UNIVERSITY OF MICHIGAN
ARCHITECTURE, ENGINEERING AND CONSTRUCTION

ARCHITECTURE & ENGINEERING
326 East Hoover, Mail Stop B
Ann Arbor, MI 48109-1002
Phone: 734-764-3414
Fax: 734-936-3334

BuildingName
The Description of the Project
P00000000 0000

SPECIFICATION DIVISION 23

NUMBER SECTION DESCRIPTION

DIVISION 23 HEATING, VENTILATING AND AIR CONDITIONING (HVAC)
SECTION 232216 - STEAM AND CONDENSATE PIPING SPECIALTIES

END OF CONTENTS TABLE

DIVISION 23 HEATING, VENTILATING AND AIR CONDITIONING (HVAC)
SECTION 232216 - STEAM AND CONDENSATE PIPING SPECIALTIES

REVISIONS:
8-1-99: CONTENT APPROVED AS NEW MASTER
3-29-05: LAST SPEC TEAM REVISION
1-05-07:UPDATED PER STEAM & HYDRONICS COMMITTEE MTG JAN 07
06-03-08: ADDED WATON-MCDANIEL TO FLASH TANK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

INCLUDE PARAGRAPH 1.1.A AND B IN EVERY SPECIFICATION SECTION. EDIT RELATED SECTIONS 1.1.B TO MAKE IT PROJECT SPECIFIC.

A. Drawings and general provisions of the Contract, Standard General and Supplementary General Conditions, Division 1 Specification Sections, and other applicable Specification Sections including the Related Sections listed below, apply to this Section.

1.2 SCOPE OF WORK:

A. Furnish and install piping, fittings, and specialties for the following systems:

1. Low pressure steam and condensate systems (nominal 5 to 15 psig
2. Medium pressure steam and condensate systems(nominal 60 psig)
3. Pumped condensate

PART 2 - PRODUCTS

SPEC EDITOR: FOR ALL TRAPS, PROVIDE A SCHEDULE ON DRAWINGS WITH MAKE AND MODEL NUMBER.

2.1 FLOAT AND THERMOSTATIC TRAPS:

SPEC EDITOR: F&T TRAPS ARE FOR LOW PRESSURE STEAM, 25 PSI AND UNDER. THEY ARE SUBJECT TO DAMAGE IF WATER HAMMER, EXCESSIVE TEMPERATURES OR PRESSURES ARE PRESENT. THEY CAN BE USED FOR 60 PSIG STEAM.

A. Cast iron body, bolted cap, renewable, stainless steel internal components, balanced pressure thermostatic air vent. Internal parts shall be accessible without disturbing piping.

B. Capable of discharging condensate, air and other non-condensable gasses at pressures from 125 psig to 25 inches of vacuum without loss of steam.

C. Manufacturers: Armstrong A and B series, ITT Hoffman, Spirax-Sarco, Watson McDaniels.

2.2 INVERTED BUCKET TRAPS:

SPEC EDITOR: BUCKET TRAPS ARE INFREQUENTLY USED. USE WHERE CONDENSATE MUST BE LIFTED, AND FOR 60 PSIG TRAPS

A. ASTM A 278, class 30 cast iron body and cap, pressure rated for 250 psi; stainless steel head and seat; stainless steel valve retainer, lever, guide pin assembly, brass or stainless steel bucket.

B. Manufacturers: Armstrong Series 800, ITT Hoffman, Spirax-Sarco, Watson McDaniels

2.3 CONDENSATE FLASH TANK:

SPEC EDITOR: FOR USE WITH 60 PSIG STEAM ONLY.

A. Provide condensate flash tank of size and with openings as shown on drawings. Tank shall be ASME constructed and stamped for 125 PSIG.

B. Manufacturers: Cemline, Spirax-Sarco, Wessels, Watson Mcdaniel.

2.4 VACUUM BREAKERS:

SPEC EDITOR: PSIG. IS THIS THE MINIMUM ? 125 0R 150 PSIG ?

A. Brass body, stainless steel retainer tube, ball and spring, rated for 365F, 300 psig.

B. Manufacturers: Hoffman, Spirax-Sarco, Bell & Gossett

SPEC EDITOR: USED TYPICALLY WHEN VENTING STEAM.

2.5 DRIP PAN ELBOWS:

A. Cast iron construction, ASTM A126, Class B, rated for 250psig, 450F.

B. Manufacturers: Keckley, Spence, Spirax-Sarco.

2.6 GATE VALVE - CAST STEEL (FOR USE IN CENTRAL POWER PLANT ONLY):

SPEC EDITOR: USED ONLY IN POWER PLANT WORK.

A. Cast steel body, bolted bonnet, rising stem, seal-welded seat rings, flanged connections, with chromium stainless steel trim, O.S. & Y class 150, type 410 stainless steel hard facing seating surfaces, rated for steam at 1000 F.

B. Valves 10" and larger shall be positively proven to be new with a dated certificate of manufacture from the manufacturer.

C. Manufacturers: Manufacturers: Crane No: 47XU, Stockham No: J1009B8F, Nibco, Grinnell.

2.7 GATE VALVE - CAST IRON (FOR USE AT BUILDING BOILERS ONLY):

SPEC EDITOR: REVISE TO MEET BOILER CODE WITH INTERGRAL DRAIN.

