

REFERENCED NOTES

- 1 INSTALL NEW 60/2 BREAKER IN PANELBOARD "A" TO FEED NEW RTU-1, POLES 8,10.
- 2 INSTALL NEW 60/2 BREAKER IN PANELBOARD "C" TO FEED NEW RTU-2, POLES 6,8.
- 3 INSTALL NEW 20/1 BREAKER IN PANELBOARD "A" TO FEED NEW ROOF RECEPTACLE.
- 4 INSTALL NEW 20/1 BREAKER IN PANELBOARD "C" TO FEED NEW SMOKE DAMPERS.
- 5 INSTALL NEW 20/1 BREAKER IN PANELBOARD "C" TO FEED NEW SMOKE DETECTORS.
- 6 ROTATE EXISTING PANEL 180 DEGREES.
- 7 CONNECT DUCT SMOKE DETECTORS TO FIRE ALARM SYSTEM TO INITIATE ALARM.
- 8 INSTALL "SPARE" CONDUITS IN SHAFT FOR FIRE AND CONTROLS. COORDINATE WITH MECHANICAL

GENERAL: Field verify existing conditions. Comply with PSU standards and project requirements. Coordinate with other contractors.

CODES AND STANDARDS: All electrical work and equipment to comply with the applicable provisions of the Underwriters Laboratories, Inc. Publications (UL); National Electrical Code (NFPA 70); Oregon Electrical Specialty Code (2010 OESC) and Oregon Structural Specialty Code (2010 OSSC).

LABELING: All materials shall be new, free from defects and shall be either UL labeled, UL listed or bear the seal of a nationally recognized electrical testing laboratory.

PERMITS: Obtain electrical and low voltage construction permits.

AS-BUILT DRAWINGS: Provide as-built drawings to indicated installed conditions.

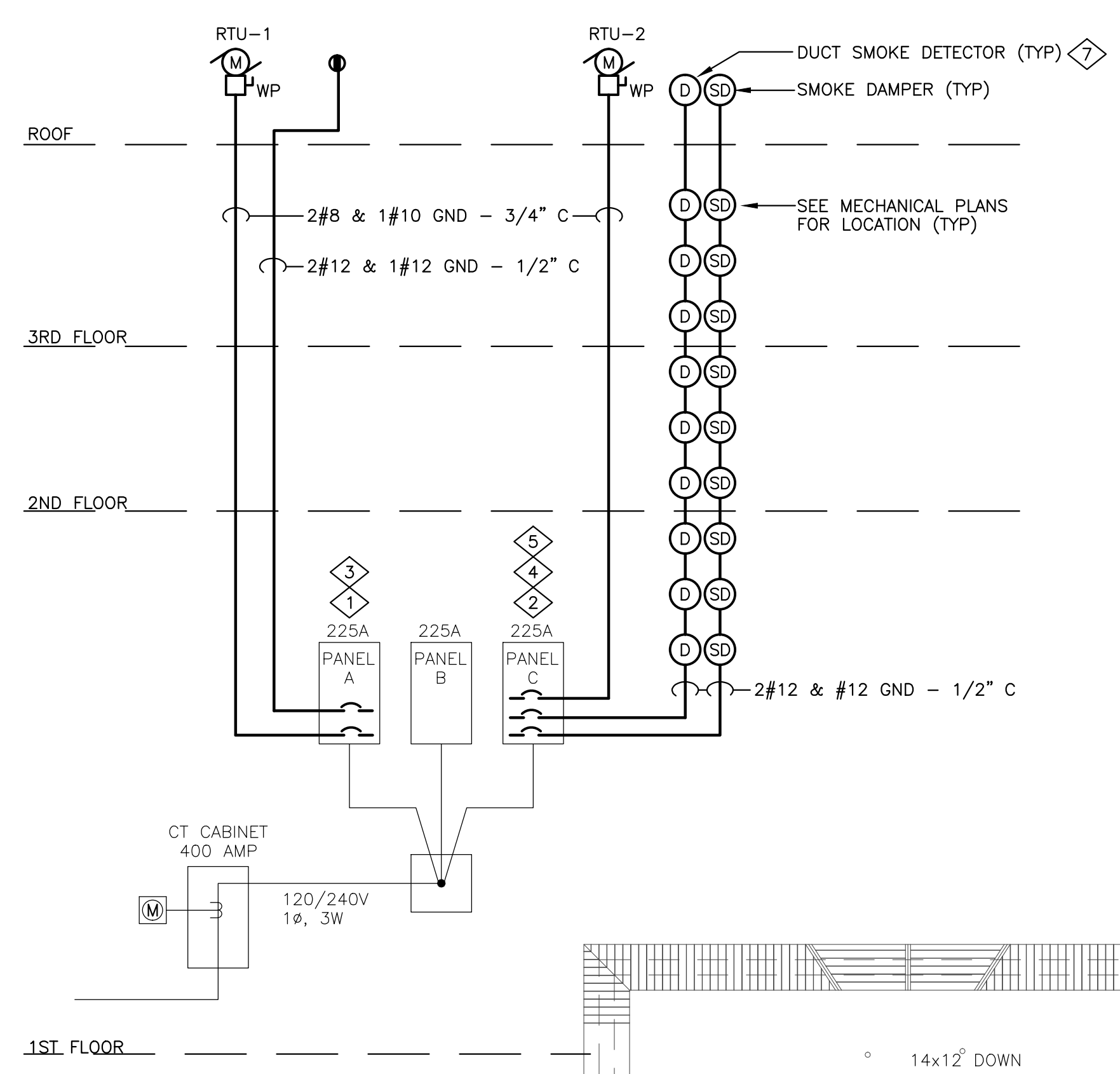
RACEWAYS AND FITTINGS: Install wiring in appropriate raceway system of electrical metallic tubing and flexible steel conduit. Install an insulated copper equipment grounding conductor through out the entire conduit system. MC Cable may be provided in lieu of wire in conduit where concealed from finished spaces and allowed by code.

CONDUCTORS: Provide 600 volt copper conductors type THHN or THWN insulation. Minimum conductor size #12 AWG. Color code cables in accordance with the National Electrical Code

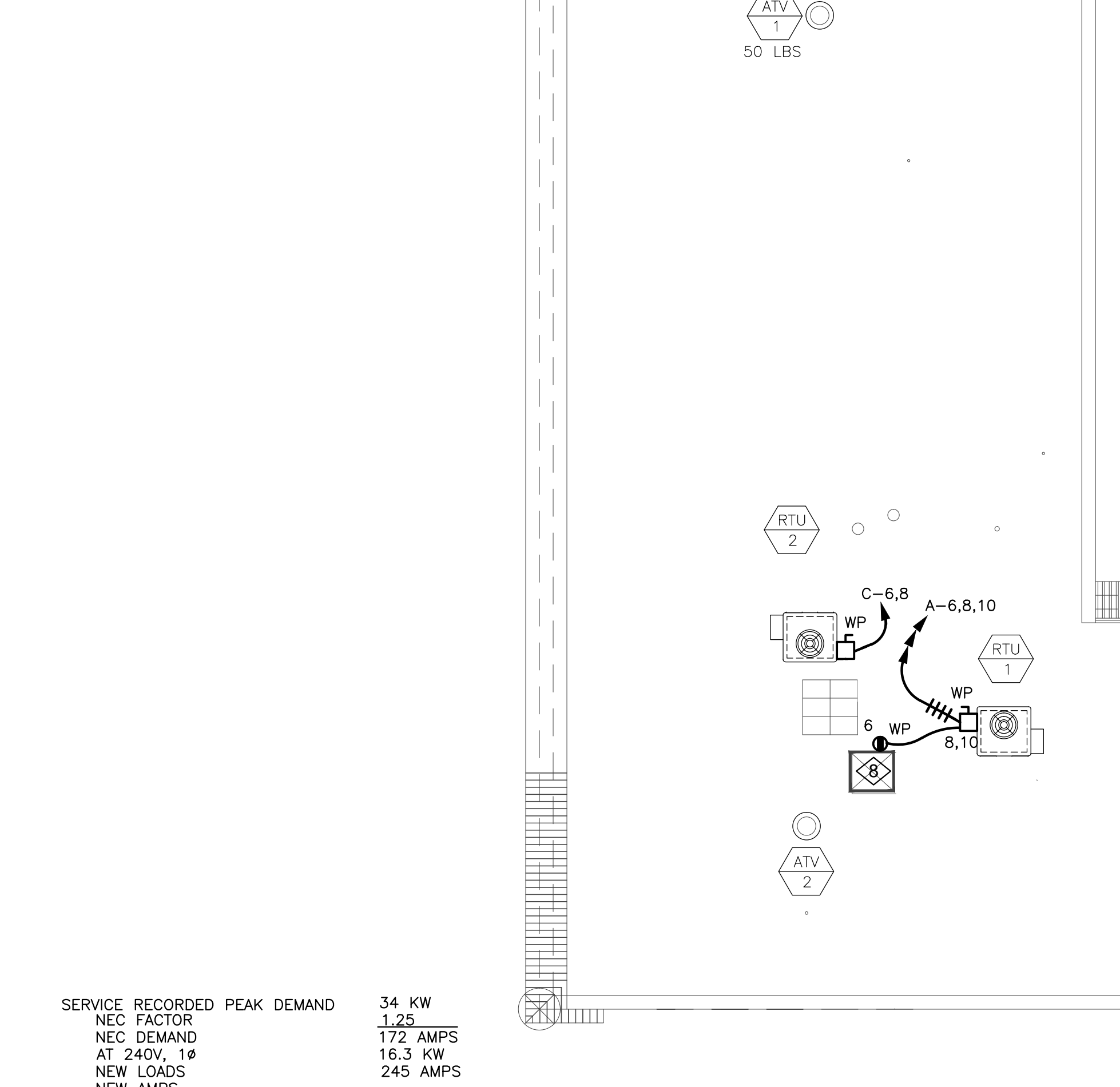
PANELBOARDS: Existing panelboards are Eaton (Cutler Hammer).

FIRE ALARM WORK: Install fire alarm cabling required for installation and monitoring of new duct smoke detectors in accordance with codes and manufacturer's requirements.

