

SECTION 230500 - BASIC MECHANICAL REQUIREMENTS

PART 1 - GENERAL

- 1.1 DESCRIPTION OF WORK
- A. THIS PROJECT SHALL INCLUDE GENERAL ADMINISTRATIVE AND PROCEDURAL REQUIREMENTS FOR THE INSTALLATION OF MECHANICAL SYSTEMS.
- B. WHEN USED IN THESE SPECIFICATIONS THE TERM "PROVIDE" IS DEFINED TO MEAN TO "FURNISH AND INSTALL" MATERIALS, EQUIPMENT, ETC.
- 1.2 APPLICABLE STANDARDS
- A. APPLICABILITY OF STANDARDS: EXCEPT WHERE THE CONTRACT DOCUMENTS INCLUDE MORE STRINGENT REQUIREMENTS, APPLICABLE CONSTRUCTION INDUSTRY STANDARDS HAVE THE SAME FORCE AND EFFECT AS IF BOUND OR COPIED DIRECTLY INTO THE CONTRACT DOCUMENTS. SUCH STANDARDS ARE MADE A PART OF THE CONTRACT DOCUMENTS BY REFERENCE.
- B. CONFLICTING REQUIREMENTS: WHERE COMPLIANCE WITH TWO OR MORE STANDARDS IS SPECIFIED, AND THE STANDARDS ESTABLISH DIFFERENT OR CONFLICTING REQUIREMENTS FOR MINIMUM QUANTITIES OR QUALITY LEVELS, REFER REQUIREMENTS THAT ARE DIFFERENT, BUT APPARENTLY EQUAL, AND UNCERTAINTIES TO THE ARCHITECT FOR A DECISION BEFORE PROCEEDING.
- C. PUBLICATION DATES: WHERE THE DATE OF ISSUE OF A REFERENCED STANDARD IS NOT SPECIFIED, COMPLY WITH THE STANDARD IN EFFECT AS OF DATE OF CONTRACT DOCUMENTS.
- D. COMPLY WITH THE REQUIREMENTS OF APPLICABLE LOCAL PLUMBING, MECHANICAL, FIRE PROTECTION, AND BUILDING CODES.
- 1.3 CONSTRUCTION PERMITS AND INSPECTIONS
- A. CONTRACTOR SHALL FILE FOR AND OBTAIN ALL REQUIRED PERMITS AND LICENSES, AND PAY ALL RELATED INSPECTION AND PERMITTING FEES, AS REQUIRED FOR THE EXECUTION OF THE CONTRACT. ARRANGE FOR NECESSARY INSPECTIONS REQUIRED BY CITY, COUNTY, STATE AND OTHER AUTHORITIES HAVING JURISDICTION IN A TIMELY MANNER AND AS REQUIRED OVER THE COMPLETE COURSE OF CONSTRUCTION. DELIVER INSPECTION CERTIFICATES AND WRITTEN APPROVAL NOTICES TO THE OWNER AT CONTRACT CLOSEOUT. THOSE ITEMS AND SYSTEMS DEEMED CRITICAL OR REQUIRED TO OBTAIN A COMPLETED CERTIFICATE OF OCCUPANCY SHALL TAKE PRIORITY OVER NON-CRITICAL ITEMS.
- 1.4 WORKMANSHIP AND QUALIFICATIONS
- A. ALL EQUIPMENT, MATERIALS, SPECIALTIES, ETC. SHALL BE INSTALLED AND CONNECTED IN ACCORDANCE WITH THE BEST ENGINEERING PRACTICE AND STANDARDS FOR THIS TYPE WORK. UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE DRAWINGS, THE RECOMMENDATIONS AND INSTRUCTIONS OF THE MANUFACTURER SHALL BE FOLLOWED FOR INSTALLING THE WORK.
- 1.5 SUBMITTALS
- A. PRIOR TO THE PERFORMANCE OF ANY WORK OR INSTALLATION OF ANY MATERIALS, OBTAIN APPROVAL FROM THE ARCHITECT BY SUBMITTING SHOP DRAWINGS AND DATA SHEETS.
- B. SUBMITTAL OF SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES WILL BE ACCEPTED ONLY WHEN SUBMITTED BY THE CONTRACTOR. DATA SUBMITTED FROM SUBCONTRACTORS AND MATERIAL SUPPLIERS DIRECTLY TO THE ENGINEER OF RECORD WILL NOT BE PROCESSED.
- C. ANY ITEM WITH A TAG NUMBER MUST BE SUBMITTED FOR REVIEW. SUBMITTALS SHALL PROVIDE ALL PERTINENT DATA AND INFORMATION NECESSARY TO EVALUATE EACH ITEM. IN ADDITION TO THE REQUIREMENTS OUTLINED IN THE SPECIFIC DIVISION 23 SECTIONS, ALL SUBMITTALS MUST INDICATE THE APPLICABLE SPECIFICATION SECTION NUMBER AND EQUIPMENT TAG NUMBER.
- D. ARCHITECT'S REVIEW OF SHOP DRAWINGS DOES NOT RELEASE CONTRACTOR FROM RESPONSIBILITY OF COORDINATING HIS WORK AT JOBSITE AND TAKING FIELD MEASUREMENTS. IN CASES WHERE INTERFERENCES BECOME APPARENT, THE CONTRACTOR SHALL NOTIFY ARCHITECT SO THAT SUCH INTERFERENCES MAY BE RESOLVED PRIOR TO PROCEEDING WITH SHOP WORK. NO CLAIM WILL BE ALLOWED FOR WORK THAT MIGHT HAVE TO BE MOVED OR REPLACED BASED ON A CLAIM THAT WORK WAS PLACED IN ACCORDANCE WITH DIMENSIONS SHOWN ON AN APPROVED SHOP DRAWING.
- 1.6 CONSTRUCTION DOCUMENTS
- A. THE DRAWINGS FOR MECHANICAL WORK ARE IN PART DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF WORK AND INDICATE GENERAL ARRANGEMENT AND APPROXIMATE SIZES AND LOCATIONS OF EQUIPMENT AND MATERIALS. WHERE CONDITIONS REQUIRE REASONABLE CHANGES IN INDICATED LOCATIONS AND ARRANGEMENT, THE CONTRACTOR SHALL MAKE SUCH CHANGES AS DIRECTED BY THE ENGINEER, WITHOUT ADDITIONAL COST TO THE OWNER.
- B. BECAUSE OF THE SCALE OF THE DRAWINGS, CERTAIN BASIC ITEMS SUCH AS ACCESS PANELS, SLEEVES, ETC. MAY NOT BE SHOWN, BUT WHERE SUCH ITEMS ARE REQUIRED BY THE NATURE OF THE WORK, THEY SHALL BE FURNISHED AND INSTALLED. ROUGH-IN DIMENSIONS AND LOCATIONS SHALL BE VERIFIED WITH THE SUPPLIER OF ALL EQUIPMENT FURNISHED BY OTHER TRADES, OR BY THE OWNER, PRIOR TO THE TIME OF ROUGH-IN.
- C. EQUIPMENT SPECIFICATIONS MAY NOT DEAL INDIVIDUALLY WITH MINUTE ITEMS REQUIRED SUCH AS COMPONENTS, PART, CONTROLS AND DEVICES WHICH MAY BE REQUIRED TO MEET THE EQUIPMENT WARRANTIES. WHERE SUCH ITEMS ARE REQUIRED, THEY SHALL BE INCLUDED BY THE SUPPLIER OF THE EQUIPMENT, WHETHER OR NOT SPECIFICALLY CALLED FOR.
- D. THE DRAWINGS AND THE SPECIFICATIONS ARE COOPERATIVE AND SUPPLEMENTARY. IT IS THE INTENT OF BOTH SAID DRAWINGS AND SPECIFICATIONS TO COVER ALL MECHANICAL REQUIREMENTS IN THEIR ENTIRETY AS NEARLY AS POSSIBLE. THE CONTRACTOR SHALL CLOSELY CHECK THE DRAWINGS AND SPECIFICATIONS FOR ANY OBVIOUS ERRORS OR OMISSIONS AND BRING ANY SUCH CONDITION TO THE ATTENTION OF THE ENGINEER PRIOR TO THE RECEIPT OF BID. IN ORDER TO PERMIT CLARIFICATION BY MEANS OF A MAILED ADDENDUM, IF THERE ARE NO QUESTIONS PRIOR TO THE BID PROPOSAL DATE, IT SHALL BE UNDERSTOOD THAT THE DRAWINGS AND SPECIFICATIONS ARE COMPLETE AND CORRECT, AND THAT THE INTENT OF SAID DOCUMENTS WILL BE COMPLIED WITH, AND THE INSTALLATION TO BE COMPLETE IN ALL RESPECTS, ACCORDING TO SAID INTENT. IF THERE IS A CONFLICT BETWEEN THE DRAWINGS AND SPECIFICATIONS, THE MORE STRINGENT REQUIREMENT SHALL GOVERN, IF NOT CLARIFIED IN WRITING BY THE ENGINEER.
- E. THE CONTRACTOR SHALL LOCATE ALL EQUIPMENT WHICH MUST BE SERVICED, OPERATED OR MAINTAINED IN FULL ACCESSIBLE POSITIONS. MINOR DEVIATIONS FROM THE CONTRACT DRAWINGS MAY BE MADE TO ALLOW FOR BETTER ACCESSIBILITY, BUT CHANGES OF MAGNITUDE, OR WHICH INVOLVE EXTRA COST, SHALL NOT BE MADE WITHOUT APPROVAL. AMPLE SPACE SHALL BE ALLOWED FOR REMOVAL OF ALL PARTS THAT MAY REQUIRE REPLACEMENT OR SERVICE IN THE FUTURE.
- 1.7 PRE-BID SITE VISIT
- A. PERSONALLY INSPECT THE SITE OF THE PROPOSED WORK AND BECOME FULLY INFORMED OF CONDITIONS UNDER WHICH THE WORK IS TO BE DONE. FAILURE TO DO SO WILL NOT BE CONSIDERED SUFFICIENT JUSTIFICATION TO REQUEST OR OBTAIN EXTRA COMPENSATION OVER AND ABOVE THE CONTRACT PRICE.

PART 2 - PRODUCTS

- 2.1 DESIGN BASIS
- A. THE PRODUCTS/MATERIALS SPECIFICALLY NAMED IN THE SPECIFICATION AND/OR ON THE DRAWINGS ARE THE BASIS OF DESIGN. THE ARCHITECT AND/OR OWNER'S REPRESENTATIVE RESERVES THE RIGHT TO REJECT PRODUCT/MATERIALS, EVEN IF FROM OTHER ACCEPTABLE MANUFACTURERS, IF IT IS FELT THEY DO NOT MEET THE INTENT OF THE SPECIFICATION.
- B. THE ARCHITECT RESERVES THE SOLE RIGHT FOR THE APPROVAL OF PROPOSED MATERIAL, FOR EQUIPMENT, AND THE PHASE, OR AN EQUIVALENT, THAT IS NOT USED IN THESE SPECIFICATIONS, OR ON THE DRAWINGS, SHALL BE INTERPRETED TO MEAN AN EQUIVALENT APPROVED BY THE ARCHITECT.
- C. ALL CHANGES REQUIRED BY ALTERNATE EQUIPMENT SHALL BE MADE AT NO ADDITIONAL COST TO THE OWNER; AND ALL COSTS INCURRED BY OTHER TRADES, PUBLIC UTILITIES OR THE OWNER, AS A RESULT OF THE USE OF SUCH EQUIPMENT, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- D. THE CONTRACTOR SHALL IDENTIFY THE DIFFERENCES IN ALTERNATE MATERIAL OR EQUIPMENT AS COMPARED TO THAT SPECIFIED, AND SHALL INDICATE THE BENEFITS TO THE PROJECT AS A RESULT OF SELECTING THE ALTERNATIVE.
- E. THE ENGINEER RESERVES THE RIGHT TO REFUSE APPROVAL OF EQUIPMENT WHICH DOES NOT MEET THE SPECIFICATION, IN HIS OPINION, OR OF EQUIPMENT FOR WHICH NO LOCAL EXPERIENCE OF SATISFACTORY SERVICE IS AVAILABLE. THE ENGINEER FURTHER RESERVES THE RIGHT TO REJECT EQUIPMENT FOR WHICH MAINTENANCE SERVICE AND THE AVAILABILITY OF REPLACEMENT PARTS IS QUESTIONABLE.

PART 3 - EXECUTION

- 3.1 MECHANICAL INSTALLATIONS
- A. GENERAL: SEQUENCE, COORDINATE, AND INTEGRATE THE VARIOUS ELEMENTS

OF MECHANICAL SYSTEMS, MATERIALS, AND EQUIPMENT. COORDINATE MECHANICAL SYSTEMS, EQUIPMENT, AND MATERIALS INSTALLATION WITH OTHER BUILDING COMPONENTS. VERIFY ALL DIMENSIONS BY FIELD MEASUREMENTS. VERIFY FINAL LOCATIONS FOR ROUGH-INS WITH FIELD MEASUREMENTS AND WITH THE REQUIREMENTS OF THE ACTUAL EQUIPMENT TO BE CONNECTED.

CUTTING AND PATCHING

- A. CUT, REMOVE AND LEGALLY DISPOSE OF SELECTED MECHANICAL EQUIPMENT, COMPONENTS, AND MATERIALS AS INDICATED, INCLUDING BUT NOT LIMITED TO REMOVAL OF MECHANICAL PIPING, HEATING UNITS, PLUMBING FIXTURES AND TRIM, AND OTHER MECHANICAL ITEMS MADE OBSOLETE BY THE NEW WORK. MAINTAIN SERVICES TO AREAS OUTSIDE DEMOLITION LIMITS. WHEN SERVICES MUST BE INTERRUPTED, INSTALL TEMPORARY SERVICES FOR AFFECTED AREAS.
- B. PROTECT THE STRUCTURE, FURNISHINGS, FINISHES, AND ADJACENT MATERIALS NOT INDICATED OR SCHEDULED TO BE REMOVED.
- C. PROVIDE AND MAINTAIN TEMPORARY PARTITIONS OR DUST BARRIERS ADEQUATE TO PREVENT THE SPREAD OF DUST AND DIRT TO ADJACENT AREAS.
- D. PATCH EXISTING FINISHED SURFACES AND BUILDING COMPONENTS USING NEW MATERIALS MATCHING EXISTING MATERIALS AND EXPERIENCED INSTALLERS. INSTALLERS' QUALIFICATIONS REFER TO THE MATERIALS AND METHODS REQUIRED FOR THE SURFACE AND BUILDING COMPONENTS BEING PATCHED.

PAINTING

- A. FACTORY PAINTED EQUIPMENT THAT HAS BEEN SCRATCHED OR MARRED SHALL BE REPAINTED TO MATCH ORIGINAL FACTORY COLOR.
- B. ALL UNINSULATED BLACK FERROUS METAL ITEMS EXPOSED TO SIGHT SUCH AS EQUIPMENT HANDLES, PIPING, FRAMES AND SUPPORTS NOT PROTECTED WITH FACTORY PRIME COAT, SHALL BE CLEANED AND PAINTED WITH ONE COAT OF RUST INHIBITING PRIMER, IN ADDITION, SUCH ITEMS IN FINISHED SPACES SHALL ALSO BE PAINTED WITH TWO COATS OF FINISH PAINT IN A COLOR TO MATCH ADJACENT SURFACES OR AS OTHERWISE SELECTED BY THE ARCHITECT.

PERFORMANCE

- A. ALL EQUIPMENT AND SYSTEMS SHALL BE PROTECTED AGAINST FREEZING, FLOODING, CORROSION, AND OTHER FORMS OF DAMAGE PRIOR TO ACCEPTANCE BY THE OWNER.
- B. DESIGN AND FABRICATION FEATURES OR PROVEN METHODS NOT SPECIFICALLY COVERED BY THIS SPECIFICATION SHALL BE SPECIFICALLY STATED AND DOCUMENTED IN THE PROPOSAL.
- C. LABOR SHALL BE FURNISHED FOR ASSEMBLING ALL PIECES OF EQUIPMENT WHICH, DUE TO SHIPPING LIMITATIONS, HAVE COMPONENTS WHICH ARRIVE ON THE JOBSITE DISASSEMBLED.

OPERATING AND MAINTENANCE INSTRUCTIONS

- A. ARRANGE FOR EACH INSTALLER OF EQUIPMENT THAT REQUIRES REGULAR MAINTENANCE TO MEET WITH THE OWNER'S PERSONNEL TO PROVIDE INSTRUCTION IN PROPER OPERATION AND MAINTENANCE. IF INSTALLERS ARE NOT EXPERIENCED IN PROCEDURES, PROVIDE INSTRUCTION BY MANUFACTURER'S REPRESENTATIVES.

FINAL INSPECTION

- A. PRIOR TO FINAL ACCEPTANCE, ALL SYSTEMS SHALL BE OPERATED TO TEST PERFORMANCE TO THE SATISFACTION OF THE OWNER.
- B. DEFECTS DEMONSTRATED BY INSPECTIONS AND TESTS SHALL BE CORRECTED TO THE SATISFACTION OF THE ENGINEER AT THE SUBCONTRACTOR'S EXPENSE.

CLEANING OF SYSTEMS AND PREMISES

- A. BEFORE THE SYSTEMS ARE TESTED AND BALANCED, DUCTS AND EQUIPMENT SHALL BE THOROUGHLY CLEANED SO THAT NO DIRT, DUST OR OTHER FOREIGN MATTER WILL BE DEPOSITED IN OR CARRIED THROUGH THE SYSTEM.
- B. AIR HANDLING UNITS SHALL NOT BE OPERATED WITHOUT FILTERS IN PLACE. ALL AIR FILTERS SHALL BE REPLACED AFTER COMPLETION OF CONSTRUCTION AND PRIOR TO AIR BALANCING. IF AIR-BALANCING SYSTEMS ARE USED FOR TEMPORARY HEATING OR COOLING, THE AIR FILTERS SHALL BE CHANGED A MINIMUM OF EVERY TWO WEEKS.
- C. WATER AND STEAM SYSTEMS SHALL BE THOROUGHLY FLUSHED AND CLEANED OF ANY AND ALL DELETERIOUS MATERIALS BEFORE THE SYSTEMS ARE PLACED IN OPERATION.
- D. ALL EQUIPMENT SHALL BE THOROUGHLY CLEANED OF DIRT AND DEBRIS AT THE COMPLETION OF THE PROJECT AND PRIOR TO ACCEPTANCE BY THE OWNER.

PROTECTION

- A. GUARDS, BARRICADES, LIGHTS, SERVICES, ETC., NECESSARY FOR THE PROTECTION OF PERSONS AND PROPERTY SHALL BE FURNISHED AND MAINTAINED.
- B. EXISTING WORK SUCH AS PAVEMENTS, LAWNS, SIDEWALKS, FLOORS, CURBS, AND OTHER STRUCTURES AND UTILITIES WHICH ARE DAMAGED OR DISTURBED DUE TO MAKING CONNECTIONS OR ANY PHASE OF OPERATIONS SHALL BE RESTORED TO THE SATISFACTION OF THE OWNER AND THE GOVERNING AUTHORITIES.

SAFETY

- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE DEMOLITION AND INSTALLATION OF THIS WORK. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY BEARING ON THE SAFETY OF PERSONS OR PROPERTY OR THEIR PROTECTION FROM DAMAGE, INJURY, OR LOSS.
- B. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE IDENTIFICATION AND PREVENTION OF UNSAFE CONDITIONS IN REGARD TO DEMOLITION, CONSTRUCTION, HAZARDOUS MATERIALS, AND EQUIPMENT USAGE. CONTRACTOR SHALL COMPLY WITH ALL OSHA, ENVIRONMENTAL PROTECTION AGENCY, AND LOCAL AUTHORITY REQUIREMENTS.
- C. THE CONTRACTOR SHALL ERECT AND MAINTAIN, AS REQUIRED BY EXISTING CONDITION AND PROGRESS OF THE WORK, ALL REASONABLE SAFEGUARDS FOR SAFETY AND PROTECTION, INCLUDING POSTING DANGER SIGNS AND OTHER WARNINGS AGAINST HAZARDS, PROMULGATION SAFETY REGULATIONS AND NOTIFYING OWNERS AND USERS OF ADJACENT UTILITIES.
- D. REMOVE DEBRIS, RUBBISH AND OTHER MATERIALS RESULTING FROM DEMOLITION OPERATIONS FROM BUILDING SITE. TRANSPORT AND LEGALLY DISPOSE OF MATERIALS OFF SITE.
- E. IF HAZARDOUS MATERIALS ARE ENCOUNTERED DURING DEMOLITION OPERATIONS, COMPLY WITH APPLICABLE REGULATIONS, LAWS, AND ORDINANCES CONCERNING REMOVAL, HANDLING AND PROTECTION AGAINST EXPOSURE OR ENVIRONMENTAL POLLUTION.

