

# CHAPTER 3

## GENERAL REGULATIONS

### SECTION MC 301 GENERAL

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

**NYC 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*.

**NYC 301.3 Identification.** All pipe and tubing and each pipe fitting utilized in a mechanical system shall bear the identification of the manufacturer.

**NYC 301.4 Plastic pipe, fittings and components.** Plastic pipe, fittings and components shall be third-party certified.

**301.5 Third-party testing and certification.** Piping, tubing and fittings shall comply with the applicable referenced standards, specifications and performance criteria of this code and shall be identified in accordance with Section 301.3. Piping, tubing and fittings shall either be tested by an approved third-party testing agency or certified by an approved third-party certification agency.

**NYC 301.6 Fuel gas appliances and equipment.** The approval and installation of fuel gas distribution piping and equipment, fuel gas-fired appliances and fuel gas-fired appliance venting systems shall be in accordance with the *New York City Fuel Gas Code*.

**NYC 301.7 Listed and labeled.** Appliances regulated by this code shall be listed and labeled for the application in which they are installed.

**Exception:** Listing and labeling of equipment and appliances used for refrigeration shall be in accordance with Section 1101.2.

**NYC 301.8 Testing of materials.** Refer to Section 28-113 of the *Administrative Code*.

**NYC 301.9 Label information.** A permanent factory-applied name-plate(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 the seal or mark of the approved agency. A label shall also include the following:

1. Electrical equipment and appliances: Electrical rating in volts, amperes and motor phase; identification of individual electrical components in volts, amperes or watts, motor phase; Btu/h (W) output; and required clearances.
2. Absorption units: Hourly rating in Btu/h (W); minimum hourly rating for units having step or automatic modulating controls; type of fuel; type of refrigerant;

cooling capacity in Btu/h (W); and required clearances.

3. Fuel-burning units: Hourly rating in Btu/h (W); type of fuel approved for use with the appliance; and required clearances.

4. Electric comfort heating appliances: Electric rating in volts, amperes and phase; Btu/h (W) output rating; individual marking for each electrical component in amperes or watts, volts and phase; and required clearances from combustibles. NYC

**301.10 Electrical.** Electrical wiring, controls and connections to equipment and appliances regulated by this code shall be in accordance with the *New York City Electrical Code*. NYC  
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**301.11 Plumbing connections.** Potable water supply and building drainage system connections to equipment and appliances regulated by this code shall be in accordance with the *New York City Plumbing Code*. NYC

**301.12 Fuel types.** Fuel-fired appliances shall be designed for use with the type of fuel to which they will be connected and the altitude at which they are installed. Appliances that comprise parts of the building mechanical system shall not be converted for the usage of a different fuel, except where approved and converted in accordance with the manufacturer's instructions. The fuel input rate shall not be increased or decreased beyond the limit rating for the altitude at which the appliance is installed.

**301.13 Reserved.** NYC

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

**301.15 Wind resistance.** Mechanical equipment, 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*. NYC

**301.16 Flood hazard.** For structures located in flood hazard areas, mechanical systems, equipment and appliances shall comply with the additional requirements of Appendix G of the *New York City Building Code*. NYC  
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**301.16.1 High-velocity wave action.** For buildings in coastal high-hazard areas and coastal A-zones as established in Section G102 of the *New York City Building Code*, mechanical systems and equipment shall not be mounted on or penetrate through breakaway walls. NYC  
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**301.17 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 the entrance of rodents in accordance with Appendix F of the *New York City Building Code*. NYC

**301.18 Seismic resistance.** Where earthquake loads are applicable in accordance with the *New York City Building Code*, mechanical system supports shall be designed and installed for the seismic forces in accordance with the *New York City Building Code*.

**SECTION MC 302  
STRUCTURAL SAFETY**

**302.1 Structural safety.** The building or structure shall not be weakened by the installation of mechanical systems. Where floors, walls, ceilings or any other portion of the building or structure are required to be altered or replaced in the process of installing or repairing any system, the building or structure shall be left in a safe structural condition in accordance with the *New York City Building Code*.

