

**HVAC NOTES**

SECTION 230593 – TESTING, ADJUSTING, AND BALANCING FOR HVAC

- 1.1 SUMMARY
- A. TESTING, ADJUSTING, AND BALANCING FOR THE FOLLOWING:
- AIR SYSTEMS: VARIABLE AIR VOLUME
- 1.2 QUALITY ASSURANCE
- A. THE CONTRACTOR SHALL PROCURE THE SERVICES OF A TESTING, ADJUSTING AND BALANCING (TAB) SPECIALIST WHO SPECIALIZES IN HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS. THE TAB AGENT SHALL HAVE THE FOLLOWING QUALIFICATIONS: AABC, NEBB OR TABB CERTIFIED.
- 1.3 EXECUTION
- A. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL EXISTING AIR AND HYDRONIC SYSTEMS THAT ARE TO REMAIN OR TO BE INCORPORATED INTO NEW WORK PRIOR TO THE STARTING OF WORK IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.
- B. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL NEW AIR AND HYDRONIC SYSTEMS AS LISTED ABOVE IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.
- C. THE REPORT SHALL INDICATE A SCHEMATIC DIAGRAM INDICATING LOCATIONS OF ALL EQUIPMENT TESTED AND MEASUREMENT LOCATIONS.
- D. PRIOR TO FINAL INSPECTION OF THE WORK, THE TAB SPECIALIST SHALL BALANCE ALL SYSTEMS AS INDICATED ABOVE TO THE REQUIREMENTS OF THE DESIGN.
- E. THE CONTRACTOR SHALL HAVE FURNISH AND INSTALL ALL ADDITIONAL BALANCING EQUIPMENT, PRESSURE TAPS, GAUGES AND OTHER EQUIPMENT AS REQUIRED FOR A PROPERLY BALANCED SYSTEM AT NO ADDITIONAL COST TO THE OWNER. SUCH ADDITIONAL EQUIPMENT SHALL ADHERE IN STRICT ACCORDANCE WITH THE RESPECTIVE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.
- F. THE CONTRACTOR SHALL HAVE THE TESTING AND BALANCING SPECIALIST COORDINATE ALL WORK OF THIS SECTION WITH THE BUILDING MANAGER. BALANCING WORK SHALL NOT CONFLICT WITH OTHER WORK SO AS TO MAINTAIN COMPLETION WITHIN THE SPECIFIED TIME.
- G. ALL INSTRUMENTS USED FOR TAB SHALL BE MAINTAINED IN GOOD WORKING CONDITION AND ACCURATELY CALIBRATED.
- H. TOLERANCES: PLUS OR MINUS 5 PERCENT OF DESIGN VALUES.
- I. INSPECTIONS: RANDOM CHECKS BY OWNER OR ARCHITECT TO VERIFY FINAL TESTING, ADJUSTING, AND BALANCING REPORT.
- J. ADDITIONAL TESTS: RANDOM TESTS WITHIN 90 DAYS OF COMPLETING TAB TO VERIFY BALANCE CONDITIONS AND SEASONAL TESTS.
- END OF SECTION 230593

**GENERAL NOTES**

- CONTRACTOR SHALL SURVEY THE AREA OF THIS WORK BEFORE SUBMITTING A BID AND SHALL BE RESPONSIBLE FOR NOTIFYING THE ARCHITECT OF ANY CONDITIONS WHICH WOULD PREVENT THE INSTALLATION OF THE WORK AS SHOWN ON DRAWINGS.
- ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS, AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING A PROPOSAL, OF ANY WORK OR MATERIALS WHICH VIOLATE ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR.
- BEFORE PROCEEDING WITH ANY WORK IN OCCUPIED OR USED AREAS, THE CONTRACTOR SHALL APPLY TO OWNER FOR PERMISSION TO ENTER SUCH AREAS. THE CONTRACTOR IS OBLIGED TO PERFORM HIS WORK ONLY AT THE TIMES DESIGNATED BY OWNER. THERE WILL BE NO ADDITIONAL COMPENSATION FOR THE WORK PERFORMED AFTER HOURS OR ON OFF-DAYS WITHOUT PRIOR WRITTEN APPROVAL.
- THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS DIRECTED, AND IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.
- THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS, WHEN SO DIRECTED, HOWEVER THE CONTRACTOR SHALL INSTALL WORK IN OVERTIME AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.
- CONTRACTOR SHALL ASCERTAIN THE APPROPRIATE METHOD FOR BRINGING THE UNITS INTO AND THROUGH THE BUILDING TO POSITION UNIT IN LOCATION SHOWN ON THE PLANS, WHERE NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM MANUFACTURER IN SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH RESTRICTIVE SPACES. COORDINATE WITH BUILDING OWNER APPROPRIATE TIMES OF DAY SUCH EQUIPMENT MAY BE MOVED THROUGH ALL AREAS.
- DUCTWORK AND PIPING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OR RUNS. THE CONTRACTOR SHALL MAKE ALLOWANCE IN PRICING FOR ROUTING OF DUCTWORK AND PIPING TO AVOID OBSTRUCTIONS. EXACT LOCATIONS ARE SUBJECT TO APPROVAL OF ARCHITECT. COORDINATION WITH THE EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES IS REQUIRED.
- SUPPORT ALL DUCTWORK AND PIPING FROM BUILDING STRUCTURE AND/OR FRAMING IN AN APPROVED MANNER. WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING OR SUPPORTS FOR EQUIPMENT, FURNISH ADDITIONAL FRAMING. INSERTS SHALL BE STEEL, SLOTTED TYPE AND FACTORY PAINTED. SINGLE ROD SHALL BE SIMILAR TO GRINNELL FIG. 281. MULTI-ROD SHALL BE SIMILAR TO FEE & MASON SERIES 9000 WITH END CAPS AND STRIPS. SUPPORTS SHALL HAVE MAXIMUM LOADING INCLUDING PIPES, DUCTWORK CONTENTS AND COVERING SHALL NOT EXCEED 75% OF RATED INSERT CAPABILITY. WHEN SUPPORTING FROM BUILDING USE BEAM CLAMPS IN APPROVED MANNER.
- PROVIDE ALL NECESSARY FLASHING AND COUNTER FLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THIS BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF PIPES, DUCTS, LOUVERS, CONDUIT, AND EQUIPMENT. PROVIDE EQUIPMENT CURBS AND DUNNAGE STEEL AS REQUIRED.
- SEAL OPENINGS AROUND DUCTS AND PIPING THROUGH PARTITIONS, WALLS AND FLOORS (NOT IN SHAFTS) WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL (FIBERGLASS INSULATION IS NOT ACCEPTABLE).
- WHERE PENETRATIONS THROUGH FIRE RATED WALLS ARE NOT FIRE PROOFED THIS CONTRACTOR SHALL BE RESPONSIBLE TO SEAL SAME TO MAINTAIN THE RATED INTEGRITY.
- INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.
- ACCESS DOORS ARE REQUIRED FOR ALL BUILDING SERVICE VALVES THAT RUN THROUGH THE SPACE, AND ACCESS DOOR SHALL HAVE THE EQUAL RATED CAPACITY (1HR, 2HR, ETC.) AS WALL. COORDINATE ALL LOCATIONS OF ACCESS DOORS WITH THE ARCHITECT.
- REMOVABLE ACCESS TILE AND/OR ACCESS DOOR ARE REQUIRED IN HUNG CEILINGS, SHAFTS AND WALLS FOR ALL VOLUME AND FIRE DAMPERS, AUTOMATIC DAMPERS AND ALL OTHER MECHANICAL EQUIPMENT AND DEVICES. HVAC CONTRACTOR TO FURNISH ACCESS LOCATION REQUIREMENTS TO GENERAL CONTRACTOR. ACCESS TILE IDENTIFICATION: PROVIDE BUTTONS, TABS, AND MARKERS TO IDENTIFY LOCATION OF CONCEALED VALVES, DAMPERS AND EQUIPMENT.
- THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.
- UNLESS OTHERWISE SPECIFICALLY SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.
- MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- ALL EQUIPMENT SHALL BE PROVIDED WITH ONE YEAR WARRANTY PARTS AND LABOR AND FIVE YEARS ON COMPRESSORS. WARRANTY PERIOD BEGINS UPON PROJECT ACCEPTANCE
- ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.

**SCOPE OF WORK**

- PROVIDE NEW OR RELOCATE EXISTING DIFFUSERS AS SHOWN ON PLAN FOR NEW OFFICE CUBICLES. CONNECT NEW SUPPLY DUCT TO EXISTING DUCTWORK WHEREVER SHOWN ON PLAN.
- THE WORK UNDER CONTRACT INCLUDES ALL LABOR, MATERIALS AND APPLIANCES NECESSARY FOR THE FURNISHING, INSTALLING AND TESTING, COMPLETE AND READY FOR SAFE OPERATION OF THE SYSTEMS AS DESCRIBED IN THE SPECIFICATIONS, FLOOR PLAN(S) DESIGN, DETAIL DRAWINGS, NOTES, RFI'S, ETC. FOR THIS PROJECT. WORK SHALL BE INSTALLED IN A NEAT, WORKMANLIKE MANNER.
- THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH THE DEPARTMENT HAVING JURISDICTION, OBTAIN PERMITS OR LICENSES NECESSARY TO CARRY OUT THIS WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR, AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.
- THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OR ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES, BY OWNER, INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.

**FLORIDA BUILDING DEPARTMENT NOTES**

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF 2023 FLORIDA BUILDING CODE (FBC) AND ALL AMENDMENTS AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE. THE LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF SUCH MECHANICAL SYSTEMS AND CONDUCTING SUCH TESTS WILL FILE DOCUMENTATION AND REPORTS OF TESTS THAT THE SYSTEM COMPLIES WITH THE CONSTRUCTION DOCUMENTS AND APPLICABLE LAWS.