SECTION 230548 - VIBRATION CONTROLS FOR HVAC

PART 1 - GENERAL

- 1.1 DESCRIPTION OF WORK
- A. THIS PROJECT SHALL INCLUDE VIBRATION ISOLATORS AT ALL MECHANICAL EQUIPMENT, UNLESS THE VIBRATION GENERATION COMPONENTS ARE INTERNALLY ISOLATED.
- B. TYPES OF VIBRATION CONTROL PRODUCTS REQUIRED INCLUDE NEOPRENE PADS AND SPRING HANGERS.
- C. FLOOR OR PAD MOUNTED EQUIPMENT WITHOUT VIBRATION ISOLATORS SHALL BE BOLTED TO THE FLOOR (SLAB OR HOUSEKEEPING PAD) WITH 3/8" DIAMETER EXPANSION BOLTS.

PART 2 - PRODUCTS

- 2.1 ACCEPTABLE MANUFACTURERS
- A. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE VIBRATION CONTROL PRODUCTS AS MANUFACTURED BY AMBERBOOTH CO., KORFUND DYNAMICS CORP., MASON INDUSTRIES, INC., OR APPROVED EQUIVALENT.

PART 3 - EXECUTION

APPLICATIONS

- A. GENERAL: EXCEPT AS OTHERWISE INDICATED, SELECT VIBRATION CONTROL PRODUCTS IN ACCORDANCE WITH ASHRAE HANDBOOK, 1991 APPLICATIONS VOLUME, CHAPTER 42 "SOUND AND VIBRATION CONTROL", TABLE 3A. WHERE MORE THAN ONE TYPE OF PRODUCT IS OFFERED, SELECTION IS INSTALLER'S OPTION.

SECTION 230553 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

- 1.1 DESCRIPTION OF WORK
- A. THIS PROJECT SHALL INCLUDE IDENTIFICATION DEVICES SPECIFIED IN THIS SECTION INCLUDING PLASTIC TAPE, AND ENGRAVED PLASTIC-LAMINATE SIGNS.

- B. CODES AND STANDARDS: COMPLY WITH ANSI A13.1 FOR LETTERING SIZE, LENGTH OF COLOR FIELD, COLORS, AND VIEWING ANGLES OF IDENTIFICATION DEVICES.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS

- A. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE MECHANICAL IDENTIFICATION MATERIALS AS MANUFACTURED BY ALLEN SYSTEMS, INC., BRADY (W.H.) CO., SIGNMARK DIV., SETON NAME PLATE CORP., OR APPROVED EQUIVALENT.

MECHANICAL IDENTIFICATION MATERIALS

- A. GENERAL: PROVIDE MANUFACTURER'S STANDARD PRODUCTS OF CATEGORIES AND TYPES REQUIRED FOR EACH APPLICATION AS REFERENCED IN OTHER DIVISION 23 SECTIONS. WHERE MORE THAN SINGLE TYPE IS SPECIFIED FOR APPLICATION, SELECTION IS INSTALLER'S OPTION, BUT PROVIDE SINGLE SELECTION FOR EACH PRODUCT CATEGORY.

PART 3 - EXECUTION

MECHANICAL EQUIPMENT IDENTIFICATION

- A. GENERAL: INSTALL ENGRAVED PLASTIC LAMINATE SIGN OR PLASTIC EQUIPMENT MARKER ON OR NEAR EACH MAJOR ITEM OF MECHANICAL EQUIPMENT AND EACH OPERATIONAL DEVICE, AS SPECIFIED HEREIN IF NOT OTHERWISE SPECIFIED FOR EACH ITEM OR DEVICE.
- B. LETTERING SIZE: MINIMUM 1/4" HIGH LETTERING FOR NAME OF UNIT WHERE VIEWING DISTANCE IS LESS THAN 2'-0", 1/2" HIGH FOR DISTANCES UP TO 6'-0", AND PROPORTIONATELY LARGER LETTERING FOR GREATER DISTANCES. PROVIDE SECONDARY LETTERING 2/3 TO 3/4 OF SIZE OF PRINCIPAL LETTERING.
- C. TEXT OF SIGNS: IN ADDITION TO NAME OF IDENTIFIED UNIT, PROVIDE LETTERING TO DISTINGUISH BETWEEN MULTIPLE UNITS, INFORM OPERATOR OF OPERATIONAL REQUIREMENTS, INDICATE SAFETY AND EMERGENCY PRECAUTIONS, AND WARN OF HAZARDS AND IMPROPER OPERATIONS.
- D. IN ADDITION TO THE PLASTIC SIGN, INSTALL PRESSURE SENSITIVE LABEL DESCRIBED IN PART 2 OR PAINTED STENCIL LABEL, ABOVE ON EACH PIECE OF MECHANICAL EQUIPMENT. THOROUGHLY CLEAN EQUIPMENT SURFACE PER LABEL MANUFACTURER'S INSTRUCTIONS PRIOR TO INSTALLING LABEL.

SECTION 230700 - MECHANICAL INSULATION

PART 1 - GENERAL

DESCRIPTION OF WORK

- A. THIS PROJECT SHALL INCLUDE MECHANICAL INSULATION FOR DUCT AND EQUIPMENT AS INDICATED ON DRAWINGS AND SCHEDULES, AND BY REQUIREMENTS OF THIS SECTION.

QUALITY ASSURANCE

- A. PROVIDE COMPOSITE MECHANICAL INSULATION (INSULATION, JACKETS, COVERINGS, SEALERS, MASTICS AND ADHESIVES) WITH FLAME-SPREAD INDEX OF 25 OR LESS, AND SMOKE-DEVELOPED INDEX OF 50 OR LESS, AS TESTED BY ASTM E 84 (NFPA 255) METHOD.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS

- A. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS MANUFACTURED BY ONE OF THE FOLLOWING: ARMSTRONG WORLD INDUSTRIES, INC.; CERTAINTED CORP.; KNAUF FIBER GLASS GMBH.; OWENS-CORNING FIBERGLAS CORP.

DUCTWORK AND EQUIPMENT INSULATION MATERIALS

- A. RIGID FIBERGLASS DUCTWORK INSULATION (TYPE RFG): ASTM C 612; "K" VALUE OF 0.24 AT 75 F, NON-COMBUSTIBLE, RIGID, JACKET, CONFIRM ASJ OR FSK WITH ARCHITECT.
- B. FLEXIBLE FIBERGLASS DUCTWORK INSULATION (TYPE FFG): ASTM C 553; "K" VALUE OF 0.38 AT 75 F, NON-COMBUSTIBLE, FLEXIBLE, JACKET, CONFIRM ASJ OR FSK WITH ARCHITECT.
- C. PROVIDE ASTM C 921 JACKETS FOR DUCTWORK INSULATION; TYPE I FOR DUCTWORK WITH TEMPERATURES BELOW AMBIENT; TYPE II FOR DUCTWORK WITH TEMPERATURES ABOVE AMBIENT.
- D. DUCTWORK ACCESSORIES: PROVIDE STAPLES, BANDS, WIRES, TAPE, ANCHORS, CORNER ANGLES AND SIMILAR ACCESSORIES AS RECOMMENDED BY INSULATION MANUFACTURER FOR APPLICATIONS INDICATED.

PART 3 - EXECUTION

DUCT AND EQUIPMENT INSULATION APPLICATION SCHEDULE

- A. INSULATE CONCEALED DUCT AND EQUIPMENT ACCORDING TO THE FOLLOWING SCHEDULE:

SERVICE	MAX SERVICE TEMP	INSULATION TYPE	INSULATION THICKNESS
-HVAC SUPPLY DUCTWORK BETWEEN FAN DISCHARGE, OR HVAC UNIT DISCHARGE, AND ROOM TERMINAL OUTLET.	450 F	RFG	R6 (MIN) 2"
-NECK AND BELLS OF SUPPLY DIFFUSERS.			
-HVAC RETURN DUCTWORK BETWEEN ROOM TERMINAL INLET AND RETURN FAN INLET, OR HVAC UNIT INLET	250 F	FFG	R6 (MIN) 2"
-HVAC PLENUMS AND UNIT HOUSINGS NOT PRE-INSULATED AT FACTORY OR LINED.			

- C. INSTALL DUCT AND EQUIPMENT THERMAL INSULATION PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS, AND IN COMPLIANCE WITH RECOGNIZED INDUSTRY PRACTICES.
- D. MAINTAIN INTEGRITY OF VAPOR-BARRIER AND PROTECT IT TO PREVENT PUNCTURE AND OTHER DAMAGE.

SECTION 233113 - METAL DUCTWORK

PART 1 - GENERAL

DESCRIPTION OF WORK

- A. THIS PROJECT SHALL INCLUDE RECTANGULAR, ROUND METAL DUCTS, AND PLENUMS FOR HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS IN PRESSURE CLASSES FROM LOW PRESSURE (STATIC PRESSURE LESS THAN OR EQUAL TO 2-INCH WATER GAGE).

QUALITY ASSURANCE

- A. COMPLY WITH THE REQUIREMENTS OF NFPA 90A, "STANDARD FOR THE INSTALLATION OF AIR CONDITIONING AND VENTILATING SYSTEMS," EXCEPT AS INDICATED OTHERWISE.

PART 2 - PRODUCTS

SHEET METAL MATERIALS

- A. GALVANIZED SHEET STEEL: LOCK-FORMING QUALITY, ASTM A 527, COATING DESIGNATION G-90, OR AN EQUIVALENT PHOSPHATIZED FINISH FOR EXPOSED SURFACES TO VIEW.
- B. REINFORCEMENT SHAPES AND PLATES: UNLESS OTHERWISE INDICATED, PROVIDE GALVANIZED STEEL REINFORCING WHERE INSTALLED ON GALVANIZED SHEET METAL DUCTS, FOR ALUMINUM AND STAINLESS STEEL DUCTS PROVIDE CORRESPONDING REINFORCING MATERIALS.
- C. TIE RODS: GALVANIZED STEEL, 3/16-INCH MINIMUM DIAMETER FOR 36-INCH LENGTH OR LESS; 3/8-INCH MINIMUM DIAMETER FOR LENGTHS LONGER THAN 36 INCHES.

SEALING MATERIALS

- A. JOINT AND SEAM TAPE: 2 INCHES WIDE, GLASS-FIBER-FABRIC REINFORCED, JOINT AND SEAM SEALANT: ONE-PART, NONSAG, SOLVENT-FREE-CURING, POLYMERIZED BUTYL SEALANT COMPLYING WITH FS TT-S-001657, TYPE I, FORMULATED WITH A MINIMUM OF 75 PERCENT SILICONE.
- C. FLANGED JOINT MASTICS: ONE-PART, ACID-CURING, SILICONE ELASTOMERIC JOINT SEALANTS, COMPLYING WITH ASTM C 920, TYPE S, GRADE NS, CLASS 25, USE O.

DUCT AND FITTING FABRICATION

- A. EXCEPT AS OTHERWISE INDICATED, FABRICATE DUCTS WITH GALVANIZED SHEET STEEL, IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS", INCLUDING THEIR ASSOCIATED DETAILS. CONFORM TO THE REQUIREMENTS IN THE REFERENCED STANDARD FOR METAL THICKNESS, REINFORCING TYPES AND INTERVALS, TIE ROD APPLICATIONS, AND JOINT TYPES AND INTERVALS.

- B. STATIC PRESSURE CLASSIFICATIONS: EXCEPT WHERE OTHERWISE INDICATED, CONSTRUCT DUCT SYSTEMS TO THE FOLLOWING PRESSURE CLASSIFICATIONS:
- SUPPLY DUCTS: 2-INCH WATER GAGE.
 - RETURN DUCTS: 1/2 INCHES WATER GAGE, NEGATIVE PRESSURE.
 - EXHAUST DUCTS: 1/2 INCHES WATER GAGE, NEGATIVE PRESSURE.

- C. FABRICATE ELBOWS, TRANSITIONS, OFFSETS, BRANCH CONNECTIONS, AND ROUND DUCT CONSTRUCTION IN ACCORDANCE WITH SMACNA "HVAC METAL DUCT CONSTRUCTION STANDARD".
- D. ROUND DUCT OF EQUIVALENT DIAMETER TO THE INDICATED RECTANGULAR DUCT MAY BE SUBSTITUTED AT THE CONTRACTOR'S OPTION.

- E. FABRICATE ROUND DUCT AND ROUND FITTINGS INCLUDING ELBOWS, TRANSITIONS, OFFSETS, BRANCH CONNECTIONS, AND OTHER DUCT CONSTRUCTION IN ACCORDANCE WITH SMACNA "HVAC METAL DUCT CONSTRUCTION STANDARD". ALL ROUND DUCT 12" DIAMETER AND GREATER SHALL BE FABRICATED OF SPIRAL-WOUND DUCT.
- F. IN LIEU OF SHOP FABRICATED DUCT AND FITTINGS, FACTORY FABRICATED DUCT AND FITTINGS MAY BE SUBSTITUTED, SUCH AS MANUFACTURED BY LINDAB, OR APPROVED EQUIVALENT.

PART 3 - EXECUTION

DUCT INSTALLATION

- A. USE FABRICATED FITTINGS FOR ALL CHANGES IN DIRECTIONS, CHANGES IN SIZE AND SHAPE, AND CONNECTIONS.
- B. LOCATE DUCTS, EXCEPT AS OTHERWISE INDICATED, VERTICALLY AND HORIZONTALLY, PARALLEL AND PERPENDICULAR TO BUILDING LINES; AVOID DIAGONAL RUNS. INSTALL DUCT SYSTEMS IN SHORTEST ROUTE THAT DOES NOT OBSTRUCT USABLE SPACE OR BLOCK ACCESS FOR SERVICING BUILDING AND ITS EQUIPMENT.
- C. SEAL DUCT SEAMS AND JOINTS ACCORDING TO SMACNA "DUCT CONSTRUCTION STANDARDS".
- D. INSTALL RIGID ROUND AND RECTANGULAR METAL DUCT WITH SUPPORT SYSTEMS INDICATED IN SMACNA "HVAC DUCT CONSTRUCTION STANDARDS".
- E. SUPPORT HORIZONTAL DUCTS WITHIN 2 FEET OF EACH ELBOW AND WITHIN 4 FEET OF EACH BRANCH INTERSECTION.
- F. SUPPORT VERTICAL DUCTS AT A MAXIMUM INTERVAL OF 16 FEET AND AT EACH FLOOR.

CONNECTIONS

- A. EQUIPMENT CONNECTIONS: CONNECT EQUIPMENT WITH FLEXIBLE CONNECTORS IN ACCORDANCE WITH DIVISION 23 SECTION "DUCT ACCESSORIES."
- B. BRANCH CONNECTIONS: COMPLY WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS".
- C. OUTLET AND INLET CONNECTIONS: COMPLY WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS".
- D. TERMINAL UNITS CONNECTIONS: COMPLY WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS".

SECTION 233900 - DUCTWORK ACCESSORIES

PART 1 - GENERAL

DESCRIPTION OF WORK

- A. THIS PROJECT SHALL INCLUDE DUCTWORK ACCESSORIES WORK AS INDICATED ON DRAWINGS AND IN SCHEDULES, AND BY REQUIREMENTS OF THIS SECTION, WHICH INCLUDES DAMPERS, DAMPER ACTUATORS, FIRE AND SMOKE DAMPERS, TURNING VANES, DUCT HARDWARE, AND DUCT ACCESS DOORS.

QUALITY ASSURANCE

- A. COMPLY WITH APPLICABLE SECTIONS OF THE FOLLOWING CODES AND STANDARDS:
- SMACNA "HVAC DUCT CONSTRUCTION STANDARDS, METAL AND FLEXIBLE".
 - ASHRAE RECOMMENDATIONS PERTAINING TO CONSTRUCTION OF DUCTWORK ACCESSORIES, EXCEPT AS OTHERWISE INDICATED.
 - UL STANDARD 55 "FIRE DAMPERS AND CEILING DAMPERS".
 - NFPA 90A "STANDARD FOR THE INSTALLATION OF AIR CONDITIONING AND VENTILATING SYSTEMS".

PART 2 - PRODUCTS

DAMPERS AND ACTUATORS

- A. LOW PRESSURE MANUAL DAMPERS: PROVIDE DAMPERS OF SINGLE BLADE TYPE OR MULTI-BLADE TYPE, CONSTRUCTED IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS", OR AS MANUFACTURED BY RUSKIN MODEL MD35, MD25 OR MDR25 AS REQUIRED, OR EQUIVALENT.
- B. BACKDRAFT DAMPERS: HEAVY DUTY, MINIMUM 0.125" WALL THICKNESS EXTRUDED ALUMINUM FRAME, MINIMUM 1/2" THICK EXTRUDED ALUMINUM BLADES WITH VINYL EDGE SEALS, SYNTHETIC BEARINGS, MILL FINISH. RUSKIN MODEL BD6, OR EQUIVALENT.
- C. CONTROL DAMPERS: PROVIDE DAMPERS WITH PARALLEL BLADES FOR 2-POSITION CONTROL, OR OPPOSED BLADES FOR MODULATING CONTROL. CONSTRUCT BLADES OF 16-GA STEEL, PROVIDE HEAVY-DUTY MOLDED SELF-LUBRICATING NYLON BEARINGS, 1/4" DIAMETER STEEL AXLES SPACED ON 9" CENTERS. CONSTRUCT FRAME OF MINIMUM 5" X 1" X 16-GUAGE STEEL HAT CHANNEL. DAMPER TO BE EQUIPPED WITH FOAM BLADE SEALS AND METAL COMPRESSION TYPE JAMB SEALS. PROVIDE GALVANIZED STEEL FINISH WITH ALUMINUM TOUCH-UP. MAXIMUM LEAKAGE ALLOWED OF 10 GFM/50 FT. OF DAMPER AREA AT 1" W.C. DIFFERENTIAL PRESSURE. DAMPER SHALL BE RUSKIN MODEL CD35, OR EQUIVALENT.
- D. DAMPER ACTUATOR: THE ACTUATOR FURNISHED SHALL BE THE DIRECT-COUPLED TYPE, ENABLING IT TO BE MOUNTED DIRECTLY TO THE DAMPER SHAFT WITHOUT THE NEED FOR CONNECTING LINKAGE. ACTUATOR SHALL BE BY BELIMO, OR EQUIVALENT.

FIRE AND SMOKE DAMPERS

- A. FIRE DAMPERS: UNLESS NOTED OTHERWISE, PROVIDE FIRE DAMPERS RATED AT 1-1/2 HOUR AND SIZED TO MATCH THE DUCT. PROVIDE FIRE DAMPERS RATED FOR DYNAMIC CONDITIONS UNLESS OTHERWISE NOTED. PROVIDE FUSIBLE LINK RATED AT 180-185° F, UNLESS OTHERWISE INDICATED. FRAME SHALL BE SMACNA TYPE B. FABRICATE IN ACCORDANCE WITH NFPA 90A AND UL 555, AND AS INDICATED.
- B. FIRE/SMOKE DAMPERS: UNLESS NOTED OTHERWISE, PROVIDE MOTOR-DRIVEN FIRE/SMOKE DAMPERS RATED AT 1-1/2 HOUR AND SIZED TO MATCH THE DUCT. PROVIDE WITH CASING CONSTRUCTED OF 11-GA GALVANIZED STEEL, FUSIBLE LINK 180-185° F, PARALLEL AIRFOIL BLADES AND SPRING RETURN ELECTRIC ACTUATORS EXTERNALLY FACTORY MOUNTED. DAMPERS SHALL BE FABRICATED IN ACCORDANCE WITH UL555S. COORDINATE ACTUATOR REQUIREMENTS WITH THE FIRE ALARM CONTRACTOR.

