

SECTION 220100 - GENERAL PLUMBING PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-01 Specification sections, apply to work of this section.

1.2 SCOPE OF DIVISION

- A. Work shall include all materials, equipment and labor necessary for a complete and properly functioning plumbing installation in accordance with all applicable codes, and contract drawings and specifications. Work shall include all work specified in Division-22, Plumbing.
- B. Pay for all required licenses, fees, inspections and permits.

1.3 RELATION TO OTHER WORK

- A. Work Not in Division 22: Related work not included in this division consists of requirements given in the following as may be included in the contract documents:
 - 1. Other divisions which may include work (such as concrete, steel, painting, ceiling systems, structure and other work) related to the work of Division 22.
- B. Work of Division 22: Any or all sections of Division 22 may include a paragraph or paragraphs under the heading, "Relation to other Work". Where such a paragraph is indicated and work directly related to the section is listed or described, such work shall be considered as relating directly to the indicated section. Any related work (directly related or otherwise) which may be omitted by reference from the "Relation to Other Work" paragraph of such section(s), shall be provided as necessary and required whether or not such work is included by reference. Such listing or description of related work within a section is given only as a convenience to the Contractor; omission of other related sections or described work does not in any way exclude the provision of such work.
- C. The Plumbing contractor shall coordinate with the controls vendor for all control related equipment that is provided by the controls vendor and installed by the Plumbing contractor.

1.4 CODES

- A. Install all work in accordance with the latest edition of all applicable regulations and governing codes, including the regulations of the utility companies serving the project.
- B. Where a conflict in code requirements occurs the more stringent requirement shall govern.

1.5 STANDARDS

- A. All equipment and devices shall bear U.L. label, the label of an industry recognized approved testing agency or A.G.A. certification for said item of equipment or device.

- B. All electrical devices must be U.L. approved.

1.6 DRAWINGS

- A. Architectural and structural drawings take precedence over plumbing drawings with reference to the building construction. Plumbing drawings are diagrammatic and indicate the general arrangement and extent of work. Architectural drawings indicate more exactly the desired relationship between diffusers, registers, lighting fixtures, equipment, electric panels and devices, plumbing fixtures, and other items which remain exposed in the completed building. Exact locations and arrangement of materials and equipment shall be determined, with the acceptance of the Architect/Engineer, as work progresses to conform in the best possible manner with the surroundings and with the adjoining work of other trades. Where locations of equipment, devices or fixtures are controlled by architectural features, establish such locations by referring to dimensions on Architectural drawings and not by scaling drawings.

1.7 DISCREPANCIES

- A. In case of differences between drawings and specifications, or where drawings and specifications are not clear or definitive, the more stringent requirement shall apply. Any such discrepancies shall be referred to Architect/Engineer for clarification and instructions.

1.8 ELECTRICAL PROVISIONS

- A. Work of Division 22 shall include the electrical requirements which are indicated to be integral with plumbing work and which can be summarized to include (but not necessarily be limited to) the following:
 - 1. Motors
 - 2. Unless shown otherwise, motor starters are to be furnished by plumbing contractor, installed by electrical contractor.
 - 3. In lieu of the plumbing contractor furnishing motor starters, the plumbing contractor can coordinate with the electrical contractor where the electrical contractor furnishes and installs a combination motor starter / disconnect switch.
 - 4. Control switch, pilot lights, interlocks and similar devices.
 - 5. Electrical heating coils and similar elements in plumbing equipment.
 - 6. Electrical work specified in Division-22 for the HVAC control system.
 - 7. Drip pans to protect electrical work.
- B. Motors, Starters, Switches:
 - 1. All motors 1HP and above associated with plumbing equipment that are not being provided with a variable frequency drive shall be provided with a motor starter.
 - 2. For motors under 1HP that are required to be controlled shall be coordinated with the building automation system to ensure start / stop control is achieved. Provide all relays, wiring and devices as required to achieve desired control.
- C. Drip Pans: Where possible, do not run plumbing piping directly above electrical (or electronic) equipment which is sensitive to moisture; otherwise provide drip pans under plumbing piping. Locate pan below piping and extend 6 inches on each side of piping and lengthwise 18 inches beyond equipment. Fabricate pans 2 inches deep, of reinforced sheet metal with rolled edges and soldered or welded seams; 20 gage copper, or 16 gage steel with 2 oz. zinc finish hot dipped after fabrication. Provide 3/4 inch copper drainage piping, properly discharged to a waste receptor.

