

SECTION 22000
MECHANICAL

PART 1: GENERAL

1.1 SCOPE

- A. THE WORK INDICATED IN THIS DIVISION AND ON THE MECHANICAL DRAWINGS IS SUBJECT TO THE REQUIREMENTS OF THE INSTRUCTIONS TO BIDDERS. THESE ARE HEREBY INCLUDED BY REFERENCE. THE CONTRACTOR IS DIRECTED TO EXAMINE ALL PORTIONS OF THE BID DOCUMENTS AS THEY PERTAIN TO THE WORK COVERED BY THIS DIVISION OF THE SPECIFICATIONS AND TO INCLUDE ALL COSTS IN BID FOR ALL MECHANICAL WORK AS CALLED FOR BY THE COMPLETE BID DOCUMENTS.
- B. PROVIDE ALL REQUIRED LABOR, MATERIALS, EQUIPMENT AND CONTRACTOR SERVICES NECESSARY FOR THE COMPLETE INSTALLATION OF EQUIPMENT INDICATED HEREIN AND ON THE DRAWINGS, COMPLETE WITH ALL RELATED SERVICES. REVIEW ALL EXISTING BUILDING CONDITIONS AS THEY RELATE TO MECHANICAL WORK AND INCLUDE COSTS IN BID. COORDINATE REQUIREMENTS WITH ELECTRICAL TRADES AS REQUIRED.
- C. ALL WORK SHALL BE PERFORMED BY EXPERIENCED PERSONNEL QUALIFIED TO CARRY OUT THE WORK IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, LOCAL CODES AND AS SPECIFIED HEREIN. THE CONTRACTOR SHALL PROVIDE APPROPRIATE QUALIFICATIONS AND RECORDS OF PAST EXPERIENCE FOR PERSONNEL AND SUBCONTRACTORS WHEN REQUESTED BY THE OWNER OR ENGINEER FOR REVIEW AND APPROVAL.

1.2 CONTRACT DOCUMENTS

- A. THE MECHANICAL DRAWINGS LISTED IN THE DRAWING INDEX, TOGETHER WITH THESE SPECIFICATIONS, ARE AN INTEGRAL PART OF THE MECHANICAL CONTRACT. WHAT IS CALLED FOR IN ONE IS AS BINDING AS IF CALLED FOR IN BOTH. IN CASE OF CONFLICT, THE GREATER QUANTITY OR BETTER QUALITY IS TO PREVAIL, SUBJECT TO THE APPROVAL OF THE ENGINEER/ARCHITECT.
- B. AFTER INSTALLATION, BUT PRIOR TO UNIT START-UP, THE LOCAL MANUFACTURER'S REPRESENTATIVE SHALL REVIEW AND APPROVE THE INSTALLATION.
- C. THE MECHANICAL AND ELECTRICAL DRAWINGS ARE DIAGRAMMATIC ONLY, BUT ARE TO BE FOLLOWED AS CLOSELY AS ACTUAL CONSTRUCTION OF THE PROJECT AND WORK OF OTHER TRADES WILL PERMIT. MINOR CHANGES FROM THESE DRAWINGS, NECESSARY TO COORDINATE WITH THE WORK OF OTHER TRADES AND TO MAKE THE WORK OF THIS CONTRACTOR CONFORM TO THE PROJECT AS CONSTRUCTED, ARE TO BE MADE AT NO ADDITIONAL COST TO THE OWNER.
- D. MECHANICAL AND ELECTRICAL DRAWINGS ARE NOT TO BE SCALED FOR THE PURPOSE OF EQUIPMENT INSTALLATION. ALL MEASUREMENTS TO BE DERIVED FROM ARCHITECTURAL AND SHOP DRAWINGS AND COORDINATED WITH FIELD CONDITIONS. ALL MEASUREMENTS MUST BE VERIFIED. THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK FITTING INTO PLACE IN A SATISFACTORY AND WORKMANLIKE MANNER.
- E. INCREASED COST OF WIRING RESULTING FROM INCREASED ELECTRICAL RATINGS, OVER THAT SHOWN ON THE MECHANICAL DRAWINGS, IS TO BE BORNE BY THE CONTRACTOR FURNISHING THE EQUIPMENT.

