MECHANICAL SPECIFICATIONS

SECTION 230000 - MECHANICAL

PART 1 - GENERAL

SCOPE OF WORK
APPLICABLE REQUIREMENTS OF BIDDING INSTRUCTIONS AND INFORMATION AND OTHER PROVISIONS OF THE GENERAL CONTRACT WORK SPECIFICATIONS SHALL APPLY TO THIS DIVISION OF THE WORK.

GENERALLY, WORK SHALL CONSIST OF NEW CONSTRUCTION. MECHANICAL CONTRACTOR SHALL MAKE A DETAILED SITE INSPECTION TO ACQUAINT THEMSELF WITH PRESENT CONDITIONS, INCLUDING THE STRUCTURE AND ANY OBSTACLES WHICH MAY BE ENCOUNTERED IN THE EXECUTION OF THE WORK.

IT IS THE SPECIFIC INTENT OF THESE SPECIFICATIONS TO INCLUDE ALL MECHANICAL WORK ITEMS OF ANY NATURE WHICH ARE NECESSARY AND ARE REQUIRED TO MAKE THE SYSTEMS OPERATE IN A SATISFACTORY AND COMPLETE CONDITION. THE MECHANICAL CONTRACTOR, THEREFORE, MUST REVIEW THESE SPECIFICATIONS AND FAMILIARIZE THEMSELF FULLY AS TO CONDITIONS SURROUNDING OR EFFECTING THIS WORK.

THE WORK TO BE DONE IN ACCORDANCE WITH THESE SPECIFICATIONS SHALL BE DONE TO COMPLY WITH THE 2018 KANSAS CITY MECHANICAL CODE AS WELL AS ALL APPLICABLE LOCALLY-ENFORCED CODES, ORDINANCES, AMENDMENTS, STATE LAWS AND FEDERAL LAWS.

FURNISH ALL LABOR, MATERIALS, HARDWARE AND EQUIPMENT REQUIRED TO COMPLETE THE INSTALLATION OF THE SYSTEMS AS DESCRIBED OR SHOWN INCLUDING ALL ACCESSORIES, FITTINGS, AUXILIARIES AND COMPONENTS REQUIRED FOR PROPER PERFORMANCE OF THE SYSTEM.

IT IS THE INTENT OF THESE SPECIFICATIONS THAT WHEREVER A MANUFACTURER OF A PRODUCT OR A CATALOG NUMBER IS SPECIFIED, EQUAL SUBSTITUTED ITEMS ARE ALLOWED UNLESS SPECIFICALLY EXCLUDED. THE SUBSTITUTED ITEM MUST CONFORM IN ALL ESSENTIAL RESPECTS TO THE SPECIFIED ITEM INCLUDING OPERATING EFFICIENCY, NOISE GENERATED, AND METHOD OF OPERATION. CONSIDERATION WILL NOT BE GIVEN CLAIMS THAT THE SUBSTITUTED ITEM MEETS PERFORMANCE REQUIREMENTS WITH LESSER CONSTRUCTION. PERFORMANCE AS DELINEATED IN SCHEDULES AND IN THE SPECIFICATIONS SHALL BE INTERPRETED AS MINIMUM PERFORMANCE. WHEN SUCH APPROVED DEVIATION REQUIRES A DIFFERENT QUANTITY AND OR ARRANGEMENT OF EQUIPMENT FROM THAT SPECIFIED OR INDICATED ON THE DRAWINGS, PROVIDE REQUIRED EQUIPMENT, WIRING, PIPING, CONNECTIONS, VALVES, AND STRUCTURAL SUPPORTS, AND ANY OTHER ADDITIONAL EQUIPMENT REQUIRED BY THE DEVIATION, AT NO ADDITIONAL COST TO THE OWNER. WHEN AN ITEM OF EQUIPMENT IS PROPOSED, OTHER THAN THAT DETAILED OR SPECIFIED ON THE DRAWINGS, WHICH REQUIRES ANY ADDITIONAL EQUIPMENT OR REDESIGN OF THE STRUCTURE, PARTITIONS, FOUNDATIONS, PIPING, WIRING OR ANY OTHER PART OF THE MECHANICAL, ELECTRICAL, PLUMBING OR ARCHITECTURAL DESIGN, SUCH COSTS SHALL BE INCURRED BY THE CONTRACTOR WITHOUT COST TO THE OWNER.

GUARANTEE
MECHANICAL CONTRACTOR SHALL GUARANTEE EACH UNIT AND ALL ACCESSORIES FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE AGAINST FAULT MATERIALS AND WORKMANSHIP AND FOR CONFORMING TO SPECIFICATIONS.

IF ANY UNIT DOES NOT OPERATE SATISFACTORILY, OR IF ANY PARTS SHOULD SHOW UNDUE WEAR DURING THE ONE YEAR PERIOD, THE MECHANICAL CONTRACTOR WILL BE NOTIFIED AND WILL BE REQUIRED TO REMEDY THE DEFECTS PROMPTLY AND MAKE THE UNIT OPERATE IN A MANNER SATISFACTORY TO THE ARCHITECT/ENGINEER. DEFECTIVE PARTS WILL BE RETURNED TO THE CONTRACTOR ONLY AT HIS OWN REQUEST AND EXPENSE.

PERMITS, FEES AND CERTIFICATES
MECHANICAL CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS AND LICENSES REQUIRED BY CITY ORDINANCES AND AFTER COMPLETION OF THE WORK SHALL FURNISH TO THE OWNER A CERTIFICATE OF FINAL INSPECTION AND APPROVAL. ALL FEES IN CONNECTION WITH INSPECTIONS, PERMITS, LICENSES AND APPROVAL SHALL BE PAID BY THE MECHANICAL CONTRACTOR.

SHOP DRAWINGS
SHOP DRAWINGS SHALL BE SUBMITTED ELECTRONICALLY AS PDF FILES. SHOP DRAWINGS SHALL INCLUDE TRANSMITTAL PAGE(S) INDICATING THE NAME OF THE PROJECT, AND THE NAME, ADDRESS, AND PHONE NUMBER OF THE GENERAL AND MECHANICAL CONTRACTORS. GENERAL CONTRACTOR AND MECHANICAL CONTRACTOR SHALL REVIEW SHOP DRAWING SUBMITTALS FOR COMPLIANCE, CONTENT AND COMPLETENESS AND PROVIDE A STAMP WITH THE DATE OF REVIEW AND SIGNATURE OF THE REVIEWER. TRANSMITTAL PAGE SHALL HAVE INDEX WITH SPECIFICATION SECTION AND DESCRIPTION OF SUBMITTED ITEMS. NO EXCEPTIONS WILL BE TAKEN. EQUIPMENT SHALL NOT BE ORDERED UNTIL ENGINEER OF RECORD HAS PROCESSED APPLICABLE SHOP DRAWINGS. A PERIOD OF TEN BUSINESS DAYS WILL BE ALLOWED FOR SUBMITTAL PROCESSING BY THE ENGINEER. MECHANICAL SUBMITTALS REQUIRED SHALL MINIMALLY INCLUDE THE FOLLOWING:

1. ALL NEW SCHEDULED EQUIPMENT WITH ACCESSORIES.
2. PIPE/ DUCTWORK INSULATION
3. SHEET METAL MATERIALS
4. AIR DEVICES

COORDINATION
MECHANICAL CONTRACTOR SHALL PROVIDE FIELD COORDINATION WITH OTHER TRADES; SYSTEMS ARE SHOWN AS DIAGRAMMATIC AND GIVE THE GENERAL ARRANGEMENT AND LOCATIONS ONLY. MECHANICAL CONTRACTOR SHALL COMPLETELY REVIEW THE ENTIRE SET OF CONSTRUCTION DRAWINGS FOR DETAILS OF CONSTRUCTION PRIOR TO STARTING WORK. ROUGH-IN OF MECHANICAL EQUIPMENT SHALL BE BASED ON THIS REVIEW. EXACT LOCATIONS AND FINAL LAYOUT SHALL BE DETERMINED IN THE FIELD. PROVIDE ALL NECESSARY EQUIPMENT, FITTINGS, HANGERS, SUPPORTS, OFFSETS AND ACCESS PANELS REQUIRED FOR A COMPLETE INSTALLATION IN ALL RESPECTS. THE MECHANICAL CONTRACTOR'S MEANS AND METHODS OF INSTALLATION SHALL PROVIDE FOR OPERATING EFFICIENCY, NEATNESS OF APPEARANCE, EASE OF MAINTENANCE, AND CODE COMPLIANCE. THE MECHANICAL CONTRACTOR SHALL PREPARE DIMENSIONED FIELD ERECTION DRAWINGS FOR USE BY THE INSTALLERS TO ENSURE PROPER INSTALLATION, CLEARANCES, AND COORDINATION WITH STRUCTURAL MEMBERS, ARCHITECTURAL WORK, AND ALL OTHER ITEMS BEING INSTALLED BY OTHER TRADE CONTRACTORS. THE MECHANICAL CONTRACTOR SHALL TAKE THEIR OWN MEASUREMENTS AT THE SITE AND BUILDING, AND BE RESPONSIBLE FOR THE CORRECT LAYOUT, INTERPRETATION, AND USE OF ALL SIZES AND DIMENSIONS. THE CONTRACTOR SHALL KEEP “AS-BUILT” INFORMATION DURING CONSTRUCTION AND FURNISH TO THE OWNER OR TENANT A RECORD SET OF LEGIBLE BLACK LINE PRINTS AND AN ELECTRONIC COPY OF THESE DOCUMENTS AT PROJECT COMPLETION.

MECHANICAL CONTRACTOR SHALL COORDINATE WITH COMMISSIONING AGENT TO PROVIDE PLANNING, REPORTING, AND MANPOWER FOR CONSTRUCTION CHECKLISTS, PRE-FUNCTIONAL CHECKLISTS, FUNCTIONAL PERFORMANCE TESTING, SEASONAL TESTING, ISSUES LOGS, OPERATIONS AND MAINTENANCE DOCUMENTATION, AND USER TRAINING. REVIEW OPR AND COMMISSIONING PLAN FOR MORE INFORMATION.

REVIEW ARCHITECTURAL DRAWINGS FOR ALL FIRE RATINGS AND FIRE RATED ASSEMBLIES PRIOR TO BIDDING THE PROJECT. PROVIDE FIRE STOP AT EACH RATED WALL, FLOOR, AND CEILING-ROOF ASSEMBLY PENETRATION. FIRE STOP SYSTEMS SHALL BE MANUFACTURED BY “3M”. PROVIDE IN STRICT COMPLIANCE WITH THE MANUFACTURER'S APPLICATION DETAILS AND INSTRUCTIONS. PROVIDE TAGGED CERTIFICATIONS AT EACH PENETRATION. PROVIDE SHOP DRAWINGS FOR REVIEW WITH THE U.L. LISTING AND TEST CRITERIA. PROVIDE FIRE STOPPING WHERE REQUIRED BY THE AHJ. EQUAL SYSTEMS AS MANUFACTURED BY “SPEC SEAL” OR “HILTI” WILL BE ACCEPTABLE.

PART 2 - PRODUCTS

23 0516 EXPANSION FITTINGS AND LOOPS FOR HVAC PIPING
- A. PRODUCTS SHALL BE SUITABLE FOR PIPING SERVICE FLUIDS, MATERIALS, WORKING PRESSURES AND TEMPERATURES.
- B. RUBBER UNION CONNECTOR EXPANSION JOINT - TWIN REINFORCED RUBBER SPHERE.
- C. FLEXIBLE HOSE PACKLESS EXPANSION JOINT - MANUFACTURED ASSEMBLY WITH INLET AND OUTLET ELBOW FITTINGS AND TWO FLEXIBLE METAL-HOSE LEGS JOINED BY LONG RADIUS, 180 DEGREE RETURN BEND.
- D. EXPANSION JOINTS FOR COPER TUBING - COPPER ALLOW FITTINGS WITH THREADED END CONNECTIONS.
- E. EXPANSION JOINTS FOR STEEL PIPING (NPS 2 AND SMALLER) - CARBON-STEEL FITTINGS WITH THREADED END CONNECTIONS.
- F. EXPANSION JOINTS FOR STEEL PIPING (NPS 2.5 TO NPS 6) - CARBON-STEEL FITTINGS WITH FLANGED END CONNECTIONS.
- G. EXPANSION JOINTS FOR STEEL PIPING (NPS 8 TO NPS 12) - CARBON-STEEL FITTINGS WITH FLANGED END CONNECTIONS.
- H. EXPANSION JOINTS FOR STEEL PIPING (NPS 14 AND LARGER) - CARBON-STEEL FITTINGS WITH FLANGED END CONNECTIONS.
- I. GROOVED JOINT EXPANSION JOINTS - GALVANIZED ASTM A 53/A 53M, SCHEDULE 40, TYPE E OR S, STEEL PIPE WITH GROOVED ENDS. FLEXIBLE TYPE COUPLINGS FOR STEEL DIMENSION.

23 0517 SLEEVES AND SLEEVE SEALS FOR HVAC PIPING
- A. CAST IRON PIPE SLEEVES: CAST OR FABRICATED OF CAST OR DUCTILE IRON AND EQUIVALENT TO DUCTILE-IRON PRESSURE PIPE WITH PLAIN ENDS AND INTEGRAL WATERSTOP COLLAR.
- B. STEEL PIPE SLEEVES: ASTM A 53/A 53M, TYPE E, GRADE B, SCH 40 WITH PLAIN ENDS AND INTEGRAL WELDED WATERSTOP COLLAR.
- C. PVC PIPE SLEEVES: ASTM D 1785, SCH 40.

23 0518 ESCUTCHEONS FOR HVAC PIPING
- A. ONE PIECE, STEEL TYPE WITH POLISHED CHROME PLATED FINISH.
- B. INSTALL WITH INSIDE DIAMETER TO CLOSELY FIT AROUND PIPE, TUBE AND INSULATION OF UNINSULATED PIPING AND WITH OUTSIDE DIAMETER THAT COMPLETELY COVERS OPENING.

23 0529 HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT
- A. CARBON-STEEL PIPE HANGERS AND SUPPORTS: MSS SP-58, TYPES 1 THROUGH 58, FACTORY-FABRICATED COMPONENTS. GALVANIZED METALLIC COATINGS: PREGALVANIZED OR HOT DIPPED. NONMETALLIC COATINGS: PLASTIC COATING, JACKET, OR LINER.
- B. TRAPEZE PIPE HANGERS: MSS SP-69, TYPE 59, SHOP- OR FIELD-FABRICATED PIPE-SUPPORT ASSEMBLY MADE FROM STRUCTURAL CARBON-STEEL SHAPES WITH MSS SP-58 CARBON-STEEL HANGER RODS, NUTS, SADDLES, AND U-BOLTS.

230553 IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT
- A. EQUIPMENT LABEL
  - a. CONTENT: INCLUDE EQUIPMENT'S DRAWING DESIGNATION OR UNIQUE EQUIPMENT NUMBER, DRAWING NUMBERS WHERE EQUIPMENT IS INDICATED (PLANS, DETAILS, AND SCHEDULES), AND THE SPECIFICATION SECTION NUMBER AND TITLE WHERE EQUIPMENT IS SPECIFIED.
  - b. INSTALL OR PERMANENTLY FASTEN LABELS ON EACH MAJOR ITEM OF MECHANICAL EQUIPMENT.
  - c. LOCATE EQUIPMENT LABELS WHERE ACCESSIBLE AND VISIBLE.
- B. PIPE LABEL
  - a. GENERAL REQUIREMENTS FOR MANUFACTURED PIPE LABELS: PREPRINTED, COLOR-CODED, WITH LETTERING INDICATING SERVICE, AND SHOWING FLOW DIRECTION ACCORDING TO ASME A13.1.
  - b. PIPE LABEL LOCATIONS: LOCATE PIPE LABELS WHERE PIPING IS EXPOSED OR ABOVE ACCESSIBLE CEILINGS IN FINISHED SPACES; MACHINE ROOMS; ACCESSIBLE MAINTENANCE SPACES SUCH AS SHAFTS, TUNNELS, AND PLENUMS; AND EXTERIOR EXPOSED LOCATIONS AS FOLLOWS:
  - i. NEAR EACH VALVE AND CONTROL DEVICE.
  - ii. NEAR EACH BRANCH CONNECTION, EXCLUDING SHORT TAKEOFFS FOR FIXTURES AND TERMINAL UNITS. WHERE FLOW PATTERN IS NOT OBVIOUS, MARK EACH PIPE AT BRANCH.
  - iii. NEAR PENETRATIONS AND ON BOTH SIDES OF THROUGH WALLS, FLOORS, CEILINGS, AND INACCESSIBLE ENCLOSURES.
  - iv. AT ACCESS DOORS, MANHOLES, AND SIMILAR ACCESS POINTS THAT PERMIT VIEW OF CONCEALED PIPING.
  - v. NEAR MAJOR EQUIPMENT ITEMS AND OTHER POINTS OF ORIGINATION AND TERMINATION.
  - vi. SPACED AT MAXIMUM INTERVALS OF 50 FEET ALONG EACH RUN.
  - vii. REDUCE INTERVALS TO 25 FEET IN AREAS OF CONGESTED PIPIPNG AND EQUIPMENT.
  - viii. ON PIPING ABOVE REMOVABLE ACOUSTICAL CEILINGS. OMIT INTERMEDIATELY SPACES LABELS.
  - c. DIRECTIONAL FLOW ARROWS: ARROWS SHALL BE USED TO INDICATE DIRECTION OF FLOW IN PIPES, INCLUDING PIPES WHERE FLOW IS ALLOWED IN BOTH DIRECTIONS.
- C. DUCT LABEL
  - a. CONTENTS: INCLUDE IDENTIFICATION OF DUCT SERVICE USING SAME DESIGNATIONS OR ABBREVIATIONS AS USED ON DRAWINGS; ALSO INCLUDE DUCT SIZE AND AN ARROW INDICATING FLOW DIRECTION.
  - b. LOCATE LABELS NEAR POINTS WHERE DUCTS ENTER INTO AND EXIT FROM CONCEALED SPACES AND AT MAXIMUM INTERVALS OF 50 FEET IN EACH SPACE WHERE DUCTS ARE EXPOSED OR CONCEALED BY REMOVABLE CEILING SYSTEM.
- D. VALVE TAGS
  - a. TABULATE VALVE NUMBER, PIPING SYSTEM, SYSTEM ABBREVIATION (AS SHOWN ON VALVE TAG), LOCATION OF VALVE (ROOM OR SPACE), NORMAL-OPERATING POSITION (OPEN, CLOSED, OR MODULATING), AND VARIATIONS FOR IDENTIFICATION. MARK VALVES FOR EMERGENCY SHUTOFF AND SIMILAR SPECIAL USES.
  - b. INSTALL TAGS ON VALVES AND CONTROL DEVICES IN PIPING SYSTEMS, EXCEPT CHECK VALVES, VALVES WITHIN FACTORY-FABRICATED EQUIPMENT UNITS, SHUTOFF VALVES, FAUCETS, CONVENIENCE AND LAWN-WATERING HOSE CONNECTIONS, AND HVAC TERMINAL DEVICES AND SIMILAR ROUGHING-IN CONNECTIONS OF END-USE FIXTURES AND UNITS. LIST TAGGED VALVES IN A VALVE SCHEDULE.

