

Part II
Division 22
Plumbing

SECTION 22 00 00

PLUMBING

1 PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. The drawings, General and Supplementary Conditions of the Contract and Division 1 General Requirements apply to the work of this Section.
- B. Examine all drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section.

1.2 DESCRIPTION OF WORK

- A. This is a design build project. The contractor shall hire Registered Professional Engineer (Maine State registration required) to prepare drawings and calculations for the owner's approval. Engineer will provide \$1,000,000.00 liability insurance. The engineer shall provide during the construction two site visits and submit report. The engineer will also provide a final punch list and report. The engineer shall also provide all the site visits required by the inspection agencies and the building department. The work covered in this section of the specifications consists of furnishing all labor, equipment, appliances and material and in performing all operations in connection with this Plumbing System, complete, in strict accordance with this Section of the specifications and without limiting the generality thereof includes:
 - 1. General Requirements:
 - a) The intention is to provide complete installed plumbing systems as required by Maine State Plumbing Code, Maine State Building Code and these specifications including drawings and calculations prepared by a Registered Professional Engineer (Maine State registration required).
 - b) If any contradiction, ambiguity, error, inconsistency, omission or incomplete system appears in or between any contract documents, the sub contractor shall before submitting the final bid and signing the contract for construction, notify the general contractor and request a written resolution as to which methods or materials will be required. If the contractor fails to make a request for interpretation or resolution, no excuse will be accepted for failure to carry out the work in a satisfactory manner, as interpreted by the architect. This generally means the use of the highest quality material, most expensive way of performing the work and providing complete functioning system

for proper operation.

- c) Each and every trade or subcontractor will be deemed to have familiarized themselves with all the contract documents of this projects, including architectural, structural, mechanical, electrical, and site work, and to have visited the site, so as to avoid error, omissions and misinterpretations. Related information may be provided on contract documents other than those associated with the subcontractor's trade. The contractor is responsible for coordinating related work of all the contract documents. No additional compensation will be authorized for alleged errors, omissions or misinterpretations whether they are a result of failure to observe this requirement or not.
 - d) All penetrations of assemblies exposed to the exterior environment shall be sealed with foam sealant or equivalent sealer to provide zero air infiltration. Coordinate with fire stopping requirements.
 - e) No component of any system shall run through the stair enclosure that does not relate to or serve the stair enclosure.
 - f) Refer to architectural drawings for type and location of all fire rated walls. Any penetration through wall bottom or top plates shall be Fire Stopped. Any penetration the fire rated wall shall be Fire Caulked. Refer to section 7250 for procedure. Provide submittals of UL designs selected and the product information for approval.
Without limitation pay attention to the following items:
 - a. Chases behind bathroom (wall between corridor and bathroom) and walls between units are fire rated. Fire Caulk all penetration.
 - b. Top and bottom wall plates at ceiling and at floor are part of fire separation. Fire Stop all penetrations through plates.
 - g) Any wall location changes shall be coordinated through the G.C for review with the architect.
 - h) Plumbing Contractor to coordinate with the General Contractor the flushing requirements for the water mains.
 - i) All roof penetrations shall be on the back slope of the roof minimum 10 ft. away from ridge.
2. Sanitary, vents, water and gas systems as described below: Review both demolition and construction drawings to identify the bath and kitchen revisions and all other plumbing work to be done. In general all the bathrooms are to be renovated and some bathrooms to be reconfigured. For renovated bathrooms where the fixtures are to be replaced in place

remove old fixtures and dispose and provide new fixtures and fittings including new toilet flange. In renovated kitchens, remove old kitchenette and provide new fixtures and fittings. Modify rough in all the bathrooms and kitchens where fixtures positions are reconfigured.

