

DIVISION 22 PLUMBING

SECTION 221000 - FACILITY PLUMBING SYSTEMS

- 1.00 GENERAL: Division 01 and Section 022000 requirements apply to this Section.
1.01 SUMMARY: Section includes: Plumbing.
B. Provide labor, material and services required for the installation of complete and satisfactorily operating plumbing systems...

- 2.00 PRODUCTS: A. The term "piping" as used herein shall mean all pipe, fittings, nipples, valves, unions, flanges, etc. as may be required for a continuous system of piping...
2.01 MATERIALS: A. The term "piping" as used herein shall mean all pipe, fittings, nipples, valves, unions, flanges, etc. as may be required for a continuous system of piping...

- 2.02 VALVES: A. Manufacturers shall be Nibco, Red-White, or equal. Except where indicated otherwise, all valves shall be a product of one manufacturer.
2.03 PIPING SPECIALTIES: A. Ductile Iron: EPDM, Colco or equal, at all connections between ferrous and non-ferrous pipe materials.

- 2.04 PLUMBING FIXTURES: A. Provide labor and material and services required for the installation of complete and satisfactorily operating plumbing systems...
2.05 CLEANING: A. Provide labor and material and services required for the installation of complete and satisfactorily operating plumbing systems...

- 2.06 EXHAUSTION: A. Provide labor and material and services required for the installation of complete and satisfactorily operating plumbing systems...
2.07 SOIL, WASTE, RAIN WATER LEADERS AND VENT PIPING: A. Piping shall be run in protected upstand and be supported at intervals as specified...

- 2.08 WATER PIPING: A. No valve shall be installed with stem below horizontal. Valve shall be line size, unless otherwise indicated.
2.09 PIPE JOINTS AND CONNECTIONS: A. Joints in No-Hub cast iron pipe shall be made with "O-ring" or "Nutsy" repress couplings...

- 2.10 INSULATION: A. Apply insulation over all tests have been satisfactorily completed.
2.11 EXAMINATION: A. Prior to installation, carefully inspect the installed work of other trades and verify that such work is complete to the point where this installation may properly commence.

- 2.12 PREPARATION: A. Hand trim excavations to required elevations. Correct over excavations with fine concrete aggregate or lean concrete.
2.13 INSTALLATION: A. All pipe and equipment shall be handled and installed in accordance with manufacturer's instructions and pertinent codes and regulations.

- B. Insulate all domestic hot water piping, tempered water, hot water return and all concealed domestic cold water piping and rain water leaders with 1/2 inch non-rigid pipe insulation...
3.05 HANDICAP PLUMBING FEATURES INSTALLATION: A. Plumbing fixtures installation height and type shall comply with state and federal requirements...

- 3.06 CLEANING AND PRESERVATION: A. Plumbing fixtures and equipment shall be thoroughly cleaned of scale, rust, labels, prior to enclosing and placing in operation.
3.07 TESTS: A. General: 1. Acceptance testing of piping in sections so as not to leave any pipe or joint untested.

- 3.08 STERILIZATION/CHLORINATION OF DOMESTIC WATER SYSTEM: A. Upon completion of the work, the entire new domestic hot and cold water piping systems...
3.09 COMPLETION: A. At completion of work and just before occupancy, plumbing fixtures, faucets, and exposed connections, and interior of traps, shall be cleaned.

- 3.10 GUARANTEE: A. Guarantee materials, apparatus, equipment, and workmanship furnished to be free from defects, and replace without compensation within two years from date of Substantial Completion.
3.11 END OF SECTION

SECTION 221115 - FACILITY WATER DISTRIBUTION PIPING

- 1.00 GENERAL: Division 1 requirements apply to this Section.
1.01 SUMMARY: A. Section includes: Provide all water service, including: 1. Yard piping. 2. Water meter (unless provided by water supplier).

- 1.02 REFERENCES: A. AWWA: American Water Works Association.
1.03 PROJECT RECORD DOCUMENTS: A. Submit documents under project number Section 01720 and Mechanical Division 221115.
1.04 REGULATORY REQUIREMENTS: A. Comply with applicable State and local code for materials and installation of the work of this Section.

