

HVAC SYMBOLS

SYMBOL	DESCRIPTION
	ARROW INDICATES EXISTING TO BE RELOCATED AS INDICATED ON PLAN
	REDISTRIBUTE AIR TO EXISTING DIFFUSER AS INDICATED ON PLAN
	INDICATES SIZE, CFM, AND DIFFUSER TYPE
	NEW CEILING SUPPLY DIFFUSER
	NEW RETURN AIR/EXHAUST GRILLE
	EXISTING RETURN AIR/EXHAUST GRILLE
	NEW SLOT DIFFUSER
	EXISTING SLOT DIFFUSER
	POINT OF CONNECTION BETWEEN NEW AND EXISTING WORK
	EXISTING TO REMAIN
	REMOVE EXISTING AS INDICATED
	CAP EXISTING DUCT
	MANUAL VOLUME CONTROL DAMPER
	DUCT TRANSITION
	FIRE (SMOKE) DAMPER (24V ACTUATOR)
	NEW OR RELOCATED THERMOSTAT
	EXISTING THERMOSTAT
	FLEXIBLE DUCT
	INDICATES A WALL TO DECK (FOR COORDINATION PURPOSE ONLY-REFER TO ARCHITECTS PLANS FOR REQUIREMENTS)
	INDICATES NEW EXPOSED DUCT

MECHANICAL INSULATION SCHEDULE					
APPLICATION	INSULATION		INSULATION FINISH		
	INSULATION TYPE	THICKNESS	INDOOR CONCEALED	INDOOR EXPOSED INCL. MECH ROOMS	OUTDOOR
DUCTWORK					
CONCEALED SUPPLY & OA DUCTS:	FIBERGLASS 3i	2"	6F	NA	NA
EXPOSED SUPPLY DUCTS AND OUTSIDE AIR DUCTS IN PUBLIC AREAS:	FIBERGLASS 5i	1.5"	NA	0F	NA
EXPOSED SUPPLY/OA DUCTS, AND PLENUMS IN MECH ROOMS/ BOH AREAS:	FIBERGLASS 2i	2"	NA	6F	NA
EXPOSED SUPPLY/OA DUCTS, AND PLENUMS IN MECH ROOMS/ BOH AREAS:	FIBERGLASS 2i	1"	NA	6F	NA
SUPPLY, RETURN AND OUTSIDE AIR DUCTS LOCATED OUTDOORS:	FIBERGLASS 5i & 2i	2 LAYERS OF 2"	NA	NA	7F
KITCHEN HOOD EXHAUST:	FIREMASTER FASTWRAP	2 LAYERS OF 1-1/2"	NA	NA	NA
REFRIGERANT SUCTION AND/OR HOT-GAS LINE PIPING					
INDOOR:	CELLULAR FOAM-4i	1"	0F	0F	NA
OUTDOOR:	CELLULAR FOAM-4i	1"	NA	NA	9F
				REFRIGERANT LIQUID LINES SO NOT NEED TO BE INSULATED	
MISCELLANEOUS PIPING					
AIR COND. CONDENSATION DRAIN PIPING:	CELLULAR FOAM-4i	1/2"	0F	0F	9F
CHILLED WATER SUPPLY & RETURN PIPING					
INDOOR:					
1-1/4" & SMALLER:	FIBERGLASS-6i	1"	8F	5F	NA
	CELLULAR FOAM-4i	1"	0F	0F	NA
1-1/2" & LARGER:	FIBERGLASS-6i	1-1/2"	8F	5F	NA
	CELLULAR FOAM-4i	1-1/2"	0F	0F	NA
OUTDOOR:					
1-1/4" & SMALLER:	FIBERGLASS-6i	1"	NA	NA	3F
	CELLULAR FOAM-4i	1"	NA	NA	9F
1-1/2" & LARGER:	FIBERGLASS-6i	2"	NA	NA	3F
	CELLULAR FOAM-4i	2"	NA	NA	9F
CONDENSER WATER SUPPLY & RETURN PIPING					
INDOOR W/ WATER SIDE ECONOMIZER:	FIBERGLASS-6i	1-1/2"	8F	5F	NA
INDOOR W/O WATER SIDE ECONOMIZER:	NONE	0	NA	PAINT	NA
STEAM & STEAM CONDENSATE:	MINERAL-FIBER-7i	4-1/2"	10F	10F	NA
OUTDOOR:	FIBERGLASS-6i	2"	NA	NA	3F
HEATING WATER SUPPLY & RETURN					
INDOOR 1-1/4" & SMALLER:	FIBERGLASS-6i	1-1/2"	8F	5F	3F
INDOOR 1-1/2" & LARGER:	FIBERGLASS-6i	2"	8F	5F	3F
OUTDOOR - ALL:	FIBERGLASS-6i	3"	NA	NA	3F
INSULATION MATERIALS: 1. CALCIUM SILICATE - MAXIMUM K FACTOR AT 500 DEGREES F SHALL BE 0.55, MUST ASTM C411 TO 1200 DEGREES F, AND MUST MEET NFPA 255 AND UL 723 FOR 0/0 FLAME SPREAD AND SMOKE DEVELOPED. 2. FIBERGLASS BOARD - PROVIDE SEMI-RIGID FIBERGLASS BOARD WITH A DENSITY OF 3 LBS/FT ³ , MAXIMUM K FACTOR AT 75 DEGREES F SHALL BE 0.24 AND A TEMPERATURE LIMIT OF 250 DEGREES F (FACED) AND 450 DEGREES F (UNFACED). NFPA 255 AND UL 723 FOR 25/50 FLAME SPREAD AND SMOKE DEVELOPED. 3. FIBERGLASS DUCT WRAP - MAXIMUM K FACTOR AT 75 DEGREES F SHALL BE 0.30, MUST PASS ASTM C411 TO 250 DEGREES F FACED. DENSITY SHALL BE 0.75 LBS/FT ³ . NFPA 255 AND UL 723 FOR 25/50 FLAME SPREAD AND SMOKE DEVELOPMENT. 4. CELLULAR FOAM - EQUAL TO AP/ARMAFLEX TUBES OR SHEETS, AS APPLICABLE TO INSTALLATION. MAXIMUM K FACTOR AT 75 DEGREES F SHALL BE 0.28. MAXIMUM OPERATING TEMPERATURE OF 200 DEGREES F. MUST MEET NFPA 255 AND UL723 FOR 25/50 FLAME SPREAD AND SMOKE DEVELOPED AND MUST BE FREE OF ANY CFCs, HCFCs, OR HFCs. 5. FIBERGLASS DUCT LINER W/ ANTIMICROBIAL RESISTANT COATING OR CLOSED-CELL ELASTOMERIC DUCT LINER - REFER TO SECTION 23313 FOR ADDITIONAL INFORMATION. 6. FIBERGLASS PIPE INSULATION ONLY WHERE SPECIFICALLY CALLED FOR ON DRAWINGS OR IN SPECS - MAXIMUM K FACTOR AT 100 DEGREES F SHALL BE 0.24, MUST PASS ASTM C411 TO 850 DEGREES F. DENSITY SHALL BE 3.5 LBS/FT ³ / NFPA 255 AND UL 723 FOR 25/50 FLAME SPREAD AND SMOKE DEVELOPED. 7. MINERAL FIBER, PREFORMED PIPE INSULATION, TYPE I OR II. NA. NOT APPLICABLE OR NONE REQUIRED. FINISH TYPES 0F. NO FINISHES REQUIRED 1F. 0.010" T-304 STAINLESS STEEL JACKETING -- CORRUGATED, PROVIDE 3/16" CORRUGATED ROLL JACKETING FOR PIPING AND TANKS LESS THAN 6 FEET DIAMETER AND DEEP CORRUGATED SHEETS FOR DIAMETERS LARGER THAN 6 FEET. 2F. 0.010" T-304 STAINLESS STEEL JACKETING -- SMOOTH FINISH. 3F. CORRUGATED ALUMINUM -- 0.016" UP THROUGH 24" PIPE SIZE, 0.024" LARGER THAN 24". 4F. SMOOTH ALUMINUM -- 0.016" UP THROUGH 12" PIPE SIZE, 0.024" LARGER THAN 12". 5F. 20-MIL PVC (25 FLAME SPREAD AND 50 SMOKE DEVELOPED.) 6F. FOLYREINFORCED/RACT JACKET (VAPOR BARRIER). 7F. 14-INCH WEATHERPROOF MASTIC WITH GLASS MESH REINFORCEMENT, SLOPE TOP OF DUCT MINIMUM OF 1/4" PER FOOT TO PREVENT PONDING. 8F. WHITE ALL-SERVICE JACKET (VAPOR BARRIER). 9F. WATER BASED LATEX ENAMEL WEATHER RESISTANT AND UV RESISTANT FINISH EQUAL TO ARMAFLEX WB FINISH. 10F. 125 MILS THICK EXTRUDED, BLACK, HIGH DENSITY POLYETHYLENE (HDPE). INNER SURFACE SHALL BE OXIDIZED BY MEANS OF CORONA OR FLAME TREATMENT. NA. NOT APPLICABLE OR NONE REQUIRED.					

MECHANICAL PIPING, FITTINGS, & JOINTS SCHEDULE			
APPLICATION	MATERIAL	FITTINGS	JOINTS
CONDENSATE			
	COPPER	WROUGHT COPPER	SOLDERED
REFRIGERANT			
	ACR	WROUGHT COPPER	BRAZED
1. SHARKBITE IS NOT ACCEPTED. ACCEPTABLE PRESS FITTINGS MANUFACTURER ARE: NIBCO, VIEGA-PROGRESS, VIEGA MEGAPRESS, PARKER-ZOOMLOCK (REFRIGERANT PIPING ONLY). 2. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION. 3. NOT ALL PIPE TYPES MAY BE USED. REFER TO FLOOR PLANS FOR FURTHER DETAILS.			

GENERAL NOTES:

- ALL WORK SHALL COMPLY WITH APPLICABLE NATIONAL, STATE AND LOCAL CODES, RULES, REGULATIONS AND REQUIREMENTS.
- ALL WORK SHALL COMPLY WITH THE BUILDING TENANT CONSTRUCTION GUIDE. COORDINATE WITH BUILDING MANAGEMENT/OWNER FOR ACCESS TO ANY TENANT LEASE SPACES THAT MIGHT BE REQUIRED FOR THE INSTALLATION. UNLESS DIRECTED BY LANDLORD ALL EQUIPMENT AND WORKMANSHIP SHALL BE GUARANTEED FOR 1 YEAR.
- EXISTING CONDITIONS ARE BASED ON INFORMATION PROVIDED BY SITE SURVEY AND PREVIOUS DRAWINGS DATED 12/15/21. HOWEVER, IT IS NOT INTENDED TO BE A TRUE REPRESENTATION OF ACTUAL CONDITIONS. CONTRACTOR SHALL VISIT JOB SITE PRIOR TO BIDDING TO ASCERTAIN EXISTING CONDITIONS AND SHALL NOTIFY ARCHITECT OF ANY DISCREPANCIES PRIOR TO BID.
- CONTRACTOR SHALL ENGAGE AN INDEPENDENT AIR BALANCING COMPANY TO OBTAIN AIR QUANTITIES SHOWN ON DRAWING. AT COMPLETION OF AIR BALANCE, BALANCING DAMPER SHALL BE TIGHTENED AND PROPERLY SEALED WITH FOIL TAPE.
- ALL MEDIUM AND LOW PRESSURE DUCTWORK SHALL BE GALVANIZED SHEET METAL. FABRICATED, INSTALL AND SEAL MEDIUM PRESSURE DUCTWORK FOR 3" W.G. AND LOW PRESSURE DUCTWORK FOR 1" W.G. IN ACCORDANCE WITH SMACNA STANDARD. DUCTWORK SHALL BE INSULATED WITH 2" FIBERGLASS BLANKET WITH FOIL FACED VAPOR BARRIER TO MEET IECC REQUIREMENT (MIN RS VALUE). IF DUCTWORK IS IN AN EXPOSED CEILING, PROVIDE INTERNALLY LINED/INSULATED PAINT GRIP DUCTWORK.
- ALL SUPPLY AND RETURN DUCT SIZES ARE FREE AREAS.
- INDIVIDUAL DUCT RUN-OUTS TO EACH DIFFUSER SHALL BE SIZED IN ACCORDANCE TO THE DIFFUSER NECK SIZE FOUND IN THE GRILLES-REGISTERS-DIFFUSERS SCHEDULE UNLESS NOTED OTHERWISE.
- OFFSET DUCTS INTO JOIST SPACE FOR CLEARANCE WHERE SPACE ABOVE CEILING IS NOT SUFFICIENT FOR DUCTS TO CROSS OTHER DUCTS OR WORK OF OTHER TRADES.
- INSULATED FLEX DUCT IN THE MEDIUM PRESSURE SYSTEM SHALL BE UTILIZED AT INLET TO VAV BOX OR FAN POWERED BOX ONLY. LENGTH SHALL BE LIMITED TO AN OVERALL LENGTH OF TWO (2) FEET AND BE STRAIGHT RUN. INSULATED FLEX DUCT IN THE LOW PRESSURE SYSTEM SHALL BE LIMITED TO AN OVERALL LENGTH OF SIX (6) FEET WITH A MAXIMUM OF A 90 DEGREE CHANGE IN DIRECTION. SUPPORTS SHALL BE SADDLE BANNED TO STRUCTURE, SUPPORTING FROM FIRE PROTECTION PIPING, ELECTRICAL CONDUIT OR CEILING SUPPORT WIRES IS NOT ACCEPTABLE.
- VAV BOXES AND FAN POWERED BOXES SHALL HAVE 24" MINIMUM CLEARANCE ON ALL SIDES OF BOX.
- CONTRACTOR SHALL VERIFY ALL EXISTING SLOT DIFFUSERS AS LOCATED PER DRAWINGS OR ENSURE RELOCATION TO MATCH PLANS. CONTRACTOR SHALL ALSO VERIFY THAT EXISTING SLOT INDICATED SHALL BE ABLE TO DELIVER CFM AS NOTED. IF NOT, CONTRACTOR SHALL REMOVE EXISTING SLOT AND REPLACE WITH NEW OR RELOCATED SLOT THAT CAN DELIVER CFM AS INDICATED.
- ALL ENCLOSED ROOMS (INTERIOR AND PERIMETER) SHALL HAVE RETURN AIR PATH ROOMS WITH ALL WALLS TO DECK SHALL HAVE LINED SHEET METAL RETURN AIR BOOTS PLACED IN WALL ABOVE CEILING SIZED FOR 500 FPM MAXIMUM. FIRE RATED WALLS SHALL HAVE FIRE DAMPERS WITHIN THE DUCT PER LOCAL CODE REQUIREMENTS. FIRE DAMPERS AND FIRE-SMOKE DAMPERS SHALL BE FREE AREA/OUT OF AIRSTREAM TYPE. ALL MOTORIZED DAMPERS SHALL BE FREE AREA/OUT OF AIRSTREAM TYPE.
- PIPES AND DUCTS TO BE COORDINATED ON JOB WITH BUILDING STRUCTURE AND WORK OF OTHER CONTRACTORS. ROUTE AS HIGH AS PHYSICALLY POSSIBLE.
- COORDINATE CEILING DIFFUSERS AND GRILLES WITH LIGHTING FIXTURES. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN.
- THERMOSTATS TO BE MOUNTED 48" ABOVE FINISHED FLOOR LEVEL UNLESS NOTED OTHERWISE ON THE PLANS. CONTRACTOR SHALL COORDINATE LOCATION OF THERMOSTATS WITH ARCHITECT IN FIELD.
- REPAIR AND PATCH CONSTRUCTION DAMAGED DUE TO THE DEMOLITION OF THIS PROJECT. USING SAME METHODS AND MATERIALS TO MATCH EXISTING.
- EVAPORATORS SHALL HAVE A PRIMARY INSULATED CONDENSATE DRAIN LINE SLOPED 1/8"FT. EXTENDED TO NEAREST FLOOR DRAIN IN MECHANICAL ROOM OR MOP SINK. GALVANIZED SHEET METAL, SECONDARY DRAIN PANS SHALL HAVE LEAK DETECTION TAPE IN PAN AND ROUTE THE PAN'S INSULATED CONDENSATE DRAIN LINE SLOPED 1/8"FT NEXT TO BUT INDEPENDENT OF PRIMARY DRAIN LINES.
- COMPUTER GRADE AC UNITS AND WATER SOURCE HEAT PUMPS SHALL HAVE TWO (2) SETS OF 2" PLEATED FILTERS. FIRST SET FOR DURING CONSTRUCTION, SECOND SET AT MOVE-IN.
- PROVIDE TEMPORARY HIGH EFFICIENCY FILTER MEDIA ON MAIN RETURN AIR AND EXHAUST FROM FLOOR AT BEGINNING OF PROJECT AND REPLACED AT TWO (2) WEEK INTERVALS UNTIL PROJECT COMPLETION AT WHICH TIME THE FILTER MEDIA SHALL BE REMOVED.
- CONTRACTOR SHALL PROVIDE YOUNG CONCEALED DAMPER REGULATORS WITH A DAMPER CABLE CONTROL KIT EQUAL TO BOWDEN MODEL 270-866P FOR ALL GYPSUM BOARD APPLICATIONS. COORDINATE SHAFT SIZE OF DAMPERS WITH KIT FOR PROPER COMPATIBILITY. REFER TO ARCHITECTURAL DRAWINGS FOR ALL LOCATIONS INDICATED WITH GYPSUM BOARD CEILING AND COORDINATE WITH ARCHITECT FOR EXACT LOCATION OF INSTALLATION.
- CONNECTIONS BETWEEN FERROUS AND NON-FERROUS PIPING SYSTEMS, AND BETWEEN FERROUS PIPING SYSTEMS AND NON-FERROUS CONNECTIONS TO EQUIPMENT SHALL BE MADE BY THE USE OF DIELECTRIC UNIONS, COUPLINGS OR FLANGES AS MANUFACTURED BY CRANE, EPCO, F.M. MALONEY, UNIVERSAL MANUFACTURING CO.
- FLEXIBLE DUCTS SHALL BE SIMILAR AND EQUAL TO THERMOFLEX. TYPE M-KE. FLEXIBLE DUCTS SHALL COMPLY WITH APPLICABLE REQUIREMENTS OF UL-181, NFPA 98-A AND OTHER GOVERNING AUTHORITIES.
- FLEXIBLE DUCT BETWEEN DUCT AND AC UNITS AND EXHAUST FANS SHALL BE EQUAL TO VENTFABRICS "VENTGLAS".
- AIR CONDITIONING COOLING CONDENSATE PIPING TO BE ONE-HALF INCH THICK ARMAFLEX. FITTINGS SHALL BE PRE-MOLDED OF THE SAME MATERIAL. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- DUCT LINER SHALL BE 1-INCH ACOUSTICAL DUCT LINING IN ACCORDANCE WITH SMACNA STANDARDS. DUCT LINING SHALL BE OWENS-CORNING FIBERGLAS "AEROFLEX" NO. 200 OR EQUAL.
- IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THAT THE EXISTING DUCTWORK SIZE IS THE SAME AS INDICATED ON THE PLANS AND IS ADEQUATE FOR NO MORE THAN 0.30 OF STATIC PRESSURE PER 100 FEET FOR MEDIUM PRESSURE DUCTWORK BASED ON THE CFM'S INDICATED ON THE PLANS AND THAT EXISTING DIFFUSER NECK SIZES MEET THE REQUIREMENTS AS INDICATED FOR NEW DIFFUSERS.
- ALL EXISTING DUCTWORK SHALL BE FIELD VERIFIED TO BE INSULATED AND IN GOOD CONDITION, ANY TORN, DAMAGED OR MISSING INSULATION WILL BE REPLACED. EXISTING CONTROLS SHALL BE CONFIRMED TO BE IN WORKING CONDITION.
- CONTRACTOR SHALL ENGAGE A STRUCTURAL ENGINEERING FIRM FOR STRUCTURAL SUPPORT OF ROOFTOP UNITS ON ROOF AS REQUIRED. VERIFY EXACT LOCATION OF ROOFTOP UNITS ON ROOF WITH ARCHITECT AND OBTAIN A WRITTEN APPROVAL FROM LANDLORD BEFORE INSTALLATION OF ROOFTOP UNITS. CUTTING AND WEATHER PROOFING OF ROOF SHALL BE PERFORMED BY A LICENSED ROOF CONTRACTOR AND APPROVED BY THE LANDLORD.
- CONTROL CONTRACTOR SHALL PROVIDE 24V TRANSFORMER EACH VAV BOX. PROVIDE CONTROL WIRE TO EACH VAV BOX. REFER TO GENERAL NOTE XX ON SHEET XX.
- INSTALL DUCTMOUNTED SMOKE DETECTORS (FURNISHED BY DIV 16).

