**Supplement to the 8th Edition (2023) Florida Building Code, Residential**

**Note 1**: Throughout the document, change International Building Code to Florida Building Code, Building; change the International Energy Conservation Code tothe Florida Building Code, Energy Conservation; change the International Existing Building Code to Florida Building Code, Existing Building; change the International Fire code to Florida Fire Prevention Code; change International Fuel Gas Code to Florida Building Code, Fuel Gas; change the International Mechanical Code to Florida Building Code, Mechanical; change the International Plumbing Code to Florida Building Code, Plumbing; change the International Residential Code to Florida Building Code, Residential.

**Chapter 1 SCOPE AND ADMINISTRATION**

**No Change**

**Chapter 2 DEFINITIONS**

**Revise as follows:**

**Add new definition as follows:**

**TYPE X.** A type of gypsum panel product with special core additives to increase the fire resistance as specified by the applicable standards specified in Section R702.3 and Part IX. (see the definition of 'Gypsum panel product')

(F10943) (G5-22 Part II AS)

**Delete and substitute as follows:**

**~~[MP] HEAT PUMP~~.** ~~An~~ *~~appliance~~* ~~having heating or heating and cooling capability and that uses refrigerants to extract heat from air, liquid~~ ~~or other sources.~~

**[MP] HEAT PUMP.**

A refrigeration system or factory-made appliance that utilizes refrigerant to transfer heat into a space or substance.

(M11236) (M4-21 Part II AS)

**~~[MP] REFRIGERANT~~.** ~~A substance used to produce refrigeration by its expansion or evaporation~~.

**[MP] REFRIGERANT.**

The fluid used for heat transfer in a refrigeration system that undergoes a change of state to absorb heat.

(M11270) (M8-21 Part III AM)

##### [MP]~~REFRIDGERATING~~ REFRIGERATION SYSTEM

**.**

A combination of interconnected parts ~~forming a closed circuit~~ in which refrigerant is enclosed and is circulated for the purpose of extracting, then rejecting, heat. ~~A direct refrigerating system is one in which the evaporator or condenser of the refrigerating system is in direct contact~~ ~~with the air or other substances to be cooled or heated. An indirect refrigerating system is one in which a secondary coolant cooled or~~ ~~heated by the refrigerating system is circulated to the air or other substance to be cooled or heated.~~

(M11290) (M10-21 Part II AS)

##### [RB] LISTED.

[RB] LISTED. Equipment, materials, products or services included in a list published by an organization acceptable to the code official and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose. Terms that are used to identify listed equipment, products, or materials include “listed”, “certified”, “classified” or other terms as determined appropriate by the listing organization. ~~For the definition applicable in Chapter 11, see Section N1101.6.~~

(S11339) (ADM1-22 Part II AS)

**RAINSCREEN SYSTEM.** An assembly applied to the exterior side of an exterior wall which consists of, at minimum, an outer layer, an inner layer, and a cavity between them sufficient for the passive removal of liquid water and water vapor.

(S11388) (RB28-22 AS)

##### [RB] EXTERIOR WALL.

An above-grade wall that defines the exterior boundaries of a building. Includes between-floor spandrels, peripheral edges of floors, roof and basement knee walls, dormer walls, gable end walls, gable end roof trusses, walls enclosing a mansard roof and basement walls with an average below-grade wall area that is less than 50 percent of the total opaque and nonopaque area of that enclosing side. ~~For the definition applicable in Chapter 11, see Section N1101.6.~~

(S11384) (RB22-22 AS)

**[RB] FIRE-RETARDANT-TREATED WOOD.** Wood products that, when impregnated with chemicals by a pressure process or other means during manufacture, exhibit reduced surface burning characteristics and resist propagation of fire.

**~~Other means during manufacture~~.** ~~A process where the wood raw material is treated with a fire-retardant formulation while undergoing~~ ~~creation as a finished product.~~

**~~Pressure process~~.** ~~A process for treating wood using an initial vacuum followed by the introduction of pressure above atmospheric~~.

(F11385) (RB23-22 AS)

**[RB] PAN FLASHING.** Corrosion-resistant flashing at the base of an opening that is integrated into the building exterior wall to direct water to the *water-resistive barrier* surface or to the exterior and is premanufactured, fabricated, formed or applied at the job site.

(S11386) (RB26-22 AS)

**PHOTOVOLTAIC (PV) PANEL SYSTEM, GROUND-MOUNTED.** An independent photovoltaic (PV) panel system without useable space underneath, installed directly on the ground.

(S11387) (RB27-22 AS)

**PHOTOVOLTAIC (PV) SUPPORT STRUCTURE, ELEVATED.** An independent photovoltaic (PV) panel support structure designed with useable space underneath with minimum clear height of 7 feet 6 inches (2286 mm), intended for secondary use such as providing shade or parking of motor vehicles.

(S11481) (RB150-22 AMPC1)

**[RB] GYPSUM BOARD.** ~~The generic name for a family of sheet products~~A type of gypsum panel product consisting of a noncombustible core primarily of gypsum with paper surfacing. ~~Gypsum wallboard, gypsum sheathing, gypsum base for gypsum~~ *~~veneer~~* ~~plaster, exterior~~ ~~gypsum soffit board, predecorated gypsum board and water-resistant gypsum backing board complying with the standards listed in Section~~ ~~R702.3 and Part IX of this code are types of gypsum board.~~

**[RB] GYPSUM PANEL PRODUCT.** The general name for a family of sheet products consisting essentially of gypsumcomplying with the standards specified in Section R702.3 and Part IX of this code.

**[RB] GYPSUM SHEATHING.** Gypsum panel products specifically manufactured with enhanced water resistance for use as a substrate for exterior surface materials.

**[RB] GYPSUM WALLBOARD.** A gypsum board used primarily as interior surfacing for building structures.

(S11344) (G1-22 Part II AS)

**SLEEPING LOFT.** A space designated for sleeping on an intermediate level or levels between the floor and ceiling of a story, open on one or more sides to the room in which the space is located, and in accordance with Section R326.

(F11483) (RB153-22 AMPC1,2,3)

**RESPONSIVE VAPOR RETARDER.** A vapor retarder material complying with a *vapor retarder class* of Class I or Class II but which also has a vapor permeance of 1 perm or greater in accordance with ASTM E96, water method (Procedure B).

(S11532) (RB209-22AM)

**AIR, MAKEUP .** Any combination of outdoor and transfer air intended to replace exhaust air and exfiltration.

**AIR, OUTDOOR .**

Ambient air that enters a building through a ventilation system, through intentional openings for natural ventilation, or by infiltration.

**AIR, TRANSFER .** Air moved from one indoor space to another.

(M11620) (RM26-21 AMPC1)

Revise definition for “Wind-Borne Debris Region” as follows:

~~WINDBORNE DEBRIS REGION. Areas within hurricane-prone regions located in accordance with one of the following:~~

~~1. Within 1 mile (1.61 km) of the mean high water line where an Exposure D condition exists upwind at the waterline and the ultimate design wind speed, Vult, is 130 mph (58 m/s) or greater.~~

~~2. In areas where the ultimate design wind speed, Vult, is 140 mph (63.6 m/s) or greater; or Hawaii.~~

WINDBORNE DEBRIS REGION. Areas within hurricane-prone regions located in accordance with one of the following:

1. Within 1 mile (1.61 km) of the coastal mean high water line where the ultimate design wind speed, Vult, is 130 mph (58 m/s) or greater.

2. In areas where the ultimate design wind speed, Vult, is 140 mph (63.6 m/s) or greater; or Hawaii.

Supplement 2 – Annual Amendment

**CHAPTER 1 – SCOPE AND ADMINISTRATION**

Revise Section R101.2 (Exception 1) as follows:

**Exceptions:**

1. Live/work units located in *townhouses* and complying with the requirements of Section 508.5 of the *Florida Building Code, Building* shall be permitted to be constructed in accordance with the *Florida Building Code, Residential*. Fire suppression required by Section ~~419.5~~ 508.5.7 of the *Florida Building Code, Building* where constructed under the *Florida Building Code, Residential* shall conform to Section P2904

F-FBC-R – Ch.1 – Errata #1

**Chapter 3 Building Planning**

Revise R301.1.1 to read as follows:

**R301.1.1 Alternative provisions.** As an alternative to the requirements in Section R301.1, the following standards are permitted subject to the limitations of this code and the limitations therein. Where engineered design is used in conjunction with these standards, the design shall comply with the *Florida Building Code, Building*.

1. AF&PA *Wood Frame Construction Manual* (AWC WFCM).

2. AISI *Standard for Cold-Formed Steel Framing— Prescriptive Method for One- and Two-Family Dwellings* (AISI S230).

3. ICC *Standard on the Design and Construction of Log Structures* (ICC 400).

Revise Section R301.2.1.1.2 to read as follows:

**R301.2.1.1.2 Alternative design method for screen enclosure.**

(1) The purpose of this section is to provide an alternate method for designing aluminum screen enclosures as defined by the *Florida Building Code,* permitting the loads of the structural frame to be based on portions of the screen in the screen walls removed, retracted, moved to the open position, or cut. The use of framing materials other than aluminum is allowed in accordance with

Section 104.11 of the *Florida Building Code, Building*. The method applies only to walls and roofs with 100-percent screen.

(c) Design in accordance with the *Florida Building Code, Building*, Section 1605.~~2~~1shall be permitted.

S-FBC-R – Ch. 3 – Errata #1

**TABLE R301.2(2) COMPONENT AND CLADDING LOADS FOR A BUILDING WITH A MEAN ROOF HEIGHT OF 30 FEET LOCATED IN EXPOSURE B (ASD) (psf)a, b, c, d, e, f, g**

Revise the component and cladding load for “Gable Roof > 27 to 45 degrees” – Zone 3 – Effective Wind Area 20 – Wind speed 140 (POS) to read “17.7” instead of “0.0.”

**Supplement 4 – Errata**

**~~R301.2.1.2.1 Application of ASTM E1996~~.** ~~The text of Section 2.2 of ASTM E1996 shall be substituted as follows~~:

~~2.2 ASCE Standard:~~

~~ASCE 7-10 American Society of Civil Engineers~~ *~~Minimum Design Loads for Buildings and Other Structures~~*

~~The text of Section 6.2.2 of ASTM E1996 shall be substituted as follows~~:

* + 1. ~~Unless otherwise specified, select the wind zone based on the ultimate design wind speed,~~*~~V~~ult*, as follows:
       1. ~~Wind Zone 1–130 mph ≤ ultimate design wind speed,~~*~~V~~ult* < 140 mph.
       2. ~~Wind Zone 2–140 mph ≤ ultimate design wind speed,~~*~~V~~ult* < 150 mph at greater than 1 mile (1.6 km) from the coastline. The ~~coastline shall be measured from the mean high-water mark.~~
       3. ~~Wind Zone 3–150 mph (67 m/s) ≤ ultimate design wind speed,~~*~~V~~ult* ≤ 170 mph (76 m/s), or 140 mph (54 m/s) ≤ ultimate design wind ~~speed,~~ *~~V~~ult* ≤ 170 mph (76 m/s) and within 1 mile (1.6 km) of the coastline. The coastline shall be measured from the mean high-water mark.

~~Wind Zone 4–ultimate design wind speed,~~*~~V~~ult* > 170

(S11178) (S119-22 Part II AS)

**R301.2.4 Floodplain construction.** Buildings and structures constructed in whole or in part in flood hazard areas ~~(including A or V Zones)~~ ~~as~~ established in Table R301.2, and substantial improvement and *repair* of substantial damage of buildings and structures located in whole or in part in flood hazard areas, shall be designed and constructed in accordance with Section R322. Buildings and structures that are located in more than one flood hazard area, including A Zones, Coastal A Zones, and V Zones, shall comply with the provisions associated with the most restrictive flood hazard area. Buildings and structures located in whole or in part in identified floodways shall be designed and constructed in accordance with ASCE 24.

(S11398) (RB42-22 AS)

**R301.7 Deflection.** The allowable deflection of any structural member under the *live load* listed in Sections R301.5 and R301.6 or wind loads determined by Section R301.2.1 shall not exceed the values in Table R301.7.

**Revise as follows:**

**TABLE R301.7 ALLOWABLE DEFLECTION OF STRUCTURAL MEMBERSb, c**

**Portions of table not shown remain unchanged.**

|  |  |
| --- | --- |
| **STRUCTURAL MEMBER** | **ALLOWABLE DEFLECTION** |
| All other structural members excluding guards and handrails. | *L*/240 |

**Note:** *L* = span length, *H* = span height.

(S11399) (RB44-22 AS)

R302.2.4 Parapets for townhouses. Parapets constructed in accordance with Section R302.2.3 shall be constructed for town houses as an extension of exterior walls or common walls separating townhouse units in accordance with the following:

1 – 2 No change

3. A parapet is not required where roof surfaces adjacent to the wall or walls are at different elevations and the higher roof is more than 30 inches (762 mm) above the lower roof. The common wall construction from the lower roof to the underside of the higher roof deck shall have not less than a 1-hour fire-resistance rating. The wall shall be rated for exposure from both sides. Openings shall not be permitted in the wall.

(F11407) (RB54-22 AS)

Revise Section R302.3 to read as follows:

**R302.3 Two-family dwellings.** *Dwelling units* in two-family dwellings shall be separated from each other by wall and floor assemblies having not less than a 1-hour fire-resistance rating where tested in accordance with ASTM E119, UL 263 or Section ~~703.3~~ 703.2.2 of the *Florida Building Code, Building*. Fire-resistance-rated floor/ceiling and wall assemblies shall extend to and be tight against the exterior wall, and wall assemblies shall extend to the underside of the roof sheathing.

F-FBC-R – Ch.3 – Errata #3

**R302.3.2 Shared accessory rooms.** Shared accessory ~~room~~ rooms shall be separated from each individual dwelling unit in accordance with Table R302.3.2. Openings between the shared accessory room and dwelling unit shall comply with Section R302.3.2.1. Attachment of gypsum board shall comply with Table R702.3.5.

**TABLE R302.3.2 DWELLING SHARED ACCESSORY ROOM SEPARATION**

|  |  |
| --- | --- |
| **SEPARATION** | **MATERIAL** |
| From the dwelling units and attics | Not less than 1/2-inch gypsum board or equivalent applied to the  accessory room side wall |
| From habitable rooms above or below the common shared accessory room | Not less than 5/8-inch Type X gypsum board or equivalent |
| Structures supporting floor/ceiling and wall assemblies used for separation required by this  section | Not less than 1/2-inch gypsum board or equivalent |
| Common accessory rooms located less than 3 feet from a dwelling unit on the same lot | Not less than 1/2-inch gypsum board or equivalent applied to the interior side of exterior walls that are within this area |

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

**R302.3.2.1 Opening protection.** Openings from a shared accessory room or area directly into a room used for sleeping purposes shall not be permitted. Other openings between the shared accessory room or area and dwelling units shall be equipped with solid wood doors not less than 1 3/8 inches in thickness, solid or honeycomb core steel doors not less than 1 3/8 inches thick, or a fire door assembly with a 20-minute fire-protection rating, equipped with a self-closing or automatic-closing device.

**R302.3.2.2 Duct penetration.** Ducts penetrating the walls or ceilings separating the *dwelling* from the shared accessory room shall be constructed of a minimum No. 26 gage (0.48 mm) sheet steel or other *approved* material and shall not have openings into the shared accessory room.

**R302.3.2.3 Other penetrations.** Penetrations through the walls, ceiling, and floor level separation required in Section R302.3.2 shall be protected as required by Section R302.11, Item 4.

(F11411) (RB64-22 AMPC1,2)

##### TABLE R302.6 DWELLING-GARAGE SEPARATION

**Committee Modification:** TABLE R302.6 DWELLING-GARAGE SEPARATION

|  |  |
| --- | --- |
| **SEPARATION** | **MATERIAL** |
| From the residence and attics | Not less than 1/2-inch gypsum board or equivalent applied to the garage side |
| From portions of the *dwelling unit* above the garage | Not less than 5/8-inch Type X gypsum board or equivalent |
| Structure(s) supporting floor/ceiling assemblies used for separation  required by this section | Not less than 1/2-inch gypsum board or equivalent |
| Garages located less than 3 feet from a dwelling unit on the same lot | Not less than 1/2-inch gypsum board or equivalent applied to the interior side of exterior walls  that are within this area |

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

(F11412) (RB71-22 AM)

**~~R802.1.5~~ R302.15 Fire-retardant-treated wood.** Fire-retardant-treated wood (FRTW) is any wood product that, when impregnated with chemicals by a pressure process or other means during manufacture, shall have, when tested in accordance with ASTM E84 or UL 723, a listed flame spread index of 25 or less. In addition, the ASTM E84 or UL 723 test shall be continued for an additional 20-minute period and the flame front shall not progress more than 10.5 feet (3200 mm) beyond the center line of the burners at any time during the test.

**~~R802.1.5.1~~ R302.15.1 Pressure process.** For wood products impregnated with chemicals by a pressure process, the process shall be performed in closed vessels under pressures not less than 50 pounds per square inch gauge (psig) (344.7 kPa).

**~~R802.1.5.2~~ R302.15.2 Other means during manufacture.** For wood products impregnated with chemicals by other means during manufacture, the treatment shall be an integral part of the manufacturing process of the wood product. The treatment shall provide permanent protection to all surfaces of the wood product. The use of paints, coating, stains or other surface treatments is not an *approved* method of protection as required by this section.

**~~R802.1.5.3~~ R302.15.3 Testing.** For fire-retardant-treated wood products, the front and back faces of the wood product shall be tested in accordance with and produce the results required in Section R302.15 ~~R802.1.5~~.

**~~R802.1.5.3.1~~ R302.15.3.1 Fire testing of wood structural panels.** *Wood structural panels* shall be tested with a ripped or cut longitudinal gap of 1/8 inch (3.2 mm).

**~~R802.1.5.4~~ R302.15.4 Labeling.** Fire-retardant-treatedlumber and *wood structural panel* shall be *labeled*. The *label* shall contain:

1. The identification *mark* of an *approved agency* in accordance with Section 1703.5 of the International Building Code.
2. Identification of the treating manufacturer.
3. The name of the fire-retardant treatment.
4. The species of wood treated.
5. Flame spread index and *smoke-developed index*.
6. Method of drying after treatment.
7. Conformance to applicable standards in accordance with SectionsR302.15.5 through R302.15.10 ~~R802.1.5.5 through R802.1.5.10~~.
8. For FRTW exposed to weather, or a damp or wet location, the words “No increase in the listed classification when subjected to the Standard Rain Test” (ASTM D2898).

**~~R802.1.5.5~~ R302.15.5 Strength adjustments.** Design values for untreated lumber and *wood structural panels* as specified in Section R802.1 shall be adjusted for fire-retardant-treated wood. Adjustments to design values shall be based on an *approved* method of investigation that takes into consideration the effects of the anticipated temperature and humidity to which the fire-retardant-treated wood will be subjected, the type of treatment and redrying procedures.

**~~R802.1.5.6~~ R302.15.6 Wood structural panels.** The effect of treatment and the method of redrying after treatment, and exposure to high temperatures and high humidities on the flexure properties of fire-retardant-treated softwood plywood shall be determined in accordance with ASTM D5516. The test data developed by ASTM D5516 shall be used to develop adjustment factors, maximum loads and spans, or both for untreated plywood design values in accordance with ASTM D6305. Each manufacturer shall publish the allowable maximum loads and spans for service as floor and roof sheathing for their treatment.

**~~R802.1.5.7~~ R302.15.7 Lumber.** For each species of wood treated, the effect of the treatment and the method of redrying after treatment and exposure to high temperatures and high humidities on the allowable design properties of fire-retardant-treated lumber shall be determined

in accordance with ASTM D5664. The test data developed by ASTM D5664 shall be used to develop modification factors for use at or near room temperature and at elevated temperatures and humidity in accordance with ASTM D6841. Each manufacturer shall publish the modification factors for service at temperatures of not less than 80°F (27°C) and for roof framing. The roof framing modification factors shall take into consideration the climatological location.

**~~R802.1.5.8~~ R302.15.8 Exposure to weather.** Where fire-retardant-treated wood is exposed to weather or damp or wet locations, it shall be identified as “Exterior” to indicate there is not an increase in the *listed* flame spread index as defined in SectionR302.15 ~~R802.1.5~~ when subjected to ASTM D2898.

**~~R802.1.5.9~~ R302.15.9 Interior applications.** Interior fire-retardant-treated wood shall have a moisture content of not over 28 percent when tested in accordance with ASTM D3201 procedures at 92-percent relative humidity. Interior fire-retardant-treated wood shall be tested in accordance with Section R302.15.6 or R302.15.7 ~~R802.1.5.6 or R802.1.5.7~~. Interior fire-retardant-treated wood designated as Type A shall be tested in accordance with the provisions of this section.

**~~R802.1.5.10~~ R302.15.10 Moisture content.** Fire-retardant-treated wood shall be dried to a moisture content of 19 percent or less for lumber and 15 percent or less for *wood structural panels* before use. For wood kiln dried after treatment (KDAT) the kiln temperatures shall not exceed those used in kiln drying the lumber and plywood submitted for the tests described in Section ~~R802.1.5.6~~ R302.15.6 for plywood and R302.15.7 ~~R802.1.5.7~~ for lumber.

(S11559) (RB241-22 AS)

**R303.1 Habitable rooms.** *Habitable space* ~~rooms~~ shall be provided natural light and natural ventilation in accordance with Sections R303.1.1 through R303.1.3. ~~have an aggregate glazing area of not less than 8 percent of the floor area of such rooms. Natural~~*~~ventilation~~* ~~shall be through windows, skylights, doors, louvers or other~~ *~~approved~~* ~~openings to the outdoor air. Such openings shall be provided with~~ ~~ready access or shall otherwise be readily controllable by the building occupants. The openable area to the outdoors shall be not less than~~ ~~4 percent of the floor area being ventilated.~~

**Exceptions:**

1. ~~For habitable rooms other than kitchens, the glazed areas need not be openable where the opening is not required by Section~~ ~~R310 and a whole-house mechanical~~ *~~ventilation~~* ~~system or a mechanical ventilation system capable of producing 0.35 air~~ ~~changes per hour in the habitable rooms is installed in accordance with Section M1507.~~
2. ~~For kitchens, the glazed areas need not be openable where the opening is not required by Section R310 and a local exhaust~~ ~~system is installed in accordance with Section M1507.~~
3. ~~The glazed areas need not be installed in rooms where Exception 1 is satisfied and artificial light is provided that is capable of~~ ~~producing an average illumination of 6 footcandles (65 lux) over the area of the room at a height of 30 inches (762 mm) above~~ ~~the floor level.~~
4. ~~Use of~~ *~~sunroom~~* ~~and patio covers, as defined in Section R202, shall be permitted for natural~~ *~~ventilation~~* ~~if in excess of 40 percent~~ ~~of the exterior~~ *~~sunroom~~* ~~walls are open, or are enclosed only by insect screening~~.

**Add new text as follows:**

**R303.1.1 Natural light.** Habitable rooms shall have an aggregate area of glazed openings not less than 8 percent of the floor area of such rooms. Required glazed openings shall face directly onto a street, alley or *public way*, or a *yard* or *court* located on the same *lot* as the *building.*

**Exceptions:**

1. Required glazed openings shall be permitted to face into a roofed porch, deck or patio adjacent to a street, alley, *public way*,

*yard* or *court*, where there the longer side of the roofed area is not less than 65 percent unobstructed and the ceiling height is not less than 7 feet (2134 mm).

1. Required glazed openings shall be permitted to face into a sunroom adjacent to a street, alley, public way, yard or court.
2. Glazed openings are not required where artificial light is provided that is capable of producing an average illumination of 6 footcandles (65 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.
3. Eave projections shall not be considered as obstructing the clear open space of a yard or court.

**R303.1.2 Natural ventilation.** Habitable rooms shall have an aggregate area openable to the outdoors not less than 4 percent of the floor area of such rooms. Openings shall be through windows, skylights, doors, louvers or other approved openings to the outdoor air. Such openings shall be provided with ready access or shall otherwise be readily controllable by the building occupants.

**Exceptions:**

1. Natural ventilation shall not be required in habitable rooms other than kitchens where a whole-house mechanical ventilation system or a mechanical ventilation system capable of producing 0.35 air changes per hour in the habitable rooms is installed in accordance with Section M1507.
2. Natural ventilation shall not be required in kitchens where a local exhaust system is installed in accordance with Section M1505.
3. Required ventilation openings shall be permitted to open into a thermally isolated sunroom or roofed porch, deck, or patio where not less than 40 percent of the roofed area perimeter is open to the outdoor air.
4. Required ventilation openings shall be permitted to open into a thermally isolated sunroom provided there is an openable area between the adjoining room and the sunroom of not less than one-tenth of the floor area of the interior room and not less than 20 square feet (2 m2). The minimum openable area of the sunroom to outdoor air shall be based on the total floor area of the adjoining room and the sunroom.

**Revise as follows:**

**~~R303.2~~ R303.1.3 Adjoining rooms.** For the purpose of determining light and *ventilation* requirements, rooms shall be considered to be a portion of an adjoining room where not less than one-half of the area of the common wall is open and unobstructed and provides an opening of not less than one-tenth of the floor area of the interior room and not less than 25 square feet (2.3 m2).

**~~Exception:~~** ~~Openings required for light or~~ *~~ventilation~~* ~~shall be permitted to open into a~~ *~~sunroom~~* ~~with thermal isolation or a patio cover,~~ ~~provided that there is an openable area between the adjoining room and the~~ *~~sunroom~~* ~~or patio cover of not less than one-tenth of the~~ ~~floor area of the interior room and not less than 20 square feet (2 m~~2~~). The minimum openable area to the outdoors shall be based on~~ ~~the total floor area being ventilated.~~

**Delete without substitution:**

**~~R303.9 Required glazed openings~~.** ~~Required glazed openings shall open directly onto a street or public alley, or a~~*~~yard~~* ~~or court located on~~ ~~the same~~ *~~lot~~* ~~as the building.~~

**~~Exceptions:~~**

1. ~~Required glazed openings that face into a roofed porch where the porch abuts a street,~~ *~~yard~~* ~~or court and the longer side of the~~ ~~porch is not less than 65 percent unobstructed and the ceiling height is not less than 7 feet (2134 mm).~~
2. ~~Eave projections shall not be considered as obstructing the clear open space of a~~ *~~yard~~* ~~or court.~~
3. ~~Required glazed openings that face into the area under a deck, balcony, bay or floor cantilever where a clear vertical space not~~ l~~ess than 36 inches (914 mm) in height is provided.~~

**~~R303.9.1 Sunroom additions~~.** ~~Required glazed openings shall be permitted to open into~~*~~sunroom additions~~* ~~or patio covers that abut a~~ ~~street,~~ *~~yard~~* ~~or court if in excess of 40 percent of the exterior~~*~~sunroom~~* ~~walls are open, or are enclosed only by insect screening, and the~~ ~~ceiling height of the~~ *~~sunroom~~* ~~is not less than 7 feet (2134 mm)~~.

(F11415) (RB76-22 AM)

**R308.4.6 Glazing adjacent to stairs and ramps.** Glazing where the bottom exposed edge of the glazing is less than 36 inches (914 mm) above the plane of the adjacent walking surface of *flights* *stairs ~~stairways~~*, landings between flights of stairs and *ramps* shall be considered to be a hazardous location.

**Exceptions:**

* 1. Where glazing is adjacent to a walking surface and a horizontal rail is installed at 34 to 38 inches (864 to 965 mm) above the walking surface. The rail shall be capable of withstanding a horizontal load of 50 pounds per linear foot (730 N/m) without contacting the glass and have a cross-sectional height of not less than 11/2 inches (38 mm).
  2. Glazing 36 inches (914 mm) or more measured horizontally from the walking surface.

(F11417) (RB84-22AM)

**R308.6.5 Screens not required.** Screens shall not be required where laminated glass complying with Item 1 of Section R308.6.2 is used as single glazing or the inboard pane in multiple glazing. Screens shall not be required where fully tempered glass is used as single glazing or the inboard pane in multiple glazing and either of the following conditions is met:

1. The glass area is 16 square feet (1.49 m2) or less; the highest point of glass is not more than 12 feet (3658 mm) above a walking surface; the nominal glass thickness is not more than 3/16 inch (4.8 mm); and for multiple glazing only the other pane or panes are fully tempered, laminated or wired glass.
2. The ~~glass area is greater than 16 square feet (1.49 m~~2~~); the~~ glass is sloped 30 degrees (0.52 rad) or less from vertical; and the highest point of glass is not more than 10 feet (3048 mm) above a walking surface.

(F11418) (RB85-22 AS)

**R309.4 Automatic garage door openers.** Automatic garage door openers, if provided, shall be *listed* and *labeled* in accordance with UL 325, and shall be installed in accordance with the manufacturer’s installation instructions.

(F11419) (RB86-22 AM)

* 1. **Automotive Lifts.**

Where provided, automotive lifts shall be *listed* and *labeled* in accordance with ANSI/ALI ALCTV and Sections 309.6.1.

* + 1. **Installation.**

Automotive lifts shall be installed in accordance withANSI/ALI ALCTV, the listing, and the lift manufacturer's installation instructions.Automotive lifts shall not be installed within the habitable space of a dwelling unit.

**Add new standard(s) as follows:**

**ALI ALCTV-2017.** Standard for Automotive Lifts-Safety Requirements for Construction, Testing and Validation (ANSI)

(F11421) (RB87-22 AMPC1)

**R309.7 Electric vehicle charging systems.** Where provided, electric vehicle charging systems shall be installed in accordance with NFPA 70. Electric vehicle charging system equipment shall be listed and labeled in accordance with UL 2202. Electric vehicle supply equipment shall be listed and labeled in accordance with UL 2594.

**Add new standard(s) as follows:**



(F11422) (RB88-22 AS)

**SECTION R310**

**EMERGENCY ESCAPE AND RESCUE OPENINGS**

**R310.1 Emergency escape and rescue opening required.** *Basements, habitable attics,* the room to which a sleeping loft is open, and every sleeping room shall have not less than one operable *emergency escape and rescue opening*. Where *basements* contain one or more sleeping rooms, an *emergency escape and rescue opening* shall be required in each sleeping room. *Emergency escape and rescue openings* shall open directly into a *public way*, or to a *yard* or court having a minimum width of 36 inches (914 mm) that opens to a*public way*.

**Exceptions:**

* 1. *Storm shelters* and *basements* used only to house mechanical *equipment* not exceeding a total floor area of 200 square feet (18.58 m2).
  2. Where the *dwelling unit* or *townhouse unit* is equipped with an automatic sprinkler system installed in accordance with Section P2904, sleeping rooms in *basements* shall not be required to have *emergency escape and rescue openings* provided that the *basement* has one of the following:
     1. One means of egress complying with Section R311 and one *emergency escape and rescue opening*.
     2. Two means of egress complying with Section R311.
  3. A *yard* shall not be required to open directly into a *public way* where the *yard* opens to an unobstructed path from the *yard* to the *public way*. Such path shall have a width of not less than 36 inches (914 mm).

