

GENERAL NOTES

- A. DO NOT SCALE DRAWINGS. IF DIMENSIONS CANNOT BE DETERMINED OR DOCUMENTS ARE IN CONFLICT (WITH THEMSELVES OR FIELD CONDITIONS), THE CONTRACTOR MUST OBTAIN CLARIFICATION FROM THE ARCHITECT PRIOR TO CONTINUATION OF WORK.
- B. CONTRACTOR(S) SHALL VISIT THE SITE TO ACQUANT THEMSELVES WITH THE EXISTING OR NEWLY INSTALLED CONDITIONS. CONTRACTOR(S) SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, UTILITIES, AND EXISTING OR NEWLY INSTALLED CONDITIONS PRIOR TO CONSTRUCTION.
- C. THE CONSTRUCTION DOCUMENTS AND DRAWING NOTES / SPECIFICATIONS ARE INTENDED TO DESCRIBE AND PROVIDE FOR A FINISHED PIECE OF WORK. THE WORK SHALL BE COMPLETED IN EVERY DETAIL EVEN THOUGH EVERY ITEM NECESSARILY INVOLVED IS NOT PARTICULARLY MENTIONED OR SPECIFIED. ALL WORK SHALL BE INSTALLED AS SHOWN ON THE DRAWINGS AND / OR MANUFACTURER'S SPECIFICATIONS AND INSTALLATION INSTRUCTIONS. IF ANY CONTRACTOR IS IN DOUBT AS TO THE TRUE MEANING OF ANY PART OF THE DOCUMENTS, OR FINDS DISCREPANCIES IN OR OMISSIONS FROM ANY PART OF THE DOCUMENTS, HE MUST CONTACT THE ARCHITECT FOR CLARIFICATION.
- D. ALL DIMENSIONS ARE TO FACE OF STUD, CONCRETE, MASONRY, OR CENTERLINE OF COLUMN, UNLESS NOTED OTHERWISE. WHEN EXISTING CONDITIONS ARE SHOWN, DIMENSIONS ARE TO FACE OF EXISTING FINISH, UNLESS NOTED OTHERWISE.
- E. FINISH FLOOR ELEVATIONS ARE FOR GENERAL REFERENCE. REFER TO CIVIL SHEETS FOR ACTUAL FINISH FLOOR ELEVATIONS.
- F. EQUIPMENT AND FURNITURE SHOWN IS FOR REFERENCE ONLY. EQUIPMENT AND FURNITURE PROVIDED BY OWNER (UNLESS NOTED OTHERWISE). COORDINATE EQUIPMENT AND FURNITURE INSTALLATION AND UTILITY CONNECTIONS WITH OWNER AND OWNER'S SUPPLIER.
- G. **DEFINITIONS:**
NECESSARY: WORK NEEDED TO COMPLETE THE WORK TO "MAKE IT OPERATIONAL".
REQUIRED: WORK NEEDED TO BE IN COMPLIANCE WITH BUILDING CODE, GOVERNING CODE, OR JURISDICTION HAVING AUTHORITY.
PROVIDE: RESPONSIBLE FOR PURCHASE, DELIVERY, RECEIVING, INSPECTION, STORAGE, PREPARATION, AND INSTALLATION OF ITEM(S).
FURNISH: RESPONSIBLE FOR PURCHASE AND DELIVERY OF ITEM(S).
INSTALL: RESPONSIBLE FOR RECEIVING, INSPECTION, STORAGE, PREPARATION, AND INSTALLATION OF ITEM(S).
BASIS OF DESIGN: AN ACCEPTABLE MANUFACTURER OR PRODUCT, DESIGNATED BY THE DESIGN PROFESSIONAL, WHICH EXHIBITS THE INTENDED STANDARDS AND DESIGN CRITERIA THAT MUST BE MET FOR PERFORMANCE. THE ITEM(S) INDICATED MAY BE PROVIDED OR AN ITEM OF EQUIVALENT APPEARANCE, AESTHETIC, QUALITY, MATERIAL, CONSTRUCTION, AND PERFORMANCE MAY BE SUBSTITUTED SUBJECT TO THE ARCHITECT'S OR DESIGN PROFESSIONAL'S APPROVAL. (REFER TO THE "SUBSTITUTIONS" SPECIFICATION FOR ADDITIONAL INFORMATION).
OR EQUAL: MAY FOLLOW A "BASIS OF DESIGN" OR OTHER SPECIFIED MANUFACTURER OR PRODUCT AND INDICATES THAT AN ITEM OF EQUIVALENT APPEARANCE, AESTHETIC, QUALITY, MATERIAL, CONSTRUCTION, AND PERFORMANCE MAY BE SUBSTITUTED SUBJECT TO THE ARCHITECT'S OR DESIGN PROFESSIONAL'S APPROVAL. (REFER TO THE "SUBSTITUTIONS" SPECIFICATION FOR ADDITIONAL INFORMATION).

HVAC GENERAL SPECIFICATIONS

- A. UPON COMPLETION OF ALL HVAC WORK, THE CONTRACTOR SHALL SUBMIT (2) COPIES OF THE MANUFACTURER'S OPERATION AND MAINTENANCE MANUALS FOR ALL EQUIPMENT TO THE OWNER. THE CONTRACTOR SHALL PROVIDE TO THE ARCHITECT A COMPILED SET OF RECORD DRAWINGS WITH ANY AND ALL CHANGES OR MODIFICATIONS TO THE DESIGN, CONSTRUCTION, SYSTEMS, OR EQUIPMENT CLEARLY INDICATED; SHOP DRAWINGS; INFORMATION ON THE THERMOSTATS, CONTROL, WIRING DIAGRAMS, AND OTHER PERTINENT INFORMATION.
- B. **HVAC EQUIPMENT:** ALL EQUIPMENT SHALL BE COMPLETE IN EVERY RESPECT WITH ALL DEVICES, APPURTENANCES, AND ACCESSORIES PROVIDED TO MEET THE DESIGN INTENT AND OPERATION OF THE SYSTEMS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN. EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. ALL AIR CONDITIONING EQUIPMENT MUST HAVE A CONDENSATE DRAIN AND BE TRAPPED IN ACCORDANCE WITH MANUFACTURER'S DATA. ALL COMPRESSORS ARE TO INCLUDE A 5-YEAR EXTENDED WARRANTY.
- C. **GAS PIPING (IF INCLUDED IN THE PROJECT):** CONTRACTOR TO COORDINATE (INCLUDING VERIFICATION OF EXISTING SYSTEM EQUIPMENT, MAINS, LINE SIZES, AND REQUIREMENTS) AND SIZE GAS PIPING PER MANUFACTURER'S RECOMMENDATIONS, LOCAL CODE, AND UTILITY COMPANY REQUIREMENTS, UNLESS PROVIDED OTHERWISE IN THE CONSTRUCTION DOCUMENTS - **ARCHITECT/ENGINEER TO REVIEW AND APPROVE GAS PIPING SIZING PRIOR TO INSTALLATION.** GAS PIPING TO BE INSTALLED PER NFPA 54. REFER TO PLUMBING GENERAL SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- D. **REFRIGERANT LINE SET:** HVAC CONTRACTOR TO SIZE REFRIGERANT LINE SET SIZES PER MANUFACTURER'S RECOMMENDATIONS AND FIELD CONDITIONS - **ARCHITECT/ENGINEER TO REVIEW AND APPROVE LINE SET SIZES PRIOR TO INSTALLATION.** LINES EXCEEDING 150 FEET LENGTH REQUIRE A PUMP (SIZED AND PROVIDED BY THE HVAC CONTRACTOR).
- E. **NOISE AND VIBRATION:** MECHANICAL AND ELECTRICAL EQUIPMENT IS TO OPERATE WITHOUT OBJECTIONABLE NOISE OR VIBRATION. ALL MOTOR OPERATED OR ROTATING EQUIPMENT IS TO BE VIBRATION ISOLATED OR FREE FROM ALL BEAMS, COLUMNS, FLOORS, CEILING, JOISTS, WALLS, AND OTHER PARTS OF THE BUILDING STRUCTURE. HANGER RODS FOR ALL PIPING EQUIPMENT AND DUCTWORK CONNECTED TO MOTOR OPERATED OR ROTATING EQUIPMENT IS TO BE PROVIDED WITH KINETICS OR APPROVED EQUAL FIBERGLASS ISOLATOR HANGERS. PROVIDE FLEXIBLE COLLARS IN ALL CONNECTIONS BETWEEN VIBRATING EQUIPMENT (FANS, ROOFTOP UNITS, ETC.) AND DUCTS. THE FLEXIBLE CONNECTION IS TO BE RATED FOR THE OPERATING PRESSURE OF THE SYSTEM.
- F. **CURBS AND STEEL FRAMING FOR SUPPORT:** PROVIDE ALL NECESSARY CURBS AND STEEL FRAMING REQUIRED TO INSTALL ALL HVAC EQUIPMENT AS DESCRIBED OR IMPLIED ON THE DRAWINGS. CURBS SHALL BE OF THE SAME MANUFACTURER OF THE EQUIPMENT SUPPORTED. INSULATE UNDER THE COMPRESSOR SECTION TO PREVENT CONDENSATION. ALL CURBS MUST BE INSTALLED SO THAT TOP OF CURBS ARE LEVEL.
- G. **DUCTWORK:** DUCTWORK IS TO BE FABRICATED WITH GALVANIZED SHEET STEEL (NO FIBERGLASS ALLOWED) IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS-METAL AND FLEXIBLE" AND NAIMA "FIBERGLASS DUCT CONSTRUCTION STANDARDS". LATEST EDITIONS, CONFORMING TO THE REQUIREMENTS IN THE REFERENCED STANDARD FOR METAL THICKNESS, REINFORCING TYPES AND INTERVALS, THE ROOF APPLICATIONS, AND JOINT TYPES AND INTERVALS. SEAMS AND CONNECTIONS MUST BE SECURELY FASTENED AND SEALED AIRTIGHT IN COMPLIANCE WITH THE INTERNATIONAL ENERGY CONSERVATION CODE AND OHIO MECHANICAL CODE.
- H. **BRANCH DUCTWORK:** ALL DUCT BRANCHES TO DIFFUSERS ARE TO BE RECTANGULAR OR ROUND RIGID DUCT. ALL BRANCH TAKEOFFS FROM RECTANGULAR MAINS TO BE CONNECTED TO SPIN COLLARS WITH SCOOPS AND QUADRANT DAMPERS.
- I. **FLEXIBLE DUCTWORK:** FLEX DUCTWORK IS TO BE NFPA 90 AND 90A APPROVED INDICATING NO VINYL. TESTED IN ACCORDANCE WITH UL 181, AND LISTED AND LABELED AS CLASS 0 OR CLASS 1 DUCT. NO FLEX DUCT RUN TO EXCEED **8'-0"** MAXIMUM TOTAL LENGTH AT ANY ONE LOCATION. ALL FLEXIBLE CONNECTIONS TO BE TAPED AND STRAPPED PER MANUFACTURER'S INSTRUCTIONS. FLEXIBLE AIR DUCT MAY ONLY BE USED IN VERTICAL APPLICATIONS WITH PRIOR APPROVAL FROM THE ARCHITECT. **FLEXIBLE DUCTWORK IS NOT PERMITTED TO BE USED FOR RETURN DUCTWORK.**
- J. **DUCTWORK INSULATION:** INSTALL INSULATION PRODUCTS IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS AND IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES. INSULATION MUST COMPLY WITH NFPA 90A. DUCT SIZES SHOWN ON DRAWINGS ARE INSIDE CLEAR DIMENSIONS. INSULATE DUCTWORK PER THE DUCT CONSTRUCTION SCHEDULE. PROVIDE DUCTWORK INSULATION WITHOUT INTERRUPTION THROUGH WALLS, FLOORS, AND SIMILAR PENETRATIONS. ALL INSULATION SHALL HAVE A FLAME SPREAD RATING OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING OF NO HIGHER THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM C411, OR AS REQUIRED BY LOCAL CODES.
- K. WHERE ROUND DUCTWORK IS INDICATED ON PLANS, PROVIDE RECTANGULAR DUCTWORK. IF ROUND DUCTWORK CANNOT BE INSTALLED BECAUSE OF OBSTRUCTIONS, INSUFFICIENT CLEARANCES OR OTHER CAUSES DUE TO FIELD CONDITIONS, CONTRACTOR'S OPTION TO INSTALL RECTANGULAR DUCTWORK IN LIEU OF INDICATED ROUND DUCTWORK AT OTHER LOCATIONS. SIZE ALL RECTANGULAR DUCTWORK CONVERSIONS COMPARABLE TO INDICATED DUCTWORK SIZE PER SMACNA "HVAC DUCT CONSTRUCTION STANDARDS-METAL AND FLEXIBLE". LATEST EDITION. SHOULD THE CONTRACTOR BE IN DOUBT OF THE REQUIREMENTS UNDER THIS SECTION, DUCTWORK SIZING, OR SHOULD ANY DISCREPANCY BE REVEALED BASED ON FIELD CONDITIONS, IMMEDIATELY CONTACT THE ARCHITECT FOR CLARIFICATION.
- L. PROVIDE A FLEXIBLE CONNECTION BETWEEN BONNET AND RIGID DUCT ON ALL SUPPLY AND RETURN DUCTWORK.
- M. **DIFFUSERS, GRILLES, REGISTERS, AND DAMPERS:** PROVIDE DIFFUSERS, GRILLES, AND REGISTERS AS SCHEDULED. DEVICES TO BE COMPLETE WITH BALANCING DAMPERS, FRAMES, AND ALL ACCESSORIES. FINISH AS INDICATED. PROVIDE UL LISTED (UL555) FIRE RATED DAMPERS AT ALL FIRE PARTITION OR FIRE BARRIER PENETRATIONS, WHETHER SHOWN OR NOT SHOWN ON THE PLANS. ALL GRAVITY DAMPERS REQUIRE SEALS.
- N. **SUPPORT AND BRACING:** INSTALL RIGID ROUND AND RECTANGULAR METAL DUCTWORK WITH APPROVED SUPPORT SYSTEMS INDICATED IN SMACNA STANDARDS AND STATE BUILDING CODE. SUPPORT HORIZONTAL DUCTS AT A MAXIMUM INTERVAL OF 10 FEET AND WITHIN 2 FEET OF EACH ELBOW AND WITHIN 4 FEET OF EACH BRANCH INTERSECTION USING DOUBLE STRAP HANGERS ON EACH SIDE OF FITTING. SUPPORT VERTICAL DUCTS AT A MAXIMUM INTERVAL OF 10 FEET AND AT EACH FLOOR. FLEXIBLE AND OTHER FACTORY MADE DUCTS SHALL BE SUPPORTED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. NO WOOD SHALL BE USED TO SUPPORT OR BRACE DUCTS. PROVIDE SWAY AND SEISMIC BRACING AS REQUIRED BY STATE AND LOCAL CODES. PROVIDE FIXED ANCHORS AT EACH MECHANICAL DIFFUSER OR GRILLE TO CEILING GRID. CEILING GRID CONTRACTOR TO PROVIDE SUPPORT WIRES AT OPPOSITE CORNERS OF LIGHT FIXTURES, MECHANICAL DIFFUSERS, AND GRILLES TO STRUCTURE ABOVE.

