

## SECTION 220100 - PLUMBING SPECIALTIES

### 1. GENERAL

- A. The Contractor's attention is directed to the General and Special Conditions, General Conditions-Mechanical and to all other Contract Documents as they apply to this branch of the work. Attention is also directed to all other sections of the Contract Documents which affect the work specified in this section.
- B. The Contractor shall provide all equipment and specialties complete with trim required and connect in a manner conforming to the International Plumbing Code.
- C. The Contractor shall obtain exact centerline rough-in dimensions between partitions, walls, etc. as required for lay-out of his rough-in work. All work shall be roughed-in so that all exposed piping will be straight and true without bends or offsets.
- D. Prior to final inspection, test by operation at least twice, all equipment.
- E. Prior to final inspection, remove all stick-on labels, dirt, grease, other removable stampings, lettering, etc. from equipment and specialties and thoroughly clean same.
- F. All equipment and specialties shall be installed as recommended by the manufacturer in a neat and workmanlike manner. Unacceptable workmanship shall be removed and replaced at the installing Contractor's cost.
- G. All pipes, valves, fittings, fixtures, etc. for use in potable water systems 2" and below shall comply with federal lead-free requirements that the lead content of wetted surfaces cannot exceed 0.25% by weight.

### 2. DRAINAGE SPECIALTIES

#### A. GENERAL

- (1) Provide all drainage specialties indicated, specified and/or required to provide complete and acceptable removal of all storm, sanitary, waste, laboratory waste, etc. from the building and into approved receptors.
- (2) Drainage specialties shall be on non-electrolytic conduction to the material to which they are connected.
- (3) Drainage specialties shall be installed in a manner so as to ensure no leakage of toxic or odorous gases or liquids and shall have traps and/or backflow preventers where required. Nor shall they allow backflow into other or existing systems.

#### B. CLEANOUTS - INTERIOR (CO)

- (1) In addition to cleanouts indicated, provide cleanouts in soil and waste piping and storm drainage at the following minimum locations:
  - a. At base of each stack.
  - b. At fifty (50) foot maximum intervals in horizontal lines.
  - c. At each change of direction of a horizontal line.
  - d. As required by current IPC.
  - e. As required to permit rodding of entire system. (If in doubt, contact Engineers.)
- (2) Water closets, slop sinks and other fixtures with fixed traps shall not be accepted as cleanouts.
- (3) Cleanouts and/or test tees concealed in inaccessible pipe spaces, walls and other locations shall have an eight (8) inch by eight (8) inch (minimum) access panel or cover plates shall be set flush with finished floors and walls and shall be key or screw driver operable.
- (4) Access panels for cleanouts shall be of the Zurn, 1460 series or equivalent by Josam or Watts. They may, at the Contractor's option, be Perma-Coated steel, prepared to receive finish. The Contractor shall coordinate the finish of all access panels installed in finished areas with Architect.
- (5) Cleanouts and access panels shall be sized so as to permit the entry of a full sized rodding head capable of one hundred percent circumferential coverage of the line served.
- (6) Provide a non-hardening mixture of graphite and grease on threads of all screwed cleanouts during installation.
- (7) Do not install cleanouts against walls, partitions, etc. where rodding will be difficult or impossible. Extend past the obstruction.
- (8) In finished walls, floors, etc., ensure that cleanouts are installed flush with finished surfaces and, where required, grout or otherwise finish in a neat and workmanlike manner.
- (9) Cleanouts shall be as manufactured by Zurn, Josam, Jay R. Smith, Watts, MIFAB, Ancon or equivalent, similar to the following:
  - a. Zurn, Z-1440 cleanouts or Z-1445 cleanout tee at base of exposed stack and at change in direction of exposed lines.
  - b. Zurn, Z-1440 cleanout or Z-1445-1 cleanout tee where stacks are concealed in finished walls
  - c. Zurn, ZN-1400-T cleanout with square scoriated top in finished concrete and masonry tile floors.
  - d. Zurn, ZN-1400-Tx cleanout with square recessed top for tile in vinyl and linoleum finished floors.

- e. Zurn, ZN-1400-Z cleanout with round recessed top for terrazzo floors.
- f. Zurn, Z-1400-HD cleanout with tractor cover for exterior locations. Provide concrete supporting pad crowned to shed water. Refer to drawings for pad size.
- g. Mueller, No. D-731 or D-714, Nibco, Flage or equivalent for cleanouts in copper waste with cover plates and/or access panels listed for other cleanouts.
- h. Threaded hex head type cleanouts of same materials as pipe for piping 2" and smaller.
- i. Zurn, cleanout with round top with adjustable retainer for carpet area. Install flush with carpet.

