VALVE SCHEDULE

GENERAL NOTES FOR VALVES:

QUALITY ASSURANCE

VALVES SHALL COMPLY WITH ALL APPLICABLE ANSI, ASTM AND ASME STANDARDS.

PRODUCTS

VALVES LISTED BELOW ARE SHUT-OFF, BALANCING, CHECK AND DRAIN SHUT-OFF FOR HOT WATER, CHILLED WATER PIPING AND STEAM AND CONDENSATE RETURN PIPING SYSTEMS.

WORKING PRESSURES SHALL EXCEED THOSE IMPOSED BY THE SERVICE APPLIED.

VALVES LOCATED IN INSULATED PIPING SHALL HAVE EXTENDED SHAFTS AND/OR OPERATING HANDELS.

PROVIDE FLOW MEASURING GAUGES WITH COCKS, HOSES & CONNECTORS FOR BALANCING VALVES. PROVIDE METERING TOOL.

PROVIDE INSULATION BOXES ON BALANCING VALVES ON CHILLED WATER PIPING.

"E1" VALVES ARE ONLY TO BE UTILIZED ON RUNOUT PIPES TO HEATING OR COOLING DEVICES.

VALVE MANUFACTURERS:
SHUT-OFF VALVES - ANVIL, APOLLO, CONBRACO, CRANE, MILWAUKEE, NIBCO, WATTS
CHECK VALVES - NIBCO, STOCKHAM, WATTS
BALANCING VALVES - BELL & GOSSETT, ARMSTRONG, WATTS

EXECUTION

VALVES SHALL BE INSTALLED WITH STEM ABOVE CENTERLINE OF PIPE.

INTERNALS SHALL BE REMOVED AND THE REMAINING PORTIONS PROTECTED AGAINST HEAT DAMAGE DURING SOLDERING AND/OR BRAZING.

PROVIDE HOSE-THREAD ADAPTERS ON DRAIN VALVES NOT PIPED TO DRAINAGE POINT

PACKING GLANDS SHALL BE TIGHTENED BEFORE PLACING IN SERVICE.

PIPING SYSTEM	VALVE TYPE		
	SHUT-OFF	CHECK	BALANCING
HOT, CHILLED, CONDENSER - 0.5" TO 2"	B1	C1, C3	E1
HOT, CHILLED, CONDENSER - 2.5" & LARGER	A1, A2, A3, B2, B3	C2, C4	E2, E3

TYPE	DESCRIPTION	TYPE	DESCRIPTION	TYPE	DESCRIPTION
A1	BUTTERFLY VALVE NIBCO LD-2000 175 W.W.P. DUCTILE OR CAST IRON TAPPED LUG BODY, ALUMINUM BRONZE DISC, EPDM SEAT, 416 S.S. STEM, 10-POSITION HANDLE.	C1	CHECK VALVE NIBCO T-413-Y 125 W.W.P. BRONZE BODY Y-PATTERN, THREADED ENDS, RENEWABLE BRONZE SWING DISC TFE SEAT RING	E1	BALANCING VALVE BELL & GOSSETT MODEL CB 125 W.W.P. BRONZE BODY BRASS BALL THREADED ENDS READOUT & DRAIN PORTS TFE SEATS CALIBRATED NAMEPLATE HANDLE WITH MEMORY STOP
A2	BUTTERFLY VALVE NIBCO GD-4765 200 W.W.P. DUCTILE IRON EPDM-CTD. BODY GROOVED ENDS DUCTILE IRON EPDM-CTD. DISC EPDM SEAL 416 S.S. STEM 10-POSITION HANDLE	C2	CHECK VALVE NIBCO F-918-B 125 W.W.P. CAST IRON BODY FLANGED ENDS BRONZE TRIM RENEWABLE BRONZE SWING DISC & SEAT RING	E2	BALANCING VALVE BELL & GOSSETT MODEL CB 125 W.W.P. CAST IRON BODY BRASS BALL FLANGED OR GROOVED ENDS READOUT & DRAIN PORTS TFE SEATS CALIBRATED NAMEPLATE HANDLE WITH MEMORY STOP
B1	BALL VALVE NIBCO T-580-70/T-585-70 150 W.W.P. 2-PIECE FULL PORT BRONZE BODY THREADED/PRESS ENDS CHROME PLATED BRONZE BALL/BRONZE STEM TFE SEAT AND SEAL HANDLE.	C3	CHECK VALVE NIBCO T-480-Y 125 W.W.P. IN-LINE SPRING ACTUATED CENTER GUIDED SILENT CHECK BRONZE BODY THREADED ENDS TFE DISC AND EAT RING	E3	BALANCING VALVE BELL & GOSSETT MODEL MV 125 W.W.P. BRASS BODY CHROME BALL VENTURI TYPE THREADED ENDS READOUT PORTS TEFLON SEATS HANDLE WITH MEMORY STOP
B2	BALL VALVE NIBCO T-580-70-66/ T-585-70-66 150 W.W.P. 2-PIECE CONV. PORT BRONZE BODY THREADED/PRESS ENDS, 316 S.S. BALL AND STEM REINFORCED TFE SEAT AND SEAL HANDLE	C4	CHECK VALVE NIBCO F-910-B 125 W.W.P. IN-LINE SPRING ACTUATED CENTER GUIDED SILENT CHECK GLOBE STYLE IRON BODY FOR INSTALLATION BETWEEN FLANGES BRONZE SEAT AND DISC		
B3	BALL VALVE WATTS G4000M1 125 W.W.P. 2-PIECE FULL PORT EPOXY COATED CAST IRON BODY FLANGED ENDS 316 S.S. BALL AND STEM TEFLON SEAT AND SEAL D.I. HANDLE				

