

## ADDENDUM # 3

**Project Name: DOC CCF Tunnel Repair/Replacement Main Bldg to SW Wing**  
**DAS# 9444.00**  
**RFP 944400-02**  
**Addendum # 3**  
**Dated: 02/18/26**

This Addendum forms a part of the Request for Bid documents. This Addendum supersedes and supplements all portions of the original Request for Bid dated January 09, 2026, with which it conflicts.

ACKNOWLEDGE RECEIPT OF THIS ADDENDUM IN THE REQUEST FOR BID. FAILURE TO DO SO MAY SUBJECT TO DISQUALIFICATION.

### 1. Questions:

1. Is this project inside the correctional center fence?
  - a. *A: This project is NOT inside the fence with the facility.*
2. Do we need to have a guard to escort us every day?
  - a. *A: You will NOT have a guard escorting on a daily basis. Samuels Group will have a superintendent on site 2 days a week during the construction.*
3. Do tools need to be inventoried every morning and evening by a guard before entering and leaving?
  - a. *A: NO, the contractor shall create a master list of tool and give to the facility for verification on a daily basis.*
4. Can Metraflex be entered into the specification for expansion loops and guides? STEAM EXPANSION COMPENSATOR 1 Metraflex 6" Welded Metragator Expansion Compensator with 6" of Movement 1 Metraflex 6" Flanged Metragator Expansion Compensator with 6" of Movement Metraflex Style IV Pipe Guides for 6" Steam and 4.5" Insulation?
  - a. *A: Product noted is acceptable. Refer to added specification section 230516 for additional information. An updated specification TOC has also been provided indicating addition of this section.*
5. Looking at the drawings, it shows SCH 80 for the medium pressure steam. This is not the norm. Condensate will be SCH 80 but not the steam supply. Please advise if this is accurate. Did you consider the weight of the SCH 80 pipe when designing the hanger system?
  - a. *A: SCH 40 pipe is acceptable for medium pressure steam. Refer to updated specification section 232213 for additional information.*
  - b. *Pipe supports are sufficient for either SCH 40 or SCH 80.*
6. I see notes on demo for removing 12KV electrical pipe I don't see where this originates and is there a high voltage switch that goes with this conduit or is it just abandoned?
  - a. *A: The 12K conduit and conductors are abandoned in the tunnel.*
7. Saw this in the spec just confirming they were allowing PVC or IMC in the tunnel?
  - a. *A: Conduits in tunnel shall be PVC, IMC or Rigid Aluminum Conduit*

8. Is there a bathroom on site the contractors can use or is a porta potty needed?  
a. *A: There is a bathroom that can be used at the facility.*

**2. Clarifications:**

- a. *N/A*

**3. Drawings:**

- a. *N/A*

**4. Specifications:**

- a. *Add Specification Section 230516 in its entirety.*  
b. *Revised Specification TOC to include addition of section 230516. Refer to clouds on attachment.*  
c. *Revised specification 232213. Refer to clouds on attachment.*

**5. Attachments:**

- a. *N/A*

**END OF ADDENDUM**


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**SECTION 23 05 16**  
**EXPANSION FITTINGS AND LOOPS FOR HVAC PIPING**

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**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A Flexible pipe connectors.
- B Expansion joints and compensators.

**1.2 REFERENCE STANDARDS**

- A ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2022.
- B EJMA (STDS) - EJMA Standards; Tenth Edition.
- C UL (DIR) - Online Certifications Directory; Current Edition.

**1.3 GENERAL**

- A Provide expansion joints as indicated on the contract drawings or as required to accommodate any axial thermal expansion or contraction of the piping system.
- B Expansion joints to be of the packless, externally pressurized type where system line pressure is external to the bellows to minimize squirm.
- C Externally pressurized bellows expansion joints shall not be utilized to compensate for lateral, angular or rotational movements.
- D All materials of construction, pressure ratings, and end fittings shall be appropriate for the application. Guiding and anchoring per EJMA recommendations and guidelines
- E Delegated-Design Submittal: Provide analysis signed and sealed by a qualified professional engineer. Submittal shall include:
  - 1. Design Calculations: Calculate requirements for thermal expansion of piping systems and criteria for selecting and designing expansion joints, hard-pipe loops, and swing connections.
  - 2. Schedule and drawings: Indicate type, manufacturer's number, size, material, pressure rating, end connections, and locations for each expansion joint, anchor and guide.

