SECTION 235100 - BREECHINGS, CHIMNEYS, AND STACKS

This Section includes breeching, chimneys, and stacks used for venting flue gases from fuel fired heat generating appliances.

Manufacturers found in SpecAgent for this Section were identified as representative and not as an endorsement for meeting the requirements of this specification.

This Section includes performance, proprietary, and descriptive type specifications. Edit to avoid conflicting requirements.

This Section includes the term Architect/Engineer. "Architect" is used in AIA contract documents; "Engineer" is used in EJCDC contract documents. Retain appropriate term.

See the Drawing Coordination Considerations for information needed to coordinate this specification Section with the Drawings.

1. GENERAL
   * + 1. SUMMARY
          1. Section Includes:

Breeching.

Type B double wall gas vents.

Refractory lined metal stacks.

Double wall metal stacks.

Single wall metal stacks.

Induced draft fans.

* + - * 1. Related Sections:

Section 031000 - Concrete Forming and Accessories: Execution requirements for inserts specified by this section.

Section 033000 - Cast-In-Place Concrete: Concrete for stack foundations.

Section 223400 - Fuel-Fired Domestic Water Heaters: Water heaters using breeching, chimneys, and stacks.

Section 230513 - Common Motor Requirements for HVAC Equipment: Product requirements for draft fan motors for placement by this section.

Section 230529 - Hangers and Supports for HVAC Piping and Equipment: Product requirements for hangers and supports for placement by this section.

Section 230700 - HVAC Insulation: Execution requirements for insulation specified by this section.

Section 235223 - Cast-Iron Boilers: Boilers using breeching, chimneys, and stacks.

Section 235233.13 - Finned Water-Tube Boilers: Boilers using breeching, chimneys, and stacks.

Section 235233.16 - Steel Water-Tube Boilers: Boilers using breeching, chimneys, and stacks.

Section 235236 - Flexible Water-Tube Boilers: Boilers using breeching, chimneys, and stacks.

Section 235239 - Fire-Tube Boilers: Boilers using breeching, chimneys, and stacks.

Section 235400 - Furnaces: Furnaces using breeching, chimneys, and stacks.

Section 235500 - Fuel-Fired Heaters: Fuel fired heaters using breeching, chimneys, and stacks.

Section 260503 - Equipment Wiring Connections: Execution requirements for electrical connections specified by this section.

* + - 1. REFERENCES

List reference standards included within text of this section. Edit the following for Project conditions.

* + - * 1. American National Standards Institute:

ANSI Z21.66 - Automatic Vent Damper Devices for Use with Gas-Fired Appliances.

ANSI Z21.67 - Mechanically Actuated Automatic Vent Damper Device.

ANSI Z21.68 - Thermatically Actuated Automatic Vent Damper Devices.

ANSI Z95.1 - Oil Burning Equipment, Installation.

* + - * 1. ASTM International:

ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.

ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

A1011/A1011M-07 Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength

ASTM C401 - Standard Classification of Alumina and Alumina-Silicate Castable Refractories.

* + - * 1. National Fire Protection Association:

NFPA 31 - Standard for the Installation of Oil-Burning Equipment.

NFPA 54 - National Fuel Gas Code.

NFPA 82 - Standard on Incinerators and Waste and Linen Handling Systems and Equipment.

NFPA 211 - Standard for Chimneys, Fireplaces, Vents, and Solid Fuel Burning Appliances.

* + - * 1. Sheet Metal and Air Conditioning Contractors:

SMACNA - Guide for Steel Stack Construction.

SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

* + - * 1. Underwriters Laboratories Inc.:

UL 103 - Factory-Built Chimneys for Residential Type and Building Heating Appliances.

UL 127 - Factory-Built Fireplaces.

UL 378 - Draft Equipment.

UL 441 - Gas Vents.

UL 641 - Type L Low-Temperature Venting Systems.

UL 959 - Medium Heat Appliance Factory Built Chimneys.

* + - 1. DEFINITIONS
         1. Breeching: Vent Connector.
         2. Chimney: Primarily vertical shaft enclosing at least one vent for conducting flue gases outdoors.
         3. Smoke Pipe: Round, single wall vent connector.
         4. Vent: Portion of a venting system designed to convey flue gases directly outdoors from a vent connector or from an appliance when a vent connector is not used.
         5. Vent Connector: Part of a venting system that conducts the flue gases from the flue collar of an appliance to a chimney or vent, and may include a draft control device.
      2. DESIGN REQUIREMENTS

Use this article carefully; restrict statements to identify system design requirements only.

