

## SECTION 15410 - PLUMBING - GENERAL PURPOSE

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Furnish labor, equipment, materials, and tools and perform operations in connection with the renovations and additions to the plumbing system. Comply with codes and authorities having jurisdiction, preparation of Record Drawings and Owner's Manuals, guarantees and warranties, protection of work and quality assurance of workmanship.
- B. Section Includes:
  - 1. Inside sanitary, storm drainage, cold water, hot water and natural gas piping.
  - 2. Cold water from the existing service entrance located in the utility room between the bank and the new tenant space. Verify that the incoming service is a minimum of 2" diameter. Provide a new meter and backflow preventer as shown on the detail in the construction documents.
  - 3. Natural gas piping from the utility room between the bank and the new tenant space. Local natural gas provider shall provide new equipment as required to meet the new building gas loads.
  - 4. Plumbing fixtures.
  - 5. Valves, faucets, strainers, tailpieces, traps, adapters and final connections to fixtures and equipment provided either by the Owner or under other Sections of these Specifications.
  - 6. Cleaning, sterilizing and testing of the piping systems and related equipment.
- C. Related Sections:
  - 1. Section 02200: Earthwork.
  - 2. Section 09900: Painting.
  - 3. Section 15010: Mechanical General Requirements.
  - 4. Section 15190: Mechanical Identification.
  - 5. Section 15260: Piping Insulation.
  - 6. Section 15450: Plumbing Equipment.
  - 7. Division 16 - Electric.

#### 1.2 SUBMITTALS

- A. Submittals:
  - 1. Prepare and submit Submittals in accordance with the requirements of Sections 01330 and 05010, and obtain the Architect's approval before proceeding with the fabrication and work.
  - 2. Show plans, elevations, details and job conditions, relationship to other work, and indicate finishes.
  - 3. Fixtures of the same material (such as china, stainless steel, or fiberglass) shall be of the same manufacturer. Sink faucets shall be of the same manufacturer. Floor drains, cleanouts and carriers shall be of the same manufacturer.
  - 4. Submittals shall indicate Specification Section and paragraph requiring equipment submitted.
    - a. Plumbing fixtures.
    - b. Floor drains.
    - c. Valves.
    - d. Cleanouts.

- e. Trap Primers.
- B. Samples: Submit samples as requested by the Architect of materials specified herein in accordance with requirements of the Conditions of Contract, and before ordering materials, obtain written approval from the Architect.
- C. Product Guarantees and Warranties: Provide manufacturers standard guarantee/warranty for products provided in this Section.
  - 1. Electric water coolers shall have a five-year non-pro-rated guarantee.
  - 2. Sink Faucets: Five (5) year non-pro-rated guarantee.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

Product model numbers used reference the first manufacturer listed for the appropriate item.

- A. Water Closets: TOTO, American Standard, Kohler or approved equal.
- B. Toilet Seats: TOTO, Church, Bemis or approved equal.
- C. Urinals: TOTO, Kohler or approved equal.
- D. Flush Valves: TOTO or approved equal.
- E. Lavatories: American Standard or Kohler.
- F. Faucets:
  - 1. Lavatory: TOTO or approved equal.
  - 2. Sinks and Mop Receptors: Chicago Faucet, T & S, Speakman or Symmons.
  - 3. Hose Bibbs: Chicago Faucet or equal.
- G. Showers: Aqua Bath or equal.
- H. Shower Valves: Powers or equal.
- I. Drinking Fountains: Halsey-Taylor, Oasis, Haws, or Sunroc.
- J. Floor Drains: Zurn, Watts, MiFab, Josam, or J. R. Smith.
- K. Cleanouts: Zurn, Watts, MiFab, Josam, or J. R. Smith.
- L. Shock Arresters: Precision Plumbing Products, Zurn, Josam, J. R. Smith or Wade.
- M. Trap Primers: Zurn, Sioux Chief, Precision Plumbing Products, Josam, J. R. Smith or Wade.
- N. Valves:
  - 1. Ball: Milwaukee, Apollo, Nibco or Crane.
  - 2. Gate and Drain: Milwaukee, Nibco or Crane.
  - 3. Check: Milwaukee, Nibco or Crane.
  - 4. Spring Loaded Resilient Seat Check: Nibco or approved equal.