(F11483) (RB153-22 AMPC1,2,3)

**R311.7.5.3 Nosings.** *Nosings* at treads, landings and floors of *stairways* shall have a radius of curvature at the *nosing* not greater than 9/16 inch (14 mm) or a bevel not greater than 1/2 inch (12.7 mm). A *nosing* projection not less than 3/4 inch (19 mm) and not more than 11/4 inches (32 mm) shall be provided on *stairways*. The greatest *nosing* projection shall not exceed the smallest *nosing* projection by more than 3/8 inch (9.5 mm) within a *~~stairway~~ flight* and the landing at the top of the *flight*.

**Exception:** A *nosing* projection is not required where the tread depth is not less than 11 inches (279 mm).

(F11367) (RB105-22 AS)

**R311.4 Vertical egress.** Egress from basements and habitable levels i~~ncluding habitable attics and~~ *~~basements~~* that are not provided with an egress door in accordance with Section R311.2 shall be by a *ramp* in accordance with Section R311.8 or a *stairway* in accordance with Section R311.7.

(F11435) (RB101-22 AS)

**R311.7.5.3 Nosings.** *~~Nosings~~* ~~at treads~~ Treads, landings and floors of *stairways* shall have a radius of curvature at the *nosing* not greater than 9/16 inch (14 mm) or a bevel not greater than1/2 inch (12.7 mm). A *nosing* projection not less than 3/4 inch (19 mm) and not more than 11/4 inches (32 mm) shall be provided on *stairways*. The greatest *nosing* projection shall not exceed the smallest *nosing* projection by more than 3/8 inch (9.5 mm) within a *stairway*.

**~~Exception~~ Exceptions:**

1. A *nosing* projection is not required where the tread depth is not less than 11 inches (279 mm).
2. Where risers are *open*, the maximum nosing projection shall be permitted to exceed 1 1/4 inches (32 mm).

(F11436) (RB103-22 AS)/ (F11452) (RB106-22 AS)

**R311.7.6 Landings for stairways.** There shall be a floor or landing at the top and bottom of each *flight of stairs ~~stairway~~*. The width perpendicular to the direction of travel shall be not less than the width of the flight served. For landings of shapes other than square or rectangular, the depth at the walk line and the total area shall be not less than that of a quarter circle with a radius equal to the required landing width. Where the *stairway* has a straight run, the depth in the direction of travel shall be not less than 36 inches (914 mm).

**Exceptions.**

1. The top landing of an interior *stairway*, including those in an enclosed garage, shall be permitted to be on the other side of a door located at the top of the *stairway* ~~A floor or landing is not required at the top of an interior flight of stairs, including stairs in an~~ ~~enclosed garage~~, provided ~~that a~~ the door does not swing over the *stairs*.
2. Exterior *stairways* to grade with three or fewer risers serving a deck, porch or patio shall have a minimum bottom landing width of 36 inches, provided the stairway is not the required access to grade serving the required egress door.
3. See Section R311.3 for exterior doors where a step down is provided.

(F11453) (RB107-22 AS)/ (F11454) (RB108-22 AS)

**R314.1 General.** Smoke alarms shall comply with NFPA 72, ~~and~~ Section R314 and the manufacturer’s installation instructions.

**R314.1.1 Listings.** Smoke alarms shall be *listed* in accordance with UL 217. Combination smoke and carbon monoxide alarms shall be *listed* in accordance with UL 217 and UL 2034.

**Revise as follows:**

**R314.3.1 Installation near cooking appliances.** Smoke alarms shall ~~not~~ be installed a minimum of 10 ft. (3.0 m) horizontally from a permanently installed cooking appliance. i~~n the following locations unless this would prevent placement of a smoke alarm in a location~~ ~~required by Section R314.3.~~

1. ~~Ionization smoke alarms shall not be installed less than 20 feet (6096 mm) horizontally from a permanently installed cooking~~

*~~appliance~~*~~.~~

1. ~~Ionization smoke alarms with an alarm-silencing switch shall not be installed less than 10 feet (3048 mm) horizontally from a~~ ~~permanently installed cooking~~ *~~appliance~~*~~.~~
2. ~~Photoelectric smoke alarms shall not be installed less than 6 feet (1828 mm) horizontally from a permanently installed cooking~~

*~~appliance~~*~~.~~

1. ~~Smoke alarms~~ *~~listed~~* ~~and marked “helps reduce cooking nuisance alarms” shall not be installed less than 6 feet (1828 mm)~~ ~~horizontally from a permanently installed cooking~~ *~~appliance~~*~~.~~

**Exception:** Smoke alarms shall be permitted to be installed a minimum of 6 ft. (1.8 m) horizontally from a permanently installed cooking appliance where necessary to comply with Section R314.3.

(F11460) (RB121-22 AS)

**R314.1.1 Listings.** Smoke alarms shall be *listed* and *labeled* in accordance with UL 217. Combination smoke and carbon monoxide alarms shall be *listed and labeled* in accordance with UL 217 and UL 2034.

**Add new text as follows:**

**R314.1.2 Installation.** Smoke alarms and combination smoke and carbon monoxide alarms shall be installed in accordance with their listing and the manufacturer’s instructions.

(F11461) (RB122-22 AMPC1)

**SECTION 314 SMOKE ALARMS**

**R314.3 Location.** Smoke alarms shall be installed in the following locations:

1. In each sleeping room.
2. Outside each separate sleeping area in the immediate vicinity of the bedrooms ~~and sleeping lofts~~.
3. On each additional story of the *dwelling*, including *basements* and *habitable attics* and not including crawl spaces and uninhabitable *attics*. In *dwellings* or *dwelling units* with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full *story* below the upper level.
4. Not less than 3 feet (914 mm) horizontally from the door or opening of a bathroom that contains a bathtub or shower unless this would prevent placement of a smoke alarm required by this section.
5. In the hallway and in the room open to the hallway in*dwelling units* where the ceiling height of a room open to a hallway serving bedrooms exceeds that of the hallway by 24 inches (610 mm) or more.
6. Within the room to which a sleeping loft is open, in the immediate vicinity of the sleeping loft

(F11483) (RB153-22 AMPC1,2,3)/ (F11483) (RB153-22 AMPC1,2,3)

**~~R315.1.1 Listings.~~** ~~Carbon monoxide alarms shall be~~ *~~listed~~* ~~and~~ *~~labeled~~* ~~in accordance with UL 2034. Combination carbon monoxide and smoke alarms shall be~~ *~~listed~~* ~~and~~ *~~labeled~~* ~~in accordance with UL 2034 and UL 217.~~

**~~Add new text as follows:~~**

**~~R315.1.2 Installation.~~** ~~Carbon monoxide alarms shall be installed in accordance with their~~ *~~listing~~* ~~and the manufacturer’s instructions.~~

**~~Committee Modification:~~**

**~~R315.1.2 Installation.~~** ~~Carbon monoxide alarms, and combination carbon monoxide and smoke alarms, shall be installed in accordance with their~~ *~~listing~~* ~~and the manufacturer’s instructions.~~

(F11462) (RB124-22 AM) Overlap

**SECTION R316 FOAM PLASTIC**

**R316.1 General.** The provisions of this section shall govern the materials, design, application, construction and installation of foam plastic materials.

**Add new text as follows:**

**R316.1.1 Spray-applied foam plastic.** Single- and multiple-component spray-applied foam plastic insulation shall comply with the provisions of Section R316 and ICC 1100.

**R316.1.2 Insulating sheathing.** Foam plastic materials used as *insulating sheathing* shall comply with the provisions of Section R316 and the material standards in Table R316.1.2.

**TABLE R316.1.2 MATERIAL STANDARDS FOR FOAM PLASTIC INSULATING SHEATHING**

|  |  |
| --- | --- |
| Expanded Polystyrene (EPS) | ASTM C578 |
| Extruded Polystyrene (XPS) | ASTM C578 |
| Polyisocyanurate | ASTM C1289 |

**Add new standard(s) as follows:**

International Code Council, Inc. 500 New Jersey Avenue NW 6th Floor

**ICC**

Washington, DC 20001

1100-2018 Standard for Spray-applied Foam Plastic Insulation

(F11465) (RB127-22 AS)

**R316.8 Wind resistance.** Foam plastic insulation complying with ASTM C578 and ASTM C1289 and used as exterior wall sheathing on framed wall assemblies shall comply with SBCA FS 100 for wind pressure resistance unless installed directly over or under a sheathing material that is separately capable of resisting the wind load or otherwise exempted from the scope of SBCA FS 100.

(F11467) (RB131-22 AS)

**R317.3 Fasteners and connectors in contact with preservative-treated and fire-retardant-treated wood.** Fasteners, including nuts and washers, and connectors in contact with preservative-treated wood and fire-retardant-treated wood shall be in accordance with this section. The coating weights for zinc-coated fasteners shall be in accordance with ASTM A153. The coating weight for zinc-coated nails shall be in accordance with ASTM A153 Class D (1 oz / ft²) or ASTM A641 Class 3S (1 oz / ft²). Stainless steel driven fasteners shall be in accordance with the material requirements of ASTM F1667.

ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken, PA 19428

**ASTM**

A641/A641M—~~09a(2014)~~ 2019 Specification for Zinc-coated (Galvanized) Carbon Steel Wire

(F11468) (RB133-22 AS)

**R322.1 General.** Buildings and structures constructed in whole or in part in flood hazard areas~~, including A or V Zones and Coastal A~~ ~~Zones, as~~ established in Table R301.2, and substantial improvement and *repair* of substantial damage of buildings and structures located in whole or in part in flood hazard areas, shall be designed and constructed in accordance with the provisions contained in this section. Buildings and structures that are located in more than one flood hazard area, including A Zones, Coastal A Zones, and V Zones, shall comply with the provisions associated with the most restrictive flood hazard area. Buildings and structures located in whole or in part in identified floodways shall be designed and constructed in accordance with ASCE 24.

(S11398) (RB42-22 AS)

**R322.3.5 Walls below required elevation.** Walls and partitions are permitted below the elevation required in Section R322.3.2, provided that such walls and partitions are not part of the structural support of the building or structure and:

1. Electrical, mechanical and plumbing system components are not to be mounted on or penetrate through walls that are designed to break away under flood loads; and
2. Are constructed with insect screening or open lattice; or
3. Are designed to break away or collapse without causing collapse, displacement or other structural damage to the elevated portion of the building or supporting foundation system. Such walls, framing and connections shall have a resistance of not less than 10 (479 Pa) and not more than 20 pounds per square foot (958 Pa) as determined using allowable stress design, or a resistance to an ultimate load of not less than 17 (814 Pa) and not more than 33 pounds per square foot (1580 Pa); or
4. Where wind loading values of this code exceed 20 pounds per square foot (958 Pa), as determined using allowable stress design or an ultimate load of 33 pounds per square foot (1580 Pa), the *construction documents* shall include documentation prepared and sealed by a registered *design professional* that:
   1. The walls and partitions below the required elevation have been designed to collapse from a water load less than that which would occur during the base flood.
   2. The elevated portion of the building and supporting foundation system have been designed to withstand the effects of wind and flood loads acting simultaneously on structural and nonstructural building components. Water-loading values used shall be those associated with the design flood. Wind-loading values shall be those required by this code.
5. Walls intended to break away under flood loads as specified in Item 3 or 4 have flood openings that meet the criteria in Section R322.2.2, Item 2.

(F11475) (RB142-22 AS)

R324.3.1 Equipment listings. Photovoltaic panels and modules shall be listed and labeled in accordance with UL 1703. Inverters shall be listed and labeled in accordance with UL 1741. Systems connected to the utility grid shall use inverters listed for utility interaction. Mounting systems listed and labeled in accordance with UL 2703 shall be installed in accordance with the manufacturer’s installation instructions and their listings. BIPV roof coverings and BIPV roof assemblies shall be listed and labeled in accordance with UL 7103.

(F11477) (RB145-22 AS)

**R324.5 Building-integrated photovoltaic systems.** Building-integrated photovoltaic (BIPV) systems ~~that serve as roof coverings~~ shall be designed and installed in accordance with Section ~~R905~~ Sections R324.5.1 through R324.5.2.

**R324.5.1 ~~Photovoltaic shingles~~ BIPVroofing systems.** ~~Photovoltaic shingles~~ BIPV roofing systems shall comply with Section R905.16. BIPV roof panels shall comply with Section R905.17.

**~~R324.5.2~~R324.5.1.1 Fire classification.** *Building-integrated photovoltaic systems* shall have a fire classification in accordance with Section R902.1.

**~~R324.5.3 BIPV roof panels~~.** ~~BIPV roof panels shall comply with Section R905.17~~.

###### Add new text as follows:

**R324.5.2 BIPV Exterior wall coverings and fenestration.** BIPV exterior wall coverings and fenestration shall comply with Section R705.

(F11478) (RB146-22 AS)

**R324.7 Ground-mounted photovoltaic (PV) panel systems.** Ground-mounted photovoltaic (PV) panel systems shall be designed and installed in accordance with Section R301.

(S11387) (RB27-22 AS)

**Add new text as follows:**

**R324.7 Elevated photovoltaic (PV) support structures.** Elevated PV support structures used as an accessory structure shall comply with either Section R324.7.1 or R324.7.2. Elevated PV support structures shall be considered a roof for the purposes of establishing the number of stories and fire separation distances.

**R324.7.1 PV panels installed over open-grid framing or non-combustible deck.** Elevated PV support structures with PV panels installed over open-grid framing or over a noncombustible deck shall have PV panels tested, *listed,* and *labeled* with a fire type rating in accordance with UL 1703 or with both UL 61730-1 and UL 61730-2. Photovoltaic panels marked “not fire rated” shall not be installed on elevated PV support structures.

**324.7.2 PV panels installed over a roof assembly.** Elevated PV support structures with a PV panel system installed over a roof assembly shall have a fire classification in accordance with Section R902.4.

(S11481) (RB150-22 AMPC1)

**SECTION R325 MEZZANINES**

**Revise as follows:**

**R325.1 General.** *Mezzanines* shall comply with Section R325.

**Exception:** Sleeping lofts in dwelling units and sleeping units shall be permitted to comply with Section R331, subject to the limitations in Section R331.2.

(F11483) (RB153-22 AMPC1,2,3)

**R328.4 Locations.** *ESS* shall be installed only in the following locations:

1. Detached garages and detached accessory structures.
2. Attached garages separated from the dwelling unit living space in accordance with Section R302.6.
3. Outdoors or on the exterior side of exterior walls located not less than 3 feet (914 mm) from doors and windows directly entering the dwelling unit.
4. Enclosed utility closets, basements, storage or utility spaces within dwelling units with finished or noncombustible walls and ceilings. Walls and ceilings of unfinished wood-framed construction shall be provided with not less than 5/8-inch (15.9 mm) Type X gypsum wallboard. Openings into the dwelling shall be equipped with solid wood doors not less than 1-3/8 inches (35 mm) in thickness, solid or honeycomb- core steel doors not less than 1-3/8 inches (35 mm) thick, or door with a 20-minute fire protection rating. Doors shall be self-latching and equipped with a self-closing or automatic-closing device. Penetrations through the required gypsum wallboard into the dwelling shall be protected as required by Section R302.11, Item 4.

*ESS* shall not be installed in sleeping rooms, or closets or spaces opening directly into sleeping rooms.

(F11485) (RB157-22 AM)

Revise title for Section R328 as follows:

**SECTION R328 -**

**~~STATIONARY STORAGE BATTERY SYSTEMS~~ ENERGY STORAGE SYSTEMS**

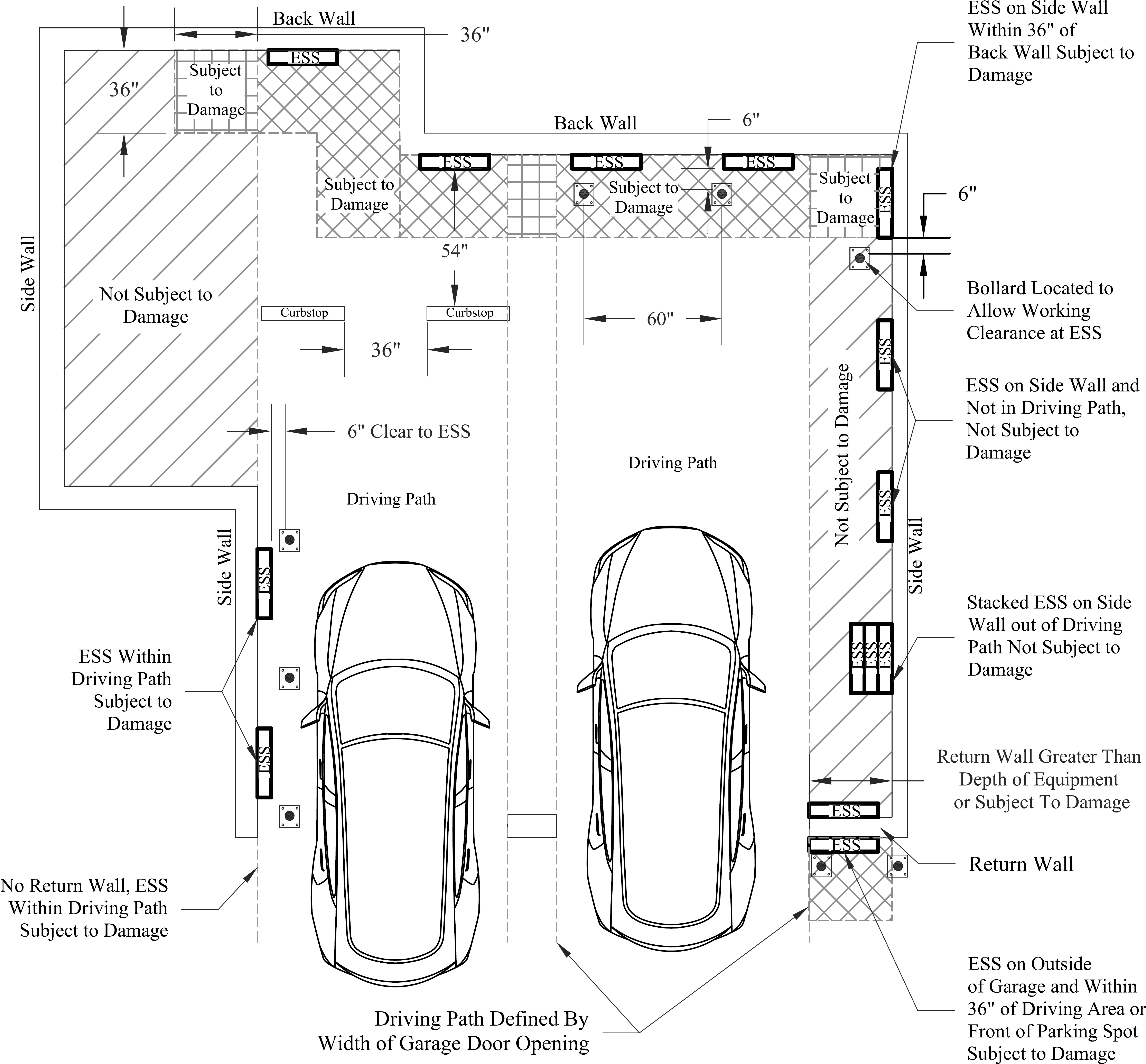
F-FBC-R – Ch.3 – Errata #2

**R328.8 Protection from impact.** *ESS* installed in a location subject to vehicle damage shall be protecte~~dby~~ *~~approved~~* ~~barriers~~ in accordance with Section R328.8.1 or R328.8.2.

**Add new text as follows:**

**R328.8.1 Garages.** Where an ESS is installed in the normal driving path of vehicle travel within a garage, impact protection complying with Section R328.8.3 shall be provided. The normal driving path is a space between the garage vehicle opening and the interior face of the back wall to a height of 48 inches (1219 mm) above the finished floor. The width of the normal driving path shall be equal to the width of the garage door opening. Impact protection shall also be provided for an ESS installed at either of the following locations (see Figure R328.8.1):

1. On the interior face of the back wall and located within 36 inches (914 mm) to the left or to the right of the normal driving path.
2. On the interior face of a side wall and located within 24 inches (610 mm) from the back wall and 36 inches (914 mm) of the normal driving path.

**Exception:** Where the clear height of the vehicle garage opening is 7 feet 6 inch (2286 mm) or less, ESS installed not less than 36 inches (914 mm) above finished floor are not subject to vehicle impact protection requirements.

**FIGURE R328.8.1 ESS VEHICLE IMPACT PROTECTION**

**R328.8.2 Other locations subject to vehicle impact.** Where an ESS is installed in a location other than as defined in Section R328.8.1, and is subject to vehicle damage, impact protection shall be provided in accordance with Section R328.8.3.

**R328.8.3 Impact protection options.** ESS protection shall comply with one of the following:

1. Bollards constructed in accordance with one of the following:
   1. Minimum 48 inches (1219 mm) in length by 3 inches (76 mm) in diameter schedule 80 steel pipe embedded in a concrete pier not less than 12 inches (304 mm) deep and 6 inches (152 mm) in diameter, with at least 36 inches (914 mm) of pipe exposed, filled with concrete, and spaced at a maximum interval of 5 feet (1524 mm). Each bollard shall be located not less than 6 inches (152 mm) from an ESS.
   2. Minimum 36 inches (914 mm) in height by 3 inches (76 mm) in diameter schedule 80 steel pipe fully welded to a minimum 8 inches (203 mm) by ¼ inch (6.4 mm) thick steel plate and bolted to a concrete floor by means of 4-1/2 inch (114 mm) concrete anchors with 3 inch (76 mm) minimum embedment. Spacing shall be not greater than 60 inches (1524 mm), and each bollard shall be located not less than 6 inches (152 mm) from the ESS.
   3. Pre-manufactured steel pipe bollards filled with concrete and anchored in accordance with the manufacturer’s installation instructions, with spacing not greater than 60 inches (1524 mm). Each bollard shall be located not less than 6 inches (152 mm) from the ESS.
2. Wheel barriers constructed in accordance with one of the following:
   1. Four inches (102 mm) in height by 5 inches (127 mm) in width by 70 inches (1778 mm) in length wheel barrier made of concrete or polymer, anchored to the concrete floor not less than every 36 inches (914 mm) and located not less than 54 inches (1372 mm) from the ESS. Minimum 3– ½ inch (90 mm) diameter concrete anchors with 3 inch (76 mm) embedment per barrier shall be used. Spacing between barriers shall be no greater than 36 inches (914 mm).
   2. Pre-manufactured wheel barriers shall be anchored in accordance with the manufacturer’s installation instructions.
3. *Approved* method designed to resist a 2000 pounds per square foot (8899 Newtons) impact in the direction of travel at 24 inches (608 mm) above grade.

(F11487) (RB161-22 AS)

**Add new text as follows:**

**SECTION R331 SLEEPING LOFTS**

**R331.1 Sleeping lofts.** Where provided in dwelling units or sleeping units, sleeping lofts shall comply with this code as modified by Sections R331.2 through R331.5. Sleeping lofts constructed in compliance with this section shall be considered a portion of the story below. Such sleeping lofts shall not contribute to the number of stories as regulated by this code.

**Exception:** Sleeping lofts need not comply with Section R331 where they meet any of the following conditions:

1. The sleeping loft has a maximum depth of less than 3 feet (914 mm).
2. The sleeping loft has a floor area of less than 35 square feet (3.3 m ).
3. The sleeping loft is not provided with a permanent means of egress.

**R331.2 Sleeping loft limitations.** Sleeping lofts shall comply with the following conditions:

1. The sleeping loft floor area shall be less than 70 square feet (6.5 m ).
2. The sleeping loft ceiling height shall not exceed 7 feet (2134 mm) for more than one-half of the sleeping loft floor area.

**R331.3 Sleeping loft ceiling height.** The clear height below the sleeping loft floor construction shall not be less than 7 feet (2134 mm). The ceiling height above the finished floor of the sleeping loft shall not be less than 3 feet (914 mm). Spaces adjacent to the sleeping loft with a sloped ceiling measuring less than 3 feet (914 mm) from the finished floor to the finished ceiling shall not contribute to the sleeping loft floor area.

**R3331.4 Sleeping loft area.** The aggregate area of all sleeping lofts and mezzanines within a room shall comply with Section R325.3.

**Exception:** The area of a single sleeping loft located within a dwelling unit or sleeping unit equipped with an automatic sprinkler system in accordance with Section P2904 shall not be greater than two-thirds of the area of the room in which it is located, provided that no other sleeping lofts or mezzanines are open to the room in which the sleeping loft is located.

**R331.5 Permanent egress for sleeping lofts.** A permanent means of egress shall be provided for sleeping lofts. The means of egress shall comply with Section 311 as modified by Sections R331.5.1 through R331.5.3.

**R331.5.1 Ceiling height at sleeping loft means of egress.** A minimum ceiling height of 3 feet (914 mm) shall be provided for the entire width of the means of egress from the sleeping loft.

**R331.5.2 Stairways.** Stairways providing egress from sleeping lofts shall be permitted to comply with Sections R331.5.2.1 through R331.5.2.3.

**R331.5.2.1 Width.** Stairways providing egress from a sleeping loft shall not be less than 17 inches (432 mm) in clear width at or above the handrail. The width below the handrail shall be not less than 20 inches (508 mm).

**R331.5.2.2 Treads and risers.** Risers for stairs providing egress from a sleeping loft shall be not less than 7 inches (178 mm) and not more than 12 inches (305 mm) in height. Tread depth and riser height shall be calculated in accordance with one of the following formulas:

1. The tread depth shall be 20 inches (508 mm) minus four-thirds of the riser height.
2. The riser height shall be 15 inches (381 mm) minus three-fourths of the tread depth.

**R331.5.2.3 Landings.** Landings at stairways providing egress from sleeping lofts shall comply with Section R311.7.6, except that the depth of landings in the direction of travel shall be not less than 24 inches (508 mm).

**R331.5.3 Ladders.** Ladders complying with Sections R331.5.3.1 and R331.5.3.2 shall be permitted as a means of egress from sleeping lofts.

**R331.5.3.1 Size and capacity.** Ladders providing egress from sleeping lofts shall have a rung width of not less than 12 inches (305 mm), and 10-inch (254 mm) to 14-inch (356 mm) spacing between rungs. Ladders shall be capable of supporting a 300-pound (136 kg) load on any rung. Rung spacing shall be uniform within 3/8 inch (9.5 mm).

**R331.5.3.2 Incline.** Ladders shall be inclined at 70 to 80 degrees from horizontal.

(F11483) (RB153-22 AMPC1,2,3)

**Chapter 4 Foundations**

**TABLE R404.1.1(1) PLAIN MASONRY FOUNDATION WALLSf**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **MAXIMUM UNSUPPORTED WALL HEIGHT**  **(feet)** | **MAXIMUM UNBALANCED BACKFILL HEIGHTc**  **(feet)** | **PLAIN MASONRYa MINIMUM NOMINAL WALL THICKNESS**  **(inches)** | | |
| **Soil classes and lateral soil loadb (psf per foot below grade)** | | |
| **GW, GP, SW and SP soils 30** | **GM, GC, SM, SM-SC and ML soils 45** | **SC, MH, ML-CL and inorganic CL soils 60** |
| 5 | 4 | 6 solidd or 8 | 6 solidd or 8 | 6 solidd or 8 |
| 5 | 6 solidd or 8 | 8 | 10 |
| 6 | 4 | 6 solidd or 8 | 6 solidd or 8 | 6 solidd or 8 |
| 5 | 6 solidd or 8 | 8 | 10 |
| 6 | 8 | 10 | 12 |
| 7 | 4 | 6 solidd or 8 | 8 | 8 |
| 5 | 6 solidd or 8 | 10 | 10 |
| 6 | 10 | 12 | 10 solidd |
| 7 | 12 | 10 solidd | 12 solidd |
| 8 | 4 | 6 solidd or 8 | 6 solidd or 8 | 8 |
| 5 | 6 solidd or 8 | 10 | 12 |
| 6 | 10 | 12 | 12 solidd |
| 7 | 12 | 12 solidd | Note e |
| 8 | 10 groutd | 12 groutd | Note e |
| 9 | 4 | 6 groutd or 8 solidd or 12 | 6 groutd or 8 solidd | 8 groutd or 10 solidd |
| 5 | 6 groutd or 10 solidd | 8 groutd or 12 solidd | 8 groutd |
| 6 | 8 groutd or 12 solidd | 10 groutd | 10 groutd |
| 7 | 10 groutd | 10 groutd | 12 grout |
| 8 | 10 groutd | 12 grout | Note e |
| 9 | 12 grout | Note e | Note e |

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

No change to the footnotes

(S11494) (RB168-22 AS)

**Revise as follows:**

**R404.1.2.1 Masonry foundation walls.** *Concrete masonry* and *clay masonry* foundation walls shall be constructed as set forth in Table ~~R404.1.1(1)~~ R404.1.2.1(1), ~~R404.1.1(2)~~R404.1.2.1(2), ~~R404.1.1(3)~~ R404.1.2.1(3) or ~~R404.1.1(4)~~ R404.1.2.1(4) and shall also comply with

applicable provisions of Section R606. Rubble stone masonry foundation walls shall be constructed in accordance with Sections R404.1.8 and R606.4.2.

**TABLE ~~R404.1.1(1)~~ R404.1.2.1(1) PLAIN MASONRY FOUNDATION WALLSf**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **MAXIMUM UNSUPPORTED WALL HEIGHT**  **(feet)** | **MAXIMUM UNBALANCED BACKFILL HEIGHTc**  **(feet)** | **PLAIN MASONRYa MINIMUM NOMINAL WALL THICKNESS**  **(inches)** | | |
| **Soil classesb** | | |
| **GW, GP, SW and SP** | **GM, GC, SM, SM-SC and ML** | **SC, MH, ML-CL and inorganic CL** |
| 5 | 4 | 6 solidd or 8 | 6 solidd or 8 | 6 solidd or 8 |
| 5 | 6 solidd or 8 | 8 | 10 |
| 6 | 4 | 6 solidd or 8 | 6 solidd or 8 | 6 solidd or 8 |
| 5 | 6 solidd or 8 | 8 | 10 |
| 6 | 8 | 10 | 12 |
| 7 | 4 | 6 solidd or 8 | 8 | 8 |
| 5 | 6 solidd or 8 | 10 | 10 |
| 6 | 10 | 12 | 10 solidd |
| 7 | 12 | 10 solidd | 12 solidd |
| 8 | 4 | 6 solidd or 8 | 6 solidd or 8 | 8 |
| 5 | 6 solidd or 8 | 10 | 12 |
| 6 | 10 | 12 | 12 solidd |
| 7 | 12 | 12 solidd | Note e |
| 8 | 10 groutd | 12 groutd | Note e |
| 9 | 4 | 6 groutd or 8 solidd or 12 | 6 groutd or 8 solidd | 8 groutd or 10 solidd |
| 5 | 6 groutd or 10 solidd | 8 groutd or 12 solidd | 8 groutd |
| 6 | 8 groutd or 12 solidd | 10 groutd | 10 groutd |
| 7 | 10 groutd | 10 groutd | 12 grout |
| 8 | 10 groutd | 12 grout | Note e |
| 9 | 12 grout | Note e | Note e |

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

a – d no change

e. Wall construction shall be in accordance with Table

~~R404.1.1(2)~~ R404.1.2.1(2), ~~R404.1.1(3)~~R404.1.2.1(3) or ~~R404.1.1(4)~~R404.1.2.1(4), or a design shall be provided.

