CSARCH

Bid Addendum No. 2

January 14, 2025
Nyack Union Free School District – Boiler Replacements
CSArch Project No. 226-2301
SED Control No. 50-03-04-03-0-006-17, 50-03-04-03-0-007-024, 50-03-04-03-0-005-010

Architect's Seal

This Bid Addendum No. 2 forms part of the Contract Documents and modifies the original bidding documents dated December 19, 2024. Bid Addendum No. 2 consists of zero (0) 30x42 drawings, two (2) specification sections, and response to Bidder RFI.

GENERAL INFORMATION

1. Bid Addendum No. 2 issued to all Bidders / Plan Holders on January 14, 2025.

REVISIONS TO THE PROJECT MANUAL

1. DELETE Section 230523. ADD revised Section 230523 in its entirety.
2. DELETE Section 232000. ADD revised Section 232000 in its entirety.

RESPONSES TO BIDDER RFIs

1. Are grooved fittings acceptable for HWS 2" and above, or does it have to be weld? *RESPONSE: Grooved pipe and fittings are acceptable for Hot Water Supply and Return (HWS & HWR) piping size 2-1/2" and above.*

END OF BID ADDENDUM NO. 2

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 230523 – VALVES – *REVISED BY BID ADDENDUM 2*

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 RELATED WORK SPECIFIED ELSEWHERE

HVAC Piping: Section 232000
Pumps:Section 232123
Pipe and Valve Identification: Section 230553
Direct Digital Control for HVAC: Section 230923
Cleaning and Testing: Section 230593

1.3 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data for each valve type. Include body material, valve design, pressure and temperature classification, end connection details, seating materials, trim material and arrangement, dimensions and required clearances, and installation instructions. Include list indicating valve and its application.

C. Valve Schedule: Valve schedule listing type of valve, manufacturer's model number and size for each service application.

D. Maintenance data for valves to include in the operation and maintenance manual specified in Division 1. Include detailed manufacturer's instructions on adjusting, servicing, disassembling, and repairing.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements: Valves and pressure relief devices shall conform to the specifications, regulations and requirements of all Agencies (Federal, State and Local), Codes, Local Gas and Power Companies and Associations having jurisdiction governing construction, sizing, application and location of same.

B. Single-Source Responsibility: Comply with the requirements specified in Division 1 Section "Materials and Equipment," under "Source Limitations" Paragraph.

C. ASME Compliance: Comply with ASME B31.9 for building services piping and ASME B31.1 for power piping.

D. MSS Compliance: Comply with the various MSS Standard Practice Documents referenced.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Prepare valves for shipping as follows:

1. Protect internal parts against rust and corrosion.
2. Protect threads, flange faces, grooved ends, and weld ends.
3. Set globe and gate valves closed to prevent rattling.
4. Set ball and plug valves open to minimize exposure to functional surfaces.
5. Set butterfly valves closed or slightly open.
6. Block check valves in either closed or open position.

B. Use the following precautions during storage:

1. Maintain valve end protection.
2. Store indoors and maintain valve temperature higher than ambient dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

C. Use a sling to handle large valves. Rig to avoid damage to exposed parts. Do not use hand wheels and stems as rigging points.

PART 2 - PRODUCTS

2.1 VALVES - GENERAL

A. Valve Standardization: Valves supplied for each specific valve type shall be the product of one manufacturer. Valves from one or more manufacturers may be used. Grooved valves shall be of the same manufacturer as the adjoining couplings.

B. Valves shall be first quality, free from all imperfections and defects, with body markings indicating manufacturer and rating. Valve parts of same manufacturer, size and type shall be interchangeable. All manually operated gate, globe and angle valves shall be of rising stem type, unless otherwise specified. All valves, which use packing, shall be capable of being packed when wide open and under full working

pressure. Size valves the same size as the piping in which they are installed, unless specified otherwise.

C. Furnish valves with chain operators when installed more than 8'-0" above grade or finished floor.

2.2 BALL VALVES

Conbraco Industries, Inc.; Apollo Division.
NIBCO Inc.
Stockham Valves & Fittings, Inc.
Watts Regulator Company.

A. Type BV: 300 psig OWG, cold, non-shock and a minimum working water pressure of 200 psig at 250 degrees F., with screwed or soldered ends, as required by the particular application. Furnish two piece bronze body valve with full port bronze ball, balancing stop, "Teflon" seats, "Teflon" or "Viton" stuffing box washers and gland seals, blow-out proof brass stem and corrosion resistant steel manual operating handle with a cool gripping cover. Provide extended stem valve handles on all valves.

