SECTION 235116 - FABRICATED BREECHINGS AND ACCESSORIES

Revise this Section by deleting and inserting text to meet Project-specific requirements.

This Section uses the term "Architect." Change this term to match that used to identify the design professional as defined in the General and Supplementary Conditions.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

1. GENERAL
	* + 1. RELATED DOCUMENTS

Retain or delete this article in all Sections of Project Manual.

* + - * 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
			1. SUMMARY
				1. Section Includes:

Listed, refractory-lined breechings.

Field-fabricated metal breechings.

Guying and bracing materials.

* + - 1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: For each type of product.

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

* + - * 1. Shop Drawings: For breechings.

Include plans, elevations, sections, and attachment details.

Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

Detail fabrication and assembly of hangers and seismic restraints.

Retain "Welding certificates" paragraph below if retaining "Welding Qualifications" paragraph in "Quality Assurance" Article.

* + - * 1. Welding certificates.

Retain "Seismic Qualification Certificates" paragraph below if required by seismic criteria applicable to Project. Coordinate with Section 230548 "Vibration and Seismic Controls for HVAC." See ASCE/SEI 7 for certification requirements for equipment and components.

* + - * 1. Seismic Qualification Certificates: For factory-fabricated breeching, accessories, and components from manufacturer.

Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity, and locate and describe mounting and anchorage provisions.

Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

* + - * 1. Sample Warranty: For special warranty.
			1. QUALITY ASSURANCE

Retain "Welding Qualifications" Paragraph below if shop or field welding is required. If retaining, also retain "Welding certificates" Paragraph in "Informational Submittals" Article. The American Welding Society (AWS) states that welding qualifications remain in effect indefinitely unless welding personnel have not welded for more than six months or there is a specific reason to question their ability.

* + - * 1. Welding Qualifications: Qualify procedures and personnel according to the following:

AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports.

AWS D9.1/D9.1M, "Sheet Metal Welding Code," for shop and field welding of joints and seams in breechings.

* + - * 1. Certified Sizing Calculations: Manufacturer shall certify venting system sizing calculations.
			1. WARRANTY

Retain this article for breechings containing refractory.

When warranties are required, verify with Director’s Representative's counsel that special warranties stated in this article are not less than remedies available to Director’s Representative under prevailing local laws.

* + - * 1. Special Warranty: Manufacturer agrees to repair or replace components of venting system that fail in materials or workmanship within specified warranty period.

Failures include, but are not limited to, structural failures caused by expansion and contraction.

Verify available warranties and warranty periods for units and components.

Warranty Period: [**10**] [**15**] [**25**] <**Insert number**> years from date of Substantial Completion.

1. PRODUCTS

Manufacturers and products listed in SpecAgent and Masterworks Paragraph Builder are neither recommended nor endorsed by the AIA or Deltek. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications. For definitions of terms and requirements for Contractor's product selection, see Section 016000 "Product Requirements."

* + - 1. LISTED, REFRACTORY-LINED METAL BREECHINGS

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=10700) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Van-Packer Company, Inc](http://www.specagent.com/Lookup?uid=123456962008).

[Warren Environment, Inc](http://www.specagent.com/Lookup?uid=123456962009).

Approved equivalent.

* + - * 1. Comply with ASME STS-1.
				2. Design Wind Loads: [**150 mph (241 km/h)**] <**Insert wind speed**>.
				3. Design for seismic conditions at Project site.
				4. Refractory Lining: Tested according to UL 959 for temperature and acid resistance and bearing the testing laboratory label.

Temperature Rating: 1800 deg F (982 deg C) continuously and 2000 deg F (1093 deg C) intermittently.

Acid Extraction: Maximum of 0.2 percent.

Cold Crushing Strength: Minimum of 3200 psig (22 MPa).

Thickness: Minimum of 2 inches (50 mm).

Paint materials and applications are specified in Section 099600 "High-Performance Coatings."

* + - * 1. Finish: Factory-applied, high-heat-resistant paint; color as selected by Architect.
			1. FIELD-FABRICATED METAL BREECHINGS

Retain first paragraph below for low-heat appliances.

* + - * 1. Fabricate breechings from ASTM A1011/A1011M hot-rolled steel with continuously welded joints, complying with NFPA 211 for minimum metal thickness.

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).

Up to 1.396 Sq. Ft. (0.129 Sq. m) or 16 Inches (406 mm) in Diameter: 0.067 inch (1.7 mm).

Up to 1.764 Sq. Ft. (0.164 Sq. m.) or 18 Inches (457 mm) in Diameter: 0.093 inch (2.36 mm).

Larger Than 1.764 Sq. Ft. (0.164 Sq. m.) or 18 Inches (457 mm) in Diameter: 0.123 inch (3.12 mm).

* + - * 1. Fabricate cleanout doors from compatible material, same thickness as breeching, bolted and gasketed.

Retain paragraph below for engine exhaust applications that use steel pipe.

* + - * 1. Fabricate engine exhaust from ASTM A53/A53M, Type E (electric-resistance welded), Grade B; or ASTM A106/A106M, Type S, Grade B, [**Schedule 40**] [**Schedule 80**] pipe; with welded joints and carbon-steel fittings and flanges.

Wrought-Steel Fittings: ASME B16.9, wall thickness to match adjoining pipe.

Wrought Cast- and Forged-Steel Flanges and Flanged Fittings: ASME B16.5, Class 150, including bolts, nuts, and gaskets.

* + - 1. GUYING AND BRACING MATERIALS

This article contains materials recommended by one manufacturer that also advises that a professional engineer design components and connections to adjacent structures.

* + - * 1. Cable: [**Three**] [**Four**] <**Insert number**> galvanized, stranded wires of the following thickness:

Retain appropriate size in subparagraphs below.

* + - * 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).
				8. Pipe: [**Two**] [**Three**] <**Insert number**> galvanized steel, NPS 1-1/4 (DN 32).
				9. Angle Iron: [**Two**] [**Three**] <**Insert number**> galvanized steel, 2 by 2 by 0.25 inch (50 by 50 by 6 mm).
1. EXECUTION
	* + 1. EXAMINATION
				1. Examine areas and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of Work.
				2. Proceed with installation only after unsatisfactory conditions have been corrected.
			2. APPLICATION
				1. Listed, Refractory-Lined Metal Breechings: Freestanding dual-fuel boiler vents, oven vents, water heaters, exhaust for engines, fireplaces, and other solid-fuel-burning appliances.
				2. Field-Fabricated Metal Breechings: Dual-fuel boilers, oven vents, water heaters, exhaust for engines, fireplaces, and other solid-fuel-burning appliances.
			3. INSTALLATION OF UNLISTED, FIELD-FABRICATED BREECHINGS
				1. Suspend breechings independent of their appliance connections.

Retain first paragraph below for Projects in seismic areas.

* + - * 1. Install seismic restrains according to manufacturer's written instructions. Comply with requirements in Section 230548 "Vibration and Seismic Controls for HVAC."
				2. Align breechings at connections, with smooth internal surface and a maximum 1/8-inch (3-mm) misalignment tolerance.

Retain first paragraph below for appliances more than 83 percent efficient.

* + - * 1. Slope breechings down in direction of appliance, with condensate drain connection at lowest point piped to nearest drain.
				2. Lap joints in direction of flow.
				3. 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.
			1. CLEANING
				1. After completing system installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris, and repair damaged finishes.
				2. 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.
				3. Provide temporary closures at ends of breechings that are not completed or connected to equipment.

END OF SECTION 235116