- TESTS OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING SECTIONS OF THE 2023 FMC, 8TH EDITION:
  - VENTILATION SYSTEM – 2023 FMC 403
- THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
  - DUCT CONSTRUCTION AND INSTALLATION – 2023 FMC 603
  - AIR INTAKES, EXHAUSTS AND RELIEF – 2023 FMC 401.5
  - GAS FIRED EQUIPMENT – 2023 FLORIDA FUEL GAS CODE
- MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
- VENTILATION FOR ALL AREA SHALL COMPLY WITH 2023 FMC 401.
- A STATEMENT SHALL BE FILED BY THE OWNER OR TENANT IN POSSESSION THAT THE VENTILATION SYSTEM WILL BE KEPT IN CONTINUOUS OPERATION AT ALL TIMES DURING THE NORMAL OCCUPANCY OF THE STRUCTURE AS REQUIRED BY 2023 FMC 403.3.1.3 (SYSTEM OPERATION)
- REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE-RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.
- THESE PLANS ARE APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.
- ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.
- DUCT SMOKE DETECTOR SHALL MEET UL268A.
- VENTILATION SYSTEMS SHALL BE BALANCED TO MAINTAIN THE MINIMUM VENTILATION AIRFLOW RATE AS SHOWN IN VENTILATION REQUIREMENT TABLE. THIS SYSTEM SHALL BE BALANCED BY APPROVED METHOD – FMC 2023 608.1. CONTRACTOR SHALL SUBMIT THE AIR BALANCE REPORT TO THE INSPECTOR.

**MECHANICAL SYMBOLS LIST**

EQUIPMENT SYMBOL		MECHANICAL ABBREVIATIONS	
AC-1	TXF-1	AC	AIR CONDITIONING UNIT
XX	X	ACC	AIR COOLED CONDENSER
<b>AIR DEVICES</b>			
☒	☒	AL	ACOUSTIC LINING
SUPPLY GRILL		GD	GRAVITY DAMPER
RETURN GRILL		CFM	CUBIC FEET OF AIR PER MINUTE
<b>DUCT ACCESSORIES</b>			
GD		C.O.	CLEAN OUT
GRAVITY DAMPER		COP	COEFFICIENT OF PERFORMANCE
FIRE DAMPER W/ ACCESS DOOR		CP	CONDENSATE PUMP
MOTORIZED DAMPER W/ ACCESS DOOR		CR	CONDENSATE RETURN PIPING
VOLUME DAMPER W/ ACCESS DOOR		CD	CONDENSATE DRAIN PIPE
DOOR UNDERCUT		DN	DOWN
<b>HVAC PIPING</b>			
CP		EDH	ELECTRIC DUCT HEATER
REF		EER	ENERGY EFFICIENCY RATIO
NEW CONDENSATE PIPING		EUH	ELECTRIC UNIT HEATER
NEW REFRIGERANT PIPING		EG	EXHAUST GRILLE
<b>CONTROLS AND SENSORS</b>			
Ⓢ		EN	ENERGY ANALYSIS
THERMOSTAT		FD	FIRE DAMPER W/FUSIBLE LINK
S		GX	GENERAL EXHAUST RISER
MANUAL ON/OFF SWITCH		GXF	GENERAL EXHAUST FAN
S <sub>0</sub>		HS	HYDRO SEPERATOR
DUCT SMOKE DETECTOR		HSPF	HEATING SEASONAL PERFORMANCE FACTOR
CO		GRXF	GARAGE EXHAUST FAN
CO DETECTOR		IEER	INTEGRATED ENERGY EFFICIENCY RATIO
<b>DUCTWORK</b>			
=====		MD	MOTORIZED DAMPER
AIR DUCT W/ 1.5" ACOUSTICAL LINING		OA	OUTDOOR AIR
~~~~~		REF	REFRIGERANT PIPING
FLEXIBLE DUCT		RG	RETURN GRILLE
FC FC		SAR	SUPPLY AIR REGISTER
FLEXIBLE CONNECTION		SEER	SEASONAL ENERGY EFFICIENCY RATIO
24X12		SG	SUPPLY GRILLE
RECTANGULAR DUCT (WIDTH X DEPTH)		TRXF	TRASH ROOM EXHAUST FAN
Ø12		TRX	TRASH ROOM EXHAUST RISER
ROUND DUCT (DIAMETER)		TX	TOILET EXHAUST RISER
⊙		TXF	TOILET EXHAUST FAN
ROUND DUCT CROSS SECTION		VD	VOLUME DAMPER
☒		VAV	VARIABLE AIR VOLUME
SUPPLY AIR RECTANGULAR DUCT CROSS SECTION		FTU	FAN TERMINAL UNIT
☒		EAT	ENTERING AIR TEMPERATURE
RETURN AIR RECTANGULAR DUCT CROSS SECTION		LAT	LEAVING AIR TEMPERATURE
		MAX	MAXIMUM
		MIN	MINIMUM
		KW	KILOWATT
		(E)	EXISTING
		(N)	NEW

MECHANICAL DRAWING LIST	
M0.1	MECHANICAL SYMBOLS, ABBREVIATIONS AND NOTES
M0.2	MECHANICAL SPECIFICATIONS
M1.0	MECHANICAL FLOOR PLAN
M5.0	MECHANICAL DETAILS
M6.0	MECHANICAL SCHEDULES AND HEAT LOAD CALCULATION



SECTION 230713 – DUCT INSULATION

1.1 QUALITY ASSURANCE

SURFACE-BURNING CHARACTERISTICS: ALL INSULATION SHALL HAVE COMPOSITE (INSULATION JACKET OR FACING AND ADHESIVE USED TO ADHERE THE FACING OR JACKET TO THE INSULATION) A FLAME-SPREAD INDEX OF 25, AND SMOKE-DEVELOPED INDEX OF 50 FOR INSULATION INSTALLED INDOOR, 75, AND SMOKE-DEVELOPED INDEX OF 150 FOR INSULATION INSTALLED OUTDOORS; ACCORDING TO ASTM E 84.

1.2 FIELD QUALITY CONTROL

A. FIELD INSPECTIONS: BY OWNER-ENGAGED AGENCY.

1.3 INDOOR DUCT AND PLENUM INSULATION SCHEDULE;

A. CONCEALED, RECTANGULAR, ROUND AND FLAT-OVAL, SUPPLY-RETURN, OUTDOOR-AND EXHAUST-AIR DUCT AND AIR PLENUM INSULATION:  
 B. FLEXIBLE ELASTOMERIC, MINERAL-FIBER BLANKET, MINERAL-FIBER BOARD OR POLYOLEFIN WITH MINIMUM INSTALLED THERMAL RESISTANCE AS FOLLOWS:

	SUPPLY	RETURN
UNCONDITIONED SPACES WITHIN BUILDING:	R-4.2	R-4.2
WITHIN BUILDING ENVELOPE ASSEMBLY:	R-6	R-4.2
OUTSIDE OF BUILDING:	R-6	R-4.2

1.4 ITEMS NOT INSULATED:

- FIBROUS-GLASS DUCTS.
- METAL DUCTS WITH DUCT LINER OR SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE ANDASHRAE/IESNA 90.1.
- FACTORY-INSULATED FLEXIBLE DUCTS.
- FACTORY-INSULATED PLENUMS AND CASINGS.
- FLEXIBLE CONNECTORS.
- VIBRATION-CONTROL DEVICES.
- FACTORY-INSULATED ACCESS PANELS AND DOORS.
- DUCTS THAT HAVE INTERNAL ACOUSTICAL LINING.

1.5 PRODUCTS

A. THE FOLLOWING INSULATION MANUFACTURERS WILL BE ACCEPTABLE:  
 1. JOHNS-MANVILLE  
 2. OWENS-CORNING

1.6 ACOUSTICAL TREATMENT

- WHERE SHOWN ON THE DRAWINGS, LOW PRESSURE DUCTWORK SHALL BE LINED WITH 1/2" THICK R-6 AS MANUFACTURED BY DUCTMATE, 1-1/2 POUND MINIMUM DENSITY, NEOPRENE COATED, FLEXIBLE FIBERGLASS DUCT LINER. LINING SHALL COMPLY WITH NFPA 90A AND SHALL HAVE A FLAME SPREAD CLASSIFICATION OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING NOT MORE THAN 50. DUCT SIZES WHERE LINING IS INDICATED ON PLANS ARE MINIMUM INSIDE CLEAR DIMENSIONS REQUIRED,

END OF SECTION 230713

SECTION 233113 – METAL DUCTS

1.1 CONSTRUCTION

A. EACH DUCT SYSTEM SHALL BE CONSTRUCTED FOR THE SPECIFIC SMACNA DUCT PRESSURE CLASSIFICATIONS SHOWN ON THE CONTRACT DRAWINGS. WHERE NO PRESSURE CLASSES ARE SPECIFIED BY THE DESIGNER, THE SMACNA 1 INCH WG PRESSURE, SEAL CLASS "A".

B. ALL DUCTWORK SHALL BE CONSTRUCTED TO SMACNA 1" WG DESIGN AND NOT LESS THAN THE FOLLOWING STANDARDS:

- CONSTRUCT SO THAT ALL INTERIOR SURFACES ARE SMOOTH. USE SLIP AND DRIVE OR FLANGED AND BOLTED CONSTRUCTION WHEN FABRICATING RECTANGULAR DUCTWORK. USE SPIRAL LOCK SEAM CONSTRUCTION WHEN FABRICATING ROUND SPIRAL DUCTWORK. SHEET METAL SCREWS MAY BE USED ON DUCT HANGERS, TRANSVERSE JOINTS AND OTHER SMACNA APPROVED LOCATIONS IF THE SCREW DOES NOT EXTEND MORE THAN 1/2 INCH INTO THE DUCT.