#### C. FLOOR DRAINS

- (1) Provide floor drains at locations indicated. Install in a neat and workmanlike manner. Coordinate locations with appropriate persons or party to ensure floor pitch to drain where required.
- (2) Install floor drains in strict accordance with manufacturer's recommendations and the IPC unless otherwise indicated.
- (3) Each floor drain located on floors above the lowest floor shall be provided complete with a three (3) foot by three (3) foot, four (4) pound sheet lead flashing and clamping collar or chlorinated polyethylene shower pan liner of 30 mil. Lead pans shall be given a heavy coat of asphaltum on bottom and sides before installation and a heavy coat on exposed surfaces (if any). After installation, provide one ply of fifteen (15) pound roofing felt beneath each pan.
- (4) Ensure by coordination with the appropriate persons or party that spaces served by a floor drain(s) has a water seal extending at least three (3) inches from the floor of the space served on all floors above the lowest level.
- (5) The floor drains shall be Zurn, Josam, Watts, Jay R. Smith, MIFAB, Sioux Chief or equivalent, similar to the following:
  - a. FD-1:  
Refer to plans.

#### D. TRAP PRIMERS

Provide trap primers for all floor drains and open receptacle. Acceptable Trap Primer Manufacturers included Zurn, Precision Plumbing Products and Sioux Chief. Trap Primer selection shall be as follows:

- (1) Trap Primer Type-1 (TP-1)

Refer to plans.

E. CLEANOUTS (EXTERIOR) (ECO)

Provide exterior cleanouts at each location indicated and in the manner indicated.

F. ROOF DRAINS

(1) Each drain shall be provided complete with a three (3) foot by three (3) foot, four (4) pound sheet lead flashing and clamping collar. Roof drains shall be installed in strict accordance with the drain manufacturers and roofing manufacturer's instructions. Provide all accessories required for a complete installation.

(2) RD-1

Refer to plans

G. VARMINT GUARDS

Provide at each live discharge and/or culvert discharge (where culvert exceeds 30 linear feet in length) and where the line has a surface opening greater than one-half (2) square feet, a three (3) inch mesh steel varmint guard made up with frame and 3/8-inch minimum steel rods welded together and affixed tightly into the end of the open pipe.

3. WATER SUPPLY SPECIALTIES

A. GENERAL

(1) Provide all water supply specialties indicated, specified and/or required for the complete installation. Install in a neat and workmanlike manner in accordance with the manufacturer's recommendations and the IPC.

(2) Where required by the AHJ, install code approved vacuum breakers in each water supply specialty.

B. FREEZEPROOF WALL HYDRANTS (FPWH)

(1) Provide code approved wall hydrants at each location indicated in a neat and workmanlike manner. Affix tight to walls and ensure that the feed piping is on the heated side of the building insulation blanket.

(2) Where hydrants are of handwheel type, remove handwheels and turn over to owners in an envelope labeled "Wall Hydrants" exterior upon completion of the project.

- (3) Where hydrants have key operators, turn over at least two (2) keys in an envelope labeled "Wall Hydrants" to owners upon completion of the project.
- (4) Where hydrants have lockable boxes, turn over at least two (2) keys in an envelope labeled "Wall Hydrants, Exterior" to owners upon completion of project.
- (5) Mount all wall hydrants at least twenty (20) inches above finished exterior grade. Where this is not possible or practical, contact Engineers.
- (6) Wall hydrants shall be as follows or equivalent:
  - a. Refer to plans.

C. WATER HAMMER ARRESTORS (WHA): Provide water hammer arrestors at each location indicated and/or as required to eliminate hydrostatic on the domestic water system. Provide at least one water hammer arrestor at all quick acting valve locations including:

- Automatic Clothes Washers – Type “A”
- Commercial Dishwashers – Type “B”
- Sterilizers – Type “B”
- Mop Basins (downstream of check valve) – Type “A”
- Flush valve fixtures - Type “B” (Each toilet room with 1-3 flush valve fixtures shall have its own Type “B” water hammer arrestor.)