- 1.05 MEASUREMENTS: A. Make all necessary measurements in the field to ensure proper fit of items required under this Section with Drawings and Specifications.
1.06 MATERIALS: A. Provide labor and material and services required for the installation of complete and satisfactorily operating plumbing systems...

- 2.02 CONTROL VALVES: A. General: Provide valves and flow control devices as indicated and required by local plumbing codes, whichever is more stringent.
2.03 WATER METERS: A. General: The water meters and street service lines will be installed by the local utility company, unless utility companies are approved to do the installation...

- 2.04 ACCESSORIES: A. General: Provide accessories for tees, plugs, caps, and bends. After installation, apply a full coat of asphalt or other acceptable corrosion resistant material to surfaces of rods and clamps.
2.05 EXHAUSTION: A. Hand trim excavations to required elevations. Correct over excavations with fine concrete aggregate or lean concrete.

- 2.06 EXAMINATION: A. Prior to installation, carefully inspect the installed work of other trades and verify that such work is complete to the point where this installation may properly commence.
2.07 PREPARATION: A. Hand trim excavations to required elevations. Correct over excavations with fine concrete aggregate or lean concrete.

- B. Water Service Piping: Extend water service piping of size and in location indicated to water service entrance of building. Provide pressure in excess of 100 psi at water service entrance, make entry waterproof.
3.04 FIELD QUALITY CONTROL: A. Field inspection and testing will be performed under provisions of Section 01400.

- 3.05 PROTECTION: A. Protect finished installation under provisions of Section 01500.
3.06 EXAMINATION: A. Prior to installation, carefully inspect the installed work of other trades and verify that such work is complete to the point where this installation may properly commence.

SECTION 230000 - HVAC SYSTEMS

- 1.00 GENERAL: Division 01 and Section 230000 requirements apply to this Section.
1.01 SUMMARY: Section includes: Heating, Ventilating, and Air Conditioning (HVAC) Systems.
B. Provide labor, material and services required for the installation of complete and satisfactorily operating HVAC systems...

- 1.02 REFERENCES: A. ASHRAE: American Society of Heating, Refrigerating and Air-Conditioning Engineers.
1.03 QUALITY ASSURANCE: A. Work and materials shall be in full accordance with the latest edition of the National Electrical Code, the National Fire Protection Association's International Building Code, and other applicable codes and standards.

- 1.04 REFERENCES: A. ASHRAE: American Society of Heating, Refrigerating and Air-Conditioning Engineers.
1.05 SUBMITTALS: A. Submit a list of materials and equipment.
1.06 WARRANTY: A. Submit warranties or guarantees to the Owner's Project Manager for equipment as required.

- 1.07 BASIS OF SPECIFICATION: A. The basis of specification is to provide and install all materials and labor required to complete the work of this Section.
1.08 SUMMARY: A. The contractor shall furnish and install complete HVAC systems as shown on the drawings and specifications.

- 1.09 AIR CONDITIONING UNIT GENERAL DESCRIPTION: A. Units furnished and installed shall be combination heating/cooling packaged rooftop units as scheduled on contract documents and specifications.
1.10 FANS AND MOTORS: A. Provide evaporator fan section with forward curved, double width, double inlet, centrifugal type fan.

- 1.11 INSULATION: A. Apply insulating materials according to the latest published instructions of the manufacturer.
1.12 AIR OUTLETS: A. Anchor all devices against severe earthquake forces.
1.13 FLASHING: A. Provide weatherstrip sheet metal flashing and counter-flashing as required for the work under this Section of the specifications.

- 1.14 EXHAUSTION: A. Provide labor and material and services required for the installation of complete and satisfactorily operating plumbing systems...
1.15 SOIL, WASTE, RAIN WATER LEADERS AND VENT PIPING: A. Piping shall be run in protected upstand and be supported at intervals as specified...

- 1.16 WATER PIPING: A. No valve shall be installed with stem below horizontal. Valve shall be line size, unless otherwise indicated.
1.17 PIPE JOINTS AND CONNECTIONS: A. Joints in No-Hub cast iron pipe shall be made with "O-ring" or "Nutsy" repress couplings...