1. The use of this table shall be prohibited for soil classifications not shown.

**TABLE ~~R404.1.1(2)~~ R404.1.2.1(2) 8-INCH MASONRY FOUNDATION WALLS WITH REINFORCING WHERE d ≥ 5 INCHESa, c, f**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **MAXIMUM UNSUPPORTED WALL HEIGHT** | **HEIGHT OF UNBALANCED BACKFILLe** | **MINIMUM VERTICAL REINFORCEMENT AND SPACING (INCHES)b, c** | | |
| **Soil classes and lateral soil loadd (psf per foot below grade)** | | |
| **GW, GP, SW and SP soils 30** | **GM, GC, SM, SM-SC and ML soils 45** | **SC, ML-CL and inorganic CL soils 60** |
| 6 feet 8 inches | 4 feet (or less) | #4 at 48 | #4 at 48 | #4 at 48 |
| 5 feet | #4 at 48 | #4 at 48 | #4 at 48 |
| 6 feet 8 inches | #4 at 48 | #5 at 48 | #6 at 48 |
| 7 feet 4 inches | 4 feet (or less) | #4 at 48 | #4 at 48 | #4 at 48 |
| 5 feet | #4 at 48 | #4 at 48 | #4 at 48 |
| 6 feet | #4 at 48 | #5 at 48 | #5 at 48 |
| 7 feet 4 inches | #5 at 48 | #6 at 48 | #6 at 40 |
| 8 feet | 4 feet (or less) | #4 at 48 | #4 at 48 | #4 at 48 |
| 5 feet | #4 at 48 | #4 at 48 | #4 at 48 |
| 6 feet | #4 at 48 | #5 at 48 | #5 at 48 |
| 7 feet | #5 at 48 | #6 at 48 | #6 at 40 |
| 8 feet | #5 at 48 | #6 at 48 | #6 at 32 |
| 8 feet 8 inches | 4 feet (or less) | #4 at 48 | #4 at 48 | #4 at 48 |
| 5 feet | #4 at 48 | #4 at 48 | #5 at 48 |
| 6 feet | #4 at 48 | #5 at 48 | #6 at 48 |
| 7 feet | #5 at 48 | #6 at 48 | #6 at 40 |
| 8 feet 8 inches | #6 at 48 | #6 at 32 | #6 at 24 |
| 9 feet 4 inches | 4 feet (or less) | #4 at 48 | #4 at 48 | #4 at 48 |
| 5 feet | #4 at 48 | #4 at 48 | #5 at 48 |
| 6 feet | #4 at 48 | #5 at 48 | #6 at 48 |
| 7 feet | #5 at 48 | #6 at 48 | #6 at 40 |
| 8 feet | #6 at 48 | #6 at 40 | #6 at 24 |
| 9 feet 4 inches | #6 at 40 | #6 at 24 | #6 at 16 |
| 10 feet | 4 feet (or less) | #4 at 48 | #4 at 48 | #4 at 48 |
| 5 feet | #4 at 48 | #4 at 48 | #5 at 48 |
| 6 feet | #4 at 48 | #5 at 48 | #6 at 48 |
| 7 feet | #5 at 48 | #6 at 48 | #6 at 32 |
| 8 feet | #6 at 48 | #6 at 32 | #6 at 24 |
| 9 feet | #6 at 40 | #6 at 24 | #6 at 16 |
| 10 feet | #6 at 32 | #6 at 16 | #6 at 16 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot per foot = 0.157 kPa/mm.

Footnotes – no change

**TABLE ~~R404.1.1(3)~~R404.1.2.1(3) 10-INCH MASONRY FOUNDATION WALLS WITH REINFORCING WHERE d ≥ 6.75 INCHESa, c, f**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **MAXIMUM UNSUPPORTED WALL HEIGHT** | **HEIGHT OF UNBALANCED BACKFILLe** | **MINIMUM VERTICAL REINFORCEMENT AND SPACING (INCHES)b, c** | | |
| **Soil classes and later soil loadd (psf per foot below grade)** | | |
| **GW, GP, SW and SP soils 30** | **GM, GC, SM, SM-SC and ML soils 45** | **SC, ML-CL and inorganic CL soils 60** |
| 6 feet 8 inches | 4 feet (or less) | #4 at 56 | #4 at 56 | #4 at 56 |
| 5 feet | #4 at 56 | #4 at 56 | #4 at 56 |
| 6 feet 8 inches | #4 at 56 | #5 at 56 | #5 at 56 |
| 7 feet 4 inches | 4 feet (or less) | #4 at 56 | #4 at 56 | #4 at 56 |
| 5 feet | #4 at 56 | #4 at 56 | #4 at 56 |
| 6 feet | #4 at 56 | #4 at 56 | #5 at 56 |
| 7 feet 4 inches | #4 at 56 | #5 at 56 | #6 at 56 |
| 8 feet | 4 feet (or less) | #4 at 56 | #4 at 56 | #4 at 56 |
| 5 feet | #4 at 56 | #4 at 56 | #4 at 56 |
| 6 feet | #4 at 56 | #4 at 56 | #5 at 56 |
| 7 feet | #4 at 56 | #5 at 56 | #6 at 56 |
| 8 feet | #5 at 56 | #6 at 56 | #6 at 48 |
| 8 feet 8 inches | 4 feet (or less) | #4 at 56 | #4 at 56 | #4 at 56 |
| 5 feet | #4 at 56 | #4 at 56 | #4 at 56 |
| 6 feet | #4 at 56 | #4 at 56 | #5 at 56 |
| 7 feet | #4 at 56 | #5 at 56 | #6 at 56 |
| 8 feet 8 inches | #5 at 56 | #6 at 48 | #6 at 32 |
| 9 feet 4 inches | 4 feet (or less) | #4 at 56 | #4 at 56 | #4 at 56 |
| 5 feet | #4 at 56 | #4 at 56 | #4 at 56 |
| 6 feet | #4 at 56 | #5 at 56 | #5 at 56 |
| 7 feet | #4 at 56 | #5 at 56 | #6 at 56 |
| 8 feet | #5 at 56 | #6 at 56 | #6 at 40 |
| 9 feet 4 inches | #6 at 56 | #6 at 40 | #6 at 24 |
| 10 feet | 4 feet (or less) | #4 at 56 | #4 at 56 | #4 at 56 |
| 5 feet | #4 at 56 | #4 at 56 | #4 at 56 |
| 6 feet | #4 at 56 | #5 at 56 | #5 at 56 |
| 7 feet | #5 at 56 | #6 at 56 | #6 at 48 |
| 8 feet | #5 at 56 | #6 at 48 | #6 at 40 |
| 9 feet | #6 at 56 | #6 at 40 | #6 at 24 |
| 10 feet | #6 at 48 | #6 at 32 | #6 at 24 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot per foot = 0.157 kPa/mm.

Footnotes – no change

**TABLE ~~R404.1.1(4)~~R404.1.2.1(4) 12-INCH MASONRY FOUNDATION WALLS WITH REINFORCING WHERE d ≥ 8.75 INCHESa, c, f**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **MAXIMUM UNSUPPORTED WALL HEIGHT** | **HEIGHT OF UNBALANCED BACKFILLe** | **MINIMUM VERTICAL REINFORCEMENT AND SPACING (INCHES)b, c** | | |
| **Soil classes and lateral soil loadd (psf per foot below grade)** | | |
| **GW, GP, SW and SP soils 30** | **GM, GC, SM, SM-SC and ML soils 45** | **SC, ML-CL and inorganic CL soils 60** |
| 6 feet 8 inches | 4 feet (or less) | #4 at 72 | #4 at 72 | #4 at 72 |
| 5 feet | #4 at 72 | #4 at 72 | #4 at 72 |
| 6 feet 8 inches | #4 at 72 | #4 at 72 | #5 at 72 |
| 7 feet 4 inches | 4 feet (or less) | #4 at 72 | #4 at 72 | #4 at 72 |
| 5 feet | #4 at 72 | #4 at 72 | #4 at 72 |
| 6 feet | #4 at 72 | #4 at 72 | #5 at 72 |
| 7 feet 4 inches | #4 at 72 | #5 at 72 | #6 at 72 |
| 8 feet | 4 feet (or less) | #4 at 72 | #4 at 72 | #4 at 72 |
| 5 feet | #4 at 72 | #4 at 72 | #4 at 72 |
| 6 feet | #4 at 72 | #4 at 72 | #5 at 72 |
| 7 feet | #4 at 72 | #5 at 72 | #6 at 72 |
| 8 feet | #5 at 72 | #6 at 72 | #6 at 64 |
| 8 feet 8 inches | 4 feet (or less) | #4 at 72 | #4 at 72 | #4 at 72 |
| 5 feet | #4 at 72 | #4 at 72 | #4 at 72 |
| 6 feet | #4 at 72 | #4 at 72 | #5 at 72 |
| 7 feet | #4 at 72 | #5 at 72 | #6 at 72 |
| 8 feet 8 inches | #5 at 72 | #7 at 72 | #6 at 48 |
| 9 feet 4 inches | 4 feet (or less) | #4 at 72 | #4 at 72 | #4 at 72 |
| 5 feet | #4 at 72 | #4 at 72 | #4 at 72 |
| 6 feet | #4 at 72 | #5 at 72 | #5 at 72 |
| 7 feet | #4 at 72 | #5 at 72 | #6 at 72 |
| 8 feet | #5 at 72 | #6 at 72 | #6 at 56 |
| 9 feet 4 inches | #6 at 72 | #6 at 48 | #6 at 40 |
| 10 feet | 4 feet (or less) | #4 at 72 | #4 at 72 | #4 at 72 |
| 5 feet | #4 at 72 | #4 at 72 | #4 at 72 |
| 6 feet | #4 at 72 | #5 at 72 | #5 at 72 |
| 7 feet | #4 at 72 | #6 at 72 | #6 at 72 |
| 8 feet | #5 at 72 | #6 at 72 | #6 at 48 |
| 9 feet | #6 at 72 | #6 at 56 | #6 at 40 |
| 10 feet | #6 at 64 | #6 at 40 | #6 at 32 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot per foot = 0.157 kPa/mm.

Footnotes – no change

**R404.1.3.2 Reinforcement for foundation walls.** Concrete foundation walls shall be laterally supported at the top and bottom. Horizontal reinforcement shall be provided in accordance with Table ~~R404.1.2(1)~~ R404.1.3.2(1). Vertical reinforcement shall be provided in accordance with Table ~~R404.1.2(2)~~R404.1.3.2 (2), ~~R404.1.2(3)~~R404.1.3.2 (3), ~~R404.1.2(4)~~ R404.1.3.2(4), ~~R404.1.2(5)~~ R404.1.3.2(5), ~~R404.1.2(6)~~

R404.1.3.2(6), ~~R404.1.2(7)~~ R404.1.3.2(7) or ~~R404.1.2(8)~~ R404.1.3.2(8). Vertical reinforcement for flat *basement* walls retaining 4 feet (1219 mm) or more of unbalanced backfill is permitted to be determined in accordance with Table ~~R404.1.2(9)~~ R404.1.3.2(9). For *basement* walls supporting above-grade concrete walls, vertical reinforcement shall be the greater of that required by Tables ~~R404.1.2(2)~~ R404.1.3.2(2)

through ~~R404.1.2(8)~~ R404.1.3.2(8) or by Section R608.6 for the above-grade wall.

**TABLE ~~R404.1.2(1)~~ R404.1.3.2(1) MINIMUM HORIZONTAL REINFORCEMENT FOR CONCRETE BASEMENT WALLSa, b**

|  |  |
| --- | --- |
| **MAXIMUM UNSUPPORTED WALL HEIGHT (feet)** | **LOCATION OF HORIZONTAL REINFORCEMENT** |
| ≤ 8 | One No. 4 bar within 12 inches of the top of the wall story and one No. 4 bar near mid-height of the wall story. |
| > 8 | One No. 4 bar within 12 inches of the top of the wall story and one No. 4 bar near third points in the wall story. |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square inch = 6.895 kPa.

1. Horizontal reinforcement requirements are for reinforcing bars with a minimum yield strength of 40,000 psi and concrete with a minimum concrete compressive strength of 2,500 psi.
2. See Section R404.1.3.2 for minimum reinforcement required for foundation walls supporting above-grade concrete walls.

**TABLE ~~R404.1.2(2)~~ R404.1.3.2(2) MINIMUM VERTICAL REINFORCEMENT FOR 6-INCH NOMINAL FLAT CONCRETE BASEMENT**

**WALLSb, c, d, e, g, h, i, j, k**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **MAXIMUM UNSUPPORTED WALL HEIGHT**  **(feet)** | **MAXIMUM UNBALANCED BACKFILL HEIGHTf**  **(feet)** | **MINIMUM VERTICAL REINFORCEMENT-BAR SIZE AND SPACING (inches)** | | |
| **Soil classesa and design lateral soil (psf per foot of depth)** | | |
| **GW, GP, SW, SP 30** | **GM, GC, SM, SM-SC and ML 45** | **SC, ML-CL and inorganic CL 60** |
| 8 | 4 | NR | NR | NR |
| 5 | NR | 6 @ 39 | 6 @ 48 |
| 6 | 5 @ 39 | 6 @ 48 | 6 @ 35 |
| 7 | 6 @ 48 | 6 @ 34 | 6 @ 25 |
| 8 | 6 @ 39 | 6 @ 25 | 6 @ 18 |
| 9 | 4 | NR | NR | NR |
| 5 | NR | 5 @ 37 | 6 @ 48 |
| 6 | 5 @ 36 | 6 @ 44 | 6 @ 32 |
| 7 | 6 @ 47 | 6 @ 30 | 6 @ 22 |
| 8 | 6 @ 34 | 6 @ 22 | 6 @ 16 |
| 9 | 6 @ 27 | 6 @ 17 | DR |
| 10 | 4 | NR | NR | NR |
| 5 | NR | 5 @ 35 | 6 @ 48 |
| 6 | 6 @ 48 | 6 @ 41 | 6 @ 30 |
| 7 | 6 @ 43 | 6 @ 28 | 6 @ 20 |
| 8 | 6 @ 31 | 6 @ 20 | DR |
| 9 | 6 @ 24 | 6 @ 15 | DR |
| 10 | 6 @ 19 | DR | DR |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot per foot = 0.1571 kPa2/m, 1 pound per square inch = 6.895 kPa. NR = Not Required.

DR = Design Required.

1. – b no change
2. Vertical reinforcement with a yield strength of less than 60,000 psi and bars of a different size than specified in the table are permitted in accordance with Section R404.1.3.3.7.6 and Table ~~R404.1.2(9)~~ R404.1.3.2(9).
3. – k no change

**TABLE ~~R404.1.2(3)~~ R404.1.3.2(3) MINIMUM VERTICAL REINFORCEMENT FOR 8-INCH (203 mm) NOMINAL FLAT CONCRETE BASEMENT WALLSb, c, d, e, f, h, i, j**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **MAXIMUM UNSUPPORTED WALL HEIGHT**  **(feet)** | **MAXIMUM UNBALANCED BACKFILL HEIGHTg**  **(feet)** | **MINIMUM VERTICAL REINFORCEMENT-BAR SIZE AND SPACING (inches)** | | |
| **Soil classesa and design lateral soil (psf per foot of depth)** | | |
| **GW, GP, SW, SP 30** | **GM, GC, SM, SM-SC and ML 45** | **SC, ML-CL and inorganic CL 60** |
| 8 | 4 | NR | NR | NR |
| 5 | NR | NR | NR |
| 6 | NR | NR | 6 @ 37 |
| 7 | NR | 6 @ 36 | 6 @ 35 |
| 8 | 6 @ 41 | 6 @ 35 | 6 @ 26 |
| 9 | 4 | NR | NR | NR |
| 5 | NR | NR | NR |
| 6 | NR | NR | 6 @ 35 |
| 7 | NR | 6 @ 35 | 6 @ 32 |
| 8 | 6 @ 36 | 6 @ 32 | 6 @ 23 |
| 9 | 6 @ 35 | 6 @ 25 | 6 @ 18 |
| 10 | 4 | NR | NR | NR |
| 5 | NR | NR | NR |
| 6 | NR | NR | 6 @ 35 |
| 7 | NR | 6 @ 35 | 6 @ 29 |
| 8 | 6 @ 35 | 6 @ 29 | 6 @ 21 |
| 9 | 6 @ 34 | 6 @ 22 | 6 @ 16 |
| 10 | 6 @ 27 | 6 @ 17 | 6 @ 13 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot per foot = 0.1571 kPa2/m, 1 pound per square inch = 6.895 kPa. NR = Not Required.

a – b no change

1. Vertical reinforcement with a yield strength of less than 60,000 psi and bars of a different size than specified in the table are permitted in accordance with Section R404.1.3.3.7.6 and Table ~~R404.1.2(9)~~ R404.1.3.2(9).

No change to the remaining footnotes

**TABLE ~~R404.1.2(4)~~ R404.1.3.2(4) MINIMUM VERTICAL REINFORCEMENT FOR 10-INCH NOMINAL FLAT CONCRETE BASEMENT**

**WALLSb, c, d, e, f, h, i, j**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **MAXIMUM UNSUPPORTED WALL HEIGHT**  **(feet)** | **MAXIMUM UNBALANCED BACKFILL HEIGHTg**  **(feet)** | **MINIMUM VERTICAL REINFORCEMENT-BAR SIZE AND SPACING (inches)** | | |
| **Soil classesa and design lateral soil (psf per foot of depth)** | | |
| **GW, GP, SW, SP 30** | **GM, GC, SM, SM-SC and ML 45** | **SC, ML-CL and inorganic CL 60** |
| 8 | 4 | NR | NR | NR |
| 5 | NR | NR | NR |
| 6 | NR | NR | NR |
| 7 | NR | NR | NR |
| 8 | 6 @ 48 | 6 @ 35 | 6 @ 28 |
| 9 | 4 | NR | NR | NR |
| 5 | NR | NR | NR |
| 6 | NR | NR | NR |
| 7 | NR | NR | 6 @ 31 |
| 8 | NR | 6 @ 31 | 6 @ 28 |
| 9 | 6 @ 37 | 6 @ 28 | 6 @ 24 |
| 10 | 4 | NR | NR | NR |
| 5 | NR | NR | NR |
| 6 | NR | NR | NR |
| 7 | NR | NR | 6 @ 28 |
| 8 | NR | 6 @ 28 | 6 @ 28 |
| 9 | 6 @ 33 | 6 @ 28 | 6 @ 21 |
| 10 | 6 @ 28 | 6 @ 23 | 6 @ 17 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot per foot = 0.1571 kPa2/m, 1 pound per square inch = 6.895 kPa. NR = Not Required.

a – b no change

1. Vertical reinforcement with a yield strength of less than 60,000 psi and bars of a different size than specified in the table are permitted in accordance with Section R404.1.3.3.7.6 and Table ~~R404.1.2(9)~~ R404.1.3.2(9).

No change to the remaining footnotes.

**TABLE ~~R404.1.2(5)~~ R404.1.3.2(5) MINIMUM VERTICAL WALL REINFORCEMENT FOR 6-INCH WAFFLE-GRID BASEMENT WALLSb,**

**c, d, e, g, h, i, j**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **MAXIMUM UNSUPPORTED WALL HEIGHT**  **(feet)** | **MAXIMUM UNBALANCED BACKFILL HEIGHTf**  **(feet)** | **MINIMUM VERTICAL REINFORCEMENT-BAR SIZE AND SPACING (inches)** | | |
| **Soil classesa and design lateral soil (psf per foot of depth)** | | |
| **GW, GP, SW, SP 30** | **GM, GC, SM, SM-SC and ML 45** | **SC, ML-CL and inorganic CL 60** |
| 8 | 4 | 4 @ 48 | 4 @ 46 | 6 @ 39 |
| 5 | 4 @ 45 | 5 @ 46 | 6 @ 47 |
| 6 | 5 @ 45 | 6 @ 40 | DR |
| 7 | 6 @ 44 | DR | DR |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **MAXIMUM UNSUPPORTED WALL HEIGHT**  **(feet)** | **MAXIMUM UNBALANCED BACKFILL HEIGHT**  **(feet)** | **MINIMUM VERTICAL REINFORCEMENT-BAR SIZE AND SPACING (inches)** | | |
| **Soil classes and design lateral soil (psf per foot of depth)** | | |
| **GW, GP, SW, SP 30** | **GM, GC, SM, SM-SC and ML 45** | **SC, ML-CL and inorganic CL 60** |
|  | 8 | 6 @ 32 | DR | DR |
| 9 | 4 | 4 @ 48 | 4 @ 46 | 4 @ 37 |
| 5 | 4 @ 42 | 5 @ 43 | 6 @ 44 |
| 6 | 5 @ 41 | 6 @ 37 | DR |
| 7 | 6 @ 39 | DR | DR |
| > 8 | DRi | DR | DR |
| 10 | 4 | 4 @ 48 | 4 @ 46 | 4 @ 35 |
| 5 | 4 @ 40 | 5 @ 40 | 6 @ 41 |
| 6 | 5 @ 38 | 6 @ 34 | DR |
| 7 | 6 @ 36 | DR | DR |
| > 8 | DR | DR | DR |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot per foot = 0.1571 kPa2/m, 1 pound per square inch = 6.895 kPa. DR = Design Required.

a – b no change

c.Maximum spacings shown are the values calculated for the specified bar size. Where the bar used is Grade 60 and the size specified in the table, the actual spacing in the wall shall not exceed a whole-number multiple of 12 inches (12, 24, 36 and 48) that is less than or equal to the tabulated spacing. Vertical reinforcement with a yield strength of less than 60,000 psi and bars of a different size than specified in the table are permitted in accordance with Section R404.1.3.3.7.6 and Table

~~R404.1.2(9)~~ R404.1.3.2(9).

No change to the remaining footnotes

**TABLE ~~R404.1.2(6)~~ R404.1.3.2(6) MINIMUM VERTICAL REINFORCEMENT FOR 8-INCH WAFFLE-GRID BASEMENT WALLSb, c, d, e, f,**

**h, i, j, k**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **MAXIMUM UNSUPPORTED WALL HEIGHT**  **(feet)** | **MAXIMUM UNBALANCED BACKFILL HEIGHTg**  **(feet)** | **MINIMUM VERTICAL REINFORCEMENT-BAR SIZE AND SPACING (inches)** | | |
| **Soil classesa and design lateral soil (psf per foot of depth)** | | |
| **GW, GP, SW, SP 30** | **GM, GC, SM, SM-SC and ML 45** | **SC, ML-CL and inorganic CL 60** |
| 8 | 4 | NR | NR | NR |
| 5 | NR | 5 @ 48 | 5 @ 46 |
| 6 | 5 @ 48 | 5 @ 43 | 6 @ 45 |
| 7 | 5 @ 46 | 6 @ 43 | 6 @ 31 |
| 8 | 6 @ 48 | 6 @ 32 | 6 @ 23 |
| 9 | 4 | NR | NR | NR |
| 5 | NR | 5 @ 47 | 5 @ 46 |
| 6 | 5 @ 46 | 5 @ 39 | 6 @ 41 |
| 7 | 5 @ 42 | 6 @ 38 | 6 @ 28 |
| 8 | 6 @ 44 | 6 @ 28 | 6 @ 20 |
| 9 | 6 @ 34 | 6 @ 21 | DR |
| 10 | 4 | NR | NR | NR |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **MAXIMUM UNSUPPORTED WALL HEIGHT**  **(feet)** | **MAXIMUM UNBALANCED BACKFILL HEIGHT**  **(feet)** | **MINIMUM VERTICAL REINFORCEMENT-BAR SIZE AND SPACING (inches)** | | |
| **Soil classes and design lateral soil (psf per foot of depth)** | | |
| **GW, GP, SW, SP 30** | **GM, GC, SM, SM-SC and ML 45** | **SC, ML-CL and inorganic CL 60** |
|  | 5 | NR | 5 @ 46 | 5 @ 44 |
| 6 | 5 @ 46 | 5 @ 37 | 6 @ 38 |
| 7 | 5 @ 38 | 6 @ 35 | 6 @ 25 |
| 8 | 6 @ 39 | 6 @ 25 | DR |
| 9 | 6 @ 30 | DR | DR |
| 10 | 6 @ 24 | DR | DR |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot per foot = 0.1571 kPa2/m, 1 pound per square inch = 6.895 kPa. NR = Not Required.

DR = Design Required.

a – b no change

c.Maximum spacings shown are the values calculated for the specified bar size. Where the bar used is Grade 60 (420 MPa) and the size specified in the table, the actual spacing in the wall shall not exceed a whole-number multiple of 12 inches (12, 24, 36 and 48) that is less than or equal to the tabulated spacing. Vertical reinforcement with a yield strength of less than 60,000 psi and bars of a different size than specified in the table are permitted in accordance with Section R404.1.3.3.7.6 and Table ~~R404.1.2(9)~~ R404.1.3.2(9).

No change to remaining footnotes

**TABLE ~~R404.1.2(7)~~ R404.1.3.2(7) MINIMUM VERTICAL REINFORCEMENT FOR 6-INCH (152 mm) SCREEN-GRID BASEMENT**

**WALLSb, c, d, e, g, h, i, j**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **MAXIMUM UNSUPPORTED WALL HEIGHT**  **(feet)** | **MAXIMUM UNBALANCED BACKFILL HEIGHTf**  **(feet)** | **MINIMUM VERTICAL REINFORCEMENT-BAR SIZE AND SPACING (inches)** | | |
| **Soil classesa and design lateral soil (psf per foot of depth)** | | |
| **GW, GP, SW, SP 30** | **GM, GC, SM, SM-SC and ML 45** | **SC, ML-CL and inorganic CL 60** |
| 8 | 4 | 4 @ 48 | 4 @ 48 | 5 @ 43 |
| 5 | 4 @ 48 | 5 @ 48 | 5 @ 37 |
| 6 | 5 @ 48 | 6 @ 45 | 6 @ 32 |
| 7 | 6 @ 48 | DR | DR |
| 8 | 6 @ 36 | DR | DR |
| 9 | 4 | 4 @ 48 | 4 @ 48 | 4 @ 41 |
| 5 | 4 @ 48 | 5 @ 48 | 6 @ 48 |
| 6 | 5 @ 45 | 6 @ 41 | DR |
| 7 | 6 @ 43 | DR | DR |
| > 8 | DR | DR | DR |
| 10 | 4 | 4 @ 48 | 4 @ 48 | 4 @ 39 |
| 5 | 4 @ 44 | 5 @ 44 | 6 @ 46 |
| 6 | 5 @ 42 | 6 @ 38 | DR |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **MAXIMUM UNSUPPORTED WALL HEIGHT**  **(feet)** | **MAXIMUM UNBALANCED BACKFILL HEIGHT**  **(feet)** | **MINIMUM VERTICAL REINFORCEMENT-BAR SIZE AND SPACING (inches)** | | |
| **Soil classes and design lateral soil (psf per foot of depth)** | | |
| **GW, GP, SW, SP 30** | **GM, GC, SM, SM-SC and ML 45** | **SC, ML-CL and inorganic CL 60** |
|  | 7 | 6 @ 40 | DR | DR |
| > 8 | DR | DR | DR |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot per foot = 0.1571 kPa2/m, 1 pound per square inch = 6.895 kPa. DR = Design Required.

a – b no change

c.Maximum spacings shown are the values calculated for the specified bar size. Where the bar used is Grade 60 and the size specified in the table, the actual spacing in the wall shall not exceed a whole-number multiple of 12 inches (12, 24, 36 and 48) that is less than or equal to the tabulated spacing. Vertical reinforcement with a yield strength of less than 60,000 psi and bars of a different size than specified in the table are permitted in accordance with Section R404.1.3.3.7.6 and Table ~~R404.1.2(9)~~R404.1.3.2(9).