3. Roof drainage system shall remain as is. If the roof is to be replaced, replace roof drains.
4. Gas piping to boilers, roof top HVAC units, retail spaces. Provide individual meters for housing and retail for each retail space. Repipe existing restaurant service only. Coordinate with HVAC contractor prior to bid.
5. Gas piping design shall be based on low pressure gas.
6. Sub meters for city water shall be provided for each dwelling unit, each retail space and common areas. Plumbing contractor shall coordinate all work with G.C.
7. Provide central hot domestic hot water heating system with recirculation loop per code. The capacity will be minimum 600,000 BTH with 400 gallon storage tank and Holby mixing valve.
8. Stub up sanitary and water piping for future retail space plumbing. Terminate at the retail premises. Provide check meter for each retail.
9. Elevator sump pump (Oil/Minder) installed and piped per code.
10. Plumbing fixtures.
11. Pipe insulation.
12. Testing, sterilization per Code and local water department requirements.
13. Access panels if required.
14. Permits and fees except fees for utility connections.
15. Exterior non-freeze, key type wall hydrants per Code.
16. Back flow preventors per code.
17. Pressure reducing valves as required by the local utility company.
18. Pressure testing of the systems per Code and manufacturers recommendations.

1.3 RELATED WORK IN OTHER SECTIONS

- A. The following items shall be furnished or performed under other Sections of these Specifications:

Excavation and backfill	Section	02200
Power Wiring	Section	16000
Water Service	Section	15400
Access panels	Section	08305

1.4 COOPERATION WITH OTHER TRADES

- A. The work shall be so performed that the progress of the entire building construction, including all other trades shall not be delayed or interfered with. Material and apparatus shall be installed as fast as conditions of the building will permit and must be installed promptly when and as desired.
- B. Check with Heating, Ventilating and Air Conditioning work, and Electrical work, as to location of pipes, ducts, slights and apparatus, and install Plumbing in such a manner as to avoid interference with other trades.

1.5 MATERIAL AND EQUIPMENT STANDARDS

- A. All material shall be new and of the best quality. Where no specific make of material is mentioned, any first class product of a reputable manufacturer may be used provided it conforms to the drawings and specifications and has the approval of the Architect.
- B. Materials and equipment offered for approved equal shall be equal to those specified in type, size, quality, capacity, space requirements, and power requirements. The request for each substitution must be accompanied by complete specifications of the materials or equipment offered, altogether with drawings, or samples where necessary to properly appraise the materials and equipment. No equipment or material shall be used unless previously approved by the Architect. When one or more manufacturer's names are given for a product, and these names are not followed by the words "or approved equal", the bid shall be based on the equipment named in the specifications.

1.6 DRAWINGS

- A. This is a design build project. The contractor shall hire Registered Professional engineer (Maine State registration required) to prepare drawings and calculations in compliance with Maine State Plumbing Code, Maine State Building Code and these specifications.
- B. Drawings shall be coordinated through the General Contractor with all other trades including structure prior to completion.

- C. The design should incorporate freezing prevention for all water, sanitary and storm drain piping in unheated spaces including garage. Heat trace and insulation alone will not be accepted.

- D. Should any contradiction, ambiguity, error, inconsistency, omission or incomplete system appear in or between any of the Contract Documents, the Contractor shall, before submitting the final bid and signing the contract for construction, notify the General contractor and request a written resolution as to which methods or materials will be required. In the event of conflicting requirements of standards, drawings or specifications, the Contractor shall comply with the more stringent requirements. Before submitting the final bid and signing the contract for construction the Contractor shall obtain a written interpretation from the Architect. In no case shall the Contractor proceed with the affected work until advised by the Architect.
If the Contractor fails to make a request for interpretation or resolution no excuse will be accepted for failure to carry out the work in a satisfactory manner, as interpreted by the Architect. This generally means the use of the highest quality material, most expensive way of performing work and providing complete functioning systems for proper operation,
Each and every trade or Subcontractor will be deemed to have familiarized themselves with all Contract Documents of this project, including Architectural, Structural, Mechanical, Electrical and Site Work, and to have visited the site, so as to avoid errors, omissions and misinterpretations. Related information may be provided on Contract Documents other than those associated with the Subcontractor's trade. The Contractor is responsible for coordinating related work of all the Contract Documents. No additional compensation will be authorized for alleged errors, omissions and misinterpretations, whether they are a result of failure to observe this requirement or not.