- (1) Multiple Fixtures – Branch Line Less Than 20’ Long: The preferred location for a Zurn Shoktrol is at the end of the branch line between the last two fixtures when the branch lines do not exceed 20’ in length, from the start of the horizontal branch line to the last fixture supply on this line.
- (2) Multiple Fixtures – Branch Line More Than 20’ Long: On branch lines over 20’ in length, use two Shoktrols whose capacities total the requirement of the branch. Locate one unit between the last and next to last fixture and the other unit approximately midway between the fixtures.
- (3) Water hammer arrestors shall be Zurn, Z-1700, Shoktrol, Smith, Josam, Wade, or equivalent. Water hammer arrestors shall be stainless steel, bellows type. Field fabricated capped cylinders shall not be acceptable.
- (4) Note: Provide insulation unions where arrestors are of dissimilar material from the piping served (unless piping is non-conducting, such as ABS or PVC).

MARK	MANUFACTURER & MODEL	SIZE	P.D.I. SIZE
TYPE "A"	ZURN, Z-1700 # 100	1-11	A

TYPE "B"	ZURN, Z-1700 # 200	12-32	B
TYPE "C"	ZURN, Z-1700 # 300	33-60	C
TYPE "D"	ZURN, Z-1700 # 400	61-113	D

D. REDUCED PRESSURE BACKFLOW PREVENTERS (RPZ-1)

Watts #LF909S or equivalent reduced pressure backflow preventer. Provide with gate valves for isolation, FDA food grade strainer and air gap fitting. RPBP shall be UL listed.

4. GENERAL SPECIALTIES

A. VACUUM BREAKERS AND BACK FLOW PREVENTERS

Where required by the IPC, whether indicated or not, provide approved vacuum breakers or backflow preventers at the following locations.

- (1) Where domestic water system connects to fire protection system.
- (2) Where domestic water system connects to hydronic system.
- (3) At any hose (threaded) tap on the domestic water system.

B. ROOF FLASHINGS

All plumbing vents or other plumbing passing thru the roof shall be flashed as approved by the IPC and as recommended by the roofing manufacturer and/or Contractor.

C. GAS PRESSURE REGULATORS

Provide gas pressure regulators for all gas fired equipment that requires a lower pressure than what is delivered to the appliance. Regulators shall be installed in accordance with the requirements of NFPA 54 and/or International Fuel Gas Code, whichever is more stringent.

END OF SECTION 220100

## SECTION 220200 - PLUMBING FIXTURES, FITTINGS AND TRIM

### 1. GENERAL

- A. The Contractor's attention is directed to the General and Special Conditions, General Conditions-Mechanical and to all other Contract Documents as they apply to this branch of the work. Attention is also directed to all other sections of the Contract Documents which affect the work of this section and which are hereby made a part of the work specified in this section.
- B. The Contractor shall provide all fixtures complete with trim required and connect in a manner conforming to the State Plumbing Code.
- C. The Contractor shall obtain exact centerline rough-in dimensions between partitions, walls, etc. as required for lay-out of his rough-in work. All work shall be roughed-in so that all exposed piping will be straight and true without bends or offsets.
- D. All exposed piping or in casework below sinks, stops, traps, tailpieces, etc., shall be code approved chrome plated brass unless otherwise indicated or specified. Water supplies shall connect through walls with stops and chrome plated escutcheons with set screws.
- E. All fittings, fixtures and trim shall be new unless otherwise indicated or specified. They shall also be of equivalent quality, dimensions, material, etc. as those specified. All faucets, shower heads, drains, levers, trim, etc. shall be constructed of metal and not plastic.
- F. Handicapped fixtures shall be mounted as recommended by the ADA.
- G. All fixtures shall be mounted as recommended by the manufacturer. Fixtures shall be rigidly mounted to walls and floors. Pay particular attention to flush valves and bracket concealed portion to building structure during rough-in. Loose, shaky flush valves, lavatories, etc. shall not be acceptable.
- H. Prior to final inspection open all faucets and allow to run for fifteen (15) minutes, then remove all faucet aerators and thoroughly clean until smooth flow is obtained.
- I. Prior to final inspection, test by operation at least twice:
  - (1) (Where applicable) adequate flow of hot and/or cold water at;
    - a. Shower Heads
    - b. All Faucets
    - c. Flush Valves and Tanks
    - d. Tub Drains
    - e. Hose Bibbs
    - f. Sill Cocks
    - g. All Other Valved Hot and/or Cold-Water Openings in the Plumbing System