- O. Thermometers and Pressure Gauges: Terrice, Amtek, Ernst, or Weiss.
- P. Fire Stop Sealant: SpecSeal Firestop Products or equal.
- Q. Pressure Reducing Valve: Watts or equal.
- R. Safety Fixtures:
  - 1. Eyewashes: Guardian, Haws, Speakman or equal.
  - 2. Tempering Valve: Powers or equal.
- S. Traps and Supplies:
  - 1. SK, L & WC: McGuire.

## 2.2 MATERIALS

- A. Soil, Waste, Vent, Indirect Waste and Primary Storm Drainage Piping:
  - 1. Schedule 40 polyvinyl chloride (PVC) with solvent cement joints. Fittings shall be of the drainage pattern.
  - 2. Double branch drainage connections 2" and smaller shall be made with double wye fittings.
- B. Cold Water, Hot Water and Hot Water Return Piping:
  - 1. Above Ground:
    - a. Type "L" hard-drawn copper tubing with wrought copper, solder-type fittings; immediate exposed piping at fixtures shall be IPS copper, cast brass threaded fittings, finished and chrome-plated, unless otherwise noted.
    - b. Take-offs may be made in copper piping using the "T-drill" method with brazed joints. Connections shall be constructed, prepared and joined in accordance with the recommendations of the tapping tool manufacturer.
    - c. Provide vacuum breakers at each bathroom group, where shown on drawings and where required by Codes.
- C. Gas Piping System:
  - 1. Schedule 40 black steel. Malleable iron threaded flat band black fittings or welded fittings and joints; piping of 1 psig or more or 4" IPS or larger shall have welded fittings. "Walco" brass to iron seat malleable unions. Provide shut-offs at each piece of equipment. Provide drain pockets at risers and low points. Install gas piping system in accordance with NFPA Bulletins No. 54 and No. 58.
  - 2. Gas Pressure Regulators: Shall be of manufacturers acceptable to gas supplier and approved by the American Gas Association (AGA), Industrial Risks Insurers (IRI) and in accordance with NFPA. System is designed based on delivery of 2 psig from building regulator provided by gas supplier. Regulators shall be designed for Natural gas at minimum inlet pressure of 1.5 psig and an outlet pressure of 6" water column, designed to accommodate connected load for each regulator. Where regulators are located inside, provide a 2" vent pipe through the roof and terminate with a gooseneck.
- D. Cleanouts:
  - 1. Provide cleanouts for drainage piping at base of risers, at changes in direction, where indicated, and as required by Code. Cleanouts shall be furnished with bronze plugs.
  - 2. At the completion of the work, remove cleanout covers, flush lines and grease threads.
  - 3. Resilient Tile Floors: #ZN-1400-X-BP round top, recess for tile.