* + - * 1. Design refractory lined metal stacks for wind loading of [**110 mph (180 kph)**] <**\_\_\_\_\_\_\_\_**> and seismic loads for Zone <**\_\_\_\_\_\_\_\_**>.
      1. SUBMITTALS

Only request submittals needed to verify compliance with Project requirements.

* + - * 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. Section 013300 - Submittal Procedures: Submittals procedures.
        5. Shop Drawings: Indicate general construction, dimensions, weights, support and layout of breeching. Submit layout drawings indicating plan view and elevations [**where factory built unit is used**] [**; signed and sealed by Professional Engineer**].
        6. Product Data: Submit data indicating factory built chimneys, including dimensional details of components and flue caps, dimensions and weights, electrical characteristics and connection requirements.

Include the following for draft fans.

* + - * 1. Product Data: Submit data on fans and accessories including fan curves with specified operating point plotted, power, RPM, and electrical characteristics and connection requirements.

Include the following paragraph for submission of physical samples for selection of finish, color, texture, and other properties.

* + - * 1. Samples: [**one**] <**\_\_\_\_\_\_\_\_**> sample <**\_\_\_\_**>**x**<**\_\_\_\_**> inch (<**\_\_\_\_**>**x**<**\_\_\_\_**> mm) in size illustrating finish of chimney and general appearance including flue cap.
        2. Manufacturer's Installation Instructions: Submit assembly, support details, and connection requirements.
        3. Manufacturer's Certificate: Certify products meet or exceed specified requirements.
        4. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
        5. Manufacturer’s installation instructions shall be provided along with product data.
        6. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
      1. QUALITY ASSURANCE
         1. Perform Work in accordance with [**State**] [**Municipality**] of <**\_\_\_\_\_\_\_\_**> [**Highways**] [**Public Work's**] standard.

Include the following paragraph only when cost of acquiring specified standards is justified.

* + - * 1. Maintain one copy of each document on site.
        2. Provide factory built vents and chimneys used for venting natural draft appliances complying with NFPA 211 “Standard for Chimneys, Fireplaces, Vents and Solid Fuel Burning Appliances” and UL listed and labeled.
      1. QUALIFICATIONS
         1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years [**documented**] experience.
         2. Installer: Company specializing in performing Work of this section with minimum three years [**documented**] experience [**approved by manufacturer**].
         3. Design stacks over <**\_\_\_\_\_\_\_\_**> feet above roof under direct supervision of Professional Engineer experienced in design of this Work and licensed [**at Project location.**] [**in State of <\_\_\_\_\_\_\_\_>.**]
      2. PRE-INSTALLATION MEETINGS
         1. Section 013000 - Administrative Requirements: Pre-installation meeting.
         2. Convene minimum [**one**] <**\_\_\_\_\_\_\_\_**> week prior to commencing work of this section.
      3. ENVIRONMENTAL REQUIREMENTS
         1. Section 016000 - Product Requirements.
         2. Maintain water integrity of roof during and after installation of chimney or vent.
      4. FIELD MEASUREMENTS
         1. Verify field measurements prior to fabrication.
      5. WARRANTY

This article extends warranty period beyond one year. Extended warranties increase construction costs and Owner enforcement responsibilities. Specify warranties with caution.

* + - * 1. Section 017000 - Execution and Closeout Requirements: Product warranties and product bonds.
        2. Furnish [**five**] <**\_\_\_\_\_\_\_\_**> year manufacturer warranty for manufactured units.

1. PRODUCTS
   * + 1. BREECHING

In this article, list manufacturers acceptable for this Project.

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=13045) Subject to compliance with requirements, provide products by one of the following:

American Metal Products Co.; Div. of Masco Corp.

Approved equivalent.

[Manufacturers](http://www.specagent.com/LookUp/?ulid=8295&mf=04&src=wd):

Substitutions: [Section 016000 - Product Requirements] [Not Permitted].

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

* + - * 1. Furnish materials in accordance with [**State**] [**Municipality**] of <**\_\_\_\_\_\_\_\_**> [**Highways**] [**Public Work's**] standards.

Edit the following descriptive specifications to identify Project requirements and to eliminate conflicts with manufacturers specified above.

* + - * 1. Fabricate of ASTM A1011/A1011M “Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process” carbon steel. Fabricate breeching less than 24 inch (600 mm) diameter of ASTM A653/A653M “Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process” galvanized sheet steel, lock forming quality with ASTM A653/A653M “Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process” [**G90**] [**G165**] ([**Z275**] [**Z500**]) zinc coating.
        2. Fabricate breeching from following minimum gages. Refer to SMACNA HVAC Duct Construction Standards - Metal and Flexible.

