

## MECHANICAL LEGEND

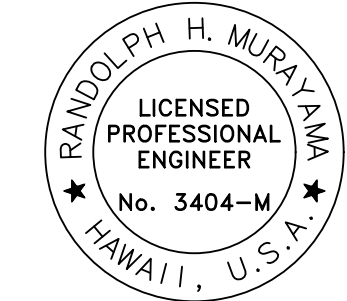
|  |  |  |
|--|--|--|
| <p>———— WASTE LINE<br/>         - - - - VENT LINE<br/>         - - - - COLD WATER LINE<br/>         - - - - HOT WATER LINE<br/>         - - - - GAS LINE<br/>         — G — GREASE WASTE LINE<br/>         — GR — FIRE EXTINGUISHER<br/>         VTR VENT THRU ROOF<br/>         FD FLOOR DRAIN<br/>         FS FLOOR SINK<br/>         FCO FLOOR CLEANOUT<br/>         WCO WALL CLEANOUT<br/>         WHA WATER HAMMER ARRESTOR<br/>         COTG CLEANOUT TO GRADE<br/>         P-1 FLUSH VALVE TYPE WATER CLOSET<br/>         P-2 WHEELCHAIR WATER CLOSET<br/>         P-3 FLUSH VALVE TYPE URINAL<br/>         P-4 WHEELCHAIR FLUSH VALVE TYPE URINAL<br/>         P-5 COUNTERTOP LAVATORY<br/>         P-6 COUNTERTOP WHEELCHAIR LAVATORY<br/>         P-7 SERVICE SINK<br/>         P-8 COUNTERTOP SINKS (2 COMPARTMENT)<br/>         P-9 ELECTRIC WATER COOLER<br/>         P-9A WHEELCHAIR ELECTRIC WATER COOLER<br/>         P-10 TANK TYPE WATER CLOSET<br/>         P-11 WHEELCHAIR TANK TYPE WATER CLOSET<br/>         P-12 LAVATORY<br/>         P-13 LAVATORY FOR WHEELCHAIR<br/>         P-14 SHOWER SUPPLY FITTINGS<br/>         P-15 HAND HELD SHOWER HEAD<br/>         P-16 LAVATORY FOR KITCHEN TOILET AND HANDSINK<br/>         P-17 COUNTERTOP SINK (SINGLE COMPARTMENT)<br/>         P-18 RECESSED ELECTRIC WATER COOLER<br/>         P-19 RECESSED WHEELCHAIR ELECTRIC WATER COOLER</p> | <p>SR SUPPLY REGISTER<br/>         RR RETURN REGISTER<br/>         SA SUPPLY AIR<br/>         TG TRANSFER GRILLE<br/>         EX EXHAUST REGISTER<br/>         SD SUPPLY DIFFUSER<br/>         OA OUTSIDE AIR<br/>         U/D UNDERCUT DOOR<br/>         CD CONDENSATE DRAIN<br/>         RL REF. LIQUID<br/>         RS REF. SUCTION<br/>         VAV VARIABLE AIR VOLUME<br/>         ⊕ SPACE THERMOSTAT<br/>         — — — — OPPOSED BLADE VOLUME DAMPER<br/>         FD FIRE DAMPER<br/>         L/D LOUVERED DOOR<br/>         AHU AIR HANDLING UNIT<br/>         FCU FAN COIL UNIT<br/>         EF EXHAUST FAN<br/>         ACCU AIR COOLED CONDENSING UNIT<br/>         CFM CUBIC FEET PER MINUTE<br/>         TYP TYPICAL<br/>         V/φ/HZ VOLTS/PHASE/HERTZ<br/>         MIN MINIMUM<br/>         MAX MAXIMUM<br/>         ⊗ FAN SWITCH</p> | <p>CW COLD WATER<br/>         HW HOT WATER<br/>         V VENT<br/>         W WASTE<br/>         G GAS<br/>         GR GREASE WASTE<br/>         HB HOSE BIBB<br/>         GPM GALLONS PER MINUTE<br/>         SST STAINLESS STEEL</p> |
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### GENERAL CONDITIONS

- 1) CONFORM TO ALL REQUIREMENTS OF THE BUILDING, PLUMBING, AND ELECTRICAL CODES OF THE CITY AND COUNTY OF HONOLULU, STATE OF HAWAII HEALTH REGULATIONS, FIRE DEPARTMENT'S REGULATIONS AND OTHER APPLICABLE REGULATIONS.
- 2) ALL ITEMS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- 3) INSTALLATION SHALL BE GUARANTEED TO BE FREE FROM DEFECTS FOR ONE YEAR FROM FINAL DATE OF ACCEPTANCE OF THE PROJECT AS A WHOLE.
- 4) CONTRACTOR SHALL VERIFY ALL FIELD CONDITIONS PRIOR TO BID AND CONSTRUCTION.
- 5) PAY FOR ALL PERMIT FEES AND APPLICATIONS.
- 6) PROVIDE ADDITIONAL MATERIALS AND LABOR FOR A COMPLETE OPERABLE SYSTEM AT NO ADDITIONAL COST TO THE GOVERNMENT.
- 7) COORDINATE ALL WORK WITH OTHER TRADES TO AVOID INTERFERENCES AND DELAYS.
- 8) COORDINATE ALL SWITCH LOCATIONS WITH USER/ARCHITECT TO AVOID INTERFERENCES WITH FURNITURE/EQUIPMENT, PICTURES, ETC.
- 9) ALL ITEMS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- 10) ALL EXPOSED STEEL SHALL BE HOT DIPPED GALVANIZED. EXPOSED TO WEATHER STEEL SHALL HAVE THREE EXTRA COATS EPOXY PAINT. ALL EXTERIOR SCREWS, BOLTS, NUTS, RODS, HANGERS, UNISTRUTS SHALL BE TYPE 316 STAINLESS STEEL.
- 11) PROVIDE DIELECTRIC UNIONS OR SEPARATIONS AT ALL DISSIMILAR METALS.
- 12) CAULK ALL ROOF AND WALL PENETRATIONS WATERTIGHT WITH NON-SHRINK, FIRE RATED CAULK.
- 13) PROVIDE REBALANCING WITHIN ONE YEAR GUARANTEE PERIOD TO SATISFY OWNER'S REQUIREMENTS. REBALANCING SHALL INCLUDE CHANGING OF PULLEY AND SHEAVES.
- 14) ALL DUCT DIMENSIONS ARE NET DIMENSIONS.
- 15) PROVIDE ACCESS PANELS FOR ALL ITEMS UNDER THIS SECTION REQUIRING SERVICING, INSPECTION AND MAINTENANCE AND ADJUSTMENT. FIRE RATED TYPE AS REQUIRED. PANELS SHALL BE HINGED TYPE, GASKETED WITH LEVER HANDLE FOR CONCEALED SPACED AND MECHANICAL ROOMS AND LOCKING CATCH (NON-TOOL TYPE) MECHANISM FOR EASY OPENINGS IN FINISHED SPACES. 12"x12" MIN. FOR WALLS, 24"x24" MIN. IN CEILINGS.
- 16) PROVIDE TURNING VANES FOR ALL DUCT TURNS.
- 17) PROVIDE SPLITTER DAMPERS WITH LOCKING QUADRANT, AIR EXTRACTORS OR BELL MOUTH TAP AT ALL TAPS TO MAIN DUCT.
- 18) ALL ROUND BRANCH TAPS SHALL BE DONE WITH BELL-MOUTH FITTINGS.
- 19) PROVIDE PORTABLE FIRE EXTINGUISHERS, 10 LB DRY CHEMICAL, UL 4A:60B:C WITH WALL MOUNTING BRACKET.
- 20) PROVIDE 12" AIR CHAMBER ON ALL COLD WATER SUPPLY LINES TO PLUMBING FIXTURES/EQUIPMENT.
- 21) PROVIDE COMBINATION FIRE/SMOKE DAMPERS AT ALL CORRIDOR/HALL DUCT PENETRATIONS AS SHOWN. PROVIDE AUXILIARY CONTACT FOR CONNECTION TO FIRE ALARM SYSTEM.
- 22) PROVIDE SWAY BRACING FOR ALL EQUIPMENT, PIPING AND DUCTWORK FOR ZONE 2 RATING.
- 23) ALL CONTROL WIRING SHALL COMPLY WITH ELECTRICAL CODE. ALL WIRING IN CONDUIT. ALL EXPOSED CONDUIT SHALL BE GALVANIZED PIPE.
- 24) ALL TRENCHING, BACKFILL AND CUSHION FILL SHALL BE IN ACCORDANCE WITH PLUMBING CODE. NO ROCKS OR OTHER DEBRIS IN CUSHION OR FILL.
- 25) CONTRACTOR SHALL OBTAIN ALL INFORMATION FROM THE EQUIPMENT SUPPLIER TO MAKE FINAL CONNECTIONS TO EQUIPMENT. FINAL CONNECTIONS SHALL INCLUDE HOT AND COLD WATER SHUT-OFF VALVES, PRESSURE REDUCING VALVES/REGULATORS, P-TRAPS, INDIRECT WASTE LINES, VACUUM BREAKERS, UNIONS, GAS REGULATORS, STRAINERS, WATER HAMMER ARRESTORS AND BACKFLOW PREVENTERS.

### REVISED ORDINANCE OF HONOLULU CHAPTER 32 BUILDING ENERGY EFFICIENCY STANDARDS

THE BUILDING ENERGY EFFICIENCY STANDARDS HAVE BEEN REVIEWED AND TO THE BEST OF MY KNOWLEDGE THIS DESIGN SUBSTANTIALLY CONFORMS TO THE MECHANICAL REQUIREMENTS OF SECTIONS 8.3, 9.3, 10.3, 11.3, 12.3 OR 13.3



Signature  
 Randolph H. Murayama  
 Name (Print)  
 President  
 Title

THE AIR CONDITIONING AND VENTILATION SYSTEM SHALL COMPLY WITH TITLE 11, ADMINISTRATIVE RULES, DEPARTMENT OF HEALTH, CHAPTER 39, AIR CONDITIONING AND VENTILATING REQUIREMENTS

### FIRE SPRINKLER NOTES:

- 1) CLASSIFICATION OF OCCUPANCY: LIGHT HAZARD AND ORDINARY HAZARD (GROUP 1) FOR KITCHEN AREAS.
- 2) PERFORM FLOW TESTS FOR EXACT WATER PRESSURES AND FLOWS. SUBMIT RESULTS TO THE ENGINEER AND THE FIRE DEPARTMENT FOR APPROVAL.
- 3) THESE FIRE SPRINKLER PLANS ARE SUBMITTED FOR CONDITIONAL APPROVAL OF THE FIRE AND BUILDING DEPARTMENTS AND THE HAWAII INSURANCE RATING BUREAU. THREE (3) SETS OF COMPLETED WORKING PLANS AND HYDRAULIC CALCULATIONS, WHEN APPLICABLE, SHALL BE SUBMITTED TO THE FIRE AND BUILDING DEPARTMENTS AND THE HAWAII INSURANCE RATING BUREAU FOR APPROVAL BEFORE INSTALLATION.
- 4) UNDERGROUND PIPING SHALL BE IN ACCORDANCE WITH NFPA 24. ENTIRE SYSTEM SHALL BE IN ACCORDANCE WITH NFPA 13.
- 5) PROVIDE SUPERVISORY GATE VALVE WITH TAMPER SWITCH AND FLOW ALARM VALVE FOR EACH LEVEL SERVED BY THE FIRE SPRINKLER SYSTEM. PROVIDE CONTACTS FROM TAMPER SWITCH AND FLOW CONNECTION TO ANNUNCIATOR PANEL.
- 6) ELECTRICAL/TRANSFORMER ROOMS AND AREAS ABOVE CEILING SHALL BE PROVIDED WITH ORDINARY GROUP II COVERAGE.
- 7) PROPER TYPES OF SPARE SPRINKLER HEADS, STOPPERS AND WRENCHES SHALL BE PROVIDED AND STORED IN A CABINET PER 1988 UFC SEC. 10.306 (a) AMMENDED.
- 8) AUTOMATIC SPRINKLER SYSTEM SHALL BE SUPERVISED PER 1988 UFC SEC. 10.307.
- 9) MOUNT FIRE SPRINKLER HEADS IN CENTER OF CEILING TILE.
- 10) ENTIRE SYSTEM SHALL BE IN ACCORDANCE WITH NFPA 13.

| REVISION NO | DESCRIPTION | DATE | BY | CHK'D |
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|---|---|
| <b>Richard Matsunaga &amp; Associates</b><br>Architects, Inc. | DEPARTMENTS OF THE ARMY AND AIR<br>NATIONAL GUARD OF HAWAII<br>OFFICE OF THE ENGINEER, FT. RUGER, HAWAII  |
|   | DESIGNED: ESN/RYT<br>DRAWN: RYT<br>SAFETY: —<br>ENGINEER: —   |
| THIS WORK WAS PREPARED BY ME<br>OR UNDER MY SUPERVISION       | 298TH REGIONAL TRAINING INSTITUTE, PHASE II<br>BELLOWS AIR FORCE STATION<br>WAIMANALO, HAWAII<br>LEGEND, NOTES  |
|   | APPROVED: _____ DATE: MARCH 28, 2000<br>HIRING, FAC MGMT OFFICER NGB, USFPO FOR HAWAII<br>APPROVED: _____ SCALE: AS NOTED<br>HING, CONTRACTING & ENGINEERING OFFICER DWG # <b>MO.1</b><br>SHEET 12 of 228 |

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22 x 34  
IT IS A REDUCED PRINT—  
SCALE REDUCED ACCORDINGLY

The Contractor will be responsible for coordinating the work among the various trades as necessary to avoid conflicts and to insure the installation of all work within the available space.

# MECHANICAL EQUIPMENT SCHEDULE

ALL MOTORS SHALL BE TOTALLY ENCLOSED FAN COOLED, PREMIUM EFFICIENCY TYPE. AIR COOLED CONDENSING UNIT COILS AND FINS SHALL BE COATED WITH BAKED PHENOLIC COATING AND UNIT CASING (INSIDE & OUTSIDE) SHALL BE PROTECTED WITH SILOXANE COATING. PROVIDE BACKDRAFT DAMPER ON ALL EXHAUST FAN DISCHARGE DUCTS. ALL STARTERS EXPOSED TO WEATHER SHALL BE NEMA 4X (STAINLESS STEEL AND WATERTIGHT). MAGNETIC ACROSS-THE-LINE TYPE WITH CONTROL VOLTAGE TRANSFORMER. REFRIGERANT SHALL BE R-22. PROVIDE MINIMUM 3 FILTER REPLACEMENTS: ONCE PRIOR TO TEST AND BALANCING, ONCE AT ACCEPTANCE OF PROJECT AND ONCE ONE MONTH AFTER OCCUPANCY.

| UNIT NO. | BUILDING SERVED      | TOTAL COOLING (BTUH) | SENSIBLE COOLING (BTUH) | TONS | SUPPLY AIR (CFM) | OUTSIDE AIR (CFM) | COIL ROWS | COIL FINS/IN. | ENT. AIR TEMP DB/WB | LVG AIR TEMP DB/WB | E.S.P. T.S.P. | FAN RPM | BHP  | HP  | V/PH/HZ  | SOUND DATA DBA | OPERATING WEIGHT | REMARKS  |
|----------|----------------------|----------------------|-------------------------|------|------------------|-------------------|-----------|---------------|---------------------|--------------------|---------------|---------|------|-----|----------|----------------|------------------|--|
| AHU 1A   | BILLETS GROUND FLOOR | 300,000              | 225,000                 | 25   | 8800             | 1560              | 8         | 12            | 80 F/67 F           | 58 F/55 F          | 2.5<br>3.5    | 915     | 7.8  | 10  | 460/3/60 | 67             | 1973             | DOUBLE CIRCUIT COIL, ROW SPLIT, INTERTWINED COIL. VARIABLE SPEED DRIVE WITH ISOLATION TRANSFORMER. |
| AHU 1B   | BILLETS GROUND FLOOR | 300,000              | 225,000                 | 25   | 8400             | 1040              | 8         | 12            | 80 F/67 F           | 58 F/55 F          | 2.5<br>3.5    | 914     | 7.4  | 7.5 | 460/3/60 | 66             | 1959             | DOUBLE CIRCUIT COIL, ROW SPLIT, INTERTWINED COIL. VARIABLE SPEED DRIVE WITH ISOLATION TRANSFORMER. |
| AHU 1C   | BILLETS SECOND FLOOR | 300,000              | 225,000                 | 25   | 9620             | 1560              | 8         | 12            | 80 F/67 F           | 58 F/55 F          | 2.5<br>3.5    | 831     | 8.8  | 10  | 460/3/60 | 67             | 2269             | DOUBLE CIRCUIT COIL, ROW SPLIT, INTERTWINED COIL. VARIABLE SPEED DRIVE WITH ISOLATION TRANSFORMER. |
| AHU 1D   | BILLETS SECOND FLOOR | 300,000              | 225,000                 | 25   | 9180             | 1040              | 8         | 12            | 80 F/67 F           | 58 F/55 F          | 2.5<br>3.5    | 918     | 8.3  | 10  | 460/3/60 | 67             | 1973             | DOUBLE CIRCUIT COIL, ROW SPLIT, INTERTWINED COIL. VARIABLE SPEED DRIVE WITH ISOLATION TRANSFORMER. |
| AHU 2    | AUDITORIUM           | 420,000              | 315,000                 | 35   | 14,000           | 5780              | 8         | 12            | 80 F/67 F           | 58 F/55 F          | 2.5<br>3.5    | 720     | 11.6 | 15  | 460/3/60 | 66             | 2858             | DOUBLE CIRCUIT COIL, ROW SPLIT, INTERTWINED COIL. VARIABLE SPEED DRIVE WITH ISOLATION TRANSFORMER. |
| AHU 3    | MESS                 | 420,000              | 315,000                 | 35   | 14,000           | 5000              | 8         | 12            | 80 F/67 F           | 58 F/55 F          | 2.5<br>3.5    | 720     | 11.6 | 15  | 460/3/60 | 66             | 2858             | DOUBLE CIRCUIT COIL, ROW SPLIT, INTERTWINED COIL. VARIABLE SPEED DRIVE WITH ISOLATION TRANSFORMER. |

## AIR COOLED CONDENSING UNITS:

TOTALLY ENCLOSED AIR COOLED FAN MOTORS, PREMIUM EFFICIENCY TYPE. SOUND REDUCTION CONDENSER FAN KIT OPTION, INTEGRAL SUCTION ACCUMULATOR ON EACH CIRCUIT.

| UNIT NO. | QTY | NET REFRIG. EFFECT (BTUH) | ENTERING AIR TEMP | CONDENSER FAN |         |                        | COMPRESSOR NO. 1 |       | COMPRESSOR NO. 2 |     | V/PH/HZ  | SOUND DATA DBA | OPERATING WEIGHT | MIN. EER/SEER | REMARKS: TOTALLY ENCLOSED COND. FAN MOTORS FOR 460V/3PH/60HZ MACHINES.  |
|----------|-----|---------------------------|-------------------|---------------|---------|------------------------|------------------|-------|------------------|-----|----------|----------------|------------------|---------------|---|
|          |     |                           |                   | NO.           | FAN HP  | FLA                    | RLA              | LRA   | RLA              | LRA |          |                |                  |               |   |
| ACCU 1   | 4   | 300,000                   | 95 F              | 2             | 1.0 EA. | 3.1                    | 22.1             | 114   | 22.1             | 114 | 460/3/60 | 94             | 1982             | 11.2 EER      | ACOUSTICALLY INSULATED COMPRESSOR CABINET, MIN. 6 STEP CAPACITY CONTROL (17%, 33%, 50%, 67%, 83%, 100%). PROVIDE UNDERVOLTAGE/OVERVOLTAGE, PHASE FAILURE/PHASE REVERSAL PROTECTION WITH AUTO RESET. PROVIDE ACCESSORY UNLOADER ON CIRCUIT 1 TO ACHIEVE 6 STEP CAPACITY CONTROL. |
| ACCU 2   | 1   | 420,000                   | 95 F              | 4             | 1.0 EA. | (1,2) 2.8<br>(3,4) 2.7 | 34.6             | 173   | 34.6             | 173 | 460/3/60 | 94             | 3547             | 10.7 EER      | ACOUSTICALLY INSULATED COMPRESSOR CABINET, STEP CAPACITY CONTROL (10% ADJ. HOT-GAS BY-PASS, 25%, 50%, 75%, 100%), PROVIDE UNDERVOLTAGE/OVERVOLTAGE, PHASE FAILURE/PHASE REVERSAL PROTECTION WITH AUTO RESET.  |
| ACCU 3   | 1   | 420,000                   | 95 F              | 4             | 1.0 EA. | (1,2) 2.8<br>(3,4) 2.7 | 34.6             | 173   | 34.6             | 173 | 460/3/60 | 94             | 3547             | 10.7 EER      | ACOUSTICALLY INSULATED COMPRESSOR CABINET, STEP CAPACITY CONTROL (10% ADJ. HOT-GAS BY-PASS, 25%, 50%, 75%, 100%), PROVIDE UNDERVOLTAGE/OVERVOLTAGE, PHASE FAILURE/PHASE REVERSAL PROTECTION WITH AUTO RESET.  |
| ACCU 4   | 1   | 60,000                    | 95 F              | 1             | —       | 1.45                   | 28.9             | 165.0 | —                | —   | 208/1/60 | 7.4 BELS       | 148              | 11.96 SEER    | PROVIDE INSULATED COMPRESSOR CABINET.   |
| ACCU 5   | 1   | 18,000                    | 95 F              | 1             | —       | 0.7                    | 8.0              | 49.0  | —                | —   | 208/1/60 | 6.8 BELS       | 244              | 11.3 SEER     | PROVIDE INSULATED COMPRESSOR CABINET.   |

## FAN COIL UNITS

ALL MOTORS SHALL BE HIGH EFFICIENCY TYPE. PROVIDE MIN. 3 FILTER CHANGES: DURING CONSTRUCTION, PRIOR TO TEST AND BALANCING AND ONE MONTH AFTER FINAL ACCEPTANCE OF THE PROJECT. TOTAL COOLING AT 95° F AMBIENT TEMPERATURE, 80° F DB/67° F WB ENTERING AIR.

| UNIT NO. | LOCATION                         | TOTAL COOLING (BTUH) | SENSIBLE COOLING (BTUH) | TONS | CFM  | OA  | E.S.P. | FAN RPM | FAN      |      | V/PH/HZ          | OPERATING WEIGHT (LBS) | SOUND POWER LEVEL (DBA) | REMARKS |
|----------|----------------------------------|----------------------|-------------------------|------|------|-----|--------|---------|----------|------|------------------|------------------------|-------------------------|---------|
|          |                                  |                      |                         |      |      |     |        |         | HP       | FLA  |                  |                        |                         |         |
| FCU 1    | BILLETS - PHYSICAL FITNESS (134) | 60,000               | 45,000                  | 5    | 2000 | 300 | 0.4"   | 1965    | 3/4      | 5.4  | 208 V/1 PH/60 HZ | 175                    | 61                      |         |
| FCU 2    | BILLETS - OFFICE (140)           | 18,000               | 13,500                  | 1.5  | 550  | 60  | —      | —       | 44 WATTS | 0.53 | 208 V/1 PH/60 HZ | 38.5                   | —                       |         |

## VARIABLE AIR VOLUME TERMINAL UNITS:

FACTORY FABRICATED, ELECTRICALLY CONTROLLED COMPLETE WITH REMOTE THERMOSTAT, ACTUATOR AND VOLUME CONTROL DAMPER. SYSTEM POWERED NOT ALLOWED. SET MINIMUM FLOW TO 20% OF DESIGN AIR VOLUME. MAXIMUM PRESSURE DIFFERENTIAL OF 0.4". NC 30 BASED ON 10 DB CEILING INSERTION LOSS AND 8 DB ROOM EFFECT AT 1" S.P. AT BOX INLET. PROVIDE 115V POWER FOR CONTROLS.

| UNIT NO. | INLET DIA. | CFM RANGE |
|----------|------------|-----------|
| VAV A    | 6"         | 0 - 350   |
| VAV B    | 7"         | 0 - 450   |
| VAV C    | 8"         | 0 - 600   |
| VAV D    | 10"        | 0 - 800   |
| VAV E    | 12"        | 0 - 1050  |
| VAV F    | 14"        | 0 - 1250  |
| VAV G    | 16"        | 0 - 1800  |
| VAV H    | 18"        | 0 - 2000  |

## INSULATED FLEXIBLE DUCT SIZES (PROVIDE REDUCING FITTINGS AS REQ'D)

| NET DUCT DIA. | CFM RANGE |
|---------------|-----------|
| 6"            | 0 - 100   |
| 8"            | 0 - 200   |
| 10"           | 0 - 300   |
| 12"           | 0 - 600   |

**IWH** INSTANTANEOUS WATER HEATER:  
1 94° F TO 119° F, 1.0 GPM FLOW RATE. 8,000 WATTS, 38 AMPS, 208 V/1 PH/60 HZ. 6"x9"x2-1/2" OVERALL DIMENSIONS, 6 LBS. LOW PRESSURE MODEL.

**HRU** HEAT RECOVERY UNIT - 1: HEAT HARVESTER MODEL E30 OR APPROVED EQUAL PACKAGED, CONDENSER HEAT RECOVERY UNIT DESIGNED FOR USE WITH LEAD COMPRESSOR OF 8.75 TON CONDENSING UNIT. 115V/1PH/60HZ, 1/20 HP, .50 AMPS. UNIT TO BE COMPLETE WITH HEAT EXCHANGER COIL, WATER CIRCULATING PUMP, VARIABLE SPEED PUMP CONTROLS, AND HEAD PRESSURE CONTROLS. 6 GPM, 45200 BTUH @ 120° CONDENSING AND 45° EVAPORATING TEMPERATURES. UNIT TO BE FACTORY MATCHED TO CONDENSING UNIT. MECHANICAL CONTRACTOR TO PROVIDE ALL NECESSARY REFRIGERANT AND HOT WATER PIPING AND CONNECTIONS. CONTRACTOR SHALL ENSURE THAT ALL EQUIPMENT WARRANTIES (ACCU & HEAT RECOVERY UNIT) TO REMAIN INTACT. STAINLESS STEEL WEATHERPROOF CABINET, TUBE-IN-TUBE VENTED HEAT EXCHANGERS. PROVIDE MAGNETIC STARTER W/ CONTROL VOLTAGE TRANSFORMER.

**P-13/P-13A** DUAL HEIGHT ELECTRIC WATER COOLER:  
4.0 GPH OF 50° F DRINKING WATER AT 80° F INLET WATER AND 90° F ROOM TEMPERATURE. 1/6 HP COMPRESSOR, 3.0 FLA, 244 RATED WATTS. 120 V/1 PH/60 HZ.

**ACF** AIR CURTAIN FAN:  
1 2925 FPM MAX. AT NOZZLE, 2550 CFM MAX. AT NOZZLE. MOTOR: 1/2 HP AT 1750 RPM, 4.3 AMPS AT 115 V/1 PH/60 HZ. 65 LBS. OPERATING WEIGHT. 70 DBA AT 5 FT. FROM NOZZLE. 42 INCHES LONG LENGTH. PROVIDE MANUAL "ON-OFF" SWITCH.

**ACF** AIR CURTAIN FAN:  
2 3400 FPM MAX. AT NOZZLE, 5100 CFM MAX. AT NOZZLE. MOTOR (2): 1/2 HP AT 1750 RPM, 8.6 AMPS AT 115 V/1 PH/60 HZ. 120 LBS., OPERATING WEIGHT. 70 DBA AT 5 FT. FROM NOZZLE. 72 INCHES LONG LENGTH. PROVIDE MANUAL "ON-OFF" SWITCH.

**SWH** GAS WATER HEATER:  
1 80 GALLON CAPACITY, 180,000 BTUH. 230 GPH RECOVERY AT 100° F TEMPERATURE RISE. UNIT SHALL COMPLY WITH ASHRAE 90.1b - 1982. 645 LBS. OPERATING WEIGHT. ELECTRONIC IGNITION, 12 AMPS, 115V/ 1 PH/60 HZ. PROVIDE PRESSURE AND TEMPERATURE RELIEF VALVE, VACUUM BREAKER, VALVES AND UNIONS.

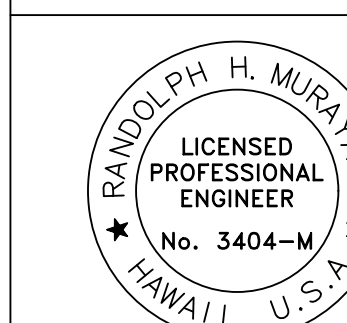
**SWH** GAS WATER HEATER:  
2 100 GALLON CAPACITY, 199,990 BTUH. 268 GPH RECOVERY AT 100 DEG F TEMPERATURE RISE. UNIT SHALL COMPLY WITH ASHRAE 90.1b-1982. 825 LBS. OPERATING WEIGHT. ELECTRONIC IGNITION, 12 AMPS, 115 V/1 PH/ 60 HZ. PROVIDE PRESSURE AND TEMPERATURE RELIEF VALVE, VACUUM BREAKER, VALVES AND UNIONS.

**CP** CIRCULATING PUMP:  
1 IN-LINE CENTRIFUGAL PUMP, 70 GPM AT 90 FT. TDH, 1750 RPM. 3 HP, 208 V/3 PH/60 HZ. PROVIDE SUPPORT STANDS, 2" SUCTION AND DISCHARGE.

IF SHEET IS LESS THAN 22 x 34 IT IS A REDUCED PRINT-SCALE REDUCED ACCORDINGLY

The Contractor will be responsible for coordinating the work among the various trades as necessary to avoid conflicts and to insure the installation of all work within the available space.

Richard Matsunaga & Associates  
Architects, Inc.



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

| REVISION NO | DESCRIPTION | DATE | BY | CHK'D |
|-------------|-------------|------|----|-------|
|             |             |      |    |       |
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|---|---|-----------------|--|
| DEPARTMENTS OF THE ARMY AND AIR NATIONAL GUARD OF HAWAII<br>OFFICE OF THE ENGINEER, FT. RUGER, HAWAII |   |                 |  |
| DESIGNED: ESN/RYT   | 298TH REGIONAL TRAINING INSTITUTE, PHASE II<br>BELLOWS AIR FORCE STATION<br>WAIMANALO, HAWAII |                 |  |
| DRAWN: RYT  |   |                 |  |
| SAFETY: —   | MECHANICAL EQUIPMENT SCHEDULE   |                 |  |
| ENGINEER: —   |   |                 |  |
| APPROVED: _____   | APPROVED: _____   | DATE            |  |
|   |   | MARCH 28, 2000  |  |
|   |   | SCALE: AS NOTED |  |
|   |   | DWC #           |  |
|   |   | MO.2            |  |
|   |   | SHEET 13 of 228 |  |

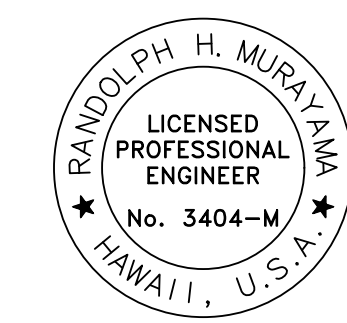
EXHAUST FANS/POWER ROOF VENTILATORS

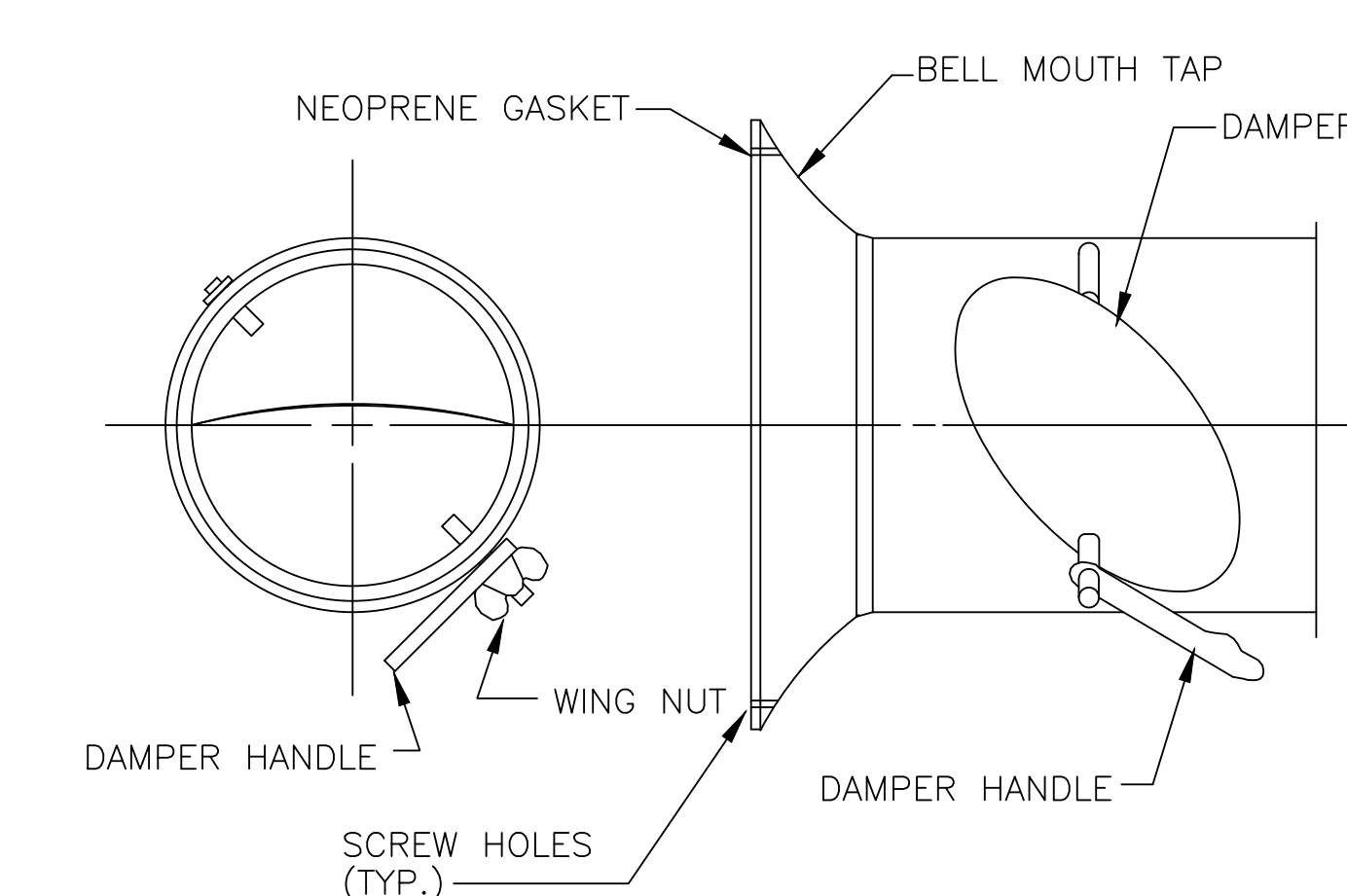
| UNIT NO. | LOCATION   | CFM  | S.P.<br>(IN. WG) | RPM  | WATTS | HP    | V/PH/HZ  | OPERATING<br>WEIGHT (LBS) | SOUND DATA<br>SONES | REMARKS  |
|----------|--|------|------------------|------|-------|-------|----------|---------------------------|---------------------|--|
| EF 1     | BILLETS -<br>TOILETS   | 100  | 0.375            | 867  | 121   | --    | 115/1/60 | 31                        | 3.1                 | INTERLOCK WITH LIGHT SWITCH OF ROOM SERVED.              |
| EF 2     | BILLETS -<br>MEN'S LATRINE (153), WOMEN'S LATRINE (158),<br>MEN'S LATRINE (239), WOMEN'S LATRINE (243) | 950  | 0.375            | 1050 | 370   | --    | 115/1/60 | 56                        | 6.1                 | INTERLOCK WITH LIGHT SWITCH OF ROOM SERVED.              |
| EF 3     | BILLETS -<br>ROOF  | 720  | 0.5              | 1248 | --    | 1/4   | 115/1/60 | 50                        | 6.0                 | POWER ROOF VENTILATOR                                    |
| EF 4     | BILLETS -<br>ROOF  | 840  | 0.5              | 1059 | --    | 1/4   | 115/1/60 | 50                        | 7.2                 | POWER ROOF VENTILATOR                                    |
| EF 5     | BILLETS -<br>UNI-SEX TOILET (136)  | 200  | 0.25             | 1000 | 83    | --    | 115/1/60 | 21                        | 3.4                 | INTERLOCK WITH LIGHT SWITCH OF ROOM SERVED.              |
| EF 6     | BILLETS -<br>LAUNDRY ROOM (137)  | 2500 | 0.375            | 474  | --    | 1/3   | 115/1/60 | 123                       | 5.0                 | INTERLOCK WITH SPACE THERMOSTAT<br>POWER ROOF VENTILATOR |
| EF 7     | NOT USED   |      |                  |      |       |       |          |                           |                     |  |
| EF 8     | BILLETS -<br>ELEC. ROOM (139)  | 3650 | 0.375            | 544  | --    | 1/2   | 115/1/60 | 123                       | 7.5                 | INTERLOCK WITH SPACE THERMOSTAT<br>POWER ROOF VENTILATOR |
| EF 9     | AUDITORIUM -<br>STOR (108), STOR(111), COMM(112)   | 100  | 0.375            | 867  | 121   | --    | 115/1/60 | 31                        | 3.1                 | INTERLOCK WITH LIGHT SWITCH OF ROOM SERVED.              |
| EF 10    | AUDITORIUM -<br>JAN. ROOM (106)  | 120  | 0.375            | 869  | 121   | --    | 115/1/60 | 31                        | 3.2                 | INTERLOCK WITH LIGHT SWITCH OF ROOM SERVED.              |
| EF 11    | NOT USED   |      |                  |      |       |       |          |                           |                     |  |
| EF 12    | NOT USED   |      |                  |      |       |       |          |                           |                     |  |
| EF 13    | MESS -<br>ABOVE ICE MACHINE  | 500  | 0.375            | 1080 | 325   | --    | 115/1/60 | 36                        | 5.2                 | INTERLOCK WITH LIGHT SWITCH OF ROOM SERVED.              |
| EF 14    | MESS -<br>JAN. ROOM (113)  | 100  | 0.375            | 867  | 121   | --    | 115/1/60 | 31                        | 3.1                 |  |
| EF 15    | MESS -<br>JAN. ROOM (106)  | 180  | 0.375            | 877  | 121   | --    | 115/1/60 | 31                        | 3.4                 |  |
| EF 16    | MESS -<br>STOR. (109)  | 370  | 0.375            | 740  | 285   | --    | 115/1/60 | 56                        | 5.1                 |  |
| EF 17    | MESS -<br>WOMEN'S LATRINE (103),<br>STOR. (116)  | 330  | 0.375            | 839  | 420   | --    | 115/1/60 | 56                        | 5.5                 |  |
| EF 18    | MESS -<br>MEN'S LATRINE (104)  | 410  | 0.375            | 737  | 285   | --    | 115/1/60 | 56                        | 5.1                 |  |
| EF 19    | MESS -<br>TOILET (117)   | 120  | 0.375            | 869  | 121   | --    | 115/1/60 | 31                        | 3.2                 |  |
| EF 20    | MESS -<br>GREASE HOOD  | 6300 | 1.2              | 535  | --    | 3     | 208/3/60 | 311                       | 15.0                | INTERLOCK WITH SF-1.<br>UPBLAST PRV, UL 762 RATED        |
| EF 21    | MESS -<br>GREASE HOOD  | 1400 | 1.2              | 1388 | --    | 3/4   | 208/1/60 | 65                        | 11.6                | INTERLOCK WITH SF-1.<br>UPBLAST PRV, UL 762 RATED        |
| EF 22    | MESS -<br>DISHWASHING HOOD   | 2250 | 1.2              | 1282 | --    | 1     | 208/3/60 | 103                       | 14.5                | INTERLOCK WITH SF-1.<br>UPBLAST PRV, UL 762 RATED        |
| EF 23    | MESS -<br>ELECTRICAL ROOM  | 500  | 0.25             | 732  | 420   | --    | 115/1/60 | 56                        | 4.8                 | INTERLOCK WITH SPACE THERMOSTAT                          |
| SF 1     | MESS -<br>KITCHEN  | 4480 | 0.85             | 650  | --    | 1-1/2 | 208/1/60 |                           |                     | CENTRAL STATION AIR HANDLER                              |
| OAF 1    | BILLETS -<br>OFFICE  | 60   | 0.25             | 950  | 51    | --    | 115/1/60 | 16                        | 1.3                 | INTERLOCK WITH LIGHT SWITCH OF ROOM SERVED.              |
| EF 24    | MESS -<br>KITCHEN  | 500  | 0.25             | 732  | 420   | --    | 115/1/60 | 56                        | 4.8                 | IN-LINE CABINET FAN W/ SWITCH                            |

IF SHEET IS LESS THAN  
22 x 34  
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SCALE REDUCED ACCORDINGLY

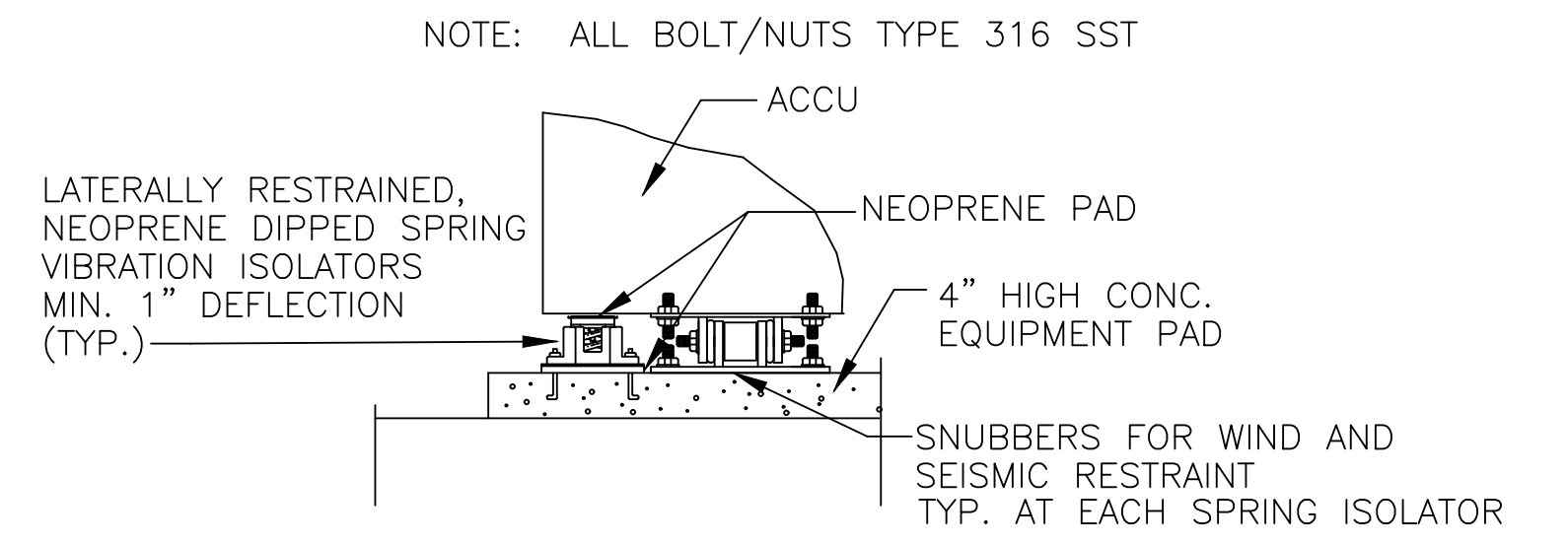
The Contractor will be responsible  
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available space.

| REVISION NO | DESCRIPTION | DATE | BY | CHK'D |
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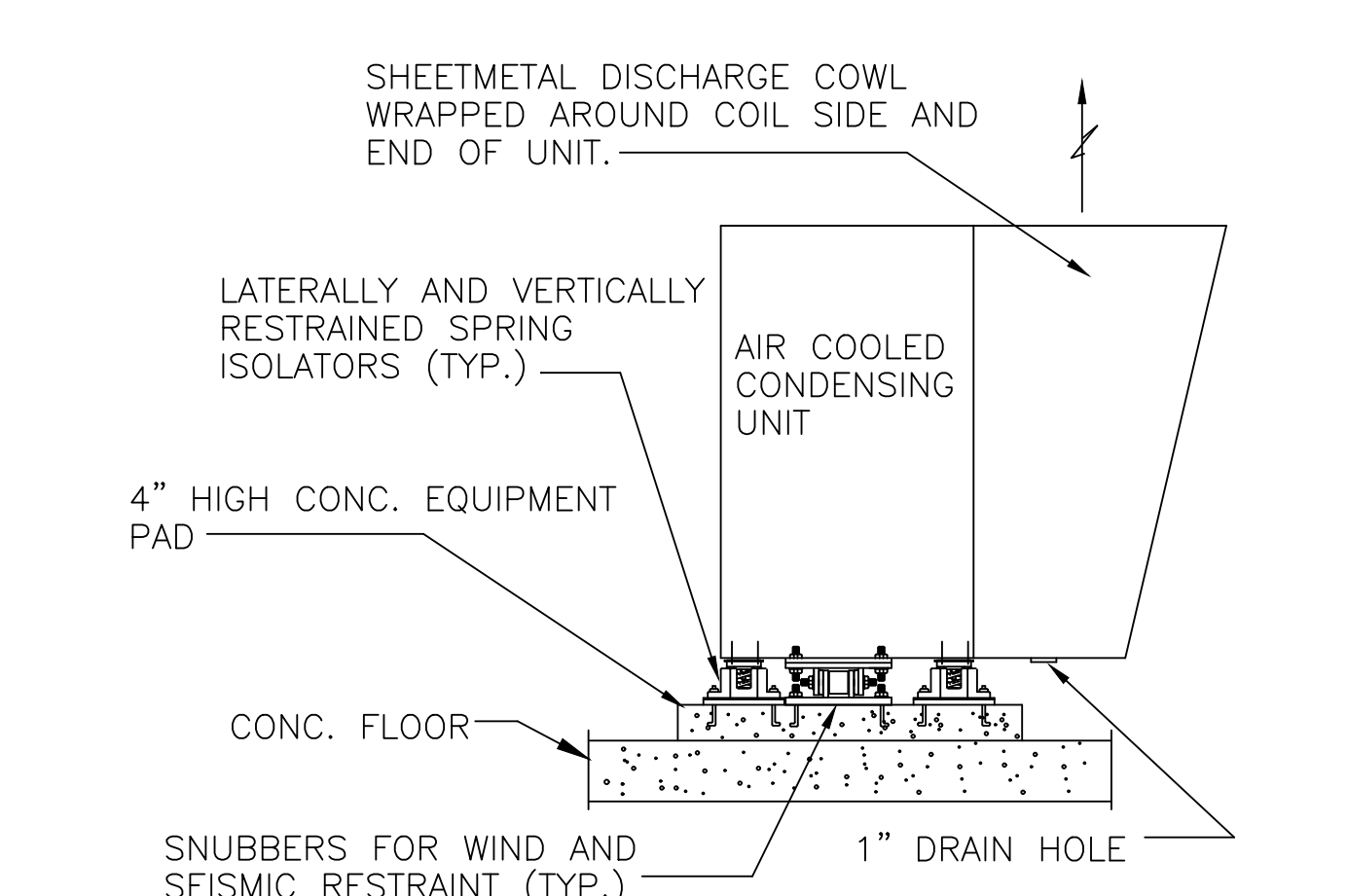
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|---|---------|--|----------------|
| <b>Richard Matsunaga &amp; Associates<br/>Architects, Inc.</b>                        |         | DEPARTMENTS OF THE ARMY AND AIR<br>NATIONAL GUARD OF HAWAII<br>OFFICE OF THE ENGINEER, FT. RUGER, HAWAII |                |
|  |         | 298TH REGIONAL TRAINING INSTITUTE, PHASE II<br>BELLOWS AIR FORCE STATION<br>WAIMANALO, HAWAII            |                |
| DESIGNED:   | ESN/RYT | MECHANICAL EQUIPMENT SCHEDULE  |                |
| DRAWN:  | RYT     |  |                |
| SAFETY:   |         |  |                |
| ENGINEER:   |         |  |                |
| APPROVED:   |         | APPROVED:  | DATE           |
| HARRIG, FAC MGMT OFFICER  |         | NSB, USPFO FOR HAWAII  | MARCH 28, 2000 |
| APPROVED:   |         | SCALE: AS NOTED  |                |
|   |         | DWC #  |                |
|   |         | MO.3   |                |
| THIS WORK WAS PREPARED BY ME<br>OR UNDER MY SUPERVISION                               |         | SHEET 14 of 228  |                |



