

SECTION 15510D - HYDRONIC PIPING

A. SECTION INCLUDES

1. Pipe and Tube Materials
2. Joining Materials
3. Fittings
4. Valves
5. Insulation

B. ABBREVIATIONS

Materials:

BZA - Bronze Alloy
CU - Copper
CI - Cast Iron
CS - Carbon Steel
DI - Ductile Iron
FS - Forged Steel
SMLS - Seamless Steel
SS - Stainless Steel
WS - Wrought Steel
ERW - Electric Resistance Welded Steel

Valves:

BAV - Ball Valve
BUV - Butterfly Valve
GAV - Gate Valve
GLV - Globe Valve

Special Duty Valves and Specialties

AFCV - Automatic Flow Control Valve
CBV - Calibrated Balancing Valve
PRV - Pressure Reducing Valve
PTRV - Pressure Temperature Relief
Valve
SRV - Safety Relief Valve
TDV - Triple Duty Valve

Joints:

BWE - Butt Weld End
SWE - Socket Weld End
SE - Soldered End
FE - Flanged End
TE - Threaded End
RFF - Raised Face Flange
FFF - Flat Face Flange

Insulation:

CG - Cellular Glass
CS - Calcium Silicate
FEC - Flexible Elastomeric Cellular
GFP - Glass Fiber Performed

Specialties

AAV - Automatic Air Vent
AE - Air Eliminator
MAV - Manual Air Vent
AS - Air Separator
ET - Expansion Tank
CF - Chemical Feeder

C. DESIGN CRITERIA

1. Piping Systems:

SERVICE:	ABOVE GROUND, CHILLED WATER, GLYCOL/WATER COOLING, MAKEUP WATER, CONDENSER WATER, CONDENSATE DRAIN PIPING
PRESSURE:	250 PSIG
TEMPERATURE:	35F - 220F

ITEM	1/2 IN. THRU 2	1/2 IN. THRU 2	2-1/2 IN. - 20 IN
PIPE			
MAT'L	COPPER	STEEL	STEEL
ASTM	B 88	A 53 B	A 53 B
MFGR PROC	DRAWN	SEAMLESS	SEAMLESS, ERW
WALL THK	TYPE-L	STANDARD	STANDARD
JOINT	SOLDER, 95-5	THREAD	WELD
FITTING			
MAT'L	WRT COPPER	CAST IRON	WROUGHT STEEL
CLASS	---	250	STANDARD
ASTM	B16.22	B16.4	B16.9
JOINT	SOLDER	THRD	WELD, FLANGE
VALVE (1)			
MAT'L	BRONZE	CAST IRON	CAST IRON
CLASS		250	250
TYPE	GAV, BAV	GAV, BAV	GAV, BUV
INSULATION (2)	GFP, FEC	GFP, FEC	GFP, FEC

- (1) Refer to Section 15100 for valve requirements.
- (2) Refer to Section 15260 for insulation requirements.

SERVICE:	BELOW GROUND: CHILLED WATER, CONDENSER WATER, HOT WATER
PRESSURE:	250 PSIG
TEMPERATURE:	150F

ITEM:	4 INCH THRU 20	
PIPE:		
MAT'L	DUCTILE IRON	
ASTM	A 21.51	
MFGR PROCESS	CAST	
WALL THK	CLASS 50	
JOINT:	FLANGE, COUPLING	
FITTING:		
MAT'L	DUCTILE IRON	
CLASS	B	
ASTM	A 21.10	
VALVE (1):		
MAT'L	CAST IRON	
CLASS	250	
TYPE	GAV, BUV(HI-SERVICE)	
INSULATION (2):	GFP(3), CG(3)	

- (1) Refer to Section 15100 for valve requirements.
- (2) Refer to Section 15260 for insulation requirements.
- (3) Refer to "Below Ground Pipe Insulation Installation" in Section 15260.