Sizes up to 12 inches (300 mm): 18 gage (1.2 mm).

Sizes 13 to 24 inches (325 to 600 mm): 16 gage (1.5 mm).

Sizes 25 to 36 inches (625 to 900 mm): 14 gage (1.8 mm).

Sizes 37 to 60 inches (925 to 1500 mm): 12 gage (2.5 mm).

Sizes over 60 inches (1500 mm): 10 gage (3.3 mm).

* + - * 1. Furnish adjustable self-actuating barometric draft dampers, [**where indicated on Drawings,**] full size of breeching.
        2. Furnish cleanout doors of same gage as breeching[**, where indicated on Drawings**].
        3. Weld longitudinal seams. Fabricate joints by welding, lapping and bolting, or with companion flanges. For breeching less than 24 inches (600 mm) diameter, furnish groove seam (pipe lock or flat lock) with end joints beaded and crimped.
        4. Reinforce rectangular breeching with angle frames and round breeching with flanged girth joints or angle frames. Refer to SMACNA HVAC Duct Construction Standards - Metal and Flexible.

Sizes up to 30 inches (750 mm): No reinforcing required.

Sizes 31 to 36 inches (780 to 900 mm): 1-1/2 x 1-1/2 x 3/16 inches (40 x 40 x 5 mm), at 60 inches (1500 mm) centers.

Sizes 37 to 60 inches (925 to 1500 mm): 2 x 2 x 1/4 inch (50 x 50 x 6 mm), at 60 inch (1500 mm) centers.

Sizes over 60 inches (1500 mm): 3 x 3 x 1/2 inch (75 x 75 x 12 mm), at 60 inch (1500 mm) centers.

* + - * 1. Fabricate breeching fittings to match adjoining breeching. Fabricate elbows with centerline radius equal to breeching width or diameter. Limit angular tapers to 20 degrees maximum.
      1. TYPE B DOUBLE WALL GAS VENTS

In this article, list manufacturers acceptable for this Project.

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=13045) Subject to compliance with requirements, provide products by one of the following:

American Metal Products Co.; Div. of Masco Corp.

General Products Co., Inc.

Hart & Cooley Mfg. Co.

Selkirk Metalbestos.

Approved equivalent.

[Manufacturers](http://www.specagent.com/LookUp/?ulid=8296&mf=04&src=wd):

Substitutions: [Section 016000 - Product Requirements] [Not Permitted].

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

* + - * 1. Furnish materials in accordance with [**State**] [**Municipality**] of <**\_\_\_\_\_\_\_\_**> [**Highways**] [**Public Work's**] standards.

Edit the following descriptive specifications to identify Project requirements and to eliminate conflicts with manufacturers specified above.

Fabrication: Inner pipe of sheet aluminum, and outer pipe of galvanized sheet steel, tested in compliance with UL 441 “Gas Vents”.

Vent Dampers: [**Electrically**] [**Mechanically**] [**Thermally**] actuated, same size as draft hood collar, constructed of stainless steel or galvanized steel, with corrosion-resistant components, in compliance with [**ANSI Z21.66.**] [**ANSI Z21.67.**] [**ANSI Z21.68.**]

* + - 1. REFRACTORY LINED METAL STACKS

In this article, list manufacturers acceptable for this Project.

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=13045) Subject to compliance with requirements, provide products by one of the following:

Power Pac Enterprises, Ltd.

Susquehanna Concrete Products, Inc.

Van-Packer Co.

Stacks, Inc., Div. of Air Management, Inc.

Approved equivalent.

[Manufacturers](http://www.specagent.com/LookUp/?ulid=8297&mf=04&src=wd):

Substitutions: [Section 016000 - Product Requirements] [Not Permitted].

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

* + - * 1. Furnish materials in accordance with [**State**] [**Municipality**] of <**\_\_\_\_\_\_\_\_**> [**Highways**] [**Public Work's**] standards.

Edit the following descriptive specifications to identify Project requirements and to eliminate conflicts with manufacturers specified above.