1.3 MATERIALS AND EQUIPMENT

- A. WHERE "OR APPROVED EQUAL" CLAUSE IS INDICATED, IT MEANS MATERIAL, APPARATUS, EQUIPMENT AND SUPPLIES HAVING RECOGNIZED STANDARDS OF QUALITY AND PERFORMANCE WHICH, IN THE JUDGMENT OF THE ENGINEER/ARCHITECT, WILL MEET THE DESIGN AND SPECIFICATION REQUIREMENTS. MATERIAL AND EQUIPMENT BY MANUFACTURERS, OTHER THAN THOSE LISTED IN THE PLANS OR SPECIFICATIONS, MUST BE SUBMITTED FOR APPROVAL AS OUTLINED IN THE INSTRUCTION TO BIDDERS.
- B. WHERE "OR EQUAL" CLAUSE IS INDICATED, IT MEANS MATERIAL AND EQUIPMENT OF EQUAL OR BETTER QUALITY AND PERFORMANCE THAN THAT LISTED IN THE PLANS AND SPECIFICATIONS, EXCEPT THAT NO APPROVAL PRIOR TO BIDDING IS REQUIRED.

1.4 SHOP DRAWINGS AND SUBMITTALS

- A. PROVIDE ALL SUBMITTALS AS CALLED FOR IN THE SPECIFICATIONS AND AS REQUIRED BY THE ARCHITECT, INCLUDING SHOP DRAWINGS, SAMPLES, MATERIAL LISTS, SCHEDULE OF VALUE, ETC. SHOP DRAWINGS SHALL BE COMPLETELY REVIEWED AND APPROVED BY THE CONTRACTOR AND TRADE FURNISHING THE EQUIPMENT (INDICATED BY THE CONTRACTORS APPROVAL STAMP) PRIOR TO SUBMITTING TO THE ENGINEER/ARCHITECT.
- B. WHERE SHOP DRAWING SUBMITTALS ARE ASSEMBLED IN A FOLDER OR BOUND SETS, ALL FOLDERS OR SETS ARE TO BE IDENTICAL AND EACH SET MUST CONTAIN AN INDEX OF THE ITEMS ENCLOSED IN THE SET OR FOLDER. QUANTITY OF ORIGINAL COLOR SAMPLES REQUIRED SHALL BE COORDINATED WITH THE ARCHITECT.
- C. REVIEW AND APPROVAL OF SHOP DRAWINGS BY THE ENGINEER/ARCHITECT IS FOR GENERAL CONFORMITY TO DESIGN INTENT ONLY. THIS REVIEW DOES NOT AUTHORIZE CHANGES TO THE CONTRACT SUM OR RELIEVE THE CONTRACTOR IN ANY WAY OF HIS CONTRACT OBLIGATIONS.
- D. PROVIDE SUBMITTALS FOR THE FOLLOWING:
1. INSULATION
 2. BOILER
 3. ROOF TOP UNIT
 4. PUMPS

1.5 GUARANTEES AND WARRANTIES

- A. ALL LABOR, MATERIALS AND EQUIPMENT SHALL BE GUARANTEED BY THE CONTRACTOR AND WARRANTED BY THE MANUFACTURER FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE BY THE OWNER, UNLESS LONGER PERIOD IS SPECIFIED FOR SPECIFIC EQUIPMENT.
- B. THE CONTRACTOR SHALL MAKE ALL NECESSARY REPAIRS AND ALTERATIONS DURING THE GUARANTEE PERIOD AS MAY BE REQUIRED BY THE OWNER OR ARCHITECT FOR CORRECT SYSTEM OPERATION AND TO COMPLY WITH THE DRAWINGS AND SPECIFICATIONS. THESE REPAIRS AND ALTERATIONS SHALL BE AT NO ADDITIONAL COST TO THE OWNER.
- C. THE OWNER RESERVES THE RIGHT TO MAKE EMERGENCY SYSTEM REPAIRS WITHOUT VOIDING THE CONTRACTOR'S GUARANTEE.

