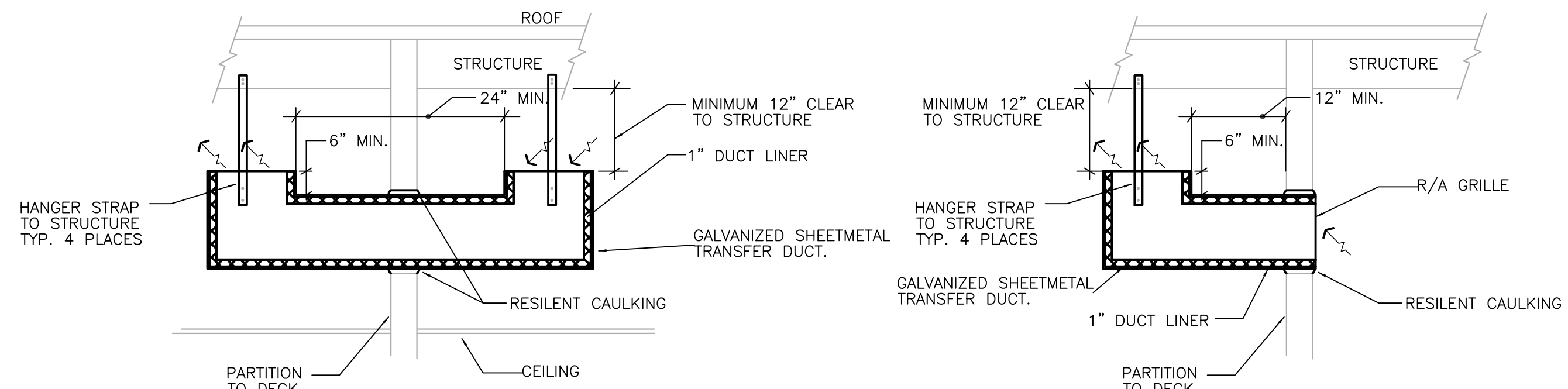
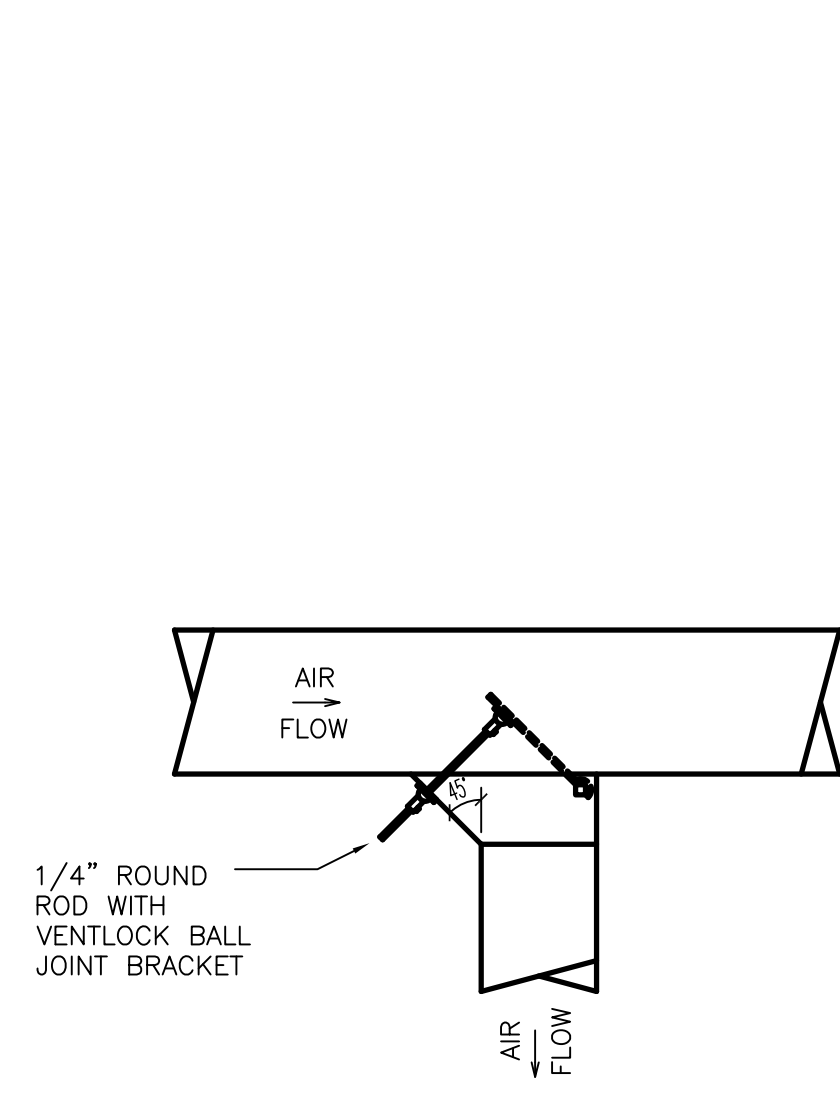


