CHAPTER 23.110
LOCAL AMENDMENTS TO THE INTERNATIONAL FUEL GAS CODE, 2000 EDITION

SECTIONS

23.110.Appendix A Sizing and Capacities of Gas Piping

23.110.100 Local Amendments To The 2000 International Fuel Gas Code

The amendments to the 2000 International Fuel Gas Code are listed hereafter by section. The last digits of the number (after the title and chapter digits) are the section of the 2000 International Fuel Gas Code to which the amendments refers, i.e., 23.110.210 refers to amendments to Section 210 of the 2000 International Fuel Gas Code.

23.110.101.3 – 23.110.109.7

Delete Sections 101.3 through 109.7

Add new section 108 as follows:

23.110.108 Authority to Render Gas Service

108.1 Unlawful acts. It shall be unlawful for any person, firm, or corporation, excepting an authorized agent or employee of a person, firm, or corporation engaged in the business of furnishing or supplying gas and whose service pipes supply or connect with the particular premises, to turn on or reconnect gas service in or on any premises where and when gas service is, at the time, not being rendered.

108.2 Authority to disconnect. The administrative authority or the serving gas supplier is hereby authorized to disconnect any gas piping or appliance, or both, which shall be found not to conform to the requirements of this code or which may be found defective and in such condition as to endanger life or property. Where such disconnection has been made, a notice shall be attached to such gas piping, appliance, or both which shall state the same has been disconnected, together with the reasons therefore.

23.110.303 Appliance Location

Amend by adding a new section 303.8 titled Liquefied Petroleum Gas Facilities, to read as follows:

303.8 Liquefied Petroleum Gas Facilities. Liquefied petroleum gas facilities shall not be located in any pit, basement, crawlspace, under show windows, or interior stairways, in engine, boiler, heater, or electric meter rooms. LPG facilities means tanks, containers, container valves, regulating equipment, meters, and/or appurtenances for the storage and supply of LPG for any building structure or premises.

Amend by adding a new section 303.9 titled Liquefied Petroleum Gas Piping, to read as follows:

303.9 Liquefied Petroleum Gas Piping. Liquefied petroleum gas piping shall not serve any gas appliance located in a pit or basement where heavier than air gas might collect to form a flammable mixture.

23.110.303.3 Prohibited Locations

Amend section by deleting Exceptions 2, 3, and 4

23.110.304 Combustion, Ventilation, and Dilution Air

Amend by adding a new section 304.16 titled LPG Systems, to read as follows:

304.16 LPG Systems. Appliances using LPG shall have two combustion air openings. The lower opening shall be at floor level or below and shall be sloped down toward the exterior. These systems shall be continuously ducted to outside the building.

Amend by adding a new section 304.17, to read as follows:

304.17. Use of underfloor areas for supply of combustion air to LPG burning appliances is prohibited.

23.110.304.3 Outdoor Air Required

Amend by adding the following sentence to the end of the paragraph:

Combustion air shall not be obtained from the attic, unless prior written approval is obtained from the administrative authority.

23.110.304.13 Specially Engineered Installations

Add new subsection:

Section 304.13.1 Cold Climate Alternate Requirements For Combustion and Ventilation Air

304.13.1.1 Purpose

304.13.1.1 Purpose. The purpose of this section is to provide alternate methods of designing combustion air and ventilation air systems for fuel burning appliances in cold climate regions. Only persons registered to practice engineering in the applicable jurisdiction will be permitted to use these alternate design methods.

304.13.1.2 Scope

304.13.1.2.1 Scope. The requirements of this section apply to all fuel gas burning appliances.

Exception: Direct vent appliances, listed cooking appliances, appliances having separated combustion system, enclosed furnaces, refrigerators and domestic clothes dryers.

304.13.1.3 Definitions

Certain words and terms used in this section shall have meanings as listed. The below-listed definitions shall apply to this section only, even though they may differ with broader definitions found elsewhere in the code.