1.6 DEMOLITION

- A. PROVIDE ALL LABOR, MATERIALS AND NECESSARY COORDINATION FOR DEMOLITION WORK AS CALLED FOR BY THE CONTRACT DOCUMENTS. REMOVAL SHALL BE PARTIAL OR COMPLETE AS CALLED FOR AND SHALL BE COORDINATED WITH OTHER TRADES AND NEW CONSTRUCTION. WORK SHALL ALSO INCLUDE MISCELLANEOUS ITEMS RELATED TO WORK INDICATED WHERE NOT REUSED FOR NEW CONSTRUCTION.
- B. CONTRACTOR SHALL NOT CUT ANY BEAMS OR COLUMNS OR ANY PORTION OF STRUCTURAL SYSTEM WITHOUT SPECIFIC PERMISSION. CONTRACTOR SHALL COORDINATE WITH OWNER/ARCHITECT/ENGINEER.
- C. THE CONDITION OF THE SITE, BUILDINGS AND SURROUNDINGS SHALL BE ACCEPTED AS FOUND. RESPONSIBILITY FOR CONDITIONS ARE SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.
- D. VERIFY WORK TO BE PERFORMED BEFORE PROCEEDING. WORK TO REMAIN SHALL BE PROTECTED AND, IF DAMAGED, SHALL BE RESTORED TO LIKE NEW CONDITION. COORDINATE DEMOLITION WITH OTHER TRADES AS REQUIRED. ITEMS INDICATED FOR DEMOLITION SHALL BE COMPLETELY REMOVED, HAULED OFF-SITE AND DISPOSED OF PROPERLY AT NO ADDITIONAL COST TO THE OWNER.

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PART 2: PRODUCTS

2.1 PIPING

- A. CONDENSATE DRAIN
1. CPVC, SCHEDULE 40 WITH SOLVENT WELD FITTINGS. ASSEMBLY SHALL BE REMOVABLE FRO CLEANING.
 2. COPPER TUBING, ASTM B88, TYPE L OR K, WROUGHT COPPER SOLDER JOINT FITTINGS, ANSI B16.22.
- B. NATURAL GAS
1. BLACK STEEL, ASTM A53 OR A106 GRADE B, SCHEDULE 40, FURNACE WELDED OR SEAMLESS.
 2. EQUIVALENT GALVANIZED IS ALSO ALLOWED IF PERMITTED BY THE LOCAL BUILDING OFFICIAL.
- C. HYDRONIC HOT WATER
1. SEAMLESS TYPE "L" COPPER, ASTM B88.

2.2 INSULATION

- A. FIBERGLASS PIPE INSULATION SHALL BE COMPLETE WITH ALL SERVICE REINFORCED JACKET.
- B. ELASTOMERIC FOAM INSULATION SHALL BE AR ARMAFLEX BY ARMSTRONG OR EQUAL.
- A. INSULATION SHALL HAVE A 25/50 FLAME/SMOKE RATING IN ACCORDANCE WITH ASTM E84.

D. DUCTWORK:

1. ALL SUPPLY AIR DUCTS SHALL BE INSULATED WITH BLANKET FIBERGLASS, 1-1/2 INCH THICKNESS, WITH FSK VAPOR BARRIER. FIBERGLASS INSULATION SHALL HAVE A MINIMUM DENSITY OF 1.0 PCF. INSULATION SHALL BE OWENS-CORNING, MANVILLE OR EQUAL. SEAL ALL JOINTS, SEAMS AND EDGES WITH MATCHING FSK TAPE. TAPE AND INSULATION MUST BE COMPLETELY CLEAN AND NEW WHEN APPLIED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING ANY LOOSE TAPE AND INSULATION DURING THE WARRANTY PERIOD. WHERE DUCT IS LOCATED ABOVE THE BUILDING INSULATION "ENVELOPE", PROVIDE TWO LAYERS OF ABOVE MENTIONED INSULATION.
2. NO INTERIOR LINED DUCTWORK IS ALLOWED.