HVAC GENERAL SPECIFICATIONS CONT'D

- O. **CONTROLS:** EACH UNIT TO BE CONTROLLED BY THERMOSTAT WITH PROPER STAGES OF HEATING AND COOLING - MOUNTED AT 54" AFF. (REFER TO MECHANICAL SHEETS FOR MODEL NO. AND LOCATION). CONTROL WIRING IS TO BE FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR. POWER WIRING IS TO BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
- P. **POWER AND CONTROL WIRING:** ELECTRICAL CONTRACTOR TO PROVIDE ALL NECESSARY POWER WIRING FOR HVAC EQUIPMENT FROM SUITABLE FUSED DISCONNECT SOURCE TO UNIT WITH FUSED DISCONNECT TO MEET NATIONAL ELECTRIC CODE (NEC), STATE AND LOCAL CODES. HVAC CONTRACTOR TO PROVIDE 24 VOLT OR LESS CONTROL WIRING.
- Q. **STARTUP:** HVAC CONTRACTOR TO PROVIDE STARTUP PER MANUFACTURER'S WRITTEN RECOMMENDATIONS.
- R. **AIRFLOW AND TESTING:** ALL DUCT AS PER SMACNA GUIDELINES. THE SYSTEM TO BE BALANCED AND TESTED BY AN INDEPENDENT, "NEBB" CERTIFIED, BALANCING CONTRACTOR PER "NEBB".
- S. PROCEDURES: THE HVAC CONTRACTOR SHALL INCLUDE THE COST OF THE BALANCING AND TESTING IN HIS BID. THE BALANCING CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, TRANSPORTATION, AND EQUIPMENT NECESSARY TO COMPLETELY BALANCE THE AIR FLOW FOR THE HVAC SYSTEMS AS SHOWN ON THE DRAWINGS. HVAC CONTRACTOR SHALL INSTALL NEW FILTERS IN ALL UNITS PRIOR TO THE AIR BALANCE. THE COMPLETE AIR BALANCE SHALL TAKE PLACE WITH OUTSIDE AIR DAMPERS IN MINIMUM POSITION. BALANCE THE SYSTEM TO WITHIN +5 PERCENT OF THE DESIGN REQUIREMENTS. THE HVAC CONTRACTOR AT NO ADDITIONAL COST SHALL PERFORM ANY REQUIRED CHANGES REQUIRED TO ACHIEVE SPECIFIED FLOW RATES. ALL CONTROL SEQUENCES SHALL BE TESTED (INTERLOCKED EQUIPMENT, SMOKE DETECTORS, SMOKE EVACUATION, ECONOMIZER, CO2 SENSORS, ETC.) AND OPERATING STATUS RECORDED IN THE REPORT. A DIGITAL OR THREE (3) PRINTED COPIES OF THE BALANCE AND TESTING REPORT SHALL BE PROVIDED TO THE OWNER, OWNER'S REPRESENTATIVE, OR ARCHITECT BEFORE PROJECT CLOSE OUT FOR REVIEW. THE BALANCING CONTRACTOR SHALL RECHECK ANY ITEMS THAT THE OWNER OR ARCHITECT DEEMS REASONABLY NECESSARY AT NO ADDITIONAL COST TO THE OWNER.
- T. VENTILATION AND COMBUSTION AIR INTAKE: PROVIDE OUTSIDE VENTILATION AIR BY NATURAL VENTILATION OR MECHANICAL EQUIPMENT AS REQUIRED BY THE MECHANICAL CODE (REFER TO OUTSIDE AIR VENTILATION SCHEDULE). IF GAS-FIRED EQUIPMENT IS USED, VERIFY THAT THE MECHANICAL ROOM AND / OR MECHANICAL EQUIPMENT ARE PROVIDED WITH ADEQUATE COMBUSTION AND DILUTION AIR IN COMPLIANCE WITH THE MECHANICAL CODE. PROVIDE ADDITIONAL AIR AS REQUIRED. PROVIDE A VENT DESIGNED FOR THE TYPE OF APPLIANCE BEING VENTED FOR ALL GAS-FIRED EQUIPMENT TO THE EXTERIOR. PROVIDE VENTS DIRECTLY TO THE EXTERIOR FOR ALL EXHAUST FANS. ALL EXHAUST AND INTAKE OPENINGS MUST BE LOCATED A MINIMUM OF 10 FEET FROM LIT LINES OR BUILDINGS ON THE SAME LOT.
- U. PROVIDE A SMOKE DETECTOR IN RETURN AIR SYSTEMS WITH A DESIGN CAPACITY GREATER THAN 2,000 CFM IN THE RETURN AIR DUCT OR PLENUM UPSTREAM OF ANY FILTERS, EXHAUST AIR CONNECTIONS, OUTDOOR AIR CONNECTIONS, OR DECONTAMINATION EQUIPMENT AND APPLIANCES (PER OMC SECTION 605.1) WHERE TWO OR MORE UNITS SHARE THE SAME RETURN. THE COMBINED AMOUNT OF CFM SHALL BE USED IN DETERMINING WHETHER A DUCT SMOKE DETECTOR IS REQUIRED. COORDINATE THESE REQUIREMENTS BETWEEN THE HVAC AND THE ELECTRICAL OR FIRE ALARM CONTRACTORS.
- V. PROVIDE ACCESS TO ALL DAMPERS, CONTROLS, AND OTHER ITEMS IN DUCTWORK THAT REQUIRE SERVICE OR INSPECTION. IF THE ACCESS PANEL LOCATION IS EXPOSED, THE OWNER OR THE ARCHITECT MUST APPROVE IT PRIOR TO INSTALLATION. ACCESS PANELS ARE NOT REQUIRED ABOVE LAY-IN GRID TYPE CEILING.
- W. ALL HVAC EVAPORATORS AND COOLING COILS REQUIRE A CONDENSATE DRAIN, WHICH IS CONVEYED TO AN APPROPRIATE PLACE OF DISPOSAL, TYPICALLY INDIRECTLY INTO A FLOOR DRAIN, A SECONDARY DRAIN OR AUXILIARY DRAIN PAN (WITH A SEPARATE DRAIN OR A WATER LEVEL DETECTION DEVICE CONFORMING TO UL 508 THAT WILL SHUT OFF THE EQUIPMENT SERVED PRIOR TO OVERFLOW OF THE AUXILIARY DRAIN PAN) IS REQUIRED FOR ANY EQUIPMENT THAT PRODUCES CONDENSATE AND WHERE DAMAGE MAY OCCUR AS A RESULT OF OVERFLOW FROM THE EQUIPMENT DRAIN PAN OR STOPPAGE IN THE CONDENSATE DRAIN (PER OMC SECTION 307.2.3). COORDINATE THESE REQUIREMENTS BETWEEN THE HVAC AND PLUMBING CONTRACTORS AND THE ARCHITECT.
- X. ALL ROOF AND/OR EXTERIOR WALL PENETRATIONS ARE TO BE SEALED AIR AND WATER TIGHT. COORDINATE WITH THE GENERAL CONTRACTOR AND OTHER SUB-CONTRACTORS. ALL EQUIPMENT, PIPES, DUCTS, ETC. ARE TO BE INSTALLED CONCEALED ABOVE THE CEILING UNLESS SHOWN OTHERWISE.
- Y. VERIFY ALL SUSPENDED MECHANICAL LOADS WITH ARCHITECT PRIOR TO ORDERING NEW MECHANICAL EQUIPMENT.
- Z. HVAC CONTRACTOR TO COORDINATE ROUTING AND LOCATION OF ALL DEVICES WITH BUILDING STRUCTURE AND OTHER CEILING MOUNTED DEVICES.
- AA. HVAC CONTRACTOR TO REVIEW DRAWINGS FOR COMPLIANCE WITH LOCAL CODES AND WITH AUTHORITIES HAVING JURISDICTION OVER THIS PROJECT. CONTACT ARCHITECT WITH ANY QUESTIONS OR CONCERNS.