230593 TESTING, ADJUSTING, AND BALANCING FOR HVAC
- A. TAB SPECIALISTS QUALIFICATIONS: CERTIFIED BY AABC, NEBB, OR TABB.
- B. PERFORM TESTING AND BALANCING PROCEDURES ON EACH SYSTEM ACCORDING TO THE PROCEDURES CONTAINED IN AABC'S "NATIONAL STANDARDS FOR TOTAL SYSTEM BALANCE", ASHRAE 111, NEBB'S "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND BALANCING OF ENVIRONMENTAL SYSTEMS", SMACNA'S "HVAC SYSTEMS - TESTING, ADJUSTING, AND BALANCING", AND IN THIS SECTION.
- C. ALL MECHANICAL SYSTEMS SHALL BE TESTED, BALANCED, AND ADJUSTED. COORDINATE AND PROVIDE BALANCING DEVICE REQUIREMENTS WITH TEST AND BALANCE SERVICE TO ASSURE ADEQUATE DAMPERS AND VALVES ARE PROVIDED FOR FLOW CONTROL. MECHANICAL CONTRACTOR TO PROVIDE ALL MANUAL VOLUME DAMPERS WHERE SHOWN ON DRAWINGS AND WHERE REQUESTED BY BALANCING CONTRACTOR TO PROVIDE A COMPLETE AND FUNCTIONING SYSTEM.
- D. SYSTEM BALANCING SHALL INCLUDE:
  - a. AIR SYSTEM BALANCE
  - b. HYDRONIC SYSTEM BALANCE
  - c. CONTROL SYSTEMS VERIFICATION
  - d. DUCT LEAKAGE TESTING
  - e. SYSTEM PERFORMANCE VERIFICATION
  - f. OPPOSITE SEASON TEST
  - g. PRE-CONSTRUCTION VERIFICATION SURVEY REPORT (FOR RENOVATION PROJECTS)

230713 DUCT INSULATION
- A. COMPLY WITH REQUIREMENTS IN "DUCT INSULATION SCHEDULE" ON PLANS FOR WHERE INSULATING MATERIALS SHALL BE APPLIED.

231123 FACILITY NATURAL GAS PIPING
- A. NATURAL GAS - SEISMICALLY ACTIVE
  - a. SCHEDULE 40 BLACK STEEL, TYPE E OR S, GRADE B ASTM A53/A53M - WROUGHT STEEL FITTINGS ASTM A234/A234M. WELD PER AWS D10.12/D10.12M OR BRAZE PER AWS A5.8/A5.8M.
  - b. DRAWN COPPER TUBE, TYPE "L" ASTM B88, WROUGHT COPPER FITTINGS ASTM B16.22, BRAZE PER AWS A5.8/A5.8M.
  - c. ANSI/IAS LC 1 CORRUGATED, STAINLESS-STEEL TUBING. ASTM A 240/A 240M, CORRUGATED, SERIES 300 STAINLESS STEEL TUBING. COPPER-ALLOY MECHANICAL FITTINGS, LISTED FOR USE WITH CORRUGATED STAINLESS-STEEL TUBING, SEAL WITHOUT GASKETS. INCLUDE BRAZING SOCKET OR THREADED ENDS ASME B1.20.1.
- B. NATURAL GAS - COMBUSTION AIR+VENT EXHAUST
  - a. SOLID WALL PVC SCHEDULE 40 , ASTM D 2665 DWV, PVC FITTINGS: ASTM D 2665 MADE TO ASTM 3311 DWV, PRIMER: ASTM F 656, SOLVENT: ASTM D 2564.
- C. NATURAL GAS - COMBUSTION AIR+VENT EXHAUST, PLENUM SPACES
  - a. HEATFAB/SELKIRK "SAF-T VENT SEAL SPECIAL GAS VENT AND CONNECTORS". FOR ANSI CATEGORY TYPE IV GAS APPLIANCES. SINGLE WALL AL 29-4C STAINLESS STEEL. TESTED AND LISTED TO UL 1738.
- D. ALL GAS PIPING EXPOSED TO THE ELEMENTS SHALL BE PAINTED WITH RUST INHIBITING PAINT. COORDINATE COLOR WITH ARCHITECT.

23 2113 HYDRONIC PIPING
- B. PERFORMANCE REQUIREMENTS
  - a. HYDRONIC PIPING COMPONENTS AND INSTALLATION SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING MINIMUM WORKING PRESSURE AND TEMPERATURE UNLESS OTHERWISE INDICATED:
  - i. CONDENSATE DRAIN PIPING: 150 DEG F.
- C. CONDENSATE PIPING
  - a. PIPING LOCATED IN RETURN AIR PLENUM SHALL BE TYPE M HARD DRAWN COPPER.
  - b. PIPING LOCATED OUT OF A RETURN AIR PLENUM SHALL BE SCHEDULE 40 PVC WITH SOLVENT WELDED JOINTS.
  - c. PIPING SHALL BE PITCHED IN THE DIRECTION OF FLOW WITH A PITCH OF 1” PER 8'.
  - d. PIPING SHALL BE INSULATED WITH ½” WALL THICKNESS “AP ARMAFLEX SS” INSULATION.
- D. INSTALL PIPING IN CONCEALED LOCATIONS UNLESS OTHERWISE INDICATED AND EXCEPT IN EQUIPMENT ROOMS AND SERVICE AREAS.

23 2300 REFRIGERANT PIPING
- A. COPPER TUBE AND FITTINGS
  - a. HARD DRAWN COPPER TUBE SHALL BE ASTM B 280, TYPE ACR WITH WROUGHT COPPER FITTINGS. ALL JOINTS SHALL BE BRAZED.
- B. INSULATE REFRIGERANT SUCTION LINES WITH 1” WALL THICKNESS INSULATED EQUAL TO “AP ARMAFLEX SS.” COAT EXTERIOR INSULATION WITH UV, OZONE, AND MOISTURE RESISTANT COMPOUND.

23 3113 METAL DUCTS
- A. SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS:
  - a. COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" BASED ON INDICATED STATIC-PRESSURE CLASS UNLESS OTHERWISE INDICATED.
  - b. TRANSVERSE JOINTS: SELECT JOINT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-1, "RECTANGULAR DUCT/TRANSVERSE JOINTS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
  - c. LONGITUDINAL SEAMS: SELECT SEAM TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-2, "RECTANGULAR DUCT/LONGITUDINAL SEAMS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
  - d. ELBOWS, TRANSITIONS, OFFSETS, BRANCH CONNECTIONS, AND OTHER DUCT CONSTRUCTION: SELECT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," CHAPTER 4, "FITTINGS AND OTHER CONSTRUCTION," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
- B. SINGLE-WALL ROUND DUCTS AND FITTINGS
  - a. GENERAL FABRICATION REQUIREMENTS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," CHAPTER 3, "ROUND, OVAL, AND FLEXIBLE DUCT," BASED ON INDICATED STATIC-PRESSURE CLASS UNLESS OTHERWISE INDICATED.
  - b. TRANSVERSE JOINTS: SELECT JOINT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-1, "ROUND DUCT TRANSVERSE JOINTS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
  - c. LONGITUDINAL SEAMS: SELECT SEAM TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-2, "ROUND DUCT LONGITUDINAL SEAMS," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
  - d. TEES AND LATERALS: SELECT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-5, "90 DEGREE TEES AND LATERALS," AND FIGURE 3-6, "CONICAL TEES," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
- C. DUCT SEALING: SEAL DUCTS AT A MINIMUM TO THE FOLLOWING SEAL CLASSES IN ACCORDANCE WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE":
  - a. COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
  - b. OUTDOOR, SUPPLY-AIR DUCTS: SEAL CLASS A.
  - c. CONDITIONED SPACE, SUPPLY-AIR DUCTS IN PRESSURE CLASSES 2-INCH WG (500 PA) AND LOWER: SEAL CLASS C.
  - d. CONDITIONED SPACE, SUPPLY-AIR DUCTS IN PRESSURE CLASSES HIGHER THAN 2-INCH WG (500 PA): SEAL CLASS B.
  - e. CONDITIONED SPACE, EXHAUST DUCTS: SEAL CLASS B.
  - f. CONDITIONED SPACE, RETURN-AIR DUCTS: SEAL CLASS C.

23 3300 AIR DUCT ACCESSORIES
- A. ASSEMBLY DESCRIPTION
  - a. COMPLY WITH SMACNA'S “HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE” FOR ACCEPTABLE MATERIALS, MATERIAL THICKNESSES, AND DUCT CONSTRUCTION METHODS UNLESS OTHERWISE INDICATED. SHEET METAL MATERIALS SHALL BE FREE OF PITTING, SEAM MARKS, ROLLER MARKS, STAINS, DISCOLORATION, AND OTHER IMPERFECTIONS.
- B. DAMPERS
  - a. MAXIMUM AIR VELOCITY: 2000 FPM
  - b. MAXIMUM SYSTEM PRESSURE: 2-INCH WG.

23 3423 HVAC POWER VENTILATORS
- A. PROVIDE EXHAUST FANS AS SCHEDULED.

23 3713 AIR DEVICES
- A. PROVIDE AIR DEVICES AS SCHEDULED. NOISE CRITERIA SHALL BE 25 OR LESS. SUPPLY REGISTERS SHALL CONTAIN AN ADJUSTABLE VOLUME DAMPER.

PART 3 - EXECUTION

- A. UPON SUBSTANTIAL COMPLETION OF THE PROJECT AND PRIOR TO MECHANICAL CONTRACTOR'S REQUEST FOR FINAL INSPECTION, THE CONTRACTOR SHALL FURNISH TO THE GENERAL CONTRACTOR FOR REVIEW, ONE (1) SET OF OPERATION AND MAINTENANCE MANUALS ON ONE (1) THUMB DRIVE MEMORY USB STICKS. O&M MANUALS SHALL MINIMALLY INCLUDE THE FOLLOWING:
  - a. STARTUP AND SHUTDOWN PROCEDURES FOR EACH MAJOR PIECE OF EQUIPMENT.
  - b. OPERATING INSTRUCTIONS OUTLINING THE SAFE AND EFFICIENT OPERATION OF EACH MAJOR PIECE OF EQUIPMENT.
  - c. EQUIPMENT LIST OF EACH MAJOR PIECE OF EQUIPMENT INCLUDING THE MAKE, MODEL, SERIAL NUMBER (IF APPLICABLE), VOLTAGE, PHASE, # WIRES, AMPACITY AND ALL OTHER INDUSTRY STANDARD NAMEPLATE DATA.
  - d. SERVICE INSTRUCTIONS OUTLINING THE RECOMMENDED SPARE PARTS, ALONG WITH THE CONTACT INFORMATION FOR THE LOCAL SUPPLIER AND/OR FACTORY REPRESENTATIVE(S), AND THE RECOMMENDED FREQUENCY OF SERVICE OF EACH MAJOR PIECE OF EQUIPMENT.
  - e. COPIES OF REVIEWED/APPROVED SHOP DRAWINGS/SUBMITTALS.
  - f. AS-BUILT/RECORD DRAWINGS AND DOCUMENTATION.
  - g. GUARANTEES/WARRANTIES.
  - h. INSPECTION CARDS AND APPROVALS.
  - i. NAME OF OWNER, ARCHITECT, ENGINEER OF RECORD, CONTRACTOR AND ALL SUB-CONTRACTORS.

MECHANICAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	HRCU	HEAT RECOVERY CONDENSING UNIT
AHJ	AUTHORITY HAVING JURISDICTION	HWCP	HOT WATER CIRC. PUMP
AHU	AIR HANDLING UNIT	HX	HEAT EXCHANGER
AIP	ABANDON IN PLACE	IOM	INSTALLATION & OPERATION MANUAL
AL	ALUMINUM	ID	INSIDE DIAMETER
ALT	ALTERNATE	IR	INFRA-RED TUBE HEATER (GAS)
AP	ACCESS PANEL	IV	INTAKE VENTILATOR
AS	AIR SEPARATOR	KEF	KITCHEN EXHAUST FAN
ATC	AUTOMATIC TEMPERATURE CONTROL VALVE	LLSV	LIQUID LINE SOLENOID VALVE
ATR	ALL THREAD ROD	LV	LOUVER
ATU	AIR TERMINAL UNIT	LPG	LIQUEFIED PETROLEUM GAS (PROPANE)
AV	MANUAL AIR VENT	MAX	MAXIMUM
BB	BASEBOARD HEATER	MC	MECHANICAL WORK CONTRACTOR
BDD	BACK DRAFT DAMPER	MCA	MINIMUM CIRCUIT AMPERES
BMS	BUILDING MANAGEMENT SYSTEM	MD	MANUAL DAMPER
BOD	BOTTOM OF DUCT	MIN	MINIMUM
BOE	BOTTOM OF EQUIPMENT	MOCP	MAXIMUM OVER CURRENT PROTECTION
BOP	BOTTOM OF PIPE	MTD	MOUNTED
BS	BRANCH SELECTOR - DAIKIN	MUA	MAKE-UP AIR
CH	CHILLER	MUW	MAKE UP WATER
CLG	CEILING	NC	NORMALLY CLOSED
CO	CARBON MONOXIDE	NIC	NOT IN CONTRACT
CO2	CARBON DIOXIDE	NO	NORMALLY OPEN
CR	CONDENSER WATER RETURN	OA	OUTDOOR AIR
CRAC	COMPUTER ROOM AIR CONDITIONER	OD	OUTSIDE DIAMETER
CRCU	COMPUTER ROOM CONDENSING UNIT	OX	OXYGEN
CS	CONDENSER WATER SUPPLY	PC	PLUMBING WORK CONTRACTOR
CSST	CORRUGATED STAINLESS STEEL TUBING	PCF	POUNDS/CUBIC FOOT
CT	COOLING TOWER	PSG	PUMP SUCTION GUIDE
CU	CONDENSING UNIT	PT	PRESSURE TREATED
CUH	CABINET UNIT HEATER	PVC	POLYVINYL CHLORIDE
DDC	DIRECT DIGITAL CONTROL	RA	RETURN AIR
DISC	DISCONNECT	RAH	RELIEF AIR HOOD
DLSS	DUCTLESS SPLIT SYSTEM	RF	RETURN FAN
DN	DOWN	RG	RETURN GRILLE
DPS	DIFFERENTIAL PRESSURE SWITCH	RL	EXISTING DEVICE RELOCATED
(E)	EXISTING	RTD	RESISTANCE TEMPERATURE DETECTOR
EA	EXHAUST AIR	RTU	ROOF TOP UNIT
EBB	ELECTRIC BASE BOARD	RV	RELIEF VENTILATOR
EC	ELECTRICAL WORK CONTRACTOR	SA	SUPPLY AIR
EF	EXHAUST FAN	SF	SUPPLY FAN
EG	EXHAUST GRILLE	SG	SUPPLY GRILLE
EMS	ENERGY MANAGEMENT SYSTEM	SMS	SHEET METAL SCREW
EQPT	EQUIPMENT	SS	STAINLESS STEEL
ERV	ENERGY RECOVERY VENTILATOR	TA	TRANSFER AIR
ET	EXPANSION TANK	TEMP	TEMPORARY
EUH	ELECTRIC UNIT HEATER	TOD	TOP OF DUCT
EWC	ELECTRIC WATER COOLER	TOP	TOP OF PIPE
EWH	ELECTRIC WATER HEATER	TXV	THERMAL EXPANSION VALVE
EXH	EXHAUST	TYP	TYPICAL
FC	FLEX CONNECTION	UH	UNIT HEATER
FCU	FAN COIL UNIT	UON	UNLESS OTHERWISE NOTED
FD	FIRE DAMPER	UNV	UNIVERSAL
FPC	FIRE PROTECTION CONTRACTOR	UTR	UP THROUGH ROOF
FRT	FIRE-RETARDANT-TREATED	VAV	VARIABLE AIR VOLUME
FSD	FIRE/SMOKE DAMPER	VFD	VARIABLE FREQUENCY DRIVE
FSEC	FOOD SERVICE EQPT. CONTRACTOR	VRF	VARIABLE REFRIGERANT FLOW
FTU	FAN TERMINAL UNIT	VRV	VARIABLE REFRIGERANT VOLUME
FV	FIELD VERIFY	VSD	VARIABLE SPEED DRIVE
GC	GENERAL WORK CONTRACTOR	W/	WITH
GF	GAS FURNACE	WP	WEATHERPROOF
GWH	GAS WATER HEATER	WSHP	WATER SOURCE HEAT PUMP
HP	HEAT PUMP or HORSEPOWER	XFMR	TRANSFORMER

MECHANICAL SYMBOLS

DUCT AND DAMPERS

SUPPLY AIR DUCT UP
SUPPLY AIR DUCT DOWN
RETURN AIR DUCT UP
RETURN AIR DUCT DOWN
EXHAUST AIR DUCT UP
EXHAUST AIR DUCT DOWN
CHANGE IN DUCT SIZE
TURNING VANES
FLEXIBLE DUCT CONNECTION
HORIZONTAL LIFE SAFETY DAMPER
VERTICAL LIFE SAFETY DAMPER
MOTORIZED AUTOMATIC DAMPER (MAD)
MANUAL DAMPER
EXISTING DUCT TO REMAIN
EXISTING TO BE DEMOLISHED
DUCT INSULATION TAG
PIPE/DUCT IN ATTIC
PIPE/DUCT BELOW FLOOR OR GRADE
PIPE/DUCT ABOVE CEILING
EXPOSED DUCT, W/ MILL PHOSPHATIZED FINISH
PIPE/DUCT ON ROOF

SYMBOLS AND TAGS

CARBON DIOXIDE DETECTOR
CARBON MONOXIDE DETECTOR
HUMIDISTAT
MANOMETER
PRESSURE SWITCH
RETURN AIR SMOKE DETECTOR
REFRIGERANT (Rxxx) DETECTOR
REFRIGERANT LEAK HORN-STROBE
THERMOSTAT (48" AFF UON)
NEW CONNECTION TO EXISTING (VERIFY SIZE AND LOCATION IN FIELD)
KEYED NOTE SYMBOL
REVISION SYMBOL
EQUIPMENT CALLOUT
GRILLE/DIFFUSER CALLOUT
LIFE SAFETY DAMPER CALLOUT

