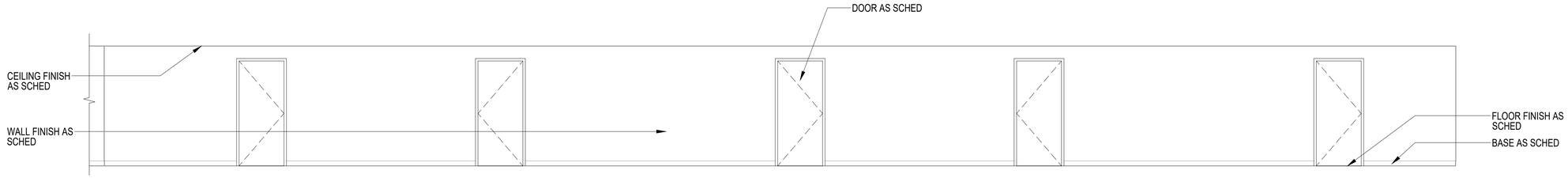
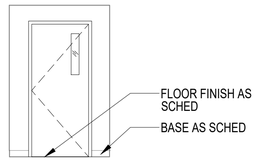


ELEVATION A



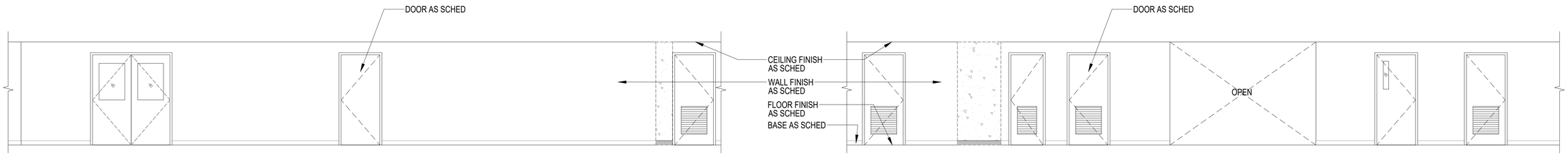
ELEVATION C



ELEVATION D

1 031 CORRIDOR 3A INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

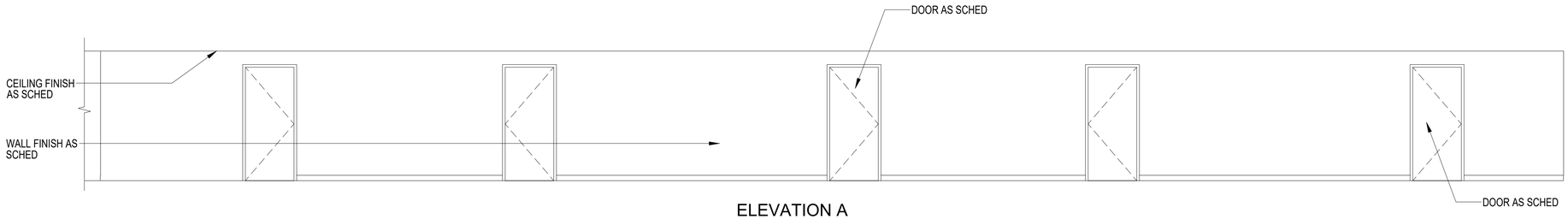


ELEVATION A

ELEVATION C

2 032 CORRIDOR 3B INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A

3 033 CORRIDOR 3C INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

BRIAN F. FUNAI
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Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - THIRD FLOOR

ENGINEERING PARTNERS		HAPRG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-420
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: AU	APPROVED BY:	DATE JUNE 2026	SHEET 102
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:36 am
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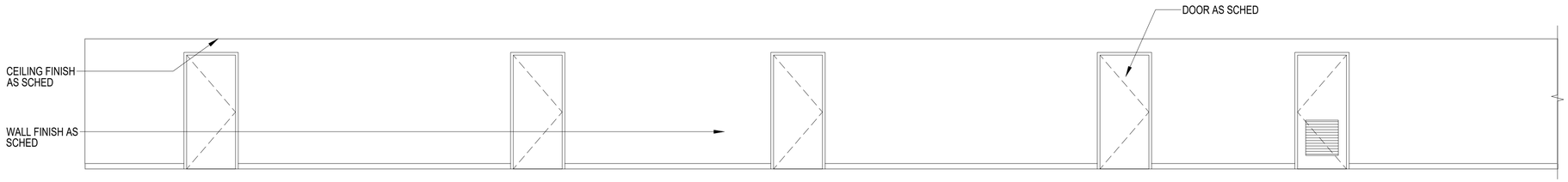
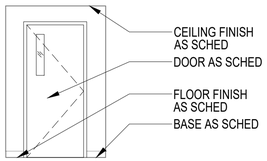


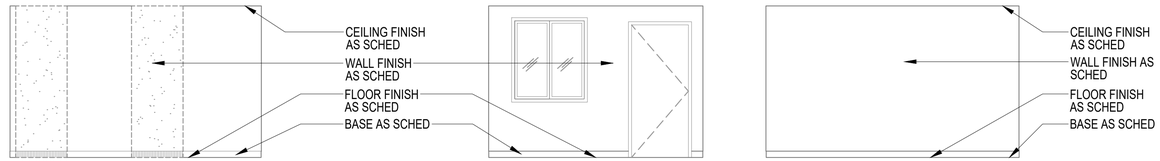
ELEVATION C



ELEVATION B

1 034 CORRIDOR 3C INTERIOR ELEVATIONS

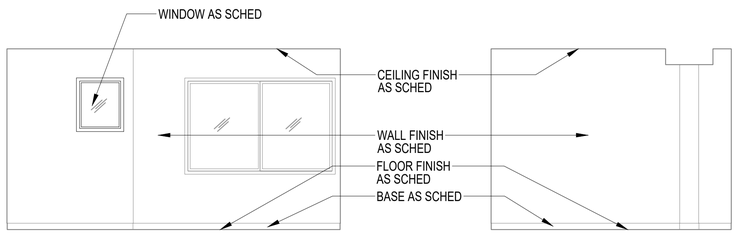
SCALE: 1/4" = 1'-0" 0 4' 8'



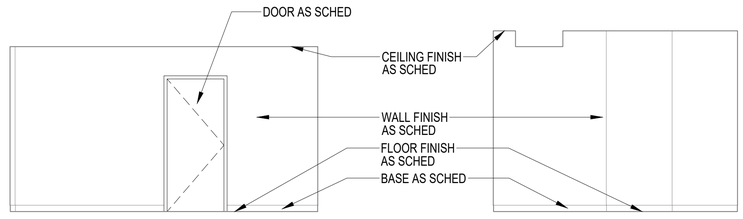
ELEVATION B ELEVATION C ELEVATION D

2 035 VESTIBULE INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



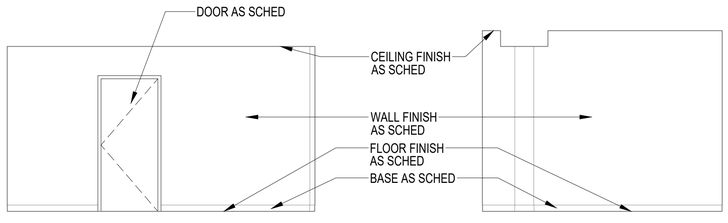
ELEVATION A ELEVATION B



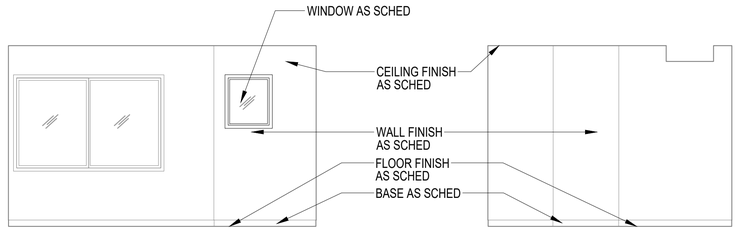
ELEVATION C ELEVATION D

3 300 OFFICE 3A INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A ELEVATION B



ELEVATION C ELEVATION D

4 301 OFFICE 3B INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - THIRD FLOOR

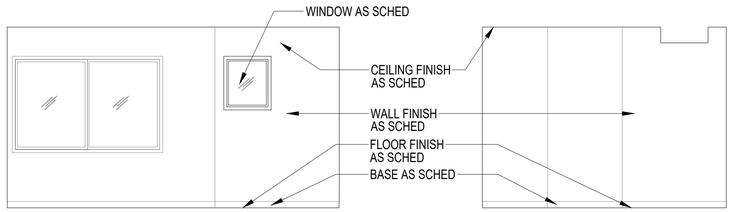
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HAARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-421
DRAWN BY: AU	APPROVED BY:	DATE JUNE 2026	SHEET 103 OF 276 SHTS
SCALE: AS NOTED			

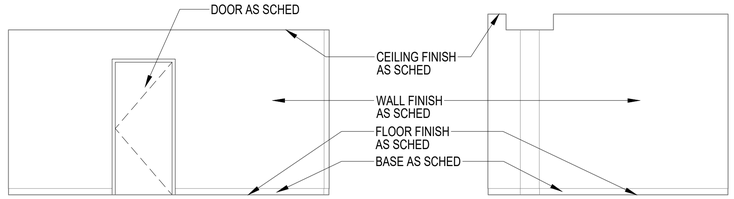
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:36 am
C:\USERS\PC_3\TEAM MANILA_DROPBOX\PJ_DROPBOX\PJ_DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\12018-25-01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-420.DWG



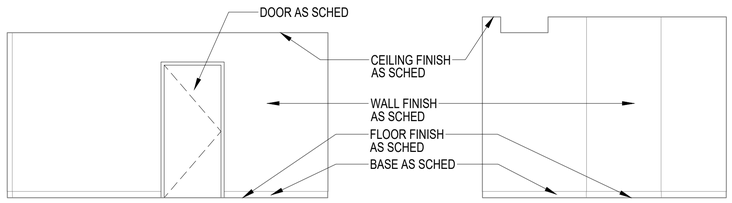
ELEVATION A ELEVATION B



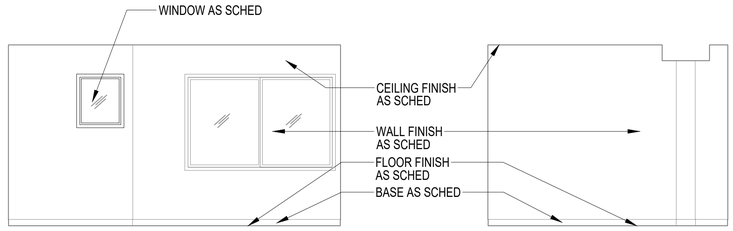
ELEVATION C ELEVATION D

1 302 OFFICE 3C INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



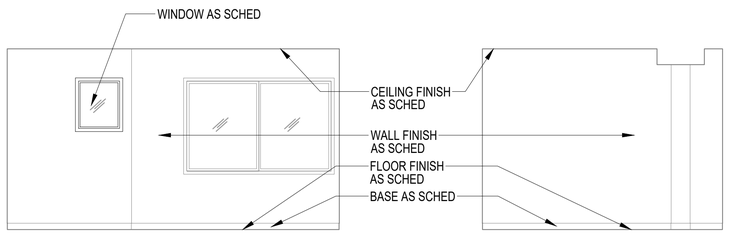
ELEVATION A ELEVATION B



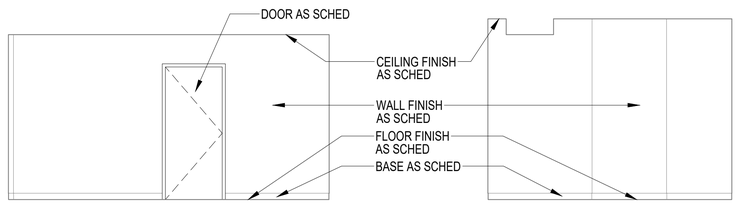
ELEVATION C ELEVATION D

2 303 OFFICE 3D INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



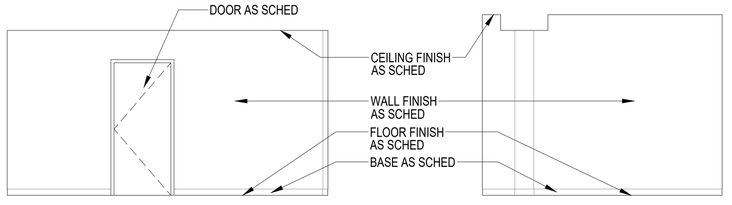
ELEVATION A ELEVATION B



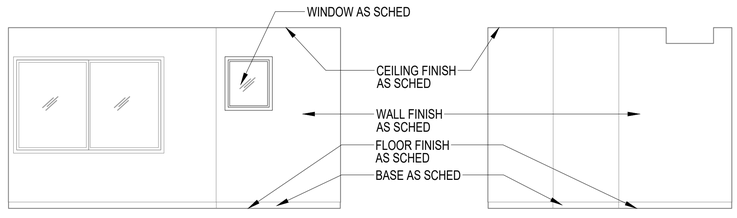
ELEVATION C ELEVATION D

3 304 OFFICE 3E INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A ELEVATION B



ELEVATION C ELEVATION D

4 305 OFFICE 3F INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - THIRD FLOOR

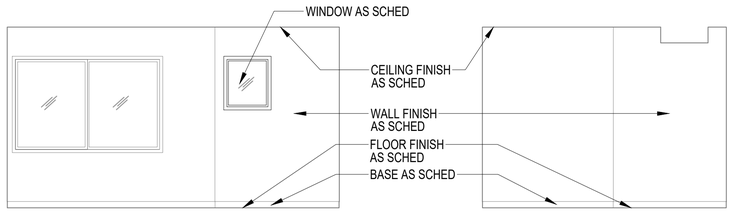
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HAPPG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-422
DRAWN BY: AU	APPROVED BY:	DATE JUNE 2026	SHEET 104
SCALE: AS NOTED			OF 276 SHTS

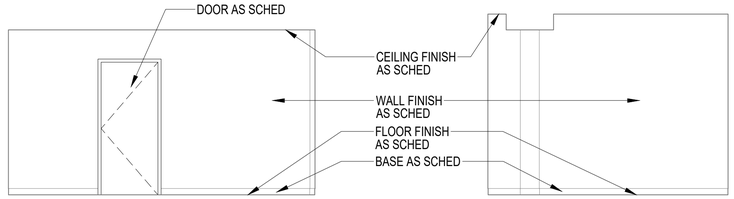
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:36 am
C:\USERS\YP...\3.TEAM MANILA_DROPBOX\YP_DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\12018-25-01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-420.DWG



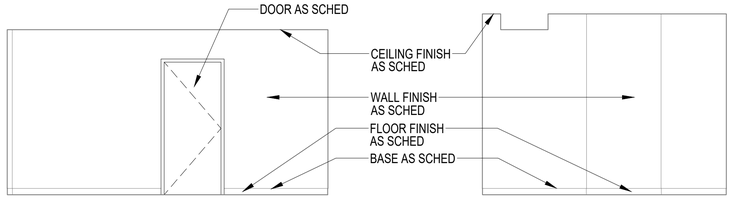
ELEVATION A ELEVATION B



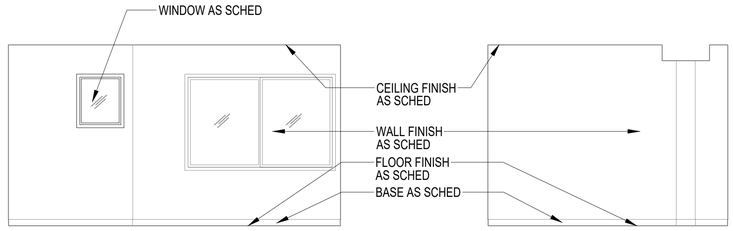
ELEVATION C ELEVATION D

1 306 OFFICE 3G INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



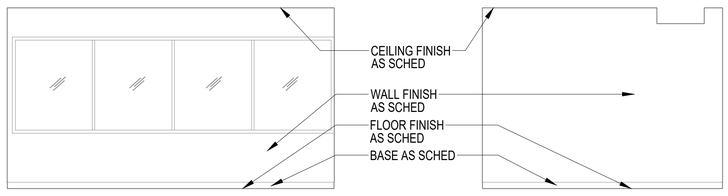
ELEVATION A ELEVATION B



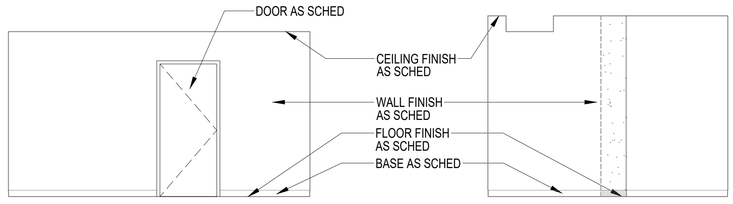
ELEVATION C ELEVATION D

2 307 OFFICE 3H INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



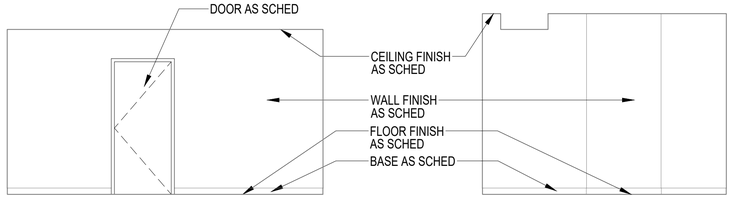
ELEVATION A ELEVATION B



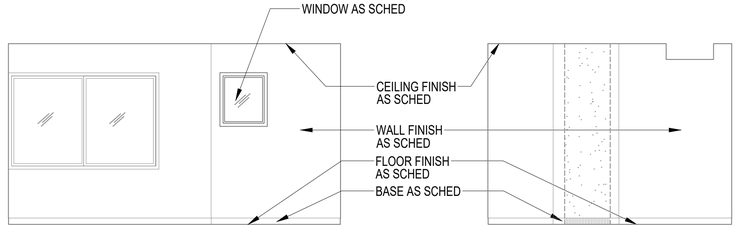
ELEVATION C ELEVATION D

3 308 OFFICE 3I INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A ELEVATION B



ELEVATION C ELEVATION D

4 309 OFFICE 3J INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - THIRD FLOOR

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HAPRG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-423
DRAWN BY: AU	APPROVED BY:	DATE JUNE 2026	SHEET 105 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:36 am
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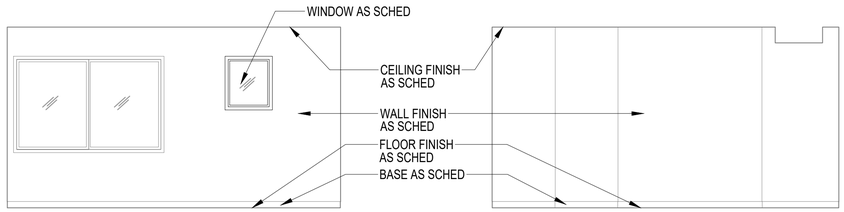
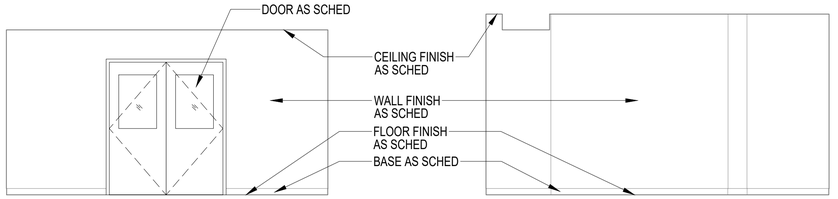


ELEVATION A



ELEVATION B

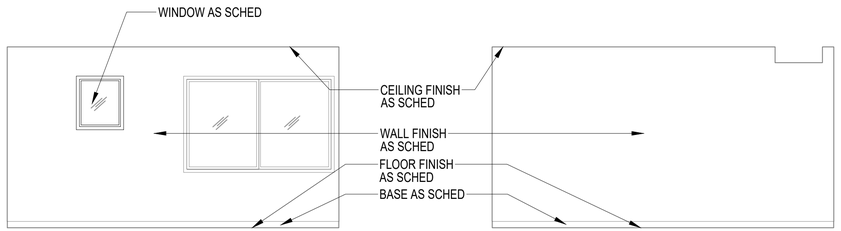
ELEVATION C

ELEVATION D

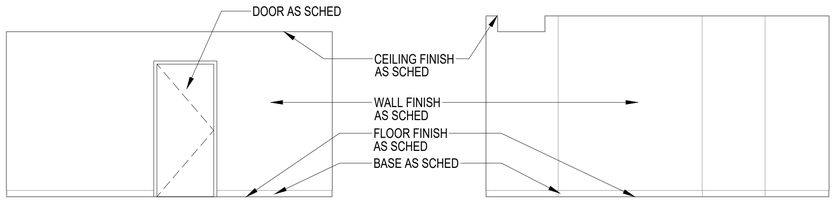
1 310 CONFERENCE 3 INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'



ELEVATION A



ELEVATION B

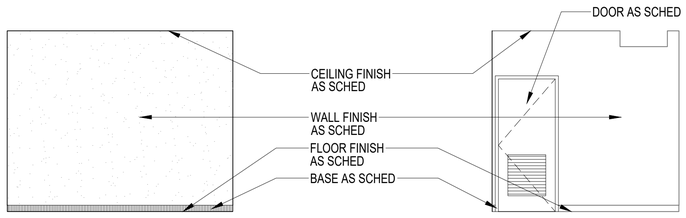
ELEVATION C

ELEVATION D

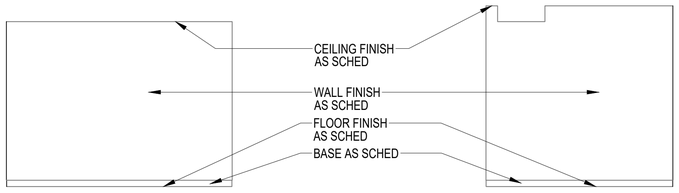
2 313 SIM LAB INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'



ELEVATION A



ELEVATION B

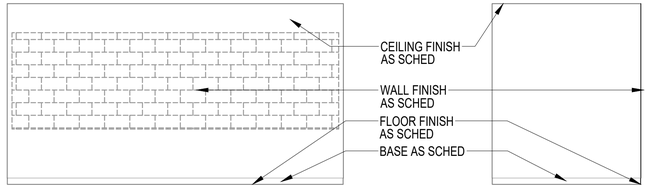
ELEVATION C

ELEVATION D

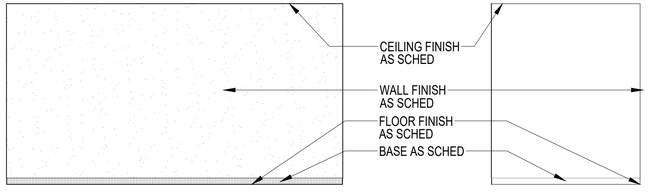
3 316 WOMEN'S LOCKER ROOM INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'



ELEVATION A



ELEVATION B

ELEVATION C

ELEVATION D

4 317 MEN'S LOCKER ROOM INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - THIRD FLOOR

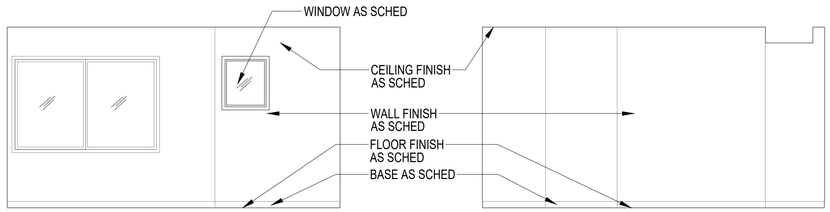
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HI&PNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-424
DRAWN BY: AU	APPROVED BY:	DATE JUNE 2026	SHEET 106
SCALE: AS NOTED			OF 276 SHTS

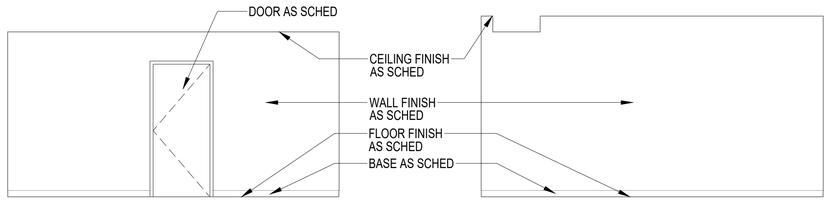
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:36 am
C:\USERS\PC.3\TEAM MANILA DROPBOX\EPI DROPBOX--PROJECTS\01 ACTIVE PROJECTS\12018-25-01 B46 MEDCOM RENOVATIONS\4-DWG\ARCH\A-420.DWG



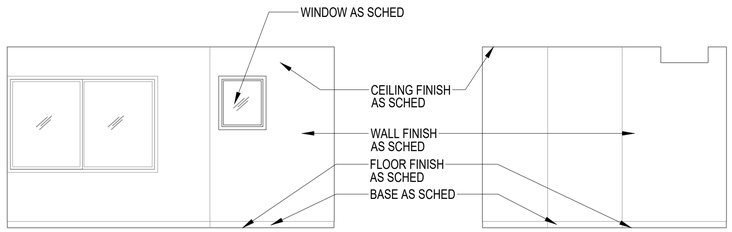
ELEVATION A ELEVATION B



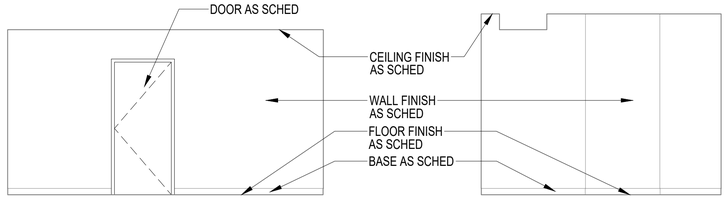
ELEVATION C ELEVATION D

1 318 OFFICE 3K INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



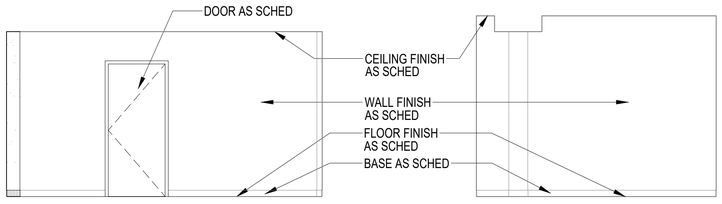
ELEVATION A ELEVATION B



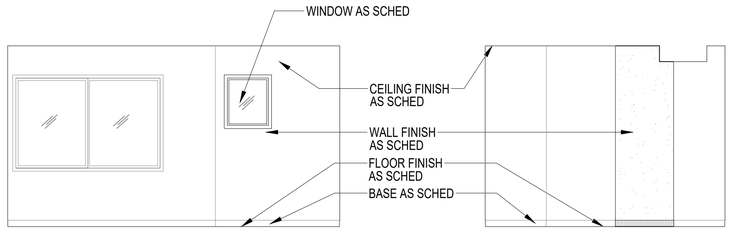
ELEVATION C ELEVATION D

2 322 OFFICE 3L INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



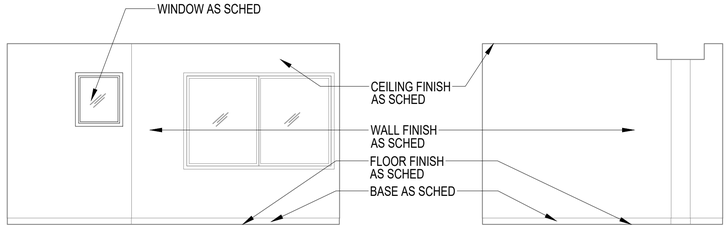
ELEVATION A ELEVATION B



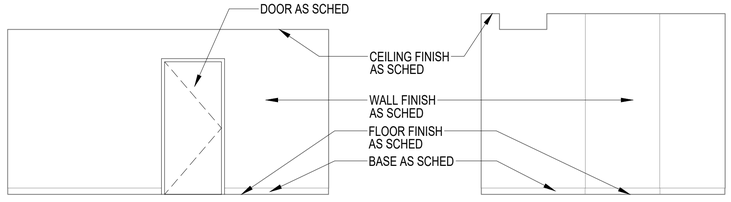
ELEVATION C ELEVATION D

3 323 OFFICE 3M INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A ELEVATION B



ELEVATION C ELEVATION D

4 324 OFFICE 3N INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - THIRD FLOOR

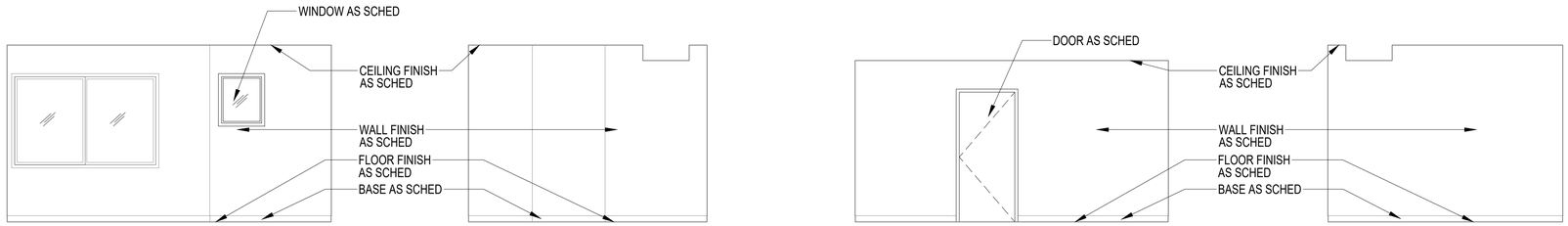
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-425
DRAWN BY: AU	APPROVED BY:	DATE: JUNE 2026	SHEET 107 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:36 am
C:\USERS\PC_3\TEAM MANUA_DROPBOX\PI_DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\12018-25-01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-420.DWG



ELEVATION A ELEVATION B ELEVATION C ELEVATION D

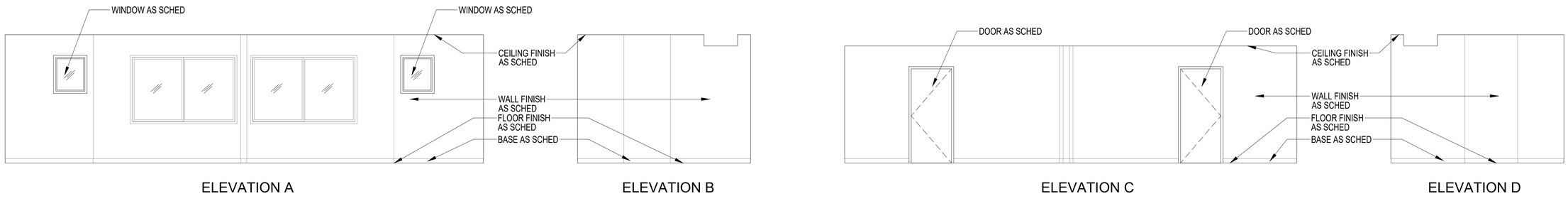
1 326 OFFICE 3Q INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

ELEVATION A ELEVATION B ELEVATION C ELEVATION D

2 325 OFFICE 3P INTERIOR ELEVATIONS

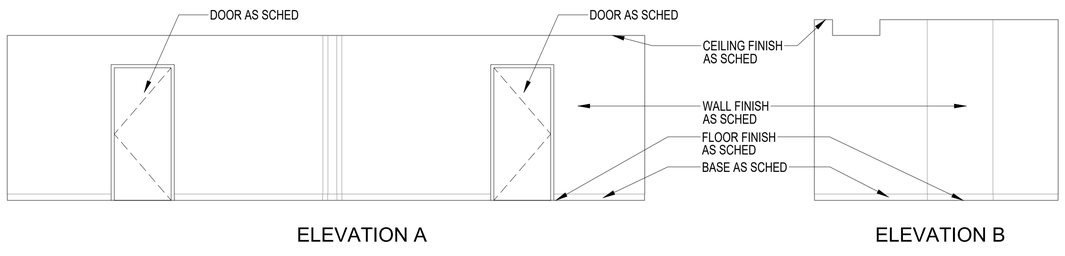
SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A ELEVATION B ELEVATION C ELEVATION D

3 326 MEDIC TRAINING ROOM INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A ELEVATION B

4 327 COMPUTER LAB INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

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BRIAN F. FUNAI LICENSED PROFESSIONAL ARCHITECT Exp. 04/30/28 No. AR-7698 HAWAII, U.S.A.

SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - THIRD FLOOR

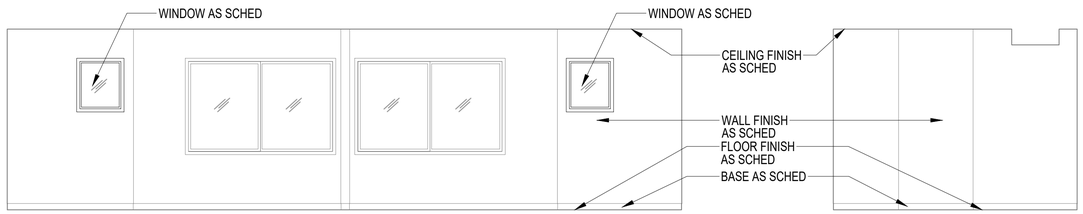
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-426
DRAWN BY: AU	APPROVED BY:	DATE: JUNE 2026	SHEET 108 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:37 am
C:\USERS\PC_3\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01 ACTIVE PROJECTS\12018-25-01 B46 MEDCOM RENOVATIONS\4-DWG\ARCH\A-420.DWG



ELEVATION C

ELEVATION D

1 327 COMPUTER LAB INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - THIRD FLOOR

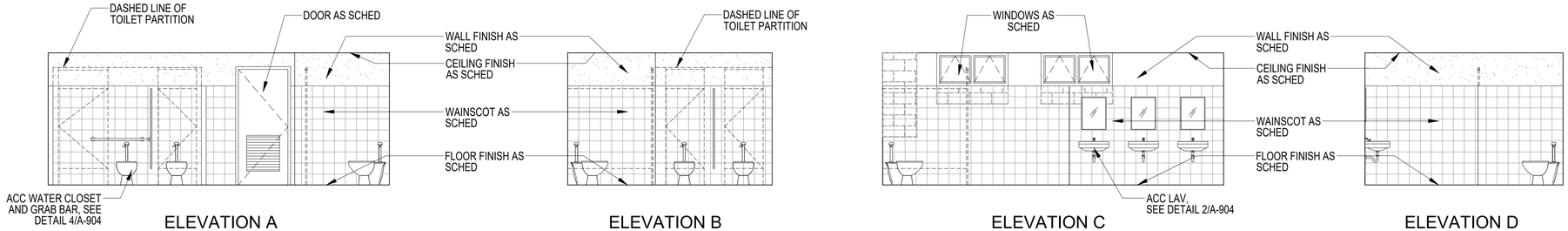
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-427
DRAWN BY: AU	APPROVED BY:	DATE: JUNE 2026	SHEET 109 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

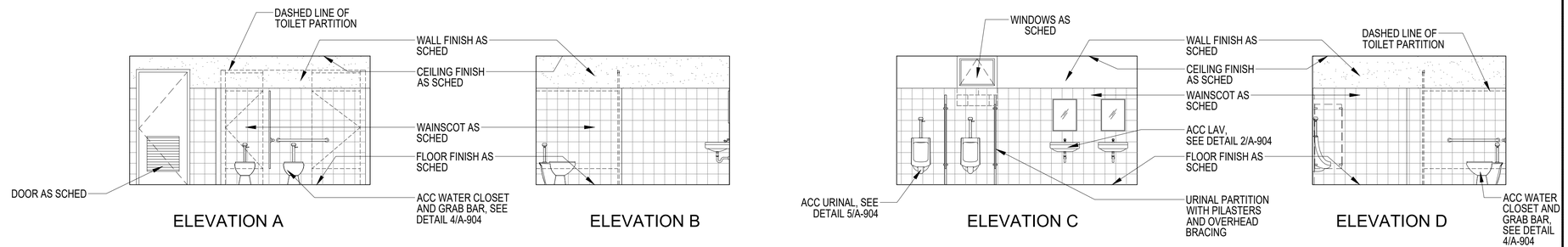
05/07/2026 10:37 am
C:\USERS\PC.3\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\12018-25-01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-420.DWG



1 115 WOMEN'S RESTROOM INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

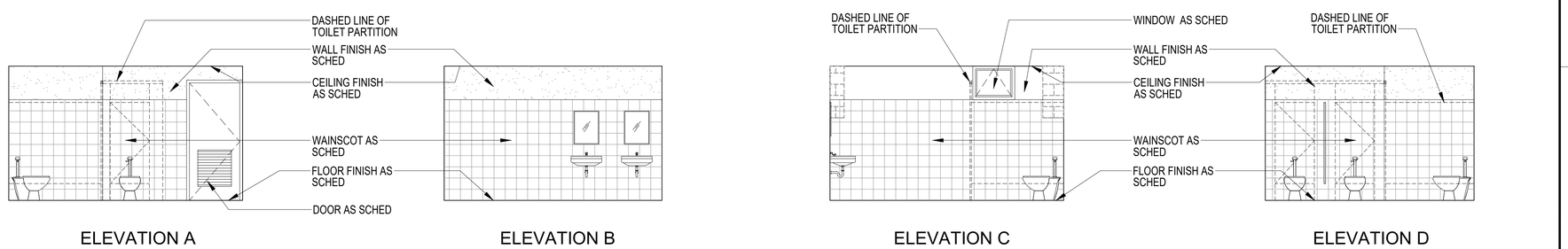
0 4' 8'



2 117 MEN'S RESTROOM INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'



3 215 WOMEN'S RESTROOM INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - RESTROOMS

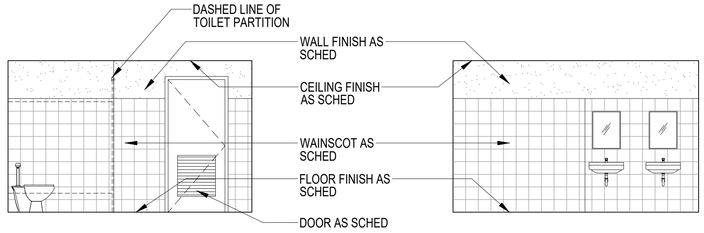
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-428
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 110 OF 276 SHTS
SCALE: AS NOTED			

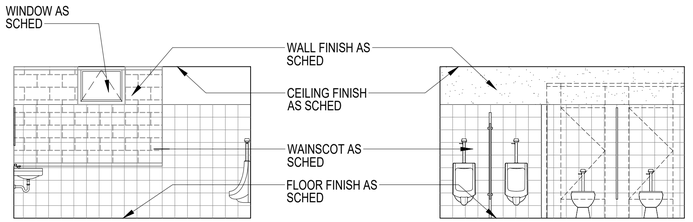
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ____

06/03/2026 12:25 pm
C:\USERS\PC_3\TEAM MANILA DROPBOX\FP\ DROPBOX--PROJECTS\01_ACTIVE_PROJECTS\2018-25-01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-428.DWG



ELEVATION A ELEVATION B

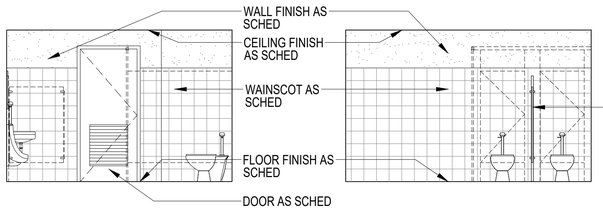


ELEVATION C ELEVATION D

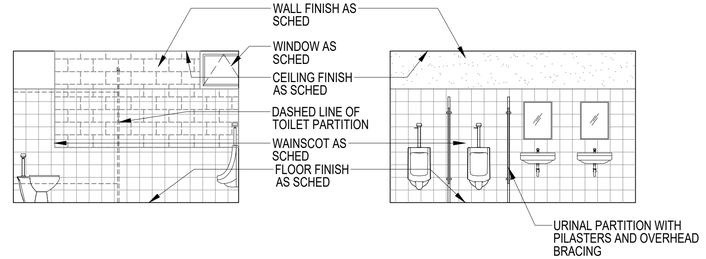
1 218 MEN'S RESTROOM INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'



ELEVATION A ELEVATION B

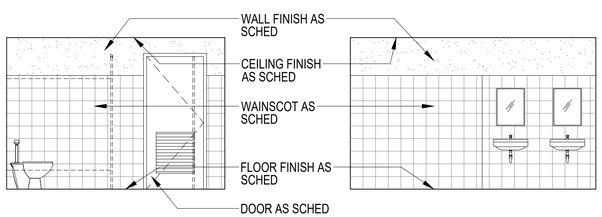


ELEVATION C ELEVATION D

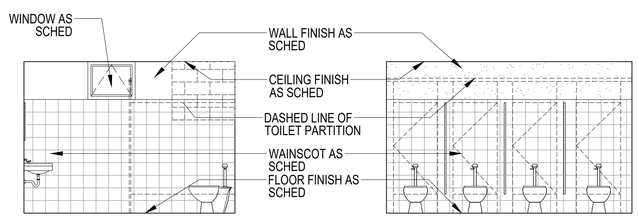
2 314 MEN'S RESTROOM INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'



ELEVATION A ELEVATION B



ELEVATION C ELEVATION D

3 319 WOMEN'S RESTROOM INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - RESTROOMS

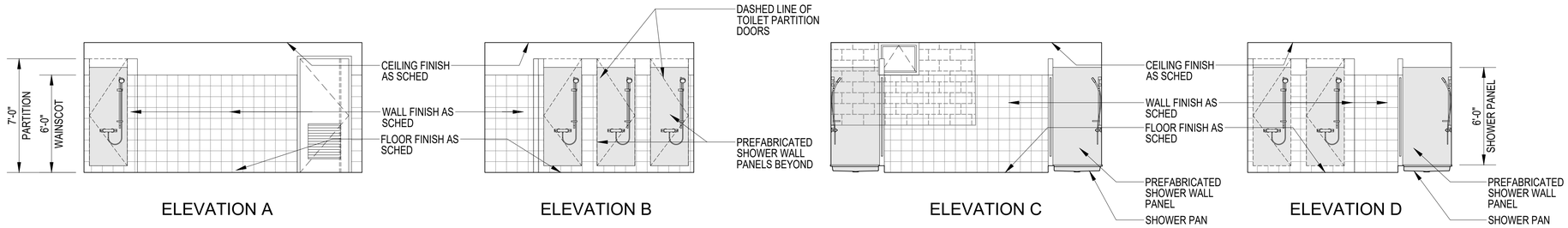
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HARNG JOB NO. FEDERAL: PN1SH000033 STATE: CA-202505-D	DRAWING NO. A-429
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 111 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

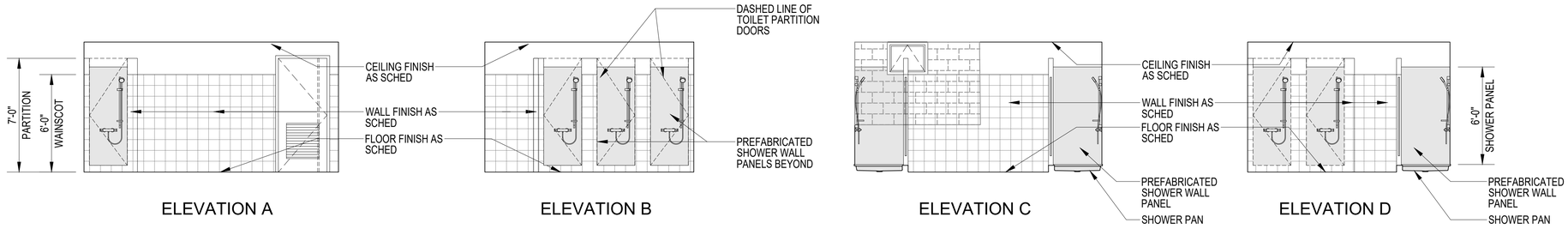
06/03/2026 12:25 pm
C:\USERS\PC_3\TEAM MANILA DROPBOX\EP| DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\2018-25-01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-429.DWG



1 320 MEN'S SHOWER ROOM INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

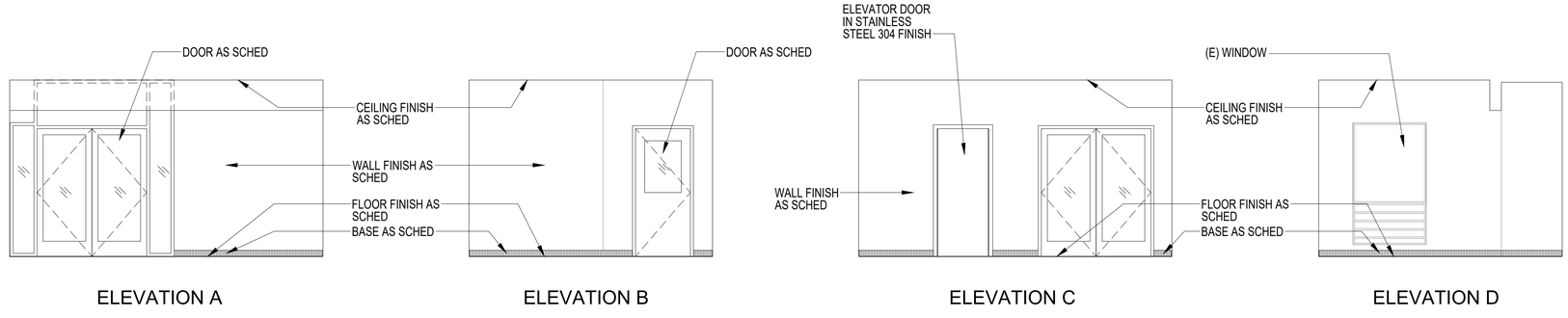
0 4' 8'



2 321 WOMEN'S SHOWER ROOM INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'



3 017 ELEV LOBBY 1 INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

0 4' 8'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - RESTROOMS, ELEV LOBBY

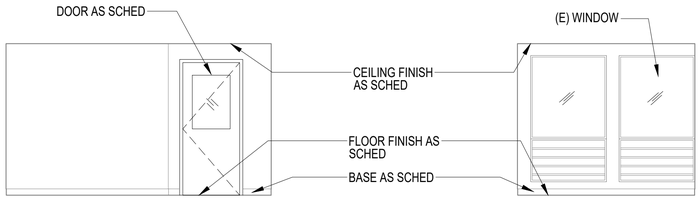
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HARNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. A-430
DRAWN BY: AP	APPROVED BY:	DATE	SHEET 112
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

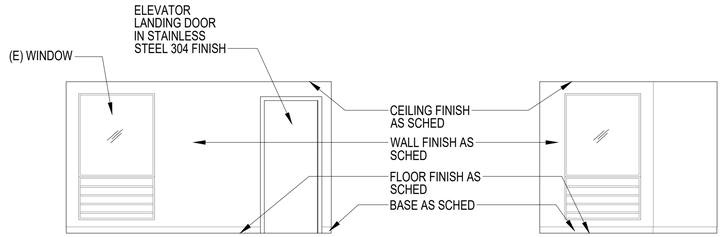
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:38 am
C:\USERS\PC_3\TEAM MANILA (DROPBOX\EP) (DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\2018-25-01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-428.DWG



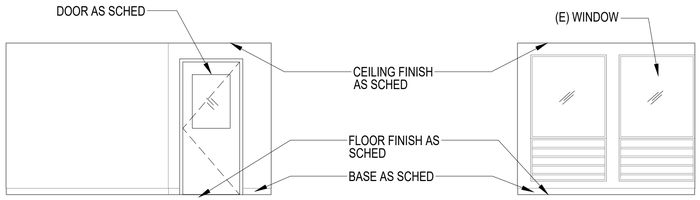
ELEVATION A ELEVATION B



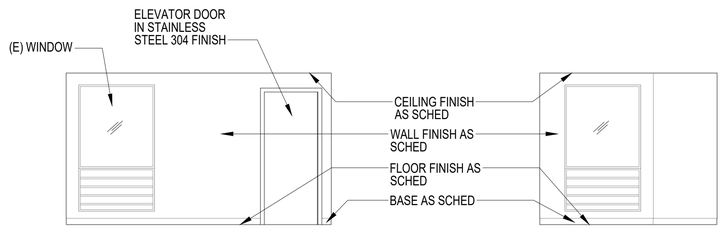
ELEVATION C ELEVATION D

1 025 ELEV LOBBY 2 INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



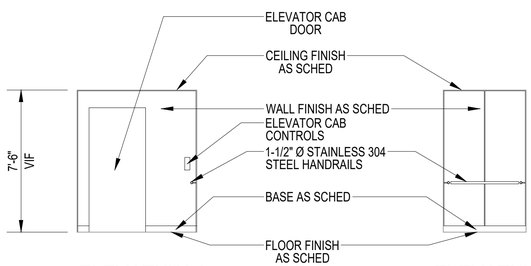
ELEVATION A ELEVATION B



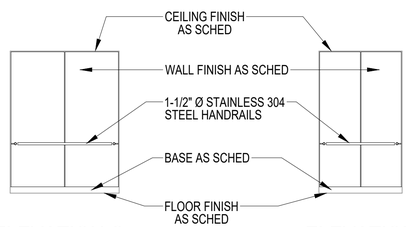
ELEVATION C ELEVATION D

2 036 ELEV LOBBY 3 INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'



ELEVATION A ELEVATION B



ELEVATION C ELEVATION D

3 ELEV CAB INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0" 0 4' 8'

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

INTERIOR ELEVATIONS - ELEV LOBBY, ELEV CAB

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. A-431
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: AP	APPROVED BY:	DATE JUNE 2026	SHEET 113
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:38 am
C:\USERS\PC_3\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\2018-25-01 B46_MEDCOM_RENOVATIONS\A-DWG\ARCH\A-428.DWG

MARK	DOOR TYPES, SEE DETAIL A/A-601	MATERIAL	THICKNESS	SIZE		FRAME ASSEMBLY FIRE RATING MINUTES & LABEL	FRAME DOOR FRAME TYPE, SEE DETAIL B/A-601	FRAME MATERIAL	DETAIL HEAD	DETAIL STRIKE JAMB	DETAIL HINGE JAMB	DETAIL THRESHOLD	HARDWARE NO.	REMARKS
				WIDTH	HEIGHT									
FIRST FLOOR														
011A	D6	MET	1-3/4"	36"	84"	-	F1	MET	2/A-602	3/A-602	3/A-602	4/A-602	003	PROVIDE ELEC RIM EXIT DEVICE, ELECTRONIC CONTROLLED ENTRY/EXIT HARDWARE, SEE HDWE SCHED
012A	D6	MET	1-3/4"	36"	84"	20	F1	MET	5/A-602	6/A-602	6/A-602	7/A-602	007	PROVIDE RIM EXIT DEVICE
014A	D6	MET	1-3/4"	36"	84"	-	F1	MET	2/A-602 SIM	3/A-602 SIM	3/A-602 SIM	4/A-602 SIM	003	PROVIDE ELEC RIM EXIT DEVICE, ELECTRONIC CONTROLLED ENTRY/EXIT HARDWARE, SEE HDWE SCHED
015A	D9	ALUM	1-3/4"	34" + SIDELITE SEE A/A-601	SEE A/A-601	-	-	ALUM	8/A-602	9/A-602	9/A-602	10/A-602	001	PROVIDE ELECTRONIC SECURITY HARDWARE, REFER TO DOOR TYPES FOR TOPLITE AND SIDELITE DIMENSIONS
016A	D2	MET	1-3/4"	36"	84"	-	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	4/A-603 SIM	015	PROVIDE WALL OR FLOOR STOP AS HDWE SCHED
016B	D2	MET	1-3/4"	36"	84"	20	F1	MET	5/A-603	6/A-603	6/A-603	4/A-603	015	PROVIDE WALL OR FLOOR STOP AS HDWE SCHED
017A	D8	ALUM	1-3/4"	2(36")	84"	-	-	ALUM	7/A-603	8/A-603	8/A-603	9/A-603	001	PROVIDE ELECTRONIC SECURITY HARDWARE
017B	D10	ALUM	1-3/4"	2(36") + SIDELITES SEE A/A-601	SEE A/A-601	20	-	ALUM	10/A-603	11/A-603	11/A-603	1/A-603	001	FOR MEETING STILE DETAIL, SEE 1/A-602 PROVIDE ELECTRONIC SECURITY HARDWARE
017C	D2	MET	1-3/4"	36"	84"	-	F1	MET	2/A-604	3/A-604	3/A-604	4/A-604	004	PROVIDE RIM EXIT DEVICE AS HDWE SCHED
018A	D4	MET	1-3/4"	34"	84"	-	F1	MET	2/A-602 SIM	11/A-602 SIM	11/A-602 SIM	4/A-602 SIM	005	
100A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	009	PROVIDE WALL STOP AS HDWE SCHED
101A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
102A	D1	MET	1-3/4"	36"	84"	45	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
102B	D1	MET	1-3/4"	36"	84"	45	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
103A	D2	MET	1-3/4"	36"	84"	45	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	009	PROVIDE WALL STOP AS HDWE SCHED
103B	D2	MET	1-3/4"	36"	84"	45	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
104A	D2	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	015	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
105A	D4	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	014	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
106A	D1	MET	1-3/4"	36"	84"	20	F1	MET	6/A-604	7/A-604	7/A-604	5/A-604	022	PROVIDE LEVER WITH OCCUPANCY INDICATOR, PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
107A	D2	MET	1-3/4"	36"	84"	-	F1	MET	8/A-604 SIM	6/A-603 SIM	6/A-603 SIM	5/A-604 SIM	015	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
108A	D1	MET	1-3/4"	36"	84"	45	F1	MET	6/A-604	7/A-604	7/A-604	5/A-604	025	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
110A	D3	MET	1-3/4"	2(36")	84"	-	F1	MET	2/A-602	11/A-602	11/A-602	13/A-604	006	PROVIDE FLUSH BOLT, SURFACE O.H. STOP, FOR MEETING STILE DETAIL, SEE 1/A-604

MARK	DOOR TYPES, SEE DETAIL A/A-601	MATERIAL	THICKNESS	SIZE		FRAME ASSEMBLY FIRE RATING MINUTES & LABEL	FRAME DOOR FRAME TYPE, SEE DETAIL B/A-601	FRAME MATERIAL	DETAIL HEAD	DETAIL STRIKE JAMB	DETAIL HINGE JAMB	DETAIL THRESHOLD	HARDWARE NO.	REMARKS
				WIDTH	HEIGHT									
FIRST FLOOR														
111A	D1	MET	1-3/4"	36"	84"	45	F1	MET	8/A-604 SIM	6/A-603 SIM	6/A-603 SIM	5/A-604 SIM	009	PROVIDE WALL STOP AS HDWE SCHED
112A	D4	MET	1-3/4"	36"	84"	-	F1	MET	9/A-604	10/A-604	10/A-604	4/A-603	012	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
113A	D1	MET	1-3/4"	36"	84"	-	F1	MET	11/A-604 SIM	12/A-604 SIM	12/A-604 SIM	4/A-603 SIM	024	PROVIDE WALL STOP AS HDWE SCHED
114A	D4	MET	1-3/4"	36"	84"	-	F1	MET	2/A-602	11/A-602	11/A-602	4/A-602	005	
115A	D4	MET	1-3/4"	36"	84"	-	F1	MET	8/A-604 SIM	6/A-603 SIM	6A-603 SIM	1/A-605 SIM	019	PROVIDE KICKPLATE AS HDWE SCHED
116A	D4	MET	1-3/4"	28"	84"	20	F1	MET	8/A-604	6/A-603	6A-603	1/A-605	011	PROVIDE WALL STOP AS HDWE SCHED
117A	D4	MET	1-3/4"	36"	84"	-	F1	MET	8/A-604 SIM	6/A-603 SIM	6A-603 SIM	1/A-605 SIM	019	PROVIDE KICKPLATE AS HDWE SCHED
118A	D1	MET	1-3/4"	36"	84"	-	F1	MET	9/A-604	10/A-604	10/A-604	4/A-603	017	PROVIDE WALL STOP AS HDWE SCHED
119A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	015	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
120A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5A-604	015	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
121A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	015	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
122A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	015	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
123A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5A-604	015	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
124A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5A-604	015	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
125A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	015	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
126A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	015	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
127A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604 SIM	015	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
127B	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	015	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
128A	D2	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5A-604	015	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED

LEGEND:

MET - METAL
ALUM- ALUMINUM
WD - WOOD
(E) - EXISTING

A DOOR SCHEDULE - FIRST FLOOR
NO SCALE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

DOOR SCHEDULE

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HARNG JOB NO, FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-501
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 114 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/30/2026 7:36 pm
C:\USERS\ADMIN\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01 ACTIVE PROJECTS\2018-25-01 846 MEDCOM RENOVATIONS\4-DWG\ARCH\A-501 DOOR SCHED.DWG

MARK	DOOR TYPES, SEE DETAIL A/A-601	MATERIAL	THICKNESS	SIZE WIDTH	SIZE HEIGHT	FRAME ASSEMBLY FIRE RATING MINUTES & LABEL	FRAME DOOR FRAME TYPE, SEE DETAIL B/A-601	FRAME MATERIAL	DETAIL HEAD	DETAIL STRIKE JAMB	DETAIL HINGE JAMB	DETAIL THRESHOLD	HARDWARE NO.	REMARKS
SECOND FLOOR														
021A	D6	MET	1-3/4"	36"	84"	-	F1	MET	2/A-602 SIM	3/A-602 SIM	3/A-602 SIM	4/A-602 SIM	003	PROVIDE ELEC RIM EXIT DEVICE, ELECTRONIC CONTROLLED ENTRY/EXIT HARDWARE, SEE HDWE SCHED
022A	D6	MET	1-3/4"	36"	84"	20	F1	MET	6/A-604	6/A-602	6/A-602	2/A-605	008	PROVIDE RIM EXIT DEVICE, PROVIDE WALL STOP, SEE HDWE SCHED
023A	D6	MET	1-3/4"	36"	84"	-	F1	MET	2/A-602 SIM	3/A-602 SIM	3/A-602 SIM	4/A-602 SIM	003	PROVIDE ELEC RIM EXIT DEVICE, ELECTRONIC CONTROLLED ENTRY/EXIT HARDWARE, SEE HDWE SCHED
025A	D2	MET	1-3/4"	36"	84"	20	F1	MET	6/A-604	7/A-604	7/A-604	4/A-603	023	PROVIDE WALL STOP AS HDWE SCHED
200A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	009	PROVIDE WALL STOP AS HDWE SCHED
201A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
202A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
203A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	009	PROVIDE WALL STOP AS HDWE SCHED
204A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	009	PROVIDE WALL STOP AS HDWE SCHED
205A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
206A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
207A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	009	PROVIDE WALL STOP AS HDWE SCHED
208A	D2	MET	1-3/4"	36"	84"	20	F1	MET	13/A-603 SIM	8/A-603 SIM	8/A-603 SIM	5/A-604 SIM	015	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
209A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
210A	D2	MET	1-3/4"	36"	84"	20	F1	MET	6/A-604	7/A-604	7/A-604	5/A-604	015	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
210B	D5	WD	1-3/4"	104"	84"	-	F1	WD	2/A-605	5-6/A-605		4/A-605	002	FOR JAMB DETAIL, SEE 6/A-605
210C	D5	WD	1-3/4"	122"	84"	-	F1	WD	2/A-605	5-6/A-605		4/A-605	002	FOR JAMB DETAIL, SEE 6/A-605
211A	D4	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	013	PROVIDE WALL STOP AS HDWE SCHED
212A	D4	MET	1-3/4"	36"	84"	F1	F1	MET	11/A-604	12/A-604	12/A-604	5/A-604	012	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
213A	D2	MET	1-3/4"	36"	84"	20	F1	MET	6A-604 SIM	7/A-604 SIM	7/A-604 SIM	5/A-604 SIM	016	PROVIDE CONCEALED O.H. STOP AS HDWE SCHED
214A	D4	MET	1-3/4"	28"	84"	20	F1	MET	8/A-604	6/A-603	6A-603	1/A-605	011	PROVIDE WALL STOP AS HDWE SCHED
215A	D4	MET	1-3/4"	36"	84"	-	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	1/A-605 SIM	019	PROVIDE KICKPLATE AS HDWE SCHED
216A	D1	MET	1-3/4"	36"	84"	20	F1	MET	6/A-604 SIM	6/A-604 SIM	6/A-604 SIM	5/A-604 SIM	010	PROVIDE CONCEALED O.H. STOP AS HDWE SCHED
217A	D2	MET	1-3/4"	36"	84"	20	F1	MET	5/A-603	6/A-603	6/A-603	5/A-604	015	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
218A	D4	MET	1-3/4"	36"	84"	-	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	020	PROVIDE KICKPLATE AND CONCEALED O.H. STOP AS HDWE SCHED
219A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	009	PROVIDE WALL STOP AS HDWE SCHED
220A	D1	MET	1-3/4"	36"	84"	20	F1	MET	5/A-603	6/A-603	6/A-603	5/A-604	010	PROVIDE CONCEALED O.H. STOP AS HDWE SCHED
221A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
222A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	009	PROVIDE WALL STOP AS HDWE SCHED
223A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	009	PROVIDE WALL STOP AS HDWE SCHED
224A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
225A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
226A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	009	PROVIDE WALL STOP AS HDWE SCHED
227A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	009	PROVIDE WALL STOP AS HDWE SCHED
228A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
229A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
230A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	009	PROVIDE WALL STOP AS HDWE SCHED

LEGEND:

MET - METAL
ALUM- ALUMINUM
WD - WOOD
(E) - EXISTING

A DOOR SCHEDULE - SECOND FLOOR
NO SCALE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

DOOR SCHEDULE

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HARNG JOB NO, FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-502
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 115 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:40 am
C:\USERS\PC 3\TEAM MANILA DROPBOX\EP\ DROPBOX--PROJECTS\01_ACTIVE_PROJECTS\12018--25--01 R46_MEDCOM_RENOVATIONS\4--DWG\ARCH\A--501 DOOR SCHED.DWG

MARK	DOOR TYPES, SEE DETAIL A/A-601	DOOR MATERIAL	DOOR THICKNESS	DOOR SIZE WIDTH	DOOR SIZE HEIGHT	FRAME ASSEMBLY FIRE RATING MINUTES & LABEL	FRAME DOOR FRAME TYPE, SEE DETAIL B/A-601	FRAME MATERIAL	DETAIL HEAD	DETAIL STRIKE JAMB	DETAIL HINGE JAMB	DETAIL THRESHOLD	HARDWARE NO.	REMARKS
THIRD FLOOR														
031A	D6	MET	1-3/4"	36"	84"	-	F1	MET	2/A-602 SIM	3/A-602 SIM	3/A-602 SIM	4/A-602 SIM	003	PROVIDE ELEC RIM EXIT DEVICE, ELECTRONIC CONTROLLED ENTRY/EXIT HARDWARE, SEE HDWE SCHED
032A	D6	MET	1-3/4"	36"	84"	20	F1	MET	6/A-604	6/A-602	6/A-602	2/A-605	008	PROVIDE RIM EXIT DEVICE, PROVIDE WALL STOP, SEE HDWE SCHED
032B	D6	MET	1-3/4"	36"	84"	-	F1	MET	5/A-603	6/A-603	6/A-603	2/A-605	015	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
033A	D6	MET	1-3/4"	36"	84"	20	F1	MET	2/A-602 SIM	3/A-602 SIM	3/A-602 SIM	4/A-602 SIM	003	PROVIDE ELEC RIM EXIT DEVICE, ELECTRONIC CONTROLLED ENTRY/EXIT HARDWARE, SEE HDWE SCHED
036A	D2	MET	1-3/4"	36"	84"	20	F1	MET	6/A-604	7/A-604	7/A-604	4/A-603	023	
300A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	009	PROVIDE WALL STOP AS HDWE SCHED
301A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
302A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
303A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	009	PROVIDE WALL STOP AS HDWE SCHED
304A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	009	PROVIDE WALL STOP AS HDWE SCHED
305A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
306A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
307A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	009	PROVIDE WALL STOP AS HDWE SCHED
308A	D1	MET	1-3/4"	36"	84"	20	F1	MET	13/A-603 SIM	8/A-603 SIM	8/A-603 SIM	5/A-604 SIM	009	PROVIDE WALL STOP AS HDWE SCHED
309A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
310A	D7	MET	1-3/4"	72"	84"	20	F1	MET	6A-604	7/A-604	7/A-604	5/A-604	018	PROVIDE FLUSH BOLT AND COORDINATOR, SEE HDWE SCHED FOR MEETING STILE DETAIL, SEE 9/A-602
311A	D4	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
312A	D4	MET	1-3/4"	36"	84"	20	F1	MET	11/A-604	12/A-604	12/A-604	5/A-604	012	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
313A	D1	MET	1-3/4"	36"	84"	20	F1	MET	6/A-604 SIM	7/A-604 SIM	7/A-604 SIM	5/A-604 SIM	016	PROVIDE CONCEALED O.H. STOP AS HDWE SCHED
314A	D4	MET	1-3/4"	36"	84"	-	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	1/A-605 SIM	020	PROVIDE KICKPLATE AND CONCEALED O.H. STOP AS HDWE SCHED
315A	D4	MET	1-3/4"	30"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	1/A-605 SIM	011	PROVIDE WALL STOP AS HDWE SCHED
316A	D4	MET	1-3/4"	36"	84"	-	F1	MET	11/A-604	12/A-604	12/A-604	5/A-604	021	PROVIDE PUSH AND PULL PLATES AND WALL STOP, SEE HDWE SCHED
317A	D4	MET	1-3/4"	36"	84"	-	F1	MET	11/A-604	12/A-604	12/A-604	5/A-604	021	PROVIDE PUSH AND PULL PLATES AND WALL STOP, SEE HDWE SCHED
318A	D1	MET	1-3/4"	36"	84"	20	F1	MET	6A-604	7/A-604	7/A-604	5/A-604	010	PROVIDE CONCEALED O.H. STOP AS HDWE SCHED
319A	D4	MET	1-3/4"	36"	84"	-	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	1/A-605 SIM	021	PROVIDE PUSH AND PULL PLATES AND WALL STOP, SEE HDWE SCHED
320A	D4	MET	1-3/4"	30"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	1/A-605 SIM	021	PROVIDE PUSH AND PULL PLATES AND WALL STOP, SEE HDWE SCHED
321A	D4	MET	1-3/4"	36"	84"	-	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	1/A-605 SIM	021	PROVIDE PUSH AND PULL PLATES AND WALL STOP, SEE HDWE SCHED
322A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
323A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
324A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	009	PROVIDE WALL STOP AS HDWE SCHED
325A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604 SIM	009	PROVIDE WALL STOP AS HDWE SCHED
326A	D1	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	009	PROVIDE WALL STOP AS HDWE SCHED
327A	D2	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603	3/A-603	3/A-603	5/A-604	015	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
327B	D2	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604	015	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
328A	D2	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604	015	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED
328B	D2	MET	1-3/4"	36"	84"	20	F1	MET	2/A-603 SIM	3/A-603 SIM	3/A-603 SIM	5/A-604	015	PROVIDE WALL STOP OR FLOOR STOP AS HDWE SCHED

LEGEND:

MET - METAL
ALUM- ALUMINUM
WD - WOOD
(E) - EXISTING

A DOOR SCHEDULE - THIRD FLOOR
NO SCALE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

DOOR SCHEDULE

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO. FEDERAL: PN1-SH00033 STATE: CA-202505-D	DRAWING NO. A-503
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 116 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~

05/07/2026 10:40 am
C:\USERS\PC_31\TEAM MANILA DROPBOX\PEPI DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\2018--25--01 846 MEDCOM_RENOVATIONS\4-DWG\ARCH\A-501 DOOR SCHED.DWG

WINDOW MARK	WINDOW TYPE	SIZE		SCRN. INSERTS	HEADER HT.	DETAILS				REMARKS
		WIDTH	HEIGHT			HEAD	JAMB	MULLION	SILL	
FIRST FLOOR										
A	W1	30"	34"	N	96"	1/A-606	1/A-606	-	2/A-606	
B	W2	30"	34"	N	96"	3/A-606	3/A-606	-	4/A-606	
B1	W2	30"	24"	N	96"	3/A-606	3/A-606	-	4/A-606	
C	W3	94"	36"	N	84"	4/A-607	3/A-607	-	5/A-607	
D	W4	49"	86"	N	106.5"	1/A-607	1/A-607	-	1/A-607	
E	W5	52"	24"	N	96"	1/A-606	1/A-606	-	2/A-606	
F	W6	76"	61"	N	96"	6/A-607	6/A-607	-	7/A-607	

WINDOW MARK	WINDOW TYPE	SIZE		SCRN. INSERTS	HEADER HT.	DETAILS				REMARKS
		WIDTH	HEIGHT			HEAD	JAMB	MULLION	SILL	
SECOND FLOOR										
A	W1	30"	34"	N	96"	1/A-606	1/A-606	-	2/A-606	
B1	W2	30"	24"	N	96"	3/A-606	3/A-606	-	4/A-606	
B	W2	30"	34"	N	96"	3/A-606	3/A-606	-	4/A-606	
H	W5	77"	34"	N	96"	1/A-606	1/A-606	-	2/A-606	
G	W6	95"	48"	N	96"	6/A-607	6/A-607	-	7/A-607	

WINDOW MARK	WINDOW TYPE	SIZE		SCRN. INSERTS	HEADER HT.	DETAILS				REMARKS
		WIDTH	HEIGHT			HEAD	JAMB	MULLION	SILL	
THIRD FLOOR										
A	W1	30"	34"	N	96"	1/A-606	1/A-606	-	2/A-606	
B1	W2	30"	24"	N	96"	3/A-606	3/A-606	-	4/A-606	
B	W2	30"	34"	N	96"	3/A-606	3/A-606	-	4/A-606	

A WINDOW AND LOUVERS SCHEDULE

NO SCALE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

WINDOW SCHEDULE

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HAWAII JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-504
BF	YWF		
DRAWN BY: AU	APPROVED BY:	DATE: JUNE 2026	SHEET 117
SCALE: AS NOTED			OF 276 SHTS

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

05/07/2026 10:44 am
C:\USERS\PC.STEAM MANILA DROPBOX\DROPBOX\EPI DROPBOX--PROJECTS\01 ACTIVE PROJECTS\12018-25-01 846 MEDCOM RENOVATIONS\4-DWG\ARCH\A-504 WINDOW SCHED.DWG

ROOM NO.	MARK & ROOM NAME	FLOOR	BASE	WALLS				CEILING	REMARKS
				A	B	C	D		
FIRST FLOOR									
010	STAIR A	F1	B1	W1	W1	W1	W1	C1	
010A	STAIR B	F1	-	-	W1	-	-	C1	
010B	STAIR C	F1	-	-	-	-	W1	C1	
011	CORRIDOR 1A	F1	B1/B4	W1/W3	-	W1/W3	W1	C1	
012	LOBBY	F1	B1/B4	W1/W3	W1	W1	W1	C1	
013	CORRIDOR 1B	F1	B1/B4	W1/W4	-	W1/W3	-	C1	
014	CORRIDOR 1C	F1	B1	W1	W1	W1	-	C1	
015	CORRIDOR 1D	F1	B1/B4	W1	W3	-	W1	C1	
016	CORRIDOR 1E	F1	B1	W1/W4	W3	W3	-	C1	
017	ELEV LOBBY 1	F2	B2	W1	W1	W1	W1	C1	
018	ELEV MACHINE RM	F1	B1	W1	W1	W1	W1	C1	
100	OFFICE 1A	F1	B1/B4	W1	W1	W1	W2	C1	
101	OFFICE 1B	F1	B1/B4	W1	W1	W1	W2	C1	
102	UNIT SUPPLY	F1	B1/B4	W1	W2	W1/W2/ W3	W2	C1	
103	MEDLOG	F1	B1/B4	W1/W2/ W3	W2	W1	W2	C1	
104	VITALS/WAITING	F1	B1/B4	W1	W1	W1	W2	C1	
105	ELEC 1B	F1	B1/B4	W1	W1	W3	W3	C1	
106	LACTATION ROOM	F2	B2	W2	W3	W2	W2/W4	C1	
107	PAD CHECK-OUT	F1	B1/B4	W1	W1	W1/W3	W3	C1	
108	STORAGE	F1	B1/B4	W1	W1	W1	W3	C1	
109	PAD OFFICE	F1	B1/B4	W1	W1	W1/W4	W1	C1	
110	ELEC 1A	F1	B1	W1	W1	W1	W1	C1	
111	MED RECORDS	F1	B1	W3	W1	W1/W4	W1	C1	
112	TELCOM 1	F1	B1	W1/W4	W1	W1	W1	C1	
113	STORAGE	F1	B1/B4	W3	W1	W1/W4	W1	C1	
114	MECHANICAL	F1	-	W1/W4	W1	W1	W1	C1	
115	WOMEN'S RESTROOM	F4	B3	W5/W6	W6	W5	W5	C1/C3	
116	JANITOR'S ROOM	F1	B3	W1	W3	W3	W3	C1	
117	MEN'S RESTROOM	F4	B3	W5/W6	W5	W6	W6	C1/C3	
118	EKG	F1	B1/B4	W4	W1	W1/W4	W1	C1	
119	IMMZ/CHOL A	F1	B1/B4	W1/W3	W1	W1	W1	C1	
120	VISION	F1	B1/B4	W1	W2	W1	W1	C1	
121	IMMZ/CHOL B	F1	B1/B4	W1/W3	W2	W1	W1	C1	
122	DENTAL	F1	B1/B4	W1	W1	W1	W2/W3	C1	
123	DENTAL	F1	B1/B4	W1	W1	W1	W2/W3	C1	
124	DENTAL XRAY	F1	B1/B4	W1	W2/W3	W1	W1	C1	
125	DENTAL XRAY	F1	B1/B4	W1	W2/W3	W1	W1	C1	
126	HEARING CHECK-IN/OUT	F1	B1/B4	W1	W1	W1	W2	C1	
127	HEARING ROOM	F1	B1/B4	W1/W2	W2	W1	W2	C1	
128	MEDIC AND DENTAL BREAK ROOM	F1	B1/B4	W1	W2	W1	W1	C1	

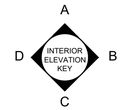
A ROOM FINISH SCHEDULE - FIRST FLOOR

NO SCALE

ROOM NO.	MARK & ROOM NAME	FLOOR	BASE	WALLS				CEILING	REMARKS
				A	B	C	D		
SECOND FLOOR									
020	STAIR A	F1	B1	W1	W1	W1	W1	C1	
020A	STAIR B	F1	-	-	W1	-	-	C1	
020B	STAIR C	F1	-	-	-	-	W1	C1	
021	CORRIDOR 2A	F1	B1/B4	W1/W3	-	W1	W1	C1	
022	CORRIDOR 2B	F1	B1/B4	W1	-	W1/W3	-	C1	
023	CORRIDOR 2C	F1	B1	W1	W1	W1	-	C1	
024	CORRIDOR 2D	F1	B1/B4	W1	W3	-	W1	C4	
025	ELEV LOBBY 2	F1	B1	W1	W1	W1	W1	C1	
200	OFFICE 2A	F1	B1/B4	W1	W1	W1	W1/W2	C1	
201	OFFICE 2B	F1	B1/B4	W1	W1	W1	W1/W2	C1	
202	OFFICE 2C	F1	B1/B4	W1	W1/W2	W1	W1	C1	
203	OFFICE 2D	F1	B1/B4	W1	W1/W2	W1	W1	C1	
204	OFFICE 2E	F1	B1/B4	W1	W1	W1	W1/W2	C1	
205	OFFICE 2F	F1	B1/B4	W1	W1	W1	W1/W2	C1	
206	OFFICE 2G	F1	B1/B4	W1	W1/W2	W1	W1	C1	
207	OFFICE 2H	F1	B1/B4	W1	W1/W2	W1	W1	C1	
208	TRAINING ROOM 2A	F1	B1/B4	W1	W1	W1/W3	W1/W2	C1	
209	OFFICE 2I	F1	B1/B4	W1	W1	W1	W1/W2	C1	
210	TRAINING ROOM 2B	F1	B1/B4	W1	W1	W1	W2	C1	
211	ELEC 2	F1	B1/B4	W1	W1	W3	W1	C1	
212	TELECOM 2	F1	B1/B4	W1	W1	W3	W1	C1	
213	TRAINING ROOM 2C	F1	B1/B4	W1	W1	W1	W2	C1	
214	JAN	F4	B3	W1	W3	W3	W1	C1	
215	WOMEN'S RESTROOM	F4	B3	W5/W6	W6	W5/W7	W5	C3	
216	OFFICE	F1	B1/B4	W2/W4	W2	W3	W2	C1	
217	BREAK ROOM	F1	B1	W1/W4	W1	W1	W3	C1	
218	MEN'S RESTROOM	F4	B3	W5/W6	W5/W6	W5/W7	W6	C3	
219	OFFICE 2J	F1	B1/B4	W1	W2	W1	W1	C1	
220	OFFICE 2K	F1	B1/B4	W1	W2	W1	W1	C1	
221	OFFICE 2L	F1	B1/B4	W1	W2	W1	W1	C3	
222	OFFICE 2M	F1	B1/B4	W1	W2/W3	W1	W1	C3	
223	OFFICE 2N	F1	B1/B4	W1	W1	W1	W2	C1	
224	OFFICE 2P	F1	B1/B4	W1	W1	W1	W2/W3	C1	
225	OFFICE 2Q	F1	B1/B4	W1	W1	W1	W1	C1	
226	OFFICE 2R	F1	B1/B4	W1	W1	W1	W2	C1	
227	OFFICE 2S	F1	B1/B4	W1	W1	W1	W2	C1	
228	OFFICE 2T	F1	B1/B4	W1	W1	W1	W1	C1	
229	OFFICE 2U	F1	B1/B4	W1	W2	W1	W1	C1	
230	OFFICE 2V	F1	B1/B4	W1	W2	W1	W1	C1	

B ROOM FINISH SCHEDULE - SECOND FLOOR

NO SCALE



FINISHES CODE

FLOOR
- F1 - RETAIN (E) FLOOR FINISH
- F2 - LUXURY VINYL TILES
- F3 - SHOWER PAN
- F4 - CERAMIC TILES

BASE
- B1 - RETAIN (E) BASE
- B2 - RUBBER BASE
- B3 - CERAMIC TILES
- B4 - BASE TO MATCH (E) ADJACENT BASE
- B5 - BRUSHED STAINLESS STEEL 304 BASE

WALL
- W1 - RETAIN (E) WALL FINISH
- W2 - REPAINT (E) WALLS
- W3 - GYPSUM WALLS IN PAINT FINISH
- W4 - CONC/CMU WALLS IN PAINT FINISH
- W5 - 6' HIGH CERAMIC TILES WAINSCOT WITH EPOXY GROUT OVER (E) WALLS, REPAINT (E) WALLS ABOVE WAINSCOT
- W6 - 6' HIGH CERAMIC TILES WAINSCOT WITH EPOXY GROUT OVER CEMENT BACKER BOARD + GYPSUM BOARD (IMPACT, MOISTURE AND MOLD RESISTANT, SMOOTH ABOVE WAINSCOT IN PAINT FINISH -
- W7 - 6' HIGH CERAMIC TILES WAINSCOT WITH EPOXY GROUT OVER CMU WALL, PAINT CMU WALLS ABOVE WAINSCOT
- W8 - PREFABRICATED SHOWER WALL PANELS
- W9 - BRUSHED STAINLESS STEEL 304 WALL PANELS

CEILING
- C1 - RETAIN (E) CEILING
- C2 - REPLACE DAMAGED GYPSUM CEILING/PROVIDE GYPSUM CEILING IN PLACE OF DEMOLISHED WALLS THEN PAINT
- C3 - GYPSUM CEILING (IMPACT, MOISTURE AND MOLD RESISTANT, SMOOTH) IN PAINT FINISH
- C4 - GYPSUM CEILING (TYPE X, SMOOTH) IN PAINT FINISH
- C5 - BRUSHED STAINLESS STEEL 304 CEILING PANELS

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ROOM FINISH SCHEDULE

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO. FEDERAL: PN1-SH00033 STATE: CA-202505-D	DRAWING NO. A-505
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 118 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~

05/07/2026 10:44 am
C:\USERS\JPC.31\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\12018--25--01 846_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-505 FINISHES SCHED.DWG

ROOM NO.	MARK & ROOM NAME	FLOOR	BASE	WALLS				CEILING	REMARKS
				A	B	C	D		
THIRD FLOOR									
030	STAIR A	F1	B1	W1	W1	W1	W1	C1	
030A	STAIR B	F1	-	-	W1	-	-	C1	
030B	STAIR C	F1	-	-	-	-	W1	C1	
031	CORRIDOR 3A	F1	B1/B4	W1/W3	-	W1	W1	C1	
032	CORRIDOR 3B	F1	B1/B4	W1/W4	-	W1/W3	-	C1	
033	CORRIDOR 3C	F1	B1	W1	W1	W1	-	C1	
034	VESTIBULE	F1	B1/B4	-	W1/W3	W1	W1	C1	
035	ELEVATOR LOBBY 3	F1	B1	W1	W1	W1	W1	C1	
300	OFFICE 3A	F1	B1/B4	W1	W1	W1	W2	C1	
301	OFFICE 3B	F1	B1/B4	W1	W1	W1	W2	C1	
302	OFFICE 3C	F1	B1/B4	W1	W2	W1	W1	C1	
303	OFFICE 3D	F1	B1/B4	W1	W2	W1	W1	C1	
304	OFFICE 3E	F1	B1/B4	W1	W1	W1	W2	C1	
305	OFFICE 3F	F1	B1/B4	W1	W1	W1	W2	C1	
306	OFFICE 3G	F1	B1/B4	W1	W2	W1	W1	C1	
307	OFFICE 3H	F1	B1/B4	W1	W2	W1	W1	C1	
308	OFFICE 3I	F1	B1/B4	W1	W1	W1	W2/W3	C1	
309	OFFICE 3J	F1	B1/B4	W1	W1	W1	W2/W3	C1	
310	CONFERENCE 3	F1	B1/B4	W1	W2	W1	W1	C1	
311	ELEC 3	F1	B1/B4	W1	W1	W3	W1	C1	
312	TELECOM 3	F1	B1/B4	W1	W1	W3	W1	C1	
313	SIM LAB	F1	B1/B4	W1	W1	W1	W2	C1	
314	MEN'S RESTROOM	F4	B3	W5	W6	W5/W7	W6	C1	
315	JANITOR'S ROOM	F4	B3	W1	W3	W3	W3	C1	
316	WOMEN'S LOCKER RM	F1	B1/B4	W3	W3	W2	W2	C1	
317	MEN'S LOCKER RM	F1	B1/B4	W4	W2	W3	W2	C1	
318	OFFICE 3K	F1	B1/B4	W1	W2	W1	W1	C1	
319	WOMEN'S RESTROOM	F4	B3	W6	W6	W5/W7	W6	C1	
320	MEN'S SHOWER RM	F4	B3	W6	W6	W5/W7	W6	C1	SEE ENLARGED PLAN DETAIL A/A-112
321	WOMEN'S SHOWER RM	F4	B3	W6	W6	W5/W7	W6	C1	SEE ENLARGED PLAN DETAIL A/A-112
322	OFFICE 3L	F1	B1/B4	W1	W2	W1	W1	C1	
323	OFFICE 3M	F1	B1/B4	W2/W3	W1	W1	W1	C1	
324	OFFICE 3N	F1	B1/B4	W1	W1	W1	W2	C1	
325	OFFICE 3P	F1	B1/B4	W1	W2	W1	W1	C1	
326	OFFICE 3Q	F1	B1/B4	W1	W2	W1	W1	C1	
327	COMPUTER LAB	F1	B1/B4	W1	W2	W1/W2	W2	C1	
328	MEDIC TRAINING ROOM	F1	B1/B4	W1/W2	W2	W1	W2	C1	
	ELEVATOR CAB								

A
D INTERIOR ELEVATION KEY B
C

FINISHES CODE

FLOOR
- F1 - RETAIN (E) FLOOR FINISH
- F2 - LUXURY VINYL TILES
- F3 - SHOWER PAN
- F4 - CERAMIC TILES

BASE
- B1 - RETAIN (E) BASE
- B2 - RUBBER BASE
- B3 - CERAMIC TILES
- B4 - BASE TO MATCH (E) ADJACENT BASE
- B5 - BRUSHED STAINLESS STEEL 304 BASE

WALL
- W1 - RETAIN (E) WALL FINISH
- W2 - REPAINT (E) WALLS
- W3 - GYPSUM WALLS IN PAINT FINISH
- W4 - CONC/CMU WALLS IN PAINT FINISH
- W5 - 6' HIGH CERAMIC TILES WAINSCOT WITH EPOXY GROUT OVER (E) WALLS, REPAINT (E) WALLS ABOVE WAINSCOT
- W6 - 6' HIGH CERAMIC TILES WAINSCOT WITH EPOXY GROUT OVER CEMENT BACKER BOARD + GYPSUM BOARD (IMPACT, MOISTURE AND MOLD RESISTANT, SMOOTH ABOVE WAINSCOT IN PAINT FINISH -
- W7 - 6' HIGH CERAMIC TILES WAINSCOT WITH EPOXY GROUT OVER CMU WALL, PAINT CMU WALLS ABOVE WAINSCOT
- W8 - PREFABRICATED SHOWER WALL PANELS
- W9 - BRUSHED STAINLESS STEEL 304 WALL PANELS

CEILING
- C1 - RETAIN (E) CEILING
- C2 - REPLACE DAMAGED GYPSUM CEILING/PROVIDE GYPSUM CEILING IN PLACE OF DEMOLISHED WALLS THEN PAINT
- C3 - GYPSUM CEILING (IMPACT, MOISTURE AND MOLD RESISTANT, SMOOTH) IN PAINT FINISH
- C4 - GYPSUM CEILING (TYPE X, SMOOTH) IN PAINT FINISH
- C5 - BRUSHED STAINLESS STEEL 304 CEILING PANELS

A ROOM FINISH SCHEDULE - THIRD FLOOR
NO SCALE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ROOM FINISH SCHEDULE

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO. FEDERAL: PN1:SH00033 STATE: CA-202505-D	DRAWING NO. A-506
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 119 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~

05/07/2026 10:45 am
C:\USERS\JPC_3\TEAM MANILA DROPBOX\EP1 DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\12018--25--01 846_MEDCOM_RENOVATIONS\4-DWG\ARCH\A--505 FINISHES SCHED.DWG

SIGN MARK	DOOR NUMBER	NUMBER/TEXTS/ SYMBOL	SIGN MATERIAL	SIGN TYPE, SEE DETAIL 1/A-608	MOUNTING CONDITION, SEE DETAIL 2/A-608	SIGN LOCATION SEE DETAIL 3/A-608	REMARKS
100 S1	100A	100 NAME OR TITLE	ACRYLIC PAPER INSERT	A2	A	A	 CONFIRM ROOM NAME OR TITLE WITH END USER
101 S2	101A	101 NAME OR TITLE	ACRYLIC PAPER INSERT	A2	A	A	 CONFIRM ROOM NAME OR TITLE WITH END USER
102 S3	102A	102 UNIT SUPPLY	ACRYLIC	A1	A	A	
102 S4	102B	102 UNIT SUPPLY	ACRYLIC	A1	A	A	
103 S5	103A	103 MEDLOG	ACRYLIC	A1	A	A	
103 S6	103B	103 MEDLOG	ACRYLIC	A1	A	A	
104 S7	104A	104 VITALS/WAITING AREA	ACRYLIC	A1	A	A	
105 S8	105A	105 ELECTRICAL ROOM	ACRYLIC	A1	A	A	
106 S9	106A	106 LACTATION ROOM	ACRYLIC	A1	A	A	
107 S10	107A	107 PAD CHECK-OUT	ACRYLIC	A1	A	A	
108 S11	108A	108 STORAGE	ACRYLIC	A1	A	A	
110 S12	110A	110 ELECTRICAL ROOM	METAL	A1	B	A	
111 S13	111A	111 MEDICAL RECORDS ROOM	ACRYLIC	A1	A	A	
112 S14	112	112 TELECOM ROOM	ACRYLIC	A1	A	A	
113 S15	113A	113 STORAGE	ACRYLIC	A1	A	A	
114 S16	114A	114 MECHANICAL ROOM	METAL	A1	B	B	

SIGN MARK	DOOR NUMBER	NUMBER/TEXTS/ SYMBOL	SIGN MATERIAL	SIGN TYPE, SEE DETAIL 1/A-608	MOUNTING CONDITION, SEE DETAIL 2/A-608	SIGN LOCATION SEE DETAIL 3/A-608	REMARKS
115 S17	115A	115 WOMEN SEE DETAIL FOR SYMBOL	ACRYLIC	B	A	A	
116 S18	116A	116 MEN SEE DETAIL FOR SYMBOL	ACRYLIC	C	A	A	
117 S19	117A	117 JANITOR'S ROOM	ACRYLIC	A1	A	A	
118 S20	118A	118 EKG	ACRYLIC	A1	A	A	
119 S21	119A	119 IMMZ/CHOL ROOM 1	ACRYLIC	A1	A	A	
120 S22	120A	120 VISION	ACRYLIC	A1	A	A	
121 S23	121A	121 IMMZ/CHOL ROOM 2	ACRYLIC	A1	A	A	
122 S24	122A	122 DENTAL	ACRYLIC	A1	A	A	
123 S25	123A	123 DENTAL	ACRYLIC	A1	A	A	
124 S26	124A	124 DENTAL X-RAY	ACRYLIC	A1	A	A	
125 S27	125A	125 DENTAL X-RAY	ACRYLIC	A1	A	A	
126 S28	126A	126 HEARING CHECK-IN/CHECK-OUT	ACRYLIC	A1	A	A	
127 S29	127A	127 HEARING ROOM	ACRYLIC	A1	A	A	
127 S30	127B	127 HEARING ROOM	ACRYLIC	A1	A	A	
128 S31	128A	127 MEDIC AND DENTAL BREAKROOM	ACRYLIC	A1	A	A	

A SIGNAGE SCHEDULE - FIRST FLOOR
NO SCALE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

SIGNAGE SCHEDULE-FIRST FLOOR

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HMRNG JOB NO. FEDERAL: PN:1SH00033	DRAWING NO.
BF	YWF	STATE: CA-202505-D	A-507
DRAWN BY:	APPROVED BY:	DATE	SHEET
AP			120
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~

05/07/2026 11:09 am
C:\USERS\PC 31\TEAM MANILA DROPBOX\EPI DROPBOX--PROJECTS\01_ACTIVE_PROJECTS\2018--25--01 846_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-507 SIGNAGE SCHED.DWG

SIGN MARK	DOOR NUMBER	NUMBER/TEXTS/ SYMBOL	SIGN MATERIAL	SIGN TYPE, SEE DETAIL 1/A-608	MOUNTING CONDITION, SEE DETAIL 2/A-608	SIGN LOCATION SEE DETAIL 3/A-608	REMARKS
200	200A	200	ACRYLIC	A2	A	A	
S32		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
201	201A	201	ACRYLIC	A2	A	A	
S33		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
202	202A	202	ACRYLIC	A2	A	A	
S34		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
203	203A	203	ACRYLIC	A2	A	A	
S35		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
204	204A	204	ACRYLIC	A2	A	A	
S36		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
205	205A	205	ACRYLIC	A2	A	A	
S37		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
206	206A	206	ACRYLIC	A2	A	A	
S38		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
207	207A	207	ACRYLIC	A2	A	A	
S39		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
208	208A	208	ACRYLIC	A1	A	A	
S40		TRAINING ROOM 1					
209	209A	209	ACRYLIC	A2	A	A	
S41		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
210	210A	210	ACRYLIC	A1	A	A	
S42		TRAINING ROOM 2					
211	211A	211	ACRYLIC	A1	A	A	
S43		ELECTRICAL ROOM					
212	212A	212	ACRYLIC	A1	A	A	
S44		TELECOM ROOM					
213	213A	213	ACRYLIC	A1	A	A	
S45		TRAINING ROOM 3					
214	214A	214	ACRYLIC	A1	A	A	
S46		JANITOR'S ROOM					
215	215A	215	ACRYLIC	G	A	A	
S47		WOMEN					
		SEE DETAIL FOR SYMBOL					

SIGN MARK	DOOR NUMBER	NUMBER/TEXTS/ SYMBOL	SIGN MATERIAL	SIGN TYPE, SEE DETAIL 1/A-608	MOUNTING CONDITION, SEE DETAIL 2/A-608	SIGN LOCATION SEE DETAIL 3/A-608	REMARKS
216	216A	216	ACRYLIC	A2	A	B	
S48		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
217	217A	210	ACRYLIC	A1	A	A	
S49		BREAK ROOM					
218	218A	218	ACRYLIC	F	A	A	
S50		MEN					
219	219A	219	ACRYLIC	A2	A	B	
S51		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
220	220A	220	ACRYLIC	A2	A	B	
S52		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
221	221A	221	ACRYLIC	A2	A	B	
S53		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
222	222A	222	ACRYLIC	A2	A	B	
S54		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
223	223A	223	ACRYLIC	A2	A	B	
S55		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
224	224A	224	ACRYLIC	A2	A	B	
S56		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
225	225A	225	ACRYLIC	A2	A	B	
S57		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
226	226A	226	ACRYLIC	A2	A	B	
S58		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
227	227	227	ACRYLIC	A2	A	B	
S59		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
228	228A	228	ACRYLIC	A2	A	B	
S60		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
229	229	229	ACRYLIC	A2	A	B	
S60		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
230	230A	230	ACRYLIC	A2	A	B	
S62		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
026	026A	025	ACRYLIC	A1	A	A	
S63		ELEVATOR LOBBY 2					

A SIGNAGE SCHEDULE - SECOND FLOOR

NO SCALE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

SIGNAGE SCHEDULE-SECOND FLOOR

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-508
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 121 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 11:09 am
C:\USERS\PC 3\TEAM MANUA DROPBOX\LEPI DROPBOX--PROJECTS\01 ACTIVE_PROJECTS\2018--25--01 B46_MEDCOM_RENOVATIONS\14--DWG\ARCH\A--507 SIGNAGE SCHED.DWG

SIGN MARK	DOOR NUMBER	NUMBER/TEXTS/ SYMBOL	SIGN MATERIAL	SIGN TYPE, SEE DETAIL 1/A-608	MOUNTING CONDITION, SEE DETAIL 2/A-608	SIGN LOCATION SEE DETAIL 3/A-608	REMARKS
300 S64	300A	300	ACRYLIC	A2	A	A	
		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
301 S65	301A	301	ACRYLIC	A2	A	A	
		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
302 S66	302A	302	ACRYLIC	A2	A	A	
		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
303 S67	303A	303	ACRYLIC	A2	A	A	
		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
304 S68	304A	304	ACRYLIC	A2	A	A	
		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
305 S69	305A	305	ACRYLIC	A2	A	A	
		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
306 S70	306A	306	ACRYLIC	A2	A	A	
		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
307 S71	307A	307	ACRYLIC	A2	A	A	
		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
308 S72	308A	308	ACRYLIC	A2	A	A	
		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
309 S73	309A	309	ACRYLIC	A2	A	A	
		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
310 S74	310A	310	ACRYLIC	A1	A	A	
		CONFERENCE ROOM					
311 S75	311A	310	ACRYLIC	A1	A	A	
		ELECTRICAL ROOM					
312 S76	312A	310	ACRYLIC	A1	A	A	
		TELECOM ROOM					
313 S77	312A	313	ACRYLIC	A1	A	A	
		SIMULATION LABORATORY					
314 S78	314A	314	ACRYLIC	F	A	A	
		MEN					
		SEE DETAIL FOR SYMBOL					
315 S79	315A	315	ACRYLIC	A1	A	A	
		JANITOR'S ROOM					

SIGN MARK	DOOR NUMBER	NUMBER/TEXTS/ SYMBOL	SIGN MATERIAL	SIGN TYPE, SEE DETAIL 1/A-608	MOUNTING CONDITION, SEE DETAIL 2/A-608	SIGN LOCATION SEE DETAIL 3/A-608	REMARKS
316 S80	316A	316	ACRYLIC	A1	A	A	
		WOMEN'S LOCKER ROOM					
317 S81	317A	317	ACRYLIC	A1	A	A	
		MEN'S LOCKER ROOM					
318 S82	318A	318	ACRYLIC	A2	A	A	
		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
319 S83	319A	319	ACRYLIC	G	A	A	
		WOMEN					
		SEE DETAIL FOR SYMBOL					
320 S84	320A	320	ACRYLIC	E	A	A	
		MEN'S SHOWER ROOM					
		SEE DETAIL FOR SYMBOL					
321 S85	321A	321	ACRYLIC	D	A	A	
		WOMEN'S SHOWER ROOM					
		SEE DETAIL FOR SYMBOL					
322 S86	322A	322	ACRYLIC	A2	A	A	
		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
323 S87	323A	323	ACRYLIC	A2	A	A	
		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
324 S88	324A	324	ACRYLIC	A2	A	A	
		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
325 S89	325A	325	ACRYLIC	A2	A	A	
		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
326 S90	326A	326	ACRYLIC	A2	A	A	
		NAME OR TITLE	PAPER INSERT				CONFIRM ROOM NAME OR TITLE WITH END USER
327 S91	327A	327	ACRYLIC	A1	A	A	
		COMPUTER LABORATORY					
327 S92	327B	327	ACRYLIC	A1	A	A	
		COMPUTER LABORATORY					
328 S93	328A	328	ACRYLIC	A1	A	A	
		MEDIC TRAINING ROOM					
328 S94	328B	328	ACRYLIC	A1	A	A	
		MEDIC TRAINING ROOM					
035 S95	035A	025	ACRYLIC	A1	A	A	
		ELEVATOR LOBBY 2					

A SIGNAGE SCHEDULE - THIRD FLOOR
NO SCALE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

SIGNAGE SCHEDULE-THIRD FLOOR

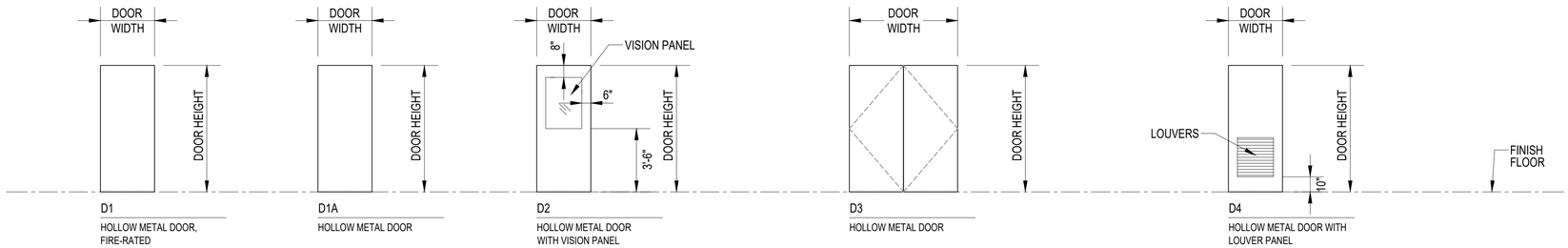
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO. FEDERAL: PN1:SH00033 STATE: CA-202505-D	DRAWING NO. A-509
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 122 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~

05/07/2026 11:09 am
C:\USERS\JR.31\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\12018--25--01 846_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-507 SIGNAGE SCHED.DWG



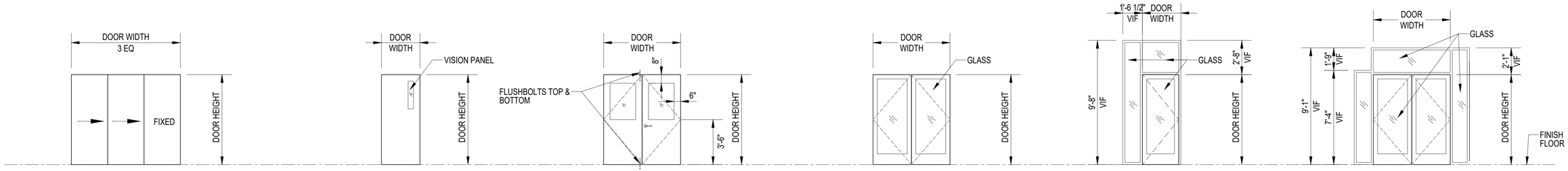
D1
HOLLOW METAL DOOR, FIRE-RATED

D1A
HOLLOW METAL DOOR

D2
HOLLOW METAL DOOR WITH VISION PANEL

D3
HOLLOW METAL DOOR

D4
HOLLOW METAL DOOR WITH LOUVER PANEL



D5
WOOD SLIDING DOORS

D6
HOLLOW METAL DOOR WITH VISION PANEL

D7
HOLLOW METAL DOOR WITH VISION PANELS

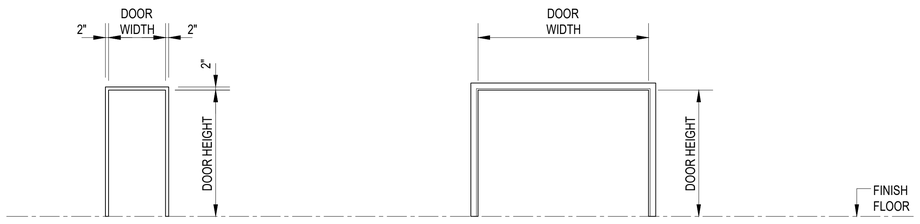
D8
ALUMINUM FRAMED STOREFRONT DOOR, TO MATCH (E)

D9
ALUMINUM FRAMED STOREFRONT DOOR WITH TOPLITE AND SIDELITE, TO MATCH (E)

D10
ALUMINUM FRAMED STOREFRONT DOOR, TO MATCH (E)

A DOOR TYPES

SCALE: 1/4" = 1'-0" 0 4' 8'



F1
HOLLOW METAL DOOR FRAME

F2
WOOD DOOR FRAME, SEE DETAILS, 4/A-604 AND 5/A-604

B DOOR FRAME

SCALE: 1/4" = 1'-0" 0 4' 8'

DOOR/GLAZING NOTES :

1. PROVIDE TEMPERED GLAZING AS REQUIRED PER 2024 IBC, SECTION 2406
2. PROVIDE GLAZING CONFORMING TO IECC 2021. NO DOORS ARE TO BE ORDERED UNTIL MANUFACTURER/SUPPLIER HAS PROVIDED DOCUMENTATION THAT DOORS MEET IECC 2021 REQUIREMENTS.
3. PROVIDE DUAL LOW "E" GLAZING, TYPICAL AT GLAZED DOORS. GLAZING TO PROVIDE A MAX OF 0.24 SHGC.
4. CONTRACTOR TO PROVIDE MFGR'S SPECIFICATIONS FOR APPROVAL PRIOR TO ORDER OR START OF ANY WORK.
5. EGRESS DOORS TO BE OPENABLE FROM EGRESS SIDE WITHOUT THE USE OF A KEY OR SPECIAL KNOWLEDGE PER IBC SECTION 1010.2.
6. THE UNLATCHING OF ANY DOOR OR LEAF FOR EGRESS MUST REQUIRE NOT MORE THAN ONE MOTION IN A SINGLE LINEAR OR ROTATIONAL DIRECTION TO RELEASE ALL LATCHING AND ALL LOCKING DEVICES PER IBC SECTION 1010.2.1
7. LOCKS AND LATCHES MUST BE PERMITTED TO PREVENT OPERATION OF DOORS WHERE ANY OF THE FOLLOWING EXIST PER IBC SECTION 1010.2.4:

IN BUILDINGS IN OCCUPANCY GROUP B, THE MAIN DOOR OR DOORS ARE PERMITTED TO BE EQUIPPED WITH KEY-OPERATED LOCKING DEVICES FROM THE EGRESS SIDE PROVIDED :

THE LOCKING DEVICE IS READILY DISTINGUISH-ABLE AS LOCKED.

A READILY VISIBLE DURABLE SIGN IS POSTED ON THE EGRESS SIDE ON OR ADJACENT TO THE DOOR STATING: THIS DOOR TO REMAIN UNLOCKED WHEN THIS SPACE IS OCCUPIED. THE SIGN MUST BE IN LETTERS 1 INCH (25 MM) HIGH ON A CONTRASTING BACKGROUND.

THE USE OF THE KEY-OPERATED LOCKING DEVICE IS REVOCABLE BY THE BUILDING OFFICIAL FOR DUE CAUSE.

8. MANUALLY OPERATED FLUSH BOLTS OR SURFACE BOLTS ARE NOT PERMITTED PER IBC SECTION 1010.2.5.

EXCEPTIONS:

WHERE A PAIR OF DOORS SERVES A STORAGE OR EQUIPMENT ROOM, MANUALLY OPERATED EDGE- OR SURFACE-MOUNTED BOLTS ARE PERMITTED ON THE INACTIVE LEAF.

WHERE A PAIR OF DOORS SERVES AN OCCUPANT LOAD OF LESS THAN 50 PERSONS IN A GROUP B OCCUPANCY, MANUALLY OPERATED EDGE- OR SURFACE-MOUNTED BOLTS ARE PERMITTED ON THE INACTIVE LEAF. THE INACTIVE LEAF MUST NOT CONTAIN DOORKNOBS, PANIC BARS OR SIMILAR OPERATING HARDWARE.

9. EXTERIOR DOORS MUST COMPLY WITH STANDARD 12 OF UFC 4-010-01: DOD MINIMUM ANTI-TERRORISM STANDARDS FOR BUILDINGS. GLAZED EXTERIOR DOORS MUST COMPLY WITH STANDARD 10.

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
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HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

DOOR TYPES, DOOR FRAME AND DOOR DETAILS, WINDOW TYPES

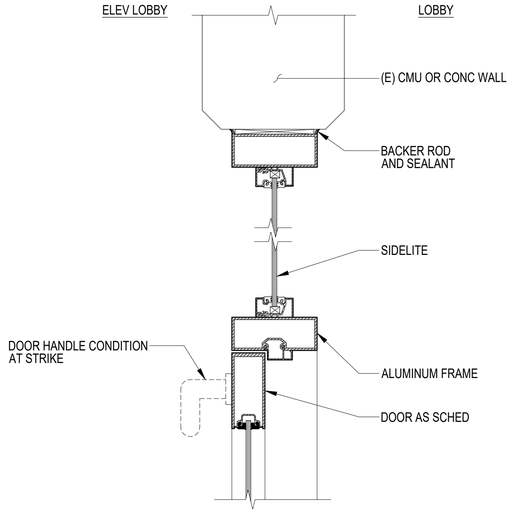
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO, FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-601
DRAWN BY: AP	APPROVED BY:	DATE JUNE 2026	SHEET 123 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

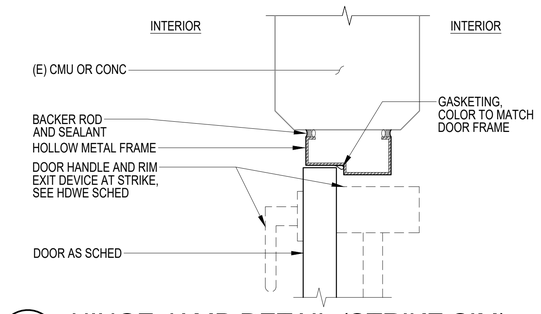
DATE ISSUED: ---

05/07/2026 11:00 am
C:\USERS\PC.13\TEAM MANILA DROPBOX\PH DROPBOX--PROJECTS\01_ACTIVE_PROJECTS\12018-25-01 846_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-601 DOOR TYPES AND DETAILS.DWG



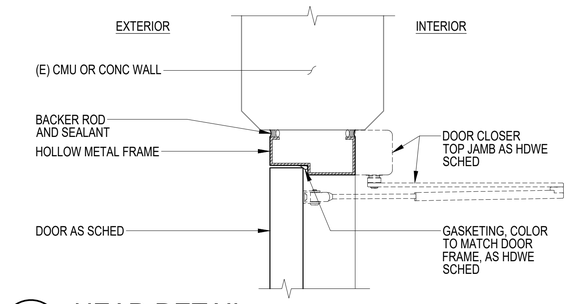
9 HINGE JAMB DETAIL (STRIKE SIM)

SCALE: 3" = 1'-0" 0 3" 6" 9"



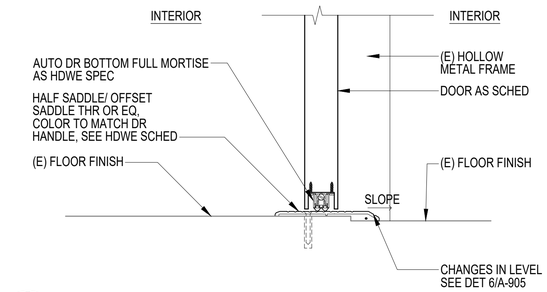
6 HINGE JAMB DETAIL (STRIKE SIM)

SCALE: 3" = 1'-0" 0 3" 6" 9"



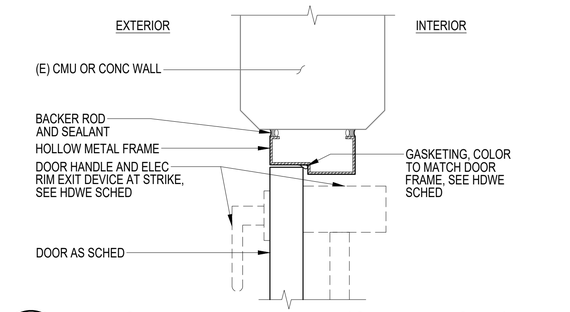
2 HEAD DETAIL

SCALE: 3" = 1'-0" 0 3" 6" 9"



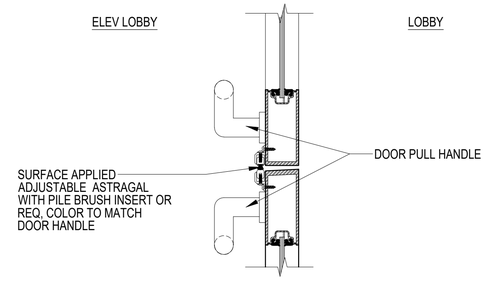
7 THRESHOLD DETAIL

SCALE: 3" = 1'-0" 0 3" 6" 9"



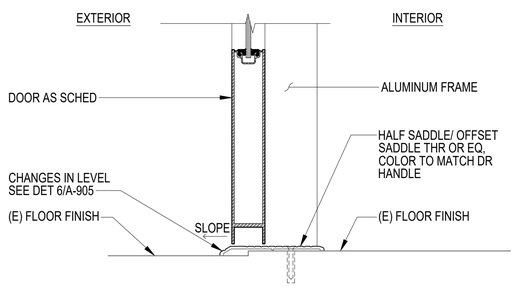
3 HINGE JAMB DETAIL (STRIKE SIM)

SCALE: 3" = 1'-0" 0 3" 6" 9"



1 MEETING STILE

SCALE: 3" = 1'-0" 0 3" 6" 9"



10 THRESHOLD DETAIL

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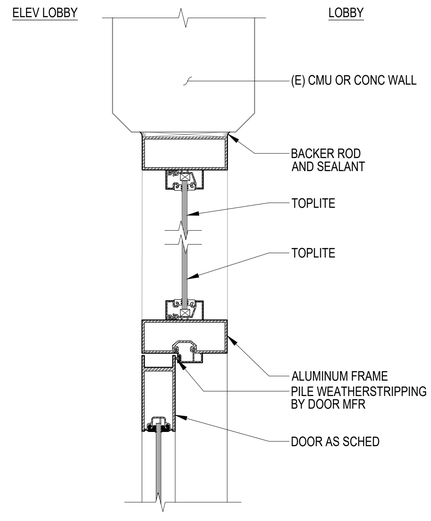

8 HEAD DETAIL

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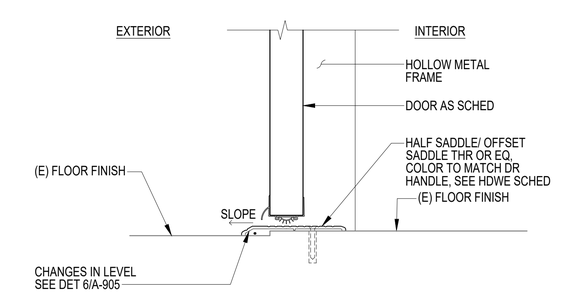

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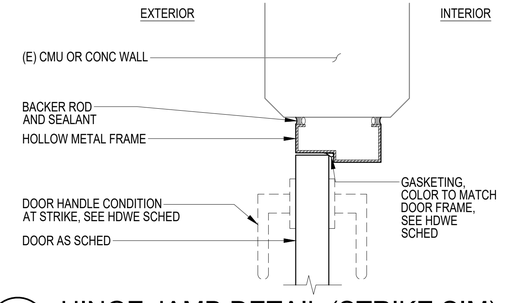
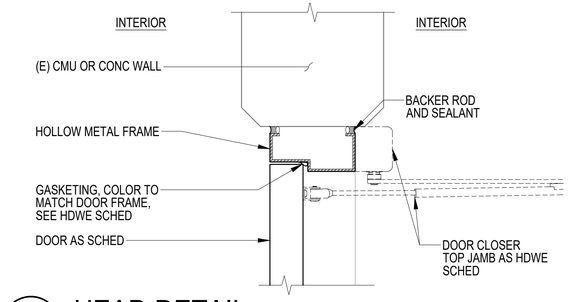


11 HINGE JAMB DETAIL (STRIKE SIM)

SCALE: 3" = 1'-0" 0 3" 6" 9"



5 HEAD DETAIL

SCALE: 3" = 1'-0" 0 3" 6" 9"

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7696
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

DOOR DETAILS

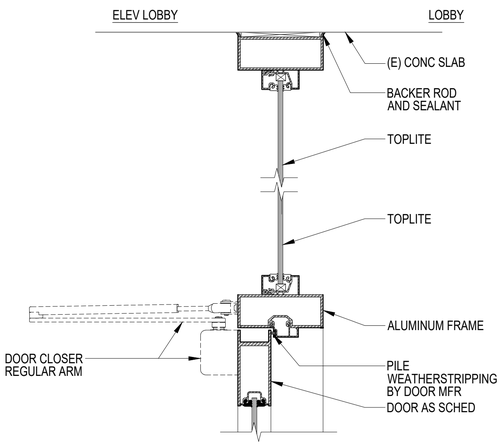
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-602
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 124 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 11:00 am
C:\USERS\PC-3\TEAM MANUA DROPBOX\LEPI DROPBOX-PROJECTS\01 ACTIVE_PROJECTS\12018-25-01 B46_MEDCOM_RENOVATIONS\4-BWG\ARCH\A-601 DOOR TYPES AND DETAILS.DWG



10 HEAD DETAIL
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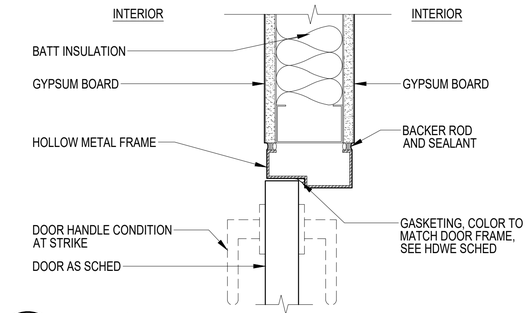

6 HINGE JAMB DETAIL (STRIKE SIM)
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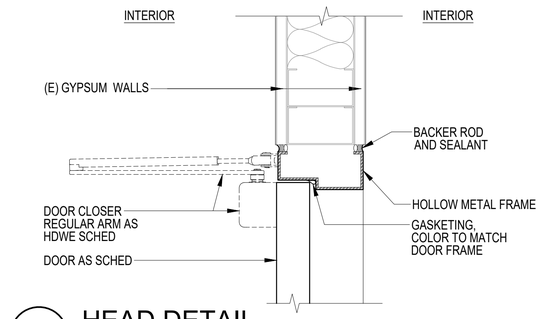

2 HEAD DETAIL
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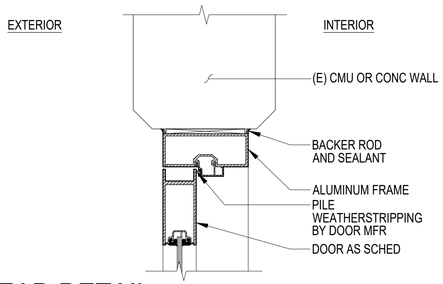

7 HEAD DETAIL
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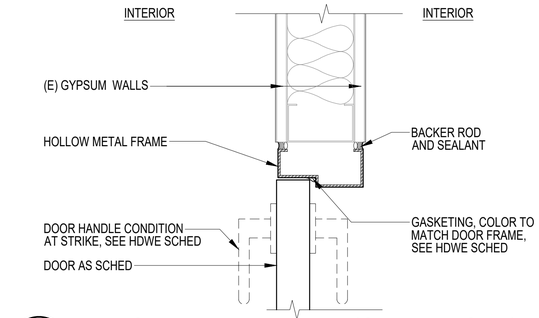

3 HINGE JAMB DETAIL (STRIKE SIM)
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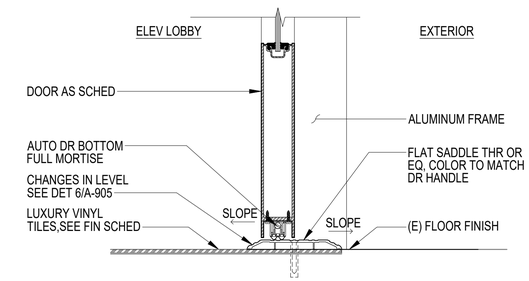

1 THRESHOLD DETAIL
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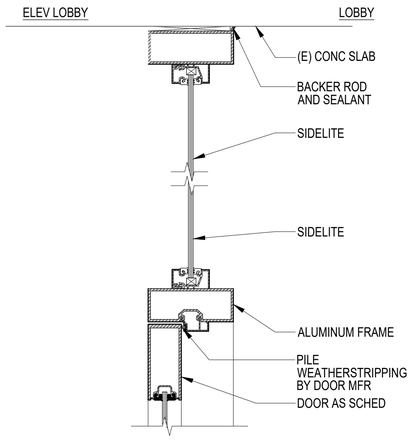

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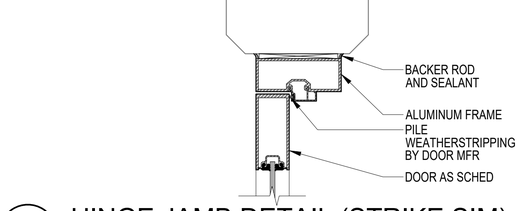
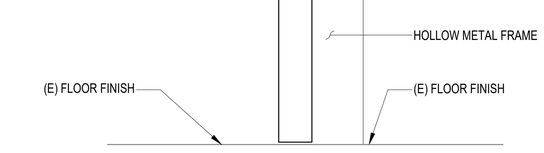
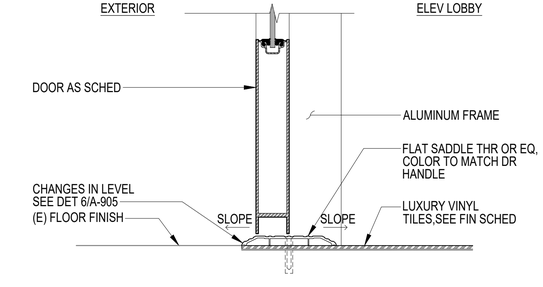


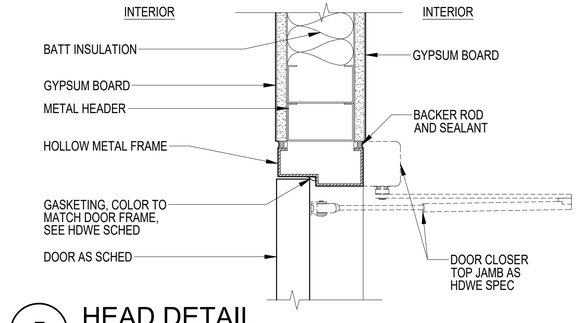
8 HINGE JAMB DETAIL (STRIKE SIM)
SCALE: 3" = 1'-0" 0 3" 6" 9"



4 THRESHOLD DETAIL
SCALE: 3" = 1'-0" 0 3" 6" 9"



9 THRESHOLD DETAIL
SCALE: 3" = 1'-0" 0 3" 6" 9"



5 HEAD DETAIL
SCALE: 3" = 1'-0" 0 3" 6" 9"

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

DOOR DETAILS

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

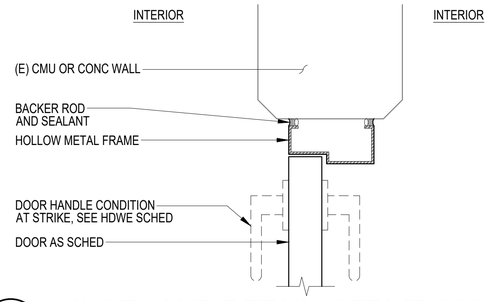
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HARNG JOB NO. FEDERAL: PN1:5H00033 STATE: CA-202505-D	DRAWING NO. A-603
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 125 OF 276 SHTS
SCALE: AS NOTED			

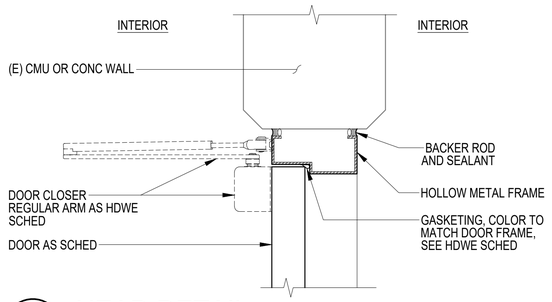
DATE ISSUED: ~~~

OF _____ DRAWER _____ FOLDER _____

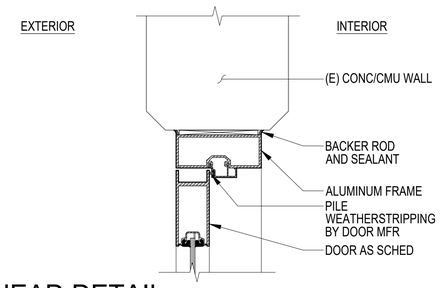
05/07/2026 11:01 am
C:\USERS\PC 31\TEAM MANILA DROPBOX\EPI DROPBOX--PROJECTS\01_ACTIVE_PROJECTS\2018--25--01 R46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-601 DOOR TYPES AND DETAILS.DWG



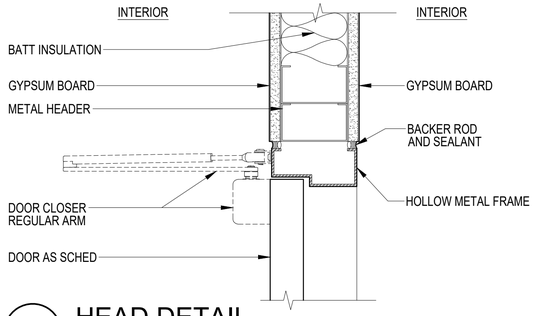
10 HINGE JAMB DETAIL (STRIKE SIM)
SCALE: 3" = 1'-0" 0 3" 6" 9"



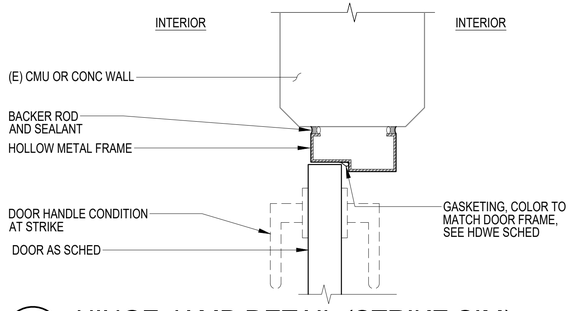
6 HEAD DETAIL
SCALE: 3" = 1'-0" 0 3" 6" 9"



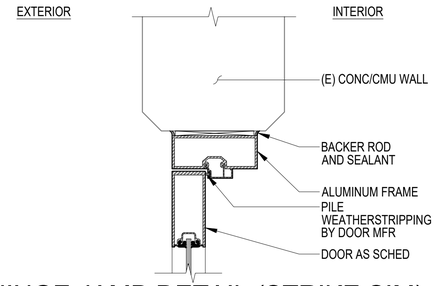
2 HEAD DETAIL
SCALE: 3" = 1'-0" 0 3" 6" 9"



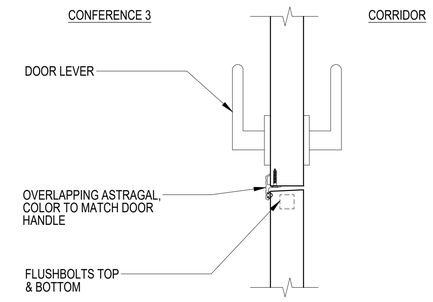
11 HEAD DETAIL
SCALE: 3" = 1'-0" 0 3" 6" 9"



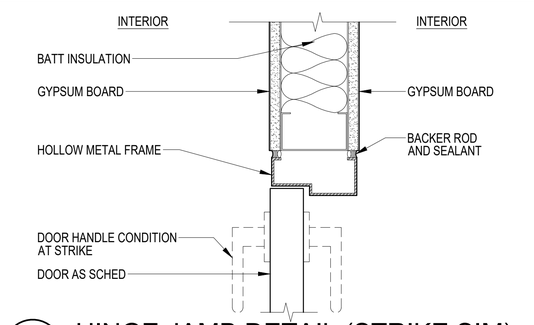
7 HINGE JAMB DETAIL (STRIKE SIM)
SCALE: 3" = 1'-0" 0 3" 6" 9"



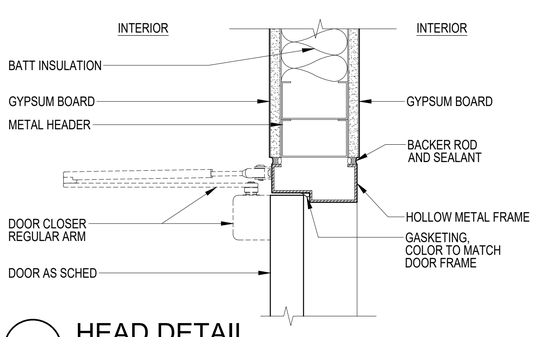
3 HINGE JAMB DETAIL (STRIKE SIM)
SCALE: 3" = 1'-0" 0 3" 6" 9"



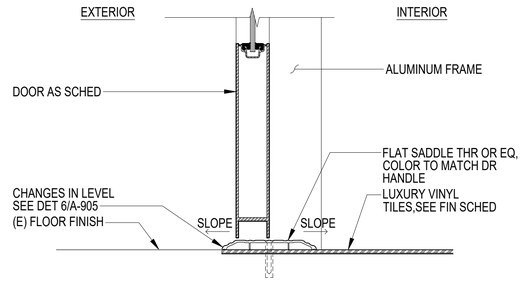
1 MEETING STILE
SCALE: 3" = 1'-0" 0 3" 6" 9"



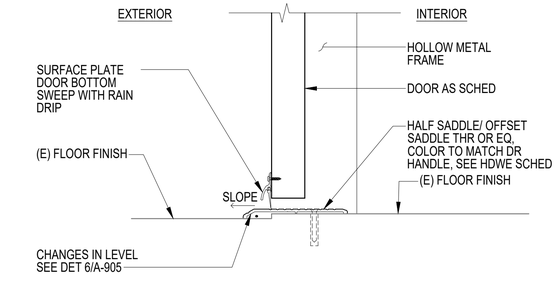
12 HINGE JAMB DETAIL (STRIKE SIM)
SCALE: 3" = 1'-0" 0 3" 6" 9"



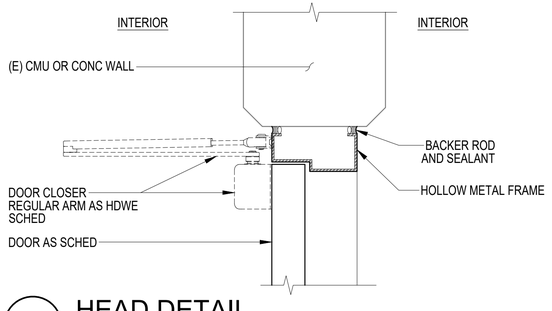
8 HEAD DETAIL
SCALE: 3" = 1'-0" 0 3" 6" 9"



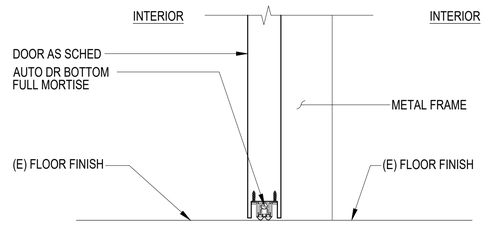
4 THRESHOLD DETAIL
SCALE: 3" = 1'-0" 0 3" 6" 9"



13 THRESHOLD DETAIL
SCALE: 3" = 1'-0" 0 3" 6" 9"



9 HEAD DETAIL
SCALE: 3" = 1'-0" 0 3" 6" 9"



5 THRESHOLD DETAIL
SCALE: 3" = 1'-0" 0 3" 6" 9"

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

DOOR DETAILS

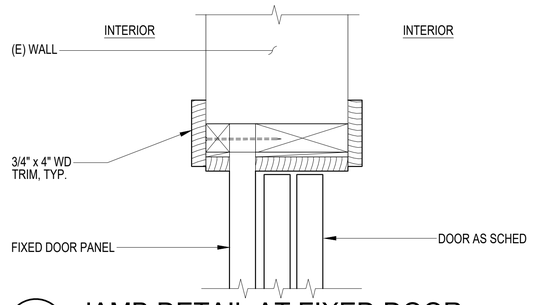
ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-604
BF	YWF		
DRAWN BY: AP	APPROVED BY:	DATE JUNE 2026	SHEET 126 OF 276 SHTS
SCALE: AS NOTED			

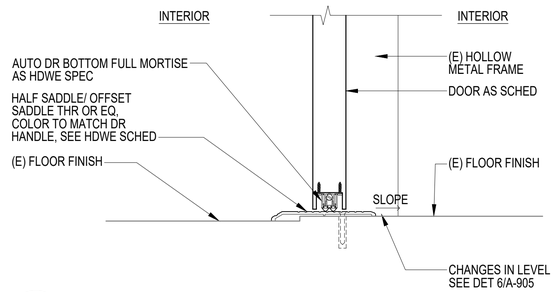
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

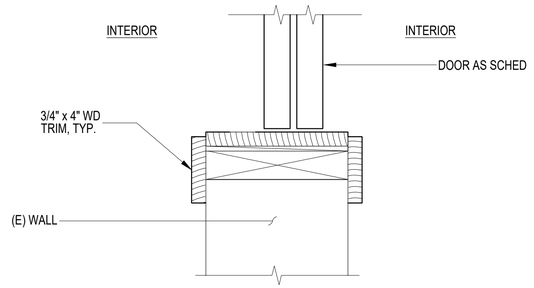
05-07-2026 11:01 am
C:\USERS\PC 3\TEAM MANILA DROPBOX\EPI DROPBOX—PROJECTS\01 ACTIVE PROJECTS\2018-25-01 846 MEDCOM RENOVATIONS\4-DWG\ARCH\A-601 DOOR TYPES AND DETAILS.DWG



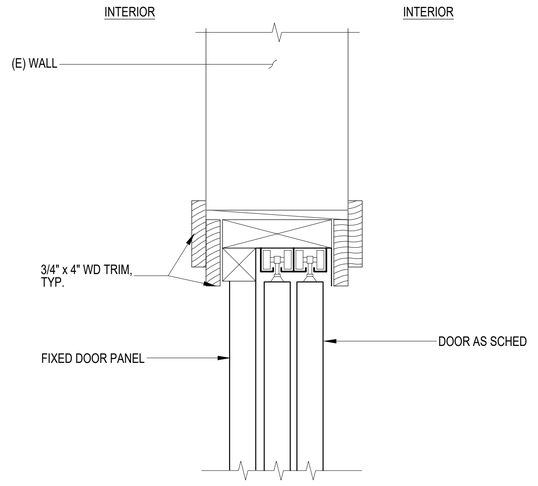
5 JAMB DETAIL AT FIXED DOOR
SCALE: 3" = 1'-0" 0 3" 6" 9"



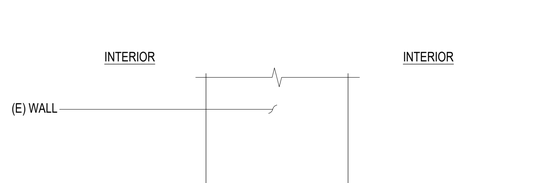
2 THRESHOLD DETAIL
SCALE: 3" = 1'-0" 0 3" 6" 9"



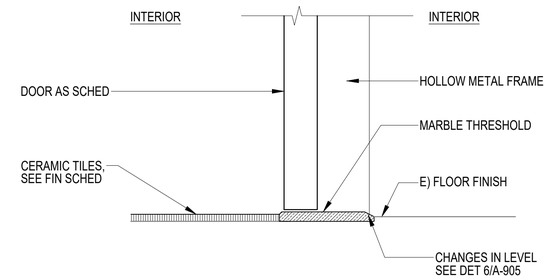
6 JAMB DETAIL
SCALE: 3" = 1'-0" 0 3" 6" 9"



3 HEAD DETAIL
SCALE: 3" = 1'-0" 0 3" 6" 9"



4 THRESHOLD DETAIL
SCALE: 3" = 1'-0" 0 3" 6" 9"



1 THRESHOLD DETAIL
SCALE: 3" = 1'-0" 0 3" 6" 9"

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

DOOR DETAILS

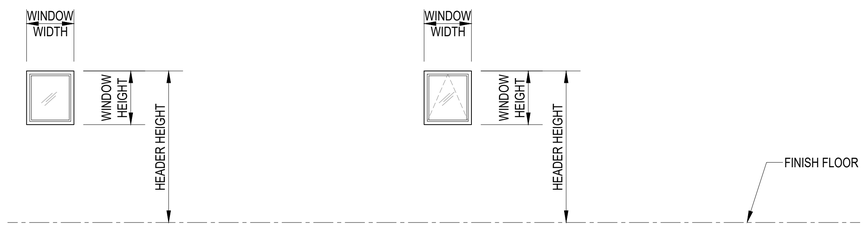
ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-2025/05-D	DRAWING NO. A-605
BF	YWF		
DRAWN BY: AP	APPROVED BY:	DATE JUNE 2026	SHEET 127 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

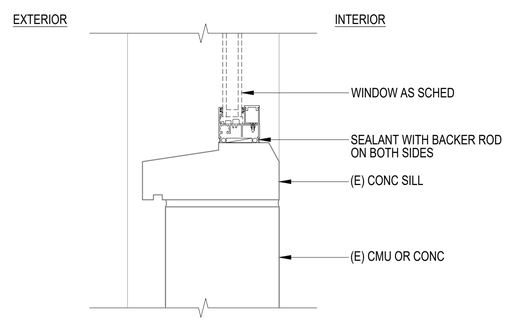
05/07/2026 11:01 am
C:\USERS\PC_3\TEAM MANUA DROPBOX\EPI DROPBOX--PROJECTS\01 ACTIVE_PROJECTS\2018-25-01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-601 DOOR TYPES AND DETAILS.DWG



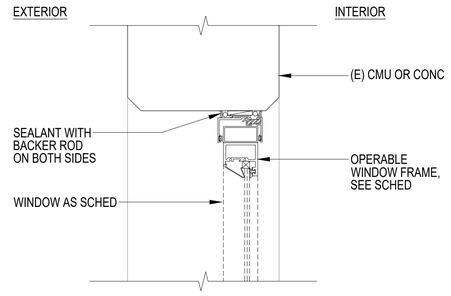
WINDOW/GLAZING NOTES :

1. PROVIDE GLAZING AS REQUIRED PER 2024 IBC, SECTION 2406.
2. PROVIDE GLAZING CONFORMING TO IECC 2021. NO WINDOWS ARE TO BE ORDERED UNTIL MANUFACTURERS/ SUPPLIER HAS PROVIDED DOCUMENTATION THAT WINDOWS MEET IECC 2021 REQUIREMENTS.
3. PROVIDE DUAL LOW "E" GLAZING, TYPICAL AT WINDOW OPENINGS GLAZING TO PROVIDE A MAX OF 0.25 SHGC.
4. CONTRACTOR TO PROVIDE MFGR'S SPECS, FOR CONTRACTING OFFICER'S AND ARCHITECTS APPROVAL PRIOR TO ORDER OR START OF ANY WORK.
5. OPERABLE PARTS OF WINDOWS TO COMPLY WITH ADA SECTION 308 REACH RANGE.
6. FOR WINDOWS FACING THE HOMELESS SHELTER ACROSS THE STREET, GLAZING MUST COMPLY WITH STANDARD 10 OF UFC 4-010-01: DOD MINIMUM ANTI-TERRORISM STANDARDS FOR BUILDINGS

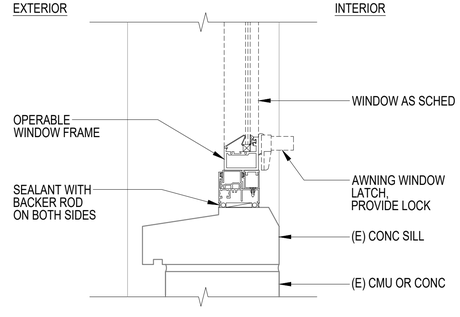
A WINDOW AND LOUVERS TYPES
SCALE: 1/4" = 1'-0" 0 4' 8'



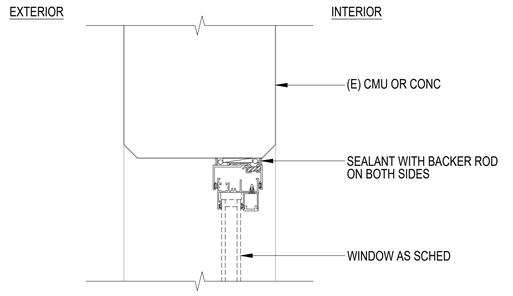
2 WINDOW SILL
SCALE: 3" = 1'-0" 0 3" 6" 9"



3 WINDOW HEAD
SCALE: 3" = 1'-0" 0 3" 6" 9"



4 WINDOW SILL
SCALE: 3" = 1'-0" 0 3" 6" 9"



1 WINDOW HEAD
SCALE: 3" = 1'-0" 0 3" 6" 9"

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

WINDOW TYPES AND DETAILS

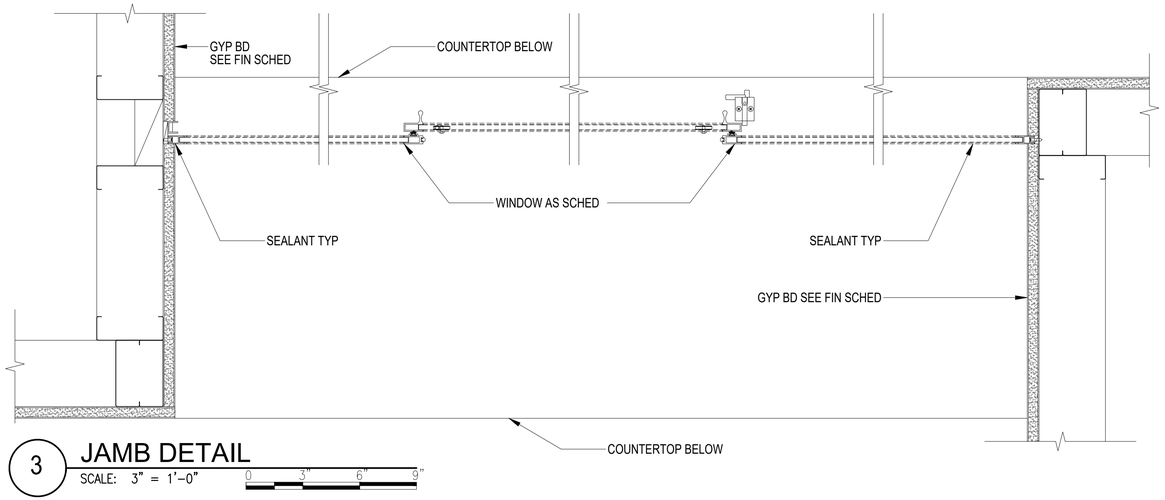
ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HMPRG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-606
BF	YWF		
DRAWN BY: AU	APPROVED BY:	DATE: JUNE 2026	SHEET 128 OF 276 SHTS
SCALE: AS NOTED			

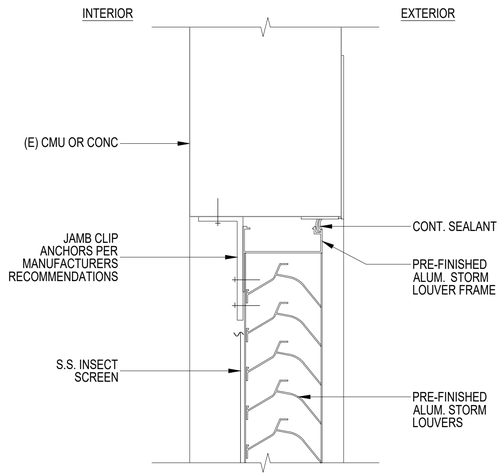
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

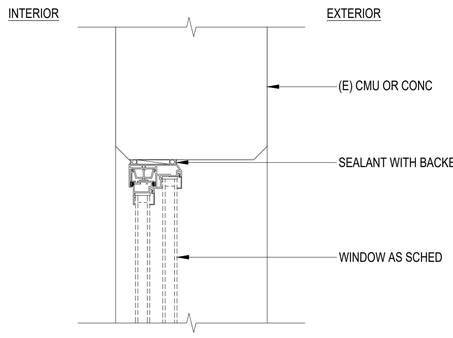
05/07/2026 11:01 am
C:\USERS\PC_3\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01 ACTIVE PROJECTS\12018-25-01 846 MEDCOM RENOVATIONS\4-DWG\ARCH\A-606 WINDOW TYPES AND DETAILS.DWG



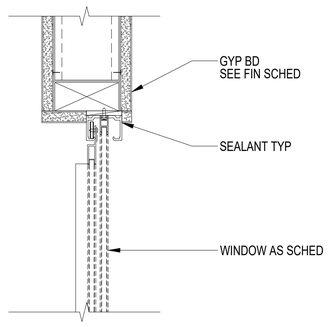
3 JAMB DETAIL
SCALE: 3" = 1'–0"



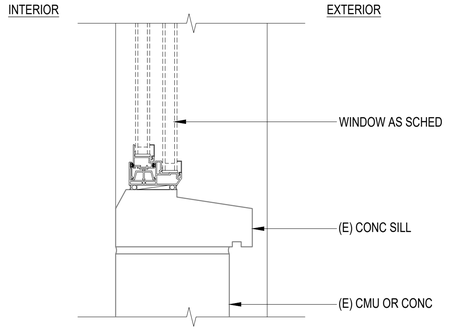
1 LOUVER HEAD DETAIL (JAMB SIM)
SCALE: 3" = 1'–0"



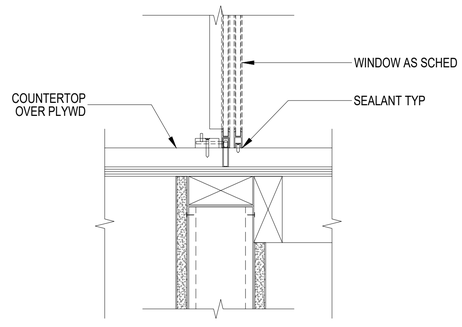
6 WINDOW HEAD
SCALE: 3" = 1'–0"



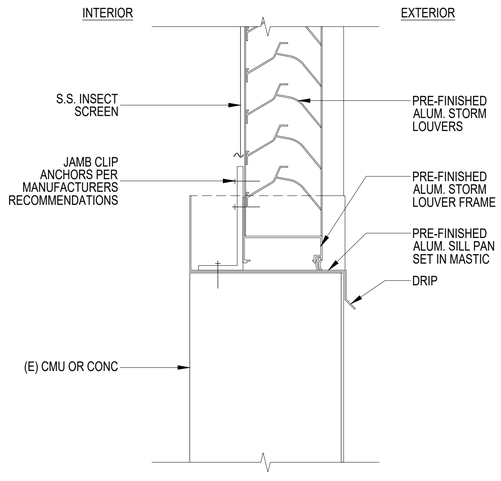
4 WINDOW HEAD
SCALE: 3" = 1'–0"



7 WINDOW SILL
SCALE: 3" = 1'–0"



5 SILL TRACK DETAIL
SCALE: 3" = 1'–0"



2 LOUVER SILL DETAIL
SCALE: 3" = 1'–0"

REV NO	DESCRIPTION	DATE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

WINDOW DETAILS

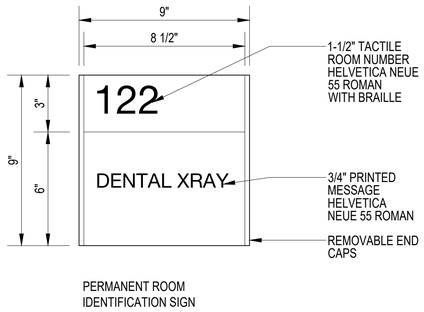
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HAARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-607
DRAWN BY: AU	APPROVED BY:	DATE: JUNE 2026	SHEET 129 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ---

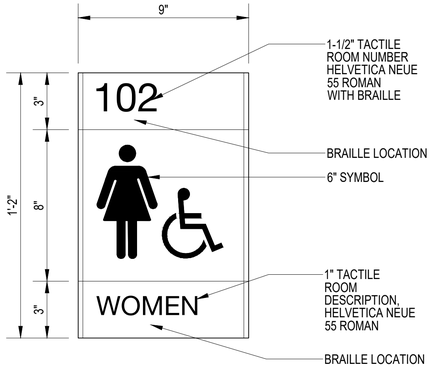
OF _____ DRAWER _____ FOLDER _____

05/07/2026 11:02 am
C:\USERS\PC_3\TEAM MANUA DROPBOX\EP! DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\2018-25-01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-606 WINDOW TYPES AND DETAILS.DWG

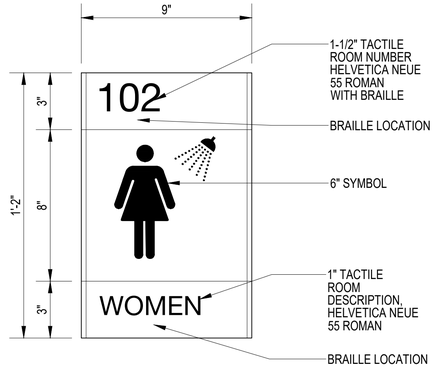


PERMANENT ROOM IDENTIFICATION SIGN

TYPE A1



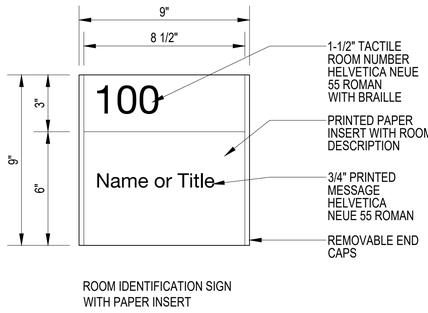
TYPE B



TYPE D

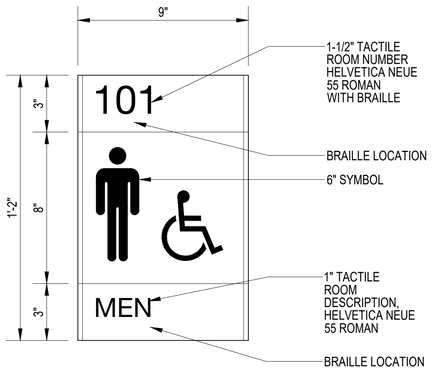
NOTE:

1. USE TACTILE CHARACTERS RAISED 0.01325 INCH FROM THE SURFACE AND GRADE 2 BRAILLE.
2. REFER TO 2015 ABA REQUIREMENTS REGARDING RESTROOM SIGN IDENTIFICATION, USE OF PICTOGRAMS, SYMBOLS OF ACCESSIBILITY, FINISH, AND CONTRAST.
3. USE ACRYLIC FOR INTERIOR AND ALUMINUM FOR EXTERIOR SIGNAGES.
4. SIGNAGES TO CONFORM WITH UFC 3-120-01 , DESIGN SIGN STANDARDS, CHANGE 4.
5. TEXT AND SYMBOL COLOR IS BLACK, BACKGROUND COLOR IS WHITE.

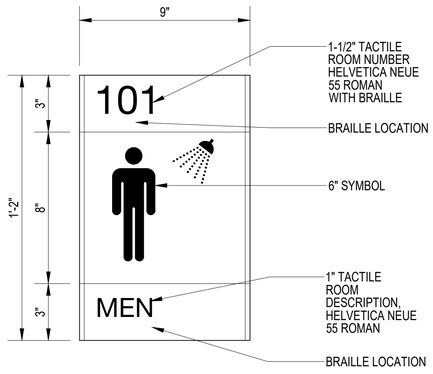


ROOM IDENTIFICATION SIGN WITH PAPER INSERT

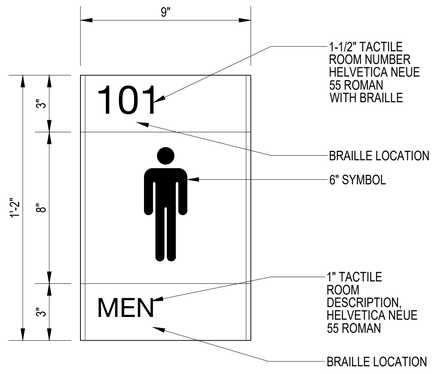
TYPE A2



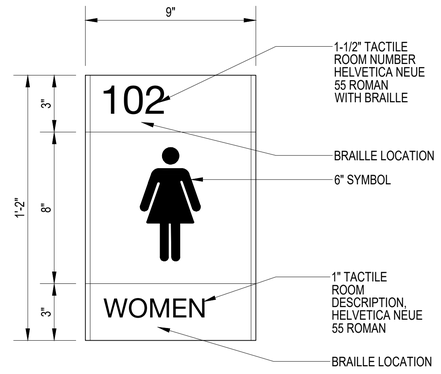
TYPE C



TYPE E



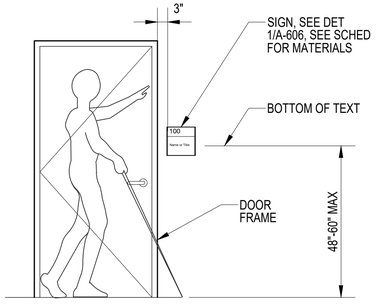
TYPE F



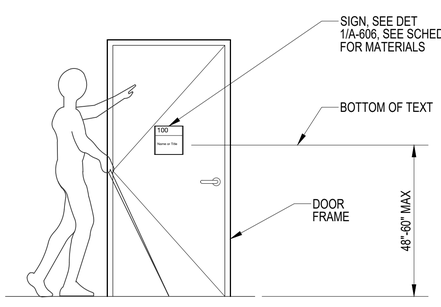
TYPE G

1 SIGN TYPES

SCALE: 3" = 1'-0" 0 3" 6" 9"



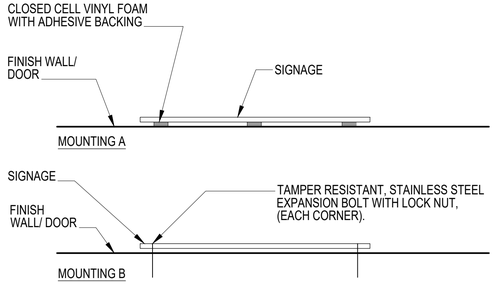
A - TYPICAL WALL SIGN LOCATION



B - TYPICAL DOOR SIGN LOCATION

3 LOCATION OF TACTILE SIGNS AT DOOR

SCALE: 1/2" = 1'-0" 0 2' 4'



2 MOUNTING CONDITIONS

SCALE: 3" = 1'-0" 0 3" 6" 9"

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

SIGN TYPES

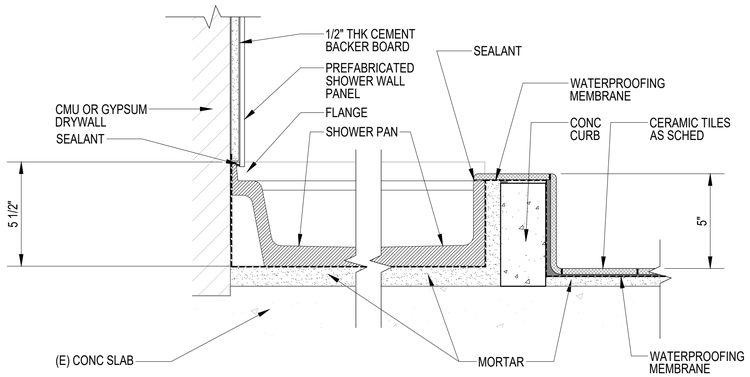
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-608
DRAWN BY: MB	APPROVED BY:	DATE: JUNE 2026	SHEET 130 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

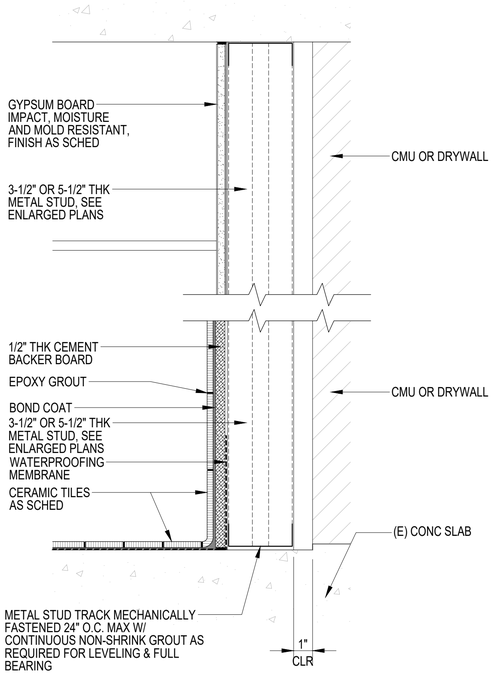
DATE ISSUED: ---

05/07/2026 11:02 am
C:\USERS\PC 3\TEAM MANILA DROPBOX\LEPI DROPBOX--PROJECTS\01 ACTIVE_PROJECTS\12018--25--01 B46_MEDCOM_RENOVATIONS\4--DWG\ARCH\A--608 SIGNAGE DETAILS.DWG



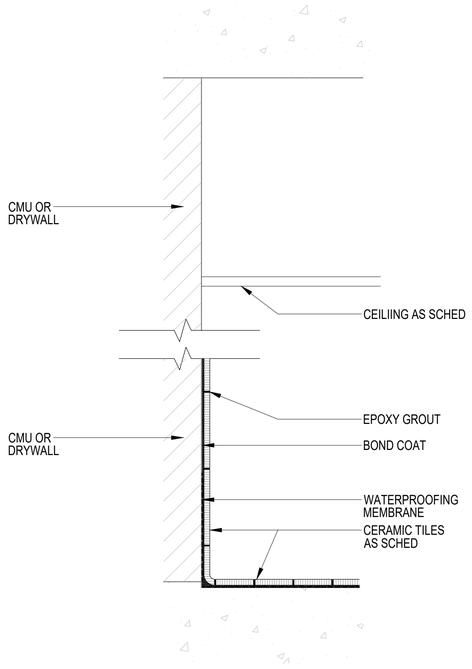
3 SHOWER PAN CURB DETAIL

SCALE: 3" = 1'-0"



1 WALL DETAIL

SCALE: 3" = 1'-0"



2 WALL DETAIL

SCALE: 3" = 1'-0"

NOTES:

1. APPLY WATERPROOFING CONTINUOUSLY FROM THE FLOOR SURFACE ONTO ALL WALLS ATLEAST 6 INCHES HIGH.
2. SURFACE PREPARATION FOR TILE MUST ACHIEVE A SMOOTH AND EVEN FINISH PRIOR TO TILE INSTALLATION.