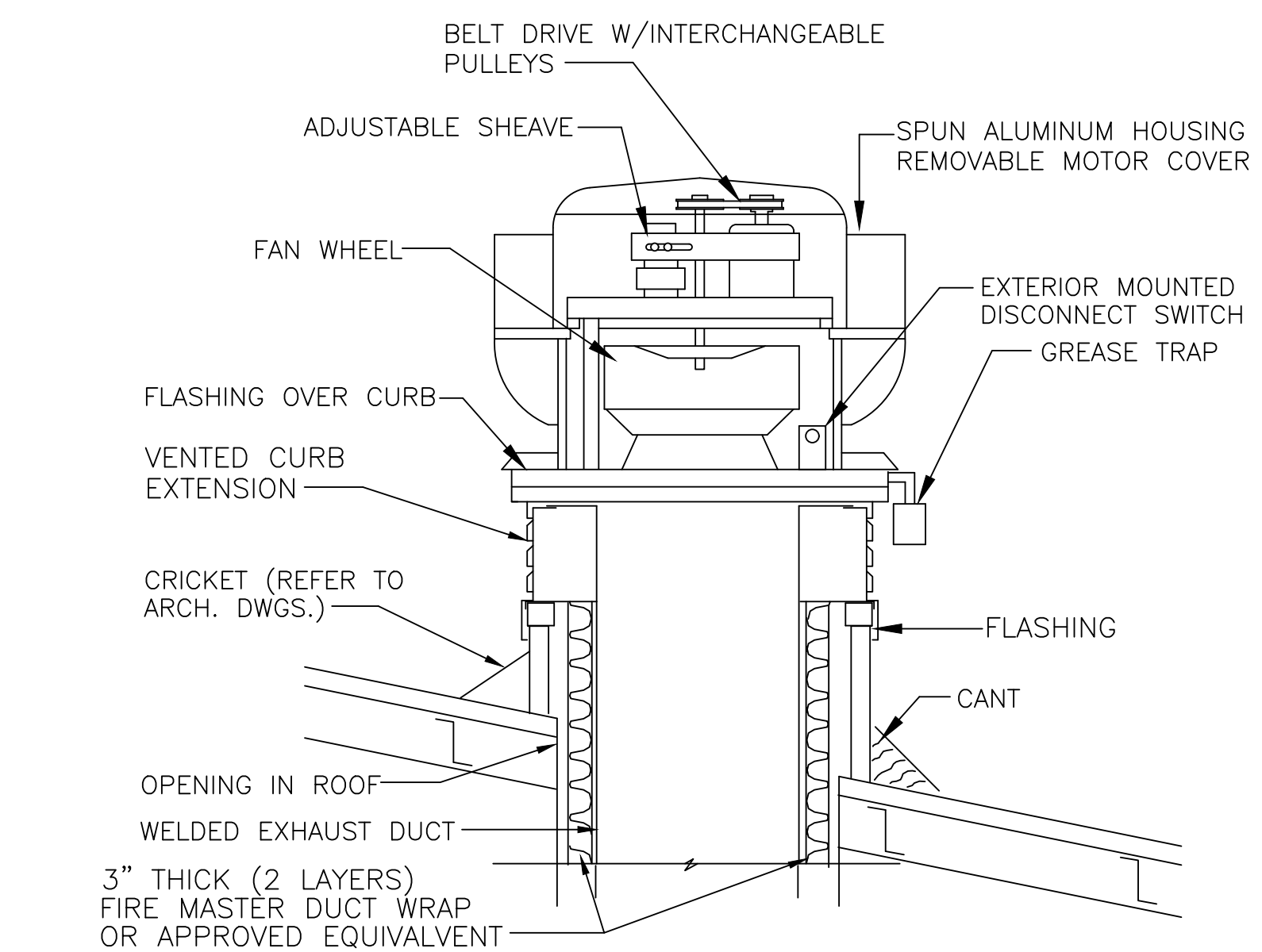
**A** BELLMOUTH TAP FITTING DETAIL  
MO.4 | MO.4 NOT TO SCALE



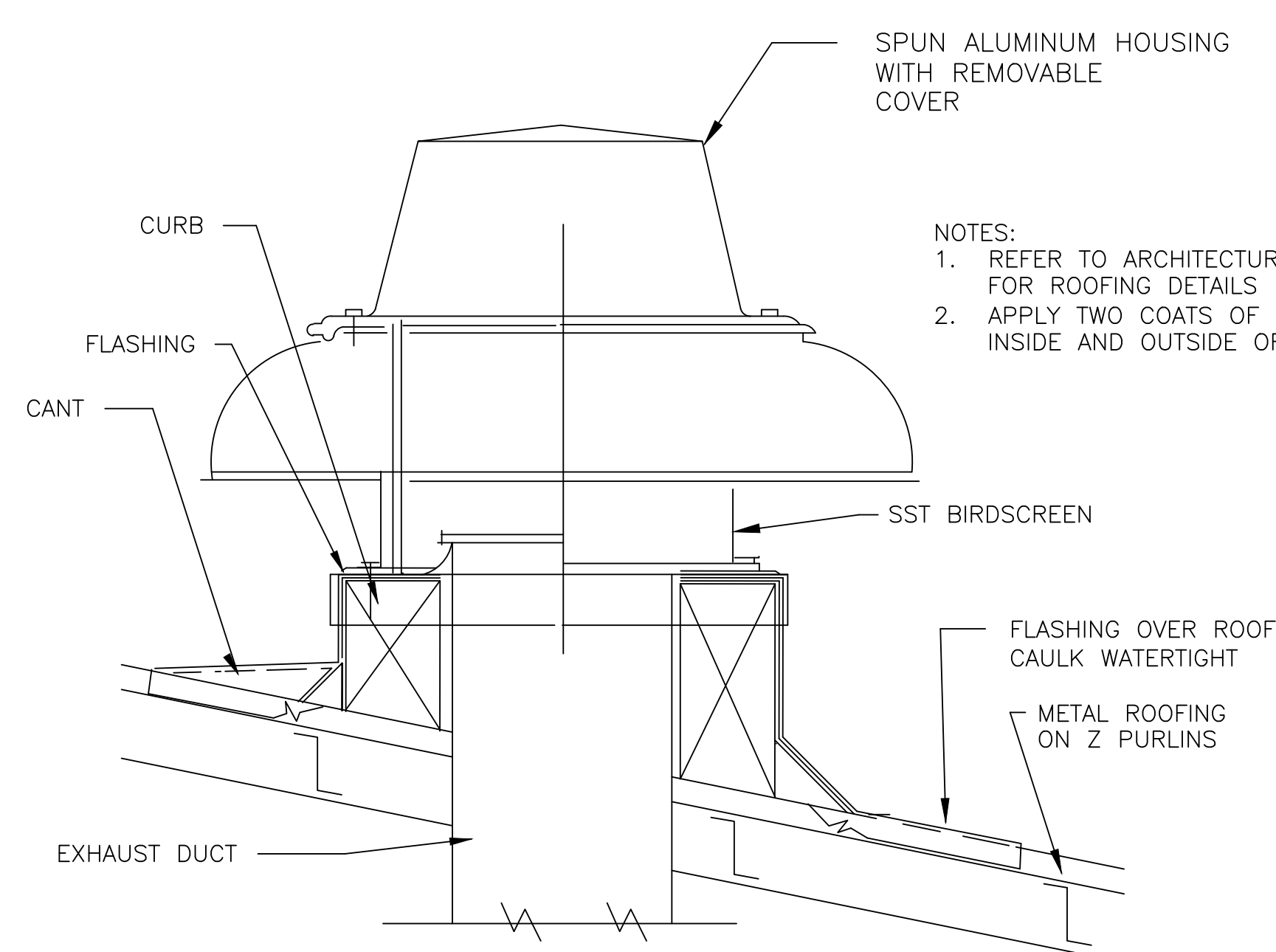
**B** ACCU MOUNTING DETAIL  
MO.4 | MO.4 NOT TO SCALE  
(AIR HANDLING UNITS SIMILAR)



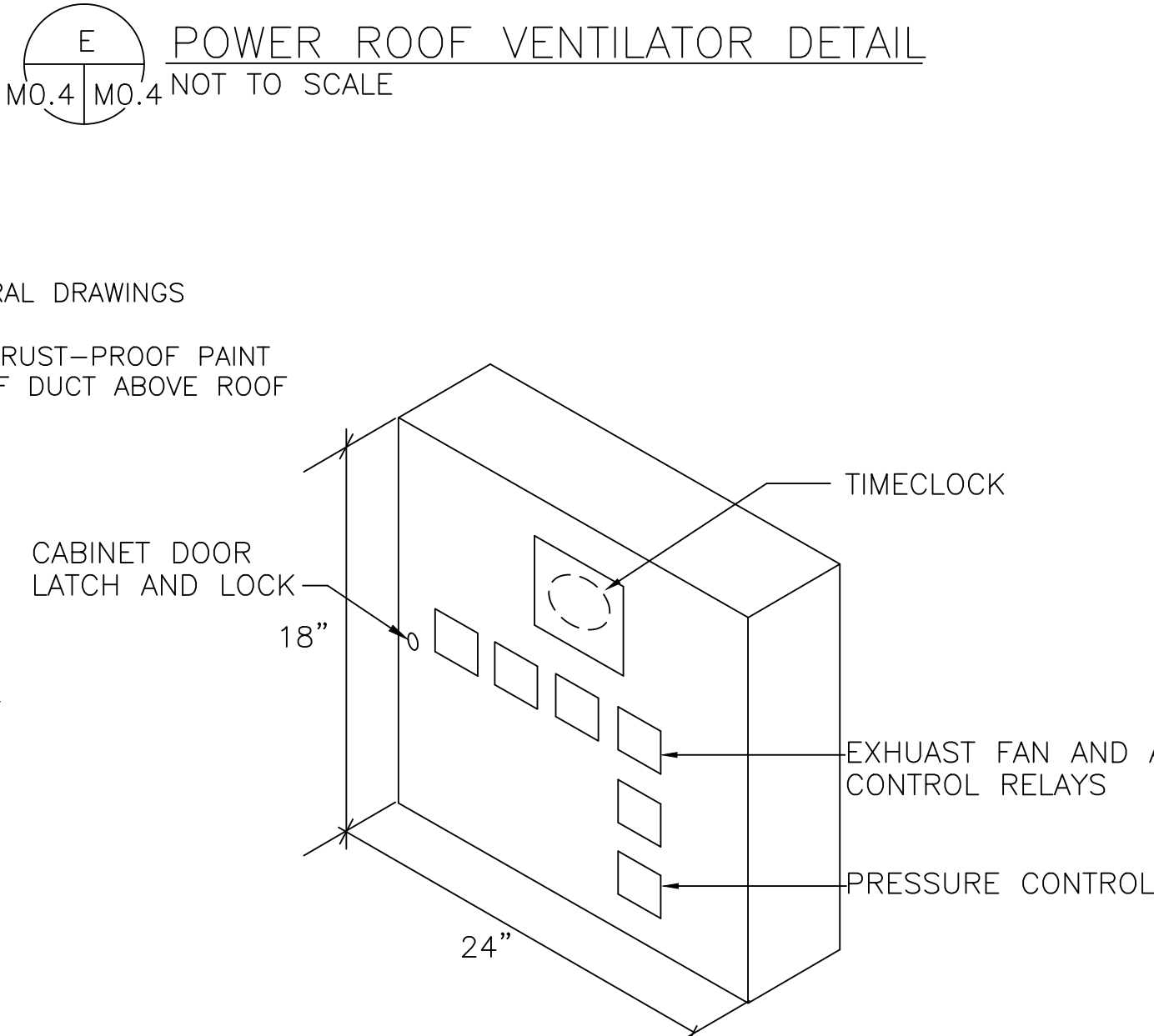
**D** DISCHARGE COWL DETAIL  
MO.4 | MO.4 NOT TO SCALE



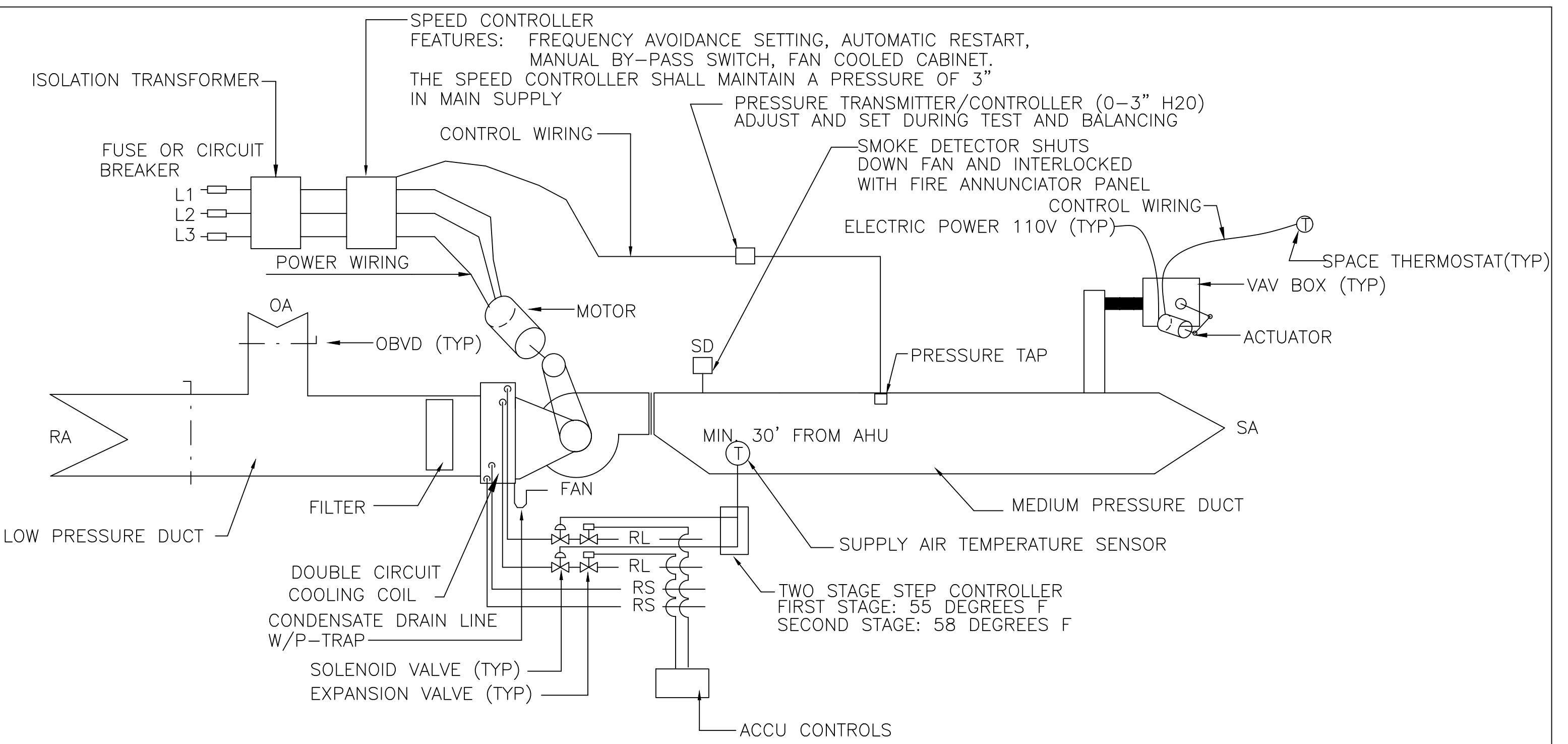
**E** POWER ROOF VENTILATOR DETAIL  
MO.4 | MO.4 NOT TO SCALE



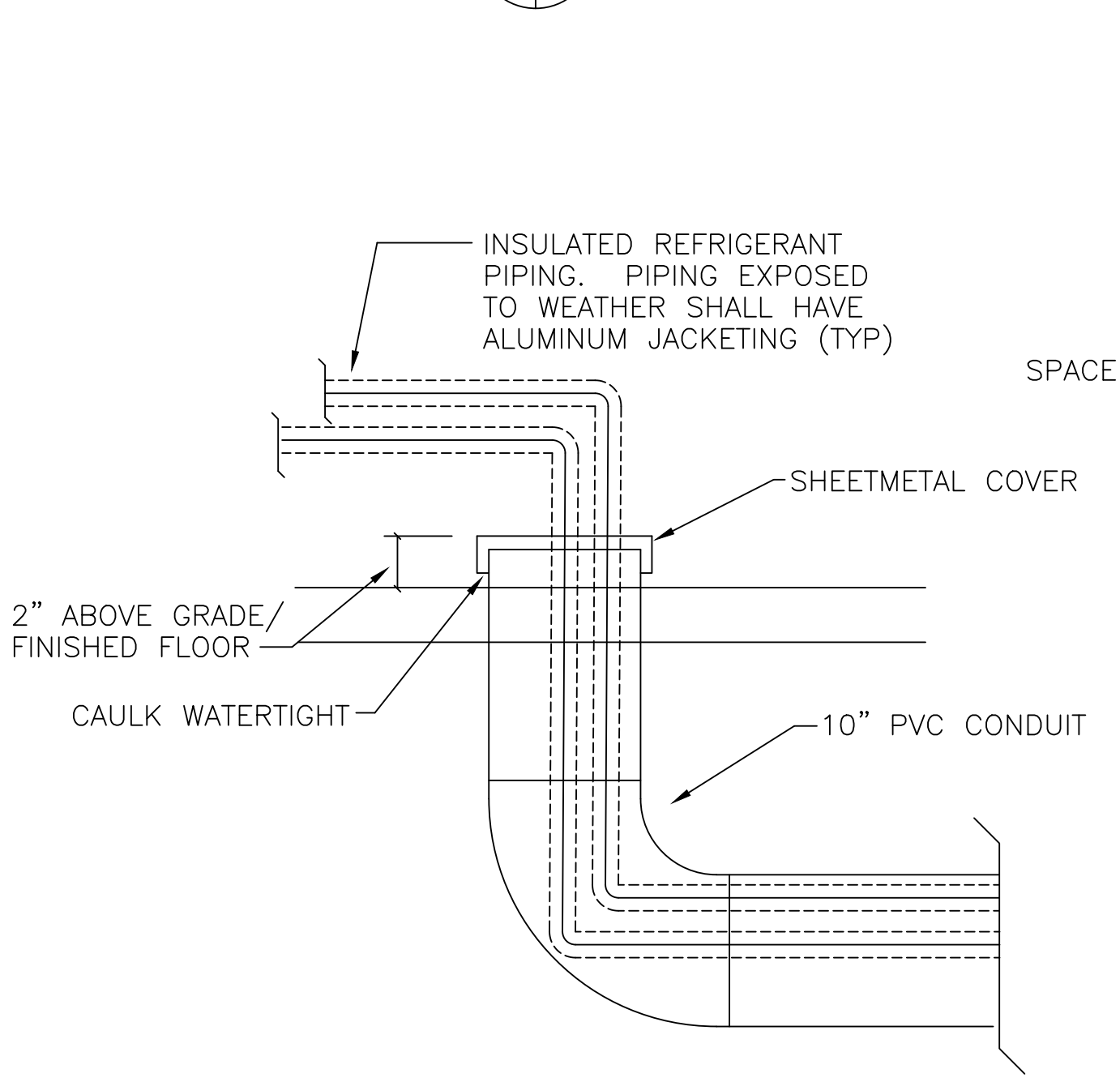
**F** ROOF DISCHARGE HOOD DETAIL  
MO.4 | MO.4 NOT TO SCALE  
NOTE: INTAKE HOOD SIMILAR. SIZE HOOD FOR MAX. 0.05" S.P. LOSS AT 600 FPM



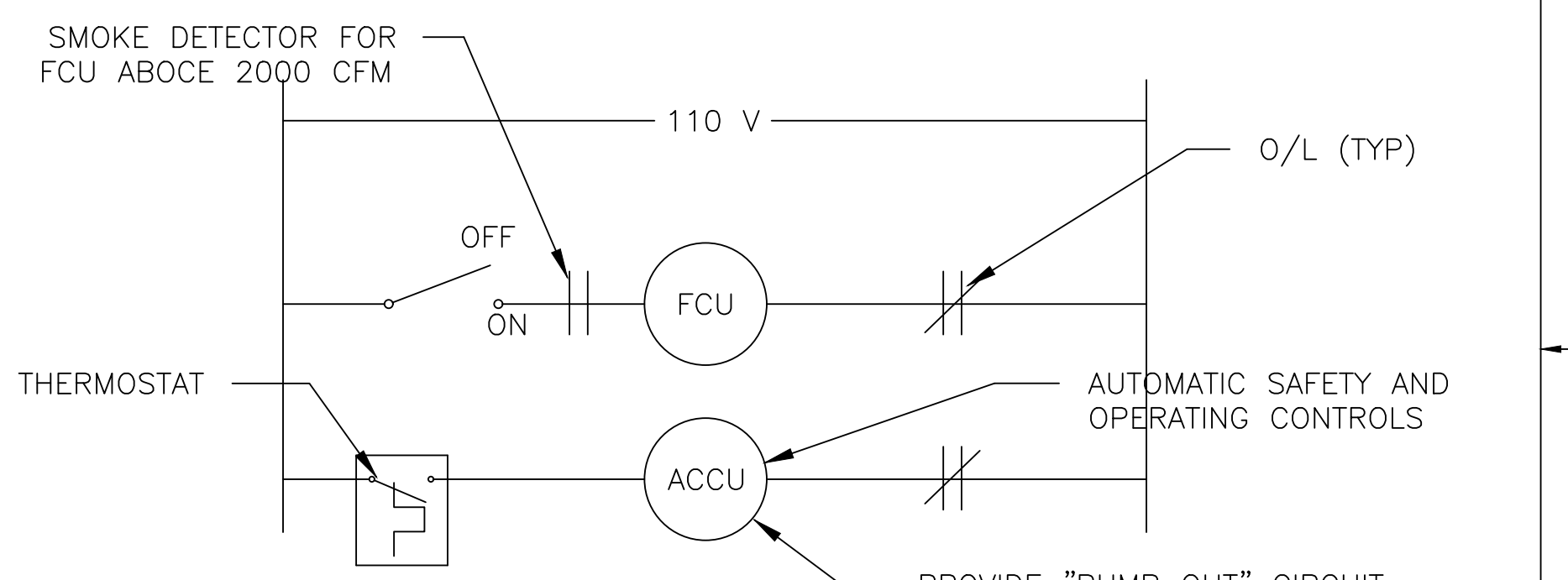
**G** CONTROL CABINET DETAIL  
MO.4 | MO.4 NOT TO SCALE



**C** TYPICAL AHU PIPING AND CONTROL SCHEMATIC  
MO.4 | MO.4 NOT TO SCALE



**H** UNDERGROUND REFRIGERANT PIPING DETAIL  
MO.4 | MO.4 NOT TO SCALE



**FCU CONTROL DIAGRAM**  
NOT TO SCALE

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SAFETY: -  
ENGINEER: -

298TH REGIONAL TRAINING INSTITUTE, PHASE II  
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WAIMANALO, HAWAII

DETAILS

APPROVED: [Signature] DATE: MARCH 28, 2000  
HARRIGAN, FAC MGMT OFFICER NGB, USPFO FOR HAWAII

APPROVED: [Signature] SCALE: AS NOTED  
HING, CONTRACTING & ENGINEERING OFFICER

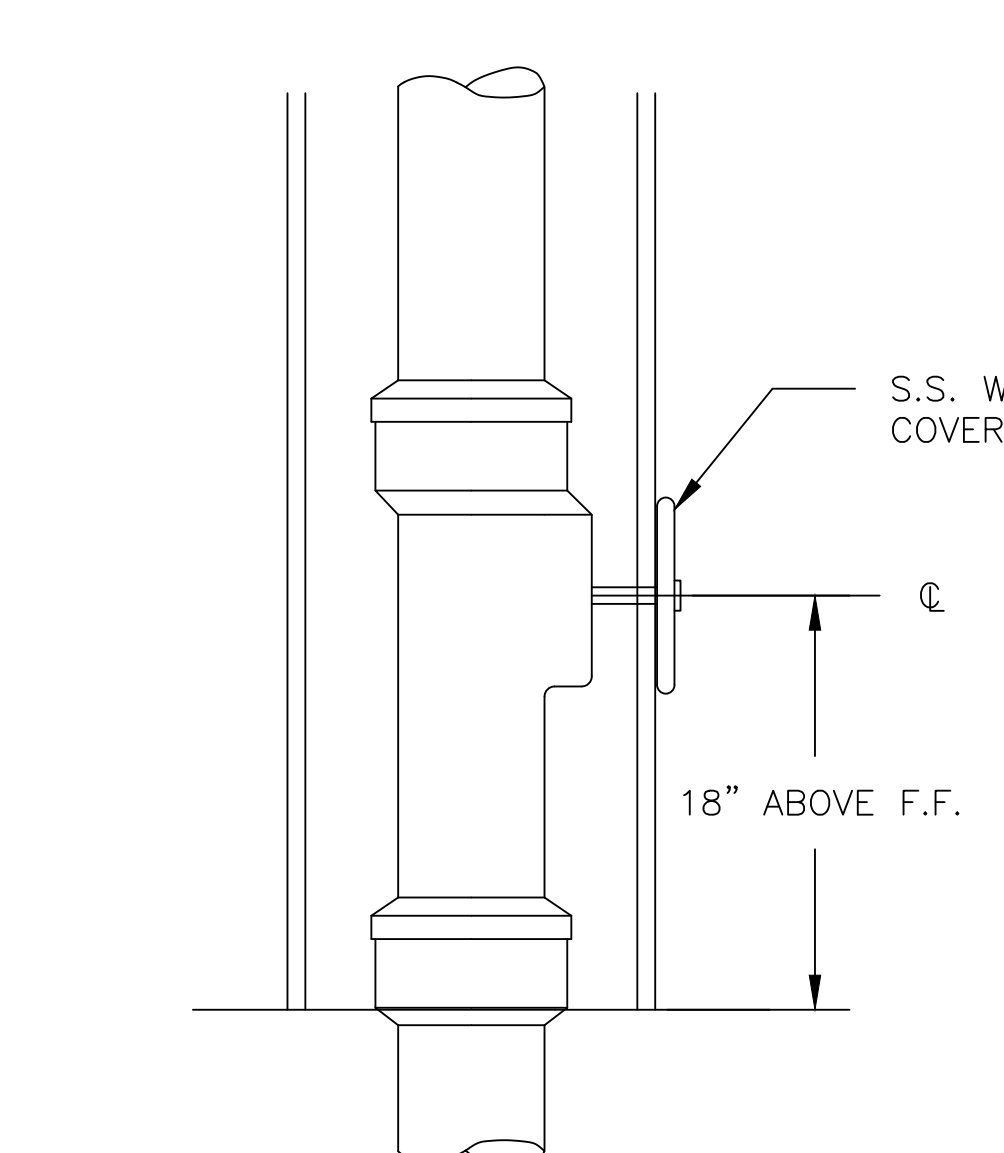
APPROVED: [Signature] DATE: MARCH 28, 2000  
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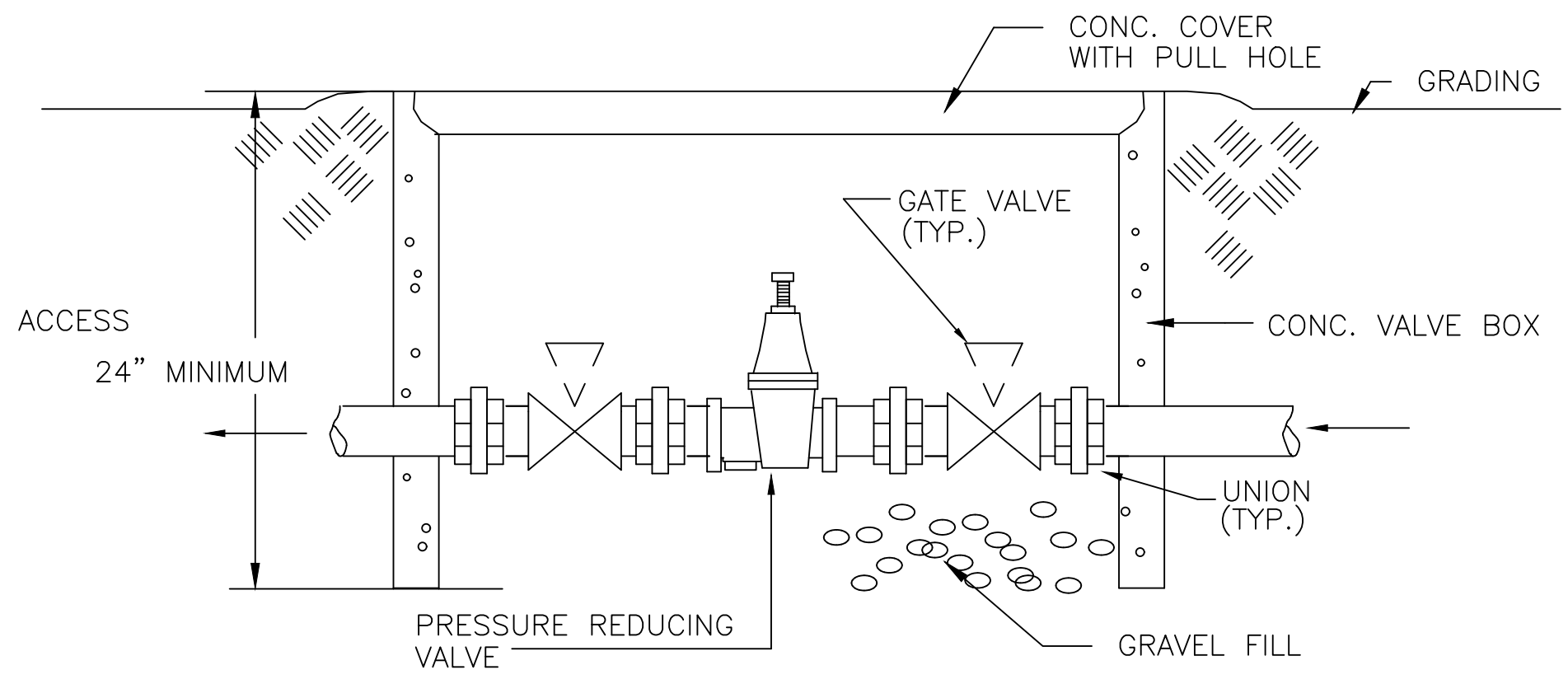
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SHEET 15 OF 228

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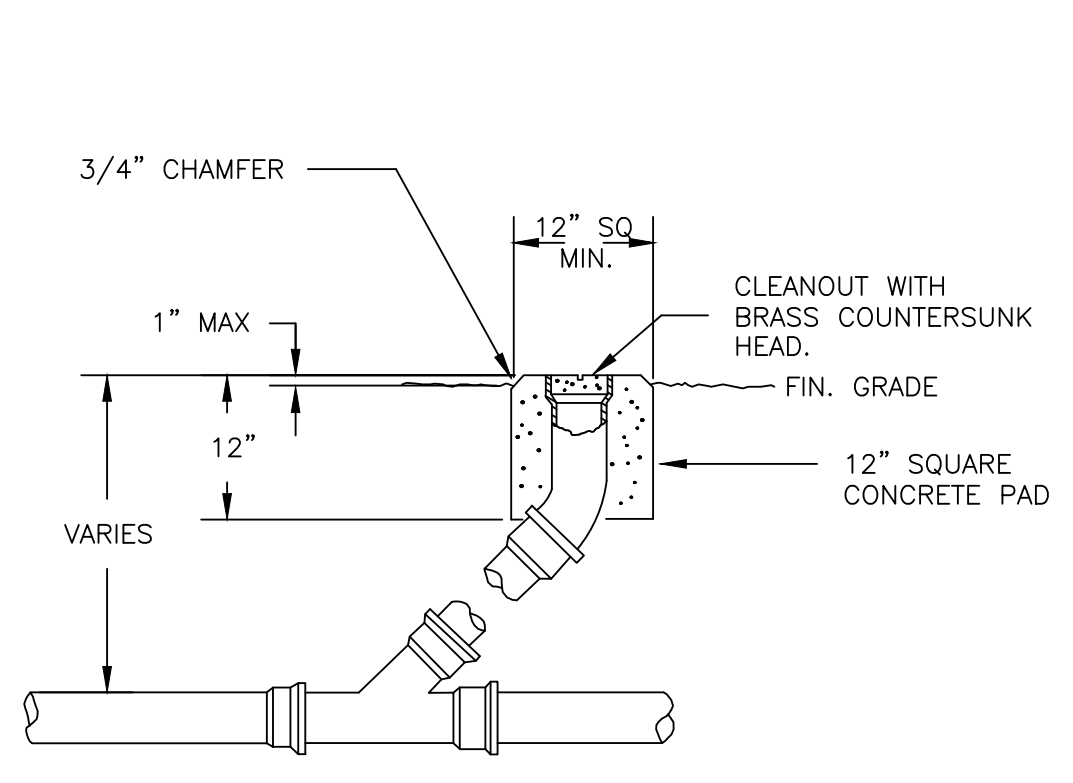
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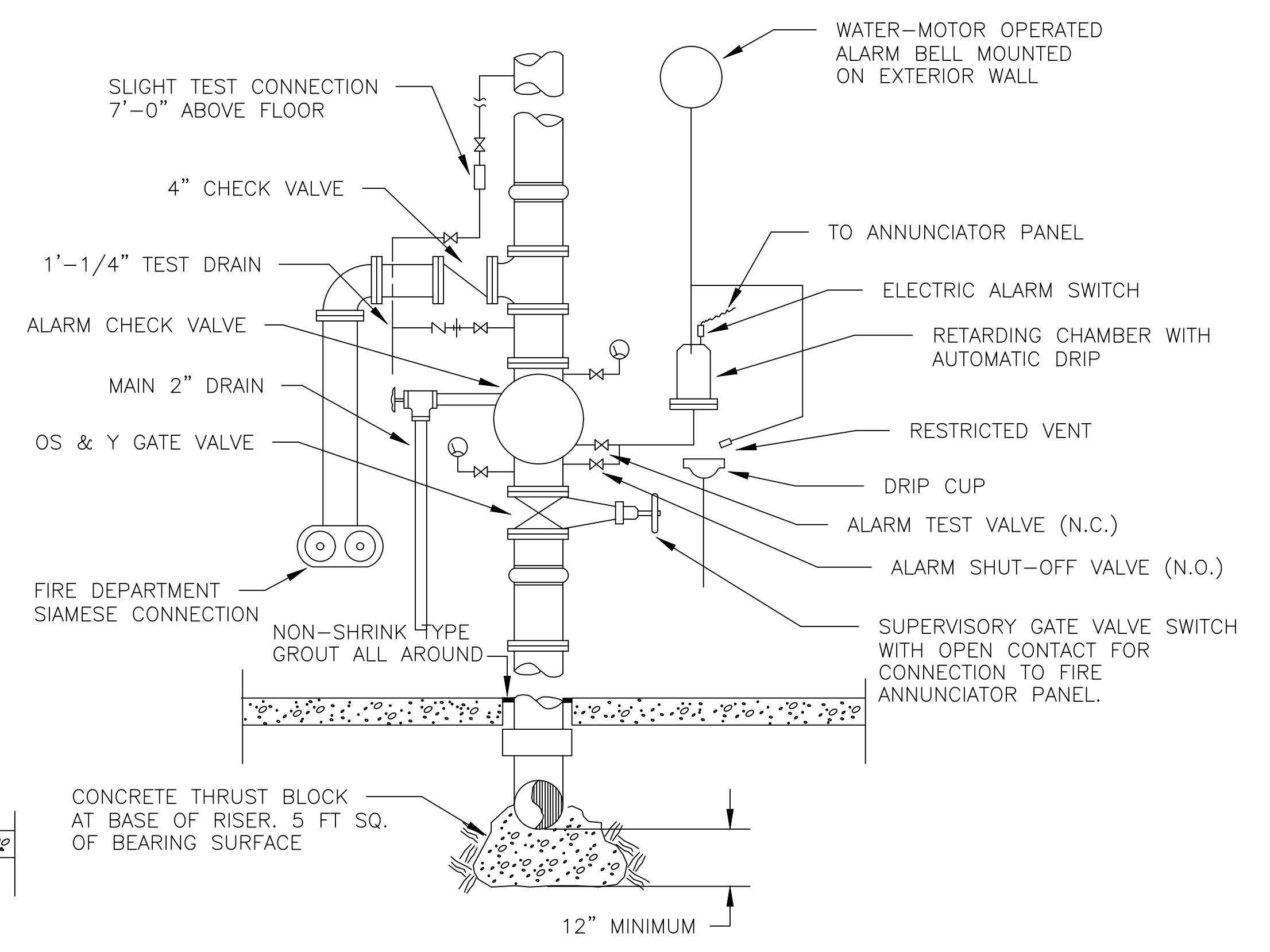
**A** WALL CLEANOUT DETAIL  
M0.5 M0.5 NOT TO SCALE



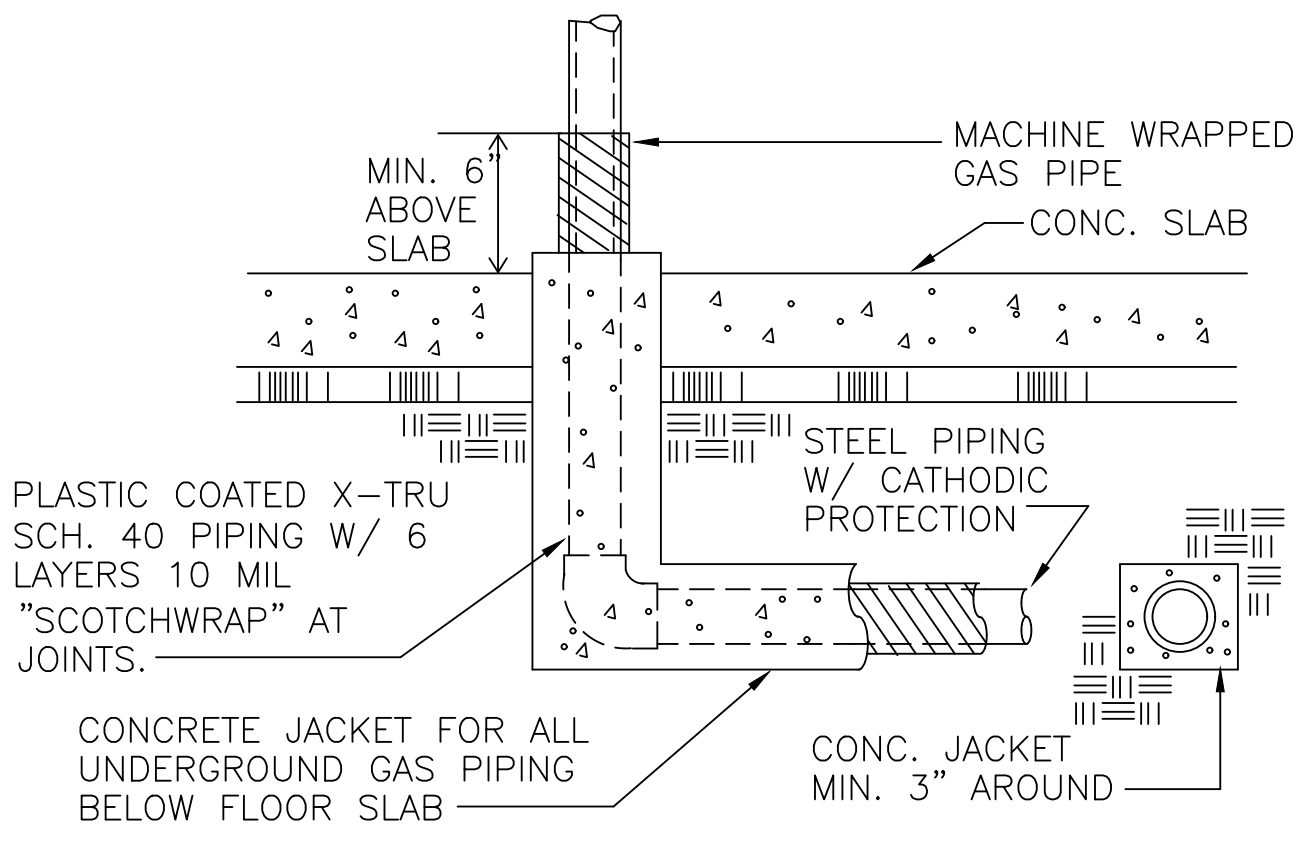
**B** VALVE BOX DETAIL  
M0.5 M0.5 NOT TO SCALE



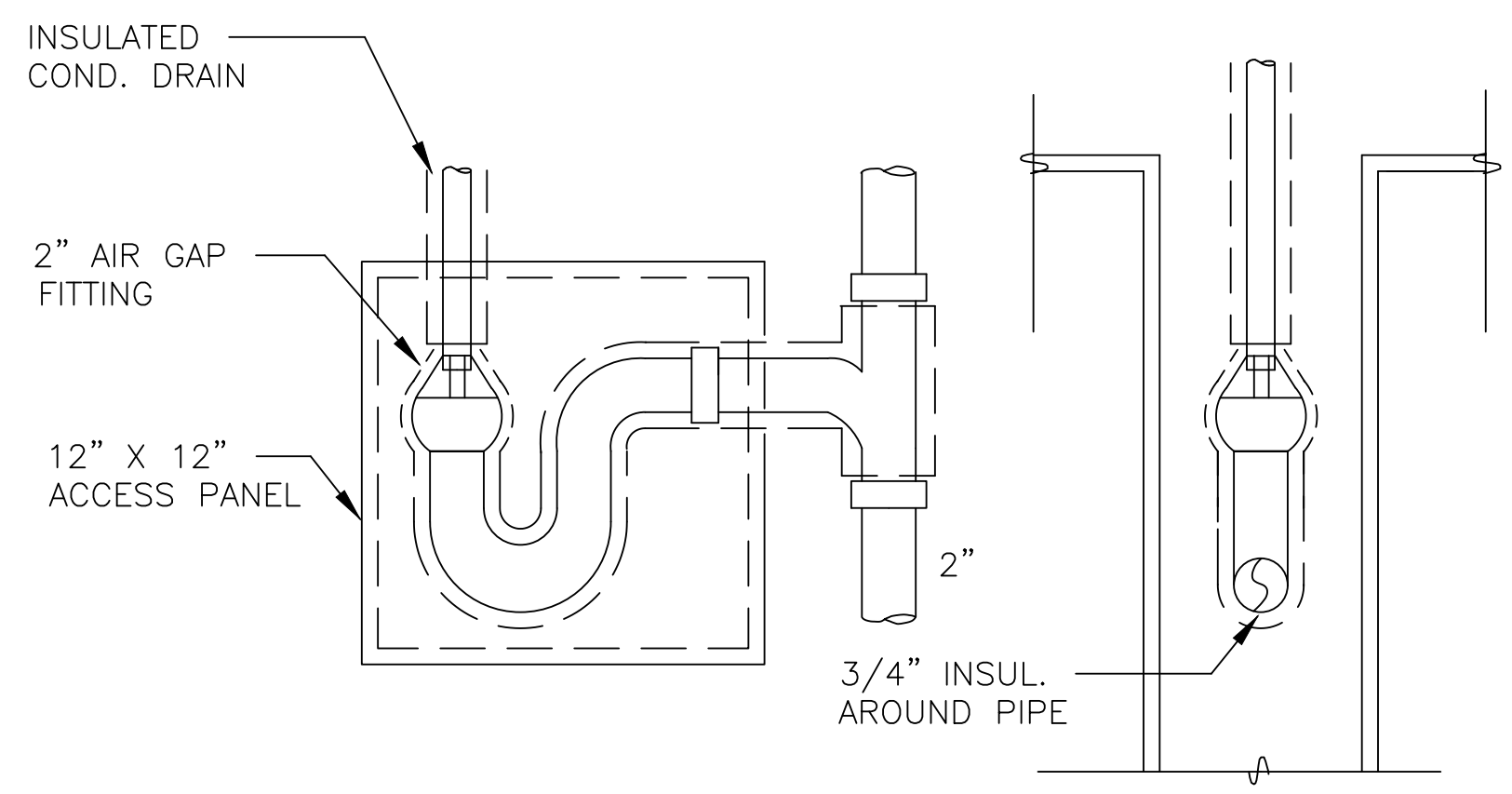
**C** CLEANOUT TO GRADE DETAIL  
M0.5 M0.5 NOT TO SCALE



