

## 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 LANDOWNER, ALL EQUIPMENT AND WORKMANSHIP SHALL BE GUARANTEED FOR 1 YEAR.
- 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.
- 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 DUCTWORK SHALL BE GALVANIZED SHEET METAL, FABRICATED, INSTALL AND SEAL DUCTWORK FOR 1" W.G. IN ACCORDANCE WITH SMACNA STANDARDS. DUCTWORK SHALL BE INSULATED WITH 2" FIBERGLASS BLANKET WITH FOIL FACED VAPOR BARRIER TO MEET IECC REQUIREMENT (MIN R5 VALUE).
- 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 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.
- VAV BOXES AND FAN POWERED BOXES SHALL HAVE 24" MINIMUM CLEARANCE ON ALL SIDES OF BOX.
- 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 CFM 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 AIRSTREAM TYPE. ALL MOTORIZED DAMPERS SHALL BE FREE AREA/OUT 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.
- FLEXIBLE DUCTS SHALL BE SIMILAR AND EQUAL TO THERMOFLEX. TYPE M-KE. FLEXIBLE DUCTS SHALL COMPLY WITH APPLICABLE REQUIREMENTS OF UL-181, NFPA 99-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.
- DUCTLINER SHALL BE 1-INCH ACOUSTICAL DUCT LINING IN ACCORDANCE WITH SMACNA STANDARDS. DUCT LINING SHALL BE OWENS-CORNING FIBERGLAS "AEROFLEX" NO. 200 OR EQUAL.
- 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.
- 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)

## FIRE PROTECTION SPECIFICATION:

MODIFY THE EXISTING WET PIPE FIRE SPRINKLER SYSTEM AS REQUIRED FOR THE NEW CORRIDOR LAYOUT INCLUDING RELOCATING PIPING TO CLEAR NEW DUCTWORK, ADDING NEW HEADS, RELOCATING EXISTING HEADS, AND LEAVING CERTAIN EXISTING HEADS IN PLACE. THE SPRINKLER DESIGN SHALL COMPLY WITH NFPA 13, THE REQUIREMENTS OF THE LOCAL AUTHORITIES HAVING JURISDICTION AND THE REQUIREMENTS OF THE OWNER'S INSURANCE COMPANY. EXISTING SPRINKLER HEADS TO BE RELOCATED MAY BE REUSED. EXISTING PIPING WHICH IS REMOVED IN THE MODIFICATION WORK SHALL NOT BE REUSED. NEW SPRINKLER PIPING SHALL BE ROUTED AS REQUIRED TO CLEAR NEW DUCTWORK. EXISTING DUCTWORK TO REMAIN, LIGHT FIXTURES, STRUCTURAL INTERFERENCES, ETC., THE NEW SPRINKLER HEADS SHALL MATCH EXISTING SPRINKLER HEADS. ALL PIPING SHALL BE SCHEDULE 40 WITH USA FITTINGS.

IN ALL CYP. BOARD CEILING AREA, PROVIDE CONCEALED SPRINKLER HEADS WITH CAPS TO BE FACTORY PAINTED TO MATCH CEILING. ALL SPRINKLER HEADS IN LAY-IN CEILING SHALL BE LOCATED IN CENTER OF TILE AND ALIGNED WITH LIGHT FIXTURES.

SPRINKLER CONTRACTOR SHALL PROVIDE SHOP DRAWINGS OF CALCULATIONS AND SPRINKLER HEAD LOCATIONS FOR ARCHITECT TO REVIEW PRIOR TO ANY INSTALLATION. NO EXCEPTION TAKEN.

