

## SECTION 235116 - FABRICATED BREECHINGS AND ACCESSORIES

**TIPS:**

To view non-printing **Editor's Notes** that provide guidance for editing, click on Masterworks/Single-File Formatting/Toggle/Editor's Notes.

To read **detailed research, technical information about products and materials, and coordination checklists**, click on Masterworks/Supporting Information.

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

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

## 1.2 SUMMARY

## A. Section Includes:

- 1. Listed, refractory-lined breechings.
- 2. Field-fabricated metal breechings.
- 3. Guying and bracing materials.

## B. Related Requirements:

- 1. Section 235113.11 "Draft Control Fans" for draft inducer fans, venturi-draft inducer fans, mechanical-draft vent fans, vent exhaust fans, and combustion-air fans.
- 2. Section 235113.16 "Vent Dampers" for motorized and barometric dampers.
- 3. Section 235123 "Gas Vents" for Type B and BW vents, Type L vents, and listed special gas vents.
- 4. Section 235133 "Insulated Sectional Chimneys" for listed chimney liners; listed building-heating-appliance chimneys; listed, refractory-lined metal chimneys; and field-fabricated chimneys.

## 1.3 ACTION SUBMITTALS

## A. Product Data: For each type of product.

- 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for product.

## B. Shop Drawings: For breechings.

- 1. Include plans, elevations, sections, and attachment details.

2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Detail fabrication and assembly of hangers and seismic restraints.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Seismic Qualification Certificates: For factory-fabricated breeching, accessories, and components from manufacturer.
  1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
  2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity, and locate and describe mounting and anchorage provisions.
  3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- C. Sample Warranty: For special warranty.

#### 1.5 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
  1. AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports.
  2. AWS D9.1/D9.1M, "Sheet Metal Welding Code," for shop and field welding of joints and seams in breechings.
- B. Certified Sizing Calculations: Manufacturer shall certify venting system sizing calculations.

#### 1.6 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of venting system that fail in materials or workmanship within specified warranty period.
  1. Failures include, but are not limited to, structural failures caused by expansion and contraction.
  2. Warranty Period: [10] [15] [25] <Insert number> years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 LISTED, REFRACTORY-LINED METAL BREECHINGS

- A. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)

- B. Comply with ASME STS-1.
- C. Design Wind Loads: [150 mph (241 km/h)] <Insert wind speed>.
- D. Design for seismic conditions at Project site.
- E. Refractory Lining: Tested according to UL 959 for temperature and acid resistance and bearing the testing laboratory label.
  - 1. Temperature Rating: 1800 deg F (982 deg C) continuously and 2000 deg F (1093 deg C) intermittently.
  - 2. Acid Extraction: Maximum of 0.2 percent.
  - 3. Cold Crushing Strength: Minimum of 3200 psig (22 MPa).
  - 4. Thickness: Minimum of 2 inches (50 mm).
- F. Finish: Factory-applied, high-heat-resistant paint; color as selected by Architect.

## 2.2 FIELD-FABRICATED METAL BREECHINGS

- A. Fabricate breechings from ASTM A 1011/A 1011M hot-rolled steel with continuously welded joints, complying with NFPA 211 for minimum metal thickness.
  - 1. Equal to or Less Than 1.069 Sq. Ft. (0.099 Sq. m.) or 14 Inches (356 mm) in Diameter: 0.053 inch (1.35 mm).
  - 2. Up to 1.396 Sq. Ft. (0.129 Sq. m.) or 16 Inches (406 mm) in Diameter: 0.067 inch (1.7 mm).
  - 3. Up to 1.764 Sq. Ft. (0.164 Sq. m.) or 18 Inches (457 mm) in Diameter: 0.093 inch (2.36 mm).
  - 4. Larger Than 1.764 Sq. Ft. (0.164 Sq. m.) or 18 Inches (457 mm) in Diameter: 0.123 inch (3.12 mm).
- B. Fabricate cleanout doors from compatible material, same thickness as breeching, bolted and gasketed.
- C. Fabricate engine exhaust from ASTM A 53/A 53M, Type E (electric-resistance welded), Grade B; or ASTM A 106/A 106M, Type S, Grade B, [Schedule 40] [Schedule 80] pipe; with welded joints and carbon-steel fittings and flanges.
  - 1. Wrought-Steel Fittings: ASME B16.9, wall thickness to match adjoining pipe.
  - 2. Wrought Cast- and Forged-Steel Flanges and Flanged Fittings: ASME B16.5, Class 150, including bolts, nuts, and gaskets.

## 2.3 GUYING AND BRACING MATERIALS

- A. Cable: [Three] [Four] <Insert number> galvanized, stranded wires of the following thickness:
  - 1. Minimum Size: 1/4 inch (6 mm) in diameter.
  - 2. For ID Sizes 4 to 15 Inches (100 to 381 mm): 5/16 inch (8 mm).
  - 3. For ID Sizes 18 to 24 Inches (457 to 610 mm): 3/8 inch (9.5 mm).
  - 4. For ID Sizes 27 to 30 Inches (685 to 762 mm): 7/16 inch (11 mm).

5. For ID Sizes 33 to 36 Inches (838 to 915 mm): 1/2 inch (13 mm).
  6. For ID Sizes 39 to 48 Inches (990 to 1220 mm): 9/16 inch (14.3 mm).
  7. For ID Sizes 51 to 60 Inches (1295 to 1524 mm): 5/8 inch (16 mm).
- B. Pipe: [Two] [Three] <Insert number> galvanized steel, NPS 1-1/4 (DN 32).
- C. Angle Iron: [Two] [Three] <Insert number> galvanized steel, 2 by 2 by 0.25 inch (50 by 50 by 6 mm).

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 APPLICATION

- A. Listed, Refractory-Lined Metal Breechings: Freestanding dual-fuel boiler vents, oven vents, water heaters, exhaust for engines, fireplaces, and other solid-fuel-burning appliances.
- B. Field-Fabricated Metal Breechings: Dual-fuel boilers, oven vents, water heaters, exhaust for engines, fireplaces, and other solid-fuel-burning appliances.

### 3.3 INSTALLATION OF UNLISTED, FIELD-FABRICATED BREECHINGS

- A. Suspend breechings independent of their appliance connections.
- B. Install seismic restrains according to manufacturer's written instructions. Comply with requirements in Section 230548 "Vibration and Seismic Controls for HVAC."
- C. Align breechings at connections, with smooth internal surface and a maximum 1/8-inch (3-mm) misalignment tolerance.
- D. Slope breechings down in direction of appliance, with condensate drain connection at lowest point piped to nearest drain.
- E. Lap joints in direction of flow.
- F. Support breechings from building structure with bolts, concrete inserts, steel expansion anchors, welded studs, C clamps, or beam clamps according to manufacturer's written instructions.

### 3.4 CLEANING

- A. After completing system installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris, and repair damaged finishes.
- B. Clean breechings internally, during and after installation, to remove dust and debris. Clean external surfaces to remove welding slag and mill film. Grind welds smooth and apply touchup finish to match factory or shop finish.
- C. Provide temporary closures at ends of breechings that are not completed or connected to equipment.

END OF SECTION 235116