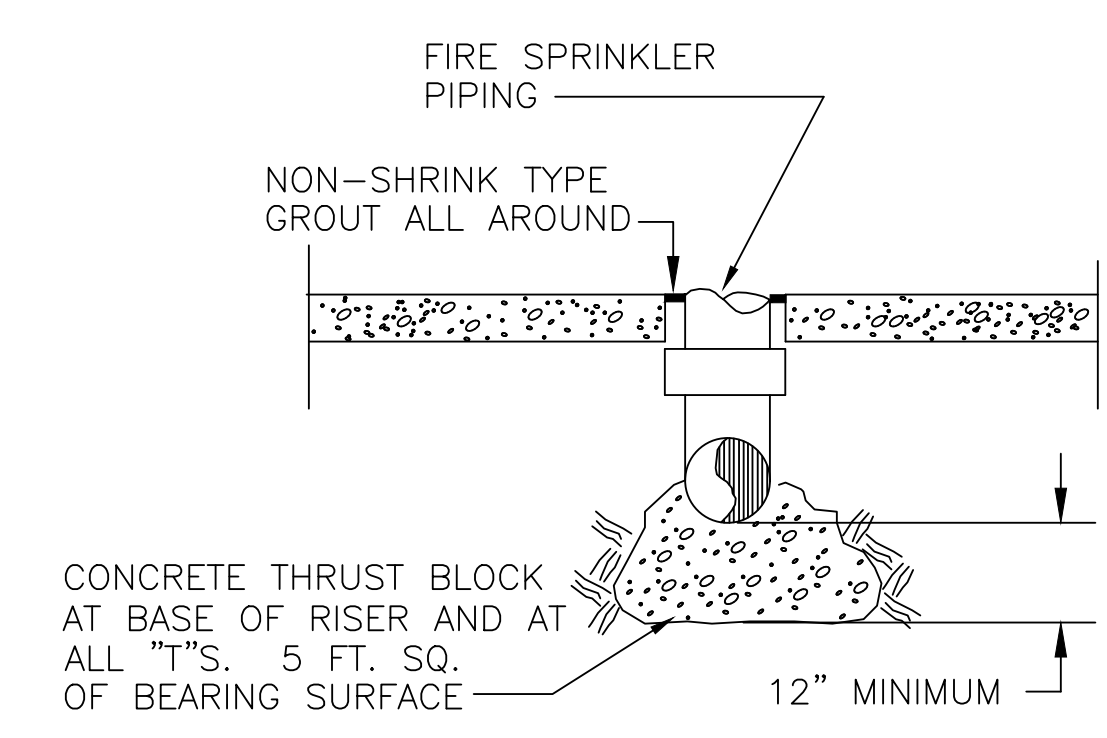
**G** FIRE SPRINKLER RISER ASSEMBLY DETAIL  
M0.5 M0.5 NOT TO SCALE



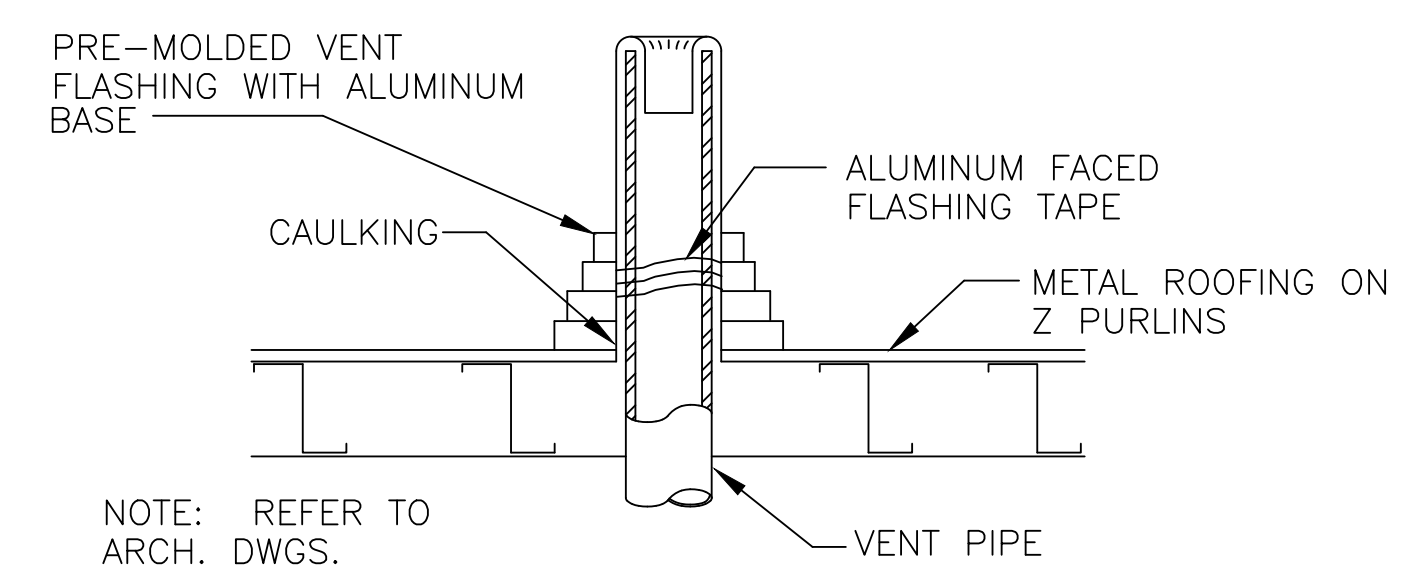
**D** GAS LINE JACKET DETAIL  
M0.5 M0.5 NOT TO SCALE



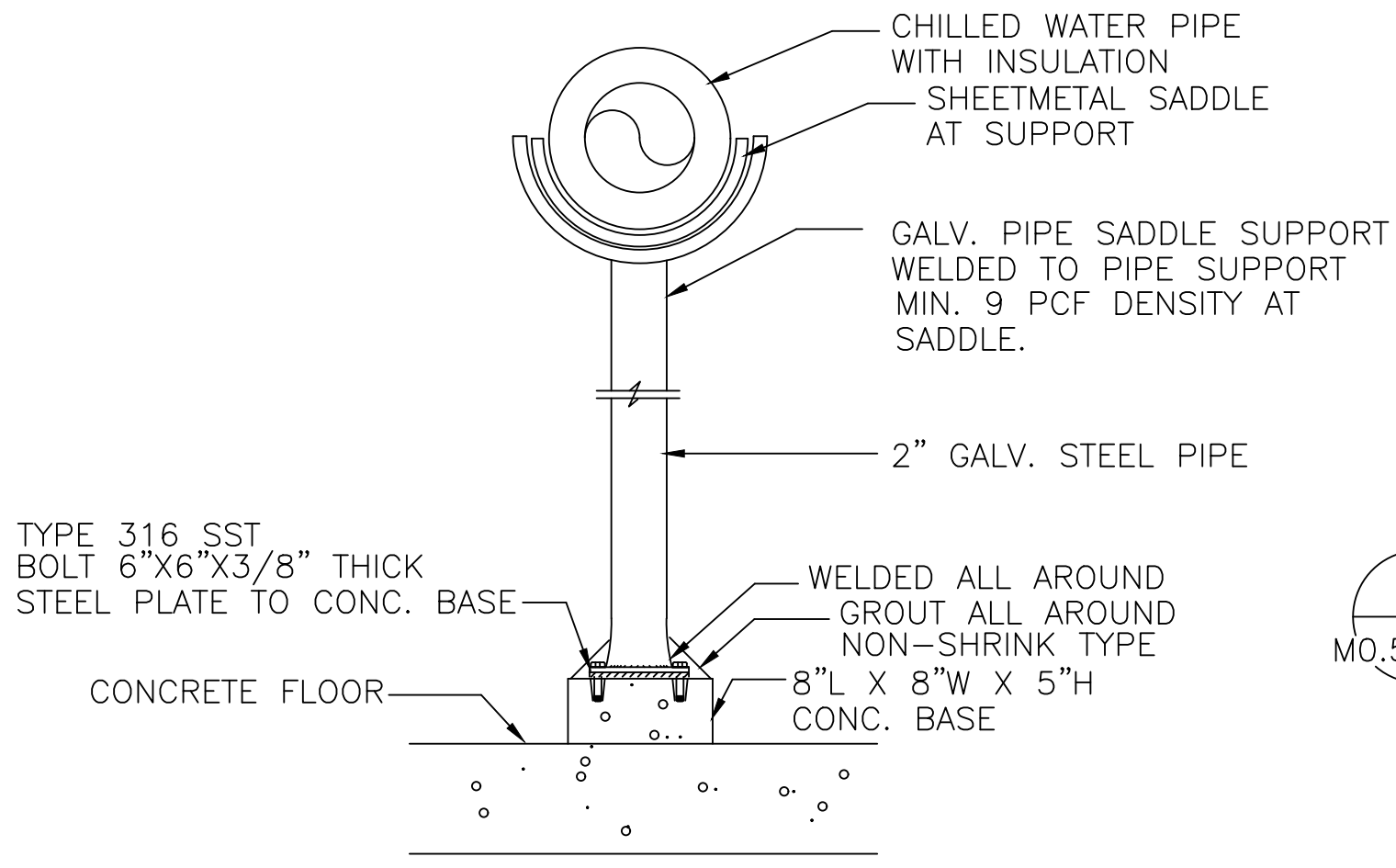
**E** TYPICAL AIR GAP FITTING DETAIL  
M0.5 M0.5 NOT TO SCALE



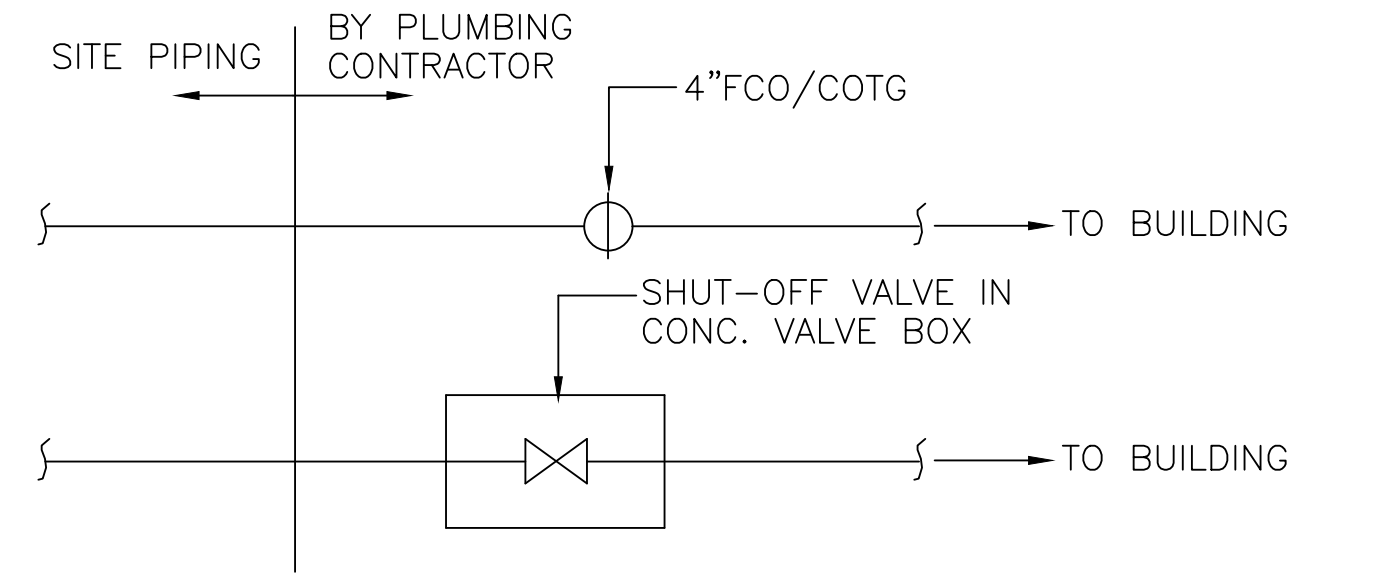
**F** CONCRETE THRUST BLOCK DETAIL  
M0.5 M0.5 NOT TO SCALE



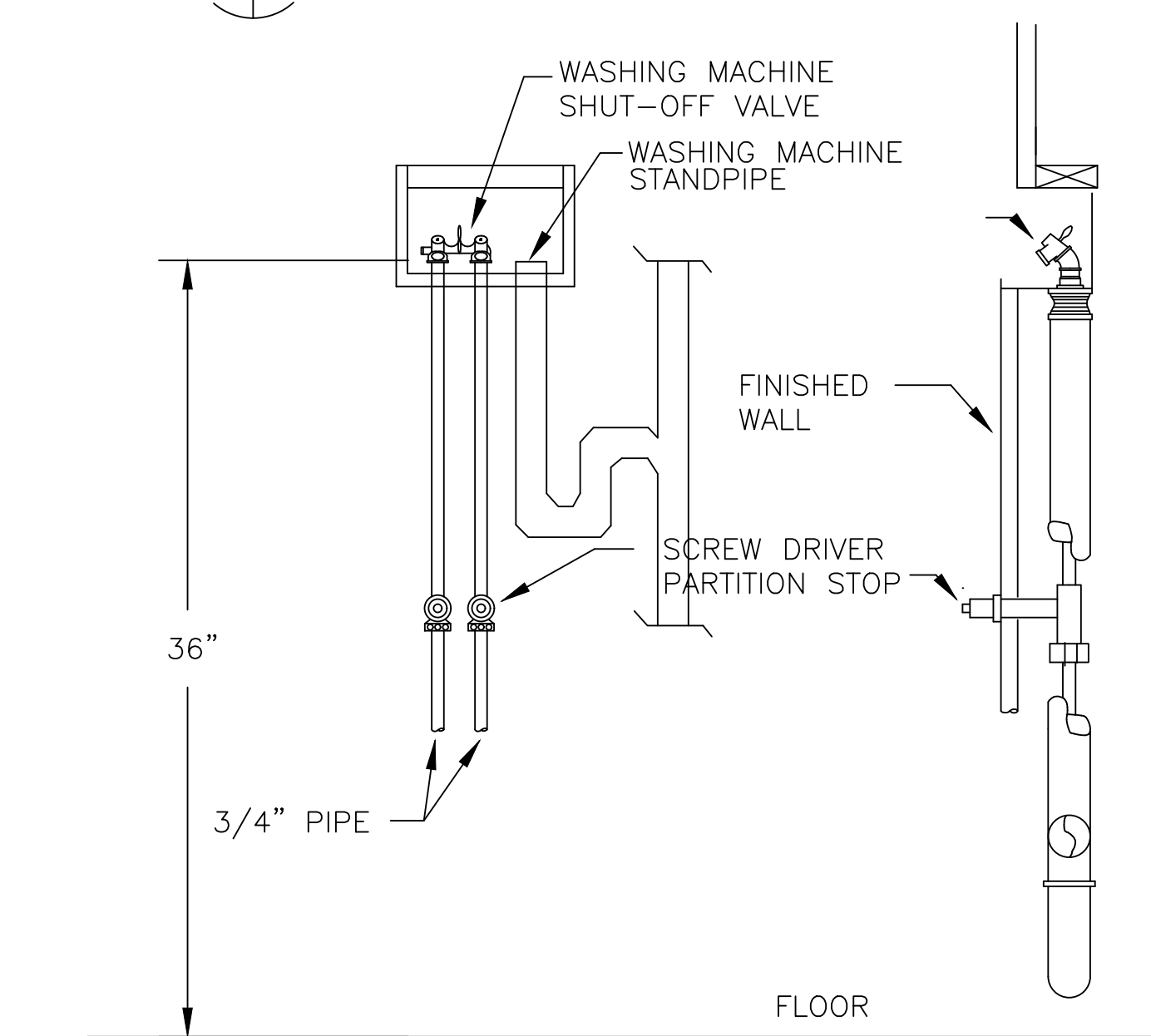
**I** VENT THRU ROOF DETAIL  
M0.5 M0.5 NOT TO SCALE



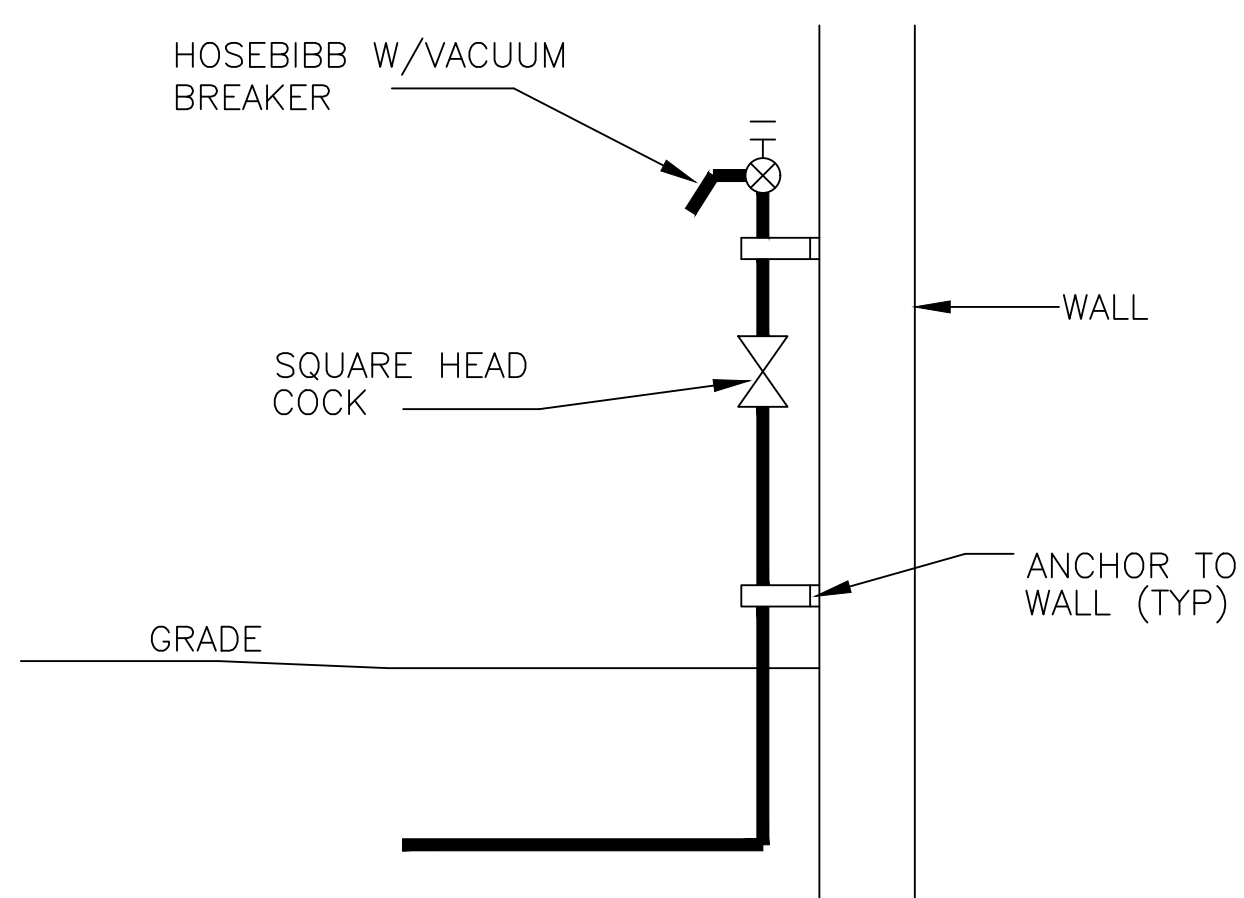
**K** PIPING SUPPORT DETAIL  
M0.5 M0.5 NOT TO SCALE



**L** UTILITY CONNECTION DETAIL  
M0.5 M0.5 NOT TO SCALE



**H** WASHING MACHINE CONNECTION DETAIL  
M0.5 M0.5 NOT TO SCALE



**J** TYPICAL HOSE BIBB DETAIL  
M0.5 M0.5 NOT TO SCALE

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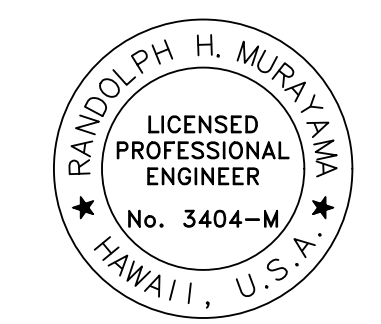
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WAIMANALO, HAWAII

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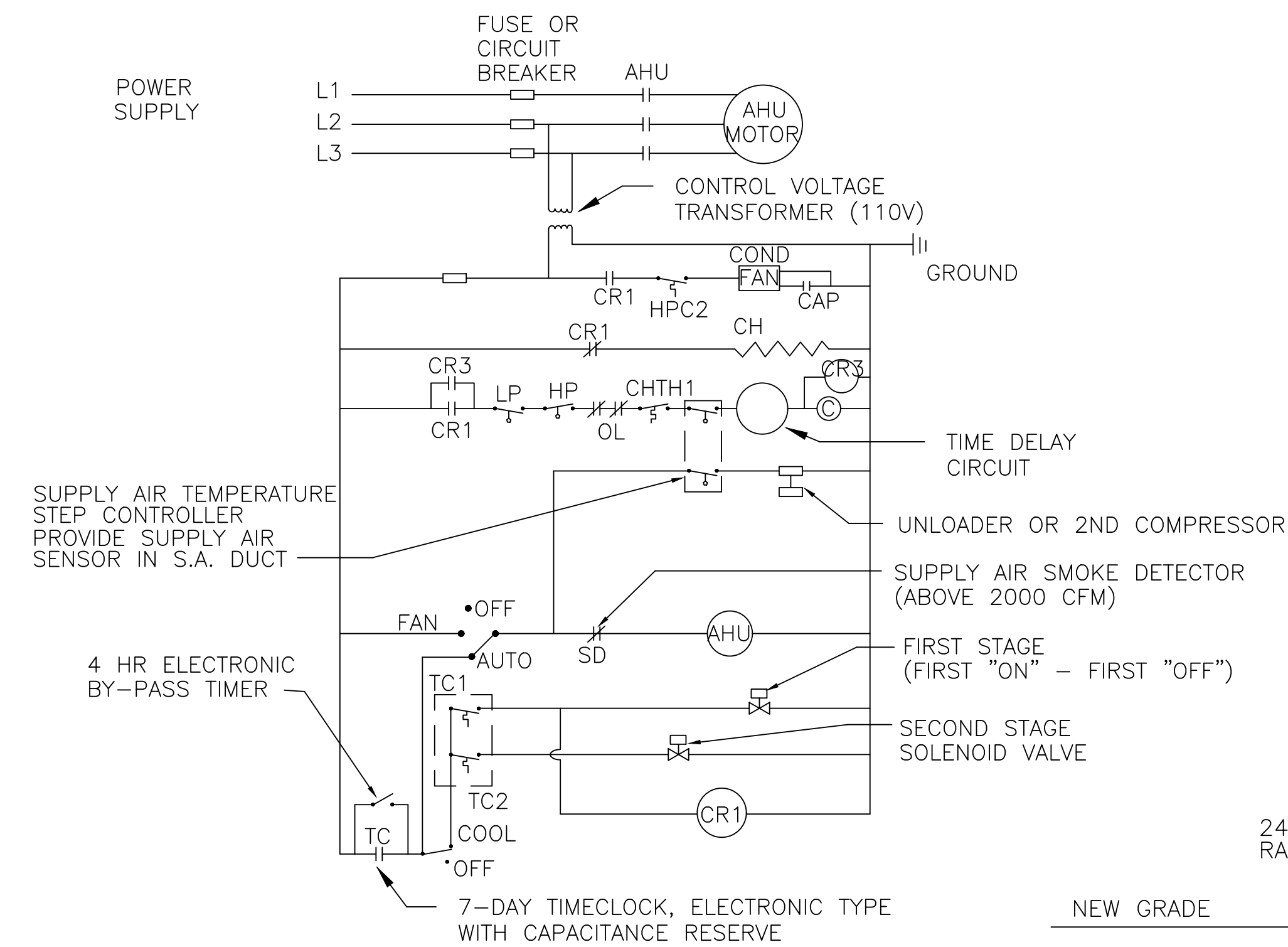
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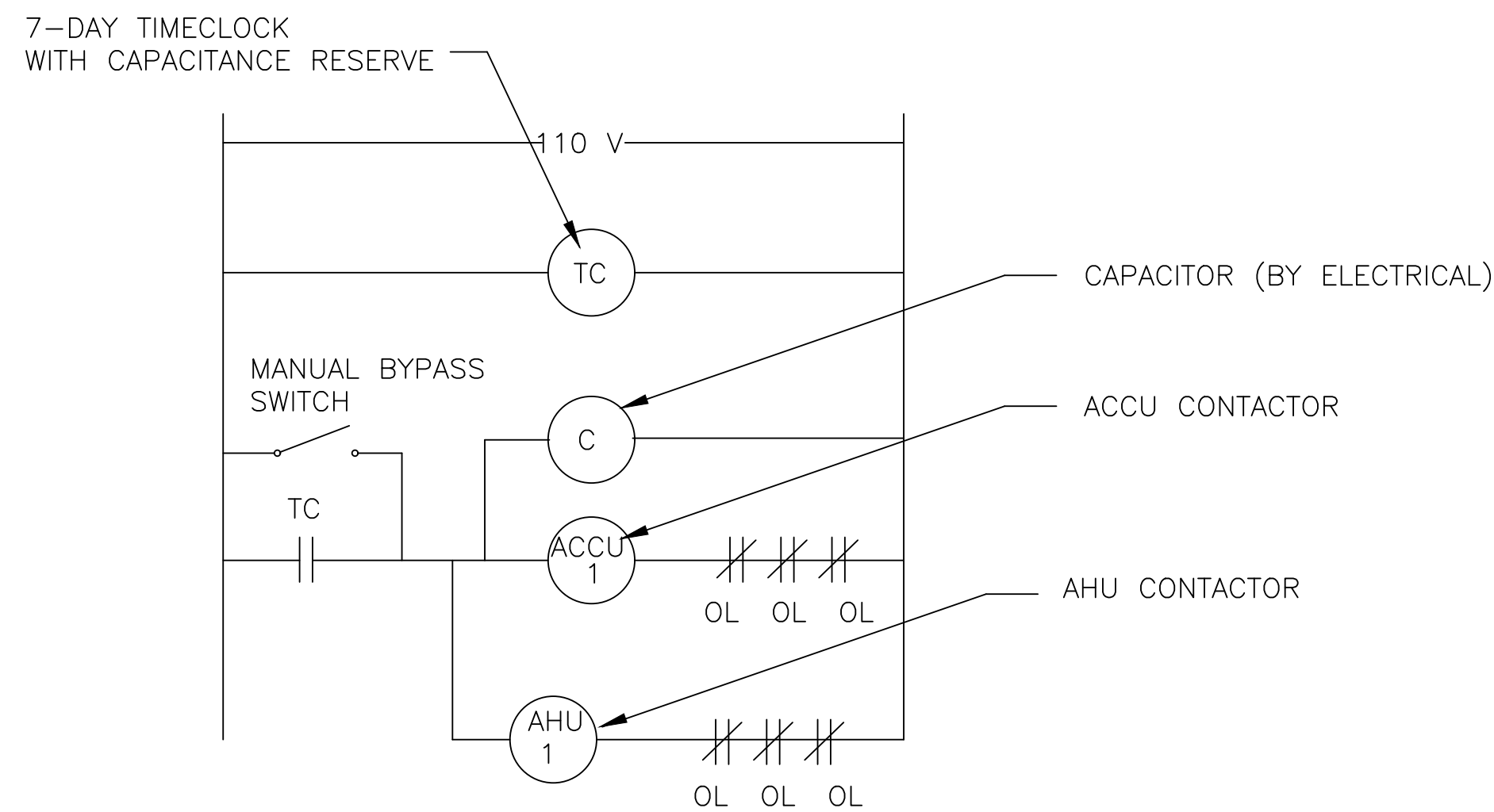
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SHEET 16 of 228



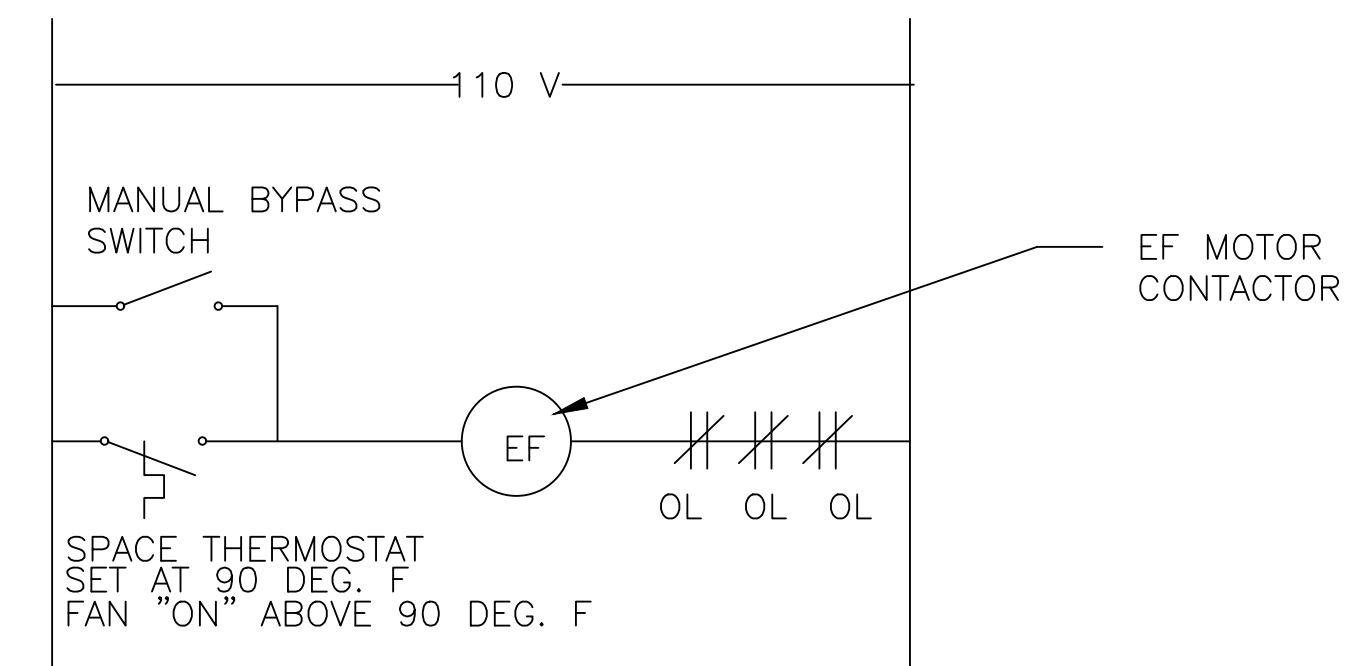
- LEGEND**
- L1 ELECTRIC POWER
  - AHU AIR HANDLING UNIT
  - CR CONTROL RELAY
  - HPC HIGH PRESSURE SWITCH
  - COND CONDENSER
  - HP HIGH PRESSURE SWITCH
  - CH CRANKCASE HEATER
  - LP LOW PRESSURE SWITCH
  - OL OVERLOAD (PER LEG)
  - CAP CAPACITOR
  - C COMPRESSOR RELAY
  - TC1 COOLING THERMOSTAT (FIRST STAGE)
  - SD SMOKE DETECTOR
  - TC TIMECLOCK CIRCUIT
  - CTH1 COMPRESSOR THERMOSTAT SWITCH



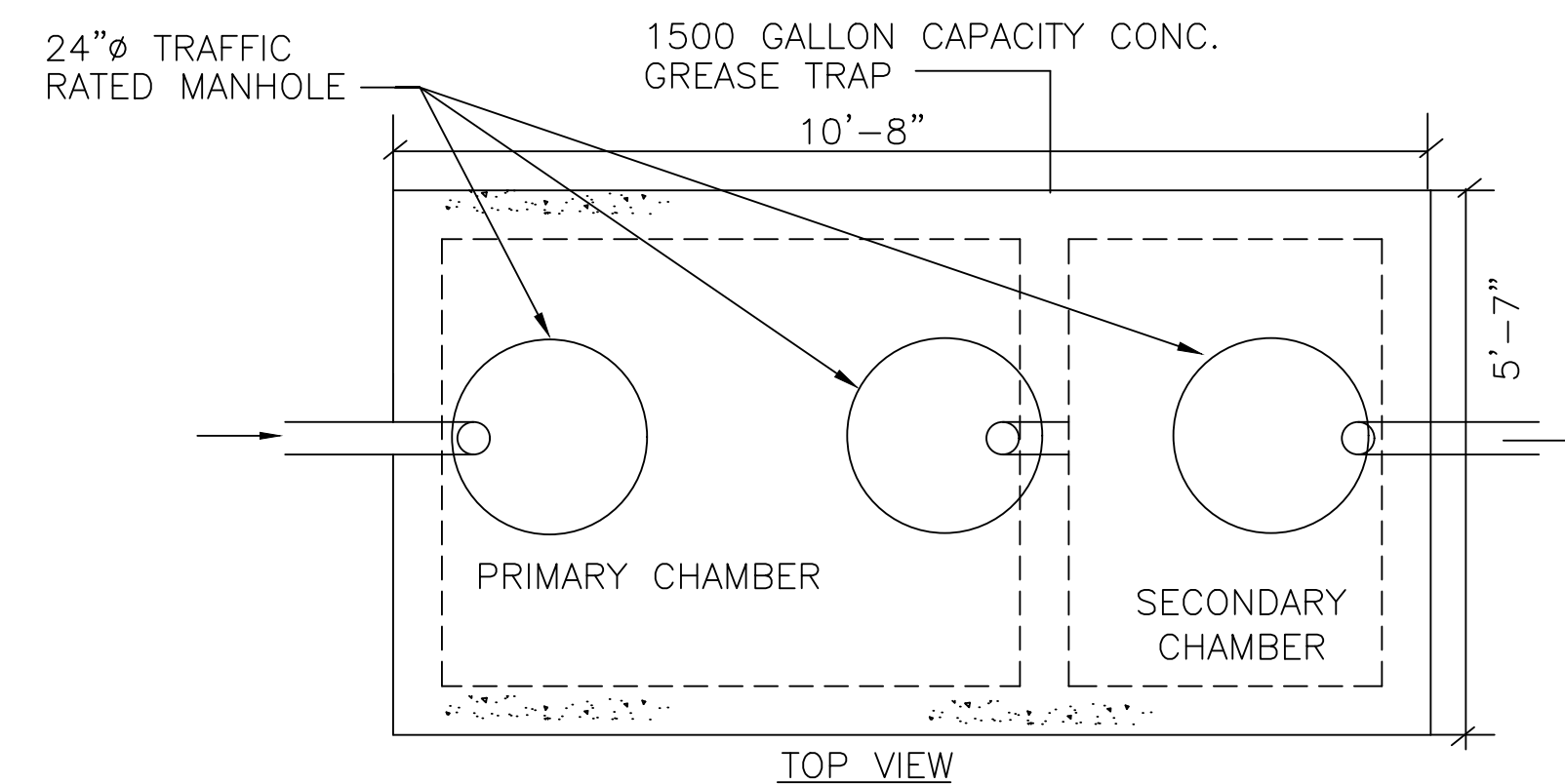
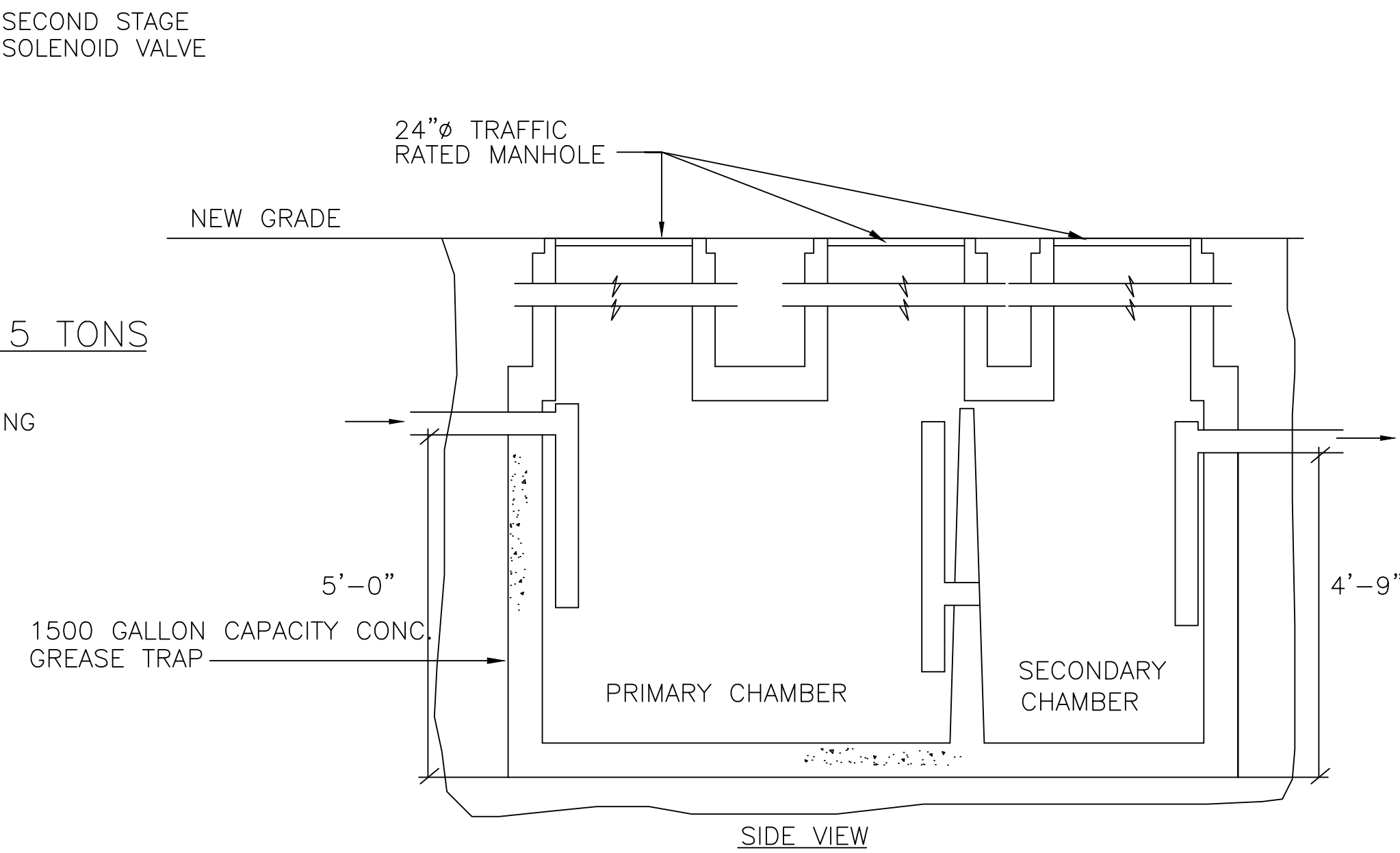
**A** TYPICAL AIR CONDITIONING CONTROLS—ABOVE 15 TONS  
 PUMP OUT SYSTEM, ABOVE 15 TONS, THERMOSTAT MUST BE CALLING FOR COOLING BEFORE CONDENSING UNIT IS ACTIVATED. SUCTION PRESSURE SWITCHES UNLOAD COMPRESSOR UNTIL CONDENSING UNIT SHUTS DOWN.  
 M0.6 M0.6



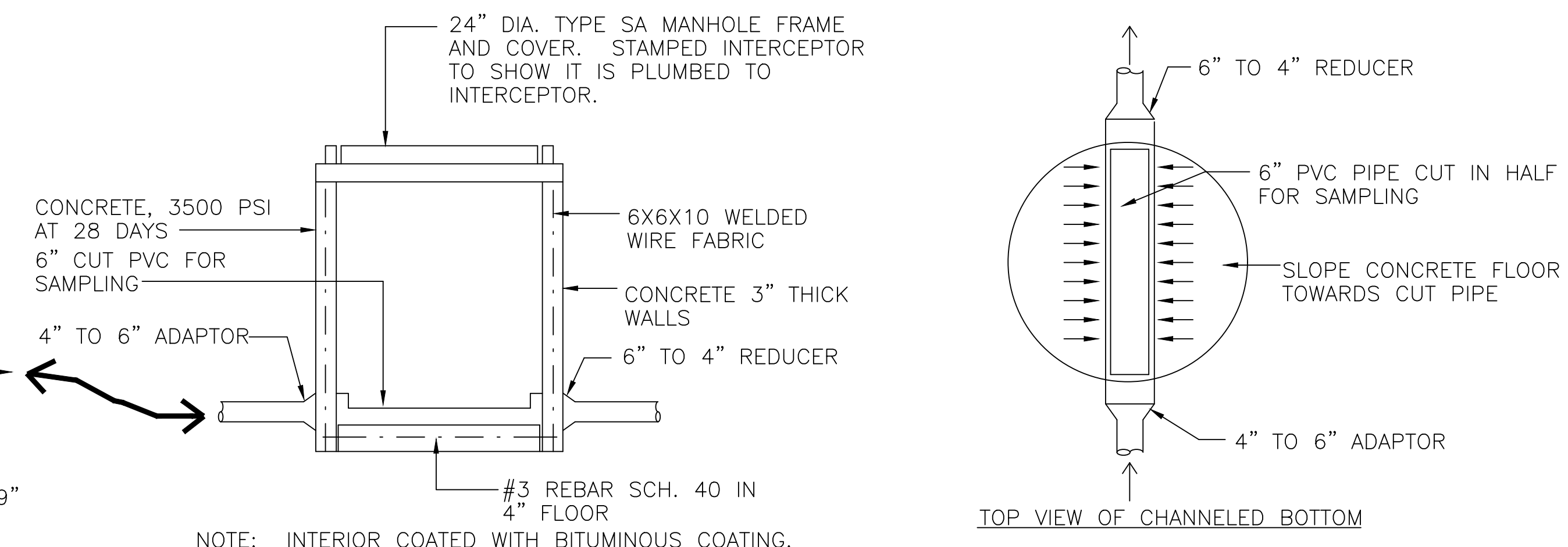
**B** TYPICAL AIR CONDITIONING CONTROL DIAGRAM  
 M0.6 M0.6 NOT TO SCALE



**C** ELECTRICAL ROOM EF CONTROL DIAGRAM  
 M0.6 M0.6 NOT TO SCALE



**D** GREASE TRAP DETAIL  
 M0.6 M0.6 1/2" = 1'-0"



**E** SAMPLING BOX DETAIL  
 M0.6 M0.6 NOT TO SCALE

**GREASE TRAP NOTES:**

- 1) ALL CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
- 2) CEMENT TO BE PORTLAND CEMENT CONFORMING TO ASTM C 150.
- 3) REINFORCING STEEL SHALL BE INTERMEDIATE GRADE, DEFORMED CONFORMING TO ASTM A-616 GRADE 40.
- 4) REINFORCING BARS SHALL BE IN LONG LENGTHS AND SHALL BE LAPPED A MINIMUM OF 15 INCHES, OR 40 BAR DIAMETERS.
- 5) ALL TANKS SHALL BE COATED ON THE INTERIOR AND SHALL COVER ALL OF THE INTERNAL AREA WITH AN APPROVED WATERPROOF COATING AND SHALL BE APPLIED PER MANUFACTURER'S RECOMMENDATION.
- 6) TANKS SHALL BEAR ON UNDISTURBED SOIL A MINIMUM OF 12" BELOW ORIGINAL GRADE ON A SOLID BED AND TO BE INSTALLED LEVEL.
- 7) IF TANK HOLE IS OVEREXCAVATED OR HAS A ROCKY UNLEVEL BOTTOM, 2" SAND-PEA GRAVEL TO LEVEL BOTTOM IS RECOMMENDED.
- 8) FILL TANK WITH WATER AFTER IT HAS BEEN SET IN PLACE AND THE SIDES BACKFILLED.
- 9) ALL PIPES LEAVING/ENTERING TANKS SHALL BE SEALED WITH A NON-SHRINK GROUT MIX.
- 10) GREASE TANK SHALL BE LOCATED IN A NON-VEHICULAR AREA.
- 11) THE GREASE TANK MANUFACTURER SHALL SUBMIT TWO (2) SETS OF PLANS STAMPED BY A STRUCTURAL ENGINEER OF EACH GREASE TANK, DRAWN TO SCALE TO THE WASTEWATER BRANCH, HAWAII DEPARTMENT OF HEALTH AND THE DESIGN ENGINEER FOR APPROVAL BEFORE FABRICATION. THE PLANS SHALL SHOW ALL DIMENSIONS, MANHOLES, TEES, BAFFLES, COMPARTMENT WALLS AND CLEANOUTS. MATERIAL SPECIFICATIONS, LIQUID AND WATER VOLUME CALCULATIONS, INSTALLATION AND MAINTENANCE INSTRUCTIONS AND MANUFACTURER'S NAME, ADDRESS AND PHONE NUMBER SHALL BE SUBMITTED UNDER A SEPARATE COVER.

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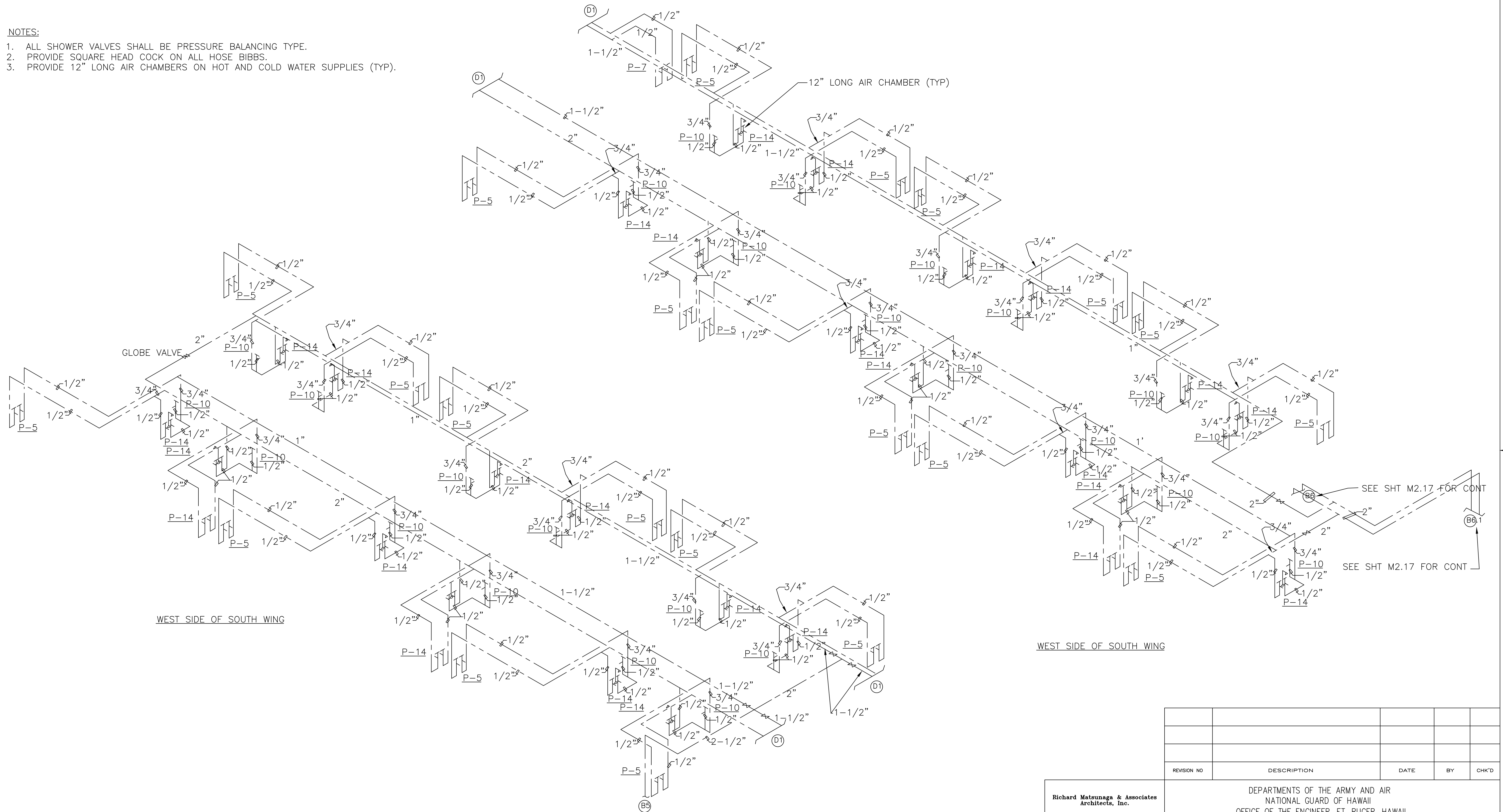
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DWG # **M0.6**  
 SHEET 17 of 228

**NOTES:**

1. ALL SHOWER VALVES SHALL BE PRESSURE BALANCING TYPE.
2. PROVIDE SQUARE HEAD COCK ON ALL HOSE BIBBS.
3. PROVIDE 12" LONG AIR CHAMBERS ON HOT AND COLD WATER SUPPLIES (TYP).



