15050 BASIC MATERIAL AND METHODS

PART 1: GENERAL

Not applicable

PART 2: PRODUCTS

2.01 PIPE AND PIPE FITTINGS

A. Allow the Contractor to use Victaulic connections on sprinkler systems and copper domestic water piping 2 ½" or larger.

B. Use gasketed joints for cast iron pipe below grade, with no-hub bands above grade.

C. Use Teflon tape for threaded pipe; use joint compound on H.P. steam.

D. Polyvinyl chloride plastic pipe is not acceptable except for quality water systems. Polybutylene is acceptable for fire protection systems when in compliance with applicable codes.

E. Pipe shall generally conform to the following schedule:

<table>
<thead>
<tr>
<th>Service</th>
<th>Pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic water, chilled water, heating system water</td>
<td>Type L hard copper 3&quot; and below, Schedule 40 steel above. Domestic water to be copper or ductile iron. Use Schedule 80 galvanized steel nipples between steel piping and first isolation valve on all connections to steel pipe below 3&quot; on chilled water.</td>
</tr>
<tr>
<td>Domestic: Buried</td>
<td>Class 52 lined ductile iron, mechanical locking type joints throughout with concrete thrust blocks; MEGALUG by EBBA Iron Sales or Clow Superlock F-128.</td>
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<tr>
<td>Chilled Water: Buried</td>
<td>See Section 15545.2.07</td>
</tr>
<tr>
<td>Sanitary waste &amp; vent</td>
<td>Above grade: DWV copper; Schedule 40 galvanized steel, or service weight cast iron. Below grade: Service weight cast iron, Hub-type with Neoprene gaskets.</td>
</tr>
<tr>
<td>Sanitary and storm sewers</td>
<td>SDR 35 PVC</td>
</tr>
<tr>
<td>outside of buildings</td>
<td>“FERNCO” connections are not allowed.</td>
</tr>
<tr>
<td>Acid waste</td>
<td>Glass, polypropylene</td>
</tr>
</tbody>
</table>
### Steam
- Schedule 40 black steel

### Condensate Drain (cooling)
- Type “M” Hard Temper

### Steam condensate
- Above grade: Schedule 80 steel
- Below grade: FRP (See Section 15551)

### Quality water, RO or DI
- PVC or PVDM, purity grade

### Compressed air, service and control 3/8" and below
- Fire rated polyethylene tubing or hard drawn copper tubing

### Compressed air 1/2" and above
- Type L hard copper

### Refrigeration
- AC&R Type L hard copper

### F. Fittings and joints shall generally conform to the following schedule:
- **Steel, 2" and below**
  - High Pressure Steam: Socket or butt weld
  - All other services: Threaded
- **Steel, above 2"**
  - Welded joints
- **Copper, heating system**
  - Wrought, 50Sn/50 Pb Solder
- **Copper, refrigerant**
  - Wrought, silver solder (45% minimum, cadmium free)
- **Copper, plumbing, chilled water and compressed air**
  - Wrought, 95Sn/5 Sb solder or 95.5 Sn/4 Cu/.5 Ag
- **Ductile**
  - Mechanical; locking type, “MEGA-LUG” by EBBA Iron, Inc. or Clow Superlock F-128
- **Cast iron**
  - Above grade: Bell and spigot with neoprene gasket or No-hub neoprene gasket and stainless steel clamp assembly.
  - Below grade: Bell and spigot with neoprene gasket.

### G. Piping shall be fully labeled throughout (mechanical rooms, chases and throughout buildings). Labels should include name of system, flow arrow, color code and size of pipe. Stencils acceptable. Label every 25 feet, and at all penetrations and branches.

### H. Provide vents and drains (minimum 1/2") with brass hose connector and cap at all high and low points in piping systems.
2.02 HOSES

All hose bibbs and other fittings with hose connections shall be complete with vacuum breakers.