**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.

**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 Chapter 7 of the *New York City Building Code* and Chapter 6 of this code.

**302.3 Cutting, notching and boring in wood framing.** The cutting, notching and boring of wood framing members shall comply with Sections 302.3.1 through 302.3.5.

**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*.

**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  $\frac{1}{4}$  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*.

**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*.

**302.3.4 Engineered wood products.** Cuts, notches and holes bored in trusses, structural composite lumber, structural glue-laminated members or 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 or ductwork 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) (16 ga) 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)  $\frac{1}{2}$  past the opening. See Figure 2308.5.8 of the *New York City Building Code*.

**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.

**302.4 Trusses.** Truss members of any material and components shall not be cut, drilled, notched, spliced or otherwise altered in any way without written concurrence and approval of a registered design professional.

**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.

**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.

**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.

**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.

**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.

NYC **302.6 Cutting, notching and coring into concrete.** The  
 NYC cutting, notching or coring of concrete must comply with  
 NYC provisions of Chapter 19 of the *New York City Building*  
 NYC *Code* and is not permitted without prior approval of the reg-  
 NYC istered design professional.

NYC **302.7 Protection of footings.** Trenching installed parallel to  
 NYC footings and walls shall not extend into the bearing plane of  
 NYC a footing or wall. The upper boundary of the bearing plane is  
 NYC a line that extends downward, at an angle of 34 degrees  
 NYC (1:1.5 slope) from horizontal, from the outside bottom edge  
 NYC of the footing or wall.

NYC **302.8 Piping materials exposed within plenums.** Piping  
 NYC materials exposed within plenums shall comply with this  
 NYC code.

**SECTION MC 303  
 EQUIPMENT AND APPLIANCE LOCATION**

**303.1 General.** Equipment and appliances shall be located  
 as required by this section, specific requirements elsewhere  
 in this code and the conditions of the equipment and appli-  
 ance listing.

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

NYC **303.3 Prohibited locations.** Appliances shall not be located  
 NYC in sleeping rooms, bathrooms, toilet rooms, storage closets  
 NYC or surgical rooms, or in a space that opens only into such  
 NYC rooms or spaces, except where the installation complies  
 NYC with one of the following exceptions:

**Exceptions:** This section shall not apply to the following  
 appliances:

- 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 are  
 NYC installed in accordance with the conditions of the  
 NYC listing and 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 702.
- NYC 3. In rooms other than those used for sleeping pur-  
 NYC poses, appliances installed in a dedicated enclosure  
 NYC in which all combustion air is taken directly from  
 NYC the outdoors, in accordance with Section 703.  
 NYC Access to such enclosure shall be through a solid  
 NYC door, weather-stripped in accordance with the exte-  
 NYC rior door air leakage requirements of the *New York*  
 NYC *City Energy Conservation Code* and equipped with  
 NYC an approved self-closing device.

NYC **303.4 Protection from physical damage.** Appliances shall  
 NYC not be installed in a location where subject to physical dam-  
 NYC age, including vehicular impact, unless protected by

approved barriers meeting the requirements of the *New*  
*York City Fire Code.* NYC  
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**303.5 Indoor locations.** Furnaces and boilers installed in  
 closets and alcoves shall be listed for such installation.

**303.6 Outdoor locations.** Appliances installed in other than  
 indoor locations shall be listed and labeled for outdoor  
 installation.