No change to remaining footnotes

**TABLE ~~R404.1.2(8)~~ R404.1.3.2(8) MINIMUM VERTICAL REINFORCEMENT FOR 6-, 8-, 10- AND 12-INCH NOMINAL FLAT BASEMENT**

**WALLSb, c, d, e, f, h, i, k, n, o**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **MAXIMUM UNSUPPORTED WALL HEIGHT**  **(feet)** | **MAXIMUM UNBALANCED BACKFILL HEIGHTg**  **(feet)** | **MINIMUM VERTICAL REINFORCEMENT-BAR SIZE AND SPACING (inches)** | | | | | | | | | | | |
| **Soil classesa and design lateral soil (psf per foot of depth)** | | | | | | | | | | | |
| **GW, GP, SW, SP 30** | | | | **GM, GC, SM, SM-SC and ML 45** | | | | **SC, ML-CL and inorganic CL 60** | | | |
| **Minimum nominal wall thickness (inches)** | | | | | | | | | | | |
| **6** | **8** | **10** | **12** | **6** | **8** | **10** | **12** | **6** | **8** | **10** | **12** |
| 5 | 4 | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| 5 | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| 6 | 4 | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| 5 | NR | NR | NR | NR | NR | NRl | NR | NR | 4 @ 35 | NRl | NR | NR |
| 6 | NR | NR | NR | NR | 5 @ 48 | NR | NR | NR | 5 @ 36 | NR | NR | NR |
| 7 | 4 | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| 5 | NR | NR | NR | NR | NR | NR | NR | NR | 5 @ 47 | NR | NR | NR |
| 6 | NR | NR | NR | NR | 5 @ 42 | NR | NR | NR | 6 @ 43 | 5 @ 48 | NRl | NR |
| 7 | 5 @ 46 | NR | NR | NR | 6 @ 42 | 5 @ 46 | NRl | NR | 6 @ 34 | 6 @ 48 | NR | NR |
| 8 | 4 | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| 5 | NR | NR | NR | NR | 4 @ 38 | NRl | NR | NR | 5 @ 43 | NR | NR | NR |
| 6 | 4 @ 37 | NRl | NR | NR | 5 @ 37 | NR | NR | NR | 6 @ 37 | 5 @ 43 | NRl | NR |
| 7 | 5 @ 40 | NR | NR | NR | 6 @ 37 | 5 @ 41 | NRl | NR | 6 @ 34 | 6 @ 43 | NR | NR |
| 8 | 6 @ 43 | 5 @ 47 | NRl | NR | 6 @ 34 | 6 @ 43 | NR | NR | 6 @ 27 | 6 @ 32 | 6 @ 44 | NR |
| 9 | 4 | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| 5 | NR | NR | NR | NR | 4 @ 35 | NRl | NR | NR | 5 @ 40 | NR | NR | NR |
| 6 | 4 @ 34 | NRl | NR | NR | 6 @ 48 | NR | NR | NR | 6 @ 36 | 6 @ 39 | NRl | NR |
| 7 | 5 @ 36 | NR | NR | NR | 6 @ 34 | 5 @ 37 | NR | NR | 6 @ 33 | 6 @ 38 | 5 @ 37 | NRl |
| 8 | 6 @ 38 | 5 @ 41 | NRl | NR | 6 @ 33 | 6 @ 38 | 5 @ 37 | NRl | 6 @ 24 | 6 @ 29 | 6 @ 39 | 4 @ 48m |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **MAXIMUM UNSUPPORTED WALL HEIGHT**  **(feet)** | **MAXIMUM UNBALANCED BACKFILL HEIGHT**  **(feet)** | **MINIMUM VERTICAL REINFORCEMENT-BAR SIZE AND SPACING (inches)** | | | | | | | | | | | |
| **Soil classes and design lateral soil (psf per foot of depth)** | | | | | | | | | | | |
| **GW, GP, SW, SP 30** | | | | **GM, GC, SM, SM-SC and ML 45** | | | | **SC, ML-CL and inorganic CL 60** | | | |
| **Minimum nominal wall thickness (inches)** | | | | | | | | | | | |
| **6** | **8** | **10** | **12** | **6** | **8** | **10** | **12** | **6** | **8** | **10** | **12** |
|  | 9 | 6 @ 34 | 6 @ 46 | NR | NR | 6 @ 26 | 6 @ 30 | 6 @ 41 | NR | 6 @ 19 | 6 @ 23 | 6 @ 30 | 6 @ 39 |
| 10 | 4 | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| 5 | NR | NR | NR | NR | 4 @ 33 | NRl | NR | NR | 5 @ 38 | NR | NR | NR |
| 6 | 5 @ 48 | NRl | NR | NR | 6 @ 45 | NR | NR | NR | 6 @ 34 | 5 @ 37 | NR | NR |
| 7 | 6 @ 47 | NR | NR | NR | 6 @ 34 | 6 @ 48 | NR | NR | 6 @ 30 | 6 @ 35 | 6 @ 48 | NRl |
| 8 | 6 @ 34 | 5 @ 38 | NR | NR | 6 @ 30 | 6 @ 34 | 6 @ 47 | NRl | 6 @ 22 | 6 @ 26 | 6 @ 35 | 6 @ 45m |
| 9 | 6 @ 34 | 6 @ 41 | 4 @ 48 | NRl | 6 @ 23 | 6 @ 27 | 6 @ 35 | 4 @ 48m | DR | 6 @ 22 | 6 @ 27 | 6 @ 34 |
| 10 | 6 @ 28 | 6 @ 33 | 6 @ 45 | NR | DRj | 6 @ 23 | 6 @ 29 | 6 @ 38 | DR | 6 @ 22 | 6 @ 22 | 6 @ 28 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot per foot = 0.1571 kPa2/m, 1 pound per square inch = 6.895 kPa. NR = Not Required.

DR = Design Required.

1. – b no change

c.Vertical reinforcement with a yield strength of less than 60,000 psi and bars of a different size than specified in the table are permitted in accordance with Section R404.1.3.3.7.6 and Table ~~R404.1.2(9)~~R404.1.3.2(9).

No change to remaining footnotes

**TABLE ~~R404.1.2(9)~~ R404.1.3.2(9) MINIMUM SPACING FOR ALTERNATE BAR SIZE AND ALTERNATE GRADE OF STEELa, b, c**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **BAR SPACING FROM APPLICABLE TABLE IN SECTION R404.1.3.2 (inches)** | **BAR SIZE FROM APPLICABLE TABLE IN SECTION R404.1.3.2** | | | | | | | | | | | | | | |
| **#4** | | | | | **#5** | | | | | **#6** | | | | |
| **Alternate bar size and alternate grade of steel desired** | | | | | | | | | | | | | | |
| **Grade 60** | | **Grade 40** | | | **Grade 60** | | **Grade 40** | | | **Grade 60** | | **Grade 40** | | |
| **#5** | **#6** | **#4** | **#5** | **#6** | **#4** | **#6** | **#4** | **#5** | **#6** | **#4** | **#5** | **#4** | **#5** | **#6** |
| **Maximum spacing for alternate bar size and alternate grade of steel (inches)** | | | | | | | | | | | | | | |
| 8 | 12 | 18 | 5 | 8 | 12 | 5 | 11 | 3 | 5 | 8 | 4 | 6 | 2 | 4 | 5 |
| 9 | 14 | 20 | 6 | 9 | 13 | 6 | 13 | 4 | 6 | 9 | 4 | 6 | 3 | 4 | 6 |
| 10 | 16 | 22 | 7 | 10 | 15 | 6 | 14 | 4 | 7 | 9 | 5 | 7 | 3 | 5 | 7 |
| 11 | 17 | 24 | 7 | 11 | 16 | 7 | 16 | 5 | 7 | 10 | 5 | 8 | 3 | 5 | 7 |
| 12 | 19 | 26 | 8 | 12 | 18 | 8 | 17 | 5 | 8 | 11 | 5 | 8 | 4 | 6 | 8 |
| 13 | 20 | 29 | 9 | 13 | 19 | 8 | 18 | 6 | 9 | 12 | 6 | 9 | 4 | 6 | 9 |
| 14 | 22 | 31 | 9 | 14 | 21 | 9 | 20 | 6 | 9 | 13 | 6 | 10 | 4 | 7 | 9 |
| 15 | 23 | 33 | 10 | 16 | 22 | 10 | 21 | 6 | 10 | 14 | 7 | 11 | 5 | 7 | 10 |
| 16 | 25 | 35 | 11 | 17 | 23 | 10 | 23 | 7 | 11 | 15 | 7 | 11 | 5 | 8 | 11 |
| 17 | 26 | 37 | 11 | 18 | 25 | 11 | 24 | 7 | 11 | 16 | 8 | 12 | 5 | 8 | 11 |
| 18 | 28 | 40 | 12 | 19 | 26 | 12 | 26 | 8 | 12 | 17 | 8 | 13 | 5 | 8 | 12 |
| 19 | 29 | 42 | 13 | 20 | 28 | 12 | 27 | 8 | 13 | 18 | 9 | 13 | 6 | 9 | 13 |
| 20 | 31 | 44 | 13 | 21 | 29 | 13 | 28 | 9 | 13 | 19 | 9 | 14 | 6 | 9 | 13 |
| 21 | 33 | 46 | 14 | 22 | 31 | 14 | 30 | 9 | 14 | 20 | 10 | 15 | 6 | 10 | 14 |
| 22 | 34 | 48 | 15 | 23 | 32 | 14 | 31 | 9 | 15 | 21 | 10 | 16 | 7 | 10 | 15 |
| 23 | 36 | 48 | 15 | 24 | 34 | 15 | 33 | 10 | 15 | 22 | 10 | 16 | 7 | 11 | 15 |
| 24 | 37 | 48 | 16 | 25 | 35 | 15 | 34 | 10 | 16 | 23 | 11 | 17 | 7 | 11 | 16 |
| 25 | 39 | 48 | 17 | 26 | 37 | 16 | 35 | 11 | 17 | 24 | 11 | 18 | 8 | 12 | 17 |
| 26 | 40 | 48 | 17 | 27 | 38 | 17 | 37 | 11 | 17 | 25 | 12 | 18 | 8 | 12 | 17 |
| 27 | 42 | 48 | 18 | 28 | 40 | 17 | 38 | 12 | 18 | 26 | 12 | 19 | 8 | 13 | 18 |
| 28 | 43 | 48 | 19 | 29 | 41 | 18 | 40 | 12 | 19 | 26 | 13 | 20 | 8 | 13 | 19 |
| 29 | 45 | 48 | 19 | 30 | 43 | 19 | 41 | 12 | 19 | 27 | 13 | 20 | 9 | 14 | 19 |
| 30 | 47 | 48 | 20 | 31 | 44 | 19 | 43 | 13 | 20 | 28 | 14 | 21 | 9 | 14 | 20 |
| 31 | 48 | 48 | 21 | 32 | 45 | 20 | 44 | 13 | 21 | 29 | 14 | 22 | 9 | 15 | 21 |
| 32 | 48 | 48 | 21 | 33 | 47 | 21 | 45 | 14 | 21 | 30 | 15 | 23 | 10 | 15 | 21 |
| 33 | 48 | 48 | 22 | 34 | 48 | 21 | 47 | 14 | 22 | 31 | 15 | 23 | 10 | 16 | 22 |
| 34 | 48 | 48 | 23 | 35 | 48 | 22 | 48 | 15 | 23 | 32 | 15 | 24 | 10 | 16 | 23 |
| 35 | 48 | 48 | 23 | 36 | 48 | 23 | 48 | 15 | 23 | 33 | 16 | 25 | 11 | 16 | 23 |
| 36 | 48 | 48 | 24 | 37 | 48 | 23 | 48 | 15 | 24 | 34 | 16 | 25 | 11 | 17 | 24 |
| 37 | 48 | 48 | 25 | 38 | 48 | 24 | 48 | 16 | 25 | 35 | 17 | 26 | 11 | 17 | 25 |
| 38 | 48 | 48 | 25 | 39 | 48 | 25 | 48 | 16 | 25 | 36 | 17 | 27 | 12 | 18 | 25 |
| 39 | 48 | 48 | 26 | 40 | 48 | 25 | 48 | 17 | 26 | 37 | 18 | 27 | 12 | 18 | 26 |
| 40 | 48 | 48 | 27 | 41 | 48 | 26 | 48 | 17 | 27 | 38 | 18 | 28 | 12 | 19 | 27 |
| 41 | 48 | 48 | 27 | 42 | 48 | 26 | 48 | 18 | 27 | 39 | 19 | 29 | 12 | 19 | 27 |
| 42 | 48 | 48 | 28 | 43 | 48 | 27 | 48 | 18 | 28 | 40 | 19 | 30 | 13 | 20 | 28 |
| 43 | 48 | 48 | 29 | 44 | 48 | 28 | 48 | 18 | 29 | 41 | 20 | 30 | 13 | 20 | 29 |
| 44 | 48 | 48 | 29 | 45 | 48 | 28 | 48 | 19 | 29 | 42 | 20 | 31 | 13 | 21 | 29 |
| 45 | 48 | 48 | 30 | 47 | 48 | 29 | 48 | 19 | 30 | 43 | 20 | 32 | 14 | 21 | 30 |
| 46 | 48 | 48 | 31 | 48 | 48 | 30 | 48 | 20 | 31 | 44 | 21 | 32 | 14 | 22 | 31 |
| 47 | 48 | 48 | 31 | 48 | 48 | 30 | 48 | 20 | 31 | 44 | 21 | 33 | 14 | 22 | 31 |
| 48 | 48 | 48 | 32 | 48 | 48 | 31 | 48 | 21 | 32 | 45 | 22 | 34 | 15 | 23 | 32 |

For SI: 1 inch = 25.4 mm.

No change to footnotes

**R404.1.3.3.7.2 Location of reinforcement in wall.** The center of vertical reinforcement in *basement* walls determined from Tables ~~R404.1.2(2)~~ R404.1.3.2(2) through ~~R404.1.2(7)~~ R404.1.3.2(7) shall be located at the centerline of the wall. Vertical reinforcement in *basement* walls determined from Table ~~R404.1.2(8)~~ R404.1.3.2(8) shall be located to provide a maximum cover of 11/4 inches (32 mm) measured from the inside face of the wall. Regardless of the table used to determine vertical wall reinforcement, the center of the steel shall not vary from the specified location by more than the greater of 10 percent of the wall thickness and 3/8 inch (10 mm). Horizontal and vertical reinforcement shall be located in foundation walls to provide the minimum cover required by Section R404.1.3.3.7.4.

**R404.1.3.3.7.6 Alternate grade of reinforcement and spacing.** Where tables in Section R404.1.3.2 specify vertical wall reinforcement

based on minimum bar size and maximum spacing, which are based on Grade 60 (414 MPa) steel reinforcement, different size bars or bars made from a different grade of steel are permitted provided that an equivalent area of steel per linear foot of wall is provided. Use of Table ~~R404.1.2(9)~~ R404.1.3.2(9) is permitted to determine the maximum bar spacing for different bar sizes than specified in the tables or bars made from a different grade of steel. Bars shall not be spaced less than one-half the wall thickness, or more than 48 inches (1219 mm) on center.

**R404.1.4.1 Masonry foundation walls. Reserved**

**R404.1.4.2 Concrete foundation walls. Reserved**

**R404.1.5.2 Concrete wall thickness.** The thickness of concrete foundation walls shall be equal to or greater than the thickness of the wall in the story above. Concrete foundation walls with corbels, brackets or other projections built into the wall for support of masonry veneer or other purposes are not within the scope of the tables in this section.

Where a concrete foundation wall is reduced in thickness to provide a shelf for the support of masonry veneer, the reduced thickness shall be equal to or greater than the thickness of the wall in the story above. Vertical reinforcement for the foundation wall shall be based on Table ~~R404.1.2(8)~~ R404.1.3.2(8) and located in the wall as required by Section R404.1.3.3.7.2 where that table is used. Vertical reinforcement shall be based on the thickness of the thinner portion of the wall.

**Exception:** Where the height of the reduced thickness portion measured to the underside of the floor assembly or sill plate above is less than or equal to 24 inches (610 mm) and the reduction in thickness does not exceed 4 inches (102 mm), the vertical reinforcement is permitted to be based on the thicker portion of the wall.

(S11496) (RB171-22AS)

**Chapter 5 Floors**

**~~R507.4.1 Deck post to deck footing connection.~~** ~~Where posts bear on concrete footings in accordance with Section R403 and Figure R507.3, lateral restraint shall be provided by manufactured connectors or a minimum post embedment of 12 inches (305 mm) in surrounding soils or concrete piers. Other footing systems shall be permitted.~~

**~~Exception:~~** ~~Where expansive, compressible, shifting or other questionable soils are present, surrounding soils shall not be relied on for lateral support~~.

(S115071) (RB182-22AS) No change needed

**TABLE R507.8.1.3(2) PLACEMENT OF LAG SCREWS AND BOLTS IN DECK LEDGERS AND BAND JOISTS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **MINIMUM END AND EDGE DISTANCES AND SPACING BETWEEN ROWS** | | | | |
|  | **TOP EDGE** | **BOTTOM EDGE** | **ENDS** | **ROW SPACING** |
| Ledgera | 2 inchesd | 3/4 inch | 2 inchesb | 15/8 inchesb |
| Band Joistc | 3/4 inch | 2 inches | 2 inchesb | 15/8 inchesb |

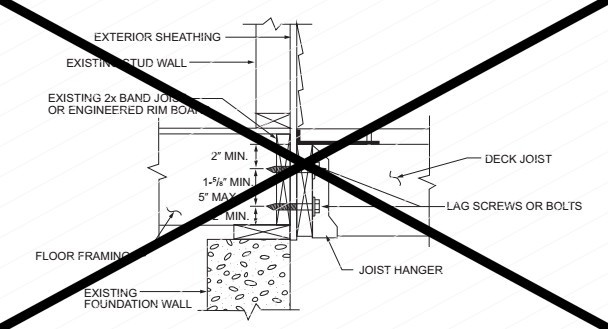
For SI: 1 inch = 25.4 mm.

No change to the footnotes

(S11512) (RB187-22AS)

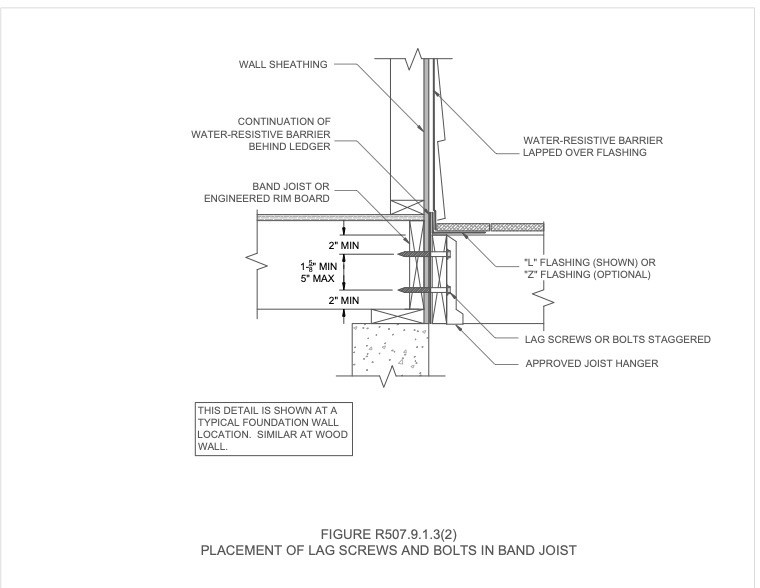
**Note – Figure number should be “R507.8.1.3(2)”**

**Delete and substitute as follows:**



~~For SI: 1 inch = 25.4~~ ~~mm.~~

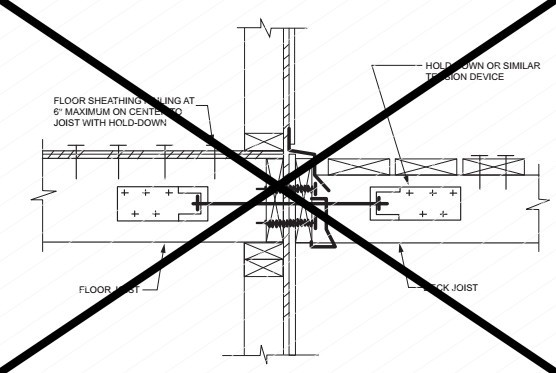
**~~FIGURE R507.9.1.3(2) PLACEMENT OF LAG SCREWS AND BOLTS IN BAND JOISTS~~**



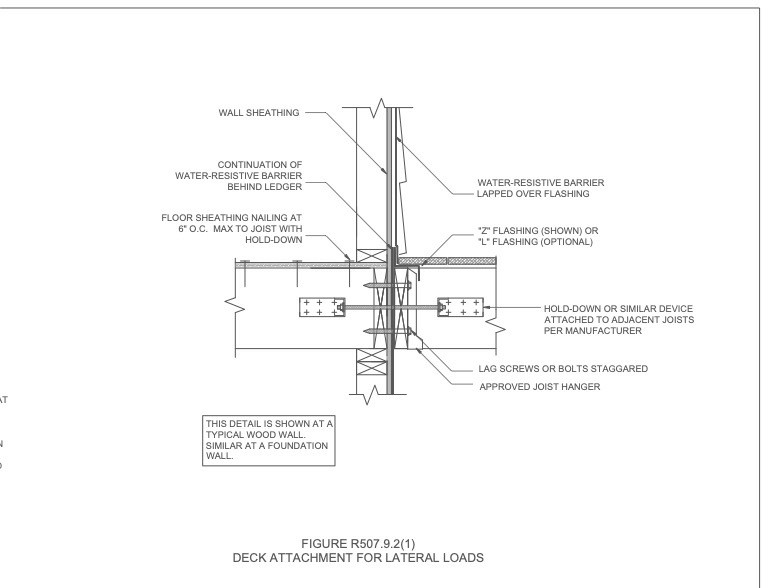
For SI: 1 inch = 25.4 mm.

~~For SI: 1 inch = 25.4~~ ~~mm.~~

**FIGURE R507.8.1.3(2) PLACEMENT OF LAG SCREWS AND BOLTS IN BAND JOISTS**

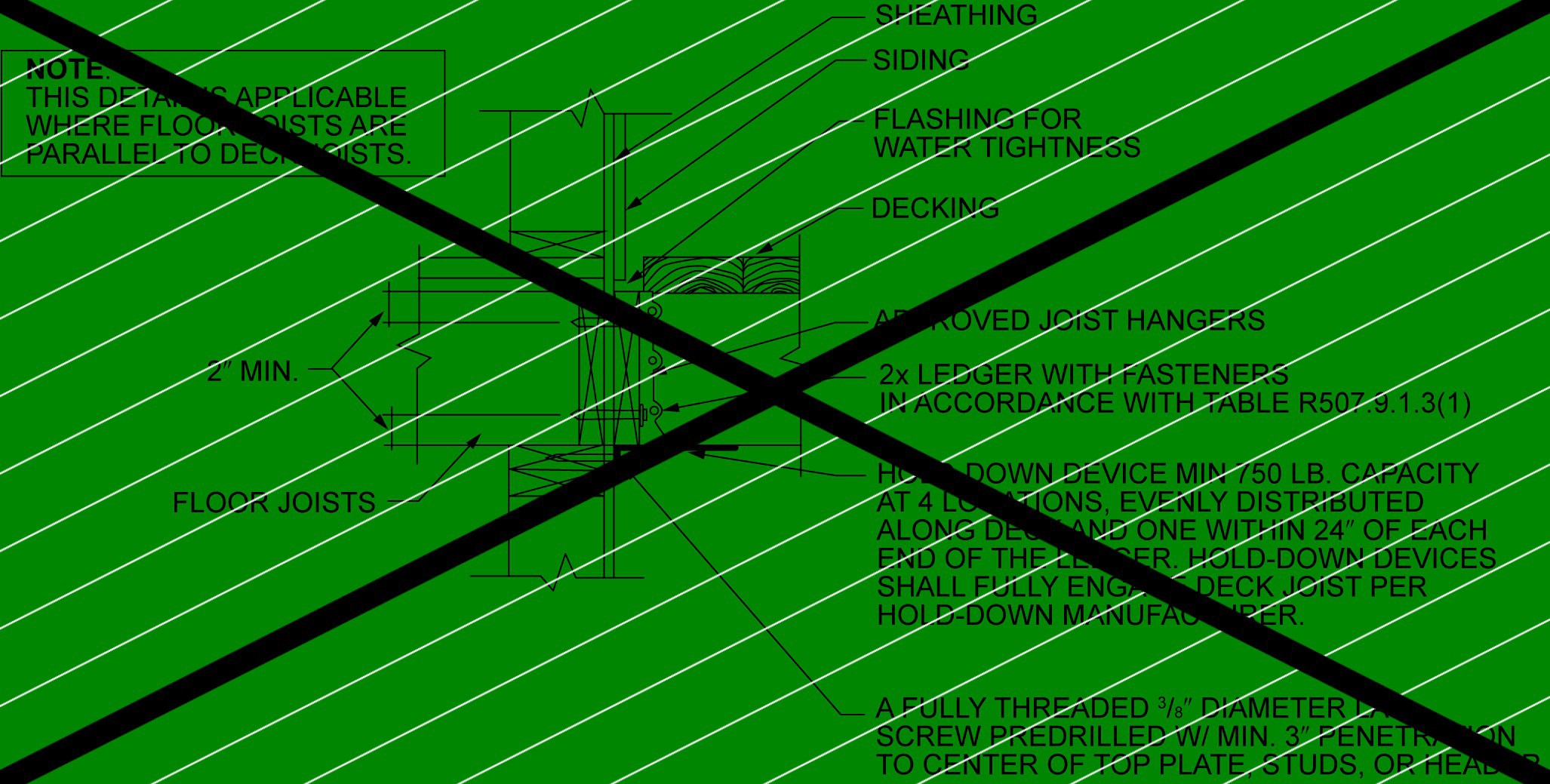


**~~FIGURE R507.9.2(1) DECK ATTACHMENT FOR LATERAL LOADS~~**



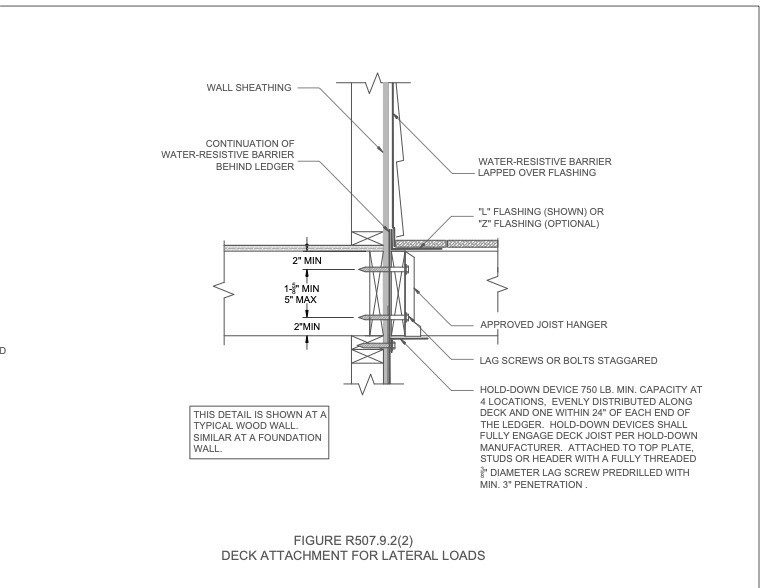
For SI: 1 inch = 25.4 mm.

**FIGURE R507.8.2(1) DECK ATTACHMENT FOR LATERAL LOADS**



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

**~~FIGURE R507.9.2(2) DECK ATTACHMENT FOR LATERAL LOADS~~**



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

**FIGURE R507.8.2(2) DECK ATTACHMENT FOR LATERAL LOADS**

(S11513) (RB189-22AS)

**Chapter 6 Wall Construction**

**R606.1.1 Professional registration not required.** When ~~the empirical design provisions of Appendix A of TMS 402,~~the provisions of TMS 403, or the provisions of this section are used to design masonry, project drawings, typical details and specifications are not required to bear the seal of the architect or engineer responsible for design, unless otherwise required by the state law of the *jurisdiction* having authority.

**R606.2.10 Mortar for AAC masonry.** Thin-bed mortar for AAC masonry shall comply with Article2.2 D.1~~2.1 C.1~~ of TMS 602. Mortar used for the leveling courses of AAC masonry shall comply with Article 2.2 D.2 ~~2.1 C.2~~ of TMS 602.

The Masonry Society 105 South Sunset Street, Suite Q

**TMS**

Longmont, CO 80501

402—~~2016~~ 2022 Building Code Requirements for Masonry Structures

602—~~2016~~ 2022 Specification for Masonry Structures

(S11528) (RB205-22)

**Chapter 7 Wall Covering**

**TABLE R702.7(3) CLASS III VAPOR RETARDERS**

|  |  |
| --- | --- |
| **CLIMATE ZONE** | **CLASS III VAPOR RETARDERS PERMITTED FOR:a, b** |
| Marine 4 | Vented cladding over wood structural panels. |
| Vented cladding over fiberboard. |
| Vented cladding over gypsum. |
| Continuous insulation with *R*-value ≥ 2.5 over 2 × 4 wall. |
| Continuous insulation with *R*-value ≥ 3.75 over 2 × 6 wall. |
| 5 | Vented cladding over wood structural panels. |
| Vented cladding over fiberboard. |
| Vented cladding over gypsum. |
| Continuous insulation with *R*-value ≥ 5 over 2 × 4 wall. |
| Continuous insulation with *R*-value ≥ 7.5 over 2 × 6 wall. |
| 6 | Vented cladding over fiberboard. |
| Vented cladding over gypsum. |
| Continuous insulation with *R*-value ≥ 7.5 over 2 × 4 wall. |
| Continuous insulation with *R*-value ≥ 11.25 over 2 × 6 wall. |
| 7 | Continuous insulation with *R*-value ≥ 10 over 2 × 4 wall. |
| Continuous insulation with *R*-value ≥ 15 over 2 × 6 wall. |
| 8 | Continuous insulation with *R*-value ≥ 12.5 over 2 × 4 wall.  Continuous insulation with *R*-value ≥ 20 over 2 × 6 wall. |

1. Vented cladding shall include vinyl, polypropylene, or horizontal aluminum siding, brick veneer with a clear airspace as specified in Table R703.8.4(1), rainscreen systems and other approved vented claddings.
2. The requirements in this table apply only to insulation used to control moisture in order to permit the use of Class III vapor retarders. The insulation materials used to satisfy this option also contribute to but do not supersede the thermal envelope requirements of Chapter 11.

(S11388) (RB28-22AS)

**R702.7 Vapor retarders.** Vapor retarder materials shall be classified in accordance with Table R702.7(1). A vapor retarder shall be provided on the interior side of frame walls of the class indicated in Table R702.7(2), including compliance with Table R702.7(3) or R702.7(4) where applicable. An *approved* design using accepted engineering practice for hygrothermal analysis shall be permitted as an alternative. Vapor retarders shall be installed in accordance with Section R702.7.1 The climate zone shall be determined in accordance with Section R301.1 of the *Florida Building Code, Energy Conservation*.

**Exceptions:**

1. *Basement walls*.
2. Below-grade portion of any wall.
3. Construction where accumulation, condensation or freezing of moisture will not damage the materials.
4. A vapor retarder shall not be required in Climate Zones 1, 2 and 3.

**Add new text as follows:**

**R702.7.2 Vapor Retarder Installation.** Vapor retarders shall be installed in accordance with the manufacturer’s instructions, accepted installation methods or an approved design. Where a vapor retarder also functions as a component of a continuous air barrier, the vapor retarder shall be installed as an air barrier in accordance with *Florida Building Code, Energy Conservation*.

(S11531) (RB208-22AS)/ (S11532) (RB209-22AM)

**Revise as follows:**

**R702.7 Vapor retarders.** Vapor retarder materials shall be classified in accordance with Table R702.7(1). A vapor retarder shall be provided on the interior side of frame walls of the class indicated in Table R702.7(2), including compliance with Table R702.7(3) or R702.7(4) where applicable. An *approved* design using accepted engineering practice for hygrothermal analysis shall be permitted as an alternative. The climate zone shall be determined in accordance with Section R301.1 of the *Florida Building Code, Energy Conservation*.

**Exceptions:**

1. *Basement walls*.
2. Below-grade portion of any wall.
3. Construction where accumulation, condensation or freezing of moisture will not damage the materials.
4. A vapor retarder shall not be required in Climate Zones 1, 2 and 3.
5. In Climate Zones 4 through 8, a vapor retarder shall not be required where the assembly complies with Table R702.7(5).