PROJECT COMMISSIONING REQUIREMENTS:

- ALL BUILDING MECHANICAL AND ELECTRICAL SYSTEMS SHALL BE COMMISSIONED BY A COMMISSIONING AGENT IN ACCORDANCE WITH ALL REQUIREMENTS OF THE INTERNATIONAL ENERGY CONSERVATION (IECC) SECTION C408. REFER TO THE APPLICABLE CODES NOTE ON THIS SHEET FOR THE REQUIRED CODE YEAR OF THE IECC. IT IS THE OWNER'S RESPONSIBILITY TO HIRE A COMMISSIONING AUTHORITY TO ENSURE ALL REQUIRED COMMISSIONING ACTIVITIES AND REQUIREMENTS ARE MET.
- THE COMMISSIONING AGENT SHALL PERFORM ALL TASKS ACCORDING TO THE REQUIREMENTS OF IECC SECTION C408 AND ANY OTHER REQUIREMENTS OF THE PROJECT.
- THE TESTING AND BALANCING (TAB), BUILDING AUTOMATION SYSTEMS (BAS), GENERAL CONTRACTOR, MECHANICAL, ELECTRICAL, AND PLUMBING CONTRACTORS SHALL PROVIDE FULL SUPPORT IN ALL COMMISSIONING ACTIVITIES AND PERFORM ALL NECESSARY COMMISSIONING TASKS ON THIS PROJECT AS REQUIRED BY IECC SECTION C408.
- LEED PROJECTS HAVE ADDITIONAL COMMISSIONING REQUIREMENTS THAT VARY FROM THOSE LISTED ABOVE.

MECHANICAL APPLICABLE CODES

- 2021 INTERNATIONAL MECHANICAL CODE (IMC)
- 2021 INTERNATIONAL ENERGY CONSERVATION (IECC)
- CITY OF PLANO, TEXAS LOCAL AMENDMENTS



325 N. Wells Street
Chicago, IL 60654

The Chicago
School - Dallas

6275 West Plano Parkway
Plano, TX 75093

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Mechanical - Electrical Engineers
17300 North Dallas
Parkway Suite 300
Dallas, TX 75245-1147
Firm Registration # F-1511
Tel: 972/239-5357
Fax: 972/239-5231
www.purdy-mcguire.com

PMJ JOB NO. 24040 001
PROJECT MGR. TODD JOHNSON
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HED
15301 Spectrum Dr.
Suite 450
Addicks, Texas
75001 USA
(972) 934-8888
WWW.HED.DESIGN



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Mechanical Notes
& Symbols

M-001

DIVISION 23 - HEATING VENTILATING AND AIR CONDITIONING

SECTION 230500 - COMMON WORK RESULTS

- PART 1 - GENERAL**
 - 1.1 GENERAL NOTES AND SCOPE OF WORK
 - A. REFER TO SECTION 220500 ON PLUMBING SHEET P1.01 FOR INFORMATION RELATED TO HVAC GENERAL CONDITIONS, MISCELLANEOUS EQUIPMENT AND MATERIALS, AND CONSTRUCTION REQUIREMENTS.
 - 1.2 RELATED SECTIONS
 - A. SECTIONS 230523, 230529, 230553 AND 230700 ARE APPLICABLE BUT THEY DO NOT APPEAR IN THESE DIVISION 23 SPECIFICATIONS. REFER TO GENERAL NOTES.
- PART 2 - PRODUCTS (NOT USED)**
- PART 3 - EXECUTION (NOT USED)**
- END OF SECTION

SECTION 230548 - VIBRATION CONTROL

- PART 1 - GENERAL**
 - 1.1 SCOPE OF WORK
 - A. REFER TO SECTION 230500.
- PART 2 - PRODUCTS**
 - 2.1 EQUIPMENT PADS
 - A. PADS SHALL BE 3/4 INCH WATER RESISTANT NEOPRENE WITH WAFFLE PATTERN, MASON TYPE WSW, OR EQUAL.
 - 2.2 ELASTOMERIC HANGERS
 - A. HANGER SHALL CONSIST OF RODS WITH STEEL BOX HOUSING NEOPRENE ISOLATION ELEMENT AND SPRING, MASON SERIES 30N, OR EQUAL.
 - 2.3 RESTRAINED SPRING ISOLATORS
 - A. ISOLATORS SHALL UTILIZE A STEEL BASE WITH WAFFLED NEOPRENE PAD, WELDED STEEL ENCLOSURE WITH SPRING AND RESTRAINING BOLTS, MASON TYPE SLR, OR EQUAL.
 - 2.4 ROOF CURB ISOLATORS
 - A. AS PART OF THE ROOF CURB, PROVIDE SPRING ISOLATORS WITH WATER-TIGHT DESIGN, RETRAINED SPRINGS AND NEOPRENE PADS, MASON TYPE RSC, OR EQUAL.
 - 2.5 INERTIA BASES
 - A. PROVIDE STEEL POURING FORM FOR REINFORCED CONCRETE BLOCKS WITH FLOOR MOUNTED SPRINGS, MASON KSL, OR EQUAL.

- PART 3 - EXECUTION**
 - 3.1 SCHEDULE
 - A. EQUIPMENT PADS - SMALL FLOOR MOUNTED EQUIPMENT OR PACKAGED EQUIPMENT WITH INTERNAL ISOLATION.
 - B. ELASTOMERIC HANGERS - SUSPENDED AIR HANDLING UNITS, EXHAUST FANS, TERMINAL UNITS, HEAT PUMPS, PUMPS, ETC.
 - C. RESTRAINED SPRING ISOLATORS - FLOOR MOUNTED FANS GREATER THAN 1/4 HP.
 - D. ROOF CURB ISOLATORS - FACTORY FABRICATED ROOFTOP UNITS.
 - E. INERTIA BASES - FLOOR MOUNTED PUMPS GREATER THAN 1/4 HP.
 - 3.2 INSTALLATION
 - A. INSTALL VIBRATION CONTROLS PER THE MANUFACTURER'S INSTRUCTIONS.

SECTION 230553 - IDENTIFICATION

- PART 1 - GENERAL**
 - 1.1 SCOPE OF WORK
 - A. REFER TO SECTION 230500.
 - B. LABEL ALL NEW EQUIPMENT AND PIPING SYSTEMS.
- PART 2 - PRODUCTS**
 - 2.1 PIPE LABELS
 - A. PRETENSION PIPE LABELS OF SEMI-RIGID PLASTIC FORMED TO COVER THE FULL CIRCUMFERENCE OF PIPE.
 - B. IDENTIFY THE SERVICE AND DIRECTION OF FLOW. LABELS SHALL CONTAIN AT LEAST 1/2 INCH HIGH LETTERING AND BE PLACED SO THEY ARE EASY TO READ.
 - 2.2 VALVE TAGS
 - A. MULTILAYER, MULTICOLOR PLASTIC LABELS WITH MECHANICAL ENGRAVING AND CHAIN FOR ATTACHMENT TO VALVE.
 - 2.3 EQUIPMENT LABELS
 - A. MULTILAYER, MULTICOLOR PLASTIC LABELS WITH MECHANICAL ENGRAVING AND HOLES FOR ATTACHMENT TO EQUIPMENT.
- PART 3 - EXECUTION**
 - 3.1 PIPE LABELS
 - A. INSTALL PIPE LABELS WHERE PIPING IS EXPOSED OR ABOVE AN ACCESSIBLE CEILING AT MAXIMUM 20 FT. CENTERS.
 - 3.2 VALVE TAGS
 - A. ATTACH TAGS TO VALVES USING CHAIN. PROVIDE A VALVE SCHEDULE FOR MOUNTING IN THE MECHANICAL ROOM.
 - 3.3 EQUIPMENT LABELS
 - A. PERMANENTLY ATTACH LABELS TO EQUIPMENT. LOCATE WHERE LABEL CAN BE EASILY SEEN AND READ.

SECTION 230593 - TESTING ADJUSTING AND BALANCING

- PART 1 - GENERAL**
 - 1.1 SCOPE OF WORK
 - A. THE WORK INCLUDED IN THIS SECTION CONSISTS OF FURNISHING ALL LABOR, MATERIALS, INSTRUMENTS, TOOLS, AND SERVICES REQUIRED IN CONNECTION WITH THE TESTING, ADJUSTING AND BALANCING (TAB) OF THE HEATING, VENTILATING AND AIR CONDITIONING (HVAC) SYSTEMS AS DESCRIBED IN THE MECHANICAL SPECIFICATIONS AND/OR SHOWN ON THE MECHANICAL PLANS, OR REASONABLY IMPLIED THEREFROM.
 - B. THE TAB FIRM SHALL HAVE A LICENSED PROFESSIONAL ENGINEER SUPERVISING ALL WORK AND THE FIRM SHALL HOLD A CURRENT AABC OR NEHB CERTIFICATION.
 - C. REFER TO SECTION 230500.
 - 1.2 START-UP, TEST AND ADJUST
 - A. PROVIDE ALL TESTS OF EQUIPMENT AND SYSTEMS REQUIRED TO PROVE COMPLIANCE WITH THE DRAWINGS AND SPECIFICATIONS. OWNER SHALL BE MADE COMPLETELY FAMILIAR WITH THE COMPLETE WORKING OF ALL THE MECHANICAL SYSTEMS.
 - B. THE TESTS SHALL DEMONSTRATE THE SPECIFIED CAPACITIES AND OPERATION OF ALL EQUIPMENT AND MATERIALS COMPRISING THE SYSTEMS. ALL DATA REQUIRED BY THESE SPECIFICATIONS SHALL BE PREPARED ON TYPED FORMS AND SUBMITTED TO THE ENGINEER FOR APPROVAL. COMPLETE APPROVAL WILL BE NECESSARY BEFORE FINAL PAYMENT CAN BE MADE. THE CONTRACTOR SHALL THEN MAKE AVAILABLE SUCH INSTRUMENTS NECESSARY FOR SPOT CHECKS ON THE SYSTEM.

PART 2 - PRODUCTS (NOT USED)

- PART 3 - EXECUTION**
 - 3.1 HVAC SYSTEM
 - A. THE HVAC CONTRACTOR SHALL WORK IN CONJUNCTION WITH THE TAB CONTRACTOR TO START-UP AND OPERATE ALL EQUIPMENT UNDER A COMBINED AIR AND WATER TEST AND BALANCE REPORT.
 - B. TAB CONTRACTOR SHALL MEASURE CFM AT ALL DIFFUSERS, REGISTERS AND GRILLES, AND HVAC UNITS, AS WELL AS WATER FLOWS AT COILS AND PUMPS, TO ASSURE THAT THEY MATCH THE QUANTITIES SHOWN ON THE PLANS (PLUS OR MINUS 5 PERCENT). CONFIRM ALL SEQUENCES OF OPERATION ARE PERFORMING CORRECTLY.
 - C. TAB CONTRACTOR SHALL CALIBRATE ALL EQUIPMENT AND SENSORS TO WORK PROPERLY AND GIVE CORRECT INFORMATION TO THE BMS SYSTEM.

END OF SECTION

SECTION 230900 - CONTROLS

- PART 1 - GENERAL**
 - 1.1 SCOPE OF WORK
 - A. REFER TO SECTION 230500.
- PART 2 - PRODUCTS**
 - 2.1 CONTROLS SYSTEM
 - A. PROVIDE NEW, MODIFY OR EXTEND AUTOMATIC TEMPERATURE CONTROLS TO ALL NEW EQUIPMENT SHOWN ON THE DRAWINGS.
 - B. REFER TO THE DRAWINGS FOR ANY SPECIAL SEQUENCES OF CONTROL AND LOCATION OF EQUIPMENT.
 - C. REMODEL PROJECTS SHALL UTILIZE EQUIPMENT BY THE SAME MANUFACTURER AS CURRENTLY EXISTS.
- PART - EXECUTION**
 - 3.1 DESIGN AND LAYOUT
 - A. THE CONTROL SYSTEM DESIGN AND LAYOUT SHALL BE PERFORMED BY A FACTORY AUTHORIZED AGENT OF THE MANUFACTURER USED.
 - 3.2 SYSTEM OPERATION
 - A. AT THE CONCLUSION OF WORK, ALL EQUIPMENT AND SYSTEMS SHALL BE PROVEN TO THE ENGINEER TO OPERATE IN ACCORDANCE WITH THE NEW OR EXISTING MAIN CONTROL PANEL AND NEW/EXISTING SEQUENCES OF OPERATION ON THE DRAWINGS.
 - B. PROVIDE ALL WIRING REQUIRED TO CONNECT INPUT/OUTPUT DEVICES TO CONTROL PANELS.
 - C. TEST AND ADJUST ALL DEVICES AND DOCUMENT CALIBRATION.
 - D. PROVIDE NECESSARY INSTRUCTION TO THE OWNER'S PERSONNEL.

