









09/28/2021

ARCHITECT: GARY TURK 879 JUNCTION DR. ALLEN, TX 75013 P:972.398.6644

CALIBER COLLISION SHEBOYGAN, WI

DATE: 09/27/2022

PROJECT NUMBER: 21138

REVISIONS

Table with 2 columns: NO, DATE. Multiple empty rows for revisions.

DRAWINGS ISSUED FOR: PERMIT SET

SHEET NUMBER

MO.4

SPECS - HVAC

COPYRIGHT © 2021

- C. Install HVAC equipment to facilitate service, maintenance, and repair or replacement of components.
D. Install equipment to allow right-of-way for piping to be installed with the required slope.
E. For rooftop-mounted equipment requiring routine maintenance, allow for an unobstructed path from the roof service entry point to the equipment.

3.07 EQUIPMENT SUPPORTS

- A. Major equipment supports (structural steel frames, framed structural slab and wall openings, etc.) shall be furnished and installed by others; however, the HVAC work shall include furnishing and installation of all miscellaneous equipment supports, structural members, rods, clamps and hangers required to provide adequate support of all HVAC equipment.
B. Unless otherwise shown on the Drawings, all HVAC equipment and accessories shall be installed level, square, and plumb.
C. All equipment, etc. supported by structural bar joists shall be supported only by the top chord of the joists.

3.08 DUCTWORK PENETRATIONS

- A. Sleeves shall be installed in all masonry or concrete walls, floors, roofs, etc. for ductwork penetrations. Sleeves for ductwork shall be 20-gauge galvanized steel. Ductwork sleeves shall be sized to provide a minimum of 1/4" clearance between the sleeve and duct.
B. As far as possible, all ductwork penetrations shall be provided for at the time of masonry or concrete construction.
C. In exposed areas, escutcheon plates shall be chrome plated.
D. Ductwork penetrating walls or floors of any material shall be installed with closure plates on both sides of the penetration.
E. All duct penetrations of fire, smoke, or fire and smoke-rated assemblies shall be fire-stopped as required to retain the integrity of the UL-rated assembly.
F. Ensure that materials used for fire-stopping, caulking, sealing, pest/rodent proofing, etc. are compatible with the piping material used.

3.09 FLASHING

- A. All ductwork penetrating roofs shall be flashed in an approved manner, shall be watertight, and shall conform to the requirements detailed in Division 7 - Thermal and Moisture Protection.

3.10 EQUIPMENT LABELING

- A. All HVAC equipment shall be labeled. This shall include all central plant, air handling or air conditioning equipment, air terminals, and other similar and miscellaneous equipment.
B. Labels for air terminals or other devices shall be located for optimum visibility through access panel or removed ceiling tiles.
C. Equipment labeling shall be one of the following, unless noted or specified otherwise:
1. Permanently attached plastic laminated signs with 1" high lettering
2. Stencil painted identification, 2" high letters, with standard fiberboard stencils and standard black (or other appropriate color) exterior stencil enamel

3.11 CLEANING

- A. At all times, the premises shall be kept reasonably clean and free of undue amounts of waste, trash and debris by periodic cleaning and removal.
B. After all equipment has been installed, but prior to testing and balancing, all equipment, ductwork, etc. shall be thoroughly cleaned both inside and out.
C. After cleaning, filters shall be installed where required and all systems shall be tested and balanced.
D. After testing and balancing and just prior to Owner review and acceptance, all systems shall be finally cleaned and left ready for use.

3.12 PAINTING

- A. Painting will be done under Division 9 - Painting except as otherwise noted, but the HVAC Contractor shall leave all surfaces of work free of rust, dirt and grease.
B. The HVAC Contractor shall touch-up any equipment scratched in shipment or during installation to match the original finish.
C. Any visible ductwork through grilles, registers and diffusers shall be painted flat black.
D. Provide one coat of rust preventive primer on all new structural steel supports and new ferrous surfaces not galvanized, including insulated and non-insulated HVAC piping.
E. All painting and coating shall match the original finish and shall conform to the requirements detailed in Division 9 - Finishes.
F. Do not paint over equipment nameplates, nonferrous hardware, accessories or trim.

3.13 PERFORMANCE AND DEMONSTRATION TESTS

- A. All testing and demonstration of any and all HVAC systems required for acceptance by any authorities having jurisdiction shall be included as part of the HVAC work.
B. For testing and demonstration of smoke control systems, the requirements in paragraph 3.16.A apply.
C. Upon completion of the work, the Contractor shall conduct operation and training session(s) for the Owner's key operating personnel.

3.14 TRAINING

- A. Upon completion of the work, the Contractor shall conduct operation and training session(s) for the Owner's key operating personnel. These sessions shall be of sufficient length and duration to adequately explain the design intent and proper operating and maintenance techniques for all HVAC equipment and systems.