3. Anchor Details: Detail fabrication of each anchor indicated. Show dimensions, methods of assembly, and attachment to building structure.
4. Alignment Guide Details: Detail field assembly and attachment to building structure.

#### **1.4 SUBMITTALS**

**A Product Data:**

1. Flexible Pipe Connectors: Indicate maximum temperature and pressure rating, face-to-face length, live length, hose wall thickness, hose convolutions per foot and per assembly, fundamental frequency of assembly, braid structure, and total number of wires in braid.
2. Expansion Joints: Indicate maximum temperature and pressure rating, and maximum expansion compensation.

**B Design Data: Indicate selection calculations.**

**C Manufacturer's Instructions: Indicate manufacturer's installation instructions, special procedures, and external controls.**

**D Maintenance Data: Include adjustment instructions.**

**E Project Record Documents: Record installed locations of flexible pipe connectors, expansion joints, anchors, and guides.**

#### **PART 2 PRODUCTS**

##### **2.1 REGULATORY REQUIREMENTS**

- A Comply with UL (DIR) requirements.**

##### **2.2 FLEXIBLE PIPE CONNECTORS - STEEL PIPING**

**A Manufacturers:**

1. Flex-Weld, Inc: [www.kelcoind.com/#sle](http://www.kelcoind.com/#sle).
2. Flex-Hose Co., Inc.
3. Flexicraft Industries.
4. Flex-Pression, Ltd.

5. Mason-Mercer: [www.mason-industries.com](http://www.mason-industries.com).
  6. The Metraflex Company: [www.metroflex.com/#sle](http://www.metroflex.com/#sle).
  7. Unisource Manufacturing, Inc: [www.unisource-mfg.com/#sle](http://www.unisource-mfg.com/#sle).
  8. Twin City Hose, Inc.
- B Application: Must be rated for steam and steam condensate usage. Rated for high pressure and high temperature.
- C Inner Hose: Stainless Steel.
- D Exterior Sleeve: Double braided, stainless steel.
- E Pressure Rating: 125 psi up to 12 inch.
- F End Connections: Flanged.
- G Size: Use pipe sized units.
- H Maximum offset: 3/4 inch on each side of installed center line.

### 2.3 EXPANSION JOINTS - EXTERNALLY PRESSURIZED

- A Manufacturers:
1. Flex-Hose Co. Inc; \_\_\_\_\_: [www.flexhose.com/#sle](http://www.flexhose.com/#sle).
  2. Flex-Weld, Inc: [www.kelcoind.com/#sle](http://www.kelcoind.com/#sle).
  3. The Metraflex Company: [www.metroflex.com/#sle](http://www.metroflex.com/#sle).
  4. Unisource Manufacturing, Inc: [www.unisource-mfg.com/#sle](http://www.unisource-mfg.com/#sle).
- B Construction: All welded construction with stainless steel bellows, steel shroud, integral guide rings, and internal liner.
- C Bellows shall be 2 ply, low corrugation style manufactured from T 304 stainless steel. The number of corrugations and overall length of the expansion joints shall be determined by the thermal expansion requirements, system design engineer, and manufacturer's recommendations based on EJMA (Expansion Joint Manufacturers Association) standards.
- D Traveling end of expansion joint shall be equipped with a O-Ring debris shield to inhibit debris from entering expansion joint.

- E All joints to be provided with drain connection and lifting lug. Double end joints shall have anchor base to act as intermediate anchor.
- F End Connections: Class 300, carbon steel, raised face flange or weld end or grooved end..
- G Maximum Axial Compression: 8 inch.
- H Maximum Working Pressure: 150 psi at 700 degrees F.
- I Application: Steel piping 2 inches and over.