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

WALL DETAILS

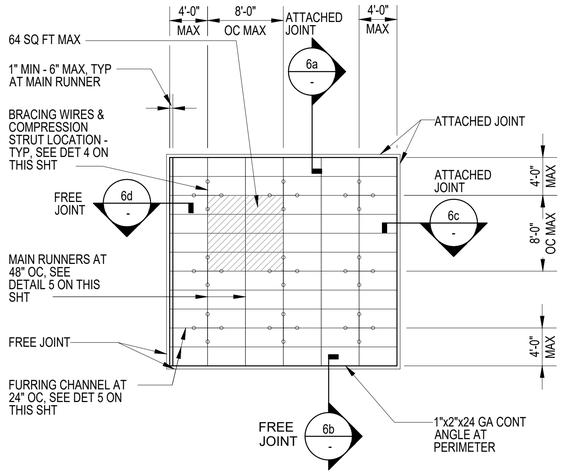
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HMRNG JOB NO. FEDERAL: PN:15H00033 STATE: CA-202505-D	DRAWING NO. A-701
DRAWN BY: AP	APPROVED BY:	DATE: JUNE 2026	SHEET 131 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ~~~

OF _____ DRAWER _____ FOLDER _____

05/07/2026 10:58 am
C:\USERS\PC_31\TEAM MANILA DROPBOX\EPI DROPBOX--PROJECTS\01_ACTIVE_PROJECTS\2018--25--01 846_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-701 WALL DETAILS.DWG



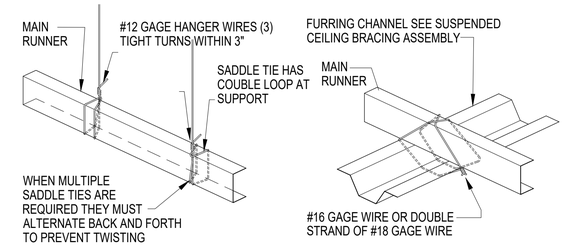
NOTES:

1. SEISMIC DESIGN CATEGORY D INSTALLATION

2. BRACING WIRES & COMPRESSION STRUT MUST OCCUR AT EVERY 64 SQ. FT. MAX (IN ROOM OVER 64 SQ. FT.)

3. INSTALL CEILINGS PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND RECOMMENDATIONS AND ANSI AND IBC STANDARDS AS REQUIRED TO MEET THE SPECIFIED SEISMIC ZONE

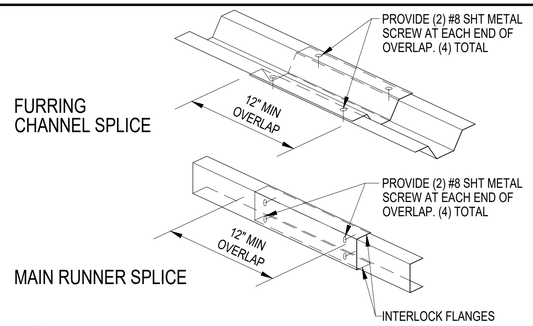
6 TYP. GYPSUM BOARD CEILING PLAN
NO SCALE



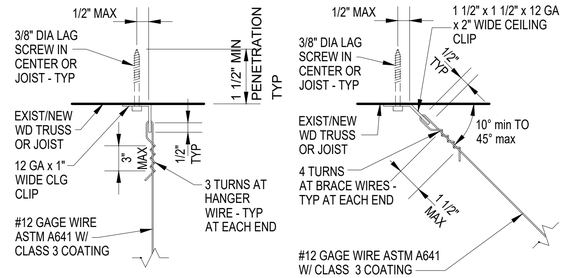
SADDLE TIE AT MAIN RUNNER TO HANGER WIRE

SADDLE TIE AT MAIN FURRING CHANNEL TO MAIN RUNNER

3 SADDLE TIE DETAILS
NO SCALE



4 SPLICE DETAILS
NO SCALE



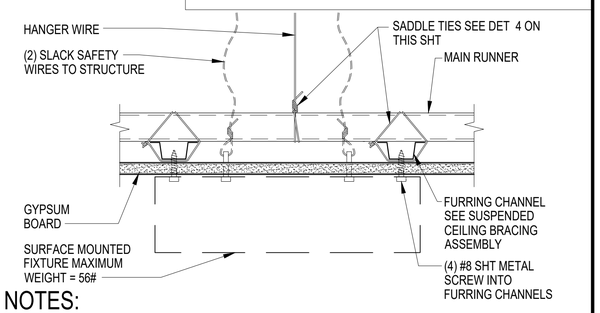
2a VERT HANGER WIRE CLIP ATT

2b BRACING WIRE CLIP ATT

NOTES:

1. SEISMIC DESIGN CATEGORY: SEE STRUCTURAL DRAWINGS.
2. INSTALL HANGER & BRACING PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND RECOMMENDATIONS AND ANSI AND IBC STANDARDS AS REQUIRED TO MEET THE SPECIFIED SEISMIC ZONE.

2 HANGING AND BRACING WIRE CONN - TYPICAL WIRE TURNS
NO SCALE



NOTES:

CEILING FIXTURES, TERMINALS, AND DEVICES:

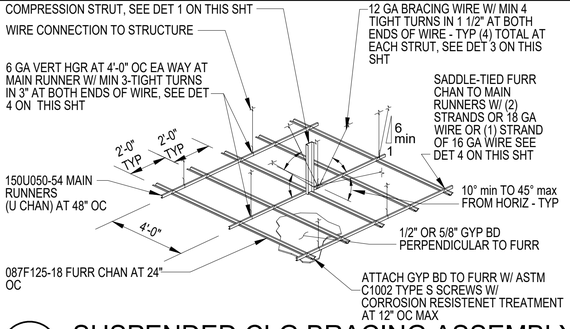
1. ALL FIXTURES, AIR TERMINALS/GRILLS, OR OTHER DEVICES (REFERRED TO ALL BY COMMON TERM FIXTURES HEREAFTER) MUST BE MOUNTED IN A MANNER THAT NOT COMPROMISE CEILING PERFORMANCE.
2. ALL FIXTURES MUST BE SUPPORTED DIRECTLY BY MAIN RUNNERS OR BY SUPPLEMENTAL FRAMING WHICH IS SUPPORTED BY MAIN RUNNERS AND POSITIVE ATTACHED WITH SCREWS OR OTHER APPROVED CONNECTORS.
3. SURFACE MOUNTED FIXTURES MUST BE ATTACHED TO A MAIN RUNNER WITH A POSITIVE CLAMPING DEVICE MADE OF MATERIAL WITH MINIMUM OF 14 GAGE. ROTATIONAL SPRING CLAMPS DON NOT COMPLY.

ACCESS PANELS: ACCESS TO THE SPACE BETWEEN THE CEILING AND THE FLOOR OR ROOF ABOVE MUST NOT BE ALLOWED. SMALL ACCESS PANELS FOR THE INSPECTION ADJUSTMENT, OR REPAIR OF UTILITY SWITCHES, VALVES, SENSORS, ETC. MAY BE ALLOWED IF THE PANEL IS NOT GREATER THAN 324 SQUARE INCHES. SUCH PANELS MUST ALSO HAVE PERMANENT WARNING LABEL AS FOLLOWS:

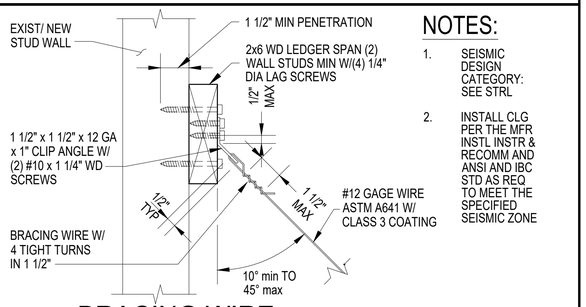
WARNING: a. DO NOT CLIMB, WALK, OR CRAWL ON THE GYPSUM BOARD CEILING.
b. DO NOT STORE O STOW ANYTHING ON THE GYPSUM BOARD CEILING.

4. ALL LIGHT FIXTURES WEIGHING LESS THAN OR EQUAL TO 10 LB. MUST HAVE ONE NO. 12 GAUGE SAFETY WIRE CONNECTED FROM FIXTURE HOUSING TO STRUCTURE ABOVE. IT IS NOT NECESSARY FOR THESE SAFETY WIRES TO BE TAUT.
5. ALL FIXTURES WEIGHING GREATER THAN 10 lb BUT LESS THAN OR EQUAL TO 56 LB. MUST HAVE TWO NO. 12 GAUGE SAFETY WIRE CONNECTED FROM FIXTURE HOUSING TO STRUCTURE ABOVE. IT IS NOT NECESSARY FOR THESE SAFETY WIRES TO BE TAUT.
6. ALL FIXTURE WEIGHING GREATER THAN 56 LB. MUST BE SUPPORTED DIRECTLY FROM STRUCTURE ABOVE BY APPROVED HANGERS.
7. PENDENT-HUNG FIXTURES MUST BE SUPPORTED DIRECTLY FROM THE STRUCTURE ABOVE USING NO LESS THAN NO. 9-GAUGE WIRE OF AN APPROVED ALTERNATE SUPPORT. THE CEILING SUSPENSION SYSTEM MUST NOT PROVIDE ANY DIRECT SUPPORT.
8. ALL RECESSED OR DROP-IN FIXTURES MUST BE SUPPORTED DIRECTLY FROM FIXTURE HOUSING TO THE STRUCTURE ABOVE WITH A MINIMUM OF TWO NO. 12 GAUGE WIRES LOCATED AT DIAGONALLY OPPOSITE WIRES MAY BE SLIGHTLY LOOSE TO ALLOW THE FIXTURE TO SEAT IN THE GRID SYSTEM. FIXTURES MUST NOT BE SUPPORTED FORM MAIN RUNNERS OR FURRING CHANNELS IF THE WEIGHT OF THE FIXTURE CAUSES TOTAL DEAD LOAD TO EXCEED THE DEFLECTION CAPABILITY OF THE CEILING SUSPENSION SYSTEM.

1 SURFACE MOUNTED FIXTURE
NO SCALE



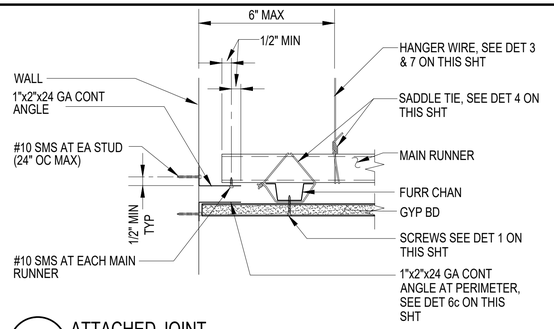
7 SUSPENDED CLG BRACING ASSEMBLY
NO SCALE



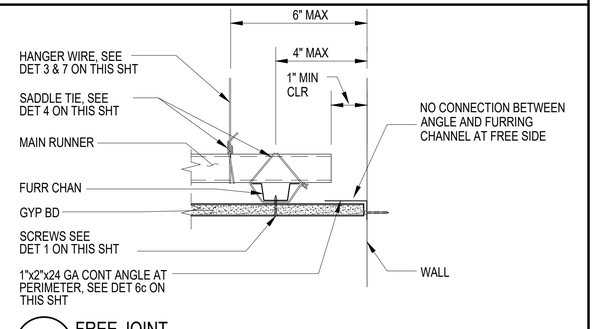
NOTES:

1. SEISMIC DESIGN CATEGORY: SEE STRL
2. INSTALL CLG PER THE MFR INSTL INSTR & RECOMM AND ANSI AND IBC STD AS REQ TO MEET THE SPECIFIED SEISMIC ZONE

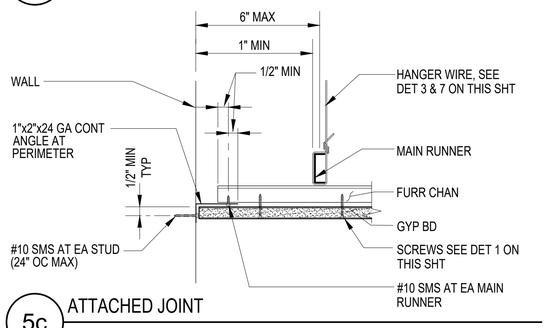
8 BRACING WIRE CONNECTION TO STUD WALL
NO SCALE



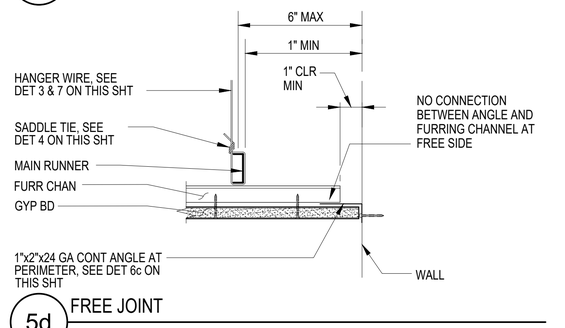
5a ATTACHED JOINT



5b FREE JOINT



5c ATTACHED JOINT



5d FREE JOINT

5 GYPSUM BOARD SUSPENSION SYSTEM PERIMETER DETAILS
NO SCALE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

GYPSUM CEILING DETAILS

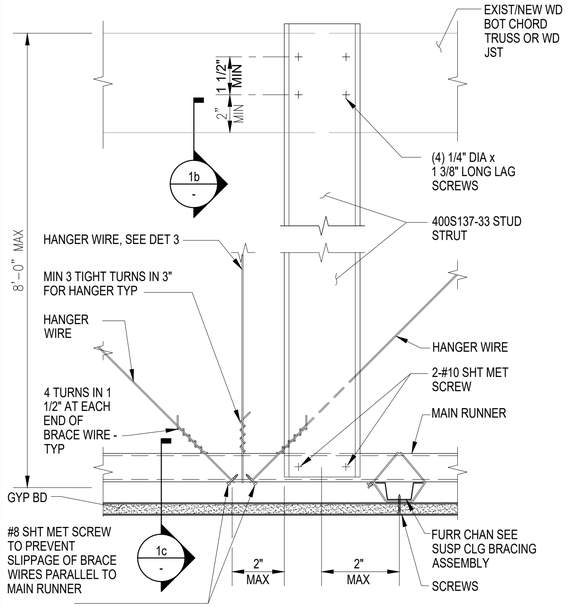
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO, FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-702
DRAWN BY: AU	APPROVED BY:	DATE	SHEET 132
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

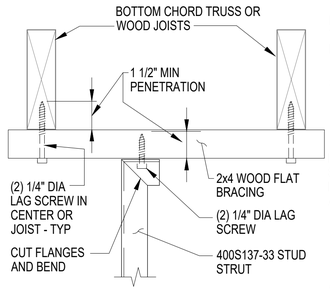
25/07/2026 10:59 am
X:\USERS\PC_3\TEAM MANILA_DROPBOX\EPI_DROPBOX\EPI_PROJECTS\01_ACTIVE_PROJECTS\12018--25--01 846_MEDCOM_RENOVATIONS\4--DWG\ARCH\A--702_CEILING_DETAILS.DWG



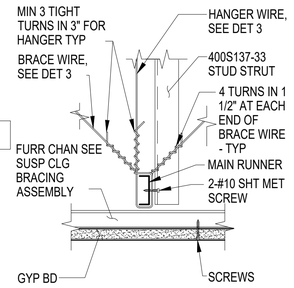
1a 1 CHANNEL STRUT CONNECTION TO MAIN RUNNER DETAILS

GYPSUM CEILING - CHANNEL STRUT DETAILS

NO SCALE



1b STRUT CONN TO BRACING



1c STRUT CONN TO MAIN RUNNER

NOTES:

1. SEISMIC DESIGN CATEGORY: SEE STRUCTURAL DRAWINGS
2. INSTALL CEILINGS PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND RECOMMENDATIONS AND ANSI AND IBC STANDARDS AS REQUIRED TO MEET THE SPECIFIED SEISMIC ZONE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

GYPSUM CEILING DETAILS

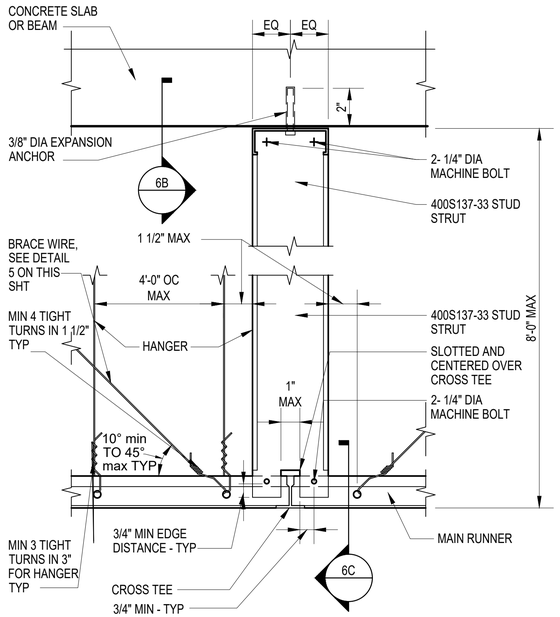
ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-703
BF	YWF		
DRAWN BY: AU	APPROVED BY:	DATE: JUNE 2026	SHEET 133 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

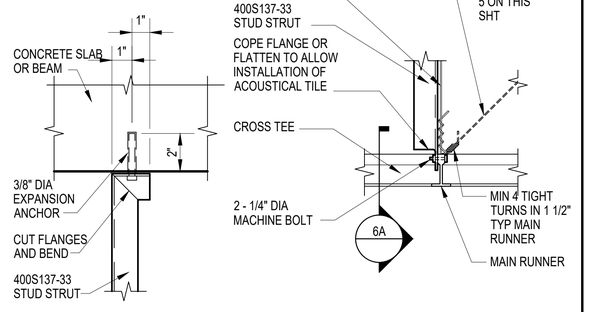
DATE ISSUED: ---

05/07/2026 10:59 am
C:\USERS\PC.STEAM MANUA.DROPBOX\EPI DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\12018-25-01 846_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-702_CEILING_DETAILS.DWG



6A STUD STRUT CONN TO MAIN RUNNER DETAIL

NO SCALE



6B STRUT CONN TO CONC SLAB

NO SCALE

6C STRUT CONN TO CONC SLAB

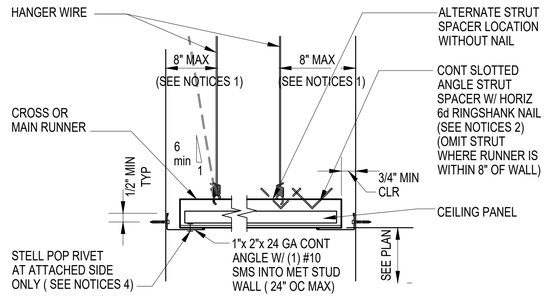
NO SCALE

NOTES:

1. SEISMIC DESIGN CATEGORY: SEE STRUCTURAL DRAWINGS
2. CEILING PANEL NOT SHOWN
3. INSTALL CEILINGS PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND RECOMMENDATIONS AND ANSI AND IBC STANDARDS AS REQUIRED TO MEET THE SPECIFIED SEISMIC ZONE

6 SUSPENDED ACOUSTICAL CEILING - STUD STRUT DETAILS

NO SCALE



4A AT JOINT

NO SCALE

4B FREE JOINT

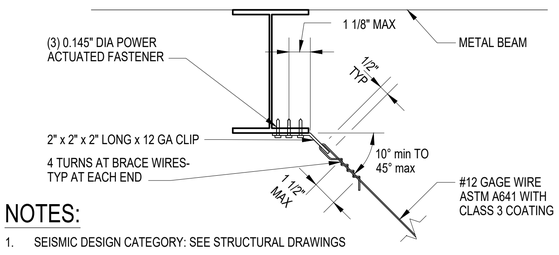
NO SCALE

NOTES:

1. PROVIDE #12 GA HANGER WIRES AT THE ENDS OF ALL MAIN AND CROSS RUNNERS WITHIN EIGHT (8) INCHES OF THE SUPPORT OR WITHIN ONE-FOURTH (1/4) OF THE LENGTH OF THE END TEE, WHICHEVER IS LESS, FOR THE PERIMETER OR THE CEILING AREA. PERIMETER WIRES ARE NOT REQUIRED WHEN THE LENGTH OF THE END TEE IS EIGHT (8) INCHES OR LESS.
2. NAILS AT ENDS OF HORIZ STRUTS ARE TO BE PLACED W/ NAIL HEAD TOWARD CENTER LINE OF SPAN OF STRUT.
3. SPACERS MAY BE SLOTTED APPROVED ANGLES OR CHANNELS W/ "DIAMOND POINTS" OF SPRING STEEL
4. HICH SNAP TIGHT TO PREVENT MOVEMENT OF STRUT.
5. STEEL POP RIVETS MUST HAVE MIN ALLOWABLE SHEAR STRENGTH OF 120# AND ULTIMATE SHEAR STRENGTH OF 300#.
6. SEISMIC DESIGN CATEGORY: SEE STRUCTURAL DRAWINGS
7. INSTALL CEILINGS PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND RECOMMENDATIONS AND ANSI AND IBC STANDARDS AS REQUIRED TO MEET THE SPECIFIED SEISMIC ZONE

4 SUSPENDED ACOUSTICAL CEILING PERIMETER

NO SCALE

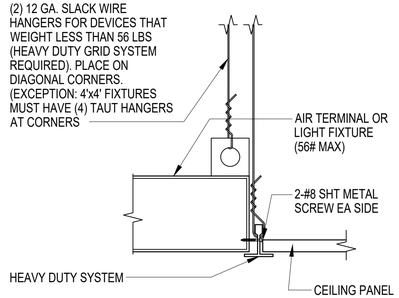


NOTES:

1. SEISMIC DESIGN CATEGORY: SEE STRUCTURAL DRAWINGS
2. BEAM FLANGE THICKNESS MUST NOT BE LESS THAN 3/16" OR MORE THAN 3/8"
3. INSTALL BRACING PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND RECOMMENDATIONS AND ANSI AND IBC STANDARDS AS REQUIRED TO MEET THE SPECIFIED SEISMIC ZONE

5 BRACING WIRE CONNECTION TO STRUCTURAL STEEL BEAM

NO SCALE

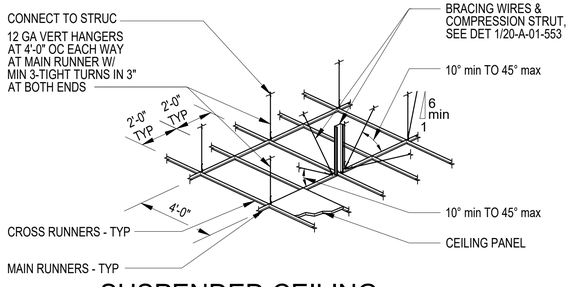


NOTES:

1. CEILING PANELS MUST NOT SUPPORT ANY LIGHT FIXTURES, AIR TERMINALS/GRILLS, OR OTHER DEVICES (REFERRED TO ALL BY COMMON TERM FIXTURES HERE AFTER).
2. ALL FIXTURES MUST BE MOUNTED IN A MANNER THAT WILL NOT COMPROMISE CEILING PERFORMANCE.
3. ALL FIXTURES MUST BE ATTACHED TO THE SUSPENDED CEILING SYSTEM BY MECHANICAL MEANS, UNLESS INDEPENDENTLY SUPPORTED. THE ATTACHMENT DEVICE MUST HAVE THE CAPACITY OF 100% OF FIXTURE WEIGHT ACTING IN ANY DIRECTION. A MINIMUM OF TWO ATTACHMENT DEVICES ARE REQUIRED FOR EACH FIXTURE.
4. SURFACE MOUNTED FIXTURES MUST BE ATTACHED TO THE MAIN RUNNER WITH POSITIVE CLAMPING DEVICES MADE OF MATERIAL WITH A MINIMUM 14 GAGE. A NO.12 GAUGE SAFETY WIRES MUST BE ATTACHED BETWEEN THE CLAMPING DEVICE AND TO THE IN NO CASE MUST THE FIXTURES STRUCTURE ABOVE. IN NO CASE MUST THE FIXTURES EXCEED THE DESIGN CAPACITY OF THE SUPPORTING MEMBERS.
5. ALL LIGHT FIXTURES WEIGHING LESS THAN OR EQUAL TO 10 LB. MUST HAVE ONE NO. 12 GAUGE SAFETY WIRE CONNECTED FROM FIXTURE HOUSING TO STRUCTURE ABOVE. IT IS NOT NECESSARY FOR THESE SAFETY WIRES TO BE TAUT.
6. ALL FIXTURES WEIGHING GREATER THAN 10 LB BUT LESS THAN OR EQUAL TO 56 LB. MUST HAVE TWO NO. 12 GAUGE SAFETY WIRE CONNECTED FROM FIXTURE HOUSING TO STRUCTURE ABOVE. IT IS NOT NECESSARY FOR THESE SAFETY WIRES TO BE TAUT.
7. ALL FIXTURES WEIGHING GREATER THAN 56 LB. MUST BE SUPPORTED DIRECTLY FROM STRUCTURE ABOVE BY APPROVED HANGERS.
8. PENDENT-HUNG FIXTURES MUST BE SUPPORTED DIRECTLY FROM THE STRUCTURE ABOVE USING NO LESS THAN NO. 9 GAUGE WIRE OR AN APPROVED ALTERNATE SUPPORT. THE CEILING SUSPENSION SYSTEM MUST NOT PROVIDE ANY DIRECT SUPPORT.
9. ALL RECESSED OR DROP-IN FIXTURES MUST BE SUPPORTED DIRECTLY FROM FIXTURE HOUSING TO THE STRUCTURE ABOVE WITH A MINIMUM OF TWO NO. 12 GAUGE WIRES LOCATED AT DIAGONALLY OPPOSITE CORNERS. LEVELING OR POSITIONING OF FIXTURES MAY BE PROVIDED BY CEILING GRID. FIXTURE SUPPORT WIRES MAY BE SLIGHTLY LOOSE TO ALLOW THE FIXTURE TO SEAT IN THE GRID SYSTEM. FIXTURES MUST NOT BE SUPPORTED FROM MAIN RUNNERS OR CROSS RUNNERS IF THE WEIGHT OF THE FIXTURES CAUSES TOTAL DEAD LOAD TO EXCEED THE DEFLECTION CAPABILITY OF THE CEILING SUSPENSION SYSTEM.

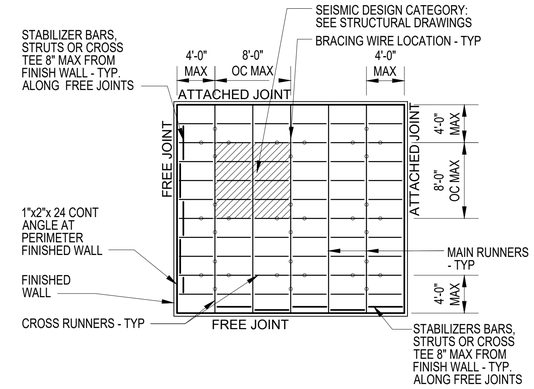
2 SUSPENDED ACOUSTICAL CLG LIGHT FIXTURES/ AIR TERMINAL SUPPORT

NO SCALE



3 SUSPENDED CEILING BRACING ASSEMBLY

NO SCALE



NOTES:

1. ACOUSTICAL TILE LAYOUT MUST BE AS RECOMMENDED BY MFR
2. SEISMIC DESIGN CATEGORY: SEE STRUCTURAL DRAWINGS
3. BRACING WIRES & COMPRESSION STRUT MUST OCCUR AT EVERY 64 SQ FT MAX (IN ROOM OVER 64 SQ FT)
4. CEILING GRID SYSTEM MUST BE RATED HEAVY DUTY AS DEFINED BY ASTM C635 AND E580
5. INSTALL CEILINGS PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND RECOMMENDATIONS AND ANSI AND IBC STANDARDS AS REQUIRED TO MEET THE SPECIFIED SEISMIC ZONE

1 TYP. ACOUSTICAL TILE CEILING PLAN

NO SCALE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ACOUSTIC CEILING DETAILS

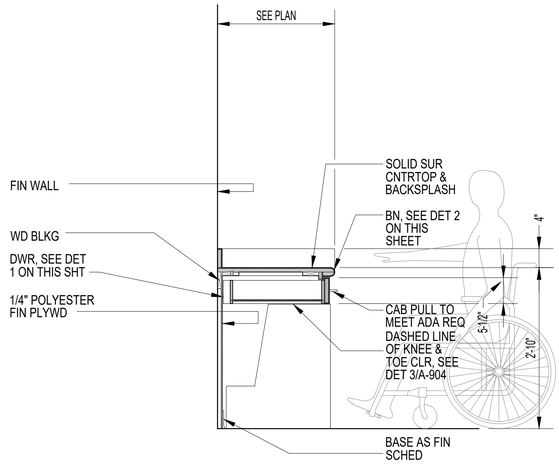
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO, FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. A-704
DRAWN BY: AU	APPROVED BY:	DATE	SHEET 134
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

DATE ISSUED: ---

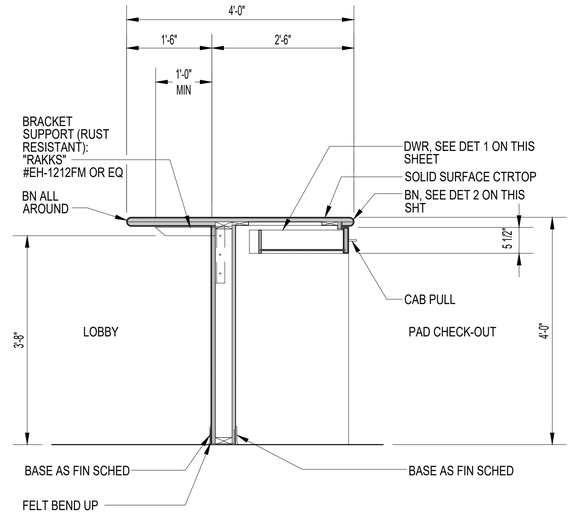
OF _____ DRAWER _____ FOLDER _____

05/07/2026 10:59 pm
C:\USERS\PC_3\TEAM MANILA DROPBOX\EP\ DROPBOX-PROJECTS\01 ACTIVE PROJECTS\2018-25-01 846 MEDCOM RENOVATIONS\4-DWG\ARCH\A-702 CEILING DETAILS.DWG



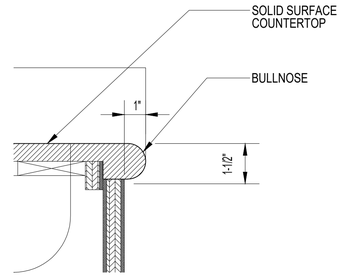
6 TYPICAL BASE CABINET DETAIL

SCALE: 3/4" = 1'-0"



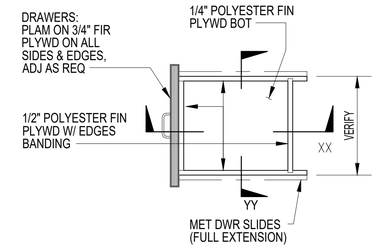
4 COUNTER/CABINET DETAIL

SCALE: 3/4" = 1'-0"

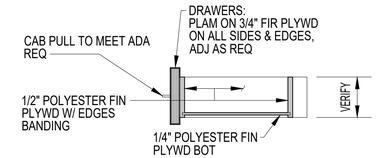


2 BULLNOSE DETAIL

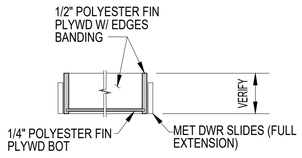
NO SCALE



PLAN



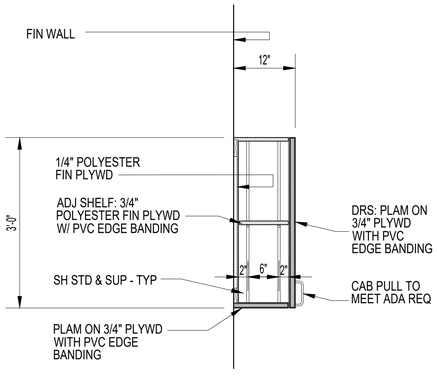
SECTION "YY"



SECTION "XX"

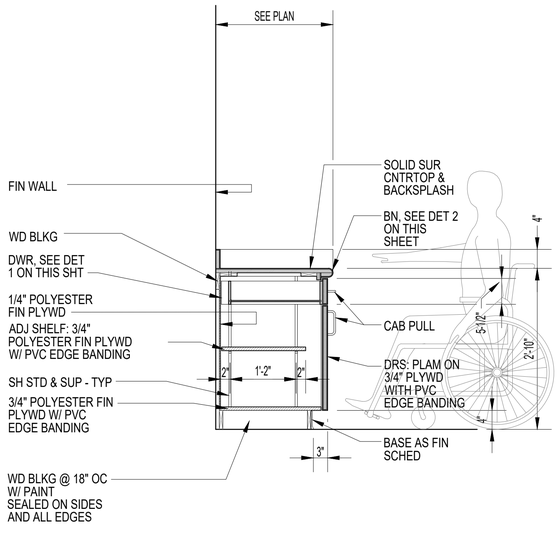
1 TYPICAL DRAWER DETAIL

SCALE: 3/4" = 1'-0"



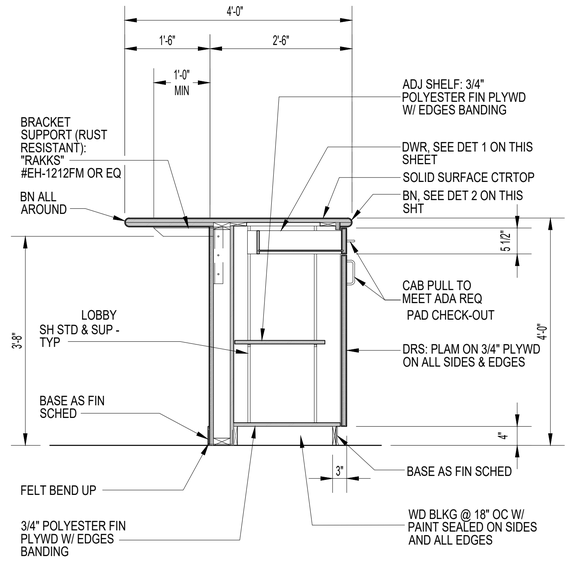
7 TYPICAL WALL CABINET DETAIL

SCALE: 3/4" = 1'-0"



5 TYPICAL BASE CABINET DETAIL

SCALE: 3/4" = 1'-0"



3 COUNTER/CABINET DETAIL

SCALE: 3/4" = 1'-0"

REV. NO	DESCRIPTION	DATE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

LACTATION ROOM AND BREAK ROOM
CABINET DETAILS WITH SINK

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HAWNG JOB NO. FEDERAL: PN69999003 STATE: CA-202505-D	DRAWING NO. A-705
DRAWN BY: AU	APPROVED BY:	DATE: JUNE 2026	SHEET 135 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 11:00 am
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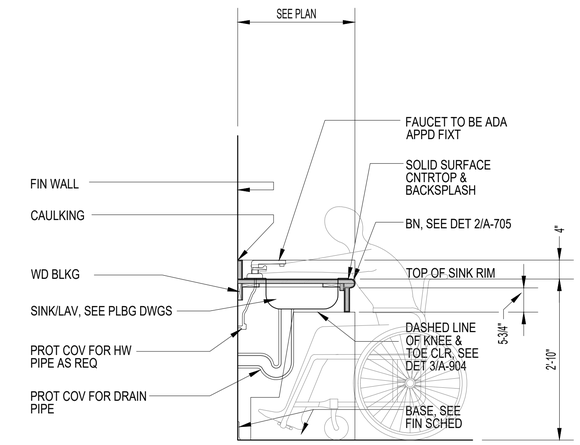

1 TYP COUNTER WITH SINK DETAIL

SCALE: 3/4" = 1'-0"

0 1' 2' 3'

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

LACTATION ROOM AND BREAK ROOM
CABINET DETAILS WITH SINK

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HARING JOB NO. FEDERAL: P*N69490083 STATE: CA-202505-D	DRAWING NO. A-706
BF	YWF		
DRAWN BY: AU	APPROVED BY:	DATE: JUNE 2026	SHEET 136
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ----

05/07/2026 11:00 am
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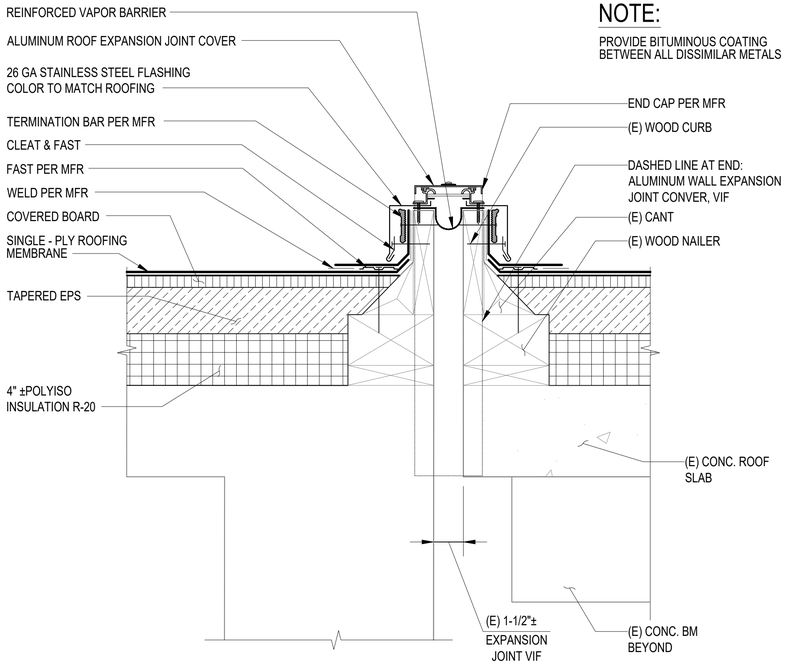
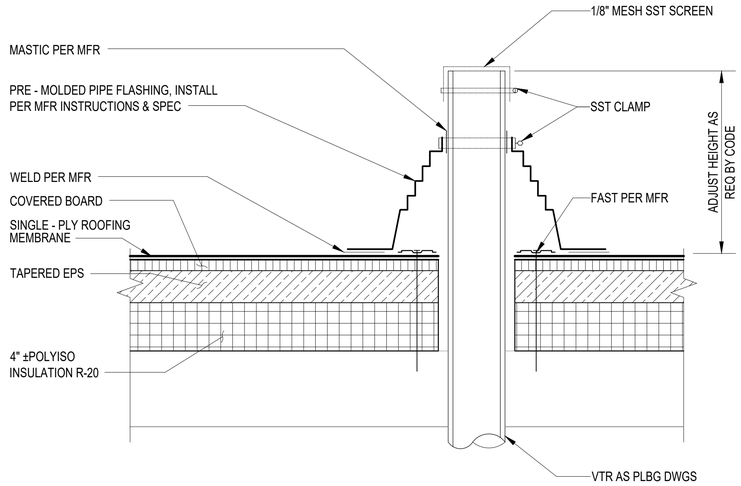


NOTE:

PROVIDE BITUMINOUS COATING
BETWEEN ALL DISSIMILAR METALS

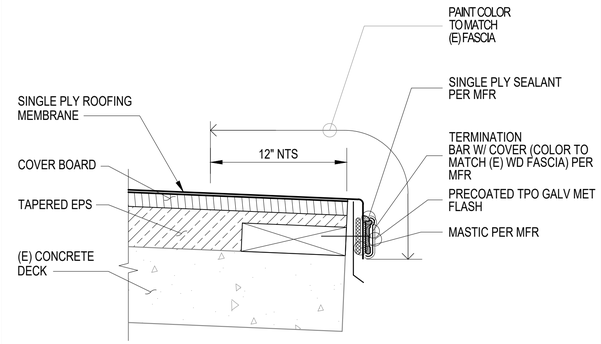
4 ROOF / ROOF EXPANSION JOINT FLASHING

SCALE: 3" = 1'-0"



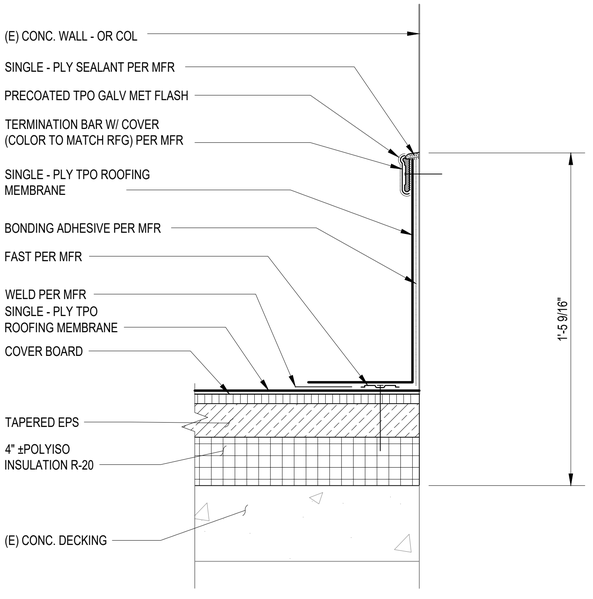
2 FLASHING AT VTR

SCALE: 3" = 1'-0"



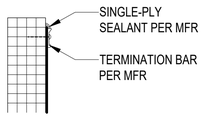
1 ROOF EDGE DETAIL

SCALE: 3" = 1'-0"

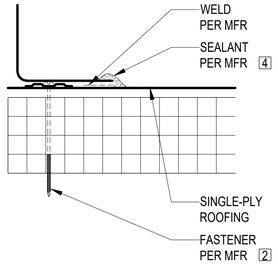


5 BASE FLASHING DETAIL

SCALE: 3" = 1'-0"



MECHANICAL TERMINATION



FASTENING DETAIL

THERMOPLASTIC ROOF MEMBER DETAIL

3

SCALE: 3" = 1'-0"

NOTE:

1. REFER TO SPECIFICATIONS FOR ACCEPTABLE FASTENERS AND PLATES AS PER MFR.

2. MECHANICAL SECUREMENT MAY BE INSTALLED INTO THE VERTICAL SUBSTRATE.

3. WHEN USING 80 MIL (2.03mm) THICK CURB FLASHING, THE INTERSECTIONS BETWEEN SPLICES MUST BE OVERLAID WITH A TPO "T-JOINT" COVER.

4. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE.

NOTES FOR ADDITIVE ALTERNATE WORK:

ADDITIVE ALTERNATE #7:
ALL DEMOLITION AND NEW WORK TO REPLACE EXISTING ROOFING SYSTEM.

BASE BID TO INCLUDE WORK FOR NEW DUCTWORK/CURBS/VENT PIPING AND PATCHING AND CAPPING EXISTING DUCTWORK/CURBS/ VENT PIPING ON EXISTING ROOFING.

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ROOF DETAILS

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HAPRG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-801
DRAWN BY: AU	APPROVED BY:	DATE: JUNE 2026	SHEET 137 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:58 am
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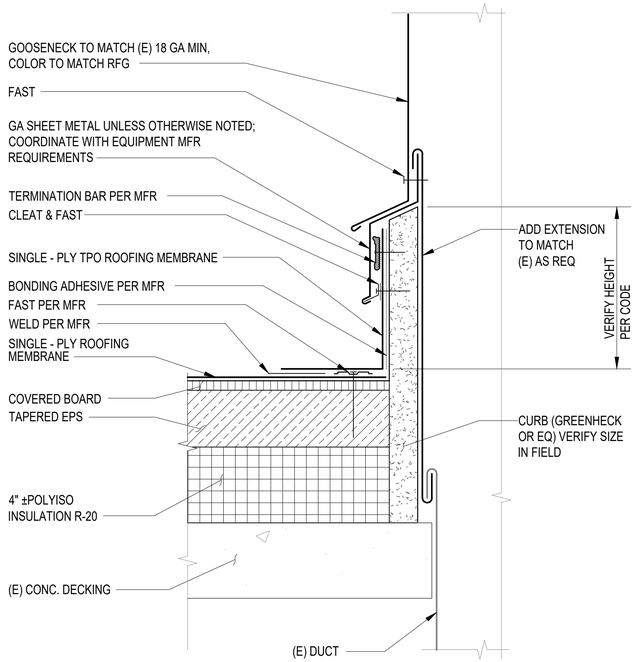
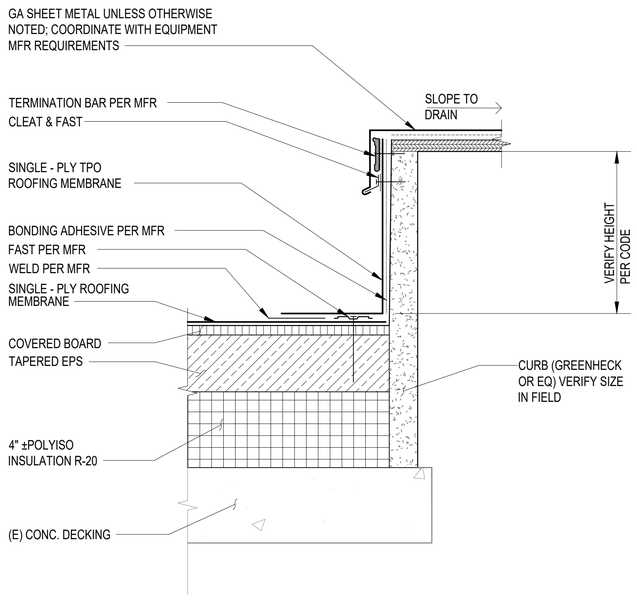


1 CURB FLASHING

SCALE: 3" = 1'-0" 0 3" 6" 9"



2 CURB FLASHING

SCALE: 3" = 1'-0" 0 3" 6" 9"

NOTES FOR ADDITIVE ALTERNATE WORK:

ADDITIVE ALTERNATE #7:
ALL DEMOLITION AND NEW WORK TO REPLACE EXISTING ROOFING SYSTEM.

BASE BID TO INCLUDE WORK FOR NEW DUCTWORK/CURBS/VENT PIPING AND PATCHING AND CAPPING EXISTING DUCTWORK/CURBS/ VENT PIPING ON EXISTING ROOFING.

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

CURB AND ROOF SCUTTLE DETAILS

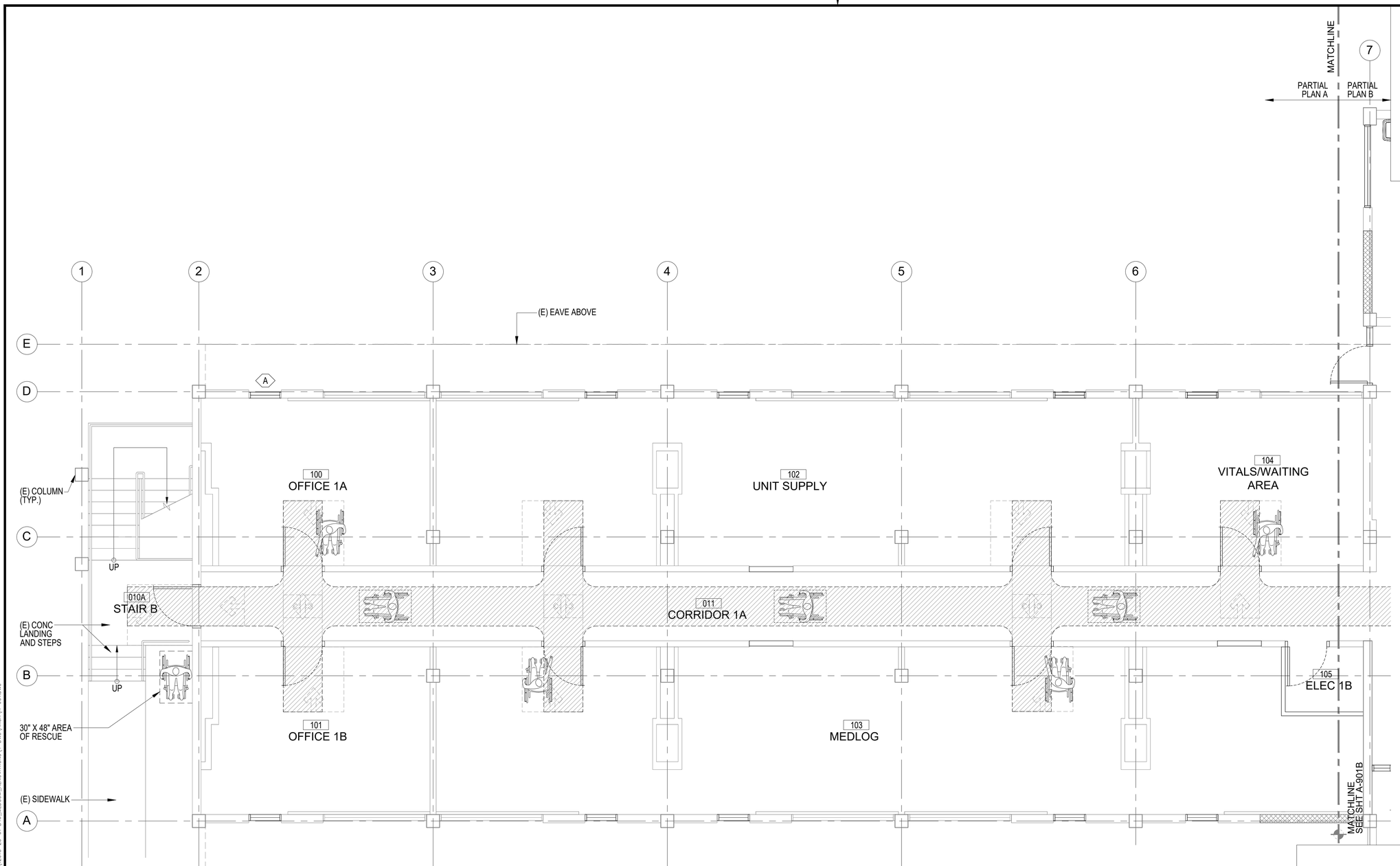
ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-802
DRAWN BY: AU	APPROVED BY:	DATE JUNE 2026	SHEET 138 OF 276 SHTS
SCALE: AS NOTED			

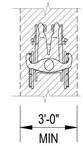
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

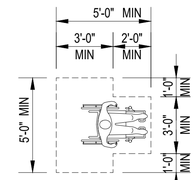
05/28/2026 7:25 pm
C:\USERS\PC_3\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01 ACTIVE PROJECTS\12018-25-01 846 MEDCOM RENOVATIONS\4-DWG\ARCH\A-801 ROOF DETAILS.DWG



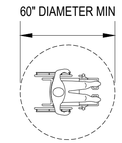
ACCESSIBLE LEGEND



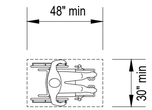
DOJ 2010 ADA STANDARDS FOR ACCESSIBLE ROUTE: DIRECTION OF TRAVEL OR APPROACH MUST COMPLY W/ SECTION 206



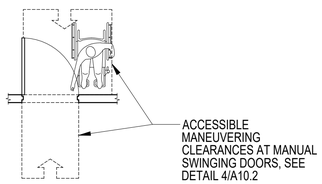
T-SHAPED SPACE (fig 304.3.2)



CIRCULAR SPACE SECTION 304.3.1



CLEAR FLOOR SPACE (fig. 305.3)



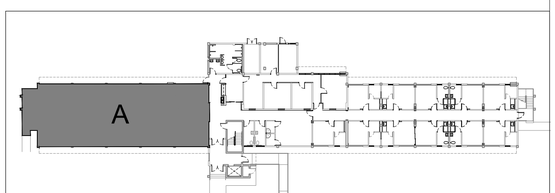
ACCESSIBLE MANEUVERING CLEARANCES AT MANUAL SWINGING DOORS, SEE DETAIL 4/A10.2

A FIRST FLOOR PARTIAL ACCESSIBLE ROUTE FLOOR PLAN

SCALE: 1/4" = 1'-0"

NORTH TRUE N

0 4' 8'



KEYPLAN

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

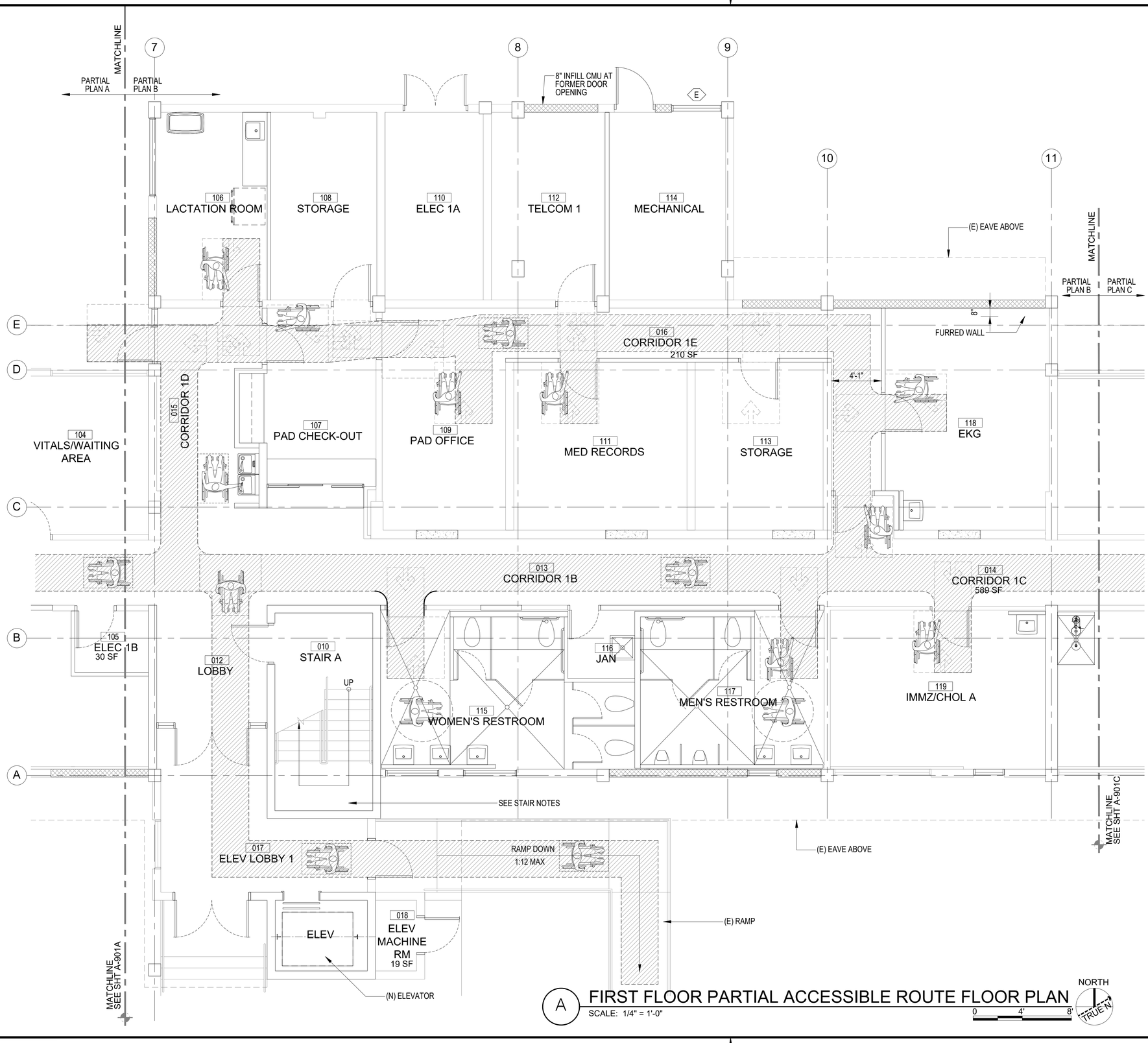
FIRST FLOOR PARTIAL ACCESSIBLE ROUTE FLOOR PLAN

ENGINEERING PARTNERS		HNARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-901A
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: AU	APPROVED BY:	DATE: JUNE 2026	SHEET 139 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 11:05 am
C:\USERS\PC.17\TEAM MANILA_DROPBOX\EPI_DROPBOX--PROJECTS\01_ACTIVE_PROJECTS\12018--25--01 B46_MEDCOM_RENOVATIONS\4--DWG\ARCH\A--901.DWG



ACCESSIBLE LEGEND

DOJ 2010 ADA STANDARDS FOR ACCESSIBLE ROUTE: DIRECTION OF TRAVEL OR APPROACH MUST COMPLY W/ SECTION 206

3'-0" MIN

48" min

30" min

CLEAR FLOOR SPACE (fig. 305.3)

5'-0" MIN

3'-0" MIN

2'-0" MIN

5'-0"

1'-0" MIN

3'-0" MIN

1'-0" MIN

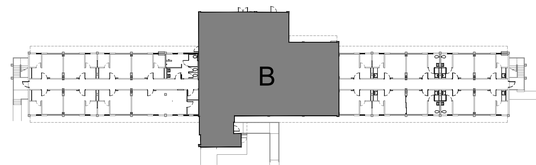
T-SHAPED SPACE (fig 304.3.2)

60" DIAMETER MIN

CIRCULAR SPACE SECTION 304.3.1

30

ACCESSIBLE MANEUVERING CLEARANCES AT MANUAL SWINGING DOORS, SEE DETAIL 4/A10.2



KEYPLAN

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

FIRST FLOOR PARTIAL ACCESSIBLE ROUTE FLOOR PLAN

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

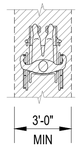
ENGINEERING PARTNERS		HAWNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. A-901B
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: AU	APPROVED BY:	DATE JUNE 2026	SHEET 140 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ---

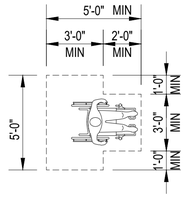
OF _____ DRAWER _____ FOLDER _____

05/07/2026 11:05 am
C:\USERS\PC_3\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\2018-25-01 B46_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-901.DWG

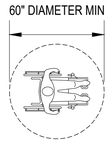
ACCESSIBLE LEGEND



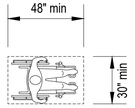
DOJ 2010 ADA STANDARDS FOR ACCESSIBLE ROUTE:
DIRECTION OF TRAVEL OR APPROACH MUST COMPLY W/ SECTION 206



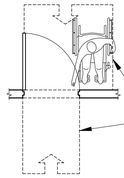
T-SHAPED SPACE (fig 304.3.2)



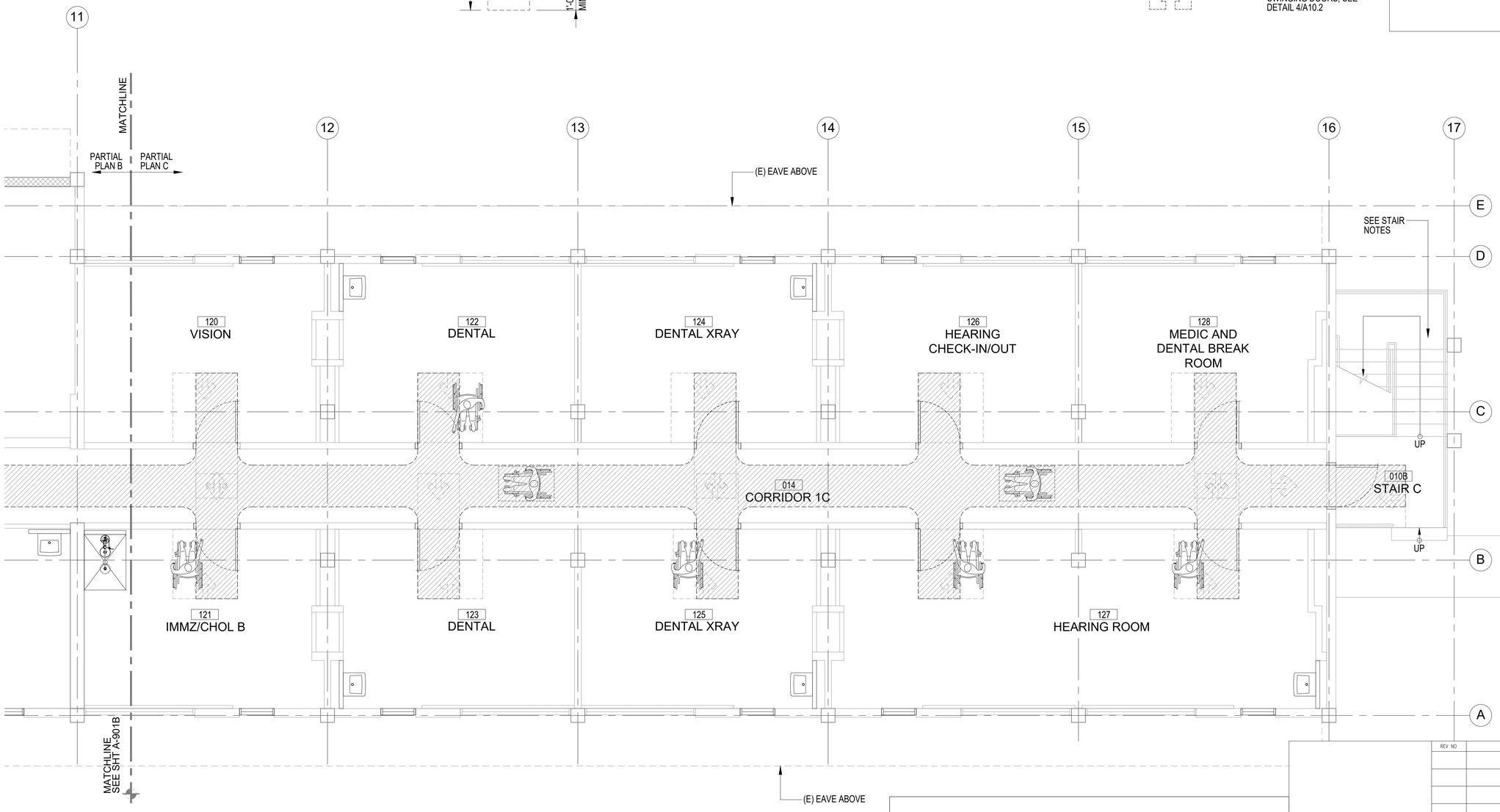
CIRCULAR SPACE SECTION 304.3.1



CLEAR FLOOR SPACE (fig. 305.3)



ACCESSIBLE MANEUVERING CLEARANCES AT MANUAL SWINGING DOORS, SEE DETAIL 4/A10.2



A FIRST FLOOR PARTIAL ACCESSIBLE ROUTE FLOOR PLAN

SCALE: 1/4" = 1'-0"

NORTH TRUE N

0 4' 8'

KEYPLAN

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

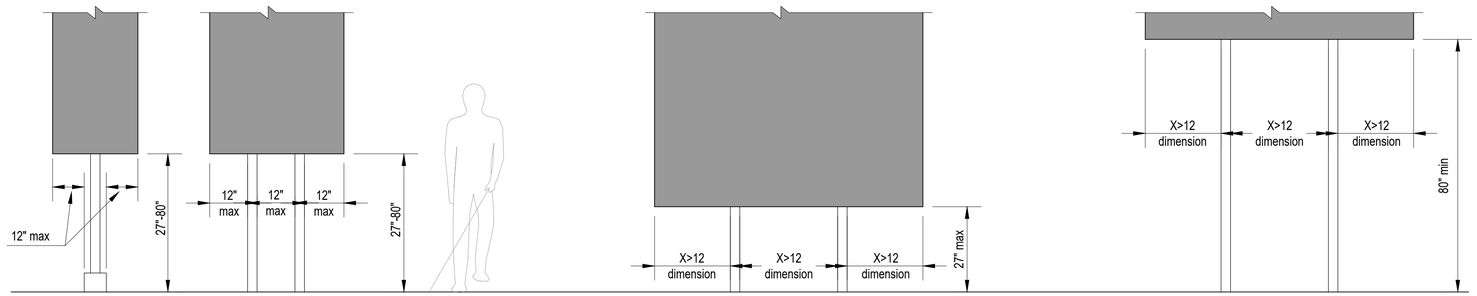
FIRST FLOOR PARTIAL ACCESSIBLE ROUTE FLOOR PLAN

ENGINEERING PARTNERS		HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-901C
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: AU	APPROVED BY:	DATE: JUNE 2026	SHEET 141 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 11:05 am
C:\USERS\PC...\TEAM MANUA..DROPBOX\EPI..DROPBOX--PROJECTS\01..ACTIVE..PROJECTS\2018--25--01 846..MEDCOM..RENOVATIONS\4--DWG\ARCH\A--901.DWG



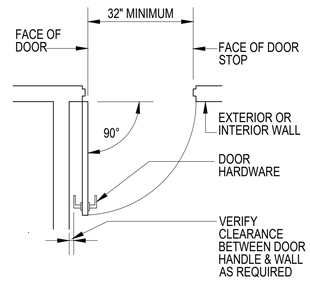
2 POST-MOUNTED PROTRUDING OBJECTS

SCALE: 1/2" = 1'-0"

0 2' 4'

NOTE:

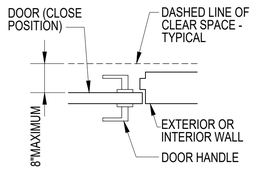
PROTRUDING OBJECT
WITH DOJ 2010 ADA S
SECTION 307.3



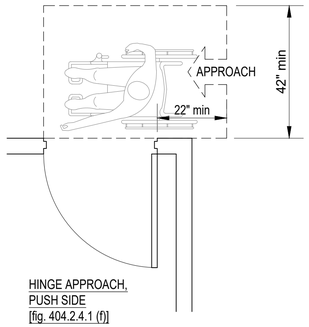
HINGE DOOR
[fig. 404.2.3 (a)]

NOTE:

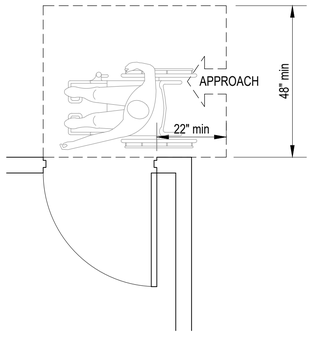
1. CLOSER SHALL BE SET FOR MAXIMUM OPENING PRESSURE OF 5 LBS AT EXTERIOR AND INTERIOR DOORS.



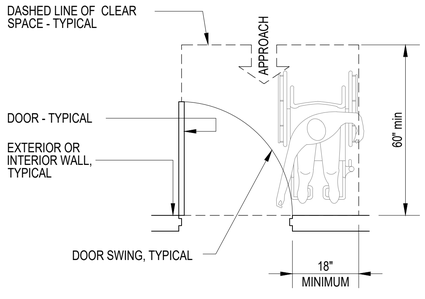
MANEUVERING CLEARANCES FOR A FOWARD APPROACH



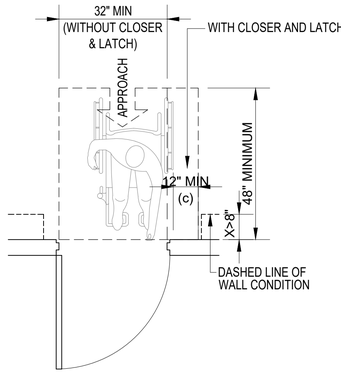
HINGE APPROACH, PUSH SIDE
[fig. 404.2.4.1 (f)]



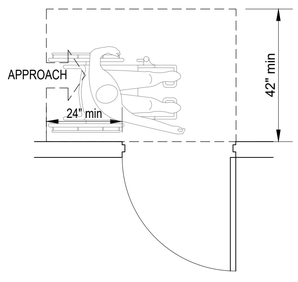
HINGE APPROACH, PUSH SIDE, DOOR PROVIDED WITH BOTH CLOSER AND LATCH
[fig. 404.2.4.2 (g)]



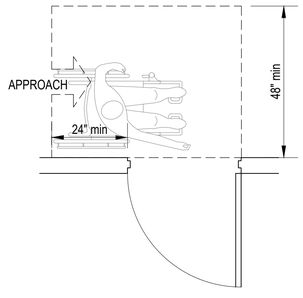
FRONT APPROACH
[fig. 404.2.4.1(a)]



1B - FRONT APPROACH
[fig. 404.2.4.1 (b,c)]



LATCH APPROACH, PUSH SIDE
[fig. 404.2.4.2 (j)]

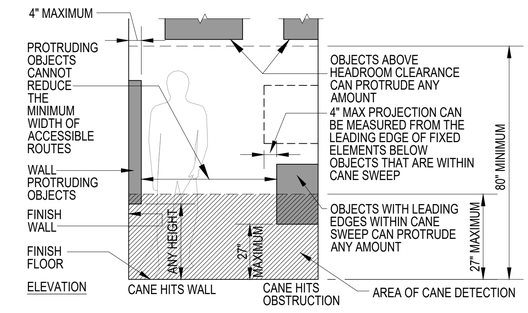


LATCH APPROACH, PUSH SIDE, DOOR PROVIDED WITH CLOSER
[fig. 404.2.4.1 (k)]

3 ACCESSIBLE MANEUVERING CLEARANCE AT SWINGING DOORS

SCALE: 1/2" = 1'-0"

0 2' 4'



NOTE:

PROTRUDING OBJECTS TO COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 307

ACCESSIBLE ROUTES TO COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 402

1 PROTRUDING OBJECTS DETAIL

SCALE: 1/2" = 1'-0"

0 2' 4'

BRIAN F. FUNAI
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No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ACCESSIBILITY DETAILS

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HWARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-902
DRAWN BY: MD/AP	APPROVED BY:	DATE	SHEET 142
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:53 am
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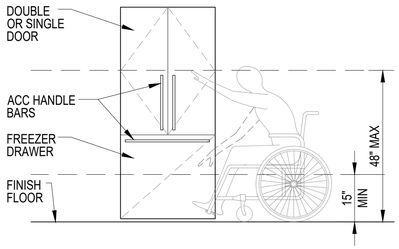
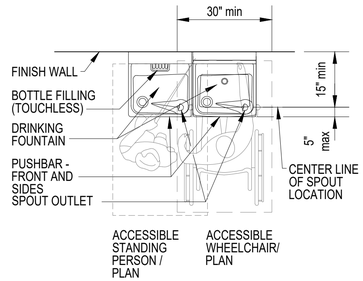


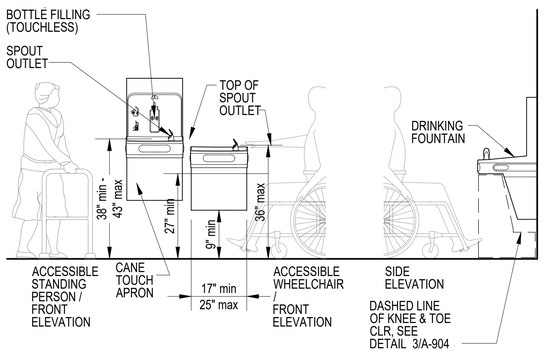
NOTE:

ACCESSIBLE SIDE REACH TO COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 308
ACCESSIBLE CLEAR FLOOR TO COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 804.6.1
OPERABLE PARTS TO COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 804.6.1

4 ACCESSIBLE FORWARD REACH REFRIGERATOR

SCALE: 1/2" = 1'-0" 0 2' 4'



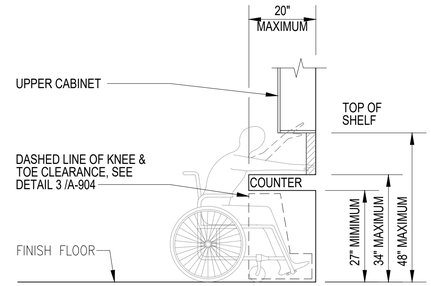


NOTE:

1. PROVIDE & INSTALL IN COMPLIANCE WITH DOJ 2010 ADA SECTION 602
2. KNEE & TOE CLEARANCE SHALL COMPLY WITH DOJ 2010 ADA SECTION 306.2
3. MAX. SLOPE 1:48 ANY DIRECTION
4. CLEAR FLOOR OR GROUND SPACE SHALL COMPLY WITH DOJ 2010 ADA SECTION 305

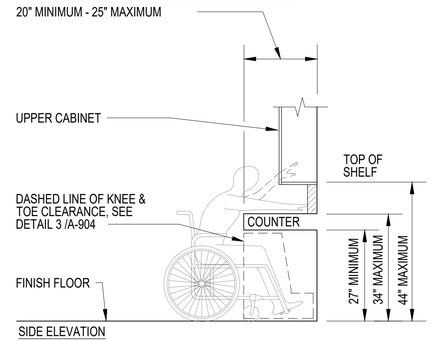
5 ACC DRINKING FOUNTAIN

SCALE: 1/2" = 1'-0" 0 2' 4'



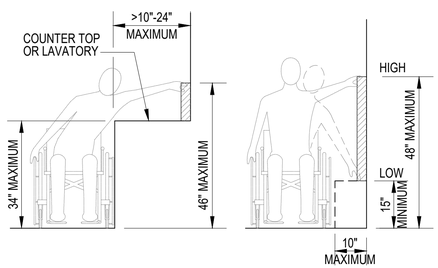
SIDE ELEVATION

MAXIMUM FORWARD REACH OVER AN OBSTRUCTION



SIDE ELEVATION

MAXIMUM FORWARD REACH OVER AN OBSTRUCTION



OBSTRUCTED HIGH SIDE REACH UNOBSTRUCTED SIDE

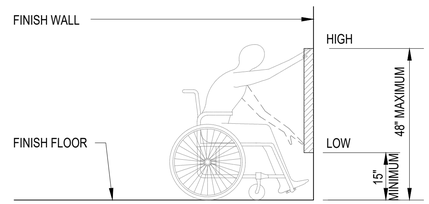
NOTE:

ACCESSIBLE SIDE REACH TO COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 308

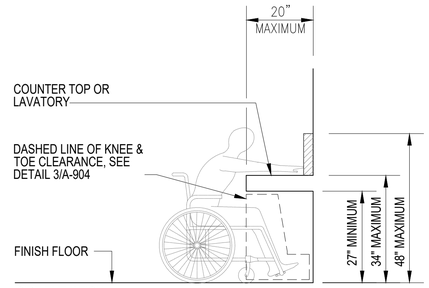
ACCESSIBLE CLEAR FLOOR TO COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 305

3 ACCESSIBLE SIDE REACH

SCALE: 1/2" = 1'-0" 0 2' 4'

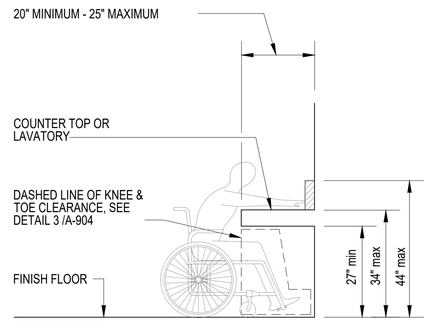


UNOBSTRUCTED FORWARD REACH



SIDE ELEVATION

MAXIMUM FORWARD REACH OVER AN OBSTRUCTION



SIDE ELEVATION

MAXIMUM FORWARD REACH OVER AN OBSTRUCTION

NOTE:

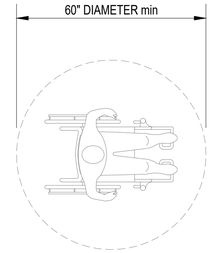
ACCESSIBLE SIDE & FORWARD REACH TO COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 308

ACCESSIBLE CLEAR FLOOR TO COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 305

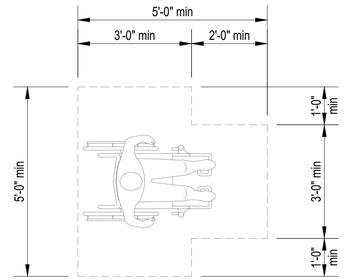
ACCESSIBLE KNEE & TOE CLEARANCE TO COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 306

2 ACCESSIBLE FORWARD REACH

SCALE: 1/2" = 1'-0" 0 2' 4'



CIRCULAR SPACE SECTION 304.3.1



T-SHAPED SPACE [fig. 304.3.2]

1 ACCESSIBLE TURNING SPACE

SCALE: 1/2" = 1'-0" 0 2' 4'

BRIAN F. FUNAI
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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ACCESSIBILITY DETAILS

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PH15H000333 STATE: CA-202505-D	DRAWING NO. A-903
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: MD/AP	APPROVED BY:	DATE: JUNE 2026	SHEET 143 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

05/07/2026 10:55 pm
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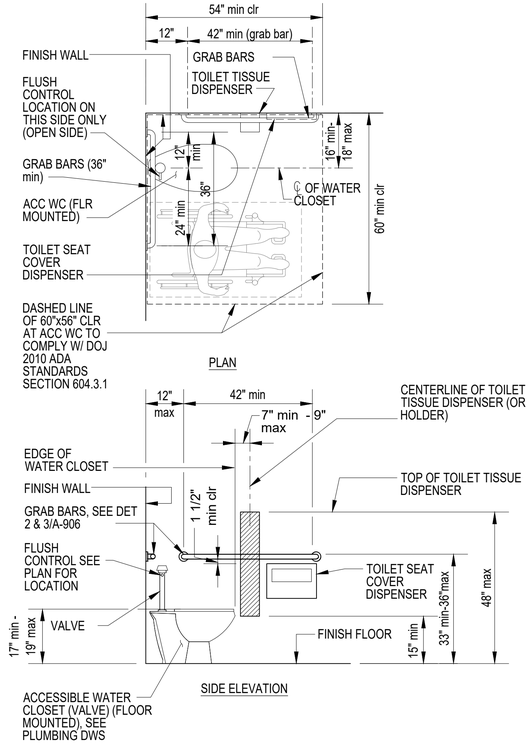


NOTE:

ACC WATER CLOSET TO COMPLY W/ DOJ 2010 ADA STANDARDS SECTION 604

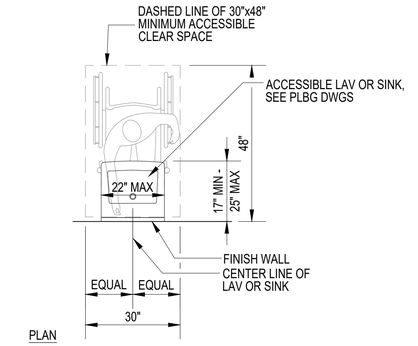
GRAB BAR TO COMPLY W/ DOJ 2010 ADA STANDARDS SECTION 604.5 & 609

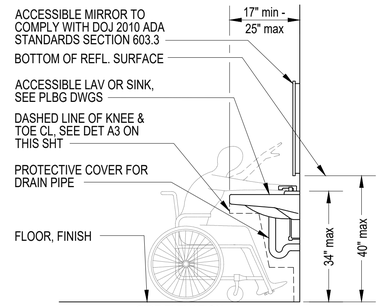
FLUSH CONTROL TO COMPLY W/ DOJ 2010 ADA STANDARDS SECTION 309 & 604.6

TOILET TISSUE DISPENSER TO COMPLY W/ DOJ 2010 ADA STANDARDS SECTION 604.7

4 ACC WATER CLOSET AND GRAB BAR DETAILS

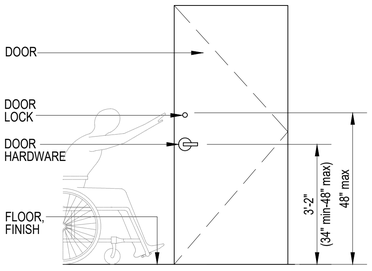
SCALE: 1/2" = 1'-0" 0 2' 4'





2 ACC LAV OR SINK

SCALE: 1/2" = 1'-0" 0 2' 4'



NOTE:

ACC DOOR TO COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 404

FLOOR OR GROUND SURFACE TO COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 404.2.4.4

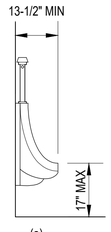
THRESHOLDS TO COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 404.2.5

DOOR HARDWARE TO COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 309.4 & 404.2.7

DOOR & GATE SURFACE TO COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 404.2.10

1 ACC HARDWARE DETAILS

SCALE: 1/2" = 1'-0" 0 2' 4'



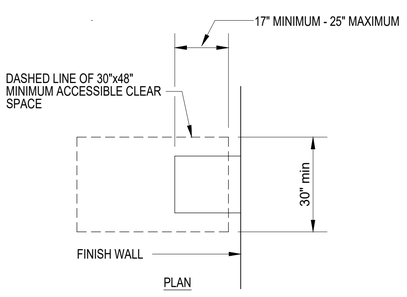
NOTE:

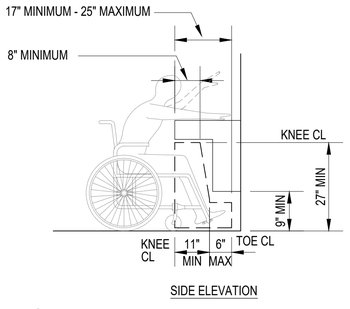
A CLEAR FLOOR OR GROUND SPACE COMPLYING WITH DOJ 2010 ADA STANDARDS SECTION 305 POSITIONED FOR FORWARD APPROACH SHALL BE PROVIDED.

FLUSH CONTROLS SHALL BE HAND OPERATED OR AUTOMATIC. HAND OPERATED FLUSH CONTROLS SHALL COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 309.

5 ACC URINAL

SCALE: 1/2" = 1'-0" 0 2' 4'





NOTE:

ACCESSIBLE KNEE AND TOE CLEARANCE TO COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 306

3 ACC KNEE AND TOE CLEARANCE

SCALE: 1/2" = 1'-0" 0 2' 4'

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ACCESSIBILITY DETAILS

BRIAN F. FUNAI
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No. AR-7698
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SIGNATURE

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HARNG JOB NO. FEDERAL: PN1:SH00033 STATE: CA-202505-D	DRAWING NO. A-904
DRAWN BY: MD/AP	APPROVED BY:	DATE	SHEET 144
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

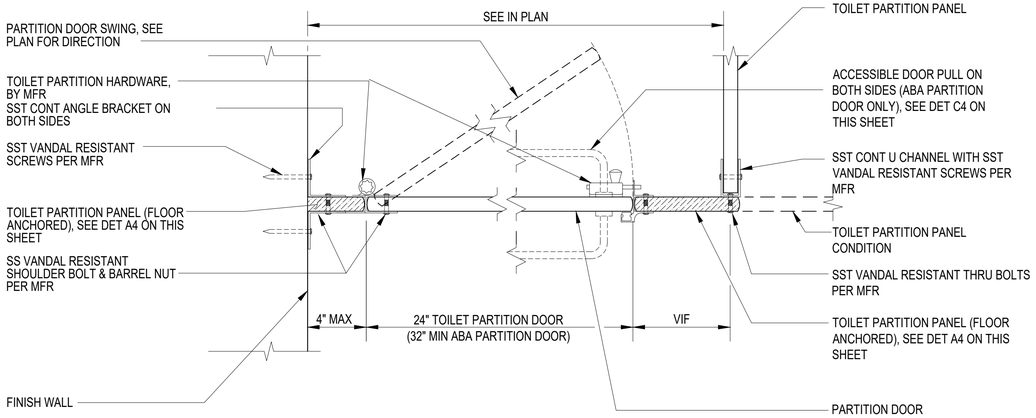
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~

05/07/2026 10:56 am
C:\USERS\PC_31\TEAM MANILA DROPBOX\EPI DROPBOX-PROJECTS\01_ACTIVE_PROJECTS\12018--25--01 846_MEDCOM_RENOVATIONS\4-DWG\ARCH\A-902.DWG

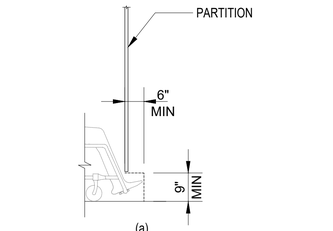
NOTE:

PROVIDE SUPPORT BRACKET (ABOVE) AS REQ PER MFR

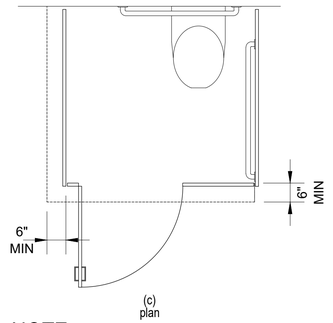


5 TOILET PARTITION DETAIL PLAN

SCALE: 3" = 1'-0" 0 3" 6" 9"



(a)
elevation adult



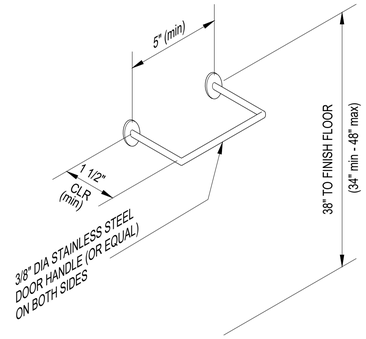
(c)
plan

NOTE:

GRAB BAR TO COMPLY W/ DOJ 2010 ADA STANDARDS SECTION 609

2 WHEELCHAIR ACCESSIBLE TOILET COMPARTMENT TOE CLEARANCE

SCALE: 1/2" = 1'-0" 0 2' 4'

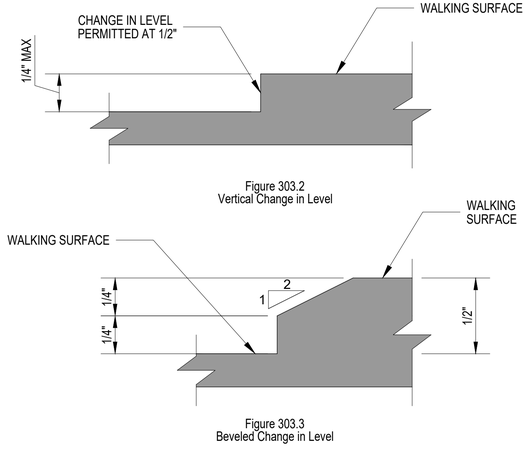


NOTE:

DOOR HARDWARE TO COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 404 & 404.2.7

1 DOOR PULL FOR TOILET COMPARTMENT

SCALE: 3" = 1'-0" 0 3" 6" 9"



NOTE:

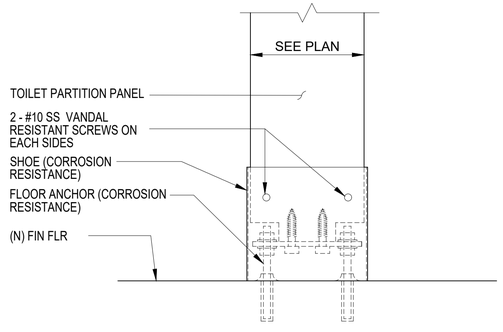
CHANGES IN LEVEL TO COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 303

SECTION 303.4: RAMPS: CHANGES IN LEVEL GREATER THAN 1/2 INCH SHALL BE RAMPED, AND SHALL COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 405 or 406.

THRESHOLDS TO COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 404.2.5.

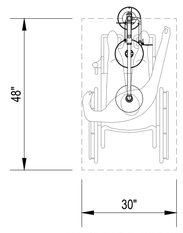
6 CHANGES IN LEVEL

SCALE: 1/2" = 1" 0 1" 2"

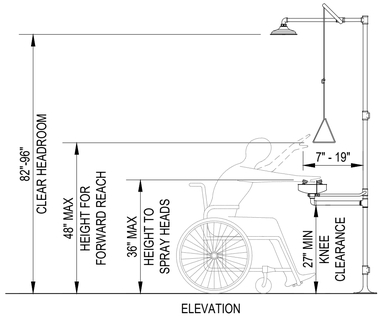


4 PARTITION ANCHORING AT FLOOR

SCALE: 3" = 1'-0" 0 3" 6" 9"



MIN CLEAR FLOOR SPACE REQUIREMENTS FOR FORWARD APPROACH PLAN



ELEVATION

NOTE:

EMERGENCY EQUIPMENT MUST COMPLY WITH THE PROVISIONS OF ANSI 117.1-1998 FOR ACCESSIBLITY

2 ACC EMERGENCY EYE WASH AND SHOWER STATION

SCALE: 1/2" = 1'-0" 0 2' 4'

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ACCESSIBILITY DETAILS

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN:15H00033 STATE: CA-202505-D	DRAWING NO. A-905
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: MD/AP	APPROVED BY:	DATE: JUNE 2026	SHEET 145
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

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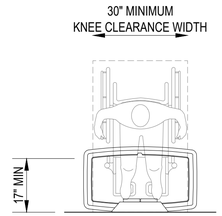


NOTE:

1. THE SPACE BELOW THE UNITS PROVIDES OVER 30" OF WIDTH FOR WHEELCHAIR ACCESS. ADAS/ ICC 2009/ 2017 306
2. THE UNDER SIDE OF THE OPEN UNIT IS OVER 27" ABOVE THE FINISHED FLOOR SURFACE. ADAS/ ICC 2009/ 2017 306
3. THE OPEN UNITS PROVIDE OVER 17" OF DEPTH FOR TOE CLEARANCE FOR WHEELCHAIR USERS. ADAS/ ICC 2009/ 2017 306

7 BABY CHANGING STATION KNEE AND TOE CLEARANCE

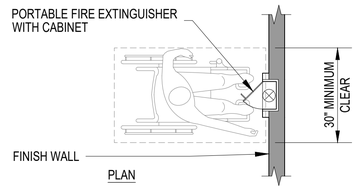
SCALE: 1/2" = 1'-0" 0 2' 4'

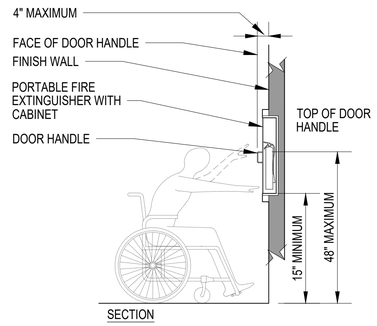
8 BABY CHANGING STATION ACCESSIBLE FORWARD REACH

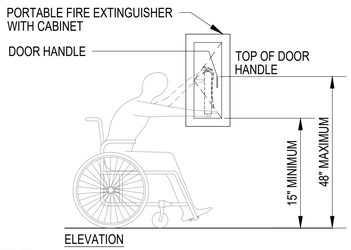
SCALE: 1/2" = 1'-0" 0 2' 4'

9 POST-MOUNTED PROTRUDING OBJECTS

SCALE: 1/2" = 1'-0" 0 2' 4'





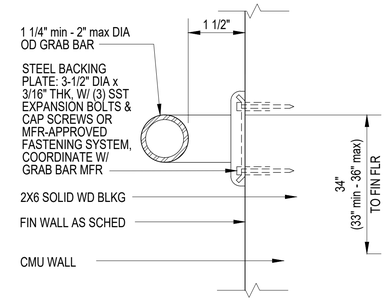


NOTE:

1. ACC KNEE & TOE CLR TO COMPLY W/ DOJ 2010 ADA STANDARDS SECTION 306
2. PROTRUDING OBJECTS TO COMPLY W/ DOJ 2010 ADA STANDARDS SECTION 307
3. ACC FORWARD & SIDE REACH TO COMPLY W/ DOJ 2010 ADA STANDARDS SECTION 308
4. OPERABLE PARTS TO COMPLY W/ DOJ 2010 ADA STANDARDS SECTION 205 & 309
5. ACC CLR FLR TO COMPLY W/ DOJ 2010 ADA STANDARDS SECTION 606.2

5 ACC FORWARD REACH PORTABLE FIRE EXTINGUISHER HOUSED IN CABINET

SCALE: 1/2" = 1'-0" 0 2' 4'

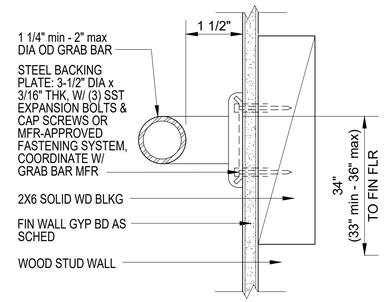


NOTE:

ACCESSIBLE GRAB BAR TO COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 609

3 ACC GRAB BAR DETAIL AT CMU/CONCRETE WALLS

SCALE: 1/2" = 1" 0 1" 2"

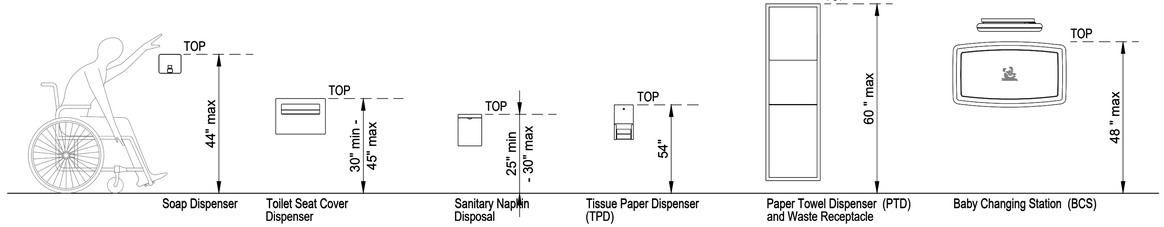


NOTE:

ACCESSIBLE GRAB BAR TO COMPLY WITH DOJ 2010 ADA STANDARDS SECTION 609

4 ACC GRAB BAR DETAIL AT TOILET PARTITION/GYPSUM WALLS

SCALE: 1/2" = 1" 0 1" 2"



6 MOUNTING HEIGHT DETAILS

SCALE: 1/2" = 1'-0" 0 2' 4'

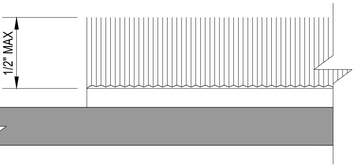


Figure 302.2

NOTE:

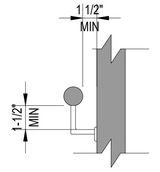
CARPET OR CARPET TILE SHALL BE SECURELY ATTACHED AND SHALL HAVE A FIRM CUSHION, PAD, OR BACKING OR NO CUSHION OR PAD. CARPET OR CARPET TILE SHALL HAVE A LEVEL LOOP, TEXTURED LOOP, LEVEL CUT PILE, OR LEVEL CUT/UNCUT PILE TEXTURE.

EXPOSED EDGES OF CARPET SHALL BE FASTENED TO FLOOR SURFACES AND SHALL HAVE TRIM ON THE ENTIRE LENGTH OF THE EXPOSED EDGE.

CARPET EDGE TRIM SHALL COMPLY WITH DOJ 2010 ADA STANDARDS SECTION.

1 CARPET PILE HEIGHT

SCALE: 1/2" = 1" 0 1" 2"



NOTE:

HANDRAIL GRIPPING SURFACES SHALL BE CONTINUOUS ALONG THEIR LENGTH AND SHALL NOT BE OBSTRUCTED ALONG THEIR TOPS OR SIDES. THE BOTTOMS OF HANDRAIL GRIPPING SURFACES SHALL NOT BE OBSTRUCTED FOR MORE THAN 20 PERCENT OF THEIR LENGTH.

HANDRAIL GRIPPING SURFACE TO COMPLY W/ DOJ 2010 ADA STANDARDS SECTION 505.6

HANDRAIL GRIPPING SURFACES SHALL HAVE A CROSS SECTION COMPLYING W/ DOJ 2010 ADA STANDARDS SECTION 505.7.1 OR 505.7.2.

2 HANDRAIL CLEARANCE AND HORIZONAL PROJECTION BELOW GRIPPING SURFACE

SCALE: 1-1/2" = 1'-0" 0 6" 1' 1'-6'

REV NO	DESCRIPTION	DATE

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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ACCESSIBILITY DETAILS

ENGINEERING PARTNERS

DESIGNED BY: BF	CHECKED BY: YWF	HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-906
DRAWN BY: AP	APPROVED BY:	DATE JUNE 2026	SHEET 146 OF 276 SHTS
SCALE: AS NOTED			

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DATE ISSUED: ---

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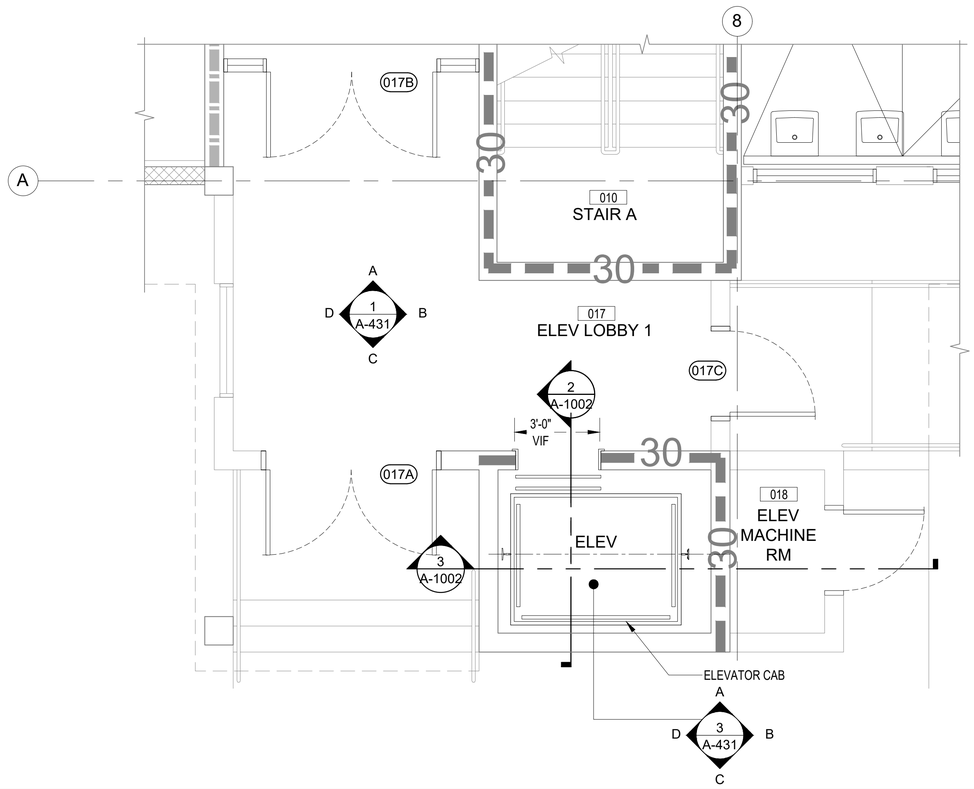


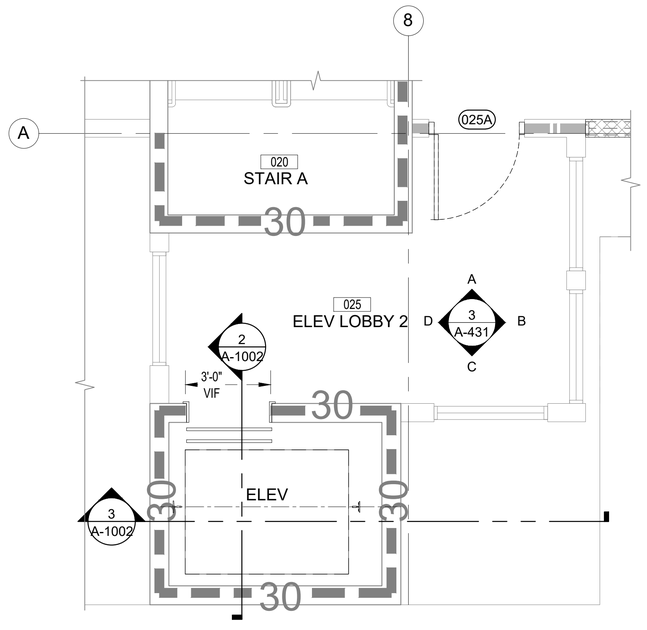
1 ENLARGED FLOOR PLAN - FIRST FLOOR

SCALE: 3/8" = 1'-0"

0 2' 4' 6'

NORTH

TRUE N



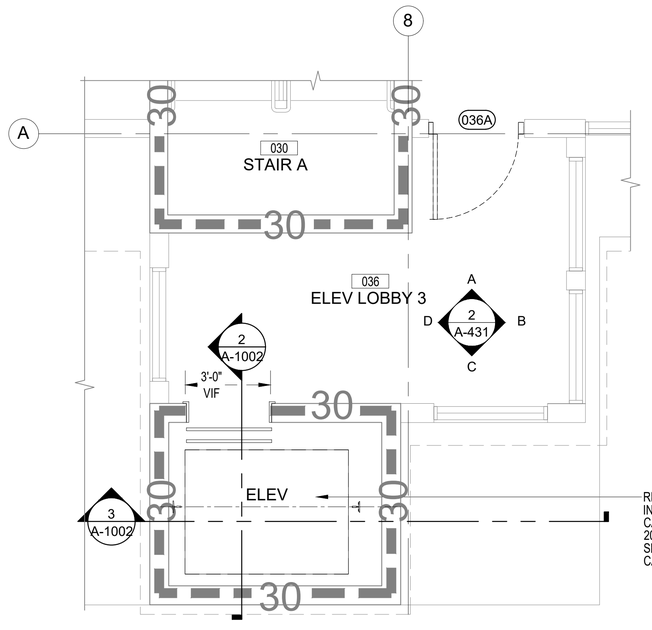
2 ENLARGED FLOOR PLAN - SECOND FLOOR

SCALE: 3/8" = 1'-0"

0 2' 4' 6'

NORTH

TRUE N



REFURBISH (E) ELEVATOR CAB INTERIOR INSTALL (N) ELEVATOR CAB CONTROLS TO COMPLY W/ 2010 ADA STANDARDS. SEE SHEET A-1105 FOR ELEVATOR CAB DETAILS AND FINISHES.

3 ENLARGED FLOOR PLAN - THIRD FLOOR

SCALE: 3/8" = 1'-0"

0 2' 4' 6'

NORTH

TRUE N

LEGEND

EXISTING

(E) COLUMNS

(E) WALLS

(E) WINDOWS

(E) DOORS

(E) ONE HOUR FIRE-RATED WALLS

30 (E) 30 MINUTE FIRE-RATED WALLS

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Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ENLARGED FLOOR PLANS - ELEVATOR

ENGINEERING PARTNERS		HNARNG JOB NO. FEDERAL: PN1:5H00033 STATE: CA-202505-D	DRAWING NO. A-1001
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: AU/AP/MB	APPROVED BY:	DATE	SHEET 147
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~

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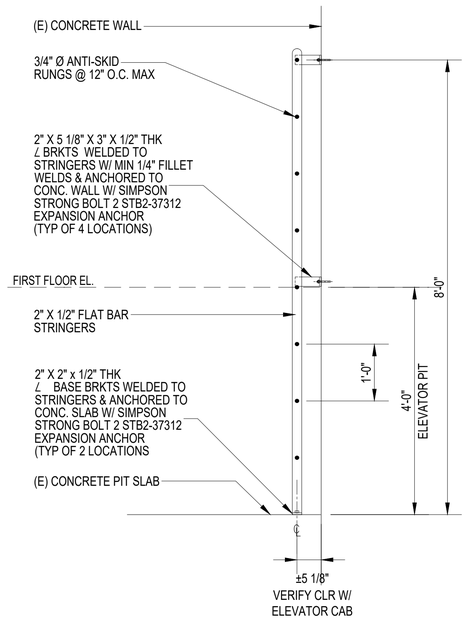
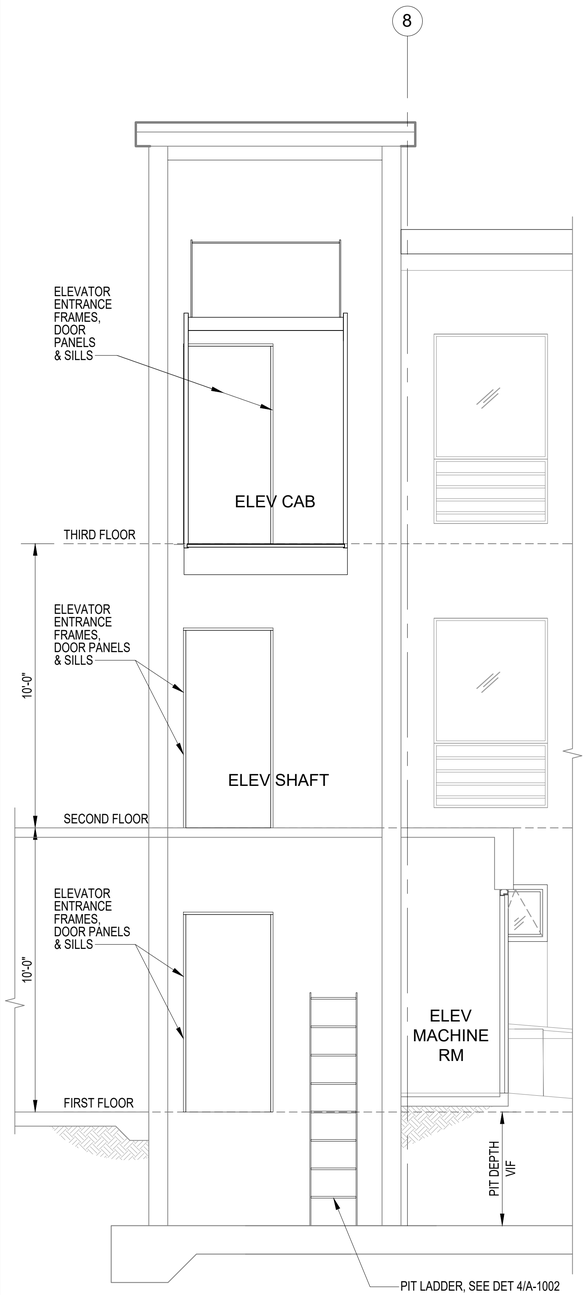


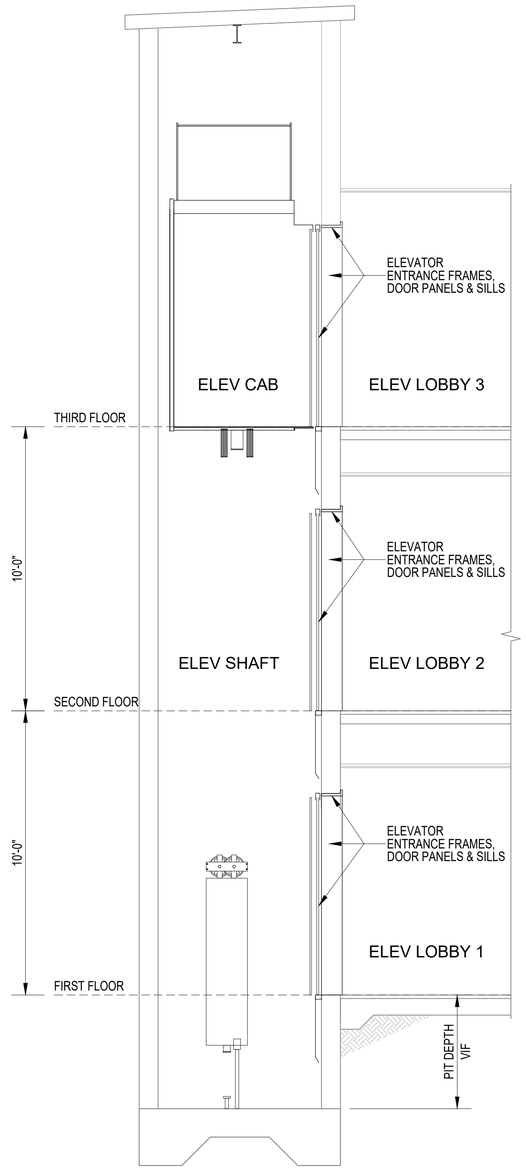
NOTES:

1. SEE PLAN FOR LOCATION
2. MIN WIDTH OF LADDER TO 16" CLEAR
3. GRIND ALL WELDS SMOOTH
4. HOT DIP GALV AFTER FAB

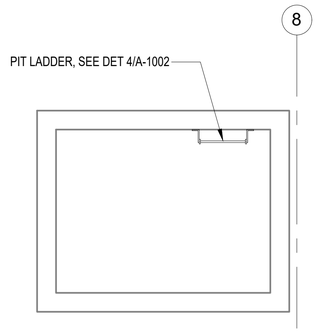
4 DETAIL OF PIT LADDER
SCALE: 3/4" = 1'-0" 0 1' 2' 3'



3 SECTION
SCALE: 3/8" = 1'-0" 0 2' 4' 6'



2 SECTION
SCALE: 3/8" = 1'-0" 0 2' 4' 6'



1 ELEVATOR PIT PLAN
SCALE: 3/8" = 1'-0" 0 2' 4' 6'

NORTH
TRUE N

REV. NO	DESCRIPTION	DATE

BRIAN F. FUNAI
LICENSED PROFESSIONAL ARCHITECT
Exp. 04/30/28
No. AR-7698
HAWAII, U.S.A.

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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ELEVATOR DETAILS

ENGINEERING PARTNERS		HI&PG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. A-1002
DESIGNED BY: BF	CHECKED BY: YWF		
DRAWN BY: AU/AP/MB	APPROVED BY:	DATE JUNE 2026	SHEET 148
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

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GENERAL PLUMBING NOTES

1. PROVIDE COMPLETE PLUMBING SYSTEM AS SPECIFIED AND INDICATED ON DRAWINGS. "PROVIDE" SHALL MEAN "FURNISH AND INSTALL" WHEN USED HEREIN.
2. THESE DRAWINGS ARE DIAGRAMMATIC TO SHOW WORK SCOPE, NOT SHOP DRAWINGS SHOWING ALL CONDITIONS OF EXISTING WORK. CONTRACTOR MAY MODIFY TO SUIT CONDITIONS.
3. WORK SHALL COMPLY WITH ALL LOCAL CODES AND ORDINANCES INCLUDING: 2018 UNIFORM PLUMBING CODE AND ITS AMENDMENTS, CITY AND COUNTY OF HONOLULU. 2018 INTERNATIONAL BUILDING CODE AND ITS AMENDMENTS, AND ALL OTHER APPLICABLE STANDARDS AND CODES.
4. CONTRACTOR SHALL ARRANGE AND PAY FOR ALL PERMITS AND FEES.
5. WORK SHALL BE COORDINATED WITH THE WORK OF OTHER TRADES. WORK SHALL BE GUARANTEED AGAINST DEFECTIVE WORKMANSHIP OR MATERIALS FOR A PERIOD OF ONE YEAR AFTER FINAL ACCEPTANCE OF THE PROJECT. WARRANTY WORK SHALL BE COMPLETED AT NO EXTRA CHARGE TO THE OWNERS. FURNISH MANUFACTURER'S PRODUCT WARRANTY CERTIFICATES IN A BINDER.
6. MATERIALS AND EQUIPMENT SHALL BE NEW AND GUARANTEED FOR ONE YEAR FROM THE DATE OF ACCEPTANCE. MATERIALS AND EQUIPMENT SHALL BE AS SCHEDULED OR EQUAL, MEETING THE REQUIREMENTS OF THE SPECIFICATION. MATERIALS AND EQUIPMENT SHALL BE SUBMITTED TO THE ARCHITECT FOR APPROVAL PRIOR TO ORDER RELEASE.
7. RECORD DRAWINGS, OPERATION MANUALS AND MAINTENANCE MANUALS SHALL BE SUBMITTED AS REQUIRED BY ARCHITECT UPON COMPLETION.
8. DRAWINGS SHALL NOT BE SCALED.
9. PENETRATIONS OF FIRE RATED WALLS OR FLOORS BY PIPE SHALL BE SEALED BY A FIRESTOPPING SYSTEM UL LISTED FOR THE APPLICATION. INSTALL PENETRATION SEAL MATERIALS IN ACCORDANCE WITH PRINTED INSTRUCTIONS OF THE UL FIRE RESISTANCE DIRECTORY AND MANUFACTURERS INSTRUCTIONS. FIRESTOPPING SYSTEM SHALL BE EQUAL TO 3M FIRE BARRIER. FIRESTOPPING MATERIAL SHALL BE CAULK OR PUTTY TYPE.
10. EQUIPMENT SHALL BE SECURED AND INSTALLED PER MANUFACTURERS RECOMMENDATIONS AND APPLICABLE SECTIONS OF THE UNIFORM BUILDING CODE AND UNIFORM MECHANICAL CODE.
11. EQUIPMENT SHALL BE IDENTIFIED WITH BAKELITE NAMEPLATES. COLOR CODING OF NAMEPLATES AND IDENTIFICATION INFORMATION SHALL BE COORDINATED WITH THE OWNER.
12. ELECTRICAL CHARACTERISTICS OF EQUIPMENT SHALL BE VERIFIED WITH ELECTRICAL DRAWINGS PRIOR TO ORDER RELEASE. ADDITIONAL ELECTRICAL WORK RESULTING FROM EQUIPMENT SUBSTITUTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
13. THE OWNER SHALL BE NOTIFIED IN WRITING OF SHUTDOWN OF UTILITIES REQUIRED BY THE EXECUTION OF THIS CONTRACT.
14. INSPECTIONS: ARRANGE FOR INSPECTIONS BY ADMINISTRATIVE AUTHORITY.
15. ELECTRICAL: CONFORM TO THE REQUIREMENTS OF ANSI, AND NATIONAL ELECTRICAL CODE. OBTAIN EQUIPMENT MANUFACTURER'S CONTROL WIRING DIAGRAMS FOR THE EQUIPMENT FURNISHED.
16. FIELD INVESTIGATIONS: VISIT THE WORK-SITE AND BECOME FULLY AWARE OF ALL EXISTING CONDITIONS. INVESTIGATE THE CONTRACT DOCUMENTS AND MAKE PROPER PROVISIONS TO AVOID INTERFERENCES OR CONSTRUCTION DELAYS. EXISTING UTILITY LOCATIONS SHALL BE FIELD-VERIFIED. UNFORESEEN OBSTRUCTIONS OR LACK OF INVERT DEPTH SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT.
17. REQUIREMENTS: PERFORM WORK USING PERSONNEL SKILLED IN THE TRADE INVOLVED. PROVIDE COMPETENT SUPERVISION. FURNISH NEW EQUIPMENT, MATERIALS AND ACCESSORIES BEARING THE MANUFACTURER'S IDENTIFICATION AND CONFORMING TO THE RECOGNIZED COMMERCIAL STANDARDS. COORDINATE WITH OTHER TRADES FOR PIPE SLEEVES AND INSTALLATION OF EQUIPMENT SUPPORTS
18. EQUIPMENT INSTALLATION: INSTALL EQUIPMENT IN THE SPACE ALLOTTED WITH SUFFICIENT CLEARANCE FOR PROPER OPERATION AND MAINTENANCE AND WITH SUFFICIENT HEAD CLEARANCE ACCORDING TO THE BUILDING CODE. WHERE EQUIPMENT DIFFERS IN ARRANGEMENT OR CONNECTIONS FROM THOSE SHOWN, PROVIDE ALL REQUIRED CHANGES IN PIPING, SUPPORTS AND APPURTENANCES. INSTALLED WORK SHALL BE PROTECTED DURING CONSTRUCTION AND CLEANED FOR FINAL INSPECTION. TOUCH-UP PAINT ALL RAW EDGES OF METAL EXPOSED TO WEATHER.
19. PIPING: INSPECT FOR AND REMOVE ALL INTERIOR OBSTRUCTIONS AND BURRS BEFORE INSTALLATION. SLOPE DRAINS AT ¼" PER FOOT. PERFORATED STRAP AND WIRES ARE NOT ACCEPTABLE HANGERS.
20. FERROUS PIPING SHALL HAVE A PROTECTIVE COATING OF AN APPROVED TYPE; MACHINE APPLIED IN ACCORDANCE WITH RECOGNIZED STANDARDS. APPROVED NONFERROUS PIPING SHALL NOT BE REQUIRED TO BE WRAPPED.
21. WATER LINES: PROTECT AGAINST ELECTROLYSIS WITH TWO LAYERS OF ANTI-CORROSION TAPE WHERE THEY CONTACT FERROUS METAL.
22. PRESSURIZE ROUGH-IN WATER LINES TO 125 PSI FOR 3 HOURS AND INSPECT FOR LEAKS BEFORE BEING CLOSED UP. RETEST LINES AT 75 PSI AFTER FIXTURES ARE CONNECTED. TEST WASTE LINES TO HOLD 10' WATER HEAD FOR 15 MINUTES WITHOUT LOSS.
23. FLUSH OUT AND DISINFECT WATER LINES WITH 50 PPM CHLORINE FOR 6 HOURS OR 100PPM FOR TWO UNLESS WAIVED BY THE OWNER IN WRITING. FLUSH PIPES UNTIL RESIDUAL IS DOWN TO 0.3 PPM.
24. TEST ALL GAS LINES IN ACCORDANCE WITH METHODS DESCRIBED IN THE PLUMBING CODE. REPAIR ALL LEAKS AND REPEAT THE TEST UNTIL ALL LINES ARE LEAK FREE.

GENERAL PLUMBING NOTES

25. INSTALL INSULATION SYSTEM IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS USING TRADESMAN SKILLED IN THIS TRADE AND APPROVED BY THE INSULATION MANUFACTURER. PROVIDE INSULATION PRODUCTS WITH A COMPOSITE (INSULATION, JACKET AND ADHESIVE) FIRE AND SMOKE HAZARD RATING AS TESTED UNDER ASTM E84, NFPA 255 AND UL 723, NOT EXCEEDING A FLAME SPREAD OF 25 AND SMOKE DEVELOPED OF 50.
26. EXPANSION CLEARANCES: AT POINTS WHERE PIPE WILL MOVE DURING EXPANSION AND CONTRACTION (EXPANSION JOINTS, Z-BENDS, EXPANSION LOOPS AND ELLS), CLEARANCES BETWEEN THE PIPE AND ENCASED INSULATION SHALL BE SIZED TO PERMIT FULL PIPE MOVEMENT WITHOUT CRACKING OR DAMAGING INSULATION AND JACKET.
27. A CLEANOUT SHALL BE PROVIDED ABOVE THE FIXTURE CONNECTION FITTING SERVING EACH URINAL, REGARDLESS OF THE LOCATION OF THE URINAL PER UPC 2018 SECTION 707.4.

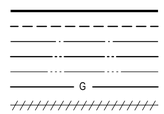
BASE BID

1. AIR CONDITIONING SYSTEM IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO ALL FAN COILS, EXTERIOR CONDENSING UNITS, CONTROLS, CONCRETE PADS, TESTING/ADJUSTING/BALANCING, INSULATION, REFRIGERANT PIPING, CONDENSATE PIPING, AND ASSOCIATED ELECTRICAL WORK.
2. PLUMBING SYSTEM IN ITS ENTIRETY, INCLUDING ALL DEMOLITION WORK, NEW WASTE/VENT PIPING, NEW HOT WATER PIPING, WATER HEATERS, AND PROPANE SYSTEM. INCLUDE ALL TRENCHING, FLOOR SLAB REPAIR NECESSARY TO INSTALL NEW WASTE LINES. INCLUDE ARCHITECTURAL WORK FOR ANY NEW FRAMED WALLS AND CEILING, WALL, OR FLOOR FINISHES NECESSARY TO SUPPORT INSTALLATION OF PLUMBING FIXTURES.
3. ELECTRICAL INFRASTRUCTURE, INCLUDING ALL EXTERIOR SERVICE ENTRY INTO THE BUILDING, NEW METERING SWITCHBOARD, PANELBOARDS, AND FEEDERS.
4. ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL WORK OCCURING WITHIN SELECT ROOMS AS INDICATED ON DRAWINGS.

ADDITIVE ALTERNATES

1. 1ST FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE/BID.
2. 2ND FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK. ALL WORK NOT INCLUDED IN BASE BID.
3. 3RD FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK. ALL NOT INCLUDED IN BASE BID.
4. DEMOLITION OF EXISTING LIGHTING AND INSTALLATION OF NEW LED LIGHTING AND ASSOCIATED BRANCH CIRCUITING, OVERCURRENT PROTECTION, AND CONTROLS.
5. ELECTRICAL BRANCH CIRCUITING FOR RECEPTACLES AND ANY OTHER ELECTRICAL WORK NOT ASSOCIATED WITH THE ABOVE BASE BID AND ADDITIVE ALTERNATES.
6. TELECOMMUNICATION WORK.
7. ROOF REPLACEMENT.
8. ELEVATOR REPLACEMENT.

PLUMBING SYMBOLS



SANITARY LINE
PLUMBING VENT
COLD WATER LINE
HOT WATER LINE
HOT WATER RETURN LINE
GAS LINE
DEMOLITION

PIPE RISER TO UPPER LEVEL
CAPPED LINE
PIPE ELBOW UP/DOWN
PIPE BRANCH TOP CONNECTION
PIPE BRANCH BOTTOM CONNECTION
PIPE UNION

BALL VALVE
CHECK VALVE
GATE VALVE
PRESSURE REDUCING VALVE
EMERGENCY GAS SHUT-OFF VALVE

EQUIPMENT TAG

PLUMBING ABBREVIATIONS

(E)	EXISTING	HZ	HERTZ
(D)	DEMOLITION	KW	KILOWATT
(N)	NEW	LAV	LAVATORY
(R)	RELOCATED	MANUF	MANUFACTURER
ABV	ABOVE	MAX	MAXIMUM
ADJ	ADJUSTABLE	MECH	MECHANICAL
AFF	ABOVE FINISHED FLOOR	MIN	MINIMUM
AFG	ABOVE FINISHED GRADE	MTD	MOUNTED
APPROX	APPROXIMATELY	NOM	NOMINAL
ARCH	ARCHITECT	NPSH	NET POSITIVE SUCTION HEAD
BLDG	BUILDING	PH	PHASE
BHP	BRAKE HORSEPOWER	PLMB	PLUMBING
BTU	BRITISH THERMAL UNITS	PRV	PRESSURE REDUCING VALVE
BV	BALL VALVE	QTY	QUANTITY
CAP	CAPACITY	RD	ROOF DRAIN
CLG	CEILING	REQ'D	REQUIRED
CONC	CONCRETE	RPBP	REDUCING PRESSURE BACKFLOW PREVENTOR
CONN	CONNECT	RM	ROOM
CONT'N	CONTINUATION	S	SANITARY
COTG	CLEANOUT TO GRADE	SD	SHOWER DRAIN
CW	COLD WATER	SHWR	SHOWER
DF	DRINKING FOUNTAIN	SS	SERVICE SINK
DN	DOWN	SQ	SQUARE
EA	EACH	T&P	TEMPERATURE AND PRESSURE
ELEC	ELECTRICAL	TDH	TOTAL DISCHARGE HEAD
EXIST	EXISTING	TEMP	TEMPERATURE
FD	FLOOR DRAIN	TP	TRAP PRIMER
FCO	FLOOR CLEANOUT	TYP	TYPICAL
FLR	FLOOR	UR	URINAL
FS	FLOOR SINK	V	VENT
GAL	GALLONS	VB	VACUUM BREAKER
GPM	GALLONS PER MINUTE	VTR	VENT TO ROOF
HB	HOSE BIBB	W/	WITH
FLEX	FLEXIBLE	WC	WATER CLOSET
FLR	FLOOR	WCO	WALL CLEANOUT
FT	FEET		
HTR	HEATER		

REV. NO	DESCRIPTION	DATE

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAI'I

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

PLUMBING SYMBOLS, ABBREVATION & SPECS

ENGINEERING PARTNERS

DESIGNED BY: MS	CHECKED BY: EW	HIARNG JOB NO, FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-001
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 149 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 4:52 pm
U:\CD PROJECTS\2025 PROJECTS\12018--25--01 DOD BLDG 46 MEDCOM RENOVATIONS\4--DWG\PLUMBING\12018--25--01 P--001.DWG

WATER HEATER SCHEDULE

UNIT NO.	LOCATION	TYPE	SUPPLY TEMP	GPH 60 TEMP RISE	MAX. LPG INPUT (BTU/HR)	ELECTRIC	EFFICIENCY	REMARKS
WH 1	MECHANICAL ROOM	ON-DEMAND FULLY MODULATING, CONDENSING	120 DEG.	390	199,950	120V/1PH/60HZ 9A	0.98	INTELLIHOT MODEL iN199A OR APPROVED EQUAL
WH 2	MECHANICAL ROOM	ON-DEMAND FULLY MODULATING, CONDENSING	120 DEG.	390	199,950	120V/1PH/60HZ 9A	0.98	INTELLIHOT MODEL iN199A OR APPROVED EQUAL
WH 3	MECHANICAL ROOM	ON-DEMAND FULLY MODULATING, CONDENSING	120 DEG.	390	199,950	120V/1PH/60HZ 9A	0.98	INTELLIHOT MODEL iN199A OR APPROVED EQUAL

PUMP SCHEDULE

UNIT NO.	DESCRIPTION	TYPE	FLOW (GPM)	TDH (FT)	MOTOR DATA		REMARKS
					HP	V/HZ/PH	
CP 1	HOT WATER CIRCULATOR	IN-LINE CIRCULATOR	3.0	15	1/25	115V/1PH/60HZ	GRUNFOS MODEL UP 15-42F OR APPROVED EQUAL

1. PROVIDE ACCESSORIES AND REQUIRED COMPONENTS FOR COMPLETE AND OPERABLE SYSTEM. PROVIDE WITH GRUNFOS UP 599388 PROGRAMMABLE TIMER AND AQUASTAT 595444, ¾" CLIP-ON

EXPANSION TANK SCHEDULE

UNIT NO.	DESCRIPTION	CAPACITY	WORKING PRESSURE	MAX TEMPERATURE	STATIC PRESSURE	REMARKS
EXP 1	THERMAL EXPANSION TANK	14 GALLONS	150 PSI MAX	150 DEG	80 PSI	ASME RATED THERMAL EXPANSION TANKSHALL BE DESIGNED FOR THERMAL XPANSION IN CLOSED HOT WATER SYSTEMS. UNIT SHALL HAVE DOMED STEEL ENDS WITH WELDED STEEL CONSTRUCTION. RIGID POLYPOPTLENE LINER FOR CORROSION RESISTANT RESERVOIR, BUTYL DIAPHRAGM WITH HOOP RING AND WELDED AIR CHARGE FITTING,. UNIT SHALL BE AMTROL THERM-XTROL ST-30VC OR APPROVED EQUAL.

TABLE 1

WATER HAMMER FIXTURE UNITS

FIXTURE	TYPE OF SUPPLY CONTROL	FIXTURE UNITS					
		PUBLIC			PRIVATE		
		TOTAL	C.W.	H.W.	TOTAL	C.W.	H.W.
WATER CLOSET 1.66 PF	FLUSH VALVE	8	8	-	5	5	-
WATER CLOSET 1.66 PF	FLUSH TANK	5	5	-	2.5	2.5	-
PEDESTAL URINAL1.06 PF	FLUSH VALVE	4	4	-	-	-	-
STALL OR WALL URINAL	FLUSH VALVE	4	4	-	-	-	-
STALL OR WALL URINAL	FLUSH TANK	2	2	-	-	-	-
LAVATORY	FAUCET	2	1-1/2	1-1/2	1	1	1
BATHTUB	FAUCET	4	2	3	2	1-1/2	1-1/2
SHOWER HEAD	MIXING VALVE	4	2	3	2	1	2
BATHROOM GROUP	FLUSH VALVE CLOSET	-	-	-	8	8	3
BATHROOM GROUP	FLUSH VALVE CLOSET	-	-	-	6	6	3
SEPARATE SHOWER	MIXING VALVE	-	-	-	2	1	2
SERVICE SINK	FAUCET	3	3	3	-	-	-
LAUNDRY TUBS (1-3)	FAUCET	-	-	-	3	3	3
COMBINATION FIXTURE	FAUCET	-	-	-	3	3	3
CLOTHES WASHER	SOLENOID VALVE	-	-	-	4	3	3
DISHWASHER	SOLENOID VALVE	-	-	-	1.5	-	1.5
ICE MAKER	SOLENOID VALVE	-	-	-	1	1	-

TABLE 2

ARRESTER SIZE	AA	A	B	C	D	E	F
FIXTURE UNITS	1-4	5-11	12-32	33-60	61-113	114-154	155-300

REV. NO	DESCRIPTION	DATE

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

PLUMBING SCHEDULES

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-002
MS	EW		
DRAWN BY: MC	APPROVED BY: EW	DATE JUNE 2026	SHEET 150 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 4:52 pm
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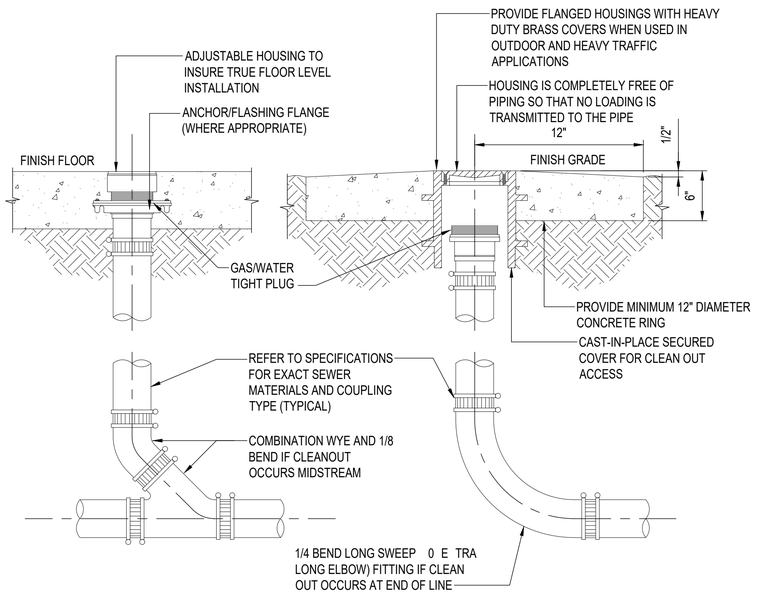

1 FLOOR/GRADE CLEANOUT DETAIL
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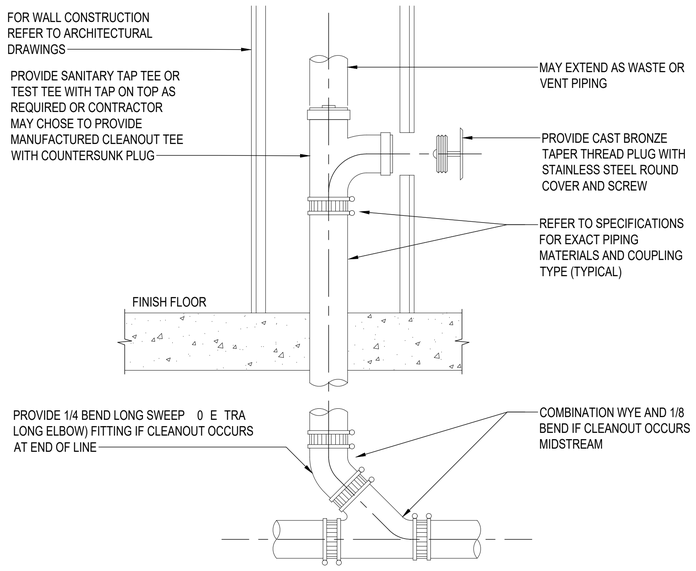
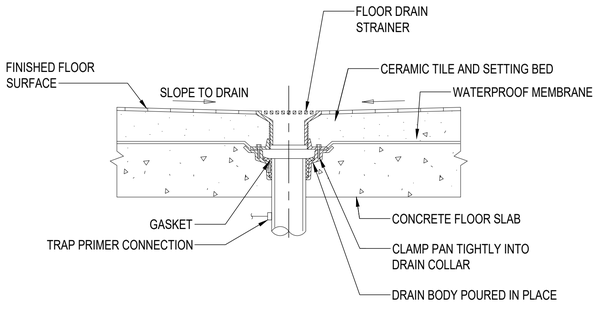
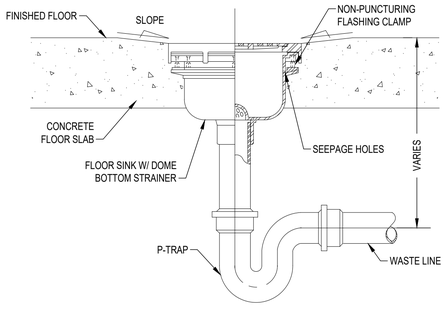


2 WALL CLEANOUT DETAIL
NO SCALE



3 FLOOR DRAIN DETAIL
NO SCALE



4 FLOOR SINK DETAIL
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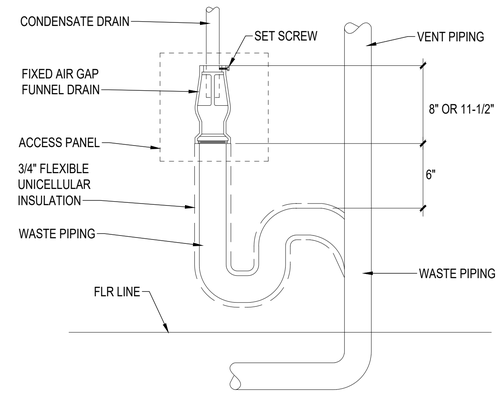

5 FUNNEL DRAIN DETAIL
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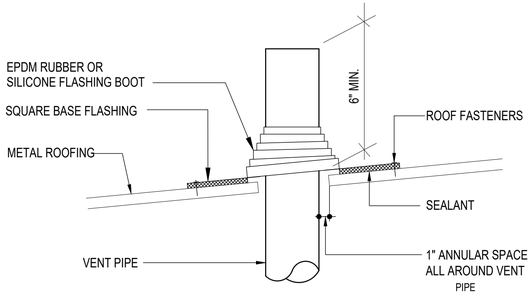

6 VENT THRU ROOF DETAIL
NO SCALE

REV NO	DESCRIPTION	DATE

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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

PLUMBING DETAILS

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-003
MS	EW		
DRAWN BY:	APPROVED BY:	DATE	SHEET
MC	EW	JUNE 2026	151 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~

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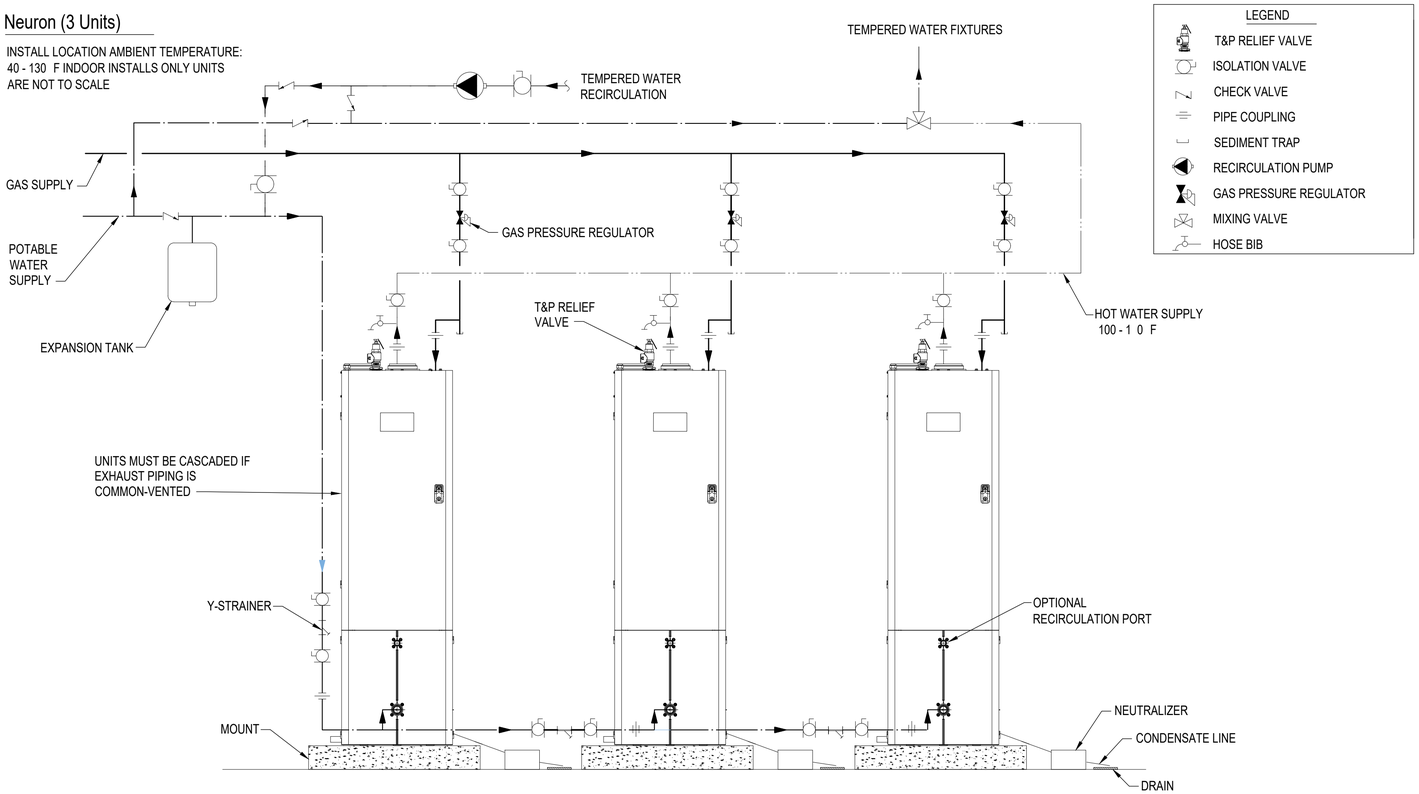
U:\ELP\ PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWGS\PLUMBING\12018-25-01_P-003.DWG

Neuron (3 Units)

INSTALL LOCATION AMBIENT TEMPERATURE:
40 - 130 F INDOOR INSTALLS ONLY UNITS
ARE NOT TO SCALE

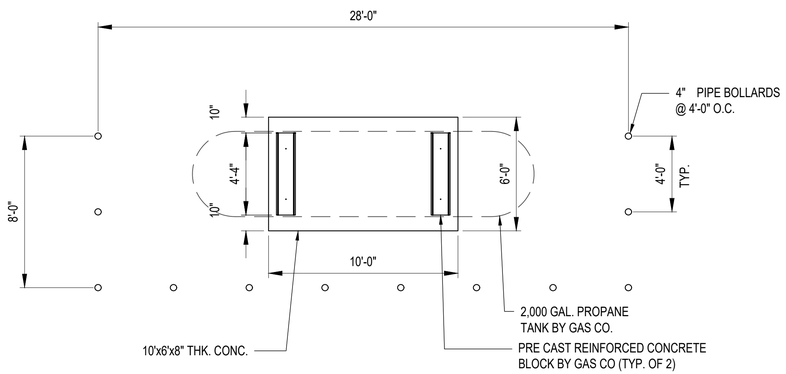


LEGEND

- T&P RELIEF VALVE
- ISOLATION VALVE
- CHECK VALVE
- PIPE COUPLING
- SEDIMENT TRAP
- RECIRCULATION PUMP
- GAS PRESSURE REGULATOR
- MIXING VALVE
- HOSE BIB

1 WATER HEATER CONFIGURATION LAYOUT DETAIL

NO SCALE

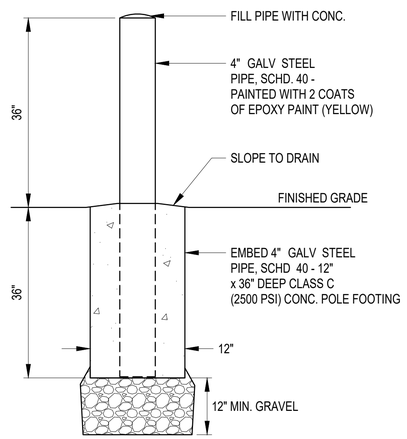


A PROPANE TANK PLAN

SCALE: 1/16" = 1'-0"

0 16' 32'

N



2 BOLLARD DETAIL

SCALE: NOT TO SCALE

REV NO	DESCRIPTION	DATE

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Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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SIGNATURE

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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAI'I

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

PLUMBING DETAILS

ENGINEERING PARTNERS

DESIGNED BY: MS	CHECKED BY: EW	HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-004
DRAWN BY: MC	APPROVED BY: EW	DATE JUNE 2026	SHEET 152 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 5:06 pm
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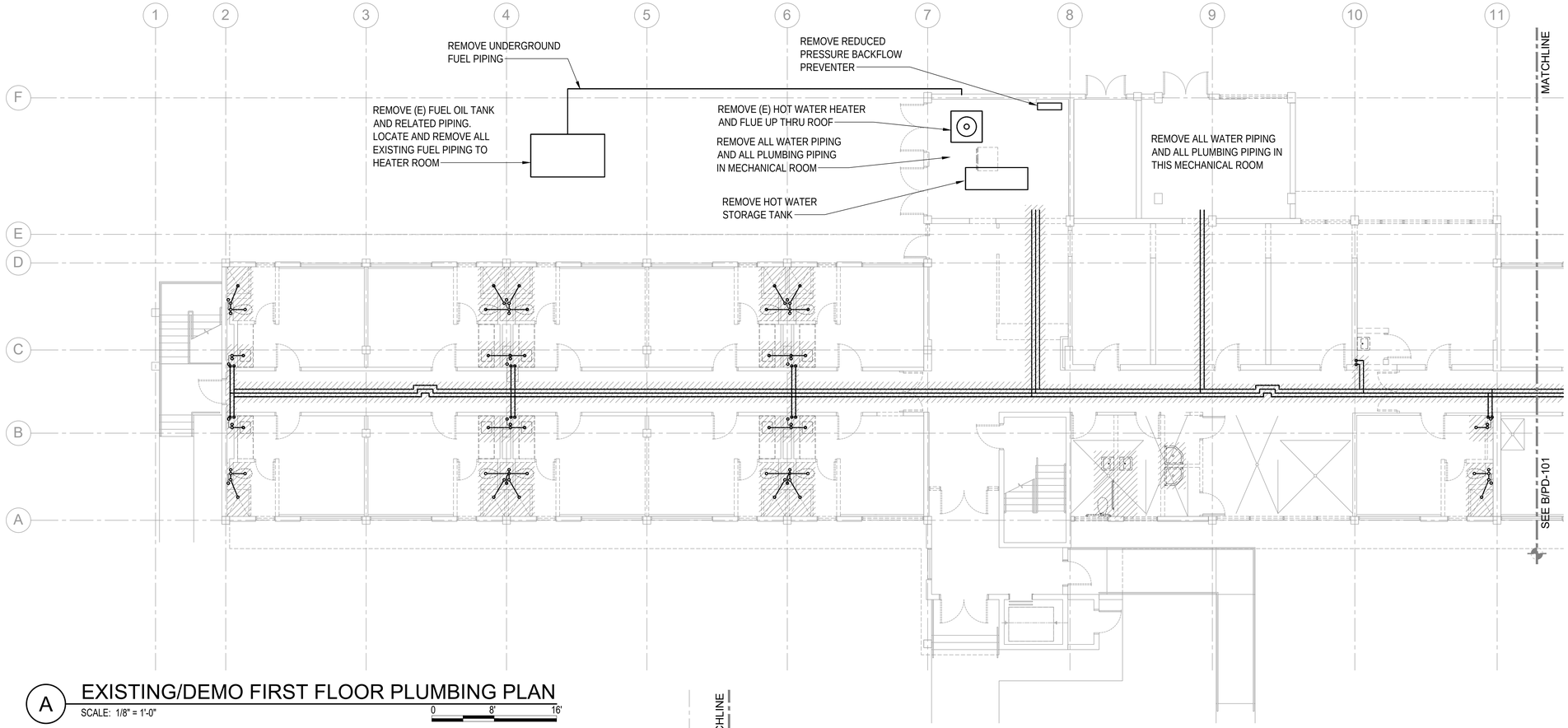
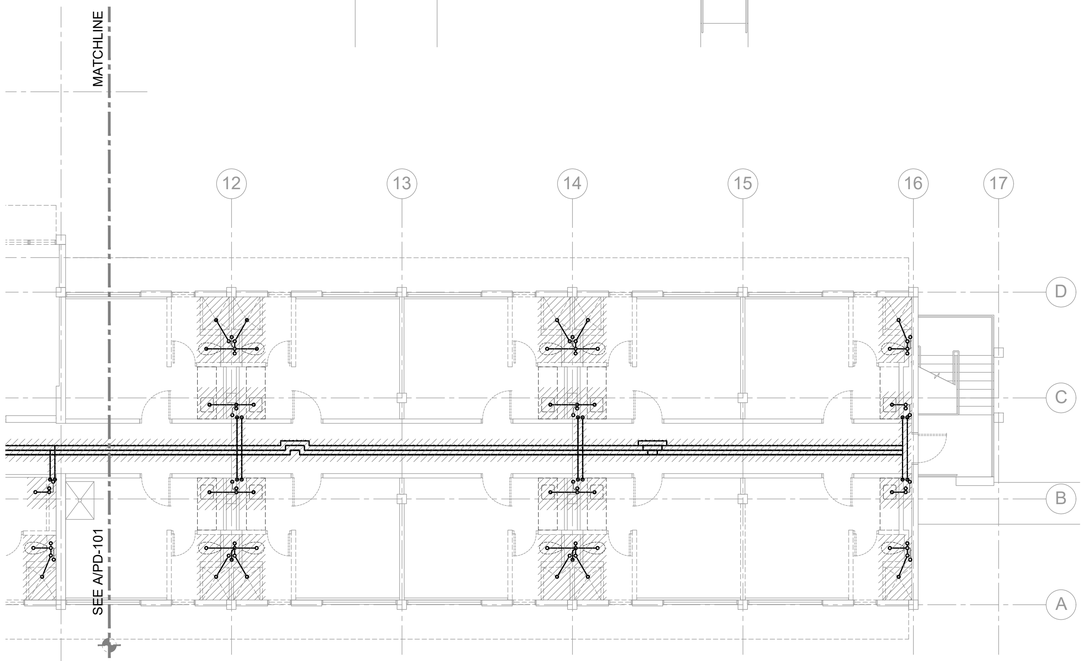


A EXISTING/DEMO FIRST FLOOR PLUMBING PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'



B EXISTING/DEMO FIRST FLOOR PLUMBING PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'

GENERAL NOTES

1. REMOVE ALL PLUMBING FIXTURES AND TRIM SHOWN HATCHED.
2. REMOVE ALL WASTE AND VENT PIPING.
3. REMOVE ALL WATER PIPING IN BUILDING.

E. L. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAI'I

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/DEMO FIRST FLOOR PLUMBING PLAN

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. PD-101
DESIGNED BY: MS	CHECKED BY: EW		
DRAWN BY: MC	APPROVED BY: EW	DATE JUNE 2026	SHEET 153
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 4:55 pm
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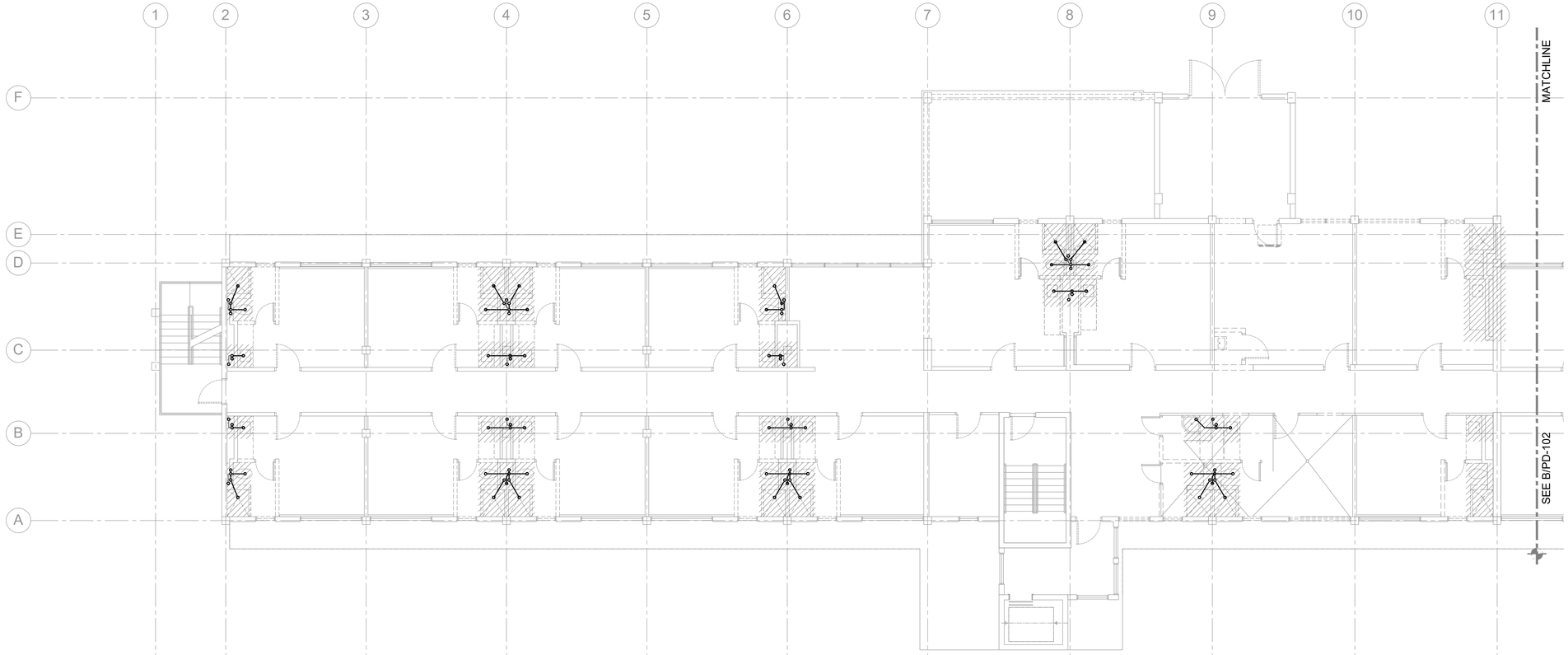
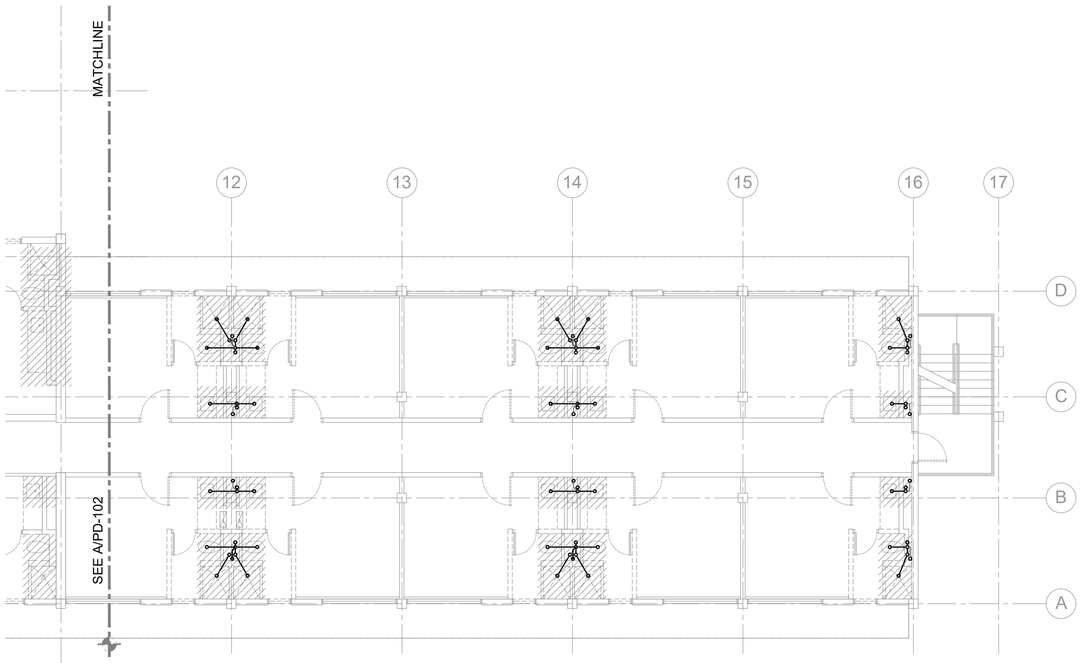


A EXISTING/DEMO SECOND FLOOR PLUMBING PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'



B EXISTING/DEMO SECOND FLOOR PLUMBING PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'

GENERAL NOTES

1. REMOVE ALL PLUMBING FIXTURES AND TRIM SHOWN HATCHED.
2. REMOVE ALL WASTE AND VENT PIPING.
3. REMOVE ALL WATER PIPING IN BUILDING.

