220500-PLUMBING PIPING

PART 1-GENERAL

1.1 SECTION INCLUDES

A. Plumbing piping (other than natural gas).

1.2 SUBMITTALS

A. Submit shop drawings and product data per applicable Division I Specification.

B. Shop drawings shall include product data noting materials, sizes, installation requirements, and dimensions.

1.3 QUALITY ASSURANCE

A. Follow manufacturers requirements for installation.

B. Soldering procedures per ANSI B16.18.

C. Comply with ANSI B31 pressure code for pressure piping.

PART 2-PRODUCTS

2.1 PLUMBING PIPING

A. Domestic water piping above grade shall be Type L hard drawn copper conforming to ASTM B88. Fittings shall be wrought copper conforming to ASTM B16.18. Joints shall be lead-free solder, ASTM B32. Acceptable manufacturers are Mueller and Cerro. (Copper press type of fittings are acceptable)

B. Sanitary, sanitary vent, and storm piping below slab
1. Schedule 40 PVC with solvent joints per ASTM D2665.
2. Cast iron hub and spigot per ASTM A74.
3. Acceptable manufacturers are Charlotte, Tyler, AB&I, Spears, and Cresline.

C. Sanitary, sanitary vent, and storm piping above finish floor.
1. Schedule 40 PVC with solvent joints per ASTM D2665 (not in plenums).
2. Cast iron no hub and fittings per ASTM A74.
3. Acceptable manufacturers are Charlotte, Tyler, AB&I, Spears, and Cresline.

D. Domestic water piping below slab shall be type ‘K’ soft copper with no joints. Acceptable manufacturers are Mueller and Cerro.

E. Sump Pump Discharge Piping
1. ASTM D2665 Schedule 40 PVC with solvent joints. Do not run in air plenums.

F. Sanitary, Sanitary Vent, Storm and Sump Pump Discharge Piping Above Ceilings in Plenum Spaces
1. Cast iron no hub and fittings per ASTM A74.

PART 3-EXECUTION

3.1 INSTALLATION

A. Terminate vent piping through roof, a minimum of 12 inches above the roof.

B. Location of vents on the roof shall be a minimum of 20 feet from any wall louver, outside air intake, or rooftop HVAC equipment outside air intake.

C. Where more than one piping system material is specified, ensure system components are compatible and joined to ensure the integrity of the system is not jeopardized. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

D. Use unions, flanges, and couplings downstream of valves and at equipment or apparatus connections. Do not use direct welded or threaded connections to valves, equipment or other apparatus.

E. Provide pipe hangers and supports as required.

F. Use ball or butterfly valves with memory stop for shut off and to isolate equipment, part of systems, or vertical risers.

G. Use ball or butterfly valves with memory stop for throttling, bypass, or manual flow control services.

H. Use 3/4 inch ball valves with hose end and cap for drains at main shut-off valves, low points of piping, bases of vertical risers, and at equipment.

I. Install in accordance with manufacturer's instructions.

J. Provide non-conducting dielectric connections wherever jointing dissimilar metals.

K. Route piping in orderly manner and maintain gradient.

L. Install piping to conserve building space and not interfere with use of space and other work.

M. Group piping whenever practical at common elevations.

N. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

O. Provide clearance for installation of insulation and access to valves and fittings.

P. Provide 24" x 24" access doors where valves are not exposed and are installed where hardboard ceiling occurs.

Q. Provide sleeves when penetrating footings, floors and walls. Seal pipe and sleeve penetrations to achieve fire resistance equivalent to fire separation required.

R. Insulation of all cold water, hot water, hot water return and storm piping by Plumbing Contractor.

S. Install bell and spigot pipe with bell end upstream.

T. Install valves with stems upright or horizontal, not inverted.

U. Do not attach pipe supports to underside of roof deck.

V. Metallic pipe or tubing exposed to corrosive action, such as soil conditions or moisture, shall be protected in an approved manner.

W. Install self-adhesive identification labels on all lines, see Section 22 05 53.

X. All pipe sizes indicated on plans and/or specifications are inside diameter.

Y. All drainage and vent piping thru return air plenum to be cast iron except for specialized plenum rated acid waste and vent products specified herein.

Z. Comply with requirements in Division 31 Section "Earth Moving" for excavating, trenching, and backfilling.

3.2 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. Prior to starting work, verify system is complete, flushed and clean.

B. Disinfect water system per applicable Codes and Regulations and per local jurisdiction requirements.

C. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651. Report any deficiencies right away.

D. Disinfection Process: The disinfection is normally carried out by through flushing and then filling the system with chlorinated water at an initial concentration of 50ppm for a contact period of 1 hour. The process has been successful if the free residual chlorine level is not less than 30ppm at the end of this period. The chemicals used to disinfect the system must be approved by the Drinking Water inspectorate for use with the supply of water for drinking, washing, cooking or food production purposes.

E. Procedure: A small diameter plugged and valved branch needs to be fitted at the upstream end of the supply/service pipe during installation to facilitate disinfection.

1. Thoroughly flush the system to remove any flux residue, swarf or other contaminates, then close all outlets and servicing valve on the supply
2. Using the valved branch, connect a suitable pump, check valve and the storage cistern outlet to the installation
3. Determine the capacity of the system and the quantity of disinfectant to use
4. Add this quantity of water to the cistern and add disinfectant to give the initial strength of 50ppm required, mix then start the pump to inject the disinfectant solution into the system
5. Working away from the temporary connection, open each draw-off fitting until

disinfectant solution is detected then close the fitting to progressively draw the solution around the system.

6. As chlorinated water is drawn off, it will be necessary to add further measured amounts of disinfectant to maintain the initial concentration during the filling process

The 1 hour contact time will start when he entire system has been filled with water containing 50ppm chlorine. If the free residual chlorine measures less that 30ppm at the end of the 1 hour contact period, it will be necessary to repeat the process.
It is vital to thoroughly drain and then flush out all the disinfectant once the 1 hour contact period is complete. Flushing should continue until the level of free chlorine is equal to the level present in the drinking water supplied.

1.1 CLEANING

A. Clean and disinfect potable domestic water piping as follows:

1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:

a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
b. Fill and isolate system according to either of the following:

1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.
2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.

c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.

END OF SECTION 220500