1.7 GUARANTEE

- A. The Plumbing Contractor shall guarantee to make good all faults and defects in the plumbing system due to defective or improper materials or workmanship that may appear within one year from the date of final acceptance of the work and make all repairs, replacements, and changes, within the guarantee period which are required to put the systems in proper operation and condition, without cost to the Owner.

1.8 PROTECTION AND CLEANING

- A. The Plumbing Subcontractor shall take effective measures to protect all materials, fixtures and fittings from loss or damage; and all pipe openings from obstructions, throughout the construction.

- B. All dirt and debris resulting from the work shall be thoroughly taken up and removed from the premises. All fixtures, exposed trim and equipment shall be cleaned and polished to leave for inspection and use in the best possible condition.

1.9 PUTTING EQUIPMENT IN OPERATION

- A. All mechanical equipment installed in connection with Plumbing work shall be put in operation in the presence of duly authorized representatives of the Owner with 24-hour notice given the Owner's representative for each appointment. Instructions shall be given to the Owner's employee appointed to familiarize himself with the systems and equipment. Two copies of the operating manual, parts list, and bulletins shall be delivered to the Owner for each item of equipment.

1.10 INSPECTION OF SITE

- A. This Subcontractor shall, prior to submitting his bid, visit the site and inspect conditions affecting the proposed work. Failure to visit the site and misinterpretation of the drawings and specifications resulting therefore shall be entirely the responsibility of the bidder. No claims based on lack of knowledge or difficulties resulting from same shall be allowed.

1.11 MISCELLANEOUS IRON AND STEEL

- A. Provide steel supports and hangers as shown on drawings or as required to support piping, pumps, tanks or other equipment.
- B. All work shall be cut, assembled, welded and finished by skilled mechanics. All shop fabricated iron and steelwork shall be cleaned and dried and given a shop coat of paint on all surfaces and in all openings.

1.12 REGULATIONS, FEES AND PERMITS

- A. All materials and the installation thereof shall conform to the requirements of the State Building Code, all State and local laws, rules and regulations and codes pertaining thereto and also to the requirements of the National Board of Fire Underwriters and all applicable Sections of the NFPA. Where provisions of the contract drawings conflict with any codes, rules or regulations, the latter shall govern.

Where the contract requirements are in excess of applicable codes, rules and regulations, the contract provisions shall govern unless the Engineer rules otherwise.

- B. All legally imposed charges made by local authorities for the work of this Section involving the connection, inspection and approval services of all bureaus administering all applicable codes and regulations shall be provided hereunder at no additional expense to the Owner.
- C. The Plumbing Contractor shall give the proper authorities all required notices or information relating to work in his charge, pay all fees, obtain all official licenses, permits and certificates, and comply with the rules of the

Department of Public Safety.

1.13 RECORD DRAWINGS

- A. Record drawings shall be kept on the job site and updated continuously by the Contractor as the work progresses.
- B. Record drawings shall show exact locations and sizes of all the work to be concealed. Especially note the location of the valves, clean outs etc.
- C. Non-availability of the updated record drawings or inaccuracies therein shall be grounds for cancellation and/or postponement of any final inspection by the Engineer.
- D. The record drawings required to be furnished under this Section are of drawings numbered P-#.

1.14 ELECTRICAL WORK

- A. Power wiring to pumps and disposers will be furnished and installed by the Electrical Contractor.
- B. All wiring, motors and controls furnished under this Section shall be in accordance with the Electrical Work Section of these Specifications, the National Electrical Code, and applicable local codes. All 110V, 24V control wiring for the aquastats shall be by the plumbing contractor.

1.15 SUBMITTAL

- A. Submit appropriate shop drawings or descriptive literature giving performance data, physical size, wiring diagrams, configuration, capacity, materials, etc. for all items under this Section including the following:
 - 1. Piping, valves and plumbing fixtures.
 - 2. Mixing valves
 - 3. Insulation
 - 4. Fire stopping methods.