PIPE INSULATION SCHEDULE

QUALITY ASSURANCE

PRODUCTS SHALL COMPLY WITH ASTM E84 FIRE, SMOKE RATINGS:
- INDOORS - FLAME SPREAD RATING OF 25 OR LESS, SMOKE DEVELOPED RATING OF 50 OR LESS.
- OUTDOORS - FLAME SPREAD RATING OF 75 OR LESS, SMOKE DEVELOPED RATING OF 150 OR LESS.

GREEN GUARD INDOOR AIR QUALITY CERTIFIED.

THICKNESSES SHALL COMPLY WITH MOST CURRENT VERSION OF ASHRAE 90.1.

PRODUCTS

REQUIREMENTS ARE FOR BOTH SUPPLY & RETURN SYSTEMS.

MANUFACTURERS:

FIBERGLASS - JOHNS MANVILLE, OWENS CORNING, KNAUF, MANSON INSULATION

CALCIUM SILICATE - PABCO, CALSILITE, JOHNS MANVILLE (IIG)

FLEXIBLE ELASTOMERIC - AEROFLEX, ARMACELL, RUBATEX

POLYISOCYANURATE - ITW

EXECUTION

INSTALLATION PER MANUFACTURER'S RECOMMENDATIONS.

COLD SERVICE PIPE INSULATION AND VAPOR BARRIER/JACKET TO BE CONTINUOUS THRU FLOOR AND WALL SLEEVES AT ALL PIPE DEVICES AND PUMP CASINGS.

INSULATION AND VAPOR BARRIER TO BE CONTINUOUS AT PIPE HANGERS AND SUPPORTS ON HORIZONTAL PIPING.

VERTICAL PIPE SUPPORTS SHALL ATTACH DIRECTLY TO PIPE. INSULATE SUPPORT AND OTHER SURFACES WITH FLEXIBLE CLOSED CELL INSULATION, SAME THICKNESS AS SYSTEM INSULATION ON COLD SERVICE PIPES TO PREVENT CONDENSATION.

EXISTING PIPE INSULATION THAT IS DAMAGED, REMOVED OR NOT PRESENT WITHIN THE CONSTRUCTION AREA SHALL BE INSULATED PER SCHEDULE FOR THE SYSTEM SERVICE INDICATED.