**PARTIAL WATER PIPING DIAGRAM - SECOND FLOOR**  
NOT TO SCALE

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SCALE REDUCED ACCORDINGLY

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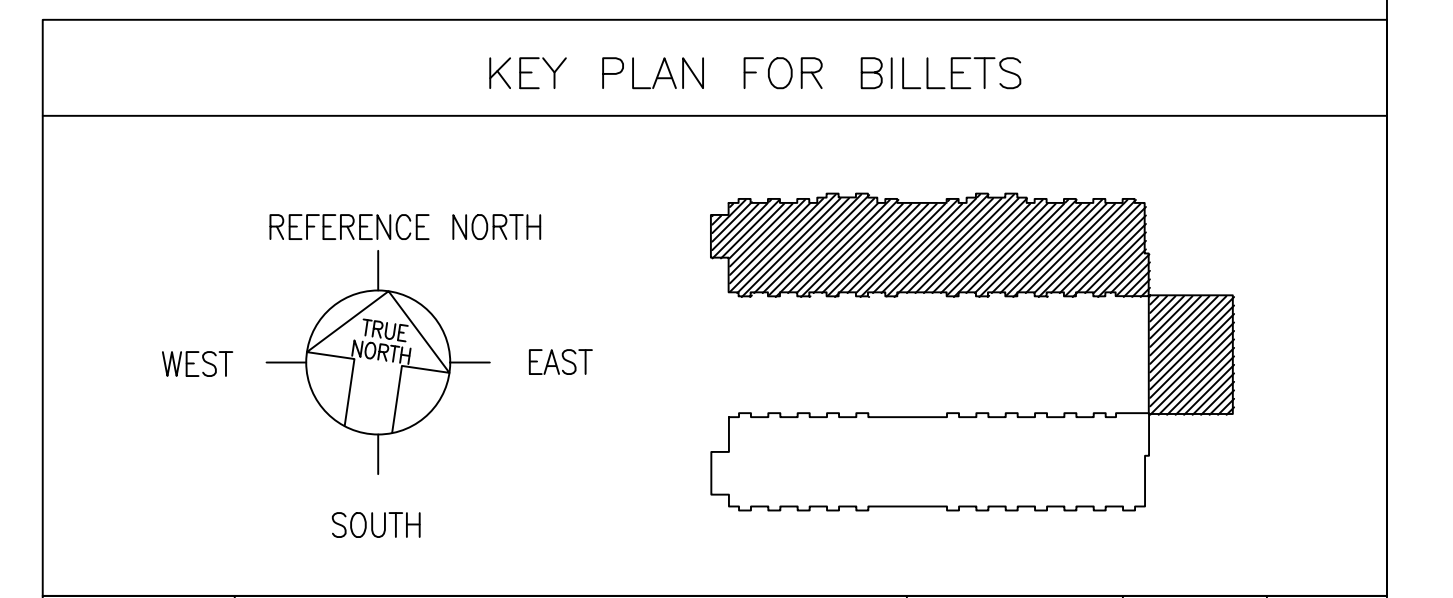
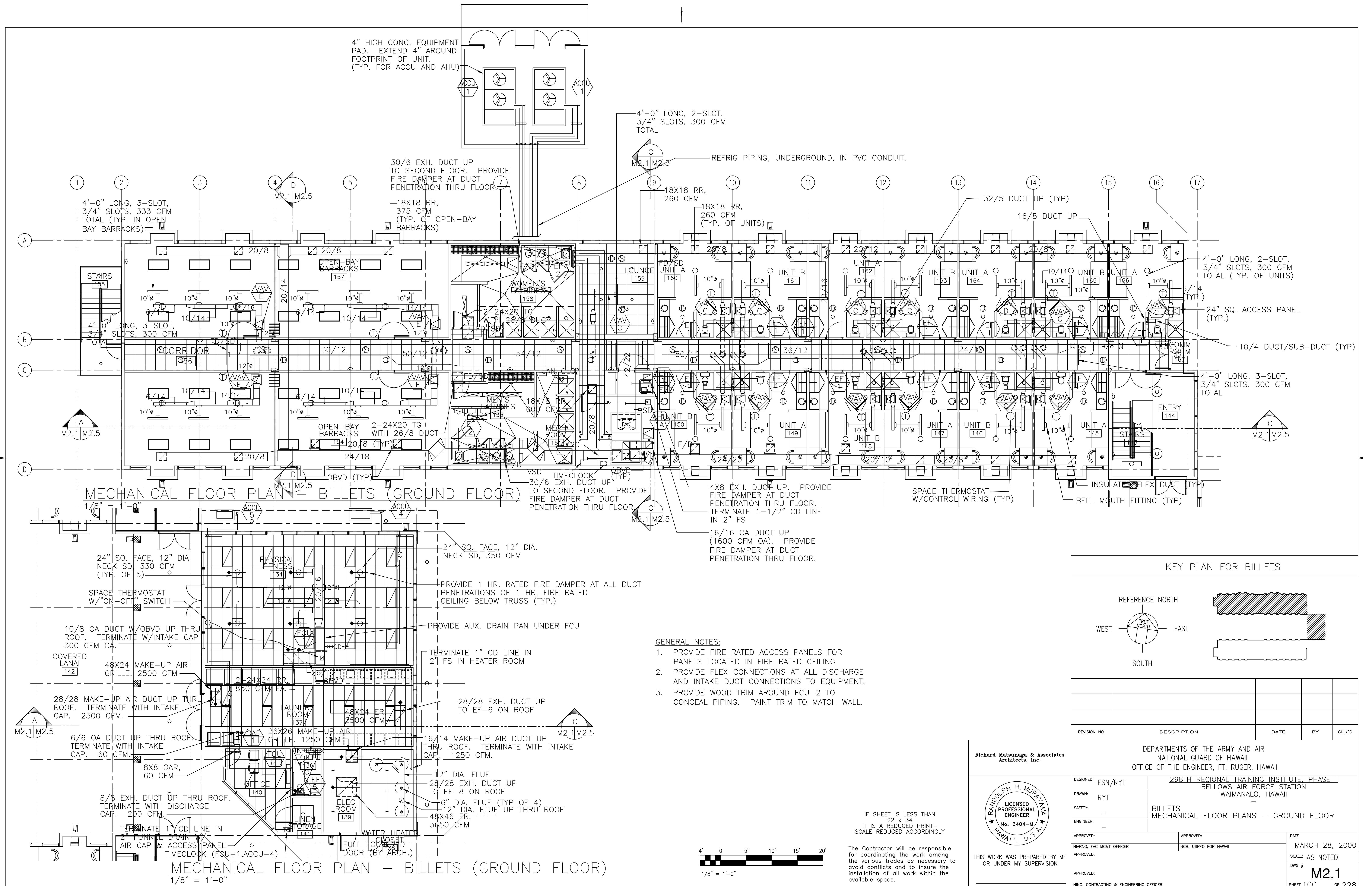
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OR UNDER MY SUPERVISION

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DRAWN: ESN  
SAFETY:  
ENGINEER:  
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BELLOWS AIR FORCE STATION  
WAIMANALO, HAWAII  
BILLETTS  
PARTIAL WATER PIPING DIAGRAM - SECOND FLOOR

|                          |                       |                    |
|--------------------------|-----------------------|--------------------|
| APPROVED:                | APPROVED:             | DATE               |
| HIARNG, FAC MGMT OFFICER | NSB, USPFO FOR HAWAII |                    |
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|                          |                       | DWG # <b>M2.19</b> |
|                          |                       | SHEET 118 of 228   |



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DEPARTMENTS OF THE ARMY AND AIR NATIONAL GUARD OF HAWAII  
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ENGINEER: -

298TH REGIONAL TRAINING INSTITUTE, PHASE II  
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WAIMANALO, HAWAII

APPROVED: [Signature] DATE: MARCH 28, 2000  
HARRIGAN, FAC MGMT OFFICER NGB, USPO FOR HAWAII

APPROVED: [Signature] SCALE: AS NOTED  
HARRIGAN, CONTRACTING & ENGINEERING OFFICER

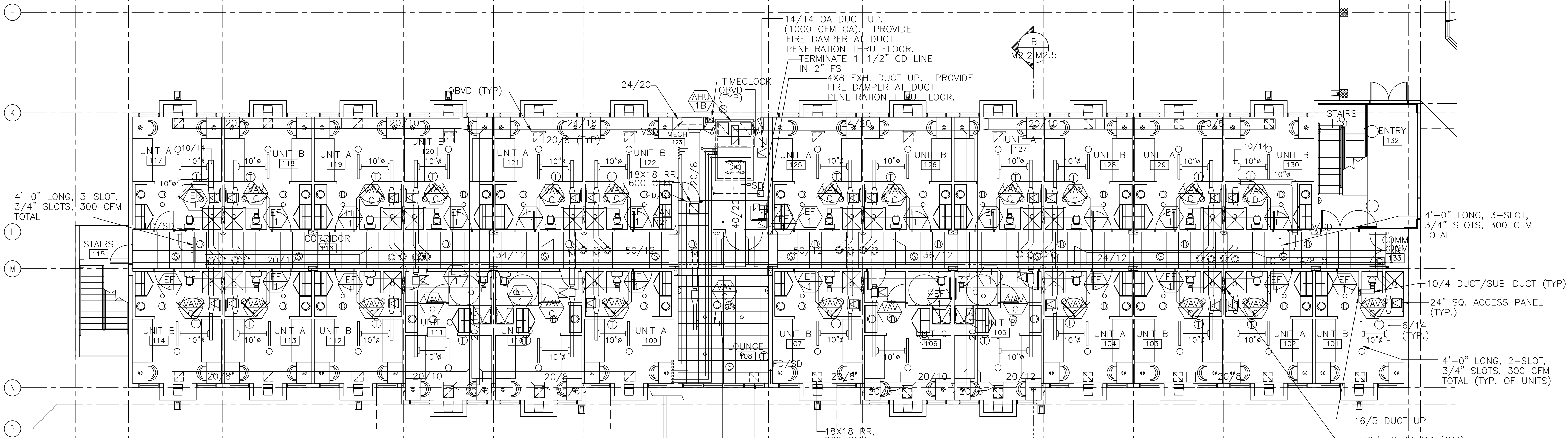
Richard Matsunaga & Associates Architects, Inc.

RANDOLPH H. MURAKAWA LICENSED PROFESSIONAL ENGINEER No. 3404-M HAWAII, U.S.A.

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DWG # **M2.1**  
SHEET 100 of 228





4'-0" LONG, 3-SLOT, 3/4" SLOTS, 300 CFM TOTAL

4'-0" LONG, 3-SLOT, 3/4" SLOTS, 300 CFM TOTAL

10/4 DUCT/SUB-DUCT (TYP.)

24" SQ. ACCESS PANEL (TYP.)

4'-0" LONG, 2-SLOT, 3/4" SLOTS, 300 CFM TOTAL (TYP. OF UNITS)

16/5 DUCT UP

32/5 DUCT UP (TYP.)

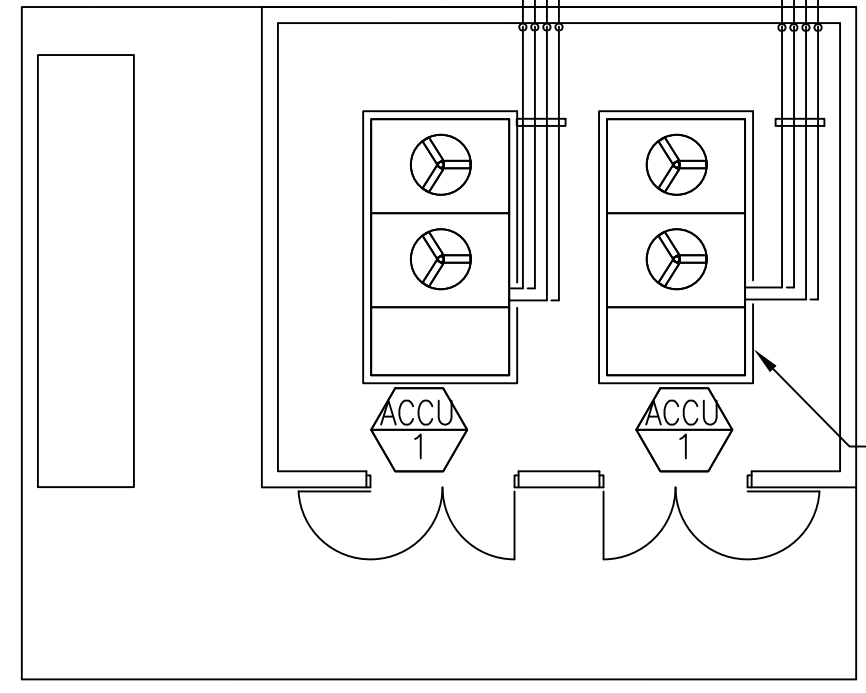
18X18 RR, 260 CFM (TYP. OF UNITS)

18X18 RR, 260 CFM

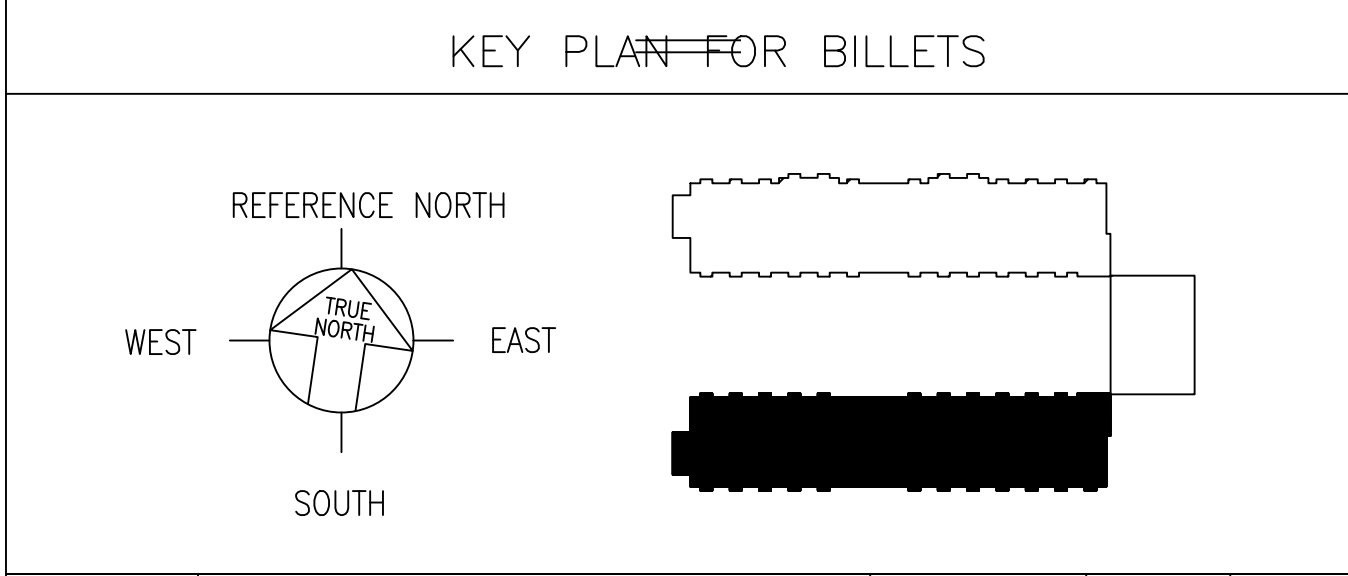
4'-0" LONG, 2-SLOT, 3/4" SLOTS, 300 CFM TOTAL

REFRIG PIPING, UNDERGROUND, IN PVC CONDUIT.

4" HIGH CONC. EQUIPMENT PAD. EXTEND 4" AROUND FOOTPRINT OF UNIT. (TYP. FOR ACCU AND AHU)

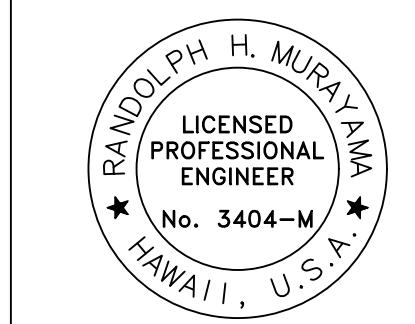


MECHANICAL FLOOR PLAN - BILLETS (GROUND FLOOR)  
1/8" = 1'-0"



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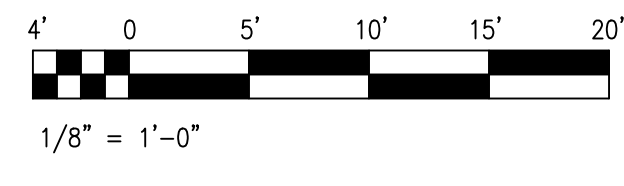
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WAIMANALO, HAWAII  
BILLETS  
MECHANICAL FLOOR PLAN - GROUND FLOOR

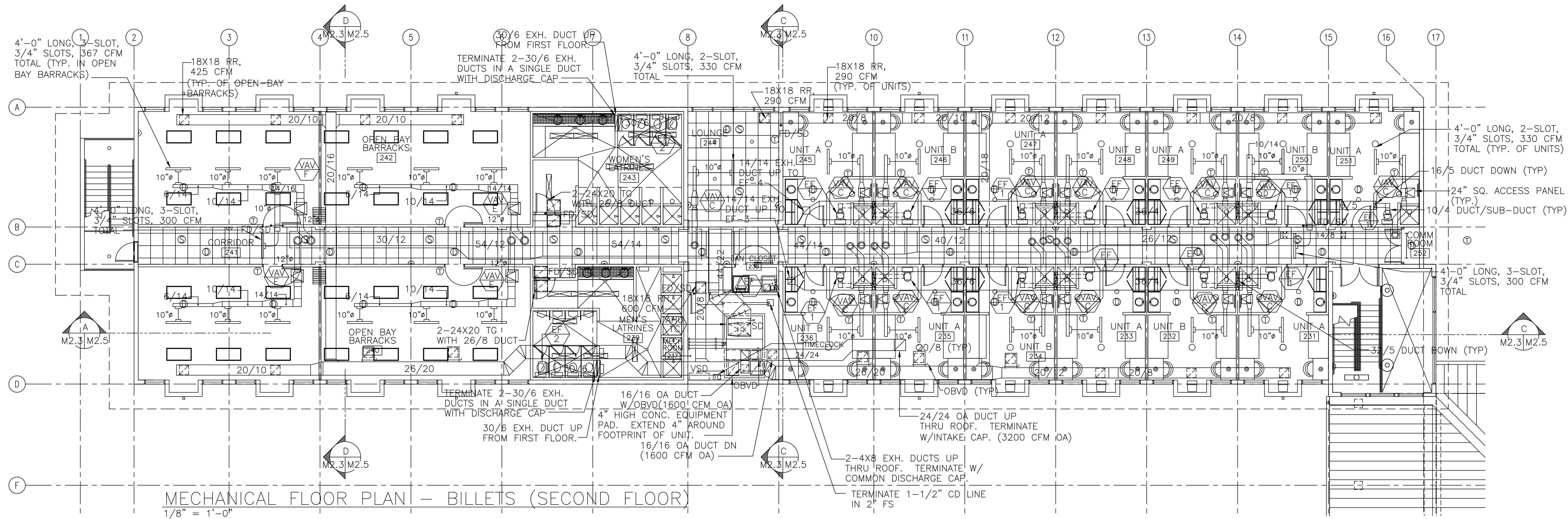
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| HIARNG, FAC MGMT OFFICER                 | NSB, USPFO FOR HAWAII | MARCH 28, 2000   |
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|  |                       | SHEET 101 of 228 |



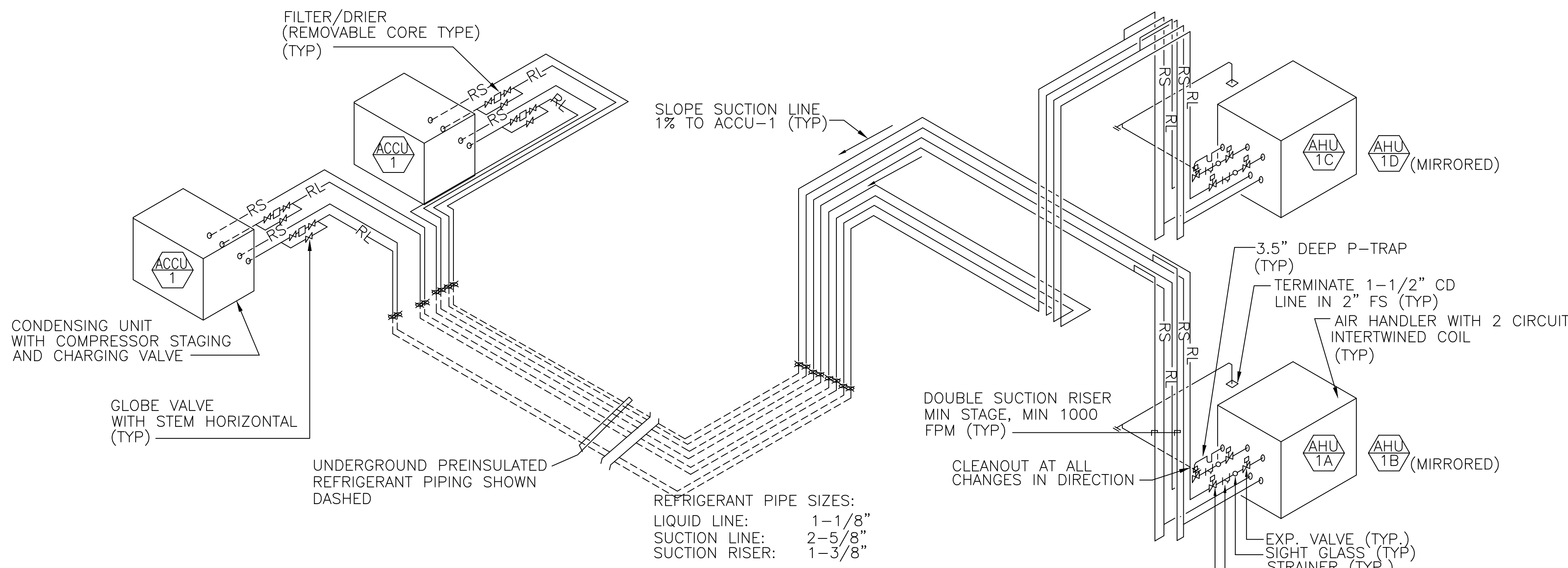
IF SHEET IS LESS THAN 22 x 34 IT IS A REDUCED PRINT-SCALE REDUCED ACCORDINGLY

The Contractor will be responsible for coordinating the work among the various trades as necessary to avoid conflicts and to insure the installation of all work within the available space.

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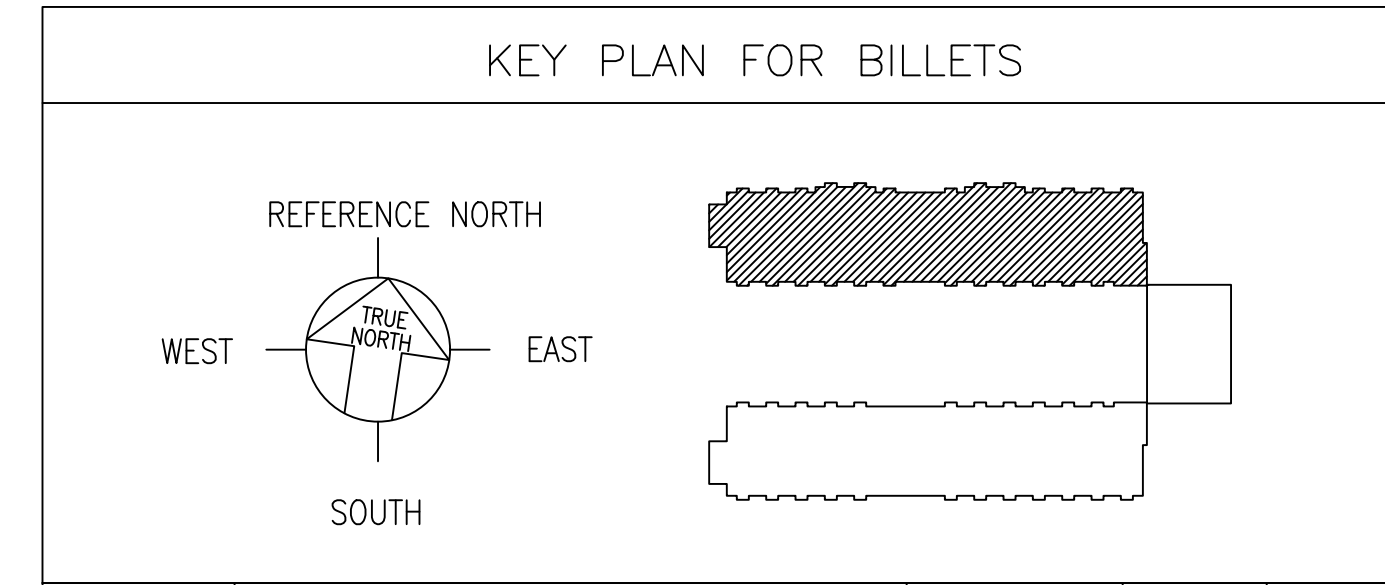


MECHANICAL FLOOR PLAN - BILLETs (SECOND FLOOR)  
1/8" = 1'-0"



- NOTES:
1. INSULATE ALL COLD PIPING IN ADDITION TO SUCTION LINES.
  2. ALL PIPE SIZES AS RECOMMENDED BY EQUIPMENT MANUFACTURER.

REFRIGERANT AND CONDENSATE DRAIN PIPING DIAGRAM  
NOT TO SCALE SIMILAR FOR AHU-1B/ACCU-1 AND AHU-1D/ACCU-1 BUT MIRRORED



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ENGINEER: -

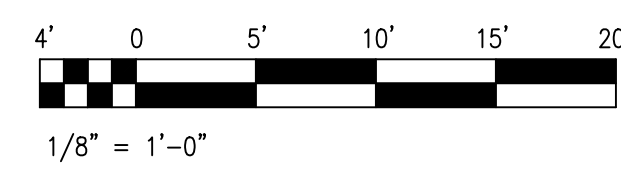
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WAIMANALO, HAWAII

BILLETs  
MECHANICAL FLOOR PLAN - SECOND FLOOR,  
REFRIGERANT PIPING DIAGRAM

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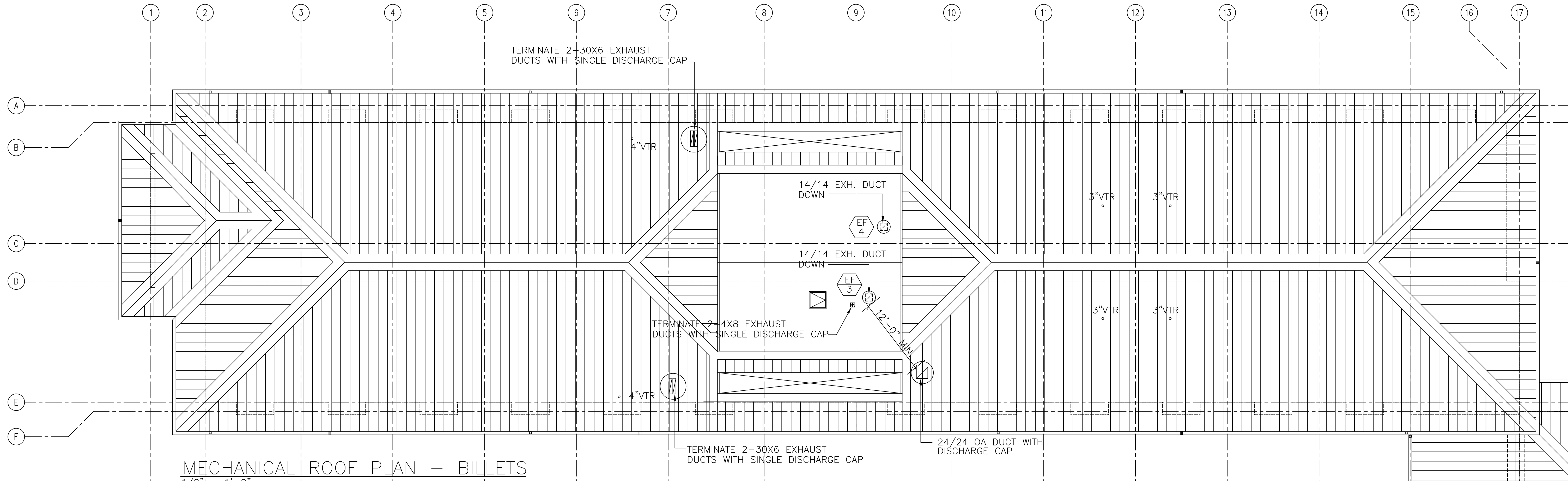
DWG # M2.3  
SHEET 102 of 228



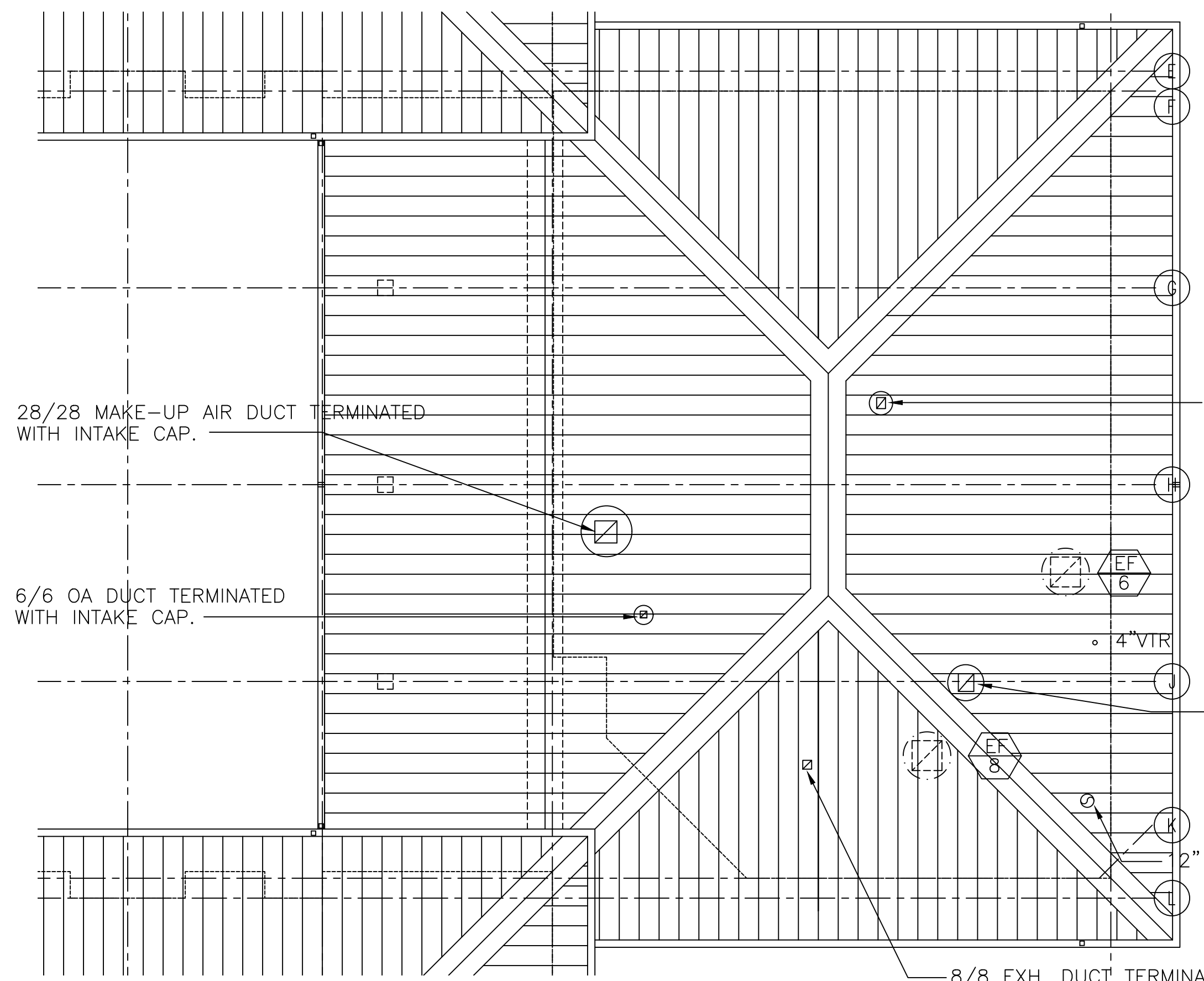
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The Contractor will be responsible for coordinating the work among the various trades as necessary to avoid conflicts and to insure the installation of all work within the available space.

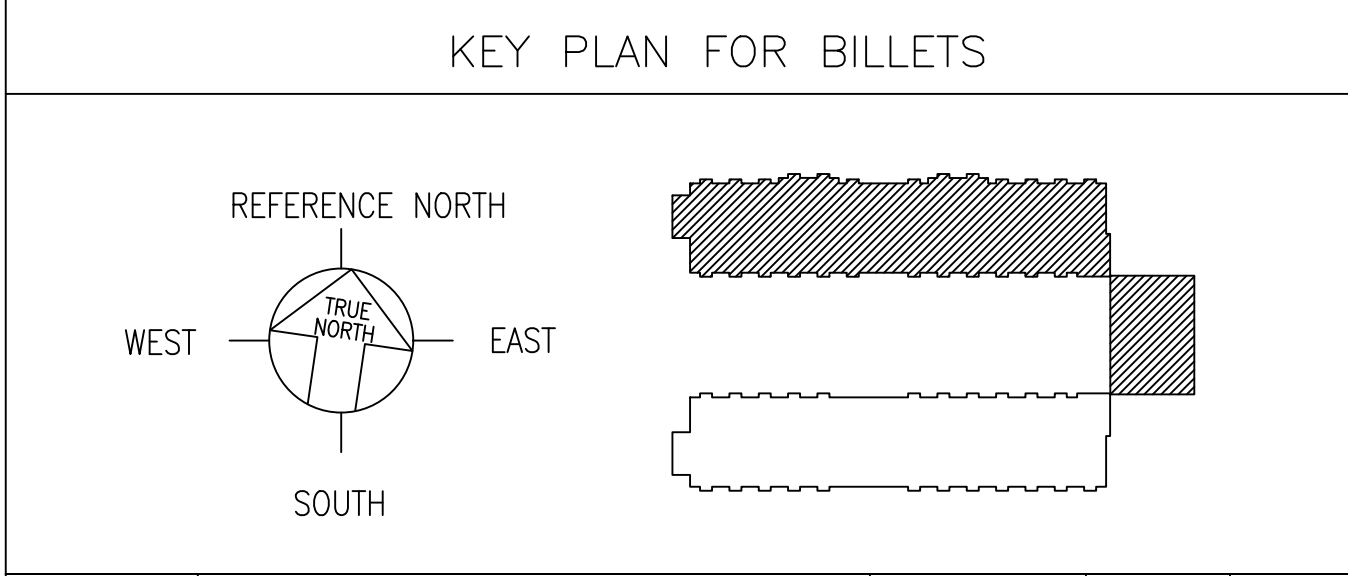




MECHANICAL ROOF PLAN - BILLETS  
1/8" = 1'-0"

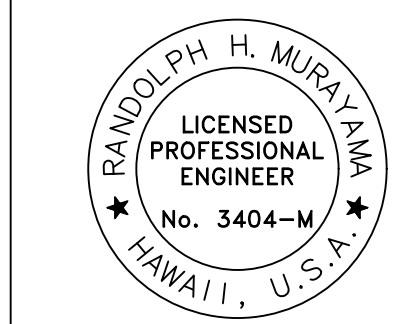


MECHANICAL ROOF PLAN - BILLETS  
1/8" = 1'-0"



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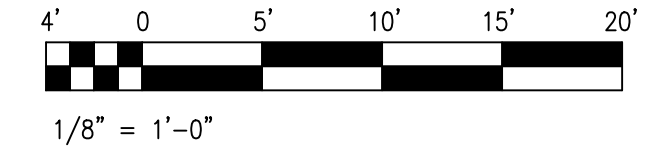
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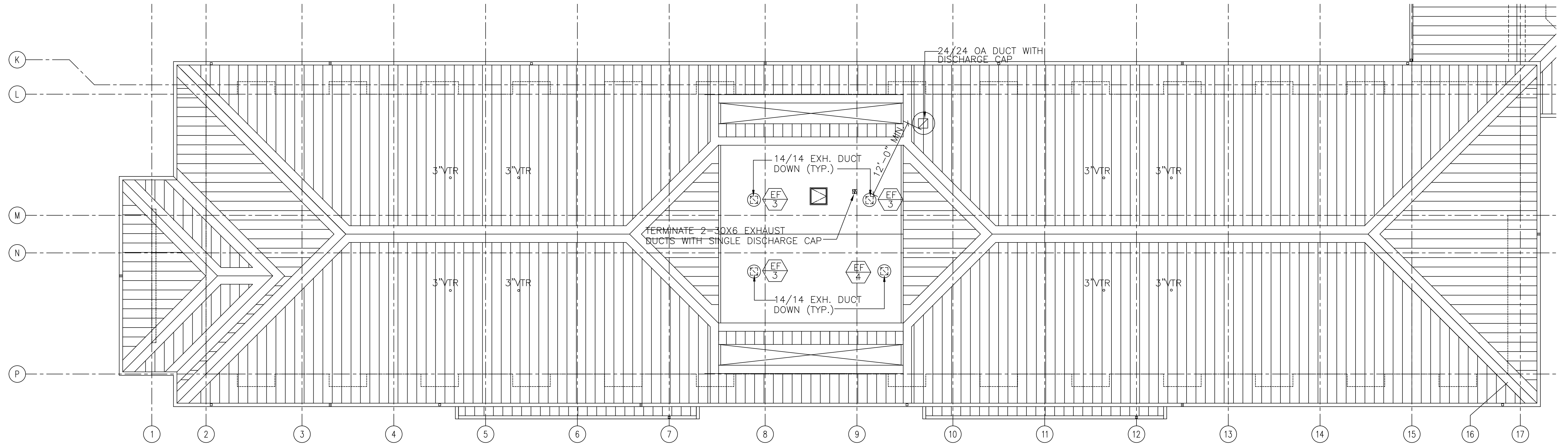
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DRAWN: RYT  
SAFETY: -  
ENGINEER: -  
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WAIMANALO, HAWAII  
BILLETS  
MECHANICAL ROOF PLANS

|   |                       |                  |
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| HING, CONTRACTING & ENGINEERING OFFICER |                       | DWG # M2.5       |
|   |                       | SHEET 104 of 228 |

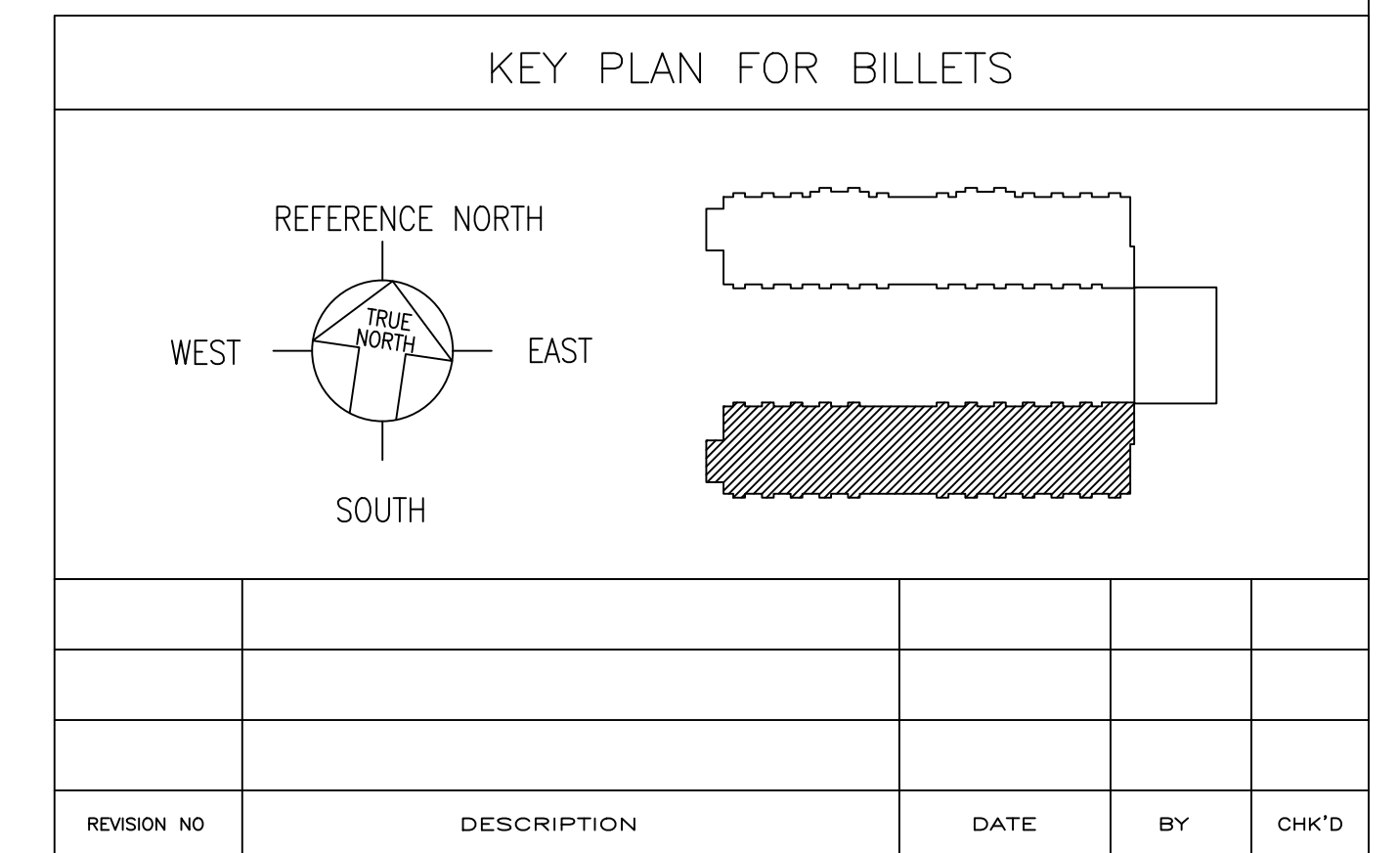


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SCALE REDUCED ACCORDINGLY

The Contractor will be responsible  
for coordinating the work among  
the various trades as necessary to  
avoid conflicts and to insure the  
installation of all work within the  
available space.



