

HVAC GENERAL NOTES

- GENERAL NOTES APPLY TO ALL DRAWINGS.
- THIS PROJECT INVOLVES CONSTRUCTION INSIDE AN EXISTING STRUCTURE. CONTRACTORS, BY SUBMITTING A BID, ARE DEEMED TO BE COMPLETELY FAMILIAR WITH THE EXISTING CONDITION OF THE BUILDING AS IT INFLUENCES THE WORK DESCRIBED. ABSOLUTELY NO CLAIMS FOR EXTRA COMPENSATION WILL BE CONSIDERED FOR EXISTING CONDITIONS VISIBLE OR REASONABLY INFERABLE FROM A CAREFUL EXAMINATION OF THE EXISTING BUILDING.
- THIS CONTRACTOR SHALL INSPECT THE EXISTING FIELD CONDITIONS AT THE SITE AND THE "AS-BUILT" BASE BUILDING CONTRACT DOCUMENTS PRIOR TO THE START OF ANY WORK TO DETERMINE WHAT EFFECT THE EXISTING CONDITIONS WILL HAVE ON HIS WORK. POTENTIAL PROBLEM AREAS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND/OR ENGINEER IMMEDIATELY.
- THIS CONTRACTOR SHALL CONNECT HIS WORK TO VARIOUS EXISTING PIPING, DUCTWORK, AND CONTROL SYSTEMS IN THE BASE BUILDING. THE NEW WORK SHALL BE COMPATIBLE WITH THE EXISTING SYSTEMS. LOCATION OF EQUIPMENT OR THE ROUTING OF THE VARIOUS SYSTEMS AS WELL AS OPENINGS IN FLOOR SLABS OR WALLS SHALL BE GOVERNED BY THE EXISTING CONDITIONS AS THEY APPEAR IN THE FIELD OR ON THE "AS-BUILT" DRAWINGS.
- CARE SHALL BE TAKEN DURING THE INSTALLATION TO NOT DAMAGE OR INTERRUPT BUILDING SYSTEMS AND SERVICES THAT ARE ALREADY INSTALLED. DAMAGE TO SUCH SYSTEMS OR EQUIPMENT CAUSED BY THIS CONTRACTOR DURING INSTALLATION SHALL BE REPAIRED AND/OR REPLACED AT THIS CONTRACTOR'S EXPENSE TO THE COMPLETE SATISFACTION OF THE BUILDING OWNER.
- SHUTDOWN OF EXISTING SYSTEMS FOR CONNECTION TO EXISTING SERVICES SHALL BE COORDINATED WITH THE CONSTRUCTION MANAGER OR GENERAL CONTRACTOR AND BUILDING OWNER. THIS CONTRACTOR SHALL SUBMIT REQUESTS, WHERE THEY AFFECT THE OPERATION OF THE BUILDING SYSTEMS, AT LEAST ONE WEEK IN ADVANCE OF ANY REQUIRED SHUTDOWN. THE ACTUAL SHUTDOWN PERIOD SHALL BE AS SHORT AS POSSIBLE AND AT A TIME MUTUALLY AGREEABLE TO THE BUILDING OWNER AND THE CONSTRUCTION MANAGER/GENERAL CONTRACTOR.
- DRAWINGS ARE DIAGRAMMATIC, THEREFORE DETERMINE EXACT LOCATIONS OF SYSTEMS AND COMPONENTS IN FIELD.
- ALL WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN PIPING AND DUCTS (INCLUDING DIVIDED DUCTS) AND TRANSITIONS AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
