PIPING AND VALVES - STEAM

DESIGN GUIDELINES

1. Summary
    a. Section includes steam supply piping, condensate return piping, feedwater piping, boiler blowdown piping, and valves.
2. Design
    a. Valve stems to be installed with the stem above the horizontal.
    b. Welded and soldered valves are to have the seats protected from heat during installation.
    c. Isolation valves to facilitate future renovations.
    d. Provide custom made insulation jackets for steam appurtenances that require maintenance.
    e. Steam equipment and condensate traps are not allowed above ceilings in occupied spaces, ex: Offices.
    f. All steam control valves shall be installed at 45 degree angle to keep actuator away from heat.
3. Related Sections
    a. Pumps – Steam condensate
    b. Heat exchangers - Hydronic
    c. Hangers and Supports

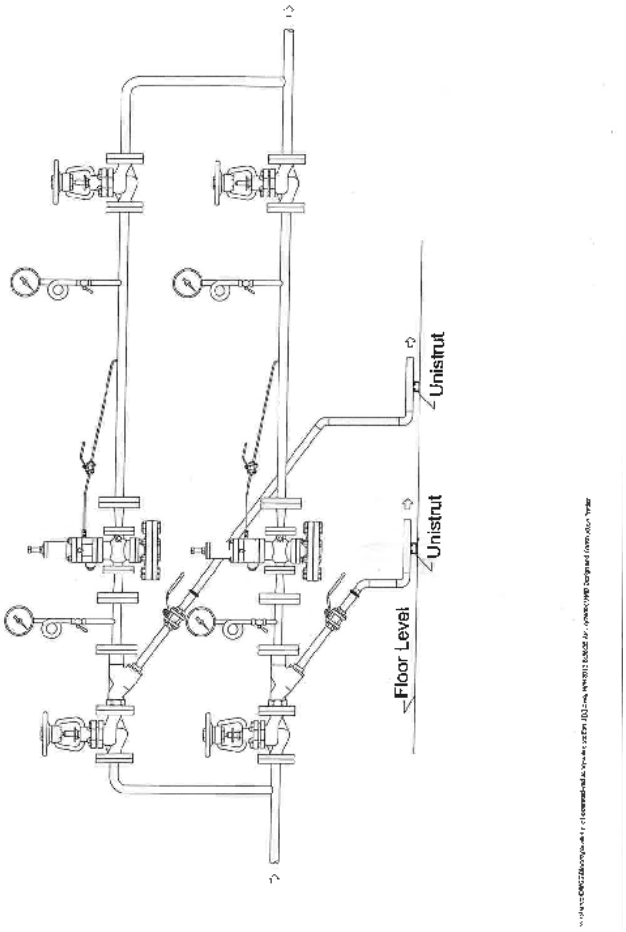
EQUIPMENT and PRODUCT REQUIREMENTS

1. All piping shall be American made.
2. Steam Piping
    a. Steam piping 2” and smaller shall be seamless Schedule 80 carbon steel pipe.
    b. Steam piping 2 ½” and larger shall be seamless Schedule 40 carbon steel pipe.
3. Condensate Return Piping and Condensate Pump Discharge Piping
    a. All condensate return piping shall be seamless Schedule 80 carbon steel pipe.
4. Feed Water Piping
    a. Seamless Schedule 40 carbon steel pipe.
5. Boiler Blowdown Piping
    a. Seamless Schedule 40 carbon steel pipe.
6. Vent Piping from Safety Valves and Blowdown Separator
    a. Seamless Schedule 40 carbon steel pipe.
7. Fittings
    a. Seamless carbon steel butt-weld, standard weight

b. Seamless carbon steel butt-weld, Schedule 80.
c. Ductile iron, screwed.
d. Cast iron, screwed.
e. Wrought or cast bronze solder fittings.