- E. Starters for motors 1/2 HP and smaller shall be manual type, and for 1/2 HP and larger, shall be magnetic type.
F. Motor controls shall be either "Hand-Off-Auto" switches or "On-Off" push buttons with one indicating light.
G. Motor starters that are not an integral part of HVAC equipment shall be installed in conformance with Division 26 - Electrical Requirements.
H. All "loose" disconnects and starters shall be installed by Division 26.

- I. Power wiring to disconnects, starters, and equipment shall be provided and installed by Division 26.
J. Provide all system controls and associated control and interlock wiring for complete and operable systems.
K. All starters shall be labeled on the face of the device with a semi-rigid plastic laminate nameplate with 1" high white letters on a black background.

- L. All starters for 3-phase equipment shall have overload devices in each phase.
M. Wiring diagrams shall be furnished by the Contractor.
N. Coordinate with the electrical drawings for the required short circuit current rating of the panelboard serving multi-motor and combination-load equipment.
O. Acceptable manufacturers shall be General Electric, Square D, Eaton, Siemens and Allen Bradley.

2.03 AIR FILTERS

- A. All filters shall be UL 900 classified.
B. Filters shall be pleated disposable type (MERV 6 minimum) unless specified otherwise.
C. Install one set of new filters in air handling equipment during construction and install a new filter prior to test and balance.
D. Temporary roll filter media shall be provided at the inlets to all air handling equipment operated during construction.
E. All work shall be designed and installed to comply with the requirements for the use group for the area in which the building is constructed.

PART 3 - EXECUTION

3.01 GENERAL

- A. All equipment and materials shall be completely installed, adjusted, and fully operational with all accessories and connections.
B. Equipment, ductwork, etc. shall fit into the spaces provided in the building and shall be installed at such time and in such a manner as to avoid damage and as required by the job progress.
C. The Engineer reserves the right to direct the removal of any item which, in his opinion, does not present an orderly and reasonably neat or workmanlike appearance.
D. Listed mounting heights are to the finished bottom of the device unless otherwise noted.
E. All work shall be designed and installed to comply with the requirements for the use group for the area in which the building is constructed.

3.02 STORAGE AND PROTECTION OF STORED MATERIALS

- A. During construction, all equipment shall be properly protected against damage, defacing and freezing with shipping cartons, plastic sheeting, shipping covers, etc.
B. All open ends of equipment shall be sealed with nipples and caps, plugs, and test plugs until final connection to system is made.
C. All equipment and ductwork shall be protected to prevent entrance of foreign matter and debris by covering exposed openings during construction.
D. Handle and store materials in accordance with manufacturer's and supplier's recommendations and in a manner to prevent damage to materials during storage and handling.
E. Equipment and materials shall not be installed until such time as the environmental conditions of the job site are suitable to protect the equipment or materials.

3.03 PROTECTION OF HVAC SYSTEMS IN OCCUPIED BUILDINGS

- A. Protect equipment and air distribution systems as outlined in SMACNA's IAQ Guidelines for Occupied Buildings Under Construction, latest edition.

3.04 BUILDING DRY-OUT DURING CONSTRUCTION

- A. HVAC equipment shall not be used to dehumidify the building interior and dry-out construction materials.
B. Coordinate with the general contractor to provide industrial grade desiccant type dehumidifiers to perform building dry-out.

3.05 CUTTING, PATCHING, AND SEALING

- A. The work shall include all cutting and patching required as part of the HVAC installation.
B. All penetrations in walls, ceilings, and partitions required by mechanical work shall be sealed with an appropriate pliable sealant or fire caulking to make the penetration airtight.

3.06 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

- A. Install equipment to allow maximum possible headroom unless specific mounting heights are indicated.
B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.

- on the Contract Drawings. Each individual submittal item shall be marked to show which specification section pertains to the item.
E. The Contractor shall provide a written statement confirming coordination of voltage requirements for all HVAC equipment requiring an electrical connection.
VOLTAGE COORDINATION STATEMENT

This statement is to confirm that the voltages of the equipment provided under this specification have been coordinated with the Electrical Drawings, as well as with the Electrical Contractor.
HVAC Contractor:
Project Manager Name:
Project Manager Signature/Date:
Electrical Contractor:
Project Manager Name:
Project Manager Signature/Date:

1.09 PERMITS

- A. The Contractor shall obtain all permits and inspections required for the installation of the HVAC work and pay all charges included thereto.
1.10 COORDINATION OF TRADES