4. Carpeted Areas: #Z-1400-CM-BP round top with carpet marker.
  5. Wall: #Z-1446-BP, cast iron ferrule, plug, with round stainless steel access cover with vandal-proof screw.
  6. Others: ZN-1400-BP round nickel bronze top.
- E. Valves and Fittings: Provide valves for complete operation and drainage. Provide accessible sectionalizing valves where water branches connect to mains. Provide drain valves at the low points.
1. Gate: Bronze body, solid bronze wedge disc, non-rising stem and threaded bonnet, 200 psi WOG for shut-offs only.
    - a. Threaded Ends: #105.
    - b. Sweat Ends: #115.
  2. Ball: Bronze body, blowout-proof stainless steel stem, stainless steel ball, teflon seats, stainless steel lever handle with vinyl grip, rated for 600 psi WOG. Use for shut-offs or balancing.
    - a. Threaded Ends: #BA-100S.
    - b. Sweat Ends: #BA-150S.
  3. Check: Bronze body and disc, 200 psi WOG, BUNA-N seal.
    - a. Threaded Ends: # 509.
    - b. Sweat Ends: #1509.
  4. Spring Loaded Resilient Seat Check: Model T-480, 125 psi, bronze body, stainless steel stem, and trim.
  5. Drain: Same as 1. or 2. above with 3/4" hose adaptor and brass hose cap with chain.
- F. Thermometers:
1. Model 80742, 4-1/2" diameter case. Thermometers shall be universal angle liquid-filled dial type, with union hub and separable brass wells. Scale range shall be 0 – 100°F for the cold water and 30• - 240•F. for the hot water piping. Graduations shall be 2•F.
  2. Thermometer Wells: Heavy brass, projecting a minimum of 2" into the fluid, with extension to the face of insulation. Provide caps and chain for each well. Pipe size shall be a minimum of 2-1/2" where wells are installed.
- G. Pressure Gauges:
1. Gas pressure gauges shall be Model 660, bellows type, low pressure design, 4 1/2" diameter face, scaled in inches of water column with a 0-100" range, 1.0 increments labeled every 10, ANSI B40.1 Grade A accuracy, cast aluminum case with a back mounting flange and a 1/4" NPT brass socket. Locate gauges inside the building; provide one at the gas entrance and one at the most pneumatically remote part of the piping system; provide 1/4" copper tubing and gauge cocks for each gauge; mount at 5'-0" above finished floor to centerline. Provide gauge ball valves before and after every secondary regulator and furnish one additional gauge to the owner.
  2. Water pressure gauges shall be model 600, bourdon tube type, standard pressure design, 4 1/2" diameter face, scaled in pounds per square inch with a 0-100 range, 0.5 increments labeled every 10 psi, ANSI B40.1 Grade A accuracy, cast aluminum case and a 1/4" NPT brass socket.
- H. Dielectric Fittings: Provide dielectric fittings wherever dissimilar metal materials are to be joined. Fittings shall be not less than 175 psig rated and have a maximum temperature rating of not less than 200•F.
- I. Hangers (Individual):

1. Hangers shall be of the adjustable clevis type with shields for plastic piping and insulated piping. Vertical pipe clamps for copper piping shall be copper, bronze or bronze plated construction; other vertical clamps and horizontal pipe hangers shall be steel construction.
2. Piping below ground shall be continuously supported on undisturbed bearing soil or on engineered compacted fill.
3. Horizontal above ground piping shall be supported as follows:
  - a. Cast Iron: At every other joint up to every 5'-0". For single lengths of pipe longer than 5'-0" provide one hanger for each length of pipe up to every 10'-0". Locate hangers within 1'-6" of a hub or a joint. Provide a hanger for each branch take-off within 1'-6" of the connecting main.
  - b. Copper: 1/2" - 1-1/4": Every 6'-0".  
1-1/2" up: Every 10'-0".
  - c. Steel: 1/2" IPS: Every 6'-0".  
3/4" & 1" IPS: Every 8'-0".  
1-1/4"+ IPS: Every 10'-0".
  - d. P.V.C.: All Sizes: Every 4'-0".
4. Vertical above ground piping shall be supported as follows:
  - a. Cast Iron: At every floor and at the base of every stack.
  - b. Copper: 1/2" - 1-1/4": Every 6'-0".  
1-1/2" up: Every 10'-0".
  - c. Steel: 1/2" IPS: Every 6'-0".  
3/4" & 1" IPS: Every 8'-0".  
1-1/4"+ IPS: At every floor level.
  - d. P.V.C.: All Sizes: Every 4'-0".
5. Provide hangers within 1'-0" each way of each change of direction except at expansion loops which shall have hangers before, after and at the mid-point of each loop.
6. Hanging supports shall be attached to the top chord of the building framing system.