## 2.4 ACCESSORIES

- A Stainless Steel Pipe: ASTM A269/A269M, seamless type, Grade TP304.
- B Pipe Alignment Guides:
  - 1. Two piece welded steel with enamel paint, bolted, with spider to fit standard pipe, frame with four mounting holes, clearance for minimum , minimum 3 inches travel.
- C Swivel Joints:
  - 1. Fabricated steel body, double ball bearing race, field lubricated, with rubber (Buna-N) o-ring seals.
- D Steel Pipe Saddles:
  - 1. Designed for high temperature service or where heat losses are to be kept at a minimum and to protect insulation against damage at the point of support
  - 2. Conforms with Federal Specification WW-H-171 (Type 40A or 40B), Manufacturers Standardization Society ANSI®/MSS-SP-58 (Type 39)
- E Pipe Rollers:
  - 1. Hanger Type:
    - a. Suspends pipe from two rods where longitudinal movement in pipe may occur due to expansion or contraction.
    - b. Conforms with Federal Specification WW-H-171 (Type 42), Manufacturers Standardization Society ANSI®/MSS-SP-58 (Type 41).
  - 2. Chair and Frame Type:

- a. Support pipe from a substructure or structural member where longitudinal movement may occur due to expansion or contraction.
- b. Conforms with Federal Specification WW-H-171 (Type 45), Manufacturers Standardization Society ANSI®/MSS-SP-58 (Type 44).

### **PART 3 EXECUTION**

#### **3.1 INSTALLATION**

- A Install in accordance with manufacturer's instructions.
- B Install in accordance with EJMA (Expansion Joint Manufacturers Association) Standards.
- C Anchor pipe to building structure where indicated. Provide pipe guides so movement is directed along axis of pipe only. Erect piping such that strain and weight is not on cast connections or apparatus.
- D Provide support and equipment required to control expansion and contraction of piping. Provide loops and pipe offsets, or expansion joints where required.

#### **3.2 ALIGNMENT-GUIDE INSTALLATION**

- A Install guides on piping adjoining pipe expansion joints and bends and loops as recommended by the manufacturer.
- B Attach guides to pipe and secure to building structure.

#### **3.3 ANCHOR INSTALLATION**

- A Install anchors at locations to prevent stresses from exceeding those permitted by ASME B31.9 and to prevent transfer of loading and stresses to connected equipment.
- B Fabricate and install steel anchors by welding steel shapes, plates, and bars to piping and to structure. Comply with ASME B31.9 and AWS D1.1.
- C Construct concrete anchors of poured-in-place concrete of dimensions indicated and include embedded fasteners.
- D Install pipe anchors according to expansion-joint manufacturer's written instructions if expansion joints or compensators are indicated.

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- E Use grout to form flat bearing surfaces for expansion fittings, guides, and anchors installed on or in concrete.

**END OF SECTION**

**SECTION 23 22 13**  
**STEAM AND CONDENSATE HEATING PIPING**

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**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A Pipe and pipe fittings.
- B Pipe hangers and supports.
- C Steam piping system.
- D Steam condensate piping system.

**1.2 CODE AND PERMIT COMPLIANCE**

- A Work shall be in accordance with all applicable codes. Where the codes and drawings do not agree, the code shall take precedence; however, code shall take precedence over what is shown only when it is more stringent than that indicated. Items that are allowed by codes which are less stringent than that shown on the Drawings shall not be substituted.
- B Contractors shall familiarize themselves with all requirements as to permits, fees, etc., and shall comply. All permits, licenses, inspections, and arrangements required for the work shall be provided by the Contractors at their expense.
- C All utilities shall be installed in accordance with utility company rules and regulations.
- D Drawings, plans, and schematics and diagrams indicate the general location and the arrangement of piping systems. Wherever practical, install piping as indicated.

**1.3 REFERENCE STANDARDS**

- A ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300; 2021.
- B ASME B31.1 - Power Piping; 2024.
- C ASME B31.9 - Building Services Piping; 2020.
- D ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.