1.16 CUTTING AND PATCHING

- A. The Plumbing Contractor shall be responsible for all required cutting and drilling associated with his work but in no case shall cut into any structural elements without the written approval of the Architect.

1.17 ACCESS PANELS

- A. The Plumbing Contractor shall provide all required access panels and shall be responsible for providing locations and quantities of the access panels the General Contractor. General Contractor. and install all access panels.

2 PART 2 PRODUCTS

2.1 HANGERS AND SUPPORTS

- A. Furnish and install all hangers and supports and all steel framework required for the support of various systems. All piping shall be supported from the building structure by means of approved hangers as manufactured by Carpenter-Patterson, Grinnell Co., or Fee & Mason.
- B. Horizontal piping shall be hung with adjustable wrought iron or malleable iron pipe hangers, spaced as follows:

PIPE SIZE	COPPER	STEEL	ROD SIZE
3/4" to 1"	6 ft.	8 ft.	3/8"
1-1/4" to 2"	8 ft.	10 ft.	3/8"
2-1/2" to 4"	10 ft.	14 ft.	1/2"

- C. Copper tube straps may be used on water lines up to 1-inch for wood joist construction only. Bands or rings supporting copper tubing shall be heavily copper plated.
- D. Hangers shall be located not more than 4 feet from elbow or 10 feet on screwed piping. Hangers for piping, sizes 4" and smaller, shall be Carpenter-Patterson No. 1A Band Type, Grinnell Co., or Fee & Mason black steel with hanger rods with machine threads. For copper tubing, the hangers shall be copperized. Hangers for piping larger than 4" shall be adjustable clevis, wrought iron or malleable iron.
- E. Chain, strap, perforated bar or wire hangers will not be approved. Approved gang hangers may be used in lieu of separate hangers on pipes running parallel to each other and close together. Where used for copper tubing, the gang hangers shall have copper saddles or shall be sheet-lead coated.
- F. Vertical stacks of soil, waste, vent and conductor piping shall have friction clamps on each floor. Vertical supply risers shall be supported at each floor by friction clamps or inserting around the supply pipe, a coupling, which shall rest on pipe sleeve. Soil, waste and conductor stacks shall be firmly supported at their base, either by a suitable hanger placed on the

horizontal line near the riser, or by a base fitting set on a pedestal or foundation carried down to a firm bearing. Copper piping shall be secured every 6 feet.

2.2 CROSS CONNECTIONS

- A. No piping shall be installed in a manner to permit backsiphonage or any flow or polluted water or other liquid into water service or distribution piping under any conditions.
- B. Air gaps, receptor type drains, approved back-flow preventors and approved vacuum breaking devices shall be provided as required by State and local codes and ordinances. Piping to inlets below fixture overflow shall have vacuum breakers of make, design, size and location approved by the Inspector of Plumbing. Breakers shall not be concealed. Breakers shall be full size of pipe and shall be Beaco, Chicago, or Watts.

2.3 VALVES

- A. The entire plumbing installation shall be provided with valves located to permit easy operation, replacement and repair. Valves shall be the product of one manufacturer except as noted. Jenkins Bros., Hammond, Walworth, Nibco, shall be the standard required.
- B. Valves shall be bronze, except as otherwise specified. Valves on each hot water recirculation branch line shall be combination balancing and stop type, all bronze, or ball valves. All shut-off valves shall be bronze ball valves.
- C. Domestic water mixing valve shall be self-contained, thermostatic type, including hot water temperature limit, check valves, strainers, and stop valves. Valve shall be selected for low pressure differential at required flow.
- D. Make: Leonard, Watts, Symmons, Powers, Johnson.

2.4 UNIONS AND FLANGES

- A. Unions and flanges shall be furnished and installed at all pieces of equipment to allow for easy removal and dismantling of equipment. No general dismantling of piping systems will be allowed for removal of equipment. Unions shall be the product of Hammond Co., Jamesbury, or Hancock.

