

# CHAPTER 3

## GENERAL REGULATIONS

### SECTION FGC 301 GENERAL

**301.1 Scope.** This chapter shall govern the approval and installation of all equipment and appliances that comprise parts of the installations regulated by this code in accordance with Section 101.2.

**301.1.1 Other fuels.** The requirements for combustion and dilution air for gas-fired appliances shall be governed by Section 304. The requirements for combustion and dilution air for appliances operating with fuels other than fuel gas shall be regulated by the *New York City Mechanical Code*.

**301.2 Energy utilization.** Heating, ventilating, air-conditioning, and refrigeration systems of all structures shall be designed and installed for efficient utilization of energy in accordance with the *New York City Energy Conservation Code*.

**301.3 Listed and labeled.** Appliances regulated by this code shall be listed and labeled.

**301.4 Labeling.** Refer to Article 114 and Section 28-113.4 of the *Administrative Code*.

**301.5 Label information.** A permanent factory-applied nameplate(s) shall be affixed to appliances on which shall appear in legible lettering: the manufacturer's name or trademark, the model number, serial number and, for listed appliances, the seal or mark of the testing agency. A label shall include the hourly rating in British thermal units per hour (Btu/h) (W), the type of fuel approved for use with the appliance; and the minimum clearance requirements.

**301.6 Plumbing connections.** Potable water supply and building drainage system connections to appliances regulated by this code shall be in accordance with the *New York City Plumbing Code*.

**301.7 Fuel types.** Appliances shall be designed for use with the type of fuel gas that will be supplied to them.

**301.7.1 Appliance fuel conversion.** Appliances shall not be converted to utilize a different fuel gas except where complete instructions for such conversion are provided by the serving gas supplier, the appliance manufacturer, the burner manufacturer or the boiler manufacturer. If a specific listing and labeling is available for the burner and boiler combination it shall be submitted to the department. If a specific listing for the combination is not available the listing for the burner and a letter confirming compatibility shall be submitted by the burner manufacturer. The completed installation shall be inspected and tested in the field by a representative of the appliance manufacturer, the burner manufacturer or the boiler manufacturer, and certified by a registered design professional. A certification of compliance by a registered design professional developed in accordance with the

requirements of the New York City Department of Environmental Protection may be used to satisfy this certification requirement. The registered design professional need not be the engineer of record for the design.

**301.7.2 Liquid petroleum gas.** Storage or use of LPG for a stationary LPG installation shall comply with the *New York City Fire Code*.

**301.8 Vibration isolation.** Where means for isolation of vibration of an appliance is installed, means for support and restraint of that appliance shall be provided as designed by a registered design professional.

**301.9 Repair.** Defective material or parts shall be replaced or repaired in such a manner so as to preserve the original approval or listing.

**301.10 Wind resistance.** Appliances and supports that are exposed to wind shall be designed and installed to resist the wind pressures determined in accordance with the *New York City Building Code*.

**301.11 Flood hazard.** For structures located in flood hazard areas, the appliance, equipment and system installations regulated by this code shall comply with the additional requirements of Appendix G of the *New York City Building Code*.

**301.12 Seismic resistance.** When earthquake loads are applicable in accordance with the *New York City Building Code*, the supports shall be designed and installed for the seismic forces in accordance with that code.

**301.13 Ducts.** Ducts required for the installation of systems regulated by this code shall be designed and installed in accordance with the *New York City Mechanical Code*.

**301.14 Rodentproofing.** Buildings or structures and the walls enclosing habitable or occupiable rooms and spaces in which persons live, sleep or work, or in which feed, food or foodstuffs are stored, prepared, processed, served or sold, shall be constructed to protect against rodents in accordance with the *New York City Building Code*.

**301.15 Prohibited location.** The appliances, equipment and systems regulated by this code shall not be located in an elevator shaft.

**301.16 Mechanical systems.** Hydronic piping, ventilation and other mechanical systems not covered by this code shall be in accordance with the *New York City Mechanical Code*.

**301.17 Electrical systems.** Electrical wiring, controls and connections to equipment and appliances regulated by this code shall be in accordance with the *New York City Electrical Code*.

**301.18 Noise control requirements.** Appliances and equipment regulated by this code must comply with Section 313 of the *New York City Mechanical Code*.