2.4 DUCTWORK

- A. ALL DUCTWORK SHALL BE RIGID GALVANIZED STEEL UNLESS OTHERWISE NOTED, IN ACCORDANCE WITH SMACNA REQUIREMENTS. DUCTWORK SHALL BE SMACNA SEAL CLASS B UNLESS SPECIFICALLY APPROVED OTHERWISE.
- B. IN ALL DUCTWORK SYSTEMS, FURNISH ALL DAMPERS NECESSARY FOR PROPER CONTROL AND BALANCING OF AIR DISTRIBUTION. FURNISH DAMPERS IN ALL BRANCHES FROM TRUNK DUCTS WITH OPERATING LEVERS READILY ACCESSIBLE. ALL MULTI-LEAF DAMPERS ARE OPPOSED BLADE TYPE. SAME MATERIAL AS DUCTWORK, RIGID CONSTRUCTION, FREE OF ALL RATTILING AND VIBRATION, WITH EDGES CRIMPED OR CREASED FOR STIFFNESS. ALL BLANK-OFF PLATES AND TRANSITIONS NECESSARY TO INSTALL SMALLER THAN DUCT SIZE DAMPERS ARE THE RESPONSIBILITY OF THE SHEET METAL SUBCONTRACTOR. COORDINATE AS REQUIRED.