2.5 VALVE TAGS AND PIPE MARKING

- A. All valves in mechanical room shall have 1-1/2" tags attached to stem of

each valve. Each tag shall be stamped clearly with large letters and numbers to designate the valve number and the service. A printed or typewritten list or schedule of all valves shall be made which shall give the number, service and location of each valve. The above list shall be mounted in fused plastic in a location directed by the Architect. All valve numbers shall correspond to numbers indicated for valves on the record drawings.

- B. All piping in mechanical room and corridors except sanitary, vent and storm water, shall be marked with Seton "Set Mark" or approved equal pipe markers showing the directions of flow and pipe service after pipe is insulated and/or painted. Use a brass tag that is secured to the valve with numbers, and charts are placed in the mechanical room area in a black framed 8 x 11 frame, also has contact information to contractor.

2.6 PENETRATION AND FIRESTOPPING

- A. All metal pipe penetrating through a fire-rated wall assembly shall have the space between the conduit and the fire rated membrane (drywall) filled with a UL approved fire caulk installation.
- B. All metal pipe penetrating through fire-rated floor assembly shall have the space between the pipe and the fire rated membrane (drywall, concrete or plywood decking) filled with a UL approved fire caulk installation.
- C. Install an expandable collar where a PVC pipe penetrates each membrane of a fire rated wall assembly.
- D. Install expandable collar where a PVC pipe penetrates each membrane of a fire rated floor/ceiling assembly.
- E. Install a UL approved fire caulk installation where any pipe penetrates a fire stop (top and bottom wall framing plates) inside the walls.
- F. Large openings in slabs, which accommodate many pipes, shall be filled with concrete so that the rodent protection of the slab is maintained.
- G. All penetrations of assemblies exposed to the exterior environment shall be sealed with foam sealant or equivalent sealer to provide zero air filtration through or around penetration. Coordinate with fire stopping requirements

2.7 WATER METER

- A. Furnish and install water meter and check meters at the equipment rooms. Meter shall comply with the requirements of the local Water Department. Install gate valve on each side of meter.

For meters 3-inches and larger provide strainer on the inflow side of the meter. In the absence of local water department preference, use a Rockwell or Hersey turbine type meter for 3" and larger service.

2.8 HOT WATER CIRCULATION

- A. Provide per code.

2.9 MISCELLANEOUS FIXTURES AND ACCESSORIES

- A. Wall Hydrant: 3/4" hose thread, non-freeze bronze hydrant, automatic draining, integral vacuum breaker and "T" handle.
- B. Make: J.R.Smith 5609, Josam, Zurn, Nibco, Woodford 65C key type.
- C. Hose Bibb: Woodford Model No. 24 or equal including vacuum breaker, 3/4" hose thread on spout, polished chrome finish.
- D. Vacuum Relief Valve: For installation in cold water supply line to heaters and storage tanks. Valve shall comply with ANSI Z21.22, State Plumbing Code and shall be A.G.A. certified. Valve shall have a cross sectional area equal to one pipe size smaller than the supply pipe. Use multiple valves in large systems. Make: Watts No. 36A, A.W. Cash, Beeco, Chicago.
- E. Combination P&T Valve: Self-closing, 150 psi setting, 210 degree. F with test lever and thermostat with non-metallic protective coating. Valve shall meet ANSI standard Z21.22 and shall be A.G.A. certified. Size per State Plumbing Code. Make: Watts Type 40 through 340, A.W. Cash, Taco, B&G.
- F. Pressure Gauges: U.S. Gauge P1525 or approved equal, Marsh, Trerice, 2-inch dial, stainless steel bulb, range 0 to 100. Install with stock cock.
- G. Laundry Valve: Sioux Chief with CPVC connections, 1-1/2" combination drain and valve assembly. Provide one for each wash machine.
- H. Backflow Preventor: Continuous pressure, for installation in boiler feed line. Brass body, integral strainer, union connections, double check valves. Make: Watts No. 909D or equal, A.W. Cash, Beeco.
- I. Thermometers: Adjustable angle, 7-inch aluminum case, separable socket, H.O. Trerice Co., or equal.

