

SECTION 22 0510
GENERAL PLUMBING REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Definitions
- B. Assurance Requirements and Installer Qualifications.
- C. Submittal Procedures Supplementing Section 01 3000.
- D. Operating and Maintenance Manuals
- E. Execution Requirements common to Division 22 systems
- F. Pipe Sleeves within building
- G. Piping Pressure Tests.
- H. Equipment bases and housekeeping pads
- I. Cleaning Requirements.
- J. Finishing Requirements

1.02 RELATED SECTIONS

- A. Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Section 01 7700 - Closeout Procedures, for additional submittal and warranty requirements.
- C. Section 03 3000 - Cast-in-Place Concrete.
- D. Section 07 8400 - Firestopping.
- E. Section 07 9200 - Joint Sealants
- F. Section 09 9000 - Painting and Coating.

1.03 DEFINITIONS

- A. Manufacturer's Representatives: Wherever MANUFACTURER'S REPRESENTATIVE is referred to in this division, said representative shall be regularly employed by the manufacturer to perform similar activities to those called for herein, which indicates his competence in that field of work.
- B. Concealed: Where the word concealed is used in this Division, it shall mean items above ceilings, in attics, in crawl spaces, in chases, in tunnels, in cabinet work, and under counters or equipment so as to be not visible from an elevation of 5 feet at a horizontal distance of 10 feet.
- C. Finished Spaces or Areas: Where finished spaces or areas are referred to in this Division, it shall mean all spaces except concealed spaces, mechanical rooms, or boiler rooms unless otherwise noted.
- D. Provide: Furnish and install.
- E. Control and Interlock Wiring: All wiring, both line voltage and low voltage, other than power wiring from an electrical distribution panel, through the primary control device, to the item of equipment.
- F. Primary Control Device: That ONE device for any item of equipment which interrupts power flow during normal operation. Where magnetic starters are provided, they are the primary control. For items not switches by starters, the primary control device will be that ONE thermostat, time clock, manual switch, aquastat, or relay performing the primary switching.
- G. Diagrammatic: A drawing that shows arrangement and relations (as of parts).i.e.: A diagrammatic drawing uses symbols rather than pictorial representation of pipes and other items shown and is not necessarily to scale. Arrangement, location, and sizes shown are firm.
- H. Readily Accessible: Equipment, valves and other items requiring service shall be installed to be readily accessible. These items shall be available for maintenance or use in a space, through

an access door from floor elevation, or above a lay-in ceiling by maintenance staff standing on a ladder no taller than the ceiling.

- I. Noted, Indicated or Shown: Where the terms "Noted", "Indicated" or "Shown" are used in these specifications, the words "in the specifications or on the plans" shall be inferred.
- J. Detail: Where reference is made to a Detail, the Detail shall be on the plans unless otherwise noted.
- K. Specifications: Where reference is made to these specifications, it shall be inferred in this Division of specifications.
- L. Notification by the Contractor, and Instructions to the Contractor: Where reference is made in these specifications to notification by or instructions given to the Contractor, it shall be inferred that Architect shall be the instructor or shall be notified, as the case exists.
- M. Division or Section Reference: Where reference is made to another Division or Section within this Division, refer to specifications table of contents for Division, Section, or Page Number.
- N. Flow Diagram: A single-line, two-dimension, non-scaled drawing depicting arrangement and sequence of equipment, valves, controls, thermometers, gauges, and other specialty devices in a pipe system.

1.04 REGULATORY REQUIREMENTS

- A. Where requirements of these specifications exceed specified codes and ordinances, conform to these specifications.
- B. Materials and equipment included in Underwriters Label Service shall bear that label. Electrical equipment shall be U.L. approved as installed.
- C. Jurisdiction: Where codes or guides refer jurisdiction to local governing code officials, such official in this procedure shall be the State Fire Marshal.
- D. Permits: Obtain all permits, paying all fees in connection therewith. At completion, have work inspected by proper authorities and furnish Architect for Owner an inspection certificate showing approval of installation.
- E. Plumbing: Conform to the Georgia State Minimum Standard Plumbing Code (International Plumbing Code), 2018 Edition, with all Georgia State Amendments.
- F. Fire Prevention Precautions in Cutting and Welding Areas: Conform to Article 2605 Fire Prevention Precautions, Georgia State Minimum Standard Fire Prevention Code (International Fire Code), 2018 Edition, with all Georgia State Amendments, for all work involving cutting and welding.
- G. Energy: Conform to the Georgia State Energy Code for Buildings (International Energy Conservation Code), 2015 Edition, with all Georgia State Amendments.
- H. All Work: Conform to State of Georgia Chapter 120-3-3 "Rules of Safety Fire Commissioner, Rules and Regulations, January 1st, 2020".
- I. All Work: Conform to State of Georgia Chapter 120-3-20 "Access To and Use of Public Facilities by Handicapped Persons" and 2010 ADA Standards for Accessible Design.
- J. Electrical: Refer to Division 26. Conform to the National Electrical Code, NFPA 70, 2020.
- K. Building Code: Conform to the Georgia State Minimum Standard Building Code (International Building Code), 2018 Edition with all Georgia State Amendments.