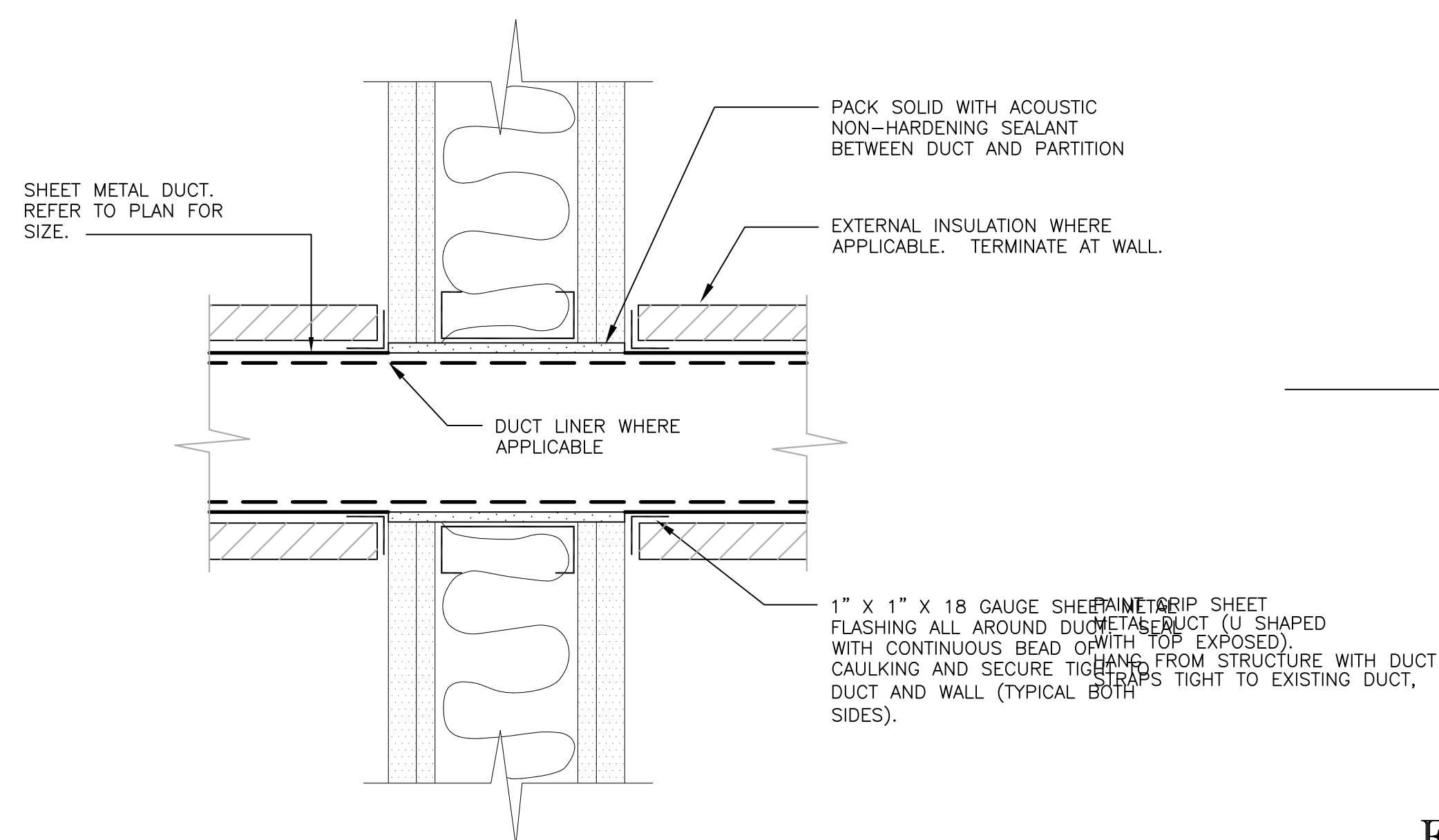
1 DIFFUSER CONNECTION DETAIL  
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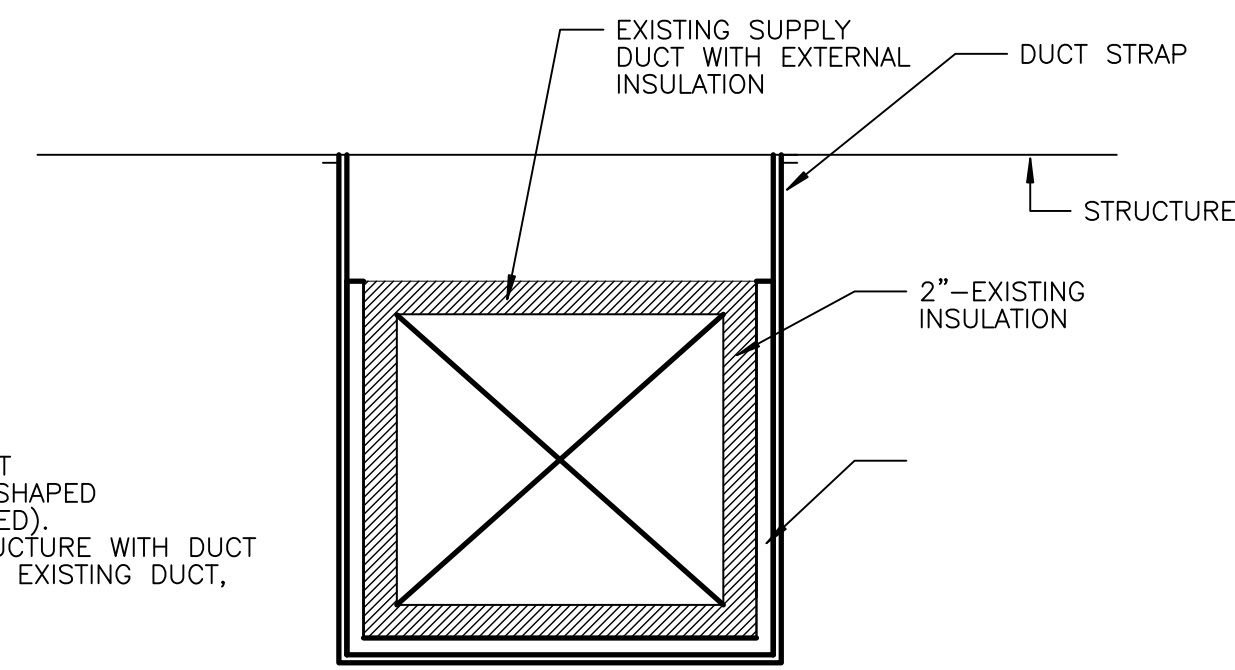
2 RA TRANSFER BOOT DETAIL  
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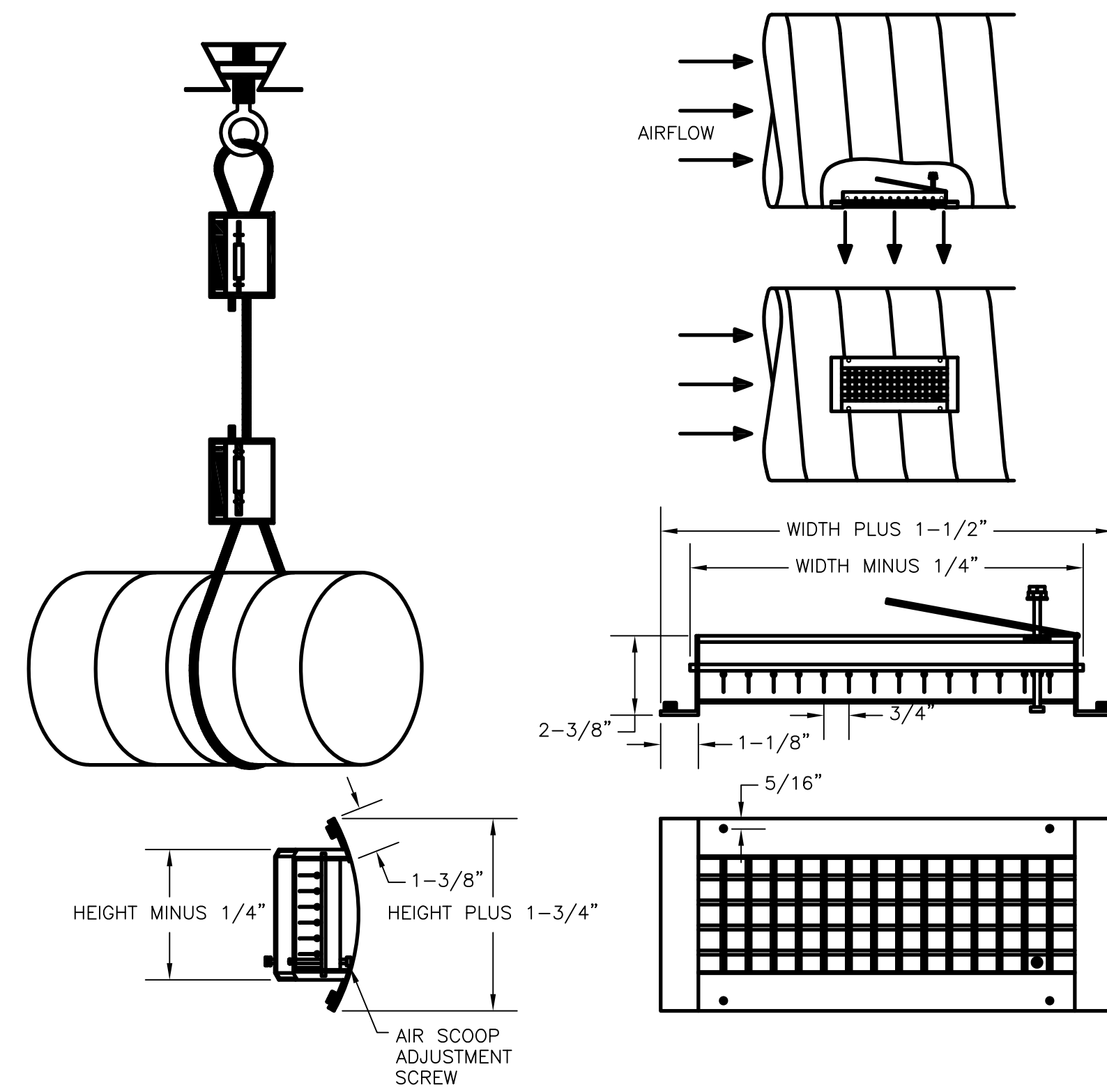
3 EXPANDED TAP DETAIL  
SCALE: NOT TO SCALE