END OF SECTION

SECTION 232119 - HYDRONIC PIPING

- PART 1 - GENERAL**
 - 1.1 SCOPE OF WORK
 - A. REFER TO SECTION 230500.
- PART 2 - PRODUCTS**
 - 2.1 PIPING APPLICATIONS
 - A. CONDENSER WATER PIPING 2 INCH AND SMALLER SHALL TYPE L, DRAWN-TEMPER COPPER TUBING.
 - B. CONDENSER WATER PIPING 2-1/2 INCH AND LARGER SHALL BE ASTM A53, A53M, TYPE E, SCHEDULE 40, BLACK STEEL WITH PLAIN ENDS.
 - C. CONDENSER WATER PIPING 2 INCH AND SMALLER SHALL UTILIZE WROUGHT-COPPER FITTINGS, AND BRAZED JOINTS.
 - D. CONDENSER WATER PIPING 2-1/2 INCH AND LARGER SHALL UTILIZE WROUGHT STEEL WELDED JOINTS OR CAST FLANGED FITTINGS.
 - E. CONDENSATE DRAIN PIPING SHALL BE TYPE M, DRAWN-TEMPER COPPER TUBING, WROUGHT-IRON COPPER FITTINGS AND SOLDERING JOINTS.
 - F. ALL PIPING SHALL BE US DOMESTIC ONLY. FOREIGN MANUFACTURED PIPING WILL NOT BE ACCEPTED.
 - 2.2 BALANCING VALVES
 - A. MANUAL BALANCING VALVES SHALL BE BRONZE BODY, BALL OR PLUG TYPE WITH CALIBRATED ORIFICE OR VENTURE, PRESSURE GAUGE CONNECTIONS, 125 PSIG, 250 DEGREE F RATING.
 - B. AUTOMATIC FLOW CONTROL VALVES SHALL BE BRASS WITH PISTON AND SPRING ASSEMBLY WITH THE ABILITY TO MAINTAIN CONSTANT FLOW WITHIN 5 PERCENT, 175 PSIG, 200 DEGREE F RATING.
- PART 3 - EXECUTION**
 - 3.1 INSTALLATION
 - A. REFER TO SECTION 230529 FOR METHODS OF SUPPORTING ALL PIPING.
 - B. INSTALL PIPING LEVEL AND FREE OF SAGS AND BENDS.
 - C. FLUSH AND CLEAN PIPING OF ALL DIRT, DEBRIS AND GREASE. CLEAN STRAINERS AND REFILL WITH FRESH WATER. ADD CORROSION INHIBITOR, AS DIRECTED BY THE OWNER.

END OF SECTION

SECTION 232300 - REFRIGERANT PIPING

- PART 1 - GENERAL**
 - 1.1 SCOPE OF WORK
 - A. REFER TO SECTION 230500.
- PART 2 - PRODUCTS**
 - 2.1 COPPER PIPE
 - A. PIPING SHALL BE COPPER TYPE ACR WITH WROUGHT COPPER FITTINGS AND BRAZED JOINTS.
- PART 3 - EXECUTION**
 - 3.1 INSTALLATION
 - A. REFER TO SECTION 230529 FOR METHODS OF SUPPORTING ALL PIPING.

END OF SECTION

SECTION 233113 - DUCTWORK

- PART 1 - GENERAL**
 - 1.1 SCOPE OF WORK
 - A. REFER TO SECTION 230500.
- PART 2 - PRODUCTS**
 - 2.1 GENERAL
 - A. CONCEALED DUCTWORK SHALL BE CONSTRUCTED OF NEW, PRIME GRADE, CONTINUOUS HOT-DIP MILL GALVANIZED, LOCK-FORMING, QUALITY STEEL. REFER TO SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
 - B. WHERE DUCTS EXPOSED TO VIEW PASS THROUGH WALLS, FLOORS OR CEILINGS, PROVIDE SHEET METAL COLLARS TO COVER VOIDS AROUND THE DUCTS.
 - C. SQUARE AND ROUND ELBOWS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SMACNA STANDARDS. ELBOWS NOT CONSTRUCTED WITH A CENTERLINE RADIUS OF AT LEAST 50 PERCENT OF THE DUCT WIDTH OR DIAMETER SHALL BE PROVIDED WITH TURNING VANES IN ACCORDANCE WITH SMACNA STANDARDS.
 - D. "FIBERBOARD" DUCTWORK WILL NOT BE ACCEPTED ON THIS PROJECT.
 - 2.2 MEDIUM PRESSURE DUCT CONSTRUCTION
 - A. UNLESS NOTED OTHERWISE, MEDIUM PRESSURE DUCTS SHALL BE CONSTRUCTED TO A PRESSURIZATION CLASSIFICATION OF THREE (3) INCHES WG POSITIVE.
 - B. ALL ROUND MEDIUM PRESSURE DUCTS SHALL BE SPIRAL TYPE.
 - 2.3 LOW PRESSURE DUCT CONSTRUCTION
 - A. LOW PRESSURE DUCTS CONNECTING SMALL AIR HANDLING EQUIPMENT, SHALL BE CONSTRUCTED TO A PRESSURIZATION CLASSIFICATION OF TWO (2) INCHES WG, POSITIVE OR NEGATIVE AS APPROPRIATE. THESE LOW PRESSURE ROUND DUCTS SHALL BE SPIRAL TYPE.
 - B. DUCTWORK DOWN STREAM OF AIR TERMINAL UNITS SHALL BE CONSTRUCTED TO A PRESSURE CLASSIFICATION OF ONE (1) INCHES WG POSITIVE. THESE LOW PRESSURE ROUND DUCTS MAY BE SPIRAL OR SNAP-LOCK TYPE.
 - C. SHOP FABRICATED DUCTS SHALL BE CONSTRUCTED, BRACED AND REINFORCED IN ACCORDANCE WITH SMACNA STANDARDS.
 - 2.4 DUCT SEALING
 - A. SEAL ALL DUCTWORK ON THE PROJECT TO SMACNA CLASSIFICATION A.
 - 2.5 FLEXIBLE DUCTS
 - A. FLEXIBLE DUCTS SHALL BE SIMILAR AND EQUAL TO THERMOFLEX TYPE M-KE AND SHALL COMPLY WITH APPLICABLE REQUIREMENTS OF UL-181, NFPA 90-A AND OTHER GOVERNING AUTHORITIES.
 - B. FLEXIBLE DUCTS SHALL BE FACTORY INSULATED WITH A NOMINAL 1 INCH THICKNESS OF FIBERGLASS INSULATION, PRODUCING A THERMAL CONDUCTANCE ("C") OF 0.23. DUCTS SHALL HAVE A POSITIVE INTERIOR AIR SEAL PERMANENTLY BONDED TO A COATED HIGH CARBON SPRING STEEL HELIX, ALL SHEATHED IN AN OUTER VAPOR BARRIER OF FIBERGLASS REINFORCED FILM LAMINATE.
 - C. FLEXIBLE DUCTS SHALL BE RATED FOR OPERATING PRESSURE OF PLUS 8 INCHES WG THROUGH 10 INCH DIAMETER, PLUS 4 INCHES WG THROUGH 16 INCH DIAMETER AND -2 INCHES WG FOR ALL SIZES.
 - D. FLEXIBLE DUCTS TO DIFFUSERS AND GRILLES SHALL BE LIMITED TO 8 FOOT LENGTHS AND A MAXIMUM OF ONE (1) 90 DEGREE CHANGE IN DIRECTION. MEDIUM PRESSURE DUCTS SERVING TERMINAL UNITS SHALL BE LIMITED TO 2 FOOT LENGTHS WITH NO ELBOWS.
 - 2.6 FLEXIBLE DUCT FABRIC
 - A. PROVIDE VENTFABRICS "VENTGLAS", OR EQUAL, 30 OZ PER SQ YD, BETWEEN SHEET METAL DUCTS AND AIR HANDLING EQUIPMENT, INCLUDING ALL FANS, AND POWER TYPE VENTILATORS.
 - 2.7 DAMPERS
 - A. DAMPER AND SPLITTER HARDWARE FOR LOW PRESSURE DUCTS SHALL BE:
 - END BEARINGS - VENTLOK #600
 - REGULATOR FINISHED AREAS - VENTLOK #666, PLAIN COVER
 - REGULATOR UNFINISHED AREAS - VENTLOK #640, 3/8 INCH
 - B. VOLUME DAMPERS SHALL BE LOCATED AT BRANCH TAKE-OFFS AT MAIN TRUNK DUCT. NO DAMPERS (SPLITTER DAMPERS) SHALL BE LOCATED IN THE CENTER OF DUCTS.
- PART 3 - EXECUTION**
 - 3.1 FABRICATION
 - A. DUCTWORK SHOWN ON THE DRAWINGS, SPECIFIED, OR REQUIRED FOR HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS SHALL BE CONSTRUCTED AND ERECTED IN A FIRST CLASS MANNER.
 - B. DUCTS SHALL BE REINFORCED IN ACCORDANCE WITH THE APPROPRIATE SMACNA STANDARDS TO PREVENT BUCKLING, BREATHING, VIBRATION AND UNNECESSARY NOISE.
 - C. PROVIDE MANUALLY OPERATED DAMPERS IN DUCT BRANCHES, FOR PROPER BALANCING OF AIR DISTRIBUTION. DAMPERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPROPRIATE SMACNA STANDARDS.
 - D. PROVIDE HINGED ACCESS DOORS IN DUCTWORK FOR ACCESS TO ALL SMOKE DETECTORS, SENSORS, AND OTHER CONTROL DEVICES, MANUAL DAMPERS, AND FOR CLEANING OPERATIONS. FACTORY FABRICATED DOORS SIMILAR AND EQUAL TO MILCOR AND MEETING THESE SPECIFICATIONS SHALL BE ACCEPTABLE.
 - E. WHERE DUCTS CONNECT TO FANS, INCLUDING ROOF EXHAUSTERS PROVIDE FLEXIBLE DUCT FABRIC CONNECTIONS. PROVIDE A MINIMUM OF 1/4 INCH SLACK IN THE CONNECTIONS, AND A MINIMUM OF 2-1/2 INCH DISTANCE BETWEEN THE EDGES OF THE DUCTS, PLUS AN ADDITIONAL MINIMUM IF 1 INCH OF SLACK FOR EACH INCH OF STATIC PRESSURE ON THE FAN SYSTEM.
 - F. PROVIDE SCREENS ON DUCTS, FANS AND OPENINGS WHICH LEAD TO, OR ARE OUTDOORS. SCREENS SHALL BE 16 GAUGE, 1/2 INCH MESH, IN REMOVABLE GALVANIZED STEEL FRAMES.
 - G. FURNISH TEST OPENINGS WITH COVERS IN EACH DUCT FOR TAKING READINGS OF AIR VELOCITIES AND PRESSURES IN DUCTS. REFER TO THE APPROPRIATE SMACNA STANDARD FOR COVER CONSTRUCTION.
 - 3.2 DUCT SUPPORTS
 - A. HORIZONTAL AND VERTICAL SHEET METAL DUCTWORK SHALL BE SUPPORTED IN ACCORDANCE WITH THE APPROPRIATE SMACNA STANDARDS.
 - B. HANGER DESIGN AND METHODS OF HANGING AND SUPPORTING SHALL BE COMPATIBLE WITH THE STRUCTURE.

END OF SECTION

SECTION 233713 - DIFFUSERS, REGISTERS AND GRILLES

- PART 1 - GENERAL**
 - 1.1 GENERAL NOTES
 - A. REFER TO SECTION 230500
- PART 2 - PRODUCTS**
 - 2.1 AIR INLETS AND OUTLETS
 - A. GRILLES, REGISTERS, CEILING OUTLETS, AND CEILING INLETS SHALL BE AS INDICATED ON THE DRAWING, AND SHALL BE PROVIDED WITH HEAVY DUTY SPONGE, OR SOFT FELT GASKETS. THE THROW SHALL BE SUCH THAT THE VELOCITY AT THE END OF THE THROW IN THE FIVE (5) FOOT OCCUPANCY ZONE WILL NOT BE MORE THAN 50 FPM NOT LESS THAN 25 FPM. NOISE LEVELS (NC CURVE) SHALL NOT EXCEED 40.
 - B. IF PRODUCTS OF A MANUFACTURER OTHER THAN THE ONES INDICATED ON THE DRAWINGS ARE USED, THE SIZES SHOWN ON THE DRAWING SHALL BE CHECKED FOR PERFORMANCE, NOISE LEVEL, FACE VELOCITY, THROW AND PRESSURE DROP BEFORE THE SUBMITTAL IS MADE. SELECTIONS SHALL MEET THE MANUFACTURER'S OWN PUBLISHED DATA FOR THE ABOVE PERFORMANCE CRITERIA. SHOULD DEVICES OTHER THAN THOSE SCHEDULED BY NAME BE FURNISHED, THE MANUFACTURER SHALL DEMONSTRATE COMPLIANCE WITH NOISE CRITERIA, ON REQUEST, TO THE ARCHITECT'S SATISFACTION.
 - C. WHERE CALLED FOR IN SCHEDULES, THE GRILLES, REGISTERS, CEILING OUTLETS, AND CEILING INLETS SHALL BE PROVIDED WITH DEFLECTING DEVICES AND MANUAL DAMPERS. THESE SHALL BE STANDARD PRODUCTS OF THE MANUFACTURER, SUBJECT TO REVIEW BY THE ARCHITECT, AND SHALL BE SIMILAR AND EQUAL TO THOSE SCHEDULED.
- PART 3 - EXECUTION**
 - 3.1 INSTALLATION
 - A. LOCATIONS OF OUTLETS SHOWN ON THE DRAWINGS ARE APPROXIMATE. COORDINATE THE EXACT LOCATION WITH REFLECTED CEILING PLAN AND OTHER TRADES.
 - B. VERIFY THE TYPE OF CEILING SYSTEM AND MATERIAL INTO EACH OF THE AIR INLETS AND OUTLETS IS TO BE INSTALLED, AND PROVIDE EQUIPMENT, WHICH PROPERLY "FITS" WHETHER SPECIFICALLY, SO INDICATED OR NOT ON THE DRAWINGS.

END OF SECTION



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Mechanical - Electrical Engineers
17300 North Dallas
Parkway Suite 300
Dallas, TX 75248-1147
Firm Registration # F-1511
Tel: 972/239-5357
Fax: 972/239-5231
www.purdy-mcguire.com

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GENERAL NOTES

PROVIDE MIN. 1" LINING FOR THE FIRST 10 FEET DOWNSTREAM OF EACH VAV BOX. THE SUPPLY/RETURN DUCT SERVING THE CONFERENCE ROOM AND SOUND SENSITIVE ROOMS SHALL BE FULLY LINED.

INSTALLATION OF ALL EXPOSED DUCTWORK SHALL COMPLY WITH THE FOLLOWING STANDARDS:

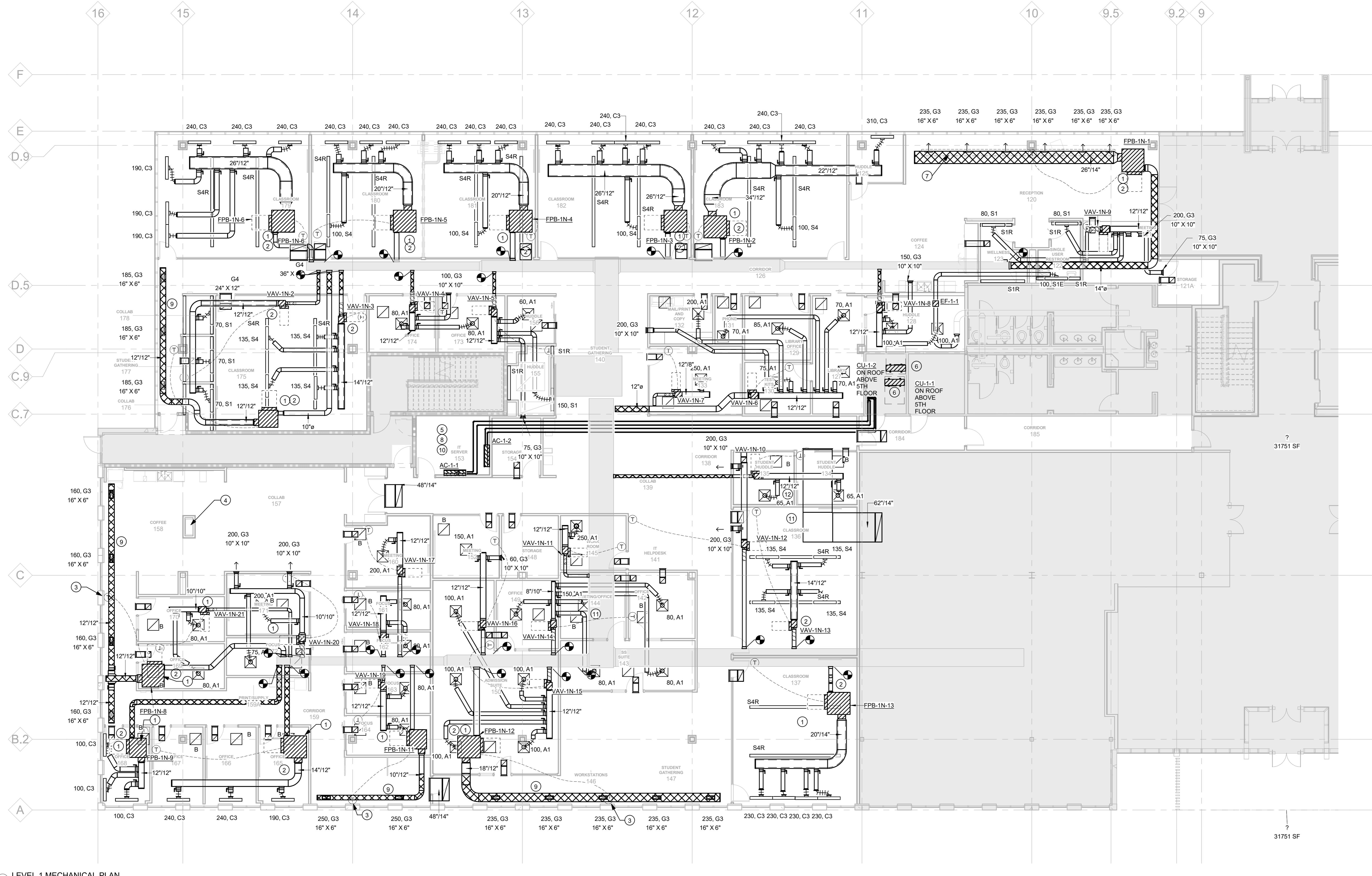
- A) ALL EXPOSED DUCTWORK SHALL BE PAINT GRIP FINISH
- B) ALL EXPOSED AIR DISTRIBUTION ON THE EXPOSED DUCTWORK SHALL HAVE A FINISH WHICH MATCHES THE PAINT GRIP FINISH OF THE DUCT AND COATED UNLESS ALTERNATE FINISHES ARE REQUIRED BY ARCHITECT. SUBMIT AIR DISTRIBUTION FINISHES FOR ARCHITECT AND MECHANICAL ENGINEERS APPROVAL.
- C) ALL DUCTWORK SHALL BE SUPPORTED AS REQUIRED BY THE CMG AND LOCAL CODES. HOWEVER, WHENEVER POSSIBLE, SUPPORT THE DUCT IN A MANNER TO HAVE THE LEAST VISUAL IMPACT, SUCH AS FOR SMALLER DUCT, THE USE OF AIRCRAFT CABLE HANGING SYSTEMS, USE OF SINGLE ALL THREAD ROD ON LARGE ROUND DUCTS EVEN AT CLOSER DUCT SPACING. USE AIRCRAFT CABLE SEISMIC RESTRAINT SYSTEMS WHEN POSSIBLE.
- D) PROTECT DUCTS EXPOSED IN FINISHED SPACES FROM BEING DENTED, SCRATCHED, OR DAMAGED.
- E) UNLESS SPECIFICALLY INDICATED ON THE PLANS, ALL DUCTWORK SHALL BE INSTALLED ORTHOGONAL TO THE BUILDING PERIMETER WALLS.
- F) TRIM DUCT SEALANTS FLUSH WITH METAL. CREATE A SMOOTH AND UNIFORM EXPOSED BEAD. DO NOT USE TWO-PART TAPE SEALING SYSTEM ON EXPOSED DUCTS.
- G) GRIND WELDS TO PROVIDE SMOOTH SURFACE FREE OF BURRS, SHARP EDGES, AND WELD SPLATTER. WHEN WELDING STAINLESS STEEL WITH A NO. 3 OR 4 FINISH, GRIND THE WELDS FLUSH, POLISH THE EXPOSED WELDS, AND TREAT THE WELDS TO REMOVE DISCOLORATION CAUSED BY WELDING.
- H) MAINTAIN CONSISTENCY, SYMMETRY, AND UNIFORMITY IN THE ARRANGEMENT AND FABRICATION OF FITTINGS, HANGERS AND SUPPORTS, DUCT ACCESSORIES, AND AIR OUTLETS.
- I) MAINTAIN THE CONSISTENCY AND UNIFORMITY OF APPEARANCE FOR ALL DUCTWORK AND AIR DISTRIBUTION.
- J) REPAIR OR REPLACE DAMAGED SECTIONS AND FINISHED WORK THAT DOES NOT COMPLY WITH THESE REQUIREMENTS.