MECHANICAL PIPING

——— A ———	COMPRESSED AIR LINE
——— CD ———	CONDENSATE DRAIN
– – – CD – – –	CONDENSATE DRAIN BELOW FLOOR
——— CS ———	CONDENSER WATER SUPPLY
– – – CR – – –	CONDENSER WATER RETURN
——— CHS ———	CHILLED & HOT WATER SUPPLY
— — CHR — —	CHILLED & HOT WATER RETURN
——— CWS ———	CHILLED WATER SUPPLY
— — CWR — —	CHILLED WATER RETURN
——— D ———	DRAIN LINE
——— G ———	GAS LINE
——— HG ———	HOT GAS LINE
——— HPWS ———	HEAT PUMP WATER SUPPLY
— — HPWR — —	HEAT PUMP WATER RETURN
— — HPC — —	HIGH PRESSURE CONDENSATE
——— HPS ———	HIGH PRESSURE STEAM
——— HWS ———	HOT WATER SUPPLY
— — HWR — —	HOT WATER RETURN
— — LPC — —	LOW PRESSURE CONDENSATE
——— LPG ———	LIQUEFIED PETROLEUM GAS (PROPANE)
——— LPS ———	LOW PRESSURE STEAM
— — MPC — —	MEDIUM PRESSURE CONDENSATE
——— MPS ———	MEDIUM PRESSURE STEAM
——— MUW ———	MAKE-UP WATER
——— RL ———	REFRIGERANT LIQUID LINE
– – – RS – – –	REFRIGERANT SUCTION LINE
~~XX~~ — TYPE ~~XX~~ —	EXISTING PIPE TO BE REMOVED
— ~~TYPE~~ —	EXISTING PIPE TO BE REMOVED
— TYPE (E) ——	EXISTING PIPING

PIPING SYMBOLS

AUTOMATIC AIR VENT (AAV)
AUTOMATIC FLOW CONTROL VALVE
AUTOMATIC TEMPERATURE CONTROL VALVE (3-WAY)
AUTOMATIC TEMPERATURE CONTROL VALVE (2-WAY)
PRESSURE RELIEF VALVE
BALL VALVE (BV)
CHECK VALVE (CV)
CIRCUIT SETTER (CS)
COMPRESSED AIR QUICK-CONNECT
CONCENTRIC PIPE REDUCER
ECCENTRIC PIPE REDUCER
EMERGENCY GAS SHUT-OFF VALVE
FLEXIBLE PIPE CONNECTION
GAS SHUT-OFF VALVE (SOV)
GATE VALVE (GT. V.)
GEAR OPERATED BUTTERFLY VALVE
GLOBE VALVE (GL. V.)
HOSE END VALVE
MANUAL AIR VENT (MAV)
PETE'S PLUG (TEMPERATURE & PRESSURE PORT)
PLUG VALVE
PRESSURE GAUGE
PRESSURE REDUCING VALVE (PRV)
STRAINER (STR)
STRAINER WITH BLOWDOWN
THERMOMETER
TRIPLE DUTY VALVE (TDV)
VALVE IN RISER
WATER METER

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A NEW:
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8526 N. JEFFERSON STREET
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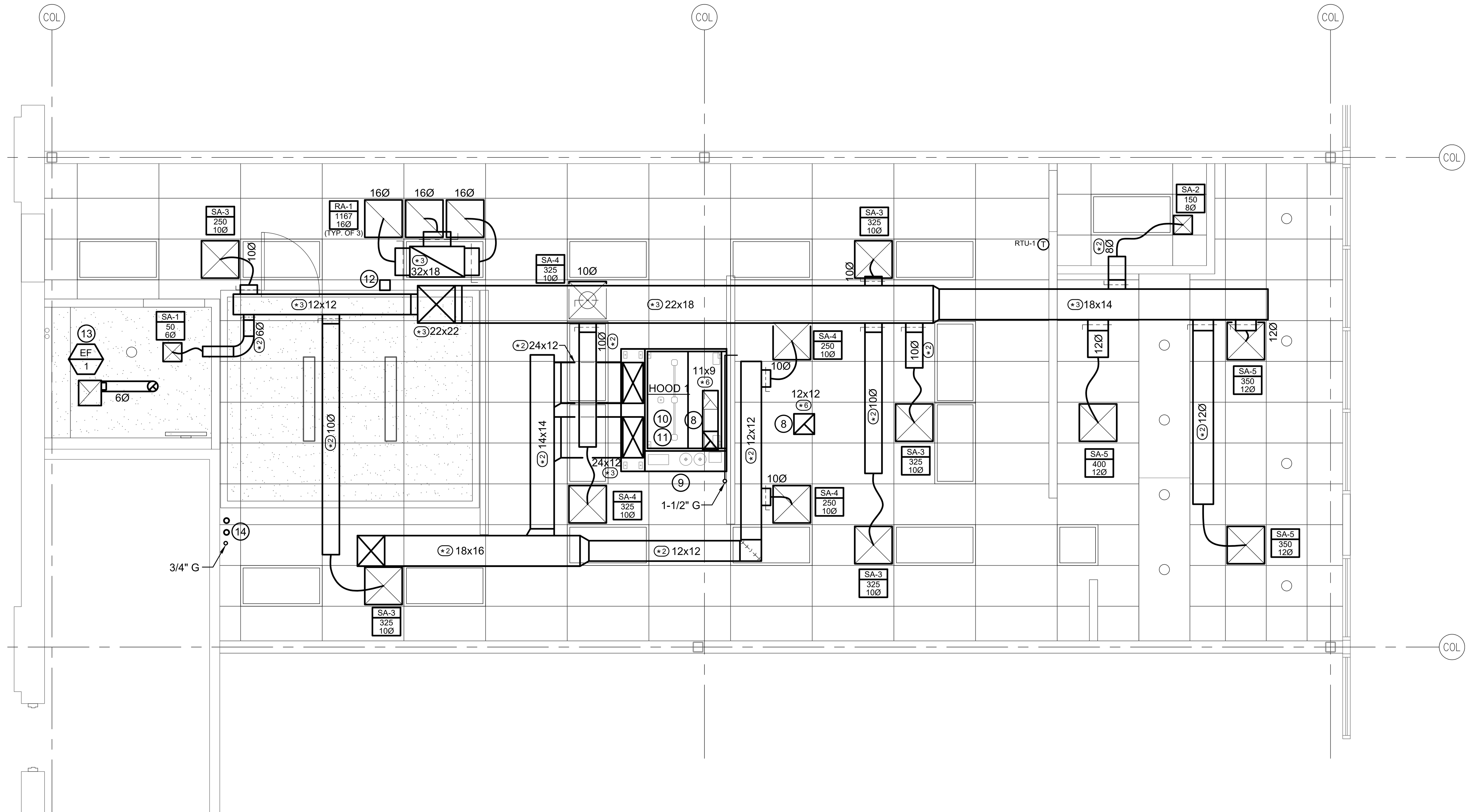
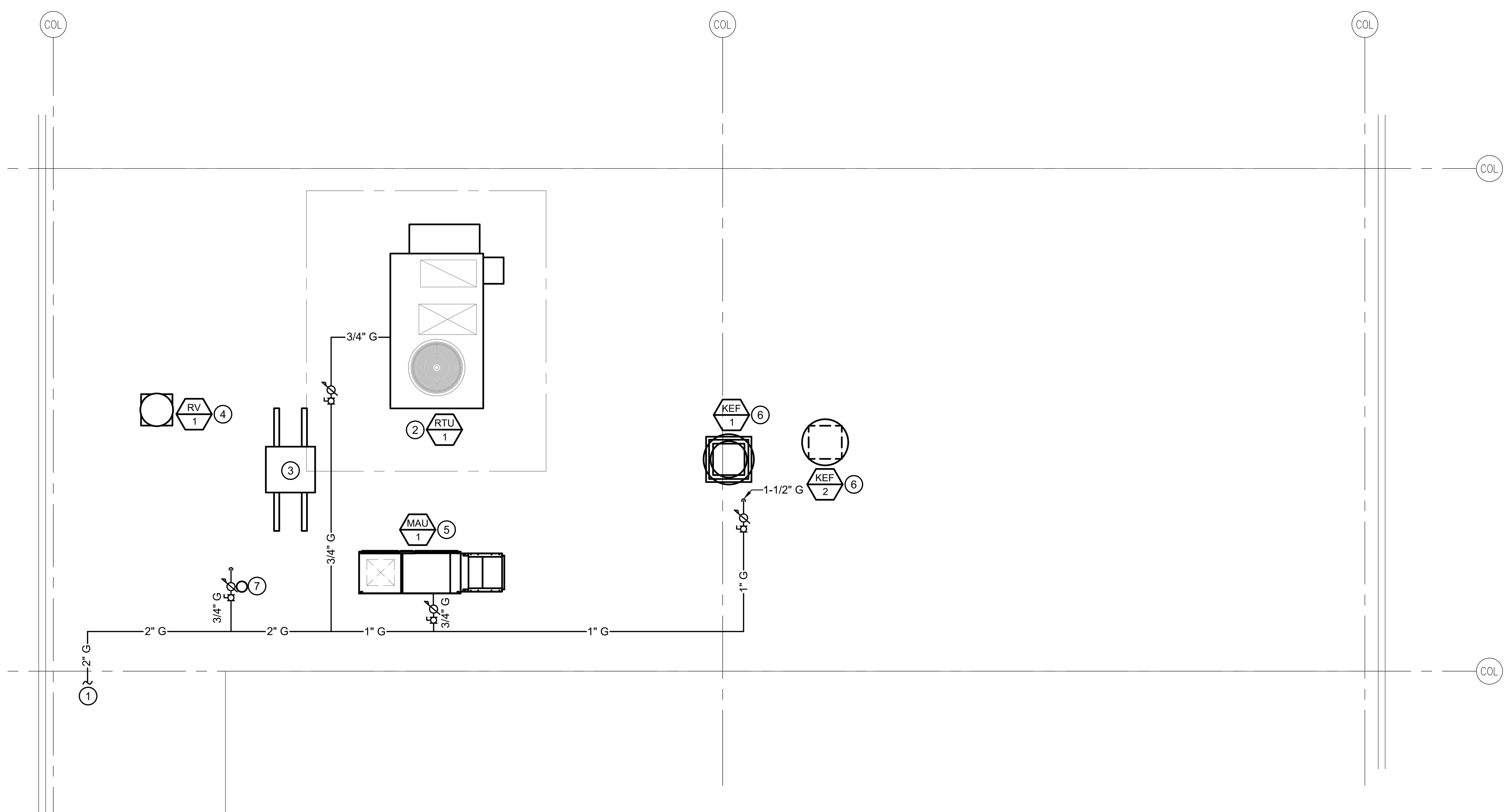
JOB NUMBER: 25030
ISSUE DATE: 06.06.2025
REVISIONS:

MECHANICAL
SYMBOLS AND
SPECIFICATIONS

M0.0



CEILING PLAN - MECHANICAL
SCALE: 1/4" = 1'-0"



ROOF PLAN - MECHANICAL
SCALE: 1/4" = 1'-0"

KEYED NOTES

1. EXTEND 2" GAS LINE APPROXIMATELY 15' ON ROOF AND CONNECT TO EXISTING GAS LINE DEDICATED FOR THIS TENANT SPACE. COORDINATE WITH LANDLORD.

2. PROVIDE AND INSTALL ELECTRIC COOLING/NATURAL GAS HEATING PACKAGED ROOFTOP UNIT AS SCHEDULED AND SPECIFIED ON MANUFACTURER PROVIDED ROOF CURB. UNIT SHALL SET DEAD LEVEL ON EQUIPMENT CURB ON ROOF, SHIM AS REQUIRED. COORDINATE ANY ROOF MODIFICATION WITH LANDLORD ROOFING CONTRACTOR. PROVIDE FLEXIBLE DUCT CONNECTIONS FROM PLENUM TO BOTTOM OF CURB. EXTEND INSULATED SUPPLY AND RETURN DUCTWORK VERTICALLY FULL SIZE FROM UNIT CONNECTION WITH FLEXIBLE DUCT CONNECTION AND TRANSITION TO DUCT SIZE SHOWN. ROUTE CONDENSATE PIPE TO NEAREST ROOF DRAIN OR GUTTER. REPLACE AIR FILTER(S) AFTER COMPLETION OF CONSTRUCTION, AND PRIOR TO OCCUPANCY. PROVIDE GAS CONNECTION PER DETAIL.

3. INSTALL COOLER CONDENSING UNIT (PROVIDED BY OTHERS) ON EQUIPMENT RAILS PER DETAIL AND ROUTE REFRIGERANT LINES TO INDOOR EVAPORATOR. COORDINATE WITH EQUIPMENT VENDOR FOR SIZING. PROVIDE ROOF PENETRATION FOR REFRIGERANT PIPING PER DETAIL.

4. PROVIDE RELIEF VENTILATOR AS SCHEDULED AND SPECIFIED ON MANUFACTURER PROVIDED ROOF CURB. UNIT SHALL SET DEAD LEVEL ON EQUIPMENT CURB ON ROOF, SHIM AS REQUIRED. COORDINATE ANY ROOF MODIFICATION WITH LANDLORD ROOFING CONTRACTOR. EXTEND DUCT TO CEILING EXHAUST FAN.

5. PROVIDE AND INSTALL DIRECT FIRED NATURAL GAS MAU ON MANUFACTURER PROVIDED ROOF CURB. COORDINATE ANY ROOF MODIFICATION WITH LANDLORD ROOFING CONTRACTOR. PROVIDE FLEXIBLE DUCT CONNECTION FROM PLENUM TO BOTTOM OF CURB. PROVIDE GAS CONNECTION PER DETAIL.

6. PROVIDE AND INSTALL NEW KITCHEN EXHAUST FAN ON MANUFACTURER PROVIDED ROOF CURB, MINIMUM OF 10' AWAY FROM OUTSIDE AIR INTAKES. UNIT SHALL SET DEAD LEVEL ON CURB, SHIM AS REQUIRED. PROVIDE CONTROLS TO INTERLOCK FAN WITH HOODS PER MANUFACTURER DRAWINGS.

7. CONCENTRIC VENT FOR GAS WATER HEATER. INSTALL PER MANUFACTURER'S IOM. MAINTAIN A MINIMUM OF 10'-0" FROM OUTSIDE AIR INTAKES.

8. TRANSITION GREASE EXHAUST DUCT UP FROM HOOD COLLAR TO KITCHEN EXHAUST FAN ON ROOF, EXHAUST DUCT SHALL MAINTAIN THE DESIGN AIR VELOCITY THROUGHOUT. FIELD VERIFY ANY REQUIRED TRANSITIONS OR OFFSETS OF EXHAUST DUCT FROM COMBUSTIBLE MATERIALS TO MAINTAIN THE MINIMUM CLEARANCES REQUIRED PER APPLICABLE CODE(S) AND FIRE WRAP PER MANUFACTURER'S INSTRUCTIONS. PROVIDE CLEANOUTS AS REQUIRED AND PITCH PER LOCAL CODE. BALANCE AS REQUIRED.

9. CONTRACTOR TO MAINTAIN REQUIRED CLEARANCE AT CONTROL SIDE OF ANSUL SYSTEM BOX PER MANUFACTURER'S RECOMMENDATIONS. COORDINATE IN FIELD.

10. CONTRACTOR TO COORDINATE LOCATION OF HOOD WITH LOCATION OF EQUIPMENT BELOW HOOD. REFER TO EQUIPMENT PLAN FOR LOCATION OF ALL KITCHEN EQUIPMENT. COORDINATE FINAL ARRANGEMENT WITH CAPTIVEAIRE PRIOR TO ORDER.

11. ALL MATERIALS INSTALLED WITHIN 18" OF TYPE 1 HOOD SHALL BE NON-COMBUSTIBLE.

12. CONTRACTOR TO PROVIDE MANUAL PULL STATION FOR KITCHEN HOOD FIRE SUPPRESSION SYSTEM ACTIVATION AND GAS SUPPLY SHUT-OFF TO BE PROVIDED BY THE FIRE-SUPPRESSION SUBCONTRACTOR. GENERAL CONTRACTOR SHALL PROVIDE RECESSED JUNCTION BOX AND CONDUIT FOR PULL STATION LINKAGE. FIRE SUPPRESSION SUBCONTRACTOR SHALL VERIFY APPROVED LOCATION WITH THE LOCAL AUTHORITY AND COORDINATE THE COMPLETE INSTALLATION WITH ALL OTHER TRADES.

13. PROVIDE CEILING MOUNTED EXHAUST FAN. ROUTE EXHAUST DUCTWORK TO RELIEF VENTILATOR ON ROOF. INTERLOCK WITH RESTROOM LIGHTING CIRCUIT.

14. 3" SOLID CORE VPC COMBUSTION AIR AND VENT PIPING FROM WATER HEATER TO CONCENTRIC VENT ON ROOF. MAINTAIN MINIMUM 10' FROM OUTSIDE AIR INTAKE.

GENERAL NOTES - MECHANICAL

A. COORDINATE ALL ROOF WORK WITH LANDLORD'S ROOFING CONTRACTOR.

B. ROOFTOP EQUIPMENT REQUIRING SERVICE SHALL BE LOCATED A MINIMUM 10' FROM THE ROOF EDGE.

C. KITCHEN EXHAUST DUCT REQUIRES A SMOKE TEST IS PERFORMED PRIOR TO WRAPPING DUCT AND COVERING.

D. DUCT SMOKE DETECTORS SHALL BE RESETTABLE BY THE FACP.

E. FRESH AIR INTAKES ARE TO BE A MINIMUM OF 10 FEET AWAY FROM ANY SANITARY SEWER VENT.

F. HVAC - MUST LABEL RTU'S WITH SUITE NUMBER.

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CEILING PLAN
MECHANICAL

M2.0

KITCHEN HOOD NOTES:

THE FOLLOWING ARE MINIMUM STANDARDS FOR THE INSTALLATION AND PERFORMANCE OF THE COMMERCIAL HOOD, EXHAUST, MAKE-UP AIR, FIRE SUPPRESSION SYSTEM AND ELECTRICAL WORK.