TURNING VANES

- A. FABRICATED TURNING VANES: PROVIDE FABRICATED TURNING VANES AND VANE RUNNERS, CONSTRUCTED IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS".
- B. MANUFACTURED TURNING VANES: PROVIDE TURNING VANES CONSTRUCTED OF 1-1/2" WIDE CURVED BLADES SET AT 90.0°, TURNED WITH BARS PERPENDICULAR TO BLADES SET AT 2° O.C., AND SET INTO SIDE STRIPS SUITABLE FOR MOUNTING IN DUCTWORK.

DUCT HARDWARE AND ACCESS DOORS

- A. PROVIDE DUCT HARDWARE, MANUFACTURED BY ONE MANUFACTURER FOR ALL ITEMS ON PROJECT, INCLUDING TEST HOLES AND QUADRANT LOCKS.
- B. ACCESS DOORS: CONSTRUCT OF SAME OR GREATER GAGE AS DUCTWORK SERVED, PROVIDE INSULATED DOORS FOR INSULATED DUCTWORK. PROVIDE FLUSH FRAMES FOR UNINSULATED DUCTWORK, EXTENDED FRAMES FOR EXTERNALLY INSULATED DUCTWORK. PROVIDE ONE-SIDE HINGED, OTHER-SIDE WITH ONE HANDLE-TYPE LATCH FOR DOORS 12" HIGH AND SMALLER, 2 HANDLE-TYPE LATCHES FOR LARGER DOORS.

FLEX DUCT

- A. FABRICATED OF ACOUSTICALLY TRANSPARENT NYLON INNER FILM LOCKED TO GALVANIZED STEEL HELIX WIRE, WITH R6 FIBERGLASS INSULATION AND REINFORCED METALIZED VAPOR BARRIER OUTER JACKET, FLEXMASTER TYPE 6M OR EQUIVALENT.

PART 3 - EXECUTION

INSTALLATION OF DUCTWORK ACCESSORIES

- A. INSTALL DUCTWORK ACCESSORIES IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS, WITH APPLICABLE PORTIONS OF DETAILS OF CONSTRUCTION AS SHOWN IN SMACNA STANDARDS, AND IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT PRODUCTS SERVE INTENDED FUNCTION.

- B. INSTALL ACCESS DOORS AT ALL FIRE DAMPERS/FIRE/SMOKE DAMPERS, CONTROL DAMPERS, OTHER DUCT MOUNTED EQUIPMENT, AND ELSEWHERE AS SHOWN ON DRAWINGS. INSTALL TO OPEN AGAINST SYSTEM AIR PRESSURE, WITH LATCHES OPERABLE FROM EITHER SIDE, EXCEPT OUTSIDE ONLY WHERE DUCT IS TOO SMALL FOR PERSON TO ENTER.
- C. COORDINATE WITH OTHER WORK, INCLUDING DUCTWORK, AS NECESSARY TO INTERFACE INSTALLATION OF DUCTWORK ACCESSORIES PROPERLY WITH OTHER WORK.
- D. CONNECT DIFFUSERS OR TROFFER BOOTS TO DUCTS WITH 5 FEET MAXIMUM LENGTH OF INSULATED FLEXIBLE DUCT. HOLD IN PLACE WITH STRAP OR CLAMP. IF THIS LENGTH IS EXCEEDED ON THE PLANS, THE EXTRA FOOTAGE REQUIRED TO MEET THIS MINIMUM LENGTH WILL BE INSTALLED AS RIGID ROUND GALVANIZED STEEL DUCT OF THE SAME SIZE OR LARGER. INSTALL FLEXIBLE DUCTWORK AT INLET TO ALL DIFFUSERS WHICH ARE SHOWN TO BE CONNECTED WITH FLEXIBLE DUCTWORK. SUPPORT ALL FLEXIBLE DUCT ON MINIMUM 4" CENTERS.

SECTION 233900 - FANS

PART 1 - GENERAL

DESCRIPTION OF WORK

- A. THIS PROJECT SHALL INCLUDE THE REQUIREMENTS OF THE SCHEDULED FANS INCLUDING CEILING MOUNTED AND IN-LINE CENTRIFUGAL FANS, ROOF MOUNTED INTAKE AND EXHAUST FANS, AND OTHER FAN TYPES AS SCHEDULED OR NOTED.

QUALITY ASSURANCE

- A. FANS SHALL BE DESIGNED, MANUFACTURED, AND TESTED IN ACCORDANCE WITH UL 705 "POWER VENTILATORS".
- B. MOTORS AND ELECTRICAL ACCESSORIES SHALL COMPLY WITH NEMA STANDARDS.

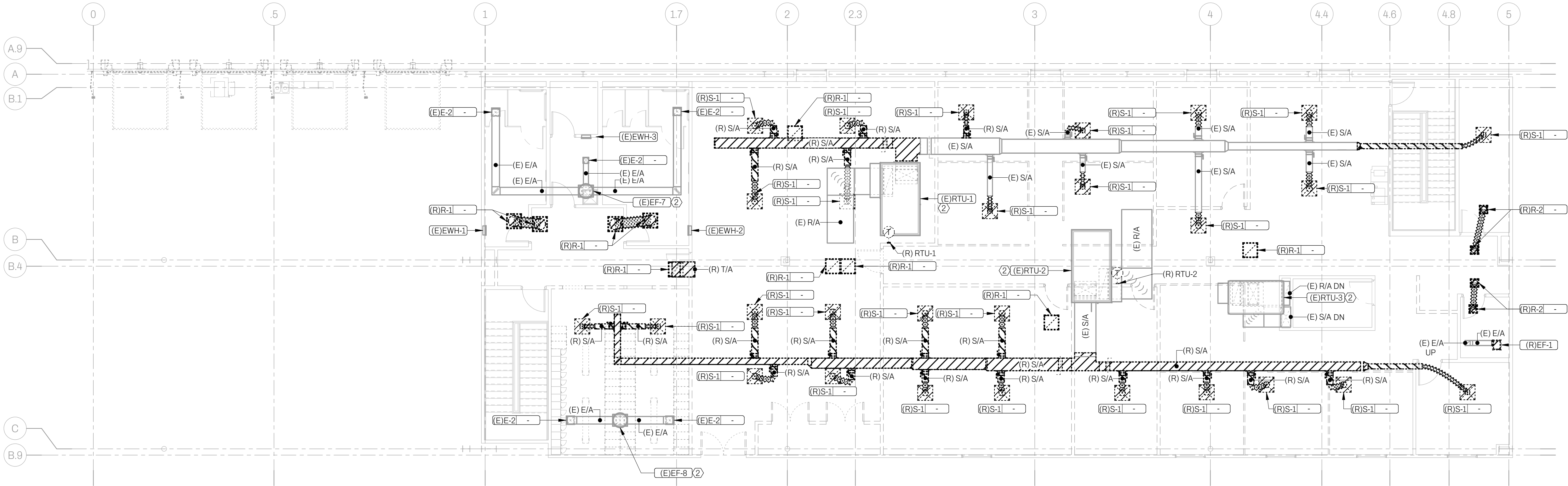
PART 2 - PRODUCTS

MANUFACTURERS

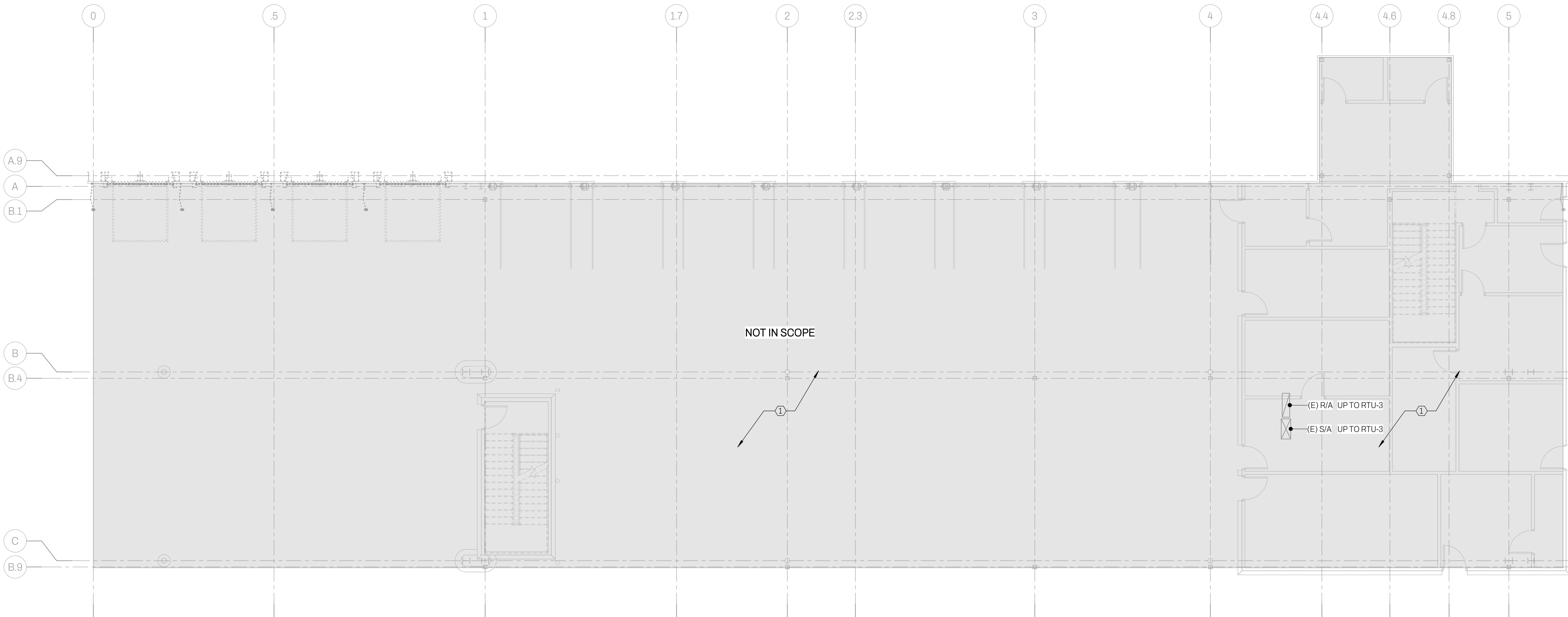
- A. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS MANUFACTURED BY COOK, GREENHECK, PENN VENTILATOR, OR APPROVED EQUIVALENT.

FANS - GENERAL

- A. GENERAL: PROVIDE FANS THAT ARE FACTORY FABRICATED AND ASSEMBLED, FACTORY TESTED, AND FACTORY FINISHED, WITH INDICATED CAPACITIES AND CHARACTERISTICS.
- B. FANS AND SHAFTS: STATICALLY AND DYNAMICALLY BALANCED AND DESIGNED FOR CONTINUOUS



2 MECHANICAL - MEZZANINE PLAN - DEMOLITION
M-010.0D 1/8" = 1'-0"



1 MECHANICAL - GROUND FLOOR - DEMOLITION
M-010.0D 1/8" = 1'-0"

GENERAL NOTES

- DRAWINGS ARE DIAGRAMMATIC ONLY. IT IS THE RESPONSIBILITY OF THE GENERAL AND MECHANICAL CONTRACTOR TO FULLY INSPECT THE SITE AND CONFIRM THE LOCATION OF ALL EXISTING EQUIPMENT PRIOR TO DEMOLITION.
- VERIFY ALL EXISTING CONDITIONS INCLUDING LOCATION OF ALL STRUCTURAL ELEMENTS, BAR, JOISTS, COLUMNS, ETC. AND COORDINATE DUCT LOCATIONS ACCORDINGLY.
- CONTRACTOR SHALL INSPECT ALL EXISTING EQUIPMENT TO REMAIN/TO BE RELOCATED AND REPAIR (IF NECESSARY) TO LIKE NEW OPERATING CONDITIONS.
- CONTRACTOR SHALL PATCH/REPAIR ALL HOLES WITHIN DUCTWORK AND DUCT INSULATION THAT MAY OCCUR TO EQUIPMENT DURING DEMOLITION OR RELOCATION.
- CONTRACTOR SHALL INSPECT AND CLEAN ALL EXISTING TO REMAIN/TO BE RELOCATED AIR DEVICES, DUCTWORK, AND DUCT ACCESSORIES. IF THE AIR DEVICE FACE IS DAMAGED, THEN DEMO AND REPLACE WITH NEW. MATCH STYLE AND FINISH IN FIELD. REFER TO NEW CONSTRUCTION PLANS FOR MORE INFORMATION.

KEY NOTES

- AREA NOT IN SCOPE. ALL HVAC IN THIS AREA TO INCLUDE BUT NOT LIMITED TO EQUIPMENT, DUCTWORK, DUCT ACCESSORIES, AIR DEVICES, AND CONTROLS ARE EXISTING TO REMAIN.
- HVAC EQUIPMENT IS LOCATED ON EXISTING ROOF AND SHOWN ON PLAN FOR DIAGRAMMATIC PURPOSES ONLY. CONFIRM EXACT LOCATION ON ROOF IN FIELD. CONTRACTOR SHALL SERVICE EQUIPMENT AND RESTORE TO "LIKE NEW" OPERATIONS. REFER TO MECHANICAL SCHEDULES FOR ADDITIONAL NOTES.

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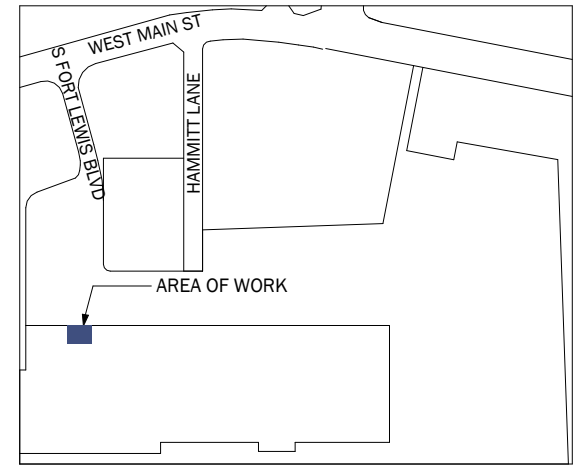
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KEY PLAN



CLIENT:

PROJECT NAME:

US FOODS
MEZZANINE RENOVATION

PROJECT ADDRESS:

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SALEM, VA 24153

DWG TITLE:

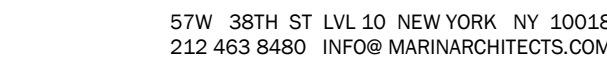
MECHANICAL - DEMOLITION PLAN

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DRAWING BY: JS	
CHKD BY: EW	
DWG No:	

ERIC MICHAEL WOLF
Lic No. 402053869
PROFESSIONAL ENGINEER

9/02/2025

M-010.0D



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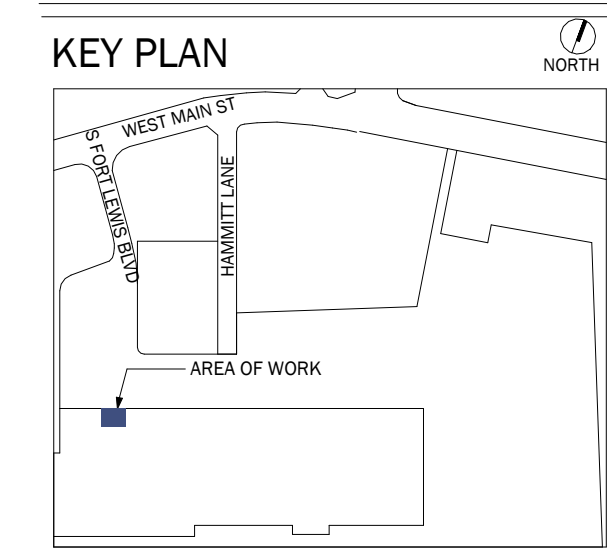
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KEY PLAN



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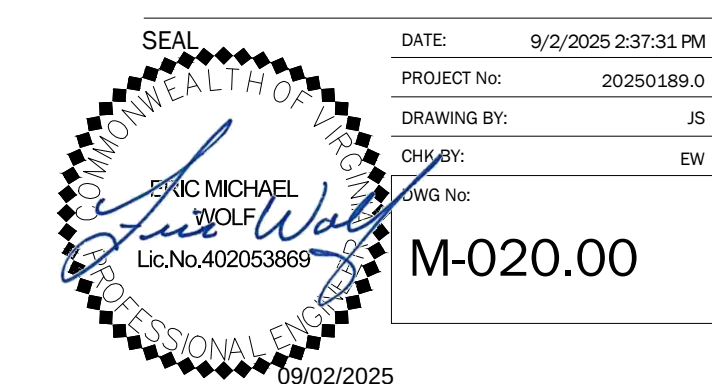
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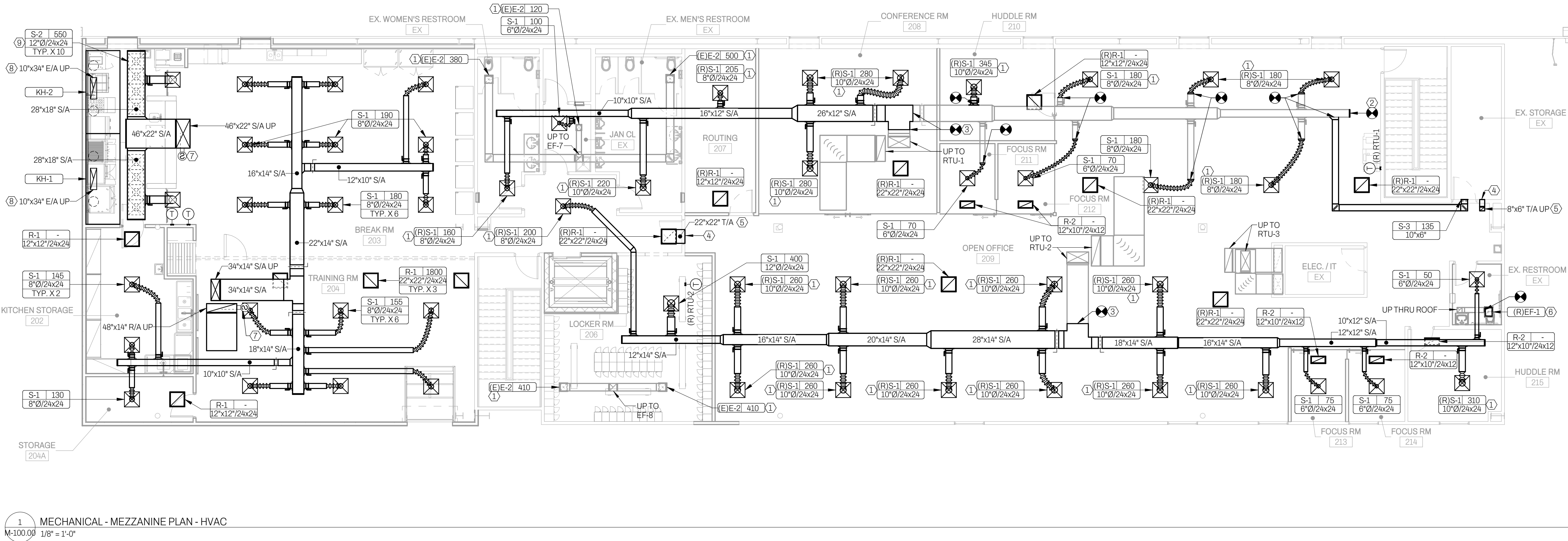
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DWG TITLE:

MECHANICAL - SITE PLAN





2 MECHANICAL - GROUND FLOOR PLAN - HVAC

1/8" = 1'-0"

GENERAL NOTES

- IT IS THE RESPONSIBILITY OF THE GENERAL AND MECHANICAL CONTRACTOR TO FULLY INSPECT THE SITE PRIOR TO COMMENCEMENT.
- VERIFY ALL EXISTING CONDITIONS INCLUDING LOCATION OF ALL STRUCTURAL ELEMENTS, BAR JOISTS, COLUMNS, ETC. AND COORDINATE DUCT LOCATIONS ACCORDINGLY.
- DRAWINGS ARE DIAGRAMMATIC ONLY. FINAL EQUIPMENT LOCATIONS SHALL BE DETERMINED IN THE FIELD. ADDITIONAL OFFSETS, ELBOWS, ETC. SHALL BE PROVIDED AND INSTALLED WITHOUT ADDITIONAL COST TO OWNER.
- LOCATE THERMOSTATS SUCH THAT THEY ARE ACCESSIBLE, PROTECTED, AND IN AN AREA OF UNOBSTRUCTED AIR CIRCULATION.
- ALL EXISTING HVAC EQUIPMENT TO REMAIN OR TO BE RELOCATED SHALL BE INSPECTED, CLEANED, AND REPAIRED AS NEEDED TO ENSURE PROPER FUNCTIONALITY.
- ALL EXISTING HVAC DUCTWORK AND DUCTWORK INSULATION TO REMAIN SHALL BE INSPECTED, CLEANED, AND REPAIRED AS NEEDED TO ENSURE AIRTIGHT.
- PROVIDE NEW FILTERS FOR ALL HVAC UNITS AT TURNOVER.
- ALL REPAIRS SPECIFIC TO THE EXISTING HVAC EQUIPMENT IS THE RESPONSIBILITY OF EXISTING MC.
- CONTRACTOR TO PROVIDE A DETAILED SCOPE OF REPAIR/REPLACE WORK AND COST FOR ALL HVAC EQUIPMENT AS A SEPARATE LINE ITEM.
- REUSE RELOCATED DUCTWORK AS NEEDED PER NEW CONSTRUCTION PLAN.