- SHEET STEEL SHALL COMPLY WITH ASTM A653 STANDARD SPECIFICATION FOR STEEL SHEET METAL, ZINC COATED (GALVANIZED) OR ZINC IRON ALLOY-COATED (GALVANNEALED) BY HOT DIP PROCESS, AND A924 STANDARD SPECIFICATION FOR GENERAL REQUIREMENT FOR SHEET METALLIC-COATED BY HOT DIP PROCESS. ALL ANGLE IRON USED FOR SUPPORT SHALL BE GALVANIZED. CONNECTIONS TO WALLS OR FLOOR SHALL BE AIR TIGHT WITH ANGLE IRON AND CAULKING. SEAL ALL DUCT SEAMS, TRANSVERSE AND LONGITUDINAL, AIR TIGHT. PROVIDE TURNING VANES ALL 90° ELBOWS.
- USE ELBOWS AND TEES WITH A CENTER LINE RADIUS TO WIDTH OR DIAMETER RATIO OF 1.5 WHEREVER SPACE PERMITS. WHEN A SHORTER RADIUS MUST BE USED DUE TO LIMITED SPACE, INSTALL SINGLE WALL SHEET METAL SPLITTER VANES IN ACCORDANCE WITH SMACNA PUBLICATIONS, TYPE RE 3. WHERE SPACE WILL NOT ALLOW AND THE C VALUE OF THE RADIUS ELBOW, AS GIVEN IN SMACNA PUBLICATIONS, EXCEEDS 0.31, USE RECTANGULAR ELBOWS WITH TURNING VANES AS SPECIFIED IN SECTION 23 33 00. SQUARE THROAT-RADIUS HEEL ELBOWS WILL NOT BE ACCEPTABLE. STRAIGHT TAPS OR BULLHEAD TEES ARE NOT ACCEPTABLE.

- WHERE RECTANGULAR ELBOWS ARE USED, PROVIDE TURNING VANES IN ACCORDANCE WITH SECTION 23 33 00.
- PROVIDE EXPANDED TAKE-OFFS OR 45 DEGREE ENTRY FITTINGS FOR BRANCH DUCT CONNECTIONS WITH BRANCH DUCTWORK AIRFLOW VELOCITIES GREATER THAN 700 FPM. SQUARE EDGE 90-DEGREE TAKE-OFF FITTINGS OR TRAITHT TAPS WILL NOT BE ACCEPTED.
- BUTTON PUNCH SNAP-LOCK CONSTRUCTION WILL NOT BE ACCEPTED ON ALUMINUM DUCTWORK.
- ROUND DUCTS MAY BE SUBSTITUTED FOR RECTANGULAR DUCTS IF SIZED IN ACCORDANCE WITH ASHRAE TABLE OF EQUIVALENT RECTANGULAR AND ROUND DUCTS. NO VARIATION OF DUCT CONFIGURATION OR SIZES PERMITTED EXCEPT BY WRITTEN PERMISSION OF THE ENGINEER.

C. WHERE LATEST EDITION OF SMACNA DOES NOT CLEARLY STATE GAUGES AND/OR STIFFENERS TO BE USED OR, WHERE SMACNA STANDARDS REQUIRE INTERPRETATION, THE FOLLOWING MINIMUM METAL GAUGES AND BRACING SHALL BE USED:

USG	MAX. SIDE INCHES	TRANSVERSE JOINTS AND BRACING
22	UP TO 12	S SLIP, DRIVE SLIP, ONE INCH POCKET LOCK ON 8 FOOT CENTERS
22	13 TO 24	1"x1"x1/8" ANGLES ON 4 FOOT CENTERS
20	25 TO 35	1"x1"x1/8" ANGLES ON 2 FOOT CENTERS

D. PROVIDE TAPPING IN DUCTS FOR THERMOMETERS WHERE SPECIFIED. IN ADDITION, PROVIDE AN AIRTIGHT PLUGGED TAPPING LOCATED AS FOLLOWS:

- UPSTREAM OF EACH REHEAT COIL AND VAV BOX.
- DOWNSTREAM OF EACH REHEAT COIL AND VAV BOX.

E. FLAT OVAL OR ROUND DUCTWORK MAY BE PROVIDED IN LIEU RECTANGULAR DUCTWORK WITH THE REINFORCEMENT FOR FLAT SIDES SAME AS SPECIFIED FOR THE RECTANGULAR DUCTWORK, AND AS PER SMACNA FLAT OVAL DUCT CONSTRUCTION STANDARDS SHOWN IN FIG. 3-6 AND AS SHOWN IN FIG. 3-1 AND 3-2 FOR ROUND DUCTWORK.

F. ALL DUCTWORK SHALL BE SEALED TO CLASS "A" AND LEAK TESTED TO MEAT SMACNA CLASS 6 FOR RECTANGULAR AND CLASS 3 FOR ROUND DUCTS.

1.2 MATERIALS

- SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS.
- SINGLE-WALL ROUND AND FLAT-OVAL DUCTS AND FITTINGS.
- SHEET METAL MATERIALS:
  - GALVANIZED SHEET STEEL.
  - STAINLESS-STEEL SHEETS.
  - ALUMINUM SHEETS.
  - FACTORY-APPLIED ANTI-MICROBIAL COATING.

D. DUCT LINER:

- FIBROUS GLASS, TYPE I, FLEXIBLE.
  - WITH ANTI-MICROBIAL EROSION-RESISTANT COATING.
- FLEXIBLE ELASTOMERIC.
- NATURAL FIBER.

E. SEALANT MATERIALS:

- TWO-PART TAPE SEALING SYSTEM.
- WATER-BASED JOINT AND SEAM SEALANT.
- SOLVENT-BASED JOINT AND SEAM SEALANT.
- FLANGED JOINT SEALANT.
- FLANGE GASKETS.
- ROUND DUCT JOINT O-RING SEALS.

1.3 DUCT CLEANING

A. CLEAN EXISTING DUCT SYSTEM(S) BEFORE TESTING, ADJUSTING, AND BALANCING.

B. CLEAN THE FOLLOWING ITEMS:

- AIR OUTLETS AND INLETS.
- SUPPLY, RETURN, AND EXHAUST FANS.
- AIR-HANDLING UNITS.
- COILS AND RELATED COMPONENTS.
- RETURN-AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
- SUPPLY-AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
- DEDICATED EXHAUST AND VENTILATION COMPONENTS AND MAKEUP AIR SYSTEMS.

1.4 DUCT SCHEDULE

A. ALL DUCTS SHALL BE GALVANIZED STEEL EXCEPT AS FOLLOWS:

- MOIST ENVIRONMENT DUCT MATERIAL: ALUMINUM.

END OF SECTION 233113

NON-METAL DUCTS

A. ALL DUCTS SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH SMACNA/ANSI-HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE, LATEST EDITION, SMACNA HVAC AIR DUCT LEAKAGE TEST MANUAL, LATEST EDITION, NAIMA FIBROUS GLASS DUCT CONSTRUCTION STANDARD AND 2020 FBC- MECHANICAL CODE , SECTION 603. THE MORE STRINGENT REQUIREMENT OF ANY CODES SHALL APPLY.

B. NONMETALLIC DUCTS SHALL BE CONSTRUCTED WITH CLASS 0 OR CLASS 1 DUCT MATERIAL AND SHALL COMPLY WITH UL 181. FIBROUS DUCT CONSTRUCTION SHALL CONFORM TO THE SMACNA FIBROUS GLASS DUCT CONSTRUCTION STANDARDS OR NAIMA FIBROUS GLASS DUCT CONSTRUCTION STANDARDS. THE AIR TEMPERATURE WITHIN NONMETALLIC DUCTS SHALL NOT EXCEED 250°F (121°C).

C. THE USE OF GYPSUM BOARDS TO FORM AIR SHAFTS (DUCTS) SHALL BE LIMITED TO RETURN AIR SYSTEMS WHERE THE AIR TEMPERATURES DO NOT EXCEED 125°F (52°C) AND THE GYPSUM BOARD SURFACE TEMPERATURE IS MAINTAINED ABOVE THE AIRSTREAM DEW-POINT TEMPERATURE. AIR DUCTS FORMED BY GYPSUM BOARDS SHALL NOT BE INCORPORATED IN AIR-HANDLING SYSTEMS UTILIZING EVAPORATIVE COOLERS.

D. FACTORY-MADE FLEXIBLE AIR DUCTS AND CONNECTORS SHALL BE NOT MORE THAN 5 FEET IN LENGTH AND SHALL NOT BE USED IN LIEU OF RIGID ELBOW OR FITTINGS. FLEXIBLE AIR DUCTS SHALL BE PERMITTED TO BE USED AS AN ELBOW AT A TERMINAL DEVICE.

SECTION 233713 – DIFFUSERS, REGISTERS, AND GRILLES

1.1 PRODUCTS

A. DIFFUSERS, REGISTERS AND GRILLES SHALL BE FURNISHED AND INSTALLED FOR CAPACITIES AND IN LOCATIONS INDICATED ON DRAWINGS. ALL REGISTERS AND DIFFUSERS SHALL BE PRIME COATED STEEL OR EXTRUDED ALUMINUM FINISHED UNLESS OTHERWISE NOTED IN BAKED WHITE ENAMEL.

B. MANUFACTURERS: TITUS

1. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCT BY ONE OF THE FOLLOWING:

- CARNES.
- HART & COOLEY INC.
- KRUEGER.
- METALAIRE, INC.
- MAILOR INDUSTRIES INC.