2.3 CHECK VALVES

Hammond Valve Corporation.
Milwaukee Valve Company, Inc.
NIBCO Inc.
Stockham Valves & Fittings, Inc
Victaulic Company

A. Type A: 125 psig WSP, 200 psig OWG, 350 psig shell hydrostatic tests, horizontal swing, bronze body, brass or bronze trim, regrindable and renewable disc. Disc shall be rubber faced for cold water service and TFE for steam and steam condensate. Screwed ends.

B. Type B: 125 psig WSP, 200 psig OWG, 300 psig shell hydrostatic tests, horizontal swing, bronze body, brass or bronze trim, regrindable and renewable disc with solder ends. Disc shall be rubber faced for cold water service.

C. Type C: IBBM, 125 psig WSP, 200 psig OWG, 350 psig shell hydrostatic tests, bolted cover of iron or brass, regrindable and renewable seat ring and disc. Disc may be cast iron with bronze face on 4" and larger.

~~D. *Type F: 2" through 3" Spring Assisted: Black enamel coated ductile iron body, ASTM A-536, Grade 65-45-12, stainless steel non-slam tilting disc, stainless steel spring and*~~

~~*brass shaft, nickel-plated seat surface, 365 psi (2517 kPa). Grooved End. Victaulic Series 716H.*~~

~~*4" through 12" Spring Assisted: Black enamel coated ductile iron body, ASTM A-536, Grade 65-45-12, elastomer encapsulated ductile iron disc suitable for intended service, stainless steel spring and shaft, welded-in nickel seat, 300 psi (2065 kPa). Victaulic Series 716.*~~

~~E.~~ ~~*Type G: 4" through 12" Venturi Check: Black enamel coated ductile iron body, ASTM A-536, Grade 65-45-12 with venturi-like taps, elastomer encapsulated ductile iron disc suitable for intended service, stainless steel spring and shaft, welded-in nickel seat, 300 psi (2065 kPa). Victaulic Series 779.*~~

2.4 LUBRICATED PLUG VALVES

Hammond Valve Corporation.
Milwaukee Valve Company, Inc.
NIBCO Inc.
Stockham Valve & Fittings, Inc.

A. Type AB: 125 psig OWG with screwed ends. Valve shall have cast iron body, brass plug with a phosphor bronze spring washer and a lubrication system. A valve wrench shall be furnished for each valve type or size.

2.5 BUTTERFLY VALVES

Hammond Valve Corporation.
Milwaukee Valve Company, Inc.
NIBCO Inc.
Keystone
Victaulic Company

A. Type BF: Iron body, flangeless wafer lugged type, (lug for each bolt hole) drilled and tapped for cap screws, build for 150 psig OWG at 180 degrees F., with replaceable reinforced resilient EPT (EPDM) seats. Valve bodies shall have raised necks of height as required to accommodate a minimum of 2" insulation for valves installed in piping systems specified to be insulated. Discs shall be bronze and stems shall be carbon steel or stainless steel. Valves shall be provided with manual actuating handles. Manual actuator handles shall be provided with an external indication of disc position and a suitable means of locking actuator in any fixed position.

~~B.~~ ~~*Type BF-G: Sizes up through 12", Ductile iron body, grooved end body, build for 300 psig CWP at 250 degrees F., with pressure-responsive elastomer seat. Valve bodies shall have raised necks of height as required to accommodate a minimum of 2"*~~

~~*insulation for valves installed in piping systems specified to be insulated. Discs shall be aluminum-bronze, stainless-steel, or electroless-nickel coated ductile iron, with stainless steel stem. (Stem shall be offset from the disc centerline to provide full 360-degree circumferential seating.) Valves shall be provided with manual actuating lever or gear operators. Victaulic MasterSeal™.*~~

~~C.~~ ~~*Type BF-Gv: Sizes 14" and above, Ductile iron body, AGS grooved end body, build for 300 psig CWP at 230 degrees F., with disc mounted elastomer seal. Valve bodies shall have raised necks of height as required to accommodate a minimum of 2" insulation for valves installed in piping systems specified to be insulated. Discs shall be PPS coated ductile iron, with stainless steel stem. (Stem shall be offset from the disc centerline to provide full 360-degree circumferential seating.) Valves shall be provided with gear operators. Victaulic AGS-Vic300.*~~

2.6 BALANCING VALVES

Taco Inc.
Armstrong Pumps, Inc.
Bell & Gossett Div., ITT Fluid Technology Corp.
Victaulic Company / Tour and Andersson

A. Calibrated Balancing Valve shall be of heavy brass, Ametal copper-alloy, or ductile iron construction, with visible graduated dial indicator built for a working water pressure of 200 psig at 250 degrees F., of straightway pattern. Valves shall have ports for reading pressure drop and charts calibrated to indicate corresponding flows. Adjustment shall be made by means of wheel handle with full turn opening.