* + - * 1. Fabricate jacket for size 36 inches (900 mm) and smaller of 24 gage (0.6 mm) galvanized steel with grooved seam joint, or 26 gage (0.5 mm) aluminized steel with riveted seams. For sizes 39 inches (980 mm) and larger fabricate of 11 gage (2.9 mm) galvanized steel with welded seam joint.
        2. Weld heavy-gage stack sections to other sections. Apply heat resistant paint to each stack section and accessory with primer and finish paint in factory. Touch-up or refinish in field.
        3. Furnish refractory lining of minimum 2 inch (50 mm) thick, ASTM C401 “Standard Classification of Alumina and Alumina-Silicate Castable Refractories” Class <**\_\_\_\_\_\_\_\_**> tested to UL 959 “Medium Heat Appliance Factory Built Chimneys” and UL listed to withstand 2000 degrees F (1093 degrees C) without fusion. Furnish lining with maximum acid extraction of 0.2 percent, have minimum of 3200 psi (22 MPa) cold crush strength, and be positively bonded to steel jacket, jointed with mortar.
        4. Accessories, UL labeled:

Anchor Lugs: Acid resistant coated cast iron.

Clean Out Section: Welded to base of stack, with gasket, and bolt tightened inspection plate.

Branching Sections: Construct with welded joints, lined with refractory, finished with smooth transition and no exposed metal on inside.

Spark Screen: Type 304 stainless steel, 16 gage (1.5 mm) 1/2 x 1/2 inch (13 x 13 mm) mesh, with rolled angle and draw band.

Drawbands: 8 inch (200 mm) wide, same material as jacket, fastened with nuts and bolts.

Roof Penetration: Factory fabricated thimble, flashing and storm collar.

* + - 1. DOUBLE WALL METAL STACKS

In this article, list manufacturers acceptable for this Project.

* + - * 1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=8298&mf=04&src=wd): Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Jeremias Exhaust Systems

Selkirk by Duravent

Van-Packer

Approved equivalent.

Substitutions: [Section 016000 - Product Requirements] [Not Permitted].

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

* + - * 1. Furnish materials in accordance with [**State**] [**Municipality**] of <**\_\_\_\_\_\_\_\_**> [**Highways**] [**Public Work's**] standards.

Edit the following descriptive specifications to identify Project requirements and to eliminate conflicts with manufacturers specified above.

* + - * 1. Furnish double wall metal stacks, tested to [**UL 103**] [**UL 127**] [**UL 641**] and UL listed, for use with building heating equipment, in compliance with NFPA 211.
        2. Fabricate with 1 inch (25 mm) minimum air space between walls. Construct inner jacket of 20 gage (0.9 mm) ASTM A240/A240M “Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications” or ASTM A666 “Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar” [**Type 304**] [**Type 316**] stainless steel. Construct outer jacket of [**aluminum coated steel**] [**[Type 304] [Type 316] stainless steel**] 24 gage (0.6 mm) for sizes 10 inches to 24 inches (250 mm to 600 mm) and 20 gage (0.9 mm) for sizes 28 inches to 48 inches (700 mm to 1200 mm).
        3. Accessories, UL labeled:

Ventilated Roof Thimble: Consists of roof penetration, vent flashing with spacers and storm collar.

Exit Cone: Consists of inner cone, and outer jacket, to increase stack exit velocity 1.5 times.

Stack Cap: Consists of conical rainshield with inverted cone for partial rain protection with low flow resistance.

* + - 1. SINGLE WALL METAL STACKS

In this article, list fabricators acceptable for this Project.

* + - * 1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=8300&mf=04&src=wd): Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

AMPCO by Duravent

Industrial Chimney Company

Jeremias Exhaust Systems

Approved equivalent.

Substitutions: [Section 016000 - Product Requirements] [Not Permitted].

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

* + - * 1. Furnish materials in accordance with [**State**] [**Municipality**] of <**\_\_\_\_\_\_\_\_**> [**Highways**] [**Public Work's**] standards.

Edit the following descriptive specifications to identify Project requirements and to eliminate conflicts with manufacturers specified above.

* + - * 1. Furnish single wall metal stacks in accordance with SMACNA Guide for Steel Stack Construction.

Stack size: [**diameter**], [**wall thickness**] and [**height**].

Stack design wind velocity: [**100**] [**125**] [**150**] miles per hour ([**45**] [**56**] [**67**] meters per second).

Stack: [**damped**] [**undamped**].

Stack wall material: [**hot-rolled steel**] [**galvanized steel**].

* + - * 1. When stack wall thickness is different than NFPA 211 “Standard for Chimneys, Fireplaces, Vents and Solid Fuel Burning Appliances” minimum, furnish stack wall thickness conforming to accepted engineering design provisions of SMACNA Guide.
        2. Furnish stack base plate and anchor details in accordance with SMACNA Guide for anchorage to concrete ground level foundation with minimum compressive strength of 4,000 psi (27.7 MPa). [**Furnish concrete foundation as indicated on Drawings.**]
      1. INDUCED DRAFT FANS

In this article, list manufacturers acceptable for this Project.