1.05 PERFORMANCE REQUIREMENTS

- A. Requirements specified herein are minimum. All equipment, when installed, shall perform equal to or exceed specified requirements.

1.06 SUBMITTALS

- A. Refer to Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Supplementing Division 1 requirements; Contractor shall:

1. Review the submittal data and check to ensure compliance with specifications prior to submitting.
 - a. The Contractor agrees that submittals of equipment and material and shop drawings of equipment and material layouts required under provisions of these specifications and processed by Architect are not Change Orders. The purpose of submittals is to demonstrate that Contractor understands the design concept of the project by indicating the equipment and materials he intends to furnish and install, and by detailing the installation he intends to achieve.
 - b. The Contractor shall conform to the requirements of the Contract Documents unless a change order is issued. The Contractor shall identify on each submittal and letter form to the Design Professional any and all deviations from the Contract Documents.
 - c. Any submittal or shop drawing not conforming to the Contract Documents without this identification and notification shall be assumed to be marked "Revise and Resubmit" (acknowledges this by the submission), and Contractor shall promptly resubmit said submittal so as to be in full compliance with the Contract Documents.
 - d. Failure of Contractor to provide this information during the shop drawing phase shall make Contractor responsible for all changes to achieve compliance with the Contract Documents without additional compensation.
2. Assemble the submittal data in complete sets in hard back three-ring binders, separate binders, and bound with numbered index sheets and tabs. All submittal data shall be submitted at one time unless unavailable data would delay project progress. Data shall include capacities, complete installation instructions, dimensional data and electrical data, BHP, motor HP, operating weights and load distribution at mounting points. Any submittals sent in pieces or not secured in a three ring binder will be marked not reviewed and will be returned to the contractor.
3. Identify all submittals by a cover sheet showing project name, specification sections, drawing or detail number, room number, date, revision date, contractor and subcontractor's organization and project manager with phone number, the model, style and size of item being submitted with manufacturers' representative, salesman (or a preparer who can answer questions), and Preparer's phone number.
4. Manufacturers' standard drawings shall be modified by deletions or additions to show only items applicable to this project.
5. Prepare a master list of submittal proposed to be submitted on the project. This list shall be updated for each submission and shall be the first sheet(s) of the submission in the quantity that is submitted for review. The information and general format shall contain an Tab number, Item Description, Item Status and any comment.
6. Provide a Letter stating that all submittals have been checked for compliance with specifications.
7. Deliver submittals to the Design Professional at the business address.
8. Electronic Delivery of Submittals:
 - a. Submittal data may be posted to the NBP Engineers FTP site when agreed upon by the Design Professional and the Owner during the preconstruction phase. The Construction Manager will be provided with a project folder and password.
 - b. Prepare the submittals as described above in Sections 1.7.A.1-7. Provide one pdf file for each specification section including all submittal data for that specification section. Provide labels identifying each piece of equipment, piping, or accessory to match the listed item in the specification. Take steps to reduce submittal file size.
 - c. Do not scan in color or high resolution unless needed for clarity.
 - d. Ensure any reproductions are legible.
 - e. Send an email to submittal@nbpengineers.com with a copy to the Plumbing Design Professional and the Architectural Design Professional (if applicable) identified during the preconstruction phase.
 - f. Provide a submittal index and identify the submittal in the email subject line using the official project title, specification section and submitted item. I.E. Project No. G-xxx.

Addition to Administrative Building - Section 22 0519 - Meters and Gages for Plumbing Piping.