- REFER TO ARCHITECT'S REFLECTED CEILING PLANS FOR CEILING TYPES. ALL DIFFUSERS, GRILLES AND REGISTER IN PLANT AREAS SHALL HAVE EPOXY FINISH.
2.14 TEMPERATURE CONTROLS: A. CONTRACTOR SHALL FURNISH ALL MATERIAL AND LABOR NECESSARY TO PROVIDE A COMPLETELY INSTALLED AND WORKING CONTROL SYSTEM AS SHOWN ON THE DRAWINGS AND SPECIFICATIONS.

- 2.15 CONTROL SYSTEMS: A. CONTRACTOR SHALL FURNISH ALL MATERIAL AND LABOR NECESSARY TO PROVIDE A COMPLETELY INSTALLED AND WORKING CONTROL SYSTEM AS SHOWN ON THE DRAWINGS AND SPECIFICATIONS.
2.16 INSULATION: A. Apply insulating materials according to the latest published instructions of the manufacturer.

- 2.17 AIR OUTLETS: A. Anchor all devices against severe earthquake forces.
2.18 FLASHING: A. Provide weatherstrip sheet metal flashing and counter-flashing as required for the work under this Section of the specifications.

- 2.19 EXHAUSTION: A. Provide labor and material and services required for the installation of complete and satisfactorily operating plumbing systems...
2.20 SOIL, WASTE, RAIN WATER LEADERS AND VENT PIPING: A. Piping shall be run in protected upstand and be supported at intervals as specified...

- 2.21 WATER PIPING: A. No valve shall be installed with stem below horizontal. Valve shall be line size, unless otherwise indicated.
2.22 PIPE JOINTS AND CONNECTIONS: A. Joints in No-Hub cast iron pipe shall be made with "O-ring" or "Nutsy" repress couplings...

- 2.23 INSULATION: A. Apply insulating materials according to the latest published instructions of the manufacturer.
2.24 AIR OUTLETS: A. Anchor all devices against severe earthquake forces.

- 2.25 FLASHING: A. Provide weatherstrip sheet metal flashing and counter-flashing as required for the work under this Section of the specifications.
2.26 EXHAUSTION: A. Provide labor and material and services required for the installation of complete and satisfactorily operating plumbing systems...

- 2.27 SOIL, WASTE, RAIN WATER LEADERS AND VENT PIPING: A. Piping shall be run in protected upstand and be supported at intervals as specified...

- 2.28 WATER PIPING: A. No valve shall be installed with stem below horizontal. Valve shall be line size, unless otherwise indicated.
2.29 PIPE JOINTS AND CONNECTIONS: A. Joints in No-Hub cast iron pipe shall be made with "O-ring" or "Nutsy" repress couplings...

- 2.30 INSULATION: A. Apply insulating materials according to the latest published instructions of the manufacturer.
2.31 AIR OUTLETS: A. Anchor all devices against severe earthquake forces.

SECTION 237413 - PACKAGED OUTDOOR AIR CONDITIONING UNITS

- 1.00 GENERAL: Division 01 requirements apply to this Section.
1.01 SUMMARY: Section includes: Packaged outdoor air conditioning units as provided by: - Trade.
B. Provide labor, material and services required for the installation of complete and satisfactorily operating HVAC systems...

- 1.02 REFERENCES: A. ASHRAE: American Society of Heating, Refrigerating and Air-Conditioning Engineers.
1.03 QUALITY ASSURANCE: A. Work and materials shall be in full accordance with the latest edition of the National Electrical Code, the National Fire Protection Association's International Building Code, and other applicable codes and standards.

- 1.04 REFERENCES: A. ASHRAE: American Society of Heating, Refrigerating and Air-Conditioning Engineers.
1.05 SUBMITTALS: A. Submit a list of materials and equipment.
1.06 WARRANTY: A. Submit warranties or guarantees to the Owner's Project Manager for equipment as required.

- 1.07 BASIS OF SPECIFICATION: A. The basis of specification is to provide and install all materials and labor required to complete the work of this Section.
1.08 SUMMARY: A. The contractor shall furnish and install complete HVAC systems as shown on the drawings and specifications.

