

**Heating, Ventilation and Air Conditioning (HVAC)
HTHW Systems (23 05 51)**

For questions regarding this section contact: AECM
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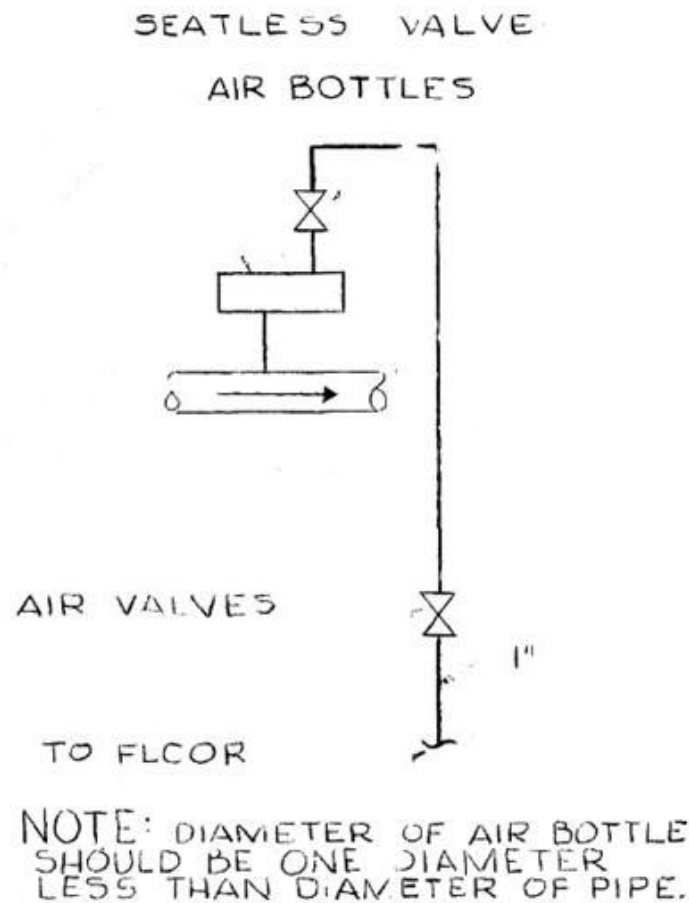
Part 1 – General

- **Before 60% design release, high temp hot water (HTHW) system design must be submitted for Campus approval.**
- **HIGH TEMPERATURE HOT WATER SYSTEMS per SUCF Directive 15H-6 plus campus requirements listed below: (NOTE: In the event of a discrepancy, campus directive(s) supersedes.)**
 - Systems shall be designed for 550 PSI/450°F operating conditions, including their effect on pipe stress, insulation, and expansion requirements. NOTE: Boiler design and max operating pressure is 575 psig.

Part 2 – Product

- All high temperature hot water piping as defined under insulation for piping shall be A.S.T.M. A-106 Grade A Seamless Steel.
- All pipe joints shall be fully welded.
- All pipe weld joints shall be 100% visually inspected. Radiographic inspection shall be required on 10% of total of all pipe weld joints, randomly selected by the Consultant. The Consultant shall retain the testing services as described in SUCF Directive 1C-6.
- If any of these inspected 10% of total pipe weld joints are found unacceptable, they shall be repaired and re-inspected. Additionally, if any of the weld joints from this first 10% of the total are found unacceptable, a second 10% of the total pipe weld joints shall be selected by the Consultant for radiographic inspection. This additional inspection shall continue until a full block of 10% of the selected weld joints are found acceptable at the first testing joint.
- All equipment connections shall be flanged using Class 300 weld neck flanges and gaskets. No threaded connections are permitted.
- All valves shall be Class 300 cast steel ASTM 216 Grade WCB. Valves shall have replaceable seats and trim.
- Stop valves: Valves up to 2 inches welded socket end connections forged steel gate valves
- Stop valves: Valves over 2 inches butt weld end connections cast steel gate valves
- Heat exchangers shall be shell and tube with the HTHW on the tube side.
- The HTHW control valve shall be a pneumatically-operated fail closed type and be installed on the return line.
- Piping systems installed in buildings and in tunnels shall be fully supported and insulated using mineral wool and metal jacket system.
- Piping systems shall be chemically cleaned after installation. Design shall include equipment bypasses with provisions for cleaning and flushing.
- Welding, welder qualifications and inspection acceptance criteria shall be per ASME B31.1 "Power Piping".
- Air vents shall be Air Bottles as detailed in below figure 1.
- Provide drain valves whenever required for complete drainage of piping, including the system side of all pumps.
- Double Valving for HTHW - Two (2) valves shall be provided at all mechanical room take-offs. Two valves shall also be provided for each vent or drain, one at the open site drain.
- All welding elbows shall be long radius ASTM A-106 Grade B seamless elbows.
- With the exception of pipe welded end-to-end all welded joints shall be made by the use of one-piece welding neck flanges, nozzles, elbows, tees, etc. as manufactured by Tube-Turn, Grinnell, Ladish, Taylor-Forge.

FIGURE 1



HTHW MANUAL VENTS &
AIR BOTTLES DETAIL

Part 3 – Execution

- Qualification of Pipe welders:

Prior to the start of work furnish the names of pipe welders to be employed in the work, together with certification for each welder of qualification tests as prescribed by the National Certified Pipe Welding Bureau, or by other reputable testing laboratory or agency, using procedure approved by the American Society of Mechanical Engineers or the American Welding Society.