**303.7 Pit locations.** Appliances installed in pits or excava-  
 tions shall not come in direct contact with the surrounding  
 soil. The sides of the pit or excavation shall be held back not  
 less than 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  
 not less than 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. NYC

**303.8 Elevator shafts.** Mechanical systems shall not be  
 located in an elevator shaft.

**SECTION MC 304  
 INSTALLATION**

**304.1 General.** Equipment and appliances shall be installed  
 as required by the terms of their approval, in accordance  
 with the conditions of the listing, the manufacturer’s instruc-  
 tions and this code. Manufacturer’s instructions shall be  
 available on the job site at the time of inspection. NYC  
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**304.2 Conflicts.** Where conflicts between this code and the  
 conditions of listing or the manufacturer’s instructions  
 occur, the provisions of this code shall apply. NYC

**Exception:** Where a code provision is less restrictive  
 than the conditions of the listing of the equipment or  
 appliance or the manufacturer’s instructions, the condi-  
 tions of the listing and the manufacturer’s instructions  
 shall apply. NYC  
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**304.3 Elevation of ignition source.** Equipment and appli-  
 ances having an ignition source and located in hazardous  
 locations and public garages, private garages, repair garages,  
 automotive motor fuel-dispensing facilities and parking  
 garages shall be elevated such that the source of ignition is  
 not less than 18 inches (457.2 mm) above the floor surface  
 on which the equipment or appliance rests. 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. NYC

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

**304.3.1 Parking garages.** Connection of a parking  
 garage with any room in which there is a fuel-fired appli-  
 ance 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 ele-  
 vated in accordance with Section 304.3.

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**Exception:** This section shall not apply to appliance installations complying with Section 304.6.

### 304.4 Prohibited equipment and appliance location.

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.

### NYC 304.5 Hydrogen generating and refueling operations.

NYC Hydrogen generating and refueling operations shall be pro-  
NYC hibited except as permitted by the Commissioner of the Fire  
NYC Department.

### 304.6 Public garages.

NYC Appliances located in public garages, motor fueling-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  
NYC appliance manufacturer and not less than 1 foot (304.8 mm) higher than the tallest vehicle garage door opening.

**Exception:** The requirements of this section shall not apply where the appliances are protected from motor vehicle impact and installed in accordance with NFPA 30A and Section 304.3 of this code.

NYC 304.7 Private garages. Appliances located in private garages and carports shall be installed with a minimum clearance of 6 feet (1828.8 mm) above the floor.

**Exception:** The requirements of this section shall not apply where the appliances are protected from motor vehicle impact and installed in accordance with Section 304.3.

NYC 304.8 Construction and protection. Boiler rooms and furnace rooms shall be protected as required by the *New York City Building Code*.

304.9 Clearances to combustible construction. Heat-producing equipment and appliances shall be installed to maintain the required clearances to combustible construction as specified in the listing and manufacturer's instructions. Such clearances shall be reduced only in accordance with Section 308. Clearances to combustibles shall include such considerations as door swing, drawer pull, overhead projections or shelving and window swing, shutters, coverings and drapes. Devices such as doorstops or limits, closers, drapery ties or guards shall not be used to provide the required clearances.

NYC 304.10 Clearances from grade. Equipment and appliances installed at grade level shall be supported on a level concrete slab or other approved material extending not less than 3 inches (76.2 mm) above adjoining grade or shall be suspended not less than 6 inches (152.4 mm) above adjoining

grade. Such support shall be in accordance with the manufacturer's instructions. NYC

304.11 Guards. Guards shall be provided where appliances, equipment, fans or other components that require service and roof hatch openings are located within 10 feet (3048 mm) of a roof edge or open side of a walking surface and such edge or open side is located more than 30 inches (762 mm) above the floor, roof, or grade below. The guard shall extend not less than 30 inches (762 mm) beyond each end of such appliances, equipment, fans, components and roof hatch openings and the top of the guard shall be located not less than 42 inches (1066.8 mm) above the elevated surface adjacent to the guard. The guard shall be constructed so as to prevent the passage of a 21-inch-diameter (533.4 mm) sphere and shall comply with the loading requirements for guards specified in the *New York City Building Code*. NYC

304.12 Area served. Appliances serving different areas of a building other than where they are installed shall be permanently marked in an approved manner that uniquely identifies the appliance and the area it serves.