- A. The Contractor shall give full cooperation to the other trades, and shall furnish all information necessary to permit the work of all trades to be installed satisfactorily and with the least possible interference or delay.
B. HVAC equipment shall not be installed without first coordinating the installation of same with other trades.
C. The Contractor shall coordinate the elevations of all ductwork and equipment above ceilings and in exposed areas with the work of all other disciplines prior to installation.
D. In areas where more than one trade is required to use common openings in beams, joists, chases, shafts and sleeves for the passage of conduits, raceways, ductwork and other materials, the Contractor must coordinate the positions of all piping and equipment to be furnished under this section so that all items including the materials and equipment of other trades may be accommodated within the space available.
E. The HVAC Contractor shall confirm that his work does not interfere with the clearances required for finished columns, pilasters, partitions, walls or other architectural or structural elements as shown on the Contract Documents.
F. Work that is installed under this Contract which interferes with the architectural design or building structure shall be removed and relocated as required at no additional cost to the Contractor.
G. The General Contractor shall coordinate service access paths for roof-mounted equipment requiring routine maintenance.
H. Coordinate with the roof system used so that a minimum of 8" of the roof curb is above the finished roof for flashing purposes.

1.11 OPERATION AND MAINTENANCE MANUALS

- A. The Contractor shall prepare a minimum of two (2) instruction manuals, one of which shall be submitted to the Architect for the Engineer's review.
B. The Contractor shall make good all defects in material, equipment, or workmanship disclosed within a period of one (1) year from date of building acceptance by the Owner.
PART 2 - PRODUCTS

2.01 GENERAL

- A. All equipment, materials, accessories, etc. used shall be new and of current production unless specified otherwise.
B. All equipment, products and materials shall be free of defects and shall be constructed to operate in a safe manner without excessive noise, vibration, leakage, or wear.
C. All equipment shall bear the inspection Label of Underwriters Laboratories Inc.
D. All equipment and material for similar applications or systems shall be provided from the same manufacturer unless noted otherwise.
2.02 ELECTRICAL WORK

2.03 ELECTRICAL WORK

- A. Except as otherwise specified or noted, electrical equipment used for HVAC systems shall be as specified herein.
B. Motor controls, system controls, starters, disconnects, pilot lights, push buttons, etc. shall be furnished by the HVAC Contractor compatible with the apparatus that it operates.
C. The Contractor shall be responsible for coordinating and furnishing equipment of voltage shown on the electrical documents.
D. Electric motors shall be NEMA Premium Efficiency open drip proof type.
A. Except as otherwise specified or noted, electrical equipment used for HVAC systems shall be as specified herein.
B. Motor controls, system controls, starters, disconnects, pilot lights, push buttons, etc. shall be furnished by the HVAC Contractor compatible with the apparatus that it operates.
C. The Contractor shall be responsible for coordinating and furnishing equipment of voltage shown on the electrical documents.
D. Electric motors shall be NEMA Premium Efficiency open drip proof type.

- H. Start-up and Commissioning
I. Demonstration and Owner Training
J. Testing, Adjusting and Balancing

1.06 ENGINEER'S DRAWINGS

- A. The locations, arrangement and extent of equipment, devices, ductwork, and other appurtenances related to the installation of the HVAC work shown on the Drawings are approximate and define the intent of the design.
B. Materials, equipment or labor not indicated but which can be reasonably inferred to be necessary for a complete installation shall be provided.
1.07 EQUIPMENT, MATERIALS AND BID BASIS

- A. Manufacturers' names, model numbers, etc. cited on the Drawings and in the Specifications are for the purpose of describing type, capacity, function and quality of equipment and materials required.
B. Alternate equipment and/or materials other than that named on the Drawings and in the Specifications may be proposed for use, but all equipment and materials shall conform entirely to the specified base items.
1. The ten (10) day prior approval submittal shall include a Compliance Review of the Specifications and Addenda (if any).
2. "C": Comply with no exceptions.
3. "D": Comply with no deviations.
4. "E": Exception, does not comply.
5. Manufacturer shall provide complete paragraph-by-paragraph compliance document detailing unit conformance to the specification.
Unless a deviation or exception is specifically noted in the Compliance Review, it is assumed that the bidder is in complete compliance with the plans and specifications.

- C. The Contractor shall coordinate the installation of all HVAC equipment proposed for use in this project with all building trades (architectural, structural, electrical, etc.).
D. All materials exposed within HVAC plenums shall have a flame-spread index of not more than 25 and a smoke-developed rating index of not more than 50 unless otherwise allowed by code.
1.08 SUBMITTALS

- A. The Contractor shall prepare, submit and obtain Engineer's review of all manufacturers' data on the HVAC equipment and systems prior to ordering, purchasing or installing any equipment or materials.
B. The Contractor shall make good all defects in material, equipment, or workmanship disclosed within a period of one (1) year from date of building acceptance by the Owner.
PART 2 - PRODUCTS

- A. All HVAC items scheduled on the Drawings
B. Equipment arrangement, ductwork and piping drawings.
C. All equipment, materials, accessories, etc. used shall be new and of current production unless specified otherwise.
B. Motor controls, system controls, starters, disconnects, pilot lights, push buttons, etc. shall be furnished by the HVAC Contractor compatible with the apparatus that it operates.
C. The Contractor shall be responsible for coordinating and furnishing equipment of voltage shown on the electrical documents.
D. Electric motors shall be NEMA Premium Efficiency open drip proof type.