2.7 DRAIN VALVES

Conbraco Industries, Inc.; Apollo Division mdl 78-200
NIBCO Inc. T-585-70-HC
Watts Regulator Company B-6000-CC

A. Ball Drain Valves: MSS SP-110, Class 150, 600-psi (4140-kPa) CWP, ASTM B 584 bronze body and bonnet, 2-piece construction; chrome-plated brass ball, standard port valves; blowout proof; bronze or brass stem; teflon seats and seals; threaded or soldered end connections:

1. Operator: Vinyl-covered steel lever handle.
2. Stem Extension: For valves installed in insulated piping.
3. Hose thread connection and brass cap with chain.

2.8 SAFETY AND RELIEF VALVES

A. General Requirements: Safety valves, relief valves and safety relief valves shall be as specified by ASME Code governing manufacture of such valves within scope of their particular usage, i.e., Heating Boilers, Unfired Pressure Valves, etc., shall be tested, rated and listed, unless otherwise specified. Safety valves, relief and safety relief valves for applications specified shall conform to the ASME Code, Section IV, Heating Boilers and the following:

1. Valves for hot water heating boilers shall have a maximum pressure rating as indicated on the drawing schedules. Valves shall be of Safety Relief type, i.e., shall lift slowly to relieve normal thermal pressure build-up and "pop" to relieve excessive pressure due to "runaway" conditions, caused by the failure of any pressure control device and shut-down firing mechanism on excessive pressure indication. Valve bodies shall be bronze or cast iron, with non-vulcanizing synthetic discs and with seats of bronze.
2. Valves for Unfired Pressure Vessels: Safety and safety relief valves on secondary side of unfired pressure tanks, water heaters and heat exchangers shall comply with Code, requirements governing applicable equipment as outlined, in ASME Code, Section IV, Article 4, Paragraph HG 400.3 and as follows: Secondary side of heat exchanger shall be protected by officially rated valves, set for same pressure or temperature as heretofore specified, when secondary side furnishes steam or hot water for purpose equivalent to purposes for which a boiler would be installed; valves for this purpose shall be sized in accordance with Unfired Vessel Code.
3. End Connections: Unless otherwise specified, safety valves, relief valves and safety relief valves, in sizes 3/4" to 3" IPS inclusive, may be furnished with male or female pipe thread inlet and female pipe thread outlet; valves over 3" IPS must be furnished with 125 lb. or 250 lb. flanged inlet and may be equipped with female threaded or 125 lb. flanged outlet.

2.9 NEEDLE STOP VALVES

Marsh Instrument Co.
H.O. Trerice Co.
Weksler Instruments Co.

A. For Temperatures to 300 degrees F.: All brass or forged carbon steel construction, union bonnet, screwed ends, built for 1000 psi at 300 degrees F.

2.10 GAGE COCKS

Marsh Instrument Company
Mueller Instruments Co.
H.O. Trerice Co.
Weksler Instruments Co.

A. Gage Cocks: All brass construction, "T" or lever handles, screwed ends, built for 300 psig hydraulic pressure.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine piping system for compliance with requirements for installation tolerances and other conditions affecting performance of valves. Do not proceed with installation until satisfactory conditions have been corrected.

B. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.

C. Operate valves from fully open to fully closed positions. Examine guides and seats made accessible by such operation.

D. Examine threads on valve and mating pipe for form and cleanliness.

E. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Check gasket material for proper size, material composition suitable for service, and freedom from defects and damage.

F. Examine grooved ends for form and cleanliness. Grooved ends shall be clean and free from indentations or projections in the area from valve end to and including the groove.

G. Do not attempt to repair defective valves; replace with new valves.

3.2 INSTALLATION

A. Install valves as indicated, according to manufacturer's written instructions.

B. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate the general arrangement of piping, fittings, and specialties.

C. Install valves with unions, flanges or grooved joint couplings at each piece of equipment arranged to allow servicing, maintenance, and equipment removal without system shutdown.

D. Locate valves for easy access and provide separate support where necessary.

E. Install valves in horizontal piping with stem at or above the center of the pipe.

F. Install valves in a position to allow full stem movement.

G. Furnish valves with chain operators when installed more than 8'-0" above grade or finished floor. Extend chains to 60" above grade or finished floor.

H. Discharge pipes on safety relief valves: If a safety relief valve is provided with a discharge pipe, the area of the discharge pipe shall not be less than the area of the valve. If multiple safety relief valves are piped together the area of the combined pipe must be greater than or equal to the sum of the areas of the valves/piping with which it connects. [NOTE: VERIFY ON DWGS]

I. Installation of Check Valves: Install for proper direction of flow as follows:

1. Swing Check Valves: Horizontal position with hinge pin level.
2. Wafer Check Valves: Horizontal or vertical position, between flanges.

