

GENERAL NOTES	
<p>1. PERFORM ALL WORK IN ACCORDANCE WITH ALL APPLICABLE CODES AND AUTHORITIES HAVING JURISDICTION. PROVIDE ALL PERMITS, INSPECTIONS, LICENSES AND FEES. FURNISH ALL LABOR, EQUIPMENT, SUPPLIES, AND MATERIALS NECESSARY TO PROVIDE COMPLETE AND OPERATIONAL SYSTEMS.</p> <p>2. THE DRAWINGS AND SPECIFICATIONS INDICATE THE GENERAL DESIGN AND ARRANGEMENT OF PIPES, FIXTURES, EQUIPMENT, SYSTEMS, ETC. INFORMATION SHOWN IS DIAGRAMMATIC IN CHARACTER AND DOES NOT NECESSARILY INDICATE EVERY REQUIRED OFFSET, FITTING, ETC. DO NOT SCALE THE DRAWINGS FOR DIMENSIONS. TAKE ALL DIMENSIONS, MEASUREMENTS, EQUIPMENT LOCATIONS, LEVELS, ETC. FROM THE ARCHITECTURAL DRAWINGS, FIELD MEASUREMENTS, AND FROM THE EQUIPMENT TO BE FURNISHED. PIPING MAY BE RELOCATED OR OFFSET FOR PROPER CLEARANCES OR TO AVOID CONFLICTS WITH OTHER TRADES. THE DESIGN INTENT (I.E. PITCHES, VELOCITIES, PRESSURE DROPS, VOLTAGE DROPS, ETC.) CANNOT BE GREATLY ALTERED WITHOUT THE APPROVAL OF THE ARCHITECT. THE COST OF THESE DEVIATIONS TO AVOID INTERFERENCE SHALL BE PART OF THE ORIGINAL CONTRACT BID.</p> <p>3. CONFER AND COOPERATE WITH ALL OTHER TRADES TO COORDINATE THEIR WORK. COORDINATION SHALL INCLUDE, BUT SHALL NOT BE LIMITED TO, MATERIALS AND EQUIPMENT ROUTED IN CEILING AND WALL CAVITIES, EQUIPMENT ARRANGEMENT IN MECHANICAL SPACES, INCLUDING EQUIPMENT CLEARANCE REQUIREMENTS, ELEVATIONS AND DIMENSIONS OF STRUCTURAL MEMBERS AND OPENINGS, ETC. NOTIFY THE ARCHITECT OF ANY CONFLICTS.</p> <p>4. BASE FINAL INSTALLATION OF MATERIALS AND EQUIPMENT ON ACTUAL DIMENSIONS AND CONDITIONS AT THE PROJECT SITE. FIELD MEASURE FOR MATERIALS AND EQUIPMENT REQUIRING EXACT FIT. NO EXTRAS WILL BE GIVEN FOR THE CONTRACTOR'S FAILURE TO FIELD COORDINATE.</p> <p>5. THE OWNER OR ENGINEER ARE NOT RESPONSIBLE FOR THE CONTRACTOR'S SAFETY PRECAUTIONS OR FOR MEANS, METHODS, TECHNIQUES, CONSTRUCTION SEQUENCES, OR PROCEDURES REQUIRED TO PERFORM THE WORK.</p> <p>6. LOCATE ALL EQUIPMENT THAT MUST BE SERVICED, OPERATED, OR MAINTAINED IN FULLY ACCESSIBLE POSITIONS. EQUIPMENT SHALL INCLUDE, BUT NOT BE LIMITED TO, VALVES, MOTORS, CONTROLLERS, SWITCHGEAR, AND DRAIN POINTS IF REQUIRED FOR BETTER ACCESSIBILITY. FURNISH ACCESS DOORS FOR THIS PURPOSE. MINOR DEVIATIONS FROM THE DRAWINGS MAY BE ALLOWED TO PROVIDE FOR BETTER ACCESSIBILITY. ANY CHANGES SHALL BE APPROVED BY THE ARCHITECT AND CONSTRUCTION MANAGER/GENERAL CONTRACTOR PRIOR TO MAKING THE CHANGE.</p> <p>7. PROVIDE ACCESS DOORS, WALL OPENINGS, ROOF OPENINGS, OR ANY OTHER CONSTRUCTION REQUIREMENT NEEDED TO ACCOMMODATE THE MECHANICAL EQUIPMENT. LOCATIONS OF THESE OPENINGS SHALL BE SUBMITTED IN SUFFICIENT TIME TO BE INSTALLED IN THE NORMAL COURSE OF WORK.</p> <p>8. COORDINATE ELECTRICAL REQUIREMENTS OF APPROVED MECHANICAL EQUIPMENT WITH THE ELECTRICAL SUB-CONTRACTOR PRIOR TO THE PURCHASE AND INSTALLATION OF ANY ELECTRICAL EQUIPMENT, DEVICES, WIRING, OR CONDUIT.</p> <p>9. PROVIDE GENERAL CONTROL WIRING, THERMOSTATS, MOTORIZED DAMPERS AND CONDUIT ASSOCIATED WITH HVAC EQUIPMENT. COORDINATE THE LOCATION OF ALL THERMOSTATS, ROOM SENSORS, ETC. WITH THE ARCHITECT AND ALL OTHER TRADES PRIOR TO INSTALLATION. IF A CONFLICT WITH MILLWORK, LIGHT SWITCHES, WINDOWS, ETC. EXISTS, NOTIFY THE ARCHITECT OF THE POTENTIAL INTERFERENCE PRIOR TO INSTALLATION. INSTALL THERMOSTATS WITH PROTECTIVE LOCKING COVER, CENTERED AT 4'-0" ABOVE FINISHED FLOOR, UNLESS OTHERWISE INDICATED. COMPLY WITH THE PROVISIONS OF THE AMERICANS WITH DISABILITIES ACT (ADA) AND THE TEXAS ACCESSIBILITY'S STANDARD (TAS).</p> <p>10. ALL DIMENSIONS SHOWN ON THE DRAWINGS FOR DUCTWORK ARE NET INSIDE CLEAR DIMENSIONS. FOR RECTANGULAR DUCT, THE FIRST FIGURE OF THE DUCT SIZE INDICATES THE DIMENSION OF THE FACE SHOWN. VERIFY THAT THE DUCTWORK SPECIFIED WILL FIT IN THE SPACE AVAILABLE USING THE ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL DRAWINGS AS REFERENCE PRIOR TO FABRICATION AND INSTALLATION. ROUND DUCT OF EQUAL NET INSIDE CLEAR AREA MAY BE USED IN LIEU OF RECTANGULAR DUCT.</p> <p>11. PROVIDE TURNING VANES ON ALL RECTANGULAR SUPPLY, EXHAUST, AND RETURN DUCTWORK INCLUDING THE TOP AND BOTTOM OF VERTICAL DUCTS UNLESS OTHERWISE INDICATED.</p> <p>12. PROVIDE A LOCKING QUADRANT VOLUME DAMPER AT THE TOP OF EACH RUN-OUT TO DIFFUSERS FOR BALANCING PURPOSES, UNLESS OTHERWISE INDICATED. THE RUN-OUT DUCT SIZE IS THE SAME SIZE AS THE DIFFUSER OR GRILLE NECK SIZE, UNLESS OTHERWISE INDICATED.</p> <p>13. CEILING SPACE IS NEEDED AS A RETURN AIR PLENUM IN CERTAIN AREAS. FOLLOW ALL APPLICABLE CODES AS TO MATERIALS ALLOWED FOR USE IN AIR PLENUMS. COORDINATE ALL WORK TO PROVIDE FREE RETURN OF AIR FROM ALL LOCATIONS.</p> <p>14. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION OF ALL FIRE RATED WALLS AND CEILINGS. PROVIDE FIRE DAMPERS AND/OR COMBINATION FIRE/SMOKE DAMPERS IN DUCTWORK AT ALL LOCATIONS WHERE DUCTS PASS THROUGH FIRE RATED ASSEMBLY. MECHANICAL SUB-CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING FIRE AND FIRE/SMOKE DAMPERS. COORDINATE CONSTRUCTION REQUIREMENTS AND PROVISIONS FOR CONNECTIONS TO FIRE ALARM SYSTEM.</p> <p>15. ALL DUCTWORK SHALL BE SHEET METAL FABRICATED IN ACCORDANCE WITH SMACNA STANDARDS. ALL DUCTWORK ASSOCIATED WITH VARIABLE VOLUME SYSTEMS SHALL BE CONSTRUCTED TO 2" W.G. AND SEALED TO SMACNA CLASS A. SEAL ALL SEAMS WITH MASTIC SEALANT UL 181 LISTED FOR THE APPLICATION USED. SEALANT SHALL BE DESIGNED FOR USE ON METAL DUCT AND FLEXIBLE DUCT.</p> <p>16. ALL RECTANGULAR AND ROUND SUPPLY AND RETURN DUCTWORK LOCATED IN EXPOSED INTERIOR AREAS SHALL BE INTERNALLY LINED WITH DUCT LINER AND EXTERNALLY PAINTED. REFER TO ARCHITECT FOR COLOR SELECTION.</p> <p>17. INSTALL DX PIPING AS SPECIFIED, INCLUDING FILTER/DRYER, SIGHT GLASS, ISOLATION CHARGING VALVES, AND ALL APPURTENANCES PER MANUFACTURER'S RECOMMENDATIONS. INSTALLATION SHALL BE ACCOMPLISHED IN A NEAT AND ORDERLY FASHION, AS APPROVED BY THE ENGINEER. COORDINATE FOR ROUTING OF DX PIPING, UP INSIDE OF WALLS, ETC. AS REQUIRED, TERMINATING AT AHUs. PROVIDE BRACING/ISOLATION AS REQUIRED TO PREVENT VIBRATION OF DX PIPING INSIDE WALLS, ETC. SIZE, ROUTE, AND INSULATE DX PIPING PER MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATION REQUIREMENTS.</p> <p>18. PROVIDE VIBRATION ISOLATORS FOR MOTOR DRIVEN EQUIPMENT, UNLESS OTHERWISE NOTED. PROVIDE ISOLATION AS INDICATED OR AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER.</p> <p>19. SOME PIPES AND DUCTS SHOWN ON EACH FLOOR PLAN MAY BE SHOWN WITH AN OFFSET FOR CLARITY.</p> <p>20. SEAL ALL PIPE AND DUCT PENETRATIONS THROUGH FIRE RATED BUILDING ELEMENTS WITH AN APPROVED FIRE PROOFING MATERIAL.</p> <p>21. ALL EQUIPMENT SHALL HAVE IDENTIFICATION TAGS. TAGS SHALL BE PLASTIC LAMINATE, WHITE FACE WITH 1/2" TALL BLACK LETTERS. THE TAG SHALL MATCH THE UNIT DESIGNATIONS SHOWN ON THE SCHEDULES.</p> <p>22. EXPAND OR REDUCE DUCTS AT EQUIPMENT CONNECTIONS BASED ON THE EQUIPMENT PURCHASED, WITH TRANSITIONS NOT TO EXCEED 30 DEGREES. SIZES SHOWN ON SCHEDULES, ETC. ARE FOR GUIDANCE ONLY. ASPECT RATIO SHALL BE NO GREATER THAN 4:1, PER SMACNA'S GUIDELINES.</p> <p>23. ALL DUCTS WITH A DIMENSION GREATER THAN 12" PASSING THRU A NON-RATED WALL SHALL HAVE THE OPENING FRAMED IN WITH METAL STUDS. COORDINATE OPENING SIZE AND LOCATION WITH OTHER TRADES.</p> <p>24. PROVIDE HIGH POINT AIR VENTS AS SHOWN ON PLANS. WHERE PIPING ROUTING CREATES AIR TRAPS AIR VENTS SHALL BE INSTALLED ON EITHER SIDE OF TRAP.</p> <p>25. WHERE DAMPERS ARE LOCATED ABOVE HARD CEILINGS PROVIDE CONCEALED YOUNG REGULATORS. REGULATORS SHALL NOT BE LOCATED IN CORRIDORS, PATIENT CARE, OR TREATMENT AREAS. EACH REGULATOR SHALL BE LABELED PER THE SPECIFICATIONS.</p> <p>26. TEST AND BALANCE SHALL BE PERFORMED BY AN ASAC LICENSED FIRM IN THE TESTING, ADJUSTING, AND BALANCING (TAB) BUSINESS FOR A MINIMUM OF 10 YEARS. ASAC FIRM SHALL SUBMIT A REPORT TO THE ENGINEER OF RECORD INDICATING EQUIPMENT NAMEPLATE DATA, DESIGN PERFORMANCE, INITIAL TESTED PERFORMANCE, AND FINAL ADJUSTED PERFORMANCE. REPORT SHALL BE SUBMITTED IN A TIMELY FASHION PRIOR TO JOB CLOSE-OUT. TAB SHALL BE PERFORMED ON ALL NEW SYSTEMS SPECIFIED AND ON ALL EXISTING SYSTEMS MODIFIED AS PART OF THIS CONTRACT. TAB FIRM SHALL PERFORM A FUNCTIONAL PERFORMANCE TEST OF THE SYSTEM BASED ON THE CONTRACT DOCUMENTS HEREIN AND SHALL RELAY ALL DISCREPANCIES AND OUTSTANDING CONSTRUCTION ITEMS RELATING TO THE MECHANICAL EQUIPMENT AND PERFORMANCE TO THE ENGINEER OF RECORD.</p>	

ABBREVIATIONS			
AD	AIR CONDITIONING UNIT	L	LENGTH
A/C	ARCHITECT/ENGINEER	LAT	LEAVING AIR TEMPERATURE
A/E	ABOVE FINISHED FLOOR	LPC	LOW PRESSURE CONDENSATE
AFF	AIR FLOW SWITCH	LPS	LOW PRESSURE STEAM
AFS	AIR HANDLING UNIT	LB	POUNDS
AHU	APPROXIMATE	LRA	LOCKED ROTOR AMPS
APPROX	BRAKE HORSEPOWER	LWT	LEAVING WATER TEMPERATURE
BHP	BRITISH THERMAL UNIT PER HOUR	MAX	MAXIMUM
BTU	COMBUSTION AIR	MBH	1000 BRITISH THERMAL UNITS/HOUR
C/A	COOLING COIL	MCA	MINIMUM CIRCUIT AMPACITY
C/C	CUBIC FEET PER HOUR	MFR	MANUFACTURER
CFH	CUBIC FEET PER MINUTE	MIN	MINIMUM
CFM	CEILING	N/A	NOT APPLICABLE
CLG	CONDENSING UNIT	N/O	NORMALLY OPEN
CU	EQUIPMENT DRAIN	N/C	NORMALLY CLOSED
D	DEGREES	O/A	OUTSIDE AIR/FRESH AIR
DEG	DRY BULB	OBD	OPPOSED BLADE DAMPER
DB	DOWN	O/C	ON CENTER
DN	EXISTING	PEF	PURGE EXHAUST FAN
EJ	ENTERING AIR TEMPERATURE	PH	PHASE
EAT	EXHAUST AIR	PROVIDE	FURNISH AND INSTALL
E/A	ELECTRIC DUCT HEATER	PRV	PRESSURE REDUCING VALVE
EDH	EXHAUST FAN	PSI	POUNDS PER SQUARE INCH
EF	EQUIPMENT	R/A	RETURN AIR
EQUIP	ENTERING WATER TEMPERATURE	RE	REFERENCE, REFER
EWT	DEGREES FAHRENHEIT	RL	REFRIGERANT LIQUID
°F	FAN COIL UNIT	RLA	RUNNING LOAD AMPS
FCU	FIRE DAMPER	RM	ROOM
FD	FULL LOAD AMPS	RPM	REVOLUTIONS PER MINUTE
FLA	FLOOR	RS	REFRIGERANT SUCTION
FLR	FLAT OVAL DUCT	S/A	SUPPLY AIR
FO	FIRE SMOKE DAMPER	SD	SMOKE DETECTOR
FSD	FOOT, FEET	SF	SQUARE FOOT, SUPPLY FAN
FT	FEET WATER GAUGE	SPECS	SPECIFICATIONS
FT, WG	U.S. GAUGE	T, TSTAT	THERMOSTAT, ROOM SENSOR
GA	GALLONS PER MINUTE	T/A	TRANSFER AIR
HP	HORSEPOWER	THRU	THROUGH
HPC	HIGH PRESSURE CONDENSATE	TSP	TOTAL STATIC PRESSURE
HPS	HIGH PRESSURE STEAM	TYP	TYPICAL
HRT	HEATING WATER RETURN	UL	UNDERWRITERS LABORATORIES, INC.
HWR	HEATING WATER SUPPLY	UH	UNIT HEATER
HWS	HEATING WATER SUPPLY	V	VOLTS
HZ	HERTZ	VAV	VARIABLE VOLUME
IN	INCH, INCHES	VEL	VELOCITY
IN, WG	INCHES WATER GAUGE	VFD	VARIABLE FREQUENCY DRIVE
J, BOX	JUNCTION BOX	W/	WITH
KW	KILOWATT	WB	WET BULB
		W/O	WITHOUT

LINE TYPES	
SYMBOL	DESCRIPTION
—CWS	CONDENSER WATER SUPPLY
—CWR	CONDENSER WATER RETURN
—CHW	CHILLED WATER SUPPLY
—CHR	CHILLED WATER RETURN
—HWS	HEATING WATER SUPPLY
—HWR	HEATING WATER RETURN
—RD	REFRIGERANT DISCHARGE
—RL	REFRIGERANT SUCTION
—RLS	REFRIGERANT LIQUID
—HPS	HIGH PRESSURE STEAM
—HPC	HIGH PRESSURE CONDENSATE
—LPS	LOW PRESSURE STEAM
—LPC	LOW PRESSURE CONDENSATE
—PC	PUMPED CONDENSATE
—MU	MAKE-UP WATER
—	DIRECTION OF FLOW
—	DIRECTION OF PIPE SLOPE DOWN

VALVES AND FITTINGS	
SYMBOL	DESCRIPTION
—	SHUT-OFF / ISOLATION VALVE
—	BALL VALVE
—	BUTTERFLY VALVE
—	GLOBE VALVE
—	PLUG VALVE / COCK VALVE
—	CHECK VALVE
—	2-WAY CONTROL VALVE
—	3-WAY CONTROL VALVE
—	SOLENOID VALVE
—	STRAINER
—	CALIBRATED BALANCING VALVE
—	FLOW SWITCH
—	UNION (DIELECTRIC)
—	VALVE IN RISER
—	END RISE (90° ELL)
—	END DROP (90° ELL)
—	RISE OR DROP
—	TEE OUT OF TOP OF PIPE
—	TEE OUT OF BOTTOM OF PIPE
—	CAP ON END OF PIPE
—AG	ALIGNMENT GUIDE
—	PIPE ANCHOR, PIPE DEMOLITION

DRAWING/DETAIL REFERENCE	
REFER TO DRAWING/DETAIL NUMBER	RE: 2/M1.71
SHEET NUMBER	10X10 250
NECK SIZE OR WIDTH X HEIGHT (FOR LOUVERS)	
AMOUNT OF AIR	
DIFFUSER, GRILLE DESIGNATION	
ELEVATION NUMBER	1-M301
SHEET NUMBER	

MISCELLANEOUS	
DRAWING NOTE REFERENCE (I.E., NOTES BY SYMBOL)	
CONNECTION TO EXISTINGS	

SYMBOLS	
SYMBOL	DESCRIPTION
20/20	ACoustical, DUCT LINING (FIGURES SHOWN ARE INSIDE DUCT DIMENSIONS)
20/20	SUPPLY AIR DUCT UP (POSITIVE PRESSURE)
20/20	RETURN, EXHAUST OR OUTSIDE AIR INTAKE
20/20	SUPPLY AIR DUCT DOWN (POSITIVE PRESSURE)
20/20	RETURN, EXHAUST OR OUTSIDE AIR INTAKE
20/20	SUPPLY AIR DUCT DOWN (POSITIVE PRESSURE)
20/20	RETURN, EXHAUST OR OUTSIDE AIR INTAKE
18"0	ROUND DUCT UP
18"0	ROUND DUCT DOWN
18"0	ROUND DUCT UP
18"0	ROUND DUCT DOWN
18"0	ROUND DUCT UP
18"0	ROUND DUCT DOWN
0.5 1.0	ARROW INDICATES DIRECTION OF AIR FLOW
UP	INDICATES SMACNA PRESSURE CLASS OF DUCT CONSTRUCTION
AD	CHANGE OF ELEVATION, RISE(UP) OR DROP (DN) IN DIRECTION OF ARROW
AD	ACCESS DOOR, BOTTOM (UNLESS OTHERWISE NOTED) SIZE AS NOTED OR SPECIFIED
AD	ACCESS DOOR, SIDE, SIZE AS NOTED OR SPECIFIED
RECTANGULAR DUCT SQUARE ELBOW WITH TURNING VANES	
RECTANGULAR DUCT RADIUS ELBOW	R=3W/2
ROUND DUCT RADIUS ELBOW	R=3D/2
TRANSITION CONCENTRIC (UNLESS TOP LEVEL(TOP LVL) OR BOTTOM LEVEL(BOT LVL) IS NOTED)	16/20
TRANSITION, RECTANGULAR TO ROUND CONCENTRIC (UNLESS TOP LEVEL(TOP LVL) OR BOTTOM LEVEL (BOT LVL) IS NOTED)	20/20 16"0
DUCT FLEXIBLE CONNECTION	
SOUND ATTENUATOR	
SQUARE CEILING DIFFUSER (SUPPLY; 4-WAY UNLESS OTHERWISE INDICATED)	
SQUARE RETURN CEILING GRILLE	
SQUARE EXHAUST CEILING GRILLE	
THERMOSTAT, TEMP SENSOR, CARBON MONOXIDE SENSOR	T T CO
DUCT SPLITTER WITH DAMPER	
MOTORIZED DAMPER	M
MANUAL VOLUME DAMPER	or
FIRE DAMPER	FD or FD

BASIS OF MECHANICAL DESIGN	
PRIMARY MECHANICAL CODES: MECHANICAL: 2015 INTERNATIONAL MECHANICAL CODE (WITH CITY AMENDMENTS). ENERGY: 2006 INTERNATIONAL ENERGY CODE (WITH CITY AMENDMENTS).	
PROJECT DESIGN VALUES: OUTDOOR DESIGN TEMPERATURE (SUMMER): 101.2°F (DRYBULB), 72.7°F (WETBULB) AMBIENT TEMPERATURE AT CONDENSING UNITS: 105°F (DRYBULB, SUMMER) OUTDOOR DESIGN TEMPERATURE (WINTER): 18.6°F (DRYBULB) INDOOR DESIGN TEMPERATURE (SUMMER): 75°F (DRYBULB), 50% (RELATIVE HUMIDITY) INDOOR DESIGN TEMPERATURE (WINTER): 72°F (DRYBULB)	

DEMOLITION WORK NOTES	
GENERAL	
<p>1. EXISTING WORK SHOWN ON PLANS IS FROM PREVIOUS ENGINEERING DOCUMENTS AND FIELD OBSERVATIONS. ACTUAL CONDITIONS MAY VARY. FIELD VERIFY EXISTING WORK AND MAKE MINOR ADJUSTMENTS NECESSARY TO COMPLETE WORK. IF EXISTING CONDITIONS PROHIBIT WORK, NOTIFY THE ARCHITECT FOR DIRECTION, AS REQUIRED.</p> <p>2. WHERE EXISTING EQUIPMENT OR DUCTWORK IS LOCATED SUCH THAT IT IS ALONG THE TOP OF NEW WALLS TO DECK, IT SHALL BE RELOCATED. COORDINATE SUCH WORK WITH OTHER TRADES. RELOCATED EQUIPMENT SHALL BE TO A LOCATION THAT ALLOWS ACCESS FOR PERIODIC SERVICING AND REPAIR.</p> <p>3. COORDINATE WITH ALL TRADES FOR REQUIRED CEILING REMOVAL IN EXISTING BUILDING. NOTIFY THE ARCHITECT AND OWNER PRIOR TO COMMENCING REMOVAL. REMOVE ONLY THAT PORTION OF THE CEILING NECESSARY TO ACCESS AND COMPLETE THE WORK. UPON COMPLETION OF THE ABOVE CEILING WORK, CEILING IS TO BE REINSTALLED. REPLACE ANY DAMAGED CEILING TILES WITH NEW TILES TO MATCH EXISTING.</p> <p>4. DEMOLITION SHALL EXTEND TO POINTS OF CONNECTION WITH LIVE SERVICES (PANELBOARDS, PIPING MAINS, ETC). DEMOLITION SHALL NOT PERMIT ABANDONMENT OF ANY PORTION OF ANY SYSTEM UNLESS SPECIFICALLY NOTED AS "ABANDON IN PLACE" OR "TO REMAIN".</p> <p>5. DEMOLITION SHALL INCLUDE EQUIPMENT, PIPING, DUCTWORK, SUPPORTS, FITTINGS, ACCESSORIES, CONTROLS, WIRING, CONDUIT, ETC. IN THEIR ENTIRETY UNLESS OTHERWISE NOTED.</p> <p>6. VERIFY THE CONDITION OF ALL EXISTING EQUIPMENT WITHIN THE PROJECT SCOPE. EXACT SIZES OF EXISTING DUCT AND PIPING, ETC BEFORE COMMENCING DEMOLITION WORK. REPORT ANY DISCREPANCIES BETWEEN PLANS AND ACTUAL FIELD CONDITIONS TO ARCHITECT PRIOR TO THE COMMENCEMENT OF DEMOLITION WORK.</p> <p>7. PATCH OPENINGS IN WALLS TO MAINTAIN THE INTEGRITY OF THE WALL WHERE AIR DEVICES HAVE BEEN REMOVED. REFER TO ARCHITECTURAL DRAWINGS/SPECIFICATIONS FOR ADDITIONAL INSTRUCTIONS.</p>	
EQUIPMENT	
<p>1. THE OWNER HAS THE FIRST RIGHT-OF-REFUSAL FOR ALL DEMOLISHED EQUIPMENT. THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND PROPER DISPOSAL OF ANY EQUIPMENT REFUSED BY THE OWNER.</p> <p>2. ALL REMOVED EQUIPMENT SHALL BE MAINTAINED IN GOOD CONDITION. REMOVED EQUIPMENT NOT INDICATED FOR RE-USE SHALL REMAIN THE PROPERTY OF THE OWNER. REMOVE THE EQUIPMENT AND DELIVER IT TO THE OWNER. SHOULD THE OWNER DECLINE THE POSSESSION OF THE REMOVED EQUIPMENT, IT SHALL BECOME THE PROPERTY OF THE CONTRACTOR FOR REMOVAL FROM SITE.</p> <p>3. WHEN ALL CONSTRUCTION IS COMPLETE, INSTALL NEW, CLEAN PRE-/POST-FILTERS IN AIR UNITS SERVING THE RENOVATED AREAS. VERIFY CONDITION OF UNIT FILTER GAUGES AND REPAIR OR REPLACE IF FOUND TO BE DAMAGED OR NON-FUNCTIONAL.</p> <p>4. FOR ALL EQUIPMENT TO BE DEMOLISHED, RECLAIM REFRIGERANT PRIOR TO DEMO OR REMOVAL OF EQUIPMENT IN ACCORDANCE WITH LOCAL AIR REQUIREMENTS AND US EPA REGULATIONS. REFRIGERANT RECLAIMER MUST BE CERTIFIED BY THE EPA.</p>	
DUCTWORK	
<p>1. CAP AND SEAL AIR TIGHT ALL POINTS AT WHICH DUCTWORK IS REMOVED FROM DUCTWORK THAT WILL REMAIN. RE-INSULATE REMAINING DUCTWORK TO MAINTAIN VAPOR BARRIER.</p> <p>3. TAKE AIR READINGS OF ALL GRILLES, REGISTERS, AND DIFFUSERS IN PROJECT AREAS PRIOR TO DEMOLITION. RECORD AND SUBMIT TO ARCHITECT/ENGINEER.</p> <p>4. VERIFY CLEARANCE REQUIREMENTS AND INDICATE ROUTING OF NEW DUCTWORK BEFORE FABRICATION BEGINS AS RISES AND DROPS MAY BE NECESSARY DUE TO EXISTING FIELD CONDITIONS.</p>	
PIPING	
<p>1. WHERE PIPING IS SHOWN TO BE DEMOLISHED, IT SHALL BE DEMOLISHED TO THE POINT OF ORIGIN AT THE NEAREST ACTIVE MAIN. INSTALL SHUT-OFF VALVE AND CAP FOR FUTURE CONNECTION.</p>	
CONTROLS	
<p>1. DEMOLITION AND/OR RELOCATION OF CONTROLS FOR EQUIPMENT SHALL INCLUDE, BUT NOT BE LIMITED TO: SPACE AND DUCT THERMOSTATS SPACE AND DUCT TEMPERATURE/HUMIDITY SENSORS; SMOKE DETECTORS, FIRE-STATS, FREEZE-STATS, AND OTHER SAFETY OR LIMITING DEVICES. RTU AND EXISTING CONTROL SYSTEMS CONTROL PANELS</p> <p>2. VERIFY CONDITION OF ALL EXISTING LIVE SAFETY DEVICES (FIRE DAMPERS, DUCT DETECTORS, ETC) THAT ARE TO REMAIN AND ARE WITHIN LIMITS OF CONSTRUCTION. REPAIR OR REPLACE IF FOUND TO BE DAMAGED OR NON-FUNCTIONAL.</p>	