4 DUCT PENETRATION AT SOUND PARTITION  
SCALE: NOT TO SCALE



5 EXISTING INSULATED DUCT WITH SHEET METAL WRAP  
SCALE: NOT TO SCALE



6 SPIRAL GRILLE DETAIL  
SCALE: NTS

## GENERAL NOTES:

- A. ALL WORK SHALL COMPLY WITH APPLICABLE NATIONAL, STATE AND LOCAL CODES, RULES, REGULATIONS AND REQUIREMENTS.
- B. 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.
- C. EXISTING 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 CONDITIONS. CONTRACTOR SHALL VISIT JOB SITE PRIOR TO BIDDING TO ASCERTAIN EXISTING CONDITIONS AND SHALL NOTIFY ARCHITECT OF ANY DISCREPANCIES PRIOR TO BID.
- D. 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.
- E. ALL DUCTWORK SHALL BE GALVANIZED SHEET METAL, FABRICATED, INSTALL AND SEAL DUCTWORK FOR 1\"/>
- F. ALL SUPPLY AND RETURN DUCT SIZES ARE FREE AREAS.
- G. INDIVIDUAL DUCT RUN-OUTS TO EACH DIFFUSER SHALL BE SIZED IN ACCORDANCE TO THE DIFFUSER NECK SIZE FOUND IN THE GRILLES-REGISTERS-DIFFUSERS SCHEDULED UNLESS NOTED OTHERWISE.
- H. 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.
- I. INSULATED FLEX DUCT IN THE 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 CONNECTING TO SUPPLY GRILLES 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 BANDED TO STRUCTURE. SUPPORTING FROM FIRE PROTECTION PIPING, ELECTRICAL CONDUIT OR CEILING SUPPORT WIRES IS NOT ACCEPTABLE.
- J. VAV BOXES AND FAN POWERED BOXES SHALL HAVE 24\"/>
- K. 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.
- L. PIPES AND DUCTS TO BE COORDINATED ON JOB WITH BUILDING STRUCTURE AND WORK OF OTHER CONTRACTORS. ROUTE AS HIGH AS PHYSICALLY POSSIBLE.
- M. COORDINATE CEILING DIFFUSERS AND GRILLES WITH LIGHTING FIXTURES. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN.
- N. THERMOSTATS TO BE MOUNTED 48\"/>
- O. REPAIR AND PATCH CONSTRUCTION DAMAGED DUE TO THE DEMOLITION OF THIS PROJECT, USING SAME METHODS AND MATERIALS TO MATCH EXISTING.
- P. EVAPORATORS SHALL HAVE A PRIMARY INSULATED CONDENSATE DRAIN LINE SLOPED 1/8\"/>
- Q. COMPUTER GRADE AC UNITS AND WATER SOURCE HEAT PUMPS SHALL HAVE TWO (2) SETS OF 2\"/>
- R. 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.
- S. FLEXIBLE DUCTS SHALL BE SIMILAR AND EQUAL TO THERMOFLEX: TYPE M-KE. FLEXIBLE DUCTS SHALL COMPLY WITH APPLICABLE REQUIREMENTS OF UL-181, NFPA 90-A AND OTHER GOVERNING AUTHORITIES.
- T. FLEXIBLE DUCT BETWEEN DUCT AND AC UNITS AND EXHAUST FANS SHALL BE EQUAL TO VENTFABRICS \"VENTGLAS\".
- U. 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.
- V. DUCTLINER SHALL BE 1-INCH ACOUSTICAL DUST LINING, IN ACCORDANCE WITH SMACNA STANDARDS. DUCT LINING SHALL BE OWENS-CORNING FIBERGLAS \"AEROFLEX\" NO. 200 OR EQUAL.
- W. 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.
- X. CONTROL CONTRACTOR SHALL PROVIDE 24V TRANSFORMER FOR UP TO 5 VAV BOXES SERVED FROM 120V J-BOX. PROVIDE CONTROL WIRE TO EACH VAV BOX.

## 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 CONNECTION
	INDICATES A WALL TO DECK (FOR COORDINATION PURPOSE ONLY-REFER TO ARCHITECTS PLANS FOR REQUIREMENTS)

# OTJ

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PROJ. JOB NO.  
PROJECT MGR.  
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ISSUES

#	DESCRIPTION	DATE
1	ISSUE FOR PERMIT	08/25/25

SEAL



PROJECT NAME + ADDRESS  
BILLINGSLEY

6275 W Plano Pkwy  
Plano, TX 75093

PROJECT NUMBER 13106.000

SHEET NAME  
MECHANICAL NOTES & SYMBOLS

DRAWN BY Designer  
CHECKED BY Checker

SCALE  
1/8" = 1'-0"

ORIENTATION

SHEET NUMBER

# M1-001

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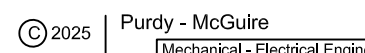
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**ISSUES**

#	DESCRIPTION	DATE
1	ISSUE FOR PERMIT	08/25/25

**SEAL**



**PROJECT NAME + ADDRESS**

**BILLINGSLEY**

6275 W Plano Pkwy  
Plano, TX 75093

**PROJECT NUMBER** 13106.000

**SHEET NAME**

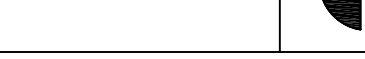
MECHANICAL SCHEDULES

**DRAWN BY** Designer

**CHECKED BY** Checker

**SCALE**  
1/8" = 1'-0"

**ORIENTATION**



**SHEET NUMBER**

**M1-002**

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**FAN POWERED BOXES (SUITE 240)**

DESIG.	SERVES	DESIGN COOLING CFM	MIN COOLING CFM	ELECTRIC HEATING COIL				VOLT/PH	INLET SIZE (IN.)	EQUAL TO MANUF & MODEL NO.
				HEATING CFM	FAN HP	ELEC KW				
FP2S-13	OFFICES 216-219	850	213	595	1/4	7.5	480/3	10	BUILDING STOCK	

- NOTES: (APPLICABLE TO ALL BOXES)  
 1) REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.  
 2) PROVIDE FIBER FREE LINER EQUAL TO PLYMER FOAM INSULATION.  
 3) REFER TO SCHEDULE FOR MINIMUM SETPOINTS  
 4) BOXES SHALL BE COMPLETE WITH TRANE TRACER DDC CONTROLS AND CONNECTED TO BMS VIA BUILDING STANDARD SEQUENCE OF OPERATION.  
 5) APPROVED MANUFACTURERS: ENVIRO-TEC, PRICE, NAILOR, TITUS, JCI, METALAIRE, GREENHECK, & TRANE.  
 6) ALL SUBSTITUTIONS SHALL BE APPROVED, IN WRITING, PRIOR TO BID.  
 7) PROVIDE SINGLE POINT CONNECTION AND FUSED DISCONNECT FOR EACH UNIT.  
 8) BOXES SHALL BE PROVIDED WITH MAGNETIC CONTACTORS, SCR, AIR FLOR SWITCHES AND DOOR INTERLOCK.  
 9) FILTER RESISTANCE IS NOT INCLUDED IN THE SCHEDULED EXTERNAL STATIC PRESSURE.  
 10) BOXES SHALL BE PRESSURE INDEPENDENT.

**FAN POWERED BOXES (SUITE 250)**

DESIG.	SERVES	DESIGN COOLING CFM	MIN COOLING CFM	ELECTRIC HEATING COIL				VOLT/PH	INLET SIZE (IN.)	EQUAL TO MANUF & MODEL NO.
				HEATING CFM	FAN HP	ELEC KW				
FP2S-14	OPEN WORK 257	920	230	644	1/4	7.5	480/3	10	BUILDING STOCK	
FP2S-15	OPEN WORK 257	920	230	644	1/4	6.5	480/3	10	METELAIRE FV1-500	

- NOTES: (APPLICABLE TO ALL BOXES)  
 1) REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.  
 2) PROVIDE FIBER FREE LINER EQUAL TO PLYMER FOAM INSULATION.  
 3) REFER TO SCHEDULE FOR MINIMUM SETPOINTS  
 4) BOXES SHALL BE COMPLETE WITH TRANE TRACER DDC CONTROLS AND CONNECTED TO BMS VIA BUILDING STANDARD SEQUENCE OF OPERATION.  
 5) APPROVED MANUFACTURERS: ENVIRO-TEC, PRICE, NAILOR, TITUS, JCI, METALAIRE, GREENHECK, & TRANE.  
 6) ALL SUBSTITUTIONS SHALL BE APPROVED, IN WRITING, PRIOR TO BID.  
 7) PROVIDE SINGLE POINT CONNECTION AND FUSED DISCONNECT FOR EACH UNIT.  
 8) BOXES SHALL BE PROVIDED WITH MAGNETIC CONTACTORS, SCR, AIR FLOR SWITCHES AND DOOR INTERLOCK.  
 9) FILTER RESISTANCE IS NOT INCLUDED IN THE SCHEDULED EXTERNAL STATIC PRESSURE.  
 10) BOXES SHALL BE PRESSURE INDEPENDENT.

**FAN POWERED BOXES (SUITE 270)**

DESIG.	SERVES	DESIGN COOLING CFM	MIN COOLING CFM	ELECTRIC HEATING COIL				VOLT/PH	INLET SIZE (IN.)	EQUAL TO MANUF & MODEL NO.
				HEATING CFM	FAN HP	ELEC KW				
FP2S-16	OFFICES 246-248	1170	293	819	1/2	10.0	480/3	12	BUILDING STOCK	
FP2S-17	CONFERENCE 245	510	128	357	1/8	3.5	480/3	8	BUILDING STOCK	

- NOTES: (APPLICABLE TO ALL BOXES)  
 1) REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.  
 2) PROVIDE FIBER FREE LINER EQUAL TO PLYMER FOAM INSULATION.  
 3) REFER TO SCHEDULE FOR MINIMUM SETPOINTS  
 4) BOXES SHALL BE COMPLETE WITH TRANE TRACER DDC CONTROLS AND CONNECTED TO BMS VIA BUILDING STANDARD SEQUENCE OF OPERATION.  
 5) APPROVED MANUFACTURERS: ENVIRO-TEC, PRICE, NAILOR, TITUS, JCI, METALAIRE, GREENHECK, & TRANE.  
 6) ALL SUBSTITUTIONS SHALL BE APPROVED, IN WRITING, PRIOR TO BID.  
 7) PROVIDE SINGLE POINT CONNECTION AND FUSED DISCONNECT FOR EACH UNIT.  
 8) BOXES SHALL BE PROVIDED WITH MAGNETIC CONTACTORS, SCR, AIR FLOR SWITCHES AND DOOR INTERLOCK.  
 9) FILTER RESISTANCE IS NOT INCLUDED IN THE SCHEDULED EXTERNAL STATIC PRESSURE.  
 10) BOXES SHALL BE PRESSURE INDEPENDENT.

