

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes piping, special-duty valves, and hydroid specialties for hot-water heating and chilled-water cooling; blow down drain lines; and condensate drain piping.

1.2 CHEMICAL CLEANING SOLUTIONS of Hydronic System

- A. Chemical cleaning solutions shall not be harmful to the environment or materials of construction for pipe cleaning, cutting oil, excess pipe joint compound, weld slag, mill scale, finely divided solids and other similar foreign materials shall be removed from all the piping systems before they are placed in operation. After the systems has been drained, flushed and refilled, they shall be left slightly on the alkaline side (pH 7.5). Contractor shall work with University approved vendor for this process and further noted as Passivating of new systems.
- B. After building system if fully commissioned and all equipment is in operation. The following shall occur; Place the required dosage of TowerClean 819 product or equivalent in the circulating system for at least twenty-four (24) hours. Circulation rate should be maintained at a minimum flow rate of 3-5 ft/sec. with approved product and should be fed via a pot feeder or pumped into the system with a high volume pump. Collect a pint of sample water before product addition and after a twenty-four (24) hour circulation for the reference point on water clarity. After passivating the system for the required twenty-four (24) hours, it may be drained and refilled with water ready for normal operation and chemical treatment. Take another sample of the water prior to the addition of approved loop treatment chemicals to verify the cleaner and containments have been removed. Add 20% above loop chemical make-up water with CorrShield MD 401 for chilled water and CorrShield OR4407 for hot water or approved product to system prior to opening into the chilled/hot water loop and circulate for four (4) hours. After a four (4) hour system circulation has been completed, then connect to the campus chilled/hot water main loop.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

- A. Chilled Water Piping: Schedule 40 black steel pipe, ASTM A-53, Grade A or B, 150 lb. black malleable iron screwed fittings ANSI B16.3 for 2" and Smaller fitting, and Standard weight seamless, carbon steel, long radius butt welding fittings ASTM A-234 Grade B or grooved and mechanical joint type in exposed location only as manufactured by Victaulic Style 77 or equal. Option for pipe 2-1/2" and smaller shall be type L hard drawn copper tube with wrought copper solder joint fitting, Silvabrite, Bridgit or Stay-Safe 50.
- B. Heating Hot Water Piping: Schedule 40 black steel pipe, ASTM A-53, Grade A or B, 150 lb. black malleable iron screwed fittings ANSI B16.3 for 2" and Smaller fitting, and Standard weight seamless, carbon steel, long radius butt welding fittings ASTM A-234 Grade B or grooved. Option for pipe 2-1/2" and smaller can be type L hard drawn copper tube with wrought copper solder joint fitting, Silvabrite, Bridgit or Stay-Safe 50.

- C. Condensate drain piping: Schedule 40 galvanized steel pipe ASTM A-53, Grade A or B, with screwed cast iron drainage fitting. Option for pipe 2-1/2" and smaller shall be type K hard drawn copper tube with wrought copper solder joint fitting, drainage type fitting, Silvabrite, Bridgit or Stay-Safe 50.
- D. Grooved Mechanical-Joint Fittings and Couplings Manufacturers:
 - 1. Central Sprinkler Company; Central Grooved Piping Products.
 - 2. Gruvlok – Anvil International.
 - 3. Victaulic Company of America.
 - 4. Or approved equal.
- E. Calibrated Balancing Valves Manufacturers:
 - 1. Armstrong Pumps, Inc.
 - 2. Flow Design, Inc.
 - 3. Gerand Engineering Company.
 - 4. Griswold Controls.
 - 5. ITT Bell & Gossett; ITT Fluid Technology Corp.
 - 6. Taco, Inc.
 - 7. Gruvlok – Anvil International.
 - 8. Or approved equal.

2.2 COPPER TUBE AND FITTINGS

- A. Copper pipe shall be made in USA only.

PART 3 - EXECUTION

3.1 GENERAL

- A. As required by engineer, manufacturer and code.

3.2 PRESSURE TEST

- A. Water test chilled water and heating hot water piping with 150 psig pressure for 120 minutes.

3.3 CLEANING

- A. Provide 10% by volume FERROQUEST FQ71011 or 10 gallons of FERROQUEST FQ71011 Pre-operational Cleaner per 100 gallons of water in system. Monitor system Ph and add FERROQUEST FQ7102 NEUTRALIZER 1% to 2% by volume or as required, to bring Ph into the 6.5 - 7.0 range.
- B. Cleaner to be introduced and circulated from 48 to 72 hours and removed from system by Design/Builder by dumping and flushing system.
- C. Each system to be flushed until conductivity of water in system is back to conductivity of make-up water.
- D. Remove and clean or replace strainer screens. After cleaning and flushing hydroid piping systems, but before balancing, remove disposable fine-mesh strainers in pump suction diffusers.

END OF SECTION