KEY NOTES

- REBALANCE AIR DEVICE TO CFM SHOWN ON PLAN.
- CAP EXISTING DUCTWORK. MATCH EXISTING TRUNK SIZE IN FIELD.
- EXTEND EXISTING DUCTWORK AND TRANSITION TO SIZE SHOWN ON PLAN. ALL TRANSITIONS SHALL BE MADE IN ACCORDANCE TO SMACNA STANDARDS. CONFIRM EXISTING DUCT SIZE IN FIELD.
- COVER OPEN ENDED DUCT WITH 1/2" X 1/2" HARDWARE MESH.
- INSTALL TRANSFER DUCT ABOVE CEILING AND TERMINATES IN RETURN AIR PLENUM.
- INSTALL RELOCATED CEILING EXHAUST FAN WITHIN NEW CELING GRID. COORDINATE FINAL LOCATION WITH ARCHITECTURAL RCP. CONNECT TO EXISTING E/A DUCTWORK IN FIELD. PROVIDE ADDITIONAL OFFSETS, ELBOWS, OR TRANSITIONS AS NEEDED.
- INSTALL AND MOUNT DUCT MOUNTED SMOKE DETECTOR IN SUPPLY/RETURN AIR DUCT, AS SHOWN ON PLAN. MECHANICAL CONTRACTOR SHALL PROVIDE DETECTOR AS UNIT ACCESSORY. FIRE ALARM CONTRACTOR TO WIRE FOR UNIT SHUT DOWN AND TIE INTO BUILDING MANAGEMENT SYSTEM (IF APPLICABLE).
- PROVIDE PRE-FABRICATED, STAINLESS STEEL, SINGLE WALLED DUCTWORK FOR ALL GREASE EXHAUST DUCTS.
- SUSPEND AIR DEVICE IN SPACE.

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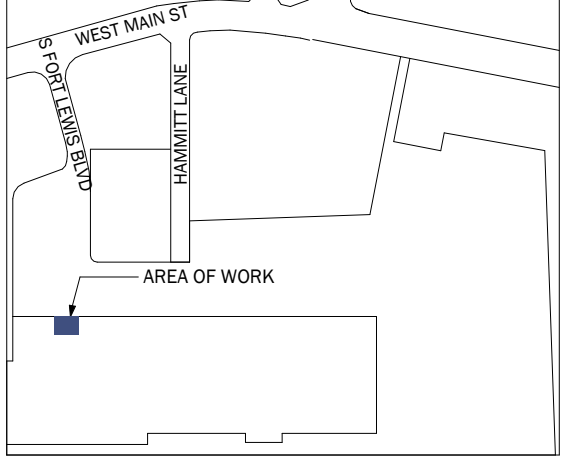
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KEY PLAN



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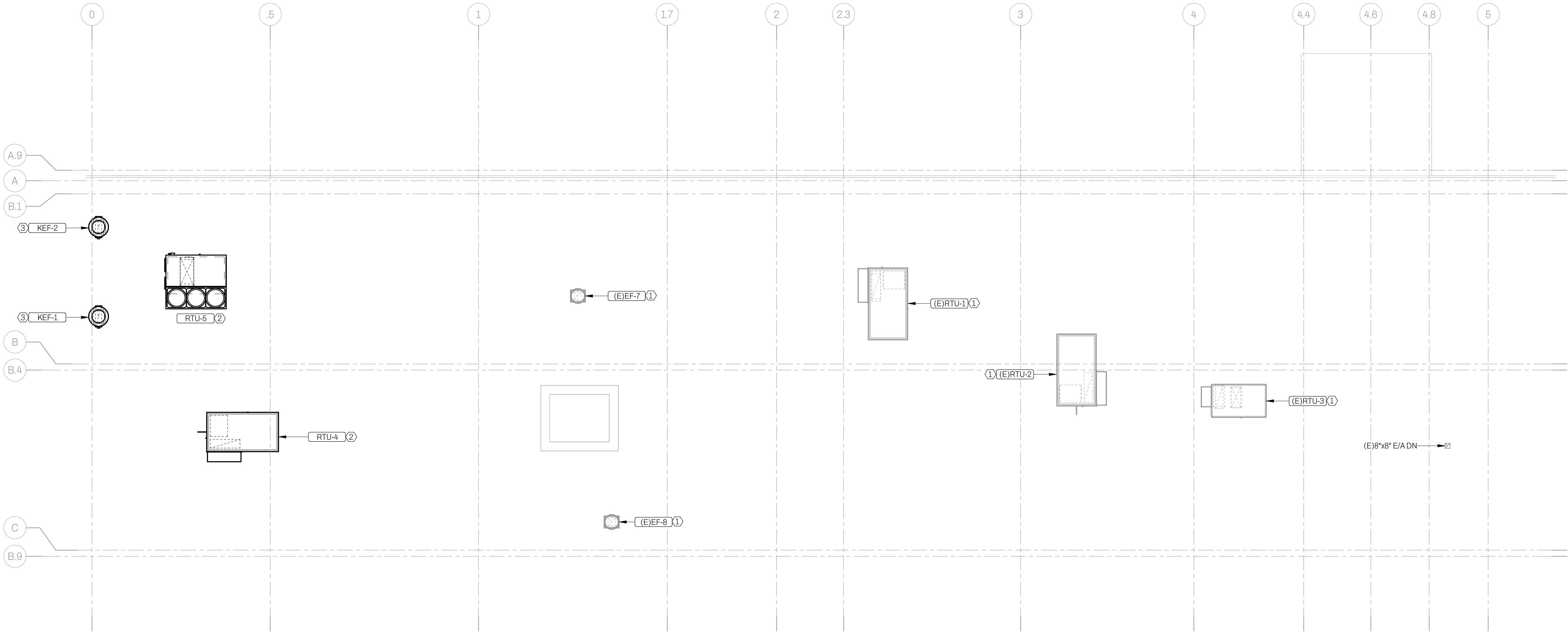
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MECHANICAL - FLOOR PLANS - HVAC

SEAL
COMMONWEALTH OF VIRGINIA
PROFESSIONAL ENGINEER
ERIC MICHAEL WOLF
Lic. No. 402053869

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CHKD BY: EW
DWG No: M-100.00

09/02/2025



1 MECHANICAL - EXISTING ROOF PLAN - HVAC
M-101.00 1/8" = 1'-0"

GENERAL NOTES

- IT IS THE RESPONSIBILITY OF THE GENERAL AND MECHANICAL CONTRACTOR TO FULLY INSPECT THE SITE PRIOR TO COMMENCEMENT.
- VERIFY ALL EXISTING CONDITIONS INCLUDING LOCATION OF ALL STRUCTURAL ELEMENTS, BAR JOISTS, COLUMNS, ETC. AND COORDINATE DUCT LOCATIONS ACCORDINGLY.
- DRAWINGS ARE DIAGRAMMATIC ONLY. FINAL EQUIPMENT LOCATIONS SHALL BE DETERMINED IN THE FIELD. ADDITIONAL OFFSETS, ELBOWS, ETC. SHALL BE PROVIDED AND INSTALLED WITHOUT ADDITIONAL COST TO OWNER.
- LOCATE THERMOSTATS SUCH THAT THEY ARE ACCESSIBLE, PROTECTED, AND IN AN AREA OF UNOBSTRUCTED AIR CIRCULATION.
- ALL EXISTING HVAC EQUIPMENT TO REMAIN OR TO BE RELOCATED SHALL BE INSPECTED, CLEANED, AND REPAIRED AS NEEDED TO ENSURE PROPER FUNCTIONALITY.
- PROVIDE NEW FILTERS FOR ALL HVAC UNITS AT TURNOVER.
- ALL REPAIRS SPECIFIC TO THE EXISTING HVAC EQUIPMENT IS THE RESPONSIBILITY OF EXISTING MC.
- CONTRACTOR TO PROVIDE A DETAILED SCOPE OF REPAIR/REPLACE WORK AND COST FOR ALL HVAC EQUIPMENT AS A SEPARATE LINE ITEM.

KEY NOTES

- HVAC UNIT EXISTING TO REMAIN. REFER TO MECHANICAL SCHEDULES FOR ADDITIONAL INFORMATION.
- INSTALL ROOF TOP UNIT ON ROOF CURB. CURB SHALL MATCH ROOF'S PITCH. COORDINATE EXACT LOCATION IN FIELD WITH OTHER TRADES. PROVIDE DUCT DROPS FROM UNIT, FULL SIZE OF CURB OPENINGS, AND TRANSITION TO SIZES SHOWN ON PLAN. TRANSITIONS SHALL BE MADE IN ACCORDANCE WITH SMACNA STANDARDS. VERIFY UNIT OPENINGS AND CONFIGURATION AND CURB OPENINGS AND CONFIGURATION WITH MANUFACTURER AND STRUCTURAL ENGINEER BEFORE PURCHASE AND INSTALLATION.
- INSTALL EXHAUST FAN ON ROOF CURB. CURB SHALL MATCH ROOF'S PITCH. COORDINATE EXACT LOCATION IN FIELD WITH OTHER TRADES. PROVIDE GREASE DUCT DROP FROM UNIT, FULL SIZE OF CURB OPENING AND TRANSITION TO SIZES SHOWN ON PLAN. TRANSITIONS SHALL BE MADE IN ACCORDANCE WITH SMACNA STANDARDS. VERIFY UNIT OPENINGS AND CONFIGURATION AND CURB OPENINGS WITH MANUFACTURER AND STRUCTURAL ENGINEER BEFORE PURCHASE AND INSTALLATION.

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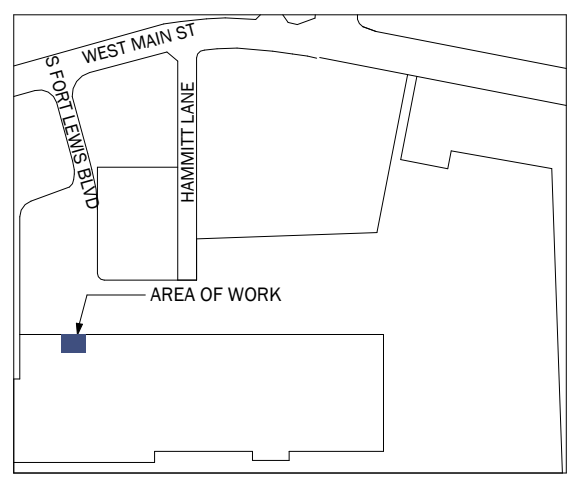
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KEY PLAN



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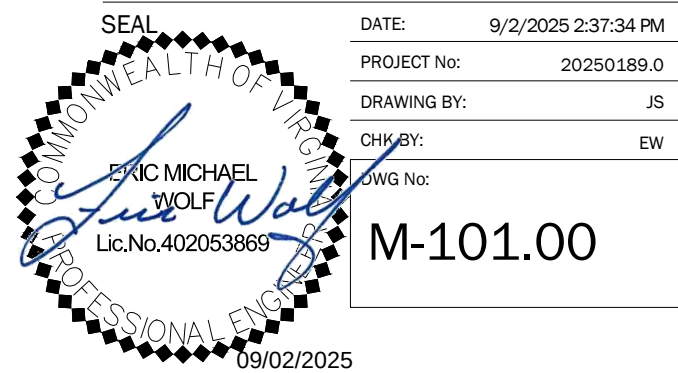
US FOODS
MEZZANINE RENOVATION

PROJECT ADDRESS:

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DWG TITLE:

MECHANICAL - ROOF PLAN



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CHKD BY: EW
DWG No:

M-101.00

09/02/2025

EXISTING EXHAUST FAN SCHEDULE							
UNIT MARK	PHASE DESIGNATION*	MANUFACTURER	MODEL	CFM	VOLTAGE (V)	PHASE	REMARKS
EF-1	EXISTING	CONFIRM IN FIELD	CONFIRM IN FIELD	130	120	1	1
EF-7	EXISTING	CONFIRM IN FIELD	CONFIRM IN FIELD	1000	120	1	1
EF-8	EXISTING	CONFIRM IN FIELD	CONFIRM IN FIELD	820	120	1	1
REMARKS							
1	FIELD ADJUST RPM TO MEET SCHEDULED CFM VALUES.						

MINIMUM EXHAUST REQUIREMENTS						
UNIT NAME	ROOM NAME	OCCUPANCY CATEGORY	NUMBER OF FIXTURES	ZONE FLOOR AREA	CALCULATED AIRFLOW	DESIGN AIRFLOW
EF-1	EX RESTROOM	TOILETS - PUBLIC - INTERMITTENTLY	1	52 SF	70 CFM	70 CFM
EF-1					70 CFM	70 CFM
EF-7	EX JAN CL	JANITOR CLOSETS, TRASH ROOMS, RECYCLING	0	56 SF	56 CFM	60 CFM
EF-7	EX MEN'S RESTROOM	TOILETS - PUBLIC - CONTINUOUSLY	6	219 SF	300 CFM	300 CFM
EF-7	EX WOMEN'S RESTROOM	TOILETS - PUBLIC - CONTINUOUSLY	2	157 SF	100 CFM	100 CFM
EF-7					456 CFM	460 CFM
EF-8	206 LOCKER RM	LOCKER/DRESSING ROOMS	0	416 SF	104 CFM	105 CFM
EF-8					104 CFM	105 CFM

[illegible]

AIR DEVICE SCHEDULE							
MARK	MANUFACTURER	MODEL	DESCRIPTION	FACE SIZE	MATERIAL	MOUNTING STYLE	REMARKS
R-1	TITUS	350FL	RETURN GRILLE WITH 3/4" BLADE SPACING, 35 DEGREE DEFLECTION AND FRONT BLADES PARRALEL TO SHORT DIMENSION	24x24	ALUMINUM	LAY-IN	1, 3
R-2	TITUS	350FL	RETURN GRILLE WITH 3/4" BLADE SPACING, 35 DEGREE DEFLECTION AND FRONT BLADES PARRALEL TO SHORT DIMENSION	24x12	ALUMINUM	LAY-IN	1, 3
S-1	TITUS	TMS-AA	HIGH PERFORMANCE 3-CONE DIFFUSER	24x24	ALUMINUM	LAY-IN	1, 2, 3, 5
S-2	CAPTIVE AIRE	DI-PSP	DROP-IN PERFORATED SUPPLY PLENUM	24x24	STAINLESS STEEL	DUCT	1, 2, 3, 5
S-3	TITUS	300FL	DOUBLE DEFLECTION SUPPLY REGISTER WITH 3/4" BLADE SPACING AND FRONT BLADES PARRALEL TO LONG DIMENSION	SEE PLANS	ALUMINUM	SURFACE	1, 2, 3, 4

REMARKS:

- COORDINATE BORDER TYPE AND FINISH WITH ARCHITECT PRIOR TO PURCHASING.
- MATCH SNAPLOCK AND FLEXIBLE DUCT RUNOUT SIZES AS NOTED ON PLANS.
- MODULE SIZE INDICATED INCLUDES NOMINAL BORDER SIZE.
- PROVIDE OPPOSED BLADE MANUAL VOLUME DAMPER FOR AIRFLOW ADJUSTMENT ACCESSIBLE THROUGH GRILLE FACE.
- PROVIDE MANUAL VOLUME DAMPER AT DUCT BRANCH CONNECTOR.

UNIT MARK	MANUFACTURER	MODEL	AREA SERVED	NOMINAL SIZE (TONS)	SUPPLY FAN				COOLING			GAS HEAT				ELECTRICAL					WEIGHT	REMARKS
					TOTAL	OUTSIDE AIR	ESP	HP	TOTAL	SENSIBLE	EER	TYPE	INPUT	OUTPUT	AFUE	VOLTAGE	PHASE	FREQUENCY	MCA	MOCP		
RTU-4	CARRIER	48FEDM12	KITCHEN STORAGE, TRAINING ROOM, BREAK ROOM	10.0	3,000 CFM	615 CFM	1.00 IN-WG	5.00 HP	117,400 BTU/H	78,900 BTU/H	13	NG	180,000 BTU/H	148,000 BTU/H	82.2%	460 V	3	60 HZ	26.0 A	30.0 A	1300 LB	
RTU-5	CAPTIVEAIRE	CAS-HVAC3-1.400 -24- 20T-MPU	KH-1 & KH-2	20.0	5,500 CFM	5,500 CFM	0.50 IN-WG	5.00 HP	255,800 BTU/H	144,800 BTU/H	12	NG	349,291 BTU/H	282,926 BTU/H	81%	460 V	3	60 HZ	48.0 A	60.0 A	2700 LB	

REMARKS:
1. SELECTIONS SCHEDULED ARE BASIS OF DESIGN. APPROVED EQUALS MUST MEET OR EXCEED THE PERFORMANCE AND THE SPECIFICATIONS.
2. PROVIDE UNIT WITH R454B REFRIGERANT.
3. PROVIDE UNIT WITH DOWNFLOW/VERTICAL AIRFLOW CONFIGURATION.
4. PROVIDE UNIT WITH STAINLESS STEEL HEAT EXCHANGER.
5. PROVIDE UNIT WITH LOW LEAK ECONOMIZER AND COMPARATIVE ENTHALPY WITH BAROMETRIC RELIEF. PROVIDE ECONOMIZER WITH FAULT DETECTION.
6. PROVIDE UNIT WITH SINGLE ZONE VARIABLE AIR VOLUME STANDARD MOTOR.
7. PROVIDE UNIT WITH FACTORY INSTALLED VFDS WITH NETWORK CARDS FOR INTEGRATION TO CONTROL SYSTEM.
8. PROVIDE UNIT WITH LOW AMBIENT CONTROLS, COMPRESSOR ANTI-RECYCLE CONTROLS, HINGED DOOR ACCESS, MERV8 FILTERS, DIRTY FILTER SWITCH AND MOTORIZED FRESH AIR DAMPER.
9. PROVIDE UNIT WITH SINGLE POINT POWER CONNECTION AND FACTORY FURNISHED DISCONNECTS. PROVIDE NON-FUSED DISCONNECT SWITCH AND UNPOWERED CONVENIENCE OUTLET.
10. PROVIDE UNIT WITH BACNET CAPABILITIES.
11. PROVIDE UNIT WITH FACTORY MOUNTED SMOKE DETECTOR AND INTERNAL FLOAT SWITCH WIRED FOR UNIT SHUTDOWN.
12. PROVIDE UNIT WITH CO2 SENSOR IN THE RETURN AIR DUCTWORK FOR DEMAND CONTROL VENTILATION. CO2 CONCENTRATION SETPOINT SHALL BE BETWEEN 300-900 PPM.
13. PROVIDE UNIT WITH PREFABRICATED FACTORY 24" HIGH INSULATED, SPRING ISOLATED ROOF CURB.
14. PROVIDE UNIT WITH DISCHARGE AIR TEMPERATURE SENSOR.
15. PROVIDE UNIT WITH 5-YEAR COMPRESSOR WARRANTY AND 10-YEAR HEAT EXCHANGER WARRANTY.
16. PROVIDE UNIT WITH HOT GAS REHEAT.
17. PROVIDE UNIT WITH HUMIDITY SENSOR IN THE RETURN AIR DUCT. MAINTAIN 50% RELATIVE HUMIDITY.
18. PROVIDE UNIT WITH DIRECT DRIVE BLOWER AND ELECTRONIC EXPANSION VALVE.
19. PROVIDE UNIT WITH EC MOTOR CONDENSING FANS.
20. PROVIDE UNIT WITH REFRIGERATION PRESSURE MONITORING ON HIGH AND LOW PRESSURE SIDE OF SYSTEM.
21. PROVIDE UNIT WITH FIXED 100% OUTSIDE AIR.
* CONFIRM ALL UNIT DIMENSIONS WITH MANUFACTURER AND COORDINATE WITH ARCHITECTURAL AND STRUCTURAL DESIGNS. UNIT HEIGHT LISTED WITHOUT ROOF CURB.

