

① MECHANICAL MAIN FLOOR DEMOLITION PLAN
1/4" = 1'-0"

GENERAL NOTES – DEMOLITION LOWER LEVEL

1. REMOVE EXISTING DUCTWORK AND ASSOCIATED SPECIALTIES WHERE INDICATED ON DRAWINGS. REFER TO DWG M-300.00 FOR NEW SCOPE OF WORK.

DESIGN NOTES – DEMOLITION LOWER LEVEL

- ① REMOVE EXISTING MIXING BOXES WHERE INDICATED INCLUDING ALL INTAKE DUCTWORK BACK TO MAIN AND CAP, DISCHARGE DUCTWORK AND SPECIALTIES, CIRCUITRY, SUPPORTS AND CONTROLS.
- ② REMOVE EXISTING RECESSED HOT WATER CABINET HEATERS SERVING THE RESTROOMS AND ALL ASSOCIATED CONTROLS. REMOVE HOT WATER PIPING BACK TO FLOOR SLAB AND CAP.
- ③ REMOVE EXISTING RETURN GRILLE AND ASSOCIATED DUCTWORK AND SPECIALTIES THRU RATED ENCLOSURE AND REPAIR TO MATCH EXISTING. COORDINATE WITH ARCHITECT.
- ④ EXISTING EXHAUST DUCT THRU ROOF TO REMAIN
- ⑤ HVAC SCOPE OF WORK NOT REQUIRED ON THIS AREA.
- ⑥ EXISTING ROOF DRAIN TO REMAIN.
- ⑦ CUT BACK EXISTING DUCTWORK TO THIS POINT AND CAP.

Revisions & Issues		
No.	Description	Date
1	Issued for Review	04.15.2016
2	Issued for Value Engineering Revision	01.30.2017
3	Issued for Construction	02.20.2017

Purchase College
STATE UNIVERSITY OF NEW YORK

AT
SUNY PURCHASE
735 Anderson Hill Road
Purchase, NY 10577

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Seal

Issue Date: **June. 7, 2016**

Project No.: **15-44**

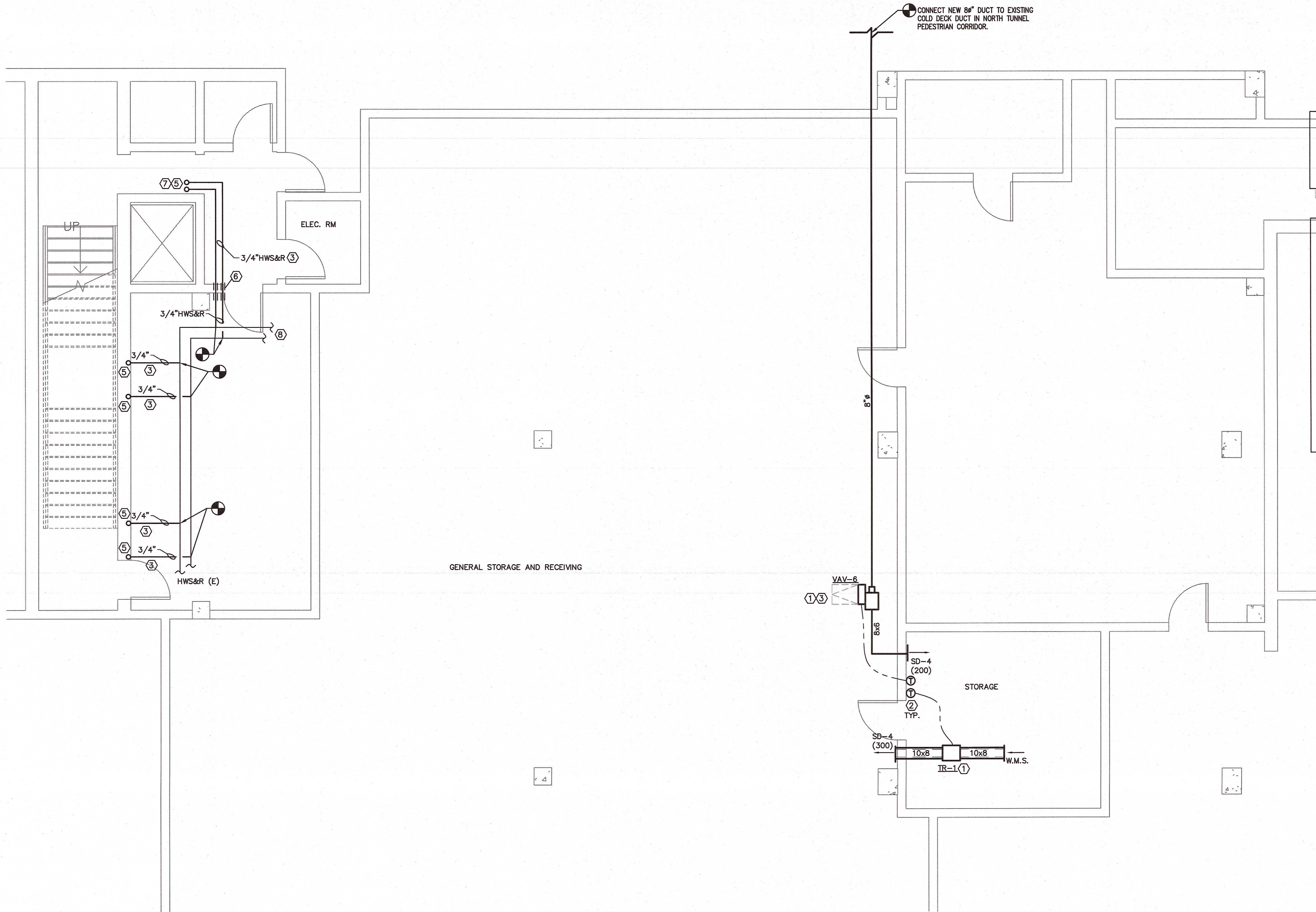
Sheet No.: **M-2.1**

Sheet Title: **Mechanical Demolition**

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GENERAL NOTES – NEW WORK

- EXISTING CEILING AREAS THAT SHALL BE REMOVED TO PERFORM MECHANICAL SCOPE OF WORK SHALL BE REPAIR TO MATCH EXISTING.

DESIGN NOTES – NEW WORK

- BALANCE INDICATED VAV'S BOXES AND FAN TO THE AIR FLOWS SHOWN ON ITS RESPECTIVE SCHEDULE ON DWG M5.1.
- PROVIDE NEW TEMPERATURE SENSOR WHERE INDICATED MINIMUM 48" ABOVE FINISHED FLOOR. COORDINATE FINAL LOCATION WITH ARCHITECT.
- ROUTE HWS&R PIPING TO ITS RESPECTIVE HYDRONIC HEATER TIGHT TO THE SLAB.
- PROVIDE VAV'S WITH MANUFACTURER RECOMMENDED MINIMUM MAINTENANCE CLEARANCE.
- FOR CONTINUATION REFER TO DWG M3.2
- PROVIDE SLEEVES FOR PIPING ROUTED THRU IRE RATED WALL PENETRATIONS. PROVIDE FIRESTOP AS REQUIRED.
- FIREPROOFING PIPING THRU SHAFT ENCLOSURE.
- EXISTING HW&R HEATING LOOP. COORDINATE SHUTDOWNS WITH OWNER.

MECHANICAL PARTIAL BASEMENT FLOOR PLAN - NEW WORK
1/4" = 1'-0"

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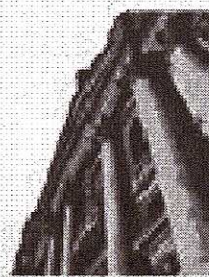
M-3.1

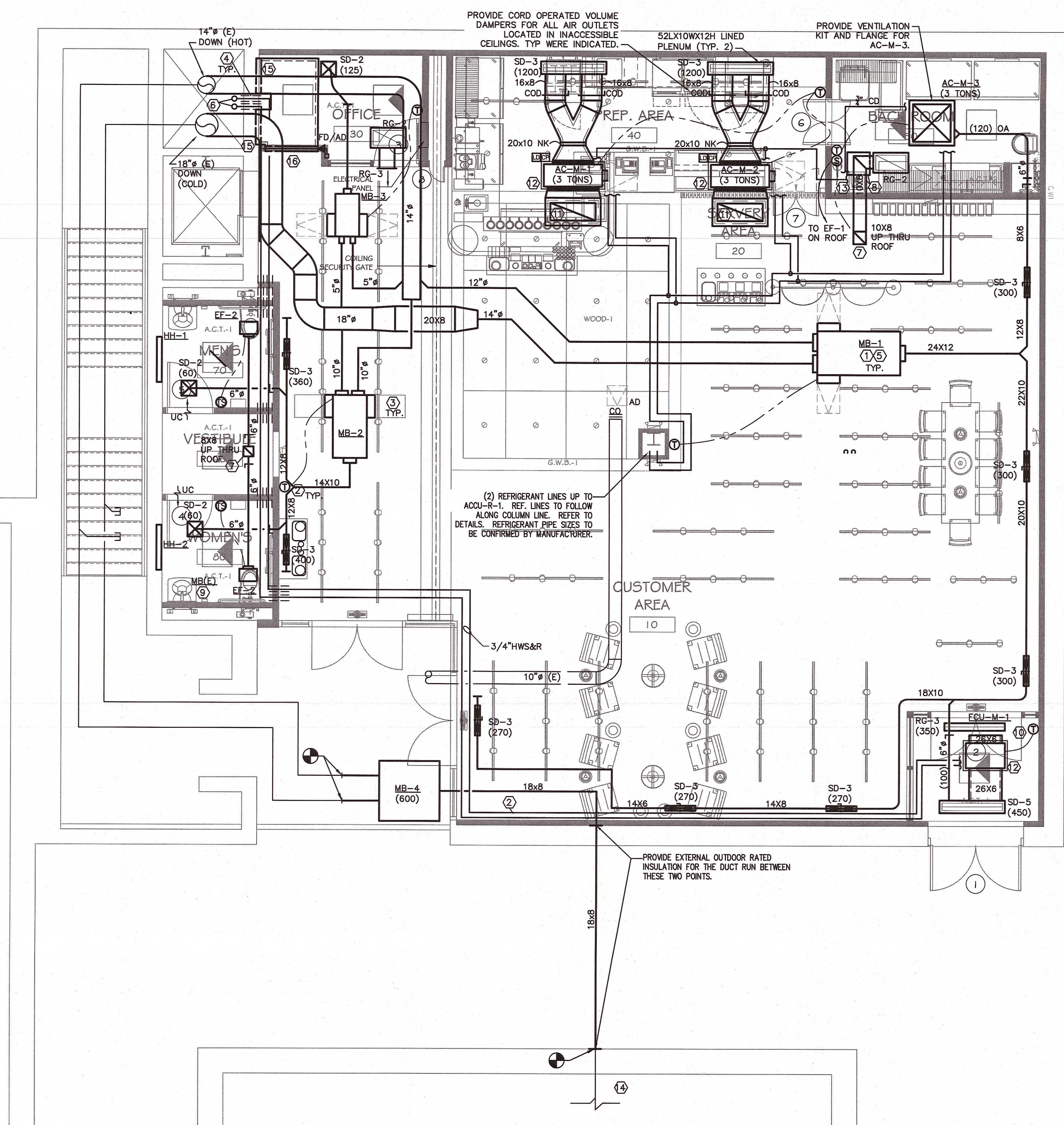
**Mechanical
Construction Plan**
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MECHANICAL MAIN FLOOR PLAN - NEW WORK
1/4" = 1'-0"