MISCELLANEOUS

DRAWING NOTE REFERENCE (I.E., NOTES BY SYMBOL)

1

CONNECTION TO EXISTING

DATE

DESCRIPTION

REV. DATE

DANIEL BUILDING RENOVATION

J.S. BRIDWELL ACTIVITIES CENTER & CANNEDY GREEK COMMONS

MSU TEXAS

WESTERN STATE UNIVERSITY

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MECHANICAL GENERAL NOTES AND LEGENDS

M001

INDOOR HYDRONIC AIR HANDLER SCHEDULE																															
MARK AHU-	SERVES	ARRANGMENT	SCFM	MIN O/A CFM	DESIGN O/A CFM	EXT. S.P. IN WG	COOLING DATA										HEATING DATA								FAN ELEC. DATA				WEIGHT (lbs)	MANUFACTURER AND MODEL	REMARKS
							ENT AIR DB	DEG. F. WB	LV AIR DB	DEG. F. WB	MIN. CAP. MBH	SENS	TOTAL	GPM	WATER ENT. DEG. F.	LVG. DEG. F.	MAX. PD FT WG	EAT DB DEG. F.	LAT DB DEG. F.	MIN. CAP. MBH	GPM	WATER ENT. DEG.	LVG. DEG	MAX. PD FT WG	H.P.	V	PH	MCA			
1	EVENT	DOWN FLOW/ FLOOR MOUNT	4,920	250	1,085	2	81.1	64.8	54.9	52.9	124.9	159.1	19.9	45.0	61.0	20	58.7	95.0	193.1	19.3	180.0	160.0	1	7.5	208	3	26.4	45	2,293	JCI/XTI	1,2,3,4,5,6,7,8,9,10,12,14,15,16,17
2	STUDENT GOVER B AND CORE	DOWN FLOW/ FLOOR MOUNT	3,335	N/A	620	2	79.5	64.3	57.3	54.1	120.1	134.4	16.8	45.0	61.0	20	60.4	95.0	124.5	12.4	180.0	160.0	1	5	208	3	26.4	45	2,280	JCI/XTI	1,2,3,4,5,6,7,8,9,10,12,14,15,16,17
3	GREEK C	HORIZONTAL/ FLOOR MOUNT	2,110	N/A	495	0.7	81.5	65.1	55.3	53.5	61.8	74.1	9.3	45.0	61.0	20	57.9	95.0	84.4	8.4	180.0	160.0	1	2	208	3	8.3	15	623	JCI/HDD	1,2,3,4,5,6,7,8,13,16,17
4	GREEK D	HORIZONTAL/ FLOOR MOUNT	2,120	N/A	480	0.7	81.3	65.0	54.1	52.6	56.9	70.4	8.8	45.0	61.0	20	58.4	95.0	83.9	8.4	180.0	160.0	1	2	208	3	8.3	15	623	JCI/HDD	1,2,3,4,5,6,7,8,13,16,17
5	GREEK E	HORIZONTAL/ FLOOR MOUNT	2,120	N/A	480	0.7	81.3	65.0	54.1	52.6	55.2	68.6	8.6	45.0	61.0	20	58.4	95.0	83.9	8.4	180.0	160.0	1	2	208	3	8.3	15	623	JCI/HDD	1,2,3,4,5,6,7,8,13,16,17
6	GREEK F	HORIZONTAL/ FLOOR MOUNT	2,120	N/A	480	0.7	81.3	65.0	54.1	52.6	55.0	68.4	8.6	45.0	61.0	20	58.4	95.0	83.9	8.4	180.0	160.0	1	2	208	3	8.3	15	623	JCI/HDD	1,2,3,4,5,6,7,8,13,16,17
7	GREEK G	VERTICAL/ FLOOR MOUNT	590	N/A	100	0.7	81.3	65.0	55.0	52.7	12.6	14.5	1.8	45.0	61.0	20	61.3	95.0	21.5	2.1	180.0	160.0	1	1/4	115	1	6.1	15	161	JCI/CDV	1,2,3,4,5,6,7,8,11,13,17
8	CAFÉ	VERTICAL/ FLOOR MOUNT	2,100	N/A	510	0.7	81.7	65.0	54.1	52.6	56.2	70.3	8.8	45.0	61.0	20	57.5	95.0	85.0	8.5	180.0	160.0	1	2	208	3	8.3	15	623	JCI/VD	1,2,3,4,5,6,7,8,13,16,17
9	SEATING AND VESTIBULE	VERTICAL/ FLOOR MOUNT	2,150	N/A	190	0.7	77.4	63.5	54.1	52.6	64.9	69.3	8.7	45.0	61.0	20	65.5	95.0	68.6	6.9	180.0	160.0	1	2	208	3	8.3	15	623	JCI/VD	1,2,3,4,5,6,7,8,13,17
10	STUDENT GOVER. H	VERTICAL/ FLOOR MOUNT	555	N/A	100	0.7	81.3	65.0	55.0	53.2	12.6	14.5	1.8	45.0	61.0	20	60.7	95.0	20.5	2.1	180.0	160.0	1	1/4	115	1	6.1	15	161	JCI/CDV	1,2,3,4,5,6,7,8,11,13,17

- EXTERNAL STATIC PRESSURE DOES NOT INCLUDE FILTER OR UNIT LOSSES
- PROVIDE MOTORIZED CONTROL DAMPER ON THE RETURN AND OUTDOOR AIR CONNECTIONS
- PROVIDE FILTER RACK/SECTION DESIGNED FOR 2" MERV. 8 FILTERS.
- PROVIDE COOLING COIL AND HEATING COIL PIPING PACKAGE WITH CONTROL AND ISOLATION VALVES.
- PROVIDE WITH ECONOMIZER MODE. OUTSIDE AIR DAMPERS SHALL BE SPLIT FOR ECONOMIZER MODE AND FOR DESIGN OUTSIDE AIRFLOW.
- JCI IS THE AHU BASIS OF DESIGN. ACCEPTABLE MANUFACTURER: CARRIER AND YORK. CONTRACTOR IS RESPONSIBLE FOR VARIATION TO FIT, ELECTRICAL CONNECTION.
- PROVIDE WITH STAINLESS STEEL DRAIN PAN.
- PROVIDE ABB VFD FOR CONTROL OF SUPPLY FAN.
- UNIT SHALL BE DOUBLE WALL CONSTRUCTION WITH MINIMUM 2" FOAM INSULATION BETWEEN PANELS. R-VALUES OF INSULATION SHALL BE R-13 OR HIGHER. PANELS SHALL BE THERMALLY BROKEN.
- AHU EQUIPMENT PAD HEIGHT SHALL BE SIZED TO MEET THE CONDENSATE TRAP DIMENSIONS.
- EQUIPMENT IS NOT IN BASE BID. EQUIPMENT IS FOR ALTERNATE 2.
- EQUIPMENT WILL REQUIRE SEPARATE POWER CONNECTION FOR LIGHTS AND OUTLET (120V, 1PH, 60 HZ, 15 MOCP). COORDINATE WITH ELECTRICAL CONTRACTOR TO PROVIDE POWER AS NEEDED.
- UNIT SHALL BE SINGLE WALL CONSTRUCTION WITH 1" FOAM INSULATION.
- PROVIDE WITH MANUFACTURER'S DEMAND CONTROLLED VENTILATION PACKAGE.
- PROVIDE WITH CO2 SENSOR
- PROVIDE WITH HUMIDITY SENSOR
- CAPACITIES LISTED ARE NET FROM UNIT DISCHARGE. UNIT SHALL PERFORM TO LISTED CAPACITIES. UNIT PERFORMANCE MUST SATISFY BOTH SENSIBLE AND LATENT CAPACITY REQUIREMENTS.

DX DUCTLESS SPLIT SYSTEM HEAT PUMP SCHEDULE																													
MARK ACCU- AC-	SERVICE	AIR HANDLER				MANUFACTURER MAKE AND MODEL	AIR COOLED CONDENSING UNIT				HEATING PERFORMANCE DATA					COOLING PERFORMANCE DATA					REMARKS								
		ARRANGEMENT	CFM	FLA	POWER CONNECTION				COMPRESSORS NO.	REF. TYPE	FANS		POWER CONNECTION				TOTAL CAPACITY (MBH)	O.D. D.B.F.	ENT. D.B.F.	LVG. D.B.F.		HSPF	CAPACITY (MBH)		O.D. D.B.F.	ENTERING		MIN. SEER	
					V.		Ph.	MCA			MOCPP	NO.	FLA	V.	Ph.	MCA							MOCPP	TOTAL		SENS	D.B.F.		W.B.F.
1	ELECTRICAL ROOM	WALL MOUNT	530	0.4	POWERED THRU CU	LG/LSN243HLV	1	14.6	R410A	1	0.25	208	1	19	30	LG/LSU243HLV	14.3	18.0	70.0	95.0	12.0	20.4	17.9	105	75	58	21.5	1,2,3,4,5,6,7,8,9,10	
2	I.D.F	WALL MOUNT	530	0.4	POWERED THRU CU	LG/LSN243HLV	1	14.6	R410A	1	0.25	208	1	19	30	LG/LSU243HLV	14.3	18.0	70.0	95.0	12.0	20.4	17.9	105	75	58	21.5	1,2,3,4,5,6,7,8,9,10	

- PROVIDE WITH LG HARD WIRED THERMOSTAT AND CONDENSATE PUMP
- SIZE, ROUTE, INSULATE AND PROVIDE APPURTENANCES FOR DX PIPING SYSTEMS, PER MANUFACTURER RECOMMENDATIONS
- COORDINATE OUTDOOR UNIT MOUNTING REQUIREMENTS.
- PROVIDE WITH MANUFACTURER'S LONG REFRIGERANT LINE KIT AS NEEDED.
- LG IS THE BASIS FOR DESIGN. ACCEPTABLE ALTERNATE MANUFACTURERS ARE: DAIKIN AND MITSUBISHI - NO EXCEPTIONS. CONTRACTOR IS RESPONSIBLE FOR VARIATIONS IN FIT, AND ELECTRICAL SERVICE.
- PROVIDE FILTER DRYER AND SIGHT GLASS ON THE DX LINE.
- PROVIDE UNIT WITH FACTORY CONDENSATE PUMP. VERIFY PUMP HEAD WITH CONDITIONS IN THE FIELD. COORDINATE POWER REQUIREMENTS WITH ELECTRICAL CONTRACTOR.
- CONDENSING UNIT IS A SINGLE POINT OF POWER CONNECTION. CONDENSING UNIT POWERS ASSOCIATED AIR HANDLER FROM TERMINAL STRIP LOCATED ON CONDENSING UNIT. FOLLOW MANUFACTURER'S RECOMMENDED GUIDELINES.
- LISTED CAPACITIES ARE FOR THE AIR HANDLER UNIT AND CONDENSER UNIT COMBINATION. UNITS SHALL PERFORM TO LISTED CAPACITIES.
- PROVIDE WITH MANUFACTURER BACNET CARD FOR MIGRATING INTO EXISTING BAS SYSTEM.

FAN SCHEDULE														
MARK EF-	SERVE	CFM	EXT. SP IN. WG	MOTOR DATA			DRIVE	MAX. SONES	WEIGHT (lbs)	MANUFACTURER AND MODEL NUMBER	TOGGLE SWITCH	CONTROLS	DDC	REMARKS
				HP (WATTS)	VOLTS	PH						24HR/7DAY PROG. TIME CLOCK		
1	WOMENS R.R AND FAMILY R.R	675	0.4	(249)	115	1	DIRECT	4.0	42	LOREN-COOK, GN			X	1,2,3,4,5,6,7,8
2	MENS R.R	525	0.5	(249)	115	1	DIRECT	4.0	42	LOREN-COOK, GN			X	1,2,3,4,5,6,7,8
3	GREEK SUITE C R.R.	150	0.5	(71)	115	1	DIRECT	3.5	25	LOREN-COOK, GN			X	1,2,3,4,5,6,7,8
4	GREEK SUITE D R.R.	150	0.5	(71)	115	1	DIRECT	3.5	25	LOREN-COOK, GN			X	1,2,3,4,5,6,7,8
5	GREEK SUITE E R.R.	150	0.5	(71)	115	1	DIRECT	3.5	25	LOREN-COOK, GN			X	1,2,3,4,5,6,7,8
6	GREEK SUITE F R.R.	150	0.5	(71)	115	1	DIRECT	3.5	25	LOREN-COOK, GN			X	1,2,3,4,5,6,7,8
7	GREEK SUITE G R.R.	75	0.5	(36)	115	1	DIRECT	2.0	21	LOREN-COOK, GN			X	1,2,3,4,5,6,7,8,9

- OR APPROVED EQUAL
- FAN OPERATES BASED ON DDC SYSTEM SCHEDULES.
- LOREN COOK IS THE BASIS FOR DESIGN. ACCEPTABLE ALTERNATE MANUFACTURER'S ARE: GREENHECK, TWIN CITY, AND CAPTIVEAIRE - NO EXCEPTIONS. CONTRACTOR IS RESPONSIBLE FOR VARIATIONS IN FIT AND ELECTRICAL SERVICE.
- PROVIDE OSHA APPROVED GUARDS
- PROVIDE A GRAVITY BACKDRAFT DAMPER
- IN-LINE CABINET FAN, CENTRIFUGAL
- SUSPEND FROM STRUCTURE ABOVE. USE FAN MANUFACTURER'S HANGING VIBRATION ISOLATOR KIT
- PROVIDE FAN WITH INTEGRAL DISCONNECT
- EQUIPMENT IS NOT IN BASE BID. EQUIPMENT IS FOR ALTERNATE 2.

PUMP SCHEDULE												
MARK	LOCATION	SERVES	TYPE	GPM	TOTAL HEAD FT. WG	MOTOR DATA					MANUFACTURER AND MODEL	REMARKS
						HP	RPM	V	PH	HZ		
HWP-1	MECH ROOM	(E) STEAM TO HOT WATER CONVERTER	VERTICAL INLINE	85	60	3	2982	208	3	60	ARMSTRONG/ 4300	1,2,3,4,5,6

- OR APPROVED EQUAL
- VERTICAL INLINE CASE CENTRIFUGAL
- PROVIDE WITH VARIABLE FREQUENCY DRIVE BUILT INTO MOTOR.
- ARMSTRONG IS BASIS OF DESIGN. CONTRACTOR IS RESPONSIBLE IN VARIATION TO FIT AND ELECTRICAL SERVICE.
- CAPACITIES LISTED ARE NET FROM UNIT DISCHARGE. UNIT MUST SATISFY ALL CAPACITY REQUIREMENTS.
- PROVIDE STATION SUPPORTS FOR PAD MOUNTING.

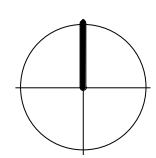
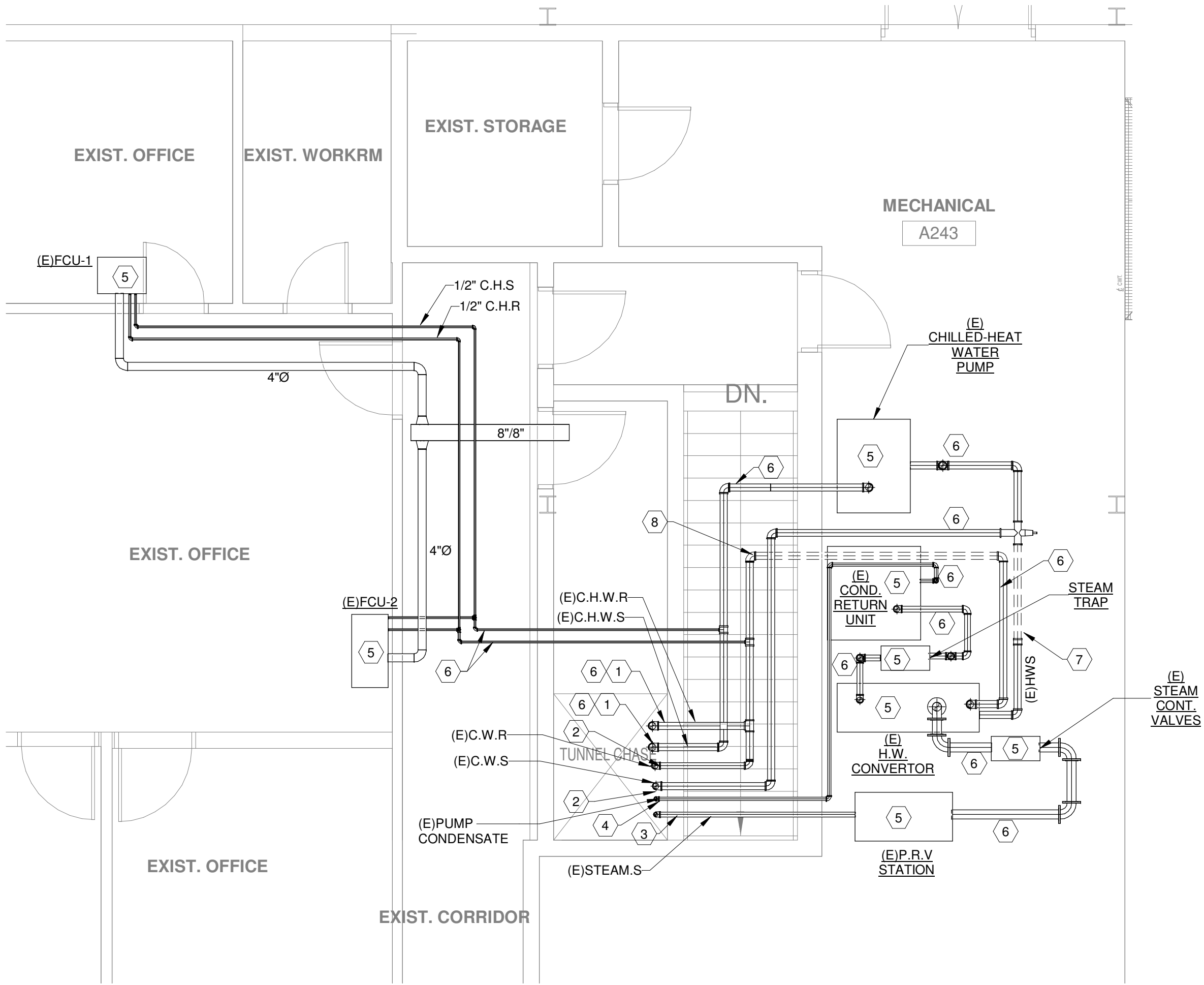
CASED REHEAT COIL SCHEDULE												
MARK	LOCATION	SERVES	SCFM	AIR PRESS. DROP	REHEAT DATA					MAX. PD FT WG	MANUFACTURER AND MODEL	REMARKS
					EAT DB DEG.	LAT DB DEG.	MIN. CAP. MBH	GPM	ENT. DEG.	LVG. DEG.		
HC-1	IN DUCT	AHU-3	2,110	0.26	55.0	70.0	34.2	6.0	180	160	1.6	TEMTROL 1,2
HC-2	IN DUCT	AHU-4	2,120	0.26	55.0	70.0	34.3	6.0	180	160	1.6	TEMTROL 1,2
HC-3	IN DUCT	AHU-5	2,120	0.26	55.0	70.0	34.3	6.0	180	160	1.6	TEMTROL 1,2
HC-4	IN DUCT	AHU-6	2,120	0.26	55.0	70.0	34.3	6.0	180	160	1.6	TEMTROL 1,2
HC-5	IN DUCT	AHU-8	2,100	0.26	55.0	70.0	34.0	6.0	180	160	1.6	TEMTROL 1,2

- COIL SHALL BE SHIPPED WITH FLANGES FOR DUCT CONNECTION.
- HEATING COIL SHALL BE FACTORY SHIPPED WITH 2-WAY VALVE, ACTUATOR AND ASSOCIATED PIPING.

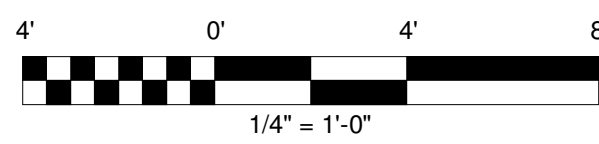
AIR DEVICE SCHEDULE							
MARK	SERVES	NECK SIZE	FACE SIZE	MOUNTING	TYPE	MANUFACTURER AND MODEL NO.	REMARKS
A	SUPPLY	10"	24" X 24"	LAY-IN	LOUVERED	TITUS OMNI	1,2,3,4,5,6,8
B	SUPPLY	8"	24" X 24"	LAY-IN	LOUVERED	TITUS OMNI	1,2,3,4,5,6,8
C	SUPPLY	6"	24" X 24"	LAY-IN	LOUVERED	TITUS OMNI	1,2,3,4,5,6,8
D	SUPPLY	14" X 6"	16" X 8"	SIDE WALL	AEROBLADE	TITUS 272 FL	1,2,3,5,7
E	SUPPLY	8" X 8"	10" X 10"	SIDE WALL	AEROBLADE	TITUS 272 FL	1,2,3,5,7
G	RETURN	22" X 22"	24" X 24"	LAY-IN	PERFORATED	TITUS PAR	1,2,3
H	TRANSFER	12" X 12"	24" X 24"	LAY-IN	PERFORATED	TITUS PAR	1,2,3,5
J	EXHAUST	12"	24" X 24"	LAY-IN	PERFORATED	TITUS PAR	1,2,3
K	EXHAUST	8"	24" X 24"	LAY-IN	PERFORATED	TITUS PAR	1,2,3
M	EXHAUST	6"	24" X 24"	LAY-IN	PERFORATED	TITUS PAR	1,2,3
N	EXHAUST	6" X 6"	8" X 8"	SIDE WALL	PERFORATED	TITUS 8F	1,2,3,7

- UNITS SHALL BE FURNISHED WITH APPROPRIATE FRAMES, ETC. FOR MOUNTING IN RESPECTIVE CEILING/WALL TYPES AND CONDITIONS
- OFF-WHITE BAKED ENAMEL FINISH
- OR APPROVED EQUAL
- FOUR-WAY THROW UNLESS OTHERWISE INDICATED ON PLAN
- TRANSITION FROM BACK OF GRILLE TO DUCT SIZE SHOWN
- 18" X 18" FACE SIZE, FOR 24" X 24" LAY-IN MODULE SIZE
- PROVIDE WITH OPPOSED BLADE DAMPER
- PROVIDE INSULATION BLANKET ON BACK OF DIFFUSER.

AIR HOOD SCHEDULE							
MARK	SERVES	LOCATION	CFM	EXT. SP IN. WG	WEIGHT (LBS)	MANUFACTURER AND MODEL	REMARKS
OAH-1	AHU-1	ROOF	1,085	0.05	93	LOREN COOK/ PR	1,3,4,5,6,7
OAH-2	AHU-2	ROOF	720	0.05	71	LOREN COOK/ PR	1,3,4,5,6,7
OAH-3	AHU-3	ROOF	495	0.05	51	LOREN COOK/ PR	1,3,4,5,6,7
OAH-4	AHU-4	ROOF	480	0.05	51	LOREN COOK/ PR	1,3,4,5,6,7
OAH-5	AHU-5	ROOF	480	0.05	51	LOREN COOK/ PR	1,3,4,5,6,7
OAH-6	AHU-6	ROOF	480	0.05	51	LOREN COOK/ PR	1,3,4,5,6,7
OAH-7	AHU-7	ROOF	100	0.05	34	LOREN COOK/ PR	1,3,4,5,6
OAH-8	AHU-8	ROOF	510	0.05	51	LOREN COOK/ PR	1,3,4,5,6,7
OAH-9	AHU-9	ROOF	180	0.05	51	LOREN COOK/ PR	1,3,4,5,6,7
OAH-10	AHU-10	ROOF	100	0.05	34	LOREN COOK/ PR	1,3,4,5,6
EAH-1	EF-1	ROOF	675	0.05	64	LOREN COOK/ PR	1,2,3,4
EAH-2	EF-2	ROOF	525	0.05	64	LOREN COOK/ PR	1,2,3,4
EAH-3	EF-3	ROOF	150	0.05	34	LOREN COOK/ PR	1,2,3,4
EAH-4	EF-4	ROOF	150	0.05	34	LOREN COOK/ PR	1,2,3,4
EAH-5	EF-5	ROOF	150	0.05	34	LOREN COOK/ PR	1,2,3,4
EAH-6	EF-6	ROOF	150	0.05	34	LOREN COOK/ PR	1,2,3,4
EAH-7	EF-7	ROOF	75	0.05	34	LOREN COOK/ PR	1,2,3,4



1



ENLARGED SECOND FLOOR MECHANICAL ROOM DEMOLITION PLAN

M102 - GENERAL NOTES

1 CONTRACTOR FIELD VERIFY EXISTING CONDITION PRIOR TO COMMENCE ANY WORK.

M102 NOTES BY SYMBOL

NUMBER	NOTE
1	EXISTING 3\"
2	EXISTING 2 1/2\"
3	EXISTING 2\"
4	EXISTING 1 1/4\"
5	EXISTING MECHANICAL EQUIPMENT TO REMAIN.
6	EXISTING PIPING TO REMAIN.
7	CONTRACTOR SHALL DEMOLISH EXISTING HEATED WATER SUPPLY PIPING UP TO THIS POINT. CONTRACTOR SHALL CAP AND SEAL OPEN ENDS OF PIPING FOR FUTURE USE. RE:1/M303 FOR NEW WORK.
8	CONTRACTOR SHALL DEMOLISH EXISTING CHILLED-HEATED WATER RETURN PIPE UP TO THIS POINT. CONTRACTOR SHALL CAP AND SEAL OPEN ENDS OF PIPING FOR FUTURE USE. RE:1/M303 FOR NEW WORK.