**VAV BOXES (SUITE 240)**

DESIG.	SERVES	2ND FLOOR		
		COOLING CFM	INLET SIZE (IN.)	EQUAL TO BASIS OF DESIGN MFR & MODEL #
VAV2S-14	CONFERENCE 202	170	6"	BUILDING STOCK
VAV2S-15	RECEPTION/PRINT	200	6"	BUILDING STOCK
VAV2S-16	OPEN WORK 206	500	8"	BUILDING STOCK

- NOTES: (APPLICABLE TO ALL BOXES)  
 1) BOXES SHALL BE COMPLETE WITH TRANE TRACER DDC CONTROLS CONNECTED TO BMS VIA BUILDING STANDARD SEQUENCE OF OPERATION.  
 2) PROVIDE FIBER FREE LINER EQUAL TO PLYMER FOAM INSULATION.  
 3) BOX MINIMUM SETPOINT TO BE SET AT 20% OF COOLING CFM (ADJUSTABLE).  
 4) APPROVED MANUFACTURERS: ENVIRO-TEC, NAILOR, PRICE, TITUS, GREENHECK, & TRANE.  
 5) ALL SUBSTITUTIONS SHALL BE APPROVED, IN WRITING, PRIOR TO BID.  
 6) BOXES SHALL BE PRESSURE INDEPENDENT.  
 7) REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

**VAV BOXES (SUITE 260)**

DESIG.	SERVES	2ND FLOOR		
		COOLING CFM	INLET SIZE (IN.)	EQUAL TO BASIS OF DESIGN MFR & MODEL #
VAV2S-11	OPEN WORK 215	700	10"	BUILDING STOCK
VAV2S-12	BREAK ROOM 213	185	6"	METALAIRE TH-500
VAV2S-13	CONFERENCE 212	165	6"	METALAIRE TH-500

- NOTES: (APPLICABLE TO ALL BOXES)  
 1) BOXES SHALL BE COMPLETE WITH TRANE TRACER DDC CONTROLS CONNECTED TO BMS VIA BUILDING STANDARD SEQUENCE OF OPERATION.  
 2) PROVIDE FIBER FREE LINER EQUAL TO PLYMER FOAM INSULATION.  
 3) BOX MINIMUM SETPOINT TO BE SET AT 20% OF COOLING CFM (ADJUSTABLE).  
 4) APPROVED MANUFACTURERS: ENVIRO-TEC, NAILOR, PRICE, TITUS, GREENHECK, & TRANE.  
 5) ALL SUBSTITUTIONS SHALL BE APPROVED, IN WRITING, PRIOR TO BID.  
 6) BOXES SHALL BE PRESSURE INDEPENDENT.  
 7) REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

**VAV BOXES (SUITE 280)**

DESIG.	SERVES	2ND FLOOR		
		COOLING CFM	INLET SIZE (IN.)	EQUAL TO BASIS OF DESIGN MFR & MODEL #
VAV2S-9	CONFERENCE 221	165	6"	METALAIRE TH-500
VAV2S-10	RECEPTION/BREAK ROOM	240	6"	METALAIRE TH-500
VAV2S-23	OPEN WORK 225	1060	12"	BUILDING STOCK

- NOTES: (APPLICABLE TO ALL BOXES)  
 1) BOXES SHALL BE COMPLETE WITH TRANE TRACER DDC CONTROLS CONNECTED TO BMS VIA BUILDING STANDARD SEQUENCE OF OPERATION.  
 2) PROVIDE FIBER FREE LINER EQUAL TO PLYMER FOAM INSULATION.  
 3) BOX MINIMUM SETPOINT TO BE SET AT 20% OF COOLING CFM (ADJUSTABLE).  
 4) APPROVED MANUFACTURERS: ENVIRO-TEC, NAILOR, PRICE, TITUS, GREENHECK, & TRANE.  
 5) ALL SUBSTITUTIONS SHALL BE APPROVED, IN WRITING, PRIOR TO BID.  
 6) BOXES SHALL BE PRESSURE INDEPENDENT.  
 7) REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

**VAV BOXES (SUITE 250)**

DESIG.	SERVES	2ND FLOOR		
		COOLING CFM	INLET SIZE (IN.)	EQUAL TO BASIS OF DESIGN MFR & MODEL #
VAV2S-17	CONFERENCE 251	250	6"	METALAIRE TH-500
VAV2S-18	OFFICES 254-255	150	6"	METALAIRE TH-500
VAV2S-19	RECEPTION/PHONE/BREAK	295	8"	METALAIRE TH-500
VAV2S-20	OPEN WORK 257	820	10"	BUILDING STOCK

- NOTES: (APPLICABLE TO ALL BOXES)  
 1) BOXES SHALL BE COMPLETE WITH TRANE TRACER DDC CONTROLS CONNECTED TO BMS VIA BUILDING STANDARD SEQUENCE OF OPERATION.  
 2) PROVIDE FIBER FREE LINER EQUAL TO PLYMER FOAM INSULATION.  
 3) BOX MINIMUM SETPOINT TO BE SET AT 20% OF COOLING CFM (ADJUSTABLE).  
 4) APPROVED MANUFACTURERS: ENVIRO-TEC, NAILOR, PRICE, TITUS, GREENHECK, & TRANE.  
 5) ALL SUBSTITUTIONS SHALL BE APPROVED, IN WRITING, PRIOR TO BID.  
 6) BOXES SHALL BE PRESSURE INDEPENDENT.  
 7) REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

**VAV BOXES (SUITE 270)**

DESIG.	SERVES	2ND FLOOR		
		COOLING CFM	INLET SIZE (IN.)	EQUAL TO BASIS OF DESIGN MFR & MODEL #
VAV2S-21	BREAK ROOM/RECEPTION	320	8"	METALAIRE TH-500
VAV2S-22	OPEN WORK 244	945	10"	BUILDING STOCK

- NOTES: (APPLICABLE TO ALL BOXES)  
 1) BOXES SHALL BE COMPLETE WITH TRANE TRACER DDC CONTROLS CONNECTED TO BMS VIA BUILDING STANDARD SEQUENCE OF OPERATION.  
 2) PROVIDE FIBER FREE LINER EQUAL TO PLYMER FOAM INSULATION.  
 3) BOX MINIMUM SETPOINT TO BE SET AT 20% OF COOLING CFM (ADJUSTABLE).  
 4) APPROVED MANUFACTURERS: ENVIRO-TEC, NAILOR, PRICE, TITUS, GREENHECK, & TRANE.  
 5) ALL SUBSTITUTIONS SHALL BE APPROVED, IN WRITING, PRIOR TO BID.  
 6) BOXES SHALL BE PRESSURE INDEPENDENT.  
 7) REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

**VAV BOXES (SUITE 285)**

DESIG.	SERVES	2ND FLOOR		
		COOLING CFM	INLET SIZE (IN.)	EQUAL TO BASIS OF DESIGN MFR & MODEL #
VAV2S-7	RECEPTION/BREAK ROOM	370	8"	METALAIRE TH-500
VAV2S-8	CONFERENCE 231	245	6"	METALAIRE TH-500
VAV2S-24	OPEN WORK 233	960	10"	BUILDING STOCK

- NOTES: (APPLICABLE TO ALL BOXES)  
 1) BOXES SHALL BE COMPLETE WITH TRANE TRACER DDC CONTROLS CONNECTED TO BMS VIA BUILDING STANDARD SEQUENCE OF OPERATION.  
 2) PROVIDE FIBER FREE LINER EQUAL TO PLYMER FOAM INSULATION.  
 3) BOX MINIMUM SETPOINT TO BE SET AT 20% OF COOLING CFM (ADJUSTABLE).  
 4) APPROVED MANUFACTURERS: ENVIRO-TEC, NAILOR, PRICE, TITUS, GREENHECK, & TRANE.  
 5) ALL SUBSTITUTIONS SHALL BE APPROVED, IN WRITING, PRIOR TO BID.  
 6) BOXES SHALL BE PRESSURE INDEPENDENT.  
 7) REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

# DALLAS GREEN BUILDING REQUIREMENTS:

SECTION 802.1 - SCOPE. TO FACILITATE THE OPERATION AND MAINTENANCE OF THE COMPLETED BUILDING, THE BUILDING AND ITS SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF SECTIONS 802.2 AND 802.3.