5 ELECTRICAL SPECIFICATIONS
 SCALE: NTS



2 ONE LINE DIAGRAM
 SCALE: 1/8"=1'-0"



1 EAST HALL PARTIAL 1ST FLOOR PLAN
 SCALE: 1/8"=1'-0"

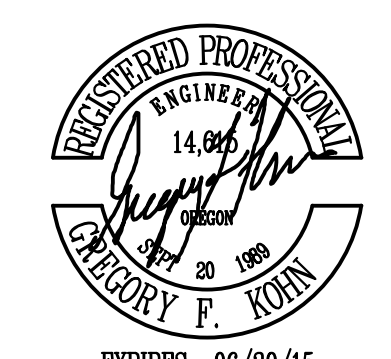
SERVICE RECORDED PEAK DEMAND	34 KW
NEC FACTOR	1.25
NEC DEMAND AT 240V, 1Ø	172 AMPS
NEW LOADS	16.3 KW
NEW AMPS	245 AMPS

3 LOAD CALCULATIONS
 SCALE: NTS

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KEY PLAN

ISSUANCE
 PERMIT SET
 PROJECT NUMBER

DATE
 04.25.2014
 SCALE

DRAWING TITLE
 FLOOR PLANS, ONELINE
 DIAGRAM AND CALCULATIONS -
 ELECTRICAL

SHEET NUMBER

E1

MECHANICAL LEGEND AND SYMBOLS

SA		SUPPLY AIR DUCT CROSS-SECTION
RA		RETURN AIR DUCT CROSS-SECTION
RA		EXHAUST AIR DUCT CROSS-SECTION
OSA		OUTSIDE AIR DUCT CROSS-SECTION
CD		CEILING DIFFUSER, 2 - WAY
CD		CEILING DIFFUSER, 4 - WAY
CR		CEILING RETURN AIR GRILLE
CE		CEILING EXHAUST AIR GRILLE
SWS		SIDE WALL SUPPLY REGISTER
SWR		SIDE WALL RETURN GRILLE
CD		CONDENSATE DRAIN
		ROOM THERMOSTAT
		EQUIPMENT IDENTIFICATION
SINGLE LINE		
DOUBLE LINE		
		DESCRIPTION
		VOLUME DAMPER
		FIRE DAMPER
		FIRE/SMOKE DAMPER
		SMOKE DAMPER
		MOTORIZED DAMPER
		MITERED ELBOW WITH TURNING VANES
		RADIUSSED ELBOW
		RECTANGULAR MAIN WITH ROUND BRANCH
		RECTANGULAR MAIN WITH RECTANGULAR BRANCH
		CONCENTRIC SQUARE TO ROUND
		ECCENTRIC TRANSITION, RECTANGULAR OR ROUND
		NON-SYMMETRICAL WYE
		SYMMETRICAL WYE
		RECTANGULAR DUCT RISER
		ROUND DUCT RISER
		RECTANGULAR DUCT DROP
		ROUND DUCT DROP
		RECTANGULAR OFFSET LESS THAN 15°
		RECTANGULAR OFFSET MORE THAN 15°
		ROUND WYE
		EXTRACTOR
		BELLMOUTH
		ROUND DUCT WITH ROUND BRANCH
		CONCENTRIC TRANSITION, RECTANGULAR OR ROUND
		ACOUSTICALLY LINED DUCT (SIZES SHOWN ARE NET INSIDE)
		FLEXIBLE CONNECTION

HVAC GENERAL NOTES:

- DUCTS SHALL BE SUPPORTED WITH APPROVED HANGERS AT INTERVALS NOT EXCEEDING 10 FEET OR BY OTHER APPROVED DUCT SUPPORT SYSTEMS DESIGNED IN ACCORDANCE WITH THE BUILDING CODE. FLEXIBLE AND OTHER FACTORY-MADE DUCTS SHALL BE SUPPORTED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- THIS CONTRACTOR SHALL PAY FOR ALL PERMITS AND FEES.
- CONTROL LOW VOLTAGE WIRING BY MECHANICAL CONTRACTOR AND CONDUIT BY ELECTRICAL CONTRACTOR. WIRING, CABLE, AND RACEWAYS SHALL BE LISTED AND LABELED AS PLENUM-RATED AND SHALL BE INSTALLED IN ACCORDANCE WITH THE ELECTRICAL CODE, PER 2010 O.M.S.C. 602.2.1.1. NEW CONDUITS SHALL BE INSTALLED IN THE NEW SHAFTS.
- CONDENSATE DRAIN PIPING AND FINAL CONNECTION TO UNIT BY MECHANICAL CONTRACTOR.
- DUCT PENETRATION, CUTTING AND PATCHING BY GENERAL CONTRACTOR, UNLESS OTHERWISE NOTED ON PLAN.
- THERMOSTAT SHALL BE 24 VOLT, ONE STAGE HEATING AND ONE OR TWO STAGE COOLING WITH MATCHING SUBBASE AND TAMPER PROOF COVER.
- PROVIDE FILTER FOR AIR CONDITIONING AND/OR AIR SIDE UNITS AS REQUIRED PER ASHRAE AND CODE.
- THIS CONTRACTOR SHALL COORDINATE WITH GENERAL CONTRACTOR FOR SIZE AND LOCATION OF DUCTWORK WALL OPENINGS AND WITH ELECTRICAL CONTRACTOR FOR ELECTRICAL REQUIREMENTS OF ALL MECHANICAL EQUIPMENT AND ARCHITECTURAL DRAWINGS FOR AIR DISTRIBUTION LOCATION.
- THE CONTRACTOR SHALL SUBMIT BID BASED ON THE DRAWINGS AND ALTERNATE FOR COST SAVING. THESE DRAWINGS ARE FOR BIDDING PURPOSES.
- COORDINATE THE LOCATION OF ALL CEILING DIFFUSERS, REGISTERS AND GRILLES WITH THE ARCHITECTURAL REFLECTED CEILING PLAN, ELECTRICAL LIGHTING LAYOUT AND ARCHITECTURAL ROOM ELEVATIONS.
- DUCTS SHALL BE SUPPORTED WITH 1" WIDE 16-GAUGE HANGER STRAPS AND SHALL BE SPACED AT NO MORE THAN 7'-0" ON CENTERS AND SHALL BE SECURED TO STRUCTURAL MEMBER. EXPOSED DUCTWORK ON ROOF SHALL BE SUPPORTED BY GALVANIZED STEEL ANGLE & SHALL BE PER LOCAL CODE.
- ROUND AND RECTANGULAR DUCTWORK ARE INTERCHANGEABLE IF CROSS SECTION AREAS ARE EQUIVALENT. CONTRACTOR IS TO VERIFY THE EXACT CEILING SPACE AND INTERCHANGE THE DUCT SIZE TO FIT THE CEILING SPACE WITHOUT ADDITIONAL FEE CHARGE.
- INSTALL VOLUME CONTROL DAMPERS AT EACH SUPPLY DIFFUSER TO AFFORD COMPLETE CONTROL OF THE AIR FLOW IN THE VARIOUS DUCT SYSTEMS.
- COORDINATE ENTIRE INSTALLATION OF THE H.V.A.C. SYSTEM WITH THE WORK OF ALL OTHER TRADES PRIOR TO ANY FABRICATION OR INSTALLATION. PROVIDE ALL FITTINGS, OFFSETS, AND TRANSITIONS AS REQUIRED FOR A COMPLETE WORKABLE INSTALLATION.
- PROVIDE BACK-DRAFT DAMPERS FOR ALL EXHAUST AIR DUCTS UNLESS OTHERWISE NOTED PER CODE.
- CONTRACTOR SHALL SUBMIT A COMPLETE BALANCE REPORT FOR APPROVAL. THE REPORT SHALL INCLUDE THE FOLLOWING:
 - AIR QUANTITIES AT EACH REGISTER.
 - STATIC PRESSURE READINGS AT INLET AND DISCHARGE OF EACH AIR HANDLING SYSTEM AND AT INLET OF EACH EXHAUST AIR SYSTEM.
 - COOLING AND HEATING SUPPLY AND RETURN AIR TEMPERATURES AT EACH AIR CONDITIONING UNIT.
- ALL LINED DUCT DIMENSIONS ARE NET CLEAR DIMENSION AFTER LINING HAS BEEN INSTALLED.
- ANY MATERIAL, ARTICLE OR PIECE OF EQUIPMENT OTHER THAN THAT INDICATED SHALL NOT BE USED UNLESS APPROVED IN WRITING BY THE ENGINEER AND ANY CHANGES IN MECHANICAL, ELECTRICAL AND/OR OTHER SYSTEMS REQUIRED DUE TO SUCH SUBSTITUTION SHALL BE THE RESPONSIBILITY OF THE HVAC CONTRACTOR; AND AT NO ADDITIONAL COST TO THE OWNER.
- EXHAUST TERMINATION SHALL BE MINIMUM 10'-0" AWAY OR 3'-0" ABOVE FROM ANY FRESH AIR INTAKE, OPENABLE WINDOWS, DOORS AND 10'-0" MINIMUM ABOVE GRADE.
- THE CONTRACTOR SHALL FURNISH AND INSTALL ACCESS DOORS AND/OR ACCESS PANELS AT LOCATIONS AS NECESSARY TO SERVICE FIRE DAMPERS AND PROVIDE MAINTENANCE FOR EQUIPMENT. ALL ACCESS DOORS AND PANEL LOCATIONS SHALL BE VERIFIED WITH THE ARCHITECT PRIOR TO INSTALLATION.
- ACCURATE AS-BUILT DRAWINGS SHALL BE MADE DURING CONSTRUCTION AND SUBMITTED FOR APPROVAL UPON COMPLETION OF INSTALLATION.
- THE CONTRACTOR SHALL VISIT SITE PRIOR TO BIDDING TO VERIFY LOCATIONS AND SIZES OF ALL EXISTING EQUIPMENT AND INFORM THE ARCHITECT OF ANY DISCREPANCIES.
- THE CONTRACTOR SHALL FURNISH ALL MATERIALS, LABOR, EQUIPMENT, TRANSPORTATION AND SERVICES NECESSARY FOR COMPLETION OF THE WORK. ALL MATERIALS AND WORK SHALL COMPLY WITH APPLICABLE CODES AND GOVERNING REGULATIONS AND MEET THE APPROVAL OF THE LOCAL JURISDICTION.
- TAKE ALL PRECAUTIONS NECESSARY TO PROTECT THE MATERIALS BEFORE, DURING AND AFTER INSTALLATION. IN THE EVENT OF DAMAGE, IMMEDIATELY REPAIR ALL DAMAGED AND DEFECTIVE WORK TO THE APPROVAL OF THE ARCHITECT AT NO ADDITIONAL COST TO THE OWNER.
- THESE DRAWINGS ARE DIAGRAMMATIC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH ALL OTHER TRADES. THIS INCLUDES COORDINATING THE LOCATION AND SIZE OF ALL OPENINGS, LOCATIONS OF EQUIPMENT PADS AND CHANGES OF ELEVATIONS OF DUCTWORK, PIPING AND OTHER EQUIPMENT.
- PROVIDE ALL FRESH AIR INTAKES AND EXHAUST OUTLETS WITH HOOD, 1/2" GALVANIZED MESH SCREENS AND OUTSIDE AIR BACKDRAFT DAMPERS.
- DUCTWORK SHALL BE INSULATED OR LINED AS NOTED ON DRAWINGS. ALL DUCTWORK EXPOSED ON ROOF SHALL BE INTERNALLY LINED UNLESS OTHERWISE INDICATED OR SPECIFIED. ALL DUCT SIZES ARE SHEET METAL SIZES. ALL DUCT JOINTS SHALL BE SEALED PER SPECIFICATIONS.
- ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS. PROVIDE ALL FITTINGS, TRANSITIONS, DAMPERS, VALVES AND OTHER DEVICES REQUIRED FOR A COMPLETE WORKABLE INSTALLATION.