3.3 SOLDERED CONNECTIONS

A. Cut tube square and to exact lengths.

B. Clean end of tube to depth of valve socket with steel wool, sand cloth, or a steel wire brush to a bright finish. Clean valve socket.

C. Apply proper soldering flux in an even coat to inside of valve socket and outside of tube.

D. Open gate and globe valves to fully open position.

E. Remove the cap and disc holder of swing check valves having composition discs.

F. Insert tube into valve socket, making sure the end rests against the shoulder inside valve. Rotate tube or valve slightly to ensure even distribution of the flux.

G. Apply heat evenly to outside of valve around joint until solder melts on contact. Feed solder until it completely fills the joint around tube. Avoid hot spots or overheating valve. Once the solder starts cooling, remove excess amounts around the joint with a cloth or brush.

3.4 THREADED CONNECTIONS

A. Note the internal length of threads in valve ends and proximity of valve internal seat or wall to determine how far pipe should be threaded into valve.

B. Align threads at point of assembly.

C. Apply appropriate tape or thread compound to the external pipe threads, except where dry seal threading is specified.

D. Assemble joints, wrench tight. Wrench on valve shall be on the valve end into which the pipe is being threaded.

3.5 FLANGED CONNECTIONS

A. Align flange surfaces parallel.

B. Assemble joints by sequencing bolt tightening to make initial contact of flanges and gaskets as flat and parallel as possible. Use suitable lubricants on bolt threads. Tighten bolts gradually and uniformly with a torque wrench.

C. For dead-end service, butterfly valves require flanges both upstream and downstream for proper shutoff and retention.

3.6 GROOVED CONNECTIONS

A. Grooved joint valves shall be installed in accordance with the manufacturer's latest published installation instructions.

B. Grooved ends shall be clean and free from indentations, projections, and roll marks in the area from pipe end to groove.

C. Gaskets, seals, and seats shall be of an elastomer grade suitable for the intended service, and shall be molded and produced by the coupling manufacturer.

3.7 ADJUSTING

A. Adjust or replace packing after piping systems have been tested and put into service, but before final adjusting and balancing. Replace valves if leak persists.

3.8 VALVE APPLICATION SCHEDULE

A. Written continuity for specifying valves, using abbreviations and types, as employed under this Article, is as follows: Service of piping, symbol of service, pressure rating psig, size of valves, pipe end connection or valve end type, type of valve (gate or butterfly, globe or angle, check) in the aforementioned order unless otherwise specified.

B. General Application: Gate, ball, and butterfly valves for shutoff duty. Globe, ball and butterfly valves for throttling duty.

C. Schedule of valve applications for the different services is as follows:

1. Hot Water - 125 psig and Less:
   a. 2" and Less: BV ball valves, A or B checks. Screwed or solder ends.
   b. 2-1/2" and Up: BF, BF-G, BF-Gv butterfly and C, F or G checks. Flanged end.

3.9 CALIBRATED BALANCING VALVE APPLICATION SCHEDULE

A. Valves at full open shall have a pressure drop of approximately 5 ft. wg

B. Schedule of valve sizes and flows to be used is as follows:

Size (in.)	Nominal Flow (gpm)	Max* Flow (gpm)
1/2	0.5 - 2.8	4.5
3/4	2.8 - 6	10
1	6 - 10	15
1-1/4	10 - 15	25
1-1/2	15 - 20	34
2	20 - 36	60
2-1/2	36 - 100	160
3	100 - 130	220
4	130 - 200	320
5	200 - 320	520
6	320 - 450	700

*Maximum flow is calculated for the valve fully open and ♠P approximately 5 ft. wg (speed of water max 8.5 ft/sec)

C. Valve chart is based on Tour and Anderson, Model STAD/STAT and STAF.STAG. Verify valve size with manufacturer for specific application.

END OF SECTION 230523

SECTION 232000 – HVAC PIPING – *REVISED BY BID ADDENDUM 2*

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. All work under this title, on drawings or specified, is subject to the architectural general and special contract conditions for the entire project, and the contractor for this portion of the work is required to refer especially thereto, and to the architectural drawings.

1.2 RELATED WORK SPECIFIED ELSEWHERE

Common Work Results for HVAC: Section 230500
Cutting and Patching: Section 230503
Valves: Section 230523
Cleaning and Testing: 230593
Piping and Equipment Insulation: Section 230719
Direct Digital Control for HVAC: 230923

1.3 SUBMITTALS

A. Product Data: Manufacturer's name and the schedule, type of class of all pipe and fittings.

1. Where optional materials are specified in the "Pipe and Fitting Schedule", provide a pipe schedule to indicate the options selected; including piped systems, pipe material and break down of pipe sizes.