TYPE I HOOD EXHAUST FAN

1. HOOD EXHAUST FAN MUST BE CONSTRUCTED TO COMPLY WITH 2018 IMC 506.5.3 AND 2017 NFPA 96 7.8.2.1 (4), (5) AND CONTAIN AN APPROVED GREASE COLLECTOR THAT IS NONCOMBUSTIBLE, RAIN PROOF, STRUCTURALLY SOUND AND WILL NOT SUSTAIN COMBUSTION.
2. THE EXHAUST FAN SHALL TERMINATE 40" MINIMUM ABOVE THE ROOF PER 2018 IMC 506.3.13.1 AND 2017 NFPA 96 7.8.2.1 (8)(B) PER FIGURE 7.8.2.1
3. TYPE I HOOD EXHAUST FANS MUST BE HINGED AND INCLUDE A SERVICE HOLD OPEN RETAINER PER 2017 NFPA 96 7.8.2.1(8) AND 8.1.2.1. ALSO REFER TO FIGURE A.4.2(A).
4. EXHAUST FAN SHALL BE PROVIDED WITH A SAFE ACCESS AND WORK SURFACE FOR INSPECTION AND CLEANING PER 2017 NFPA 96 7.8.2.2.
5. TERMINATION OF EXHAUST DUCT AT FAN SHALL EXTEND 18" MINIMUM ABOVE THE ROOF PER 2018 IMC 506.5.4 AND 2017 NFPA 96 7.8.2.1 (8)(A).
6. DUCT TO EXHAUST FAN CONNECTION MUST BE FLANGED AND GASKETED AT THE BASE OF THE FAN PER 2018 IMC 506.3.2.3.
7. M.C. SHALL PROVIDE GUARDS WHERE ROOF EQUIPMENT, FANS OR OTHER COMPONENTS REQUIRE SERVICE AND ARE LOCATED WITHIN 10 FEET OF A ROOF EDGE OR OPEN SIDE OF A WALKING SURFACE AND SUCH EDGE IS LOCATED MORE THAN 30 INCHES ABOVE THE FLOOR, ROOF OR GRADE BELOW. REFER TO 2018 IMC 304.11.
8. OUTDOOR AIR INTAKE AND EXHAUST OPENINGS MUST BE LOCATED A MINIMUM OF 10'-0" FROM LOT LINES OR BUILDINGS ON THE SAME LOT, PER 2018 IMC 401.4, 506.3.13.3, AND 2017 NFPA 96 7.8.2.1(1).
9. EXHAUST FAN MUST DISCHARGE A MINIMUM OF 10'-0" AWAY FROM ANY OUTDOOR AIR INTAKE OR A MINIMUM OF 3'-0" ABOVE ANY OUTDOOR AIR INTAKE PER 2018 IMC 506.3.13.3 AND 2017 NFPA 96 7.8.2.1(3).

TYPE I HOOD, COOKING EQUIPMENT, AND WALL CONSTRUCTION

10. TYPE I HOOD MUST EXTEND A MINIMUM OF 6" ON ALL OPEN SIDES BEYOND THE COOKING EQUIPMENT AND NOT BE GREATER THAN 4'-0" ABOVE THE COOKING SURFACE PER 2018 IMC 507.4.1.
11. THE HOOD GREASE FILTERS MUST BE A MINIMUM DISTANCE ABOVE THE COOKING SURFACE AS SPECIFIED IN 2018 IMC TABLE 507.2.8.
12. EXHAUST OUTLET SHALL NOT SERVE MORE THAN A 12-FOOT SECTION OF HOOD PER 2018 IMC 507.1.5 UNLESS THE HOOD IS UL 710 TESTED, LISTED AND LABELED IN ACCORDANCE 2018 IMC 507.1, EXCEPTION #1, AND INSTALLED ACCORDING TO 2018 IMC 304.1.
13. ALL DEEP FAT FRYERS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 16" BETWEEN THE FRYER AND SURFACE FLAMES FROM ADJACENT EQUIPMENT PER 2017 NFPA 96 12.1.2.4.
14. WALL CONSTRUCTION BEHIND HOOD SHALL BE MINIMUM 5/8" GYPSUM BOARD ATTACHED TO NONCOMBUSTIBLE STRUCTURES, WITH STAINLESS STEEL SHEET METAL BETWEEN GYPSUM BOARD AND HOOD, SHEET METAL SHALL EXTEND A MINIMUM 18" IN ALL DIRECTIONS FROM THE HOOD PER 2018 IMC 507.2.6 AND THE LISTED EXCEPTION.
15. CONSTRUCTION OF THE ADJACENT WALL AT THE HOOD SHALL BE NONCOMBUSTIBLE AND DETAILED ON THE ARCHITECTURAL PLANS PER 2018 IMC 507.2.6 AND 308.4.2 OR 2017 NFPA 4.2.1 THROUGH 4.2.3.4 AND A.4.2.

FIRE SUPPRESSION, CONTROLS, AND INTERLOCKING

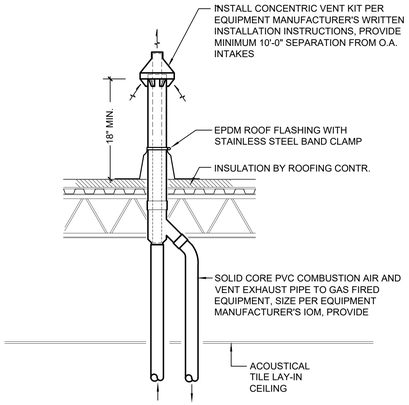
16. TYPE I HOOD SYSTEMS SHALL BE DESIGNED AND INSTALLED TO AUTOMATICALLY ACTIVATE THE EXHAUST FAN WHENEVER COOKING OPERATIONS OCCUR. THE ACTIVATION OF THE EXHAUST FAN SHALL OCCUR THROUGH AN INTERLOCK WITH THE COOKING APPLIANCES, BY MEANS OF HEAT SENSORS OR OTHER APPROVED METHODS PER 2018 IMC 507.1.1.
17. THE MAKE-UP AIR UNIT AND THE EXHAUST FAN MUST BE ELECTRICALLY INTERLOCKED, REFER TO 2018 IMC 508.1.
18. A TYPE I HOOD THAT IS INSTALLED FOR THE REMOVAL FOR GREASE VAPORS OR SMOKE SHALL BE PROVIDED WITH AN AUTOMATIC FIRE SUPPRESSION SYSTEM PER 2018 IMC 509.1.
19. TYPE I HOOD EXHAUST FAN MUST CONTINUE TO OPERATE AFTER ACTIVATION OF THE FIRE SUPPRESSION SYSTEM. SEE 2017 NFPA 96 8.2.3.1, UNLESS THE PROVISIONS OF 2017 NFPA 96 8.2.3.2 ARE MET.
20. MAKE-UP AIR FAN MOTOR MUST SHUT OFF UPON ACTIVATION OF THE FIRE SUPPRESSION SYSTEM PER 2017 NFPA 96 8.3.2.
21. ACTIVATION OF THE FIRE SUPPRESSION SYSTEM MUST SHUT OFF SOURCES OF FUEL AND ELECTRIC POWER TO ALL COOKING EQUIPMENT SERVED BY HOOD PER 2017 NFPA 96 10.4.1.
22. MANUAL ACTIVATION OF THE FIRE SUPPRESSION SYSTEM MUST CONFORM TO 2017 NFPA 96 10.5 AND 10.6.

GREASE DUCT & MAU DUCT

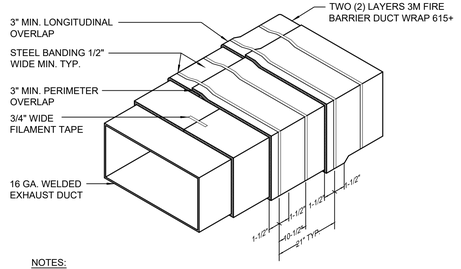
23. CLEANOUTS SHALL BE PROVIDED IN THE EXHAUST DUCT EVERY 10'-0" AND EACH CHANGE OF DIRECTION PER 2017 NFPA 96 7.3.1 THROUGH 7.3.8, AND 7.4.1.1 THROUGH 7.4.3.4 AND 2018 IMC 506.3.8 AND 506.3.9.
24. NO FLEXIBLE DUCT CONNECTIONS WILL BE ALLOWED AT THE HOOD CONNECTIONS PER 2018 IMC 506.3.2.2.
25. GREASE EXHAUST DUCT MUST SLOPE 1/4"/FOOT MINIMUM TOWARDS THE HOOD OR APPROVED GREASE COLLECTOR PER 2018 IMC 506.3.7.
26. GREASE DUCT VELOCITY MUST BE A MINIMUM OF 500 FPM PER 2018 IMC 506.3.4 AND 2017 NFPA 96 8.2.1.1.
27. EXHAUST DUCT ENCLOSURE OR PROTECTION FOR THE CEILING, WALL AND ROOF PENETRATIONS IS IDENTIFIED ON THE DRAWINGS, ALSO REFER TO 2018 IMC 506.3.11.
28. A BACKDRAFT DAMPER CANNOT BE INSTALLED IN THE EXHAUST AIR DUCT PER 2017 NFPA 96 7.1.4.4 AND 9.1.1.
29. HOOD EXHAUST DUCTS SHALL BE CONSTRUCTED OF CONTINUOUS WELDED 16 GAGE (0.055 INCH) STEEL OR 18 GAGE (0.0478 INCH) STAINLESS STEEL PER 2018 IMC 506.3.1.1, OR LISTED AND LABELED FACTORY-BUILT COMMERCIAL KITCHEN GREASE DUCTS.
30. ELECTRICAL DEVICES SHALL NOT BE INSTALLED IN DUCTS OR HOODS OR LOCATED IN THE PATH OF TRAVEL OF EXHAUST PRODUCTS UNLESS SPECIFICALLY APPROVED FOR SUCH USE, REFER TO 2017 NFPA 96 9.2.2.
31. HOOD DUCTWORK ON BUILDING EXTERIOR MUST BE PROTECTED FROM THE ELEMENTS PER 2018 IMC 603.16 AND 2017 NFPA 7.6.4 THROUGH 7.6.6.
32. PRIOR TO CONCEALMENT OF ANY PORTION OF A GREASE DUCT SYSTEM, A LEAKAGE TEST SHALL BE PERFORMED IN THE PRESENCE OF THE CODE OFFICIAL. DUCTS SHALL BE CONSIDERED TO BE SEALED WHERE INSTALLED IN SHAFTS OR COVERED BY COATINGS OR WRAPS THAT PREVENT THE DUCTWORK FROM BEING VISUALLY INSPECTED ON ALL SIDES. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE THE NECESSARY EQUIPMENT AND PERFORM THE GREASE DUCT LEAKAGE TEST PER 2018 IMC 506.3.2.5.
33. PRIOR TO FINAL INSPECTION, THE MECHANICAL CONTRACTOR SHALL PROVIDE A PERFORMANCE TEST CONDUCTED IN ACCORDANCE WITH 2018 IMC 507.6 AND 507.6.1.
34. A FIRE-ACTUATED DAMPER MUST BE INSTALLED IN THE SUPPLY AIR PLENUM AT EACH POINT WHERE A SUPPLY AIR DUCT PENETRATES THE CONTINUOUS WELDED HOOD ASSEMBLY PER 2017 NFPA 96 5.3.4.1.

TYPE II HOODS

35. EXHAUST DUCTS FOR TYPE II HOODS SHALL BE CONSTRUCTED OF (ALUMINUM-STAINLESS STEEL) RIGID METALLIC MATERIALS. DUCTS CONVEYING MOISTURE-LADEN OR WASTE-HEAT-LADEN AIR SHALL BE CONSTRUCTED, JOINED AND SEALED IN AN APPROVED MANNER PER 2018 IMC 506.4.2.
36. TYPE II HOODS, JOINTS, SEAMS AND PENETRATIONS SHALL BE CONSTRUCTED AS SET FORTH IN CHAPTERS 5 AND 6 OF THE 2018 IMC, SHALL BE SEALED ON THE INTERIOR OF THE HOOD AND SHALL PROVIDE A SMOOTH SURFACE THAT IS READILY CLEANABLE AND WATER TIGHT.

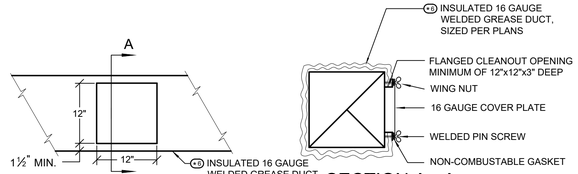


4 / M5.0 COMBUSTION AIR & VENT PIPING ROOF CONCENTRIC VENT KIT
NO SCALE



NOTES:
1. PROVIDE 3M FIRE BARRIER DUCT WRAP 615+, TESTED IN ACCORDANCE WITH ASTM E2336 AND ICC-ES AC101.
2. INSTALL PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. INSTALLATION INSTRUCTIONS SHALL BE AVAILABLE ON THE JOB SITE AT ALL TIMES.
3. LAYER 3M FIRE BARRIER DUCT WRAP 615+, AS DETAILED FOR ZERO CLEARANCE TO COMBUSTIBLES.
4. FIELD MEASURE AND PRECUT DUCT WRAP.
5. PROVIDE REMOVABLE PANELS FOR ACCESS TO CLEANOUTS AS REQUIRED BY CODE AND AS NOTED ON PLANS.

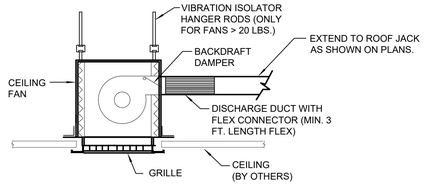
3 / M5.0 TYPICAL SECTION THROUGH TYPE I HOOD EXHAUST DUCT
NO SCALE



SECTION A - A
NO SCALE

NOTE:
WHEN DUCT DIMENSIONS ARE NOT LARGE ENOUGH TO ACCOMMODATE 12"x12" CLEANOUT, CLEANOUT SHALL BE LOCATED IN ACCORDANCE WITH INTERNATIONAL MECHANICAL CODE 2018 SECTION 506.3.9.

1 / M5.0 DETAIL OF WELDED GREASE DUCT CLEANOUT
NO SCALE

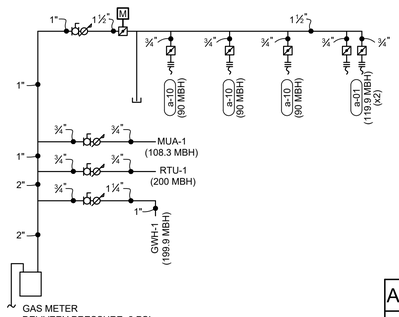


2 / M5.0 CEILING EXHAUST FAN
NOT TO SCALE

NATURAL GAS CONNECTION SCHEDULE

EQUIPMENT	KITCHEN EQUIPMENT TAG	MECH/PLBG EQUIPMENT TAG	MBH	EQUIPMENT PRESSURE	NOMINAL DELIVERY PRESSURE	NOTES
GAS WATER HEATER	-	GWH-1	199.9	3.5-10.5" W.C.	2 PSI	1, 3
FRYER	a-10	-	90.0	7-9" W.C.	2 PSI	1, 2, 3
FRYER	a-10	-	90.0	7-9" W.C.	2 PSI	1, 2, 3
FRYER	a-10	-	90.0	7-9" W.C.	2 PSI	1, 2, 3
PIZZA OVEN	a-01	-	119.9 (x2)	6-14" W.C.	2 PSI	1, 2, 3
MAKE UP AIR UNIT	-	MAU-1	108.3	7-14" W.C.	2 PSI	1
ROOFTOP UNIT	-	RTU-1	200.0	4.5-14" W.C.	2 PSI	1
TOTAL			1018.0			

NOTES:
1. GAS PRESSURE REGULATOR AND FINAL CONNECTION TO ALL EQUIPMENT PROVIDED BY M.C. VENT REGULATOR PER MANUFACTURER'S AND AHJ'S INSTRUCTIONS.
2. FLEXIBLE GAS CONNECTION WITH QUICK DISCONNECT FURNISHED WITH KITCHEN EQUIPMENT, INSTALLED BY M.C.
3. EQUIPMENT PROVIDED BY OTHERS.



5 / M5.0 GAS PIPING DIAGRAM
NO SCALE

AIR BALANCE SCHEDULE

	KITCHEN & MISC. (CFM)		
UNIT	SA	OA	EA
MAU-1	1400	1400	
KEF-1			-1125
KEF-2			-670
EF-1			-75
RTU-1	3500	650	
TOTALS	4900	2050	-1870
NET PRESSURIZATION	180		

DUCT INSULATION SCHEDULE

ID TAG	MATERIAL $D\frac{lb}{FT^3}$	OUT OF PACKAGE THICK-NESS	OUT OF PACKAGE R-VALUE (K VALUE)	AT 25% COMPRESSION THICK-NESS	AT 25% COMPRESSION R-VALUE (K VALUE)	NO. OF LAYERS	EXPOSED SURFACE	VAPOR RETARDER REQUIRED
(+2)	MINERAL-FIBER BLANKET (1.0)	2"	7.4 (0.27)	1½"	6.0 (0.25)	ONE	FSF	YES
(+3)	LINER (1.5)	1"	4.2 (0.24)	NA	NA	ONE	ANTIMICROBIAL	YES
(+6)	3M FIRE BARRIER DUCT WRAP 615+	1½"	6.3 (0.22)	NA	NA	TWO	SCRIM REINFORCED FOIL	NO

GENERAL NOTE: DUCT SIZES INDICATED ON DRAWINGS ARE SHEET METAL SIZE AND INCLUDE LINER SPECIFIED.

EXHAUST FAN SCHEDULE

PLAN MARK	MANUFACTURER	MODEL NUMBER	CFM	E.S.P. (IN. WG)	HP (WATT)	RPM	DRIVE	SONES	WEIGHT	V/PH/HZ	NOTES
EF-1	LOREN COOK	GC-146	75	0.25	(31)	811	DIRECT	1.1	16	120/1/60	1
KEF-2	ACME	PDU135F6	670	0.25	1/3	860	DIRECT	6.1	50	120/1/60	2

NOTES:
1. FURNISH FAN WITH PLUG DISCONNECT, FAN SPEED CONTROLLER, BACKDRAFT DAMPER, ISOLATOR KIT, AND ALUMINUM GRILLE. INTERLOCK WITH RESTROOM LIGHTING CIRCUIT.
2. PROVIDE WITH VENTED ROOF CURB, GREASE TROUGH, CURB HINGE, AND VFD. INTERLOCK WITH PIZZA OVEN HOOD PER MANUFACTURER'S IOM.