ROOF TOP UNIT SCHEDULE

MARK	MANUF. & MODEL NO.	INDOOR FAN			MIN. OSA (CFM)	COOLING BTUH TOTAL	EER/SEER	HEATING		AFUE %	WEIGHT LBS.	POWER UTILIZATION				NOTES
		CFM	ESP IN WG.	MTR. HP				INPUT MBH	OUTPUT MBH			VOLT/PH	FLA	MCA	MOC	
RTU 1	CARRIER 48VL-060-090-3	2,000	1.5	1.0	500	60,000	14	90	73	81	600	230/1/60	-	42.5	60	1,2,3,4,5,6
RTU 2	CARRIER 48VL-060-090-3	2,000	1.5	1.0	500	60,000	14	90	73	81	600	230/1/60	-	42.5	60	1,2,3,4,5

- NOTES:
- PROVIDE INTEGRAL DISCONNECT SWITCH.
 - PROVIDE FACTORY INSTALLED MOTOR STARTERS
 - PROVIDE FACTORY 8" HIGH CURB'S.
 - PROVIDE DAMPERS, ECONOMIZER W/POWER EXHAUST AND ACTURATORS. ACTUATORS TO ABLE TO RECEIVE A 0-10V SIGNAL. CONTROLS TO BE PROVIDED AND INSTALLED BY PSU.
 - PROVIDE AND FIELD INSTALL SMOKE DUCT DETECTOR IN RETURN SIDE.
 - PROVIDE ELECTRICAL OUTLET.

DIFFUSERS, REGISTERS AND RETURN AIR GRILLES

SYMBOL	MODEL NO.	TYPE	FACE	MODULE SIZE	FRAME	BORDER	MAX N.C.	REMARKS
SG-1	TITUS 272RL	SIDEWALL SUPPLY	BLADES	SEE DRAWING	SURFACE	-	18	1,2,3
RG-2	TITUS 23RL	SIDEWALL RETURN	LOUVERED	SEE DRAWING	SURFACE	-	10	1,2,3
DG-2	TITUS CT-700	DOOR GRILLE	LOUVERED	SEE DRAWING	SURFACE	-	10	1,2

- NOTES:
- SEE DRAWINGS FOR NECK SIZES.
 - COORDINATE WITH ARCHITECT/OWNER.
 - PAINT INTERIOR OF GRILLE FLAT BLACK

ATTIC TURBINE VENTILATOR SCHEDULE

SYMBOL	SERVICE	CFM @ 4MPH WIND	MATERIAL	SIZE	MAKE/MODEL	REMARKS
ATV 1	ROOF/ATTIC	630	ALUMINUM	12"ø	EMPIRE/TV12G	1,2
ATV 2	ROOF/ATTIC	630	ALUMINUM	12"ø	EMPIRE/TV12G	1,2
ATV 3	ROOF/ATTIC	630	ALUMINUM	12"ø	EMPIRE/TV12G	1,2
ATV 4	ROOF/ATTIC	630	ALUMINUM	12"ø	EMPIRE/TV12G	1,2

- NOTES:
- FURNISH ROOF BASE FLASHING AND BASE.
 - COORDINATE FINAL LOCATION WITH OWNER/ARCHITECT.

GENERAL SPECIFICATIONS:

- EVERY DUCT AND PLENUM WHICH IS A PORTION OF THE COMFORT HEATING AND/OR COOLING SYSTEM SHALL COMPLY WITH THE REQUIREMENTS OF OREGON STATE MECHANICAL CODE AND/OR ASHRAE. THIS CONSTRUCTION INSULATION AND SUPPORT OF EVERY DUCT AND PLENUM SHALL COMPLY WITH LOCAL CODE.
- CONCEALED SPACES, CIRCULATION AIR
 - NO COMBUSTIBLE MATERIAL (SUCH AS EXPOSED COMMUNICATION CABLES, INSULATED WIRES, PLASTIC TUBING OR PIPING, PIPE INSULATION, CONDENSATE PAN INSULATION, WOOD, PVC, ABS AND OTHER PLASTICS) TO BE IN CONCEALED SPACES USED TO CONVEY CIRCULATING AIR SUPPLY. WHEN COMBUSTIBLE MATERIAL IS TO BE LOCATED IN THE ABOVE SPACES, IT SHALL BE APPROVED FOR SUCH INSULATION.
- INSULATION OF DUCTS
 - EVERY CONDITIONED AIR SUPPLY AND PLENUM SHALL BE INSULATED WITH NO LESS THAN THE AMOUNT OF INSULATION INDICATED BELOW (EXCEPT FOR DUCTS AND PLENUMS DIRECTLY EXPOSED TO THE CONDITIONED SPACES.) ONLY APPROVED MATERIALS SHALL BE USED WITHIN DUCTS OR PLENUMS FOR INSULATING, SOUND DEADENING OR OTHER PURPOSES.

DUCT LOCATION	INSULATION TYPE	
	COOLING ONLY	HEATING ONLY
ROOF OR EXPOSED TO OSA	C & W	A & W
ATTICS BETWEEN AND UNDER FLOOR CRAWL SPACES AND BASEMENTS	A	A

 - INSULATION TYPES
 - A 1", 0.60 LB/CU. FT. MINERAL FIBER BLANKET 1/2 INC., 1.5 LB/CU. FT. MINERAL FIBER BLANKET (DUCT LINER) 1/2 INC., 3 LB/CU. FT. MINERAL FIBER BOARD MATERIAL WITH A CONDUCTANCE OF 0.48 OR LESS
 - C 3", 0.60 LB/CU. FT. MINERAL FIBER BLANKET 1-1/2", 1.5 LB/CU. FT. MINERAL FIBER BLANKET (DUCT LINER) 1-1/2", 3 LB/CU. FT. MINERAL FIBER BOARD MATERIAL WITH A CONDUCTANCE OF 0.16 OR LESS
 - W WEATHERPROOF BARRIER
 - WHERE DUCTS ARE USED FOR BOTH HEATING AND COOLING, THE MINIMUM INSULATION TO BE AS REQUIRED FOR THE MOST RESTRICTIVE CONDITION. INSULATION MAY BE OMITTED ON THAT PORTION OF A DUCT WHICH IS LOCATED WITHIN A WALL OR A FLOOR-CEILING SPACE WHERE BOTH SIDES AND THIS SPACE ARE EXPOSED TO CONDITIONED AIR AND WHERE THIS SPACE IS NOT VENTILATED OR OTHERWISE EXPOSED TO UNCONDITIONED AIR.
- SEALING
 - TRANSVERSE SUPPLY DUCTS, TAPED OR SEALED WITH MASTIC EXCEPT FOR DUCTS EXPOSED TO CONDITIONED SPACE, WHERE DUCT STATIC PRESSURE EXCEEDS 3/4" WATER. LONGITUDINAL JOINTS, TAPED OR SEALED WITH MASTIC.
- INSPECTION
 - INSPECTION TO BE MADE AND DUCTWORK APPROVED BEFORE COVERING WITH INSULATION.

HVAC GENERAL SPEC'S (CONTINUED)

- TEMPERATURE CONTROLS
 - EACH HVAC SYSTEM SHALL BE PROVIDED WITH AT LEAST ONE AUTOMATIC TEMPERATURE CONTROL DEVICE FOR THE REGULATION OF TEMPERATURE. THESE AUTOMATIC TEMPERATURE CONTROL DEVICES SHALL BE CAPABLE OF BEING SET TO MAINTAIN SPACE TEMPERATURE SET POINTS FROM 55 DEGREES F TO 85 DEGREES F, SHALL BE CAPABLE OF OPERATING THE SYSTEM HEATING AND/OR COOLING IN SEQUENCE.
 - EXCEPT AS ALLOWED, THESE CONTROLS SHALL BE ADJUSTABLE TO PROVIDE A DEAD BAND OF 5 DEGREES F BETWEEN FULL HEATING AND FULL COOLING. CONTROLS SHALL HAVE THE CAPABILITY OF TERMINATING ALL HEATING AT A TEMPERATURE NO MORE THAN 70 DEGREES F AND OF TERMINATING ALL COOLING AT A TEMPERATURE NOT LESS THAN 78 DEGREES F.
- AN AUTOMATIC TIME SWITCH CONTROL DEVICE WITH AN ACCESSIBLE FOUR (4) HOUR MANUAL OVERRIDE SHALL BE PROVIDED.
- A MAINTENANCE LABEL SHALL BE AFFIXED TO MECHANICAL EQUIPMENT AND A MAINTENANCE MANUAL SHALL BE PROVIDED TO THE OWNER PER STANDARDS.
- ALL DUCTWORK SHALL BE GALVANIZED SHEET METAL. ALL DUCTWORK SHALL BE CONSTRUCTED TO 2" PRESSURE STANDARDS AS DEFINED BY THE SMACNA "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE". CONSTRUCTION OF FITTINGS, ELBOWS AND JOINTS SHALL BE IN ACCORDANCE WITH CURRENT SMACNA AND ASHRAE STANDARDS.
- DUCT MATERIALS:
 - A. GALVANIZED STEEL DUCTS: ASTM A525 AND ASTM A527 GALVANIZED STEEL SHEET, LOCK-FORMING QUALITY, HAVING ZINC COATING OF IN CONFORMANCE WITH ASTM A90.
 - B. STEEL DUCTS: ASTM A366.
 - C. ALUMINUM DUCTS: ASTM B209; ALUMINUM SHEET, ALLOY 3003-H14. ALUMINUM CONNECTORS AND BAR STOCK: ALLOY 6061-T6 OR OF EQUIVALENT STRENGTH.
- WEIGHT OF METAL DUCT:

A. RECTANGULAR DUCTS	GAUGE
UP TO 12 INCHES	26
13 INCHES TO 30 INCHES	24
31 INCHES TO 60 INCHES	22
61 INCHES TO 90 INCHES	20
91 INCHES & OVER	18

 - B. ROUND DUCT

SPIRAL PIPE GAUGE	FITTING	GAUGE
3 TO 14 INCHES	26	24
15 TO 26 INCHES	24	22
27 TO 36 INCHES	22	20
37 TO 50 INCHES	20	20

DRAWING LIST

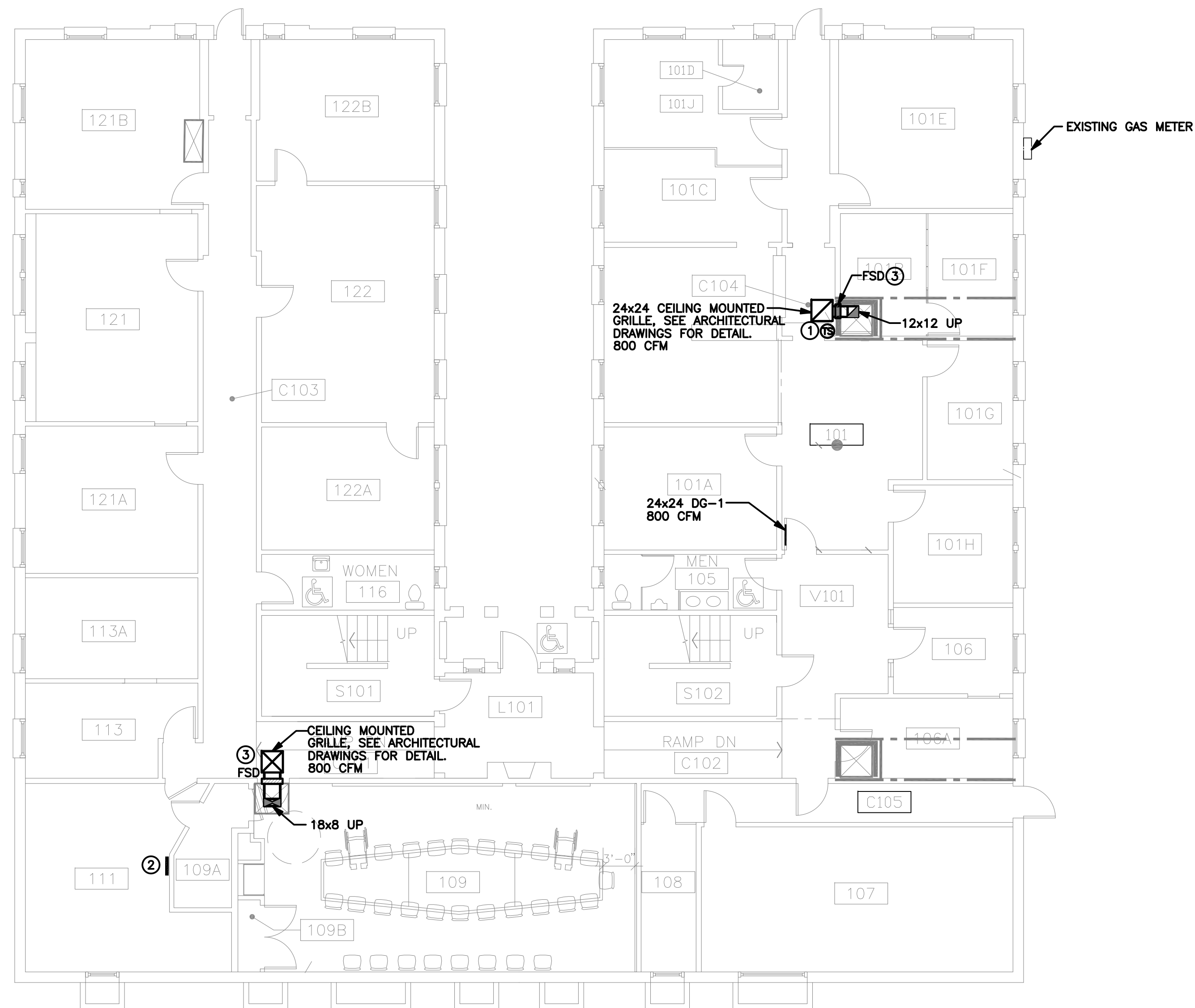
DRAWING	TITLE
M0	HVAC SCHEDULES AND LEGEND
M1	HVAC FIRST FLOOR PLAN
M2	HVAC SECOND FLOOR PLAN
M3	HVAC THIRD FLOOR PLAN
M4	HVAC ROOF PLAN
M5	HVAC DETAILS

GENERAL NOTES:

1. EVERY EFFORT HAS BEEN MADE TO ASCERTAIN EXISTING CONDITIONS. DUCTWORK INDICATED HAS BEEN ROUTED AND SIZED TO MAINTAIN CEILING CONDITIONS AND HEIGHTS INDICATED ON ARCHITECTURAL CEILING PLAN. ALSO MAINTAIN EQUIPMENT CLEARANCES.
2. CONTRACTOR IS TO SURVEY THE SPACE TO VERIFY THAT DUCTWORK CAN BE INSTALLED AS INDICATED, PRIOR TO MANUFACTURE. IF CONFLICTS ARE ENCOUNTERED AS A RESULT OF THIS SURVEY, THE ARCHITECT AND OWNER IS TO BE NOTIFIED IMMEDIATELY.
3. PROVIDE BALANCING DAMPERS FOR ALL BRANCH DUCTWORK.
4. CONTRACTOR SHALL PROVIDE VERTICAL SUPPORT AND SEISMIC BRACING FOR ALL SUSPENDED MECHANICAL EQUIPMENT, DUCTWORK AND ACCESSORIES. THE SUPPORT, BRACING AND CONNECTIONS TO THE BUILDING FRAME SHALL CONFORM TO A PRE-APPROVED, CODE-COMPLIANT SYSTEM SUCH AS NUSIG.
5. PORTLAND STATE UNIVERSITY CREWS ARE TO PROVIDE ALL CONTROL WIRING, CONTROL DEVICES AND PROGRAMMING.

SHEET NOTES:

- ① PROVIDE AVERAGING TEMPERATURE SENSOR. AVERAGE THE TEMPERATURE BETWEEN FLOORS.
- ② EXISTING SIEMENS CONTROL PANEL TO BE REPLACED WITH A NEW PANEL. ALL DEVICES TO BE ROUTED TO THIS PANEL.
- ③ FSD TO BE ACCESSABLE THROUGH CEILING GRILLE.



1 EAST HALL 1ST FLOOR PLAN
 SCALE: 1/8"=1'-0"

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SCALE

DRAWING TITLE
 MECHANICAL
 1ST FLOOR PLANS

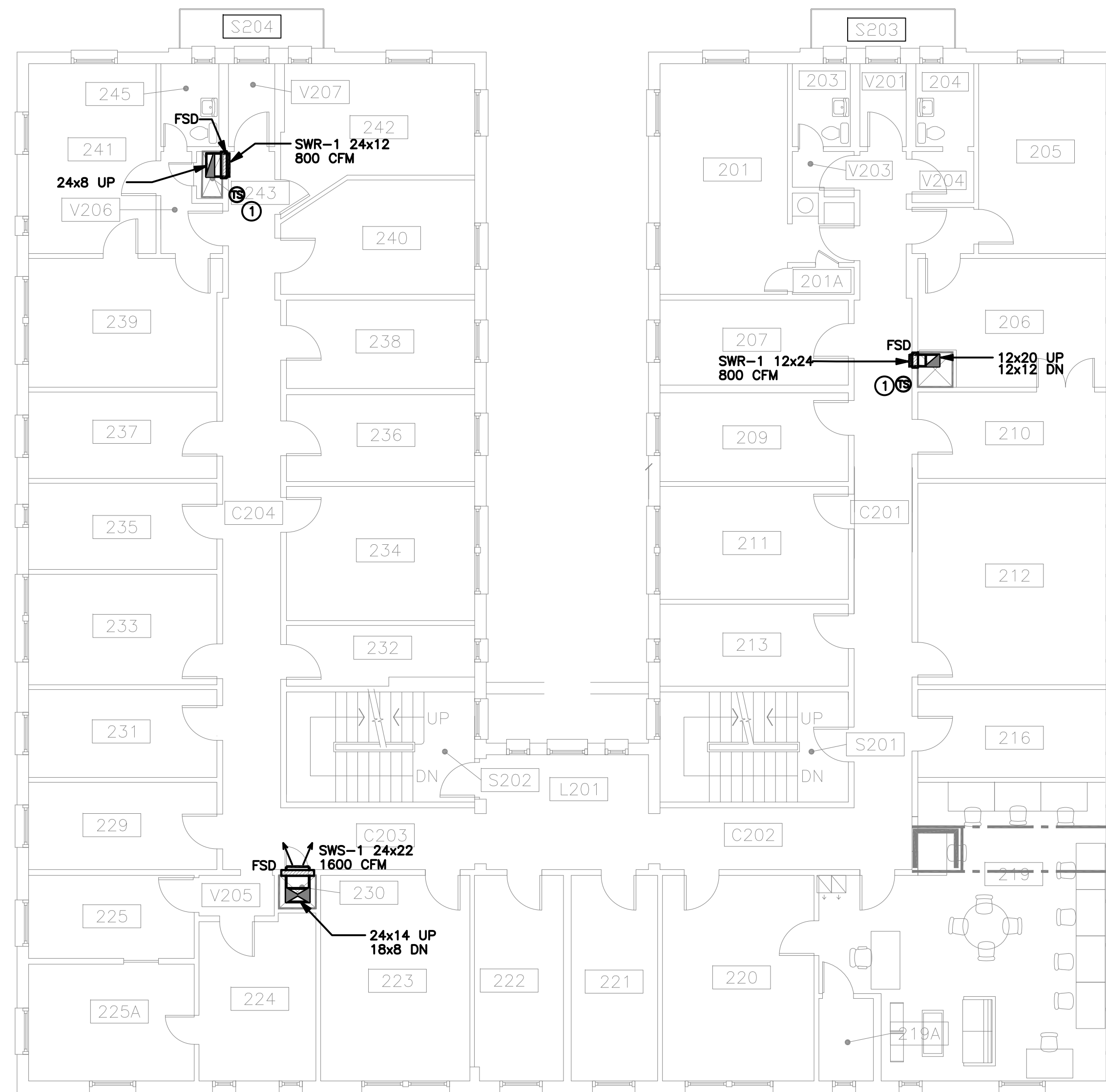
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M1

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5. PORTLAND STATE UNIVERSITY CREWS ARE TO PROVIDE ALL CONTROL WIRING, CONTROL DEVICES AND PROGRAMMING.

