MECHANICAL SYMBOL LEGEND <u>DUCTWORK</u> 24"x12" SQ. DUCT SIZE (WIDTH X HEIGHT) 24"/12" OVAL DUCT SIZE (WIDTH / HEIGHT) 18"Ø ROUND DUCT SIZE (DIAMETER) EXISTING DUCT TO REMAIN DUCT TO BE DEMOLISHED S/A SUPPLY AIR **OUTDOOR AIR** O/A R/A **RETURN AIR** E/A GENERAL EXHAUST AIR KITCHEN EXHAUST DUCT KED LABORATORY FUME EXHAUST FLUE GAS VENT RECT. SUPPLY DUCT RISE / DROP ROUND SUPPLY DUCT RISE / DROP RECT. RETURN DUCT RISE / DROP ROUND RETURN DUCT RISE / DROP RECT. EXHAUST DUCT RISE / DROP ROUND EXHAUST DUCT RISE / DROP **DIFFUSER/GRILLES** TYPE (SEE SCHEDULE) 200 AIRFLOW 8"Ø/24x24 → NECK SIZE / MODULE SIZE 0 → AIRFLOW √ NECK SIZE YP. X 4 → TYPE COUNT FOR SPACE O ├-----AIRFLOW J~ NOMINAL NECK SIZE ∩ } AIRFLOW 2s/48"L NECK SIZE/ SLOT(S)/ ACTIVE LENGTH R-1 | 200 | — AIRFLOW | 22"x22"/24x24 — NECK SIZE / MODULE SIZE MECHANICAL EQUIPMENT IDENTITY (E)AHU-2 ■ EXISTING TO REMAIN EOUIPMENT (R)AHU-3 ← EXISTING RELOCATED **EQUIPMENT DUCT ACCESSORIES** BALANCING DAMPER ------MOTORIZED DAMPER BACKDRAFT DAMPER ------ \blacksquare SMOKE DAMPER $\qquad \qquad \Box$ FIRE DAMPER COMB. FIRE/SMOKE DAMPER \blacksquare DUCT SMOKE DETECTOR MECHANICAL DEVICES (AHU-1)→ UNIT IDENTITY TEMPERATURE SENSOR TEMP/HUMIDITY SENSOR TEMP/CO2 SENSOR **THERMOSTAT ₽**(H) HUMIDISTAT CARBON DIOXIDE DETECTOR CARBON MONOXIDE DETECTOR NITROGEN DIOXIDE DETECTOR GENERAL PLAN SYMBOLS PLAN REVISION NUMBER # \ — DETAIL NUMBER ON SHEET M-#/ -- SHEET NUMBER WHERE DETAIL IS PLACED KEYNOTE SYMBOL CONTINUATION SYMBOL POINT WHERE NEW CONNECTS TO EXISTING ROOM NAME / NUMBER

AREA BEING DEMOLISHED

AREA NOT IN CONTRACT

MECHANICAL GENERAL NOTES

ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CURRENT EDITION OF ALL APPLICABLE CODES LOCAL CODES AS APPLIED BY THE AUTHORITY HAVING JURISDICTION.

- B. DO NOT SCALE DRAWINGS. VERIFY DIMENSIONS IN FIELD PRIOR TO COMMENCEMENT OF WORK. MECHANICAL PLANS ARE GENERAL, DIAGRAMMATIC IN NATURE, AND ARE TO BE READ IN CONJUNCTION WITH ARCHITECTURAL, PLUMBING, ELECTRICAL, FIRE SPRINKLER, STRUCTURAL AND INTERIOR DESIGNER PLANS AND SHALL BE CONSIDERED AS ONE SET OF DOCUMENTS. PROVIDE OFFSETS AND DEVIATIONS FROM WORK SHOWN ON THE DRAWINGS AS REQUIRED TO FIT SPACE CONDITIONS. SUCH WORK SHALL BE AT NO ADDITIONAL COST TO THE OWNER. DUCTWORK CHANGES MAY BE MADE BY CONTRACTOR USING EQUIVALENT SIZED DUCT. CONTACT ENGINEER IF DUCT AREA OR EQUIVALENTS CAN NOT AVOID OBSTRUCTIONS.
- C. THE OWNER, OPERATOR, ARCHITECT NOR ENGINEER ARE RESPONSIBLE FOR THE CONTRACTOR'S SAFETY PRECAUTIONS, MEANS AND METHODS. WORK TECHNIQUES. CONSTRUCTION SEQUENCE, OR PROCEDURES REQUIRED TO COMPLETE THE WORK
- D. CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING CONFLICTS IN THE DRAWINGS AND SPECIFICATIONS PRIOR TO BIDDING. REPORT CONFLICTS TO THE ENGINEER PRIOR TO BIDDING. ANY CHANGES RESULTING FROM CONFLICTS IN THE FIELD, WHICH WERE NOT BROUGHT TO THE ENGINEER'S ATTENTION, ARE TO BE MADE BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
- CONTRACTOR SHALL GUARANTEE THE INSTALLATION AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP WHICH MAY OCCUR UNDER NORMAL USAGE FOR A PERIOD OF ONE YEAR AFTER OWNER'S ACCEPTANCE OF COMPLETED WORK. DEFECTS SHALL BE PROMPTLY REMEDIED WITHOUT COST TO THE OWNER.
- F. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS, FEES. INSPECTIONS, AND TESTS. CONTRACTOR SHALL OBTAIN PERMIT AND APPROVED SUBMITTALS PRIOR TO COMMENCEMENT OF NEW WORK, INCLUDING THE ORDERING OF MATERIALS AND EQUIPMENT. CONTRACTOR SHALL BE PRESENT FOR ALL INSPECTIONS OF WORK BY REGULATORY AUTHORITIES.
- G. CONTRACTOR SHALL PROVIDE A RECORD OF DRAWINGS TO THE BUILDING OWNER AND ARCHITECT. DRAWINGS SHALL INCLUDE ALL ADDENDUM ITEMS, CHANGE ORDERS, ALTERATIONS, REROUTING,
- H. CONTRACTOR SHALL PROVIDE INSURANCE FOR PROTECTION AGAINST PUBLIC LIABILITY AND PROPERTY DAMAGE FOR THE DURATION OF THE WORK.
- I. ALL MATERIALS SHALL BE NEW, BY UNITED STATES MANUFACTURERS, AND OF GOOD QUALITY. ALL WORK SHALL BE PERFORMED AT INDUSTRY STANDARD QUALITY LEVELS BY CERTIFIED PROFESSIONALS. ALL EQUIPMENT SHALL BE UL OR ETL LISTED.
- J. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS FOR ALL MECHANICAL EQUIPMENT, CONTROLS AND ACCESSORIES COORDINATED WITH ALL TRADES AT ONE TIME, INDEXED IN A NEAT AND ORDERLY MANNER. PARTIAL SUBMITTALS WILL NOT BE ACCEPTED. CONTRACTOR SHALL NOT ORDER ANY EQUIPMENT WITHOUT APPROVAL FROM ENGINEER, ARCHITECT, OWNER, AND INTERIOR DESIGNER (IF APPLICABLE).

- THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING, PRIOR TO FINAL BID, ALL EXISTING CONDITIONS FOR MECHANICAL SYSTEMS WITHIN TENANT SPACE AND WITHIN CLOSE PROXIMITY OF TENANT SPACE.
- WHERE FLOOR DRAINS OCCUR WITHIN THE LIMITS OF CONSTRUCTION. PREVENT CONSTRUCTION DEBRIS FROM ENTERING DRAIN BODY BY SEALING DRAIN OPENING PRIOR TO START OF WORK. UNSEAL DRAINS AT COMPLETION OF CONSTRUCTION.
- C. REMOVE FROM THE SITE AND LEGALLY DISPOSE OF ALL ITEMS GENERATED AS CONSTRUCTION DEBRIS AS A RESULT OF NEW WORK ON THIS PROJECT.

HVAC FIELD AND NEW WORK NOTES

- LOCATE THERMOSTATS, TEMPERATURE SENSORS, CONTROLLERS CO2 SENSORS, AND HUMIDITY SENSORS ABOVE FINISHED FLOOR AS PER ACCESSIBILITY CODE SECTION 5 REQUIREMENT 5. COORDINATE LOCATIONS WITH OTHER EQUIPMENT, FURNITURE, AND DOOR SWINGS. MECHANICAL CONTRACTOR SHALL COORDINATE ALL POWER AND CONTROL REQUIREMENTS WITH THE ELECTRICAL CONTRACTOR AND DEFINE RESPONSIBILITY AND SCOPE OF WORK PRIOR TO PURCHASING/INSTALLATION, AND DEFINE RESPONSIBILITIES AND SCOPE OF WORK FOR EACH TRADE PRIOR TO PURCHASING/INSTALLATION.
- B. ALL OUTSIDE AIR INLETS SHALL BE LOCATED A MINIMUM OF 10 FEET FROM ANY EXHAUST AIR OUTLETS OR PLUMBING VENT STACKS UNLESS OTHERWISE STATED. SUCH WORK SHALL BE COORDINATED WITH THE PLUMBING DRAWINGS AND WITH THE PLUMBING AND GENERAL CONTRACTORS IN THE FIELD.
- ENGINEER HAS VERIFIED DIMENSIONAL AND PERFORMANCE SUITABILITY OF BASIS-OF-DESIGN EQUIPMENT MANUFACTURERS AS LISTED IN THE EQUIPMENT SCHEDULES. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY UNIT PROPOSED TO BE INSTALLED FITS ALL REQUIRED PROJECT DIMENSIONS AND MEETS ALL SCHEDULED OR SPECIFIED PERFORMANCE CRITERIA PRIOR TO BID. ANY ADDITIONAL WORK DUE TO EQUIPMENT OTHER THAN THAT SPECIFIED AS 'BASIS-OF-DESIGN' SHALL BE AT THE EXPENSE OF THE CONTRACTOR.
- D. UNDERCUT DOORS BY 3/4" TO ALLOW RETURN OR EXHAUST AIR FLOW. COORDINATE WITH ARCHITECTURAL DRAWINGS AND WITH GENERAL CONTRACTOR.
- E. CONTRACTOR SHALL PROVIDE A CERTIFIED TEST & BALANCE REPORT AT COMPLETION OF PROJECT PRIOR TO FINAL INSPECTION. IT SHALL BE DONE BY AN INDEPENDENT COMPANY FOR ALL MECHANICAL EQUIPMENT, AIR AND WATER DEVICES, DAMPERS, AND ANY AIR MOVING SYSTEMS. THE TEST AND BALANCE REPORT SHALL BE IN ACCORDANCE WITH THE AABC OR NEBB STANDARDS AND PROCEDURES AND SHALL INCLUDE AIR QUANTITIES FOR ALL SUPPLY GRILLES, RETURN GRILLES AND EXHAUST GRILLES AND THE LEAVING AND ENTERING AIR TEMPERATURE (°F) FROM SUPPLY GRILLES, EVAPORATORS, ENERGY RECOVERY UNITS AND ANY TYPE OF HEAT EXCHANGERS. CONTRACTOR SHALL INCLUDE COSTS NECESSARY (PART OF BID) TO MAKE ONE CHANGE IN EACH UNITS SHEAVE, BUSHINGS AND BELTS, BALANCING DAMPERS REQUIRED AND ANY OTHER DEVICES REQUIRED FOR THE CORRECT BALANCE OF THE SYSTEM AS REQUIRED BY THE TAB FIRM.
- PROVIDE FIRE DAMPERS (FD) IN ALL FIRE RATED WALLS/CEILINGS AS IDENTIFIED ON ARCHITECTURAL DRAWINGS. THE RATINGS OF THE FIRE DAMPERS SHALL MEET OR EXCEED THE RATINGS OF THE WALL/CEILING UNLESS OTHERWISE STATED. FIRE DAMPERS SHALL BE UL LISTED AND SHALL BE TYPE B OR TYPE C DAMPERS. PROVIDE AND INSTALL DUCT MOUNTED ACCESS PANEL FOR ALL NON-ACCESSIBLE FIRE DAMPERS.
- PROVIDE ULLISTED THROUGH-PENETRATION ASSEMBLIES FOR FIRE RATED PARTITIONS, WALLS, AND FLOORS. REVIEW ARCHITECTURAL DRAWINGS TO CONFIRM LOCATIONS, QUANTITIES, AND UL LISTINGS OF ALL FIRE PARTITIONS.

INTERDISCIPLINARY COORDINATION NOTES

- ALL WORK SHALL BE COORDINATED WITH ELECTRICAL. PLUMBING. STRUCTURAL, AND FIRE PROTECTION CONTRACTOR'S IN ORDER TO PROVIDE A COMPLETE MECHANICAL SYSTEM(S) AS DETAILED ON THE DRAWINGS AND SPECIFICATIONS. WORK CONSISTS OF PROVIDING ALL MATERIALS, EQUIPMENT, APPURTENANCES, AND OPENINGS SUCH AS THOSE IN WALLS, FOUNDATIONS, FLOORS, CEILINGS, AND ROOFS, ETC. REQUIRED FOR A COMPLETE SYSTEM(S). INCLUDE ANY INCIDENTAL APPARATUS, APPLIANCES, MATERIALS, LABOR, PERMITS, SERVICES, ETC. NECESSARY TO MAKE WORK COMPLETE AND READY FOR OPERATION. IT IS THE INTENT OF THE DRAWINGS AND SPECIFICATIONS TO CALL FOR COMPLETE FINISHED WORK. COMPLETED WORK REFLECTS NEW WORK THAT HAS BEEN TESTED AND IS READY FOR OPERATION.
- B. IF THE CONTRACTOR SHOULD ELECT TO PROPOSE ANY EQUIPMENT THAT HAS DIFFERENT PHYSICAL OR ELECTRICAL CHARACTERISTICS ETC. WHEN COMPARED TO THE BASIS OF DESIGN EQUIPMENT, THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THESE CHANGES WITH THE OTHER TRADES PRIOR TO BID, AND AGAIN AFTER ORDERING OF SAID EQUIPMENT. IF THERE SHOULD BE ANY ADDITIONAL WORK INCURRED BY THE OTHER TRADES AS A RESULT OF THIS CONTRACTOR'S EQUIPMENT SELECTION, ALL COSTS ASSOCIATED WITH THE ADDITIONAL WORK SHALL BE BORNE BY THIS CONTRACTOR.

- A. EQUIPMENT WITH FILTERS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S CLEARANCES, SUCH THAT FILTERS SHALL BE EASILY REMOVED, SERVICED, AND REPLACED. FURTHERMORE, EXAMINE MANUFACTURER'S LITERATURE TO DETERMINE RECOMMENDED FULL CLEARANCES. THESE CLEARANCES, IN ADDITION TO MINIMUM CLEARANCES REQUIRED BY THE NATIONAL ELECTRICAL CODE, SHALL BE ESTABLISHED AND MAINTAINED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THESE REQUIREMENTS WITH ALL OTHER TRADES. ADDITIONAL WORK SHALL BE BORNE BY THIS CONTRACTOR. EQUIPMENT INSTALLED ABOVE CEILINGS SHALL BE MOUNTED AT A MAXIMUM OF 2'-0" ABOVE CEILING UNLESS OTHERWISE STATED ON THESE DRAWINGS FOR MAINTENANCE ACCESS.
- B. PROVIDE DISPOSABLE CONSTRUCTION FILTERS DURING CONSTRUCTION AND REPLACE WITH NEW FILTERS (AS SCHEDULED) BEFORE START-UP, REPLACE PRIOR TO FINAL ACCEPTANCE BY OWNER.
- C. PROVIDE ACCESS TO ANY INSPECTION OR MAINTAINABLE DEVICE, EQUIPMENT, ETC. ACCESS PANEL OR ACCESS DOOR SHALL BE OF ADEOUATE SIZE TO WORK ON DEVICE. ALL ACCESS DOORS/PANELS SHALL BE COORDINATE WITH ARCHITECT
- D. THE MECHANICAL CONTRACTOR SHALL PERFORM SERVICE AND REPAIR ON THE EXISTING EQUIPMENT AND ITS ACCESSORIES AS REQUIRED FOR THE SYSTEM TO OPERATE AT PROPER SPECIFIED OR TAGGED CAPACITIES. CONTRACTOR SHALL REPORT ANY ISSUES TO ENGINEER AND OWNER.

ALL DUCT SIZES SHOWN ARE INSIDE CLEAR DIMENSIONS.