- g. Each pdf should include bookmarks to each product, and specification section to easily navigate the pdf file.
- h. Ensure the submittal posted to the FTP site has the same identification.
- i. NBP Design Professionals will not process or react to submittals which are not properly transmitted, indexed, and identified.

C. Product Data:

1. Provide data specific to the Product proposed indicating capacity data, all standard and optional features to be supplied and all accessories and options available for that product.
2. Manufacturer's standard drawings shall be modified by deletions or additions to show only items applicable to this project.

1.07 OPERATING AND MAINTENANCE MANUALS

A. Operating and Maintenance Manuals shall be prepared by the Contractor for all equipment and be submitted for review a minimum of prior to the request for Material Completion.

B. Digital delivery of Operating and Maintenance Manuals:

1. Operating and Maintenance Manuals may be delivered digitally and posted to the NBP Engineers FTP site when agreed upon by the Design Professional and the Owner during the preconstruction phase. The Contractor will be provided with a project folder and password.
2. Prepare the Operating and Maintenance Manuals as described above. Take steps to reduce submittal file size.
3. Do not scan in color or high resolution unless required for clarity.
4. Ensure any reproductions are legible.
5. Send an email to submittal@nbpengineers.com with a copy to the Plumbing Design Professional and the Architectural Design Professional (if applicable) identified during the preconstruction phase.
6. Identify the manuals in the email subject line using the official project title, specification section and submitted item. I.E. Project No. G-xxx, Addition to Administrative Building.
7. Table of Contents(Index) sheets shall be included in the order listed with identifications typed in capital letters.
8. Ensure the manuals posted to the FTP site has the same identification.
9. The O&M Pdf should contain bookmarks to each section of the manual, and bookmarks to each product.
10. NBP Design Professionals will not process or react to manuals which are not properly transmitted, indexed, and identified.

C. Each Manual shall contain the following information, data and drawings:

1. Copies of submittals (with Design Professional's review comments and stamp), equipment and materials.
2. Manufacturer's installation, operating and maintenance instructions for each item of equipment with moving parts including recommended frequency of inspections and maintenance for one year of facility operation.
3. Manufacturer's list of renewal parts for each item of equipment with recommended stock items and quantities indicated.
4. Copies of as-built shop drawings showing layouts and construction details.

1.08 QUALITY ASSURANCE

A. Plumbing Installer Qualifications:

1. Wherever the word "company" or "firm" is used in these subparagraphs, it shall mean the contractor/subcontractor of record for the installations used for proficiency qualification.
2. Refer to the individual sections within this division for additional installer qualification requirements.

3. The Contractor expressly warrants that the company performing the installation of the plumbing systems has demonstrated proficiency in the installation and adjustment of such systems by the successful performance of work of the nature specified herein on at least three commercial or institutional buildings, each containing water heating systems, pumping systems(i.e. hot water recirculation, sump pumps, or pressure booster pumps), and a minimum of 10 plumbing fixtures.
4. The Contractor also warrants that the aforesaid installer, if any, has been in business performing services of the nature specified herein for at least three(3) years.

1.09 PRODUCT DELIVERY, STORAGE, AND PROTECTION

- A. Accept all products on site in factory-fabricated protective containers. Inspect for damage.
- B. Store products in a clean dry place and protect from weather and construction traffic.
- C. Handle products carefully to avoid damage to components, enclosures, and finish.
- D. After placement, protect products from damage during construction, by all trade contractors.
- E. Protect equipment nameplates and labels from damage, being painted, scaring, etc.

1.10 WARRANTY

- A. Refer to Section 01 7700 - Closeout Procedure, for additional warranty requirements.
- B. Where extended warranties beyond Contractor's one (1) year warranty are specified, the additional warranty time shall start at the end of Contractor's warranty.
- C. Correct defective Work within a one year period after Date of the Material Completion.

PART 2 PRODUCTS-NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

- A. Refer to the specifications and Architectural and Structural drawings for additional requirements pertaining to work under this discipline. Notify Architect for clarification in the event of conflict.
- B. All materials of systems installation exposed in hollow spaces that are used as ducts or plenums shall have a flame spread rating of 25 or less and a smoke development rating of 50 or less.