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- E ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2023a.
- F ASTM F708 - Standard Practice for Design and Installation of Rigid Pipe Hangers; 1992 (Reapproved 2008).
- G AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding; 2019.
- H AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).
- I MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2018, with Amendment (2019).
- J MSS SP-69 - Pipe Hangers and Supports - Selection and Application; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2003.
- K MSS SP-89 - Pipe Hangers and Supports - Fabrication and Installation Practices; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2003.

**1.4 SYSTEM DESCRIPTION**

- A When more than one piping system material is selected, ensure systems components are compatible and joined to ensure the integrity of the system is not jeopardized. Provide necessary joining fittings. Ensure flanges, unions, and couplings for servicing are consistently provided.
- B Use unions and flanges downstream of valves and at equipment or apparatus connections. Use dielectric unions where joining dissimilar materials. Do not use direct welded or threaded connections.
- C Provide pipe hangers and supports in accordance with ASME B31.9 unless indicated otherwise.
- D Use gate valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- E Use gate valves for throttling, bypass, or manual flow control services.

**1.5 SUBMITTALS**

- A Product Data: Provide data on pipe materials, pipe fittings, valves and accessories. Provide manufacturers catalogue information. Indicate valve data and ratings.
- B Welders Certificate: Include welders certification of compliance with ASME BPVC-IX.
- C Manufacturer's Installation Instructions: Indicate hanging and support methods, joining procedures.

- D Project Record Documents: Record actual locations of valves.
- E Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.
- F Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. Valve Repacking Kits: One for each type and size of valve.

## 1.6 QUALITY ASSURANCE

- A Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.
- B Welder Qualifications: Certified in accordance with ASME BPVC-IX.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A Accept valves on site in shipping containers with labelling in place. Inspect for damage.
- B Provide temporary protective coating on cast iron and steel valves.
- C Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- D Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

## PART 2 PRODUCTS

### 2.1 HIGH PRESSURE STEAM PIPING (150 PSIG MAXIMUM)

- A Steel Pipe: ASTM A53/A53M, Schedule 80, black.
  - 1. Fittings: ASME B16.3 malleable iron Class 150, or ASTM A234/A234M wrought steel welding type.
  - 2. Joints: Threaded, or AWS D1.1/D1.1M welded.

### 2.2 MEDIUM PRESSURE STEAM PIPING (30 PSIG MAXIMUM)

- A Steel Pipe: ASTM A53/A53M, Schedule 40, black.



1. Fittings: ASME B16.3 malleable iron Class 150, or ASTM A234/A234M wrought steel welding type.
2. Joints: Threaded, or AWS D1.1/D1.1M welded.

### **2.3 MEDIUM AND HIGH PRESSURE STEAM CONDENSATE PIPING (20-100 PSI)**

A Steel Pipe: ASTM A53/A53M, Schedule 80, black.

1. Fittings: ASME B16.3 malleable iron Class 125, threaded, or ASTM A 234/A 234M wrought steel.
2. Joints: Threaded, or AWS D1.1/D1.1M welded.

### **2.4 PIPE HANGERS AND SUPPORTS**

A Provide hangers and supports that comply with MSS SP-58.

1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.

B Conform to ASME B31.9.

C Hangers for Pipe Sizes 1/2 to 1-1/2 Inch: Malleable iron, adjustable swivel, split ring.

D Hangers for Pipe Sizes 2 to 4 Inches: Carbon steel, adjustable, clevis.

E Hangers for Pipe Sizes 6 Inches and Over: Adjustable steel yoke, cast iron roll, double hanger.

F Multiple or Trapeze Hangers for Pipe Sizes to 4 inches: Steel channels with welded spacers and hanger rods.

G Multiple or Trapeze Hangers for Pipe Sizes 6 Inches and Over: Steel channels with welded spacers and hanger rods; cast iron roll and stand.

H Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.

I Wall Support for Pipe Sizes 4 to 5 Inches: Welded steel bracket and wrought steel clamp.