- B. DUCT CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE SMACNA HVAC DUCT CONSTRUCTION STANDARD AND DETAILS ON THESE PLANS.
- C. ALL AIR DEVICES (DIFFUSERS, REGISTERS AND GRILLES) SHALL BE COORDINATED WITH THE ARCHITECTURAL CEILING PLAN PRIOR TO INSTALLATION.
- D. PROVIDE MANUAL VOLUME BALANCING DAMPERS WITH EXTRACTOR FOR ALL SUPPLY AND RETURN DIFFUSERS, REGISTERS, AND FLEX TAKE-OFFS TO ENSURE PROPER AIRFLOW BALANCE
- E. PROVIDE OPPOSED BLADE DAMPERS AT FACE OF DUFFUSER, REGISTERS, AND GRILLES FOR HARD SURFACES OR INACCESSIBLE
- F. ALL BRANCH TAKE-OFFS SHALL BE PROVIDED WITH MANUAL VOLUME DAMPERS. PROVIDE RADIUS ELBOWS WHERE FEASIBLE, SQUARE ELBOWS AND TEE'S SHALL BE FURNISHED W/SINGLE FOIL TURNING
- G. SMACNA DUCT PRESSURE CLASSES BASED ON OPERATING PRESSURE ARE: 1/2", 1", 2", 3", 4", 6", AND 10". EACH DUCT SYSTEM SHALL BE CONSTRUCTED FOR THE SPECIFIC DUCT PRESSURE CLASS SHOWN ON PLANS. WHERE NO PRESSURE CLASS IS SPECIFIED FOR CONSTANT VOLUME SYSTEMS, 1" W.G. PRESSURE CLASS IS THE BASIS OF COMPLIANCE WITH THE SMACNA STANDARDS REGARDLESS OF VELOCITY. WHERE NO PRESSURE CLASS IS SPECIFIED FOR VARIABLE VOLUME SYSTEMS, 2" W.G. PRESSURE CLASS IS THE BASIS OF COMPLIANCE WITH THE SMACNA STANDARDS FOR DUCTWORK UPSTREAM OF VAV BOXES. ALL DUCTWORK SHALL BE SEALED TO SMACNA "HVAC DUCT CONSTRUCTION STANDARDS" FOR ITS PRESSURE CLASS SEALING METHODS.
- H. ALL INSULATION SHALL HAVE FIRE/SMOKE SPREAD RATING LESS THAN 25/50, UNLESS STATED OTHERWISE ON THESE DRAWINGS.

- A. MATERIALS ALLOWED IN RETURN AIR PLENUMS OR ABOVE CEILINGS USED AS RETURN AIR PLENUM SHALL COMPLY WITH LOCAL MECHANICAL CODE. IF SPACE WITHIN RETURN AIR PLENUM HAS ANY CEILING STRUCTURE TO DECK, OR DECK TO DECK PARTITIONS, AIR TRANSFER DUCTS MUST BE INSTALLED. WHEN CPVC PIPING IS USED FOR FIRE SPRINKLER SYSTEMS, THE R/A GRILLES LAYOUT SHALL BE (FIELD) COORDINATED SUCH THAT NO PORTION OF PIPING WILL BE DIRECTLY OVER THE RA GRILLES.
- B. ALL PENETRATIONS OF REQUIRED FIRE RATED WALLS, SLABS, AND CEILINGS SHALL CONTAIN AN ACCESSIBLE U.L. LABELED FIRE DAMPER OR A U.L. LISTED FIRE STOPPING SYSTEM INSTALLED IN ACCORDANCE WITH THE MANUFACTURE'S LISTED DETAILS AND
- C. USE OF COMBUSTIBLE MATERIALS IS NOT ALLOWED IN THE RETURN AIR PLENUM. MATERIALS USED DEFINED PLENUMS SHALL HAVE A FLAME/SMOKE DEVELOPED RATING NOT TO EXCEED 25/50 WHEN TESTED IN ACCORDANCE WITH ASTM E 84. ALL EXPOSED WIRING WITHIN PLENUMS SHALL BE RATED FOR SUCH USE AND CLEARLY LABELED.

- GENERAL DEMOLITION NOTES

 A. ALL WORK UNDER THIS SECTION SHALL BE COORDINATED WITH ALL OTHER TRADES AND SITE PROJECT CONDITIONS PRIOR TO INSTALLATION.
- B. DEMOLITION/RELOCATIONS: EACH LICENCE HOLDING CONTRACTOR SHALL BE RESPONSIBLE FOR DEMOLITION AND RELOCATIONS OF SERVICES, EQUIPMENT AND MATERIAL RELATING TO THEIR RESPECTIVE TRADE.
- C. PRIOR TO DEMOLITION CONTRACTOR SHALL REVIEW WITH OWNER ALL MATERIALS TO BE REMOVED. SHOULD THE OWNER OPT TO KEEP ANY MATERIALS, THE CONTRACTOR SHALL REMOVE AND DELIVER THE PARTS TO THE OWNER ON SITE WHERE SO DIRECTED. OTHERWISE, ALL DEMOLISHED OR REMOVED MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR, SHALL BE REMOVED FROM THE SITE, AND BE DISPOSED OF IN A LEGAL
- D. DEMOLITION SHALL INCLUDE REMOVAL OF ALL EQUIPMENT, PARTS, AND ASSOCIATED APPARATUSES COMPLETE. BACK TO THE POINTS INDICATED. REMOVE BACK TO SOURCE IF SUCH POINTS ARE NOT INDICATED. WHERE CONDITIONS PROHIBIT TOTAL REMOVAL, THE REMAINING PORTION SHALL BE CUT FLUSH WITH THE SURROUNDING SURFACE AND SHALL BE REFINISHED IN AN APPROVED MANNER.
- E. MAINTAIN EXISTING UTILITIES AS INDICATED OR WHERE REQUIRED TO KEEP SCOPE IN SERVICE. PROTECT AGAINST DAMAGE DURING DEMOLITION OPERATIONS. DO NOT INTERRUPT EXISTING UTILITIES SERVING OCCUPIED OR USED FACILITIES, ASIDE FROM PREVIOUSLY AGREED UPON TIMES AND DATES COORDINATED WITH BUILDING
- F. DO NOT REMOVE EXISTING STRUCTURAL WORK. DO NOT REMOVE OPERATIONAL ELEMENTS AND SAFETY RELATED COMPONENTS IN A MANNER RESULTING IN A REDUCTION OF CAPACITIES TO PERFORM IN THE MANNER INTENDED, OR RESULTING IN DECREASED OPERATIONAL LIFE, INCREASED MAINTENANCE, OR DECREASED
- G. REMOVALS, DISCONNECTIONS, AND RELOCATIONS SHALL BE PERFORMED BY CONTRACTORS SKILLED IN THE TRADE INVOLVED AND SHALL BE EMPLOYED BY A CONTRACTOR LICENSED IN THE TRADE INVOLVED. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ACCEPTED TRADE PRACTICES.
- H. PROVIDE ADEQUATE TEMPORARY SUPPORT FOR WORK TO REMAIN TO PREVENT FAILURE. COORDINATE AS TO NOT ENDANGER OTHER
- I. PROTECTION: PROVIDE ADEQUATE PROTECTION WHERE REQUIRED FOR THE PRESENT BUILDING AND ITS CONTENTS. SITE APPROVED DUST & DIRT PROOF PROTECTIVE BARRICADES AND BARRIERS SHALL BE ERECTED WHERE REQUIRED FOR PROTECTION OF PERSONNEL, FOR SECURITY, AND FOR PROTECTION AGAINST FIRE AND WEATHER SYSTEMS. CONTRACTOR SHALL TAKE EVERY PRECAUTION AGAINST FIRE BY EMPLOYING FIRE DEPARTMENT TYPE HOSES AND PORTABLE FIRE EXTINGUISHERS AS REQUIRED BY OSHA AND/OR THE OWNER'S INSURANCE UNDERWRITER.
- J. ALL DRAWINGS ARE DIAGRAMMATIC. CONTRACTOR SHALL CAREFULLY EXAMINE EXISTING EQUIPMENT AND BUILDING CONDITIONS PRIOR TO BID/NEW WORK.
- K. ALL EXISTING EQUIPMENT TO BE REUSED SHALL BE CLEANED. RECONDITIONED, CALIBRATED, AND ADJUSTED. IN ALL INSTANCES WHERE CONTRACTOR FINDS THAT EXISTING EQUIPMENT IS DEFECTIVE TO THE POINT WHERE IT CANNOT BE PROPERLY RESTORED AND WILL NOT OPERATE AS SCHEDULED OR LABELED AND DEFINED ON SITE. CONTRACTOR SHALL REPORT THE SPECIFIC INSTRUMENTS OR EQUIPMENT TO THE ENGINEER FOR DIRECTIONS.

MECHANICAL SHEET INDEX

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ABOVE

ABV

M-701.00 MECHANICAL COMPLIANCE FORMS

MECHANICAL ABBREVIATIONS

ADD ADDENDUM AFF ABOVE FINISHED FLOOR AFUE ANNUAL FUEL UTILIZATION EFFICIENCY ALTERNATE ARCH ARCHITECT/ARCHITECTURAL BFF BELOW FINISHED FLOOR BLW BELOW BRITISH THERMAL UNITS BTU BTUH BRITISH THERMAL UNITS PER HOUR CAP CAPACITY **CATCH BASIN** CB CFM **CUBIC FEET PER MINUTE** DEGREE DRY BULB DIAMETER

DN DOWN E/A EXHAUST AIR EACH

EAT ENTERING AIR TEMPERATURE **ELEC** ELECTRICAL

EQUIP EQUIPMENT ETC **ETCETERA** EWT ENTERING WATER TEMPERATURE

EXIST FXISTING **DEGREES FAHRENHEIT** FLOOR FEET PER MINUTE FPM

FOOT/FEET

GALLON GENERAL CONTRACTOR GALLONS PER MINUTE HORSE POWER

HTG HEATING LAT LEAVING AIR TEMPERATURE

POUND LB/HR POUNDS PER HOUR LWT LEAVING WATER TEMPERATURE M/A MIXED AIR

MAX MAXIMUM MBH ONE THOUSAND BTU PER HOUR MECH **MECHANICAL** MFR MANUFACTURER

MINIMUM MISC **MISCELLANEOUS** MTR MOTOR NOT IN CONTRACT NTS NOT TO SCALE ROUND OUTSIDE AIR

PRESSURE DROP PLBG PLUMBING PWR POWER **DUCT RISER** RETURN AIR

RETURN/EXHAUST FAN RELATIVE HUMIDITY **RELIEF AIR** RL/A RMRPM REVOLUTIONS PER MINUTE

SUPPLY AIR **SQUARE FOOT** STATIC PRESSURE STM STEAM THERMOSTAT

TEMPERATURE DROP TEMP TEMPERATURE TYP TYPICAL UG UNDERGROUND

UON UNLESS OTHERWISE NOTED VARIABLE AIR VOLUME VAV **VENT** VENTILATION WET BULB

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KEY PLAN - AREA OF WORK

CLIENT:

PROJECT NAME:

US FOODS MEZZANINE RENOVATION

PROJECT ADDRESS:

40 S FORT LEWIS BLVD SALEM, VA 24153

DWG TITLE:

MECHANICAL LEGEND, SYMBOLS, AND ABBREVIATIONS



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
- D. COMPLY WITH THE REQUIREMENTS OF APPLICABLE LOCAL PLUMBING, MECHANICAL, FIRE PROTECTION, AND BUILDING CODES.

1.3 CONSTRUCTION PERMITS AND INSPECTIONS

CONTRACT DOCUMENTS.

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

A. PRIOR TO THE PERFORMANCE OF ANY WORK OR INSTALLATION OF ANY MATERIALS, OBTAIN APPROVAL FROM THE ARCHITECT BY SUBMITTING SHOP

MANUFACTURER SHALL BE FOLLOWED FOR INSTALLING THE WORK.

- 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. 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 JOB 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. 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

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 PHRASE, "OR AN APPROVED EQUIVALENT", 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.

3.2 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.

3.3 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 HANGERS, PIPING, FRAMES AND SUPPORTS NOT PROVIDED 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.

A. ALL EQUIPMENT AND SYSTEMS SHALL BE PROTECTED AGAINST FREEZING, FLOODING, CORROSION, AND OTHER FORMS OF DAMAGE PRIOR TO ACCEPTANCE 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.

3.5 OPERATING AND MAINTENANCE INSTRUCTIONS 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.

3.6 FINAL INSPECTION

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

3.7 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-HANDLING SYSTEMS ARE USED FOR TEMPORARY HEATING OR COOLING, THE AIR FILTERS SHALL BE CHANGED A MINIMUM OF EVERY TWO WFFKS.

C. WATER AND STEAM SYSTEMS SHALL BE THOROUGHLY FLUSHED AND CLEANED OF ANY AND ALL DELETERIOUS MATERIALS BEFORE THE SYSTEMS ARE PLACED IN D. ALL EQUIPMENT SHALL BE THOROUGHLY CLEANED OF DIRT AND DEBRIS AT THE

COMPLETION OF THE PROJECT AND PRIOR TO ACCEPTANCE BY THE OWNER.

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.

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

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.

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. 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

ACCEPTABLE MANUFACTURERS

A. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE VIBRATION CONTROL PRODUCTS AS MANUFACTURED BY AMBER/BOOTH CO., KORFUND DYNAMICS CORP., MASON INDUSTRIES, INC., OR APPROVED EQUIVALENT.

PART 3 - EXECUTION

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 34. WHERE MORE THAN ONE TYPE OF PRODUCT IS OFFERED, SELECTION IS INSTALLER'S

SECTION 230553 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

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

2.1 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

2.2 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

PART 3 - EXECUTION

3.1 MECHANICAL EQUIPMENT IDENTIFICATION

SELECTION FOR EACH PRODUCT CATEGORY.

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 MANUFACTURERS INSTRUCTIONS PRIOR TO INSTALLING LABEL.

SECTION 230700 - MECHANICAL INSULATION

PART 1 - GENERAL

1.1 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.

1.2 QUALITY ASSURANCE

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

2.1 ACCEPTABLE MANUFACTURERS

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

2.2 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 B. FLEXIBLE FIBERGLASS DUCTWORK INSULATION (TYPE FFG): ASTM C 553, 'K' VALUE

OF 0.36 AT 75 F, NON-COMBUSTIBLE, FLEXIBLE, JACKET. CONFIRM ASJ OR FSK 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 INSULATION ACCESSORIES: PROVIDE STAPLES, BANDS, WIRES, TAPE,

ANCHORS, CORNER ANGLES AND SIMILAR ACCESSORIES AS RECOMMENDED BY

3.1 DUCT AND EQUIPMENT INSULATION APPLICATION SCHEDULE A. INSULATE CONCEALED DUCT AND EQUIPMENT ACCORDING TO THE FOLLOWING

INSULATION MANUFACTURER FOR APPLICATIONS INDICATED.

SUNEDULE.			
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

1.1 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).

1.2 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

2.1 SHEET METAL MATERIALS

GALVANIZED SHEET STEEL: LOCK-FORMING QUALITY, ASTM A 527, COATING DESIGNATION G 90. PROVIDE MILL PHOSPHATIZED FINISH FOR EXPOSED SURFACES OF DUCTS EXPOSED 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 REINFORCING OF COMPATIBLE MATERIALS.

C. TIE RODS: GALVANIZED STEEL, 1/4-INCH MINIMUM DIAMETER FOR 36-INCH LENGTH OR LESS; 3/8-INCH MINIMUM DIAMETER FOR LENGTHS LONGER THAN 36 INCHES.

2.2 SEALING MATERIALS JOINT AND SEAM TAPE: 2 INCHES WIDE, GLASS-FIBER-FABRIC REINFORCED. JOINT AND SEAM SEALANT: ONE-PART, NONSAG, SOLVENT-RELEASE-CURING, POLYMERIZED BUTYL SEALANT COMPLYING WITH FS TT-S-001657, TYPE I;

FORMULATED WITH A MINIMUM OF 75 PERCENT SOLIDS. C. FLANGED JOINT MASTICS: ONE-PART, ACID-CURING, SILICONE ELASTOMERIC JOINT SEALANTS, COMPLYING WITH ASTM C 920, TYPE S, GRADE NS, CLASS 25, USE

2.3 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 OTHER 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

3.1 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 USEABLE SPACE OR BLOCK ACCESS FOR SERVICING BUILDING AND ITS

FOUIPMENT 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

3.2 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

SECTION 233300 - DUCTWORK ACCESSORIES

CONSTRUCTION STANDARDS".

PART 1 - GENERAL

1.1 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.

1.2 QUALITY ASSURANCE A. COMPLY WITH APPLICABLE SECTIONS OF THE FOLLOWING CODES AND

> SMACNA "HVAC DUCT CONSTRUCTION STANDARDS, METAL AND FLEXIBLE". ASHRAE RECOMMENDATIONS PERTAINING TO CONSTRUCTION OF DUCTWORK ACCESSORIES, EXCEPT AS OTHERWISE INDICATED.

3. UL STANDARD 55 "FIRE DAMPERS AND CEILING DAMPERS". 4. NFPA 90A "STANDARD FOR THE INSTALLATION OF AIR CONDITIONING AND

PART 2 - PRODUCTS

2.1 DAMPERS AND ACTUATORS

VENTILATING SYSTEMS"

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 MDRS25 AS REQUIRED, OR EQUIVALENT.

B. BACKDRAFT DAMPERS: HEAVY DUTY, MINIMUM 0.125" WALL THICKNESS EXTRUDED ALUMINUM FRAME, MINIMUM 0.070 " 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, ½ " 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 CFM/SQ. 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.

2.2 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 160-165° F, UNLESS OTHERWISE INDICATED. FRAME SHALL BE SMACNA TYPE B. FABRICATE IN ACCORDANCE WITH NFPA 90A AND UL 555, AND

B. FIRE/SMOKE DAMPERS: UNLESS NOTED OTHERWISE, PROVIDE MOTOR-DRIVEN FIRE/SMOKE DAMPERS RATED AT 1-1/2 HOUR AND LEAKAGE CLASS I, AND SIZED TO MATCH THE DUCT. PROVIDE WITH CASING CONSTRUCTED OF 11-GA GALVANIZED STEEL, FUSIBLE LINK 160-165°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.