2.10 CLEANOUTS, COVERS AND FRAMES

- A. Floor cleanout: Duco cast iron with tapered cleanout plug. Adjustable scoriated polished bronze top for concrete finished floors; recess type top

for tile or Terrazzo floors. Provide cleanout stainless steel marker for cleanouts that occur in carpeted floors.

- B. Make: J.R.Smith, Fig. 4720, Zurn, Josam.
- C. Wall cleanout: Cleanout plugs concealed in walls shall be made accessible with chrome plated bronze round or square frame and cover secured with slotted screws.
- D. Make: J.R.Smith Fig. 4720, Zurn, Josam.

2.11 DRAIN

- A. General Use Drain: Cast iron drain with double flange, weep-holes, caulk bottom outlet, adjustable polished brass strainer, J.R. Smith, 2010-A, or approved equal, Zurn, Josam. Provide flashing clamp for drains in slabs above ground floor level. Use for laundry rooms and other finished areas.
- B. Drains in Boiler Rooms, shall be J.R. Smith #2230 or equal Zurn, Josam with cast iron grate and sediment. Watts is acceptable product.

2.12 INSULATING FITTINGS

- A. Furnish and install patented type dielectric fittings or couplings, Epcos, Vallett, Watts in pipe systems wherever dissimilar metals are joined.
- B. Dielectric fittings shall not be concealed within walls or ceilings.

2.13 INSULATION

- A. All insulation when installed shall have composite fire and smoke hazard ratings as tested by Procedure ASTM-E-84, NFPA-255, and UL-723, not exceeding a flame spread of 25 and smoke developed of 50 when compared with red oak as 100, as approved under NFPA and NBFU Pamphlet No. 90A and No. 90B standards.
- B. Insulation material and application shall be in accordance with the State Building Code and NFPA.
- C. Cold water: Piping shall be insulated with 1/2" thick, fiberglass insulation with factory-applied all-service jacket secured in place with self-sealing laps. Fittings shall be insulated with premolded PVC fitting covers secured in place with stainless steel tacks.
- D. Hot water: Piping shall be insulated with fiberglass pipe insulation with factory-applied all-service jacket secured in place with outward clinching

staples. Fittings shall be insulated with premolded PVC fitting covers secured in place with stainless steel stacks.

- E. Piping, insulation materials as manufactured by Gustin-Bason, Johns-Manville, Owens-Corning, Knauf, or Certain Teed.
- F. Insulate the following:
 - 1. All cold water piping: 1/2" thick rubber .
 - 2. Hot water piping: 1" thick rubber on all piping
 - 3. Hot water recirculation: 1"
 - 4. Horizontal rain leaders: 1/2" fiberglass
 - 5. All piping under handicapped lavatories and sinks with premolded True-Bro Basin Guard or Lav shield Guard.

2.14 PIPE, FITTINGS AND FABRICATION

- A. All piping materials for the various systems specified under this Section shall conform to the standards listed below. (Refer to system materials for type of pipe to be used.)
 - 1. Bell and spigot, cast iron, service weight, both pipe and fittings products of one manufacturer; Combustion Engineering, Central Foundry, Russell, Alabama Foundry, or Charlotte Foundry. Piping shall be coated with asphaltum or coal tar pitch inside and outside.
 - 2. Hubless cast iron, service weight, ASTM-A-74, manufactured and installed in accordance with C.I.S.P.I. Standard 301-75 and Pamphlet 100.
 - 3. DWV copper tubing with cast brass or wrought copper drainage pattern fittings.
 - 4. Type "L" copper tubing (hard temper), ASTM-B-88, manufacturers as listed above, used with cast brass or wrought copper solder fittings.
 - 5. Black steel pipe, Schedule 40 CW/ERW black steel pipe with welded joints for 2-1/2" and larger, Schedule 40 CW/ERW with screwed malleable fittings for 2" and under as manufactured by Stockham, Wheatland Tube, U.S. Steel or Republic.
 - 6. Ductile iron, cement lined, 150 psi pressure rated pipe,

ANSI A21-51, with ductile iron fittings conforming to ANSI A21.10.