DUCTWORK SYMBOL LEGEND			
	SUPPLY OR OUTSIDE AIR DUCT UP		RADIUS RECTANGULAR ELBOW
	RETURN OR EXHAUST AIR DUCT UP		SUPPLY OR OUTSIDE AIR ROUND DUCT UP
	SUPPLY OR OUTSIDE AIR DUCT DOWN		RETURN OR EXHAUST AIR ROUND DUCT DOWN
	RETURN OR EXHAUST AIR DUCT DOWN		ROUND DUCT DOWN
	SUPPLY OR OUTSIDE AIR DUCT OFFSET		ROUND OFFSET
	RETURN AIR DUCT OFFSET		ROUND ELBOW
	MANUAL BALANCING DAMPER		ROUND WYE
	MOTORIZED DAMPER		RECTANGULAR BRANCH TAKEOFF
	FIRE DAMPER		RECTANGULAR DUCT TERMINATION
	RECTANGULAR TO ROUND TRANSITION		ROUND DUCT TERMINATION
	RECTANGULAR TRANSITION		
	STANDARD RECTANGULAR ELBOW		

ANNOTATION SYMBOL LEGEND			
	THERMOSTAT OR TEMP. SENSOR		SECTION SYMBOL
	HUMIDISTAT		EQUIPMENT PLAN MARK
	SWITCH		DETAIL SYMBOL
	KEYED NOTE SYMBOL		
	CONNECT TO EXISTING		
	VAV TERMINAL UNIT MARK		
	EQUIPMENT MARK		
	AIR DEVICE MARK - NECK SIZE		
	AIRFLOW		
	ROUND DUCT SIZE		
	RECTANGULAR DUCT SIZE		

AIR DEVICE AND DUCT ACCESS. LEGEND			
	RETURN AIR GRILLE		SUPPLY AIR DIFFUSER (HARD CONNECTION)
	SUPPLY AIR DIFFUSER WITH FLEXIBLE RUNOUT AND DAMPER		RETURN OR EXH. GRILLE (HARD CONNECTION)
	SIDEWALL DIFFUSER		14X14 TRANSFER OPENING IN WALL
	SUPPLY AIR DIFFUSER (HARD CONNECTION)		TRANSFER OPENING IN WALL
	RETURN OR EXH. GRILLE (HARD CONNECTION)		

PIPE SYMBOL LEGEND	
	PIPE DOWN
	PIPE UP
	TEE DOWN
	TEE UP
	PIPE BREAK (FOR CLARITY)
	CAPPED PIPE
	REFRIGERANT SUCTION PIPE
	REFRIGERANT HOT GAS PIPE



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No.	Description	Date
	FOR BID/PERMIT	10/21/2024

Drawn By

KDB

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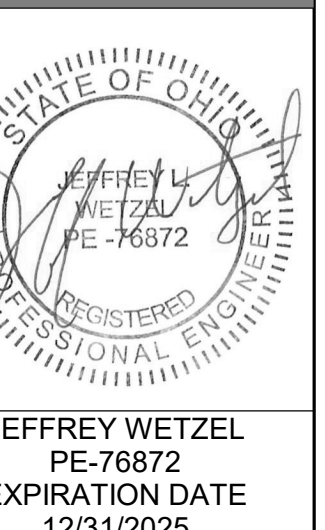
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Client No.

818

Project No.

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JEFFREY WETZEL
PE-76872
EXPIRATION DATE
12/31/2025

HVAC LEGEND AND GENERAL NOTES

H001

HVAC INDEX OF DRAWINGS	
SHEET NUMBER	SHEET NAME
H001	HVAC LEGEND AND GENERAL NOTES
H002	HVAC SPECIFICATIONS
H003	HVAC SCHEDULES AND DETAILS
H101	HVAC FLOOR PLAN - DEMOLITION
H102	HVAC FLOOR PLAN - NEW WORK

MECHANICAL SPECIFICATIONS

SECTION 1910: BASIC MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION-1 SPECIFICATION SECTIONS, APPLY TO THE WORK OF THIS SECTION.

1.02 SUMMARY

- A. FURNISH ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, AND SERVICES FOR ALL MECHANICAL WORK AS SPECIFIED AND INDICATED, IN ACCORDANCE WITH PROVISIONS OF CONTRACT DOCUMENTS. COMPLETELY COORDINATE WITH WORK OF ALL OTHER TRADES. ALTHOUGH SUCH WORK IS NOT SPECIFICALLY INDICATED, FURNISH AND INSTALL ALL SUPPLEMENTARY OR MISCELLANEOUS ITEMS, APPURTENANCES AND DEVICES INCIDENT TO OR NECESSARY FOR A SOUND, SECURE AND COMPLETE INSTALLATION.
- B. FURNISH AND PROVIDE ALL NECESSARY NOTICES, OBTAIN AND PAY FOR ALL PERMITS AND PAY ALL GOVERNMENT SALES TAXES, FEES AND OTHER COSTS INCURRED IN CONNECTION WITH THE WORK. OBTAIN ALL REQUIRED CERTIFICATES OF INSPECTION FOR THE WORK.
- C. DRAWINGS, USE AND INTERPRETATION:
 - A. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND EQUIPMENT, EXCEPT WHEN SPECIFICALLY DIMENSIONED OR DETAILED.
 - B. FOR EXACT LOCATIONS OF BUILDING ELEMENTS, REFER TO DIMENSIONED ARCHITECTURAL AND STRUCTURAL DRAWINGS.
 - C. FIELD MEASUREMENTS TAKE PRECEDENCE OVER DIMENSIONED DRAWINGS.
 - D. PIPING AND DUCTWORK PLANS ARE INTENDED TO SHOW SIZE, CAPACITY, APPROXIMATE LOCATION, DIRECTION AND GENERAL RELATIONSHIP OF ONE WORK PHASE TO ANOTHER, BUT NOT THE EXACT DETAIL OR ARRANGEMENT.
 - E. FIELD VERIFY LOCATIONS AND ARRANGEMENT OF ALL EXISTING SYSTEMS AND EQUIPMENT.

1.03 QUALITY ASSURANCE

A. PERFORM ALL WORK IN ACCORDANCE WITH APPLICABLE CODES AND STANDARDS.

1.04 JOB CONDITIONS

- A. CAUSE AS LITTLE INTERFERENCE OR INTERRUPTION OF EXISTING UTILITIES AND SERVICES AS POSSIBLE. NOTIFY AND OBTAIN PERMISSION FOR INTERFERENCE OR INTERRUPTION IN ADVANCE WITH CONSTRUCTION MANAGER.
- B. EXAMINE CONTRACT DOCUMENTS TO DETERMINE HOW OTHER WORK WILL AFFECT EXISTING UTILITIES AND SERVICES.
- C. DETERMINE AND VERIFY LOCATIONS OF ALL EXISTING UTILITIES.
- D. ESTABLISH LINES AND LEVELS FOR EACH SYSTEM AND COORDINATE WITH OTHER SYSTEMS TO PREVENT CONFLICTS AND MAINTAIN PROPER CLEARANCES AND ACCESSIBILITY.

PART 2 - PRODUCTS

2.01 GENERAL

- A. MATERIALS FOR MECHANICAL WORK, USE ONLY PRIME QUALITY, NEW MATERIALS, APPARATUS AND EQUIPMENT.
 - a. STANDARD PRODUCTS OF MANUFACTURER SPECIFIED.
 - b. WHERE MORE THAN ONE MANUFACTURER IS LISTED, FURNISH BY THE SAME MANUFACTURER, EXCEPT WHERE SPECIFIED OTHERWISE.
 - c. INSTALL SAME MANUFACTURER, EXCEPT AS OTHERWISE SPECIFIED.
 - d. INSTALL MATERIALS AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- B. FURNISH EQUIPMENT THAT WILL OPERATE UNDER ALL CONDITIONS OF LOAD WITHOUT ANY SOUND OR VIBRATION THAT IS OBJECTIONABLE IN THE OPINION OF THE ARCHITECT/ENGINEER. VIBRATION OR NOISE CONSIDERED OBJECTIONABLE WILL BE CORRECTED BY THE SUBCONTRACTOR AT HIS EXPENSE.
- C. FURNISH AND INSTALL ALL NECESSARY FOUNDATIONS, SUPPORTS, PADS, BASES AND PIERS REQUIRED FOR ALL MATERIALS AND EQUIPMENT FURNISHED UNDER THIS CONTRACT.
- D. PROVIDE ALL REQUIRED FIRESTOPPING AT PIPING AND DUCT PENETRATIONS OF FIRE RATED WALL, FLOORS, CEILINGS AND ROOFS.

2.02 MATERIALS AND EQUIPMENT

- A. DELIVER MATERIALS OR EQUIPMENT TO SITE IN THE MANUFACTURER'S ORIGINAL UNOPENED, LABELED CONTAINERS AND ADEQUATELY PROTECT AGAINST MOISTURE, TAMPERING OR DAMAGE FROM IMPROPER HANDLING OR STORAGE. DO NOT DELIVER TO SITE BEFORE ITEMS ARE READY FOR INSTALLATION.
- B. FACTORY APPLIED FINISHES, REPAIR AND/OR REFINISH WORK DAMAGED BY THE WORK OF THIS DIVISION, TO THE ENGINEER'S SATISFACTION. OBTAIN FINISHING MATERIALS FROM EQUIPMENT MANUFACTURER.
- C. COMPLY WITH THE REQUIREMENTS FOR SUBSTITUTIONS SPECIFIED ELSEWHERE IN THIS SECTION.

2.03 MANUFACTURERS

- A. QUALIFICATIONS: FIRMS REGULARLY ENGAGED IN MANUFACTURE OF PRODUCTS SPECIFIED, OF TYPES AND CAPACITIES REQUIRED, WHOSE PRODUCTS HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR NOT LESS THAN 5 YEARS, UNLESS OTHERWISE SPECIFIED.
- B. SUBJECT TO COMPLIANCE WITH REQUIREMENTS SPECIFIED, PROVIDE MATERIAL OR PRODUCT FROM ONE OF THE MANUFACTURERS LISTED FOR EACH ITEM.
- C. SUBMITTALS
 - A. WITHIN THIRTY DAYS AFTER AWARD OF CONTRACT, PROVIDE SIX COPIES OF A COMPLETE LIST OF ALL MATERIALS AND EQUIPMENT PROPOSED FOR THIS PROJECT.
 - B. INCLUDE MAKE, TYPE, MANUFACTURER'S NAME, TRADE DESIGNATION, OPERATING WEIGHT AND LOCATION OF THE CENTER OF GRAVITY (WHERE APPLICABLE) OF EACH ITEM OF EQUIPMENT IN MANUFACTURER'S CUT SHEET.
 - C. REVIEW OF SUBMITTALS SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY OF DEVIATIONS FROM THE PLANS OR SPECIFICATIONS, UNLESS HE HAS, IN WRITING, CALLED THE ARCHITECT'S/ENGINEER'S ATTENTION TO DEVIATIONS AT THE TIME OF SUBMISSION, AND OBTAINED HIS WRITTEN REVIEW. REVIEW OF SUBMITTALS DOES NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS IN SHOP DRAWINGS OR LITERATURE.
 - D. EQUIPMENT REQUIRING SUBMITTALS:
 - a. HVAC EQUIPMENT
 - b. GRILLES, REGISTERS, DIFFUSERS.

2.05 SUBSTITUTION

- A. GENERAL:
 - a. MODEL, SIZE AND SCHEDULED DATA REFER TO THE MANUFACTURER INDICATED IN EQUIPMENT SCHEDULES.
 - b. MANUFACTURERS NAMED IN THIS SPECIFICATION ARE ACCEPTABLE, BUT THEIR EQUIPMENT, MATERIALS AND/OR METHODS ARE SUBJECT TO THE ENGINEER'S REVIEW AND ACCEPTANCE.
 - c. WHERE "OR EQUAL" IS MENTIONED AND MANUFACTURER, MATERIAL AND/OR METHOD OTHER THAN SPECIFIED ARE SUBMITTED FOR APPROVAL, INCLUDE PROOF OF EQUALITY. THE BURDEN OF PROOF AS TO THE EQUALITY OF ANY PROPOSED SUBSTITUTE MANUFACTURER, MATERIAL OR METHOD SHALL REST UPON THE CONTRACTOR.
 - d. THE ENGINEER'S DECISION SHALL BE FINAL.
- B. REQUESTS FOR SUBSTITUTION REVIEW AND ACCEPTANCE SHALL BE ACCOMPISHED BY TABLE OF COMPARISON LISTING PERTINENT FEATURES OF BOTH SPECIFIED AND PROPOSED MATERIALS, SUCH AS MATERIAL OF CONSTRUCTION, REPLACEMENT OR MAINTENANCE ACCESS, MOTOR TYPE, HORSEPOWER, VOLTAGE, PHASE, SERVICE. REVIEW OF PROPOSED SUBSTITUTIONS WILL NOT BE MADE UNTIL RECEIPT OF SATISFACTORY COMPARISON TABULATION.
- C. SUBSTITUTIONS SHALL BE LIMITED TO ONE PROPOSAL FOR EACH TYPE OR KIND OF ITEM, UNLESS OTHERWISE PERMITTED BY ENGINEER. IF FIRST PROPOSED PRODUCT SUBMITTAL IS REJECTED, CONTRACTOR SHALL THEN SUBMIT THE FIRST-NAMED OR SCHEDULED PRODUCT.