- VERIFY ALL EQUIPMENT CONNECTIONS WITH MANUFACTURER'S CERTIFIED DRAWINGS. VERIFY AND PROVIDE DUCT AND/OR PIPE TRANSITIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DIMENSIONS BEFORE FABRICATION.
- REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF AIR TERMINAL DEVICES.
- ALL MATERIALS AND EQUIPMENT UNLESS SPECIFICALLY INDICATED AS REUSED, SHALL BE NEW.
- DUCTWORK SHALL NOT RUN ALONG FULL HEIGHT PARTITIONS.
- ACCESS PANELS SHALL BE PROVIDED TO ALLOW FOR CLEANING OF COILS AND SERVICING OF DAMPERS, HEATERS, VALVES, AND ALL CONCEALED MECHANICAL EQUIPMENT.
- THE INSIDE OF ALL DUCTWORK VISIBLE THROUGH A GRILLE OR DIFFUSER SHALL BE PAINTED FLAT BLACK.
- EXISTING ROOM THERMOSTATS AND SENSORS SHALL BE PROTECTED DURING CONSTRUCTION AND RELOCATED AS INDICATED ON THE DRAWINGS. INSTALL NEW AND RELOCATED ROOM THERMOSTATS AND SENSORS 4 FEET AFF OR AS DIRECTED OTHERWISE BY ARCHITECT.
- WHEN SECTION OF DUCTWORK IS NOT LABELED FOR SIZE, THE LARGER SIZE INDICATED ON THE CONNECTED DUCT SHALL PREVAIL. SIZE OF DUCT RUN-OUTS TO DIFFUSER SHALL EQUAL DIFFUSER NECK SIZE.
- CONTRACTOR SHALL PROVIDE THE FOLLOWING SERVICES, AS APPLICABLE, ON ALL EXISTING HVAC EQUIPMENT INDICATED TO BE REUSED: 1) FILTER CHANGES, 2) BALANCING, 3) LUBRICATION. CONTRACTOR SHALL REPORT ANY EQUIPMENT DEFICIENCIES FOUND TO THE ARCHITECT AND/OR ENGINEER.
- THE FIRE PROOFING OF THE BUILDING STRUCTURE IS NOT TO BE REMOVED FOR THE INSTALLATION OF HANGERS, SUPPORTS, DUCTWORK, ETC. IF FIRE PROOFING IS DAMAGED, IT SHALL BE REPAIRED AT THE EXPENSE OF THE TRADE.
- CONTRACTOR SHALL TEST AND CALIBRATE ALL CONTROLS AND VERIFY ALL ARE FULLY FUNCTIONAL AND SUBMIT DOCUMENTATION. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- CONTRACTOR SHALL PROVIDE AND SUBMIT DOCUMENTATION FOR TESTING AND BALANCING OF ALL AIR AND WATER SYSTEMS, DUCT AND PIPING PRESSURE AND LEAKAGE TESTS, OPERATING AND MAINTENANCE MANUALS, AND AS BUILT DRAWINGS. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- REFER TO THE PROJECT SPECIFICATIONS FOR FURTHER REQUIREMENTS.
- MANY EQUIPMENT SCHEDULES DO NOT LIST QUANTITIES. CONTRACTOR SHALL REFER TO ALL DRAWINGS AND PROVIDE THE REQUIRED QUANTITIES FOR ALL COMPONENTS.