SERVICE	ABOVE GROUND HOT WATER HEATING
PRESSURE	220 PSIG
TEMPERATURE	220F

ITEM:	1/2 IN. THRU 2	1/2 IN. THRU 2	1/2 IN. THRU 2	2-1/2 THRU 20
PIPE:				
MAT'L	COPPER	STEEL		STEEL
ASTM	B 88	A 53 B		A 53 B
MFGR PROCESS	DRAWN	SEAMLESS		ERW, SEAMLESS
WALL THK	TYPE L	STD		STD
JOINT:	SOLDER, 95-5	THREAD, WELDED		WELDED
FITTING:				
MAT'L	WROUGHT COPPER	CAST IRON		WROUGHT STEEL
CLASS		125		STD
ASTM	B 16.22	B 16.4		B 16.9
VALVE (1):				
MAT'L	BRONZE	BRONZE, CAST IRON		CAST IRON
CLASS		125		125
TYPE	BAV, GAV	BAV, GAV		BUV, GAV
INSULATION (2)	GFP, FEC, CG, CS	GFP, FEC, CG, CS		GFP, FEC, CG, CS

- (1) Refer to Section 15100 for valve requirements.
(2) Refer to Section 15269 for insulation requirements.

2. Special Duty Valves

SERVICE:	CHILLED WATER, CONDENSER WATER, GLYCOL/WATER, MAKEUP WATER,
PRESSURE:	250 PSIG
TEMPERATURE:	35F - 100F

ITEM	CALIBRATED BALANCING VALVE (CBV)	PUMP DISCHARGE VALVE (TRIPLE DUTY) (TDV)	PRESSURE REDUCING VALVES (PRV)
SIZE:	1 - 14 INCHES	1 - 14 INCHES	1 - 14 INCHES
BODY:	BRONZE IRON	CAST IRON	BRASS, CAST IRON
TRIM:	BRONZE STEEL	BRONZE DISC & SEAT, SS STEM & SPRING	NON-CORROSIVE
PACKING & SEAL:		TEFLON	
JOINT:	THREAD, FLANGE	THREAD, FLANGE	THREAD, FLANGE
FEATURES:	* DP PORTS W/	* NON-SLAM	* FACTORY SET

	SHRADER VALVES & CAPS. * CALIBRATED INDICATOR W/ MEMORY STOP * SHUTOFF *PERFORMED, REMOVABLE INSUL.	CHECK VALVE. * CALIBRATED FLOW ADJUSTMENT * SHUTOFF	PRESS. * CAPABLE OF FIELD ADJUSTMENT. * CAPABLE OF STRAINER REMOVAL W/O SHUTDOWN.
MISC.:	* CALIBRATION CURVE * GAGE KIT		

ITEM	AUTOMATIC FLOW CONTROL VALVE (AFCV)	SAFETY RELIEF VALVE (SRV)	COMBINED PRESSURE/TEMP. RELIEF VALVE (PTRV)
SIZE:	1/2 - 14		
BODY:	CAST IRON	CAST IRON	CAST IRON OR BRASS
CLASS:	250		
TRIM:	STAINLESS STEEL	BRASS	NON-CORROSIVE
PACKING/SEAL:		RUBBER	RUBBER
JOINT:	THREAD: 1/2-2 IN FLANGED: 2-1/2 - 14	THREAD FLANGED	THREAD FLANGED
FEATURES:	* FACTORY SET FLOW W/ +/- 5% DESIGN * PRESSURE COMPENSATING * QUICK DIS-CONNECTS FOR PRESSURE PORTS.	* ASME LABEL, PER SECTION IV OF CODE	* ASME LABEL PER SECTION IV OF CODE * FACTORY SET PRESS W/FIELD ADJUST CAPABILITY * INLET CHECK VALVE * INLET STRAINER REMOVABLE W/O SHUTDOWN * FAST FILL FEATURE
MISC.:	* METAL I.D. TAG		

3. Hydronic Piping Specialties

SERVICE:	CHILLED WATER, CONDENSER WATER, GLYCOL/WATER, MAKEUP WATER
PRESSURE:	250 PSIG
TEMPERATURE:	35F TO 100F

ITEM:	AUTOMATIC AIR VENT (AAV)	MANUAL AIR VENT (MAV)	AIR ELIMINATOR (AE)
SIZE:	1/2 INCH	1/2 INCH	LINE SIZE, W/ 1/2 IN. THREADED VENT
BODY:	CAST IRON	CAST IRON, GLOBE OR BALL VALVE	CAST IRON, ONE PIECE
TRIM:	NON-CORROSIVE		
JOINTS:	THREADED	THREADED	THREADED, FLANGED
FEATURES:	* POSITIVE, FLOAT ACTUATED VENTING AT ALL OPERATING PRESSURES.		
MISC. :		* EXTEND DISCHARGE TUBE TO DRAIN OR TO WITHIN 5' 0" ABOVE FLOOR W/HOSE END FITTING.	