J Wall Support for Pipe Sizes 6 Inches and Over: Welded steel bracket and wrought steel clamp; adjustable steel yoke and cast iron roll.

K Vertical Support: Steel riser clamp.

L Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.

M Steel Pipe Saddles:

1. Designed for high temperature service or where heat losses are to be kept at a minimum and to protect insulation against damage at the point of support
2. Conforms with Federal Specification WW-H-171 (Type 40A or 40B), Manufacturers Standardization Society ANSI/MSS-SP-58 (Type 39)

**2.5 UNIONS, FLANGES, AND COUPLINGS**

A Unions for Pipe 2 Inches and Under:

1. Ferrous Piping: 150 psig galvanized malleable iron, threaded.

B Flanges for Pipe Over 2 Inches:

1. Ferrous Piping: 150 psig forged steel, slip-on.
2. Gaskets: 1/16 inch thick preformed non-asbestos graphite fiber.

C Dielectric Connections: Dielectric flanges, couples, or nipples.

D Dielectric unions shall not be used.

E Waterways and Nipples:

1. Water impervious insulation barrier capable of limiting galvanic current to 1 percent of short circuit current in a corresponding bimetallic joint.
2. Dry insulation barrier able to withstand 600 volt breakdown test.
3. Construct of galvanized steel with threaded end connections to match connecting piping.
4. Suitable for the required operating pressures and temperatures.
5. Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig minimum working pressure at 225 degrees F

F Flanges:

1. Dielectric flanges with same pressure ratings as standard flanges.
2. Water impervious insulation barrier capable of limiting galvanic current to 1 percent of short circuit current in a corresponding bimetallic joint.
3. Dry insulation barrier able to withstand 600 volt breakdown test.

4. Construct of galvanized steel with threaded end connections to match connecting piping.
  5. Suitable for the required operating pressures and temperatures.
  6. Dielectric-Flange Insulation Kits: Field-assembled, companion-flange assembly, full-face or ring type. Components include neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.
- G Dielectric Couplings: Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining; threaded ends; and 300-psig minimum working pressure at 225 degrees F.

## 2.6 Y-STRAINERS

### A Manufacturers:

1. Apollo Valves: [www.apollovalves.com](http://www.apollovalves.com).
2. Crane Co.; Crane Valve Group: [www.cranevalve.com](http://www.cranevalve.com).
3. Hammond Valve: [www.hammondvalve.com](http://www.hammondvalve.com).
4. Nibco, Inc: [www.nibco.com](http://www.nibco.com).
5. Milwaukee Valve Company: [www.milwaukeevalve.com](http://www.milwaukeevalve.com).
6. Mueller Steam Specialty: [www.muellersteam.com](http://www.muellersteam.com).
7. Powell: [www.powellvalves.com](http://www.powellvalves.com).
8. Stockham: [www.stockham.com](http://www.stockham.com).

### B High Pressure Steam (150 psi max):

1. Up to and Including 2 Inches:
  - a. Class 250, bronze or iron body, stainless steel screen, bolted cover where available, threaded.
2. 2-1/2 Inches and Larger:
  - a. Class 300, iron body, stainless steel screen, bolted cover, flanged.

### C Low and Medium Pressure Steam (70 psi max):

1. Up to and Including 2 Inches:

- a. Class 125, bronze or iron body, stainless steel screen, bolted cover where available, threaded.
2. 2-1/2 Inches and Larger:
    - a. Class 125, iron body, stainless steel screen, bolted cover, flanged.

### **PART 3 EXECUTION**

#### **3.1 PREPARATION**

- A Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B Remove scale and dirt on inside and outside before assembly.
- C Prepare piping connections to equipment with flanges or unions.
- D Keep open ends of pipe free from scale and dirt. Whenever work is suspended during construction protect open ends with temporary plugs or caps.