COMBUSTION AIR is that air required for stoichiometric combustion, plus excess air, plus flue dilution air.

VENTILATION AIR is that air required for cooling of the appliance enclosure to maintain temperatures required for proper equipment operation.

FREE AREA is the net actual open area of a louver, screen, duct, or intake grille.

304.13.1.4 General

304.13.1.4.1 Air Supply. Fuel-burning equipment shall be provided with a sufficient supply of combustion and ventilation air.

304.13.1.4.1.1 Enclosures Containing Fuel Burning Appliances. Enclosures shall be provided with minimum unobstructed combustion air openings as specified in Section 304.13.1.9 and arranged as specified in Sections 304.13.1.5 and 304.13.1.6 of this code and ventilation air systems shall be as specified in Section 304.13.1.10.

304.13.1.4.1.2 Existing Buildings. When fuel-burning appliances are installed in an existing building containing other fuel-burning equipment, the enclosure shall be provided with sufficient combustion and ventilation air for all fuel-burning equipment contained therein as specified in Sections 304.13.1.9 and 304.13.1.10.

304.13.1.5 Combustion Air Openings

304.13.1.5.1 Location. The combustion air opening(s) may be located anywhere in the enclosure provided that there is an unobstructed area extended to the fire box that does not increase the total combustion air system static pressure requirements.

304.13.1.5.2 Dampers Prohibited. Combustion air openings shall not be installed so as to open into construction where fire dampers are required. Volume dampers shall not be installed in combustion air openings.

Exception: Dampers electrically interlocked with the firing cycle of the appliance, so as to prevent operation of the appliance when the dampers are not proven open.

304.13.1.5.3 Screening. Combustion air openings shall be covered with corrosion-resistant screen of 1/2 inch (12.8 mm) mesh, except as provided in Section 304.13.1.7.3.

Exception: Combustion air openings serving a nonresidential portion of a building may be covered with a screen having openings larger than 1/2 inch (12.8mm) but in no case larger than 1 inch (25.4 mm).

304.13.1.6 Sources Of Combustion And Ventilation Air

304.13.1.6.1 Air from Outside. Combustion and ventilation air obtained from outside the building shall be supplied as follows:

1. Through permanent openings of the required area directly to the outside of the building through the floor, roof, or walls of the appliance enclosure; or
2. Through continuous ducts of the required cross-sectional area extending from the appliance enclosure to the outside of the building.

304.13.1.6.2 Under-Floor Supply. Combustion and ventilation air openings may connect with under-floor areas conforming to the following requirements:

1. Under-floor spaces having unobstructed openings to the exterior which are sized to not exceed the maximum system static pressure requirements specified in Sections 304.13.1.9 and 304.13.1.10.
2. The height of the under-floor space shall comply with the requirements of the Building Code and be without obstruction to the free flow of air.

304.13.1.6.3 Interior Spaces. Large indoor areas may be used for combustion and/or ventilation air if sufficient infiltration or other outside air supply is available by nature of the building construction, system design, or building use.

304.13.1.6.4 Prohibited Sources. Openings and ducts shall not connect appliance enclosures with space in which the operation of a fan may adversely affect the flow of combustion air. Combustion and ventilation air shall not be obtained from a hazardous location or from any area in which objectionable quantities of flammable vapor, lint or dust are given off. Combustion and ventilation air shall not be taken from a machinery room.

304.13.1.7 Combustion And Ventilation Air Ducts

304.13.1.7.1 General. Combustion and ventilation air ducts shall:

1. Be of galvanized steel complying with Chapter 6 or equivalent corrosion-resistant material approved for this use.
2. Have a minimum cross-sectional dimension of 3 inches.
3. Serve a single appliance enclosure.

304.13.1.7.2 Dampers. Combustion air ducts shall not be installed so as to pass through construction where fire dampers are required, unless properly enclosed in a rated shaft. Volume dampers shall not be installed in combustion air ducts.

