

# STATE UNIVERSITY CONSTRUCTION FUND

## PROGRAM DIRECTIVES

DIRECTIVE 15H-6

Issue date: July 2002

### HIGH TEMPERATURE HOT WATER SYSTEMS

1. Systems shall be designed for 400 PSI/400°F operating conditions, including their affect on pipe stress, insulation, and expansion requirements.
2. All piping carrying HTHW shall be carbon steel ASTM A53 Grade B seamless. All pipe joints shall be fully welded.
3. 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 Directive 1C-6.

If any of these inspected 10% of total pipe weld joints are found unacceptable, they shall be repaired and reinspected. 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 of the joint.

4. All equipment connections shall be flanged using Class 300 weld neck flanges and gaskets. No threaded connections are permitted.
5. All valves shall be Class 300 cast steel ASTM 216 Grade WCB. High performance quarter-turn valves are preferred. Valves shall have replaceable seats and trim.
6. 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 supply line. The HTHW return line shall have a check valve (rebuildable) with 1/16" hole in the disc. The vent and drain shall be piped to a floor drain.
7. Water treatment and bypass filtration shall be provided.
8. Makeup water source shall be protected by a reduced pressure zone backflow preventor.
9. See Fund Directive 2-3 for additional site utility-related requirements.

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10. Piping systems installed in buildings and in tunnels shall be fully supported and insulated using mineral wool and metal jacket system.
11. Direct bury systems (when approved) shall be Class A drainable/dryable/testable. All systems shall include the manufacturer's pressure-testable outer casing field joint design with an additional secondary joint wrap shrink sleeve seal which encases the entire joint. Fund system design approval must be obtained.
12. Piping systems shall be chemically cleaned after installation. Design shall include equipment bypasses with provisions for cleaning and flushing.
13. Welding, welder qualifications and inspection acceptance criteria shall be per ASME B31.1 "Power Piping".

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