SECTION 15591

1. SCOPE

1.1 Work Included:

2. PIPING SYSTEMS

2.1 General:

A. Plans show the sizes and approximate locations.

B. All indicated sizes must be maintained.

C. Consult with Owners Representative and follow directions as to accurate and required location of piping.

D. Cooperate and consult with other trades to avoid any interferences in running of pipes.

E. Install perfectly plumb and free of depression and pockets.

F. Suspend from building construction to provide adequate suspension system in accordance with recognized engineering practices.

G. Where piping is supported from concrete structure, concrete inserts shall be installed.

H. Where continuous inserts are required, galvanized inserts shall be used.

I. Where piping is supported from steel structures, beam clamps shall be used and shall be of the adjustable type with swivel adjustment.

J. Vertical runs of piping shall be supported by means of riser clamps.

K. Suspended piping to be supported on clevis type hangers, or trapeze hangers. Insulation protection saddles as hereinafter specified shall be used at all hangers to protect the insulation.

L. Space all hangers not more than 10 ft. apart; where concentrated loads, etc. occur, closer spacing may be necessary.

M. Piping run along walls shall be supported on wall brackets.

N. Supply and return connections to all equipment shall have unions. Unions to and including 2", ground joint with bronze inserts and over 2", flanged unions with gasketed flange.

O. Piping to be installed complete with fittings, valves, automatic valves, hangers, expansion shields, anchors, expansion joints, hanger rods as per plans, details and as required.

P. All pump and boiler connections on spring isolators to be made with braided metal flexible connectors suitable for 250 degrees F steady duty.

Q. Welding required on all steel piping over 4" and permitted on all other piping except where otherwise specified in accordance with MCA standards using long radius elbows and welding fittings where branch size exceeds 1/2 main size.

R. Install all piping to allow for free expansion.

S. Vent all high points, drain all low points on water systems.

3. HWS/R PIPING SYSTEM

3.1 Comfort heating system piping:

A. Schedule 40 ASTM Spec. A-120 steel pipe to 4" size.

B. ASTM Spec. Malleable iron fitting on screwed construction. Socket welds are acceptable.

C. ASTM Spec. A-234 class 150 steel fittings on welded construction.

D. Vent high points as per plans, details and as required for air elimination with vent piping constructed of ASTM Spec. 88 Type L soft temper copper tubing terminating in vent cock accessible from floor.

E. Install drain valves as indicated and drain plugs at all low points.

F. At the Contractor's option, all supply and return lines may be type "L" hard drawn copper tubing with wrought copper sweat type fittings jointed to pipe with 95/5 solder.

G. At the Contractor’s option, a Victaulic or Rigid Press Fit type coupling system may be used on all piping thru 4”.

3.2 Condensate drain piping:

A. Type “M” copper.

3.3 Gauges & Thermometers:

A. Gauges:

1. Trerice or Taylor PT-4 Series pressure gauges where indicated on plans.
2. Complete with cast aluminum case without back flange with chrome plated ring, double strength glass; 4-1/2" diameter dial, vapor or liquid filled bulbs. Accuracy within one scale division.
3. Ranges and intervals suitable for the applications.

B. Thermometers (Pipe):

1. Trerice No. BX91400 or Taylor, industrial mercury thermometers with universal angle adjustment.
2. Complete with cast aluminum case acrylic lens, 9" scale case, vapor or liquid filled bulbs. Accuracy within one scale division.
3. Submit shop drawings indicating ranges.

C. Gauge Valves (Ball Valve):

1. Milwaukee BA100/150 XH, Apollo, or Nibco. Brass body & chrome plated ball with bronze stem and Teflon packing. 150 lb. working pressure. Fully ported. Zinc dichromate plated steel handle with plastic protective covering…with extension stem.

D. Installation:

1. For 2-1/2" pipe sizes and smaller, install thermometers without wells in a plugged tee as shown on drawings. Provide union hubs as required. Increase pipe size at stem location to a minimum of 3/4" pipe. Stems to be a minimum of 3-1/2" long.
2. For 3" pipe sizes and over, install thermometers in brass sockets.
3. All gauges and thermometers to be readable from floor.