SECTION 23 00 00 HVAC GENERAL

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Refer to Division 1 - General Requirements and any and all Supplementary or Special Requirements, all of which apply to work described in Division 23 - HVAC as if written in full herein.
B. The scope of work described in these Specifications and/or indicated on the Drawings shall include the furnishing of all materials, equipment, appurtenances, accessories, connections, labor, etc. required and/or necessary to completely install, clean, inspect, adjust, test, balance and leave in safe and proper operating condition all HVAC systems.
C. The Drawings and Specifications are complementary to each other and what is called for by one shall be as binding as if called for by both.

1.02 CODES AND STANDARDS

- A. All HVAC work shall conform to all ordinances and regulations of the City, County and State where the work will take place, including the requirements of all authorities having jurisdiction.
1. The 2015 International Codes
2. State Amendments to the Code
3. National Fire Protection Association (NFPA) Standards and Guidelines
4. Local and State Fire Marshal requirements
5. Local Building and Inspection Department requirements
6. Local adopted codes, standards, ordinances (including noise ordinances), or amendments
7. American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. (ASHRAE)
8. Sheet Metal and Air Conditioning Contractors' National Association, Inc. (SMACNA) Manuals
9. Air Conditioning, Heating, and Refrigeration Institute (AHRI)
10. Air Conditioning Contractors of America (ACCA)
11. American Society of Mechanical Engineers (ASME)
12. Underwriters Laboratories Inc. (UL)
13. Americans with Disabilities Act (ADA)

- B. If Code or other requirements exceed the provisions shown on the Contract Documents, the Engineer shall be notified in writing.
1.03 NOISE CRITERIA DESIGN GOALS

- A. Mechanical equipment, air distribution systems and devices shall be designed to not exceed the following noise criteria (NC) levels:
1. Public Space Areas: NC <35
2. Utility/All Other Areas: NC <40

1.04 MISCELLANEOUS DEFINITIONS

- A. Terms: The following definitions of terms supplement those of the Division 01- General Requirements and are applicable to Division 23 - Heating, Ventilation, and Air Conditioning (HVAC):
1. Contractor: As used herein the term shall mean "the person or entity referred to throughout the Contract Documents as if singular in number.
2. Furnish: As used herein shall mean "supply and deliver to Project site, unload and inspect for damage."
3. Install: As used herein the term shall mean "to place in position for service, temporarily store, unpack, assemble, erect, apply, place, protect, clean, start up, and make ready for use."
4. Owner: As used herein the term shall mean "the person or entity identified as such and is referred to throughout the Contract Documents as if singular in number.
5. Product: As used herein shall include materials, systems, and/or equipment, machinery, components, and fixtures forming the work result.
6. Provide: As used herein shall mean "furnish and install, complete and ready for the intended use."
7. The Work: As used herein the term shall mean "the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations.
8. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.05 WORK INCLUDED

- The HVAC Systems installed and work performed under this Division of the Specifications shall include, but not necessarily be limited to:
A. Airside Systems
1. Equipment: including fans, fan-coil units, etc.
2. Ductwork and Accessories: including sheet metal, duct-board, flexible ductwork, fire and smoke dampers, access doors, etc.
3. Air Distribution Devices: including registers, grilles, diffusers, etc.
B. Equipment, Ductwork and Piping Supports
1. Equipment Mounts: including roof curbs, concrete housekeeping pads, equipment rails, miscellaneous steel, etc.
2. Hangers and Support Devices: including inserts, hanger rods, strut channel, cross-bracing, anchor bolts, restraints, etc.
C. Insulation
1. Ductwork Insulation: including exterior duct wrap, internal duct liner, fire wrap, etc.
D. Miscellaneous HVAC Equipment: electric heaters, roof hoods, etc.
E. Automatic Temperature Controls
1. Decentralized: including all thermostats, control dampers, control valves, programmable controllers, line and low-voltage wiring, smoke detectors, gas sensors, control logic, etc.
F. Labor and Equipment: including project management, supervision, tradesmen, lifts, fork-trucks, cranes, scaffolding, saws, wrenches, etc.
G. Equipment and Valve Identification

END OF SECTION



Jordan & Skala Engineers 17855 North Dallas Parkway, Suite 300 • Dallas, TX 75287