## VAV BOXES

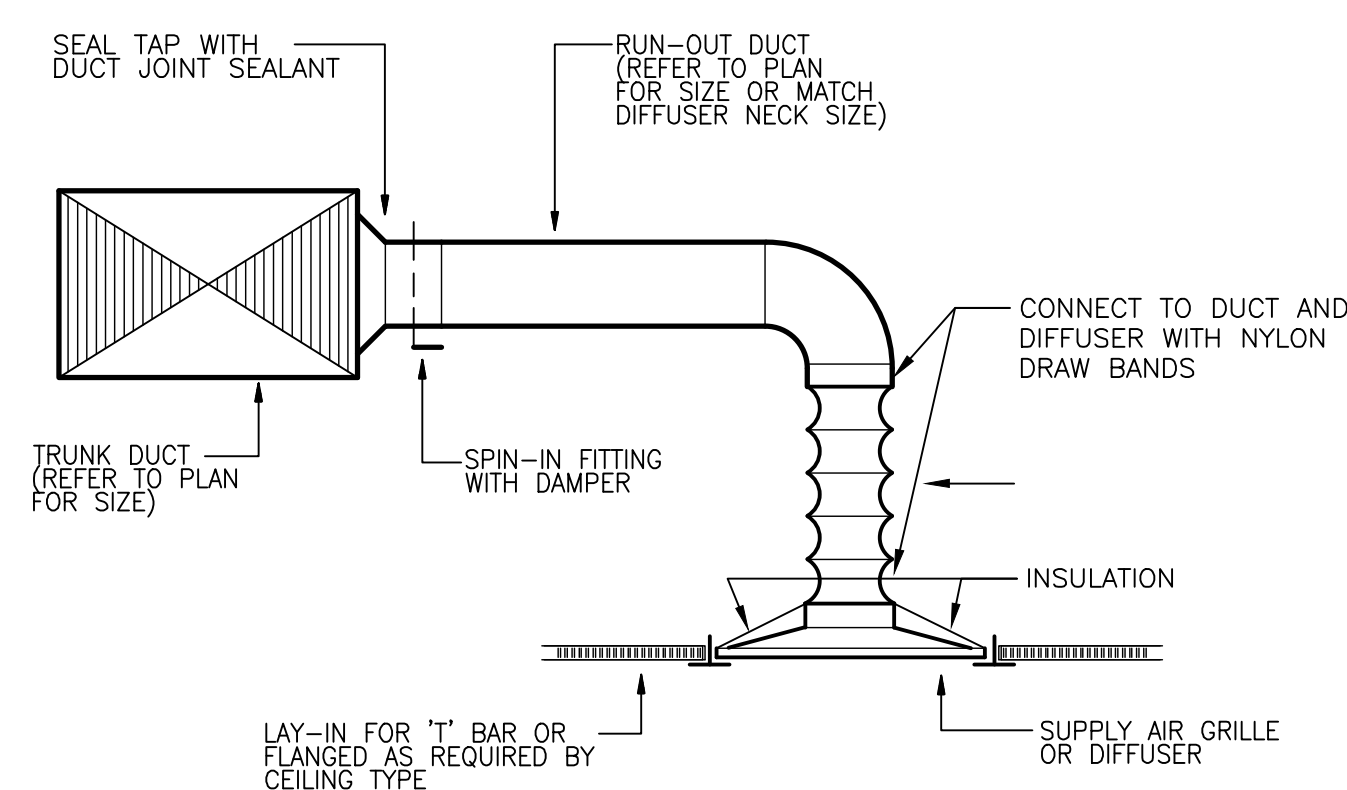
		FIFTH FLOOR		
DESIG.	SERVICES	COOLING CFM	INLET SIZE (IN.)	EQUAL TO BASIS OF DESIGN MFR & MODEL #
VAV-05-01	FULL FLOOR CORRIDOR	400	6"	TITUS REG

NOTES: (APPLICABLE TO ALL BOXES)  
 1) BOXES SHALL BE DCC.  
 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: ENVRO-TEC, NALOR, 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.

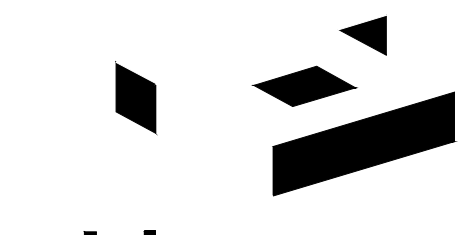
## GRILLES - REGISTERS - DIFFUSERS

DESIG.	DUTY	TYPE	MOUNTING LOCATION	MATERIAL	VOLUME CONTROL	FINISH	AIR PATTERN CONTROL	METHOD OF SUPPORT	EQUAL TO MANUFACTURER AND MODEL NO.	REMARKS
A	SUPPLY	SQUARE PLAQUE	LAY-IN CLG	STEEL	NO	OFF WHITE	YES	T-BAR	TITUS OMNI	SEE NOTE 1,2
B	RETURN	PERFORATED	LAY-IN CLG	STEEL	NO	OFF WHITE	NO	T-BAR	TITUS PAR 240X4 FACE	SEE NOTE 2
C	SUPPLY	LINEAR SLOT	GYP BD CLG	ALUMINUM	NO	OFF WHITE	YES	SURFACE	TITUS ML-39 (1" SLOT)	SEE NOTE 1,3

- NOTES:  
 1) NECK SIZES AS FOLLOWS:
- | DESIGNATION "A" | NECK SIZE | DESIGNATION "C" | NECK SIZE |
|-----------------|-----------|-----------------|-----------|
| 000-300         | 8"RD      | 000-220         | 8"RD      |
| 305-435         | 10"RD     | 225-300         | 10"RD     |
| 440-600         | 12"RD     | 305-360         | 12"RD     |
| 600-745         | 14"RD     | 365-450         | 14"RD     |
- 2) NOTIFY ENGINEER OF ANY DISCREPANCIES BETWEEN NEW MODEL NUMBER AND EXISTING NUMBER PRIOR TO PURCHASE.  
 3) CONTINUOUS GRILLE: PROVIDE REQUIRED MP-39 PLENUMS AS NEEDED.  
 4) APPROVED MANUFACTURERS: PRICE, TITUS, NALOR, GREENHECK, & KRUEGER.