**SECTION FGC 302  
STRUCTURAL SAFETY**

**302.1 Structural safety.** The building shall not be weakened by the installation of any gas piping. In the process of installing or repairing any gas piping, the finished floors, walls, ceilings, tile work or any other part of the building or premises which is required to be changed or replaced shall be left in a safe structural condition in accordance with the requirements of the *New York City Building Code*.  
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**302.1.1 Loading.** Alterations resulting in the addition of loads to any member, such as HVAC equipment and water heaters, shall not be permitted without verification that the members are capable of supporting such additional loading.  
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**302.2 Penetrations of floor/ceiling assemblies and fire-resistance-rated assemblies.** Penetrations of floor/ceiling assemblies and assemblies required to have a fire-resistance rating shall be protected in accordance with the *New York City Building Code*.  
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**302.3 Cutting, notching and boring in wood members.** The cutting, notching and boring of wood members shall comply with Sections 302.3.1 through 302.3.5.  
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**302.3.1 Solid non-engineered joist notches and holes.** Notches on the ends of the solid non-engineered joists shall not exceed one-fourth the joist depth. Notches in the top or bottom of joists shall not exceed one-sixth the depth, shall not be longer than one-third the depth and shall not be located in the middle third of the span. Holes bored in joists shall not be within 2 inches (50.8 mm) of the top or bottom of the joist, and the diameter of any such hole shall not exceed one-third the depth of the joist. Holes bored in the middle third of the span shall be located at the center of the joist depth. Clear distance between holes and notches shall be a minimum of 2 inches (50.8 mm). See Figure 2308.5.8 of the *New York City Building Code*.  
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**302.3.2 Stud cutting and notching.** In exterior walls and bearing partitions, wood studs are permitted to be cut or notched to a depth not exceeding 25 percent of the width of the stud. Cutting or notching of studs to a depth not greater than 40 percent of the width of the stud is permitted in nonbearing partitions supporting no loads other than the weight of the partition. See Figure 2308.5.8 of the *New York City Building Code*.  
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**302.3.3 Bored holes in studs.** Bored holes not greater than 40 percent of the stud width are permitted to be bored in any wood stud. Bored holes not greater than 60 percent of the stud width are permitted in nonbearing partitions or in any wall where each bored stud is doubled, provided not more than two such successive doubled studs are so bored. In no case shall the edge of the bored hole be nearer than  $\frac{5}{8}$  inch (15.9 mm) to the edge of the stud. Bored holes shall not be located at the same section of stud as a cut or notch. See Figure 2308.5.8 of the *New York City Building Code*.  
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**302.3.4 Engineered wood products.** Cuts, notches and holes bored in trusses, structural composite lumber, struc-

tural glued-laminated members and I-joists are prohibited except where permitted by the manufacturer's recommendations or where the effects of such alterations are specifically considered in the design of the member by a registered design professional.

**302.3.5 Drilling and notching of top plate.** When piping is placed in or partly in an exterior wall or interior load-bearing wall, necessitating cutting, drilling or notching of the top plate by more than 50 percent of its width, a galvanized metal tie not less than 0.054 inch thick (1.37 mm) (No. 16 gage) and  $1\frac{1}{2}$  inches (38.1 mm) wide shall be fastened across and to the plate at each side of the opening with not less than eight 10d (0.148 inch diameter) nails having a minimum length of  $1\frac{1}{2}$  inches (38.1 mm) at each side or equivalent. The metal tie must extend a minimum of 6 inches (152.4 mm) past the opening. See Figure 2308.5.8 of the *New York City Building Code*.  
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**Exception:** When the entire side of the wall with the notch or cut is covered by wood structural panel sheathing, additional fastening is not required.  
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**302.4 Trusses.** Truss members of any material and components shall not be cut, drilled, notched, spliced or otherwise altered in any way without the written concurrence and approval of a registered design professional.  
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**302.5 Cutting, notching and boring in steel framing.** The cutting, notching and boring of steel framing members shall comply with Sections 302.5.1 through 302.5.4.  
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**302.5.1 Structural steel framing.** The cutting, notching and boring of holes in structural steel framing members shall be as prescribed by the registered design professional.  
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**302.5.2 Cold-formed steel framing.** Flanges and lips of load-bearing, cold-formed steel framing members shall not be cut or notched. Holes in webs of load-bearing, cold-formed steel framing members shall be permitted along the centerline of the web of the framing member and shall not exceed the dimensional limitations, penetration spacing or minimum hole edge distance as prescribed by the registered design professional.  
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**302.5.3 Nonstructural cold-formed steel wall framing.** Flanges and lips of nonstructural cold-formed steel wall studs shall be permitted along the centerline of the web of the framing member, shall not exceed  $1\frac{1}{2}$  inches (38.1 mm) in width or 4 inches (101.6 mm) in length, and the holes shall not be spaced less than 24 inches (609.6 mm) center to center from another hole or less than 10 inches (254 mm) from the bearing end.  
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**302.5.4 Steel floor and roof decking.** Cutting, notching and boring holes in steel floor and roof decking shall be as prescribed by the registered design professional.  
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**302.6 Cutting, notching and coring into concrete.** The cutting, notching or coring of concrete must comply with provisions of Chapter 19 of the *New York City Building Code* and is not permitted without prior approval of the registered design professional.  
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**302.7 Protection of footings.** Trenching installed parallel to footings and walls shall not extend into the bearing plane of a  
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NYC footing or wall. The upper boundary of the bearing plane is a  
 NYC line that extends downward, at an angle of 34 degrees (1:1.5  
 NYC slope) from horizontal, from the outside bottom edge of the  
 NYC footing or wall.

NYC **303.8 Piping materials exposed within plenums.** Piping  
 NYC materials exposed within plenums shall comply with the pro-  
 NYC visions of the *New York City Mechanical Code*.

**SECTION FGC 303  
 APPLIANCE LOCATION**

**303.1 General.** Appliances shall be located as required by  
 this section, specific requirements elsewhere in this code and  
 the conditions of the equipment and appliance listing.

**303.2 Hazardous locations.** Appliances shall not be located  
 in a hazardous location unless listed and approved for the  
 specific installation.