VENTILATOR SCHEDULE

PLAN MARK	MANUFACTURER	MODEL NUMBER	TYPE	THROAT AREA (SQ FT)	THROAT VELOCITY (FPM)	NO. TIERS	CFM	P.D.	NOTES
RV-1	LOREN COOK	8 PR	RELIEF	0.39	190	1	75	0.006	1

NOTES:
1. PROVIDE WITH 14" ROOF CURB, BIRD SCREEN, AND BACKDRAFT DAMPER.

GRILLE, REGISTER, AND DIFFUSER SCHEDULE

PLAN MARK	MANUFACTURER	MODEL NO.	NECK SIZE	FACE SIZE	MAX CFM	P.D.	BORDER	PATTERN	FINISH	NOTES
SA-1	TITUS	PAS	6Ø	12" x 12"	110	0.1	TYPE 1	4-WAY	#26	-
SA-2	TITUS	PAS	8Ø	12" x 12"	235	0.1	TYPE 3	4-WAY	#26	1,2
SA-3	TITUS	PAS	10Ø	24" x 24"	345	0.1	TYPE 3	4-WAY	#26	1,2
SA-4	TITUS	PAR	10Ø	24" x 24"	345	0.1	TYPE 3	-	#26	1,2
SA-5	TITUS	PAS	12Ø	24" x 24"	520	0.1	TYPE 3	4-WAY	#26	1,2
RA-1	TITUS	PAR	16Ø	24" x 24"	1200	0.1	TYPE 3	-	#26	1,2

NOTES:
1. PROVIDE FRAME WITH NO SCREW HOLES FOR LAY-IN CEILING INSTALLATION.
2. MECHANICAL CONTRACTOR TO VERIFY CEILING CONSTRUCTION WITH ARCHITECT AND ENSURE THAT IT IS COMPATIBLE WITH GRILLE, REGISTER, AND DIFFUSER FRAMING, INCLUDING BORDER TYPES, T-BARS, AND CROSS NOTCHES.

ROOFTOP UNIT SCHEDULE

PLAN MARK	MANUFACTURER	MODEL NUMBER	UNIT SIZE	SUPPLY AIRFLOW CFM	SUPPLY AIRFLOW ESP.	SUPPLY AIRFLOW FAN HP	OUTSIDE AIR SUMMER DB	OUTSIDE AIR SUMMER WB	OUTSIDE AIR WINTER DB	OUTSIDE AIR WINTER WB	OUTSIDE AIR O/A CFM	COOLING COIL TOT MBH	COOLING COIL SEN MBH	COOLING COIL ENTERING DB	COOLING COIL ENTERING WB	COOLING COIL LEAVING DB	COOLING COIL LEAVING WB	EER	IEER	STAGES	GAS HEATING INPUT MBH	GAS HEATING OUTPUT MBH	GAS HEATING E.A.T DB	GAS HEATING L.A.T. DB	GAS HEATING STAGES	ELECTRICAL VOLT/PH	ELECTRICAL MCA	ELECTRICAL MOCP	WEIGHT (LB)	NOTES
RTU-1	TRANE	YSK120	10 TONS	3500	0.6	3	96.0	75.0	-1.0	-2.5	650	120.1	94.3	78.8	65.1	54.0	53.4	11.0	14.6	3	200.0	162.0	55.2	97.3	2	208/3	57	80	1332	1

NOTES
1. PROVIDE WITH VERTICAL DISCHARGE, SZVAV OPERATION, FACTORY INSTALLED ECONOMIZER WITH BAROMETRIC RELIEF, NON-FUSED DISCONNECT SWITCH, POWERED GFI OUTLET, 7-DAY PROGRAMMABLE THERMOSTAT WITH TOUCH SCREEN, CONDENSER COIL HAIL GUARD, HINGED ACCESS PANELS WITH 2" MERV 8 PLEATED FILTERS, AND 14" GALVANIZED ROOF CURB.

TIM HOLLERBACH DESIGNS
1548 JEFFCO BLVD
ARNOLD, MO 63010
314-578-9470
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MISSOURI DIVISION OF ACADEMY: E2003101Y554

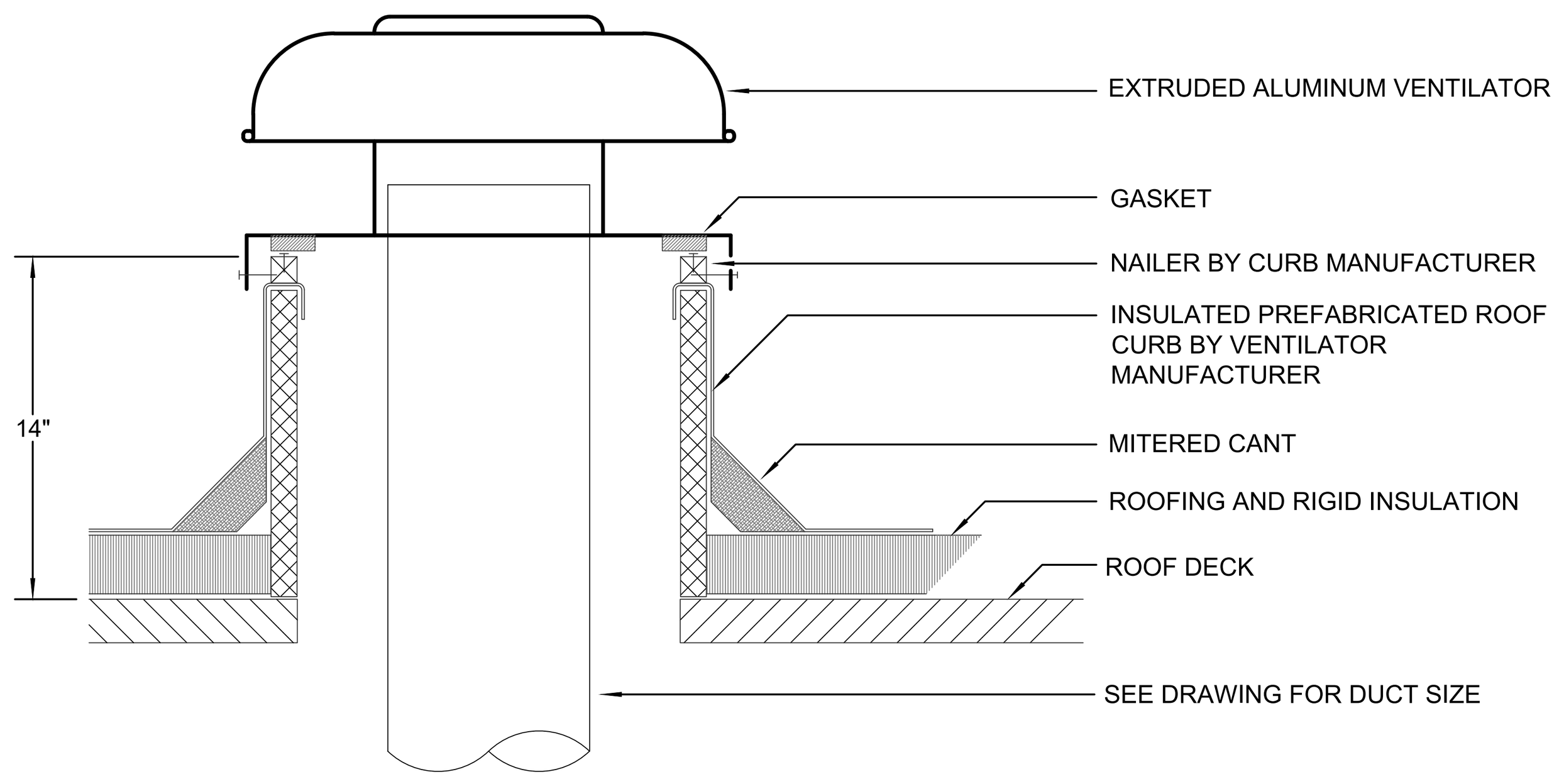
06-06-2025
Marcus Eckstein - Engineer
MO# PE-2019017810

A NEW:
PIZZA IMO'S
METRO NORTH CROSSING
8526 N. JEFFERSON STREET
KANSAS CITY, MO 64155

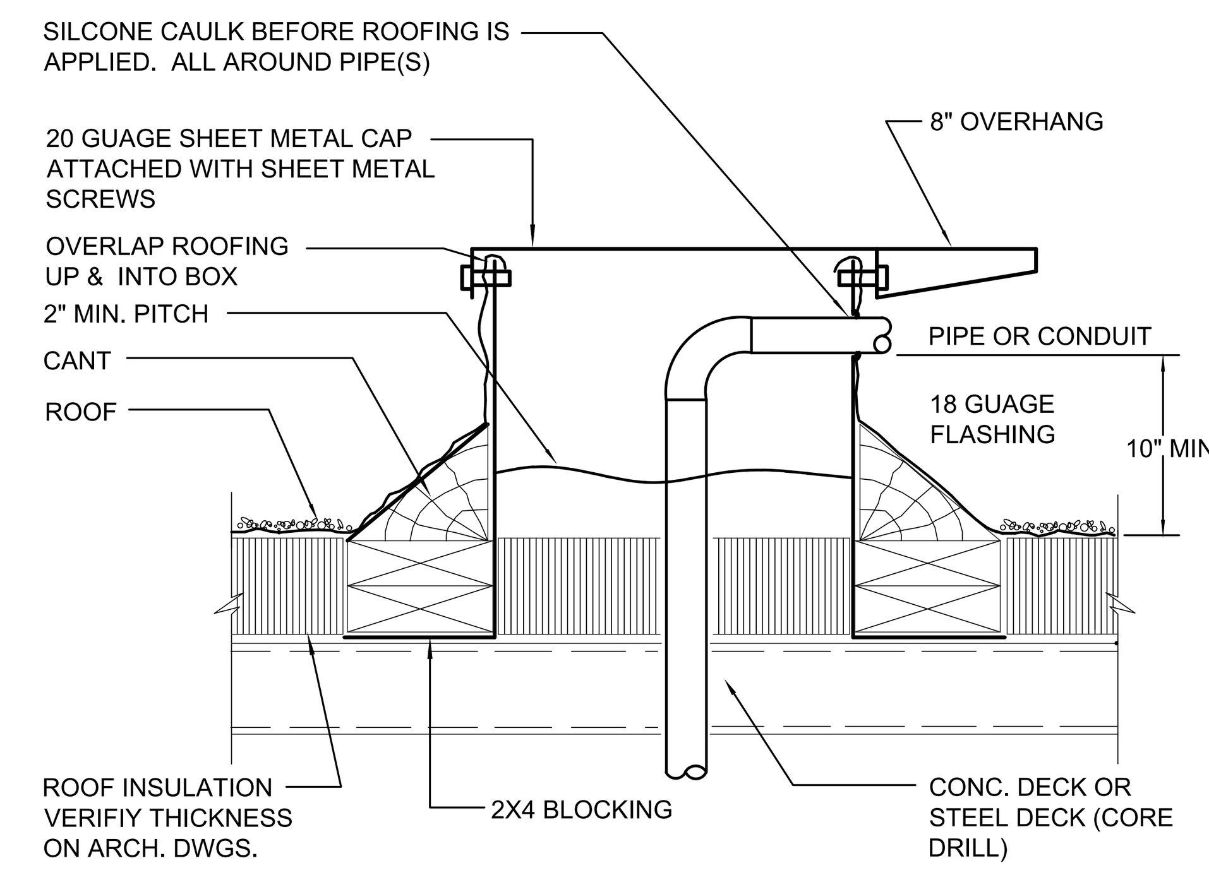
JOB NUMBER: 25030
ISSUE DATE: 06.06.2025
REVISIONS:

MECHANICAL SCHEDULES

M5.0



10 / M6.0 **ROOF JACK DETAIL**
NO SCALE

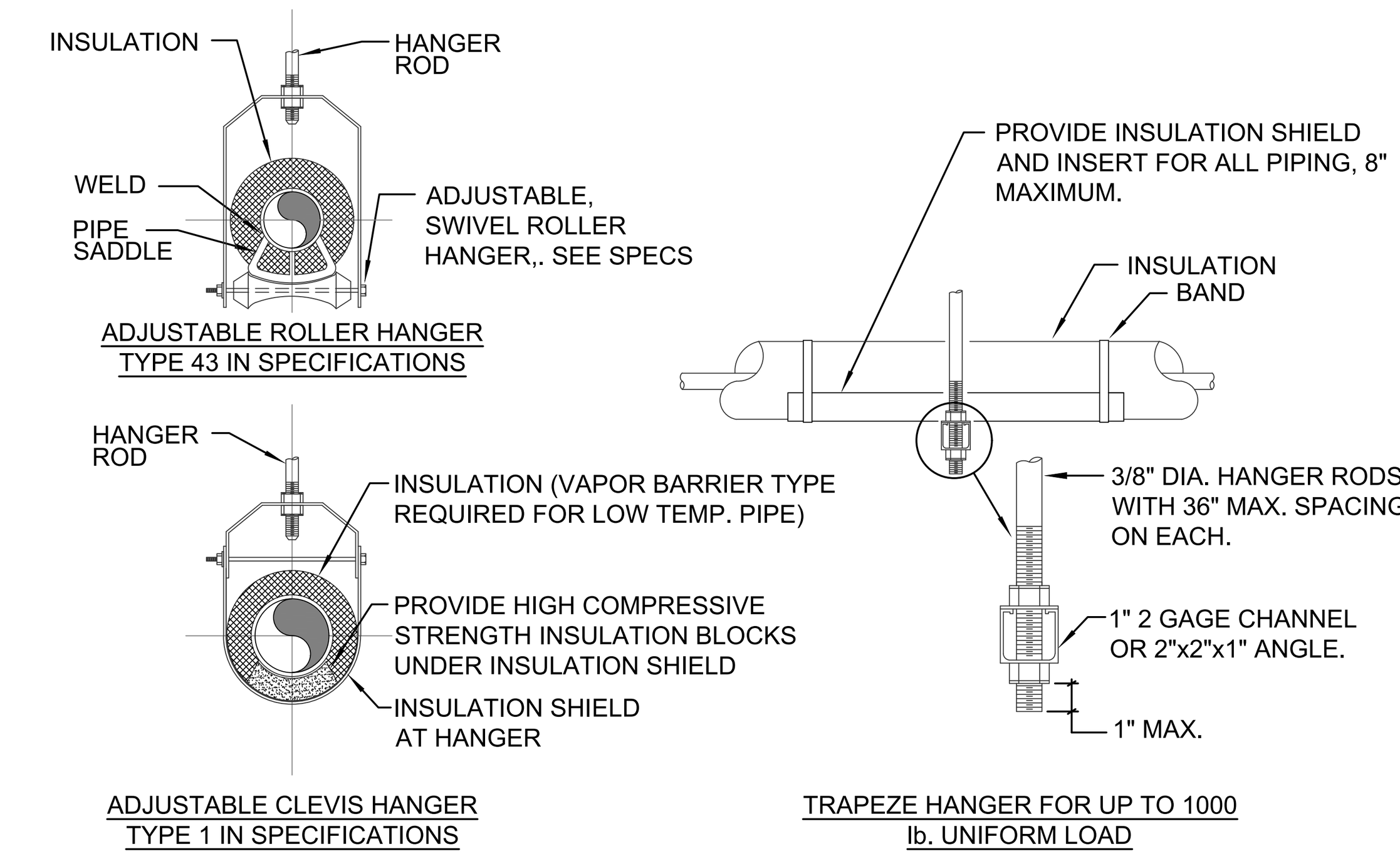


7 / M6.0 **PIPING THRU ROOF DETAIL**
NO SCALE

PIPE & TUBING SUPPORT SPACING

NOMINAL PIPE SIZE (IN.)		< 1/2	1/2	3/4	1	1-1/2	2	3	4	5	6	8	10	12	14	16	18	20	24
MAXIMUM SUPPORT SPACING (FT.)	PIPE	7	7	7	9	10	11	12	14	16	17	19	22	23	25	27	28	30	32
	TUBING	5	6	7	8	8	9	10	12	13	14	16	-	-	-	-	-	-	-

NOTE: FOR TRAPEZE HANGER TAKE SPACING OF SMALLEST SIZE ON TRAPEZE.