* + - * 1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=8299&mf=04&src=wd): Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Field Controls LLC

Quickdraft, ENERVEX, Inc.

Tjernlund Products, Inc.

Approved equivalent.

Substitutions: [Section 016000 - Product Requirements] [Not Permitted].

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

* + - * 1. Furnish materials in accordance with [**State**] [**Municipality**] of <**\_\_\_\_\_\_\_\_**> [**Highways**] [**Public Work's**] standards.

Edit the following descriptive specifications to identify Project requirements and to eliminate conflicts with manufacturers specified above.

* + - * 1. Mechanical Draft Induction Type:

Venturi Tube Section: Enameled steel for sizes up to 20 inch (500 mm) and Type 304 stainless steel for sizes 22 inch (550 mm) to 48 inch (1200 mm) diameter.

Fan: Forward curved venturi type, tested to UL 378 “Draft Equipment”, with [**shaded pole, sleeve bearing**] [**open drip proof, ball bearing**] motor.

* + - * 1. Induced Draft Type:

Forward curved fan and scroll of mild steel with direct drive shaded pole motor with ball bearings, internal cooling fan, stainless steel shaft [**,**] [**and internal centrifugal switch,**] tested to UL 378.

Capacity: <**\_\_\_\_\_\_\_\_**> cu ft/min (<**\_\_\_\_\_\_\_\_**> L/s) standard air at <**\_\_\_\_\_\_\_\_**> inch (<**\_\_\_\_\_\_\_\_**> Pa) negative static pressure, and <**\_\_\_\_\_\_\_\_**> inch (<**\_\_\_\_\_\_\_\_**> Pa) negative static pressure at tight suction shut-off.

* + - * 1. Motor: [**<\_\_\_\_\_\_\_\_> hp (<\_\_\_\_\_\_\_\_> W).**]
        2. Wiring Terminations: Furnish terminal lugs to match branch-circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box.

1. EXECUTION
   * + 1. PREPARATION
          1. Install concrete inserts for support of breeching, chimneys, and stacks in coordination with formwork.
       2. INSTALLATION
          1. Install in accordance with [**NFPA 54**] [**NFPA 31**] [**SMACNA Guide for Steel Stack Construction**].

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

* + - * 1. Install Work in accordance with [**State**] [**Municipality**] of <**\_\_\_\_\_\_\_\_**> [**Highways**] [**Public Work's**] standards.
        2. Install breeching with minimum of joints. Align accurately at connections, with internal surfaces smooth.
        3. Support breeching from building structure, rigidly with suitable ties, braces, hangers and anchors to hold to shape and prevent buckling. Support vertical breeching, chimneys, and stacks at 12 foot (4 m) spacing, to adjacent structural surfaces, or at floor penetrations. Refer to SMACNA HVAC Duct Construction Standards - Metal and Flexible for equivalent duct support configuration and size.
        4. Install stacks on concrete foundations. Refer to Section 033000.
        5. Pitch breeching with positive slope up from fuel-fired equipment to chimney or stack.
        6. Coordinate installation of dampers, and induced draft fans.
        7. Insulate breeching in accordance with Section 230700.
        8. For Type B double wall gas vents, maintain UL listed minimum clearances from combustibles. Assemble pipe and accessories for complete installation.
        9. Install vent dampers, locating close to draft hood collar, and secured to breeching.
        10. Assemble and install stack sections in accordance with NFPA 82 “Standard on Incinerators and Waste and Linen Handling Systems and Equipment”, industry practices, and in compliance with UL listing. Join sections with acid-resistant joint cement. Connect base section to foundation using anchor lugs.
        11. Level and plumb chimney and stacks.
        12. Clean breeching, chimneys, and stacks during installation, removing dust and debris.
        13. Install slip joints allowing removal of appliances without removal or dismantling of breeching, breeching insulation, chimneys, or stacks.
        14. Provide [**minimum length**] [**maximum 2 feet (600 mm)**] of breeching to connect appliance to chimney. [**Provide Type B chimney continuously from appliances.**]
        15. Extend vent above roof in accordance with applicable code.
        16. Maximum Vent Horizontal Distance: 75 percent of vent vertical distance.
        17. Where appliance requires draft hood or barometric control device, install manufacturer furnished listed devices in accordance with manufacturer's instructions and applicable code.

END OF SECTION 235100