PART 3 - EXECUTION

3.01 GENERAL

- A. COORDINATE ALL WORK WITH THE VARIOUS TRADES INVOLVED TO PROVIDE A COMPLETE AND SATISFACTORY INSTALLATION.
- B. WHEN CHANGES IN LOCATION OF ANY WORK ARE REQUIRED, OBTAIN APPROVAL AND SUPPLEMENTARY CONDITIONS BEFORE MAKING SUCH CHANGES. DO NOT PROCEED TO DO NOT CHANGE INDICATED SIZES WITHOUT APPROVAL OF ENGINEER.
- C. PROVIDE ALL NECESSARY OFFSETS AND CROSSOVERS IN PIPING AND DUCTWORK, WHETHER INDICATED OR NOT.
- D. INSTALL PIPING PARALLEL TO WALLS AND VERTICALLY PLUMB.
- E. EXAMINE AREAS AND CONDITIONS UNDER WHICH MECHANICAL SYSTEM MATERIALS AND PRODUCTS ARE TO BE INSTALLED. DO NOT PROCEED WITH WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED IN MANNER ACCEPTABLE TO INSTALLER.

3.02 ELECTRICAL

- A. ELECTRIC MOTORS REQUIRED FOR EQUIPMENT SPECIFIED IN THIS SECTION SHALL BE PROVIDED AND INSTALLED BY THIS SUBCONTRACTOR, MOTOR STARTERS, DISCONNECTS, RELAYS, PILOT LIGHTS, ETC. ARE, IN GENERAL, TO BE FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR, STARTERS, RELAYS, CONTROLS, ETC. WHICH ARE FACTORY ASSEMBLED INTO PACKAGED EQUIPMENT SHALL BE FURNISHED BY THIS SUBCONTRACTOR UNDER THIS SECTION OF THE SPECIFICATIONS.
- B. ALL MOTORS SHALL BE PROVIDED WITH ADEQUATE STARTING AND PROTECTIVE EQUIPMENT AS SPECIFIED OR REQUIRED. MOTOR CAPACITY SHALL BE SUFFICIENT TO OPERATE DRIVEN DEVICE UNDER ALL CONDITIONS OF OPERATION AND LOAD WITHOUT OVERLOAD. MINIMUM HORSEPOWER SHALL BE AS SPECIFIED.

3.03 EXCAVATING, TRENCHING, AND BACKFILLING

- A. GENERAL: LAY PIPE TO REQUIRED LINES AND GRADES. PLACE FITTINGS AND VALVES AT REQUIRED LOCATIONS AND WITH JOINTS CENTERED, SPIGOTS HOME, AND VALVE STEMS PLUMB.
 - a. SUBSURFACE EXPLORATIONS: WHENEVER NECESSARY TO DETERMINE LOCATION OF EXISTING UNDERGROUND UTILITY STRUCTURES, EXAMINE AVAILABLE RECORDS AND MAKE EXPLORATIONS AND EXCAVATIONS NECESSARY TO DETERMINE UTILITY LOCATIONS.
 - b. OBSTRUCTIONS CAUSED BY OTHER UTILITY STRUCTURES: WHERE GRADES OR ALIGNMENT OF PIPE IS OBSTRUCTED BY EXISTING UTILITY STRUCTURES SUCH AS CONDUITS, DUCTS, PIPES, BRANCH CONNECTIONS TO MAIN SEWERS, OR MAIN DRAINS; PERMANENTLY SUPPORT, RELOCATE, REMOVE, OR RECONSTRUCT OBSTRUCTION.
 - c. PROTECTING UNDERGROUND AND SURFACE STRUCTURES: PROVIDE TEMPORARY SUPPORT AND ADEQUATE PROTECTION AND MAINTENANCE OF UNDERGROUND AND SURFACE UTILITY STRUCTURES, DRAINS, SEWERS, AND OTHER OBSTRUCTIONS ENCOUNTERED IN PROGRESS OF THE WORK. PROTECT POLES, FENCES, TREES, AND OTHER PROPERTY UNLESS THEIR REMOVAL IS AUTHORIZED. SATISFACTORILY RESTORE ANY PROPERTY DAMAGED.
 - d. DEVIATIONS: MAKE NO DEVIATION FROM REQUIRED LINE OR GRADE WITHOUT WRITTEN PERMISSION.

3.04 CUTTING AND PATCHING

- A. PROVIDE ALL CUTTING AND PATCHING NECESSARY TO INSTALL THE WORK SPECIFIED IN THIS PROJECT.
- B. SECTIONS:
 - a. PATCHING SHALL MATCH ADJACENT SURFACES.
 - b. NO STRUCTURAL MEMBERS SHALL BE CUT WITHOUT THE APPROVAL OF THE ARCHITECT/ENGINEER.
 - c. PROVIDE CUTTING AND PATCHING TO PERMIT NEAT INSTALLATION OF PIPING, DUCTWORK AND EQUIPMENT.

3.05 INSTALLATION OF EQUIPMENT

- A. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- B. PROVIDE ALL NECESSARY ANCHORING DEVICES AND SUPPORTS.
 - a. USE STRUCTURAL SUPPORTS SUITABLE FOR EQUIPMENT, OR AS INDICATED.
 - b. CHECK LOADINGS AND DIMENSIONS OF EQUIPMENT WITH SHOP DRAWINGS.
 - c. DO NOT CUT OR WELD TO BUILDING STRUCTURAL MEMBERS, UNLESS SPECIFICALLY INDICATED OTHERWISE.
 - d. PROVIDE ALL EQUIPMENT SUPPORTS NOT DETAILED ON ARCHITECTURAL AND MECHANICAL DRAWINGS.
- C. VERIFY THAT EQUIPMENT IDENTIFICATION MATERIALS:
 - a. WHERE SUBSTITUTE EQUIPMENT IS USED, REVISE INDICATED SUPPORTS TO FIT.
 - b. COORDINATE SIZE AND LOCATION OF ROOF PENETRATIONS AND WALL OPENINGS WITH WORK OF OTHER SECTIONS.
- D. INSTALL RAIN HOODS AND METAL COUNTER FLASHINGS AS INDICATED AND TO MAKE ALL PENETRATIONS OF MECHANICAL WORK THROUGH WALLS AND ROOFS, WATER AND WEATHER-TIGHT. FURNISH ALL CLAMPS, WATERPROOFING MATERIAL AND LABOR NECESSARY. INSTALL EQUIPMENT TO PERMIT EASY ACCESS FOR NORMAL MAINTENANCE.
 - a. MAINTAIN EASY ACCESS TO FILTERS, MOTORS, DRIVES, VALVES, ETC.
 - b. MINOR CHANGES FROM THE DRAWINGS MAY BE MADE, WITH PRIOR APPROVAL, TO ALLOW FOR BETTER ACCESSIBILITY.
- E. IN MECHANICAL AREAS, COORDINATE LOCATIONS OF FLOOR DRAINS, FLOOR SINKS, ETC., WITH LOCATIONS OF EQUIPMENT AND HOUSEKEEPING PADS. LOCATE DRAINS TO PROPERLY SERVE EQUIPMENT AND TO RESULT IN ORDERLY ROUTING OF DRAIN PIPING, WHILE MINIMIZING TRIPPING HAZARDS, ETC.

3.06 INSTALLATION OF EQUIPMENT FURNISHED BY OWNER OR OTHER DIVISION

- A. RECEIVE, UN-CRATE, INSPECT, MOVE IN PLACE AND INSTALL ANY OWNER SUPPLIED EQUIPMENT. PROVIDE ROUGH-IN AND FINAL CONNECTIONS TO ALL EQUIPMENT REQUIRING MECHANICAL SERVICES.
- B. INSTALL ALL FITTINGS, VALVES, AND OTHER ITEMS FURNISHED AS INTEGRAL PART OF EQUIPMENT, BUT SHIPPED LOOSE.

3.07 FIELD QUALITY CONTROL

- A. PERFORM INDICATED TESTS TO DEMONSTRATE WORKMANSHIP, OPERATION, AND PERFORMANCE.
 - a. CONDUCT TESTS IN PRESENCE OF INSPECTORS OF AGENCIES HAVING JURISDICTION, AS REQUIRED.
 - b. FURNISH ALL LUBRICATING MATERIALS REQUIRED FOR TEST.
 - c. REPAIR OR REPLACE EQUIPMENT AND SYSTEMS FOUND INOPERATIVE OR DEFECTIVE AND RE-TEST.
 - d. IF EQUIPMENT OR SYSTEM FAILS RE-TEST, REPLACE IT WITH PRODUCTS WHICH CONFORM WITH CONTRACT DOCUMENTS, CONTINUE REMEDIAL MEASURES AND RETESTS UNTIL SATISFACTORY RESULTS ARE OBTAINED.

3.08 ADJUST AND CLEAN

- A. INSPECT ALL EQUIPMENT AND PUT IN GOOD WORKING ORDER.
- B. CLEAN ALL EXPOSED AND CONCEALED ITEMS.
 - a. CLEAN FLOOR DRAINS, CLEANOUTS, AND PLUMBING FIXTURES.
 - b. CLEAN SPECIALTIES SUCH AS TRAPS AND STRAINERS.
- C. EQUIPMENT AND MATERIALS: REMOVE FOREIGN MATERIALS INCLUDING DIRT, GREASE, SPLASHED PAINT, AND PLASTER, ETC. RESTORE TO ORIGINAL CONDITION AND FINISH DAMAGED.
- D. DOMESTIC WATER SYSTEMS:
 - a. STERILIZATION: AFTER ABOVE FLUSHING, DRAINING, AND REFILLING, STERILIZE DOMESTIC WATER SYSTEMS IN ACCORDANCE WITH REQUIREMENTS OF PUBLIC HEALTH AGENCY HAVING JURISDICTION. IF HEALTH DEPT. DOES NOT HAVE SPECIFIC REQUIREMENTS, USE FOLLOWING ALTERNATIVE.
 - b. ALTERNATIVE PROCEDURE: STERILIZE DOMESTIC WATER SYSTEMS WITH 4% CHLORINE SOLUTION INJECTED INTO SYSTEM TO CONCENTRATION OF 50 PARTS PER MILLION AND ALLOW TO STAND FOR 24 HOURS.
 - c. AFTER THIS PERIOD, PURGE THROUGHOUT ENTIRE STRUCTURE AT OUTLETS; REDUCE SYSTEM CHLORINE CONTENT TO LESS THAN 1 PART PER MILLION.
 - d. WARNING SIGNS: PROVIDE SIGNS AT OUTLETS DURING CHLORINATION.
 - e. GAS: AFTER TESTING OF NATURAL GAS SYSTEM, AND BEFORE ANY GAS IS PUT INTO LINE, BLOW OUT ENTIRE SYSTEM OF PIPING TO REMOVE SCALE AND DIRT; PURGE AIR BY FILLING SYSTEM WITH GAS.
- E. ADJUSTING: ADJUST EQUIPMENT AND SYSTEM COMPONENTS AS INDICATED OR AS OTHERWISE REQUIRED TO RESULT IN INTENDED SYSTEM OPERATION. THEREAFTER, AS A RESULT OF SYSTEM OPERATION OR AS DIRECTED, MAKE READJUSTMENTS AS NECESSARY TO REFINE PERFORMANCE AND TO EFFECT COMPLETE SYSTEM TUNE-UP.