SHEET NOTES:

- ① PROVIDE AVERAGING TEMPERATURE SENSOR. AVERAGE THE TEMPERATURE BETWEEN FLOORS.



① EAST HALL 2ND FLOOR PLAN
 SCALE: 1/8"=1'-0"



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 SCALE

DRAWING TITLE
 MECHANICAL
 SECOND FLOOR PLAN

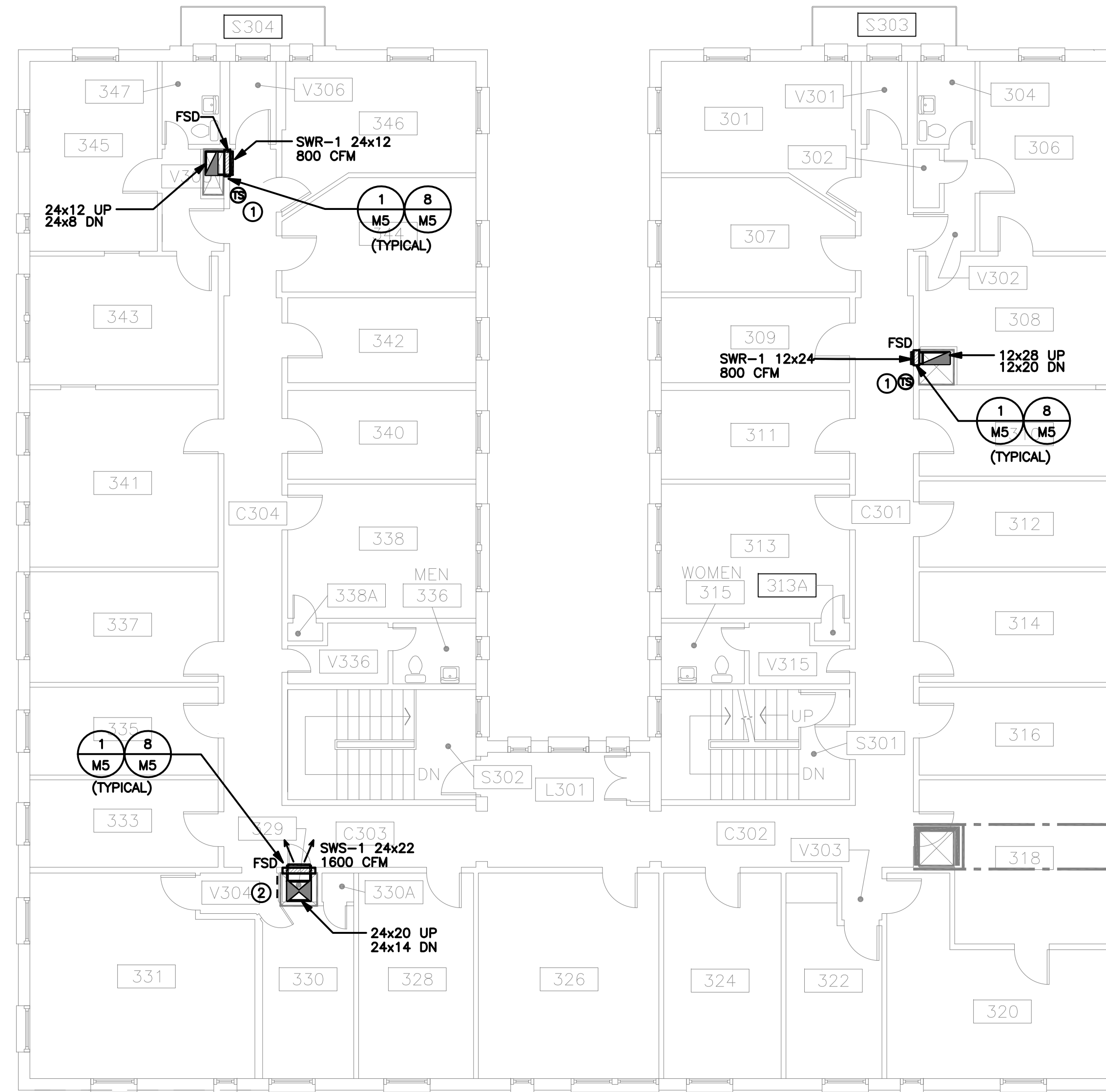
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M2

GENERAL NOTES:

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5. PORTLAND STATE UNIVERSITY CREWS ARE TO PROVIDE ALL CONTROL WIRING, CONTROL DEVICES AND PROGRAMMING.

SHEET NOTES:

- ① PROVIDE AVERAGING TEMPERATURE SENSOR. AVERAGE THE TEMPERATURE BETWEEN FLOORS.
- ② LOCATION OF THE TEC DEVICES. PROVIDED AND INSTALLED BY PSU.



1 EAST HALL 3RD FLOOR PLAN
 SCALE: 1/8" = 1'-0"



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 MECHANICAL
 THIRD FLOOR PLANS

SHEET NUMBER

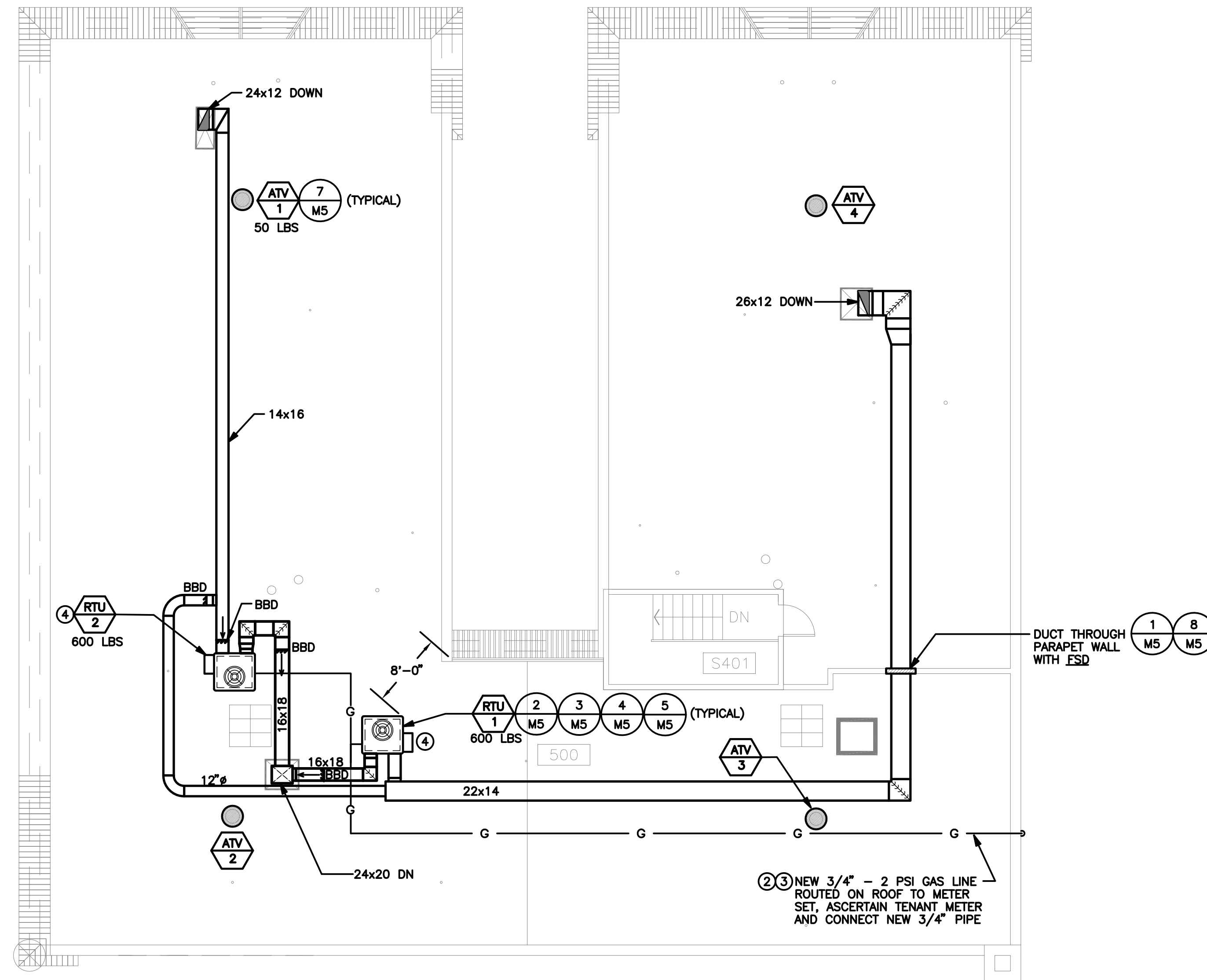
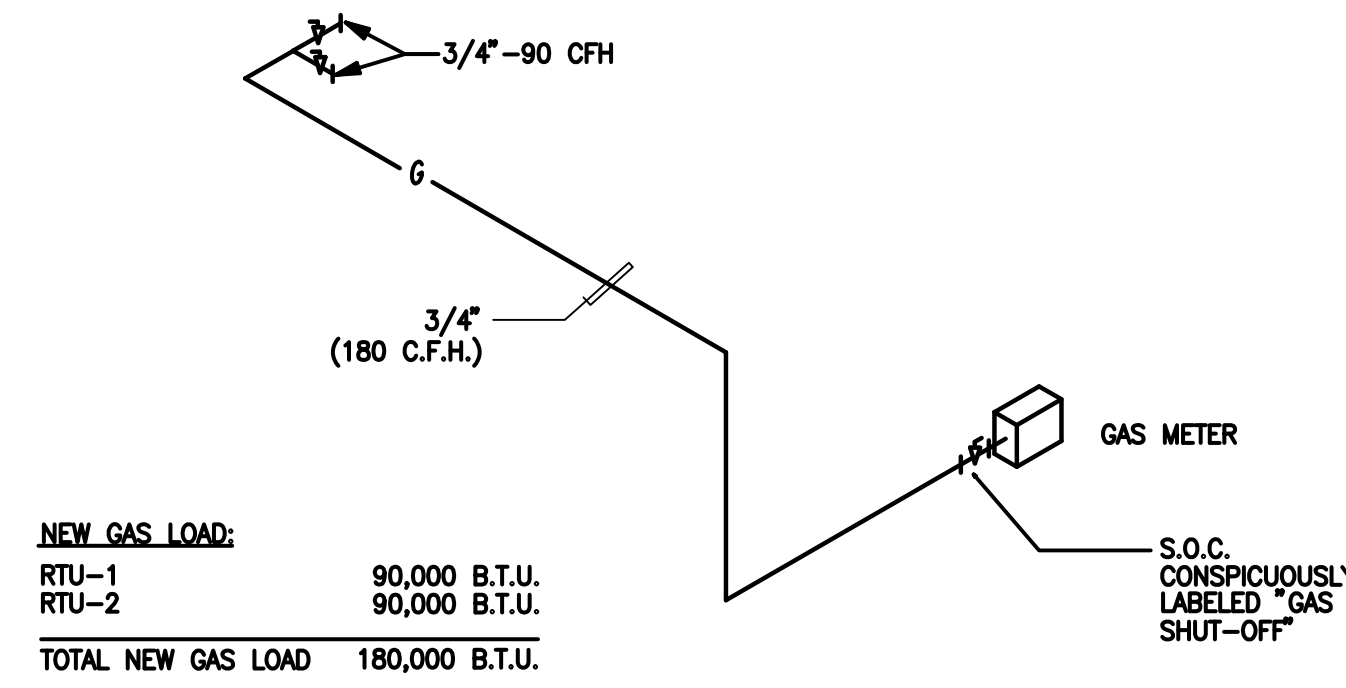
M3