B. Quality Control Submittals

1. Installers Qualification Data
   a. Welder Qualification Data: Copies of certification; including names and previous project experience of welders.

1.4 QUALITY ASSURANCE

A. Qualifications of Welding Procedures, Welders and Welding Operators: Comply with the following:

1. Section IX ASME Boiler and Pressure Vessel Code, Part QW Welding.
2. American Welding Society Standard AWS D10.9, AR-3.

PART 2 – PRODUCTS

2.1 STEEL PIPE AND FITTINGS

A. Standard Weight Schedule 40 or Extra Heavy Weight Schedule 80 Pipe, black or galvanized: ASTM A 53, ASTM A 106 or ASTM A 135.

B. Flanges, Welding Neck Type, Same Pressure Rating as Adjoining Pipe: ASME B16.5.

C. Welding Fittings, Carbon Steel:

1. Butt Welding Type: ASME B16.9.
   a. Allied Piping Products Co., Inc.'s Branchlets, Type 1 or 2.
   b. Bonney Forge Corp's Weldolets.
2. Socket Welding Type: ASME B16.11.
   a. Allied Piping Products Co., Inc.'s Branchlets, Type 1 or 2.
   b. Bonney Forge Corp's Threadolets or Sockolets.

D. Compact Design Weld Fittings: Landish Co.'s LP, Nibco Inc's Husky, Taylor Forge Inc.'s Compact Line, Tube Turns Inc.'s Econo.

E. Malleable Iron, Steam Pattern Threaded Fittings.

1. 150 lb. Class: ASME B16.3.
2. 300 lb. Class: ASME B16.3.

F. Cast Iron Fittings

1. Drainage Pattern, Threaded: ASME B16.12
2. Steam Pattern, Threaded: ASME B16.4
   a. Standard Weight: Class 125
   b. Extra Heavy Weight: Class 250
3. Flanged Fittings and Threaded Flanges: ASME B16.1
   a. Standard Weight: Class 125
   b. Extra Heavy Weight: Class 250

G. Unions: Rated 250 psi at 210 degrees F; ASME B16.39

H. Unions: Rated 250 psi at 275 degrees F; ASME B16.39

I. Couplings: Same material and pressure rating as adjoining pipe, conforming to standards for fittings in such pipe. Use taper tapped threaded type in screwed

pipe systems operating in excess of 15 psig.

J. Nipples: Same material and strength as adjoining pipe, except nipples having a length of less than one inch between threads shall be extra heavy.

2.2 COPPER AND BRASS PIPE, TUBING AND FITTINGS

A. Water Tube, Types K, L, and M: ASTM B 88.

B. Wrot Copper Water Tube Fittings, Solder Joint: ASME B16.22.

C. Refrigerant Tube, Dry Sealed, Soft Annealed: ASTM B 280.

D. Flared Tube Fittings:

1. Water Tube Type: ASME B16.26.
2. Automotive Tube Type: SAE J512.
3. Refrigerant Tube Type: SAE J513.

E. Flanges: Conform to the Standards for fittings used in systems.

1. Brazing Flanges: ASME B16.24, hubs modified for brazing ends.

F. Unions: Cast bronze, 150 lb. Class, bronze-to-bronze seats, threaded or solder joint.

2.3 JOINING AND SEALANT MATERIALS

A. Thread Sealant

1. Lake Chemical Co.'s, Slic-Tite.
2. Loctite Corp's pipe sealant with Teflon.

B. Solder: Solid wire type conforming to the following:

1. Lead-free tin-Silver solder (ASTM B 32 Alloy Grade Sn 96): All-State Welding Products Inc.'s 430, J. W. Harris Co. Inc's Stay-Brite or Engelhard Corp's Silvabrite.

C. Soldering Flux for Soldered Joints

1. Solder: All-State Welding Products Inc.'s Duzall; J. W. Harris Co. Inc.'s Stay-Clean; Engelhard Corp's General Purpose Liquid or Paste.

D. Electrodes and Welding Rods

1. Electrodes for use in Arc Welding: Heavily coated, not larger than 3/16-inch diameter exclusive of coating, unless otherwise acceptable.
2. Welding Rods: Free flowing when fused, so as to avoid excessive

puddling.

3. Electrodes for Welding Stainless Steels: Coated and used with reverse polarity
4. Filler material shall conform to the appropriate AWS-ASTM specification.

E. Flange Gasket Material

1. For Use with Cold Water or Chilled Water: 1/16 inch thick rubber and chemical compatibility with the system fluid.
2. For Use with Hot Water, Air or Steam: Waterproofed non-asbestos mineral or ceramic fiber, or a combination of metal and waterproofed non-asbestos mineral or ceramic fiber, designed for the temperature and pressures of the piping systems in which installed and chemical compatibility with the system fluid.