ELI B. WALTZ
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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/DEMO SECOND FLOOR PLUMBING PLAN

ENGINEERING PARTNERS

DESIGNED BY: MS	CHECKED BY: EW	HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. PD-102
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 154 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 4:55 pm
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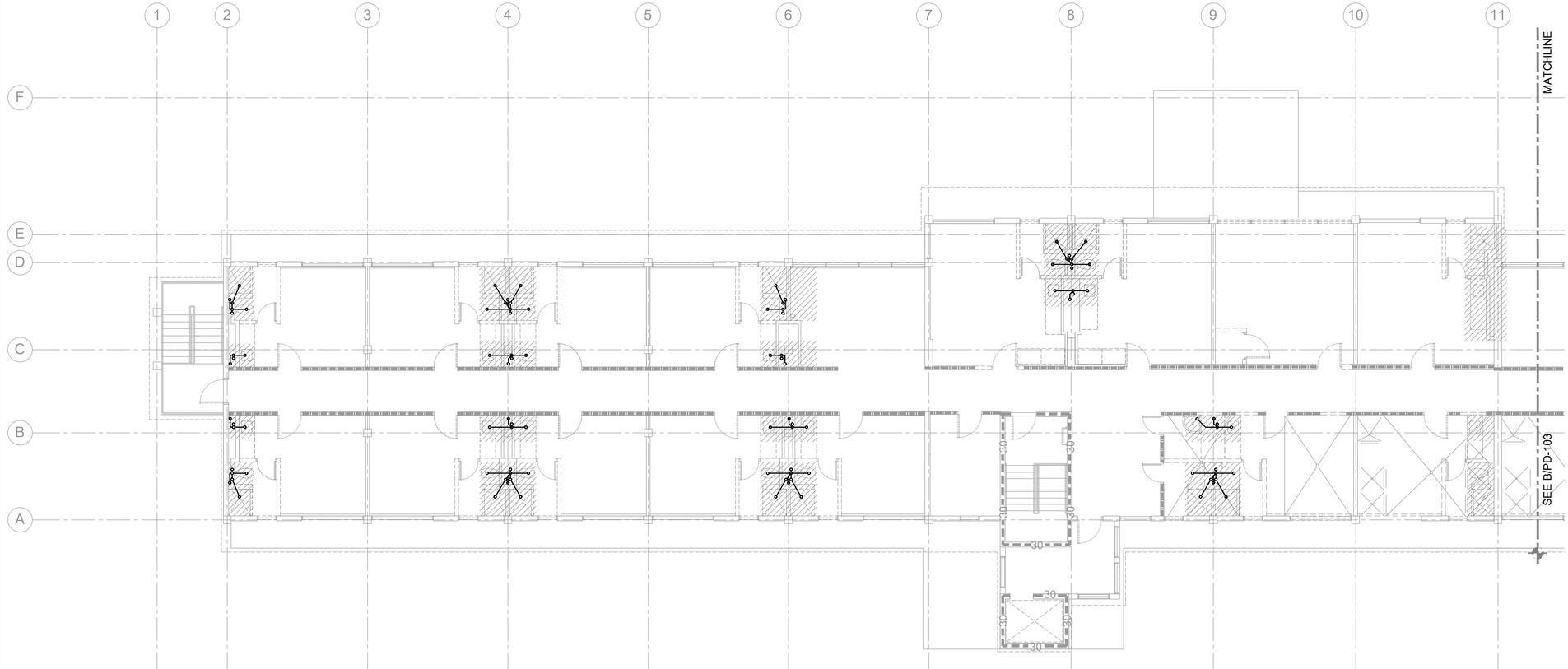
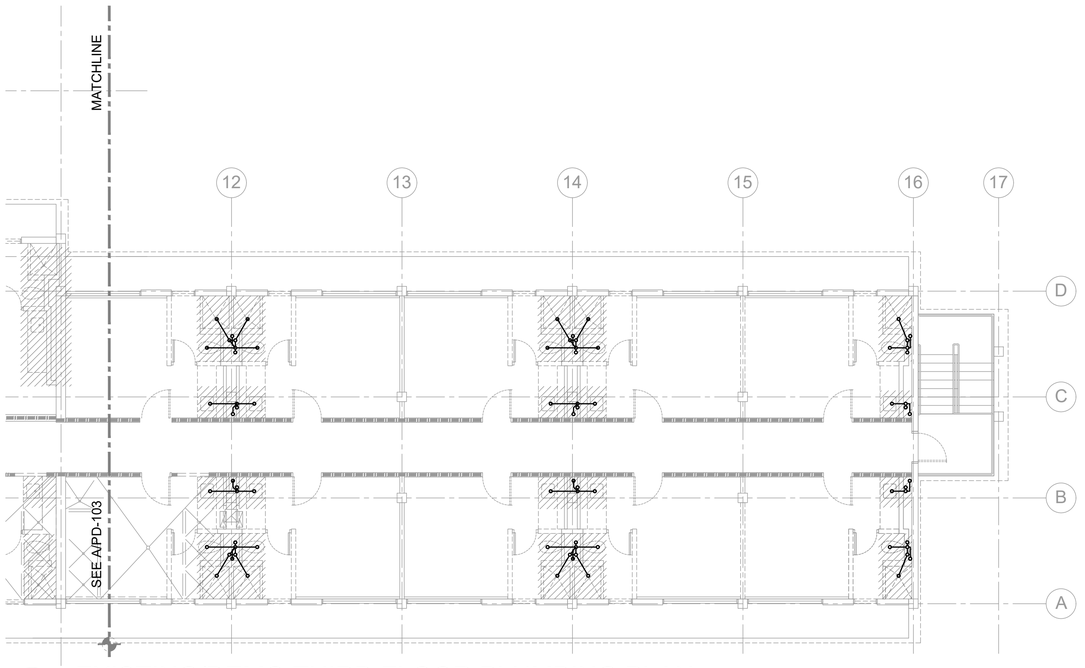


A EXISTING/DEMO THIRD FLOOR PLUMBING PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'



B EXISTING/DEMO THIRD FLOOR PLUMBING PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'

GENERAL NOTES

1. REMOVE ALL PLUMBING FIXTURES AND TRIM SHOWN HATCHED.
2. REMOVE ALL WASTE AND VENT PIPING.
3. REMOVE ALL WATER PIPING IN BUILDING.

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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/DEMO THIRD FLOOR PLUMBING PLAN

ENGINEERING PARTNERS

DESIGNED BY: MS	CHECKED BY: EW	HAPNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. PD-103
DRAWN BY: MC	APPROVED BY: EW	DATE JUNE 2026	SHEET 155 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 4:55 pm
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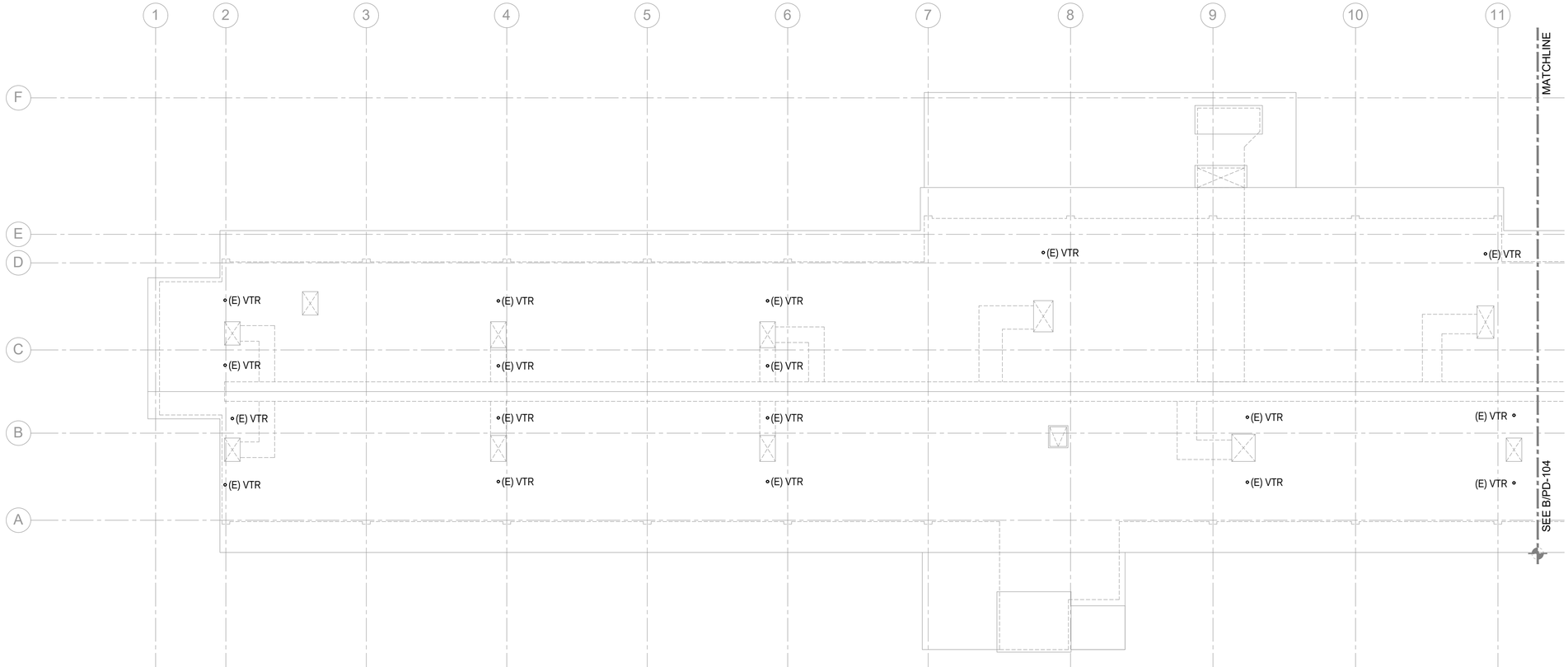
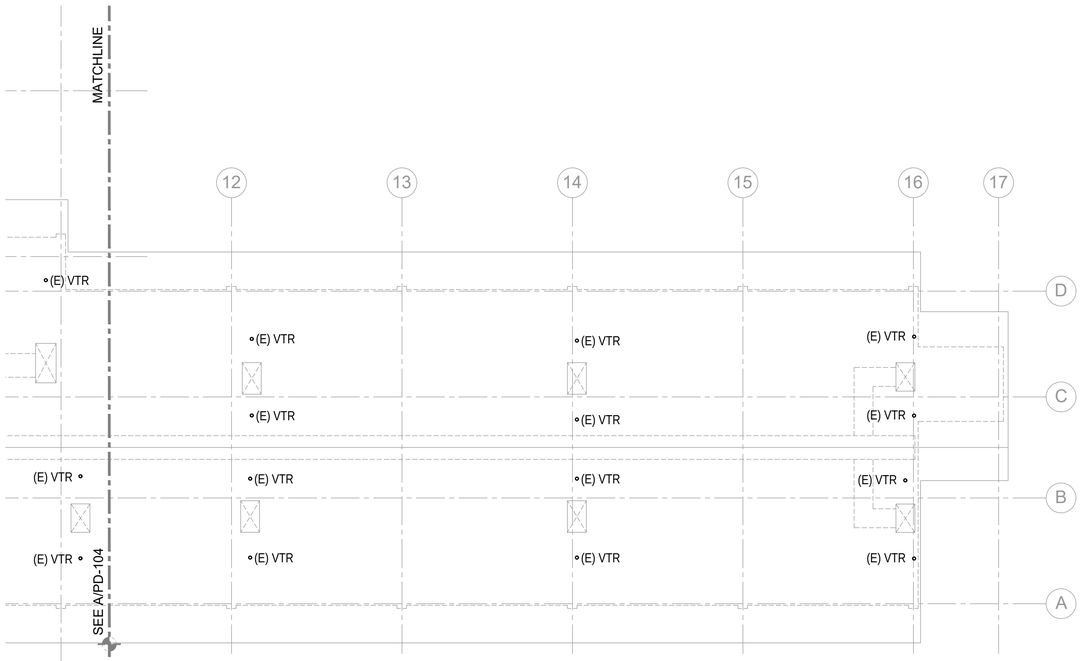


A EXISTING/DEMO ROOF PLUMBING PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'



B EXISTING/DEMO ROOF PLUMBING PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'

GENERAL NOTES

1. REMOVE ALL EXISTING VENT THRU ROOF PIPING.

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DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/DEMO ROOF PLUMBING PLAN

ENGINEERING PARTNERS

DESIGNED BY: MS	CHECKED BY: EW	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. PD-104
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 156 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 5:05 pm
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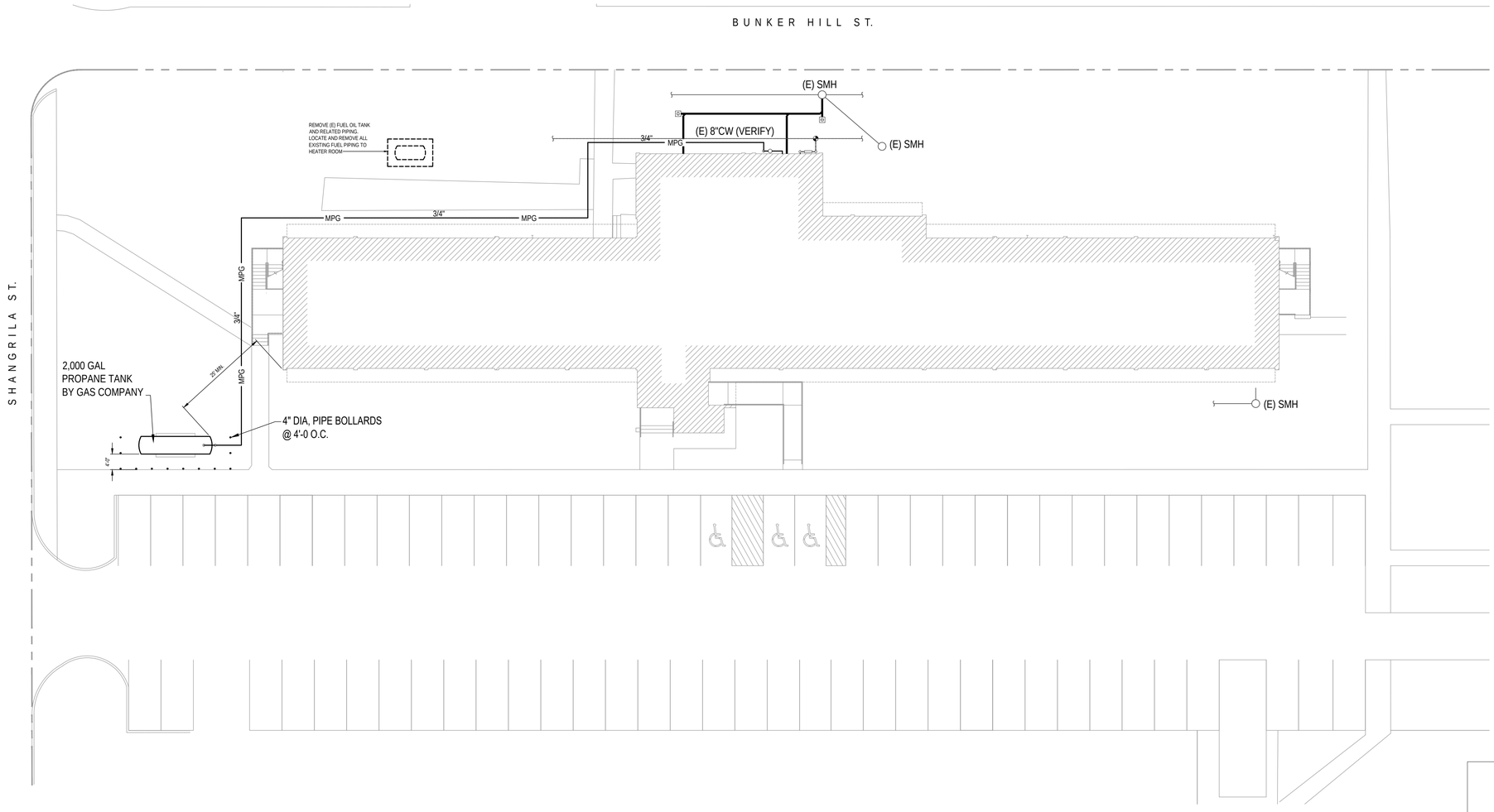

A SITE PLUMBING PLAN

SCALE: 1/16" = 1'-0"

0 16' 32'

N

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAI'I

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

SITE PLUMBING PLAN

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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SIGNATURE

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:
MS	EW
DRAWN BY:	APPROVED BY:
MC	EW

SCALE: AS NOTED

HARNG JOB NO.
FEDERAL: PN15H00033
STATE: CA-202505-D

DATE: JUNE 2026

DRAWING NO. P-100

SHEET 157 OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 5:00 pm
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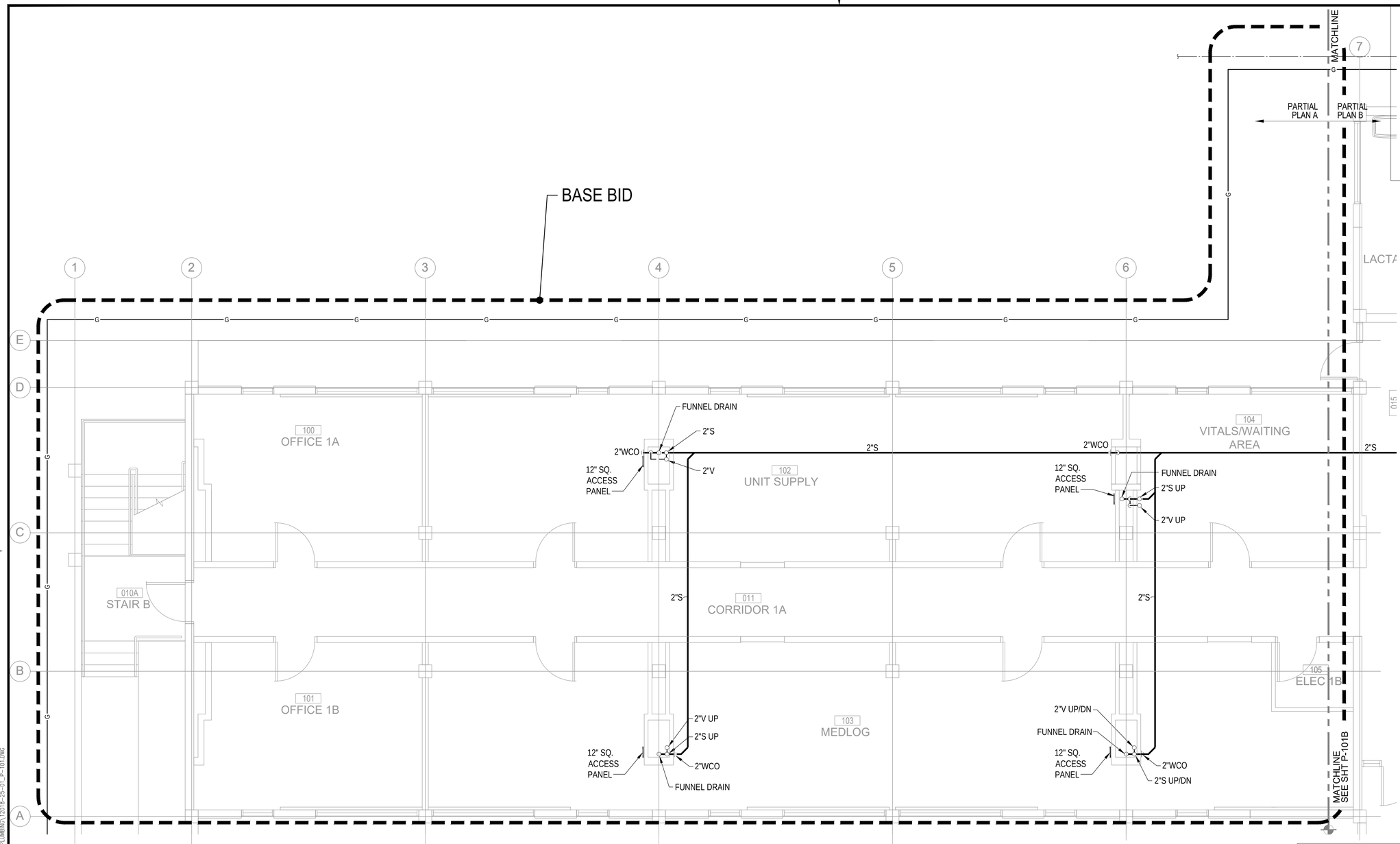


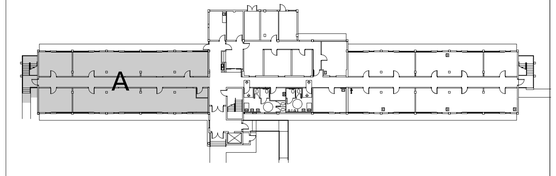
BASE BID

1. AIR CONDITIONING SYSTEM IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO ALL FAN COILS, EXTERIOR CONDENSING UNITS, CONTROLS, CONCRETE PADS, TESTING/ ADJUSTING/ BALANCING, INSULATION, REFRIGERANT PIPING, CONDENSATE PIPING, AND ASSOCIATED ELECTRICAL WORK.
2. PLUMBING SYSTEM IN ITS ENTIRETY, INCLUDING ALL DEMOLITION WORK, NEW WASTE/ VENT PIPING, NEW HOT WATER PIPING. WATER HEATERS, AND PROPANE SYSTEM. INCLUDE ALL TRENCHING, FLOOR SLAB REPAIR NECESSARY TO INSTALL NEW WASTE LINES. INCLUDE ARCHITECTURAL WORK FOR ANY NEW FRAMED WALLS AND CEILING, WALL, OR FLOOR FINISHES NECESSARY TO SUPPORT INSTALLATION OF PLUMBING FIXTURES.
3. ELECTRICAL INFRASTRUCTURE, INCLUDING ALL EXTERIOR SERVICE ENTRY INTO THE BUILDING, NEW METERING SWITCHBOARD, PANEL BOARDS, AND FEEDERS.
4. ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL WORK OCCURRING WITHIN SELECT ROOMS AS INDICATED ON DRAWINGS.

A EXISTING/NEW FIRST FLOOR WASTE & VENT PLUMBING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'



KEYPLAN

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAI'I

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW FIRST FLOOR WASTE & VENT PLUMBING PLAN

ENGINEERING PARTNERS		HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-101A
DESIGNED BY: MS	CHECKED BY: EW		
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 158 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 5:09 pm
U:\JOB PROJECTS\2025 PROJECTS\12018--25--01 DOD BLDG 46 MEDCOM RENOVATIONS\4--DWG\PLUMBING\12018--25--01_P--101.DWG

(E) SMH
4" COTG W/ 12" SQ CONC. COLLAR
4"S
4"S
4"S
4" COTG W/ 12" SQ CONC. COLLAR
GAS REGULATOR & RELIEF VENT AND GAS SHUTOFF COCK ON RISER
4"S
ABOVE GRADE
POC TO (E) 8"CW (VERIFY)
(E) SMH
3"S
BELOW GRADE
3" APPROVED REDUCED PRESSURE BACKFLOW PREVENTER
7
8
9
10
11
MATCHLINE
PARTIAL PLAN A
PARTIAL PLAN B
S-2
2"S
2"S
2"FCO
2"FD-1 W/ TRAP PRIMER CONN. (TYP.)
2"CONDENSATE DRAIN UP/DN
2"CONDENSATE DRAIN TO DRY WELL, SEE MECH.
106 LACTATION ROOM
108 STORAGE
110 ELEC 1A
112 TELCOM 1
114 MECHANICAL
PARTIAL PLAN B
PARTIAL PLAN C
MATCHLINE
BASE BID
E
D
3"S
016 CORRIDOR 1E
2" CO
2"S UP
2"S IN CLG SPACE
2"S DN
015 CORRIDOR 1D
104 VITALS/WAITING AREA
109 PAD OFFICE
111 MED RECORDS
118 EKG
113 STORAGE
2"S
RAIN
107 PAD CHECK-OUT
3"WCO
EWC
FUNNEL DRAIN
2"V UP
4"S
FUNNEL DRAIN
12" SQ. ACCESS PANEL
S-1
2"WCO
2"S
C
3" WCO
2"FD-1 W/ TRAP PRIMER CONN. (TYP.)
013 CORRIDOR 1B
3"FCO
3"S
R1
R2
2"S UP
3"S
4"S
R3
4"S UP
4"S
2"S UP
R5
014 CORRIDOR 1C
2"S UP
2"S
012 LOBBY
4"WCO
MS
12" SQ. ACCESS PANEL
2"FD-1 W/ TRAP PRIMER CONN.
WC-2
WC-1
R4
2"V UP
2"WCO
S-1
B
105 ELEC 1B
010 STAIR A
WC-1
WC-2
3" WCO
4"S UP
116 JAN
FUNNEL DRAIN
2"FD-1 W/ TRAP PRIMER CONN.
3"V UP
119 IMMZ/CHOL A
EW/S
WC-2
115 WOMEN'S RESTROOM
117 MEN'S RESTROOM
2" WCO
L-1
L-1
L-1
FCO
WC-2
L-1
L-1
UR
UR
2"WCO
A
MATCHLINE SEE SHT P-101A
2"FCO
2"FD-1 W/ TRAP PRIMER CONN.
2"WCO
MATCHLINE SEE SHT P-101C
017 ELEV LOBBY 1

A EXISTING/NEW FIRST FLOOR WASTE & VENT PLUMBING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

BASE BID

1. AIR CONDITIONING SYSTEM IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO ALL FAN COILS, EXTERIOR CONDENSING UNITS, CONTROLS, CONCRETE PADS, TESTING/ ADJUSTING/ BALANCING, INSULATION, REFRIGERANT PIPING, CONDENSATE PIPING, AND ASSOCIATED ELECTRICAL WORK.
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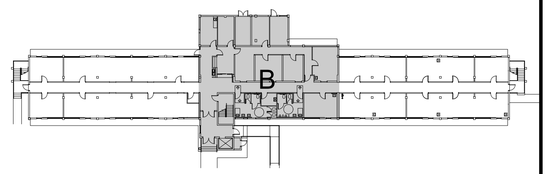

KEYPLAN

REV. NO	DESCRIPTION	DATE

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

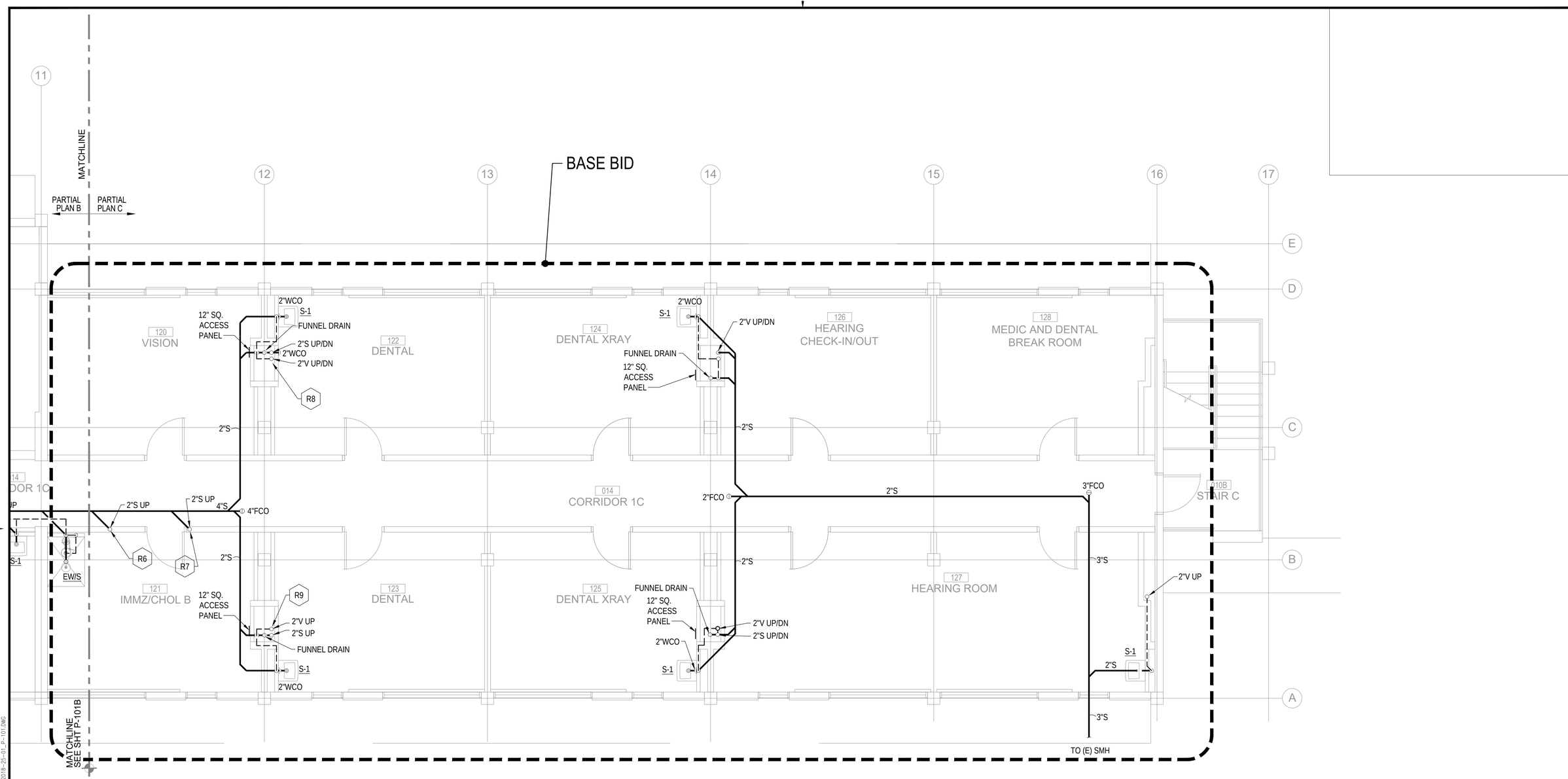
EXISTING/NEW FIRST FLOOR WASTE & VENT PLUMBING PLAN

ENGINEERING PARTNERS		HIARNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. P-101B
DESIGNED BY: MS	CHECKED BY: EW		
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 159 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 5:08 pm
U:\CAD PROJECTS\2018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\PLUMBING\2018-25-01_P-101.DWG



BASE BID

1. AIR CONDITIONING SYSTEM IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO ALL FAN COILS, EXTERIOR CONDENSING UNITS, CONTROLS, CONCRETE PADS, TESTING/ ADJUSTING/ BALANCING, INSULATION, REFRIGERANT PIPING, CONDENSATE PIPING, AND ASSOCIATED ELECTRICAL WORK.
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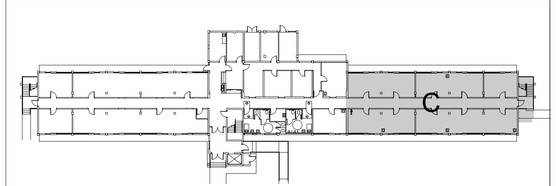
A EXISTING/NEW FIRST FLOOR WASTE & VENT PLUMBING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'



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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW FIRST FLOOR WASTE & VENT PLUMBING PLAN

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-101C
DESIGNED BY: MB	CHECKED BY: EW		
DRAWN BY: MC	APPROVED BY: EW	DATE	SHEET 160
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 5:08 pm
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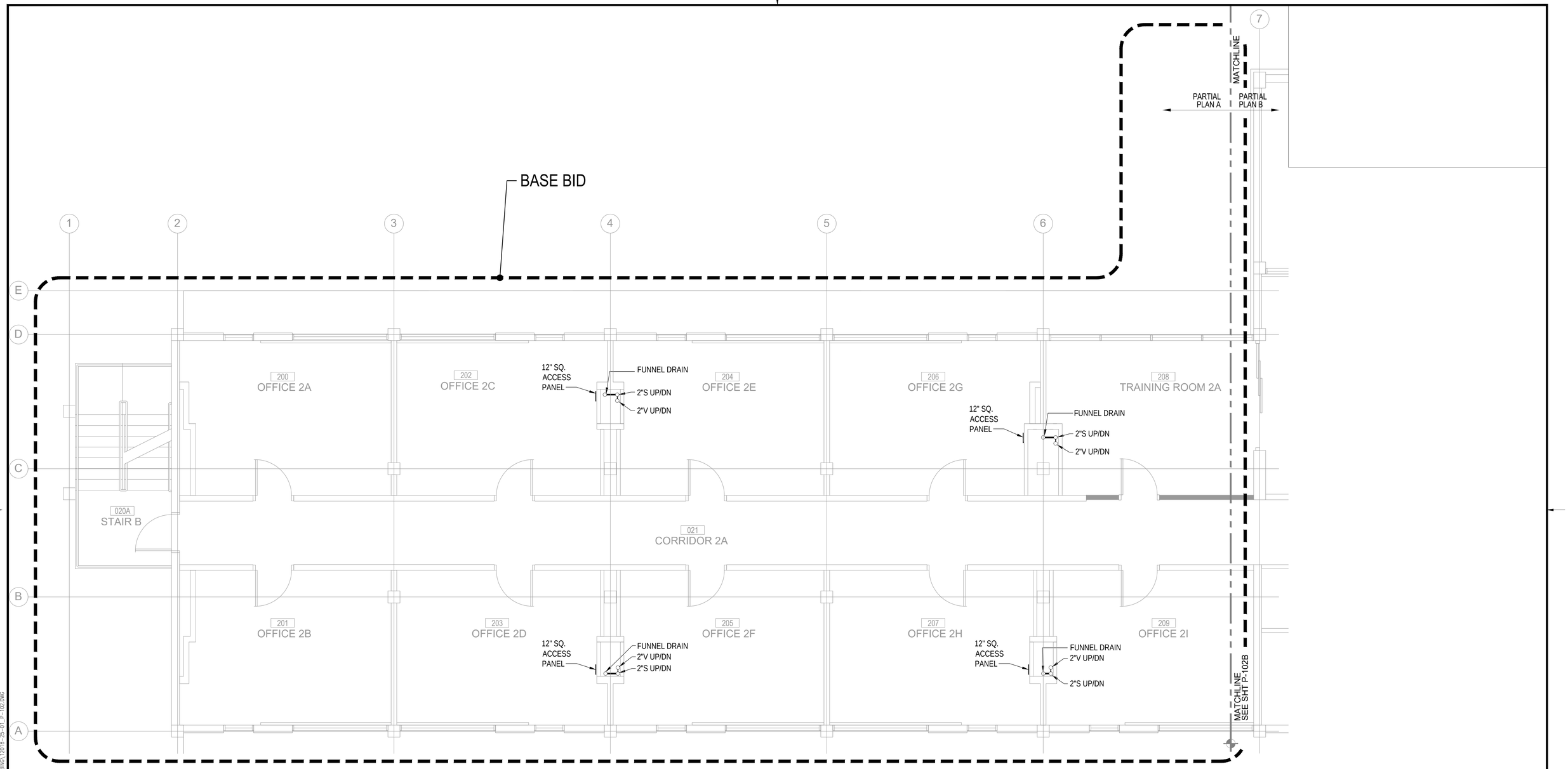

BASE BID

1. AIR CONDITIONING SYSTEM IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO ALL FAN COILS, EXTERIOR CONDENSING UNITS, CONTROLS, CONCRETE PADS, TESTING/ ADJUSTING/ BALANCING, INSULATION, REFRIGERANT PIPING, CONDENSATE PIPING, AND ASSOCIATED ELECTRICAL WORK.
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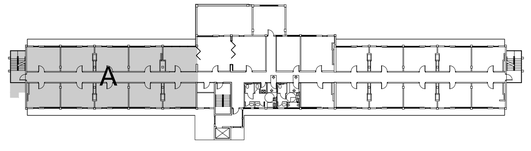
4. ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL WORK OCCURRING WITHIN SELECT ROOMS AS INDICATED ON DRAWINGS.

A EXISTING/NEW SECOND FLOOR WASTE & VENT PLUMBING PLAN

SCALE: 1/4" = 1'-0" 0 4' 8'



KEYPLAN

E.L.I. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW SECOND FLOOR WASTE & VENT PLUMBING PLAN

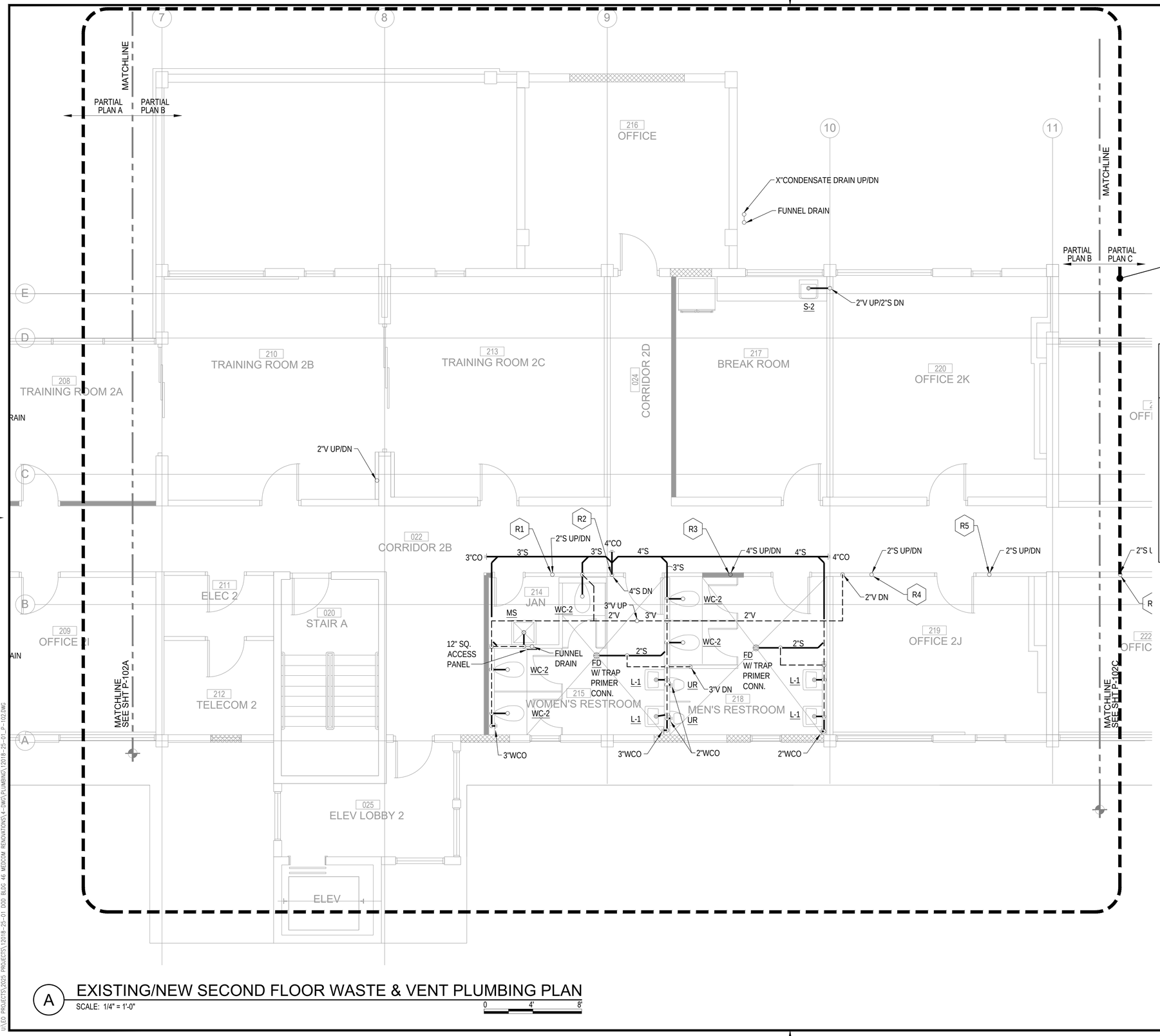
ENGINEERING PARTNERS

DESIGNED BY: MS	CHECKED BY: EW	HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-102A
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 161 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

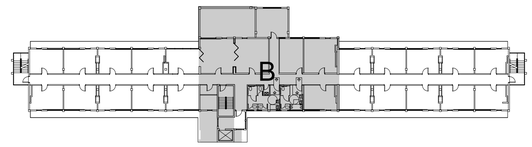
DATE ISSUED: ---

06/02/2026 5:06 pm
LA:\O PROJECTS\2025 PROJECTS\12018--25--01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWGS PLUMBING\12018--25--01 P--102.DWG



BASE BID

1. AIR CONDITIONING SYSTEM IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO ALL FAN COILS, EXTERIOR CONDENSING UNITS, CONTROLS, CONCRETE PADS, TESTING/ ADJUSTING/ BALANCING, INSULATION, REFRIGERANT PIPING, CONDENSATE PIPING, AND ASSOCIATED ELECTRICAL WORK.
2. PLUMBING SYSTEM IN ITS ENTIRETY, INCLUDING ALL DEMOLITION WORK, NEW WASTE/ VENT PIPING, NEW HOT WATER PIPING. WATER HEATERS, AND PROPANE SYSTEM. INCLUDE ALL TRENCHING, FLOOR SLAB REPAIR NECESSARY TO INSTALL NEW WASTE LINES. INCLUDE ARCHITECTURAL WORK FOR ANY NEW FRAMED WALLS AND CEILING, WALL, OR FLOOR FINISHES NECESSARY TO SUPPORT INSTALLATION OF PLUMBING FIXTURES.
3. ELECTRICAL INFRASTRUCTURE, INCLUDING ALL EXTERIOR SERVICE ENTRY INTO THE BUILDING, NEW METERING SWITCHBOARD, PANEL BOARDS, AND FEEDERS.
4. ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL WORK OCCURRING WITHIN SELECT ROOMS AS INDICATED ON DRAWINGS.



KEYPLAN

A EXISTING/NEW SECOND FLOOR WASTE & VENT PLUMBING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

EXISTING/NEW SECOND FLOOR WASTE & VENT PLUMBING PLAN

ENGINEERING PARTNERS

DESIGNED BY: MS	CHECKED BY: EW	HIARNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. P-102B
DRAWN BY: MC	APPROVED BY: EW	DATE	SHEET 162
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 4:58 pm
U:\ED PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\PLUMBING\12018-25-01 P-102.DWG

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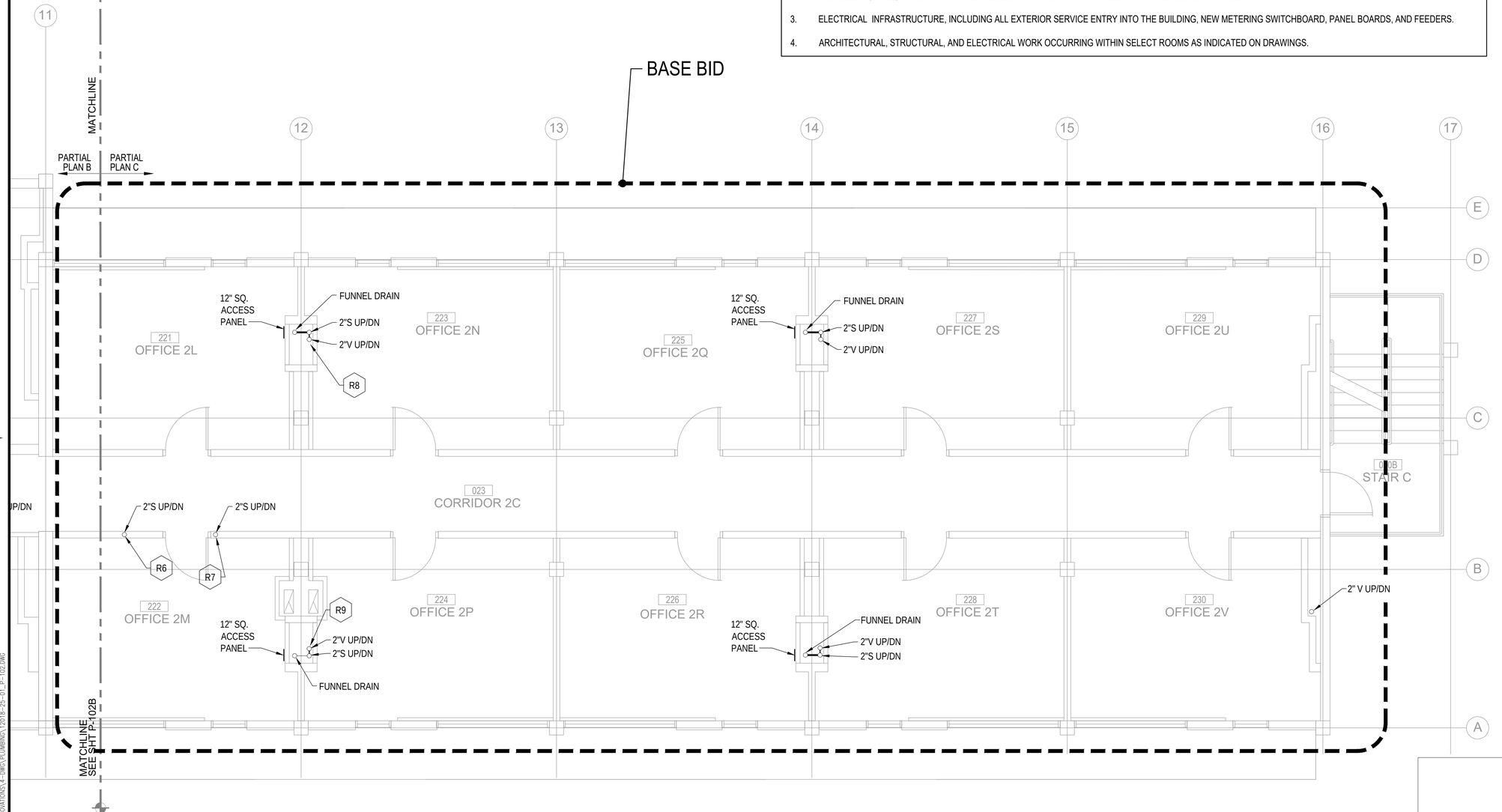
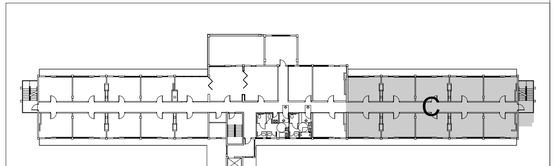


A EXISTING/NEW SECOND FLOOR WASTE & VENT PLUMBING PLAN
SCALE: 1/4" = 1'-0"



KEYPLAN

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW SECOND FLOOR WASTE & VENT PLUMBING PLAN

ENGINEERING PARTNERS		HIARNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. P-102C
DESIGNED BY: MS	CHECKED BY: EW		
DRAWN BY: MC	APPROVED BY: EW	DATE JUNE 2026	SHEET 163
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 5:08 pm
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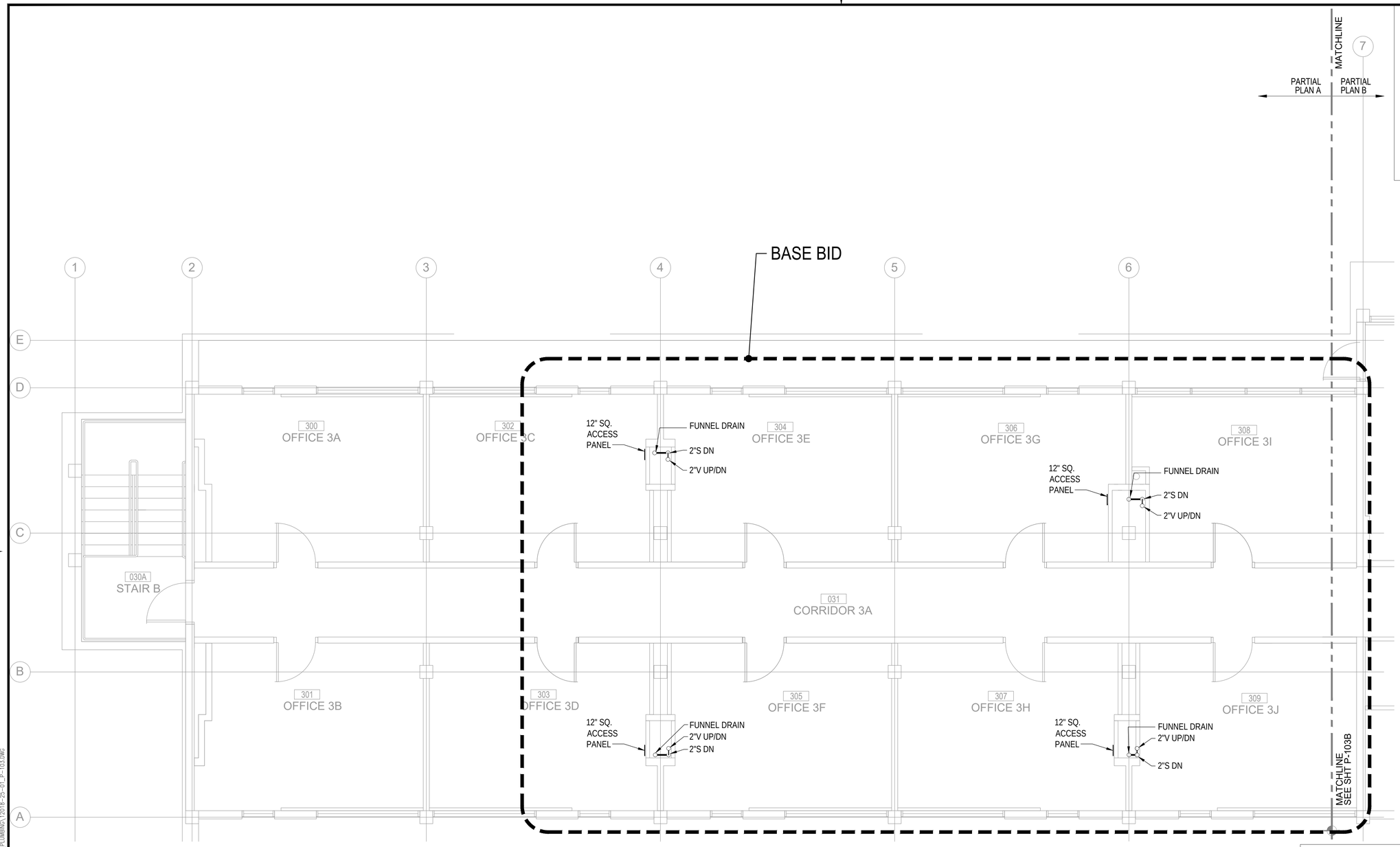

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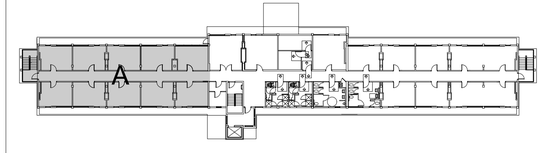
A EXISTING/NEW THIRD FLOOR WASTE & VENT PLUMBING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'



KEYPLAN

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW THIRD FLOOR WASTE & VENT PLUMBING PLAN

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-103A
DESIGNED BY: MS	CHECKED BY: EW		
DRAWN BY: MC	APPROVED BY: --	DATE JUNE 2026	SHEET 164
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 5:03 pm
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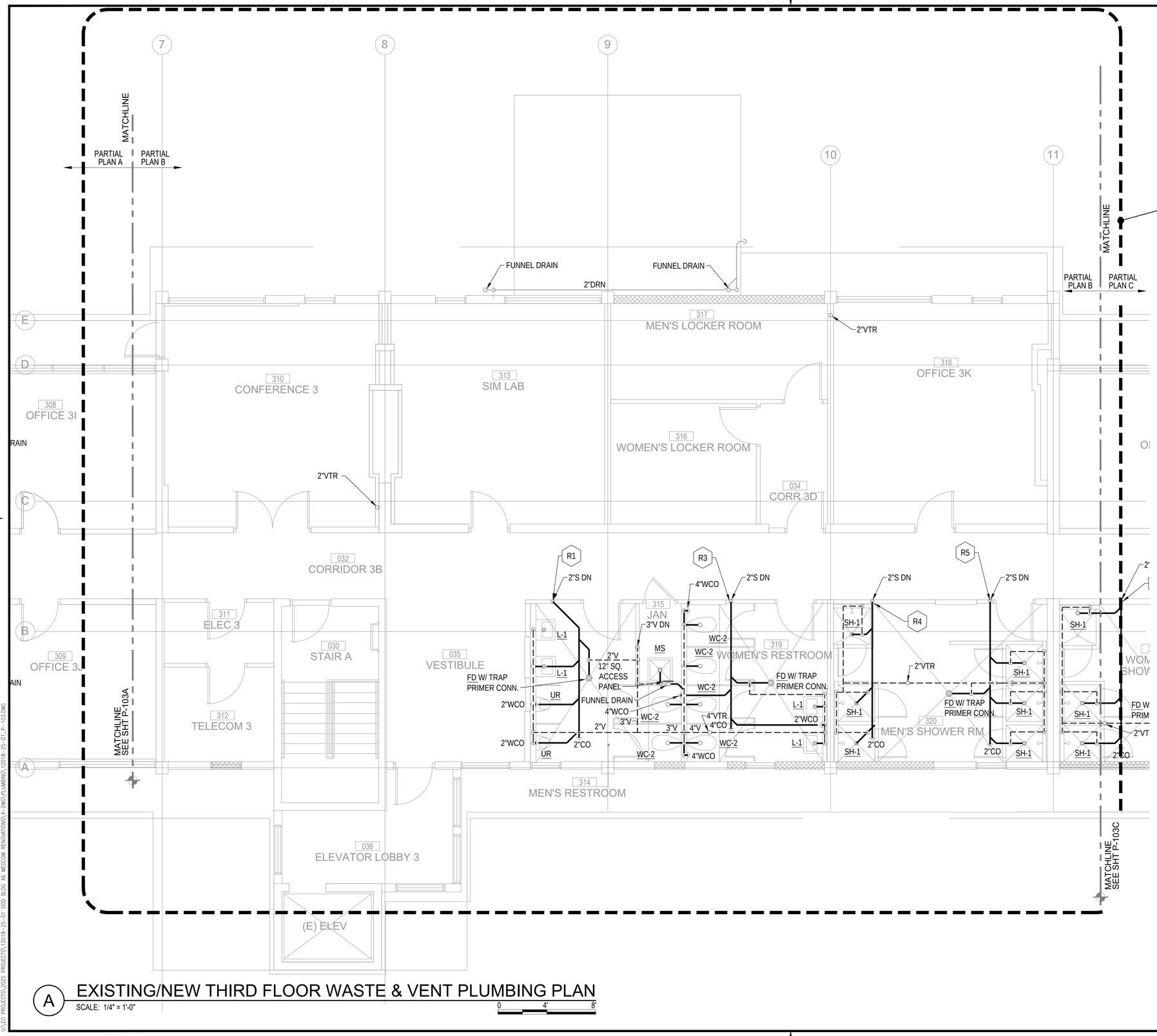

A EXISTING/NEW THIRD FLOOR WASTE & VENT PLUMBING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

BASE BID

1. AIR CONDITIONING SYSTEM IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO ALL FAN COILS, EXTERIOR CONDENSING UNITS, CONTROLS, CONCRETE PADS, TESTING/ ADJUSTING/ BALANCING, INSULATION, REFRIGERANT PIPING, CONDENSATE PIPING, AND ASSOCIATED ELECTRICAL WORK.
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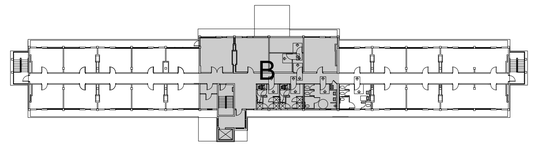

KEYPLAN

REV NO	DESCRIPTION	DATE

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW THIRD FLOOR WASTE & VENT PLUMBING PLAN

ENGINEERING PARTNERS

DESIGNED BY: MS	CHECKED BY: EW	HAARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-103B
DRAWN BY: MC	APPROVED BY: --	DATE	SHEET 165
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 5:03 pm
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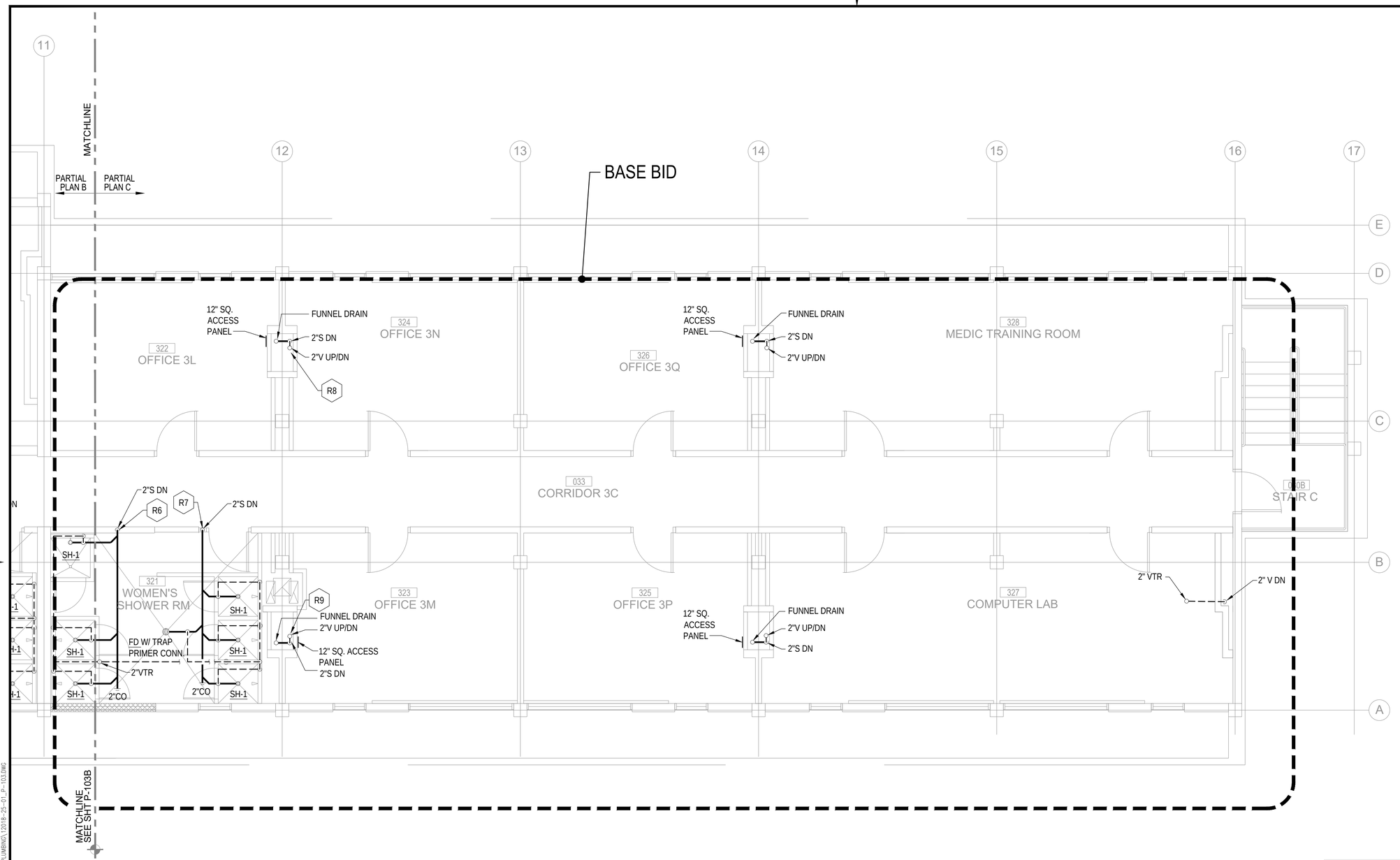

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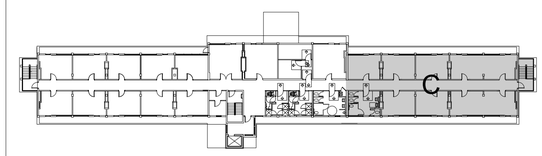
A EXISTING/NEW THIRD FLOOR WASTE & VENT PLUMBING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'



KEYPLAN

E. L. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

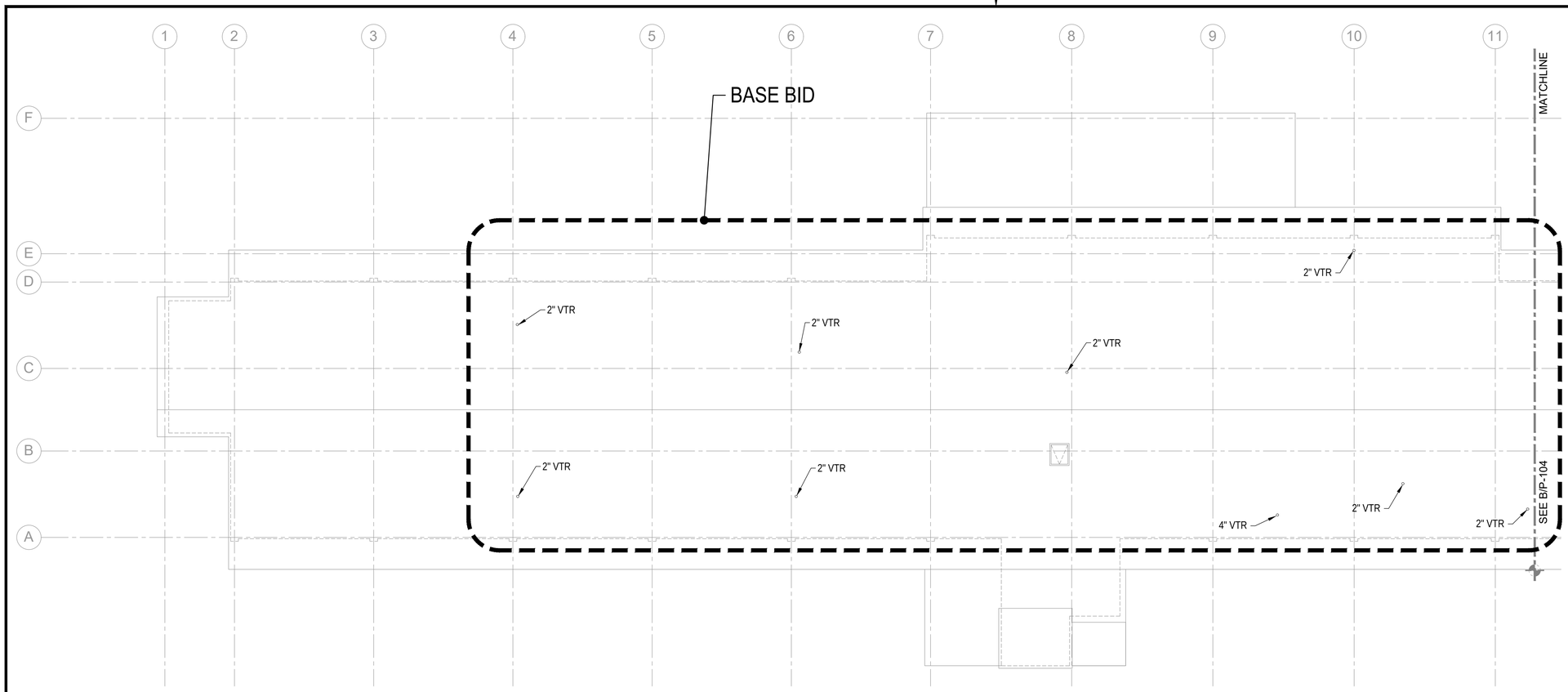
EXISTING/NEW THIRD FLOOR WASTE & VENT PLUMBING PLAN

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-103C
DESIGNED BY: MS	CHECKED BY: EW		
DRAWN BY: MC	APPROVED BY: EW	DATE JUNE 2026	SHEET 166 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

06/02/2026 4:58 pm
U:\ED PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\PLUMBING\12018-25-01_P-103.DWG

DATE ISSUED: ---



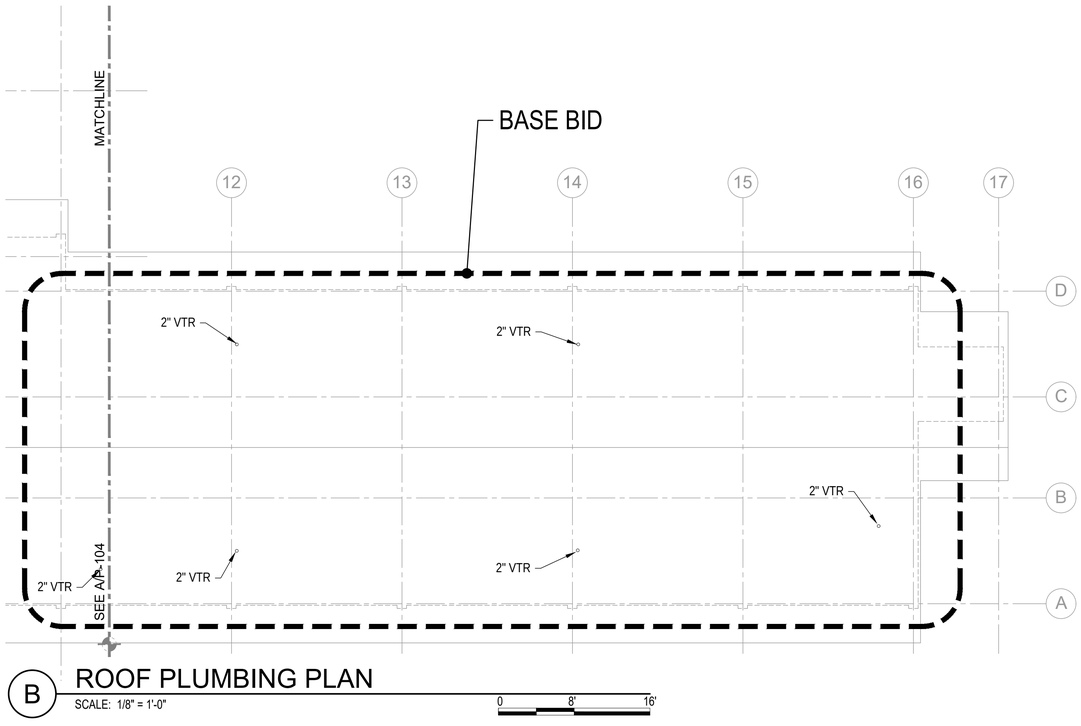
GENERAL NOTES

1. REMOVE ALL EXISTING VENT THRU ROOF PIPING.

A ROOF PLUMBING PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'



B ROOF PLUMBING PLAN

SCALE: 1/8" = 1'-0"

0 8' 16'

ELI B. WALTZ
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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ROOF PLUMBING PLAN

ENGINEERING PARTNERS

DESIGNED BY: MS	CHECKED BY: EW	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-104
DRAWN BY: MC	APPROVED BY: EW	DATE	SHEET 167
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~

06/02/2026 4:58 pm
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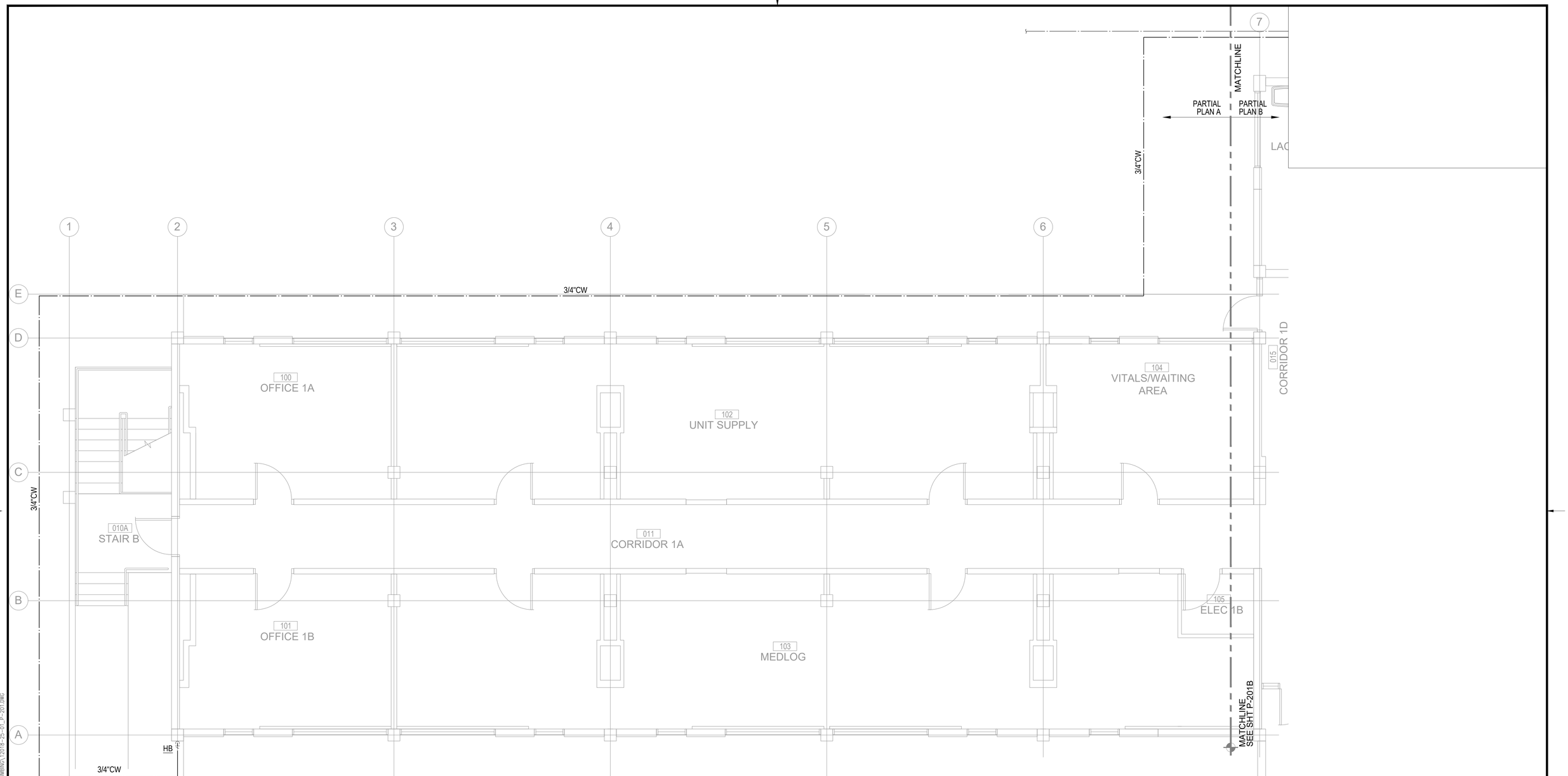

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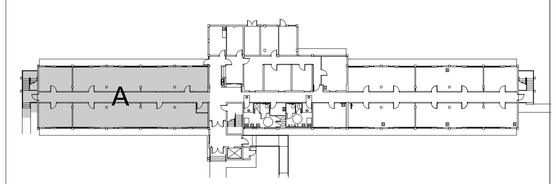
A EXISTING/NEW FIRST FLOOR DOMESTIC WATER PLUMBING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'



KEYPLAN

E. L. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAI'I

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

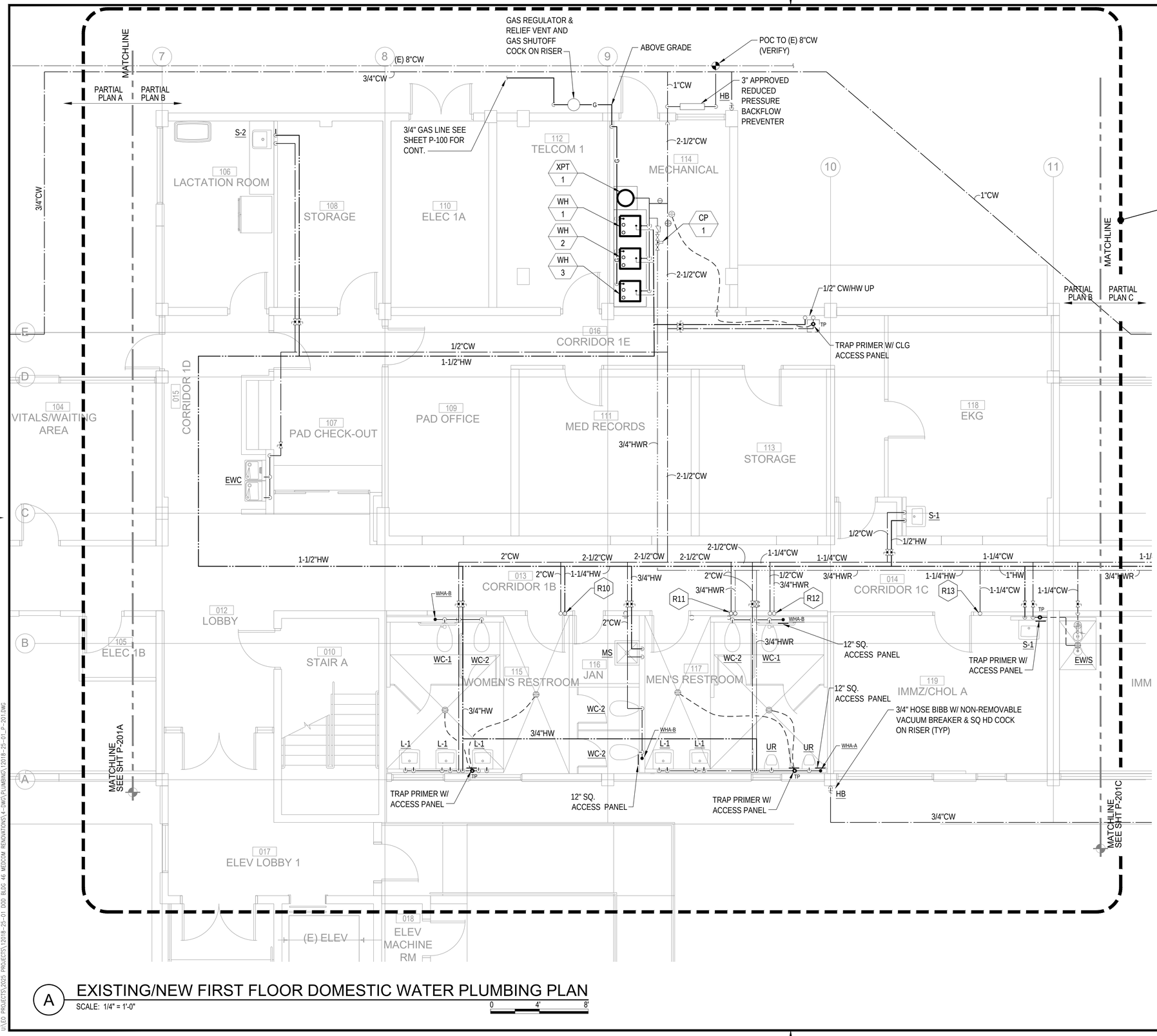
EXISTING/NEW FIRST FLOOR DOMESTIC WATER PLUMBING PLAN

ENGINEERING PARTNERS		HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-201A
DESIGNED BY: MS	CHECKED BY: EW		
DRAWN BY: MC	APPROVED BY: EW	DATE JUNE 2026	SHEET 168
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 5:03 pm
U:\CD PROJECTS\2025 PROJECTS\12018--25--01 DOD BLDG 46 MEDCOM RENOVATIONS\4--DWG\PLUMBING\12018--25--01 P--201.DWG



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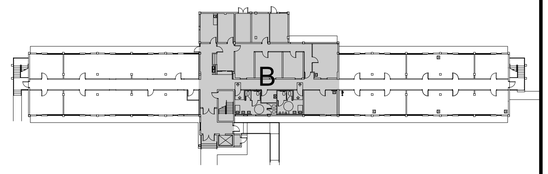

KEYPLAN

A EXISTING/NEW FIRST FLOOR DOMESTIC WATER PLUMBING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW FIRST FLOOR DOMESTIC WATER PLUMBING PLAN

ELI B. WALTZ
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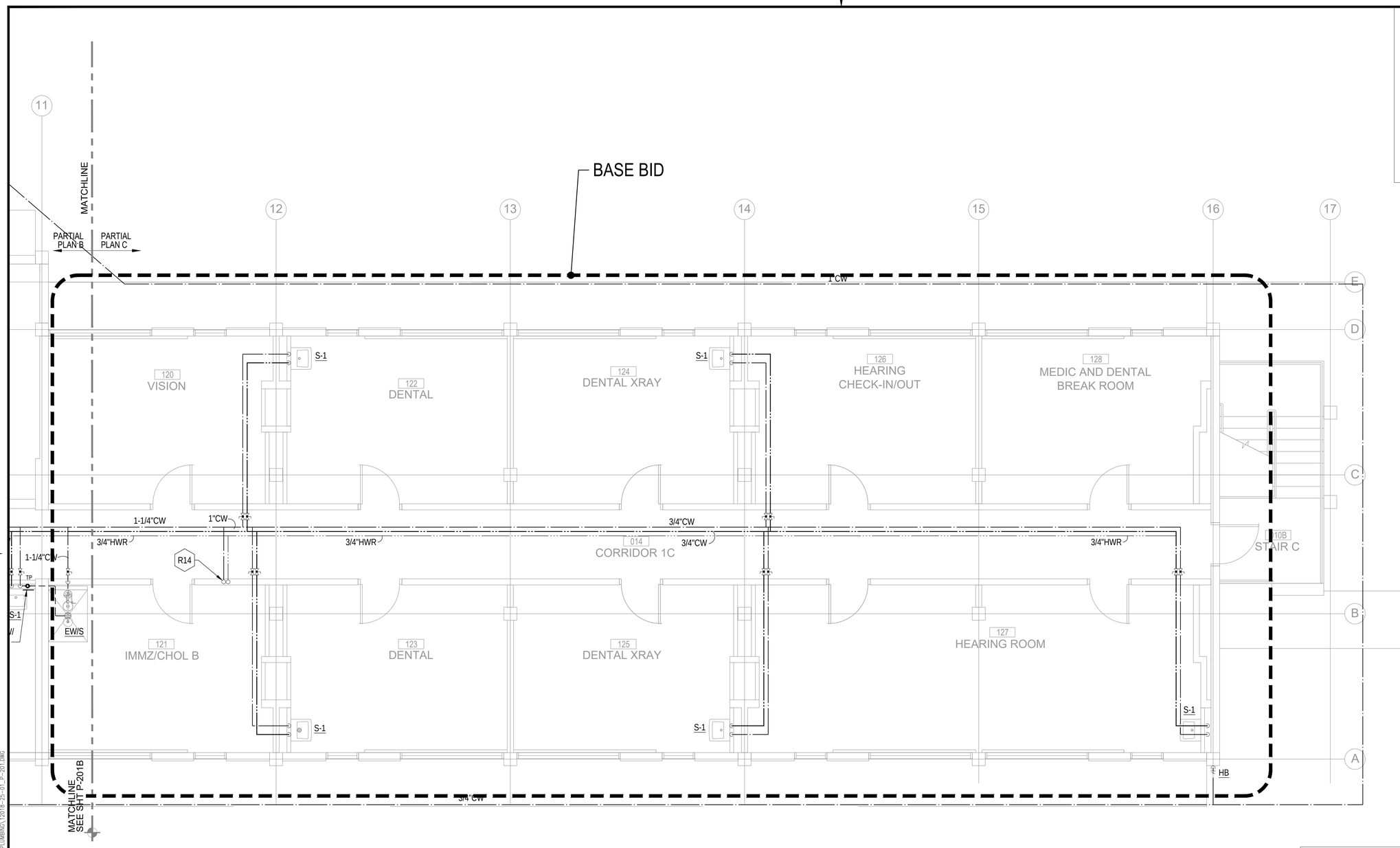
ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-201B
MS	EW		
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 169 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 5:09 pm
U:\LCO PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG'S PLUMBING\12018-25-01_P-201.DWG



BASE BID

1. AIR CONDITIONING SYSTEM IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO ALL FAN COILS, EXTERIOR CONDENSING UNITS, CONTROLS, CONCRETE PADS, TESTING/ ADJUSTING/ BALANCING, INSULATION, REFRIGERANT PIPING, CONDENSATE PIPING, AND ASSOCIATED ELECTRICAL WORK.
2. PLUMBING SYSTEM IN ITS ENTIRETY, INCLUDING ALL DEMOLITION WORK, NEW WASTE/ VENT PIPING, NEW HOT WATER PIPING. WATER HEATERS, AND PROPANE SYSTEM. INCLUDE ALL TRENCHING, FLOOR SLAB REPAIR NECESSARY TO INSTALL NEW WASTE LINES. INCLUDE ARCHITECTURAL WORK FOR ANY NEW FRAMED WALLS AND CEILING, WALL, OR FLOOR FINISHES NECESSARY TO SUPPORT INSTALLATION OF PLUMBING FIXTURES.
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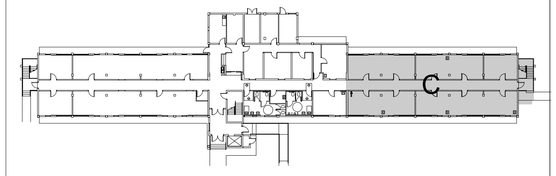
4. ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL WORK OCCURRING WITHIN SELECT ROOMS AS INDICATED ON DRAWINGS.

A EXISTING/NEW FIRST FLOOR DOMESTIC WATER PLUMBING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'



KEYPLAN

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW FIRST FLOOR DOMESTIC WATER PLUMBING PLAN

ENGINEERING PARTNERS		HAWAII JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-201C
DESIGNED BY: MS	CHECKED BY: EW		
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 170 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 5:05 pm
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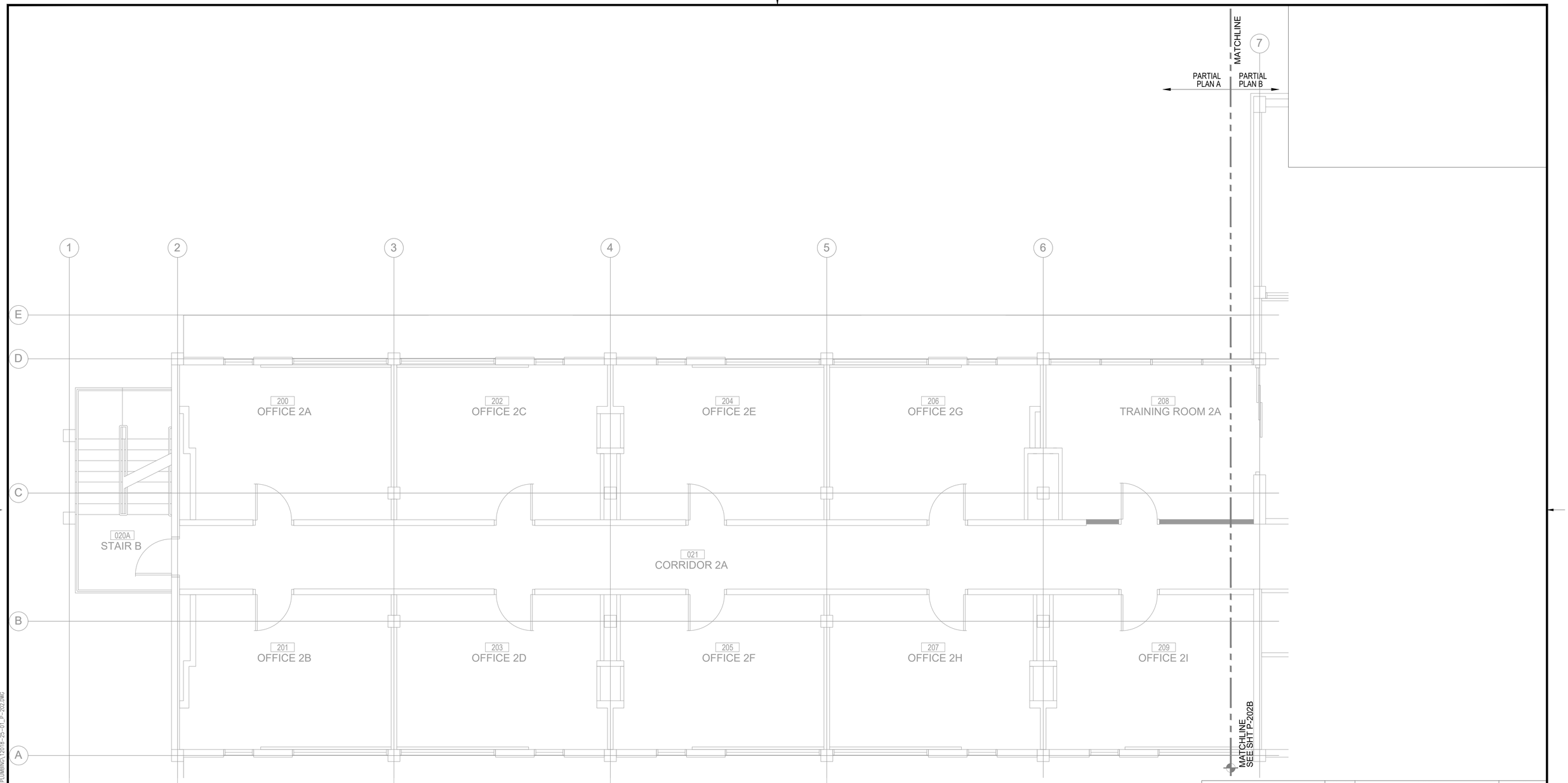

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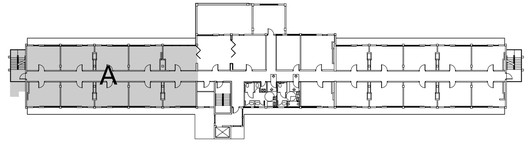
A EXISTING/NEW SECOND FLOOR DOMESTIC WATER PLUMBING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'



KEYPLAN

E. L. I. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW SECOND FLOOR DOMESTIC WATER PLUMBING PLAN

ENGINEERING PARTNERS		HAING JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-202A
DESIGNED BY: MS	CHECKED BY: EW		
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 171 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

06/02/2026 4:57 pm
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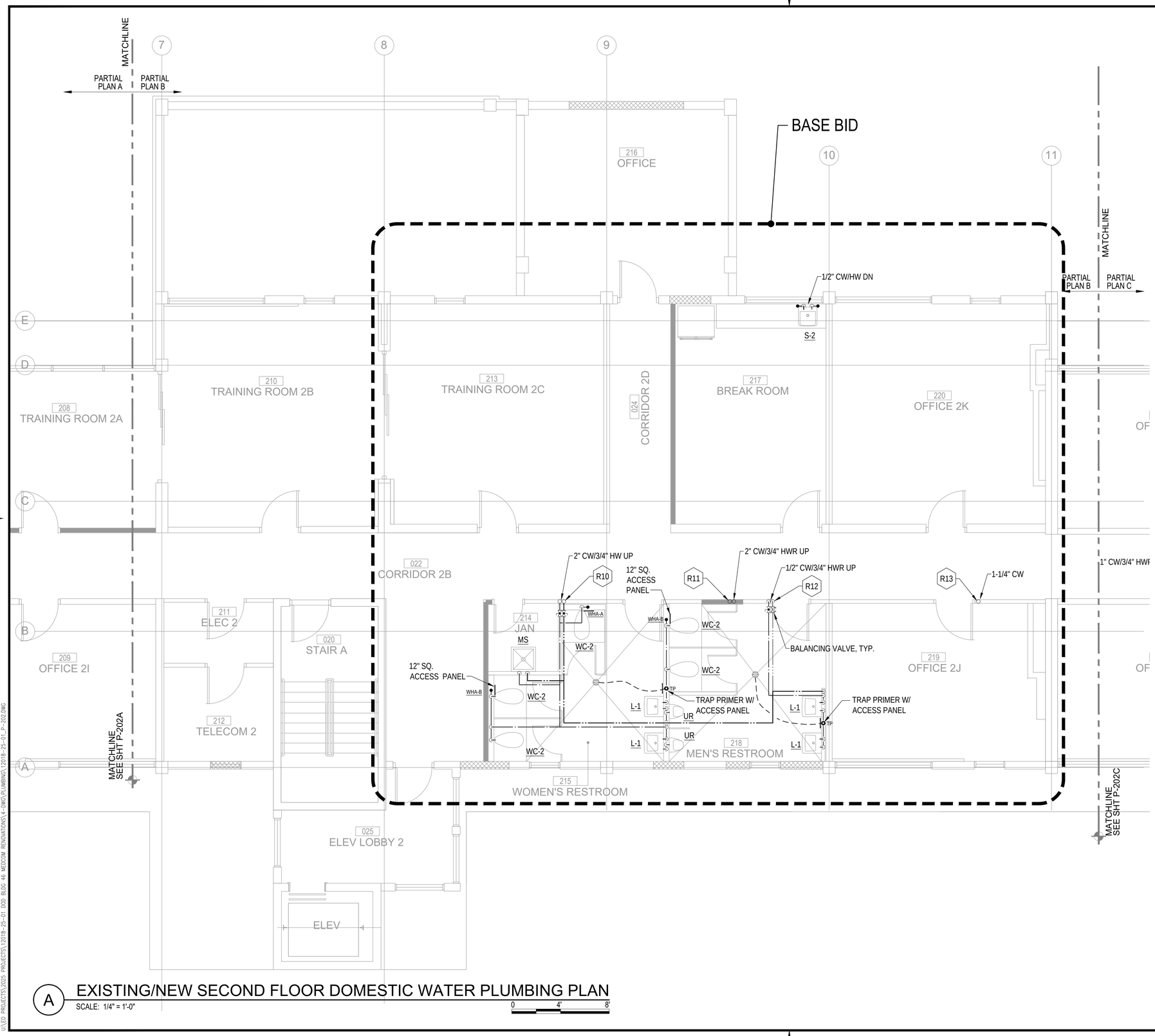

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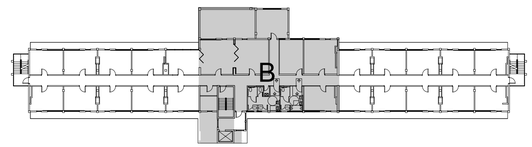

KEYPLAN

A EXISTING/NEW SECOND FLOOR DOMESTIC WATER PLUMBING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

REV. NO	DESCRIPTION	DATE

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAI'I

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW SECOND FLOOR DOMESTIC WATER PLUMBING PLAN

ENGINEERING PARTNERS		HI&RNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. P-202B
DESIGNED BY: MS	CHECKED BY: EW		
DRAWN BY: MC	APPROVED BY: EW	DATE	SHEET 172
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 4:57 pm
U:\CAD PROJECTS\2025 PROJECTS\12018--25--01 DOD BLDG 46 MEDCOM RENOVATIONS\4--DWG\PLUMBING\12018--25--01_P--202.DWG

BASE BID

1. AIR CONDITIONING SYSTEM IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO ALL FAN COILS, EXTERIOR CONDENSING UNITS, CONTROLS, CONCRETE PADS, TESTING/ ADJUSTING/ BALANCING, INSULATION, REFRIGERANT PIPING, CONDENSATE PIPING, AND ASSOCIATED ELECTRICAL WORK.
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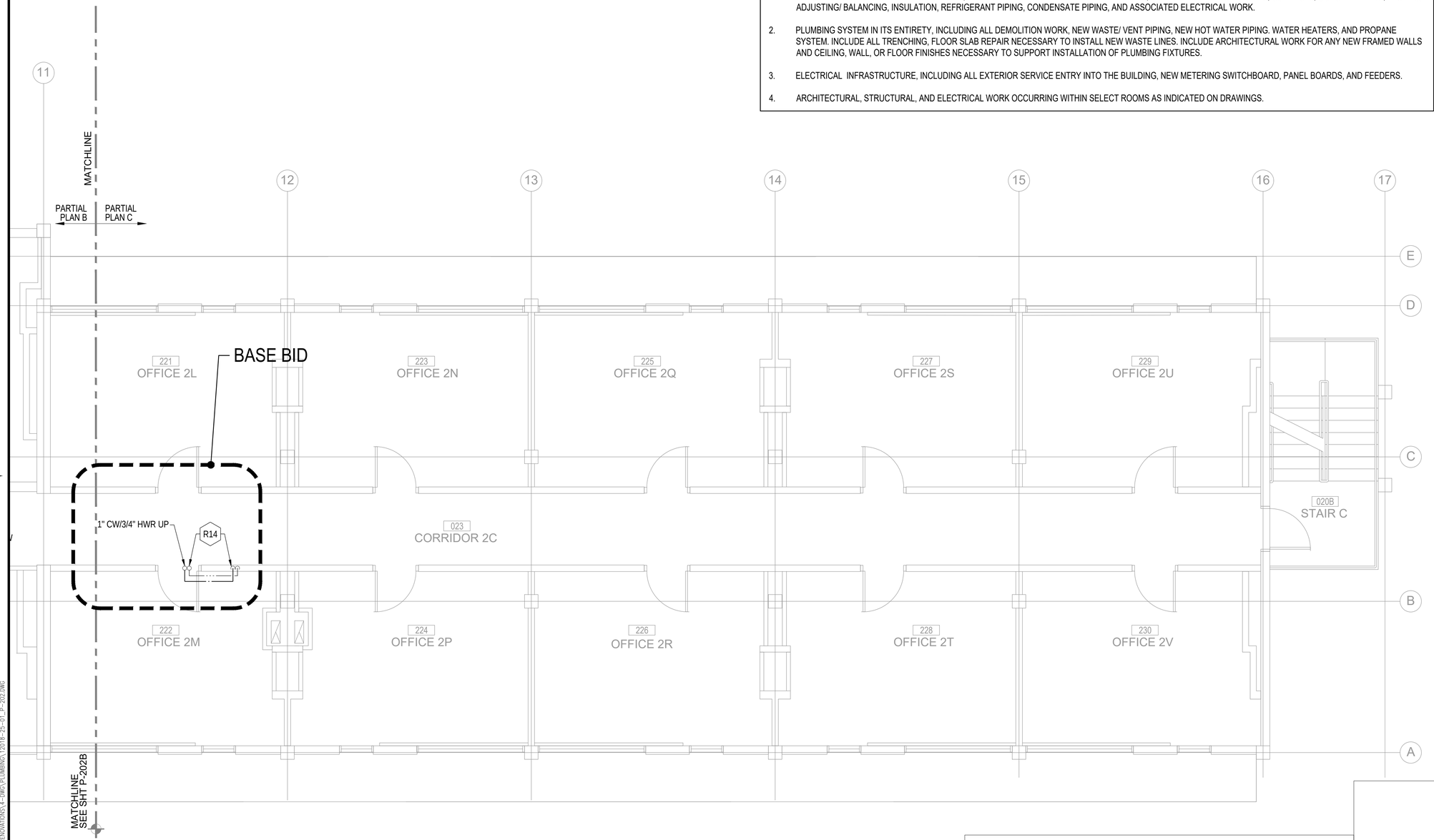
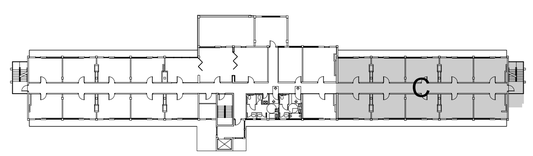


A EXISTING/NEW SECOND FLOOR DOMESTIC WATER PLUMBING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'



KEYPLAN

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAI'I

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW SECOND FLOOR DOMESTIC WATER PLUMBING PLAN

ENGINEERING PARTNERS

DESIGNED BY: MS	CHECKED BY: EW	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-202C
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 173 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 5:05 pm
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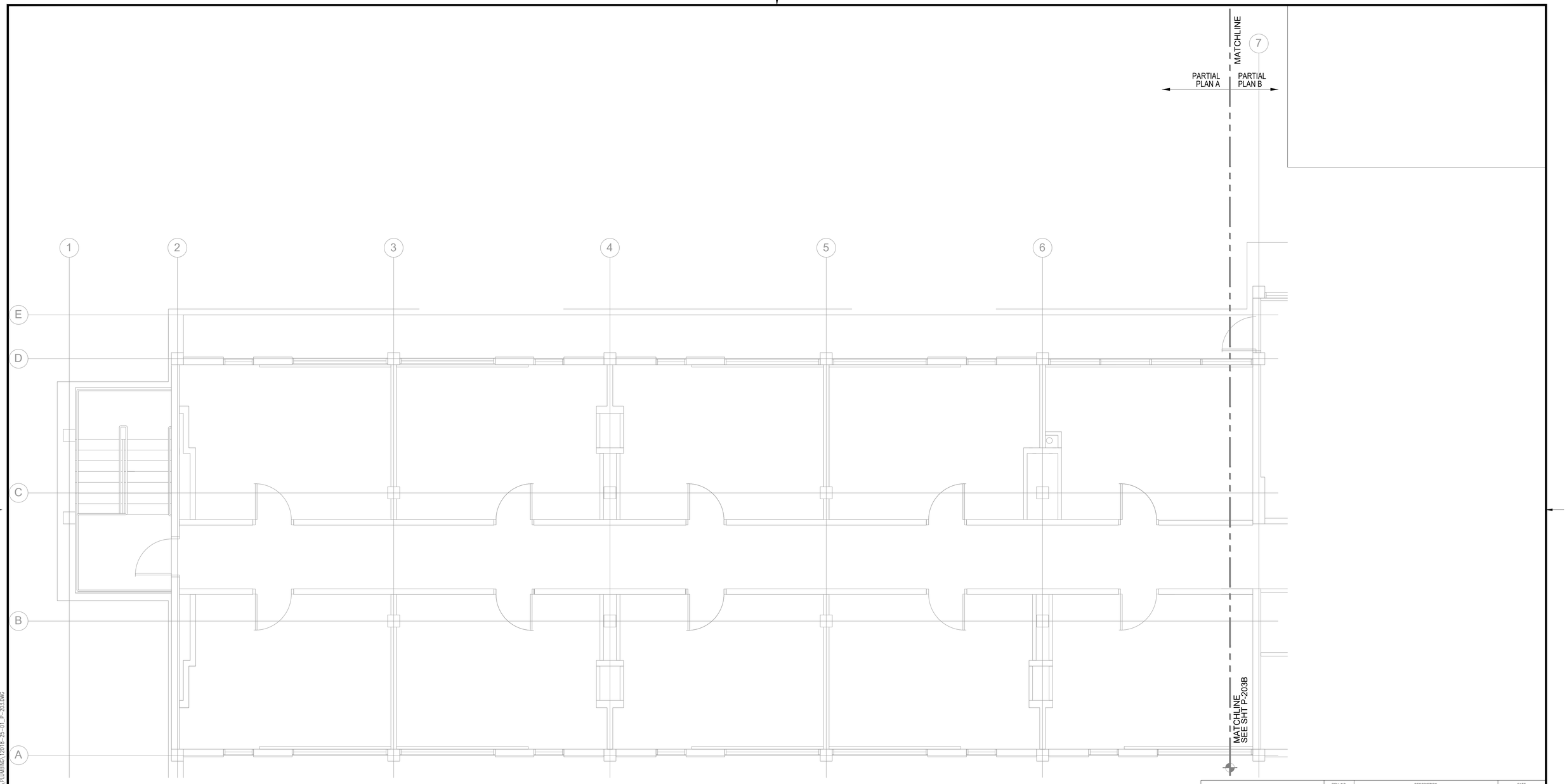

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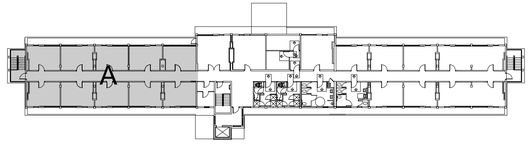
A EXISTING/NEW THIRD FLOOR DOMESTIC WATER PLUMBING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'



KEYPLAN

E.L.I. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW THIRD FLOOR DOMESTIC WATER PLUMBING PLAN

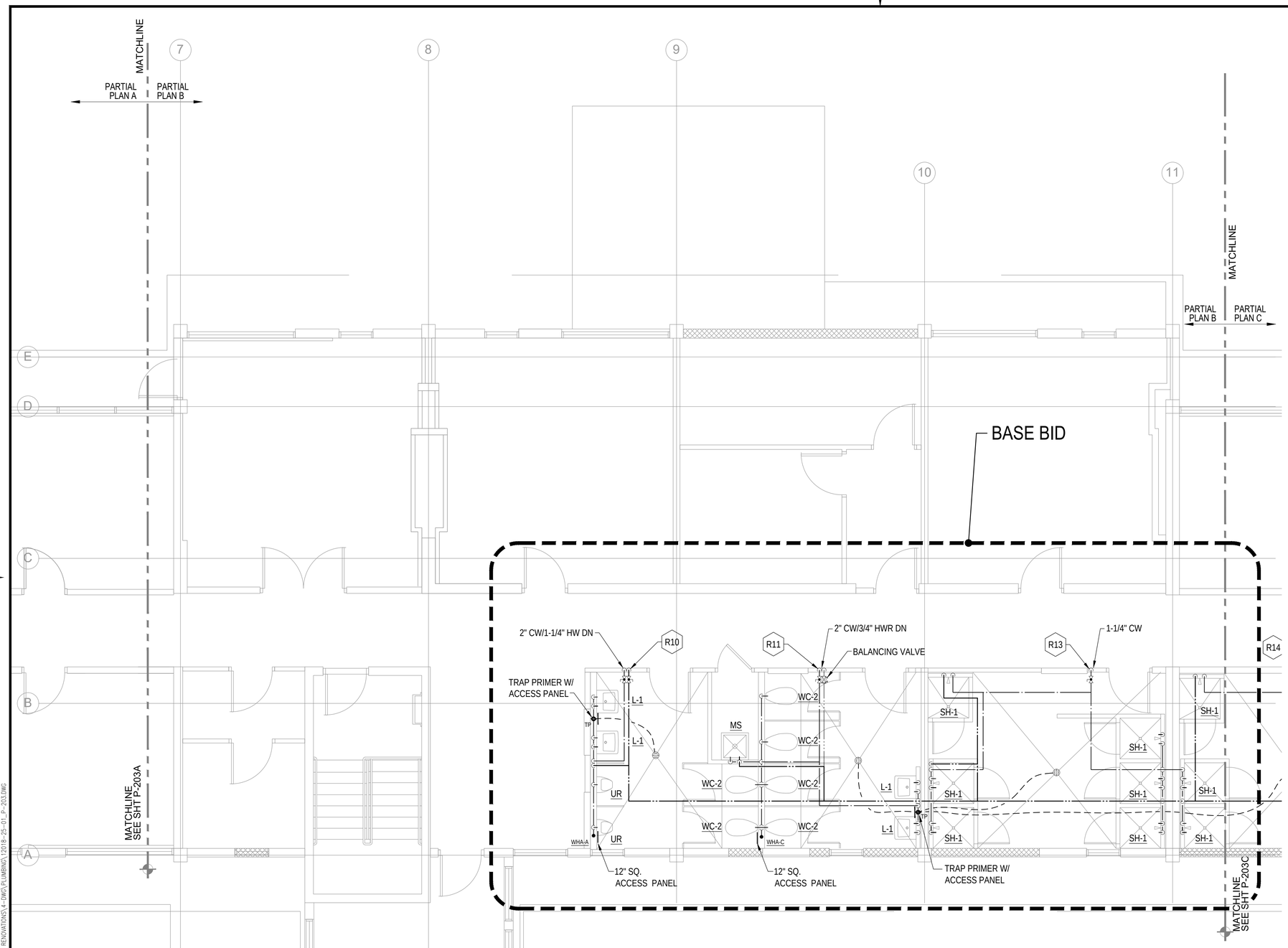
ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-203A
MS	EW		
DRAWN BY:	APPROVED BY:	DATE:	SHEET 174
MC	EW	JUNE 2026	OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

06/02/2026 5:11 pm
U:\JOB PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWGS PLUMBING\12018-25-01_P-203.DWG

DATE ISSUED: ---



BASE BID

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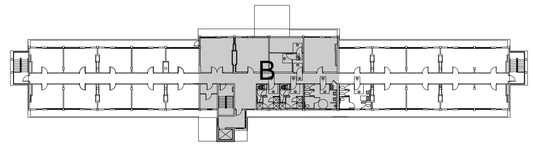

KEYPLAN

A EXISTING/NEW THIRD FLOOR DOMESTIC WATER PLUMBING PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW THIRD FLOOR DOMESTIC WATER PLUMBING PLAN

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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SIGNATURE

ENGINEERING PARTNERS		HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-203B
DESIGNED BY: MS	CHECKED BY: EW		
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 175 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ----

06/02/2026 5:06 pm
U:\CO PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\PLUMBING\12018-25-01_P-203.DWG

BASE BID

1. AIR CONDITIONING SYSTEM IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO ALL FAN COILS, EXTERIOR CONDENSING UNITS, CONTROLS, CONCRETE PADS, TESTING/ ADJUSTING/ BALANCING, INSULATION, REFRIGERANT PIPING, CONDENSATE PIPING, AND ASSOCIATED ELECTRICAL WORK.
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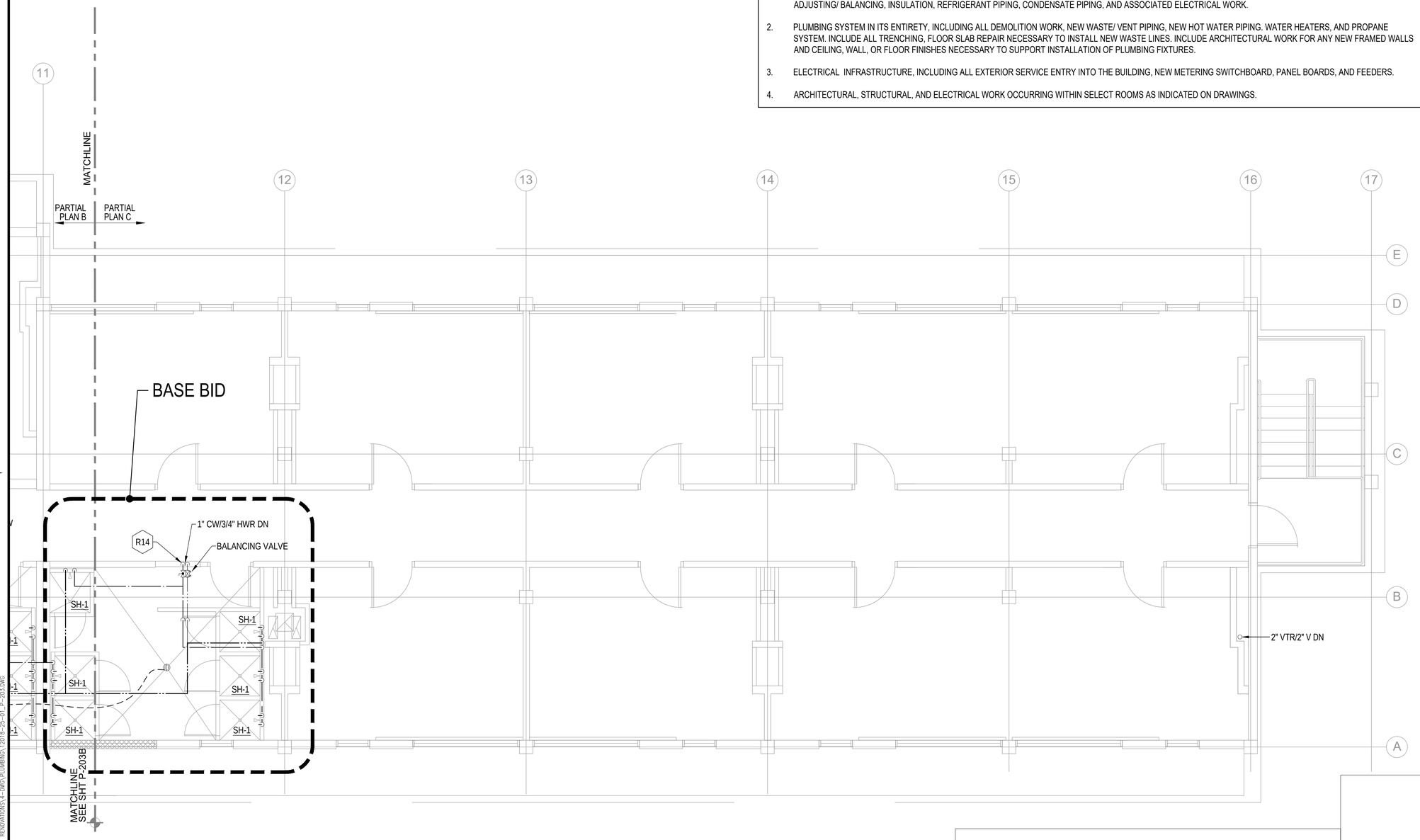

A EXISTING/NEW THIRD FLOOR DOMESTIC WATER PLUMBING PLAN

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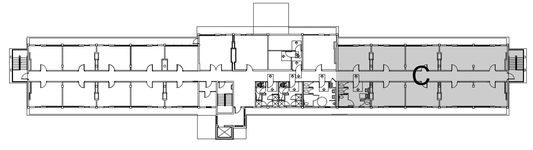

KEYPLAN

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/NEW THIRD FLOOR DOMESTIC WATER PLUMBING PLAN

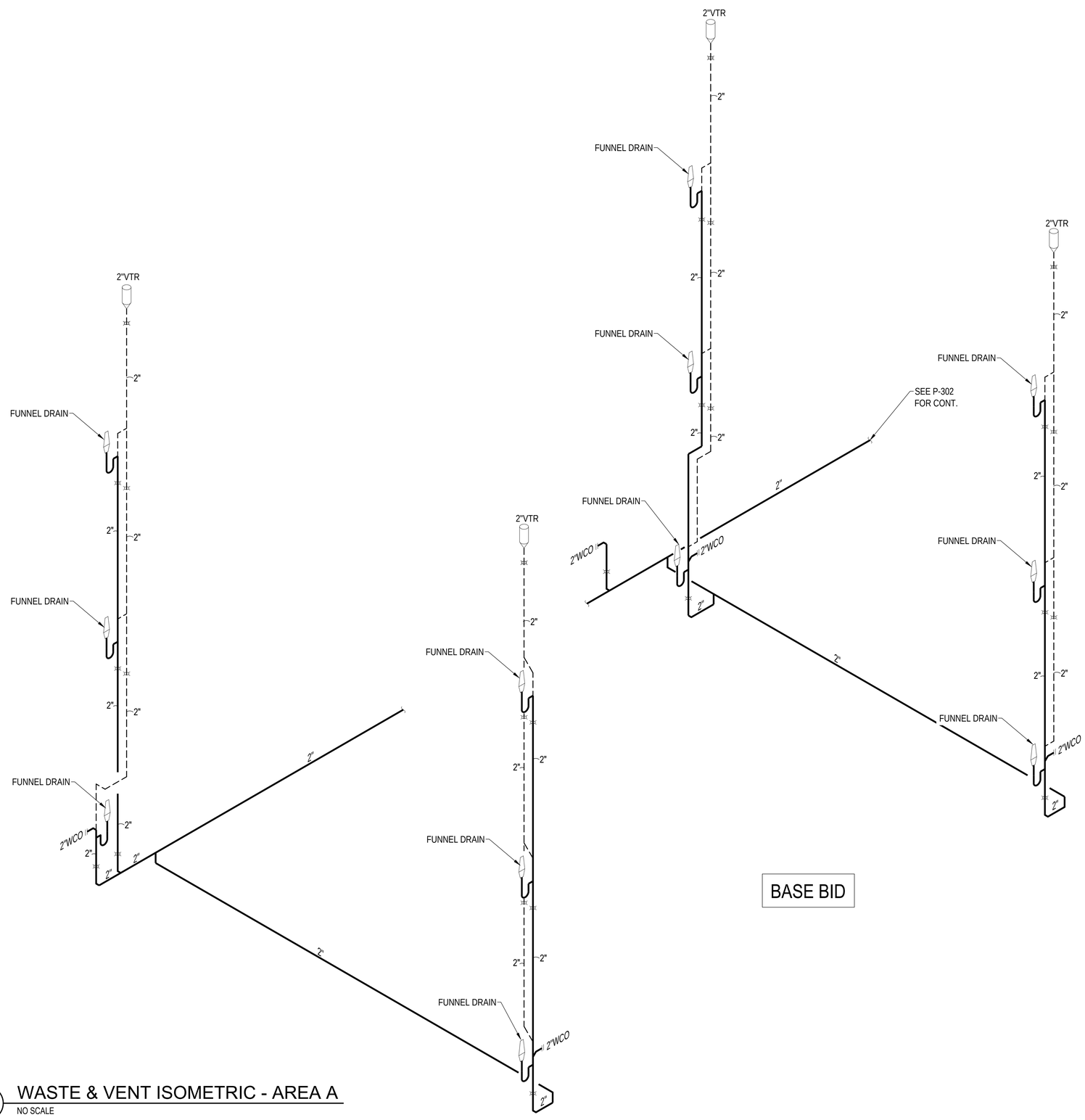
ENGINEERING PARTNERS

DESIGNED BY: MS	CHECKED BY: EW	HAWAII JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-203C
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 176 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 4:57 pm
U:\JOB PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\PLUMBING\12018-25-01_P-203.DWG



BASE BID

A WASTE & VENT ISOMETRIC - AREA A

NO SCALE

BASE BID

1. AIR CONDITIONING SYSTEM IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO ALL FAN COILS, EXTERIOR CONDENSING UNITS, CONTROLS, CONCRETE PADS, TESTING/ ADJUSTING/ BALANCING, INSULATION, REFRIGERANT PIPING, CONDENSATE PIPING, AND ASSOCIATED ELECTRICAL WORK.
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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

WASTE & VENT ISOMETRIC - AREA A

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-301
MS	EW		
DRAWN BY: MC	APPROVED BY: EW	DATE JUNE 2026	SHEET 177 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

06/02/2026 5:01 pm
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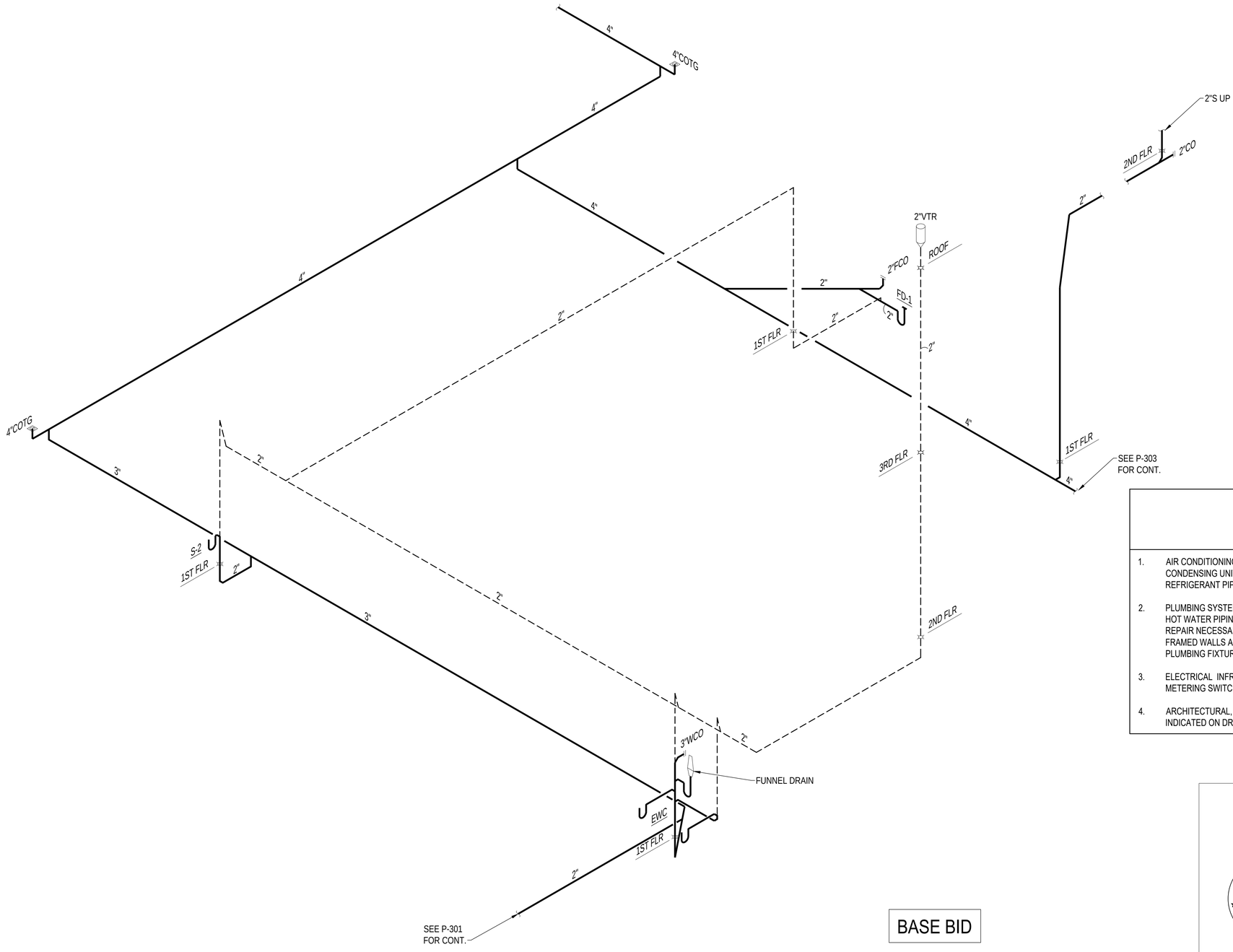

BASE BID

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1. AIR CONDITIONING SYSTEM IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO ALL FAN COILS, EXTERIOR CONDENSING UNITS, CONTROLS, CONCRETE PADS, TESTING/ ADJUSTING/ BALANCING, INSULATION, REFRIGERANT PIPING, CONDENSATE PIPING, AND ASSOCIATED ELECTRICAL WORK.
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A WASTE & VENT ISOMETRIC - 1ST FLOOR AREA B

NO SCALE

REV NO	DESCRIPTION	DATE

E.L. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

WASTE & VENT ISOMETRIC - 1ST FLOOR AREA B

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-302
MS	EW		
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 178 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

06/02/2026 5:00 pm
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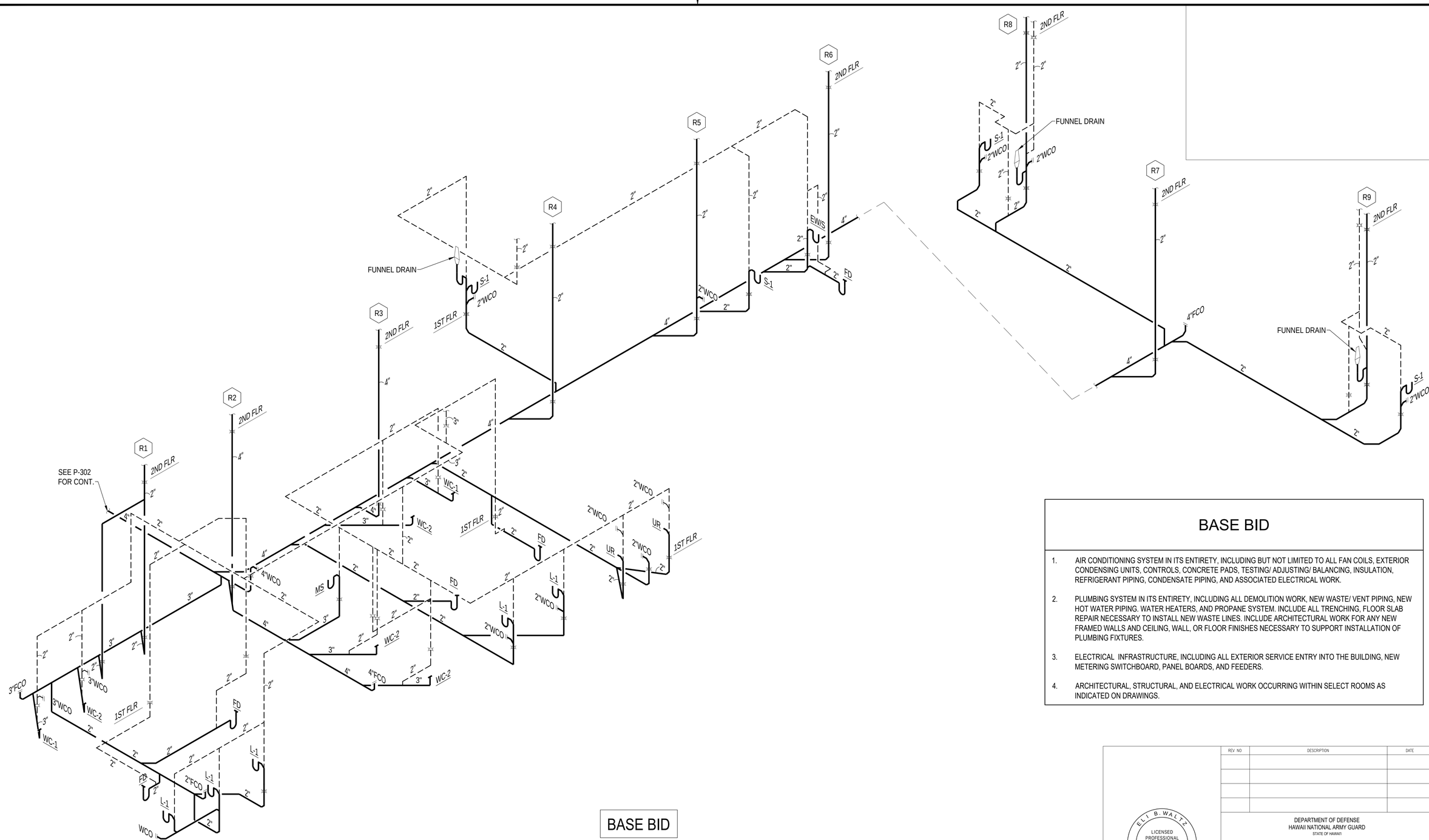

BASE BID

A WATE & VENT ISOMETRIC- 1ST FLOOR AREA B

NO SCALE

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MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

WATE & VENT ISOMETRIC- 1ST FLOOR AREA B

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-303
MS	EW		
DRAWN BY:	APPROVED BY:	DATE	SHEET 179
MC	EW		
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~

06/02/2026 5:01 pm
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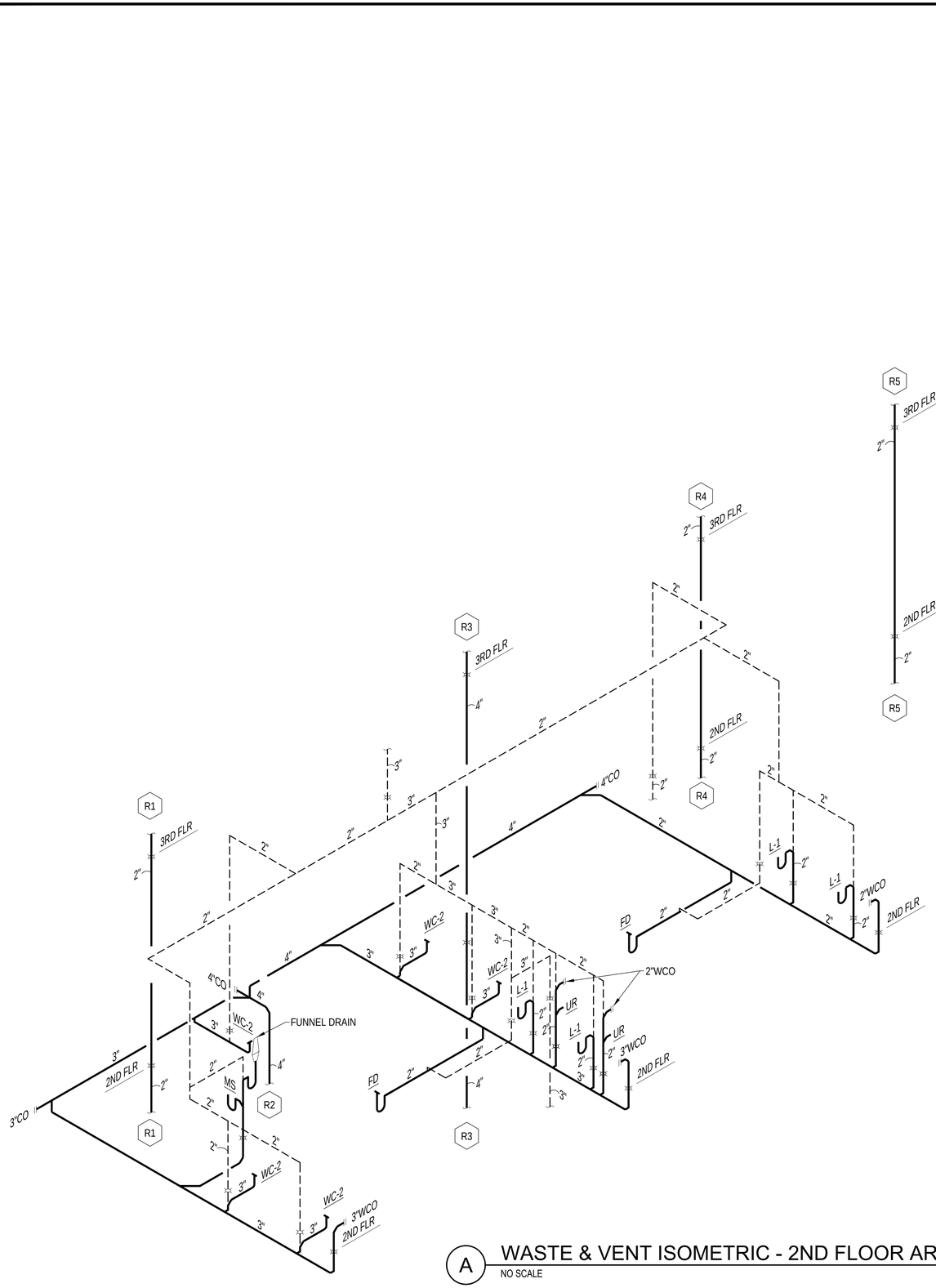
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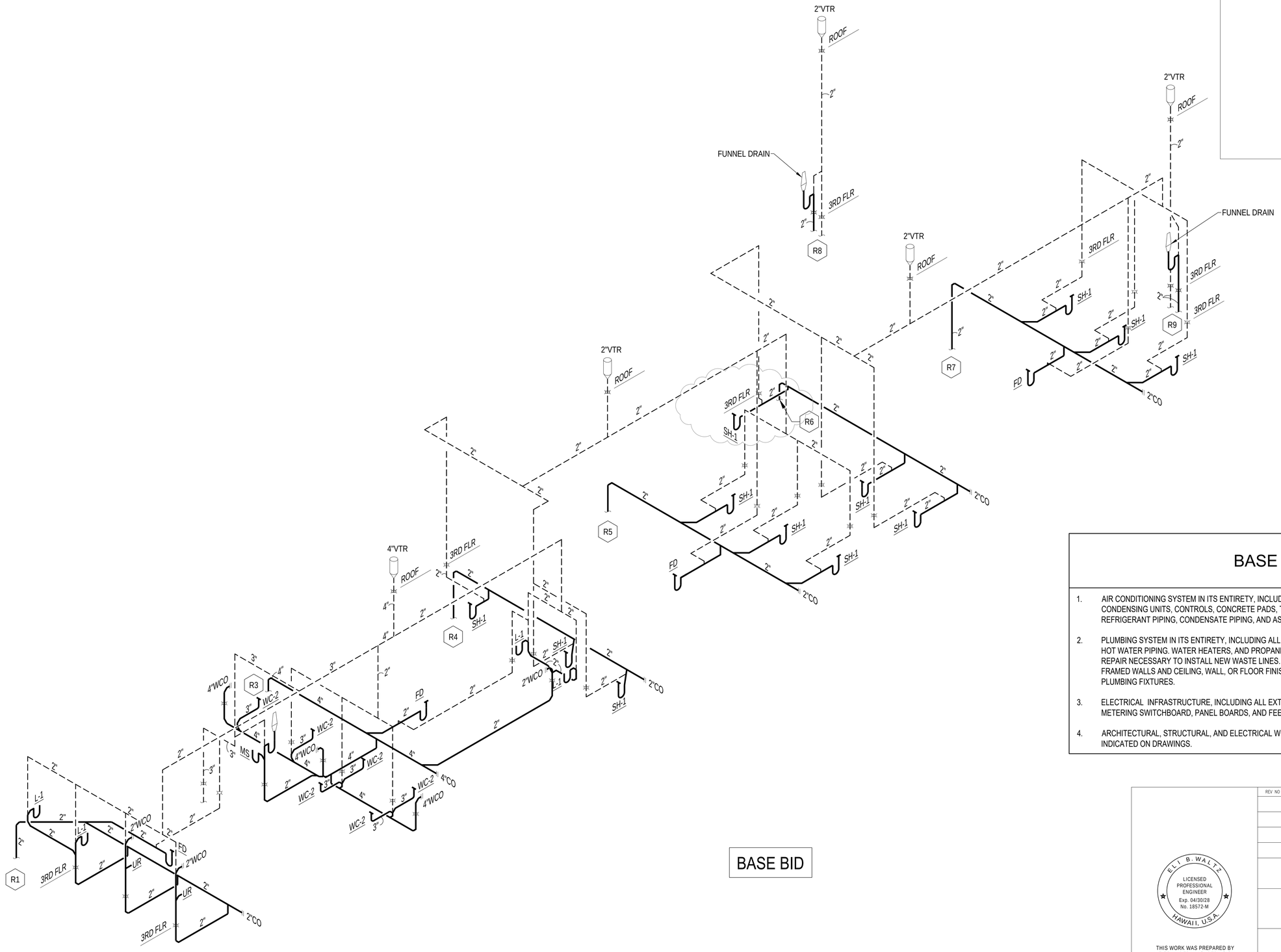

A WASTE & VENT ISOMETRIC - 3RD FLOOR AREA B

NO SCALE

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1. AIR CONDITIONING SYSTEM IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO ALL FAN COILS, EXTERIOR CONDENSING UNITS, CONTROLS, CONCRETE PADS, TESTING/ ADJUSTING/ BALANCING, INSULATION, REFRIGERANT PIPING, CONDENSATE PIPING, AND ASSOCIATED ELECTRICAL WORK.
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STATE OF HAWAI'I

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

WASTE & VENT ISOMETRIC - 3RD FLOOR AREA B

ENGINEERING PARTNERS		HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-305
DESIGNED BY: MS	CHECKED BY: EW		
DRAWN BY: MC	APPROVED BY: EW	DATE JUNE 2026	SHEET 181 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 4:53 pm
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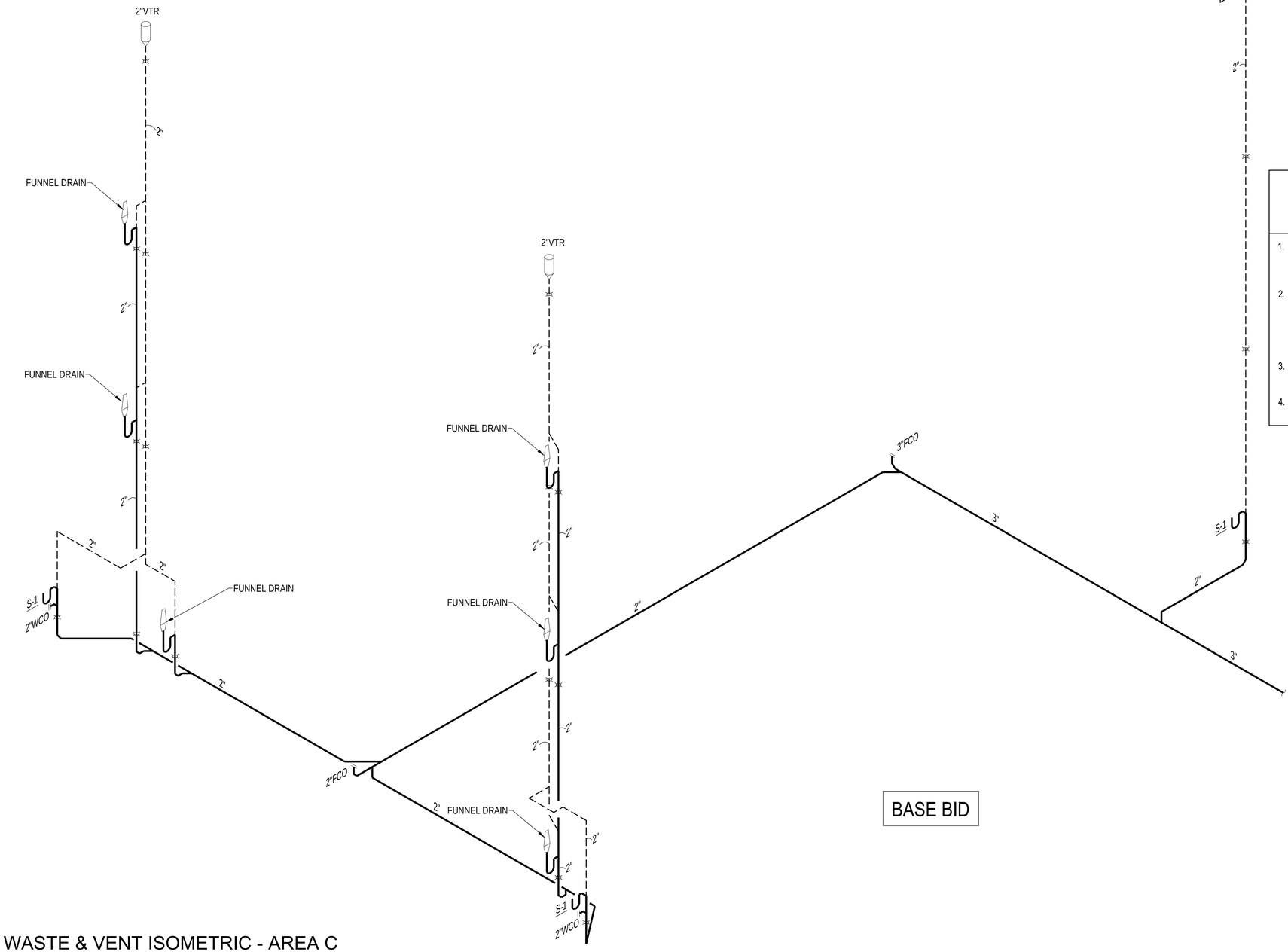

A WASTE & VENT ISOMETRIC - AREA C
NO SCALE

BASE BID

BASE BID

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DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

WASTE & VENT ISOMETRIC - AREA C

ENGINEERING PARTNERS

DESIGNED BY: MS	CHECKED BY: EW	HAPNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-306
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 182 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

06/02/2026 5:11 pm
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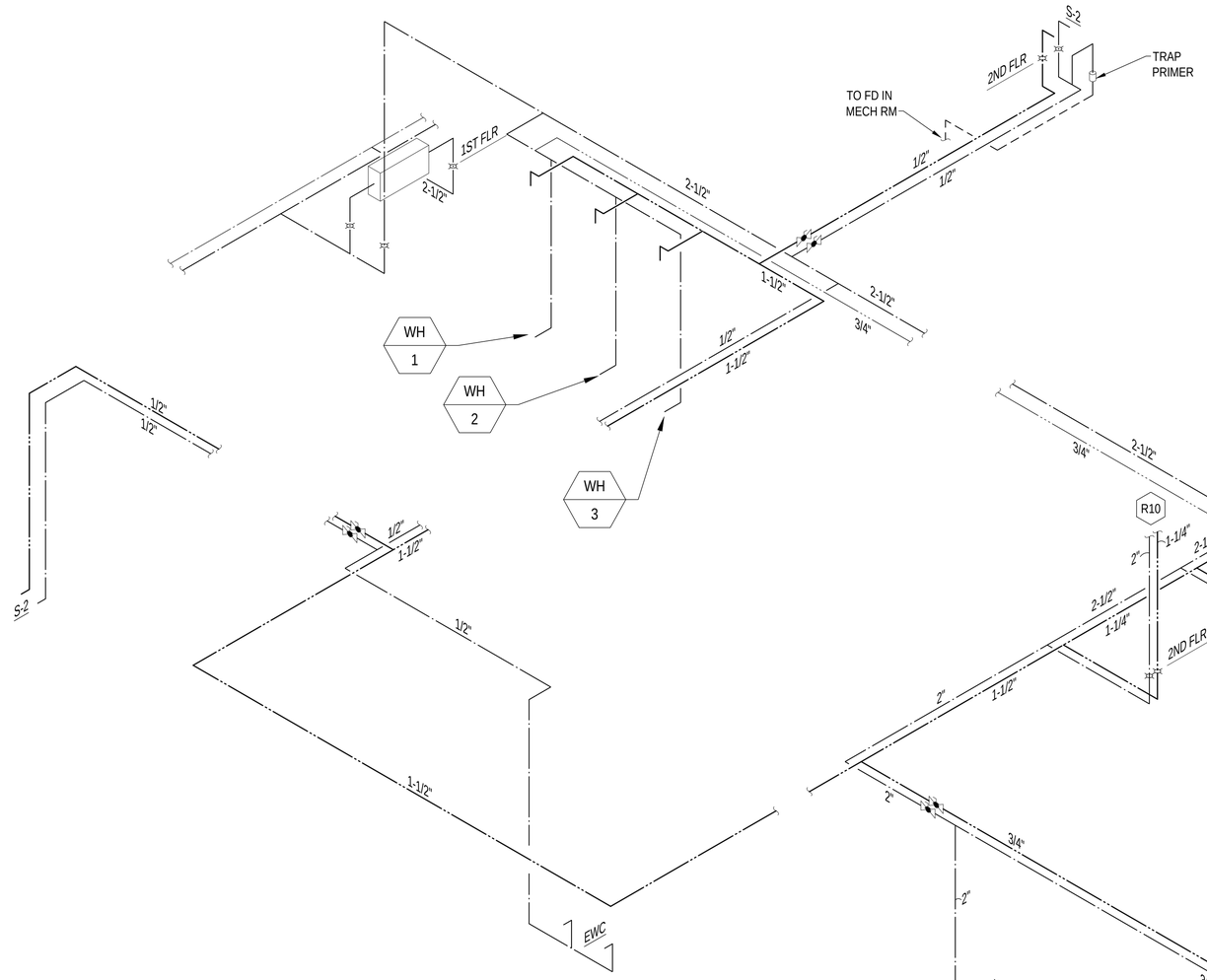

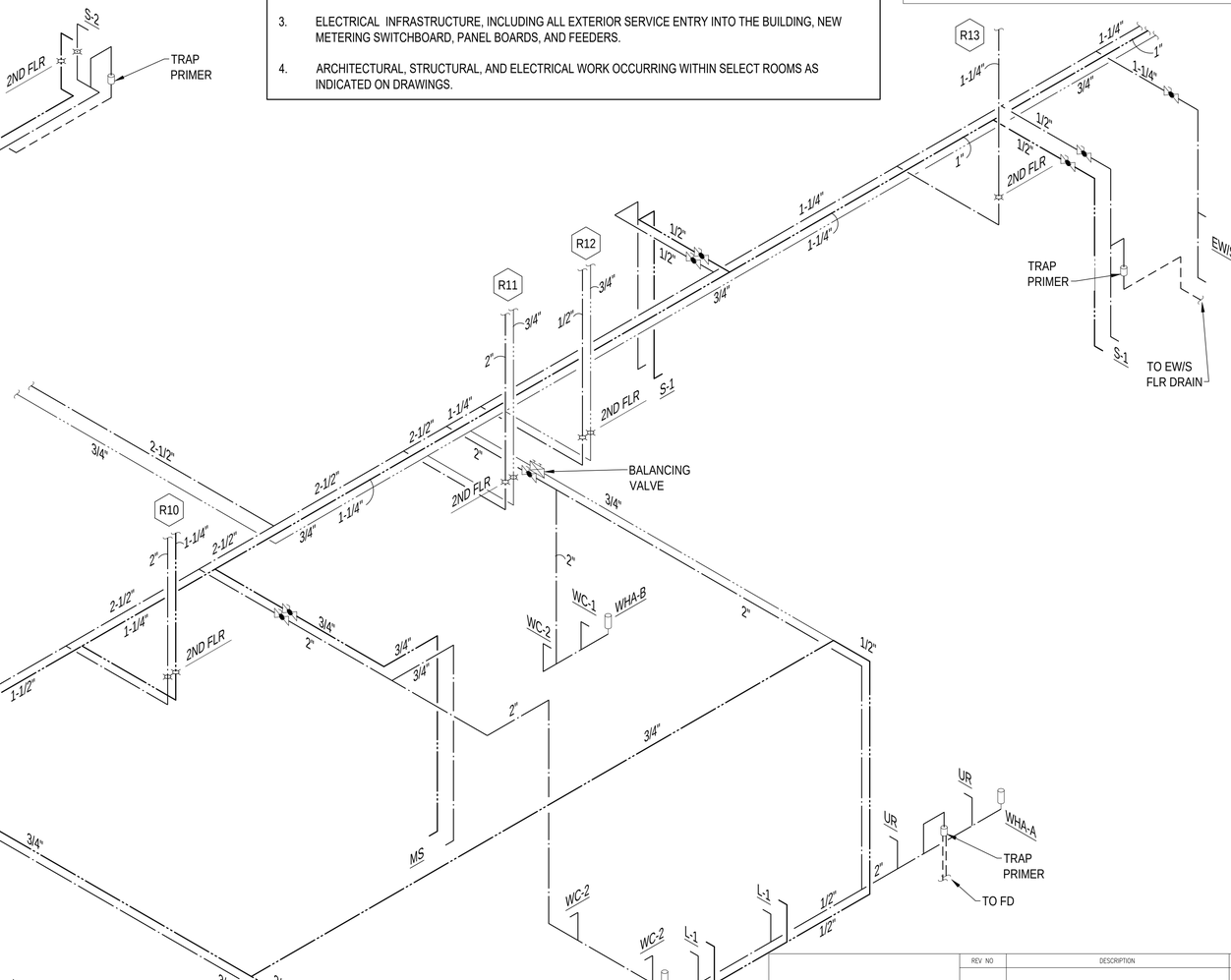

BASE BID

A DOMESTIC WATER ISOMETRIC - 1ST FLOOR AREA B

NO SCALE

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

DOMESTIC WATER ISOMETRIC - 1ST FLOOR AREA B

ENGINEERING PARTNERS		HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-307
DESIGNED BY: MS	CHECKED BY: EW		
DRAWN BY: MC	APPROVED BY: EW	DATE	SHEET 183
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 5:09 pm
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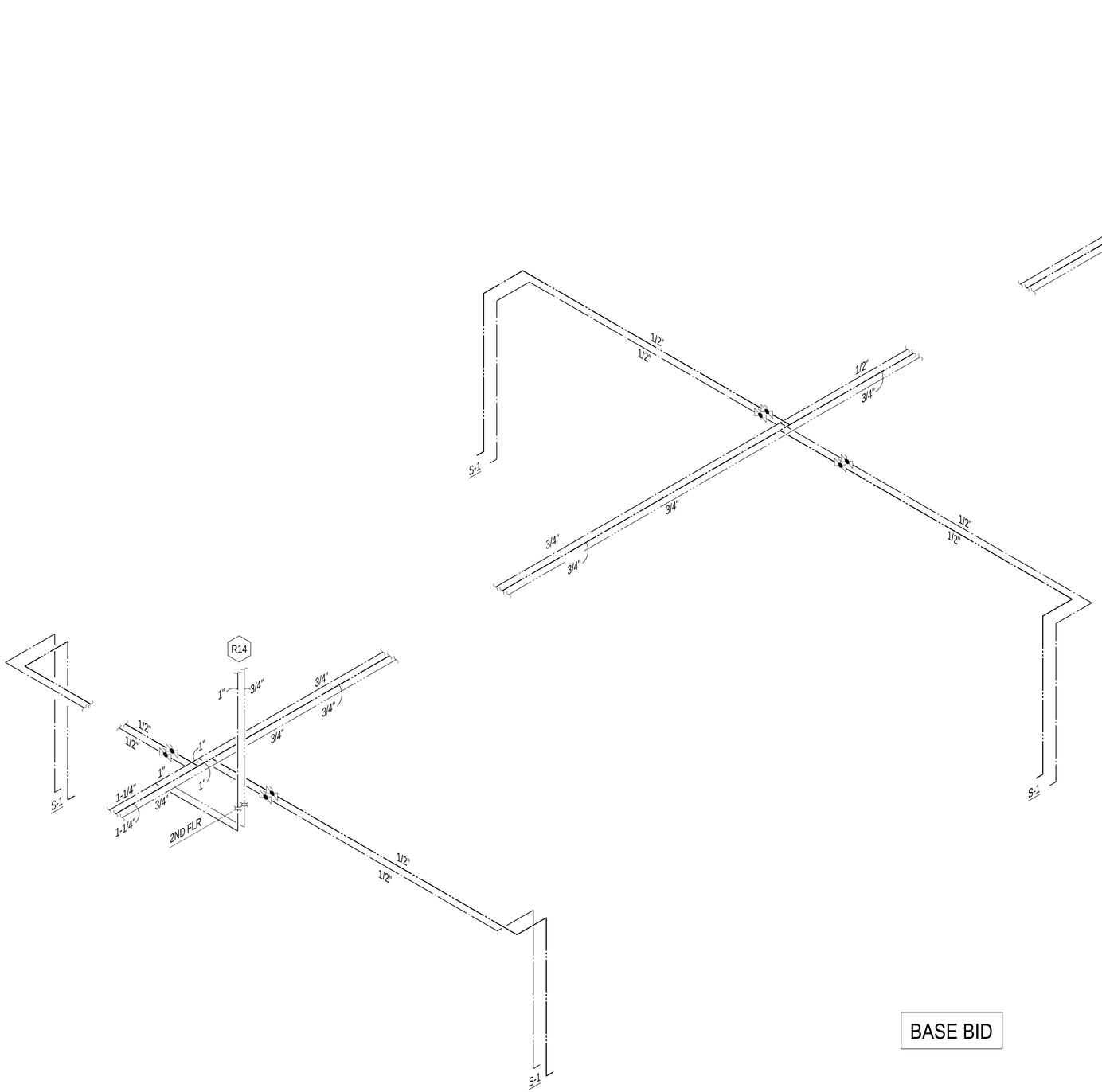

A DOMESTIC WATER ISOMETRIC - 1ST FLOOR AREA C
NO SCALE

BASE BID

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ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

DOMESTIC WATER ISOMETRIC - 1ST FLOOR AREA C

ENGINEERING PARTNERS		HI&PW JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. P-308
DESIGNED BY: MS	CHECKED BY: EW		
DRAWN BY: MC	APPROVED BY: EW	DATE	SHEET 184
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 5:01 pm
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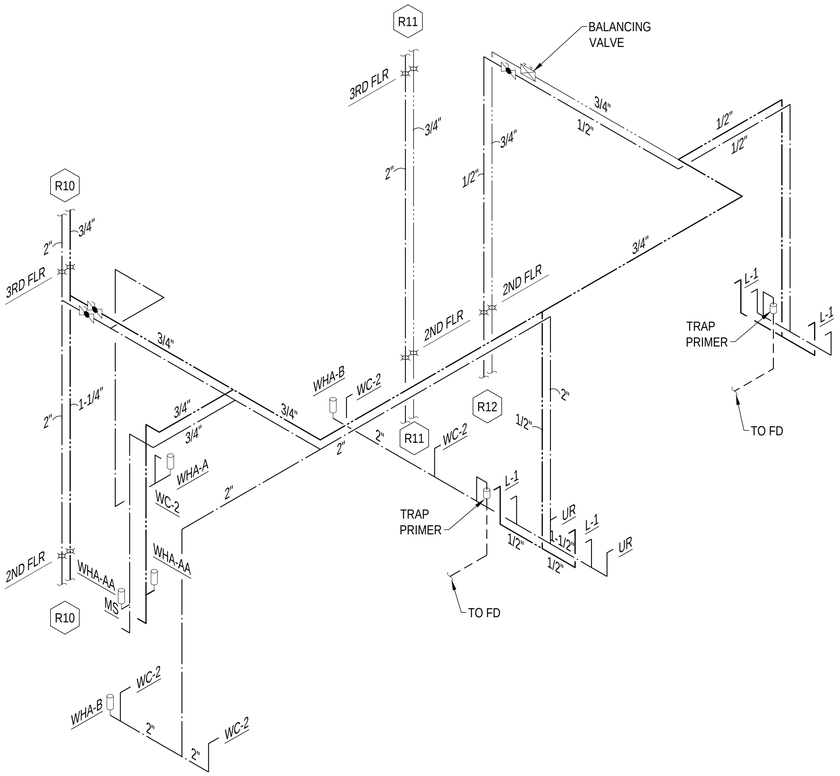

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A DOMESTIC WATER ISOMETRIC - 2ND FLOOR AREA B
NO SCALE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

DOMESTIC WATER ISOMETRIC - 2ND FLOOR AREA B

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DESIGNED BY:	CHECKED BY:	HIARNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. P-309
MS	EW		
DRAWN BY: MC	APPROVED BY: EW	DATE JUNE 2026	SHEET 185 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 4:53 pm
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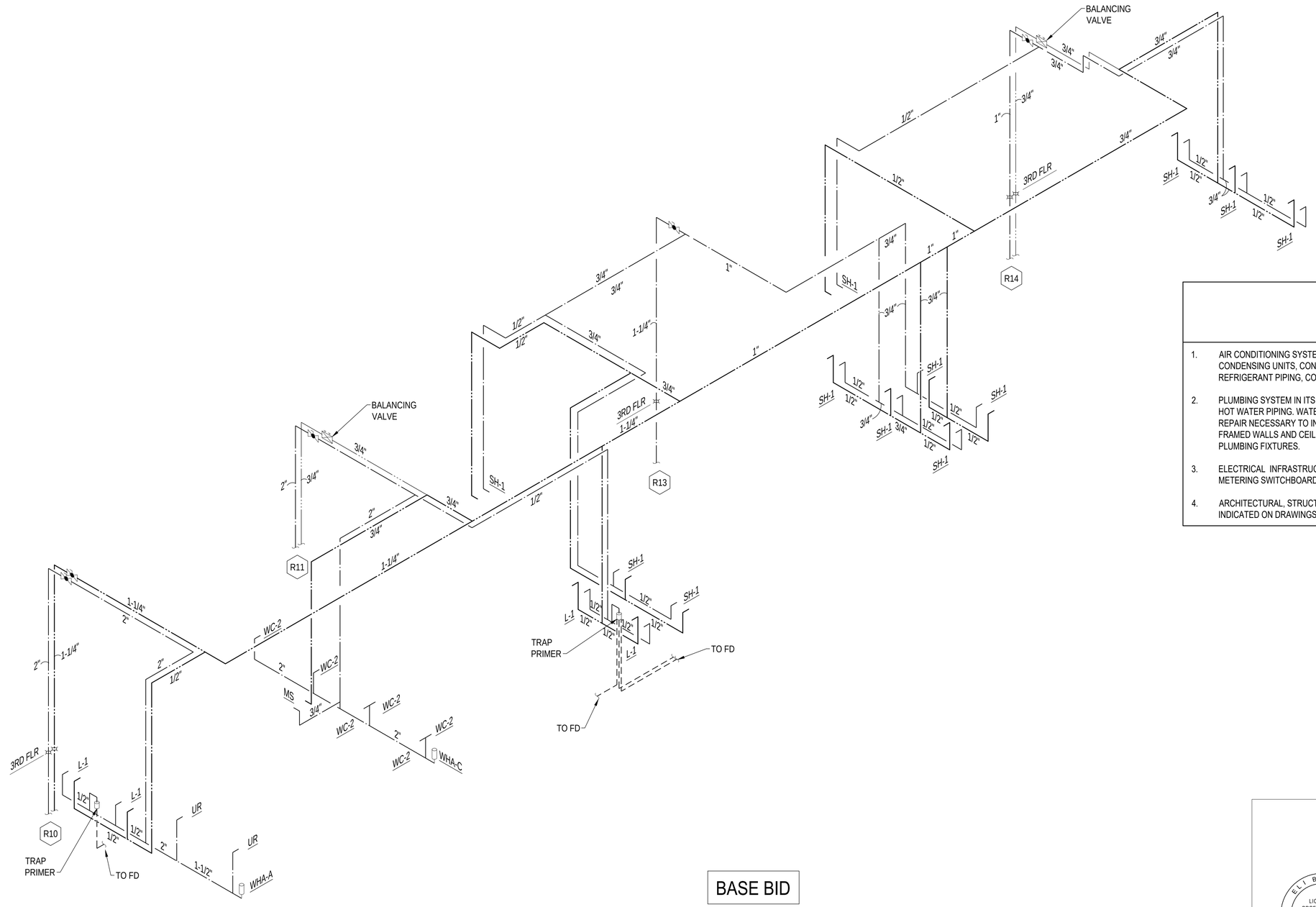

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A DOMESTIC WATER ISOMETRIC - 3RD FLOOR AREA B

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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

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DOMESTIC WATER ISOMETRIC - 3RD FLOOR AREA B

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DRAWN BY: MC	APPROVED BY: EW	DATE	SHEET 186
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

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06/02/2026 5:00 pm
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A2L REFRIGERANT GENERAL SPECIFICATIONS

1. THIS PROJECT SHALL UTILIZE A2L REFRIGERANTS TO ACCOMMODATE THE ENVIRONMENTAL REGULATIONS SET FORTH BY THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY. THIS FACILITY SHALL BE PROVIDED WITH REFRIGERANT R-454B OR APPROVED EQUAL.
2. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETE INSTALLATION OF THE HVAC SYSTEM WITH THE USE OF CLASS A2L REFRIGERANTS IN ACCORDANCE WITH THE REQUIREMENTS OF ASHRAE 15 2024, UL 60335-2, NFPA 70, INTERNATIONAL BUILDING CODE, AND ALL OTHER REQUIREMENTS OF THE AHJ.
3. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE WITH ALL OTHER TRADES THAT SLIGHTLY FLAMMABLE REFRIGERANT WILL BE INSTALLED. THE MECHANICAL CONTRACTOR IS RESPONSIBLE TO REVIEW ALL OTHER DISCIPLINE PLANS TO DETERMINE THE NEED OF PROTECTION FOR REFRIGERANT PIPING.
4. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE VOLUME CALCULATION AND DETERMINING THE EFFECTIVE DISPERSAL VOLUME FOR EACH ROOM SERVICED BY THE HVAC SYSTEM IN ACCORDANCE WITH THE REQUIREMENTS OF ASHRAE 15 AND AS REQUIRED BY THE MANUFACTURER.
5. ALL REFRIGERANT SHALL BE NEW REFRIGERANT SPECIFIED BY THE EQUIPMENT MANUFACTURER, THE USE OF RECOVERED OR RECYCLED REFRIGERANT SHALL NOT BE PERMITTED.
6. REFRIGERANT DETECTION SYSTEM SHALL BE PROVIDED IN ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS.
7. INTEGRAL REFRIGERANT DETECTION SHALL BE PROVIDED PER THE MANUFACTURERS DIRECTION AND AS NOTED BELOW.
   - 7.1. DUCTED HVAC SYSTEMS WITH A RELEASABLE REFRIGERANT CHARGE MORE THAN 4.0 LB AND WITH ANY DUCT OPENING LESS THAN 5.9' ABOVE THE FINISHED FLOOR.
   - 7.2. DUCTED HVAC SYSTEMS WHERE SPACES CONNECTED TO THE SUPPLY AIR DUCT ARE USED AS THE DISPERSAL FLOOR AREA TO CALCULATE VOLUME PER ASHRAE 15 SECTION 7.2.
   - 7.3. REFRIGERATION SYSTEMS INSTALLED WHERE THE OCCUPANCY CLASSIFICATION IS INSTITUTIONAL OCCUPANCY
8. REFRIGERANT DETECTION SHALL COMPLY WITH THE FOLLOWING:
   - 8.1. UTILIZE A SET POINT, NONADJUSTABLE IN THE FIELD, TO GENERATE AN OUTPUT SIGNAL TO INITIATE MITIGATION ACTIONS.
   - 8.2. FIELD RE-CALIBRATION OF THE REFRIGERANT DETECTION SYSTEM SHALL NOT BE PERMITTED.
   - 8.3. BE CAPABLE OF DETECTING THE PRESENCE OF A SPECIFIED REFRIGERANT CORRESPONDING TO THE REFRIGERANT DESIGNATION OF THE REFRIGERANT CONTAINED IN THE REFRIGERATION SYSTEM.
   - 8.4. HAVE ACCESS FOR REPLACEMENT OF REFRIGERANT DETECTION SYSTEM COMPONENTS.
   - 8.5. HAVE SELF-DIAGNOSTICS TO DETERMINE OPERATIONAL STATUS OF THE SENSING ELEMENT.
   - 8.6. UPON FAILURE OF A SELF-DIAGNOSTIC CHECK, ENERGIZE AIR CIRCULATION FANS OF THE EQUIPMENT.
   - 8.7. WHERE REQUIRED PER ASHRAE 15 SECTION 7.6.4, AND UPON FAILURE OF A SELF-DIAGNOSTIC CHECK, ACTIVATE THE MECHANICAL VENTILATION SYSTEM SERVING THE SPACE OR CONNECTED SPACES.
   - 8.8. GENERATE AN OUTPUT SIGNAL IN NOT MORE THAN 30 SECONDS WHEN EXPOSED TO A REFRIGERANT CONCENTRATION OF 25% LFL (+0%,-1%)
9. MITIGATION ACTIONS SHALL BE COMPLETED WITH NO MORE THAN 15 SECONDS UPON RECEIVING AN OUTPUT SIGNAL FROM THE REFRIGERANT DETECTION SYSTEM AND SHALL BE MAINTAINED FOR AT LEAST FIVE (5) MINUTES AFTER OUTPUT SIGNAL HAS RESET.
10. OPEN-FLAME-PRODUCING DEVICES SHALL NOT BE PERMANENTLY INSTALLED IN THE DUCTWORK THAT SERVES THE SPACE.
11. UNCLASSIFIED ELECTRICAL DEVICES SHALL NOT BE LOCATED WITHIN THE DUCTWORK THAT SERVES THE SPACE.
12. ALL MECHANICAL VENTILATION USED FOR REFRIGERATION MITIGATION SHALL COMPLY WITH ASHRAE 15 SECTION 7.6.4 OR SHALL BE LISTED AND INSTALLED IN ACCORDANCE WITH UL 60335-2-40 / CSA C22.2 No. 60335-2-40.
13. PRESSURE RELIEF DEVICES SHALL BE PROVIDED IN ACCORDANCE WITH ASHRAE 15 AND AS REQUIRED BY THE MANUFACTURER.
14. THE INSTALLATION OF PIPING CONTAINING CLASS A2L REFRIGERANT SHALL MEET ALL THE REQUIREMENTS OF ASHRAE 9.12.1 AND AS SPECIFIED IN OTHER DESIGN DOCUMENTS. ADDITIONALLY WHERE PIPING IS INSTALLED IN STUDS, JOISTS, RAFTERS, OR SIMILAR MEMBER SPACES AND LOCATED LESS THAN 1.5 IN FROM THE NEAREST EDGE OF THE MEMBER, SHALL BE CONTINUOUSLY PROTECTED BY SHIELD PLATES. PROTECTIVE STEEL SHIELD PLATES HAVING A MINIMUM THICKNESS OF 0.0575 IN SHALL COVER THE AREA OF THE TUBE AND SHALL EXTEND A MINIMUM OF 2 IN BEYOND THE OUTSIDE EDGE OF THE TUBE.
15. SHAFT VENTILATION SHALL BE REQUIRED IN ACCORDANCE WITH ASHRAE 15 SECTION 9.12.2.2.
16. MECHANICAL CONTRACTOR SHALL PROVIDE THE FOLLOWING LABELS
   - 16.1 A LABEL INDICATING A FLAMMABLE REFRIGERANT IS USED SHALL BE PLACED ADJACENT TO SERVICE PORTS AND OTHER LOCATIONS WHERE SERVICE INVOLVING COMPONENTS CONTAINING REFRIGERANT IS PERFORMED, AS SPECIFIED BY THE PRODUCT LISTING.
   - 16.2 REFRIGERANT PIPING SHALL BE LABELED WITH "WARNING---RISK OF FIRE. FLAMMABLE REFRIGERANT" IN AREAS OTHER THAN THE ROOM OR SPACE WHERE THE REFRIGERANT EQUIPMENT IS LOCATED. THE PIPING SHALL BE LABELED IN ACCORDANCE WITH ANSI/ASME A13.1 IN INTERVALS OF NOT LESS THAN 20' WITH A MINIMUM LETTER HEIGHT OF 0.5 IN.