GENERAL NOTES:

1. EVERY EFFORT HAS BEEN MADE TO ASCERTAIN EXISTING CONDITIONS. DUCTWORK INDICATED HAS BEEN ROUTED AND SIZED TO MAINTAIN CEILING CONDITIONS AND HEIGHTS INDICATED ON ARCHITECTURAL CEILING PLAN. ALSO MAINTAIN EQUIPMENT CLEARANCES.
2. CONTRACTOR IS TO SURVEY THE SPACE TO VERIFY THAT DUCTWORK CAN BE INSTALLED AS INDICATED, PRIOR TO MANUFACTURE. IF CONFLICTS ARE ENCOUNTERED AS A RESULT OF THIS SURVEY, THE ARCHITECT AND OWNER IS TO BE NOTIFIED IMMEDIATELY.
3. PROVIDE BALANCING DAMPERS FOR ALL BRANCH DUCTWORK.
4. CONTRACTOR SHALL PROVIDE VERTICAL SUPPORT AND SEISMIC BRACING FOR ALL SUSPENDED MECHANICAL EQUIPMENT, DUCTWORK AND ACCESSORIES. THE SUPPORT, BRACING AND CONNECTIONS TO THE BUILDING FRAME SHALL CONFORM TO A PRE-APPROVED, CODE-COMPLIANT SYSTEM SUCH AS NUSIG.
5. ALL DUCT PARTS EXPOSED TO THE ATMOSPHERE SHALL BE PROTECTED BY ONE (1) COAT OF CORROSION RESISTANT PRIMER AND ONE (1) COAT CORROSION RESISTANT PAINT.
6. PATCH AND REPAIR ROOF PENETRATIONS PER LANDLORDS REQUIREMENTS.
7. INTERNALLY LINE THE SUPPLY AND RETURN DUCTS IN THE SHAFTS AND 5 FEET PAST THE FIRST ELBOW.
8. DUCT BRACING AND SUPPORTS SHALL BE NON-COMBUSTIBLE MATERIAL SECURELY ATTACHED TO THE STRUCTURE AND DESIGNED TO CARRY GRAVITY AND SEISMIC LOADS WITHIN THE STRESS LIMITATIONS OF THE BUILDING CODE. BOLTS, SCREWS, RIVETS AND OTHER MECHANICAL FASTENERS SHALL NOT PENETRATE THE DUCT WALLS.
9. PORTLAND STATE UNIVERSITY CREWS ARE TO PROVIDE ALL CONTROL WIRING, CONTROL DEVICES AND PROGRAMMING.

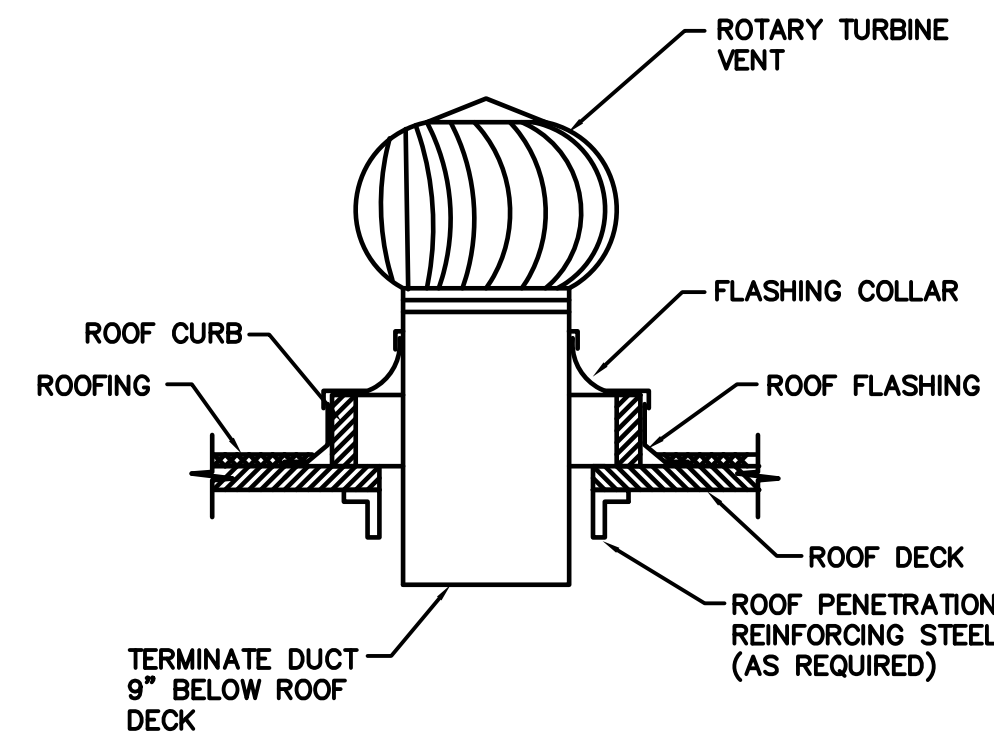
SHEET NOTES:

1. EXTEND PLUMBING VENT TO ABOVE THE OSA OF THE NEAREST ROOF TOP UNIT.
2. ALL GAS PIPING AND FITTINGS SHALL BE SCHED. 40 BLACK STEEL, AND WHERE EXPOSED IT SHALL BE COATED A NON CORROSIVE COATING.
3. FURNISH GAS PRESSURE REGULATORS WHERE REQUIRED. REGULATORS TO BE ADJUSTABLE AND CAPABLE OF PROVIDING OUTLET PRESSURE FROM 4" TO 7" W.C. FOR NATURAL GAS AND TO BE SIZED AS REQUIRED BY BTUH.
4. FOR SEQUENCE OF OPERATION, STAGE THE ROOF TOP UNITS SO THAT RTU-1 IS THE PRIMARY HEATING/COOLING UNIT. WHEN RTU-1 CANNOT SATISFY THE CONDITIONS, STAGE RTU-2 TO PROVIDE ADDITIONAL HEATING/COOLING.