3 / M6.0 **PIPE HANGER DETAILS**
NO SCALE

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06-06-2025
Marcus Eckstein - Engineer
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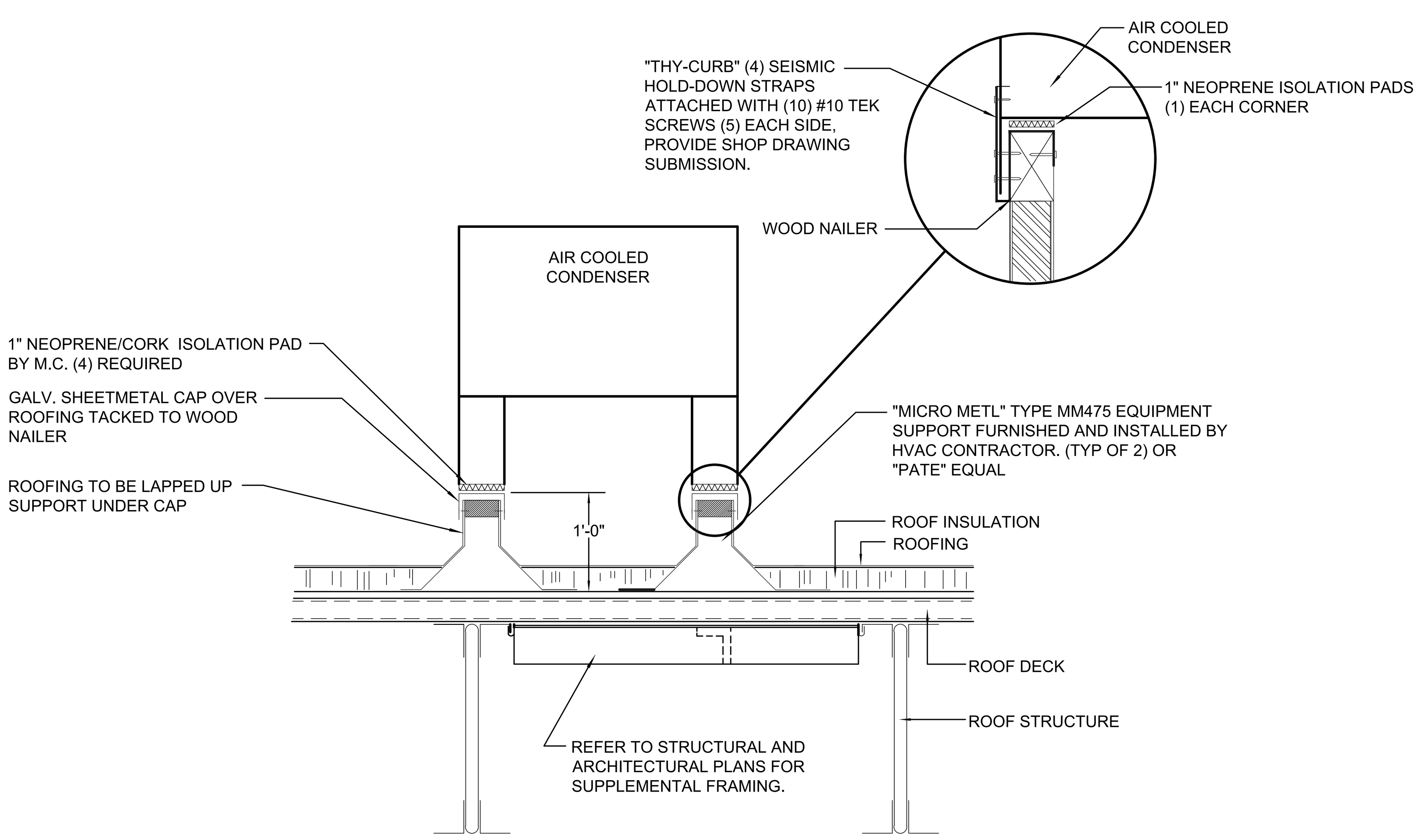
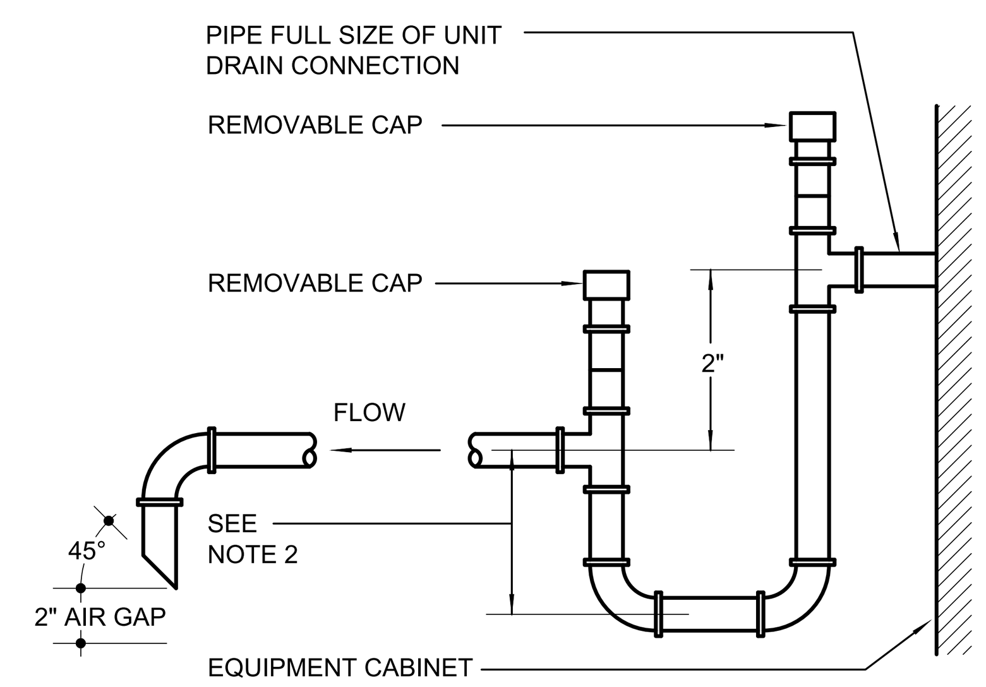


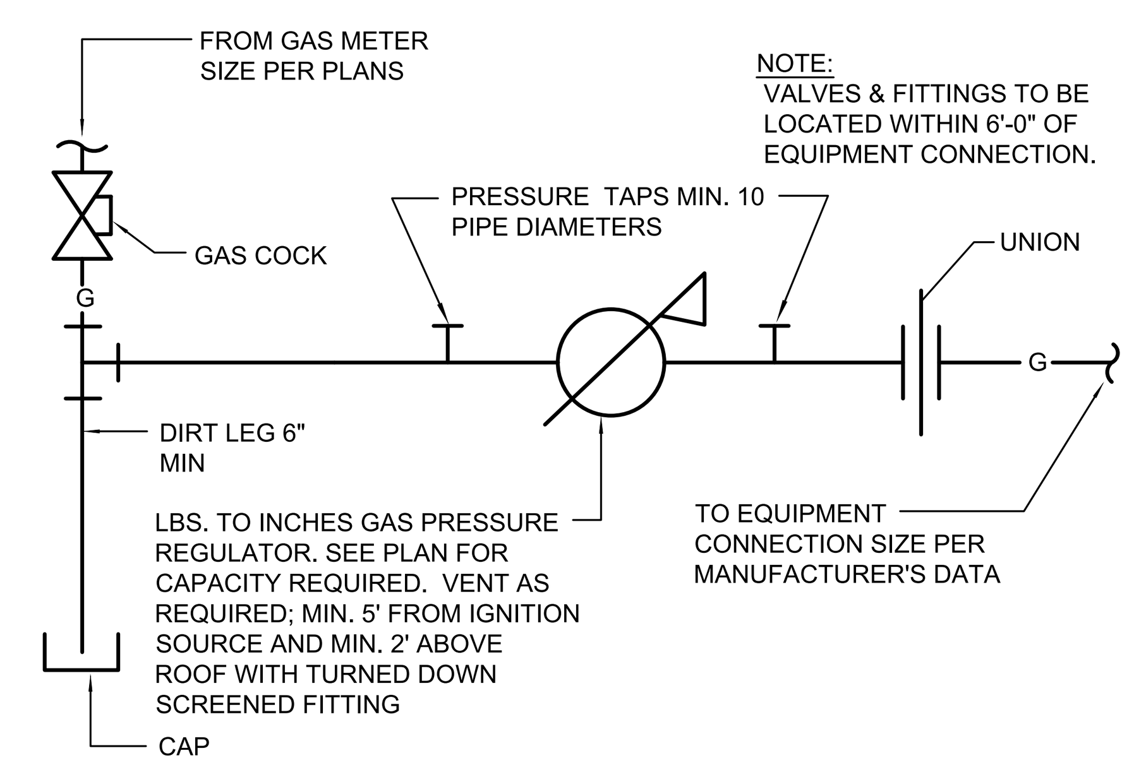
9 / M6.0 **AIR COOLED CONDENSER SUPPORT DETAIL**
NO SCALE



NOTES:

1. LOCATE TRAPS SO AS TO BE ACCESSIBLE FOR CLEANING.
2. HEIGHT SHALL BE EQUAL TO FAN STATIC PRESSURE, PLUS 1".
3. TERMINATE CONDENSATE LINE VIA INDIRECT CONNECTION TO NEAREST: ROOF DRAIN, GUTTER, OR FLOOR DRAIN.
4. VERIFY MFR. REQUIREMENT FOR P-TRAP, UNIT MAY CONTAIN INTERNAL TRAP.
5. PROVIDE MINIMUM 2" AIR GAP @ DRAIN TERMINATION

6 / M6.0 **COOLING EQUIPMENT CONDENSATE DRAIN TRAP**
NO SCALE

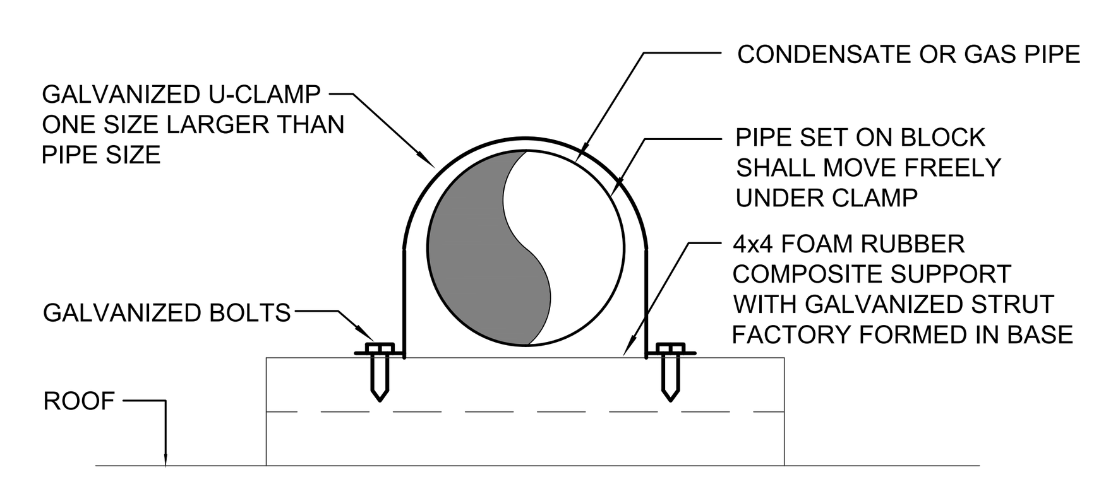


NOTE:
VALVES & FITTINGS TO BE LOCATED WITHIN 6'-0" OF EQUIPMENT CONNECTION.

5 / M6.0 **GAS PIPING CONNECTION DETAIL**
NO SCALE

STEEL PIPE NOMINAL SIZE OF PIPE (IN.)	SPACING OF SUPPORTS (FT.)
½"	6
¾" OR 1"	8
1¼" OR LARGER (HORIZONTAL)	10

NOTE:
INSTALL SUPPORTS ACCORDING TO NATIONAL FUEL GAS CODE 2018 EDITION



4 / M6.0 **PIPE SUPPORT DETAIL**
NO SCALE

RECTANGULAR DUCT HANGER SCHEDULE

PAIR SPACING:	10 FT.		8 FT.		5 FT.		4 FT.	
DUCT PERIMETER, MAXIMUM HALF	STRAP	WIRE/ ROD	STRAP	WIRE/ ROD	STRAP	WIRE/ ROD	STRAP	WIRE/ ROD
	IN. x GA		IN. x GA		IN. x GA		IN. x GA	
P/2 = 30"	1 x 22	10 GA (.135")	1 x 22	10 GA (.135")	1 x 22	12 GA (.106")	1 x 22	12 GA (.106")
P/2 = 72"	1 x 18	3/8"	1 x 20	1/4"	1 x 22	1/4"	1 x 22	1/4"
P/2 = 96"	1 x 16	3/8"	1 x 18	3/8"	1 x 20	3/8"	1 x 22	1/4"
P/2 = 120"	1.5 x 16	1/2"	1 x 16	3/8"	1 x 18	3/8"	1 x 20	1/4"
P/2 = 168"	1.5 x 16	1/2"	1.5 x 16	1/2"	1 x 16	3/8"	1 x 18	3/8"
P/2 = 192"	NONE	1/2"	1.5 x 16	1/2"	1 x 16	3/8"	1 x 16	3/8"
P/2 = 193"+	SPECIAL ANALYSIS REQUIRED							

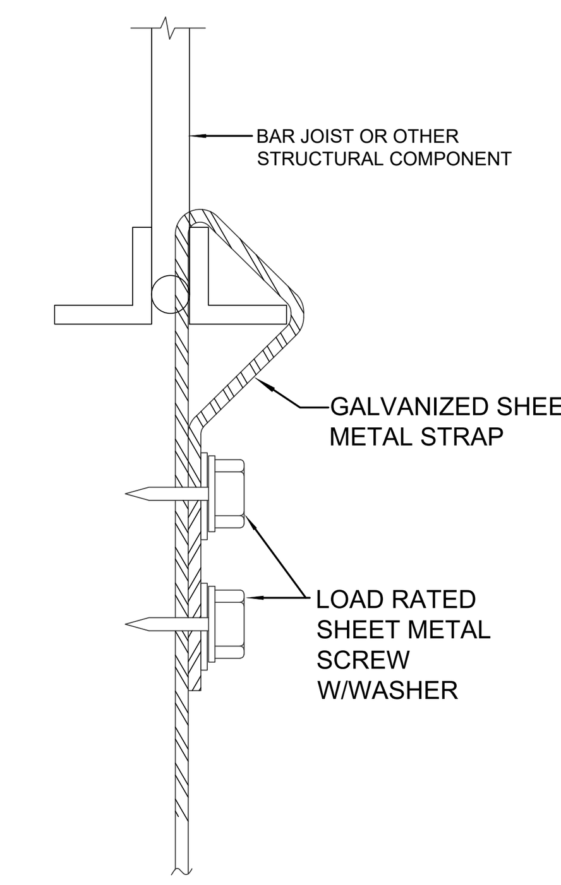
SINGLE HANGER MAXIMUM ALLOWABLE LOAD

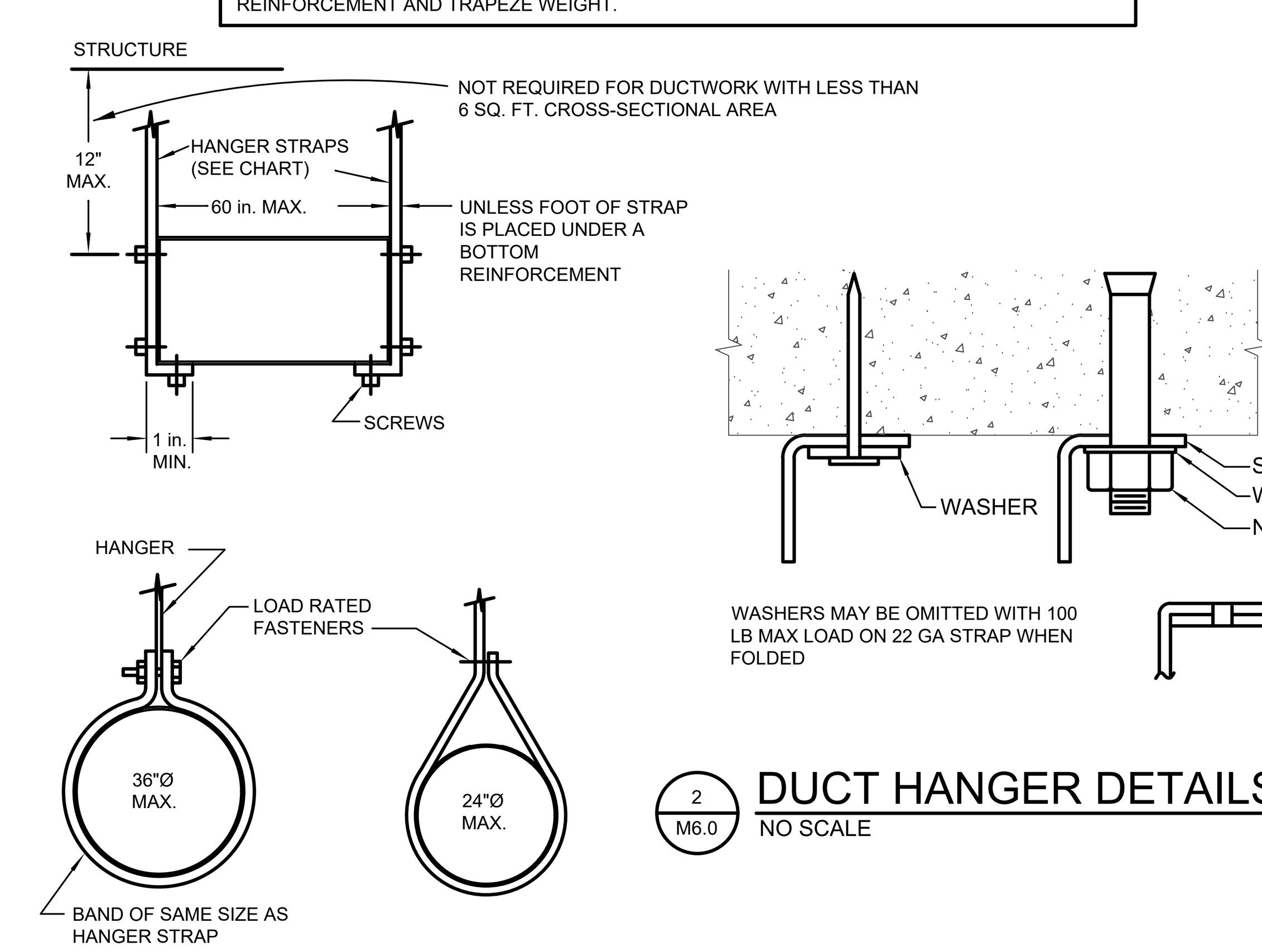
STRAP	WEIGHT	WIRE/ ROD	WEIGHT
IN. x GA	LBS.	Ø (IN.)	LBS.
1 x 22	260	0.106	80
1 x 20	320	0.135	120
1 x 18	420	0.162	160
1 x 16	700	1/4	270
1.5 x 16	1100	3/8	680
		1/2	1250
		5/8	2000
		3/4	3000

LAP JOINED STRAPS, MINIMUM FASTENERS (PLACE FASTENERS IN SERIES, NOT SIDE BY SIDE):

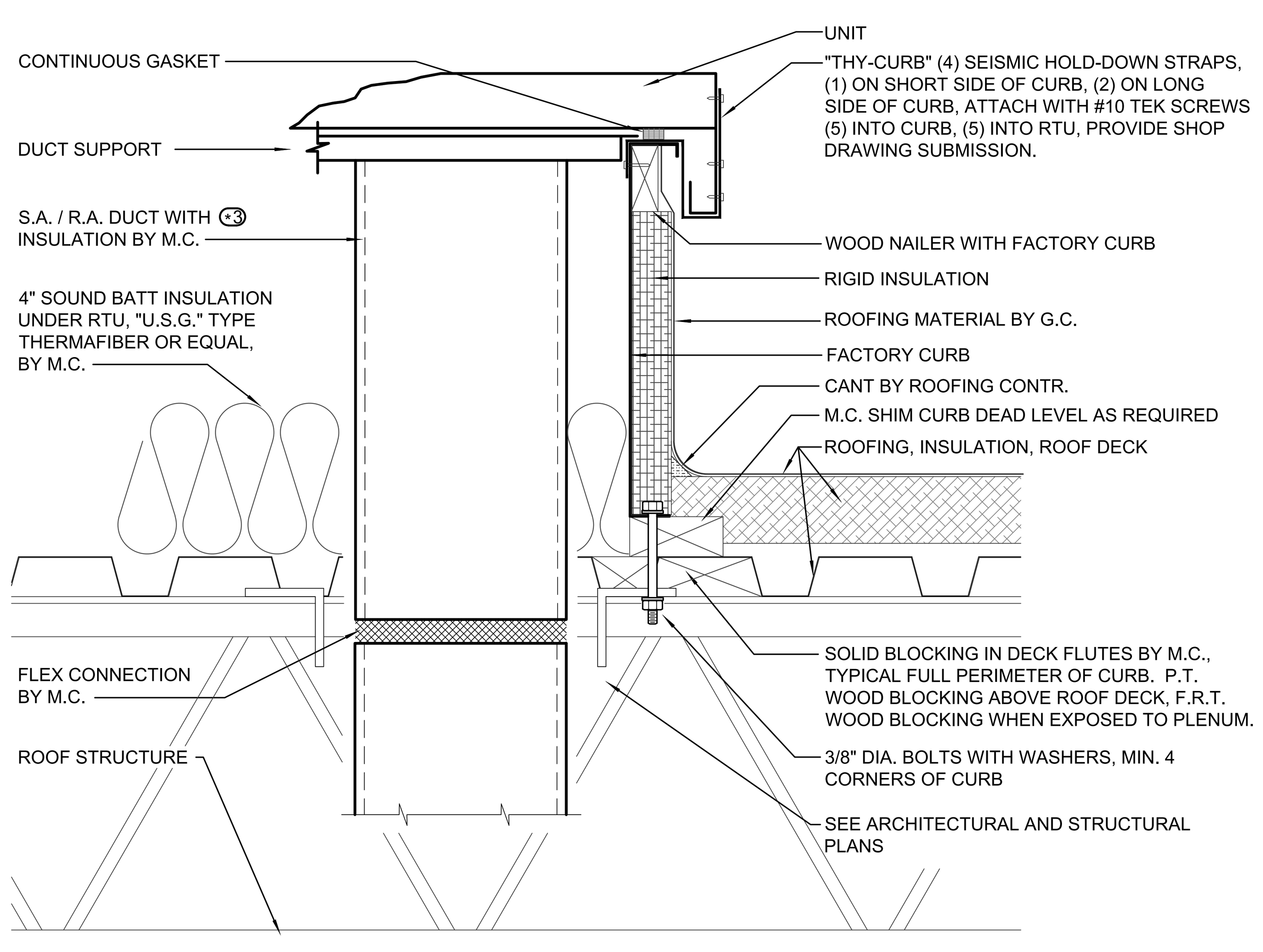
STRAP IN. x GA	FASTENERS (QTY) - SIZE
1 x 18, 20, 22	(2) - #10 SMS or
	(1) - 1/4"Ø BOLT
1 x 16	(2) - 1/4"Ø BOLT
1.5 x 16	(2) - 3/8"Ø

NOTE: TABLE ALLOWS FOR DUCT WEIGHT, 1 LB./SQ. FT. INSULATION WEIGHT, AND NORMAL REINFORCEMENT AND TRAPEZE WEIGHT.