3.09 TESTING

- A. PIPING:
 - a. ALL PLUMBING PIPING SHALL BE TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE UNIFORM PLUMBING CODE, LATEST EDITION. OTHER PIPING SYSTEMS SHALL BE TESTED TO 1.5 TIMES THE OPERATING PRESSURE, FOR A MINIMUM PERIOD OF TWO HOURS.
 - b. IF THE TEST PRESSURE FALLS MORE THAN 5 PERCENT DURING THE TEST PERIOD, THE LEAK SHALL BE LOCATED, REPAIRED AND THE TEST REPEATED.
- B. TEST THERMOMETERS, PRESSURE GAGES, AND WATER METERS FOR ACCURATE INDICATION:
 - a. AUTOMATIC WATER FEEDERS, AIR VENTS, TRAP PRIMERS, VACUUM BREAKERS, AND OTHER SPECIALTIES FOR PROPER PERFORMANCE.
- C. SYSTEMS:
 - a. ALL SYSTEMS, INCLUDING HEATING, VENTILATING, AIR CONDITIONING, AND PLUMBING SYSTEMS, SHALL BE TESTED AT THE COMPLETION OF THE BUILDING TO ESTABLISH THAT THE SYSTEMS OPERATE AS SPECIFIED AND REQUIRED.
 - b. TESTING SHALL BE PERFORMED AFTER AIR AND WATER BALANCING IS COMPLETED.
 - c. ALL CONTROLS SHALL BE CALIBRATED ACCURATELY AND ALL EQUIPMENT SHALL BE ADJUSTED FOR SATISFACTORY OPERATION. EXCESSIVE VIBRATION OR NOISE FROM ANY SYSTEM SHALL BE CORRECTED.
- D. THE AIR CONDITIONING SYSTEM SHALL BE TESTED FOR SATISFACTORY OPERATION WHEN THE OUTSIDE AIR TEMPERATURE REACHES 60 DEGREES F. OR WARMER. ALL OTHER SYSTEMS SHALL BE TESTED AT BUILDING COMPLETION.
- E. ALL TESTS SHALL BE PERFORMED IN THE PRESENCE OF THE ARCHITECT/ENGINEER OR HIS REPRESENTATIVE.
- F. HANGERS AND SUPPORTS: WITH SYSTEMS IN NORMAL OPERATION, TEST HANGERS, SUPPORTS AND RODS TO INSURE THEY ARE PLUMB AND SUPPORTING PROPER SHARE OF LOAD.
- G. ADDITIONALLY SUPPORT SYSTEMS AND EQUIPMENT THAT SWAY, CRAWL, OR VIBRATE.
- H. OTHER MATERIALS AND EQUIPMENT:
 - a. TEST AS SPECIFIED AS RECOMMENDED BY EQUIPMENT MANUFACTURER, AND AS OTHERWISE NECESSARY OR DIRECTED TO ASSURE THEY ARE COMPLETE, OPERABLE, AND READY FOR USE.

3.10 BALANCING

- A. PRIOR TO FINAL ACCEPTANCE BY THE OWNERS, ALL AIR SYSTEMS IN THE BUILDING SHALL BE BALANCED TO DELIVER THE QUANTITIES AS SPECIFIED OR DIRECTED.
- B. THE AIR BALANCE SHALL BE PERFORMED BY AN INDEPENDENT AGENCY SPECIALIZING IN BALANCING.
- C. TEST PROCEDURES:
 - a. EXAMINE INSTALLED WORK AND CONDITIONS UNDER WHICH TESTING IS TO BE DONE TO ENSURE THAT WORK HAS BEEN COMPLETED, CLEANED, AND IS OPERABLE DO NOT PROCEED WITH
 - b. TESTING, ADJUSTING AND BALANCING (TAB) WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED IN MANNER ACCEPTABLE TO TESTER.
 - c. TEST, ADJUST AND BALANCE ENVIRONMENTAL SYSTEMS AND COMPONENTS AS INDICATED, IN ACCORDANCE WITH PROCEDURES OUTLINED IN APPLICABLE STANDARDS.
 - d. TEST, ADJUST AND BALANCE SYSTEM DURING SUMMER SEASON FOR AIR CONDITIONING SYSTEMS AND DURING WINTER SEASON FOR HEATING SYSTEMS, INCLUDING AT LEAST LEAD OF OPERATION AT OUTSIDE CONDITIONS WITHIN 5 DEGREES F WET BULB TEMPERATURE OF MAXIMUM SUMMER DESIGN CONDITION, AND WITHIN 10 DEGREES F DRY BULB TEMPERATURE OF MINIMUM WINTER DESIGN CONDITION. WHEN SEASONAL OPERATION DOES NOT PERMIT MEASURING FINAL TEMPERATURES, THIS TARGET TEMPERATURE SHALL BE READINGS WHEN SEASONAL OPERATION DOES PERMIT.
 - e. PREPARE REPORT OF TEST RESULTS, INCLUDING INSTRUMENTATION CALIBRATION REPORTS, IN FORMAT RECOMMENDED BY APPLICABLE STANDARDS.
 - f. PATCH HOLES IN INSULATION, DUCTWORK AND HOUSINGS, WHICH HAVE BEEN CUT OR DRILLED FOR TEST PURPOSES, IN MANNER RECOMMENDED BY ORIGINAL INSTALLER.
 - g. MARK EQUIPMENT SETTINGS, INCLUDING DAMPER CONTROL POSITIONS, VALVE INDICATORS, FAN SPEED CONTROL LEVERS, AND SIMILAR CONTROLS AND DEVICES, TO SHOW FINAL SETTINGS AT COMPLETION OF TAB WORK. PROVIDE MARKINGS WITH PAINT OR OTHER SUITABLE PERMANENT IDENTIFICATION MATERIALS.
 - h. RETEST, ADJUST, AND BALANCE SYSTEMS SUBSEQUENT TO SIGNIFICANT SYSTEM MODIFICATIONS, AND RESUBMIT TEST RESULTS.
- D. AIR BALANCING:
 - GENERAL:
 - BALANCE SO THAT OUTSIDE AIR FLOW DOES NOT GO BELOW MINIMUM VALUE AT ANY TIME.
 - VERIFY PROPER AUTOMATIC OPERATION OF AUTOMATIC OUTSIDE RETURN, AND EXHAUST AIR DAMPERS THROUGHOUT ENTIRE RANGE OF OPERATION.
 - BALANCE WITH FILTER PRESSURE DROP AT MIDPOINT BETWEEN CLEAN AND DIRTY FILTERS. ARTIFICIALLY CREATE REQUIRED PRESSURE DROP, IF NECESSARY, BY BLANKING OFF COILS.
 - BALANCE WITH DOORS AND WINDOWS IN THEIR NORMAL CLOSED POSITION.
 - b. BALANCE AIR TO FOLLOWING TOLERANCES:
 - EACH OUTLET AND EACH INLET: PLUS 10% TO MINUS 10% OF CFM INDICATED ON DRAWINGS.
 - EACH ROOM AND AIR TERMINAL UNIT: 0% TO PLUS 10% OF AIR MONITOR CFM.
 - EACH FAN: 0% TO PLUS 10% OF SYSTEM CFM.
 - c. ADJUST THROW PATTERNS OF SUPPLY AIR OUTLETS INCLUDING SLOT DIFFUSERS.
 - d. ADJUST FAN DRAFT FRESH ROOM AIR DISTRIBUTION.
 - e. ADJUST AS INDICATED, WHERE NOT INDICATED, ADJUST AS DIRECTED BY ENGINEER. REQUEST SUCH DIRECTION PRIOR TO BALANCING.
 - f. UNLESS OTHERWISE INDICATED OR DIRECTED, ADJUST AIR OUTLETS TO DISTRIBUTE AIR HORIZONTALLY ALONG CEILING AND ADJUST PERIMETER SLOT DIFFUSERS TO BLOW AWAY FROM BUILDING PERIMETER.
 - g. SYSTEM DESIGN STATIC PRESSURES ARE APPROXIMATIONS. MAKE CHANGES IN SHEAVES AND BELTS AS REQUIRED FOR SPECIFIED STATIC PRESSURE DIFFERENTIAL ACROSS FAN, AND RATED SPEED.
 - h. INSPECT ALL ROOMS FOR ROOM TEMPERATURES, DRAFTS, AND NOISE. MAKE ADJUSTMENTS TO CORRECT ANY PROBLEMS.

3.11 SYSTEMS START UP

- A. STARTUP REQUIREMENTS APPLY TO CONTRACTOR AND OWNER SUPPLIED EQUIPMENT AND SYSTEMS.
- B. PRIOR TO FINAL ACCEPTANCE, AT TIME AGREED TO BY OWNER AND ENGINEER, PUT ALL SYSTEMS INTO SATISFACTORY OPERATION.
- C. AT FIRST HEATING OR COOLING SEASON FOLLOWING FINAL ACCEPTANCE, START UP SYSTEMS NOT STARTED DUE TO LACK OF SEASONAL DESIGN LOAD OR OPERATION OF THE CENTRAL SYSTEM.
- D. OPERATE ALL SYSTEMS IN GOOD WORKING ORDER FOR PERIOD OF FIVE (5) WORKING DAYS.
- E. PROVIDE SERVICES OF AUTHORIZED FACTORY SERVICE REPRESENTATIVE TO PERFORM START-UP AND OPERATION DEMONSTRATION SERVICES.
- F. PERFORM SERVICES IN ACCORDANCE WITH MANUFACTURER'S WRITTEN START-UP INSTRUCTIONS. TEST CONTROL AND DEMONSTRATE COMPLIANCE WITH REQUIREMENTS. REPLACE DAMAGED OR MALFUNCTIONING CONTROLS AND EQUIPMENT.
- G. MAINTENANCE AND OPERATION TRAINING:
 - a. AFTER THE MECHANICAL SYSTEM IS COMPLETELY INSTALLED AND OPERATIONS, THE MECHANICAL CONTRACTOR SHALL PROVIDE A MINIMUM OF TWO HOURS TRAINING AND INSTRUCTION TIME FOR THE BUILDING OWNER OR HIS REPRESENTATIVE. DURING THIS PERIOD, THE CONTRACTOR SHALL INSTRUCT THE OWNER IN THE OPERATION AND MAINTENANCE OF ALL PARTS OF THE MECHANICAL SYSTEM, USING THE O&M MANUAL WHERE APPLICABLE.

3.12 SPECIAL TOOLS

- A. FURNISH TO OWNER NOT LATER THAN WHEN OWNER TAKES POSSESSION OF EQUIPMENT.
- B. DEFINITION OF SPECIAL TOOLS: IDENTIFIED IN OR OTHERWISE IMPLIED BY, THE MANUFACTURER'S OPERATION AND MAINTENANCE MANUALS FOR THE FURNISHED EQUIPMENT, OR WHICH ARE OTHERWISE REQUIRED FOR THE OPERATION, WITH THE MANUFACTURER'S RECOMMENDED PROCEDURES FOR OPERATION, ADJUSTMENT AND MAINTENANCE. SPECIAL TOOLS DO NOT INCLUDE THOSE REQUIRED FOR MAJOR REPAIRS NORMALLY DONE BY FACTORY TRAINED OR OTHERWISE SPECIALIZED SERVICE PERSONNEL, NOR DO THEY INCLUDE THOSE NORMALLY FOUND IN THE POSSESSION OF OWNERS ON SITE MAINTENANCE PERSONNEL.

3.13 RECORD DOCUMENTS AND OPERATING AND MAINTENANCE MANUALS

- A. THE CONTRACTOR SHALL PROVIDE TWO COPIES OF AN OPERATIONS AND MAINTENANCE MANUAL AT LEAST THIRTY DAYS PRIOR TO COMPLETION OF WORK. THE MANUAL SHALL BE OF THE THREE RING BINDER TYPE, ENTITLED, "OPERATION AND MAINTENANCE MANUAL," WITH THE JOB NAME AND YEAR OF COMPLETION ALSO INCLUDED. THE MANUAL SHALL INCLUDE AS A MINIMUM:
 - a. LIST OF ALL EQUIPMENT WITH MANUFACTURER'S NAME, MODEL NUMBER, AND LOCAL REPRESENTATIVE, SERVICE FACILITIES AND NORMAL CHANNEL OF SUPPLY FOR EACH ITEM.
 - b. SYSTEM DESCRIPTION: DESCRIPTION OF START UP AND OPERATING PROCEDURES.
 - c. CONTROLS, DIAGRAMS AND DESCRIPTION OF OPERATION SEQUENCE OF EACH SYSTEM.
 - d. EQUIPMENT: MANUFACTURER'S BROCHURES, RATINGS, CERTIFIED SHOP DRAWINGS, LUBRICATION CHARTS AND DATA, PARTS LISTS WITH PART NUMBERS, AND BELT AND SHEAVE DATA. MARK EACH SHEET WITH EQUIPMENT IDENTIFICATION NUMBER AND ACTUAL INSTALLED CONDITION.
 - e. MATERIALS AND ACCESSORIES: MANUFACTURER'S BROCHURES, PARTS LISTS WITH PART NUMBERS AND LUBRICATION DATA WHERE APPLICABLE. MARK EACH SHEET WITH EQUIPMENT IDENTIFICATION NUMBER OR SYSTEM AND LOCATION OF INSTALLATION, AND TO SPECIFICALLY IDENTIFY WHICH OPTIONS ARE PROVIDED (IN CASE WHERE DATA SHEET SHOWS MULTIPLE OPTIONS).
 - f. CERTIFICATE OF FACTORY TEST AND CODE COMPLIANCE AS SPECIFIED.
 - g. AIR AND/OR WATER SYSTEM BALANCE REPORT AS HEREIN SPECIFIED.
 - h. GUARANTEE LETTER AS HEREIN SPECIFIED.
 - i. ANY ADDITIONAL INFORMATION REQUIRED TO ENABLE THE OWNER TO PROPERLY OPERATE AND MAINTAIN THE BUILDING MECHANICAL SYSTEM.
- B. PROVIDE TWO COMPLETE SETS OF BLUELINE AS-BUILT MECHANICAL DRAWINGS, REPLACEMENTS BECAUSE OF DEFECTIVE MATERIALS OR WORKMANSHIP OR NONCOMPLIANCE WITH CODE SHALL BE PROVIDED WITHOUT ADDITIONAL COST TO THE OWNER. CONTRACTOR SHALL FURNISH A LETTER INDICATING ABOVE GUARANTEE WITH SPACE FOR DATE OF ACCEPTANCE AND EXPIRATION OF GUARANTEE. LETTER SHALL BE INCLUDED IN O&M MANUAL.