F. Anti-Seize Lubricant: Bostick Inc.'s Never Seez or Dow Corning Corp's Molykote 1000.

2.4 GROOVED PIPING SYSTEM

A. Grooved piping system as manufactured by Victaulic Co., Grinnell by Tyco, Gruvlok by ANVIL or acceptable manufacturer.

B. Pipe:

1. Standard Weight Schedule 40 or Extra Heavy Weight Schedule 80 Pipe, black or galvanized: ASTM A 53, ASTM A 106 or ASTM A 135.
2. Cut grooved end piping is not acceptable.
3. Couplings: Victaulic Co.'s flexible type Style 77 and W77,-having pressure rating of:
a. 1000 psi for 3/4 inch to 6 inch
b. 800 psi for 8 inch to 12 inch
c. 350 psi for 14 inch to 24 inch

C. Couplings and Fittings for Grooved End Pipe

1. Grooved-End-Tube Couplings: Rigid pattern gasketed fitting. Ductile-iron housing cast with offsetting, angle-pattern bolt pads to provide visual confirmation of joint integrity upon metal-to-metal pad contact. Tongue and recess rigid type couplings may only be used if the contractor uses a torque wrench for installation. Required torque shall be in accordance with the manufacturer's latest recommendations and each coupling shall be tagged indicating the specific value of torque attained to confirm joint rigidity and proper installation. Synthetic EPDM gasket similar to Grade EHP rated for maximum 250 deg F or Grade E EPDM rated to maximum of 230 deg F for use with housing, and steel bolts and nuts. Couplings shall be manufactured to connect copper tubing sized tube and fittings.

2. Couplings: Victaulic co.'s Zero-Flex Style 07 and 107H, having minimum pressure rating of:

a. Style 107H or Style 07.

1) 750psi from 2 inch to 5 inch.

2) 700psi for 6 inch.

3) 600psi for 8 inch.

4) 500psi for 10 inch (07 only).

5) 400psi for 12 inch (07 only).

c. Style W07: 350 psi.

3. Fittings: By same manufacturer as couplings, having pressure ratings equal to or greater than couplings. Comply with the following standards:

a. Steel: ASTM A53 or A106, Grade B

b. Wrought Steel: ASTM A234, Grade WPB

c. Ductile Iron: ASTM A536

4. Gaskets for Use with Grooved End Pipe and Fittings: Type and materials as recommended and furnished by the fitting manufacturer, for the service of piping system in which installed.

5. Flange Adapter: Flat face, ductile iron housings with elastomeric pressure responsive gasket, for direct connection to ANSI Class 125 or 150 flanged components. Victaulic Style 741/W741.

6. Pipe Joint Make-up:

a. Grooved Pipe Joint. Make up joint with grooved end fittings and couplings, in conformance with the manufacturer's printed installation instructions. Pipe grooving shall be rolled in accordance with joint manufacturer's specifications. Lubricate gasket exterior including lips, pipe ends and housing interiors to prevent pinching the gasket during installation. Lubricant shall be as recommended by coupling manufacturer.

2.5 PACKING MATERIALS FOR BUILDING CONSTRUCTION PENETRATIONS

A. Mechanical Modular Seals: Thunderline Corp's Link Seal wall and floor seals designed for the service of piping system in which installed.

2.6 DIELECTRIC CONNECTORS

A. Brass nipples, couplings, fittings, valves or combinations of are not considered a dielectric connection and shall not be an acceptable assembly for such.

B. Dielectric waterway fittings with an inert, non-corrosive thermoplastic lining (NSF/FDA listed). Manufacturer: Grinnell, GruvLok or Victaulic Co.

C. Flange Electrical Insulation Kit: Consisting of dielectric sleeves and washers and dielectric gasket.

1. Rated 250 psi at 210 degrees F.
2. Rated 250 psi at 275 degrees F.

D. Flange Unions: Rated 175 psi at 210 degrees F; ASTM B16.42 (iron) and ASTM B16.24 (bronze).

2.7 PIPE SLEEVES

A. Type A: Schedule 40 steel pipe.

B. Type B: No. 16 gauge galvanized sheet steel.

C. Type C: Schedule 40 steel pipe and 1/4 inch steel collar continuously welded to pipe sleeve. Size steel collard as required to span a minimum of one cell or corrugation, on all sided of the rough opening thru the metal deck.

D. Type D: No. 16 gauge galvanized sheet steel with 16 gauge sheet steel metal collar rigidly secured to sleeve. Size metal collard as required to span a minimum of one cell or corrugation on all sides of the rough opening thru the metal deck.