432, 8.24.2020, 20118



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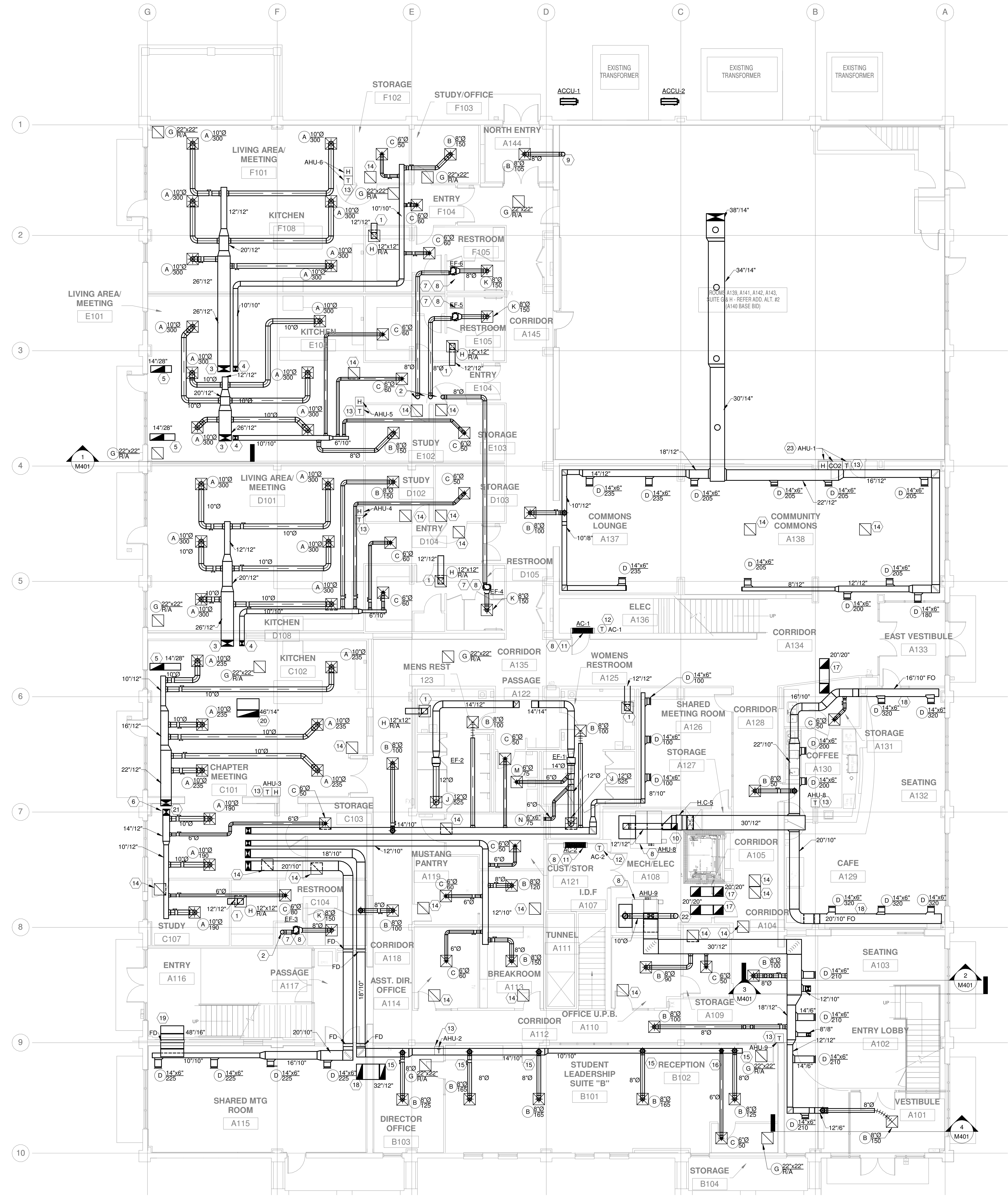
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DATE 05/24/2020
PROJECT NO. 18071

ENLARGED SECOND FLOOR MECHANICAL ROOM DEMOLITION PLAN

M102



1 FIRST FLOOR MECHANICAL PLAN

8' 0' 8' 16'

1/8" = 1'-0"

M201 - GENERAL NOTES	
1	CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITION PRIOR TO ORDERING OR FABRICATING ANY MECHANICAL WORK.

M201 NOTES BY SYMBOL	
NUMBER	NOTE
1	PROVIDE TRANSFER AIR PATH WITH 12/12 DUCT. PROVIDE TYPE "H", 12/12 NECK SIZE, 24/24 FACE SIZE TRANSFER AIR GRILLE IN THE BATH ROOM SIDE END. OTHER SIDE WILL BE OPEN TO PLENUM SPACE.
2	8" DIA EXHAUST DUCT UP THROUGH FLOOR. RE:1/M202 FOR CONTINUATION.
3	26/12 SUPPLY DUCT UP THROUGH THE FLOOR ABOVE. RE:1/M202 FOR CONTINUATION.
4	10/10 SUPPLY DUCT UP THROUGH THE FLOOR ABOVE. RE:1/M202 FOR CONTINUATION.
5	14/28 RETURN DUCT UP THROUGH THE FLOOR ABOVE. RETURN AIR DUCT RUN BETWEEN JOISTS. RE:1/M202 FOR CONTINUATION.
6	14/12 SUPPLY DUCT UP THROUGH THE FLOOR ABOVE. RE:1/M202 FOR CONTINUATION.
7	CONTRACTOR SHALL PROVIDE AND INSTALL ACCESS PANEL IN THIS LOCATION.
8	CONTRACTOR SHALL PROVIDE AND INSTALL MECHANICAL EQUIPMENT WITH MANUFACTURER'S RECOMMENDED CLEARANCE.
9	8" DIA SUPPLY DUCT UP THROUGH THE FLOOR ABOVE. RE:1/M202 FOR CONTINUATION.
10	12/12 O/A DUCT UP THROUGH THE FLOOR ABOVE. RE:1/M202 FOR CONTINUATION. CONTRACTOR SHALL PROVIDE AND INSTALL MOTORIZED DAMPER AND MANUAL BALANCE DAMPER ON THE VERTICAL RISE DUCT. MOTORIZED DAMPER SHALL INTERLOCK WITH ASSOCIATED AHU. MOTORIZED DAMPER SHALL BE FULLY CLOSED WHEN ASSOCIATED AHU IS OFF.
11	CONTRACTOR SHALL PROVIDE AND INSTALL WALL MOUNTED AC UNIT ON THIS WALL. MOUNTING HEIGHT WILL BE 8'-0" AFF. COORDINATE WITH ARCHITECT FOR FINAL LOCATION.
12	PROVIDE THERMOSTAT IN THIS LOCATION. MOUNTING HEIGHT FOR T-STAT IS 4'-0" AFF. COORDINATE WITH ARCHITECT FOR FINAL LOCATION.
13	PROVIDE TEMPERATURE SENSOR IN THIS LOCATION. MOUNTING HEIGHT FOR TEMPERATURE SENSOR IS 4'-0" AFF. COORDINATE WITH ARCHITECT FOR FINAL LOCATION.
14	CONTRACTOR SHALL PROVIDE AND INSTALL TYPE "G", 22/22 NECK SIZE, 24/24 FACE SIZE RETURN AIR GRILLE IN THIS LOCATION. REFER TO AIR DEVICE SCHEDULE FOR DETAIL.
15	8" SUPPLY DUCT SHALL BE ROUTED THROUGH JOIST.
16	8" SUPPLY DUCT SHALL BE ROUTED THROUGH JOIST.
17	PROVIDE 20/20 TRANSFER AIR DUCT IN THIS LOCATION. PROVIDE TRANSFER AIR DUCT SHALL BE LOCATED IN BETWEEN STRUCTURAL JOIST.
18	PROVIDE 32/12 TRANSFER AIR DUCT IN THIS LOCATION. PROVIDE TRANSFER AIR DUCT AS HIGH AS POSSIBLE
19	PROVIDE 48/16 TRANSFER AIR DUCT IN THIS LOCATION. PROVIDE TRANSFER AIR DUCT AS HIGH AS POSSIBLE
20	46/14 RETURN AIR DUCT UP THROUGH FLOOR ABOVE AND TERMINATE AT AHU-2. RE:1/M202 FOR CONTINUATION.
21	22/12 SUPPLY DUCT UP THROUGH THE FLOOR ABOVE. RE:1/M202 FOR CONTINUATION.
22	10" DIA O/A DUCT UP THROUGH THE FLOOR ABOVE. RE:1/M202 FOR CONTINUATION. CONTRACTOR SHALL PROVIDE AND INSTALL MOTORIZED DAMPER AND MANUAL BALANCE DAMPER ON THE VERTICAL RISE DUCT. MOTORIZED DAMPER SHALL INTERLOCK WITH ASSOCIATED AHU. MOTORIZED DAMPER SHALL BE FULLY CLOSED WHEN ASSOCIATED AHU IS OFF.
23	PROPOSED SENSOR LOCATIONS FOR BASED BID ONLY. ALT2 WILL HAVE DIFFERENT SENSOR LOCATION. RE:1/M204 FOR NEW LOCATIONS.

8/24/2020
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M202 - GENERAL NOTES	
1	CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITION PRIOR TO ORDERING OR FABRICATING ANY MECHANICAL WORK.

M202 NOTES BY SYMBOL	
NUMBER	NOTE
1	CONTRACTOR SHALL PROVIDE AND INSTALL MECHANICAL EQUIPMENT WITH MANUFACTURER'S RECOMMENDED CLEARANCE.
2	26" O/A DUCT UP THROUGH THE ROOF AND TERMINATE AT ROOF WITH O/A INTAKE AIR HOOD. CONTRACTOR SHALL PROVIDE MOTORIZED DAMPER AND MANUAL BALANCE DAMPER ON THE VERTICAL RISE DUCT. MOTORIZED DAMPER SHALL INTERLOCK WITH ASSOCIATED AHU. MOTORIZED DAMPER SHALL BE FULLY CLOSED WHEN ASSOCIATED AHU IS OFF.
3	10" DIA O/A DUCT UP THROUGH THE ROOF AND TERMINATE AT ROOF WITH O/A INTAKE AIR HOOD. CONTRACTOR SHALL PROVIDE MOTORIZED DAMPER AND MANUAL BALANCE DAMPER ON THE VERTICAL RISE DUCT. MOTORIZED DAMPER SHALL INTERLOCK WITH ASSOCIATED AHU. MOTORIZED DAMPER SHALL BE FULLY CLOSED WHEN ASSOCIATED AHU IS OFF.
4	PROVIDE VERTICAL HYDRONIC FAN COIL UNIT WITH MANUFACTURER'S MIXING BOX. REFER TO MECHANICAL EQUIPMENT SCHEDULES.
5	14" O/S SUPPLY DUCT DOWN TO FLOOR BELOW. RE:1/M201 FOR CONTINUATION.
6	22" O/S SUPPLY DUCT DOWN TO FLOOR BELOW. RE:1/M201 FOR CONTINUATION.
7	8" EXHAUST DUCT UP THROUGH THE ROOF AND TERMINATE WITH EXHAUST AIR HOOD. RE:1/M203
8	26" O/S SUPPLY DUCT DOWN TO FLOOR BELOW. RE:1/M201 FOR CONTINUATION.
9	10" O/S SUPPLY DUCT DOWN TO FLOOR BELOW. RE:1/M201 FOR CONTINUATION.
10	28" O/S RETURN DUCT DOWN TO FLOOR BELOW. RE:1/M201 FOR CONTINUATION.
12	12" O/A DUCT UP THROUGH THE ROOF AND TERMINATE AT ROOF WITH O/A INTAKE AIR HOOD. CONTRACTOR SHALL PROVIDE MOTORIZED DAMPER AND MANUAL BALANCE DAMPER ON THE VERTICAL RISE DUCT. MOTORIZED DAMPER SHALL INTERLOCK WITH ASSOCIATED AHU. MOTORIZED DAMPER SHALL BE FULLY CLOSED WHEN ASSOCIATED AHU IS OFF.
13	PROVIDE HORIZONTAL FAN COIL UNIT WITH MANUFACTURER'S MIXING BOX. REFER TO MECHANICAL EQUIPMENT SCHEDULES.
14	PROVIDE 48" O/S TRANSFER AIR OPENING IN THIS LOCATION. PROVIDE TRANSFER AIR OPENING AS HIGH AS POSSIBLE.
15	12" O/S SUPPLY DUCT DOWN THROUGH THE FLOOR BELOW. RE:1/M201 FOR CONTINUATION.
16	18" O/S SUPPLY DUCT DOWN THROUGH THE FLOOR BELOW. RE:1/M201 FOR CONTINUATION.
17	20" O/S SUPPLY DUCT DOWN THROUGH THE FLOOR BELOW. RE:1/M201 FOR CONTINUATION.
18	12" O/S EXHAUST DUCT UP THROUGH THE ROOF AND TERMINATE WITH EXHAUST AIR HOOD. RE:1/M203
19	8" DIA SUPPLY DUCT DOWN TO FLOOR BELOW. RE:1/M201 FOR CONTINUATION.
20	12" O/A DUCT UP THROUGH THE ROOF AND TERMINATE AT THE ROOF LEVEL WITH ROOF CAP. RE:1/M203 FOR CONTINUATION.
21	14" O/S EXHAUST DUCT UP THROUGH THE ROOF AND TERMINATE WITH EXHAUST AIR HOOD. RE:1/M203
22	THIS EQUIPMENT IS FOR ALTERNATE 2. CONTRACTOR SHALL NOT INCLUDE THIS EQUIPMENT AND ALL ASSOCIATED ACCESSORIES, FITTINGS, AND DUCTWORK IN BASE BID.
23	22" O/S SUPPLY DUCT DOWN TO FLOOR BELOW. RE:1/M201 FOR CONTINUATION.
24	14" O/S SUPPLY DUCT DOWN TO FLOOR BELOW. RE:1/M201 FOR CONTINUATION.
25	6" DIA SUPPLY DUCT DOWN TO FLOOR BELOW. RE:1/M201 FOR CONTINUATION.
26	14" O/A DUCT UP THROUGH THE ROOF AND TERMINATE AT ROOF WITH O/A INTAKE AIR HOOD. CONTRACTOR SHALL PROVIDE MOTORIZED DAMPER AND MANUAL BALANCE DAMPER ON THE VERTICAL RISE DUCT. MOTORIZED DAMPER SHALL INTERLOCK WITH ASSOCIATED AHU. MOTORIZED DAMPER SHALL BE FULLY CLOSED WHEN ASSOCIATED AHU IS OFF.
27	38" O/S SUPPLY DUCT DOWN TO FLOOR BELOW. RE:1/M201 FOR CONTINUATION.
28	6" EXHAUST DUCT UP THROUGH THE ROOF AND TERMINATE WITH EXHAUST AIR HOOD. RE:1/M203
29	10" DIA O/A DUCT UP THROUGH THE ROOF AND TERMINATE AT THE ROOF LEVEL WITH ROOF CAP. RE:1/M203 FOR CONTINUATION.

1 SECOND FLOOR MECHANICAL PLAN

8' 0' 8' 16'

1/8" = 1'-0"

432, 8.24.2020, 20118

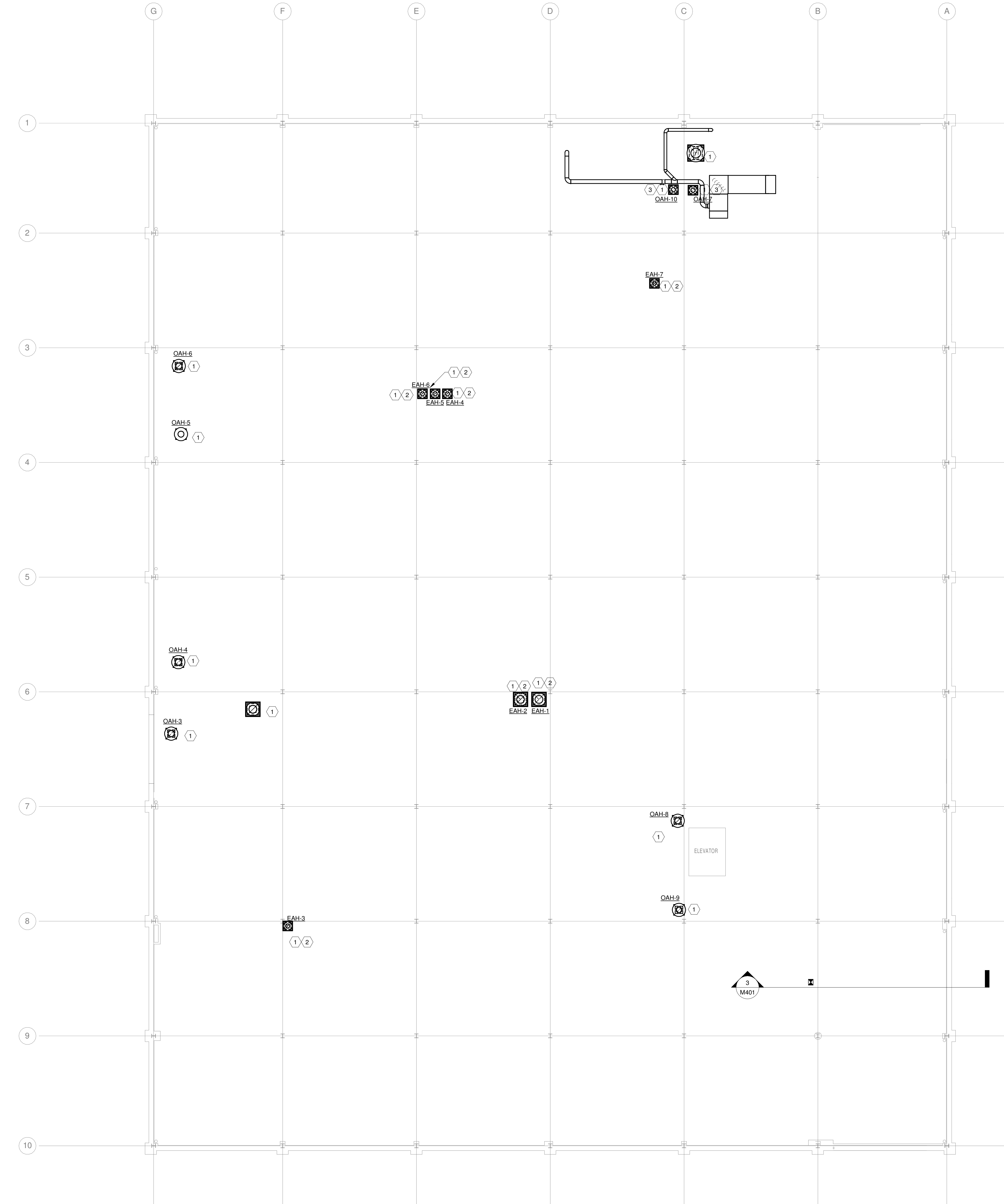
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1 MECHANICAL ROOF PLAN

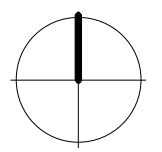
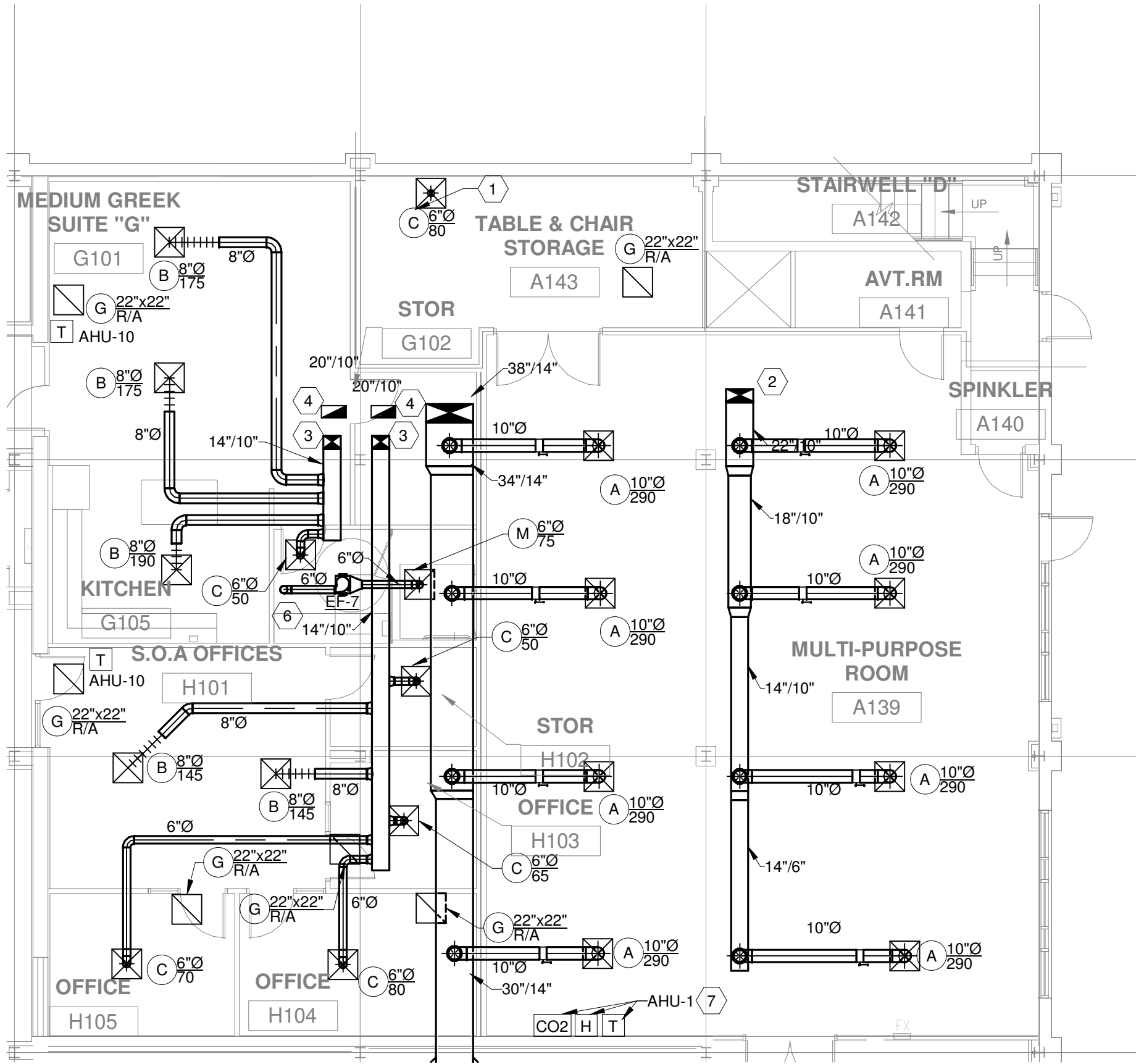
M203 - GENERAL NOTES	
1	CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITION PRIOR TO ORDERING OR FABRICATING ANY MECHANICAL WORK.

M203 NOTES BY SYMBOL	
NUMBER	NOTE
1	CONTRACTOR SHALL PROVIDE AND INSTALL MECHANICAL EQUIPMENT WITH MANUFACTURER'S RECOMMENDED CLEARANCE.
2	EXHAUST AIR HOOD SHALL MAINTAIN MINIMUM 10 FEET CLEARANCE FROM ANY FRESH AIR INTAKES AS REQUIRED BY CODE.
3	MECHENICAL EQUIPMENT FOR ALTERNATE 2. THIS EQUIPMENT SHALL NOT BE INCLUDED FOR BASE BID. SHOWN FOR REFERENCE.

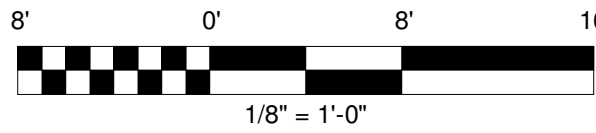


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1 FIRST FLOOR MECHANICAL FLOOR PLAN - ALT 2



M204 - GENERAL NOTES	
1	ALL WORK SHOWN IN THIS SHEET FOR ALTERNATE 2. THIS WORK SHALL NOT BE INCLUDED FOR BASE BID.
2	CONTRACTOR SHALL VERIFY EXISTING CONDITION PRIOR TO ORDERING OR FABRICATING ANY MECHANICAL WORK.

M204 NOTES BY SYMBOL	
NUMBER	NOTE
1	8" DIA SUPPLY DUCT UP THROUGH THE ROOF AND TERMINATE AT EXHAUST AIR HOOD. RE:1/M203 FOR CONTINUATION.
2	22/10 SUPPLY DUCT UP THROUGH THE FLOOR ABOVE. RE:1/M202 FOR CONTINUATION.
3	14/10 SUPPLY DUCT UP THROUGH THE FLOOR ABOVE. RE:1/M202 FOR CONTINUATION.
4	20/10 SUPPLY DUCT UP THROUGH THE FLOOR ABOVE. RE:1/M202 FOR CONTINUATION.
6	6" DIA EXHAUST DUCT UP THROUGH THE ROOF AND TERMINATE AT EXHAUST AIR HOOD. RE:1/M203 FOR CONTINUATION.
7	CONTRACTOR SHALL RELOCATE SENSORS ASSIATED WITH AHU-1 TO THIS LOCATION.