2.8 PACKAGED GAS FIRED ROOFTOP UNIT

- A. GENERAL: SIZE, TYPE AND CAPACITY INDICATED, GAS FIRED HEATING AND ELECTRIC COOLING. UNIT SHALL BE COMPLETE WITH CASINGS, COILS, SUPPLY FANS, MOTOR, DRIVE, FILTERS, DAMPERS AND ALL NECESSARY APPURTENANCES. THE UNIT SHALL BE OF ONE-PIECE PACKAGED CONSTRUCTION, COMPLETELY ASSEMBLED, WIRED, FACTORY TESTED AND INCLUDE A FULL OPERATING CHARGE OF R410A AND 100% RUN-TESTED BEFORE LEAVING THE FACTORY. COOLING COIL SECTION AND DRAIN PAN SHALL BE OF AN "IAQ" TYPE DESIGN TO RESIST BIOLOGICAL GROWTH AND STANDING WATER.
- B. CASING SHALL BE WITH INSULATED PANELS TO MEET CURRENT ASHRAE 62.1 AND IAQ STANDARDS, CONSTRUCTED OF GALVANIZED STEEL, BONDERIZED AND COATED WITH WEATHER-RESISTANT BAKED ENAMEL FINISH. FURNISH AND INSTALL RTU'S WITH ROOF CURB ADAPTOR, COORDINATE AS REQUIRED FOR ROOF SLOPE AND ATTACHMENT METHOD. ACCESS PANELS SHALL BE HINGED.
- C. COMPRESSORS: THE COMPRESSORS SHALL BE OF THE DIRECT-DRIVE HERMETIC SCROLL OR RECIPROCATING TYPE, WITH POSITIVE LUBRICATION TO MOVING PARTS. MOTORS SHALL BE SUCTION GAS COOLED WITH FORCED FEED LUBRICATION AND INTERNAL MOTOR WINDING PROTECTION.
- COMPRESSOR SHALL HAVE INTERNAL SPRING ISOLATION. COMPRESSOR PROTECTION SHALL INCLUDE INTERNAL TEMPERATURE AND CURRENT SENSITIVE OVERLOADS AND LOW PRESSURE SWITCHES.
- D. GAS FIRED HEATING SECTION SHALL BE INDUCED OR FORCED COMBUSTION WITH PILOTLESS IGNITION SYSTEM. UNIT SHALL FIRE ON NATURAL GAS IN STAGES AS REQUIRED BY THE SIZE OF THE UNIT (OR AS INDICATED IN SCHEDULE).
- E. ELECTRICAL: WIRING INTERNAL TO THE UNIT SHALL BE COLORED AND NUMBERED FOR SIMPLIFIED IDENTIFICATION. ELECTRICAL SHALL BE A SINGLE POINT CONNECTION INSIDE THE UNIT. ALSO PROVIDE WITH FACTORY INSTALLED DISCONNECT SWITCH AND SERVICE RECEPTACLE.
- F. REFRIGERANT CIRCUITS: EACH REFRIGERANT CIRCUIT SHALL HAVE THERMOSTATIC EXPANSION DEVICE AND SERVICE PRESSURE PORTS AND REFRIGERANT LINE FILTER DRIER.
- G. EVAPORATOR COIL SHALL BE SEAMLESS COPPER TUBING OF 3/8" O.D. AND SHALL BE MECHANICALLY BONDED TO HEAVY DUTY ALUMINUM FINS OF CONFIGURATED DESIGN. COIL SHALL BE PRESSURE AND LEAK TESTED AT 200 PSI. EXPANSION VALVES SHALL BE STANDARD EQUIPMENT.
- H. CONDENSER COIL SHALL BE AS SPECIFIED ABOVE FOR EVAPORATOR COIL.
- I. EVAPORATOR FAN MAY BE BELT DRIVEN OR DIRECT DRIVE, CENTRIFUGAL TYPE WITH ADJUSTABLE MOTOR SHEAVE STANDARD. MOTOR SHALL BE PERMANENTLY LUBRICATED. ENTIRE MOTOR AND FAN ASSEMBLY SHALL BE COMPLETELY ISOLATED WITH RUBBER OR SPRING MOUNTS.
- J. CONDENSER FANS SHALL BE DIRECT DRIVE, STATICALLY AND DYNAMICALLY BALANCED. FAN MOTOR SHALL BE WEATHERPROOF AND UL LISTED FOR OUTDOOR USE WITH BUILT-IN THERMAL OVERLOAD PROTECTION AND PERMANENTLY LUBRICATED MOTOR.
- K. EVAPORATOR DRAIN PAN SHALL BE STAINLESS STEEL, INSULATED, TO MEET ASHRAE 62.1-01 IAQ STANDARD, INTERNALLY SEALED AND SLOPED FOR POSITIVE DRAINAGE. PIPE CONDENSATE TO ROOF OR AS INDICATED.
- L. FILTERS SHALL BE 2-INCH THICK MERV 8. FURNISH UNIT COMPLETE WITH 2 SETS OF PLEATED MEDIA AS WELL AS ADDITIONAL FILTERS FOR USE DURING THE CONSTRUCTION PHASE AND UNIT START-UP. PROVIDE COMPLETE FILTER CHANGE-OUT AT COMPLETION OF CONSTRUCTION.
- M. ECONOMIZER: FURNISH A COMPLETE ECONOMIZER AND POWER EXHAUST. INCLUDE WIRING AS REQUIRED.
- N. THERMOSTATS: REMOTE WALL-MOUNTED THERMOSTAT, LOW-VOLTAGE TYPE PROVIDED WITH AUTOMATIC CHANGEOVER FEATURE FOR BOTH, HEATING AND COOLING STAGES, 7-DAY PROGRAM WITH TWO (2) STARTS AND STOPS PER DAY, WITH TOUCH SCREEN.
- O. DUCT SMOKE DETECTOR: WHERE REQUIRED, PROVIDE UNIT COMPLETE WITH A RETURN AIR DUCT MOUNTED, UL LISTED SMOKE DETECTOR COMPLETE WITH REMOTE TEST-ANNUNCIATOR STATION.
- P. ACCEPTABLE MANUFACTURERS
1. CARRIER
 2. BRYANT
 3. TRANE
 4. YORK
 5. DAIKIN

2.8 BOILER

- A. PROVIDE NEW GAS FIRED 82% MINIMUM EFFICIENCY BOILER (SAME MANUFACTURER AS RECENTLY INSTALLED BOILER). INCLUDE CONTROLS, STATUS INDICATION AND AIR INTAKE FILTER.
- B. LOCHINVAR OR APPROVED EQUAL.