END OF SECTION 1910

3.14 GUARANTEE

- A. ALL WORK FURNISHED UNDER THIS SECTION SHALL BE GUARANTEED IN WRITING TO BE FREE FROM DEFECTIVE WORK OR MATERIALS FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE OF THE CONTRACT. ALL REPAIRS OR REPLACEMENTS BECAUSE OF DEFECTIVE MATERIALS OR WORKMANSHIP OR NONCOMPLIANCE WITH CODE SHALL BE PROVIDED WITHOUT ADDITIONAL COST TO THE OWNER. CONTRACTOR SHALL FURNISH A LETTER INDICATING ABOVE GUARANTEE WITH SPACE FOR DATE OF ACCEPTANCE AND EXPIRATION OF GUARANTEE. LETTER SHALL BE INCLUDED IN O&M MANUAL.



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ISSUANCES

No.	Description	Date
	FOR BID/PERMIT	10/21/2024

Drawn By

KDB

Checked By

DST

Client No.

818

Project No.

7479



JEFFREY WETZEL
PE-76872
EXPIRATION DATE
12/31/2025

HVAC SPECIFICATIONS

H002

AIR INLETS AND OUTLETS SCHEDULE								
PLAN MARK	DESCRIPTION	BASIS OF DESIGN		MOUNTING	FINISH	MATERIAL	ACCESSORIES	NOTES
		MANUF.	MODEL					
A1	SQUARE FACE CEILING DIFFUSER, 24x24 FACE	TITUS	TMS	LAY-IN	WHITE	STEEL	-	-
A2	SQUARE FACE CEILING DIFFUSER, 24x24 FACE	TITUS	TMS	SURFACE	WHITE	STEEL	OPP. BLADE DMPR.	-
B1	EGGCRATE RETURN GRILLE	TITUS	50F	LAY-IN	WHITE	STEEL	-	-
B2	EGGCRATE RETURN GRILLE	TITUS	50F	SURFACE	WHITE	STEEL	OPP. BLADE DMPR.	-
B3	EGGCRATE RETURN GRILLE	TITUS	50F-A	SURFACE	WHITE	ALUM.	OPP. BLADE DMPR.	-
C1	DOUBLE DEFLECTION SUPPLY GRILLE	TITUS	272RL	DUCT MOUNTED	WHITE	STEEL	OPP. BLADE DMPR.	-

GENERAL NOTES:
A. LAY-IN AIR DEVICES SHALL BE DESIGNED TO INSTALL INTO A 24"x24" OR 24"x48" ACT CEILING SYSTEM
B. ACCEPTABLE ALTERNATE MANUFACTURERS: PRICE, KREUGER AND TUTTLE & BAILEY
C. PROVIDE AUXILIARY MOUNTING FRAME FOR DEVICES INSTALLED WITHIN GYPSUM, PLASTER, TILE OR OTHER SIMILAR SURFACE
D. UNLESS OTHERWISE DESIGNATED ON PLANS, SUPPLY DIFFUSERS SHALL BE 4-WAY DIRECTIONAL DISCHARGE.

NOTES:
1. .

DUCTWORK CONSTRUCTION SCHEDULE											
DUCT SYSTEM	SHAPE	PRESS. CLASS W.G.	MATERIAL	LINER			INSULATION			NOTES	
				THK.	TYPE	D	THK.	TYPE	D		
CONCEALED SUPPLY	RND/RECT	-1/2"	GS	-	-	-	1.5"	IFD	-	FFJ	7
CONCEALED RETURN	RND/RECT	-1/2"	GS	-	-	-	1.5"	IFD	-	FFJ	-
CONCEALED RETURN IN PLENUMS	RND/RECT	-1/2"	GS	-	-	-	-	-	-	-	-
CONCEALED SUPPLY AIR DEVICE RUNOUT	RND	+1"	IFD	-	-	-	1.5"	IFD	-	FFJ	1
EXHAUST	RND/RECT	-1"	GS	-	-	-	-	-	-	-	-
EXPOSED SPIRAL SUPPLY	RND	+2"	GS	1"	PFL	-	-	-	-	-	-
	RND/RECT	-1/2"	GS	-	-	-	-	-	-	-	-

GENERAL NOTES:
A. ALL PAINTING BY GENERAL CONTRACTOR.
B. ALL DUCT JOINTS AND SEAMS SHALL BE SEALED PER OMC CHAPTER 5.

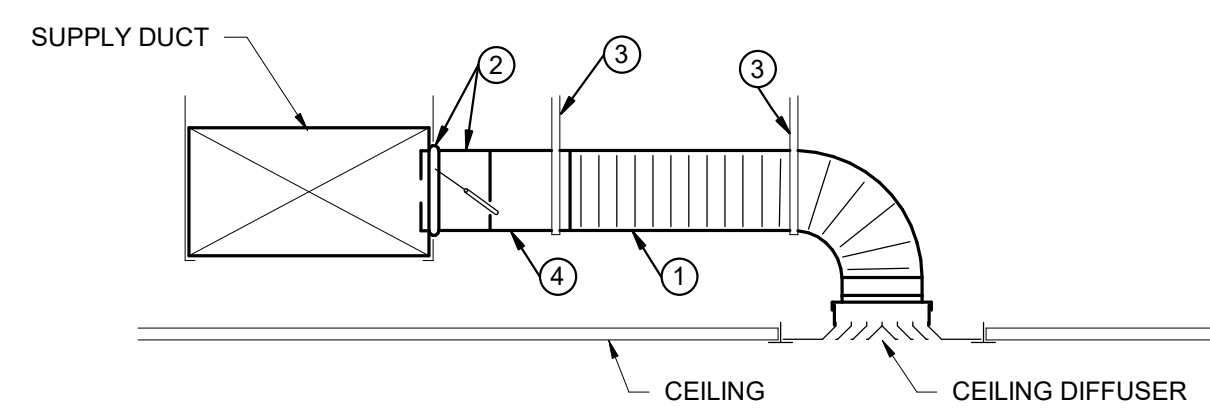
SCHEDULE NOTES:
1. ROUND RUNOUTS TO AIR DEVICES SHALL BE EXTERNALLY INSULATED. DUCT FIRE WRAP SHALL BE OF THICKNESS AND DENSITY TO PROVIDE ZERO CLEARANCE TO COMBUSTIBLES.
2. DUCTWORK SHALL COMPLY WITH OHIO MECHANICAL CODE AND NFPA 96.
3. ALL SEAMS SHALL BE CONTINUOUSLY WELDED.
4. EXTERIOR DUCTWORK SHALL HAVE ALUMINUM JACKETING OVER RIGID INSULATION BOARD. ALL SEAMS SHALL BE OVERLAPPED AND SEALED WATERTIGHT.
5. DUCTWORK LOCATED IN ATTIC SHALL BE INSULATED WITH MINIMUM R-6 INSULATION.
6. INCLUDES DUCTWORK ROUTED IN ABOVE CEILING PLENUM SPACES.

ABBREVIATIONS:
AIFD ACOUSTICAL INSULATED FLEX-DUCT FFJ FOIL FACED JACKET PGSS PAINTGRIP GALVANIZED STEEL
ALUM ALUMINUM FFW FIBERGLASS WRAP PVCCS PVC COATED GALVANIZED STEEL
ABA ADHESIVE BACKED ALUMINUM GS FIRE WRAP RECT RECTANGULAR
ASJ ALL SERVICE JACKET GS GALVANIZED STEEL RND ROUND
CS CARBON STEEL GSSP GALVANIZED STEEL SPIRAL PIPE SS STAINLESS STEEL
D DENSITY (PCF) IFD INSULATED FLEXIBLE DUCT TH THICKNESS
DWI DOUBLEWALL INSULATED MFF MATT FACED FIBERGLASS UFD UNINSULATED FLEXIBLE DUCT
ETPS EXTRUDED POLYSTYRENE PFD PERFORATED FABRIC DUCT
FB FIBERGLASS BOARD PFL PREFORMED LINER

VENTILATION SCHEDULE									
ROOM NUMBER	ROOM NAME	OCCUPANCY TYPE	AREA (SF)	OCCUPANT DENSITY (#/1000SF)	PEOPLE AIR RATE (CFM/PERSON)	AREA AIR RATE (CFM/SF)	NUMBER OF PEOPLE	MINIMUM OA AIRFLOW (CFM)	
300	ELEVATOR LOBBY	LOBBY	548	10	5	0.06	6	63	
301	RECEPTION	RECEPTION	325	5	5	0.06	4	111	
302	CORRIDOR	CORRIDOR	170	0	0	0.06	0	10	
303	CORRIDOR	CORRIDOR	205	0	0	0.06	0	12	
304	EXST STAIR		188						
305	COPY/PRINT	OFFICE	124	5	5	0.06	1	12	
306	OPEN OFFICE	OFFICE	580	5	5	0.06	4	61	
307	OFFICE	OFFICE	191	5	5	0.06	1	16	
308	OFFICE	OFFICE	184	5	5	0.06	1	16	
309	SMALL CONFERENCE	CONFERENCE	197	50	5	0.06	10	62	
311	OFFICE	OFFICE	121	5	5	0.06	1	12	
312	OFFICE	OFFICE	121	5	5	0.06	1	12	
313	EXST TELCO ROOM	OFFICE	119	5	5	0.06	1	12	
314	LARGE BREAK ROOM	BREAK ROOM	536	50	5	0.12	27	199	
316	OPEN OFFICE	OFFICE	1501	5	5	0.06	8	130	
317	OFFICE	OFFICE	120	5	5	0.06	1	12	
318	OFFICE	OFFICE	120	5	5	0.06	1	12	
319	OFFICE	OFFICE	120	5	5	0.06	1	12	
321	OFFICE	OFFICE	120	5	5	0.06	1	12	
322	OPEN OFFICE	OFFICE	1370	5	5	0.06	7	117	
323	CORRIDOR	CORRIDOR	190	0	0	0.06	0	11	
324	EXST MENS RESTROOM		249						
326	EXST WOMENS RESTROOM		249						
327	MOTHER'S ROOM		124						
328	ADA TOILET/SHOWER ROOM		105						
329	MED. CONFERENCE	CONFERENCE	245	50	5	0.06	13	80	
331	SECURE WORK AREA	OFFICE	242	5	5	0.06	2	25	
332	CORRIDOR	CORRIDOR	325	0	0	0.06	0	20	
333	SECRET OSA CONFERENCE ROOM	CONFERENCE	1461	50	5	0.06	74	458	
334	STORAGE		96						
337	CORRIDOR	CORRIDOR	105	0	0	0.06	0	6	
338	EXST MECH RM		58						
339	COPY/PRINT	OFFICE	119	5	5	0.06	1	12	
341	EXST STAIRS		210						
342	OPEN OFFICE	OFFICE	2222	5	5	0.06	12	193	
343	Huddle	CONFERENCE	156	50	5	0.06	8	49	
344	OFFICE	OFFICE	121	5	5	0.06	1	12	
346	OFFICE	OFFICE	178	5	5	0.06	1	16	
347	EXST ELEC RM		30						
348	OFFICE	OFFICE	120	5	5	0.06	1	12	
349	OFFICE	OFFICE	120	5	5	0.06	1	12	
351	OFFICE	OFFICE	120	5	5	0.06	1	12	
352	OFFICE	OFFICE	120	5	5	0.06	1	12	
353	OPEN OFFICE	OFFICE	1860	5	5	0.06	10	162	
354	OFFICE	OFFICE	120	5	5	0.06	1	12	
356	OFFICE	OFFICE	120	5	5	0.06	1	12	
357	OFFICE	OFFICE	120	5	5	0.06	1	12	
358	OFFICE	OFFICE	120	5	5	0.06	1	12	
359	EXST OFFICE	OFFICE	119	5	5	0.06	1	12	
361	EXST ELEC RM		30						
362	EXST JANITOR CLOSET		76						
363	OPEN OFFICE	OFFICE	2178	5	5	0.06	11	186	
364	OFFICE	OFFICE	198	5	5	0.06	1	17	
365	EXST ELEC RM		42						
366	OFFICE	OFFICE	137	5	5	0.06	1	13	
367	SMALL CONFERENCE	CONFERENCE	243	50	5	0.06	13	80	

NOTE: BUILDING OUTSIDE AIR VENTILATION CONTROLLED BY BUILDING DEMAND CONTROL SYSTEM. BALANCE EXISTING SYSTEM TO MINIMUM CFM LISTED. COORDINATE BALANCE WITH BUILDING OWNER.