GENERAL NOTES – NEW WORK


- SUPPLY AND RETURN DUCTWORK UPSTREAM AND DOWNSTREAM OF AIR HANDLING UNITS AND FANS, AND DOWNSTREAM SHALL BE PROVIDED WITH 1.5" ACOUSTIC LINING FOR 25 FEET OF DUCT RUN. REFER TO DETAILS FOR ADDITIONAL REQUIREMENTS. PROVIDE SIMILAR FOR 15 FEET DOWNSTREAM OF ALL VAV & FAN POWERED BOXES.
- EXISTING CEILING AREAS THAT SHALL BE REMOVED TO PERFORM MECHANICAL SCOPE OF WORK SHALL BE REPAIR TO MATCH EXISTING.
- ALL VIBRATING AND ROTATING EQUIPMENT SHALL HAVE FLEXIBLE CANVAS CONNECTION AT DUCT CONNECTION TO EQUIPMENT AND SHALL BE RATED FOR PRESSURES TO MATCH CONNECTING DUCTWORK.
- FIRE PROOFING TO BE CHOPPED, AS REQUIRED TO INSTALL DUCTWORK AND HVAC EQUIPMENT AS HIGH AS POSSIBLE. INTUMESCENT PAINT TO BE PROVIDED WHERE FIREPROOFING IS REMOVED TO MAINTAIN THE REQUIRED FIRE RATING. COORDINATE THIS WORK WITH THE GC.
- ALL BRANCH DUCTWORK TO BE PROVIDED WITH VOLUME/AIR BALANCING DAMPERS. ALL BRANCH DUCTS ABOVE ACCESSIBLE CEILINGS SHALL BE PROVIDED WITH MANUAL BALANCING DAMPERS. PROVIDE A CABLE OPERATED DAMPER FOR ALL BRANCH DUCTWORK ABOVE AN INACCESSIBLE CEILING (I.E. GYPSUM BOARD/DRYWALL CEILING) AND BRANCH DUCTWORK SERVING LINEAR DIFFUSERS. DAMPER SHALL BE LOCATED NO MORE THAN TWO FEET FROM THE ASSOCIATED DIFFUSER/REGISTER FOR PROPER AIR BALANCING.
- ALL LOW VOLTAGE CONTROL WIRING SHALL BE ENCASED IN RIGID METAL CONDUIT WHEN ROUTED THROUGH UTILITY ROOMS (I.E. JANITOR'S CLOSETS, MECHANICAL ROOMS, ELECTRICAL ROOMS, ETC.), STAIRS AND EXPOSED AREAS. SEE MECHANICAL SPECIFICATIONS FOR MORE INFORMATION.
- ALL HVAC EQUIPMENT INSTALLED IN THE CEILING (I.E. SUPPLY DIFFUSERS, RETURN GRILLES, ETC.) SHALL BE ALIGNED WITH OTHER CEILING DEVICES (I.E. SPRINKLER HEADS, ARCHITECTURAL LIGHTING, ETC.)
- INSTALL ALL HVAC SQUARE DIFFUSERS CENTERED WITHIN THE CEILING TILE. ANY CUTTING OR MODIFICATION OF THE CEILING TILE AND/OR SUPPORT SYSTEM REQUIRED TO INSTALL DIFFUSERS CENTERED WITHIN TILE SHALL BE INCLUDED IN THE BID FOR THIS WORK AND COORDINATED WITH THE GC.
- PROVIDE WIRE MESH SCREENS AT ALL OPEN END DUCTS AND TRANSFER SLEEVES. ALL TRANSFER DUCTS TO BE PROVIDED WITH TRANSFER GRILLES ON THE EXPOSED SIDE (BASIS: ANEMOSTAT SE3HD – 45 DEG DEFLECTION). SIZE OF GRILLE TO MATCH TRANSFER DUCT OUTER DIMENSIONS. COLOR FINISH TO MATCH WALL UNLESS OTHERWISE SPECIFIED BY THE ARCHITECT.
- ALL DUCT SMOKE DETECTORS AND COMBINATION FIRE/SMOKE DAMPERS TO BE TIED INTO THE BASEBUILDING FIRE ALARM SYSTEM. COORDINATE THIS WORK WITH BUILDING MANAGEMENT AND THE BUILDING FIRE ALARM VENDOR.
- MC TO PROVIDE RECTANGULAR TO ROUND CONNECTIONS AS REQUIRED TO CONNECT VAVS TO SUPPLY TRUNKS AS SHOWN.
- ALL DUCTWORK DIMENSIONS SHOWN ON THIS PLAN REPRESENT THE INTERIOR DIMENSION. REFER TO MECHANICAL SPECIFICATIONS FOR INSULATION REQUIREMENTS.
- ALL DUCTWORK AND PIPING SHALL BE INSTALLED AS HIGH AS POSSIBLE TO THE UNDERSIDE OF STRUCTURE(S). COORDINATE THIS WITH ALL OTHER TRADES INSTALLED ABOVE THE CEILING. SUBMIT FULLY COORDINATED SHOP DRAWINGS FOR REVIEW INDICATING ALL CONFLICTS FOR THE ENGINEER'S REVIEW, AND APPROVAL, PRIOR TO FABRICATION, PURCHASING OF EQUIPMENT AND INSTALLATION.
- PROVIDE LOCKABLE, TAMPER PROOF THERMOSTAT GUARDS (CLEAR) FOR ALL THERMOSTATS INSTALLED IN PUBLIC AREAS. THERMOSTAT SHALL BE COORDINATED WITH ARCHITECTURE AND BE INSTALLED ABOVE LIGHT SWITCHES WHEN LOCATED IN ENCLOSED ROOMS (I.E. OFFICES, ETC.). MOUNT 5'-0" ABOVE FINISHED FLOOR UNLESS OTHERWISE SPECIFIED.
- ALL EQUIPMENT SHALL BE ACCESSIBLE. ACCESS DOORS TO BE PROVIDED FOR ALL ACCESS POINTS SHOWN ON THE DRAWING. ACCESS DOORS REQUIRED IN INACCESSIBLE CEILINGS SHALL BE SPECIFIED BY THE ARCHITECT AND BE NO LESS THAN 24"x24"
- ALL MEDIUM PRESSURE DUCTWORK IS TO BE LEAK TESTED AS PER SMACNA LEAK TEST MANUAL AND RESULTS SUBMITTED TO BASE BUILDING MANAGEMENT.
- ALL EXPOSED DUCTWORK TO BE INTERNALLY LINED AND PAINTABLE. COORDINATE DUCT FINISH WITH ARCHITECT'S REQUIREMENTS. PROVIDE ADD/ALTERNATE FOR FLAT OVAL EXPOSED DUCTWORK.

DESIGN NOTES – NEW WORK


- PROVIDE NEW TEMPERATURE SENSOR WHERE INDICATED MINIMUM 48" ABOVE FINISHED FLOOR. COORDINATE FINAL LOCATION WITH ARCHITECT. PROVIDE TAMPER PROOF COVERS IF REQUESTED BY OWNER.
- ROUTE HWS&R PIPING TO ITS RESPECTIVE AIR HEATER TIGHT TO THE SLAB.
- PROVIDE FLAT OVAL TAKE-OFF TRANSITION WHERE NEW OR EXISTING DUCT HEIGHT MATCH NEW DUCTWORK BRANCH SIZE.
- PROVIDE SLEEVES FOR PIPING ROUTED THRU WALL PENETRATIONS AND FIREPROOFING THRU SHAFT ENCLOSURE.
- PROVIDE EXISTING MIXING BOX WITH NEW LINED SUPPLY DISCHARGE DUCTWORK WHERE INDICATED. SIZE TO MATCH EXISTING.
- FOR CONTINUATION REFER TO DWG M3.1
- FOR CONTINUATION REFER TO DWG M3.3
- PROVIDE ALUMINUM DUCTWORK FOR DUCTWORK SERVING THE EF-1, PITCH DUCTWORK BACK TO 18X18 DRAIN PAN WHERE INDICATED. EXTEND DRAIN TO NEAR FLOOR DRAIN AND TERMINATE WITH 2" AIR GAP.
- PROVIDE AN ALTERNATE TO RELOCATE EXISTING MIXING BOX TO CORRIDOR, RECONNECT ALL ASSOCIATED UTILITIES (DUCTWORK, CONTROL, POWER) AND PROVIDE NEW ACCESS PANEL. CONFIRM NEW LOCATION WITH BUILDING ENGINEER AND FIELD CONDITIONS.
- PROVIDE THERMOSTAT WITH INSULATED BACK COVER.
- 44"Lx22"Wx16"H RETURN PLENUM WITH 36"x14" TOP OPEN RETURN OPENING W/ W.M.S.
- PROVIDE AUXILIARY STAINLESS STEEL DRIP PAN WITH LEAK DETECTOR BENEATH ALL AC UNITS WHERE NOTED. LEAK DETECTION TO BE CONNECTED TO BMS AND UNIT OPERATION. SHUTDOWN OF AC UNIT SHALL OCCUR IF LEAK IS DETECTED.
- 3" CONDENSATE DRAIN PIPE TO TERMINATE AT FLOOR SINK IN BACK ROOM. CONDENSATE DRAIN TO BE PITCHED DOWNWARD TOWARD TERMINATION AT 1/8" PER LINEAR FOOT.
- REBALANCE EXISTING (3) DIFFUSERS TO 200 CFM EACH, 600 CFM TOTAL.
- PROVIDE 28x20 RETURN AIR OPENINGS WITH W.M.S.
- PROVIDE 42x24 RETURN AIR OPENING ABOVE CEILING WITH FD/AD AND W.M.S.

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15.44

Sheet Title:
**Mechanical
Construction Plan**

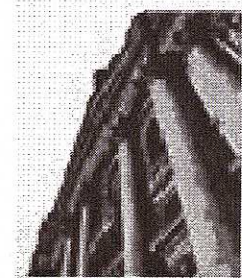
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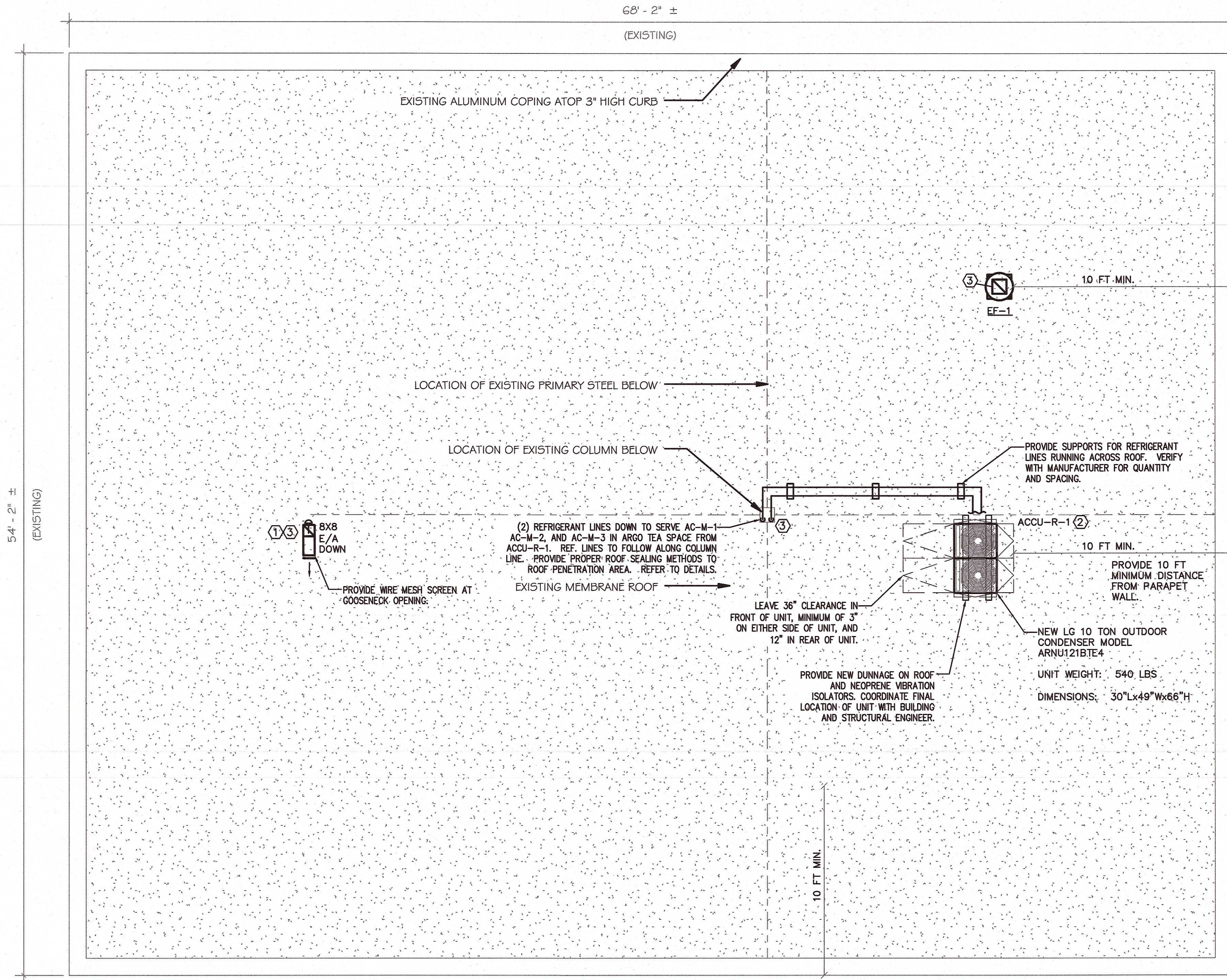
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DESIGN NOTES — NEW WORK

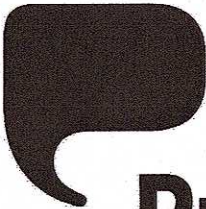
- ① EXTEND EXHAUST DUCTWORK THRU ROOF AND TERMINATE WITH GOOSENECK. SEAL DUCT PENETRATION THRU ROOF WATER TIGHT. REFER TO DUCT PENETRATION THRU ROOF AND GOOSENECK DETAILS ON DWG M4.1
- ② CONTRACTOR SHALL TAKE SPECIAL PRECAUTION WHEN RIGGING HVAC UNIT TO ROOF. ADJACENT AREA AROUND BUILDING IS "PLAZA" AND IS RATED 30 PSF. RIGGER SHALL HIRE LICENSE STRUCTURAL ENGINEER TO REVIEW APPROACH TO PLACEMENT OF HVAC UNIT. SUBMIT DETAILED PLANS TO OWNERSHIP FOR APPROVAL PRIOR TO RIGGING HVAC UNIT.
- ③ FOR CONTINUATION REFER TO DWG M3.2

