

## SECTION 15510

### HYDRONIC PIPING AND SPECIALTIES

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes: This section describes specific requirements, products and methods of execution for liquid heat transfer systems of throughout the project.

#### PART 2 PRODUCTS

##### 1.2 PIPE AND FITTINGS

- A. Heating Water Systems (above ground):
1. Copper Pipe:
    - a. Type 'L' copper hard temper, except where Type 'K' or 'M', or soft temper is specified or indicated.
    - b. Fittings: Wrought copper, solder joint.
    - c. Extracted branch joints (T-Drill) may be approved when Contractor can demonstrate satisfactory experience with this method. All joints shall be brazed in accordance with the Copper Development Association Copper Tube Handbook using B-Cup series filler metal.
    - d. Fit joints using 430 silver solder, 95-5 tin-antimony or other approved lead-free solder. Solder type must be compatible with pipe and fittings. Solder containing lead shall not be allowed on the job site.
    - e. Soldering flux: Water flushable, low corrosivity type meeting the requirements of ASTM B813. Flux shall have label indicating it meets these requirements.
  2. Steel Pipe:
    - a. Welded: Schedule 40 black with butt weld fittings of type and wall thickness to suit pipe. Weld-O-Lets and Thread-O-Lets may be used on pipe two inch and larger where branch is minimum of two pipe sizes smaller than main. Pipes 12 inches and larger may be Schedule 30.
    - b. No threaded pipe allowed.
    - c. Mechanical joint type pipe systems are not permitted.
- B. Glycol heating systems:
1. Same as heating system.
- C. Heating Water Systems (below ground):
1. Continuous runs of Type K soft copper.

- D. Chilled water piping system:
  - 1. Same as heating system.
  - 2. Grooved Piping system
    - a. Schedule 40 pipe or type L hard drawn copper.
    - b. Coupling housings constructed with ductile iron. Suitable for rolled or cut grooves.
    - c. Ductile iron fittings.
    - d. Gasket suitable and approved for service. Molded synthetic rubber designed with a wide annular interior recess open to fluid pressure such that fluid pressure presses the gasket to both the pipe and the coupling.
    - e. Furnish a new roll grooving tool the Department capable of direct roll grooves for 2 inch to 6-inch tubes. Tool may be operated with a standard 3/8-inch socket drive. Victaulic VE 226S.
    - f. Victaulic or equal.
- E. Cooling Tower Supply and Return Piping:
  - 1. Same as chilled water piping system.
- F. Equipment drains and overflows:
  - 1. Type L copper pipe, wrought copper fittings.

### **1.3 VALVES**

- A. Select valves of the best quality and type suited for the specific service and piping system used. Minimum working pressure rating 125 psig saturated steam or 200 psig W.O.G. Packing material or seals shall not contain asbestos.
- B. Provide ball valves for shut-off service, 2" and smaller. Larger may be butterfly valves.

### **1.4 AUTOMATIC FLOW LIMITING VALVES**

- A. Provide flow limiting valves at all hydronic terminal devices to limit flow to the design values. Provide valves with integral isolation valve, strainer, and pressure test ports.
- B. Provide valve with maximum flow set to design flow of the heat transfer device being served at 2-psig differential pressure.

## **PART 3 EXECUTION**

### **1.5 INSTALLATION**

- A. Route all pipes and ducts parallel with building lines, and as high as possible, except where underground, or shown otherwise on the drawings.
- B. Route piping and ducts to clear all doors, windows, and other openings and to avoid all other pipes and ducts, light fixtures, and similar products.
- C. Conceal all pipes and ducts where routed through finished areas, unless authorized by ANC or otherwise indicated on the drawings.

- D. Preserve access to all pipes and ducts for future connections and alterations; at the same time optimize space usage by consolidating the routing of pipes and ducts where possible.
- E. Avoid combining piping of different materials such as copper and steel in one system, except that brass valves and specialties may be used with steel pipe. When use of dissimilar metals cannot be avoided, provide dielectric isolators.
- F. Reduce pipe sizes using reducing tees or reducing fittings. Bushings not permitted except on tanks and similar equipment.
- G. Provide air vents with isolation gate valves at high points and where piping turns down in direction of flow. Where large air quantities can accumulate, provide enlarged air collection standpipes. Provide manual air vents at system high points and as indicated.
- H. Slope pipelines and provide low point drains for piping and equipment.
- I. Provide isolation valves at major piping branches as shown and at all terminal devices. Use ball valves for isolation service. For pipes 2-1/2 inches and larger butterfly valves may be used.
- J. Install valves with stems vertical wherever possible, and in no case with stems below the horizontal.
- K. Provide automatic flow limiting valves at each point in the fluid system where it is necessary to preset the maximum flow including heating or cooling coils, heating elements, heat exchangers and domestic hot water recirculation branches; also provide at system branches and pump discharge connections where indicated.
- L. Install flow-limiting valves and serviceable products for heating terminal units to be operable and adjustable without removal of the finish cover, unless shown otherwise.
- M. Provide pressure and temperature test plugs on both sides of heat transfer elements to measure the drop across runs of all heat transfer elements.
- N. Thermal Expansion
  - 1. Install all piping to allow for normal thermal expansion and contraction.
  - 2. Provide anchors where necessary and as shown.
  - 3. Provide expansion loops, expansion compensators, and alignment guides to suit conditions and as shown on drawings.
  - 4. Piping shall be guided and restrained as recommended by the manufacturer.

## **1.6 CONNECTING TO EXISTING SYSTEMS**

- A. Complete cleaning testing of new system prior to connecting to existing system. Isolate and drain heating and cooling piping loops as necessary to connect new piping.

## **1.7 CLEANING**

- A. Thoroughly clean all internal surfaces of the completed heating system as follows:
1. Flush hydronic piping to remove all black magnetic iron oxide and mill scale from the system.
  2. Flush system piping with synthetic organic dispersant (CH2O Product 6149) to remove all grease. Circulate solution through system at 150 degrees F. or greater for twelve(12) to twenty-four (24) hours.
  3. Repeat process until the system is clean.
  4. Flush system with fresh water as necessary to remove residual cleaning agent.
  5. Exercise proper care during flushing and cleaning of systems to insure no damage done to equipment, valves, fittings, or work of other trades. Restore damaged system components or work of other trades to new or original condition at no additional cost to Owner.

**END OF SECTION**