WRAP UNIT WITH A MASS-LOADED VINYL SYSTEM SIMILAR TO THE HUSHCORE PREMIUM SYSTEM.

SUPPLY DUCTWORK SHALL BE 22 GAUGE.
RETURN DUCTWORK SHALL BE 20 GAUGE.

KEYED NOTES - SHEET IM-201

- 1 PROVIDE FULL SIZE LINED FAN INLET BOOT FOR FAN POWERED BOX.
- 2 WRAP UNIT WITH MASS-LOADED VINYL SYSTEM SIMILAR TO THE HUSHCORE PREMIUM SYSTEM.
- 3 PROVIDE INSULATION PAD TO BE INSTALLED BETWEEN THERMOSTAT AND PERIMETER WALL FOR THERMOSTATS MOUNTED ON EXTERIOR COLUMN/WALLS.
- 4 KEEP AREA FREE AROUND WATER FEATURE.
- 5 PROVIDE IMS SYSTEM. REF IM-601 FOR SCHEDULE.
- 6 COORDINATE LOCATION OF CONDENSING UNIT ON ROOF ABOVE 5TH FLOOR.
- 7 ADJUST BLADES TO 45 DEGREES DOWNWARD.
- 8 COORDINATE WITH MANUFACTURER'S SPECIFICATIONS FOR REFRIGERANT REQUIREMENTS. COORDINATE ROUTING FROM AC UNIT TO ROOF WHERE CONDENSING UNIT IS LOCATED. LOCATION OF CU SHALL NOT EXCEED 225' OF PIPING BETWEEN UNITS.
- 9 MOUNT DUCT AS HIGH AS POSSIBLE.
- 10 INSULATED CONDENSATE DRAIN PIPING ABOVE CEILING. EXTEND AND DISCHARGE TO NEAREST JANITORS MOP SINK. CONDENSATE PIPING SHOWN OFF WALL FOR CLARITY ONLY. ALL PIPING SHALL BE INSTALLED AS HIGH AS POSSIBLE, ABOVE RAISED FLOOR.
- 11 PROVIDE DUCT LAGGING.
- 12 COORDINATE RETURN AIR BOOT WITH EXISTING SPRINKLER LINE.



1 LEVEL 1 MECHANICAL PLAN
1/8" = 1'-0"



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 Mechanical - Electrical Engineers
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 Parkway Suite 300
 Dallas, TX 75248-1147
 Firm Registration # F-1511
 Tel: 972.239-5357
 Fax: 972.239-5231
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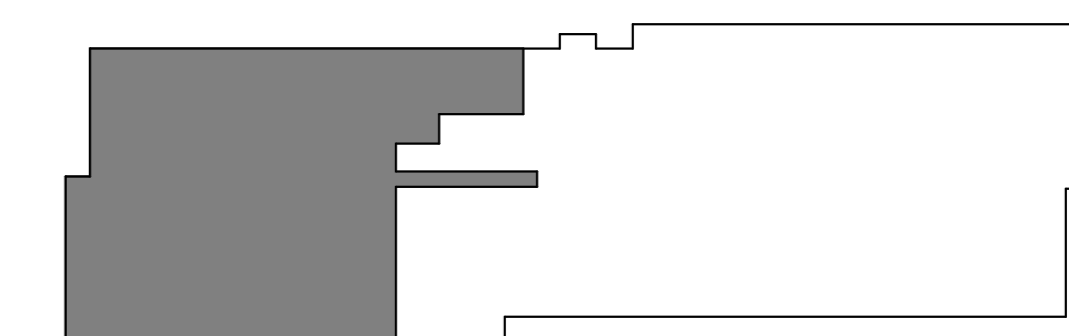
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KEY PLAN



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Level 1
Mechanical Plan

M-201

KEYED NOTES - SHEET IM-211

1 MOUNT BOOTS CENTERED IN DOORWAY AT TOP OF DUCT ELEVATION AT STRUCTURE HEIGHT. TYPICAL ENTIRE FLOOR

RETURN AIR NOTES:

- A. EXISTING RETURN AIR CONDITIONS ARE BASED ON INFORMATION PROVIDED BY SITE SURVEY AND PREVIOUS RECORD DRAWINGS. HOWEVER, IT IS NOT INTENDED TO BE A TRUE REPRESENTATION OF ACTUAL RETURN AIR CONDITIONS. CONTRACTOR SHALL ENSURE A CLEAR UNOBSTRUCTED PATH BACK TO MAIN RETURN AIR IN MECHANICAL ROOM AND MAKE ALL REQUIRED MODIFICATIONS AS NEEDED TO ENSURE CLEAR RETURN AIR PATH.
- B. WALLS TO DECK INDICATED ON THESE DRAWINGS ARE BASED ON OUR UNDERSTANDING OF ARCHITECTURAL PLANS. COORDINATE ALL WALLS TO DECK WITH ARCHITECT AND INFORM THE ARCHITECT OF ANY DIFFERENCES WITH THIS PLAN PRIOR TO BIDDING. ANY ADDITIONAL BOOTS REQUIRED SHALL BE SIZED AT 500 FPM.
- C. ALL CUTTING AND CHANNELING OF EXISTING BUILDING SHALL BE ACCOMPLISHED IN A NEAT AND WORKMANLIKE MANNER WITHOUT REMOVAL OF EXCESS MATERIALS. THIS CONTRACTOR SHALL PATCH AND REPLACE WITH MATERIAL SIMILAR TO ADJACENT CONSTRUCTION. ALL BOOTS SHALL BE SEALED AT THE WALL PENETRATION.
- D. ALL WORK MUST BE COORDINATED AND SCHEDULED WITH THE OWNER AND OCCUPANTS OF THIS BUILDING SO AS TO PROVIDE THE LEAST AMOUNT OF DISRUPTION OF THE NORMAL BUILDING ACTIVITIES AS POSSIBLE. MAINTAIN CONDITIONED SPACE FOR ALL OWNER OCCUPIED AREAS DURING CONSTRUCTION.

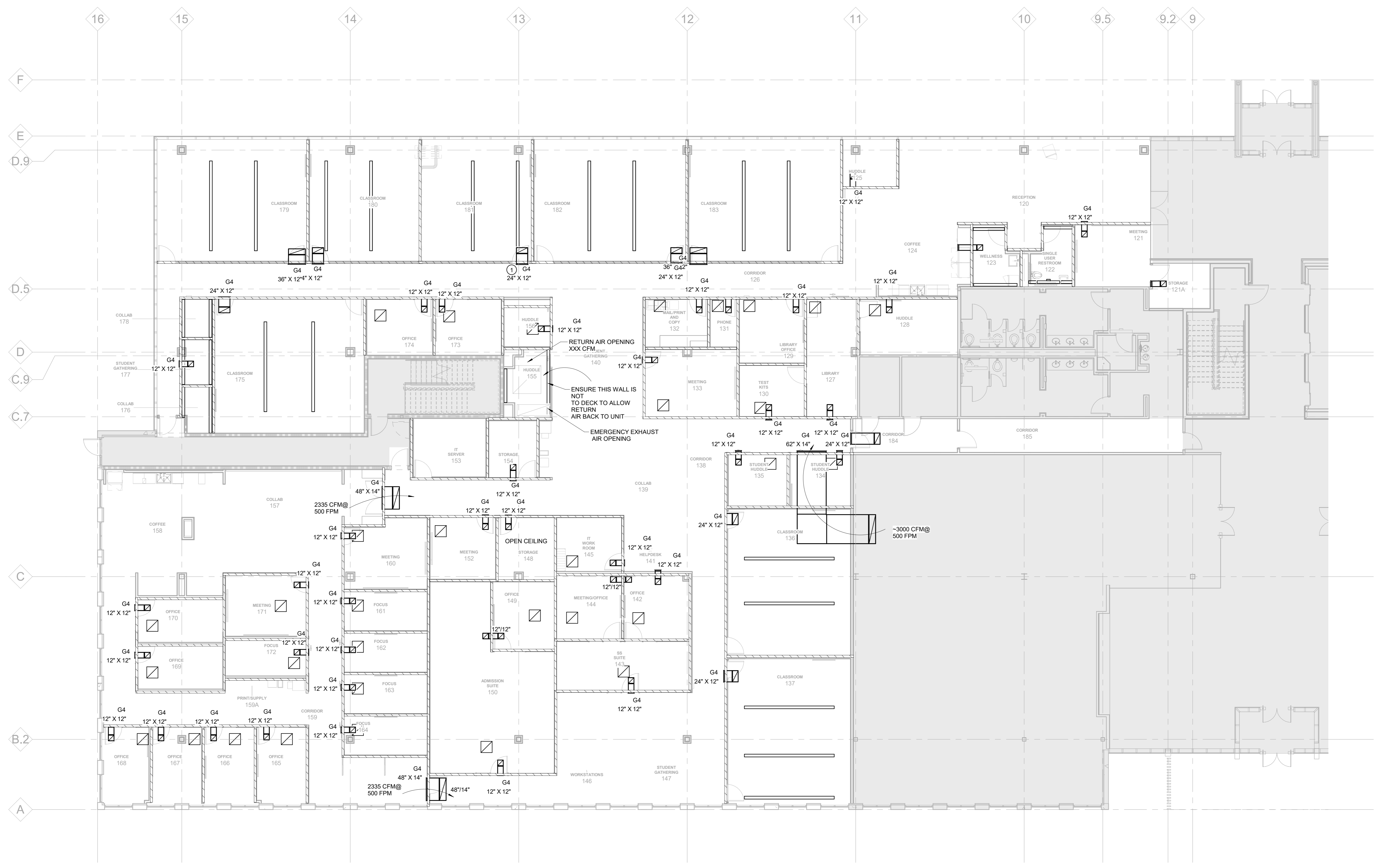


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1 LEVEL 1 MECHANICAL RETURN AIR PLAN
1/8" = 1'-0"

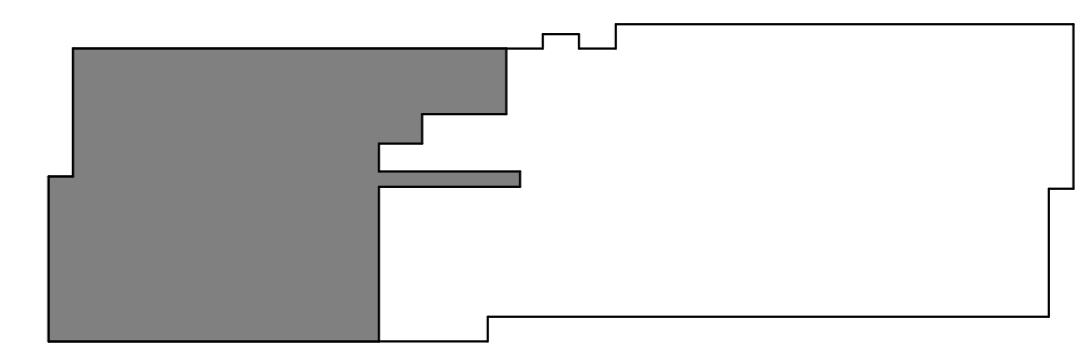
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 17300 North Dallas
 Parkway Suite 300
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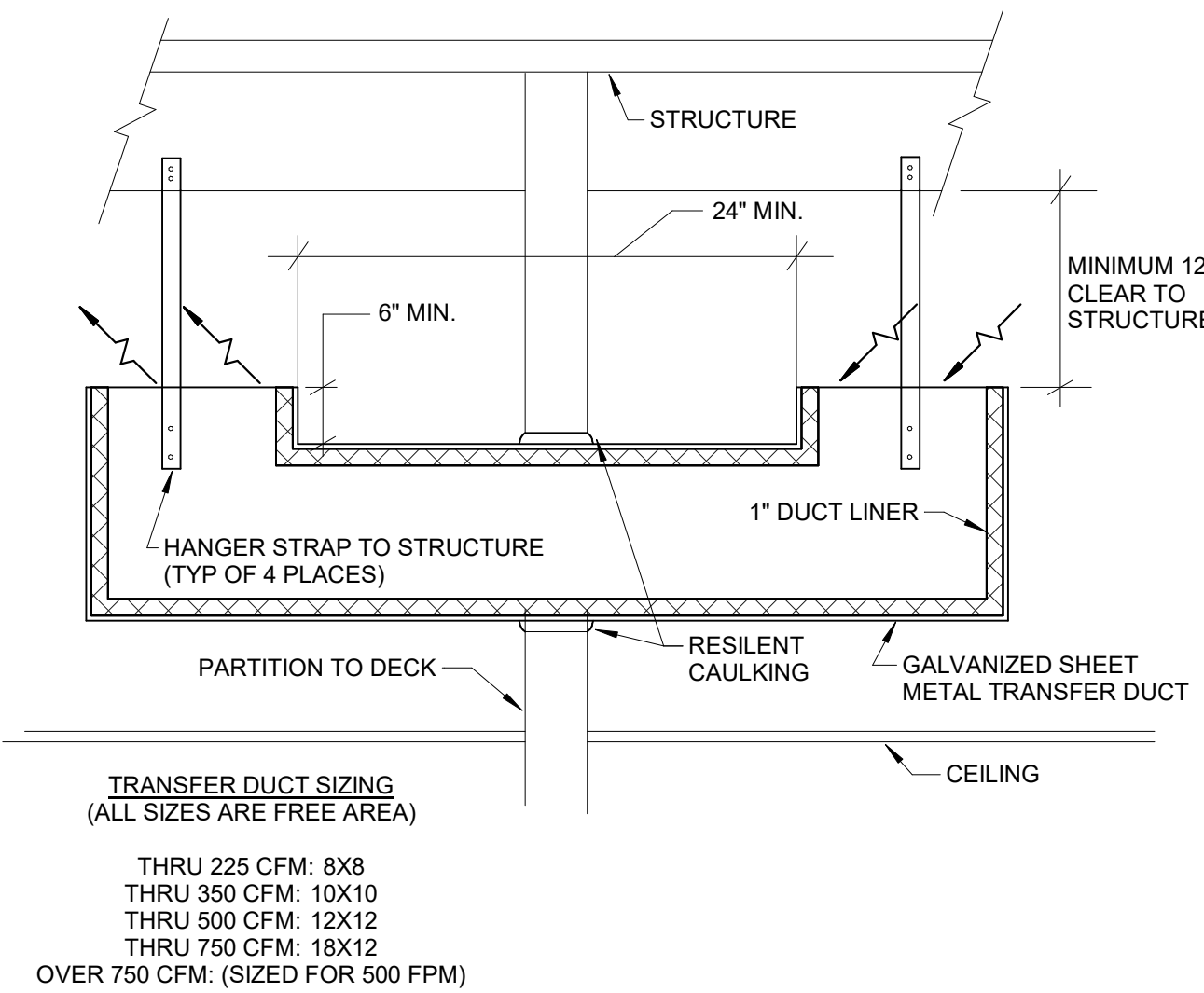
KEY PLAN