2.8 FLOOR, WALL, AND CEILING PLATES

A. Cast Brass: Polished chrome plated finish, with set screw.

1. Solid Type: Models 5 and 5T by Pegasus Manufacturing Inc., Cheshire, CT; and Models 951 – 960 (inclusive) by Bridgeport Plumbing Products, Moultrie, GA.
2. Split Type: Models 3 and 3T by Pegasus Manufacturing Inc., Cheshire, CT.

B. Cast Iron: Solid type, unplated, with set screw. Model 395 by Grinnell Corp., Cranston, RI.

PART 3 - EXECUTION

3.1 INSTALLATION – GENERAL

A. The drawings show the general arrangement of pipe equipment but do not show all required fittings and offsets that may be required. Provide all necessary fittings, offsets and pipe runs based on field measurements.

B. Provide dielectric connections whenever connecting dissimilar materials.

C. Install vertical piping plumb and piping generally parallel to walls and column center lines, unless shown otherwise on the drawings. Space piping, including insulation, to provide one inch minimum clearance between adjacent piping or other surface. Unless shown otherwise, slope steam, condensate and drain piping down in the direction of flow not less than 25 mm (one inch) in 12 m (40 feet). Provide eccentric reducers to keep bottom of sloped piping flat.

D. Install piping clear of door swings and above sash heads.

E. Make allowances for expansion and contraction.

F. Use fittings for offsets and direction changes, except for Type K soft temper water tube.

G. Cut pipe and tubing ends square: ream before joining.

H. Threading: Use American Standard taper pipe thread dies.

1. Thread brass pipe with special brass threading dies.

I. Make final connections to equipment with unions, flanges, or mechanical type joint couplings.

J. Provide taps and install wells in piping for EMS/control system sensors and flow measurement devices.

3.2 WATER PIPING SYSTEMS

A. Pitch

1. Pitch horizontal piping 1/8 inch per 10 ft. in direction indicated on drawings. When direction of flow is not indicated, pitch supply piping up in direction of flow and return piping downward indirection of flow.
2. Pitch single pipe systems up in direction of flow 1/8 inch per 10 ft.

B. Air Vents: Install air vents at locations indicated on the drawings and at each high point in system. Use manually operated air vents, unless otherwise indicated.

C. Drains

1. Install piping to be completely drainable. Provide drains at low points, consisting of a 1/2-inch Drain Valve (Apollo #78-200) and at the following locations and equipment:
   a. In each section of piping separated by valves.
   b. For each riser, where riser or runout to riser has a valve installed.

c. For each heating cooling unit, having valves in supply and return connections.
d. In low point of piping to each down fed convector or radiator.

D. Runouts: Connect runouts to upfeed risers to top of mains and runouts to downfeed riser to bottom of mains.

1.3 PIPE JOINT MAKE-UP

A. Threaded: Threads shall conform to ASME B1.20, joint compound shall be applied to male threads only and joints made up so no more than three threads show. Coat exposed threads on steel pipe with joint compound, or red lead point for corrosion protection.

B. Soldered: Thoroughly clean tube end and inside of fitting with sandpaper or wire brush. Apply flux to the pre-cleaned surfaces. Install fitting, heat to soldering temperature, and join the metals with type solder specified. Remove residue.

C. Flange:

1. Install threaded companion flanges on steel pipe; flanges on galvanized pipe are not required to be galvanized.
2. Provide a gasket for each joint.
   a. Hot Water Pipe Gasket: Coat with a thin film of oil before making up joint.
   b. Compressed, Control, and Instrument Air Pipe Gasket: Coat with a thin film of oil before making up joint.
3. Coat bolt threads and nuts with anti-seize lubricant before making up joint

D. Welded: Beveling, spacing and other details shall conform to ASME B31.9. See Welder's qualification requirements under "Quality Control Submittals" in Section 1.03, Submittals.

E. Welded: Beveling, spacing and other details shall conform to ASME B31.1. See Welder's qualification requirements under "Quality Control Submittals" in Section 1.03, Submittals.

F. Compact design weld fittings up to and including 12 inch in size may be used in low pressure steam and heating hot water piping systems.

G. Dissimilar Pipe Joints

1. Joining Dissimilar Threaded Piping: Make up connection with a threaded coupling or with companion flanges.
2. Joining Dissimilar Non-threaded Piping: Make up connection with

adapters recommended by the manufacturers of the piping to be joined.

3. Joining Steel pipe, Brass or Copper Tubing: Make up joint with a dielectric connector.

1.4 PIPING PENETRATIONS

A. Sleeve Schedule: Unless otherwise shown, comply with the following schedule for the type of sleeve to be used where piping penetrates wall, floor, or roof construction.