ITEM:	AIR SEPARATOR (AS)	EXPANSION TANK (ET)	CHEMICAL FEEDER (CF)
SIZE:			5 GALLON CAPACITY, BYPASS TYPE.
BODY:	WELDED STEEL TANK, ASME STAMPED	WELDED STEEL TANK, ASME STAMPED	WELDED STEEL
JOINTS:	THREAD/ FLANGED	THREADED/FLAN GED	THREADED/ FLANGED
TRIM:			
FEATURES:	* INTEGRAL STRAINER	* REMOVABLE, HVY DUTY, BUTYL BLADDER	* FILL FUNNEL * VALVES AT INLET, OUTLET & DRAIN
MISC.:	* 1/2 INCH DRAIN * 1/2 COMPRESSION TANK CONNECTION	* PRESSURE GAGE TAP * AIR CHARGING FITTING. * DRAIN FITTING * VERTICAL TANK SUPPORT: STEEL LEGS OR BASE. * HORIZONTAL TANK SUPPORT: STEEL SADDLES	

SERVICE:	CHILLED WATER, CONDENSER WATER, GLYCOL/WATER, MAKEUP WATER
PRESSURE:	250 PSIG
TEMPERATURE:	35F TO 100F

ITEM:	Y-TYPE STRAINER	Y-TYPE STRAINER	BASKET STRAINERS
PIPING SYSTEM:	COPPER	STEEL	
SIZE:	1/2 - 2, 2-1/2 & UP	1/2 - 2 2-1/2 UP	1/2 - 14
BODY:	BRONZE BRONZE	CAST IRON CAST IRON	CAST IRON
CLASS:	250 300	250 250	250
SCREEN:	304 SS 304 SS	304 SS 304 SS	304 SS
PERFORATIONS	0.045 IN. 0.125	0.033 IN THRU 3" PIPE 0.045 IN THRU 6" PIPE 0.125 IN @ 8" & UP	0.045 IN THRU 6" PIPE 0.125 IN @ 8" & UP

ITEM:	SUCTION DIFFUSERS		
PIPING SYSTEM:	STEEL		
SIZE:	LINE		
BODY:	CAST IRON, ANGLE TYPE, W/STEEL VANES		
CLASS:	250		
SCREEN:	COMBINATION DIFFUSER/STRAIN ER,		
PERFORATIONS	0.047 IN, PERMANENT 16 MESH FOR STARTUP		
FEATURES:	* REMOVABLE PERMANENT MAGNET * ADJUSTABLE SUPPORT FOOT * PLUGGED GAGE PORT & BLOWDOWN PORT.		
JOINTS:	FLANGED		

D. INSTALLATION

1. Valve Applications

- a. Shut-off duty: Gate, ball, or butterfly at each branch connection to supply mains, at supply connection to each piece of equipment and elsewhere as appropriate.
- b. Throttling duty: Globe, ball or butterfly valves at each branch connection to return mains, at return connections to each piece of equipment, and elsewhere as indicated.
- c. Calibrated balancing valves: in the outlet line of each heating and cooling element and elsewhere as required to facilitate system balancing.
- d. Drain valves: at low points in mains, risers, branch lines, and elsewhere as required for system drainage. Specify 3/4 inch hose drain valve with cap in lines up to 10 inch; and 2 inch ball valve with cap and chain in lines 10 inch and larger.
- e. Vent valves (manual and automatic): at the high points in mains, risers, branch lines, and elsewhere as required to facilitate system filling and venting. Specify 1/2 inch inlet with 1/4 inch outlet vent valves for lines up to 10 inch; and 3/4 inch vent valves on lines 10 inch and greater. Specify manual vents in concealed locations.
- f. Check valves: Specify for each pump discharge and elsewhere as required to control flow direction.
- g. Pump discharge (Triple duty) valve: Specify for stem to be in the upward position and allow clearance for removal of check valve mechanism.
- h. Safety relief valves: Install on hot water generators, systems and elsewhere as required.

2. Specialties Applications

1. Specify air eliminators at piping take-offs to system expansion tanks.
2. Strainers: Clean strainer screens, clean and flush piping system, re-clean strainer screens and re-check screens in three months.

E. COMMISSIONING

1. Refer to UC commissioning standard.

END