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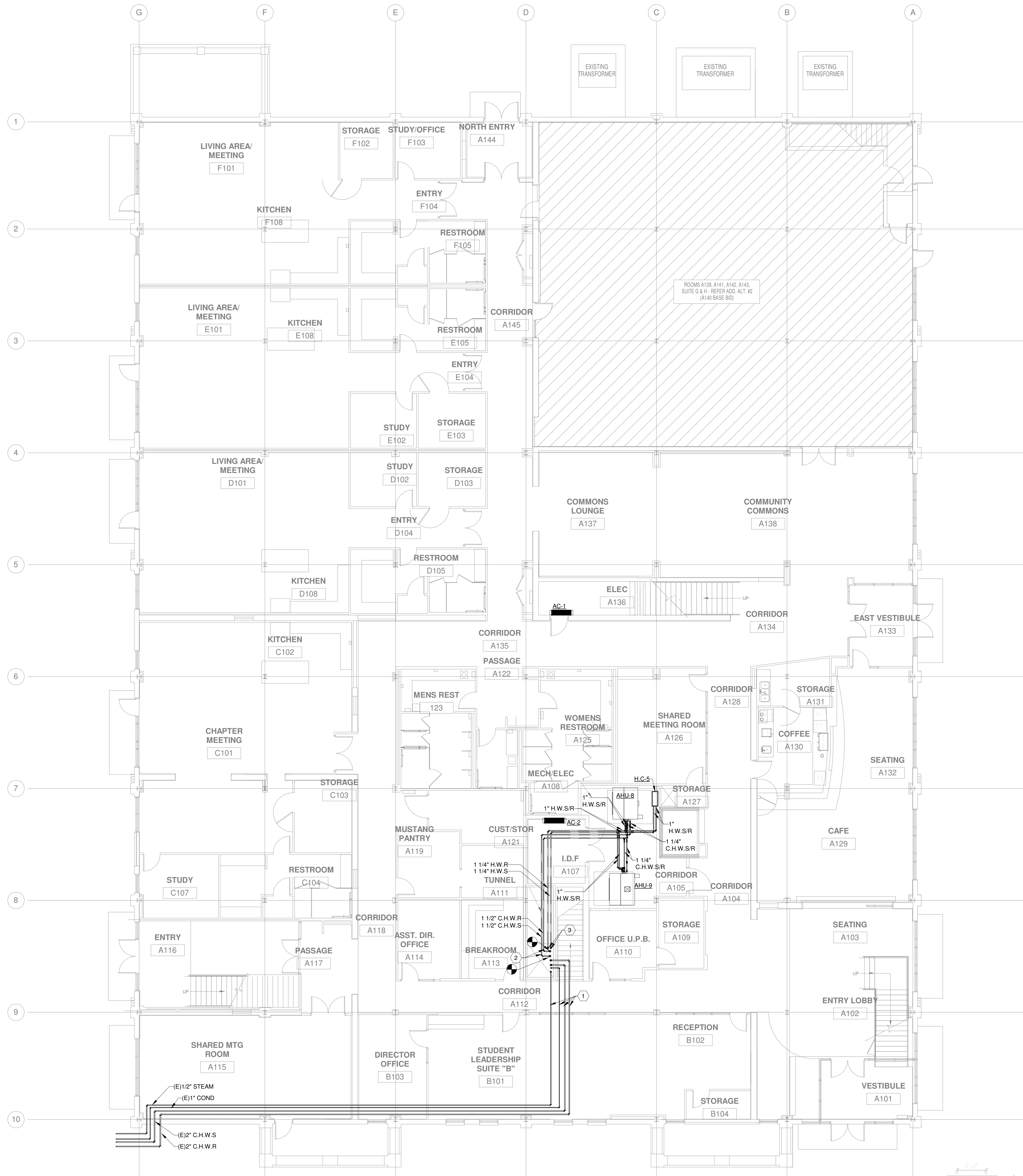
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FIRST FLOOR
MECHANICAL PLAN ALT2

M204



M301 - GENERAL NOTES	
1	CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITION PRIOR TO ORDERING OR FABRICATING ANY MECHANICAL WORK.

M301 NOTES BY SYMBOL	
NUMBER	NOTE
1	EXISTING PIPING TO REMAIN
2	TAP 1 1/2" CHILLED WATER SUPPLY AND RETURN PIPING TO EXISTING MAIN AT 1ST FLOOR PLENUM.
3	1 1/2" HOT WATER SUPPLY AND RETURN PIPE UP THROUGH FLOOR ABOVE. RE:1M303 FOR CONTINUATION.

1 FIRST FLOOR MECHANICAL HYDRONIC PLAN

8' 0' 8' 16'

1/8" = 1'-0"

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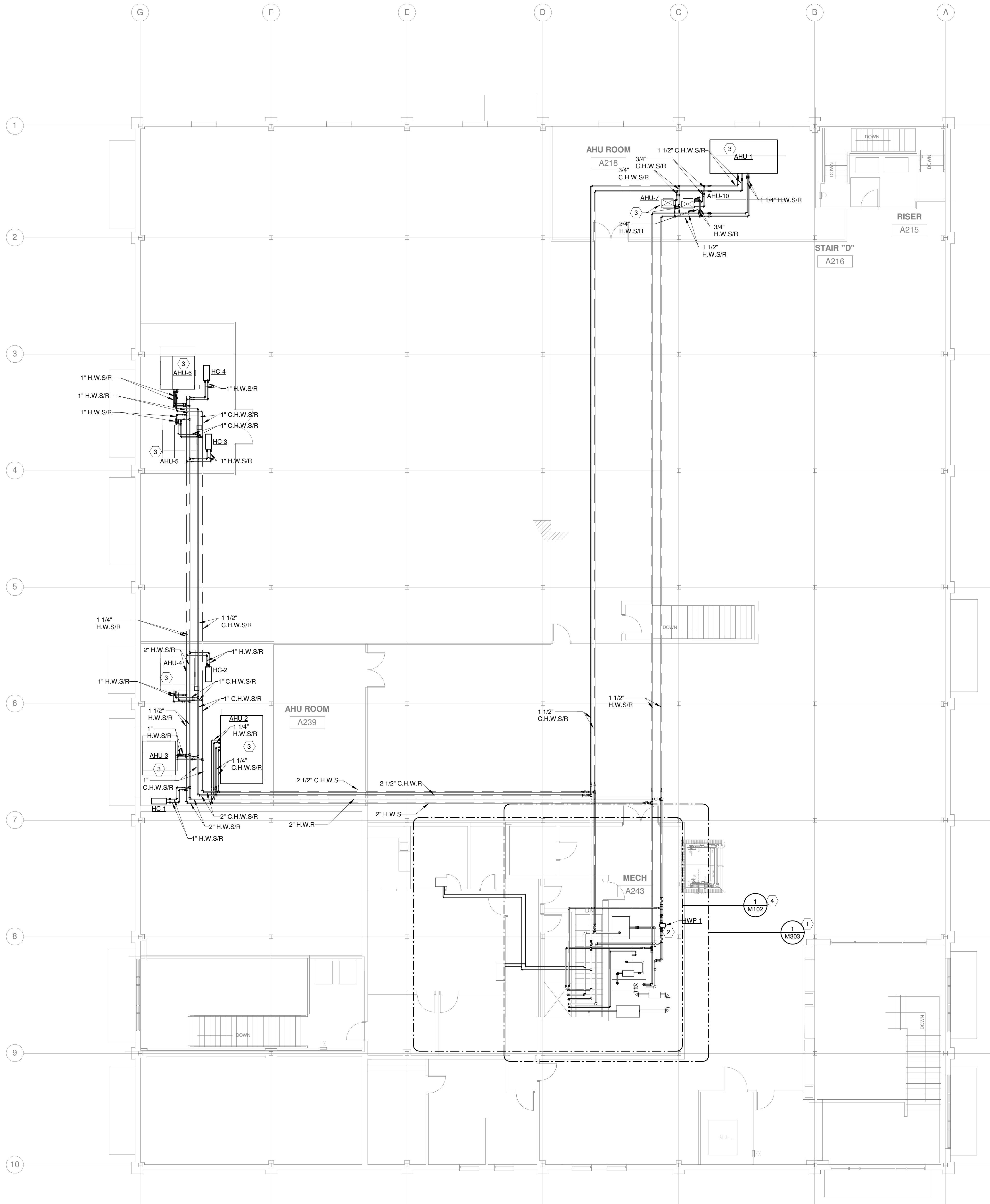
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M302 - GENERAL NOTES	
1	CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITION PRIOR TO ORDERING OR FABRICATING ANY MECHANICAL WORK.

M302 NOTES BY SYMBOL	
NUMBER	NOTE
1	RE:1/M303 FOR ENLARGED MECHANICAL ROOM NEW PIPING LAYOUT.
2	CONTRACTOR SHALL PROVIDE AND INSTALL HOT WATER PUMP IN THIS LOCATION. RE:1/M303 FOR ENLARGED PLAN
3	RE:2/M601 FOR PIPING DETAIL.
4	RE:1/M102 FOR ENLARGED MECHANICAL ROOM DEMOLITION PIPING LAYOUT.

1 SECOND FLOOR MECHANICAL HYDRONIC PLAN

8' 0' 8' 16'

1/8" = 1'-0"

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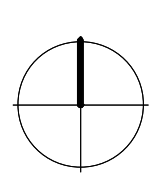
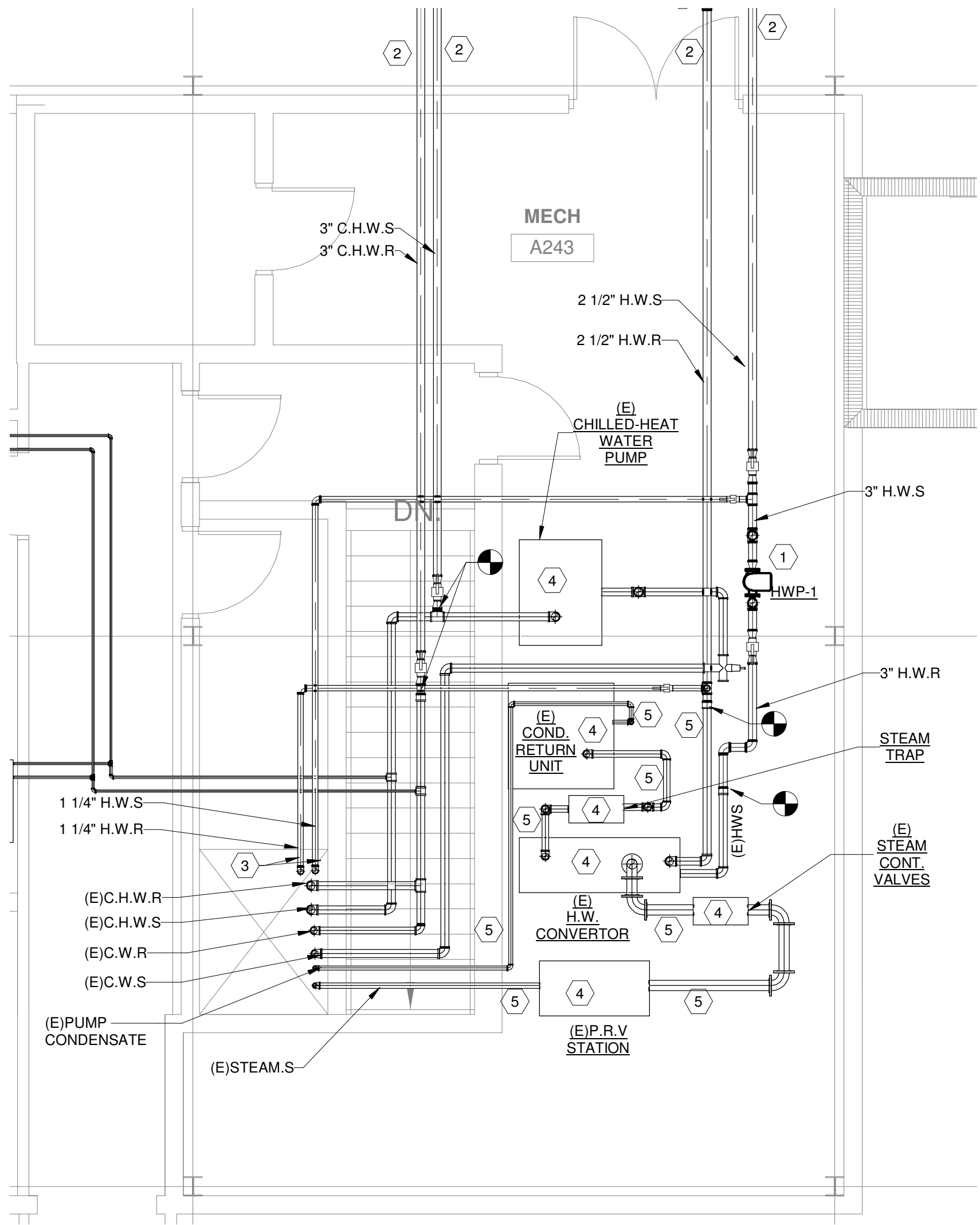
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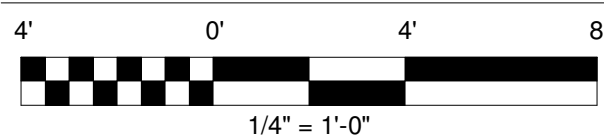
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1

ENLARGED SECOND FLOOR MECHANICAL ROOM HYDRONIC PLAN



M303 NOTES BY SYMBOL	
NUMBER	NOTE
1	CONTRACTOR SHALL PROVIDE AND INSTALL HOT WATER PUMP IN THIS LOCATION. PROVIDE PUMP WITH MANUFACTURER'S RECOMMENDED CLEARANCE. RE:1/M603 FOR DETAIL.
2	RE:1/M302 FOR CONTINUATION.
3	HEATING WATER SUPPLY AND RETURN DOWN TO FLOOR BELOW. RE:1/M301 FOR CONTINUATION.
4	EXISTING MECHANICAL EQUIPMENT TO REMAIN.
5	EXISTING HYDRONIC, STEAM, AND CONDENSATE PIPING TO REMAIN.



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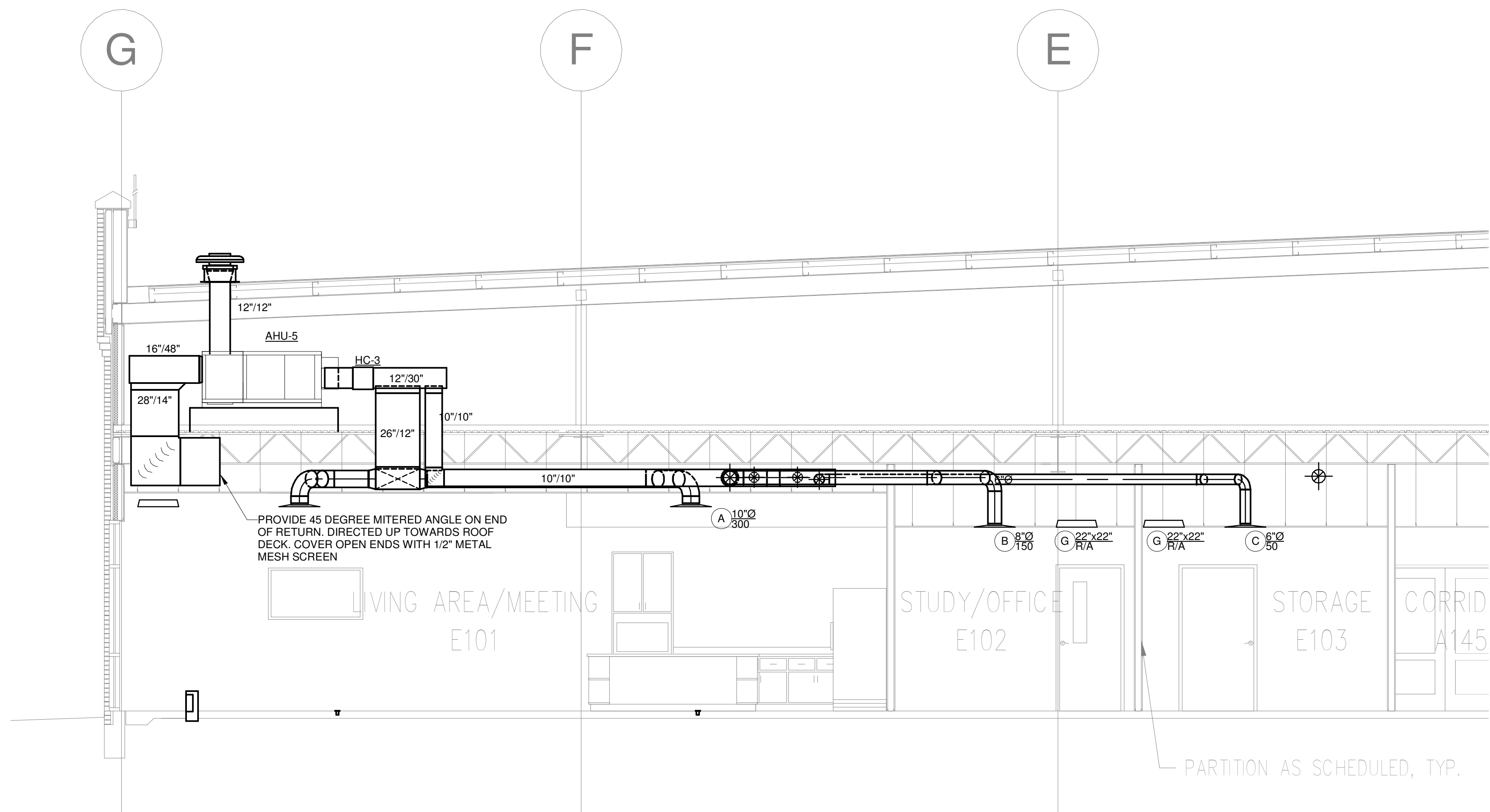
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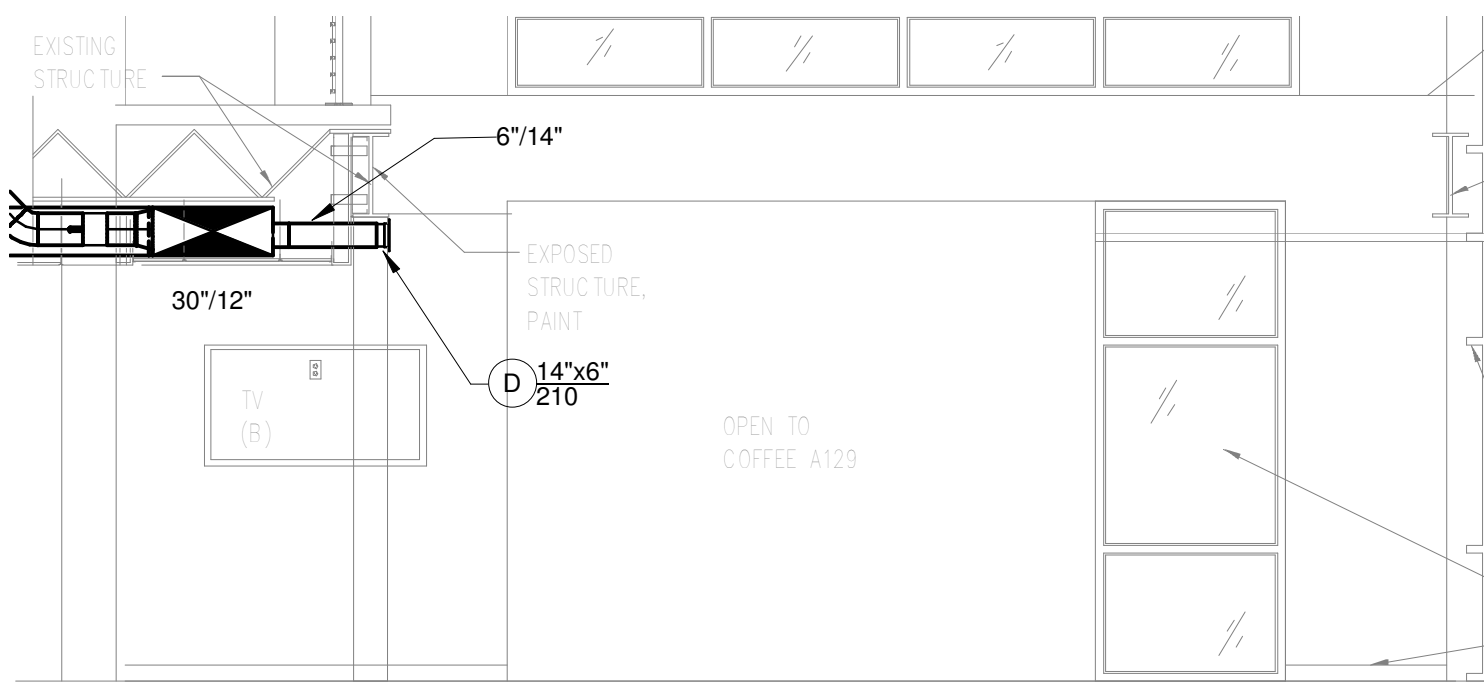
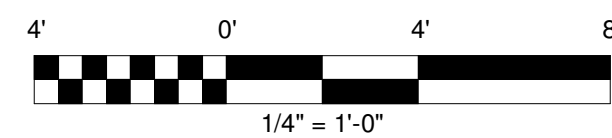
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ENLARGED SECOND
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ROOM HYDRONIC PLAN

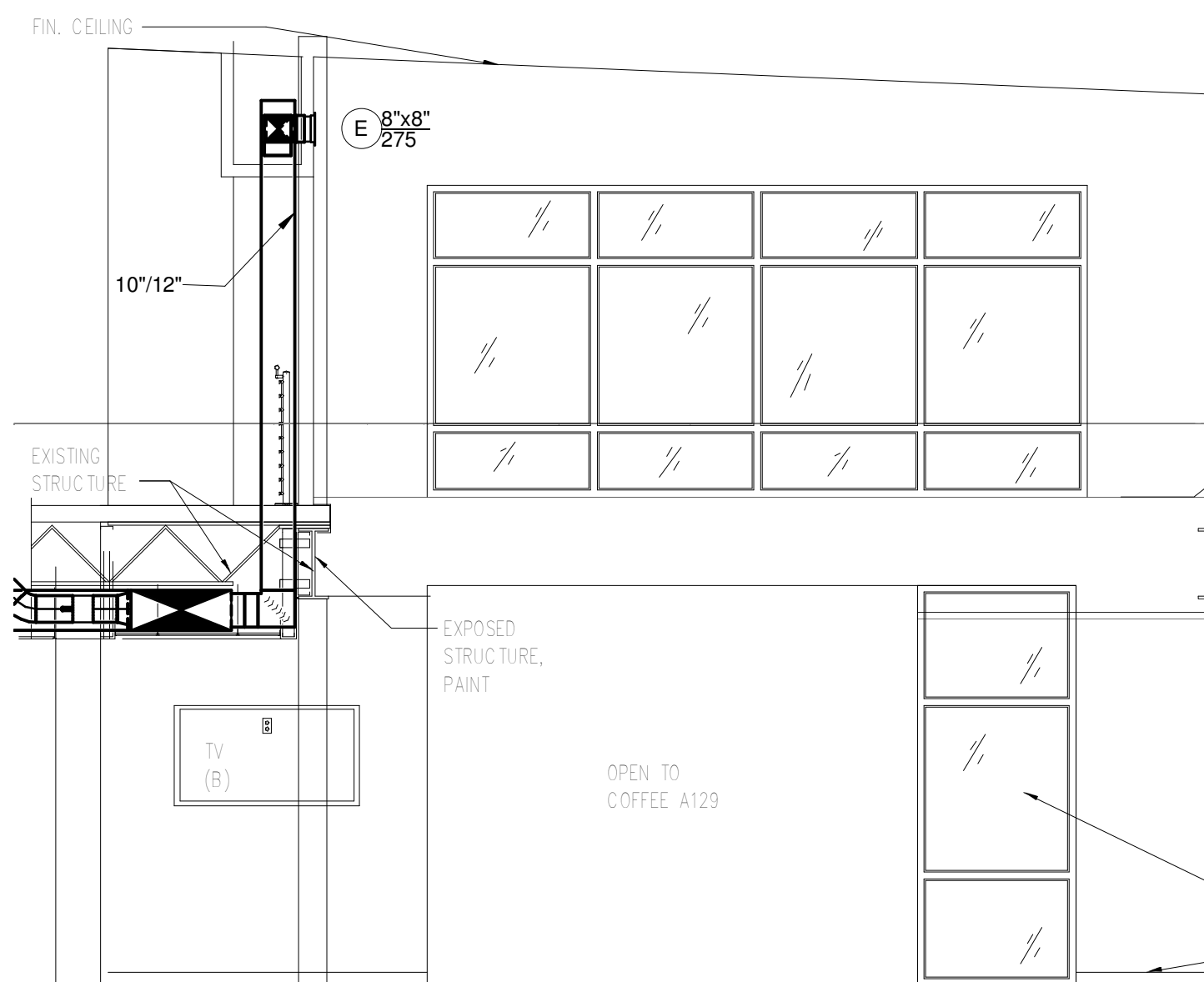
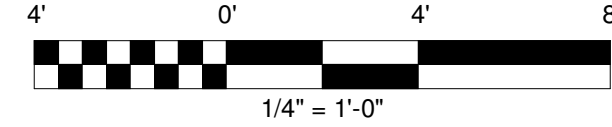
M303



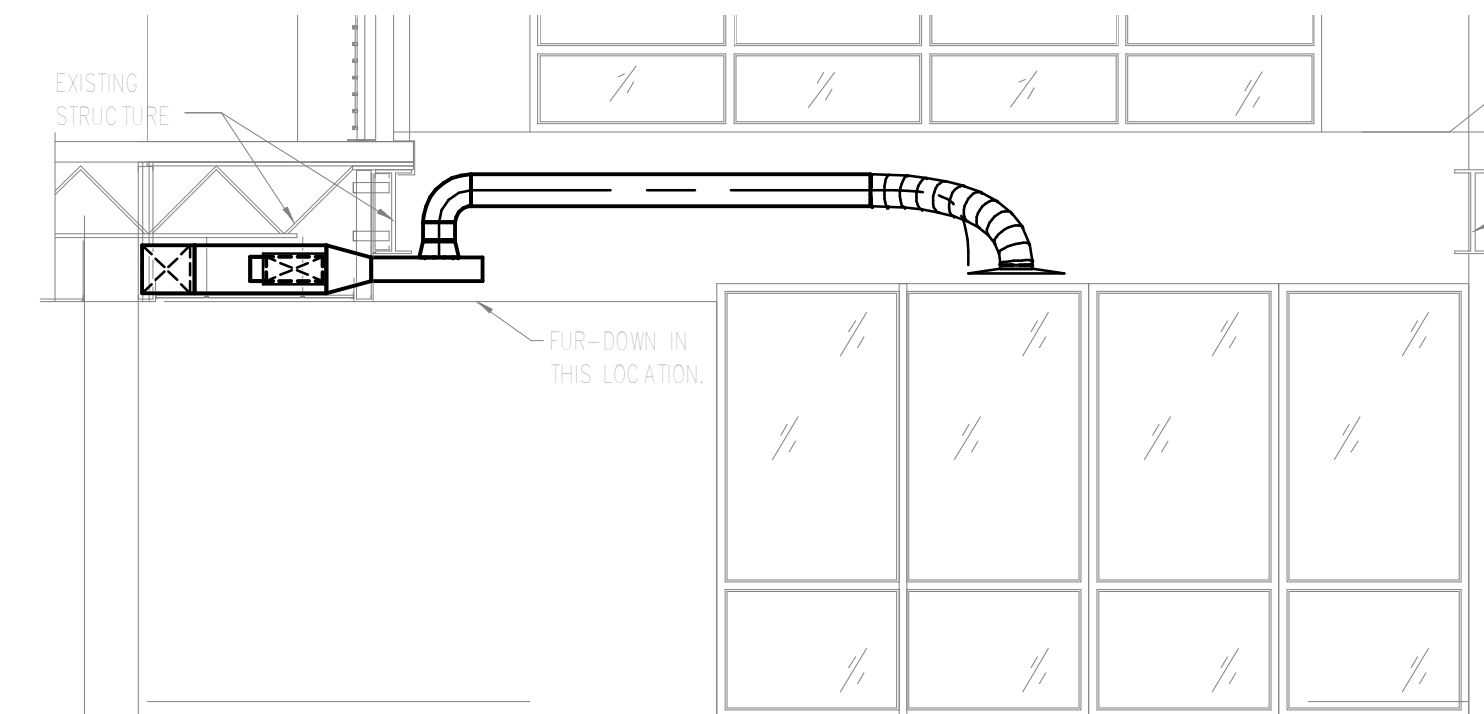
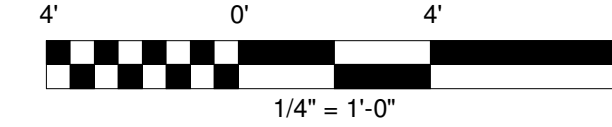
1 TYPICAL GREEK SUITE SECTION