2.3 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 3/4" O.C., SUPPORTED WITH BARS PERPENDICULAR TO BLADES SET AT 2" O.C., AND SET INTO SIDE STRIPS SUITABLE FOR MOUNTING IN DUCTWORK.

2.4 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 DUCT. PROVIDE ONE SIDE HINGED, OTHER SIDE WITH ONE HANDLE-TYPE LATCH FOR DOORS 12" HIGH AND SMALLER, 2 HANDLE-TYPE LATCHES FOR LARGER DOORS.

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.

2.5 FLEX DUCT

PART 3 - EXECUTION 3.1 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 233400 - FANS

PART 1 - GENERAL

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.

A. FANS SHALL BE DESIGNED, MANUFACTURED, AND TESTED IN ACCORDANCE

WITH UL 705 "POWER VENTILATORS." B. MOTORS AND ELECTRICAL ACCESSORIES SHALL COMPLY WITH NEMA

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

2.2 FANS - GENERAL 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 OPERATION AT THE MAXIMUM RATED FAN SPEED AND MOTOR HORSEPOWER. FANS SHALL BE FACTORY BALANCED AND CHECKED FOR VIBRATION. MAXIMUM FAN SELF-EXCITED VIBRATION VELOCITY SHALL NOT EXCEED 0.157 INCH/SECOND AT BEARING CAPS, MEASURED WITH THE FAN FULLY ASSEMBLED AND OPERATING AT DESIGN CONDITIONS. FAN SHAFT SHALL BE TURNED, GROUND, AND POLISHED STEEL DESIGNED TO OPERATE AT NO MORE THAN 70 PERCENT OF THE FIRST CRITICAL SPEED AT THE TOP OF THE

SPEED RANGE OF THE FAN'S CLASS. C. FACTORY FINISH: THE FOLLOWING FINISHES ARE REQUIRED: SHEET METAL PARTS: PRIME COATING PRIOR TO FINAL ASSEMBLY.

EXTERIOR SURFACES: BAKED-ENAMEL FINISH COAT AFTER ASSEMBLY ON

ALL FERROUS METAL PARTS. NO FINISH ON GALVANIZED OR ALUMINUM

ACCURATELY LOCATE ROOF CURBS. SECURE ROOF-MOUNTED FANS TO ROOF

AIR DIFFUSERS AND REGISTERS, WALL REGISTERS AND GRILLES, AND LOUVERS.

A. CODES AND STANDARDS: AIR OUTLETS AND INLETS SHALL BE TESTED AND RATED

PART 3 - EXECUTION

3.1 INSTALLATION - GENERAL A. INSTALL FANS LEVEL AND PLUMB, IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS. SUPPORT UNITS AS DESCRIBED BELOW, USING THE VIBRATION CONTROL DEVICES INDICATED.

CURBS WITH CADMIUM-PLATED HARDWARE B. ARRANGE INSTALLATION OF UNITS TO PROVIDE ACCESS SPACE AROUND UNITS FOR SERVICE AND MAINTENANCE.

A. DUCT INSTALLATIONS AND CONNECTIONS ARE SPECIFIED IN OTHER DIVISION 23 SECTIONS. MAKE FINAL DUCT CONNECTIONS WITH FLEXIBLE CONNECTIONS.

SECTION 233713 - AIR OUTLETS AND INLETS

PART 1 - GENERAL

3.2 CONNECTIONS

1.1 DESCRIPTION OF WORK A. THIS PROJECT SHALL INCLUDE AIR OUTLETS AND INLETS WORK AS INDICATED BY DRAWINGS AND SCHEDULES, AND BY REQUIREMENTS OF THIS SECTION. B. TYPES OF AIR OUTLETS AND INLETS REQUIRED FOR PROJECT INCLUDE CEILING

REFER TO PLANS AND EQUIPMENT SCHEDULES. 1.2 QUALITY ASSURANCE

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Contractor CTS Builders

Structural Engineer Penn Fusion Engineering

MEP Engineering Wolf Engineering

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CLIENT:

PROJECT NAME: US FOODS

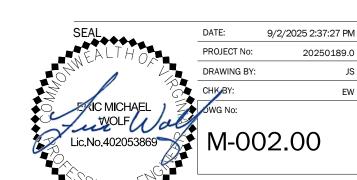
MEZZANINE RENOVATION

PROJECT ADDRESS:

40 S FORT LEWIS BLVD SALEM, VA 24153

DWG TITLE:

MECHANICAL SPECIFICATIONS



IN CONFORMANCE WITH APPLICABLE SECTIONS OF ARI 650, ASHRAE 70, AMCA 500 AND NFPA 90A.

PART 2 - PRODUCTS

2.1 DIFFUSERS AND GRILLES GENERAL: EXCEPT AS OTHERWISE INDICATED, PROVIDE MANUFACTURER'S STANDARD CEILING AIR DIFFUSERS AND WALL GRILLES WHERE SHOWN; OF SIZE, SHAPE, CAPACITY AND TYPE INDICATED; CONSTRUCTED OF MATERIALS AND

COMPONENTS AS INDICATED, AND AS REQUIRED FOR COMPLETE INSTALLATION. B. PERFORMANCE: PROVIDE DIFFUSERS AND GRILLES THAT HAVE, AS MINIMUM, TEMPERATURE AND VELOCITY TRAVERSES, THROW AND DROP, AND NOISE CRITERIA RATINGS FOR EACH SIZE DEVICE AS LISTED IN MANUFACTURER'S CURRENT DATA.

C. CEILING COMPATIBILITY: PROVIDE DIFFUSERS WITH BORDER STYLES THAT ARE COMPATIBLE WITH ADJACENT CEILING SYSTEMS, AND THAT ARE SPECIFICALLY MANUFACTURED TO FIT INTO CEILING MODULE WITH ACCURATE FIT AND ADEQUATE SUPPORT. REFER TO GENERAL CONSTRUCTION DRAWINGS AND SPECIFICATIONS FOR TYPES OF CEILING SYSTEMS WHICH WILL CONTAIN EACH TYPE OF CEILING AIR DIFFUSER.

D. PROVIDE MOUNTING FRAMES TO ADAPT TO CONSTRUCTION TYPE. WHERE INSTALLED IN HARD CEILINGS OR WALLS, PROVIDE SURFACE MOUNT FRAME BELOW CEILING WITH PERIMETER FLANGE AND GASKET TO SEAL AGAINST CEILING

E. WHERE INDICATED, PROVIDE ADJUSTABLE OPPOSED BLADE DAMPER ASSEMBLY, KEY OPERATED FROM FACE OF DIFFUSER.

F. PROVIDE, WHERE REQUIRED TO PROTECT FIRE RATED CEILING PENETRATIONS, COMBINATION ADJUSTABLE OPPOSED BLADE DAMPER AND FUSIBLE LINK FIRE DAMPER WITH UL APPROVED LINK AND ASSEMBLY DESIGNED TO MEET REQUIREMENTS OF NFPA 90A.

G. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE EQUIPMENT MANUFACTURED BY KRUEGER MFG. CO.; TITUS PRODUCTS CO.; TUTTLE & BAILEY CORP.; OR APPROVED EQUIVALENT:

PART 3 - EXECUTION

GENERAL: INSTALL AIR OUTLETS AND INLETS IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS AND IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES TO INSURE THAT PRODUCTS SERVE

INTENDED FUNCTIONS. B. COORDINATE WITH OTHER WORK, INCLUDING DUCTWORK AND DUCT ACCESSORIES, AS NECESSARY TO INTERFACE INSTALLATION OF AIR OUTLETS AND INLETS WITH OTHER WORK

C. LOCATE CEILING AIR DIFFUSERS, REGISTERS, AND GRILLES, AS INDICATED ON GENERAL CONSTRUCTION "REFLECTED CEILING PLANS". UNLESS OTHERWISE INDICATED, LOCATE UNITS IN CENTER OF ACOUSTICAL CEILING MODULES.

SECTION 238900 - TESTING, ADJUSTING, AND BALANCING

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. THIS PROJECT SHALL INCLUDE THE REOUIREMENTS AND PROCEDURES FOR TOTAL MECHANICAL SYSTEMS TESTING, ADJUSTING, AND BALANCING. REQUIREMENTS INCLUDE MEASUREMENT AND ESTABLISHMENT OF THE FLUID QUANTITIES OF THE MECHANICAL SYSTEMS AS REQUIRED TO MEET DESIGN SPECIFICATIONS, AND RECORDING AND REPORTING THE RESULTS. WORK INCLUDES TESTING, ADJUSTING AND BALANCING THE SUPPLY AIR SYSTEMS, RETURN AIR SYSTEMS, EXHAUST AIR SYSTEMS, AND VERIFYING THE TEMPERATURE CONTROL SYSTEM OPERATION.

B. SYSTEMS/DEVICES TO BE BALANCED INCLUDE THE FOLLOWING: ALL AIR DEVICES, INCLUDING ALL SUPPLY DIFFUSERS, RETURN GRILLES AND

EXHAUST GRILLES.

ALL NEW/EXISTING EXHAUST FANS. ALL NEW/EXISTING ROOFTOP UNITS, INCLUDING TOTAL SUPPLY AIR, RETURN

AIR AND OUTDOOR AIR.

1.2 QUALITY ASSURANCE

AGENCY OUALIFICATIONS: EMPLOY THE SERVICES OF AN INDEPENDENT TESTING. ADJUSTING, AND BALANCING AGENCY MEETING THE QUALIFICATIONS SPECIFIED BELOW. TO BE THE SINGLE SOURCE OF RESPONSIBILITY TO TEST, ADJUST, AND BALANCE THE BUILDING MECHANICAL SYSTEMS IDENTIFIED ABOVE, TO PRODUCE THE DESIGN OBJECTIVES. SERVICES SHALL INCLUDE CHECKING INSTALLATIONS FOR CONFORMITY TO DESIGN, MEASUREMENT AND ESTABLISHMENT OF THE FILID OLIANTITIES OF THE MECHANICAL SYSTEMS AS REQUIRED TO MEET DESIGN SPECIFICATIONS, AND RECORDING AND REPORTING THE RESULTS.

 THE INDEPENDENT TESTING, ADJUSTING, AND BALANCING AGENCY SHALL BE CERTIFIED BY THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB) IN THOSE TESTING AND BALANCING DISCIPLINES REQUIRED FOR THIS PROJECT, AND HAVING AT LEAST ONE PROFESSIONAL ENGINEER REGISTERED IN THE STATE IN WHICH THE SERVICES ARE TO BE PERFORMED, CERTIFIED BY AABC OR NEBB AS A TEST AND BALANCE ENGINEER.

CODES AND STANDARDS: NEBB: "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND

BALANCING OF ENVIRONMENTAL SYSTEMS." AABC: "NATIONAL STANDARDS FOR TOTAL SYSTEM BALANCE".

ASHRAE: ASHRAE HANDBOOK, HVAC APPLICATIONS VOLUME, CHAPTER 39, TESTING, ADJUSTING, AND BALANCING.

PART 3 - EXECUTION

3.1 INITIAL BASELINE TESTING

A. PRIOR TO THE START OF CONSTRUCTION. PERFORM A BASELINE TEST TO DETERMINE THE EXISTING CONDITIONS OF ALL SYSTEMS SERVING THE AREA OF CONSTRUCTION WHICH WILL BE MODIFIED AS A RESULT OF THE PROJECT.

MEASURE AIRFLOW AT EACH INLET AND OUTLET. MEASURE TOTAL AIRFLOW AT FAN DISCHARGE BY PITOT TUBE. MEASURE VOLTAGE AND AMPERAGE OF ALL SYSTEM MOTORS.

RECORD OPERATING CONDITIONS AND PROVIDE REPORT TO THE OWNER AND ENGINEER, SPECIFICALLY NOTING ANY DEFICIENCIES WHICH MAY IMPACT THE SUCCESSFUL COMPLETION OF THIS PROJECT.

3.2 PERFORMING TESTING, ADJUSTING, AND BALANCING A. A. EXAMINATION: BEFORE COMMENCING TESTS, VERIFY THAT SYSTEMS ARE

COMPLETE AND OPERABLE. ENSURE THE FOLLOWING:

EQUIPMENT IS OPERABLE AND IN SAFE AND NORMAL CONDITION. TEMPERATURE CONTROL SYSTEMS ARE INSTALLED COMPLETE AND

OPFRABLE PROPER THERMAL OVERLOAD PROTECTION IS IN PLACE AND OPEN.

DUCT SYSTEMS ARE CLEAN OF DEBRIS

FIRE AND VOLUME DAMPERS ARE IN PLACE AND OPEN. ACCESS DOORS ARE CLOSED AND DUCT END CAPS ARE IN PLACE.

AIR OUTLETS ARE INSTALLED AND CONNECTED. DUCT SYSTEM LEAKAGE HAS BEEN MINIMIZED.

PERFORM TESTING AND BALANCING PROCEDURES ON EACH SYSTEM IDENTIFIED, IN ACCORDANCE WITH THE DETAILED PROCEDURES OUTLINED IN THE REFERENCED STANDARDS.

C. CUT INSULATION, DUCTWORK, AND PIPING FOR INSTALLATION OF TEST PROBES TO THE MINIMUM EXTENT NECESSARY TO ALLOW ADEQUATE PERFORMANCE OF PROCEDURES. PATCH INSULATION, DUCTWORK, AND HOUSINGS, USING MATERIALS IDENTICAL TO THOSE REMOVED. SEAL INSULATION TO RE-ESTABLISH INTEGRITY OF THE VAPOR BARRIER.

D. MARK EQUIPMENT SETTINGS, INCLUDING DAMPER CONTROL POSITIONS, VALVE INDICATORS, FAN SPEED CONTROL LEVERS, AND SIMILAR CONTROLS AND DEVICES, TO SHOW FINAL SETTINGS. MARK WITH PAINT OR OTHER SUITABLE, PERMANENT IDENTIFICATION MATERIALS.

3.3 RECORD AND REPORT DATA

PREPARE TEST AND BALANCE REPORT AND SUBMIT ONE (1) COPY TO THE ENGINEER AND ONE (1) COPY TO THE OWNER'S REPRESENTATIVE. REPORT SHALL BE STANDARD NEBB OR AABC FORMAT.

B. AIR BALANCE AND ADJUSTING 1. SUPPLY AIR SYSTEMS INSTALLED IN FINISHED AREAS OF THE BUILDING SHALL

BE BALANCED AND ADJUSTED AS FOLLOWS: A. AFTER DUCT SYSTEMS HAVE BEEN INSTALLED COMPLETE WITH ALL VAV BOXES, TERMINAL DEVICES, GRILLES, DAMPERS, DUCTS, COILS, AND OTHER ITEMS HEREINAFTER SPECIFIED THE CONTRACTOR SHALL MAKE ADJUSTMENTS, AS REQUIRED, TO DELIVER THE VOLUME OF AIR AT EACH AIR OUTLET WITHIN 5% OF DESIGN FLOW AS SHOWN ON THE DRAWINGS. AFTER THE FINISHED AREA IS OCCUPIED, THE AIR VOLUMES SHALL BE READJUSTED, IF REQUIRED, TO PROPERLY BALANCE THE COOLING AND HEATING LOADS THROUGHOUT THE CONDITIONED AREAS.

AIR OUTLETS SHALL BE BALANCED WITH AIR PATTERN AS SHOWN ON THE DRAWINGS

ALL BALANCING MUST BE ACCOMPLISHED WITH DIFFUSER AIR PATTERNS AS INDICATED ON THE DRAWINGS. 3. THE CONTRACTOR SHALL SUBMIT DETAILED BALANCING PROCEDURES AND

RECORDING FORMS FOR THE ENGINEER'S REVIEW, PRIOR TO COMMENCING ANY AIR BALANCE WORK. C. FINAL AIR BALANCE READINGS

1. AFTER AIR FLOW ARE BALANCED, AND WITH THE TEMPERATURE CONTROLS SET TO PRODUCE DESIGN COOLING, MEASURE AND RECORD ALL DATA NECESSARY TO COMPILE A COMPLETE REPORT TO DEMONSTRATE THE THE FOLLOWING DATA IN THE REPORT:

ACCEPTABILITY OF THE VARIOUS MECHANICAL SYSTEMS. INCLUDE AT LEAST

A. OUTSIDE DRY BULB AND WET BULB TEMPERATURE. B. INSIDE DRY BULB AND WET BULB TEMPERATURES IN SIX SELECTED AREAS OF THE CONDITIONED SPACE, ROOM OR AREA SELECTED BY THE

DRY BULB TEMPERATURES OF AIR ENTERING AND LEAVING ALL COILS. TEMPERATURE OF WATER ENTERING AND LEAVING EACH WATER COIL.

THE BALANCED POSITION OF EACH CONTROLLING VALVE AND DAMPER SHALL

BE PERMANENTLY MARKED ON THE PIPE, INSULATION, OR DUCTWORK. D. TEMPERATURE CONTROL ADJUSTING. 1. AUTOMATIC TEMPERATURE CONTROLS SHALL BE CALIBRATED AND ALL THERMOSTATS, DAMPERS, ETC., ADJUSTED SO THAT CONTROL SYSTEM IS IN THE PROPER OPERATING CONDITION, SUBJECT TO REVIEW BY THE

ENGINEER. E. FINAL REPORT 1. SUBMIT PDF AND SIX (6) COPIES OF COMPLETE REPORTS TO THE ARCHITECT.