802.2 AIR HANDLING SYSTEM ACCESS: THE ARRANGEMENT AND LOCATION OF AIR HANDLING SYSTEM COMPONENTS, INCLUDING, BUT NOT LIMITED TO, DUCTS, AIR HANDLING UNITS, FANS, COILS, AND CONDENSATE PANS, SHALL ALLOW ACCESS FOR CLEANING AND REPAIR OF AIR HANDLING SURFACES OF SUCH COMPONENTS ACCESS PORTS SHALL BE INSTALLED IN THE AIR HANDLING SYSTEM TO PERMIT SUCH CLEANING AND REPAIRS. PIPING, CONDUITS, AND OTHER BUILDING COMPONENTS SHALL NOT BE LOCATED SO AS TO OBSTRUCT THE REQUIRED ACCESS PORTS.

802.3 AIR HANDLING SYSTEM FILTRATION AND BYPASS PATHWAYS: AIR HANDLING EQUIPMENT AND HVAC EQUIPMENT SHALL BE DESIGNED AND INSTALLED TO LIMIT THE AMOUNT OF AIRFLOW THAT BY PASSES THE AIR FILTERS AND SHALL COMPLY WITH THE FOLLOWING:

- CHANNELS, RACKS AND OTHER FILTER-RETAINING CONSTRUCTIONS THAT DO NOT SEAL TIGHTLY TO THE FILTER FRAME BY MEANS OF FRICTION FIT SHALL BE PROVIDED WITH A MEANS TO SEAL THE FILTER FRAME TO THE FILTER-HOLDING CONSTRUCTION.
- WHERE STANDARD SIZE FILTERS ARE INSTALLED IN BANKS OF MULTIPLE FILTERS, GASKETS SHALL SEAL THE GAP BETWEEN THE FRAMES OF ADJACENT FILTERS.
- AS AN ALTERNATIVE TO GASKETS, THE FRAMES OF ADJACENT FILTERS SHALL BE COMPRESSED TIGHTLY TOGETHER BY MEANS OF SPRING ELEMENTS THAT ARE BUILT INTO THE FILTER RETAINING CONSTRUCTION.
- CHANNELS, RACKS AND OTHER FILTER-RETAINING CONSTRUCTIONS SHALL BE SEALED TO THE DUCT OR HOUSING OF THE HVAC EQUIPMENT SERVED BY THE FILTERS.
- FILTER ACCESS DOORS IN DUCTS AND HVAC EQUIPMENT SHALL BE DESIGNED TO LIMIT THE AMOUNT OF AIRFLOW THAT BYPASSES THE FILTERS.
- FIELD OR SHOP-FABRICATED SPACERS SHALL NOT BE INSTALLED FOR THE PURPOSE OF REPLACING THE INTENDED SIZE FILTER WITH A SMALLER SIZE FILTER.
- GASKETS AND SEALS SHALL BE ACCESSIBLE FOR REPAIR, MAINTENANCE AND REPLACEMENT.

803.1 CONSTRUCTION PHASE REQUIREMENTS. THE VENTILATION OF BUILDINGS DURING THE CONSTRUCTION PHASE SHALL BE IN ACCORDANCE WITH SECTIONS 803.1.1 THROUGH 803.1.3.

803.1.1 DUCT OPENINGS. DUCT AND OTHER RELATED AIR DISTRIBUTION COMPONENT OPENINGS SHALL BE COVERED WITH TAPE, PLASTIC, SHEET METAL, OR SHALL BE CLOSED BY AN APPROVED METHOD TO REDUCE THE AMOUNT OF DUST AND DEBRIS THAT COLLECTS IN THE SYSTEM FROM THE TIME OF ROUGH-IN INSTALLATION AND UNTIL STARTUP OF THE HEATING AND COOLING EQUIPMENT. DUST AND DEBRIS SHALL BE CLEANED FROM DUCT OPENINGS PRIOR TO SYSTEM FLUSH OUT AND BUILDING OCCUPANCY.

803.1.2 INDOOR AIR QUALITY DURING CONSTRUCTION. TEMPORARY VENTILATION DURING CONSTRUCTION SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 803.1.2.1 THROUGH 803.1.2.3.

803.1.2.1 VENTILATION. VENTILATION DURING CONSTRUCTION SHALL BE ACHIEVED THROUGH OPENINGS IN THE BUILDING ENVELOPE USING ONE OR MORE OF THE FOLLOWING METHODS:

- NATURAL VENTILATION IN ACCORDANCE WITH THE PROVISIONS OF THE INTERNATIONAL BUILDING CODE OR THE INTERNATIONAL MECHANICAL CODE.
- FANS THAT PRODUCE A MINIMUM OF THREE AIR CHANGES PER HOUR.
- EXHAUST IN THE WORK AREA AT A RATE OF NOT LESS THAN 0.05 CFM/FT<sup>2</sup> (0.24 L/S/IN<sup>2</sup>) AND NOT LESS THAN 10 PERCENT GREATER THAN THE SUPPLY AIR RATE SO AS TO MAINTAIN NEGATIVE PRESSURIZATION OF THE SPACE.

803.1.2.2 PROTECTION OF HVAC SYSTEM OPENINGS. HVAC SUPPLY AND RETURN DUCT AND EQUIPMENT OPENINGS SHALL BE PROTECTED DURING DUST-PRODUCING OPERATIONS.

803.1.2.3 RETURN AIR FILTERS. WHERE A FORCED AIR HVAC SYSTEM IS USED DURING CONSTRUCTION, NEW RETURN AIR FILTERS SHALL BE INSTALLED PRIOR TO SYSTEM FLUSH OUT AND BUILDING OCCUPANCY.

803.1.3 CONSTRUCTION PHASE DUCTLESS SYSTEM OR FILTER. WHERE SPACES ARE CONSTRUCTED DURING THE CONSTRUCTION PHASE, SPACE CONDITIONING SYSTEMS SHALL BE OF THE DUCTLESS VARIETY. OR FILTERS FOR THE DUCTED SYSTEMS SHALL BE RATED AT MERV 8 OR HIGHER IN ACCORDANCE WITH ASHRAE 52.2, AND SYSTEM EQUIPMENT SHALL BE DESIGNED TO BE COMPATIBLE. DUCT SYSTEM DESIGN SHALL ACCOUNT FOR PRESSURE DROP ACROSS THE FILTER.

803.2 THERMAL ENVIRONMENTAL CONDITIONS FOR HUMAN OCCUPANCY. BUILDING SHALL BE DESIGNED IN COMPLIANCE WITH ASHRAE 55, SECTIONS 6.1, "DESIGN" AND 6.2, "DOCUMENTATION."

EXCEPTION: SPACES WITH SPECIAL REQUIREMENTS FOR PROCESSES, ACTIVITIES, OR CONTENTS THAT REQUIRE A THERMAL ENVIRONMENT OUTSIDE OF THAT WHICH HUMANS FIND THERMALLY ACCEPTABLE, SUCH AS FOOD STORAGE, NATATORIUMS, SHOWER ROOMS, SAUNAS AND DRYING ROOMS.

803.3 ISOLATION OF POLLUTANT SOURCES. THE ISOLATION OF POLLUTANT SOURCES RELATED TO PRINT, COPY AND JANITORIAL ROOMS, GARAGES AND HANGERS SHALL BE IN ACCORDANCE WITH SECTION 803.3.1.

803.3.1 PRINTER, COPIER AND JANITORIAL ROOMS. ENCLOSED ROOMS OR SPACES THAT ARE OVER 100 SQUARE FEET (9.3 M<sup>2</sup>) IN AREA AND THAT ARE USED PRIMARILY AS A PRINT OR COPY FACILITY CONTAINING FIVE OR MORE PRINTERS, COPY MACHINES, SCANNERS, FACSIMILE MACHINES OR SIMILAR MACHINES IN ANY COMBINATION, AND ROOMS USED PRIMARILY AS JANITORIAL ROOMS OR CLOSETS WHERE THE USE OR STORAGE OF CHEMICALS OCCURS, SHALL COMPLY WITH ALL OF THE FOLLOWING:

- THE ENCLOSING WALLS SHALL EXTEND FROM THE FLOOR SURFACE TO THE UNDERSIDE OF THE FLOOR, ROOF DECK OR SOLID CEILING ABOVE AND SHALL BE CONSTRUCTED TO RESIST THE PASSAGE OF AIRBORNE CHEMICAL POLLUTANTS AND SHALL BE CONSTRUCTED AND SEALED AS REQUIRED FOR 1-HOR FIRE-RESISTANCE-RATED CONSTRUCTION ASSEMBLIES. ALTERNATIVELY, FOR JANITORIAL ROOMS AND CLOSETS, ALL CHEMICALS SHALL BE STORED IN APPROVED CHEMICAL SAFETY STORAGE CABINETS.
- DOORS IN THE ENCLOSING WALLS SHALL BE AUTOMATIC OR SELF-CLOSING.
- AN HVAC SYSTEM SHALL BE PROVIDED THAT PROVIDES SEPARATE EXHAUST AIRFLOW TO THE OUTDOORS AT A RATE OF NOT LESS THAN 0.50 CFM PER SQUARE FOOT (2.4 L/S/M<sup>2</sup>); THAT MAINTAINS A NEGATIVE PRESSURE OF NOT LESS THAN 7 PA WITHIN THE ROOM; AND THAT PORHIBITS THE RECIRCULATION OF AIR FROM THE ROOM TO OTHER PORTIONS OF THE BUILDINGS.