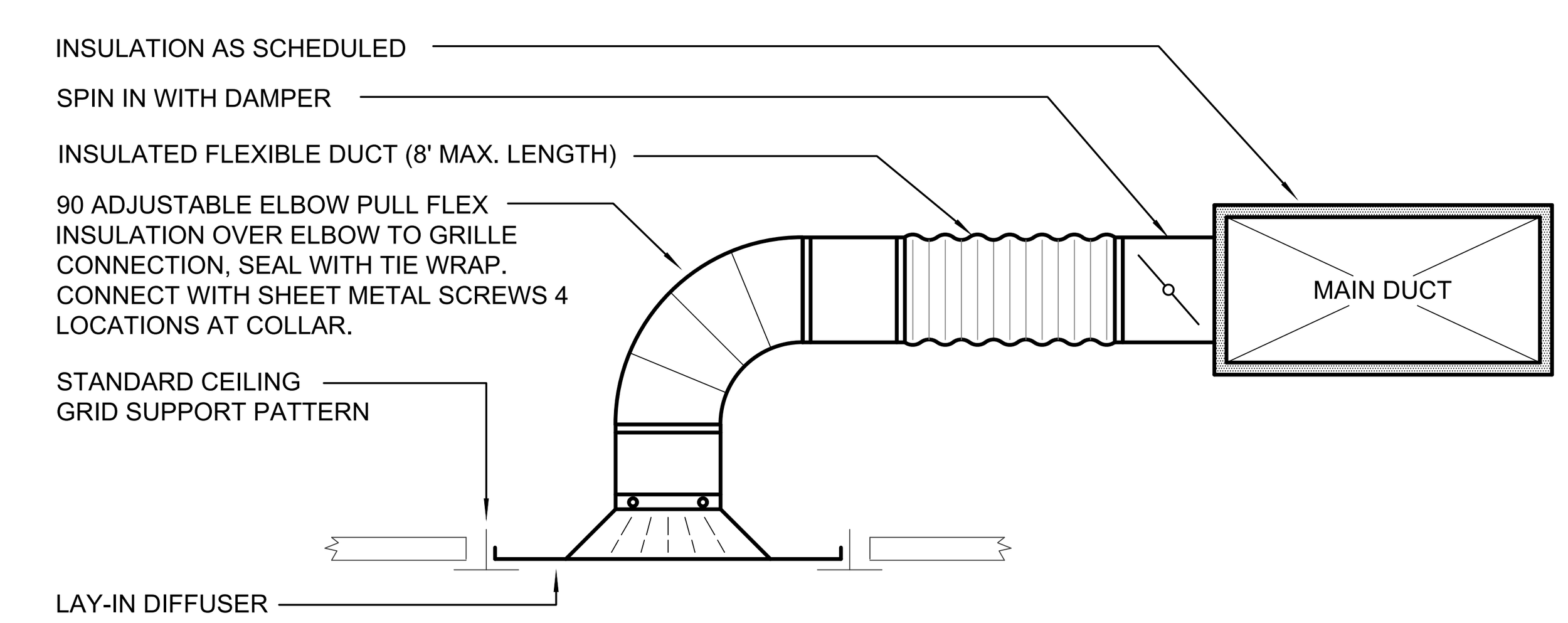




2 / M6.0 **DUCT HANGER DETAILS**
NO SCALE



8 / M6.0 **SEISMIC ROOF CURB DETAIL**
NO SCALE



1 / M6.0 **LAY-IN CEILING DIFFUSER AND BRANCH DUCT**
NO SCALE

A NEW:
IMO'S PIZZA
METRO NORTH CROSSING
8526 N. JEFFERSON STREET
KANSAS CITY, MO 64155

JOB NUMBER: 25030
ISSUE DATE: 06.06.2025
REVISIONS:

MECHANICAL DETAILS

M6.0

HOOD INFORMATION

HOOD NO.	MARK	MODEL	HOOD DIMENSIONS (IN.) LENGTH	WIDTH	HEIGHT	HOOD CONSTR.	COOKING LOAD / DUTY RATING	EXHAUST TOTAL CFM	COLLAR(S) WIDTH	LENGTH	DIA.	CFM	S.P.	SUPPLY MUA CFM	AC CFM	HANGING WEIGHT LBS.	SECTION LOCATION
1	HOOD- FRYERS	XBEW-60-S	60	48	24	430 SS WHERE EXPOSED	HEAVY	1125	9	11		1125	0.454	900		401	SINGLE

HOOD INFORMATION

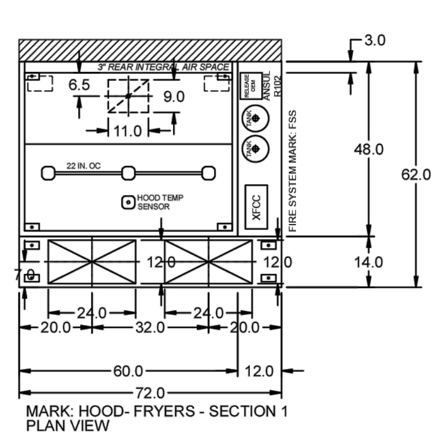
HOOD NO.	MARK	LIGHTING DETAILS FIXTURE TYPE BULB / LAMP INFO	QTY	FOOT CANDLES	GREASE FILTRATION DETAILS TYPE / MODEL MATERIAL	QTY	SIZE (IN.) L	H	UTILITY CABINET(S) LOCATION	FIRE SYSTEM TYPE	SIZE	CONTROLS MODEL	INTERFACE
1	HOOD- FRYERS	INCANDESCENT (GLOBE) 100W A19 (BULBS NOT INCL.)	3	43.28	BAFFLE STAINLESS STEEL	0 / 3	16 / 20	20	RIGHT	ANSUL R102	6	XFCC	SWITCHES

SUPPLY PLENUM INFORMATION

HOOD NO.	MARK	POS.	TYPE	SIZE (IN.) L	W	H	INSULATED	DAMPER(S)	LED LIGHT(S) SUPPLIED	QTY	TOTAL CFM	TOTAL S.P.	COLLARS TYPE	MOUNTING	QTY	W	L	DIA.	CFM	VEL.
1	HOOD- FRYERS	FRONT	ASP	72	14	4	NO	YES	NO		900	0.01	MUA	FACTORY	2	12	24		450	225

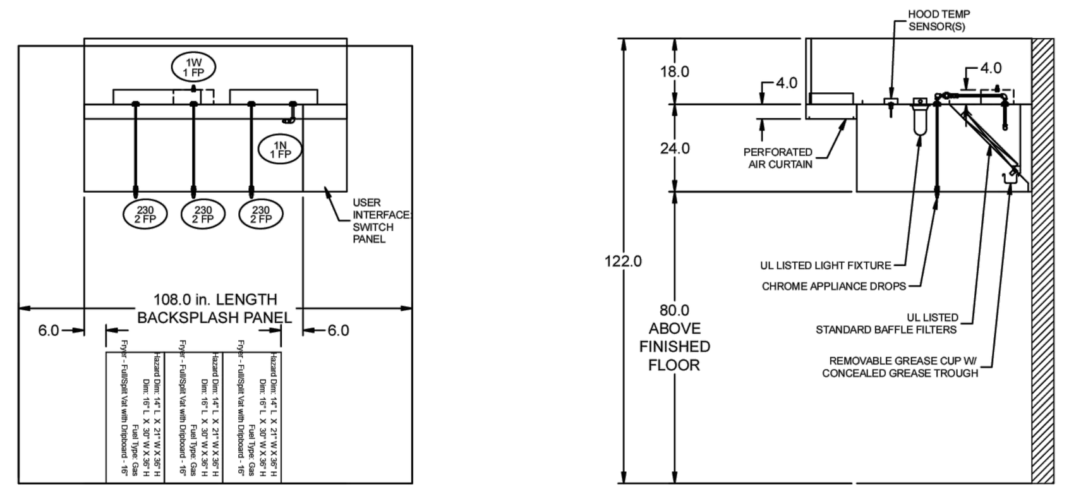
HOOD OPTIONS

- UL 710 LISTED W/ OUT EXHAUST FIRE DAMPER - UL #R25625
- BACK INTEGRAL AIR SPACE - 3 IN WIDE
- 18 IN HIGH CEILING ENCLOSURES - FRONT LEFT RIGHT - FIELD INSTALLED
- SHIPPED LOOSE EXHAUST COLLAR(S)
- BACKSPLASH 120.00 IN HIGH 108.00 IN LONG
- PERFORMANCE ENHANCING LIP (PEL) TECHNOLOGY
- STANDING SEAM CONSTRUCTION FOR SUPERIOR STRENGTH



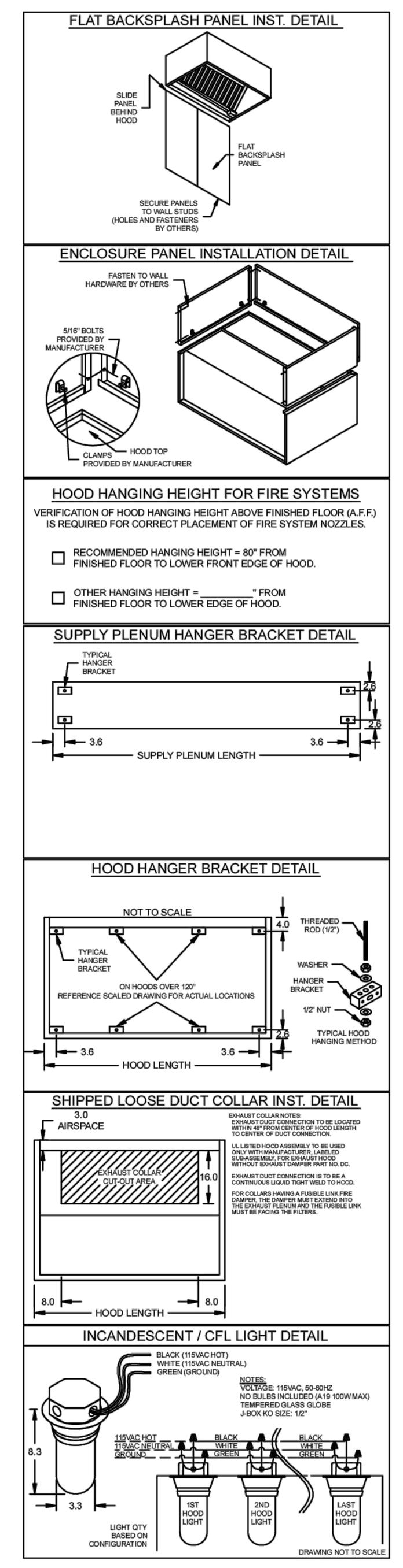
MARK: HOOD- FRYERS - SECTION 1
PLAN VIEW

FIRE (PIPING/DROPS/NOZZLES/ETC.) SUBJECT TO CHANGE, AS-BUILT DRAWINGS CAN BE PROVIDED AT TIME OF ORDER AND INCLUDED WITH PRODUCT SHIPMENT



MARK: HOOD- FRYERS - SECTION 1
ELEVATION VIEW

MARK: HOOD- FRYERS
SECTION VIEW



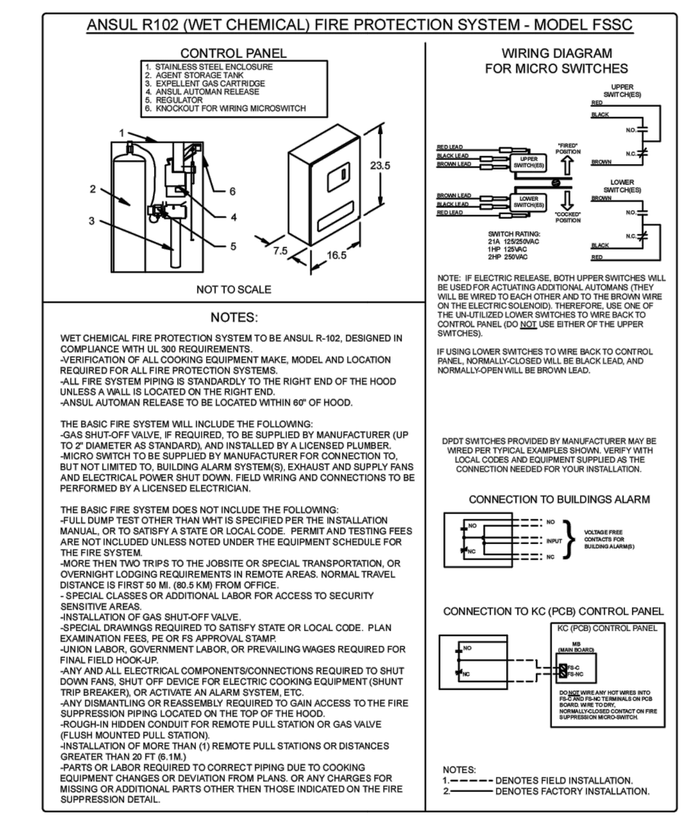
IMO'S PIZZA- KANSAS CITY
HOOD- FRYERS
ACCUREX EASTERN MO SOUTHERN IL
SCOTT DALLMAN
SCOTT.DALLMAN@ACCUREX.COM
ACCUREX

FIRE SYSTEM INFORMATION

MARK	MODEL	LOCATION	FLOW POINTS HOODS	PCU	SUPPLY LINE	DETECTION	MARK(S) PROTECTED BY FIRE SYSTEM
FSS	ANSUL R-102 WET CHEMICAL	CABINET – RIGHT END OF HOOD-FRYERS	19 UTILIZED 22 AVAILABLE		CONTINUOUS	FUSIBLE LINK	HOOD- FRYERS SECTION 1 / HOOD- PIZZA SECTION 1

FIRE SYSTEM OPTIONS AND ACCESSORIES

- FULL INSTALLATION (INCLUDES PRE-PIPED HOOD(S) WITH DETECTION AND FACTORY COORDINATED INSTALL)
- CHROME SLEEVES FOR FACTORY PROVIDED APPLIANCES DROPS - INCLUDED
- METAL BLOW-OFF CAPS - INCLUDED
- GAS VALVE - INCLUDED - MECHANICAL SHUTOFF VALVE, 2", (ANSUL) - PART# 468817
- HOOD SUPPRESSION TANK - INCLUDED - 6 GAL. - [(2) 3.0 TANK(S)]
- REMOTE PULL STATION - STANDARD - FIELD INSTALLATION AT SINGLE POINT OF EGRESS



IMO'S PIZZA- KANSAS CITY
FSS
ACCUREX

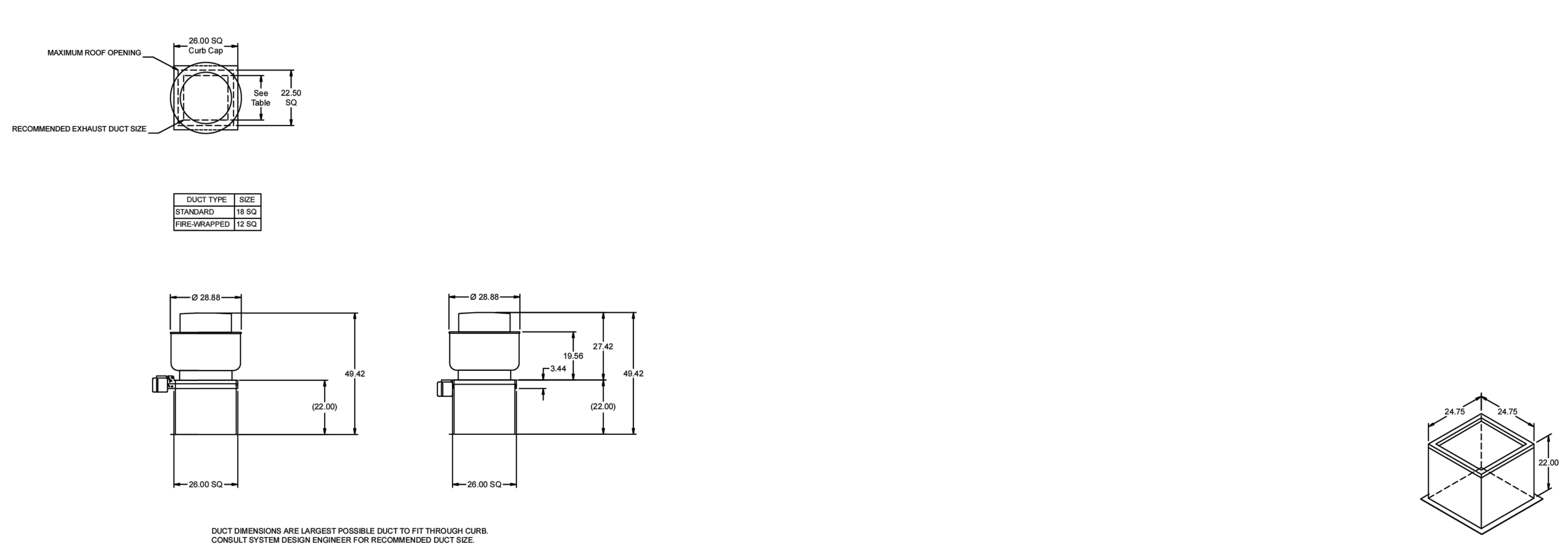
Belt Drive Upblast Centrifugal Roof Exhaust Fan