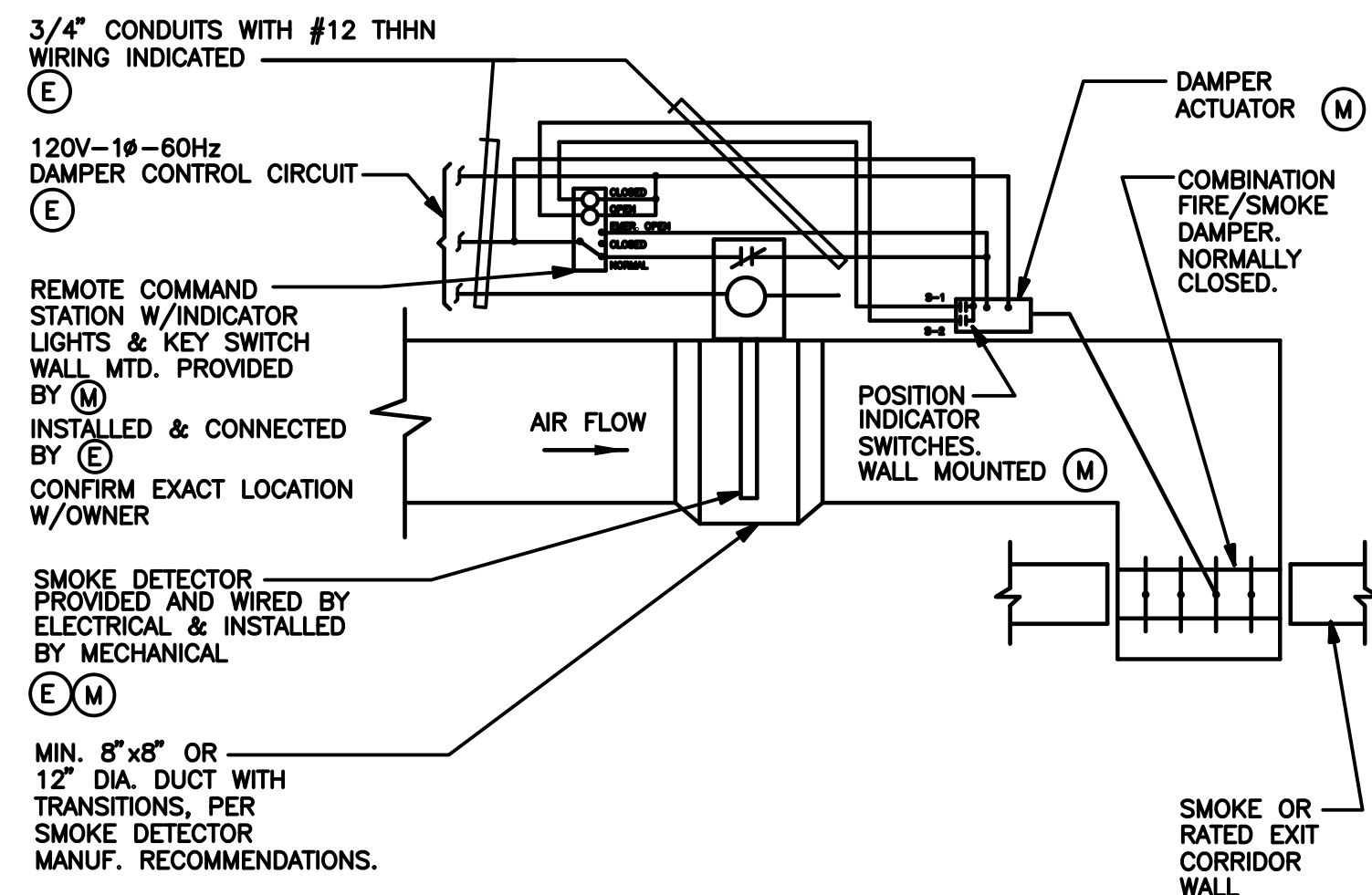


1 EAST HALL ROOF PLAN
 SCALE: 1/8"=1'-0"





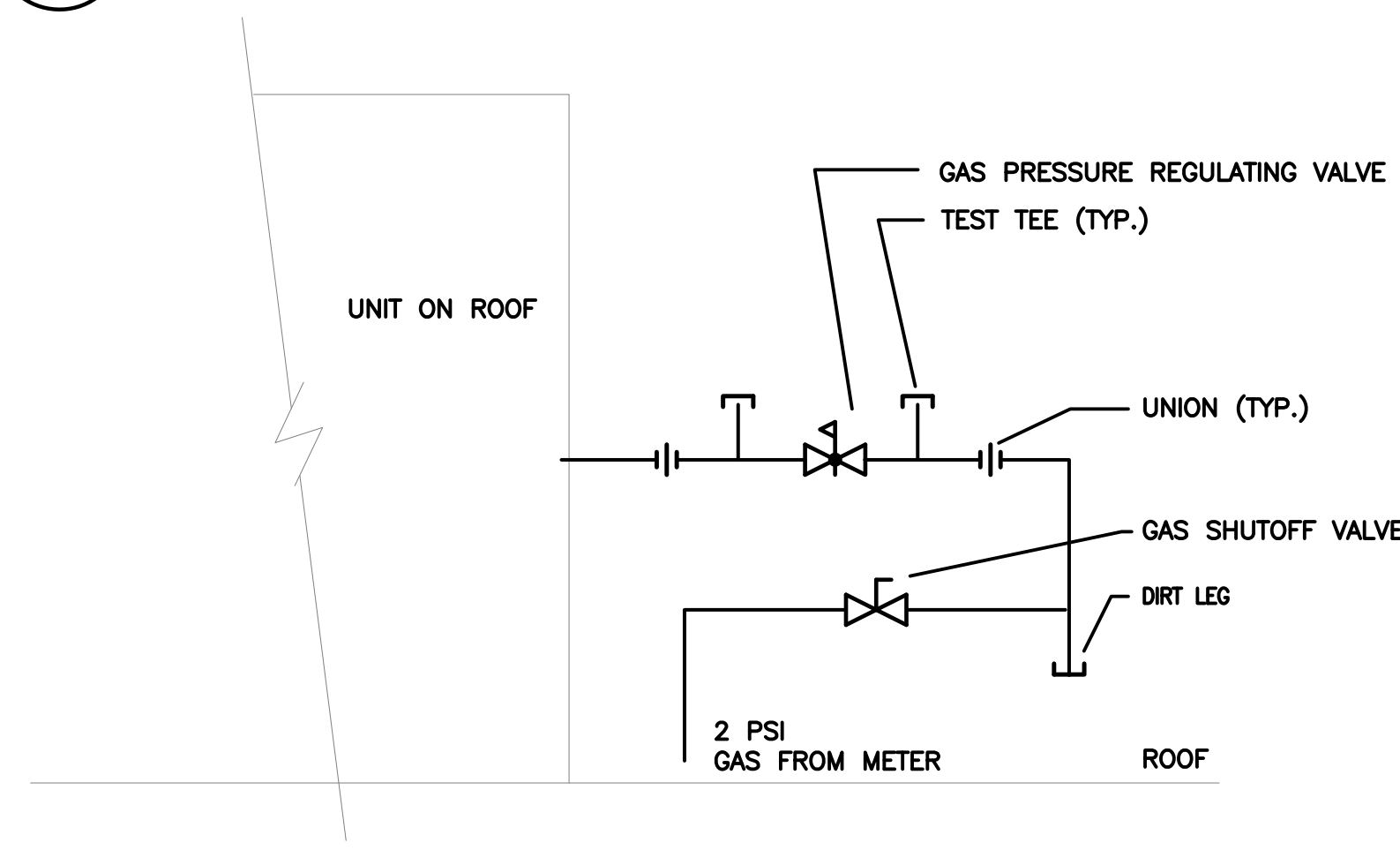
7 ROTARY TURBINE VENT DETAIL
NTS



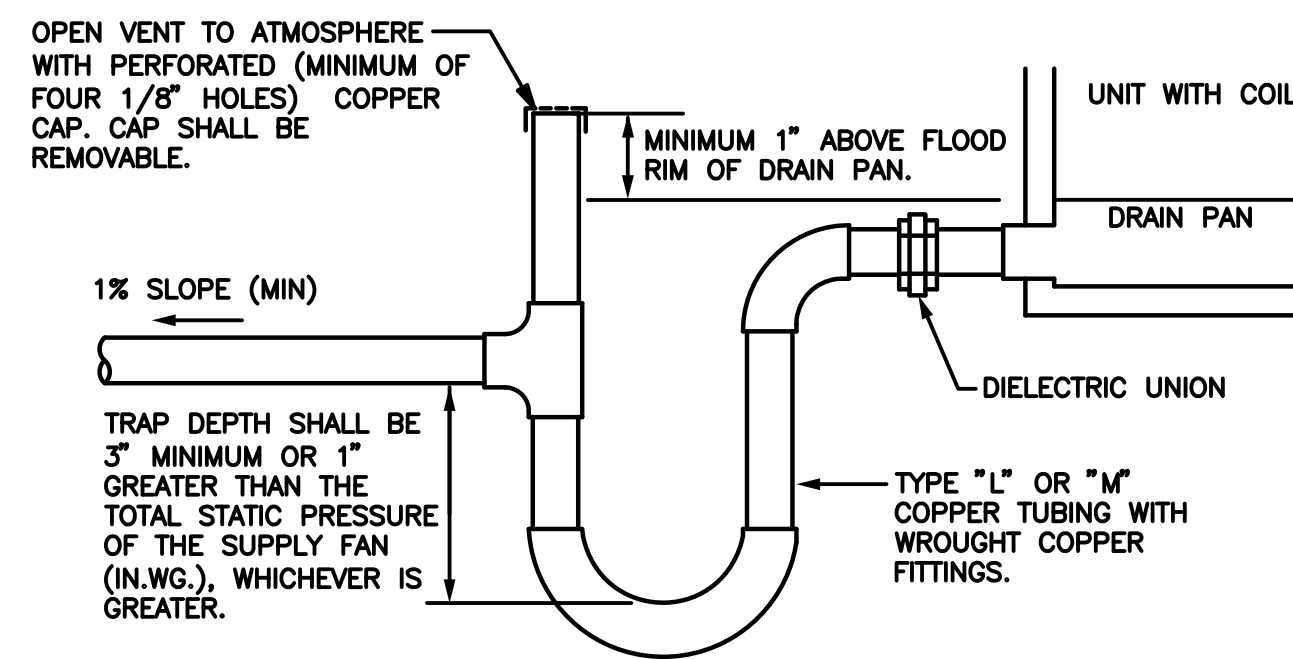
LEGEND
 (M) ITEMS TO BE PROVIDED BY MECHANICAL CONTRACTOR
 (E) ITEMS TO BE PROVIDED BY ELECTRICAL CONTRACTOR