Exception: Motor operated dampers interlocked with appliance controls to open damper prior to firing appliance are permitted, if damper blade actuated end switches are provided to prevent appliance operation should dampers fail to open.

304.13.1.7.3 Screen. Neither end of the ducts that terminate in an attic shall be screened.

304.13.1.8 Special Conditions Created By Mechanical Exhausting Or Fireplaces

Operation of exhaust fans, kitchen ventilation systems, clothes dryers or fireplaces shall be considered in determining combustion and ventilation air requirements to avoid unsatisfactory operation of installed fuel burning appliances.

304.13.1.9 Area Of Combustion Air Openings

304.13.1.9.1 General. The free area of openings, ducts or plenums, screens and louvers supplying combustion air to enclosures containing fuel-burning appliances shall be as required: The opening(s) shall communicate directly or by means of ducts with outdoors or to such spaces (crawl space) that freely communicate with outdoors and shall be sized in accordance with Table No. 304.13.1.1.

304.13.1.10 Ventilation Air

304.13.1.10.1 General. In addition to the combustion air required, sufficient ventilation shall be supplied for proper operation of equipment. Ventilation system shall be designed to maintain positive or atmospheric pressures within the enclosure. If exhaust fans are provided, mechanical make-up air fan must be installed to make-up exhausted air. Natural or gravity make-up air is not allowed.

TABLE NO. 304.13.1.1 COMBUSTION AIR SYSTEM DESIGN CRITERIA

Fuels	System Static Pressure Limits[1]			Combustion Air Requirements
	Atmospheric		Forced Draft	
	Draft Hoods	Barometric Dampers		All Types
GAS (Natural, Propane, Butane)	0.02" WG	0.02" WG	0.05" WG	24 CFM / 100,000 BTUH

Note 1: Static pressure values represent maximum static pressure losses across all components of the combustion air system including screens, louvers, ducts and fittings.

Note 2: For enclosures containing both atmospheric and forced draft appliances, the most restrictive design requirements shall apply.

PER ASHRAE 1993 FUNDAMENTALS HANDBOOK
CHAPTER 15 TABLE 11 (Pg 15.10)

1 cu. ft. natural gas requires 9.6 cu. ft. air

Convert to CF/1000 Btu

GAS: 9.6 cu. ft. air / 1 cu. ft. gas X 1 cu. ft. gas / 1000 Btu = 9.6 cu. ft. air/1000 Btu (14.4 @ 50% excess)

*Air at 2000 feet above sea level. Installations above this must derate appliance output 4%/1000 feet.

EXAMPLE: Combustion Air Flow Rates (CFM) per 100,000 Btuh input. Verify heating values and adjust CFM as required.

	STOICHIOMETRIC 0% EXCESS AIR	COMBUSTION @ 50% EXCESS AIR
Natural Gas	16.0 CFM	24 CFM
1000 Btu/cu. ft.	100,000 Btuh	100,000 Btuh

23.110.304.15 Combustion Air Ducts

Delete the exception to Item 1 in its entirety.

23.110.305 Installation

Amend by adding a new section 305.5 titled Aircraft Servicing and Storage Areas, to read as follows:

> 305.5 Aircraft Servicing and Storage Areas. Overhead heaters installed in aircraft storage or servicing areas shall be at least 10 feet (3048 mm) above or away from the upper surface of wings or engine enclosures of the tallest aircraft which may be housed in the hangar.

23.110.306.4 Appliances Under Floors

Amend by adding the following as the first sentence:

> Installation of appliances in underfloor crawlspaces is prohibited unless prior written approval is obtained from the administrative authority.

23.110.402.3 Sizing

Amend by adding the following sentence at the end of the paragraph:

> Sections 1217 and 1218 in the 2000 Uniform Plumbing Code shall be considered an acceptable method of sizing gas piping.