**TABLE R702.7(1) VAPOR RETARDER MATERIALS AND CLASSES**

|  |  |
| --- | --- |
| **CLASS** | **ACCEPTABLE MATERIALS** |
| I | Sheet polyethylene, nonperforated aluminum foil or other approved materials with a perm rating less than or equal to 0.1. |
| II | Kraft-faced fiberglass batts, vapor retarder paint or other approved materials applied in accordance with the manufacturer's installation instructions for a perm rating greater than 0.1 and less than or equal to 1.0. |
| III | Latex paint, enamel paint or other approved materials applied in accordance with the manufacturer's installation instructions for a perm rating greater than 1.0 and less than or equal to 10.0. |

**TABLE R702.7(2) VAPOR RETARDER OPTIONS**

|  |  |  |  |
| --- | --- | --- | --- |
| **CLIMATE ZONE** | **VAPOR RETARDER CLASS** | | |
| CLASS Ia | CLASS IIa | CLASS III |
| 1, 2 | Not Permitted | Not Permitted | Permitted |
| 3, 4 (except Marine 4) | Not Permitted | Permittedc | Permitted |
| Marine 4, 5, 6, 7, 8 | Permittedb,c | Permittedc | See Table R702.7(3) |

1. A *responsive vapor retarder* ~~Class I and II vapor retarders with vapor permeance greater than 1 perm when measured by ASTM~~ ~~E96 water method (Procedure B)~~ shall be allowed on the interior side of any frame wall in all climate zones.
2. Use of a Class I interior vapor retarder, that is not a *responsive vapor retarder*, in frame walls with a Class I vapor retarder on the exterior side shall require an *approved* design.
3. Where a Class I or II vapor retarder is used in combination with foam plastic insulating sheathing or insulated siding installed as *continuous insulation* on the exterior side of frame walls, the *continuous insulation* shall comply with Table R702.7(4) and the ClassI or II vapor retarder shall be a *responsive vapor retarder* ~~have a vapor permeance greater than 1 perm when measured by ASTM E96 water method~~ ~~(Procedure B)~~.

**TABLE R702.7(3) CLASS III VAPOR RETARDERS**

|  |  |
| --- | --- |
| **CLIMATE ZONE** | **CLASS III VAPOR RETARDERS PERMITTED FOR:a, b** |
| Marine 4 | Vented cladding over wood structural panels. |
| Vented cladding over fiberboard. |
| Vented cladding over gypsum. |
| Continuous insulation with *R*-value ≥ 2.5 over 2 × 4 wall. |
| Continuous insulation with *R*-value ≥ 3.75 over 2 × 6 wall. |
| 5 | Vented cladding over wood structural panels. |
| Vented cladding over fiberboard. |
| Vented cladding over gypsum. |
| Continuous insulation with *R*-value ≥ 5 over 2 × 4 wall. |
| Continuous insulation with *R*-value ≥ 7.5 over 2 × 6 wall. |
| 6 | Vented cladding over fiberboard. |
| Vented cladding over gypsum. |
| Continuous insulation with *R*-value ≥ 7.5 over 2 × 4 wall. |
| Continuous insulation with *R*-value ≥ 11.25 over 2 × 6 wall. |
| 7 | Continuous insulation with *R*-value ≥ 10 over 2 × 4 wall. |
| Continuous insulation with *R*-value ≥ 15 over 2 × 6 wall. |
| 8 | Continuous insulation with *R*-value ≥ 12.5 over 2 × 4 wall.  Continuous insulation with *R*-value ≥ 20 over 2 × 6 wall. |

1. Vented cladding shall include vinyl, polypropylene, or horizontal aluminum siding, brick veneer with a clear airspace as specified in Table R703.8.4(1), rainscreen systems, and other approved vented claddings.
2. The requirements in this table apply only to insulation used to control moisture in order to permit the use of Class III vapor retarders. The insulation materials used to satisfy this option also contribute to but do not supersede the thermal envelope requirements of Chapter 11.

**TABLE R702.7(4) CONTINUOUS INSULATION WITH CLASS I OR II RESPONSIVE VAPOR RETARDER**

|  |  |
| --- | --- |
| CLIMATE ZONE | CLASS II VAPOR RETARDERSPERMITTED CONDITIONS FOR:a |
| 3 | Continuous insulation with *R*-value ≥ 2. |
| 4, 5 and 6 | Continuous insulation with *R*-value ≥ 3 over 2 × 4 wall. Continuous insulation with *R*-value ≥ 5 over 2 × 6 wall. |
| 7 | Continuous insulation with *R*-value ≥ 5 over 2 × 4 wall. Continuous insulation with *R*-value ≥ 7.5 over 2 × 6 wall. |
| 8 | Continuous insulation with *R*-value ≥ 7.5 over 2 × 4 wall. Continuous insulation with *R*-value ≥ 10 over 2 × 6 wall. |

1. The requirements in this table apply only to insulation used to control moisture in order to permit the use of Class II vapor retarders. The insulation materials used to satisfy this option also contribute to but do not supersede the thermal envelope requirements of Chapter 11.

**Add new text as follows:**

**R702.7(5) CONTINUOUS INSULATION ON WALLS WITHOUT A CLASS I, II, OR III INTERIOR VAPOR RETARDERa**

|  |  |
| --- | --- |
| **CLIMATE ZONE** | **PERMITTED CONDITIONS:b,c** |
| 4 | *Continuous insulation* with R-value >= 4.5 |
| 5 | *Continuous insulation* with R-value >= 6.5 |
| 6 | *Continuous insulation* with R-value >= 8.5 |
| 7 | *Continuous insulation* with R-value >= 11.5 |
| 8 | *Continuous insulation* with R-value >= 14 |

1. The total insulating value of materials to the interior side of the exterior *continuous insulation*, including any cavity insulation, shall not exceed R-5. Where the R-value of materials to the interior side of the exterior *continuous insulation* exceed R-5, an *approved* design shall be required.
2. A water vapor control material layer having a permeance not greater than 1 perm in accordance with ASTM E96, Procedure A (dry cup) shall be placed on the exterior side of the wall and to the interior side of the exterior *continuous insulation*. The exterior *continuous insulation* shall be permitted to serve as the vapor control layer where, at its installed thickness or with a facer on its interior face, the exterior *continuous insulation* is a Class I or II vapor retarder.
3. The requirements in this table apply only to insulation used to control moisture in order to allow walls without a Class I, II, or III interior vapor retarder. The insulation materials used to satisfy this option also contribute to but do not supersede the thermal envelope requirements of the *Florida Building Code, Energy Conservation*.

**R702.7.1 Spray foam plastic insulation for moisture control with Class II and III vapor retarders.** For purposes of compliance with Tables R702.7(3) and R702.7(4), spray foam with a maximum permeance of 1.5 perms at the installed thickness applied to the interior side of wood structural panels, fiberboard, *insulating sheathing* or gypsum shall be deemed to meet the continuous insulation moisture control requirement in accordance with one of the following conditions:

1. The spray foam *R*-value is equal to or greater than the specified continuous insulation *R*-value.
2. The combined *R*-value of the spray foam and continuous insulation is equal to or greater than the specified continuous insulation*R*- value.

(S11532) (RB209-22AM)/(S11533) (RB210-22AS)

**R703.2 Water-resistive barrier.** Not fewer than one layer of *water-resistive barrier* shall be applied over studs or sheathing of all exterior walls with flashing as indicated in Section R703.4, in such a manner as to provide a continuous water-resistive barrier behind the exterior wall veneer. The water-resistive barrier material shall be continuous to the top of walls and terminated at penetrations and building appendages in a manner to meet the requirements of the exterior wall envelope as described in Section R703.1. Where the water-resistive barrier also functions as a component of a continuous air barrier, the water-resistive barrier shall be installed as an air barrier in accordance with *Florida Building Code, Energy Conservation*. Water-resistive barrier materials shall comply with one of the following:

1. No. 15 felt complying with ASTM D226, Type 1.
2. ASTM E2556, Type 1 or 2.
3. Foam plastic insulating sheathing water-resistive barrier systems complying with Section R703.1.1 and installed in accordance with the manufacturer's installation instructions.
4. ASTM E331 in accordance with Section R703.1.1.
5. Other approved materials in accordance with the manufacturer's installation instructions.

No.15 asphalt felt and *water-resistive barriers* complying with ASTM E2556 shall be applied horizontally, with the upper layer lapped over the lower layer not less than 2 inches (51 mm), and where joints occur, shall be lapped not less than 6 inches (152 mm).

**Exception:** A water-resistive barrier shall not be required in unconditioned detached tool sheds, storage sheds, playhouses, and other similar accessory structures provided all of the following requirements are met:

* 1. Exterior wall covering is limited to siding that is attached direct to studs.
  2. Exterior walls are uninsulated.
  3. Interior side of exterior walls has no wall covering or wall finishes.

(S11534) (RB212-22 AS)/ (S11535) (RB213-22 AS)/ (S11536) (RB214-22 AS)

**R703.3.6 Siding clearance at wall and adjacent surfaces.** Unless otherwise specified by the cladding manufacturer or this code, polypropylene, insulated vinyl, and vinyl claddings shall have clearance of at least 6 inches (152 mm) from the ground and at least 1/2 inch (13 mm) from other adjacent surfaces (decks, roofs, slabs).

(S11538) (RB215-22 AMPC1)

**R703.6.1 Application.** Wood shakes or shingles shall be applied either single course or double course over nominal 1/2-inch (12.7 mm) wood-based sheathing or to furring strips over 1/2-inch (12.7 mm) nominal nonwood sheathing. A *water-resistive barrier* shall be provided over all sheathing, with horizontal overlaps in the membrane of not less than 2 inches (51 mm) and vertical overlaps of not less than 6 inches (152 mm). Where horizontal furring strips are used, they shall be 1 inch by 3 inches or 1 inch by 4 inches (25 mm by 76 mm or 25 mm by 102 mm) and shall be fastened to the studs with minimum 7d or 8d box nails and shall be spaced a distance on center equal to the actual weather exposure of the shakes or shingles, not to exceed the maximum exposure specified in Table R703.6.1. When installing shakes or shingles over a nonpermeable *water-resistive barrier*, furring strips shall be placed first vertically over the barrier and in addition, horizontal furring strips shall be fastened to the vertical furring strips prior to attaching the shakes or shingles to the horizontal furring strips. Where installed over foam plastic *insulating sheathing*, furring attachments shall comply with Sections R703.15, R703.16, or R703.17. Alternatively, horizontal furring shall be gapped a minimum of 3/16-inch from the surface of the *water-resistive barrier* without the requirement for a vertical furring strip. The spacing between adjacent shingles to allow for expansion shall be 1/8 inch (3.2 mm) to 1/4 inch (6.4 mm) apart, and between adjacent shakes shall be 3/8 inch (9.5 mm) to 1/2 inch (12.7 mm) apart. The offset spacing between joints in adjacent courses shall be not less than 11/2 inches (38 mm).

(S11542) (RB220-22 AS)/ (S11523) (RB222-22 AS)

**R703.6.3 Attachment.** Wood shakes or shingles shall be installed according to this chapter and the manufacturer’s instructions. Where wind pressures determined in accordance with Table R301.2(2) do not exceed 30 psf, each shake or shingle shall be held in place by two stainless steel Type 304, Type 316 or hot-dipped zinc-coated galvanized corrosion-resistant box nails in accordance with Table R703.6.3(1) or R703.6.3(2). The hot-dipped zinc-coated galvanizing shall conform to minimum standard ASTM A153D or ASTM A641 Class 3S, 1.0 ounce per square foot. In single-course application, the fasteners shall be concealed by the course above and shall be driven approximately 1 inch (25 mm) above the butt line of the succeeding course and 3 /4 inch (19 mm) from the edge. In double-course applications, the exposed shake or shingle shall be face-nailed with two fasteners, driven approximately 2 inches (51 mm) above the butt line and 3 /4 inch (19 mm) from each edge. Fasteners installed within 15 miles (24 km) of salt water coastal areas shall be stainless steel Type 316. Fasteners for fireretardant-treated shakes or shingles in accordance with Section R902 or pressure-impregnated-preservativetreated shakes or shingles in accordance with AWPA U1 shall be stainless steel Type 316. The fasteners shall penetrate the sheathing or furring strips by not less than 1 /2 inch (13 mm) and shall not be overdriven. Fasteners for untreated (natural) and treated products shall comply with ASTM F1667

ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken, PA 19428

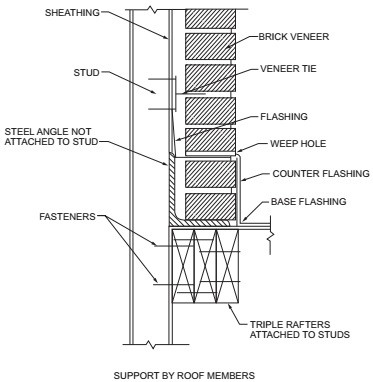
**ASTM**

A641/A641M—~~09a(2014)~~ 2019 Specification for Zinc-coated (Galvanized) Carbon Steel Wire

(S11543) (RB223-22 AS)

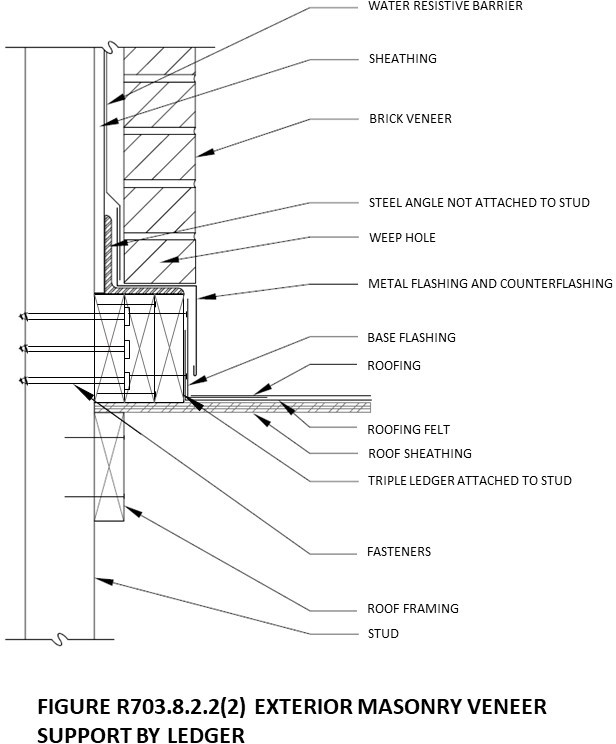
**R703.8.2.2 Support by ledger or roof construction.** A steel angle shall be placed directly on top of the ledger or roof construction. The ledger or roof ~~supporting~~ construction ~~for~~ supporting the steel angle shall consist of not fewer than three 2-inch by 6-inch (51 mm by 152 mm) wood members for wood construction or three 550S162 cold-formed steel members for cold-formed steel light frame construction. ~~A~~ The wood member abutting the vertical wall stud construction shall be anchored with not fewer than three5/8-inch (15.9 mm) diameter by 5- inch (127 mm) lag screws to every wood stud spacing. Each additional wood roof member shall be anchored by the use of two 10d nails at every wood stud spacing. A cold-formed steel member abutting the vertical wall stud shall be anchored with not fewer than nine No. 8 screws to every cold-formed steel stud. Each additional cold-formed steel roof member shall be anchored to the adjoining roof member using two No. 8 screws at every stud spacing. Not less than two-thirds the width of the masonry veneer thickness shall bear on the steel angle. Flashing and weep holes shall be located in the masonry veneer wythe in accordance with Figure R703.8.2.2(1) or Figure R703.8.2.2(2). The maximum height of the masonry veneer above the steel angle support shall be 12 feet 8 inches (3861 mm). The airspace separating the masonry veneer from the wood backing shall be in accordance with Sections R703.8.4 and R703.8.4.2. The support for the masonry veneer shall be constructed in accordance with Figure R703.8.2.2(1) or Figure R703.8.2.2(2).

The maximum slope of ~~the~~ a steel angle installed ~~roof construction~~ without stops shall be 7:12. A steel angle installed ~~Roof construction~~ with a slope~~s~~ greater than 7:12 but not more than 12:12 shall have stops of a minimum 3-inch by 3-inch by1/4-inch (76 mm by 76 mm by 6.4 mm) steel plate welded to the angle at 24 inches (610 mm) on center along the angle or as *approved* by the *building official*.



**FIGURE R703.8.2.2(1) EXTERIOR MASONRY VENEER SUPPORT BY ROOF MEMBERS**

**Add new text as follows:**



**FIGURE R703.8.2.2(2) EXTERIOR MASONRY VENEER SUPPORT BY LEDGER**

(S11545) (RB226-22 AS)

**TABLE R703.8.3.1 ALLOWABLE SPANS FOR LINTELS SUPPORTING MASONRY VENEERa, b, c, d**

**Portions of table not shown remain unchanged.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SIZE OF STEEL ANGLEa, c, d (inches)** | | **NO STORY**  **ABOVE** | **ONE STORY**  **ABOVE** | **TWO STORIES**  **ABOVE** | **NO. OF 1/2-INCH OR EQUIVALENT REINFORCING BARS IN REINFORCED**  **LINTELb, d** |
| 5  or | x 3 x 5/16  × 31/2 × 5/16 | 10′-0″ | 8′-0″ | 6′-0″ | 2 |
| 5 |
| 6  or | × 31/2 × 5/16 | 14′-0″ | 9′-6″ | 7′-0″ | 2 |
| 5 x 3 x 5/16 with 2-9 gauge wires between first and second course | |

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

* 1. Long leg of the angle shall be placed in a vertical position.
  2. Depth of reinforced lintels shall be not less than 8 inches and all cells of hollow masonry lintels shall be grouted solid. Reinforcing bars shall extend not less than 8 inches into the support.
  3. Steel members indicated are adequate typical examples; other steel members meeting structural design requirements shall be permitted to be used.
  4. Use either ~~Either~~ steel angle or reinforced lintel ~~shall~~ to span opening.

(S11546) (RB227-22 AS)

**703.12 Adhered masonry veneer installation.** Adhered masonry veneer shall comply with the requirements of Section R703.7.3 and the requirements in Sections 13.1~~12.1~~ and 13.3 ~~12.3~~ of TMS 402. Adhered masonry veneer shall be installed in accordance with Section R703.7.1, Article 3.3D~~3.3C~~ of TMS 602 or the manufacturer’s instructions.

No change to the remaining text

(S11528) (RB205-22)

**TABLE R703.15.1 CLADDING MINIMUM FASTENING REQUIREMENTS FOR DIRECT ATTACHMENT OVER FOAM PLASTIC SHEATHING TO SUPPORT CLADDING WEIGHTa**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CLADDING FASTENER MINIMUM PENETRATION INTO WOOD WALL FRAMINGTHROUGH FOAM SHEATHINGb** | **CLADDING FASTENER TYPE AND MINIMUM SIZEc** | **CLADDING FASTENER VERTICAL**  **SPACINGd (inches)** | **MAXIMUM THICKNESS OF FOAM SHEATHINGde**  **(inches)** | | | | | | | | | |
| **16″ o.c. Fastener**  **Horizontal Spacing** | | | | | **24″ o.c. Fastener**  **Horizontal Spacing** | | | | |
| **Cladding Weightf:** | | | | | **Cladding Weightf:** | | | | |
| **3**  **psf** | **11**  **psf** | **15**  **psf** | **18**  **psf** | **25**  **psf** | **3**  **psf** | **11**  **psf** | **15**  **psf** | **18**  **psf** | **25**  **psf** |
| Wood framing (minimum 11/4-inch penetration) | 0.113″ diameter nail | 6 | 2.00 | 1.45 | 1.00 | 0.75 | DR | 2.00 | 0.85 | 0.55 | DR | DR |
| 8 | 2.00 | 1.00 | 0.65 | DR | DR | 2.00 | 0.55 | DR | DR | DR |
| 12 | 2.00 | 0.55 | DR | DR | DR | 1.85 | DR | DR | DR | DR |
| 0.120″ diameternail | 6 | 3.00 | 1.70 | 1.15 | 0.90 | 0.55 | 3.00 | 1.05 | 0.65 | 0.50 | DR |
| 8 | 3.00 | 1.20 | 0.80 | 0.60 | DR | 3.00 | 0.70 | DR | DR | DR |
| 12 | 3.00 | 0.70 | DR | DR | DR | 2.15 | DR | DR | DR | DR |
| 0.131″ diameter nail | 6 | 4.00 | 2.15 | 1.50 | 1.20 | 0.75 | 4.00 | 1.35 | 0.90 | 0.70 | DR |
| 8 | 4.00 | 1.55 | 1.05 | 0.80 | DR | 4.00 | 0.90 | 0.55 | DR | DR |
| 12 | 4.00 | 0.90 | 0.55 | DR | DR | 2.70 | 0.50 | DR | DR | DR |
| 0.162″ diameter nail | 6 | 4.00 | 3.55 | 2.50 | 2.05 | 1.40 | 4.00 | 2.25 | 1.55 | 1.25 | 0.80 |
| 8 | 4.00 | 2.55 | 1.80 | 1.45 | 0.95 | 4.00 | 1.60 | 1.10 | 0.85 | 0.50 |
| 12 | 4.00 | 1.60 | 1.10 | 0.85 | 0.50 | 4.00 | 0.95 | 0.60 | DR | DR |

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa, 1 pound per square inch = 6.895 kPa. DR = Design Required.

o.c. = On Center.

1. Wood framing shall be Spruce-pine-fir or any wood species with a specific gravity of 0.42 or greater in accordance with AWC NDS.
2. The thickness of wood structural panels complying with the specific gravity requirement of Note a shall be permitted to be included in satisfying the minimum penetration into framing. For cladding connections to wood structural panels, refer to Table R703.3.2. For brick veneer tie connections to wood structural panels, refer to Table R703.8.4(2).
3. Nail fasteners shall comply with ASTM F1667, except nail length shall be permitted to exceed ASTM F1667 standard lengths.
4. Fastener vertical spacing is an average spacing associated with the following nail count per foot: 6 inch spacing is associated with 2 nails per foot, 8 inch spacing is associated with 1.5 nails per foot, and 12 inch spacing is associated with 1 nail per foot.

~~d.~~e. Foam sheathing shall have a minimum compressive strength of 15 psi in accordance with ASTM C578 or ASTM C1289.

1. Cladding weight is the maximum weight of cladding materials in pounds per square foot of wall area. The 3 psf category typically applies to panel and lap siding materials; the 11 psf category typically applies to conventional 3-coat stucco of 7/8- inch thickness; and 15 psf to 25 psf categories typically apply to adhered masonry veneers.

**TABLE R703.15.2 FURRING MINIMUM FASTENING REQUIREMENTS FOR APPLICATION OVER FOAM PLASTIC SHEATHING TO SUPPORT CLADDING WEIGHTa, b**

**Portions of table not shown remain unchanged.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **FURRING MATERIAL** | **FRAMING MEMBER** | **FASTENER TYPE AND MINIMUM SIZE** | **MINIMUM PENETRATION INTO WALL**  **FRAMING (inches)c** | **FASTENER SPACING IN FURRING**  **(inches)** | **MAXIMUM THICKNESS OF FOAM**  **SHEATHINGe(inches)** | | | | | | | | | |
| **16″ o.c. Furringf** | | | | | **24″ o.c. Furringf** | | | | |
| **Siding Weight:g** | | | | | **Siding Weight:g** | | | | |
| **3**  **psf** | **11**  **psf** | **15**  **psf** | **18**  **psf** | **25**  **psf** | **3**  **psf** | **11**  **psf** | **15**  **psf** | **18**  **psf** | **25**  **psf** |

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa, 1 pound per square inch = 6.895 kPa. DR = Design Required.

o.c. = On Center.

1. Cladding weight is the maximum weight of cladding materials in pounds per square foot of wall area. The 3 psf category typically applies to panel and lap siding materials; the 11 psf category typically applies to conventional 3-coat stucco of 7/8- inch thickness; and 15 psf to 25 psf categories typically apply to adhered masonry veneers.

(S11551) (RB233-22 AMPC1)

**R703.18 Fiber-mat reinforced cementitious backer units.** Fiber-mat reinforced cementitious backer units used on exterior walls as a substrate for the application of exterior finish materials shall comply with ASTM C1325. Installation shall be in accordance with manufacturer’s installation instructions. Backer units shall be installed using corrosion-resistant fasteners. Finish materials shall be installed in accordance with manufacturer’s instructions.

(S11553) (RB235-22 AS)

Revise section R704 to read as follows:

**~~R704.3 Aluminum fascia.~~** ~~Aluminum fascia shall have a minimum thickness of 0.019 inches and be installed in accordance with the manufacturer’s instructions and this code. Fasteners~~

~~shall be aluminum or stainless steel. Aluminum fascia shall be attached in accordance with Section R704.3.1, R704.3.2 or R704.3.3. The drip edge shall comply with R905.2.8.5, and the thickness of the drip edge shall be in accordance with Table R903.2.1.~~

**~~R704.3.1 Fascia installation where the design wind pressure is 30 psf or less.~~** ~~Where the design wind pressure is 30 pounds per square foot (1.44 kPA) or less, aluminum fascia shall be attached as follows:~~

~~1. Finish nails shall be provided in the return leg (11/4″ × 0.057″ × 0.177″ head diameter) spaced a maximum of2. The fascia shall be inserted under the drip edge with not less than half the height of the drip edge or 1.0 inch (25 mm), whichever is greater, of the fascia material covered by the drip edge. One finish nail shall be centered in the face of the fascia from each end of the fascia material section located no more than 1 inch below the drip edge.~~

**~~R704.3.2 Fascia installation where the design wind pressure exceeds 30 psf but is 60 psf or less.~~** ~~Where the design wind pressure is 60 pounds per square foot (2.88 kPA) or less, aluminum fascia shall be attached in accordance with Section R704.3.2.1 or Section R704.3.2.2.~~

**~~R704.3.2.1.~~** ~~Where the height of the fascia from the top of the roof sheathing to the bottom of the subfascia plus any thickness of soffit material below the subfascia is less than or equal to 6.5 inches (165 mm) or less, aluminum fascia shall be attached as follows:~~

~~1. Finish nails shall be provided in the return leg (11/4″ × 0.057″ × 0.177″ head diameter) spaced a maximum of 24 inches (610 mm) on center, and 2. The fascia shall be inserted under the drip edge with not less than half the height of the drip edge or 1 inch (25 mm), whichever is greater, of the fascia material covered by the drip edge. One finish nail shall be centered in the face of the fascia from each end of the fascia material section located no more than 1 inch (25 mm) below the drip edge.~~

**~~R704.3.2.2.~~** ~~Where the height of the fascia from the top of the roof sheathing to the bottom of the sub-fascia plus any thickness of soffit material below the subfascial is greater than 6.5 inches (165 mm), the top edge of the fascia shall be secured using utility trim installed beneath the drip edge with snap locks punched into the fascia spaced no more than 6 inches (152 mm) on center.~~

**~~R704.3.3 Fascia installation where the design wind pressure exceeds 60 psf.~~** ~~Where the design wind pressure is greater than 60 pounds per square foot (2.88 kPA), aluminum~~

~~fascia shall be attached as follows in accordance with Section R704.3.3.1 or Section R704.3.3.2.~~

**~~R704.3.3.1.~~** ~~Where the height of the fascia from the top of the roof sheathing to the bottom of the subfascia plus any thickness of soffit material below the subfascia isless than or equal to 4.5 inches (114 mm) or less, aluminum fascia shall be attached as follows:~~

~~1. Finish nails shall be provided in the return leg (11/4″ × 0.057″ × 0.177″ head diameter) spaced a maximum of 24 inches (610 mm) on center, and 2. The fascia shall be inserted under the drip edge with not less than half the height of the drip edge or 1.0 inch (25 mm), whichever is greater, of the fascia material covered by the drip edge. One finish nail shall be centered in the face of the fascia from each end of the fascia material section located no more than 1 inch (25 mm) below the drip edge.~~

**~~R704.3.3.2~~** ~~Where the height of the fascia from the top of the roof sheathing to the bottom of the subfascia plus any thickness of soffit material below the subfascia is greater than 4.5 inches (114 mm), the top edge of the fascia shall be secured using utility trim installed beneath the drip edge with snap locks punched into the fascia spaced no more than 6 inches (152 mm) on center.~~

**R704.3 Aluminum fascia.**

Aluminum fascia shall have a minimum thickness of 0.019 inches and be installed in accordance with the manufacturer’s instructions and this code. Fasteners shall be aluminum or stainless steel. Aluminum fascia shall be attached in accordance with [Section R704.3.1](https://codes.iccsafe.org/lookup/FLRC2023P1_Pt03_Ch07_SecR704.3.1/3260%22)~~,~~or [R704.3.2](https://codes.iccsafe.org/lookup/FLRC2023P1_Pt03_Ch07_SecR704.3.2/3260%22) ~~or an~~ and R704.4 or R704.5[~~R704.3.3~~](https://codes.iccsafe.org/lookup/FLRC2023P1_Pt03_Ch07_SecR704.3.3/3260%22)~~.~~ The drip edge shall comply with [R905.2.8.5](https://codes.iccsafe.org/lookup/FLRC2023P1_Pt03_Ch09_SecR905.2.8.5/3260%22), and the thickness of the drip edge shall be in accordance with [Table R903.2.1](https://codes.iccsafe.org/lookup/FLRC2023P1_Pt03_Ch09_SecR903.2.1_TblR903.2.1/3260%22).

**R704.3.1 Fascia installation where the design wind pressure is 30 psf or less.**

Where the design wind pressure is 30 pounds per square foot (1.44 kPA) or less, aluminum fascia shall be attached as follows:

1. Finish nails shall be provided in the return leg (11/4″ × 0.057″ × 0.177″ head diameter) spaced a maximum of 24 inches (610 mm) on center, and

2. The fascia shall be inserted under the drip edge with not less than half the height of the drip edge or 1.0 inch (25 mm), whichever is greater, of the fascia material covered by the drip edge. One finish nail shall be centered in the face of the fascia from each end of the fascia material section located no more than 1 inch below the drip edge.