- 1.09 AIR CONDITIONING UNIT GENERAL DESCRIPTION: A. Units furnished and installed shall be combination heating/cooling packaged rooftop units as scheduled on contract documents and specifications.
1.10 FANS AND MOTORS: A. Provide evaporator fan section with forward curved, double width, double inlet, centrifugal type fan.

- 1.11 INSULATION: A. Apply insulating materials according to the latest published instructions of the manufacturer.
1.12 AIR OUTLETS: A. Anchor all devices against severe earthquake forces.

- 1.13 FLASHING: A. Provide weatherstrip sheet metal flashing and counter-flashing as required for the work under this Section of the specifications.
1.14 EXHAUSTION: A. Provide labor and material and services required for the installation of complete and satisfactorily operating plumbing systems...

- 1.15 SOIL, WASTE, RAIN WATER LEADERS AND VENT PIPING: A. Piping shall be run in protected upstand and be supported at intervals as specified...

- 1.16 WATER PIPING: A. No valve shall be installed with stem below horizontal. Valve shall be line size, unless otherwise indicated.
1.17 PIPE JOINTS AND CONNECTIONS: A. Joints in No-Hub cast iron pipe shall be made with "O-ring" or "Nutsy" repress couplings...

- 1.18 INSULATION: A. Apply insulating materials according to the latest published instructions of the manufacturer.
1.19 AIR OUTLETS: A. Anchor all devices against severe earthquake forces.

- B. Provide factory installed indoor evaporator defrost control to prevent compressor stalling by interrupting compressor operation.
2.13 STAGING CONTROLS: A. Provide NEC Class II, Adjustable zone control to control heating stages in accordance with temperature setpoints.
2.14 ROOF CURBS: A. Contractor shall provide one piece galvanized and insulated curb for rooftop units exhaust fans and air conditioning units.

- 2.15 EXHAUSTION: A. Hand trim excavations to required elevations. Correct over excavations with fine concrete aggregate or lean concrete.
2.16 SOIL, WASTE, RAIN WATER LEADERS AND VENT PIPING: A. Piping shall be run in protected upstand and be supported at intervals as specified...

- 2.17 WATER PIPING: A. No valve shall be installed with stem below horizontal. Valve shall be line size, unless otherwise indicated.
2.18 PIPE JOINTS AND CONNECTIONS: A. Joints in No-Hub cast iron pipe shall be made with "O-ring" or "Nutsy" repress couplings...

- 2.19 INSULATION: A. Apply insulating materials according to the latest published instructions of the manufacturer.
2.20 AIR OUTLETS: A. Anchor all devices against severe earthquake forces.

- 2.21 FLASHING: A. Provide weatherstrip sheet metal flashing and counter-flashing as required for the work under this Section of the specifications.
2.22 EXHAUSTION: A. Provide labor and material and services required for the installation of complete and satisfactorily operating plumbing systems...

- 2.23 SOIL, WASTE, RAIN WATER LEADERS AND VENT PIPING: A. Piping shall be run in protected upstand and be supported at intervals as specified...

- 2.24 WATER PIPING: A. No valve shall be installed with stem below horizontal. Valve shall be line size, unless otherwise indicated.
2.25 PIPE JOINTS AND CONNECTIONS: A. Joints in No-Hub cast iron pipe shall be made with "O-ring" or "Nutsy" repress couplings...

- 2.26 INSULATION: A. Apply insulating materials according to the latest published instructions of the manufacturer.
2.27 AIR OUTLETS: A. Anchor all devices against severe earthquake forces.

- 2.28 FLASHING: A. Provide weatherstrip sheet metal flashing and counter-flashing as required for the work under this Section of the specifications.
2.29 EXHAUSTION: A. Provide labor and material and services required for the installation of complete and satisfactorily operating plumbing systems...

- 2.30 SOIL, WASTE, RAIN WATER LEADERS AND VENT PIPING: A. Piping shall be run in protected upstand and be supported at intervals as specified...

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SHEET NO.: SC6

DATE: 06/23/18

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