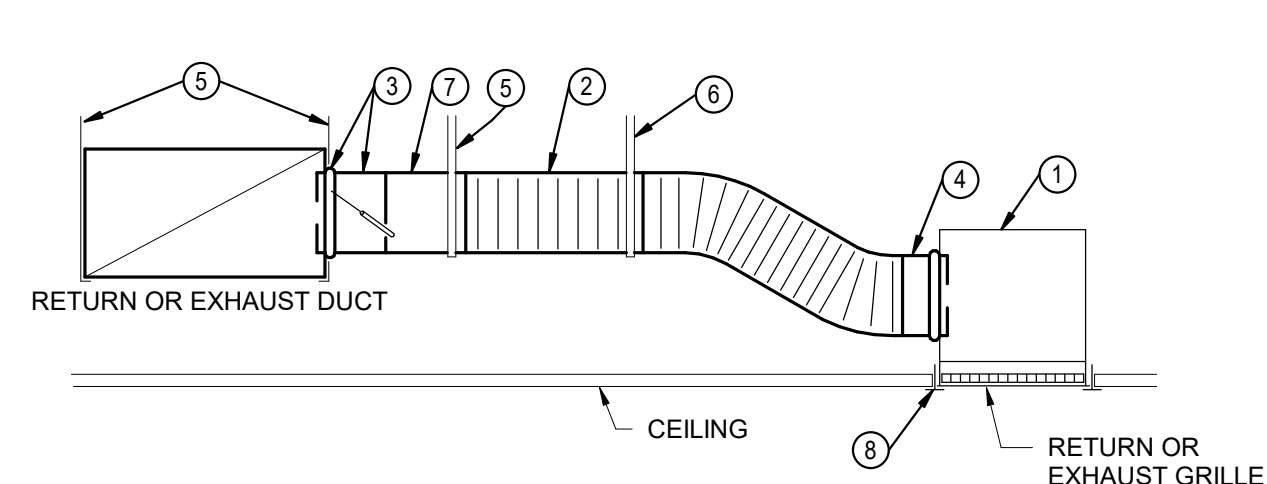
HVAC DESIGN CRITERIA			
GENERAL DESIGN INFORMATION		OUTDOOR DESIGN INFORMATION	
BUILDING LOCATION: MIAMISBURG, OHIO		SUMMER DRY BULB: 90.3°F (ASHRAE 0.4%)	MECHANICAL: OHIO MECHANICAL CODE 2024
		SUMMER WET BULB: 73.6°F (ASHRAE 0.4%)	PLUMBING: OHIO PLUMBING CODE 2024
		WINTER DRY BULB: 0.6°F (ASHRAE 99.6%)	ENERGY: ASHRAE 90.1-2019
			VENTILATION: ASHRAE 62.1-2019
INDOOR DESIGN INFORMATION		APPLICABLE CODES	
INDOOR SUMMER DRY BULB: 75°F	INDOOR SUMMER RH%: 60% MAX		
INDOOR WINTER DRY BULB: 70°F	INDOOR WINTER RH%: AMBIENT		



NOTES

- INSULATED FLEXIBLE DUCT SAME DIAMETER AS BRANCH DUCT, 6 FT. MAXIMUM TOTAL LENGTH PER AIR DEVICE. STRETCH FLEXIBLE DUCT TO AT LEAST 90% OF FULLY EXTENDED LENGTH.
- SPIN-IN BRANCH TAP FITTING, STRAIGHT SIDE WITH MANUAL DAMPER, DAMPER SHAFT IN HORIZONTAL. INTEGRAL INSULATION GUARD SLEEVE REQUIRED FOR TAP FITTING TO MAIN DUCT WITH INTERNAL INSULATION, AND EXTENDED DAMPER SHAFT AND HANDLE WITH STAND-OFF TO ACCOMMODATE EXTERNAL INSULATION.
- DUCT STRAP HANGER. ATTACH TO STRUCTURE.
- ROUND SHEET METAL BRANCH DUCT, SAME SIZE AS DIFFUSER INLET UNLESS NOTED OTHERWISE.

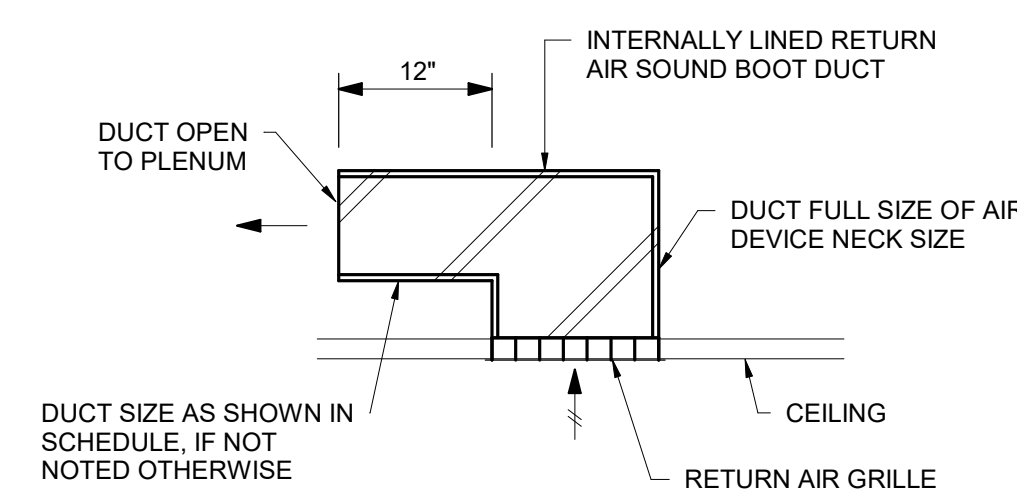
1 CEILING DIFFUSER DUCT CONNECTION NTS



NOTES

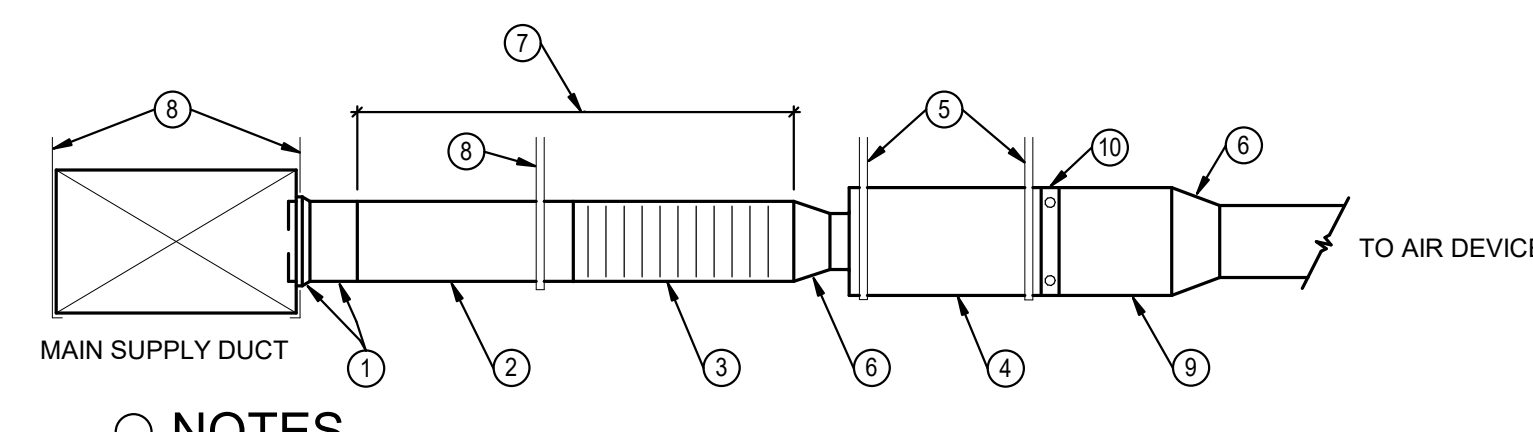
- SHEET METAL PLENUM, FULL SIZE OF GRILLE NECK, MINIMUM 4" TALLER THAN DUCT RUNOUT SIZE, WITH SAME INTERNAL OR EXTERNAL INSULATION AS RETURN OR EXHAUST DUCT, CONNECT TO GRILLE.
- FLEXIBLE DUCT, SAME DIAMETER AS BRANCH DUCT, 7 FT. MAXIMUM TOTAL LENGTH PER AIR DEVICE. STRETCH FLEXIBLE DUCT TO AT LEAST 90% OF FULLY EXTENDED LENGTH.
- SPIN-IN BRANCH TAP FITTING, STRAIGHT SIDE WITH MANUAL DAMPER, DAMPER SHAFT IN HORIZONTAL. INTEGRAL INSULATION GUARD SLEEVE REQUIRED FOR TAP FITTING TO MAIN DUCT WITH INTERNAL INSULATION, EXTENDED DAMPER SHAFT AND HANDLE WITH STAND-OFF REQUIRED FOR EXTERNALLY INSULATED DUCTWORK.
- SPIN-IN TAP FITTING, NO DAMPER.
- DUCT STRAP HANGER. ATTACH TO STRUCTURE.
- STRAP HANGER REQUIRED IF LENGTH OF FLEXIBLE DUCT IS LONGER THAN 4 FT.
- ROUND SHEET METAL BRANCH DUCT, SAME SIZE AS AIR TERMINAL UNIT INLET SIZE UNLESS NOTED OTHERWISE.
- CEILING T-BAR SUPPORT (FOR LAY-IN APPLICATIONS), COORDINATE AND VERIFY T-BAR TYPE FOR COMPATIBILITY WITH GRILLE.

3 RETURN/EXHAUST GRILLE CONNECTION NTS



AIR DEVICE SIZE	DUCT SIZE
12x12	12x10
24x12	12x12
24x24	24x12

2 RETURN AIR SOUND BOOT NTS



NOTES

- CONICAL SPIN-IN BRANCH TAP FITTING, STRAIGHT SIDE, INTEGRAL INSULATION GUARD SLEEVE REQUIRED FOR TAP FITTING TO MAIN SUPPLY DUCT WITH INTERNAL INSULATION.
- ROUND SHEET METAL BRANCH DUCT, SAME SIZE AS AIR TERMINAL UNIT INLET SIZE UNLESS NOTED OTHERWISE.
- INSULATED FLEXIBLE DUCT, MAXIMUM LENGTH OF 4 FT. MINIMUM LENGTH OF 4 IN. STRETCH FLEXIBLE DUCT TO 90% OF FULLY EXTENDED LENGTH.
- AIR TERMINAL UNIT.
- MINIMUM FOUR STRAP HANGERS FOR UNIT (CORNER POINTS), ATTACH TO STRUCTURE.
- TRANSITION WHEN REQUIRED.
- MINIMUM STRAIGHT LENGTH OF DUCT SHALL BE TERMINAL UNIT MANUFACTURER'S REQUIRED LENGTH, BUT AT LEAST 3 TIMES UNIT INLET DIAMETER.
- STRAP HANGER. ATTACH TO STRUCTURE.
- DUCT SHALL BE FULL SIZE OF UNIT OUTLET UNLESS NOTED OTHERWISE ON FLOOR PLANS.
- REPEAT COIL WHEN SPECIFIED. REFER TO COIL DETAIL.