VARIABLE AIR VOLUME TERMINAL BOX WITH HOT WATER HEATING COIL SCHEDULE

TAG	SELECTION RANGE (CFM)	INLET SIZE (IN.)	DISCHARGE SIZE (IN.)		MAX. S.P. DROP W/ COIL (IN.WG)	NC RATING		HOT WATER COIL DATA								MANUFACTURER AND MODEL NUMBER (AS STANDARD)	REMARKS
			W	H		NC @ 1.5 S.P.	% CFM	MBH	EWT (°F)	LWT (°F)	EAT (°F)	LAT (°F)	GPM	MAX P.D. (FT.)	ROWS		
			VAV-10.1	75-300		6"Ø	12	8	0.5	21	100	3.6	135	115	55		
VAV-10.2	65-250	6"Ø	12	8	0.5	20	100	3.6	135	115	55	90	0.5	0.15	1	PRICE SDV	SEE NOTES
VAV-10.3	65-250	6"Ø	12	8	0.5	20	100	3.6	135	115	55	90	0.5	0.15	1	PRICE SDV	SEE NOTES
VAV-10.4	200-795	10"Ø	14	12.5	0.5	20	100	7.6	135	115	55	90	1.0	0.19	1	PRICE SDV	SEE NOTES

NOTES:

- REFER TO SPECIFICATIONS, DETAILS, AND CONTROL DRAWINGS FOR ADDITIONAL INFORMATION.
- COIL HEATING CAPACITY SHALL BE BASED ON MINIMUM CFM AND WATER FLOW LISTED ON DRAWINGS FOR EACH BOX.
- MINIMUM LEAVING AIR TEMPERATURE (LAT) SHALL BE 90°F.

DIFFUSER, GRILLE & REGISTER SCHEDULE

TAG	SELECTION RANGE (CFM)	NECK SIZE (IN.)	OVERALL SIZE (IN.)	SERVICE	MOUNTING	ACCESSORIES	MANUFACTURER AND MODEL NUMBER (AS STANDARD)	MAX NC	REMARKS
SA	115-180	8"Ø	24x24	SUPPLY	LAY-IN	-	PRICE SPD	30	SEE NOTES
SB	0-100	6"Ø	48" x (4) 1/2" SLOTS	SUPPLY	LAY-IN	INS. PLENUM	PRICE SDAI 50	30	SEE NOTES
SC	105-160	8"Ø	48" x (4) 1/2" SLOTS	SUPPLY	LAY-IN	INS. PLENUM	PRICE SDAI 50	30	SEE NOTES
SD	0-100	6"Ø	24" x (4) 1/2" SLOTS	SUPPLY	LAY-IN	INS. PLENUM	PRICE SDAI 50	30	SEE NOTES
RA	0-500	10"Ø	24x24	RETURN	LAY-IN	-	PRICE PDDR	30	SEE NOTES

NOTES:

- REFER TO SPECIFICATIONS AND DETAILS FOR ADDITIONAL INFORMATION.
- SEE PLANS FOR LOCATIONS AND QUANTITIES FOR EACH AIR DEVICE.
- SEE PLANS FOR BLOW PATTERNS FOR EACH AIR DEVICE.
- AIR DEVICE FINISHES SHALL BE VERIFIED WITH THE ARCHITECT.
- BORDER TYPES SHALL BE COMPATIBLE WITH THE REFLECTED CEILING PLANS.
- PROVIDE ALL LINEAR DIFFUSERS WITH MANUFACTURER'S INSULATED PLENUM.

MINIMUM DUCT INSULATION R-VALUES (IECC - 2015 AND ASHRAE 90.1-2013 COMPLIANCE)

LOCATION	SUPPLY	RETURN	RAW OUTDOOR AIR	EXHAUST	
				WITH ENERGY RECOVERY	WITHOUT ENERGY RECOVERY
RETURN AIR PLENUM	R-4	-0-	R-4	-0-	-0-

DUCT LINING SCOPE: ACOUSTIC DUCT LINING OF THE TYPE AND THICKNESS SPECIFIED SHALL BE INSTALLED ON ALL LOW PRESSURE DUCTWORK DOWNSTREAM OF ALL TYPES OF SUPPLY VOLUME BOXES (VAV, ETC.), AND WHERE DETAILED OR SHOWN ON DRAWINGS.

NOTES: (SEE SPECIFICATIONS FOR R-VALUES OF VARIOUS DUCT INSULATION AND LINERS).

- R-VALUES SHOWN MAY BE OBTAINED BY ADDING THE R-VALUES OF BOTH THE LINING (WHERE SHOWN OR USED) AND EXTERNAL DUCT INSULATION.
- R-VALUES SHOWN ARE AS INSTALLED. USE R-VALUES FOR 25% COMPRESSION FOR NON-RIGID INSULATION.
- REFER TO SPECIFICATIONS AND DETAILS FOR ADDITIONAL INFORMATION.