INSULATION MAY BE OMITTED ON HOT WATER VALVES AND DEVICES 2" AND SMALLER PIPE SIZE (EXCEPT WITHIN 12" OF AIR REHEAT BOXES), HOT WATER PIPING WITHIN UNIT HEATERS, EXPOSED COOLING COIL CONDENSATE PIPING AND SAFETY RELIEF VALVE PIPING. SEE HEATING COIL PIPING DETAIL.

SYSTEM & SIZE	INSULATION THICKNESS	TYPE	LOCATION
CHILLED WATER & GLYCOL > 35°F	1.5"	F1, F2, F3	INTERIOR
CHILLED WATER & GLYCOL > 35°F	1.5"	E2, P1	EXTERIOR (CHILLED ONLY)
HOT WATER ≤ 1.25"	1.5"	F1	INTERIOR
HOT WATER ≥ 1.5"	2"	F1	INTERIOR
DOMESTIC MAKE-UP WATER	0.5"	F1	INTERIOR
REFRIGERANT LIQUID	0.75"	E1, E2	INTERIOR/EXTERIOR
REFRIGERANT SUCTION	0.75"	E1, E2	INTERIOR/EXTERIOR
COOLING COIL CONDENSATE	0.5"	F1, F2, F3	INTERIOR
CONDENSER WATER	0.5"	F1, F2, F3	INTERIOR

TYPE	BASIS OF DESIGN	APPROVED EQUALS	DESCRIPTION
F1	OWENS CORNING #ALL SERVICE JACKET	- KNAUF #1000° PIPE - JOHNS MANVILLE #MICRO-LOK HP	PREFORMED, TUBULAR, INORGANIC GLASS FIBER WITH RESIN BONDING. K=0.24 @ 100 DEG. F, 3.5 - 5.5 PCF. WHITE FSRK JACKET. LONGITUDINAL LAP, SELF-SEALING ADHESIVE. ELBOWS, TEES, VALVES, CAPS, ETC., WHITE ONE PIECE, PREMOLDED 25/50 0.20" PVC FITTING COVERS WITH HIGH DENSITY FIBERGLASS INSULATION INSERTS SAME THICKNESS, K=0.26 EQUAL TO ZESTON OR PROTO.
F2	OWENS CORNING #VAPORWICK	-	HIGH DENSITY, FIBERGLASS INSULATION WITH ORGANIC BINDER AND SYNTHETIC WICKING MATERIAL. K=0.24 @ 100 DEG. F. WHITE, RESILIENT POLYMER FACING EQUAL TO PVC JACKETING. AUXILIARY WICK MATERIAL FOR FITTINGS, ELBOWS, TEES, ETC.
F3	OWENS CORNING #PIPE SHIELD FIBERGLASS PIPE INSULATION	- KNAUF #1000° PIPE - JOHNS MANVILLE #MICRO-LOK HP	HIGH DENSITY, RESIN BONDED INORGANIC GLASS FIBERS, 850 DEG. F. RATED OPERATING TEMPERATURE. PREFORMED TUBULAR. K=0.54 @ 500 DEG. F. LONGITUDINAL WRAP. SELF-SEALING ADHESIVE. WHITE POLYMER JACKET, 225 DEG. F. RATING.
E1	AEROFLEX #AEROCEL EPDM	- ARMACELL - RUBATEX	FLEXIBLE, PRE-FORMED, CLOSED CELL, EPDM ELASTOMERIC TUBULAR INSULATION, OR SHEET INSULATION. K=0.25 @ 75 DEG. F. CLEAN PIPE SURFACE WITH DENATURED ALCOHOL PRIOR TO INSULATING.
E2	ARMACELL #AP ARMAFLEX FS	- AEROFLEX - RUBATEX	FLEXIBLE, PRE-FORMED, CLOSED CELL, ELASTOMERIC TUBULAR INSULATION. CLEAN PIPE SURFACE WITH DENATURED ALCOHOL PRIOR TO INSULATING. K=0.25 @ 75 DEG. F. 25/50 FLAME/SMOKE RATING. PROVIDE 0.20" ROLL ALLOY ALUMINUM EMBOSSED JACKET, SEAM SIDE DOWN WITH 0.50" WIDE, 0.015" S.S. STRAP AND SEALS EQUAL TO PABCO-CHILDERS METALS/GERRARD.
P1	ITW #TRYMER 4000	-	RIGID, PRE-FORMED, CLOSED CELL, POLYISOCYANURATE TUBULAR INSULATION K=0.19 @ 75 DEG. F. 4.0 PCF. LONGITUDINAL LAP WITH SELF-SEALING ADHESIVE. ELBOWS PRE-MOLDED PROVIDE HEAVY DUTY 13-PLY LAMINATE COATED ZERO PERMEABILITY VAPOR BARRIER CLADING, NATURAL ALUMINUM WITH FLAT FINISH. EQUAL TO VENTURETAPE "VENTURECLAD PLUS."