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2.9 PACKAGED ELECTRIC HEAT ROOFTOP UNIT

- A. GENERAL: SIZE, TYPE AND CAPACITY INDICATED, ELECTRIC RESISTANCE HEATING AND ELECTRIC COOLING. UNIT SHALL BE COMPLETE WITH CASINGS, COILS, SUPPLY FANS, MOTOR, DRIVE, FILTERS, DAMPERS AND ALL NECESSARY APPURTENANCES. THE UNIT SHALL BE OF ONE-PIECE PACKAGED CONSTRUCTION, COMPLETELY ASSEMBLED, WIRED, FACTORY TESTED AND INCLUDE A FULL OPERATING CHARGE OF R410A AND 100% RUN-TESTED BEFORE LEAVING THE FACTORY. COOLING COIL SECTION AND DRAIN PAN SHALL BE OF AN "IAQ" TYPE DESIGN TO RESIST BIOLOGICAL GROWTH AND STANDING WATER.
- B. CASING SHALL BE WITH INSULATED PANELS TO MEET CURRENT ASHRAE 62.1 AND IAQ STANDARDS, CONSTRUCTED OF GALVANIZED STEEL, BONDERIZED AND COATED WITH WEATHER-RESISTANT BAKED ENAMEL FINISH. FURNISH AND INSTALL RTU'S WITH ROOF CURB ADAPTOR, COORDINATE AS REQUIRED FOR ROOF SLOPE AND ATTACHMENT METHOD. ACCESS DOORS SHALL BE HINGED.
- C. COMPRESSORS: THE COMPRESSORS SHALL BE OF THE DIRECT-DRIVE HERMETIC SCROLL OR RECIPROCATING TYPE, WITH POSITIVE LUBRICATION TO MOVING PARTS. MOTORS SHALL BE SUCTION GAS COOLED WITH FORCED FEED LUBRICATION AND INTERNAL MOTOR WINDING PROTECTION.
- COMPRESSOR SHALL HAVE INTERNAL SPRING ISOLATION. COMPRESSOR PROTECTION SHALL INCLUDE INTERNAL TEMPERATURE AND CURRENT SENSITIVE OVERLOADS AND LOW PRESSURE SWITCHES.
- D. ELECTRIC HEATING: ELECTRIC RESISTANCE TYPE WITH OVERCURRENT AND AIRFLOW PROTECTION. HEATER SHALL BE 3-PHASE WITH NICKEL CHROMIUM ELEMENTS. FEED THRU UNIT SINGLE POINT POWER CONNECTION.
- E. ELECTRICAL: WIRING INTERNAL TO THE UNIT SHALL BE COLORED AND NUMBERED FOR SIMPLIFIED IDENTIFICATION. ELECTRICAL SHALL BE A SINGLE POINT CONNECTION INSIDE THE UNIT. ALSO PROVIDE WITH FACTORY INSTALLED DISCONNECT SWITCH AND SERVICE RECEPTACLE.
- F. EVAPORATOR COIL SHALL BE SEAMLESS COPPER TUBING AND SHALL BE MECHANICALLY BONDED TO HEAVY DUTY ALUMINUM FINS OF CONFIGURATED DESIGN. COIL SHALL BE PRESSURE AND LEAK TESTED AT 200 PSI. EXPANSION VALVES SHALL BE STANDARD EQUIPMENT.
- G. CONDENSER COIL SHALL BE AS SPECIFIED ABOVE FOR EVAPORATOR COIL.
- H. EVAPORATOR FAN SHALL BE MULTI-TAP OR ECM, CENTRIFUGAL TYPE.
- I. CONDENSER FANS SHALL BE DIRECT DRIVE, STATICALLY AND DYNAMICALLY BALANCED. FAN MOTOR SHALL BE WEATHERPROOF AND UL LISTED FOR OUTDOOR USE WITH BUILT-IN THERMAL OVERLOAD PROTECTION AND PERMANENTLY LUBRICATED MOTOR.
- J. EVAPORATOR DRAIN PAN SHALL BE STAINLESS STEEL, INSULATED, TO MEET ASHRAE 62.1-01 IAQ STANDARD, INTERNALLY SEALED AND SLOPED FOR POSITIVE DRAINAGE. PIPE CONDENSATE TO ROOF OR AS INDICATED.
- K. FILTERS SHALL BE 2-INCH THICK MERV 8. FURNISH UNIT COMPLETE WITH 2 SETS OF PLEATED MEDIA AS WELL AS ADDITIONAL FILTERS FOR USE DURING THE CONSTRUCTION PHASE AND UNIT START-UP. PROVIDE COMPLETE FILTER CHANGE-OUT AT COMPLETION OF CONSTRUCTION.
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- N. ACCEPTABLE MANUFACTURERS
1. CARRIER
 2. BRYANT
 3. TRANE
 4. YORK
 5. DAIKIN