~~Where the design wind pressure is 60 pounds per square foot (2.88 kPA) or less, aluminum fascia shall be attached in accordance with~~ [~~Section R704.3.2.1~~](https://codes.iccsafe.org/lookup/FLRC2023P1_Pt03_Ch07_SecR704.3.2.1/3260%22) ~~or~~ [~~Section R704.3.2.2~~](https://codes.iccsafe.org/lookup/FLRC2023P1_Pt03_Ch07_SecR704.3.2.2/3260%22)~~.~~

**R704.3.2 Fascia installation where the design wind pressure exceeds 30 psf.**

Where the design wind pressure is greater than 30 pounds per square foot (1.44 kPa), aluminum fascia shall be attached with one a finish nail [11/4 inches by 0.57 inch by 0.177 inch head diameter (32 mm × 14.5 mm × 4.5 mm)] in the return leg spaced a maximum of 16 inches (406 mm) on center. The fascia shall be inserted under the drip edge with not less than half the height of the drip edge or 1.0 inch (25 mm), whichever is greater, of the fascia material covered by the drip edge. And one of the following additional attachments:

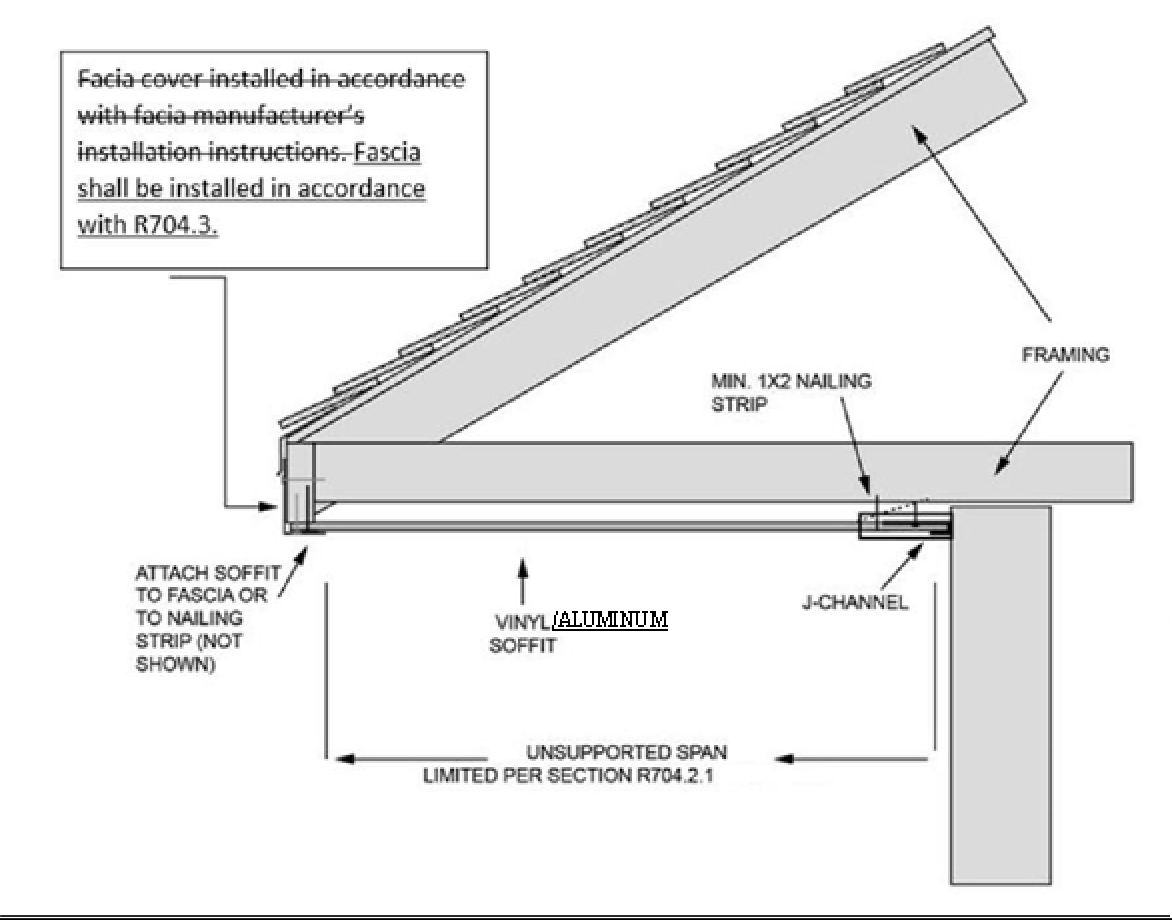
1. One finish nail shall be centered in the face of the fascia from each end of the fascia material section located no more than 1 inch (25mm) below the drip edge.
2. Top edge of the fascia is secured using utility trim installed beneath the drip edge with snap locks punched into the fascia spaced not more than 6 inches (152 mm) on center, or
3. An approved adhesive applied to the inside of the fascia cover or onto the exterior face of the subfascia framing member.

**R704.4 Corners on hip roofs.**

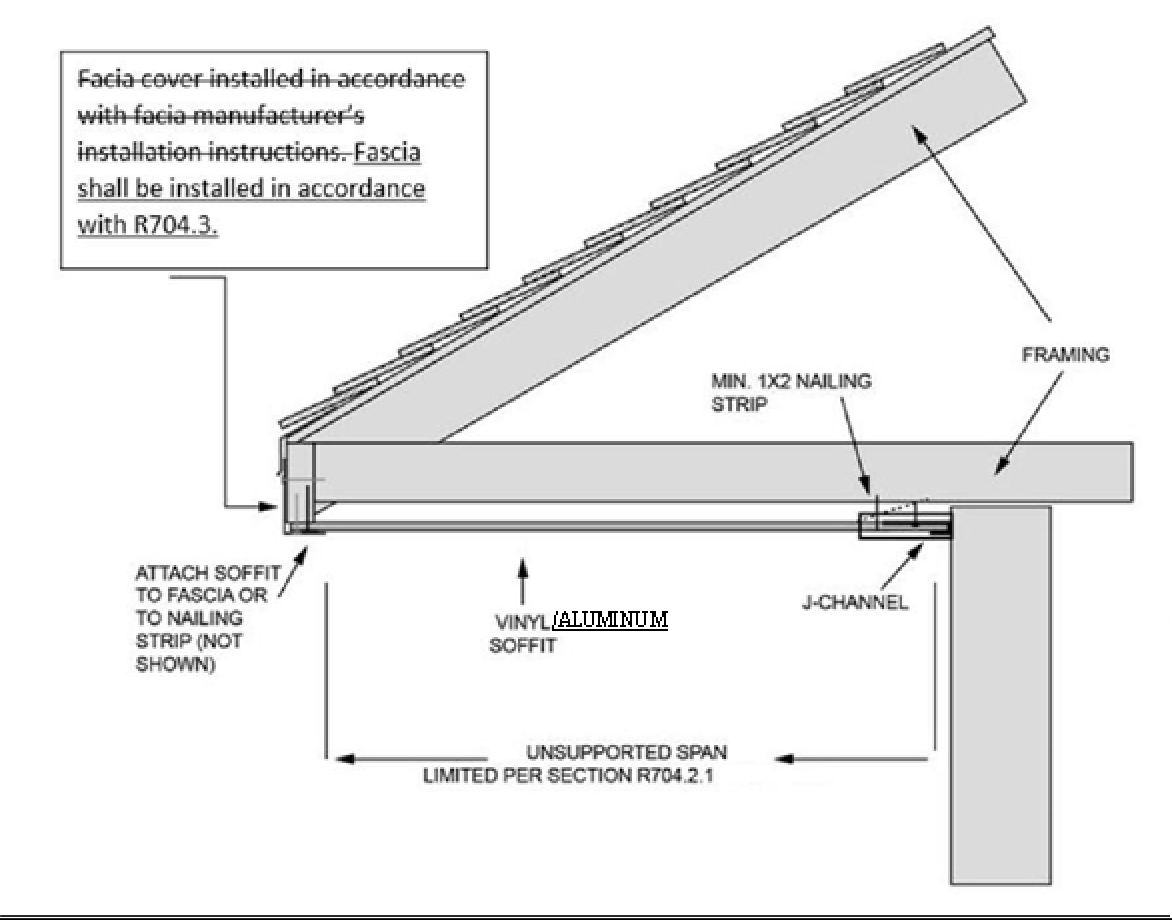
Fascia shall be bent around corners and extend at least 12 inches (305 mm) beyond the corner. The next fascia material section shall overlap the extension a minimum of 3 inches (76 mm) and be fastened through the return leg at the overlap.

**R704.5 Corners on gable roofs.**

Fascia shall be wrapped (tabbed) around and extend at least 1 inch (25 mm) beyond the corner. The gable fascia material section shall overlap the tab and be fastened through the fascia cover and the tab at the end with two face nails (11/4″ × 0.057″ × 0.177″ head diameter) for a 2 × 4-inch subfascia and three face nails for 2 × 6- inch and greater sub fascia.



**FIGURE 704.2.1(1) TYPICAL SINGLE-SPAN VINYL OR ALUMINUM SOFFIT PANEL SUPPORT**



**FIGURE 704.2.1(2) TYPICAL DOUBLE-SPAN VINYL OR ALUMINUM SOFFIT PANEL SUPPORT**

S - FBC-B/R - Ch. 14/7 – Glitch #1

**SECTION R705**

**BIPV SYSTEMS FOR EXTERIOR WALL COVERINGS AND FENESTRATION**

**R705.1 Listing required.** In addition to complying with other provisions of this code, BIPV systems used as exterior wall coverings or fenestration shall be *listed* and *labeled* in accordance with UL 1703 or both UL 61730-1 and UL 61730-2.

(S11557) (RB240-22 AS)

**Chapter 8 Roof-Ceiling Construction**

**R807.1 Attic access.** Buildings with ~~combustible ceiling or roof construction~~ attics shall have an ~~attic~~ access opening to attic areas that have a vertical height of 30 inches (762 mm) or greater over an area of not less than 30 square feet (2.8 m2). The vertical height shall be measured from the top of the ceiling framing members to the underside of the roof framing members.

The rough-framed opening shall be not less than 22 inches by 30 inches (559 mm by 762 mm) and shall be located in a hallway or other location with *ready access*. Where located in a wall, the opening shall be not less than 22 inches wide by 30 inches high (559 mm wide by 762 mm high). Where the access is located in a ceiling, minimum unobstructed headroom in the attic space shall be 30 inches (762 mm) along at least one side~~at some point~~ above the access measured vertically from the bottom of the ceiling framing members. See Section M1305.1.3 for access requirements where mechanical *equipment* is located in *attics*.

(S11563) (RB249-22 AS)/ (S11368) (RB250-22 AS)

**Chapter 9 Roof Assemblies**

**R905.2.8.4 Other flashing.** Flashing against a vertical front wall, as well as soil stack, vent pipe and chimney flashing, shall be applied in accordance with the asphalt shingle manufacturer’s ~~printed~~ instructions.

(R11677) (RB265-22 AS)/Already covered by the foundation code

**R905.6.8 Wind resistance of slate shingles.** Slate shingles shall be tested in accordance with ASTM D3161. Slate shingle packaging shall bear a label indicating compliance with ASTM D3161 and the required classification in Table R905.6.8.

**TABLE R905.6.8 CLASSIFICATION OF SLATE SHINGLES TESTED IN ACCORDACNE WITH ASTM D3161**

|  |  |  |
| --- | --- | --- |
| **MAXIMUM ULTIMATE DESIGN WIND SPEED, *Vult*, FROM FIGURE R301.2(2) (mph)** | **MAXIMUM BASIC WIND SPEED, *Vasd*, FROM TABLE R301.2.1.3 (mph)** | **ASTM D3161 CLASSIFICATION** |
| 110 | 85 | A, D or F |
| 116 | 90 | A, D or F |
| 129 | 100 | A, D or F |
| 142 | 110 | F |
| 155 | 120 | F |
| 168 | 130 | F |
| 181 | 140 | F |
| 194 | 150 | F |

For SI: 1 mph=0.447 m/s

(R11576) (RB268-22 AS)

**SECTION R905.18ROOF COATINGS**

**R905.18.1 General.** The installation of a *roof coating* on a *roof covering* shall comply with the requirements of Section R902, R904 and this section. *Roof coatings* shall be installed in accordance with the manufacturer's installation instructions.

**R905.18.2 Material standards.** *Roof coating* materials shall comply with one of the standards in Table R905.18.2.

**TABLE R905.182 ROOF COATING MATERIAL STANDARDS**

|  |  |
| --- | --- |
| **COATING MATERIAL** | **STANDARD** |
| Acrylic coating | ASTM D6083 |
| Asphaltic emulsion coating | ASTM D1227 |
| Asphalt coating | ASTM D2823 |
| Asphalt roof coating | ASTM D4479 |
| Aluminum-pigmented asphalt coating | ASTM D2824 |
| Silicone coating | ASTM D6694 |
| Moisture-cured polyurethane coating | ASTM D6947 |

(R11583) (RB280-22 AS)

**Chapter 10 Chimneys and Fireplaces**

**R1001.11 Fireplace clearance.** Wood beams, joists, studs and other *combustible material* shall have a clearance of not less than 2 inches (51 mm) from the front faces and sides of masonry fireplaces and not less than 4 inches (102 mm) from the back faces of masonry fireplaces. The airspace shall not be filled, except for noncombustible material or to provide fireblocking in accordance with Section R1001.12.

**Exceptions:**

1. Masonry fireplaces *listed* and *labeled* for use in contact with combustibles in accordance with UL 127 and installed in accordance with the manufacturer’s instructions are permitted to have *combustible material* in contact with their exterior surfaces.
2. Where masonry fireplaces are part of masonry or concrete walls, *combustible materials* shall not be in contact with the masonry or concrete walls less than 12 inches (306 mm) from the inside surface of the nearest firebox lining.
3. Exposed combustible *trim* and the edges of sheathing materials such as wood siding, flooring and gypsum board shall be permitted to abut the masonry fireplace sidewalls and hearth extension in accordance with Figure R1001.11, provided such combustible *trim* or sheathing is not less than 12 inches (305 mm) from the inside surface of the nearest firebox lining.
4. Exposed combustible mantels or *trim* is permitted to be placed directly on the masonry fireplace front surrounding the fireplace opening providing such *combustible materials* are not placed within 6 inches (152 mm) of a fireplace opening. *Combustible material* within 12 inches (306 mm) of the fireplace opening shall not project more than1/8 inch (3 mm) for each 1-inch (25 mm) distance from such an opening.

(R11585) (RB283-22 AM)

**R1001.11 Fireplace clearance.** Wood beams, joists, studs and other *combustible material* shall have a clearance of not less than 2 inches (51 mm) from the front faces and sides of masonry fireplaces and not less than 4 inches (102 mm) from the back faces of masonry fireplaces. The airspace shall not be filled, except to provide fireblocking in accordance with Section R1001.12.

**Exceptions:**

* 1. Masonry fireplaces *listed* and *labeled* for use in contact with combustibles in accordance with UL 127 and installed in accordance with the manufacturer’s instructions are permitted to have *combustible material* in contact with their exterior surfaces.
  2. Where masonry fireplaces are part of masonry or concrete walls, *combustible materials* shall not be in contact with the masonry or concrete walls less than 12 inches (306 mm) from the inside surface of the nearest firebox lining.
  3. Exposed combustible *trim* and the edges of sheathing materials such as wood siding, flooring and gypsum board shall be permitted to abut the masonry fireplace sidewalls and hearth extension in accordance with Figure R1001.11, provided such combustible *trim* or sheathing is not less than ~~12 inches (305 mm)~~ 8 inches (203 mm) from the inside surface of the nearest firebox lining. Where the fireplace opening is 6 square feet (0.6 m2) or larger such combustible or sheathing shall be permitted to abut the masonry fireplace sidewalls and hearth extension provided such combustible or sheathing is not less than 12 inches (305 mm) from the inside surface of the nearest firebox lining.
  4. Exposed combustible mantels or *trim* is permitted to be placed directly on the masonry fireplace front surrounding the fireplace opening providing such *combustible materials* are not placed within 6 inches (152 mm) of a fireplace opening. *Combustible material* within 12 inches (306 mm) of the fireplace opening shall not project more than1/8 inch (3 mm) for each 1-inch (25 mm) distance from such an opening.

(R11586) (RB284-22 AS)

**R1003.18 Chimney clearances.** Any portion of a *masonry chimney* located in the interior of the building or within the exterior wall of the building shall have a minimum airspace clearance to combustibles of 2 inches (51 mm). Chimneys located entirely outside the exterior walls of the building, including chimneys that pass through the soffit or cornice, shall have a minimum airspace clearance of 1 inch (25 mm). The airspace shall not be filled, except to provide fire blocking in accordance with Section R1003.19.

**Exceptions:**

1. Masonry chimneys equipped with a chimney lining system *listed* and *labeled* for use in chimneys in contact with combustibles in accordance with UL 1777 and installed in accordance with the manufacturer’s instructions are permitted to have *combustible material* in contact with their exterior surfaces.
2. Where masonry chimneys are constructed as part of masonry or concrete walls, *combustible materials* shall not be in contact with the masonry or concrete wall less than ~~12 inches (305 mm)~~ 8 inches (203 mm) from the inside surface of the nearest flue lining.
3. ~~Exposed combustible~~ *~~trim~~* ~~and the edges of sheathing materials, such as wood siding and flooring,~~ Combustible materials shall be permitted to abut the *masonry chimney* side walls, in accordance with Figure R1003.18, provided such combustible ~~trim or~~ ~~sheathing~~ material is not less than 8 inches (203 mm) from the inside surface of the nearest flue lining.

(R11587) (RB287-22 AS)/ (R11588) (RB288-22 AS)

**R1004.4 Unvented gas log heaters.** An unvented gas log heater or a fireplace insert shall not be installed in a factory-built fireplace unless the fireplace system has been specifically tested, *listed* and *labeled* for such use in accordance with UL 127.

(R11589) (RB289-22 AS)

**R1005.9 Factory built chimney offsets**. Where ~~a~~ fireplace manufacturer's instructions do not address factory built chimney offsets, no part of the chimney shall be at an angle of more than 30 degrees (0.52 rad.) from vertical at any point in the assembly and the chimney assembly shall not include more than 4 elbows.

(M11619) (RM22-21 AM)

**CHAPTER 11 [RE] ENERGY EFFICIENCY**

**No change**

**CHAPTER 12 MECHANICAL ADMINISTRATION**

**No change**

**CHAPTER 13 GENERAL MECHANICAL SYSTEM REQUIREMENTS**

**M1308.2.1 Piping through bored holes or notches.** Where *piping* is installed through holes or notches in framing members and is located less than ~~1~~1/2 inches (38 mm) 1 1/4 inches (32 mm) from the framing member face to which wall, ceiling or floor membranes will be attached, the pipe shall be protected by shield plates that cover the width of the pipe and the framing member and that extend 2 inches (51 mm) to each side of the framing member. Where the framing member that the piping passes through is a bottom plate, bottom track, top plate or top track, the shield plates shall cover the framing member and extend 2 inches (51 mm) above the bottom framing member and 2 inches (51 mm) below the top framing member.

**M1308.2.2 Piping in other locations.** Where piping is located within a framing member and is less than ~~1 1/2 inches (38 mm)~~ 1 1/4 inches (32 mm) from the framing member face to which wall, ceiling or floor membranes will be attached, the piping shall be protected by shield plates that cover the width and length of the piping. Where piping is located outside of a framing member and is located less than 11/2 inches (38 mm) from the nearest edge of the face of the framing member to which the membrane will be attached, the piping shall be protected by shield plates that cover the width and length of the piping.

(M11352) (P6-21 Part II AM)

**Chapter 14 Heating and Cooling Equipment**

**M1402.1 General.** Oil-fired central furnaces shall ~~conform to~~ be *listed* and *labeled* in accordance with ~~ANSI /~~UL 727. Electric furnaces shall ~~conform to~~ be *listed* and *labeled* in accordance with UL 1995 or UL/CSA60335-2-40.

**M1403.1 Heat pumps.** Electric heat pumps shall be *listed* and *labeled* in accordance with UL 1995 or UL/CSA~~/ANCE~~ 60335-2-40.

**M1412.1 ~~Approval of~~ Listed equipment.** Absorption systems shall be installed in accordance with the manufacturer’s instructions. Absorption *equipment* shall ~~comply~~ be *listed* and *labeled* in accordance with UL 1995 or UL/CSA~~/ANCE~~ 60335-2-40.

(M11608) (RM4-21 AS)



**Committee Modification:**

**M1404.1 Compliance.** Refrigeration cooling *equipment* shall ~~comply~~ be listed and labeled in accordance with ~~UL 474,~~ UL 484, UL 1995, or UL/CSA 60335-2-40.

~~Standard for Safety Dehumidifiers~~

~~UL 474-2015~~

(M11609) (RM05-21 AM)

**M1411.1 Approved refrigerants.** Refrigerants used in direct refrigerating systems shall conform to the applicable provisions of ANSI/ASHRAE 34.

**Add new text as follows:**

**M1411.2 Refrigeration system listing.** Refrigeration systems using Group A2L refrigerants shall be listed and labeled to UL 60335-2- 40/CAN/CSA C22.2 No. 60335-2-40. Refrigeration systems using Group A1 refrigerants shall be listed to UL 60335-2-40/CAN/CSA C22.2 No. 6-335-2-40 or UL 1995/CSA C22.2 No. 236. The equipment shall be installed in accordance with the listing.

**M1411.3 Refrigeration system installation.** Refrigeration systems shall be installed in accordance with the manufacturer's installation instructions. After installation, the manufacturer's installation instructions, owner's manuals, service manuals, and any other product literature provided with the equipment shall be attached to the indoor unit or left with the homeowner.

**M1411.4 Field installed accessories.** All Field installed accessories shall be installed in accordance with the accessory and equipment manufacturer's installation instructions. Accessories installed in the ductwork of Group A2L refrigeration systems shall not contain electric heating elements, open flames, or devices switching electrical loads greater than 2.5 kVA.

**M1411.5 Signs and identification.** Each refrigeration system using Group A2L refrigerant shall have the following information legibly and permanently indicated on a markable label provided by the equipment manufacturer.

1. Contact information of the responsible company that installed the refrigeration system, and
2. The system refrigerant charge and the refrigerant number.

**M1411.6 Refrigerant charge.** All refrigeration systems shall have refrigerant charge in compliance with the equipment manufacturer's installation instructions and the requirements of the listing. Group A2L refrigerant charge for an individual refrigeration system shall not exceed 34.5 lbs (15.7 kg).

**M1411.7 Group A2L refrigerant piping testing.** The piping system containing Group A2L refrigerant shall be tested in accordance with the manufacturer's installation instructions and the requirements of the listing.

**Renumber existing sections as appropriate.**

**Delete without substitution:**

Association of Standardization and Certification Av. Lázaro Cárdenas No. 869 Fraccion 3

**ANCE**

Col. Nva. Industrial Vallejo Deleg. Gustavo A. Madero, México, D.F.

~~NMX-J-521/2-40-ANCE—2014/CAN/CSA-22.2 No. 60335~~-~~Safety of Household and Similar Electric Appliances, Part 2-40: Particular Requirements for Heat Pumps, Air-Conditioners and Dehumidifiers~~

~~2014/CAN/CSA-22.2 No. 60335~~

~~2-40—12/UL 60335-2-40~~

**Revise as follows:**

CSA Group 8501 East Pleasant Valley Road Cleveland, OH 44131-5516

**CSA**

UL 60335-2-40- Standard for Safety of Household and Similar Electrical Appliances, Part 2-40: Particular Requirements

2019/CAN/CSA/C22.2 No. 60335- for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers 2-40—~~2012~~19

UL LLC

**UL**

333 Pfingsten Road

Northbrook, IL 60062

UL~~/CSA/ANCE~~ 60335-2-40 Standard for Safety Household and Similar Electrical Appliances, - Safety - Part 2-40: Particular

—~~2012~~2019/CAN/CSA C22.2 No. Requirements for Electrical Heat Pumps, Air Conditioners and Dehumidifiers ~~Motor-compressors~~ 60335-2-40-19

(M11610) (RM6-21 AS)

**Chapter 15 Exhaust Systems**

**M1502.6 Makeup air .**  Installations exhausting more than 200 cfm (0.09 m3/s) shall be provided with makeup air.

**M1502.6.1 Closet Installation .**  Where a closet is designed for the installation of a clothes dryer, makeup air shall be provided in accordance with the dryer manufacturer's installation instructions. If the manufacturer installation instructions do not include specifications for provision of makeup air, one or more permanent openings having a total area of not less than 100 square inches (645 mm2) shall be provided in the closet enclosure, or makeup air shall be provided by other approved means.

**M1503.4.1 Location.** Kitchen exhaust makeup air that is ducted from the outdoors shall be discharged into the same room in which the exhaust system is located or into rooms or *duct systems* that communicate through one or more permanent openings with the room in which such exhaust system is located. Such permanent openings shall have a net cross-sectional area not less than the required area of the makeup air supply openings.

(M11611) (RM8-21 AMPC1)

**M1507.4 Local exhaust rates.** *Local exhaust* systems shall be designed to have the capacity to exhaust the minimum airflow rate determined in accordance with Table ~~M1507.4. The~~ M1507.4 at one or more speed settings. The listed exhaust airflow rate for a bathroom or toilet roomexhaust fan shall equal or exceed the exhaust airflow rate in Table M1507.4 at a minimum static pressure of 0.25 inch wc at one or more speed settings.

**TABLE M1507.4 MINIMUM REQUIRED LOCAL EXHAUST RATES FOR ONE- AND TWO-FAMILY DWELLINGS**

|  |  |
| --- | --- |
| **AREA TO BE EXHAUSTED** | **EXHAUST RATESa** |
| Kitchens | 100 cfm intermittent or 25 cfm continuous |
| Bathrooms-Toilet Rooms | Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous |

For SI: 1 cubic foot per minute = 0.0004719 m3/s, 1 inch water column = 0.2488 kPa.

1. ~~The listed exhaust rate for bathrooms-toilet rooms shall equal or exceed the exhaust rate at a minimum static pressure of 0.25 inch water~~ ~~column.~~

(M11620) (RM26-21 AMPC1)

**M1506**

**LOCAL EXHAUST RATES**

**Revise as follows:**

**~~M1505.4.4~~ M1506.1 ~~Local exhaust rates~~ General.** *Local exhaust* systems shall be designed to have the capacity to exhaust the minimum airflow rate determined in accordance with Table ~~M1505.4.4.~~ M1506.1.

**TABLE ~~M1505.4.4~~ M1506.1 MINIMUM REQUIRED LOCAL EXHAUST RATES ~~FOR ONE- AND TWO-FAMILY DWELLINGS~~**

|  |  |
| --- | --- |
| **AREA TO BE EXHAUSTED** | **EXHAUST RATESa** |
| Kitchens | 100 cfm intermittent or 25 cfm continuous |
| Bathrooms-Toilet Rooms | Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous |

For SI: 1 cubic foot per minute = 0.0004719 m3/s, 1 inch water column = 0.2488 kPa.

a. The listed exhaust rate for bathrooms-toilet rooms shall equal or exceed the exhaust rate at a minimum static pressure of 0.25 inch water column in accordance with Section M1505.3.

**M1503.5 Kitchen exhaust rates.** Where domestic kitchen cooking *appliances* are equipped with ducted range hoods or down-draft exhaust systems, ~~the fans shall be sized in accordance with Section M1505.4.4~~. the minimum exhaust rate shall be in accordance with Section M1506.1

**Committee Modification:**

**~~M1506.1~~ M1505.5 ~~General~~ Local exhaust rates.** *Local exhaust* systems shall be designed to have the capacity to exhaust the minimum airflow rate determined in accordance with Table ~~M1506.1~~ M1505.5

**TABLE ~~M1506.1~~ M1505.5 MINIMUM REQUIRED LOCAL EXHAUST RATES**

|  |  |
| --- | --- |
| **AREA TO BE EXHAUSTED** | **EXHAUST RATESa** |
| Kitchens | 100 cfm intermittent or 25 cfm continuous |
| Bathrooms-Toilet Rooms | Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous |

For SI: 1 cubic foot per minute = 0.0004719 m3/s, 1 inch water column = 0.2488 kPa.

a. The listed exhaust rate for bathrooms-toilet rooms shall equal or exceed the exhaust rate at a minimum static pressure of 0.25 inch water column in accordance with Section M1505.3.

**M1503.5 Kitchen exhaust rates.** Where domestic kitchen cooking *appliances* are equipped with ducted range hoods or down-draft exhaust systems, the exhaust rate shall equal or exceed the airflow required in Table M1505.5 at one or more speed settings.~~the minimum~~ ~~exhaust rate shall be in accordance with Section M1506.1~~

Public Comment 1

**Further modify as follows:**

2021 International Residential Code

**~~M1506 LOCAL EXHAUST RATES~~ .**

**TABLE M1505.5 MINIMUM REQUIRED LOCAL EXHAUST RATES**

|  |  |
| --- | --- |
| **AREA TO BE EXHAUSTED** | **EXHAUST RATESa** |
| Kitchens | 100 cfm intermittent or 25 cfm continuous |
| Bathrooms-Toilet Rooms | Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous |

For SI: 1 cubic foot per minute = 0.0004719 m3/s, 1 inch water column = 0.2488 kPa.

a. The listed exhaust rate for bathrooms-toilet rooms shall equal or exceed the exhaust rate at a minimum static pressure of 0.25 inch water column in accordance with Section M1505.3.

**M1503.5 Kitchen exhaust rates .** Where domestic kitchen cooking *appliances* are equipped with ducted range hoods or down-draft exhaust systems, the exhaust rate shall equal or exceed the airflow required in Table M1505.5 at one or more speed settings.

**M1505.5 Local exhaust rates .** *Local exhaust* systems shall be designed to have the capacity to exhaust the minimum airflow rate determined in accordance with Table ~~M1505.5.~~M1505.5 at one or more speed settings.

(M11615) (RM17-21 AMPC1) Review with 11620

**Chapter 16 Duct Systems**

**M1602.2 Return air openings.** Return air openings for heating, *ventilation* and air-conditioning systems shall comply with all of the following:

1. Openings shall not be located less than 10 feet (3048 mm) measured in any direction from an open combustion chamber or draft hood of another *appliance* located in the same room or space.
2. The amount of return air taken from any room or space shall be not greater than the flow rate of supply air delivered to such room or space.
3. Return and transfer openings shall be sized in accordance with the*appliance* or *equipment* manufacturer’s installation instructions, Manual D or the design of the *registered design professional*.
4. Return air shall not be taken from a closet,~~bathroom,~~ toilet room, kitchen, garage, mechanical room, boiler room, furnace room or unconditioned attic.

**Exceptions:**

* 1. Taking return air from a kitchen is not prohibited where such return air openings serve the kitchen only, and are located not less than 10 feet (3048 mm) from the cooking *appliances*.
  2. Dedicated forced-air systems serving only the garage shall not be prohibited from obtaining return air from the garage.

1. For other than dedicated HVAC systems, return air shall not be taken from indoor swimming pool enclosures and associated deck areas except where the air in such spaces is dehumidified,
2. Taking return air from an unconditioned*crawl space* shall not be accomplished through a direct connection to the return side of a forced-air furnace. Transfer openings in the *crawl space* enclosure shall not be prohibited.
3. Return air from one *dwelling unit* shall not be discharged into another *dwelling unit*.