NOTICE OF ADDITIVE ALTERNATES:

UNLESS OTHERWISE NOTED, ALL WORK IDENTIFIED ON DRAWINGS IS TO BE INCLUDED UNDER ADDITIVE ALTERNATE. REFER TO COVER SHEET AND DIVISION 1 SPECIFICATIONS FOR DESCRIPTION OF WORK. REVIEW ALL DISCIPLINE DRAWINGS TO ENSURE ALL REQUIRED WORK SCOPE.

1. 1ST FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
2. 2ND FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
3. 3RD FLOOR ARCHITECTURAL/STRUCTURAL DEMO AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
4. DEMOLITION OF EXISTING LIGHTING AND INSTALLATION OF NEW LED LIGHTING AND ASSOCIATED BRANCH CIRCUITING, OVERCURRENT PROTECTION, AND SWITCHES.
5. ELECTRICAL BRANCH CIRCUITING FOR RECEPTACLES AND ANY OTHER ELECTRICAL WORK NOT ASSOCIATED WITH THE ABOVE BASE BID AND ADDITIVE ALTERNATIVES.
6. TELECOMMUNICATIONS
7. ROOF REPLACEMENT
8. ELEVATOR REPLACEMENT

MECHANICAL ALTERNATE BID

1. CONFIRM ADDITIONAL ALTERNATE BIDS SELECTED WITH CONTRACTING OFFICER. VERIFY FINAL NUMBERING AND ASSOCIATED ADDITIONAL ALTERNATE BID WORK WITH CONTRACTING OFFICER.
2. IF ROOFING IS NOT REMOVED AND REPLACED, ALL DUCTS PENETRATIONS SHALL BE CUT ABOVE THE ROOF LEVEL AND CAPPED WITH A SHEET METAL CAP AND SEALED TO BE WATER TIGHT. THE CONTRACTOR SHALL NOT ALTER THE EXISTING ROOF TO INSTALL SHEET METAL CAPS.
3. ALL NEW ROOF INTAKE CAPS SHALL BE INSTALLED AS NEEDED, THE ROOFING AROUND THE NEW CAPS SHALL BE REPAIRED AND MADE WATER TIGHT.
4. IF CEILINGS ARE TO BE REPLACED THE CONTRACTOR SHALL ENSURE ALL CEILING CASSETTES ARE MOUNTED IN THE CENTER OF TILES AND ADEQUATE ACCESS TO EQUIPMENT IS PROVIDED. FINAL FIELD LOCATIONS OF VISIBLE EQUIPMENT, PIPING, ETC. SHALL BE COORDINATED WITH ARCHITECTURAL, STRUCTURAL, AND LIGHTING BASED ON FINAL SELECTED BID ALTERNATES.

MECHANICAL SYMBOLS

- SHEET METAL DUCTWORK
- DUCTWORK TRANSITION
- DEMOLITION
- SUPPLY OR OA DUCT ELBOW DOWN
- RETURN OR EXHAUST DUCT ELBOW DOWN
- 45° BOOT BRANCH TAKEOFF
- DUCT CONTINUATION
- ELBOW WITH TURNING VANES
- SUPPLY OR OA DUCT UP
- RETURN AIR OR EXHAUST DUCT UP
- EXHAUST AIR DUCT UP
- SUPPLY AIR DIFFUSER
- RETURN AIR OR EXHAUST REGISTER
- VD — VOLUME DAMPER
- F — FIRE DAMPER OR CEILING RADIATION DAMPER
- F S — COMBINATION FIRE SMOKE DAMPER
- M — MOTORIZED DAMPER
- BDD — BACKDRAFT DAMPER
- T — THERMOSTAT MOUNTED AT MAX +48" A.F.F. TO THE TOP OF THE CONTROL DEVICE PLATE

- EQUIPMENT TAG
- CO2 — CO2 SENSOR MOUNTED IN DUCT
- SD — SMOKE DETECTOR MOUNTED IN DUCT
- # / M#.## — DETAIL DESIGNATION
- CEILING ACCESS PANEL
- PIPE RISER TO UPPER LEVEL
- CAPPED LINE
- PIPE ELBOW UP/DOWN
- PIPE BRANCH TOP CONNECTION
- RS/RL — REFRIGERANT PIPES (SUCTION AND LIQUID)
- PIPE BRANCH BOTTOM CONNECTION
- PIPE UNION
- POINT OF CONNECTION
- POINT OF DISCONNECTION

GENERAL MECHANICAL SPECIFICATIONS

1. PROVIDE COMPLETE AND OPERATING SYSTEMS AS SPECIFIED AND INDICATED ON DRAWINGS. "PROVIDE" SHALL MEAN "FURNISH AND INSTALL" WHEN USED HEREIN.
2. WORK SHALL COMPLY WITH ALL LOCAL CODES AND ORDINANCES INCLUDING: ANSI B9.1/ASHRAE 15 - SAFETY CODE FOR MECHANICAL REFRIGERATION; HAWAII DOH CHAPTER 39, TITLE 11 - AIR CONDITIONING AND VENTILATION; STATE AND HONOLULU CITY AND COUNTY BUILDING CODES; ASHRAE 62.1-2016 - VENTILATION STANDARD; SMACNA HVAC DUCT CONSTRUCTION STANDARDS; 2021 INTERNATIONAL ENERGY CONSERVATION CODE.
3. CONTRACTOR SHALL ARRANGE AND PAY FOR ALL PERMITS AND FEES.
4. MATERIALS AND EQUIPMENT SHALL BE NEW AND GUARANTEED FOR TWO YEAR FROM THE DATE OF ACCEPTANCE. MATERIALS AND EQUIPMENT SHALL BE AS SCHEDULED OR EQUAL, MEETING THE REQUIREMENTS OF THE SPECIFICATION. MATERIALS AND EQUIPMENT SHALL BE SUBMITTED TO THE CONTRACTING OFFICER FOR APPROVAL PRIOR TO ORDER RELEASE. WORK SHALL BE GUARANTEED AGAINST DEFECTIVE WORKMANSHIP OR MATERIALS FOR A PERIOD OF ONE YEAR AFTER FINAL ACCEPTANCE OF THE PROJECT. WARRANTY WORK SHALL BE COMPLETED AT NO EXTRA CHARGE TO THE STATE. FURNISH MANUFACTURER'S PRODUCT WARRANTY CERTIFICATES IN A BINDER.
5. PRIOR TO COMMENCEMENT OF WORK AND ORDERING OF EQUIPMENT, CONTRACTOR SHALL SUBMIT ELECTRONIC PDF DOCUMENTS OF PROPOSED MATERIALS AND EQUIPMENT. RECORD DRAWINGS, OPERATION MANUALS AND MAINTENANCE MANUALS SHALL BE SUBMITTED AS REQUIRED BY CONTRACTING OFFICER UPON COMPLETION.
6. PREPARE SUBMITTALS FOR ALL PRODUCTS TO BE FURNISHED BY THE CONTRACTOR, INCLUDING BUT NOT LIMITED TO EQUIPMENT, DUCT-WORK, PIPING, AIR TERMINALS, AND SIMILAR ITEMS. SHOULD CONTRACTOR PROCEED WITH ORDERING OR INSTALLING PRODUCTS PRIOR TO SUBMITTAL REVIEW, ALL COSTS REQUIRED TO MODIFY OR REPLACE SUCH PRODUCTS SHALL BE BORNE BY THE CONTRACTOR. THE PROPOSED USE OF ITEMS SPECIFIED ON THESE DRAWINGS DOES NOT ALLEVIATE THE CONTRACTOR FROM ITS RESPONSIBILITY TO PREPARE SUBMITTALS.
7. DRAWINGS SHALL NOT BE SCALED.
8. PENETRATIONS OF FIRE RATED WALLS OR FLOORS BY PIPE SHALL BE SEALED BY A FIRESTOPPING SYSTEM UL LISTED FOR THE APPLICATION. INSTALL PENETRATION SEAL MATERIALS IN ACCORDANCE WITH PRINTED INSTRUCTIONS OF THE UL FIRE RESISTANCE DIRECTORY AND MANUFACTURERS INSTRUCTIONS. FIRESTOPPING SYSTEM SHALL BE EQUAL TO 3M FIRE BARRIER. FIRESTOPPING MATERIAL SHALL BE CAULK OR PUTTY TYPE. PROVIDE FIRE DAMPERS ON ALL DUCT PENETRATIONS THROUGH FIRE RATED WALLS AS REQUIRED TO PRESERVE THE FIRE RATING OF THE STRUCTURE.
9. MECHANICAL EQUIPMENT SHALL BE SECURED AND INSTALLED PER MANUFACTURERS RECOMMENDATIONS AND APPLICABLE SECTIONS OF THE INTERNATIONAL BUILDING CODE AND INTERNATIONAL MECHANICAL CODE.
10. ELECTRICAL CHARACTERISTICS OF MECHANICAL EQUIPMENT SHALL BE VERIFIED WITH ELECTRICAL DRAWINGS PRIOR TO ORDER RELEASE. ADDITIONAL ELECTRICAL WORK RESULTING FROM EQUIPMENT SUBSTITUTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
11. DUCT-WORK, PIPING AND EQUIPMENT SHALL BE PROVIDED WITH SEISMIC RESTRAINTS IN ACCORDANCE WITH THE SMACNA SEISMIC RESTRAINT MANUAL - GUIDELINES FOR MECHANICAL SYSTEMS.
12. ELECTRICAL: CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE. CONTRACTOR SHALL REVIEW DRAWINGS AND SPECIFICATIONS BY ALL OTHER DIVISIONS. CONTRACTOR SHALL NOTIFY OTHER CONTRACTORS OF ANY ADDITIONAL WORK REQUIRED UNDER OTHER DIVISIONS TO COMPLETE OWN WORK. OBTAIN EQUIPMENT MANUFACTURER'S CONTROL WIRING DIAGRAMS FOR THE EQUIPMENT FURNISHED. ELECTRICAL EQUIPMENT SHALL BE FURNISHED WITH WEATHER PROOF (NEMA 4X) ENCLOSURES FOR OUTDOOR INSTALLATIONS AND OTHERWISE AS INDICATED ON PLANS.
13. FIELD INVESTIGATIONS: CONTRACTOR SHALL VISIT WORK-SITE TO VERIFY AND BECOME FULLY AWARE OF ALL EXISTING CONDITIONS. EXISTING CONDITIONS PRIOR TO BID. ALL COSTS REQUIRED TO ACCOMMODATE EXISTING CONDITIONS SHALL BE INCLUDED IN THE CONTRACTOR'S BID. NO ADDITIONAL ALLOWANCE AFTER BID WILL BE CONSIDERED DUE TO LACK OF SUCH DUE DILIGENCE OR FIELD EXAMINATION. INVESTIGATE THE CONTRACT DOCUMENTS AND MAKE PROPER PROVISIONS TO AVOID INTERFERENCES OR CONSTRUCTION DELAYS. DETERMINE THE EXACT ROUTE OF EACH DUCT AND PIPE. ANY DISCREPANCY SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE CONTRACTING OFFICER.
14. WORK CONDITIONS: FIELD VERIFY CONDITIONS AND DIMENSIONS FOR INTERFERENCES. INSTALLED WORK SHALL BE PROTECTED DURING CONSTRUCTION AND CLEANED FOR FINAL INSPECTION. TOUCH-UP PAINT ALL RAW EDGES OF METAL EXPOSED TO WEATHER. COORDINATE WITH OTHER TRADES FOR PIPE SLEEVES AND INSTALLATION OF EQUIPMENT SUPPORTS.
15. REQUIREMENTS: PERFORM WORK USING PERSONNEL SKILLED IN THE TRADE INVOLVED. PROVIDE COMPETENT SUPERVISION. FURNISH NEW EQUIPMENT, MATERIALS AND ACCESSORIES BEARING THE MANUFACTURER'S IDENTIFICATION AND CONFORMING TO THE RECOGNIZED COMMERCIAL STANDARDS.
16. EQUIPMENT INSTALLATION: INSTALL EQUIPMENT IN THE SPACE ALLOTTED WITH SUFFICIENT CLEARANCE FOR PROPER OPERATION AND MAINTENANCE AND WITH SUFFICIENT HEAD CLEARANCE ACCORDING TO THE BUILDING CODE. WHERE EQUIPMENT DIFFERS IN ARRANGEMENT OR CONNECTIONS FROM THOSE SHOWN, PROVIDE ALL REQUIRED CHANGES IN PIPING, SUPPORTS AND APPURTENANCES. PROVIDE ACCESS PANELS WHERE REQUIRED FOR MAINTENANCE ACCESS TO EQUIPMENT.

MECHANICAL ABBREVIATIONS

(E)	EXISTING	FPM	FEET PER MINUTE
(D)	DEMOLISH	FT	FEET
(N)	NEW	HTR	HEATER
(R)	RELOCATED	HZ	HERTZ
A	AMPERE	KW	KILOWATT
A/C	AIR CONDITIONING	LAT	LEAVING AIR TEMPERATURE
ABV	ABOVE	LBS	POUNDS
ADJ	ADJUSTABLE	MAN	MANUFACTURER
AFF	ABOVE FINISHED FLOOR	MAX	MAXIMUM
ACCU	AIR COOLED CONDENSING UNIT	MCA	MINIMUM CIRCUIT AMPS
AHU	AIR HANDLING UNIT	MECH	MECHANICAL
APPROX	APPROXIMATELY	MIN	MINIMUM
ARCH	ARCHITECT	MOCP	MAXIMUM OVERCURRENT PROTECTION
BLDG	BUILDING	MTD	MOUNTED
BHP	BRAKE HORSEPOWER	NOM	NOMINAL
BV	BALL VALVE	OA	OUTSIDE AIR
CAP	CAPACITY	PH	PHASE
CD	CEILING DIFFUSER	PLMB	PLUMBING
CLG	CEILING	QTY	QUANTITY
CFM	CUBIC FEET PER MINUTE	REQ'D	REQ'D
CONC	CONCRETE	RM	ROOM
CONN	CONNECT	RA	RETURN AIR
CONT	CONTINUATION	RAR	RETURN AIR REGISTER
DB	DRY BULB	RLA	RUNNING LOAD AMPS
DBA	DECIBELS (A-WEIGHTED)	SA	SUPPLY AIR
DN	DOWN	SQ	SQUARE
EA	EXHAUST AIR	SS	STAINLESS STEEL
EAT	ENTERING AIR TEMPERATURE	TDH	TOTAL DISCHARGE HEAD
EF	EXHAUST FAN	TEMP	TEMPERATURE
ELEC	ELECTRICAL	TYP	TYPICAL
ER	EXHAUST REGISTER	V	VOLT
ESP	EXTERNAL STATIC PRESSURE	VAV	VARIABLE AIR VOLUME
EXH	EXHAUST	VD	MANUAL VOLUME DAMPER
EXIST	EXISTING	VTR	VENT TO ROOF
FC	FAN COIL	W	WATT
FD	FIRE DAMPER	W/	WITH
FLA	FULL LOAD AMPS	WB	WET BULB
FLEX	FLEXIBLE	ZD	ZONE DAMPER
FLR	FLOOR		

CITY AND COUNTY OF HONOLULU
REVISED ORDINANCES OF HONOLULU 2021,
CHAPTER 16B

TO THE BEST OF KNOWLEDGE, THIS PROJECT'S DESIGN SUBSTANTIALLY CONFORMS TO THE BUILDING ENERGY CONSERVATION CODE FOR:

_____ BUILDING COMPONENT SYSTEMS
_____ ELECTRICAL COMPONENT SYSTEMS
_X_ MECHANICAL COMPONENT SYSTEMS

SIGNATURE: _____ DATE: 06/03/26
NAME: ELI B. WALTZ
TITLE: MECHANICAL ENGINEER
LICENSE NO.: 18572-M

REV. NO	DESCRIPTION	DATE

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

MECHANICAL SPECIFICATIONS, SYMBOLS & ABBREVIATIONS

ENGINEERING PARTNERS		HNARNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. M-001
DESIGNED BY: DH/MC	CHECKED BY: DH/MC		
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 187 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/03/2026 5:38 pm
M:\EO PROJECTS\2025 PROJECTS\12018--25--01 DOD BLDG 46 MEDCOM RENOVATIONS\4--DWG\MECHANICAL\1M--X -- NOTES\S1.DWG

GENERAL NOTES

1. PROVIDE PSX 700 OR APPROVED EQUAL FOR ALL OUTDOOR EQUIPMENT HOUSINGS (INTERNAL & EXTERNAL). MINIMUM 5,500 SALT SPRAY HOURS PER ASTM B117.
2. PROVIDE BLYGOLD POLUAL XT OR APPROVED EQUAL FOR ALL OUTDOOR EQUIPMENT COILS. MINIMUM 10,000 SALT SPRAY HOURS PER ASTM B117 .
3. PROVIDE PROTECTIVE COATING FOR ALL OUTDOOR UNIT CIRCUIT BOARDS, USE CIRCUIT SHIELD OR APPROVED EQUAL INTENDED TO PREVENT SHORT CIRCUITING FROM GECKOS, RODENTS, ETC. CIRCUIT BOARD COATING SHALL ENSURE A UNIFORM DRY FILM THICKNESS OF 10-36 MICRONS (0.4-1.4 MILS) AND MEETS 5B RATING FOR CROSSHATCH ADHESION PER ASTM D3359. CORROSION DURABILITY SHALL BE CONFIRMED THROUGH TESTING TO NO LESS THAN 2,500 HOURS SALT SPRAY RESISTANCE PER DIN 53167 (ASTM B117) USING ALUMINUM TEST COUPONS. DIELECTRIC WITHSTANDING VOLTAGE TEST SHALL PASS AT 1500 VOLTS/MIL THICKNESS.

PIPING INSULATION NOTES

1. PROVIDE PIPE INSULATION THICKNESSES PER IECC 2021 TABLE C403.12.3
2. PIPING REQUIRING INSULATION SHALL BE INSULATED CONTINUOUSLY THROUGH CLAMPING, SUPPORTS, AND SLEEVING WITH THE INSULATION THICKNESS AND SPECIFICATIONS PER IECC (CURRENT EDITION).

DUCT AND PLENUM INSULATION NOTES

1. DUCT INSULATION THICKNESS SHALL BE GREATER THAN OR EQUAL TO R-6 FOR SUPPLY AND RETURN DUCTS AND PLENUMS LOCATED IN UNCONDITIONED SPACES.
2. DUCT INSULATION THICKNESS SHALL BE GREATER THAN OR EQUAL TO R-8 FOR SUPPLY AND RETURN DUCTS AND PLENUMS LOCATED OUTDOORS.
3. DUCTS AND PLENUMS TO BE SEALED PER IMC 2021.

MINIMUM PIPE INSULATION THICKNESS

FROM IECC 2021 TABLE C403.12.3

FLUID OPERATING TEMPERATURE RANGE AND USAGE (°F)	INSULATION CONDUCTIVITY		NOMINAL PIPE OR TUBE SIZE (INCHES)				
	CONDUCTIVITY BTU*IN./(H*FT^2*°F)	MEAN RATING TEMPERATURE, °F	< 1	1 TO < 1-1/2	1-1/2 TO < 4	4 TO < 8	>=8
> 350	0.32 - 0.34	250	4.5	5.0	5.0	5.0	5.0
251 - 350	0.29 - 0.32	200	3.0	4.0	4.5	4.5	4.5
201 - 250	0.27 - 0.30	150	2.5	2.5	2.5	3.0	3.0
141 - 200	0.25 - 0.29	125	1.5	1.5	2.0	2.0	2.0
105 - 140	0.21 - 0.28	100	1.0	1.0	1.5	1.5	1.5
40 - 80	0.21 - 0.27	75	1.0	1.0	1.0	1.0	1.0
< 40	0.20 - 0.26	50	1.0	1.0	1.0	1.0	1.5

NOTES

1. PROVIDE PIPE INSULATION THICKNESSES PER IECC 2021 TABLE C403.12.3
2. FOR PIPING SMALLER THAN 1-1/2 INCHES AND LOCATED IN PARTITIONS WITHIN CONDITIONED SPACES, REDUCTION OF THESE THICKNESSES BY 1 INCH SHALL BE PERMITTED (BEFORE THICKNESS ADJUSTMENT REQUIRED IN NOTE 3 BUT NOT TO A THICKNESS LESS THAN 1 INCH.
3. FOR INSULATION OUTSIDE THE STATED CONDUCTIVITY RANGE, THE MINIMUM THICKNESS (T) SHALL BE DETERMINED AS FOLLOWS:
   - 3.1. $T = r\{(1 + t/r)K/k - 1\}$
   - 3.2. where:
     - 3.2.1. T = MINIMUM INSULATION THICKNESS,
     - 3.2.2. r = ACTUAL OUTSIDE RADIUS OF PIPE,
     - 3.2.3. t = INSULATION THICKNESS LISTED IN THE TABLE FOR APPLICABLE FLUID TEMPERATURE AND PIPE SIZE,
     - 3.2.4. K = CONDUCTIVITY OF ALTERNATE MATERIAL AT MEAN RATING TEMPERATURE INDICATED FOR THE APPLICABLE FLUID TEMPERATURE (BTU · IN/H · FT^2 · °F) AND
     - 3.2.5. k = THE UPPER VALUE OF THE CONDUCTIVITY RANGE LISTED IN THE TABLE FOR THE APPLICABLE FLUID TEMPERATURE.
   - 3.3. FOR DIRECT-BURIED HEATING AND HOT WATER SYSTEM PIPING, REDUCTION OF THESE THICKNESSES BY 1-1/2 INCHES (38 MM) SHALL BE PERMITTED (BEFORE THICKNESS ADJUSTMENT REQUIRED IN NOTE 3 BUT NOT TO THICKNESSES LESS THAN 1 INCH (25 MM).

ELI B. WALTZ
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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
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MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

MECHANICAL NOTES

ENGINEERING PARTNERS

DESIGNED BY: DH/MC	CHECKED BY: DH/MC	HAWAII JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-002
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 188 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

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M:\JOB PROJECTS\2025 PROJECTS\12018-25--01 DOD BLDG 46 MEDCOM RENOVATIONS\4--DWG\MECHANICAL\1M--X -- NOTES\13.DWG

AIR COOLED CONDENSING UNIT SCHEDULE

UNIT NO.	AREA SERVED	NOMINAL CAPACITY (TONS)	COMPRESSOR QTY/TYPE	CONDENSER EAT (°F)	ELECTRICAL			WEIGHT (LBS)	SYSTEM EFFICIENCY	REMARKS
					V/HZ/PH	MCA	MOP			
ACCU 1-1	1ST FLOOR WEST	12	2/INVERTER TWIN ROTARY	95	208/60/3	51.5	60	758	22.2/11.3 IEER/EER	TOSHIBA CARRIER MODEL MMY-MUB HEAT PUMP OR APPROVED EQUAL
ACCU 1-2	1ST FLOOR MID	10	2/INVERTER TWIN ROTARY	95	208/60/3	50.5	60	708	21.8/11.5 IEER/EER	TOSHIBA CARRIER MODEL MMY-MUB HEAT PUMP OR APPROVED EQUAL
ACCU 1-3	1ST FLOOR EAST	16	2/INVERTER TWIN ROTARY	95	208/60/3	36.6 + 36.6	45 + 45	1226	22.15/10.1 IEER/EER	TOSHIBA CARRIER MODEL MMY-MUB HEAT PUMP OR APPROVED EQUAL
ACCU 1-4	1ST FLOOR TELECOM	1.5	1/INVERTER	95	208/60/1	14	15	81.6	23.8 SEER2	TOSHIBA CARRIER MODEL RAV-BP OR APPROVED EQUAL
ACCU 2-1	2ND FLOOR WEST	14	2/INVERTER TWIN ROTARY	95	208/60/3	57.4	70	758	21.85/10.6 IEER/EER	TOSHIBA CARRIER MODEL MMY-MUB HEAT PUMP OR APPROVED EQUAL
ACCU 2-2	2ND FLOOR MID	12	2/INVERTER TWIN ROTARY	95	208/60/3	51.5	60	758	22.2/11.3 IEER/EER	TOSHIBA CARRIER MODEL MMY-MUB HEAT PUMP OR APPROVED EQUAL
ACCU 2-3	2ND FLOOR EAST	14	2/INVERTER TWIN ROTARY	95	208/60/3	57.4	70	758	21.85/10.6 IEER/EER	TOSHIBA CARRIER MODEL MMY-MUB HEAT PUMP OR APPROVED EQUAL
ACCU 2-4	2ND FLOOR TELECOM	1	1/INVERTER	95	208/60/1	14	15	81.6	23.8 SEER2	TOSHIBA CARRIER MODEL RAV-BP OR APPROVED EQUAL
ACCU 3-1	3RD FLOOR WEST	20	2/INVERTER TWIN ROTARY	95	208/60/3	51.5 + 36.6	60 + 45	1276	21.85/10.1 IEER/EER	TOSHIBA CARRIER MODEL MMY-MUB HEAT PUMP OR APPROVED EQUAL
ACCU 3-2	3RD FLOOR MID	16	2/INVERTER TWIN ROTARY	95	208/60/3	36.6 + 36.6	45 + 45	1226	22.15/10.1 IEER/EER	TOSHIBA CARRIER MODEL MMY-MUB HEAT PUMP OR APPROVED EQUAL
ACCU 3-3	3RD FLOOR EAST	22	2/INVERTER TWIN ROTARY	95	208/60/3	57.4 + 36.6	70 + 45	1276	20.7/9.7 IEER/EER	TOSHIBA CARRIER MODEL MMY-MUB HEAT PUMP OR APPROVED EQUAL
ACCU 3-4	3RD FLOOR TELECOM	1	1/INVERTER	95	208/60/1	14	15	81.6	23.8 SEER2	TOSHIBA CARRIER MODEL RAV-BP OR APPROVED EQUAL

FAN COIL UNIT SCHEDULE

UNIT NO.	AREA SERVED	CFM	OA CFM	NOM. CAPACITY (BTUH)	TOTAL CAPACITY (BTUH)	SENS. CAPACITY (BTUH)	EXT. STATIC PRESSURE	AIR TEMPERATURE				ELECTRICAL DATA			UNIT WEIGHT (LB)	REMARKS
								ENT. °F		LVG. °F		POWER INPUT (W)	MOP	V/HZ/PH		
								DB	WB	DB	WB					
FC 1-1-1	RM 100	450	65*	18,000	14,100	12,600	-	77.2	65.5	59.7	58.6	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-1-2	RM 102	350	35*	12,000	10,800	10,000	-	76.4	65	59.8	58.7	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-1-3	RM 102	390	35*	15,000	12,700	11,900	-	76.8	65.5	60.5	59.4	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-1-4	RM 104	340	40*	9,000	6,500	5,700	-	77.3	65.8	59.8	58.7	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-1-5	CORRIDOR A	320	35*	7,500	3,300	2,500	-	76.2	66.6	60.1	59.2	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-1-6	RM 101	390	40*	15,000	11,600	10,800	-	76.4	65.1	59.9	58.9	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION. PROVIDE WITH BLANK OFF ACCESSORY.
FC 1-1-7	RM 103	350	35*	12,000	10,000	7,200	-	76.5	65.3	60.3	59.3	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-1-8	RM 103	390	35*	15,000	13,000	12,000	-	76.1	64.8	59.6	58.5	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-1-9	RM 103	350	35*	12,000	10,000	7,200	-	76.5	65.3	60.3	59.3	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC O-1-1	FC 1-1- (1 TO 5)	265 (CONSTANT)	265	7,500	2,600	2,600	0.5	89.0	73.0	75.0	68.9	150	15	208/60/1	56	TOSHIBA CARRIER MMD DUCTED OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION. PROVIDE WITH PRE-MANUFACTURED LOW STATIC DROP MERV 13 FILTER BOX.
FC O-1-2	FC 1-1- (6 TO 8)	265 (CONSTANT)	265	7,500	2,300	2,300	0.5	89.0	73.0	75.0	68.9	150	15	208/60/1	56	TOSHIBA CARRIER MMD DUCTED OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION. PROVIDE WITH PRE-MANUFACTURED LOW STATIC DROP MERV 13 FILTER BOX.
FC 1-2-1	LOBBY	350	50*	12,000	7,000	6,000	-	79.1	66.9	59.4	58.3	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-2-2	PAD CHECK-OUT	350	50*	12,000	7,000	6,000	-	79.1	66.9	59.4	58.3	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-2-3	RM 106	350	40*	12,000	8,100	7,400	-	77.4	65.8	60.5	59.4	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-2-4	RM 109	340	35*	9,000	7,600	7,000	-	76.5	65.4	59.9	58.9	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-2-5	RM 111	320	35*	7,500	2,500	1,900	-	78.4	66.7	59.0	57.9	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-2-6	CORRIDOR 1B/1C	320	35*	7,500	5,600	4,200	-	76.2	66.4	59.7	58.8	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-2-7	RM 118	320	40*	7,500	6,400	5,400	-	77.2	65.7	59.5	58.4	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-2-8	RM 119	350	40*	12,000	8,700	8,000	-	76.7	65.5	60.4	59.3	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.

GENERAL NOTES

1. PROVIDE PSX 700 OR APPROVED EQUAL FOR ALL OUTDOOR EQUIPMENT HOUSINGS (INTERNAL & EXTERNAL). MINIMUM 5,500 SALT SPRAY HOURS PER ASTM B117.
2. PROVIDE BLYGOLD POLUAL XT OR APPROVED EQUAL FOR ALL OUTDOOR EQUIPMENT COILS. MINIMUM 10,000 SALT SPRAY HOURS PER ASTM B117 .
3. PROVIDE PROTECTIVE COATING FOR ALL OUTDOOR UNIT CIRCUIT BOARDS, USE CIRCUIT SHIELD OR APPROVED EQUAL INTENDED TO PREVENT SHORT CIRCUITING FROM GECKOS, RODENTS, ETC. CIRCUIT BOARD COATING SHALL ENSURE A UNIFORM DRY FILM THICKNESS OF 10-36 MICRONS (0.4-1.4 MILS) AND MEETS 5B RATING FOR CROSSHATCH ADHESION PER ASTM D3359. CORROSION DURABILITY SHALL BE CONFIRMED THROUGH TESTING TO NO LESS THAN 2,500 HOURS SALT SPRAY RESISTANCE PER DIN 53167 (ASTM B117) USING ALUMINUM TEST COUPONS. DIELECTRIC WITHSTANDING VOLTAGE TEST SHALL PASS AT 1500 VOLTS/MIL THICKNESS.

FAN COIL NOTES

1. * INDICATES OA IS PROVIDE BY A DEDICATED FAN COIL UNIT.

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

MECHANICAL SCHEDULES

ENGINEERING PARTNERS

HAWNG JOB NO.
FEDERAL: PN15H00033
STATE: CA-202505-D

DRAWING NO. M-003

DESIGNED BY: DH/MC
CHECKED BY: DH/MC
DRAWN BY: MC
APPROVED BY: EW
DATE: JUNE 2026
SCALE: AS NOTED
SHEET 189 OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/03/2026 5:38 pm
M:\EO PROJECTS\2025 PROJECTS\2018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\MECHANICAL\2M-X SCHEDULESV3.DWG

FAN COIL UNIT SCHEDULE

UNIT NO.	AREA SERVED	CFM	OA CFM	NOM. CAPACITY (BTUH)	TOTAL CAPACITY (BTUH)	SENS. CAPACITY (BTUH)	EXT. STATIC PRESSURE	AIR TEMPERATURE ENT. °F DB	AIR TEMPERATURE ENT. °F WB	AIR TEMPERATURE LVG. °F DB	AIR TEMPERATURE LVG. °F WB	ELECTRICAL DATA POWER INPUT (W)	ELECTRICAL DATA MOP	ELECTRICAL DATA V/HZ/PH	UNIT WEIGHT (LB)	REMARKS
FC 1-2-17	RM 113	320	35*	7,500	800	600	-	76.3	66.7	58.9	58.1	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-2-12	RM 108	320	35*	7,500	2,500	2,300	-	76.3	65.7	60.8	59.8	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 0-1-3	FC 1-2- (1 TO 12)	490 (CONSTANT)	490	12,000	6,000	6,000	0.5	89.0	73.0	75.0	68.9	150	15	208/60/1	73	TOSHIBA CARRIER MMD DUCTED OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION. PROVIDE WITH PRE-MANUFACTURED LOW STATIC DROP MERV 13 FILTER BOX.
FC 1-3-1	RM 120	350	40*	12,000	9,000	8,100	-	77.1	65.5	59.8	58.7	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-3-2	RM 122	450	70*	18,000	14,100	12,600	-	77.3	65.5	59.8	58.7	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-3-3	RM 124	450	40*	18,000	14,300	13,300	-	76.8	65	59.6	58.4	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-3-4	RM 126	390	40*	15,000	11,000	10,100	-	77.3	65.7	60.4	59.3	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-3-5	RM 128	450	50*	18,000	16,900	15,900	-	76.9	64.9	59.6	58.5	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION. PROVIDE WITH BLANK OFF ACCESSORY.
FC 1-3-6	RM 121	350	40*	12,000	8,100	7,500	-	77.0	65.7	60.7	59.6	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-3-7	RM 123	390	60*	15,000	10,900	9,900	-	76.8	65.5	60.2	59.1	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-3-8	RM 125	390	40*	15,000	13,600	12,900	-	76.2	64.6	59.4	58.3	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-3-9	RM 127	340	35*	9,000	8,000	7,500	-	76.9	65.6	60.7	59.6	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-3-10	RM 127	340	35*	9,000	8,000	7,500	-	76.9	65.6	60.7	59.6	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 1-3-11	CORRIDOR C	340	35*	9,000	5,600	4,200	-	76.5	65.4	59.9	57.9	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 0-1-4	FC 1-3- (1 TO 5)	320 (CONSTANT)	320	7,500	3,600	3,600	0.5	89.0	73.0	75.0	68.9	150	15	208/60/1	56	TOSHIBA CARRIER MMD DUCTED OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION. PROVIDE WITH PRE-MANUFACTURED LOW STATIC DROP MERV 13 FILTER BOX.
FC 0-1-5	FC 1-3- (6 TO 11)	320 (CONSTANT)	320	7,500	3,700	3,700	0.5	89.0	73.0	75.0	68.9	150	15	208/60/1	56	TOSHIBA CARRIER MMD DUCTED OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION. PROVIDE WITH PRE-MANUFACTURED LOW STATIC DROP MERV 13 FILTER BOX.
FC 1-4-1	RM 112 TELECOM	530	-	18,000	16,700	16,700	-	76.1	46.4	59.3	37.9	POWER FROM OUTDOOR UNIT			34	TOSHIBA CARRIER RAV-HB WALL MOUNTED CASSETTE OR APPROVED EQUAL. PROVIDE EMERGENCY SAFETYSHUT OFF VALVE, ISOLATION VALVE, AND LEAK DETECTION.
FC 2-1-1	RM 200	390	35*	15,000	11,000	10,100	-	77.0	65.6	60.4	59.3	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-1-2	RM 202	350	35*	12,000	9,600	8,700	-	76.6	65.2	59.7	58.6	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-1-3	RM 204	350	35*	12,000	9,600	8,700	-	76.6	65.2	59.7	58.6	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-1-4	RM 206	350	35*	12,000	9,500	8,600	-	76.9	65.5	60.1	59.0	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-1-5	RM 208	450	75*	18,000	14,200	12,600	-	77.6	65.8	60.1	59.0	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-1-6	CORRIDOR 2A	320	35*	7,500	3,400	2,200	-	76.2	67.7	60.2	59.4	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-1-7	RM 201	390	35*	15,000	11,800	10,900	-	76.3	64.9	59.7	58.6	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION. PROVIDE WITH BLANK OFF ACCESSORY.
FC 2-1-8	RM 203	350	35*	12,000	9,500	8,700	-	76.3	64.9	59.6	58.5	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-1-9	RM 205	350	35*	12,000	9,500	8,700	-	76.3	64.9	59.6	58.5	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-1-10	RM 207	350	35*	12,000	9,500	8,700	-	76.3	64.9	59.6	58.5	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-1-11	RM 209	350	35*	12,000	9,200	8,400	-	76.7	65.6	60.5	59.4	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 0-2-1	FC 2-1- (1 TO 5)	265 (CONSTANT)	265	7,500	3,200	3,200	0.5	89.0	73.0	75.0	68.9	150	15	208/60/1	56	TOSHIBA CARRIER MMD DUCTED OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION. PROVIDE WITH PRE-MANUFACTURED LOW STATIC DROP MERV 13 FILTER BOX.
FC 0-2-2	FC 2-1- (6 TO 11)	265 (CONSTANT)	265	7,500	3,200	3,200	0.5	89.0	73.0	75.0	68.9	150	15	208/60/1	56	TOSHIBA CARRIER MMD DUCTED OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION. PROVIDE WITH PRE-MANUFACTURED LOW STATIC DROP MERV 13 FILTER BOX.

FAN COIL NOTES

1. * INDICATES OA IS PROVIDE BY A DEDICATED FAN COIL UNIT.

REV NO	DESCRIPTION	DATE

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

MECHANICAL SCHEDULES

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HARNG JOB NO. FEDERAL:	DRAWING NO.
DH/MC	DH/MC	PN15H00033 STATE: CA-202505-D	M-004
DRAWN BY: MC	APPROVED BY: EW	DATE	SHEET 190
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

06/03/2026 5:39 pm
M:\EO PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\MECHANICAL\2M-X SCHEDULES\VA.DWG

FAN COIL UNIT SCHEDULE

UNIT NO.	AREA SERVED	CFM	OA CFM	NOM. CAPACITY (BTUH)	TOTAL CAPACITY (BTUH)	SENS. CAPACITY (BTUH)	EXT. STATIC PRESSURE	AIR TEMPERATURE				ELECTRICAL DATA			UNIT WEIGHT (LB)	REMARKS
								ENT. °F		LVG. °F		POWER INPUT (W)	MOP	V/HZ/PH		
								DB	WB	DB	WB					
FC 2-2-1	RM 210	350	55*	12,000	9,000	7,500	-	77.8	65.8	59.8	58.7	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-2-2	RM 210	350	55*	12,000	9,000	7,500	-	77.8	65.8	59.8	58.7	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-2-3	RM 213	350	55*	12,000	8,000	7,000	-	78.5	66.6	60.1	59.0	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-2-4	RM 213	350	55*	12,000	8,000	7,000	-	78.5	66.6	60.1	59.0	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-2-7	RM 217	350	90*	12,000	9,700	7,800	-	78.38	66.7	59.7	58.6	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-2-8	RM 216	450	35*	18,000	16,400	15,500	-	76.5	65.1	60.2	59.1	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-2-9	RM 220	350	40*	12,000	9,000	7,600	-	77.1	65.9	59.9	58.9	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-2-10	RM 219	350	35*	12,000	8,500	7,700	-	76.7	65.6	60.3	59.3	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-2-11	CORRIDOR 2B	320	35*	7,500	5,100	3,400	-	76.2	67.4	59.9	59.1	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC O-2-3	FC 2-2- (1 TO 11)	590 (CONSTANT)	590	12,000	6,000	6,000	0.5	89.0	73.0	75.0	68.9	150	15	208/60/1	73	TOSHIBA CARRIER MMD DUCTED OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION. PROVIDE WITH PRE-MANUFACTURED LOW STATIC DROP MERV 13 FILTER BOX.
FC 2-3-1	RM 221	350	35*	12,000	9,600	8,700	-	76.8	65.3	59.8	58.7	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-3-2	RM 223	350	35*	12,000	9,600	8,700	-	76.6	65.2	59.7	58.6	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-3-3	RM 225	350	35*	12,000	9,500	8,600	-	76.6	65.2	59.8	58.7	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-3-4	RM 227	350	35*	12,000	9,500	8,600	-	76.6	65.2	59.8	58.7	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-3-5	RM 229	390	35*	15,000	11,100	10,100	-	76.8	65.3	59.9	58.8	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION. PROVIDE WITH BLANK OFF ACCESSORY.
FC 2-3-6	CORRIDOR 2C	320	35*	7,500	3,300	2,100	-	76.2	67.6	59.7	58.9	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-3-7	RM 222	350	35*	12,000	9,300	8,500	-	76.5	65.3	60.2	59.1	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-3-8	RM 224	350	35*	12,000	9,500	8,700	-	76.3	64.9	59.6	58.5	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-3-9	RM 226	350	35*	12,000	9,500	8,700	-	76.3	64.9	59.6	58.5	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-3-10	RM 228	350	35*	12,000	9,500	8,700	-	76.3	64.9	59.6	58.5	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 2-3-11	RM 230	350	35*	12,000	10,100	9,200	-	76.4	65	59.7	58.6	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC O-2-4	FC 2-3- (1 TO 6)	265 (CONSTANT)	265	7,500	3,200	3,200	0.5	89.0	73.0	75.0	68.9	150	15	208/60/1	56	TOSHIBA CARRIER MMD DUCTED OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION. PROVIDE WITH PRE-MANUFACTURED LOW STATIC DROP MERV 13 FILTER BOX.
FC O-2-5	FC 2-3- (7 TO 11)	265 (CONSTANT)	265	7,500	2,600	2,600	0.5	89.0	73.0	75.0	68.9	150	15	208/60/1	56	TOSHIBA CARRIER MMD DUCTED OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION. PROVIDE WITH PRE-MANUFACTURED LOW STATIC DROP MERV 13 FILTER BOX.
FC 2-4-1	RM 212 TELECOM 2	530	-	12,000	-	-	-	76.1	46.4	59.3	37.9	POWER FROM OUTDOOR UNIT			34	TOSHIBA CARRIER RAV-HB WALL MOUNTED CASSETTE OR APPROVED EQUAL. PROVIDE EMERGENCY SAFETYSHUT OFF VALVE, ISOLATION VALVE, AND LEAK DETECTION.

FAN COIL NOTES

1. * INDICATES OA IS PROVIDE BY A DEDICATED FAN COIL UNIT.

REV NO	DESCRIPTION	DATE

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAI'I

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

MECHANICAL SCHEDULES

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HARNG JOB NO. FEDERAL:	DRAWING NO.
DH/MC	DH/MC	PN15H00033 STATE: CA-202505-D	M-005
DRAWN BY: MC	APPROVED BY: EW	DATE	SHEET 191
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/03/2026 5:39 pm
M:\JOB PROJECTS\2025 PROJECTS\12018-25--01 DOD BLDG 46 MEDCOM RENOVATIONS\4--DWG\MECHANICAL\2M--X SCHEDULES\V3.DWG

FAN COIL UNIT SCHEDULE

UNIT NO.	AREA SERVED	CFM	OA CFM	NOM. CAPACITY (BTUH)	TOTAL CAPACITY (BTUH)	SENS. CAPACITY (BTUH)	EXT. STATIC PRESSURE	AIR TEMPERATURE				ELECTRICAL DATA			UNIT WEIGHT (LB)	REMARKS
								ENT. °F		LVG. °F		POWER INPUT (W)	MOP	V/HZ/PH		
								DB	WB	DB	WB					
FC 3-1-1	RM 300	450	35*	18,000	17,600	16,600	-	76.8	65.3	60.3	59.1	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-1-2	RM 302	450	35*	18,000	16,000	15,000	-	76.6	65.0	59.8	58.7	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-1-3	RM 304	450	35*	18,000	16,000	15,000	-	76.6	65.0	59.8	58.7	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-1-4	RM 306	450	35*	18,000	16,000	15,000	-	76.6	65.0	59.8	58.7	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-1-5	RM 308	450	35*	18,000	16,000	15,000	-	76.6	65.0	59.8	58.7	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-1-6	CORRIDOR 3A	450	35*	18,000	17,000	15,700	-	76.0	64.9	59.7	58.6	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-1-7	RM 301	450	35*	18,000	15,700	14,700	-	76.5	65.1	60.1	59.0	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION. PROVIDE WITH BLANK OFF ACCESSORY.
FC 3-1-8	RM 303	450	35*	18,000	13,900	12,800	-	76.3	64.7	59.3	58.2	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-1-9	RM 305	450	35*	18,000	13,900	12,800	-	76.3	64.7	59.3	58.2	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-1-10	RM 307	450	35*	18,000	13,900	12,800	-	76.3	64.7	59.3	58.2	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-1-11	RM 309	450	35*	18,000	13,700	12,700	-	76.6	65.0	59.7	58.6	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC O-3-1	FC 3-2- (1 TO 6)	265 (CONSTANT)	265	7,500	3,200	3,200	0.5	89.0	73.0	75.0	68.9	150	15	208/60/1	56	TOSHIBA CARRIER MMD DUCTED OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION. PROVIDE WITH PRE-MANUFACTURED LOW STATIC DROP MERV 13 FILTER BOX.
FC O-3-2	FC 3-2- (7 TO 11)	265 (CONSTANT)	265	7,500	2,600	2,600	0.5	89.0	73.0	75.0	68.9	150	15	208/60/1	56	TOSHIBA CARRIER MMD DUCTED OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION. PROVIDE WITH PRE-MANUFACTURED LOW STATIC DROP MERV 13 FILTER BOX.
FC 3-2-1	RM 310	450	50*	18,000	13,400	12.2	-	77.2	65.3	59.7	58.6	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-2-2	RM 310	450	50*	18,000	13,400	12.2	-	77.2	65.3	59.7	58.6	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-2-3	RM 313	450	50*	18,000	13,000	11,800	-	77.2	65.4	59.8	58.7	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-2-4	RM 313	450	50*	18,000	13,000	11,800	-	77.2	65.4	59.8	58.7	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-2-7	RM 317	350	35*	12,000	8,200	7,800	-	76.3	65.0	60.0	58.9	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-2-8	RM 316	340	35*	9,000	6,500	6,000	-	76.2	65.0	59.8	58.7	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-2-9	RM 318	350	35*	12,000	10,200	9,500	-	77.1	65.7	60.6	59.5	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-2-10	RM 318	350	35*	12,000	10,200	9,500	-	77.1	65.7	60.6	59.5	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-2-12	CORRIDOR 3B	450	35*	18,000	15,000	14,000	-	76.2	65.0	59.9	58.9	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-2-13	CORRIDOR 3B	450	35*	18,000	15,000	14,000	-	76.2	65.0	59.9	58.9	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC O-3-3	FC 3-2- (1 TO 12)	490 (CONSTANT)	490	7,500	4,600	4,600	0.5	89.0	73.0	75.0	68.9	150	15	208/60/1	73	TOSHIBA CARRIER MMD DUCTED OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION. PROVIDE WITH PRE-MANUFACTURED LOW STATIC DROP MERV 13 FILTER BOX.

FAN COIL NOTES

1. * INDICATES OA IS PROVIDE BY A DEDICATED FAN COIL UNIT.

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

MECHANICAL SCHEDULES

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-006
DH/MC	DH/MC		
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 192 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

06/03/2026 5:38 pm
M:\ED PROJECTS\2025 PROJECTS\12018-25-01 OOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\MECHANICAL\2M-X SCHEDULES\X3.DWG

FAN COIL UNIT SCHEDULE

UNIT NO.	AREA SERVED	CFM	OA CFM	NOM. CAPACITY (BTUH)	TOTAL CAPACITY (BTUH)	SENS. CAPACITY (BTUH)	EXT. STATIC PRESSURE	AIR TEMPERATURE				ELECTRICAL DATA			UNIT WEIGHT (LB)	REMARKS
								ENT. °F		LVG. °F		POWER INPUT (W)	MOP	V/HZ/PH		
								DB	WB	DB	WB					
FC 3-3-1	RM 322	450	35*	18,000	15,600	14,600	-	76.9	65.4	60.3	59.2	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-3-2	RM 324	450	35*	18,000	15,600	14,600	-	76.9	65.4	60.3	59.2	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-3-3	RM 326	450	35*	18,000	15,700	14,700	-	76.8	65.3	60.2	59.2	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-3-4	RM 328	450	50*	18,000	14,900	13,600	-	76.6	64.8	59.2	58.0	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-3-5	RM 328	450	50*	18,000	14,900	13,600	-	76.6	64.8	59.2	58.0	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-3-6	RM 328	450	50*	18,000	14,900	13,600	-	76.6	64.8	59.2	58.0	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-3-7	CORRIDOR 3C	350	35*	12,000	10,100	9,400	-	76.6	65.4	60.5	59.4	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-3-9	RM 323	390	35*	15,000	13,400	12,400	-	76.9	65.5	60.3	59.2	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-3-10	RM 325	390	35*	15,000	13,500	12,500	-	77.0	65.5	60.3	59.2	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-3-11	RM 327	450	50*	18,000	13,400	12,200	-	76.9	65	59.3	58.2	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-3-12	RM 327	450	50*	18,000	13,400	12,200	-	76.9	65	59.3	58.2	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-3-13	RM 327	450	50*	18,000	13,400	12,200	-	76.9	65	59.3	58.2	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC 3-3-14	CORRIDOR 3C	350	35*	12,000	10,100	9,400	-	76.6	65.4	60.5	59.4	60	15	208/60/1	36	TOSHIBA CARRIER MMU CEILING CASSETTE OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION.
FC O-3-4	FC 3-3- (1 TO 7)	320 (CONSTANT)	320	7,500	4,400	4,400	0.5	89.0	73.0	75.0	68.9	150	15	208/60/1	56	TOSHIBA CARRIER MMD DUCTED OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION. PROVIDE WITH PRE-MANUFACTURED LOW STATIC DROP MERV 13 FILTER BOX.
FC O-3-5	FC 3-3- (8 TO 14)	320 (CONSTANT)	320	7,500	3,900	3,900	0.5	89.0	73.0	75.0	68.9	150	15	208/60/1	56	TOSHIBA CARRIER MMD DUCTED OR APPROVED EQUAL. PROVIDE ISOLATION VALVE AND LEAK DETECTION. PROVIDE WITH PRE-MANUFACTURED LOW STATIC DROP MERV 13 FILTER BOX.
FC 3-4-1	RM 312 TELECOM 3	530	-	12,000	-	-	-	76.1	46.4	59.3	37.9	POWER FROM OUTDOOR UNIT			34	TOSHIBA CARRIER RAV-HB WALL MOUNTED CASSETTE OR APPROVED EQUAL. PROVIDE EMERGENCY SAFETYSHUT OFF VALVE, ISOLATION VALVE, AND LEAK DETECTION.

EMERGENCY SHUTOFF VALVE SCHEDULE

UNIT NO.	AREA SERVED	NUMBER OF PORTS	ELECTRICAL DATA			UNIT WEIGHT (LB)	REMARKS
			MCA	MOCP	V/HZ/PH		
ESV 102A	ACCU 1-1	1	0.3	15	208/60/3	62	TOSHIBA CARRIER EMERGENCY SHUT OFF VALVE MODEL NUMBER RBM-SVB0611HUPUL OR APPROVED EQUAL. PROVIDE CONTAINMENT HOUSING WITH EXHAUST DUCT PORT.
ESV 102B	ACCU 1-1	4	0.5	15	208/60/3	75	TOSHIBA CARRIER EMERGENCY SHUT OFF VALVE MODEL NUMBER RBM-SVB0611HUPUL OR APPROVED EQUAL. PROVIDE CONTAINMENT HOUSING WITH EXHAUST DUCT PORT.
ESV 113A	ACCU 1-2	8	0.5	15	208/60/3	121	TOSHIBA CARRIER EMERGENCY SHUT OFF VALVE MODEL NUMBER RBM-SVB0611HUPUL OR APPROVED EQUAL. PROVIDE CONTAINMENT HOUSING WITH EXHAUST DUCT PORT.
ESV 126A	ACCU 1-3	1	0.3	15	208/60/3	62	TOSHIBA CARRIER EMERGENCY SHUT OFF VALVE MODEL NUMBER RBM-SVB0611HUPUL OR APPROVED EQUAL. PROVIDE CONTAINMENT HOUSING WITH EXHAUST DUCT PORT.
ESV 126B	ACCU 1-3	4	0.5	15	208/60/3	75	TOSHIBA CARRIER EMERGENCY SHUT OFF VALVE MODEL NUMBER RBM-SVB0611HUPUL OR APPROVED EQUAL. PROVIDE CONTAINMENT HOUSING WITH EXHAUST DUCT PORT.
ESV 204A	ACCU 2-1	1	0.3	15	208/60/3	62	TOSHIBA CARRIER EMERGENCY SHUT OFF VALVE MODEL NUMBER RBM-SVB0611HUPUL OR APPROVED EQUAL. PROVIDE CONTAINMENT HOUSING WITH EXHAUST DUCT PORT.
ESV 204B	ACCU 2-1	4	0.5	15	208/60/3	75	TOSHIBA CARRIER EMERGENCY SHUT OFF VALVE MODEL NUMBER RBM-SVB0611HUPUL OR APPROVED EQUAL. PROVIDE CONTAINMENT HOUSING WITH EXHAUST DUCT PORT.
ESV 214A	ACCU 2-2	4	0.5	15	208/60/3	75	TOSHIBA CARRIER EMERGENCY SHUT OFF VALVE MODEL NUMBER RBM-SVB0611HUPUL OR APPROVED EQUAL. PROVIDE CONTAINMENT HOUSING WITH EXHAUST DUCT PORT.
ESV 224A	ACCU 2-3	1	0.3	15	208/60/3	62	TOSHIBA CARRIER EMERGENCY SHUT OFF VALVE MODEL NUMBER RBM-SVB0611HUPUL OR APPROVED EQUAL. PROVIDE CONTAINMENT HOUSING WITH EXHAUST DUCT PORT.
ESV 224B	ACCU 2-3	4	0.5	15	208/60/3	75	TOSHIBA CARRIER EMERGENCY SHUT OFF VALVE MODEL NUMBER RBM-SVB0611HUPUL OR APPROVED EQUAL. PROVIDE CONTAINMENT HOUSING WITH EXHAUST DUCT PORT.
ESV 304A	ACCU 3-1	1	0.3	15	208/60/3	62	TOSHIBA CARRIER EMERGENCY SHUT OFF VALVE MODEL NUMBER RBM-SVB0611HUPUL OR APPROVED EQUAL. PROVIDE CONTAINMENT HOUSING WITH EXHAUST DUCT PORT.
ESV 304B	ACCU 3-1	4	0.5	15	208/60/3	75	TOSHIBA CARRIER EMERGENCY SHUT OFF VALVE MODEL NUMBER RBM-SVB0611HUPUL OR APPROVED EQUAL. PROVIDE CONTAINMENT HOUSING WITH EXHAUST DUCT PORT.
ESV 318A	ACCU 3-2	8	0.5	15	208/60/3	121	TOSHIBA CARRIER EMERGENCY SHUT OFF VALVE MODEL NUMBER RBM-SVB0611HUPUL OR APPROVED EQUAL. PROVIDE CONTAINMENT HOUSING WITH EXHAUST DUCT PORT.
ESV 328A	ACCU 3-3	8	0.5	15	208/60/3	121	TOSHIBA CARRIER EMERGENCY SHUT OFF VALVE MODEL NUMBER RBM-SVB0611HUPUL OR APPROVED EQUAL. PROVIDE CONTAINMENT HOUSING WITH EXHAUST DUCT PORT.

FAN COIL NOTES

1. * INDICATES OA IS PROVIDE BY A DEDICATED FAN COIL UNIT.

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAI'I

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

MECHANICAL SCHEDULES

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HIARNG JOB NO. FEDERAL:	DRAWING NO.
DH/MC	DH/MC	PN15H00033 STATE: CA-202505-D	M-007
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 193 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

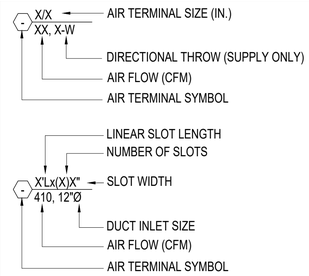
06/03/2026 5:39 pm
M:\JOB PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\MECHANICAL\2M-X SCHEDULES\S3.DWG

EXHAUST FAN SCHEDULE

UNIT NO.	AREA SERVED	CFM	STATIC PRESSURE (IN. W.G.)	MOTOR DATA		DRIVE	RPM	TYPE	WEIGHT (LBS.)	SOUND LEVEL (SONES)	OPERATION	REMARKS
				HP/W	V/HZ/PH							
EF 102	SAFETY BOX IN 102	30	0.5	64W	120/60/1	DIRECT	2435	IN LINE CENTRIFUGAL	6.3	-	SAFETY SHUT OFF VALVE	FANTECH FR OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL.
EF 113	SAFETY BOX IN 113	30	0.5	64W	120/60/1	DIRECT	2435	IN LINE CENTRIFUGAL	6.3	-	SAFETY SHUT OFF VALVE	FANTECH FR OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL.
EF 114	MECH. RM	150	0.5	53 W	115/60/1	DIRECT	1,240	CEILING MOUNTED	32	3	SWITCH	GREENHECK SP OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL. PROVIDE WITH INTEGRAL BACKDRAFT DAMPER
EF 115	WOMENS RESTROOM	310	0.5	65 W	115/60/1	DIRECT	1,065	CEILING MOUNTED	50	3.5	INTERLOCK W/ LIGHT SWITCH	GREENHECK SP OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL. PROVIDE WITH INTEGRAL BACKDRAFT DAMPER
EF 116	JAN	60	0.5	17 W	115/60/1	DIRECT	817	CEILING MOUNTED	10	2.5	SWITCH	GREENHECK SP OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL. PROVIDE WITH INTEGRAL BACKDRAFT DAMPER
EF 117	MENS RESTROOM	310	0.5	65 W	115/60/1	DIRECT	1,065	CEILING MOUNTED	50	3.5	INTERLOCK W/ LIGHT SWITCH	GREENHECK SP OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL. PROVIDE WITH INTEGRAL BACKDRAFT DAMPER
EF 126	SAFETY BOX IN 126	30	0.5	64W	120/60/1	DIRECT	2435	IN LINE CENTRIFUGAL	6.3	-	SAFETY SHUT OFF VALVE	FANTECH FR OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL.
EF 204	SAFETY BOX IN 204	30	0.5	64W	120/60/1	DIRECT	2435	IN LINE CENTRIFUGAL	6.3	-	SAFETY SHUT OFF VALVE	FANTECH FR OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL.
EF 213A	WOMENS RESTROOM	310	0.5	65 W	115/60/1	DIRECT	1,065	CEILING MOUNTED	50	3.5	INTERLOCK W/ LIGHT SWITCH	GREENHECK SP OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL. PROVIDE WITH INTEGRAL BACKDRAFT DAMPER
EF 213B	MENS RESTROOM	310	0.5	65 W	115/60/1	DIRECT	1,065	CEILING MOUNTED	50	3.5	INTERLOCK W/ LIGHT SWITCH	GREENHECK SP OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL. PROVIDE WITH INTEGRAL BACKDRAFT DAMPER
EF 213C	JAN	50	0.5	17 W	115/60/1	DIRECT	817	CEILING MOUNTED	10	2.5	SWITCH	GREENHECK SP OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL. PROVIDE WITH INTEGRAL BACKDRAFT DAMPER
EF 217	SAFETY BOX IN 217	30	0.5	64W	120/60/1	DIRECT	2435	IN LINE CENTRIFUGAL	6.3	-	SAFETY SHUT OFF VALVE	FANTECH FR OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL.
EF 227	SAFETY BOX IN 227	30	0.5	64W	120/60/1	DIRECT	2435	IN LINE CENTRIFUGAL	6.3	-	SAFETY SHUT OFF VALVE	FANTECH FR OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL.
EF 304	SAFETY BOX IN 304	30	0.5	64W	120/60/1	DIRECT	2435	IN LINE CENTRIFUGAL	6.3	-	SAFETY SHUT OFF VALVE	FANTECH FR OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL.
EF 314	MENS SHOWER	220	0.375	50 W	115/60/1	DIRECT	1,092	IN-LINE	36	0.6	INTERLOCK W/ LIGHT SWITCH	GREENHECK CSP OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL. PROVIDE WITH INTEGRAL BACKDRAFT DAMPER
EF 315	WOMENS SHOWER	220	0.375	50 W	115/60/1	DIRECT	1,092	IN-LINE	36	0.6	INTERLOCK W/ LIGHT SWITCH	GREENHECK CSP OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL. PROVIDE WITH INTEGRAL BACKDRAFT DAMPER
EF 316	WOMENS LOCKER	100	0.375	32 W	115/60/1	DIRECT	1,050	CEILING MOUNTED	31	2.5	INTERLOCK W/ LIGHT SWITCH	GREENHECK SP OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL. PROVIDE WITH INTEGRAL BACKDRAFT DAMPER
EF 317	MENS LOCKER	100	0.375	32 W	115/60/1	DIRECT	1,050	CEILING MOUNTED	31	2.5	INTERLOCK W/ LIGHT SWITCH	GREENHECK SP OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL. PROVIDE WITH INTEGRAL BACKDRAFT DAMPER
EF 318	SAFETY BOX IN 318	30	0.5	64W	120/60/1	DIRECT	2435	IN LINE CENTRIFUGAL	6.3	-	SAFETY SHUT OFF VALVE	FANTECH FR OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL.
EF 319	MENS RESTROOM	310	0.375	65 W	115/60/1	DIRECT	1,065	CEILING MOUNTED	50	3.5	INTERLOCK W/ LIGHT SWITCH	GREENHECK SP OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL. PROVIDE WITH INTEGRAL BACKDRAFT DAMPER
EF 320	JAN	50	0.375	17 W	115/60/1	DIRECT	817	CEILING MOUNTED	10	2.5	SWITCH	GREENHECK SP OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL. PROVIDE WITH INTEGRAL BACKDRAFT DAMPER
EF 321	WOMENS RESTROOM	310	0.375	65 W	115/60/1	DIRECT	1,065	CEILING MOUNTED	50	3.5	INTERLOCK W/ LIGHT SWITCH	GREENHECK SP OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL. PROVIDE WITH INTEGRAL BACKDRAFT DAMPER
EF 328	SAFETY BOX IN 328	30	0.5	64W	120/60/1	DIRECT	2435	IN LINE CENTRIFUGAL	6.3	-	SAFETY SHUT OFF VALVE	FANTECH FR OR APPROVED EQUAL. PROVIDE WITH SPEED CONTROL.

AIR TERMINAL SCHEDULE

RETURN/EXHAUST AIR	DESCRIPTION
1	ALL ALUMINUM CONSTRUCTION, SURFACE MOUNTED, ALUMINUM OPPOSED BLADE VOLUME DAMPER. TITUS 350FL OR APPROVED EQUAL.



AIR TERMINAL NOTES

1. ALL AIR DEVICES SHALL BE FULLY INSULATED SUCH THAT NO METAL PORTIONS OF THE DIFFUSER ARE EXPOSED IN UNCONDITIONED AREAS. PROVIDE MOLDED FIBERGLASS INSULATION DIFFUSER BLANKET FOR 24"X24" LAY-IN MODULES. DIFFUSER BLANKET SHALL HAVE FOIL BACK VAPOR BARRIER WITH 6.0 R-VALUE OR GREATER.
2. ALL AIR DEVICES SHALL BE UNIFORM IN COLOR. OWNER'S REPRESENTATIVE TO CONFIRM COLOR OF ALL AIR TERMINALS.

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAI'I

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

MECHANICAL SCHEDULES

ENGINEERING PARTNERS

DESIGNED BY: DH/MC	CHECKED BY: DH/MC	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-008
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 194 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

06/03/2026 5:38 pm
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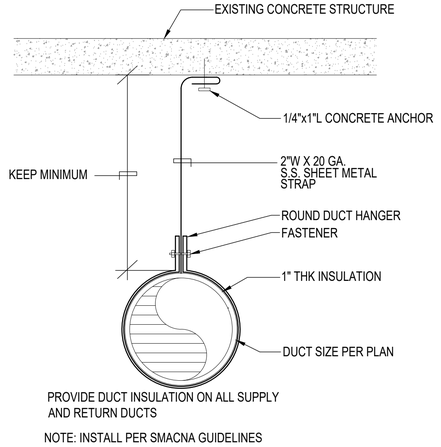
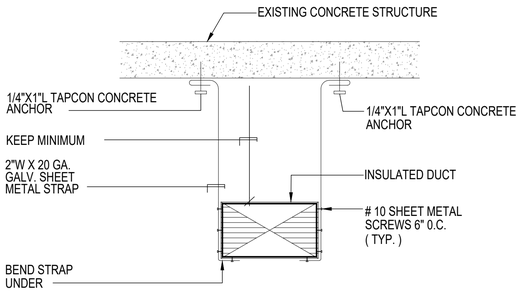


NOTE: INSTALL PER SMACNA GUIDELINES

1 ROUND DUCT SUPPORT DETAIL

NO SCALE

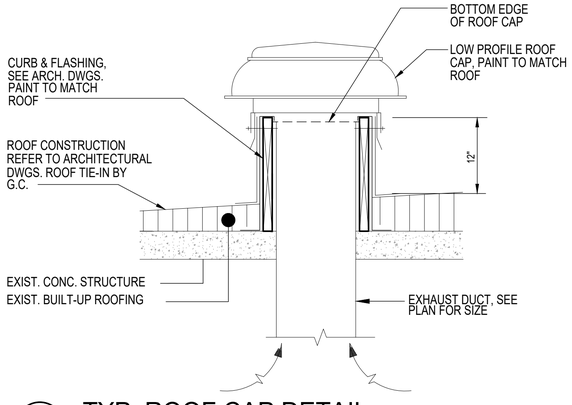


NOTE: INSTALL PER SMACNA GUIDELINES

PROVIDE DUCT INSULATION ON ALL SUPPLY AND RETURN DUCTS

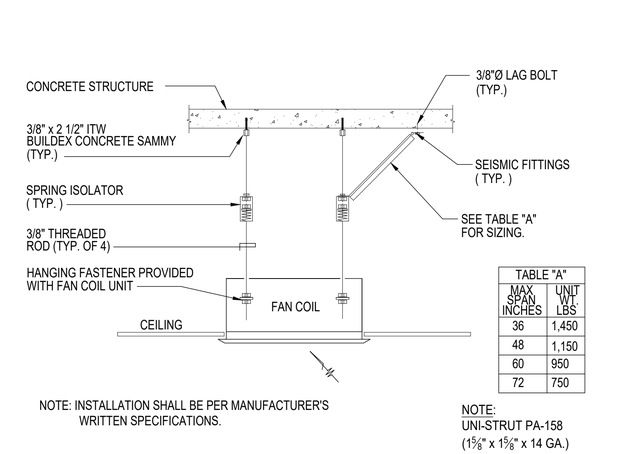
2 DUCT SUPPORT DETAIL

NO SCALE



3 TYP. ROOF CAP DETAIL

NO SCALE



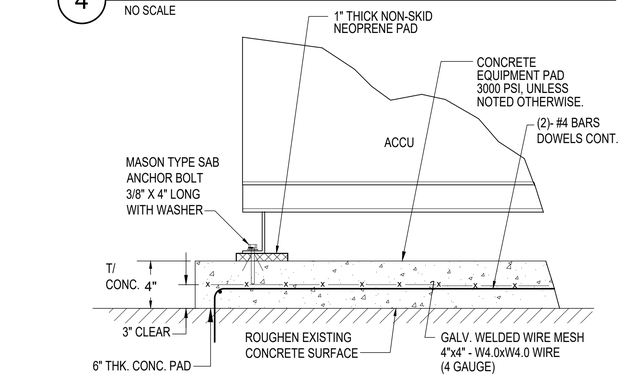
NOTE: INSTALLATION SHALL BE PER MANUFACTURER'S WRITTEN SPECIFICATIONS.

TABLE "A"	
MAX SPAN INCHES	UNIT WT. LBS
36	1,450
48	1,150
60	950
72	750

NOTE:
UNI-STRUT PA-158
(1⅝" x 1⅝" x 14 GA.)

4 TYPICAL FAN COIL HANGER DETAIL

NO SCALE

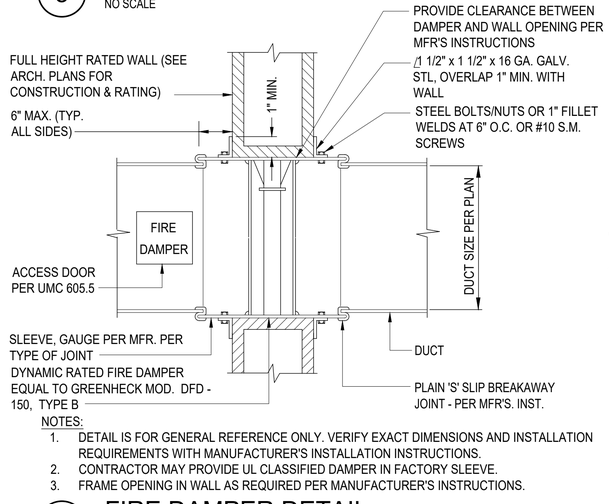


NOTE: PROVIDE ACCESSORIES AS REQUIRED TO INSTALL PER MANUFACTURER'S REQUIREMENTS AND SPECIFICATIONS.

NOTE:
PROVIDE MASON TYPE HG ISOLATOR WASHER & BUSHING AT ALL METAL TO BOLT CONN.

5 ACCU LATERAL SUPPORT DETAIL

NO SCALE



NOTES:
1. DETAIL IS FOR GENERAL REFERENCE ONLY. VERIFY EXACT DIMENSIONS AND INSTALLATION REQUIREMENTS WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. CONTRACTOR MAY PROVIDE UL CLASSIFIED DAMPER IN FACTORY SLEEVE.
3. FRAME OPENING IN WALL AS REQUIRED PER MANUFACTURER'S INSTRUCTIONS.

6 FIRE DAMPER DETAIL

NO SCALE

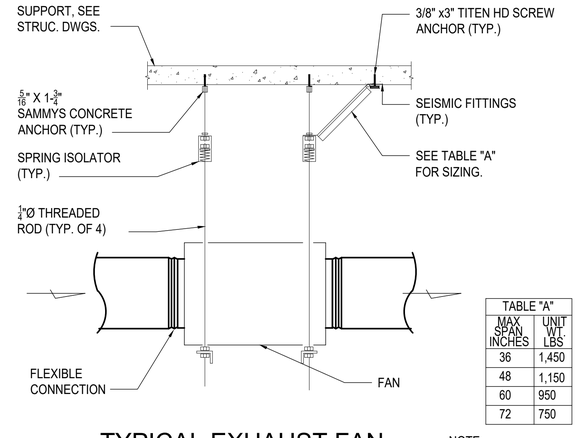


TABLE "A"	
MAX SPAN INCHES	UNIT WT. LBS
36	1,450
48	1,150
60	950
72	750

NOTE:
UNI-STRUT PA-158
(1⅝" x 1⅝" x 14 GA.)

7 TYPICAL EXHAUST FAN MOUNTING DETAIL

NO SCALE

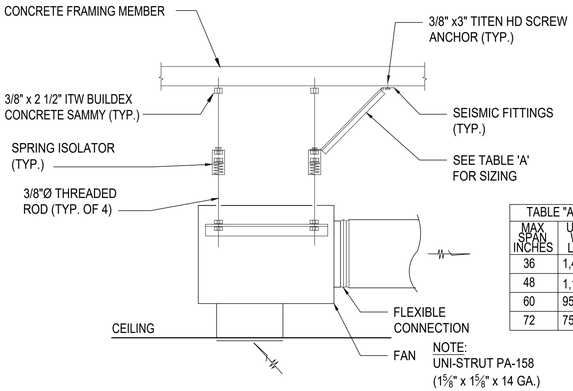
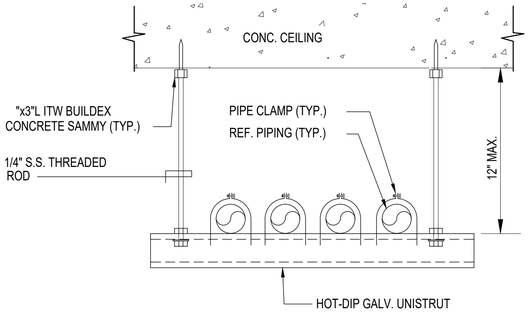


TABLE "A"	
MAX SPAN INCHES	UNIT WT. LBS
36	1,450
48	1,150
60	950
72	750

NOTE:
UNI-STRUT PA-158
(1⅝" x 1⅝" x 14 GA.)

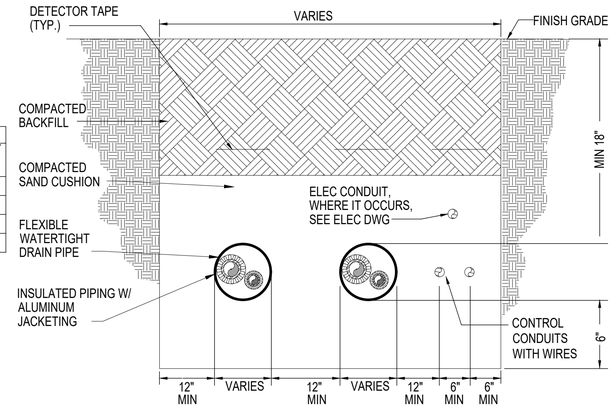
8 TYPICAL CEILING EXHAUST FAN MOUNTING DETAIL

NO SCALE



9 INSULATED PIPING HANGER DETAIL

NO SCALE



NOTE: SOFT DRAWN COPPER SHALL NOT BE ALLOWED FOR UNDERGROUND PIPING.

10 TYP.SECTION OF REFRIGERANT PIPING BELOW GRADE

NO SCALE

NOTICES

1. ALL ATTACHMENT HARDWARE FOR ANCHORING OUTDOOR PIPING AND EQUIPMENT SHALL BE STAINLESS STEEL 316 CONSTRUCTION, INCLUDING NUTS, BOLTS, PIPE CLAMPS, AND HANGERS. ALL SLOTTED STEEL CHANNELS SHALL BE STAINLESS STEEL 316 CONSTRUCTION.
2. ALL NON-STAINLESS STEEL EXPOSED EQUIPMENT, PIPING, AND SUPPORTS SHALL BE PAINTED WITH CORROSION RESISTANT COATINGS. COLOR TO MATCH SURROUNDINGS.

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

MECHANICAL DETAILS

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HARNG JOB NO. FEDERAL:	DRAWING NO.
DH/MC	DH/MC	PN15H00033 STATE: CA-202505-D	M-009
DRAWN BY:	APPROVED BY:	DATE	SHEET
MC	EW	JUNE 2026	195 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/03/2026 5:38 pm
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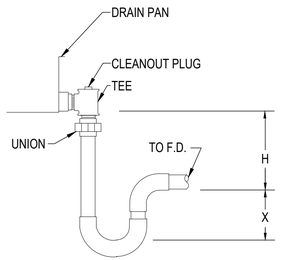


H=(1" FOR EACH 1" OF MAX. NEGATIVE STATIC PRESSURE) + 1"

X=H/2

1 DRAW THRU DRAIN TRAP DETAIL

NO SCALE

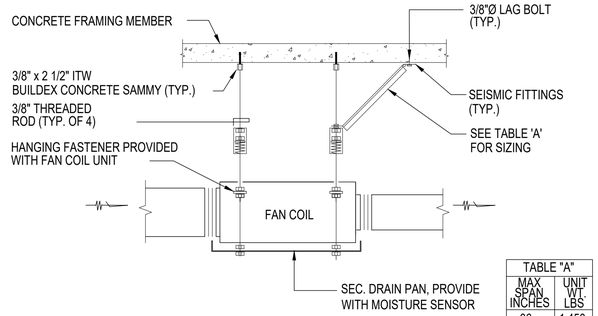


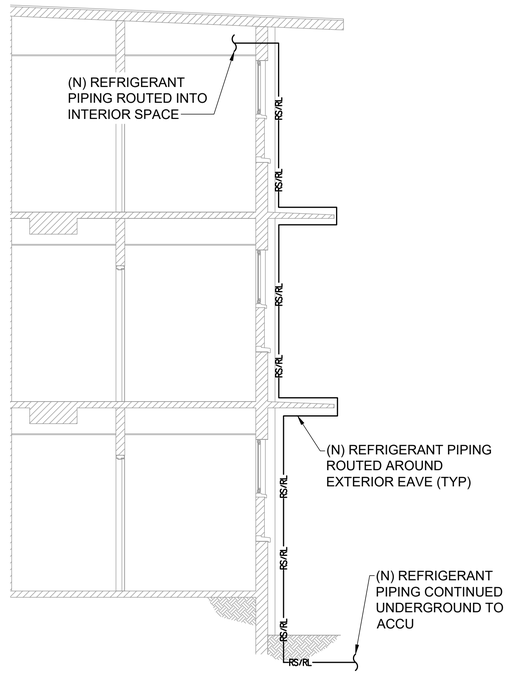
TABLE "A"	
MAX SPAN INCHES	UNIT WT. LBS
36	1,450
48	1,150
60	950
72	750

NOTE: INSTALLATION SHALL BE PER MANUFACTURER'S WRITTEN SPECIFICATIONS.

NOTE:
UNI-STRUT PA-158
(1⅝" x 1⅝" x 14 GA.)

4 TYPICAL FAN COIL HANGER DETAIL

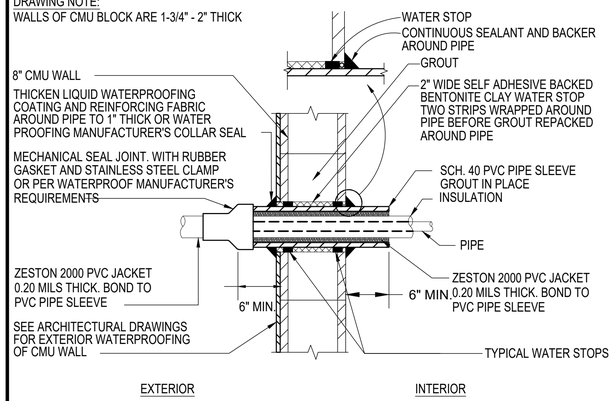
NO SCALE



6 EXTERIOR PIPE ROUTING DETAIL

NO SCALE

DRAWING NOTE:
WALLS OF CMU BLOCK ARE 1-3/4" - 2" THICK



2 PIPE PENETRATION DETAIL

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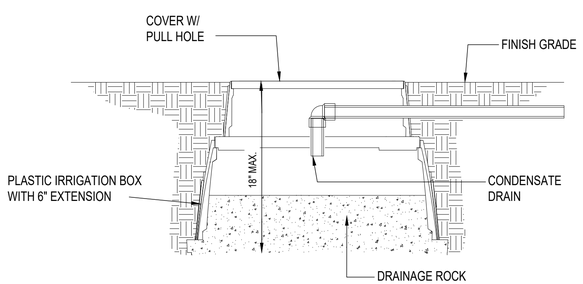
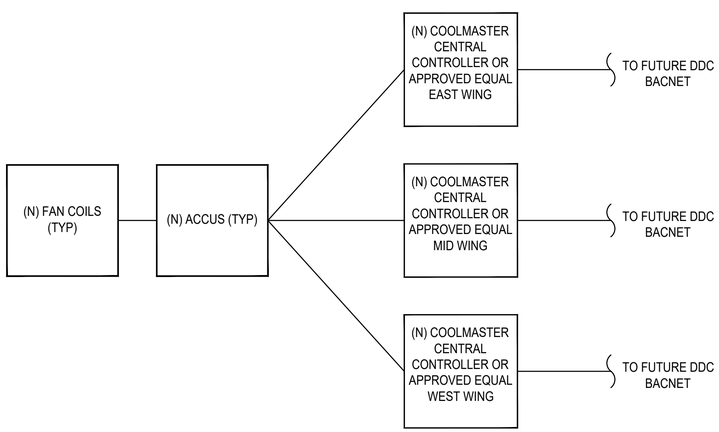


3 CONDENSATE DRY WELL DETAIL

NO SCALE



5 SCHEMATIC CONTROL DIAGRAM

NO SCALE

SEQUENCE OF OPERATION

FAN COIL UNIT
RUN CONDITIONS - AUTOMATIC OPERATION:
THE UNIT SHALL RUN ACCORDING TO A USER DEFINABLE 7-DAY PROGRAMMABLE TIME SCHEDULE IN THE FOLLOWING MODES:
THE UNIT SHALL MAINTAIN A 72°F (ADJ.) COOLING SETPOINT

ALARMS SHALL BE PROVIDED AS FOLLOWS:
HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).
LOW ZONE TEMP: IF THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

FAN:
THE FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES. THE FAN SPEEDS SHALL AUTOMATICALLY BE INDEXED AS FOLLOWS:
LOW SPEED SHALL RUN ANYTIME THE ZONE TEMPERATURE IS WITHIN SETPOINTS.
MEDIUM SPEED SHALL RUN ANYTIME THE ZONE TEMPERATURE IS OUTSIDE OF SETPOINTS.
HIGH SPEED SHALL RUN ANYTIME THE ZONE TEMPERATURE IS OUTSIDE OF SETPOINTS BY A DEFINABLE AMOUNT (ADJ.).

AIR-COOLED CONDENSING UNIT
RUN CONDITIONS - AUTOMATIC OPERATION:
THE UNIT SHALL RUN ACCORDING TO INDOOR FAN COIL LOAD AND SHALL DETERMINE THE NECESSARY COMPRESSOR SPEED TO PROVIDE COOLING FOR INDOOR FAN COIL DEMAND.

ALARMS SHALL BE PROVIDED AS FOLLOW:
LOW LIQUID OR SUCTION LINE PRESSURE
HIGH LIQUID OR SUCTION LINE PRESSURE

FAN:
THE FAN SHALL RUN ANYTIME THE INDOOR UNITS ARE ACTIVATED, UNLESS SHUTDOWN ON SAFETIES. THE FANS SHALL AUTOMATICALLY OPERATE AT A SET SPEED TO PROVIDE ADEQUITE COOLING TO ALL ACTIVE FAN COIL UNITS.

NOTICES

1. ALL ATTACHMENT HARDWARE FOR ANCHORING OUTDOOR PIPING AND EQUIPMENT SHALL BE STAINLESS STEEL 316 CONSTRUCTION, INCLUDING NUTS, BOLTS, PIPE CLAMPS, AND HANGERS. ALL SLOTTED STEEL CHANNELS SHALL BE STAINLESS STEEL 316 CONSTRUCTION.
2. ALL NON-STAINLESS STEEL EXPOSED EQUIPMENT, PIPING, AND SUPPORTS SHALL BE PAINTED WITH CORROSION RESISTANT COATINGS. COLOR TO MATCH SURROUNDINGS.

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAI'I

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

MECHANICAL DETAILS

ENGINEERING PARTNERS

DESIGNED BY: DH/MC	CHECKED BY: DH/MC	HIARNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. M-010
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 196 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~

06/03/2026 5:38 pm
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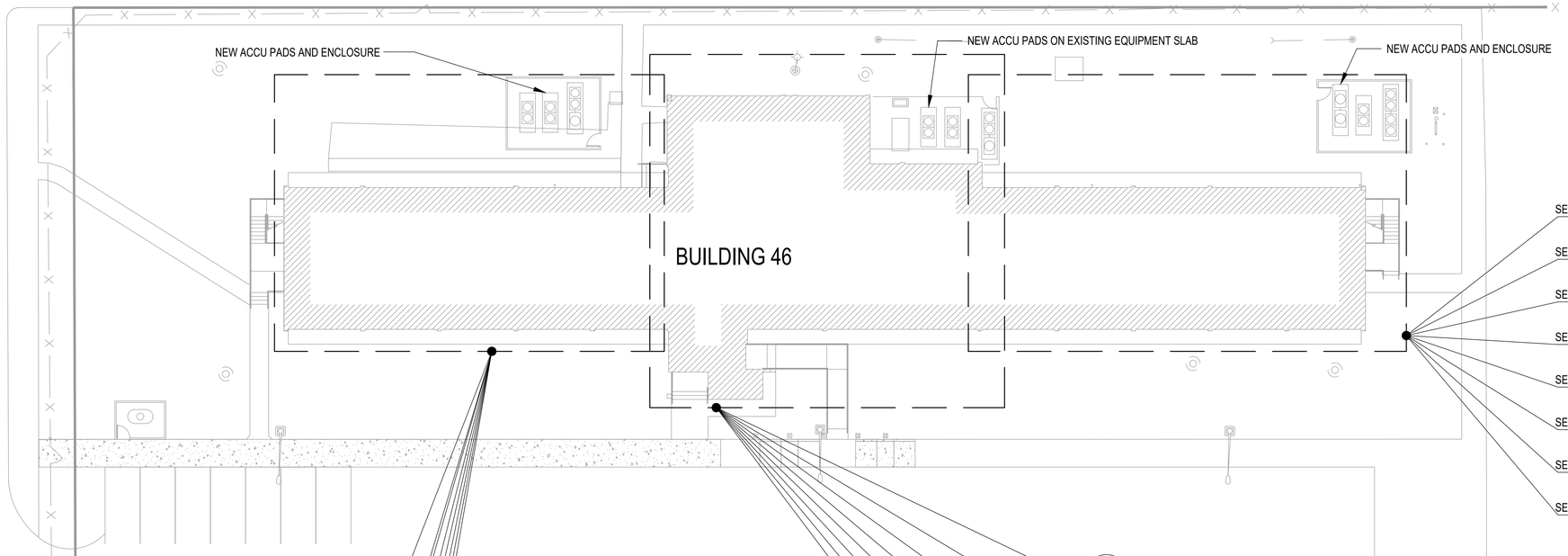
BUNKER HILL ST

SHANGRILA ST



SEE A M-201A FIRST FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

SEE A M-202A SECOND FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

SEE A M-203A THIRD FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

SEE A M-204A ROOF - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

SEE A M-301A FIRST FLOOR - EXISTING/NEW AIR CONDITIONING AND VENTILATION PLAN

SEE A M-302A SECOND FLOOR - EXISTING/NEW AIR CONDITIONING AND VENTILATION PLAN

SEE A M-303A THIRD FLOOR - EXISTING/NEW AIR CONDITIONING AND VENTILATION PLAN

SEE A M-304A ROOF - EXISTING/NEW AIR CONDITIONING AND VENTILATION PLAN

SEE A M-201B FIRST FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

SEE A M-202B SECOND FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

SEE A M-203B THIRD FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

SEE A M-204B ROOF - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

SEE A M-301B FIRST FLOOR - EXISTING/NEW AIR CONDITIONING AND VENTILATION PLAN

SEE A M-302B SECOND FLOOR - EXISTING/NEW AIR CONDITIONING AND VENTILATION PLAN

SEE A M-303B THIRD FLOOR - EXISTING/NEW AIR CONDITIONING AND VENTILATION PLAN

SEE A M-304B ROOF - EXISTING/NEW AIR CONDITIONING AND VENTILATION PLAN

GENERAL NOTES

1. CONTRACTOR SHALL VISIT SITE AND VERIFY EXISTING CONDITIONS PRIOR TO BID. ALL COSTS REQUIRED TO ACCOMMODATE EXISTING CONDITIONS SHALL BE INCLUDED IN THE CONTRACTOR'S BID. NO ADDITIONAL ALLOWANCE AFTER BID WILL BE CONSIDERED DUE TO LACK OF SUCH DUE DILIGENCE OR FIELD EXAMINATION.

SEE A M-201C FIRST FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

SEE A M-202C SECOND FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

SEE A M-203C THIRD FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

SEE A M-204C ROOF - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

SEE A M-301C FIRST FLOOR - EXISTING/NEW AIR CONDITIONING AND VENTILATION PLAN

SEE A M-302C SECOND FLOOR - EXISTING/NEW AIR CONDITIONING AND VENTILATION PLAN

SEE A M-303C THIRD FLOOR - EXISTING/NEW AIR CONDITIONING AND VENTILATION PLAN

SEE A M-304C ROOF - EXISTING/NEW AIR CONDITIONING AND VENTILATION PLAN

A OVERALL MECHANICAL SITE PLAN

SCALE: 1/16" = 1'-0"

0 16' 32'

NORTH

TRUE N

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

OVERALL MECHANICAL SITE PLAN

ENGINEERING PARTNERS

DESIGNED BY: DH/MC	CHECKED BY: DH/MC	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-101
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 197 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/03/2026 5:39 pm
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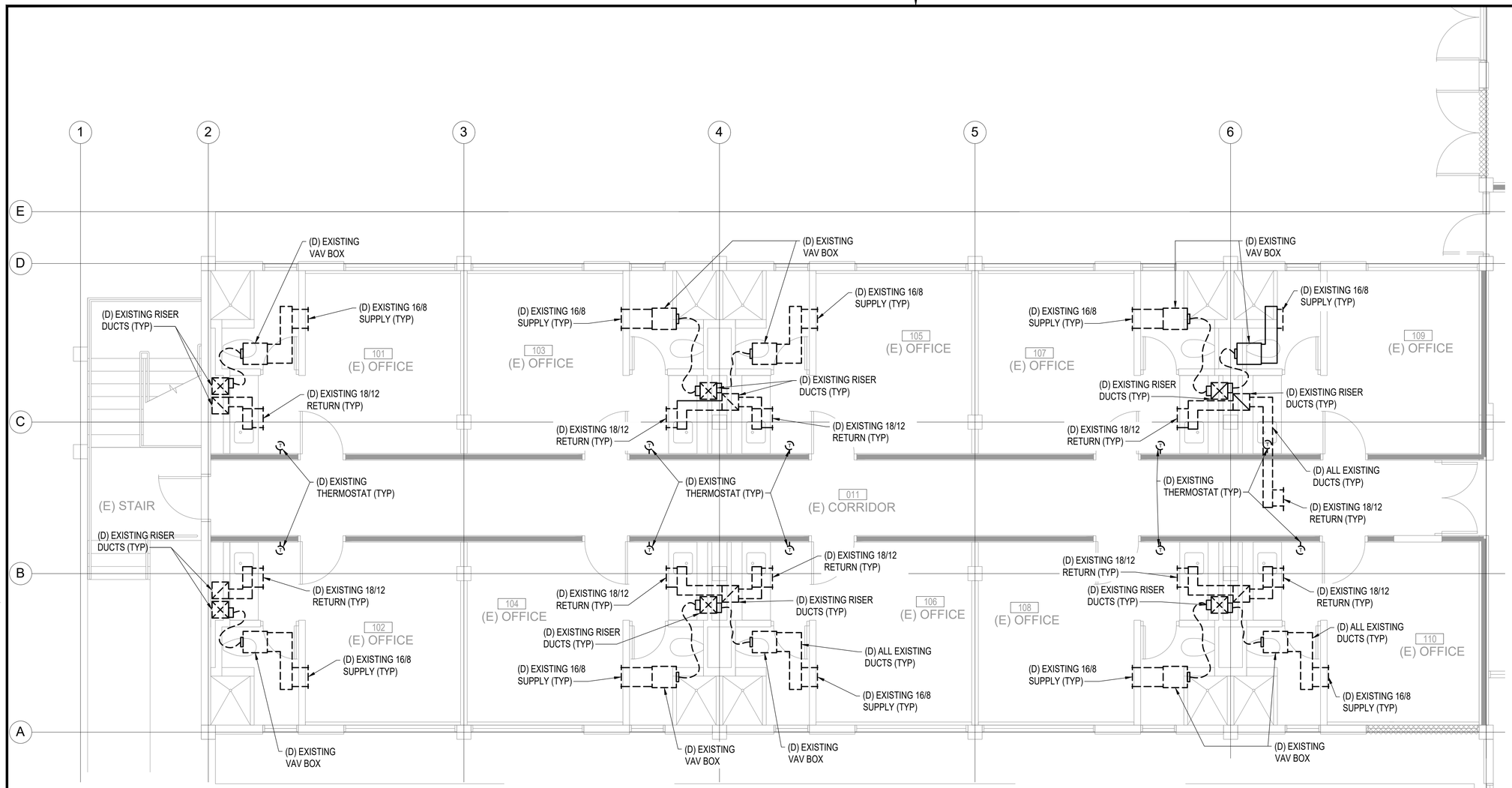


GENERAL NOTES

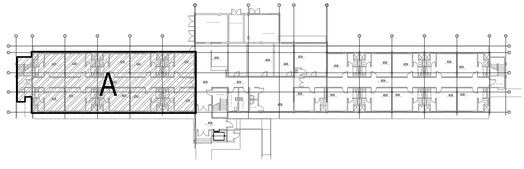
1. ALL EXISTING DUCTING, PIPING, AND DEVICES ASSOCIATED WITH THE HVAC SYSTEM ARE TO BE REMOVED. CONTRACTOR SHALL COORDINATE TO HAVE ALL AREAS AROUND REMOVED DEVICES REPAIRED AND FINISHED.
2. CONTRACTOR MUST FIELD VERIFY EXACT LOCATION OF EXISTING DEVICES BEFORE BEGINNING ANY WORK.

A FIRST FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N



KEYPLAN

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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAI'I

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

FIRST FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HAWNG JOB NO. FEDERAL:	DRAWING NO.
DH/MC	DH/MC	PN15H00033 STATE: CA-202505-D	M-201A
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 198 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

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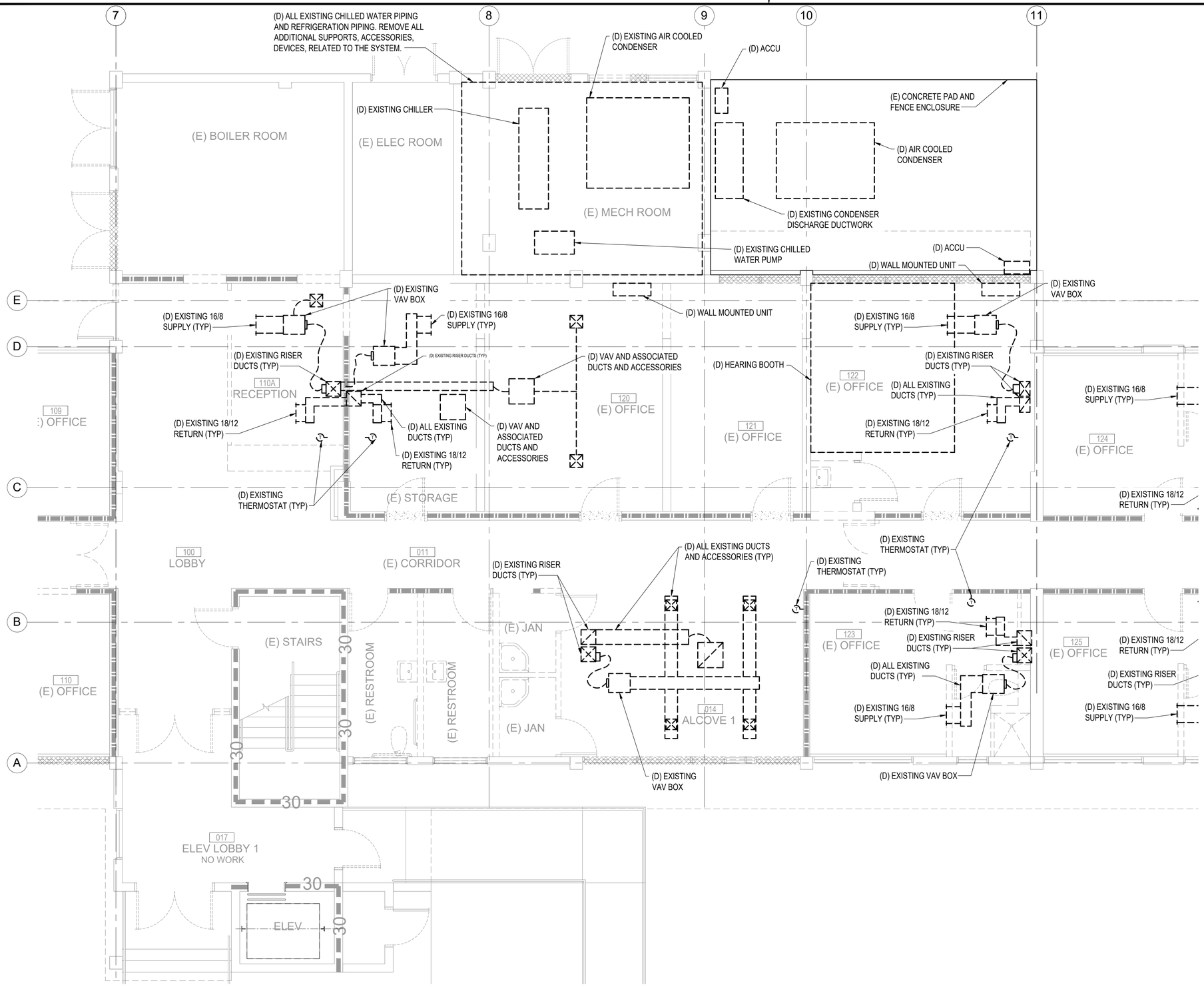

A FIRST FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH

TRUE N

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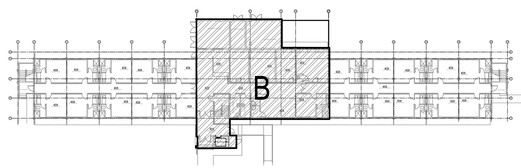

KEYPLAN

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STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

FIRST FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

ENGINEERING PARTNERS		HAARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-2025O5-D	DRAWING NO. M-201B
DESIGNED BY: DH/MC	CHECKED BY: DH/MC		
DRAWN BY: MC	APPROVED BY: EW	DATE JUNE 2026	SHEET 199
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/03/2026, 5:38 pm
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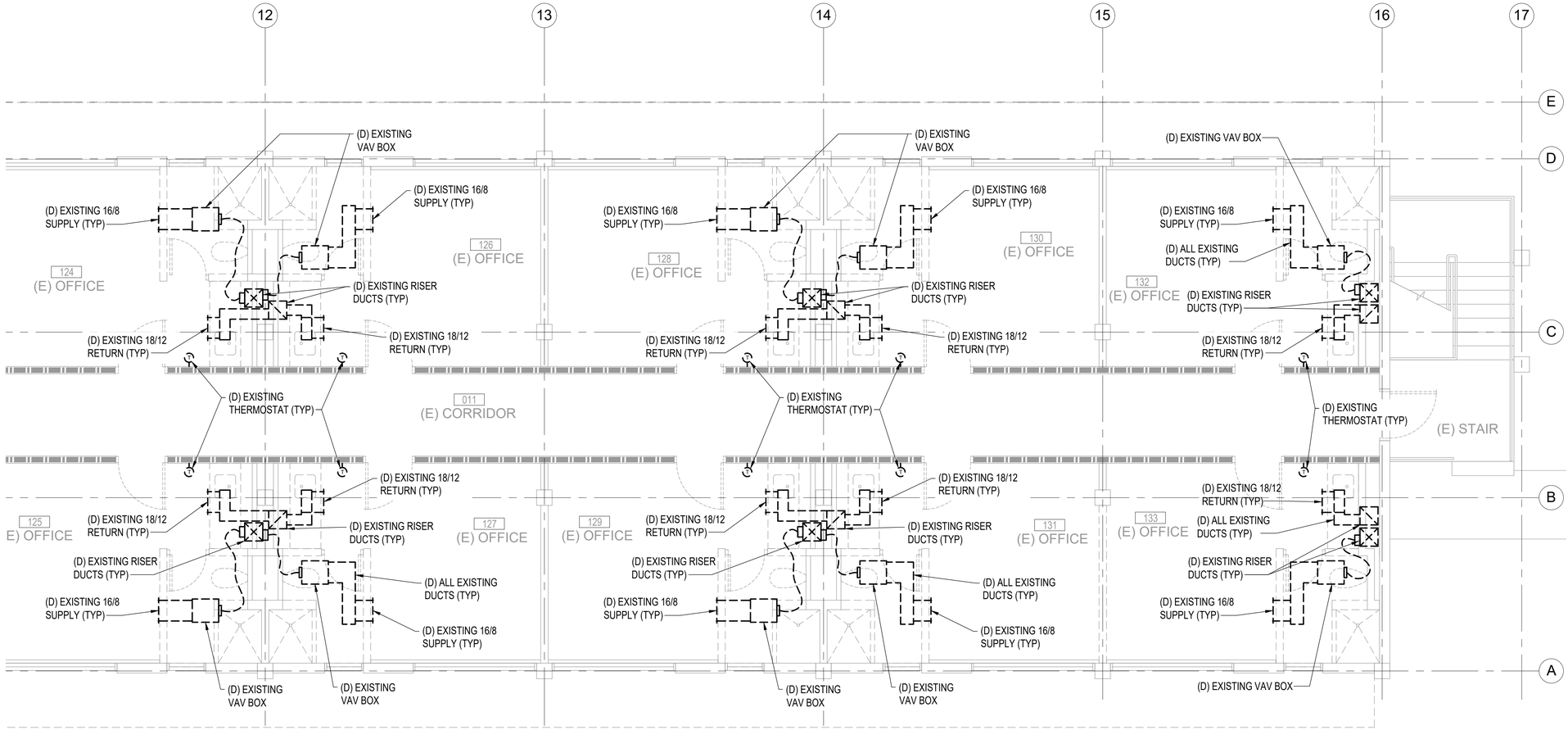

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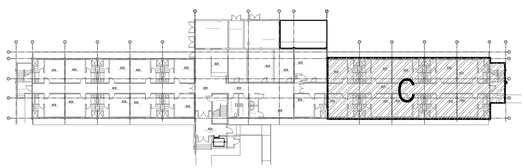
A FIRST FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N



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STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

FIRST FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

ENGINEERING PARTNERS		HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-201C
DESIGNED BY: DH/MC	CHECKED BY: DH/MC		
DRAWN BY: MC	APPROVED BY: EW	DATE JUNE 2026	SHEET 200 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

06/03/2026 5:39 pm
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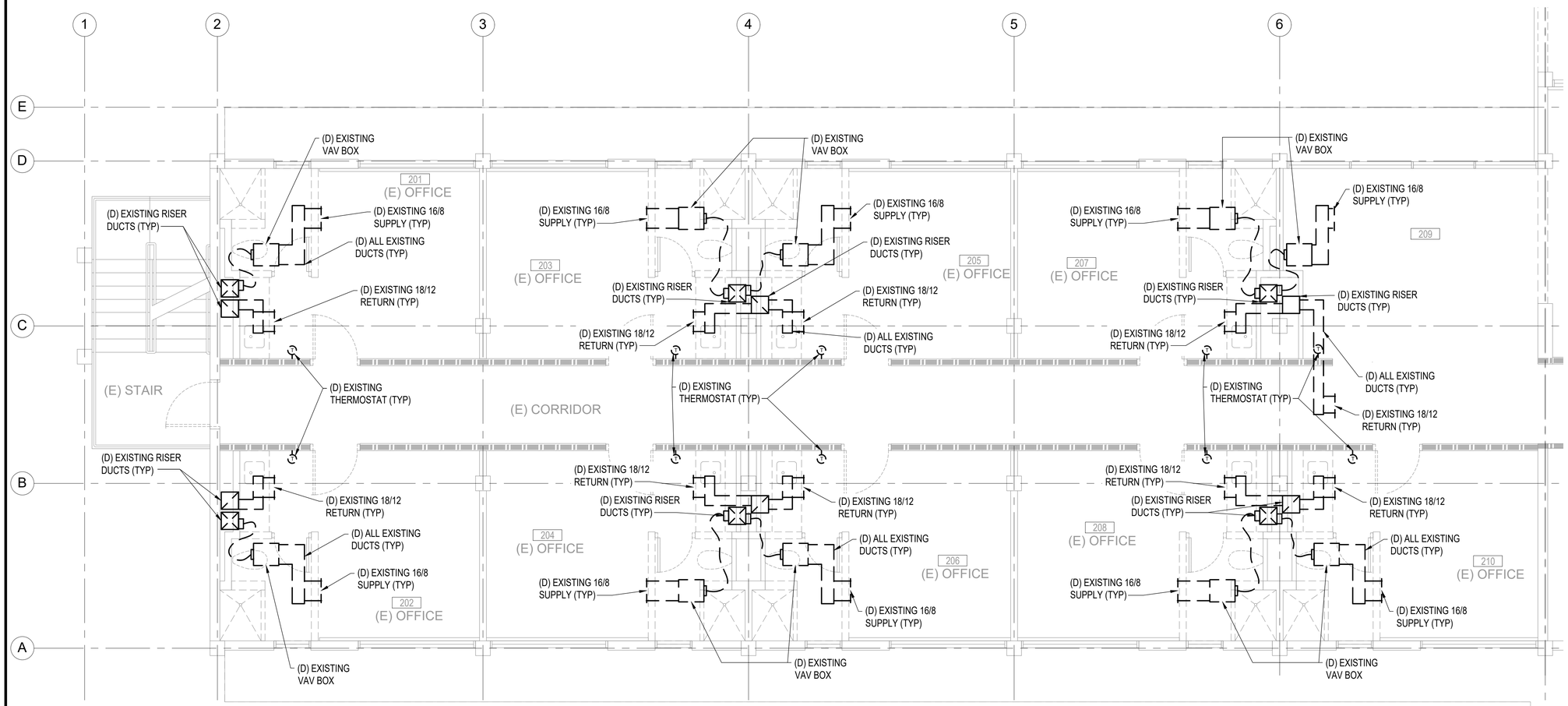

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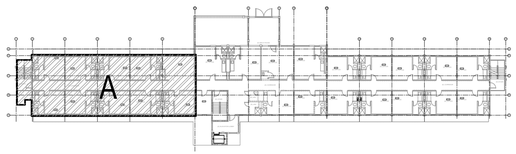
A SECOND FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N



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DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

SECOND FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. M-202A
DESIGNED BY: DH/MC	CHECKED BY: DH/MC		
DRAWN BY: MC	APPROVED BY: EW	DATE	SHEET 201
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/03/2026 5:39 pm
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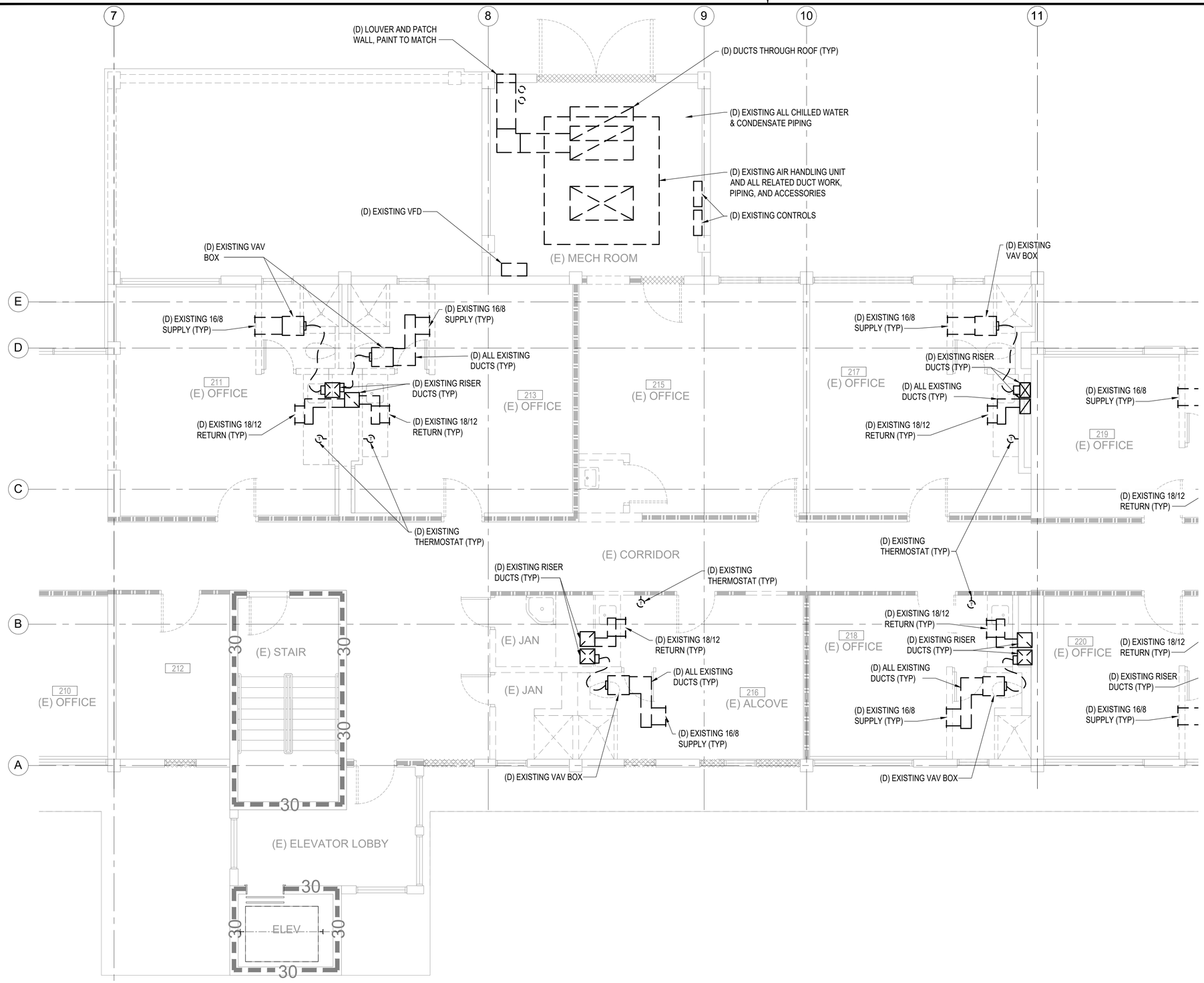

A SECOND FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N

GENERAL NOTES

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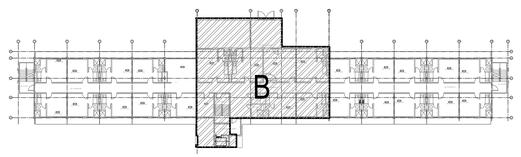

KEYPLAN

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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAI'I

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

SECOND FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

ENGINEERING PARTNERS		HAWAII JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-202B
DESIGNED BY: DH/MC	CHECKED BY: DH/MC		
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 202 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/03/2026 5:38 pm
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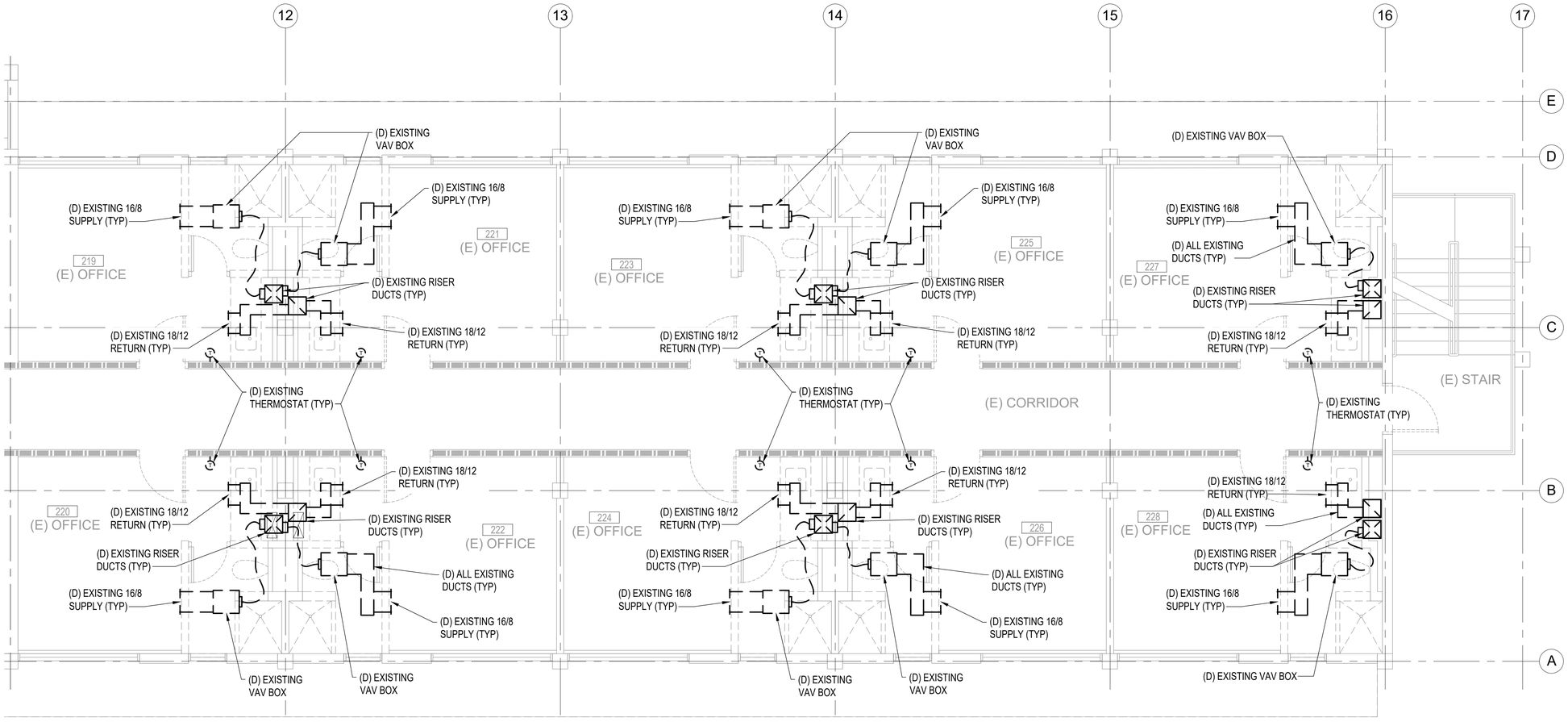

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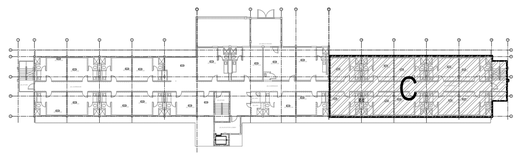
A SECOND FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N



KEYPLAN

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REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAI'I

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

SECOND FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

ENGINEERING PARTNERS

DESIGNED BY: DH/MC	CHECKED BY: DH/MC	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-202C
DRAWN BY: MC	APPROVED BY: EW	DATE	SHEET 203
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/03/2026 5:38 pm
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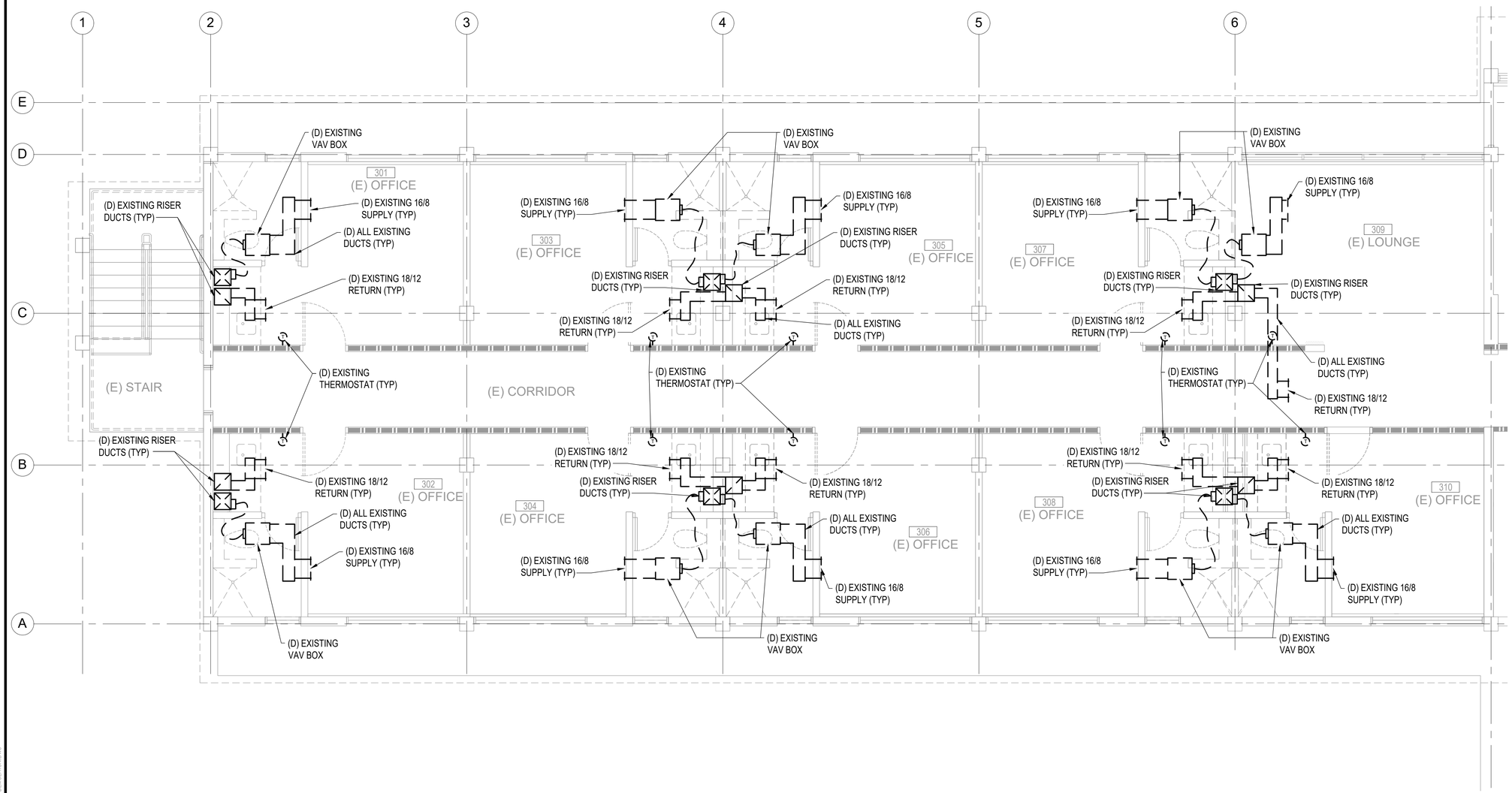

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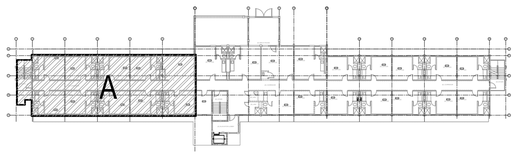
A THIRD FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N



KEYPLAN

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SIGNATURE

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DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

THIRD FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. M-203A
DESIGNED BY: DH/MC	CHECKED BY: DH/MC		
DRAWN BY: MC	APPROVED BY: EW	DATE	SHEET 204
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

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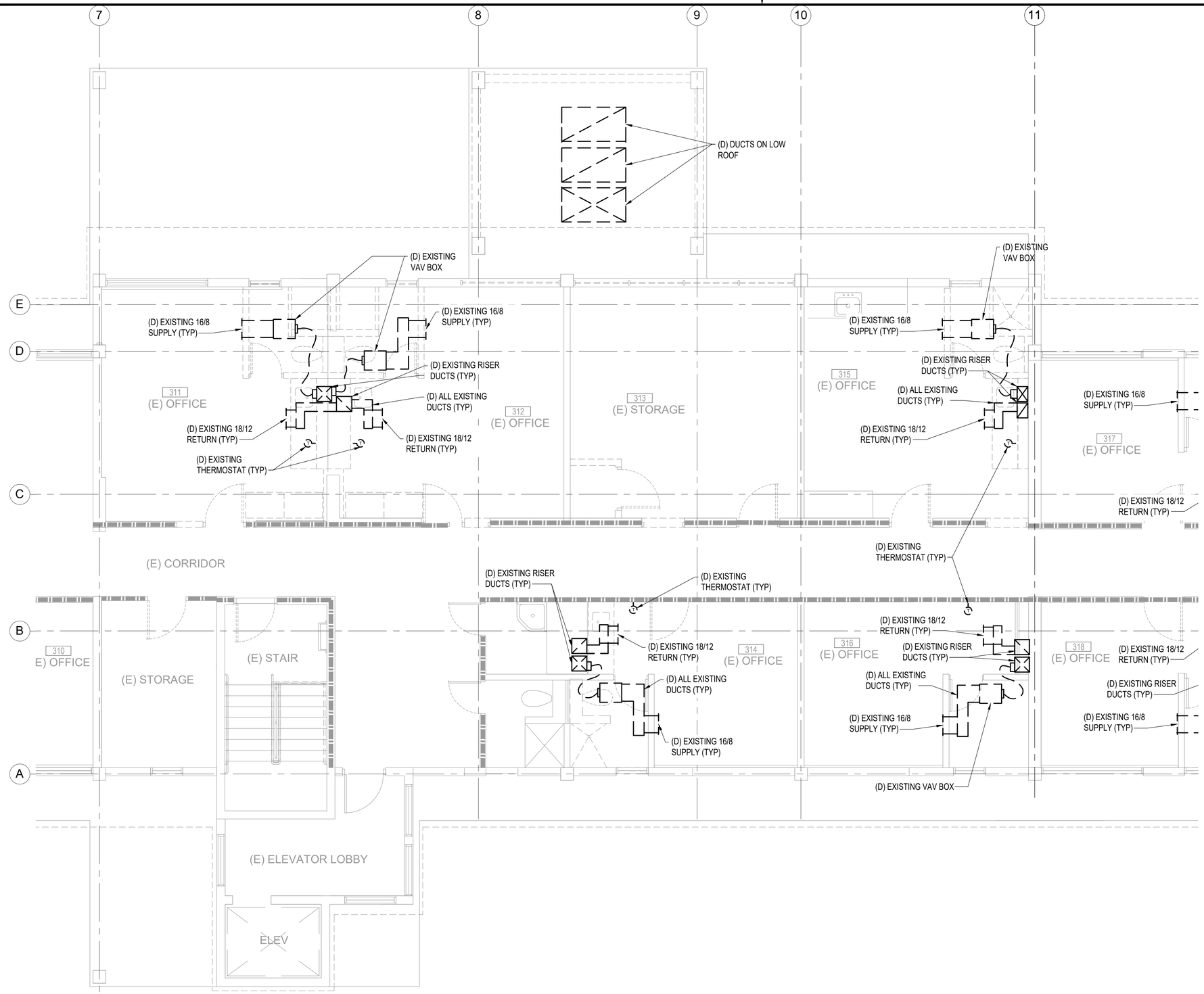

A THIRD FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N

GENERAL NOTES

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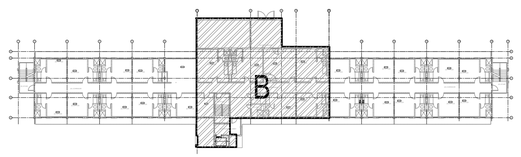

KEYPLAN

REV NO	DESCRIPTION	DATE

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STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

THIRD FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

ENGINEERING PARTNERS		HAPNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-203B
DESIGNED BY: DH/MC	CHECKED BY: DH/MC		
DRAWN BY: MC	APPROVED BY: EW	DATE JUNE 2026	SHEET 205 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

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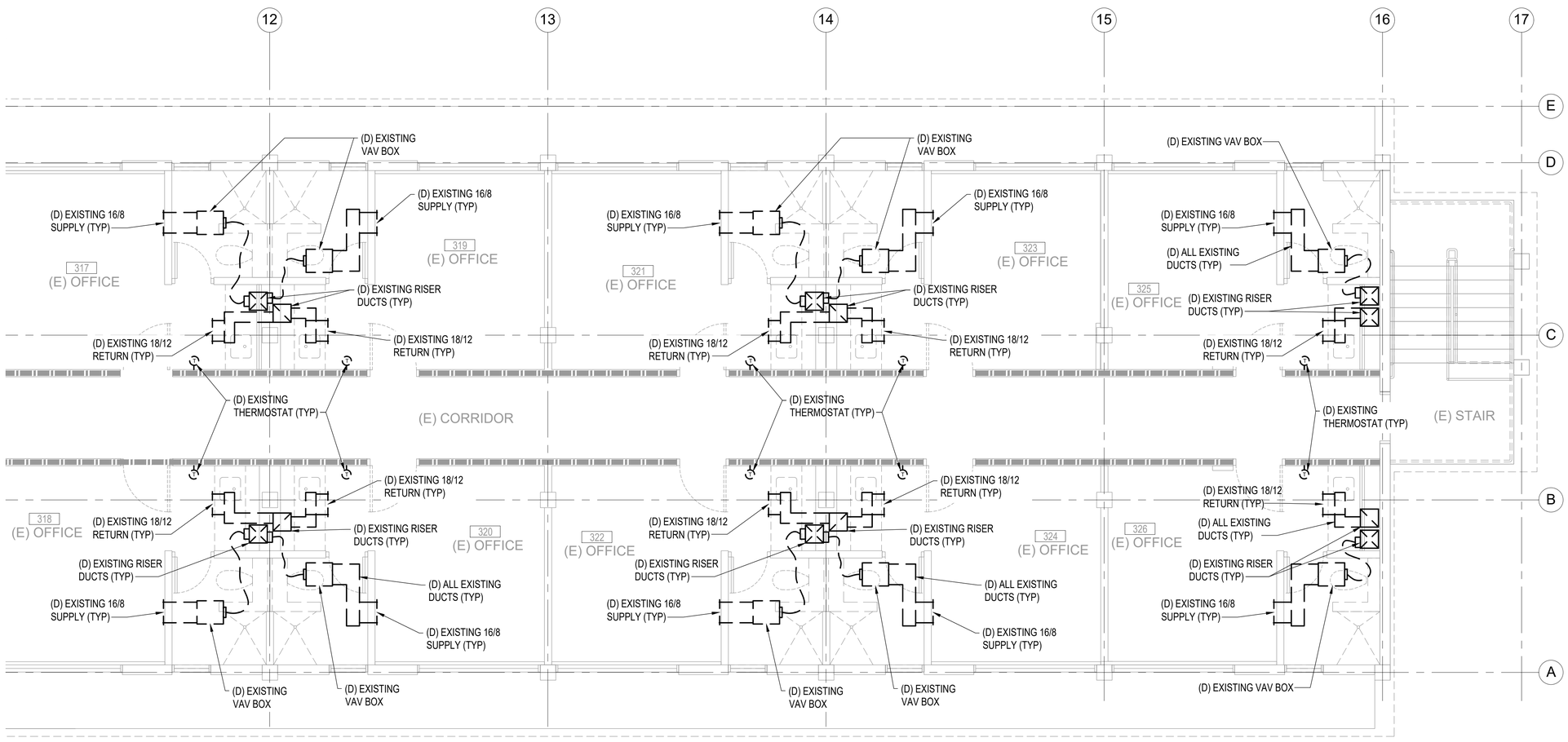

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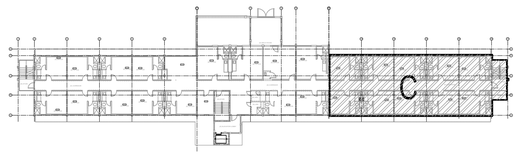
A THIRD FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N



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MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

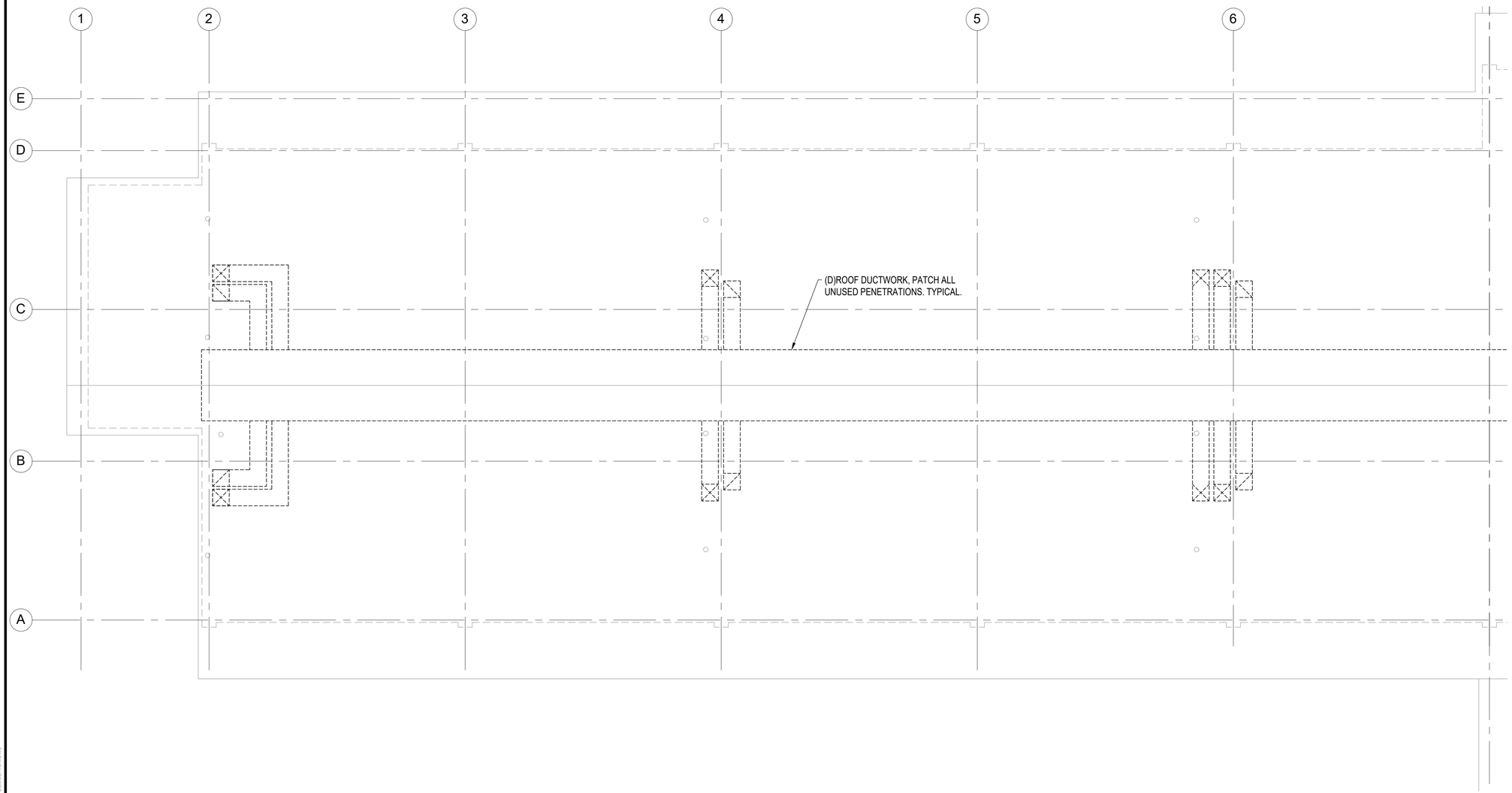
THIRD FLOOR - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

ENGINEERING PARTNERS		HAPRG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-203C
DESIGNED BY: DH/MC	CHECKED BY: DH/MC		
DRAWN BY: MC	APPROVED BY: EW	DATE JUNE 2026	SHEET 206 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/03/2026 5:38 pm
M:\ED PROJECTS\2025 PROJECTS\12018--25--01 DOD BLDG 46 MEDCOM RENOVATIONS\4--DWG\MECHANICAL\4M--X -- DEMOLITION.DWG



GENERAL NOTES

1. ALL EXISTING DUCTING, PIPING, AND DEVICES ASSOCIATED WITH THE HVAC SYSTEM ARE TO BE REMOVED. CONTRACTOR SHALL COORDINATE TO HAVE ALL AREAS AROUND REMOVED DEVICES REPAIRED AND FINISHED.
2. CONTRACTOR MUST FIELD VERIFY EXACT LOCATION OF EXISTING DEVICES BEFORE BEGINNING ANY WORK.

ALTERNATE BID

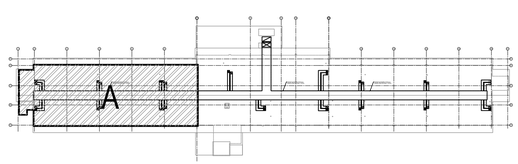
1. IF ROOFING IS NOT TO BE REMOVED AND REPLACED ALL EXISTING DUCT WORK SHALL BE DEMOLISHED. ALL EXISTING DUCT PENETRATIONS SHALL BE CUT ABOVE THE ROOF AND CAPPED IN PLACE. THE CONTRACTOR SHALL CONDUCT THIS WORK WITHOUT DAMAGING THE EXISTING ROOFING. SEE ARCH FOR DETAILS.

A ROOF - EXISTING/DEMOLITION PLAN AIR CONDITIONING AND VENTILATION PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N



KEYPLAN

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04.30.28
No. 18572-M
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

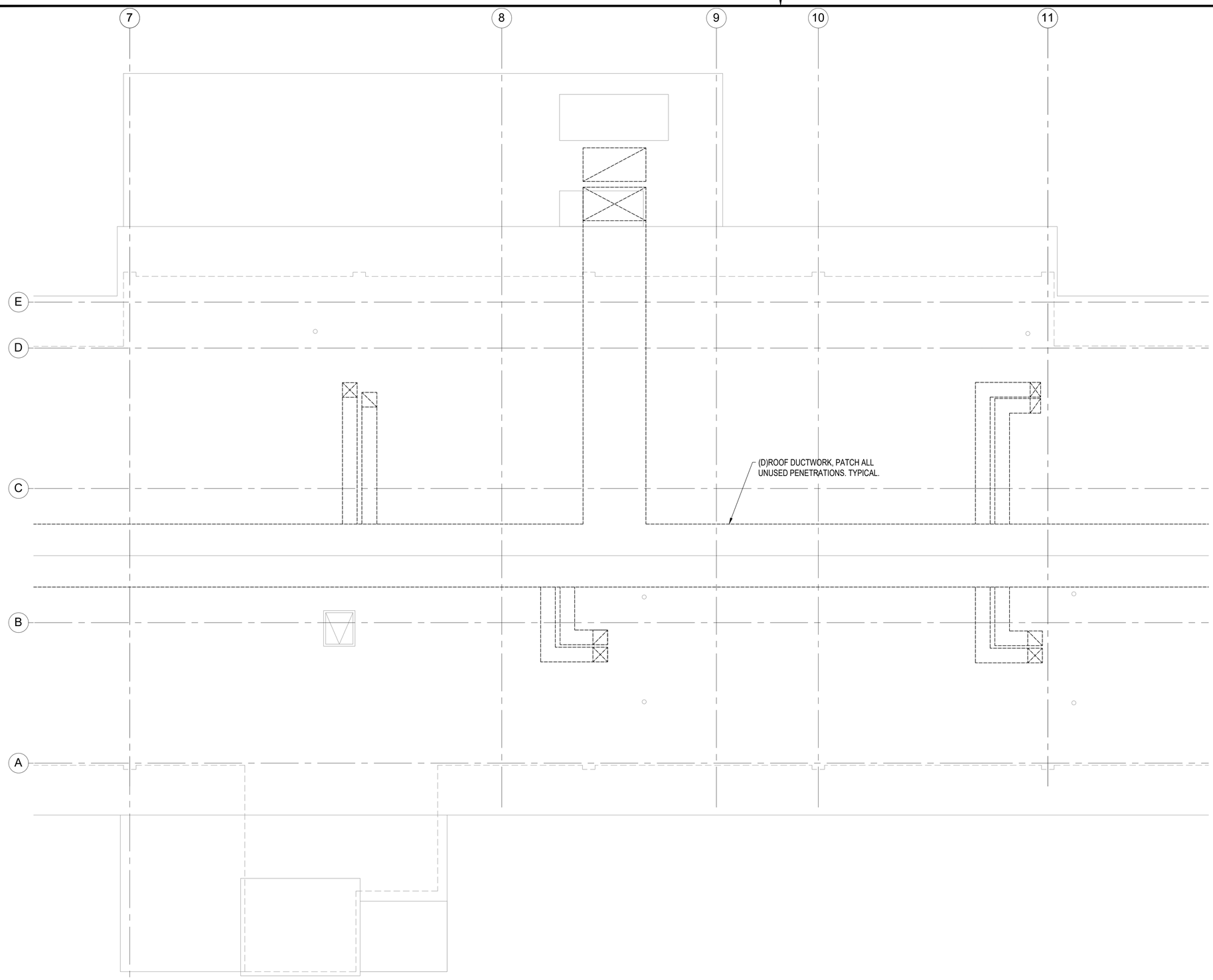
ROOF - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

ENGINEERING PARTNERS		MARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-204A
DESIGNED BY: DH/MC	CHECKED BY: DH/MC		
DRAWN BY: MC	APPROVED BY: EW	DATE JUNE 2026	SHEET 207
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ----

06/03/2026 5:39 pm
M:\ECO PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\MECHANICAL\AM-X - DEMOLITION.DWG



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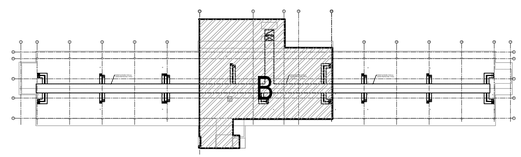

KEYPLAN

A ROOF - EXISTING/DEMOLITION PLAN AIR CONDITIONING AND VENTILATION PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N

ELI B. WALTZ
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Exp. 04/30/28
No. 18572-M
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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ROOF - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

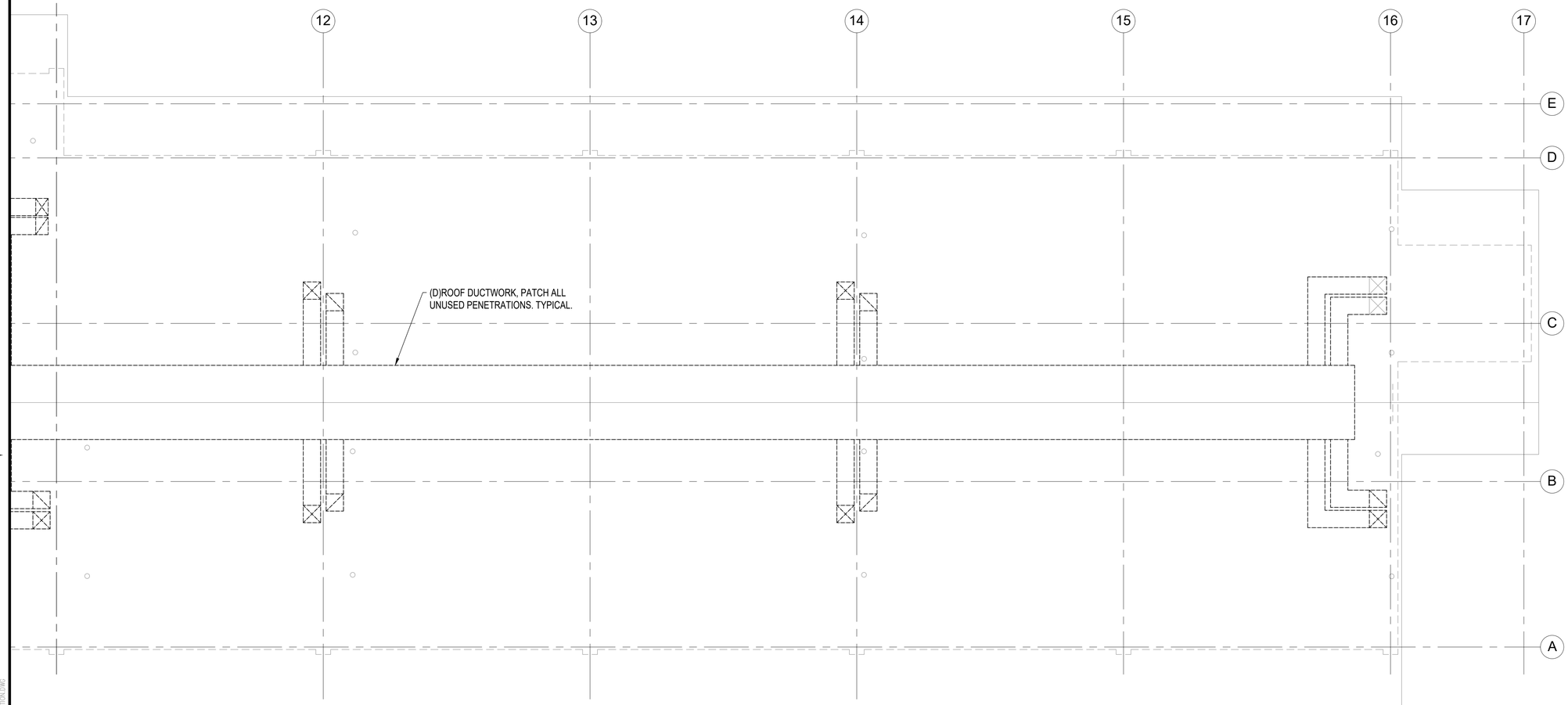
ENGINEERING PARTNERS

DESIGNED BY: DH/MC	CHECKED BY: DH/MC	HAWAII JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-204B
DRAWN BY: MC	APPROVED BY: EW	DATE JUNE 2026	SHEET 208
SCALE: AS NOTED			OF 276 SHTS

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

06/03/2026 5:39 pm
M:\ED PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\MECHANICAL\M4-X - DEMOLITION.DWG



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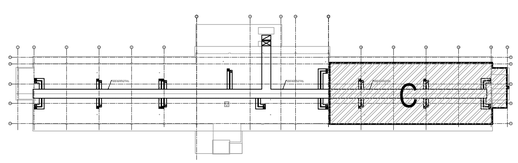
A ROOF - EXISTING/DEMOLITION PLAN AIR CONDITIONING AND VENTILATION PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N



KEYPLAN

ELI B. WALTZ
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Exp. 04/30/28
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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ROOF - EXISTING/DEMOLITION AIR CONDITIONING AND VENTILATION PLAN

ENGINEERING PARTNERS		HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-204C
DESIGNED BY: DH/MC	CHECKED BY: DH/MC		
DRAWN BY: MC	APPROVED BY: EW	DATE JUNE 2026	SHEET 209
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

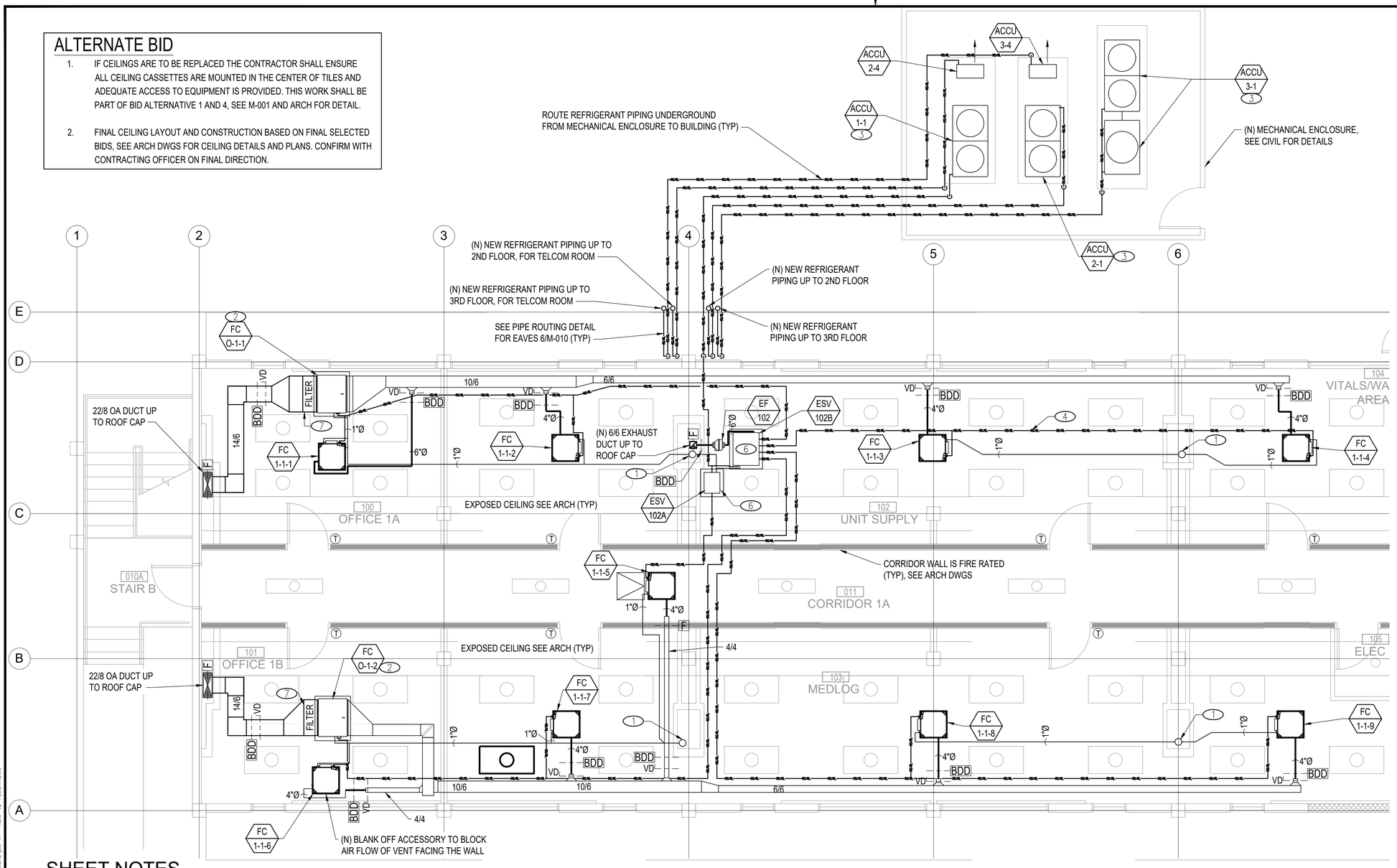
DATE ISSUED: ---

06/02/2026 5:39 pm
M:\JOB PROJECTS\2025 PROJECTS\12018--25--01 DOD BLDG 46 MEDCOM RENOVATIONS\4--DWG\MECHANICAL\AM--X -- DEMOLITION.DWG

ALTERNATE BID

1. IF CEILINGS ARE TO BE REPLACED THE CONTRACTOR SHALL ENSURE ALL CEILING CASSETTES ARE MOUNTED IN THE CENTER OF TILES AND ADEQUATE ACCESS TO EQUIPMENT IS PROVIDED. THIS WORK SHALL BE PART OF BID ALTERNATIVE 1 AND 4, SEE M-001 AND ARCH FOR DETAIL.

2. FINAL CEILING LAYOUT AND CONSTRUCTION BASED ON FINAL SELECTED BIDS, SEE ARCH DWGS FOR CEILING DETAILS AND PLANS. CONFIRM WITH CONTRACTING OFFICER ON FINAL DIRECTION.



GENERAL NOTES

1. ALL THERMOSTATS SHALL BE MOUNTED AT MAX. +48" A.F.F. TO THE TOP OF CONTROL DEVICE PLATE. INSTALLATION AND MOUNTING HEIGHTS SHALL CONFORM TO ADAAG 2010.
2. PROVIDE JACKETING FOR ALL OUTDOOR MOUNTED INSULATED PIPING. PAINT TO MATCH FINISH COLOR OF ADJACENT SUBSTRATE.
3. ALL NEW PENETRATIONS SHALL BE SCANNED BEFORE WORK BEGINS FOR REBAR AND STRUCTURAL COMPONENTS. ALL REBAR AND STRUCTURAL COMPONENTS SHALL NOT BE ALTERED.
4. POWER SHALL BE COORDINATED WITH AND PROVIDED BY THE ELECTRICAL CONTRACTOR.
5. ALL RECESSED THERMOSTATS/CONTROLLERS SHALL BE PROVIDED WITH A 1" CONDUIT 6" STUB OUT ABOVE WALL FOR FUTURE BACNET CONNECTIONS.
6. ALL THERMOSTATS/CONTROLLERS MOUNTED ON CMU/CONCRETE WALLS SHALL BE PROVIDED WITH A JUNCTION BOX AND WIREMOLDING TO PROTECT THE CONTROL WIRING AND FUTURE BACNET CONNECTION
7. REFRIGERANT SYSTEM SHALL USE A2L REFRIGERANTS COMPLYING WITH ASHRAE 15 AND AS NOTED ON SHEET M-001.
8. ALL PIPE AND DUCT PENETRATIONS THROUGH FIRE/SMOKE RATED ASSEMBLY SHALL BE FIRE STOPPED TO MAINTAIN FIRE/SMOKE RATING OF THE ASSEMBLY.
9. PROVIDE CONDENSATION PIPING WITH CLEANOUTS FOR ALL CHANGES IN DIRECTIONS FOR CONDENSATE PIPING. CONDENSATE PIPING SHALL BE MINIMUM 1" INNER DIAMETER.

SHEET NOTES

1. CONDENSATE TO AIR GAP, SEE PLUMBING DWGS.
2. PROVIDE SECONDARY DRAIN PAN. PROVIDE MOISTURE SENSOR IN PAN, WIRE UNIT SUCH THAT FAN COIL SHUTS DOWN UPON DETECTION OF MOISTURE.
3. 6" THICK CONCRETE MAINTENANCE PAD. EXTEND 6" MIN. AROUND ALL UNITS ON ALL SIDE, SLOPE TO REPEL WATER.
4. REFRIG PIPING ABOVE CEILING., CONSULT WITH MFR. FOR SIZING AND INSTALLATION (TYP.)
5. NEW CONDENSATION DRY WELL, SEE DETAIL 3/M-009.
6. PROVIDE SECONDARY DRAIN PAN FOR EMERGENCY SHUTOFF VALVE BOX. PROVIDE MOISTURE SENSOR IN PAN, WIRE UNIT SUCH THAT BRANCH BOX SHUTS DOWN AND CLOSES VALVES UPON DETECTION OF MOISTURE.
7. PRE-FABRICATED MERV 13 FILTER BOX.

A FIRST FLOOR - EXISTING/NEW AIR CONDITIONING AND VENTILATION PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N

KEYPLAN

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

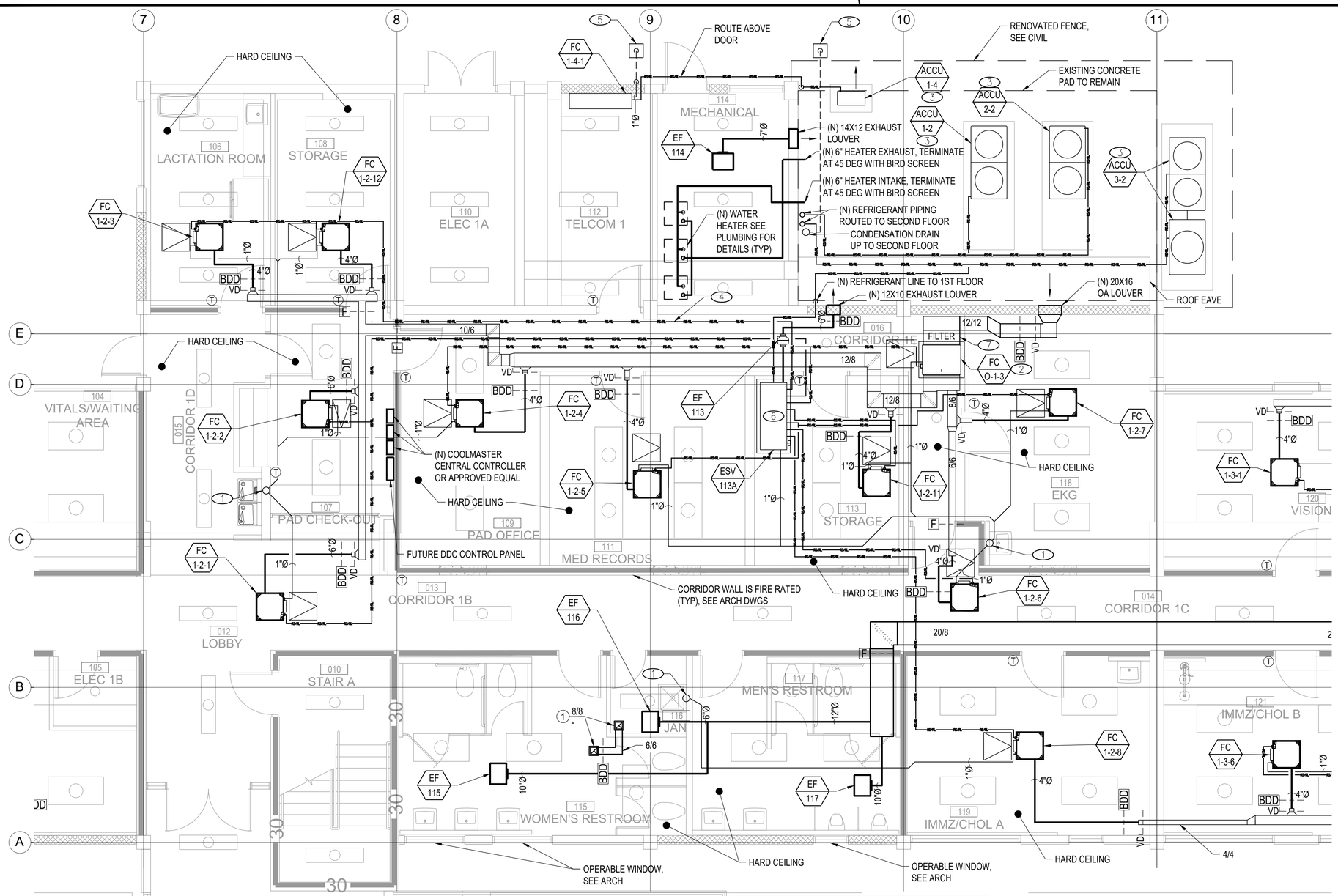
FIRST FLOOR - EXISTING/NEW AIR CONDITIONING AND VENTILATION CEILING PLAN

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-301A
DESIGNED BY: DH/MC	CHECKED BY: DH/MC		
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 210 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ____

06/03/2026 5:38 pm
M:\JOB PROJECTS\2025 PROJECTS\120188-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\MECHANICAL\SM-X - NEW-V2-FLOOR1.DWG



GENERAL NOTES

1. ALL THERMOSTATS SHALL BE MOUNTED AT MAX. +48" A.F.F. TO THE TOP OF CONTROL DEVICE PLATE. INSTALLATION AND MOUNTING HEIGHTS SHALL CONFORM TO ADAAG 2010.
2. PROVIDE JACKETING FOR ALL OUTDOOR MOUNTED INSULATED PIPING. PAINT TO MATCH FINISH COLOR OF ADJACENT SUBSTRATE.
3. ALL NEW PENETRATIONS SHALL BE SCANNED BEFORE WORK BEGINS FOR REBAR AND STRUCTURAL COMPONENTS. ALL REBAR AND STRUCTURAL COMPONENTS SHALL NOT BE ALTERED.
4. POWER SHALL BE COORDINATED WITH AND PROVIDED BY THE ELECTRICAL CONTRACTOR.
5. ALL RECESSED THERMOSTATS/CONTROLLERS SHALL BE PROVIDED WITH A 1" CONDUIT 6" STUB OUT ABOVE WALL FOR FUTURE BACNET CONNECTIONS.
6. ALL THERMOSTATS/CONTROLLERS MOUNTED ON CMU/CONCRETE WALLS SHALL BE PROVIDED WITH A JUNCTION BOX AND WIREMOLDING TO PROTECT THE CONTROL WIRING AND FUTURE BACNET CONNECTION
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8. ALL PIPE AND DUCT PENETRATIONS THROUGH FIRE/SMOKE RATED ASSEMBLY SHALL BE FIRE STOPPED TO MAINTAIN FIRE/SMOKE RATING OF THE ASSEMBLY.
9. PROVIDE CONDENSATION PIPING WITH CLEANOUTS FOR ALL CHANGES IN DIRECTIONS FOR CONDENSATE PIPING. CONDENSATE PIPING SHALL BE MINIMUM 1" INNER DIAMETER.

