

PART I – GENERAL**WORK SPECIFIED HEREIN**

- Furnishing and installing a complete domestic hot and cold water system within the building and outside of the building as shown, including water meters in meter boxes.
- Final hot and cold water connections to all fixtures, devices and equipment requiring water connections, including connections to air conditioning equipment, and equipment specified under other sections. Refer to the Equipment Coordination Schedule on the architectural drawings for all requirements. Provide ball valves on all water connections to all fixtures, devices equipment, and etc.
- Excavation, trenching, backfill, and disposal of excess earth in connection with above system, in accordance with above system, in accordance with the requirements of Division 2, Sitework.

SUBMITTALS

- Unless otherwise noted, the contractor shall prepare all shop drawings, product literature, etc. only as required to properly coordinate and construct the project.
- Review of submittals by the Professional of Record is limited to specific shop drawings as called for in the Project Manual.

PART II – PRODUCTS**MATERIALS**

Basic materials as specified in Section 15101, Basic Material and Methods.

Plumbing fixtures, equipment and trim as specified in Section 15105 Plumbing Fixtures, Equipment and Trim.

PART III – EXECUTION**WORKMANSHIP**

- Verify all measurements before starting work; be responsible for their correctness. Make variations only with the written permission of the Architect.
- Do all cutting and patching of new and existing work necessary to accommodate plumbing. Cut structural members only where permitted by architect. Perform all excavation and backfill required.
- Coordinate with others to provide necessary holes, slots, chases, etc., to accommodate plumbing as work progresses. Obtain architect's approval for sizes of all openings.
- Tube/Pipe rough-in work shall proceed as rapidly as general construction of building will permit. Complete and test tube/pipe rough-in before insulation or any other finish work is applied.
- Run tube/pipe parallel to building elements and conceal all piping and ducts in walls, floors, ceilings, chases, unless otherwise specifically noted on drawings. Install tube/pipe work accurately to fit rough-in drawings of plumbing fixtures, heating equipment, cooling

equipment, etc., into which it connects. Install tubes/pipes so that contraction and expansion will not damage any work. Provide necessary concrete thrust blocks for all underground piping.

- Locate all tubes/pipes out of the way of all doors, windows, service areas, access holes, etc. Run no tubing/piping in nor interfere with bond beams or other structural elements.
- Provide manufactured water hammer arresters, for all isolated fixtures and each fixture battery on both hot and cold water lines that contain any device, equipment, or flush valve containing a solenoid or quick opening valve, i.e., laundry, washing machine, urinal, etc. Install per manufacturer's recommendations.
- Test all tube/pipe systems and prove to be tight as per test prescribed by the latest city adopted edition - "Uniform Plumbing Code" and/or any other governing provincial or local code. Covering of work before acceptance is prohibited.
- Install drain valves at all low points of each system to enable complete drainage, and air vents at all high points in the piping system to enable complete air venting.
- Water piping installed in an exterior wall shall be electrically traced.

DISINFECTING DOMESTIC WATER LINES:

- Disinfect all lines with fluid chlorine or hypochlorite. Introduce sufficient chlorine to provide an initial concentration of 50 ppm. Disinfect for 24-hour period, opening and closing valves in system at various points during disinfection, per health department requirements.

PREPARATION**Service Cock:**

- Provide service cock or valve within three feet of supply main for introducing disinfecting agent into lines.

Flushing:

- Leave each fixture or outlet wide open after final pressure test until flow shows only clear water.

Domestic Hot Water Temperature:

- Reduce to that of cold water system during disinfecting procedure.

PROCEDURE

1. **Flushing:** With system full of water and under main pressure, open all outlets.
2. Inject disinfectant through service cock at slow, even continuous rates until orthotolidine test at each outlet shows chlorine residual concentration of more than 50 parts per million (ppm).
3. At ends of all waste lines more than five feet in length.

4. **Test:** Orthotolidine test, after 24-hour period, shall indicate minimum chlorine residual concentration of 50 ppm. If not, repeat disinfection procedure until the standard is attained.
5. **Final Flushing:** After satisfactory completion of above test, flush out system until orthotolidine tests show maximum chlorine residual of 0.5 ppm.
6. **Bacteriological Analysis of Water:** After final flushing, analyze water samples to test negative for coli-aerogene organisms. Analysis to indicate total plate count less than 100 bacteria per cc or equal to control sample.
7. **Final Approval:** If analysis results are not satisfactory, repeat disinfection procedure until specified standards are met.
8. **Certification:** Submit a certificate stating (1) system capacity, (2) disinfectant used, (3) time and rate applied, and (4) resultant residuals in parts per million at completion of work.
9. Provide a pre-cast concrete valve box with cast iron cover over each underground valve. Set valve a minimum of 24 inches below grade, or below frost line, whichever is greater, with stem extended to maximum of 6" below cast iron cover.
10. Install all tubing/piping to operate without objectionable noise or vibration.
11. Water tubing/piping below grade shall be buried a minimum of 18", or below frost line, whichever is greater.
12. Provide a water shut-off valve and hose bibb drain on all water supply lines where they enter buildings.
13. Shut-off valves above suspended ceiling no more than 1 foot above ceiling elevation or readily accessible.

PROTECTION OF MATERIALS

- Protect all fixtures and material against damage or use during construction.

TESTING

- After completion, inspect and test all fixtures for adequate water pressure and flow and for proper flushing action, and make necessary adjustments. Cooperate with other trades in testing fixtures and equipment involving work under this section. Test system hydrostatically 1-1/2 times operating pressure and maintain without leaks or pressure loss for eight hours.

END OF SECTION