304.13 Rooftop access and obstructions. Equipment and appliances installed on rooftops of buildings shall be installed in accordance with the requirements of the *New York City Fire Code* regarding rooftop access and obstructions, and shall not obstruct or interfere with firefighting operations or the operation of any doors, windows, fire escapes, or other means of egress or other building components requiring operation or access. NYC

## SECTION MC 305 PIPING SUPPORT

305.1 General. Mechanical system piping shall be supported in accordance with this section.

305.2 Materials. Pipe hangers and supports shall have sufficient strength to withstand all anticipated static and specified dynamic loading conditions associated with the intended use. NYC

Pipe hangers and supports that are in direct contact with piping shall be of materials that are compatible with the piping and that will not promote galvanic action. NYC

305.3 Structural attachment. Hangers and anchors shall be attached to the building structure. Post-installed anchors shall be subject to special inspection in accordance with Section 1705.37 of the *New York City Building Code*. NYC

305.4 Interval of support. Piping shall be supported at distances not exceeding the spacing specified in Table 305.4, or in accordance with ANSI/MSS SP-58. NYC

**TABLE 305.4  
PIPING SUPPORT SPACING<sup>a</sup>**

PIPING MATERIAL	MAXIMUM HORIZONTAL SPACING (feet)	MAXIMUM VERTICAL SPACING (feet)
ABS pipe	4	10 <sup>c</sup>
Aluminum pipe and tubing	10	15
Brass pipe	10	10
Brass tubing, 1 <sup>1</sup> / <sub>4</sub> -inch diameter and smaller	6	10
Brass tubing, 1 <sup>1</sup> / <sub>2</sub> -inch diameter and larger	10	10
Cast-iron pipe <sup>b</sup>	5	15
Copper or copper-alloy pipe	12	10
Copper or copper-alloy tubing, 1 <sup>1</sup> / <sub>4</sub> -inch diameter and smaller	6	10
Copper or copper-alloy tubing, 1 <sup>1</sup> / <sub>2</sub> -inch diameter and larger	10	10
CPVC pipe or tubing, 1 inch and smaller	3	10 <sup>c</sup>
CPVC pipe or tubing, 1 <sup>1</sup> / <sub>4</sub> -inch and larger	4	10 <sup>c</sup>
Lead pipe	Continuous	4
PB pipe or tubing	2 <sup>2</sup> / <sub>3</sub> (32 inches)	4
PE-RT < 1 inches	2 <sup>2</sup> / <sub>3</sub> (32 inches)	10 <sup>c</sup>
PE-RT > 1 <sup>1</sup> / <sub>4</sub> inches	4	10 <sup>c</sup>
PEX tubing	2 <sup>2</sup> / <sub>3</sub> (32 inches)	10 <sup>c</sup>
Polypropylene (PP) pipe or tubing, 1 inch or smaller	2 <sup>2</sup> / <sub>3</sub> (32 inches)	10 <sup>c</sup>
Polypropylene (PP) pipe or tubing 1 <sup>1</sup> / <sub>4</sub> inches or larger	4	10 <sup>c</sup>
PVC pipe	4	10 <sup>c</sup>
Steel tubing	8	10
Steel pipe	12	15

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. See Section 301.18.

b. The maximum horizontal spacing of cast-iron pipe hangers shall be increased.

c. Mid-story guide.

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**305.5 Protection against physical damage.** In concealed locations where piping, other than cast-iron or steel, is installed through holes or notches in studs, joists, rafters or similar members less than 1<sup>1</sup>/<sub>2</sub> inches (38.1 mm) from the nearest edge of the member, the pipe shall be protected by shield plates. Protective steel shield plates having a minimum thickness of 0.0575 inch (1.463 mm) (No. 16 gage) shall cover the area of the pipe where the member is notched or bored, and shall extend not less than 2 inches (50.8 mm) above sole plates and below top plates.