803.4 FILTERS. FILTERS FOR AIR CONDITIONING SYSTEMS THAT SERVE OCCUPIED SPACES SHALL BE RATED AT MERV 11 OR HIGHER. IN ACCORDANCE WITH ASHRAE STANDARD 52.2, AND SYSTEM EQUIPMENT SHALL BE DESIGNED TO BE COMPATIBLE. THE AIR HANDLING SYSTEM DESIGN SHALL ACCOUNT FOR PRESSURE DROP ACROSS THE FILTER. THE PRESSURE DROP ACROSS CLEAN MERV 11 FILTERS SHALL BE NOT GREATER THAN 0.45 IN. W.C. AT 600 FPM (412 PA AT 2.54 M/S) FILTER FACE VELOCITY. FILTER PERFORMANCE SHALL BE SHOWN ON THE FILTER MANUFACTURER'S DATA SHEET.

EXCEPTION: FILTERS FOR AIR CONDITIONING SYSTEMS THAT SERVE OCCUPIED SPACES IN MULTI-FAMILY RESIDENTIAL UNITS OR LIGHT COMMERCIAL SPACES SHALL BE RATED AT MERV 6 FOR SYSTEMS RATED AT 30,000 BTU/H OR LESS AND MERV 8 FOR SYSTEMS RATED OVER 30,000 BTU/H BUT NO GREATER THAN 60,000 BTU/H.

## DIVISION 23 - HEATING VENTILATING AND AIR CONDITIONING

### SECTION 230500 - COMMON WORK RESULTS

#### PART 1 - GENERAL

- GENERAL NOTES AND SCOPE OF WORK
  - 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

- 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 CONTROLS

#### PART 1 - GENERAL

#### 1.1 SCOPE OF WORK

- REFER TO SECTION 230500.

#### PART 2 - PRODUCTS

#### 2.1 EQUIPMENT PADS

- PADS SHALL BE 3/4 INCH WATER RESISTANT NEOPRENE WITH WAFFLE PATTERN, MASON TYPE WSW, OR EQUAL.

#### 2.2 ELASTOMERIC HANGERS

- HANGER SHALL CONSIST OF RODS WITH STEEL BOX HOUSING NEOPRENE ISOLATION ELEMENT AND SPRING, MASON SERIES 30N, OR EQUAL.

#### 2.3 RESTRAINED SPRING ISOLATORS

- 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

- 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

- PROVIDE STEEL POURING FORM FOR REINFORCED CONCRETE BLOCKS WITH FLOOR MOUNTED SPRINGS, MASON KSL, OR EQUAL.

#### PART 3 - EXECUTION

#### 3.1 SCHEDULE

- EQUIPMENT PADS - SMALL FLOOR MOUNTED EQUIPMENT OR PACKAGED EQUIPMENT WITH INTERNAL ISOLATION.
- ELASTOMERIC HANGERS - SUSPENDED AIR HANDLING UNITS, EXHAUST FANS, TERMINAL UNITS, HEAT PUMPS, PUMPS, ETC.
- RESTRAINED SPRING ISOLATORS - FLOOR MOUNTED FANS GREATER THAN 1/4 HP.
- ROOF CURB ISOLATORS - FACTORY FABRICATED ROOFTOP UNITS.
- INERTIA BASES - FLOOR MOUNTED PUMPS GREATER THAN 1/4 HP.

#### 3.2 INSTALLATION

- INSTALL VIBRATION CONTROLS PER THE MANUFACTURER'S INSTRUCTIONS.

END OF SECTION

### SECTION 230553 - IDENTIFICATION

#### PART 1 - GENERAL

#### 1.1 SCOPE OF WORK

- REFER TO SECTION 230500.

- VALUE TAGS

#### 1.2 EQUIPMENT LABELS

- MULTILAYER, MULTICOLOR PLASTIC LABELS WITH MECHANICAL ENGRAVING AND HOLES FOR ATTACHMENT TO EQUIPMENT.

#### PART 3 - EXECUTION

#### 3.1 PIPE LABELS

- INSTALL PIPE LABELS WHERE PIPING IS EXPOSED OR ABOVE AN ACCESSIBLE CEILING AT MAXIMUM 20 FT. CENTERS.

#### 3.2 VALVE TAGS

- ATTACH TAGS TO VALVES USING CHAIN. PROVIDE A VALVE SCHEDULE FOR MOUNTING IN THE MECHANICAL ROOM.

#### 3.3 EQUIPMENT LABELS

- PERMANENTLY ATTACH LABELS TO EQUIPMENT. LOCATE WHERE LABEL CAN BE EASILY SEEN AND READ.

END OF SECTION

### SECTION 230593 - TESTING ADJUSTING AND BALANCING

#### PART 1 - GENERAL

#### 1.1 SCOPE OF WORK

- 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 THERE FROM.

- THE TAB FIRM SHALL HAVE A LICENSED PROFESSIONAL ENGINEER SUPERVISING ALL WORK AND THE FIRM SHALL HOLD A CURRENT ASBC OR NEIB CERTIFICATION.

- REFER TO SECTION 230500.

#### 1.2 START-UP, TEST AND ADJUST

- 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.

- 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

- THE HVAC CONTRACTOR SHALL WORK IN CONJUNCTION WITH THE TAB CONTRACTOR TO START-UP AND OPERATE ALL EQUIPMENT NECESSARY TO PROVIDE A COMPLETE AIR AND WATER TEST AND BALANCE REPORT.

- THE 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.

- THE 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

- REFER TO SECTION 230500.

#### PART 2 - PRODUCTS

#### 2.1 CONTROLS SYSTEM

- PROVIDE NEW, MODIFY OR EXTEND AUTOMATIC TEMPERATURE CONTROLS TO ALL NEW EQUIPMENT SHOWN ON THE DRAWINGS.

- REFER TO THE DRAWINGS FOR ANY SPECIAL SEQUENCES OF CONTROL AND LOCATION OF EQUIPMENT.

- REMODEL PROJECTS SHALL UTILIZE EQUIPMENT BY THE SAME MANUFACTURER AS CURRENTLY EXISTS.

#### PART - EXECUTION

#### 3.1 DESIGN AND LAYOUT

- THE CONTROL SYSTEM DESIGN AND LAYOUT SHALL BE PERFORMED BY A FACTORY AUTHORIZED AGENT OF THE MANUFACTURER USED.

#### 3.2 SYSTEM OPERATION

- 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.

- PROVIDE ALL WIRING REQUIRED TO CONNECT INPUT/OUTPUT DEVICES TO CONTROL PANELS.

- TEST AND ADJUST ALL DEVICES AND DOCUMENT CALIBRATION.

- PROVIDE NECESSARY INSTRUCTION TO THE OWNER'S PERSONNEL.

END OF SECTION

### SECTION 233113 - DUCTWORK

#### PART 1 - GENERAL

- SCOPE OF WORK
  - REFER TO SECTION 230500.

#### PART 2 - PRODUCTS

#### 2.1 GENERAL

- UNEXPOSED DUCTWORK SHALL BE CONSTRUCTED OF NEW, PRIME GRADE, CONTINUOUS HOT-DIP MILL GALVANIZED, LOCK-FORMING, QUALITY STEEL. REFER TO SMACNA HVAC DUCT CONSTRUCTION STANDARDS.

- WHERE DUCTS EXPOSED TO VIEW PASS THROUGH WALLS, FLOORS OR CEILINGS, PROVIDE SHEET METAL COLLARS TO COVER VOIDS AROUND THE DUCTS.

- 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.

- 'FIBERBOARD' DUCTWORK WILL NOT BE ACCEPTED ON THIS PROJECT.

#### 2.2 MEDIUM PRESSURE DUCT CONSTRUCTION

- UNLESS NOTED OTHERWISE, MEDIUM PRESSURE DUCTS SHALL BE CONSTRUCTED TO A PRESSURIZATION CLASSIFICATION OF THREE (3) INCHES WG POSITIVE.