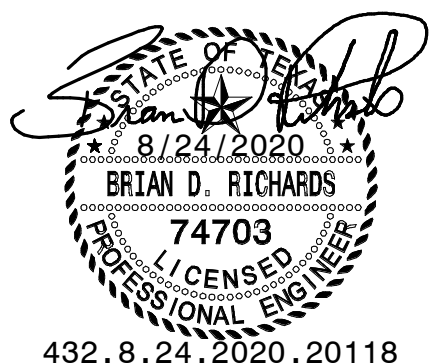
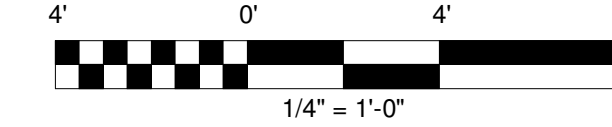
2 ENTRY ENTRY E-W SECTION 1



3 ENTRY LOBBY E-W SECTION 2



4 MAIN ENTRY VESTIBUL E-W SECTION

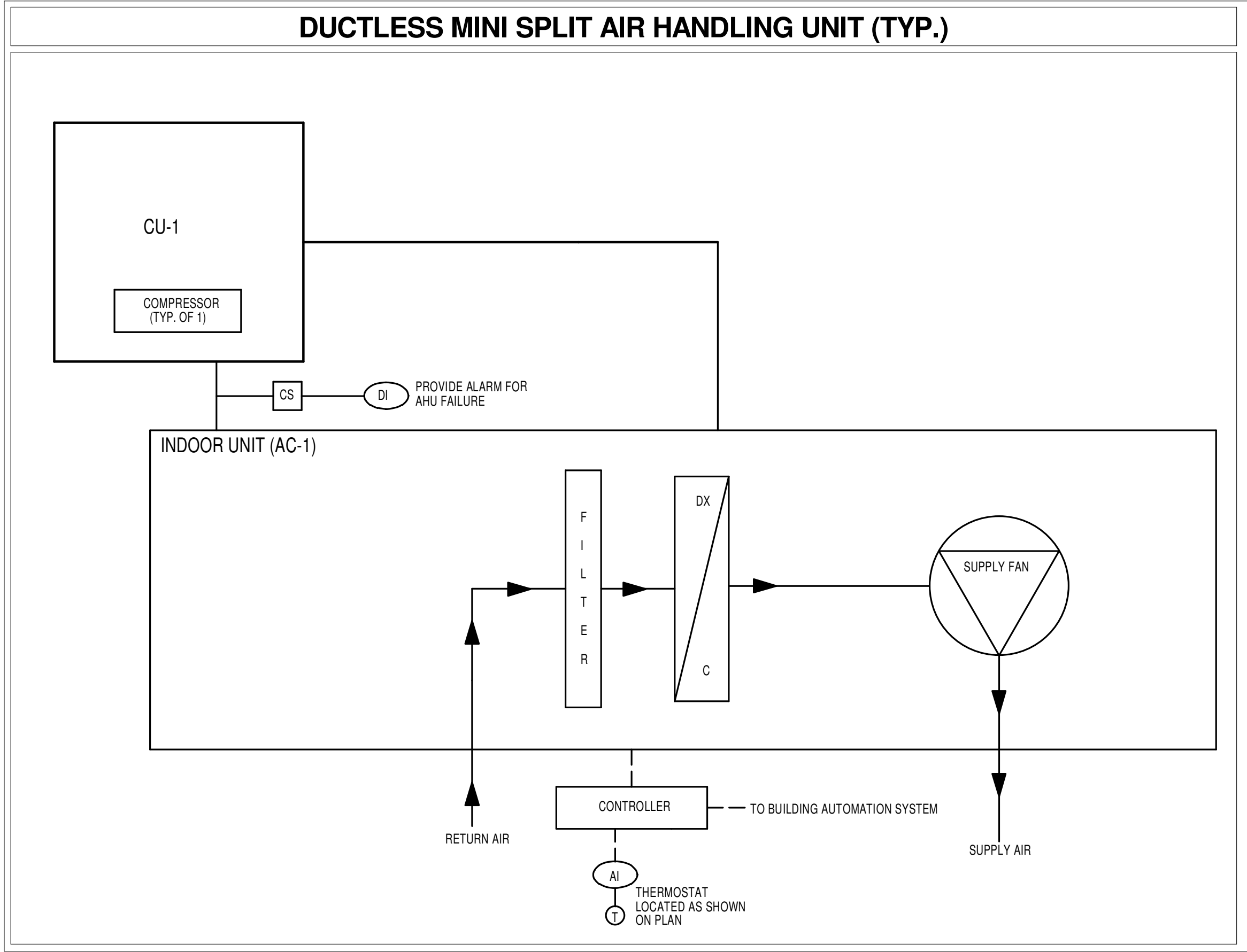


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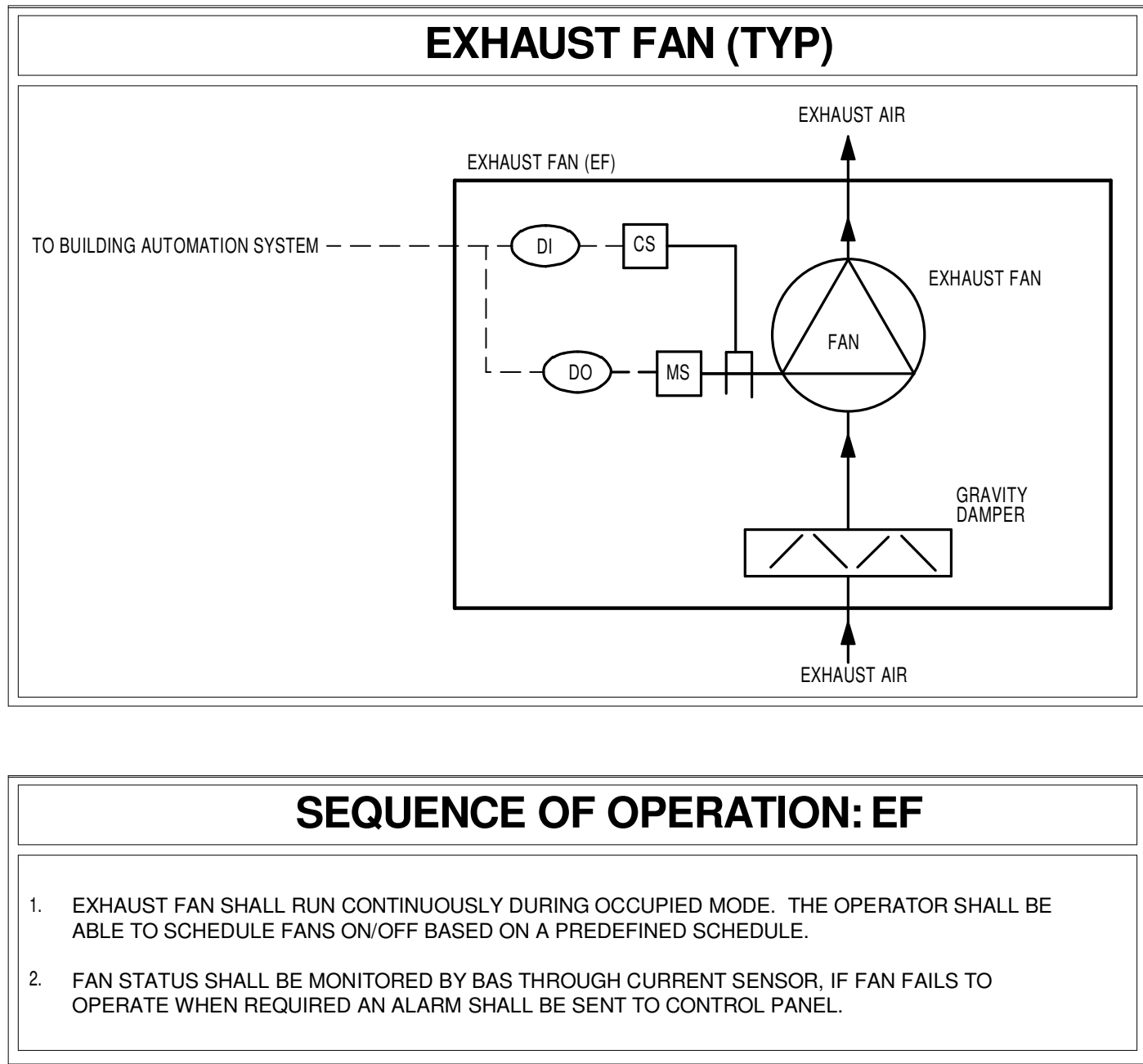
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DDC CONTROL SYSTEM - GENERAL NOTES	
1.	PROVIDE A PROGRAMMABLE ELECTRONIC HVAC CONTROL SYSTEM OF OWNER'S PREFERENCE. THE SYSTEM SHALL BE CAPABLE OF INTERFACING TO AND CONTROLLING THE HVAC EQUIPMENT SHOWN ON PLANS. SYSTEM SHALL BE CAPABLE OF ALARMING AND SYSTEM CONTROL DESCRIBED IN THE SEQUENCE OF OPERATION. THE SYSTEM SHALL HAVE 7-DAY PROGRAMMING CAPABILITY AND HAVE A MINIMUM 10 HOUR BATTERY BACK-UP SYSTEM.
2.	THE CONTROL SYSTEMS SHALL BE COMPLETE WITH ALL WIRING, CONDUIT, POWER SUPPLIES AND ALL OTHER ITEMS REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM THAT WILL ACCOMPLISH THE SEQUENCE OF OPERATIONS AND INTENT OF CONTROL DIAGRAMS. THE MAIN CONTROL PANEL (COMPUTER) SHALL BE LOCATED PER THE OWNER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE ALL ASPECTS OF THE DDC CONTROL SYSTEM AND THE FIRE ALARM/SUPPRESSION SYSTEMS TO ENSURE THAT THE SYSTEMS OPERATE AS REQUIRED BY THESE DOCUMENTS AND NATIONAL AND LOCAL CODES.
3.	ALL COMMUNICATIONS WIRING TO BE SHIELDED TWISTED WIRE PAIR.
4.	ALL COMMUNICATIONS WIRING TO WALL MOUNTED CONTROLLERS AND INSTALLED IN AREAS WITH EXPOSED STRUCTURE SHALL BE ROUTED IN CONDUIT, CONDUIT TO EXTEND UP TO ABOVE CEILING OR EXPOSED ROOF STRUCTURE. WIRING FOR ROOF MOUNTED EQUIPMENT SHALL BE ROUTED WITHIN THE CONFINES OF THE ROOF CURB. ALL CONTROL DEVICES INSTALLED IN LOCATIONS EXPOSED TO THE WEATHER SHALL BE PROVIDED WITH WEATHER-PROOF ENCLOSURES.
5.	THE CONTROLS CONTRACTOR SHALL BE RESPONSIBLE FOR ALL NECESSARY ELECTRICAL POWER NEEDED FOR THE BAS. THE INSTALLATION OF THESE POWER SYSTEMS SHALL BE IN FULL ACCORDANCE WITH ELECTRICAL SPECIFICATIONS. COORDINATE POWER SOURCE, VOLTAGE AND PHASE OF EACH PIECE OF EQUIPMENT BEFORE ORDERING ANY MECHANICAL OR ELECTRICAL EQUIPMENT.
6.	LOCATE ROOM THERMOSTATS, HUMIDISTAT, CARBON DIOXIDE SENSORS AND TEMPERATURE AND HUMIDITY SENSORS 4'-0" (CENTERLINE) ABOVE FINISHED FLOOR. MOUNT ALL TEMPERATURE AND HUMIDITY READOUT DEVICES AT 5'-0" (CENTERLINE) ABOVE FINISHED FLOOR (EYE-LEVEL).
7.	ALL DUCT AND EQUIPMENT SMOKE DETECTORS SHALL BE INTERFACED WITH THE BUILDING FIRE ALARM SYSTEM. UPON ACTIVATION, UNIT SHALL BE SHUTDOWN AND A NOTIFICATION SENT TO THE FIRE ALARM SYSTEM.
8.	COORDINATE CONTROLLER REQUIREMENTS WITH HVAC EQUIPMENT MANUFACTURER'S SUBMITTAL. CONTROLS CONTRACTOR TO REVIEW SUBMITTAL AND ENSURE ALL NECESSARY CONTACTS, ACTUATORS, SMOKE DETECTORS, ETC. ARE FULLY COORDINATED AND PROVIDED.
9.	ALL SET-POINTS CALLED OUT HERE SHALL BE ADJUSTABLE AT THE BAS UNLESS OTHERWISE NOTED
10.	THE COMMUNICATIONS PROTOCOL FOR DDC CONTROL HARDWARE SHALL BE BASED UPON BACNET STANDARD. REFER TO OWNER FOR PREFERRED INSTALLATION LOCATION OF PRIMARY CONTROL PANEL.
11.	CONTROLS CONTRACTOR SHALL ALLOCATE 4 HOURS OF COMMISSIONING TIME. THIS DOES NOT RELIEVE THE CONTRACTOR OF COMMISSIONING HIS OWN WORK PRIOR TO REVIEW OF WORK BY ENGINEER OF RECORD.
12.	PROVIDE FULL CONTROLS SUBMITTAL PACKAGE AT THE TIME OF GENERAL MECHANICAL SUBMITTALS. SUBMITTALS SHALL INCLUDE: COMPLETE BILL OF MATERIALS INDICATING QUANTITY, CONTROL DIAGRAMS, INPUT/OUTPUT POINTS LISTS, ROOM AND EQUIPMENT SCHEDULE, TECHNICAL INFORMATION FOR EQUIPMENT INCLUDED, AND SEQUENCES OF OPERATION.
13.	CONTRACTOR SHALL COORDINATE ALL CONTROLS AND TAB WORK REQUIREMENTS PRIOR TO BIDDING.

SYMBOL LIST	
SYMBOL	DESCRIPTION
	OPPOSED BLADE DAMPER
	HEATING OR COOLING COIL
	FAN OR PUMP MOTOR
	PRESSURE TRANSMITTER
	SMOKE DETECTOR
	TEMPERATURE SENSOR
	THERMOSTAT
	TERMINAL CONTROL UNIT
	VARIABLE FREQUENCY DRIVE
	VAV DAMPER W/FLOW MONITOR
	DDC DIGITAL INPUT POINT
	DDC DIGITAL OUTPUT POINT
	DDC ANALOG INPUT POINT
	DDC ANALOG OUTPUT POINT
	MOTORIZED DAMPER
	MOTOR STARTER
	CO2 SENSOR
	ENTHALPY SENSOR, ECONOMIZER
	HIGH STATIC PRESS. LIMIT SENS.
	VFD (DUCT) PRESSURE SENSOR
	THERMOSTAT/TEMPERATURE SENSOR
	AIR FLOW MONITORING STATION
	FLOW SENSOR
	CURRENT SENSOR
	AIR FLOW MONITORING STATION



SEQUENCE OF OPERATION - TYP. MINI SPLIT SYSTEM	
1.	PROVIDE A CONTROLLER FOR POINTS REQUIRED BY THE CONTROL DOCUMENTS AND NECESSARY TO ACCOMPLISH THE SEQUENCE OF OPERATION. THE CONTROLS SHALL BE ENERGIZED TO OPERATE CONTINUOUSLY.
2.	SUPPLY FAN OFF. WHEN THE SUPPLY FAN IS OFF, ALL COMPRESSORS AND HEATER ARE OFF.
3.	SAFETY SHUTDOWN AND ALARMS OF THE UNIT.
4.	PROVIDE UNIT WITH START/STOP ABILITY. UNIT DOES NOT RUN BASED UPON THE BUILDING SCHEDULE. UNIT CYCLES TO MAINTAIN 70 DEGREE FAHRENHEIT TEMPERATURE 24 HOURS A DAY, 7 DAYS A WEEK.
5.	COOLING CONTROL: IF ZONE TEMPERATURE IS ABOVE SET POINT, UNIT WILL BE ENERGIZED, COOLING CYCLE SHALL START.
6.	HEATING CONTROL: NO HEATING FOR THIS UNIT.
7.	PROVIDE FOR AHU STATUS (ON/OFF). PROVIDE AN ALARM FOR AHU AND CONDENSATE PUMP FAILURE.



SEQUENCE OF OPERATION: EF	
1.	EXHAUST FAN SHALL RUN CONTINUOUSLY DURING OCCUPIED MODE. THE OPERATOR SHALL BE ABLE TO SCHEDULE FANS ON/OFF BASED ON A PREDEFINED SCHEDULE.
2.	FAN STATUS SHALL BE MONITORED BY BAS THROUGH CURRENT SENSOR, IF FAN FAILS TO OPERATE WHEN REQUIRED AN ALARM SHALL BE SENT TO CONTROL PANEL.



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DATE

05/24/2020

PROJECT NO.

18071

MECHANICAL
CONTROLS

M501

SEQUENCE OF OPERATION, AHU-1 THROUGH AHU-10

- SYSTEM TYPE:
SINGLE ZONE VARIABLE VOLUME HYDRONIC AIR HANDLING UNIT
MODULATING CHILLED WATER COOLING
MODULATING HOT WATER HEATING
OUTDOOR AIR DAMPERS
DEMAND CONTROLLED VENTILATION (AHU-1 ONLY)
DEHUMIDIFICATION (WHERE REHEAT COIL SCHEDULED)
- SETPOINTS:
ALL SETPOINTS ADJUSTABLE UNLESS INDICATED OTHERWISE
SPACE SETPOINT (COOLING): 74°F
SPACE SETPOINT (HEATING): ROOM COOLING SETPOINT - 5°F
UNOCCUPIED ROOM SETPOINT (COOLING): 85°F
UNOCCUPIED ROOM SETPOINT (HEATING): 50°F
SPACE CO2 SETPOINT (WHERE DOV IS SCHEDULED): 1000PPM
HUMIDITY TEMPERATURE SETPOINT: SEE TABLE 1
ECONOMIZER DRY BULB MAXIMUM (WHERE ECONOMIZER SCHEDULED): 56°F
ECONOMIZER DRY BULB MINIMUM (WHERE ECONOMIZER SCHEDULED): 48°F
ECONOMIZER DAMPER MAXIMUM POSITION: TO BE DETERMINED IN THE FIELD BY TEST AND BALANCE AND RELATED TO CONTROLS CONTRACTOR FOR PROGRAMMING
- OPERATING MODES:
OCCUPIED MODE
UNOCCUPIED MODE
DEHUMIDIFICATION MODE
DEMAND CONTROLLED VENTILATION
*REFER TO NOTE SECTION FOR MODE ENABLE / DISABLE PARAMETERS.
- ROOM DEVICES
 - AHU-1 - SPACE THERMOSTAT WITH TEMPERATURE DISPLAY AND OVERRIDE. PROVIDE +/-3°F (ADJ.) TEMPERATURE RANGE. TEMPERATURE RANGE ADJUSTMENT CAN BE MADE AT CONTROLLER. CO2 SENSOR WILL BE PROVIDED.
 - AHU-2 - SPACE THERMOSTAT THERMOSTAT WITH TEMPERATURE DISPLAY AND OVERRIDE. PROVIDE +/-3°F (ADJ.) TEMPERATURE RANGE. TEMPERATURE RANGE ADJUSTMENT CAN BE MADE AT CONTROLLER.
 - AHU-3 - SPACE THERMOSTAT THERMOSTAT WITH TEMPERATURE DISPLAY AND OVERRIDE. PROVIDE +/-3°F (ADJ.) TEMPERATURE RANGE. TEMPERATURE RANGE ADJUSTMENT CAN BE MADE AT CONTROLLER. HUMIDITY SENSOR WILL BE PROVIDED.
 - AHU-4 - SPACE THERMOSTAT THERMOSTAT WITH TEMPERATURE DISPLAY AND OVERRIDE. PROVIDE +/-3°F (ADJ.) TEMPERATURE RANGE. TEMPERATURE RANGE ADJUSTMENT CAN BE MADE AT CONTROLLER. HUMIDITY SENSOR WILL BE PROVIDED.
 - AHU-5 - SPACE THERMOSTAT THERMOSTAT WITH TEMPERATURE DISPLAY AND OVERRIDE. PROVIDE +/-3°F (ADJ.) TEMPERATURE RANGE. TEMPERATURE RANGE ADJUSTMENT CAN BE MADE AT CONTROLLER. HUMIDITY SENSOR WILL BE PROVIDED.
 - AHU-6 - SPACE THERMOSTAT THERMOSTAT WITH TEMPERATURE DISPLAY AND OVERRIDE. PROVIDE +/-3°F (ADJ.) TEMPERATURE RANGE. TEMPERATURE RANGE ADJUSTMENT CAN BE MADE AT CONTROLLER.
 - AHU-7 - SPACE THERMOSTAT THERMOSTAT WITH TEMPERATURE DISPLAY AND OVERRIDE. PROVIDE +/-3°F (ADJ.) TEMPERATURE RANGE. TEMPERATURE RANGE ADJUSTMENT CAN BE MADE AT CONTROLLER.
 - AHU-8 - SPACE THERMOSTAT THERMOSTAT WITH TEMPERATURE DISPLAY AND OVERRIDE. PROVIDE +/-3°F (ADJ.) TEMPERATURE RANGE. TEMPERATURE RANGE ADJUSTMENT CAN BE MADE AT CONTROLLER. HUMIDITY SENSOR WILL BE PROVIDED.
 - AHU-9 - SPACE THERMOSTAT THERMOSTAT WITH TEMPERATURE DISPLAY AND OVERRIDE. PROVIDE +/-3°F (ADJ.) TEMPERATURE RANGE. TEMPERATURE RANGE ADJUSTMENT CAN BE MADE AT CONTROLLER. HUMIDITY SENSOR WILL BE PROVIDED.
 - AHU-10 - SPACE THERMOSTAT THERMOSTAT WITH TEMPERATURE DISPLAY AND OVERRIDE. PROVIDE +/-3°F (ADJ.) TEMPERATURE RANGE. TEMPERATURE RANGE ADJUSTMENT CAN BE MADE AT CONTROLLER.

- OCCUPIED MODE:
SUPPLY AIR FAN: THE SUPPLY AIR FAN SHALL BE COMMANDED ON. THE FAN SHALL RUN CONTINUOUSLY.

SINGLE-ZONE COOLING COIL TEMPERATURE CONTROL: THE UNIT TEMPERATURE CONTROLLER WITH ITS SPACE MOUNTED TEMPERATURE TRANSMITTER MODULATES BOTH THE COOLING COIL VALVES AND FAN SPEED DURING OCCUPIED MODE TO MAINTAIN 55°F DISCHARGING AIR TEMPERATURE UNTIL FAN RAMP DOWN TO ITS MINIMUM SPEED. WHEN FAN RAMP DOWN TO ITS MINIMUM SPEED, THE COOLING COIL VALVES WILL MODULATE TO MAINTAIN 55°F DISCHARGING AIR TEMPERATURE. THERE SHALL BE AN ADJUSTABLE DEAD BAND OF (MINIMUM) 5°F TO SEPARATE HEATING AND COOLING MODES. MODE SHALL BE DETERMINED BY RETURN AIR TEMPERATURE RELATIONSHIP TO SPACE SET POINT. IF RETURN AIR TEMPERATURE IS ABOVE SPACE SETPOINT, UNIT SHALL BE IN COOLING MODE. IF RETURN AIR TEMPERATURE IS BELOW SPACE SETPOINT, UNIT SHALL BE IN HEATING MODE. IF SPACE TEMPERATURE IS NOT WITH IN 10% OF SET POINT BAS SHALL ALARM.

SINGLE-ZONE HEATING COIL TEMPERATURE CONTROL: THE UNIT TEMPERATURE CONTROLLER WITH ITS SPACE MOUNTED TEMPERATURE TRANSMITTER MODULATES THE HEATING COIL VALVE DURING OCCUPIED MODE TO MAINTAIN A SPACE SETPOINT. THERE SHALL BE AN ADJUSTABLE DEAD BAND OF (MINIMUM) 5°F TO SEPARATE HEATING AND COOLING MODES. MODE SHALL BE DETERMINED BY RETURN AIR TEMPERATURE RELATIONSHIP TO SPACE SET POINT. IF RETURN AIR TEMPERATURE IS ABOVE SPACE SETPOINT, UNIT SHALL BE IN COOLING MODE. IF RETURN AIR TEMPERATURE IS BELOW SPACE SETPOINT, UNIT SHALL BE IN HEATING MODE. IF SPACE TEMPERATURE IS NOT WITH IN 10% OF SET POINT BAS SHALL ALARM.

DEHUMIDIFICATION MODE (APPLY WHERE REHEAT COIL SCHEDULED): WHEN SPACE TEMPERATURE SATISFIED AND RELATIVE HUMIDITY ABOVE THE SETPOINT, DEHUMIDIFICATION MODE WILL BE ENGAGED. WHEN DEHUMIDIFICATION MODE IS ENGAGED, THE UNIT SUPPLY AIR FAN WILL RUN AT ITS MINIMUM SPEED AND COOLING COIL VALVES MODULATES TO MAINTAIN 55°F DISCHARGING AIR TEMPERATURE (ADJ.) FOR DEHUMIDIFICATION. REHEAT COIL VALVES WILL MODULATE AT THE SAME MANNER TO HEAT SUPPLY AIR TO 70°F (ADJ.). DEHUMIDIFICATION MODE WILL BE DISENGAGED WHEN SPACE HUMIDITY DECREASES 2% (ADJ.) BELOW THE SETPOINT.

OUTSIDE AIR DAMPER: FOR UNITS WHERE DEMAND CONTROLLED VENTILATION IS SCHEDULED, CONTROLS CONTRACTOR SHALL PROVIDE CO2 SENSOR ADJACENT TO THERMOSTAT. THE OUTSIDE AIR DAMPER SHALL MODULATE TO MAINTAIN SPACE CO2 BETWEEN MIN. OA POSITION AND MAX. OA POSITION (SCHEDULED OA VALUE).

ECONOMIZER MODE: ECONOMIZER MODE WILL ENABLE WHEN COOLING IS REQUIRED AND OUTSIDE AIR TEMPERATURE IS BETWEEN THE ECONOMIZER DRY BULB MAXIMUM (56°F) AND THE ECONOMIZER DRY BULB MINIMUM (48°F). THE ECONOMIZER WILL HAVE A MAXIMUM POSITION OF THE ECONOMIZER DAMPER MAXIMUM POSITION.

RETURN AIR DAMPER: THE RETURN AIR DAMPER SHALL MODULATE INVERSELY OF THE OUTSIDE AIR DAMPER.

6. UNOCCUPIED MODE:

SUPPLY AIR FAN: THE SUPPLY AIR FAN WILL BE DISABLED.
CHILLED WATER COOLING: THE COOLING COIL VALVES WILL REMAIN CLOSED.
HOT WATER HEATING: THE HEATING COIL VALVES WILL REMAIN CLOSED.
OUTSIDE AIR DAMPER: THE OUTSIDE AIR DAMPER WILL CLOSE.
RETURN AIR DAMPER: THE RETURN AIR DAMPER WILL OPEN.