EXISTING ROOF TOP UNIT SCHEDULE																			
UNIT MARK	PHASE DESIGNATION*	MANUFACTURER	MODEL	MANUFACTURE YEAR	NOMINAL TONNAGE	SUPPLY AIR CFM	OUTSIDE AIR CFM	ESP (IN. W.G.)	SUPPLY HP	COOLING TOTAL CAPACITY (MBH)	COOLING SENSIBLE CAPACITY (MBH)	HEATING INPUT (MBH)	HEATING OUTPUT (MBH)	VOLTAGE (V)	PHASE	MCA (A)	MOCp (A)	WEIGHT (LB)	REMARKS
RTU-1	EXISTING	CARRIER	48TFE009	2001	8.5	3045	455	1.000	2	CONFIRM WITH MFR	CONFIRM WITH MFR	180	144	460	3	25.4	30	-	1, 2
RTU-2	EXISTING	CARRIER	48TFD012	2001	10	3710	385	1.000	3	CONFIRM WITH MFR	CONFIRM WITH MFR	180	144	208	3	45.9	50	-	1, 2
RTU-3	EXISTING	AMERICAN STANDARD	GBC048	2002	4	1300	360	0.825	3	CONFIRM WITH MFR	CONFIRM WITH MFR	115	92	460	3	11	15	-	1, 2
REMARKS																			
1	UNIT SCHEDULED IS THE INSTALLED EQUIPMENT INFORMATION FOUND IN FIELD. FIELD ADJUST RPM TO MEET SCHEDULED CFM VALUES.																		
2	UNIT IS NEAR END OF STANDARD LIFE. RECOMMEND TO REPLACE UNIT ONE FOR ONE. CONTRACTOR SHALL PROVIDE PRICING FOR THE REPLACEMENT AS A SEPARATE LINE ITEM.																		

MARK	MANUFACTURER	MODEL	TYPE	SERVES	DESIGN AIRFLOW RATE	ESP	MOTOR	VOLTAGE	PHASE	FLA	FAN INTERLOCK	WEIGHT	REMARKS
							POWER						
KEF-1	CAPTIVEAIRE	DUI180HFA	UPBLAST	KH-1	3,600 CFM	1.50 IN-WG	3.00 HP	208 V	3	9.5 A	KH-1	198 LB	1, 2, 3, 4, 5, 6
KEF-2	CAPTIVEAIRE	DUI180HFA	UPBLAST	KH-2	3,300 CFM	1.50 IN-WG	3.00 HP	208 V	3	9.5 A	KH-2	198 LB	1, 2, 3, 4, 5, 6

REMARKS:

1. PROVIDE UNIT WITH GREASE BOX AND GREASE CUP.
2. PROVIDE UNIT WITH UNIT MOUNTED VFD AND VFD MOUNTING BRACKET.
3. PROVIDE UNIT WITH EXHAUST HEAT BAFFLE.
4. PROVIDE UNIT WITH FACTORY-MOUNTED VENTED, HINGED, INSULATED CURB.
5. PROVIDE UNIT WITH NAME PLATE TO INCLUDE DESIGNATION AND AREA SERVED BY FAN.
6. SELECTIONS SCHEDULED ARE BASIS OF DESIGN. APPROVED EQUALS MUST MEET OR EXCEED THE PERFORMANCE AND THE SPECIFICATIONS.

*CONFIRM ALL UNIT DIMENSIONS WITH MANUFACTURER AND COORDINATE WITH ARCHITECTURAL AND STRUCTURAL DESIGNS.

UNIT MARK	MANUFACTURER	MODEL	DESCRIPTION	INSTALLATION TYPE	EXHAUST AIRFLOW RATE	EFFICIENCY @ 7 MICRONS	DIMENSIONS			PRODUCT WEIGHT	INTERLOCK	REMARKS
							LENGTH	DEPTH	HEIGHT			
KH-1	CAPTIVEAIRE	6018 SND-2	HEAVY DUTY TYPE I	WALL MOUNT	3,600 CFM	85%	144"	60"	18"	912 LB	KEF-1 & RTU-5	1, 2, 3, 4, 5, 6, 7, 8
KH-2	CAPTIVEAIRE	6018 SND-2	HEAVY DUTY TYPE I	WALL MOUNT	3,300 CFM	85%	132"	60"	18"	646 LB	KEF-2 & RTU-5	1, 2, 3, 4, 5, 6, 7, 8

REMARKS:

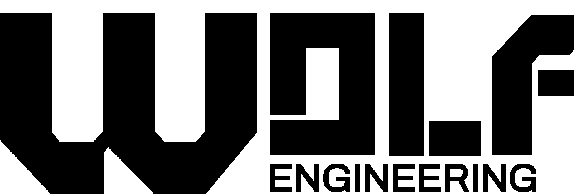
1. PROVIDE UNIT WITH FILTER(S). QTY AND SIZE PER MANUFACTURER. REFER TO SCHEDULED EFFICIENCY.
2. PROVIDE UNIT WITH RECESSED ROUND LIGHTS, WITH NO WIRE GUARD. QTY PER MANUFACTURER. COORDINATE POWER WITH EC.
3. PROVIDE UNIT WITH FIRE SYSTEM PIPING.
4. PROVIDE UNIT WITH FIELD WRAPPER, BACKSPLASH, AND SIDE SPLASH.
5. PROVIDE UNIT WITH INSULATION FOR TOP OF HOOD AND BACK OF HOOD.
6. PROVIDE UNIT WITH STRUCTURAL FRONT PANEL.
7. PROVIDE UNIT WITH WALL MOUNTED, TANK TYPE FIRE SYSTEM UTILITY CABINET.
8. PROVIDE MANUFACTURER REQUIRED GAS VALVES.

MARIN
ARCHITECTS

57W 38TH ST LVL 10 NEW YORK NY 10018
212 463 8480 INFO@MARINARCHITECTS.COM

Contractor
CTS Builders

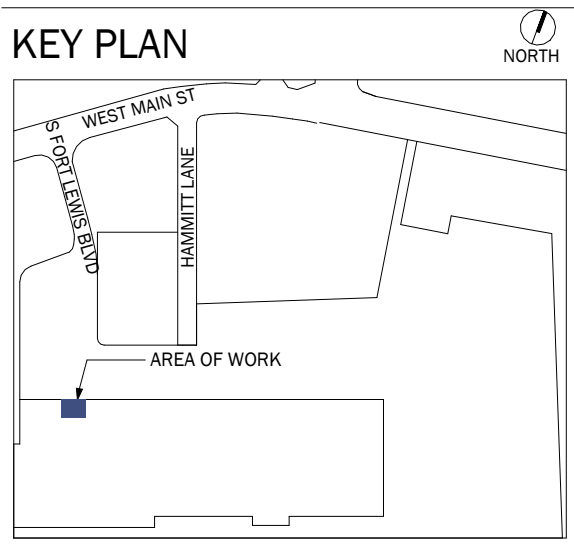
Structural Engineer
Penn Fusion Engineering

MEP Engineering
Wolf Engineering

P.O. BOX 38 | DALTON, GA 30722

09/02/25	FILING SET	
08/25/25	90% REVIEW	
08/07/25	60% PROGRESS SET	

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CLIENT:

PROJECT NAME:

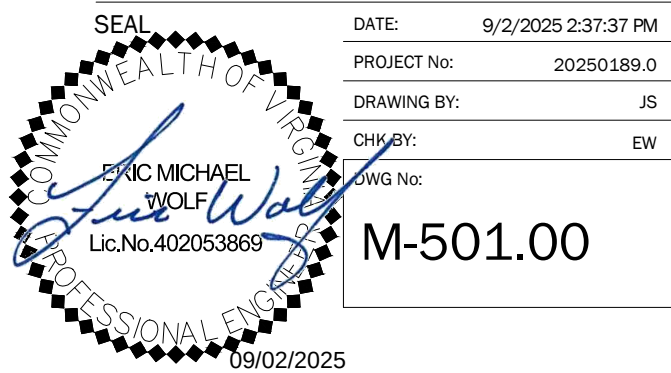
US FOODS MEZZANINE RENOVATION

PROJECT ADDRESS

40 S FORT LEWIS BLVD
SALEM, VA 24153

DWG TITLE:

MECHANICAL SCHEDULES



Structural Engineer
Penn Fusion Engineering

MEP Engineering
Wolf Engineering



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CLIENT

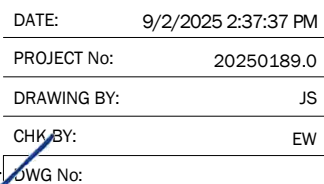
PROJECT NAME

PROJECT ADDRESS

40 S FORT LEWIS BLVD
SALEM, VA 24153

DWG TITLE

MECHANICAL DETAILS



M-601.0C

09/02/2025



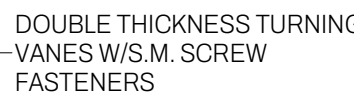
1. MECHANICAL CONTRACTOR SHALL COORDINATE LOCATION AND SIZE OF ROOF OPENING REQUIRED BY ACTUAL EQUIPMENT INSTALLED WITH THE GENERAL CONTRACTOR IN THE FIELD.
2. PREFABRICATED ROOF CURB SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR AND INSTALLED BY THE ROOFING CONTRACTOR.
3. CONNECTION OF THE ROOF CURB TO THE BUILDING STRUCTURE SHALL BE AS DETAILED BY THE STRUCTURAL ENGINEER. ARCHITECT TO RESIST WIND LOADING IN ACCORDANCE TO THE INTERNATIONAL BUILDING CODE. ATTACHMENT OF THE ROOFTOP UNIT TO THE ROOF CURB SHALL BE IN ACCORDANCE TO THE MANUFACTURER'S RECOMMENDATIONS TO RESIST WIND LOADING IN ACCORDANCE TO THE INTERNATIONAL BUILDING CODE.

M-601.00 NOT TO SCALE



1. PROVIDE BACKDRAFT DAMPER W/ BIRDScreen.
2. FLASH AND SEAL WALL/ROOF CAP.
3. PROVIDE INTERNAL ISOLATION AND SOUND INSULATION
4. SUPPORT FAN FROM STRUCTURE.
5. REFER TO FAN SCHEDULE FOR FAN CONTROL.

M-601.00 NOT TO SCALE



M-601.00 NOT TO SCALE



1. MECHANICAL CONTRACTOR SHALL COORDINATE ROOF OPENING SIZES AND LOCATIONS FOR STRUCTURAL SUPPORT FRAMING WITH GENERAL CONTRACTOR.
2. CURB SHALL BE MANUFACTURED WITH SLOPING BASE TO MATCH ROOF PITCH AND LEVEL TOP.
3. ALTERNATE METHODS OF TIE-DOWN SHALL BE APPROVED BY THE STRUCTURAL ENGINEER PRIOR TO COMMENCEMENT OF WORK OR EQUIPMENT ORDER.

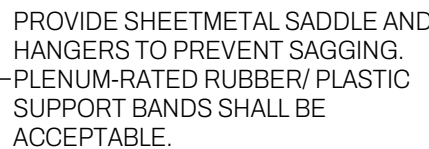
M-601.00 NOT TO SCALE



GENERAL NOTE

1. THE INTERIOR SURFACE OF ALL RADIUS ELBOWS SHALL BE MADE ROUND.
2. ALL STANDARD RADIUS ELBOWS SHOWN ON FLOOR PLANS MAY BE MADE SHORT RADIUS ELBOWS. SHORT RADIUS ELBOWS SHALL HAVE VANES. VANES SHALL BE CONSTRUCTED, SUPPORTED, AND FASTENED AS RECOMMENDED BY SMACNA.

M-601.00 NOT TO SCALE



M-601.00 NOT TO SCALE



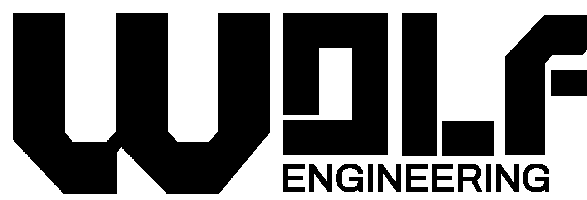
L=1/2(W), 4" MIN

VOLUME/BALANCE
E DAMPER
W/LOCK

FIT ALL CONNECTIONS TO AVOID
VISIBLE OPENINGS AND SECURE
THEM SUITABLY FOR THE PRESSURE
CLASS. ADDITIONAL MECHANICAL
FASTENERS ARE REQUIRED FOR
3" W.G. AND OVER

M-601.00 NOT TO SCALE

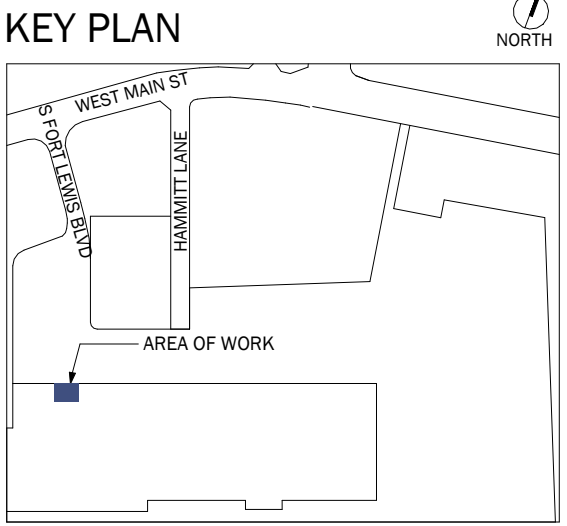




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CLIENT:

PROJECT NAME:

US FOODS
MEZZANINE RENOVATION

PROJECT ADDRESS:

40 S FORT LEWIS BLVD
SALEM, VA 24153

DWG TITLE:

MECHANICAL DETAILS

DATE: 9/2/2025 2:37:39 PM
PROJECT No: 20250189.0
DRAWING BY: JS
CHKD BY: EW
DWG No: M-602.00

9/02/2025

REVISIONS	
DESCRIPTION	DATE



1395 S. Marettta Pkwy, Bldg 100, Ste 105, Marettta, GA, 30067 PHONE: (470) 419 - 4768 EMAIL: reg122@captivemechanical.com

CAPTIVE
Atlanta Mechanical

US Foods - Roanoke, VA
SALEM, VA, 24153

DATE: 8/25/2025

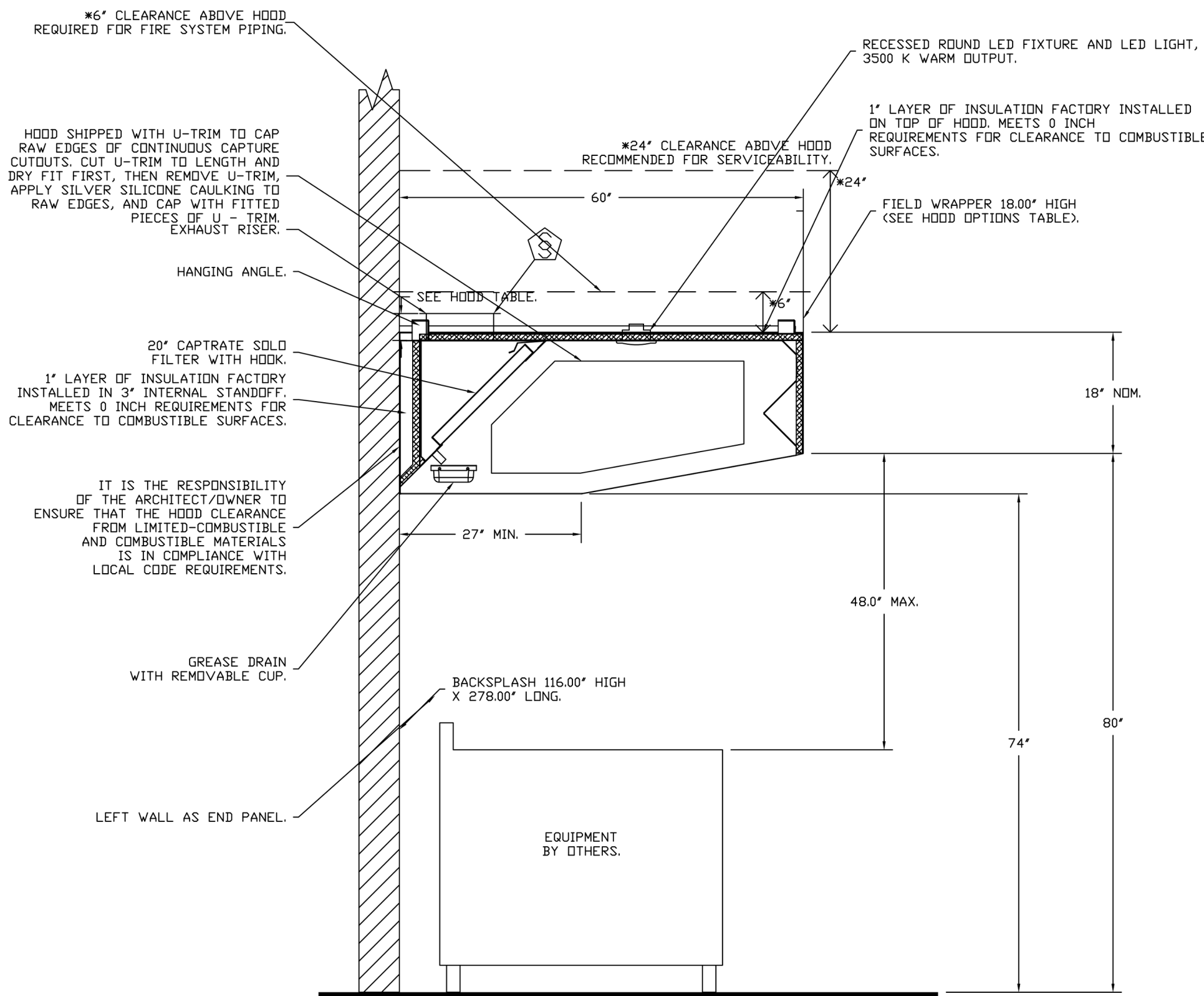
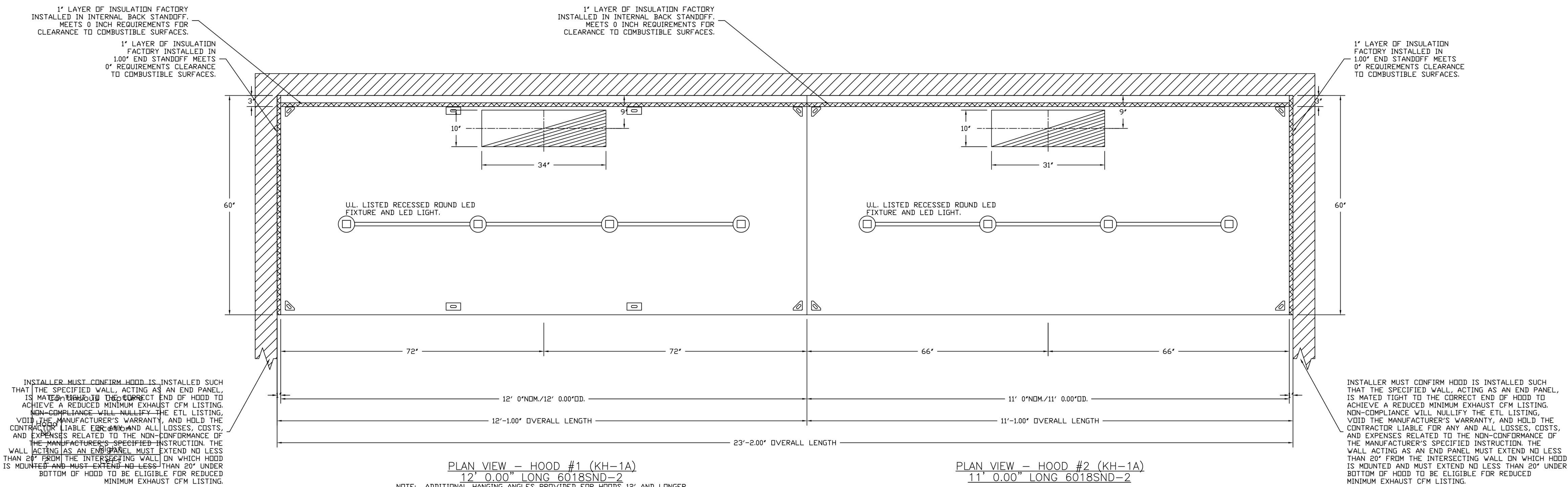
DWG.#:
8190782