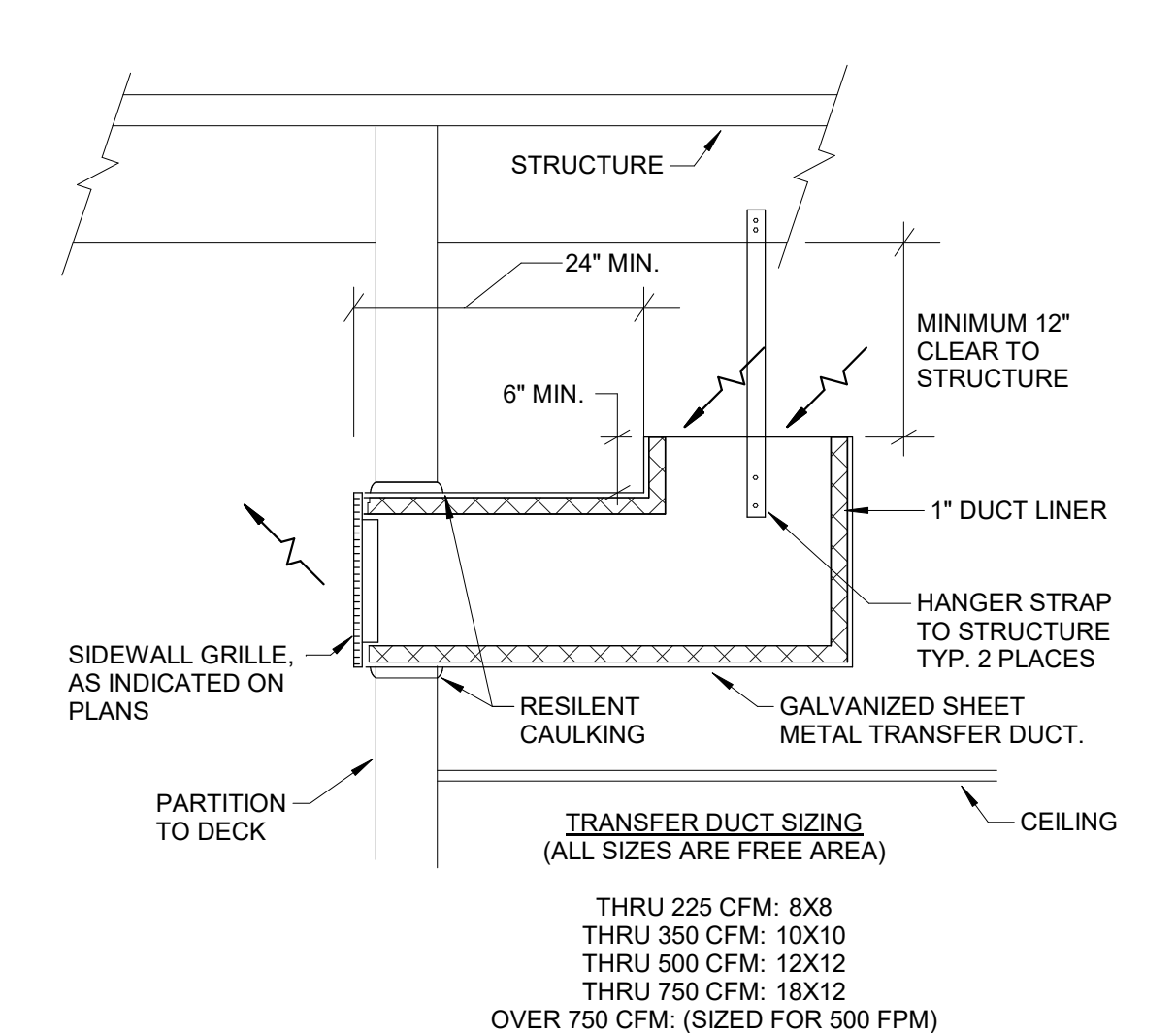
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Level 1
Mechanical
Return Air Plan

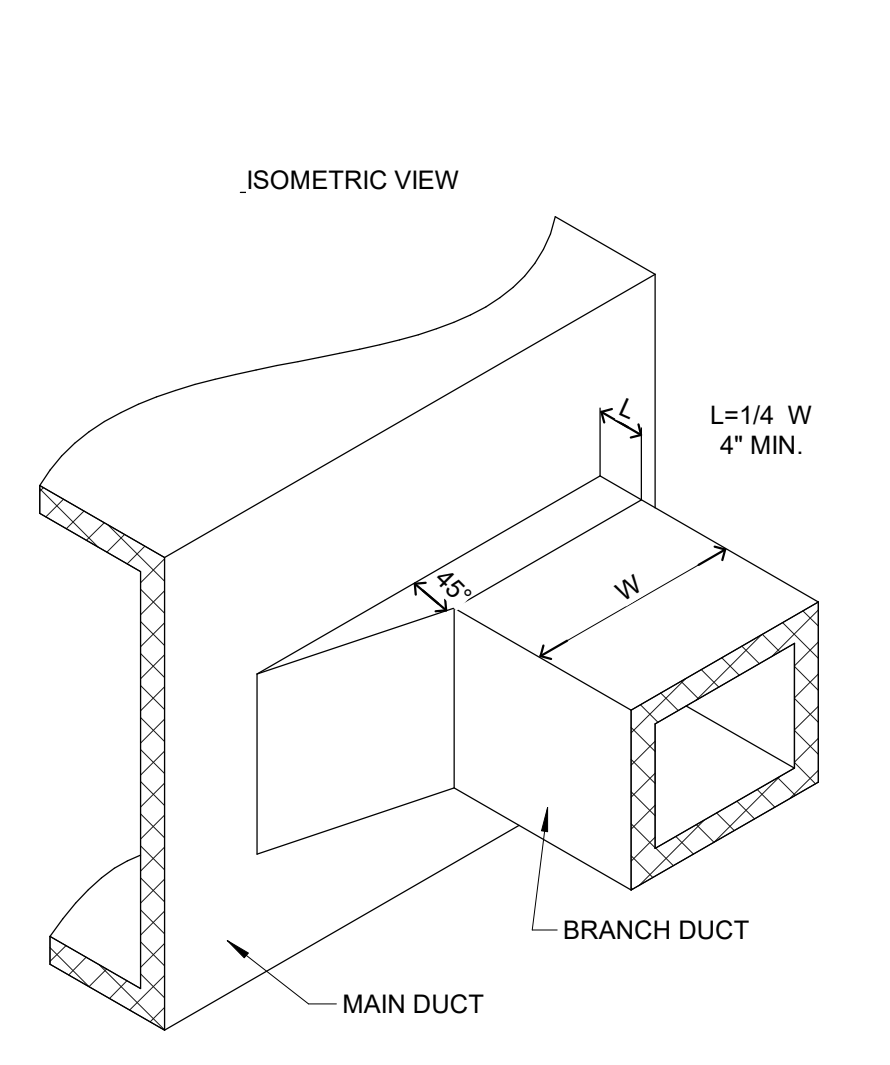
M-211



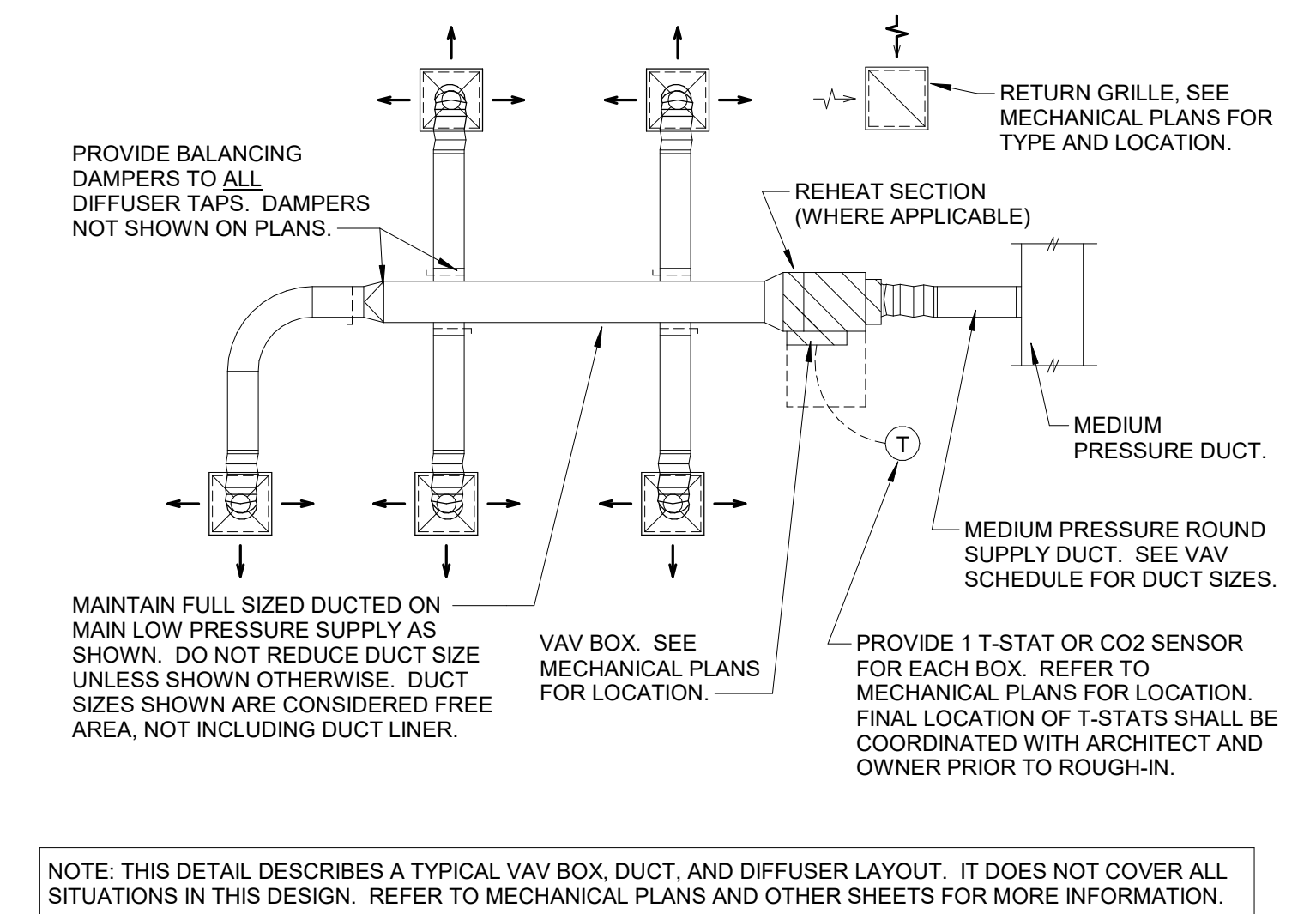
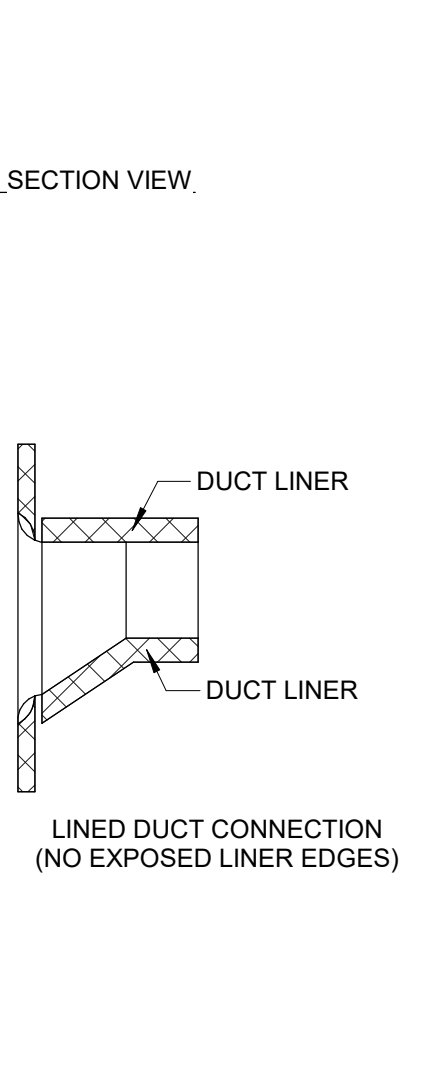
1 RETURN AIR TRANSFER BOOT U DETAIL NOT TO SCALE