SECTION 237416 PACKAGED ROOFTOP AIR-CONDITIONING UNITS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. THIS PROJECT SHALL INCLUDE AIR PACKAGED, INTERMEDIATE-CAPACITY ROOFTOP AIR-CONDITIONING UNIT WORK AS INDICATED BY DRAWINGS AND SCHEDULES, AND BY REQUIREMENTS OF THIS SECTION. REFER TO PLANS AND EQUIPMENT SCHEDULES.

PART 2 PRODUCTS

2.1 PACKAGED, ROOFTOP AIR-CONDITIONING UNITS

A. GENERAL 1. INTERMEDIATE-CAPACITY: ROOF MOUNTED UNITS HAVING HEATING ELEMENT(S) AND ELECTRIC REFRIGERATION THAT ARE 7.5 TONS TO 25

TONS IN CAPACITY. B. DESCRIPTION: SELF-CONTAINED, PACKAGED, FACTORY ASSEMBLED AND PREWIRED, CONSISTING OF CABINET AND FRAME, SUPPLY FAN, HEAT ELEMENT(S), CONTROLS, AIR FILTERS, REFRIGERANT COOLING COIL AND COMPRESSOR, CONDENSER COIL AND CONDENSER FAN.

C. DISCONNECT SWITCH: FACTORY MOUNT DISCONNECT SWITCH IN CONTROL

A. CABINET: STEEL WITH BAKED ENAMEL FINISH, INCLUDING ACCESS PANELS WITH SCREWDRIVER-OPERATED FLUSH, CAM TYPE FASTENERS. STRUCTURAL MEMBERS TO BE MINIMUM 18 GAUGE, 0.0478 INCH (1.21 MM), WITH ACCESS DOORS OR PANELS OF MINIMUM 20 GAUGE, 0.0359 INCH (0.91 MM).

2.3 FANS A. SUPPLY FAN: FORWARD CURVED CENTRIFUGAL TYPE, RESILIENTLY MOUNTED WITH V-BELT DRIVE. ADJUSTABLE VARIABLE PITCH PULLEY, AND RUBBER ISOLATED HINGE MOUNTED. PROVIDE WITH HIGH EFFICIENCY MOTOR OR

DIRECT DRIVE AS INDICATED. ISOLATE COMPLETE FAN ASSEMBLY.

2.4 BURNERS

A. GAS BURNER: ATMOSPHERIC TYPE BURNER WITH ADJUSTABLE COMBUSTION AIR SUPPLY, PRESSURE REGULATOR, GAS VALVES, MANUAL SHUT-OFF. INTERMITTENT SPARK OR GLOW COIL IGNITION, FLAME-SENSING DEVICE, AND AUTOMATIC 100 PERCENT SHUTOFF PILOT.

B. GAS BURNER SAFETY CONTROLS: ENERGIZE IGNITION, LIMIT TIME FOR ESTABLISHMENT OF FLAME, PREVENT OPENING OF GAS VALVE UNTIL PILOT FLAME IS PROVEN, STOP GAS FLOW ON IGNITION FAILURE, ENERGIZE BLOWER MOTOR, AND AFTER AIRFLOW PROVEN AND SLIGHT DELAY, ALLOW GAS VALVE

C. HIGH LIMIT CONTROL: TEMPERATURE SENSOR WITH FIXED STOP AT MAXIMUM PERMISSIBLE SETTING, DE-ENERGIZE BURNER ON EXCESSIVE BONNET TEMPERATURE. AND ENERGIZE BURNER WHEN TEMPERATURE DROPS TO LOWER SAFE VALUE.

D. SUPPLY FAN CONTROL: TEMPERATURE SENSOR SENSING BONNET TEMPERATURES AND INDEPENDENT OF BURNER CONTROLS, WITH PROVISIONS FOR CONTINUOUS FAN OPERATION.

2.5 EVAPORATOR COIL A. PROVIDE COPPER TUBE ALUMINUM FIN COIL ASSEMBLY WITH GALVANIZED

DRAIN PAN AND CONNECTION. B. PROVIDE CAPILLARY TUBES OR THERMOSTATIC EXPANSION VALVES FOR UNITS OF 6 TONS CAPACITY AND LESS, AND THERMOSTATIC EXPANSION VALVES AND ALTERNATE ROW CIRCUITING FOR UNITS 7.5 TONS COOLING CAPACITY AND

2.6 CONDENSER COIL

A. PROVIDE COPPER TUBE ALUMINUM FIN COIL ASSEMBLY WITH SUBCOOLING ROWS AND COIL GUARD.

B. PROVIDE DIRECT DRIVE PROPELLER FANS, RESILIENTLY MOUNTED WITH FAN GUARD, MOTOR OVERLOAD PROTECTION, WIRED TO OPERATE WITH COMPRESSOR. PROVIDE HIGH EFFICIENCY FAN MOTORS.

C. PROVIDE REFRIGERANT PRESSURE SWITCHES TO CYCLE CONDENSER FANS.

2.7 COMPRESSORS

A. PROVIDE HERMETIC COMPRESSORS, 3600 RPM MAXIMUM, RESILIENTLY MOUNTED WITH POSITIVE LUBRICATION, CRANKCASE HEATER, HIGH AND LOW PRESSURE SAFETY CONTROLS, MOTOR OVERLOAD PROTECTION, SUCTION AND DISCHARGE SERVICE VALVES AND GAUGE PORTS, AND FILTER DRIER.

B. FOR HEAT PUMP UNITS, PROVIDE REVERSING VALVE, SUCTION LINE ACCUMULATOR, DISCHARGE MUFFLER, FLOW CONTROL CHECK VALVE, AND SOLID-STATE DEFROST CONTROL UTILIZING THERMISTORS.

2.8 AIR FILTERS:

A. MERV8 DISPOSABLE FILTER IN METAL FRAMES. UNLESS NOTED OTHERWISE.

2.9 OPERATING CONTROLS

A. PROVIDE LOW VOLTAGE, ADJUSTABLE ROOM THERMOSTAT TO CONTROL BURNER OPERATION, COMPRESSOR AND CONDENSER FAN, AND SUPPLY FAN TO MAINTAIN TEMPERATURE SETTING.

1. INCLUDE SYSTEM SELECTOR SWITCH HEAT-OFF-COOL AND AUTO-ON FAN CONTROL SWITCH. B. PROVIDE REMOTE-MOUNTED AUTO-ON FAN CONTROL SWITCH.

2.10 OPERATING CONTROLS - SINGLE ZONE UNITS

A. ELECTRIC SOLID STATE MICROCOMPUTER-BASED ROOM THERMOSTAT, LOCATED AS INDICATED IN SERVICE AREA WITH REMOTE SENSOR LOCATED AS

INDICATED IN SERVICE AREA WITH REMOTE SENSOR.

2.13 ROOF CURBS A. ROOF MOUNTING CURB: 14 INCHES HIGH, GALVANIZED STEEL, CHANNEL FRAME WITH GASKETS, NAILER STRIPS.

PART 3 EXECUTION

A. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. B. MOUNT UNITS ON FACTORY BUILT ROOF MOUNTING CURB PROVIDING WATERTIGHT ENCLOSURE TO PROTECT DUCTWORK AND UTILITY SERVICES. INSTALL ROOF MOUNTING CURB LEVEL.

3.02 SYSTEM STARTUP A. PREPARE AND START EQUIPMENT. ADJUST FOR PROPER OPERATION.

SECTION 237433 DEDICATED OUTDOOR AIR UNITS

PART 2 PRODUCTS

A. PACKAGED UNIT

 CASING AND COMPONENTS: A. FABRICATION: AHRI 210/240 AND UL 207 CONSTRUCTION, ASHRAE STD

B. PROVIDE BOLTED ACCESS PANELS TO ACCESS EACH SECTIONS FROM EITHER SIDE OF UNIT. PROVIDE HINGED DOOR WITH LOCKABLE HANDLE FOR SERVICEABLE

D. DRAIN PAN: GALVANIZED STEEL WITH CORROSION-RESISTANT

COATING. PERFORMANCE RATINGS: ASHRAE STD 90.1, EER AND COP AS APPLICABLE. 3. REGULATORY REQUIREMENTS: AHRI 270 RATED, NFPA 70, AND UL (DIR)

4. EXTERNAL SURFACE FINISH: HEAT RESISTANT BAKED ENAMEL.

5. OUTDOOR INSTALLATION: WEATHERPROOFED CASING, WITH INTAKE

LOUVER OR HOOD. 6. OUTSIDE AIR DAMPER WITH RAIN HOOD AND SCREEN: A. SET MOTORIZED OUTDOOR AIR DAMPER(S) TO FACTORY-IDENTIFIED PRESET POSITION TO PROVIDE UP TO 30 PERCENT OUTSIDE AIR WHEN

FAN STARTS AND CLOSE 30 SECONDS AFTER FAN STOPS, ADJUSTABLE. B. DAMPERS TO MODULATE WHEN UNIT IS ON ECONOMIZER, SPACE PRESSURIZATION, OR CO2 CONTROL.

B. FILTER SECTION: 1. FILTER: REMOVABLE MERV-8. UNLESS NOTED OTHERWISE.

C. HEATING SECTION:

 INDIRECT GAS-FIRED FURNACE: A. FULLY SEALED NATURAL GAS BURNING ASSEMBLY CONFIGURED FOR MODULATED 25:1 TURN DOWN RATIO USING ELECTRICALLY OPERATED DEVICES INCLUDING MODULATING MAIN GAS VALVE, SHUT DOWN VALVE, MAIN GAS, AND PILOT GAS REGULATORS. MANUAL MAIN GAS SHUT-OFF VALVE AND PILOT ADJUSTMENT VALVE.

INSULATION: NEOPRENE FACED GLASS FIBER INSULATION, 1 INCH THICK, ON INLET COMPONENTS TO BURNER PROFILE PLATE. C. OBSERVATION PORT: ON BURNER SECTION FOR OBSERVING MAIN AND

PILOT FLAMES. D. PILOT: ELECTRICALLY IGNITED BY SPARK ROD THROUGH HIGH

VOLTAGE IGNITION TRANSFORMER. E. DAMPER: MOTORIZED WITH END SWITCH TO PROVE POSITION BEFORE BURNER WILL FIRE.

D. COOLING SECTION: PACKAGED DX COOLING:

MAIN UNIT CONTROLS.

A. CONFIGURATION: AHRI 520 RATED, R-410A REFRIGERANT SYSTEM WITH

B. EVAPORATOR COIL: COPPER TUBE ALUMINUM FIN COIL ASSEMBLY WITH ALTERNATE ROW CIRCUITING, AND WITH GALVANIZED DRAIN PAN AND THERMOSTATIC EXPANSION VALVE C. COMPRESSOR: ONE HERMETIC SINGLE-STAGE SCROLL OR

RECIPROCATING, 3,600 RPM MAXIMUM RESILIENCE WITH POSITIVE LUBRICATION, CRANKCASE HEATER, HIGH PRESSURE CONTROL, LOW PRESSURE CONTROL, MOTOR OVERLOAD PROTECTION, SERVICE VALVES AND DRYER. D. CONDENSER SIDE: ALUMINUM FIN AND COPPER TUBE COIL, DIRECT

DRIVE AXIAL FAN RESILIENTLY MOUNTED, GALVANIZED FAN GUARD. ECM CONDENSER FANS. E. OPERATING AND SAFETY CONTROLS: INTERNALLY COORDINATED WITH

E. ENTHALPHY ECONOMIZER SECTION: PROVIDE FACTORY-INSTALLED SENSORS, ELECTRICALLY-ACTUATED RETURN AIR DAMPER, AND ELECTRICALLY-ACTUATED EXHAUST DAMPER FULLY COORDINATED WITH RETURN, EXHAUST SECTION. CONFIGURE CONTROLS FOR FAULT-DETECTION DIAGNOSTICS.

F. FAN SECTION: 1. PROVIDE DIRECT OR PLENUM MOUNTED VARIABLE-SPEED FAN MOTORS. 2. DRAW-THROUGH, FORWARD-CURVED FAN, CONSTRUCTED OF CORROSION-RESISTANT, GALVANIZED MATERIAL AND DESIGNED FOR

EFFICIENT, QUIET OPERATION. FACTORY PROGRAM FOR BOTH SOFT START AND CONSTANT FLOW OUTPUT OVER STATIC PRESSURE RANGE.

4. PROVIDE PREINSTALLED NEUTRAL WIRE PROTECTION WHEN REQUIRED TO SUPPORT SPECIFIED FAN TYPE.

MOTOR TO INCLUDE THERMAL OVERLOAD PROTECTION, QUICI

DISCONNECT PLUG, AND PERMANENTLY LUBRICATED BEARINGS. 6. BELT-DRIVEN MOTOR REQUIREMENTS: PROVIDE ADJUSTABLE BLOWER MOTOR/SHEAVE COMBINATION DEVICE BASED ON INDICATED FLOW PERFORMANCE REQUIREMENTS. STATICALLY AND DYNAMICALLY BALANCED CENTRIFUGAL FAN MOUNTED ON SOLID STEEL SHAFT WITH HEAVY-DUTY, SELF-ALIGNING, PRELUBRICATED BALL BEARINGS AND V-

BELT DRIVE WITH MATCHING MOTOR SHEAVES AND BELTS. VARIABLE SPEED CONTROL: CONFIGURE CONTROLLER TO MAINTAIN ADJUSTABLE FLOW SETPOINT FOR MODULATING OR SPEED-SWITCHED 8. FAN TURNDOWN: DESIGN CONTROL FEATURES TO ALLOW FAN SPEED

ZONE SET POINT TEMPERATURE IS SATISFIED OR WHEN UNIT RUNS IN FAN-ONLY MODE. G. UNIT CONTROLS:

 DDC: APPLICATION SPECIFIC CONTROLLER; FACTORY-PROVIDED. B. TESTED TO MONITOR AND HANDLE SEQUENCING FUNCTIONS AND OTHER OPERATIONAL MODES USING FIELD-MOUNTED THERMOSTAT

REDUCTION TO ADJUSTABLE 50 PERCENT OF ITS CAPACITY WHEN THE

AND OTHER SENSORS. C. COORDINATION AND SEQUENCING:

1. INTERNAL DEVICES: INCLUDE COMPRESSORS, BLOWER, SENSORS, SWITCHES, VALVES, SAFETIES, OTHER COMPONENTS. 2. FIELD-INSTALLED DEVICES: SOLENOID VALVES, THERMOSTAT, EWT SENSORS, LWT SENSORS, INTERNAL AND REMOTE CONTACTS, AND

OTHER DEVICES REQUIRED FOR OPERATION. 3. SAFETIES: AT MINIMUM INCLUDE ANTI-SHORT-CYCLE COMPRESSOR PROTECTION, CONDENSATE OVERFLOW, REFRIGERANT HIGH PRESSURE, REFRIGERANT LOW PRESSURE, LOSS-OF-CHARGE, REFRIGERANT FREEZE PROTECTION, AND

FREEZESTAT. 2. THERMOSTAT: A. FIELD MOUNTED AND WIRED, TIED INTO PREWIRED CONTROL-

INTERFACE TERMINALS. 3. LOCAL CONTROL PANEL: INTERFACE TO INCLUDE ON-OFF-AUTO SWITCH, SUMMER-WINTER SWITCH, HEAT-OFF-COOL SWITCH, INDICATING LIGHTS FOR SUPPLY FAN, PILOT OPERATION, BURNER OPERATION, LOCKOUT INDICATION, AND CLOGGED FILTER INDICATION.

H. FURNISH DEDICATED OUTDOOR AIR UNIT AND ASSOCIATED COMPONENTS AND ACCESSORIES PRODUCED BY A SINGLE MANUFACTURER.

PART 3 EXECUTION

3.1 INSTALLATION

A. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. B. PROVIDE UNIT- OR DUCT-MOUNTED SMOKE DETECTORS AND OTHER NFPA 90A

PROVISIONS. REFER TO PLANS. C. FOLLOW NFPA 54 GUIDELINES TO PROVIDE NATURAL GAS SYSTEM

CONNECTION.

D. INSTALL UNIT ON VIBRATION ISOLATOR PAD OR ROOF CURB. E. PROVIDE FLEXIBLE DUCT CONNECTIONS ON INLET AND OUTLET FROM UNIT.

F. CONNECT DRAIN PAN OUTLET TO NEAREST BUILDING DRAIN SYSTEM PIPING. G. ADJUSTING: USE PLENUM STATIC PRESSURE READINGS AGAINST MANUFACTURER CALIBRATION CHART TO ADJUST PRIMARY AIRFLOW AS OTHER MEASURING METHODS WILL NOT WORK.