**303.3 Prohibited locations.** Appliances shall not be located  
 in sleeping rooms, bathrooms, toilet rooms, storage closets  
 or surgical rooms, or in a space that opens only into such  
 rooms or spaces.

NYC **Exceptions:**

- NYC 1. In rooms other than those used for sleeping pur-  
 NYC poses, direct-vent appliances that obtain all com-  
 NYC bustion air directly from the outdoors and installed  
 NYC in accordance with the conditions of the listing and  
 NYC the manufacturer’s instructions.
- NYC 2. In rooms other than those used for sleeping pur-  
 NYC poses, vented room heaters, wall furnaces, vented  
 NYC decorative appliances, vented gas fireplaces, vented  
 NYC gas fireplace heaters and decorative appliances for  
 NYC installation in vented solid fuel-burning fireplaces  
 NYC that are installed in rooms that meet the required  
 NYC volume criteria of Section 304.5.
- NYC 3. In rooms other than those used for sleeping pur-  
 NYC poses, appliances installed in an enclosure in which  
 NYC all combustion air is taken from the outdoors, in  
 NYC accordance with Section 304.6. Access to such  
 NYC enclosure shall be through a solid weather-stripped  
 NYC door, equipped with an approved self-closing  
 NYC device.

NYC **303.3.1 Gas-fired direct vent appliances.** Gas-fired  
 NYC direct vent space-heating appliances used for providing  
 NYC heat in rooms for sleeping purposes shall be deemed to be  
 NYC located outside of the sleeping room provided that the  
 NYC appliance and its installation comply with Sections  
 NYC 303.3.1.1 through 303.3.1.7.

NYC **303.3.1.1 General.** Such unit is factory assembled and  
 NYC manufactured with an integral, factory assembled and  
 NYC hard-wired carbon monoxide detector interlock and  
 NYC automatic main gas shut-off valve. The appliance shall  
 NYC be tested, designed and evaluated in accordance with  
 NYC Section 622 of this code. Acceptable gas-fired direct  
 NYC vent space-heating appliances shall be listed and  
 NYC labeled by an approved agency in accordance with  
 NYC Section 28-113.2.3 of the *Administrative Code*. Instal-

lation shall be in accordance with the manufacturer’s  
 NYC instructions and the applicable listing. NYC

**303.3.1.2 Carbon monoxide detector.** The carbon  
 NYC monoxide detector shall be listed and labeled in accor-  
 NYC dance with UL 2034 and UL 2075 and installed in  
 NYC accordance with the carbon monoxide detector manu-  
 NYC facturer’s instructions. The carbon monoxide detector  
 NYC may be installed integral to the appliance, on the sur-  
 NYC face of the appliance or remotely, but hard-wired, no  
 NYC more than 5 feet (1.5 m) from the appliance. NYC

**303.3.1.3 Internal safety controls.** The appliance  
 NYC shall be hard-wired to the carbon monoxide detector in  
 NYC a supervisory signaling mode. If the carbon monoxide  
 NYC detector connection is not sensed, the appliance shall  
 NYC not initiate a startup sequence and shall alert the opera-  
 NYC tor to the fault condition. The appliance shall be sup-  
 NYC plied with a carbon monoxide fault indicator easily  
 NYC visible and recognizable to the operator. The appliance  
 NYC shall be equipped with a manual restart control. Auto-  
 NYC matic reset is not permitted. NYC

**303.3.1.4 Gas piping.** The appliance shall be installed  
 NYC with natural gas only. All gas piping shall be hard-  
 NYC piped with no flexible connectors. Pursuant to Section  
 NYC 27-2034(f) of the *New York City Housing Mainte-  
 NYC nance Code*, each heater shall be equipped with an  
 NYC effective device to automatically shut off the gas sup-  
 NYC ply to the heater if its pilot light or other constantly  
 NYC burning flame is extinguished, or in the event of an  
 NYC interruption of the gas supply to the heater, and will  
 NYC not permit the heater to be relighted unless such shut-  
 NYC off device is first reset manually. NYC

**303.3.1.5 Venting.** Such unit shall be of direct vent  
 NYC type, such that all air for combustion is derived from  
 NYC the outdoors and that all flue gases are discharged  
 NYC directly to the outdoors. Such unit shall be installed  
 NYC through a sleeve located in an exterior wall. NYC

**303.3.1.6 Installation.** Gas-fired direct vented appli-  
 NYC ances shall be installed in accordance with the follow-  
 NYC ing:

- NYC 1. Carbon monoxide detectors installed with gas-  
 NYC fired direct vent space-heating appliance shall be  
 NYC provided in addition to code required carbon  
 NYC monoxide detector devices in dwelling units. NYC
- NYC 2. Carbon monoxide detectors installed with gas-  
 NYC fired direct vent space-heating appliance shall  
 NYC not be interconnected to other carbon monoxide  
 NYC detecting devices in the dwelling unit. NYC
- NYC 3. The appliance shall only be installed by a master  
 NYC licensed plumber. NYC

**303.3.1.7 Clearances.** Gas-fired direct vented appli-  
 NYC ances shall be installed with the following clearances:

- NYC 1. Clearances from adjacent combustible surfaces  
 NYC shall meet the minimum clearances indicated by  
 NYC the manufacturer’s instructions and the listing  
 NYC agency. NYC

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- 2. Clearances from adjacent openings or packaged terminal air conditioners (PTAC) and packaged terminal heat pumps (PTHP), the bottom of the vent terminal and the air intake shall be located at least 12 inches (304.8 mm) above finished ground level and in accordance with Table 303.3.1.7.
- 3. For all other equipment, all vent termination clearances from adjacent openings shall be in accordance with Section 503.8.