DUCTWORK PRESSURE CLASS AND SEAL CLASS

PRESSURE CLASS	STATIC PRESSURE CLASS	SMACNA SEAL CLASS	SMACNA LEAKAGE CLASS		DESIGN VELOCITY LIMITS
			RECTANGULAR	ROUND	
4"	4" POS. OR NEG.	A	6	3	3000 FPM OR LESS
2"	2" POS. OR NEG.	A	6	3	2000 FPM OR LESS

UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE DRAWINGS, USE THE FOLLOWING PRESSURE CLASSIFICATIONS FOR THE TYPES OF DUCTWORK LISTED BELOW

4" (POS) CLASS:	ALL SUPPLY DUCTWORK BETWEEN THE DISCHARGE OF AIR SUPPLY UNITS TO THE INLETS OF SUPPLY TERMINAL VOLUME BOXES.
2" CLASS:	ALL OTHER DUCTWORK.

NOTES:

- REFER TO SPECIFICATIONS AND DETAILS FOR ADDITIONAL INFORMATION.
- CONTRACTOR SHALL LEAK TEST (SUBMIT REPORT) A MINIMUM OF 25% OF THE SURFACE AREA FOR ALL DUCTWORK ABOVE PRESSURE CLASS 3".

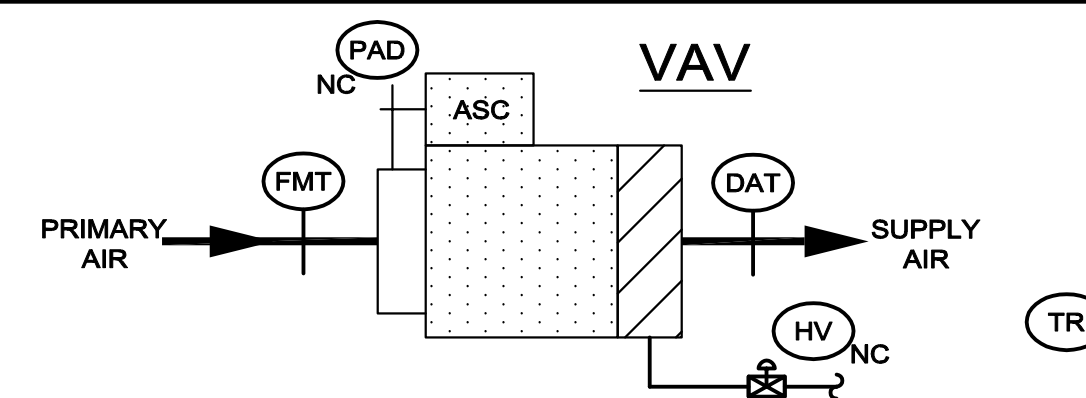
PIPE INSULATION (IECC - 2015 AND ASHRAE 90.1 -2013 COMPLIANCE)

MINIMUM INSULATION THICKNESS IN INCHES FOR INDOOR PIPE SIZES (SEE NOTES BELOW)

PIPING SYSTEM TYPES	FLUID TEMP. RANGE (°F)	PIPE SIZES			K-FACTOR (BTU-INCH/°F-HR-SF) AT AVE. TEMP. (°F)
		< 1"	1" & 1 1/4"	1 1/2" - 3"	
LOW TEMPERATURE HEATING	141 - 200	1.5	1.5	2	0.25-0.29 @ 125°F
FULLY CONDENSING BOILERS	105 - 140	1	1	1.5	0.22-0.28 @ 100°F

NOTES:

- REFER TO SPECIFICATIONS AND DETAILS FOR ADDITIONAL INFORMATION.
- FOR MINIMUM THICKNESS OF ALTERNATIVE INSULATION TYPES OUTSIDE THE STATED CONDUCTIVITY RANGE, SEE TEST METHOD FOR STEADY STATE HEAT TRANSFER PROPERTIES OF HORIZONTAL PIPE INSULATIONS, ASTM C 335-95, AND THE STATE ENERGY CODE.