- RUSKIN

C. ALL DIFFUSERS SHALL HAVE CONTROLLING/EQUALIZING GRID AND OPPOSED BLADE DAMPER UNLESS OTHERWISE NOTED.

D. ALL DUCTED RETURN REGISTERS SHALL HAVE AN OPPOSED BLADE DAMPER UNLESS OTHERWISE NOTED.

END OF SECTION 233713

THERMOSTATIC CONTROLS:

C403.4.1 THERMOSTATIC CONTROLS  
 THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONE SHALL BE CONTROLLED BY INDIVIDUAL THERMOSTATIC CONTROLS CAPABLE OF RESPONDING TO TEMPERATURE WITHIN THE ZONE. WHERE HUMIDIFICATION OR DEHUMIDIFICATION OR BOTH IS PROVIDED, NOT FEWER THAN ONE HUMIDITY CONTROL DEVICE SHALL BE PROVIDED FOR EACH HUMIDITY CONTROL SYSTEM.

C403.4.1.2 DEADBAND  
 WHERE USED TO CONTROL BOTH HEATING AND COOLING, ZONE THERMOSTATIC CONTROLS SHALL BE CONFIGURED TO PROVIDE A TEMPERATURE RANGE OR DEADBAND OF NOT LESS THAN 5°F (2.8°C) WITHIN WHICH THE SUPPLY OF HEATING AND COOLING ENERGY TO THE ZONE IS SHUT OFF OR REDUCED TO A MINIMUM.

C403.4.1.3 SETPOINT OVERLAP RESTRICTION  
 WHERE A ZONE HAS A SEPARATE HEATING AND A SEPARATE COOLING THERMOSTATIC CONTROL LOCATED WITHIN THE ZONE, A LIMIT SWITCH, MECHANICAL STOP OR DIRECT DIGITAL CONTROL SYSTEM WITH SOFTWARE PROGRAMMING SHALL BE CONFIGURED TO PREVENT THE HEATING SETPOINT FROM EXCEEDING THE COOLING SETPOINT AND TO MAINTAIN A DEADBAND IN ACCORDANCE WITH SECTION C403.4.1.2.

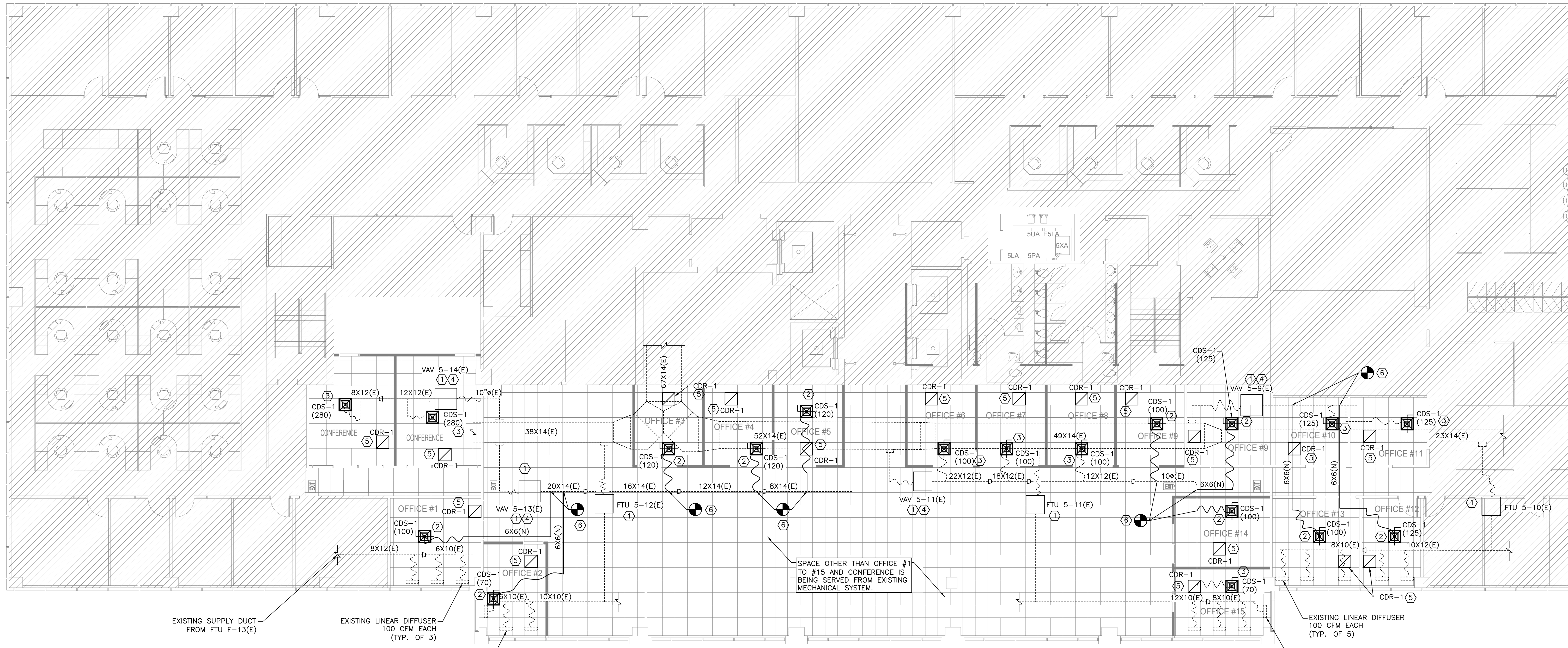
C403.4.2 OFF-HOUR CONTROLS  
 EACH ZONE SHALL BE PROVIDED WITH THERMOSTATIC SETBACK CONTROLS THAT ARE CONTROLLED BY EITHER AN AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROL SYSTEM.

C403.4.2.1 THERMOSTATIC SETBACK  
 THERMOSTATIC SETBACK CONTROLS SHALL BE CONFIGURED TO SET BACK OR TEMPORARILY OPERATE THE SYSTEM TO MAINTAIN ZONE TEMPERATURES DOWN TO 55°F (13°C) OR UP TO 85°F (29°C).

C403.4.2.2 AUTOMATIC SETBACK AND SHUTDOWN  
 AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROLS SHALL BE CAPABLE OF STARTING AND STOPPING THE SYSTEM FOR SEVEN DIFFERENT DAILY SCHEDULES PER WEEK AND RETAINING THEIR PROGRAMMING AND TIME SETTING DURING A LOSS OF POWER FOR NOT FEWER THAN 10 HOURS. ADDITIONALLY, THE CONTROLS SHALL HAVE A MANUAL OVERRIDE THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO 2 HOURS; A MANUALLY OPERATED TIMER CONFIGURED TO OPERATE THE SYSTEM FOR UP TO 2 HOURS; OR AN OCCUPANCY SENSOR.

C403.4.2.3 AUTOMATIC START AND STOP  
 AUTOMATIC START AND STOP CONTROLS SHALL BE PROVIDED FOR EACH HVAC SYSTEM. THE AUTOMATIC START CONTROLS SHALL BE CONFIGURED TO AUTOMATICALLY ADJUST THE DAILY START TIME OF THE HVAC SYSTEM IN ORDER TO BRING EACH SPACE TO THE DESIRED OCCUPIED TEMPERATURE IMMEDIATELY PRIOR TO SCHEDULED OCCUPANCY. AUTOMATIC STOP CONTROLS SHALL BE PROVIDED FOR EACH HVAC SYSTEM WITH DIRECT DIGITAL CONTROL OF INDIVIDUAL ZONES. THE AUTOMATIC STOP CONTROLS SHALL BE CONFIGURED TO REDUCE THE HVAC SYSTEM'S HEATING TEMPERATURE SETPOINT AND INCREASE THE COOLING TEMPERATURE SETPOINT BY NOT LESS THAN 2°F (-16.6°C) BEFORE SCHEDULED UNOCCUPIED PERIODS BASED ON THE THERMAL LAG AND ACCEPTABLE DRIFT IN SPACE TEMPERATURE THAT IS WITHIN COMFORT LIMITS

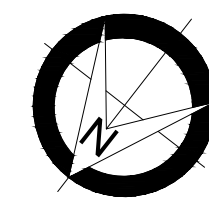




## MECHANICAL FLOOR PLAN

1801 HERMITAGE BOULEVARD - 5TH FLOOR

SC: 1/8" = 1'-0"



### MECHANICAL GENERAL NOTES:

- CONTRACTOR SHALL BALANCE EACH DEVICE WITH THE CFM SHOWN ON PLAN.
- NEW DUCTWORK SHOWN ON PLAN ARE SCHEMATIC ONLY. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES FOR PIPING AND DUCTWORK ROUTING. OFFSET AND RUN PIPING, DUCTWORK INSIDE THE STRUCTURE IF REQUIRED. PROVIDE ANY EXTRA PIPING, DUCTWORK, FITTINGS, INSULATIONS AND OTHER ACCESSORIES IN ORDER TO COMPLETE THE INSTALLATION.
- EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED. PROVIDE VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.
- DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE AIR STREAM DIMENSIONS.
- CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.
- CONTRACTOR SHALL COORDINATE EQUIPMENT WEIGHTS AND SUPPORTS BASED ON ACTUAL EQUIPMENT SELECTED.
- COORDINATE WITH ALL TRADES FOR MATERIALS IN RATED AND PLENUM SPACES.
- ALL SOURCE OF MECHANICAL INTAKE SHALL MAINTAIN 10 LINEAR FEET SEPARATION BETWEEN ANY SOURCE OF EXHAUST. CONTRACTOR IS RESPONSIBLE TO ADJUST DUCT LENGTH AS NEEDED.
- MOUNT DUCTWORK AS HIGH AS POSSIBLE.
- TEST AND BALANCE AIR SYSTEMS. PROVIDE REPORT TO G.C AND OWNER.
