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. Chilled Water Pumps
   a. Pump Quantities: N+1 redundancy required
      i. Two 100% pumps, or
      ii. Three 50% pumps.
   b. Pumps shall use variable frequency drives (refer to Rice Standards 26 29 23)
   c. Horizontal, pad-mounted pumps are preferred where space permits. Vertical in-line pumps may be used upon Rice Project Manager approval.

2. Heating Water Pumps
   a. Pump Quantities: N+1 redundancy required
      i. Two 100% pumps or
      ii. Three 50% pumps.
   b. Pumps shall use variable frequency drives (refer to Rice Standards 26 29 23)
   c. Horizontal pad-mounted pumps are preferred where space permits. Vertical in-line pumps may be used upon Rice Project Manager approval.

3. Piping
   a. Size piping for maximum pressure loss per 100 feet of 3-5 feet based on 30 year old pipe using Cameron or equivalent sizing charts. Maximum velocity in pipe mains should be 8 feet per second.
   b. Piping 1½” and below shall be threaded.
   c. Piping 2” and larger shall be butt-welded or flanged joints.
   d. Groove lock pipe fittings (Victaulic or similar) are NOT permitted.
   e. Black steel piping should be covered with insulated pipe covering or should be painted where insulation is not required or exposed to exterior.
   f. Expansion compensation that depends on manufactured devices and requires periodic maintenance should be avoided (especially in main pipe runs). Pipe loops and anchors are preferred for expansion compensation.
   g. Risers through floors should be curbed or sleeved to a minimum height of 2” in mechanical rooms to prevent water migration. 2” welded steel angle grouted to floor is preferred.
h. Piping or valves supported from the floor shall be supported with either unistrut, steel pipe or steel angle mounted to a baseplate of the same material.

i. Piping supported from above shall be secured to structural elements only. No supports hung from other piping.

j. Balancing at pumps and at each coil should be considered. Design should use balancing valves with memory stops and employ pressure/temperature test plugs at each coil and in major zone branches.

k. Install pipe markers on each system. Include arrows showing normal direction of flow.
   i. Pipe labels and arrows are to be installed by plumbers, not insulators.

l. Refrigerant piping must be Type "K" copper ACR tubing.

m. Refrigerant pipe fittings must be wrought copper streamlined sweat fitting. Solder must be Sil-Fos 15%, except on valves use solder recommended by valve manufacturer.

n. Piping to/from building pumps shall have flexible stainless steel hose for vibration isolation.

o. Piping to/from air handling coils in sound sensitive areas shall have flexible stainless steel hose for vibration isolation.
   i. Sound sensitive areas shall include:
      1. classrooms,
      2. Sound sensitive laboratories.
      3. Other University designated spaces.
      4. Architect to request list of sound sensitive areas during schematic design.