MECHANICAL ROOF PLAN – BILLETS  
 1/8" = 1'-0"



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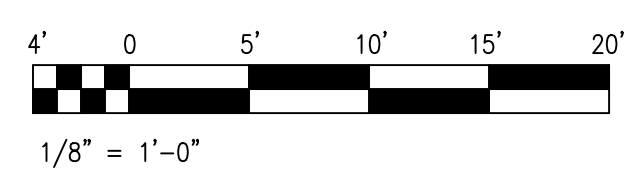
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 DRAWN: RYT  
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 ENGINEER: —

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BILLETS  
 MECHANICAL ROOF PLAN

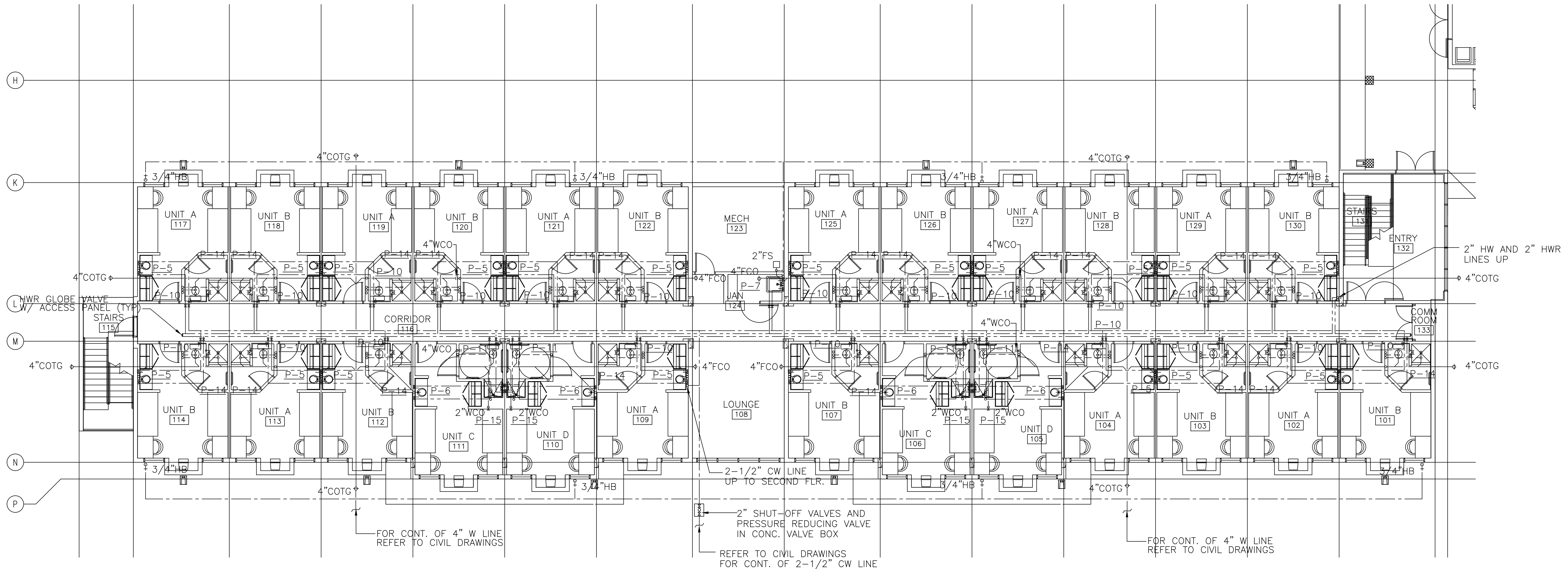
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 HAWNG, FAC MGMT OFFICER NGB, USPFO FOR HAWAII  
 APPROVED: \_\_\_\_\_ SCALE: AS NOTED  
 HING, CONTRACTING & ENGINEERING OFFICER DWG # M2.6  
 SHEET 105 of 228



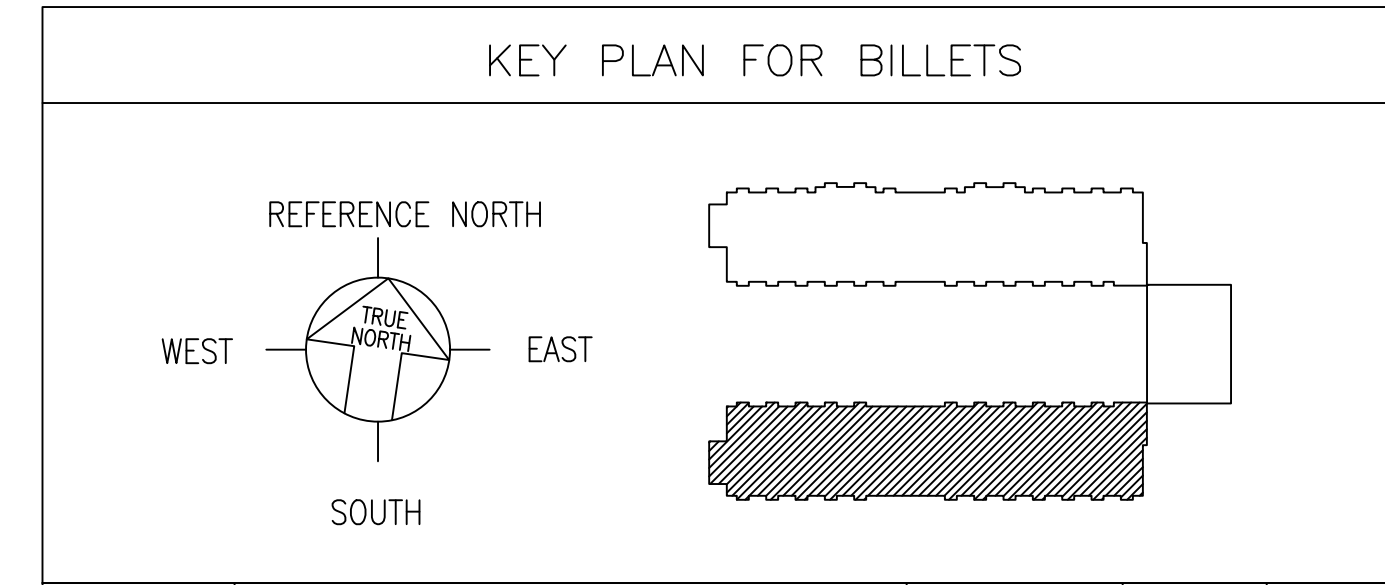
IF SHEET IS LESS THAN  
 22 x 34  
 IT IS A REDUCED PRINT—  
 SCALE REDUCED ACCORDINGLY

The Contractor will be responsible  
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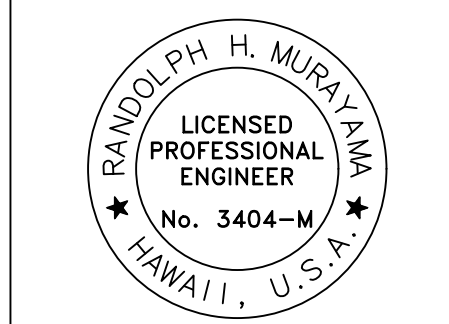


1 PLUMBING FLOOR PLAN - BILLETS (GROUND FLOOR)  
 M2.7 M2.8 1/8" = 1'-0"



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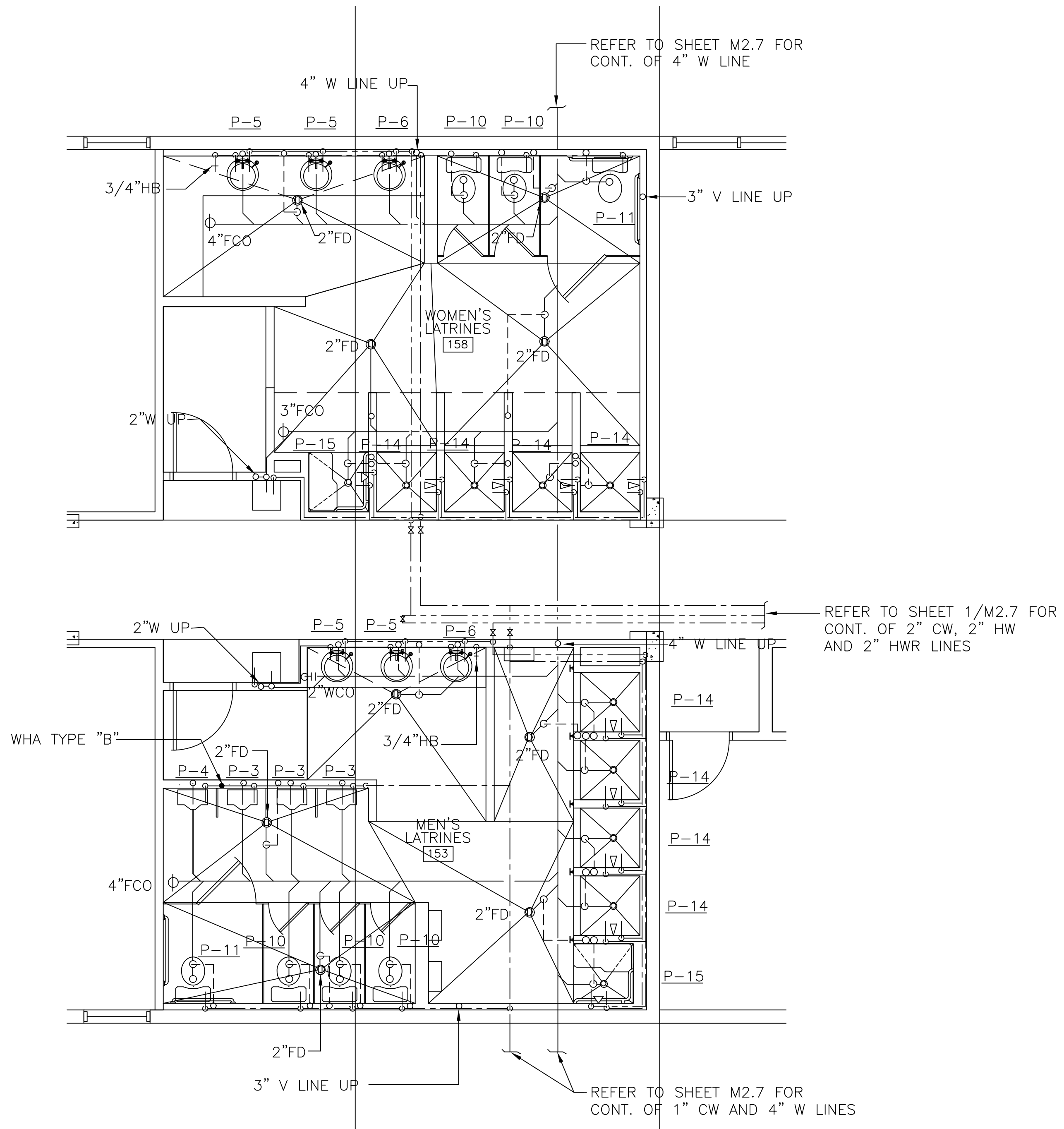
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 DRAWN: RYT  
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 ENGINEER: -  
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 BILLETS  
 PLUMBING FLOOR PLAN - GROUND FLOOR

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|   |                       | SHEET 107 of 228 |

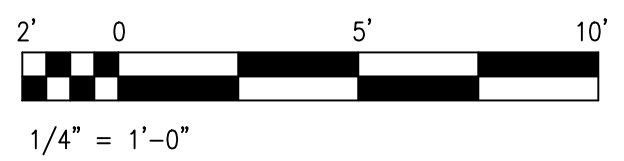
IF SHEET IS LESS THAN  
 22 x 34  
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 SCALE REDUCED ACCORDINGLY

The Contractor will be responsible  
 for coordinating the work among the  
 various trades as necessary to  
 avoid conflicts and to insure the  
 installation of all work within the  
 available space.

4' 0 5' 10' 15' 20'  
 1/8" = 1'-0"

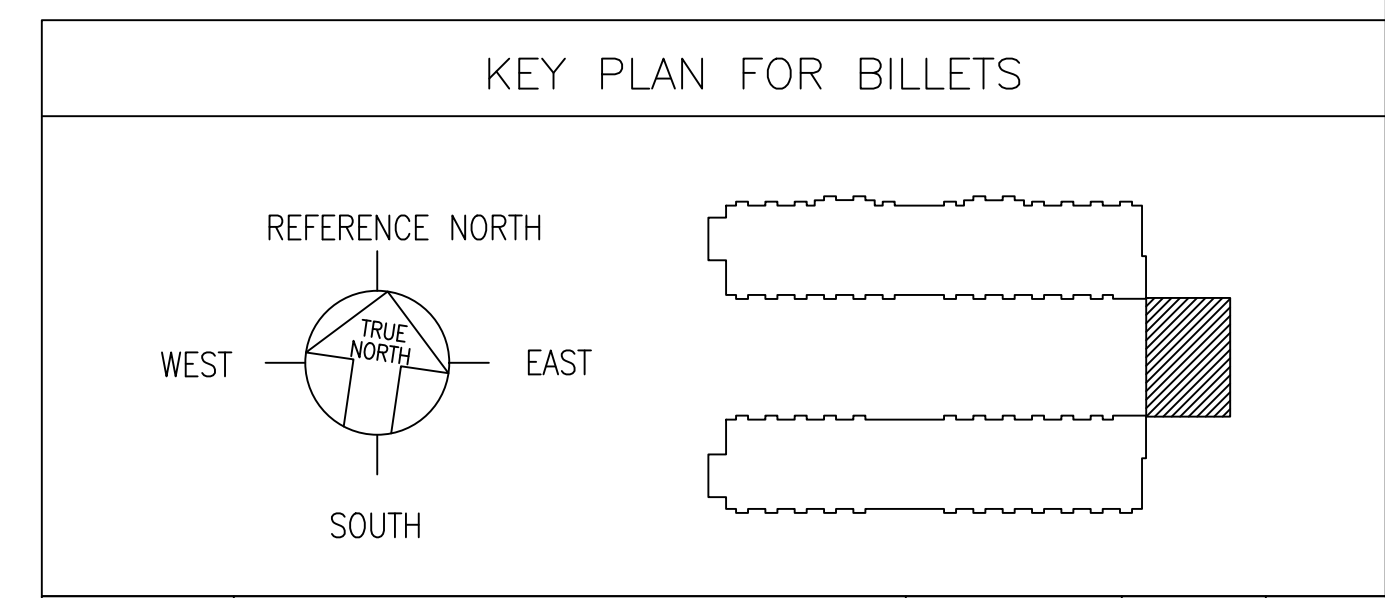


1 ENLARGED PLUMBING FLOOR PLAN — GROUND FLOOR  
 M2.7 M2.9 1/4" = 1'-0"



IF SHEET IS LESS THAN  
 22 x 34  
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 SCALE REDUCED ACCORDINGLY

The Contractor will be responsible  
 for coordinating the work among  
 the various trades as necessary to  
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 installation of all work within the  
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 ENGINEER: —

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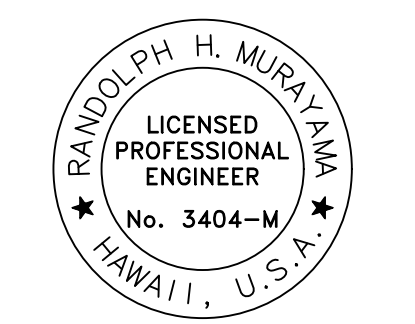
BILLETS  
 ENLARGED PLUMBING FLOOR PLAN

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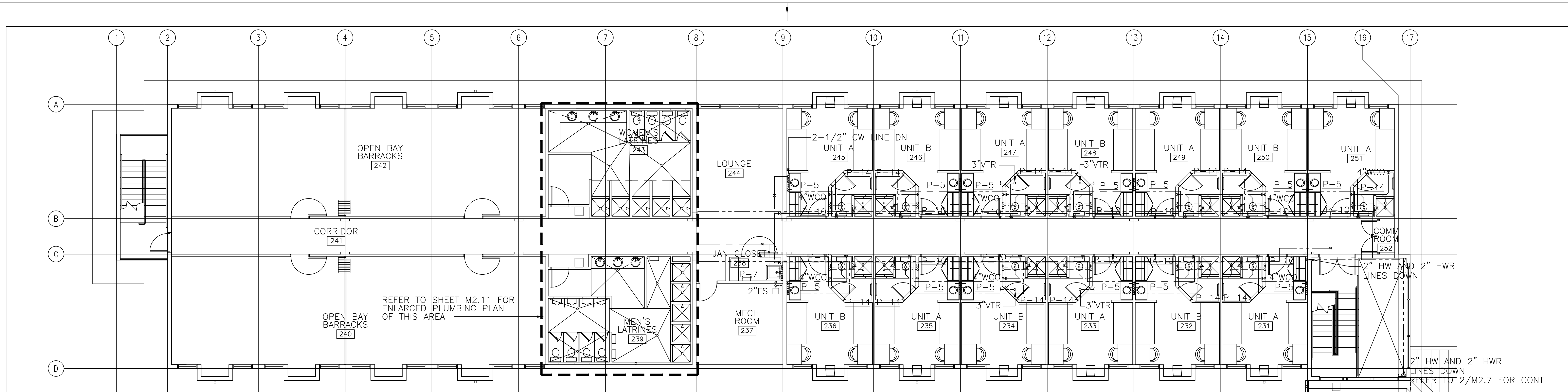
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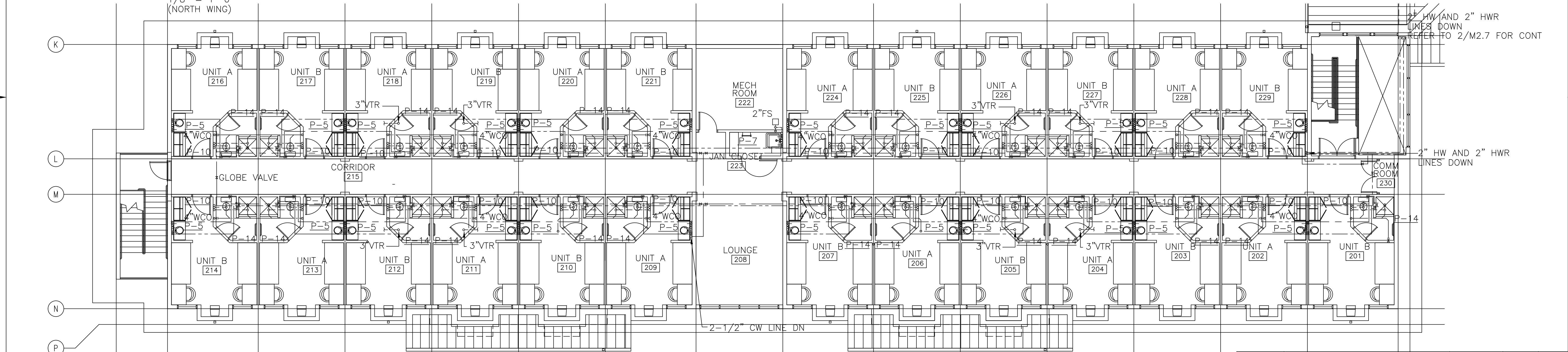






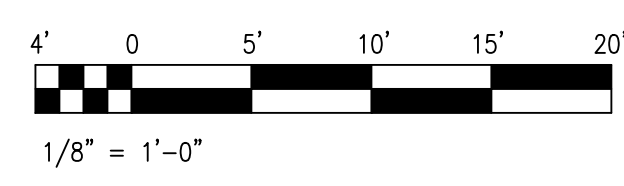
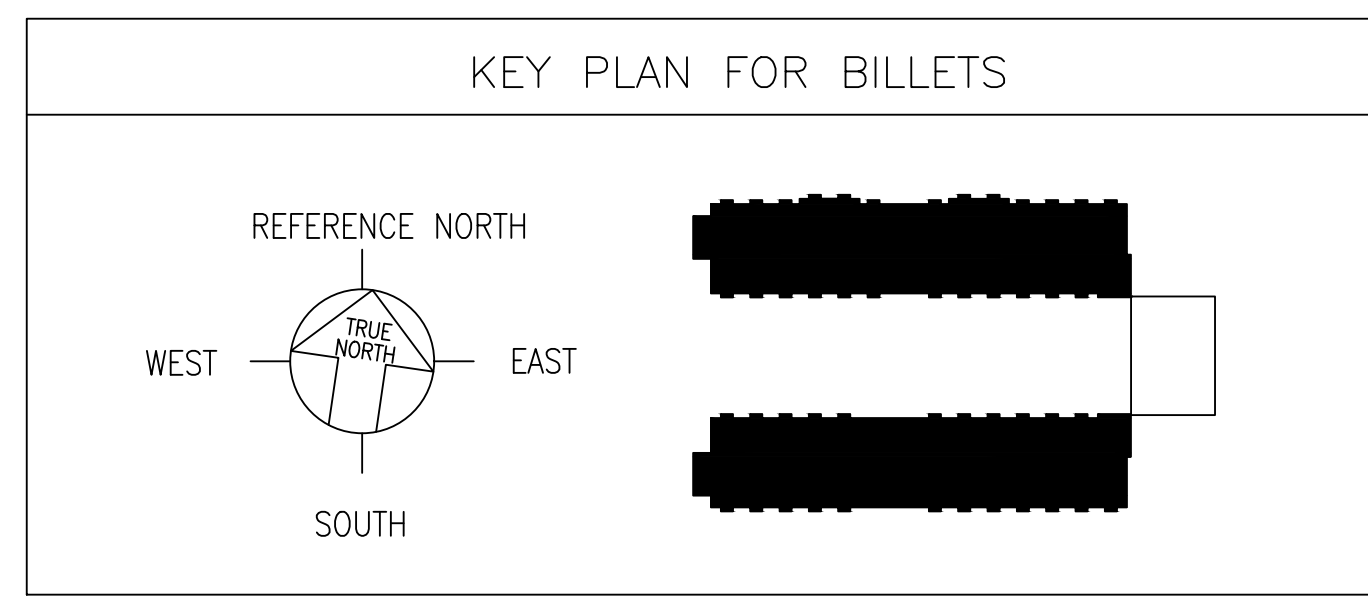
PLUMBING FLOOR PLAN - BILLET (SECOND FLOOR)

1/8" = 1'-0"  
(NORTH WING)



PLUMBING FLOOR PLAN - BILLETS (SECOND FLOOR)

1/8" = 1'-0"  
(SOUTH WING)



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the various trades as necessary to  
avoid conflicts and to insure the  
installation of all work within the  
available space.

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BILLETS  
PLUMBING FLOOR PLANS - SECOND FLOOR

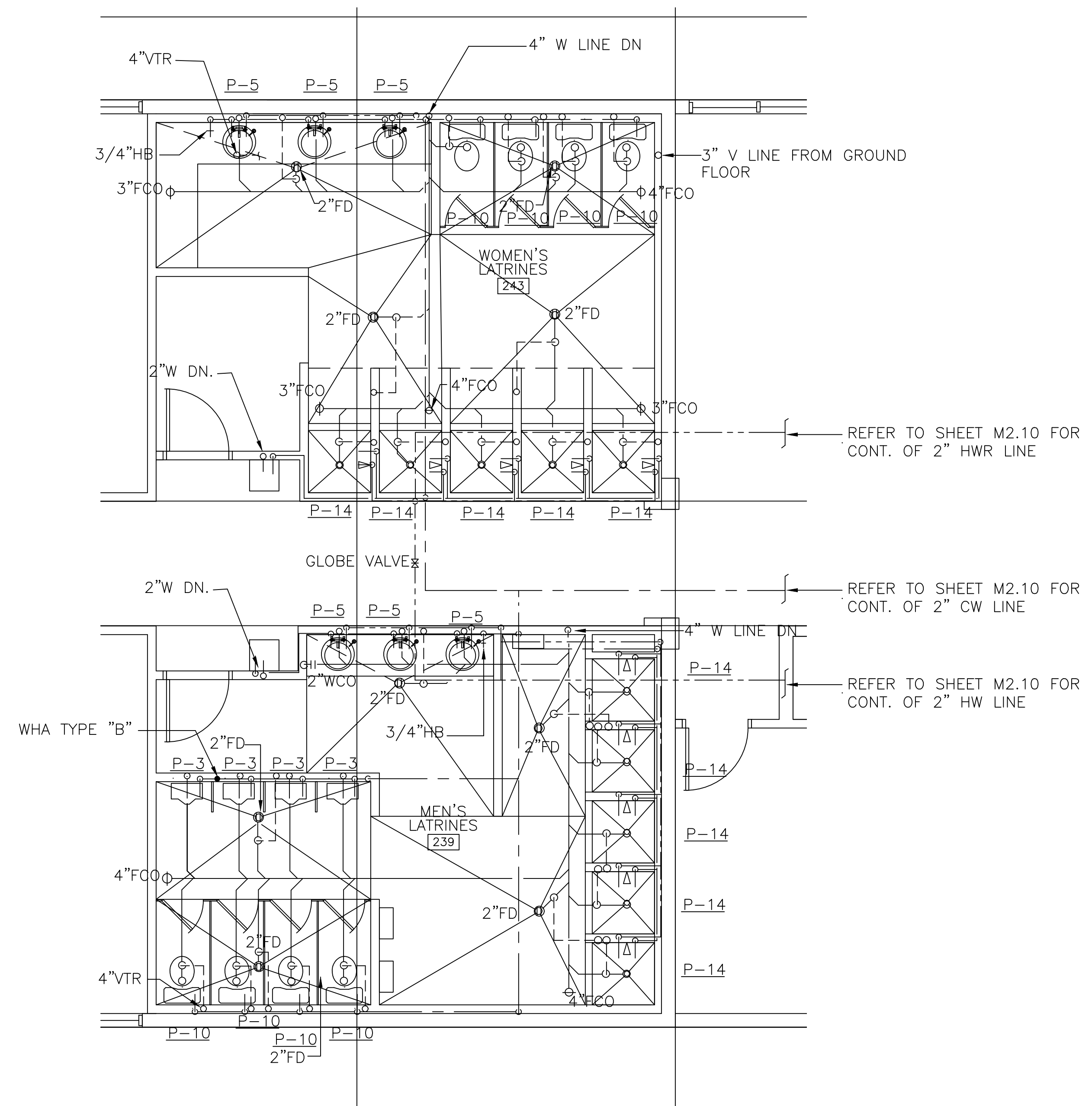
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DWG # M2.10  
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RANDOLPH H. MURAKAWA  
LICENSED PROFESSIONAL ENGINEER  
No. 3404-M  
HAWAII, U.S.A.

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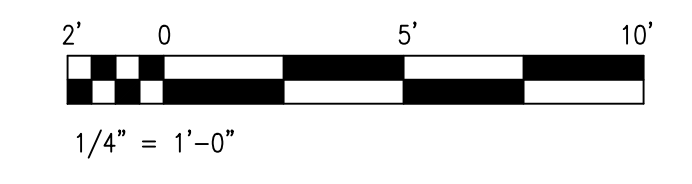


ENLARGED PLUMBING FLOOR PLAN - SECOND FLOOR  
 1/4" = 1'-0"  
 (NORTH WING)

REFER TO SHEET M2.10 FOR  
 CONT. OF 2" HWR LINE

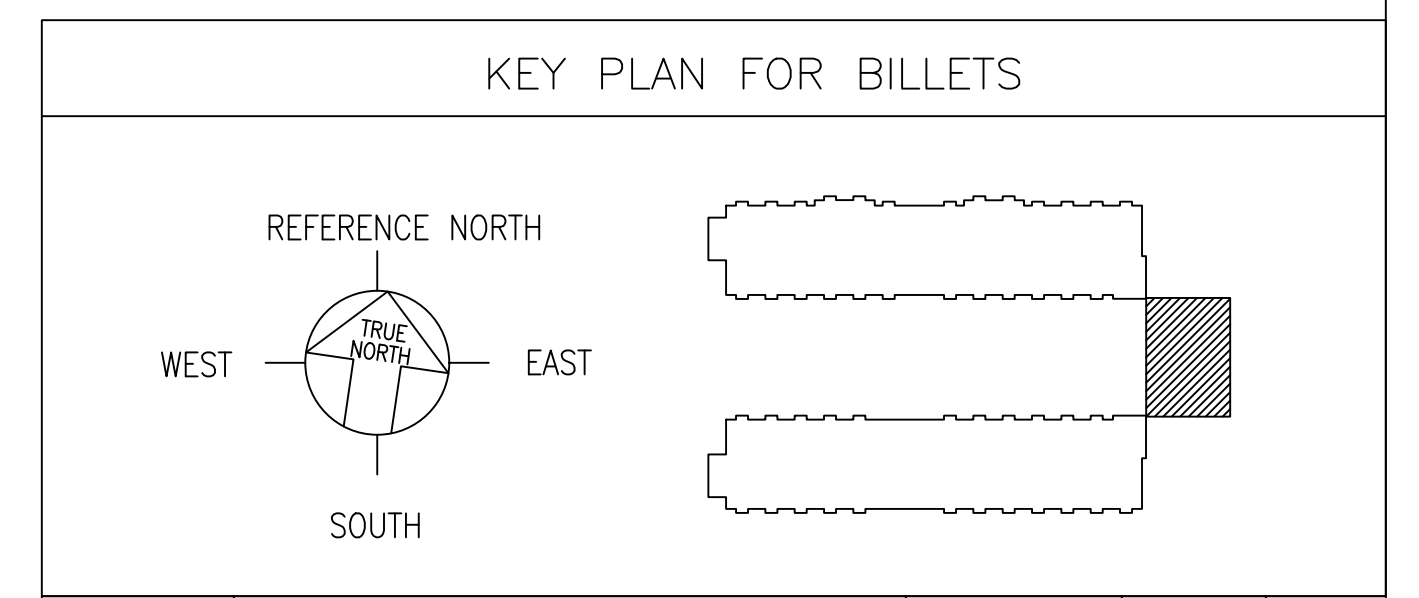
REFER TO SHEET M2.10 FOR  
 CONT. OF 2" CW LINE

REFER TO SHEET M2.10 FOR  
 CONT. OF 2" HW LINE



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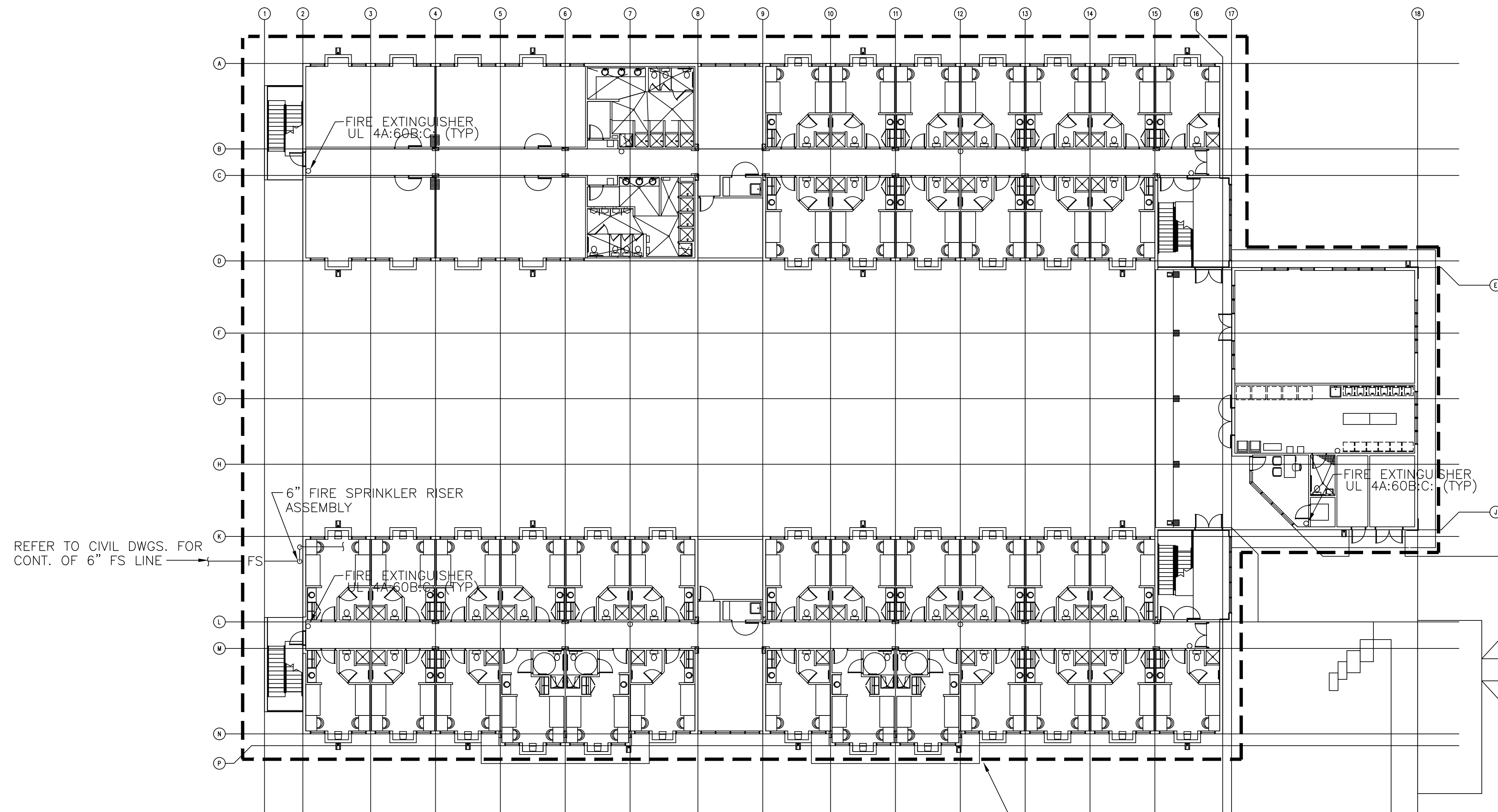
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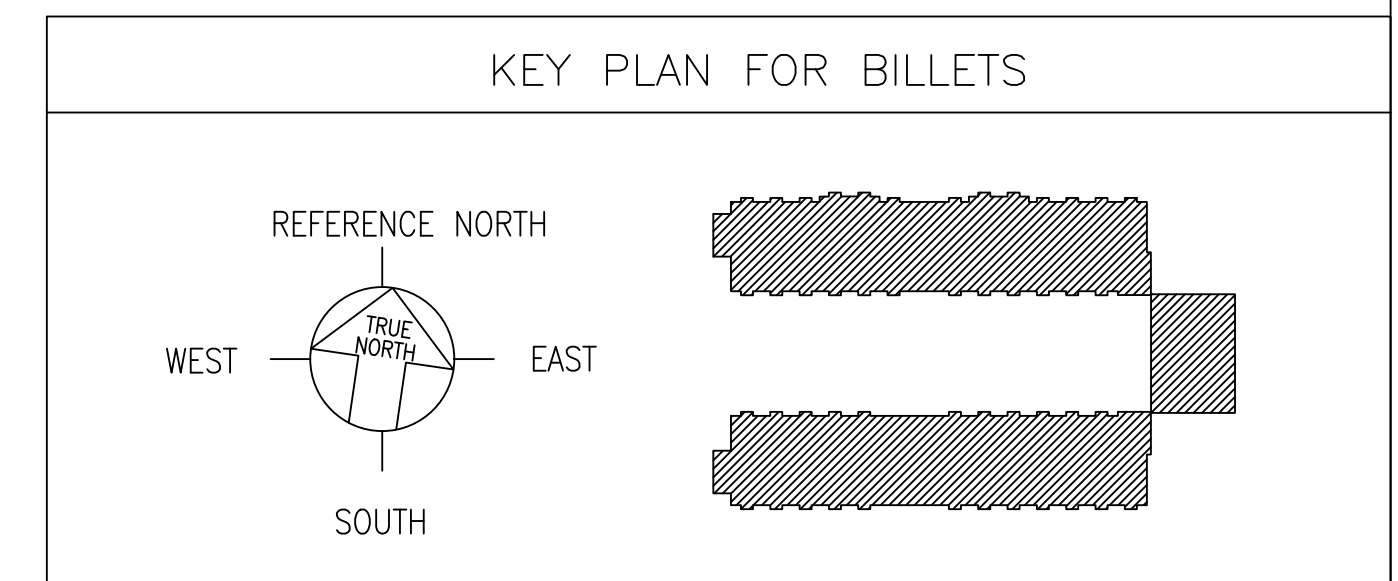
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| DRAWN: RYT        |                 | BELLOWS AIR FORCE STATION                   |  |
| SAFETY: -         |                 | WAIMANALO, HAWAII                           |  |
| ENGINEER: -       |                 | BILLETS                                     |  |
|                   |                 | ENLARGED PLUMBING FLOOR PLAN                |  |
| APPROVED: _____   | APPROVED: _____ | DATE: MARCH 28, 2000                        |  |
|                   |                 | SCALE: AS NOTED                             |  |
|                   |                 | DWC #                                       |  |
|                   |                 | SHEET 110 of 228                            |  |



REFER TO CIVIL DWGS. FOR CONT. OF 6" FS LINE

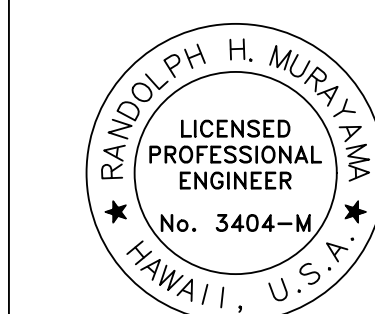
FIRE PROTECTION FLOOR PLAN - BILLET (GROUND FLOOR)  
1/16" = 1'-0"

ENTIRE AREA TO BE FIRE SPRINKLED PER NFPA 13 FOR LIGHT HAZARD OCCUPANCY (0.10 GPM/SQ. FT. AT 1800 SQ. FT.) EXCEPT LAUNDRY ROOM ORDINARY HAZARD GROUP 1 COVERAGE. PROVIDE NEW FIRE SPRINKLER PIPING AND FIRE SPRINKLER HEADS FOR ALL AREAS INCLUDING COMBUSTIBLE CEILING SPACE/PARAPET/MANSARD/OVERHANGS.



| REVISION NO | DESCRIPTION | DATE | BY | CHK'D |
|-------------|-------------|------|----|-------|
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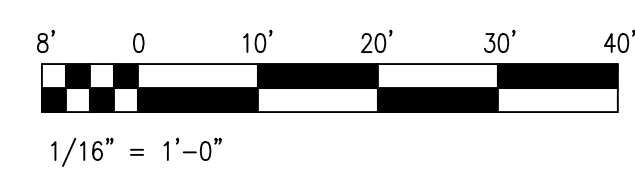
DEPARTMENTS OF THE ARMY AND AIR  
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DESIGNED: ESN  
DRAWN: ESN  
SAFETY: ESN  
ENGINEER: ESN

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BELLOWS AIR FORCE STATION  
WAIMANALO, HAWAII

BILLET  
FIRE PROTECTION FLOOR PLAN - GROUND FLOOR

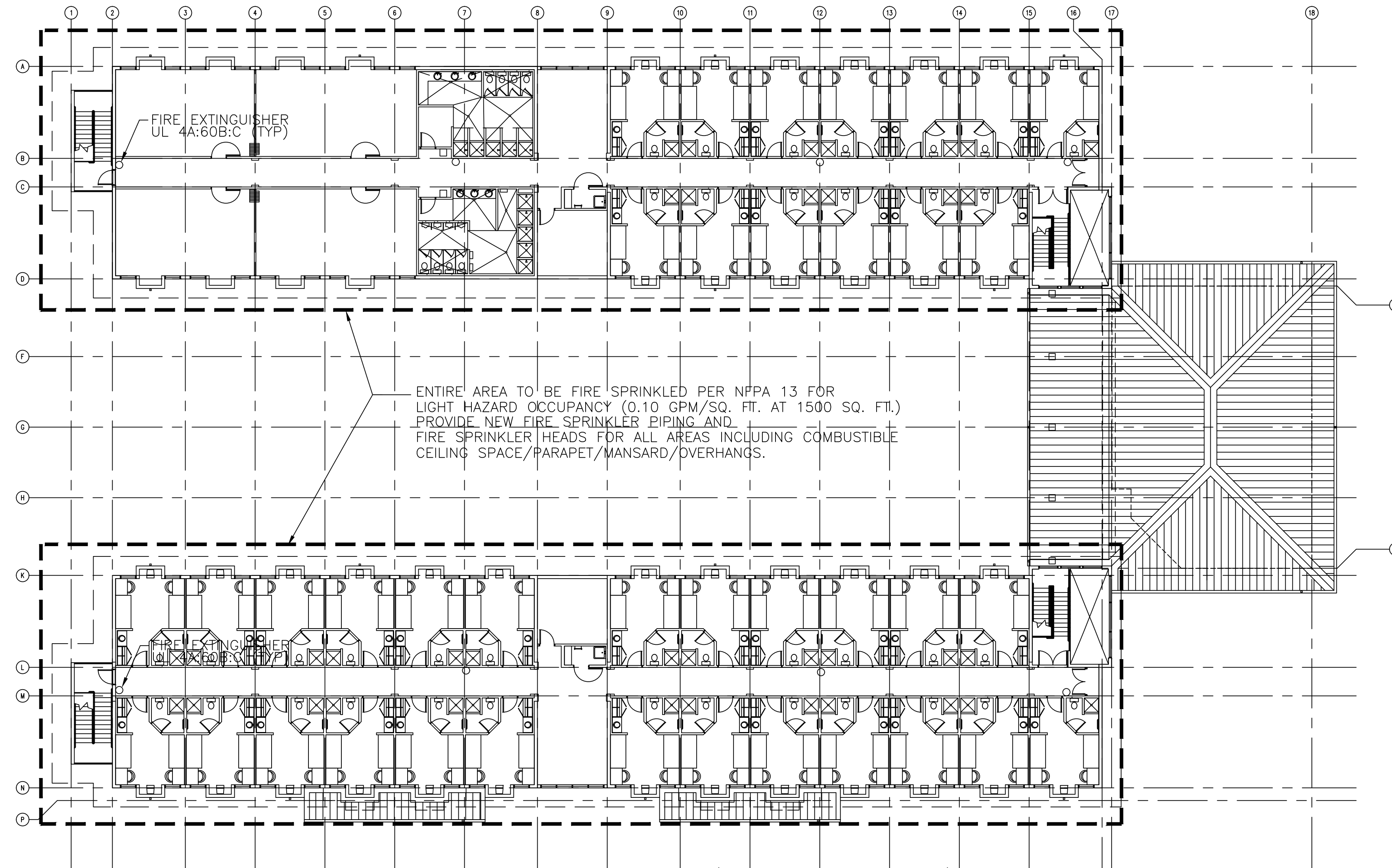
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| APPROVED:                               | APPROVED:             | DATE            |
| HARRIG, FAC MGMT OFFICER                | NGB, USPFO FOR HAWAII |                 |
| APPROVED:                               |                       | SCALE: AS NOTED |
| HING, CONTRACTING & ENGINEERING OFFICER |                       | DWG # M2.12     |



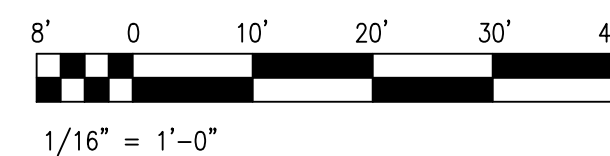
IF SHEET IS LESS THAN 22 x 34 IT IS A REDUCED PRINT-SCALE REDUCED ACCORDINGLY

The Contractor will be responsible for coordinating the work among the various trades as necessary to avoid conflicts and to insure the installation of all work within the available space.

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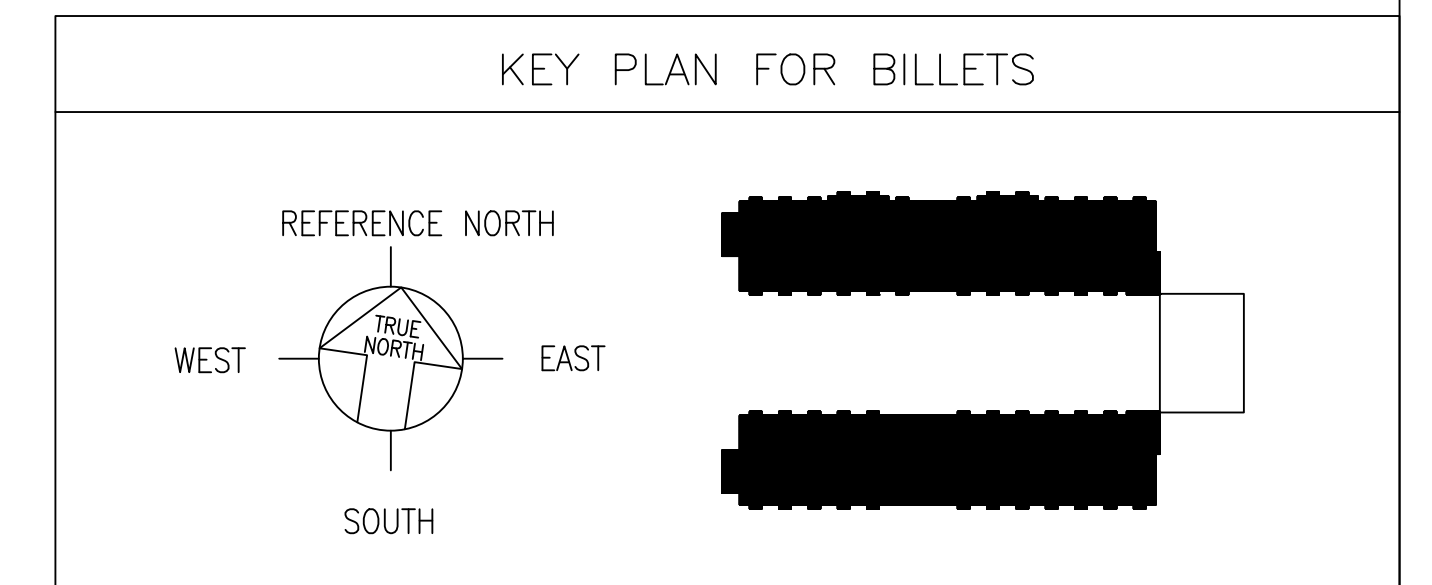


FIRE PROTECTION FLOOR PLAN — BILLETS (SECOND FLOOR)  
 1/16" = 1'-0"



IF SHEET IS LESS THAN  
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The Contractor will be responsible  
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DESIGNED: ESN/RYT  
 DRAWN: RYT  
 SAFETY: —  
 ENGINEER: —

298TH REGIONAL TRAINING INSTITUTE, PHASE II  
 BELLOWS AIR FORCE STATION  
 WAIMANALO, HAWAII

BILLETS  
 FIRE PROTECTION FLOOR PLAN — SECOND FLOOR

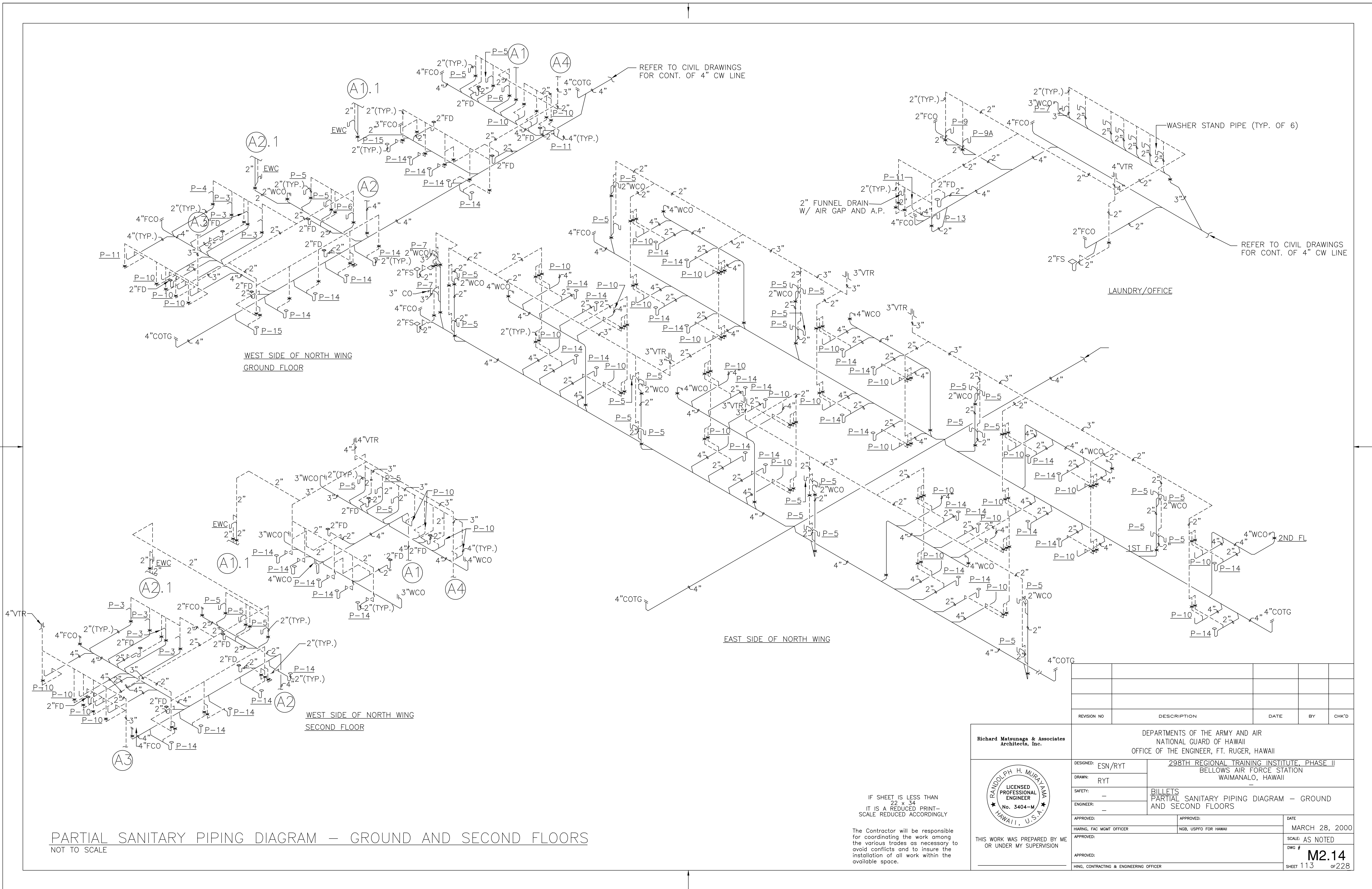
APPROVED: \_\_\_\_\_ DATE: MARCH 28, 2000  
 HARRIG, FAC MGMT OFFICER NGB, USPFO FOR HAWAII SCALE: AS NOTED

APPROVED: \_\_\_\_\_  
 HING, CONTRACTING & ENGINEERING OFFICER SHEET 112 of 228

DWG # **M2.13**



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**PARTIAL SANITARY PIPING DIAGRAM – GROUND AND SECOND FLOORS**  
 NOT TO SCALE