2 RETURN AIR TRANSFER BOOT L DETAIL NOT TO SCALE

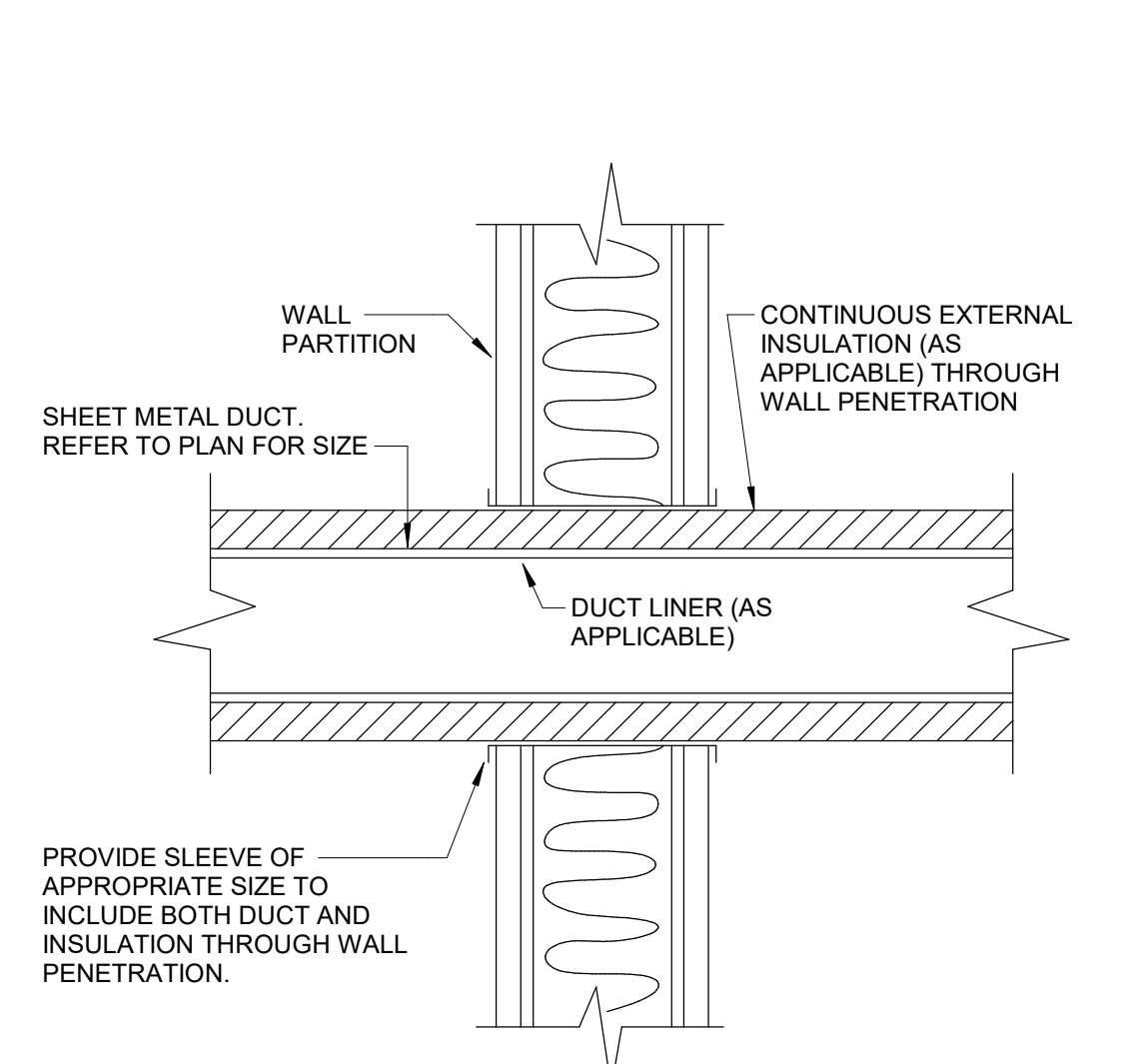


3 45 DEGREE BRANCH DUCT TAP NOT TO SCALE

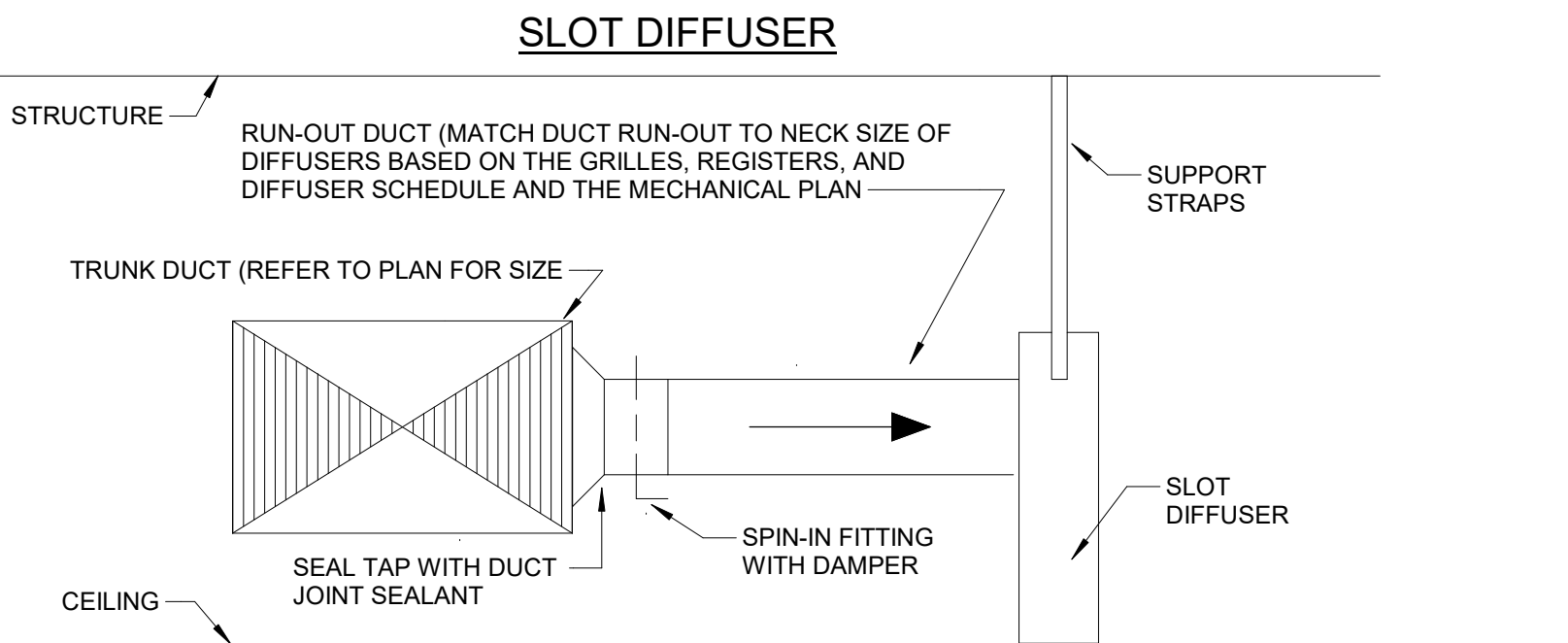
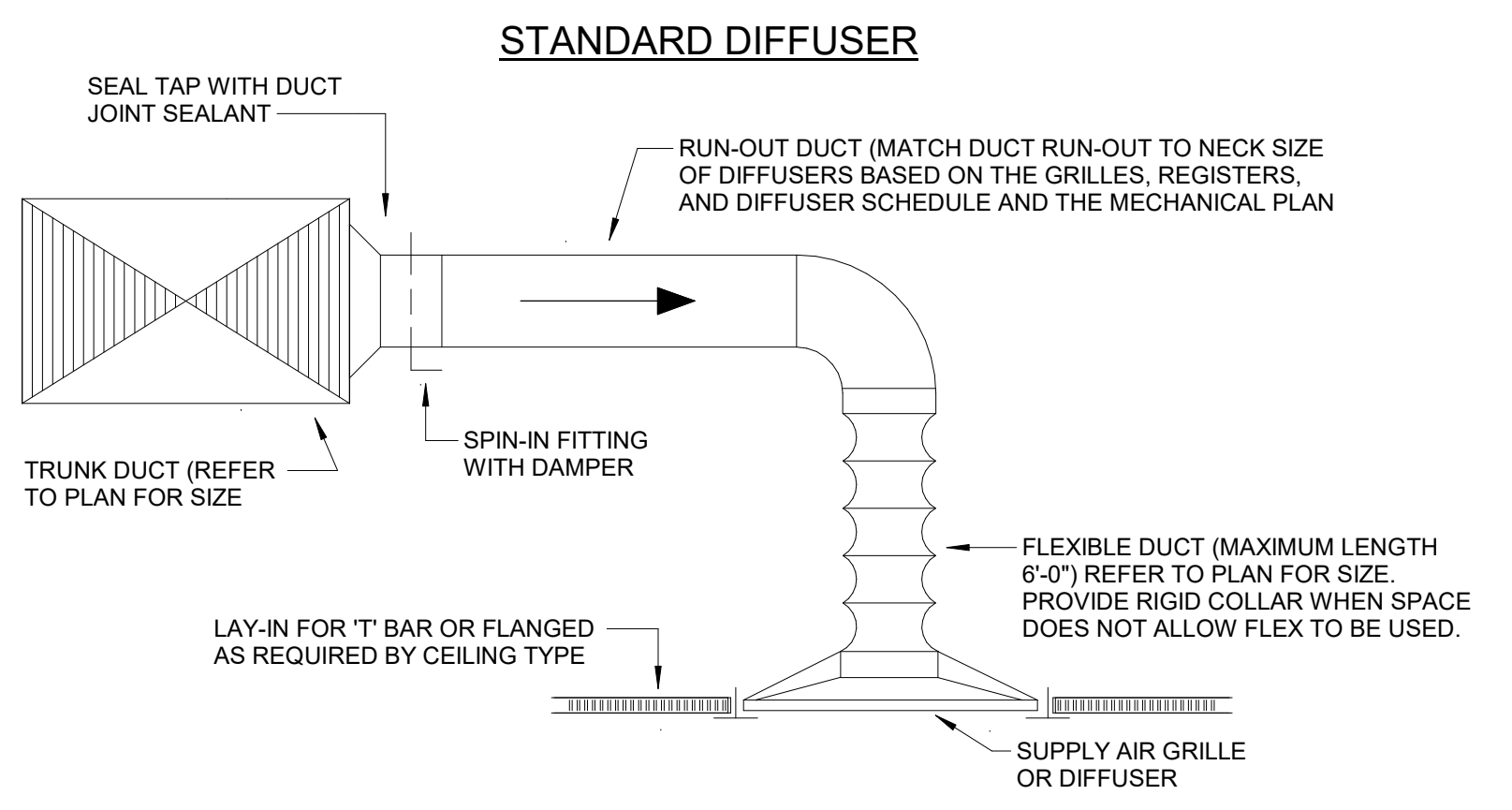


NOTE: THIS DETAIL DESCRIBES A TYPICAL VAV BOX, DUCT, AND DIFFUSER LAYOUT. IT DOES NOT COVER ALL SITUATIONS IN THIS DESIGN. REFER TO MECHANICAL PLANS AND OTHER SHEETS FOR MORE INFORMATION.

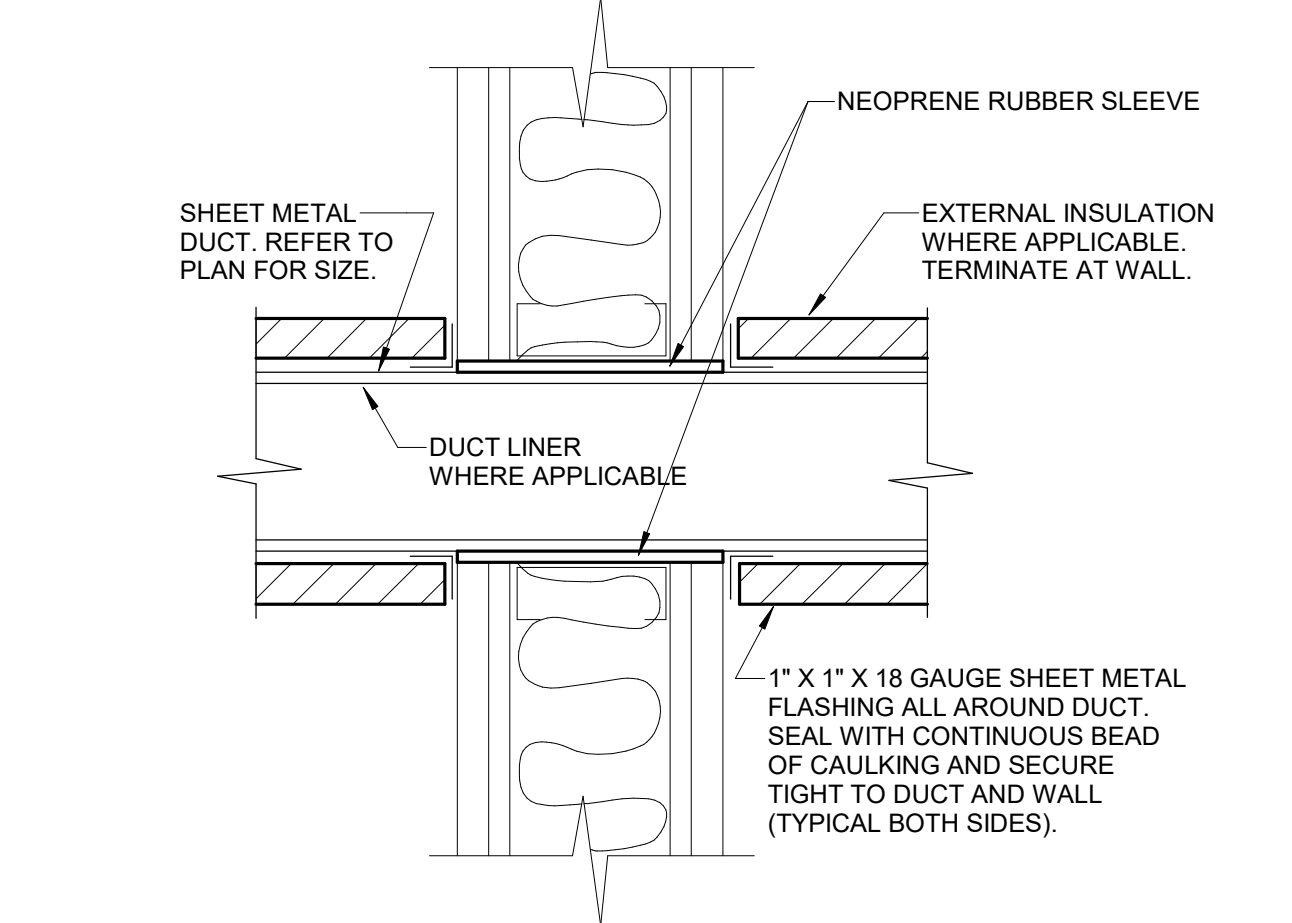
4 VAV BOX TYPICAL LAYOUT NOT TO SCALE



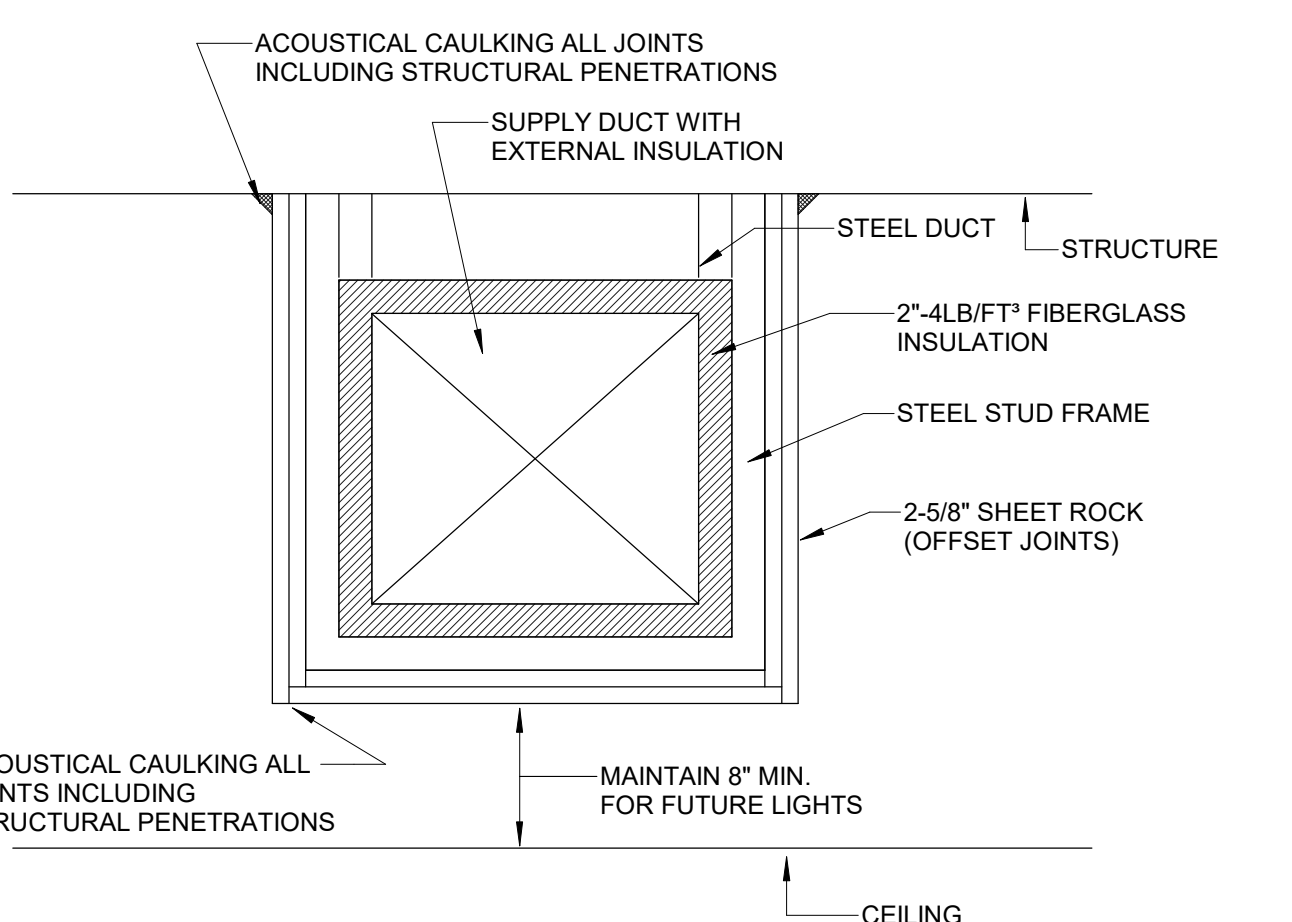
5 STANDARD DUCT WALL PENETRATION DETAIL NOT TO SCALE



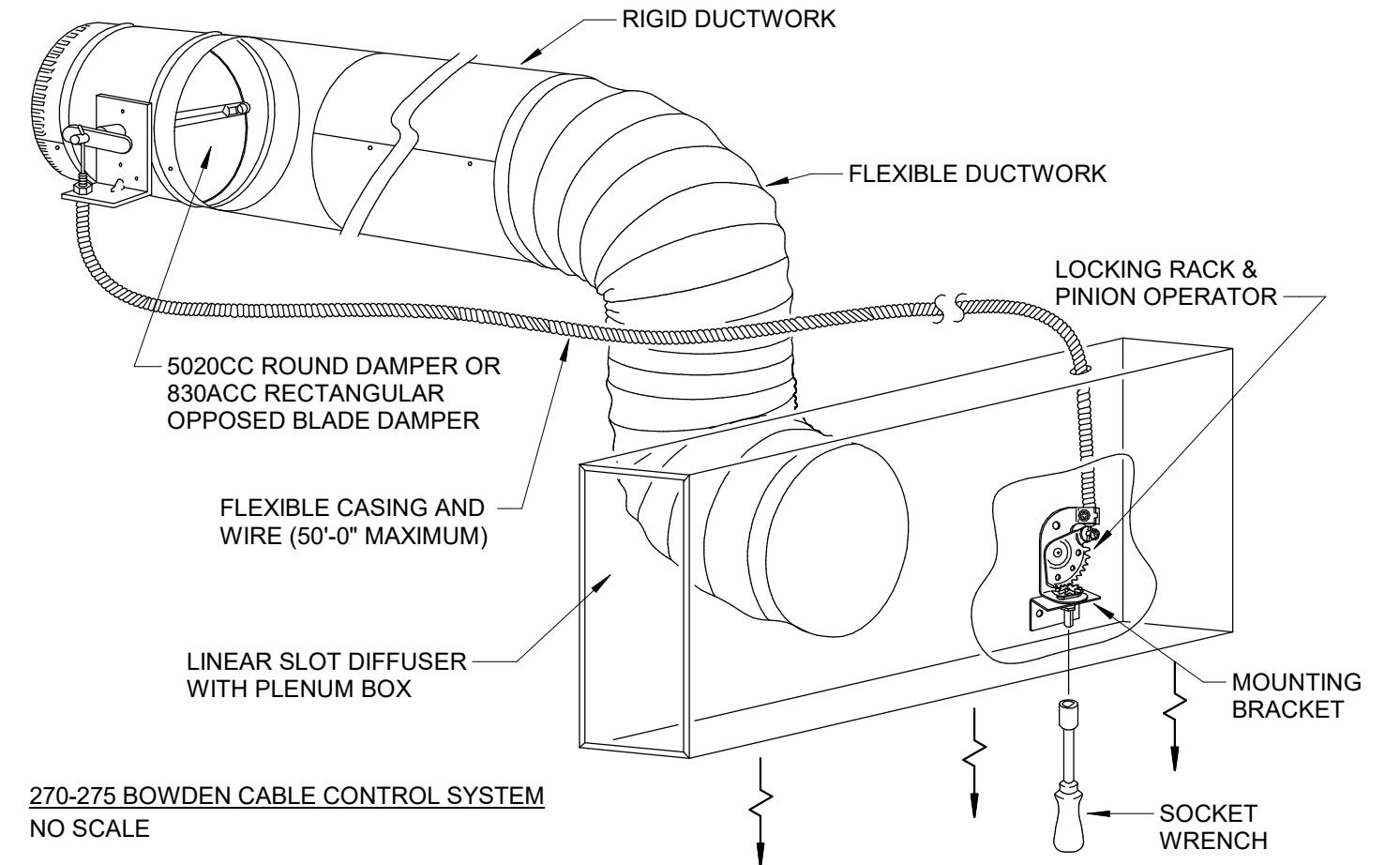
6 TYPICAL DIFFUSER CONNECTION DETAIL NOT TO SCALE