SPEC EDITOR: USED ONLY AT THE DISCHARGE FROM STEAM BOILERS.

A. Cast iron body ASTM A126 class B or class C, bolted bonnet, rising stem, flanged connections, bronze trim with bronze seat rings, nickel plate steel stem, wedge disk type gate, O.S.& Y. class 125.

B. Manufacturers: Crane Fig. 465, Grinnell 6020A, NIBCO F-637-31, Stockham

2.8 GLOBE VALVE:

SPEC EDITOR: ONLY USED FOR STEAM PRV BYPASS.

A. Through 2": 150 pound rated, bronze body, threaded, Teflon disc, rising stem. Manufacturer: Crane No. 7TF, Grinnell No. 3240, Nibco, Stockham B-22-T.

B. 1/2" and larger": 125 pound rated, iron body, bronze trim, renewable seat and disc. Manufacturer: Crane No. 351, Grinnell No. 6200A, Nibco, Stockham G-512.

2.9 SAFETY RELIEF VALVES:

SPEC EDITOR: IF SAFETY RELIEF VALVES ARE REQUIRED, ADD TEXT TO SPECIFICATIONS. USE THIS RELIEF VALVE WITH PRV INSTALLATION. BOILER RELIEF VALVES SHOULD BE SPECIFIED WITH THE BOILER.

SAFETY RELIEF VALVES IN FLASH TANKS - VM/RP TO ADD SPECS.

2.10 PRESSURE REDUCING VALVES:

SPEC EDITOR: VERIFY SECO METAL DISC.

A. Pressure reducing valves shall be single seated, flanged, ASA 250 lb.; cast iron body, stainless steel diaphragm, Seco metal disc, stainless steel stem, and carbon steel main spring. Valves shall be normally closed type and designed for dead end service. Steam velocity through the valve shall be limited to 7,000 fpm.

B. Provide muffling orifice required to limit sound level to 85 dba, 3 feet from the valve.

C. Manufacturers: Armstrong, Leslie, Spirax-Sarco, Spence.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION:

A. See Section 221113 for piping materials and installation requirements.

B. Do not raise gravity condensate return pipe unless authorized by the engineer.

SPEC EDITOR: DRIP LEG AND ALL THE TRAP LOCATIONS SHALL BE INDICATED IN DRAWINGS

C. Drip and Trap: At end of steam mains, at the end of horizontal runs, prior to control valves (where condensate will collect behind valve when closed), at low points (where steam pipe rises in direction of flow), at intervals of no less than 200 feet for continuous pipe, and where noted on the drawings, provide drip leg and connect to gravity condensate return piping through float and thermostatic, minimum 3/4". See drawings for drip size and detail.

3.2 STEAM TRAP SELECTION AND INSTALLATION:

SPEC EDITOR: INSTALLATIONS AND PIPING ARRANGEMENTS VARY WITH EQUIPMENT SERVED, STEAM PRESSURES, TRAP TYPE AND MANY OTHER CONSIDERATIONS. CONSULT MANUFACTURER'S REPRESENTATIVE FOR PROPER APPLICATION AND INSTALLATION DETAILS.

A. Unless noted otherwise, select traps for three times design load for coils, and two times design load for converters. Install steam traps in accessible locations as close as practical to connected equipment. Locate trap below outlet of equipment served to minimize condensate accumulation in equipment. See drawings for installation requirements.

3.3 PRESSURE REDUCING STATION INSTALLATION:

SPEC EDITOR: DRIP PAN ELBOW IS REQUIRED ON RELIEF VALVE INSTALLATION WHERE DISCHARGE MUST GO UP AFTER COMING OUT OF RELIEF VALVE. SHOW ROUTING OD RELIEF VALVE ON DRAWINGS. ROUTE TO SAFE LOCATION, WHERE DISCHARGE WILL NOT POSE A HAZARD TO PEOPLE.

A. Provide single stage PRV stations where indicated and as scheduled on drawings. Each station shall consist of steam pressure reducing valves, strainers, relief valves, isolation gate valves, globe style bypass valves, pressure gauges etc. as detailed.

3.4 BYPASS AND DRAIN INSTALLATION:

SPEC EDITOR: THIS IS USED TO SLOWLY ACTIVATE STEAM LINES, AND TO REDUCE WATER HAMMER. IT IS NOT REQUIRED AT TERMINAL CONNECTION (ABSORPTION CHILLERS). IT IS USED PRIMARILY IN MAIN VALVES. INDICATE REQUIRED LOCATIONS ON DRAWINGS.

A. Provide bypass and drain connection for steam valves 8" and larger. Comply with MSS SP-45 bypass and drain connections.

3.5 PRESSURE REDUCING STATION INSTALLATION:

A. Install drip pan elbow as close as possible to relief valve. Extend drains for drip pan elbow to indirect waste at floor drain.

B. Extend relief valve discharge as indicated on drawings.

C. Set valves to relieve at 15 psig.

D. Properly hang, guide and anchor all related piping to secure the pipe during PRV operation.

3.6 SAFETY RELIEF INSTALLATION:

A. Install in vertical upright position as close as possible to the pressure reducing valve.

B. The installation shall comply with all manufacturer's recommendations.

3.7 FLASH TANK INSTALLATION:

A. Install as detailed and per manufacturer's recommendation.

END OF SECTION 232216