1 DIFFUSER CONNECTION DETAIL  
 SCALE: NOT TO SCALE



2641 IRVING BLVD.  
 DALLAS, TEXAS 75207  
 TEL: 214-638-8800

Purdy - McQuire  
 Mechanical - Electrical Engineers  
 17300 North Dallas Parkway  
 Suite 300  
 Dallas, Texas 75248-1147  
 Form Registration #11-1911  
 Tel: 972-238-5207  
 Fax: 972-238-5231  
 www.purdy-mcquire.com

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 PROJECT MGR. TODD JOHNSON

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PROJECT NO.: 600-005  
 DRAWN BY: MK  
 CHECKED BY: CB

**BILLINGSLEY**  
 COMPANY

6275 WEST PLANO PARKWAY  
 5TH FLOOR CORRIDOR

6275 WEST PLANO  
 PKWY  
 5TH FLOOR  
 PLANO, TX 75093

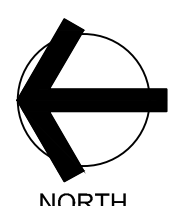
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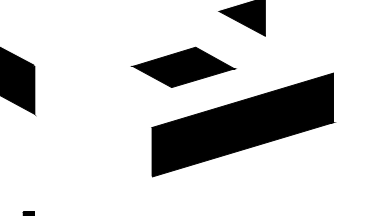
LAND ORD REVIEW/ISSUE DATE: 04/24/2023  
 BID ISSUE DATE: 04/24/2023  
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DRAWING TITLE  
 MECHANICAL NOTES & SYMBOLS

DRAWING NUMBER  
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2641 IRVING BLVD.  
DALLAS, TEXAS 75207  
TEL: 214-638-8800



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**BILLINGSLEY**  
COMPANY

**6275 WEST PLANO PARKWAY**  
**5TH FLOOR CORRIDOR**

6275 WEST PLANO  
PKWY  
5TH FLOOR  
PLANO, TX 75093

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**MECHANICAL SPECIFICATIONS**

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**M1.01**

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**SECTION 231113 - 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. "THERMOBOARD" 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.

**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&E 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.
- C. 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.
- A. 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**

- A. PROVIDE VENTILATORS "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 9697
  - REGULATOR FINISHED AREAS - VENTLOK #666, PLAIN COVER
  - REGULATOR UNFINISHED AREAS - VENTLOK #660, 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, VIBRATION AND UNNECESSARY NOISE.
- C. 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.
- 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 1/2 INCH SLACK IN THE CONNECTIONS, AND A MINIMUM OF 2-1/2 INCH DISTANCE BETWEEN THE EDGES OF THE DUCTS PLUS AN ADDITIONAL MINIMUM OF 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 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 231113 - 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**

**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**

**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 220800 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, 230531 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 230544 - VIBRATION CONTROLS**

**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 WAFLED 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 3/4 HP.
- D. ROOF CURB ISOLATORS - FACTORY FABRICATED ROOF TOP UNITS.
- E. INERTIA BASES - FLOOR MOUNTED PUMPS GREATER THAN 3/4 HP.

**3.2 INSTALLATION**

- A. INSTALL VIBRATION CONTROLS PER THE MANUFACTURER'S INSTRUCTIONS.

**END OF SECTION**

**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 3/8 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.

**END OF SECTION**

**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 AIAH OR NEHC CERTIFICATION.
- 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. 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 NECESSARY TO PROVIDE A COMPLETE 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 3 - EXECUTION**

**3.1 DESIGN AND LAYOUT**

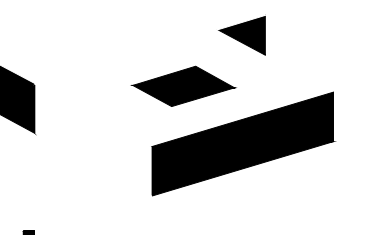
- A. THE CONTROL SYSTEM DESIGN AND LAYOUT SHALL BE PERFORMED BY A FACTORY AUTHORIZED AGENT OF THE MANUFACTURER USED.