8 ACOUSTICAL DUCT PENETRATION AT SOUND PARTITION DETAIL NOT TO SCALE



9 CONCEALED DAMPER OPERATOR IN-DIFFUSER DETAIL NOT TO SCALE

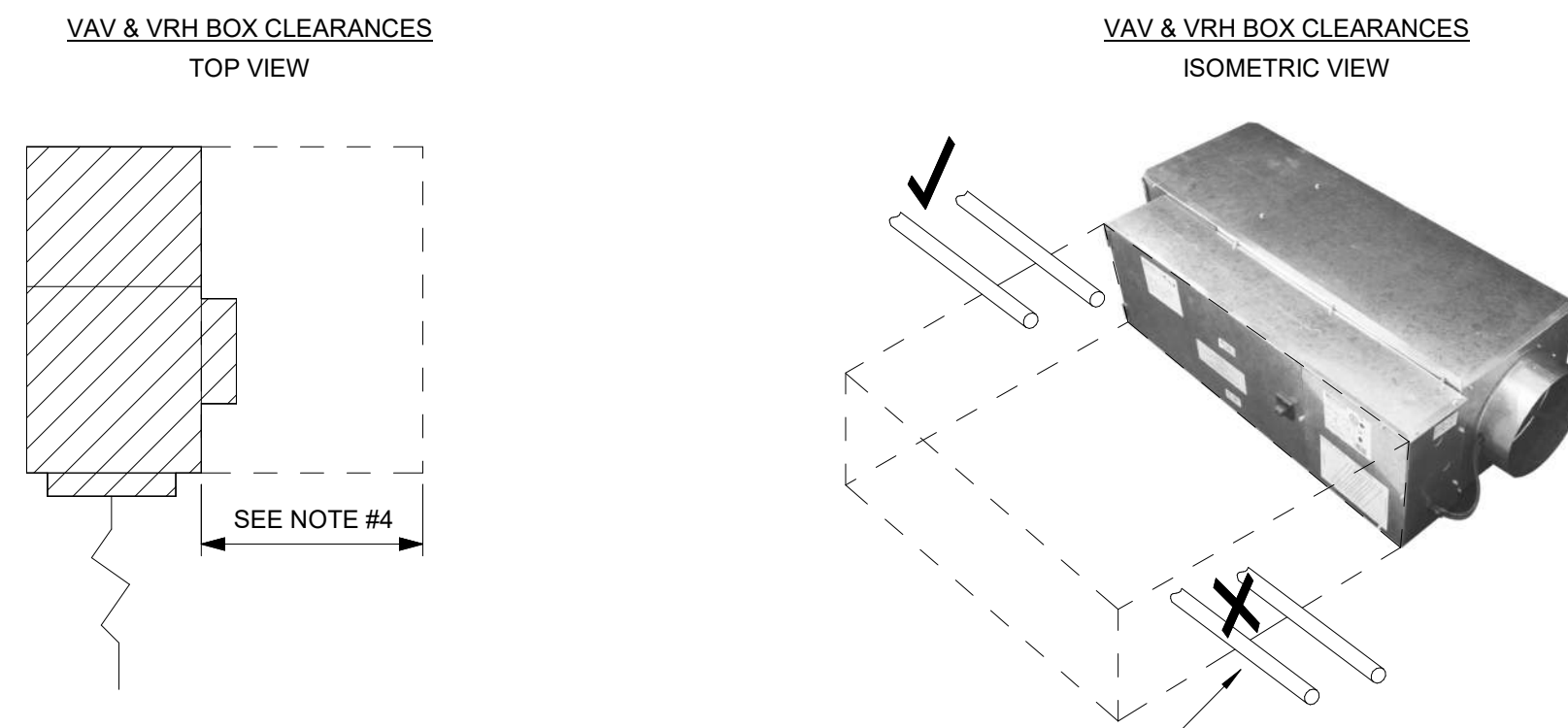


270-275 BOWDEN CABLE CONTROL SYSTEM
NO SCALE

NOTES:

- THE 270-275 BOWDEN CABLE CONTROL SYSTEM IS DESIGNED FOR USE WITH EXTERNALLY CONTROLLED ROUND OR RECTANGULAR DAMPERS AND CAN BE MOUNTED IN A WIDE VARIETY OF LOCATIONS INCLUDING CEILING JOISTS, LAY-IN CEILING, BEHIND GRILLES, ON OR INSIDE OTHER VARIOUS TYPES OF DIFFUSERS, ETC.
- CABLE SHALL CONSIST OF BOWDEN CABLE 0.054" STAINLESS STEEL CONTROL WIRE ENCAPSULATED IN 1/16" FLEXIBLE GALVANIZED SPIRAL WIRE SHEATH.
- LOCKING RACK AND PINION GEAR DRIVE SHALL BE CONSTRUCTED OF 14 GAUGE STEEL AND SHALL BE USED TO CONVERT ROTARY MOTION INTO PUSH-PULL MOTION.
- CONTROL SHAFT SHALL BE "D"-STYLE FLATTENED 1/4" DIAMETER WITH 265° ROTATION PROVIDING 1-1/2" LINEAR TRAVEL CAPABILITY.

9 CONCEALED DAMPER OPERATOR IN-DIFFUSER DETAIL NOT TO SCALE



NO PIPING, CONDUIT, DUCT, STRUCTURE, ETC ALLOWED TO BLOCK THE CLEARANCE ZONE OR BELOW THE CLEARANCE ZONE. THE INTENT IS FOR MAINTENANCE ACCESS TO BE FREE AND CLEAR FROM BELOW. ANY CROSSING PIPE, CONDUIT, ETC SHALL BE ROUTED ABOVE THE BOX CLEARANCE ZONE, LIKE SHOWN IN THIS DIAGRAM.

NOTES:

- PROVIDE 2X2 ACCESS PANELS FOR ALL VAV BOXES IN INACCESSIBLE LOCATIONS. ACCESS PANELS SHALL BE LOCATED UNDERNEATH THE CLEARANCE SPACE OF EACH BOX AND NOT DIRECTLY BELOW THE BOX. VERIFY EXACT LOCATION OF ACCESS PANEL WITH ARCHITECT.
- THE DASHED AREAS REPRESENT A HORIZONTAL AND VERTICAL CLEARANCE FOR THE FULL DIMENSIONS OF THE UNIT. NO OBSTRUCTIONS CAN PASS THROUGH THE DASHED AREA. AREA SHALL REMAIN CLEAR FOR MAINTENANCE PURPOSES.
- ANY UNIT MOUNTED DISCONNECTS MUST MEET THE CLEARANCES SHOWN IN NOTE #4.
- NEC WORKING SPACE CLEARANCES MUST COMPLY WITH NEC TABLE 110.26(A)(1). SUMMARY OF THIS TABLE SHOWN BELOW.

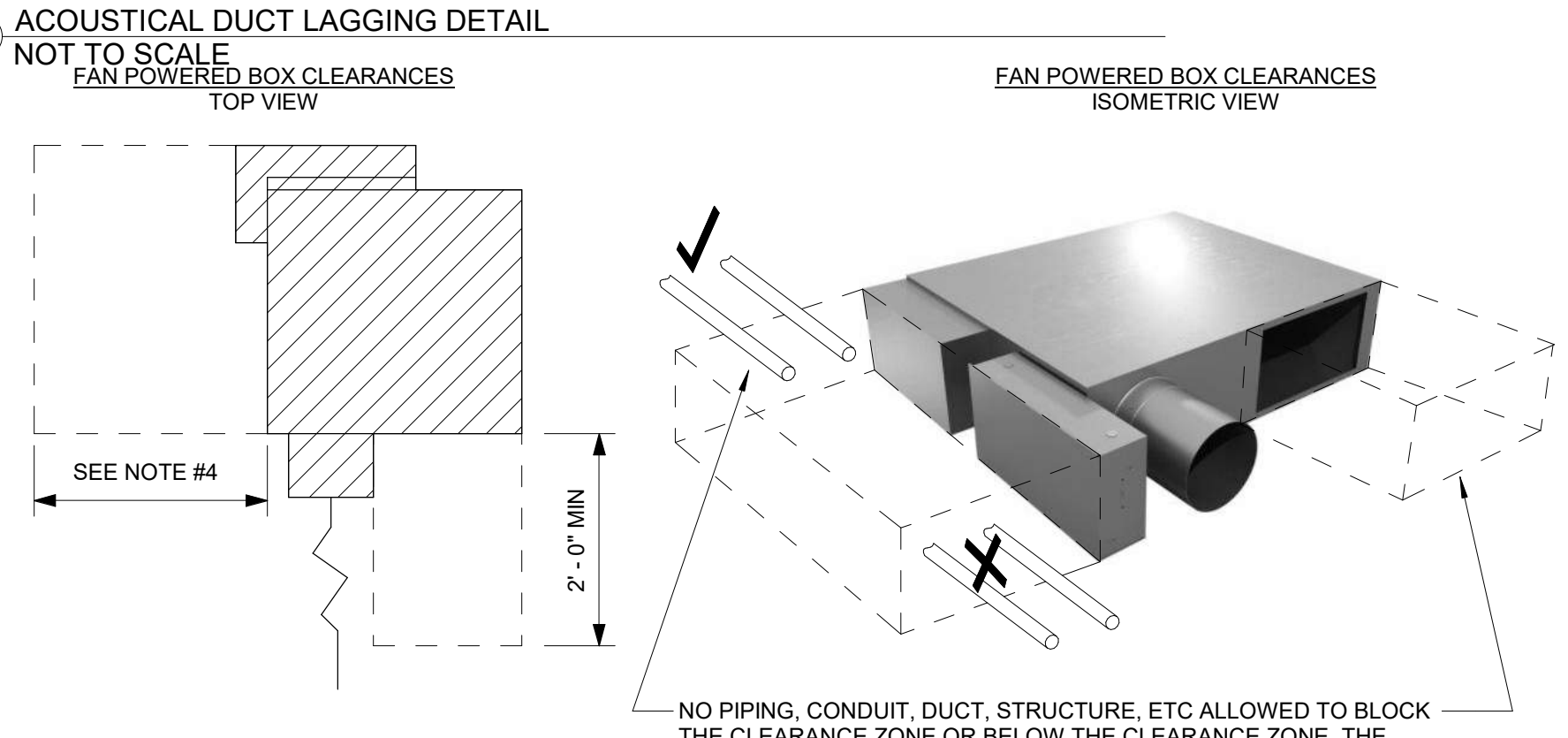
NOMINAL VOLTAGE	CONDITION 1	CONDITION 2	CONDITION 3
0-150V	3 FT	3 FT	3 FT
151-600V	3 FT	3 FT-6 IN	4 FT

CONDITION 1 - EXPOSED LIVE PARTS ON ONE SIDE OF THE WORKING SPACE AND NO LIVE OR GROUNDED PARTS ON THE OTHER SIDE OF THE WORKING SPACE, OR EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORKING SPACE THAT ARE EFFECTIVELY GUARDED BY INSULATED MATERIALS.

CONDITION 2 - EXPOSED LIVE PARTS ON ONE SIDE OF THE WORKING SPACE AND GROUNDED PARTS ON THE OTHER SIDE OF THE WORKING SPACE. CONCRETE, BRICK, OR TILE WALLS SHALL BE CONSIDERED AS GROUNDED.

CONDITION 3 - EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORKING SPACE.

10 VAV BOX REQUIRED NEC CLEARANCES NOT TO SCALE



NO PIPING, CONDUIT, DUCT, STRUCTURE, ETC ALLOWED TO BLOCK THE CLEARANCE ZONE OR BELOW THE CLEARANCE ZONE. THE INTENT IS FOR MAINTENANCE ACCESS TO BE FREE AND CLEAR FROM BELOW. ANY CROSSING PIPE, CONDUIT, ETC SHALL BE ROUTED ABOVE THE BOX CLEARANCE ZONE, LIKE SHOWN IN THIS DIAGRAM.

NOTES:

- PROVIDE 2X2 ACCESS PANELS FOR ALL FPBs IN INACCESSIBLE LOCATIONS. ACCESS PANELS SHALL BE LOCATED UNDERNEATH THE CLEARANCE SPACE OF EACH BOX AND NOT DIRECTLY BELOW THE BOX. VERIFY EXACT LOCATION OF ACCESS PANEL WITH ARCHITECT. ELECTRICAL DISCONNECTS, CONTROL BOXES, AIR FILTERS / FAN BOX SHALL ALL BE ACCESSIBLE.
- THE DASHED AREAS REPRESENT A HORIZONTAL AND VERTICAL CLEARANCE FOR THE FULL DIMENSIONS OF THE UNIT. NO OBSTRUCTIONS CAN PASS THROUGH THE DASHED AREA. AREA SHALL REMAIN CLEAR FOR MAINTENANCE PURPOSES.
- ANY UNIT MOUNTED DISCONNECTS MUST MEET THE CLEARANCES SHOWN IN NOTE #4.
- NEC WORKING SPACE CLEARANCES MUST COMPLY WITH NEC TABLE 110.26(A)(1). SUMMARY OF THIS TABLE SHOWN BELOW.

NOMINAL VOLTAGE	CONDITION 1	CONDITION 2	CONDITION 3
0-150V	3 FT	3 FT	3 FT
151-600V	3 FT	3 FT-6 IN	4 FT

CONDITION 1 - EXPOSED LIVE PARTS ON ONE SIDE OF THE WORKING SPACE AND NO LIVE OR GROUNDED PARTS ON THE OTHER SIDE OF THE WORKING SPACE, OR EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORKING SPACE THAT ARE EFFECTIVELY GUARDED BY INSULATED MATERIALS.

CONDITION 2 - EXPOSED LIVE PARTS ON ONE SIDE OF THE WORKING SPACE AND GROUNDED PARTS ON THE OTHER SIDE OF THE WORKING SPACE. CONCRETE, BRICK, OR TILE WALLS SHALL BE CONSIDERED AS GROUNDED.

CONDITION 3 - EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORKING SPACE.