3.4 Valves:

A. Drain Valves (ball valves): Milwaukee BA100/150XH,or Apollo , brass body & chrome plated ball with bronze stem and Teflon packing. Zinc dichromate plated steel handle with plastic protective covering and extension stem.

B. Ball Valves: Milwaukee BA100/150XH or Apollo. Brass body and chrome plated ball with bronze stem and Teflon packing. 150 lb. working pressure. Fully ported. Zinc dichromate plated steel handle with plastic protective covering and extension stem.

C. Balancing and Shut Off Valves (4" and under): Milwaukee BA100/150 XH, Apollo, or Nibco. Brass body & chrome plated ball with raised bronze stem and Teflon packing. 150 lb. working pressure. Fully ported. Zinc dichromate plated steel handle with plastic protective covering. Extension stem and memory stop.

D. Check Valves: Milwaukee 1400 Series or Metraflex of sizes indicated. Wafer-Type, silent operating, non-slam check valve. Open and close at 1 foot differential. 150 psig construction.

3.5 Specialties:

A. General:

1. Of sizes, capacities and quantities indicated.

B. Strainers:

1. Mueller, O.C. Keckley or approved equal. 125# cast iron body, Y-Type with stainless steel perforated screen.

2. Provide ball valve on strainer drain for blowing down.

C. Relief Valves:

1. Bell & Gossett, ASME rated - diaphragm type.

D. Pete's Plugs:

1. Provide Pete's Plugs where indicated and provide owner with test kit.

E. Flexible Connectors:

1. Provide Mason Industries; Flexonics; Metraflex, or approved equal braided metal flexible connectors.

F. Manual Air Vents:

1. Contractor shall furnish and install accessible manual air vents at all high points of the closed hot water system to maintain an air-free system. Equivalent to Dole Series 14.

3.6 Chemical Treatment:

A. Initial Cleaning:

1. All new water piping systems shall be cleaned to remove silt, oils, mill scale, grease and preservatives.
2. Contractor shall provide certification that the system has been properly cleaned and is ready for start-up.

B. Hot Water Systems;

1. Contractor shall provide chemical treatment recommended by Nalco Chemical Company, or equal.

C. Testing Equipment:

1. The water treatment company shall furnish water testing equipment that shall include:
   a. Any special equipment required for proper control of the chemical treatment

D. Water Treatment Service Program:

1. Provide the following water treatment services after start-up:
   a. Initial water analyses and recommendations
   b. Initial equipment clean-up chemicals, procedures and certification after clean-up is complete
   c. Assistance during start-up of the treatment program
   d. Instructions to operating personnel on proper feeding and control techniques.

NOTE: BOILERS SHALL BE BY-PASSED DURING INNITIAL FLUSH AND FILL

4. GAS PIPING SYSTEMS

4.1 Schedule 40 ASTM Spec. A-120 steel with ASTM Spec. A-197 Class 150 Steel welding fittings.

4.2 Full size scale pocket before final connections.

4.3 Gas Valves:

A. DeZurik Fig. 400 eccentric valves, semi-steel body, bronze plug and bearings.

4.4 Painting:

A. All gas piping shall be painted with (2) coats of OSHA yellow paint.

5. PROTECTION OF EXISTING STRUCTURES AND UTILITIES

5.1 All surface structures and features, including buildings, pavements, etc., adjacent to the construction easement, or right-of-way, and those within the construction easement, or right-of-way, are to be saved and shall be properly protected against all damage.

5.2 All existing gas pipes, water pipes, electric and telephone conduits, drains, valves, and other surface or subsurface structures, either of a private or of public ownership, whether or not indicated or shown on the Drawings, shall be carefully supported and protected from injury by the CONTRACTOR. All such work shall be done by and at the expense of the CONTRACTOR and according to his own Drawings. The fact that the Owner may be under no legal obligation to provide for doing such work will be no excuse for the CONTRACTOR neglecting or refusing to perform the same.

END OF SECTION 15591