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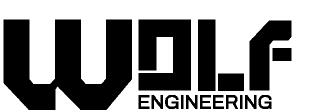
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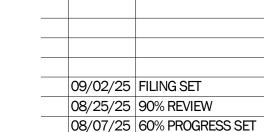
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© 2019. **KEY PLAN** AREA OF WORK

CLIENT:

PROJECT NAME:

US FOODS MEZZANINE RENOVATION

PROJECT ADDRESS:

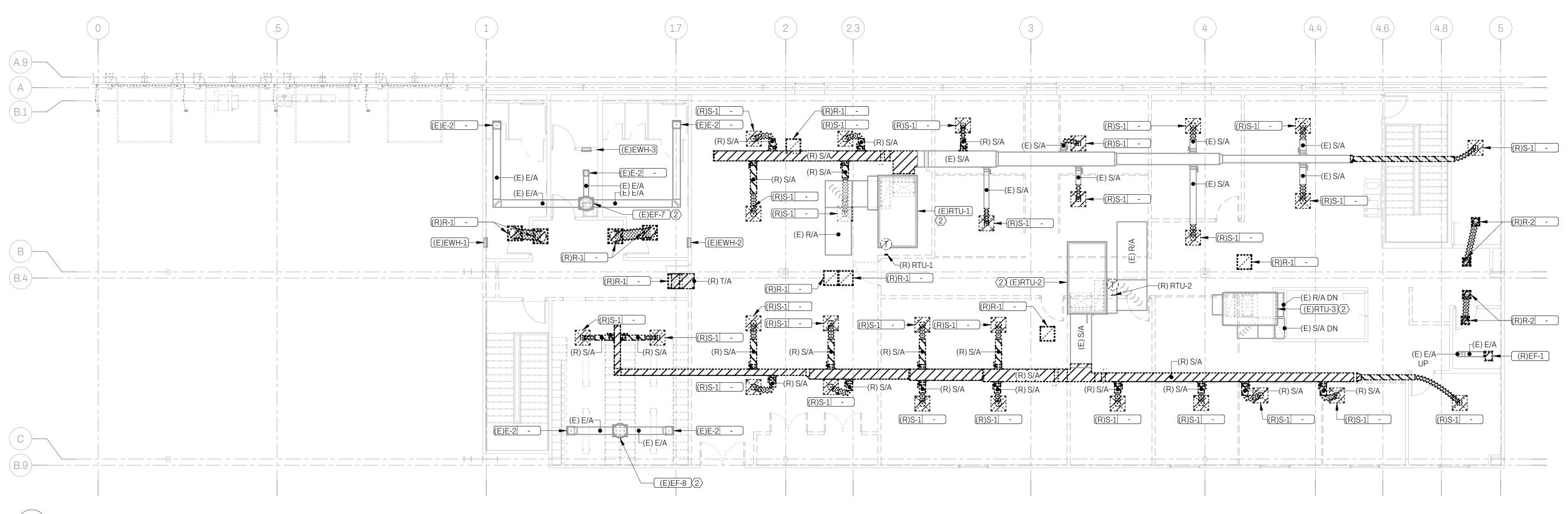
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DWG TITLE:

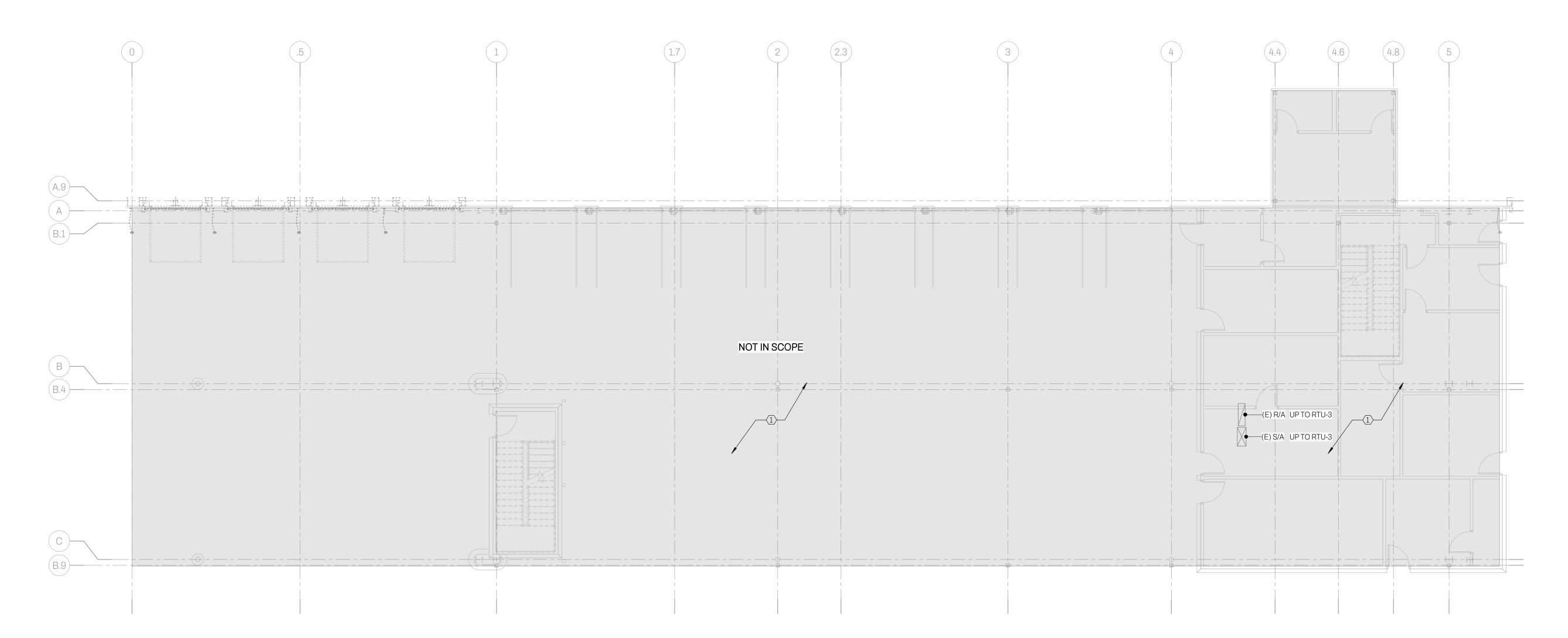
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MECHANICAL SPECIFICATIONS

Lic.No.402053869



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



GENERAL NOTES

- A. 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.
- B. VERIFY ALL EXISTING CONDITIONS INCLUDING LOCATION OF ALL STRUCTURAL ELEMENTS, BAR JOISTS, COLUMNS, ETC. AND COORDINATE DUCT LOCATIONS ACCORDINGLY.
- C. CONTRACTOR SHALL INPECT ALL EXISTING EQUIPMENT TO REMAIN/TO BE RELOCATED AND REPAIR (IF NECESSARY) TO LIKE NEW OPERATING CONDITIONS.
- D. CONTRACTOR SHALL PATCH/REPAIR ALL HOLES WITHIN DUCTWORK AND DUCT INSULATION THAT MAY OCCUR TO EQUIPMENT DURING
- 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.

DEMOLITION OR RELOCATION.

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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KEY PLAN

PROJECT NAME:

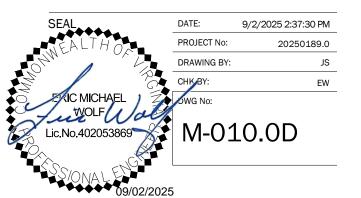
US FOODS MEZZANINE RENOVATION

PROJECT ADDRESS:

40 S FORT LEWIS BLVD SALEM, VA 24153

DWG TITLE:

MECHANICAL - DEMOLITION PLAN



1 MECHANICAL - GROUND FLOOR - DEMOLITION
M-010.00 1/8" = 1'-0"

GENERAL NOTES

- A. 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.
- B. VERIFY ALL EXISTING CONDITIONS INCLUDING LOCATION OF ALL STRUCTURAL ELEMENTS, BAR JOISTS, COLUMNS, ETC. AND COORDINATE DUCT LOCATIONS ACCORDINGLY.
- C. CONTRACTOR SHALL INPECT ALL EXISTING EQUIPMENT TO REMAIN/TO BE RELOCATED AND REPAIR (IF NECESSARY) TO LIKE NEW OPERATING CONDITIONS.
- D. CONTRACTOR SHALL PATCH/REPAIR ALL HOLES WITHIN DUCTWORK AND DUCT INSULATION THAT MAY OCCUR TO EQUIPMENT DURING DEMOLITION OR RELOCATION.
- E. 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

- 1. AREA OF SCOPE. REFER TO SHEET M-010.0D AND M-100.00 FOR MORE INFORMATION.
- 2. EXISTING OFFICE TO BE DEMOED. DEMO ALL ASSOCIATED HVAC EQUIPMENT, DUCTWORK, DUCT ACCESSORIES, AND AIR DEVICES.

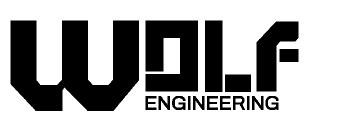
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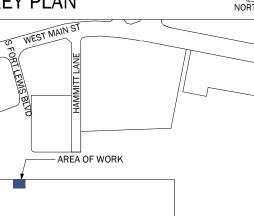


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KEY PLAN



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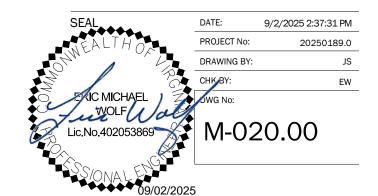
US FOODS
MEZZANINE RENOVATION

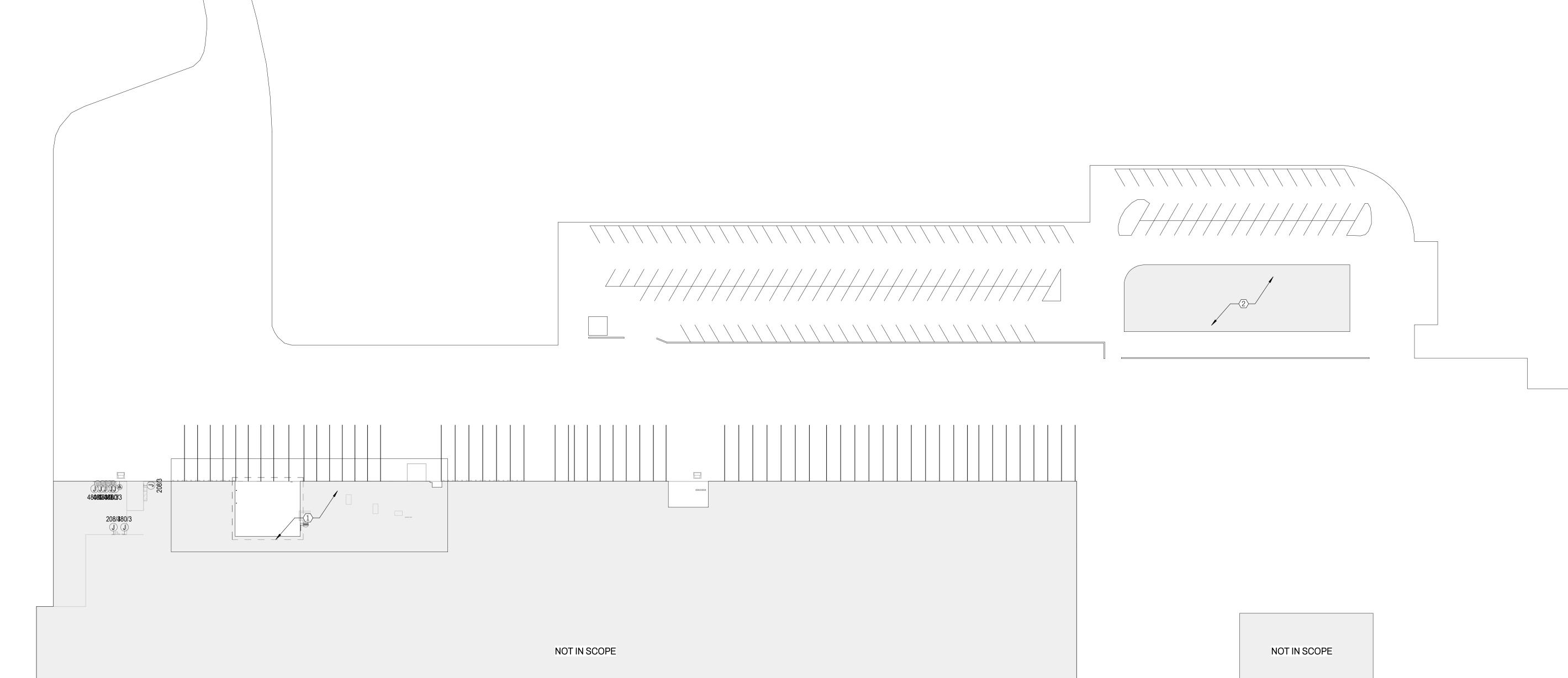
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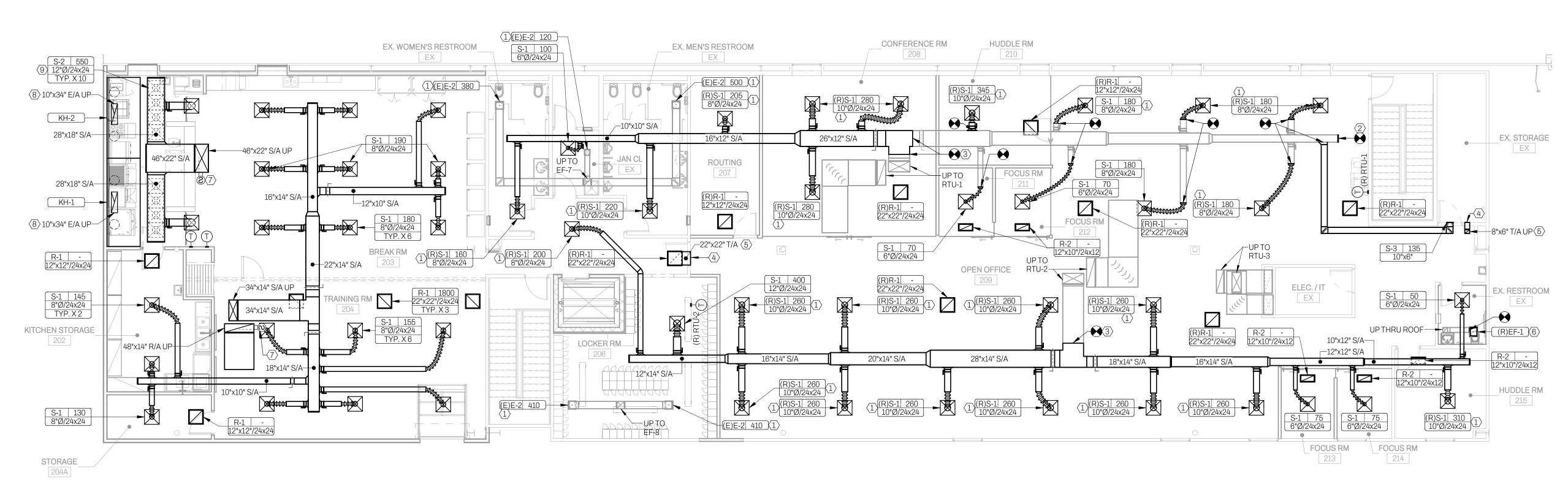
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DWG TITLE:

MECHANICAL - SITE PLAN







1 MECHANICAL - MEZZANINE PLAN - HVAC M-100.00 1/8" = 1'-0"



GENERAL NOTES

- A. IT IS THE RESPONSIBILITY OF THE GENERAL AND MECHANICAL CONTRACTOR TO FULLY INSPECT THE SITE PRIOR TO COMMENCEMENT.
- B. VERIFY ALL EXISTING CONDITIONS INCLUDING LOCATION OF ALL STRUCTURAL ELEMENTS, BAR JOISTS, COLUMNS, ETC. AND COORDINATE DUCT LOCATIONS ACCORDINGLY.
- C. 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
- D. LOCATE THERMOSTATS SUCH THAT THEY ARE ACCESSIBLE, PROTECTED, AND IN AN AREA OF UNOBSTRUCTED AIR CIRCULATION.
- E. ALL EXISTING HVAC EQUIPMENT TO REMAIN OR TO BE RELOCATED SHALL BE INSPECTED, CLEANED, AND REPAIRED AS NEEDED TO ENSURE PROPER FUNCTIONALITY.
- F. ALL EXISTING HVAC DUCTWORK AND DUCTWORK INSULATION TO REMAIN SHALL BE INSPECTED, CLEANED, AND REPAIRED AS NEEDED TO ENSURE AIRTIGHT.
- G. PROVIDE NEW FILTERS FOR ALL HVAC UNITS AT TURNOVER.
- H. ALL REPAIRS SPECIFIC TO THE EXISTING HVAC EQUIPMENT IS THE RESPONSIBILITY OF EXISTING MC.
- I. CONTRACTOR TO PROVIDE A DETAILED SCOPE OF REPAIR/REPLACE WORK AND COST FOR ALL HVAC EQUIPMENT AS A SEPARATE LINE ITEM.
- J. REUSE RELOCATED DUCTWORK AS NEEDED PER NEW CONSTRUCTION PLAN.

KEY NOTES

- 1. REBALANCE AIR DEVICE TO CFM SHOWN ON PLAN.
- 2. CAP EXISTING DUCTWORK. MATCH EXISTING TRUNK SIZE IN FIELD.
- 3. 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.
- 4. COVER OPEN ENDED DUCT WITH 1/2" X 1/2" HARDWARE MESH.
- 5. INSTALL TRANSFER DUCT ABOVE CEILING AND TERMINATES IN RETURN AIR PLENUM.
- 6. 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.
- 7. 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).
- 8. PROVIDE PRE-FABRICATED, STAINLESS STEEL, SINGLE WALLED DUCTWORK FOR ALL GREASE EXHAUST DUCTS.
- 9. SUSPEND AIR DEVICE IN SPACE.