3.02 PREPARATION

- A. Drawings are diagrammatic and show the general proximity of the equipment and pipes. They are not to be scaled, and do not include all required changes in direction or offsets necessary in coordinating the installation of various materials either between trades or within the same trade. All dimensions shall be verified at the building site. Prefabrication and/or installation of work from drawings shall be at Contractor's risk. Refer to Architectural plans for exact building dimensions and details.
- B. Space Conditions:
 1. All apparatus shall fit into the available spaces in the building and must be introduced into the building so as not to cause damage to the structure. Equipment larger than access to equipment spaces shall be disassembled into sub-assemblies for installation.
 2. Where deviations from the plans are required in order to conform to the space limitations, such changes shall be made at no additional cost to Owner and shall be subject to approval.
 3. All equipment requiring service shall be made accessible. Coordinate piping installation to avoid conflict with other trades.
- C. Where new work is specified tying into old work and materials are different from existing, the contractor shall request a clarification from Architect prior to performing the work.
- D. Where sanitary drainage systems or storm drainage systems are to be reused in existing buildings. The contractor shall camera all existing piping below slab that is to be reused to verify the piping is the correct size, the piping is sloped in the correct direction, the pipe is not

broken or damaged, and the piping is free of obstructions. The contractor shall notify the design professional of any deficiencies prior to performing any work.

3.03 DEMOLITION

- A. Drawings showing existing building conditions and utilities are based on casual field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as shown.
 - 2. Report discrepancies to the Architect before disturbing existing installation.
 - 3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. The demolition plans have been prepared to assist the contractor in determining the scope of demolition work and should not be construed to be all of the demolition required. The contractor shall visit job site (after carefully reviewing the contract documents) and determine exact areas and quantities of existing materials to be removed to accomplish new construction.
- C. All existing equipment and material removed from the facility shall be the property of the Contractor, unless otherwise noted, and shall be removed from the facility as required by the Contract provisions concerning trash removal.
- D. Where the Documents indicate an equipment item to be removed. Remove all associated material including hangers, supports, etc. Do not leave abandoned items.
- E. Remove exposed and accessible piping, and other materials rendered useless due to changes or modifications. Cap outlets in piping. Repair piping insulation damaged during construction.
- F. Remove concealed piping which is exposed by the removal of walls, partitions, etc., and reconnect and re-route as required to maintain system continuity.
- G. Sleeves left open by removal of piping shall be cut flush with the finished slab or wall, filled with non-shrinking cement grout and/or fire rated foam flush with both sides of slab or wall to maintain slab or wall fire rating.
- H. Material and equipment which has been removed shall not be used in the new work, except as noted.
- I. Where existing piping and/or equipment is shown on the Drawings, its size and location shall be verified prior to performing any work relating to demolition. Notify Architect of any discrepancies.
- J. Dispose of any material to be discarded in accordance with all laws and regulations.
- K. Comply with all other applicable requirements of this Section and related Sections of the project manual.

3.04 INSTALLATION

- A. Clearance above and in front of electrical switchgear, electrical power panels or control panels shall be maintained by mechanical systems so that no pipes, vents, or equipment is routed above or across the space directly above this equipment in conformance with the National Electrical Code.
- B. All equipment shall be installed in accordance with manufacturers' published installation instructions shipped with the equipment. In the event there is a discrepancy between these specifications or Drawings and the manufacturers' instructions, no work shall be performed until additional instructions are received.
- C. Install and connect all appliances, equipment, and appurtenances as specified, indicated or required in accordance with the manufacturer's instructions and recommendations. Furnish and install complete auxiliary piping, water seals, valves, electric connections, and similar items, recommended by the manufacturer or as required for proper operation.
- D. Provide equipment coupling guards shielding the perimeter and face of all new shafts and couplings. Provide openings opposite drive shafts to permit use of revolution counter.
- E. Route piping to avoid skylights, translucent, and transparent ceilings.
- F. Pipe Sleeves in Slabs, Masonry Walls and Partitions:

1. Provide sleeves in all slabs and walls/partitions unless otherwise noted.
 2. Omit sleeves on cast iron pipe through slabs on grade.
 3. Masonry Partitions: Schedule 40 black steel pipe: Sleeves shall be sized to include the insulation with minimum gap around insulation. Install, without developing a break in the pipe insulation, according to the fire sealant manufacturer's installation instructions for a U.L. Listed assembly for a rated pipe penetration through a rated masonry wall/partition.
 4. Omit sleeves in openings core drilled in masonry partitions.
 5. Rated Drywall Partitions: Schedule 40 black steel pipe. Sleeves shall be sized to include the insulation with minimum gap around the insulation. Install, without developing a break in the pipe insulation, according to the fire sealant manufacturer's installation instructions for a U.L. Listed assembly for a rated pipe penetration through a rated drywall wall/partition.
 6. Non-Rated Drywall Partitions: Omit sleeves.
- G. Seal sleeves and openings in mechanical room walls, fire rated partitions, and floors above grade vaportight, watertight, or for smoke/fire protection as applicable. Refer to Section 07 2700- Firestopping.
- H. Seal sleeves and openings in exterior walls vaportight or watertight as applicable. Refer to Section 07 9200 - Joint Sealants.
- I. Equipment and pipe support upper attachments shall be 3" x 3" x 1/4" galvanized steel angles, minimum, spanning structural members unless noted otherwise. Provide inserts and bolts for supporting pipes and equipment from structural members.
- J. Saw cut or core drill openings in existing work for the installation of the plumbing system. Patching shall be performed by the trade whose work is cut. Contractor shall lay out and install his work ahead of the work of other trades wherever possible.

3.05 PIPING PRESSURE TESTS

- A. General:
1. Provide 48 hours notification to Architect in advance of any test.
 2. Complete tests prior to insulating.
 3. Leaks shall be repaired, defective materials replaced, and system shall be retested.
 4. Strike all joints in copper and steel piping under a pressure test.
 5. Conduct tests prior to connecting to equipment or isolate equipment from system.
 6. No water pressure test shall be conducted in freezing weather where subject to freezing.
 7. Test shall be maintained at conditions specified until approved but, in no event, for less than eight (8) hours minimum duration, unless otherwise noted.
 8. Hydrostatic pressure tests shall maintain pressure without change, except that due to temperature change.
- B. Domestic Water System: Hydrostatic test; 150 PSIG.
- C. Soil, Waste and Vent System: Static test; 10 feet minimum head. Test system in its entirety or in sections. Plug all openings except highest opening above the roof. Water shall be kept in the system, or in the portion under test, for a minimum of one (1) hour. Inspect the system, or the portion under test, after one (1) hour, the system shall be tight at all points.
- D. Natural Gas System: Pressure test; 50 PSIG air or inert gas; 3 hours minimum duration. Oxygen shall not be used.
- E. Compressed Air System Above Ground: Pressure test; 150 PSIG air or inert gas; three hours minimum duration. Oxygen shall not be used.

3.06 EQUIPMENT BASES and HOUSEKEEPING PADS

- A. Provide housekeeping and equipment bases as shown or listed below. Rough up slab under bases before pouring concrete.
- B. Materials: Refer to Section 03 3000 - Cast-in-Place Concrete. Omit test cylinders for concrete poured under this section.

- C. Bases/Pads shall be rectangular with vertical sides 2 inches from edges of equipment, unless otherwise noted.
- D. Height:
 - 1. Water Heater: 4-inches.
 - 2. Housekeeping Pads for Other Equipment: 4-inches or as shown on plans.
- E. Chamfer: 3/4-inch on edges and corners.
- F. Reinforcing: 6"x 6" 10/10 WWF at mid-depth of slab. (4 inch thick pads.)

3.07 CLEANING and PROTECTION

- A. All materials, equipment and mechanical rooms shall be cleaned prior to Material Completion.
- B. Wash down and scrub clean all mechanical room floors, walls, equipment bases and equipment.
- C. Paint equipment where finish has been damaged requiring retouching of finish to match factory finish.
- D. Chipped or scraped paint shall be retouched to match original finish.
- E. Clean and polish all equipment nameplates. All nameplate information shall be legible.
- F. All dents and sags in equipment casings shall be straightened.
- G. All insulation, equipment, pipe, pipe fittings and appurtenances shall be free of dust, rust and stains prior to Material Completion.

3.08 FINISHING PLUMBING EQUIPMENT AND MATERIAL

- A. Use paint systems specified in Division 9 for the substrates to be finished.
- B. Paint shop-primed equipment.
- C. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.
- D. Paint all exposed pipes, unless otherwise indicated.
- E. All ferrous fasteners and hanger supports not having a corrosion resistant plated finish shall be painted to prevent rust.
- F. Paint all equipment, including that which is factory-finished, exposed to weather or to view on the roof and outdoors.
- G. Paint all exposed un-insulated ferrous metals.

END OF SECTION