① MECHANICAL ROOF PLAN - NEW WORK


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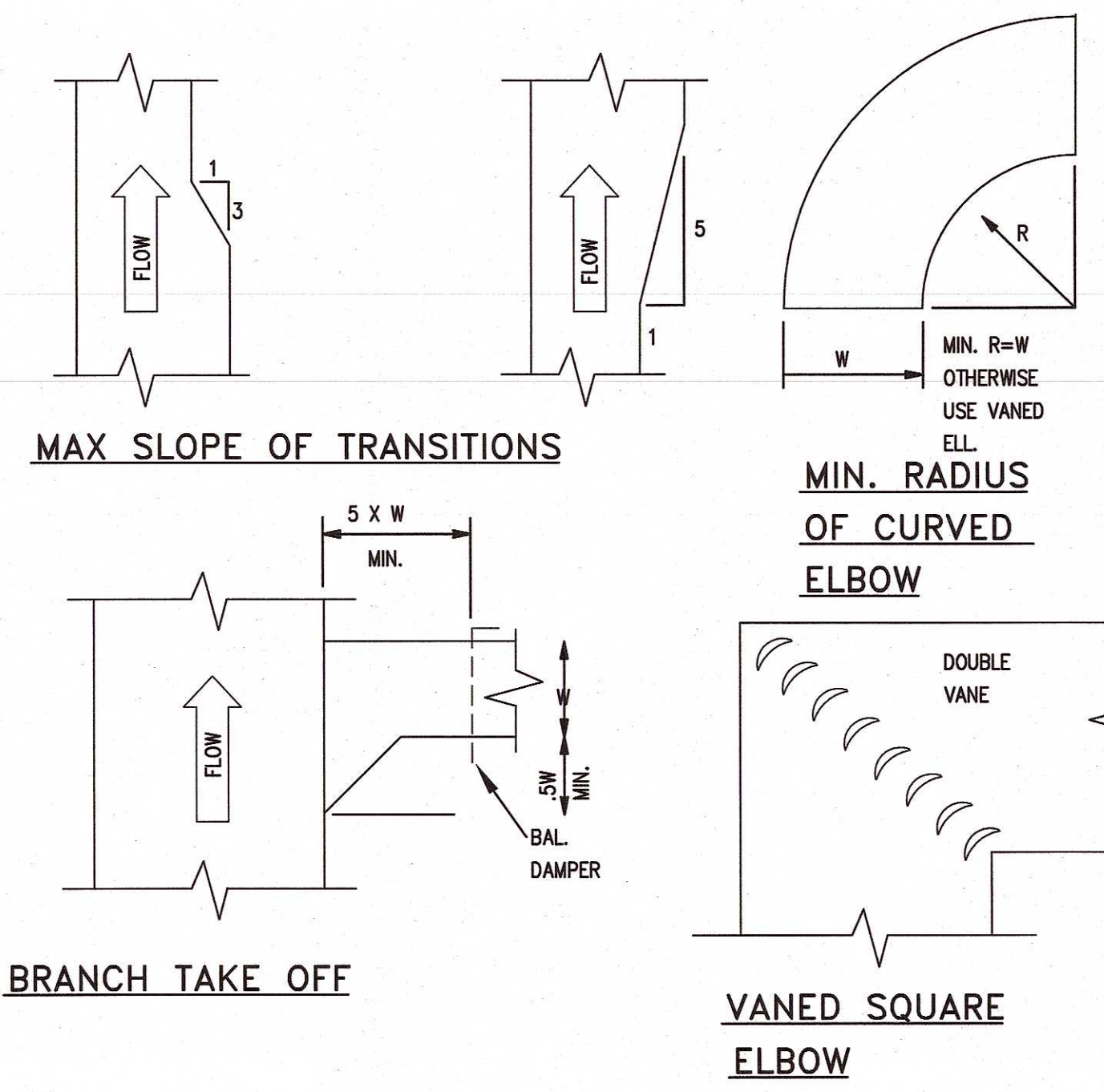
Sheet Title: **Mechanical Construction Plan**

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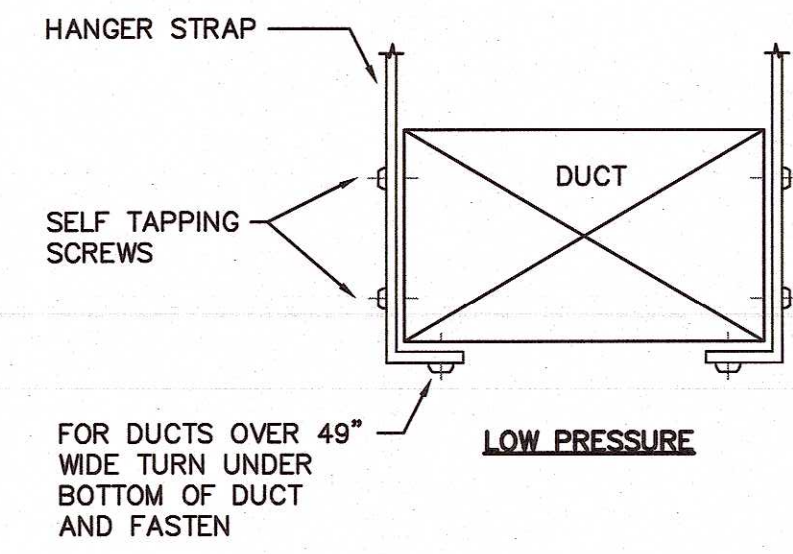
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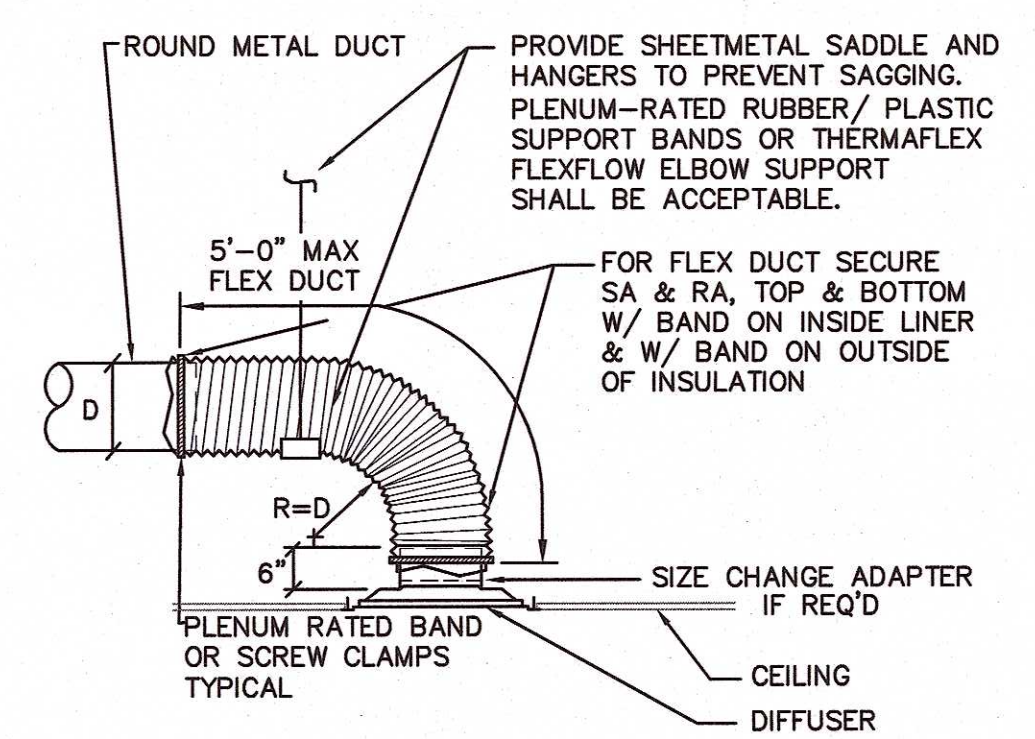