17 PARALLEL FAN POWERED BOX REQUIRED NEC CLEARANCES NOT TO SCALE

FAN POWERED BOX - PARALLEL ELECTRIC REHEAT SCHEDULE

DESIGNATION														BASIS OF DESIGN									
TYPE	MARK	MAX COOLING CFM	MIN COOLING CFM	E.S.P.	INLET SIZE	HEATING CFM	FAN HP	VOLT	PH	ENTERING (EAT)	HEATER RETURN (RAT)	MIXED (RAT)	LEAVING (LAT)	HEATER KW	VOLT	PH	MANUFACTURER	MODEL					
FPB	1N-1	1410	353	0.3	12"	987	0.5	277 V	1	55°F	70°F	65°F	96°F	10	480 V	3	PURCHASE FROM BUILDING STOCK						
FPB	1N-2	1370	343	0.3	12"	959	0.5	277 V	1	55°F	70°F	65°F	95°F	9.5	480 V	3	METALAIRE FV1500						
FPB	1N-3	1060	265	0.3	12"	742	0.5	277 V	1	55°F	70°F	65°F	95°F	7.5	480 V	3	METALAIRE FV1500						
FPB	1N-4	820	205	0.3	10"	574	0.25	277 V	1	55°F	70°F	65°F	95°F	6	480 V	3	METALAIRE FV1500						
FPB	1N-5	820	205	0.3	10"	574	0.25	277 V	1	55°F	70°F	65°F	95°F	6	480 V	3	METALAIRE FV1500						
FPB	1N-6	1050	263	0.3	12"	735	0.5	277 V	1	55°F	70°F	65°F	95°F	7.5	480 V	3	METALAIRE FV1500						
FPB	1N-7	555	139	0.3	8"	389	0.13	277 V	1	55°F	70°F	65°F	95°F	4	480 V	3	METALAIRE FV1500						
FPB	1N-8	640	160	0.3	10"	448	0.25	277 V	1	55°F	70°F	65°F	95°F	4.5	480 V	3	METALAIRE FV1500						
FPB	1N-9	300	75	0.3	8"	210	0.13	277 V	1	55°F	70°F	65°F	95°F	2.5	480 V	3	METALAIRE FV1500						
FPB	1N-10	670	168	0.3	10"	469	0.25	277 V	1	55°F	70°F	65°F	95°F	5	480 V	3	METALAIRE FV1500						
FPB	1N-11	500	125	0.3	8"	350	0.13	277 V	1	55°F	70°F	65°F	95°F	3.5	480 V	3	METALAIRE FV1500						
FPB	1N-12	1175	294	0.3	12"	823	0.5	277 V	1	55°F	70°F	65°F	95°F	8	480 V	3	METALAIRE FV1500						
FPB	1N-13	920	230	0.3	10"	644	0.25	277 V	1	55°F	70°F	65°F	100°F	7.5	480 V	3	PURCHASE FROM BUILDING STOCK						

NOTES: (APPLICABLE TO ALL BOXES UNLESS NOTED)

- BOXES SHALL BE DDC. REFER TO SPECIFICATION FOR ADDITIONAL REQUIREMENTS.
- PROVIDE NON-FIBER LINER.
- PROVIDE ALL BOXES WITH FACTORY MOUNTED, FUSED UNIT DISCONNECT WITH SINGLE POINT ELECTRICAL CONNECTION (INCLUDING CONTROL POWER).
- PROVIDE ALL BOXES WITH SCR HEATING CONTROLS.
- PROVIDE ALL BOXES WITH FACTORY MOUNTED CONTROL TRANSFORMER.
- SET MINIMUM AIR FOR ALL BOXES TO 20% OF SCHEDULED COOLING CFM (ADJUSTABLE).
- MOTOR SIZES: (8" - 1/8 HP) (10" - 1/4 HP) (12" - 1/2 HP) (14" - 3/4 HP) - ALL AT 277 VOLT.
- APPROVED MANUFACTURERS ARE: GREENHECK, PRICE, NAILOR, TITUS, & TRANE.
- ALL SUBSTITUTIONS MUST BE APPROVED, IN WRITING, PRIOR TO BID.
- PROVIDE ALL FAN POWERED BOXES OVER 2,000 CFM WITH A DEDICATED SMOKE DETECTOR IN THE RETURN AIR PATH OF THAT SPECIFIC TERMINAL.
- COORDINATE PURCHASE OF BUILDING STOCK BOXES WITH BUILDING MANAGEMENT.

EXHAUST FAN SCHEDULE

MECHANICAL										BASIS OF DESIGN				ELECTRICAL			
TYPE	MARK	SERVICE	LOCATION	TYPE	CONTROL	CFM	ESP (IN W.G.)	DRIVE	ACCESSORIES (SEE BELOW)	WEIGHT (LBS)	MANUFACTURER	MODEL	WATTS	RPM	VOLT	PH	
EF	1-1	EXHAUST	PLENUM	CENT	BMS	100	0.5	DIRECT	G.E	31	GREENHECK	CSPA250	29	803	120	1	

ACCESSORIES:

- (A) BACKDRAFT DAMPER
- (B) BIRDSCREEN
- (C) PRE-WIRED NON-FUSED SERVICE DISCONNECT
- (D) PRE-WIRED NON-FUSED SERVICE DISCONNECT (NEMA 3R)
- (E) SPRING ISOLATION
- (F) INTERLOCK W/AHU SUPPLY FAN
- (G) INSULATED ROOF CURB 14" ABOVE FINISHED ROOF WITH HINGED COVER
- (H) INSULATED AND VENTED ROOF CURB 14" ABOVE FINISHED ROOF WITH HINGED COVER
- (J) GREASE EXHAUST FAN SHALL BE UL-782 RATED FOR KITCHEN VENTILATION
- (K) TEFC MOTOR ENCLOSURE FOR PROTECTION FROM GREASE-LADEN AIRSTREAM
- (L) GREASE CAPTURE TROUGH WITH REMOVABLE LID
- (M) AMCA TYPE 'A' CONSTRUCTION FOR 'EXPLOSION PROOF' FANS

- REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- CONTROL DESCRIPTION (WHERE PROVIDED, REFER TO SEQUENCE OF OPERATION FOR ADDITIONAL INFORMATION)
 - BMS - BUILDING AUTOMATION SYSTEM
 - T-STAT - LINE VOLTAGE THERMOSTAT PROVIDED BY DIV. 23
 - H-STAT - HUMIDISTAT CONTROL
 - T-CLOCK - TIMECLOCK FOR OPERATION (PROVIDED BY DIV. 23 AND INSTALLED BY DIV. 26)
- ALL ROOF CURBS ARE STANDARD INSULATED TC-2 CURBS WITH GASKET, UNLESS OTHERWISE NOTED.
- PROVIDE VFD RATED MOTOR WHEN FAN IS EQUIPPED WITH VFD. PROVIDE STARTER WHEN VFD IS NOT REQUIRED.
- PROVIDE FANS WITH OSHA RATED GUARDS.
- APPROVED MANUFACTURERS - COOK, GREENHECK, TWIN CITIES.
- ALL SUBSTITUTIONS SHALL BE PRE-APPROVED, IN WRITING, PRIOR TO BID.
- PROVIDE GREASE GUARD G2 XD CONTAINMENT PAD AND DRIP GUARD (OR EQUAL) FOR ALL KITCHEN EXHAUST FANS.

AIR TERMINAL SCHEDULE

IMAGE	DESIG.	DUTY	TYPE	MOUNTING LOCATION	MATERIAL	VOLUME CONTROL	FINISH	AIR PATTERN CONTROL	METHOD OF SUPPORT	NECK SIZE	SLOT/FACE SIZE	BASIS OF DESIGN		REMARKS
												MANUF.	MODEL	
	A1	SUPPLY	PLAQUE	LAY-IN CEILING	STEEL	NO	WHITE	YES	T-BAR	NOTE 1	24X24	PRICE INDUSTRIES	SPD	SEE NOTES 1,2,5,6,7
	B	RETURN	PERFORATED	LAY-IN CEILING	STEEL	NO	WHITE	NO	T-BAR	--	24X24	PRICE INDUSTRIES	PFRF	SEE NOTES 2,6,7
	C3	SUPPLY	T-BAR SLOT	LAY-IN CEILING	ALUMINUM	YES	WHITE	YES	LAY-IN (TYPE 15)	NOTE 1	(2) 1.0"	PRICE INDUSTRIES	TB04	SEE NOTES 1,2,4,5,6,7
	G3	SUPPLY	GRILLE	SIDEWALL	STEEL	YES	WHITE	NO	SURFACE	--	SEE PLANS	PRICE INDUSTRIES	520L - DOUBLE DEFLECTION	SEE NOTES 2,3,5,6,7
	G4	RETURN	GRILLE	SIDEWALL	STEEL	YES	WHITE	NO	SURFACE	--	SEE PLANS	PRICE INDUSTRIES	530	SEE NOTES 2,3,6,7
	S1	SUPPLY	MUD-IN SLOT	GYP BOARD CEILING	ALUMINUM	YES	BLACK	YES	SURFACE (CMF)	NOTE 1	(1) 2.0"	PRICE INDUSTRIES	CF - CUSTOM FLOW	<varies>
	S1R	REURNR	MUD-IN SLOT (CF FRAME)	GYP BOARD CEILING	ALUMINUM	NO	BLACK	NO	SURFACE (CMF)	--	(1) 2.0"	PRICE INDUSTRIES	CF - CUSTOM FLOW	
	S4	SUPPLY	T-BAR SLOT	LAY-IN CEILING	ALUMINUM	YES	BLACK	YES	T-BAR	NOTE 1	(1) 3.0"	PRICE INDUSTRIES	CF - CUSTOM FLOW	SEE NOTES 1,2,4,5,6,7
	S4R	RETURN	T-BAR SLOT	LAY-IN CEILING	ALUMINUM	NO	BLACK	NO	T-BAR	--	(1) 3.0"	PRICE INDUSTRIES	CF - CUSTOM FLOW	

NOTES:

- NECK SIZES AS FOLLOWS:

DESIGNATION "A1 - A4"		DESIGNATION "A5 - A8"		DESIGNATION "B2 / E1"		DESIGNATION "B3 / E2"	
CFM RANGE	NECK SIZE	CFM RANGE	NECK SIZE	CFM RANGE	NECK SIZE	CFM RANGE	NECK SIZE
000 - 250	8"Ø	000 - 150	8"Ø	000 - 400	8"Ø	000 - 200	8"Ø
255 - 400	10"Ø	155 - 225	8"Ø	405 - 550	10"Ø	200 - 300	8"Ø
405 - 550	12"Ø			555 - 750	12"Ø		
555 - 700	14"Ø						

DESIGNATION "C1 / C3 / C5" (2 - 1.0" SLOT)			DESIGNATION "C2 / C4 / C6" (3 - 1.0" SLOT)			DESIGNATION "S1 / S3 / S5" (2.0" SLOT)			DESIGNATION "S2 / S4 / S6" (3.0" SLOT)		
CFM RANGE	NECK SIZE	LENGTH	CFM RANGE	NECK SIZE	LENGTH	CFM RANGE	NECK SIZE	LENGTH	CFM RANGE	NECK SIZE	LENGTH
000 - 200	8"Ø	4"Ø	000 - 300	10"Ø	4"Ø	000 - 200	8"Ø	4"Ø	000 - 300	10"Ø	4"Ø
--	--	--	205 - 250	10"Ø	4"Ø	205 - 250	10"Ø	4"Ø	305 - 350	12"Ø	4"Ø
--	--	--	255 - 300	12"Ø	4"Ø	--	--	--	--	--	--

- NOTIFY ENGINEER OF ANY DISCREPANCIES BETWEEN NEW MODEL NUMBER AND EXISTING NUMBER PRIOR TO PURCHASE.
- REFER TO MECHANICAL FLOOR PLANS FOR GRILLE FACE/NECK SIZES.
- PROVIDE THE FOLLOWING ACCESSORIES FOR SLOT DIFFUSERS:
 - A. ENGINEERED PLENUM BOX FOR SLOT DIFFUSERS UTILIZED FOR SUPPLY OR EXHAUST AIR.
 - B. OPTIONAL MITERED CORNER MODULE FOR SLOT DIFFUSER APPLICATIONS WHERE DIFFUSERS MEET AT SQUARED CORNERS. REFER TO MECHANICAL PLANS FOR LOCATIONS.
 - C. MITERED END CONDITIONS.
 - D. INSULATED SHEET METAL LIGHTPROOF SIGHT Baffle EQUAL TO PRICE INDUSTRIES 'RBI' FOR RETURN AIR SLOT DIFFUSERS AND INACTIVE SECTIONS.
 - E. FOR LINEAR SLOT DIFFUSERS UTILIZED AS RETURN - REMOVE PATTERNS CONTROLLERS TO MAXIMIZE FREE AREA.
- PROVIDE MANUAL BALANCING DAMPER FOR ALL SUPPLY AND DUCTED RETURN/EXHAUST GRILLES AND DIFFUSERS.
 - A. FOR SUPPLY AND/OR EXHAUST GRILLES AND DRUM LOUVERS, PROVIDE OPTIONAL OPPOSED BLADE DAMPER ACCESSORY THAT CAN BE ADJUSTED AT GRILLE FACE.
 - B. FOR ANY DIFFUSERS LOCATED IN GYP BOARD CEILINGS (OR INACCESSIBLE CEILINGS), PROVIDE A CONCEALED DAMPER CONTROL CABLE SYSTEM EQUAL TO YOUNG REGULATOR BOWDEN CABLE CONTROLLER MODEL 270-275.
- COORDINATE FINISH COLOR OF ALL DIFFUSERS/GRILLES WITH ARCHITECT PRIOR TO PURCHASE. PRIME AND PAINT AS REQUIRED.
- APPROVED MANUFACTURERS ARE PRICE INDUSTRIES, TITUS, NAILOR, KRUEGER, AND METALAIRE. ANY SUBSTITUTIONS MUST BE APPROVED, IN WRITING, PRIOR TO BID.

VAV BOXES SCHEDULE

DESIGNATION				BASIS OF DESIGN			
TYPE	MARK	DESIGN COOL CFM	INLET SIZE	MANUFACTURER	MODEL	WATTS	PH
VAV	1N-1	210	6"	METALAIRE	TH-500		
VAV	1N-3	540	8"	PURCHASE FROM BUILDING STOCK			
VAV	1N-4	280	8"	PURCHASE FROM BUILDING STOCK			
VAV	1N-5	285	8"	METALAIRE			
VAV	1N-6	770	10"	METALAIRE			
VAV	1N-7	250	6"	METALAIRE			
VAV	1N-8	350	8"	METALAIRE			
VAV	1N-9	635	10"	METALAIRE			
VAV	1N-10	130	6"	METALAIRE			
VAV	1N-11	250	6"	METALAIRE			
VAV	1N-12	400	8"	PURCHASE FROM BUILDING STOCK			
VAV	1N-13	540	8"	PURCHASE FROM BUILDING STOCK			
VAV	1N-14	480	8"	PURCHASE FROM BUILDING STOCK			
VAV	1N-15	500	8"	METALAIRE			
VAV	1N-16	210	6"	METALAIRE			
VAV	1N-17	200	6"	METALAIRE			
VAV	1N-18	160	6"	METALAIRE			
VAV	1N-19	160	6"	METALAIRE			
VAV	1N-20	675	10"	METALAIRE			
VAV	1N-21	160	6"	METALAIRE			

NOTES: (APPLICABLE TO ALL BOXES)

- BOXES SHALL BE DDC.
- PROVIDE FIBER FREE LINER.
- BOX MINIMUM SETPOINT TO BE SET AT 20% OF COOLING CFM (ADJUSTABLE).
- APPROVED MANUFACTURERS: JCI, ETI, PRICE, GREENHECK, KRUEGER, NAILOR, TITUS, & TRANE.
- ALL SUBSTITUTIONS SHALL BE APPROVED, IN WRITING, PRIOR TO BID.
- BOXES SHALL BE PRESSURE INDEPENDENT.
- COORDINATE PURCHASE OF BUILDING STOCK BOXES WITH BUILDING MANAGEMENT.
- REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

DX AIR CONDITIONING INDOOR UNIT

DESIGNATION		COOLING				ELECTRIC		BASIS OF DESIGN	
TYPE	MARK	CFM	WATT	TOTAL MBH	SENS MBH	SEER	FLA	VOLT	PH
AC	1-1	920	69	28.0	22	19.2	0.26 A	208 V	1
AC	1-2	920	69	28.0	22	19.2	0.26 A	208 V	1

DX AIR CONDITIONING OUTDOOR UNIT

DESIGNATION		ELECTRICAL				BASIS OF DESIGN	
TYPE	MARK	MCA	MOCp	VOLT	PH	MANUFACTURER	MODEL
CU	1-1	25	30	208	1	MITSUBISHI	TPKAA0361KA70A
CU	1-2	25	30	208	1	MITSUBISHI	TPKAA0361KA70A

SERVER ROOM - IMS MONITORING SYSTEM

MARK NO.	MANUFACTURER AND MODEL NO.	AREA MONITORED	LOCATION	CONNECTION METHOD	MIN NUMBER OF INPUTS	INPUT TYPES	ELECTRICAL DATA			DIMENSIONS W"xHxD"	REMARKS
							VOLTS	PHASE	HZ		
IMS 1-1	SENSAPHONE IMS-4000	SERVER ROOM	1ST FLOOR SEE PLAN	ETHERNET & PHONE LINE	8 STANDARD, EXPANDABLE TO 256	-IMS SOLUTION	115	1	60	17"x1.75"x10"	1,2,3,4,5,6,7,8

REMARKS:
 1. PROVIDE BACKUP BATTERY MODULE
 2. WIRING AND INSTALLATION SHALL BE MANUFACTURER'S RECOMMENDATION
 3. THE UNIT SHALL BE PROVIDED WITH LED'S FOR ALARM STATUS, POWER STATUS AND ETHERNET LINK.
 4. PROVIDE MIN. 1 YEAR WARRANTY.
 5. UNIT SHALL BE PROVIDED WITH REMOTE ACCESS CAPABILITY
 6. PROVIDE CLIENT TRAINING FOR TEMPERATURE SETPOINT MODIFICATIONS, PROGRAMMING OF ON-CALL PERSONNEL ALARM NOTIFICATIONS AND WEB BASED SOFTWARE.
 7. MECHANICAL CONTRACTOR SHALL PROVIDE A WALL MOUNTED AIR TEMPERATURE MONITORING SENSOR WHICH SHALL REPORT TO THE SENSAPHONE IMS 4000 CONTROLLER IF THE TEMPERATURE OF THE SPACE EXCEEDS 82 F (IT PERSONNEL USER ADJUSTABLE).
 8. THE UNIT SHALL PROVIDE ALARM NOTIFICATION CAPABILITIES SHALL INCLUDE THE FOLLOWING
 (-)30 ALARM DESTINATION (ANY COMBINATION OF EMAIL, TEXT MESSAGE, OR SNMP TRAPS)
 (-)8 ALARM ESCALATION LEVEL WITH COMPREHENSIVE SCHEDULING PER INPUT PROFILE AND ALARM DESTINATION.