23.110.403.10.1 Pipe Joints

Amend by adding the following at the end of the paragraph:

> All joints in underground ferrous piping shall be welded when any of the following conditions apply:
>
> 1. The nominal pipe diameter is 2 ½ inch or larger.
> 2. The pipe is installed under a driveway.
> 3. Medium pressure systems.

23.110.403.10.2 Tubing Joints

Amend by adding the following sentence at the end of the paragraph:

All joints in underground copper shall be brazed with wrought copper fittings. No underground joints shall be permitted unless the underground length of run exceeds 60 feet (18.3 m). All pipe to tubing transitions shall be made above ground.

23.110.403.10.4 Metallic Fittings

Amend Item 2 by deleting the words "cast iron."

Delete Item 5.

23.110.404 Piping System Installation

Add new paragraphs as follows:

404.17 At all points where fuel gas piping enters or leaves the ground there shall be installed, above ground, a connection capable of absorbing relative motion due to frost heave action. Such connectors shall be of a type approved by the building official and installed in such a manner to absorb a 6 inch (152 mm) displacement in any direction. A wire braided kink-proof flexible connection with woven jacket and oil proof synthetic tube and cover and neoprene liner may be used. Supporting wire shall run the full length of hose. Hose-to-pipe connectors shall be of the removable metal compression type. Working temperature range of the connector shall be -40 degrees F (-40c) to +250 degrees F (121c). (Aeroquip #1503 medium-pressure single-wire braid hose equipped with non-swivel male pipe fittings is an example of a suitable connector.)

404.18 Flex connectors listed for outdoor use may be used between meter and house main. No flex connector may pass through any wall, partition, panel or other barrier. Solid fittings shall be used on each end.

404.19 At points where copper tubing type systems enter or leave the ground, they shall be protected from frost heave action by the incorporation of suitable above ground 6-inch (152 mm) radius bends or approved flex connection of equal size.

404.20 Pounds to inches water column regulators serving mobile homes and connected to copper tubing shall be attached directly to the inlet connection on the exterior of the mobile home, and shall not be located under the mobile home. An approved gas valve shall be installed immediately preceding the regulator.

23.110.404.4 Piping Through Foundation Wall

Delete paragraph in its entirety and replace with the following:

All building fuel gas piping entrances and exits shall be located above grade or in an approved vented vault.

23.110.404.9 Minimum Burial Depth

Amend by adding the following sentence to the end of the paragraph:

Plastic and copper gas piping shall have at least 18 inches of earth cover or other equivalent protection.

23.110.406.4.1 Test Pressure

Replace the minimum test pressure of 3 psig with 10 psig and add the following sentence at the end of the paragraph:

Required pressure tests of 10 psig shall be performed with gauges of 1/10 psi increments or less.

23.110.409.5 Equipment Shutoff Valve

Amend section by deleting exception.

23.110.501.7 Connection to Fireplace

Delete wording of 501.7 and replace with the following:

> Gas fired appliances shall not be connected to fireplace chimneys without prior approval of the Administrative Authority.

23.110.501.8 Equipment Not Required To Be Vented

Delete Item 8

23.110.502 Vents

Amend by adding a new section 502.7, to read as follows:

> 502.7 Venting systems installed exterior to the building outside the thermal envelope shall be listed for exterior use in cold climates, or shall be enclosed in an insulated (R-19 minimum) shaft. The portion of the vent system that is above the last roof and its projected plane need not be enclosed. The portion of the venting system passing through an attic space need not be insulated or enclosed.

Amend by adding a new section 502.8, to read as follows:

> 502.8 Vent terminations that penetrate a metal roof with a pitch shall be protected by an ice dam or deflector of an approved type acceptable to the Administrative Authority.

23.110.503.8 Venting System Termination Location

Amend by adding new Item 5 to read as follows:

> 5. An anticipated snow depth of 12 inches shall be used when determining the manufacturer's minimum vent termination height. Measurements shall be made to the bottom of the vent outlet.

