

23 50 00 Central Heating Equipment

Revision 01/04/2019

Purpose:

The Architect and/or Engineer shall incorporate the Rice specific requirements indicated in this standard's section into their design. The Architect and/or Engineer shall further produce project specifications in line with industry standards that are updated to reflect these Rice specific requirements.

1. General requirements

- a. The University's first preference is to heat buildings utilizing the Central Plant's steam distribution system. If location is impractical then individual building heating equipment may be used. This shall be approved by the Rice Project Manager prior to the start of system design.

2. Central Utility Plant

- a. Boilers
 - i. Use Scotch Marine fire tube boilers
 - ii. Normal operating pressure range between 60 and 100 psig.
 1. Occasional operating pressure to 125 psig.
 - iii. Minimum 8 to 1 turn down
 - iv. Low emission burners
 - v. Blowers shall utilize Variable Frequency Drives
 - vi. Combustion air shall be ducted from the exterior building with a damper to allow for combustion air to be drawn from inside the boiler plant.
- b. Heat Recovery Steam Generators
 - i. Normal operating pressure range between 60 and 100 psig.
 1. Occasional operating pressure to 125 psig.
 - ii. Optional duct burner
 1. Low emission burners

3. Individual Buildings

- a. Buildings on Central Steam
 - i. Steam shall enter buildings directly into mechanical rooms.
 - ii. Steam shall be reduced through PRV stations from campus pressure to 15 psig
 1. Each PRV shall be 1/3 – 2/3 design and have a manual bypass.
 - iii. Buildings shall be heated utilizing heating water via steam to hot water shell and tube heat exchanger (steam in shell design). Plate and frame heat exchangers only allowed with Rice Project Manager approval.
- b. Standalone buildings
 - i. Do not use steam
 - ii. Modular high efficiency water heaters
 1. Cast iron modular boilers are not permitted.

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- iii. Minimum one redundant heater
- iv. Water heater manufacturer will supply heater control package that will at a minimum:
 - 1. Start/stop heaters based on demand
 - 2. Rotate lead and lag
 - 3. Transmit loop temperature and general alarms to the Building Management System via BACnet Protocol
- v. Modular units shall be piped, wired, and controlled so individual units may be removed and replaced while not taking other unit(s) out of service.