(M11616) (RM18-21 AS) Review

**M1602.2 Return air openings.** Return air openings for heating, *ventilation* and air-conditioning systems shall comply with all of the following:

1. Openings shall not be located less than 10 feet (3048 mm) measured in any direction from an open combustion chamber or draft hood of another *appliance* located in the same room or space.
2. The amount of return air taken from any room or space shall be not greater than the flow rate of supply air delivered to such room or space.
3. Return and transfer openings shall be sized in accordance with the *appliance* or *equipment* manufacturer’s installation instructions, Manual D or the design of the *registered design professional*.
4. Where return air is taken from a closet smaller than 30 ft2 (2.8 m2) the return air shall be no more than 30 cfm (15 l/s), shall serve only the closet, and shall not require a dedicated supply duct.
5. Where return air is taken from a closet smaller than 30 ft2 (2.8 m2) the closet door shall be undercut a minimum of 1.5 inches (38 mm) or the closet shall include a louvered door or transfer grille with a minimum net free area of 30 inch2 (194 cm2).
6. 6. Return air shall not be taken from a ~~closet,~~ bathroom, toilet room, kitchen, garage, mechanical room, boiler room, furnace room or unconditioned attic.

**Exceptions:**

* 1. Taking return air from a kitchen is not prohibited where such return air openings serve the kitchen only, and are located not less than 10 feet (3048 mm) from the cooking *appliances*.
  2. Dedicated forced-air systems serving only the garage shall not be prohibited from obtaining return air from the garage.
  3. Return air taken from closets shall serve only the closet and may shall be permitted to be taken from closets that have no dedicated supply duct.

1. 7. For other than dedicated HVAC systems, return air shall not be taken from indoor swimming pool enclosures and associated deck areas except where the air in such spaces is dehumidified,
2. 8. Taking return air from an unconditioned *crawl space* shall not be accomplished through a direct connection to the return side of a forced-air furnace. Transfer openings in the *crawl space* enclosure shall not be prohibited.
3. 9. Return air from one *dwelling unit* shall not be discharged into another *dwelling unit*.

Public Comment 1

**M1602.2 Return air openings .** Return air openings for heating, *ventilation* and air-conditioning systems shall comply with all of the following:

1. Openings shall not be located less than 10 feet (3048 mm) measured in any direction from an open combustion chamber or draft hood of another *appliance* located in the same room or space.
2. The amount of return air taken from any room or space shall be not greater than the flow rate of supply air delivered to such room or space.
3. Return and transfer openings shall be sized in accordance with the*appliance* or *equipment* manufacturer’s installation instructions, Manual D or the design of the *registered design professional*.
4. ~~Where return air is taken from a closet smaller than 30 ft2 (2.8 m2) the return air shall be no more than 30 cfm (15 l/s), shall~~ ~~serve only the closet, and shall not require a dedicated supply duct.~~
5. ~~Where return air is taken from a closet smaller than 30 ft2 (2.8 m2) the closet door shall be undercut a minimum of 1.5 inches (38~~ ~~mm) or the closet shall include a louvered door or transfer grille with a minimum net free area of 30 inch2 (194 cm2).~~
6. Where return air is taken from a closet the return air shall be no more than 30 cfm (15 l/s), shall serve only the closet, shall not require a dedicated supply duct and the closet door shall be undercut a minimum of 1.5 inches (38 mm) or the closet shall include a louvered door or transfer grille with a minimum net free area of 30 inch2 (194 cm2).
7. ~~6.~~ Return air shall not be taken from a bathroom, toilet room, kitchen, garage, mechanical room, boiler room, furnace room or unconditioned attic.

**Exceptions:**

* 1. Taking return air from a kitchen is not prohibited where such return air openings serve the kitchen only, and are located not less than 10 feet (3048 mm) from the cooking *appliances*.
  2. Dedicated forced-air systems serving only the garage shall not be prohibited from obtaining return air from the garage.
  3. Return air taken from closets shall serve only the closet~~and may shall~~ and ~~may~~ shall be permitted to be taken from closets that have no dedicated supply duct.

1. ~~7.~~ For other than dedicated HVAC systems, return air shall not be taken from indoor swimming pool enclosures and associated deck areas except where the air in such spaces is dehumidified,
2. ~~8.~~ Taking return air from an unconditioned*crawl space* shall not be accomplished through a direct connection to the return side of a forced-air furnace. Transfer openings in the *crawl space* enclosure shall not be prohibited.
3. ~~9.~~ Return air from one *dwelling unit* shall not be discharged into another *dwelling unit*.

(M11617) (RM19-21 AMPC1) Review

**M1602.2 Return air openings.** Return air openings for heating, *ventilation* and air-conditioning systems shall comply with all of the following:

1. Openings shall not be located less than 10 feet (3048 mm) measured in any direction from an open combustion chamber or draft hood of another *appliance* located in the same room or space.
2. The amount of return air taken from any room or space shall be not greater than the flow rate of supply air delivered to such room or space. Return air taken from mechanical rooms shall serve only the mechanical room and shall be permitted to be taken from mechanical rooms that have no dedicated supply duct.
3. Return and transfer openings shall be sized in accordance with the *appliance* or *equipment* manufacturer’s installation instructions, Manual D or the design of the *registered design professional*.
4. Where return air is taken from a mechanical room with combustion appliances only sealed combustion appliances shall be permitted within the mechanical room.
5. Where return air is taken from a mechanical room the pressure differential across the mechanical room door shall be limited to

0.01 inch WC (2.5 pascals) or less by undercutting the door, or installing a louvered door or transfer grille, or by some other means.

1. 6. Return air shall not be taken from a closet, bathroom, toilet room, kitchen, garage, ~~mechanical room, boiler room, furnace room~~ or unconditioned attic.

**Exceptions:**

* 1. Taking return air from a kitchen is not prohibited where such return air openings serve the kitchen only, and are located not less than 10 feet (3048 mm) from the cooking *appliances*.
  2. Dedicated forced-air systems serving only the garage shall not be prohibited from obtaining return air from the garage.

1. 7. For other than dedicated HVAC systems, return air shall not be taken from indoor swimming pool enclosures and associated deck areas except where the air in such spaces is dehumidified,
2. 8. Taking return air from an unconditioned*crawl space* shall not be accomplished through a direct connection to the return side of a forced-air furnace. Transfer openings in the *crawl space* enclosure shall not be prohibited.
3. 9. Return air from one *dwelling unit* shall not be discharged into another *dwelling unit*.

Public Comment

**M1602.2 Return air openings .** Return air openings for heating, *ventilation* and air-conditioning systems shall comply with all of the following:

1. Openings shall not be located less than 10 feet (3048 mm) measured in any direction from an open combustion chamber or draft hood of another *appliance* located in the same room or space.
2. The amount of return air taken from any room or~~space~~ space except mechanical rooms, boiler rooms or furnace rooms shall be not greater than the flow rate of supply air delivered to such room or space. Return air taken from mechanical rooms, boiler rooms or furnace roomsshall serve only the mechanical room and shall be permitted to be taken from mechanical rooms that have no dedicated supply duct.
3. Return and transfer openings shall be sized in accordance with the*appliance* or *equipment* manufacturer’s installation instructions, Manual D or the design of the *registered design professional*.
4. Where return air is taken from a mechanical room, boiler room or furnace room with combustion appliances only sealed combustion appliances shall be permitted within the mechanical room.
5. Where return air is taken from a mechanical room, boiler room or furnace room the pressure differential across the mechanical ~~room door~~ room ~~door~~ , boiler room or furnace roomdoor shall be limited to 0.01 inch WC (2.5 pascals) or less by undercutting the door, or installing a louvered door or transfer grille, or by some other means.
6. Return air shall not be taken from a closet, bathroom, toilet room, kitchen, garage, or unconditioned attic.

**Exceptions:**

* 1. Taking return air from a kitchen is not prohibited where such return air openings serve the kitchen only, and are located not less than 10 feet (3048 mm) from the cooking *appliances*.
  2. Dedicated forced-air systems serving only the garage shall not be prohibited from obtaining return air from the garage.

1. For other than dedicated HVAC systems, return air shall not be taken from indoor swimming pool enclosures and associated deck areas except where the air in such spaces is dehumidified,
2. Taking return air from an unconditioned *crawl space* shall not be accomplished through a direct connection to the return side of a forced-air furnace. Transfer openings in the *crawl space* enclosure shall not be prohibited.
3. Return air from one *dwelling unit* shall not be discharged into another *dwelling unit*.

(M11618) (RM20-21 AMPC1) Review

**CHAPTER 17 COMBUSTION AIR**

No change

**Chapter 18 Chimneys and Vents**

No change

**CHAPTER 19 SPECIAL APPLIANCES, EQUIPMENT AND SYSTEMS**

No change

**CHAPTER 20 BOILERS AND WATER HEATERS**

**M2002.4 Pressure relief valve.** Boilers shall be equipped with pressure relief valves with minimum rated capacities for the equipment served. Pressure relief valves shall be set at the maximum rating of the boiler. ~~Discharge shall be piped to drains by gravity to within 18~~ i~~nches (457 mm) of the floor or to an open receptor.~~

**M2002.4.1 Requirements for discharge pipe.** The discharge piping serving a pressure relief valve, temperature relief valve or combination valve shall:

1. Not be directly connected to the drainage system.
2. Discharge through an air break located in the same room as the boiler.
3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air.
4. Serve a single relief device and shall not connect to piping serving any other relief device or equipment.
5. Discharge to the floor, to the pan serving the boiler or storage tank, to a waste receptor or to the outdoors.
6. Discharge in a manner that does not cause personal injury or structural damage.
7. Discharge to a termination point that is readily observable by the building occupants.
8. Not be trapped.
9. Be installed to flow by gravity.
10. Terminate not more than 6 inches (152 mm) above the floor or waste receptor flood level rim.
11. Not have a threaded connection at the end of the piping.
12. Not have valves or tee fittings.
13. Be constructed of those materials indicated in Section P2906.5 or materials tested, rated and approved for such use in accordance with ASME A112.4.1.

(M11332/M66-21 Part II AMPC1)

**M2006.1 General.** Pool and spa heaters shall be installed in accordance with the manufacturer’s installation instructions. Oil-fired pool heaters shall ~~comply~~ be *listed* and *labeled* in accordance with UL 726. Electric pool and spa heaters shall ~~comply be~~ *listed* ~~and~~ *labeled* i~~n~~ ~~accordance~~ with UL 1261. Pool and spa heat pump water heaters shall ~~comply~~ be *listed* and *labeled* in accordance with UL 1995, or UL/CSA~~/ANCE~~ 60335-2-40 ~~or CSA C22.2 No. 236~~.

**Exception:** Portable residential spas and portable residential exercise spas shall ~~comply~~ be *listed* and *labeled* in accordance with UL 1563 or CSA C22.2 No. 218.1.

(M11608) (RM4-21 AS) Overlap

**Chapter 21 Hydronic Piping**

**TABLE M2101.1 HYDRONIC PIPING AND FITTING MATERIALS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **MATERIAL** | **USE CODEa** | **STANDARDb** | **JOINTS** | **NOTES** |
| Acrylonitrile butadiene styrene (ABS) plastic pipe | 1, 5 | ASTM D1527, ASTM F2806, ASTM F2969 | Solvent cement joints | — |
| Chlorinated poly (vinyl chloride) (CPVC) pipe and  tubing | 1, 2, 3 | ASTM D2846 | Solvent cement joints, compression joints and  threaded adapters | — |
| Copper and copper-alloy pipe | 1 | ASTM B42, ASTM B43, ASTM B302 | Brazed, soldered and mechanical fittings  threaded, welded and flanged | — |
| Copper and copper-alloy tubing (Type K, L or M) | 1, 2 | ASME B16.51, ASTM B75, ASTM B88, ASTM B135, ASTM  B251, ASTM B306 | Brazed, soldered, press-connected and flared  mechanical fittings | Joints embedded in concrete shall be  brazed |
| Cross-linked polyethylene (PEX) | 1, 2, 3 | ASTM F876; ASTM F3253 | (See PEX fittings) | Install in accordance with manufacturer’s  instructions |
| Cross-linked polyethylene/ aluminum/cross-  linked polyethylene (PEX-AL-PEX) pressure pipe | 1, 2 | ASTM F1281 or CAN/CSA B137.10 | Mechanical, crimp/insert | Install in accordance with manufacturer’s  instructions |
| PEX fittings | — | ASTM F877, ASTM F1807, ASTM F1960, ASTM F2098,  ASTM F2159, ASTM F2735, ASTM F3253; ASTM F3348 | Copper crimp/insert fittings, cold expansion  fittings, stainless steel clamp, insert fittings | Install in accordance with manufacturer’s  instructions |
| Polybutylene (PB) pipe and tubing | 1, 2, 3 | ASTM D3309 | Heat-fusion, crimp/insert and compression | Joints in concrete shall be heat-fused |
| Polyethylene/aluminum/polyethylene (PE-AL-PE)  pressure pipe | 1, 2, 3 | ASTM F1282, CSA B137.9 | Mechanical, crimp/insert | — |
| Polypropylene (PP) | 1, 2, 3 | ISO 15874, ASTM F2389 | Heat-fusion joints, mechanical fittings,  threaded adapters, compression joints | — |
| Raised temperature polyethylene (PE-RT) | 1, 2, 3 | ASTM F2623, ASTM F2769, CSA B137.18 | Copper crimp/insert fitting, stainless steel  clamp, insert fittings | — |
| Raised temperature polyethylene (PE-RT) fittings | 1, 2, 3 | ASTM D3261, ASTM F1807, ASTM F2098, ASTM F2159,  ASTM F2735, ASTM F2769, ASTM F3348; CSA B137.18 | Copper crimp/insert fitting, stainless steel  clamp, insert fittings | — |
| Steel pipe | 1, 2 | ASTM A53, ASTM A106 | Brazed, welded, threaded, flanged and mechanical fittings | Joints in concrete shall be welded. Galvanized pipe shall not be welded or  brazed. |
| Steel tubing | 1 | ASTM A254 | Mechanical fittings, welded | — |

For SI: °C = [(°F) – 32]/1.8.

1. Use code:
   1. Above ground.
   2. Embedded in radiant systems.
   3. Temperatures below 180°F only.
   4. Low temperature (below 130°F) applications only.
   5. Temperatures below 160°F only.
2. Standards as listed in Chapter 44.

**Add new standard(s) as follows:**

ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken, PA 19428

**ASTM**

F3348-18 Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

(M11351) (RM100-21 AS)

**M2103.3 Piping joints.** Copper and copper-alloy systems shall be soldered, brazed, or press connected. Soldering shall be in accordance with ASTM B828. Fluxes for soldering shall be in accordance with ASTM B813. Brazing fluxes shall be in accordance with AWS A5.31.

Press-connect joints shall be in accordance with ASME B16.51 or ASTM F3226. Piping joints that are embedded shall be installed in accordance with the following requirements:

1. Steel pipe joints shall be welded.
2. Copper tubing shall be joined by brazing complying with Section P3003.6.1.
3. Polybutylene pipe and tubing joints shall be installed with socket-type heat-fused polybutylene fittings.
4. CPVC tubing shall be joined using solvent cement joints.
5. Polypropylene pipe and tubing joints shall be installed with socket-type heat-fused polypropylene fittings.
6. Cross-linked polyethylene (PEX) tubing shall be joined using cold expansion, insert or compression fittings.
7. Raised temperature polyethylene (PE-RT) tubing shall be joined using insert or compression fittings.

(M11621) (RM27-21 AS) Overlap

**Chapter 22 Special Piping and Storage Systems**

No change

**Chapter 23 – Solar Thermal Energy Systems**

No change

**CHAPTER 24 FUEL GAS**

**Note: Revise for consistency with Chapter 24 of the 2021 IRC.**

Revise Section 2404.8 (301.12) to read as follows:

**2404.8 (301.12) Seismic resistance.** Reserved. ~~Where earthquake loads are applicable in accordance with this code, the supports shall be designed and installed for the seismic forces in accordance with this code.~~

P-FBC-FG – Ch24 – Errata #1

Revise section G2427.2.2 as follows:

G2427.2.2 (503.2.4) Appliances with integral vents. Appliances incorporating integral venting means shall be installed in accordance with Section G2427.8~~, Items 1 and 2~~.

P-FBC-FG – Ch24 – Errata #2

Revise Section G2427.5.4 (503.5.5), Item as follows:

**G2427.5.4, Item 3**

3. The effective area of the chimney flue or a venting system serving two appliances with draft hoods shall be not less than the area of the larger draft hood out[1]let plus 50 percent of the area of the smaller draft hood outlet, nor greater than seven times the smallest draft hood outlet area.

P-FBC-FG – Ch24 – Errata #3

**Chapter 25 Plumbing Administration**

**Delete and substitute as follows:**

**~~P2503.5.2 Finished plumbing~~.** ~~After the plumbing fixtures have been set and their traps filled with water, their connections shall be tested~~ ~~and proved gastight or watertight as follows:~~

1. ~~Watertightness. Each fixture shall be filled and then drained. Traps and fixture connections shall be proven watertight by visual~~ i~~nspection.~~
2. ~~Gastightness. Where required by the local administrative authority, a final test for gastightness of the DWV system shall be made by~~ ~~the smoke or peppermint test as follows:~~
   1. ~~Smoke test. Introduce a pungent, thick smoke into the system. When the smoke appears at vent terminals, such terminals~~ ~~shall be sealed and a pressure equivalent to a 1-inch water column (249 Pa) shall be applied and maintained for a test period~~ ~~of not less than 15 minutes.~~
   2. ~~Peppermint test. Introduce 2 ounces (59 mL) of oil of peppermint into the system. Add 10 quarts (9464 mL) of hot water and~~ ~~seal the vent terminals. The odor of peppermint shall not be detected at any trap or other point in the system.~~

**P2503.5.2 Drainage and vent final test.** The final test of the drainage and vent system shall be visual to determine compliance with the provisions of this code. Each fixture shall be filled and then drained. Traps and fixture connections shall be proven watertight.

(P11622) (RP1-21 AS)

**Chapter 26 General Plumbing Requirements**

**P2603.2.1 Protection against physical damage.**

In concealed locations, where piping, other than cast-iron or galvanized steel, is installed through holes or notches in studs, joists, rafters or similar members less than 11/4 inches (31.8 mm) from the nearest edge of the member, the pipe shall be protected by steel shield plates.~~Such shield plates shall have a thickness of not less than 0.0575 inch (1.463 mm) (No. 16 Gage).~~ Such plates shall cover the area of the pipe where the member is notched or bored, and shall extend not less than 2 inches (51 mm) above sole plates and below top plates.

**P2603.2.1.1 Shield plates.** Shield plates shall be of steel material having a thickness of not less than 0.0575 inch (1.463 mm) (No. 16 gage).

(M11352) (P6-21 Part II AM)

**Chapter 27 Plumbing Fixtures**

**P2704.1 Slip joints.** Slip-joint connections shall be installed only for tubular waste piping and only between the waste ~~trap~~ outlet of a fixture and the connection to the drainage piping. Slip-joint connections shall be made with an *approved* elastomeric sealing gasket. Slip-joint connections shall be accessible. Such access shall provide an opening that is not less than 12 inches (305 mm) in its smallest dimension.

(P11623) (RP3-21 AS)

**P2709.3 Installation.** Lining materials shall be sloped1/4 unit vertical in 12 units horizontal (2-percent slope) to weep holes in the subdrain by means of a smooth, solidly formed subbase, shall be properly recessed and fastened to *approved* backing so as not to occupy the space required for the wall covering, and shall not be nailed or perforated at any point less than 1 inch (25.4 mm) above the finished threshold. The assembly shall be tested in accordance with Section P2503.6

(P11624) (RP4-21 AS)

**P2717.2 ~~Sink and dishwasher.~~ Dishwasher waste connection.** ~~The combined discharge from a dishwasher and a one- or two-~~ ~~compartment sink, with or without a food-waste disposer, shall be served by a trap of not less than 1~~1/2 inches (38 mm) in outside diameter. ~~The dishwasher discharge pipe or tubing shall rise to the underside of the counter and be fastened or otherwise held in that position before~~ ~~connecting to the head of the food-waste disposer or to a wye fitting in the sink tailpiece.~~The waste connection of a dishwasher shall connect directly to a wye branch fitting on the tailpiece of the kitchen sink, directly to the dishwasher connection of a food waste disposer, or through an air break to a standpipe. The waste line of the dishwasher shall rise and be securely fastened to the underside of the sink rim or countertop. Where a waste line drains into a standpipe, the waste line shall be securely fastened to the top of the standpipe.

(P11625) (RP5-21 AM)

**Chapter 28 Water Heaters**

**~~P2801.1 Required~~.** *~~Hot water~~* ~~shall be supplied to plumbing fixtures and plumbing~~ *~~appliances~~* ~~intended for bathing, washing or culinary~~ ~~purposes.~~

(P11626) (RP6-21 AS)

**P2801.9 Lead Content.** Water heaters shall comply with NSF 372 and shall have a weighted average lead content of 0.25% or less.

(P10945) (P54-21 Part II AS)

**Chapter 29 Wayer Supply and Distribution**

**TABLE P2906.6 PIPE FITTINGS**

|  |  |
| --- | --- |
| **MATERIAL** | **STANDARD** |
| Acrylonitrile butadiene styrene (ABS) plastic | ASTM D2468 |
| Cast iron | ASME B16.4 |
| Chlorinated polyvinyl chloride (CPVC) plastic | ASSE 1061; ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6 |
| Copper or copper alloy | ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F3226 |
| Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE) | ASTM F1986 |
| Fittings for cross-linked polyethylene (PEX) plastic tubing | ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2098; ASTM F2159; ASTM  F2434; ASTM F2735; ASTM F3348; CSA B137.5 |
| Gray iron and ductile iron | AWWA C110/A21.10; AWWA C153/A21.53 |
| Malleable iron | ASME B16.3 |
| Insert fittings for Polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked  polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) | ASTM F1281; ASTM F1282; ASTM F1974; CSA B137.9; CSA B137.10 |
| Polyethylene (PE) plastic | ASTM D2609; CSA B137.1 |
| Fittings for polyethylene of raised temperature (PE-RT) plastic tubing | ASSE 1061; ASTM D2683; ASTM D3261; ASTM F1055; ASTM F1807; ASTM F2098; ASTM F2159; ASTM  F2735; ASTM F2769; ASTM F3348; CSA B137.18 |
| Polypropylene (PP) plastic pipe or tubing | ASTM F2389; CSA B137.11 |
| Polyvinyl chloride (PVC) plastic | ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3 |
| Stainless steel (Type 304/304L) pipe | ASTM A312; ASTM A778 |
| Stainless steel (Type 316/316L) pipe | ASTM A312; ASTM A778 |
| Steel | ASME B16.9; ASME B16.11; ASME B16.28 |

**Add new standard(s) as follows:**

ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken, PA 19428

**ASTM**

F3348-20b Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

(P10975) (P65-21 Part II AS)

**P2903.12 Existing piping used for grounding.** Existing metallic water service piping used for electrical grounding shall not be replaced with non-metallic pipe or tubing until other approved means of grounding is provided.

(P11628) (RP8-21 AS)

**TABLE P2903.9.4 VALVES**

|  |  |
| --- | --- |
| **MATERIAL** | **STANDARD** |
| Chlorinated polyvinyl chloride (CPVC) plastic | ASME A112.4.14, ASME A112.18.1/CSA B125.1, ASTM F1970, CSA B125.3, MSS SP-122 |
| Copper or copper alloy | ASME A112.4.14, ASME A112.18.1/CSA B125.1, ASME B16.34, CSA B125.3, IAPMO Z1157, MSS SP-67, MSS SP-80, MSS SP-110, MSS SP-139 |
| Gray and ductile iron | ASTM A126, AWWA C500, AWWA C504, AWWA C507, MSS SP-42, MSS SP-67, MSS SP-70, MSS SP-71, MSS SP-72, MSS SP-78 |
| Cross-linked polyethylene (PEX) plastic | ASME A112.4.14, ASME A112.18.1/CSA B125.1, CSA B125.3, IAPMO Z1157, NSF 359 |
| Polypropylene (PP) plastic | ASME A112.4.14, ASTM F2389 |
| Polyvinyl chloride (PVC) plastic | ASME A112.4.14, ASTM F1970, MSS SP-122 |
| Stainless Steel | IAPMO Z1157 |

**Add new standard(s) as follows:**

IAPMO Group 4755 E. Philadelphia Street Ontario, CA 91761-USA

**IAPMO**

Z1157-2014e1 Ball Valves

(P10978) (P68-21 Part II AS)

**TABLE P2906.5 WATER DISTRIBUTION PIPE**

|  |  |
| --- | --- |
| **MATERIAL** | **STANDARD** |
| Chlorinated polyvinyl chloride (CPVC) plastic pipe and tubing | ASTM D2846; ASTM F441; ASTM F442/F442M; CSA B137.6 |
| Chlorinated polyvinyl chloride/aluminum/chlorinated polyvinyl chloride (CPVC/AL/CPVC) plastic pipe | ASTM F2855 |
| Copper or copper-alloy pipe | ASTM B42; ASTM B43; ASTM B302 |
| Copper or copper-alloy tubing (Type K, WK, L, WL, M or WM) | ASTM B75/B75M; ASTM B88; ASTM B251; ASTM B447 |
| Cross-linked polyethylene (PEX) plastic tubing | ASTM F876; CSA B137.5 |
| Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pipe | ASTM F1281; ASTM F2262; CSA B137.10 |
| Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE) pipe | ASTM F1986 |
| Galvanized steel pipe | ASTM A53 |
| Polyethylene/aluminum/polyethylene (PE-AL-PE) composite pipe | ASTM F1282 |
| Polyethylene of raised temperature (PE-RT) plastic tubing | ASTM F2769; CSA B137.18 |
| Polypropylene (PP) plastic pipe or tubing | ASTM F2389; CSA B137.11 |
| Stainless steel (Type 304/304L) pipe | ASTM A269; ASTM A312; ASTM A554; ASTM A778 |
| Stainless steel (Type 316/316L) pipe | ASTM A269; ASTM A312; ASTM A554; ASTM A778 |
| Stainless steel (Type 304/304L) tubing | ASTM A269; ASTM A312; ASTM A554; ASTM A778 |
| Stainless steel (Type 316/316L) tubing | ASTM A269; ASTM A312; ASTM A554; ASTM A778 |

**Add new standard(s) as follows:**

ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken, PA 19428

**ASTM**

A554-16 Standard Specification for Welded Stainless Steel Mechanical Tubing

Public Comment 1

**TABLE P2903.9.4 VALVES**

|  |  |
| --- | --- |
| **MATERIAL** | **STANDARD** |
| Chlorinated polyvinyl chloride (CPVC) plastic | ASME A112.4.14, ASME A112.18.1/CSA B125.1, ASTM F1970, CSA B125.3, MSS SP-122 |
| Copper or copper alloy | ASME A112.4.14, ASME A112.18.1/CSA B125.1, ASME B16.34, CSA B125.3, IAPMO Z1157, MSS SP-67, MSS SP-80, MSS SP-110, MSS SP-139 |
| Gray and ductile iron | ASTM A126, AWWA C500, AWWA C504, AWWA C507, MSS SP-42, MSS SP-67, MSS SP-70, MSS SP-71, MSS SP-72, MSS SP-78 |
| Cross-linked polyethylene (PEX) plastic | ASME A112.4.14, ASME A112.18.1/CSA B125.1, CSA B125.3, IAPMO Z1157, NSF 359 |
| Polypropylene (PP) plastic | ASME A112.4.14, ASTM F2389 |
| Polyvinyl chloride (PVC) plastic | ASME A112.4.14, ASTM F1970, MSS SP-122 |
| Stainless Steel | IAPMO Z1157, ASME A112.4.14 |

(P10965) (P68-21 Part II AMPC1)

**TABLE P2906.5 WATER DISTRIBUTION PIPE**

|  |  |
| --- | --- |
| **MATERIAL** | **STANDARD** |
| Chlorinated polyvinyl chloride (CPVC) plastic pipe and tubing | ASTM D2846; ASTM F441; ASTM F442/F442M; CSA B137.6 |
| Chlorinated polyvinyl chloride/aluminum/chlorinated polyvinyl chloride (CPVC/AL/CPVC) plastic pipe | ASTM F2855 |
| Copper or copper-alloy pipe | ASTM B42; ASTM B43; ASTM B302 |
| Copper or copper-alloy tubing (Type K, WK, L, WL, M or WM) | ASTM B75/B75M; ASTM B88; ASTM B251; ASTM B447 |
| Cross-linked polyethylene (PEX) plastic tubing | ASTM F876; CSA B137.5 |
| Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pipe | ASTM F1281; ASTM F2262; CSA B137.10 |
| Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE) pipe | ASTM F1986 |
| Galvanized steel pipe | ASTM A53 |
| Polyethylene/aluminum/polyethylene (PE-AL-PE) composite pipe | ASTM F1282 |
| Polyethylene of raised temperature (PE-RT) plastic tubing | ASTM F2769; CSA B137.18 |
| Polypropylene (PP) plastic pipe or tubing | ASTM F2389; CSA B137.11 |
| Stainless steel (Type 304/304L) pipe | ASTM A269; ASTM A312; ASTM A554; ASTM A778 |
| Stainless steel (Type 316/316L) pipe | ASTM A269; ASTM A312; ASTM A554; ASTM A778 |
| Stainless steel (Type 304/304L) tubing | ASTM A269; ASTM A312; ASTM A554; ASTM A778 |
| Stainless steel (Type 316/316L) tubing | ASTM A269; ASTM A312; ASTM A554; ASTM A778 |

**Add new standard(s) as follows:**

ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken, PA 19428

**ASTM**

A554-16 Standard Specification for Welded Stainless Steel Mechanical Tubing

**Committee Modification:**

|  |  |
| --- | --- |
| TABLE P2906.5 WATER DISTRIBUTION PIPE |  |
| Stainless steel (Type 304/304L) pipe | ASTM A269; ASTM A312; ~~ASTM A554;~~ ASTM A778 |
| Stainless steel (Type 316/316L) pipe | ASTM A269; ASTM A312; ~~ASTM A554;~~ ASTM A778 |
| Stainless steel (Type 304/304L) tubing | ASTM A269; ASTM A312; ~~ASTM A554;~~ ASTM A778 |
| Stainless steel (Type 316/316L) tubing | ASTM A269; ASTM A312; ~~ASTM A554;~~ ASTM A778 |