**TABLE 303.3.1.7  
PTAC AND PTHP VENT TERMINATION  
CLEARANCE TO AIR OPENINGS**

Appliance Input Rating (BTU per hour)	Vent Termination Clearance to Any Air Opening Into Same or Adjacent Building (inches)
10,000 or less	6
Over 10,000 but less than 50,000	9
50,000 or over	12

For SI: 1 inch = 25.4 mm, 1 British thermal unit per hour = 0.2931 W.

**303.4 Protection from physical damage.** Appliances shall not be installed in a location where subject to physical damage, including vehicular impact, unless protected by approved barriers meeting the requirements of the *New York City Fire Code*.

**303.5 Indoor locations.** Furnaces and boilers installed in closets and alcoves shall be listed for such installation.

**303.5.1 Gas fired appliances.** Boilers, furnaces and other centrally installed space heating equipment, regardless of btu per hour input, shall be located in an enclosure in accordance with Section 509 of the *New York City Building Code*.

**Exception:** Gas-fired direct vented appliances with a 350,000 btu per hour (102.6 kW) input or less may be installed in a non-fire rated enclosure.

**303.5.2 Maximum temperature.** Maximum indoor temperature in spaces surrounding appliances shall not exceed the greater of the operational temperature of the installed equipment or 104°F (40°C).

**303.6 Outdoor locations.** Appliances installed in outdoor locations shall be either listed for outdoor installation or provided with protection from outdoor environmental factors that influence the operability, durability and safety of the appliances.

**303.7 Pit locations.** Appliances installed in pits or excavations shall not come in direct contact with the surrounding soil. The sides of the pit or excavation shall be held back a minimum of 12 inches (304.8 mm) from the appliance. Where the depth exceeds 12 inches (304.8 mm) below adjoining grade, the walls of the pit or excavation shall be lined with concrete or masonry, such concrete or masonry shall extend a minimum of 4 inches (101.6 mm) above adjoining grade and shall have sufficient lateral load-bearing capacity to resist collapse. The appliance shall be protected from flooding in a manner approved by the commissioner.

**SECTION FGC 304  
COMBUSTION, VENTILATION AND DILUTION AIR**

**304.1 General.** Air for combustion, ventilation and dilution of flue gases for appliances installed in buildings shall be provided by application of one of the methods prescribed in Sections 304.5 through 304.9. Where the requirements of Section 304.5 are not met, outdoor air shall be introduced in accordance with one of the methods prescribed in Sections 304.6 through 304.9. Direct-vent appliances, gas appliances of other than natural draft design, vented gas appliances not designated as Category I and appliances equipped with power burners shall be provided with combustion, and dilution air in accordance with the appliance manufacturer's instructions. Combustion, and dilution air shall be obtained solely from the outdoors for fuel-burning appliances with an input greater than 350,000 Btu/h (102.6 kW). Ventilation air shall be provided by any suitable means. The mechanical room shall comply with the requirements of Section 1012 of the *New York City Mechanical Code* and Sections C402.5.3 and R402.4.4, as applicable, of the *New York City Energy Conservation Code*.

**Exception:** Type 1 clothes dryers that are provided with makeup air in accordance with Section 504 of the *New York City Mechanical Code*.

**304.1.1 Crawl space and attic space.** For the purposes of this chapter, an opening to a naturally ventilated crawl space or attic space shall be considered equivalent to an opening to the outdoors.

**304.1.1.1 Crawl space.** Where lower combustion air openings connect with crawl spaces, such spaces shall have unobstructed openings to the outdoors at least twice that required for the combustion air openings. The height of the crawl space shall comply with the requirements of the *New York City Building Code* and shall be without obstruction to the free flow of air.

**304.1.1.2 Attic space.** Where combustion air is obtained from an attic area, the attic ventilating openings shall not be subject to ice or snow blockage, and the attic shall have not less than 30 inches (762 mm) vertical clear height at its maximum point. Attic ventilation openings shall be sufficient to provide the required volume of combustion air and the attic ventilation required by the *New York City Building Code*. The combustion air openings shall be provided with a sleeve of not less than 0.019 inch (0.48 mm) (No. 26 Gage) galvanized steel or other approved material extending from the appliance enclosure to at least 6 inches (152.4 mm) above the top of the ceiling joists and insulation.

**304.2 Appliance location.** Appliances shall be located so as not to interfere with proper circulation of combustion, ventilation and dilution air.

**304.3 Draft hood/regulator location.** Where used, a draft hood or a barometric draft regulator shall be installed in the same room or enclosure as the equipment served to prevent any difference in pressure between the hood or regulator and the combustion air supply. A barometric damper may be installed in an adjacent room provided that a louver is

NYC installed in the adjacent room to the outside air. The net free  
 NYC area of the louver shall be equal to or greater than the area of  
 NYC the barometric damper.