8 FIRE/SMOKE DAMPER WIRING
NTS

3 NOT USED
NTS



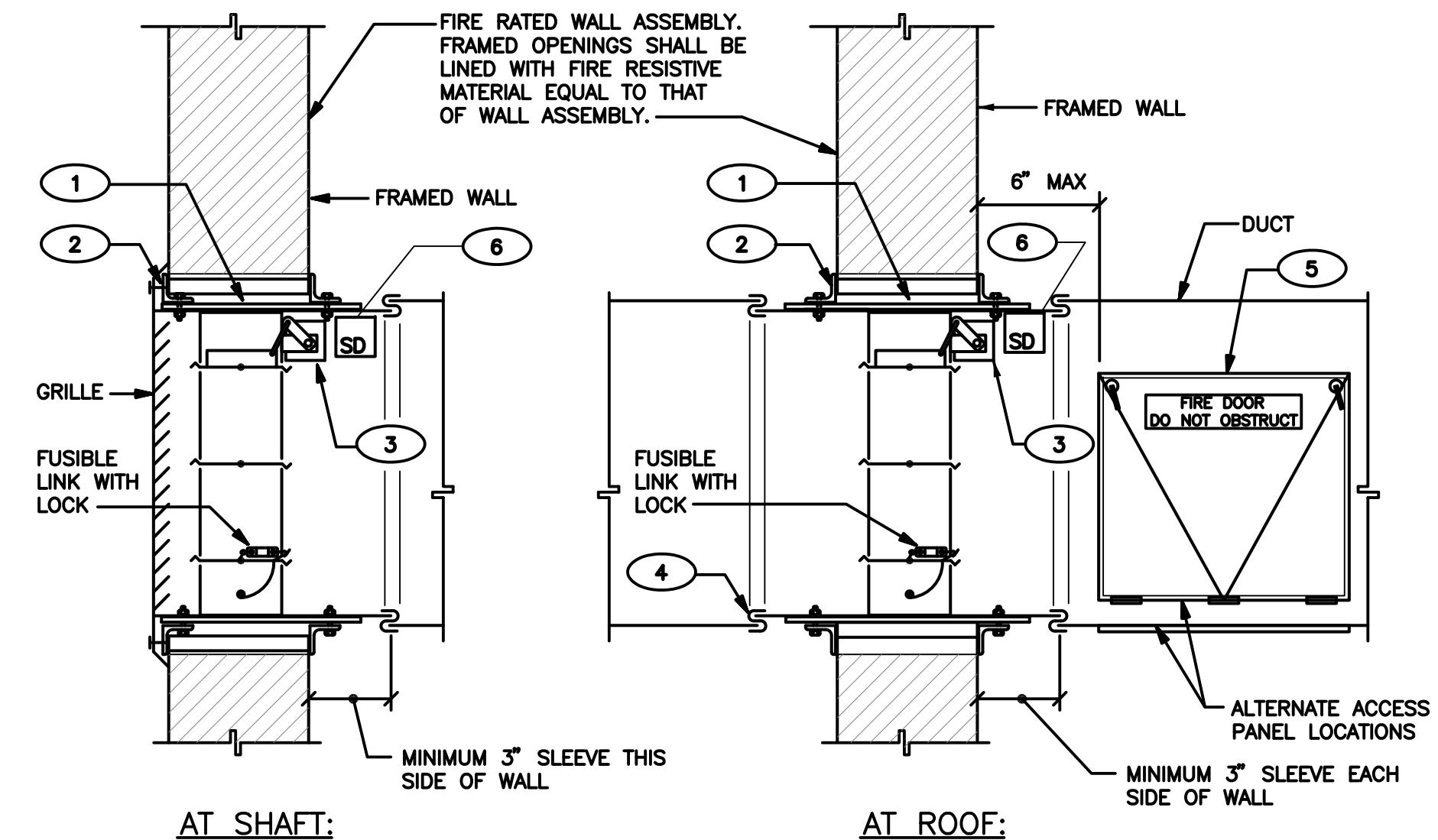
4 GAS CONNECTION TO UNITS
NTS



- NOTES:**
- CONDENSATE PIPE TERMINATION SHALL BE LOCATED A MINIMUM OF 1" ABOVE THE FLOOD RIM OF AN APPROVED TRAPPED RECEPTOR, LANDSCAPING AREA OR OTHER LOCATION AS APPROVED BY THE AUTHORITY HAVING JURISDICTION.
 - ALL INTERIOR CONDENSATE DRAIN PIPING ABOVE CEILINGS SHALL BE INSULATED.
 - PROVIDE PIPE SUPPORTS AS REQUIRED TO MAINTAIN MINIMUM 1% SLOPE.
 - INSTALL TRAP PARALLEL TO UNIT, IF POSSIBLE.
 - MINIMUM CONDENSATE PIPE SIZES SHALL BE PER THE FOLLOWING TABLE

CAPACITY	SIZE
UP TO 20 TONS	3/4"
21 TO 40 TONS	1"

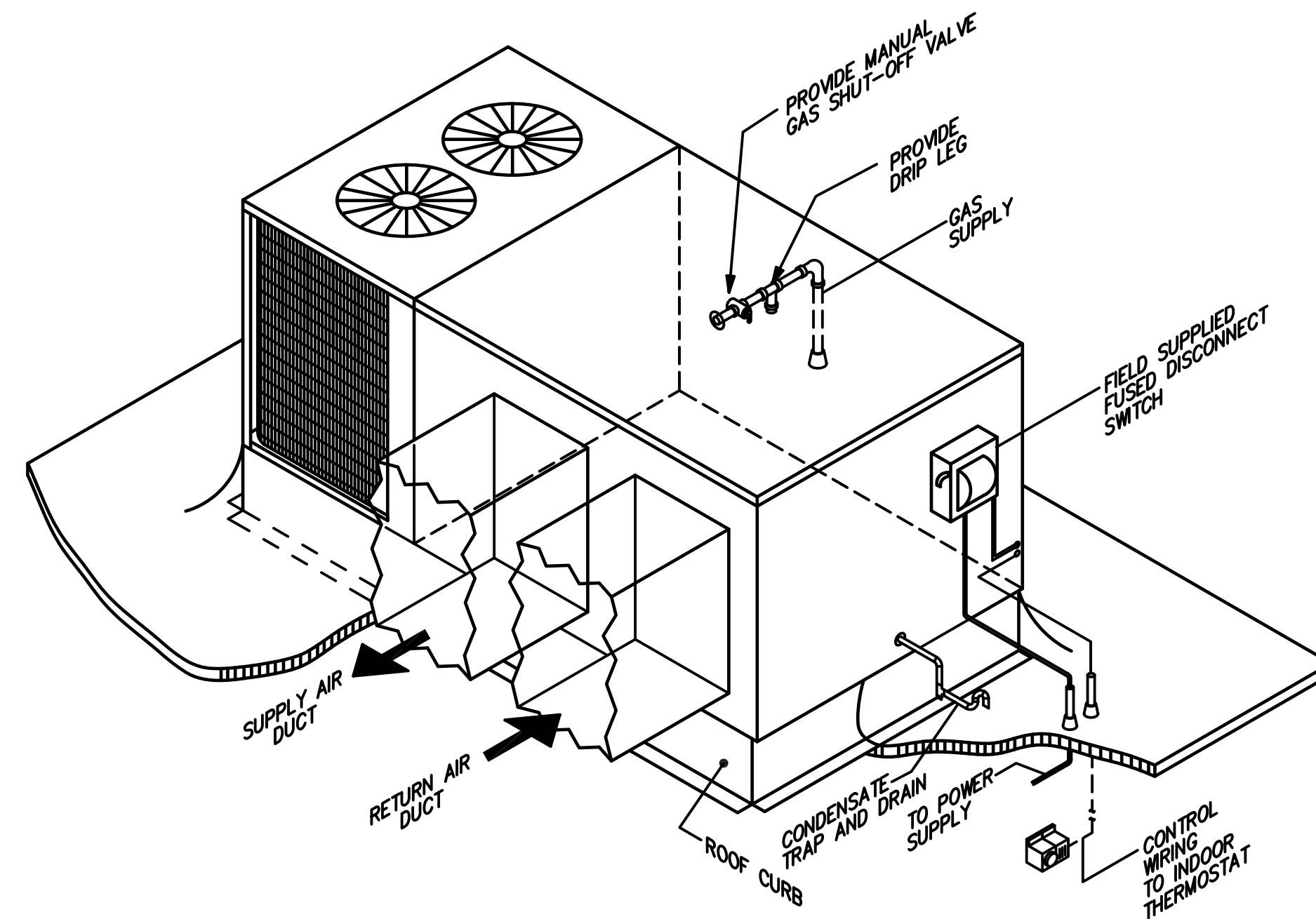
5 COOLING COIL CONDENSATE TRAP
NTS



NOTES:

- ALLOWABLE CLEARANCE ON TOP OF FIRE DAMPER TO TOP OF OPENING SHALL BE 1/4" PER FOOT OF FIRE DAMPER HEIGHT. FIRE DAMPER SHALL REST ON BOTTOM OF WALL OPENING AND SHALL BE CENTERED SIDE TO SIDE IN OPENING WITH CLEARANCE OF 1/4" PER FOOT OF FIRE DAMPER ON EACH SIDE.
- SLEEVE RETAINING ANGLES FASTENED TO FIRE DAMPER SLEEVE. ANGLES SHALL BE INSTALLED ON ALL FOUR SIDES OF DAMPER AND ON EACH SIDE OF THE WALL. ANGLE GAGE AND FASTENING METHOD AS PERMITTED AS A CONDITION OF DAMPER LISTING. REFER TO MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS. MINIMUM 1" ANGLE OVERLAP ON ALL FOUR SIDES.
- ACTUATOR MOTOR SHALL BE INTERLOCKED WITH SMOKE DETECTOR. COORDINATE WITH ELECTRICAL INSTALLER FOR POWER AND CONTROL WIRING.
- DUCT CONNECTION AS PERMITTED AS A CONDITION OF DAMPER LISTING ("S" SLIP CONNECTION SHOWN).
- ACCESS TO FIRE DAMPER BLADES AND ACTUATOR MOTOR SHALL BE THROUGH DUCT ACCESS PANEL. PANEL SHALL BE HINGED WITH A TIGHT FITTING SEAL. ACCESS SIZE SHALL BE A MINIMUM OF 18" LONG IN DIRECTION OF AIRFLOW BY HEIGHT OR WIDTH OF DUCT (PERPENDICULAR TO AIRFLOW) WITH A 12" MINIMUM. WHERE 12" CANNOT BE ACHIEVED, CONTRACTOR SHALL INSTALL EASILY REMOVABLE AND REPLACABLE TIGHTLY GASKETED DUCT SECTION(S). ACCESS PANEL SHALL BE LABELED WITH THE WORDS, "FIRE DOOR - DO NOT OBSTRUCT" IN LETTERS NO LESS THAN 1" IN HEIGHT. EXTERNAL INSULATION SHALL NOT CONCEAL ACCESS UNLESS A LABEL IS ATTACHED TO THE INSULATION WHICH INDICATES THE EXACT LOCATION OF THE OPENING.
- INTEGRAL DUCT SMOKE DETECTOR. COORDINATE WITH ELECTRICAL INSTALLER FOR POWER AND CONTROL WIRING.
- LOCATE 3/4" HIGH WHITE PLASTIC LAMINATE SIGNS WITH 3/8" HIGH BLACK LETTERING WITH THE INITIALS "FSD" AND UNIQUE NUMBER ON THE CEILING ACCESS DOOR OR T-BAR CEILING GRID IN THE AREA OF THE DAMPER ACCESS PANEL. ATTACH TO CEILING WITH EPOXY ADHESIVE.
- FIRE/SMOKE DAMPER DETAIL FOR REFERENCE ONLY. FIRE DAMPERS SHALL BE STATE FIRE MARSHAL APPROVED AND COMPLETE INSTALLATION SHALL BE PER MANUFACTURER'S PRINTED INSTRUCTIONS WHICH SHALL BE MADE AVAILABLE TO INSPECTION AUTHORITIES.

1 FIRE SMOKE DAMPER DETAIL
NTS



2 GAS FIRED PACKAGE ROOFTOP UNIT DETAIL
NTS