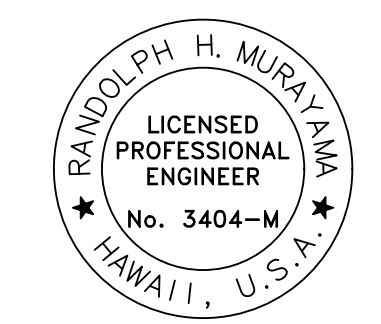
IF SHEET IS LESS THAN  
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 SCALE REDUCED ACCORDINGLY

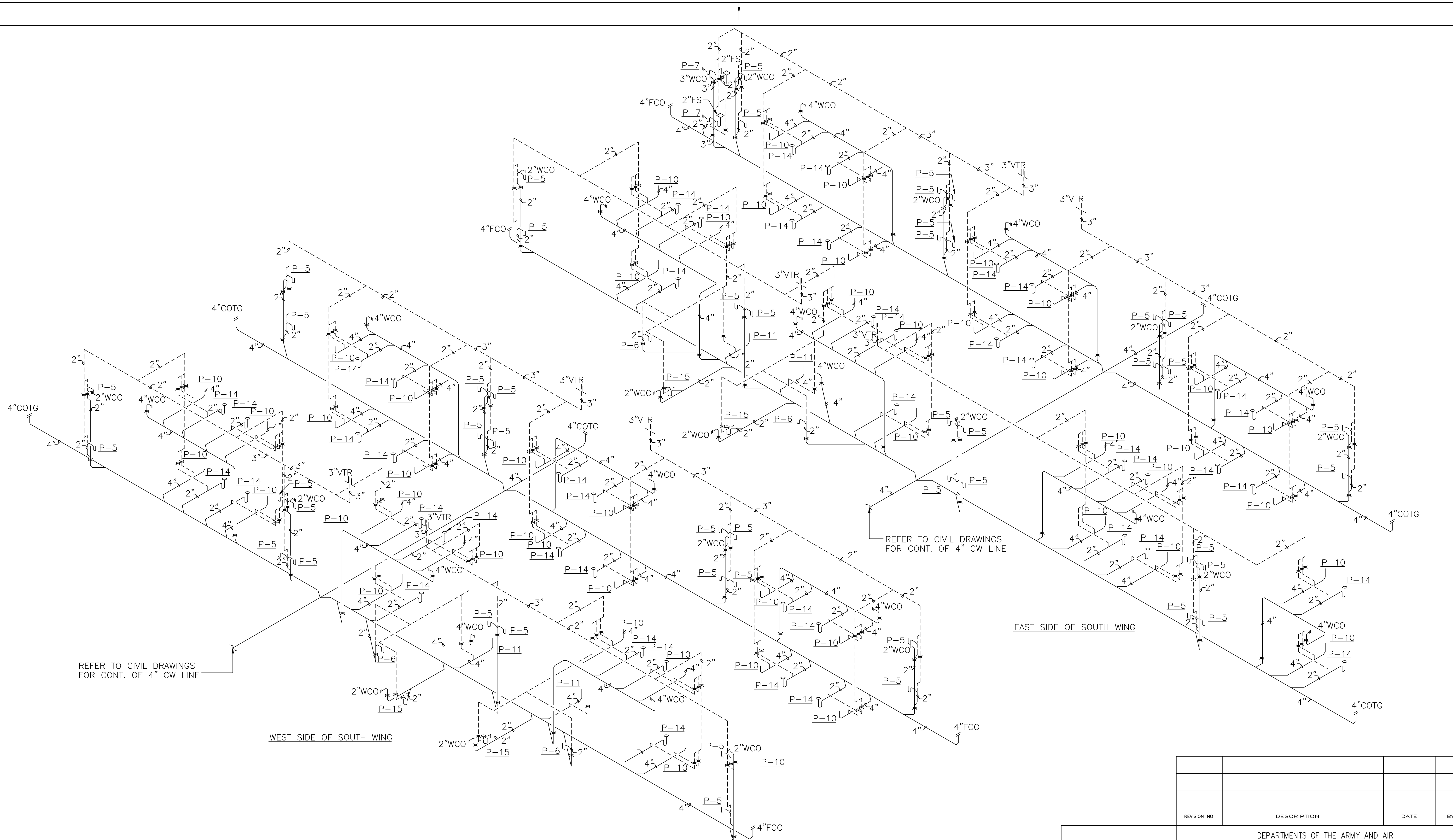
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| REVISION NO | DESCRIPTION | DATE | BY | CHK'D |
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| <b>Richard Matsunaga &amp; Associates</b><br>Architects, Inc. |   | DEPARTMENTS OF THE ARMY AND AIR<br>NATIONAL GUARD OF HAWAII<br>OFFICE OF THE ENGINEER, FT. RUGER, HAWAII |  |
| DESIGNED: ESN/RYT<br>DRAWN: RYT<br>SAFETY: —<br>ENGINEER: —   | 298TH REGIONAL TRAINING INSTITUTE, PHASE II<br>BELLOWS AIR FORCE STATION<br>WAIMANALO, HAWAII |  |  |
| APPROVED: _____<br>HIRING, FAC MGMT OFFICER                   | APPROVED: _____<br>NSB, USPFO FOR HAWAII  | DATE<br>MARCH 28, 2000   | SCALE: AS NOTED<br>DWG #<br><b>M2.14</b> |
| APPROVED: _____<br>HING, CONTRACTING & ENGINEERING OFFICER    |   | THIS WORK WAS PREPARED BY ME<br>OR UNDER MY SUPERVISION  | SHEET 113 OF 228                         |



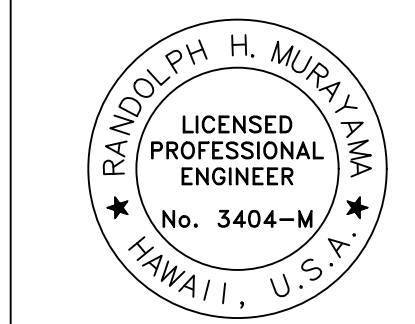


**PARTIAL SANITARY PIPING DIAGRAM – GROUND AND SECOND FLOORS**  
 NOT TO SCALE

IF SHEET IS LESS THAN  
 22 x 34  
 IT IS A REDUCED PRINT—  
 SCALE REDUCED ACCORDINGLY

The Contractor will be responsible  
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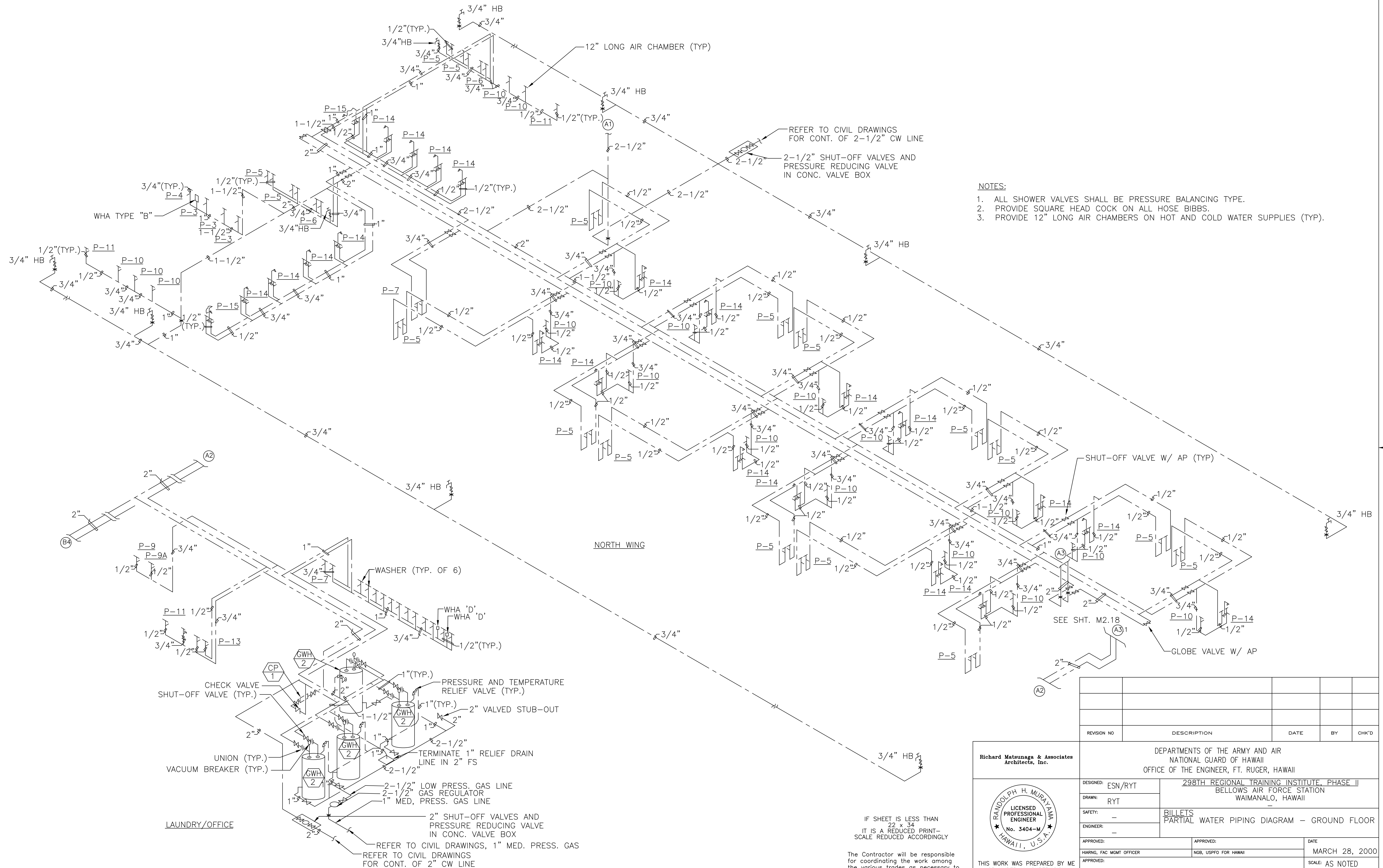
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| DESIGNED: ESN/RYT<br>DRAWN: RYT<br>SAFETY: —<br>ENGINEER: —  | 298TH REGIONAL TRAINING INSTITUTE, PHASE II<br>BELLOWS AIR FORCE STATION<br>WAIMANALO, HAWAII<br>—<br>BILLETS<br>PARTIAL SANITARY PIPING DIAGRAM — GROUND<br>AND SECOND FLOORS |
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| APPROVED: _____<br>HING, CONTRACTING & ENGINEERING OFFICER   | DATE: MARCH 28, 2000<br>SCALE: AS NOTED<br>DWG #: <b>M2.15</b><br>SHEET 114 OF 228   |



- NOTES:**
1. ALL SHOWER VALVES SHALL BE PRESSURE BALANCING TYPE.
  2. PROVIDE SQUARE HEAD COCK ON ALL HOSE BIBBS.
  3. PROVIDE 12" LONG AIR CHAMBERS ON HOT AND COLD WATER SUPPLIES (TYP.).

**PARTIAL WATER PIPING DIAGRAM – GROUND FLOOR**  
 NOT TO SCALE

IF SHEET IS LESS THAN  
 22 x 34  
 IT IS A REDUCED PRINT—  
 SCALE REDUCED ACCORDINGLY

The Contractor will be responsible for coordinating the work among the various trades as necessary to avoid conflicts and to insure the installation of all work within the available space.

| REVISION NO | DESCRIPTION | DATE | BY | CHK'D |
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 SAFETY: -  
 ENGINEER: -

**298TH REGIONAL TRAINING INSTITUTE, PHASE II**  
**BELLOWS AIR FORCE STATION**  
**WAIMANALO, HAWAII**

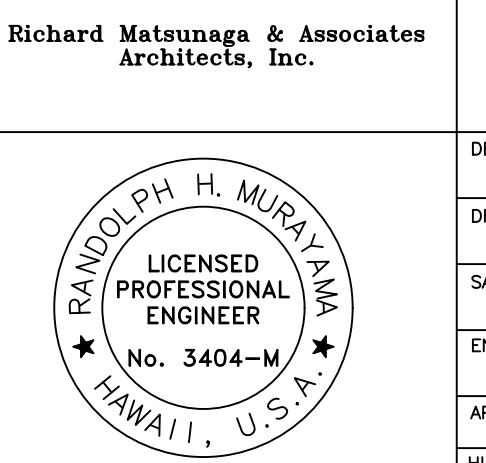
**BILLETS**  
**PARTIAL WATER PIPING DIAGRAM – GROUND FLOOR**

DATE: MARCH 28, 2000  
 SCALE: AS NOTED  
 DWG #: M2.16  
 SHEET 115 OF 228

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 HING, CONTRACTING & ENGINEERING OFFICER

APPROVED: \_\_\_\_\_  
 NGB, USPFO FOR HAWAII

APPROVED: \_\_\_\_\_  
 HING, CONTRACTING & ENGINEERING OFFICER

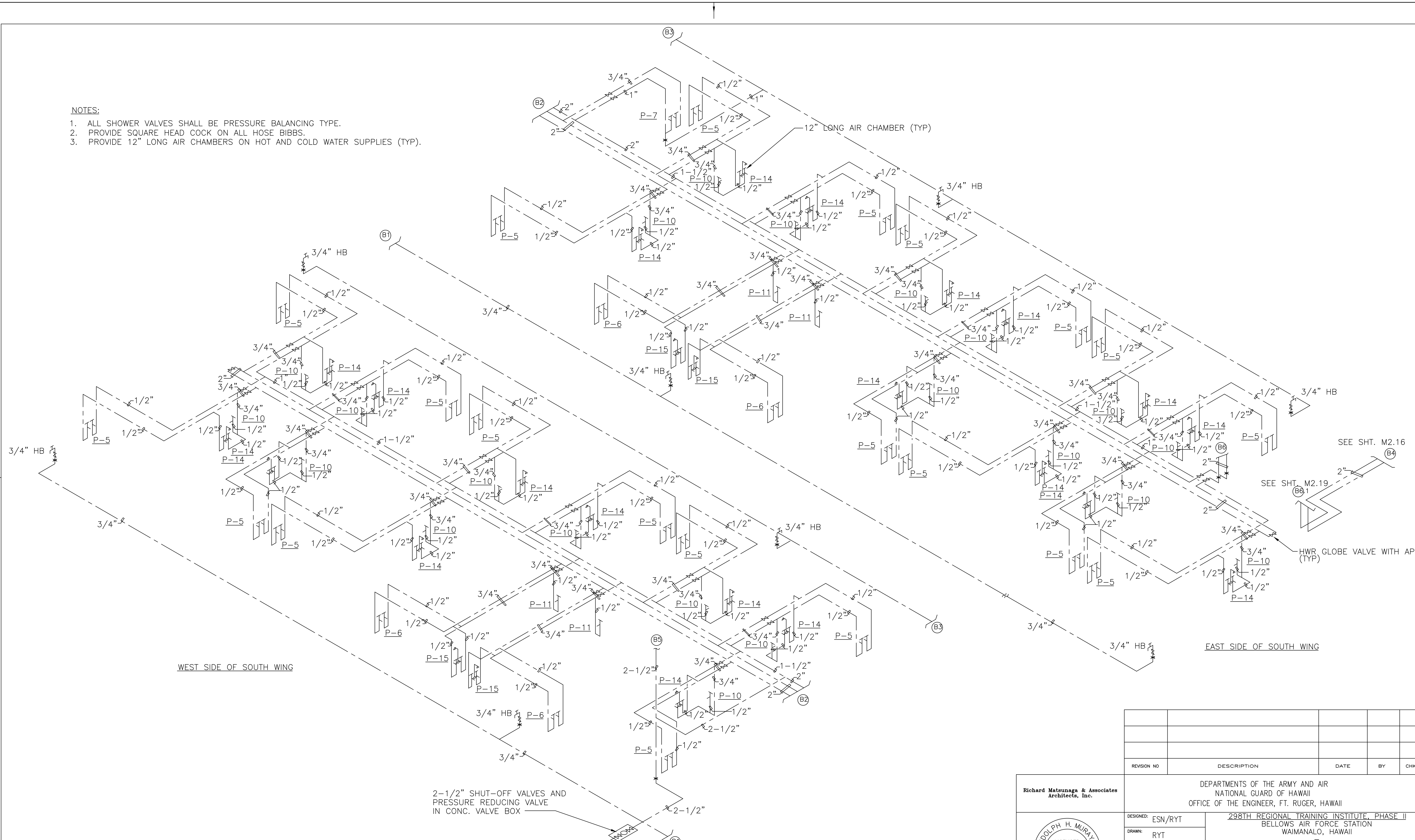


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**NOTES:**

1. ALL SHOWER VALVES SHALL BE PRESSURE BALANCING TYPE.
2. PROVIDE SQUARE HEAD COCK ON ALL HOSE BIBBS.
3. PROVIDE 12" LONG AIR CHAMBERS ON HOT AND COLD WATER SUPPLIES (TYP).



WEST SIDE OF SOUTH WING

EAST SIDE OF SOUTH WING

2-1/2" SHUT-OFF VALVES AND  
PRESSURE REDUCING VALVE  
IN CONC. VALVE BOX

REFER TO CIVIL DRAWINGS  
FOR CONT. OF 2-1/2" CW LINE

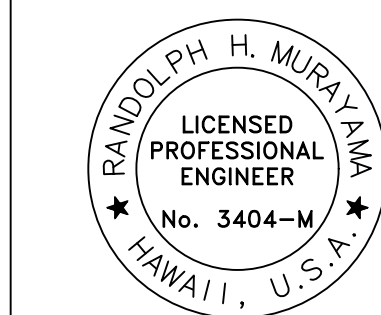
**PARTIAL WATER PIPING DIAGRAM - GROUND FLOOR**  
NOT TO SCALE

IF SHEET IS LESS THAN  
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SCALE REDUCED ACCORDINGLY

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| REVISION NO | DESCRIPTION | DATE | BY | CHK'D |
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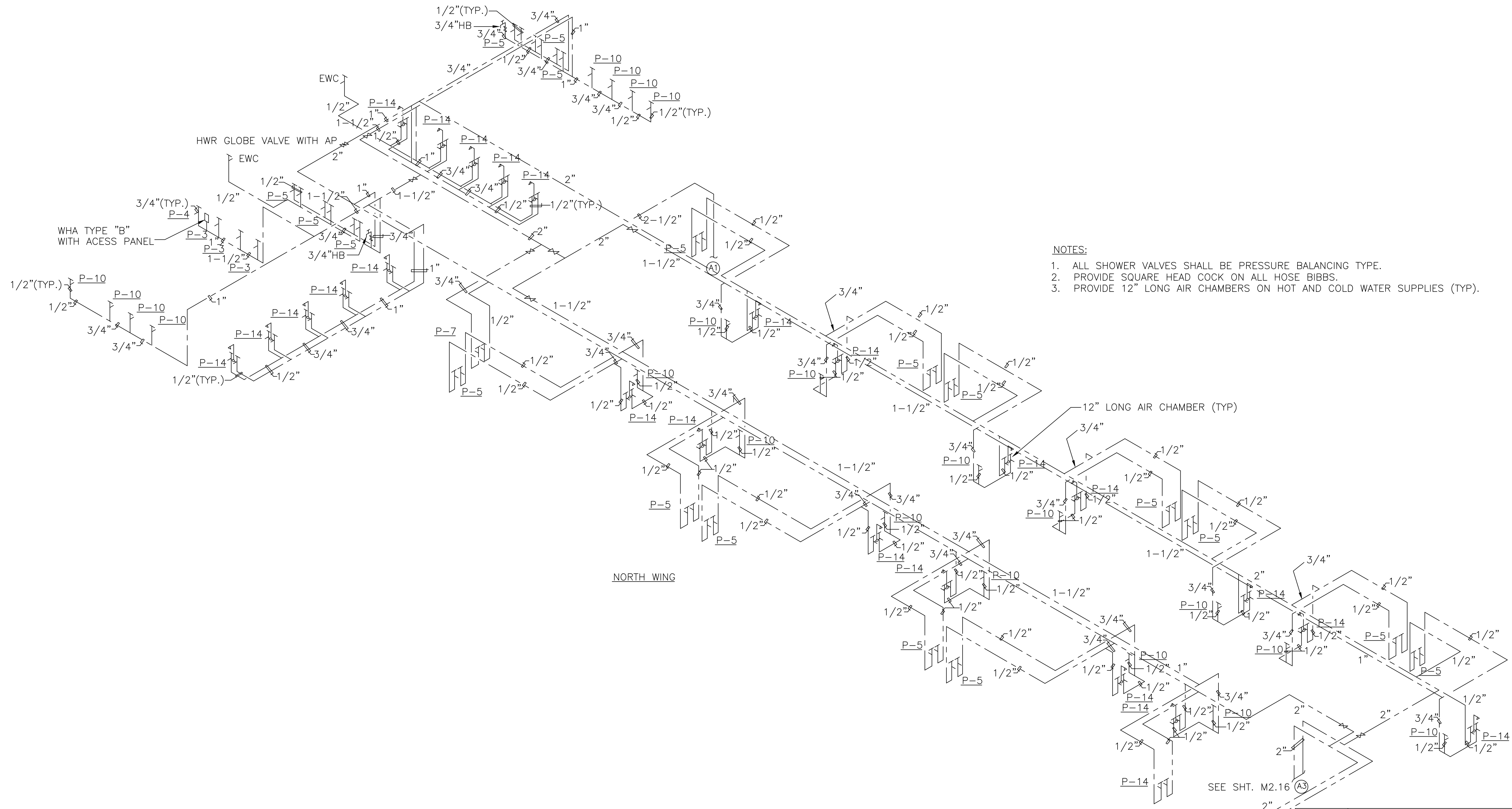
DESIGNED: ESN/RYT  
DRAWN: RYT  
SAFETY: -  
ENGINEER: -

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BELLOWS AIR FORCE STATION  
WAIMANALO, HAWAII

BILLETS  
PARTIAL WATER PIPING DIAGRAM - GROUND FLOOR

|                          |                      |                    |
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| APPROVED:                | APPROVED:            | DATE               |
| HIARNG, FAC MGMT OFFICER | NSB, USPO FOR HAWAII | MARCH 28, 2000     |
| APPROVED:                |                      | SCALE: AS NOTED    |
|                          |                      | DWG # <b>M2.17</b> |
|                          |                      | SHEET 116 of 228   |





- NOTES:
1. ALL SHOWER VALVES SHALL BE PRESSURE BALANCING TYPE.
  2. PROVIDE SQUARE HEAD COCK ON ALL HOSE BIBBS.
  3. PROVIDE 12" LONG AIR CHAMBERS ON HOT AND COLD WATER SUPPLIES (TYP).

NORTH WING

SEE SHT. M2.16 (A3)

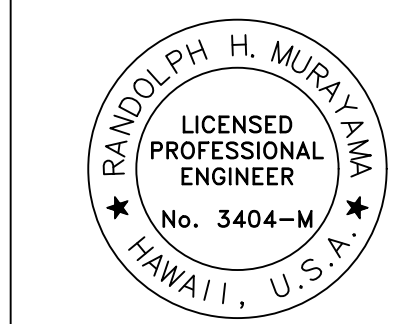
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PARTIAL WATER PIPING DIAGRAM - SECOND FLOOR  
NOT TO SCALE

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The Contractor will be responsible for coordinating the work among the various trades as necessary to avoid conflicts and to insure the installation of all work within the available space.

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DRAWN: RYT  
SAFETY: -  
ENGINEER: -

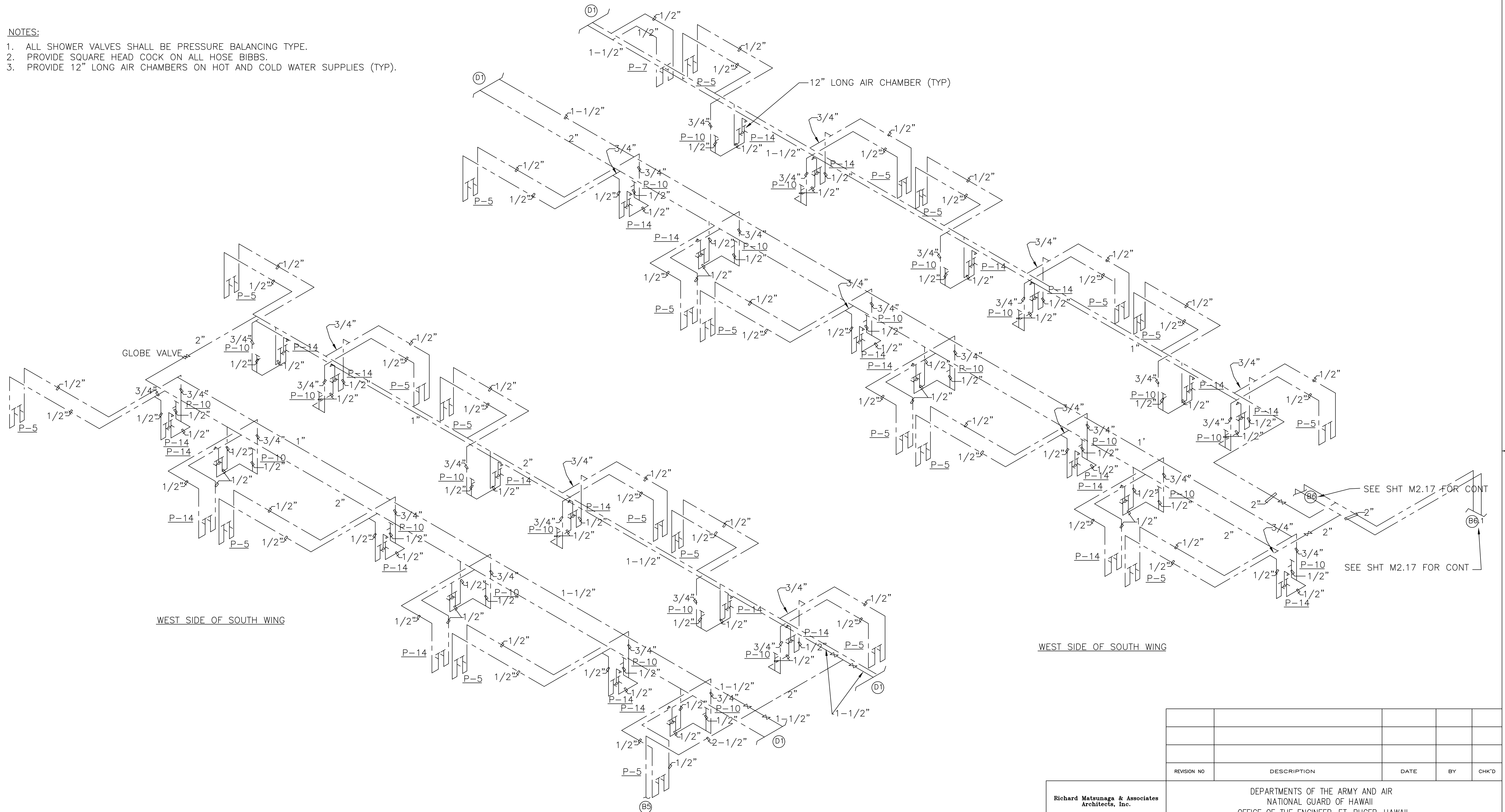
298TH REGIONAL TRAINING INSTITUTE, PHASE II  
BELLOWS AIR FORCE STATION  
WAIMANALO, HAWAII

BILLETS  
PARTIAL WATER PIPING DIAGRAM - SECOND FLOOR

|   |                       |                  |
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| APPROVED:                               | APPROVED:             | DATE             |
| HARRIG, FAC MGMT OFFICER                | NSB, USPFO FOR HAWAII | MARCH 28, 2000   |
| APPROVED:                               |                       | SCALE: AS NOTED  |
| HING, CONTRACTING & ENGINEERING OFFICER |                       | DWG # M2.18      |
|   |                       | SHEET 117 of 228 |

**NOTES:**

1. ALL SHOWER VALVES SHALL BE PRESSURE BALANCING TYPE.
2. PROVIDE SQUARE HEAD COCK ON ALL HOSE BIBBS.
3. PROVIDE 12" LONG AIR CHAMBERS ON HOT AND COLD WATER SUPPLIES (TYP).

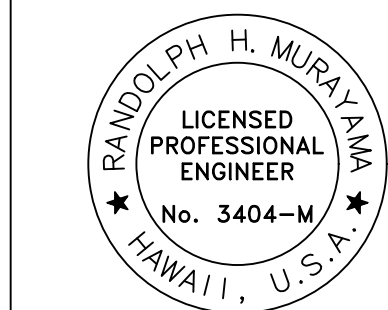


**PARTIAL WATER PIPING DIAGRAM - SECOND FLOOR**  
NOT TO SCALE

IF SHEET IS LESS THAN  
22 x 34  
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SCALE REDUCED ACCORDINGLY

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available space.

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Architects, Inc.

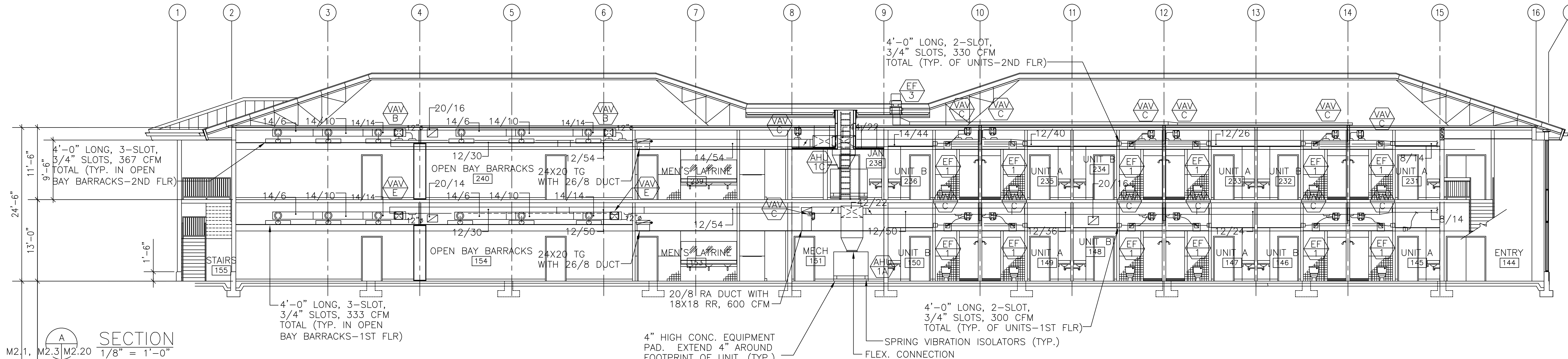


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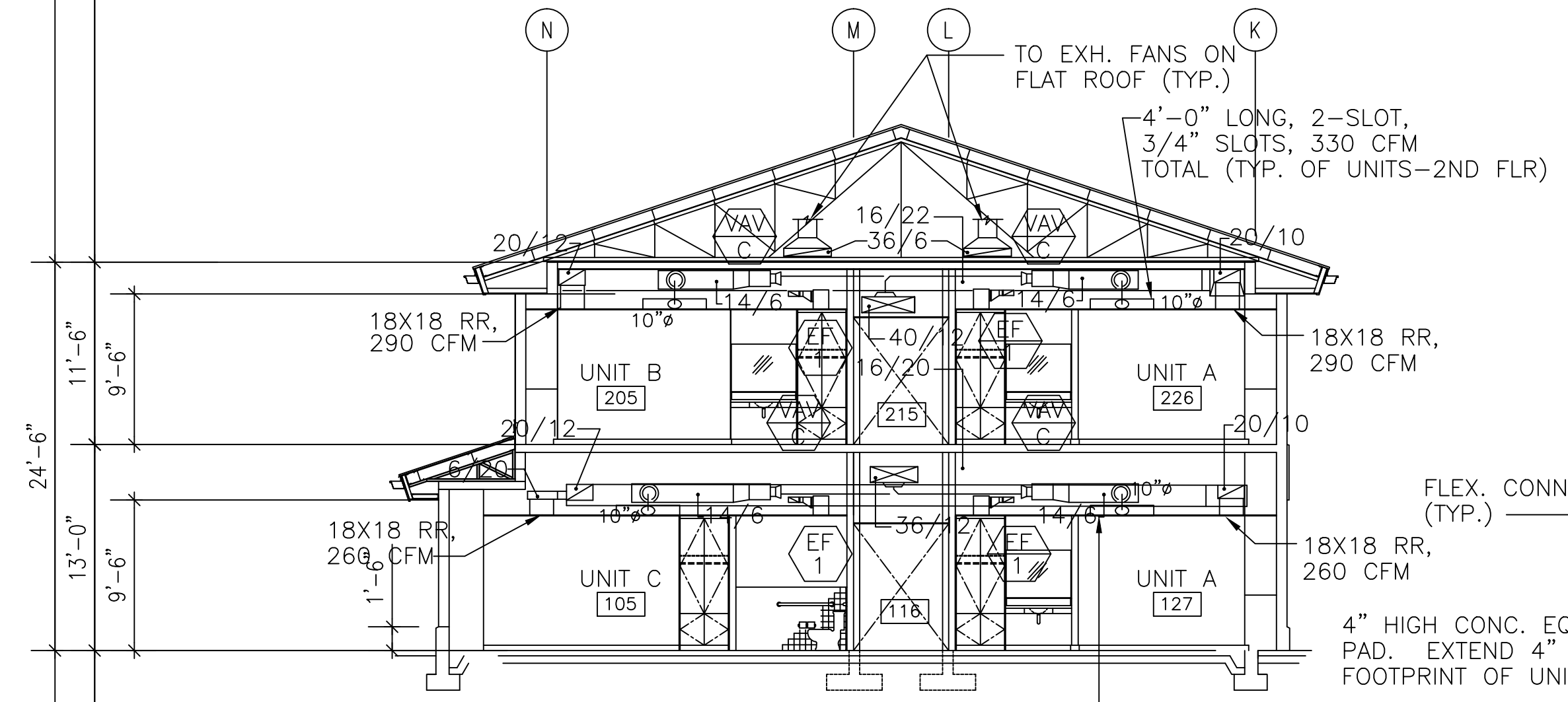
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| DESIGNED:  | ESN | 298TH REGIONAL TRAINING INSTITUTE, PHASE I<br>BELLOWS AIR FORCE STATION<br>WAIMANALO, HAWAII |      |
| DRAWN:   | ESN | BILLETES<br>PARTIAL WATER PIPING DIAGRAM - SECOND FLOOR                                      |      |
| SAFETY:  |     |  |      |
| ENGINEER:  |     |  |      |
| APPROVED:  |     | APPROVED:  | DATE |
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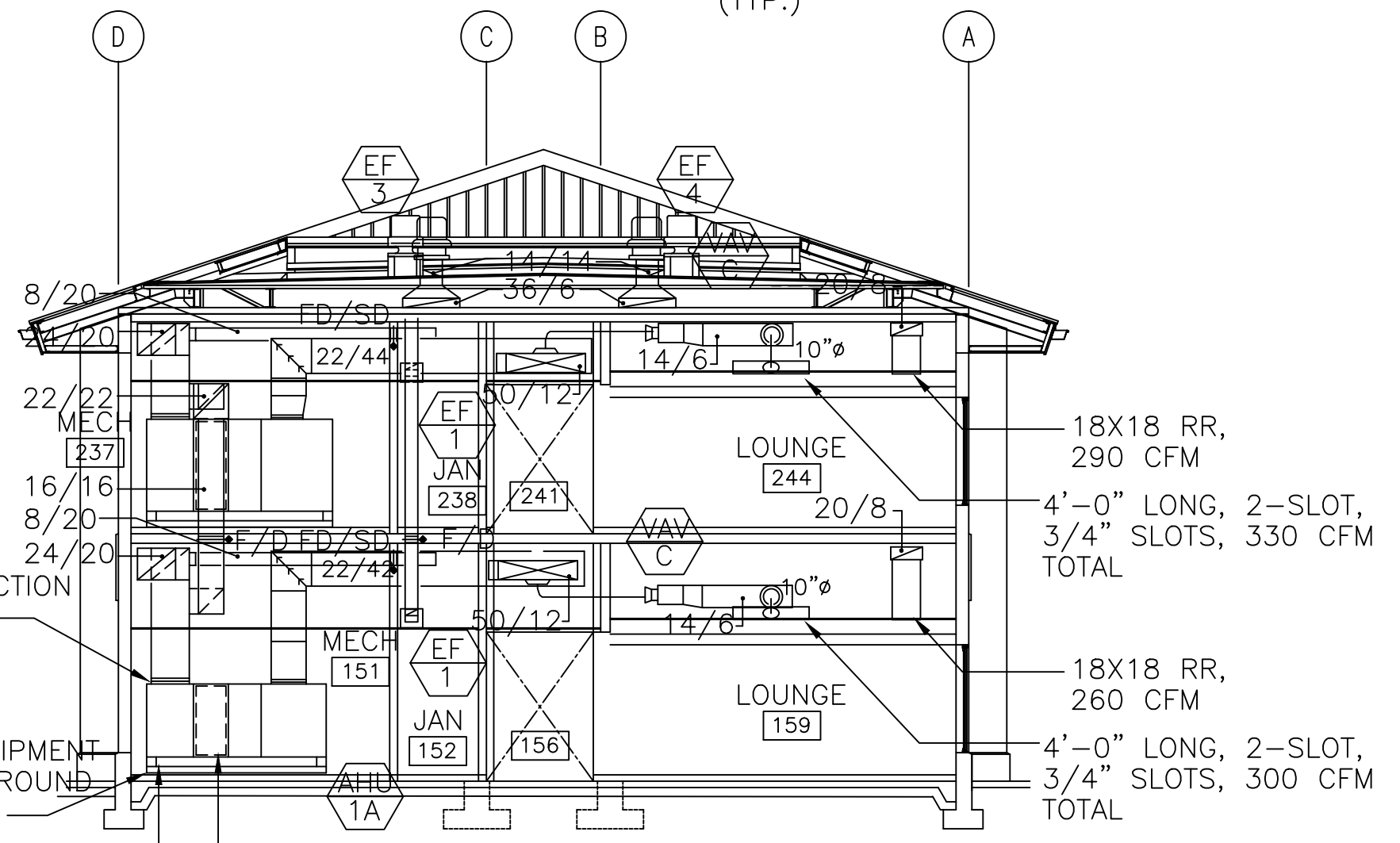
SCALE: AS NOTED  
DWG # **M2.19**  
SHEET 118 of 228



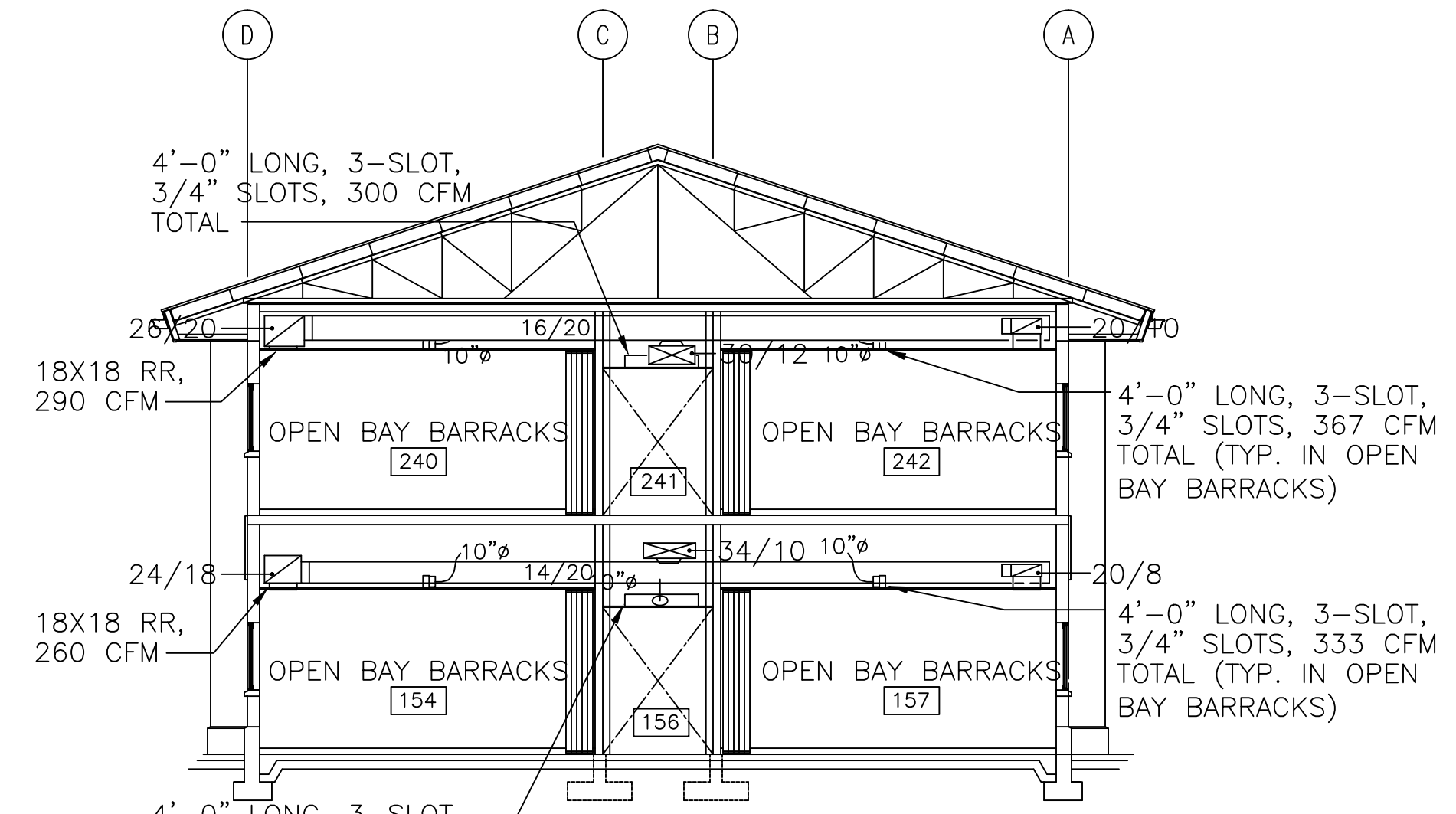
**SECTION A**  
M2.1, M2.3 M2.20 1/8" = 1'-0"



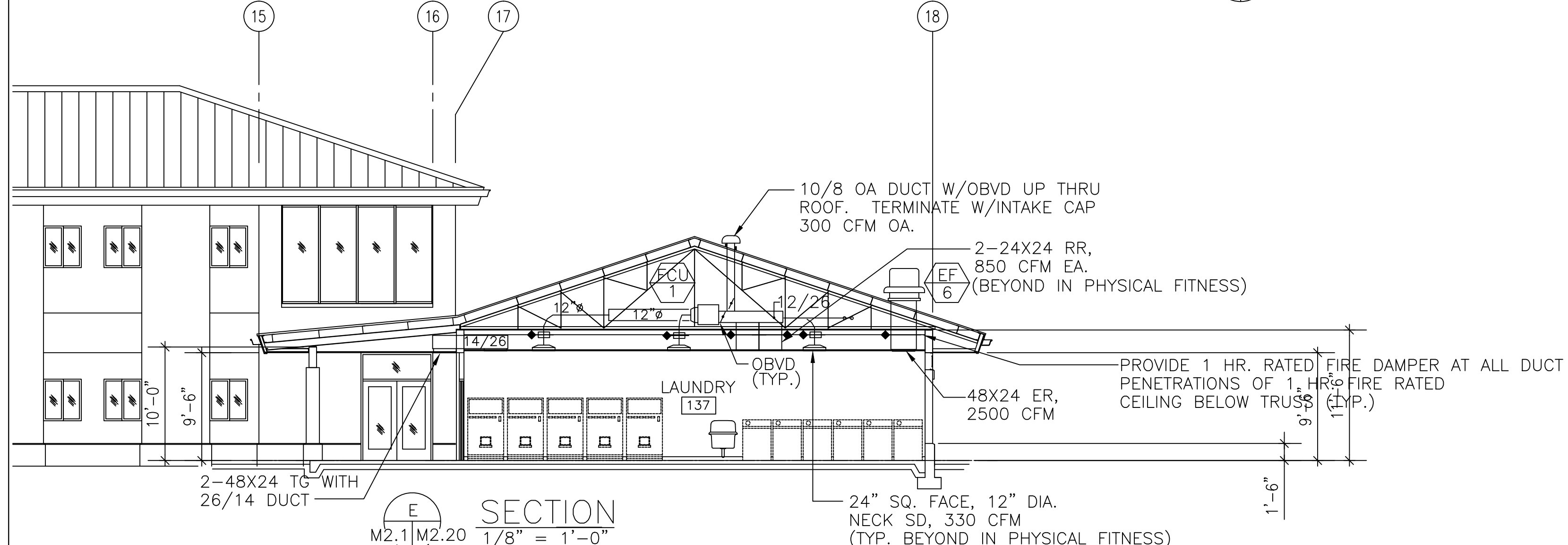
**SECTION B**  
M2.2, M2.4 M2.20 1/8" = 1'-0"



**SECTION C**  
M2.1, M2.3 M2.20 1/8" = 1'-0"



**SECTION D**  
M2.1, M2.3 M2.20 1/8" = 1'-0"



**SECTION E**  
M2.1 M2.20 1/8" = 1'-0"

| REVISION NO | DESCRIPTION | DATE | BY | CHK'D |
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**298TH REGIONAL TRAINING INSTITUTE, PHASE II  
BELLOW'S AIR FORCE STATION  
WAIMANALO, HAWAII**

DESIGNED: ESN/RYT  
DRAWN: RYT  
SAFETY: -  
ENGINEER: -

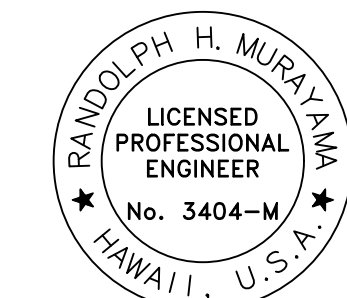
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HAWAII, FAC MGMT OFFICER NGB, USPO FOR HAWAII

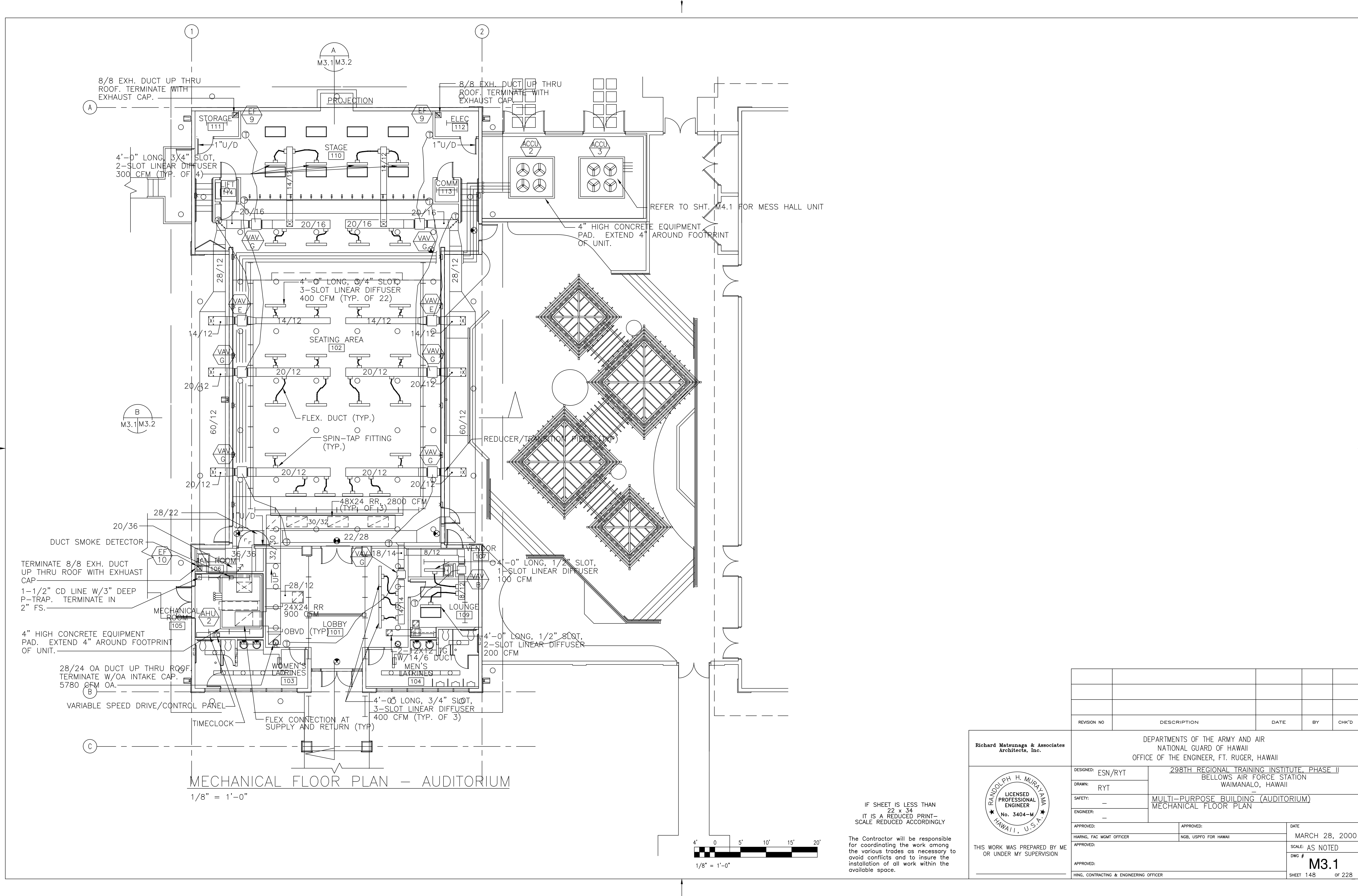
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HAWAII, CONTRACTING & ENGINEERING OFFICER DWG # **M2.20**

SHEET 119 of 228

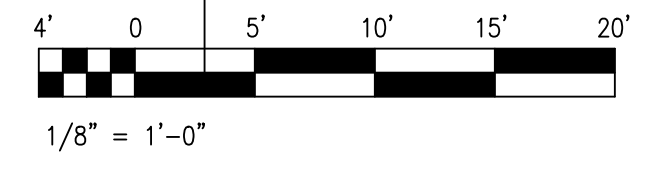
IF SHEET IS LESS THAN 22" x 34" IT IS A REDUCED PRINT-SCALE REDUCED ACCORDINGLY

The Contractor will be responsible for coordinating the work among the various trades as necessary avoid conflicts and to insure the installation of all work within the available space.