- ALL EXPOSED ROUND DUCTWORK SHALL BE INTERNALLY LINED. ALL DUCTWORK DIMENSIONS ARE INSIDE CLEAR.
- NEW DUCTWORK IN CONCEALED AREAS MAY BE RECTANGULAR WITH EQUIVALENT CROSS SECTIONAL FLOW AREA.
- PROVIDE FIRE OR FIRE+SMOKE DAMPER WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATED WALLS/BARRIERS. COORDINATE WITH ARCHITECTURAL DRAWINGS FOR FIRE RATINGS OF THE WALLS.
- CONTRACTOR TO FIELD VERIFY EXISTING DUCTWORK, ASSOCIATED ACCESSORIES AND EXISTING HVAC EQUIPMENT. ALL EXISTING DUCTWORK, ASSOCIATED ACCESSORIES AND EXISTING HVAC EQUIPMENT TO BE DEMOLISHED.
- PROVIDE MINIMUM R-8 INSULATION (EXTERNAL) FOR OUTSIDE AIR INTAKE DUCTS. PROVIDE MINIMUM R-6 INSULATION (INTERNAL FOR EXPOSED DUCTS AND EXTERNAL FOR CONCEALED DUCTS) FOR SUPPLY & RETURN AIR DUCTS. PROVIDE ACOUSTIC INSULATION ON MAIN SUPPLY AND RETURN DUCTS UP TO 10 FT. FROM HVAC UNIT.
- OUTDOOR AIR INTAKE, EXHAUST OPENINGS, STAIRWAY AND SHAFT VENTS SHALL BE PROVIDED WITH CLASS I MOTORIZED DAMPERS. THE DAMPERS SHALL HAVE AN AIR LEAKAGE RATE NOT GREATER THAN 4 CFM/FT2 OF DAMPER SURFACE AREA AT 1.0 INCH WATER GAUGE AND SHALL BE LABELED BY AN APPROVED AGENCY WHEN TESTED IN ACCORDANCE WITH AMCA 500D
- CONTRACTOR TO VERIFY THAT THE OUTSIDE AIR DAMPER AT AIR HANDLING UNIT IS MODULATED AT LEAST AT 20% OF SUPPLY AIR SO THAT THE VENTILATION REQUIREMENT FOR NEW OFFICE CUBICLES IS MET.