B. Piping Joints

1. Joints in cast iron bell and spigot piping shall be caulked and made gas and watertight, firmly packed with picked oakum to a depth of 1-1/2 inch, and secured with pouring of molten virgin lead. Joints for Titon or Push Joints will be as per manufacturer's recommendations.
2. Joints for hubless cast iron pipe and fittings shall be made with double clamp retainer sleeve and neoprene gasket as manufactured by MG or Clamp-All and approved by State Plumbing Code.
3. Joints in plastic piping (except special wastes) shall be made with solvent cement manufactured specifically for the materials to be joined.
4. Joints in copper tubing shall be properly fluxed and made with 95-5 solder.
5. Joints in threaded steel shall be for National taper screw thread with approved compound applied to male thread, and with pipe ends reamed.
6. Joints between copper tubing and cast iron soil pipe shall be made with cast iron bronze or brass adapters for leading into bell and soil pipe.
7. Joints on cast iron water pipe shall be made with cast iron, Dresser, Smith-Blair, or Adams coupling.

C. System Materials:

Sanitary and vent: Below Ground: Sch.40 PVC with solvent joints.

Above Ground: Sch.40 PVC with solvent joints.Foam Core

Water Piping: Corzan and Flowguard CPVC

Gas Piping: Schedule 40 ER/ERW black steel with threaded joints or welded or Tracpipe per Code.

2.15 PLUMBING FIXTURES (TO BE VERIFIED)

- A. See attached plumbing fixture schedule:

3 PART 3 EXECUTION

3.1 SERVICES AND SYSTEMS

- A. Water System:

1. Piping shall be run parallel with the lines of the building; well supported from the structure; free from pockets and sags; pitched to drain points; and installed with pipe expansion loops, mechanical expansion joints, pipe guides, offsets and anchors to adequately care for thermal expansion.
2. Piping shall be installed to provide not less than 3/4" spacing from finished covering to other covering or surfaces of other construction.
3. All piping shall be protected from water hammer or shocks by approved water hammer arrestor. Air cushion shall be provided at tops of risers, and mechanical arrestor at all quick closing or solenoid valve equipped apparatus.
4. Drain points at bottom of all risers shall have 3/4" bronze hose and drawoff, cap and chain.
5. Valves shall be installed as indicated on riser diagrams, on branches leaving mains, at base of risers, at branches to large groups of fixtures and at single fixtures when trim does not include stops.
6. Final connections shall be made to all fixtures, appliances, or equipment with plumbing connections whether furnished by this contractor or by others.
7. Sterilization: Before any use of water system is made for domestic purposes, sterilize the entire water distribution system.
8. Arrange for installation of domestic water service. Assist the general contractor to make all necessary applications and secure all approvals from local Water Department.
10. Water piping shall be covered as specified except where chrome plated piping is used, or other notation is made.

11. The installation shall be coordinated with other trades through G.C. to allow space allocations and avoid conflicts during construction.