**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**



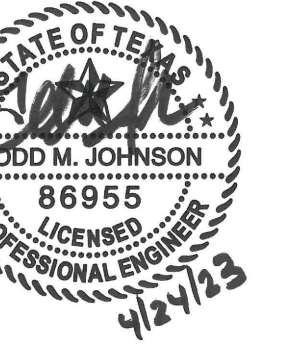


2641 IRVING BLVD.  
DALLAS, TEXAS 75207  
TEL: 214-638-8800

Purdy - McGuire  
Mechanical - Electrical Engineers  
17300 North Dallas Parkway  
Suite 200  
Dallas, Texas 75248-1147  
Firm Registration # E-15111  
Tel: 972-238-5307  
Fax: 972-238-5231  
www.purdy-mcguire.com

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PMI JOB NO. 23028.002  
PROJECT MGR. TODD JOHNSON

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PROJECT NO. 600-005  
DRAWN BY: MK  
CHECKED BY: CB

**BILLINGSLEY**  
COMPANY

**6275 WEST PLANO PARKWAY  
5TH FLOOR CORRIDOR**

6275 WEST PLANO  
PKWY  
5TH FLOOR  
PLANO, TX 75093

NO.	REVISIONS	DATE

LANDLORD REVIEW/ISSUE DATE: 04/24/2023  
BD ISSUE DATE: 04/24/2023  
PERMIT ISSUE DATE: 04/24/2023

DRAWING TITLE  
LEVEL 05  
MECHANICAL PLAN

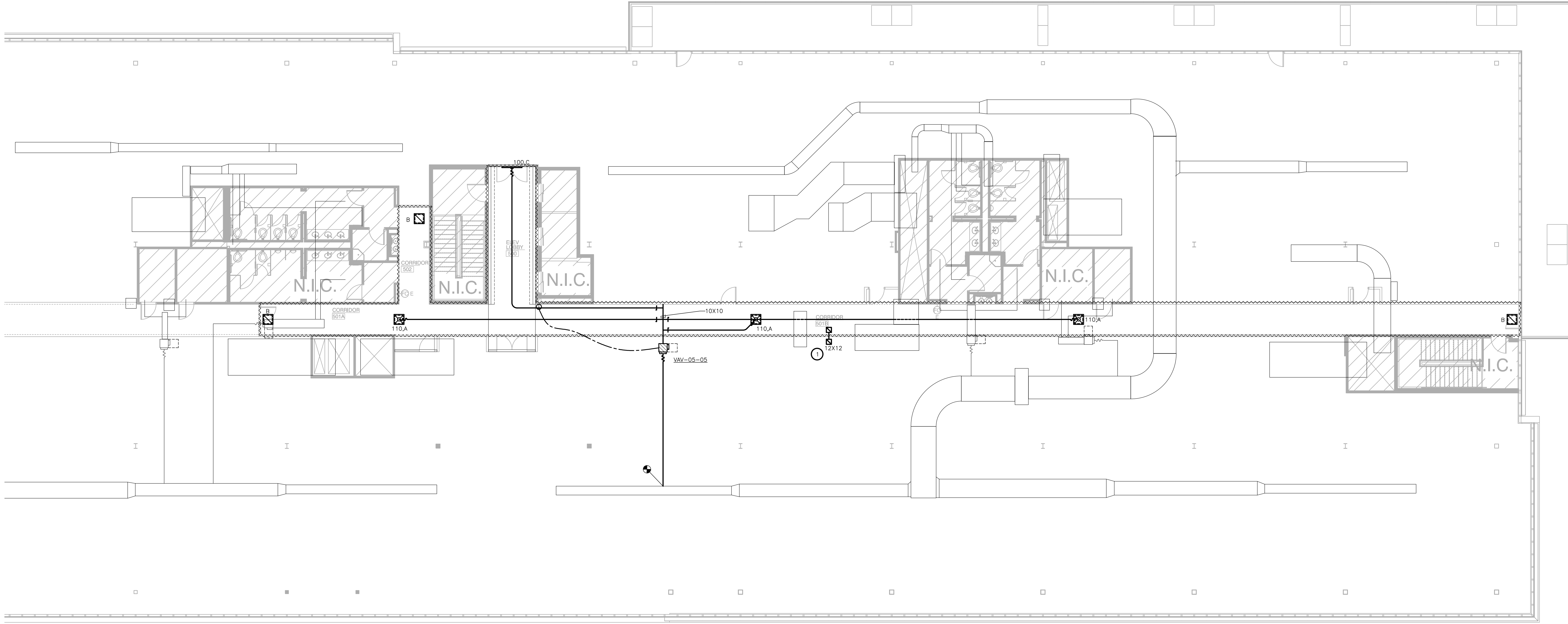
DRAWING NUMBER  
**M2.05**

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**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.

REFER TO SHEET M0.01  
FOR GENERAL NOTES,  
SCHEDULES AND SYMBOLS.



**1 LEVEL 05 MECHANICAL PLAN**  
SCALE: 1/8"=1'-0"