- ALL ROUND MEDIUM PRESSURE DUCTS SHALL BE SPIRAL TYPE.

#### 2.3 LOW PRESSURE DUCT CONSTRUCTION

- ALLOW 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.

- 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.

- SHOP FABRICATED DUCTS SHALL BE CONSTRUCTED, BRACED AND REINFORCED IN ACCORDANCE WITH SMACNA STANDARDS.

#### 2.4 DUCT SEALING

- SEAL ALL DUCTWORK ON THE PROJECT TO SMACNA CLASSIFICATION A.

#### 2.5 FLEXIBLE DUCTS

- 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.

- 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.

- FLEXIBLE DUCTS SHALL BE RATED FOR OPERATING PRESSURE OF PLUS 6 INCHES WG THROUGH 10 INCH DIAMETER, PLUS 4 INCHES WG THROUGH 16 INCH DIAMETER AND - 2 INCHES WG FOR ALL SIZES.

- FLEXIBLE DUCTS TO DIFFUSERS AND GRILLES SHALL BE LIMITED TO 6 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

- 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

- DAMPER AND SPLITTER HARDWARE FOR LOW PRESSURE DUCTS SHALL BE:
  - END BEARINGS - VENTLOK #657
  - REGULATOR FINISHED AREAS - VENTLOK #666, PLAIN COVER
  - REGULATOR UNFINISHED AREAS - VENTLOK #640, 3/8 INCH.

- 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

- 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.

- DUCTS SHALL BE REINFORCED IN ACCORDANCE WITH THE APPROPRIATE SMACNA STANDARDS TO PREVENT BUCKLING, BREATHING, VIBRATION AND UNNECESSARY NOISE.

- PROVIDE MANUALLY OPERATED VOLUME CONTROL DAMPERS IN DUCT BRANCHES, FOR PROPER BALANCING OF AIR DISTRIBUTION. DAMPERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPROPRIATE SMACNA STANDARDS.

- 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.

- WHERE DUCTS CONNECT TO FANS, INCLUDING ROOF EXHAUSTERS PROVIDE FLEXIBLE DUCT FABRIC CONNECTIONS. PROVIDE A MINIMUM OF 1/2 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.

- 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.

- 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

- HORIZONTAL AND VERTICAL SHEET METAL DUCTWORK SHALL BE SUPPORTED IN ACCORDANCE WITH THE APPROPRIATE SMACNA STANDARDS.

- 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

- GENERAL NOTES
  - REFER TO SECTION 230500

#### PART 2 - PRODUCTS

#### 2.1 AIR INLETS AND OUTLETS

- 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.

- 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.

- 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

- LOCATIONS OF OUTLETS SHOWN ON THE DRAWINGS ARE APPROXIMATE. COORDINATE THE EXACT LOCATION WITH REFLECTED CEILING PLAN AND OTHER TRADES.

- 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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#### ISSUES

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1	ISSUE FOR PERMIT	08/25/25

#### SEAL



**NOTES BY SYMBOL (X) :**

- EXISTING LOCATION OF TERMINAL BOX TO BE RELOCATED. REMOVE EXISTING MEDIUM AND LOW PRESSURE DUCTWORK AS INDICATED ON DRAWINGS.
- NEW LOCATION OF TERMINAL BOX. MOUNT BOX FROM STRUCTURE ABOVE. ENSURE BOX CLEARANCES ARE MAINTAINED AT NEW LOCATION. EXTEND NEW MEDIUM AND LOW PRESSURE DUCT AS INDICATED ON DRAWINGS. COORDINATE RELOCATION WITH OTHER TRADES INVOLVED.
- PROVIDE YOUNG REGULATOR FOR VOLUME DAMPER CONTROLS. REFER TO GENERAL NOTES FOR ADDITIONAL INFORMATION.
- SUSPEND CEILING MOUNTED CABINET VENTILATION FAN FROM STRUCTURE USING ALTHREAD HANGER RODS WITH VIBRATION ISOLATOR PER EACH ROD (4 THUS). REFER TO RETURN AIR PLAN ON SHEET M1.212 FOR ADDITIONAL INFORMATION.
- ALL EXPOSED ROUND DUCTWORK SHALL BE SPIRAL DUCT, MOUNTED AT HEIGHT REQUIRED TO MAINTAIN BOTTOM OF DUCT ABOVE LIGHTING.
- EXPOSED RECTANGULAR SUPPLY DUCT SHALL HAVE 2" THICK FLEXIBLE FIBERGLASS WITH FOIL WITH A VAPOR BARRIER WITH ALUMINUM WRAP OVER INSULATION.
- PROVIDE EXPANDED TAP AT LOCATION INDICATED ON DRAWINGS. REFER TO SHEET M0.01 FOR DETAIL.

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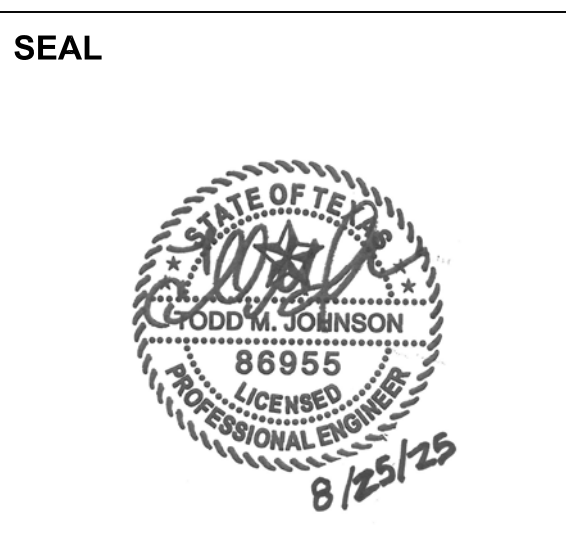
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**PROJECT NAME + ADDRESS**  
**BILLINGSLEY**

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Plano, TX 75093

**PROJECT NUMBER** 13106.000

**SHEET NAME**  
LEVEL 02 MECHANICAL PLAN

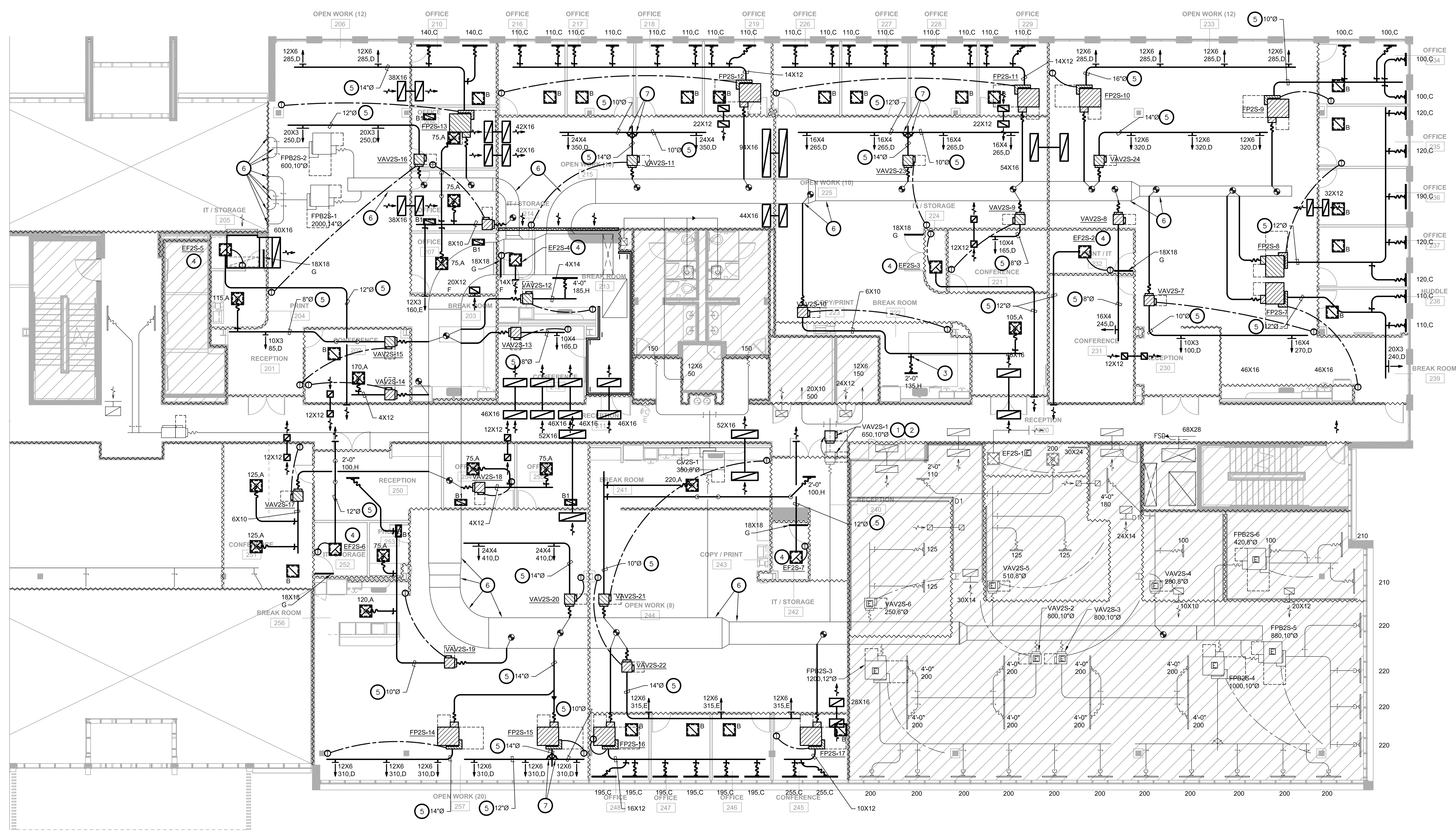
**DRAWN BY** Designer  
**CHECKED BY** Checker