ALTERNATE BID

1. IF CEILINGS ARE TO BE REPLACED THE CONTRACTOR SHALL ENSURE ALL CEILING CASSETTES ARE MOUNTED IN THE CENTER OF TILES AND ADEQUATE ACCESS TO EQUIPMENT IS PROVIDED. THIS WORK SHALL BE PART OF BID ALTERNATIVE 1 AND 4, SEE M-001 AND ARCH FOR DETAIL.
2. FINAL CEILING LAYOUT AND CONSTRUCTION BASED ON FINAL SELECTED BIDS, SEE ARCH DWGS FOR CEILING DETAILS AND PLANS. CONFIRM WITH CONTRACTING OFFICER ON FINAL DIRECTION.

SHEET NOTES

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2. PROVIDE SECONDARY DRAIN PAN. PROVIDE MOISTURE SENSOR IN PAN, WIRE UNIT SUCH THAT FAN COIL SHUTS DOWN UPON DETECTION OF MOISTURE.
3. 6" THICK CONCRETE MAINTENANCE PAD. EXTEND 6" MIN. AROUND ALL UNITS ON ALL SIDE, SLOPE TO REPEL WATER.
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5. NEW CONDENSATION DRY WELL, SEE DETAIL 3/M-009.
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7. PRE-FABRICATED MERV 13 FILTER BOX.

KEYPLAN

A FIRST FLOOR - EXISTING/NEW AIR CONDITIONING AND VENTILATION PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH
TRUE N

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

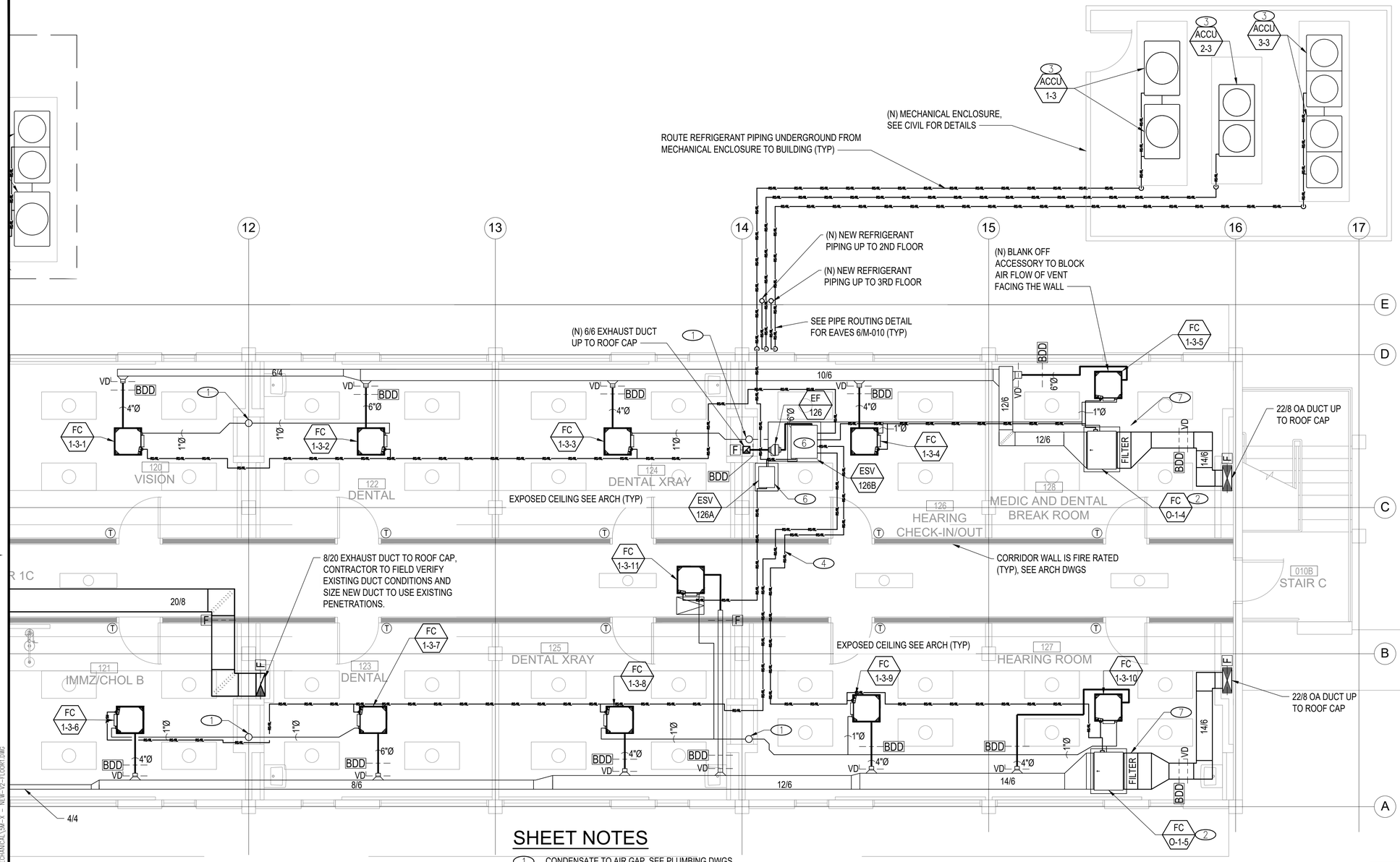
FIRST FLOOR - EXISTING/NEW AIR CONDITIONING AND VENTILATION CEILING PLAN

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-301B
DESIGNED BY: DH/MC	CHECKED BY: DH/MC		
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 211 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/03/2026 5:39 pm
M:\ED PROJECTS\2025 PROJECTS\2018--25--01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\MECHANICAL\5M--X -- NEW--V2--FLOOR1.DWG



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A FIRST FLOOR - EXISTING/NEW AIR CONDITIONING AND VENTILATION PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N

KEYPLAN

ELI B. WALTZ
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Exp. 04/30/28
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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

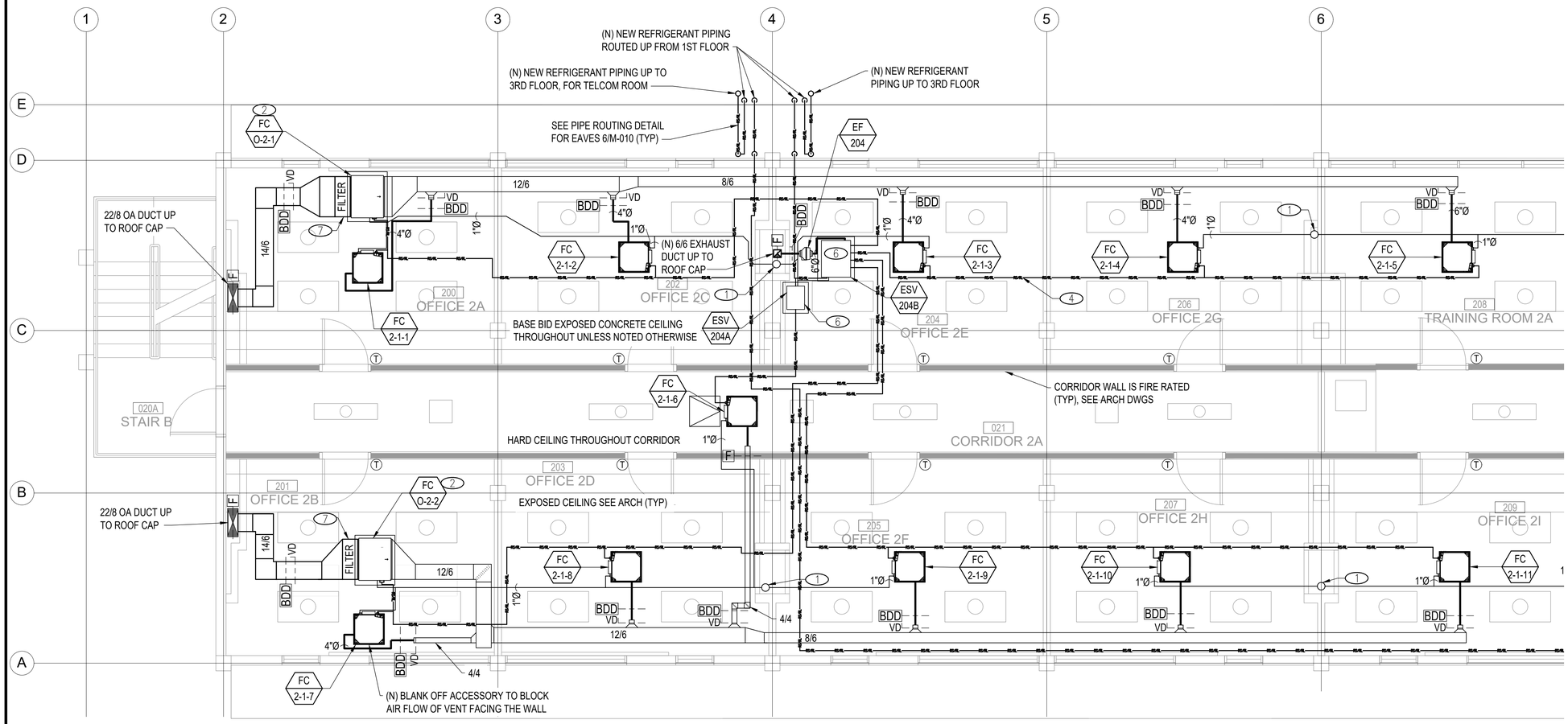
FIRST FLOOR - EXISTING/NEW AIR CONDITIONING AND VENTILATION CEILING PLAN

ENGINEERING PARTNERS		HARING JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-301C
DESIGNED BY: DH/MC	CHECKED BY: DH/MC		
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 212
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ----

06/03/2026 5:39 pm
M:\ED PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\MECHANICAL\SM-X - NEW-V2-FLOOR1.DWG



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9. PROVIDE CONDENSATION PIPING WITH CLEANOUTS FOR ALL CHANGES IN DIRECTIONS FOR CONDENSATE PIPING. CONDENSATE PIPING SHALL BE MINIMUM 1" INNER DIAMETER.

ALTERNATE BID

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2. FINAL CEILING LAYOUT AND CONSTRUCTION BASED ON FINAL SELECTED BIDS, SEE ARCH DWGS FOR CEILING DETAILS AND PLANS. CONFIRM WITH CONTRACTING OFFICER ON FINAL DIRECTION.

SHEET NOTES

1. CONDENSATE TO AIR GAP, SEE PLUMBING DWGS.
2. PROVIDE SECONDARY DRAIN PAN. PROVIDE MOISTURE SENSOR IN PAN, WIRE UNIT SUCH THAT FAN COIL SHUTS DOWN UPON DETECTION OF MOISTURE.
3. 6" THICK CONCRETE MAINTENANCE PAD. EXTEND 6" MIN. AROUND ALL UNITS ON ALL SIDE, SLOPE TO REPEL WATER.
4. REFRIG PIPING ABOVE CEILING., CONSULT WITH MFR. FOR SIZING AND INSTALLATION (TYP.)
5. NEW CONDENSATION DRY WELL, SEE DETAIL 3/M-009.
6. PROVIDE SECONDARY DRAIN PAN FOR EMERGENCY SHUTOFF VALVE BOX. PROVIDE MOISTURE SENSOR IN PAN, WIRE UNIT SUCH THAT BRANCH BOX SHUTS DOWN AND CLOSES VALVES UPON DETECTION OF MOISTURE.
7. PRE-FABRICATED MERV 13 FILTER BOX.

A SECOND FLOOR - EXISTING/NEW AIR CONDITIONING AND VENTILATION PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N

KEYPLAN

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

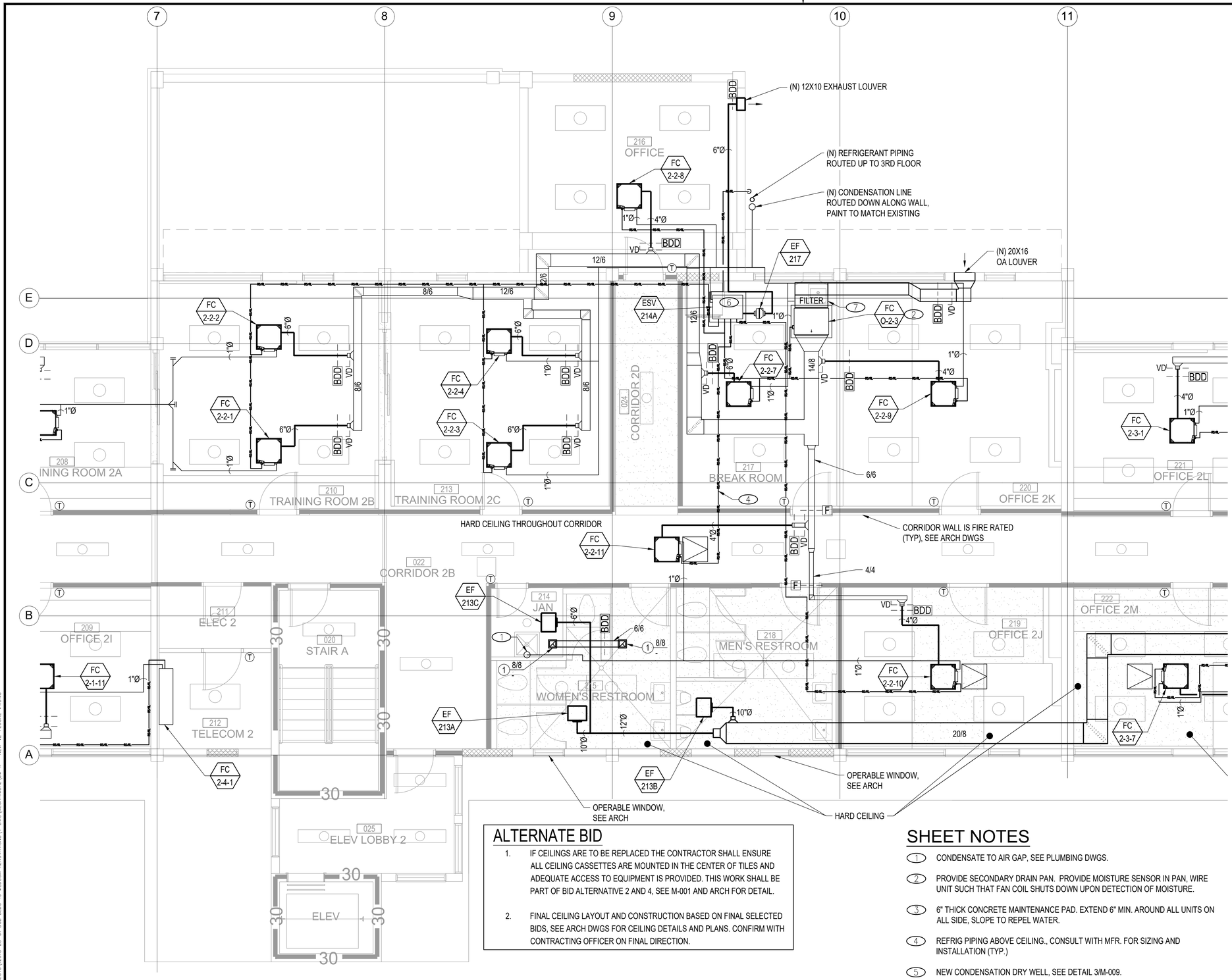
SECOND FLOOR - EXISTING/NEW AIR CONDITIONING AND VENTILATION CEILING PLAN

ENGINEERING PARTNERS		HAWAII JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-302A
DESIGNED BY: DH/MC	CHECKED BY: DH/MC		
DRAWN BY: MC	APPROVED BY: EW	DATE JUNE 2026	SHEET 213 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ----

06/03/2026 5:38 pm
M:\ED PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\MECHANICAL\5M-X - NEW-V2-FLOOR2 V4.DWG



ALTERNATE BID

1. IF CEILINGS ARE TO BE REPLACED THE CONTRACTOR SHALL ENSURE ALL CEILING CASSETTES ARE MOUNTED IN THE CENTER OF TILES AND ADEQUATE ACCESS TO EQUIPMENT IS PROVIDED. THIS WORK SHALL BE PART OF BID ALTERNATIVE 2 AND 4, SEE M-001 AND ARCH FOR DETAIL.
2. FINAL CEILING LAYOUT AND CONSTRUCTION BASED ON FINAL SELECTED BIDS, SEE ARCH DWGS FOR CEILING DETAILS AND PLANS. CONFIRM WITH CONTRACTING OFFICER ON FINAL DIRECTION.

SHEET NOTES

1. CONDENSATE TO AIR GAP, SEE PLUMBING DWGS.
2. PROVIDE SECONDARY DRAIN PAN. PROVIDE MOISTURE SENSOR IN PAN, WIRE UNIT SUCH THAT FAN COIL SHUTS DOWN UPON DETECTION OF MOISTURE.
3. 6" THICK CONCRETE MAINTENANCE PAD. EXTEND 6" MIN. AROUND ALL UNITS ON ALL SIDE, SLOPE TO REPEL WATER.
4. REFRIG PIPING ABOVE CEILING., CONSULT WITH MFR. FOR SIZING AND INSTALLATION (TYP.)
5. NEW CONDENSATION DRY WELL, SEE DETAIL 3/M-009.
6. PROVIDE SECONDARY DRAIN PAN FOR EMERGENCY SHUTOFF VALVE BOX. PROVIDE MOISTURE SENSOR IN PAN, WIRE UNIT SUCH THAT BRANCH BOX SHUTS DOWN AND CLOSES VALVES UPON DETECTION OF MOISTURE.
7. PRE-FABRICATED MERV 13 FILTER BOX.

GENERAL NOTES

1. ALL THERMOSTATS SHALL BE MOUNTED AT MAX. +48" A.F.F. TO THE TOP OF CONTROL DEVICE PLATE. INSTALLATION AND MOUNTING HEIGHTS SHALL CONFORM TO ADAAG 2010.
2. PROVIDE JACKETING FOR ALL OUTDOOR MOUNTED INSULATED PIPING. PAINT TO MATCH FINISH COLOR OF ADJACENT SUBSTRATE.
3. ALL NEW PENETRATIONS SHALL BE SCANNED BEFORE WORK BEGINS FOR REBAR AND STRUCTURAL COMPONENTS. ALL REBAR AND STRUCTURAL COMPONENTS SHALL NOT BE ALTERED.
4. POWER SHALL BE COORDINATED WITH AND PROVIDED BY THE ELECTRICAL CONTRACTOR.
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8. ALL PIPE AND DUCT PENETRATIONS THROUGH FIRE/SMOKE RATED ASSEMBLY SHALL BE FIRE STOPPED TO MAINTAIN FIRE/SMOKE RATING OF THE ASSEMBLY.
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0 4' 8'

NORTH TRUE-N

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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAI'I

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

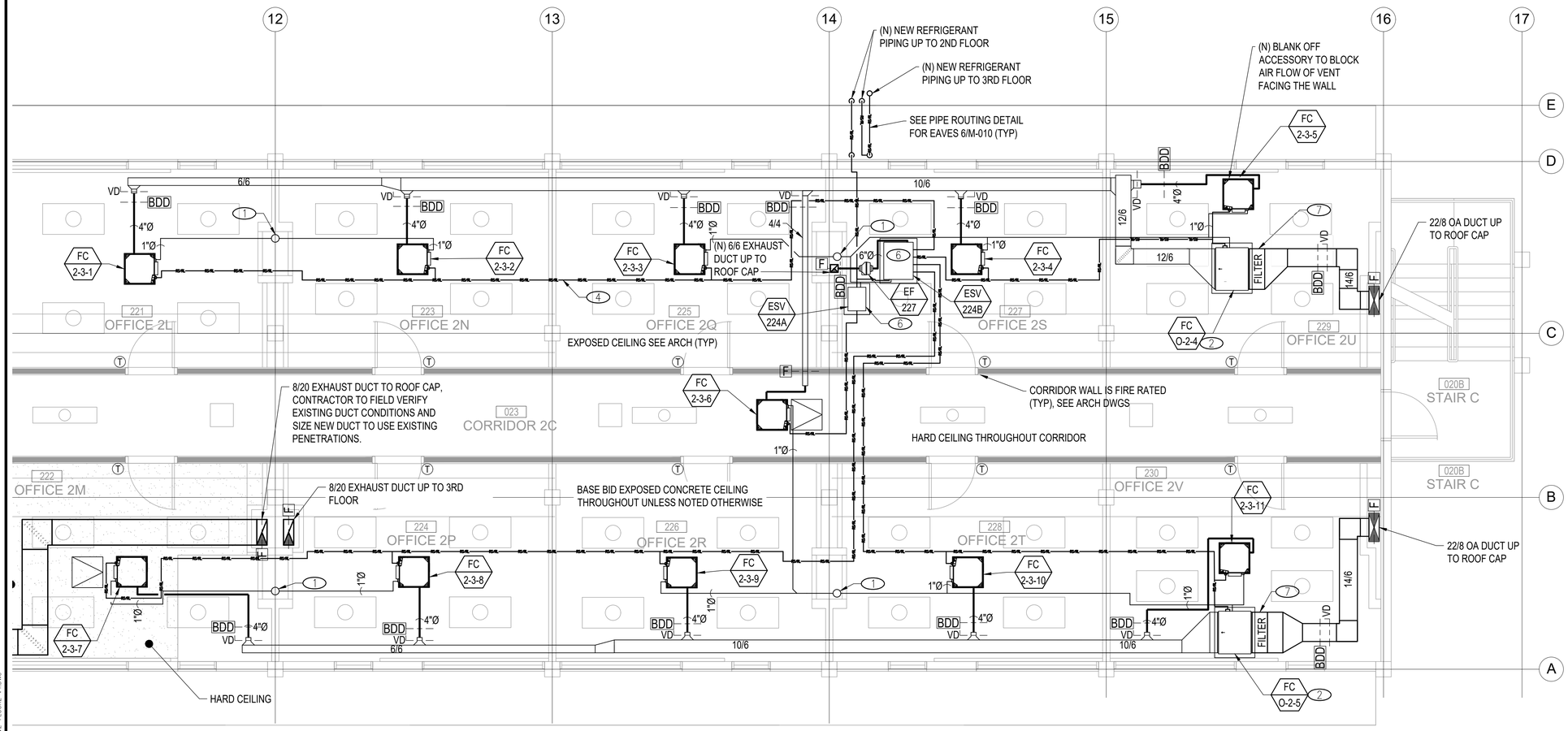
SECOND FLOOR - EXISTING/NEW AIR CONDITIONING AND VENTILATION CEILING PLAN

ENGINEERING PARTNERS		HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-302B
DESIGNED BY: DH/MC	CHECKED BY: DH/MC		
DRAWN BY: MC	APPROVED BY: EW	DATE: JUNE 2026	SHEET 214 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/03/2026 5:39 pm
M:\JOB PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\MECHANICAL\SM-X - NEW-V2-FLOOR2 V4.DWG



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STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

SECOND FLOOR - EXISTING/NEW AIR CONDITIONING AND VENTILATION CEILING PLAN

ENGINEERING PARTNERS		HARNG JOB NO, FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-302C
DESIGNED BY: DH/MC	CHECKED BY: DH/MC		
DRAWN BY: MC	APPROVED BY: EW	DATE	SHEET 215
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

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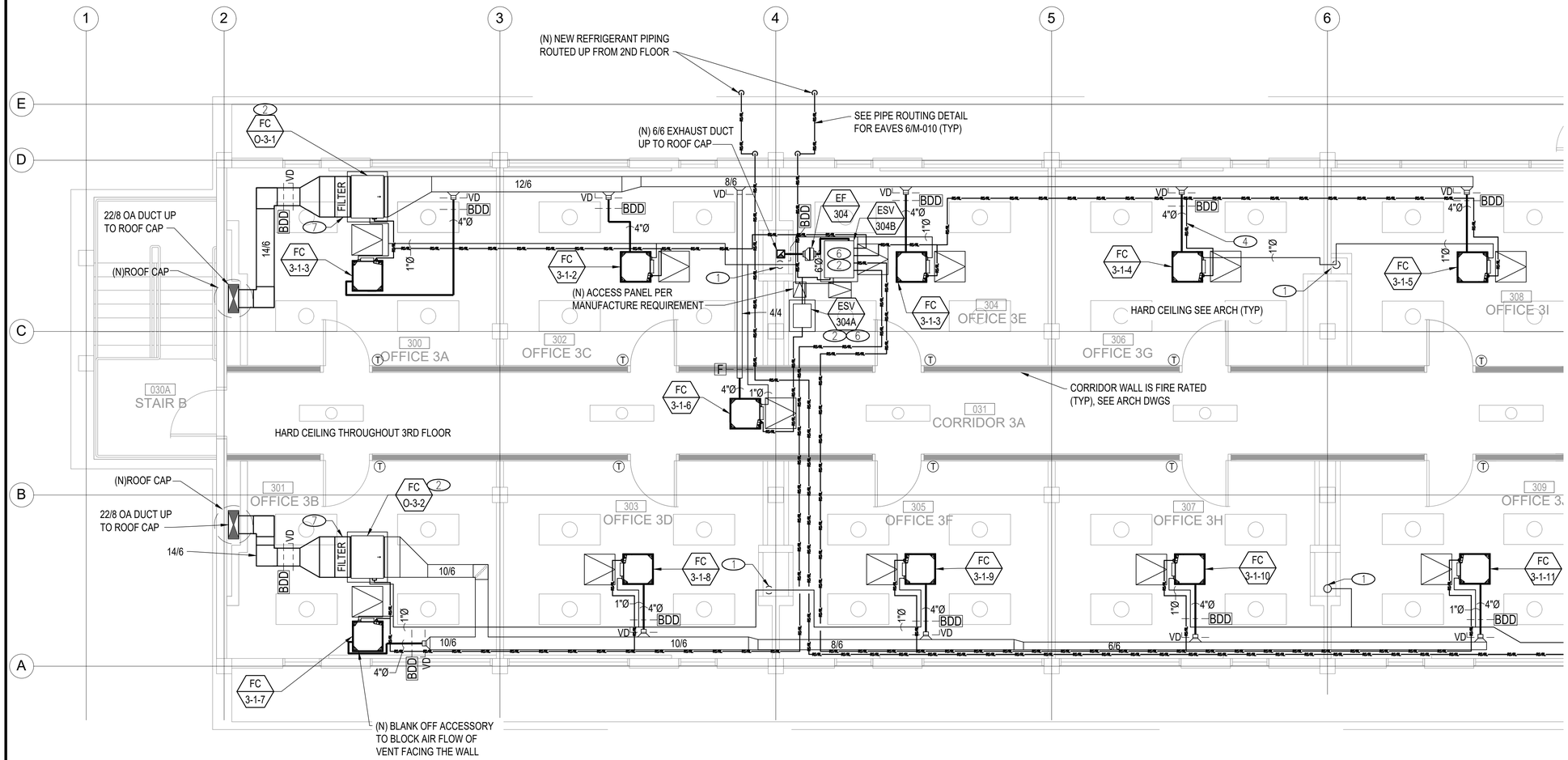
M:\ED PROJECTS\2025 PROJECTS\12018--25--01 DOD BLDG 46 MEDCOM RENOVATIONS\4--DWG\MECHANICAL\5M--X -- NEW--V2--FLOOR2 14.DWG



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THIRD FLOOR - EXISTING/NEW AIR CONDITIONING AND VENTILATION CEILING PLAN

ENGINEERING PARTNERS		HAWAII JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-303A
DESIGNED BY: DH/MC	CHECKED BY: DH/MC		
DRAWN BY: MC	APPROVED BY: EW	DATE JUNE 2026	SHEET 216 OF 276 SHTS
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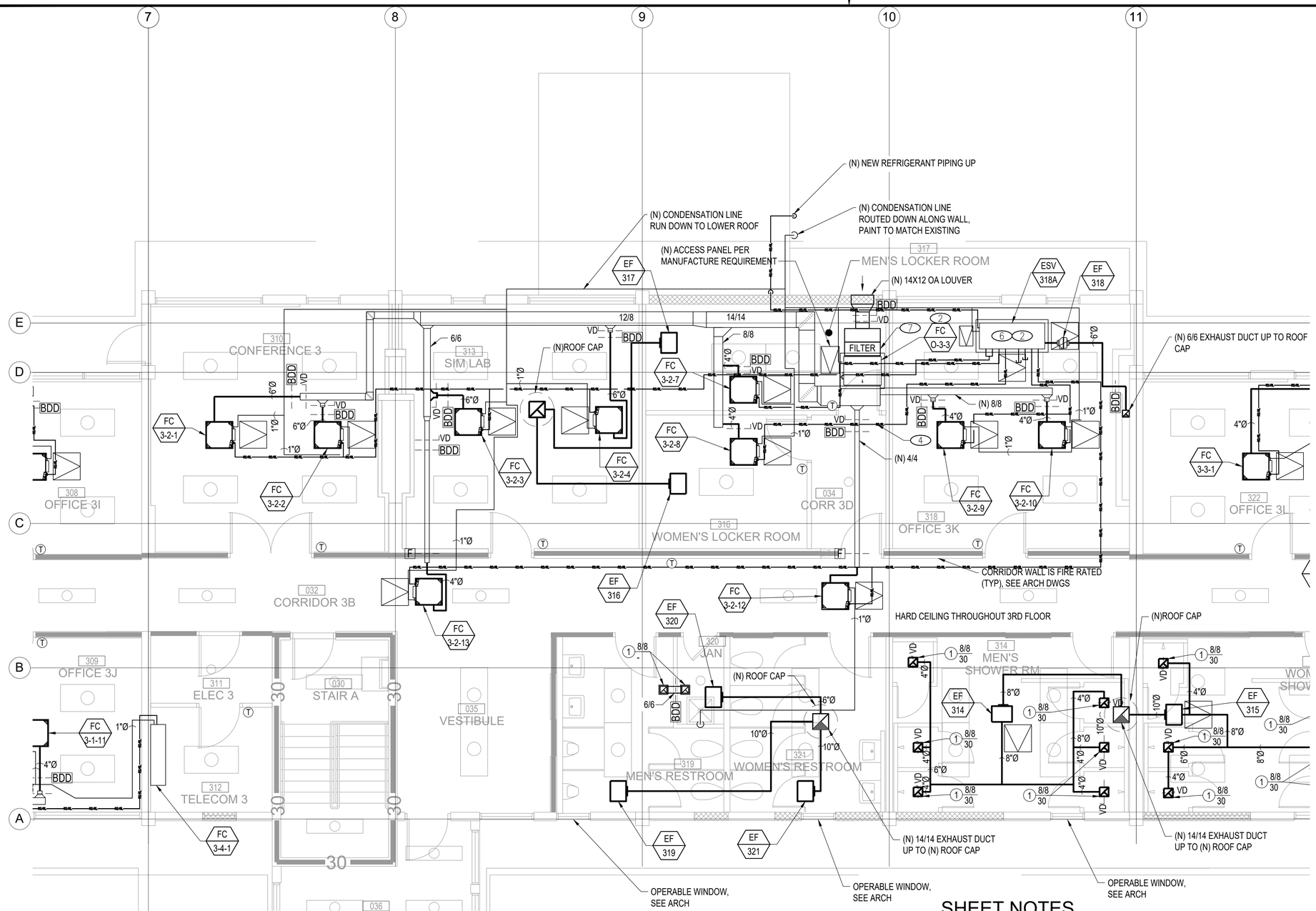
M:\LEO PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\MECHANICAL\3M-X - NEW-V2-FLOOR3.DWG



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ENGINEERING PARTNERS		HAWAII JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-303B
DESIGNED BY: DH/MC	CHECKED BY: DH/MC		
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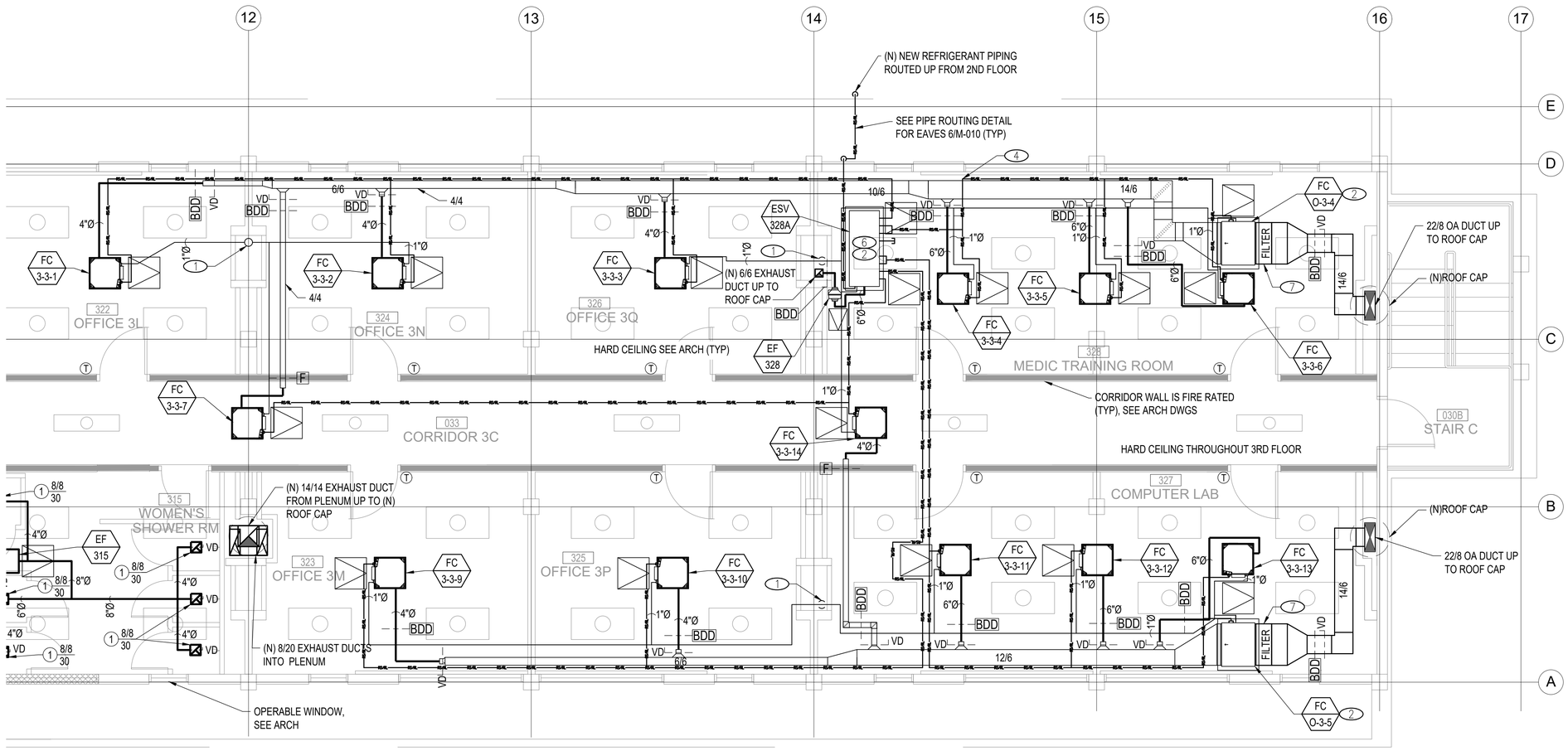

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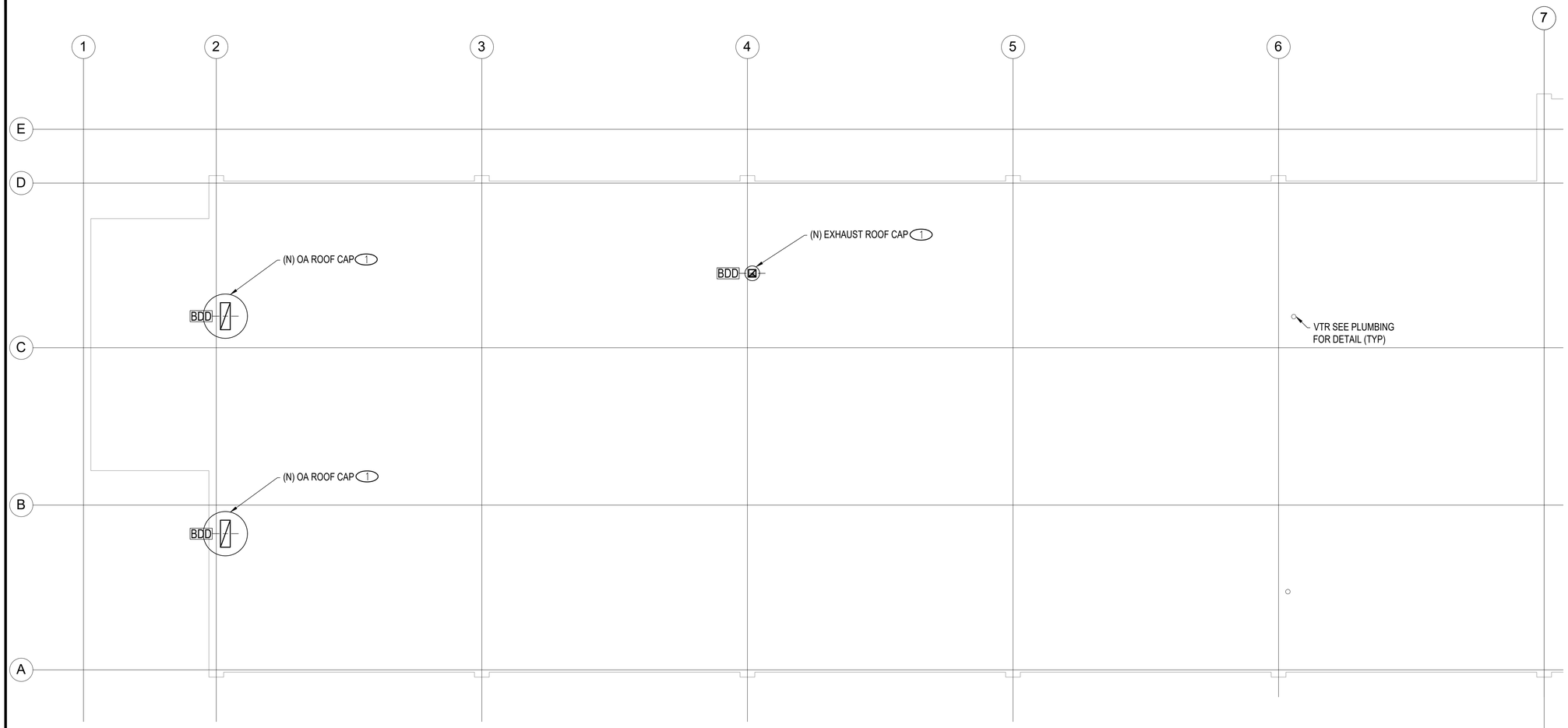

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2. ALL EXHAUST OUTLETS SHALL BE A MINIMUM 12 FEET AWAY FROM ALL INTAKES INTO THE BUILDING INCLUDING BUT NOT LIMITED TO FRESH AIR INTAKES, WINDOWS, DOORS, ETC.
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1. ALTERNATIVES WORK SHALL BE BASED ON THE SELECTION OF ALTERNATIVE BID 7 SEE M-001 AND ARCH FOR DETAIL.
2. IF ROOFING IS NOT REMOVED AND REPLACED, ALL DUCTS PENETRATIONS SHALL BE CUT ABOVE THE ROOF LEVEL AND CAPPED WITH A SHEET METAL CAP AND SEALED TO BE WATER TIGHT. THE CONTRACTOR SHALL NOT ALTER THE EXISTING ROOF TO INSTALL SHEET METAL CAPS.
3. ALL NEW ROOF INTAKE CAPS SHALL BE INSTALLED AS NEEDED, THE ROOFING AROUND THE NEW CAPS SHALL BE REPAIRED AND MADE WATER TIGHT.
4. IF NEW ROOFING IS INSTALLED ALL DUCTING SHALL BE DEMOLISHED BELOW THE ROOF LEVEL. NEW BLOCKING AND A PIECE OF SHEET METAL SHALL BE PLACED FLUSH WITH THE ROOF AND SHALL BE COMPLETELY WATER PROOF. THE SHEET METAL SHALL BE ROOFED OVER, ALL WORK SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR.

SHEET NOTES

1 ROUTE DUCT THROUGH EXISTING DUCT PENETRATION

A ROOF - EXISTING/NEW PLAN AIR CONDITIONING AND VENTILATION PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH

TRUE N

KEYPLAN

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-M
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

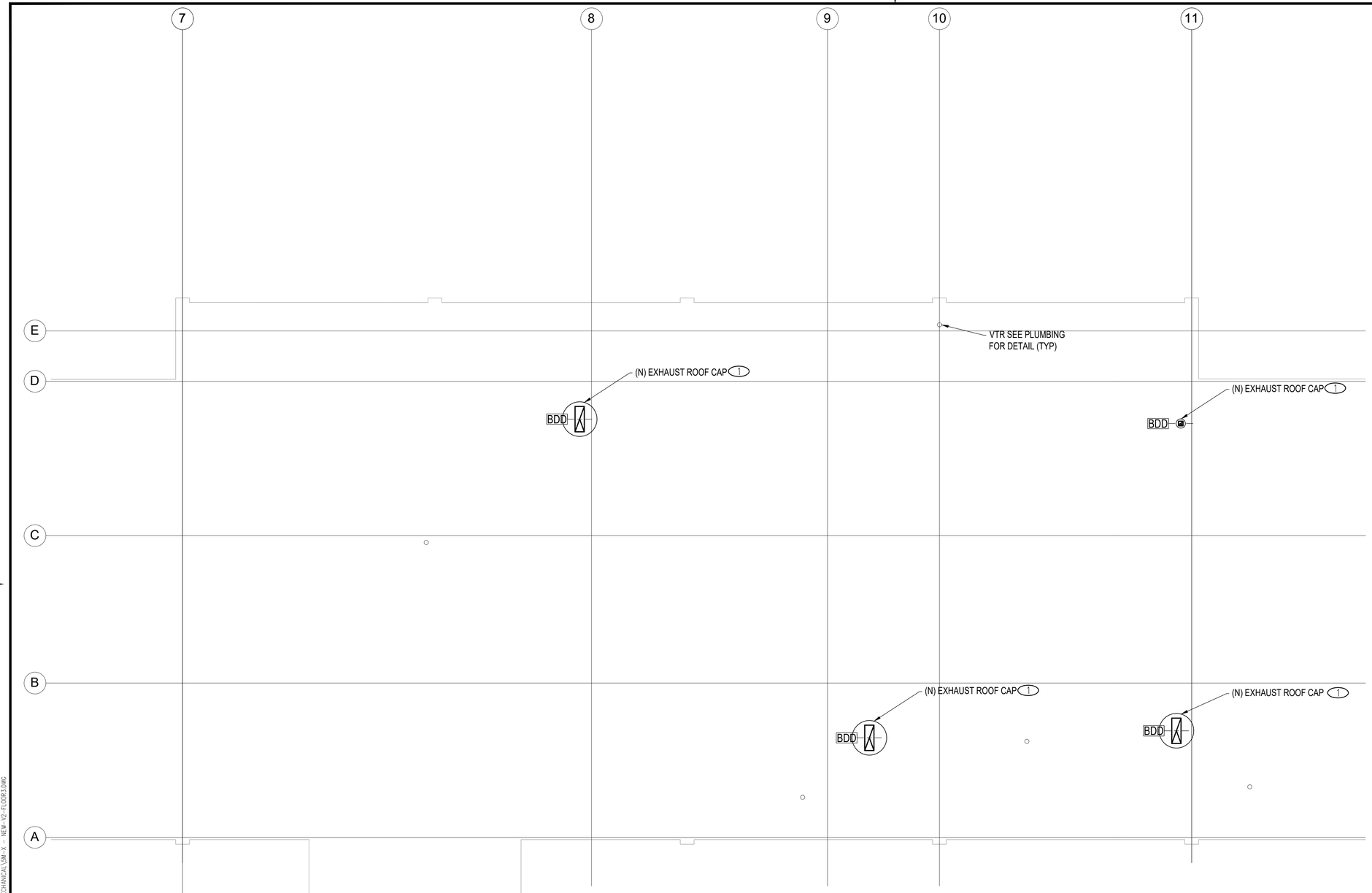
ROOF - EXISTING/NEW AIR CONDITIONING AND VENTILATION PLAN

ENGINEERING PARTNERS		HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-304A
DESIGNED BY: DH/MC	CHECKED BY: DH/MC		
DRAWN BY: MC	APPROVED BY: EW	DATE	SHEET 219
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

06/03/2026 5:39 pm
M:\CO_PROJECTS\2025_PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\MEP\HANICAL\SM-X - NEW-V2-FLOOR3.DWG



A ROOF - EXISTING/NEW PLAN AIR CONDITIONING AND VENTILATION PLAN

SCALE: 1/4" = 1'-0"

0 4' 8'

NORTH TRUE N

GENERAL NOTES

1. ALL NEW PENETRATIONS SHALL BE SCANNED BEFORE WORK BEGINS FOR REBAR AND STRUCTURAL COMPONENTS. ALL REBAR AND STRUCTURAL COMPONENTS SHALL NOT BE ALTERED.
2. ALL EXHAUST OUTLETS SHALL BE A MINIMUM 12 FEET AWAY FROM ALL INTAKES INTO THE BUILDING INCLUDING BUT NOT LIMITED TO FRESH AIR INTAKES, WINDOWS, DOORS, ETC.
3. ALL PIPE AND DUCT PENETRATIONS THROUGH FIRE/SMOKE RATED ASSEMBLY SHALL BE FIRE STOPPED TO MAINTAIN FIRE/SMOKE RATING OF THE ASSEMBLY.

ALTERNATE BID

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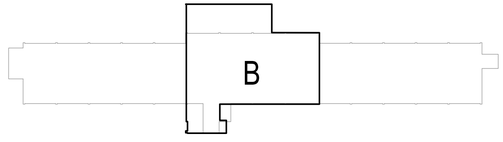

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BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ROOF - EXISTING/NEW AIR CONDITIONING AND VENTILATION PLAN

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. M-304B
DH/MC	DH/MC		
DRAWN BY: MC	APPROVED BY: EW	DATE	SHEET 220
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/03/2026 5:38 pm
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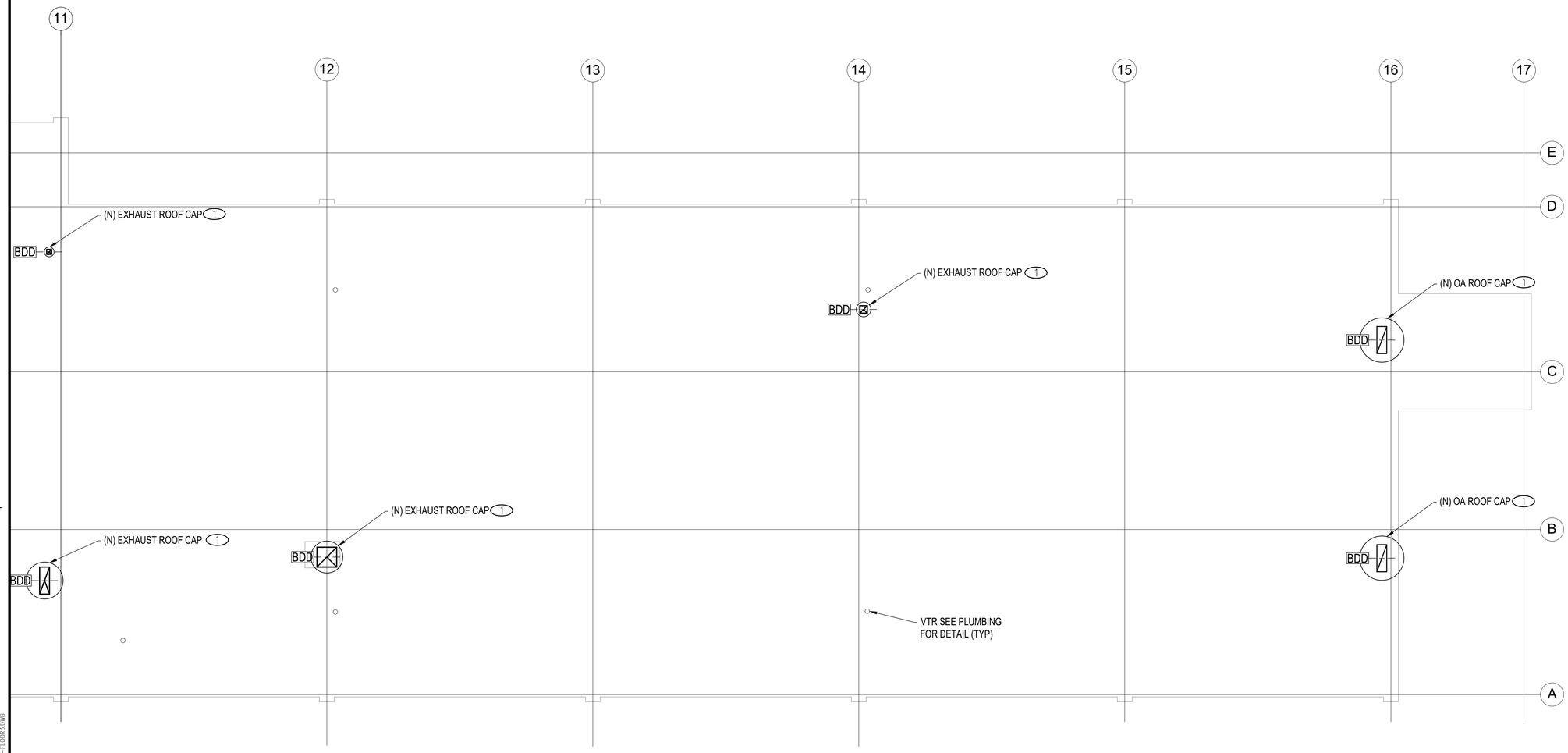

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STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ROOF - EXISTING/NEW AIR CONDITIONING AND VENTILATION PLAN

ENGINEERING PARTNERS

DESIGNED BY: DH/MC	CHECKED BY: DH/MC	HIARNG JOB NO, FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. M-304C
DRAWN BY: MC	APPROVED BY: EW	DATE	SHEET 221
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

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M:\ED PROJECTS\2025 PROJECTS\12018--25--01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\MECHANICAL\M-X - NEW-V2-FLOOR3.DWG

GENERAL ELECTRICAL SPECIFICATIONS

1. CONTRACTOR SHALL COMPLY WITH VERSION OF NFPA 70 CURRENTLY ADOPTED AND ENFORCED BY THE AUTHORITY HAVING JURISDICTION.
2. DO NOT SCALE DRAWINGS. VERIFY DIMENSIONS IN FIELD PRIOR TO BID.
3. THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC IN NATURE. ROUTE CONDUITS AND LOCATE EQUIPMENT BASED ON THE INTENT IDENTIFIED ON DRAWINGS, MODIFY TO SUITE FIELD CONDITIONS. PROVIDE ALL CONDUITS, FITTINGS, BOXES, WIRING, CONDUIT SEALS, ETC., AS REQUIRED FOR COMPLETION OF THE RACEWAY SYSTEM IN COMPLIANCE WITH THE NEC AND THE CONTRACT DOCUMENTS. CONTRACTOR SHALL ACCOMMODATE FOR UPSIZED CONDUCTORS DUE TO VOLTAGE DROP VIA CABLE REDUCERS OR JUNCTION BOXES.
4. FINAL CONNECTIONS & ROUGH-IN REQUIREMENTS TO EQUIPMENT SHALL BE PER MANUFACTURER'S APPROVED WIRING DIAGRAMS, DETAILS AND INSTRUCTIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE MATERIALS AND EQUIPMENT COMPATIBLE WITH EQUIPMENT ACTUALLY SUPPLIED.
5. CONTRACTOR SHALL REVIEW DRAWINGS AND SPECIFICATIONS BY ALL OTHER DIVISIONS. ELECTRICAL WORK NOTED OR OTHERWISE REQUIRED UNDER OTHER DIVISIONS SHALL BE REVIEWED AND INCLUDED UNDER THE ELECTRICAL CONTRACTOR'S SCOPE.
6. CONTRACTOR SHALL VISIT SITE AND VERIFY EXISTING CONDITIONS PRIOR TO BID. ALL COSTS REQUIRED TO ACCOMMODATE EXISTING CONDITIONS SHALL BE INCLUDED IN THE CONTRACTOR'S BID. NO ADDITIONAL ALLOWANCE AFTER BID WILL BE CONSIDERED DUE TO LACK OF SUCH DUE DILIGENCE OR FIELD EXAMINATION.
7. WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.
8. WORK, MATERIALS AND EQUIPMENT SHALL CONFORM TO THE LATEST EDITIONS OF LOCAL, STATE AND NATIONAL CODES AND ORDINANCES, OR THOSE CURRENTLY ADOPTED BY THE LOCAL JURISDICTION.
9. ALL ELECTRICAL SYSTEMS COMPONENTS SHALL BE LISTED OR LABELED BY U.L. OR OTHER RECOGNIZED TESTING FACILITY.
10. PROVIDE PERMITS AND INSPECTIONS REQUIRED.
11. PREPARE SUBMITTALS FOR ALL PRODUCTS TO BE FURNISHED BY THE CONTRACTOR, INCLUDING BUT NOT LIMITED TO EQUIPMENT, RACEWAYS AND BOXES, WIRING, LIGHT FIXTURES, AND SIMILAR ITEMS. SHOULD CONTRACTOR PROCEED WITH ORDERING OR INSTALLING PRODUCTS PRIOR TO SUBMITTAL REVIEW, ALL COSTS REQUIRED TO MODIFY OR REPLACE SUCH PRODUCTS SHALL BE BORNE BY THE CONTRACTOR. THE PROPOSED USE OF ITEMS SPECIFIED ON THESE DRAWINGS DOES NOT ALLEVIATE THE CONTRACTOR FROM ITS RESPONSIBILITY TO PREPARE SUBMITTALS.
17. SYSTEMS SHALL BE COMPLETE, OPERABLE AND READY FOR CONTINUOUS OPERATION. GUARANTEE THE INSTALLATION AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR. START OF GUARANTEE PERIOD SHALL COMMENCE AFTER 30 DAYS OF TROUBLE FREE OPERATION AFTER AFTER PROJECT ACCEPTANCE. DEFECTS SHALL BE PROMPTLY REMEDIED WITHOUT ADDITIONAL COST.
18. PROVIDE RECORD DRAWINGS AND ALL OTHER CLOSEOUT MATERIALS REQUIRED AS A PART OF THIS CONTRACT. RECORD DRAWINGS SHALL INCLUDE ALL ADDENDUM ITEMS, CHANGE ORDERS, ALTERATIONS, REROUTINGS, ETC.
19. VERIFY EXACT LOCATION AND ELECTRICAL CHARACTERISTICS OF EQUIPMENT TO BE FURNISHED BY OTHER DISCIPLINES PRIOR TO ROUGH-IN.
20. SYSTEMS SHALL BE TESTED FOR PROPER OPERATION. IF TESTS SHOW THAT WORK IS DEFECTIVE, CONTRACTOR SHALL MAKE CORRECTIONS NECESSARY AT NO ADDITIONAL COST.
21. CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING EQUIPMENT WHICH IS DAMAGED DUE TO INCORRECT FIELD WIRING PROVIDED UNDER THIS SECTION OR FACTORY WIRING IN EQUIPMENT PROVIDED UNDER THIS SECTION.
22. CONTRACTOR'S FAILURE TO ORDER OR RELEASE ORDER FOR MATERIALS AND/OR EQUIPMENT WILL NOT BE ACCEPTED AS A REASON TO SUBSTITUTE ALTERNATE MATERIALS OR EQUIPMENT.
23. PENETRATIONS OF FIRE RATED WALLS OR FLOORS BY PIPE SHALL BE SEALED BY A FIRESTOPPING SYSTEM UL LISTED FOR THE APPLICATION. INSTALL PENETRATION SEAL MATERIALS IN ACCORDANCE WITH PRINTED INSTRUCTIONS OF THE UL FIRE RESISTANCE DIRECTORY AND MANUFACTURERS INSTRUCTIONS. FIRESTOPPING SYSTEM SHALL BE EQUAL TO 3M FIRE BARRIER. FIRESTOPPING MATERIAL SHALL BE CAULK OR PUTTY TYPE. FIRESTOP ALL PENETRATIONS THROUGH FIRE RATED WALLS AS REQUIRED TO PRESERVE THE FIRE RATING OF THE STRUCTURE.
24. PROTRUDING OBJECTS SHALL COMPLY WITH ADAAG 307. WALL MOUNTED FIXTURES OR SIMILAR WALL MOUNTED DEVICES SHALL NOT PROTRUDE MORE THAN 4" HORIZONTALLY INTO THE CIRCULATION PATH, OR OTHERWISE SHALL BE INSTALLED 80" MINIMUM TO THE BOTTOM OF THE FIXTURE.
25. WHERE PROJECT WORK INVOLVES COORDINATION WITH THE LOCAL UTILITY, IMMEDIATELY UPON AWARD OF CONTRACT CONTRACTOR SHALL CONTACT UTILITY TO ENSURE ALL UTILITY AGREEMENTS, PROPOSAL, AND UTILITY DRAWINGS ARE COMPLETE AND APPROVED. PROVIDE PROPOSED DATE OF ENERGIZING SERVICE IN ORDER TO FACILITATE PROPER SCHEDULING WITH THE UTILITY SERVICE.

ELECTRICAL ABBREVIATIONS

+18"	INDICATES MOUNTING HEIGHTS ARE TO CENTERLINE OF DEVICE AFF OR AFG	HELCO	ELECTRICAL UTILITY COMPANY
AF	AMP FUSE (FOR FUSES), AMP FRAME (FOR CIRCUIT BREAKERS)	IWP	IN-USE WEATHER-PROOF (NEMA 3R)
AFF	ABOVE FINISHED FLOOR	LO	LUGS ONLY (SEE ALSO MLO)
AFG	ABOVE FINISHED GRADE	MCB	MAIN CIRCUIT BREAKER
AHJ	LOCAL AUTHORITY HAVING JURISDICTION	MLO	MAIN LUGS ONLY
AT	AMP TRIP	NEC	NATIONAL ELECTRICAL CODE, AS ADOPTED BY THE AHJ
ATS	AUTOMATIC TRANSFER SWITCH	P	POLE
MTS	MANUAL TRANSFER SWITCH	PFFB	PROVISION FOR FUTURE BREAKER
C	CONDUIT	PH	PHASE
CONT	CONTINUATION	PNL	INDICATES PANEL
CU	COPPER	TYP	TYPICAL
CW	COLD WATER PIPE	UPS	UNINTERRUPTIBLE POWER SYSTEM
FACP	FIRE ALARM CONTROL PANEL	WP	WEATHER-PROOF (NEMA 3R)
AFCI	INDICATES ARC FAULT CIRCUIT INTERRUPTER WITH DEDICATED NEUTRAL	XFMR	TRANSFORMER
		UNO	UNLESS NOTED OTHERWISE
GFCI	GROUND FAULT CIRCUIT INTERRUPTER WITH DEDICATED NEUTRAL	(D)	DEMOLITION
GFP	GROUND FAULT PROTECTION	(E)	EXISTING
GND	GROUND	(N)	NEW
		(R)	RELOCATE/RELOCATED

ELECTRICAL SYMBOLS

- (D) or — ELECTRICAL DEMOLITION. REMOVE EQUIPMENT AND APPURTENANCES IN THEIR ENTIRETY U.N.O. COORDINATE WORK RESTRICTIONS PRIOR TO DEMOLITION.
- HOMERUN CONDUIT - STROKES INDICATE QUANTITY OF CONDUCTORS
- CONDUIT/WIRE CONCEALED IN WALL OR ABOVE CEILING EXCEPT IN EXPOSED STRUCTURE AREAS 1/2"-2 #12 & 1 #12 GND THWN U.N.O.
- CONDUIT AND/OR WIRE BELOW FLOOR OR GRADE 3/4"-2 #12 & 1 #12 GND THWN UNLESS NOTED
- EXISTING CONDUIT AND/OR CONDUCTORS TO REMAIN (SHOWN LIGHT)
- OH — OH — OVERHEAD POWER LINES
- CONDUIT RISER UP/DOWN
- CONDUIT STUB OUT
- S^a_b — SINGLE POLE SWITCH @ +48" TO TOP UNLESS NOTED
  a = DEVICE SWITCH IDENTIFICATION (LOWERCASE)
  IF b:
  F = 3 SPEED SWITCH; D = DIMMER SWITCH
  2 = 2 POLE SWITCH; M = VACANCY SENSOR SWITCH
  3 = 3-WAY SWITCH; T = THERMAL OVERLOAD SWITCH
- WALL MOUNTED DUPLEX RECEPTACLE @ +18" TO CENTER U.N.O.
  = RECEPTACLE PROTECTED BY GFCI BREAKER, OR GFCI TYPE RECEPTACLE INSTALLED PER NEC 210.8.
  = DOUBLE DUPLEX RECEPTACLE
  = 1/2 SWITCHED (BOTTOM HALF) DUPLEX RECEPTACLE
- $\ominus^a_b$ — IF a:
  C = RECEPTACLE INSTALLED ABOVE COUNTER
  H = RECEPTACLE INSTALLED HORIZONTALLY
  IG = ISOLATED GROUND TYPE (ORANGE) RECEPTACLE
  IF b:
  MOUNTING HEIGHT IN INCHES TO TOP OF RECEPTACLE
- FLOOR MOUNT RECEPTACLE
- SPECIAL RECEPTACLE @ +18" TO CENTER UNLESS NOTED
- (M) CEILING MOUNTED VACANCY SENSOR
- (PC) PHOTOCELL (INSTALL ON ROOF FACING NORTH)
- [a] IF a:
  R = RELAY; CB = CIRCUIT BREAKER
  C = CONTACTOR; TS = TIMESWITCH
  P = POWER SUPPLY; PB = PUSH BUTTON TYPE CONTROL STATION
- FIRE ALARM MANUAL PULLSTATION @ +48" AFF TO TOP
- FIRE ALARM HORN - WALL MOUNTED. TOP OF DEVICE TO BE NOT LESS THAN 90" TO TOP AFF AND NO CLOSER THAN 6" TO FINISHED CEILING
- FIRE ALARM HORN WITH ADA/ANSI STROBE - WALL MOUNTED. ENTIRE LENS TO BE NOT LESS THAN 80" AND NOT GREATER THAN 96" AFF TO TOP.
  M = MASS NOTIFICATION LENS CANDELA SETTING
  F = FIRE ALARM LENS CANDELA SETTING
- FIRE ALARM ADA/ANSI STROBE - WALL MOUNTED. ENTIRE LENS TO BE NOT LESS THAN 80" AND NOT GREATER THAN 96" AFF TO TOP
- (2) SMOKE DETECTOR
- DUCT SMOKE DETECTOR
- [a] / A — LUMINAIRE IDENTIFICATION
  A = LUMINAIRE DESIGNATION (UPPERCASE)
  a = SWITCH DESIGNATION (LOWERCASE)
- SURFACE MOUNT TROFFER
- LUMINAIRE ON EMERGENCY CIRCUIT OR INTEGRAL BATTERY BACK-UP
- DOWNLIGHT LUMINAIRE
- WALL MOUNTED LUMINAIRE
- EMERGENCY BATTERY LIGHTING UNIT WITH TWIN HEADS
- EMERGENCY BATTERY LIGHTING UNIT WITH TWIN HEADS AND EXIT SIGN
- SURFACE MOUNTED PANELBOARD
- FLUSH MOUNTED PANELBOARD
- MAIN SWITCHBOARD, MOTOR CONTROL CENTER OR DISTRIBUTION BOARD
- T1 — TRANSFORMER (SIZE AND CLEARANCES BASED ON KVA RATING)
- METER
- N — NON-FUSED DISCONNECT SWITCH
- F — FUSED DISCONNECT SWITCH
- [J]a — JUNCTION BOX, IF a:
  FS = FIRE/SMOKE DAMPER CONNECTION
  V = VARIABLE AIR VOLUME BOX CONNECTION
  CF = CEILING FAN
  S = SIGNAGE
  WH = WATER HEATER
- FUSIBLE SWITCH
- (M) SINGLE METER WITH CT,
- CIRCUIT BREAKER
- TRANSFORMER
- (HP) MOTOR LOAD
- GROUND BUS & GROUND ELECTRODES
- GROUNDING BUSBAR
- X — TELEPHONE/DATA OUTLET
  (X) 4-PAIR CAT-6 CABLES (TYPE 'H')
  PROVIDE CORRESPONDING FACEPLATE WITH QTY OF PORTS AS REQUIRED, WHERE "X" INDICATED NUMBER OF PORTS.
  IF QUANTITY IS NOT IDENTIFIED, PROVIDE 2 PORTS WITH CORRESPONDING CABLING
- (S) X — CEILING MOUNTED COMBINATION AUDIO/VISUAL ALARM DEVICE
  M = MASS NOTIFICATION LENS CANDELA SETTING
  F = FIRE ALARM LENS CANDELA SETTING
  NONE = AUDIO ALARM DEVICE
- HD — HEAT DETECTOR
- CR — CARD READER

BASE BID

1. AIR CONDITIONING SYSTEM IN ITS ENTIRETY, INCLUDING BUT NOT LIMITED TO ALL FAN COILS, EXTERIOR CONDENSING UNITS, CONTROLS, CONCRETE PADS, TESTING/ ADJUSTING/ BALANCING, INSULATION, REFRIGERANT PIPING, CONDENSATE PIPING, AND ASSOCIATED ELECTRICAL WORK.
2. PLUMBING SYSTEM IN ITS ENTIRETY, INCLUDING ALL DEMOLITION WORK, NEW WASTE/ VENT PIPING, NEW HOT WATER PIPING. WATER HEATERS, AND PROPANE SYSTEM. INCLUDE ALL TRENCHING, FLOOR SLAB REPAIR NECESSARY TO INSTALL NEW WASTE LINES. INCLUDE ARCHITECTURAL WORK FOR ANY NEW FRAMED WALLS AND CEILING, WALL, OR FLOOR FINISHES NECESSARY TO SUPPORT INSTALLATION OF PLUMBING FIXTURES.
3. ELECTRICAL INFRASTRUCTURE, INCLUDING ALL EXTERIOR SERVICE ENTRY INTO THE BUILDING, NEW METERING SWITCHBOARD, PANEL BOARDS, AND FEEDERS.
4. ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL WORK OCCURRING WITHIN SELECT ROOMS AS INDICATED ON DRAWINGS.

CITY AND COUNTY OF HONOLULU
REVISED ORDINANCES OF HONOLULU 2021
CHAPTER 16B

TO THE BEST OF KNOWLEDGE, THIS PROJECT'S DESIGN SUBSTANTIALLY CONFORMS TO THE BUILDING ENERGY CONSERVATION CODE FOR:

___ BUILDING COMPONENT SYSTEMS
_X_ ELECTRICAL COMPONENT SYSTEMS
___ MECHANICAL COMPONENT SYSTEMS

SIGNATURE: _____ DATE: 04/20/2026
NAME: ELI B. WALTZ
TITLE: ELECTRICAL ENGINEER
LICENSE NO.: 18572-E

ADDITIVE ALTERNATES

1. 1ST FLOOR ARCHITECTURAL/ STRUCTURAL DEMOLITION AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
2. 2ND FLOOR ARCHITECTURAL/ STRUCTURAL DEMOLITION AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
3. 3RD FLOOR ARCHITECTURAL/ STRUCTURAL DEMOLITION AND NEW WORK, ALL WORK NOT INCLUDED IN BASE BID.
4. DEMOLITION OF EXISTING LIGHTING AND INSTALLATION OF NEW LED LIGHTING AND ASSOCIATED BRANCH CIRCUITING, OVERCURRENT PROTECTION, AND CONTROLS.
5. ELECTRICAL BRANCH CIRCUITING FOR RECEPTACLES AND ANY OTHER ELECTRICAL WORK NOT ASSOCIATED WITH THE ABOVE BASE BID AND ADDITIVE ALTERNATES.
6. TELECOMMUNICATIONS WORK.
7. ROOF REPLACEMENT.
8. ELEVATOR REPLACEMENT.

ELI B. WALTZ
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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ELECTRICAL SPECIFICATIONS, SYMBOLS & ABBREVIATIONS

ENGINEERING PARTNERS		HAWAII JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-001
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE: JUNE 2026	SHEET 222 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:32 pm
M:\JOB PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG. 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_DEMO - (BASE).DWG

SEE A E-201 EXISTING/ DEMOLITION POWER PLAN - FIRST FLOOR

SEE A E-202 EXISTING/ DEMOLITION POWER PLAN - SECOND FLOOR

SEE A E-203 EXISTING/ DEMOLITION POWER PLAN - THIRD FLOOR

SEE A E-204 EXISTING/ DEMOLITION LIGHTING PLAN - FIRST FLOOR

SEE A E-205 EXISTING/ DEMOLITION LIGHTING PLAN - SECOND FLOOR

SEE A E-206 EXISTING/ DEMOLITION LIGHTING PLAN - THIRD FLOOR

SEE B E-201 EXISTING/ DEMOLITION POWER PLAN - FIRST FLOOR

SEE B E-202 EXISTING/ DEMOLITION POWER PLAN - SECOND FLOOR

SEE B E-203 EXISTING/ DEMOLITION POWER PLAN - THIRD FLOOR

SEE B E-204 EXISTING/ DEMOLITION LIGHTING PLAN - FIRST FLOOR

SEE B E-205 EXISTING/ DEMOLITION LIGHTING PLAN - SECOND FLOOR

SEE B E-206 EXISTING/ DEMOLITION LIGHTING PLAN - THIRD FLOOR

SEE B E-207 EXISTING/ DEMOLITION FIRE ALARM PLAN - FIRST FLOOR

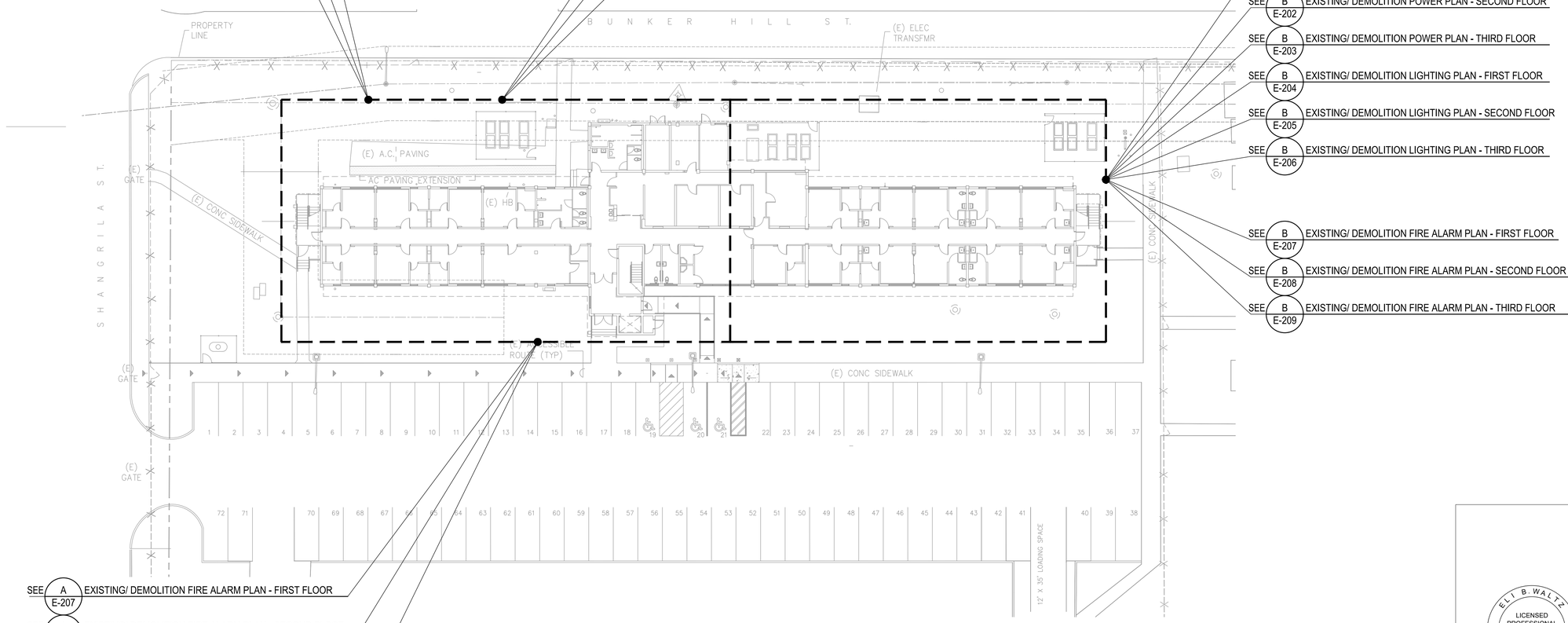
SEE B E-208 EXISTING/ DEMOLITION FIRE ALARM PLAN - SECOND FLOOR

SEE B E-209 EXISTING/ DEMOLITION FIRE ALARM PLAN - THIRD FLOOR

SEE A E-207 EXISTING/ DEMOLITION FIRE ALARM PLAN - FIRST FLOOR

SEE A E-208 EXISTING/ DEMOLITION FIRE ALARM PLAN - SECOND FLOOR

SEE A E-209 EXISTING/ DEMOLITION FIRE ALARM PLAN - THIRD FLOOR



A OVERALL EXISTING/DEMOLITION ELECTRICAL SITE PLAN

SCALE: 1" = 20'

0 20' 40'

N

REV NO	DESCRIPTION	DATE

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

OVERALL EXISTING/ DEMOLITION ELECTRICAL SITE PLAN

ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-101
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 223 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ----

06/02/2026 12:32 pm
M:\ECO PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_DEMO - (BASE).DWG

SEE A E-301A EXISTING/ NEW POWER PLAN - FIRST FLOOR
SEE A E-302A EXISTING/ NEW POWER PLAN - SECOND FLOOR
SEE A E-303A EXISTING/ NEW POWER PLAN - THIRD FLOOR
SEE A E-401A EXISTING/ NEW LIGHTING PLAN - FIRST FLOOR
SEE A E-402A EXISTING/ NEW LIGHTING PLAN - SECOND FLOOR
SEE A E-403A EXISTING/ NEW LIGHTING PLAN - THIRD FLOOR

SEE A E-301B EXISTING/ NEW POWER PLAN - FIRST FLOOR
SEE A E-302B EXISTING/ NEW POWER PLAN - SECOND FLOOR
SEE A E-303B EXISTING/ NEW POWER PLAN - THIRD FLOOR
SEE A E-401B EXISTING/ NEW LIGHTING PLAN - FIRST FLOOR
SEE A E-402B EXISTING/ NEW LIGHTING PLAN - SECOND FLOOR
SEE A E-403B EXISTING/ NEW LIGHTING PLAN - THIRD FLOOR

SEE B E-304A NEW MECHANICAL POWER PLAN - FIRST FLOOR
SEE B E-305A NEW MECHANICAL POWER PLAN - SECOND FLOOR
SEE B E-306A NEW MECHANICAL POWER PLAN - THIRD FLOOR

SEE A E-304A NEW MECHANICAL POWER PLAN - FIRST FLOOR
SEE A E-305A NEW MECHANICAL POWER PLAN - SECOND FLOOR
SEE A E-306A NEW MECHANICAL POWER PLAN - THIRD FLOOR

SEE A E-301C EXISTING/ NEW POWER PLAN - FIRST FLOOR
SEE A E-302C EXISTING/ NEW POWER PLAN - SECOND FLOOR
SEE A E-303C EXISTING/ NEW POWER PLAN - THIRD FLOOR
SEE A E-401C EXISTING/ NEW LIGHTING PLAN - FIRST FLOOR
SEE A E-402C EXISTING/ NEW LIGHTING PLAN - SECOND FLOOR
SEE A E-403C EXISTING/ NEW LIGHTING PLAN - THIRD FLOOR
SEE A E-304C NEW MECHANICAL POWER PLAN - FIRST FLOOR
SEE A E-305C NEW MECHANICAL POWER PLAN - SECOND FLOOR
SEE A E-306C NEW MECHANICAL POWER PLAN - THIRD FLOOR
SEE A E-501C EXISTING/ NEW FIRE ALARM PLAN - FIRST FLOOR
SEE A E-502C EXISTING/ NEW FIRE ALARM PLAN - SECOND FLOOR
SEE A E-503C EXISTING/ NEW FIRE ALARM PLAN - THIRD FLOOR

SEE A E-504A EXISTING/ NEW TELECOM PLAN - FIRST FLOOR
SEE A E-505A EXISTING/ NEW TELECOM PLAN - SECOND FLOOR
SEE A E-506A EXISTING/ NEW TELECOM PLAN - THIRD FLOOR

SEE B E-504A EXISTING/ NEW TELECOM PLAN - FIRST FLOOR
SEE B E-505A EXISTING/ NEW TELECOM PLAN - SECOND FLOOR
SEE B E-506A EXISTING/ NEW TELECOM PLAN - THIRD FLOOR

SEE A E-501A EXISTING/ NEW FIRE ALARM PLAN - FIRST FLOOR
SEE A E-502A EXISTING/ NEW FIRE ALARM PLAN - SECOND FLOOR
SEE A E-503A EXISTING/ NEW FIRE ALARM PLAN - THIRD FLOOR

SEE A E-501B EXISTING/ NEW FIRE ALARM PLAN - FIRST FLOOR
SEE A E-502B EXISTING/ NEW FIRE ALARM PLAN - SECOND FLOOR
SEE A E-503B EXISTING/ NEW FIRE ALARM PLAN - THIRD FLOOR

B U N K E R H I L L S T.
PROPERTY LINE
(E) ELEC TRANSFMR
S H A N G R I L A S T.
(E) GATE
(E) CONC SIDEWALK
(E) A.C. PAVING
A.C. PAVING EXTENSION
(E) HB
(E) CONC SIDEWALK
(E) CONC SIDEWALK
12' x 50' LOADING SPACE

A OVERALL EXISTING/ NEW ELECTRICAL SITE PLAN
SCALE: 1" = 20'
0 20' 40'
N

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

OVERALL EXISTING/ NEW ELECTRICAL SITE PLAN

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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SIGNATURE

ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HNARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-102
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 224 OF 276 SHTS
SCALE: AS NOTED			

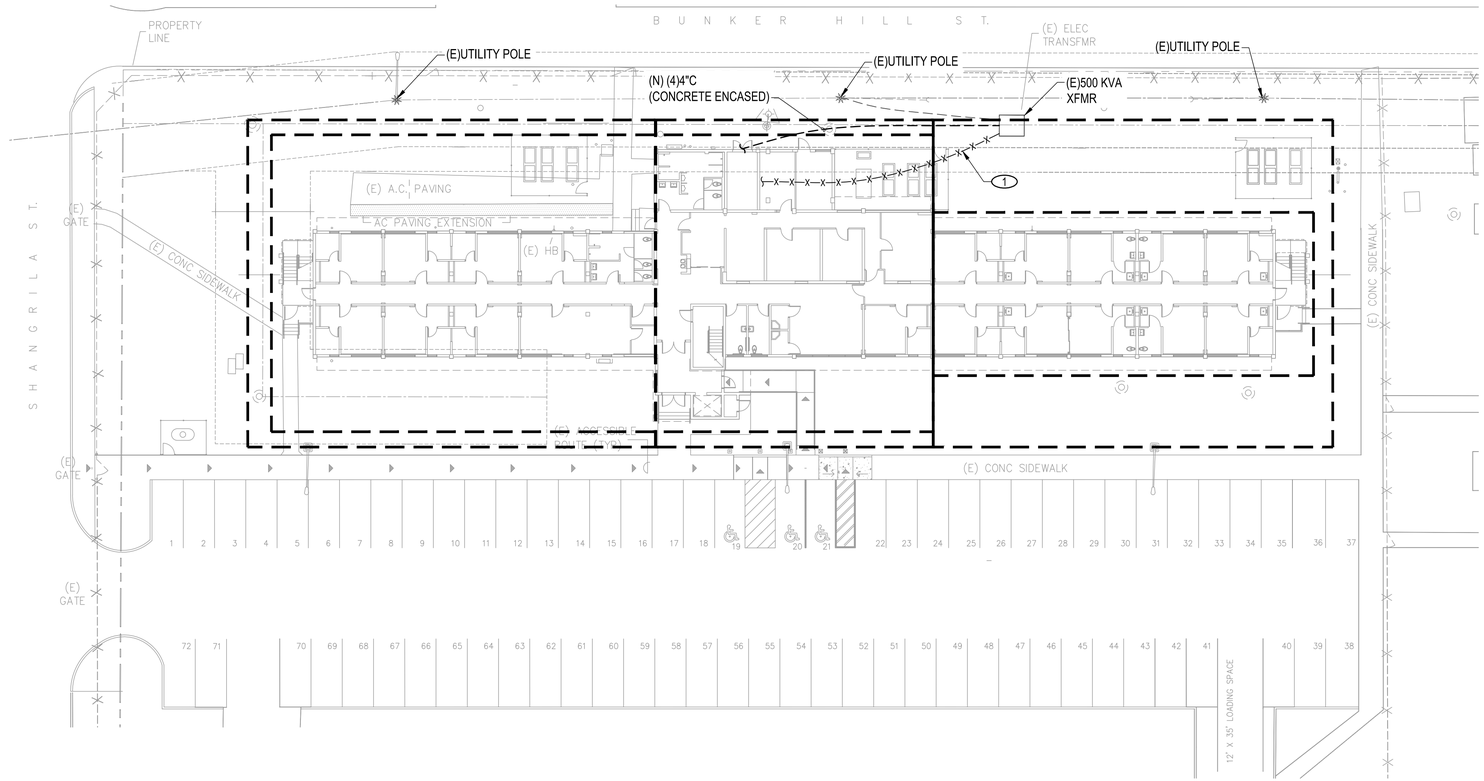
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ----

06/02/2026 12:32 pm
M:\ECO PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_DEMO - (BASE).DWG

SHEET NOTES

(1) REMOVE CONDUCTORS FROM TRANSFORMER TO DISTRIBUTION PANEL. CAP AND ABANDON EXISTING CONDUIT.



A OVERALL EXISTING/ DEMOLITION/ NEW SITE PLAN

SCALE: 1" = 20'

0 20' 40'

N

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

OVERALL EXISTING/ DEMOLITION/ NEW SITE PLAN

E.I. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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SIGNATURE

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-103
CF	EW		
DRAWN BY:	APPROVED BY:	DATE	SHEET
KD	EW	JUNE 2026	225
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ____

06/02/2026 12:32 pm
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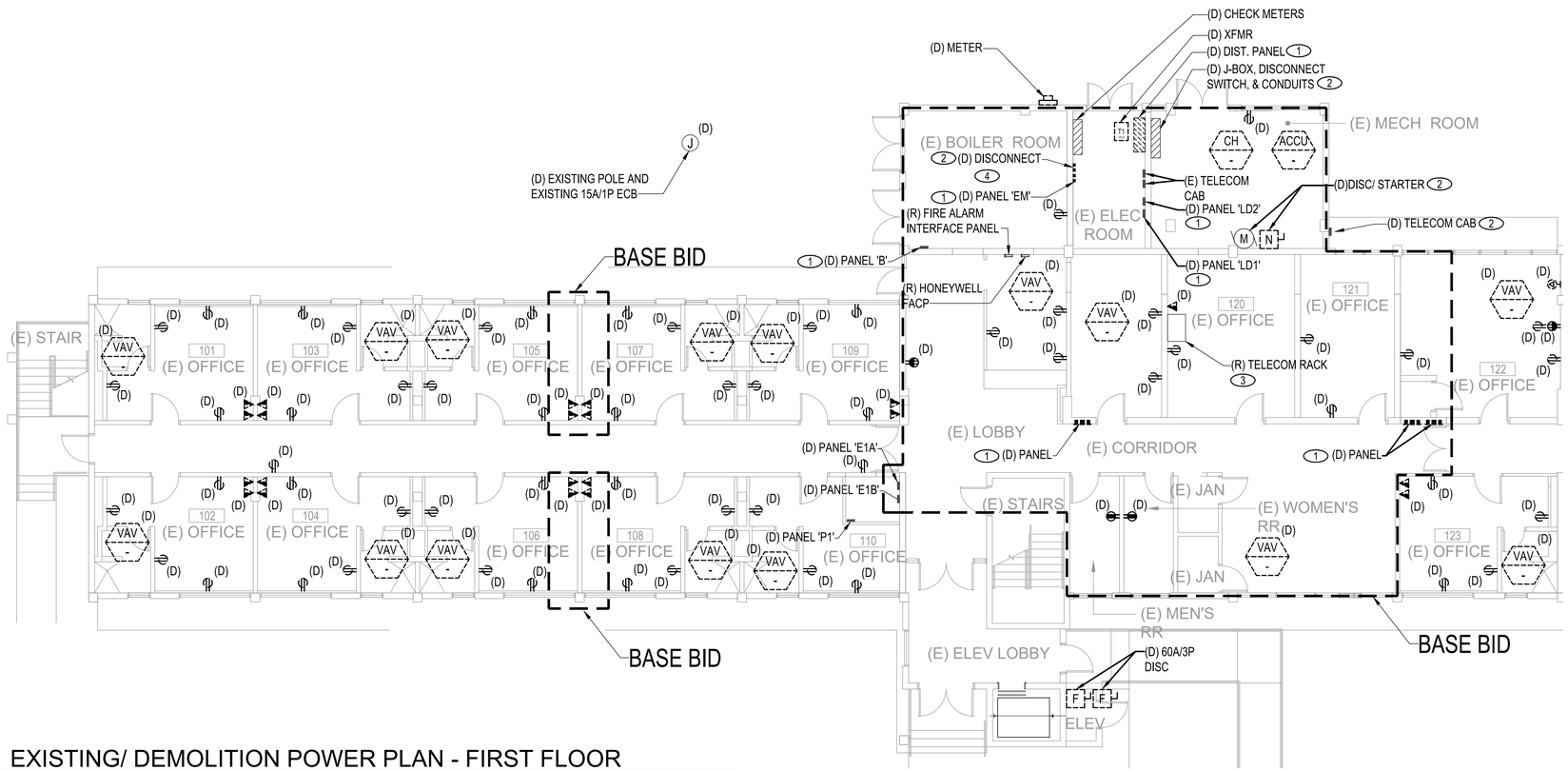
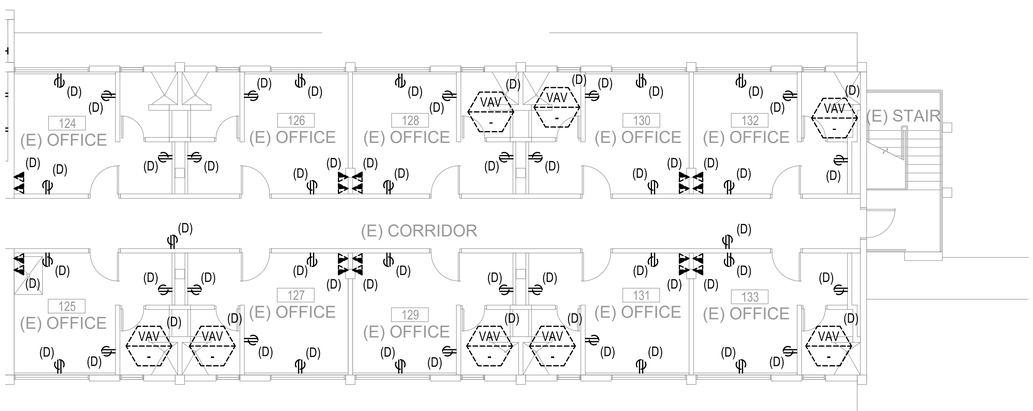


A EXISTING/ DEMOLITION POWER PLAN - FIRST FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'



B EXISTING/ DEMOLITION POWER PLAN - FIRST FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'

NOTICE OF ADDITIVE ALTERNATES:

1. UNLESS OTHERWISE NOTED, ALL WORK IDENTIFIED ON DRAWINGS IS TO BE INCLUDED UNDER ADDITIVE ALTERNATE. REFER TO COVER SHEET AND DIVISION 1 SPECIFICATIONS FOR DESCRIPTION OF WORK. REVIEW ALL DISCIPLINE DRAWINGS TO ENSURE ALL REQUIRED WORK SCOPE.

GENERAL NOTES

1. UNDER BASE BID ALL EXISTING RECEPTACLES THAT ARE CONTAINED ON EXISTING WALLS SHALL REMAIN. WHERE WALLS ARE DEMOLISHED, DEMOLISH RECEPTACLE, CONDUIT AND CONDUCTORS BACK TO NEAREST ACTIVE JUNCTION BOX, RETAIN POWER CONTINUITY TO REMAINING RECEPTACLES ON CIRCUIT.
2. UNDER BASE BID ALL EXISTING DATA OUTLETS THAT ARE CONTAINED ON EXISTING WALLS SHALL REMAIN. WHERE WALLS ARE DEMOLISHED, DEMOLISH DATA OUTLET, ABANDON CONDUIT AND REMOVE CABLES BACK TO SOURCE.
3. UNDER BASE BID DEMOLITION OF ALL VAV BOXES AND HVAC EQUIPMENT TO BE INCLUDED. WHERE MECHANICAL DEVICES ARE SHOWN AS DEMOLISHED REMOVE CONDUIT AND CONDUCTORS BACK TO SOURCE.

SHEET NOTES

1. REMOVE ALL PANELS. DEMOLISH FEEDER CONDUIT AND CONDUCTORS BACK TO SOURCE. RETAIN BRANCH CIRCUITS AND CONNECT TO NEW PANEL.
2. DEMOLISH CONDUIT AND CONDUCTORS BACK TO SOURCE.
3. RELOCATE TELECOM RACK TO NEW TELECOM ROOM. EXTEND CABLES TO NEW RACK LOCATION.
4. DEMOLISH ALL ELECTRICAL DEVICES, CONDUCTORS AND CONDUIT ASSOCIATED WITH BOILER.

REV NO	DESCRIPTION	DATE

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

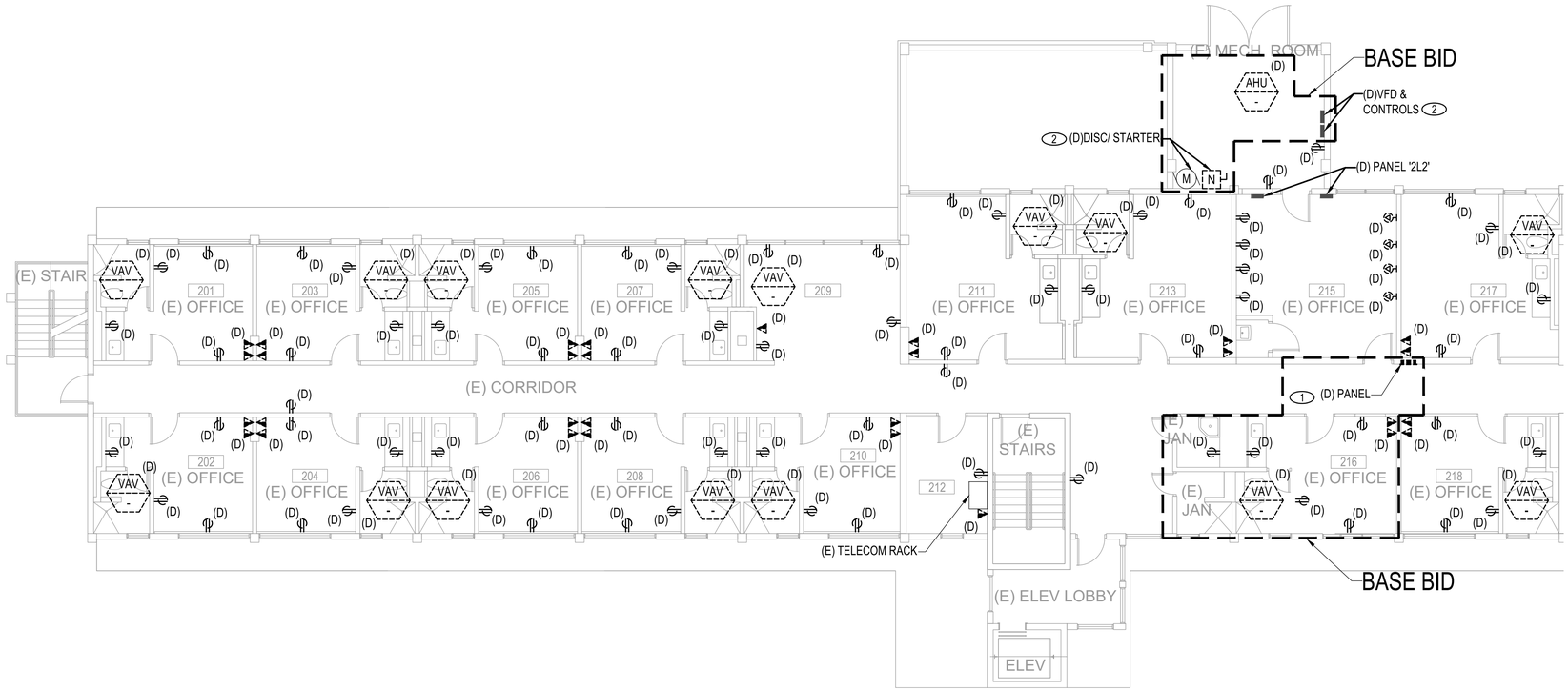
EXISTING/ DEMOLITION POWER PLAN - FIRST FLOOR

ENGINEERING PARTNERS		HAWAII JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-201
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 226 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ----

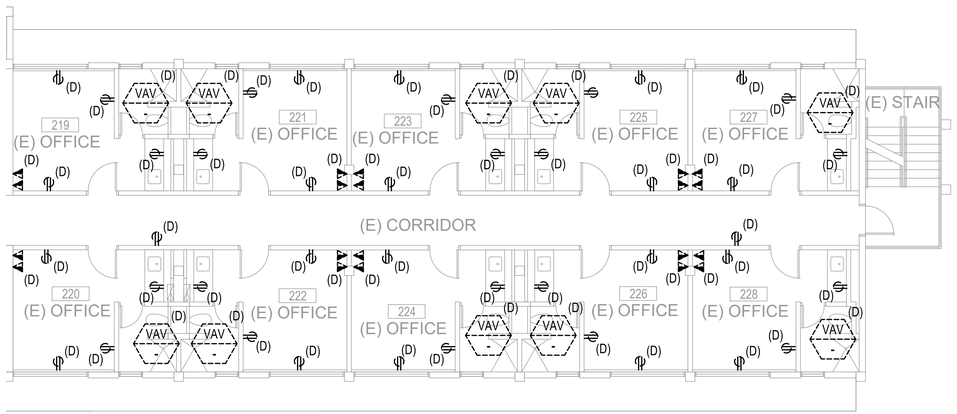
06/02/2026 12:32 pm
M:\EO PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_DEMO - (BASE).DWG



A EXISTING/ DEMOLITION POWER PLAN - SECOND FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'



B EXISTING/ DEMOLITION POWER PLAN - SECOND FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'

NOTICE OF ADDITIVE ALTERNATES:

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GENERAL NOTES

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SHEET NOTES

1. REMOVE ALL PANELS. DEMOLISH FEEDER CONDUIT AND CONDUCTORS BACK TO SOURCE. RETAIN BRANCH CIRCUITS AND CONNECT TO NEW PANEL.
2. DEMOLISH CONDUIT AND CONDUCTORS BACK TO SOURCE.

E.L. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ DEMOLITION POWER PLAN - SECOND FLOOR

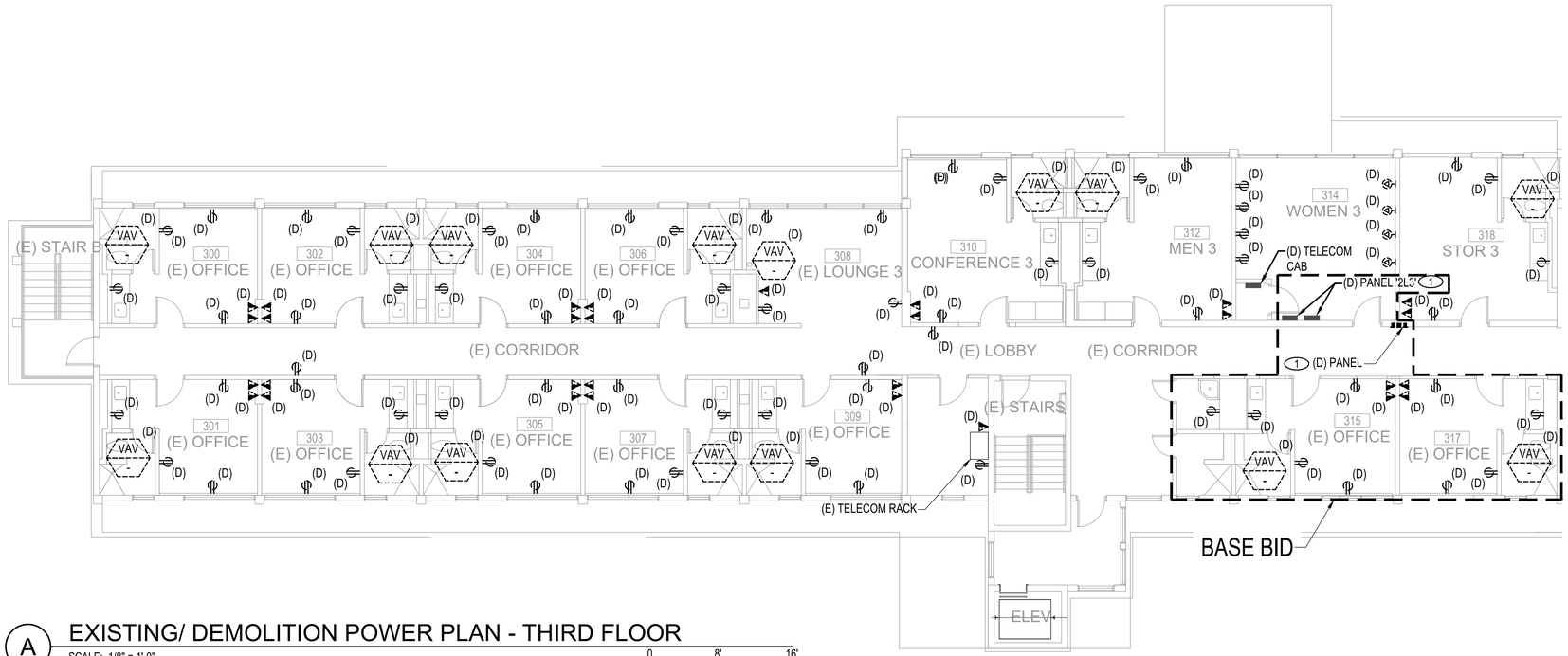
ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HAWG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-202
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 227 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE: ISSUED: ---

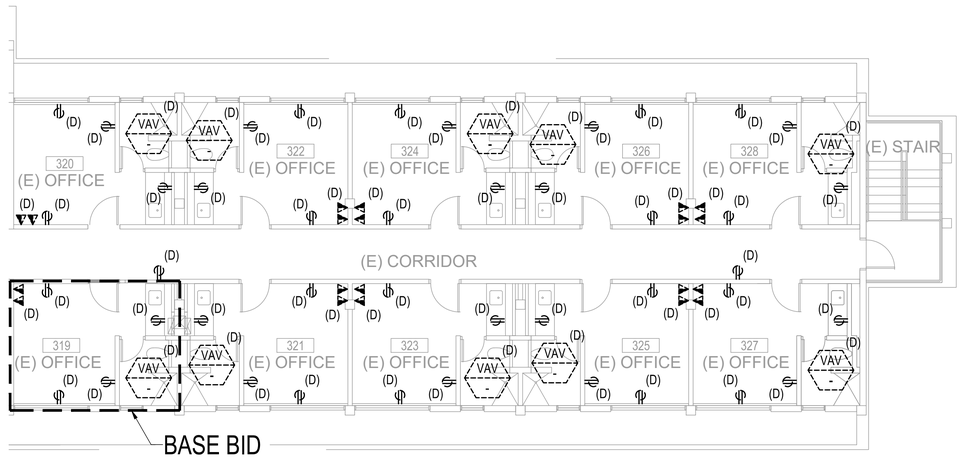
06/02/2026 12:32 pm
M:\ELEC PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_DEMO - (BASE).DWG



A EXISTING/ DEMOLITION POWER PLAN - THIRD FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'



B EXISTING/ DEMOLITION POWER PLAN - THIRD FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'

NOTICE OF ADDITIVE ALTERNATES:

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GENERAL NOTES

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2. UNDER BASE BID ALL EXISTING DATA OUTLETS THAT ARE CONTAINED ON EXISTING WALLS SHALL REMAIN. WHERE WALLS ARE DEMOLISHED, DEMOLISH DATA OUTLET, ABANDON CONDUIT AND REMOVE CABLES BACK TO SOURCE.
3. UNDER BASE BID DEMOLITION OF ALL VAV BOXES AND HVAC EQUIPMENT TO BE INCLUDED. WHERE MECHANICAL DEVICES ARE SHOWN AS DEMOLISHED REMOVE CONDUIT AND CONDUCTORS BACK TO SOURCE.

SHEET NOTES

(1) REMOVE ALL PANELS. DEMOLISH FEEDER CONDUIT AND CONDUCTORS BACK TO SOURCE. RETAIN BRANCH CIRCUITS AND CONNECT TO NEW PANEL.

E. L. I. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ DEMOLITION POWER PLAN - THIRD FLOOR

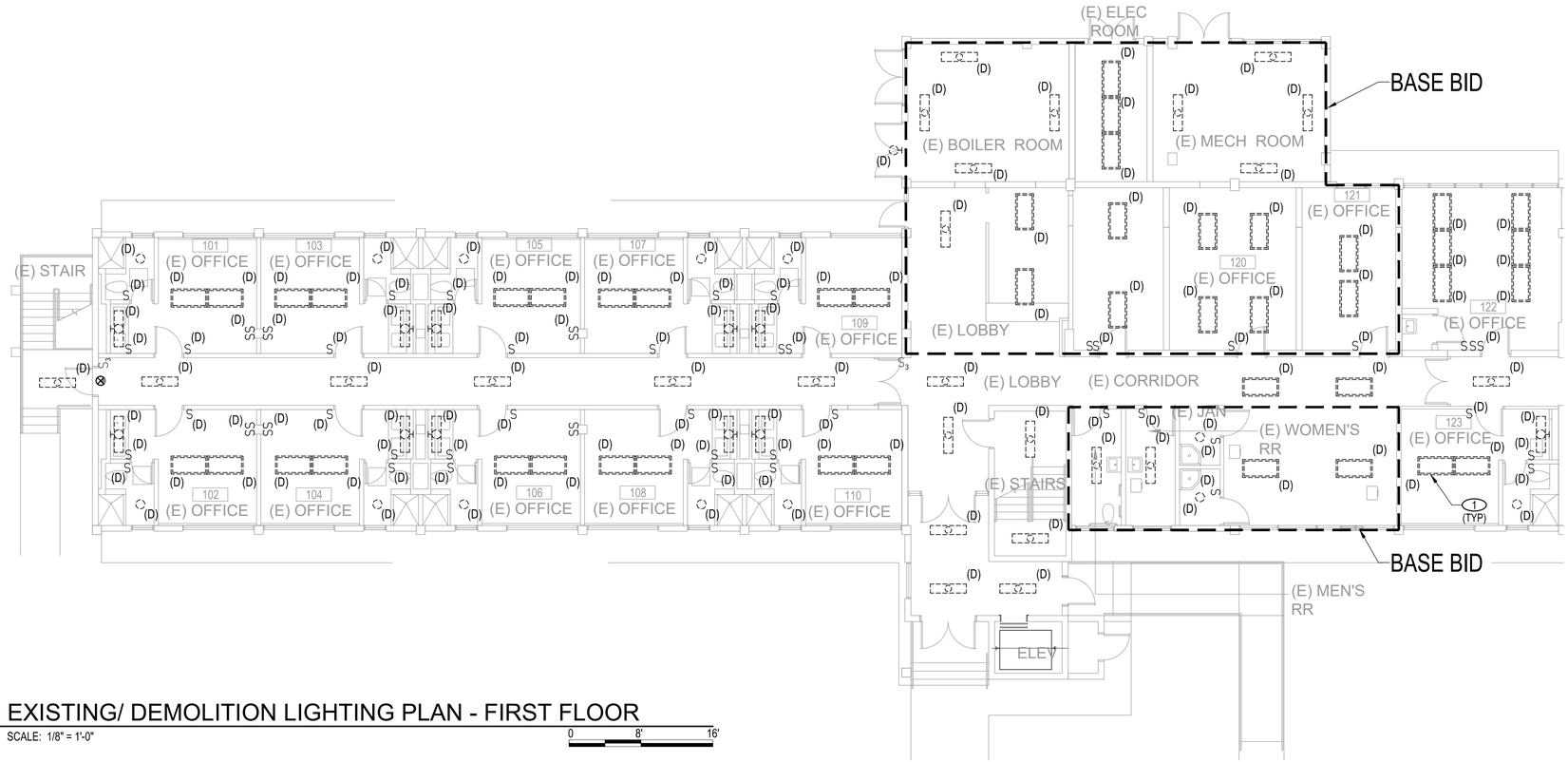
ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-203
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 228 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

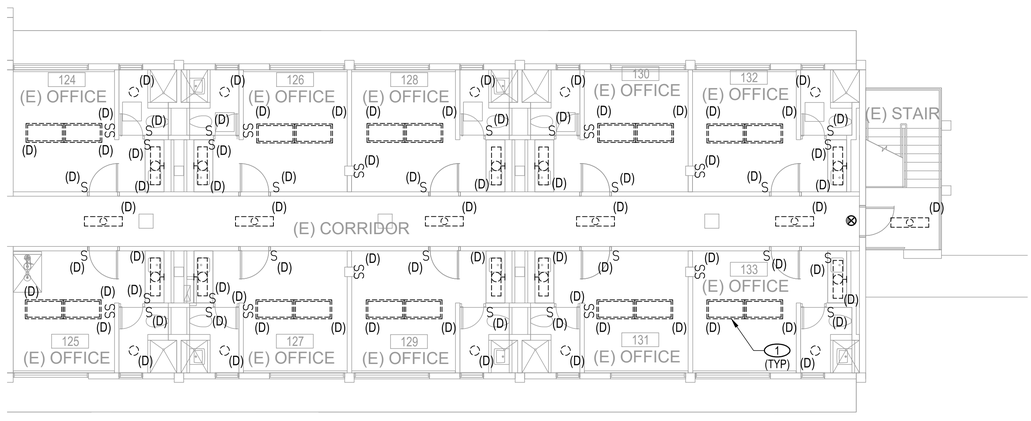
06/02/2026 12:32 pm
M:\ECO PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_DEMO - (BASE).DWG



A EXISTING/ DEMOLITION LIGHTING PLAN - FIRST FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'



B EXISTING/ DEMOLITION LIGHTING PLAN - FIRST FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'

NOTICE OF ADDITIVE ALTERNATES:

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SHEET NOTES

(1) REMOVE ALL LIGHTING, AND SWITCHES. DEMOLISH CONDUIT AND CONDUCTORS BACK TO SOURCE.

REV NO	DESCRIPTION	DATE

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ DEMOLITION LIGHTING PLAN - FIRST FLOOR

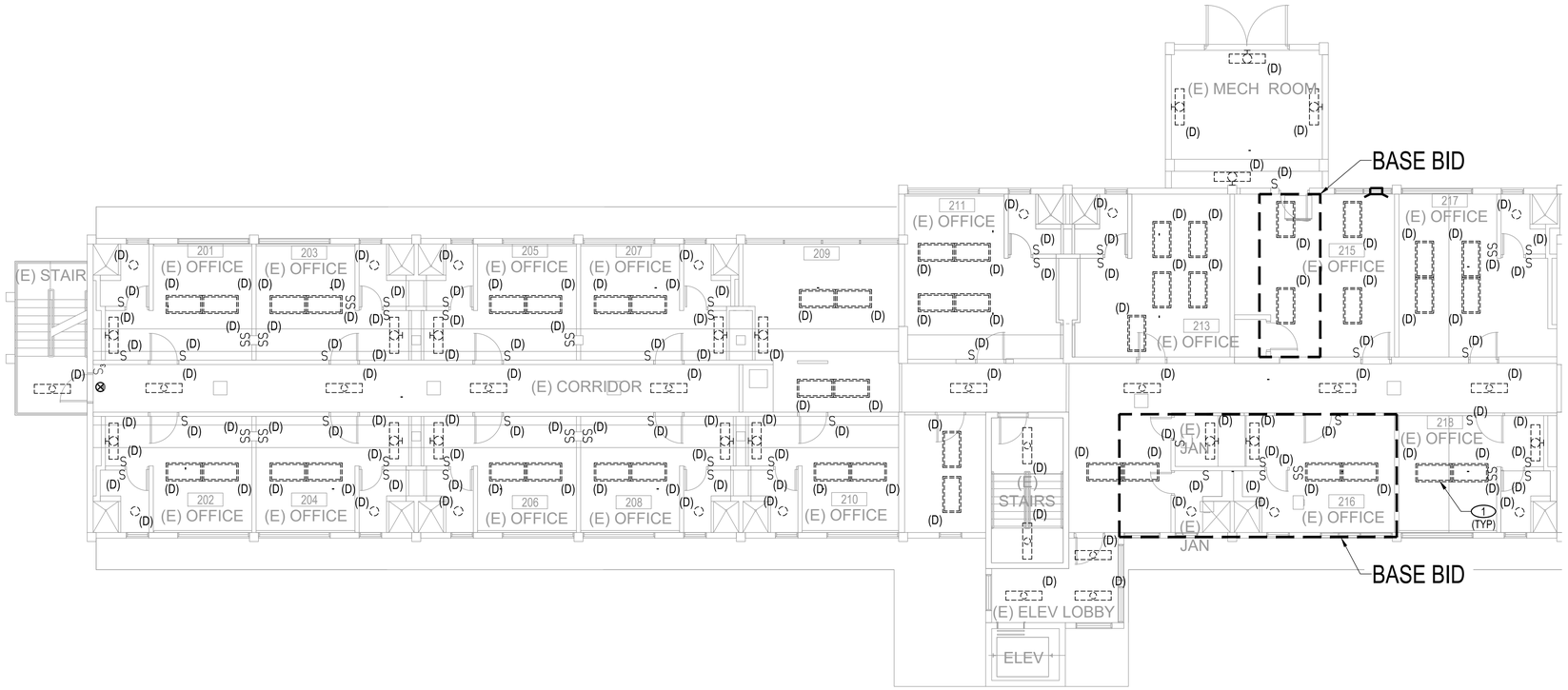
ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-204
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 229 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

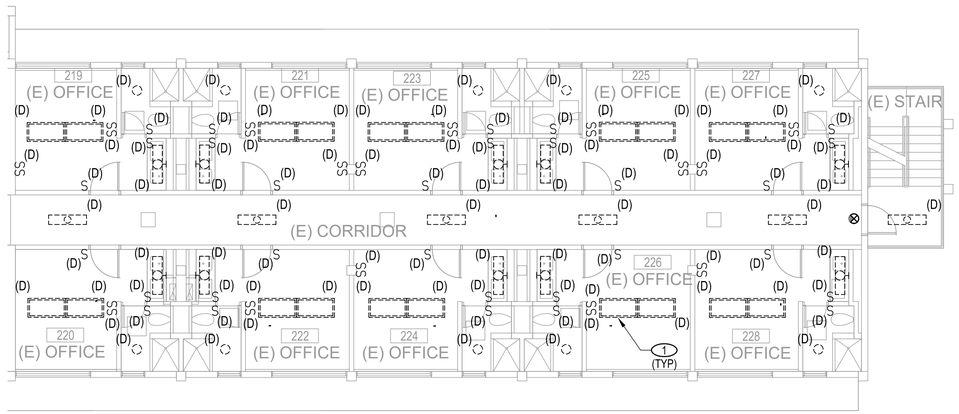
06/02/2026 12:23 pm
M:\EO PROJECTS\2025 PROJECTS\12018-25-01 IDOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_DEMO - (BASE).DWG



A EXISTING/ DEMOLITION LIGHTING PLAN - SECOND FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'



B EXISTING/ DEMOLITION LIGHTING PLAN - SECOND FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'

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SHEET NOTES

(1) REMOVE ALL LIGHTING, AND SWITCHES. DEMOLISH CONDUIT AND CONDUCTORS BACK TO SOURCE.

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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ DEMOLITION LIGHTING PLAN - SECOND FLOOR

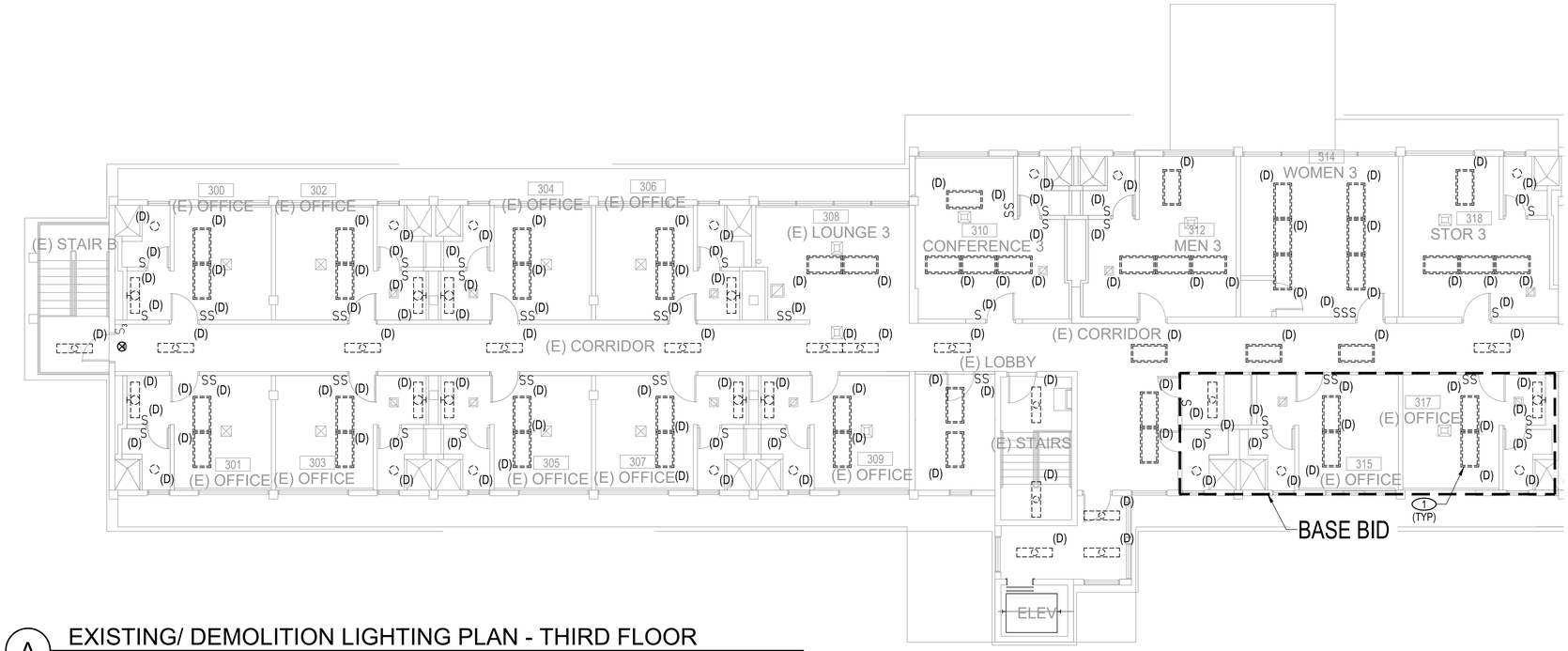
ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HIARNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. E-205
DRAWN BY: KD	APPROVED BY: EW	DATE	SHEET 230
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

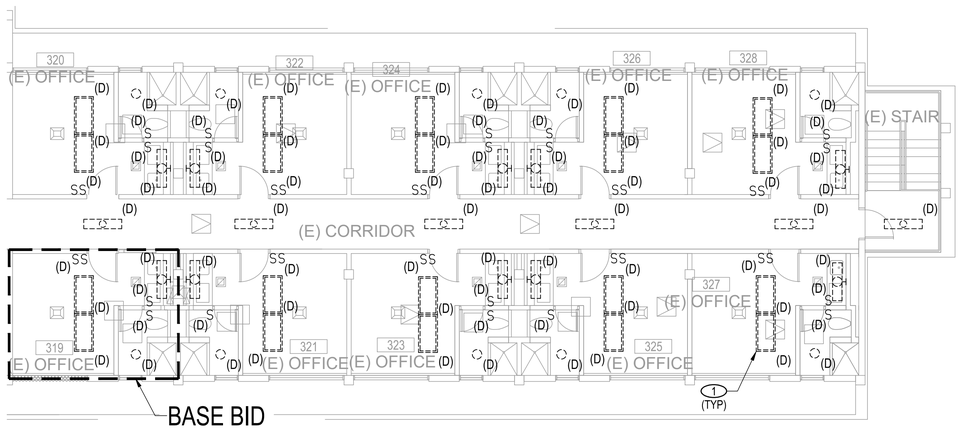
06/02/2026 12:33 pm
M:\E\D PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_DEMO - (BASE).DWG



A EXISTING/ DEMOLITION LIGHTING PLAN - THIRD FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'



B EXISTING/ DEMOLITION LIGHTING PLAN - THIRD FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'

NOTICE OF ADDITIVE ALTERNATES:

1. UNLESS OTHERWISE NOTED, ALL WORK IDENTIFIED ON DRAWINGS IS TO BE INCLUDED UNDER ADDITIVE ALTERNATE. REFER TO COVER SHEET AND DIVISION 1 SPECIFICATIONS FOR DESCRIPTION OF WORK. REVIEW ALL DISCIPLINE DRAWINGS TO ENSURE ALL REQUIRED WORK SCOPE.

SHEET NOTES

(1) REMOVE ALL LIGHTING, AND SWITCHES. DEMOLISH CONDUIT AND CONDUCTORS BACK TO SOURCE.

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ DEMOLITION LIGHTING PLAN - THIRD FLOOR

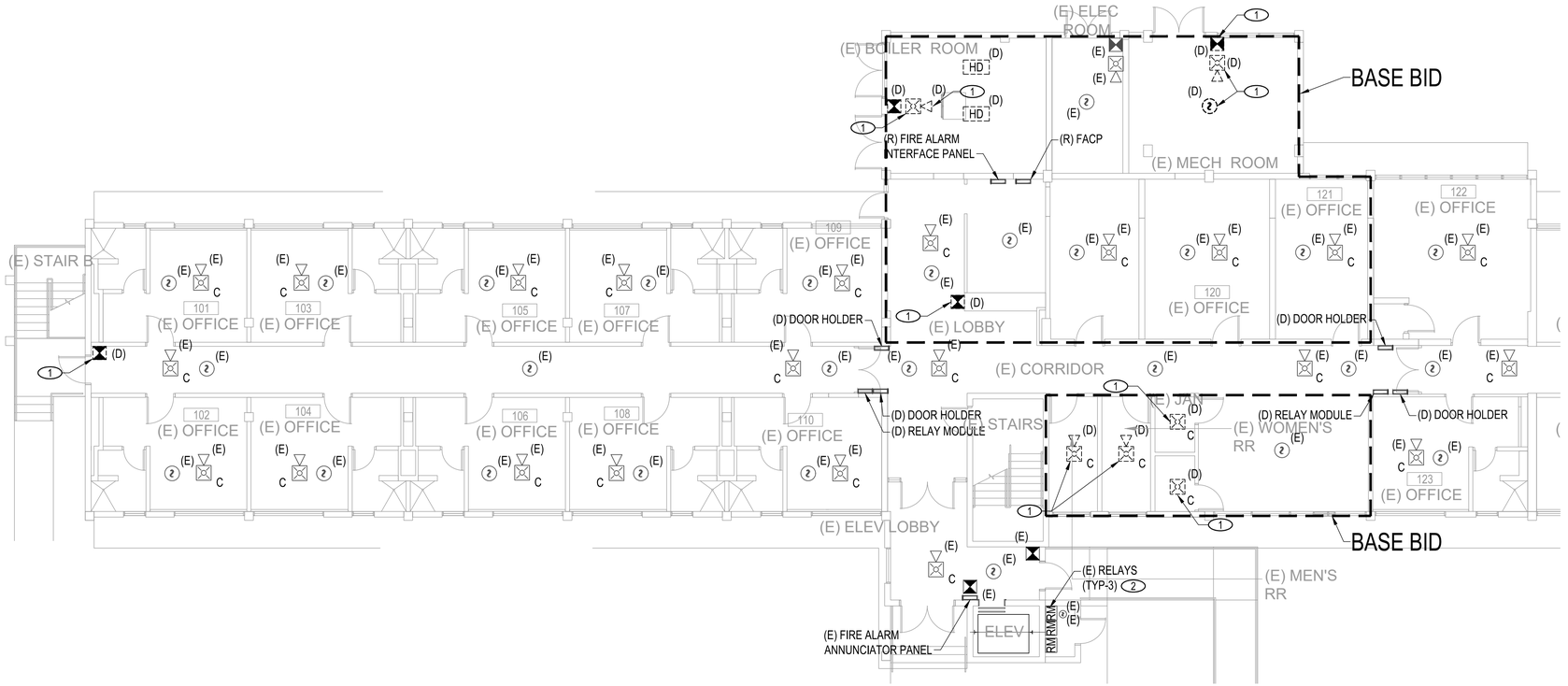
ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HI&PAC JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-206
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 231 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

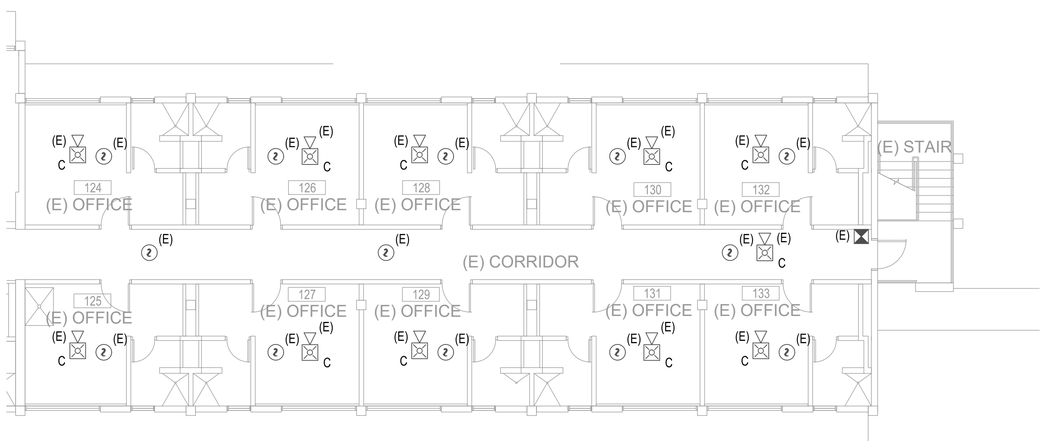
06/02/2026 12:33 pm
M:\ECI PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_DEMO - (BASE).DWG



A EXISTING/ DEMOLITION FIRE ALARM PLAN - FIRST FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'



B EXISTING/ DEMOLITION FIRE ALARM PLAN - FIRST FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'

NOTICE OF ADDITIVE ALTERNATES:

1. UNLESS OTHERWISE NOTED, ALL WORK IDENTIFIED ON DRAWINGS IS TO BE INCLUDED UNDER ADDITIVE ALTERNATE 1. REFER TO COVER SHEET AND DIVISION 1 SPECIFICATIONS FOR DESCRIPTION OF WORK. REVIEW ALL DISCIPLINE DRAWINGS TO ENSURE ALL REQUIRED WORK SCOPE.

SHEET NOTES

1. REMOVE FIRE ALARM DEVICE. DEMOLISH CONDUIT AND CONDUCTORS BACK TO NEAREST ACTIVE JUNCTION BOX.
2. RETAIN EXISTING RELAYS AND CONNECT TO NEW ELEVATOR CONTROLLER.

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ DEMOLITION FIRE ALARM PLAN - FIRST FLOOR

ENGINEERING PARTNERS		HIARNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. E-207
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE	SHEET 232
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~

06/02/2026 12:33 pm
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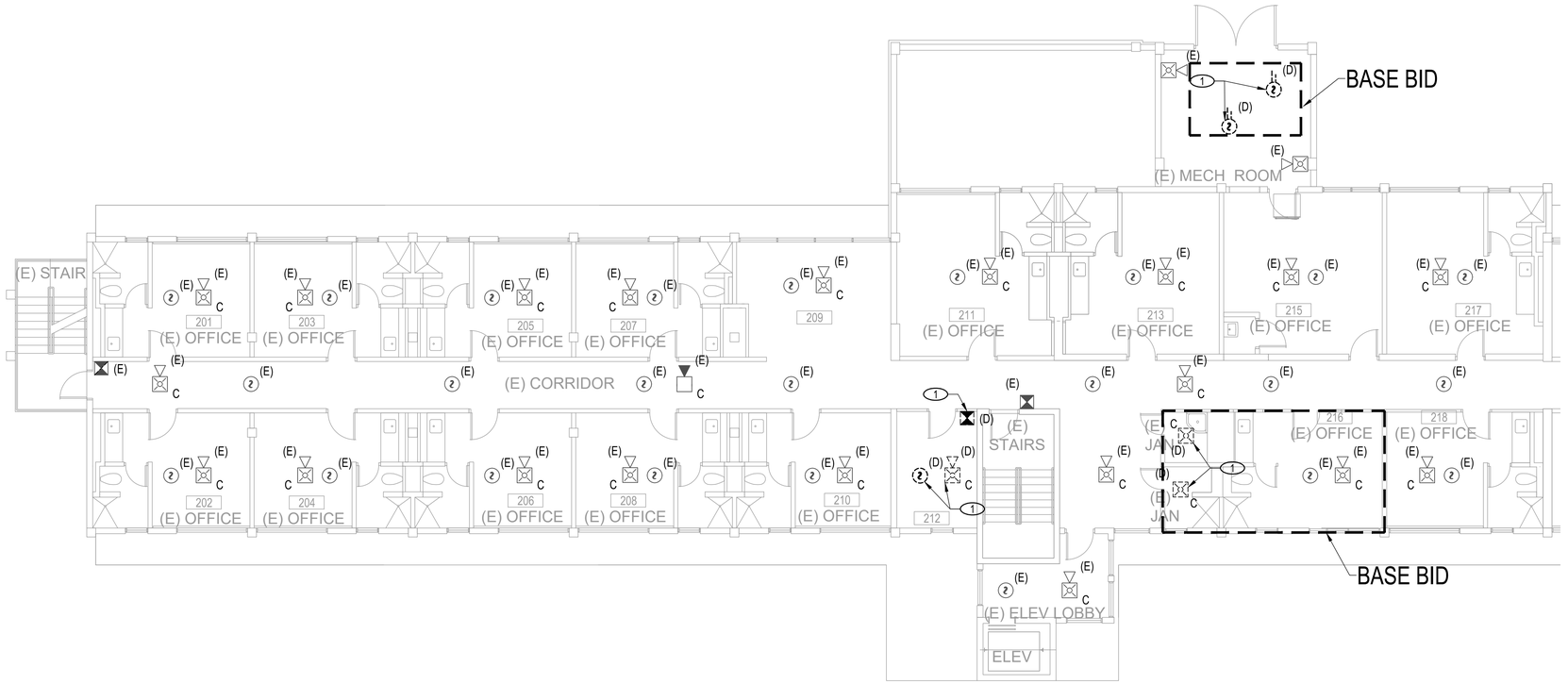
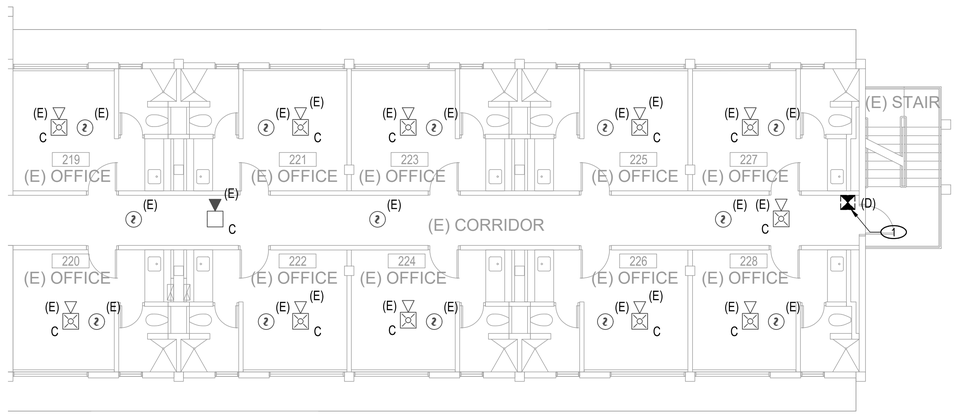


A EXISTING/ DEMOLITION FIRE ALARM PLAN - SECOND FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'



B EXISTING/ DEMOLITION FIRE ALARM PLAN - SECOND FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'

NOTICE OF ADDITIVE ALTERNATES:

1. UNLESS OTHERWISE NOTED, ALL WORK IDENTIFIED ON DRAWINGS IS TO BE INCLUDED UNDER ADDITIVE ALTERNATE 2. REFER TO COVER SHEET AND DIVISION 1 SPECIFICATIONS FOR DESCRIPTION OF WORK. REVIEW ALL DISCIPLINE DRAWINGS TO ENSURE ALL REQUIRED WORK SCOPE.

SHEET NOTES

(1) REMOVE FIRE ALARM DEVICE. DEMOLISH CONDUIT AND CONDUCTORS BACK TO NEAREST ACTIVE JUNCTION BOX.

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ DEMOLITION FIRE ALARM PLAN - SECOND FLOOR

ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HAWG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-208
DRAWN BY: KD	APPROVED BY: EW	DATE	SHEET 233
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
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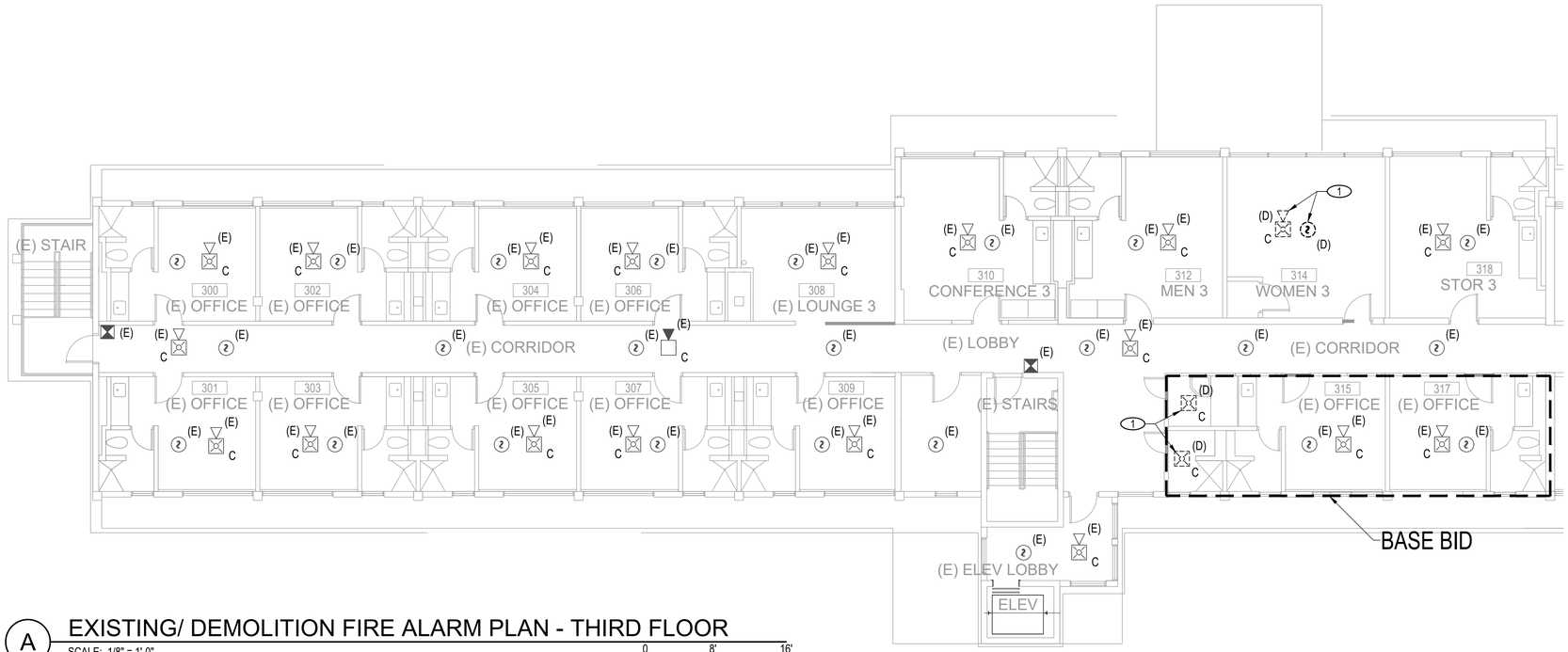
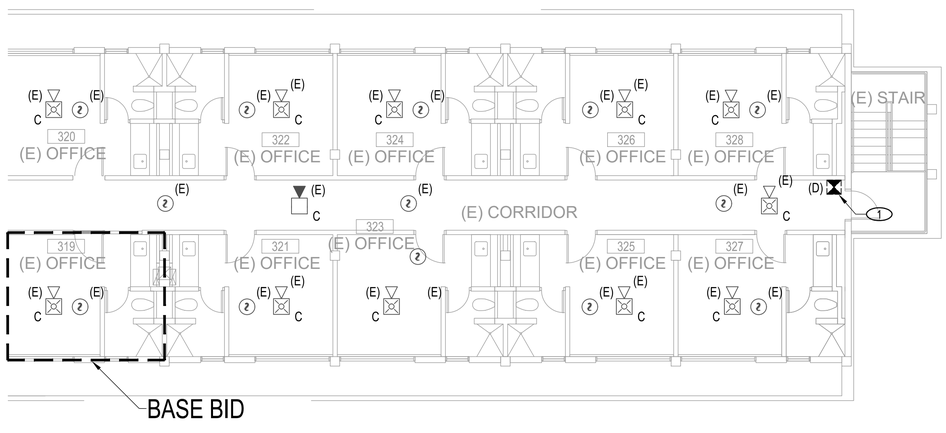


A EXISTING/ DEMOLITION FIRE ALARM PLAN - THIRD FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'



B EXISTING/ DEMOLITION FIRE ALARM PLAN - THIRD FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'

NOTICE OF ADDITIVE ALTERNATES:

1. UNLESS OTHERWISE NOTED, ALL WORK IDENTIFIED ON DRAWINGS IS TO BE INCLUDED UNDER ADDITIVE ALTERNATE 3. REFER TO COVER SHEET AND DIVISION 1 SPECIFICATIONS FOR DESCRIPTION OF WORK. REVIEW ALL DISCIPLINE DRAWINGS TO ENSURE ALL REQUIRED WORK SCOPE.

SHEET NOTES

(1) REMOVE FIRE ALARM DEVICE. DEMOLISH CONDUIT AND CONDUCTORS BACK TO NEAREST ACTIVE JUNCTION BOX.

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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SIGNATURE

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DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ DEMOLITION FIRE ALARM PLAN - THIRD FLOOR

ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-209
DRAWN BY: KD	APPROVED BY: EW	DATE: JUNE 2026	SHEET 234 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

06/02/2026 12:33 pm
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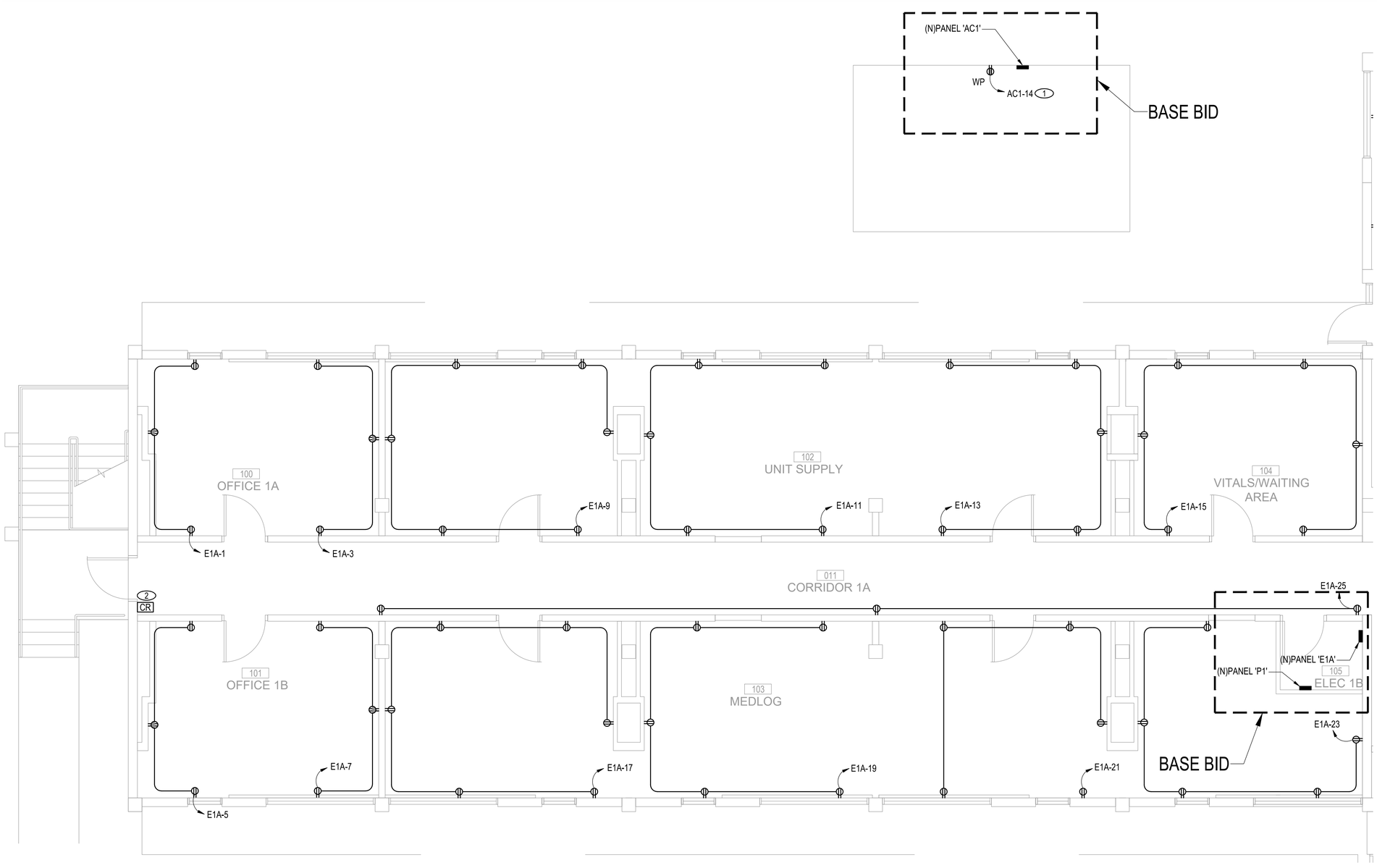

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GENERAL NOTES

1. UNDER BASE BID ALL EXISTING RECEPTACLES THAT ARE CONTAINED ON EXISTING WALLS SHALL REMAIN. ALL NEW CIRCUITS SERVING RECEPTACLES ARE PART OF ADDITIVE ALTERNATE #5 UNLESS OTHERWISE NOTED.
2. ALL WORK IDENTIFIED HEREIN SHALL COMPLY WITH NEC 517, AS APPLICABLE.
3. ALL BRANCH CIRCUITING SERVING PATIENT CARE AREAS SHALL BE PROVIDED WITH AN EFFECTIVE GROUND-FAULT CURRENT PATH UTILIZING A REDUNDANT INSULATED GROUND PER NEC 517.13. SUCH AREAS INCLUDE EXAMINATION ROOMS, TREATMENT ROOMS, OR ANY OTHER AREAS REQUIRED BY THE LOCAL AUTHORITY.
4. ALL RECEPTACLES WITHIN ROOMS IN CATEGORY 1, 2, OR 3 AREAS, AS DEFINED IN NEC 517 AND NFPA 99, SHALL BE HOSPITAL GRADE AND IDENTIFIED AS SUCH.

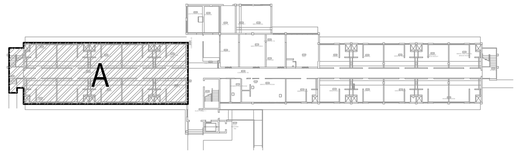
SHEET NOTES

1. PROVIDE CIRCUIT UNDER BASE BID.
2. PROVIDE DATA CONNECTIONS PER MANUFACTURER.

A EXISTING/ NEW POWER PLAN - FIRST FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'



KEYPLAN

E. L. I. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

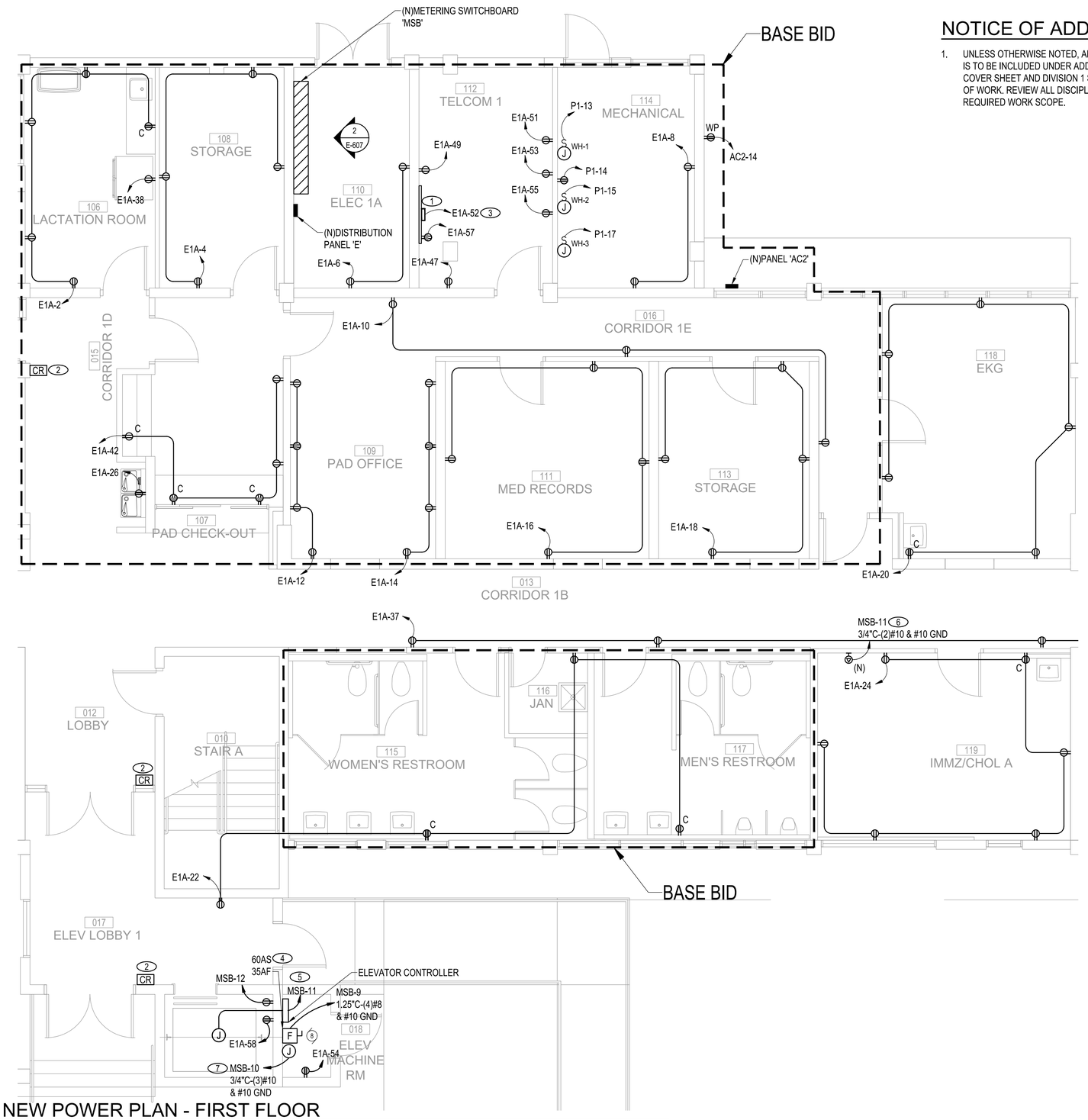
EXISTING/ NEW POWER PLAN - FIRST FLOOR

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-301A
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 235 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
M:\CO PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG. 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_NEW - (BASE).DWG



A EXISTING/ NEW POWER PLAN - FIRST FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'

NOTICE OF ADDITIVE ALTERNATES:

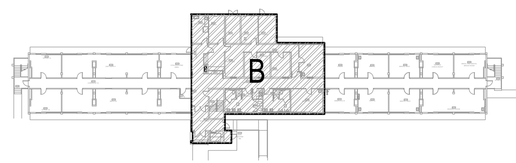
1. UNLESS OTHERWISE NOTED, ALL WORK IDENTIFIED ON DRAWINGS IS TO BE INCLUDED UNDER ADDITIVE ALTERNATE. REFER TO COVER SHEET AND DIVISION 1 SPECIFICATIONS FOR DESCRIPTION OF WORK. REVIEW ALL DISCIPLINE DRAWINGS TO ENSURE ALL REQUIRED WORK SCOPE.

GENERAL NOTES

1. UNDER BASE BID ALL EXISTING RECEPTACLES THAT ARE CONTAINED ON EXISTING WALLS SHALL REMAIN. ALL NEW CIRCUITS SERVING RECEPTACLES ARE PART OF ADDITIVE ALTERNATE #5 UNLESS OTHERWISE NOTED.
2. ALL WORK IDENTIFIED HEREIN SHALL COMPLY WITH NEC 517, AS APPLICABLE.
3. ALL BRANCH CIRCUITING SERVING PATIENT CARE AREAS SHALL BE PROVIDED WITH AN EFFECTIVE GROUND-FAULT CURRENT PATH UTILIZING A REDUNDANT INSULATED GROUND PER NEC 517.13. SUCH AREAS INCLUDE EXAMINATION ROOMS, TREATMENT ROOMS, OR ANY OTHER AREAS REQUIRED BY THE LOCAL AUTHORITY.
4. ALL RECEPTACLES WITHIN ROOMS IN CATEGORY 1, 2, OR 3 AREAS, AS DEFINED IN NEC 517 AND NFPA 99, SHALL BE HOSPITAL GRADE AND IDENTIFIED AS SUCH.

SHEET NOTES

1. 48" X 48" X 3/4" PRESSURE TREATED BACKBOARD, PAINTED WITH (2) COATS OF FIRE RETARDANT PAINT. PROVIDE #6 BARE CU GROUND FROM TELECOM GROUNDING BUS BAR TO MAIN SERVICE GROUND.
2. PROVIDE DATA CONNECTIONS PER MANUFACTURER.
3. PROVIDE ACCESS CONTROL CONTROLLER AND HEAD-END SYSTEM.
4. PROVIDE FUSED ELEVATOR DISCONNECT SWITCH, BUSSMANN QUIK-SPEC POWER MODULE SWITCH. THE DISCONNECT SHALL HAVE INTEGRAL 120V SHUNT TRIP, 200KA SCCR, FIRE SAFETY INTERFACE RELAY, FIRE MONITORING , CLASS J FUSES, KEY TEST SWITCH, PILOT LIGHT, TYPE 1 SPD (50KA), AND AUXILIARY CONTACTS. ENSURE DISCONNECT IS LOCKING TYPE.
5. PROVIDE A LOCKABLE BREAKER. TERMINATE THE CAB CIRCUIT IN THE ELEVATOR CONTROLLER.
6. COORDINATE FINAL LOCATION OF UPS RECEPTACLE IN FIELD.
7. PROVIDE A TEMPORARY CIRCUIT FOR INSTALLATION OF THE ELEVATOR. 220V, 1PH, 4W 30A SUPPLY. CONFIRM WITH ELEVATOR REPRESENTATIVE FOR CONFIRMATION OF LOCATION AND TYPE OF POWER.
8. CONFIRM FINAL LOCATION OF HOISTWAY RECEPTACLES WITH ELEVATOR MANUFACTURER.



KEYPLAN

REV NO	DESCRIPTION	DATE

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

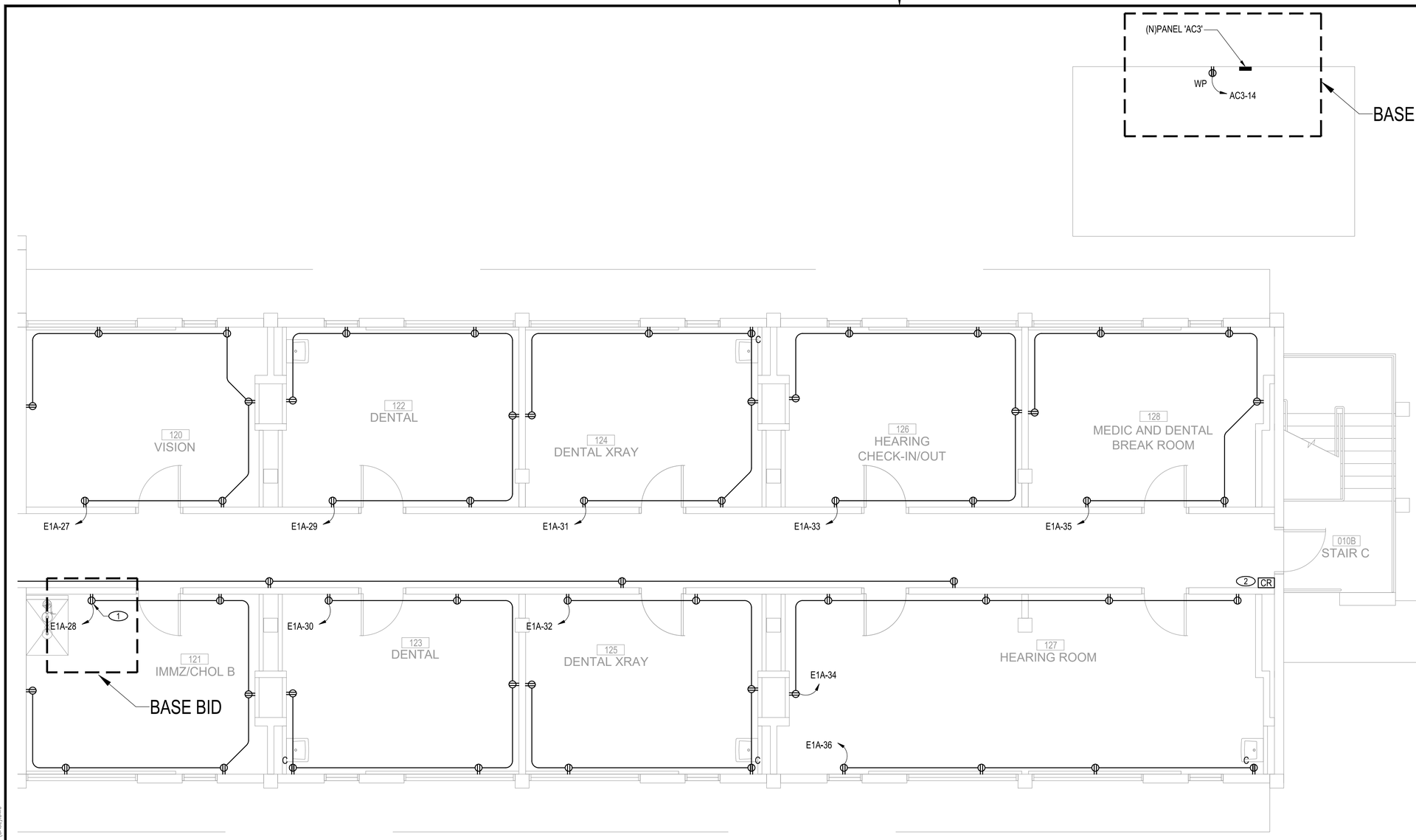
EXISTING/ NEW POWER PLAN - FIRST FLOOR

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-301B
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 236
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
M:\ED PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-PWO\ELECTRICAL\E-X_NEW - (BASE).DWG



NOTICE OF ADDITIVE ALTERNATES:

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GENERAL NOTES

1. UNDER BASE BID ALL EXISTING RECEPTACLES THAT ARE CONTAINED ON EXISTING WALLS SHALL REMAIN. ALL NEW CIRCUITS SERVING RECEPTACLES ARE PART OF ADDITIVE ALTERNATE #5 UNLESS OTHERWISE NOTED.
2. ALL WORK IDENTIFIED HEREIN SHALL COMPLY WITH NEC 517, AS APPLICABLE.
3. ALL BRANCH CIRCUITING SERVING PATIENT CARE AREAS SHALL BE PROVIDED WITH AN EFFECTIVE GROUND-FAULT CURRENT PATH UTILIZING A REDUNDANT INSULATED GROUND PER NEC 517.13. SUCH AREAS INCLUDE EXAMINATION ROOMS, TREATMENT ROOMS, OR ANY OTHER AREAS REQUIRED BY THE LOCAL AUTHORITY.
4. ALL RECEPTACLES WITHIN ROOMS IN CATEGORY 1, 2, OR 3 AREAS, AS DEFINED IN NEC 517 AND NFPA 99, SHALL BE HOSPITAL GRADE AND IDENTIFIED AS SUCH.