4 AIR TERMINAL UNIT DUCT CONNECTION NTS

Miamisburg Office Renovation

Sierra Nevada Corporation

9555 Springboro Pike
Miamisburg, Ohio
45342

ISSUANCES

No.	Description	Date
	FOR BID/PERMIT	10/21/2024

Drawn By

KDB

Checked By

DST

Client No.

818

Project No.

7479

HVAC SCHEDULES AND DETAILS

H003



10 S Patterson Blvd
Dayton, OH 45402
T 937.224.4474

thinkchamplin.com

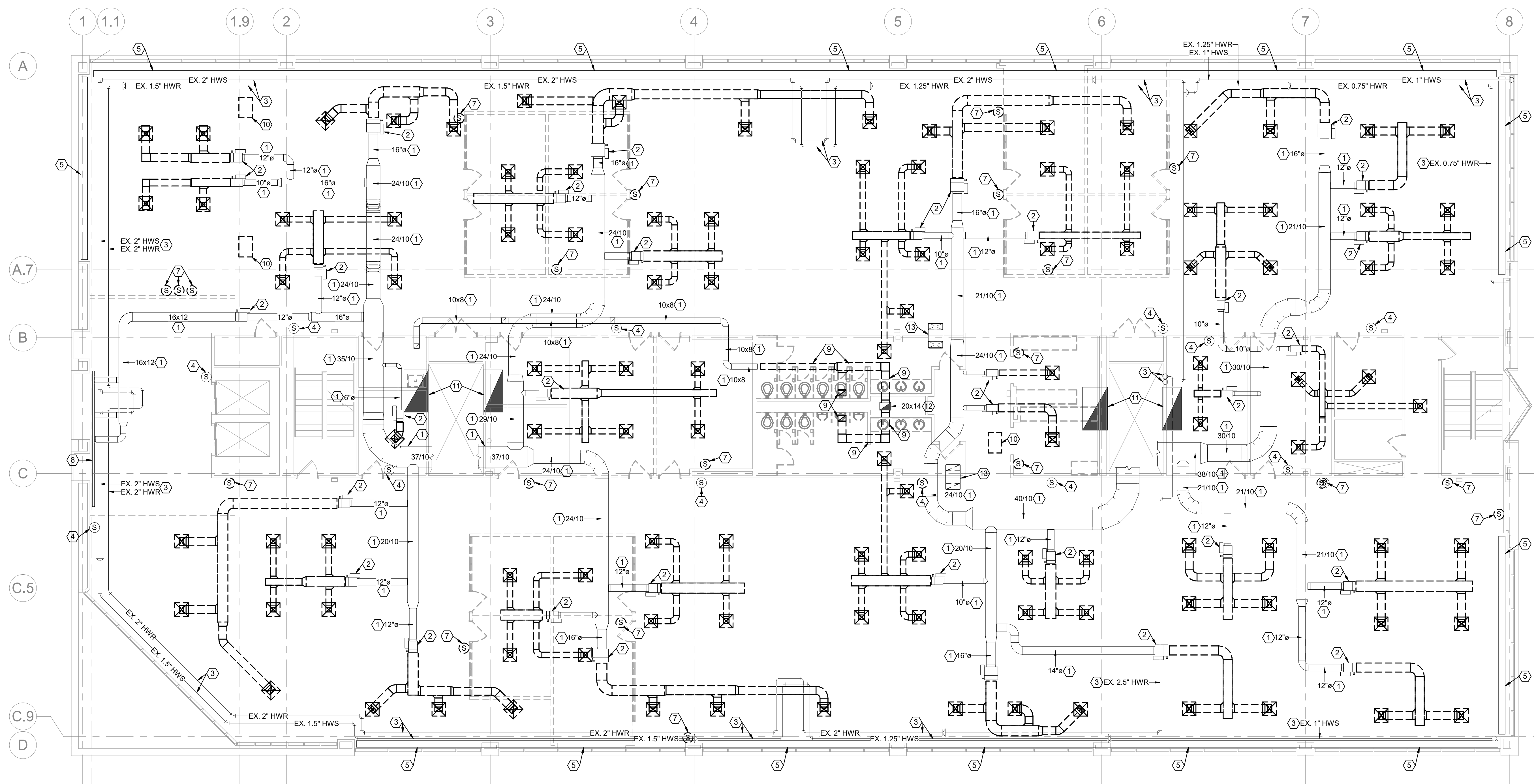
THINK CREATE REALIZE

GENERAL NOTES

- A. ALL DUCTWORK AND AIR DIFFUSERS LOCATED DOWNSTREAM OF EXISTING VAV BOXES TO BE REMOVED, AS INDICATED ON PLAN, UNLESS OTHERWISE NOTED.

DRAWING NOTES

- 1. EXISTING DUCTWORK TO REMAIN.
- 2. EXISTING VAV BOX TO REMAIN.
- 3. EXISTING HOT WATER PIPING TO REMAIN.
- 4. EXISTING THERMOSTAT TO REMAIN.
- 5. EXISTING PERIMETER FINITUBE TO REMAIN (TYPICAL).
- 6. EXISTING EXHAUST SYSTEM TO REMAIN.
- 7. EXISTING THERMOSTAT TO BE RELOCATED.
- 8. EXISTING SLOT DIFFUSER TO REMAIN.
- 9. EXISTING EXHAUST DUCTWORK AND ASSOCIATED AIR DEVICES TO BE REMOVED TO POINT INDICATED ON PLAN.
- 10. EXISTING EXHAUST FAN AND ALL ASSOCIATED DUCTWORK AND AIR DEVICES TO BE REMOVED.
- 11. EXISTING RETURN AIR DUCT (PLENUM RETURN SYSTEM) TO REMAIN.
- 12. EXISTING DUCTWORK UP TO EXISTING ROOF MOUNTED EXHAUST FAN TO REMAIN.
- 13. EXISTING TRANSFER GRILLS AND DUCTWORK TO REMAIN.



1 HVAC FLOOR PLAN - DEMOLITION
1/8" = 1'-0"

Miamisburg Office Renovation

Sierra Nevada Corporation

9555 Springboro Pike
Miamisburg, Ohio
45342

ISSUANCES

No.	Description	Date
1	FOR BID/PERMIT	10/21/2024

Drawn By

KDB

Checked By

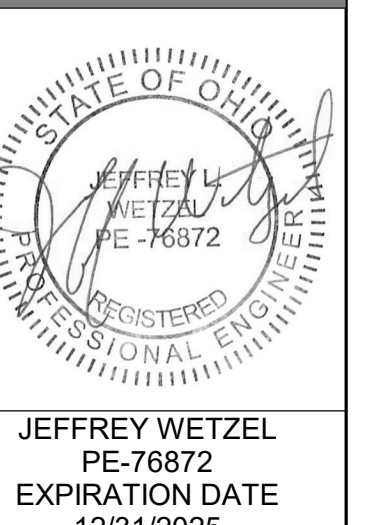
DST

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Project No.

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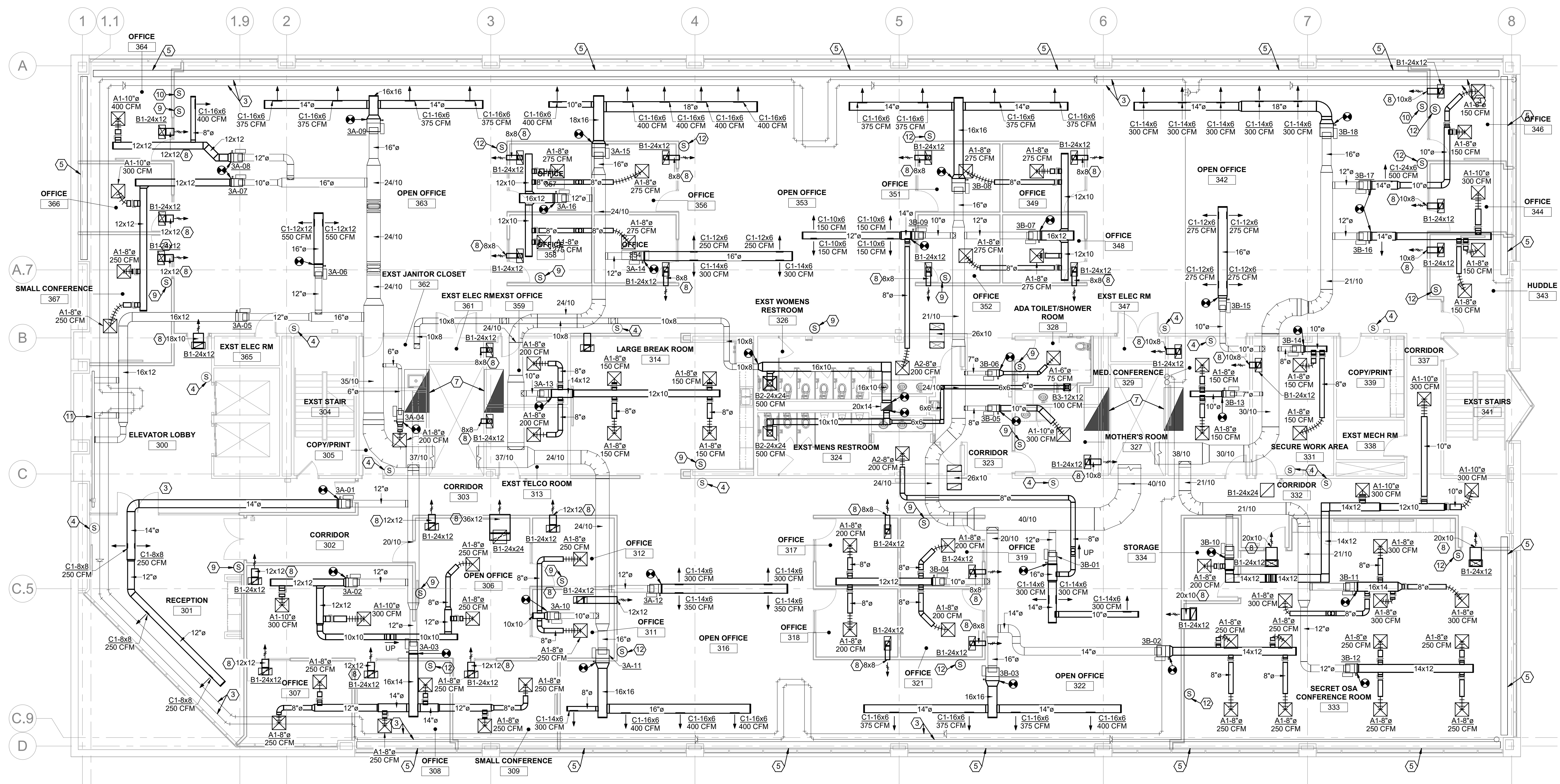
JEFFREY WETZEL
PE-76872
EXPIRATION DATE
12/31/2025

HVAC FLOOR PLAN -
DEMOLITION

H101

DRAWING NOTES

1. EXISTING DUCTWORK TO REMAIN (TYPICAL).
2. EXISTING VAV BOX TO REMAIN (TYPICAL).
3. EXISTING HOT WATER PIPING TO REMAIN (TYPICAL).
4. EXISTING THERMOSTAT TO REMAIN (TYPICAL).
5. EXISTING PERIMETER FINITUBE TO REMAIN (TYPICAL).
6. EXISTING EXHAUST SYSTEM TO REMAIN (TYPICAL).
7. EXISTING RETURN AIR DUCT STUB FOR PLENUM RETURN AIR TO REMAIN.
8. PROVIDE TRANSFER AIR DUCT.
9. RELOCATED EXISTING VAV THERMOSTAT.
10. RELOCATED EXISTING FINITUBE THERMOSTAT.
11. EXISTING SLOT DIFFUSER AND ASSOCIATED DUCTWORK TO REMAIN.
12. PROVIDE NEW VAV BOX THERMOSTAT WITH FINITUBE CONTROL INTERLOCK WITH VAV BOX.



1 HVAC FLOOR PLAN - NEW WORK
1/8" = 1'-0"

Miamisburg Office Renovation

Sierra Nevada Corporation

9555 Springboro Pike
Miamisburg, Ohio
45342

ISSUANCES

No.	Description	Date
FOR BID/PERMIT		10/21/2024

Drawn By	KDB
Checked By	DST
Client No.	818
Project No.	JEFFREY WETZEL PE-76872 EXPIRATION DATE 12/31/2025

HVAC FLOOR PLAN - NEW WORK