DRAWN
BY: Jacob Harris

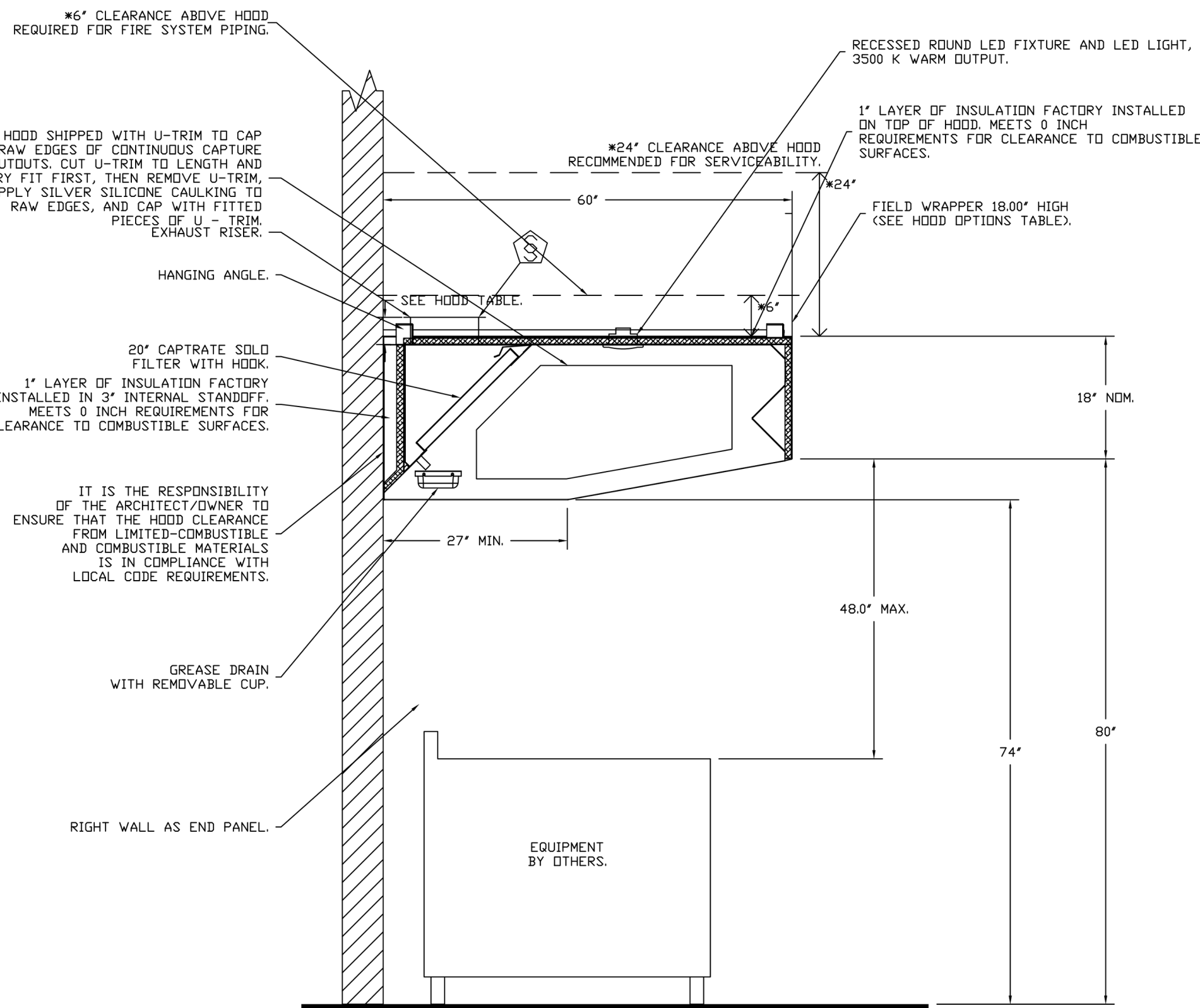
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3/4" = 1'-0"

MASTER DRAWING

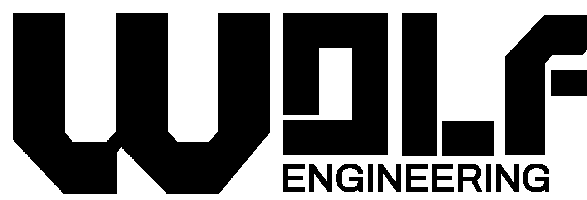
SHEET NO.
2



SECTION VIEW - MODEL 6018SND-2
HOOD - #1 (KH-1A)



SECTION VIEW - MODEL 6018SND-2
HOOD - #2 (KH-1A)

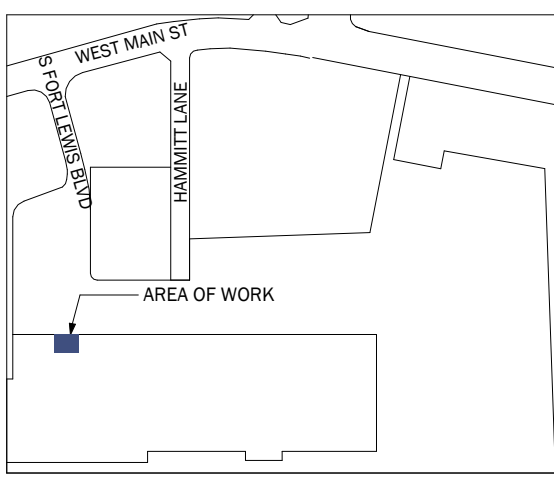


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KEY PLAN



CLIENT:

PROJECT NAME:

US FOODS
MEZZANINE RENOVATION

PROJECT ADDRESS:

40 S FORT LEWIS BLVD
SALEM, VA 24153

DWG TITLE:

MECHANICAL DETAILS

SEAL
DATE: 9/2/2025 2:37:42 PM
PROJECT No: 20250189.0
DRAWING BY: JS
CHK BY: EW
DWG No: M-603.00

09/02/2025

REVISIONS

DESCRIPTION

DATE

www.captiveaire.com

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1395 S Marietta Pkwy, Bldg 100, Ste 105, Marietta, GA, 30067 PHONE: (470) 419 - 4768 EMAIL: reg122@captiveaire.com

US Foods - Roanoke, VA

SALEM, VA, 24153

DATE: 8/25/2025

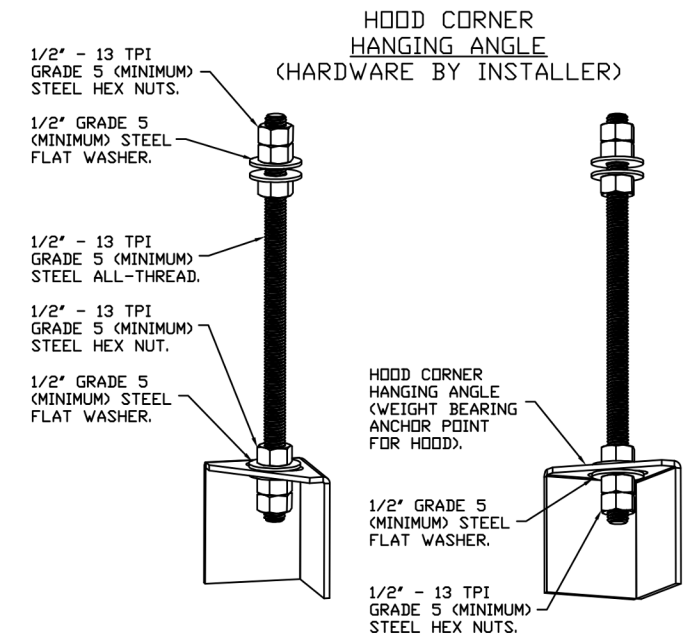
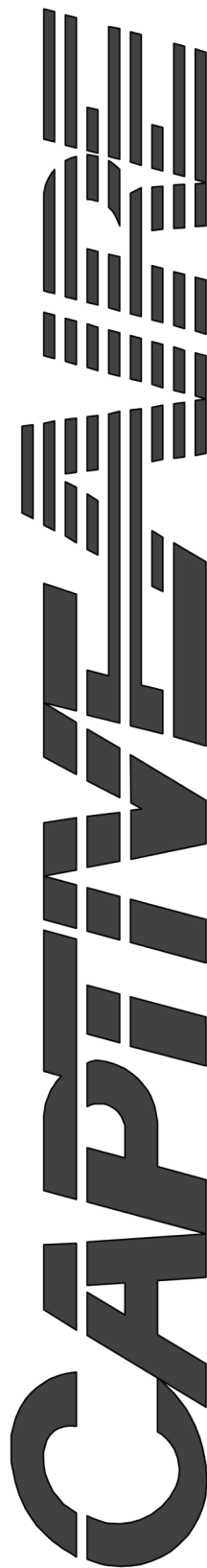
DWG.#: 8190782

DRAWN BY: Jacob Harris

SCALE: 3/4" = 1'-0"

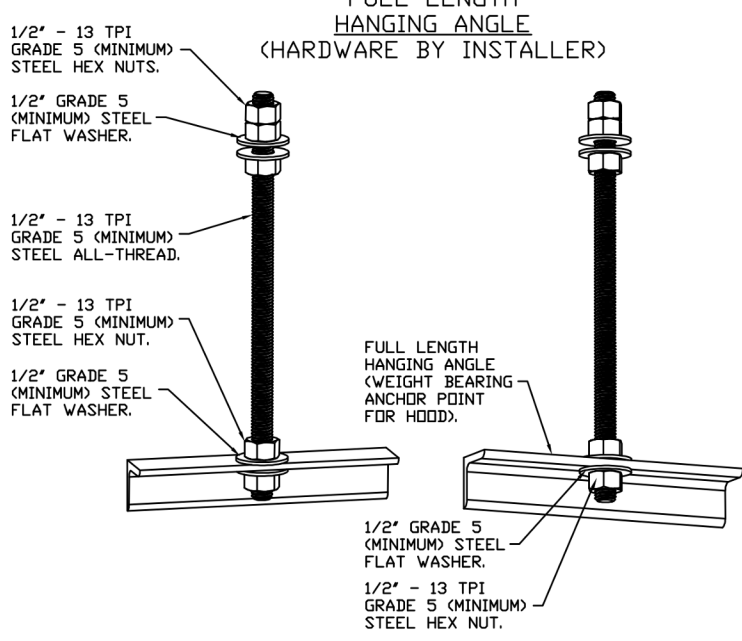
MASTER DRAWING

SHEET NO. 3



ASSEMBLY INSTRUCTIONS

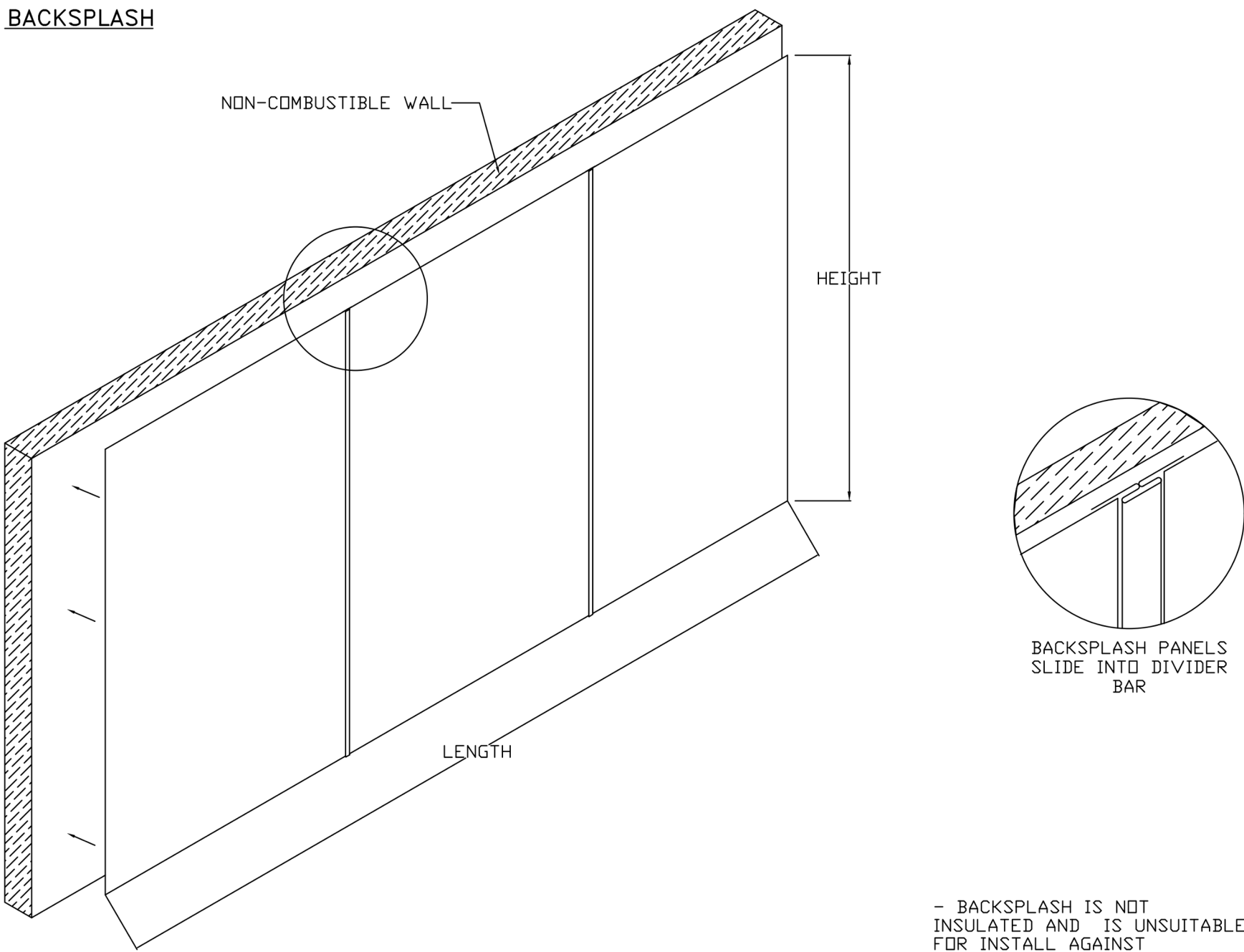
HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TPI GRADE 5 (MINIMUM) ALL-THREAD. SANDWICH HANGING ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHERS AND 1/2" - 13 TPI GRADE 5 (MINIMUM) HEX NUTS AS SHOWN. MUST USE DOUBLED HEX NUT CONFIGURATION BENEATH HOOD HANGING ANGLES AND ABOVE CEILING ANCHORS. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS.



ASSEMBLY INSTRUCTIONS

HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TPI GRADE 5 (MINIMUM) ALL-THREAD. SANDWICH HANGING ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHERS AND 1/2" - 13 TPI GRADE 5 (MINIMUM) HEX NUTS AS SHOWN. MUST USE DOUBLED HEX NUT CONFIGURATION ABOVE CEILING ANCHORS. SINGLE HEX NUT BENEATH HANGING ANGLE IS ACCEPTABLE FOR FULL LENGTH HANGING ANGLES. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS.

BACKSPLASH

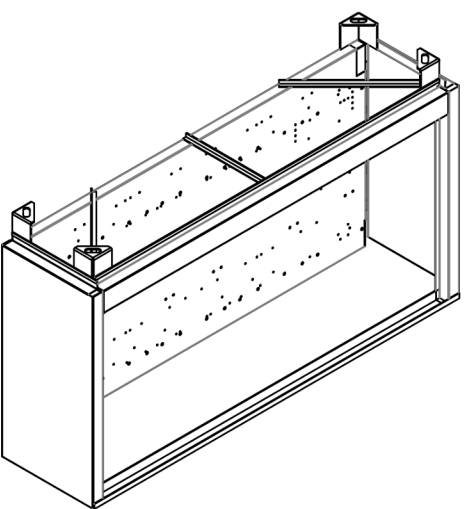
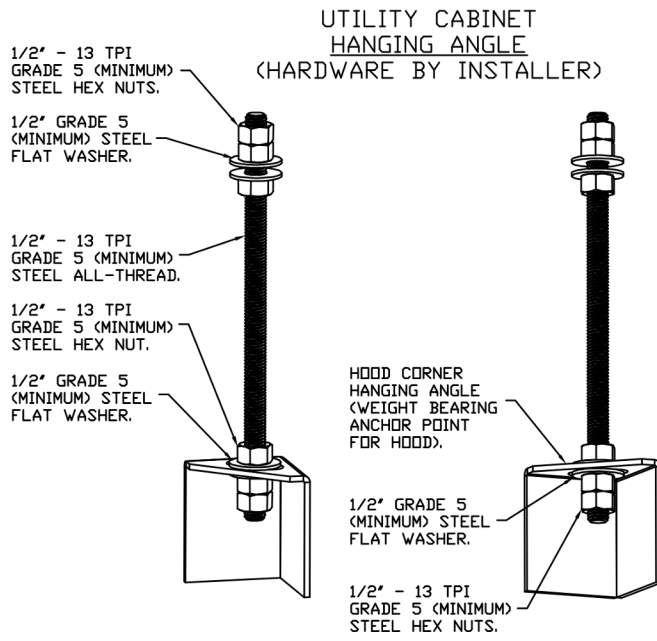


- BACKSPLASH IS NOT INSULATED AND IS UNSUITABLE FOR INSTALL AGAINST COMBUSTIBLE WALLS

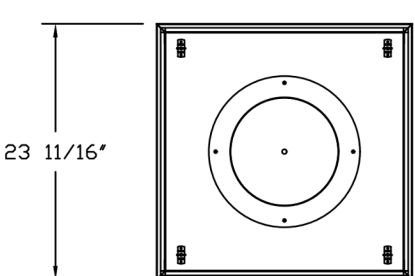
WALL-MOUNT UTILITY CABINET
ASSEMBLY INSTRUCTIONS

CABINET TO BE HUNG BY OTHERS. SEE UTILITY CABINET SCHEDULE FOR CABINET SIZE.

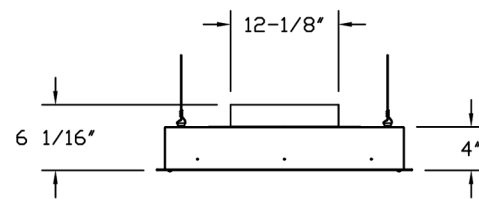
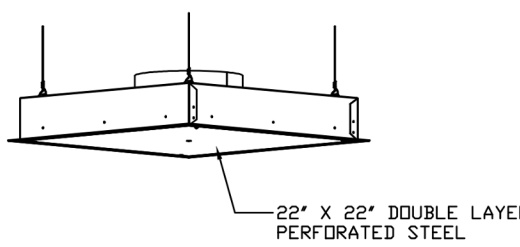
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QTY 11-DROP-IN PERFORATED SUPPLY PLENUM DIFFUSER
(DI-PSP)



FEATURES:
STAINLESS STEEL PERFORATION AND TRIM
REMOVABLE PERFORATION FOR PLENUM CLEANING
DOUBLE PERFORATION FOR EVEN AIR DISTRIBUTION
1/2" THICK INSULATION ON EXTERIOR TOP AND SIDES
APPROX. WEIGHT = 20 lbs



INSTALLATION NOTES:
INTENDED FOR INSTALLATION IN LAY IN (DROP) CEILINGS
INSTALL SLIDING RADIAL DAMPER ON TOP SIDE OF COLLAR

VERTICAL THROW DATA (FID)			
CFM	1 TSD	1 TSD	1 TSD
600	1.25'	3.00'	7.75'
500	0.95'	2.50'	6.25'
400	---	1.25'	4.50'
300	---	---	3.75'
200	---	---	0.50'

DIFFUSER SPECIFICATION

SPECIFICATION: CAPRATE® GREASE-STOP® SOLID FILTER

THE CAPRATE GREASE-STOP SOLID FILTER IS A SINGLE-STAGE FILTER FEATURING A UNIQUE S-BAFFLE DESIGN IN CONJUNCTION WITH A SLOTTED REAR BAFFLE DESIGN, TO DELIVER EXCEPTIONAL FILTRATION EFFICIENCY.