**MECHANICAL FLOOR PLAN - AUDITORIUM**  
 1/8" = 1'-0"

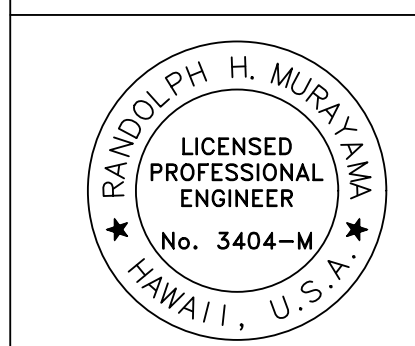


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| REVISION NO | DESCRIPTION | DATE | BY | CHK'D |
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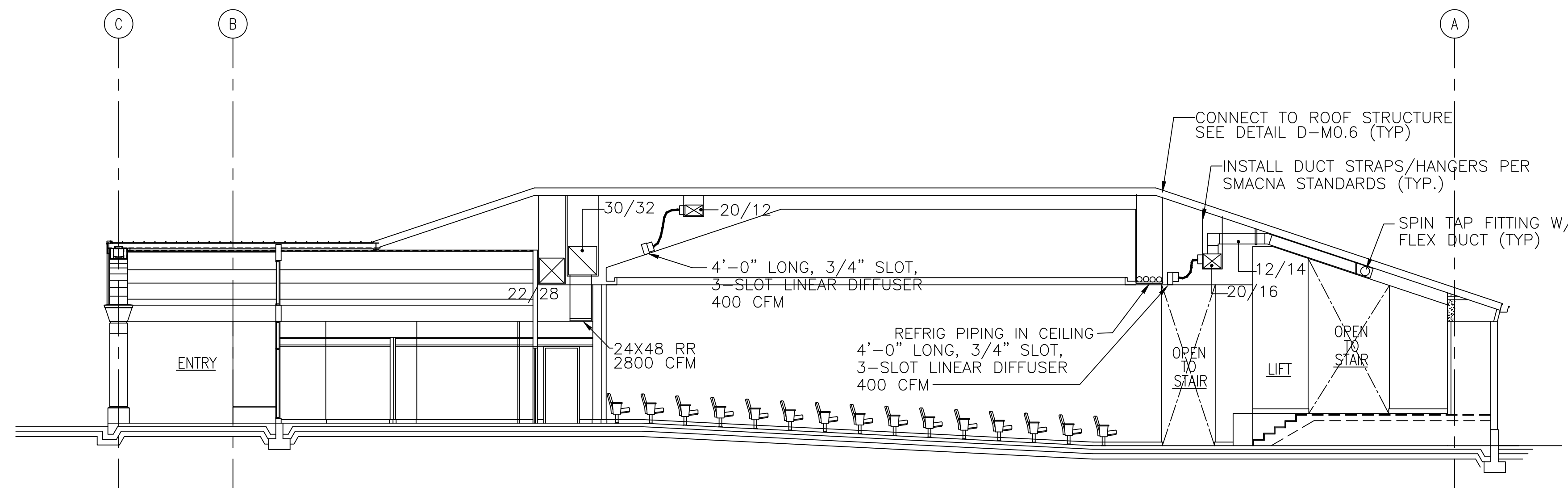
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 NATIONAL GUARD OF HAWAII  
 OFFICE OF THE ENGINEER, FT. RUGER, HAWAII

DESIGNED: ESN/RYT  
 DRAWN: RYT  
 SAFETY: —  
 ENGINEER: —

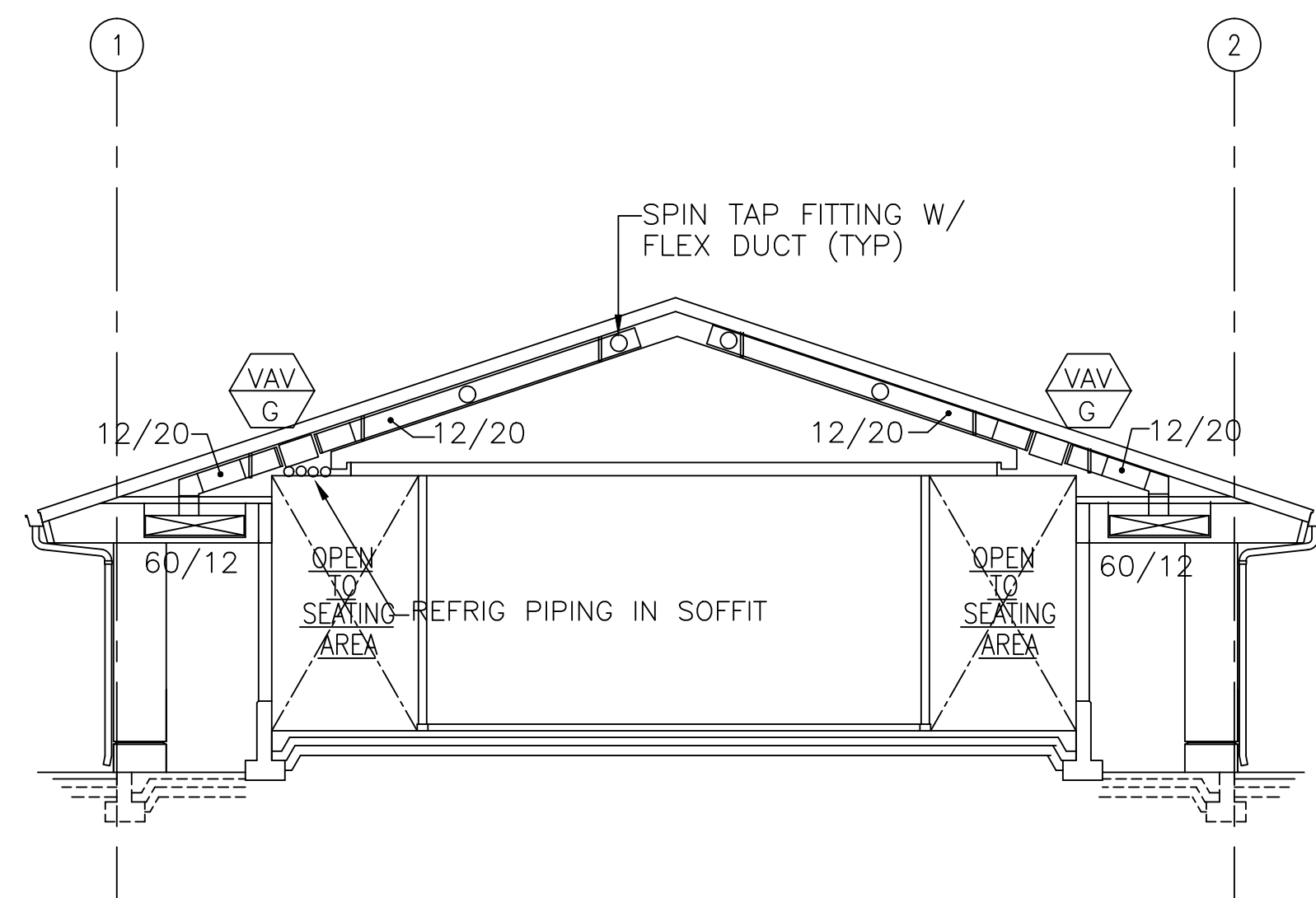
298TH REGIONAL TRAINING INSTITUTE, PHASE II  
 BELLOWS AIR FORCE STATION  
 WAIMANALO, HAWAII

MULTI-PURPOSE BUILDING (AUDITORIUM)  
 MECHANICAL FLOOR PLAN

|  |                       |                  |
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| APPROVED:                                | APPROVED:             | DATE             |
| HIARG, FAC MGMT OFFICER                  | NSB, USPFO FOR HAWAII | MARCH 28, 2000   |
| APPROVED:                                |                       | SCALE: AS NOTED  |
| HIENG, CONTRACTING & ENGINEERING OFFICER |                       | DWG #            |
|  |                       | <b>M3.1</b>      |
|  |                       | SHEET 148 OF 228 |



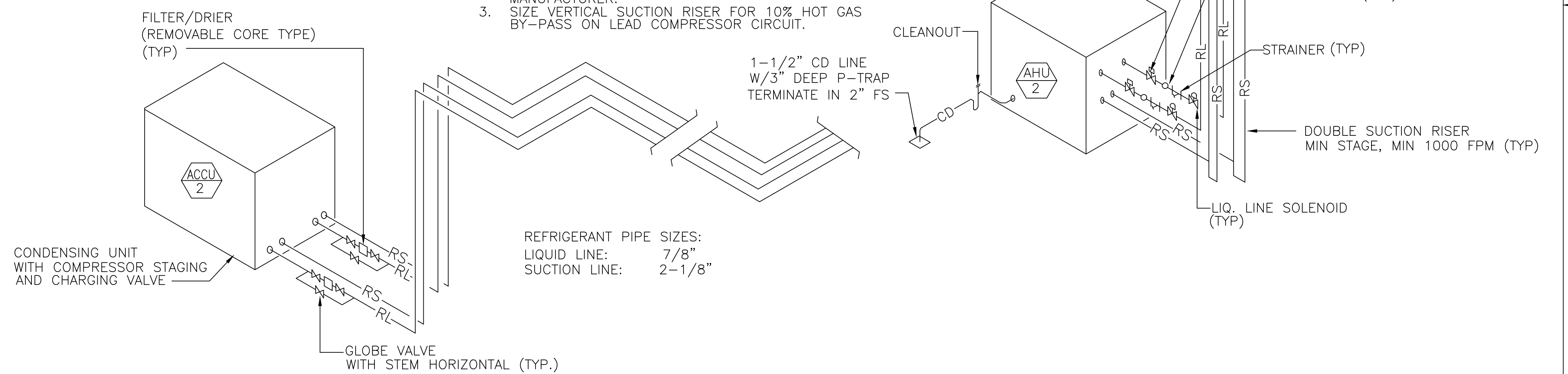
**A SECTION**  
M3.1M3.2 1/8" = 1'-0"



**B SECTION**  
M3.1M3.2 1/8" = 1'-0"

**NOTES:**

1. INSULATE ALL COLD PIPING IN ADDITION TO SUCTION LINES.
2. ALL PIPE SIZES AS RECOMMENDED BY EQUIPMENT MANUFACTURER.
3. SIZE VERTICAL SUCTION RISER FOR 10% HOT GAS BY-PASS ON LEAD COMPRESSOR CIRCUIT.



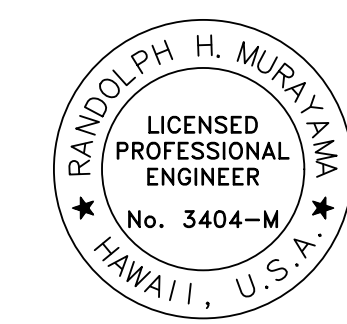
**AUDITORIUM BUILDING REFRIGERANT AND CONDENSATE DRAIN PIPING DIAGRAM**  
NOT TO SCALE

IF SHEET IS LESS THAN 22 x 34 IT IS A REDUCED PRINT-SCALE REDUCED ACCORDINGLY

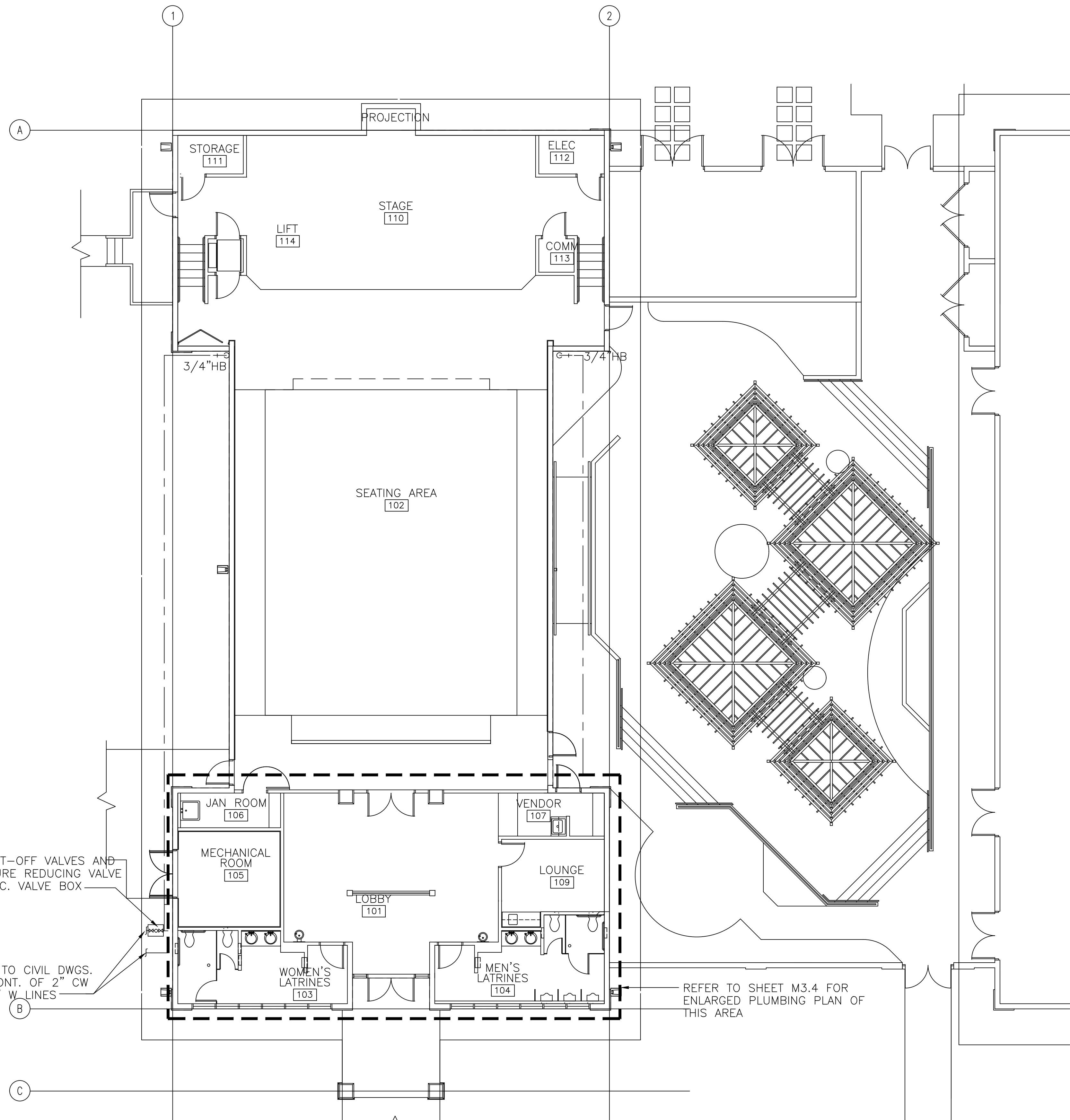
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| REVISION NO | DESCRIPTION | DATE | BY | CHK'D |
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|---|---|---|---|
| <b>Richard Matsunaga &amp; Associates Architects, Inc.</b>  |   | DEPARTMENTS OF THE ARMY AND AIR NATIONAL GUARD OF HAWAII<br>OFFICE OF THE ENGINEER, FT. RUGER, HAWAII |   |
| DESIGNED: ESN/RYT<br>DRAWN: RYT<br>SAFETY: -<br>ENGINEER: - | 298TH REGIONAL TRAINING INSTITUTE, PHASE II<br>BELLOWS AIR FORCE STATION<br>WAIMANALO, HAWAII<br>MULTI-PURPOSE BUILDING (AUDITORIUM)<br>MECHANICAL SECTIONS |   |   |
| APPROVED: _____<br>HIRING, FAC MGMT OFFICER                 | APPROVED: _____<br>NGB, USPFO FOR HAWAII  | DATE<br>MARCH 28, 2000  | SCALE: AS NOTED<br>DWG #<br><b>M3.2</b> |
| APPROVED: _____<br>HING, CONTRACTING & ENGINEERING OFFICER  |   | SHEET 149   | OF 228                                  |



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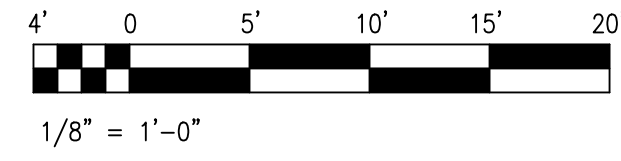


2" SHUT-OFF VALVES AND PRESSURE REDUCING VALVE IN CONC. VALVE BOX

REFER TO CIVIL DWGS. FOR CONT. OF 2" CW AND 4" W LINES

REFER TO SHEET M3.4 FOR ENLARGED PLUMBING PLAN OF THIS AREA

PLUMBING FLOOR PLAN - AUDITORIUM  
1/8" = 1'-0"

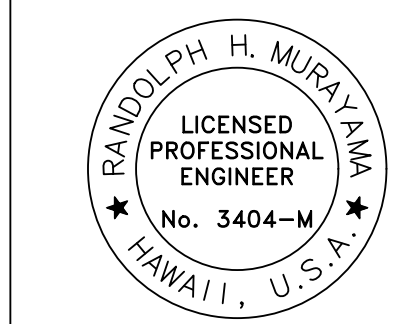


IF SHEET IS LESS THAN 22 x 34 IT IS A REDUCED PRINT - SCALE REDUCED ACCORDINGLY

The Contractor will be responsible for coordinating the work among the various trades as necessary to avoid conflicts and to insure the installation of all work within the available space.

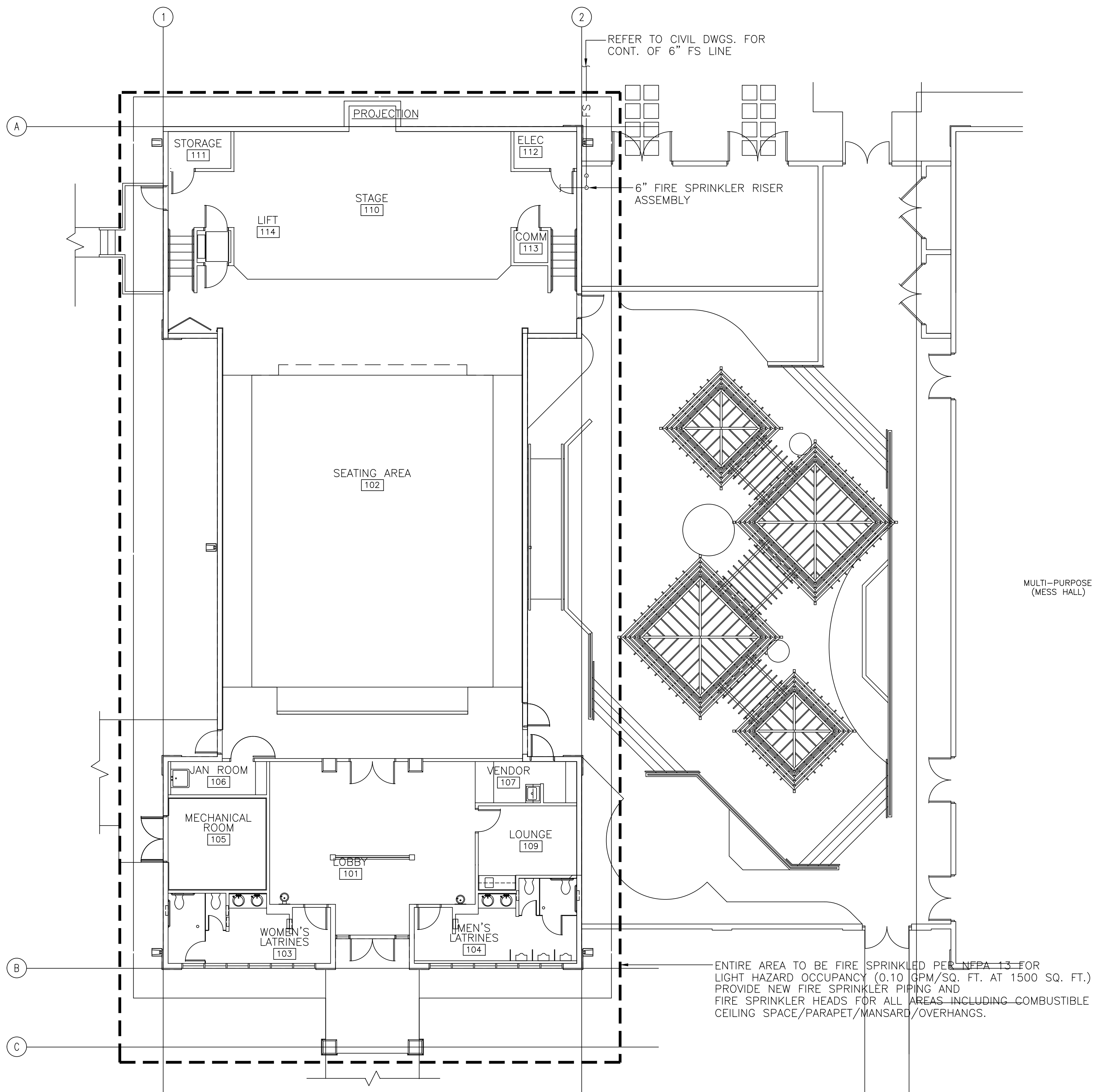
| REVISION NO | DESCRIPTION | DATE | BY | CHK'D |
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Richard Matsunaga & Associates  
Architects, Inc.



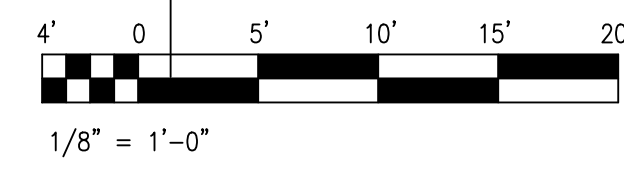
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|   |  |      |  |                  |
|---|--|------|--|------------------|
| DEPARTMENTS OF THE ARMY AND AIR NATIONAL GUARD OF HAWAII<br>OFFICE OF THE ENGINEER, FT. RUGER, HAWAII |  |      |  |                  |
| DESIGNED: ESN   | 298TH REGIONAL TRAINING INSTITUTE, PHASE I<br>BELLOWS AIR FORCE STATION<br>WAIMANALO, HAWAII |      |  |                  |
| DRAWN: ESN  | MULTI-PURPOSE BUILDING (AUDITORIUM)<br>PLUMBING FLOOR PLAN                                   |      |  |                  |
| SAFETY:   |  |      |  |                  |
| ENGINEER:   |  |      |  |                  |
| APPROVED:   | APPROVED:  | DATE |  |                  |
| HARRIG, FAC MGMT OFFICER  | NSB, USPFO FOR HAWAII  |      |  |                  |
| APPROVED:   |  |      |  | SCALE: AS NOTED  |
| APPROVED:   |  |      |  | DWG # M3.3       |
| HING, CONTRACTING & ENGINEERING OFFICER   |  |      |  | SHEET 150 of 228 |



FIRE PROTECTION FLOOR PLAN - AUDITORIUM  
1/8" = 1'-0"

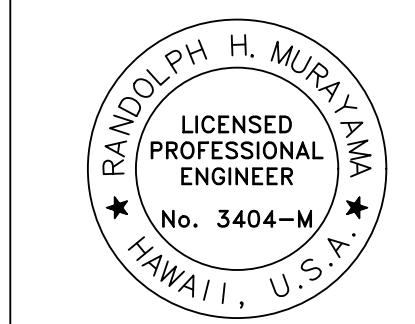
ENTIRE AREA TO BE FIRE SPRINKLED PER NFPA 13 FOR LIGHT HAZARD OCCUPANCY (0.10 GPM/SQ. FT. AT 1500 SQ. FT.) PROVIDE NEW FIRE SPRINKLER PIPING AND FIRE SPRINKLER HEADS FOR ALL AREAS INCLUDING COMBUSTIBLE CEILING SPACE/PARAPET/MANSARD/OVERHANGS.



IF SHEET IS LESS THAN 22 x 34 IT IS A REDUCED PRINT - SCALE REDUCED ACCORDINGLY

The Contractor will be responsible for coordinating the work among the various trades as necessary to avoid conflicts and to insure the installation of all work within the available space.

Richard Matsunaga & Associates Architects, Inc.



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| REVISION NO | DESCRIPTION | DATE | BY | CHK'D |
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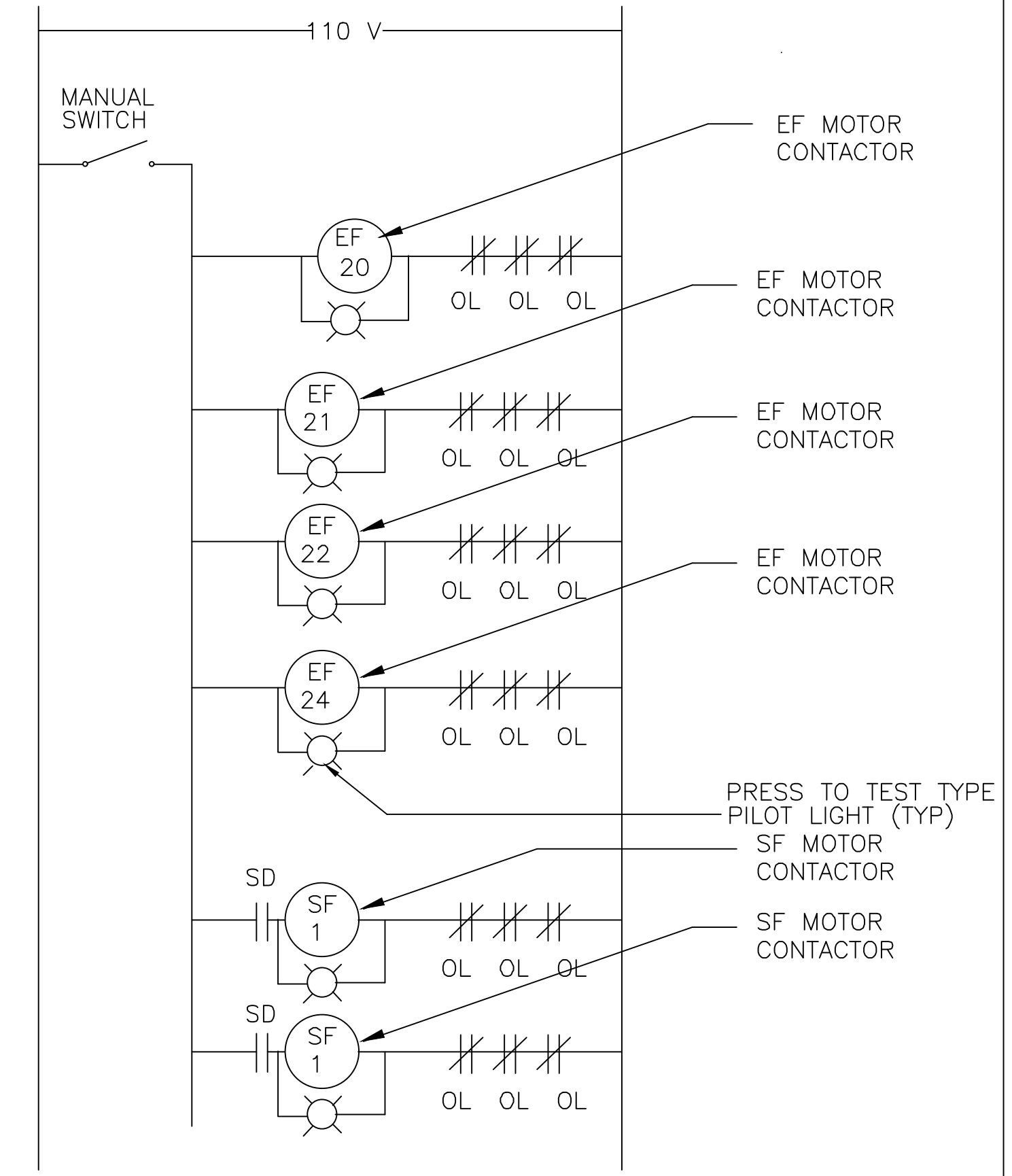
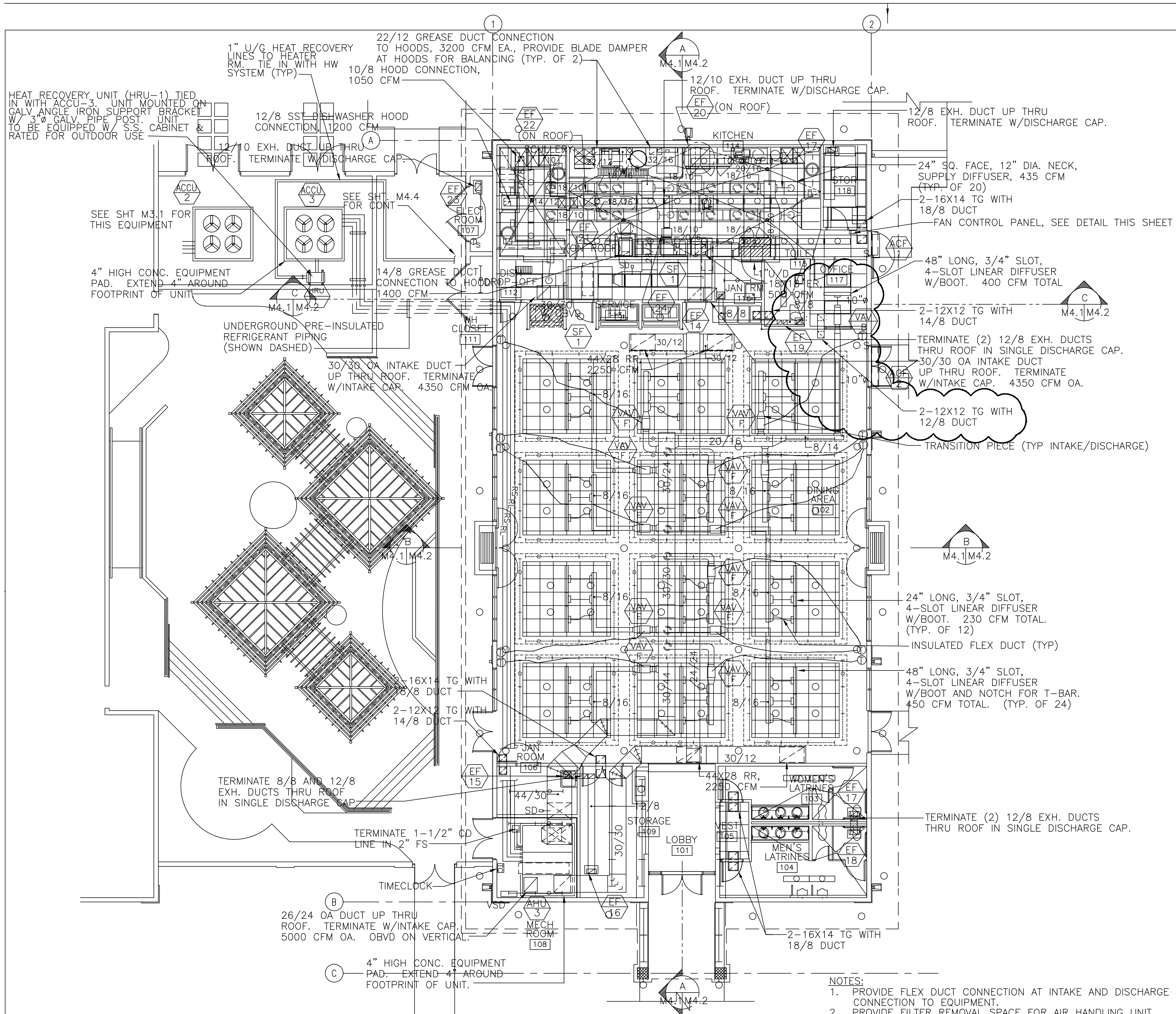
DEPARTMENTS OF THE ARMY AND AIR NATIONAL GUARD OF HAWAII  
OFFICE OF THE ENGINEER, FT. RUGER, HAWAII

DESIGNED: ESN  
DRAWN: ESN  
SAFETY: ESN  
ENGINEER: ESN

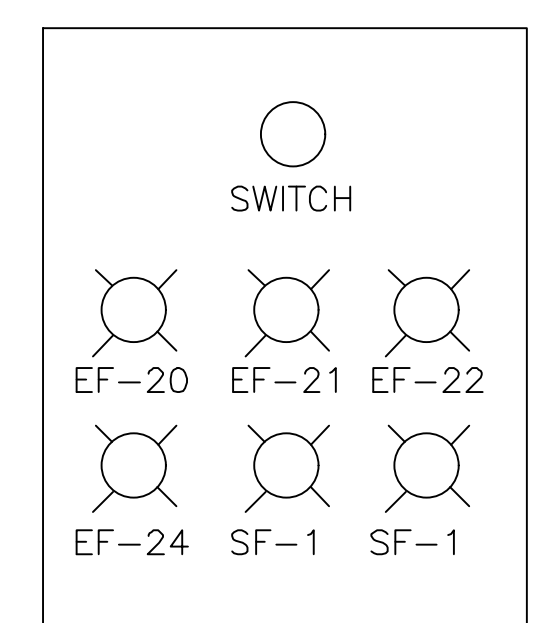
298TH REGIONAL TRAINING INSTITUTE, PHASE I  
BELLOWS AIR FORCE STATION  
WAIMANALO, HAWAII

MULTI-PURPOSE BUILDING (AUDITORIUM)  
FIRE PROTECTION FLOOR PLAN

|                          |                       |                   |
|--------------------------|-----------------------|-------------------|
| APPROVED: _____          | APPROVED: _____       | DATE _____        |
| HIARNG, FAC MGMT OFFICER | NSB, USPFO FOR HAWAII |                   |
| APPROVED: _____          |                       | SCALE: AS NOTED   |
|                          |                       | DWG # <b>M3.5</b> |
|                          |                       | SHEET 152 OF 228  |



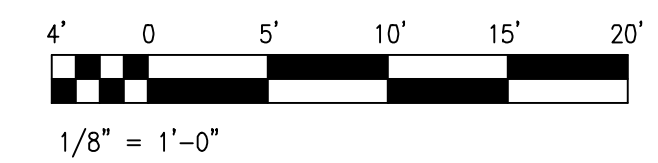
KITCHEN SF AND EF CONTROL DIAGRAM  
NOT TO SCALE



KITCHEN SF AND EF CONTROL PANEL  
NOT TO SCALE

MECHANICAL FLOOR PLAN - MESS  
1/8" = 1'-0"

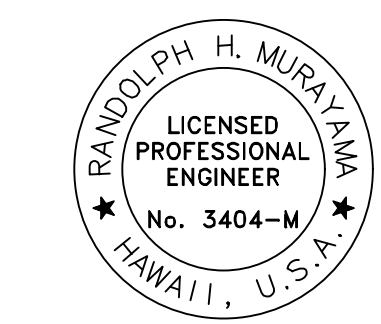
- NOTES:
1. PROVIDE FLEX DUCT CONNECTION AT INTAKE AND DISCHARGE CONNECTION TO EQUIPMENT.
  2. PROVIDE FILTER REMOVAL SPACE FOR AIR HANDLING UNIT AND SUPPLY FANS.
  3. PROVIDE SPACE THERMOSTATS AND CONTROL WIRING/CONDUIT.



IF SHEET IS LESS THAN 22 x 34 IT IS A REDUCED PRINT-SCALE REDUCED ACCORDINGLY

The Contractor will be responsible for coordinating the work among the various trades as necessary to avoid conflicts and to insure the installation of all work within the available space.

Richard Matsunaga & Associates  
Architects, Inc.



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| REVISION NO | DESCRIPTION | DATE | BY | CHK'D |
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DEPARTMENTS OF THE ARMY AND AIR NATIONAL GUARD OF HAWAII  
OFFICE OF THE ENGINEER, FT. RUGER, HAWAII

DESIGNED: ESN/RYT  
DRAWN: RYT  
SAFETY: -  
ENGINEER: -

298TH REGIONAL TRAINING INSTITUTE, PHASE II  
BELLOWS AIR FORCE STATION  
WAIMANALO, HAWAII

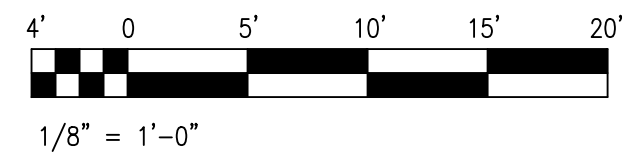
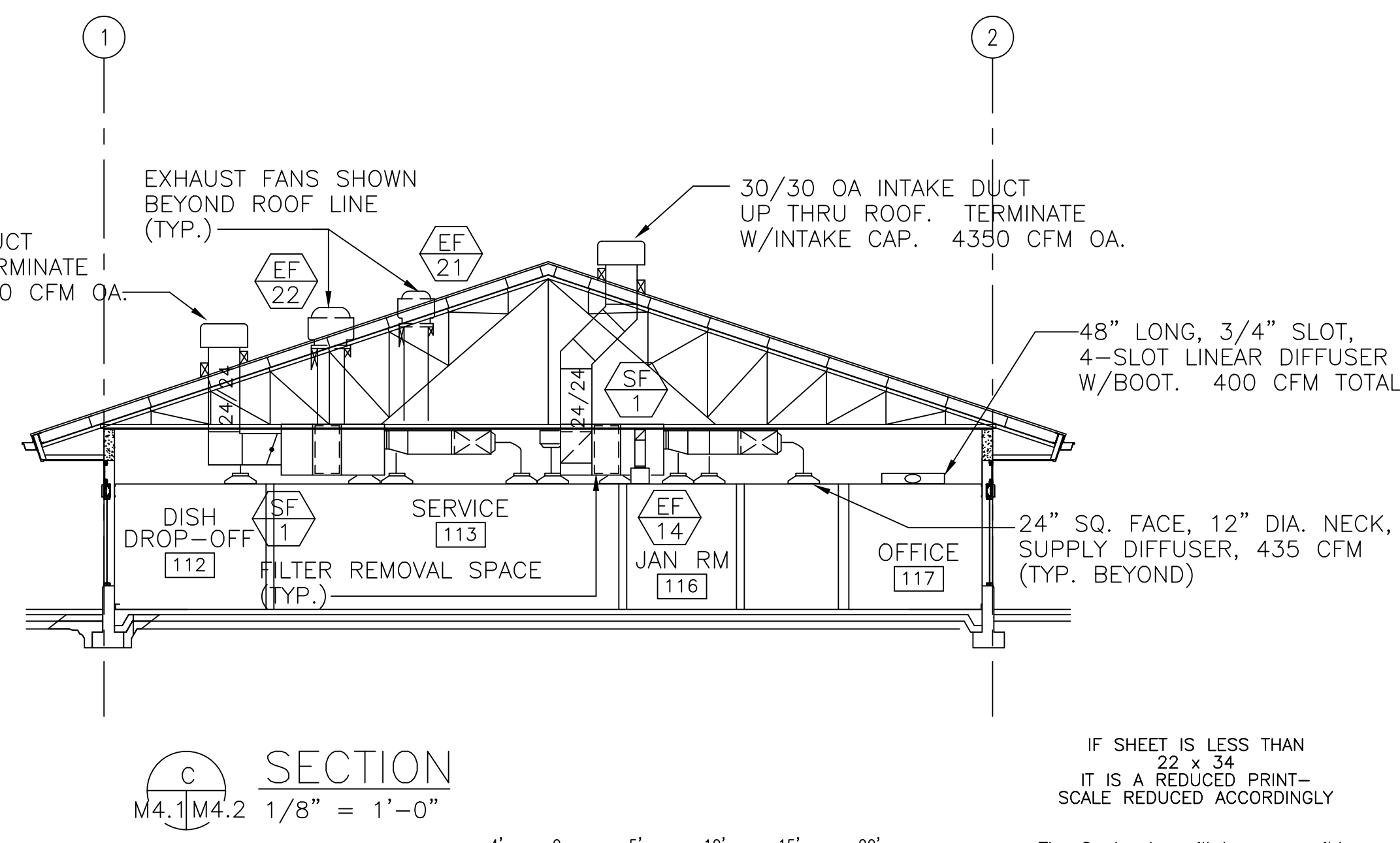
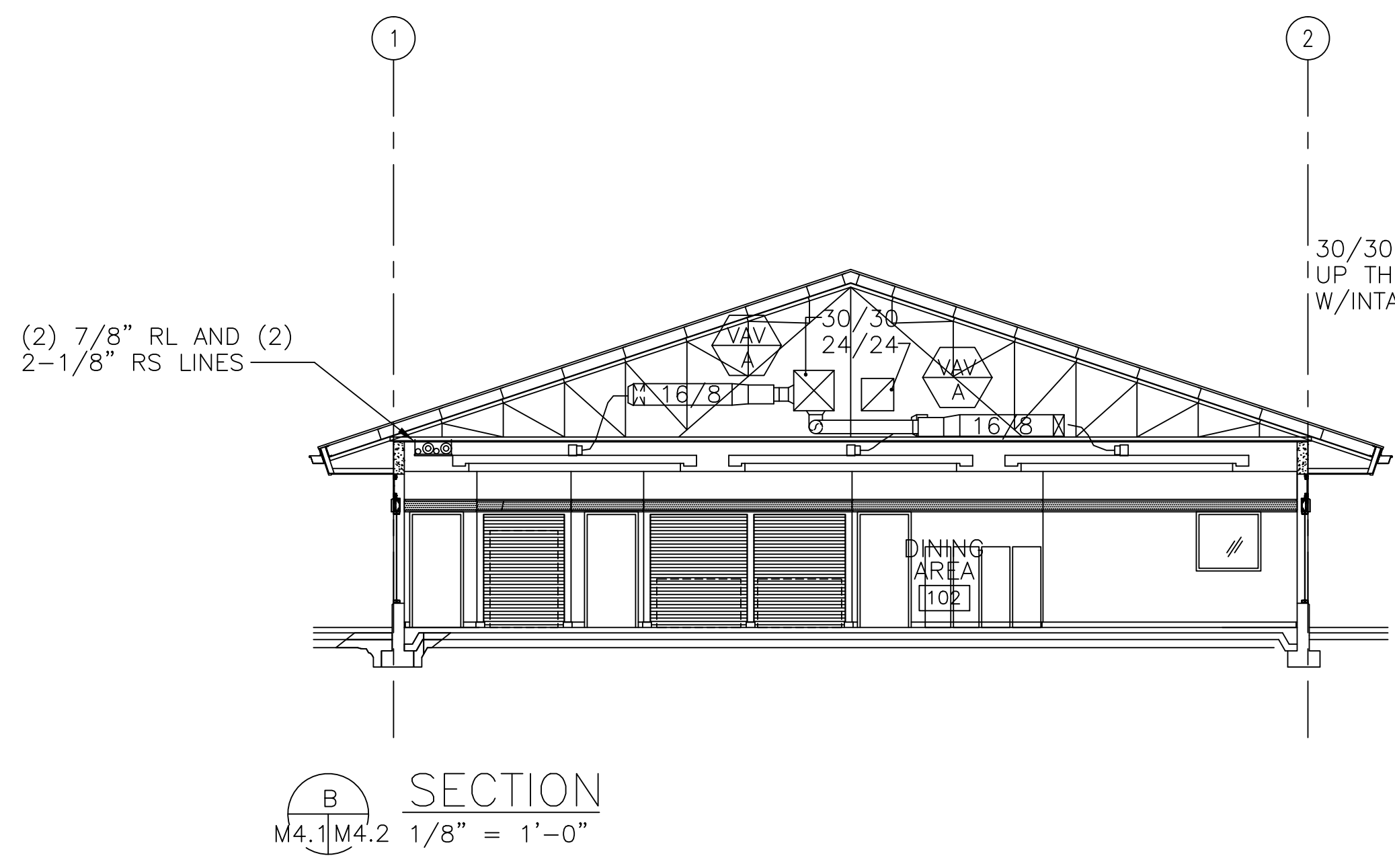
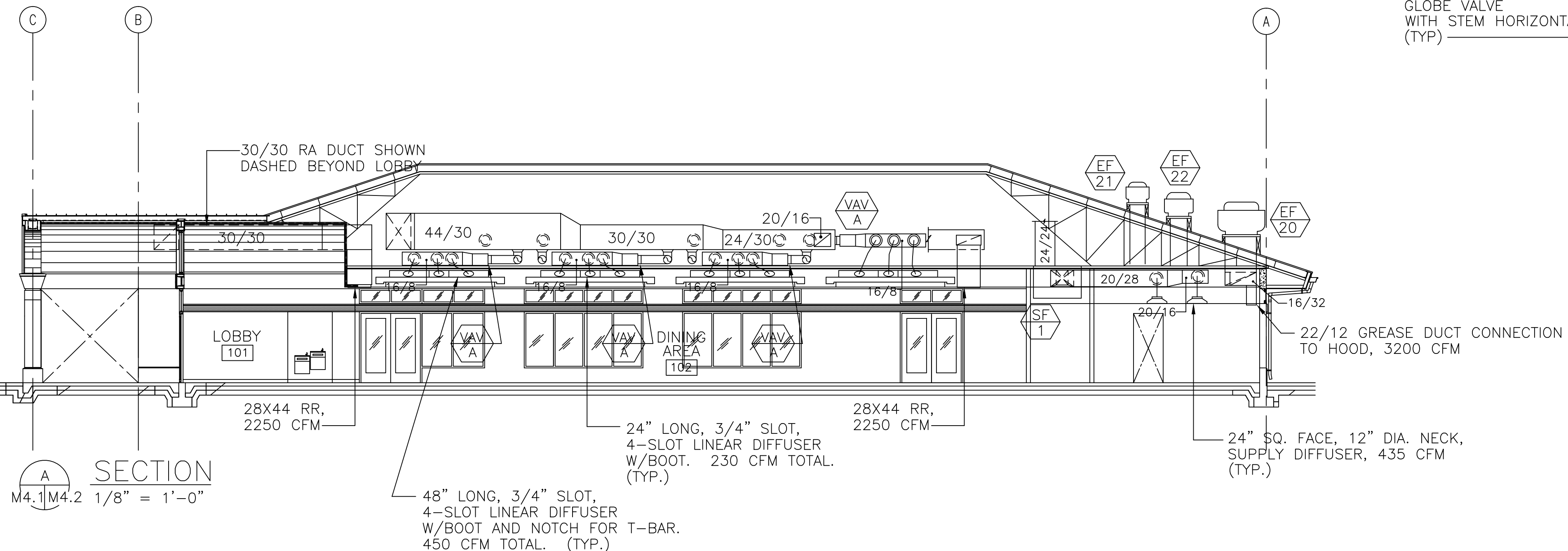
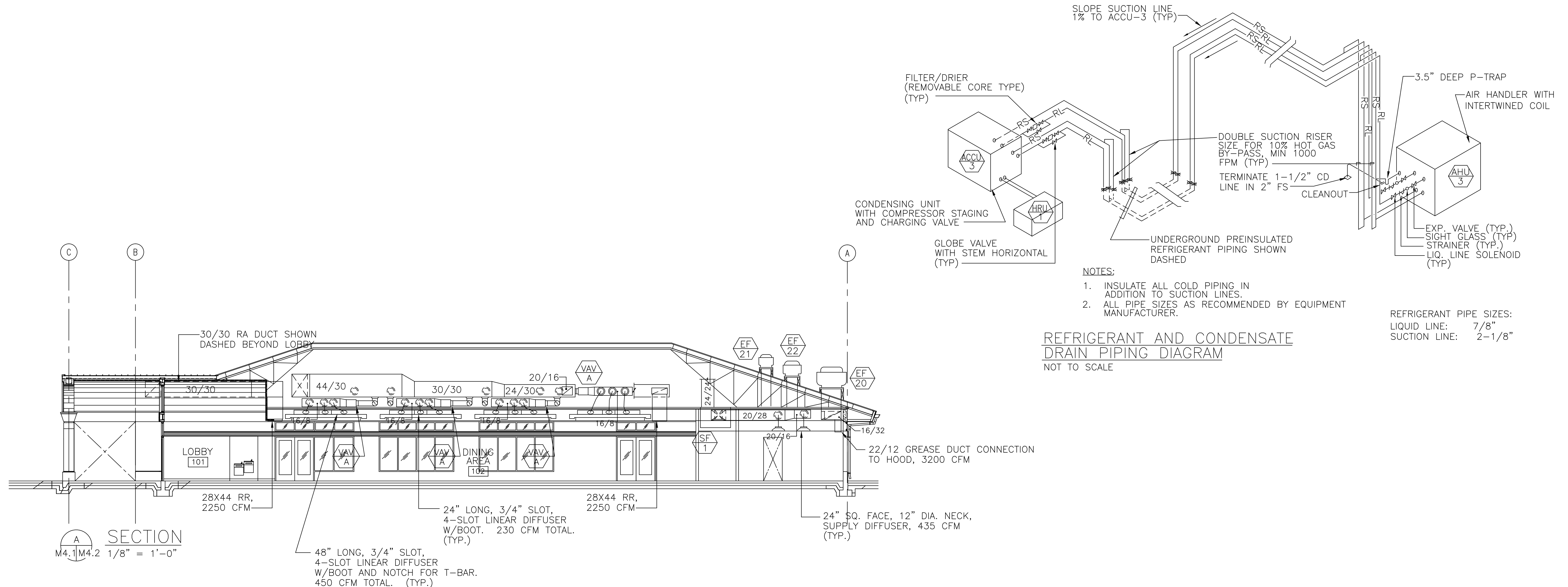
MULTI-PURPOSE BUILDING (MESS HALL)  
MECHANICAL FLOOR PLAN