#### **3.2 INSTALLATION**

- A Install in accordance with manufacturer's instructions.
- B Route piping in orderly manner, plumb and parallel to building structure, and maintain gradient.
- C Install piping to conserve building space and avoid interference with use of space.
- D Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- E Pipe Hangers and Supports:
  1. Install in accordance with ASME B31.9.
  2. Support horizontal piping as indicated.
  3. Place hangers within 12 inches of each horizontal elbow.
  4. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
  5. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.

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- a. Where trapeze hangers are constructed, the threaded rods supporting the trapeze member shall not extend more than 1" below assembly.
6. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
  7. Steel Pipe Saddles:
    - a. Provide on all steam and steam condensate piping 3" and larger.
- F Provide clearance for installation of insulation and access to valves and fittings.
- G Provide access where valves and fittings are not exposed.
- H Slope steam piping one inch in 40 feet in direction of flow. Use eccentric reducers to maintain bottom of pipe level.
- I Slope steam condensate piping one inch in 40 feet. Provide drip trap assembly at low points and before control valves. Run condensate lines from trap to nearest condensate receiver piping. Provide loop vents over trapped sections.
- J Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welds.
- K Install valves with stems upright or horizontal, not inverted.
- L Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.
- M Reduce pipe sizes using eccentric reducer fitting installed with straight side down.
- N Install branch connections to steam mains using 45-degree fittings in main pipe, with the takeoff coming out the top of the main pipe. Use of 90-degree tee fittings is permissible if 45-degree fittings are impractical. If length of branch takeoff is less than 10 feet, pitch branch line down toward mains at a 0.4 percent grade.
- O Install unions in piping 2" and smaller adjacent to each control valve, at final connections of each piece of equipment, and elsewhere as indicated.
- P Install flanges in piping 2-1/2" and larger at final connections of each piece of equipment and elsewhere as indicated.
- Q Install strainers on supply side of each control valve, pressure-reducing valve, solenoid valve, traps, and elsewhere as indicated. Install 3/4" nipple and gate valve with hose end and brass cap and chain in blowdown connection of strainers 2" and larger. Match size of strainer blowoff connection for strainers smaller than 2".

- R Anchor piping for proper direction of expansion and contraction.
- S Install drip legs at low points and natural drainage points such as ends of mains, bottoms of risers, and ahead of pressure regulators, control valves, isolation valves, pipe bends, steam traps and expansion joints.
1. On straight runs with no natural drainage points, install drip legs at intervals not exceeding 300 feet where pipe is pitched down in direction of steam flow and a maximum of 150 feet where pipe is pitched up in direction of steam flow.
  2. Size drip legs at vertical risers same size as pipe and extend beyond rise. Size drip legs at other locations same diameter as main. In steam mains 6" and larger, drip leg size can be reduced, but to no less than 4".
  3. Drip leg sizing, unless indicated otherwise:
    - a. Main size (Inches):   Drip leg size (Inches):   Drip leg Length (Inches):
    - b. 3 or less                      Full size as Main                      12"
    - c. 4 - 8                                      4                                      12"
    - d. 10 - 12                                      6                                      18"
    - e. 14 - 16                                      8                                      24"
    - f. 18 - 20                                      10                                      30"
    - g. 24    12                                      36"
  4. Install gate valve at drip legs, dirt pockets, and strainer blowdowns to allow removal of dirt and scale.
  5. Install steam traps close to drip legs.
- T Install swing check valves as required to control direction of flow and to serve as vacuum breakers.

**3.3 VALVE APPLICATIONS**

- A General-Duty Valve Applications: Unless otherwise indicated, use the following valve types:
1. Shutoff Duty: Gate and ball valves.
  2. Throttling Duty: Globe valves.

- B Provide shutoff duty valves at each branch connection to supply mains, at supply connection to each piece of equipment, unless only one piece of equipment is connected in the branch line.

### 3.4 SAFETY VALVE INSTALLATIONS

- A Install safety valves according to ASME B31.1. Pipe safety valve discharge without valves to atmosphere outside building. Install drip-pan elbow fitting adjacent to safety valve and pipe drain connection to near-est floor drain.

### 3.5 SCHEDULES

- A Hanger Spacing for Steel Steam Piping.