J. Hangers (trapeze):

1. Model P1001, 12 gage 1 5/8" wide by 3 1/4" deep channel designed for both top and bottom clamping. The channel shall be capable of supporting no less than 950 pounds uniform load over a 8'-0" span at a deflection of L/240. Space channels by the lowest applicable value in Item 2.02 M 3. above.
2. Support each channel with a minimum of two 1/2" dia. threaded rods. Attach rods with beam clamps to either the top chord of joists at the panel points or the top flange of the beams. Rods shall be spaced no more than 8'-0" along the channel. A pipe may be attached to a cantilevered side of the channel within 12" of a hanger rod.
3. Provide "cush-a-clamp" assemblies with shoulder bolted stainless steel clamps and thermoplastic elastomer cushion for gas piping. For other pipes provide #P2024 thru #P2070-84 shoulder bolted stainless steel clamp assemblies with insulation shields.

K. Gas Piping Seismic Supports:

1. Provide both lateral and longitudinal braces sized in accordance with the BOCA Building Code. Provide load calculations for braces used or manufacturers load tables for pre-engineered systems.
2. Braces must be placed parallel to the forces acting on the piping being restrained either in the 2-way or 4-way configuration. 3-way braces are not acceptable.
3. Maximum spacing between braces shall be per the BOCA Building Code.

L. Expansion Loops: #MLS80XXX "Metraloop" pre-engineered expansion loop with 4 in. of allowable movement, sweat copper ends, single braid design; loop shall match pipe size of the

connecting lines. Provide guides for piping 1'-0" each side of loop. For Kitec tubing follow the manufacturer recommendations.

- M. Anchors and guides shall be supported from steel beams or angle iron and other steel work provided.
- N. Sleeves:
  - 1. Pipes Through Interior Partitions: Form with steel pipe or 16 gauge galvanized steel.
  - 2. Size: The minimum sleeve diameter shall be either 2 pipe sizes or 2" in diameter larger than the outside diameter of the pipe. The outside diameter of insulated piping shall be measured at the insulation jacket.
- O. Escutcheon plates shall be installed where piping passes through walls, partitions, floors, ceilings, and other building assemblies. Escutcheon plates shall be all-metal construction and of standard one piece design. In finished areas, they shall be chrome plated; in unfinished areas, they shall have prime coat of paint. Hangers extended through finished ceilings shall have chrome-plated washers.
- P. Solder and Brazing Metals:
  - 1. Solder metal shall be a composite of 95% tin and 5% antimony or 95.5% tin, 4% copper and 0.5% silver.
  - 2. Brazing metal shall be a composite of 45% (+1%) silver, 25% (+2%) zinc and 30% (+1%) copper.

## 2.3 FIXTURES

- A. Water Closets: WC-1: Model No. CT705EL; white elongated bowl, floor mounted, vitreous china, low consumption, elongated rim, siphon jet, 1-1/2" top spud, with model TETILN32#CP 1.28 GPF Eco flush valve. Automatic infrared sensor activated, piston flush valve, with sensor adjustment on installation. Manual override button. Piston valve and solenoid with self-cleaning mechanism. Hydro-powered turbine shall charge the power supply during usage, eliminating the need for battery replacement for up to ten years. Automatic flush every 24 hours is not used. No. SC534 elongated open front seat, less cover. Angle stop and vacuum breaker included.
- B. Urinals: U-1: Model UT104E, white low consumption washout with top spud inlet, wall hung with model TEUILN12#CP 0.5 GPF Eco flush valve. Automatic infrared sensor activated, piston flush valve, with sensor adjustment on installation. Manual override button. Piston valve and solenoid with self-cleaning mechanism. Hydro-powered turbine shall charge the power supply during usage, eliminating the need for battery replacement for up to ten years. Automatic flush every 24 hours is not used. Angle stop and vacuum breaker included.
- C. Lavatories: Provide #155-A grid strainer and 1-1/4" tailpiece, chrome-plated brass, 3/8" loose key supplies.
  - 1. L-1: No. 0954.000 "Murro" 22" x 17" white vitreous china, 3 faucet holes; #TEL5GSC-10 and TN71V100 cover plate, Ecopower generation sensor faucets, thermal mixing valve set to deliver 110 degree water, continuous discharge up to 10 seconds, hydro power charge, 10 year based upon 2,000 cycles per month, automatically turns off after ten seconds, three year warranty.