1.9 ELECTRICAL/PLUMBING WORK

- A. Definitions: Definitions for the purpose of Plumbing/electrical control and power coordination are as follows: (Note: The use of the words, "Provide", "furnish" and "install" are intended only for use in describing the coordination indicated by this paragraph and do not necessarily have the same definitions when used outside of the context of this paragraph.) Any items which do not fall within the scope of this paragraph shall be coordinated as individually specified.
1. "Furnish" means to procure an item and to deliver it to the project for installation.
 2. "Install" means to determine (in coordination with others as necessary) the appropriate intended location of an item and to set and connect it in place.
 3. "Provide" means to both furnish and install.
 4. Power Circuit: Circuit which carries main electric power to apparatus to which the power circuit is connected.
 5. Control Circuit: Circuit which carries electrical signals directing the performance of a controller, but which does not carry the main electric power. (See NEC, Section 430-71.) Such circuits shall also include those which serve a dual control and power function (e.g., a line voltage thermostat circuit which both activates and powers a small fan motor).
 6. Controller: A device, or group of devices, which serves to govern, in some predetermined manner, electric power delivered to apparatus to which the controller is connected and includes any switch or device normally used to start and stop a motor. (See NEC, Article 100, Definitions, "Controller", and Section 430-81(a).)
 7. Control Device: A device which reacts to an operating condition (pressure, temperature, flow, humidity, etc.) and which initiates transmission of an electrical control signal which causes operation of a controller or which causes operation of pressure switches, etc.
 8. Auxiliary Control Device: A device (such as a low voltage control transformer, electric relay, etc.) which is located in a control circuit and which carries or responds to (but does not initiate) an electrical control signal initiated by a control device.
- B. Work of Division-22 includes (but is not necessarily limited to):
1. Provide:
 - a. All controllers which are generally manufactured or shipped as integral with Division-22 equipment
 - b. All electric motors and other electrical power consuming equipment (such as electric air heating coils, electric boilers, electric hot water heaters, etc.) which are specified in Division 22.
 - c. All control circuits (including conduit and boxes) from the Division-26 panels to point of use including the necessary circuit breakers.
 - d. All other control circuits, including conduit and boxes.
 - e. All control connections to equipment.
 - f. All control connections to controllers, switches, motors and other plumbing systems electrical power consuming equipment (such as, electric boilers, electric hot water heaters, etc.).
 - g. Auxiliary control devices.
 - h. All control devices (thermostats, pressure switches, flow switches, humidistats, etc.) and make control circuit connections thereto.
 - i. Any and all pneumatic and electronic and electric control devices and electric or pneumatic connections thereto.
 2. Furnish:
 - a. All controllers which are generally manufactured and/or shipped as separate but companion items to Division-22 equipment.

1.10 AUXILIARIES AND ACCESSORIES

- A. Include all auxiliaries and accessories for complete and properly operating systems.

1.11 COORDINATION

- A. Provide all required coordination and supervision where work of this division connects to or is affected by work of others.

1.12 PROVISIONS FOR OPENINGS

- A. Provide all openings required for work performed under Division-22. Provide sleeves or other approved methods to allow passage of items installed under any Section of Division-22.

1.13 CLEANING AND PROTECTION

- A. Equipment: All plumbing equipment provided shall be thoroughly cleaned of all dirt, oil, concrete, etc. Any dents, scratches or other visible blemishes shall be corrected, and the appearance of the equipment made "like new" and to the satisfaction of the Architect/Engineer.
- B. Upon completion, and before final acceptance of the work, all debris, rubbish, leftover materials, tools and equipment shall be removed from the site.
- C. Protection of Work Until Final Acceptance: Protect all materials and equipment from damage, entrance of dirt and construction debris from the time of installation until final acceptance. Any materials and equipment which are damaged shall be repaired to "as new" condition or replaced at the direction of the Architect/Engineer. Where factory finishes occur and damage is minor, finishes may be touched up. If, in the opinion of the Architect/Engineer the damage is excessive, factory finish shall be replaced to "new" condition.

1.14 SHOP DRAWINGS

- A. Submit shop drawings for all items, services and systems included in the project.
- B. Shop drawings shall clearly show the following:
 - 1. Technical and descriptive data in detail equal to or greater than the data given in the item specification. Indicate all characteristics, special modifications and features. Where performance and characteristic data is shown on the drawings or specified, submitted data shall be provided in a degree which is both quantitatively and qualitatively equal to that specified and shown so that comparison can be made. Present data in detail equal to or greater than that given in item specification and include all weights, deflections, speeds, velocities, pressure drops, operating temperatures, operating curves, temperature ranges, sound ratings, dimensions, sizes, manufacturers' names, model numbers, types of material used, operating pressures, full load amperages, starting amperages, fouling factors, capacities, set points, chemical compositions, certifications and endorsements, operating voltages, thicknesses, gauges and all other related information as applicable to particular item.
 - 2. Exceptions to or deviations from the contract documents. Should Architect/Engineer accept any items having such deviations which are not clearly brought to

Architect/Engineer's attention, in writing, on item submittal, then Contractor is responsible for correction of such deviations regardless of when such deviations are discovered.

- C. Additional Requirements: See specific sections of the Specifications for any additional requirements.

