SECTION 20 05 16 – piping Expansion compensation

GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

Specifications throughout all Divisions of the Project Manual are directly applicable to this Section, and this Section is directly applicable to them.

SUMMARY

Perform all Work required to provide and install the following piping expansion compensation equipment indicated by the Contract Documents with supplementary items necessary for their proper installation.

Flexible pipe connectors.

Expansion joints and compensators.

Pipe loops, offsets, and swing joints.

REFERENCE STANDARDS

The latest published edition of a reference shall be applicable to this Project unless identified by a specific edition date.

All reference amendments adopted prior to the effective date of this Contract shall be applicable to this Project.

All materials, installation and workmanship shall comply with the applicable requirements and standards addressed within the following references:

MIL-E-17814E-Expansion Joints, Pipe, Slip-Type, Packed.

QUALITY ASSURANCE

Provide structural Work and equipment required to control expansion and contraction of piping. Verify that anchors, guides, and expansion joints provided, adequately protect system.

Expansion Calculations

Installation temperature: 50 degrees F.

Safety Factory: 30 percent.

Hot Water Heating, Domestic Hot Water, Chilled Water and Steam temperature shall be as per system design.

SUBMITTALS

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.

Expansion Joints: Indicate maximum temperature and pressure rating, and maximum expansion compensation. Indicate alignment, guide locations, quantities, spacing, etc.

Operation and Maintenance Data: Include adjustment instructions, warranty.

Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with minimum three (3) years documented experience.

EXTRA MATERIALS

Provide two (2) 12-ounce containers of packing coverage for leak-free performance of expansion joints.

WARRANTY

Provide a five (5) year warranty including coverage for leak-free performance of expansion joints.

PRODUCTS

GENERAL

All materials shall meet or exceed all applicable referenced standards, federal, state and local requirements, and conform to codes and ordinances of authorities having jurisdiction.

Manufacturers

Flexible Pipe Connectors:

Hyspan Model Series 3505.

Pathway Model Xpress FF with anchor foot.

Expansion Joints – Steam:

Hyspan Model Series 3505.

Pathway Model Xpress FF with anchor foot.

Expansion Joints – Steel Piping:

Hyspan Model 3501 series.

Pathway Model Xpress FF with anchor foot.

Expansion Joints – External Ring:

Hyspan Model Series 5500.

Pathway Model Flexway CT.

Flexonics Model TCS-R.

Pipe Alignment Guides:

Anvil Model Fig. 255.

Piping Technology & Products Model Fig. 6.

Hyspan Model Series 9500.

AAA Technology Model Fig. 295.

FLEXIBLE PIPE CONNECTORS

Copper Piping - Domestic Water:

Pathway Model Xpress FF with anchor foot.

Exterior Sleeve: Braided bronze or stainless.

Pressure Rating: 200 psig WOG and 250 degrees F.

Joint: As specified for pipe joints.

Size: Use pipe-sized units.

Maximum offset: 3/4 inch on each side of installed centerline.

EXPANSION JOINTS

Steam - Stainless Steel Bellows (Externally Pressurized Guided Type):

Pressure Rating: 300 psig, maximum temperature 850 degrees F.

Maximum Compression: 4 inch.

Maximum Extension: 1 inch.

Joint: As specified for ANSI class.

Size: Use pipe-sized units.

Application: Steel piping 3 inches and under.

Steel Piping - 150 psig Chilled Water, 150 psig Heating Water, and Steam Condensate:

Annular Corrugated Inner Core: Steel laminated bellows meeting ASTM A 240.

Exterior Sleeve: Steel housing meeting ASTM A 53 GRB.

Pressure Rating: 150 psig and 300 psig at 750 degrees F. Refer to Drawings.

Joint: Flanged 150 and 300 raised face as required for piping system.

Size: Use pipe-sized units.

Axial Compression: 4 inches.

External Ring Stainless Steel Bellows Restrained (Chilled and Heating Water Pump Connectors) Type:

Pressure Rating: 350 psig at 400 degrees F.

Maximum Compression: 0.75 to 1.00 inches.

Maximum Extension: 0.25 inches.

Maximum Offset: 0.13 inches.

Joint: Flanged as required by ANSI class.

Size: Use pipe-sized units.

Bellows: Type 321 stainless steel.

Application: Steel piping over 3 inches.

ACCESSORIES

Pipe Alignment Guides:

Two (2) piece welded steel with enamel paint, bolted, with spider to fit standard pipe, frame with four mounting holes, clearance for minimum 1 inch thick insulation, minimum 3 inch travel.

Provide and install alignment guides at expansion joints per manufacturer’s requirements.

EXECUTION

INSTALLATION

Installation shall meet or exceed all applicable federal, state and local requirements, referenced standards and conform to codes and ordinances of authorities having jurisdiction.

All installation shall be in accordance with manufacturer’s published recommendations.

Accomplish structural work and provide equipment required to control expansion and contraction of piping, loops, pipe offsets, and swing joints, and provide corrugated bellows type expansion joints where indicated on Drawings or required.

Provide pipe anchors as shown on the Drawings and/or as required to facilitate proper operation of pipe guides. Install anchors in compression. Weld anchors to pipe and to building structure

Provide pipe guides so that movement takes place along axis of pipe only. Guide sizes shall be the nominal pipe size with insulation. Guides shall not carry dead weight load on pipe and are not intended to take the place of the required pipe supports and rollers.

Construct spool pieces to exact size of flexible connection for future insertion.

Install flexible pipe connectors on pipes connected to equipment supported by vibration isolation. Provide line size flexible connectors.

Install flexible connectors at right angles to displacement. Install one end immediately adjacent to isolated equipment and anchor the other end. Install in a horizontal plane unless indicated otherwise.

Rigidly anchor pipe to building structure where shown or where necessary. 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.

TESTING

Prepare and Start-up systems under provisions of Section 20 01 00 and Section 26 01 00.

Provide inspection services by flexible pipe manufacturer's representative for final installation.

Certify that installation is in accordance with manufacturer's recommendations and that connectors are performing satisfactorily. Notify Owner’s Project Manager at least five (5) calendar days prior to the inspection.

END OF SECTION 20 05 16