**SCALE**  
1/8" = 1'-0"

**ORIENTATION**

**SHEET NUMBER**  
**M1-202**

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**1 LEVEL 02 MECHANICAL PLAN**  
SCALE: 1/8"=1'-0"

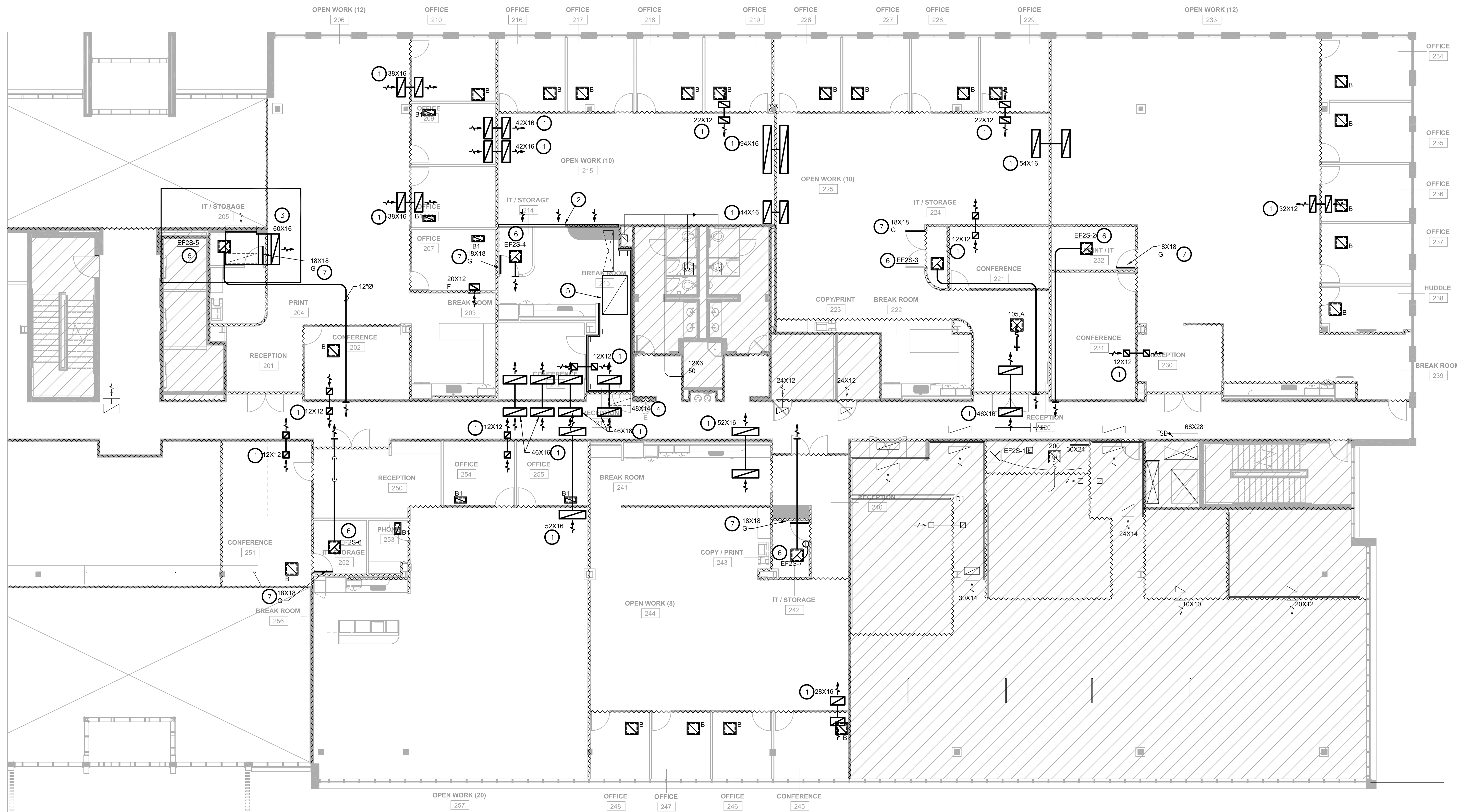
## NOTES BY SYMBOL :

1. PROVIDE ACOUSTICALLY LINED RETURN AIR BOOT THRU WALL TO DECK AS HIGH AS POSSIBLE ABOVE CEILING WITH INLET ELBOW AND OUTLET 90° ELBOW FACING UPWARD. SIZE PER PLANS. REFER TO DETAIL SHEET M0.01 FOR MORE INFORMATION.
2. COORDINATE OPENING ABOVE WALL TO DECK TO ENSURE A CLEARANCE OF 10" BELOW DECK OR PROVIDE 2360 SQUARE INCHES OF FREE AREA THRU RETURN AIR BOOTS BASED ON 500 FPM THRU OPENING.
3. MODIFY DUCT TO EXTEND FULL SIZED DUCT FROM EXISTING SIDEWALL GRILLE IN FOYER, PROVIDE 90 DEGREE ELBOW AND TERMINATE INSIDE SUITE 240 AS SHOWN ON DRAWINGS.
4. REMOVE EXISTING 48X14 TRANSFER DUCTS (TYPICAL OF 4). VERIFY LOCATION OF OPENINGS AT JOB SITE. REPAIR AND PATCH EXISTING CONSTRUCTION DAMAGED DUE TO THE DEMOLITION OF TRANSFER DUCTS USING SAME METHODS AND MATERIALS TO MATCH EXISTING.
5. 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.
6. EXTEND ROUND SPIRAL EXHAUST DUCT FROM CEILING MOUNTED CABINET FAN IN IT CLOSET AS SHOWN ON DRAWINGS.
7. PROVIDE DOOR TRANSFER GRILLE IN LOWER PART OF IT CLOSET DOOR PRIMED AND READY FOR PAINTING. COORDINATE EXACT LOCATION WITH GENERAL CONTRACTOR.
8. MODIFY DUCT TO EXTEND FULL SIZED DUCT FROM EXISTING SIDEWALL GRILLE IN FOYER, PROVIDE 90 DEGREE ELBOW AND TERMINATE INSIDE SUITE 240 AS SHOWN ON DRAWINGS.

## RETURN AIR NOTES:

- 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.
- 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.
- 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.
- RETURN AIR BOOTS SHOWN ON DRAWINGS SHALL BE 1" INSULATED SHEET METAL BOOTS. CONTRACTOR SHALL PROVIDE PRICING FOR DUCT BOARD IN LIEU OF SHEET METAL BOOTS.

REFER TO SHEET M1.001 FOR GENERAL NOTES, AND SYMBOLS.



① LEVEL 01 MECHANICAL RETURN AIR PLAN  
SCALE: 1/8"=1'-0"

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PROJ. JOB NO. 25114602  
PROJECT MGR. TODD JOHNSON  
THIS DRAWING SHALL NOT BE REPRODUCED FOR ANY PROJECT OTHER THAN THE PROJECT NOTED IN THE TITLE BLOCK, WITHOUT THE WRITTEN CONSENT OF PURDY AND GUILLET, THE DALLAS, TX.

ISSUES  
# DESCRIPTION DATE  
1 ISSUE FOR PERMIT 08/25/25

SEAL



PROJECT NAME + ADDRESS  
BILLINGSLEY

6275 W Plano Pkwy  
Plano, TX 75093

PROJECT NUMBER 13106.000

SHEET NAME  
LEVEL 02 MECHANICAL  
RETURN AIR PLAN

DRAWN BY Designer  
CHECKED BY Checker

SCALE  
1/8" = 1'-0"



SHEET NUMBER  
M1-212

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