23.110.503.10.2.1 General

Amend by adding the following at the end of the paragraph:

> Single wall material of noncombustible corrosion-resistant material capable of withstanding the flue gas temperatures produced by the appliance, such as in Tables 503.10.2.4 and 506.10.2.5 may be used to vent the following:
>
> A. Vent connector serving a single gas appliance connected to an individual vent system.
>
> B. Vent connector system serving two gas appliances connected to a common vent.
>
> C. Three or more gas appliances connected to a common vent system may have single wall vent connectors to the point of connection to the common vent connector.
>
> D. An engineered system acceptable to the Administrative Authority.

23.110.602.1 General

Amend second sentence by deleting the words "be tested in accordance with an approved method" and replacing with "not be allowed."

23.110.602.2 Flame Safeguard Device

Amend first sentence by deleting the words "with the exception of those tested in accordance with an approved method."

23.110.612.2

Add new subsection 612.2 to read as follows:

612.2. Domestic gas fired clothes dryers may be installed in bathrooms if provided with makeup air openings (in the bathroom enclosure) with a net free area not less than one square inch per 1000 BTU input.

23.110.620 Unvented Room Heaters

Delete section 620 in its entirety.

23.110.622 Cooking Appliances

Add new subsections 622.6 and 622.7 to read as follows:

622.6 Ventilating Hoods. Ventilating hoods shall be installed over all domestic free standing or built-in ranges, unless the range is otherwise listed for forced down draft ventilation. The hood or ventilation system shall exhaust to exterior of the building.

622.7 Vertical Clearance above Cooking Top. Domestic freestanding or built-in ranges shall have a vertical clearance above the cooking top of not less than 30 inches (762 mm) to unprotected combustible material. When the underside of such combustible material is protected with insulating millboard at least ¼ inch (6 mm) thick covered with 0.021-inch-thick (0.41 mm) (No. 28 U.S. gauge) or a metal ventilating hood, the distance shall not be less than 24 inches (610 mm).

23.110.628.2 Small Ceramic Kilns--Ventilation

Add a new subsection 628.2 to read as follows:

Ventilation. A canopy-type hood shall be installed directly above each kiln. The face opening area of the hood shall be equal to or greater than the top horizontal surface area of the kiln. The hood shall be constructed of not less than 0.024-inch (0.61mm) (No. 24 U.S. gauge) galvanized steel or equivalent and be supported at a height of between 12 inches (305 mm) and 30 inches (750 mm) above the kiln by noncombustible supports.

Exception: Electric kilns installed with listed exhaust blowers may be used when marked as being suitable for the kiln and installed in accordance with manufacturer's instructions.

Each hood shall be connected to a gravity ventilation duct extending in a vertical direction to outside the building. This duct shall be of the same construction as the hood and shall have a minimum cross-sectional area of not less than one fifteenth of the face opening area of the hood. The duct shall terminate a minimum of 12 inches (305 mm) above any portion of a building within 4 feet (1.22 m) and terminate no less than 4 feet (1.22 m) from any openable windows or other openings into the building or adjacent property line. The duct opening to the outside shall be shielded, without reduction of duct area, to prevent entrance of rain into the duct. The duct shall be supported at each section by noncombustible supports.

Provisions shall be made for air to enter the room in which a kiln is installed at a rate at least equal to the air being removed through the kiln hood.

23.110.632 Chimney Damper Opening Area

Delete section 632 and Table 632.1 in their entirety.

23.110.633 Other Appliances

Add a new section 633 to read as follows:

Other Appliances. For installation requirements of specific appliances not covered in this code, refer to the latest edition of ANSI Z 21.30, or N.F.P.A. #54, or manufacturer's installation instructions. (CAC 14.56.160-1905(a) and (b) and GAAB 22.15.010-1905(a) and (b).

23.110.Appendix A Sizing and Capacities of Gas Piping

Adopt Appendix A in its entirety.