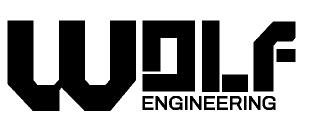
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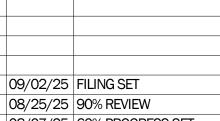
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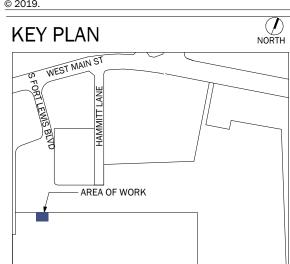
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CLIENT:

PROJECT NAME:

US FOODS
MEZZANINE RENOVATION

PROJECT ADDRESS:

40 S FORT LEWIS BLVD SALEM, VA 24153

DWG TITLE:

MECHANICAL - FLOOR PLANS - HVAC



(E)EF-7 (1) (1) (E)RTU-2 (E)8"x8" E/A DN——✓ (E)EF-8 (1)

1 MECHANICAL - EXISTING ROOF PLAN - HVAC

GENERAL NOTES

- A. IT IS THE RESPONSIBILITY OF THE GENERAL AND MECHANICAL CONTRACTOR TO FULLY INSPECT THE SITE PRIOR TO COMMENCEMENT.
- B. VERIFY ALL EXISTING CONDITIONS INCLUDING LOCATION OF ALL STRUCTURAL ELEMENTS, BAR JOISTS, COLUMNS, ETC. AND COORDINATE DUCT LOCATIONS ACCORDINGLY.
- C. 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.
- D. LOCATE THERMOSTATS SUCH THAT THEY ARE ACCESSIBLE, PROTECTED, AND IN AN AREA OF UNOBSTRUCTED AIR CIRCULATION.
- E. ALL EXISTING HVAC EQUIPMENT TO REMAIN OR TO BE RELOCATED SHALL BE INSPECTED, CLEANED, AND REPAIRED AS NEEDED TO ENSURE PROPER FUNCTIONALITY.
- F. PROVIDE NEW FILTERS FOR ALL HVAC UNITS AT TURNOVER.
- G. ALL REPAIRS SPECIFIC TO THE EXISTING HVAC EQUIPMENT IS THE RESPONSIBILITY OF EXISTING MC.
- H. CONTRACTOR TO PROVIDE A DETAILED SCOPE OF REPAIR/REPLACE WORK AND COST FOR ALL HVAC EQUIPMENT AS A SEPARATE LINE

KEY NOTES

- 1. HVAC UNIT EXISTING TO REMAIN. REFER TO MECHANICAL SCHEDULES FOR ADDITIONAL INFORMATION.
- 2. 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.
- 3. 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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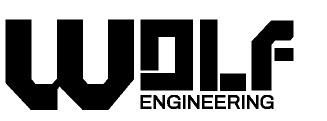
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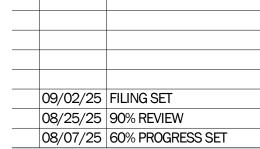
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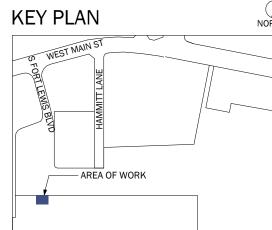
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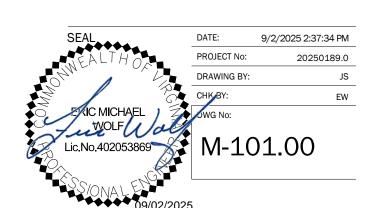
US FOODS MEZZANINE RENOVATION

PROJECT ADDRESS:

40 S FORT LEWIS BLVD SALEM, VA 24153

DWG TITLE:

MECHANICAL - ROOF PLAN



	E	XISTING EXHAU	ST FAN SCHED	ULE			
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	FIELD ADJUST RPM TO ME	EET SCHEDULED CFM	VALUES.				

		MINIMUM EXHAUST R	EQUIREMEN	TS		
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 - CONTINUOSLY	6	219 SF	300 CFM	300 CFM
EF-7	EX WOMEN'S RESTROOM	TOILETS - PUBLIC - CONTINUOSLY	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

		MINIMUM V	ENTILAT	ION CALCULA	ATIONS			
UNIT NAME	ROOM NAME	OCCUPANCY CATEGORY	ZONE FLOOR AREA	ZONE POPULATION (RA)	ZONE AIR DISTRIBUTION EFFECTIVENESS (EZ)	BREATHING ZONE OUTDOOR AIRFLOW (VBZ)	REQUIRED OUTDOOR AIR INTAKE FLOW (VOT)	ZONE OUTDOOR AIR FLOW (VOZ)
RTU-1	207 ROUTING	OFFICE SPACE	203 SF	1	0.8	17 CFM	21 CFM	25
RTU-1	208 CONFERENCE RM	CONFERENCE/MEETING	515 SF	26	0.8	161 CFM	201 CFM	205
RTU-1	209 OPEN OFFICE	OFFICE SPACE	881 SF	4	0.8	73 CFM	91 CFM	95
RTU-1	210 HUDDLE RM	CONFERENCE/MEETING	184 SF	9	0.8	56 CFM	70 CFM	75
RTU-1	211 FOCUS RM	OFFICE SPACE	67 SF	1	0.8	9 CFM	11 CFM	15
RTU-1	212 FOCUS RM	OFFICE SPACE	69 SF	1	0.8	9 CFM	11 CFM	15
RTU-1	EX JAN CL	JANITOR CLOSETS, TRASH ROOMS, RECYCLING	56 SF	0	0.8	0 CFM	0 CFM	0
RTU-1	EX MEN'S RESTROOM	TOILETS - PUBLIC - CONTINUOSLY	219 SF	0	0.8	0 CFM	0 CFM	0
RTU-1	EX STORAGE	STORAGE ROOMS	135 SF	0	0.8	16 CFM	20 CFM	25
RTU-1	EX WOMEN'S RESTROOM	TOILETS - PUBLIC - CONTINUOSLY	157 SF	0	0.8	0 CFM	0 CFM	0
RTU-1			1				427 CFM	455
RTU-2	206 LOCKER RM	LOCKER/DRESSING ROOMS	416 SF	0	0.8	0 CFM	0 CFM	0
RTU-2	209 OPEN OFFICE	OFFICE SPACE	2667 SF	13	0.8	225 CFM	281 CFM	285
RTU-2	213 FOCUS RM	OFFICE SPACE	68 SF	1	0.8	9 CFM	11 CFM	15
RTU-2	214 FOCUS RM	OFFICE SPACE	71 SF	1	0.8	9 CFM	12 CFM	15
RTU-2	215 HUDDLE RM	CONFERENCE/MEETING	148 SF	7	0.8	44 CFM	55 CFM	55
RTU-2	CORRIDOR	CORRIDORS	196 SF	0	0.8	12 CFM	15 CFM	15
RTU-2	EX RESTROOM	TOILETS - PUBLIC - INTERMITTENTLY	52 SF	0	0.8	0 CFM	0 CFM	0
RTU-2			1				374 CFM	385
RTU-4	39 STORAGE	STORAGE ROOMS	86 SF	0	0.8	10 CFM	13 CFM	15
RTU-4	202 KITCHEN STORAGE	STORAGE ROOMS	233 SF	0	0.8	28 CFM	35 CFM	35
RTU-4	203 BREAK RM	BREAKROOMS	1012 SF	6	0.8	91 CFM	113 CFM	115
RTU-4	204 TRAINING RM	CONFERENCE/MEETING	905 SF	45	0.8	279 CFM	349 CFM	350
RTU-4			1	1	1	1	510 CFM	515

	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						

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

PACKAGED ROOFTOP UNIT SCHEDULE (GAS)

								Г	AUNAULDINU	OF TOP OINTE	OHLDO	ILL (UA	3)									
UNIT				NOMINAL		SUPPL	Y FAN		COOLING				GAS	SHEAT				ELECTRICAL				
MARK MA	MANUFACTURER	MODEL	AREA SERVED	SIZE (TONS)	TOTAL	OUTSIDE AIR	ESP	HP	TOTAL	SENSIBLE	EER	TYPE	INPUT	OUTPUT	AFUE	VOLTAGE	PHASE	FREQUENCY	MCA	MOCP	WEIGHT R	REMARKS
RTU-4	CARRIER	48FEDM12	KITCHEN STORAGE, TRAINING ROOM, BREAK ROOM	10.0	3,000 CFM	515 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-I.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	

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.C.)	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	0.625	3	CONFIRM WITH MFR	CONFIRM WITH MFR	115	92	460	3	11	15	-	1, 2

- 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.

	EXHAUST FAN SCHEDULE													
					DESIGN		MOTOR				FAN			
MARK	MANUFACTURER	MODEL	TYPE	SERVES	AIRFLOW RATE	ESP	POWER	VOLTAGE	PHASE	FLA	INTERLOCK	WEIGHT	REMARKS	
KEF-1	CAPTIVEAIRE	DU180HFA	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	DU180HFA	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	

- 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.

KITCHEN HOOD SCHEDULE

UNIT				INSTALLATION	EXHAUST	EFFICIENCY		DIMENSIO	NS	PRODUCT			
MARK	MANUFACTURER	MODEL	DESCRIPTION	TYPE	AIRFLOW RATE	@7 MICRONS	LENGTH	DEPTH	HEIGHT	WEIGHT	INTERLOCK	REMARKS	
KH-1	CAPTIVEAIRE	6018 SND-2	HEAVY DUTY TYPE I	WALL MOUNT	3,600 CFM	85%	144"	60"	18"	912 LB	KEF-18 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	

- 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.

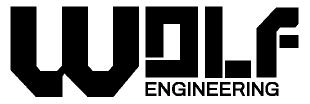
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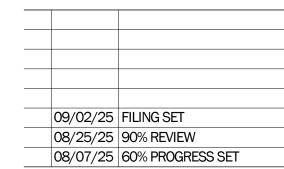
CTS Builders

Structural Engineer Penn Fusion Engineering

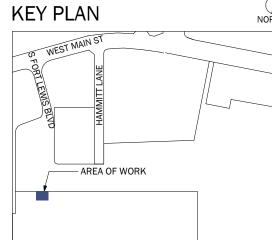
MEP Engineering Wolf Engineering







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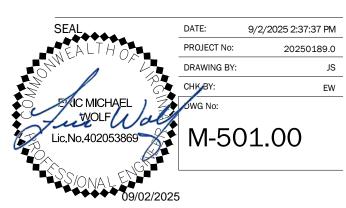
PROJECT NAME: US FOODS MEZZANINE RENOVATION

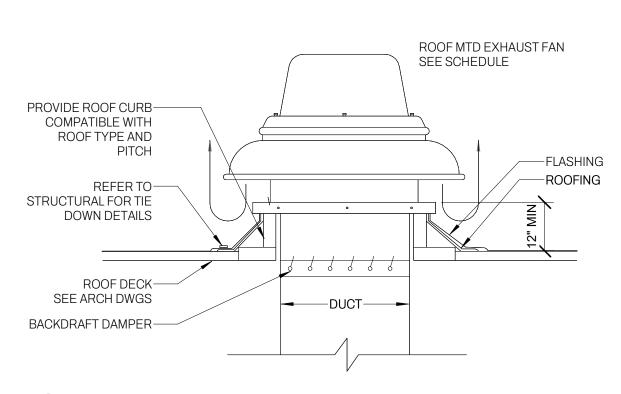
PROJECT ADDRESS:

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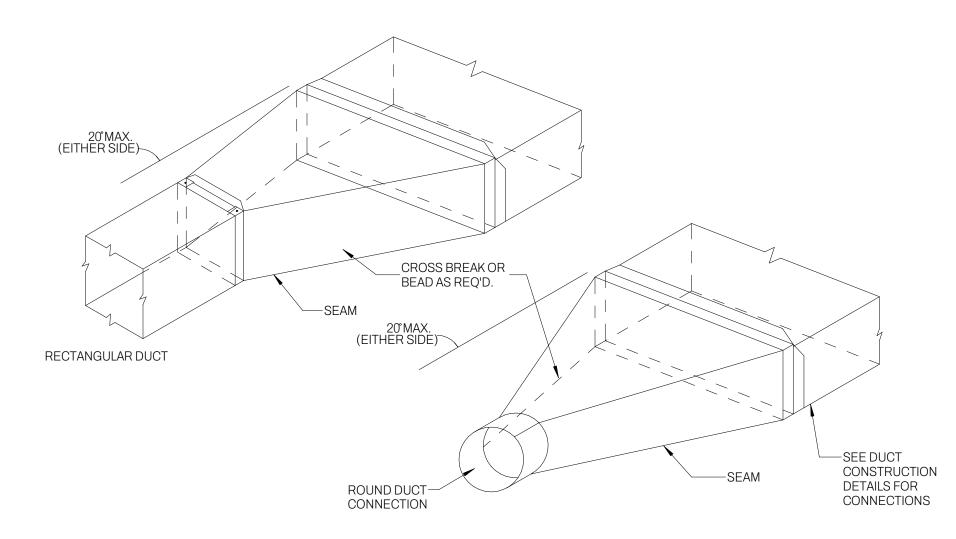
DWG TITLE:

MECHANICAL SCHEDULES





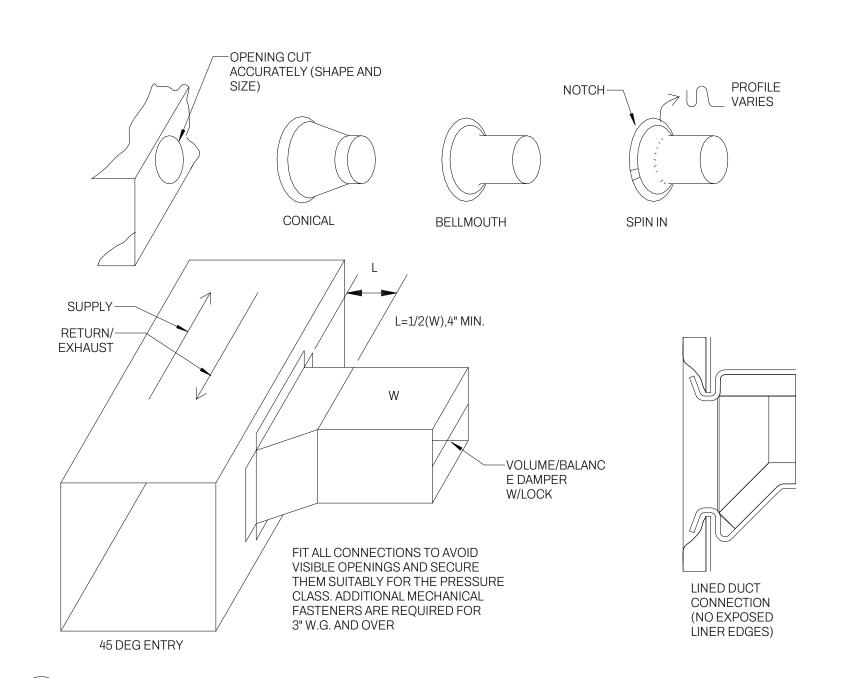
7 ROOF MOUNTED EXHAUST FAN M-601.00 NOT TO SCALE

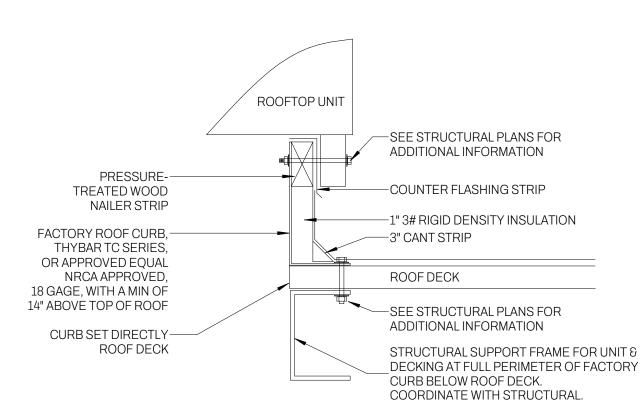


4 TRANSITION DETAIL M-601.00 NOT TO SCALE

DUCT BRANCH CONNECTION DETAIL

M-601.00 NOT TO SCALE





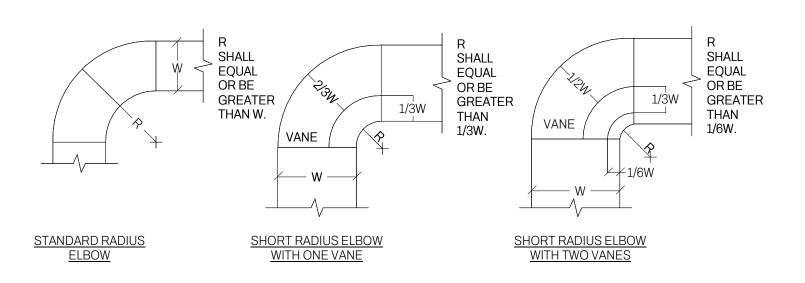
GENERAL NOTES:

L. MECHANICAL CONTRACTOR SHALL COORDINATE ROOF OPENING SIZES AND LOCATIONS FOR STRUCTURAL

SUPPORT FRAMING WITH GENERAL CONTRACTOR. . 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.