NYC **304.4 Circulation of air.** The equipment and appliances  
 NYC within every room containing fuel-burning appliances shall  
 NYC be installed so as to allow free circulation of air. Provisions  
 NYC shall be made to allow for the simultaneous operation of  
 NYC mechanical exhaust systems, fireplaces or other equipment  
 NYC and appliances operating in the same room or space from  
 NYC which combustion, ventilation, and dilution air is being  
 NYC drawn. Such provisions shall prevent the operation of such  
 NYC appliances, equipment and systems from affecting the sup-  
 NYC ply of combustion, ventilation, and dilution air.

NYC **304.4.1 Makeup air for fuel-burning† devices.** Where  
 NYC exhaust fans are installed, makeup air shall be provided to  
 NYC replace the exhausted air. Calculations shall be provided  
 NYC on the construction documents to validate the use of the  
 NYC exhaust fan(s) and compliance with this chapter†.

NYC **304.4.2 Ventilation air for fuel-burning† devices.**  
 NYC Where ventilation air is brought in by mechanical means  
 NYC for heat generation mitigation, provisions must be made  
 NYC for proper air balance to prevent a negative or positive  
 NYC pressure in the boiler room and to discharge the ventila-  
 NYC tion directly to the outside.

NYC **304.4.3 Prohibited sources.** Openings and ducts shall  
 NYC not connect appliance enclosures with a space in which  
 NYC the operation of a fan will adversely affect the flow of the  
 NYC combustion, ventilation, and dilution air. Combustion,  
 NYC ventilation, and dilution air shall not be subject to ice or  
 NYC snow blockage. No combustion, ventilation, and dilution  
 NYC air inlet shall be less than 30 inches (762 mm) above  
 NYC grade. Combustion, ventilation, and dilution air shall not  
 NYC be obtained from a hazardous location, except where the  
 NYC fuel-fired appliances are located within the hazardous  
 NYC location and are not installed in accordance with this  
 NYC code. Combustion, ventilation, and dilution air shall not  
 NYC be taken from a refrigeration machinery room, except  
 NYC where a refrigerant vapor detector system is installed to  
 NYC automatically shut off the combustion process in the  
 NYC event of refrigerant leakage. For structures in flood haz-  
 NYC ard areas, air shall be obtained from a location complying  
 NYC with the additional requirements of Appendix G of the  
 NYC *New York City Building Code.*

**304.5 Indoor combustion air.** The required volume of  
 indoor air shall be determined in accordance with Section  
 304.5.1 or 304.5.2, except that where the air infiltration rate  
 is known to be less than 0.40 air changes per hour (ACH),  
 Section 304.5.2 shall be used. The total required volume  
 shall be the sum of the required volume calculated for all  
 appliances located within the space. Rooms communicating  
 directly with the space in which the appliances are installed  
 through openings not furnished with doors, and through  
 combustion air openings sized and located in accordance  
 with Section 304.5.3, are considered to be part of the  
 required volume.

NYC **Exception:** Combustion, ventilation, and dilution air  
 NYC shall be obtained solely from the outdoors for fuel-burn-

ing appliances with an input greater than 350,000 Btu/h (102.6 kW). NYC

**304.5.1 Standard method.** The minimum required vol- NYC  
 ume shall be 50 cubic feet per 1,000 Btu/h (4.8 m<sup>3</sup>/kW) of NYC  
 the appliance input rating.

**304.5.2 Known air-infiltration-rate method.** Where the  
 air infiltration rate of a structure is known, the minimum  
 required volume shall be determined as follows:

For appliances other than fan-assisted, calculate volume  
 using Equation 3-1.

$$Required\ Volume_{other} \geq \frac{21\ ft^3}{ACH} \left( \frac{I_{other}}{1,000\ Btu/h} \right) \quad NYC$$

(Equation 3-1) NYC

For fan-assisted appliances, calculate volume using  
 Equation 3-2.

$$Required\ Volume_{fan} \geq \frac{15\ ft^3}{ACH} \left( \frac{I_{fan}}{1,000\ Btu/h} \right) \quad NYC$$

(Equation 3-2) NYC

where:

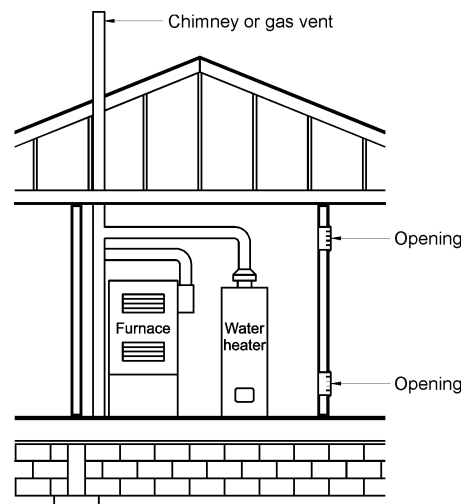
$I_{other}$  = All appliances other than fan assisted NYC  
 (input in Btu/h). NYC

$I_{fan}$  = Fan-assisted appliance (input in Btu/h). NYC

$ACH$  = Air change per hour (percent of volume of NYC  
 space exchanged per hour, expressed as a NYC  
 decimal). NYC

For purposes of this calculation, an infiltration rate  
 greater than 0.60 ACH shall not be used in Equations 3-1  
 and 3-2.