### MECHANICAL PLAN KEY NOTES:

- EXISTING VAV/FTU UNIT. MECHANICAL CONTRACTOR TO FIELD VERIFY THE WORKING CONDITION OF THE UNIT, REPAIR OR REPLACE IN KIND IF EXISTING VAV/FTU ARE NOT IN PROPER WORKING CONDITION. REPORT BACK TO THE ENGINEER OF RECORD IN CASE OF ANY DISCREPANCY. PLACE BID ACCORDINGLY.
- PROVIDE NEW SUPPLY AIR DIFFUSER. MODULATE THE SUPPLY AIRFLOW AS SHOWN ON PLAN.
- RELOCATE THE EXISTING DIFFUSER IN THE CEILING. MODULATE THE SUPPLY AIRFLOW AS SHOWN ON PLAN.
- RELOCATE THE EXISTING SUPPLY DIFFUSERS AND DUCTS IN THE CEILING CONNECTED TO THE EXISTING VAV UNIT SHOWN OTHER THAN THE PLAN. COORDINATE AND CONFIRM EXACT LOCATIONS OF THE DIFFUSERS WITH LATEST REFLECTED CEILING PLAN AND ARCHITECT. MODULATE THE SUPPLY AIRFLOW IN THE DIFFUSERS TO BALANCE THE OVERALL SUPPLY AIR IN EXISTING VAV UNITS.
- PROVIDE NEW RETURN DIFFUSER AS SHOWN ON PLAN.
- CONNECT NEW SUPPLY DUCT BRANCH TO THE EXISTING DUCTWORK AS SHOWN.

DATE: JAN. 14, 2025

DRAWN BY: NYE

REVISION:

DATE:

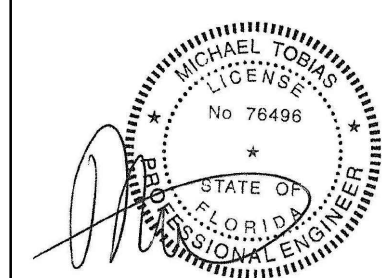
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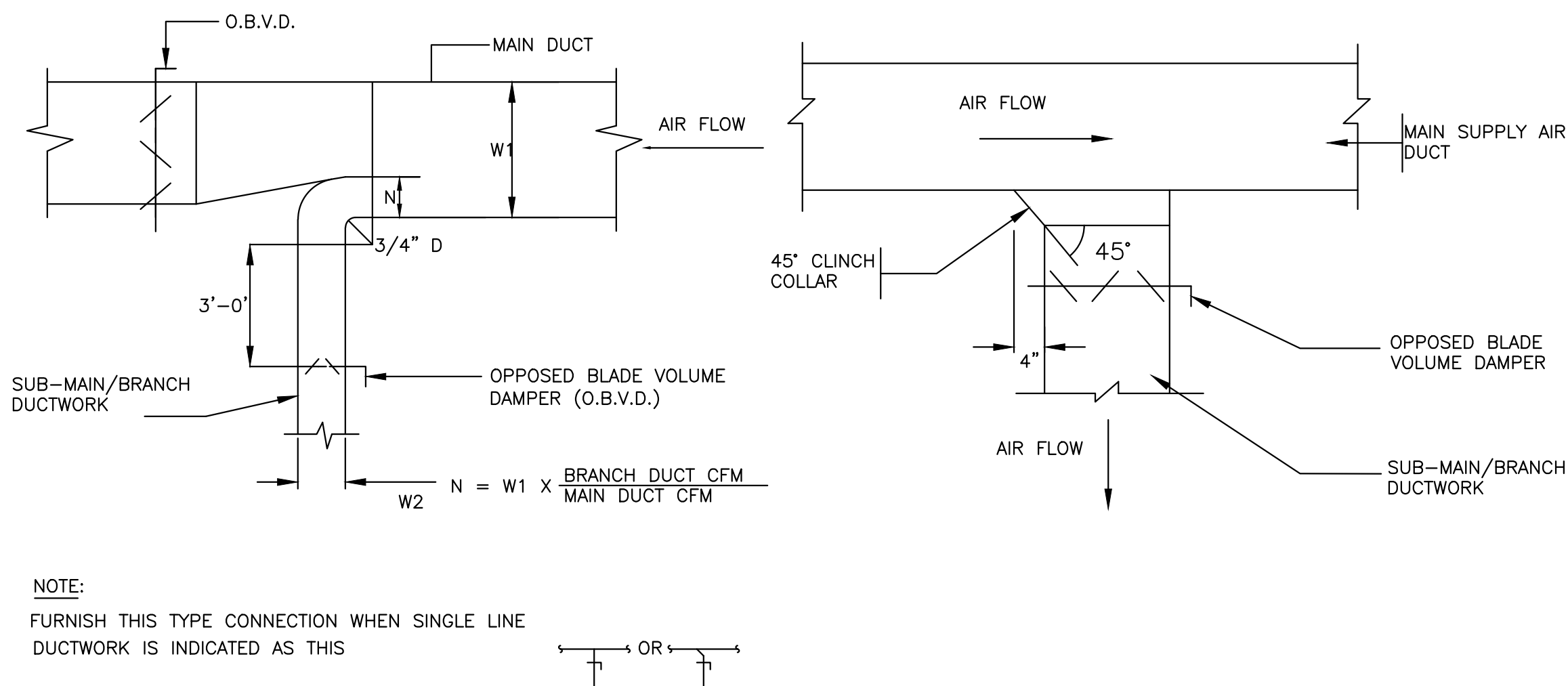
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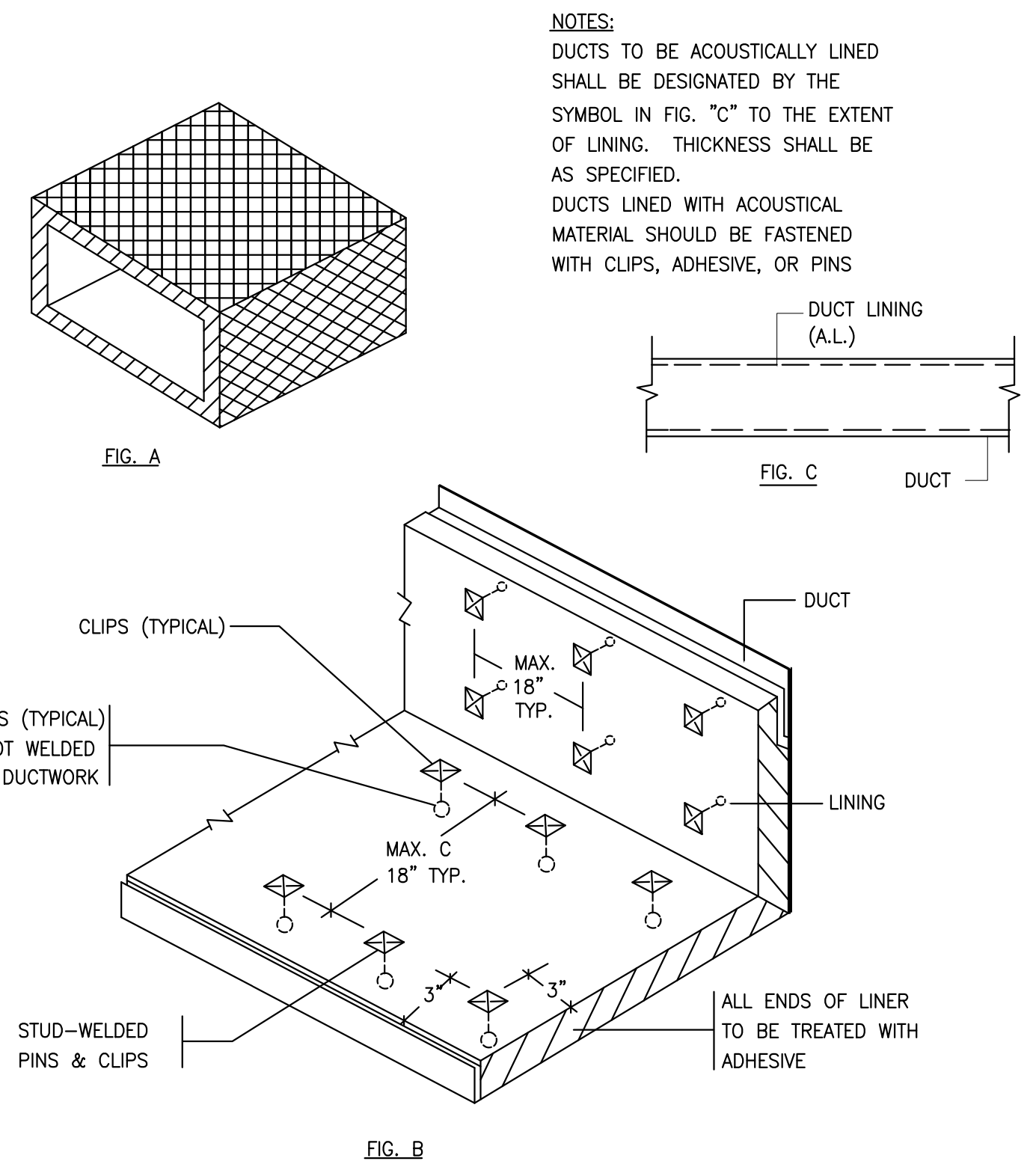
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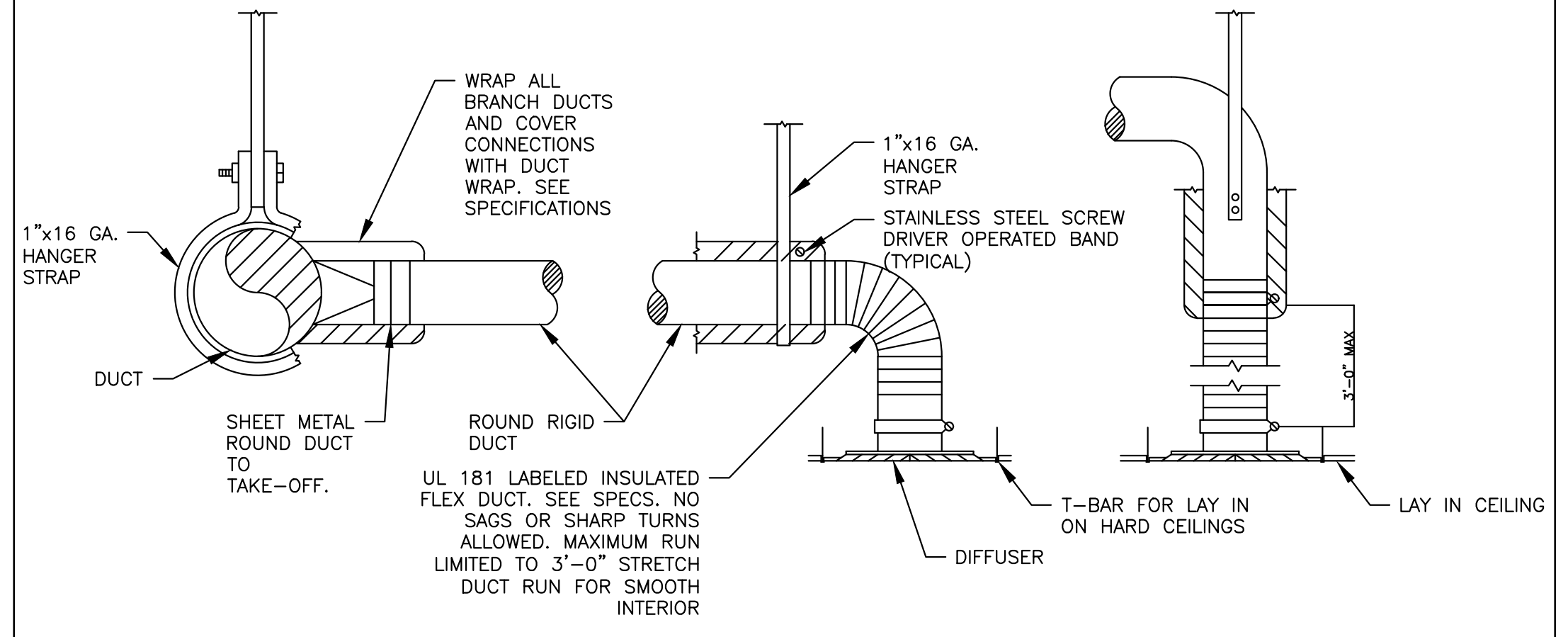




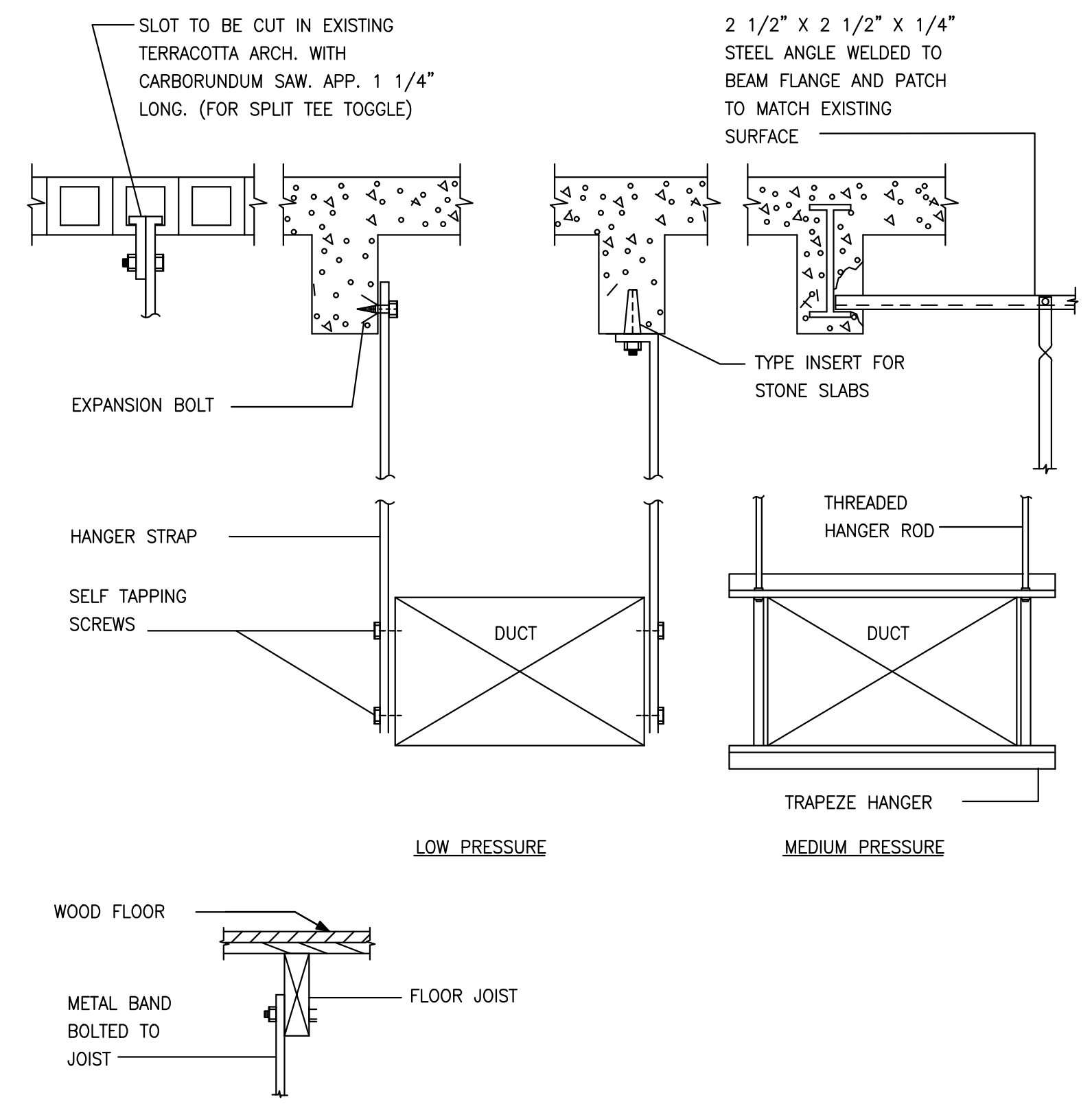
1 SUPPLY AIR DUCTWORK SUB-MAIN/BRANCH DUCT CONNECTION  
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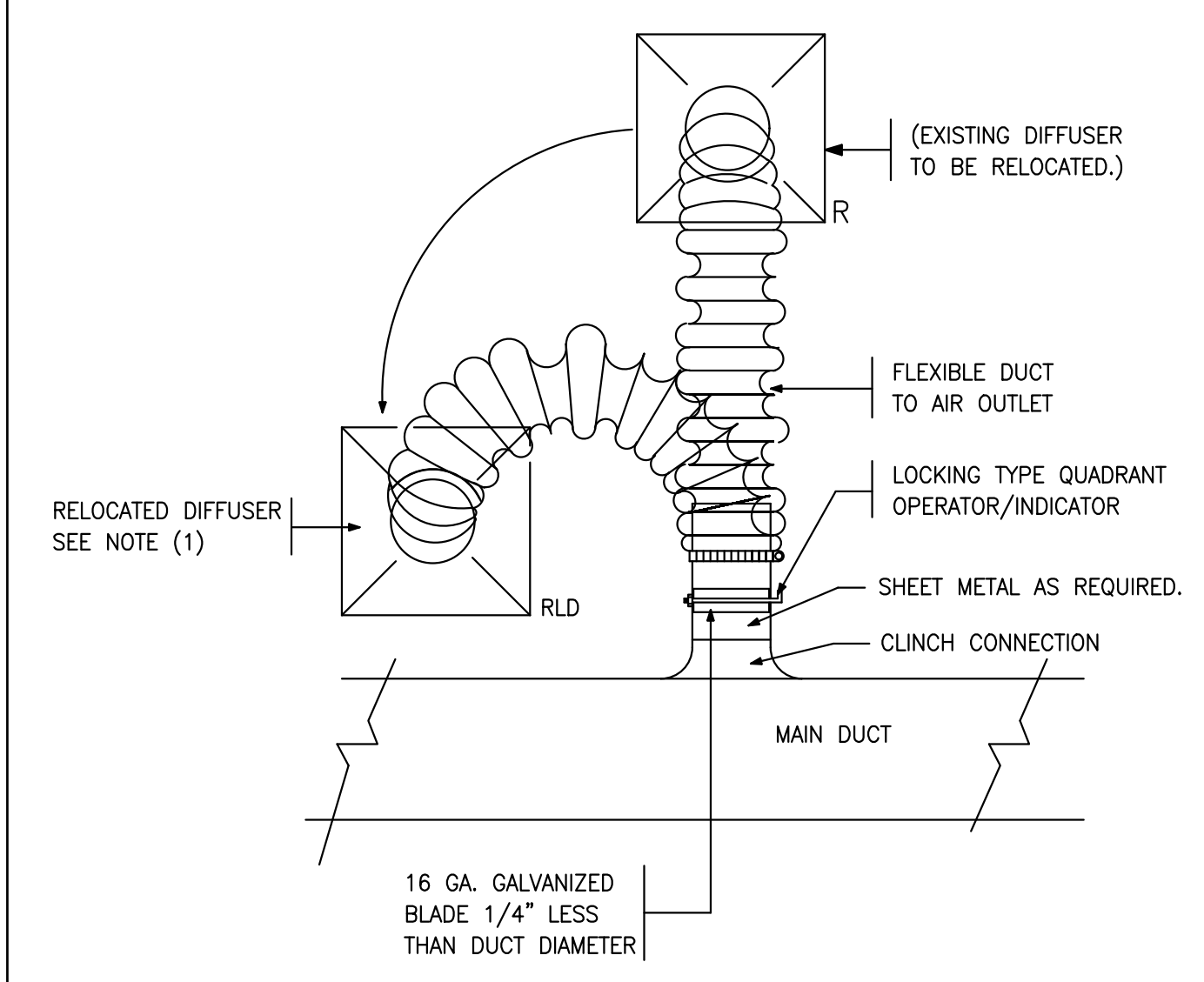
2 ACOUSTICAL TREATMENT DUCT LINING  
M5.0 N.T.S



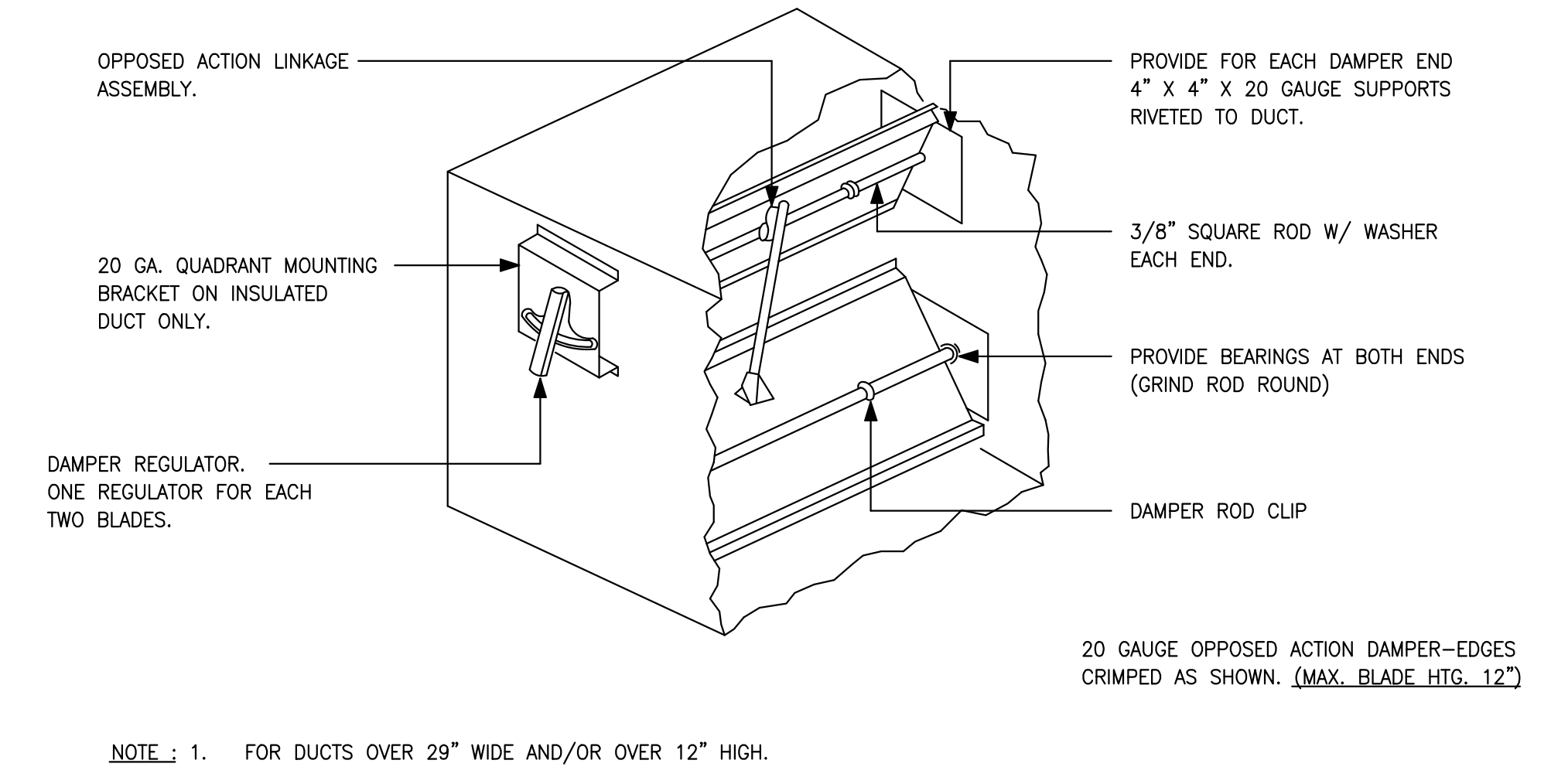