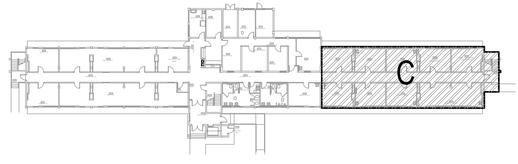
SHEET NOTES

1. REMOVE RECEPTACLE AND REPLACE WITH GFCI RECEPTACLE.
2. PROVIDE DATA CONNECTIONS PER MANUFACTURER.

A EXISTING/ NEW POWER PLAN - FIRST FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'



KEYPLAN

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW POWER PLAN - FIRST FLOOR

ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-301C
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 237
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ----

06/02/2026 12:13 pm
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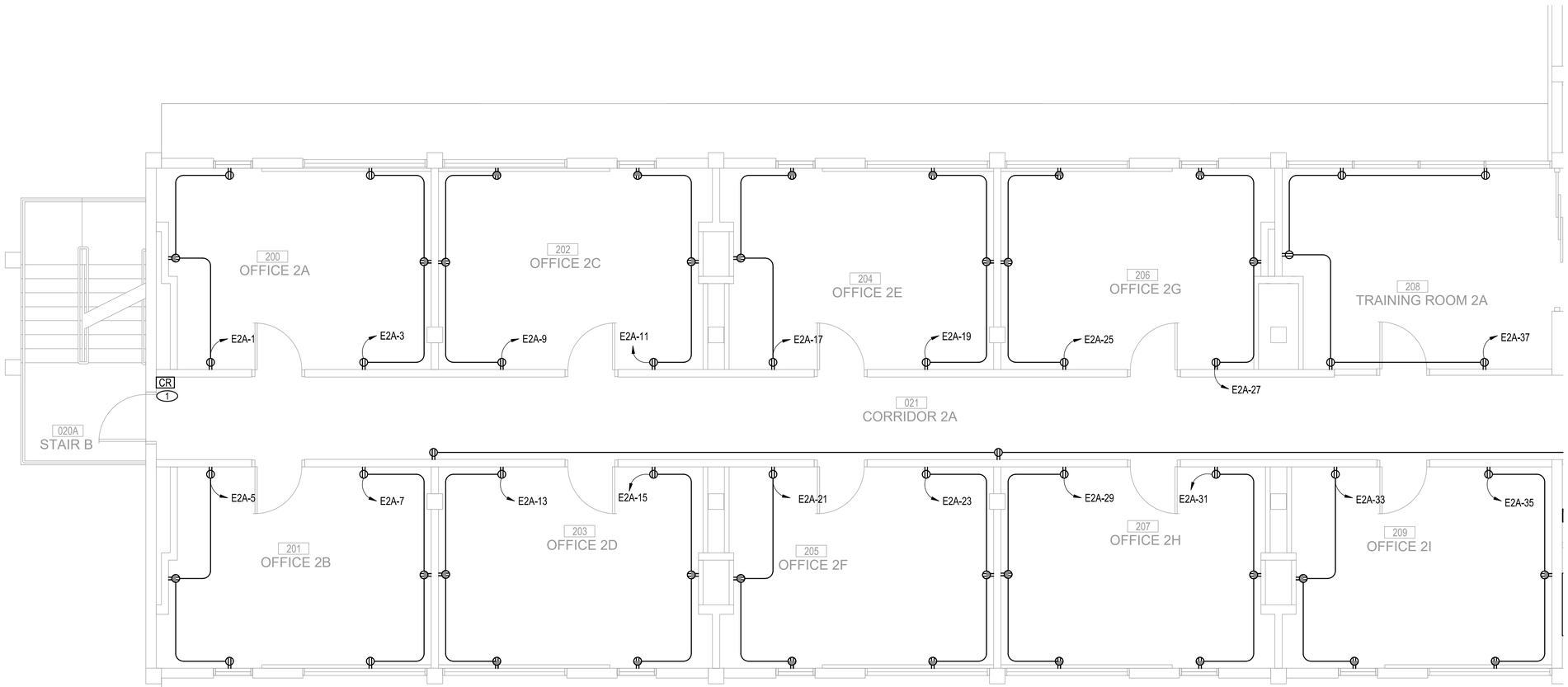

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GENERAL NOTES

1. UNDER BASE BID ALL EXISTING RECEPTACLES THAT ARE CONTAINED ON EXISTING WALLS SHALL REMAIN. ALL NEW CIRCUITS SERVING RECEPTACLES ARE PART OF ADDITIVE ALTERNATE #5 UNLESS OTHERWISE NOTED.
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3. ALL BRANCH CIRCUITING SERVING PATIENT CARE AREAS SHALL BE PROVIDED WITH AN EFFECTIVE GROUND-FAULT CURRENT PATH UTILIZING A REDUNDANT INSULATED GROUND PER NEC 517.13. SUCH AREAS INCLUDE EXAMINATION ROOMS, TREATMENT ROOMS, OR ANY OTHER AREAS REQUIRED BY THE LOCAL AUTHORITY.
4. ALL RECEPTACLES WITHIN ROOMS IN CATEGORY 1, 2, OR 3 AREAS, AS DEFINED IN NEC 517 AND NFPA 99, SHALL BE HOSPITAL GRADE AND IDENTIFIED AS SUCH.

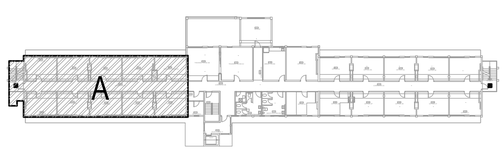
SHEET NOTES

(1) PROVIDE DATA CONNECTIONS PER MANUFACTURER.

(A) EXISTING/ NEW POWER PLAN - SECOND FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'



KEYPLAN

E. I. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW POWER PLAN - SECOND FLOOR

ENGINEERING PARTNERS		HIARNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. E-302A
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE: JUNE 2026	SHEET 238 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
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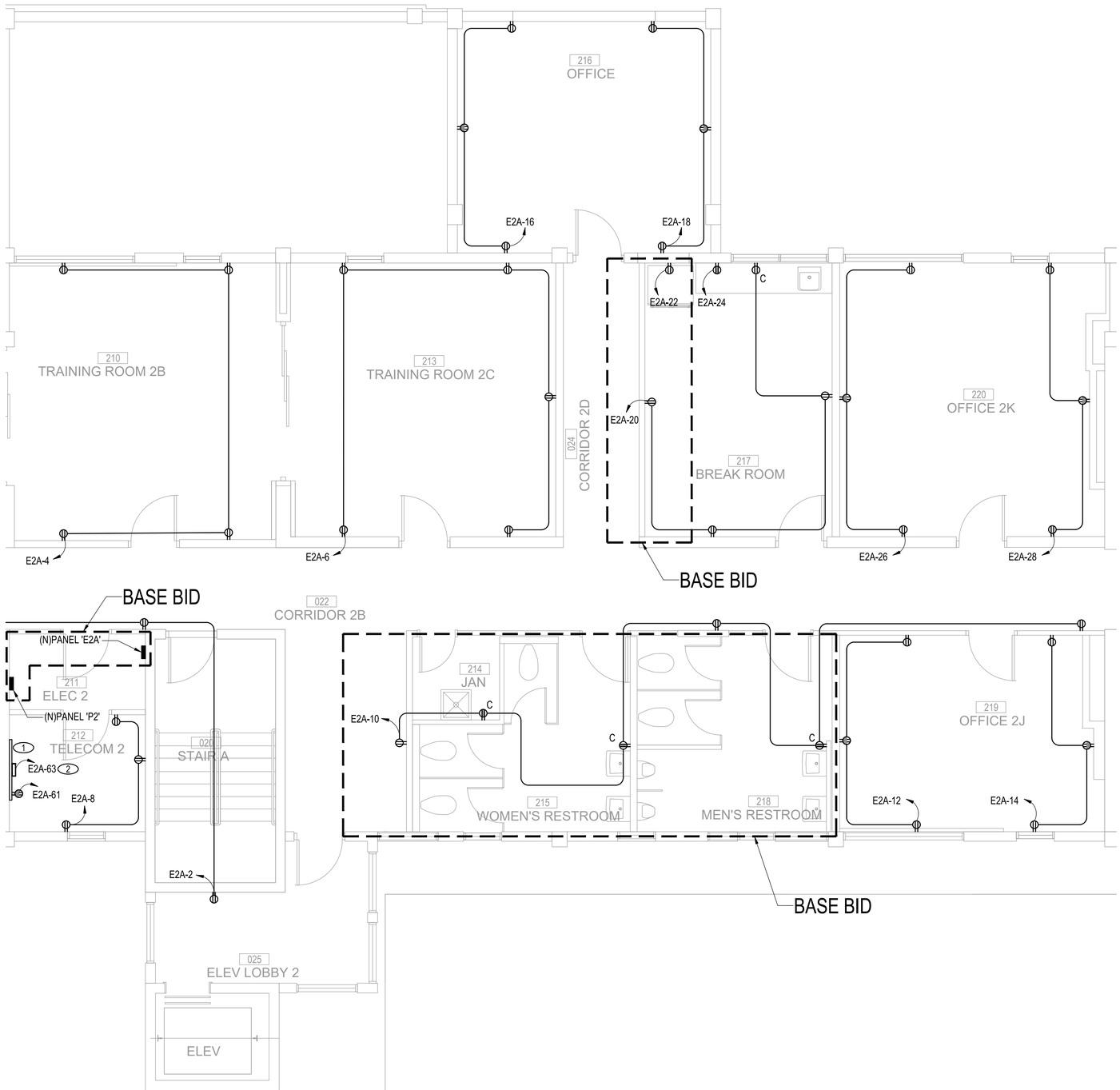


A EXISTING/ NEW POWER PLAN - SECOND FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'

NOTICE OF ADDITIVE ALTERNATES:

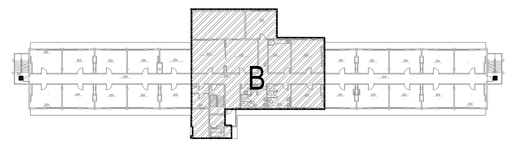
1. UNLESS OTHERWISE NOTED, ALL WORK IDENTIFIED ON DRAWINGS IS TO BE INCLUDED UNDER ADDITIVE ALTERNATE. REFER TO COVER SHEET AND DIVISION 1 SPECIFICATIONS FOR DESCRIPTION OF WORK. REVIEW ALL DISCIPLINE DRAWINGS TO ENSURE ALL REQUIRED WORK SCOPE.

GENERAL NOTES

1. UNDER BASE BID ALL EXISTING RECEPTACLES THAT ARE CONTAINED ON EXISTING WALLS SHALL REMAIN. ALL NEW CIRCUITS SERVING RECEPTACLES ARE PART OF ADDITIVE ALTERNATE #5 UNLESS OTHERWISE NOTED.
2. ALL WORK IDENTIFIED HEREIN SHALL COMPLY WITH NEC 517, AS APPLICABLE.
3. ALL BRANCH CIRCUITING SERVING PATIENT CARE AREAS SHALL BE PROVIDED WITH AN EFFECTIVE GROUND-FAULT CURRENT PATH UTILIZING A REDUNDANT INSULATED GROUND PER NEC 517.13. SUCH AREAS INCLUDE EXAMINATION ROOMS, TREATMENT ROOMS, OR ANY OTHER AREAS REQUIRED BY THE LOCAL AUTHORITY.
4. ALL RECEPTACLES WITHIN ROOMS IN CATEGORY 1, 2, OR 3 AREAS, AS DEFINED IN NEC 517 AND NFPA 99, SHALL BE HOSPITAL GRADE AND IDENTIFIED AS SUCH.

SHEET NOTES

1. 48" X 48" X 3/4" PRESSURE TREATED BACKBOARD, PAINTED WITH (2) COATS OF FIRE RETARDANT PAINT. PROVIDE #6 BARE CU GROUND FROM TELECOM GROUNDING BUS BAR TO MAIN SERVICE GROUND.
2. PROVIDE ACCESS CONTROL CONTROLLER AND HEAD-END SYSTEM.



KEYPLAN

REV. NO	DESCRIPTION	DATE

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

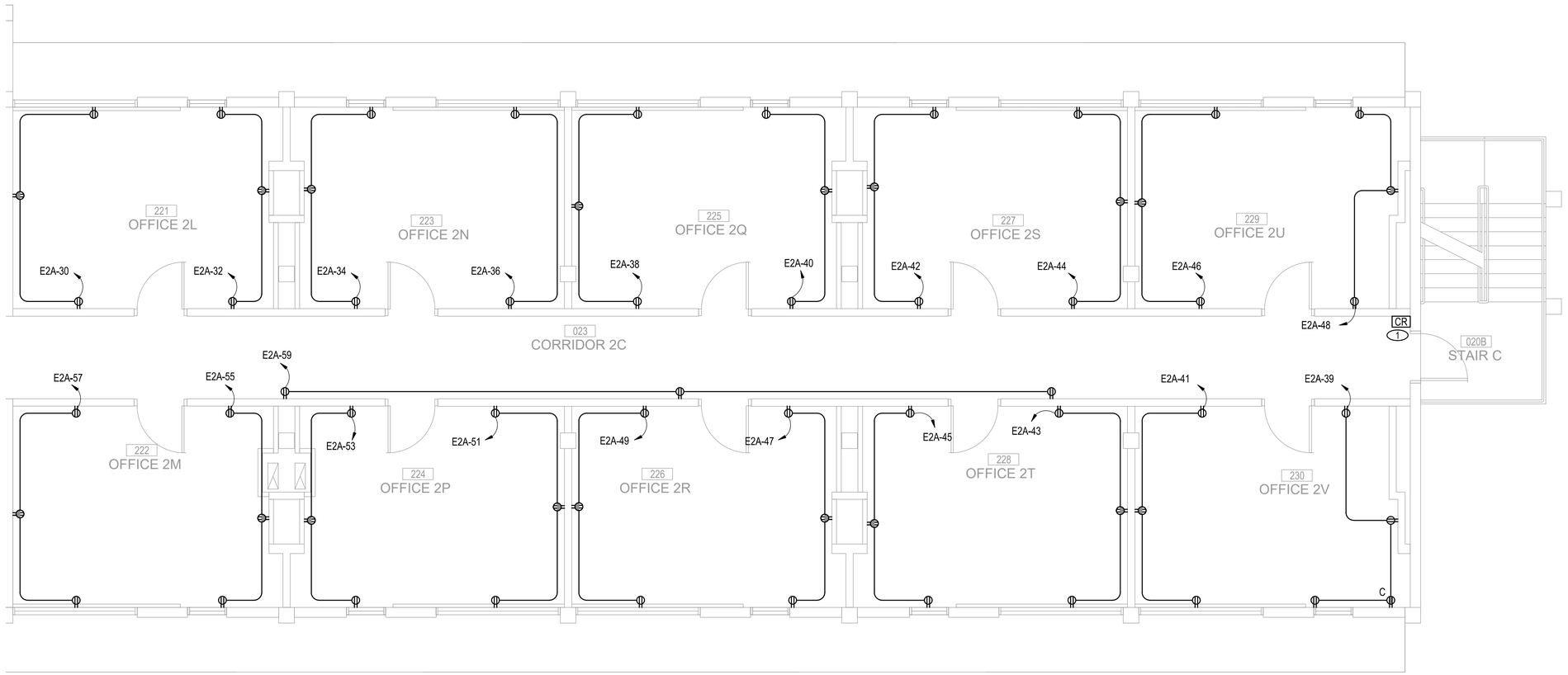
EXISTING/ NEW POWER PLAN - SECOND FLOOR

ENGINEERING PARTNERS		HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-302B
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 239 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

06/02/2026 12:33 pm
M:\JCO PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_NEW - (BASE).DWG



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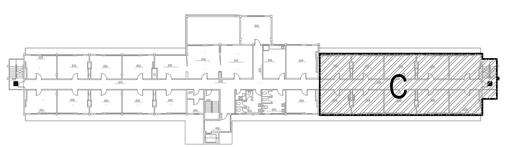
SHEET NOTES

(1) PROVIDE DATA CONNECTIONS PER MANUFACTURER.

A EXISTING/ NEW POWER PLAN - SECOND FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'



KEYPLAN

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW POWER PLAN - SECOND FLOOR

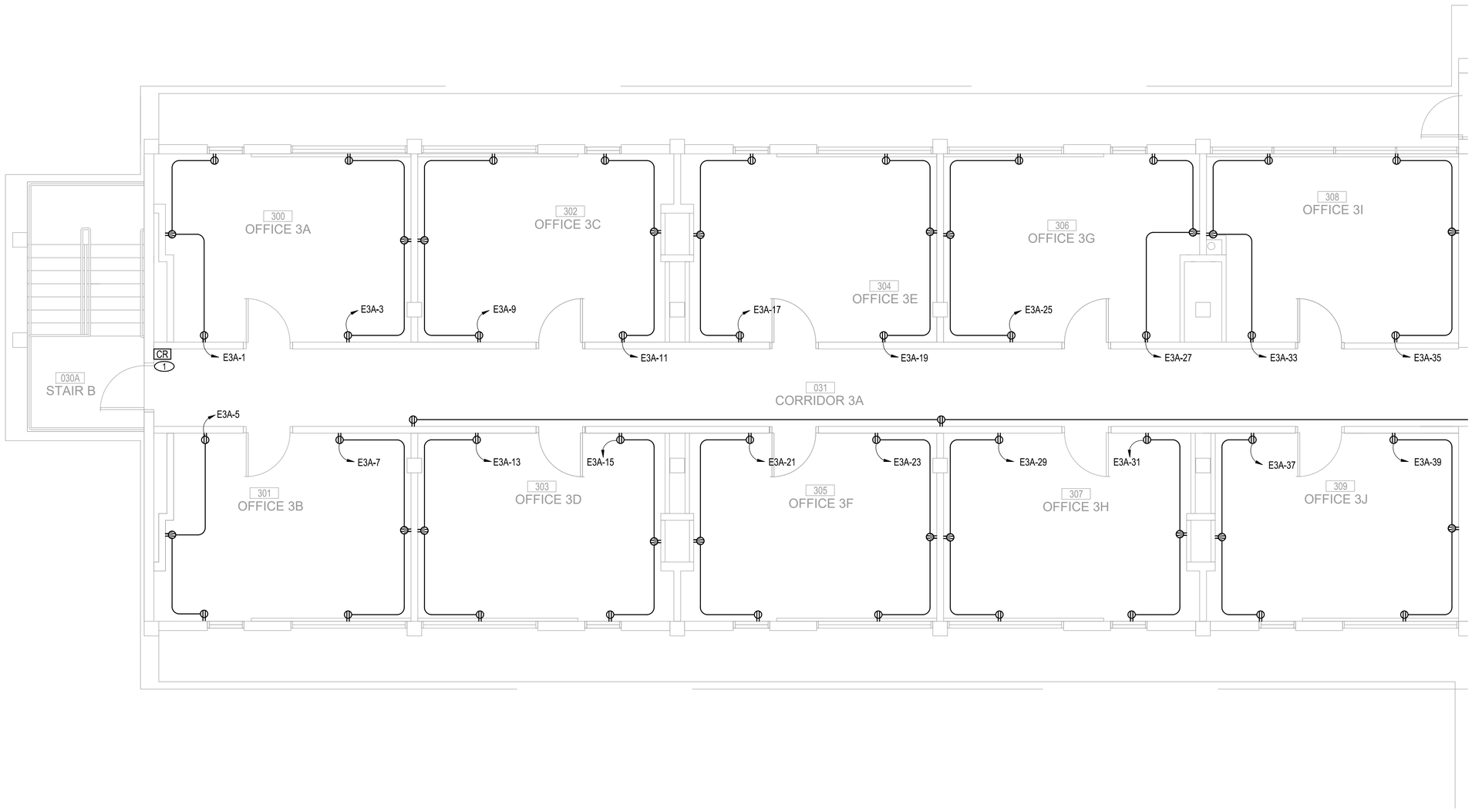
ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-302C
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 240
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ____

06/02/2026 12:33 pm
MACO PROJECTS\2025 PROJECTS\12018-25-01 JOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_NEW - (BASE).DWG



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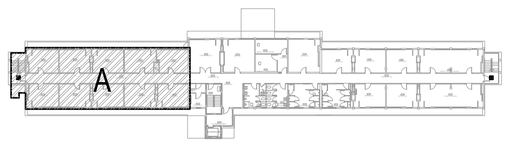
SHEET NOTES

(1) PROVIDE DATA CONNECTIONS PER MANUFACTURER.

A EXISTING/ NEW POWER PLAN - THIRD FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'



KEYPLAN

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW POWER PLAN - THIRD FLOOR

ENGINEERING PARTNERS		HIARNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. E-303A
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE	SHEET 241
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
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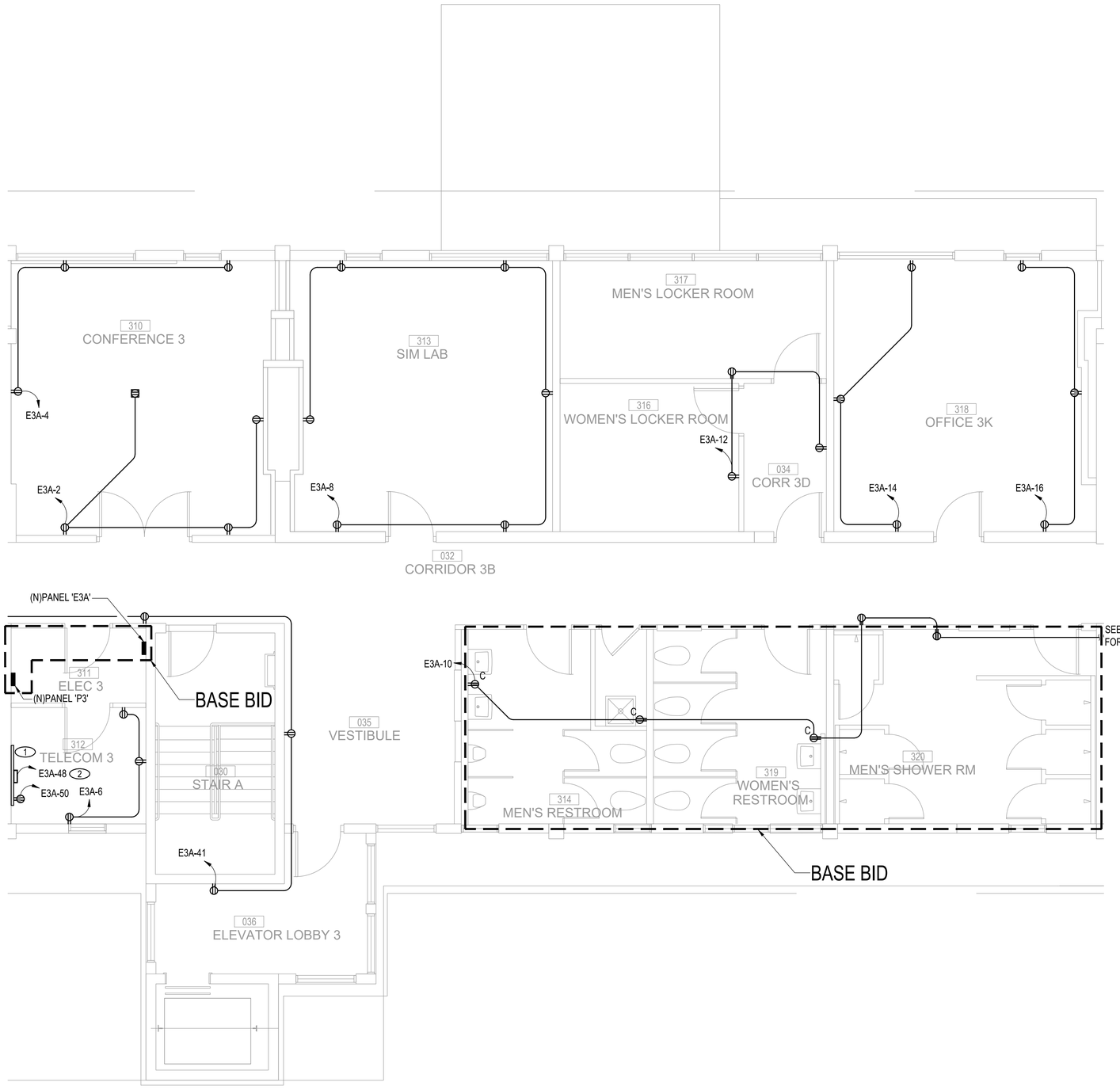

A EXISTING/ NEW POWER PLAN - THIRD FLOOR

SCALE: 1/4" = 1'-0"

0 4" 8"

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(1) 48" X 48" X 3/4" PRESSURE TREATED BACKBOARD, PAINTED WITH (2) COATS OF FIRE RETARDANT PAINT. PROVIDE #6 BARE CU GROUND FROM TELECOM GROUNDING BUS BAR TO MAIN SERVICE GROUND.

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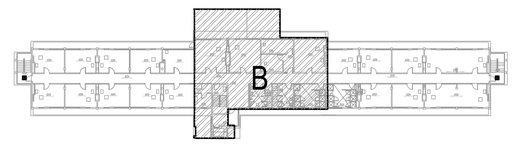

KEYPLAN

REV NO	DESCRIPTION	DATE

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW POWER PLAN - THIRD FLOOR

ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HAPRG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-303B
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 242 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
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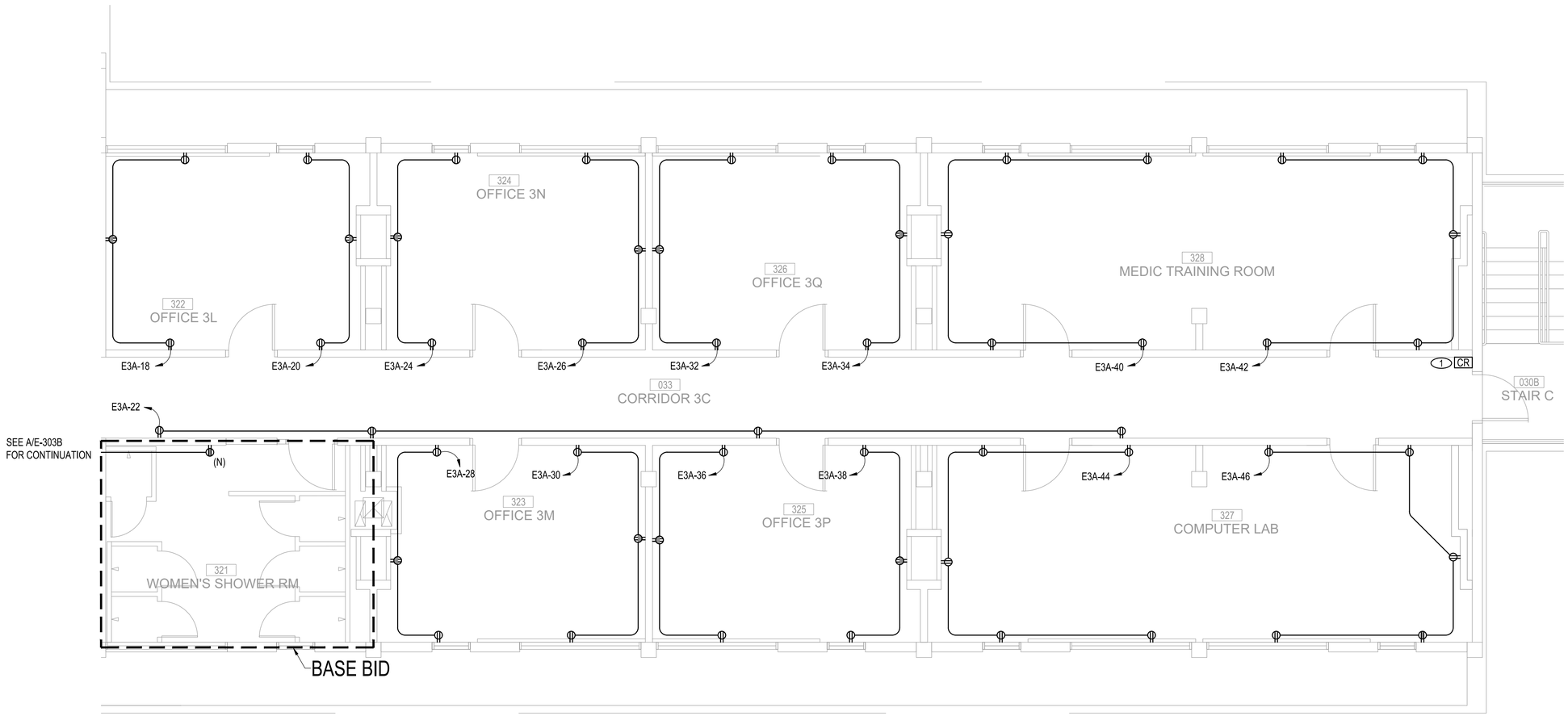

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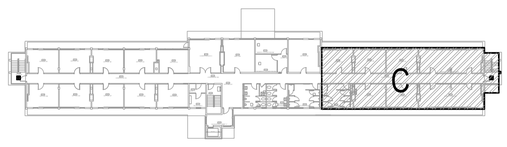
SHEET NOTES

(1) PROVIDE DATA CONNECTIONS PER MANUFACTURER.

A EXISTING/ NEW POWER PLAN - THIRD FLOOR

SCALE: 1/4" = 1'-0"

0 4" 8"



KEYPLAN

E. L. I. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW POWER PLAN - THIRD FLOOR

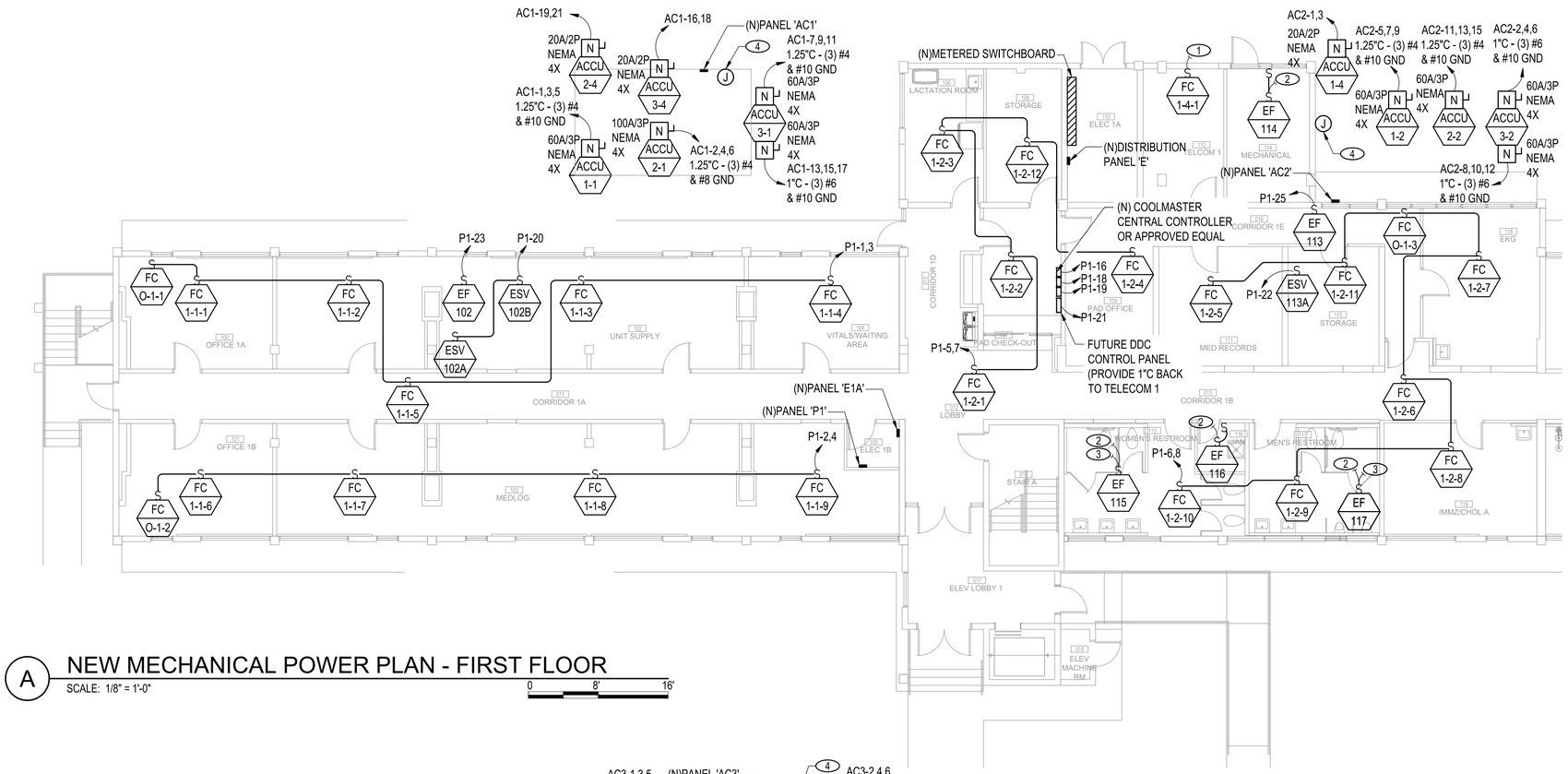
ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HAPRO JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-303C
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 243 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

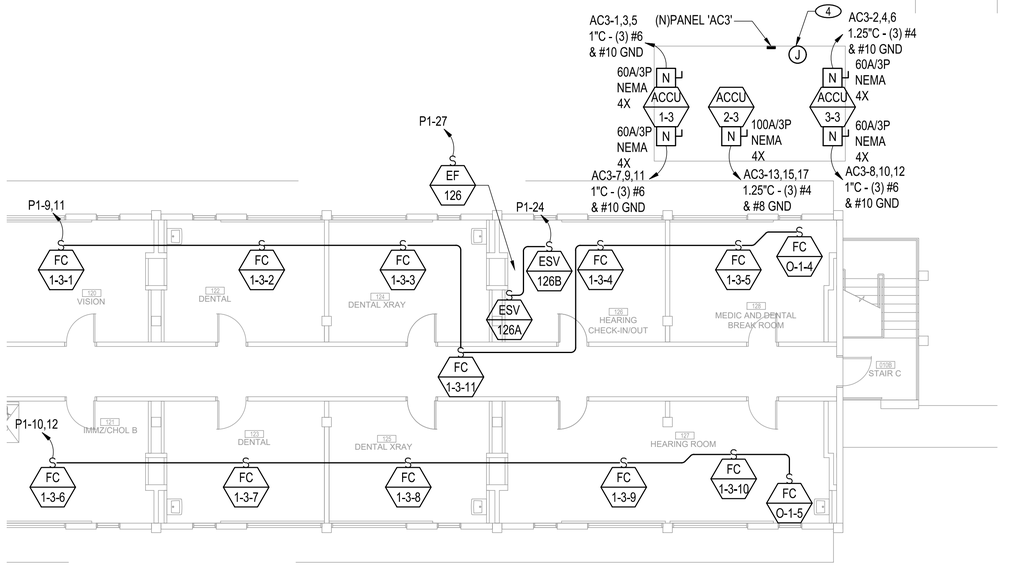
06/02/2026 12:33 pm
M:\LOD PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_NEW - (BASE).DWG



A NEW MECHANICAL POWER PLAN - FIRST FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'



B NEW MECHANICAL POWER PLAN - FIRST FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'

GENERAL NOTES

1. ALL WORK IDENTIFIED HEREIN SHALL COMPLY WITH NEC 517, AS APPLICABLE.
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SHEET NOTES

1. POWERED BY ACCU 1-4. PROVIDE CONNECTION BETWEEN INDOOR UNIT PER MANUFACTURERS INSTRUCTIONS.
2. CONNECT EXHAUST FAN TO LIGHTING CIRCUIT.
3. INTERLOCK EXHAUST FAN TO LIGHT SWITCH.
4. PROVIDE NEMA 4X JUNCTION BOX WITH 2"C BACK TO TELECOM 1.

REV NO	DESCRIPTION	DATE

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

NEW MECHANICAL POWER PLAN - FIRST FLOOR

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-304A
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 244 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:13 pm
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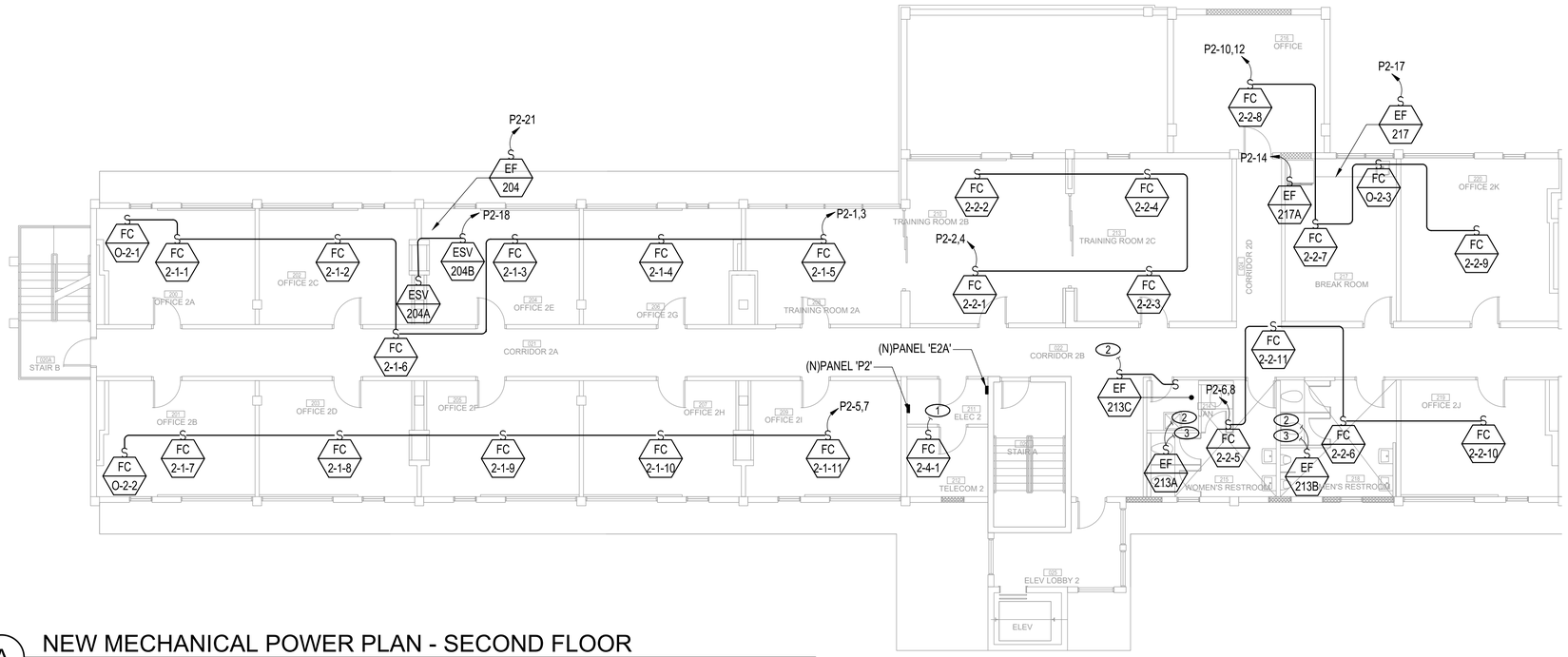
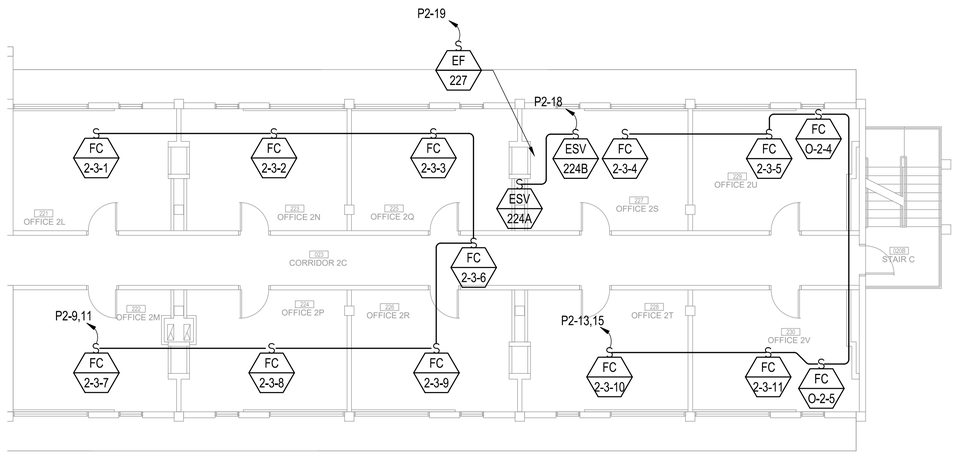


A NEW MECHANICAL POWER PLAN - SECOND FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'



B NEW MECHANICAL POWER PLAN - SECOND FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'

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SHEET NOTES

1. POWERED BY ACCU 2-4. PROVIDE CONNECTION BETWEEN INDOOR UNIT PER MANUFACTURERS INSTRUCTIONS.
2. CONNECT EXHAUST FAN TO LIGHTING CIRCUIT.
3. INTERLOCK EXHAUST FAN TO LIGHT SWITCH.

E. L. I. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
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HAWAII, U.S.A.

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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

NEW MECHANICAL POWER PLAN - SECOND FLOOR

ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-305A
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 245 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
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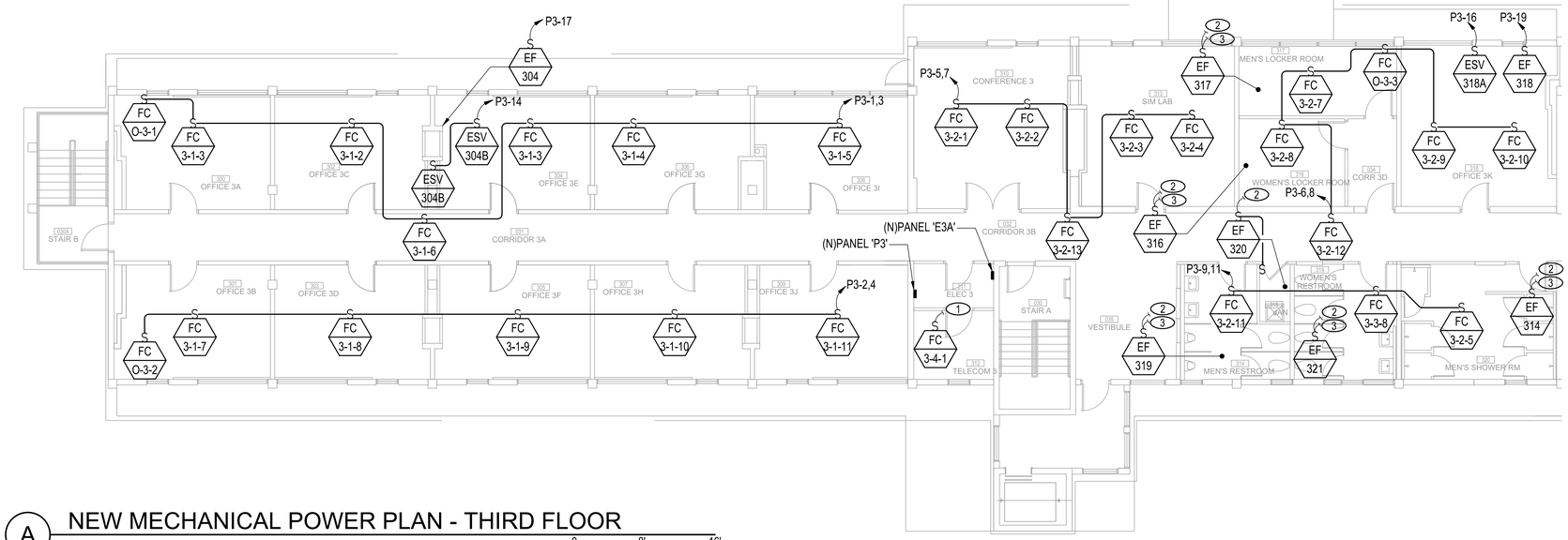
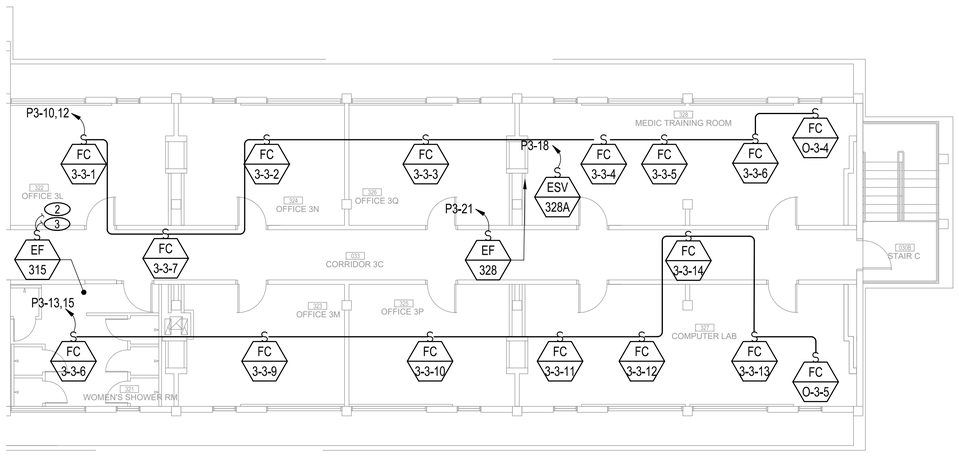


A NEW MECHANICAL POWER PLAN - THIRD FLOOR

SCALE: 1/8" = 1'-0"

0 8' 16'



B NEW MECHANICAL POWER PLAN - THIRD FLOOR

SCALE: 1/8" = 1'-0"

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SHEET NOTES

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(2) CONNECT EXHAUST FAN TO LIGHTING CIRCUIT.

(3) INTERLOCK EXHAUST FAN TO LIGHT SWITCH.

ELI B. WALTZ
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STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

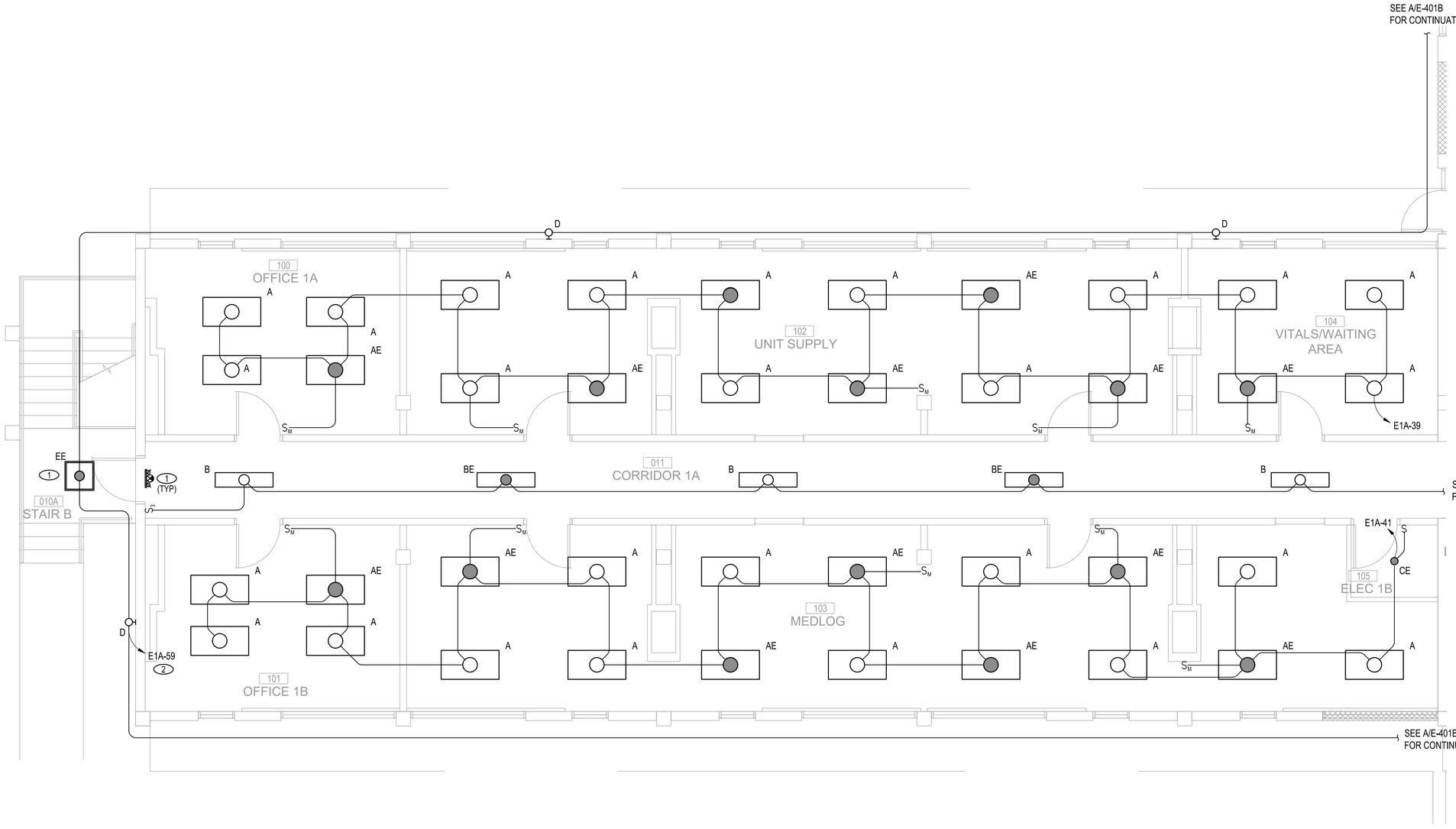
NEW MECHANICAL POWER PLAN - THIRD FLOOR

ENGINEERING PARTNERS		HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-306A
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 246
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
M:\ECO PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_NEW - (BASE).DWG



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GENERAL NOTES

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3. ALL BRANCH CIRCUITING SERVING PATIENT CARE AREAS SHALL BE PROVIDED WITH AN EFFECTIVE GROUND-FAULT CURRENT PATH UTILIZING A REDUNDANT INSULATED GROUND PER NEC 517.13. SUCH AREAS INCLUDE EXAMINATION ROOMS, TREATMENT ROOMS, OR ANY OTHER AREAS REQUIRED BY THE LOCAL AUTHORITY.

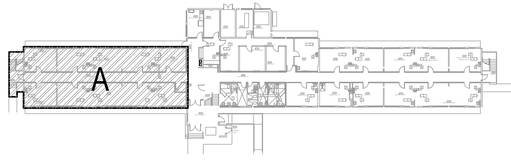
SHEET NOTES

1. CONNECT NEW EMERGENCY FIXTURE TO NEAREST UNSWITCHED PORTION OF LIGHTING CIRCUIT.
2. CIRCUIT VIA PHOTOCELL/ TIMECLOCK, SEE DETAIL 3/E-607.

A EXISTING/ NEW LIGHTING PLAN - FIRST FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'



KEYPLAN

E.I. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW LIGHTING PLAN - FIRST FLOOR

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-401A
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE: JUNE 2026	SHEET 247 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
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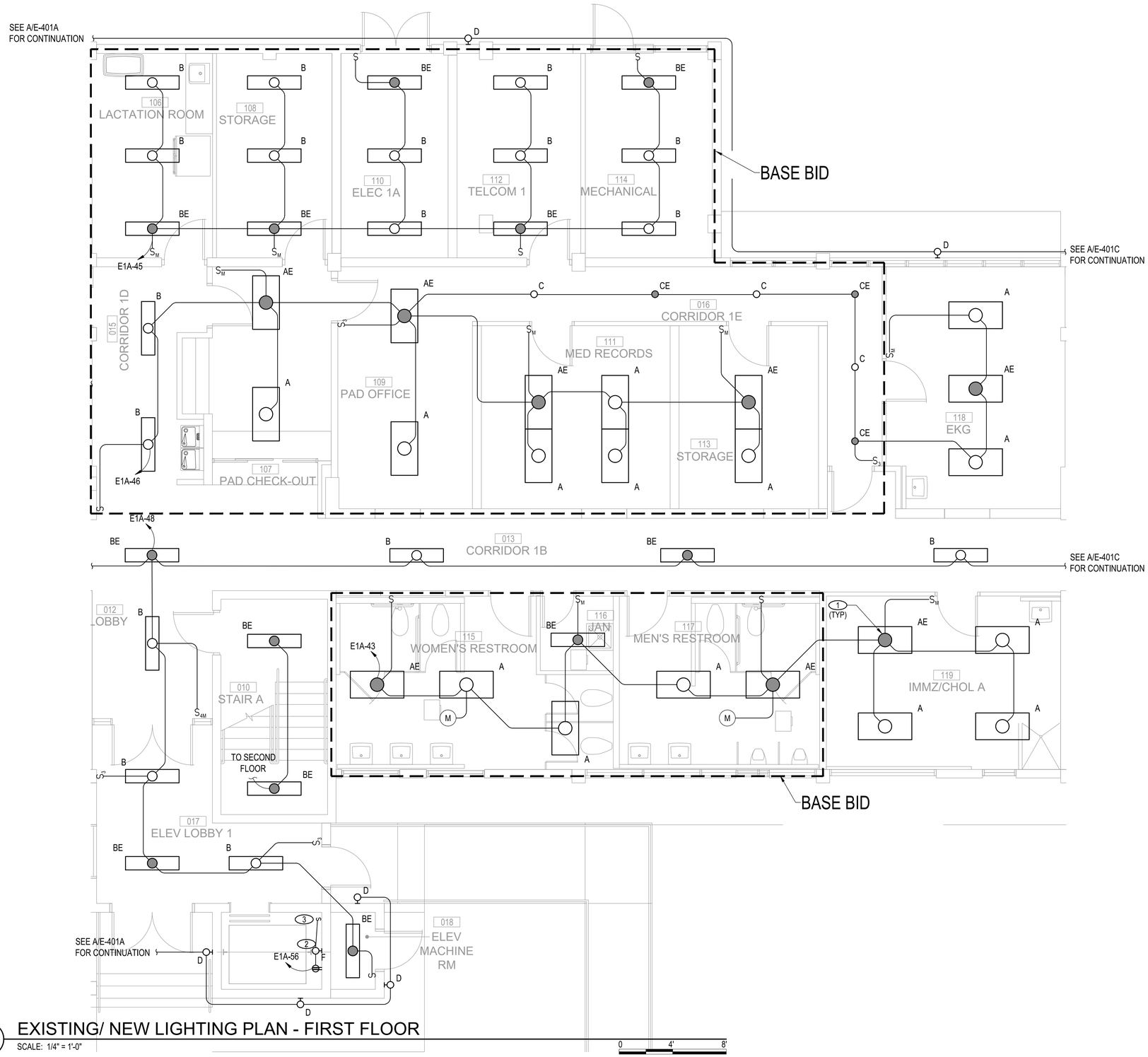

A EXISTING/ NEW LIGHTING PLAN - FIRST FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'

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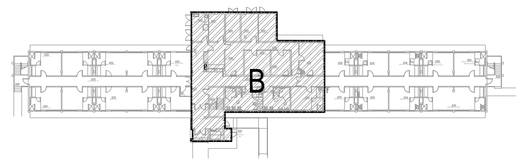
SHEET NOTES

(1) CONNECT NEW EMERGENCY FIXTURE TO NEAREST UNSWITCHED PORTION OF LIGHTING CIRCUIT.

(2) LOCATE PER MANUFACTURER REQUIREMENTS.



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ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW LIGHTING PLAN - FIRST FLOOR

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-401B
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 248
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
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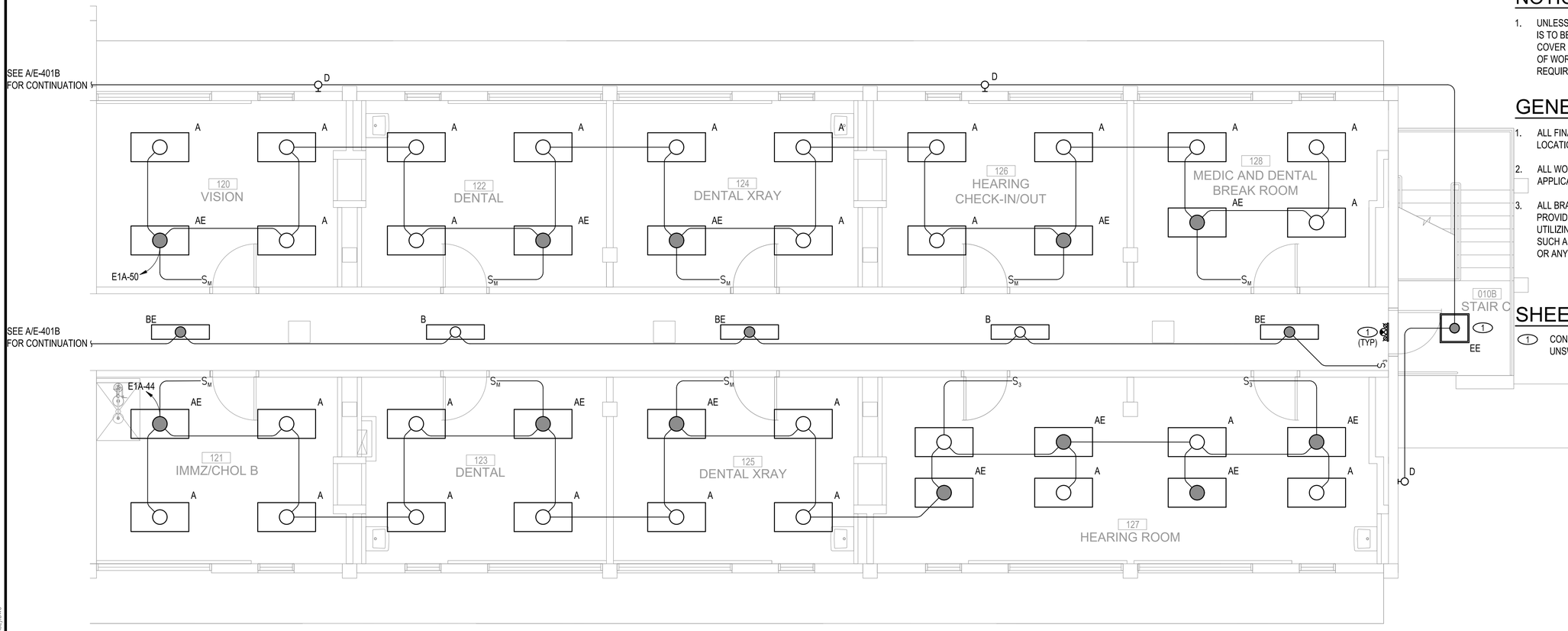

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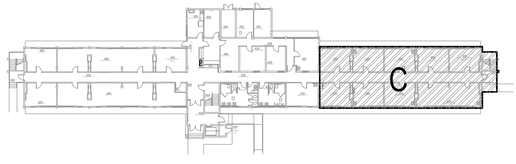
(1) CONNECT NEW EMERGENCY FIXTURE TO NEAREST UNSWITCHED PORTION OF LIGHTING CIRCUIT.

A EXISTING/ NEW LIGHTING PLAN - FIRST FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'



KEYPLAN

E. L. B. WALTZ
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Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW LIGHTING PLAN - FIRST FLOOR

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-401C
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE	SHEET 249
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:43 pm
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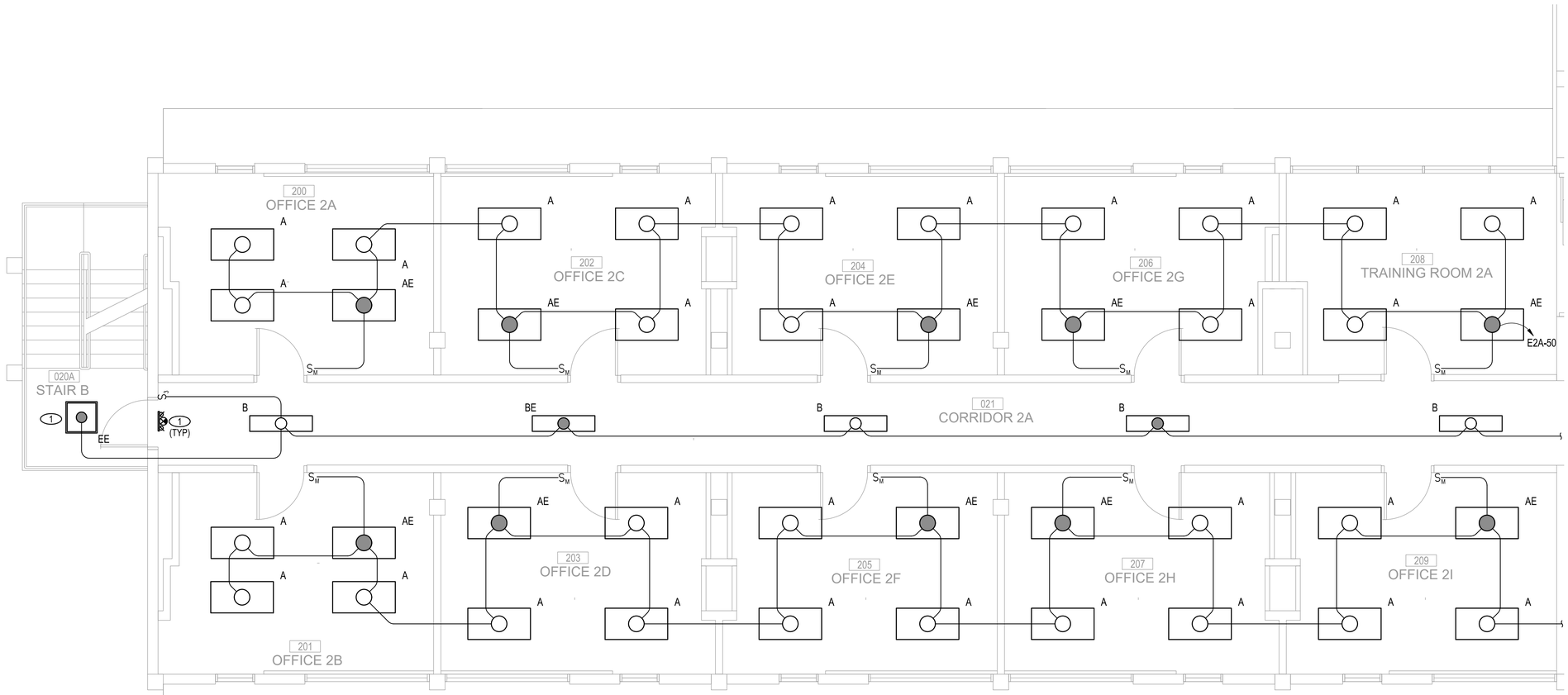

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SHEET NOTES

(1) CONNECT NEW EMERGENCY FIXTURE TO NEAREST UNSWITCHED PORTION OF LIGHTING CIRCUIT.

A EXISTING/ NEW LIGHTING PLAN - SECOND FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'

KEYPLAN

ELI B. WALTZ
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Exp. 04/30/28
No. 18572-E
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SIGNATURE

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DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW LIGHTING PLAN - SECOND FLOOR

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-402A
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE	SHEET 250
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:13 pm
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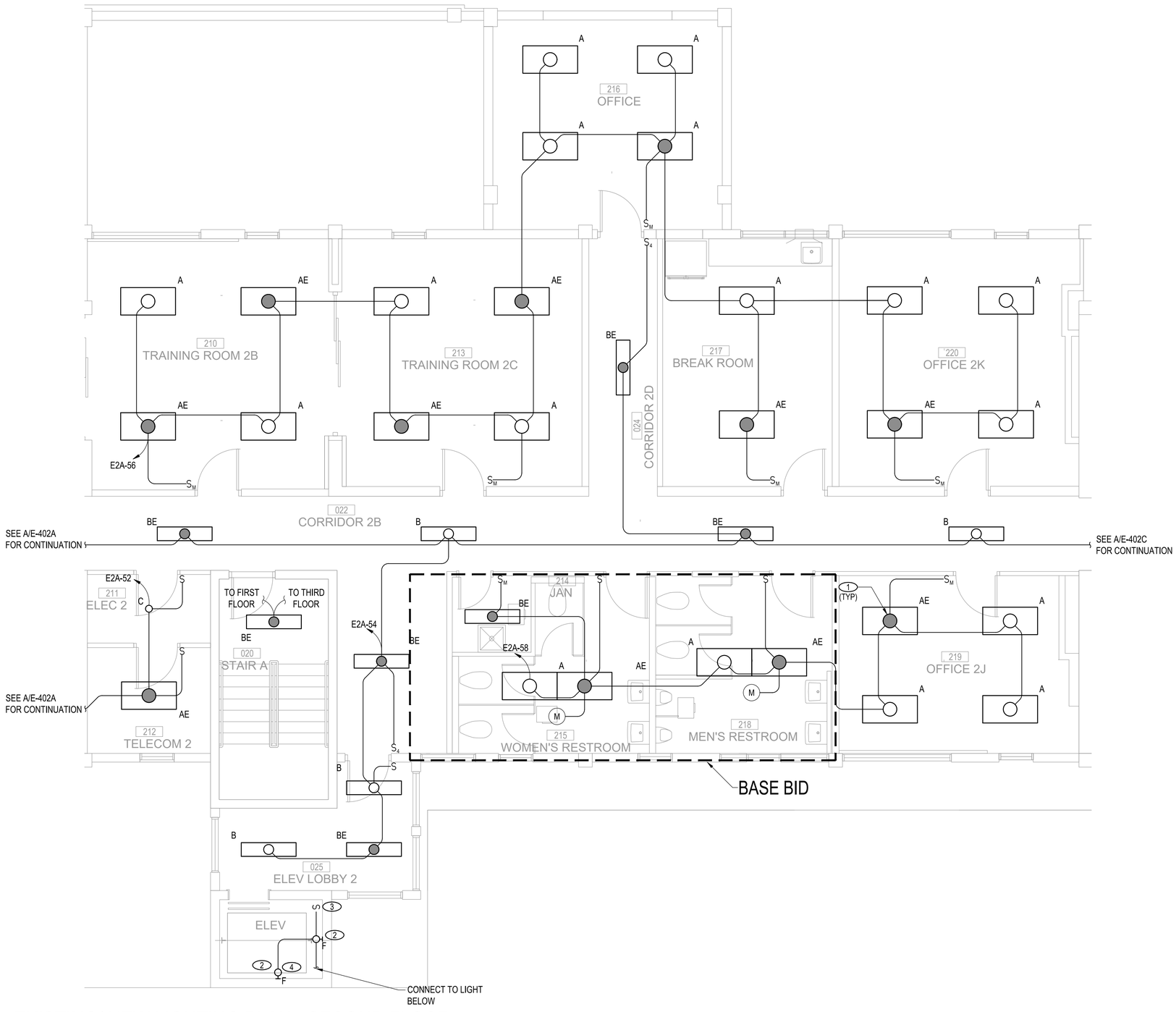

A EXISTING/ NEW LIGHTING PLAN - SECOND FLOOR

SCALE: 1/4" = 1'-0"

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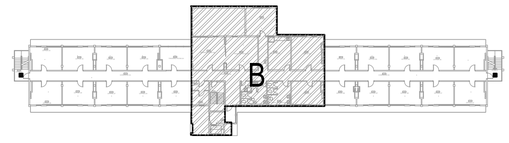
3. LOCATE SWITCH TO BE ACCESSIBLE FROM PIT LADDER.
4. LIGHT TO BE MOUNTED ABOVE HIGHEST ELEVATOR STOP LOCATION.



KEYPLAN

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Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW LIGHTING PLAN - SECOND FLOOR

ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HIARNG JOB NO, FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-402B
DRAWN BY: KD	APPROVED BY: EW	DATE	SHEET 251
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

06/02/2026 12:33 pm
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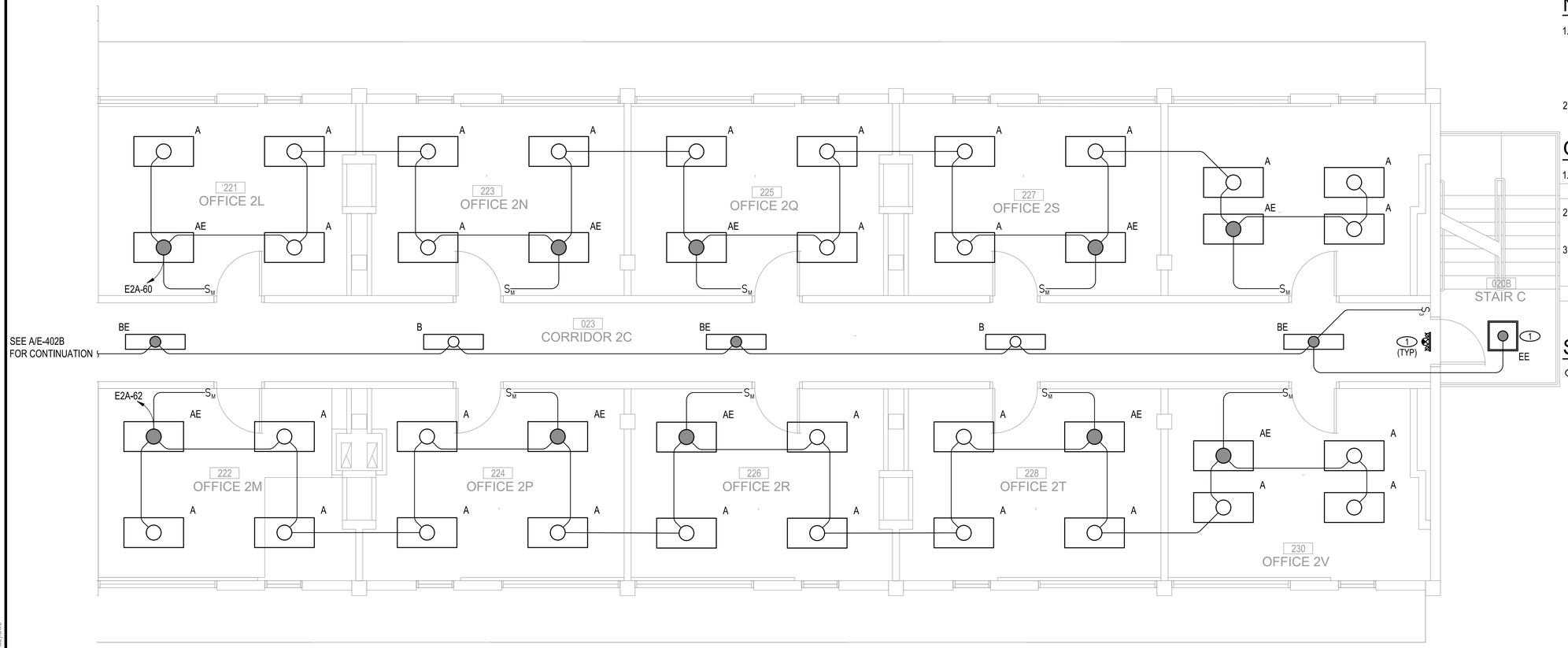

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2. DEMOLITION ON ALL VAV BOXES TO BE INCLUDED UNDER BASE BID.

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SHEET NOTES

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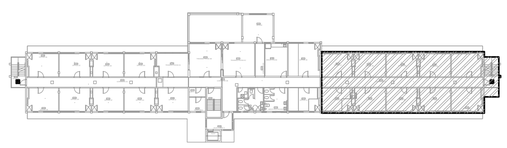
A EXISTING/ NEW LIGHTING PLAN - SECOND FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'



KEYPLAN

E. L. B. WALTZ
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Exp. 04/30/28
No. 18572-E
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DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

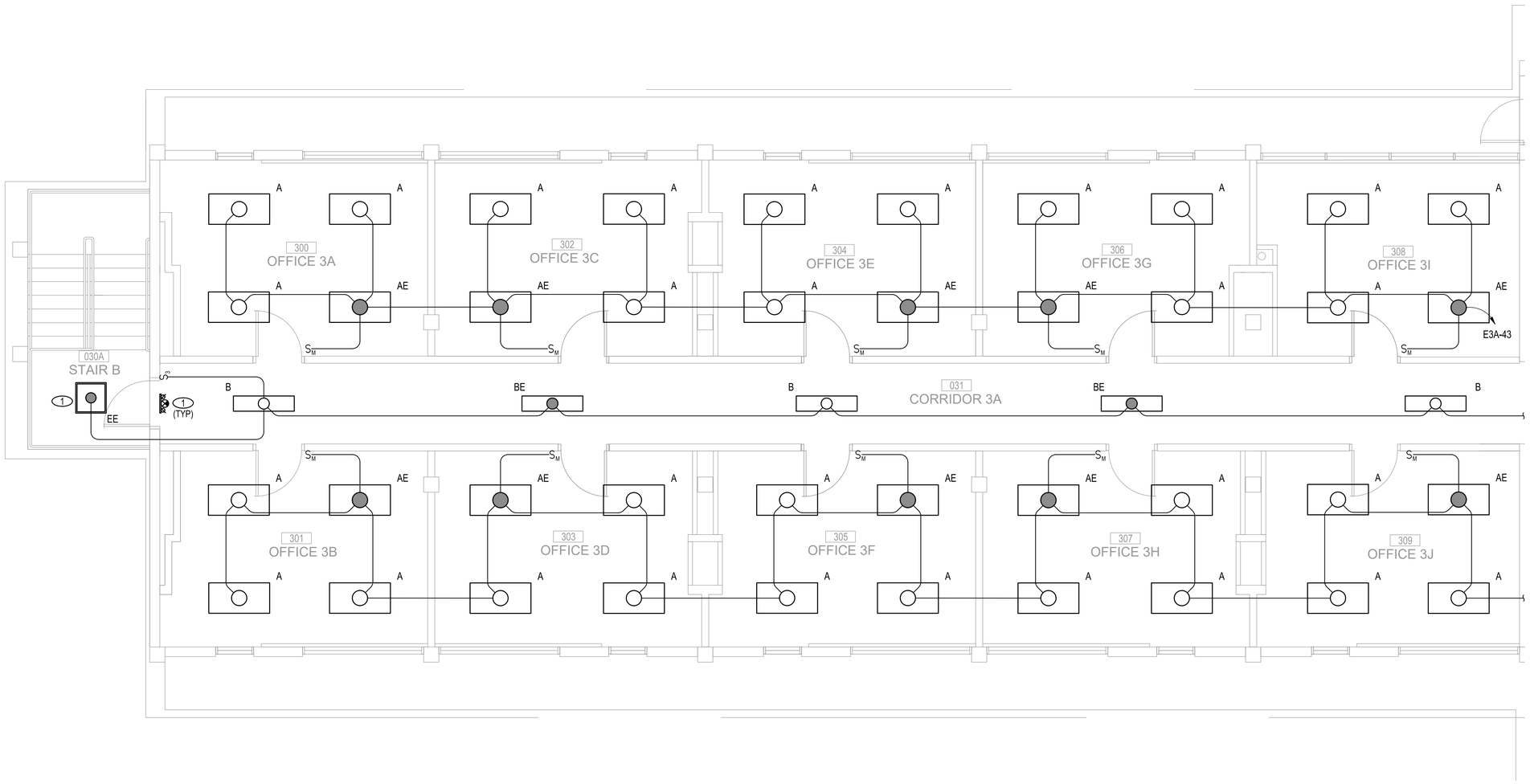
EXISTING/ NEW LIGHTING PLAN - SECOND FLOOR

ENGINEERING PARTNERS		HIARNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. E-402C
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE	SHEET 252
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
M:\JOB PROJECTS\2018--25--01 DOD BLDG 46 MEDCOM RENOVATIONS\4--DWG\ELECTRICAL\E-X_NEW -- (BASE).DWG



SEE A/E-403B
FOR CONTINUATION

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FOR CONTINUATION

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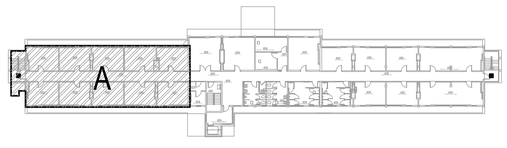
A EXISTING/ NEW LIGHTING PLAN - THIRD FLOOR
SCALE: 1/4" = 1'-0"

0 4' 8'



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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

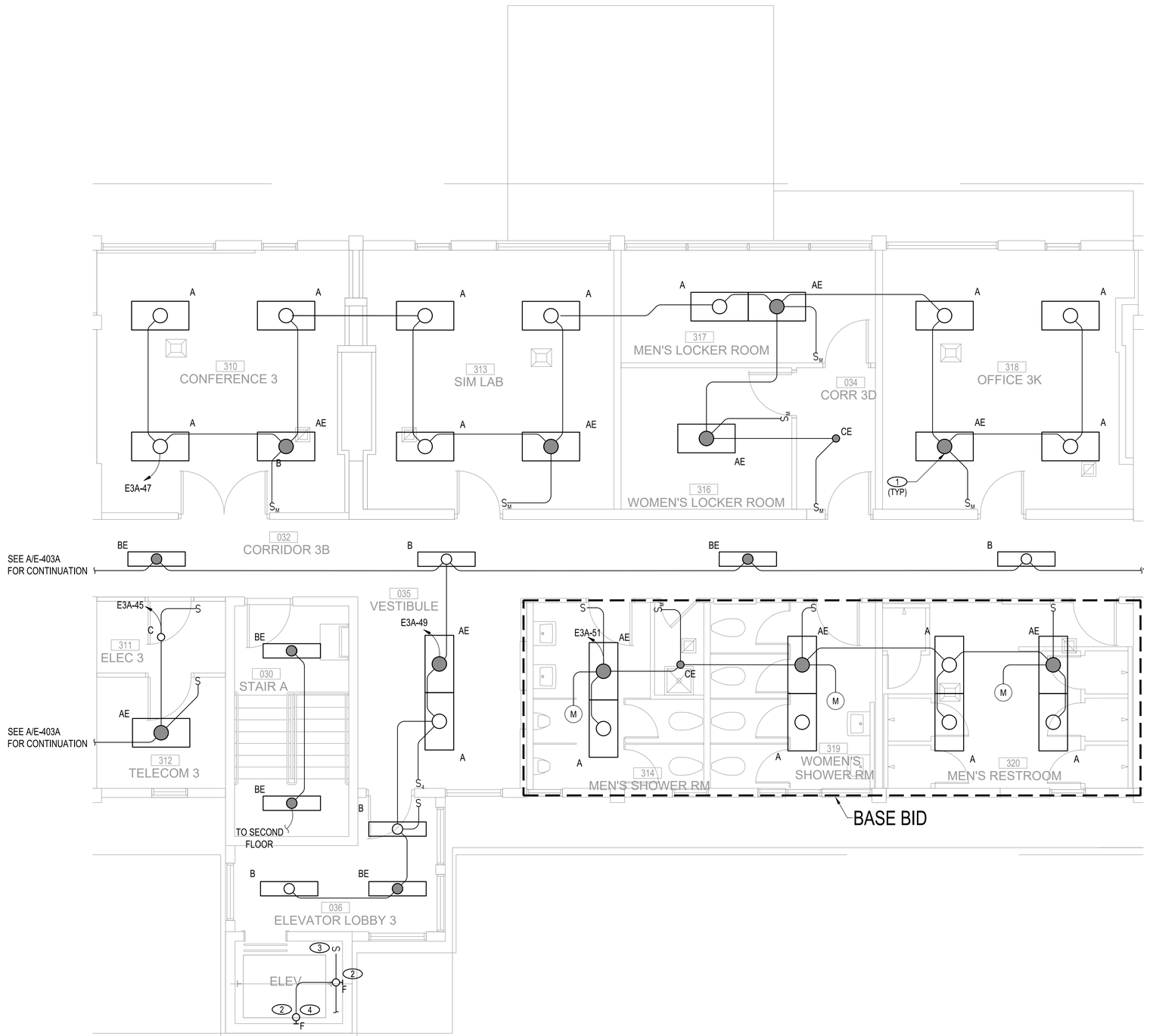
EXISTING/ NEW LIGHTING PLAN - THIRD FLOOR

ENGINEERING PARTNERS		HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-403A
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE: JUNE 2026	SHEET 253 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

06/02/2026 12:33 pm
M:\JOB PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG. 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_NEW - (BASE).DWG



A EXISTING/ NEW LIGHTING PLAN - THIRD FLOOR

SCALE: 1/4" = 1'-0"

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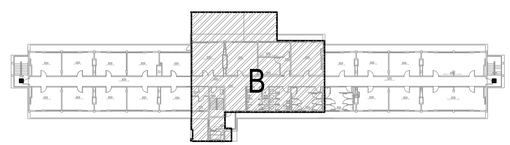

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STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW LIGHTING PLAN - THIRD FLOOR

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-403B
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 254 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ---

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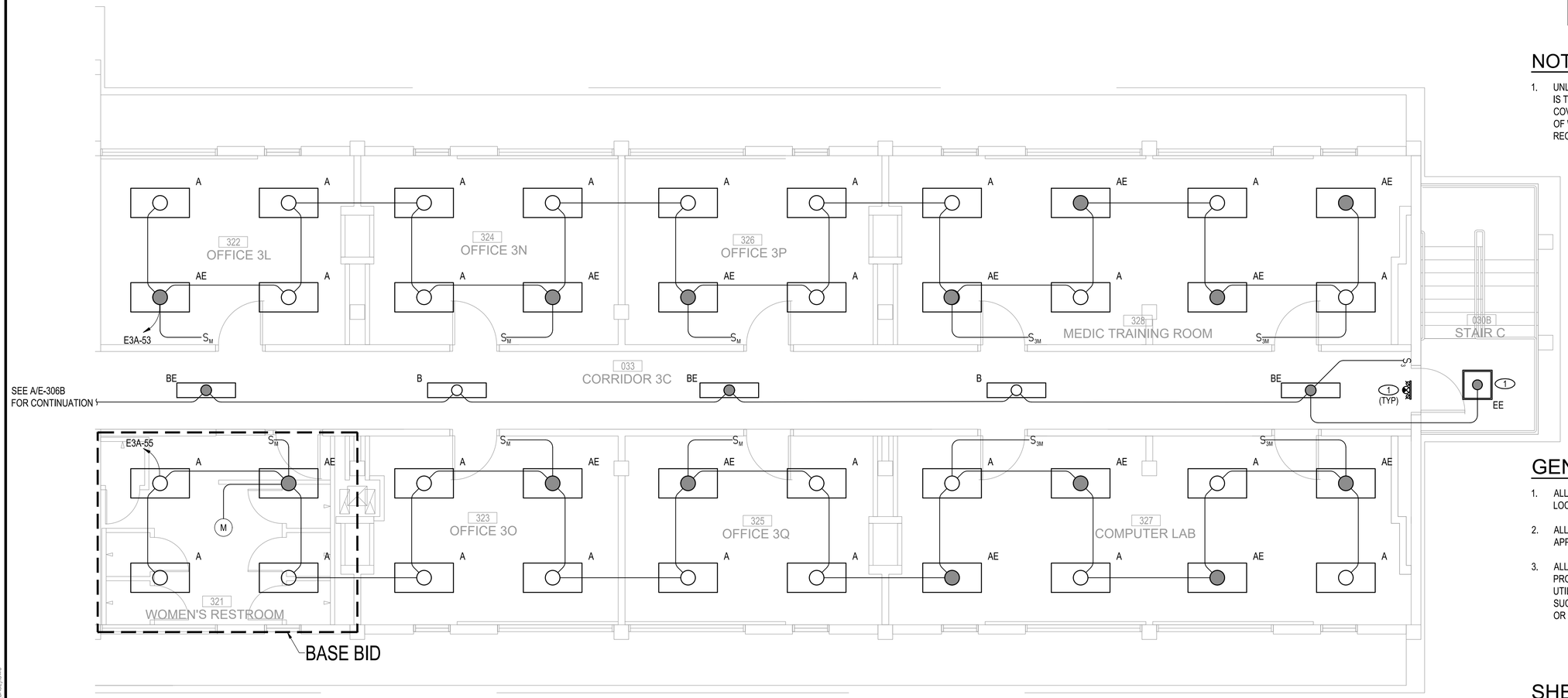
06/02/2026 12:33 pm
M:\ED PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_NEW - (BASE).DWG



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GENERAL NOTES

1. ALL FINAL LIGHT LOCATIONS TO BE CONFIRMED IN FIELD. FINAL LOCATIONS DEPENDANT ON FINAL FLOOR PLAN AND RCP.
2. ALL WORK IDENTIFIED HEREIN SHALL COMPLY WITH NEC 517, AS APPLICABLE.
3. ALL BRANCH CIRCUITING SERVING PATIENT CARE AREAS SHALL BE PROVIDED WITH AN EFFECTIVE GROUND-FAULT CURRENT PATH UTILIZING A REDUNDANT INSULATED GROUND PER NEC 517.13. SUCH AREAS INCLUDE EXAMINATION ROOMS, TREATMENT ROOMS, OR ANY OTHER AREAS REQUIRED BY THE LOCAL AUTHORITY.

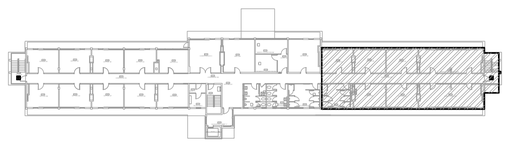
SHEET NOTES

(1) CONNECT NEW EMERGENCY FIXTURE TO NEAREST UNSWITCHED PORTION OF LIGHTING CIRCUIT.

A EXISTING/ NEW LIGHTING PLAN - THIRD FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'



KEYPLAN

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW LIGHTING PLAN - THIRD FLOOR

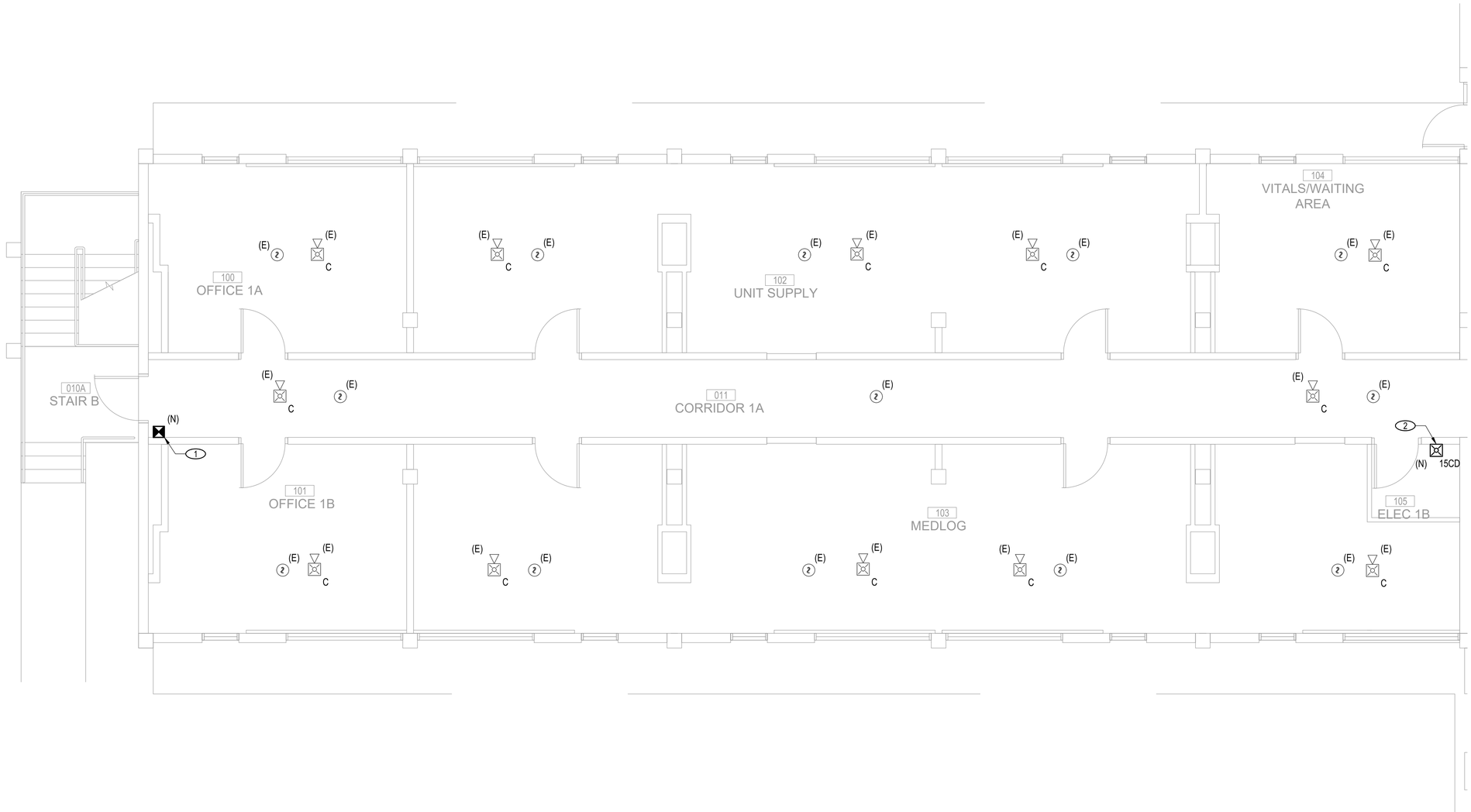
ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HIARNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. E-403C
DRAWN BY: KD	APPROVED BY: EW	DATE	SHEET 255
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
M:\JOB PROJECTS\2025 PROJECTS\12018--25--01 DOD BLDG 46 MEDCOM RENOVATIONS\4--DWG\ELECTRICAL\E-X_NEW -- (BASE).DWG



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GENERAL NOTES

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2. VISUAL INDICATING APPLIANCE: 24 VDC, XENON FLASHER, INTENSITY 15 CANDELA MINIMUM, ADJUSTABLE TO 110, FLASH RATE MINIMUM 1 HZ MAXIMUM 3 HZ, MAXIMUM DURATION 0.2 SECONDS AT MAXIMUM DUTY CYCLE 40 PERCENT, CLEAR LENS, RED HOUSING WITH WHITE "FIRE" LABEL, FLUSH MOUNTING OUTLET BOX.
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SHEET NOTES

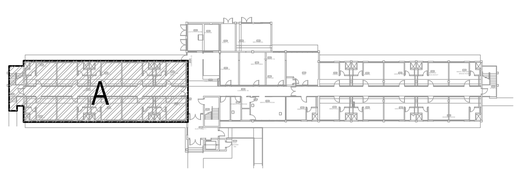
(1) CONNECT TO NEAREST INITIATION CIRCUIT.

(2) CONNECT TO NEAREST NOTIFICATION CIRCUIT.

A EXISTING/ NEW FIRE ALARM PLAN - FIRST FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'



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DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW FIRE ALARM PLAN - FIRST FLOOR

ENGINEERING PARTNERS		HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-501A
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 256
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
M:\EO PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_NEW - (BASE).DWG

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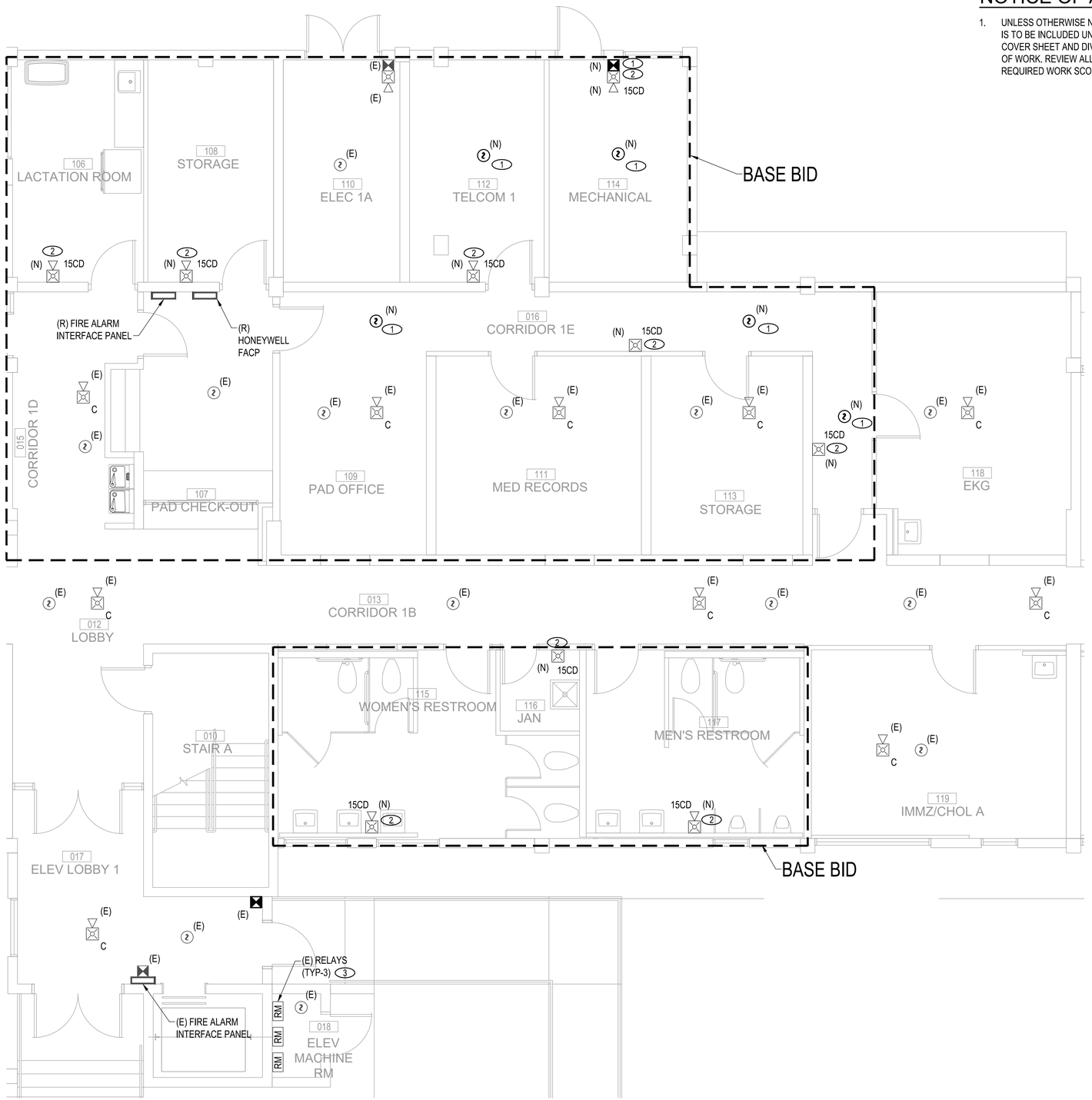

A EXISTING/ NEW FIRE ALARM PLAN - FIRST FLOOR

SCALE: 1/4" = 1'-0"

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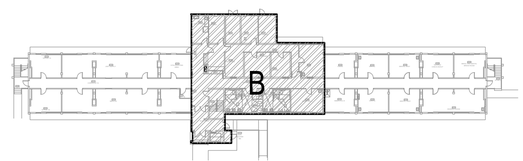
SHEET NOTES

(1) CONNECT TO NEAREST INITIATION CIRCUIT.

(2) CONNECT TO NEAREST NOTIFICATION CIRCUIT.

(3) CONNECT EXISTING RELAYS TO NEW ELEVATOR CONTROLLER.



KEYPLAN

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LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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SIGNATURE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW FIRE ALARM PLAN - FIRST FLOOR

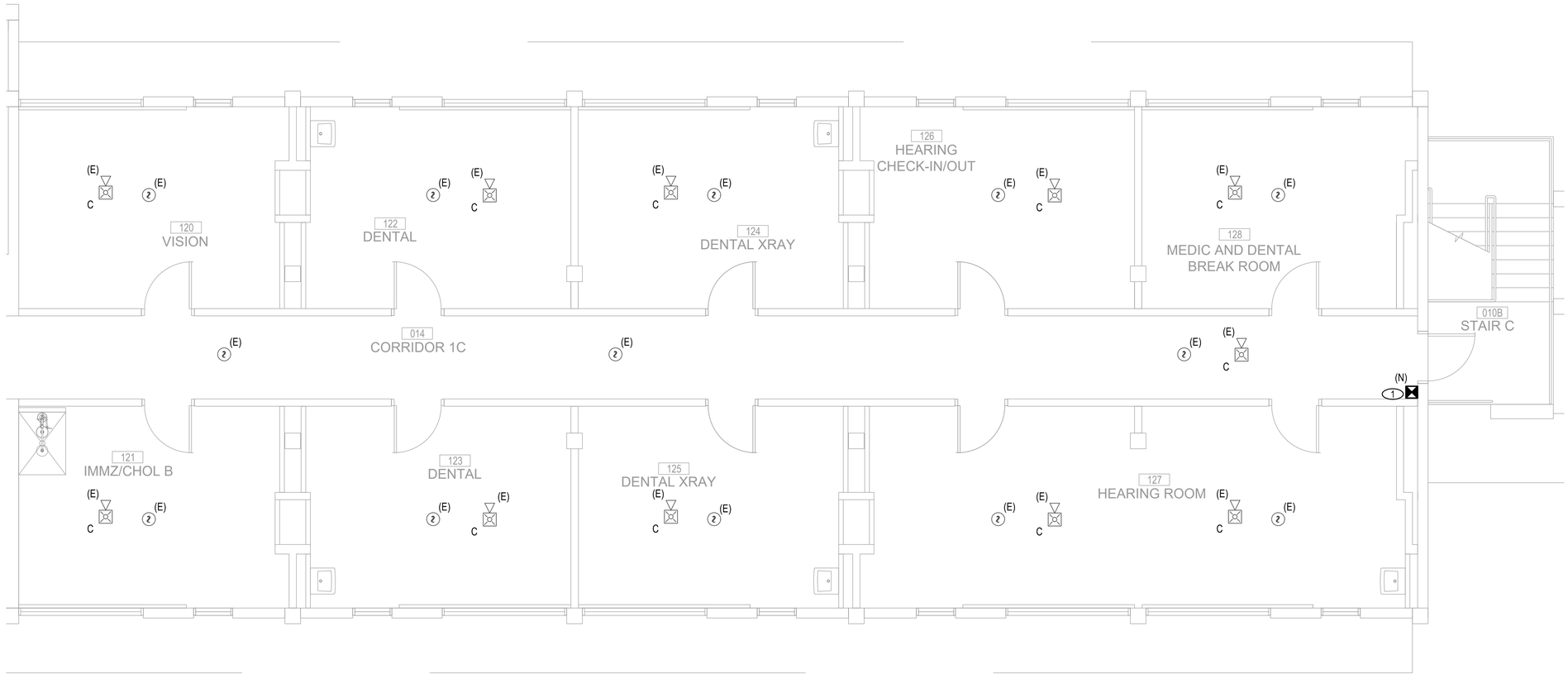
ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-501B
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 257 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
M:\ED PROJECTS\2025_PROJECTS\12018-25-01 IDOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_NEW - (BASE).DWG



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SHEET NOTES

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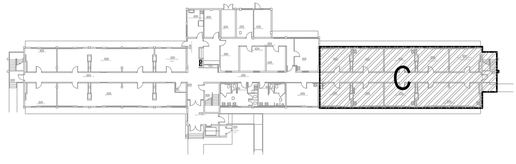
A EXISTING/ NEW FIRE ALARM PLAN - FIRST FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'



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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW FIRE ALARM PLAN - FIRST FLOOR

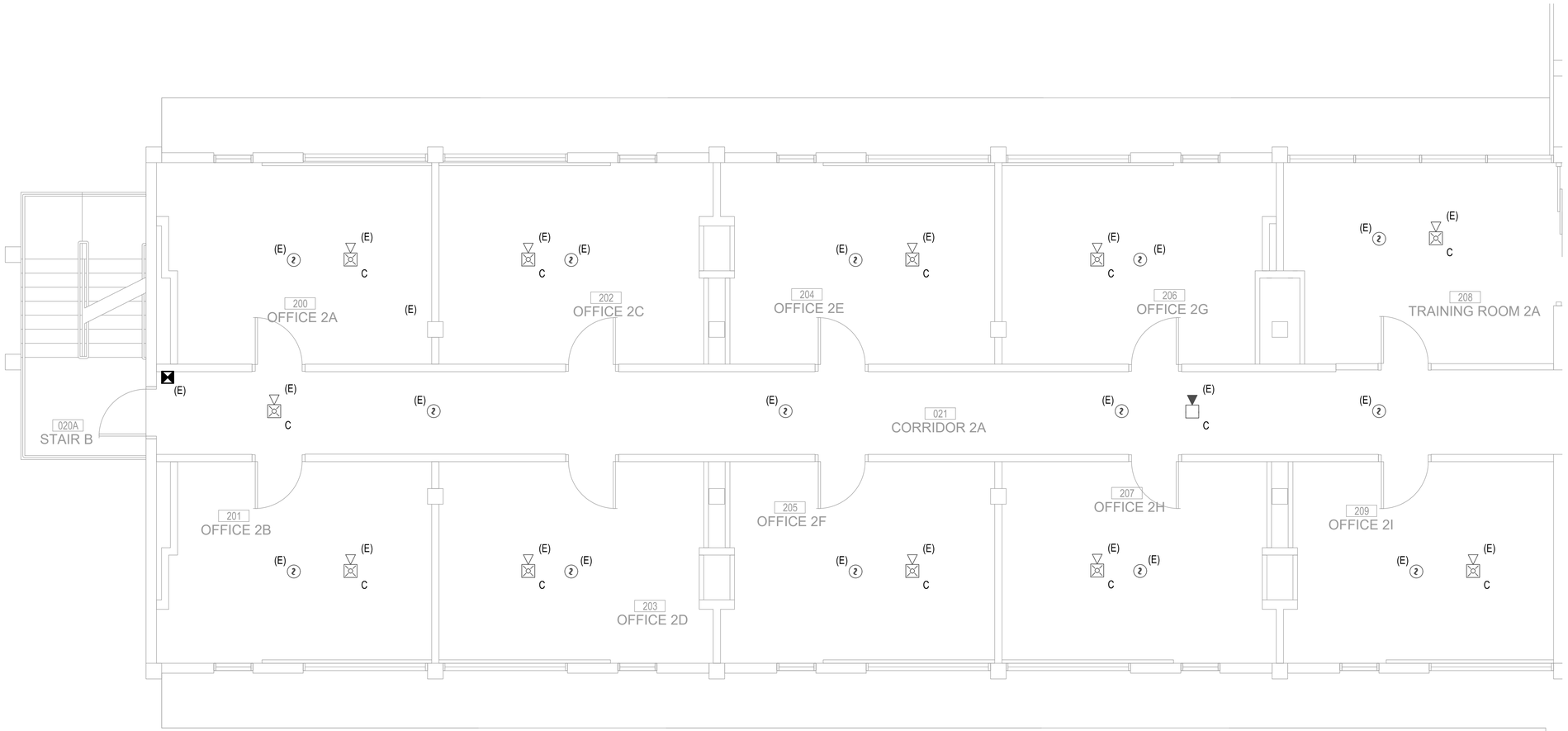
ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-501C
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 258 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
M:\ED PROJECTS\2025 PROJECTS\12018-25-01 (OD) BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_NEW - (BASE).DWG



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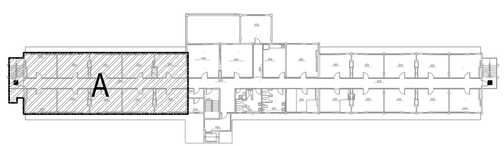
A EXISTING/ NEW FIRE ALARM PLAN - SECOND FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'



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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW FIRE ALARM PLAN - SECOND FLOOR

ENGINEERING PARTNERS		HAARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-502A
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 259 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

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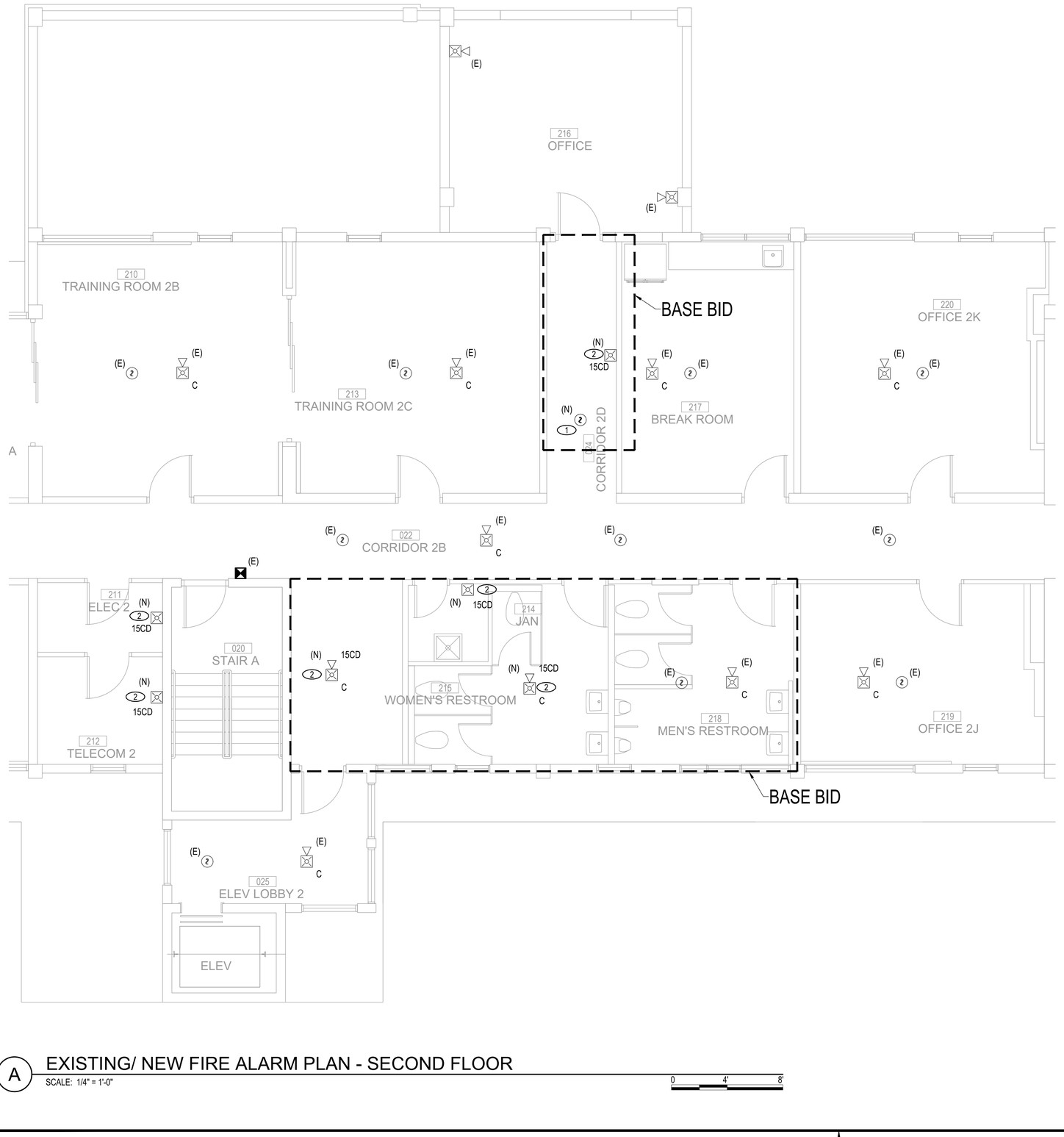
06/02/2026 12:33 pm
M:\ECI PROJECTS\2025 PROJECTS\120118-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_NEW - (BASE).DWG



A EXISTING/ NEW FIRE ALARM PLAN - SECOND FLOOR

SCALE: 1/4" = 1'-0"

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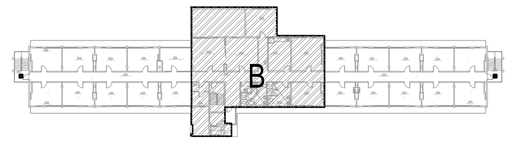

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EXISTING/ NEW FIRE ALARM PLAN - SECOND FLOOR

ENGINEERING PARTNERS		HAPNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-502B
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 260 OF 276 SHTS
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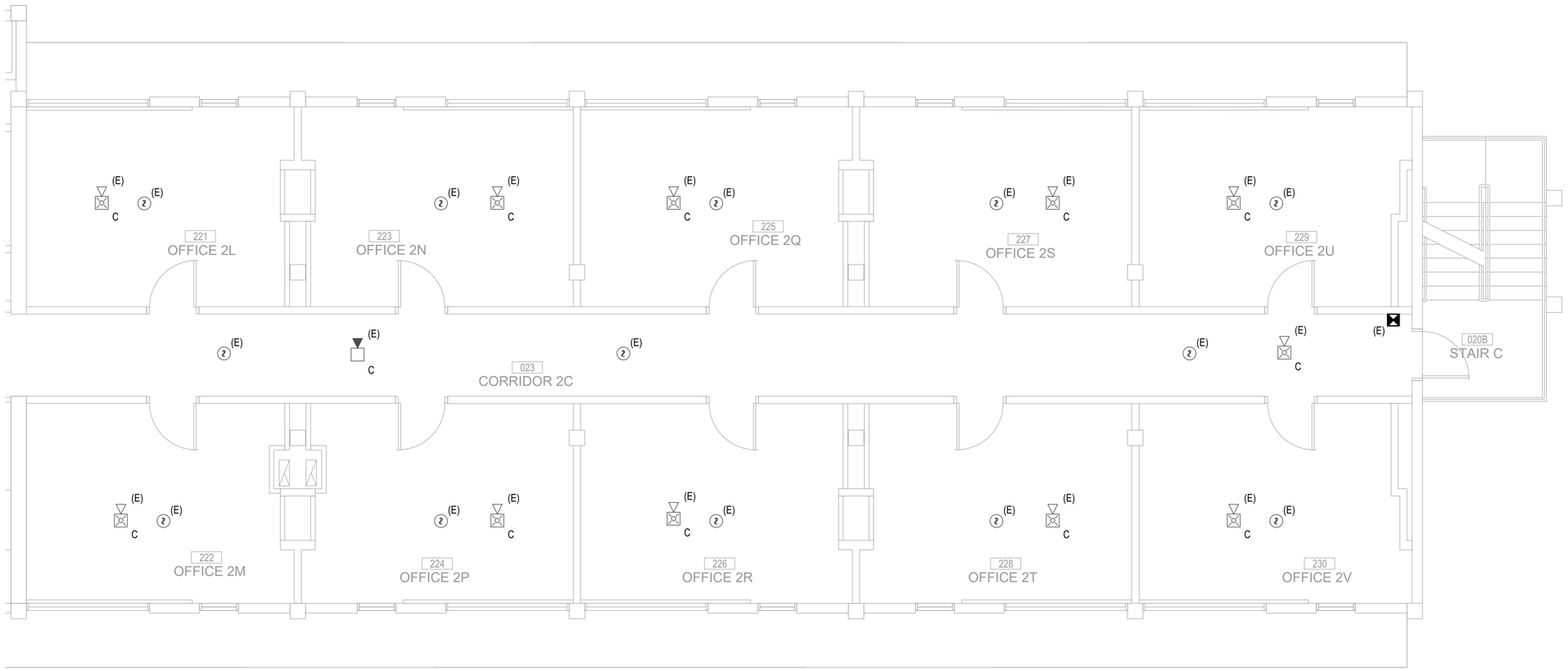

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1. AUDIO INDICATING APPLIANCE: D.C. VIBRATING HORN, 24 VDC, 0.38 AMPERES, 87 dbA AT 10 FEET. SOUND LEVEL SHALL BE MINIMUM 15 dbA OVER PREVAILING SOUND LEVEL OR 5 dbA FOR 60 SECONDS OVER MAXIMUM SOUND LEVEL, EXCEPT THAT THE MAXIMUM ALLOWABLE SOUND LEVEL OF AUDIBLE NOTIFICATION APPLIANCES COMPLYING WITH NFPA 72 SHALL HAVE A SOUND LEVEL OF NO MORE THAN 110 dbA AT THE MINIMUM HEARING DISTANCE FROM THE AUDIBLE APPLIANCE. RED HOUSING, APPROXIMATE 4-3/4"x4-3/4", FLUSH MOUNTING OUTLET BOX. (FURNISH "MINI-HORN" WHERE INDICATED.)

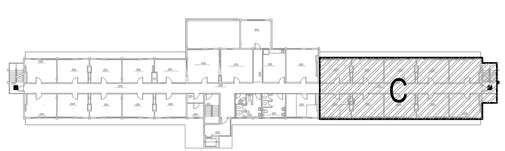
2. VISUAL INDICATING APPLIANCE: 24 VDC, XENON FLASHER, INTENSITY 15 CANDELA MINIMUM, ADJUSTABLE TO 110, FLASH RATE MINIMUM 1 HZ MAXIMUM 3 HZ, MAXIMUM DURATION 0.2 SECONDS AT MAXIMUM DUTY CYCLE 40 PERCENT, CLEAR LENS, RED HOUSING WITH WHITE "FIRE" LABEL, FLUSH MOUNTING OUTLET BOX.

3. ALL FIRE ALARM DEVICES IN THE AREA OF WORK ARE EXISTING. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING PROPER VISUAL COVERAGE PER CANDELA SETTINGS SHOWN ON DRAWINGS AND MAKE ADJUSTMENTS TO EXISTING FIRE ALARM DEVICES AS REQUIRED. AUDIBLE COVERAGE OF EXISTING HORNS SHALL BE TESTED AND VERIFIED THAT THE SOUND LEVEL IS A MINIMUM 15 dba OVER PREVAILING SOUND LEVELS OR 5 dba FOR 60 SECONDS OVER MAXIMUM SOUND LEVEL OF AUDIBLE NOTIFICATION APPLIANCES COMPLYING WITH NFPA 72 SHALL HAVE A SOUND LEVEL OF NO MORE THAN 110 dba AT THE MINIMUM HEARING DISTANCE FROM THE AUDIBLE APPLIANCE.

A EXISTING/ NEW FIRE ALARM PLAN - SECOND FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'



KEYPLAN

E. L. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW FIRE ALARM PLAN - SECOND FLOOR

ENGINEERING PARTNERS		HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-502C
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 261 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
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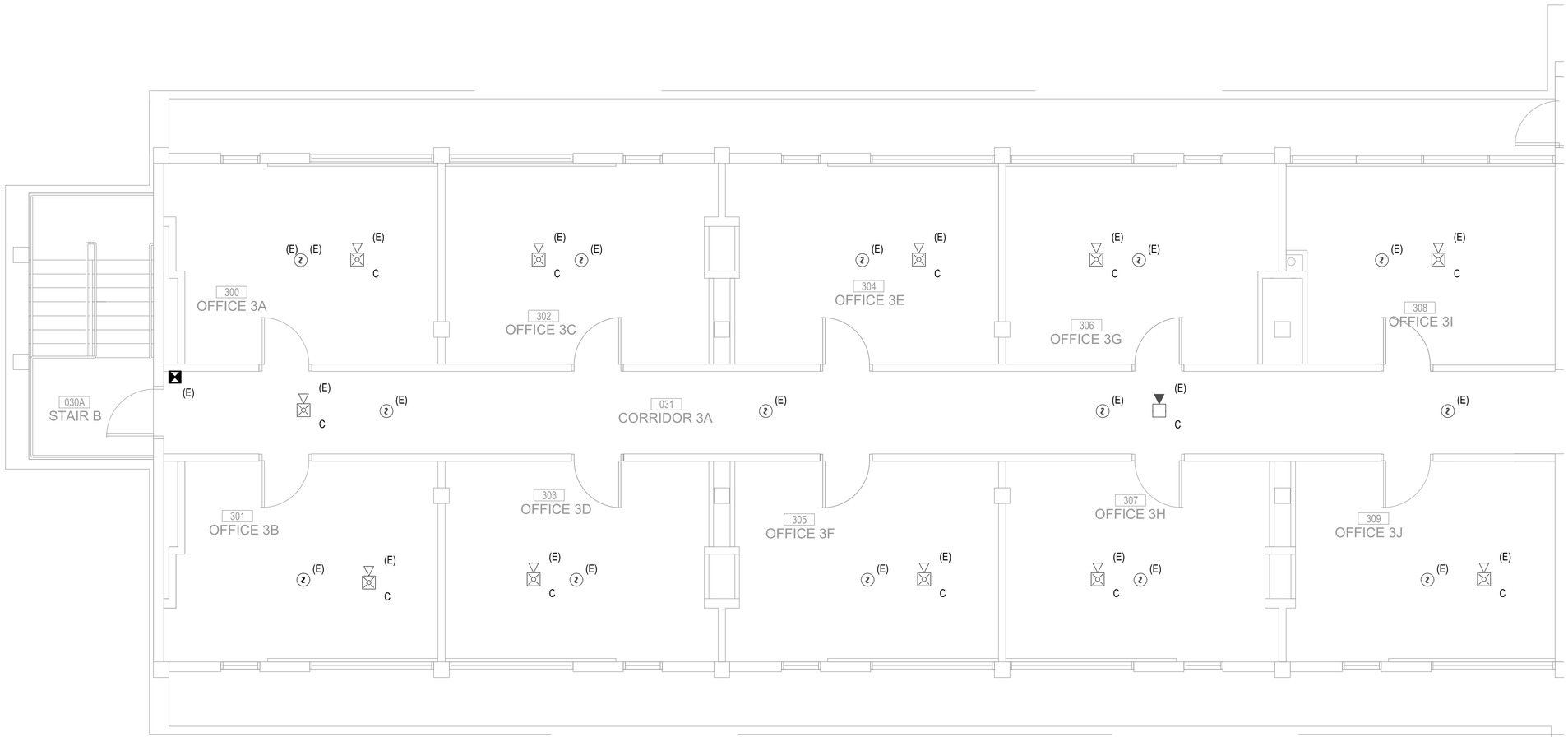

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GENERAL NOTES

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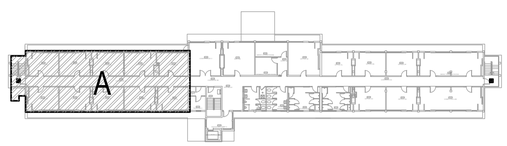
A EXISTING/ NEW FIRE ALARM PLAN - THIRD FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'



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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW FIRE ALARM PLAN - THIRD FLOOR

ENGINEERING PARTNERS		HAWAII JOB NO. FEDERAL: PN15H000033 STATE: CA-202505-D	DRAWING NO. E-503A
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE: JUNE 2026	SHEET 262 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
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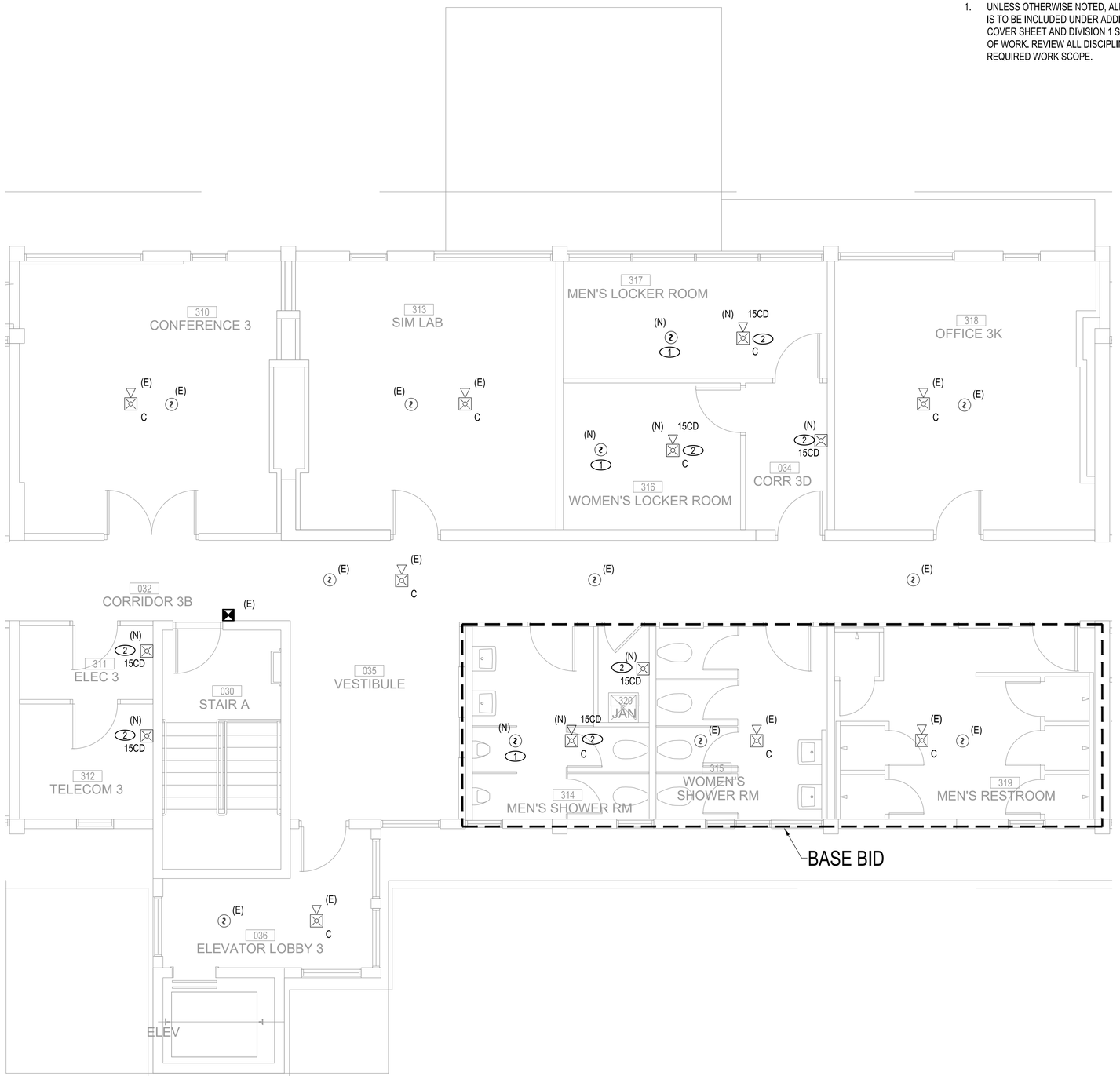

A EXISTING/ NEW FIRE ALARM PLAN - THIRD FLOOR

SCALE: 1/4" = 1'-0"

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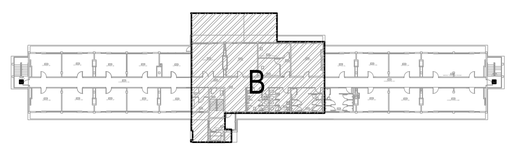
SHEET NOTES

(1) CONNECT TO NEAREST INITIATION CIRCUIT.

(2) CONNECT TO NEAREST NOTIFICATION CIRCUIT.



KEYPLAN

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW FIRE ALARM PLAN - THIRD FLOOR

E. L. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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SIGNATURE

ENGINEERING PARTNERS		HIARNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. E-503B
DESIGNED BY: CF	CHECKED BY: EW		
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 263 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
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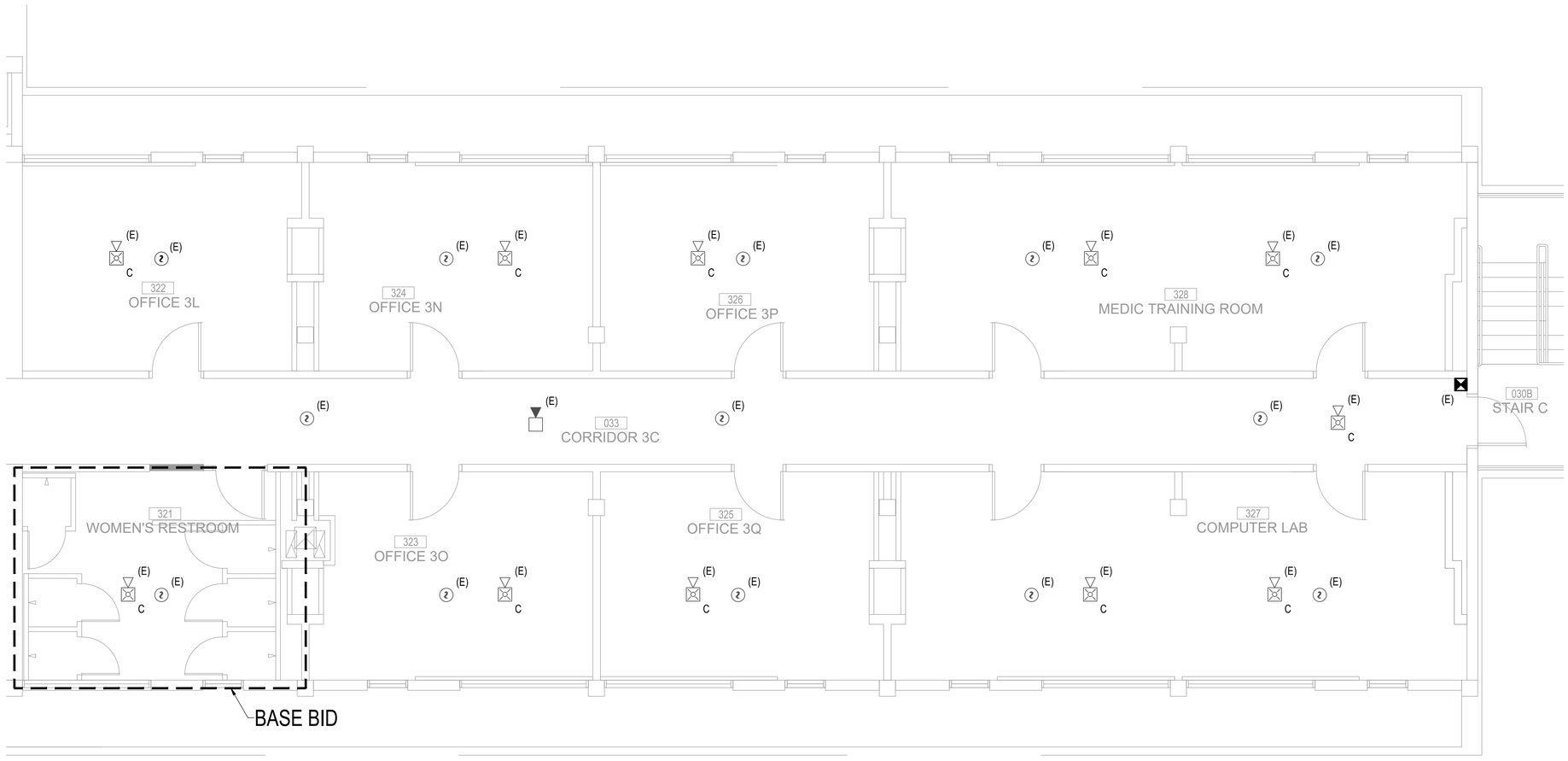

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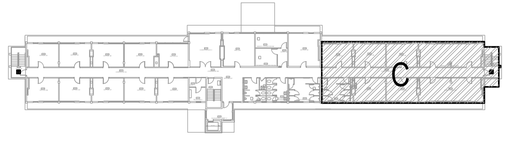
A EXISTING/ NEW FIRE ALARM PLAN - THIRD FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'



KEYPLAN

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LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW FIRE ALARM PLAN - THIRD FLOOR

ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-503C
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 264 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
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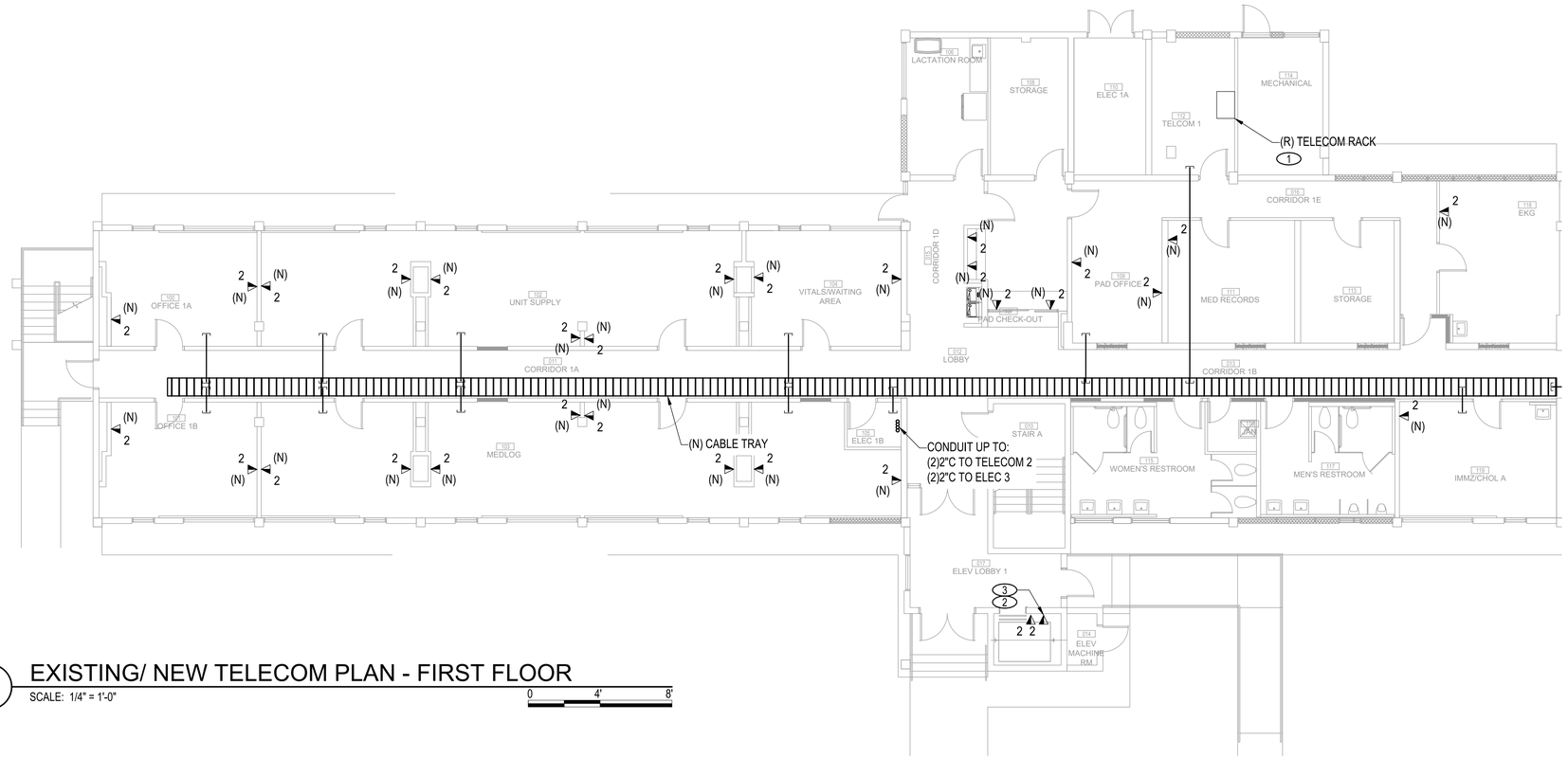
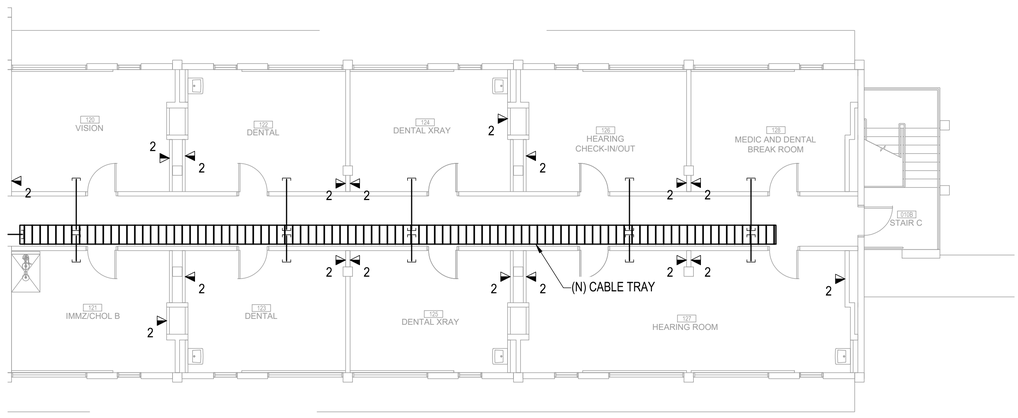


A EXISTING/ NEW TELECOM PLAN - FIRST FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'



B EXISTING/ NEW TELECOM PLAN - FIRST FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'

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SHEET NOTES

1. EXTEND CABLES TO NEW RACK LOCATION.
2. PROVIDE DEDICATED TELEPHONE LINE. TERMINATE AT THE ELEVATOR CONTROLLER.
3. PROVIDE DEDICATED DATA TERMINATION TO SERVE ELEVATOR CAB INTERNAL RESCUE ASSISTANCE SYSTEM.

E. L. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
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HAWAII, U.S.A.

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DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW TELECOM PLAN - FIRST FLOOR

ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-504A
DRAWN BY: KD	APPROVED BY: EW	DATE	SHEET 265
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
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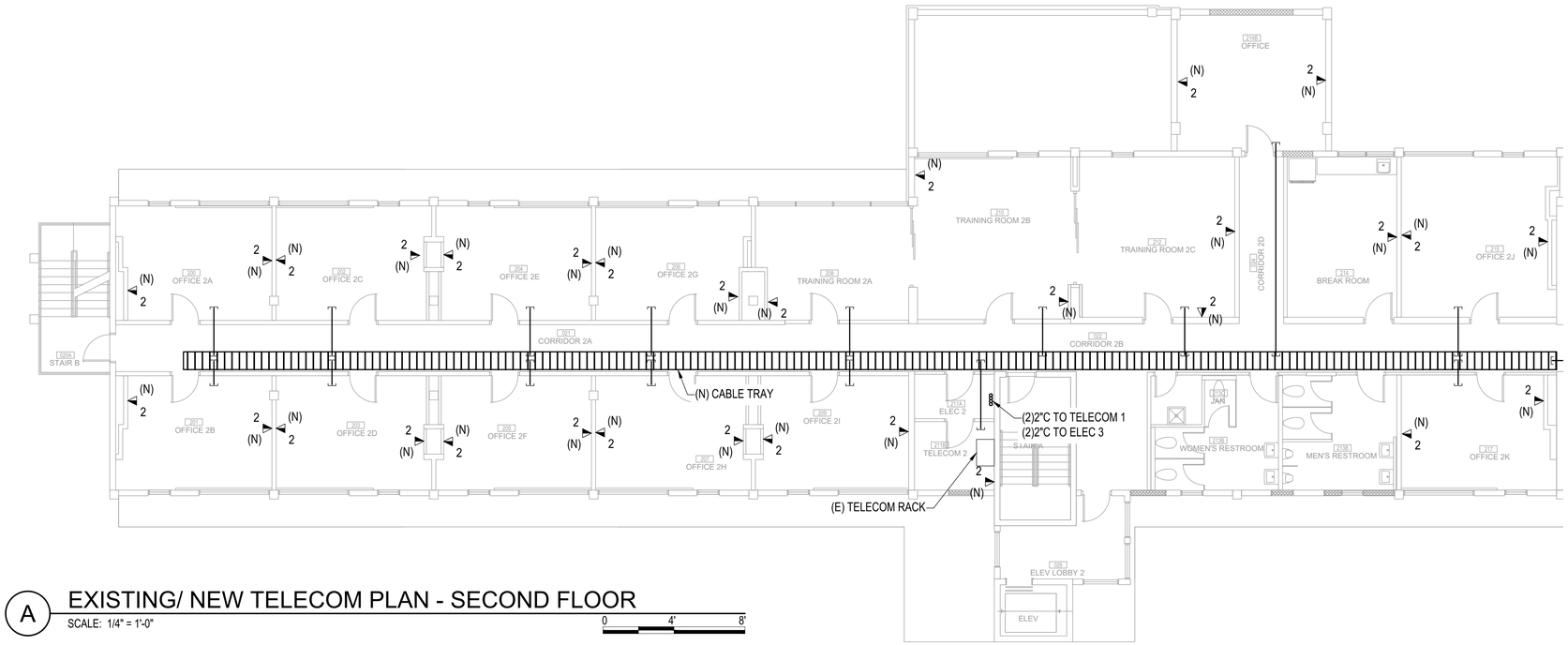
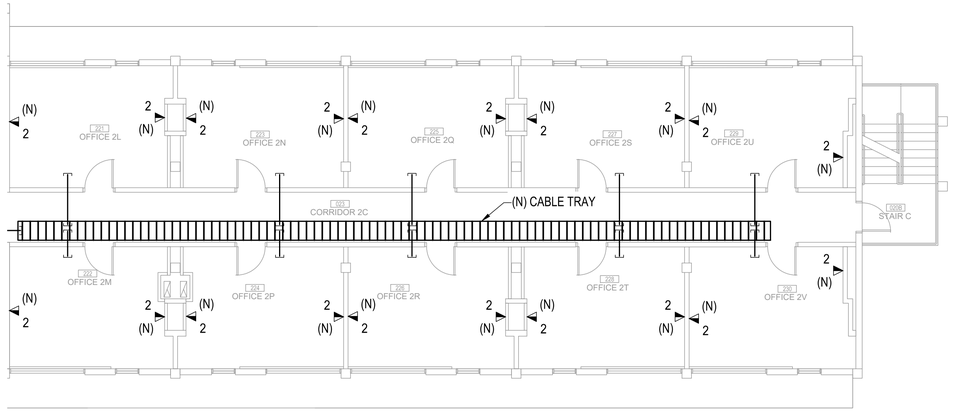


A EXISTING/ NEW TELECOM PLAN - SECOND FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'



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STATE OF HAWAII

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MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW TELECOM PLAN - SECOND FLOOR

ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-505A
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 266 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

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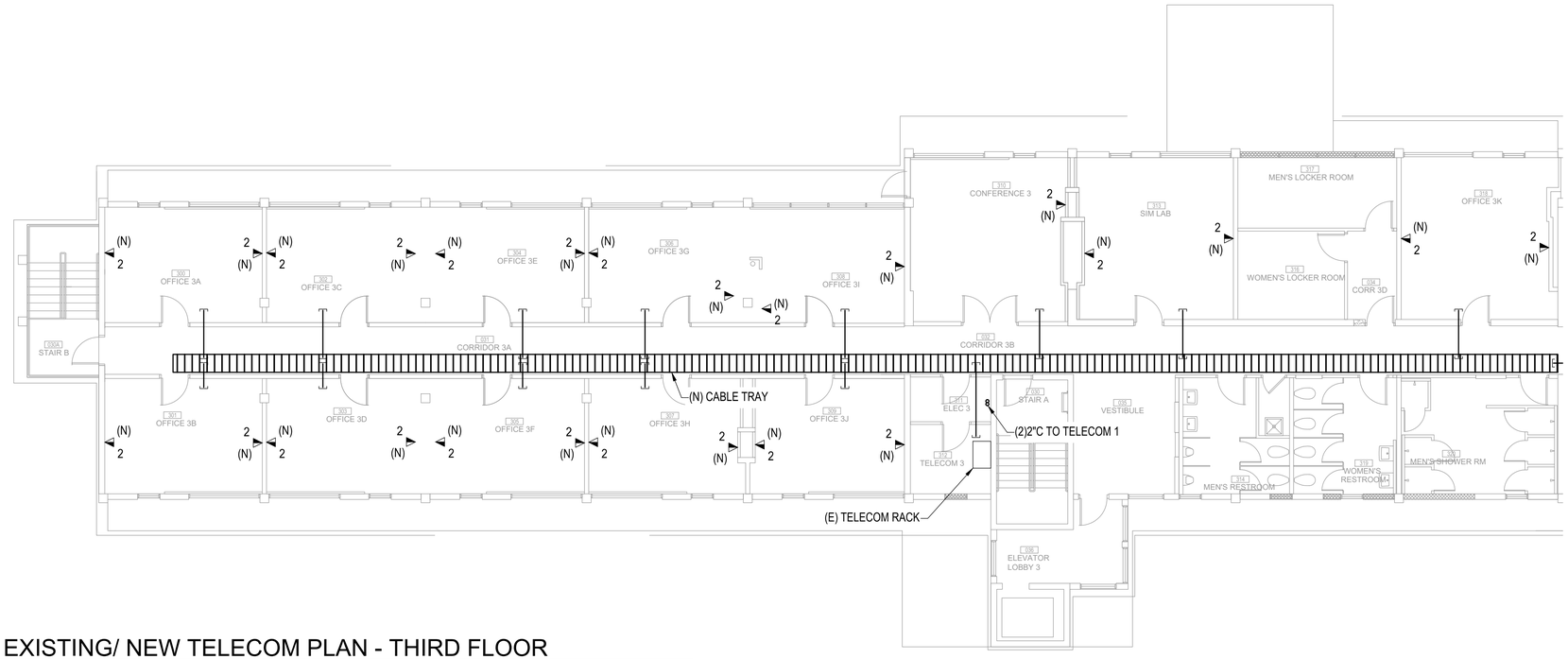
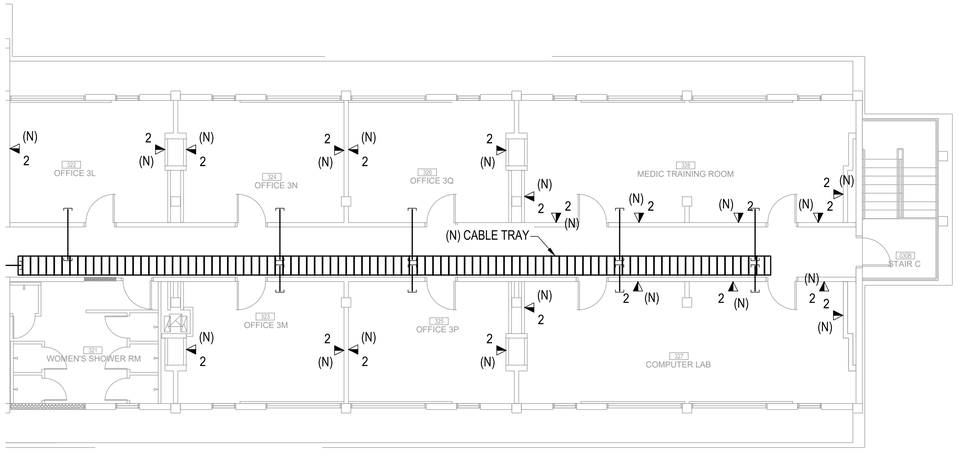


A EXISTING/ NEW TELECOM PLAN - THIRD FLOOR

SCALE: 1/4" = 1'-0"

0 4' 8'



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STATE OF HAWAII

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KALAELOA, KAPOLEI, OAHU, HAWAI'I

EXISTING/ NEW TELECOM PLAN - THIRD FLOOR

ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HI&PAC JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-506A
DRAWN BY: KD	APPROVED BY: EW	DATE	SHEET 267
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

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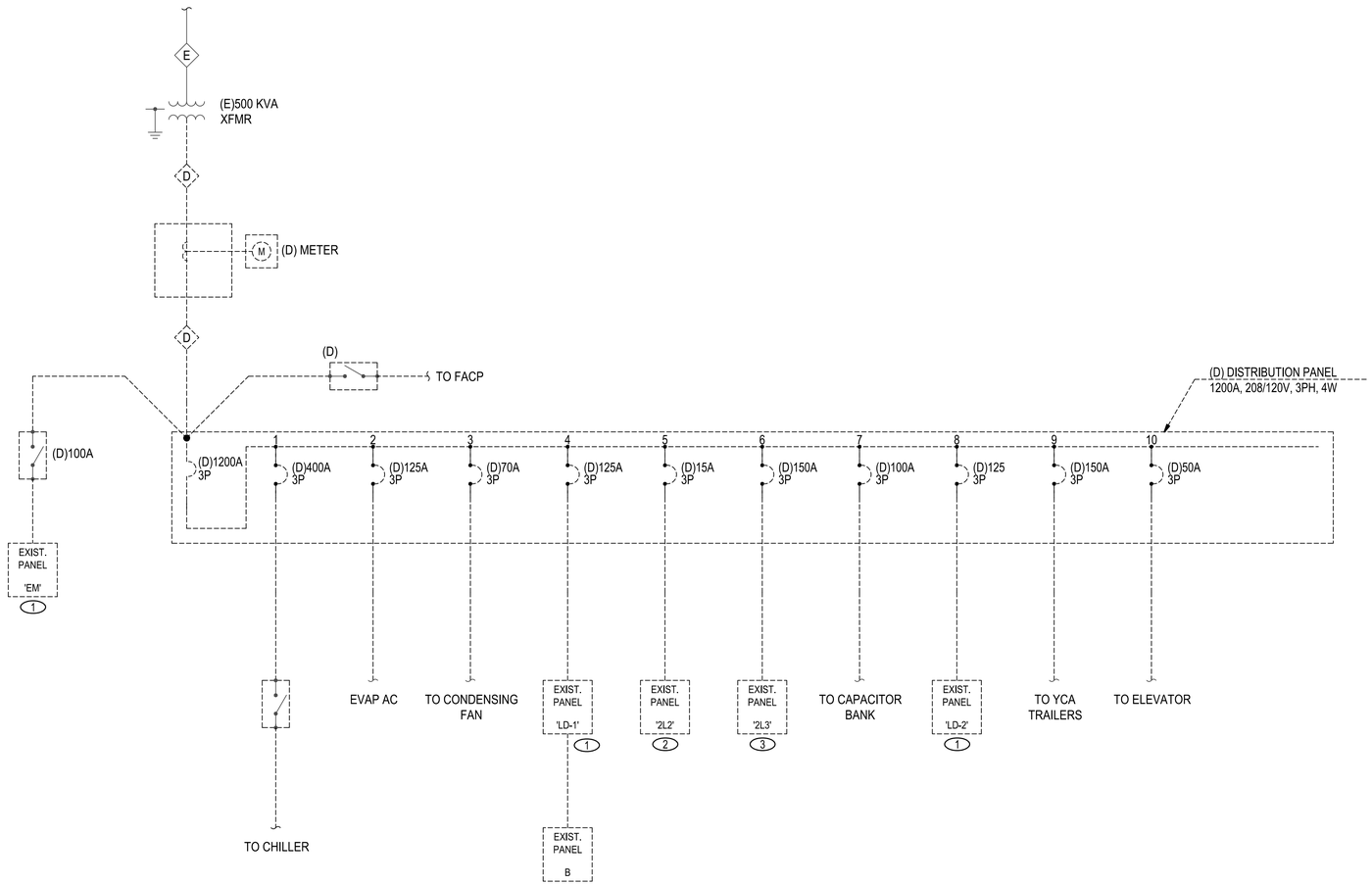

1 DEMOLITION SINGLE LINE DIAGRAM
NO SCALE

FEEDER SCHEDULE		
FDR #	DESCRIPTION	CONDUIT & WIRE SIZE
E	UTLITY SERVICE	RETAIN EXISTING CONDUIT AND CONDUCTORS
D	SECONDARY FEEDER	DEMOLISH CONDUCTORS. CAP AND ABANDON CONDUIT IN PLACE.

GENERAL NOTES

1. REMOVE ABANDONED CABLES AND EXPOSED CONDUITS. CONCEALED AND UNDERGROUND CONDUIT SHALL BE ABANDONED IN PLACE.

SHEET NOTES

(1) EXTEND REMAINING BRANCH CIRCUITS TO NEW DISTRIBUTION PANEL 'E'.

(2) EXTEND REMAINING BRANCH CIRCUITS TO NEW PANEL 'E2A'.

(3) EXTEND REMAINING BRANCH CIRCUITS TO NEW PANEL 'E3A'.

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STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

DEMOLITION SINGLE LINE DIAGRAM

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-601
CF	EW		
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 268
SCALE: AS NOTED			OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ----

06/02/2026 12:33 pm
M:\EO PROJECTS\2025 PROJECTS\12018-25-01 IDOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X.NEW - (BASE).DWG

GENERAL NOTES

1. REMOVE ABANDONED CABLES AND EXPOSED CONDUITS. CONCEALED AND UNDERGROUND CONDUIT SHALL BE ABANDONED IN PLACE.

SHEET NOTES

(1) BOND TO ALL AVAILABLE GROUNDING ELECTRODES PER NEC 250.52.

(2) BOND TO ALL AVAILABLE GROUNDING ELECTRODES PER NEC 250.32.

(3) CONTRACTOR TO SUBMIT SWITCHBOARD DRAWINGS FOR APPROVAL PRIOR TO FABRICATION.

(4) PROVIDE NOT LESS THAN 10% SPARE BREAKER CAPACITY FOR FUTURE LOADS.

(5) PROVIDE UPS TO SERVE REFRIGERATOR. DESIGN IS BASED OFF SAVERCELL-24-4KWH-S.

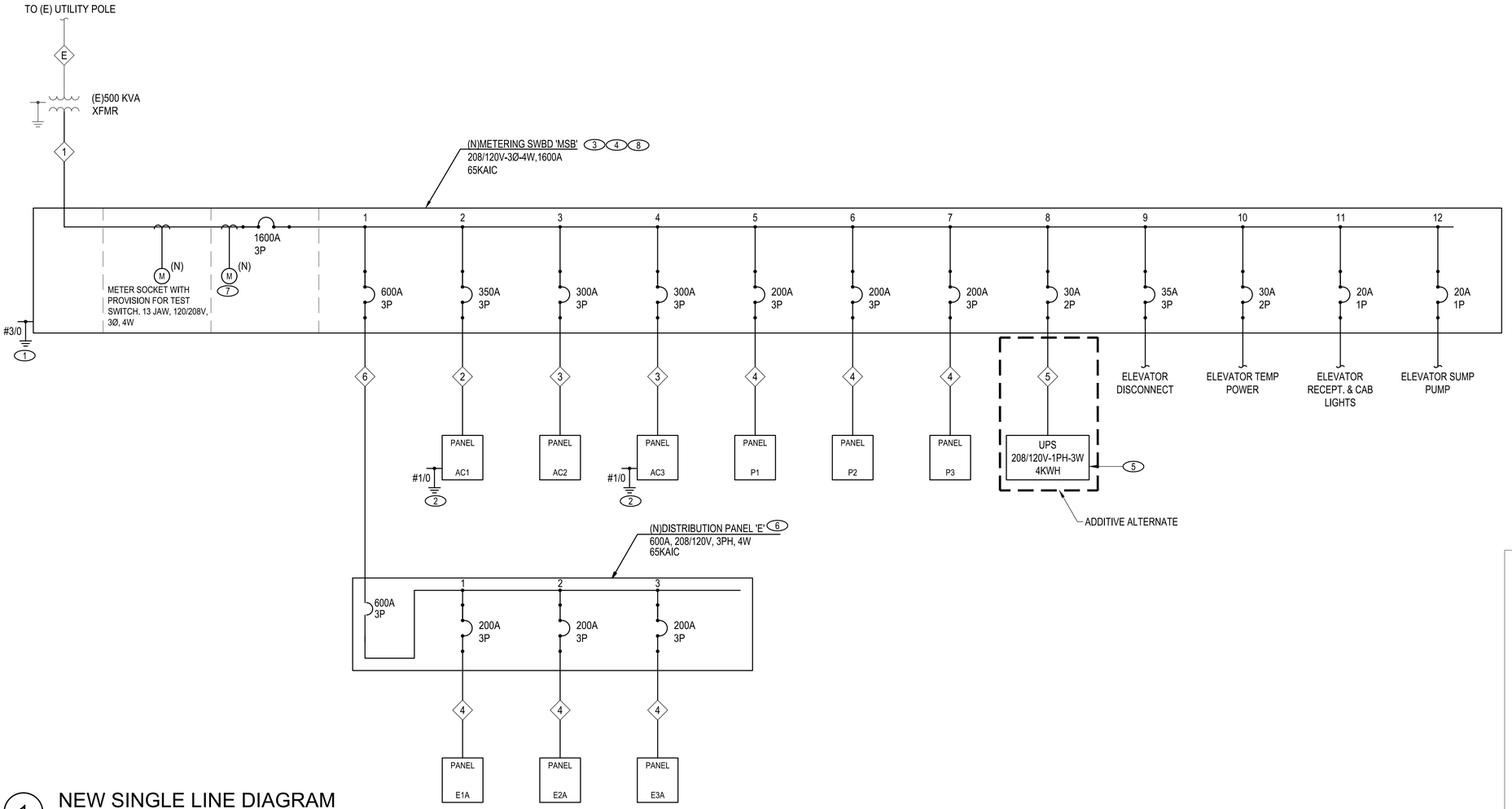
(6) SEE PANEL SCHEDULE FOR ADDITIONAL BRANCH CIRCUITS.

(7) PROVIDE POWER METER WITH A DIGITAL DISPLAY THAT MONITORS CURRENT, VOLTAGE, POWER AND ENERGY.

(8) PROVIDE WITH INTEGRAL SURGE PROTECTION.

FEEDER SCHEDULE

FDR #	DESCRIPTION	CONDUIT & WIRE SIZE
E	UTLITY SERVICE	RETAIN EXISTING CONDUIT AND CONDUCTORS
1	1600A FEEDER	(4) 4"C - EACH WITH (4)#350 KCMIL & #3/0 GND
2	350A FEEDER	3"C - (4)#500 KCMIL & #3 GND
3	300A FEEDER	3"C - (4)#350 KCMIL & #4 GND
4	200A FEEDER	2"C - (4)#3/0 & #6 GND
5	30A FEEDER	1"C - (3)#10 & #10 GND
6	600A FEEDER	(2) 3"C - EACH WITH (4)#350 KCMIL & #1 GND



1 NEW SINGLE LINE DIAGRAM
NO SCALE

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION, CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

NEW SINGLE LINE DIAGRAM

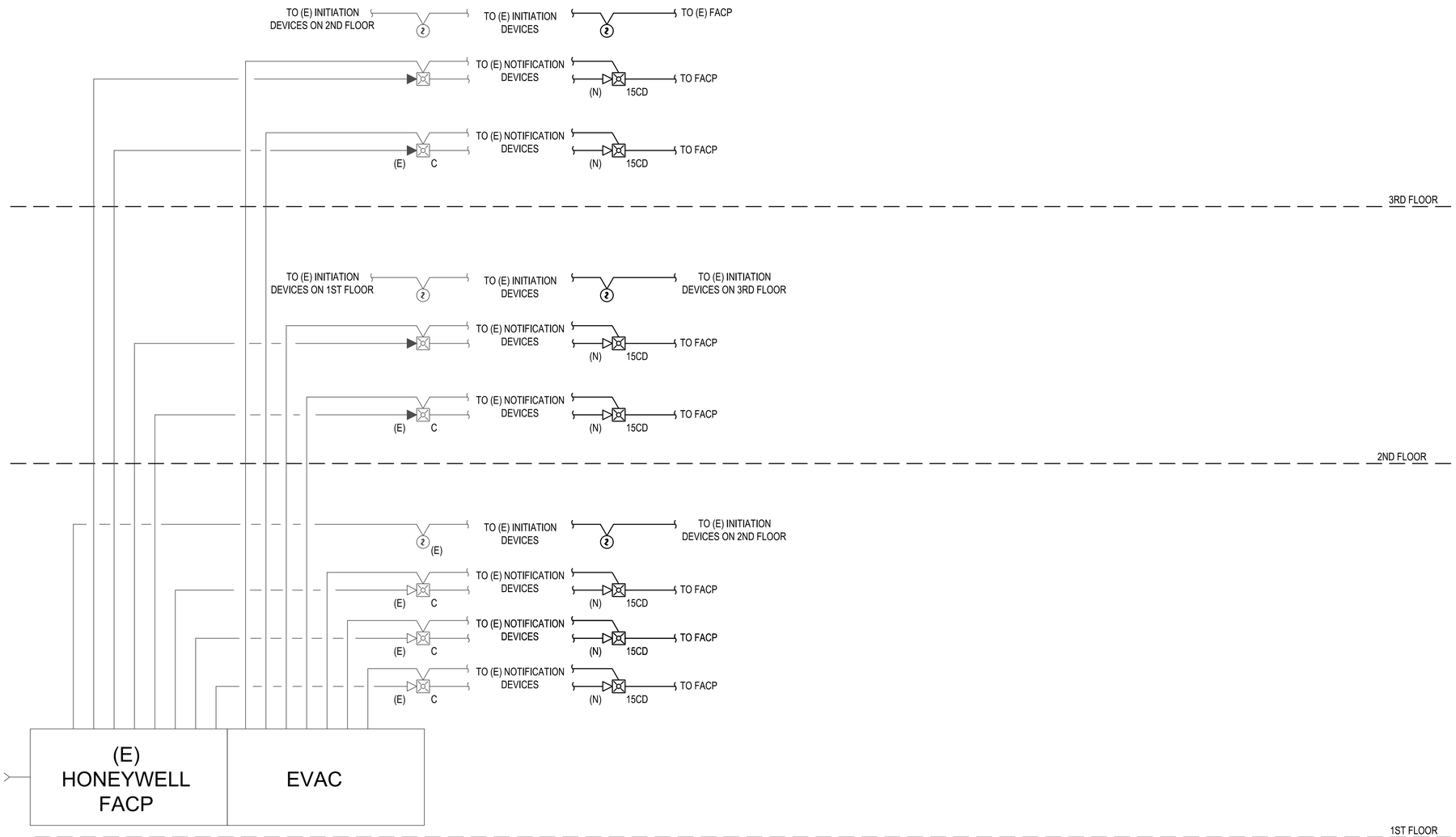
ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-602
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 269 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ~~~

06/02/2026 12:33 pm
M:\ED PROJECTS\2025 PROJECTS\12018-25-01 000 BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_NEW - (BASE).DWG



1 FIRE RISER DIAGRAM
NO SCALE

NOTICE OF ADDITIVE ALTERNATES:

1. UNLESS OTHERWISE NOTED, ALL WORK IDENTIFIED ON DRAWINGS IS TO BE INCLUDED UNDER ADDITIVE ALTERNATE. REFER TO COVER SHEET AND DIVISION 1 SPECIFICATIONS FOR DESCRIPTION OF WORK. REVIEW ALL DISCIPLINE DRAWINGS TO ENSURE ALL REQUIRED WORK SCOPE.