**304.5.3 Indoor opening size and location.** Openings  
 used to connect indoor spaces shall be sized and located  
 in accordance with Sections 304.5.3.1 and 304.5.3.2 (see  
 Figure 304.5.3).



**FIGURE 304.5.3**  
**ALL AIR FROM INSIDE THE BUILDING**  
 (see Section 304.5.3)

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**304.5.3.1 Combining spaces on the same story.** Each opening shall have a minimum free area of 1 square inch per 1,000 Btu/h (2200 mm<sup>2</sup>/kW) of the total input rating of all appliances in the space, but not less than 100 square inches (0.06 m<sup>2</sup>). One opening shall commence within 12 inches (304.8 mm) of the top and one opening shall commence within 12 inches (304.8 mm) of the bottom of the enclosure. The minimum dimension of air openings shall be not less than 3 inches (76.2 mm).

**304.5.3.2 Combining spaces in different stories.** The volumes of spaces in different stories shall be considered as communicating spaces where such spaces are connected by one or more openings in doors or floors having a total minimum free area of 2 square inches per 1,000 Btu/h (4402 mm<sup>2</sup>/kW) of total input rating of all appliances.

**304.6 Outdoor combustion air.** Outdoor combustion air shall be provided through opening(s) to the outdoors in accordance with Section 304.6.1 or 304.6.2. The minimum dimension of air openings shall be not less than 3 inches (76.2 mm). The size of the openings connecting the room to the outdoor air supply shall also comply with any applicable rules of the New York City Department of Environmental Protection.

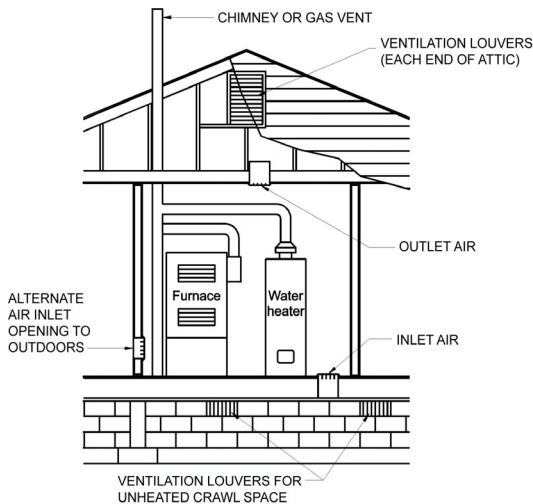
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**304.6.1 Two-permanent-openings method.** Two permanent openings, one commencing within 12 inches (304.8 mm) of the top and one commencing within 12 inches (304.8 mm) of the bottom of the enclosure, shall be provided. The openings shall communicate directly or by ducts with the outdoors or spaces that freely communicate with the outdoors.

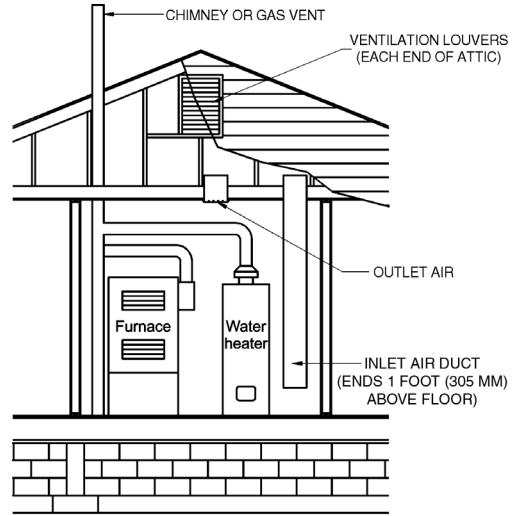
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Where directly communicating with the outdoors, or where communicating with the outdoors through vertical ducts, each opening shall have a minimum free area of 1 square inch per 4,000 Btu/h (550 mm<sup>2</sup>/kW) of total input rating of all appliances in the enclosure (see Figures 304.6.1(1) and 304.6.1(2)).

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**FIGURE 304.6.1(1)**  
**ALL AIR FROM OUTDOORS—INLET AIR FROM VENTILATED CRAWL SPACE AND OUTLET AIR TO VENTILATED ATTIC**  
(see Section 304.6.1)

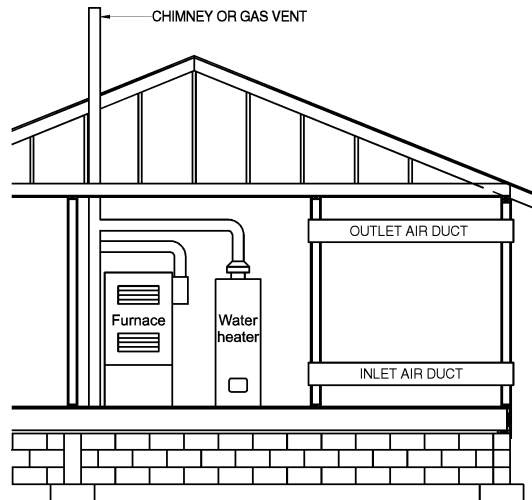


For SI: 1 foot = 304.8 mm.