PART 3: EXECUTION

3.1 CODES, RULES AND REGULATIONS

- A. ALL WORK SHALL BE IN ACCORDANCE WITH NATIONAL, STATE AND LOCAL CODES IN FORCE AT TIME OF BIDDING, INCLUDING BUT NOT LIMITED TO THE INDIANA CONSTRUCTION RULES. IN ADDITION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND INSPECTION APPROVALS AS THE WORK PROGRESSES. ANY WORK WHICH IS COMPLETED WITHOUT THESE APPROVALS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST OR INCONVENIENCE TO THE OWNER TO THE SATISFACTION OF THE BUILDING OFFICIALS AND OWNER'S REPRESENTATIVES.

3.2 COORDINATION

- A. COORDINATE ROUTING OF PIPING, DUCTWORK, ETC. PRIOR TO STARTING INSTALLATION.
- B. COORDINATE EXACT PLACEMENT OF GRILLES AND DIFFUSERS, ETC. WITH ARCHITECTURAL AND ELECTRICAL ITEMS BEFORE INSTALLATION.
- C. COORDINATE EXACT PLACEMENT OF UNITS, PIPING AND VENTING WITH ARCHITECTURAL AND ELECTRICAL ITEMS BEFORE INSTALLATION.
- D. MECHANICAL TRADE SHALL COORDINATE ROOF AND WALL FLASHING WITH GENERAL TRADE.
- E. MECHANICAL TRADE SHALL PROVIDE ALL WALL AND ROOF OPENINGS.
- F. ALL WIRING TO PROVIDE THE COMPLETE SYSTEM OF TEMPERATURE REGULATION SHALL BE PROVIDED BY THE MECHANICAL TRADE. PROVIDE ALL NECESSARY DRAWINGS FOR DETERMINING CONNECTION POINTS, WIRE COUNTS, ETC. VERIFY REQUIREMENTS FOR NEW, EXISTING AND RELOCATED EQUIPMENT.

3.3 INSTALLATION

- A. FIELD VERIFY FRAMING, CEILING HEIGHTS, ETC. BEFORE ORDERING OR FABRICATING DUCTWORK.
- B. FIELD VERIFY EXISTING CONDITIONS BEFORE ORDERING OR SETTING EQUIPMENT, PIPING OR VENTING.
- C. ALL DUCTWORK SHALL COMPLY WITH SMACNA STANDARDS.
- D. WHERE PVC PIPING PENETRATES FIRE RATED WALLS OR CEILINGS INCULMESCENT FIRE-STOPPING MUST BE PROVIDED (AS MANUFACTURED BY 3M OR EQUAL).
- E. PROVIDE SHUT-OFF VALVES ON SUPPLY PIPING TO EACH FIXTURE.
- F. INSTALL ALL EQUIPMENT PER MANUFACTURER'S INSTRUCTIONS. NOTIFY ENGINEER/ARCHITECT IF THIS INFORMATION APPEARS TO CONFLICT WITH THE DRAWINGS AND SPECIFICATIONS PRIOR TO INSTALLATION.
- G. PROVIDE VACUUM BREAKERS AT ALL HOSE TYPE CONNECTIONS.

3.4 ACCESSIBILITY

- A. MAINTAIN ACCESSIBILITY TO ALL EQUIPMENT FOR OPERATION, MAINTENANCE AND REPAIR. REFER TO MANUFACTURER'S REQUIREMENTS.