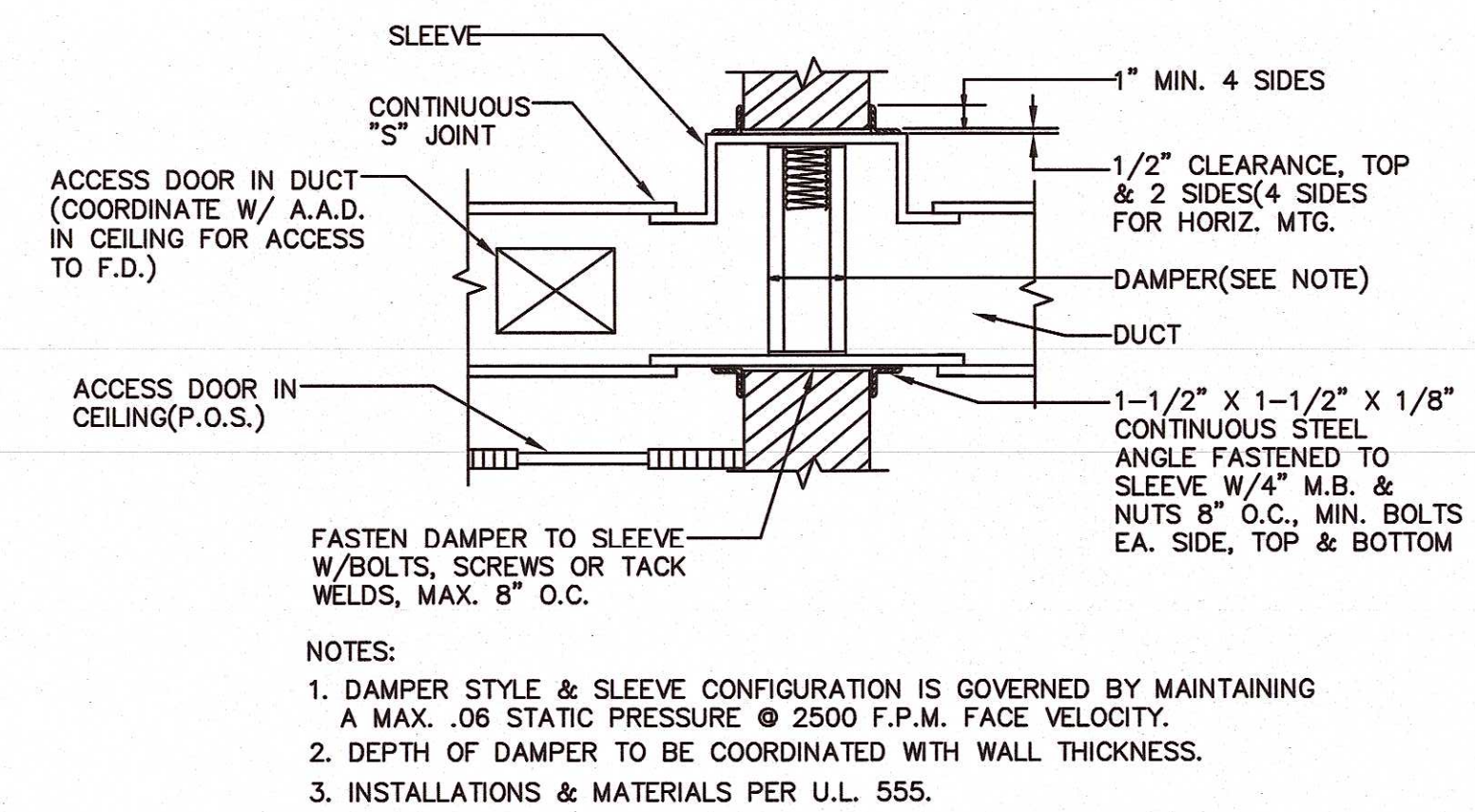
1 DUCT CONSTRUCTION DETAIL
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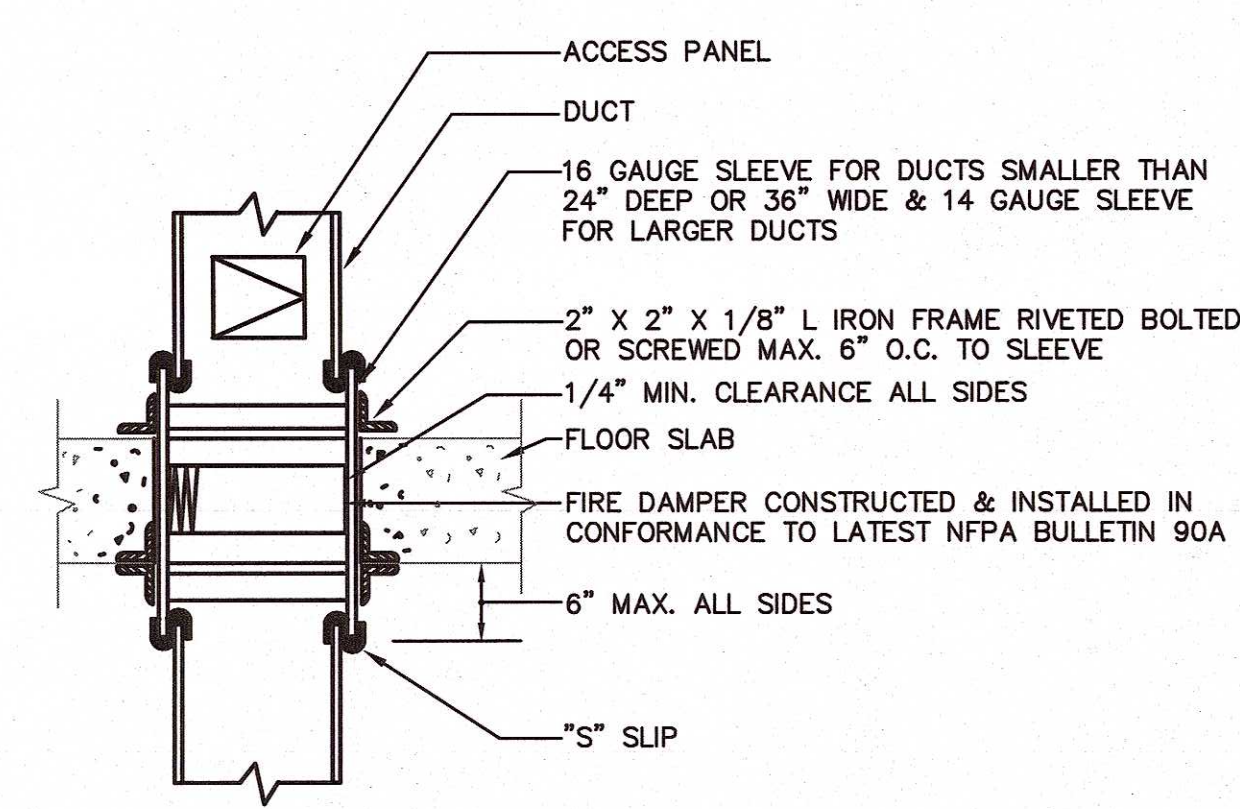
2 METHOD OF HANGING DUCTWORK
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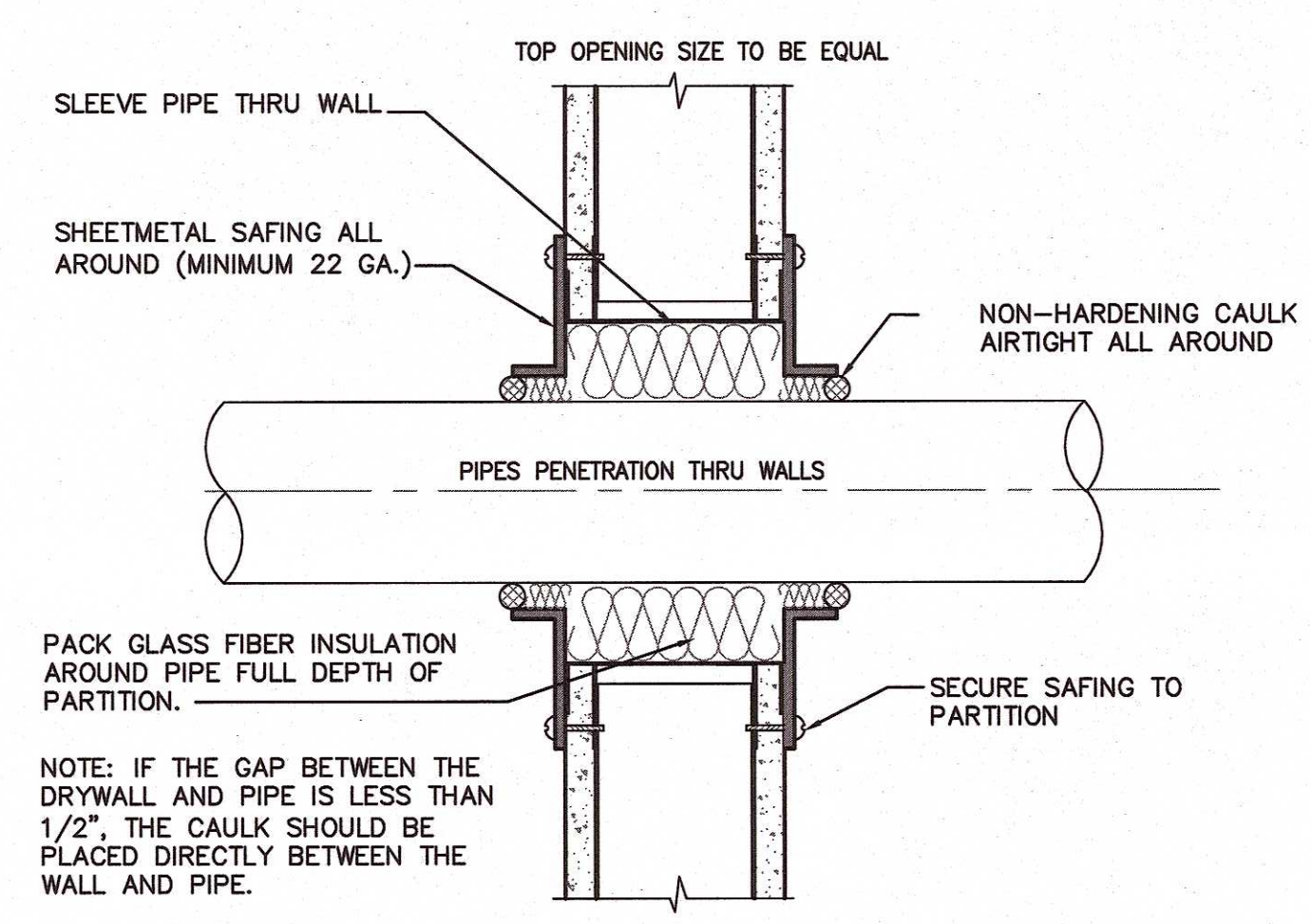
3 TYPICAL DIFFUSER CONNECTION DETAIL
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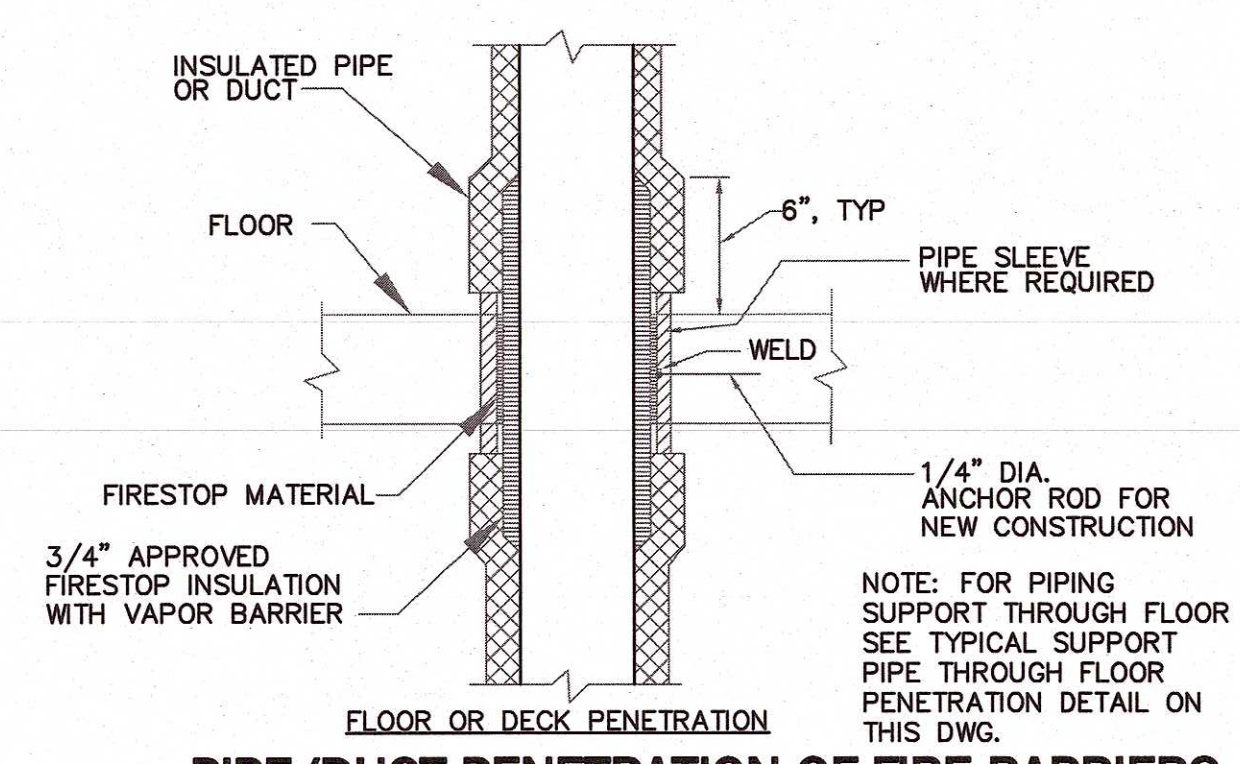
4 VERTICAL FIRE DAMPER DETAIL
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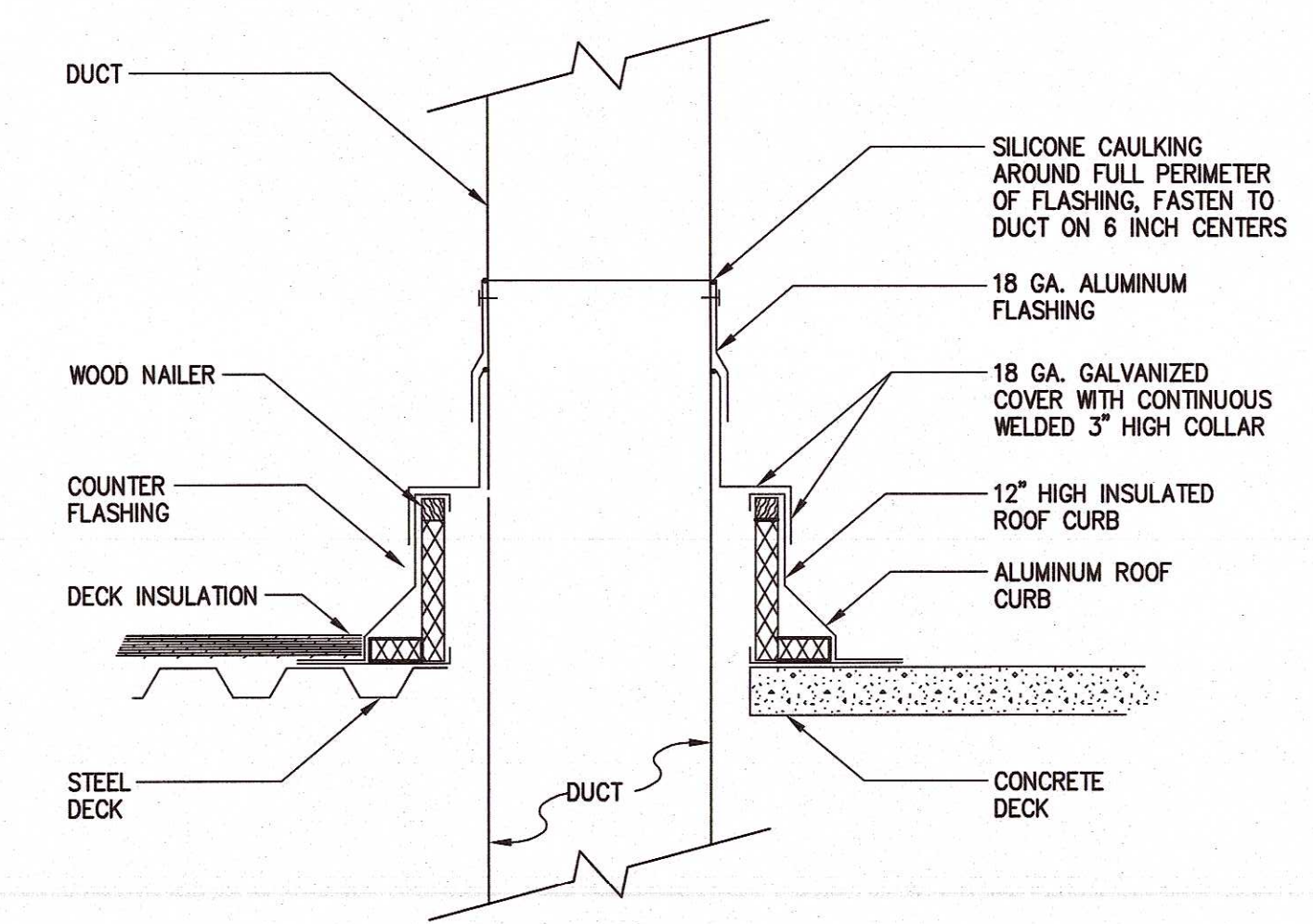
5 HORIZONTAL FIRE DAMPER DETAIL
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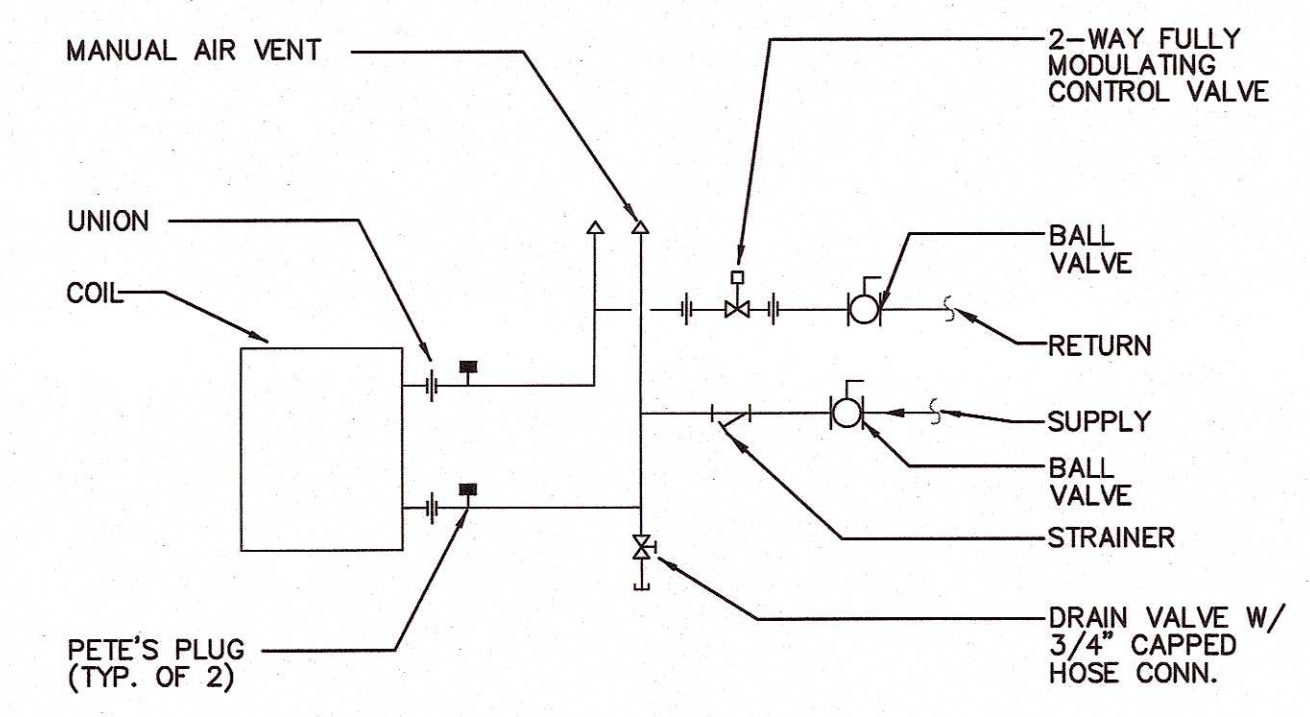
6 PIPE PENETRATION DETAIL
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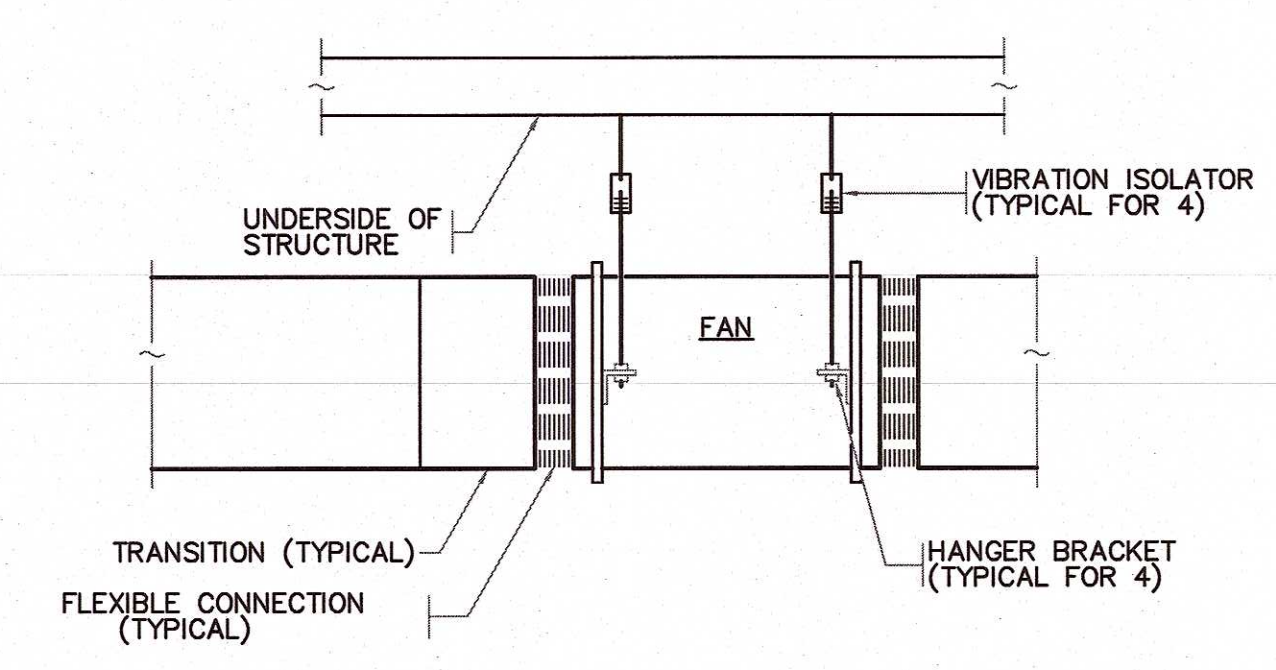
7 PIPE/DUCT PENETRATION OF FIRE BARRIERS
SCALE: NONE