**FIGURE 304.6.1(2)**  
**ALL AIR FROM OUTDOORS THROUGH VENTILATED ATTIC**  
(see Section 304.6.1)

Where communicating with the outdoors through horizontal ducts, each opening shall have a minimum free area of not less than 1 square inch per 2,000 Btu/h (1100 mm<sup>2</sup>/kW) of total input rating of all appliances in the enclosure (see Figure 304.6.1(3)).

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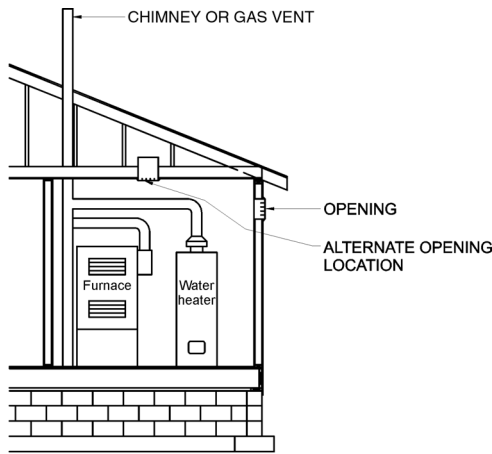


**FIGURE 304.6.1(3)**  
**ALL AIR FROM OUTDOORS**  
(see Section 304.6.1)

**304.6.2 One-permanent-opening method.** One permanent opening, commencing within 12 inches (304.8 mm) of the top of the enclosure, shall be provided. The appliance shall have clearances of not less than 1 inch (25.4 mm) from the sides and back and 6 inches (152.4 mm) from the front of the appliance. The opening shall directly communicate with the outdoors, or through a vertical or horizontal duct, to the outdoors or spaces that freely communicate with the outdoors (see Figure 304.6.2) and shall have a minimum free area of 1 square inch per 3,000 Btu/h (734 mm<sup>2</sup>/kW) of the total input

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rating of all appliances located in the enclosure and not less than the sum of the areas of all vent connectors in the space.



**FIGURE 304.6.2**  
**SINGLE COMBUSTION AIR OPENING,**  
**ALL AIR FROM THE OUTDOORS**

**304.7 Combination indoor and outdoor combustion air.** The use of a combination of indoor and outdoor combustion air shall be in accordance with Sections 304.7.1 through 304.7.3.

**304.7.1 Indoor openings.** Where used, openings connecting the interior spaces shall comply with Section 304.5.3.

**304.7.2 Outdoor opening location.** Outdoor opening(s) shall be located in accordance with Section 304.6.

**304.7.3 Outdoor opening(s) size.** The outdoor opening(s) size shall be calculated in accordance with the following:

1. The ratio of interior spaces shall be the available volume of all communicating spaces divided by the required volume.
2. The outdoor size reduction factor shall be one minus the ratio of interior spaces.
3. The minimum size of outdoor opening(s) shall be the full size of outdoor opening(s) calculated in accordance with Section 304.6, multiplied by the reduction factor. The minimum dimension of air openings shall be not less than 3 inches (76.2 mm).

**NYC 304.8 Reserved.**

**304.9 Mechanical combustion air supply.** Where all combustion air is provided by a mechanical air supply system, the combustion air shall be supplied from the outdoors at a rate not less than 0.35 cubic feet per minute per 1,000 Btu/h (0.034 m<sup>3</sup>/min per kW) of total input rating of all appliances located within the space. Combustion air rates shall also comply with any applicable rules of the New York City Department of Environmental Protection. The mechanical air supply shall be sufficient to accommodate combustion air, ventilation air, and dilution air requirements of the installation.

**304.9.1 Makeup air.** Where exhaust fans are installed, makeup air shall be provided to replace the exhausted air.

**304.9.2 Appliance interlock.** Each of the appliances served shall be interlocked with the mechanical air supply system to prevent main burner operation when the mechanical air supply system is not in operation. The air flow and the damper operation shall be proven prior to burner operation.

**304.9.3 Reserved.**

**304.10 Openings obstructions, locations and protection.** The required size of openings for combustion, ventilation, and dilution air shall be based on the net free area of each opening. The net free area of an opening shall be that specified by the manufacturer of the opening covering. In the absence of such information, openings covered with metal louvers shall be deemed to have a net free area of 60 percent of the area of the opening, and openings covered with wood louvers shall be deemed to have a net free area of 10 percent of the area of the opening. Louvers and grilles shall be fixed in the open position.

**Exception:** Operable louvers shall be interlocked with the appliance so that they are proven to be in the full open position prior to main burner ignition and during main burner operation. Means shall be provided to prevent the main burner from igniting if the louvers fail to open during burner startup and to shut down the main burner if the louvers close during operation.

**304.10.1 Dampered openings.** Where the combustion air openings are provided with automatic, smoke or fire dampers, the dampers shall be electrically interlocked with the appliances served, so as to prevent operation of any appliance when any of the dampers are closed. Manually operated dampers shall not be installed in combustion air openings. The damper opening shall be proven prior to burner operation.

**304.10.2 Caution sign.** A sign stating, "Louvers, dampers and/or ventilation openings must not be blocked or disabled." shall be permanently affixed, in clear view, adjacent to the opening(s) within the room containing the equipment. The letters used on the sign shall be at least 1 inch (25.4 mm) in height.