B. Drainage System:

1. The interior drainage systems shall be constructed using materials and methods as specified and/or indicated.
2. Provide properly trapped and vented waste connections to fixtures, floor drains, and special equipment. Each drain leaving the building shall have cleanout installed to meet the approval of the Plumbing Inspector.
3. Drain piping shall be uniformly pitched to conform with local and state code requirements; the inverts indicated on drawings shall be checked and accurately set. In the absence of invert elevations, check site utility drawings and verify location, size, and elevation of street sewers before proceeding.
4. Cleanouts shall be installed at the base of all stacks, beyond running traps, at changes in direction of more than 45 degrees, at not over 50 foot intervals in horizontal runs. Cleanout tees shall not be used where it is possible to use a straight tee.
5. Traps of material and design approved by local or State Plumbing Inspector shall be furnished and installed by the Plumbing Contractor for all equipment and appliances. All traps shall have the bottom cleanouts where access can be provided.
6. Vents through roof shall be base flashed by roofer. Vents shall extend at least two feet above the roof.
7. Carefully inspect for damaged materials. Run piping as shown on the drawings, making changes in direction with long sweep, 1/8 and/or 1/16 bends. Make connections to horizontal lines with Y's and 1/8 bends. Connections to stacks may be with sanitary T-fittings.
8. Clamps on hubless cast iron type joint shall be tightened to not less than 48 pound of torque. A calibrated present torque wrench developed by pipe manufacturers shall be used.

9. Hubless type joints suspended more than 1/8 inches below the floor slab shall be provided with sway bracing.
12. Plastic piping shall be protected from damage due to thermal expansion. Install expansion fittings as required by code and in accordance with the manufacturer's recommendations. System to meet State of Maine Plumbing Codes
13. The installation shall be coordinated with other trades through G.C. to allow space allocations and avoid conflicts during construction.

C. Gas Systems:

1. Handle owner's application for gas service and meter to the gas Company. Any fees and costs incurred shall be paid by the owner.
2. All gas piping from master meter to equipment shall be by Plumbing Contractor.
3. Pipe dope shall be for natural gas service. Pitch all piping to low points with 6" long drip pockets and removable caps at low points. Minimum pitch 1/4" in 15'-0".
4. Take branch lines from top or sides of horizontal lines, not the bottom. Provide a cock, dirt leg and suitable pressure regulator at each gas utilization device, except for devices furnished with regulators
5. The gas system installation shall include all pipe, fittings, valves and all accessories and incidentals to conform with code requirements.
6. All piping shall be level and true and shall be installed in accordance with all State and Local Code requirements including NFPA Pamphlet No. 54 and State Gas Regulatory Board.
7. Gas valves 2-1/2" and larger including main shutoff shall be lubricated wrench operated plug valve with round post opening and flanged ends.
8. Gas valves 2" and smaller shall be bronze body ball valves with lever handle, approved by local and State Codes. Gas system will be installed to meet State Gas Codes and Manufacturer's recommendations
9. The installation shall be coordinated with other trades through G.C. to allow space allocations and avoid conflicts during construction.

3.2 TESTING

- A. Testing of all systems shall be done at the expense of the Plumbing Subcontractor, and with equipment furnished by him. Testing shall be done in the presence of duly authorized inspectors and the Owner's representative with 48-hour notice given these authorities. All systems shall be repaired and retested until requirements are met, without additional expense to the Owner.
- B. Sanitary and vent piping shall be tested by plugging where leaving the building at outlets on the system; filling the system by section and proving tight, without addition of water of one hour duration. Systems tested by sections shall be subjected to a water pressure of 10 psi gauge and proven tight for one hour or by similar test required by the Inspector of Plumbing. Install necessary test plugs in stacks during installation.
- C. Interior water piping shall be tested to meet codes and Inspector will be notified to inspect and approve installation on phases
- D. Gas piping shall be tested with air pressure at 15 inches of mercury for 2 hours, or as required by local authority. All systems will be tested to meet codes and Inspector will be notified to inspect and approve installation on phases

3.3 STERILIZATION

- A. The entire potable water distribution system shall be thoroughly disinfected per code and inspector requirements.

3.4 COMPLETION

- A. Provide properly executed certificate of inspection from authorities having jurisdiction.
- B. Instruct such persons as the Owner designates in the proper operation and maintenance of the systems and their parts. Submit to the Architect a letter naming the person or persons so instructed and the dates of such instruction.
- C. Prepare and deliver literature showing operating, service and replacement data for all equipment which will require periodic maintenance or replacement.
- D. Verify that project record documents are complete as specified under Submittal and Record Documents.

...END OF THIS SECTION