THE ABOVE SHALL OCCUR EXCEPT IN THE FOLLOWING CONDITIONS:

- WHEN THE SPACE TEMPERATURE EXCEEDS THE UNOCCUPIED ROOM SETPOINT (COOLING), THE SUPPLY FAN WILL ENGAGE AND THEN THE COOLING COIL VALVES SHALL MODULATE IN THE SAME MANNER AS DESCRIBED IN OCCUPIED MODE COOLING SEQUENCE.
- WHEN THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED ROOM SETPOINT (HEATING), THE SUPPLY FAN WILL ENGAGE AND THEN THE HEATING COIL VALVES SHALL MODULATE IN THE SAME MANNER AS DESCRIBED IN OCCUPIED MODE HEATING SEQUENCE.
- OVERRIDE: WHEN AN OVERRIDE BUTTON IS PRESSED AT THE THERMOSTAT, THE UNIT SHALL OPERATE IN OCCUPIED MODE FOR A 2HR PERIOD (ADJ.) AND THEN REVERT BACK TO UNOCCUPIED MODE.

7. NOTES:

a. OCCUPIED MODE: THE UNIT WILL BE IN OCCUPIED MODE BASED ON THE UNIT'S ASSOCIATED TIME SCHEDULE AND THE MASTER HOLIDAY SCHEDULE. COORDINATE SCHEDULE WITH OWNER AND DOCUMENT COORDINATION.

b. UNOCCUPIED MODE: THE UNIT WILL BE IN UNOCCUPIED MODE BASED ON THE UNIT'S ASSOCIATED TIME SCHEDULE AND THE MASTER HOLIDAY SCHEDULE. COORDINATE SCHEDULE WITH OWNER AND DOCUMENT COORDINATION.

c. HUMIDITY CONTROL MODE:

SPACE AIR TEMPERATURE	STATUS	SPACE HUMIDITY SETPOINT	SUPPLY AIR SETPOINT
< 70°F	NOT ALLOWED	N/A	N/A
70°F - 77°F	ALLOWED	60% (ADJ.)	50°F-55°F (ADJ.)
> 77°F	NOT ALLOWED	N/A	N/A

Table 1 - Humidity Control Mode Setpoints

d. OUTSIDE AIR CFM (FOR UNITS DESIGNED FOR DEMAND CONTROLLED VENTILATION AS SCHEDULED): WHEN THE OUTSIDE AIR DAMPER IS MODULATING TO MAINTAIN SPACE CO2, THE OUTSIDE AIR DAMPER SHALL MODULATE WITHIN THE MINIMUM AND MAXIMUM DAMPER POSITION DETERMINED BY TABLE 2 - OUTSIDE AIR CFM RESET.

MINIMUM CFM	MAXIMUM CFM	OA/RA DAMPER MIN. POSITION	OA/RA DAMPER MAX. POSITION
AS SCHEDULED	AS SCHEDULED	DET. BY TAB	DET. BY TAB

Table 2 - OUTSIDE AIR CFM RESET

e. ALARMS: THE SUPPLY AIR FAN ALARM SHALL BE ACTIVE WHEN THE SUPPLY AIR FAN IS COMMANDED ON FOR 3 MINUTES AND THE SUPPLY AIR FAN STATUS IS NOT PROVEN OR THE SUPPLY AIR FAN IS COMMANDED OFF AND THE SUPPLY AIR FAN STATUS IS PROVEN FOR 3 MINUTES.

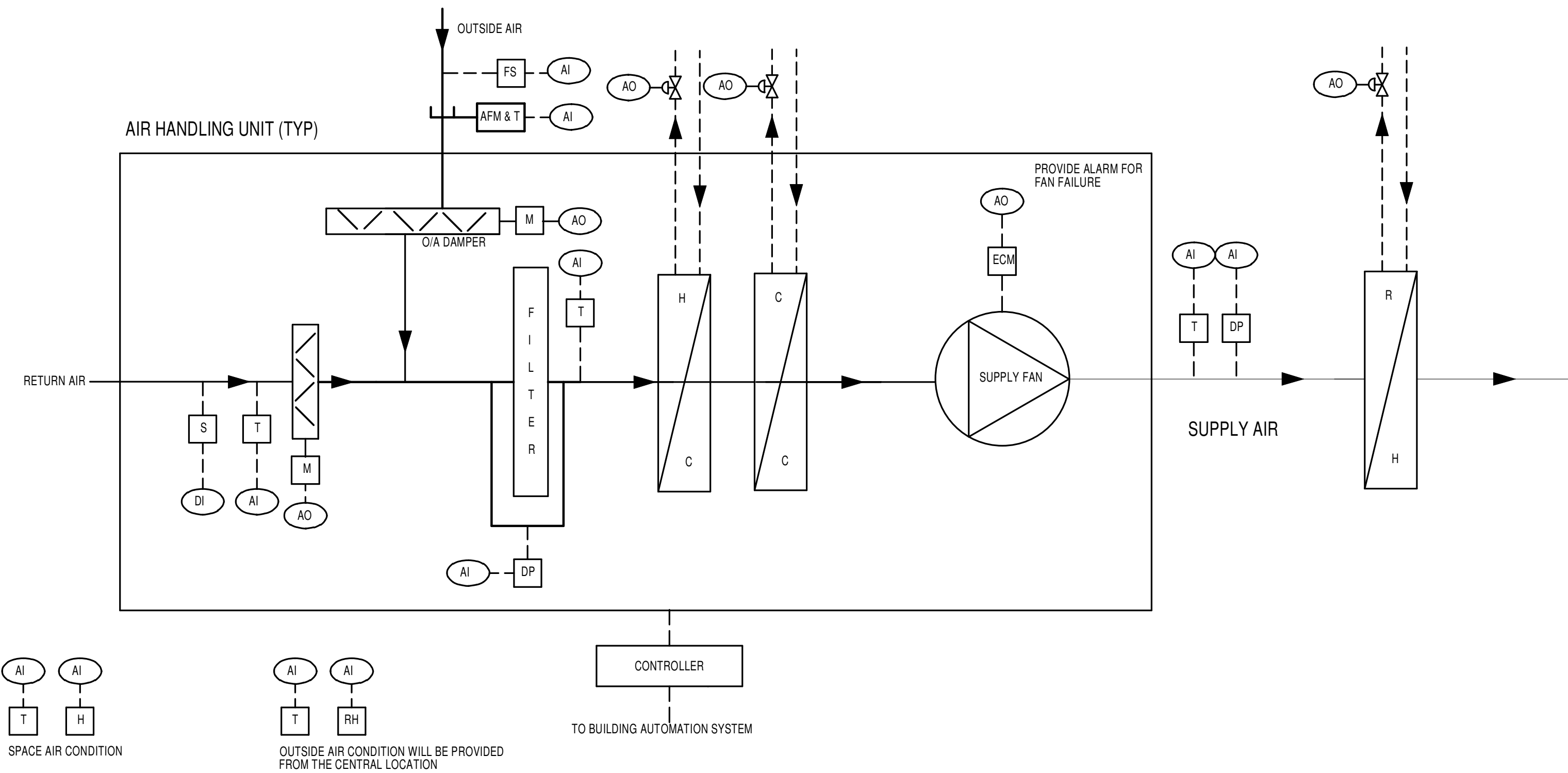
f. SAFETIES:

f.a. THE SUPPLY AIR FAN SHALL STOP VIA A HARDWIRED SWITCH UPON SMOKE DETECTION IN THE DUCT.

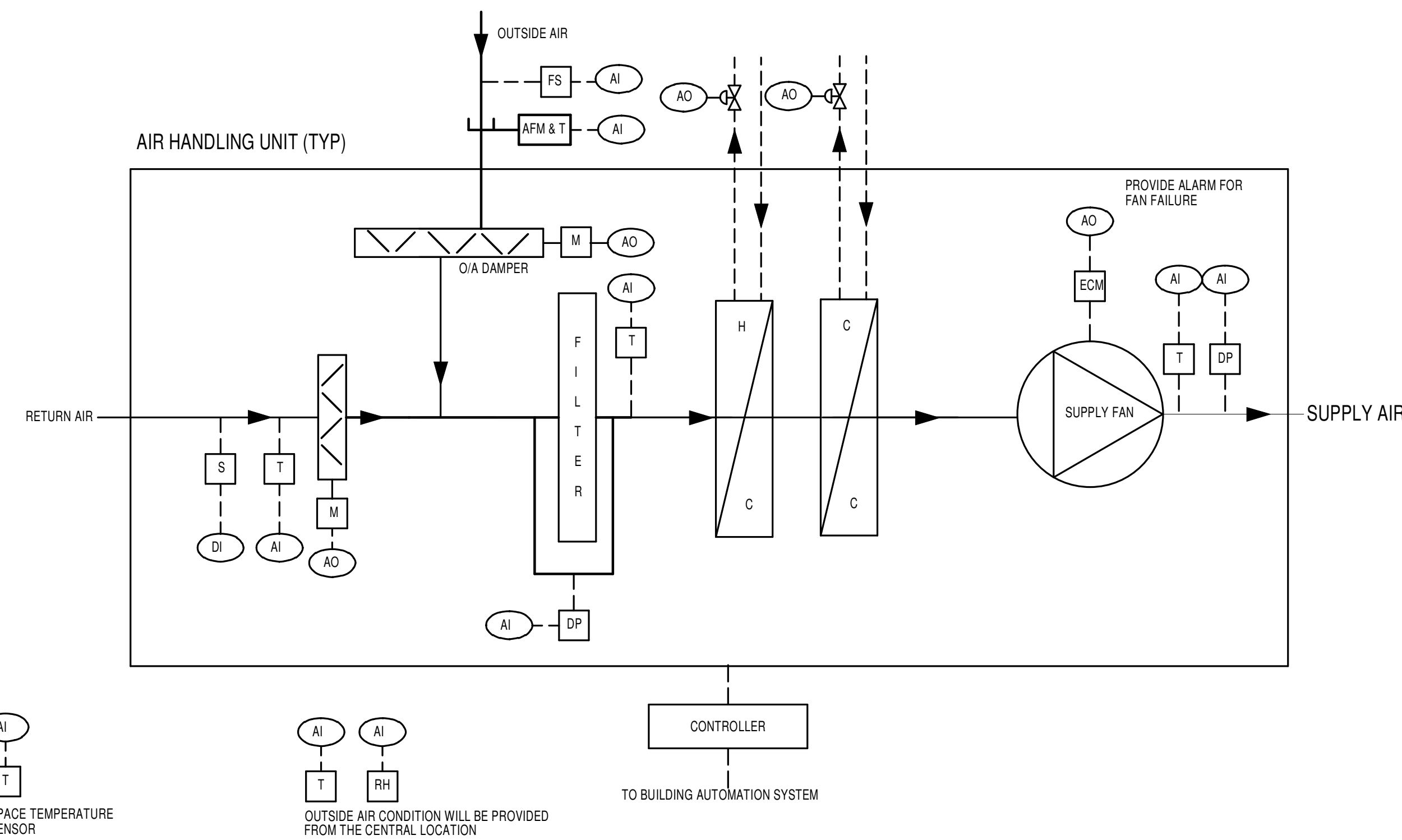
f.b. THE SUPPLY AIR FAN SHALL STOP VIA A HARDWIRED FIRE ALARM SWITCH.

g. OUTSIDE AIR DAMPER AND RETURN AIR DAMPER TO BE PHYSICALLY LINKED. IF NOT, A LOW STATIC PRESSURE SENSOR SHALL BE INSTALLED. WHEN A LOW STATIC PRESSURE SENSOR IS INSTALLED, THE SUPPLY FAN, AND HEAT SHALL DISENGAGE WHEN THE STATIC PRESSURE REACH TO THE LOW STATIC PRESSURE SET POINT

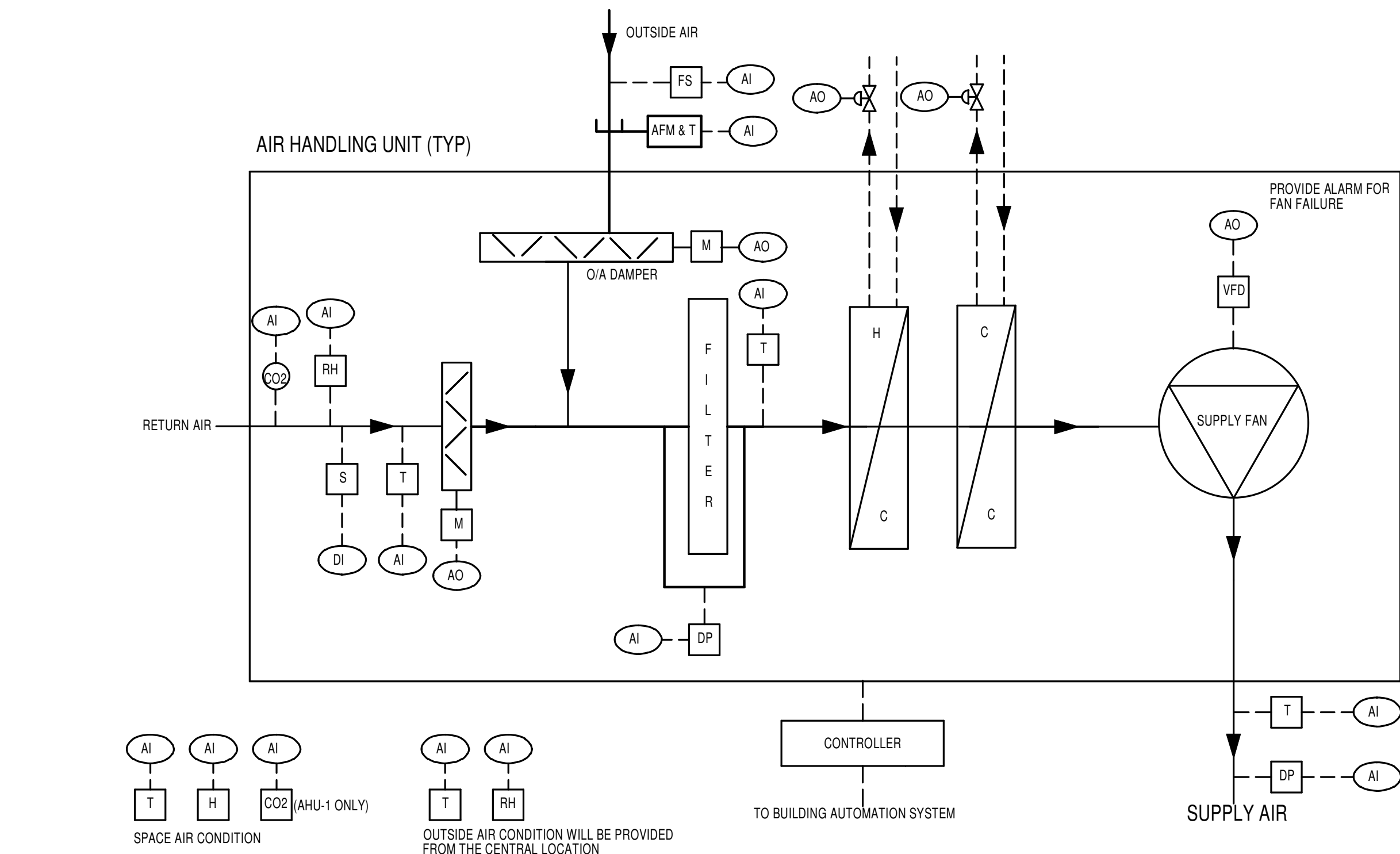
AHU-3, 4, 5, 6, AND 8 CONTROL DIAGRAM



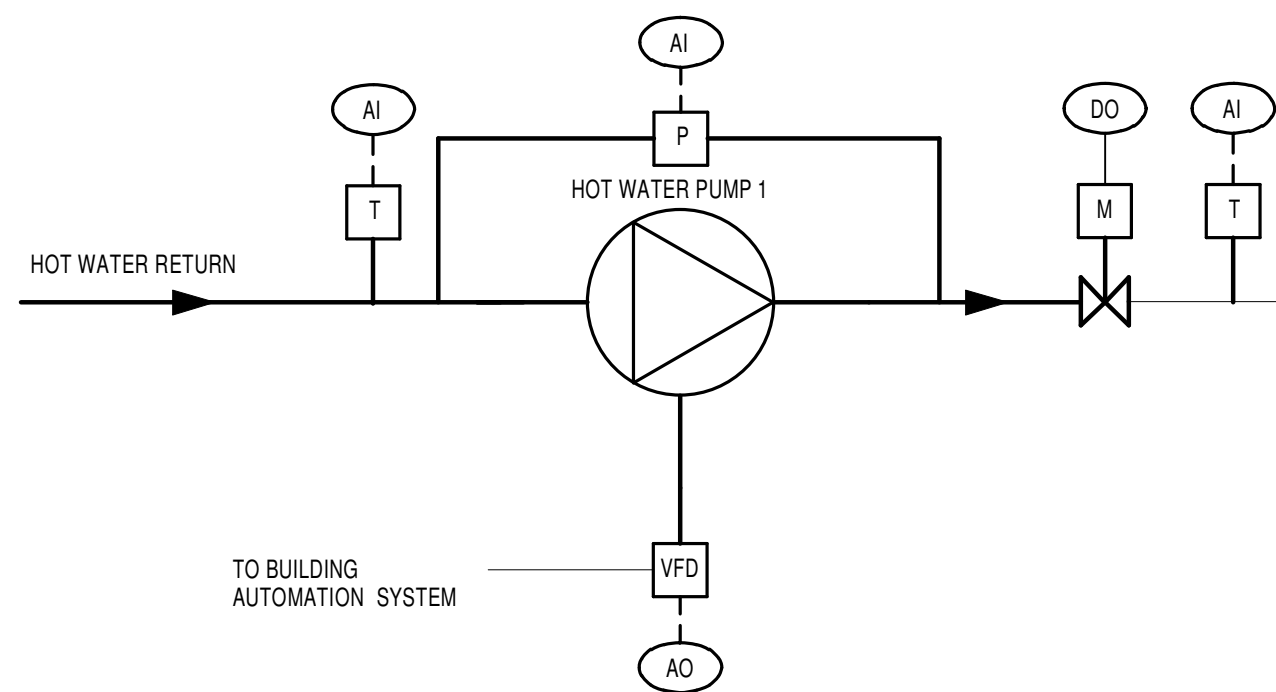
AHU-7,9, AND 10 CONTROL DIAGRAM



AHU-1 AND AHU-2 CONTROL DIAGRAM



HWP-1 CONTROL DIAGRAM



SEQUENCE OF OPERATION - HWP-1

- THE PRESSURE AND TEMPERATURE SHALL BE MEASURED ON THE RETURN AND SUPPLY SIDE OF PUMP.
- WHEN THERE IS A CALL FOR HEATING OR DEHUMIDIFICATION FROM ANY AIR HANDLERS THE BAS SHALL OPEN THE SHUTOFF VALVE AND START THE HOT WATER PUMP ASSOCIATED WITH THE EXISTING STEAM TO HOT WATER CONVERTER IN 2ND FLOOR MECHANICAL ROOM AND STEAM BOILER IN CENTRAL PLANT. START STEAM BOILER AND STEAM TO HOT WATER CONVERTOR AND MAINTAIN LEAVING HOT WATER TEMPERATURE AT 180°F. WHEN A PUMP IS SHUTDOWN, ITS CORRESPONDING CONTROL VALVE (ISOLATION VALVE) SHALL BE IN THE CLOSED POSITION.
- HOT WATER PUMP FAILURE - WHEN A HOT WATER PUMP HAS FAILED, SEND AN ALARM TO THE BAS. SHUTDOWN BOILER, THEN HOT WATER PUMP, THEN CLOSE ISOLATION VALVE.
- VFD SHALL CONTROL HOT WATER PUMP SPEED BASED ON THE PRESSURE DIFFERENTIAL ON THE FURTHEST AHU IN THE SYSTEM. WHEN THE PRESSURE DIFFERENTIAL BECOMES TOO LOW THE VFD SHALL INCREASE THE SPEED OF THE PUMP. WHEN THE PRESSURE DIFFERENTIAL BECOMES TOO HIGH THE VFD SHALL DECREASE THE SPEED OF THE PUMP.



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PROJECT NO: 18071

MECHANICAL CONTROLS

M502

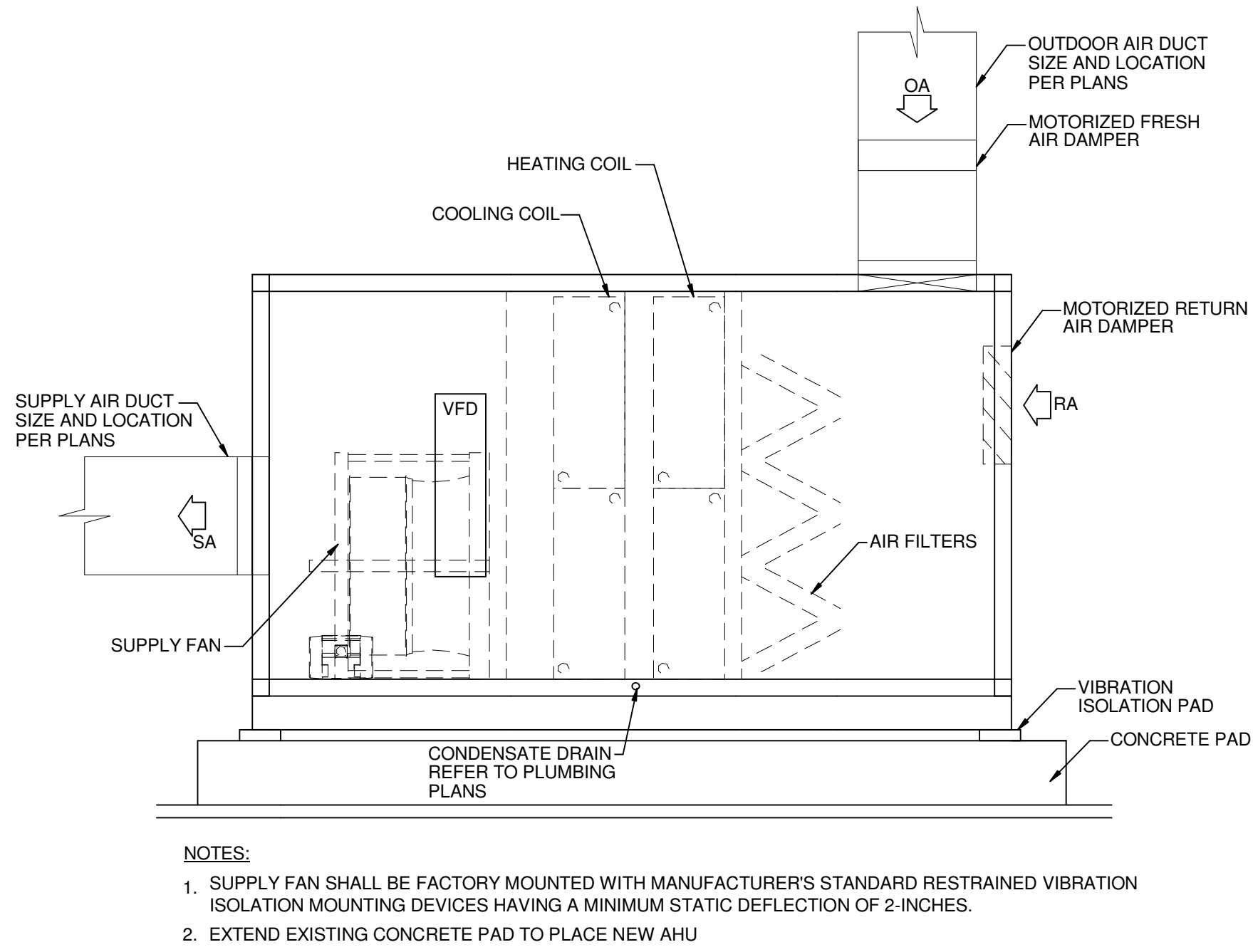
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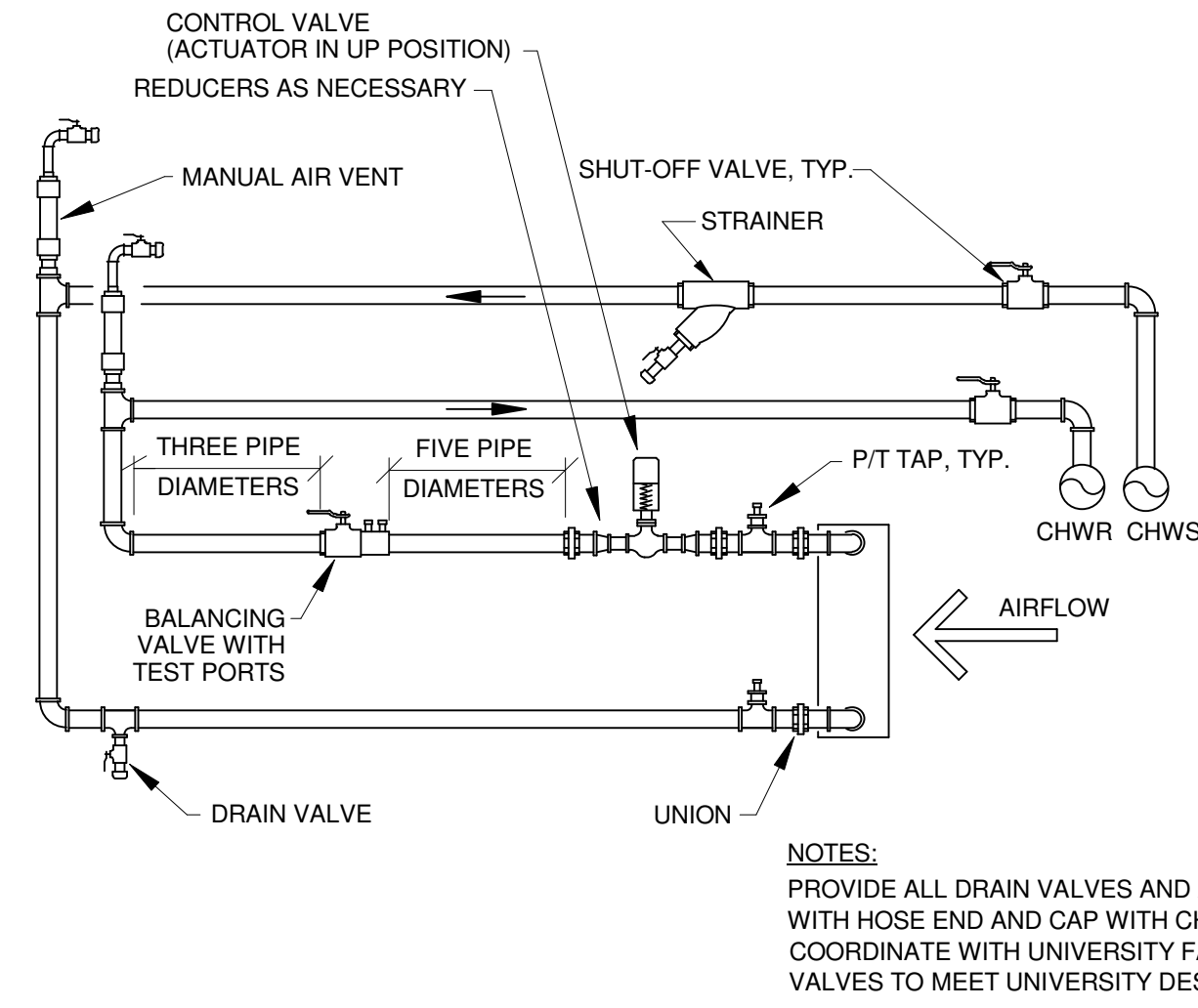
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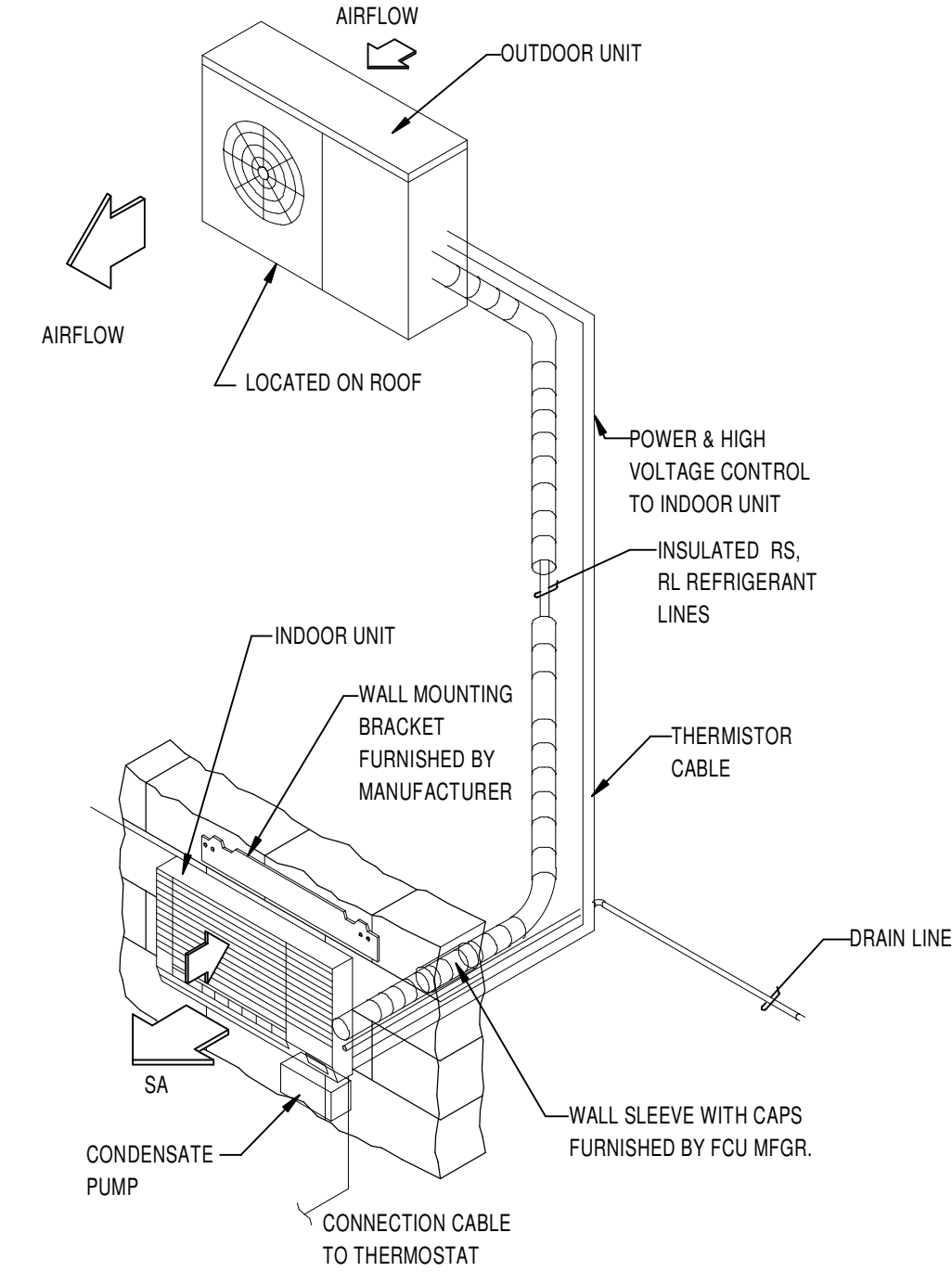
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TEXAS
MIDWESTERN STATE UNIVERSITY