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**SECTION MC 306  
ACCESS AND SERVICE SPACE**

**306.1 Access.** Appliances, control devices, heat exchangers and HVAC system components that require maintenance shall be accessible for inspection, service, repair and replacement without disabling the function of a fire-resistance-rated assembly or removing permanent construction, other appliances, venting systems or any other piping or ducts not connected to the appliance being inspected, serviced, repaired or replaced. A level working space not less than 30 inches deep and 30 inches wide (762 mm by 762

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mm) shall be provided in front of the control side to service an appliance. Clearance shall also be provided as required by the *New York City Electrical Code*.

**306.1.1 Central furnaces.** Central furnaces within compartments or alcoves shall have a minimum working space clearance of 3 inches (76.2 mm) along the sides, back and top with a total width of the enclosing space being not less than 12 inches (304.8 mm) wider than the furnace. Furnaces having a firebox open to the atmosphere shall have not less than 6 inches (152.4 mm) working space along the front combustion chamber side. Combustion air openings at the rear or side of the compartment shall comply with the requirements of Chapter 7.

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**Exception:** This section shall not apply to replacement appliances installed in existing compartments and alcoves where the working space clearances are in accordance with the equipment or appliance manufacturer's instructions.

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**306.2 Appliances in rooms.** Rooms containing appliances shall be provided with a door and an unobstructed passage-

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NYC way measuring not less than 36 inches (914.4 mm) wide and 80 inches (2032 mm) high.

**Exception:** Within a dwelling unit, appliances installed in a compartment, alcove, basement or similar space shall be accessed by an opening or door and an unobstructed passageway measuring not less than 24 inches (609.6 mm) wide and large enough to allow removal of the largest appliance in the space, provided that a level service space of not less than 30 inches (762 mm) deep and the height of the appliance, but not less than 30 inches (762 mm), is present at the front or service side of the appliance with the door open.

NYC **306.3 Appliances in attics.** Attics containing appliances shall be provided with an opening and unobstructed passageway large enough to allow removal of the largest appliance. The passageway shall be not less than 30 inches (762 mm) high and 22 inches (558.8 mm) wide and not more than 20 feet (6096 mm) in length measured along the centerline of the passageway from the opening to the appliance. The passageway shall have continuous solid flooring not less than 24 inches (609.6 mm) wide. A level service space not less than 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be present at the front or service side of the appliance. The clear access opening dimensions shall be not less than 20 inches by 30 inches (508 mm by 762 mm), and large enough to allow removal of the largest appliance.

**Exceptions:**

1. The passageway and level service space are not required where the appliance is capable of being serviced and removed through the required opening.
2. Where the passageway is unobstructed and not less than 6 feet (1828.8 mm) high and 24 inches (609.6 mm) wide for its entire length, the passageway shall be not greater than 50 feet (15 250 mm) in length.

NYC **306.3.1 Electrical requirements.** A luminaire controlled by a switch located at the required passageway opening and a receptacle outlet shall be provided at or near the appliance location in accordance with the *New York City Electrical Code*.

NYC **306.4 Appliances under floors.** Under-floor spaces containing appliances shall be provided with an access opening and unobstructed passageway large enough to remove the largest appliance. The passageway shall be not less than 30 inches (762 mm) high and 22 inches (558.8 mm) wide, nor more than 20 feet (6096 mm) in length measured along the centerline of the passageway from the opening to the appliance. A level service space not less than 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be present at the front or service side of the appliance. If the depth of the passageway or the service space exceeds 12 inches (304.8 mm) below the adjoining grade, the walls of the passageway shall be lined with concrete or masonry. Such concrete or masonry shall extend not less than 4 inches (101.6 mm) above the adjoining grade and shall have sufficient lateral-bearing capacity to resist collapse. The clear access opening dimensions shall be not less than 22 inches by 30 inches

(558.8 mm by 762 mm), and large enough to allow removal of the largest appliance. NYC

