DESIGN GUIDELINE 232216
STEAM SPECIALTIES

General

Consult with Project Coordinator whenever the quality of the steam is an issue to the A/E. See University Provided Utilities in the SID Section for steam pressures available.

Design Requirements

Where medium pressure steam (60 psig) is available, a pressure reducing station shall be provided to meet the total low pressure (5 psig) load during major breakdowns or planned maintenance.

Where intermediate steam pressure is required (e.g. 15 psig) a jet compressor should be provided to supplement the low pressure steam.

The pressure reducing valve or jet compressor should be insulated and covered with sound attenuation wrapping.

Equipment Requirements

Traps, Strainers and Meters

Float and thermostatic traps - F & T traps should have heavy cast iron bodies. The float valve mechanism should be of heavy brass and should have a variable level action to ensure quick and full opening.

The thermostatic bellows member for venting air should have not less than 10 corrugations and should be protected against damage from water hammer by a brass shield cup.

Inverted Bucket Traps - IB traps should have high-strength cast iron bodies. Bucket should be of brass and the level mechanism should be of heat treated stainless steel operating on knife edges. Removable seats and plungers should be heat treated stainless steel. Steam tight seal between seats and covers should be provided using an automotive type copper gasket.

A vertical tube should be threaded into the inlet opening and capped with a baffle to prevent condensate from impinging on the bucket.

Strainers - Strainers should be of the 'Y' type having heavy cast iron bodies with blow-off tappings in screen covers.

Sizes 1/2 inch through 1-1/2 inches should have a screen of 20 mesh Monel.

Sizes 2 inches and over should be .016 inch thick perforated stainless steel, with 324 holes 1 per square inch, each .033 inch diameter.

Steam and Condensate Meters - Where possible all steam shall be metered by gravity type condensate meters as manufactured by CADILLAC METER CO., or as approved by the University Utilities Engineer through the University Project Coordinator. Flashtanks shall be provided before the meters.

Medium pressure steam that will not be returned as condensate shall be metered directly with an orifice plate and a calibratable, differential pressure cell and transmitter with pressure compensation. "Shunt flow" or by-pass type steam meters are not acceptable.

Meters should be complete with a low voltage pulse totalizer output and a 4-20 mA output proportional to flow where appropriate for external interface with a building management system.

Steam Humidifiers

Humidification should be normally provided for each project. If required, primary humidification at the central AHU's will be provided after evaluating problems that may be caused by condensation on the perimeter glazing.

When a specific zone requires a higher humidity level than adjoining areas, the A/E should provide for the prevention of moisture migration from this high humidity zone. This will require that doors remain closed except for individual ingress/egress for Rh differentials approaching 20 percent and non-permeable floor/wall/ceiling treatment for greater differentials.

All steam humidifiers connected to the building steam supply, whether primary or secondary, should contain insulated dispersion tubes.

Installation Requirements

Size traps for twice the condensate rating unless the coil or vessel manufacturer recommends otherwise. Install multiple traps where one trap will not handle the condensate rating.

The run-out from unit being trapped should be the same size as the drain tapping.

The discharge line downstream of the pressure reducing valve or jet compressor shall be fitted with a pressure relief vented to atmosphere (outside the building) to prevent overpressurization of equipment and components.

Install strainers ahead of all controlled devices. Install a valved blow-down line for each strainer. Screens should be removable without disturbing the pipes.

Install inverted bucket traps on all steam equipment drains and all steam line condensate drains except for steam using equipment served by modulating steam control valves. For this equipment, install float and thermostatic traps.

Humidifiers to be located to assure absorption into the airstream rather than wetting of parts such as fans, turning vanes, etc. The preferred location is in the supply ductwork, with 10-12 feet of straight duct downstream. Internal lining should not be used downstream within 10 feet of humidifier.