VARIABLE AIR VOLUME (VAV) BOX WITH HOT WATER HEATING COIL CONTROL SEQUENCES

GENERAL

- VAV BOX SHALL BE CONTROLLED BY AN APPLICATION SPECIFIC CONTROLLER (ASC). COORDINATE OCCUPIED/UNOCCUPIED SCHEDULES WITH OWNER. ALL SET POINTS SHALL BE ADJUSTABLE. ALL ACTUATORS SHALL BE ELECTRONIC.
- ALL TEMPERATURES LISTED ARE FAHRENHEIT AND SHALL BE ADJUSTABLE.
- AIRFLOW SHALL BE MEASURED BY THE FLOW MEASURING TRANSMITTER (FMT) AND DISPLAYED ON THE GRAPHICS.
- OCCUPIED HEATING SET POINT SHALL BE 70°F. OCCUPIED COOLING SET POINT SHALL BE 75°F.
- ROOM TEMPERATURES SHALL BE SET BY THE BUILDING AUTOMATION SYSTEM (BAS) AND CAPABLE OF LOCAL +/- 2°F ADJUSTMENT.
- MINIMUM AND MAXIMUM PRIMARY AIR FLOWS ARE SHOWN ON THE SCHEDULES.

OCCUPIED HEATING CONTROL

- UPON A CALL FOR HEATING FROM THE ROOM TEMPERATURE SENSOR (TR), THE PRIMARY AIR DAMPER (PAD) SHALL MODULATE TO ITS MINIMUM AIR FLOW AND THE HEATING CONTROL VALVE (HV) SHALL MODULATE AS REQUIRED TO MAINTAIN THE HEATING SET POINT. THE REVERSE SHALL OCCUR ON A RISE IN SPACE TEMPERATURE.

OCCUPIED COOLING CONTROL

- UPON A CALL FOR COOLING FROM THE ROOM TEMPERATURE SENSOR (TR), THE PRIMARY AIR DAMPER (PAD) SHALL MODULATE BETWEEN MINIMUM AND MAXIMUM AIR FLOWS AS REQUIRED TO MAINTAIN THE COOLING SET POINT. THE HEATING CONTROL VALVE (HV) SHALL BE CLOSED.

UNOCCUPIED CONTROL

- UNOCCUPIED CONTROL SHALL BE PER BASE BUILDING STANDARD.

WARM-UP CONTROL

- WARM-UP CONTROL SHALL BE PER BASE BUILDING STANDARD.

ALARMS

- IF, DURING OCCUPIED MODE, THE ROOM TEMPERATURE SENSOR (TR) SENSES A TEMPERATURE MORE THAN 5°F ABOVE THE COOLING SET POINT, OR 5°F BELOW THE HEATING SET POINT FOR 5 MINUTES, OR BELOW 50°F DURING UNOCCUPIED CONTROL, THE DDC SYSTEM SHALL GIVE A DETAILED ROOM "HIGH" OR "LOW" TEMPERATURE ALARM SIGNAL.



VARIABLE AIR VOLUME BOX WITH HOT WATER HEATING CONTROL SEQUENCES

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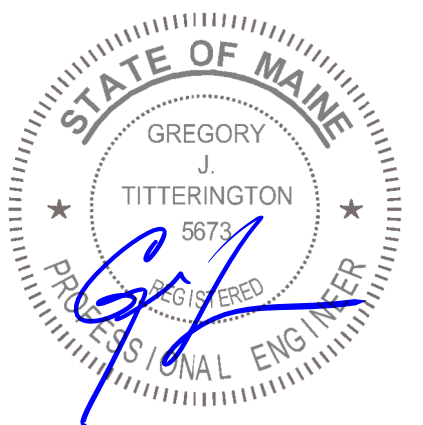
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TITLE HVAC SCHEDULES, CONTROL SEQUENCES, & GENERAL NOTES

DATE JOB NO.

06/29/17 20170237

DRAWING NO.

M-8

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