3 TYPICAL DIFFUSER CONNECTION DETAIL  
M5.0 N.T.S



4 METHOD OF HANGING DUCTWORK  
M5.0 N.T.S



5 RELOCATED DIFFUSER DETAIL  
M5.0 N.T.S



6 LOW PRESSURE BALANCING DAMPER  
M5.0 N.T.S

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VENTILATION CALCULATION										
ROOM NAME	AREA	OCCUPANCY AS PER 2023 FMC PER 1000 SQ. FT.	OCCUPANCY AS PER 2023 FMC	NO. OF CHAIR	FINAL OCCUPANCY	OA CFM/PERSON	OA CFM/SQ.FT	OA REQUIRED CFM	MIN. SUPPLY AIR REQUIRED* FOR VENTILATION	SUPPLY AIR PROVIDED
OFFICE 1	200	5	1	1	1	5	0.06	20	125	400
OFFICE 2	160	5	1	1	1	5	0.06	15	94	430
OFFICE 3	140	5	1	1	1	5	0.06	15	94	120
OFFICE 4	140	5	1	1	1	5	0.06	15	94	120
OFFICE 5	140	5	1	1	1	5	0.06	15	94	120
OFFICE 6	140	5	1	1	1	5	0.06	15	94	100
OFFICE 7	140	5	1	1	1	5	0.06	15	94	100
OFFICE 8	140	5	1	1	1	5	0.06	15	94	100
OFFICE 9	140	5	1	1	1	5	0.06	15	94	100
OFFICE 10	175	5	1	1	1	5	0.06	20	125	125
OFFICE 11	130	5	1	1	1	5	0.06	15	94	125
OFFICE 12	135	5	1	1	1	5	0.06	15	94	125
OFFICE 13	130	5	1	1	1	5	0.06	15	94	325
OFFICE 14	195	5	1	1	1	5	0.06	20	125	400
OFFICE 15	170	5	1	1	1	5	0.06	20	125	100
OFFICE 16	160	5	1	1	1	5	0.06	15	94	550
CONFERENCE-501A	220	50	11	6	6	5	0.06	45	280	280
CONFERENCE-501B	235	50	12	6	6	5	0.06	45	280	280
<b>TOTAL</b>	<b>2890</b>							<b>350</b>		

\* MINIMUM 16% OUTSIDE AIR INTAKE IS CONSIDERED FOR AHU-X SERVING 5TH FLOOR. CONTRACTOR TO FILED VERIFY WITH FACILITY MANAGER/ENGINEER OR THE SAME AND ADJUST AS REQUIRED. REPORT BACK TO ENGINEER OF RECORD IN CASE OF ANY DISCREPANCY.