3.5 CUTTING AND PATCHING

- A. LAY OUT WORK CAREFULLY IN ADVANCE, AND WHERE CUTTING, CHANNELING, CHASING OR DRILLING OF FLOORS, WALLS, PARTITIONS, CEILINGS OR OTHER SURFACES IS NECESSARY FOR THE PROPER INSTALLATION, SUPPORT, OR ANCHORAGE OF MECHANICAL EQUIPMENT, THE WORK IS TO BE CAREFULLY DONE AND ANY DAMAGE TO THE BUILDING, PIPING, OR EQUIPMENT REPAIRED BY SKILLED MECHANICS OF THE TRADES INVOLVED, AT NO ADDITIONAL COST TO THE OWNER. THIS CONTRACTOR/TRADE SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING RELATED TO THE WORK OF THIS DIVISION OF THE SPECIFICATIONS.

3.6 RECORD DRAWINGS

- A. MAINTAIN ACCURATE RECORDS OF ALL CHANGES MADE DURING CONSTRUCTION. PROVIDE A NEATLY MARKED SET OF PRINTS TO THE ENGINEER/ARCHITECT AT COMPLETION OF THE PROJECT INDICATING ALL FIELD CHANGES.

3.7 WORKMANSHIP

- A. INSTALL ALL MATERIALS AND EQUIPMENT IN A NEAT AND WORKMANLIKE MANNER AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, AS APPROVED BY THE ENGINEER/ARCHITECT TO CONFORM WITH THE CONTRACT DOCUMENTS.

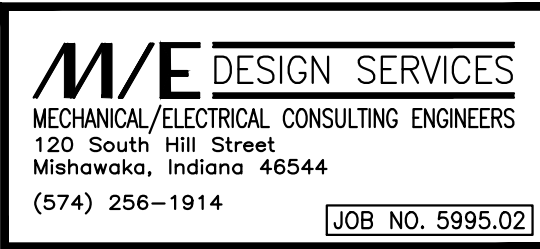
3.8 OPERATING AND MAINTENANCE MANUALS AND INSTRUCTION

- A. PROVIDE TWO (2) BOUND SETS OF COMPLETE INSTALLATION, OPERATING, AND MAINTENANCE INSTRUCTIONS. MANUALS SHALL ALSO INCLUDE COMPLETE PARTS LISTS, OPERATING INSTRUCTIONS, COPIES OF ORIGINAL SHOP DRAWINGS, SUBCONTRACTOR LISTS, WARRANTIES, WARNINGS, ETC. GENERIC INSTRUCTIONS SHALL HIGHLIGHT APPLICABLE SECTIONS WHEN NEEDED TO DIFFERENTIATE FROM NON-RELEVANT EQUIPMENT.
- B. UPON COMPLETION OF THE WORK AND AT A DESIGNATED TIME, PROVIDE INSTRUCTIONS TO THE OWNER'S REPRESENTATIVE ON OPERATION AND MAINTENANCE OF ALL MECHANICAL EQUIPMENT. NOTIFY ENGINEER/ARCHITECT OF SCHEDULED TIME AND PLACE.
- C. TURN OVER TO OWNER ALL TOOLS SUPPLIED WITH EQUIPMENT.

3.9 TESTING AND BALANCING

- A. PROVIDE COMPLETE TESTING AND BALANCING FOR ALL AIR AND WATER SYSTEMS IN ACCORDANCE WITH THE GUIDELINES OF ABC OR NEBB. SUBMIT 3 COPIES OF COMPLETED REPORT FOR APPROVAL. REBALANCE IF REQUIRED TO ACHIEVE SPECIFIED CONDITIONS. SUBSTANTIAL COMPLETION MAY BE DENIED IF TESTING AND BALANCING WORK IS NOT COMPLETED AND APPROVED.

END OF SECTION



DATE:	SEPTEMBER 13, 2023
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WATERFALL BOILER & RIVERSIDE RTU REPLACEMENT
ELKHART HOUSING AUTHORITY
WATERFALL AND RIVERSIDE HIGH RISE BUILDINGS
ELKHART

INDIANA

MECHANICAL
SPECIFICATIONS

ME104