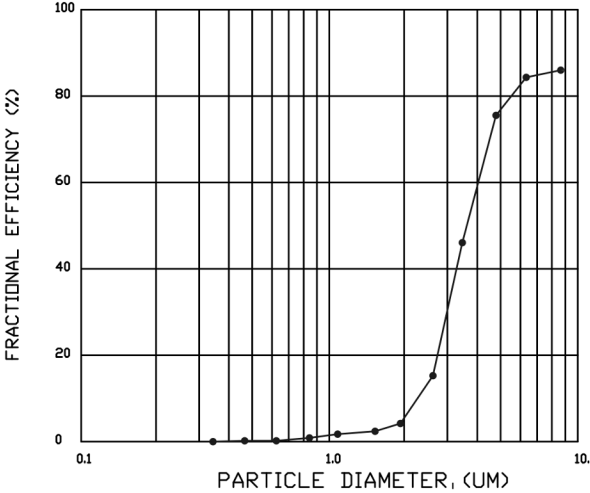
FILTER IS STAINLESS STEEL CONSTRUCTION, AND SIZED TO FIT INTO STANDARD 2-INCH DEEP HOOD CHANNEL(S).

UNITS SHALL INCLUDE STAINLESS STEEL HANDLES AND A FASTENING DEVICE TO SECURE THE TWO COMPONENTS WHEN ASSEMBLED.

GREASE EXTRACTION EFFICIENCY PERFORMANCE SHALL REMOVE AT LEAST 75% OF GREASE PARTICLES FIVE MICRONS IN SIZE, AND 85% GREASE PARTICLES SEVEN MICRONS IN SIZE AND LARGER, WITH A CORRESPONDING PRESSURE DROP NOT TO EXCEED 1.0 INCHES OF WATER GAUGE.

THE CAPRATE GREASE-STOP WAS TESTED TO ASTM STANDARD ASTM F2519-05. MANUFACTURER APPROVED FOR USE IN SOLID FUEL APPLICATIONS AS A SPARK ARRESTER.

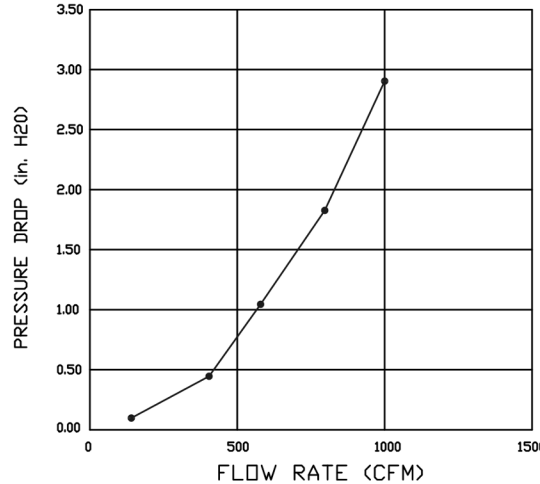
EFFICIENCY VS. PARTICLE DIAMETER

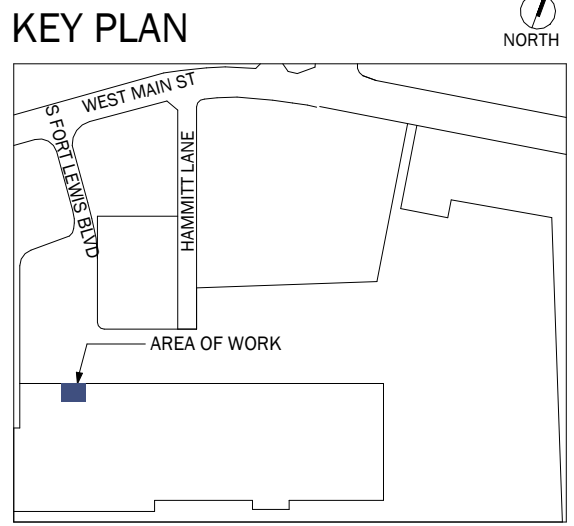


CAPRATE FILTERS ARE BUILT IN COMPLIANCE WITH:
NFPA #96,
NSF STANDARD #2,
UL STANDARD #1046,
INT. MECH. CODE (IMC),
ULC-S649.



PRESSURE DROP VS. FLOW RATE





CLIENT:

PROJECT NAME:
**US FOODS
MEZZANINE RENOVATION**

PROJECT ADDRESS:
**40 S FORT LEWIS BLVD
SALEM, VA 24153**

DWG TITLE:
MECHANICAL DETAILS

SEAL
DATE: 9/2/2025 2:37:44 PM
PROJECT No: 20250189.0
DRAWING BY: JS
CHKD BY: EW
DWG No: M-604.00

09/02/2025

REVISIONS	
DESCRIPTION	DATE

CAPTIVE

Atlanta Mechanical

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US Foods - Roanoke, VA
SALEM, VA, 24153

DATE: 8/25/2025

DWG.#:
8190782

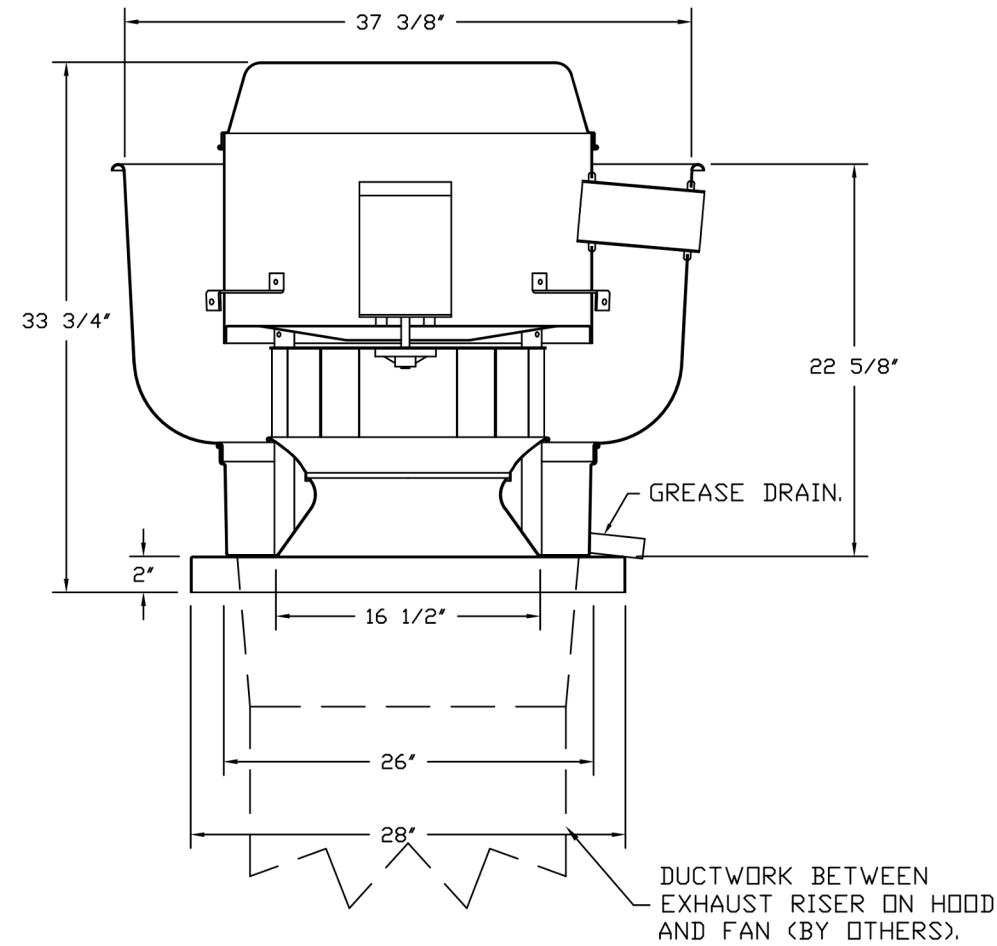
DRAWN
BY: Jacob Harris

SCALE:
3/4" = 1'-0"

MASTER DRAWING

SHEET NO.
5

FANS #1 (KEF-1A), #2 (KEF-1B) - DU180HFA EXHAUST FAN



TOP VIEW

FEATURES:

- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- RESTAURANT MODEL.
- UL705 AND UL762 AND ULC-S645
- VARIABLE SPEED CONTROL.
- INTERNAL WIRING.
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE).
- HIGH HEAT OPERATION 300°F (149°C).
- GREASE CLASSIFICATION TESTING.
- NEMA 3R SAFETY DISCONNECT SWITCH.

NORMAL TEMPERATURE TEST

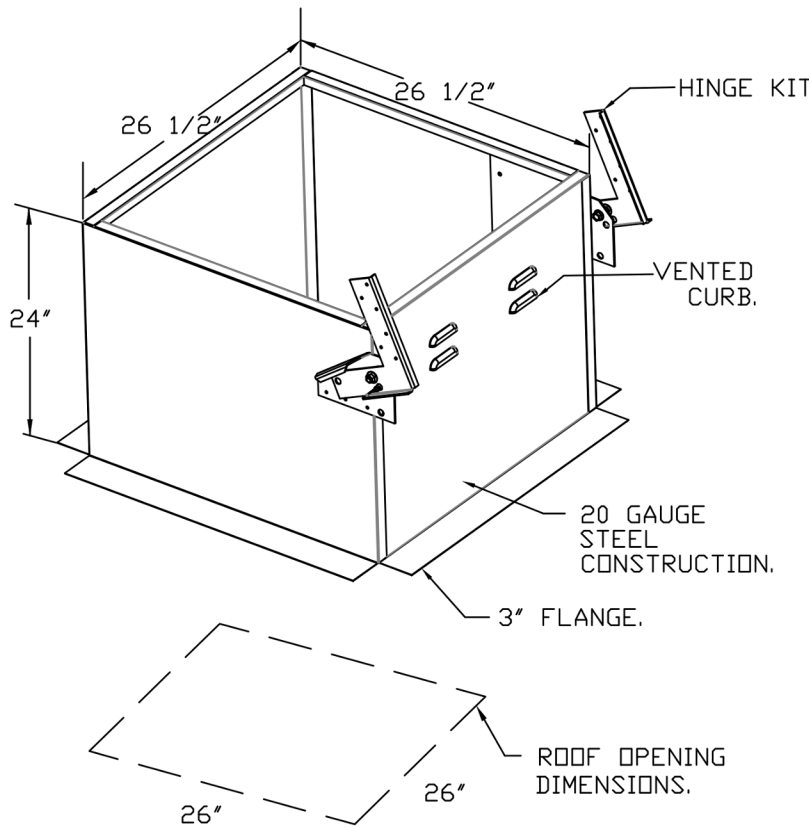
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 300°F (149°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

ABNORMAL FLARE-UP TEST

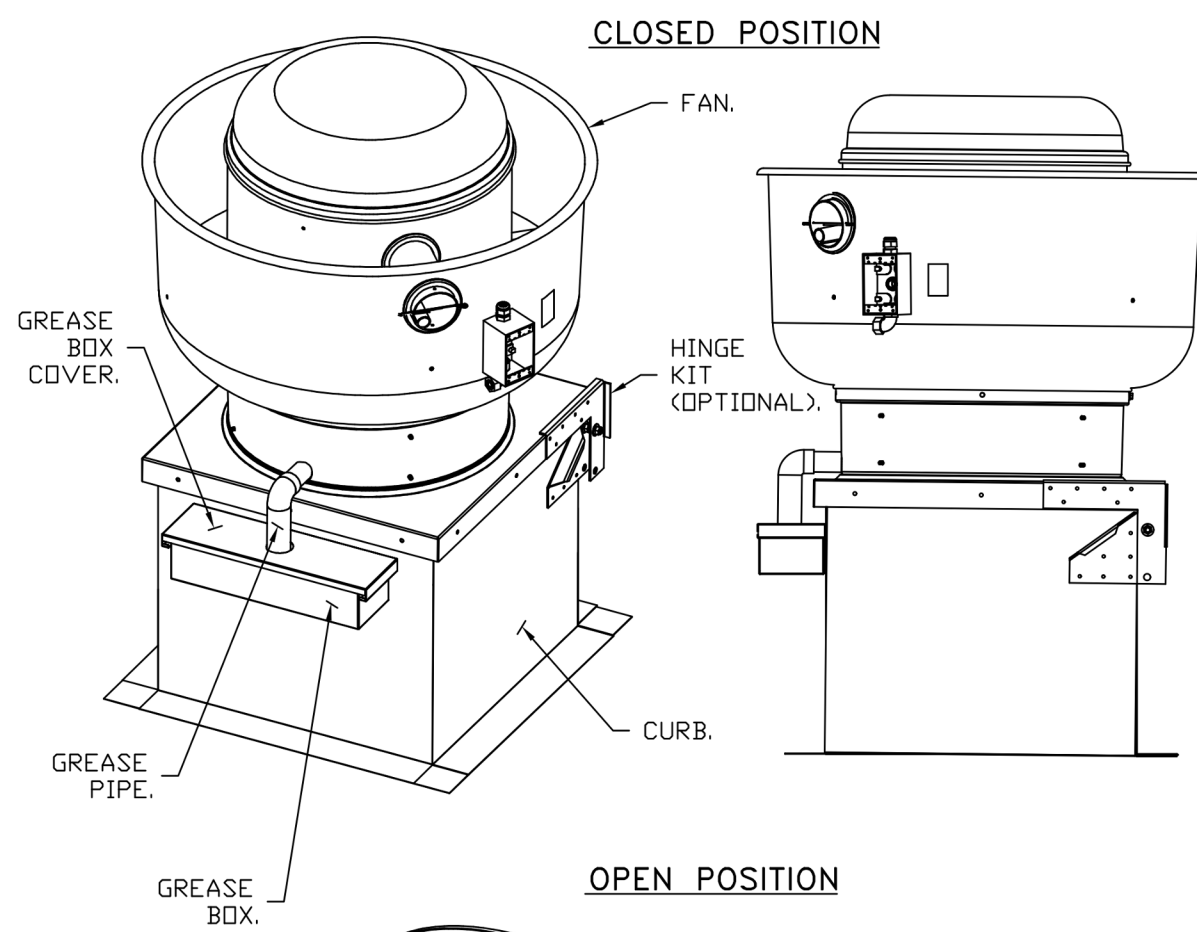
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING BURNING GREASE VAPORS AT 600°F (316°C) FOR A PERIOD OF 15 MINUTES WITHOUT THE FAN BECOMING DAMAGED TO ANY EXTENT THAT COULD CAUSE AN UNSAFE CONDITION.

OPTIONS

- GREASE BOX.
- FAN BASE CERAMIC SEAL - DU/DR180HFA
- INSTALLED AT PLANT - FOR GREASE DUCTS.
- UNIT MOUNTED VFD FOR USE WITH ECPM03
- VFD MOUNTING BRACKET FOR DU/DR 180
- 200.
- EXHAUST FAN HEAT BAFFLE.
- 2 YEAR PARTS WARRANTY.



GREASE BOX INSTALLATION



PARTS INCLUDED

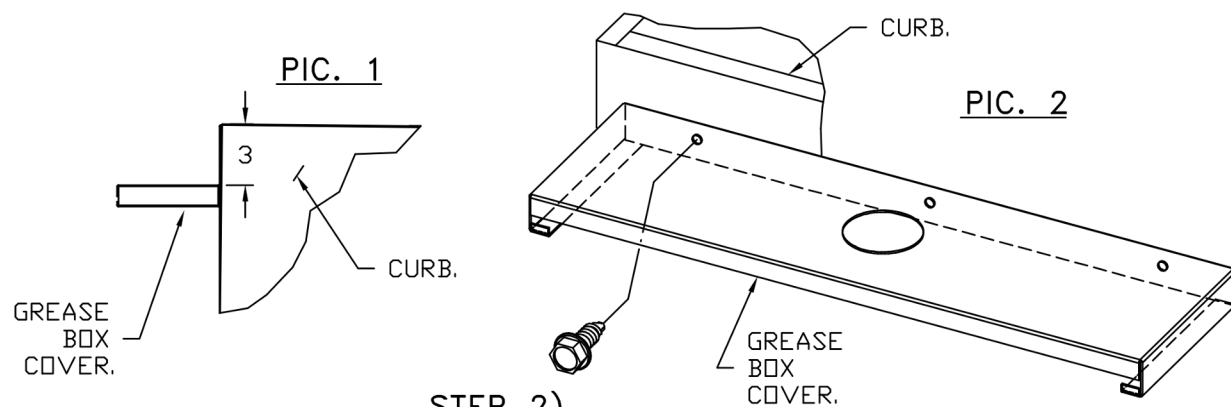
GREASE BOX.
GREASE BOX COVER.
GREASE PIPE.

SHEET METAL SCREWS
3 - LONG (3/4" LG.).

GREASE BOX FIELD INSTALLATION

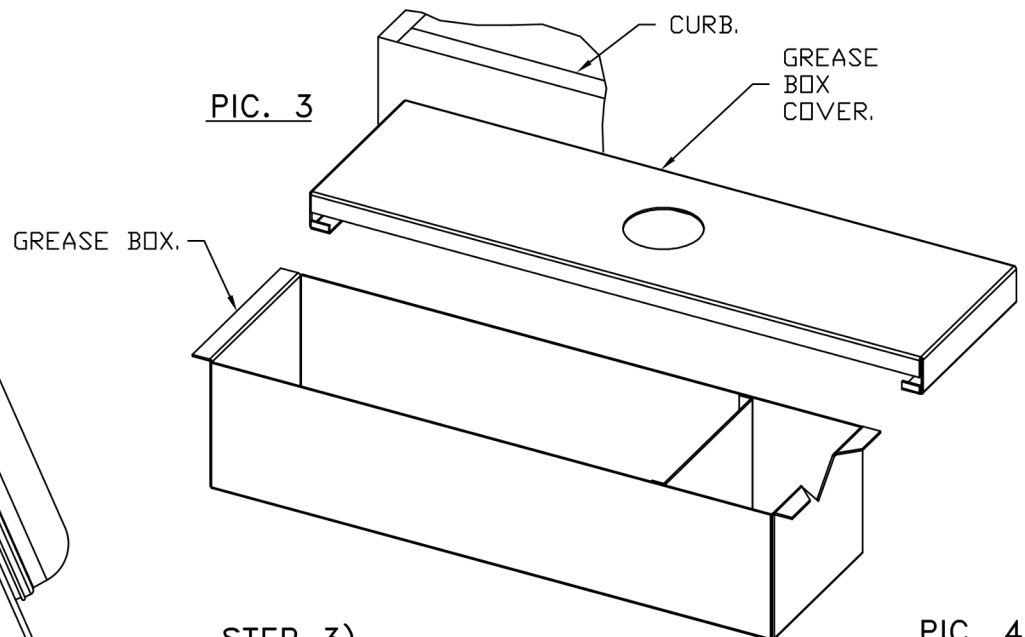
STEP 1)

ATTACH GREASE BOX COVER TO THE CURB, HOLD 3" DIMENSION AS SHOWN ON PIC. 1. SCREW GREASE BOX COVER TO CURB USING (3) LONG (3/4" LG.) SCREWS AS SHOWN ON PIC. 2.