8 DUCT PENETRATION THROUGH ROOF DETAIL
SCALE: NONE



9 HOT WATER COIL DETAIL
SCALE: NONE



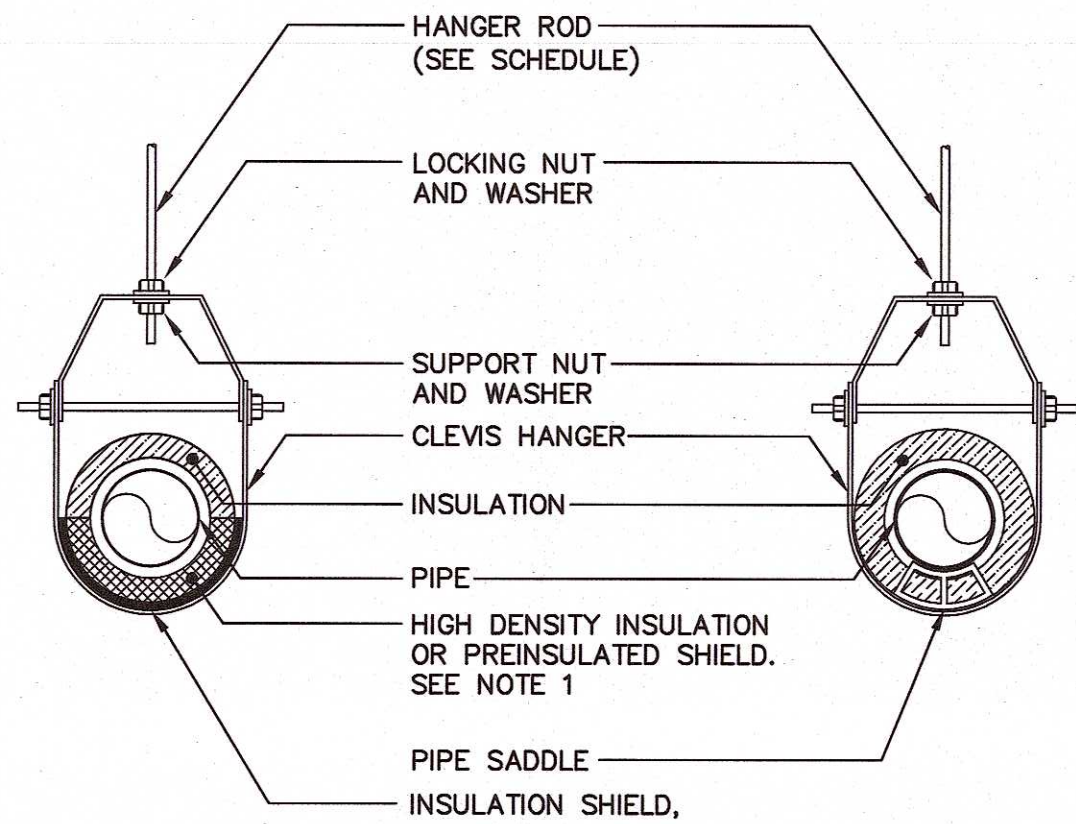
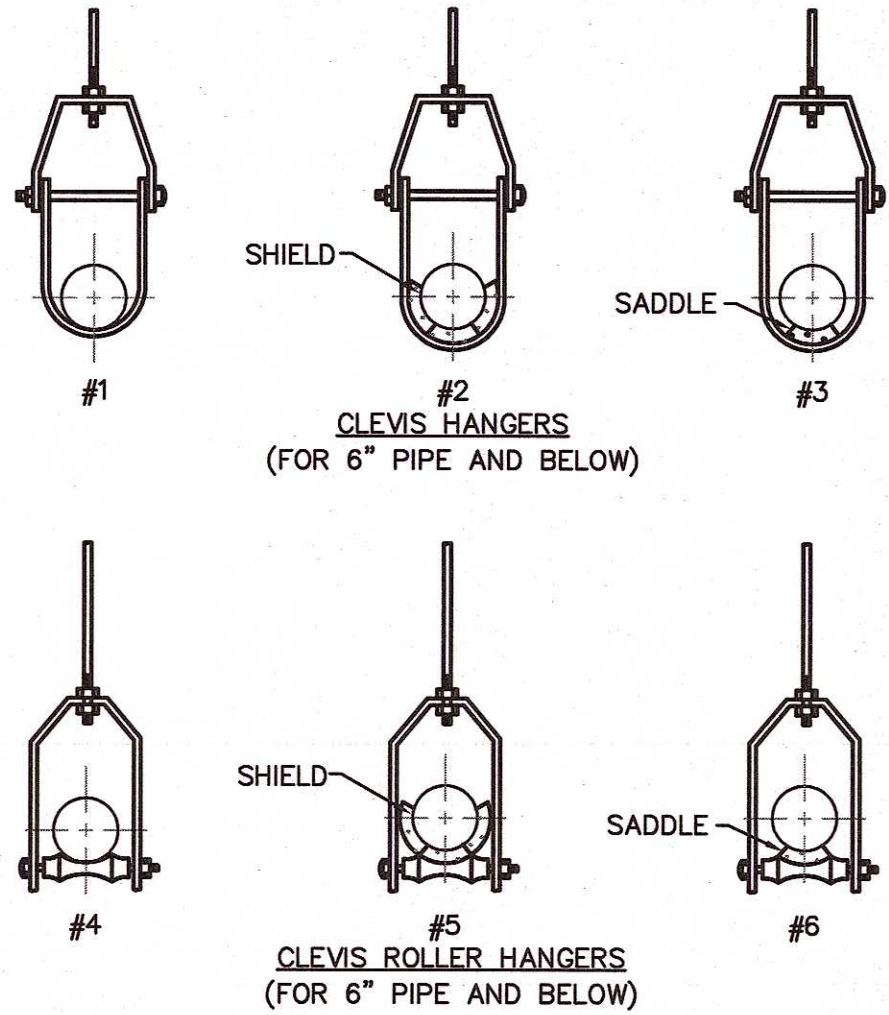
10 IN-LINE FAN DETAIL
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Revisions & Issues <table border="1"> <tr> <th>No.</th> <th>Description</th> <th>Date</th> </tr> <tr> <td>1</td> <td>Issued for Review</td> <td>04.15.2016</td> </tr> <tr> <td>2</td> <td>Issued for Value Engineering Revision</td> <td>01.30.2017</td> </tr> <tr> <td>3</td> <td>Issued for Construction</td> <td>02.20.2017</td> </tr> </table>			No.	Description	Date	1	Issued for Review	04.15.2016	2	Issued for Value Engineering Revision	01.30.2017	3	Issued for Construction	02.20.2017	Client / Project Purchase College STATE UNIVERSITY OF NEW YORK		argo tea. AT SUNY PURCHASE 735 Anderson Hill Road Purchase, NY 10577		M.E.P. Engineer Southport Associates Southport Engineering Associates, PC 11 Bailey Avenue Ridgfield, CT 06877 Tel.: (203) 431-6844 Fax: (203) 431-6877		Seal 		Issue Date: June. 7, 2016 Project No.: 15.44 Sheet No.: M-4.1 Architect: DAVID A. TETRO ARCHITECT P.C. AIA - LEED A.P. - NCARB 302 Lewis Avenue Yorktown Heights, NY 10598 914-962.3113 - tel. 914-962.3393 - fax dttdesign@verizon.net www.DavidTetroArchitect.com	
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1. PIPE SUPPORTS, ROD SPACING AND ROD SIZING SHALL COMPLY TO MSS-69.
2. SHIELDS AND HIGH DENSITY INSULATION SHALL BE A MINIMUM OF 12" OR 1.5 PIPE DIAMETER WHICHEVER IS LONGER, MAXIMUM LENGTH OF SHIELD IS 24". SHIELDS THICKNESS 0.06 UP TO 6 INCH PIPE SIZE. 0.075" FOR LARGER SIZES.

HANGER ROD SCHEDULE		HANGER ROD SPACING	
PIPE SIZE	ROD SIZE	PIPE SIZE	MAX. SPACING
UP TO 2"	3/8" DIA.	1/2" to 1-1/4"	9'
2 1/2" THRU 3"	1/2"	1 1/2"	7'
4 & 5"	5/8"	2" AND 3"	10'
6"	3/4"	4" AND 5"	14'
8 THRU 12"	7/8"	6" AND 8"	17'
LARGER SIZES	1"	LARGER	20'

SCALE: NONE

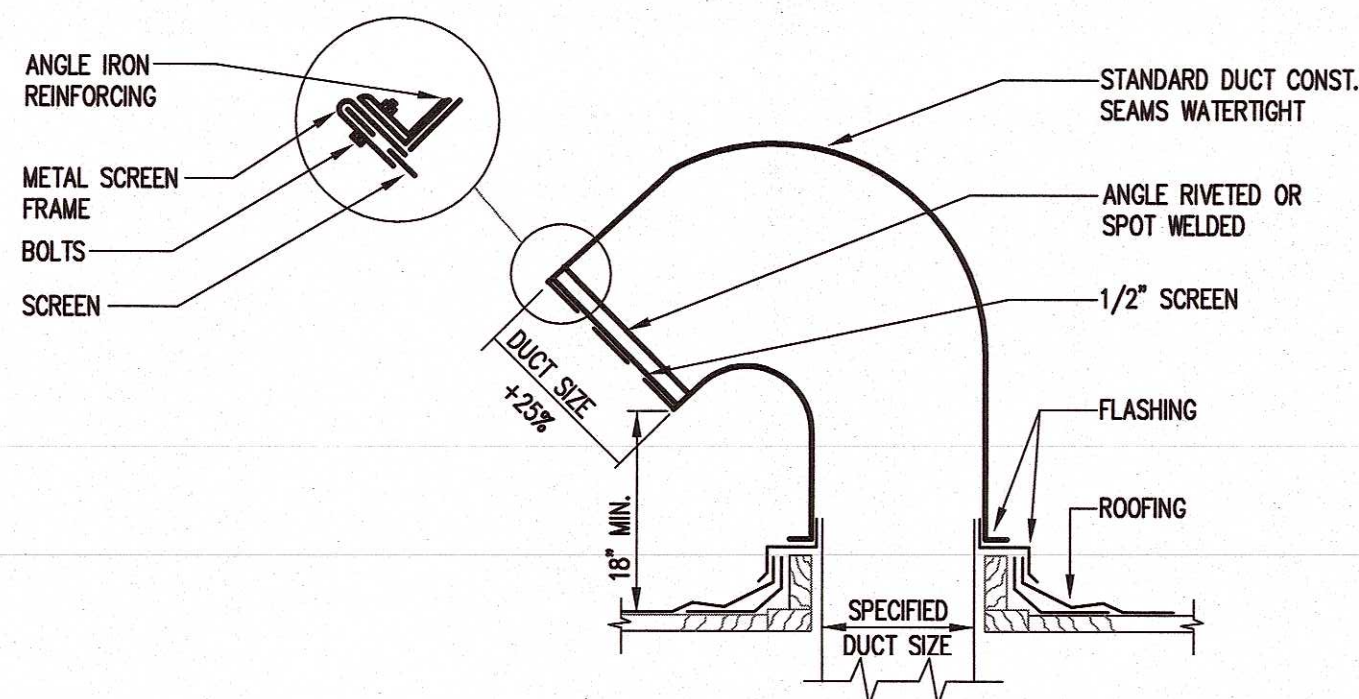


12 SCALE: NTS

CLEVIS HANGER SHOWN: INSTALLATION TYPICAL FOR ROLLER HANGERS AND TRAPEZE HANGERS.