E.L.I. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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REV. NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

FIRE RISER DIAGRAM

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HIARNG JOB NO. FEDERAL:	DRAWING NO.
CF	EW	PN15H00033 STATE: CA-202505-D	E-603
DRAWN BY: KD	APPROVED BY: EW	DATE	SHEET
SCALE: AS NOTED		JUNE 2026	270 OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
M:\CO PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_NEW - (BASE).DWG

NOTICE OF ADDITIVE ALTERNATES:

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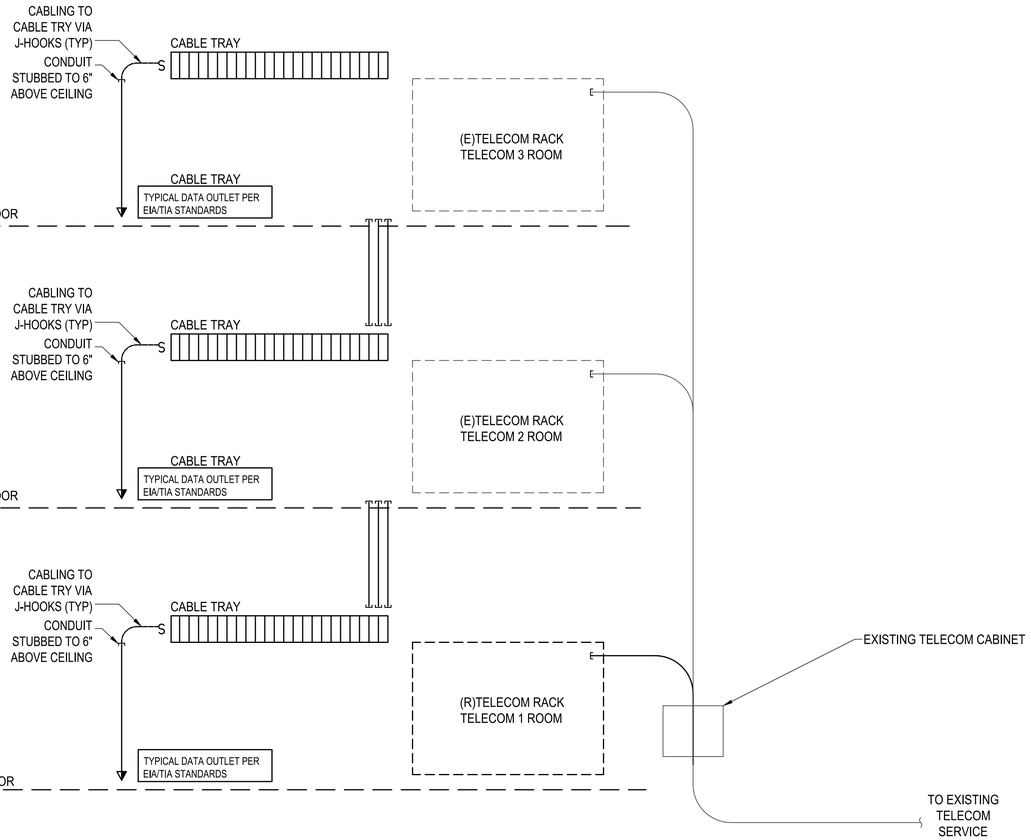

1 TELECOMMUNICATION RISER DIAGRAM

NO SCALE

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

TELECOM DIAGRAM

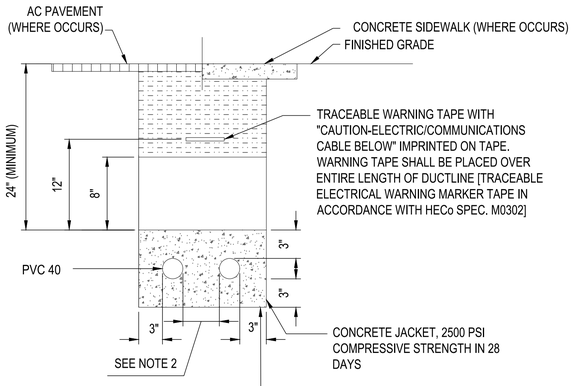
ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HIARNG JOB NO. FEDERAL: PN1SH00033 STATE: CA-202505-D	DRAWING NO. E-604
DRAWN BY: KD	APPROVED BY: EW	DATE	SHEET 271
SCALE: AS NOTED		JUNE 2026	OF 276 SHTS

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
M:\ED PROJECTS\2025 PROJECTS\12018-25-01 OOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_NEW - (BASE).DWG



BACKFILL:

TYPE "A" — NON-CONTAMINATED NATIVE SOIL MATERIAL WHICH DOES NOT CONTAIN MORE THAN 50% GRAVEL, AND ALSO, DOES NOT CONTAIN HARD LUMPS OF EARTH 3 INCHES IN GREATEST DIMENSION, ROCKS LARGER THAN 3 INCHES IN LARGEST DIMENSION, HIGHLY PLASTIC CLAY, POORLY-GRADED SAND AND GRAVEL (CLASSIFIED AS SP AND GP USING THE UNITED SOIL CLASSIFICATION SYSTEM), ORGANICS, DEBRIS, OR OTHER UNSUITABLE OR DELETERIOUS MATERIALS.

TYPE "B" — SELECT GRANULAR MATERIAL PASSING A ONE (1) INCH SIEVE SUCH AS THREE-QUARTERS (3/4) INCH AGGREGATE BASE COURSE GRAVEL, S4C OR MATERIAL THAT IS FREE OF ORGANICS DEBRIS OR HIGHLY-PLASTIC CLAY AND MEETS THE FOLLOWING GRADATION:

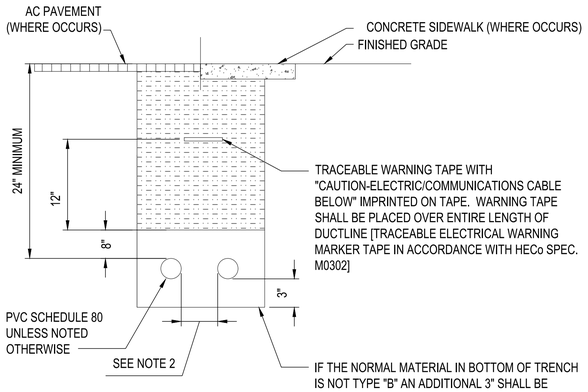
SIEVE SIZE	PERCENT PASSING BY WEIGHT
1"	100
3/4"	90-100
NO. 4	35-100
NO. 40	10-30
NO. 200	3-15

NOTES:

1. ELECTRICAL AND TELEPHONE DUCTS SIMILAR.
2. PROVIDE 3" SEPARATION BETWEEN DUCTS OF SAME SYSTEM AND 12" BETWEEN DUCTS OF DIFFERENT SYSTEMS
3. WHERE TRENCH ENCOUNTERS EXISITING CONCRETE OR ASPHALT CONCRETE, SURFACE SHALL BE SAWCUT. BACKFILL, COMPACT AND PATCH SURFACE TO MATCH ADJACENT AREA. SEE TRENCH RESTORATION DETAIL
4. SEE DUCT SECTION DETAILS FOR CONDUIT ARRANGEMENT

1 TYPICAL DUCT SECTION CONCRETE ENCASED

NO SCALE



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SIEVE SIZE	PERCENT PASSING BY WEIGHT
1"	100
3/4"	90-100
NO. 4	35-100
NO. 40	10-30
NO. 200	3-15

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2. PROVIDE 3" SEPARATION BETWEEN DUCTS OF SAME SYSTEM AND 12" SEPARATION BETWEEN ELECTRICAL DUCTS AND DUCTS OF DIFFERENT SYSTEMS.

2 TYPICAL DUCT SECTION DIRECT BURIED

NO SCALE

ELI B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

DETAILS

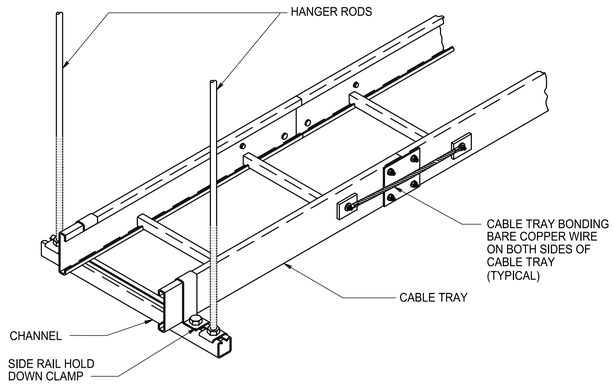
ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HIARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-605
DRAWN BY: KD	APPROVED BY: EW	DATE JUNE 2026	SHEET 272 OF 276 SHTS
SCALE: AS NOTED			

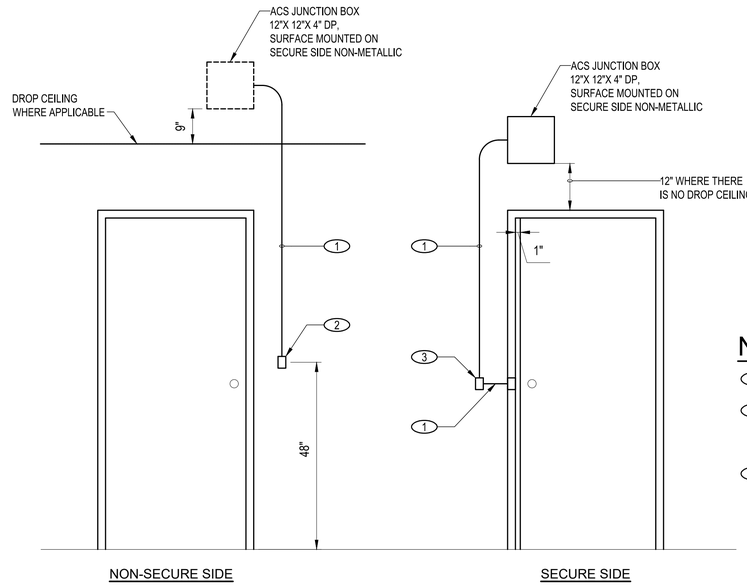
OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ---

06/02/2026 12:33 pm
M:\EI PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_NEW - (BASE).DWG

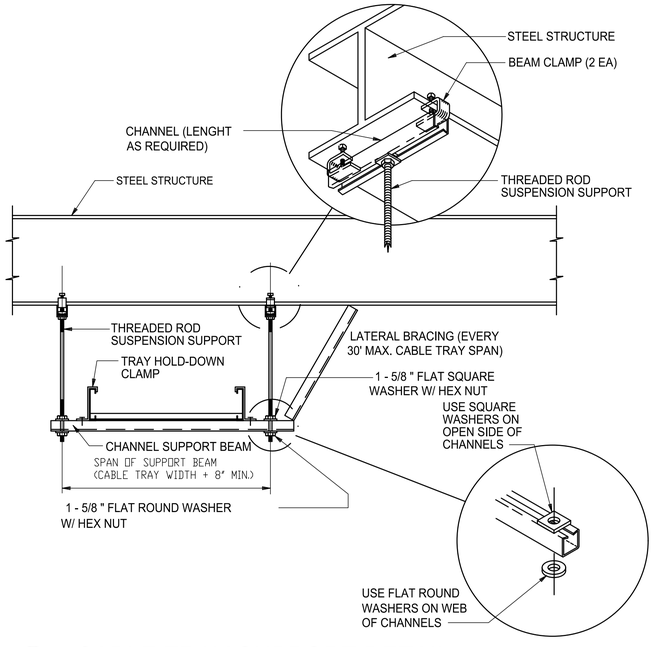


1 CABLE TRAY BONDING
NO SCALE

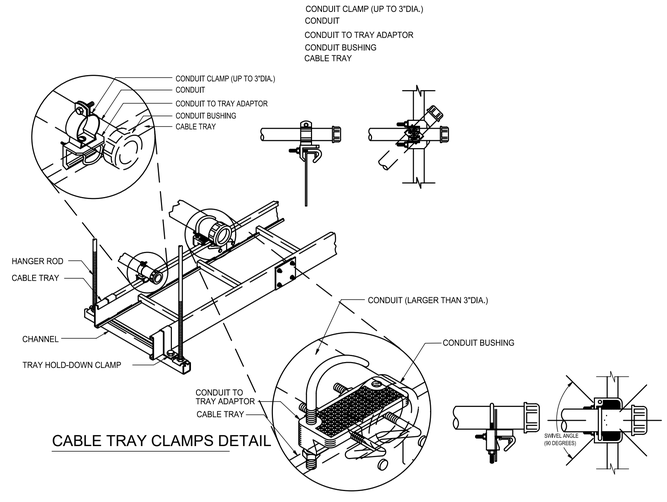


4 DOOR ACS CONDUIT DIAGRAM
NO SCALE

NOTES
1. 3/4"C WITH PULLSTRING CONCEALED IN WALL
2. ACS OUTLET BOX (FOR COMBINATION KEYPAD/ CARD READER), 2"X 4" FLUSH MOUNTED ON NON-SECURE SIDE, +48" AFF.
3. ACS OUTLET BOX (FOR DOOR STRIKE CONNECTION), 2"X 4" FLUSH MOUNTED ON SECURE SIDE. COORDINATE LOCATION WITH DOOR INSTALLATION.



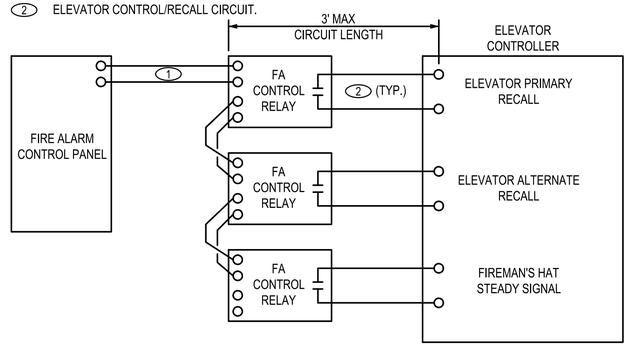
2 CABLE TRAY SUPPORT DETAIL
NO SCALE



CABLE TRAY CLAMPS DETAIL

3 CABLE TRAY & CONDUIT INSTALLATION
NO SCALE

NOTES
1. FIRE ALARM SIGNAL LINE CIRCUIT.
2. ELEVATOR CONTROL/RECALL CIRCUIT.



5 ELEVATOR RECALL DIAGRAM
NO SCALE

E.I. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

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DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

DETAILS

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HAWAII JOB NO. FEDERAL:	DRAWING NO.
CF	EW	PN15H00033 STATE: CA-202505-D	E-606
DRAWN BY:	APPROVED BY:	DATE	SHEET
KD	EW	JUNE 2026	273 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

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06/02/2026 12:33 pm
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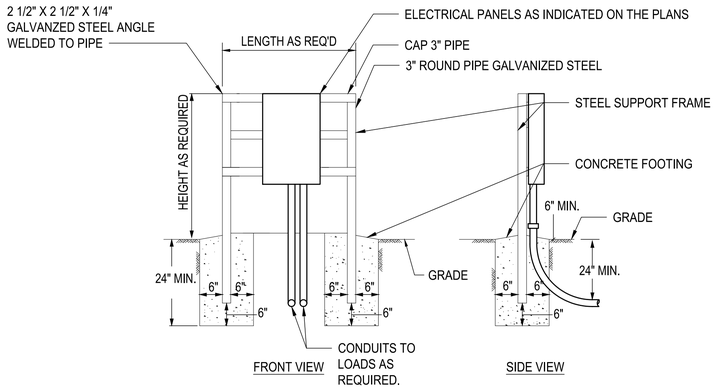
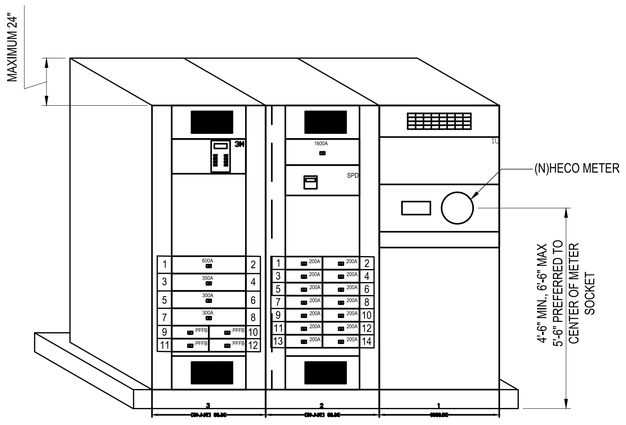
LUMINAIRE SCHEDULE

FIXTURE TYPE	MANUFACTURER NAME	MANUFACTURER CATALOG NUMBER	VOLT AMPS	MOUNTING	LAMP TYPE	REMARKS	VOLT
A	LITHONIA	CPANL 2X4 AL06 SWW7 M2	36/45/55	SURFACE	LED	2'X4' LED PANEL. SWITCHABLE LUMENS, 4000K. PROVIDE SURFACE MOUNT KIT.	120/277
B	LITHONIA	CPANL 1X4 AL01 SWW7 M4	22/31/41	SURFACE	LED	1'X4' LED PANEL. SWITCHABLE LUMENS, 4000K. PROVIDE SURFACE MOUNT KIT.	120/277
C	LITHONIA	LBR6-AL03-30LM-40K-WR-LSS-WD-MVOLT-UGZ	38	RECESSED	LED	6" LED 3000 LUMEN, 4000K	120/277
D	NLS LIGHTING	FLW-1-T4-16L-35-30K-UNV-WM-BRZ-COHI	25	WALL	LED	OUTDOOR LED SCONCE, 3000K, FULL CUT OFF. 2% OR LESS BLUE LIGHT. COUNTY OF HAWAII APPROVED.	120/277
E	NLS LIGHTING	GRD-T5-20L-53-30K8-UNV-CM-WHT-EM8-AL	33	SURFACE	LED	OUTDOOR SURFACE MOUNT LED, 3000K, FULL CUT OFF. 2% OR LESS BLUE LIGHT. COUNTY OF HAWAII APPROVED. PROVIDE WITH EMERGENCY BATTERY BACKUP.	120/277
F	ABOVE ALL	JJR20LEDSW1-CWM-GY	20	WALL	LED	VAPOR PROOF LIGHT WITH TEMPERED GLASS AND WIRE GUARD.	120/277
	LITHONIA	LHQM-LED-R-SD	5	UNIVERSAL	LED	EXIT SIGN WITH LED HEAD COMBO AND EMERGENCY 90 MINUTE BATTERY BACK UP OPTION.	120/277



1 EXTERIOR PANEL MOUNT DETAIL

NO SCALE

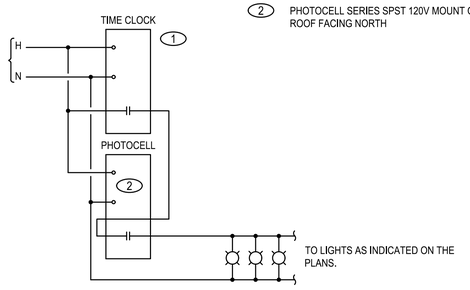


2 METERING SWITCHBOARD ELEVATION

NO SCALE

NOTES

1. INTERMATIC ASTRONOMICAL TIMECLOCK, DIGITAL INTERFACE WITH 10HR BATTERY BACKUP. MOUNT ABOVE PANEL.
2. PHOTOCELL SERIES SPST 120V MOUNT ON ROOF FACING NORTH



3 LIGHTING CONTROL WITH TIMECLOCK AND PHOTOCELL

NO SCALE

ELECTRICAL LOAD CALCULATIONS

METERING SWITCHBOARD 'MSB'
(1600A, 120/208V, 3Ø, 4W)

DISTRIBUTION PANEL 'E'	=	128.4 KVA
PANEL 'AC1'	=	86.4 KVA
PANEL 'AC2'	=	66.4 KVA
PANEL 'AC3'	=	78.8 KVA
PANEL 'P1'	=	7.1 KVA
PANEL 'P2'	=	3.0 KVA
PANEL 'P3'	=	3.4 KVA
ELEVATOR	=	10.1 KVA
UPS	=	1.0 KVA
TOTAL	=	384.6 KVA
/208 V , 3Ø	=	1067.5 A

SERVICE / LOAD DATA

A. ELECTRIC

1. SERVICE VOLTAGE: 3PH, 208/120V., 4W
2. LOAD DATA: CONNECTED KVA: 384.6 KVA , ESTIMATED DEMAND KVA: 269.9 KVA
3. SERVICE CONDUCTORS: (4)4"C EACH W/ (4)#350 KCMIL
4. METERING: HAWAIIAN ELECTRIC STD. B-8; RATE J
5. TYPE OF SERVICE: UNDERGROUND
6. BILLING ADDRESS: STATE OF HAWAII
   DEPARTMENT OF DEFENSE
   3949 DIAMOND HEAD ROAD
   HONOLULU HI, 96816

E.I. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
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HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ELECTRICAL SCHEDULES ,DIAGRAMS, & METER ELEVATION

ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HAWNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-607
DRAWN BY: KD	APPROVED BY: EW	DATE: JUNE 2026	SHEET 274 OF 276 SHTS
SCALE: AS NOTED			

OF _____ DRAWER _____ FOLDER _____

DATE ISSUED: ____

06/02/2026 12:33 pm
M:\CD PROJECTS\2025 PROJECTS\12018-25-01 000 BLDG 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_NEW - (BASE).DWG

NEW

PANEL: AC-1

VOLTAGE: 208 / 120 3Ø 4W CIRCUIT CODE: blank or
BUS: 400A
DATE: 4/24/26 4:36 PM MAINS: M.L.O. LOCATION: EXTERIOR
JOB: 12018-25-01 AIC RATING: 22,000 MOUNTING: SURFACE
N: NON-CONTINUOUS
L: LONG-CONTINUOUS
R: DEMANDABLE RECEPTACLES
K: KITCHEN NO. OF EQUIPMENT: 0

CKT NO	CODE	TRIP	POLE	LOAD DESCRIPTION (NOTE)	M	R	L	ØA	ØB	ØC	A	B	C	ØA	ØB	ØC	L	R	M	(NOTE) LOAD DESCRIPTION	TRIP	POLE	CODE	CKT NO
1	N	60		ACCU 1-1				6185			•			6893						ACCU 2-1	70		N	2
3	N			--					6185			•			6893					--			N	4
5	N		3	--						6185			•			6893				--		3	N	6
7	N	60		ACCU 3-1				6185			•									SPARE	20	1		8
9	N			--					6185			•								SPARE	20	1		10
11	N		3	--						6185			•							SPARE	20	1		12
13	N	45		ACCU 3-1				4372			•			180						RECEPT-MAINT	20	1	R	14
15	N			--					4372			•			6177					ACCU 3-4	15		N	16
17	N		3	--						4372			•			6177				--		2	N	18
19	N	15		ACCU 2-4				1456			•			-						SPARE	20	1		20
21	N		2	--					1456			•			-					SPARE	20	1		22
23		20	1	SPARE						-			•			-				SPARE	20	1		24
25		20	1	SPARE				-			•			-						SPARE	20	1		26
27		20	1	SPARE					-			•			-					PFFB				28
29				PFFB						-			•			-				PFFB				30
31								-			•			-										32
33									-			•			-									34
35										-			•			-								36
37								-			•			-										38
39									-			•			-									40
41										-			•			-								42

PANEL NOTES:	PHASE TOTALS	ØA: 25271	ØB: 31268	ØC: 29812	TOTAL CONNECTED VA	86351
					CONNECTED VA (CODE N)	86171
					CONNECTED VA (CODE L)	0
					CONNECTED VA (CODE R)	180
					CONNECTED VA (CODE K)	0
					PANEL CONNECTED KVA	86.4
					PANEL DEMAND KVA	86.4
30 CIRCUIT PANEL, NEMA 4X					PANEL DEMAND AMPS	239.7
					HIGH Ø AMPS w/ DEMAND	260.4

NEW

PANEL: AC-2

VOLTAGE: 208 / 120 3Ø 4W CIRCUIT CODE: blank or
BUS: 400A
DATE: 4/24/26 4:36 PM MAINS: M.L.O. LOCATION: EXTERIOR
JOB: 12018-25-01 AIC RATING: 22,000 MOUNTING: SURFACE
N: NON-CONTINUOUS
L: LONG-CONTINUOUS
R: DEMANDABLE RECEPTACLES
K: KITCHEN NO. OF EQUIPMENT: 0

CKT NO	CODE	TRIP	POLE	LOAD DESCRIPTION (NOTE)	M	R	L	ØA	ØB	ØC	A	B	C	ØA	ØB	ØC	L	R	M	(NOTE) LOAD DESCRIPTION	TRIP	POLE	CODE	CKT NO
1	N	20		ACCU 1-4				1456			•			4372						ACCU 3-2	45		N	2
3	N		2	--					1456			•			4372					--			N	4
5	N	60		ACCU 1-2						6177			•			4372				--		3	N	6
7	N			--				6177			•			4372						ACCU 3-2	45		N	8
9	N		3	--					6177			•			4372					--			N	10
11	N	60		ACCU 2-2						6185			•			4372				--		3	N	12
13	N			--				6185			•			180						RECEPT-MAINT	20	1	R	14
15	N		3	--					6185			•			-					SPARE	20	1		16
17		20	1	SPARE						-			•			-				SPARE	20	1		18
19		20	1	SPARE				-			•			-						SPARE	20	1		20
21		20	1	SPARE					-			•			-					PFFB				22
23				PFFB						-			•			-				PFFB				24
25				PFFB				-			•			-						PFFB				26
27				PFFB					-			•			-					PFFB				28
29				PFFB						-			•			-				PFFB				30
31								-			•			-										32
33									-			•			-									34
35										-			•			-								36
37								-			•			-										38
39									-			•			-									40
41										-			•			-								42

PANEL NOTES:	PHASE TOTALS	ØA: 22742	ØB: 22562	ØC: 21106	TOTAL CONNECTED VA	66410
					CONNECTED VA (CODE N)	66230
					CONNECTED VA (CODE L)	0
					CONNECTED VA (CODE R)	180
					CONNECTED VA (CODE K)	0
					PANEL CONNECTED KVA	66.4
					PANEL DEMAND KVA	66.4
30 CIRCUIT PANEL, NEMA 4X					PANEL DEMAND AMPS	184.3
					HIGH Ø AMPS w/ DEMAND	189.4

NEW

PANEL: AC-3

VOLTAGE: 208 / 120 3Ø 4W CIRCUIT CODE: blank or
BUS: 400A
DATE: 4/24/26 4:36 PM MAINS: M.L.O. LOCATION: EXTERIOR
JOB: 12018-25-01 AIC RATING: 22,000 MOUNTING: SURFACE
N: NON-CONTINUOUS
L: LONG-CONTINUOUS
R: DEMANDABLE RECEPTACLES
K: KITCHEN NO. OF EQUIPMENT: 0

CKT NO	CODE	TRIP	POLE	LOAD DESCRIPTION (NOTE)	M	R	L	ØA	ØB	ØC	A	B	C	ØA	ØB	ØC	L	R	M	(NOTE) LOAD DESCRIPTION	TRIP	POLE	CODE	CKT NO
1	N	45		ACCU 1-3				4372			•			6185						ACCU 3-3	60		N	2
3	N			--					4372			•			6185					--			N	4
5	N		3	--						4372			•			6185				--		3	N	6
7	N	45		ACCU 1-3				4372			•			4372						ACCU 3-3	45		N	8
9	N			--					4372			•			4372					--			N	10
11	N		3	--						4372			•			4372				--		3	N	12
13	N	70		ACCU 2-3				6893			•			180						RECEPT-MAINT	20	1	R	14
15	N			--					6893			•			-					SPARE	20	1		16
17	N		3	--						6893			•			-				SPARE	20	1		18
19		20	1	SPARE				-			•			-						SPARE	20	1		20
21		20	1	SPARE					-			•			-					PFFB				22
23		20	1	SPARE						-			•			-				PFFB				24
25				PFFB				-			•			-						PFFB				26
27				PFFB					-			•			-					PFFB				28
29				PFFB						-			•			-				PFFB				30
31								-			•			-										32
33									-			•			-									34
35										-			•			-								36
37								-			•			-										38
39									-			•			-									40
41										-			•			-								42

PANEL NOTES:	PHASE TOTALS	ØA: 26374	ØB: 26194	ØC: 26194	TOTAL CONNECTED VA	78762
					CONNECTED VA (CODE N)	78582
					CONNECTED VA (CODE L)	0
					CONNECTED VA (CODE R)	180
					CONNECTED VA (CODE K)	0
					PANEL CONNECTED KVA	78.8
					PANEL DEMAND KVA	78.8
30 CIRCUIT PANEL, NEMA 4X					PANEL DEMAND AMPS	218.6
					HIGH Ø AMPS w/ DEMAND	219.6

NEW

PANEL: P1

VOLTAGE: 208 / 120 3Ø 4W CIRCUIT CODE: blank or
BUS: 225A
DATE: 4/24/26 4:36 PM MAINS: M.L.O. LOCATION: INTERIOR
JOB: 12018-25-01 AIC RATING: 10,000 MOUNTING: SURFACE
N: NON-CONTINUOUS
L: LONG-CONTINUOUS
R: DEMANDABLE RECEPTACLES
K: KITCHEN NO. OF EQUIPMENT: 0

CKT NO	CODE	TRIP	POLE	LOAD DESCRIPTION (NOTE)	M	R	L	ØA	ØB	ØC	A	B	C	ØA	ØB	ØC	L	R	M	(NOTE) LOAD DESCRIPTION	TRIP	POLE	CODE	CKT NO
1		15		FC-011,111,112,115,113,114				225			•			195						FC-012,116,117,118,119	15			2
3			2	--					225			•			195					--		2		4
5		15		FC-121,123,1212,124						150			•			210				FC-125,1211,127,126,118,119,1110	15			6
7			2	--				150			•			210						--		2		8
9		15		FC-131,132,133,1311,134,135,014					255			•			255					FC-136,137,138,139,1310,015	15			10
11			2	--						255			•			255				--		2		12
13		20	1	WH-1				1080			•			180						RECEPT-CIRC PUMP	20	1		14
15		20	1	WH-2					1080			•			100					COOLMASTER CONTROLLER	20	1		16
17		20	1	WH-3						1080			•			100				COOLMASTER CONTROLLER	20	1		18
19		20	2	COOLMASTER CONTROLLER				100			•			100						SAFETY BOXES	20	1		20
21		20	1	DDC CONTROL PANEL					100			•			50					SAFETY BOXES	20	1		22
23		20	1	EF-102						100			•			100				SAFETY BOXES	20	1		24
25		20	1	EF-113				100			•			-						SPARE	20	1		26
27		20	1	EF-126					100			•			-					SPARE	20	1		28
29		20	1	SPARE						100			•			-				SPARE	20	1		30
31		20	1	SPARE				-			•			-						SPARE				32
33		20	1	SPARE					-			•			-					PFFB				34
35				PFFB						-			•			-				PFFB				36
37								-			•			-										38
39									-			•			-									40
41										-			•			-								42

PANEL NOTES:	PHASE TOTALS	ØA: 2340	ØB: 2360	ØC: 2350	TOTAL CONNECTED VA	7050
					CONNECTED VA (CODE N)	7050
					CONNECTED VA (CODE L)	0
					CONNECTED VA (CODE R)	0
					CONNECTED VA (CODE K)	0
					PANEL CONNECTED KVA	7.1
					PANEL DEMAND KVA	7.1
36 CIRCUIT PANEL					PANEL DEMAND AMPS	19.6
					HIGH Ø AMPS w/ DEMAND	19.7

NEW

PANEL: P2

VOLTAGE: 208 / 120 3Ø 4W CIRCUIT CODE: blank or
BUS: 225A
DATE: 4/24/26 4:36 PM MAINS: M.L.O. LOCATION: INTERIOR
JOB: 12018-25-01 AIC RATING: 10,000 MOUNTING: SURFACE
N: NON-CONTINUOUS
L: LONG-CONTINUOUS
R: DEMANDABLE RECEPTACLES
K: KITCHEN NO. OF EQUIPMENT: 0

CKT NO	CODE	TRIP	POLE	LOAD DESCRIPTION (NOTE)	M	R	L	ØA	ØB	ØC	A	B	C	ØA	ØB	ØC	L	R	M	(NOTE) LOAD DESCRIPTION	TRIP	POLE	CODE	CKT NO
1		15		FC-021,211,212,216,213,214,215				255			•			120						FC-221,222,223,224	15			2
3			2	--					255			•			120					--		2		4
5		15		FC-022,217,218,219,2110,2111						225			•			120				FC-225,2211,226,2210	15			6
7			2	--				225			•			120						--		2		8
9		15		FC-231,232,233,236,239,238,237					180			•			120					FC-228,227,023,229	15			10
11			2	--						180			•			120				--		2		12
13		15		FC-2310,2311,025,024,235,234				270			•			50						SAFETY BOXES	15	1		14
15		2		--					270			•			100					SAFETY BOXES	15	1		16
17		20	1	EF-217						100			•			100				SAFETY BOXES	20	1		18
19		20	1	EF-227				100			•			-						SPARE	20	1		20
21		20	1	EF-204					-			•			-					SPARE	20	1		22
23		20	1	SPARE						-			•			-				SPARE	20	1		24
25		20	1	SPARE				-			•			-						PFFB				26
27		20	1	SPARE					-			•			-					PFFB				28
29				PFFB						-			•			-				PFFB				30
31								-			•			-										32
33									-			•			-									34
35										-			•			-								36
37								-			•			-										38
39									-			•			-									40
41										-			•			-								42

PANEL NOTES:	PHASE TOTALS	ØA: 1140	ØB: 1045	ØC: 845	TOTAL CONNECTED VA	3030
					CONNECTED VA (CODE N)	3030
					CONNECTED VA (CODE L)	0
					CONNECTED VA (CODE R)	0
					CONNECTED VA (CODE K)	0
					PANEL CONNECTED KVA	3.0
					PANEL DEMAND KVA	3.0
30 CIRCUIT PANEL					PANEL DEMAND AMPS	8.4
					HIGH Ø AMPS w/ DEMAND	9.5

E. L. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ELECTRICAL SCHEDULES

ENGINEERING PARTNERS

DESIGNED BY:	CHECKED BY:	HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-608
CF	EW		
DRAWN BY: KD	APPROVED BY: EW	DATE: JUNE 2026	SHEET 275 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

06/02/2026 12:33 pm
MA:\O PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG. 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_NEW - (BASE).DWG

NEW

PANEL: P3

VOLTAGE: 208 / 120 3Ø 4W CIRCUIT CODE: blank or
BUS: 225A
DATE: 4/24/26 5:56 PM MAINS: M.L.O. LOCATION: INTERIOR
JOB: 12018-25-01 AIC RATING: 10,000 MOUNTING: SURFACE
N: NON-CONTINUOUS
L: LONG-CONTINUOUS
R: DEMANDABLE RECEPTACLES
K: KITCHEN NO. OF EQUIPMENT: 0

CKT NO	CODE	TRIP	POLE	LOAD DESIGNATION DESCRIPTION (NOTE)	M	R	L	CONNECTED VA ØA	ØB	ØC	A	B	C	ØA	ØB	ØC	L	R	M	LOAD DESIGNATION (NOTE) DESCRIPTION	TRIP	POLE	CODE	CKT NO
1		15		FC-031,131,132,136,133,134,135				255			•			225						FC-032,137,138,139,1310,1311	15			2
3			2	--					255			•			225					--		2		4
5		15		FC-321,322,3213,323,324						150			•			180				FC-3212,328,327,033,329,3210	15			6
7			2	--				150			•			180						--		2		8
9		15		FC-325,326,3211					90			•			285					FC-331,337,332,333,334,335,336,034	20	1		10
11			2	--						90			•			285				--	20	1		12
13		15		FC-338,339,3310,3311,3312,3314,3313,035				285			•			100						SAFTEY BOXES	15	1		14
15			2	--					285			•			50					SAFTEY BOXES	15	1		16
17		20	1	EF-304						100			•			50				SAFTEY BOXES	15	1		18
19		20	1	EF-318				100			•			-						SPARE	15	1		20
21		20	1	EF-328					100			•			-					SPARE	15	1		22
23		20	1	SPARE						-			•			-				SPARE	15	1		24
25		20	1	SPARE				-			•			-						PFFB				26
27		20	1	SPARE					-			•			-					PFFB				28
29				PFFB						-			•			-				PFFB				30
31								-			•			-										32
33									-			•			-									34
35										-			•			-								36
37								-			•			-										38
39									-			•			-									40
41										-			•			-								42

PANEL NOTES: PHASE TOTALS ØA: 1295 ØB: 1290 ØC: 855

TOTAL CONNECTED VA	3440
CONNECTED VA (CODE N)	3440
CONNECTED VA (CODE L)	0
CONNECTED VA (CODE R)	0
CONNECTED VA (CODE K)	0
PANEL CONNECTED KVA	3.4
PANEL DEMAND KVA	3.4
PANEL DEMAND AMPS	9.5
HIGH Ø AMPS w/ DEMAND	10.8

30 CIRCUIT PANEL

NEW DISTRIBUTION

PANEL: E

VOLTAGE: 208 / 120 3Ø 4W CIRCUIT CODE: blank or
BUS: 600A
DATE: 4/24/26 5:56 PM MAINS: 600A LOCATION: INTERIOR
JOB: 12018-25-01 AIC RATING: 65,000 MOUNTING: SURFACE
N: NON-CONTINUOUS
L: LONG-CONTINUOUS
R: DEMANDABLE RECEPTACLES
K: KITCHEN NO. OF EQUIPMENT: 0

CKT NO	CODE	TRIP	POLE	LOAD DESIGNATION DESCRIPTION (NOTE)	M	R	L	CONNECTED VA ØA	ØB	ØC	A	B	C	ØA	ØB	ØC	L	R	M	LOAD DESIGNATION (NOTE) DESCRIPTION	TRIP	POLE	CODE	CKT NO
1	N	20	1	FIRE ALARM 1				100			•			-						SPARE	20	1		2
3		20	1	SPARE					-			•			-					SPARE	20	1		4
5		20	1	SPARE						-			•			-				SPARE	20	1		6
7		20	1	SPARE				-			•			-						PFFB	20	1		8
9				PFFB					-			•			-					PFFB	20	1		10
11				PFFB						-			•			-				PFFB	20	1		12
13				PFFB				-			•			-						PFFB	20	1		14
15				PFFB					-			•			-					PFFB	20	1		16
17				PFFB						-			•			-				PFFB	20	1		18
19				PFFB				-			•			-						PFFB	20	1		20
21				PFFB					-			•			-					PFFB	20	1		22
23				PFFB						-			•			-				PFFB	20	1		24
25				PFFB				-			•			-						PFFB	20	1		26
27				PFFB					-			•			-					PFFB	20	1		28
29				PFFB						-			•			-				PFFB	20	1		30
31				PFFB				-			•			15930						PANEL 'E2A'	200			32
33				PFFB					-			•			14863					--				34
35				PFFB						-			•			14843				--		3		36
37	200			PANEL 'E1A'				14736			•			14117						PANEL 'E3A'	200			38
39				--					14780			•			12866					--				40
41		3		--						14051			•			12115				--		3		42

PANEL NOTES: PHASE TOTALS ØA: 44883 ØB: 42509 ØC: 41009

TOTAL CONNECTED VA	128401
CONNECTED VA (CODE N)	128401
CONNECTED VA (CODE L)	0
CONNECTED VA (CODE R)	0
CONNECTED VA (CODE K)	0
PANEL CONNECTED KVA	128.4
PANEL DEMAND KVA	128.4
PANEL DEMAND AMPS	356.4
HIGH Ø AMPS w/ DEMAND	373.7

1. BREAKER SHALL BE PERMANENTLY IDENTIFIED AS "FIRE ALARM", PROVIDED WITH A BREAKER LOCK, AND HAVE A RED MARKING PER NFPA 72

42 CIRCUIT PANEL

NEW

PANEL: E1A

VOLTAGE: 208 / 120 3Ø 4W CIRCUIT CODE: blank or
BUS: 225A
DATE: 4/24/26 5:56 PM MAINS: M.L.O. LOCATION: INTERIOR
JOB: 12018-25-01 AIC RATING: 10,000 MOUNTING: SURFACE
N: NON-CONTINUOUS
L: LONG-CONTINUOUS
R: DEMANDABLE RECEPTACLES
K: KITCHEN NO. OF EQUIPMENT: 0

CKT NO	CODE	TRIP	POLE	LOAD DESIGNATION DESCRIPTION (NOTE)	M	R	L	CONNECTED VA ØA	ØB	ØC	A	B	C	ØA	ØB	ØC	L	R	M	LOAD DESIGNATION (NOTE) DESCRIPTION	TRIP	POLE	CODE	CKT NO
1	R	20	1	RECEPT-OFFICE 1A				720			•			1080						RECEPT-LACTATION RM	20	1	R	2
3	R	20	1	RECEPT-OFFICE 1A					720			•			720					RECEPT-STORAGE	20	1	R	4
5	R	20	1	RECEPT-OFFICE 1B						720			•			360				RECEPT-ELEC 1A,TELCOM	20	1	R	6
7	R	20	1	RECEPT-OFFICE 1B				720			•			360						RECEPT-MECH RM	20	1	R	8
9	R	20	1	RECEPT-UNIT SUPPLY					1080			•			540					RECEPT-CORRIDOR 1E	20	1	R	10
11	R	20	1	RECEPT-UNIT SUPPLY						900			•			900				RECEPT-PAD OFFICE	20	1	R	12
13	R	20	1	RECEPT-UNIT SUPPLY				900			•			900						RECEPT-PAD OFFICE	20	1	R	14
15	R	20	1	RECEPT-VITALS/WAITING AREA					1080			•			720					RECEPT-MED RECORDS	20	1	R	16
17	R	20	1	RECEPT-MEDLOG						1080			•			720				RECEPT-STORAGE	20	1	R	18
19	R	20	1	RECEPT-MEDLOG				900			•			1080						RECEPT-EKG	20	1	R	20
21	R	20	1	RECEPT-MEDLOG					900			•			720					RECEPT-ELEV LOBBY,RESTRMS	20	1	R	22
23	R	20	1	RECEPT-MEDLOG						900			•			1080				RECEPT-IMMZ/CHOL A	20	1	R	24
25	R	20	1	RECEPT-CORRIDOR				540			•			500						RECEPT-DF	20	1	R	26
27	R	20	1	RECEPT-VISION					1080			•			1080					RECEPT-IMMZ/CHOL B	20	1	R	28
29	R	20	1	RECEPT-DENTAL						1080			•			1080				RECEPT-DENTAL	20	1	R	30
31	R	20	1	RECEPT-DENTAL XRAY				1080			•			1080						RECEPT-DENTAL XRAY	20	1	R	32
33	R	20	1	RECEPT-HEARING/CHECK IN					1080			•			900					RECEPT-HEARING RM	20	1	R	34
35	R	20	1	RECEPT-MEDIC/DENTAL BREAK RM						1080			•			720				RECEPT-HEARING RM	20	1	R	36
37	R	20	1	RECEPT-CORRIDOR 1B				1080			•			1000						RECEPT-REFER	20	1	R	38
39	L	20	1	LIGHTS-OFFICE,UNIT SUPLY					900			•			1000					RECEPT-MICROWAVE	20	1	R	40
41	L	20	1	LIGHTS-OFFICE,MEDLOG,ELEC						893			•			1080				RECEPT-PAD CHECK OUT	20	1	R	42
43	L	20	1	LIGHTS-RESTRMS,IMMZ,CHOL A				436			•			900						LIGHTS-CHOL B,DENTAL,XRAY,HEAR RM	20	1	L	44
45	L	20	1	LIGHTS-LAC,STOR,ELEV,MECH					465			•			875					LIGHTS-CORR,CHCK OUT,EKG	20	1	L	46
47	R	20	1	RECEPT-TELCOM 1						180			•			558				LIGHTS-CORRIDOR,LOBBY,ELEV	20	1	L	48
49	R	20	1	RECEPT-TELCOM 1				180			•			900						LIGHTS-VISION,DENTAL,XRAY,BRK RM	20	1	L	50
51	R	20	1	RECEPT-TELCOM 1					180			•			200					ELECTRONIC DOOR	20	1	N	52
53	R	20	1	RECEPT-TELCOM 1						180			•			180				RECEPT-ELEV MACHINE RM	20	1	R	54
55	R	20	1	RECEPT-TELCOM 1				180			•			200						MAINT RECEPT & LIGHTS	20	1	R	56
57	R	20	1	RECEPT-TELCOM 1 QUAD					360			•			180					RECEPT-ELEVATOR PIT	20	1	R	58
59	L	20	1	LIGHTS-EXTERIOR						360			•			-				SPARE	20	1		60
61		20	1	SPARE				-			•			-						SPARE	20	1		62
63		20	1	SPARE					-			•			-					SPARE	20	1		64
65		20	1	SPARE						-			•			-				SPARE	20	1		66
67		20	1	SPARE				-			•			-						PFFB				68
69				PFFB					-			•			-					PFFB				70
71				PFFB						-			•			-				PFFB				72
73				PFFB				-			•			-						PFFB				74
75				PFFB					-			•			-					PFFB				76
77				PFFB						-			•			-				PFFB				78
79				PFFB				-			•			-						PFFB				80
81				PFFB					-			•			-					PFFB				82
83				PFFB						-			•			-				PFFB				84

PANEL NOTES: PHASE TOTALS ØA: 14736 ØB: 14780 ØC: 14051

TOTAL CONNECTED VA	43567
CONNECTED VA (CODE N)	200
CONNECTED VA (CODE L)	6287
CONNECTED VA (CODE R)	37080
CONNECTED VA (CODE K)	0
PANEL CONNECTED KVA	43.6
PANEL DEMAND KVA	31.6
PANEL DEMAND AMPS	87.7
HIGH Ø AMPS w/ DEMAND	90.2

84 CIRCUIT PANEL

NEW

PANEL: E2A

VOLTAGE: 208 / 120 3Ø 4W CIRCUIT CODE: blank or
BUS: 225A
DATE: 4/24/26 5:56 PM MAINS: M.L.O. LOCATION: INTERIOR
JOB: 12018-25-01 AIC RATING: 10,000 MOUNTING: SURFACE
N: NON-CONTINUOUS
L: LONG-CONTINUOUS
R: DEMANDABLE RECEPTACLES
K: KITCHEN NO. OF EQUIPMENT: 0

CKT NO	CODE	TRIP	POLE	LOAD DESIGNATION DESCRIPTION (NOTE)	M	R	L	CONNECTED VA ØA	ØB	ØC	A	B	C	ØA	ØB	ØC	L	R	M	LOAD DESIGNATION (NOTE) DESCRIPTION	TRIP	POLE	CODE	CKT NO
1		20	1	RECEPT-OFFICE 2A				720			•			540						RECEPT-CORRIDOR 2B	20	1		2
3		20	1	RECEPT-OFFICE 2A					720			•			720					RECEPT-TRAINING ROOM 2B	20	1		4
5		20	1	RECEPT-OFFICE 2B						720			•			900				RECEPT-TRAINING ROOM 2C	20	1		6
7		20	1	RECEPT-OFFICE 2B				720			•			720						RECEPT-TELCOM 2	20	1		8
9		20	1	RECEPT-OFFICE 2C					720			•			900					RECEPT-CORRIDOR 2B/ELEV LOBBY	20	1		10
11		20	1	RECEPT-OFFICE 2C						720			•			720				RECEPT-OFFICE 2J	20	1		12
13		20	1	RECEPT-OFFICE 2D				720			•			720						RECEPT-OFFICE 2J	20	1		14
15		20	1	RECEPT-OFFICE 2D					720			•			720					RECEPT-OFFICE 216	20	1		16
17		20	1	RECEPT-OFFICE 2E						720			•			720				RECEPT-OFFICE 216	20	1		18
19		20	1	RECEPT-OFFICE 2E				720			•			720						RECEPT-BREAK ROOM	20	1		20
21		20	1	RECEPT-OFFICE 2F					720			•			1000					RECEPT-REFER	20	1		22
23		20	1	RECEPT-OFFICE 2F						720			•			1000				RECEPT-MICRO	20	1		24
25		20	1	RECEPT-OFFICE 2G				720			•			720						RECEPT-OFFICE 2K	20	1		26
27		20	1	RECEPT-OFFICE 2G					720			•			720					RECEPT-OFFICE 2K	20	1		28
29		20	1	RECEPT-OFFICE 2H						720			•			720				RECEPT-OFFICE 2L	20	1		30
31		20	1	RECEPT-OFFICE 2H				720			•			720						RECEPT-OFFICE 2L	20	1		32
33		20	1	RECEPT-OFFICE 2I					720			•			720					RECEPT-OFFICE 2N	20	1		34
35		20	1	RECEPT-OFFICE 2I						720			•			720				RECEPT-OFFICE 2N	20	1		36
37		20	1	RECEPT-TRAINING ROOM 2A				900			•			720						RECEPT-OFFICE 2Q	20	1		38
39		20	1	RECEPT-OFFICE 2V					720			•			720					RECEPT-OFFICE 2Q	20	1		40
41		20	1	RECEPT-OFFICE 2V						720			•			720				RECEPT-OFFICE 2S	20	1		42
43		20	1	RECEPT-OFFICE 2T				720			•			720						RECEPT-OFFICE 2S	20	1		44
45		20	1	RECEPT-OFFICE 2T					720			•			720					RECEPT-OFFICE 2U	20	1		46
47		20	1	RECEPT-OFFICE 2R						720			•			720				RECEPT-OFFICE 2U	20	1		48
49		20	1	RECEPT-OFFICE 2R				720			•			900						LIGHTS-OFFICE-TRAINING RM 2A	20	1		50
51		20	1	RECEPT-OFFICE 2P					720			•			983					LIGHTS-OFFICE 2B-ELEC 2	20	1		52
53		20	1	RECEPT-OFFICE 2P						720			•			703				LIGHTS-CORRIDOR 2B	20	1		54
55		20	1	RECEPT-OFFICE 2M				720			•			810						LIGHTS-TRAIN RM 2B,2C,OFFICE,BRK RM	20	1		56
57		20	1	RECEPT-OFFICE 2M					720			•			360					LIGHTS-RESTRMS	20	1		58
59		20	1	RECEPT-CORRIDOR 2C					540			•			900					LIGHTS-OFFICE 2L-2U	20	1		60
61		20	1	RECEPT-TELCOM QUAD				360			•			900						LIGHTS-OFFICE 2M-2V	20	1		62
63		20	1	ELECTRONIC DOOR					100			•			-					SPARE	20	1		64
65		20	1	SPARE						-			•			-				SPARE	20	1		66
67		20	1	SPARE				-			•			-						SPARE	20	1		68
69		20	1	SPARE					-			•			-					PFFB				70
71				PFFB						-			•			-				PFFB				72
73				PFFB				-			•			-						PFFB				74
75				PFFB					-			•			-					PFFB				76
77				PFFB						-			•			-				PFFB				78
79				PFFB				-			•			-						PFFB				80
81				PFFB					-			•			-					PFFB				82
83				PFFB						-			•			-				PFFB				84

PANEL NOTES: PHASE TOTALS ØA: 15930 ØB: 14863 ØC: 14843

TOTAL CONNECTED VA	45636
CONNECTED VA (CODE N)	45636
CONNECTED VA (CODE L)	0
CONNECTED VA (CODE R)	0
CONNECTED VA (CODE K)	0
PANEL CONNECTED KVA	45.6
PANEL DEMAND KVA	45.6
PANEL DEMAND AMPS	126.7
HIGH Ø AMPS w/ DEMAND	132.7

84 CIRCUIT PANEL

NEW

PANEL: E3A

VOLTAGE: 208 / 120 3Ø 4W CIRCUIT CODE: blank or
BUS: 225A
DATE: 4/24/26 5:56 PM MAINS: M.L.O. LOCATION: INTERIOR
JOB: 12018-25-01 AIC RATING: 10,000 MOUNTING: SURFACE
N: NON-CONTINUOUS
L: LONG-CONTINUOUS
R: DEMANDABLE RECEPTACLES
K: KITCHEN NO. OF EQUIPMENT: 0

CKT NO	CODE	TRIP	POLE	LOAD DESIGNATION DESCRIPTION (NOTE)	M	R	L	CONNECTED VA ØA	ØB	ØC	A	B	C	ØA	ØB	ØC	L	R	M	LOAD DESIGNATION (NOTE) DESCRIPTION	TRIP	POLE	CODE	CKT NO
1		20	1	RECEPT-OFFICE 3A				720			•			720						RECEPT-CONF RM 3	20	1		2
3		20	1	RECEPT-OFFICE 3A					720			•			540					RECEPT-CONF RM 3	20	1		4
5		20	1	RECEPT-OFFICE 3B						720			•			720				RECEPT- TELCOM 3	20	1		6
7		20	1	RECEPT-OFFICE 3B				720			•			1080						RECEPT-SIM LAB	20	1		8
9		20	1	RECEPT-OFFICE 3C					720			•			1080					RECEPT-CORRIDOR,RESTRM	20	1		10
11		20	1	RECEPT-OFFICE 3C						720			•			720				RECEPT-WOMENS,MENSM CORR	20	1		12
13		20	1	RECEPT-OFFICE 3D				720			•			720						RECEPT-OFFICE 3K	20	1		14
15		20	1	RECEPT-OFFICE 3D					720			•			720					RECEPT-OFFICE 3K	20	1		16
17		20	1	RECEPT-OFFICE 3E						720			•			720				RECEPT-OFFICE 3L	20	1		18
19		20	1	RECEPT-OFFICE 3E				720			•			720						RECEPT-OFFICE 3L	20	1		20
21		20	1	RECEPT-OFFICE 3F					720			•			900					RECEPT-WOMENS,CORR 3C	20	1		22
23		20	1	RECEPT-OFFICE 3F						720			•			720				RECEPT-OFFICE 3N	20	1		24
25		20	1	RECEPT-OFFICE 3G				720			•			720						RECEPT-OFFICE 3N	20	1		26
27		20	1	RECEPT-OFFICE 3G					720			•			720					RECEPT-OFFICE 3M	20	1		28
29		20	1	RECEPT-OFFICE 3H						720			•			720				RECEPT-OFFICE 3M	20	1		30
31		20	1	RECEPT-OFFICE 3H				720			•			720						RECEPT-OFFICE 3Q	20	1		32
33		20	1	RECEPT-OFFICE 3I					720			•			720					RECEPT-OFFICE 3Q	20	1		34
35		20	1	RECEPT-OFFICE 3I						720			•			720				RECEPT-OFFICE 3P	20	1		36
37		20	1	RECEPT-OFFICE 3J				720			•			720						RECEPT-OFFICE 3P	20	1		38
39		20	1	RECEPT-OFFICE 3J					720			•			900					RECEPT-MEDIC TRAINING RM	20	1		40
41		20	1	RECEPT-CORRIDOR 3B						900			•			900				RECEPT-MEDIC TRAINING RM	20	1		42
43		20	1	LIGHTS-OFFICE 3A-3I				900			•			900						RECEPT-COMPUTER LAB	20	1		44
45		20	1	LIGHTS-OFFICE 3B-ELEC 3					938			•			900					RECEPT-COMPUTER LAB	20	1		46
47		20	1	LIGHTS-CONF 3-OFFICE K						675			•			100				ELECTRONIC DOOR	20	1		48
49		20	1	LIGHTS-CORRIDOR 3B,VEST,ELEV LOBBY				617			•			360						RECEPT-TELCOM 3	20	1		50
51		20	1	LIGHTS-MENS SHWR-JAN 3					408			•			-					SPARE	20	1		52
53		20	1	LIGHTS-OFFICE L- MED TRAIN RM						900			•			-				SPARE	20	1		54
55		20	1	LIGHTS- WOMENS-COMP LAB				900			•			-						SPARE	20	1		56
57		20	1	SPARE					-			•			-					PFFB				58
59		20	1	SPARE						-			•			-				PFFB				60
61		20	1	SPARE				-			•			-						PFFB				62
63				PFFB					-			•			-					PFFB				64
65				PFFB						-			•			-				PFFB				66
67				PFFB				-			•			-						PFFB				68
69				PFFB					-			•			-					PFFB				70
71				PFFB						-			•			-				PFFB				72
73				PFFB				-			•			-						PFFB				74
75				PFFB					-			•			-					PFFB				76
77				PFFB						-			•			-				PFFB				78
79				PFFB				-			•			-						PFFB				80
81				PFFB					-			•			-					PFFB				82
83				PFFB						-			•			-				PFFB				84

PANEL NOTES: PHASE TOTALS ØA: 14117 ØB: 12866 ØC: 12115

TOTAL CONNECTED VA	39098
CONNECTED VA (CODE N)	39098
CONNECTED VA (CODE L)	0
CONNECTED VA (CODE R)	0
CONNECTED VA (CODE K)	0
PANEL CONNECTED KVA	39.1
PANEL DEMAND KVA	39.1
PANEL DEMAND AMPS	108.5
HIGH Ø AMPS w/ DEMAND	117.6

84 CIRCUIT PANEL

E. L. I. B. WALTZ
LICENSED PROFESSIONAL ENGINEER
Exp. 04/30/28
No. 18572-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

SIGNATURE

REV NO	DESCRIPTION	DATE

DEPARTMENT OF DEFENSE
HAWAII NATIONAL ARMY GUARD
STATE OF HAWAII

BUILDING 46
MEDCOM RENOVATIONS
KALAELOA, KAPOLEI, OAHU, HAWAI'I

ELECTRICAL SCHEDULES

ENGINEERING PARTNERS

DESIGNED BY: CF	CHECKED BY: EW	HARNG JOB NO. FEDERAL: PN15H00033 STATE: CA-202505-D	DRAWING NO. E-609
DRAWN BY: KD	APPROVED BY: EW	DATE: JUNE 2026	SHEET 276 OF 276 SHTS
SCALE: AS NOTED			

DATE ISSUED: ---

OF _____ DRAWER _____ FOLDER _____

06/02/2026 12:33 pm
M:\ED PROJECTS\2025 PROJECTS\12018-25-01 DOD BLDG. 46 MEDCOM RENOVATIONS\4-DWG\ELECTRICAL\E-X_NEW - (BASE).DWG

SPECIAL NOTICE TO BIDDERS - CONSTRUCTION

QUALIFICATIONS OF BIDDERS - Prospective bidders must be capable of performing the work for which bids are being called.

The Department of Defense no longer requires a submittal of "INTENTION TO BID" unless otherwise stated in the notice to bidders.

If two (2) or more prospective bidders desire to bid jointly as a joint venture on a single project, they must file an affidavit of joint venture with their notice of intention to bid or if no intent to bid is required, shall submit an affidavit of joint venture prior to bid opening. Such affidavit of joint venture will be valid only for the specific project for which it is filed. No further license is required when all parties to the joint venture possess current and appropriate contractor's licenses. Joint venture are required to be licensed in accordance with Chapter 444 of the Hawaii Revised Statutes, as amended, and the rules and regulations of the Contractor's License Board when any party to the joint venture agreement does not hold a current or appropriate contractor's license.

The Adjutant General or his designated representative may, in accordance with Section 103D-310, Hawaii Revised Statutes, require the prospective bidder to submit answers to questions in the "Standard Questionnaire and Financial Statement for Bidders," on the form provided by the Department, properly executed and notarized, setting forth a complete statement of the experience of such prospective bidder and his organization in performing similar work and a statement of the equipment proposed to be used, together with adequate proof of the availability of such equipment, at least forty-eight (48) hours prior to the time advertised for the opening of bids. If the information in the questionnaire proves satisfactory, the bidder's proposal will be received. All information contained in the answers to the questionnaire shall be kept confidential. The questionnaire will be returned to the bidder after it has served its purpose.

If upon review of the Questionnaire, or otherwise, the bidder appears not fully qualified or able to perform the intended work, the Adjutant General or his designated representative shall, after affording the bidder an opportunity to be heard and if still of the opinion that the bidder is not fully qualified to perform the work, refuse to receive or to consider any bid offered by the prospective bidder.

Failure to complete the prequalification questionnaire, (IF SENT TO YOU), will be sufficient cause for the Department to disqualify a prospective bidder.

INTERPRETATION OF QUANTITIES IN BID SCHEDULE - When quantities for individual items of work are listed in the bid form for which respective unit prices are asked, said quantities are to be considered as approximate and are to be used by the Department only for the purpose of comparing on a uniform basis bids offered for the work. The Department does not, expressly or by implication, agree that the actual quantity of work

will correspond therewith. The undersigned agrees that his is satisfied with and will at no time dispute said estimated quantities as a means of comparing the bids.

After determining the low bidder by comparison of bids submitted in accordance with the proposal form, the Adjutant General or his designated representative reserves the right to increase or decrease the scope of the improvement.

On unit price bids, payment will be made only for the actual number of units incorporated into the finished project at the unit price bid.

It is understood and agreed that the contractor will make no claim for anticipated profit or loss of profit due to the Department's right to eliminate entirely portions of the work or to increase or decrease any or all of the quantities shown in the proposal form and/or scope of work.

CONTENTS OF CONTRACT FORMS – The Statement of Work will provide the location, description, and the contract time of the work contemplated for which a lump sum bid price is asked or containing a schedule of items, together with estimated quantities of work to be performed and materials to be furnished, for which unit bid prices and/or lump sum bid prices are asked.

Proposal forms will include a listing of joint contractor and/or subcontractors asking the name of each person or firm to be engaged on the project as a joint contractor or subcontractor.

All papers bound with or attached to the offer form shall be considered a part thereof and shall not be detached or altered when the bid is submitted.

The plans, specifications and other documents designated in the bid document package, will also be considered a part thereof whether attached or not.

BIDDERS RESPONSIBILITY FOR EXAMINATION OF PLANS, SPECIFICATIONS, SITE OF WORK, ETC. - The bidder shall examine carefully the site work contemplated and the proposal, plans, specifications, supplemental specifications, special provisions and contract and bond forms therefore. The submission of a bid shall be considered as a warranty that the bidder has made such examination and is satisfied with the conditions to be encountered in performing the work and with the requirements of the plans, specifications, supplemental specifications, special provisions, contract and bond.

No extra compensation will be given by reason of the Contractor's misunderstanding or lack of knowledge of the requirements of the work to be accomplished or the conditions to be encountered in performing the project.

Where an investigation of subsurface conditions has been made by the Department in respect to foundation or other design, the bidders may inspect the records of the Department as to such investigation, including examination of samples, if any. It is

understood, however, that any such information furnished is for the bidders' convenience only and no assurance is given that conditions found at the time of subsurface investigation, such as the presence or absence of water, will be conditions that prevail at the time of construction.

When the contract plan includes a log of test borings showing a record of the data obtained by the Department's investigation of subsurface conditions, said log represents only the opinion of the Department as to the character of material encountered by it in its test borings and there is no warranty, either expressed implied, that the conditions indicated are representative of those existing throughout the work or any part of it, or that unforeseen developments may not occur.

Information regarding the site of work given on the drawings or specifications has been obtained by the Department and is believed to be reasonably correct, however, it is the responsibility of the bidder to verify all such information. Any utilities that the Contractor encounters during the progress of the work, such as telephone ducts, electric ducts, water lines, sewer lines, electric lines and drainage pipes, whether shown or not on the contract plans, shall not be disturbed or damaged unless otherwise instructed in the plans and specifications.

In the event the utilities are damaged or disturbed by the Contractor, the Contractor shall be held liable for the damage or disturbed utilities which were:

A. Shown on the plan.
B. Located and exposed on the job as it progressed.
C. Pointed out to the Contractor in the field.

The Contractor shall repair the damaged or disturbed utilities to the existing condition at no cost to the Department or the project. Any damage claims due to the disruption of service caused by the utilities being damaged shall be paid by the Contractor who shall save harmless the Department from all suits, actions, or claims of any character brought on account of such damages.

In the event utilities which were not shown on the plans and specifications are damaged or disturbed by the Contractor, the Contractor shall not be held liable but shall notify the Engineer. Upon instruction from the Engineer, the Contractor shall repair all damages which shall be considered to be additional work.

Utilities which must be relocated due to construction and not so indicated in the plans and specifications shall also be considered to be additional work. The Contractor shall not in any case, if he encounters underground utilities, proceed with any work until he has notified the Engineer.

No information derived from such inspection of records of subsurface investigations made by the Department or from the Engineer or from his authorized representative or from maps, plans, specifications or drawings will in any way relieve the Contractor from

any risk or from properly fulfilling all the terms of the contract. The log tests borings if included in the plans are only for the convenience of the bidder and do not constitute a part of the contract. The Contractor is solely responsible for all assumptions, deductions, or conclusions he may make or derive from the subsurface records furnished.

ADDENDA AND INTERPRETATIONS - Discrepancies, omissions, or doubts as to the meaning of drawings and specifications should be communicated via email as directed in the Notice to Bidders and must be received by the Engineering Office, Department of Defense, no later than the date stated in the Notice to Bidders for submittal of questions. Any interpretation, if made, and any supplemental instructions will be in the form of written addenda. All addenda will be posted on the State Procurement Office website http://spo.hawaii.gov . Failure of any bidder to receive any such addendum or interpretations shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the contract documents.

PREPARATION OF PROPOSAL - The bidder's proposal must be submitted on the proposal form furnished by the Department. The proposal must be prepared in full accordance with the instructions therein. The bidder must state, both in words and numerals, the lump sum price at which the work contemplated is proposed to be done. These prices must be written in ink or typed. Prices written in pencil are not acceptable. In case of a discrepancy between the prices written in words and those written in figures, the words shall govern over the figures. The bidder shall sign the proposal in the spaces provided with ink.

If the proposal is made by an individual, his name and post office address must be shown in the space provided. If made by a partnership, the name and post office address of each member of the partnership must be shown and the proposal signed by all partners or evidence in the form of a partnership agreement must be submitted showing the authority of the partner to enter, on behalf of said partnership, into contract with the State. If made by a corporation, the proposal must show the name, titles, and business address of the president, secretary and treasurer and also evidence in the form of a corporate resolution must be submitted showing the authority of the particular corporate representative to enter on behalf of said corporation into contract with the State. (See sample). If made by a joint venture the name and post office address of each member of the individual form, partnership or corporation comprising the joint venture must be shown with other pertinent information required of individuals, partnerships or corporations as the case may be. The proposal must be signed by all parties to the joint venture or evidence in the form of a Joint Venture Agreement must be submitted showing the authority of the Joint Venture's representative to enter on behalf of said Joint Venture into contract with the State.

Pursuant to the requirements of Section 103D-302, Hawaii Revised Statutes, each bidder shall include in his bid the name of each person or firm to be engaged by the bidder on the project as joint contractor or subcontractor indicating also the nature and scope of work to be performed by such joint contractor and/or subcontractor.

BID SECURITY - No proposal totaling $25,000 or more will be considered unless accompanied by one of the following forms of bidder's security:

A. Surety bond underwritten by a company licensed to issue bonds in this State.

B. Legal Tender.

C. Certificate of Deposit; share certificate; or cashier's, treasurer's, tellers or official check drawn by, or certified check accepted by, and payable on demand to the State by a bank, a savings institution, or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration.

(1) These instruments may be utilized only to a maximum of $100,000.

(2) If the required security amount totals over $100,000, more than one instrument not exceeding $100,000 each and issued by different financial institutions shall be accepted.

THE BID SECURITY SHALL BE AT LEAST FIVE (5) PERCENT OF THE BID AMOUNT.

If the bidder is a corporation, evidence in the form of a corporate resolution, authorizing the corporate representative to execute the bond must be submitted with the proposal. If the bidder is a partnership, all partners must sign the bond or evidence in the form of a partnership agreement must be submitted showing the authority of the partner.

If the bidder is a joint venture, all parties to the joint venture must sign the bond or evidence in the form of a joint venture agreement must be submitted showing the authority of the bidder to sign the bond on behalf of the joint venture.

In the case where the award will be made on a group or item basis, the amount of proposal guaranty shall be based on the total bid for all groups or items submitted.

Bidders are cautioned that surety bid bonds which place a limit in value to the difference between the bid amount and the next acceptable bid, such value not to exceed the purported amount of the bond, are acceptable. Also, surety bid bonds which place a time limit on the right of the State to make claim other than allowed by statutes or these General Conditions are not acceptable. Bidders are hereby notified that a surety bid bond containing such limitation(s) is not acceptable and a bidder's bid accompanied by such surety bid bond will be automatically rejected.

DELIVERY OF PROPOSALS - The entire proposal shall be placed together with the bid security, in a sealed envelope so marked as to indicate the identity of the project, the project number, the date of bid opening and the name and address of the bidder and then delivered as indicated in the Notice to Bidders. Bids which do not comply with this requirement may not be considered. Proposals will be received up to the time fixed in the

public notice for opening of bids and must by that time be in the hands of the officials indicated. The words 'SEALED BID' must be clearly written or typed on the face of the sealed envelope containing the proposal guaranty.

WITHDRAWAL OR REVISION OF PROPOSALS - Any bid may be withdrawn or revised at any time prior to, but not after, the time fixed in the public notice for the opening of bids, provided that a request in writing, executed by the bidder or his duly authorized representative, for the withdrawal or revision of such bid is filed with the Adjutant General before the time set for the opening of bids. The withdrawal of a bid shall not prejudice the right of a bidder to file a new bid. Whether or not bids are opened exactly at the time fixed in the public notice for opening bids, a bid will not be received after that time, nor may any bid be withdrawn after the time fixed in the public notice for the opening of bids.

PUBLIC OPENING OF PROPOSALS - Proposals will be opened and read publicly at the time and place indicated in the Notice to Bidders. Bidders, their authorized agents, and other interested parties are invited to be present.

DISQUALIFICATION OF BIDDERS - Any one or more of the following cause will be considered as sufficient for the disqualification of a bidder and the rejection of his proposal or proposals:

A. Non-compliance with “QUALIFICATION OF BIDDERS".

B. Evidence of collusion among bidders.

C. Lack of responsibility and cooperation as shown by past work.

D. Being in arrears on existing contracts with the State of Hawaii or having defaulted on a previous contract.

E. Lack of proper equipment and/or sufficient experience to perform the work contemplated as revealed by the Standard Questionnaire and Financial Statement for Bidders.

F. No contractor's license or a contractor's license which does not cover type of work contemplated.

G. More than one proposal for the same work from an individual, firm, partnership, corporation, or joint venture under the same or different name.

H. Delivery of bids after the deadline specified in the advertisement calling for bids.

I. Failure to pay, or satisfactorily settle, all bids overdue for labor and material on former contracts in force at the time of issuance of proposal forms.

CONSIDERATION OF PROPOSALS - After the proposals are opened and read, the figures will be extended and/or totaled in accordance with the bid prices of the acceptable proposals and the totals will be compared and the results of such comparison shall immediately be made public. In the comparison of bids, words written in the proposals will govern over figures and unit prices will govern over totals. Until the award of the contract, however, the right will be reserved to reject any and all proposals and to waive any defects or technicalities as may be deemed best for the interest of the State.

IRREGULAR PROPOSALS - Proposals will be considered irregular and may be rejected for the following reasons:

A. If the proposal is unsigned.

B. Bid security not in accordance with paragraph "BID SECURITY".

C. If proposal is on a form other than that furnished by the Department or if the form is altered or any part thereof detached.

D. If the proposal shows any non-compliance with applicable law, alteration of form, additions not called, conditional bids, incomplete bids, uninitiated erasures, other defects, or if the prices are obviously unbalanced, or if sufficient funds are not available to prosecute the work.

E. If the bidder adds any provisions reserving the right to accept or reject an award, or to enter into a contract pursuant to an award.

This does not exclude a proposal limiting the maximum gross amount of awards acceptable to any one bidder at any one bid letting, provided that any selection of awards will be made by the Department.

F. When a proposal is signed by an officer or officers of a corporation and a currently certified corporate resolution authorizing such signer(s) to submit such proposal is not submitted with the proposal or when the proposal is signed by an agent other than the officer or officers of a corporation or a member of a partnership and a Power of Attorney is not submitted with the proposal.

G. Where there is an incomplete or ambiguous listing of joint contractors and/or subcontractors the proposal may be rejected. All work which is not listed as being performed by joint contractor and/or subcontractors must be performed by the bidder with his own employees. Additions to the list of joint contractors or subcontractors will not be allowed. Whenever there is a doubt as to the completeness of the list, the bidder will be required to submit within five (5) working days, written confirmation that the work in question will be performed with his own force. Whenever there is more than one joint contractor and/or subcontractor listed for the same item of work, the bidder will be required to either confirm in writing within five (5) working days that all joint contractors or subcontractors listed will actually be engaged on the project or obtain with five (5) working

days, written releases from those joint contractor and/or subcontractors who will not be engaged.

AWARD OF CONTRACT - The award of contract, if it be awarded, will be made within ninety (90) consecutive calendar days after the opening of the proposals to the lowest responsible and responsive bidder (including the alternate or alternates which may be selected by the Adjutant General in the case of alternate bids) whose proposal complies with all the requirements prescribed, but in no case will an award be made until all necessary investigations are made. The successful bidder will be notified, by letter mailed to the address shown on the proposal that his bid has been accepted and that he has been awarded the contract.

No contract will be awarded to any person or firm suspended under the provisions of Chapter 104 and Chapter 444, Hawaii Revised Statutes, as amended.

CANCELLATION OF AWARD - The Adjutant General or his designated representative reserves the right to cancel the award of any contract at any time before the execution of said contract by all parties without any liability to the awardee and to any other bidder.

RETURN OF BID SECURITY (excluding bid bonds) - All bid securities, except those of the four (4) lowest bidders, will be returned immediately following the opening and checking of the proposals. The retained bid securities of the remaining two (2) lowest bidders will be returned within five (5) working days following the execution of contract. The successful bidder's bid security may be returned after a satisfactory contract bond has been furnished and the contract has been executed.

RETURN OF BID BONDS – The bid bonds will be returned only after receipt of a written request from the contractor.

REQUIREMENT OF PERFORMANCE AND PAYMENT BONDS - Performance and Payment Bonds shall be required for contracts exceeding $25,000. At the time of the execution of the contract, the successful bidder shall file a good and sufficient performance and payment bonds on the form furnished by the Department or the contractors Surety, each in an amount equal to one hundred percent (100%) of the amount of the contract price unless otherwise stated in the solicitation of bids. Acceptable performance and payment bonds shall be limited to the following:

A. Surety bond underwritten by a company licensed to issue bonds in this State; or

B. Legal Tender; or

C. A certificate of deposit; share certificate; or cashier's, treasurer's, teller's or official check drawn by, or a certified check accepted by, and payable on demand to the State by a bank, a savings institution, or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration.

(1) These instruments may be utilized only to a maximum of $100,000.

(2) If the required security or bond amount totals over $100,000, more than one instrument not exceeding $100,000 each and issued by different financial institutions shall be acceptable.

If the contractor fails to deliver the required performance and payment bonds, the contractor's award shall be canceled, its bid security enforced, and award of the contract shall be made to the next lowest bidders.

EXECUTION OF THE CONTRACT - The contract shall be signed by the successful bidder and returned, together with a satisfactory performance and payment bonds, within ten (10) consecutive calendar days, after the bidder has received his contract for execution or within such further time as the Adjutant General or his designated representative may allow. No proposal or contract shall be considered binding upon the State until the contract has been fully and properly executed by all parties thereto and the Adjutant General or his designated representative has endorsed therein his certificate, as required by Section 103D-309, Hawaii Revised Statutes, that there is an available unexpended appropriation or balance of an appropriation over and above all outstanding contracts sufficient to cover the State's amount required by such contract.

On any individual award totaling less than $50,000, the State reserves the right to execute the contract by the issuance of a State Purchase Order. Acceptance shall result in a binding contract between the parties without further action by the State. Executing the contract by Purchase Order shall not be deemed a waiver of these specification requirements.

FAILURE TO EXECUTE THE CONTRACT - If the bidder to whom a contract is awarded shall fail or neglect to enter into the contract and to furnish satisfactory security within ten (10) consecutive calendar days after such award or within such further time as the Adjutant General or his designated representative may allow, the award shall be canceled and the bid security shall be declared forfeited. The bid security shall thereupon become a realization of the State, not as a penalty, but in liquidation of the damages sustained. The Adjutant General may thereupon award the contract to the next lowest responsible bidder or may call for new bids, whichever method he may deem is to the best interest of the State.

NOTICE TO PROCEED - After the contract is fully executed, the Contractor will be sent a formal "Notice to Proceed" advising the Contractor of the date on which he may proceed with the work. The Contractor shall be allowed ten (10) consecutive working days from said date to begin his work. In the event that the Contractor refuses or neglects to start the work, the Adjutant General or his designated representative may terminate the contract.

SPECIAL PROVISIONS FOR CONSTRUCTION CONTRACTS

RESPONSIBILITY OF OFFERORS

Offeror shall furnish proof of compliance in accordance with Act 190 Amendment to HRS 103D-310(c)

Required as a prerequisite to entering into a contract, the contractor shall register on the Hawaii Compliance Express web site for all tax clearances by going to http://vendors.ehawaii.gov and registering there.

A Certificate of Vendor Compliance generated from this website should be included with their bid proposal. A Compliant status is required prior to awarding the contract.

COMPREHENSIVE ANNUAL FINANCIAL REPORTING

For any project that involves work on multiple structures, including non-building structures, whether it be new work or renovation work, or when the project involves both site improvements and a structure, the Contractor shall provide the following information to the Project Manager for fixed asset allocation purposes:

1. Within 30 calendar days of award as applicable to the project, the following shall be submitted:
   a. The total cost of each individual structure.
   b. The total cost of on-site improvement work; and
   c. The total cost of off-site improvement work.

2. After all work, including all change order work has been completed, and prior to a request for final payment, the following shall be submitted:
   a. The total cost of each individual structure including any related change order cost.
   b. The total cost of on-site improvement work including any related change order cost; and
   c. The total cost of off-site improvement work including any related change order cost.

3. The sum total cost of each category noted above shall total to the contract amount awarded, plus all change order work issued.
   a. The cost of each individual structure includes the cost of the structure and any work within five (5) feet of the structure or building line which may include, but is not limited to its foundation, foundation earthwork, and utility improvements within and immediately below the building line.
   b. The on-site improvement cost includes all site improvement work from

five (5) feet and beyond the building line and up to the project's property line, which may include but is not limited to clearing and grubbing, grading, drainage system, site utility, walkway, parking lot, and landscape improvements.

c. The off-site improvement cost includes all off-site improvement work outside of the project's property line, which may include but is not limited to walkway, landscape, drainage, utility, and roadway improvements.

LIABILITY INSURANCE

The Contractor shall not commence any work until it obtains, at its own expense, all required liability insurance. Such insurance must have the approval of the State as to limit form and amount and must be maintained with a company acceptable to the State. Such insurance must be maintained for the full period of the contract and shall provide protection from claims arising out of or resulting from the Contractor's operations under the Contract itself Subcontractor or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable.

The contractor shall take out and maintain during the life of this contract broad form public liability (Bodily Injury) and broad form property damage liability insurance in a combined single limit not less than $1,000,000 and not less than $2,000,000 in the aggregate to protect such contractor and all his subcontractors from claims for damages for personal injury, accidental death and property damage which may arise from operations under this contract, whether such operations be by himself or anyone directly or indirectly employed by either of them and to include automotive liability, workers compensation and employers liability.

The insurance described herein will be maintained by the Contractor for the full period of the Contract and in no event will be terminated or otherwise allowed to lapse prior to final acceptance of the work by the State.

A certificate of insurance acceptable to the State shall be filed with the State prior to commencement of the work. Such certificate shall contain a provision that coverage afforded under the policy will not be canceled or changed until at least thirty days written notice has been given to the State by registered mail at the address denominated for the State in the Contract for official communications to it should any policy be canceled before final acceptance by the State, and the Contractor fails to immediately procure replacement insurance as specified, the State reserves the right to procure such insurance and to deduct the cost thereof from any sum due the Contractor.

BID PREPARATION

Offer Form, Page Of-1. Offeror is requested to submit its offer using Offeror's exact legal name as registered with the Department of Commerce and Consumer Affairs, if applicable; and to indicate exact legal name in the appropriate space on Offer Form, page OF-1. Failure to do so may delay proper execution of the contract.

The authorized signature on the first page of the Offer Form shall be an original signature in ink. If unsigned or the affixed signature is a facsimile or a photocopy, the offer shall be automatically rejected unless accompanied by other material, containing an original signature, indicating the Offeror's intent to be bound.

Hawaii Business. A business entity referred to as a "Hawaii business", is registered and incorporated or organized under the laws of the State of Hawaii.

Compliant non-Hawaii business. A business entity referred to as a "compliant non-Hawaii business," is not incorporated or organized under the laws of the State of Hawaii but is registered to do business in the State.

Tax Liability. Work to be performed under this solicitation is a business activity taxable under Chapter 237, Hawaii Revised Statutes (HRS), and vendors are advised that they are liable for the Hawaii GET at the current rate.

4.712% tax rate. All businesses located on Oahu are required to pay the ½% County Surcharge tax on all Oahu transactions for which they pay the 4% GE tax. Neighbor island and out-of-state businesses that deliver goods or services to Oahu and have a 'physical presence' on Oahu, must pay the new ½% County Surcharge tax on their Oahu transactions.

4% tax rate. Neighbor island and out-of-state businesses that do not deliver any goods or services to Oahu are not subject to the new ½% County Surcharge tax.

If, however, an Offeror is a person exempt by the HRS from paying the GET and therefore not liable for the taxes on this solicitation, Offeror shall state its tax-exempt status and cite the HRS chapter or section allowing the exemption.

Taxpayer Preference. For evaluation purposes, pursuant to §103D-1008, HRS, the Bidder's tax-exempt price offer submitted in response to an IFB shall be increased by the applicable retail rate of general excise tax and the applicable use tax. Under no circumstance shall the dollar amount of the award include the aforementioned adjustment.

AWARD OF CONTRACT

Method of Award. Award, if made, shall be to the responsive, responsible offeror submitting the lowest Lump Sum Bid unless otherwise noted in the bid documents.

Responsibility of Lowest Responsive Bidder. Reference Responsibility of Offerors in §3-122-112, HAR. If compliance documents have not been submitted to the State Department of Defense prior to award, the lowest responsive offeror shall produce documents to the procurement officer to demonstrate compliance with this section.

HRS Chapter 237 tax clearance requirement for award and final payment.
Instructions are as follows:

In accordance with Act 190 Amendment to HRS 103D-310(c)

Required as a prerequisite to entering into a contract, the contractor shall register on the Hawaii Compliance Express web site for all tax clearances by going to http://vendors.ehawaii.gov and registering there.

A Certificate of Vendor Compliance generated from this website should be included with their bid proposal. A Compliant status is required prior to awarding the contract.

A current Certificate of Vendor Compliance must accompany the invoice for final payment on the contract.

HRS Chapters 383 (Unemployment Insurance), 386 (Workers' Compensation), 392 (Temporary Disability Insurance), and 393 (Prepaid Health Care) requirements for award. Instructions are as follows:

Pursuant to §103D-310(c), HRS, The Certificate of Vendor Compliance must have a "Compliant" rating with the DLIR.

Compliance with Section 103D-310(c)(1) and (2), HRS.
Contractors are required to provide a state and federal tax clearance as a prerequisite to entering into a public contract of $2,500 or more. To meet this requirement, all bidders shall submit valid tax clearances with their bid proposals when the bid is $2,500 or more.

In accordance with Act 190 Amendment to HRS 103D-310(c), required as a prerequisite to entering into a contract, the contractor shall register on the Hawaii Compliance Express web site for all tax clearances by going to http://vendors.ehawaii.gov and registering there.

A Certificate of Vendor Compliance generated from this website shall be included with their bid proposal. A Compliant status is required prior to awarding the contract.

Failure to submit the required tax clearance will be sufficient grounds for the State to refuse to receive or consider the prospective bidder's proposal.

The Certificate of Vendor Compliance should be applied for as soon as possible. If a valid certificate is not submitted on a timely basis for award of a contract, an offer otherwise responsive and responsible may not receive the award.

Final Payment Requirements. A current Certificate of Vendor Compliance will be required for final payment.

SPECIAL PROVISIONS for Act 68, SLH 2010, as amended by Act 192, SLH 2011, CONSTRUCTION CONTRACTS

Definitions for terms used in HRS Chapter 103B as amended by Act 192, SLH 2011:

a. "Contract" means contracts for construction under 103D, HRS.

b. "Contractor" has the same meaning as in section 103D-104, HRS, provided that "contractor" includes a Subcontractor where applicable.

c. "Construction" has the same meaning as in section 103D-104, HRS.

d. "Procurement Officer" has the same meaning as in section 103D-104, HRS.

e. "Procurement Officer" has the same meaning as in Section 103D-104, HRS.

f. "Resident" means a person who is physically present in the State of Hawaii at the time the person claims to have established the person's domicile in the State of Hawaii and shows the person's intent is to make Hawaii the person's primary residence.

g. "Shortage trade" means a construction trade in which there is a shortage of Hawaii residents qualified to work in the trade as determined by the Department of Labor and Industrial Relations.

EMPLOYMENT OF STATE RESIDENTS REQUIREMENTS – HRS Chapter 103B as amended by Act 192, SLH 2011:

a. A Contractor awarded a contract shall ensure that Hawai' i residents comprise not less than 80% of the workforce employed to perform the contract work on the project. The 80 % requirement shall be determined by dividing the total number of hours worked on the contract by Hawai'i residents, by the total number of hours worked on the contract by all employees of the Contractor in the performance of the contract. The hours worked by any Subcontractor of the

Contractor shall count towards the calculation for this section. The hours worked by employees within shortage trades, as determined by the Department of Labor and Industrial Relations (DLIR), shall not be included in the calculation for this section.

b. Prior to award of a contract, an Offeror/Bidder may withdraw an offer/bid without penalty if the Offeror/Bidder finds that it is unable to comply with HRS Chapter 103B as amended by Act 192, SLH 2011.

c. Prior to starting any construction work, the Contractor shall submit the subcontract dollar amount for each of its Subcontractors.

d. The requirements of this section shall apply to any subcontract of $50,000 or more in connection with the Contractor, that is, such Subcontractors must also ensure that Hawaii residents compose not less than 80% of the Subcontractor’s workforce used to perform the subcontract.

e. The Contractor and any Subcontractor whose subcontract is $50,000 or more shall comply with the requirements of HRS Chapter 103B as amended by Act 192, SLH 2011.

1. Certification of compliance shall be made in writing under oath by an officer of the General Contractor and applicable Subcontractors and submitted with the final payment request.

2. The certification of compliance shall be made under oath by an officer of the company by completing a "Certification of Compliance for Employment of State Residents" form and executing the Certificate before a licensed notary public.

3. In addition to the certification of compliance as indicated above, the Contractor and Subcontractors shall maintain records such as certified payrolls for laborers and mechanics who performed work at the site and time sheets for all other employees who performed work on the project. These records shall include the names, addresses and number of hours worked on the project by all employees of the Contractor and Subcontractor who performed work on the project to validate compliance with HRS Chapter 103B as amended by Act 192, SLH 2011. The Contractor and Subcontractors shall retain these records and provide access to the State for a minimum period of four (4) years after the final payment, except that if any litigation, claim, negotiation, investigation, audit or other action involving the records has been started before the expiration of the four-year period, the Contractor and Subcontractors shall retain the records until completion of the action and resolution of all issues that arise from it, ot until the end of the four-year period, whichever occurs later. Furthermore, it shall be the Contractor's responsibility to enforce compliance with this provision by any Subcontractor.

f. A General Contractor or applicable Subcontractor who fails to comply with this

·section shall be subject to any of the following sanctions:

1. With respect to the General Contractor, withholding of payment on the contract until the Contractor or its Subcontractor complies with HRS Chapter 103B as amended by Act 192, SLH 2011.

2. Proceedings for debarment or suspension of the Contractor or Subcontractor under Hawai'i Revised Statues §103D-702.

Conflict with Federal Law:

This section shall not apply if the application of this section is in conflict with any federal law, or if the application of this section will disqualify the State from receiving Federal funds or aid.

Davis-Bacon Act:

Davis-Bacon Act prevailing wage rates apply to all State of Hawaii Construction contracts over $2,000.00.

PN15H00033 BUILDING 46 MEDCOM RENOVATIONS, STATE OF HAWAII, DEPARTMENT OF DEFENSE, HAWAII ARMY NATIONAL GUARD, JOB NO. CA-202505-C

Adjutant General
State Department of Defense
3949 Diamond Head Road
Honolulu, Hawaii 96816-4495

Dear Sir:

The undersigned has carefully read and understands the terms and conditions specified in the Specifications, and all documents attached hereto, and hereby submits the following offer to perform the work specified herein, all in accordance with the true intent and meaning thereof. The undersigned further understands and agrees that by submitting this offer, 1) he/she is declaring his/her offer is not in violation of Chapter 84, Hawaii Revised Statutes, concerning prohibited State contracts, and 2) he/she is certifying that the price(s) submitted was (were) independently arrived at without collusion.

The undersigned represents: **(Check √ one only)**

☐ A **Hawaii business** incorporated or organized under the laws of the State of Hawaii; **OR**

☐ A **Compliant Non-Hawaii business** not incorporated or organized under the laws of the State of Hawaii. Business shall be registered prior to award at the State of Hawaii Department of Commerce and Consumer Affairs Business Registration Division to do business in the State of Hawaii. State of incorporation: _____

Offeror is:

☐ Sole Proprietor ☐ Partnership ☐ Corporation ☐ Joint Venture

☐ Other _____

Federal I.D. No.: _____

Hawaii General Excise Tax License I.D. No.: _____

Payment address (other than street address below): _____

City, State, Zip Code: _____

Business address (street address): _____

City, State, Zip Code: _____

Respectfully submitted:

(x) _____
Authorized (Original) Signature (*1)

Date: _____

_____
Name and Title (Please Type or Print)

Telephone No.: _____

*_____
Exact Legal Name of Company (Offeror) (*2)

Fax No.: _____

(*2) If Offeror is a "dba" or a "division" of a corporation, furnish the exact legal name of the corporation under which the awarded contract will be executed:

E-mail Address: _____

(*1)
Original signature in ink. If unsigned or the affixed signature is a facsimile or a photocopy, the offer shall be automatically rejected unless accompanied by other material, containing an original signature, indicating the Offeror's intent to be bound.

The undersigned has carefully examined the attached plans and specifications and hereby proposes to furnish at his own expense all labor, materials, tools and equipment necessary to construct all work as shown and called for, in strict accordance with the specifications, schedules and drawings pertaining thereto, all for the LUMP SUM of:

TOTAL LUMP SUM PRICE:

_____ DOLLARS ($_____).

BASE BID: (AIR CONDITIONING SYSTEM IN ENTIRETY; PLUMBING SYSTEM IN ENTIRETY; ELECTRICAL INFRASTRUCTURE; AND ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL WORK WITHIN AREAS INDICATED ON DRAWINGS)

_____ DOLLARS ($_____).

ADDITIVE ALTERNATE 1: (1ST FLOOR ARCHITECTURAL DEMO AND NEW, UNLESS OTHERWISE INCLUDED IN BASE BID)

_____ DOLLARS ($_____).

ADDITIVE ALTERNATE 2: (2ND FLOOR ARCHITECTURAL DEMO AND NEW, UNLESS OTHERWISE INCLUDED IN BASE BID)

_____ DOLLARS ($_____).

ADDITIVE ALTERNATE 3: (3RD FLOOR ARCHITECTURAL DEMO AND NEW, UNLESS OTHERWISE INCLUDED IN BASE BID)

_____ DOLLARS ($_____).

ADDITIVE ALTERNATE 4: (DEMO OF EXIST LIGHTING, INSTALLATION OF LED LIGHTS)

_____ DOLLARS ($_____).

ADDITIVE ALTERNATE 5: (ELECTRICAL BRANCH CIRCUITING, UNLESS OTHERWISE INCLUDED IN BASE BID OR OTHER ADDITIVE ALTERNATES)

_____ DOLLARS ($_____).

ADDITIVE ALTERNATE 6: (TELECOMMUNICATIONS)

_____ DOLLARS ($_____).

ADDITIVE ALTERNATE 7: (ROOF REPLACEMENT)

_____ DOLLARS ($_____).

ADDITIVE ALTERNATE 8: (ELEVATOR REPLACEMENT)

_____ DOLLARS ($_____).

(Including the cost of delivery, unloading, freight charges, all applicable taxes, and other cost involved) and will fully complete all the work under this contract within 365 consecutive calendar days from the date of commencement specified by the written order of the Adjutant General including the date of said order.

NOTE:

1. Davis-Bacon Act prevailing wage rate or State wage rates apply to this contract.

2. A Site Visit/Pre-bid meeting will be held on August 20, 2026 at 11:00am. The address of the site is Building 46, 91-1152 Enterprise Ave., Kapolei, HI 96707. Contractors are to meet Mr. Cory Machida at the entrance to the guard shack at the corner of Shangri-La St. and Enterprise St. prior to 11:00am. Please email Mr. Machida at cory.h.machida@hawaii.gov or call at 808-754-6795 before 11:00am on August 19, 2026 to register for the site visit. If no answer, please leave your company information, attendees names and a contact number, you may assume that you are registered for the site visit. All interested bidders and sub-contractors are welcome, but not required to attend.

   All requests for substitution, clarification of bidding documents, specifications and/or questions must be received via email to jesper.h.andersen@hawaii.gov with the subject line "CA-202505 Questions" via email, prior to Sunday, August 26, 2026, 2:00 pm.

3. The State reserves the right to determine the extent of the contract by selecting and/or omitting bid items (not necessarily in sequence) to the extent required to come within the funds available for the project. The award of the contract shall be made to the responsible bidder whose total bid is the lowest.

4. **CAMPAIGN CONTRIBUTIONS BY STATE AND COUNTY CONTRACTORS PROHIBITED**. If awarded a contract in response to this solicitation, offeror agrees to comply with HRS §11-355, which states that campaign contributions are prohibited from a State and County government contractor during the term of the contract if the contractor is paid with funds appropriated by the legislative body between the execution of the contract through the completion of the contract.

5. The Surety shall not be held liable beyond two (2) years of the project acceptance date.

HAWAII PRODUCTS PREFERENCE

In accordance with ACT 174, SLH 2022, effective June 27, 2022, Hawaii Products Preference shall not apply to solicitations for public works construction. Therefore, the Hawaii Products Preference shall not apply to this project.

APPRENTICESHIP AGREEMENT PREFERENCE

The estimated value of the public works contract is $250,000 or more and the apprenticeship agreement preference pursuant to Hawaii Revised Statutes §103-55.6 (Act 17, SLH 2009) **shall apply**.

1. If applicable to this project, any bidder seeking the preference must be a party to an apprenticeship agreement registered with the State Department of Labor and Industrial Relations (DLIR) at the time the bid is submitted for each apprenticeable trade the bidder will employ to construct the project. "Employ" means the employment of a person in an employer-employee relationship.

    a. The apprenticeship agreement shall be registered with the DLIR and conform to the requirements of Hawaii Revised Statutes Chapter 372.

    b. Subcontractors do not have to be a party to an apprenticeship agreement for the bidder to obtain the preference.

    c. The bidder is not required to have apprentices in its employ at the time the bid is submitted to qualify for the preference.

2. A bidder seeking the preference must state the apprenticeable trade the bidder will employ for each trade to be employed to perform the work by submitting a completed **signed original** *Certification of Bidder's Participation – Form 1* verifying participation in an apprenticeship program registered with the DLIR. "Apprenticeable trade" shall have the same meaning as "apprenticeable occupation" pursuant to Hawaii Administrative Rules (HAR) §12-30-5.

    a. The *Certification of Bidder's Participation – Form 1 s*hall be authorized by an apprenticeship sponsor listed on the DLIR list of registered apprenticeship programs. "Sponsor" means an operator of an apprenticeship program and in whose name the program is approved and registered with the DLIR pursuant to HAR §12-30-1.

    b. The authorization shall be an original signature by an authorized official of the apprenticeship sponsor.

    c. The completed *Certification of Bidder's Participation – Form 1* for each trade must be submitted with the bid. A facsimile or copy is acceptable to be submitted with the bid, however the signed original must be submitted within five (5) working days of the bid open date. If the signed original is not received within this timeframe, the preference may be denied. Previous certifications shall not apply.

    d. When filling out the *Certification of Bidder's Participation – Form 1*, the name of Apprenticeable Trade and Apprenticeship Sponsor must be the same as recorded in the List of Construction Trades in Registered Apprenticeship Programs that is

posted on the State Department of Labor and Industrial Relations website. "Registered apprenticeship program" means a construction trade program approved by and registered with the DLIR pursuant to HAR § 12-30-1 and §12-30-4.

e. The *Certification of Bidder's Participation – Form 1* and the List of Construction Trades in Registered Apprenticeship Programs is available on the DLIR website at: http://hawaii.gov/labor/wdd

3. Upon receiving the *Certification of Bidder's participation – Form 1,* the Procurement Officer will verify that the apprenticeship program is on the List of Construction Trades in Registered Apprenticeship Programs and that the form is signed by an authorized official of the Apprenticeship Program Sponsor. If the programs and signature are not confirmed by the DLIR, the bidder will not qualify for the preference.

4. If the bidder is certified to participate in an apprenticeship program for each trade which will be employed by the bidder for the project, a preference will be applied to decrease the bidder's bid amount by five (5) percent for evaluation purposes.

5. Should the bidder qualify for other preferences (for example, Hawaii Products), all applicable preference shall be applied to the bid price.

6. If the winning bidder has submitted Form 1 with his bid packet, the Form 2 will be required the first week of each month for the prior month beginning with the month of the start of work.

CHARACTER OF WORKERS OR EQUIPMENT

The Contractor shall perform with his own organization, work amounting to not less than twenty percent (20%) of the total contract cost. The Engineer may require the Contractor to verify the percentage of work he will be providing with his own organization by furnishing pertinent information such as all of the actual subcontractor(s)' quotations he received for the bid. If requested, the Contractor shall provide such verification within 5 working days of the request.

CERTIFICATION FOR SAFETY AND HEALTH PROGRAM FOR BIDS IN EXCESS OF $100,000

In accordance with HRS 396-18, by submitting this proposal, the undersigned certifies that his company will have a written safety and health plan for this project that will be available and implemented by the Notice to Proceed date of this project. Details of the requirements of this plan may be obtained from the Department of Labor and Industrial Relations, Occupational Safety and Health Division (HIOSH).

TAX CLEARANCES FROM THE STATE DIRECTOR OF TAXATION AND INTERNAL REVENUE SERVICE

Contractors are required to provide a state and federal tax clearance as a prerequisite to entering into a public contract of $2,500 or more. To meet this requirement, all bidders shall submit valid tax clearances with their bid proposals when the bid is $2,500 or more.

Failure to submit the required tax clearance may be sufficient grounds for the State to refuse to receive or consider the prospective bidder's proposal.

In accordance with Act 190 Amendment to HRS 103D-310(c), required as a prerequisite to entering into a contract, the contractor shall register on the Hawaii Compliance Express web site for all tax clearances by going to http://vendors.ehawaii.gov and registering there.

A Certificate of Vendor Compliance generated from this website should be included with their bid proposal. A Compliant status is required prior to awarding the contract.

LICENSE

Due to the nature of the work contemplated, bidder must possess a valid State of Hawaii Contractor's license in the appropriate classification.

1. The Adjutant General or his designated representative reserves the right to reject any and/or all bids and waive any defects when, in his opinion, such rejection or waiver will be in the best interest of the State.

2. The award of the contract shall be conditioned upon funds being made available for these projects and further upon the right of the Adjutant General or his designated representative to hold all bids received for a period of ninety (90) days from the date of the opening thereof, unless otherwise required by law, during which time no bid may be withdrawn.

3. The liquidated damages per working day for failure to complete the work on time shall be at $270.00 per working day or as stipulated in the General Conditions, whichever is higher.

4. By submitting this proposal, the undersigned is declaring his firm has not been assisted or represented on this matter by an individual who has, in a State capacity, been involved in the subject matter of this contract in the past two years.

5. Upon the acceptance of the proposal by the Adjutant General or his designated representative, the undersigned must enter into and execute a contract for the same and furnish a bond, as required by law. This bond shall conform to the provisions of Section 103D-324 of the Hawaii Revised Statutes and any law applicable thereto.

6. If the lowest bid received by the State exceeds the funds available for this project, the State reserves the right to negotiate with the lowest responsible bidder as permitted under Section 103D-302, Hawaii Revised Statutes, as amended, to reduce the scope of work and award a contract therefore.

7. This contract may be awarded as an informal contract as determined by the Adjutant General or his designated representative in accordance with the applicable Hawaii Revised Statutes as amended, whereby a purchase order will be executed and used as the formal contract.

Receipt of the following addenda issued by the Department is acknowledged by the day(s) of the receipt indicated below:

Addendum No. 1 _____ Addendum No. 2 _____
Date
Addendum No. 3 _____ Addendum No. 4 _____

It is understood that failure to receive any such addendum shall not relieve the Contractor from any obligation under this Proposal as submitted. (See Special Notice to Bidders for information regarding addenda.)

ALL JOINT CONTRACTORS & SUBCONTRACTORS TO ENGAGE ON THIS PROJECT

The bidder certifies that the following is a complete listing of all joint contractors or subcontractors covered under Chapter 444, Hawaii Revised Statutes, who will be engaged by the bidder on this project to perform the nature and scope of work indicated pursuant to Section 103D-302, Hawaii Revised Statutes, and understands that failure to comply with this requirement shall be just cause for rejection of the bid.

The bidder further certifies that only those joint contractors or subcontractors listed shall be allowed to perform work on this project and that all other work necessary shall be performed by the bidder with his own employees. If no joint contractor or subcontractor is listed, it shall be construed that all of the work shall be performed by the bidder with his own employees.

All bidders must be sure that they possess and that the subcontractors listed in the proposal possess all the necessary specialty licenses needed to perform the work for this project. The bidder shall be solely responsible for assuring that all of the specialty licenses required to perform the work is covered in his bid.

The bidder shall include the license number of the joint contractors or subcontractors listed below. Failure to provide the correct names and license numbers as registered with the Contractor's Licensing Board may cause rejection of the bid submitted.

Complete Firm Name of Joint Contractor or Subcontractor for Lump Sum Bid	License Number	Nature and Scope of Work to be performed

Enclosed herewith as required by law (Check Applicable Only):

- ☐ Surety Bond
- ☐ Certificate of Deposit
- ☐ Certified Check
- ☐ Cashier's Check
- ☐ Share Certificate
- ☐ Legal Tender

_____

_____ DOLLARS ($ _____).

_____
*Signature

Title _____

_____
Name of Company

_____
Address

_____

_____

Telephone _____

Date _____

HAWAII GENERAL EXCISE TAX

I.D. NO. _____

LICENSE CLASSIFICATION AND/OR SUBCLASSIFICATION NO.

_____

(CORPORATE SEAL)

*Please attach to this page evidence of the authority of this officer to submit bids on behalf of the Company, and also the names and residence addresses of all officers of the Company.

NOTE: Fill in all blank spaces with the information asked for or bid may be invalidated. PROPOSAL PAGES MUST BE INTACT; MISSING PAGES MAY INVALIDATE YOUR BID.

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Request for Substitution
Name of Corporation
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ARTICLE 1 - Definitions

Whenever the following terms or pronouns are used in these Bidding and Execution of Contract Requirements, and General Conditions, or in any contract documents or instruments where these Bidding and Execution of Contract Requirements, and General Conditions govern, the intent and meaning shall be interpreted as follows

1.1_ ADDENDUM (plural - Addenda) A written or graphic document, including Drawings and Specifications, issued by the Engineer during the bidding period which modify or interpret the bidding documents, by additions, deletions, clarifications or corrections which shall be considered and made a part of the bid proposal and the contract when executed.

1.2_ ADDITION (to the contract sum) Amount added to the contract Sum by Change Order.

1.3_ ADMINISTRATIVE RULES - Hawaii Administrative Rules for Chapter 103-D of the Hawaii Revised Statutes.

1.4_ ADMINISTRATOR - The Public Works Administrator, Department of Accounting and General Services

1.5_ ADVERTISEMENT - A public announcement soliciting bids or offers.

1.6_ AMENDMENT - A written document properly executed by the Contractor and DOD issued to amend the existing contract between the State and the Contractor.

1.7_ BAD WEATHER DAY - When weather or other conditions prevent a minimum of four hours of work with the Contractor's normal work force on controlling items of work at the site.

1.8_ BENEFICIAL OCCUPANCY - The point of project completion when the State can use the constructed facility in whole or in part for its intended purpose even though substantial completion may not be achieved.

1.9_ BID See OFFER

1.10_ BID SECURITY - The security furnished by the bidder from which the State may recover its damages in the event the bidder breaches its promise to enter into a contract with the State and fails to execute the required bonds covering the work contemplated, if its proposal is accepted.

1.11_ BIDDER - See Offeror

1.12_ BIDDING DOCUMENTS (or SOLICITATION DOCUMENTS) - The advertisement solicitation notice and instructions, Offer requirements, Offer forms, and the proposed contract documents including all addenda, and clarifications issued prior to receipt of the Offer.

1.13_ BULLETIN - A written notice to the Contractor requesting a price and / or time proposal for contemplated changes preparatory to the issuance of a field order or change order.

1.14_ BY OR TO THE ENGINEER - To avoid cumbersome and confusing repetition of expressions in these General Conditions, it is provided that whenever the following words or words of like import are used, they shall be understood as if they were followed by the words "by the Engineer" or "to the Engineer", unless the context clearly indicates another meaning: contemplated, required, determined, directed, specified, authorized, ordered, given, designated, indicated, considered necessary, deemed necessary, permitted, reserved, suspended, established, approval, approved, disapproved, acceptable, unacceptable, suitable, accepted, satisfactory, unsatisfactory, sufficient, insufficient, rejected or condemned.

1.15_ CALENDAR DAY - Any day shown on the calendar beginning at midnight and ending at midnight the following day. If no designation of calendar or working day is made, "day" shall mean calendar day.

1.16_ CHANGE ORDER - A written order signed by the Engineer that establishes the full payment and final settlement of all claims for direct, indirect and consequential costs, including costs of delays, and establishes any adjustments to contract time related to the work covered and affected by one or more field orders, or for change work done or agreed to be done without issuance of a separate field order. A change order signed by all the parties to the contract constitutes a supplemental agreement.

1.17_ COMPLETION - See SUBSTANTIAL COMPLETION and FINAL COMPLETION.

1.18_ COMPTROLLER - The Comptroller of the State of Hawaii, Department of Accounting and General Services.

1.19_ CONSULTANT - A person, firm or corporation having a contract with the State to furnish services with respect to the project

1.20_ CONTRACT - The written agreement between the Contractor and the State of Hawaii by its Adjutant General, by which the Contractor is bound to furnish all labor, equipment, and materials and to perform the specified work within the contract time stipulated, and by which the State of Hawaii is obligated to compensate the Contractor therefore at the prices set forth therein. The contract shall include the Contract Documents and also any and all amendments and change orders which are required to complete the construction in an acceptable manner.

1.21_ CONTRACT COMPLETION DATE - The calendar day on which all work on the project, required by the contract, must be completed. See CONTRACT TIME and FINAL COMPLETION.

1.22_ CONTRACT DOCUMENTS - The Contract, Addenda (which pertain to the Contract Documents, Contractor's Proposal (including Wage Schedule, List of Subcontractors and other documentation accompanying the Bid and any post bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Contract, the Notice to Proceed, the Bonds, these GENERAL CONDITIONS, the SPECIAL CONDITIONS, the Specifications and the Drawings as the same are more specifically identified in the Contract together with all written Amendments, Change Orders, Field Orders, a written order for minor changes in the work and Engineer's written interpretations and clarifications issued on or after the effective date of the Contract.

1.23_ CONTRACT PRICE - The amount designated on the face of the contract for the performance of work including allowances for extra if any.

1.24_ CONTRACT TIME (or CONTRACT DURATION) - The number of calendar (or working) days provided for completion of the contract, inclusive of authorized time extensions. The number of days shall begin running on the effective date in the Notice to Proceed. If in lieu of providing a number of calendar (or working) days, the contract requires completion by a certain date, the work shall be completed by that date.

1.25_ CONTRACTOR - Any individual, partnership, firm, corporation, joint venture, or other legal entity undertaking the execution of the work under the terms of the contract with the State of Hawaii, and acting directly or through its agents, or employees.

1.26_ DEPARTMENT - The Department of Defense, State of Hawaii (abbreviated DOD).

1.27_ DRAWINGS (or Plans) - The contract drawings in graphic or pictorial form, which show the design, location, character, dimensions and details of the Work to be done and which shall be a part of the Contract Documents.

1.28_ ENGINEER - The Department of Defense Engineer, or the authorized person to act in the Engineer's behalf.

1.29_ EQUAL OR APPROVED EQUAL - Whenever this term is used in the drawings or specifications, it shall be interpreted to mean a brand or article, prequalified in accordance with Section 6.3 SUBSTITUTION OF MATERIALS AND EQUIPMENT, that may be used in place of the one specified.

1.30_ FIELD ORDER - A written order issued by the Engineer or the Engineer's authorized representative to the Contractor requiring the contract work to be performed in accordance with a change or changes in the work. A field order may (1) establish a price adjustment and/or time adjustment in an amount the Engineer believes is reasonable for the change; or (2) may declare that the Engineer does not intend to adjust contract time or price for the work; or (3) may request the Contractor to submit a proposal for an adjustment to the contract time and/or price by a certain date.

1.31_ FINAL COMPLETION - The date set by the Engineer that all work required by the contract and any amendments or changes thereto is in full compliance with the contract.

1.32_ FORCE ACCOUNT - Term used when Work is ordered to be done without prior agreements as to lump sum or unit price cost thereof and is to be billed for at cost of labor, materials and

equipment, insurances, taxes, etc., plus an agreed percentage for overhead and profit.

1.33_ GUARANTEE - Legally enforceable assurance of the duration of satisfactory performance of quality of a product or Work

1.34_ GOODS - Materials. §103D-104

1.35_ HAZARDOUS MATERIALS - Any and all radioactive materials, asbestos, polychlorinated biphenyls, petroleum, crude oil, chemicals known to cause cancer or reproductive toxicity, pollutants, contaminants, toxic substances or materials cited in Hazardous Material Laws. Abandoned motor vehicles or parts thereof are not hazardous material.

1.36_ HOLIDAYS - The days of each year which are set apart and established as State holidays pursuant to Chapter 8, Hawaii Revised Statutes.

1.37_ INSPECTOR - The person assigned by the Engineer to make detailed inspections of contract performance and materials supplied for the work.

1.38_ LAWS - All Federal, State, City and County Laws, ordinances, rules and regulations, and standard specifications including any amendments thereto effective as of the date of the call for sealed bids.

1.39_ PERFORMANCE LIQUIDATED DAMAGES The amount prescribed in the General Conditions, Section 7.26 FAILURE TO COMPLETE THE WORK ON TIME to be paid to the State or to be deducted from any payments due or to become due the Contractor for each working day or calendar day (as applicable) delay in completing the whole or any specified portion of the work beyond the Contract Time.

1.40_ LETTER OF AWARD - A written notice from the Engineer to the successful bidder(s) stating that its proposal has been accepted by the State.

1.41_ MAJOR UNIT PRICE ITEM - A unit price item which, when extended on its estimated quantities in the proposal form, exceeds five percent (5%) of the total base bid proposal less any allowance and contingent items included in the proposal.

1.42_ NON-CONFORMING WORK - Work that does not fulfill the requirements of the Contract Documents.

1.43_ NOTICE TO CONTRACTORS – See Solicitation.

1.44_ NOTICE TO PROCEED - A written notice from the Contracting Officer to the Contractor advising it of the date on which it is to begin the prosecution of the Work, which date shall also be the beginning of Contract Time.

1.45_ POST CONTRACT DRAWINGS - Drawings issued after the award of the contract for the purpose of clarification and / or changes to the work indicated in the original drawings and which may be made a part of the contract.

1.46_ PROJECT ACCEPTANCE DATE - The calendar day on which the Engineer accepts the project as sufficiently completed in compliance with the contract so that the State can occupy or utilize the Work for its intended use. See SUBSTANTIAL COMPLETION.

1.47_ PROJECT CONTRACT LIMITS (or Contract Zone) - The portion of the site as delineated on the drawings which define the Contractor's primary area of operation for the prosecution of the work. It does not define the exact limits of all construction that may be required under the contract.

1.48_ PROJECT GUARANTEE - A guarantee issued by the Contractor to the State. See GUARANTEE.

1.49_ PROPOSAL (Bid) – See Offer (or Bid).

1.50_ PROPOSAL FORM – See Offer Form (or Bid Form).

1.51_ PUNCH LIST - A list compiled by the Engineer (or Contractor) stating work yet to be completed or corrected by the Contractor in order to substantially complete or finally complete the contract requirements.

1.52_ QUESTIONNAIRE - The specified forms on which the bidder shall furnish required information as to its ability to perform and finance the work.

1.53_ SHOP DRAWINGS - All drawings, diagrams illustrations, schedules and other data or information which are specifically prepared or

assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

1.54_ SPECIAL CONDITIONS - Supplements or modifies the standard clauses of the GENERAL CONDITIONS setting forth conditions or requirements peculiar to the individual project under consideration, which are not thoroughly or satisfactorily covered, described or explained in these GENERAL CONDITIONS.

1.55_ SPECIFICATIONS - That portion of the Contract Documents consisting of written descriptions for materials, equipment, construction systems, standards, workmanship, directions, provisions and requirements that pertain to the method and manner of performing the work and certain administrative requirements applicable thereto.

1.56_ STATE - The State of Hawaii acting through its authorized representative.

1.57_ SUBCONTRACT - Any written agreement between the Contractor and its subcontractors which contains the conditions under which the subcontractor is to perform a portion of the work for the Contractor.

1.58_ SUBCONTRACTOR - An individual, partnership, firm, corporation, joint venture or other legal entity, as covered in Chapter 444, Hawaii Revised Statutes, which enters into an agreement with the Contractor to perform a portion of the work for the Contractor.

1.59_ SUBSTANTIAL COMPLETION - The status of the project when the Contractor has completed all the work and 1) all utilities and services are connected and working, 2) all equipment is in acceptable working condition, 3) additional activity by the Contractor to correct punch list items as described herein will not prevent or disrupt use of the work or the facility in which the work is located, and 4) the building, structure, improvement or facility can be used for its intended purpose.

1.60_ SUPERINTENDENT - The employee of the Contractor who is charged with the responsibility of all the Work.

1.61_ SURETY - The qualified individual, firm or corporation other than the Contractor, which executes a bond with and for the Contractor to insure its acceptable performance of the contract.

1.62_ UNUSUALLY SEVERE WEATHER Uncommonly harsh weather including but not limited to hurricanes, tornados, tropical storms and tropical depressions, or as otherwise defined in the SPECIAL CONDITIONS.

1.63_ WORK - The furnishing of all labor, materials, equipment, and other incidentals necessary or convenient for the successful completion of the project and the execution of all the duties and obligations imposed by the contract.

1.64_ WORKING DAY - A calendar day, exclusive of Saturdays, Sundays and State-recognized legal holidays for the month in question.

1.65_ OFFER (or Bid) – The executed document submitted by an Offeror in response to a solicitation request, to perform the work required by the proposed contract documents, for the price quoted and within the time allotted.

1.66_ OFFEROR (or BIDDER) – Any individual, partnership, firm, corporation, joint venture or other legal entity submitting directly or through a duly authorized representative or agent, an Offer for the work or construction contemplated.

1.67_ OFFER FORM (or BID FORM) – The form prepared by the Department on which the Offeror submits the written offer or bid. By submitting an offer or bid, the Offeror adopt the language on the form as its own.

1.68_ PROJECT START DATE – The date established in the Notice to Proceed when the Contractor shall begin prosecution of the work and the start of contract time.

1.69_ SOLICITATION – An Invitation to Bid or Request for Proposals or any other document issued by the Department to solicit bids or offers to perform a contract. The solicitation may indicate the time and place to receive the bids or offers and the location, nature and character of the work, construction or materials to be provided.

ABBREVIATIONS

HAR Hawaii Administrative Rules

HRS Hawaii Revised Statutes

VECP Value Engineering cost Proposal

DOTAX State Department of Taxation

IRS Internal Revenue Service

BIDDING AND EXECUTION OF CONTRACT REQUIREMENTS

ARTICLE 2 - Proposal Requirements and Conditions

2.1 QUALIFICATION OF BIDDERS Prospective bidders must be capable of performing the work for which bids are invited, and must be capable of entering into a public contract of $25,000 or more.

2.1.1 Notice of Intention to Bid

2.1.1.1 In accordance with Section 103D-310, Hawaii Revised Statutes, and Section 3-122-111, Hawaii Administrative Rules, a written notice of intention to bid need not be filed for construction of any public building or public work. A written notice of intention to bid need not be filed for mere furnishing and installing of furniture, equipment, appliances, material and any combination of these items when a Contractor's license is not required under Chapter 444 of the Hawaii Revised Statutes, as amended, and the rules and regulations of the Contractor's License Board.

2.1.1.2 If two (2) or more prospective bidders desire to bid jointly as a joint venture on a single project, they must file an affidavit of joint venture. Such affidavit of joint venture will be valid only for the specific project for which it is filed. No further license is required when all parties to the joint venture possess current and appropriate contractor's licenses. Joint ventures are required to be licensed in accordance with Chapter 444 of the Hawaii Revised Statutes, as amended, and the rules and regulations of the Contractor's License Board when any party to the joint venture agreement does not hold a current or appropriate contractor's license. The joint venture must register with the office of the Director of Commerce and Consumer Affairs in accordance with Chapter 425 of the Hawaii Revised Statutes, as amended.

2.1.1.3 No persons, firm or corporation may bid where (1) the person, firm, or corporation, or (2) a corporation owned substantially by the person, firm, or corporation, or (3) a substantial stockholder or an officer of the corporation, or (4) a partner or substantial investor in the firm is in arrears in any payment owed to the State of Hawaii or any of its political subdivisions or is in default of any obligation to the State of Hawaii or to all or to any of its political subdivisions, including default as a surety or failure to perform faithfully and diligently any previous contract with the Department.

2.1.1.4 The Engineer may, in accordance with Section 103D-310 Hawaii Revised Statutes, require the prospective Bidder to submit answers to questions contained in the STANDARD QUALIFICATION QUESTIONNAIRE FOR PROSPECTIVE BIDDERS ON PUBLIC WORKS CONTRACTS, on the form provided by the Department, properly executed and notarized, setting forth a complete statement of the experience of such prospective Bidder and its organization in performing similar work and a statement of the equipment proposed to be used, together with adequate proof of the availability of such equipment, at least two (2) working days prior to the time advertised for the opening of bids. If the information in the questionnaire proves satisfactory, the Bidder's proposal will be received. All information contained in the answers to the questionnaire shall be kept confidential. The questionnaire will be returned to the Bidder after it has served its purpose.

2.1.1.5 If upon review of the Questionnaire, or otherwise, the Bidder appears not fully qualified or able to perform the intended work, the Engineer shall, after affording the Bidder an opportunity to be heard and if still of the opinion that the Bidder is not fully qualified to perform the work, refuse to receive or to consider any bid offered by the prospective Bidder.

2.1.1.6 Failure to complete and submit the prequalification questionnaire by the designated deadline will be sufficient cause for the Department to disqualify a prospective Bidder.

2.1.2 Compliance Certificate § 103D -310(c) HRS)

2.1.2.1 Contractors are required to provide proof of compliance in order to receive a contract of $25,000 or more. To meet this requirement, Offerors may apply and register at the "Hawaii Compliance Express" website: http://vendors.ehawaii.gov/hce/splash/welcome/html

2.1.2.2 Tax clearances may be obtained by completing the Tax Clearance Application (Form A-6) and submitting it to the Hawaii State Department of Taxation (DOTAX) or the Internal Revenue Service (IRS). The application may be obtained from the DOTAX, or the IRS. The application may be mailed in or walked in to either the DOTAX or the IRS. Both tax agencies encourage the use of their mail-in process, which should

be completed within twenty-one (21) calendar days. Tax clearance certificates will be issued to the applicant upon determination that the applicant has filed all tax returns due, and has paid all amounts owing on such returns, including penalty and interest.

2.1.2.3 Only original tax clearance certificates or certified copies will be accepted for this purpose. Failure to submit the required tax clearance certificates may be sufficient grounds for the Department to refuse to receive or consider the prospective bidder's proposal.

2.1.2.4 Tax clearance certificates are valid for six (6) months. The six-month period will begin with the later approval date stamped on the tax clearance. An original copy of a tax clearance that bears an original green certified copy stamp will be accepted by the Department for final payment. The period of validity is two months.

2.1.2.5 The tax clearances submitted with the bid proposals must be valid on the solicitation's first legal advertisement date or any date thereafter up to the bid opening date. Valid tax clearances submitted with the proposal will remain valid for the contract award and encumbrance.

2.1.2.6 Any person, firm or corporation that is not presently doing business in the State of Hawaii and submits a Notice of Intention to Bid must submit along with said Notice of Intention to Bid a certified letter stating that said person, firm or corporation is not doing business in the State of Hawaii and is not in default of any obligations due to the State or any of its political subdivisions.

2.1.2.7 If a business cannot obtain a tax clearance certificate because of tax delinquencies, it may submit a "special letter" from DOTAX and/or the IRS. The "special letter" may only be obtained if (1) the business has an existing installment agreement with the tax agency, or (2) the delinquency is the subject of an administrative or judicial appeal. The bidder is cautioned that the "special letter" from the IRS must be certified by DOTAX. All conditions applied to tax clearance certificates for this purpose are applicable to these "special letters". Instructions to obtain the "special letter" are available from each respective tax agency.

2.1.2.8 Various combinations of tax clearance certificates and "special letters" are acceptable for this purpose as follows: Tax clearance certificate signed by both tax agencies;

(a) Individual tax clearance certificates from each tax agency, respectively;

(b) Tax clearance certificate from one tax agency and a "special letter" from the other tax agency;

(c) "Special letters" from both tax agencies.

2.1.3 Wrongful Refusal to Accept a Bid - In the event the Engineer, for any reason, wrongfully refuses to accept what would otherwise be a responsive and responsible lowest bid, the exclusive remedy for such lowest bidder shall be the recovery of the reasonable actual costs of preparing the bid. No other bidder shall have any claim for damages. Refer to 2.13 PROTEST.

2.2 INTERPRETATION OF QUANTITIES IN BID SCHEDULE

2.2.1 When quantities for individual items of work are listed in the proposal form for which respective unit prices are asked, said quantities are estimated or approximate and are to be used by the Department only for the purpose of comparing on a uniform basis bids offered for the work. The Department does not, expressly or by implication, agree that the actual quantity of work will correspond therewith.

2.2.2 After determining the low bidder by comparison of bids submitted in accordance with the proposal form and Section 3.1 CONSIDERATION OF PROPOSALS; CANCELLATION in these specifications, the quantities of unit price items of work may increase or decrease.

2.2.3 On unit price bids, payment will be made only for the actual number of units incorporated into the finished project at the unit price bid, subject to Section 4.7 VARIATIONS IN ESTIMATED QUANTITIES.

2.3 CONTENTS OF PROPOSAL FORMS

2.3.1 Prospective bidders will be furnished with proposal forms giving the location, description, and the contract time of the work contemplated for which a lump sum bid price is asked or containing a schedule of items, together with estimated quantities of work to be performed and materials to be furnished, for which unit bid prices and/or lump sum bid prices are asked.

2.3.2 All papers bound with or attached to the proposal form shall be considered a part thereof and shall not be detached or altered when the proposal is submitted.

2.3.3 The drawings, specifications and other documents designated in the proposal form, will also be considered a part thereof whether attached or not.

2.3.4 By submitting a bid on the proposal form, a bidder accepts the language therein as its own.

2.4 THE SITE AND PROPOSED CONTRACT DOCUMENTS

2.4.1 The Bidder shall examine carefully the Project Site contemplated and the proposal, drawings, specifications, supplemental specifications, SPECIAL CONDITIONS, and any documents or items referenced therein and contract and bond forms therefore. The submission of a bid shall be considered as a warranty that the Bidder has made such examination and is informed of the conditions to be encountered in performing the Work and of the requirements of the drawings, specifications, supplemental specifications, SPECIAL CONDITIONS and any documents and items referenced therein, and contract and bonds.

2.5 ADDENDA AND BID CLARIFICATIONS

2.5.1 The terms and requirements of the bid documents (i.e. drawings, specifications and other bid and contract documents) cannot be changed prior to the bid opening except by a duly issued addenda or bid clarification.

2.5.2 The Department may alter, increase or decrease the scope of the work or the contract time, provisions and conditions by issuing a written addendum which sets forth such alterations, increase or decrease.

2.5.3 Bid Discrepancy - If a bidder discovers what it considers to be a discrepancy, ambiguity, omission or doubt as to the meaning of drawings, specifications and any other bid or contract documents, the bidder shall request in writing no later than 14 days before the bids are opened.

2.5.4 Addenda to the bid documents will be provided to all prospective bidders at the respective offices furnished for such purposes. Each addendum shall be an addition to the Contract Documents.

2.5.5 Upon providing an addenda, all bidders shall be deemed to be on notice of the information therein whether or not the addendum or bid clarification is actually received. All addenda and bid clarifications so issued shall become part of the Contract Documents.

2.5.6 No claim for additional compensation and/or time for performance will be allowed if the Contractor discovered, or in the exercise of reasonable care, should have discovered a discrepancy, ambiguity, omission or doubt for which an interpretation was not requested.

2.6 SUBSTITUTION OF MATERIALS AND EQUIPMENT BEFORE BID OPENING

2.6.1 Brand names of materials or equipment are specified or shown on the drawings to indicate a quality, style, appearance or performance and not to limit competition. The Bidder shall base its bid on one of the specified brand names unless alternate brands are qualified as equal or better in an addendum. Qualifications of such proposed alternate brands shall be submitted in writing and addressed to the Engineer. The face of the envelope containing the request must be clearly marked “SUBSTITUTION REQUEST”. The request may be hand carried to the Department of Defense, State of Hawaii, 3949 Diamond Head Road, Honolulu, HI 96816-4495, or mailed. In either case, the written request must be received no later than the time and date specified in the NOTICE TO BIDDERS. The written request will be time stamped by the Department. For the purpose of this section, the time designated by the time stamping device in the Engineering Office shall be official. If the written request is hand carried, the bearer is responsible to ensure that the request is time stamped by the Engineering Office.

2.6.2 Submit three (3) sets of the written request, technical brochures, and a statement of variances. Refer to the Appendix for the Sample “Request for Substitution.”

2.6.3 Statement of Variances - The statement of variances must list all features of the proposed substitution which differ from the drawings, specifications and / or product(s) specified and must further certify that the substitution has no other variant features. The brochure and information submitted shall be clearly marked showing make, model, size, options, etc., and must include sufficient evidence to evaluate each feature listed as a variance. A request will be denied if submitted without sufficient evidence. If after installing the substituted product, an unlisted variance is discovered, Contractor shall immediately replace the product with a specified product all at no cost to the State

2.6.4 Substitution Denial - Any substitution request not complying with the above requirements will be denied. Substitution requests sent to other agencies and received by the Engineering Office after the deadline above will be denied.

2.6.5 An addendum shall be issued to inform all prospective bidders of any accepted substitution in accordance with Section 2.5 ADDENDA AND BID CLARIFICATIONS.

2.6.6 For substitutions of materials and equipment after issuance of the Letter of Award, refer to Section 6.3 SUBSTITUTION OF MATERIALS AND EQUIPMENT AFTER BID OPENING.

2.7 PREPARATION OF PROPOSAL

2.7.1 The Bidder's proposal must be submitted on the proposal form furnished by the Department. The proposal must be prepared in full accordance with the instructions thereon. The Bidder must state, both in words and numerals, the lump sum price or total sum bid at which the work contemplated is proposed to be done. These prices must be written in ink or typed. In case of a discrepancy between the prices written in words and those written in figures, the words shall govern over the figures. The Bidder shall sign the proposal in the spaces provided with ink. By submitting a bid, the Bidder adopts the language of the proposal as its own.

2.7.2 If the proposal is made by an individual, the person's name and post office address must be shown in the space provided. If made by a partnership the name and post office address of each member of the partnership must be shown and the proposal signed by all partners or evidence in the form of a partnership agreement must be submitted showing the authority of the partner to enter, on behalf of said partnership, into contract with the State. If made by a corporation the proposal must show the name, titles, and business address of the president, secretary and treasurer and also evidence in the form of a corporate resolution must be submitted showing the authority of the particular corporate representative to enter on behalf of said corporation into contract with the State. If made by a joint venture the name and post office address of each member of the individual firm, partnership or corporation comprising the joint-venture must be shown with other pertinent information required of individuals, partnerships or corporations as the case may be. The proposal must be signed by all parties to the joint-venture or evidence in the form of a Joint-Venture Agreement must be submitted showing the authority of the joint-venture's representative to enter on behalf of said joint-venture into contract with the State.

2.7.3 Pursuant to the requirements of Section 103D-302, HRS, each Bidder shall include in its bid the name of each person or firm to be engaged by the Bidder on the project as joint contractor or subcontractor indicating also the nature and scope of work to be performed by such
joint contractor and/or subcontractor and their respective contractor's license number. If the Bidder fails to list a joint contractor or subcontractor, the State may accept the bid if it is in the State's best interest and the value of the work to be performed by the joint contractor or subcontractor is equal to or less than one percent of the total bid amount. The Bidder shall be solely responsible for verifying that their joint contractor or subcontractor has the proper license at the time of the submitted bid.

2.8 BID SECURITY §3-122-223(d) HAR

2.8.1 Subject to the exceptions in Section 3-122-223(d) HAR, all lump sum bids of $25,000 and higher, or lump sum base bids including alternates of $25,000 and higher, that are not accompanied by bid security are non-responsive. Bid security shall be one of the following: §3-122-222(a) HAR

2.8.1.1 Surety bid bond underwritten by a company licensed to issue bonds in this State which shall be substantially in the form of the Surety Bid Bond form in the Appendix; or

2.8.1.2 Legal Tender; or

2.8.1.3 Certificate of Deposit; Credit Union share certificate; or cashier's, treasurer's, teller's or official check drawn by, or a certified check accepted by, and payable on demand to the State by a bank, a savings institution, or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration.

(a) These instruments may be utilized only to a maximum of $100,000.

(b) If the required security or bond amount totals over $100,000, more than one instrument not exceeding $100,000 each and issued by different financial institutions shall be accepted.

(c) **CAUTION** - Bidders are cautioned that certificates of deposit or share certificates with an early withdrawal penalty must have a face value sufficient to cover the maximum penalty amount in addition to the proposal guaranty requirement. If the certificate is made out to two names, the certificate must be assigned unconditionally to the Department of Defense.

2.8.2 Unless otherwise stated, the bid security shall be in an amount equal to at least five percent (5%) of the lump sum bid or lump sum base bid including alternates or in an amount required by the terms of the federal funding, where applicable.

2.8.3 If the Bidder is a corporation, evidence in the form of a corporate resolution, authorizing the corporate representative to execute the bond must be submitted with the proposal. (See sample in Appendix.) If the Bidder is a partnership, all partners must sign the bond

or evidence in the form of a partnership agreement must be submitted showing the authority of the partner.

2.8.4 If the Bidder is a joint -venture, all parties to the joint venture must sign the bond; provided, that one party to the joint-venture may sign on behalf of the joint-venture if evidence in the form of a joint-venture agreement or power of attorney, is submitted showing the authority of the signatory to sign the bond on behalf of the joint-venture.

2.8.5 In the case where the award will be made on a group or item basis, the amount of bid security shall be based on the total bid for all groups or items submitted.

2.8.6 Bidders are cautioned that surety bid bonds which place a limit in value to the difference between the bid amount and the next acceptable bid, such value not to exceed the purported amount of the bond, are not acceptable. Also, surety bid bonds which place a time limit on the right of the State to make claim other than allowed by statutes or these GENERAL CONDITIONS are not acceptable. Bidders are hereby notified that a surety bid bond containing such limitation(s) is not acceptable and a bid accompanied by such surety bid bond will be automatically rejected.

2.9 DELIVERY OF PROPOSALS - The entire proposal shall be placed together with the bid security, in a sealed envelope so marked as to indicate the identity of the project, the project number, the date of bid opening and the name and address of the bidder and then delivered as indicated in the Notice to Contractors. Bids which do not comply with this requirement may not be considered. Proposals will be received up to the time fixed in the public notice for opening of bids and must be in the hands of the official by the time indicated. The words "SEALED BID" must be clearly written or typed on the face of the sealed envelope containing the proposal and bid security.

2.10 WITHDRAWAL OR REVISION OF PROPOSAL - may be modified prior to the deadline to submit the offers by any of the following documents.

2.10.1 Withdrawal of Proposals:

2.10.1.1 A signed, written notice received in the office designated in the solicitation; or

2.10.1.2 A written notice faxed to the office designated in the solicitation; or

2.10.1.3 A telegraphic message received by telephone by the office designated in the solicitation from the receiving telegraph company office, provided the telegraph company confirms the telephone message by sending a written copy of the telegram showing that the message was received at such office prior to the time and date set for the opening.

2.10.2 Modification of Proposals:

2.10.2.1 A written notice received in the office designated in the solicitation, stating that a modification to the offer is submitted; and

2.10.2.2 The actual modification sealed securely in a separate envelope or container, accompanying the written notice.

2.11 PUBLIC OPENING OF PROPOSALS - Proposals will be opened and read publicly at the time and place indicated in the Notice to Contractors. Bidders, their authorized agents and other interested parties are invited to be present.

2.12 DISQUALIFICATION OF BIDDERS - Any one or more of the following causes will be considered as sufficient for the disqualification of a Bidder and the rejection of its proposal or proposals:

2.12.1 Non-compliance with Section 2.1 QUALIFICATION OF BIDDERS.

2.12.2 Evidence of collusion among bidders.

2.12.3 Lack of responsibility and cooperation as shown by past work such as failing to complete all of the requirements to close the project within a reasonable time or engaging in a pattern of unreasonable or frivolous claims for extra compensation.

2.12.4 Being in arrears on existing contracts with the State of Hawaii, or having defaulted on a previous contract with the State of Hawaii.

2.12.5 Lack of proper equipment and/or sufficient experience to perform the work contemplated, as revealed by the Standard Questionnaire and Financial Statement for Bidders.

2.12.6 No contractor's license or a contractor's license which does not cover type of work contemplated.

2.12.7 More than one proposal for the same work from an individual, firm, partnership, corporation or joint venture under the same or different name.

2.12.8 Delivery of bids after the deadline specified in the advertisement calling for bids.

2.12.9 Failure to pay, or satisfactorily settle, all bills overdue for labor and materials of former contracts in force at the time of issuance of proposal forms.

2.12.10 Debarment or suspension pursuant to the provisions of Chapters 103D, 104 and 444, Hawaii Revised Statutes, as amended.

2.13 PROTEST

2.13.1 Protests shall be adjudicated in accordance with §103D-701, HRS and as amended.

2.13.2 No Protest based upon the contents of the solicitation shall be considered unless it is submitted in writing to the Engineer, prior to the date set for the receipt of proposals.

2.13.3 A protest of an award or proposed award pursuant to §103D-302 or §103D-303, HRS, shall be submitted in writing to the Engineer within five (5) working days after the posting of the award of the Contract.

2.13.4 In addition to any other relief, when a protest is sustained and the protestor should have been awarded the contract under the solicitation but is not, then the protestor shall be entitled to the actual costs reasonably incurred in connection with the solicitation, including bid or proposal preparation costs but not attorney's fees.

ARTICLE 3 - Award and Execution of Contract

3.1 CONSIDERATION OF PROPOSALS; CANCELLATION - After the proposals are opened and read, the figures will be extended and/or totaled in accordance with the bid prices of the acceptable proposals and the totals will be compared and the results of such comparison shall be made public. In the event of a tie bid, the low bidder shall be determined by lot. In the comparison of bids, words written in the proposals will govern over figures and unit prices will govern over totals. Until the award of the contract, the Department may cancel the solicitation, reject any and all proposals in whole or part and may waive any defects or technicalities whenever such action is deemed to be in the best interest of the State.

3.2 IRREGULAR PROPOSALS - Proposals will be considered irregular and may be rejected for the following reasons:

3.2.1 If the proposal is unsigned.

3.2.2 If bid security is not in accordance with Section 2.8 BID SECURITY.

3.2.3 If proposal is on a form other than that furnished by the Department; or if the form is altered or any part thereof detached.

3.2.4 If the proposal shows any non-compliance with applicable law, alteration of form, additions not called, conditional bids, incomplete bids, non initialed erasures, other defects, or if the prices are obviously unbalanced.

3.2.5 If the Bidder adds any provisions reserving the right to accept or reject an award.

3.2.6 If the Bidder adds any provisions reserving the right to enter into a contract pursuant to an award.

3.2.7 When a proposal is signed by an officer or officers of a corporation and a currently certified corporate resolution authorizing such signer(s) to submit such proposal is not submitted with the proposal or when the proposal is signed by an agent other than the officer or officers of a corporation or a member of a partnership and a power of attorney is not submitted with the proposal.

3.2.8 Where there is an incomplete or ambiguous listing of joint contractors and/or subcontractors the proposal may be rejected. All work which is not listed as being performed by joint contractors and/or subcontractors must be performed by the bidder with its own employees. Additions to the list of joint contractors or subcontractors will not be allowed. Whenever there is a doubt as to the completeness of the list, the Bidder will be required to submit within five (5) working days, a written confirmation that the work in question will be performed with its own work force. Whenever there is more than one joint contractor and/or subcontractor listed for the same item of work, the Bidder will be required to either confirm in writing within five (5) working days that all joint contractors or subcontractors listed will actually be engaged on the project or obtain within five (5) working days written releases from those joint contractors and/or subcontractors who will not be engaged.

3.2.9 If in the opinion of the Engineer, the Bidder and its listed subcontractors do not have the contractor's licenses or combination of contractor's licenses necessary to complete all of the work.

3.3 CORRECTION OF BIDS AND WITHDRAWAL OF BIDS §3-122-31 HAR

3.3.1 Corrections to bids after bid openings but prior to award may be made under the following conditions:

3.3.1.1 If the mistake is attributable to an arithmetical error, the Engineer shall so correct the mistake. In case of error in extension of bid price, the unit price shall govern.

3.3.1.2 If the mistake is a minor informality which shall not affect price, quantity, quality, delivery, or contractual conditions, the Bidder shall request correction by submitting proof of evidentiary value which demonstrates that a mistake was made. The Engineer shall prepare a written approval or denial in response to this request. Examples of such mistakes include:

(a) Typographical errors;

(b) Transposition errors;

(c) Failure of a Bidder to sign the bid, but only if the unsigned bid is accompanied by other material indicating the Bidder's intent to be bound.

3.3.1.3 For reasons not allowable under paragraphs 3.3.1.1 and 3.3.1.2 when the Engineer determines that the correction or waiver of an obvious mistake is in the best interest of the Department or is warranted for the fair treatment of other bidders.

3.3.2 Withdrawal of bids after bid opening but prior to award may be made when the bid contains a mistake attributable to an obvious error which affects price, quantity, quality, delivery, or contractual conditions, and the bidder requests withdrawal by submitting proof of evidentiary value which demonstrates that a mistake was made. The Contracting Officer shall prepare a written approval or denial in response to this request.

3.3.3 Correction or withdrawal of bids after award is not permissible except in response to a written withdrawal or correction request by the Contractor, and the Engineer makes a written determination that the Department's procurement practices and policies would not be materially affected by such correction or withdrawal.

3.4 AWARD OF CONTRACT

3.4.1 The award of contract, if it be awarded, will be made within ninety (90) consecutive calendar days after the opening of the proposals to the lowest responsible and responsive Bidder (including the alternate or alternates which may be selected by the Engineer in the case of alternate bids) whose proposal complies with all the requirements prescribed, but in no case will an award be made until all necessary investigations are made. The successful Bidder will be notified, by letter mailed to the address shown on the proposal, that its bid has been accepted and that it has been awarded the contract.

3.4.2 If the contract is not awarded within the ninety (90) days noted in paragraph 3.4.1 above, the Department may request the successful Bidder to extend the time for the acceptance of its bid. The Bidder may reject such a request without penalty; and in such case, the Department may at its sole discretion make a similar offer to the next lowest responsive and responsible bidder and so on until a bid is duly accepted or until the Department elects to stop making such requests.

3.4.3 No contract will be awarded to any person or firm suspended or debarred under the provisions of Chapters 103D, 104 and Chapter 444, Hawaii Revised Statutes as amended.

3.4.4 The contract will be drawn on the forms furnished by the Comptroller. The contract will not be binding upon the Department until all required signatures have been affixed thereto and written certification that funds are available for the work has been made.

3.5 CANCELLATION OF AWARD - The Department reserves the right to cancel the award of any contract at any time before the execution of said contract by all parties. The exclusive remedy to the awardee for such cancellation shall be payment of the reasonable bid preparation costs and the reimbursement of any direct expenses incurred as directed in the Notice of Award. Such cancellation will not incur any liability by the Department to any other Bidder.

3.6 RETURN OF BID SECURITY - All bid securities, except those of the four (4) lowest Bidders, will be returned following the opening and checking of the proposals. The retained bid securities of the four lowest Bidders will be returned within five (5) working days following the complete execution of the contract.

3.7 REQUIREMENT OF PERFORMANCE AND PAYMENT BONDS

3.7.1 Performance and Payment Bonds shall be required for contracts $25,000 and higher. At the time of the execution of the contract, the successful Bidder shall file good and sufficient performance and payment bonds on the form furnished by the Department (see Appendix), each in an amount equal to one hundred percent (100%) of the amount of the contract price unless otherwise stated in the solicitation of bids. Acceptable performance and payment bonds shall be limited to the following:

3.7.1.2 Surety bonds underwritten by a company licensed to issue bonds in this State; or

3.7.1.3 A certificate of deposit; credit union share certificate; or cashier's, treasurer's, teller's or official check drawn by, or a certified check accepted by, and payable on demand to the State by a bank, a savings institution, or credit union insured by the Federal Deposit

Insurance Corporation or the National Credit Union Administration.

(a) These instruments may be utilized only a maximum of $100,000.

(b) If the required security or bond amount totals over $100,000, more than one instrument not exceeding $100,000 each and issued by different financial institutions shall be acceptable.

3.7.2 If the Contractor fails to deliver the required performance and payment bonds, the contractor's award shall be canceled, the Department shall have the remedies provided under Section 3.9 FAILURE TO EXECUTE THE CONTRACT and award of the contract shall be made to the next lowest responsible and responsive bidder.

3.8 CAMPAIGN CONTRIBUTIONS BY STATE AND COUNTY CONTRACTORS

Contractors are hereby notified of the applicability of Section 11-205.5, HRS, which states that campaign contributions are prohibited from specified State or County government contractors during the term of the contract if the contractors are paid with funds appropriated by a legislative body.

3.9 EXECUTION OF THE CONTRACT

3.9.1 Upon acceptance of the successful bidder's offer by the Contracting Officer, the Contractor shall provide satisfactory performance and payments bonds within ten (10) calendar days after the award of the contract or within such further time as granted by the Contracting Officer. No proposal or contract shall be considered binding upon the State until the contract has been fully and properly executed by all parties thereto and the Comptroller has endorsed thereon its certificate, as required by Section 103D-309, HRS, that there is an available unexpended appropriation or balance of an appropriation over and above all outstanding contracts sufficient to cover the State's amount required by such contract.

3.9.2 On any individual award totaling less than $25,000, the State reserves the right to execute the contract by the issuance of a State Purchase Order. Issuance of a State Purchase Order shall result in a binding contract between the parties without further action by the State. The issuance of a Purchase Order shall not be deemed a waiver of these General Conditions and Contract Document requirements.

3.10 FAILURE TO EXECUTE THE CONTRACT

3.10.1 Before the Award - If a low Bidder without legal justification withdraws its bid after the opening of bids but before the award of the contract, the State shall be entitled to retain as liquidated damages the amount established as bid security, and may take all appropriate actions to recover the performance liquidated damages sum from the property or third-party obligations deposited as bid security.

3.10.2 After the Award - If the Bidder to whom a contract is awarded shall fail or neglect to furnish security within ten (10) calendar days after such award or within such further time as the Contracting Officer may allow, the State shall be entitled to recover from such Bidder its actual damages, including but not limited to the difference between the bid and the next lowest responsive bid, as well as personnel and administrative costs, consulting and legal fees and other expenses incurred in arranging a contract with the next low responsive bidder or calling for new bids. The State may apply all or part of the amount of the bid security to reduce its damages. If upon determination by the State of the amount of its damages the bid security exceeds that amount, it shall release or return the excess to the person who provided same.

3.10.3 Engineer's Options - Upon a withdrawal of the lowest responsive bid, or upon a refusal or failure of the lowest Bidder to execute the contract, the Engineer may thereupon award the contract to the next lowest responsible and responsive Bidder or may call for new bids, whichever method the Engineer may deem to be in the best interests of the State.

3.11 NOTICE TO PROCEED

3.11.1 After the contract is fully executed and signed by the Department of Defense, the Contractor will be sent a formal Notice to Proceed letter advising the Contractor of the date on which it may proceed with the work. The Contractor shall be allowed ten (10) consecutive working days from said date to begin its work. In the event that the Contractor refuses or neglects to start the work, the Engineer may terminate the contract in accordance with Section 7.27 TERMINATION OF CONTRACT FOR CAUSE.

3.11.2 The Contractor may commence its operations strictly at its own risk prior to receipt of the formal notice to proceed, provided it makes a written request and has received approval from the Engineer in writing. All work performed shall be conducted in accordance with Section 7.1 PROSECUTION OF THE WORK.

3.11.3 In certain cases, the State, with agreement of the Contractor, may issue a Notice to Proceed before full execution of the contract by the Engineer and it may

further issue a Notice to Proceed concurrently with the Notice of Award.

3.11.4 In the event the Notice to Proceed is not issued within one hundred and eighty (180) days after the date of the award of contract the Contractor may submit a claim for increased labor and material costs (but not overhead costs) which are directly attributable to the delay beyond the first 180 days. Such claims shall be accompanied with the necessary documentation to justify the claim. No payment will be made for escalation costs that are not fully justified.

GENERAL CONDITIONS
ARTICLE 4 - Scope of Work

4.1 INTENT OF CONTRACT, DUTY OF CONTRACTOR - The intent of the Contract is to provide for the construction, complete in every detail, of the Work described at the accepted bid price and within the time established by the contract. The Contractor has the duty to furnish all labor, materials, equipment, tools, transportation, incidentals and supplies and to determine the means, methods and schedules required to complete the work in accordance with the drawings, specifications and terms of the contract.

4.2 CHANGES - The Engineer may at any time, during the progress of the work, by written order, and without notice to the sureties, make changes in the work as may be found to be necessary or desirable. Such changes shall not invalidate the Contract nor release the Surety, and the Contractor will perform the work as changed, as though it had been a part of the original Contract.

4.2.1 Minor Changes - Minor changes in the work may be directed by the Engineer with no change in contract price or time of performance. Minor changes are consistent with the intent of the Contract Documents and do not substantially alter the type of work to be performed or involve any adjustment to the contract sum or extension of the contract time.

4.2.2 Oral Orders

4.2.2.1 Any oral order, direction, instruction, interpretation or determination from the Engineer or any other person which in the opinion of the Contractor causes any change, shall be considered as a change only if the Contractor gives the Engineer written notice of its intent to treat such oral order, direction, instruction, interpretation or determination as a change directive. Such written notice must be delivered to the Engineer before the Contractor acts in conformity with the oral order, direction, instruction, interpretation or determination, but not more than five (5) days after delivery of the oral order to the Contractor. The written notice shall state the date, circumstances, whether a time extension will be requested, and source of the order that the Contractor regards as a change. Such written notice may not be waived and shall be a condition precedent to the filing of any claim by the Contractor. Unless the Contractor acts in accordance with this procedure, any such oral order shall not be treated as a change for which the Contractor may make a claim for an increase in the contract time or contract price related to such work.

4.2.2.2 No more than five (5) days after receipt of the written notice from the Contractor, a Field Order shall be issued for the subject work if the State agrees that it constitutes a change. If no Field Order is issued in the time established, it shall be deemed a rejection of Contractor's claim for a change. If the Contractor objects to the failure to issue a Field Order, it shall file a written protest with the Engineer within thirty (30) days after delivery to the Engineer of the Contractor's written notice of its intention to treat the oral order as a change. In all cases, the Contractor shall proceed with the work. The protest shall be determined as provided in Section 7.25 DISPUTES AND CLAIMS.

4.2.3 Field Orders – Upon receipt of a Field Order, the Contractor shall proceed with the changes as ordered. If the Contractor does not agree with any of the terms or conditions or in the adjustment or non-adjustment to the contract time and / or contract price, Contractor shall file a notice of intent to claim within thirty (30) calendar days after receipt of the written Field Order that was not agreed upon by both parties. Failure to file such protest within the time specified shall constitute agreement on the part of the Contractor with the terms, conditions, amounts and adjustment or non-adjustment to contract price and / or contract time set forth in the Field Order. The requirement for timely written notice shall be a condition precedent to the assertion of a claim.

4.2.4 Change Orders

4.2.4.1 The Department will issue sequentially numbered Change Orders at times it deems appropriate during the contract period. A Change Order may contain the adjustment in contract price and / or time for a number of Field Orders. The Change Order will be issued in the format attached (refer to the Appendix). No payment for any change will be made until the change order is issued.

4.2.4.2 The penal sum of the Surety Performance and Payment Bonds will be adjusted by the amount of each and every Change Order.

4.2.4.3 Upon receipt of a change order, that the Contractor does not agree with any of the terms or conditions or the adjustments or non adjustments of the

contract price or contract time; the Contractor shall not execute or sign the change order, but shall return the unsigned change order, along with a written notification of the conditions or items that are in dispute.

4.2.4.4 If the Contractor signs or executes the change order, this constitutes an agreement on the part of the Contractor with the terms and conditions of the change order. A change order that is mutually agreed to and signed by the parties of the contract constitutes a contract modification.

4.2.5 Claim Notification – The Contractor shall file a notice of intent to claim for a disputed change order within 30 calendar days after receipt of the written order. Failure to file the protest within the time specified constitutes an agreement on the part of the Contractor within the terms, conditions, amounts and adjustment or non-adjustment to contract price or contract time set forth in the dispute change order. The requirement for timely written notice shall be a condition precedent to the assertion of a claim.

4.2.6 Proceeding with Directed Work – Upon receipt of a contract modification, change order, or field order, the Contractor shall proceed with the directed changes and instructions. The Contractor's right to make a claim for additional compensation or an extension of time for completion is not affected by proceeding with the changes and instructions described in a change order and field order.

4.2.7 Pricing or Negotiating Costs Not Allowed – The Contractor's cost of responding to requests for price or time adjustments is included in the contract price. No additional compensation will be allowed unless authorized by the Contracting Officer.

4.3 DUTY OF CONTRACTOR TO PROVIDE PROPOSAL FOR CHANGES

4.3.1 A Field Order may request the Contractor to supply the Department with a proposal for an adjustment to the contract time or contract price for the work described therein. Any such request for a proposal shall not affect the duty of the Contractor to proceed as ordered with the work described in the Field Order.

4.3.2 The Engineer from time to time may issue a Bulletin to the Contractor requesting price and / or time adjustment proposals for contemplated changes in the work. A Bulletin is not a directive for the Contractor to perform the work described therein.

4.3.3 Within fifteen (15) days after receipt of a Bulletin or Field Order containing a request for proposal, the Contractor shall submit to the Engineer a detailed written statement in a format similar to the one shown in the Appendix to these General Conditions setting forth all charges the Contractor proposes for the change and the proposed adjustment of the contract time, all properly itemized and supported by sufficient substantiating data to permit evaluation. No time extension will be granted for delays caused by late Contractor pricing of changes or proposed changes. If the project is delayed because Contractor failed to submit the cost proposal within the fifteen (15) days, or as allowed by the Engineer, performance liquidated damages will be assessed in accordance with Section 7.26 FAILURE TO COMPLETE THE WORK ON TIME.