8. Steam fittings
    a. Provide 250 lb. cast iron fittings for all screwed fittings.
9. Condensate fittings
    a. Provide 300 lb. ductile iron fittings for all screwed fittings.
    b. Lower pressure rated fittings are not acceptable.
10. Gaskets
    a. Metal gaskets by Flexitallic or equal shall be provided.
    b. Fiber gaskets by Garlock or manufacturers are not allowable.
11. Unions and Flanges
    a. Malleable iron
    b. Forged carbon steel flange
    c. Cast bronze or brass
12. Throttling Valves - Globe
    a. 2” and smaller: Class 125 (125 psi at 400 deg F, 200 psi at 150 deg F), bronze, straightway pattern, screw-in bonnet, renewable seat and disc, in conformance with MSS SP80.
    b. 2-1/2” and larger: Class 125 (125 psi at 400 deg F, 200 psi at 150 deg F), iron body, brass mounted, flanged, straight way patter, bolted bonnet, renewable seat and disc.
13. Valves for Low Pressure Steam / High Pressure Steam / Steam Condensate Piping:
    a. Ball Valves: Cast iron body, 600 psi WOG, quarter tum lever handle, blow-out proof stem, full port 2" and smaller, standard port 2-1/2" and larger, reinforced TFE seats, all stainless steel trim, threaded ends.
    b. Ball valves shall be carbon steel with stainless steel trim. Need to add more detail
    c. Gate Valves: 2-1/2"- 12*:Class 125 (125 psi at 400"F, 200 psi at 150°F), ASTMA-125 Class B cast iron body, brass mounted, flanged, bolted bonnet. OS & Y, solid wedge, in conformance with MSS SP70.
    d. Gate Valves:14" and larger: Class 150 (150 psig at 500°F), ASTM A216 Grade WCB cast steel body, flanged bolted bonnet, OS & Y, flanged end Is in accordance with ANSI 816. 5 and 816.10, pressure temperature ratings in accordance with ASME/ANSI 816.34.
    e. Globe Valves: 2" and smaller: Class 125 (125 psi at 400°F, 200 psi at 150.F), bronze, straightway pattern, screw-in bonnet, renewable seat and disc, in conformance with MSS SP80.
    f. Globe Valves: 2-1/2" and larger: Class 125 (125 psiat400°F, 200 psi at 150"F),iron body, brass mounted, flanged, straight way pattern, bolted bonnet, renewable seat and disc.

14. Check Valves
    a. Check Valves:2" and smaller: Class 125 (125 psi at 400°F, 200 psi at 150"F), bronze, horizontal swing, vertical up-flow, Y pattern, teflon renewable seat and disc in conformance with MSS SP80.
    b. 2” and smaller: Class 125 (125 psi at 400 deg F, 200 psi at 150 deg F), iron body, flanged, horizontal swing, vertical up-flow, bolted bonnet, renewable seat and disc in conformance with MSS SP71, Type 1.
    c. Check Valves:2-1/2" and larger: Class 125 (125 psi at4oO·F. 200 psi at 150°F), iron body, flanged, horizontal swing vertical up-flow, bolted bonnet, renewable seat and disc in conformance with MSS 5P71, type 1.
    d. Do not use swing check valves in the vertical position. Any check valves located in the vertical shall be spring loaded type.
    e. Provide stainless steel check valves on discharge of condensate pumps.
15. Pressure Regulating Valves
    a. Pressure regulating valve assemblies shall be installed per the piping diagram in the following detail.



b. Provide pressure gauges on both sides of valves per details.

c. Provide valve in pilot line from PRV to downstream piping.

d. Pressure regulating valve stations shall be designed for total connected load plus 20% safety factor. Provide valves in a 1/3 and 2/3 capacity assembly. The 1/3 size valve shall be sized to operate in the low load times to minimize chattering and hunting of valve.

e. Fisher or Leslie regulating valves are not allowable.

16. Y-Pattern Strainers

    a. Strainers on steam and condensate system shall have discharge piped down to floor drain.

17. Condensate Traps

    a. Approved Manufacturers:

        - Armstrong
        - Spirax Sarco

END OF SECTION