SECTION 15510
HYDRONIC PIPING

PART 1 GENERAL

1.1 REFERENCES

A. ANSI/ASME SEC 9: Welding and Brazing Qualifications.
B. ANSI/ASME B16.3: Malleable Iron Threaded Fittings Class 150 and 300.
C. ANSI/ASME B16.23: Cast Copper Alloy Solder Joint Drainage Fittings-DWV.
D. ANSI/ASME B16.29: Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings-DWV.
E. ANSI/ASME B31.9: Building Services Piping.
F. ANSI/AWS D1.1: Structural Welding Code.
G. ANSI/AWWA C105: Polyethylene Encasement for Ductile Iron Piping for Water and Other Liquids.
H. ASTM A53: Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless.
I. ASTM A234: Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.
J. ASTM B32: Solder Metal.
K. ASTM B88: Seamless Copper Water Tube.
L. ASTM D1785: Poly Vinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120.
M. ASTM D2466: Socket-Type PVC Plastic Type Fittings, Schedule 40.
N. ASTM D2467: Socket-Type PVC Plastic Type Fittings, Schedule 80.
O. ASTM D2855: Making Solvent-Cemented Joints with PVC Pipe and Fittings.

1.2 SUBMITTALS

A. Submit under provisions of Section 15000.
B. Product Data: For each product used in this project, provide catalog data for pipe materials, pipefittings, valves, and accessories.
C. Mechanical Equipment Rooms (AHU): Obtain ⅜" scale ductwork drawings from the sheet metal contractor. Provide ⅜" scale piping drawings with ductwork shown.
D. Air Cooled Chillers and CHW Pumps: Provide ¼" scale piping drawings.
E. Water Cooled Chillers, CHW and CW Pumps, and Cooling Towers: Provide ¼" scale piping

PART 2 PRODUCTS

2.1 HEATING WATER AND GLYCOL PIPING, BURIED

A. Steel Pipe: ASTM A53, Schedule 40, black (ERW).
   1. Fittings: ASTM A234, forged steel welding type.
   2. Joints: ANSI/AWS D1.1, welded.
B. Factory Pre-insulated Steel Pipe:
   1. Carrier: ASTM A53, Schedule 40, black (ERW).
   2. Fittings: ASTM A234, forged steel welding type.
   3. Joints: ANSI/AWS D1.1, welded. Insulate and seal per manufacturer's recommendations.
   4. Casing: PVC Type 1, Grade 1, ASTM D1785. Minimum thickness shall be as follows: 0.070" for 3" pipe and smaller; 0.080" for 4" and 5" pipe; 0.100" for 6" pipe, 0.120" for 8" pipe, 0.140" for 10" pipe; 0.160" for 12" pipe; 0.180" for 14" pipe.
   5. Insulation: Factory foamed in-place closed-cell polyurethane foam completely filling the annulus between the steel pipe and casing. Minimum thickness shall be 1". For insulation ends, provide factory applied, vapor barrier mastic end seals.
   6. Performance specification is based on Pre-insulated Piping Systems, INSUL-TEK 250 Steel. Other pre-insulated piping systems satisfying the specifications are acceptable.

2.2 HEATING WATER AND GLYCOL PIPING, ABOVE GROUND

A. Steel Pipe: ASTM A53, Schedule 40, black (ERW).
   1. Fittings: ANSI/ASTM B16.3, malleable iron or ASTM A234, forged steel welding type fittings.
   2. Joints: Screwed for pipe 2" and under; ANSI/AWS D1.1 welded for pipe over 2".
B. Copper Tubing: ASTM B88, Type L, hard drawn.
   1. Fittings: ANSI/ASME B16.23 cast brass of ANSI/ASME B16.29 solder wrought copper.
   2. Joints: ASTM B32, solder, Grade 95TA.

2.3 CHILLED WATER PIPING, BURIED

A. Steel Pipe: ASTM A53, Schedule 40, black (ERW).
   1. Fittings: ASTM A234 forged steel welding type, long radius.
   2. Joints: ANSI/AWS D1.1, welded.
B. Factory Pre-insulated Steel Pipe:
   1. Carrier: ASTM A53, Schedule 40, black (ERW).
   2. Fittings: ASTM A234, forged steel welding type, factory pre-fabricated.
   3. Joints: ANSI/AWS D1.1, welded. Insulate and seal per manufacturer's recommendations.
   4. Casing: PVC Type 1, Grade 1, ASTM D1785. Minimum thickness shall be as follows: 0.070" for 3" pipe and smaller; 0.080" for 4" and 5" pipe; 0.100" for 6" pipe, 0.120" for 8" pipe, 0.140" for 10" pipe; 0.160" for 12" pipe; 0.180" for 14" pipe.
   5. Insulation: Factory foamed in-place closed-cell polyurethane foam completely filling the annulus between the steel pipe and casing. Minimum thickness shall be 1”. For insulation ends, provide factory applied, vapor barrier mastic end seals.
   6. Performance specification is based on Pre-insulated Piping Systems, INSUL-TEK 250 Steel. Other pre-insulated piping systems satisfying the specifications are acceptable.

2.4 CHILLED WATER PIPING, ABOVE GRADE

N At the end of each day all open pipe ends shall be sealed to prevent intrusion of foreign materials into the pipes.

O On projects where existing chilled water system is modified the old inactive piping shall be