**304.10.3 Opening location and protection.** Combustion air openings to the outdoors shall comply with the location and protection provisions applicable to outside air intake openings of Sections 401.5 and 401.6 of the *New York City Mechanical Code*.

**304.11 Combustion air ducts.** Combustion air ducts shall comply with all of the following:

1. Be of galvanized steel complying with Chapter 6 of the *New York City Mechanical Code* or of equivalent corrosion-resistant material approved for this application.

**Exception:** Within dwelling units, unobstructed stud and joist spaces shall not be prohibited from conveying combustion air, provided that not more than one required fireblock is removed.

## GENERAL REGULATIONS

- NYC | 2. Have a minimum dimension of 3 inches (76.2 mm) in all directions.
- NYC | 3. Terminate in an unobstructed space allowing free movement of combustion air to the appliances.
- NYC | 4. Have the same cross-sectional areas as the free area of the openings to which they connect.
- NYC | 5. Serve a single appliance enclosure.
- 6. Not serve both upper and lower combustion air openings where both such openings are used. The separation between ducts serving upper and lower combustion air openings shall be maintained to the source of combustion air.
- NYC | 7. Not be screened where terminating in an attic space.
- NYC | 8. Not slope downward toward the source of combustion air, where serving the upper required combustion air opening.
- NYC | 9. Be constructed so that the remaining space surrounding a chimney or chimney liner, installed within a masonry, metal or factory-built chimney cannot be used to supply combustion, ventilation and dilution air, except for direct vent appliances designed and installed in accordance with the equipment manufacturer's instructions and listing.

**304.12 Protection from fumes and gases.** Where corrosive or flammable process fumes or gases, other than products of combustion, are present, means for the disposal of such fumes or gases shall be provided. Such fumes or gases include carbon monoxide, hydrogen sulfide, ammonia, chlorine and halogenated hydrocarbons.

NYC | In barbershops, beauty shops and other facilities where chemicals that generate corrosive or flammable products, such as aerosol sprays, are routinely used, nondirect-vent-type appliances shall be located in a mechanical room separated or partitioned off from other areas with provisions for combustion air and dilution air from the outdoors. Direct-vent appliances shall be installed in accordance with the appliance manufacturer's instructions.

### SECTION FGC 305 INSTALLATION

**305.1 General.** Equipment and appliances shall be installed as required by the terms of their approval, in accordance with the conditions of listing, the manufacturer's instructions and this code. Manufacturers' instructions shall be available on the job site at the time of inspection. Where a code provision is less restrictive than the conditions of the listing of the equipment or appliance or the manufacturer's instructions, the conditions of the listing and the manufacturer's instructions shall apply.

**305.2 Hazardous area.** Equipment and appliances having an ignition source shall not be installed in Group H occupancies or control areas where open use, handling or dispensing of combustible, flammable or explosive materials occurs.

**305.3 Elevation of ignition source.** Equipment and appliances having an ignition source shall be elevated such that

the source of ignition is not less than 18 inches (457.2 mm) above the floor in hazardous locations and public garages, private garages, repair garages, motor fuel-dispensing facilities and parking garages. For the purpose of this section, rooms or spaces that are not part of the living space of a dwelling unit and that communicate directly with a private garage through openings shall be considered to be part of the private garage.

**Exception:** Elevation of the ignition source is not required for appliances that are listed as flammable vapor ignition resistant.

**305.3.1 Installation in residential garages.** In residential garages where appliances are installed in a separate, enclosed space having access only from outside of the garage, such appliances shall be permitted to be installed at floor level, provided that the required combustion air is taken from the exterior of the garage.

**305.3.2 Parking garages.** Connection of a parking garage with any room in which there is a fuel-fired appliance shall be by means of a vestibule providing a two-doorway separation, except that a single door is permitted where the sources of ignition in the appliance are elevated in accordance with Section 305.3.

**Exception:** This section shall not apply to appliance installations complying with Section 305.4.

**305.4 Public garages, motor fuel-dispensing facilities and repair garages.** Appliances located in public garages, motor fuel-dispensing facilities, repair garages or other areas frequented by motor vehicles shall be installed not less than 8 feet (2438.4 mm) above the floor. Where motor vehicles are capable of passing under an appliance, the appliance shall be installed at the clearances required by the appliance manufacturer and not less than 1 foot (304.8 mm) higher than the tallest vehicle garage door opening.

#### Exceptions:

- 1. The requirements of this section shall not apply where the appliances are protected from motor vehicle impact and installed in accordance with Section 305.3 of this code and NFPA 30A. NYC
- 2. Appliances installed in repair garages shall be separated from repair areas by walls or partitions, floors, or floor ceiling assemblies that are constructed so as to prohibit the transmission of vapors and having a fire-resistance rating of not less than 1 hour, and that have no openings in the wall separating the repair area within 8 feet (2438.4 mm) of the floor. Wall penetration shall be firestopped. Air for combustion purposes shall be obtained from the outdoors. The heating room shall not be used for the storage of combustible materials. NYC
- 3. Heating appliances for vehicle repair areas where there is no dispensing or transferring of Class I or Class II flammable or combustible liquids or liquefied petroleum gas shall be installed in accordance with NFPA 30A. NYC