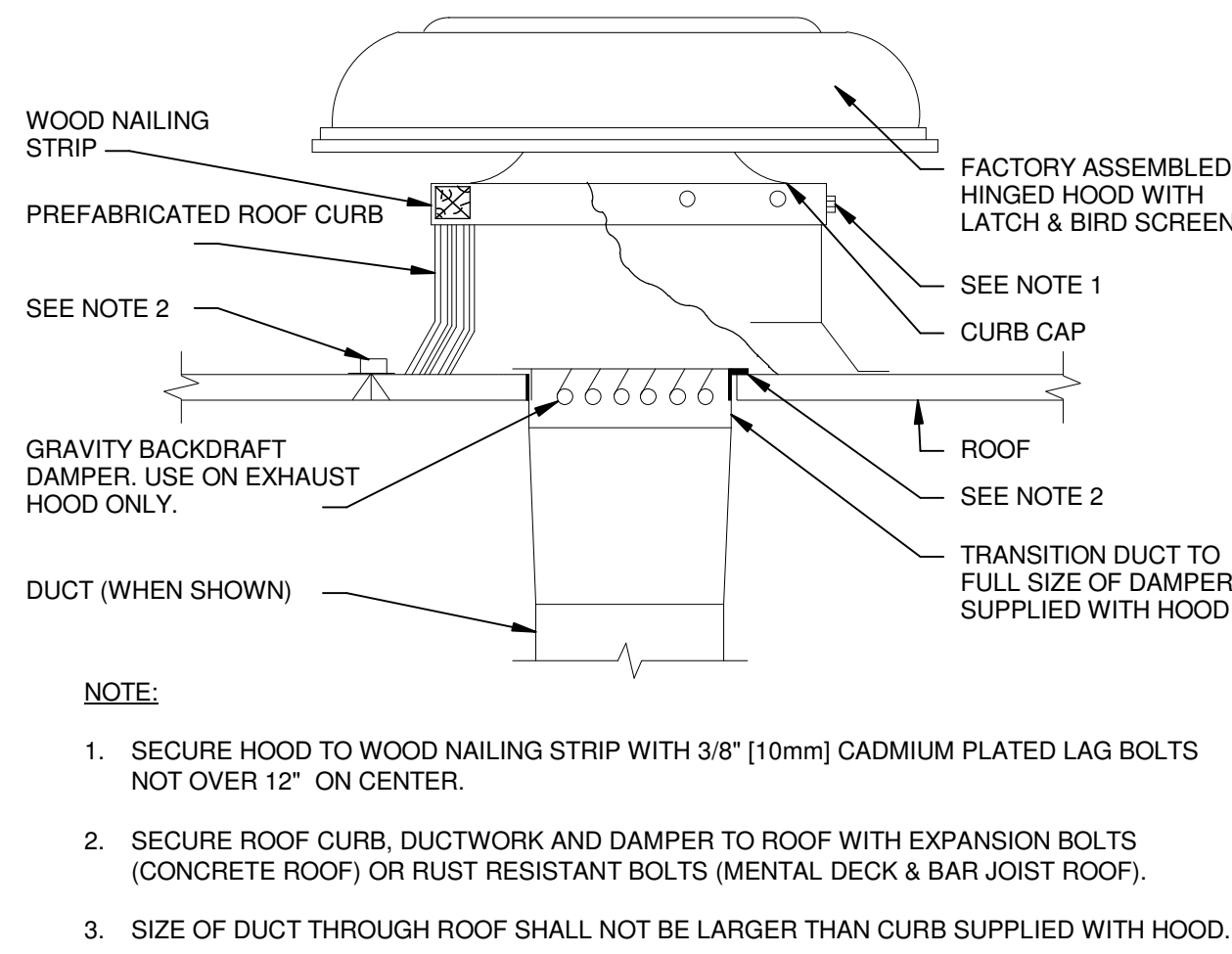
1 TYPICAL INDOOR HYDRONIC AIR HANDLING UNIT DETAIL
SCALE: NO SCALE



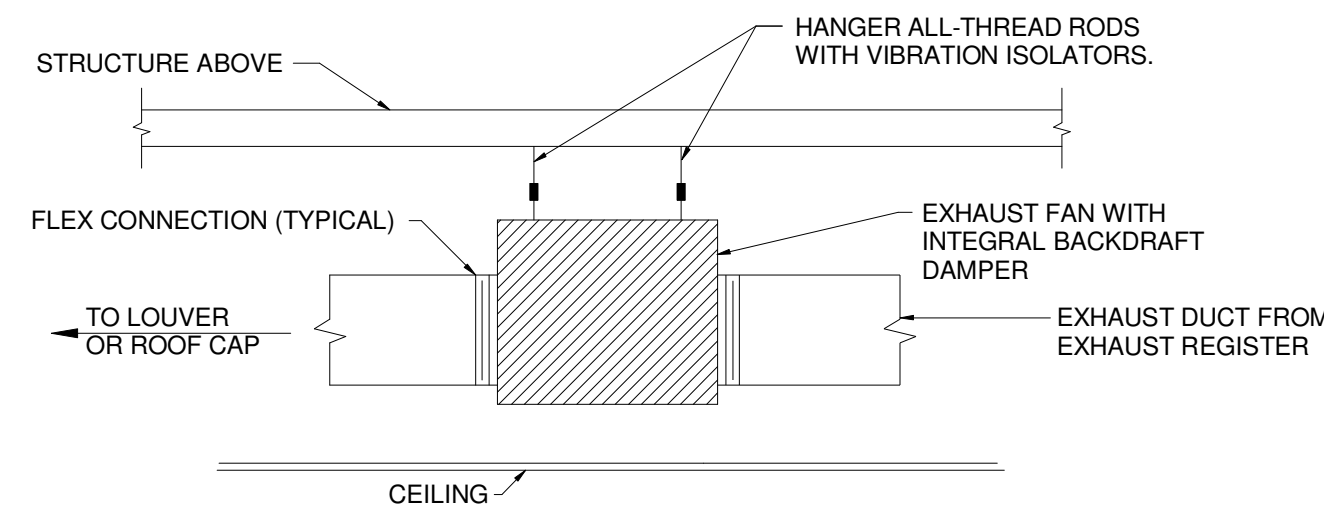
2 TYPICAL AHU COOLING/HEATING COIL WITH TWO-WAY VALVE DETAIL
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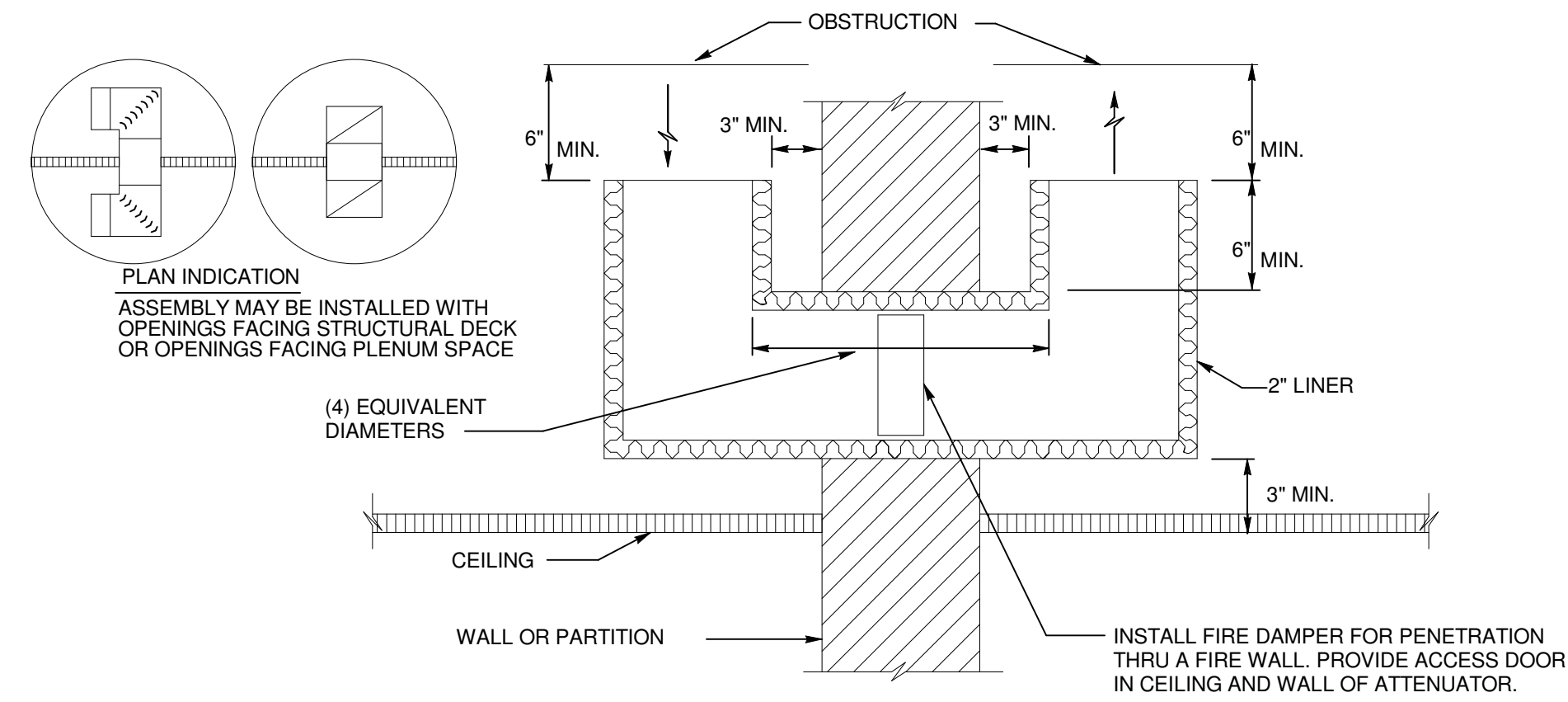
3 TYPICAL DUCTLESS AIR CONDITIONER DETAIL
SCALE: NO SCALE



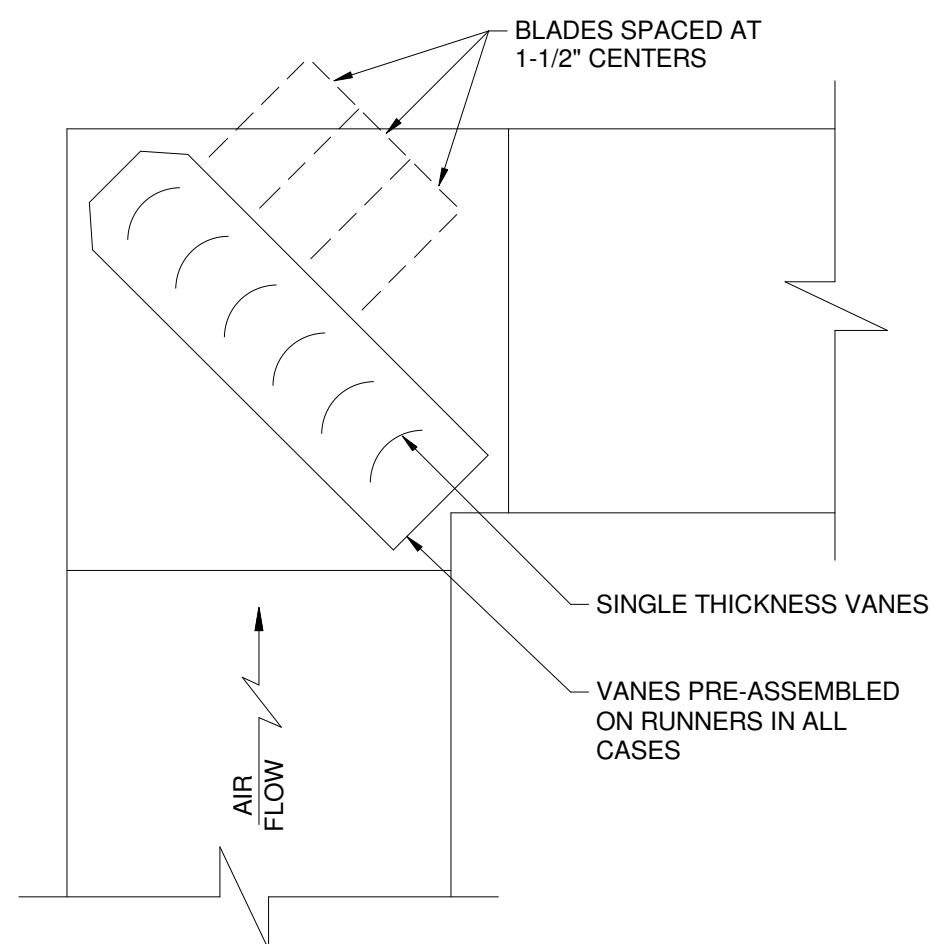
4 TYPICAL LOW-SILHOUETTE EXHAUST OR INTAKE HOOD
SCALE: NO SCALE



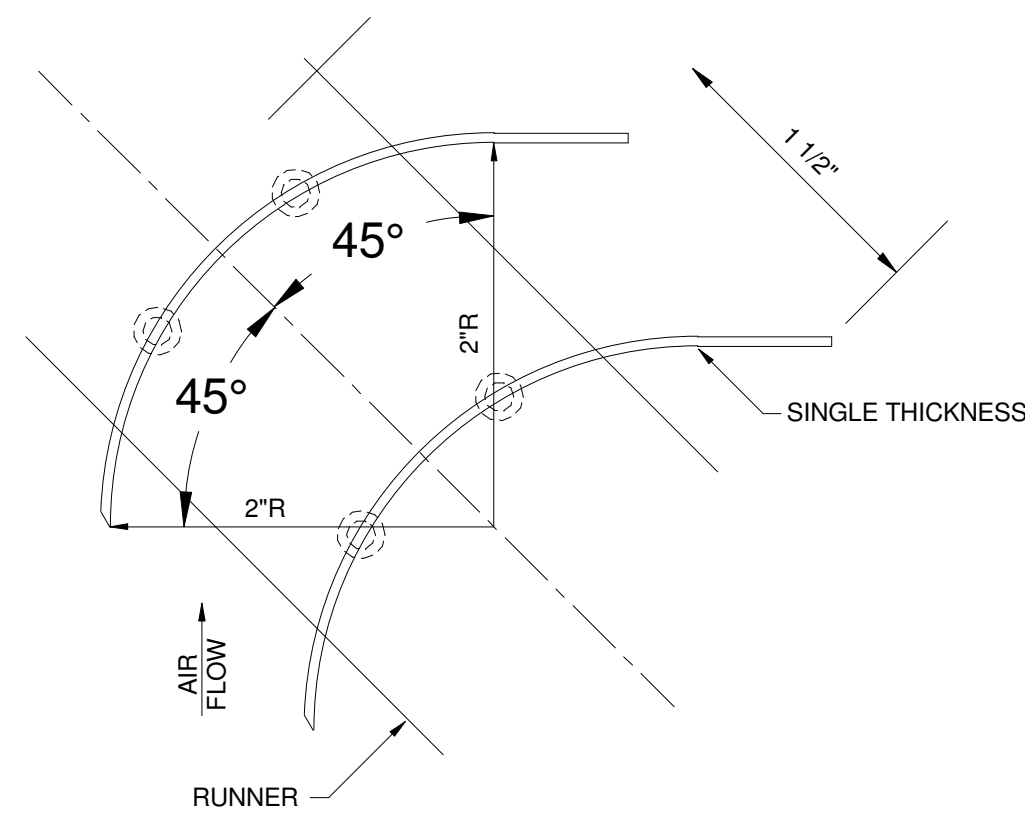
1 TYPICAL SUSPENDED INLINE EXHAUST FAN
SCALE: NO SCALE



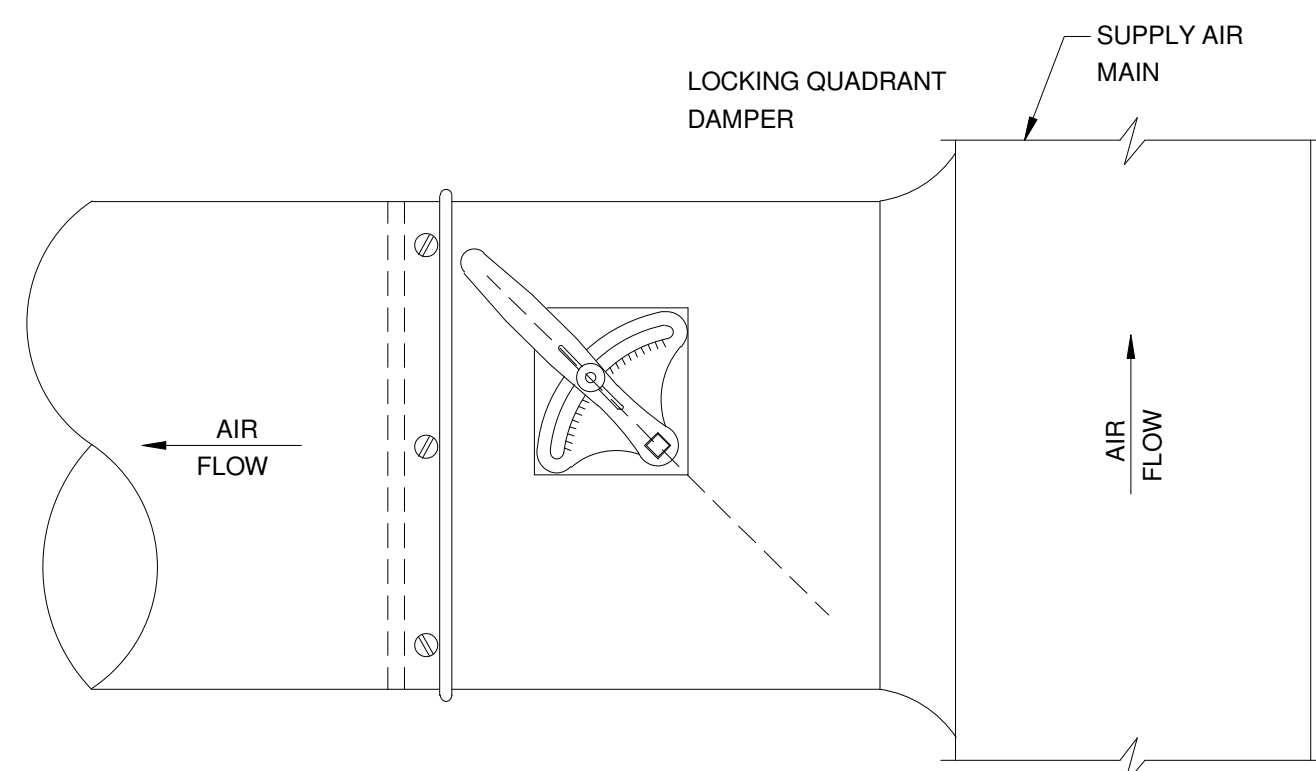
6 TYPICAL RETURN AIR TRANSFER ASSEMBLY DETAIL
SCALE: NO SCALE



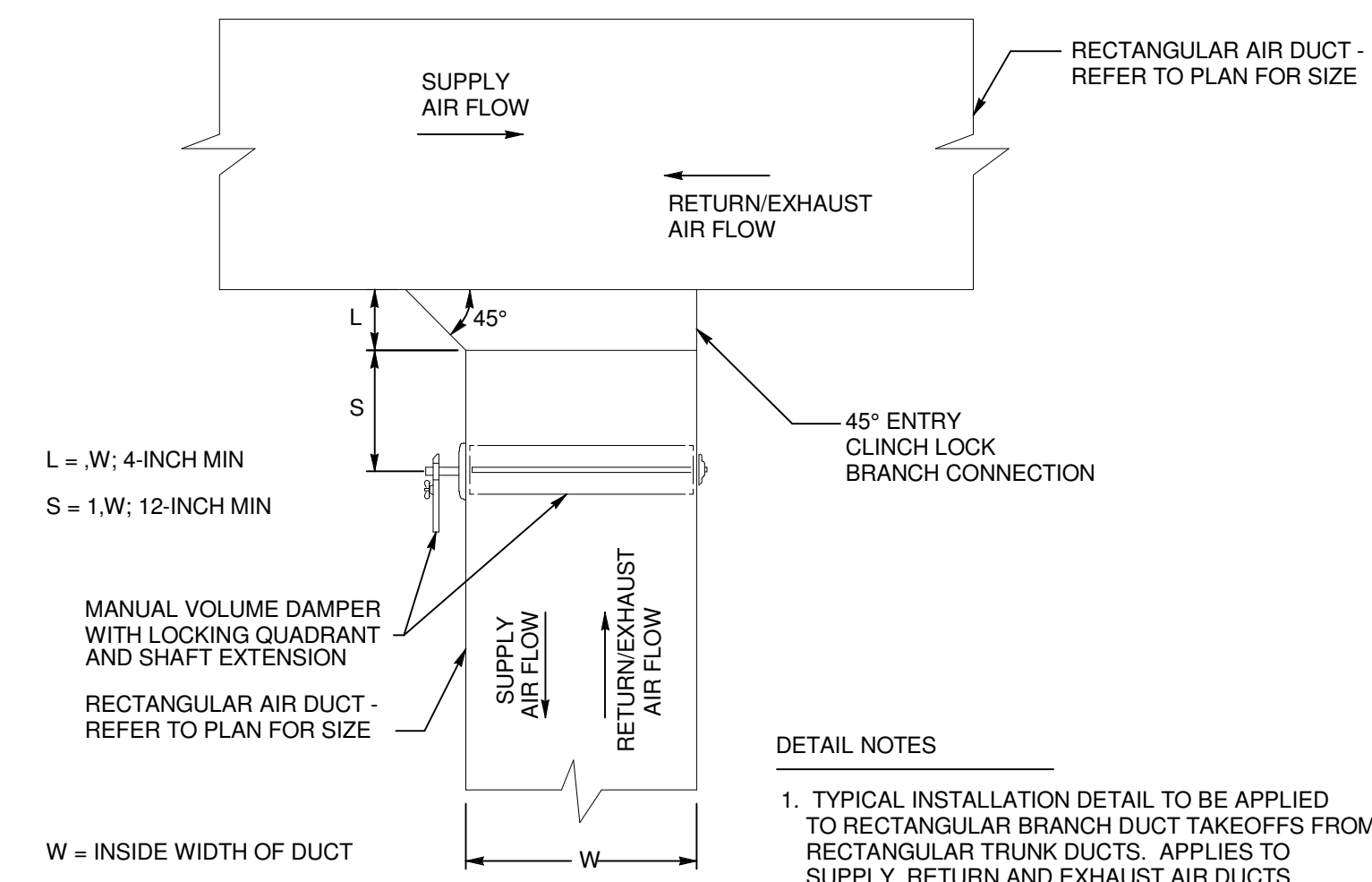
7 TYPICAL SQUARE ELBOW DETAIL
SCALE: NO SCALE