2.03 GATE VALVES

A. Gate valves are generally not acceptable. Use ball and butterfly valves only. See Section 15100.

B. Hose bibbs on building exteriors shall be frost-free type.

2.04 SELF-CONTAINED THERMOSTATIC VALVES

Self-contained thermostatic radiator valves shall be Danfoss only.

2.05 PRESSURE GAUGES

A. On devices such as pumps, strainers, coils, etc., where the differential pressure is the desired information, install only one pressure gauge with valved connections to the upstream and downstream pressure taps. Include a P/T test port in addition to the pressure gauge. Provide a second set of isolating valves at the gauge if gauge location is not within reach of tap points.

B. Pressure gauges shall be stainless steel case, non-repairable, silicone filled with minimum 3 1/2" diameter case. Gauges shall have 3% accuracy over the appropriate range of 0-30 psi, 0-100, or 0-160. Shall be suitable for operation at 160°F and include a shut-off ball valve (gauge cocks not permitted). Include a pigtail cooling loop on all steam gauges. Scale should be selected to provide a reading at mid-scale during normal operation. No snubbers.

2.06 THERMOMETERS

A. Thermowells: All thermowells for steam service shall be stainless steel and for water service shall be brass. Thermowell length shall be in accordance with ISA standards and shall include the appropriate extension to allow for pipe installation. Extension neck shall be included when required to match thermowell and insulation thickness.

B. Thermometers: All pipe mounted thermometers shall be of the industrial stick type, 9" case, with locking adjustable angle body and a case of aluminum or non-metallic material. Thermometer shall be secured to well by tapered bushing and not by set screws (Trerice or equivalent). Scale should be selected to provide a mid-scale reading at normal operating temperatures.

2.07 PUMPS

A. All pumps shall have mechanical seals with carbon and ceramic seats.
B. All pump bases shall be grouted.

C. All vibration isolators shall be installed parallel to the pump shaft.

D. Install pressure gauge manifold to gauge tappings in pump body, as in Paragraph 2.05 A above.

E. The Engineer shall consider the use of vertically mounted in-line pumps for all hydronic system applications as they save space and are, in general, easier to maintain than other centrifugal pump designs.

2.08 PIPING ACCESSORIES

A. Pressure/temperature test ports shall be provided on each coil bank, heat exchangers, fan coil, and at all permanent pressure gauge locations. Seals shall be appropriate for operating water temperature and pressure. Nordel Seat - hot water, glycol; Neoprene Seat - cold, chilled water. Use extended body style to allow for insulation thickness.

B. All coils and heat exchangers shall be equipped to measure and adjust flow. Adjustable valves with flow measuring taps are preferred. Spring loaded flow control devices are acceptable with replaceable orifices to change capacity and with flow measuring taps. The balancing valve shall not be used for coil isolation--provide ball or butterfly isolation valves in addition to the balancing valves.

If a balancing valve with flow taps cannot be used (larger than 12”), use a non-lubricated eccentric plug valve (such as Dezurik) combined with a flowmetering run and an Annubar flowmeter.

2.09 METERS

A. Water service
   See Section 15400

B. Steam service
   See Section 15550

C. Chilled Water Service
   See Section 15545

D. Provide a water meter on large permanent hard piped make-up lines to water systems (radiation, closed loop cooling, or systems with underground piping) to track make-up to these systems.
2.10 PLUMBING FIXTURES

A. Water Conservation Requirements New York State Senate Bill 3581-C amends the environmental conservation law to require water use limits on certain plumbing fixtures. The bill prescribes performance standards, labeling and testing requirements for new toilets, faucets, shower heads, and urinals. Among the requirements of this bill are that toilets sold or installed after January 1, 1992, have a maximum flow of 1.6 gallons per flush, reduced from the current limitation of 3.5 gallons per flush, and faucets installed or sold after January 1991 must have a maximum flow rate of two gallons per minute or less.

B. Designers are reminded to keep current with New York State regulations that affect water conservation through the use of more efficient plumbing fixtures.