1.15 SHOP DRAWINGS TECHNICAL INFORMATION SUBMITTALS

- A. All submittals are to be submitted electronically in the form of PDF. Electronic submittal file names must be formatted with the specification section number followed by the title of the specification section. One PDF file shall be provided for each specification section that requires submittals to be provided.
- B. A cover page shall have adequate space for Contractor, Subcontractor and Engineer review stamps and indicate the following minimum data:
 - 1. Project Name
 - 2. Project Address
 - 3. Contractor Name
 - 4. Subcontractor Name
 - 5. Specification Section Number
 - 6. Specification Section Name
 - 7. Submittal Date
- C. All shop drawings and equipment submittals shall be submitted complete based on specification division. Partial submittals of each specification section will not be accepted.
- D. All submittals shall have been reviewed for compliance by the Contractor and associated subcontractor prior to submission to the Engineer. A stamp bearing the name of the reviewer and date review was completed shall be on the cover page of the submittal.
- E. Submittal data shall be logically grouped based on equipment tags or like material. For submittals that contain data on multiple materials or equipment, it shall be clearly noted by equipment tag or applicable material.
- F. Manufacturer's data indicating multiple options or choices shall be clearly noted as to what is applicable to the material and equipment being provided. Information not applicable should be struck through or extracted.

1.16 SHOP DRAWINGS FOR PIPING SYSTEMS

- A. Shop drawings for piping systems shall be performed by the installing subcontractors. Shop drawings shall show all required maintenance and operational clearances required. Title drawings shall include identification of project and names of Architect, Engineer, Contractor, subcontractor and/or supplier, date, be numbered sequentially and shall indicate the following:
 - 1. Architectural and structural backgrounds with room names and numbers, etc., including but not limited to plans, sections, elevations, details, etc.
 - a. Fabrication and Erection dimensions.
 - b. Arrangements and sectional views.
 - c. Necessary details, including complete information for making connections with other work.

- d. Kinds of materials and finishes.
 - e. Descriptive names of equipment.
 - f. Modifications and options to standard equipment required by the contract.
- B. Shop drawings shall be submitted in electronic PDF format and shall bear the review stamp from the plumbing subcontractor and general contractor / CM that it has been reviewed for compliance.
- C. See specific sections of specifications for further requirements.

1.17 ELECTRONIC FILES

- A. Any requests for electronic files shall be preceded by processing the required electronic file release form and submitting to the Engineer for authorization. Request for electronic files should be submitted through the Contractor for submission to the Architect / Engineer.

1.18 OPERATING INSTRUCTIONS

- A. Submit for checking a specific set of written operating instructions on each item which requires instructions to operate. After acceptance, insert information in each Technical Information Brochure. Refer also to other sections which may describe operating instructions.

1.19 MAINTENANCE INFORMATION

- A. Submit for acceptance Maintenance Information consisting of manufacturer's printed instruction and parts lists for each major item of equipment. After acceptance, insert information in each Technical Information Brochure. Refer also to other sections which may describe maintenance.

1.20 SYSTEM GUARANTEE

- A. The work required under Division-22 shall include a one-year guarantee. This guarantee shall be by the Contractor to the Owner to replace for the Owner any defective workmanship, equipment, or material which has been furnished under this Contract at no cost to the Owner for a period of one year from the date of acceptance of the System. This guarantee shall also include reasonable adjustments of the system required for proper operation during the guarantee period.

1.21 MATERIALS AND EQUIPMENT

- A. Each bidder represents that his bid is based upon the materials and equipment described in this division of the specifications.
 - 1. Submittal shall include the name of the material or equipment for which it is to be substituted, substituted equipment model numbers, drawings, cuts, performance and test data and any other data or information necessary for the Architect/Engineer to determine that the equipment meets all specification and requirements. If the Architect/Engineer accepts any proposed substitutions, such acceptance will be set forth in writing.
 - 2. Substituted equipment with all accessories installed or optional equipment where permitted and accepted, must conform to space requirements. Any substituted

equipment that cannot meet space requirements, whether accepted or not, shall be replaced at the Contractor's expense. Any modifications of related systems of this or other trades as a result of substitutions shall be made at the Contractor's expense, and Contractor shall so state in his written request for substitution.

- B. Acceptable Manufacturers: Materials and Equipment specified in these contract documents are accepted only in regard to general performance and quality. It shall be the Contractor's responsibility to ensure that acceptable materials and equipment meet or exceed the efficiencies, capacities, electrical characteristics, performance and quality of the equipment herein specified. Acceptable equipment must also generally conform, without extensive modification of related systems to the accessories, weights, space and maintenance requirements, etc., of the specified equipment. Any modification to related systems of this or other trades shall be made at the Contractor's expense and the Contractor shall be responsible for coordination between trades. Any difference in capacity, efficiency, electrical characteristics, weights or quality of product, etc., between specified materials and equipment and acceptable alternates shall be submitted to the Architect/Engineer for acceptance within 30 days of Notice to Proceed.

PART 2 - PRODUCTS

- 2.1 Section part not applicable.

PART 3 - EXECUTION

- 3.1 Section part not applicable.

END OF SECTION 220100