NOTE:

1. HIGH DENSITY REQUIRED FOR BOTTOM HALF FOR CLEVIS AND ROLLER HANGERS, AND ALL AROUND FOR TRAPEZE HANGERS. HIGH DENSITY INSULATION INSERT FOR COLD PIPING SHALL BE CELLULAR TYPE OR APPROVED FOR COLD USE. CALCIUM SILICATE SHALL BE USED FOR HOT PIPING.



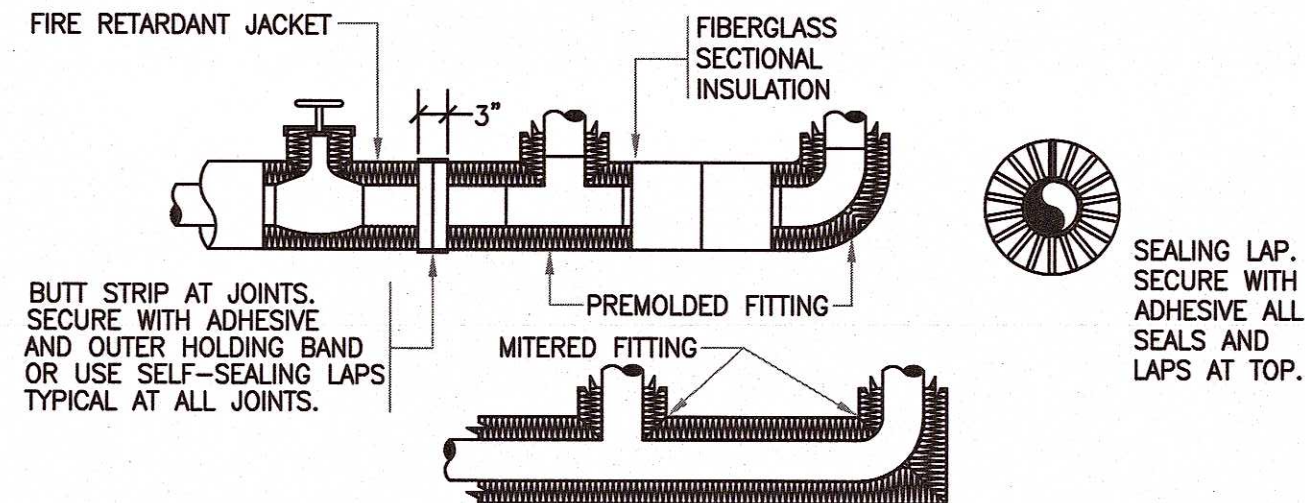
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CONCEALED VALVES AND FITTINGS

- WRAP WITH 1 INCH THICK, 1 POUND DENSITY TO REQUIRED PIPE INSULATION THICKNESS.
- SECURE WITH WIRE OR TAPE.
- VAPOR SEAL COLD WATER, CHILLED WATER AND STORM WATER PIPING.

EXPOSED VALVES AND FITTINGS

- PREMOLDED FIBERGLASS OR RADIAL MITERED PIPE INSULATION.
- SKIM COAT OF INSULATION CEMENT.
- COAT OF MASTIC
- WRAP WITH FIBERGLASS REINFORCING CLOTH.
- FINISH COAT OF MASTIC
- OVERLAP 2 INCHES ON PIPE INSULATION.



INSULATION OF PIPING, VALVES AND
FITTINGS FOR EXPOSED OR CONCEALED
LOCATION

14 SCALE: NONE



SEALING LAP.
SECURE WITH
ADHESIVE ALL
SEALS AND
LAPS AT TOP.

12 SCALE: NTS



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ISSUED FOR CONSTRUCTION

Architect:
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[illegible]

Do not scale drawings. Each Contractor shall be responsible for all field measurements.

FAN SCHEDULE: GREENHECK OR APPROVED EQUAL

UNIT No.	LOCATION	SERVICE	PERFORMANCE DATA					CONSTRUCTION DATA				FAN MOTOR DATA						SPECIFICATIONS				MODEL No.
			CFM	ESP IN. W.G	RPM	MIN. BHP	MAX. OV (FPM)	CLASS	DISCH.	ARRGMNT.	DRIVE	MHP/W	STARTER TYPE	ELECTRICAL DATA				VIBRATION ISOLATION		MIN. STATIC DEFLECTION (IN.)		
														MOTOR EFFICIENCY	VOLTS	PH	HZ	MOUNTING TYPE	BASE TYPE			
EF-1	ROOF	STORAGE	300	0.25	1725	—	—	1	DUCTED	INLINE	DIRECT	1/6HP	VG	82.5	115	1	60	SPRING	—	1	G-070	
EF-2	CEILING	RESTROOMS	100	0.25	1100	—	—	1	DUCTED	INLINE	DIRECT	52.5W	—	82.5	115	1	60	SPRING	—	1	SP-A125	
TR-1	CEILING	STORAGE	300	0.25	1350	—	—	1	DUCTED	INLINE	DIRECT	140W	—	82.5	115	1	60	SPRING	—	1	CSP-A390	
NOTES: 1. BASIS FOR DESIGN: GREENHECK. 2. PROVIDE WITH SPEED CONTROLLER, ON-OFF SWITCH AND VIBRATION ISOLATORS FOR ALL FANS AS REQUIRED. 3. PROVIDE FLEXIBLE CONNECTIONS WHERE DUCTWORK IS CONNECTING THE FANS CHASSIS. 4. PROVIDE A TIMER SWITCH FOR FAN EF-2 BESIDES THE ON-OFF SWITCH. 5. FANS TO THE BACKDRAFT DAMPER AT DISCHARGE. 6. MINIMUM MOTOR EFFICIENCY MUST MEET 2014 NY STATE ENERGY CODE AS PER ASHRAE 90.1. 7. PROVIDE MANUFACTURER RECOMMENDED ROOF CURB, HINGED CURB CAP WITH FIELD INSTALLED CABLERS, AND CURB SEAL. REFER TO MECHANICAL DETAILS.																						

HYDRONIC HEATER SCHEDULE

TAG	MANUFACTURER	MODEL No.	DIMENSIONS	SERVICE	HEATING CAPACITY					AIR FLOW (CFM)	FILTER
					BTUH	GPM	WATER PD/FT	ROWS	AVG. WATER TEMP		
HH-1/2	BEACON/MORRIS	FWG-A / 436-18	36"Lx4-13/16"Dx18"H	STORAGE	2,500	0.5	0.16	—	160	—	
NOTES: 1. PROVIDE WITH MANUFACTURER RECOMMENDED ACCESS DOOR. COORDINATE LOCATION WITH ARCHITECT 2. PROVIDE BACK-ONLY INSULATION. 3. PROVIDE BRONZE HEADER 3" NPT WITH COPPER TUBE/ALUMINUM FINS. 4. PROVIDE PENCIL-PROOF STAMPED LOUVERS.											

MIXING BOX TERMINAL UNITS: TITUS OR APPROVED EQUIVALENT

DESIGNATION	CFM RANGE	LOCATION SERVED	DAMPER & AIR VALVE DATA				CONTROL TYPE (DDC, ELECTRIC, PNEUMATIC)	CONTROL PWR V/PHASE/HZ	MAX NC RATING	MODEL NO.
			MIX AIR CFM		MIN P.D. (IN W.G.)	INLET DUCT SIZE				
			COLD DECK	HOT DECK						
MB-1	1500-2700	CUSTOMER AREA	1800	1200	0.25	14	DDC	115/1/60	30	DMDV
MB-2	900-1300	ENTRY CORRIDOR/RESTROOMS	900	650	0.25	10	DDC	115/1/60	30	DMDV
MB-3	150-350	OFFICE AREA	125	90	0.17	5	DDC	115/1/60	30	DMDV
MB-4	0-650	STUDENT BOOKSTORE	600	425	0.10	7	DDC	115/1/60	30	DMDV
NOTES										
1. PROVIDE BOX WITH DDC CONTROLLERS THAT COMPLY WITH BUILDING STANDARDS.										
2. CONTROLS SHALL MATCH BUILDING STANDARD.										
3. PROVIDE THERMOSTAT SUITABLE FOR COOLING AND HEATING, AND WITH A BLANK FACEPLATE TO AVOID TAMPERING.										
4. PROVIDE WITH CONTROL PACKAGE TO ALSO ALLOW OPERATION DURING MORNING WARM-UP CYCLE.										
5. MIXING BOX TO BE INTERNALLY LINED WITH STERILOC 1" THICK DUAL DENSITY FIBERGLASS INSULATION.										
6. TERMINAL UNITS TO FAIL IN THE OPEN POSITION.										
7. MIXING BOXES SHALL INTERLOCK WITH EXISTING EMS INCLUDING GRAPHICS, SETPOINTS, ALARMS, AND MONITORING OF THE ENTIRE SYSTEM.										
8. PROVIDE MOUNTING BRACKETS TO ACCEPT ALL THREAD HANGING RODS AND VIBRATION ISOLATION HANGERS AND SEISMIC RESTRAINTS.										
9. PROVIDE UNITS WITH MIXER/ATTENUATOR SECTION.										

HOT WATER FAN COIL UNIT SCHEDULE

TAG	MAKE	MODEL	CFM	FAN MOTOR				HEATING CAPACITY			COIL ROWS	FILTER
				FAN SPEED	WATTS	EXT. SP	VOLT/PH/HZ	TOTAL MBH	FLOW (GPM)	LAT (F)		
FCU-M-1	IEC	CPY-04	350	MEDIUM	165	0.35	115/1/60	28 MBH	165	0.35	1	1" THROWAWAY
NOTES: 1. PROVIDE MANUFACTURER RECOMMENDED DISCONNECT SWITCH. 2. PROVIDE CONTROL VALVE PIPING PACKAGE INCLUDING TWO-WAY VALVE, 2-BALL VALVES WITH 24 VOLT ACTUATORS AND AUTO CIRCUIT SETTER. 3. CONTRACTOR SHALL CONFIRM FAN COIL UNIT PIPING CONFIGURATION PER FIELD CONDITIONS. 4. PROVIDE HIGH STATIC ECM MOTOR. 5. CONTRACTOR TO PROVIDE THE FOLLOWING: SPRING-TYPE VIBRATION ISOLATION, WIRE MESH SCREEN ON RETURN, AND TRANSFORMER FOR CONTROL WIRING. 6. CONTRACTOR TO FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION.												

VRF INDOOR UNIT EQUIPMENT SCHEDULE: LG MULTI V OR APPROVED EQUAL

LOCATION	MARK	ROOM NAME		TYPE	QUANTITY	COOLING CAPACITY (BTU/h)		HEATING CAPACITY (BTU/h)	FAN AIRFLOW (CFM)	PIPING CONNECTIONS (in.)			POWER			
						TOTAL COOLING	SENSIBLE COOLING			LIQUID	GAS		VOLTS	PHASE	HZ	RLA
SEE PLAN	AC-M-1	SERVERY 20	ARNU363BGA2	DUCTED HIGH STATIC	1	36,200	—	40,600	1,141/1,024/894	3/8	5/8	208~230V	1Ph	60Hz	2.3	
SEE PLAN	AC-M-2	SERVERY 20	ARNU363BGA2	DUCTED HIGH STATIC	1	36,200	—	40,600	1,141/1,024/894	3/8	5/8	208~230V	1Ph	60Hz	2.3	
SEE PLAN	AC-M-3	BACK RM 50	ARNU363TNC4	4-WAY CASSETTE	1	36,200	—	40,600	883/777/706	3/8	3/4	208~230V	1Ph	60Hz	0.52	
NOTES: 1. PROVIDE WITH DIGITAL PROGRAMMABLE THERMOSTAT, DISCONNECT SWITCH, MIN. 1 INCH DEFLECTION SPRING VIBRATION ISOLATORS (CEILING MOUNTED UNITS, NEOPRENE PADS FOR FLOOR MOUNTED UNITS), LIQUID LINE SOLENOID VALVE, LOW AMBIENT DAMPER, HOT GAS PORT, QUICK CONNECTS, CONDENSATE PUMP, START-UP AND TRAINING BY UNIT'S MANUFACTURER'S REP. 2. PROVIDE WITH WELDED STAINLESS STEEL DRIP PAN WITH LEAK DETECTOR, LEAK DETECTOR PANEL, HOT GAS BYPASS. 3. THIS CONTRACTOR SHALL COORDINATE WITH MANUFACTURER'S FOR SIZING THE REFRIGERANT PIPING (SUCTION, HOT GAS, LIQUID LINES) REQUIRED TO INTERCONNECT THE EVAPORATOR AND THE CONDENSER/CONDENSING UNIT. THIS SHALL INCLUDE BUT NOT BE LIMITED TO: NUMBER OF PIPES, PIPE SIZES, TRAPS, SIGHT GLASS, RECEIVER TANK(S), VALVES, RECOMMENDED HOOK-UP, ETC. 4. REFRIGERANT Y-BRANCH ACCESSORIES AND HR UNITS SUPPLIED BY MANUFACTURER. 5. PROVIDE AC-M-3 WITH VENTILATION KIT AND FLANGE KIT FROM MANUFACTURER.																