(2) All toilet seats

(3) All flush tank overflows

- J. Prior to final inspection, remove all stick-on labels, dirt, grease, other removable stampings, lettering, etc. from plumbing fixtures and thoroughly clean same.
- K. All sink and lavatory traps shall have screw in plugs in the bottom for ease of cleaning and have mechanical fittings for ease of removal.
- L. All fixtures shall be set level and true and shall be grouted into finished walls, floors, etc. in a neat and workmanlike manner with an approved waterproof non-yellowing grout for such service.
- M. Special Note for Handicap Grab Rails: Coordinate top of shower valves, flush valves, flush tank, etc., with location of grab rails as shown on the architectural plans. The Contractor shall install all items to allow for installation, removal and service without removal of the grab bar.
- N. All exposed drain pipes and domestic water piping under handicap accessible sinks and lavatories shall be insulated in accordance with ADA requirements and shall have a vinyl plastic covering over all insulation.
- O. The Contractor shall obtain a copy of the casework shop drawings and confirm sinks, faucets, gas turrets, etc., will fit in the space provided. Additionally, in ADA applications with handicap sink base cabinets, the Contractor shall limit the total distance from the bottom of the sink to the bottom of the P-trap and coordinate waste pipe rough-in height to ensure the proper installation of the handicap sink base cabinet front closure panel. The Contractor shall not order sinks until he confirms no conflicts occur and shall adjust sink sizes if required. If the Contractor orders sinks, faucets, etc., that do not fit in the casework supplied, he shall replace them at no additional cost.
- P. All lavatories, sinks, etc. shall be supplied with center rear drain outlets where necessary to avoid conflict with casework, handicapped kneeboards, etc. If the Contractor orders sinks that do not fit in the casework supplied, he shall replace them at no additional cost.
- Q. All single supply faucets shall be provided with mechanical mixing valves unless otherwise noted. Mechanical mixing valves shall have hot and cold-water inlet connections, common outlet, in-line check valves, and adjustable temperature setting. Mixing valves shall be Moen model 104424 or equal. Provide one mixing valve per single supply faucet unless otherwise noted. Contractor shall provide all required connections and set mixing valve to required temperature.
- R. All gooseneck faucets shall have rigid spouts, unless swing spouts are specified. If swing spouts are specified, the spout shall have a maximum swing of 140 degrees from side to side.
- S. All plumbing fixtures shall comply with federal lead-free requirements that the lead content of wetted surfaces cannot exceed 0.25% by weight.
- T. All water closet handles on ADA water closets shall be located on the approach side of the fixture.



## 2. FIXTURES AND TRIM

Available Manufacturers: Subject to compliance with requirements of manufacturers offering plumbing fixtures and trim. Plumbing fixtures and trim, which may be incorporated in the work include, but are not limited to, the following:

### A. Plumbing Fixtures - Water Closet, Lavatory, Urinal, Bathtubs, Clinical Sink and Scrub Sink

American Standard, U.S. Plumbing Products  
Eljer Plumbingware Div., Wallace-Murray Corp.  
Kohler Co.  
Crane Plumbing  
Universal-Rundle  
Toto  
Zurn Co.  
Sloan Fixtures

### B. Plumbing Trim

American Standard, U.S. Plumbing Products  
Chicago Faucet Co.  
Kohler Co.  
Delta Co.  
T&S Brass & Bronze Work Co. (Commercial)  
Zurn Co.  
Just Co.  
Speakman Co.  
Moen Commercial

### C. Flush Valves

Delany Co.  
Sloan Valve Co.  
Zurn Co.  
American Standard

### D. Fixture Seats

Bemis Mfg. Co.  
Church Seat Co.  
Olsonite Corp., Olsonite Seats

### E. Water Coolers

Elkay Mfg. Co.

Halsey Taylor Div., King-Sealey Thermos Co.  
Haws Drinking Faucet Co.  
Western Drinking Fountains, Div. of Sunroc Corp.  
Oasis Co.  
Acorn AQUA

F. Service Sinks and Mop Basins

American Standard, U.S. Plumbing Products  
Eljer Plumbingware Div., Wallace-Murray Corp.  
Fiat Products  
Kohler Co.  
Stern-Williams Co., Inc.  
Florestone

G. Stainless Steel Sink

Elkay Mfg. Co.  
Just Mfg. Co.  
Moen, Div. of Stanadyne/Western  
Sterling Co.