ROOFTOP UNIT CURB DETAIL M-601.00 NOT TO SCALE

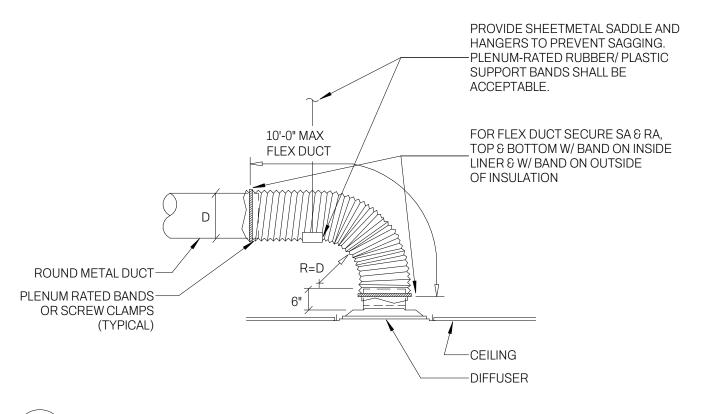


GENERAL NOTE

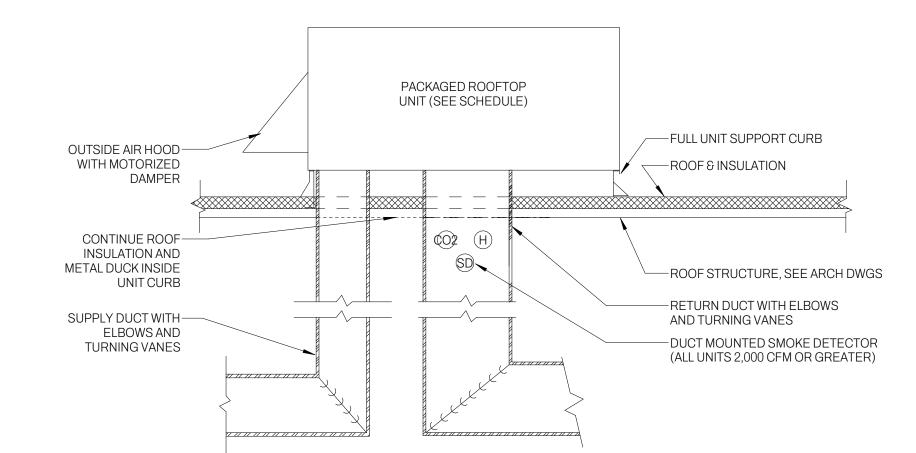
1. THE INTERIOR SURFACE OF ALL RADIUS ELBOWS SHALL BE MADE ROUND.

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.

TYPICAL RADIUS ELBOW DETAIL M-601.00 NOT TO SCALE



DIFFUSER CONNECTION DETAIL M-601.00 NOT TO SCALE

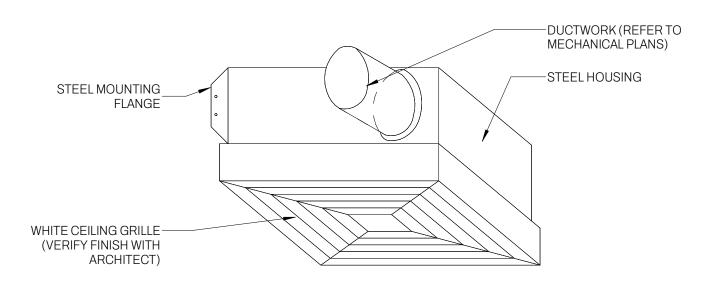


GENERAL NOTES:

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 AND/OR 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.

 iggray iggray TYPICAL PACKAGED ROOFTOP UNIT DETAIL M-601.00 NOT TO SCALE



GENERAL NOTES:

1. PROVIDE BACKDRAFT DAMPER W/ BIRDSCREEN.

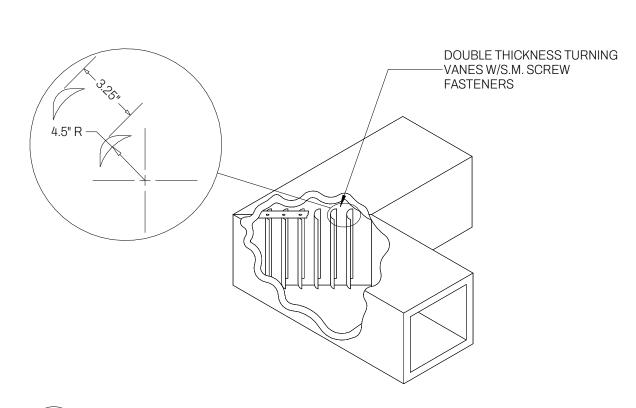
2. FLASH AND SEAL WALL/ROOF CAP.

3. PROVIDE INTERNAL ISOLATION AND SOUND INSULATION.

4. SUPPORT FAN FROM STRUCTURE.

5. REFER TO FAN SCHEDULE FOR FAN CONTROL.

CABINET CEILING EXHAUST FAN M-601.00 NOT TO SCALE



TURNING VANE DETAIL M-601.00 NOT TO SCALE

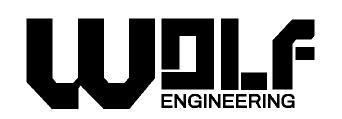
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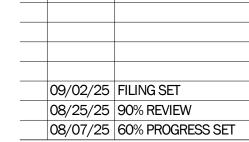
Contractor
CTS Builders

Structural Engineer Penn Fusion Engineering

MEP Engineering Wolf Engineering

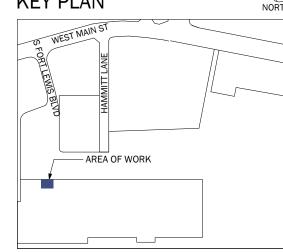


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KEY PLAN



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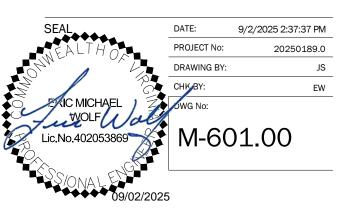
PROJECT NAME: US FOODS MEZZANINE RENOVATION

PROJECT ADDRESS:

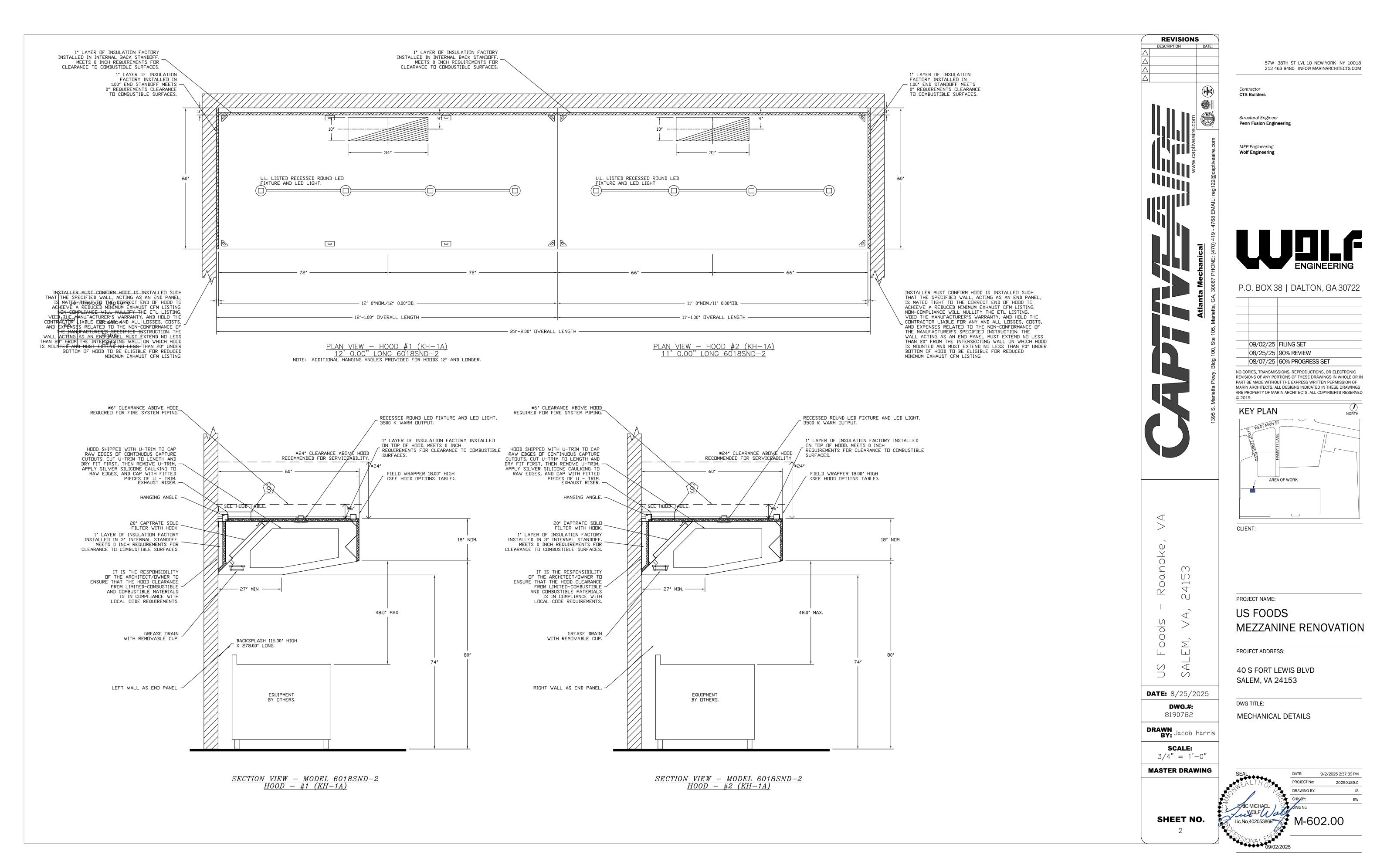
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DWG TITLE:

MECHANICAL DETAILS



MARIN ARCHITECTS



HOOD CORNER WALL-MOUNT UTILITY CABINET HANGING ANGLE (HARDWARE BY INSTALLER) ASSEMBLY INSTRUCTIONS (DI-PSP) 1/2" - 13 TPI GRADE 5 (MINIMUM) — STEEL HEX NUTS. CABINET TO BE HUNG BY OTHERS, SEE UTILITY CABINET SCHEDULE FOR CABINET SIZE. HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TPI GRADE 5 (MINIMUM) ALL-THREAD. SANDWICH HANGING 1/2' - 13 TPI GRADE 5 (MINIMUM) — STEEL ALL-THREAD. ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHERS AND 1/2" - 13 TPI 1/2" - 13 TPI GRADE 5 (MINIMUM) \ STEEL HEX NUT. GRADE 5 (MINIMUM) HEX NUTS AS SHOWN. MUST USE 23 11/16" DOUBLED HEX NUT CONFIGURATION BENEATH UTILITY CABINET HANGING ANGLES AND ABOVE CEILING ANCHORS. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS. 1/2" GRADE 5 (MINIMUM) STEE FLAT WASHER. UTILITY CABINET <u>HANGING ANGLE</u> 1/2" - 13 TPI GRADE 5 (MINIMUM) — STEEL HEX NUTS. (HARDWARE BY INSTALLER) 1/2' GRADE 5 (MINIMUM) STEEL-FLAT WASHER. ASSEMBLY INSTRUCTIONS 1/2" - 13 TPI GRADE 5 (MINIMUM) — STEEL ALL-THREAD. HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TPI GRADE 5 (MINIMUM) ALL-THREAD, SANDWICH HANGING 1/2" - 13 TPI GRADE 5 (MINIMUM) \ STEEL HEX NUT. <u>INSTALLATION NOTES:</u> INTENDED FOR INSTALLATION IN LAY IN (DROP) CEILINGS INSTALL SLIDING RADIAL DAMPER ON TOP SIDE OF COLLAR ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHERS AND 1/2" - 13 TPI HOOD CORNER HANGING ANGLE (WEIGHT BEARING ANCHOR POINT FOR HOOD). GRADE 5 (MINIMUM) HEX NUTS AS SHOWN, MUST USE 1/2' GRADE 5 (MINIMUM) STEEL ⁻ FLAT WASHER. 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. 1/2' GRADE 5 (MINIMUM) STEEL FLAT WASHER. FULL LENGTH HANGING ANGLE 1/2" - 13 TPI GRADE 5 (MINIMUM) — STEEL HEX NUTS. (HARDWARE BY INSTALLER) 1/2' - 13 TPI GRADE 5 (MINIMUM) -STEEL HEX NUTS. 1/2' GRADE 5 (MINIMUM) STEEL-FLAT WASHER. 1/2" - 13 TPI GRADE 5 (MINIMUM) \ STEEL HEX NUT. FULL LENGTH HANGING ANGLE (WEIGHT BEARINGANCHOR POINT FOR HOOD). 1/2' GRADE 5 (MINIMUM) STEEL \(\sime\) FLAT WASHER. 1/2' GRADE 5 (MINIMUM) STEEL-FLAT WASHER. 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** NON-COMBUSTIBLE WALL-BACKSPLASH PANELS SLIDE INTO DIVIDER

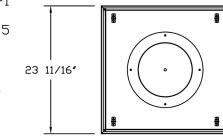
- BACKSPLASH IS NOT

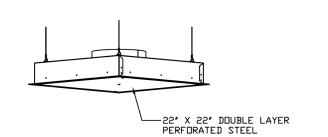
COMBUSTIBLE WALLS

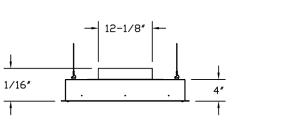
INSULATED AND IS UNSUITABLE FOR INSTALL AGAINST

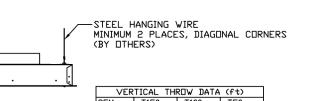
QTY 11-DROP-IN PERFORATED SUPPLY PLENUM DIFFUSER

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







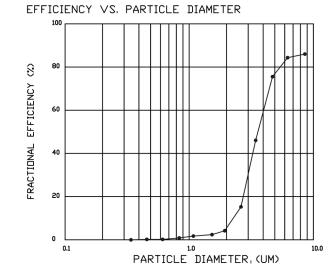


DIFFUSER SPECIFICATION

SPECIFICATION: CAPTRATE GREASE-STOP SOLO FILTER THE CAPTRATE GREASE-STOP SOLO 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.

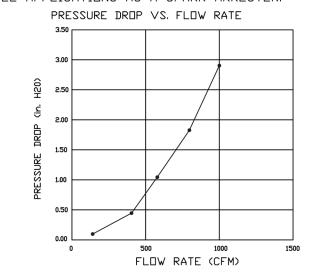
FILTER IS STAINLESS STEEL CONSTRUCTION, AND SIZED TO FIT INTO STANDARD 2-INCH DEEP HOOD CHANNEL(S). UNITS SHALL INCLUDE STAINLESS STEEL HANDLES AND A FASTENING DEVICE TO SECURE THE TWO

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



ULC-S649.

COMPONENTS WHEN ASSEMBLED.



CAPTRATE FILTERS ARE BUILT IN COMPLIANCE WITH: NFPA #96. NSF STANDARD #2. UL STANDARD #1046. INT. MECH. CODE (IMC).



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REVISIONS

DESCRIPTION

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PROJECT NAME: US FOODS MEZZANINE RENOVATION

PROJECT ADDRESS:

40 S FORT LEWIS BLVD SALEM, VA 24153

DWG TITLE: **DRAWN BY:** Jacob Harris MECHANICAL DETAILS

CLIENT:

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SCALE:

3/4" = 1'-0"

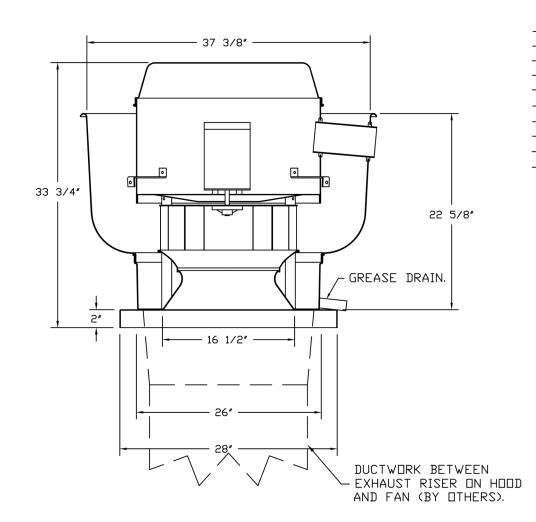
MASTER DRAWING

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DATE: 8/25/2025

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



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.

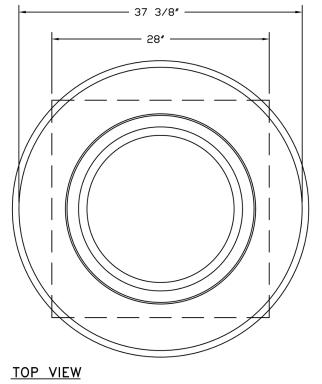
ABNORMAL FLARE-UP TEST

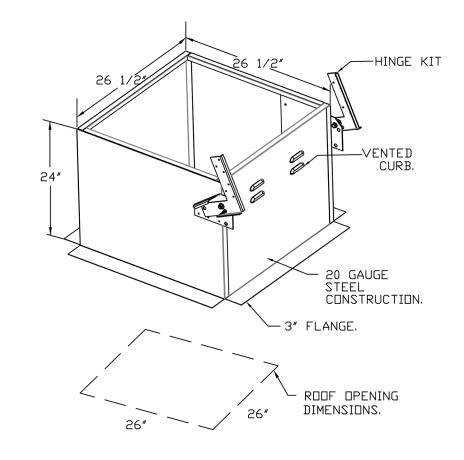
EXHAUST FAN MUST OPERATE CONTINUOUSLY
WHILE EXHAUSTING BURNING GREASE VAPORS AT 600°F (316°C) FOR A PERIOD OF 15 MINUTES WITHOUT THE FAN BECOMING DAMAGED TO ANY EXTENT THAT COULD CAUSE AN UNSAFE CONDITION.