VRF OUTDOOR UNIT EQUIPMENT SCHEDULE: LG MULTI V OR APPROVED EQUAL

LOCATION	MARK	MODEL NUMBER	TYPE	QUANTITY	CAPACITY (BTU/h)		FAN DATA		REFRIGERANT	PIPING CONNECTIONS (in.)			POWER			
					TOTAL COOLING	TOTAL HEATING	AIRFLOW (CFM)	QUANTITY		LIQUID	LP GAS	HP GAS	VOLTS	PHASE	HZ	MCA
ROOF	ACCU-R-1	ARUN121BTE4	MULTI-V IV HEAT PUMP	1	120,000	135,000	9,850	2	R410A	1/2	—	1-1/8	208V/230V	3Ph	60Hz	40.3
NOTES: 1. PROVIDE WITH FUSED DISCONNECT SWITCH FOR EACH SEPARATE CONDENSING MODULE, 1 INCH DEFLECTION SPRING VIBRATION ISOLATORS, PAINTED EXTERIOR. 2. EACH CIRCUIT TO HAVE LOW PRESSURE SWITCH BY-PASS, LOW AMBIENT CONDENSER FLOOD BACK-EXTERNAL TYPE HOT GAS BY-PASS, SUCTION LINE ACCUMULATOR, QUENCH VALVE. 3. PROVIDE MOUNTING STEEL DUNNAGE (2 FT HIGH MIN.), REVERSE TRAPS, CHARGE LINES. 4. REFRIGERANT LINES SHALL BE PITCHED TOWARDS CONDENSING UNIT AND INSULATED AS PER LATEST EDITION OF THE NYCECC. 5. CONTRACTOR TO FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION. 6. PROVIDE A DRAFT GAUGE FOR THE AIR FILTER AS PER 2008 NYC CODE SECTION 605.5. 7. PROVIDE FACTORY CERTIFIED ON SITE COMMISSIONING AND START UP SUPPORT FOR ALL 3 PHASE SYSTEMS. 8. REFER TO MANUFACTURER PROVIDED DETAILED REFRIGERANT PIPE SIZING AND FITTING SCHEDULE. PIPING SHOULD NOT BE INSTALLED IN FIELD UNTIL SHOP DRAWING SHOWING ACTUAL PIPING LENGTHS ARE CONFIRMED BY MANUFACTURER'S REP. PIPING LENGTHS AND SIZES THAT MAY BE INCLUDED IN DRAWINGS ARE FOR REFERENCE ONLY. DO NOT INSTALL PIPING BASED ON THESE SIZES.																

DIFFUSER, REGISTER, & GRILLE SCHEDULE

SYMBOL	SERVICE	TYPE	CFM RANGE	FACEWIDTH X LENGTH	NUMBER OF SLOTS	PLENUM HEIGHT	INLET SIZE SQUARE OR ROUND	N.C. @ MAX CFM	MATERIAL	MANUFACTURER	MODEL	REMARKS
SD-1	SUPPLY	SURFACE MOUNT	0-150	24X24	-	-	6	30	ALUMINUM	TITUS	OMNI	1,2,3
			155-200	24X24	-	-	6	30				
			205-300	24X24	-	-	8	30				
			305-450	24X24	-	-	10	30				
			450-600	24X24	-	-	12	30				
SD-2	SUPPLY	LAY-IN	0-150	12X12	-	-	6	30	ALUMINUM	TITUS	OMNI	1,2,3
SD-3	SUPPLY	SURFACE MOUNT	0-150	12X3	-	-	-	30	ALUMINUM	TITUS	CT-580	4
			155-250	12X6								
			255-300	12X6								
			305-450	24X4								
			2400	48X6								
SD-4	SUPPLY	SURFACE MOUNT	0-200	8x6	-	-	-	30	ALUMINUM	TITUS	301FL	1,2,3
			205-450	12x8								
			DDED	22X6								
SD-5	SUPPLY	LAY-IN	0-150	48X2-1/2	-	-	-	30	ALUMINUM	TITUS	CT-580	5
RG-1	RETURN	LAY-IN	-	24X24	-	-	-	30	ALUMINUM	TITUS	TDC	1,3
RG-2	RETURN	LAY-IN	0-300	24X12	-	-	-	30	ALUMINUM	TITUS	355RL	1,3
RG-3	TRANSFER	SIDEWALL	-	12X8	-	-	-	30	ALUMINUM	TITUS	300RL	1,3
RG-4	RETURN	LAY-IN	-	48X2-1/2	-	-	-	30	ALUMINUM	TITUS	CT-580	5
NOTES: 1. Coordinate with ceiling type for frame. No screws to be visible 2. Provide cord. operated damper for inaccessible ceilings. Where possible keep dampers a minimum of 3'-0" from diffuser. 3. Coordinate color with Architect. 4. Provide with Manufacturer single blade damper model AG-30 5. Provide with frame and border type 2												

Revisions & Issues

No.	Description	Date
1	Issued for Review	04.15.2016
2	Issued for Value Engineering Revision	01.30.2017
3	Issued for Construction	02.20.2017

Client / Project



Purchase College

STATE UNIVERSITY OF NEW YORK

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Seal



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June. 7, 2016

Project No:

15.44

Sheet Title:

Mechanical Schedules

ISSUED FOR CONSTRUCTION

Sheet No.:

M-5.1

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CONTROL SPECIFICATION

1.0 GENERAL

1.1 WORK INCLUDED

- A. THE WORK INCLUDES INSTALLATION OF DIRECT DIGITAL CONTROLS AS SPECIFIED IN THESE SPECIFICATIONS AND ON FLOW AND CONTROL DIAGRAMS ON DRAWING M6.1 AND AS NOTED ON OTHER PROJECT DRAWINGS. OTHER CONTROLS WORK SHALL INCLUDE:
- B. INTERNET INTERFACE AND SYSTEM MANAGER FOR PROGRAM AND DATA STORAGE AND COMMUNICATIONS INTERFACE.
- C. BACNET INTERFACE (OR OTHER APPROVED INTERFACE) TO LG ROOFTOP UNIT.
- D. LOW AND LINE VOLTAGE WIRING.

1.2 DIRECT DIGITAL CONTROLS

- A. BASE BID: PROVIDE LOCAL CONTROLLER TO EACH SYSTEM AND ASSOCIATED INTERFACE CONTROLS AS INDICATED ON THE SEQUENCE OF OPERATION THIS PAGE.

1.3 GENERAL REQUIREMENTS

- A. DIRECT DIGITAL CONTROLLERS (DDCS) WHICH ALLOW CUSTOM PROGRAMMING SHALL BE USED FOR ALL CONTROL APPLICATIONS. UNITARY CONTROLLERS, APPLICATION SPECIFIC CONTROLLERS AND CONTROLLERS WHICH LIMIT THE NUMBER OF CONTROL LOOPS AND FUNCTIONS SHALL NOT BE USED.
- B. A MINIMUM OF 2 SPARE POINTS OF EACH TYPE SHALL BE INSTALLED IN NEW DDC CONTROLLERS. WHERE A DDC PANEL(S) IS INSTALLED WITHIN A CONTRACTOR SUPPLIED ENCLOSURE THE ENCLOSURE MUST BE SIZED TO ALLOW THE ADDITION OF AT LEAST ONE POINT EXPANSION MODULE.
- C. IDENTIFY ALL EQUIPMENT INTERNAL TO PANEL AND FACE MOUNTED WITH LABELS TO MATCH APPROVED SHOP DRAWINGS.
- D. THE CONTRACTOR SHALL WARRANTY THE CONTROLS TO BE FREE FROM DEFECTS IN WORKMANSHIP AND MATERIAL FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF ACCEPTANCE BY THE OWNER.
- E. THE OWNER SHALL NOT BE RESTRICTED IN THE USE AND MODIFICATIONS OF ALL SOFTWARE INSTALLED FOR THIS PROJECT. COPYRIGHTING OR OTHER RESTRICTIONS, BY THE CONTRACTOR, ON THE ACCESS, BY THE OWNER, TO THE INSTALLED SOFTWARE SHALL BE PROHIBITED.

1.4 SUBMITTALS

- A. SUBMIT THREE HARD COPIES AND ONE SOFT COPY (PDF) OF THE SUBMITTALS INDICATED BELOW. INDICATE AT THE BEGINNING OF EACH SUBMITTAL, KNOWN SUBSTITUTIONS AND DEVIATIONS FROM REQUIREMENTS OF CONTRACT DOCUMENTS.
- B. SHOP DRAWING SUBMITTALS TO INCLUDE SUFFICIENT DATA TO INDICATE COMPLETE COMPLIANCE WITH CONTRACT DOCUMENTS. SUBMISSIONS IN FORM OF DRAWINGS, BROCHURES, BULLETINS, CATALOG DATA, CONTROL PROGRAMMING AND SEQUENCE OF OPERATIONS. DRAWING SIZE, 11" X 17" MINIMUM.
- C. FINAL CALIBRATION, COMMISSIONING AND TESTING REPORTS.
- D. PREPARE AS-BUILT DRAWINGS UPON COMPLETION OF THE PROJECT. AS-BUILT DRAWINGS TO INCLUDE POINT-TO-POINT WIRING, AND INDICATE ALL EQUIPMENT LOCATIONS.

2.0 PRODUCTS

2.1 SENSORS AND CONTROL DEVICES

- A. GENERAL
1. PROVIDE SENSORS AND CONTROL DEVICES AS INDICATED ON DEVICE SCHEDULE PLANS, CONTROL DIAGRAMS AND AS REQUIRED TO MEET SPECIFIED PERFORMANCE.
2. ALL COMPONENTS OF SENSORS EXPOSED TO PROCESS SHALL BE RATED TO WITHSTAND 150 PERCENT OF MAXIMUM PROCESS TEMPERATURE AND PRESSURE.
- B. TEMPERATURE SENSORS
1. TEMPERATURE SENSOR ACCURACY SHALL NOT EXCEED ±1.0°F .
2. OUTSIDE AIR SENSORS SHALL BE MOUNTED ON A NORTHERN EXPOSURE AND MOUNTED WITHIN A VENTILATED ENCLOSURE.
3. IMMERSION SENSORS SHALL BE PROVIDED WITH A SEPARABLE STAINLESS STEEL OR BRASS WELL.
- C. CURRENT RELAY: SHALL BE SPLIT CORE, ADJUSTABLE SETPOINT, CURRENT SENSING RELAY WITH SPDT OUTPUT CONTACTS

2.2 SOFTWARE

- A. GRAPHICS: EACH SYSTEM CONTROLLED SHALL HAVE A UNIQUE GRAPHIC.
- B. HISTORICAL TRENDING: ALL SYSTEM POINTS EITHER REAL OR CALCULATED SHALL BE ASSIGNABLE TO THE HISTORICAL TRENDING PROGRAM.

3.0 EXECUTION

3.1 LOCATION OF EQUIPMENT

- A. THE DRAWINGS AND SPECIFICATIONS DESCRIBE APPROXIMATE LOCATIONS OF THE WORK. VERIFY ALL LOCATIONS IN THE FIELD.
- B. LOCATE EQUIPMENT AND ACCESSORIES SO AS TO PROVIDE EASY ACCESS FOR PROPER SERVICE AND MAINTENANCE.
- C. DIRECT DIGITAL CONTROLLERS AND FIELD EQUIPMENT PANELS SHALL BE LOCATED IN THE VICINITY OF THE EQUIPMENT CONTROLLED IN MECHANICAL, ELECTRICAL AND UTILITY ROOMS IN APPROVED LOCATIONS.
- D. DDCS AND FEPS SHALL NOT BE LOCATED DIRECTLY UNDERNEATH VALVES OR OTHER AREAS WHERE THEY MAY BE SUBJECT TO WATER OR HEAT DAMAGE. IN ADDITION, PANELS SHALL BE MOUNTED WITH THE BOTTOM NO LOWER THAN 3 FEET AND TOP NO HIGHER THAN 7 FEET ABOVE THE

FLOOR, WITH A MINIMUM OF 3 FEET DEEP BY 2.5 FEET WIDE FOOT CLEARANCE AT THE FRONT.