**Exceptions:**

1. The passageway is not required where the level service space is present when the access is open and the appliance is capable of being serviced and removed through the required opening.
2. Where the passageway is unobstructed and not less than 6 feet (1828.8 mm) high and 22 inches (558.8 mm) wide for its entire length, the passageway shall not be limited in length. NYC

**306.4.1 Electrical requirements.** A luminaire controlled by a switch located at the required passageway opening and a receptacle outlet shall be provided at or near the appliance location in accordance with the *New York City Electrical Code*. NYC

**306.5 Equipment and appliances on roofs or elevated structures.** Where equipment or appliances requiring access are located on an elevated structure or the roof of a building such that personnel will have to climb higher than 16 feet (4876.8 mm) above grade, roof or floor level to access such equipment or appliances, an interior or exterior means of access shall be provided. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) in height or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent slope). Such access to the roof or elevated structure and access from the roof or elevated structure to equipment requiring maintenance shall not require the use of portable ladders. Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall. NYC

Permanent ladders installed to provide the required access shall comply with the following minimum design criteria:

1. The side railing shall extend above the parapet or roof edge not less than 30 inches (762 mm).
2. Ladders shall have rung spacing not to exceed 12 inches (304.8 mm) on center. The uppermost rung shall be not more than 24 inches (609.6 mm) below the upper edge of the roof hatch, roof or parapet, or equipment access platform, as applicable. NYC
3. Ladders shall have a toe spacing not less than 7 inches (177.8 mm) deep. NYC
4. There shall be not less than 18 inches (457.2 mm) between rails. NYC
5. Rungs shall have a diameter not less than 0.75-inch (19 mm) and be capable of withstanding a 300-pound (136.1 kg) load. NYC
6. Where a cage, well or ladder safety device is prohibited, ladders over 20 feet (6096 mm) in height shall be provided with landing platforms for each 30 feet (9144 mm) of height. Where a cage, well or ladder safety device is not provided, ladders over 20 feet (6096 mm) in height shall be provided with landing platforms for each 20 feet (6096 mm) of height. Landings shall be capable of withstanding 100 NYC

NYC | pounds (488.2 kg/m<sup>2</sup>) per square foot. A guard rail  
 NYC | and toeboard shall be provided on all open sides of  
 the landing.

7. Climbing clearance. The distance from the centerline of the rungs to the nearest permanent object on the climbing side of the ladder shall be not less than 30 inches (762 mm) measured perpendicular to the rungs. This distance shall be maintained from the point of ladder access to the bottom of the roof hatch. A minimum clear width of 15 inches (381 mm) shall be provided on both sides of the ladder measured from the midpoint of and parallel with the rungs except where cages or wells are installed.

NYC | 8. Landing required. The ladder shall be provided with  
 NYC | a clear and unobstructed bottom landing area having  
 a minimum dimension of 30 inches by 30 inches  
 (762 mm by 762 mm) centered in front of the ladder.

9. Ladders shall be protected against corrosion by approved means.

NYC | 10. Service personnel shall have access to ladders at all  
 times.

NYC | 11. Where ladder extensions are installed, the side rails  
 NYC | of through or side-step ladder extensions shall extend  
 NYC | 3½ feet (1066.8 mm) above the parapets and land-  
 NYC | ings. For through ladder extensions, the rungs shall  
 NYC | be omitted from the extensions and shall have not  
 NYC | less than 18 inches (457.2 mm) nor more than 24  
 NYC | inches (609.6 mm) of clearance between rails. For  
 NYC | side-step or offset fixed ladder sections, at landings,  
 NYC | the side rails and rungs shall be carried to the next  
 NYC | regular rung beyond or above the 3½ feet (1066.8  
 NYC | mm) minimum.

NYC | Catwalks installed to provide the required access shall be  
 not less than 24 inches (609.6 mm) wide and shall have rail-  
 ings as required for service platforms.