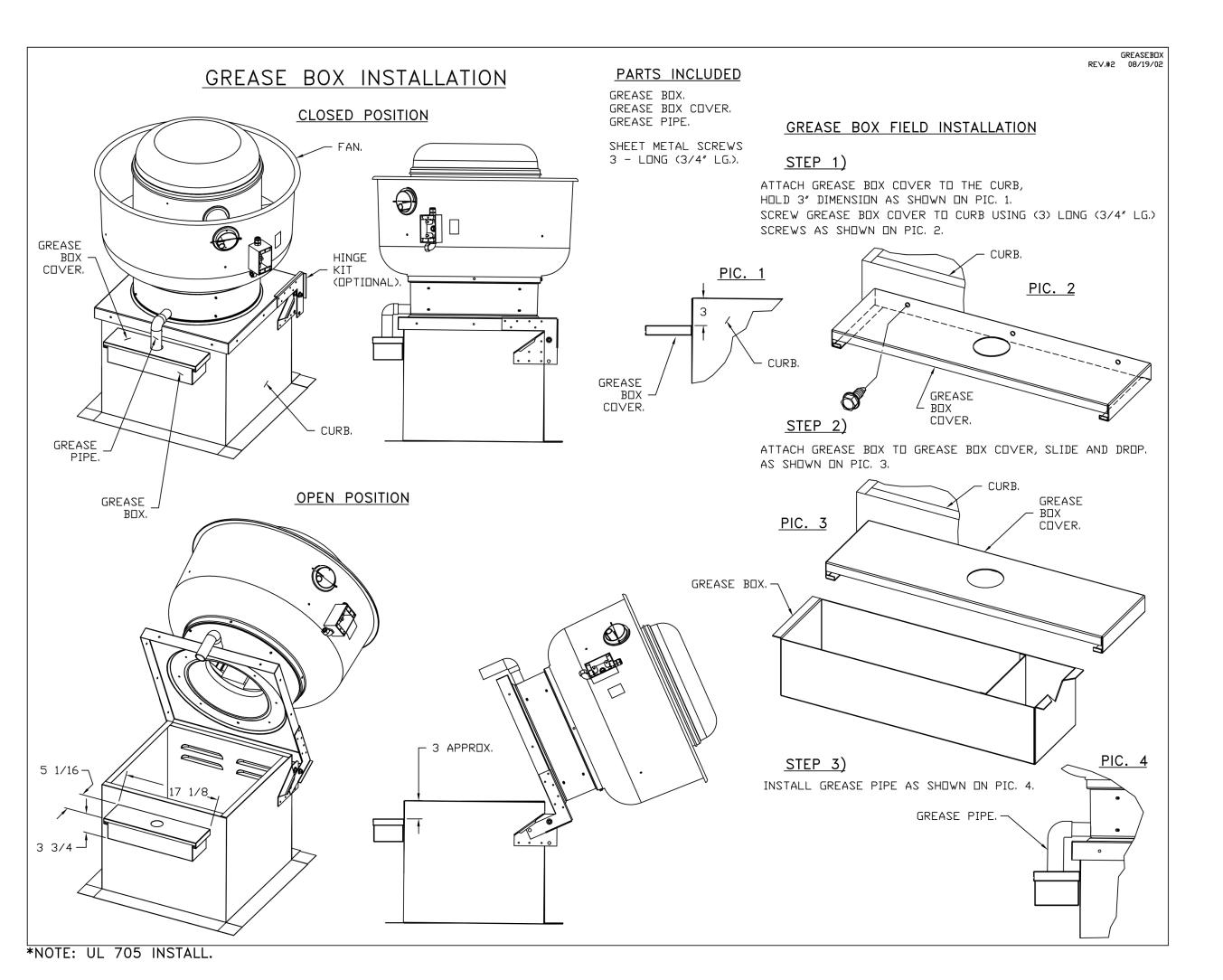
<u>OPTIONS</u>

- GREASE BOX. FAN BASE CERAMIC SEAL DU/DR180HFA INSTALLED AT PLANT FOR GREASE
- UNIT MOUNTED VFD FOR USE WITH ECPMO3.
 VFD MOUNTING BRACKET FOR DU/DR 180









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08/07/25 | 60% PROGRESS SET

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Contractor
CTS Builders

Structural Engineer Penn Fusion Engineering

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REVISIONS DESCRIPTION DATE:

> CLIENT: PROJECT NAME: US FOODS MEZZANINE RENOVATION PROJECT ADDRESS:

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DWG TITLE:

DRAWN BY: Jacob Harris

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24153 Roa \exists US SAL

DATE: 8/25/2025

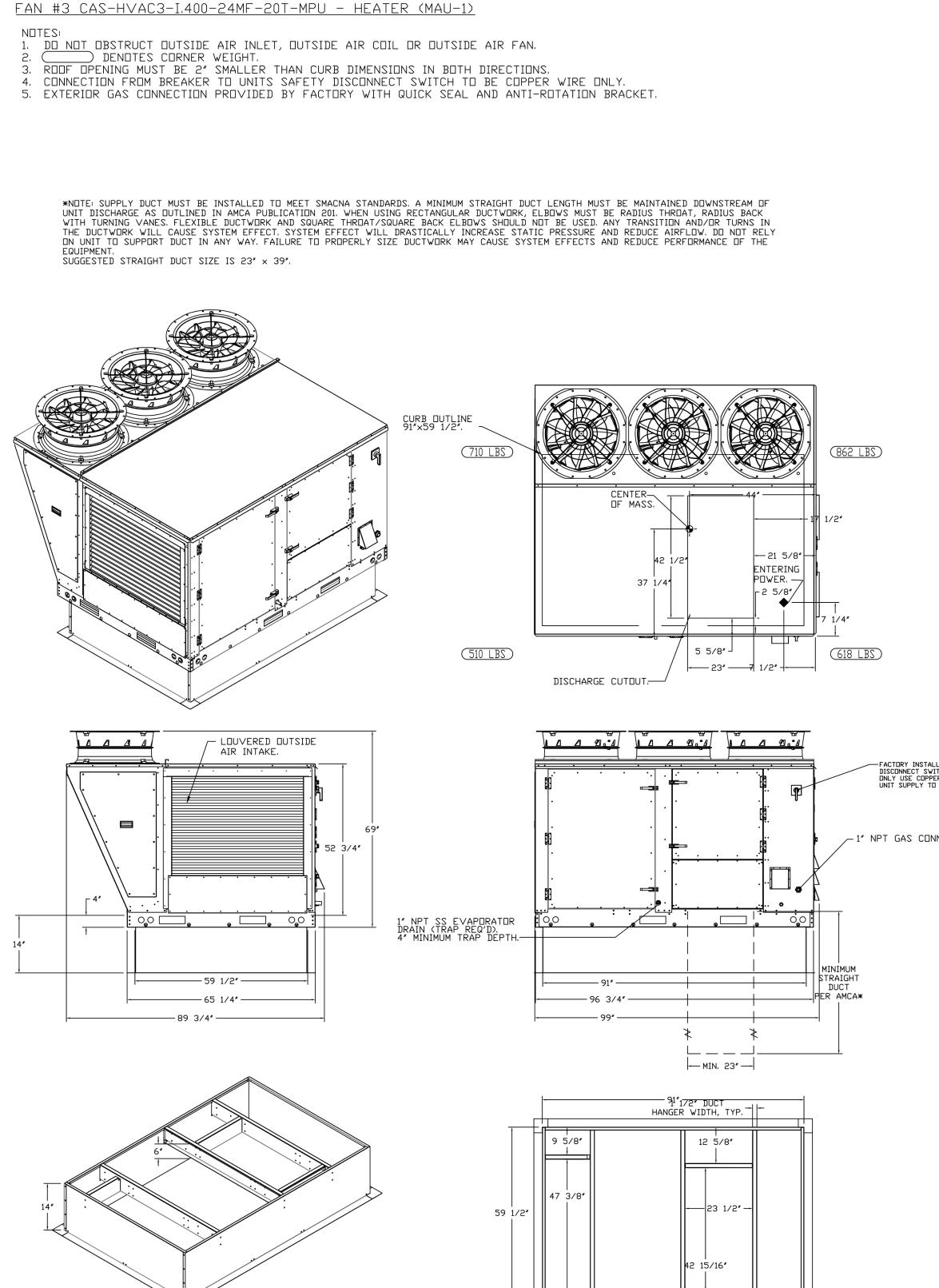
8190782

3/4" = 1'-0"

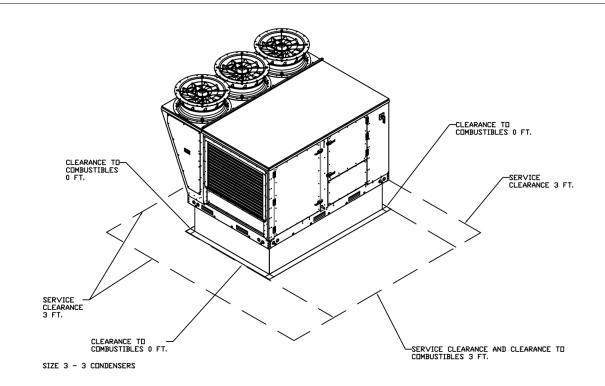
MASTER DRAWING

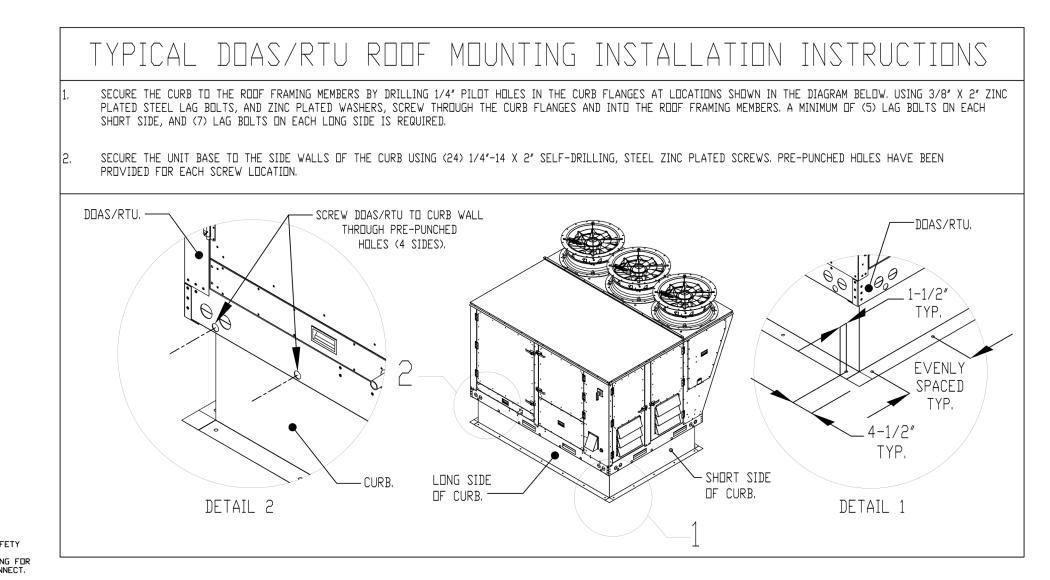
SHEET NO.

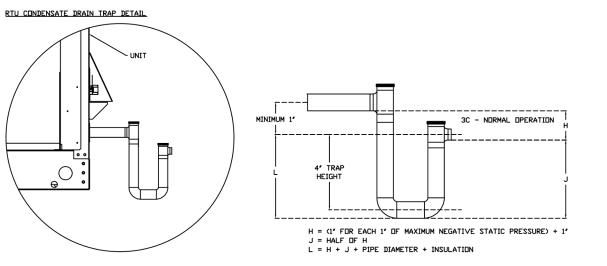
MECHANICAL DETAILS



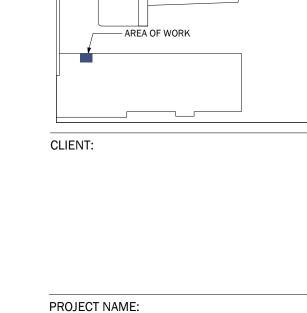
- 15 5/8" **-**











09/02/25 | FILING SET 08/25/25 90% REVIEW

08/07/25 60% PROGRESS SET

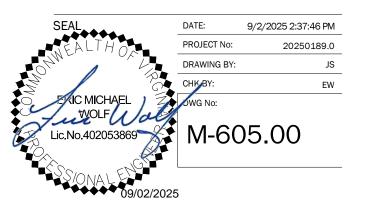
US FOODS MEZZANINE RENOVATION

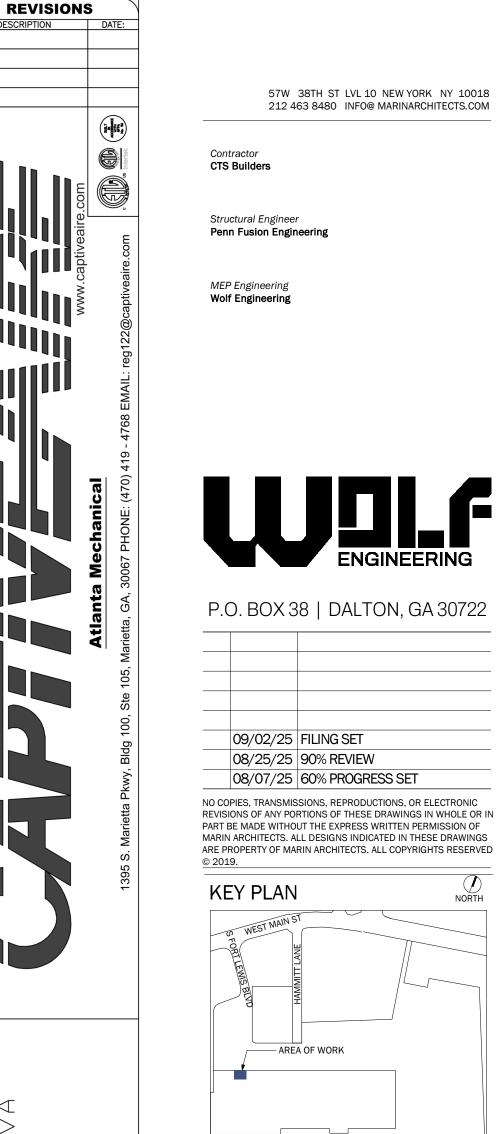
PROJECT ADDRESS:

40 S FORT LEWIS BLVD SALEM, VA 24153

DWG TITLE:

MECHANICAL DETAILS







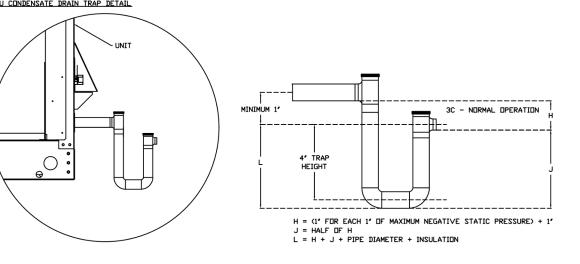
 \bigcirc $\langle \rangle$ **DATE:** 8/25/2025 DWG.#:

8190782 DRAWN BY: Jacob Harris

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

MASTER DRAWING

SHEET NO.



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

MARIN ARCHITECTS

▲ COM*check* Software Version COM*checkWeb*

Project Information

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

Project Type: Alteration

Construction Site: Owner/Agent: Designer/Contractor: 40 S FORT LEWIS BLVD.

SALEM, Virginia 24153 **Mechanical Systems List**

QuantitySystem Type & Description

1 RTU-4 (Single Zone w/ PerimeterSystem):

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

FAN 1 Supply, Single-Zone VAV, 3000 CFM, 5.0 motor nameplate hp, 0.96 fan energy index RTU-5 (Single Zone w/ PerimeterSystem):

Heating: 1 each - Central Furnace, Gas, Capacity = 349 kBtu/h
Proposed Efficiency = 81.00% Et, Required Efficiency: 81.00 % Et
Cooling: 1 each - DX DOAS (Delumbing Besting), Efficiency = 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

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

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

Mechanical Compliance Statement

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 CC/McheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

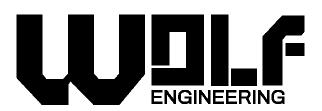
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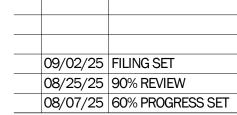
Contractor
CTS Builders

Structural Engineer Penn Fusion Engineering

MEP Engineering Wolf Engineering

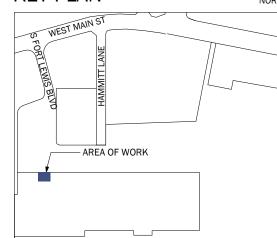


P.O. BOX 38 | DALTON, GA 30722



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© 2019. **KEY PLAN**



CLIENT:

PROJECT NAME:

US FOODS MEZZANINE RENOVATION

PROJECT ADDRESS:

40 S FORT LEWIS BLVD SALEM, VA 24153

DWG TITLE:

MECHANICAL COMPLIANCE FORMS