APPROVED: \_\_\_\_\_ DATE: MARCH 28, 2000  
HARRG, FAC MGMT OFFICER NGB, USFPO FOR HAWAII

APPROVED: \_\_\_\_\_ SCALE: AS NOTED  
HNG, CONTRACTING & ENGINEERING OFFICER

DWG # M4.1  
SHEET 178 of 228





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The Contractor will be responsible for coordinating the work among the various trades as necessary to avoid conflicts and to insure the installation of all work within the available space.

| REVISION NO | DESCRIPTION | DATE | BY | CHK'D |
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DESIGNED: ESN/RYT  
DRAWN: RYT  
SAFETY: -  
ENGINEER: -

298TH REGIONAL TRAINING INSTITUTE, PHASE II  
BELLOWS AIR FORCE STATION  
WAIMANALO, HAWAII

MULTI-PURPOSE BUILDING (MESS HALL)  
MECHANICAL SECTIONS, REFRIGERANT PIPING DIAGRAMS

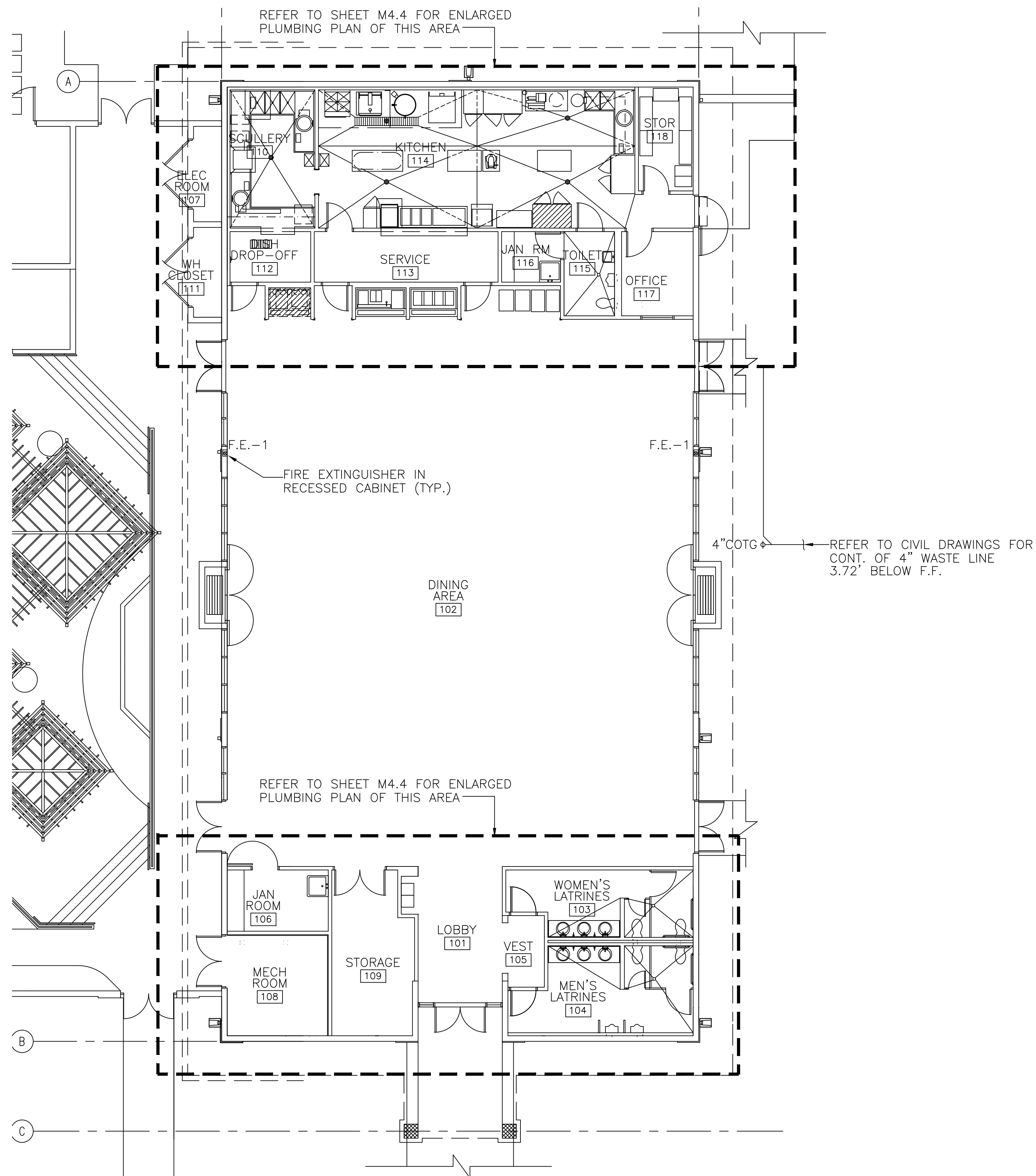
APPROVED: [Signature] DATE: MARCH 28, 2000  
HARRIG, FAC MGMT OFFICER NGB, USFPO FOR HAWAII

APPROVED: [Signature] SCALE: AS NOTED  
HING, CONTRACTING & ENGINEERING OFFICER

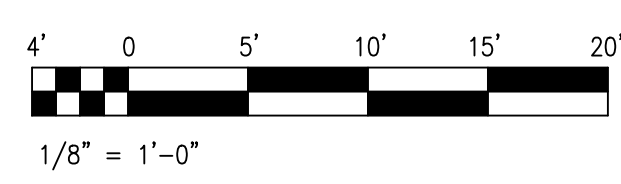
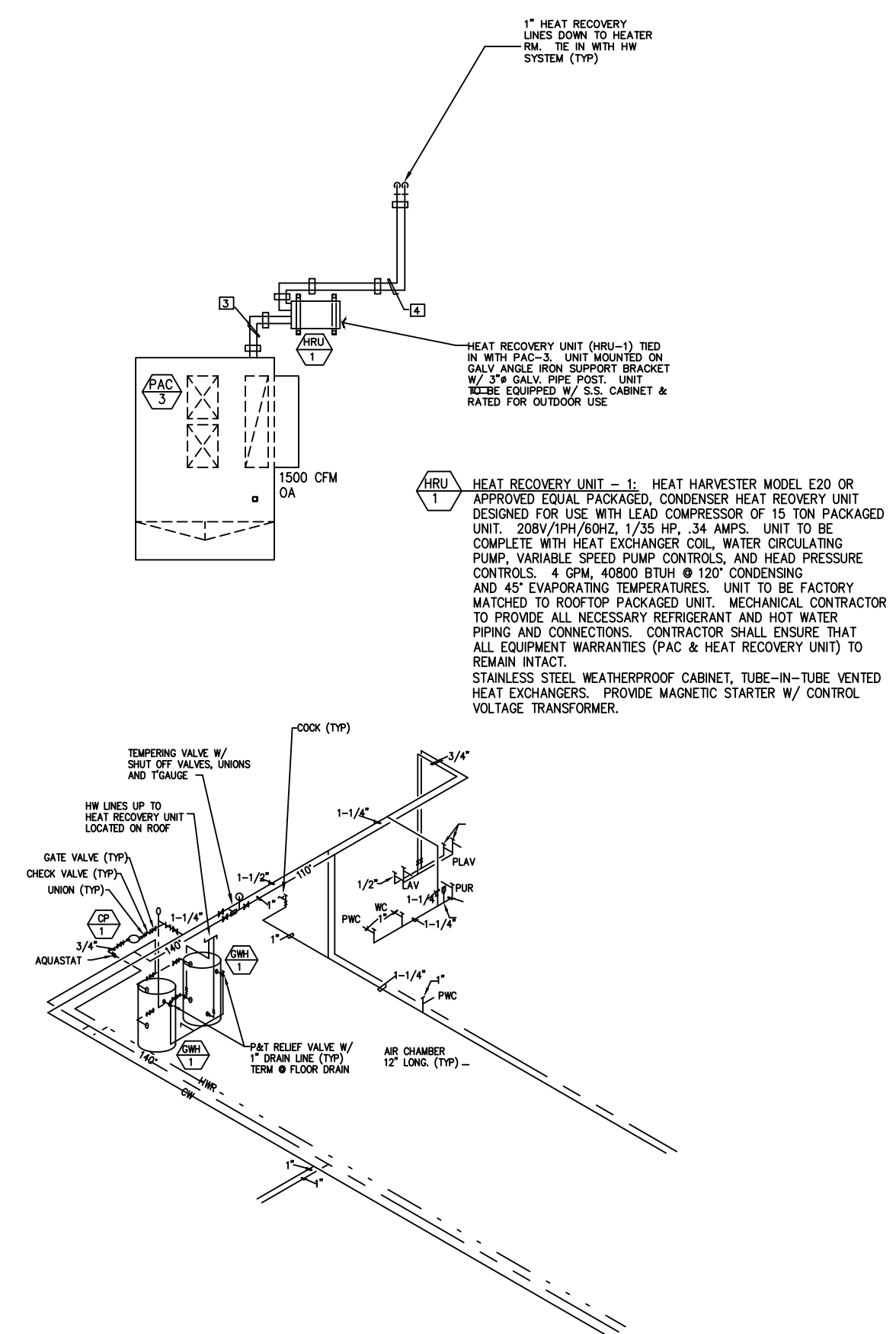
DWG # **M4.2**  
SHEET 179 of 228

Richard Matsunaga & Associates Architects, Inc.  
RANDOLPH H. MURAKAWA  
LICENSED PROFESSIONAL ENGINEER  
No. 3404-M  
HAWAII, U.S.A.

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PLUMBING FLOOR PLAN - MESS  
1/8" = 1'-0"



IF SHEET IS LESS THAN 22 x 34 IT IS A REDUCED PRINT-SCALE REDUCED ACCORDINGLY

The Contractor will be responsible for coordinating the work among the various trades as necessary to avoid conflicts and to insure the installation of all work within the available space.

| REVISION NO | DESCRIPTION | DATE | BY | CHK'D |
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OFFICE OF THE ENGINEER, FT. RUGER, HAWAII

DESIGNED: ESN  
DRAWN: ESN  
SAFETY:  
ENGINEER:

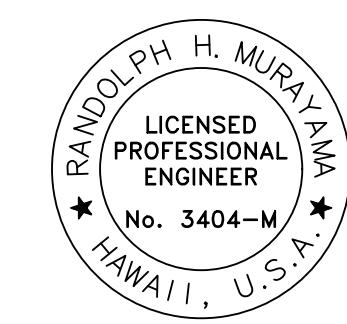
298TH REGIONAL TRAINING INSTITUTE, PHASE I  
BELLOWS AIR FORCE STATION  
WAIMANALO, HAWAII

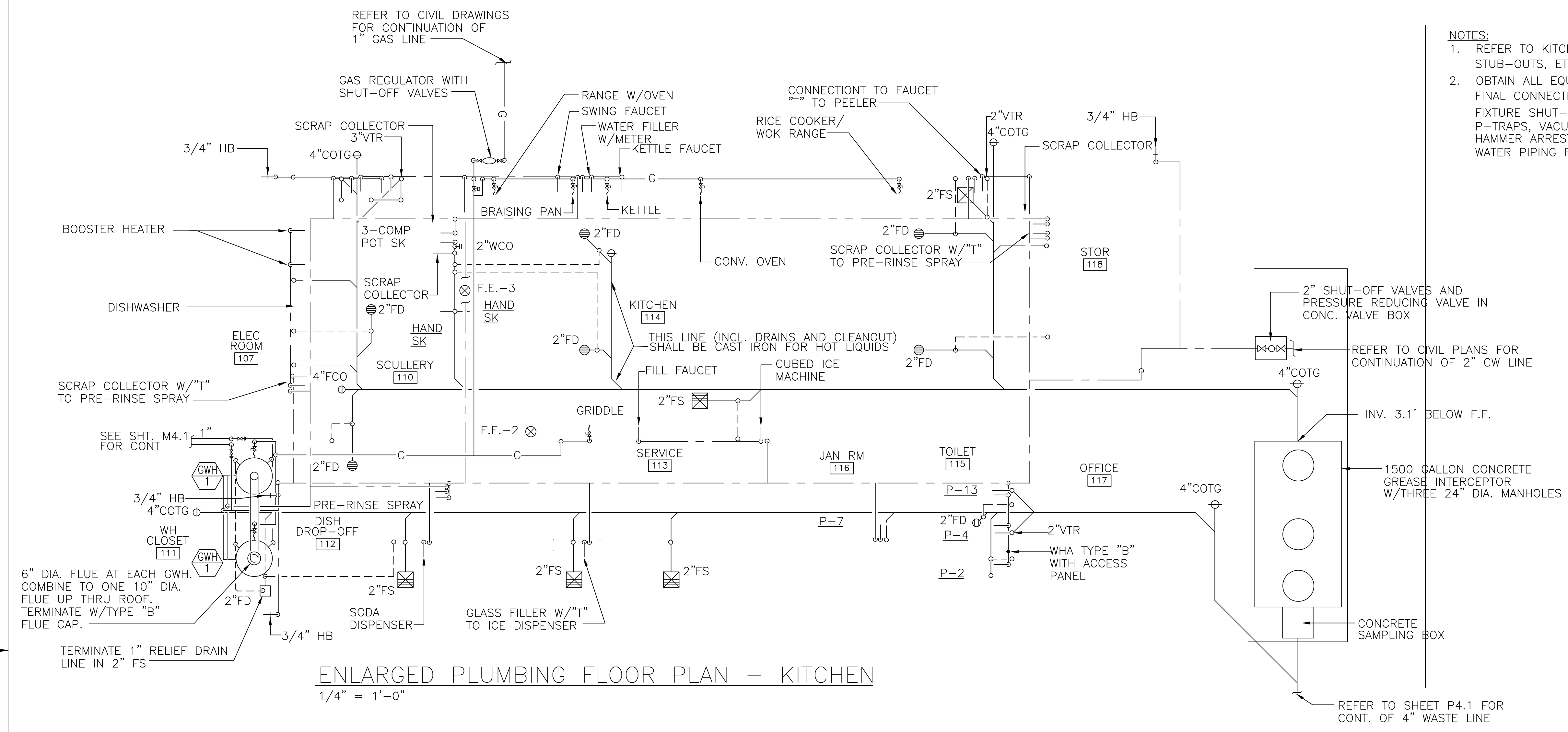
MULTI-PURPOSE BUILDING (MESS HALL)  
PLUMBING FLOOR PLAN

APPROVED: \_\_\_\_\_ DATE \_\_\_\_\_  
HARRNG, FAC MGMT OFFICER NGB, USPFO FOR HAWAII

APPROVED: \_\_\_\_\_  
HING, CONTRACTING & ENGINEERING OFFICER

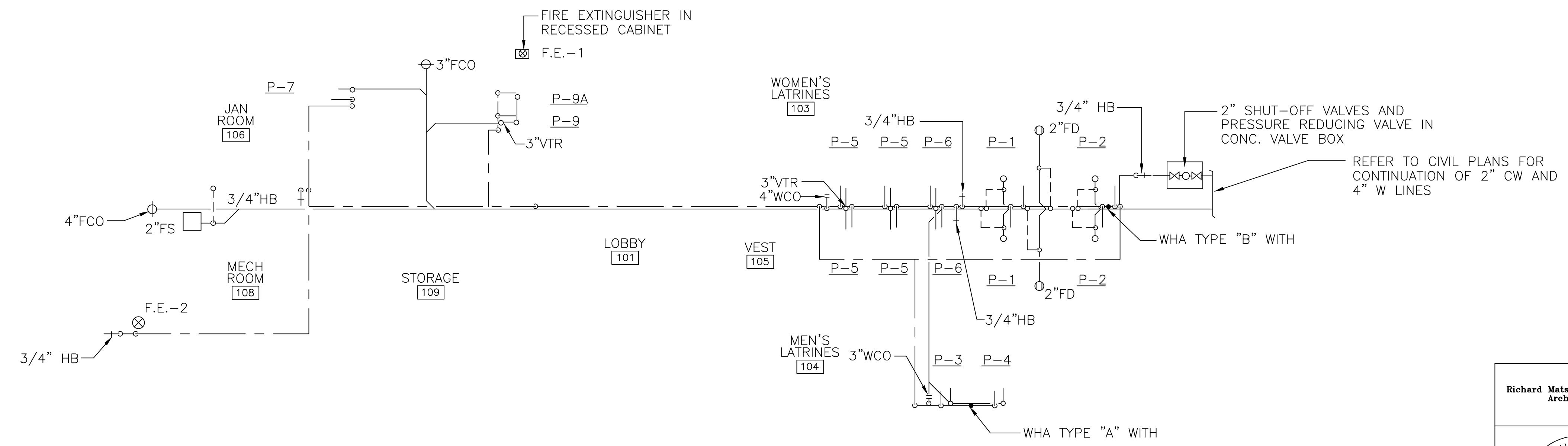
SCALE: AS NOTED  
DWG # M4.3  
SHEET 180 OF 228



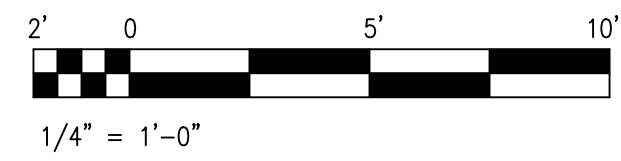


ENLARGED PLUMBING FLOOR PLAN - KITCHEN  
1/4" = 1'-0"

- NOTES:
- REFER TO KITCHEN DRAWINGS SHT. K4.3 FOR SIZES, HEIGHT OF STUB-OUTS, ETC.
  - OBTAIN ALL EQUIPMENT INFORMATION FOR FINAL CONNECTIONS. FINAL CONNECTIONS SHALL INCLUDE HOT AND COLD WATER FIXTURE SHUT-OFF VALVES, PRESSURE REDUCING VALVES/REGULATORS, P-TRAPS, VACUUM BREAKERS, GAS REGULATORS, STRAINERS, WATER HAMMER ARRESTORS, BACKFLOW PREVENTERS AND INDIRECT WATER PIPING FROM FIXTURE TO DRAIN.



ENLARGED PLUMBING FLOOR PLAN - TOILETS  
1/4" = 1'-0"



IF SHEET IS LESS THAN 22 x 34 IT IS A REDUCED PRINT-SCALE REDUCED ACCORDINGLY

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| REVISION NO | DESCRIPTION | DATE | BY | CHK'D |
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SAFETY: ESN  
ENGINEER: ESN

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BELLOWS AIR FORCE STATION  
WAIMANALO, HAWAII

MULTI-PURPOSE BUILDING (MESS HALL)  
ENLARGED PLUMBING FLOOR PLANS

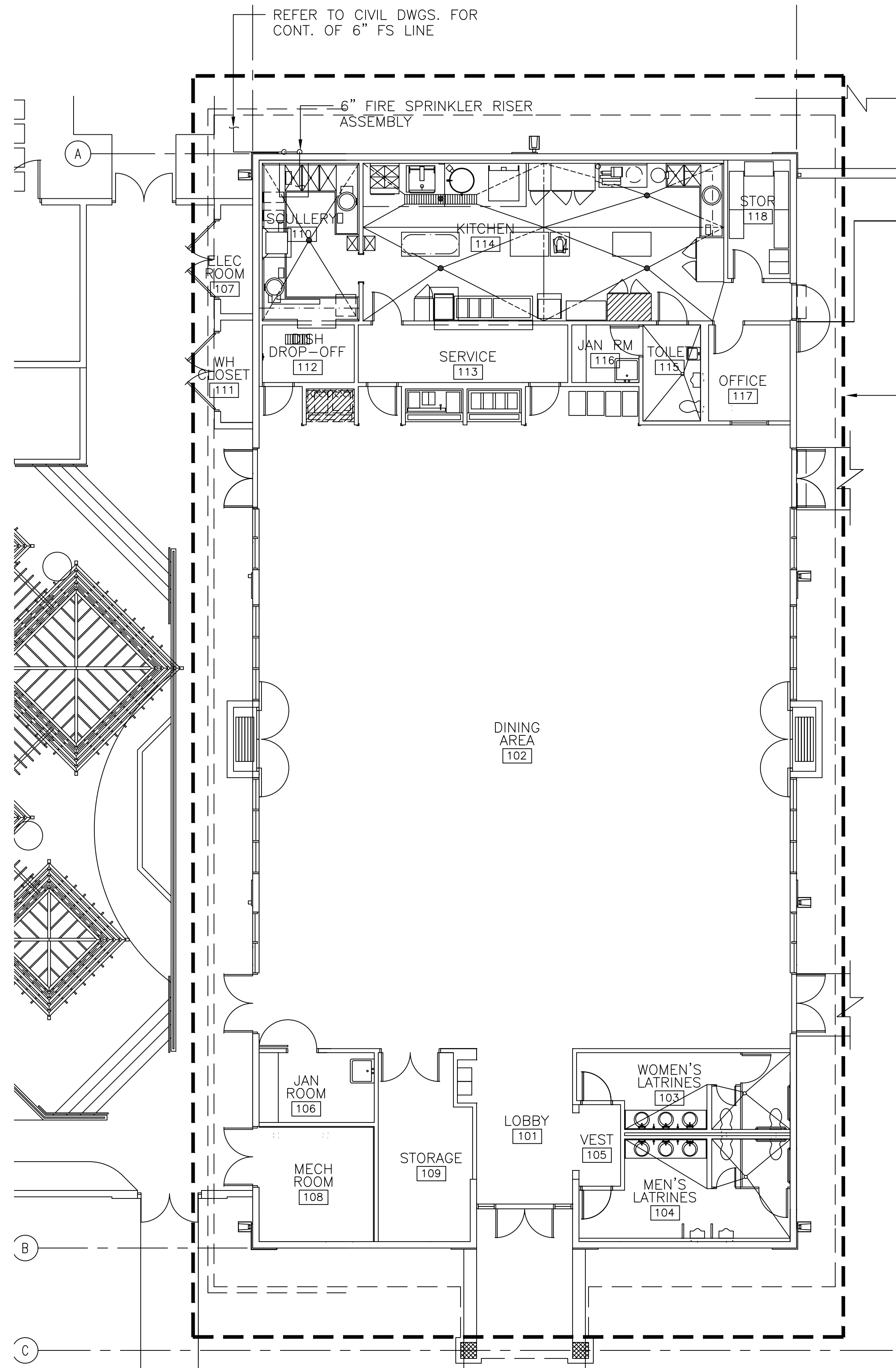
APPROVED: \_\_\_\_\_ DATE \_\_\_\_\_  
HARRING, FAC MGMT OFFICER NGB, USPFO FOR HAWAII

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HING, CONTRACTING & ENGINEERING OFFICER

SCALE: AS NOTED  
DWG # M4.4  
SHEET 181 of 228

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RANDOLPH H. MURAKAWA  
LICENSED PROFESSIONAL ENGINEER  
No. 3404-M  
HAWAII, U.S.A.

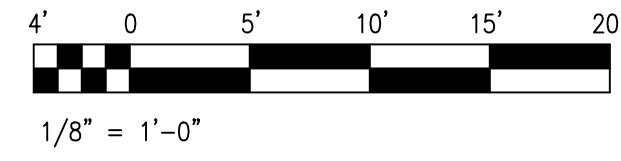


REFER TO CIVIL DWGS. FOR CONT. OF 6" FS LINE

6" FIRE SPRINKLER RISER ASSEMBLY

ENTIRE AREA TO BE FIRE SPRINKLED PER NFPA 13 FOR LIGHT HAZARD OCCUPANCY (0.10 GPM/SQ. FT. AT 1500 SQ. FT.) AND ORDINARY HAZARD (GROUP 1) (0.16 GPM/SQ. FT. AT 1500 SQ. FT.) FOR KITCHEN AREAS AND STORAGE AREAS. PROVIDE NEW FIRE SPRINKLER PIPING AND FIRE SPRINKLER HEADS FOR ALL AREAS INCLUDING COMBUSTIBLE CEILING SPACE/PARAPET/MANSARD/OVERHANGS.

FIRE PROTECTION FLOOR PLAN - MESS HALL  
1/8" = 1'-0"

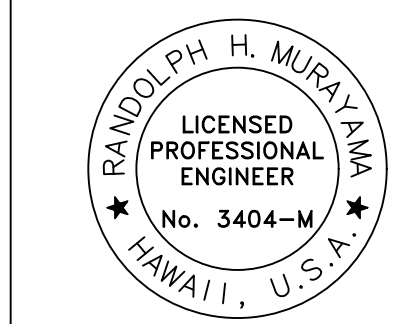


IF SHEET IS LESS THAN 22 x 34 IT IS A REDUCED PRINT—SCALE REDUCED ACCORDINGLY

The Contractor will be responsible for coordinating the work among the various trades as necessary to avoid conflicts and to insure the installation of all work within the available space.

| REVISION NO | DESCRIPTION | DATE | BY | CHK'D |
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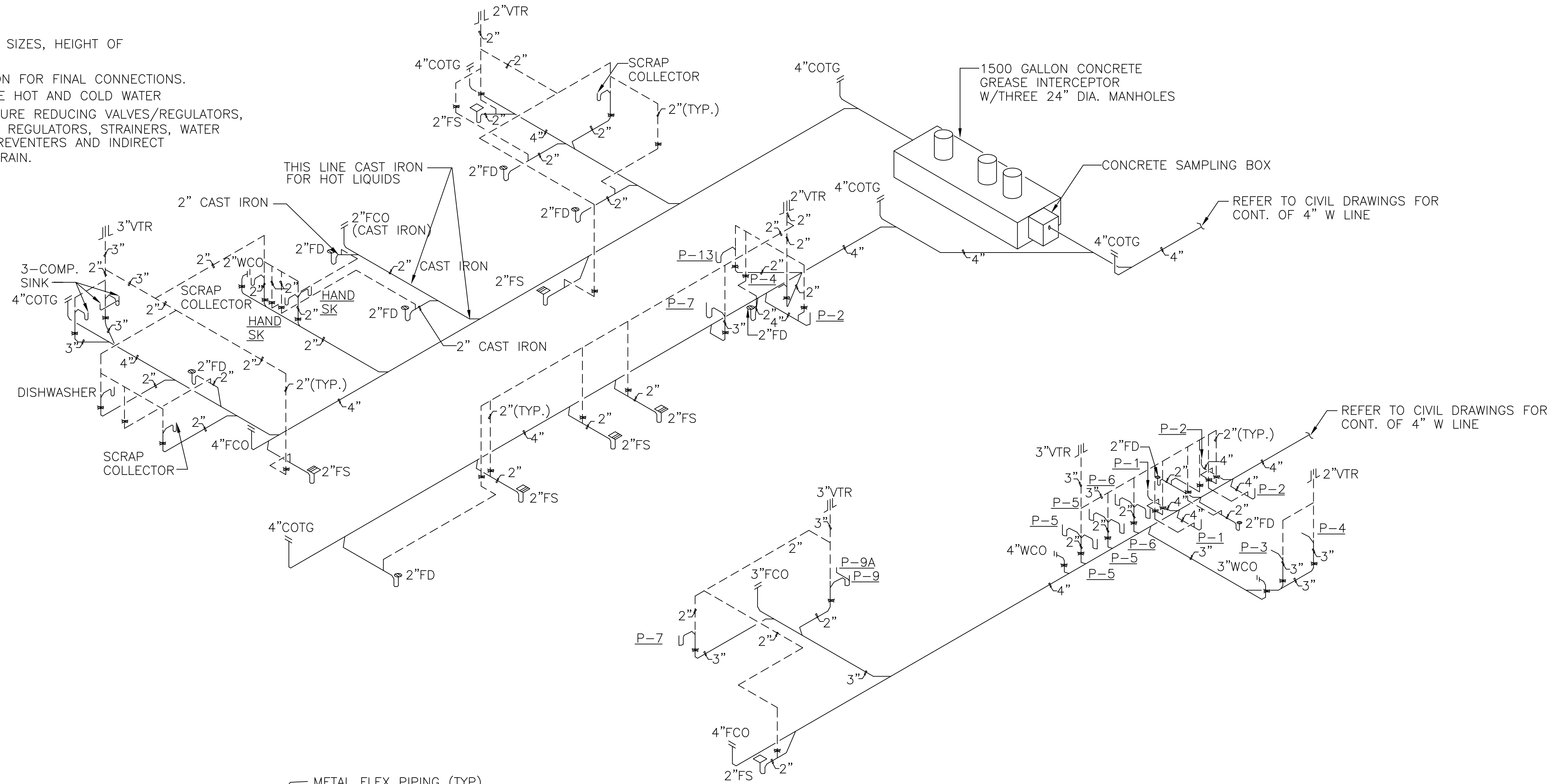


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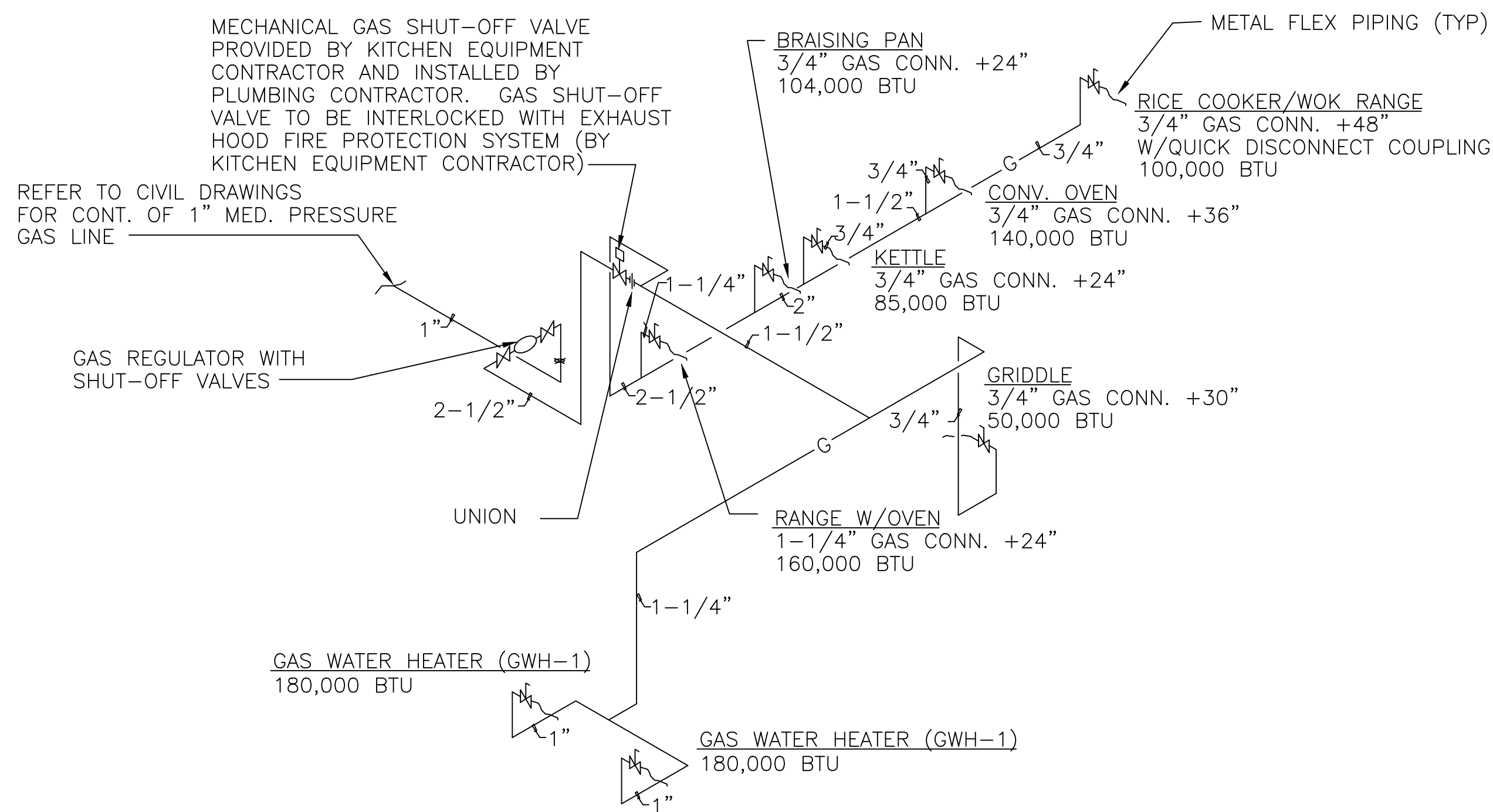
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| DESIGNED: ESN            |                       | 298TH REGIONAL TRAINING INSTITUTE, PHASE I     |  |
| DRAWN: ESN               |                       | BELLOWS AIR FORCE STATION<br>WAIMANALO, HAWAII |  |
| SAFETY:                  |                       | MULTI-PURPOSE BUILDING (MESS HALL)             |  |
| ENGINEER:                |                       | FIRE PROTECTION FLOOR PLAN                     |  |
| APPROVED:                | APPROVED:             | DATE   |  |
| HIARNG, FAC MGMT OFFICER | NSB, USPFO FOR HAWAII |  |  |
| APPROVED:                |                       | SCALE: AS NOTED                                |  |
|                          |                       | DWC #  |  |
|                          |                       | M4.5   |  |
|                          |                       | SHEET 182 of 228                               |  |

**NOTES:**

1. REFER TO KITCHEN DRAWINGS FOR SIZES, HEIGHT OF STUB-OUTS, ETC.
2. OBTAIN ALL EQUIPMENT INFORMATION FOR FINAL CONNECTIONS. FINAL CONNECTIONS SHALL INCLUDE HOT AND COLD WATER FIXTURE SHUT-OFF VALVES, PRESSURE REDUCING VALVES/REGULATORS, P-TRAPS, VACUUM BREAKERS, GAS REGULATORS, STRAINERS, WATER HAMMER ARRESTORS, BACKFLOW PREVENTERS AND INDIRECT WATER PIPING FROM FIXTURE TO DRAIN.



**SANITARY PIPING DIAGRAM**  
NOT TO SCALE



**GAS PIPING DIAGRAM**  
NOT TO SCALE

IF SHEET IS LESS THAN 22 x 34 IT IS A REDUCED PRINT-SCALE REDUCED ACCORDINGLY

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| REVISION NO | DESCRIPTION | DATE | BY | CHK'D |
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OFFICE OF THE ENGINEER, FT. RUGER, HAWAII

DESIGNED: ESN  
DRAWN: ESN  
SAFETY: ESN  
ENGINEER: ESN

298TH REGIONAL TRAINING INSTITUTE, PHASE I  
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WAIMANALO, HAWAII

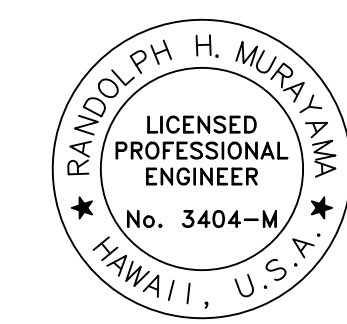
MULTI-PURPOSE BUILDING (MESS HALL)  
SANITARY AND GAS PIPING DIAGRAMS

APPROVED: \_\_\_\_\_ DATE \_\_\_\_\_  
HARRIG, FAC MGMT OFFICER NGB, USFPO FOR HAWAII

APPROVED: \_\_\_\_\_ DATE \_\_\_\_\_  
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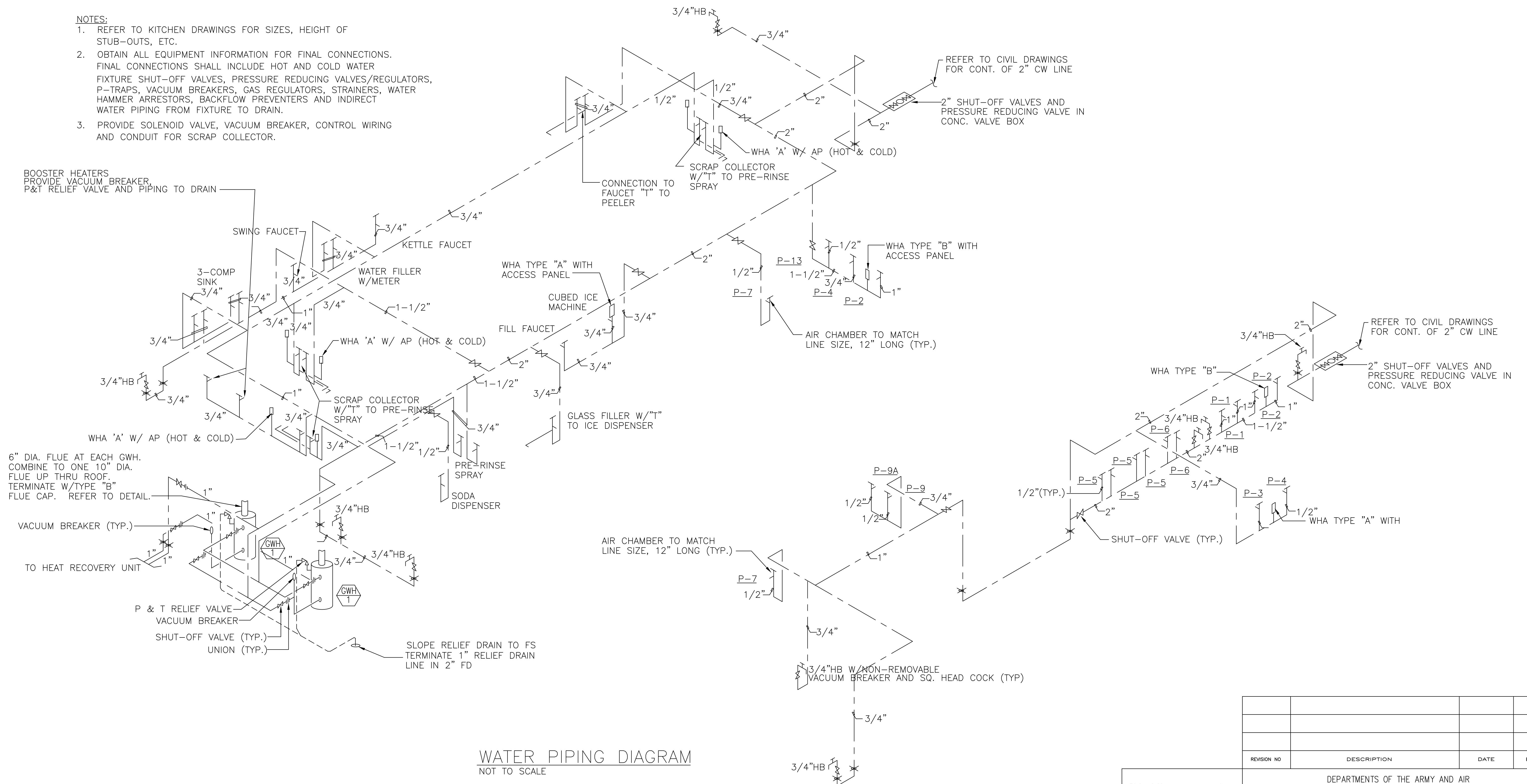
SCALE: AS NOTED  
DWG # **M4.6**  
SHEET 183 of 228



**NOTES:**

1. REFER TO KITCHEN DRAWINGS FOR SIZES, HEIGHT OF STUB-OUTS, ETC.
2. OBTAIN ALL EQUIPMENT INFORMATION FOR FINAL CONNECTIONS. FINAL CONNECTIONS SHALL INCLUDE HOT AND COLD WATER FIXTURE SHUT-OFF VALVES, PRESSURE REDUCING VALVES/REGULATORS, P-TRAPS, VACUUM BREAKERS, GAS REGULATORS, STRAINERS, WATER HAMMER ARRESTORS, BACKFLOW PREVENTERS AND INDIRECT WATER PIPING FROM FIXTURE TO DRAIN.
3. PROVIDE SOLENOID VALVE, VACUUM BREAKER, CONTROL WIRING AND CONDUIT FOR SCRAP COLLECTOR.

BOOSTER HEATERS  
PROVIDE VACUUM BREAKER,  
P&T RELIEF VALVE AND PIPING TO DRAIN



**WATER PIPING DIAGRAM**  
NOT TO SCALE

IF SHEET IS LESS THAN  
22 x 34  
IT IS A REDUCED PRINT-  
SCALE REDUCED ACCORDINGLY

The Contractor will be responsible  
for coordinating the work among  
the various trades as necessary to  
avoid conflicts and to insure the  
installation of all work within the  
available space.

| REVISION NO | DESCRIPTION | DATE | BY | CHK'D |
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|---|--|--|---|
| <b>Richard Matsunaga &amp; Associates</b><br>Architects, Inc. |  | DEPARTMENTS OF THE ARMY AND AIR<br>NATIONAL GUARD OF HAWAII<br>OFFICE OF THE ENGINEER, FT. RUGER, HAWAII |   |
| DESIGNED: ESN<br>DRAWN: ESN<br>SAFETY:<br>ENGINEER:           | 298TH REGIONAL TRAINING INSTITUTE, PHASE I<br>BELLOWS AIR FORCE STATION<br>WAIMANALO, HAWAII<br>MULTI-PURPOSE BUILDING (MESS HALL)<br>WATER PIPING DIAGRAM |  |   |
| APPROVED:<br>HIRING, FAC MGMT OFFICER                         | APPROVED:<br>NGB, USPO FOR HAWAII  | DATE   | SCALE: AS NOTED<br>DWG #<br><b>M4.7</b> |
| THIS WORK WAS PREPARED BY ME<br>OR UNDER MY SUPERVISION       |  | HING, CONTRACTING & ENGINEERING OFFICER  | SHEET 184 of 228                        |