4.3.4 No payment shall be allowed to the Contractor for pricing or negotiating proposed or actual changes.

4.4 PRICE ADJUSTMENT HRS 103D-501

4.4.1 A fully executed change order or other document permitting billing for the adjustment in price under any method listed in paragraphs (4.4.1.1) through (4.4.1.5) shall be issued within ten days after agreement on the price adjustment. Any adjustment in the contract price pursuant to a change or claim in this contract shall be made in one or more of the following ways:

4.4.1.1 By agreement on a fixed price adjustment before commencement of the pertinent performance;

4.4.1.2 By unit prices specified in the contract or subsequently agreed upon before commencement of the pertinent performance;

4.4.1.3 Whenever there is a variation in quantity for any work covered by any line item in the schedule of costs submitted as required by Section 7.2 COMMENCEMENT REQUIREMENTS, by the Department at its discretion, adjusting the lump sum price proportionately;

4.4.1.4 Force Account Method. At the sole option of the Contracting Officer, by the costs attributable to the event or situation covered by the change, plus appropriate profit or fee, all as specified in Section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT and the force account provision of Section 8.3 PAYMENT FOR ADDITIONAL WORK before commencement of the pertinent performance;

4.4.1.5 In such other manner as the parties may mutually agree upon before commencement of the pertinent performance; or

4.4.1.6 In the absence of an agreement between the two parties:

4.4.1.6.a For change orders with value not exceeding $50,000 by documented actual costs of the work, allowing for overhead and profit as set forth in Section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT. A change order shall be issued within fifteen days of submission by the contractor of proper documentation of completed force account work, whether periodic (conforming to the applicable billing cycle) or final. The procurement officer shall return any documentation that is defective to the contractor within fifteen days after receipt, with a statement identifying the defect; or

4.4.1.6.b For change orders with value exceeding $50,000 by a unilateral determination by the Contracting Officer of the reasonable and necessary costs attributable to the event or situation covered by the change, plus appropriate profit or fee, all as computed by the Contracting Officer in accordance with applicable sections of Chapters 3-123 and 3-126 of the Hawaii Administrative Rules, and Section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT. When a unilateral determination has been made, a unilateral change order shall be issued within ten days. Upon receipt of the unilateral change order, if the contractor does not agree with any of the terms or conditions, or the adjustment of non-adjustment of the contract time or contract price, the contractor shall file a notice if intent to claim within thirty days after the receipt of the written unilateral change order. Failure to file a protest within the time specified shall constitute agreement on the part of the contractor with the terms, conditions, amounts, and adjustment or non-adjustment of the contract time or the contract price set forth in the unilateral change order.

4.4.1.7 In such other manner as the parties may mutually agree;

4.4.1.8 At the sole option of the Engineer, by the costs attributable to the event or situation covered by the change, plus appropriate profit or fee, all as specified in Section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT and the force account provision of Section 8.3 PAYMENT FOR ADDITIONAL WORK; or

4.4.1.9 In the absence of an agreement between the two parties, by a unilateral determination by the Engineer of the reasonable and necessary costs attributable to the event or situation covered by the change, plus appropriate profit or fee, all as computed by the Engineer in accordance with applicable sections of Chapters 3-123 and 3-126 of the Hawaii Administrative Rules and Regulations, and Section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT.

4.4.2 Cost or Pricing Data – Contractor shall provide and certify cost or pricing data for any price adjustment to a contract involving aggregate increases and decreases in costs plus applicable profits expected to exceed $100,000. The certified cost or pricing data shall be subject to the provisions of HAR chapter 3-122, subchapter 15.

4.5 ALLOWANCES FOR OVERHEAD AND PROFIT HRS103D-501

4.5.1 In determining the cost or credit to the Department resulting from a change, the allowances for all overhead, including, extended overhead resulting from adjustments to contract time (including home office, branch office and field overhead, and related delay impact costs) and profit combined, shall not exceed the percentages set forth below:

4.5.1.1 For the Contractor, for any work performed by its own labor forces, twenty percent (20%) of the direct cost;

4.5.1.2 For each subcontractor involved, for any work performed by its own forces, twenty percent (20%) of the direct cost;

4.5.1.3 For the Contractor or any subcontractor, for work performed by their subcontractors, ten percent (10%) of the amount due the performing subcontractor.

4.5.2 Not more than three markup allowance line item additions not exceeding the maximum percentage shown above will be allowed for profit and overhead, regardless of the number of tier subcontractors.

4.5.3 The allowance percentages will be applied to all credits and to the net increase of direct costs where work is added and deleted by the changes.

4.6 PAYMENT FOR DELETED MATERIAL

4.6.1 Cancelled Orders - If acceptable material was ordered by the Contractor for any item deleted by an ordered change in the work prior to the date of notification of such deletion by the Engineer, the Contractor shall use its best efforts to cancel the order. The Department shall pay reasonable cancellation charges required by the supplier excluding any markup for overhead and profit to the Contractor.

4.6.2 Returned Materials - If acceptable deleted material is in the possession of the Contractor or is ultimately received by the Contractor, if such material is returnable to the supplier and the Engineer so directs, the material shall be returned and the Contractor will be paid for the reasonable charges made by the supplier for the return of the material, excluding any markup for overhead and profit to the Contractor. The cost to the

Contractor for handling the returned material will be paid for as provided in Section 4.4 PRICE ADJUSTMENT.

4.6.3 Uncancelled Materials - If orders for acceptable deleted material cannot be canceled at a reasonable cost, it will be paid for at the actual cost to the Contractor including an appropriate markup for overhead and profit as set forth in Section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT. In such case, the material paid for shall become the property of the State and the cost of further storage and handling shall be paid for as provided in Section 4.4 PRICE ADJUSTMENT.

4.7 VARIATIONS IN ESTIMATED QUANTITIES §3-125-10 HAR

4.7.1 Where the quantity of a major unit price item in this contract is estimated on the proposal form and where the actual quantity of such pay item varies more than fifteen percent (15%) above or below the estimated quantity stated in this contract, an adjustment in the contract price shall be made upon demand of either party. The adjustment shall be based upon any increase or decrease in costs due solely to the variation above one hundred fifteen percent (115%) or below eighty-five percent (85%) of the estimated quantity. The adjustment shall be subject to Section 4.4 PRICE ADJUSTMENT and Section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT. If the quantity variation is such as to cause an increase in the time necessary for completion, the Engineer shall, upon receipt of a written request for an extension of time within thirty (30) days of the item's completion, ascertain the facts and make such adjustment to the completion date as the Engineer finds justified.

4.8 VARIATIONS IN BOTTOM ELEVATIONS The Contractor shall plan and construct to the bottom elevations of footings, piles, drilled shafts, or cofferdams as shown on the drawings. When the bottom of a pile, drilled shaft, or cofferdam is shown as an estimated or approximate elevation, the Contractor shall plan and construct to that elevation or to any deeper elevation required by the drawings or direction of the Engineer. In the event the bottom elevation is lowered, the Contractor shall be entitled to additional payment in accordance with Sections 4.4 PRICE ADJUSTMENT and 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT. In the event the bottom elevation is raised, the State shall be entitled to a credit in accordance with Sections 4.2 CHANGES, 4.4 PRICE ADJUSTMENT and 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT.

4.9 DIFFERING SITE CONDITIONS §3-125-11 HAR

4.9.1 During the progress of the work, if the Contractor encounters conditions at the site differing materially from those shown in the drawings and specifications, Contractor shall promptly, and before any such conditions are disturbed or damaged (except in an emergency as required by subsection 7.17.8), notify the Engineer in writing of:

4.9.1.1 Subsurface or latent physical conditions at the site differing materially from those indicated in the contract; or

4.9.1.2 Unknown physical conditions at the site, of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this contract.

4.9.2 After receipt of written notice, the Engineer shall promptly investigate the site, and if it is found that such conditions do materially differ and cause an increase in the Contractor's cost of, or the time required to, perform any part of the Work, whether or not changed as a result of such conditions, an adjustment shall be made and the contract modified accordingly. Any adjustment in contract price made pursuant to this Section 4.9 shall be determined in accordance with Sections 4.4 PRICE ADJUSTMENT and 7.25 DISPUTES AND CLAIMS.

4.9.3 Nothing contained in this Section 4.9 shall be grounds for an adjustment in compensation if the Contractor had actual knowledge or should have known of the existence of such conditions prior to the submission of bids.

4.10 UTILITIES AND SERVICES

4.10.1 The cost of all the following will be included in the contract price and the Contractor shall be fully responsible for:

4.10.1.1 Reviewing and checking all such information and data,

4.10.1.2 Locating all underground and overhead utilities shown or indicated in the contract documents,

4.10.1.3 Coordination of the Work with the Owners of such underground and overhead utilities during construction, and

4.10.1.4 The safety and protection of all such underground and overhead utilities as provided in Section7.17 PROTECTION OF PERSONS AND PROPERTY and repairing any damage thereto resulting from the work.

4.10.2 Unknown Utilities - During the progress of the work, if an underground utility is uncovered or revealed at or contiguous to the site which was not shown or indicated in the Contract Documents, or found at a location that is substantially different than shown or indicated in the Contract Documents, Contractor shall promptly, and before any such conditions are disturbed or damaged (except in an emergency as required by subsection 7.17.8), notify the Engineer. Contractor shall be responsible for the safety and protection of the underground utility as provided in Section7.17 PROTECTION OF PERSONS AND PROPERTY. Refer to subsections 4.9.2 and 4.9.3.

4.10.3 If the Engineer determines a change in the Contract Documents is required, a Field Order or Change Order will be issued. Upon issuance of a duly authorized Field Order or Change Order regarding the disposition of a newly discovered utility, Contractor shall be responsible for damages to the utility, including any damage claims due to the disruption of service caused by the utility being damaged.

4.10.4 Restoration of Damaged Utilities - The Contractor shall repair and restore to pre-damaged condition any utilities or any other property it damaged. The Contractor shall be liable for any resulting damages, to the Work or to the utility owner or property owner and shall pay any claim due to the disruption of service caused by the utilities being damaged. Contractor shall defend and save harmless the State from all suits, actions or claims of any character brought on account of such damages, whether or not the State may have been partially at fault. Contractor shall obtain public liability and property damage insurance pursuant to Article 7 PROSECUTION AND PROGRESS to cover such risk of damage.

4.10.5 In the event the Contractor, simultaneously with the discovery of an unknown utility or other property, damages that utility or other property, the Contractor shall immediately notify the Engineer. If the Contractor is without fault in such a situation, notwithstanding subsection 4.10.4, the Contractor shall not be liable for resulting damages or the defense of the State from claims brought on account of said damages to unknown utilities or other property. Upon instruction from the Engineer, the Contractor shall repair all damages and execute a plan for dealing with the damaged utility or other property. This repair work shall be considered additional work as covered in Section 4.2 CHANGES.

ARTICLE 5 - Control of Work

5.1 AUTHORITY OF THE ENGINEER

5.1.1 The Engineer shall make final and conclusive decisions on all questions which may arise relating to the quality and acceptability of the materials furnished and work performed, the manner of performance and rate of progress of the work, the interpretation of the Contract Documents, the acceptable fulfillment of the contract on the part of the Contractor, the compensation under the Contract and the mutual rights of the parties to the Contract.

5.1.2 The Engineer shall have the authority to enforce and make effective such decisions and orders at the Contractor's expense when the Contractor fails to carry such decisions and orders out promptly and diligently.

5.1.3 The Engineer shall have the authority to suspend the work wholly or in part as provided in Section 7.24 SUSPENSION OF WORK.

5.1.4 The Engineer may delegate specific authority to act for the Engineer to a specific person or persons. Such delegation of authority shall be established in writing to the Contractor.

5.2 AUTHORITY OF THE INSPECTOR

5.2.1 The Inspector shall observe and inspect the contract performance and materials. The Inspector does not have any authority vested in the Engineer unless specifically delegated in writing.

5.2.2 The Inspector may offer advice and recommendations to the Contractor, but any such advice or recommendations are not directives from the Engineer.

5.2.3 The Inspector has no authority to allow deviations from the Contract Documents and may reject any and all work that the Inspector deems is not in conformity with the contract requirements. Failure of an Inspector at any time to reject non-conforming work shall not be considered a waiver of the Department's right to require work in strict conformity with the Contract Documents as a condition of final acceptance.

5.3 AUTHORITY OF CONSULTANT(S) - The Department may engage Consultant(s) for limited or full observation to supplement the inspections performed by the State and respective Counties. Unless otherwise specified in writing to the Contractor, such retained Consultant(s) will have the authority of a Project Inspector.

5.4 SHOP DRAWINGS AND OTHER SUBMITTALS

5.4.1 The following documents shall be submitted where required by the contract documents:

5.4.1.1 Shop Drawings

(1) The Contractor shall prepare, and thoroughly check, approve, all shop drawings, including those prepared by subcontractors or any other persons. The Contractor shall indicate its approval by stamping and signing each drawing. Any shop drawing submitted without being reviewed, stamped and signed will be considered as not having been submitted, and any delay caused thereby shall be the Contractor's responsibility.

(2) Shop drawings shall indicate in detail all parts of an item of work, including erection and setting instructions and engagements with work of other trades or other separate contractors. Shop drawings for structural steel, millwork and pre-cast concrete shall consist of calculations, fabrication details, erection drawings and other working drawings, as necessary, to show the details, dimensions, sizes of members, anchor bolt plans, insert locations and other information necessary for the complete fabrication and erection of the structure to be constructed.

(3) All shop drawings as required by the contract, or as determined by the Engineer to be necessary to illustrate details of the Work shall be submitted to the Engineer with such promptness as to cause no delay in the work or in that of any other Contractor. Delay caused by the failure of the Contractor to submit shop drawings on a timely basis to allow for review, possible resubmittal and acceptance will not be considered as a justifiable reason for a contract time extension. Contractor, at its own risk, may proceed with the work affected by the shop drawings before receiving acceptance; however the Department shall not be liable for any costs or time required for the correction of work done without the benefit of accepted shop drawings.

(4) It is the Contractor's obligation and responsibility to check all of its and its subcontractor's shop drawings and be fully responsible for them and for coordination with connecting and other related work. The Contractor shall prepare, and submit to the Engineer coordination drawings showing the installation locations of all plumbing, piping, duct and electrical work including equipment throughout the project. By approving and submitting shop drawings, the Contractor thereby represents that it has determined and verified all field measurements and field construction criteria, or will do so, and that it has checked and coordinated each shop drawing with the requirements of the work and the contract documents. When shop drawings are prepared and processed before field measurements and field construction criteria can be or have been determined or verified, the Contractor shall make all necessary adjustments in the work or resubmit further shop drawings, all at no change in contract price or time.

5.4.1.2 Shop Drawing Form - Each drawing and/or series of drawings submitted must be accompanied by a letter of transmittal giving a list of the titles and number of the drawings. Each series shall be numbered consecutively for ready reference and each drawing shall be marked with the following information:

(1) Date of Submission
(2) Name of Project
(3) Project Number
(4) Location of Project
(5) Name of submitting Contractor and Subcontractor
(6) Revision Number

5.4.1.3 The size of the sheets that shop drawings are prepared on shall be as appropriate to suit the drawing being presented so that the information is clearly and legibly depicted. At the determination of the Engineer, for each sheet of drawings, the submittal shall consist of either; one reproducible transparency and five prints, or eight prints.

5.4.1.4 Descriptive Sheets and Other Submittals - When a submittal is required by the contract, the Contractor shall submit to the Engineer eight (8) complete sets of descriptive sheets such as shop drawings, brochures, catalogs, illustrations, calculation, material safety data sheets (MSDS), certificates, reports, warranty, etc., which will completely describe the material, product, equipment, furniture or appliances to be used in the project as shown in the drawings and specifications and how it will be integrated into adjoining construction. When submittals are specified to be submitted under Web Based Construction Management System, the number of complete sets will be as specified or as directed by the Engineer. Prior to the submittal, the Contractor shall review and check all submittal sheets for conformity to the contract requirements and indicate such conformity by marking or stamping and signing each sheet. Where descriptive sheets include materials, systems, options, accessories, etc. that do not apply to this contract, non-relevant items shall be crossed out so that all remaining information will be considered applicable to this contract. It is the responsibility of the Contractor to submit descriptive sheets for review and acceptance by the Engineer as required at the earliest possible date after the date of award in order to meet the construction schedule. Delays caused by the failure of the Contractor to submit descriptive sheets as required will not be considered as justifiable reasons for contract time extension.

5.4.1.5 Material Samples and Color Samples – When material and color sample submittals are required by the contract, the Contractor shall submit to the Engineer no less than three (3) samples conforming to Section 6.6 MATERIAL SAMPLES. One sample will be retained by the Consultant, one sample will be retained by the State, and the remaining sample(s) will be returned to the contractor. Prior to the material and color submittal, the Contractor shall review and check all samples for conformity to the contract requirements and indicate such conformity by marking or stamping and signing each sample. It is the responsibility of the Contractor to submit samples for review and acceptance by the Engineer as required at the earliest possible date after the date of award in order to meet the construction schedule. Delays caused by the failure of the Contractor to submit material and color samples as required will not be considered as justifiable reasons for contract time extension.

5.4.1.6 Unless the technical sections (Divisions 2 – 16) specifically require the Contractor furnish a greater quantity of shop drawings and other submittals, the Contractor shall furnish the quantities required by this section.

5.4.2 Submittal Variances - The Contractor shall include with the submittal, written notification clearly identifying all deviations or variances from the contract drawings, specifications and other Contract Documents. The notice shall be in a written form separate from the submittal. The variances shall also be clearly indicated on the shop drawing, descriptive sheet, material sample or color sample. Failure to so notify of and identify such variances shall be grounds for the subsequent rejection of the related work or materials, notwithstanding that the submittal was accepted by the Engineer. If the variances are not acceptable to the Engineer, the Contractor will be required to furnish the item as specified or indicated on the contract documents at no additional cost or time.

5.4.3 Review and Acceptance Process - Submittals will be returned to the Contractor within twenty one (21) days (for projects on Oahu) and twenty five (25) days (for projects on the islands of Hawaii, Maui, Kauai, Molokai and Lanai) after receipt by the Engineer unless otherwise agreed between the Contractor and the Engineer or as stated elsewhere in the contract documents.

5.4.3.1 The acceptance by the Engineer of the Contractor's submittal relates only to their sufficiency and compliance with the intention of the contract. Acceptance by the Engineer of the Contractor's submittal does not relieve the Contractor of any responsibility for accuracy of dimensions, details, and proper fit, and for agreement and conformity of submittal with the contract drawings and specifications. Nor will the Engineer's acceptance relieve the Contractor of responsibility for variance from the contract documents unless the Contractor, at the time of submittal, has provided notice and identification of such variances required by this section. Acceptance of a variance shall not justify a contract price or time adjustment unless the Contractor requests such an
adjustment at the time of submittal and the adjustment are explicitly agreed to in writing by the Engineer. Any such request shall include price details and proposed scheduling modifications. Acceptance of a variance is subject to all contract terms, stipulations and covenants, and is without prejudice to any and all rights under the surety bond.

5.4.3.2 If the Engineer returns a submittal to the Contractor that has been rejected, the Contractor, so as not to delay the work, shall promptly make a resubmittal conforming to the requirements of the contract documents and indicating in writing on the transmittal and the subject submittal what portions of the resubmittal has been altered in order to meet the acceptance of the Engineer. Any other differences between the resubmittal and the prior submittal shall also be specifically described in the transmittal.

5.4.3.3 No mark or notation made by the Engineer on or accompanying the return of any submittal to the Contractor shall be considered a request or order for a change in work. If the Contractor believes any such mark or notation constitutes a request for a change in the work for which it is entitled to an adjustment in contract price and/or time, the Contractor must follow the same procedures established in Section 4.2 CHANGES for oral orders, directions, instructions, interpretations or determinations from the Engineer or else lose its right to claim for an adjustment.

5.5 COORDINATION OF CONTRACT DOCUMENTS - It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. The Contract Documents are complementary: any requirement occurring in one document is as binding as though occurring in all. In the event of conflict or discrepancy the priorities stated in the following subparagraphs shall govern:

5.5.1 Addenda shall govern over all other Contract Documents. Subsequent addenda issued shall govern over prior addenda only to the extent specified.

5.5.2 SPECIAL CONDITIONS and Proposal shall govern over the GENERAL CONDITIONS and Specifications.

5.5.3 Specifications shall govern over drawings.

5.5.4 Specification Error - Should an error or conflict appear within the specification, the Contractor shall immediately notify the Engineer. The Engineer shall promptly issue instructions as to procedure. Any requirement occurring in one or more parts of the specification is as binding as though occurring in all applicable parts.

5.5.4.1 Should an error or conflict appear within a specification section, between a listed manufacturer / product and the performance requirements of the specification section, the performance requirements shall govern.

5.5.5 Drawings:

5.5.5.1 Schedules shall govern over all other notes and drawings.

5.5.5.2 Bottom elevations of footings shown on drawings shall govern over a general note such as: "All footings shall rest on firm, undisturbed soil and extend a minimum of a certain number of feet into natural or finish grade, whichever is lower."

5.5.5.3 Except for drawing schedules and bottom elevations as noted above, general notes shall govern over all other portions of the drawings:

5.5.5.4 Larger scale drawings shall govern over smaller scale drawings.

5.5.5.5 Figured or numerical dimensions shall govern over dimensions obtained by scaling. Measurements from the drawings when scaled shall be subject to the approval of the Engineer.

5.5.5.6 In cases of discrepancies in the figures or drawings, the discrepancies shall be immediately referred to the Engineer without whose decision said discrepancy shall not be corrected by the Contractor save at its own risk and in the settlement of any complications arising from such adjustment without the knowledge and consent of the Engineer, the Contractor shall bear all extra expense involved.

5.5.5.7 Items shown on the drawings that are completely void in terms of description, details, quality and / or performance standards in both the drawings and specifications to make a price determination shall be considered an omission and the Contractor shall immediately refer same to the Engineer for a decision.

5.5.5.8 Where there is a conflict between the architectural sheets and the civil or landscaping or electrical sheets, etc., the conflict shall be considered a discrepancy and the Contractor shall immediately refer same to the Engineer for a decision.

5.5.5.9 Any requirement occurring in one or more of the sheets is as binding as though occurring in all applicable sheets.

5.6 INTERPRETATION OF DRAWINGS AND SPECIFICATIONS - The Contractor shall carefully study and compare the Contract Documents with each other, with field conditions and with the information furnished by the State and shall at once report to the Engineer errors, conflicts, ambiguities, inconsistencies or omissions discovered. Should an item not be sufficiently detailed or explained in the Contract Documents, Contractor shall report and request the Engineer' clarification and interpretation. The Engineer will issue a clarification or interpretation that is consistent with the intent of and reasonably inferred from Contract Documents.

5.7 EXAMINATION OF DRAWINGS, SPECIFICATIONS, PROJECT SITE

5.7.1 The Contractor shall examine carefully the Project Site to become familiar with the conditions to be encountered in performing the Work and the requirements of the Contact Documents.

5.7.1.1 No extra compensation will be given by reason of the Contractor's misunderstanding or lack of knowledge of the requirements of the Work to be accomplished or the conditions to be encountered in performing the project.

5.7.1.2 No extra compensation will be given by reason of the Contractor's misunderstanding or lack of knowledge when the existence of differing site, subsurface or physical conditions could have been reasonably discovered or revealed as a result of any examination, investigation, exploration, test or study of the site and contiguous areas required by the Bidding requirements or Contract Documents to be conducted by or for the Contractor.

5.7.2 When the Contract Drawings include a log of test borings showing a record of the data obtained by the Department's investigation of subsurface conditions, said log represents only the opinion of the Department as to the character of material encountered in its test borings and at only the location of each boring. The Contractor acknowledges that underground site conditions in Hawaii vary widely. There is no warranty, either expressed or implied, that the conditions indicated are representative of those existing throughout the work or any part of it, or that other conditions may not occur.

5.7.3 Reference is made to the SPECIAL CONDITIONS for identification of subsurface investigations, reports, explorations and tests utilized by the State in preparation the Contract Documents. Such reports, drawings, boring logs etc. are not part of the Contract Documents.

5.8 COOPERATION BETWEEN THE CONTRACTOR AND THE DEPARTMENT

5.8.1 Furnishing Drawings and Specifications - Contractor to supply copies of the Contract Drawings and Specifications. Contractor shall have and maintain at least one copy of the Contract Drawings and Specifications on the work site, at all times. Contractor shall cooperate with the Engineer, the Inspector(s), and other contractors in every possible way.

5.8.2 Superintendent - The Contractor shall have a competent superintendent or agent on the work site while work is being performed under the contract. The superintendent or agent shall be experienced in the type of project being undertaken and the work being performed. The superintendent or agent shall represent the Contractor and shall have the authority to act on behalf of the Contractor. Communications given to the superintendent or agent shall be as binding as if given to the Contractor.

5.8.2.1 If the superintendent or agent is not present at the work site, the Engineer shall have the right to suspend the work as described under Section 7.24 SUSPENSION OF WORK.

5.8.2.2 The Contractor shall file with the Engineer a written statement giving the name of the superintendent or agent assigned to the project. The Contractor shall be responsible for notifying the Engineer in writing of any change in the superintendent or agent.

5.8.2.3 The requirements of this subsection 5.8.2 may be waived by the Engineer.

5.8.3 Engineering Work - The Contractor shall properly and accurately lay out the work, perform all engineering work, and furnish all engineering materials and equipment required to establish and maintain all lines, grades, dimensions and elevations called for in the drawings or required in the progress of construction, unless otherwise noted in the contract documents. The Contractor will be held definitely and absolutely responsible for any errors in lines, grades, dimensions and elevations and shall at once, on instruction from the Engineer, correct and make good such errors or any errors, or faults in the work resulting from errors in engineering performed under the requirements of its contract to the entire satisfaction of the Engineer. Full compensation for the work shall be included in the prices paid for contract items of work. No additional allowance will be made for the correction of incorrect engineering work.

5.8.3.1 The Engineer shall furnish the requisite bench elevations.

5.8.3.2 The Contractor shall locate and verify all lines, grades, dimensions and elevations indicated on the drawings before any excavation, or construction begins. Any discrepancy shall be immediately brought to the attention of the Engineer, any change shall be made in accordance with the Engineer's instruction.

5.8.3.3 The Contractor shall verify all street survey monuments (horizontal and vertical alignment) prior to final acceptance by the Engineer in accordance with any governmental requirements.

5.8.3.4 The Contractor shall provide a surveyor or Civil Engineer licensed in the State of Hawaii to verify and establish all lines, grades, dimensions and elevations.

5.8.4 Use of Structure or Improvement - The Department shall have the right, at any time during construction of the structure or improvements, to enter same for the purpose of installing by government labor or by any other Contractor or utility any necessary work in connection with the installation of facilities, it being mutually understood and agreed, however, that the Contractors, utilities and the Department will, so far as possible work to the mutual advantage of all, where their several works in the above mentioned or in unforeseen instances touch upon or interfere with each other.

As a convenience to those involved, the Engineer shall allocate the work and designate the sequence of construction in case of controversy between Contractors on separate projects under State jurisdiction.

5.8.4.1 The Department shall also have the right to use the structure, equipment, improvement or any part thereof, at any time after it is considered by the Engineer as available. In the event that the structure, equipment or any part thereof is so used, the Department shall be responsible for all expenses incidental to such use and any damages resulting from the Department's use.

5.8.4.2 Equipment warranty will commence to run before the work is complete when and if the Department begins actual use of the equipment for the purpose for which the equipment was designed and installed.

5.8.4.3 If the Department enters the structure for construction and / or occupancy and the Contractor is delayed because of interference by the Department or by extra work resulting from damage which the Contractor is not responsible for, or by extraordinary measures the Contractor must take to accommodate the Department, the Contractor shall be granted an extension of time in accordance with Section 7.21 CONTRACT TIME. However, if such use increases the cost or delays the completion of the remaining portions of work, the Contractor shall be entitled to such extra compensation or extension of time or both, as the State may determine to be proper. Any additional work necessary will be paid in accordance with Section 8.3 PAYMENT FOR ADDITIONAL WORK.

5.9 INSPECTION - The Engineer, the Department's consultants, Inspectors employed by the Department and other representatives duly authorized by the Department shall at all times have access to the work during its construction and shall be furnished with every reasonable facility for ascertaining at any time that the materials and the workmanship are in accordance with the requirements and intentions of the contract. All work done and all materials furnished shall be subject to inspection and acceptance.

5.9.1 Such inspection and approval may extend to all or part of the work, and to the preparation, fabrication or manufacture of the materials to be used. By entering into a contract for the supply of materials, equipment or performance of labor in connection with the Work, such Material and Equipment Supplier or Labor Contractor consents to and is subject to the terms of this Section 5.9 to the same extent as the Contractor.

5.9.2 Authority to Suspend Operations - The Inspector shall have the authority to suspend operations of any work being improperly performed by issuing a written order giving the reason for shutting down the work. Should the Contractor disregard such written order, the work done thereafter will not be accepted nor paid for.

5.9.3 The inspection of the work shall not relieve the Contractor of any of its obligations to fulfill the contract as prescribed. Notwithstanding prior payment and acceptance by the Engineer, defective and nonconforming work shall be corrected to comply with the contract requirements. Unsuitable, unspecified or unapproved materials may be rejected.

5.9.4 Federal Agency Inspection - Projects financed in whole or in part with Federal funds shall be subject to inspection and corrective requirements at all times by the Federal Agency involved at no cost to the State.

5.10 REMOVAL OF DEFECTIVE, NON-CONFORMING AND UNAUTHORIZED WORK

5.10.1 All work which has been rejected as not conforming to the requirements of the Contract shall be remedied or removed and replaced by the Contractor in an acceptable manner and no compensation will be allowed for such removal or replacement. Any work done beyond the work limits shown on the drawings and specifications or established by the Engineer or any additional work done without written authority will be considered as unauthorized and will not be paid for. Work so done may be ordered removed at the Contractor expense.

5.10.2 Scheduling Corrective Work - The Contractor shall perform its corrective or remedial work at the convenience of the State and shall obtain the Engineer's approval of its schedule.

5.10.3 Failure to Correct Work -Upon failure on the part of the Contractor to comply promptly with any order of the Engineer made under the provisions of this Section 5.10, the Engineer shall have authority to cause defective work to be remedied or removed and replaced, and unauthorized work to be removed, at the Contractor's expense, and to deduct the costs from any monies due or to become due the Contractor.

5.11 VALUE ENGINEERING INCENTIVE

§3-132 HAR amended by Act 149 SLH 1999 - On projects with contract amounts in excess of $250,000, the following Value Engineering Incentive Clause shall apply to allow the Contractor to share in cost savings that ensue from cost reduction proposals it submits.

5.11.1 The Value Engineering Incentive Clause applies to all Value Engineering Change Proposals (cost reduction proposals, hereinafter referred to as (VECP) initiated and developed by the Contractor for changing the drawings, designs, specifications or other requirements of this contract. This clause does not, however apply to any VECP unless it is identified as such by the Contractor at the time of its submission to the Engineer.

5.11.2 Value Engineering Change Proposal - All VECP must:

5.11.2.1 Result in a savings to the State of at least four thousand dollars ($4,000) by providing less costly items than without impairing any essential functions and characteristics such as service life, reliability, economy of operation, ease of maintenance and all necessary features of the completed work.

5.11.2.2 Require, in order to be applied to this contract, a change order to this contract.

5.11.2.3 Not adversely impact on the schedule of performance or the contract completion date.

5.11.3 VECP Required Information - The VECP will be processed expeditiously and in the same manner as prescribed for any other change order proposal. As a minimum, the following information will be submitted by the Contractor with each proposal:

5.11.3.1 A description of the difference between the existing contract requirements and the VECP, and the comparative advantages and disadvantages of each including durability, service life, reliability, economy of operation, ease of maintenance, design safety standards, desired appearance, impacts due to construction and other essential or desirable functions and characteristics as appropriate;

5.11.3.2 An itemization of the requirements of the contract which must be changed if the VECP is adopted and a recommendation as to how to make each such change;

5.11.3.3 An estimate of the reduction in performance costs that will result from adoption of the VECP taking into account the costs of implementation by the Contractor, including any amounts attributable to subcontracts, and the basis for the estimate;

5.11.3.4 A prediction of any effects the VECP would have on other costs to the State, such as State furnished property costs, costs of related items, and costs of maintenance and operation over the anticipated life of the material, equipment, or facilities as appropriate; the construction schedule, sequence and time; and bid item totals used for evaluation and payment purposes;

5.11.3.5 A statement of the time by which a change order adopting the VECP must be issued so as to obtain the maximum cost reduction during the remainder of this contract noting any effect on the contract time; and

5.11.3.6 The dates of any previous submissions of the VECP, the numbers of any Government contracts under which submitted and the previous actions by the Government, if known.

5.11.4 Required Use of Licensed Architect or Engineer - When, in the judgment of the Engineer, a VECP alters the design prepared by a registered professional architect or engineer, the Contractor shall ensure the changes to be prepared are by or under the supervision of a licensed professional architect or engineer, and stamped and so certified.

5.11.5 Unless and until a change order applies a VECP to a contract, the Contractor shall remain obligated to perform in accordance with the terms of the contract and the Department shall not be liable for delays incurred by the Contractor resulting from the time required for the Department's determination of the acceptability of the VECP.

5.11.5.1 The determination of the Engineer as to the acceptance of any VECP under a contract shall be final.

5.11.6 Acceptance of VECP - The Engineer may accept in whole or in part any VECP submitted pursuant to this section by issuing a change order to the contract. Prior to issuance of the change order, the Contractor shall submit complete final contract documents similar to those of the original contract showing the accepted changes and the new design and features as well as the following:

5.11.6.1 Design calculations;

5.11.6.2 The design criteria used; and

5.11.6.3 A detailed breakdown of costs and expenses to construct or implement such revisions.

5.11.6.4 The change order will identify the final VECP on which it is based.

5.11.7 VECP Price Adjustments - When a VECP is accepted under a contract, an adjustment in the contract price shall be made in accordance with Section 4.4 PRICE ADJUSTMENT. The adjustment shall first be established by determining the effect on the Contractor's cost of implementing the change, including any amount attributable to subcontractors and to the Department's charges to the Contractor for architectural, engineering, or other consultant services, and the staff time required to examine and review the proposal. The contract price shall then be reduced by fifty percent (50%) of the net estimated decrease in the cost of performance.

5.11.8 The Contractor may restrict the Department's right to use the data or information or both, on any sheet of a VECP or of the supporting data, submitted pursuant to this paragraph, if it is stated on that sheet as follows:

5.11.8.1 "This data or information or both shall not be disclosed outside the Department or be duplicated, used, or disclosed, in whole or in part, for any purpose other than to evaluate this VECP. This restriction shall not limit the Department's right to use this data or information or both if obtained from another source, or is otherwise available, without limitations. If this VECP is accepted by the Department by issuance of a change

order after the use of this data or information or both in such an evaluation, the Department shall have the right to duplicate, use and disclose any data or information or both pertinent to the proposal as accepted in any manner and for any purpose whatsoever and have others so do."

5.11.9 In the event of acceptance of a VECP, the Department shall have all rights to use, duplicate or disclose in whole or in part in any manner and for any purpose whatsoever, and to have or permit others to do so, any data or information or both reasonably necessary to fully utilize such proposal.

5.11.10 The Contractor shall submit with each VECP all required information and provide all additional information as may be required by the Engineer to evaluate and implement the VECP. The cost for preparing the VECP shall be the Contractor's responsibility, and any part of the Contractor's cost for implementing the change shall be due only when the proposal is accepted and a change order is issued.

5.11.11 If the services of the Department's architect, engineer or consultant is necessary to review and evaluate a VECP, the cost therefore shall be paid for by the Contractor.

5.11.12 Each VECP shall be evaluated as applicable to this contract, and past acceptance on another Department project for a similar item shall not be automatic grounds for approval.

5.11.13 The method by which the Contractor will share a portion of the cost savings from an accepted VECP shall be for this contract only, and no consideration shall be made for future acquisition, royalty type payment or collateral savings.

5.11.13.1 The Department may accept the proposed VECP in whole or in part. The Engineer shall issue a contract change order to identify and describe the accepted VECP.

5.12 SUBCONTRACTS - Nothing contained in the contract documents shall create a contractual relationship between the State and any subcontractor. The contractor may subcontract a portion of the work but the contractor shall remain responsible for the work that is subcontracted.

5.12.1 Replacing Subcontractors - Contractors may enter into subcontracts only with subcontractors listed in the offer form. The contractor will be allowed to replace a listed subcontractor if the subcontractor:

5.12.1.1 Fails, refuses or is unable to enter into a subcontract consistent with the terms and conditions of the subcontractor's offer presented to the contractor; or

5.12.1.2 Becomes insolvent; or

5.12.1.3 Has any license or certification necessary for performance of the work suspended or revoked; or

5.12.1.4 Has defaulted or has otherwise breached the subcontract in connection with the subcontracted work; or

5.12.1.5 Agrees to be substituted by providing a written release; or

5.12.1.6 Is unable or refuses to comply with other requirements of law applicable to contractors, subcontractors, and public works projects.

5.12.2 Notice of Replacing Subcontractor – The contractor shall provide a written notice to the Contracting Officer when it wishes to replace a subcontractor, including in the notice, the reasons for replacement. The contractor agrees to defend, hold harmless and indemnify the State against all claims, liabilities, or damages whatsoever, including attorneys fees arising out of or related to the replacement of a subcontractor. The contractor may not replace the subcontractor until the Contracting Officer approves of the replacement.

5.12.3 Adding Subcontractors – The Contractor may enter into a subcontract with a subcontractor that is not listed in the offer form only after this contract becomes enforceable and only after the Contracting Officer has approved the subcontractor.

5.12.4 Subcontracting - Contractor shall perform with its own organization, work amounting to not less than twenty (20%) of the total contract cost, exclusive of costs for materials and equipment the Contractor purchases for installation by its subcontractors, except that any items designated by the State in the contract as "specialty items" may be performed by a subcontract and the cost of any such specialty items so performed by the subcontract may be deducted from the total contract cost before computing the amount of work required to be performed by the Contractor with its own organization.

ARTICLE 6 - Control of Materials and Equipment

6.1 MATERIALS AND EQUIPMENT - Contractor shall furnish, pay for and install all material and equipment as called for in the drawings and specifications. Materials and equipment shall be new and the most suitable for the purpose intended unless

otherwise specified. The State does not guarantee that the specified or pre-qualified product listed in the drawings and specifications are available at the time of bid or during the contract period.

6.2 SOURCE OF SUPPLY AND QUALITY OF MATERIALS

6.2.1 Only materials conforming to the drawings and specifications and, when required by the contract have been accepted by the Engineer, shall be used. In order to expedite the inspection and testing of materials, at the request of the Engineer, the Contractor shall identify its proposed sources of materials within ten (10) days after notification by the Engineer.

6.2.2 At the option of the Engineer, the materials may be accepted by the Engineer at the source of supply before delivery is started. Representative preliminary samples of the character and quantity prescribed shall be submitted by the Contractor or producer for examination and tested in accordance with the methods referred to under samples and tests.

6.2.3 Engineer's Authorization to Test Materials - Materials proposed to be used may be inspected and tested whenever the Engineer deems necessary to determine conformance to the specified requirements. The cost of testing shall be borne by the Contractor. However, should test results show that the material(s) is in compliance with the specified requirements, the cost of the testing will be borne by the State.

6.2.4 Unacceptable Materials - In the event material(s) are found to be unacceptable, the Contractor shall cease their use, remove the unacceptable material(s) that have already been installed or applied, and furnish acceptable materials all at no additional cost to the State. No material which is in any way unfit for use shall be used.

6.3 SUBSTITUTION AFTER CONTRACT AWARD

6.3.1 Materials, equipment, articles and systems noted on the drawings and specifications, establish a standard of quality, function, performance or design requirements and shall not be interpreted to limit competition. Should trade names, makes, catalog numbers or brand names be specified, the contractor shall infer that these items indicate the quality, style, appearance or performance of the material, equipment, article, or systems to be used in the project. The contractor is responsible to use materials, equipment, articles or systems that meet the project requirements. Unless specifically provided otherwise in the contract documents, the contractor may, at its option, use any material equipment, article or system that, in the judgment of the Contracting officer, is equal to that required by the contract documents.

6.3.1.1 If after installing a material, equipment, article or system a variance is discovered, the contractor shall immediately replace the material, equipment, article or system with one that meets the requirements of the contract documents.

6.3.2 Substitution After Contract Award - Subject to the Contracting Officer's determination; material, equipment, article or system with a variant feature(s) may be allowed as a substitution, provided it is in the State's best interest. The State may deny a substitution; and if a substitution is denied, the contractor is not entitled to any additional compensation or time extension.

6.3.2.1 The contractor shall include with the submittal, a notification that identifies all deviations or variances from the contract documents. The notice shall be in a written form separate from the submittal. The variances shall be clearly shown on the shop drawing, descriptive sheet, and material sample or color sample; and the contractor shall certify that the substitution has no other variant features. Failures to identify the variances are grounds to reject the related work or materials, notwithstanding that the Contracting Officer accepted the submittal. If the variances are not acceptable to the Contracting Officer, the contractor will be required to furnish the item as specified on the contract documents at no additional cost or time.

6.3.2.2 Acceptance of a variance shall not justify a contract price or time adjustment unless the contractor requests an adjustment at the time of submittal and the adjustments are explicitly agreed to in writing by the Contracting Officer. Any request shall include price details and proposed scheduling modifications. Acceptance of a variance is subject to all contract terms, and is without prejudice to all rights under the surety bond.

6.3.2.3 The contractor can recommend improvements to the project, for materials, equipment, articles, or systems by means of a substitution request, even if the improvements are at an additional cost. The Contracting Officer shall make the final determination to accept or reject contractor's proposed improvements. If the proposal material, equipment, article or system cost less than the specified item, the Department will require a sharing of cost similar to value engineering be implemented. State reserves its right to deny a substitution; and if a substitution is denied, the contractor is not entitled to additional compensation or time extension.

6.3.2.4 If the specified material and / or equipment inadvertently lists only a single manufacturer.

6.3.3 A substitution request after Contract Award shall be fully explained in writing. Contractor shall provide brochures showing that the substitute material and / or equipment is equal or better in essential features and also provide a matrix showing comparison of the essential features. Contractor shall justify its request and include quantities and unit prices involved, respective supplier's price quotations and such other documents necessary to fully support the request. Any savings in cost will be credited to the Department. Contractor shall absorb any additional cost for the substitute item(s) or for its installation. Submitting a substitution request, does not imply that substitutions, for brand name specified materials and equipment, will be allowed. The Engineer may reject and deny any request deemed irregular or not in the best interest of the Department. A request for substitution shall not in any way be grounds for an extension of contract time. At the discretion of the Engineer, a time extension may be granted for an approved substitution.

6.4 ASBESTOS CONTAINING MATERIALS - The use of materials or equipment containing asbestos is prohibited under this contract. Contractor warrants that all materials and equipment incorporated in the project are asbestos-free.

6.5 TEST SAMPLES

6.5.1 The Engineer may require any or all materials to be tested by means of samples or otherwise. Contractor shall collect and forward samples requested by the Engineer. Contractor shall not use or incorporate any material represented by the samples until all required tests have been made and the material has been accepted. In all cases, the Contractor shall furnish the required samples without charge. Where samples are required from the completed work, the Contractor shall cut and furnish samples from the completed work. Samples so removed shall be replaced with identical material and refinished. No additional compensation will be allowed for furnishing test samples and their replacement with new materials.

6.5.2 Tests of the material samples will be made in accordance with the latest standards of the American Society for Testing and Materials (ASTM), as amended prior to the contract date unless otherwise provided. In cases where a particular test method is necessary or specifications and serial numbers are stipulated, the test shall be made by the method stated in the above-mentioned publication. Where the test reference is the American Association of State Highway and Transportation Officials (AASHTO), it means the specifications and serial numbers of the latest edition and amendments prior to the bid date.

6.5.3 The Engineer may retest any materials which have been tested and accepted at the source of supply after the same has been delivered to the work site. The Engineer shall reject all materials which, when retested, do not meet the requirements of the contract.

6.6 MATERIAL SAMPLES

6.6.1 The Contractor shall furnish all samples required by the drawings and specifications or that may be requested by the Engineer of any and all materials or equipment it proposes to use. Unless specifically required, samples are not to be submitted with the bid.

6.6.2 No materials or equipment of which samples are required shall be used on the Work until the Engineer has received and accepted the samples. If the Contractor proceeds to use such materials before the Engineer accepts the samples, the Contractor shall bear the risk.

6.6.3 Contractor shall furnish two (2) copies of a transmittal letter with each shipment of samples, The letter shall provide a list of the samples, the name of the building or work for which the materials are intended and the brands of the materials and names of the manufacturers. Also, each sample submitted shall have a label indicating the material represented, its place of origin, the names of the producer, the Contractor and the building or work for which the material is intended. Samples of finished materials shall be marked to indicate where the materials represented are required by the drawings or specifications.

6.6.4 Acceptance of any sample(s) shall be only for the characteristics or for the uses named in such acceptance and for no other purpose. Acceptance of samples shall not change or modify any contract requirement. All samples will be provided by the Contractor at no extra cost to the Department. See also Section 5.4 SHOP DRAWINGS AND OTHER SUBMITTALS.

6.7 NON-CONFORMING MATERIALS - All materials not conforming to the requirements of these contract documents, whether in place or not, shall be rejected and removed immediately from the site of work unless otherwise permitted by the Engineer in writing. No rejected material which has subsequently been made to conform shall be used unless and until written acceptance has been given by the Engineer. If the Contractor fails to comply forthwith with any order of the Engineer made under the provisions of this Section 6.7, the Engineer shall have the authority to remove and

replace non-conforming materials and charge the cost of removal and replacement to the Contractor.

6.8 HANDLING MATERIALS - Contractor shall handle all materials to preserve their quality and fitness for work. Transport aggregates from the source or storage site to the work in tight vehicles to prevent loss or segregation of materials after loading and measuring.

6.9 STORAGE OF MATERIALS - Contractor shall store all materials to preserve their quality and fitness for the work. Unless otherwise provided, any portion of the project site within the Project Contract Limit not required for public travel, may be used for storage purposes and for the Contractor's plant and equipment. Any additional space required shall be provided by the Contractor at its expense subject to the Engineer's acceptance. Contractor shall store materials on wooden platforms or other hard, clean surfaces and covered to protect it from the weather and damage. Stored materials shall be located to allow prompt inspection.

6.10 PROPERTY RIGHTS IN MATERIALS - Nothing in the contract shall be construed to vest in the Contractor any right to any materials and equipment after such materials and equipment have been attached, affixed to, or placed in the work.

6.11 ASSIGNMENT OF ANTITRUST CLAIMS FOR OVERCHARGES FOR GOODS PURCHASED - Contractor (or Vendor) and the Department recognize that in actual economic practice, overcharges resulting from antitrust violations are in fact usually borne by the Department. Therefore, Contractor hereby assigns to the Department any and all claims for such overcharges as to goods purchased in connection with this order or contract, except as to overcharges which result from antitrust violations commencing after the price is established under this order or contract and any change order. In addition, Contractor warrants and represents that each of its first tier suppliers and subcontractors shall assign any and all such claims to the Department, subject to the aforementioned exception.

ARTICLE 7 - Prosecution and Progress
(Including Legal Relations and Responsibility)

7.1 PROSECUTION OF THE WORK

7.1.1 After approval of the contract by the Department of Defense, a Notice to Proceed will be given to the Contractor as described in Section 3.10 NOTICE TO PROCEED. The Notice to Proceed will indicate the date the Contractor is expected to begin the construction and from which date contract time will be charged.

7.1.2 The Contractor shall begin work no later than ten (10) working days from the date in the Notice to Proceed and shall diligently prosecute the same to completion within the contract time allowed. The Contractor shall notify the Engineer at least three (3) working days before beginning work.

7.1.3 If any subsequent suspension and resumption of work occurs, the Contractor shall notify the Engineer at least twenty-four (24) hours before stopping or restarting actual field operations.

7.1.4 Working Prior to Notice to Proceed - The Contractor shall not begin work before the date in the Notice to Proceed. Should the Contractor begin work before receiving the Notice to Proceed, any work performed in advance of the specified date will be considered as having been done at the Contractor's risk and as a volunteer and subject to the following conditions:

7.1.4.1 Under no circumstances shall the Contractor commence work on site until it has notified the Engineer of its intentions and has been advised by the Engineer in writing that the project site is available to the Contractor. The project site will not be made available until the Contractor has complied with commencement requirements under Section 7.2 COMMENCEMENT REQUIREMENTS.

7.1.4.2 In the event the contract is not executed, the Contractor shall, at its own expense, do such work as is necessary to leave the site in a neat condition to the satisfaction of the Engineer. The Contractor shall not be reimbursed for any work performed.

7.1.4.3 All work done prior to the Notice to Proceed shall be performed in accordance with the contract documents, but will only be considered authorized work and be paid for as provided in the contract after the Notice to Proceed is issued.

7.1.5 For repairs and/or renovations of existing buildings, unless otherwise permitted by the Engineer, the Contractor shall not commence with the physical construction unless all or sufficient amount of materials are available for either continuous construction or completion of a specified portion of the work. When construction is started, the Contractor shall work expeditiously and pursue the work diligently until it is complete. If only a portion of the work is to be done in stages, the Contractor shall leave the area safe and usable for the user agency at the end of each stage.

7.2 COMMENCEMENT REQUIREMENTS - Prior to beginning work on site, the Contractor shall submit the following to the Engineer:

7.2.1 Identification of the Superintendent or authorized representative on the job site. Refer to Section 5.8 COOPERATION BETWEEN THE CONTRACTOR AND THE DEPARTMENT.

7.2.2 Proposed Working Hours on the job. Refer to Section 7.5 NORMAL WORKING HOURS.

7.2.3 Permits and Licenses. Refer to Section 7.4 PERMITS AND LICENSES.

7.2.4 Schedule of Prices to be accepted for the agreed Monthly Payment Application. Unless the proposal provides unit price bids on all items in this project, the successful Bidder will be required, after the award of contract, to submit a schedule of prices for the various items of construction included in the contract. For projects involving more than a single building and / or facility, the breakdown cost shall reflect a separate schedule of prices for the various items of work for each building and/or facility. The sum of the prices submitted for the various items must equal the lump sum bid in the Bidder's proposal. This schedule will be subject to acceptance by the Engineer who may reject same and require the bidder to submit another or several other schedules if in the Engineer's opinion the prices are unbalanced or not sufficiently detailed. This schedule of prices shall be used for the purpose of determining the value of monthly payments due the Contractor for work installed complete in place; and may be used as the basis for determining cost and credit of added or deleted items of work, respectively.

7.2.4.1 The Contractor shall estimate at the close of each month the percentage of work completed under each of the various construction items during such month and submit the Monthly Payment Application to the Engineer for review and approval. The Contractor shall be paid the approved percentage of the price established for each item less the retention provided in Section 8.4 PROGRESS PAYMENTS.

7.2.5 Proof of Insurance Coverage. Certificate of Insurance or other documentary evidence satisfactory to the Contracting Officer that the Contractor has in place all insurance coverage required by the contract. The Certificate of Insurance shall contain wording which identifies the Project number and Project title for which the certificate of insurance is issued. Refer to Section 7.3 INSURANCE REQUIREMENTS.

7.2.6 Until such time as the above items are processed and approved, the Contractor shall not be allowed to commence on any operations unless authorized by the Engineer.

7.3 INSURANCE REQUIREMENTS

7.3.1 Obligation of Contractor - Contractor shall not commence any work until it obtains, at its own expense, all required herein insurance. Such insurance shall be provided by an insurance company authorized by the laws of the State to issue such insurance in the State of Hawaii. Coverage by a "Non-Admitted" carrier is permissible provided the carrier has a Best's Rating of "A-VII" or better.

7.3.2 All insurance described herein will be maintained by the Contractor for the full period of the contract and in no event will be terminated or otherwise allowed to lapse prior to written certification of final acceptance of the work by the State.

7.3.3 Certificate(s) of Insurance acceptable to the State shall be filed with the Engineer prior to commencement of the work. Certificates shall identify if the insurance company is a "captive" insurance company or a "Non-Admitted" carrier to the State of Hawaii. The best's rating must be stated for the "Non-Admitted" carrier. Certificates shall contain a provision that coverage's being certified will not be cancelled or materially changes without giving the Engineer at least thirty (30) days prior written notice. If the State is to be an Additional Insured on any of the required insurance, it shall be so noted on the certificate. Should any policy be canceled before final acceptance of the work by the State, and the Contractor fails to immediately procure replacement insurance as specified, the State, in addition to all other remedies it may have for such breach, reserves the right to procure such insurance and deduct the cost thereof from any money due to the Contractor.

7.3.4 Nothing contained in these insurance requirements is to be construed as limiting the extent of Contractor's responsibility for payment of damages resulting from its operations under this contract, including the Contractor's obligation to pay performance liquidated damages, nor shall it affect the Contractor's separate and independent duty to defend, indemnify and hold the State harmless pursuant to other provisions of this contract. In no instance will the State's exercise of an option to occupy and use completed portions of the work relieve the Contractor of its obligation to maintain the required insurance until the date of final acceptance of the work.

7.3.5 All insurance described herein shall be primary and cover the insured for all work to be performed under the contract, all work performed incidental thereto or directly or indirectly connected therewith, including

traffic detour work or other work performed outside the work area and all change order work.

7.3.6 The Contractor shall, from time to time, furnish the Engineer, when requested, satisfactory proof of coverage of each type of insurance required covering the work. Failure to comply with the Engineer's request may result in suspension of the work, and shall be sufficient grounds to withhold future payments due the Contractor and to terminate the contract for Contractor's default.

7.3.7 Types of Insurance - Contractor shall purchase and maintain insurance described below which shall provide coverage against claims arising out of the Contractor's operations under the contract, whether such operations be by the Contractor itself or by any subcontractor or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable.

7.3.7.1 Worker's Compensation -The Contractor shall obtain worker's compensation insurance for all persons whom they employ in carrying out the work under this contract. This insurance shall be in strict conformity with the requirements of the most current and applicable State of Hawaii Worker's Compensation Insurance laws in effect on the date of the execution of this contract and as modified during the duration of the contract.

7.3.7.2 General Liability - The Contractor shall obtain General Liability insurance with a limit of not less than $2,000,000 per occurrence and in the Aggregates. The General liability insurance shall include the State as an Additional Insured. The required limit of insurance may be provided by a single policy or with a combination of primary and excess polices. Refer to SPECIAL CONDITIONS for any additional requirements.

7.3.7.3 Auto Liability - The Contractor shall obtain Auto Liability Insurance covering all owned, non-owned and hired autos with a combined single Limit of not less than $1,000,000 per occurrence. The required limit of insurance may be provided by a single policy or with a combination of primary and excess polices. Refer to SPECIAL CONDITIONS for any additional requirements.

7.3.7.4 Property Insurance (Builders Risk)

(1) New Building(s) - The Contractor shall obtain Property Insurance covering building(s) being constructed under this Contract. The limit shall be equal to the completed value of the building(s) and shall insure against all-loss excluding earthquakes and floods. The coverage shall be provided by a company authorized to write insurance in the State of Hawaii as an insurer.

(2) Building Renovation and / or Installation Contract - The Contractor shall obtain Property Insurance with a limit equal to the completed value of the work or property being installed and shall insure against all-loss excluding earthquakes and floods. The coverage shall be provided by a company authorized to write insurance in the State of Hawaii as an insurer. Refer to SPECIAL CONDITIONS for any additional requirements.

(3) The Contractor is not required to obtain property insurance for contracts limited to site development

7.4 PERMITS AND LICENSES

7.4.1 The State or its representative may process Federal (e.g. Corps of Engineers), State and County Permit applications. The Contractor shall pick up the pre-processed Permits at the appropriate governmental agency and pay the required fees. Other permits necessary for the proper execution of the work such as utility connection permits, elevator installation permits etc., unless processed by the State and paid for by the Contractor, shall be obtained and paid for by the Contractor.

7.4.2 Until such time as the above permits are approved, the Contractor shall not be allowed to commence any operations without written approval of the Engineer.

7.4.3 The Engineer reserves the right to waive application and processing of the building permit.

7.5 NORMAL WORKING HOURS - Prior to beginning operations, unless otherwise established by the State, the Contractor shall notify the Engineer in writing of the time in hours and minutes, A.M. and P.M. respectively, at which it desires to begin and end the day's work. If the Contractor desires to change the working hours, it shall request the Engineer's approval three (3) consecutive working days prior to the date of the change.

7.6 HOURS OF LABOR (Section 104-2 Hawaii Revised Statutes)

7.6.1 No laborer or mechanic employed on the job site of any public work of the Department or any political sub-division thereof shall be permitted or required to work on Saturday, Sunday or a legal holiday of the State or in excess of eight hours on any other day unless the laborer or mechanic receives overtime compensation for all hours worked on Saturday, Sunday and a legal holiday of the State or in excess of eight hours on any

other day. For the purposes of determining overtime compensation under this Section 7.6, the basic hourly rate of any laborer or mechanic shall not be less than the basic hourly rate determined by the Department of Labor and Industrial Relations to be the prevailing basic hourly rate for corresponding classes of laborers and mechanics on projects of similar character in the Department.

7.6.2 Overtime compensation means, compensation based on one and one-half times the laborers or mechanics basic hourly rate of pay plus the cost to an employer of furnishing a laborer or mechanic with fringe benefits.

7.7 PREVAILING WAGES - (§ 104-2 HRS)

7.7.1 The Contractor shall at all times observe and comply with all provisions of Chapter 104, HRS, the significant requirements of which are emphasized in the Department of Labor and Industrial Relations Publication No. H104-3 entitled 'Requirements of Chapter 104, HRS Wages and Hours of Employees on Public Works Law'.

7.7.2 Wage Rate Schedule - The wage rate schedule is not physically enclosed in the bid documents. However, the wage rate schedule is incorporated herein by reference and made a part of the Bid and Contract Documents. Said wage rate schedule may be obtained from the Contracts Office, Department of Accounting and General Services, 1151 Punchbowl Street, Room 422, Honolulu, Hawaii or, via the FAX-ON-DEMAND system of the Department of Labor and Industrial Relations, phone number (808) 586-8695. When the bid documents are made available on respective neighbor islands, copies of the wage rate schedule may also be obtained from the office of the respective neighbor island DAGS District Office.

7.7.3 The Contractor or its subcontractor(s) shall pay all laborers and mechanics employed on the job site, unconditionally and not less often than once a week, and without deduction or rebate on any account except as allowed by law, the full amounts of their wages including overtime, accrued to not more than five (5) working days prior to the time of payment, at wage rates not less than those stated in the contract, regardless of any contractual relationship which may be alleged to exist between the Contractor and subcontractor and such laborers and mechanics. The wages stated in the contract shall not be less than the minimum prevailing wages (basic hourly rate plus fringe benefits), as determined by the Director of Labor and Industrial Relations and published in wage rate schedules. Any increase in wage rates, as determined by the Director of Labor and Industrial Relations and issued in the wage rate schedule, shall be applicable during the performance of the contract, in accordance with section 104-2(a) and (b), Hawaii Revised Statutes. Notwithstanding the provisions of the original contract, if the Director of Labor and Industrial Relations determines that prevailing wages have increased during the performance of the contract, the rate of pay of laborers and mechanics shall be raised accordingly.

7.7.4 Posting Wage Rate Schedule - The rates of wages to be paid shall be posted by the Contractor in a prominent and easily accessible place at the job site and a copy of such wages required to be posted shall be given to each laborer and mechanic employed under the contract by the Contractor at the time the person is employed thereunder, provided that where there is a collective bargaining agreement, the Contractor does not have to provide its employees the wage rate schedules. Any revisions to the schedule of wages issued by the Director of Labor and Industrial Relations during the course of the contract shall also be posted by the Contractor and a copy provided to each laborer and mechanic employed under the contract as required above.

7.7.5 The Engineer may withhold from the Contractor so much of the accrued payments as the Engineer may consider necessary to pay to laborers and mechanics employed by the Contractor or any subcontractor on the job site. The accrued payments withheld shall be the difference between the wages required by this contract and the wages actually received by such laborers or mechanics.

7.8 FAILURE TO PAY REQUIRED WAGES (§ 104-4, HRS) - If the Department finds that any laborer or mechanic employed on the job site by the Contractor or any subcontractor has been or is being paid wages at a rate less than the required rate by the contract, or has not received their full overtime compensation, the Department may, by written notice to the Contractor, terminate its right, or the right of any subcontractor, to proceed with the work or with the part of the work on which the required wages or overtime compensation have not been paid and may complete such work or part by contract or otherwise, and the Contractor and its sureties shall be liable to the Department for any excess costs occasioned thereby.

7.9 PAYROLLS AND PAYROLL RECORDS (§ 104-3 HRS)

7.9.1 A certified copy of each weekly payroll shall be submitted to the Engineer within seven (7) calendar days after the end of each weekly payroll period. Failure to do so on a timely basis shall be cause for disqualification from bidding in accordance with the provisions of Section 2.12 DISQUALIFICATION OF BIDDERS. The Contractor shall be responsible for the timely submission of certified copies of payrolls of all

subcontractors. The certification shall affirm that payrolls are correct and complete, that the wage rates contained therein are not less than the applicable rates contained in the wage determination decision, any amendments thereto during the period of the contract, and that the classifications set forth for each laborer and mechanic conform with the work they performed.

7.9.2 Payroll records for all laborers and mechanics working at the site of the work shall be maintained by the General Contractor and its subcontractors, if any, during the course of the work and preserved for a period of four (4) years thereafter. Such records shall contain the name of each employee, their correct classification, rate of pay, daily and weekly number of hours worked, itemized deductions made and actual wages paid. Such records shall be made available for inspection at a place designated by the Engineer, the Director of Labor and any authorized persons who may also interview employees during working hours on the job site.

7.9.3 Note that the falsification of certifications noted in this Section 7.9 may subject the Contractor or subcontractor to penalties and debarment under the laws referenced in Section 7.14 LAWS TO BE OBSERVED and / or criminal prosecution.

7.9A APPRENTICESHIP AGREEMENT CERTIFICATION (HRS §103-55.6)

7.9A.1 For the duration of a contract awarded and executed utilizing the apprenticeship agreement preference, the Contractor shall certify for each month that work is being conducted on the project, that it continues to be a participant in the relevant registered apprenticeship program for each trade it employs.

7.9A.2 Monthly certification shall be made by completing the *Monthly Report of Contractor's Participation – Form 2* made available by the State Department of Labor and Industrial Relations, the original to be signed by the respective apprenticeship program sponsors authorized official, and submitted by the Contractor to the Engineer with its monthly payment requests. The *Monthly Report of Contractor's Participation – Form 2* is available on the DLIR website at: http://hawaii.gov/labor/wdd.

7.9A.3 Should the Contractor fail or refuse to submit its *Monthly Report of Contractor's Participation – Form 2,* or at any time during the duration of the contract, cease to be a party to a registered apprenticeship agreement for any of the apprenticeable trades the Contractor employs, or will employ, the Contractor will be subject to the following sanctions:

7.9A.3.1 Withholding of the requested payment until all of the required *Monthly Report of Contractor's Participation – Form 2*s are properly completed and submitted.

7.9A.3.2 Temporary or permanent cessation of work on the project, without recourse to breach of contract claims by the Contractor; provided the Department shall be entitled to restitution for nonperformance or liquidated damages claims; or

7-9A.3.3 Proceedings to debar or suspend pursuant to HRS §103D-702.

7.9A.4 If events such as "acts of God", acts of public enemy, acts of the State or any other governmental body in its sovereign or contractual capacity, fires, floods, epidemics, freight embargoes, unusually severe weather, or strikes or other labor disputes prevent the Contractor from submitting the *Monthly Report of Contractor's Participation - Form 2*, the Contractor shall not be penalized as provided herein, provided the Contractor completely and expeditiously complies with the certification process when the event is over.

7.10 OVERTIME AND NIGHT WORK

7.10.1 Overtime work shall be considered as work performed in excess of eight (8) hours in any one day or work performed on Saturday, Sunday or legal holiday of the State. Overtime and night work are permissible when approved by the Engineer in writing, or as called for elsewhere within these GENERAL CONDITIONS.

7.10.2 Overtime Notification - Contractor shall notify the Engineer in writing at least two (2) working days prior to doing overtime and night work, to insure proper inspection will be available. The notification shall address the specific work to be done. A notification is not required when overtime work and night work are included as normal working hours in the contract and in the contractor's construction schedule.

7.10.3 In the event that work other than that contained in the above notification is performed and for which the Engineer determines State inspection services were necessary but not available because of the lack of notification, the Contractor may be required to remove all such work and perform the work over again in the presence of State inspection personnel.

7.10.4 Any hours worked in excess of the normal eight (8) working hours per day or on Saturdays, Sundays or legal State holidays will not be considered a working day.

7.10.5 The State hereby reserves the right to cancel the overtime, night, Saturday, Sunday or legal State holiday work when it is found that work during these periods is detrimental to the public welfare or the user agency.

7.11 OVERTIME AND NIGHT PAYMENT FOR STATE INSPECTION SERVICE

7.11.1 The Department is responsible for overtime or night time payments for Department's inspection services, including Department's Inspector, State staff personnel and the Department's Consultant(s) engaged on the project, when overtime and night work are included as normal working hours in the contract and in the contractor's construction schedule.

7.11.2 Whenever the Contractor's operations require the State's inspection and staff personnel to work overtime or at night, the Contractor shall reimburse the State for the cost of such services unless otherwise instructed in the Contract. The Engineer will notify the Contractor of the
minimum number of required Department employees and other personnel engaged by the Department prior to the start of any such work. The costs chargeable to the Contractor shall include but not be limited to the following:

7.11.2.1 The cost of salaries which are determined by the State and includes overtime and night time differential for the Department's staff and inspection personnel. In addition to the cost of the salaries, the Contractor shall reimburse the State's share of contributions to the employee's retirement, medical plan, social security, vacation, sick leave, worker's compensation funds, per diem, and other applicable fringe benefits and overhead expenses.

7.11.2.2 The transportation cost incurred by the Department's staff and inspection personnel which are based on established rental rates or mileage allowance in use by the Department for the particular equipment or vehicle.

7.11.2.3 Fees and other costs billed the State by Consultants engaged on the project for overtime and/or night time work.

7.11.3 Payment for Inspection Services - The monies due the Department for staff and inspection work and use of vehicles and equipment as determined in subsection 7.11.2 shall be deducted from the monies due or to become due the Contractor. In any and all events, the Contractor shall not pay the Department's employees directly.

7.12 LIMITATIONS OF OPERATIONS

7.12.1 Contractor shall at all times conduct the work in such manner and in such sequence as will insure the least practicable interference with pedestrian and motor traffic passageways. The Contractor shall furnish convenient detours and provide and plan all other appropriate signs, flashers, personnel, warnings, barricades and other devices for handling pedestrian and motor traffic.

7.12.2 In the event that other contractors are also employed on the job site, the Contractor shall arrange its work and dispose of materials so as not to interfere with the operations of the other contractors engaged upon adjacent work. The Contractor shall join its work to that of others and existing buildings in a proper manner, and in accordance with the drawings and specifications, and perform its work in the proper sequence in relation to that of others, all as may be directed by the Engineer.

7.12.3 Each Contractor shall be responsible for any damage done by it to work performed by another contractor. Each Contractor shall so conduct its operations and maintain the work in such condition that adequate drainage shall be in effect at all times.

7.12.4 In the event that the Contractor fails to prosecute its work as provided in this Section 7.12 or disregards the directions of the Engineer, the Engineer may suspend the work until such time as the Contractor provides for the prosecution of the work with minimum interference to traffic and passageways or other contractors, adequate drainage, the repair of damage and complies with the direction of the Engineer. No payment will be made for the costs of such suspension.

7.13 ASSIGNMENT OR CHANGE OF NAME §3-125-14 HAR

7.13.1 Assignment - The Contractor shall not sublet, sell, transfer, assign or otherwise dispose of this contract or any part hereof or any right, title or interest herein or any monies due or to become due hereunder without the prior written consent of the Engineer.

7.13.2 The Contractor may assign money due or to become due it under the contract and such assignment will be recognized by the Department, if given proper notice thereof, to the extent permitted by law; but any assignment of monies shall be subject to all proper set-offs in favor of the State and to all deductions provided in the contract and particularly all monies withheld or unpaid, whether assigned or not, shall be to use by the Department for the completion of the work in the event that the Contractors should be in default therein.

7.13.3 Recognition of a Successor in Interest; Assignment - When in the best interest of the State, a

successor in interest may be recognized in an assignment agreement in which the transferor and the transferee and the State shall agree that:

7.13.3.1 The transferee assumes all of the transferor's obligations;

7.13.3.2 Transferor remains liable for all obligations under the contract but waives all rights under the contract against the State; and

7.13.3.3 The transferor shall continue to furnish, and the transferee shall also furnish, all required bonds.

7.13.4 Change of Name - When a Contractor requests to change the name in which it holds a contract with the State, the Engineer shall, upon receipt of a document indicating such change of name (for example: an amendment to the articles of incorporation of the corporation), enter into an agreement with the requesting Contractor to effect such a change of name. The agreement changing the name shall specifically indicate that no other terms and conditions of the contract are thereby changed.

7.13.5 All change of name or novation agreements effected hereunder other than by the Engineer shall be reported to the Engineer within thirty (30) days of the date that the agreement becomes effective.

7.13.6 Notwithstanding the provisions of paragraphs 7.13.3.1 through 7.13.3.3 above, when a Contractor holds contracts with more than one purchasing agency of the State, the novation or change of name agreements herein authorized shall be processed only through the Department of Defense, State of Hawaii.

7.14 LAWS TO BE OBSERVED

7.14.1 The Contractor at all times shall observe and comply with all Federal, State and local laws or ordinances, rules and regulations which in any manner affect those engaged or employed in the work, the materials used in the work, and the conduct of the work. The Contractor shall also comply with all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the work. Any reference to such laws, ordinances, rules and regulations shall include any amendments thereto before and after the date of this contract.

7.14.2 The Contractor shall defend, protect, hold harmless and indemnify the State and its Departments and Agencies and all their officers, representatives, employees or agents against any claim or liability arising from or based on the violation of any such laws, ordinances, rules and regulations, orders or decrees, whether such violation is committed by the Contractor or its Subcontractor(s) or any employee of either or both. If any discrepancy or inconsistency is discovered in the contract for the work in relation to any such laws, ordinances, rules and regulations, orders or decrees, the Contractor shall forthwith report the same to the Engineer in writing.

7.14.3 While the Contractor must comply with all applicable laws, attention is directed to: Wage and Hours of Employees on Public Works, Chapter 104, Hawaii Revised Statutes (HRS); Hawaii Public Procurement Code, Authority to debar or suspend, Section 103D-702, HRS; Hawaii Employment Relations Act, Chapter 377, HRS; Hawaii Employment Security Law, Chapter 383, HRS; Worker's Compensation Law, Chapter 386, HRS; Wage and Hour Law, Chapter 387, HRS; Occupational Safety and Health, Chapter 396, HRS; and Authority to Debar or Suspend, Chapter 126, subchapter 2, Hawaii Administrative Rules (HAR).

7.15 PATENTED DEVICES, MATERIALS AND PROCESSES - If the Contractor desires to use any design, device, material, or process covered by letters of patent or copyright, the right for such use shall be procured by the Contractor from the patentee or owner. The Contractor shall defend, protect, indemnify and hold harmless the State and its Departments and Agencies, any affected third party, or political subdivision from any and all claims for infringement by reason of the use of any such patented design, device, material or process, or any trademark or copyright in connection with the work to be performed under the contract, shall defend, protect, indemnify and hold harmless the State and its Departments and Agencies for any costs, expenses and damages which it may be obligated to pay by reason of any such infringement at any time during the prosecution or after the completion of the work. This section shall not apply to any design, device, material or process covered by letters of patent or copyright, which the Contractor is required to use by the drawings or specifications.

7.16 SANITARY, HEALTH AND SAFETY PROVISIONS

7.16.1 The Contractor shall provide and maintain in a neat, sanitary condition such accommodations for the use of its employees as may be necessary to comply with the requirements of the State and local Boards of Health, or other bodies or tribunals having jurisdiction. Unless otherwise stated in the drawings or specifications, the Contractor shall install toilet facilities conveniently located at the job site and maintain same in a neat and sanitary condition for the use of the employees on the job site for the duration of the contract. The toilet facilities shall conform to the requirements of the State

Department of Health. The cost of installing, maintaining and removing the toilet facilities shall be considered incidental to and paid for under various contract pay items for work or under the lump sum bids as the case may be, and no additional compensation will be made therefore. These requirements shall not modify or abrogate in any way the requirements or regulations of the State Department of Health.

7.16.2 Attention is directed to Federal, State and local laws, rules and regulations concerning construction safety and health standards. The Contractor shall not require any worker to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to their health or safety.

7.17 PROTECTION OF PERSONS AND PROPERTY

7.17.1 Safety Precautions and Programs - The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall take reasonable precautions for the safety of, and shall provide reasonable protection to prevent damage, injury or loss to:

7.17.1.1 All persons on the Work site or who may be affected by the Work;

7.17.1.2 All the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor and its subcontractors; and

7.17.1.3 Other property at the site or adjacent thereto, including trees, shrubs lawns walks pavement, roadways structures, and utilities not designated for removal, relocation or replacement in the course of construction.

7.17.2 Contractor shall give notices and comply with applicable laws, ordinances, regulations, rules, and lawful orders of any public body having jurisdiction for the safety of persons or property or their protection from damage, injury or loss; and the Contractor shall erect and maintain reasonable safeguards for safety and protection, including posting danger signs, or other warnings against hazards.

7.17.3 The Contractor shall notify Owners of adjacent properties and of underground (or overhead) utilities when performing work, which may affect the Owners; and shall cooperate with the Owners in the protection, removal and replacement of their property.

7.17.4 All damage, injury or loss to any property referred to in paragraphs 7.17.1.2 and 7.17.1.3 caused by the fault or negligence or damage or loss attributable to acts or omissions directly or indirectly in whole or part by the Contractor a subcontractor or any one directly or indirectly employed by them, or by anyone for whose acts they might be liable, shall be remedied promptly by the Contractor.

7.17.5 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the protection of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor

7.17.6 The Contractor shall not load or permit any part of the construction to be loaded so as to endanger its safety. The Contractor shall not injure or destroy trees or shrubs nor remove or cut them without permission of the Engineer. Contractor shall protect all land monuments and property marks until an authorized agent has witnessed or otherwise referenced their location and shall not remove them until directed.

7.17.7 In the event the Contractor encounters on the site, material reasonably believed to be asbestos or other hazard material that has not been rendered harmless, the Contractor shall stop work in the area and notify the Engineer promptly. The work in the affected area shall be resumed in the absence of hazard materials or when the hazard has been rendered harmless.

7.17.8 Emergencies - In an emergency affecting the safety and protection of persons or the Work or property at the site or adjacent thereto, Contractor without special instructions or authorization from the Engineer, shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Contractor shall give the Engineer prompt written notice of the emergency and actions taken. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined under the provisions of Section 7.25 DISPUTES AND CLAIMS.

7.18 ARCHAEOLOGICAL SITES

7.18.1 Should historic sites such as walls, platforms, pavements and mounds, or remains such as artifacts, burials, concentration of charcoal or shells be encountered during construction, work shall cease in the immediate vicinity of the find and the find shall be protected from further damage. The Contractor shall immediately notify the Engineer and contact the State Historic Preservation Division which will assess the significance of the find and recommend the appropriate mitigation measures, if necessary.

7.18.2 When required, the Contractor shall provide and install any temporary fencing as shown on the drawings to protect archaeological sites within the project. The fencing shall be installed prior to any construction activity and shall be maintained by the Contractor for the duration of the project. Fence installation and maintenance shall be to the satisfaction of the Engineer. The Contractor shall remove the fencing upon completion of construction, or as directed by the Engineer.

7.18.3 No work shall be done within the temporary fencing area. If any construction work is done within the temporary fencing, the Contractor shall notify the Engineer immediately; and if the Contractor entered the archaeological site area without permission, it shall stop work in this area immediately. The Engineer shall notify the archaeologist to assess any damage to the area. The Contractor shall allow the archaeologist sufficient time to perform the field investigation.

7.18.4 Any site requiring data recovery within the project shall not be disturbed until data recovery is completed.

7.19 RESPONSIBILITY FOR DAMAGE CLAIMS; INDEMNITY

7.19.1 The Contractor shall indemnify the State and the Department against all loss of or damage to the State's or the Department's existing property and facilities arising out of any act or omission committed in the performance of the work by the Contractor, any subcontractor or their employees and agents. Contractor shall defend, hold
harmless and indemnify the Department and the State, their employees, officers and agents against all losses, claims, suits, liability and expense, including but not limited to attorneys' fees, arising out of injury to or death of persons (including employees of the State and the Department, the Contractor or any subcontractor) or damage to property resulting from or in connection with performance of the work and not caused solely by the negligence of the State or the Department, their agents, officers and employees. The State or the Department may participate in the defense of any claim or suit without relieving the Contractor of any obligation hereunder. The purchase of liability insurance shall not relieve the Contractor of the obligations described herein.

7.19.2 The Contractor agrees that it will not attempt to hold the State and its Departments and Agencies and their officers, representatives, employees or agents, liable or responsible for any losses or damages to third parties from the action of the elements, the nature of the work to be done under these GENERAL CONDITIONS or from any unforeseen obstructions, acts of God, vandalism, fires or encumbrances which may be encountered in the prosecution of the work.

7.19.3 The Contractor shall pay all just claims for materials, supplies, tools, labor and other just claims against the Contractor or any subcontractor in connection with this contract and the surety bond will not be released by final acceptance and payment by the Department unless all such claims are paid or released. The
Department may, but is not obligated to, withhold or retain as much of the monies due or to become due the Contractor under this contract considered necessary by the Engineer to cover such just claims until satisfactory proof of payment or the establishment of a payment plan is presented.

7.19.4 The Contractor shall defend, indemnify and hold harmless the State and its Departments and Agencies and their officers, representatives, employees or agents from all suits, actions or claims of any character brought on account of any claims or amounts arising out of or recovered under the Workers' Compensation Laws or violation of any other law, by-law, ordinance, order or decree.

7.20 CHARACTER OF WORKERS OR EQUIPMENT

7.20.1 The Contractor shall at all times provide adequate supervision and sufficient labor and equipment for prosecuting the work to full completion in the manner and within the time required by the contract.

7.20.2 Character and Proficiency of Workers - All workers shall possess the proper license and / or certification, job classification, skill and experience necessary to properly perform the work assigned to them. All workmen engaged in special work or skilled work such as bituminous courses or mixtures, concrete pavement or structures, electrical installation, plumbing installation, or in any trade shall have sufficient experience in such work and in the operation of the equipment required to properly and satisfactorily perform all work. All workers shall make due and proper effort to execute the work in the manner prescribed in these GENERAL CONDITIONS, otherwise, the Engineer may take action as prescribed herein.

7.20.2.1 Any worker employed on the project by the Contractor or by any subcontractor who, in the opinion of the Engineer, is not careful and competent, does not perform its work in a proper and skillful manner or is disrespectful, intemperate, disorderly or neglects or refuses to comply with directions given, or is otherwise objectionable shall at the written request of the Engineer,

be removed forthwith by the Contractor or subcontractor employing such worker and shall not be employed again in any portion of the work without the written consent of the Engineer. Should the Contractor or subcontractor continue to employ, or again employ such person or persons on the project, the Engineer may withhold all payments which are or may become due, or the Engineer may suspend the work until the Engineer's orders are followed, or both.

7.20.3 Insufficient Workers - A sufficient number of workers shall be present to ensure the work is accomplished at an acceptable rate. In addition, the proper ratio of apprentice to journey worker shall be maintained to ensure the work is properly supervised and performed. In the event that the Engineer finds insufficient workers are present to accomplish the work at an acceptable rate of progress or if a adequate number of journey workers are not present and no corrective action is taken by the Contractor after being informed in writing, the Engineer may terminate the contract as provided for under Section 7.27 TERMINATION OF CONTRACT FOR CAUSE.

7.20.4 Equipment Requirements - All equipment furnished by the Contractor and used on the work shall be of such size and of such mechanical condition that the work can be performed in an acceptable manner at a satisfactory rate of progress and the quality of work produced will be satisfactory.

7.20.4.1 Equipment used on any portion of the project shall be such that no injury to the work, persons at or near the site, adjacent property or other objects will result from its use.

7.20.4.2 If the Contractor fails to provide adequate equipment for the work, the contract may be terminated as provided under Section 7.27 TERMINATION OF CONTRACT FOR CAUSE.

7.20.4.3 In the event that the Contractor furnishes and operates equipment on a force-account basis, it shall be operated to obtain maximum production under the prevailing conditions.

7.21 CONTRACT TIME

7.21.1 Time is of the essence for this contract.

7.21.2 Calculation of Contract Time - When the contract time is on a working day basis, the total contract time allowed for the performance of the work shall be the number of working days shown in the contract plus any additional working days authorized in writing as provided hereinafter. Refer to Article 1 DEFINITIONS for the definition of Working Day. The count of elapsed working days to be charged against contract time shall begin from the date of Notice to Proceed and shall continue consecutively to the date of Project Acceptance determined by the Engineer. When the contract completion time is a fixed calendar date, it shall be the date on which all work on the project shall be completed. Maintenance periods are not included within the contract time unless specifically noted in the Contract Documents.

7.21.3 Modifications of Contract Time
§3-125-4 HAR

7.21.3.1 Extensions - For increases in the scope for work caused by alterations and additional work made under Section 4.2 CHANGES, the Contractor will be granted a time extension only if the changes increase the time of performance for the Contract. If the Contractor believes that an extension of time is justified and is not adequately provided for in a Field Order, it must request the additional time sought in writing when the detailed cost breakdown required by Section 4.2 CHANGES, is submitted. The Contractor must show how the time of performance for the critical path will be affected and must also support the time extension request with schedules and statements from its subcontractors, suppliers, and/or manufacturers. Compensation for any altered or additional work will be paid as provided in Section 4.2 CHANGES.

7.21.3.2 The Department may direct changes to the work at any time until the work is finally accepted. The issuance of a Field Order at any time may alter or modify the contract duration only by the days specified therein; or if not specified therein, for the days the critical path must be extended for the change. Additional time to perform the extra work will be added to the time allowed in the contract without regard to the date the change directive was issued, even if the contract completion date has passed. A change requiring time will not constitute a waiver of pre-existing Contractor delay.

7.21.4 Delay for Permits - For delays beyond the control of the Contractor in obtaining necessary permits, one day extension for each day delay may be granted by the Engineer, provided the Contractor notifies the Engineer that the permits are not available, as soon as the delay occurs. Time extensions shall be the exclusive relief granted on account of such delays. No additional compensation will be paid for these time extensions.

7.21.5 Delays Beyond Contractor's Control
§3-125-18(4) - For delays affecting the critical path caused by acts of God, or the public enemy, fire, unusually severe weather, earthquakes, floods, epidemics, quarantine restrictions, labor disputes, freight embargoes and other reasons beyond the Contractor's

control, the Contractor may be granted an extension of time provided that:

7.21.5.1 The Contractor notifies the Engineer in writing within five (5) work days after the occurrence of the circumstances described above and states the possible effects on the completion date of the contract.

7.21.5.2 No time extension will be granted for weather conditions other than unusually severe weather occurrences, and floods.

7.21.5.3 The Contractor, if requested, submits to the Engineer within ten (10) work days after the request, a written statement describing the delay to the project. The extent of delay must be substantiated as follows:

(a) State specifically the reason or reasons for the delay and fully explain in a detailed chronology the effect of this delay to the work and/or the completion date.

(b) Submit copies of purchase order, delivery tag, and any other pertinent documentation to support the time extension request.

(c) Cite the period of delay and the time extension requested.

(d) A statement either that the above circumstances have been cleared and normal working conditions restored as of a certain day or that the above circumstances will continue to prevent completion of the project.

7.21.5.4 Time extensions shall be the exclusive relief granted and no additional compensation will be paid the Contractor for such delays.

7.21.6 Delays in Delivery of Materials - For delays in delivery of materials and / or equipment which occur as a result of unforeseeable causes beyond the control and without fault or negligence of both the Contractor, its subcontractor(s) or supplier(s), the Contractor may be granted an extension of time provided that it complies with the following procedures.

7.21.6.1 The Contractor must notify the Engineer in writing within five (5) consecutive working days after it first has any knowledge of delays or anticipated delays and state the effects such delays may have on the completion date of the contract.

7.21.6.2 The Contractor, if requested, must submit to the Engineer within ten (10) working days after a firm delivery date for the material and equipment is established, a written statement as to the delay to the progress of the project. The delay must be substantiated as follows:

(a) State specifically the reason or reasons for the delay. Explain in a detailed chronology the effect of this delay to the other work and / or the completion date.

(b) Submit copies of purchase order(s), factory invoice(s), bill(s) of lading, shipping manifest(s), delivery tag(s) and any other pertinent correspondence to support the time extension request.

(c) Cite the start and end date of the delay and the days requested therefore. The delay shall not exceed the difference between the originally scheduled delivery date versus the actual delivery date.

7.21.6.3 Time extensions shall be the exclusive relief granted and no additional compensation will be paid the Contractor on account of such delay.

7.21.7 Delays For Suspension of Work - Delay during periods of suspension of the work by the Engineer shall be computed as follows:

7.21.7.1 When the performance of the work is totally suspended for one or more days (calendar or working days, as appropriate) by order of the Engineer in accordance with paragraphs 7.24.1.1, 7.24.1.2, 7.24.1.4 or 7.24.1.6 the number of days from the effective date of the Engineer's order to suspend operations to the effective date of the Engineer's order to resume operations shall not be counted as contract time and the contract completion date will be adjusted. Should the Contractor claim for additional days in excess of the suspension period, Contractor shall provide evidence justifying the additional time. During periods of partial suspensions of the work, the Contractor will be granted a time extension only if the partial suspension affects the critical path. If the Contractor believes that an extension of time is justified for a partial suspension of work, it must request the extension in writing at least five (5) working days before the partial suspension will affect the critical operation(s) in progress. The Contractor must show how the critical path was increased based on the status of the work and must also support its claim, if requested, with statements from its subcontractors. A suspension of work will not constitute a waiver of pre-existing Contractor delay.

7.21.8 Contractor Caused Delays - No time extension will be considered for the following:

7.21.8.1 Delays in performing the work caused by the Contractor, subcontractor and / or supplier.

7.21.8.2 Delays in arrival of materials and equipment caused by the Contractor, subcontractor and / or supplier in ordering, fabricating, delivery, etc.

7.21.8.3 Delays requested for changes which the Engineer determines unjustifiable due to the lack of supporting evidence or because the change is not on the critical path.

7.21.8.4 Delays caused by the failure of the Contractor to submit for review and acceptance by the Engineer, on a timely basis, shop drawings, descriptive sheets, material samples, color samples, etc. except as covered in subsection 7.21.5 and 7.21.6.

7.21.8.5 Failure to follow the procedure within the time allowed to qualify for a time extension.

7.21.8.6 Days the Contractor is unable to work due to normal rainfall or other normal bad weather day conditions.

7.21.9 Reduction in Time - If the Department deletes any portion of the work, an appropriate reduction of contract time may be made in accordance with Section 4.2 CHANGES.

7.22 CONSTRUCTION SCHEDULE

7.22.1 The Contractor shall submit its detailed construction schedule to the Engineer prior to the start of the work. The purpose of the schedule is to allow the Engineer to monitor the Contractor's progress on the work. The schedule shall account for normal inclement weather, unusual soil or other conditions that may influence the progress of the work, schedules and coordination required by any utility, off or on site fabrications, and all other pertinent factors that relate to progress.

7.22.2 Submittal of and the Engineer's receipt of the construction schedule shall not imply the Department's approval of the schedule's breakdown, its individual elements, and any critical path that may be shown. Any acceptance or approval of the schedule 1) shall be for general format only and not for sequences or durations thereon, and 2) shall not be deemed an agreement by the Department that the construction means, methods and resources shown on the schedule will result in work that conforms to the contract requirements. The Contractor has the risk of all elements (whether or not shown) of the schedule and its execution. Additional compensation shall not be due the Contractor in the event that deviations from the Contractor's schedule, caused by any design revisions required to resolve site conditions or State, County, or utility requirements, affect the efficiency of its operations.

7.22.3 In the event the Contractor submits and the Department receives an accelerated schedule (shorter than the contract time), such will not constitute an agreement to modify the contract time or completion date, nor will the receipt, acceptance or approval of such a schedule incur any obligation by the Department.

7.22.4 Caution - The Department will not be responsible if the Contractor does not meet its accelerated schedule.

7.22.5 The requirements of this Section 7.22 CONSTRUCTION SCHEDULE may be waived by the Engineer.

7.23 STATEMENT OF WORKING DAYS - For all contracts on a working day basis, the Contractor will submit a statement of the number of working days for each month together with the Monthly Payment Application. The Monthly Payment Application will not be processed without the statement of working days.

7.24 SUSPENSION OF WORK §3-125-7 HAR

7.24.1 Procedure to be followed - The Engineer may, by written order, suspend the performance of the Work up to thirty (30) days and the Engineer, for an unlimited number of days, either in whole or in part for any cause, including but not limited to:

7.24.1.1 Weather or excess bad weather days, considered unsuitable by the Engineer for prosecution of the work; or

7.24.1.2 Soil Conditions considered unsuitable by the Engineer for prosecution of the work; or

7.24.1.3 Failure of the Contractor to:

(1) Correct conditions unsafe for the general public or for the workers;

(2) Carry out orders given by the Engineer;

(3) Perform the work in strict compliance with the provisions of the contract; or

(4) Provide a qualified Superintendent on the jobsite as described under Section 5.8 COOPERATION BETWEEN THE CONTRACTOR AND THE DEPARTMENT.

7.24.1.4 When any redesign is deemed necessary by the Engineer; or

7.24.1.5 Disturbance due to noise, odors or dust arising from the construction even if such disturbance does not

violate the section on Environmental Protection contained in the specifications; or

7.24.1.6 The convenience of the State.

7.24.2 Partial, Total Suspension of Work - Suspension of work on some but not all items of work shall be considered a partial suspension. Suspension of work on the entire work at the job site shall be considered total suspension. The period of suspension shall be computed as set forth in subsection 7.21.7 -Delays for Suspension of Work.

7.24.3 Payment §3-125-7 HAR

7.24.3.1 In the event that the Contractor is ordered by the Engineer in writing as provided herein to suspend all work under the contract in accordance with paragraphs 7.24.1.4 or 7.24.1.6, the Contractor may be reimbursed for actual direct costs incurred on work at the jobsite, as authorized in writing by the Engineer, including costs expended for the protection of the work. Payment for equipment which must standby during such suspension of work shall be made as described in clause 8.3.4.5. (e). No payment will be made for profit on any suspension costs. An allowance of five percent (5%) will be paid on any reimbursed actual costs for indirect categories of delay costs, including extended branch and home-office overhead and delay impact costs.

7.24.3.2 However, no adjustment to the contract amount or time shall be made under this Section 7.24 for any suspension, delay, or interruption:

(a) To the extent that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor; or

(b) For which an adjustment is provided for or excluded under any other provision of this Contract.

7.24.3.3 Any adjustment in contract price made pursuant to this subsection shall be determined in accordance with this Section 7.24 and Section 4.2 CHANGES.

7.24.3.4 Claims for such compensation shall be filed with the Engineer within ten (10) calendar days after the date of the order to resume work or such claims will be waived by the Contractor. Together with the claim, the Contractor shall submit substantiating documents supporting the entire amount shown on the claim. The Engineer may make such investigations as are deemed necessary and shall be the sole judge of the claim and the Engineer's decision shall be final.

7.24.4 Claims Not Allowed - No claim under this Section 7.24 shall be allowed:

7.24.4.1 For any direct costs incurred more than twenty (20) days before the Contractor shall have notified the Engineer in writing of any suspension that the Contractor considered compensable. This requirement shall not apply as to a claim resulting from a suspension order under paragraphs 7.24.1.4 or 7.24.1.6, and

7.24.4.2 Unless the claim is asserted in writing within ten (10) calendar days after the termination of such suspension, delay, or interruption, but in no case not later than the date of final payment under the contract.

7.24.4.3 No provision of this Section 7.24 shall be construed as entitling the Contractor to compensation for delays due to failure of surety, for suspensions made at the request of the Contractor, for any delay required under the Contract, for partial suspension of work or for suspensions made by the Engineer under the provisions of paragraphs 7.24.1.1, 7.24.1.2, 7.24.1.3 and 7.24.1.5.

7.25 DISPUTES AND CLAIMS §3-126-31 HAR

7.25.1 Required Notification - As a condition precedent for any claim, the Contractor must give notice in writing to the Engineer in the manner and within the time periods stated in Section 4.2 CHANGES for claims for extra compensation, damages, or an extension of time due for one or more of the following reasons:

7.25.1.1 Requirements not clearly covered in the contract, or not ordered by the Engineer as an extra;
7.25.1.2 Failure by the State and Contractor to agree to an Oral Order or an adjustment in price or contract time for a Field Order or a Change Order issued by the State;

7.25.1.3 An action or omission by the Engineer requiring performance changes beyond the scope of the contract;

7.25.1.4 Failure of the State to issue a Field Order for controversies within the scope of Section 4.2 CHANGES.

7.25.1.5 For any other type of claim, the Contractor shall give notice within the time periods set forth in contract provisions pertaining to that event. If no specific contract provisions pertain to the claim, then the written notice of claim must be submitted within fifteen (15) days of the event giving rise to the claim.

7.25.2 Continued Performance of Work - The Contractor shall at all times continue with performance of the contract in full compliance with the directions of the Engineer. Continued performance by the Contractor shall not be deemed a waiver of any claim for additional compensation, damages, or an extension of time for

completion, provided that the written notice of claim is submitted in accordance with subsection 7.25.1

7.25.3 The requirement for timely written notice shall be a condition precedent to the assertion of a claim.

7.25.4 Requirements for Notice of Claim -The notice of claim shall clearly state the Contractor's intention to make claim and the reasons why the Contractor believes that additional compensation, changes or an extension of time may be remedies to which it is entitled. At a minimum, it shall provide the following:

7.25.4.1 Date of the protested order, decision or action;

7.25.4.2 The nature and circumstances which caused the claim;

7.25.4.3 The contract provision that support the claim;

7.25.4.4 The estimated dollar cost, if any, of the protested work and how that estimate was determined; and

7.25.4.5 An analysis of the progress schedule showing the schedule change or disruption if the Contractor is asserting a schedule change or disruption.

7.25.5 If the protest or claim is continuing, the information required in subsection 7.25.4 above shall be supplemented as requested by the Engineer.

7.25.6 Final Statement for Claim - The Contractor shall provide a final written statement of the actual adjustment in contract price and/or contract time requested for each notice of claim. Such statement shall clearly set forth that it is the final statement for that notice of claim. All such final statements shall be submitted within thirty (30) days after completion of the work that is the subject of the claim, but in no event no later than thirty (30) days after the Project Acceptance Date or the date of termination of the Contractor, whichever comes first.

7.25.7 All claims of any nature are barred if asserted after final payment under this contract has been made, except as provided under Section 8.9 CLAIMS ARISING OUT OF PAYMENT FOR REQUIRED WORK.

7.25.8 Contractor may protest the assessment or determination by the Engineer of amounts due the State from the Contractor by providing a written notice to the Engineer within thirty (30) days of the date of the Engineer's written assessment or determination. Said notice shall comply with all requirements of subsections 7.25.4 and 7.25.6 above. The requirement of such notice cannot be waived and it is a condition precedent to any claim by the Contractor. Failure to comply with these notice provisions constitutes a waiver of any claim.

7.25.9 In addition to the requirements of subsections 7.25.4, 7.25.6, and 7.25.8, all final written statements of claim shall be certified. This certification requirement applies to the Contractor without exception, including, but not limited to, situations involving "pass through" claims of subcontractors or suppliers. The certification must be executed by a person duly authorized to bind the Contractor with respect to the claim. The certification shall state as follows:

7.25.9.1 "I certify that the claim is made in good faith; that the supporting data are accurate and complete to the best of my knowledge and belief; that the amount requested accurately reflects the contract adjustment for which the Contractor believes the State is liable; and that I am duly authorized to certify the claim on behalf of the Contractor."

7.25.10 Decision on Claim / Appeal - The Contracting Officer shall decide all controversies between the State and the contractor which arise under, or are by virtue of, this contract and which are not resolved by mutual agreement. The decision of the Contracting Officer on the claim shall be final and conclusive, unless fraudulent or unless the contractor delivers to the Adjutant General a written appeal of the Contracting Officer's decision no later than 30 days after the date of the Contracting Officers decision. The Adjutant General's decision shall be final and conclusive, unless fraudulent or unless the contractor brings an action seeking judicial review of the Adjutant General's decision in an appropriate circuit court of this State within six months from the date of the Adjutant General's decision.

7.25.10.1 If the contractor delivers a written request for a final decision concerning the controversy, the Adjutant General shall issue a final decision within 90 days after receipt of such a request; provided that if the Adjutant General does not issue a written decision within 90 days or within such longer period as may be agreed upon by the parties, then the contractor may proceed as if an adverse decision had been received. Both parties to this contract agree that the period of up to 30 days to appeal the Contracting Officer's decision to the Adjutant General shall not be included in the 90 day period to issue a final decision.

7.25.11 Payment and Interest - The amount determined payable pursuant to the decision, less any portion already paid, normally should be paid without awaiting Contractor action concerning appeal. Such payments shall be without prejudice to the rights of either party. Interest on amounts ultimately determined to be due to a

Contractor shall be payable at the Statutory rate applicable to judgments against the State under Chapter 662, HRS from the date of receipt of a properly certified final written statement of actual adjustment required until the date of decision; except, however, that if an action is initiated in circuit court, interest under this Section 7.25 shall only be calculated until the time such action is initiated. Interest on amounts due the State from the Contractor shall be payable at the same rate from the date of issuance of the Engineer's notice to the Contractor. Where such payments are required to be returned by a subsequent decision, interest on such payments shall be paid at the statutory rate from the date of payment.

7.25.12 Contractor shall comply with any decision of the Engineer and proceed diligently with performance of this contract pending final resolution by a circuit court of this State of any controversy arising under, or by virtue of, this contract, except where there has been a material breach of contract by the State; provided that in any event the Contractor shall proceed diligently with the performance of the contract where the Engineer has made a written determination that continuation of work under the contract is essential to the public health and safety.

7.26 FAILURE TO COMPLETE THE WORK ON TIME

7.26.1 Completion of the work within the required time is important because delay in the prosecution of the work will inconvenience the public and interfere with the State's business. In addition, the State will be damaged by the inability to obtain full use of the completed work and by increased engineering, inspection, superintendence, and administrative services in connection with the work. Furthermore, delay may detrimentally impact the financing, planning, or completion of other State projects because of the need to devote State resources to the project after the required completion date. The monetary
amount of such public inconvenience, interference with State business, and damages, is difficult, if not impossible, to accurately determine and precisely prove. Therefore, it is hereby agreed that the amount of such damages shall be the appropriate sum of liquidated damages as set forth below.

7.26.1.1 When the Contractor fails to complete the Work or any portion of the Work within the time or times fixed in the contract or any extension thereof, it is agreed the Contractor shall pay liquidated damages to the Department based upon the amount stated in the Offer form.

7.26.1.2 If the Contractor fails to correct Punch list deficiencies as required by Section 7.32 PROJECT ACCEPTANCE DATE, the State will be inconvenienced and damaged, therefore, it is agreed that the Contractor shall pay liquidated damages to the Department based upon the amount stated in the Offer Form. Liquidated damages shall accrue for all days after the Contract Completion Date or ay extension thereof until the date the Punchlist items are corrected and accepted by the Engineer.

7.26.1.3 If the Contractor fails to submit final documents as required by Section 7.33 FINAL SETTLEMENT OF THE CONTRACT, the State will be inconvenienced and damaged, therefore, it is agreed that the Contractor shall pay liquidated damages to the Department based upon the amount stated in the Offer Form. Liquidated damages shall accrue for all days after the Contract Completion Date or any extension thereof, until the date the final documents are received by the Engineer.

7.26.1.4 The Engineer shall assess the total amount of liquidated damages in accordance with the amount stated in the Offer Form and provide written notice of such assessment to the Contractor.

7.26.2 Acceptance of Liquidated Damages -The assessment of liquidated damages by the Engineer shall be accepted by the parties hereto as final, unless the Contractor delivers a written appeal of the Engineer's decision in accordance with subsection 7.25.10 requirements. Any allowance of time or remission of charges or liquidated damages shall in no other manner affect the rights or obligations of the parties under this contract nor be construed to prevent action under Section 7.27 TERMINATION OF CONTRACT FOR CAUSE. If the Department terminates the Contractor's right to proceed, the resulting damage will include such liquidated damages for such time as may be required for final completion of the work after the required contract completion date.

7.26.3 Payments for Liquidated Damages -Liquidated damages shall be deducted from monies due or that may become due to the Contractor under the contract or from other monies that may be due or become due to the Contractor from the State.

7.27 TERMINATION OF CONTRACT FOR CAUSE §3-125-18 HAR

7.27.1 Default - If the Contractor refuses or fails to perform the work, or any separable part thereof, with such diligence as will assure its completion within the time specified in this contract, or any extension thereof, fails to complete the work within such time, or commits

any other material breach of this contract, and further fails within seven (7) days after receipt of written notice from the Engineer to commence and continue correction of the refusal or failure with diligence and promptness, the Engineer may, by written notice to the Contractor, declare the Contractor in breach and terminate the Contractor's right to proceed with the work or the part of the work as to which there has been delay or other breach of contract. In such event, the Department may take over the work and perform the same to completion, by contract or otherwise, and may take possession of, and utilize in completing the work, the materials, appliances, and plant as may be on the site of the work and necessary therefore. Whether or not the Contractor's right to proceed with the work is terminated, the Contractor and the Contractor's sureties shall be liable for any damage to the Department resulting from the Contractor's refusal or failure to complete the work within the specified time.

7.27.2 Additional Rights and Remedies - The rights and remedies of the Department provided in this contract are in addition to any other rights and remedies provided by law.

7.27.3 Costs and Charges

7.27.3.1 All costs and charges incurred by the Department, together with the cost of completing the work under contract, will be deducted from any monies due or which would or might have become due to the Contractor had it been allowed to complete the work under the contract. If such expense exceeds the sum which would have been payable under the contract, then the Contractor and the surety shall be liable and shall pay the Department the amount of the excess.

7.27.3.2 In case of termination, the Engineer shall limit any payment to the Contractor to the part of the contract satisfactorily completed at the time of termination. Payment will not be made until the work
has satisfactorily been completed and the tax clearance required by Section 8.8 FINAL PAYMENT is submitted by the Contractor. Termination shall not relieve the Contractor or Surety from liability for performance liquidated damages.

7.27.4 Erroneous Termination for Cause - If, after notice of termination of the Contractor's right to proceed under this Section 7.27, it is determined for any reason that good cause did not exist to allow the Department to terminate as provided herein, the rights and obligations of the parties shall be the same as, and the relief afforded the Contractor shall be limited to, the provisions contained in Section 7.28 TERMINATION FOR CONVENIENCE.

7.28 TERMINATION FOR CONVENIENCE

§3-125-22 HAR

7.28.1 Termination - The Engineer may, when the interests of the State so require, terminate this contract in whole or in part, for the convenience of the State. The Engineer shall give written notice of the termination to the Contractor specifying the part of the contract terminated and when termination becomes effective.

7.28.2 Contractor's Obligations - The Contractor shall incur no further obligations in connection with the terminated work and on the date set in the notice of termination the Contractor will stop work to the extent specified. The Contractor shall also terminate outstanding orders and subcontracts as they relate to the terminated work. The Contractor shall settle the liabilities and claims arising out of the termination of subcontracts and orders connected with the terminated work subject to the State's approval. The Engineer may direct the Contractor to assign the Contractor's right, title, and interest under terminated orders or subcontracts to the State. The Contractor must still complete the work not terminated by the notice of termination.

7.28.3 Right to Construction and Goods - The Engineer may require the Contractor to transfer title and delivery to the State in the manner and to the extent directed by the Engineer, the following:

7.28.3.1 Any completed work; and

7.28.3.2 Any partially completed construction, goods, materials, parts, tools, dies, jigs, fixtures, drawings, information, and contract rights (hereinafter called "construction material") that the Contractor has specifically produced or specially acquired for the performance of the terminated part of this contract.

7.28.3.3 The Contractor shall protect and preserve all property in the possession of the Contractor in which the State has an interest. If the Engineer does not elect to retain any such property, the Contractor shall use its best efforts to sell such property and construction material for the Department's account in accordance with the standards of section 490:2-706, HRS.

7.28.4 Compensation

7.28.4.1 Contractor shall submit a termination claim specifying the amounts due because of the termination for convenience together with cost or pricing data, submitted to the extent required by subchapter 15, chapter 3-122, HAR. If the Contractor fails to file a termination claim within one year from the effective date of termination, the Engineer may pay the Contractor, if at all, an amount set in accordance with paragraph 7.28.4.3.

7.28.4.2 The Engineer and the Contractor may agree to a settlement provided the Contractor has filed a termination claim supported by cost or pricing data submitted as required and that the settlement does not exceed the total contract price plus settlement costs reduced by payments previously made by the State, the proceeds of any sales of construction, supplies, and construction materials under paragraph 7.28.3.3 of this Section, and the contract price of the work not terminated.

7.28.4.3 Absent complete agreement, the Engineer shall pay the Contractor the following amounts, less any payments previously made under the contract.

(a) The cost of all contract work performed prior to the effective date of the notice of termination work plus a five percent (5%) markup on the actual direct costs, including amounts paid to subcontractor, less amounts previously paid or to be paid for completed portions of such work; provided, however, that if it appears that the Contractor would have sustained a loss if the entire contract would have been completed, no markup shall be allowed or included and the amount of compensation shall be reduced to reflect the anticipated rate of loss. No anticipated profit or consequential damage will be due or paid.

(b) Subcontractors shall be paid a markup of ten percent (10%) on their direct job costs incurred to the date of termination. No anticipated profit or consequential damage will be due or paid to any subcontractor. These costs must not include payments made to the Contractor for subcontract work during the contract period.

(c) In any case, the total sum to be paid the Contractor shall not exceed the total contract price reduced by the amount of any sales of construction supplies, and construction materials.

7.28.4.4 Costs claimed, agreed to, or established by the State shall be in accordance with chapter 3-123, HAR.

7.29 CORRECTING DEFECTS - If the Contractor fails to commence to correct any defects of any nature, within ten (10) working days after the correction thereof has been requested in writing by the State, and thereafter to expeditiously complete the correction of said defects, the Engineer may without further notice to the Contractor or surety and without termination of contract, correct the defects and deduct the cost thereof from the contract price.

7.30 FINAL CLEANING - Before final inspection of the work, the Contractor shall clean all ground occupied by the Contractor in connection with the Work of all rubbish, excess materials, temporary structures and equipment, and all parts of the work must be left in a neat and presentable condition to the satisfaction of the Engineer. However, the Contractor shall not remove any warning and directional signs prior to the formal acceptance by the Engineer. Full compensation for final cleaning will be included in the prices paid for the various items of work or lump sum bid, as the case may be, and no separate payment will be made therefore.

7.31 SUBSTANTIAL COMPLETION, AND FINAL INSPECTION - Before the Department accepts the project as being completed, unless otherwise stipulated by the Engineer, the following procedure shall be followed:

7.31.1 Substantial Completion:

7.31.1.1 The Contractor and its subcontractors shall inspect the project to confirm whether the Project is Substantially Complete. This inspection effort shall include the testing of all equipment and providing a Punch list that identifies deficiencies which must be corrected. Contractor shall make the corrections and if required repeat the procedure. Also, the Contractor shall schedule final Building, Plumbing, Electrical, Elevator, Fire and other required inspections and obtain final approvals.

(a) When in compliance with the above requirements, the Contractor shall notify the Engineer in writing that project is Substantially Complete and ready for a Final Inspection. Along with the Substantial Completion notification, the Contractor shall provide its Punch list(s) with the status of the deficiencies and dates when the deficiencies were corrected. The Project Inspector and / or the Engineer shall make a preliminary determination whether project is Substantially Complete.

(b) If the Project is not Substantially Complete, the Engineer shall inform the Contractor. The Contractor shall identify deficiencies which must be corrected, update its Punch list, make the necessary corrections and repeat the previous step. After completing the necessary work, the Contractor shall notify the Engineer in writing that Punch list deficiencies have been corrected and the project is ready for a Final Inspection.

(c) If the Project is Substantially Complete, the Engineer shall schedule a Final Inspection within fifteen (15) days of the Contractor's notification letter or as otherwise determined by the Engineer.

7.31.1.2 In addition, and to facilitate closing of the project, the Contractor shall also proceed to obtain the following closing documents (where applicable) prior to the Final Inspection:

(1) Field-Posted As-Built Drawings.

(2) Maintenance Service Contract and two (2) copies of a list of all equipment.

(3) Operating and maintenance manuals.

(4) Air conditioning test and balance reports.

(5) Any other final submittal required by the technical sections of the contract.

7.31.2 Final Inspection: If at the Final Inspection the Engineer determines that all work is completed, the Engineer shall notify the Contractor in accordance with Section 7.32 PROJECT ACCEPTANCE DATE. Should there be remaining deficiencies which must be corrected, the Contractor shall provide an updated Punch list to the Engineer, within five (5) days from the Final Inspection Date. The Contractor shall make the necessary corrections.

7.31.2.1 The Engineer shall confirm the list of deficiencies noted by the Contractor's punch list(s) and will notify the Contractor of any other deficiencies that must be corrected before final settlement.

7.31.3 The Engineer may add to or otherwise modify the Punch list from time to time. The Contractor shall take immediate action to correct the deficiencies.

7.31.4 Revoking Substantial Completion - At any time before final Project Acceptance is issued, the Engineer may revoke the determination of Substantial Completion if the Engineer finds it was not warranted. The Engineer shall notify the Contractor in writing with the reasons and outstanding deficiencies negating the declaration. Once notified, the Contractor shall make the necessary corrections and repeat the required steps noted in subsections 7.31.1 and 7.31.2.

7.32 PROJECT ACCEPTANCE DATE

7.32.1 If upon Final Inspection, the Engineer finds that the project has been satisfactorily completed in compliance with the contract, the Engineer shall declare the project completed and accepted and will notify the Contractor in writing of the acceptance by way of the Project Acceptance Notice.

7.32.2 Protection and Maintenance - After the Project Acceptance Date, the Contractor shall be relieved of maintaining and protecting the work EXCEPT that this does not hold true for those portions of the work which have not been accepted, including Punch list deficiencies. The State shall be responsible for the protection and maintenance of the accepted facility.

7.32.3 The date of Project Acceptance shall determine:

7.32.3.1 End of Contract Time.

7.32.3.2 Commencement of all guaranty periods except as noted in Section 7.34 CONTRACTOR'S RESPONSIBILITY FOR WORK: RISK OF LOSS.

7.32.3.3 Commencement of all maintenance services except as noted in Section 7.34 CONTRACTOR'S RESPONSIBILITY FOR WORK: RISK OF LOSS.

7.32.4 Punch list Requirements - If a Punch list is required under Section 7.31 SUBSTANTIAL COMPLETION AND FINAL INSPECTION, the Project Acceptance Notice will include the Engineer's Punch list and the date when correction of the deficiencies must be completed.

7.32.4.1 Punch list corrective work shall be completed prior to Contract Completion Date, or extension thereof.

7.32.5 Upon receiving the Punch list, the Contractor shall promptly devote the required time, labor, equipment, materials and incidentals necessary to correct the deficiencies expeditiously.

7.32.6 For those items of work that cannot be completed by the established date, the Contractor shall submit a schedule in writing to the Engineer for approval along with documentation to justify the time required, no later than five (5) working days before the date stipulated for completion of the Punch list work. A Proposed schedule submitted after the five (5) day period will not be considered.

7.32.7 Failure to Correct Deficiencies - If the Contractor fails to correct the deficiencies within the time established in paragraph 7.32.4.1, the Contracting Officer shall assess liquidated damages as required by Section 7.26 - FAILURE TO COMPLETE THE WORK ON TIME.

7.32.8 If the Contractor fails to correct the deficiencies and complete the work by the established or agreed to date, the State also reserves the right to correct the deficiencies by whatever method it deems necessary and deduct the cost from the final payment due the contractor.

7.32.9 The Contractor may further be prohibited from bidding in accordance with Section 2.12 - DISQUALIFICATION OF BIDDERS. In addition, assessment of damages shall not prevent action under

Section 7.27 - TERMINATION OF CONTRACT FOR CAUSE.

7.33 FINAL SETTLEMENT OF CONTRACT - The contract will be considered settled after the project acceptance date and when the following items have been satisfactorily submitted, where applicable:

7.33.1 Necessary Submissions in addition to the items noted under paragraph 7.31.1.2.

7.33.1.1 All written guarantees required by the contract.

7.33.1.2 Complete and certified weekly payrolls for the Contractor and its Subcontractor(s).

7.33.1.3 Certificate of Plumbing and Electrical Inspection.

7.33.1.4 Certificate of Building Occupancy.

7.33.1.5 Certificates for Soil Treatment and Wood Treatment.

7.33.1.6 Certificate of Water System Chlorination.

7.33.1.7 Certificate of Elevator Inspection, Boiler and Pressure Pipe installation.

7.33.1.8 All other documents required by the Contract.

7.33.2 Failure to Submit Closing Documents - The Contractor shall submit the final Payment Application and the above applicable closing documents within sixty (60)
days from the date of Project Acceptance or the agreed to Punch list completion date. Should the Contractor fail to comply with these requirements, the Engineer may terminate the Contract for cause. The pertinent provisions of Section 7.27 TERMINATION OF CONTRACT FOR CAUSE shall be applicable.

7.33.3 In addition, should the Contractor fail to furnish final closing documents within the required time period, the Engineer shall assess performance liquidated damages as required by Section 7.26 FAILURE TO COMPLETE THE WORK ON TIME.

7.34 CONTRACTOR'S RESPONSIBILITY FOR WORK; RISK OF LOSS

7.34.1 Until the establishment of the Project Acceptance Date or Beneficial Occupancy whichever is sooner, the Contractor shall take every necessary precaution against injury or damage to any part of the work caused by the perils insured by an All Risk policy excluding earthquakes and floods, whether arising from the execution or from the non-execution of the work. The Contractor shall rebuild, repair, restore and make good all injuries or damage to any portion of the work occasioned by the perils insured by an All Risk policy before the date of final acceptance and shall bear the risk and expense thereof.

7.34.2 After the Project Acceptance Date or Beneficial Occupancy whichever is sooner, the Contractor shall be relieved of maintaining and protecting the work except for those portions of the work which have not been accepted including Punch list deficiencies.

7.34.3 The risk of damage to the work from any hazard or occurrence that may be covered by a required Property Insurance policy is that of the Contractor, unless such risk of loss is placed elsewhere by express language in the contract documents. No claims for any loss or damage shall be recognized by the Department, nor will any such loss or damage excuse the complete and satisfactory performance of the contract by the Contractor.

7.35 GUARANTEE OF WORK

7.35.1 In addition to any required manufacturers warranties, all work and equipment shall be guaranteed by the Contractor against defects in materials, equipment or workmanship for one year from the Project Acceptance Date or as otherwise specified in the Contract Documents, whichever is earlier.

7.35.2 Repair of Work - If, within any guarantee period, repairs or changes are required in connection with the guaranteed work, which in the opinion of the Engineer is necessary due to materials, equipment or workmanship which are inferior, defective or not in accordance with the terms of the Contract, the Contractor shall within five (5) working days and without expense to the Department commence to:

7.35.2.1 Place in satisfactory condition in every instance all such guaranteed work and correct all defects therein; and

7.35.2.2 Make good and repair or replace to new or pre-existing condition all damages to the building, facility, work or equipment or contents thereof, resulting from such defective materials, equipment or installation thereof.

7.35.3 Manufacturer's and Installer's Guarantee- Whenever a manufacturer's or installer's guarantee on any product specified in the respective Specification sections, exceeds one year, this guarantee shall become part of this contract in addition to the Contractor's guarantee. Contractor shall complete the guarantee forms in the name of the Department and submit such

forms to the manufacturer within such time required to validate the guarantee. Contractor shall submit to the Department a photocopy of the completed guarantee form for the Department's record as evidence that such guarantee form was executed by the manufacturer.

7.35.4 If a defect is discovered during a guarantee period, all repairs and corrections to the defective items when corrected shall again be guaranteed for the original full guarantee period. The guarantee period shall be tolled and suspended for all work affected by the defect. The guarantee period for work affected by the defect shall restart for its remaining duration upon confirmation by the Engineer that the deficiencies have been repaired or remedied.

7.35.5 If guarantee is specified for greater than two (2) years, two (2) years shall prevail except for manufacturer's warranties. Manufacturer's warranties shall remain as specified in their respective Specification sections.

7.35.5.1 However, the number of years specified in the technical specifications shall prevail only if it is stated that the number of years for guarantee supersedes this provision.

7.36 WORK OF AND CHARGES BY UTILITIES

7.36.1 The Contractor shall be responsible for scheduling and coordinating the work with the utility companies and applicable Governmental agencies for permanent service installation and connections or modifications to existing utilities. The Contractor shall make available all portions of the work necessary for the Utility companies to do their work. The Department shall not bear the risk of any damage to the contract work caused by any utility company, and work of repairing such damage and delay costs must be resolved between the Contractor and the utility company and their insurers.

7.36.2 Unless stated as an allowance item to be paid by the Contractor, the Department will pay the utility companies and applicable governmental agencies directly for necessary modifications and connections. Contractor charges for overhead, supervision, coordination, profit, insurance and any other incidental expenses shall be included in the Contractor's Bid whether the utility is paid directly by the Department or by an allowance item in the Contract.

7.3*7* RIGHT TO AUDIT RECORDS

7.37.1 Pursuant to Section 103D-317 HRS the State, at reasonable times and places, may audit the books and records of a Contractor, prospective contractor, subcontractor and prospective subcontractor relating to the Contractor's or subcontractor's cost or pricing data. The books and records shall be maintained by the Contractor and subcontractor(s) for a period of four (4) years from the date of final payment under the contract.

7.37.2 The Contractor shall insure that its subcontractors comply with this requirement and shall bear all costs (including attorney's fees) of enforcement in the event of its subcontractor's failure or refusal to fully cooperate.

7.37.3 Additionally, Sections 231-7, 235-108, 237-39 and other HRS chapters through reference, authorizes the Department of Taxation to audit all taxpayers conducting business within the State. Contractors must make available to the Department of Taxation all books and records necessary to verify compliance with the tax laws.

7.38 RECORDS MAINTENANCE, RETENTION AND ACCESS

7.38.1 The Contractor and any subcontractor whose contract for services is valued at $25,000 or more shall, in accordance with generally acceptable accounting practices, maintain fiscal records and supporting documents and related files, papers, and reports that adequately reflect all direct and indirect expenditures and management and fiscal practices related to the Contractor and subcontractor's performance of services under this Agreement.

7.38.2 The representative of the Department, the Adjutant General of the State of Hawaii, the Attorney General, (the Federal granting agency, the Comptroller General of the United States, and any of their authorized representatives when federal funds are utilized), and the Legislative Auditor of the State of Hawaii shall have the right of access to any book, document, paper, file, or other record of the Contractor and any subcontractor that is related to the performance of services under this Agreement in order to conduct an audit or other examination and / or to make copies, excerpts and transcripts for the purposes of monitoring and evaluating the Contractor and subcontractor's performance of services and the Contractor and subcontractor's program, management, and fiscal practices to assure the proper and effective expenditure of funds and to verify all costs associated with any claims made under this Agreement.

7.38.3 The right of access shall not be limited to the required retention period but shall last as long as the records are retained. The Contractor and subcontractor shall retain all records related to the Contractor and subcontractor's performance of services under this Agreement for four (4) years from the date of final

payment, except that if any litigation, claim, negotiation, investigation, audit or other action involving the records has been started before the expiration of the four (4) year period, the Contractor and subcontractors shall retain the records until completion of the action and resolution of all issues that arise from it, or until the end of the four (4)) year retention period, whichever occurs later. Furthermore, it shall be the Contractor's responsibility to enforce compliance with this provision by any subcontractor.

ARTICLE 8 - Measurement and Payment

8.1 MEASUREMENT OF QUANTITIES

8.1.1 All work completed under the Contract shall be measured by the Engineer according to United States standard measures, or as stated in this Contract. The method of measurement and computations to be used in determination of quantities of material furnished and of work performed under the contract shall conform to good engineering practice. These measurements shall be considered correct and final unless the Contractor has protested same to the Engineer and has demonstrated the existence of an error by actual physical measurement before the work has progressed in a manner which would prohibit a proper check.

8.1.2 All measurements of the area of the various surface, pavement and base courses will be made in the horizontal projection of the actual surface and no deductions will be made for fixtures or structures having an area of nine (9) square feet or less. All measurements of headers, curbs, fences and any other type of construction which is to be paid for by its length, will be made in the horizontal projection of the actual driven length from toe to top of cutoff, except where slope exceeds ten percent (10%) and for piles, which will be by actual length. All materials which are specified for measurement by the cubic yard "Loose Measurement" or "Measured in the Vehicle" shall be hauled in approved vehicles and measured therein at the point of delivery. Approved vehicles for this purpose may be of any type or size satisfactory to the Engineer, provided that the body is of such type that the actual contents may be readily and accurately determined. Unless all approved vehicles on a job are of a uniform capacity each approved vehicle must bear a plainly legible identification mark indicating the specific approved capacity. The Inspector may reject all loads not hauled in such approved vehicles.

8.2 NO WAIVER OF LEGAL RIGHTS - The Engineer shall not be precluded or estopped by any measurements, estimate or certificate made either before or after the completion and acceptance of the work and payment therefore, from showing the true amount and character of the work performed and materials furnished by the Contractor, or from showing that any such measurement estimate or certificate is untrue or incorrectly made, or rejecting the work or materials that do not conform in fact to the contract. The Engineer shall not be precluded or estopped, notwithstanding any such measurement, estimate, or certificate and payment in accordance therewith, from recovering from the Contractor and its sureties such damages as the Department may sustain by reason of the Contractor's failure to comply with the terms of the contract. Neither the acceptance by the Engineer or any representative of the Engineer, nor any payment for or acceptance of the whole or any part of the work, nor any extension of time, or any possession taken by the Engineer, shall operate as a waiver of any portion of the contract, or of any power herein reserved, or any right to damage herein provided. A waiver of any notice requirement or breach of the contract shall not be held to be a waiver of any other notice requirement or subsequent breach.

8.3 PAYMENT FOR ADDITIONAL WORK

8.3.1 Payment for Changed Conditions – A contract modification or change order complying with section 4.4 PRICE ADJUSTMENT and section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT shall be issued for all changes that are directed under Section 4.2 CHANGES. No payment for any change including work performed under the force account provisions will be made until a change order is issued or contract modification is executed.

8.3.1.1 At the completion of the force account work or at an intermediate interval approved by the Engineer, the contractor shall submit its force account cost proposal, including; approved daily force account records with any attached invoices or receipt, to the Engineer for processing a contract modification or change order.

8.3.2 On credit proposals and proposals covering both increases and decreases, the application of overhead and profit shall be on the net change in direct costs for the performance of the work.

8.3.3 When payment is to be made for additional work directed by a field order, the total price adjustment as specified in the field order or if not specified therein for the work contained in the related change order shall be considered full compensation for all materials, labor, insurance, taxes, equipment use or rental and overheads, both field and home office including extended home and branch office overhead and other related delay impact costs.

8.3.4 Force Account Method - When, for the convenience of the Department, payment is to be made

by the Force Account method, all work performed or labor and materials and equipment furnished shall be paid for as described below. Payment by the Force Account method will not alter any rights, duties and obligations under the contract.

8.3.4.1 Labor - For all hourly workers, the Contractor will receive the rate of wage including fringe benefits when such amounts are required by collective bargaining agreement or other employment contract generally applicable to the classes of labor employed on the work, which shall be agreed upon in writing before beginning work for each and every hour that said labor is actually engaged in said work.

(a) All markups for overhead and profit shall be added subject to limitations established in Section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT.

(b) No allowance for overtime compensation will be given without the written approval of the Engineer prior to performance of such work.

8.3.4.2 Insurance and Taxes - The Contractor and subcontractor(s) will also receive the actual additional costs paid for property damage, liability, workers compensation insurance premiums, State unemployment contributions, Federal unemployment taxes, social security and Medicare taxes to which a markup of up to six percent (6%) may be added.

8.3.4.3 Materials - For materials accepted by the Engineer and used, the Contractor and subcontractor(s) shall receive the actual cost of such materials delivered and incorporated into work, plus a markup allowed under Section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT.

8.3.4.4 Subcontractors - Subcontractor costs shall be the actual costs of the subcontractor marked up as defined in this Section 8.3 plus a markup allowed under Section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT.

8.3.4.5 Equipment

(1) For machinery or special equipment (other than small tools as herein defined in clause 8.3.4.5.(h) owned or leased by the Contractor or a related entity, the use of which has been authorized by the Engineer:

(a.) The Contractor will be paid at the per-hour rental rates based on the monthly rate established for said machinery or equipment in the then-current edition of the Rental Rate Blue Book for Construction Equipment including the estimated operating cost per hour and regional correction provided therein.

(b.) If no rate is listed for a particular kind, type or size of machinery or equipment, then the monthly, hourly rates shall be as agreed upon in writing by the Contractor and the Engineer prior to the use of said machinery or equipment. If there is no agreement, the Engineer will set a rate. The Contractor may contest the rate pursuant to Section 7.25 DISPUTES AND CLAIMS.

(c.) Rental rates which are higher than those specified in the aforesaid Rental Rate Blue Book publication may be allowed where such higher rates can be justified by job conditions such as work in water and work on lava, etc. Request for such higher rates shall be submitted in writing to the Engineer for approval prior to the use of the machinery or equipment in question.

(2) For machinery or special equipment (other than small tools as herein defined in clause 8.3.4.5.(h) rented by the Contractor or a related entity specifically for the Force Account work, the use of which has been authorized by the Engineer; The Contractor will be paid the actual rental cost for the machinery or equipment, including mobilization and demobilization costs. A receipt from the equipment supplier shall be submitted to the Engineer.

(3) For machinery or special equipment (other than small tools as herein defined in clause 8.3.4.5. (h) rented by the Contractor or a related entity for use in the project, but which will also be used for the Force Account work, the use of which has been authorized by the Engineer; The Contractor will be paid the actual rental cost for the machinery or equipment. No additional mobilization and demobilization costs will be paid. A receipt from the equipment supplier shall be submitted to the Engineer.

(4) The rental rate for trucks not owned by the Contractor shall be those as established under the Hawaii State Public Utilities Commission, which will be paid for as an equipment item pursuant to paragraph 8.3.4.5. Rental rates for Contractor-owned trucks not listed in the Rental Rate Blue Book shall be agreed upon in writing by the Contractor and Engineer prior to the use of said trucks. If there is no agreement, the Engineer shall set the rate. The Contractor may contest the rate

pursuant to Section 7.25 DISPUTES AND CLAIMS.

(5) The rental period shall begin at the time equipment reaches the site of work, shall include each day that the machinery or equipment is at the site of the work and shall terminate at the end of the day on which the equipment is no longer needed. In the event the equipment must standby due to work being delayed or halted by reason of design, traffic, or other related problems uncontrollable by the Contractor, excluding Saturdays, Sundays and Legal Holidays, unless the equipment is used to perform work on such days, the rental shall be two hours per day until the equipment is no longer needed.

(5.1) The rental time to be paid will be for the time actually used. Any hours or operation in excess of 8 hours in any one day must be approved by the Engineer prior to the performance of such work.

(5.2) Rental time will not be allowed or credited for any day on which machinery or equipment is inoperative due to its breakdown. On such days, the Contractor will be paid only for the actual hours, if any, that the machinery or equipment was in operation.

(5.3) In the event the Force Account work is completed in less than 8 hours, equipment rental shall nevertheless be paid for a minimum 8 hours.

(5.4) For the purpose of determining the rental period the continuous and consecutive days shall be the normal 8-hour shift work day, Monday through Friday excluding legal holidays. Any work day to be paid less than 8 hours shall not be considered as continuous, except for equipment removed from rental for fuel and lubrication.

(5.5) No additional premium beyond the normal rates used will be paid for equipment over 8 hours per day or 40 hours per week.

(6) All rental rates for machinery and equipment shall include the cost of fuel, oil, lubricants, supplies, small tools, necessary attachments, repairs, maintenance, tire wear, depreciation, storage, and all other incidentals.

(7) All machinery and equipment shall be in good working condition and suitable for the purpose for which the machinery and equipment is to be used.

(8) Individual pieces of equipment or tools having a replacement value of one thousand dollars ($1,000) or less, whether or not consumed by use, shall be considered to be small tools and included in the allowed markup for overhead and profit and no separate payment will be made therefore.

(9) The total of all Force Account rental charges accrued over the duration of the contract for a specific item of equipment shall not exceed the replacement cost of that equipment.

(9.1) The Contractor shall provide the cost of replacement to the Engineer prior to using the equipment. If the Engineer does not agree with the replacement cost, the Engineer shall set the replacement cost. The Contractor may contest the replacement cost pursuant to Section 7.25 DISPUTES AND CLAIMS.

(10) Should the item of equipment be rented from an unrelated entity, the rental cost will be treated as an equipment cost under paragraph 8.3.4.5.

(11) Transportation and/or Mobilization: The following provisions shall govern in determining the compensation to be paid to the Contractor for use of equipment or machinery on the Force Account method:

(11.1) The location from which the equipment is to be moved or transported shall be approved by the Engineer.

(11.2) Where the equipment must be transported to the site of the force account work, the Department will pay the reasonable cost of mobilizing and transporting the equipment, including its loading and unloading, from its original location to the site of force account work. Upon completion of the work the Department will pay the reasonable cost of mobilizing and transporting the equipment back to its original location or to another location, whichever cost is less.

(11.3) The cost of transporting the equipment shall not exceed the rates established by the Hawaii State Public Utilities Commission. If such rates are nonexistent, then the rates will be determined by the Engineer based upon the prevailing rates charged by established haulers within the locale.

(11.4) Where the equipment is self-propelled, the Department will pay the cost of moving the equipment by its own power from its original location to the site of the force account work. Upon completion of the work the Department will pay the reasonable cost of moving of the Equipment back to its original or another location, whichever cost is less.

(11.5) At the discretion of the Engineer, when the Contractor desires to use such equipment for other than Force Account work, the costs of mobilization and transportation shall be prorated between the Force Account and non Force Account work.

(l2) Pickup trucks, vans, storage trailers, unless specifically rented for the Force Account work, shall be considered incidental to the Force Account work and the costs therefore are included in the markup allowed under Section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT.

8.3.4.6 State Excise (Gross Income) Tax and Bond - A sum equal to the current percentage rate for the State excise (Gross Income) tax on the total sum determined in paragraphs 8.3.4.1, 8.3.4.2, 8.3.4.3 and 8.3.4.4 above, and the bond premium shall be added as compensation to the Contractor. The actual bond premium not to exceed one percent (1%) shall be added to items covered by paragraphs 8.3.4.1, 8.3.4.2, 8.3.4.3 and 8.3.4.4 when applicable.

(1) The compensation as determined in paragraphs 8.3.4.1, 8.3.4.2, 8.3.4.3, 8.3.4.4 and 8.3.4.5 above shall be deemed to be payment in full for work paid on a force account basis.

8.3.4.7 Records - The Contractor and the Engineer shall compare records of the labor, materials and equipment rentals paid by the Force Account basis at the end of each day. These daily records, if signed by both parties, shall thereafter be the basis for the quantities to be paid for by the Force Account method. The Contractor shall not be entitled to payment for Force Account records not signed by the Engineer.

8.3.4.8 Statements - No payment will be made for work on a Force Account basis until the Contractor has submitted to the Engineer, duplicate itemized statements of the cost of such Force Account work detailed as follows:

(a) Laborers - Name, classification, date, daily hours, total hours, rate, and extension for each laborer and foreman and also the amount of fringe benefits payable if any.

(b) Equipment - Designation, dates, daily hours, total hours, rental rate, and extension for each unit of machinery and equipment.

(c) Materials

(c.1) Quantities of materials, prices and extensions

(c.2) Costs of transporting materials, if such cost is not reflected in the prices of the materials.

(c.3) Statements shall be accompanied and supported by receipted invoices for all materials used and transportation charges. However, if materials used on the Force Account work are not specifically purchased for such work but are taken from the Contractor's stock, then in lieu of the invoices the Contractors shall submit an affidavit certifying that such materials were taken from stock and that the amount claimed represents the actual cost to the Contractor.

(d) Insurance - Cost of property damage, liability and worker's compensation insurance premiums, unemployment insurance contributions, and social security tax.

8.4 PROGRESS AND / OR PARTIAL PAYMENTS

8.4.1 Progress Payments - The Contractor will be allowed progress payments on a monthly basis upon preparing the Monthly Payment Application forms and submitting them to the Engineer. The monthly payment shall be based on the items of work satisfactorily completed and the value thereof at unit prices and/or lump sum prices set forth in the contract as determined by the Engineer and will be subject to compliance with Section 7.9 PAYROLLS AND PAYROLL RECORDS.

8.4.2 In the event the Contractor or any Subcontractor fails to submit certified copies of payrolls in accordance with the requirements of Section 7.9 PAYROLLS AND PAYROLL RECORDS, the Engineer may retain the amount due for items of work for which payroll affidavits have not been submitted on a timely basis notwithstanding satisfactory completion of the work until such records have been duly submitted. The Contractor shall not be due any interest payment for any amount thus withheld.

8.4.3 Payment for Materials - The Contractor will also be allowed payments of the manufacturer's, supplier's, distributor's or fabricator's invoice cost of accepted materials to be incorporated in the work on the following conditions:

8.4.3.1 The materials are delivered and properly stored at the site of Work; or

8.4.3.2 For special items of materials accepted by the Engineer, the materials are delivered to the Contractor or subcontractor(s) and properly stored in an acceptable location within a reasonable distance to the site of Work.

8.4.4 Partial payments shall be made only if the Engineer finds that:

8.4.4.1 The Contractor has submitted bills of sale for the materials or otherwise demonstrates clear title to such materials.

8.4.4.2 The materials are insured for their full replacement value to the benefit of the Department against theft, fire, damages incurred in transportation to the site, and other hazards.

8.4.4.3 The materials are not subject to deterioration.

8.4.4.4 In case of materials stored off the project site, the materials are not commingled with other materials not to be incorporated into the project.

8.5 PROMPT PAYMENT §3-125-23 HAR

8.5.1 Any money paid to a Contractor for work performed by a subcontractor shall be disbursed to such subcontractor within ten (10) days after receipt of the money in accordance with the terms of the subcontract; provided that the subcontractor has met all the terms and conditions of the subcontract and there are no bona fide disputes on which the Engineer has withheld payment.

8.5.2 Upon final payment to the Contractor, full payment to all subcontractors shall be made within ten (10) days after receipt of the money, provided there are no bona fide disputes over the subcontractor's performance under the subcontract.

8.5.3 All sums retained or withheld from a subcontractor and otherwise due to the subcontractor for satisfactory performance under the subcontract shall be paid by the contracting officer to the contractor and subsequently, upon receipt from the contracting officer, by the contractor to the subcontractor within the applicable time periods specified in subsection 8.5.2 and section 103-10 HRS.

8.5.3.1 Where a subcontractor has provided evidence to the contractor of satisfactorily completing all work under their subcontract and has provided a properly documented final payment request as described in subsection (8.5.5) of this section, and;

8.5.3.1.a Has provided to the contractor an acceptable performance and payment bond for the project executed by a surety company authorized to do business in the State, as provided in section 8.6 RETAINAGE; or

8.5.3.1.b The following has occurred:

8.5.3.1.b.1 A period of ninety days after the day on which the last of the labor was done or performed and the last of the material was furnished or supplied has elapsed without written notice of a claim given to contractor and the surety, as provided for in section 103D-324 HRS; and

8.5.3.1.b.2 The subcontractor has provided to the contractor:

8.5.3.1.b.2.1 An acceptable release of retainage bond, executed by a surety company authorized to do business in the State, in an amount of not more than two times the amount being retained or withheld by the contractor.

8.5.3.1.b.2.2 Any other bond acceptable to the contractor; or

8.5.3.1.b.2.3 Any other form of mutually acceptable collateral.

8.5.4 If the contracting officer or the contractor fails to pay in accordance with this section, a penalty of one and one-half per cent per month shall be imposed upon the outstanding amounts due that were not timely paid by the responsible party. The penalty may be withheld from future payment due to the contractor, if the contractor was the responsible party. If a contractor has violated subsection 8.5.2 three or more times within two years of the first violation, the contractor shall be referred by the contracting officer to the contractor license board for action under section 444-17(14) HRS.

8.5.5 Final Payment Request. A properly documented final payment request from a subcontractor, as required by subsection 8.5.3, shall include:

8.5.5.1 Substantiation of the amounts requested;

8.5.5.2 A certification by the subcontractor, to the best of the subcontractor's knowledge and belief, that:

8.5.5.2.a The amounts requested are only for performance in accordance with the specification, terms, and conditions of the subcontract;

8.5.5.2.b The subcontractor has made payments due to its subcontractors and suppliers from previous payments received under the subcontract and will make timely payments from the proceeds of the payment covered by the certification, in accordance with their subcontract agreements and the requirements of this section; and

8.5.5.2.c The payment request does not include any amounts that the subcontractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of their subcontract; and

8.5.5.2.d The submission of documentation confirming that all other terms and conditions required under the subcontract agreement have been fully satisfied.

8.5.6 The Engineer shall return any final payment request that is defective to the contractor within seven days after receipt, with a statement identifying the defect.

8.5.7 A payment request made by a contractor to the Engineer that includes a request for sums that were withheld or retained from a subcontractor and are due to a subcontractor may not be approved under subsection 8.5.3 unless the payment request includes:

8.5.7.1 Substantiation of the amounts requested; and

8.5.7.2 A certification by the contractor, to the best of the contractor's knowledge and belief, that:

8.5.7.2.a The amounts requested are only for performance in accordance with the specifications, terms, and conditions of the contract;

8.5.7.2.b The subcontractor has made payments due to its subcontractors and suppliers from previous payments received under the contract and will make timely payments from the proceeds of the payment covered by the certification, in accordance with their subcontract agreements and the requirements of this section; and

8.5.7.2.c The payment request does not include any amounts that the contractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of their subcontract.

8.5.8 The Engineer shall return any final payment request that is defective to the contractor within seven days after receipt, with a statement identifying the defect.

8.5.9 This section shall not be construed to impair the right of a contractor or a subcontractor at any tier to negotiate and to include in their respective subcontracts provisions that provide for additional terms and conditions that are requested to be met before the subcontractor shall be entitled to receive final payment under subsection 8.5.3 of this section; provided that any such payments withheld shall be withheld by the Engineer.

8.6 RETAINAGE – The Department will retain a portion of the amount due under the contract to the contractor, to ensure the proper performance of the contract.

8.6.1 The sum withheld by the Department from the contractor shall not exceed five percent (5%) of the total amount due the contractor and that after fifty percent (50%) of the contract is completed and progress is satisfactory, no additional sum shall be withheld; provided further that if progress is not satisfactory, the Engineer may continue to withhold as retainage, sums not exceeding five percent (5%) of the amount due the contractor.

8.6.2 The retainage shall not include sums deducted as liquidated damages from moneys due or that may become due the contractor under the contract.

8.6.3 General Obligation Bonds – The contractor may withdraw retainage monies in whole or in part by providing a general obligation bond of the State or its political subdivisions suitable to the Department. The contractor shall endorse over to the Department and deposit with the Department any general obligation bond suitable to the Department, but in no case with a face value less than the value established by law, of the amount to be withdrawn. The Department may sell the bond and use the proceeds in the same way as it may use monies directly retained from progress payments or the final payment.

8.6.4 Any retainage provided for in this section or requested to be withheld by the contractor shall be held by the Engineer.

8.6.5 A dispute between a contractor and subcontractor of any tier shall not constitute a dispute to which the State or any county is a party, and there is no right of action against the State or any county. The State and a county may not be interpleaded in any judicial or administrative proceeding involving such a dispute.

8.6.6 The retention amount withheld by the contractor from its subcontractor shall be not more than the same percentage of retainage as that of the contractor (also applies to subcontractors who subcontract work to other subcontractors) where a subcontractor has provided evidence to the contractor of:

8.6.6.1 A valid performance and a payment bond for the project that is acceptable to the contractor and executed by a surety company authorized to do business in this State;

8.6.6.2 Any other bond acceptable to the contractor; or

8.6.6.3 Any other form of collateral acceptable to the contractor.

8.6.7 A written notice of any withholding shall be issued to a subcontractor, with a copy to the procurement officer, specifying the following:

8.6.7.1 The amount to be withheld;

8.6.7.2 The specific causes for the withholding under the terms of the subcontract; and

8.6.7.3 The remedial actions to be taken by the subcontractor to receive payment of the amounts withheld.

8.6.8 The provisions of this section shall not be construed to require payment to subcontractors of retainage released to a contractor pursuant to an agreement entered into with the contracting officer meeting the requirements of subsection 8.6.3.

8.7 WARRANTY OF CLEAR TITLE - The Contractor warrants and guarantees that all work and materials covered by progress payments made thereon shall be free and clear of all liens, claims, security interests or encumbrances, and shall become the sole property of the Department. This provision shall not, however, be construed as an acceptance of the work nor shall it be construed as relieving the Contractor from the sole responsibility for all materials and work upon which payments have been made or the restoration of any damaged work, or as waiving the right of the Department to require the fulfillment of all the items of the contract.

8.8 FINAL PAYMENT

8.8.1 Upon final settlement, the final payment amount, less all previous payments and less any sums that may have been deducted in accordance with the provisions of the contract, will be paid to the Contractor, provided the Contractor has submitted a Tax Clearance Certificate from the Department of Taxation and the Internal Revenue Service to the effect that all taxes levied or accrued under Federal and State Statutes against the contractor have been paid.

8.8.2 Sums necessary to meet any claims of any kind by the State may be retained from the sums due the Contractor until said claims have been fully and completely discharged or otherwise satisfied.

8.9 CLAIMS ARISING OUT OF PAYMENT FOR REQUIRED WORK - If the Contractor disputes any determination made by the Engineer regarding the amount of work satisfactorily completed, or the value thereof, or the manner in which payment therefore is made or calculated, it shall notify the Engineer in writing of the specific facts supporting the Contractor's position. Such notice shall be delivered to the Engineer no later than thirty (30) days after the Contractor has been tendered payment for the subject work, or, if no payment has been tendered, not later than fifty (50) days after it has submitted the Monthly Payment Application required under Section 8.4 PROGRESS PAYMENTS herein to the Engineer for the work that is the subject of the dispute. The delivery of the written notice cannot be waived and shall be a condition precedent to the filing of the claim. No claim for additional compensation for extra work or change work shall be allowed under this provision, unless the notice requirements of Article 4 SCOPE OF WORK have been followed. Acceptance of partial payment of a Monthly Payment Application amount shall not be deemed a waiver of the right to make a claim described herein provided the notice provisions are followed. The existence of or filing of a payment claim herein shall not relieve the Contractor of its duty to continue with the performance of the contract in full compliance with the directions of the Engineer. Any notice of claim disputing the final payment made pursuant to Section 8.8 FINAL PAYMENT must be submitted in writing not later than thirty (30) days after final payment that is identified as such has been tendered to the Contractor.

ARTICLE 9 - CONFIDENTIALITY OF PERSONAL INFORMATION

9.1 Definitions. "Personal information" means an individual's first name or first initial and last name in combination with any one or more of the following data elements, when either name or data elements are not encrypted:

1. Social Security number,
2. Driver's license number or Hawaii identification card number; or
3. Account number, credit or debit card number, access code, or password that would permit access to an individual's financial information.

Personal information does not include publicly available information that is lawfully made available to the general public from federal, state or local government records.
"Technological safeguards" means the technology and the policy and procedures for use of the technology to protect and control access to personal information.

9.2 Confidentiality of Material.

(1) All material given to or made available to the CONTRACTOR by the STATE by virtue of this Contract which is identified as personal information shall be safeguarded by the CONTRACTOR and shall not be disclosed without the prior written approval of the STATE.

(2) CONTRACTOR agrees not to retain, use, or disclose personal information for any purpose other than as permitted or required by this Contract.

(3) CONTRACTOR agrees to implement appropriate "technological safeguards" that are acceptable to the STATE to reduce the risk of unauthorized access to personal information.

(4) CONTRACTOR shall report to the STATE in a prompt and complete manner any security breaches involving personal information.

(5) CONTRACTOR agrees to mitigate, to the extent practicable, any harmful effect that is known to CONTRACTOR because of a use or disclosure of personal information by CONTRACTOR in violation of the requirements of this paragraph.

(6) CONTRACTOR shall complete and retain a log of all disclosures made of personal information received from the STATE, or personal information created or received by CONTRACTOR on behalf of the STATE.

9.3 Security Awareness Training and Confidentiality Agreements.

(1) CONTRACTOR certifies that all of its employees who will have access to the personal information have completed training on security awareness topics relating to protecting personal information.

(2) CONTRACTOR certifies that confidentiality agreements have been signed by all of its employees who will have access to the personal information acknowledging that:

(a) The personal information collected, used or maintained by the CONTRACTOR will be treated as confidential;

(b) Access to the personal information will be allowed only as necessary to perform the Contract; and

(c) Use of the personal information will be restricted to uses consistent with the services subject to this Contract.

9.4 Termination for Cause. In addition to any other remedies provided for by this Contract, if the STATE learns of a material breach by CONTRACTOR of this paragraph by CONTRACTOR, the State may at its sole discretion:

(1) Provide an opportunity for the CONTRACTOR to cure the breach or end the violation; or

(2) Immediately terminate this Contract.

9.5 Records Retention.

(1) Upon any termination of this Contract, CONTRACTOR shall pursuant to chapter 487R, HRS, destroy all copies (paper or electronic form) of personal information received from the STATE.

(2) The CONTRACTOR and any subcontractors shall maintain the files, books, and records that relate to the Contract, including any personal information created or received by the CONTRACTOR on behalf of the STATE, and any cost or pricing data, for three (3) years after the date of final payment under the Contract. The personal information shall continue to be confidential and shall not be disclosed without the prior written approval of the STATE. After the three (3) year retention period has ended, the files, books, and records that contain personal information shall be destroyed pursuant to chapter 487R, HRS.

ADDITIONAL GENERAL CONDITIONS FOR CONSTRUCTION CONTRACTS

The following sections of the Hawaii Administrative Rules, Chapter §3-125 are hereby incorporated and made a part of the General Conditions.

CHANGES FOR CONSTRUCTION CONTRACTS - §HAR 3-125-4

1. Change Order. The procurement officer, at any time, and without notice to any surety in a signed writing designated or indicated to be a change order, may make changes in the work within the scope of the contract as may be found to be necessary or desirable. Such changes shall not invalidate the contract or release the sureties, and the contractor will perform the work as changed, as though it had been part of the original contract. Minor changes in the work may be directed by the procurement officer with no change in contract price or time or performance.

2. Adjustments of price or time for performance. If any change order increases or decreases the contractor's cost of, or the time required for performance of any part of the work under this contract, whether or not changed by the order, an adjustment may be made and the contract modified in writing accordingly. Any adjustment in contract price made pursuant to this clause shall be determined in accordance with the price adjustment clause of this contract. Failure of the parties to agree to an adjustment shall not excuse a contractor from proceeding with the contract as changed, provided that the State promptly and duly makes such provisional adjustments in payments or time for the direct costs of the work as changed as the State deems reasonable. The right of the contractor to dispute the contract price or time required for performance or both shall not be waived by its performing the work, provided however, that it follows the notice requirements for disputes and claims established by the contract or these rules.

3. Time Period for Claim. Within thirty days after receipt of a written change order under paragraph (1), unless such period is extended by the procurement officer in writing, the contractor shall file a notice of intent to assert claim for an adjustment. The requirement for timely written notice cannot be waived and shall be a condition precedent to the assertion of a claim.

4. Claim barred after final payment. No claim by the contractor for an adjustment hereunder shall be allowed if written notice is not given prior to final payment under this contract.

5. Claims not barred. In the absence of such a change order, nothing in this clause shall restrict the contractor's right to pursue a claim under the contract or for breach of contract.

PRICE ADJUSTMENT FOR CONSTRUCTION CONTRACTS - §HAR 3-125-13.

1. Price adjustment. Any adjustment in contract price pursuant to a clause in this contract shall be made in one or more of the following ways;
   a. By agreement on a fixed price adjustment before commencement of the pertinent performance or as soon thereafter as practicable;
   b. By unit prices specified in the contract or subsequently agree upon;
   c. Whenever there is a variation in quantity for any work covered by any line item in breakdown costs provided by the contractor pursuant to contractual pre-work submittal requirements, by the procurement officer, at the procurement officer's discretion, adjusting the lump sum price proportionately;
   d. In such other manner as the parties may mutually agree;
   e. At the sole option of the procurement officer, by the costs attributable to the event or situation covered by the change, plus appropriate profit or fee; or
   f. In the absence of agreement between the parties, by a unilateral determination by the procurement officer of the costs attributable to the event or situation covered by the clause, plus appropriate profit or fee, all as computed by the procurement officer in accordance with generally accepted accounting principles and applicable sections of chapters 3-123 and 3-126 (of the Hawaii Administrative Rules).

2. Determining the cost or credit. In determining the cost or credit to the State resulting from a change, the allowances for all overhead, extended overhead resulting from adjustments to contract time (including home office and field overhead) and profit combined, shall not exceed the percentages set forth below:

   a. For the contractor, for any work performed by its own labor forces, fifteen per cent of the cost;
   b. For each subcontractor involved, for any work performed by its own forces, fifteen per cent of the cost;
   c. For the contractor or any subcontractor, for work performed by their subcontractors, ten per cent of the amount due the performing subcontractor.

3. Percentages for fee and overhead. Not more than three line item percentages for fee and overhead, not to exceed the maximum percentages shown above, will be allowed regardless of the number of tier subcontractors.

PROMPT PAYMENT BY CONTRACTORS TO SUBCONTRACTORS – §HAR 3-125-23

1. Prompt payment clause. Any money, other than retainage, paid to a contractor shall be dispersed to subcontractors within ten days after receipt of the money in accordance with the terms of the subcontract; provided that the subcontractor has met all the terms and conditions of the subcontract and there are no bona fide disputes; and, upon final payment to the contractor, full payment to the subcontractor, including retainage, shall be

made within ten days after receipt of the money; provided that there are no bona fide disputes over the subcontractor's performance under the subcontract.

CHANGES TO THE GENERAL CONDITIONS

1. Under ARTICLE 1 – DEFINITIONS, insert the following:

   "1.70 CONTRACTING OFFICER REPRESENTATIVE (COR): The Department of Defense Project Manager (PM)."

2. Under ARTICLE 2 - PROPOSAL REQUIREMENTS AND CONDITIONS, modify section 2.6 - SUBSTITUTION OF MATERIALS AND EQUIPMENT BEFORE BID OPENING, by renaming section 2.6 - SUBSTITUTION BEFORE CONTRACT AWARD and deleting subsections 2.6.1, through 2.6.6 and substitute the following three new subsections and related paragraphs 2.6.1 through 2.6.3:

   "2.6.1 For Substitutions after the Letter of Award is issued; refer to Section 6.3 SUBSTITUTION AFTER CONTRACT AWARD.

   2.6.2 Unless specifically required otherwise in the contract documents, Offerors shall not submit products, materials, equipment, articles or systems for review or approval prior to submitting their Offers.

   2.6.3 Offerors shall prepare their Offer forms based on the performance requirements of the materials, equipment, articles or systems noted on the drawings and specifications. If trade names, makes, catalog numbers or brand names are specified, Offerors shall infer that these items indicate the quality, style, appearance or performance of the material, equipment, article, or systems to be used in the project. The products and equipment of manufacturers listed throughout the specifications and other manufacturers are acceptable provided they meet or exceed the materials and construction requirements specified and are installed as specified."

3. Under Article 6, delete subsections 6.3.2.4 and 6.3.3.

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1. Non-Liability of STATE Employees. The HOPA and any of the HOPA's duly authorized representatives and subordinates, in carrying out the provisions of this Agreement or in exercising any power or authority granted herein, shall not be held personally liable in any way, it being understood that in such matters they act as agents and representatives of the STATE.

2. In Accordance with HRS 103D-713, Paragraph 7 Indemnification and Defense of the General Conditions, is amended as follows:

   "7. Indemnification and Defense. The CONTRACTOR shall, indemnify and hold harmless the governmental body and its officers, employees, and agents from and against any liability, damage, loss, cost, and expense, including reasonable attorneys' fees, and all claims, suits, and demands therefore arising out of or resulting from the negligent, reckless, intentional, or wrongful acts, errors, or omissions of the contractor, the contractor's employees, officers, agents, or subcontractors in the performance of the contract or the contractor's professional services, and the provisions shall remain in full force and effect notwithstanding the expiration or early termination of the contract."

3. Paragraph 2. Relationship of Parties: Independent Contractor Status and Responsibilities, Including Tax Responsibilities, subparagraph f. of the General Conditions is amended by adding the following:

   "Insurance. Prior to commencing with the work, the Contractor shall, at its own expense, obtain and submit to the Department, Certificate of Insurance from an insurance company authorized by the laws of the State to issue such insurance in the State of Hawaii showing full policy coverage of the Contractor.

   Required Types of Insurance:

   A. Commercial General Liability (CGL): Coverage shall be maintained with limits of no less than $1 million per occurrence and $2 million in aggregate. This insurance shall protect against claims arising from bodily injury, personal injury, and property damage that may result from or be related to the performance of services under the contract. The STATE shall be named as additional insured.
   B. Automobile Liability: Coverage shall include a limit of no less than $1 million per accident, covering claims for bodily injury and property damage resulting from the ownership, maintenance, or use of any owned, hired, or non-owned vehicles used in the performance of the contract. The STATE shall be named as additional insured.
   C. Workers' Compensation (WC): The CONTRACTOR shall maintain workers' compensation insurance as required by the Hawaii Revised Statutes (HRS) Title 21, Section 386. This coverage shall ensure compliance with state laws regarding the provision of benefits to employees for work-related injuries or illnesses, and Employer's Liability: Coverage shall be maintained with the following minimum limits:
      - $100,000 per accident for bodily injury.
      - $500,000 disease-policy limit.
      - $100,000 disease limit per employee.
   D. If required by the Department of Defense in the event Hazardous Materials (as defined herein) are or may be involved or used, Pollution Liability insurance coverage with a combined single limit coverage of at least $1,000,000 per occurrence which shall cover environmental liabilities, including, without limitation, claims for bodily injury, property damage, environmental damage, and remediation costs resulting from pollution conditions caused by the Contractor or the Contractor Agents and/or the conduct of the Services.
   E. Waiver of Subrogation: CONTRACTOR agrees to a waiver of any right to subrogation against the State of Hawaii and their respective employees and agents by each insurer

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under each required policy described herein except for the Professional Liability (Errors and Omission) policy. When required by the insurer, or should a policy condition not permit the CONTRACTOR to enter into a pre-loss agreement to waive subrogation without an endorsement, CONTRACTOR shall notify the insurer and request that the policy be endorsed with a Waiver of Transfer of Rights of Recovery Against Others, or its equivalent. This Waiver of Subrogation requirement shall not apply to any policy, which includes a condition specifically prohibiting such an endorsement, or voids coverage should the CONTRACTOR enter into such an agreement on a pre-loss basis.

It is the responsibility of the CONTRACTOR to notify the STATE of any changes to its insurance policies or if the Contractor receives a notice of cancellation of any of its insurance policies. The Contractor will immediately provide written notice to the STATE should the insurance policies evidenced on its Certificate of Insurance form be cancelled, limited in scope, or not renewed upon expiration.

In addition, CONTRACTOR's insurance policies with the exception of the Worker's Compensation and Professional Liability policies, shall contain the following clauses:

1. The State of Hawaii is added as an additional insured as respects to operations performed for the State of Hawaii.
2. It is agreed that any insurance maintained by the State of Hawaii will apply in excess of, and not contribute with, insurance provided by this policy.

Furthermore, the Certificate of Insurance shall contain the reference to the project name and the project number"

4. Conflict. If there is a conflict between this Attachment — S5 (Special Conditions) and the General Conditions, this Attachment — S5 (Special Conditions) shall govern and control unless otherwise specified.