2. L-2: No. 0954.000 "Murro" 22" x 17" white vitreous china, 3 faucet holes; #201-AGN8AE3-317XKCP, deck mounted widespread faucet, polished chrome finish, solid brass construction, 4" rigid valve body centers, 8" C-C rigid swing gooseneck spout, , 2.2 GPM compensating aerator, 4" wristblade handles, ceramic disc cartridge, lifetime limited faucet warranty.
- D. Counter Sinks: Sinks shall be all 18-8, Type 304, stainless steel construction. Provide #151-A stainless steel basket strainer with 1-1/2" tailpiece, #8912 chrome-plated brass trap with extension to wall and H2158-LK chrome-plated brass, 1/2" loose key supplies; traps and supplies to be covered with safety insulation may be un-chromed brass.
1. SK-1: #LRADQ2022-3, 18 gauge, single bowl, self rimming,, 19 1/2" left to right x 22" front to back x 6 1/2" deep, overall dimensions, three holes 4" O.C., with faucet #201-AGN8AE3-317XKCP, polished chrome plated cast brass, 4" O.C. valve body., 8" C-C swing gooseneck spout, a ceramic disc cartridge, 4" wrist blade handles with color index buttons, 2.2 gpm pressure compensating aerator, 1/2" flexible risers and mounting hardware.
  2. SK-2: #LRADQ1720-3, 18 gauge, single bowl, self rimming,, 17" left to right x 20" front to back x 6 1/2" deep, overall dimensions, three holes 4" O.C., with faucet #201-AGN8AE3-317XKCP, polished chrome plated cast brass, 4" O.C. valve body., 8" C-C swing gooseneck spout, a ceramic disc cartridge, 4" wrist blade handles with color index buttons, 2.2 gpm pressure compensating aerator, 1/2" flexible risers and mounting hardware.
  3. SK-3: #LRADQ2022-4, 18 gauge, single bowl, self rimming,, 19 1/2" left to right x 22" front to back x 6 1/2" deep, overall dimensions, four holes 4" O.C., with faucet #2304, polished chrome plated cast brass, deck mounted with spray, single lever control, rigid 8" C-C gooseneck swing spout, ceramic mixing cartridge, temperature limit stop, 2.2 gpm softflo aerator, 12" stainless steel hose, and mounting hardware. Hot water tap: Insinkerator model #F-GN1100, hot only dispenser, single lever, chrome finish, adjustable temperature from 160 – 210 degrees F, self closing hot valve, with a 2.5 gallon electric storage water heater, model #W152.
  4. SK-4: #LRADQ2022-4, 18 gauge, single bowl, self rimming,, 19 1/2" left to right x 22" front to back x 6 1/2" deep, overall dimensions, three holes 4" O.C., with faucet #201-AGN8AE3-317XKCP, polished chrome plated cast brass, 4" O.C. valve body., 8" C-C swing gooseneck spout, a ceramic disc cartridge, 4" wrist blade handles with color index buttons, 2.2 gpm pressure compensating aerator, 1/2" flexible risers and mounting hardware.
- E. Showers: SH-1, Roll-in Model #C6536BF-FUS 3/4", meets ANSI A117.1 and ADA Guidelines, Acrylic one piece molded construction, inside dimensions 60"W x 36" D x 78" H, includes stainless steel grab bars with mounting plate and curtain rod, 3/4" threshold, factory installed fold-up seat, wrap grab bar, shower bracket, 30" slide bar, weighted shower curtain and hooks, factory drilled for a dome light, and a 120 volt fluorescent dome light.
1. SH-1 shower valve: Hydroguard Series e425-A010-3Y0, thermostatic mixing valve compensates for both thermal and pressure fluctuations, built-in adjustable temperature limit stops, cast brass body, stainless steel faceplate, modified with shower heads by Croma model #E75 EcoAir standard showerhead and handheld handshower, chrome finish.
- F. Drinking Fountain: DF-1: #OVL-II ESBP-Q, oval shaped, bi-level, barrier free fountain, all stainless steel construction, one piece chrome plated drinking fountain, concealed type wall hanger, automatic stream regulator and self closing, semi circular pushbutton actuator. Cooler shall comply with ANSI 117:1, NSF/ANSI 61, and ADA for visual and motion disabilities.