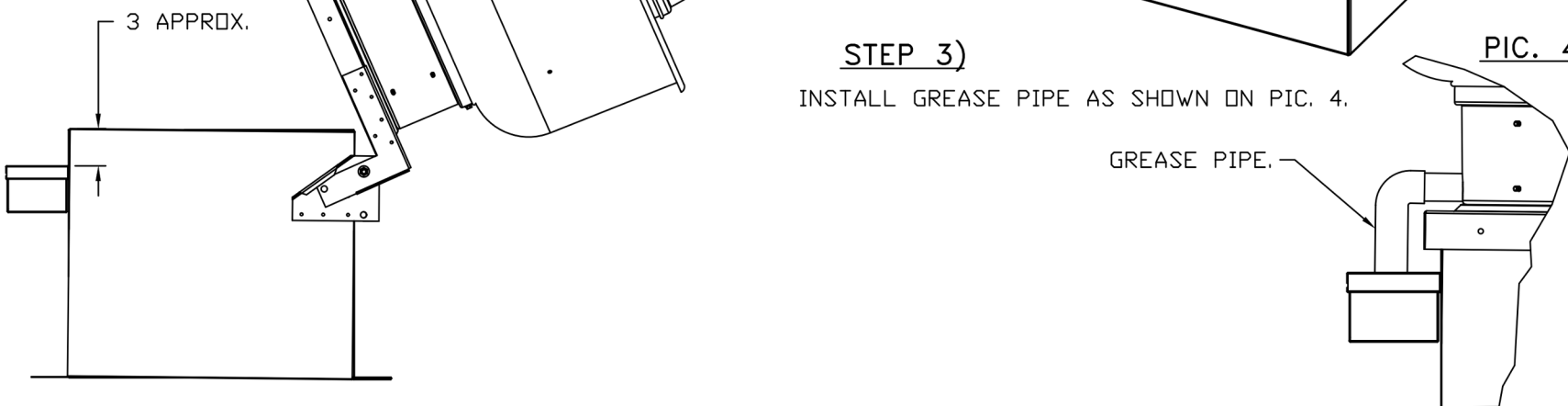
STEP 2)

ATTACH GREASE BOX TO GREASE BOX COVER, SLIDE AND DROP. AS SHOWN ON PIC. 3.

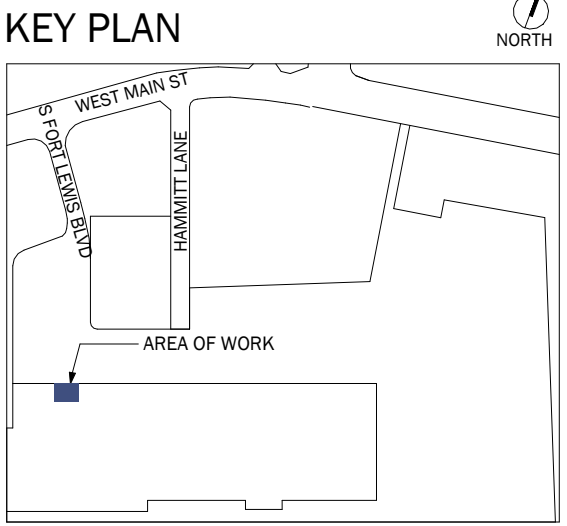


STEP 3)

INSTALL GREASE PIPE AS SHOWN ON PIC. 4.



*NOTE: UL 705 INSTALL.



CLIENT:

PROJECT NAME:

US FOODS
MEZZANINE RENOVATION

PROJECT ADDRESS:

40 S FORT LEWIS BLVD
SALEM, VA 24153

DWG TITLE:

MECHANICAL DETAILS

REVISIONS

DESCRIPTION	DATE

www.captiveaire.com

Atlanta Mechanical

1335 S. Marietta Pkwy, Bldg 100, Ste 105, Marietta, GA 30067 PHONE: (470) 419-4768 EMAIL: mg122@captiveaire.com

US Foods - Roanoke, VA
SALEM, VA, 24153

DATE: 8/25/2025

DWG.#:
8190782

DRAWN BY: Jacob Harris

SCALE:
1/2" = 1'-0"

MASTER DRAWING

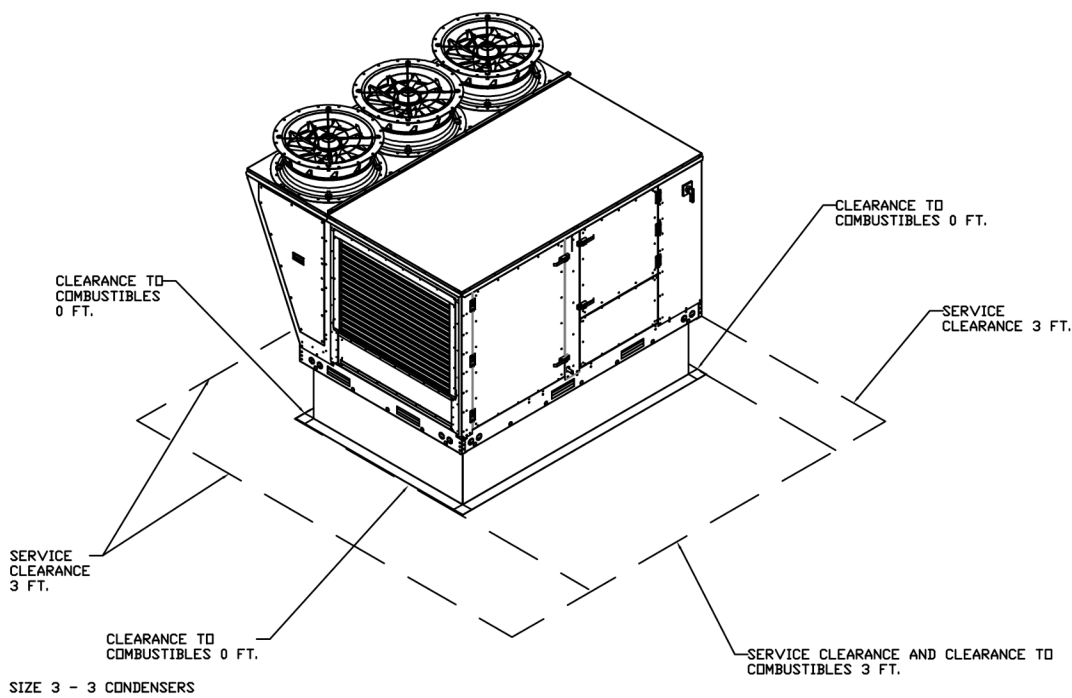
SHEET NO.
6

FAN #3 CAS-HVAC3-I.400-24MF-20T-MPU - HEATER (MAU-1)

NOTES:

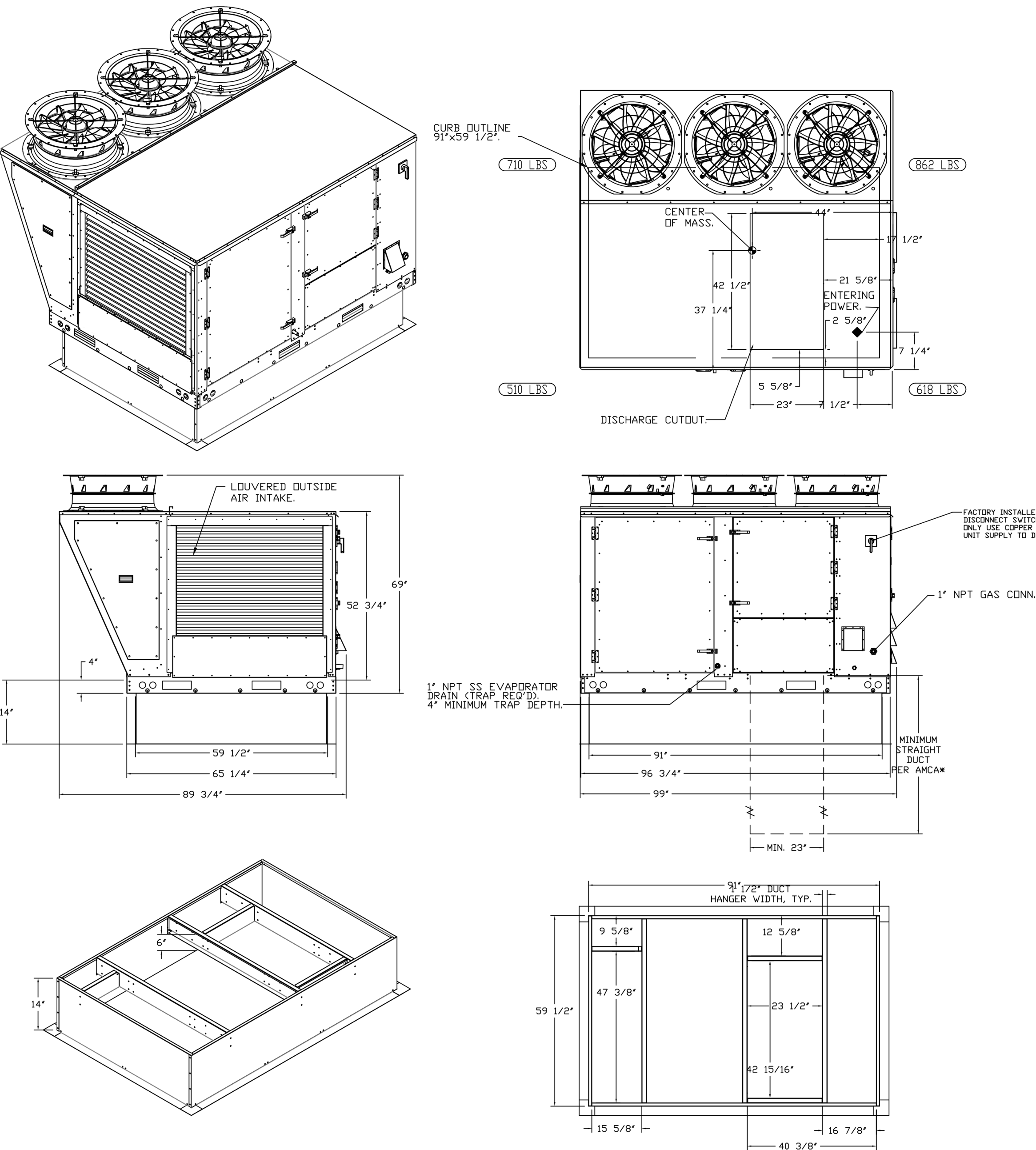
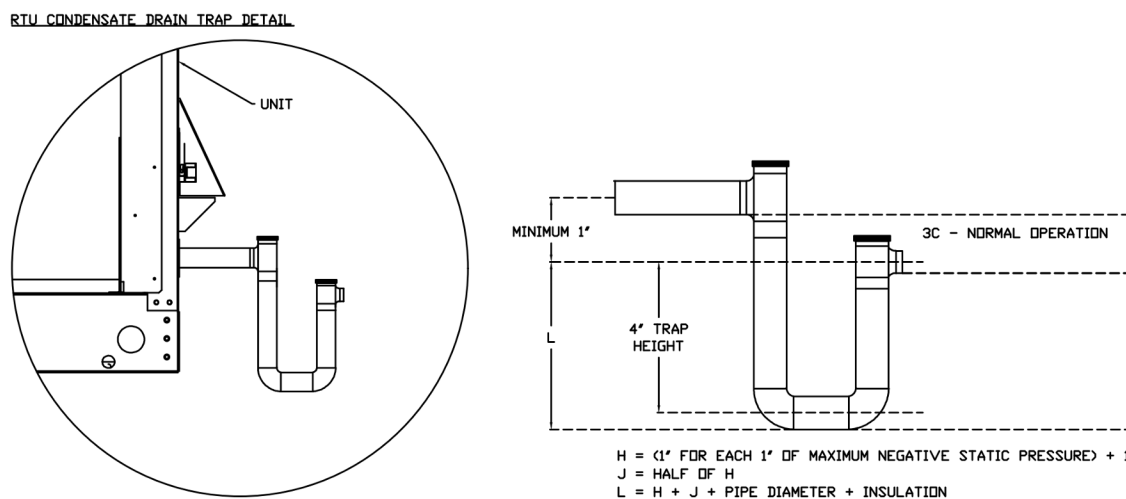
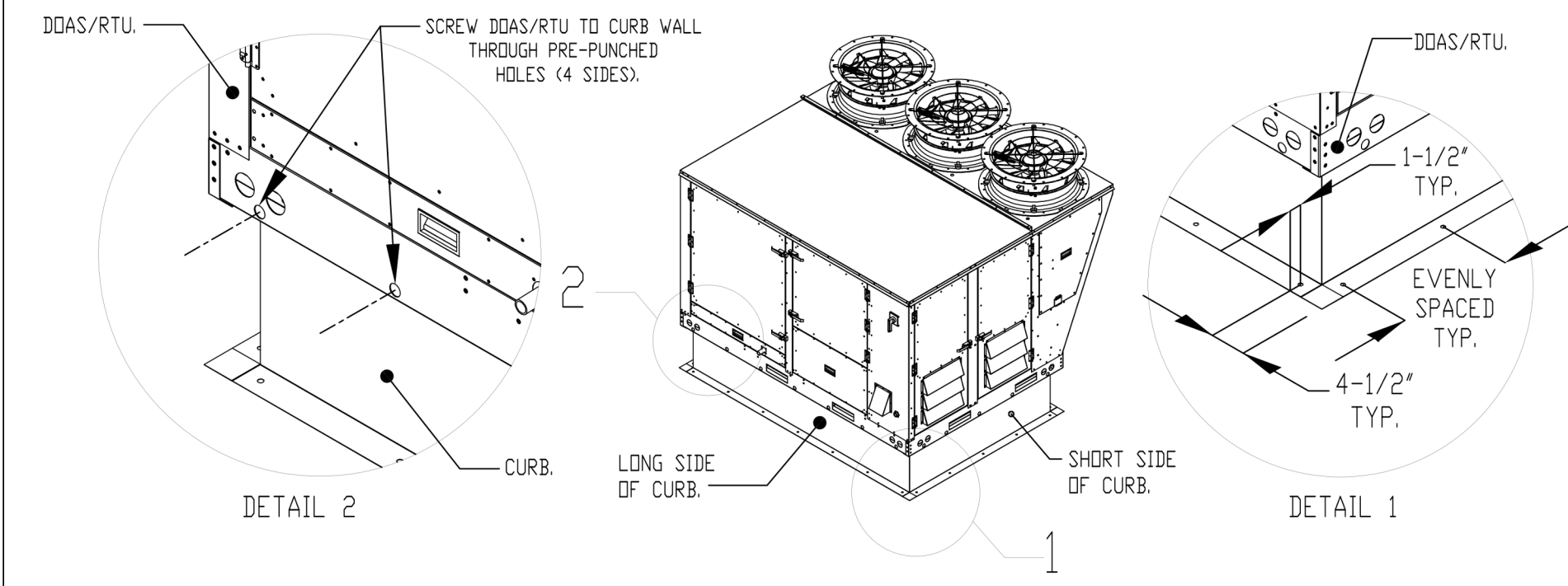
- DO NOT OBSTRUCT OUTSIDE AIR INLET, OUTSIDE AIR COIL OR OUTSIDE AIR FAN.
- DENOTES CORNER WEIGHT.
- ROOF OPENING MUST BE 2' SMALLER THAN CURB DIMENSIONS IN BOTH DIRECTIONS.
- CONNECTION FROM BREAKER TO UNITS SAFETY DISCONNECT SWITCH TO BE COPPER WIRE ONLY.
- EXTERIOR GAS CONNECTION PROVIDED BY FACTORY WITH QUICK SEAL AND ANTI-ROTATION BRACKET.

*NOTE: SUPPLY DUCT MUST BE INSTALLED TO MEET SMACNA STANDARDS. A MINIMUM STRAIGHT DUCT LENGTH MUST BE MAINTAINED DOWNSTREAM OF UNIT DISCHARGE AS OUTLINED IN AMCA PUBLICATION 201. WHEN USING RECTANGULAR DUCTWORK, ELBOWS MUST BE RADIUS THROAT, RADIUS BACK WITH TURNING VANES. FLEXIBLE DUCTWORK AND SQUARE THROAT/SQUARE BACK ELBOWS SHOULD NOT BE USED. ANY TRANSITION AND/OR TURNS IN THE DUCTWORK WILL CAUSE SYSTEM EFFECT. SYSTEM EFFECT WILL DRASTICALLY INCREASE STATIC PRESSURE AND REDUCE AIRFLOW. DO NOT RELY ON UNIT TO SUPPORT DUCT IN ANY WAY. FAILURE TO PROPERLY SIZE DUCTWORK MAY CAUSE SYSTEM EFFECTS AND REDUCE PERFORMANCE OF THE EQUIPMENT. SUGGESTED STRAIGHT DUCT SIZE IS 23" x 39".



TYPICAL DOAS/RTU ROOF MOUNTING INSTALLATION INSTRUCTIONS

- SECURE THE CURB TO THE ROOF FRAMING MEMBERS BY DRILLING 1/4" PILOT HOLES IN THE CURB FLANGES AT LOCATIONS SHOWN IN THE DIAGRAM BELOW. USING 3/8" X 2" ZINC PLATED STEEL LAG BOLTS, AND ZINC PLATED WASHERS, SCREW THROUGH THE CURB FLANGES AND INTO THE ROOF FRAMING MEMBERS. A MINIMUM OF (5) LAG BOLTS ON EACH SHORT SIDE, AND (7) LAG BOLTS ON EACH LONG SIDE IS REQUIRED.
- SECURE THE UNIT BASE TO THE SIDE WALLS OF THE CURB USING (24) 1/4"-14 X 2" SELF-DRILLING, STEEL ZINC PLATED SCREWS. PRE-PUNCHED HOLES HAVE BEEN PROVIDED FOR EACH SCREW LOCATION.





Energy Code: 2021 IECC
Project Title: US FOODS - ROANOKE
Location: Salem (Salem (city)), Virginia
Climate Zone: 4a
Project Type: Alteration

Mechanical Systems List

1 RTU-4 (Single Zone w/ Perimeter System):
Heating: 1 each - Central Furnace, Gas, Capacity = 180 kBtu/h
Proposed Efficiency = 82.00% Et, Required Efficiency: 80.00 % Et or 80% AFUE
Cooling: 1 each - Single Package DX Unit, Capacity = 117 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 13.00 EER, Required Efficiency = 11.00 EER
Proposed Part Load Efficiency = 15.00 IEER, Required Part Load Efficiency = 14.60 IEER
Fan System: RTU-4 – Compliance (Motor nameplate HP and fan efficiency method): Passes

Fans:
FAN 1 Supply, Single-Zone VAV, 3000 CFM, 5.0 motor nameplate hp, 0.96 fan energy index

1 RTU-5 (Single Zone w/ Perimeter System):
Heating: 1 each - Central Furnace, Gas, Capacity = 349 kBtu/h
Proposed Efficiency = 83.00% Et, Required Efficiency: 81.00 % Et
Cooling: 1 each - DX DOAS (Dehumidification), Capacity = 256 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 4.00 ISMRE, Required Efficiency = 4.00 ISMRE
Proposed Part Load Efficiency = 0.00, Required Part Load Efficiency = 0.00
Fan System: RTU-5 – Compliance (Motor nameplate HP and fan efficiency method): Passes

Fans:
FAN 2 Supply, Constant Volume, 5500 CFM, 5.0 motor nameplate hp, 1.10 fan energy index

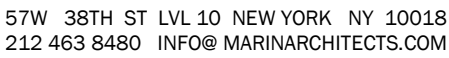
1 GWH-1:
Gas Storage Water Heater, Capacity: 96 gallons, Input Rating: 200 kBtu/h w/ Circulation Pump
Proposed Efficiency: 80.00 % Et, Required Efficiency: 80.00 % Et

Compliance Statement: The proposed mechanical alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2021 IECC requirements in COMcheck Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Eric Wolf, PE
Name - Title

Eric Wolf
Signature

Date

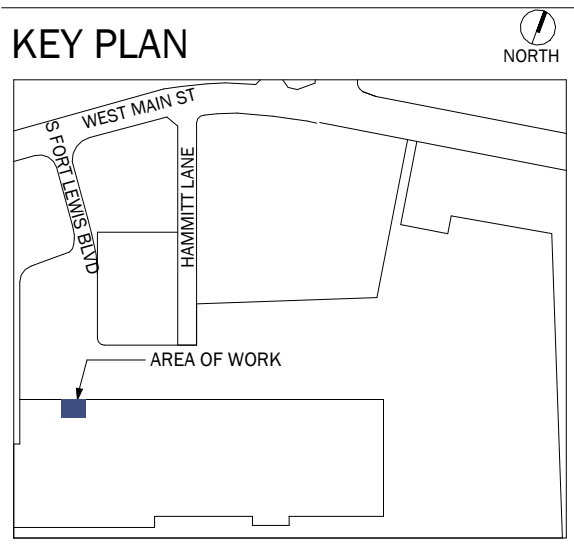


MEP Engineering
Wolf Engineering



09/02/25	FILING SET	
08/25/25	90% REVIEW	
08/07/25	60% PROGRESS SET	

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CLIENT:

PROJECT NAME:

US FOODS MEZZANINE RENOVATION

PROJECT ADDRESS:

40 S FORT LEWIS BLVD
SALEM, VA 24153

DWG TITLE:

MECHANICAL COMPLIANCE FORMS