**Exception:** This section shall not apply to Group R-3 occupancies.

NYC | **306.5.1 Sloped roofs.** Where appliances, equipment, fans  
 | or other components that require service are installed on a  
 | roof having a slope of three units vertical in 12 units hori-  
 | zontal (25-percent slope) or greater and having an edge  
 | more than 30 inches (762 mm) above grade at such edge,  
 | a level platform shall be provided on each side of the  
 | appliance or equipment to which access is required for  
 | service, repair or maintenance. The platform shall be not  
 | less than 30 inches (762 mm) in any dimension and shall  
 | be provided with guards. The guards shall extend not less  
 NYC | than 42 inches (1066.8 mm) above the platform, shall be  
 | constructed so as to prevent the passage of a 21-inch  
 NYC | (533.4 mm) diameter sphere and shall comply with the  
 NYC | loading requirements for guards specified in the *New*  
 NYC | *York City Building Code*. Access shall not require walk-  
 | ing on roofs having a slope greater than four units vertical  
 | in 12 units horizontal (33-percent slope). Where access  
 | involves obstructions greater than 30 inches (762 mm) in  
 | height, such obstructions shall be provided with ladders  
 | installed in accordance with Section 306.5 or stairways

installed in accordance with the requirements specified in the *New York City Building Code* in the path of travel to and from appliances, fans or equipment requiring service. NYC

**306.5.2 Electrical requirements.** A receptacle outlet shall be provided at or near the equipment location in accordance with the *New York City Electrical Code*. NYC

**SECTION MC 307  
 CONDENSATE DISPOSAL**

**307.1 Fuel-burning appliances.** Liquid combustion by-products of condensing appliances shall be collected and discharged to an approved plumbing fixture or disposal area in accordance with the manufacturer’s instructions. Condensate piping shall be of approved corrosion-resistant material in accordance with Section 803 of the *New York City Plumbing Code* and shall not be smaller than the drain connection on the appliance. Such piping shall maintain a minimum horizontal slope in the direction of discharge of not less than one-eighth unit vertical in 12 units horizontal (1-percent slope). Piping shall be configured to permit clearing of blockages and performance of maintenance without requiring the drain line to be cut. NYC  
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**307.1.1 Condensate disposal.** Condensate from all fuel-burning appliances and associated flues shall be neutralized to a pH of at least 6 and no more than 8 prior to disposal to a sanitary system. NYC  
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**307.2 Evaporators and cooling coils.** Condensate drain systems shall be provided for equipment and appliances containing evaporators or cooling coils. Condensate drain systems shall be designed, constructed and installed in accordance with Sections 307.2.1 through 307.2.6. NYC

**Exception:** Evaporators and cooling coils that are designed to operate in sensible cooling only and not support condensation shall not be required to meet the requirements of this section.

**307.2.1 Condensate disposal.** Condensate from all cooling coils and evaporators shall be conveyed from the drain pan outlet to an approved place of disposal. Such piping shall maintain a minimum horizontal slope in the direction of discharge of not less than one-eighth unit vertical in 12 units horizontal (1-percent slope). Condensate shall not discharge into a street, alley or other areas so as to cause a nuisance.

**307.2.2 Drain pipe materials and sizes.** Components of the condensate disposal system shall be cast iron, galvanized steel, copper, cross-linked polyethylene, polyethylene, ABS, CPVC, or PVC pipe or tubing. Polypropylene tubing may be used in lengths that do not exceed 12 inches (304.8 mm) for an individual drain application. Components shall be selected for the pressure and temperature rating of the installation. Joints and connections shall be made in accordance with the applicable provisions of Chapter 7 of the *New York City Plumbing Code* relative to the material type. Condensate waste and drain line size shall be not less than ¾-inch (19.1 mm) internal diameter and shall not decrease in size from the drain pan connection to the place of condensate NYC  
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disposal. Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with Table 307.2.2.