- G. Emergency Eyewash:
1. EEW-1, Model #G5046BP Eye Wash/Drench Hose Unit, wall mounted, meets ANSI Z358.1 2004 as both an eye wash and a drench hose. Two GS-Plus spray heads with flip top dust covers, internal flow control and filter, forged brass squeeze valve with locking clip on handle, 12 foot reinforced nylon retractable hose and an in line backflow preventer.
  2. EEW-2, Model #G1805 Deck mounted on the right next to sink SK-4, "AutoFLow" swivel eye wash, stainless steel enclosure, in-line strainer, (2) polypropylene 'GS Plus' spray head with integral flip top dust covers, filters and 1.8 GPM flow control orifices mounted on a chrome plated brass eyewash assembly. Activate valve by rotating 90 degrees horizontally from stored position. Unit shall include ANSI compliant sign, meet or exceed ANSI Z358.1-2004 and come with a 2 year warranty.
- H. Floor Drains: Dura-coated cast iron body with cast iron traps.
1. FD-1: ZN-525-H-P, 3" no hub outlet, dura-coated cast iron body, 9" round, hinged, polished nickel bronze, and trap primer connection.
  2. FD-2: ZN-415-P, 2" ho hub outlet, dura-coated cast iron body, 7" round, Type "B" strainer and polished nickel bronze top, trap primer connection where noted on construction drawings.
- I. Floor Sinks: FS-1: ZN-1902-3-, 12"x12"x6" deep cast iron body and square slotted medium duty full hinged grate, with white acid resisting porcelain enamel interior , NB anti splash interior bottom dome strainer. Dura-coated cast iron body with cast iron traps
- J. Hose Bibbs:
1. HB-1: Cold Water (Single Faucet): No. 952 inside faucet, vacuum breaker, 3/4" hose thread outlet, loose key, cast brass chrome-plated finish.
- K. Shock Arresters: Provide piston type, mechanical shock arresters for fixture groups and for remote individual fixtures.
- L. Traps:
1. Other traps shall be cast brass with a ground swivel joint and cleanout plug, provide chrome finish for traps not covered with safety insulation. Nonsiphon traps shall be provided where required by law in lieu of traps specified.
  2. Trap Primer: TP-1: Z-1022 automatic trap primer, all-bronze construction, integral vacuum breaker, designed to operate on flow.
- M. Trim: Trim supplies and immediately exposed piping at fixtures and equipment shall be chrome-plated on finished brass or on copper except where safety insulation is installed. Faucets shall have removable units and removable seats. Hot and cold water supplies to fixtures and equipment shall be fitted with stops in addition to branch shut-offs.
- N. Fixture Supports: Provide and install concealed arm, foot support chair carriers for all wall hung fixtures as follows: lavatories - #Z-1231; urinals - #Z-1222 and water coolers and drinking fountains #Z-1225.



## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Study the Drawings and Specifications, visit the site and become acquainted with existing conditions and the requirements of the Contract Documents. No claim will be recognized for extra compensation due to failure to become familiarized with the conditions and extent of proposed work.

### 3.2 ERECTION, INSTALLATION AND APPLICATION

- A. Run piping concealed in walls or above ceilings. Where two or more pipes are to be run parallel, they shall be located as close as practical to each other.
  - 1. Water piping: Run at a minimum pitch of 1" per 50'-0" to drain valves, and all piping shall be run within the heated space of the building.
  - 2. Vent piping: Run at a positive pitch to drain back to the drainage connections.
  - 3. Sanitary drainage piping: Run at 1/4" per foot (two percent) pitch.
  - 4. Storm drainage piping: Run at 1/8" per foot (one percent) pitch.
- B. Set floor drains and floor cleanouts parallel to and flush with the surrounding floor.
- C. Install fixtures level and flush to walls and floors as applicable.
- D. Seal fixtures watertight with approved sealant to adjacent surfaces. This shall include but not be limited to sealing urinals, shower walls and wall-hung lavatories and water closets to walls and counter sinks and lavatories to counter tops. Caulking shall be of the appropriate type for the given application and shall be installed in accordance with the manufacturer instructions and recommendations.
- E. Mop Receptors: Set and level in a 1/2" thick mortar base.
- F. Support fixtures and equipment in accordance with the manufacturer's recommendations unless otherwise detailed.
- G. Provide service shut-off valves and unions on inlets and outlets to equipment installed under this Section.
- H. Shut-off valves shall be in accessible locations. Valves above ceilings shall be operable within 18" of the ceiling tile plane.
- I. Provide 3'-0" minimum service space in front of control panels, access panels, motors and equipment which requires periodic maintenance and/or adjustment.
- J. The entire plumbing system shall be installed in accordance with the International Plumbing Code, and local Codes.
- K. The entire gas installation shall comply with NFPA 54 and 58 and local Codes.

### 3.3 TESTS

- A. Test and prove tight piping systems in the building. Invite the local Plumbing Inspector and the Owner's Representative to witness each test a minimum of 2 working days prior to the

commencement of the test. Submit to the Architect documentation of each test identifying the system being tested, the starting and finishing day and time of the test, the starting and finishing test pressures, the test liquid or gas used and signed by the party responsible for conducting the test.

1. Cold water, hot water and hot water return piping: Test with potable water to 125 psig.
2. Rough drainage and venting systems: Test with 5 psig air pressure.
3. Gas piping: Test with compressed air to 30 psig.
4. Conduct tests for 2 hours minimum with no pressure drop in the respective systems.

### 3.4 STERILIZATION

- A. After testing, remove diaphragms from flush valves and remove aerators from faucets, and open the faucets fully to allow water piping to be flushed with water until no visibly dirty water appears at the outlets. After flushing, reinstall diaphragms and aerators.
- B. Fill the piping system completely with water containing no less than 50 parts per million (PPM or MG/L) of chlorine. Then valve-off the system and allow to stand for no less than 24 hours. An alternative concentration of 200 PPM of chlorine allowed to stand for 2 hours may be used.
- C. At the end of 24 hours (or the alternative time of 2 hours), flush the entire system with water until no excess chlorine remains in the system.
- D. Notify the Architect a minimum of 2 working days prior to the commencement of the flushing and sterilization procedure. Submit to the Architect documentation of sterilizing procedure identifying the starting and finishing day and time, the type of chlorine concentrate used, the percent of purity of the concentrate, the total volume of concentrate used, the diluted chlorine concentration and signed by the party responsible for sterilizing the system.

### 3.5 CLEANING

- A. At the completion of work, clean fixtures and equipment in accordance with the appropriate manufacturer's recommendations. Exposed unchromed piping shall be cleaned of dirt, grease, oils, and other foreign substances, suitable to accept a prime coat of paint.

END OF SECTION 15410