H. Fixture Carriers

Josam Mfg. Co.  
Jay R. Smith  
Tyler Pipe  
Zurn Industries  
Watts

I. Shower

Bradley Co.  
Zurn Co.  
Symmons Industries, Inc.  
Chicago Faucets  
Speakman Company  
Powers  
Acorn Co.  
Moen Commercial

J. Shower Stalls

Clarion  
Universal-Rundle  
Aqua Bath

- Aquarius  
Aqua Glass  
Acryline  
Lasco Bathware
  
- K. Canwash
  - Zurn Industries
  - Murdock
  - Woodford
  - Watts
  
- L. Washer/Dryer Connection Box
  - Guy Gray Co.
  - Wolverine Brass, Inc.
  
- M. Wash Fountain
  - Bradley Co.
  - Acorn Co.
  - Intersan
  - Willoughby
  
- N. Shampoo Sink
  - Belvedere
  
- O. Care Ware - Swingette, Swivette
  - Bradley Co.
  - Acorn Co.
  - White Hall Co.
  
- P. Penal Ware
  - Bradley Co.
  - Acorn Co.
  - Willoughby
  
- Q. Emergency Fixtures - Eyewash, Showers
  - Bradley Co.
  - Speakman Co.
  - Guardian Co.

R. P-Trap Insulation Kit (Trap Wrap)

Truebro  
Brocar  
Plumberex

Note: Kitchen, Lab, Science Room Fixtures, Special Equipment, Etc.

Contractor to provide final plumbing connections to all of the equipment furnished by Owner including, but not limited to: chrome supplies, stops, continuous drains, drain tailpiece, "P" traps and escutcheons.

3. FIXTURE SELECTION

A. Refer to drawings for fixture schedule.

END OF SECTION 220200

## SECTION 220300 - PLUMBING EQUIPMENT

### 1. GENERAL

- A. All plumbing equipment shall comply with the latest provisions of the International Plumbing Code.
- B. Provide magnesium anodes for water heaters and storage tanks.

### 2. WATER HEATER

The heater(s) shall be Gold Series Commercial Electric Model Number DRE-52 as manufactured by A. O. Smith. Heater(s) shall be rated at 12 kW, 208 volts, 1 phase, 60 cycle AC, and listed by Underwriters' Laboratories and approved to the NSF Standard 5 by UL. Tank(s) shall be 50 gallon capacity. Tanks shall have 150 psi working pressure and be equipped with extruded high density anode. All internal surfaces of the heater(s) exposed to water shall be glass lined with an alkaline borosilicate composition that has been fused-to-steel by firing at a temperature range of 1400°F to 1600°F. Electric heating elements shall be low watt density. Each element shall be controlled by an individually mounted thermostat and high temperature cut-off switch. All internal circuits shall be fused. The outer jacket shall be of baked enamel finish and shall be provided with full size control compartment for performance of service and maintenance through hinged front panel and shall enclose the tank with foam insulation. Electrical junction box with heavy duty terminal block shall be provided. The drain valve shall be located in the front for ease of servicing. Heater tank shall have a three year limited warranty as outlined in the written warranty. Manufacturer shall supply ASME rated temperature and pressure relief valve. Fully illustrated instruction manual to be included. Meets standby loss requirements of the U. S. Department of Energy and current edition of ASHRAE/IES 90.1.

### 3. EXPANSION TANK (DOMESTIC WATER)

- A. The potable water expansion tank shall be of drawn steel construction. It shall have a Butyl diaphragm separating the air chamber from the water containing chamber. Inlet connector shall be Stainless Steel. Materials of manufacture for the diaphragm shall be FDA approved. The potable water expansion tank shall be a Watts Model PLT.

### 4. RECIRCULATING DOMESTIC HOT WATER PUMPS (P-DHWR)

- A. Bell and Gossett or approved equivalent stainless in-line centrifugal circulating pump with mechanical seals, drip proof motor and all required overloads, starters and disconnects. Basis of design model: ECOCIRC 20-18.

### 5. WATER SOFTENER SYSTEM

- A. The water softener system shall consist of polyglass mineral tank and brine tank with safety float. System shall also include a bypass control valve. System shall be rated for a system flow rate of 8 GPM.

END OF SECTION 220300