3.2 INSTALLATION OF WIRING

- A. PROVIDE CONTROL WIRING FOR CONTROL DEVICES, MONITORING DEVICES, INSTRUMENTATION, AND INTERLOCKS AS REQUIRED FOR A COMPLETE SYSTEM.
- B. RUN ALL WIRING IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AUTHORITIES AND CODES HAVING JURISDICTION. ALL WIRING WITHIN BOILER ROOM AND PUMP ROOMS, AND OTHER EXPOSED AREAS TO BE INSTALLED IN CONDUIT.
- C. PROVIDE SLEAVES FOR WIRING THROUGH FIRE RATED WALLS AND FLOORS. FIRESTOP TO MAINTAIN WALL AND FLOOR RATINGS.
- D. WIRING LESS THAN 50 VOLTS SHALL NOT BE RUN IN THE SAME RACEWAY WITH WIRING GREATER THAN 50 VOLTS.
- E. WHERE LOW VOLTAGE WIRING IS INSTALLED WITHIN AN ENCLOSURE WITH 120V OR GREATER VOLTAGE WIRING, THHN 600V INSULATED WIRING SHALL BE USED FOR WIRING LOW VOLTAGE.
- F. USE GREENFIELD FOR FINAL CONNECTIONS TO VALVES, MOTORS, ETC.
- G. CONNECTIONS FROM DDC CONTROLLER TO ITS FIELD DEVICES SHALL BE WITH BARRIER TYPE TERMINAL STRIPS.
- H. CONDUITS SHALL BE SEALED WHERE SUBJECT TO MOISTURE AND CONDENSATION SUCH AS CONNECTION TO COLD WATER VALVE ACTUATORS, COOLING TOWERS, OUTSIDE WALLS AND EQUIPMENT IN UNCONDITIONED SPACES.
- I. COLOR CODE OR NUMBER ALL CONTROL WIRING. CODING SHALL CORRESPOND WITH CODING SHOWN ON THE APPROVED TEMPERATURE CONTROL SYSTEM DRAWINGS.
- J. ALL WIRES IN HVAC UNIT CONTROL CABINETS, PANELS, BOXES, ETC., SHALL BE NEATLY ARRANGED, TIED WHERE NECESSARY AND LEFT WITH SUFFICIENT SLACK FOR EASE OF SERVICING. WIRES SHALL BE NEATLY GROUPED AND BUNDLED. FOR WIRING BUNDLES WITH 20 OR MORE CONDUCTORS RUN IN PANDUIT OR APPROVED PLASTIC WIREWAYS WITH SNAP-ON COVERS. SEPARATE TERMINAL BLOCKS SHALL BE INSTALLED FOR 120 VOLT A.C. WIRING AND FOR LOW LEVEL SIGNAL WIRING. TERMINAL BLOCKS SHALL BE 300 VOLT RATED, MEDIUM DUTY, CHANNEL MOUNTED, WITH NUMBERED MARKING STRIPS. SPLICES USING "WIRE NUTS" OR OTHER METHODS SHALL NOT BE PERMITTED.
- K. CONTROLS TRANSFORMERS SHALL HAVE SERVICE SWITCHES AND BE FUSED ON THE HIGH VOLTAGE SIDE.

3.3 INSTALLATION OF SENSORS AND CONTROL DEVICES

- A. EACH DDC, UC, AND CONTROL DEVICE, FIELD OR PANEL MOUNTED, SHALL BE IDENTIFIED BY A NAMEPLATE PERMANENTLY ATTACHED TO ITS ENCLOSURE (1/4" HIGH LETTERS MINIMUM). IDENTIFIERS SHALL MATCH RECORD DOCUMENTS.
- B. PROVIDE CAPPED TEST PORTS ON BOTH PORTS OF PRESSURE AIR AND WATER TRANSDUCERS.
- C. CURRENT SENSORS SHALL BE SET AT APPROXIMATELY 75% OF THE NORMAL OPERATING AMPS.
- 3.4 TRAINING
- A. THE CONTRACTOR SHALL GIVE INSTRUCTION IN THE ADJUSTMENT, OPERATION AND MAINTENANCE, INCLUDING PERTINENT SAFETY REQUIREMENTS, OF THE EQUIPMENT AND SYSTEM INSTALLED. THREE TRAINING SESSIONS SHALL BE PROVIDE WITH A MINIMUM OF 8 HOURS TOTAL.

3.5 CALIBRATION AND COMMISSIONING

- A. PERFORM COMMISSIONING CONSISTING OF FIELD I/O CALIBRATION AND COMMISSIONING, SYSTEM PROGRAM COMMISSIONING, AND SEASONAL COMMISSIONING. DOCUMENT ALL COMMISSIONING INFORMATION ON COMMISSIONING DATA SHEETS THAT SHALL BE SUBMITTED PRIOR TO ACCEPTANCE TESTING.

3.6 AUTOMATIC CONTROL PROGRAMS AND SEQUENCES

- A. GENERAL
1. ALL CONTROL AND ALARM FUNCTIONS WHICH USE ANALOG POINTS TO SWITCH EQUIPMENT ON AND OFF (E.G., FANS,) MUST BE PROGRAMMED WITH DEAD BANDS, TIME DELAYS, MINIMUM ON AND ON TIME FUNCTIONS AND/OR OTHER FUNCTIONS TO PREVENT SHORT CYCLING OF EQUIPMENT AND NUISANCE ALARMS.
2. DEGRADED MODE: IF, BY FAILURE OF ANOTHER DDC, SENSOR OR SYSTEM COMPONENT WHICH CAUSES INFORMATION CRITICAL TO A DDC'S PROGRAM TO BE LOST, DEFAULT VALUES OR SUBROUTINES WILL AUTOMATICALLY BE USED TO APPROXIMATE CRITICAL INFORMATION TO ENSURE CONTINUED CONTROL.
3. WHERE HEATING AND COOLING IS AVAILABLE TO A TEMPERATURE CONTROL ZONE THE ZONE SHALL BE PROVIDED WITH A MINIMUM OF 5 DEGREE DEADBAND BETWEEN OPERATION OF HEATING AND COOLING SUPPLIED TO THE ZONE (EXCEPTION: LOW OR HIGH LIMIT CONTROL FUNCTIONS).
- B. MIXING BOXES:
1. REFER TO CONTROL DIAGRAM THIS PAGE.
- C. HYDRONIC HEATER. (HH-1 THRU HH-3)
1. THE HEATER SHALL BE ENABLE BY ITS DEDICATED THERMOSTAT. THE CONTROL VALVE SHALL OPEN TO MAINTAIN SPACE SETPOINT. UPON SETPOINT ITS ACHIEVE THE CONTROL VALVE SHALL CLOSE.
- D. EXHAUST FAN (EF-1)
1. EXHAUST FAN EF-1 SHALL BE INTERLOCKED TO WASHER MACHINE.
- I. EXHAUST FANS (EF-2/EF-3)
1. EXHAUST FAN EF-2/3 SHALL BE ENABLE START/STOP BY ITS DEDICATED TIMER SWITCH.

DEVICE SCHEDULE DESCRIPTIONS

THE FOLLOWING DEVICE SCHEDULE IDENTIFIES THE MINIMUM MONITORING AND CONTROL DEVICE REQUIREMENTS. ADDITIONAL HARDWARE AND SOFTWARE REQUIRED TO PERFORM THE AUTOMATIC CONTROL SEQUENCES AND PROVIDE A COMPLETE WORKING CONTROL SYSTEM SHALL BE INCLUDED BY THIS CONTRACTOR WITHOUT ADDITIONAL COST.

POINT TYPE
DO – DIGITAL OUTPUT
DI – DIGITAL INPUT
AO – ANALOG OUTPUT
AOP – ANALOG OUTPUT – PNEUMATIC
AI – ANALOG INPUT
CALC – CALCULATED POINT

POINT FUNCTIONS – INDICATES THE MINIMUM REQUIRED FMCS PROCESSING AND ALARM FUNCTIONS.

PRF (PROOF ALARM) – IF THE STATUS OF THE CONTROLLED DEVICE DOES NOT MATCH THE COMMANDED STATE OF THE DEVICE, AFTER ANS ADJUSTABLE TIME DELAY, A PROOF ALARM SHALL BE ANNUNCIATED AT THE OPERATORS TERMINAL.

ALM (ALARM) – WHENEVER THE POINT CHANGES FROM THE NORMAL STATE AN ALARM SHALL BE ANNUNCIATED AT THE OPERATORS TERMINAL.

HA (HIGH ALARM) – WHENEVER THE POINT VALUE EXCEEDS THE HIGH ALARM LIMIT AN ALARM SHALL BE ANNUNCIATED AT THE OPERATORS TERMINAL.

LA (LOW ALARM) – WHENEVER THE POINT VALUE FALLS BELOW THE LOW ALARM LIMIT AN ALARM SHALL BE ANNUNCIATED AT THE OPERATOR'S TERMINAL.

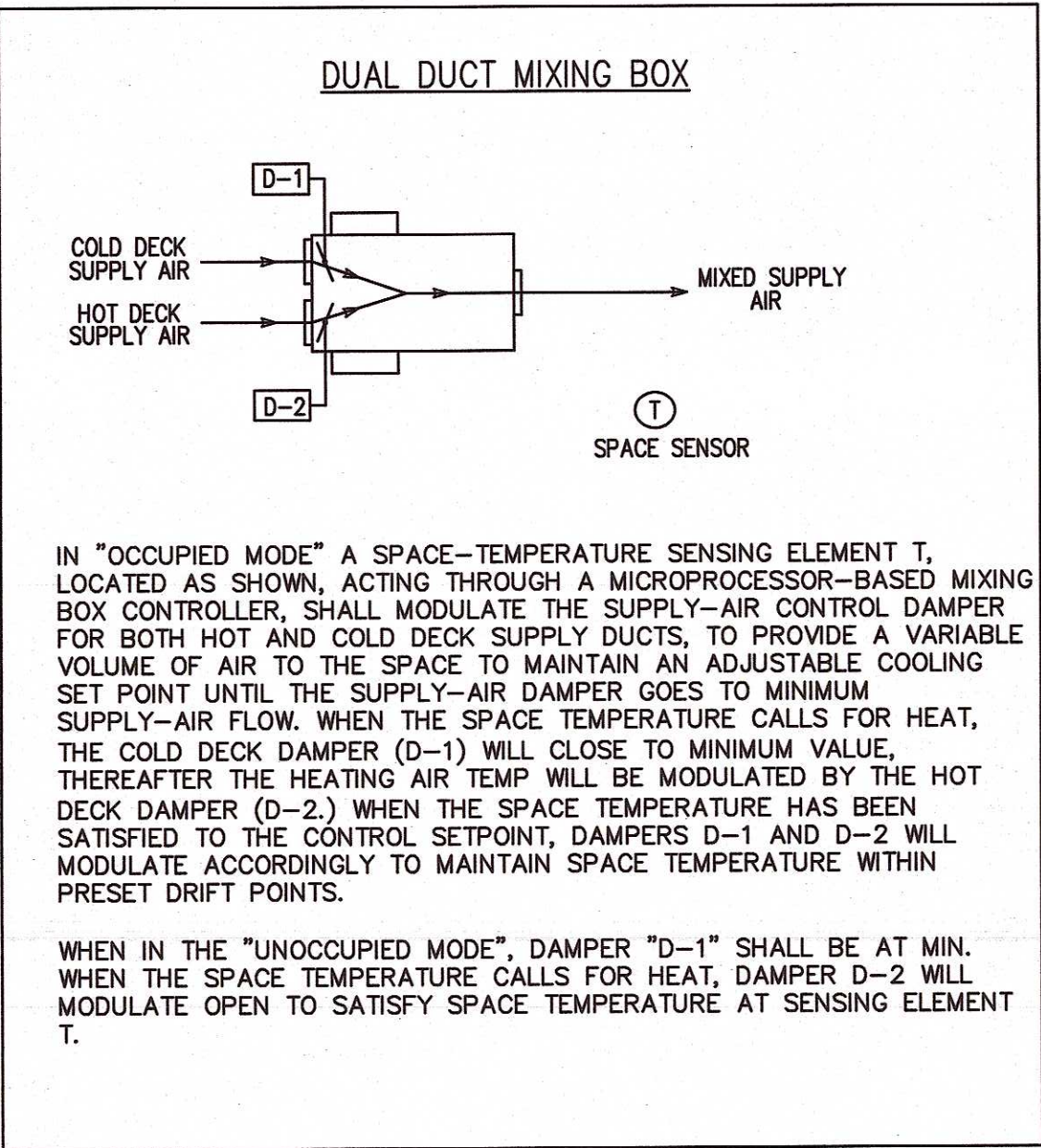
DEV (SETPOINT DEVIATION ALARM) – IF THE MEASURED VARIABLE OF A CONTROL LOOP DEVIATES FROM THE SETPOINT BY A PRESET OFFSET FOR MORE THAN A PRESET TIME LIMIT A DEVIATION ALARM SHALL BE ANNUNCIATED AT THE OPERATOR'S TERMINAL.

RT (RUN HOURS) – TOTALIZE THE HOURS OF OPERATION OF THE CONTROLLED DEVICE. WHEN THE TOTAL HOURS EXCEEDS A HIGH LIMIT VALUE AN ALARM SHALL BE ANNUNCIATED AT THE OPERATOR'S TERMINAL.

TOT (TOTAL) – TOTALIZE THE CUMULATIVE VALUE OF THE POINT (I.E., CUMULATIVE FLOW FROM A FLOW METER POINT).

PA (PULSE ACCUMULATE.) – COUNT A PULSED DIGITAL SIGNAL AND CALCULATE AN EQUIVALENT ANALOG VALUE.

CALC (CALCULATE) – CALCULATE VALUE FROM OTHER POINT INFORMATION.



Revisions & Issues			Client / Project		M.E.P. Engineer		Seal		Issue Date	Sheet No.	Architect
No.	Description	Date	 Purchase College STATE UNIVERSITY OF NEW YORK		 AT SUNY PURCHASE 735 Anderson Hill Road Purchase, NY 10577		 Southport Associates Southport Engineering Associates, PC 11 Bailey Avenue Ridgefield, CT 06877		June. 7, 2016	M-6.1	
1	Issued for Review	04-15-2016							Project No.	15.44	
2	Issued for Value Engineering Revision	01-30-2017								Mechanical Controls	
3	Issued for Construction	02-20-2017									
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