8 TYPICAL TURNING VANE DETAIL
SCALE: NO SCALE



9 TYPICAL CONICAL TAP DETAIL
SCALE: NO SCALE



10 TYPICAL RECTANGULAR BRANCH TAKEOFF DETAIL
SCALE: NO SCALE



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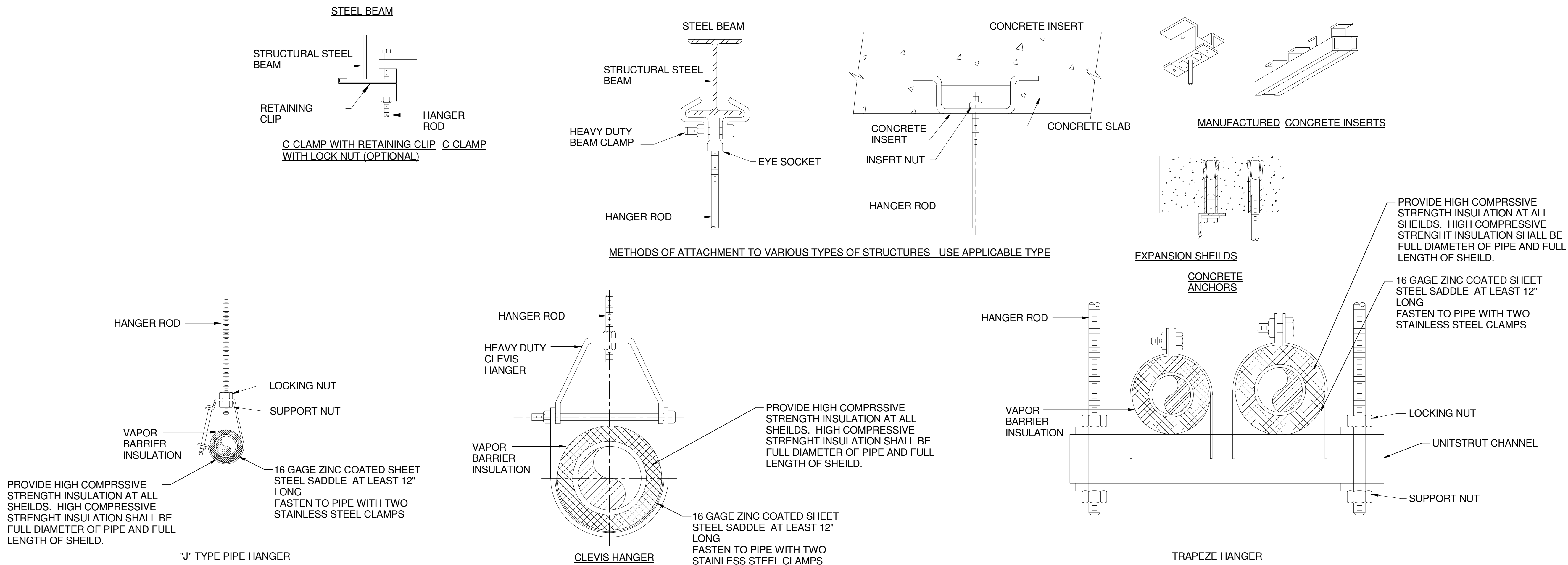


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MECHANICAL DETAILS

M601

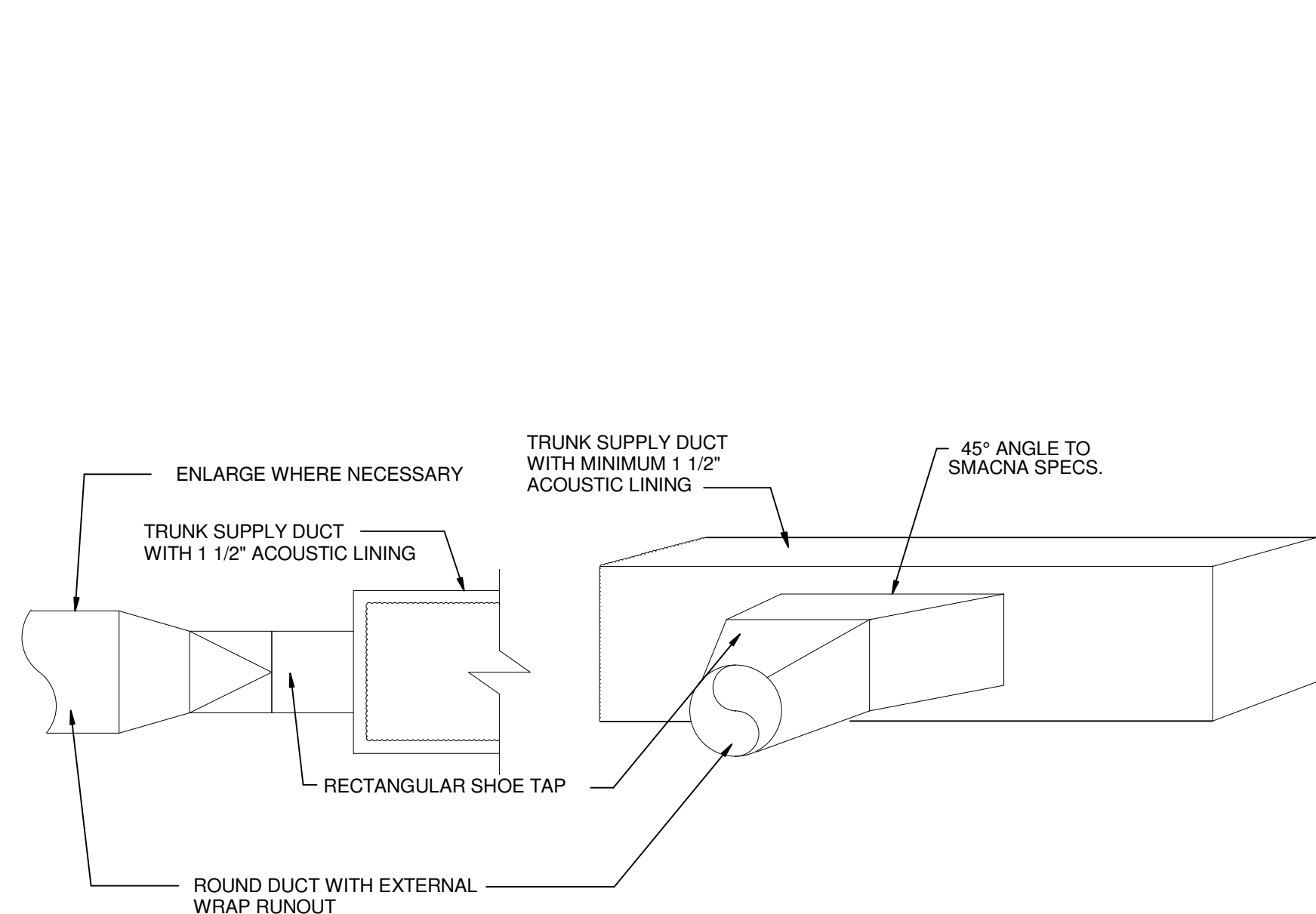


NOTE:

- HANGER SPACING PER MSS-SP-69
- SIZE ALL THREAD ROD AND TRAPEZE UNISTRUT CHANNEL FOR LOADS.

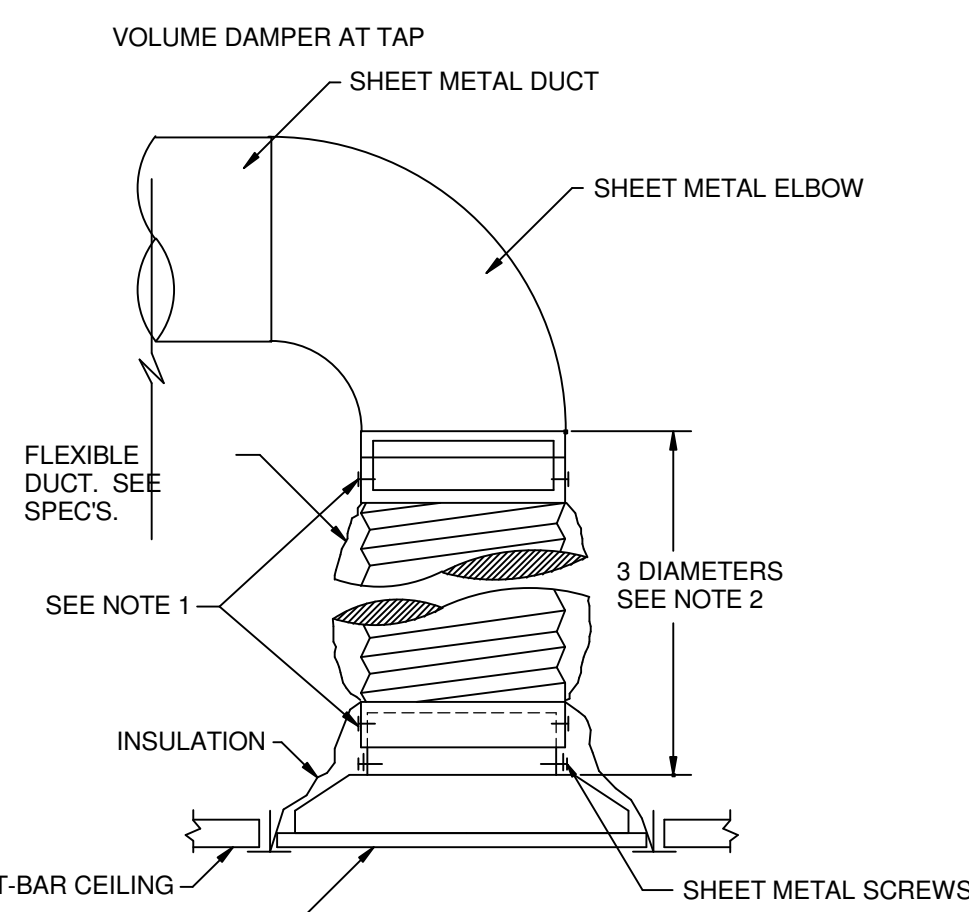
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SCALE: NO SCALE



2 BRANCH SHOE TAP

SCALE: NO SCALE

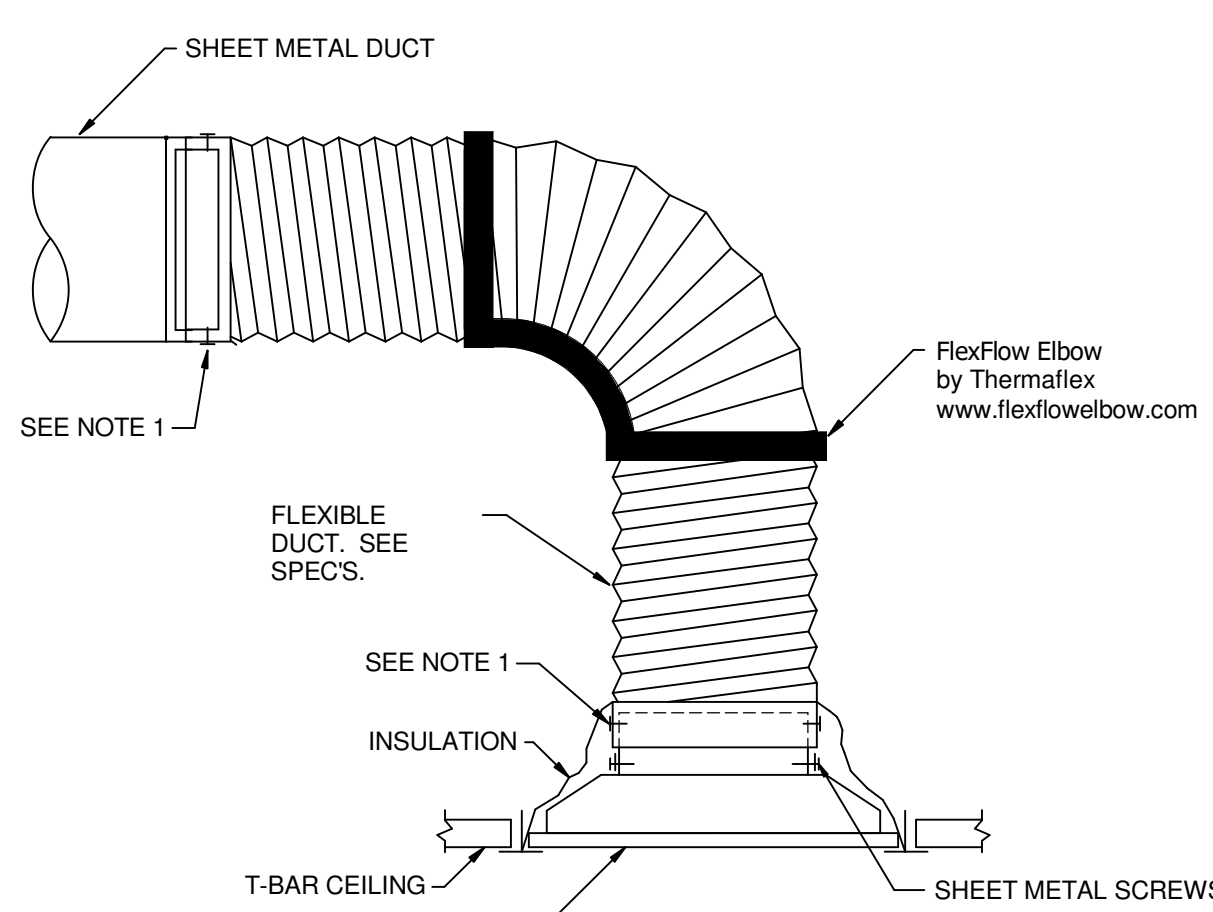


NOTES:

- USE PLENUM COLLARS TO ATTACH FLEXIBLE DUCT. USE SHEET METAL SCREWS AND (2) WRAPS OF TAPE TO SECURE PLENUM COLLARS. ALTERNATE METHOD: BANDING DEVICE OR PANDUIT STRAP, IN LIEU OF SHEET METAL SCREWS. ALL TAPES AND SEALING MATERIALS SHALL COMPLY WITH UL181A FOR RIGID DUCT AND UL181B FOR FLEXIBLE DUCT.
- SECURE SHEET METAL DROP TO DIFFUSER NECK WITH A MIN. OF (3) SHEET METAL SCREWS AND (2) FULL WRAPS OF TAPE PER UL REQUIREMENTS LISTED IN NOTE 1.
- ALL FLEX DUCT SHALL BE INSTALLED WITHOUT KINKS, SAGGING, OR SHORT-RADIUS BENDS.

3 TYPICAL FLEXDUCT CONNECTIONS DETAIL

SCALE: NO SCALE



NOTES:

- USE PLENUM COLLARS TO ATTACH FLEXIBLE DUCT. USE SHEET METAL SCREWS AND (2) WRAPS OF TAPE TO SECURE PLENUM COLLARS. ALTERNATE METHOD: BANDING DEVICE OR PANDUIT STRAP, IN LIEU OF SHEET METAL SCREWS. ALL TAPES AND SEALING MATERIALS SHALL COMPLY WITH UL181A FOR RIGID DUCT AND UL181B FOR FLEXIBLE DUCT.
- IF A MINIMUM OF 2 DIAMETERS OF STRAIGHT RUN IS NOT AVAILABLE ABOVE THE REGISTER USE HARD DUCT SHORT RADIUS CONNECTION.
- ALL FLEX DUCT SHALL BE INSTALLED WITHOUT KINKS, SAGGING, OR SHORT-RADIUS BENDS.



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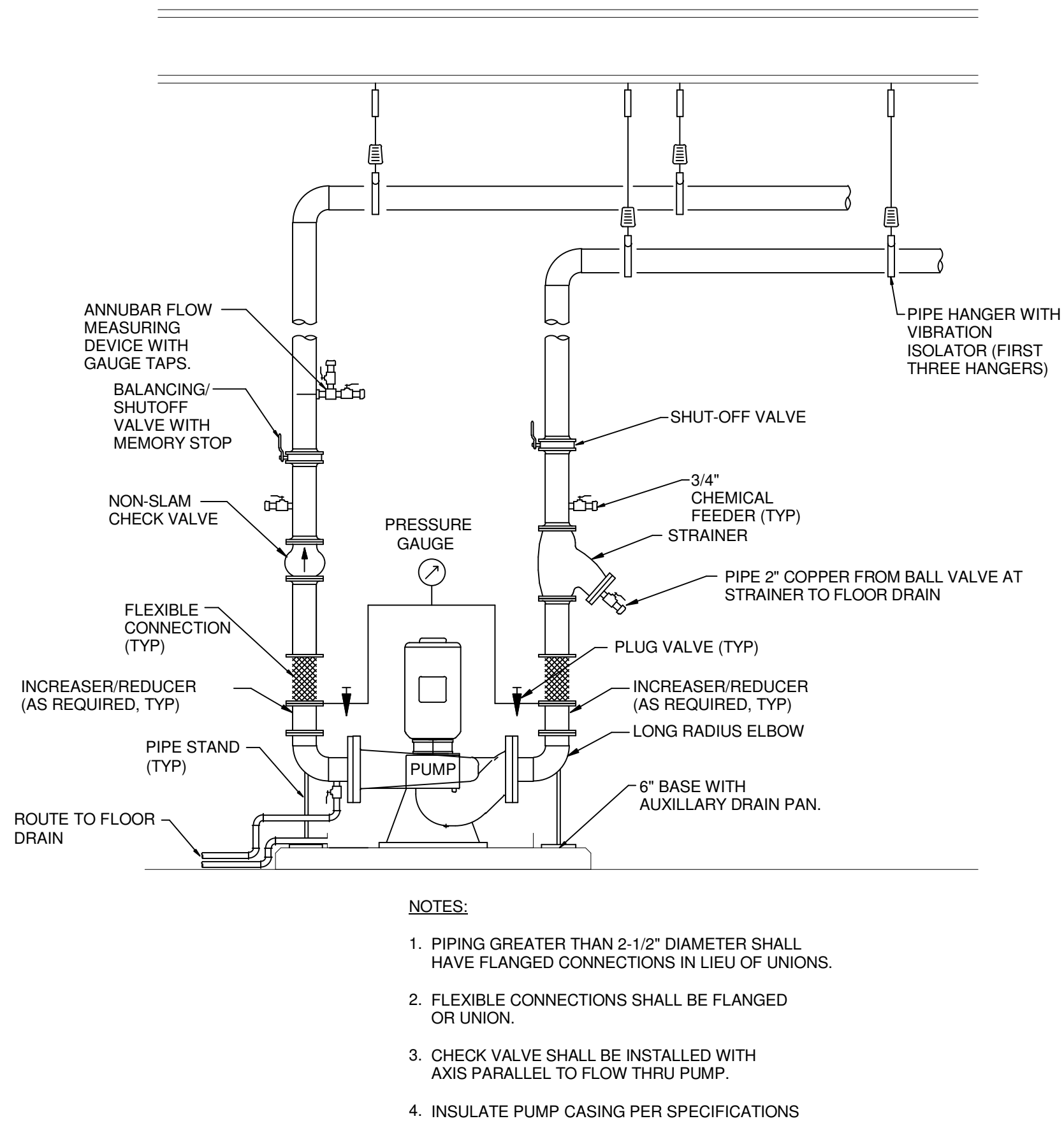
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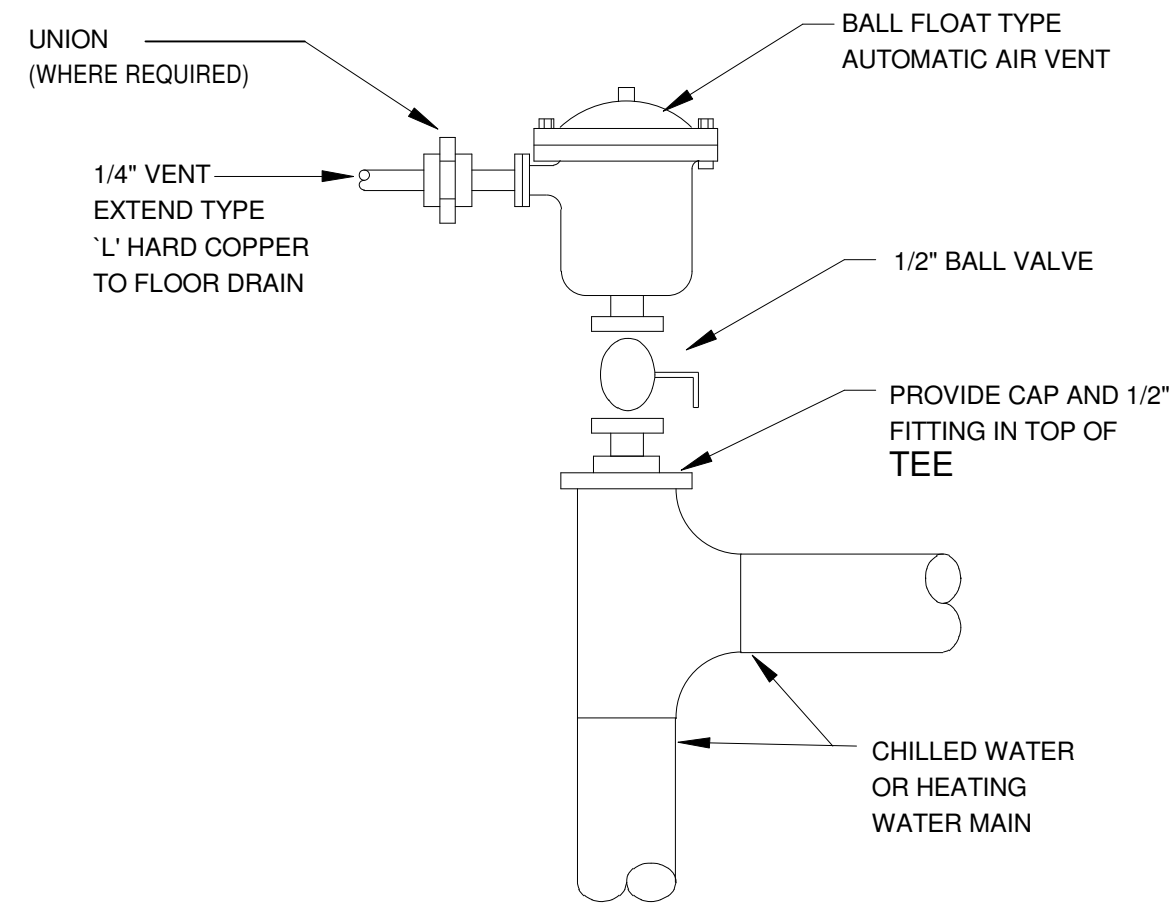
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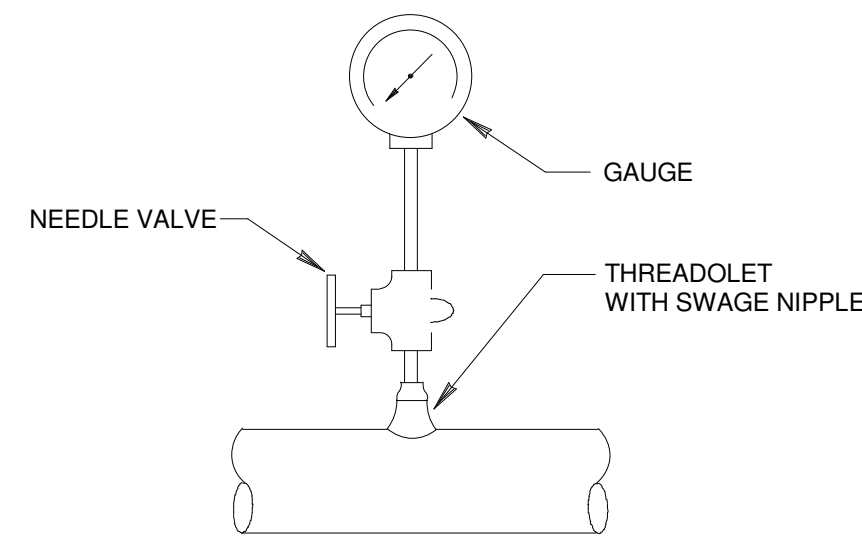
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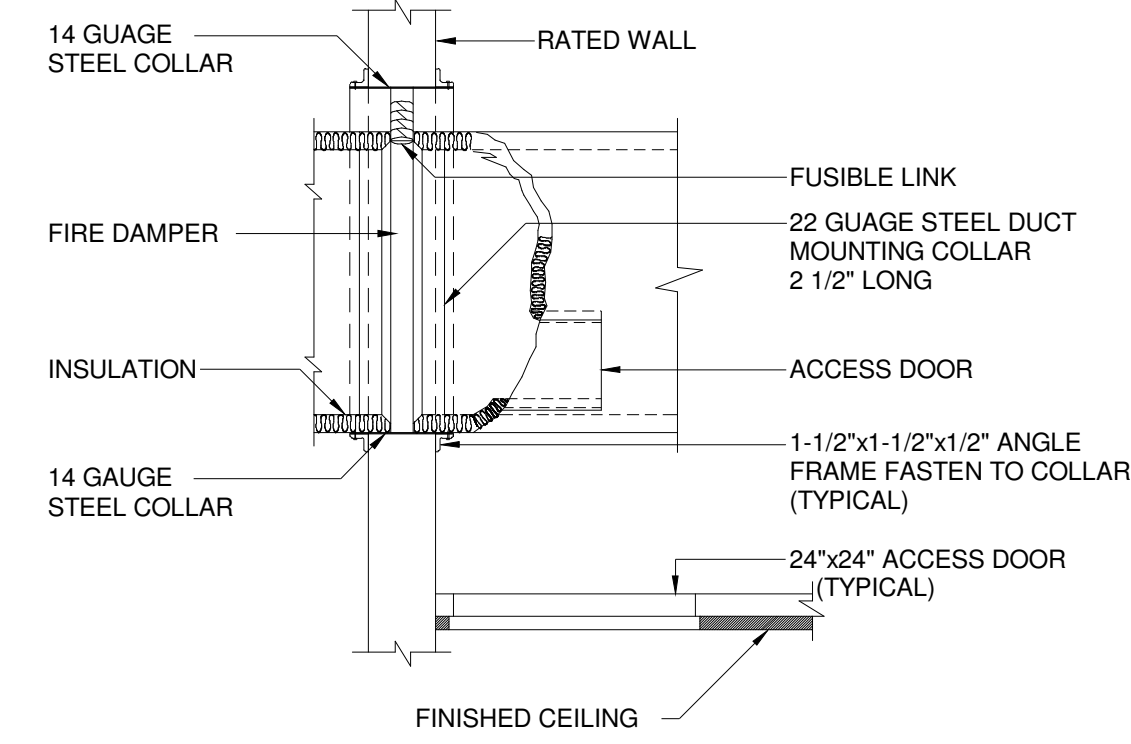
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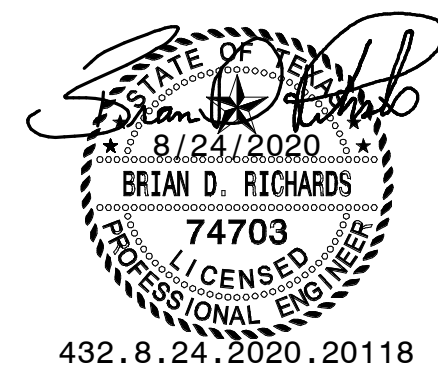
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3 TYPICAL GAUGE DETAIL
SCALE: NO SCALE



4 TYPICAL FIRE DAMPER IN DUCT THRU WALL DETAIL
SCALE: NO SCALE



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