MARK INFORMATION MARK	QTY	FAN INFORMATION MODEL	DRIVE TYPE	VOLUME (CFM)	EXTERNAL SP (IN. WG)	TOTAL EXTERNAL SP (IN. WG)	FAN SPEED (RPM)	OUTLET VELOCITY (FT/MIN)	FEI	TOTAL WEIGHT (LB)	SOUND INFORMATION INLET dBA	INLET SONES	INLET SONES (SPHERICAL)	OUTLET dBA	OUTLET SONES	MOTOR INFORMATION OPERATING POWER (HP)	MOTOR SIZE (HP)	FEP INPUT POWER (KW)	ENCLOSURE	VOLTAGE	CYCLE	PHASE	EC MOTOR	NEC FLA*
EF- FRYERS	1	XCUBE-140-7	Belt	1,125	1	1	1,284	654.07	0	98.2	59.72	11.26	0	0	0	0.38	0.75	0	OP	208	60	1	No	7.6

*NEC FLA - Based on table 430.250 or 430.248 of National Electrical Code 2020. Actual motor FLA may vary for sizing thermal overload, consult factory"

EF- FRYERS : SELECTED OPTIONS AND ACCESSORIES

- One piece fully welded windband
- Tapered bushing wheel hub
- Breather tube outlet area min. 4.4 sq. in. (sizes 99-480)
- Min. windband material thickness: 0.051" aluminum (060-240), 0.064" aluminum (240HP, 240XP), 0.080" aluminum (sizes 300-480)
- Larger Curb Cap Size - 26 Square
- UL/cUL 705 Listed - Supplement SC - "Power Ventilators for Restaurant Exh. Appliances" (Formerly UL 762)
- Switch, NEMA-1, Toggle,
- Hinge, Factory Installed
- High Temp Curb Seal Rated for Continuous Duty at 1500 F (Factory Attached)
- Grease Trap (PN 475538)



IMO'S PIZZA- KANSAS CITY
EF- FRYERS
ACCUREX

EQUIPMENT SCHEDULE

Tempered Make-Up Air Unit — Mark: MAU

Qty	Accurex Model	Volume	External SP	Total SP	MCA	MOP	Weight	SCCR
1	XDGX-P115-H05-VG	1,400 CFM	0.5 in. wg	1.461 in. wg	11.7	20	421 lb	5kA

Motor Information

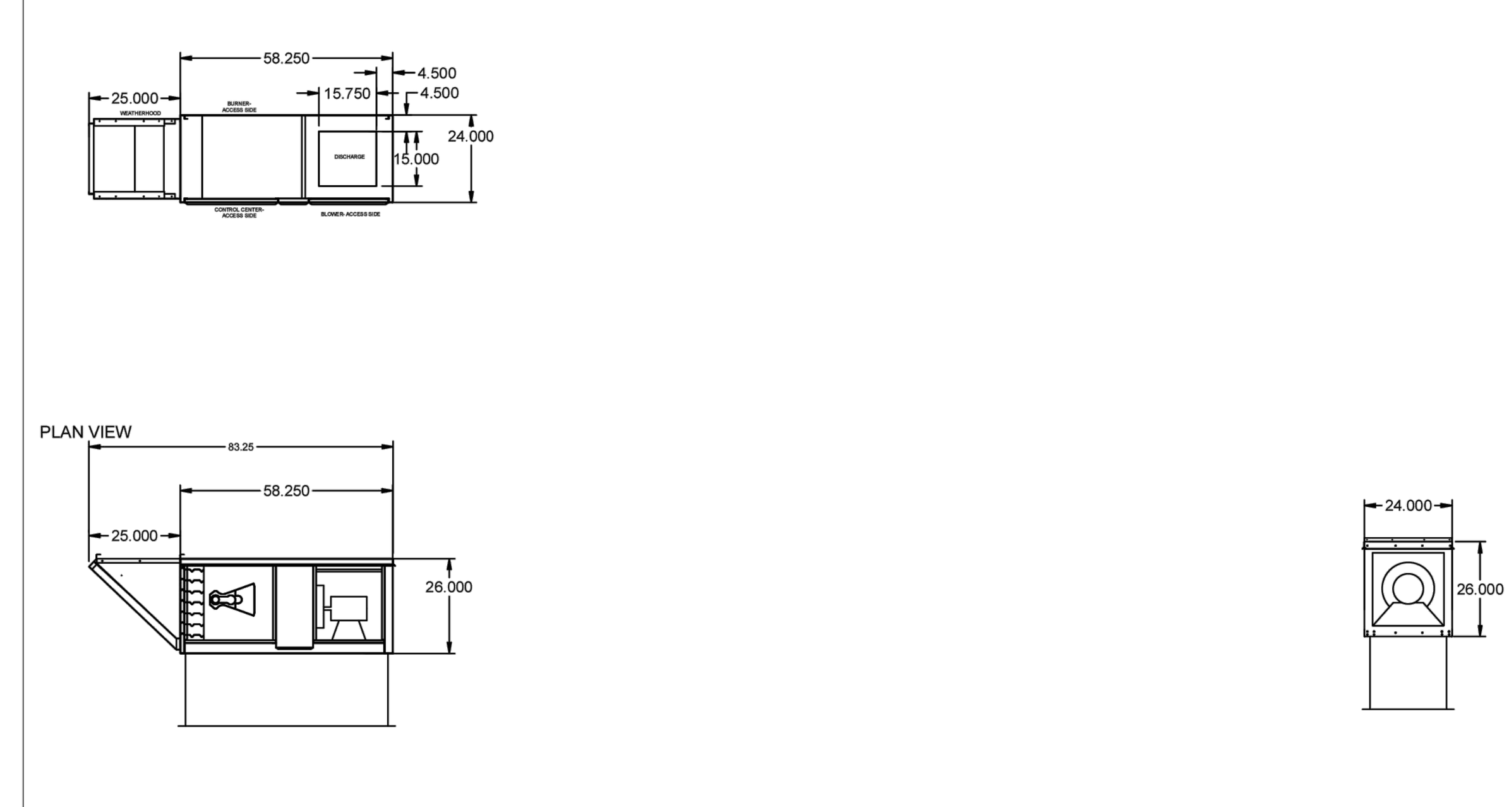
Size	V/C/P	Enclosure	Motor with Shaft Gounding	Motor RPM	Operating Power
1 hp	208/60/1	ODP	No	1725	0.73 hp

Heating

Type	Gas Type	Temperature Winter DB	Max Δ	Max LAT	Energy Input	Output	Efficiency	Connection Gas (IN)	Building Gas Pressure	Control Access	Gas Pressure Min	Max
Direct Gas	Natural	4.1 F	65.9 F	70.0 F	108.3 MBH	99.6 MBH	92%	3/4"	1/2 PSI	Right Hand	7 in. wg	0.5 PSI

OPTIONS AND ACCESSORIES

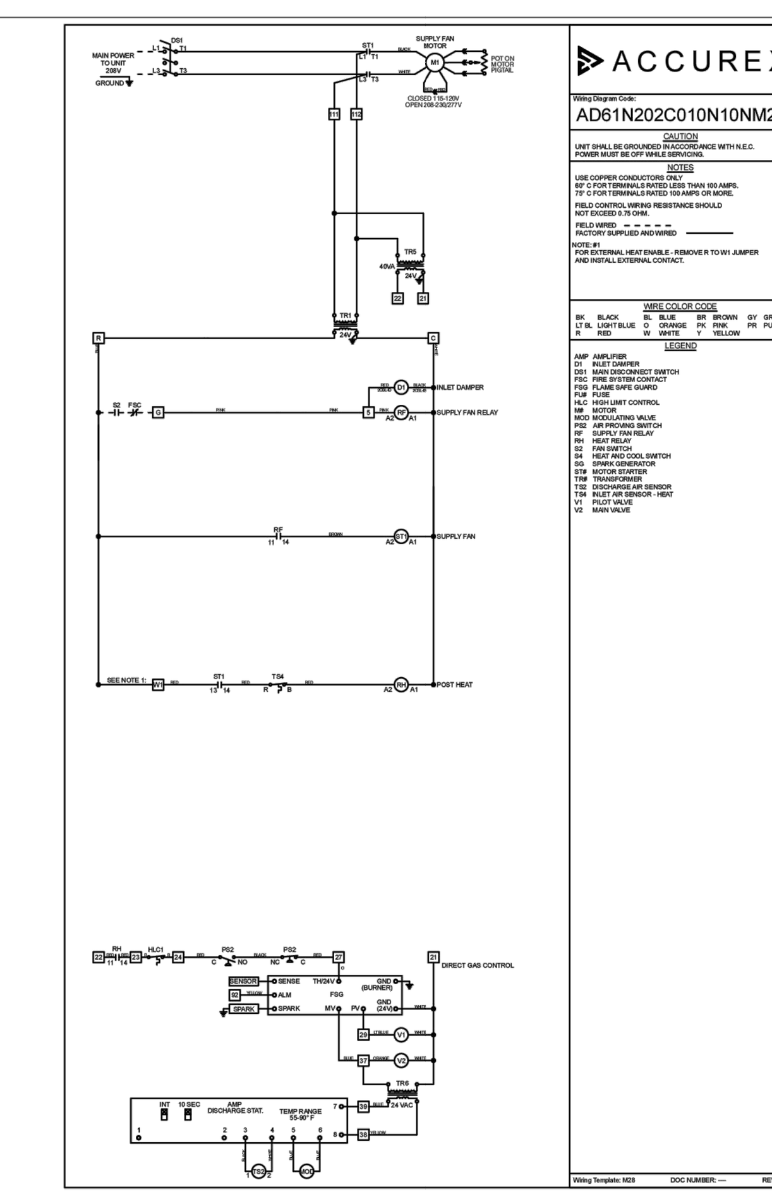
- Make Up Air
- Air Flow Arrangement: Outdoor Air Only
- Weatherhood: Aluminum Mesh, 16x20x2 - (2)
- Damper: Inlet
- Outdoor Air Intake Position: End
- Discharge Position: Bottom
- Coating: Galvanized
- Insulation: Double Wall - Tempering On
- Supply Fan Control: Vari-Green ECM
- Vari-Green Control: Dial on Motor
- Access Side: Right-Hand
- Unit Weight: 421 lb
- Control Center
- Heat Inlet Air Sensor
- Unit Controls: Terminal Strip
- Temperature Control: Discharge
- Direct Gas Options/Accessories
- Approvals: ETL
- FM Compliant
- Flame Sensing: Flame Rod
- Ignition Control: Pilot



PLAN VIEW

ELEVATION VIEW

END VIEW

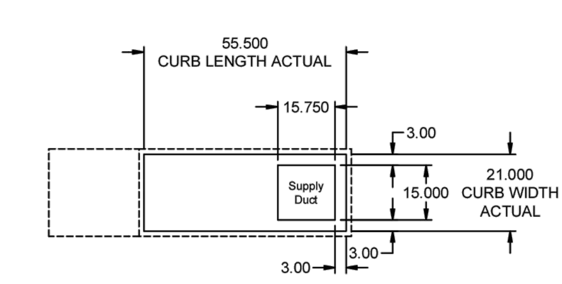


NOTE: Roof Opening Requirements:

Minimum Roof Opening: The minimum roof opening size is the illustrated duct diameter plus 0.25 in. on all sides.
For example: If the duct size is 14 x 14 in. square, the minimum roof opening size is 14.5 x 14.5 in. square.

Maximum Roof Opening: There must be a minimum perimeter of 1.75 in. between the roof opening and the roof curb.
For example: If the roof curb is 75 x 30 in. square, the maximum roof opening is 71.5 x 26.5 in. inches square.

NOTE: The weatherhood and filter sections of the make-up air unit are not supported by the curb.
This is by design, in order to help alleviate water infiltration issues. MUA Unit supports are shipped loose with unit.



FOOTPRINT

IMO'S PIZZA- KANSAS CITY
MAU
ACCUREX

TIM HOLLERBACH DESIGNS
1548 JEFFCO BLVD
ARNOLD, MO 63010
314-578-9470
www.timhollerbachdesigns.com

ENGENUITY
Building Value by Design
16305 SWINGLEY RIDGE ROAD SUITE 100
CHESTERFIELD, MO 63017

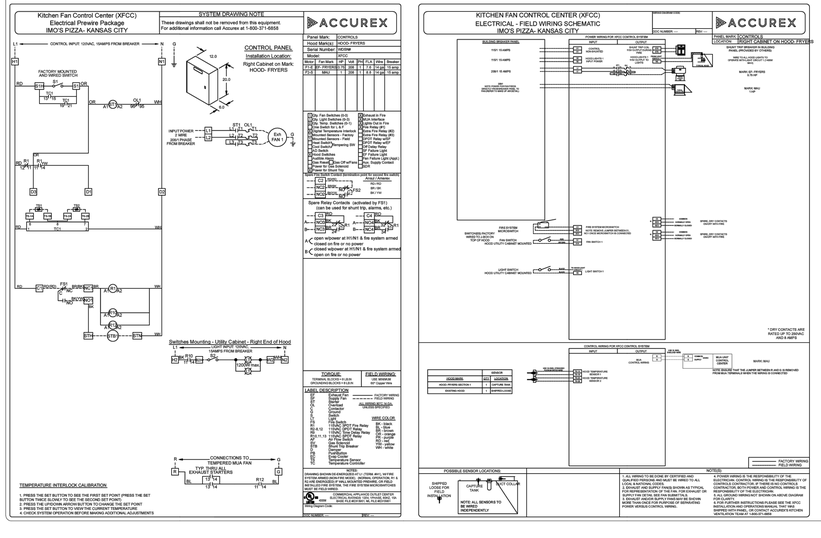
06-06-2025
Marcus Eckstein - Engineer
MO# PE-2019017810

A NEW:
IMO'S PIZZA
METRO NORTH CROSSING
8526 N. JEFFERSON STREET
KANSAS CITY, MO 64155

JOB NUMBER: 25030
ISSUE DATE: 06.06.2025
REVISIONS:

KITCHEN HOOD EQUIPMENT

M7.0



CONTROL INFORMATION

MARK	ELECTRICAL CONTROL PACKAGE		USER INTERFACE		FANS CONTROLLED				
	MODEL	LOCATION	TYPE	LOCATION	MARK	TYPE	VOLT	PHASE	HP
CONTROLS	XFCC	CABINET – RIGHT END OF HOOD- FRYERS	SWITCHES	CABINET – RIGHT END OF HOOD- FRYERS	EF- FRYERS	EXHAUST	208	1	3/4
					MAU	SUPPLY	208	1	1

CONTROL FEATURES

STARTERS PROVIDED IN CONTROL PANEL - QTY 1
2 POSITION LIGHT SWITCH - QTY 1
2 POSITION FAN SWITCH - QTY 1
-FACTORY MOUNTED EXHAUST TEMPERATURE SENSORS - QTY 1
-FIELD INSTALLED EXHAUST TEMPERATURE SENSORS - QTY 1 - (SHIPPED LOOSE)
TURN ON EXHAUST IN FIRE
LIGHTS OUT IN FIRE
MUA INTERFACE
POWER FOR SHUNT TRIP
THERMAL OVERLOADS IN CABINET

Kitchen Fan Control Center (XFCC)
Electrical Prewire Package
IMO'S PIZZA- KANSAS CITY

SYSTEM DRAWING NOTE

These drawings shall not be removed from this equipment.
For additional information call Accurex at 1-800-371-6858

Panel Mark:	CONTROLS
Hood Mark(s):	HOOD- FRYERS
Serial Number:	WDSN#
Model:	XFCC

Motor	Fan Mark	HP	Volt	PH	FLA	Wire	Breaker
F1-E	EF- FRYERS	0.75	208	1	7.6	14 ga	15 amp
F2-S	MAU	1	208	1	8.8	14 ga	15 amp

CONTROL PANEL
Installation Location:
Right Cabinet on Mark:
HOOD- FRYERS

1 Qty. Fan Switches (0-3)
1 Qty. Light Switches (0-3)
0 Qty. Temp. Switches (0-1)
☐ One Switch for L & F
☒ Digital Temperature Interlock
1 Mounted Sensors - Factory
1 Mounted Sensors - Field
☐ Heat Switch
☐ Cool Switch
Tempering SW
☐ AD Switch
☒ Hood Switches
☐ Audible Alarm
☐ Gas Reset ☐ Gas Off w/Fans
☒ Exhaust in Fire
☒ MUA Interface
☒ Lights Out in Fire
☒ Fire Relay (#1)
☐ Extra Fire Relay (#2)
☐ Extra Fire Relay (#3)
☐ DPDT Relay w/SF
☐ DPDT Relay w/EF
☐ Off Delay Relay
☐ SF Failure Light
☐ EF Failure Light
☐ Fan Failure Light (Appl.)
☐ Aux. Supply Contact

KITCHEN FAN CONTROL CENTER (XFCC)
ELECTRICAL - FIELD WIRING SCHEMATIC
IMO'S PIZZA- KANSAS CITY

WIRING DIAGRAM CODE:
DOC NUMBER: ----
REV: ----

PANEL MARK:	CONTROLS
LOCATION:	RIGHT CABINET ON HOOD- FRYERS

ACCUREX EASTERN MO SOUTHERN IL
SCOTT DALLMAN
SCOTT.DALLMAN@ACCUREX.COM
(314)324-2495

PROJECT
5/23/2025
IMO'S PIZZA- KANSAS CITY

MARK
CONTROLS

CONSTRUCTION COMPLIES WITH NFPA 96

ACCUREX

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E2021017534

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