	CONSTRUCTION	SLEEVE TYPE
1.	Foundation walls	A*
2.	Non-waterproof interior walls	B*
3.	Non-waterproof interior floors on metal decks	D*
4.	Non-waterproof interior floors not on metal decks	B*
5.	Floors over mechanical equipment, steam service, machine and boiler rooms.	A
6.	Earth supported concrete floors	None Required
7.	Fixtures with floor outlet waste piping	None Required
8.	Metal roof decks	C
9.	Mon-metal roof decks	A
10.	Waterproof floor on metal decks	D
11.	Waterproof floors not on metal decks	A
12.	Waterproof walls	A

* - core drilling is permissible in lieu of sleeves where marked with asterisks.

B. Diameter of Sleeves and Core Drilled Holes

1. Unless otherwise specified, size holes thru floors and walls in accordance with the through penetration fire stopping system being used.
2. Size holes thru exterior masonry walls or waterproofed walls above inside earth or finished floors, and exterior concrete slabs in accordance with the following:
   b. Un-insulated (Bare) Pipe: Inside diameter of sleeve or core drilled hole 1/2 inch greater than outside diameter of pipe, unless otherwise specified.
   c. Insulated Pipe: Inside diameter of sleeve or core drilled hole 1/2 inch greater than outside diameter of insulation, unless otherwise specified.
   d. Mechanical Modular Seals: Size holes in accordance with the manufacturer's recommendations.

C. Length of Sleeves (except as shown otherwise on Drawings)

1. Walls and Partitions: Equal in length to total finished thickness of wall or

partition.

2. Floors, Finished: Equal in length to total finished thickness of floor and extending 1/2 inch above the finished floor level, except as follows:
   a. In furred spaces at exterior walls, extend sleeve one inch above the finished floor level.
3. Exterior Concrete Slabs: Equal in length to total thickness of slab and extending 1/2 inch above the concrete slab.
4. Roofs: Equal in length to the total thickness of roof construction, including insulation and roofing materials, and extending one inch above the finished roof level.

D. Packing of Sleeves and Core Drilled Holes

1. Use through-penetration firestop devices, forming materials, and fill, void or cavity materials to form through-penetration firestops to prevent the passage of flame, smoke, fumes, and hot gasses as detailed in the UL Fire Resistance Directory, Warnock Hersey Certification Listings Book, or the Omega Point Laboratories Listings Directory. Where applicable design is not detailed in the Directories use forming materials and fill, void or cavity material to form appropriate through-penetration firestop in accordance with printed details and installation instructions from the Company producing the acceptable forming materials and fill, void or cavity materials.
2. Firestop through-penetration of floors, walls, partitions, ceilings, and roof in accordance with the fire resistance rating assigned to the walls, partitions, floors, ceilings, and roofs on the Construction Work Drawings.
3. Pack sleeves in exterior masonry walls or waterproofed walls above inside earth or finished floors with oakum to within 1/2 inch of each wall face, and finish both sides with one-part, non-sag polysulfide base sealant: Pecora's Synthacalk GC-9, Products Research and Chemicals PRC Rubber Calk 7000, or Sonneborn's One Part Polysulfide Sealant. Optional use of Mechanical Modular Seals is recommended.

E. Weld metal collars of sleeves to the upper surface of the metal deck. Seal voids under the metal collar as recommended by the manufacturer of the metal deck.

1.5 FLOOR, WALL AND CEILING PLATES

A. Install plates for exposed un-insulated piping passing through floors, walls, and exterior concrete slabs as follows:

1. In Finished Spaces
   a. Piping 4 Inch Size and Smaller: Solid or split, chrome plated cast brass.
   b. Piping over 4 Inch Size: Split, chrome plated cast brass.

2. Unfinished Spaces (including exterior concrete slabs): Solid, unplated cast iron.
3. Fasten plates with set screws.
4. Plates are not required in pipe shafts or furred spaces.

1.6 PIPING AND FITTING SCHEDULE

A. Abbreviations: The following abbreviations are applicable to the Pipe and Fitting Schedule.

BS – black steel
CI – cast iron
GE – grooved end
SE – screwed end
SW – standard weight
WE – weld weight

B. Where options are given, choose only one option for each piping service. Deviations from selected option will be allowed if reviewed with Engineer prior to installation.

C. Schedule of Pipe and Fittings for the different piping services is as follows:

1. Cold Water (CW) 125 psig and less:
   a. All pipe sizes: Type L hard temper copper tubing with wrot copper solder fittings, and solder.
2. Hot Water Supply and Return (HWS & HWR) 125 psig and less:
   a. 2 inch and less: Type L hard temper copper tubing with wrot copper solder fittings and solder.
   b. 2-1/2 inch size: SW BS pipe, with SE & SW CI fittings, or WE & SW ST fittings, or GE & GE fittings.
   c. 5 inch and up: SW BS pipe, with WE & SW ST fittings, or GE & GE fittings.

END OF SECTION 232000

THIS PAGE INTENTIONALLY LEFT BLANK