PIPING SYSTEMS - HVAC

GENERAL NOTES:

QUALITY ASSURANCE:

PIPING SHALL CONFORM TO OBC REQUIREMENTS.

PIPING SHALL COMPLY WITH ASME B31.9 "BUILDING SERVICES PIPING".

WELDING PROCEDURES & TESTING SHALL COMPLY WITH ANSI STANDARD B31.1.0.

PRODUCTS

REINFORCED FORGED WELDING OUTLETS EQUAL TO BONNET WELDOLET AND THREADOLET MAY BE USED WHERE BRANCH IS TWO SIZES SMALLER THAN THE MAIN.

DIELECTRIC CONNECTORS SHALL BE PROVIDED AT CONNECTIONS BETWEEN FERROUS & COPPER PIPING.

PIPING WITHIN 2'-0" OF SMALL HEATING/COOLING UNITS MAY BE TYPE "C3" PIPING.

MECHANICALLY FORMED TEES AND COUPLING (T-DRILL) ARE NOT PERMITTED

MECHANICAL JOINT PIPING SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURED RECOMMENDATIONS.

UNIONS:
COPPER TUBING - WROUGHT OR CAST COPPER, CLASS 150, SOLDERED ENDS
THREADED STEEL PIPE - MALLEABLE IRON W/GROUND SEAT, 300 LB SCREWED ENDS

FLANGES:
COPPER TUBING - CLASS 150 CAST COPPER ALLOY, SOLDERED
STEEL PIPE - CLASS 150 SLIP-ON OR WELD NECK
GASKETS - 1/16" THICK FULL FACE COMPRESSED SHEET GASKET SUITABLE FOR PRESSURE AND TEMPERATURE RANGES OF THE APPLICATION

BULB WELLS FOR TEMPERATURE SENSING SPECIFIED IN THE CONTROLS AND INSTRUMENTATION SECTION SHALL BE FURNISHED BY THE CONTROL SUBCONTRACTOR AND INSTALLED BY THE PIPING CONTRACTOR. OTHER TYPES OF CONTROL DEVICES (DIFFERENTIAL PRESSURE SWITCHES. FLOW METERS. ETC.) SHALL ALSO BE INSTALLED BY THE PIPING CONTRACTOR. DEVICES, FITTINGS (TEES, WELDOLETS, THREADOLETS), LOCATIONS AND INSTALLATION DETAILS SHALL BE CLOSELY COORDINATED WITH THE CONTROLS SUBCONTRACTOR AND DEVICE MANUFACTURER'S INSTRUCTIONS.

AUTOMATIC CONTROL VALVES SHALL BE FURNISHED BY THE CONTROLS SUBCONTRACTOR FOR INSTALLATION BY THE HVAC PIPING CONTRACTOR. FLARE FITTINGS FOR FLARE END VALVES SHALL BE PROVIDED BY THE HVAC PIPING CONTRACTOR.

EXECUTION

PIPE AND TUBING SHALL BE CUT AND FABRICATED TO FIELD MEASUREMENTS AND RUN PARALLEL TO NORMAL BUILDING LINES. PIPE INTERIOR SHALL BE CLEANED OF FOREIGN MATTER AND BURRS BEFORE ERECTION OF PIPE.

SUPPORT PIPING FROM BUILDING STRUCTURE WITH RODS, ANGLES & CLAMPS ATTACHED TO STRUCTURE. HANG PIPING WITH CLEVIS HANGER OR ROLLER SUPPORTS. HANGERS SHALL BE INSTALLED ON CENTERS AS RECOMMENDED BY MANUFACTURER.