1. 1/2 inch: Maximum span, 8 feet; minimum rod size, 1/4 inch.
2. 3/4 inch and 1 inch: Maximum span, 9 feet; minimum rod size, 1/4 inch.
3. 1-1/4 inches: Maximum span, 11 feet; minimum rod size, 3/8 inch.
4. 1-1/2 inches: Maximum span, 12 feet; minimum rod size, 3/8 inch.
5. 2 inches: Maximum span, 13 feet; minimum rod size, 3/8 inch.
6. 2-1/2 inches: Maximum span, 14 feet; minimum rod size, 3/8 inch.
7. 3 inches: Maximum span, 15 feet; minimum rod size, 3/8 inch.
8. 4 inches: Maximum span, 17 feet; minimum rod size, 1/2 inch.
9. 6 inches: Maximum span, 21 feet; minimum rod size, 1/2 inch.

- B Hanger Spacing for Steel Steam Condensate Piping.

1. 1/2 inch, 3/4 inch, and 1 inch: Maximum span, 7 feet; minimum rod size, 1/4 inch.
2. 1-1/4 inches: Maximum span, 8 feet; minimum rod size, 3/8 inch.
3. 1-1/2 inches: Maximum span, 9 feet; minimum rod size, 3/8 inch.
4. 2 inches: Maximum span, 10 feet; minimum rod size, 3/8 inch.
5. 2-1/2 inches: Maximum span, 11 feet; minimum rod size, 3/8 inch.
6. 3 inches: Maximum span, 12 feet; minimum rod size, 3/8 inch.

7. 4 inches: Maximum span, 14 feet; minimum rod size, 1/2 inch.
8. 6 inches: Maximum span, 17 feet; minimum rod size, 1/2 inch.

### 3.6 FIELD QUALITY CONTROL

- A Contractor shall provide all isolation valves and piping connections necessary for isolating new piping from existing systems to allow flushing, cleaning and fill of new piping.
- B Prepare steam and condensate piping according to ASME B31.9 and as follows:
  1. Leave joints, including welds, uninsulated and exposed for examination during test.
  2. Flush system with clean water. Clean strainers.
  3. Isolate equipment from piping. If a valve is used to isolate equipment, its closure shall be capable of sealing against test pressure without damage to valve. Install blinds in flanged joints to isolate equipment.
  4. Install safety valve, set at a pressure no more than one-third higher than test pressure, to protect against damage by expanding liquid or other source of overpressure during test.
- C Perform the following tests on steam and condensate piping:
  1. Use ambient temperature water as a testing medium unless there is risk of damage due to freezing. Another liquid that is safe for workers and compatible with piping may be used.
  2. Install relief valve set at pressure no more than 1/3 higher than test pressure to protect against damage by expansion of liquid or other source of overpressure during the test.
  3. While filling system, use vents installed at high points of system to release trapped air. Use drains installed at low points for complete draining of liquid.
  4. Check expansion tanks to determine that they are not air bound and that system is full of water.
  5. Subject piping system to a hydrostatic test pressure which, at every point in the system, is not less than 1-1/2 times the design pressure assuming 125 psi minimum design pressure. The test pressure shall not exceed the maximum pressure for any vessel, pump, valve or component on the system under the test.
  6. Test pressure shall not exceed maximum pressure for any vessel, pump, valve, or other component in system under test. Verify that stress due to pressure at bottom of vertical runs does not exceed either 90 percent of specified minimum yield strength or 1.7 times "SE" value in Appendix A of ASME B31.9, "Building Services Piping."

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7. After hydrostatic test pressure has been applied for at least 4 hours, examine piping, joints, and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components, and repeat hydrostatic test until there are no leaks.
8. Prepare written report of testing.

**3.7 CLEANING**

- A Flush steam and condensate piping with clean water. Remove and clean or replace existing strainer screens serving system to be modified.
- B Contractor shall provide all isolation valves and piping connections necessary for isolating new piping from existing systems to allow flushing, cleaning and fill of new piping. Coordinate with owner.

**END OF SECTION**