**TABLE 307.2.2  
CONDENSATE DRAIN SIZING**

EQUIPMENT CAPACITY	MINIMUM CONDENSATE PIPE DIAMETER
Up to 20 tons of refrigeration	3/4 inch
Over 20 tons to 40 tons of refrigeration	1 inch
Over 40 tons to 90 tons of refrigeration	1 1/4 inches
Over 90 tons to 125 tons of refrigeration	1 1/2 inches
Over 125 tons to 250 tons of refrigeration	2 inches

NYC For SI: 1 inch = 25.4 mm, 1 ton = 3.517 kW.

**307.2.3 Auxiliary and secondary drain systems.** In addition to the requirements of Section 307.2.1, where damage to any building components could occur as a result of overflow from the equipment primary condensate removal system, one of the following auxiliary protection methods shall be provided for each cooling coil or fuel-fired appliance that produces condensate:

1. An auxiliary drain pan with a separate drain shall be provided under the coils on which condensation will occur. The auxiliary pan drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The pan shall have a depth of not less than 1 1/2 inches (38.1 mm), shall be not less than 3 inches (76.2 mm) larger than the unit, or the coil dimensions in width and length and shall be constructed of corrosion-resistant material. Metallic pans shall have a thickness of not less than 0.0236 inch (0.6010 mm) (No. 24 gage) for galvanized sheet metal pans, 0.0179 inch (0.4546 mm) (No. 26 gage) for stainless steel pans, or 0.0320 inch (0.8128 mm) (No. 20 gage) for aluminum pans. Nonmetallic pans shall have a thickness of not less than 0.0625 inch (1.6 mm).
2. A separate overflow drain line shall be connected to the drain pan provided with the equipment. Such overflow drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The overflow drain line shall connect to the drain pan at a higher level than the primary drain connection.
3. An auxiliary drain pan without a separate drain line shall be provided under the coils on which condensate will occur. Such pan shall be equipped with a listed water-level detection device that will shut off the equipment served prior to overflow of the pan. The auxiliary drain pan shall be constructed in accordance with Item 1 of this section.

4. A listed water-level detection device shall be provided that will shut off the equipment served in the event that the primary drain is blocked. The device shall be installed in the primary drain line, the overflow drain line, or in the equipment-supplied drain pan, located at a point higher than the primary drain line connection and below the overflow rim of such pan.

**Exceptions:**

1. An auxiliary drain protection method shall not be required for fuel-fired appliances that automatically shut down operation in the event of a stoppage in the condensate drainage system.
2. An auxiliary drain protection method shall not be required where a suitably sized and located floor drain is provided.

**307.2.3.1 Water-level monitoring devices.** On down-flow units and all other coils that do not have a secondary drain or provisions to install a secondary or auxiliary drain pan, a water-level monitoring device shall be installed inside the primary drain pan. This device shall shut off the equipment served in the event that the primary drain becomes restricted. Devices installed in the drain line shall not be permitted.

**307.2.3.2 Appliance, equipment or insulation in pans.** Where an appliance, equipment or insulation is subject to water damage when auxiliary drain pans fill, that portion of the appliance, equipment or insulation shall be installed above the rim of the pans. Supports located inside of the pans to support the appliance or equipment or insulation shall be water resistant and approved.

**307.2.4 Traps.** Condensate drains shall be trapped as required by the equipment or appliance manufacturer.

**307.2.5 Drain line maintenance.** Condensate drain lines shall be configured to permit the clearing of blockages and performance of maintenance without requiring the drain line to be cut.

**307.2.6 Condensate discharge.** Where multiple evaporators and/or condensate pumps discharge into the same piping system, it shall be piped to prevent the discharge of condensate from one appliance to another.

**307.3 Exceptions.** This section applies to permanently installed equipment. Window units and through-the-wall air-conditioning units are exempt from the requirements of this section.

**SECTION MC 308  
CLEARANCE REDUCTION**

**308.1 Scope.** This section shall govern the reduction in required clearances to gypsum board, combustible materials and combustible assemblies for chimneys, vents, kitchen exhaust equipment, mechanical appliances, and mechanical devices and equipment.