PIPING SHALL BE PITCHED FOR DRAINAGE. THE LOW POINTS SHALL BE FITTED WITH A 3/4" BALL DRAIN VALVE WITH HOSE THREAD ADAPTOR.

PROVIDE PIPING SLEEVES AT FLOORS, WALLS & ROOFS IN NEW CONSTRUCTION. EXISTING WALL TO BE SAW CUT TO PASS NEW PIPING.

PIPING SHALL NOT BE RUN ABOVE ELECTRICAL SWITCHGEAR OR PANELBOARDS, NOR ABOVE THE ACCESS SPACE OF SUCH EQUIPMENT - NEC ARTICLE 384.

ANNULAR SPACE AROUND PIPING THRU ALL WALLS SHALL BE SEALED OFF WITH PERMANENT PLIABLE CAULKING OR APPROVED PATCHING SEALANT.

CLOSE OPEN ENDS OF PIPING DURING CONSTRUCTION.

CLEAN INTERIOR PIPING AFTER INSTALLATION BY FLUSHING WITH CLEAN POTABLE WATER TO CLEAR ALL INTERNAL DEBRIS.

TESTING

PIPING SHALL BE AIR TESTED AT 50% HIGHER THAN MAXIMUM SYSTEM OPERATING PRESSURE FOR EIGHT (8) HOURS BEFORE FLUSHING

IDENTIFICATION & MARKING

PLASTIC SNAP-ON PIPE MARKERS SHALL BE INSTALLED ON PIPING INDICATING SERVICE AND DIRECTION OF FLOW.

PIPING SYSTEM	TYPE
HOT WATER - 0.50" TO 2"	S2, C1, C2, C5
HOT WATER - 2.5" & ABOVE	S1, S3, C1, C2, C4, C5
CHILLED WATER W/GLYCOL - 2.5" &ABOVE	S1
CHILLED WATER W/GLYCOL - 2" & BELOW	S1, C3
1 CONDENSER WATER	C1, C2, C5
COLD WATER MAKE-UP	C1, C5
COIL CONDENSATE DRAINAGE	C3, P1

TYPE	DESCRIPTION	TYPE	DESCRIPTION
S1	WELDED BLACK STEEL SCHEDULE 40, ASTM A53 TYPE E 150 LB. C.I. FITTINGS	C3	SOLDERED COPPER TYPE "DWV" HARD COPPER ASTM B88 CAST DWV COPPER FITTINGS 95-5 SOLDER
S2	THREADED BLACK STEEL SCHEDUE 40, ASTM A53 TYPE F 150 LB. C.I. FITTINGS	C4	GROOVED COPPER TYPE "L" HARD COPPER ASTM B88 WROUGHT COPPER ASTM B75 C12200 FITTINGS VICTAULIC STYLE 606 COUPLING
S3	GROOVED BLACK STEEL SCHEDULE 40, ASTM A53 150 LB. MALLEABLE FITTINGS STEEL MECH. JOINTS EPDM 230 DEG. F. GASKETS VICTAULIC STYLE 07 COUPLING	C5	PRESS-FIT COPPER TYPE "L" HARD COPPER ASTM B88 WROUGHT COPPER ASTM B75 C12200 FITTINGS 250 DEG. F. EPDM SEALS
C1	SOLDERED COPPER TYPE "L" HARD COPPER ASTM B88 WROUGHT COPPER OR CAST BRONZE FITTINGS...	P1	PVC SCHEDULE 40 PVC ASTM D2665 DWV FITTINGS, ASTM D3311 GLUED JOINTS
C2	BRAZED COPPER TYPE "L" HARD COPPER ASTM B88 WROUGHT COPPER OR CAST BRONZE FITTINGS 15% SILVER ALLOY		

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ISSUE

NO.	DATE	DESCRIPTION
	JULY 19, 2023	ISSUE FOR PERMIT & CONSTRUCTION
1	JULY 31, 2023	ADDENDUM 1

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PIPING SCHEDULES

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