EXISTING VARIABLE AIR VOLUME BOX SCHEDULE				
UNIT NO.	FTU 5-10(E)	VAV 5-11(E)	VAV 5-12(E)	VAV 5-13(E)
PRIMARY AIR CFM	1300/205	1600/265	1560/245	1300/205
MAX/MIN CFM	(VIF)	(VIF)	(VIF)	(VIF)
INLET SIZE	12"Ø	12"Ø	12"Ø	12"Ø
MIN. OPERATING Δ P (IN. W.G.)	0.08	0.13	0.1	0.08
FAN CFM	1095 (VIF)	1415 (VIF)	1315 (VIF)	1095 (VIF)
MAX. FAN EXT. S.P. (IN. W.G.)	0.2	0.2	0.2	0.2
FAN HP	1/3	1/3	1/3	1/3
EAT/LAT (F)	63.5/85	63.5/85	63.5/85	63.5/85
ELEC. HEAT KW/NO. OF STAGES	9/3 (VIF)	14/3 (VIF)	11/3 (VIF)	9/3 (VIF)
VOLTS/PHASE/HERTZ	480/3/60	480/3/60	480/3/60	480/3/60
MANUFACTURER	TITUS	TITUS	TITUS	TITUS
MODEL NO.	DMV 3000-5 (VIF)	DMV 3000-5 (VIF)	DMV 3000-5 (VIF)	DMV 3000-5 (VIF)

NOTE:  
 1. MECHANICAL CONTRACTOR TO FIELD VERIFY THE WORKING CONDITION OF THE UNIT, REPORT BACK TO THE ENGINEER OF RECORD IN CASE OF ANY DISCREPANCY.  
 2. SAE-SAE AS EXISTING, VIF-VERIFY IN FIELD.

AIR TERMINAL SCHEDULE						
TAG	TYPE	CFM RANGE	DIMENSION(IN)	MANUFACTURER	MODEL NO.	MAX NC dBA
CD5-1	SUPPLY	0-120	24X24	TITUS	OMNI	<15
CDR-1	RETURN	-	24X24	TITUS	350FL	<20

NOTES:  
 1. CONTRACTOR SHALL COORDINATE WITH THE LATEST ARCHITECTURAL REFLECTED CEILING PLANS TO ENSURE PROPER  
 2. COORDINATE FINAL COLOR/FINISH WITH ARCHITECT/OWNER.  
 3. PROVIDE FRAME FOR MOUNTING AIR DEVICE IN LAY-IN GRID CEILING UNLESS REFLECTED CEILING PLAN INDICATES HARD  
 4. UNLESS OTHERWISE NOTED, BRANCH DUCTS SERVING AIR DEVICES SHALL BE SAME SIZE AS NECK OF AIR DEVICE.  
 5. AIR DEVICE SHALL BE OF GALVANIZED FINISH WHEN INSTALLED ON EXPOSED DUCTWORK.

NECK SIZES:  
 Up To 100 Cfm - 6" DIA  
 101 To 225 Cfm - 8" DIA  
 176 To 275 Cfm - 10" DIA  
 276 To 395 Cfm - 12" DIA  
 396 To 535 Cfm - 14" DIA  
 536 To 615 Cfm - 15" DIA

EXISTING VARIABLE AIR VOLUME BOX SCHEDULE				
UNIT NO.	VAV 5-9(E)	VAV 5-11(E)	VAV 5-13(E)	VAV 5-14(E)
MAX/MIN CFM	960/150 (VIF)	1680/265 (VIF)	1920/305 (VIF)	720/115 (VIF)
MAX Δ P (IN. W.G.)	0.15	0.15	0.15	0.15
INLET SIZE	10"Ø	12"Ø	14"Ø	10"Ø
MANUFACTURER	TITUS	TITUS	TITUS	TITUS
MODEL NO.	DESV-3000 (VIF)	DESV-3000 (VIF)	DESV-3000 (VIF)	DESV-3000 (VIF)

NOTE:  
 1. MECHANICAL CONTRACTOR TO FIELD VERIFY THE WORKING CONDITION OF THE UNIT, REPORT BACK TO THE ENGINEER OF RECORD IN CASE OF ANY DISCREPANCY.  
 2. SAE-SAE AS EXISTING, VIF-VERIFY IN FIELD.

## MECHANICAL SCHEDULES

1801 HERMITAGE BOULEVARD - 5TH FLOOR

SC: NTS

System Checksums																			
VAV 5-14(E) (CONFERENCE 501A&B)					Series Fan-Powered VAV														
<b>COOLING COIL PEAK</b> Peaked at Time: OADB/WB/HR: 96/76/105 Outside Air:					<b>CLG SPACE PEAK</b> Mo/Hr: 7/12 OADB: 94					<b>HEATING COIL PEAK</b> Mo/Hr: Heating Design OADB: 27					<b>TEMPERATURES</b> SADB: Cooling Heating Ra Plenum: 76.1 72.0 Return: 76.1 72.0 Ret/OA: 69.4 25.5 Fm M/RTD: 0.0 0.0 Fm B/RTD: 0.0 0.0 Fm Frict: 0.0 0.0				
<b>COOLING COIL SELECTION</b> Total Capacity: 8.120 ton Sens Cap: 133 MBH Coil Airflow: 12,863 cfm Enter DB/WB/HR: 100.00 Leave DB/WB/HR: 6.058 Capacity: 100.00 Ent: 100.00 Lvg: 6.058					<b>AREAS</b> Gross Total: 1.114 Glass: 4.959 R (%): 100.00					<b>HEATING COIL SELECTION</b> Capacity: 2.7 Coil Airflow: 207 cfm Ent: 65.0 Lvg: 76.8									

System Checksums																			
VAV 5-13(E) (OFFICE 1,2,3,4&5)					Series Fan-Powered VAV														
<b>COOLING COIL PEAK</b> Peaked at Time: OADB/WB/HR: 95/76/103 Outside Air:					<b>CLG SPACE PEAK</b> Mo/Hr: 6/17 OADB: 94					<b>HEATING COIL PEAK</b> Mo/Hr: Heating Design OADB: 27					<b>TEMPERATURES</b> SADB: Cooling Heating Ra Plenum: 76.0 71.6 Return: 76.0 71.6 Ret/OA: 77.2 62.1 Fm M/RTD: 0.0 0.0 Fm B/RTD: 0.0 0.0 Fm Frict: 0.0 0.0				
<b>COOLING COIL SELECTION</b> Total Capacity: 2.1 ton Sens Cap: 25.5 MBH Coil Airflow: 772 cfm Enter DB/WB/HR: 63.8 Leave DB/WB/HR: 63.2 Capacity: 63.8 Ent: 63.8 Lvg: 63.2					<b>AREAS</b> Gross Total: 2.1 Glass: 25.7 R (%): 1228					<b>HEATING COIL SELECTION</b> Capacity: 14.3 Coil Airflow: 1,188 cfm Ent: 68.0 Lvg: 78.7									

System Checksums																			
VAV 5-11(E) (OFFICE 6,7,8,9,10&15)					Series Fan-Powered VAV														
<b>COOLING COIL PEAK</b> Peaked at Time: OADB/WB/HR: 95/76/103 Outside Air:					<b>CLG SPACE PEAK</b> Mo/Hr: 6/17 OADB: 94					<b>HEATING COIL PEAK</b> Mo/Hr: Heating Design OADB: 27					<b>TEMPERATURES</b> SADB: Cooling Heating Ra Plenum: 76.0 71.8 Return: 76.0 71.8 Ret/OA: 78.6 52.3 Fm M/RTD: 0.0 0.0 Fm B/RTD: 0.0 0.0 Fm Frict: 0.0 0.0				
<b>COOLING COIL SELECTION</b> Total Capacity: 2.0 ton Sens Cap: 24.5 MBH Coil Airflow: 852 cfm Enter DB/WB/HR: 78.6 Leave DB/WB/HR: 64.8 Capacity: 69.9 Ent: 69.9 Lvg: 64.8					<b>AREAS</b> Gross Total: 2.0 Glass: 24.5 R (%): 1228					<b>HEATING COIL SELECTION</b> Capacity: 10.1 Coil Airflow: 890 cfm Ent: 67.6 Lvg: 77.8									

System Checksums																			
VAV 5-9(E) (OFFICE 11,12,13,14&16)					Series Fan-Powered VAV														
<b>COOLING COIL PEAK</b> Peaked at Time: OADB/WB/HR: 95/76/103 Outside Air:					<b>CLG SPACE PEAK</b> Mo/Hr: 6/17 OADB: 94					<b>HEATING COIL PEAK</b> Mo/Hr: Heating Design OADB: 27					<b>TEMPERATURES</b> SADB: Cooling Heating Ra Plenum: 75.9 71.9 Return: 75.9 71.9 Ret/OA: 77.2 62.1 Fm M/RTD: 0.0 0.0 Fm B/RTD: 0.0 0.0 Fm Frict: 0.0 0.0				
<b>COOLING COIL SELECTION</b> Total Capacity: 1.8 ton Sens Cap: 21.7 MBH Coil Airflow: 969 cfm Enter DB/WB/HR: 72.2 Leave DB/WB/HR: 63.3 Capacity: 67.3 Ent: 67.3 Lvg: 63.3					<b>AREAS</b> Gross Total: 1.8 Glass: 21.7 R (%): 1228					<b>HEATING COIL SELECTION</b> Capacity: 11.3 Coil Airflow: 1,028 cfm Ent: 68.0 Lvg: 77.9									

## HEAT LOAD CALCULATION

1801 HERMITAGE BOULEVARD - 5TH FLOOR

SC: NTS

**5TH FLOOR HERMITAGE BUILDING**  
**1801 HERMITAGE BOULEVARD TALLAHASSEE, FLORIDA**  
**MECHANICAL SCHEDULES AND HEAT LOAD CALCULATION**

**CONNN + ARCHITECTS**  
 1580 E. Blvd of Boulevard Tallahassee, Florida 32308  
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DATE: **JAN. 14, 2025**

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