**(P10965) (P62-21 Part II AM)**

**TABLE P2906.6 PIPE FITTINGS**

|  |  |
| --- | --- |
| **MATERIAL** | **STANDARD** |
| Acrylonitrile butadiene styrene (ABS) plastic | ASTM D2468 |
| Cast iron | ASME B16.4 |
| Chlorinated polyvinyl chloride (CPVC) plastic | ASSE 1061; ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6 |
| Copper or copper alloy | ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.51; ASSE 1061; ASTM  F3226 |
| Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE) | ASTM F1986 |
| Fittings for cross-linked polyethylene (PEX) plastic tubing | ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2098; ASTM F2159;  ASTM F2434; ASTM F2735; CSA B137.5 |
| Gray iron and ductile iron | AWWA C110/A21.10; AWWA C153/A21.53 |
| Malleable iron | ASME B16.3 |
| Insert fittings for Polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked  polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) | ASTM F1281; ASTM F1282; ASTM F1974; CSA B137.9; CSA B137.10 |
| Polyethylene (PE) plastic | ASTM D2609; CSA B137.1 |
| Fittings for polyethylene of raised temperature (PE-RT) plastic tubing | ASSE 1061; ASTM D2683; ASTM D3261; ASTM F1055; ASTM F1807; ASTM F2098; ASTM F2159;  ASTM F2735; ASTM F2769; CSA B137.18 |
| Polypropylene (PP) plastic pipe or tubing | ASTM F2389; CSA B137.11 |
| Polyvinyl chloride (PVC) plastic | ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3 |
| Stainless steel (Type 304/304L) pipe | ASTM A269; ASTM A312; ASTM A554; ASTM A778; ASTM F3226 |
| Stainless steel (Type 316/316L) pipe | ASTM A269; ASTM A312; ASTM A554; ASTM A778; ASTM F3226 |
| Steel | ASME B16.9; ASME B16.11; ASME B16.28; ASTM F3226 |

**Add new standard(s) as follows:**

ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken, PA 19428

**ASTM**

A554-16 Standard Specification for Welded Stainless Steel Mechanical Tubing

**Committee Modification:**

TABLE P2906.6 PIPE FITTINGS

|  |  |
| --- | --- |
| Stainless steel (Type 304/304L) pipe | ASTM A269; ASTM A312; ~~ASTM A554;~~ ASTM A778; ASTM F3226 |
| Stainless steel (Type 316/316L) pipe | ASTM A269; ASTM A312; ~~ASTM A554;~~ ASTM A778; ASTM F3226 |

(P10971) (P63-21 Part II AM)

**TABLE P2906.6 PIPE FITTINGS**

|  |  |
| --- | --- |
| **MATERIAL** | **STANDARD** |
| Acrylonitrile butadiene styrene (ABS) plastic | ASTM D2468 |
| Cast iron | ASME B16.4 |
| Chlorinated polyvinyl chloride (CPVC) plastic | ASSE 1061; ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6 |
| Copper or copper alloy | ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F3226 |
| Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE) | ASTM F1986 |
| Fittings for cross-linked polyethylene (PEX) plastic tubing | ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2098; ASTM F2159; ASTM  F2434; ASTM F2735; ASTM F3347; CSA B137.5 |
| Gray iron and ductile iron | AWWA C110/A21.10; AWWA C153/A21.53 |
| Malleable iron | ASME B16.3 |
| Insert fittings for Polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked  polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) | ASTM F1281; ASTM F1282; ASTM F1974; CSA B137.9; CSA B137.10 |
| Polyethylene (PE) plastic | ASTM D2609; CSA B137.1 |
| Fittings for polyethylene of raised temperature (PE-RT) plastic tubing | ASSE 1061; ASTM D2683; ASTM D3261; ASTM F1055; ASTM F1807; ASTM F2098; ASTM F2159; ASTM  F2735; ASTM F2769; ASTM F3347; CSA B137.18 |
| Polypropylene (PP) plastic pipe or tubing | ASTM F2389; CSA B137.11 |
| Polyvinyl chloride (PVC) plastic | ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3 |
| Stainless steel (Type 304/304L) pipe | ASTM A312; ASTM A778 |
| Stainless steel (Type 316/316L) pipe | ASTM A312; ASTM A778 |
| Steel | ASME B16.9; ASME B16.11; ASME B16.28 |

**Add new standard(s) as follows:**

ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken, PA 19428

**ASTM**

F3347-20a Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

(P11356) (P64-21 Part II AS)

**TABLE P2906.6 PIPE FITTINGS**

|  |  |
| --- | --- |
| **MATERIAL** | **STANDARD** |
| Acrylonitrile butadiene styrene (ABS) plastic | ASTM D2468 |
| Cast iron | ASME B16.4 |
| Chlorinated polyvinyl chloride (CPVC) plastic | ASSE 1061; ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6 |
| Copper or copper alloy | ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F3226 |
| Cross-linked polyethylene/aluminum/high-density polyethylene (PEX-AL-HDPE) | ASTM F1986 |
| Fittings for cross-linked polyethylene (PEX) plastic tubing | ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2098; ASTM F2159; ASTM  F2434; ASTM F2735; ASTM F3347; CSA B137.5 |
| Gray iron and ductile iron | AWWA C110/A21.10; AWWA C153/A21.53 |
| Malleable iron | ASME B16.3 |
| Insert fittings for Polyethylene/aluminum/polyethylene (PE-AL-PE) and cross-linked  polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) | ASTM F1281; ASTM F1282; ASTM F1974; CSA B137.9; CSA B137.10 |
| Polyethylene (PE) plastic | ASTM D2609; CSA B137.1 |
| Fittings for polyethylene of raised temperature (PE-RT) plastic tubing | ASSE 1061; ASTM D2683; ASTM D3261; ASTM F1055; ASTM F1807; ASTM F2098; ASTM F2159; ASTM  F2735; ASTM F2769; ASTM F3347; CSA B137.18 |
| Polypropylene (PP) plastic pipe or tubing | ASTM F2389; CSA B137.11 |
| Polyvinyl chloride (PVC) plastic | ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3 |
| Stainless steel (Type 304/304L) pipe | ASTM A312; ASTM A778 |
| Stainless steel (Type 316/316L) pipe | ASTM A312; ASTM A778 |
| Steel | ASME B16.9; ASME B16.11; ASME B16.28 |

**TABLE M2101.1 HYDRONIC PIPING AND FITTING MATERIALS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **MATERIAL** | **USE CODEa** | **STANDARDb** | **JOINTS** | **NOTES** |
| Acrylonitrile butadiene styrene (ABS) plastic pipe | 1, 5 | ASTM D1527, ASTM F2806, ASTM F2969 | Solvent cement joints | — |
| Chlorinated poly (vinyl chloride) (CPVC) pipe and  tubing | 1, 2, 3 | ASTM D2846 | Solvent cement joints, compression joints and  threaded adapters | — |
| Copper and copper-alloy pipe | 1 | ASTM B42, ASTM B43, ASTM B302 | Brazed, soldered and mechanical fittings  threaded, welded and flanged | — |
| Copper and copper-alloy tubing (Type K, L or M) | 1, 2 | ASME B16.51, ASTM B75, ASTM B88, ASTM B135, ASTM  B251, ASTM B306 | Brazed, soldered, press-connected and flared  mechanical fittings | Joints embedded in concrete shall be  brazed |
| Cross-linked polyethylene (PEX) | 1, 2, 3 | ASTM F876; ASTM F3253 | (See PEX fittings) | Install in accordance with manufacturer’s  instructions |
| Cross-linked polyethylene/ aluminum/cross-  linked polyethylene (PEX-AL-PEX) pressure pipe | 1, 2 | ASTM F1281 or CAN/CSA B137.10 | Mechanical, crimp/insert | Install in accordance with manufacturer’s  instructions |
| PEX fittings | — | ASTM F877, ASTM F1807, ASTM F1960, ASTM F2098,  ASTM F2159, ASTM F2735, ASTM F3253; ASTM F3347 | Copper crimp/insert fittings, cold expansion  fittings, stainless steel clamp, insert fittings | Install in accordance with manufacturer’s  instructions |
| Polybutylene (PB) pipe and tubing | 1, 2, 3 | ASTM D3309 | Heat-fusion, crimp/insert and compression | Joints in concrete shall be heat-fused |
| Polyethylene/aluminum/polyethylene (PE-AL-PE)  pressure pipe | 1, 2, 3 | ASTM F1282, CSA B137.9 | Mechanical, crimp/insert | — |
| Polypropylene (PP) | 1, 2, 3 | ISO 15874, ASTM F2389 | Heat-fusion joints, mechanical fittings,  threaded adapters, compression joints | — |
| Raised temperature polyethylene (PE-RT) | 1, 2, 3 | ASTM F2623, ASTM F2769, CSA B137.18 | Copper crimp/insert fitting, stainless steel  clamp, insert fittings | — |
| Raised temperature polyethylene (PE-RT) fittings | 1, 2, 3 | ASTM D3261, ASTM F1807, ASTM F2098, ASTM F2159,  ASTM F2735, ASTM F2769, ASTM F3347; CSA B137.18 | Copper crimp/insert fitting, stainless steel  clamp, insert fittings | — |
| Steel pipe | 1, 2 | ASTM A53, ASTM A106 | Brazed, welded, threaded, flanged and mechanical fittings | Joints in concrete shall be welded. Galvanized pipe shall not be welded or  brazed. |
| Steel tubing | 1 | ASTM A254 | Mechanical fittings, welded | — |

For SI: °C = [(°F) – 32]/1.8.

* 1. Use code:
     1. Above ground.
     2. Embedded in radiant systems.
     3. Temperatures below 180°F only.
     4. Low temperature (below 130°F) applications only.
     5. Temperatures below 160°F only.
  2. Standards as listed in Chapter 44.

**Add new standard(s) as follows:**

ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken, PA 19428

**ASTM**

ASTM F3347 Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

(M11350) (M99-21 Part II AS)

**P2906.9.1.2 CPVC plastic pipe.** Joint surfaces shall be clean and free from moisture. Joints shall be made in accordance with the pipe, fitting or solvent cement manufacturer’s installation instructions. Where such instructions require a primer to be used, an *approved* primer shall be applied, and a solvent cement, orange in color and conforming to ASTM F493, shall be applied to joint surfaces. Where such instructions allow for a one-step solvent cement, yellow, green, or red in color and conforming to ASTM F493, to be used, the joint surfaces shall not require application of a primer before the solvent cement is applied. The joint shall be made while the cement is wet, and in accordance with ASTM D2846 or ASTM F493. Solvent cement joints shall be permitted above or below ground.

(M11360) (P75-21 Part II AS)

**P2906.9.1.2 CPVC plastic pipe.** Joint surfaces shall be clean and free from moisture. Joints shall be made in accordance with the pipe, fitting or solvent cement manufacturer’s installation instructions.

Solvent cement joints shall be permitted above or below ground.

Where such instructions require a primer to be used, an *approved* primer shall be applied, and a solvent cement, orange in color and conforming to ASTM F493, shall be applied to joint surfaces. The joint shall be made while the cement is wet, and in accordance with ASTM D2855.

Where such instructions allow for a one-step solvent cement, yellow or red in color and conforming to ASTM F493, to be used, the joint surfaces shall not require application of a primer before the solvent cement is applied. The joint shall be made while the cement is wet, and in accordance with ~~ASTM D2846 or ASTM F493~~. ASTM F3328

~~Solvent cement joints shall be permitted above or below ground~~.

**P2906.9.1.3 CPVC/AL/CPVC pipe.** Joint surfaces shall be clean and free from moisture, and an *approved* primer shall be applied. Solvent cement, orange in color and conforming to ASTM F493, shall be applied to all joint surfaces. The joint shall be made while the cement is wet, and in accordance with ~~ASTM D2846 or ASTM F493~~ ASTM D2855. Solvent-cemented joints shall be installed above or below ground.

**Exception:** A primer shall not be required where all of the following conditions apply:

* 1. The solvent cement used is third-party certified as conforming to ASTM F493.
  2. The solvent cement used is yellow in color.
  3. The solvent cement is used only for joining 1/2-inch (12.7 mm) through 1-inch (25 mm) diameter CPVC/AL/CPVC pipe and CPVC fittings.
  4. The CPVC fittings are manufactured in accordance with ASTM D2846.
  5. The joint is made in accordance with ASTM F3328.

**Add new standard(s) as follows:**

ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken, PA 19428

**ASTM**

D2855-20 Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets

F3328-19 Standard Practice for the One-Step (Solvent Cement Only) Method of Joining Poly(Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets

(M11980) (P74-21 Part II AS)/ (P10983) (P76-21 Part II AS)

Delete Section P2912.1.1 as follows:

**~~P2912.1.1 Alternate compliance path.~~** ~~Systems for nonpotable uses that comply with CSA B805/ICC 805 are deemed to comply with Section P2912.~~

F/AC-FBC-R - Ch.29 – Errata #4

**Chapter 30 Sanitary Drainage**

**TABLE P3002.1(1) ABOVE-GROUND DRAINAGE AND VENT PIPE**

|  |  |
| --- | --- |
| **MATERIAL** | **STANDARD** |
| Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters, including schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular  core or composite wall | ASTM D2661; ASTM D2680; ASTM F628; ASTM F1488;  CSA B181.1 |
| Cast-iron pipe | ASTM A74; ASTM A888; CISPI 301 |
| Copper or copper-alloy pipe | ASTM B42; ASTM B43; ASTM B302 |
| Copper or copper-alloy tubing (Type K, L, M or DWV) | ASTM B75/B75M; ASTM B88; ASTM B251/B251M; ASTM  B306 |
| Galvanized steel pipe | ASTM A53/A53M |
| Polyolefin pipe | ASTM F3371; CSA B181.3 |
| Polyvinyl chloride (PVC) plastic pipe in IPS diameters, including schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or  composite wall | ASTM D2665; ASTM F891; ASTM F1488; CSA B181.2 |
| Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D. and a solid, cellular core or composite wall | ASTM D2949; ASTM F1488 |
| Stainless steel drainage systems, Types 304 and 316L | ASME A112.3.1 |

For SI: 1 inch = 25.4 mm.

**TABLE P3002.1(2) UNDERGROUND BUILDING DRAINAGE AND VENT PIPE**

|  |  |
| --- | --- |
| **PIPE** | **STANDARD** |
| Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters, including schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or  composite wall | ASTM D2661; ASTM F628; ASTM F1488; CSA  B181.1 |
| Cast-iron pipe | ASTM A74; ASTM A888;CISPI 301 |
| Copper or copper-alloy tubing (Type K, L, M or DWV) | ASTM B75/B75M; ASTM B88; ASTM B251; ASTM  B306 |
| Polyethylene (PE) plastic pipe (SDR-PR) | ASTM F714 |
| Polyolefin pipe | ASTM F714; ASTM F1412; ASTM F3371; CSA  B181.3 |
| Polyvinyl chloride (PVC) plastic pipe in IPS diameters, including schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite  wall | ASTM D2665; ASTM F891; ASTM F1488; CSA  B181.2 |
| Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D. and a solid, cellular core or composite wall | ASTM D2949; ASTM F1488 |
| Stainless steel drainage systems, Type 316L | ASME A112.3.1 |

For SI: 1 inch = 25.4 mm.

**TABLE P3002.2 BUILDING SEWER PIPE**

|  |  |
| --- | --- |
| **MATERIAL** | **STANDARD** |
| Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters, including schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular  core or composite wall | ASTM D2661; ASTM F628; ASTM F1488 |
| Acrylonitrile butadiene styrene (ABS) plastic pipe in sewer and drain diameters, including SDR 42 (PS 20), PS35, SDR 35 (PS 45), PS50, PS100,  PS140, SDR 23.5 (PS 150) and PS200; with a solid, cellular core or composite wall | ASTM D2751; ASTM F1488 |
| Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters, including PS 25, SDR 41 (PS 28), PS 35, SDR 35 (PS 46), PS 50, PS 100, SDR 26  (PS 115), PS140 and PS 200; with a solid, cellular core or composite wall | ASTM D3034; ASTM F891; ASTM F1488; CSA B182.2;  CSA B182.4 |
| Cast-iron pipe | ASTM A74; ASTM A888; CISPI 301 |
| Concrete pipe | ASTM C14; ASTM C76; CSA 8—93; CSA A257.2 |
| Copper or copper-alloy tubing (Type K or L) | ASTM B75/B75M; ASTM B88; ASTM B251/B251M |
| Polyethylene (PE) plastic pipe (SDR-PR) | ASTM F714 |
| Polyolefin pipe | ASTM F1412; ASTM F3371:CSA B181.3 |
| Polyvinyl chloride (PVC) plastic pipe in IPS diameters, including schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with solid, cellular core or  composite wall | ASTM D2665; ASTM D2949; ASTM D3034; ASTM  F1412; CSA B182.2; CSA B182.4 |
| Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D. and a solid, cellular core or composite wall | ASTM D2949, ASTM F1488 |
| Stainless steel drainage systems, Types 304 and 316L | ASME A112.3.1 |
| Vitrified clay pipe | ASTM C425; ASTM C700 |

For SI: 1 inch = 25.4 mm.

**P3003.11.1 Heat-fusion joints.** Heat-fusion joints for polyolefin pipe and tubing joints shall be installed with socket-type heat-fused polyolefin fittings or electrofusion polyolefin fittings. Joint surfaces shall be clean and free from moisture. The joint shall be undisturbed until cool. Joints shall be made in accordance with ASTM F1412, ASTM F3371. or CSA B181.3.

**Add new standard(s) as follows:**

ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken, PA 19428

**ASTM**

F3371-19 Standard Specification for Polyolefin Pipe and Fittings for Drainage, Waste, and Vent Applications

(P11026) (P120-21 Part II AS)

**P3003.9.2 Solvent cementing.** Joint surfaces shall be clean and free from moisture. A purple primer, or other *approved* primer, that conforms to ASTM F656 shall be applied. Solvent cement not purple in color and conforming to ASTM D2564, CSA B137.3 or CSA B181.2 shall be applied to all joint surfaces. The joint shall be made while the cement is wet, and shall be in accordance with ASTM D2855.

Solvent-cement joints shall be installed above or below ground.

**Exception:** A primer shall not be required where all of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM D2564.
2. The solvent cement is used only for joining PVC drain, waste and vent pipe and fittings in non-pressure applications in sizes up to and including 4 inches (102 mm) in diameter
3. The joint is made in accordance with ASTM F3328.

**Add new standard(s) as follows:**

ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken, PA 19428

**ASTM**

F3328-19 Standard Practice for the One-Step (Solvent Cement Only) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets

(P11024) (P117-21 Part II AS)

Add a new section P3012 to read as follows:

**SECTION P3012**

**REHABILITATION OF BUILDING SEWERS AND BUILDING DRAINS**

**P3012.1 Cured-in-place.** Cured-in-place rehabilitation of building sewers and building drainage piping shall be in accordance with ASTM F1216 – 2022 or ASTM F1743 - 2022.

P-FBC-P-Ch.7-Glitch #2

**Chapter 31 Vents**

**P3101.5 Flood resistance.** In flood hazard areas as established by Table R301.2, vents shall be located at or above the elevation required in Section ~~R322.1~~ R322.2 (flood hazard areas including A Zones) or~~R322.2~~ R322.3 (coastal high-hazard areas including V Zonesand Coastal A Zones, where designated).

(SP11629) (RP11-21 AS)

**Chapters 33– 44**

No change

**Chapter 45 - Private Swimming Pool**

Revise Sections R4501.6.3 and R4501.6.6 to read as follows:

**R4501.6.3 Water velocity.** Pool piping shall be designed so the water velocity will not exceed 10 feet per second (3048 mm/s) for pressure piping and 8 feet per second (2438 mm/s) for suction piping, except that the water velocity shall not exceed 8 feet per second (2438 mm/s) in

copper tubing. Main suction outlet velocity must comply with ANSI/~~APSP~~ PHTA/ICC 7.

**Exception:** Jet inlet fittings shall not be deemed subject to this requirement.

**R4501.6.6 Entrapment protection.** Entrapment protection for suction outlets shall be installed in accordance with requirements of ANSI/~~APSP~~ PHTA/ICC 7.

**Supplement 4 – Errata**

**Chapter 46 Reference Standards**

Update standard edition for UL/CSA/ANCE 60335-2-40 as follows:

UL/CSA/ANCE 60335-2-40—~~2012~~2019

Supplement 4 – Glitch

**Also see attached**

**APPENDIX J EXISTING BUILDINGS AND STRUCTURES**

**SECTION AJ110 ADDITIONS**

**AJ110.1 Additions to an existing building.** Where *existing buildings* with the addition are within the scope of the International

Residential Code, additions shall comply with this section and other applicable provisions of this code. Engineered design in accordance with Section R301.1.3 shall be permitted to meet the requirements of this section.

**AJ110.2 Structure for Horizontal Additions.** Where an *addition* involves new construction attached to an *existing building*, the new construction shall meet all of the structural requirements of this code for new construction. Alterations to the *existing building* shall comply with the requirements governing alterations within this code. In wood light-frame additions, connection of the structural components shall be permitted to be provided using wall top plates and addition studs that abut the *existing building*. Wall top plates shall be lapped and spliced in accordance with Section R602.3. Abutting studs shall be fastened in accordance with Section 602.3.

**Exception:** The addition structure shall be permitted to be connected to the *existing building* in accordance with accepted engineering practice.

**AJ110.3 Structure for Vertical Additions.** Where an *addition* involves new construction that adds a story to any part of the *existing building* or vertically increases the height of any part of the *existing building*, the new construction and the existing building together shall be shown to comply with or altered to comply with all of the structural requirements of this code for new construction.

**Exception**: Where the new structure and the existing structure together are evaluated in accordance with accepted engineering practice and are shown to be sufficient to support the combined loads from the new structure and existing structure, no structural alterations are required.

(F11489) (RB163-22 AMPC1)

**APPENDIX R LIGHT STRAW-CLAY CONSTRUCTION**

**AR101.2 Flood hazard areas.** In flood hazard areas established in Table R301.2, buildings using light straw-clay infill shall meet the requirements of Section R322.

(P11596) (RB302-22 AM)

**APPENDIX S STRAWBALE CONSTRUCTION**

**AS101.2 Flood hazard areas.** In flood hazard areas established in Table R301.2, buildings using strawbale wall systems shall meet the requirements of Section R322.

(SP11597) (RB304-22 AS)

**AS106.6.1 Compressive strength.** For plaster on *strawbale* structural walls, the *building official* is authorized to require a 2-inch (51mm) cube test conforming to ASTM C109 to demonstrate a minimum compressive strength in accordance with Table AS106.6.1. For natural hydraulic lime (NHL) plasters, the compressive strength in the NHL manufacturer's specifications is permitted to be used to satisfy the requirements in Table AS106.6.1, when the plaster mix used for the project is identical to that in the manufacturer's specifications.

(S11599) (RB307-22 AS)

**APPENDIX W 3D-PRINTED BUILDING CONSTRUCTION**

**AW101.1 Scope.** Buildings, structures and building elements fabricated in whole or in part using 3D-printed construction techniques shall be designed, constructed and inspected in accordance with the provisions contained in this appendix and other applicable requirements in this code.

**Exception:** This Appendix shall not be applicable to 3D printed buildings constructed of concrete.

(S11603) (RB312-22 AS)

**AW103.1 Fabrication process.** The process used to fabricate the 3D-printed building construction shall be evaluated by an approved agency in accordance with UL 3401.

**~~AW103.1~~ AW103.2 Design organization.** 3D-printed buildings, structures and building elements shall be designed by a registered design professional based on a report of findings prepared *by approved agency* ~~an organization certified~~ in accordance with UL 3401. ~~by an~~ *~~approved~~* ~~agency and approved by the building official in accordance with this section~~.

**~~AW103.2~~ AW103.3 Design approval.** The structural design, *construction documents* and UL 3401 report of findings shall be submitted for review and approval in accordance with Section 104.11 of the *Florida Building Code, Building.*

(S11604) (RB313-22 AMPC1)

**APPENDIX AU COB CONSTRUCTION (MONOLITHIC ADOBE)**

**Add new definition as follows:**

**BUCK.** A frame, typically wood, anchored in a wall system, that creates the rough opening into which a window or door frame is installed.

**Revise as follows:**

**COB.** A composite building material consisting of refined *clay* or *clay subsoil* wet-mixed with loose straw and sometimes sand. ~~Also known~~ ~~as “Monolithic adobe.”~~

**COB CONSTRUCTION.** A wall system of layers or lifts of moist cob placed to create monolithic walls, typically without formwork.Also known as "Monolithic Adobe."

**UNSTABILIZED.** ~~A cob~~ *Cob* or other earthen material that does not contain admixtures such as Portland cement, lime, asphalt emulsion or oil.

**AU103.8 Drying holes.** Where holes to facilitate drying are used, such holes shall bepermitted to beof any depth andshall not exceed ~~exceeding~~ 3/4 inch (19 mm) in diameter ~~on the face of~~ *~~cob~~* ~~walls~~. Drying holes shall not be spaced closer than 10 hole-diameters, and. ~~Drying holes~~ shall not be placed in *braced wall panels*. The design load on *load-bearing walls* with drying holes shall not exceed 90 percent of the allowable bearing capacity as determined in accordance with Section AU106.8. Drying holes shall be filled with *cob* before final inspection.

**AU104.1.2 Exterior wall finishes.** Where installed, exterior wall *finishes* shall be *plasters* in accordance with Section AU104.4, nonplaster exterior wall coverings in accordance with Section R703, or other *finish* systems in accordance with the following:

* 1. Specifications and details of the *finish* system’s ~~means of~~ attachment to the wall or its independent support, andof its means of draining or evaporating water that penetrates the exterior *finish,* shall be ~~provided~~*approved*.
  2. The vapor permeance of the combination of *finish* materials shall be 5 perms or greater to allow the transpiration of water vapor from the wall.
  3. *Finish* systems with weights greater than 10 pounds per square foot (48.9 kg/m) and less than or equal to 20 pounds per square foot (97.8 kg/m) of wall area shall require that the minimum total length of *cob braced wall panels* in Table AU106.11(3) be multiplied by a factor of 1.2.
  4. *Finish* systems with weights greater than 20 pounds per square foot (97.8 kg/m) of wall area shall require an engineered design.

**AU104.4 Plaster.** *Plaster* applied to *cob* walls shall be any type described in this section.*Plaster* thickness shall not exceed 3 inches (76 mm) on each face except ~~where~~with an *approved* engineered design ~~is provided~~.

**AU104.4.1 Plaster and membranes.** *Plaster* shall be applied directly to *cob* walls to facilitate transpiration of moisture from the walls and to secure a mechanical bond between the *plaster* and the *cob*, and shall comply with Section AU105.4.1. ~~A membrane shall not be located~~ ~~between the~~ *~~cob~~* ~~wall and the~~ *~~plaster~~*~~.~~

**AU105.2 Building limitations and requirements for cob wall construction.***Cob* walls shall be subject to the following limitations and requirements:

1. Number of stories: not more than one.
2. Building height: not more than 20 feet (6096 mm).
3. *Seismic design categories*: limited to use in *Seismic Design Categories* A, B and C, except~~where~~with an *approved* engineered design ~~is provided~~.
4. Wall height: in accordance with Table AU105.3, and with Table AU106.11(1) for*braced wall panels*.
5. Wall thickness, excluding *finish*, shall be not less than 10 inches (254 mm), not greater than 24 inches (610 mm) at the top two- thirds, not limited at the bottom third and, for structural walls, shall comply with Section AU106.2, Item 2. Wall taper is permitted in accordance with Section AU106.5, Item 1.
6. Interior *cob* walls shall require an *approved* engineered design that accounts for the seismic load of the interior*cob* walls, except in Seismic Design Category A for walls with a height to thickness ratio less than or equal to to 6.

**TABLE AU105.3 OUT-OF-PLANE RESISTANCE METHODS AND UNRESTRAINED WALL HEIGHT LIMITS**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **WALL TYPEa, g, h AND METHOD OF OUT-OF-PLANE LOAD RESISTANCE** | **FOR ULTIMATE DESIGN WIND SPEEDS (mph)** | **FOR SEISMIC DESIGN CATEGORIES** | **UNRESTRAINED COB WALL HEIGHT *H* b, c** | | **TOP ANCHORe SPACING**  **(inches)** | **TENSION TIEf SPACING**  **(inches)** |
| **Absolute Limit (feet)** | **Limit Based on Wall Thickness *T* d (feet)** |
| Wall 1i: no anchors, no steel wall reinforcing | ≤ 110 | A | *H* ≤ 8 | *H* ≤ 6*T* | None | 48 |
| Wall 2: top anchors,j continuous vertical 6″ × 6″ × 6″ gage steel mesh in center of wall embedded in foundation 12 inches | ≤ 140 | A, B, C | *H* ≤ 8 | *H* ≤ 8*T* | 12 | 24 |
| Wall Ai: top anchors, no vertical steel reinforcing | ≤ 120 | A, B | *H* ≤ 8 | *H* ≤ 6*T* | 12 | 48 |
| Wall Bi: top and bottom anchors, no vertical steel reinforcing | ≤ 130 | A, B | *H* ≤ 8 | *H* ≤ 6*T* | 12 | 48 |
| Wall C: top and bottom anchors, continuous vertical threaded rod at 4 feet on center embedded in foundation and connected to bond beam | ≤ 140 | A, B, C | *H* ≤ 8 | *H* ≤ 8*T* | 12 | 24 |
| Wall D: continuous vertical threaded rod at 1 foot on center embedded in foundation and connected to bond beam | ≤ 140 | A, B, C | *H* ≤ 8 | *H* ≤ 8*T* | N/A | 24 |
| Wall E: top anchors, continuous vertical 6″ × 6″ × 6″ gage steel mesh 2 inches from each face of wall embedded in foundation | ≤ 140 | A, B, C | *H* ≤ 8 | *H* ≤ 8*T* | 12 | 24 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s.

N/A = Not Applicable

* 1. See Table AU106.11(1) for reinforcing and anchorage specifications for wall Types A, B, C, D and E.
  2. *H* = height of the cob portion of the wall only. See Figure AU101.4. The maximum*H* is the absolute limit or the limit based on wall thickness, whichever is more restrictive.
  3. Bond beams or other horizontal restraints are~~capable of separating~~permitted to divide a wall into more than one unrestrained wall height with an *approved* engineered design.
  4. *T* = Cob wall thickness (in feet) at its minimum, without plaster.
  5. 5/8-inch threaded rod anchors at prescribed spacing with 12-inch embedment in cob, full embedment in concrete bond beams or full penetration in wood bond beam with a nut and washer.
  6. Attach rafters to bond beam with 4-inch by 3-inch by 3-inch by 18 gage tension tie angles at prescribed spacing. See Figure AU106.9.5. Where rafters are attached to tension ties, roof sheathing shall be edge nailed.
  7. All walls shall be tested for compressive strength in accordance with Section AU106.6.
  8. For curved walls with an arc length (ARCc) to radius(Rc) ratio of 1.5:1 or greater, the *H*/*T* factor shall be increased by 1, and the absolute height limit by 1 foot.See Section AU106.11.3.
  9. Wall type requires a modulus of rupture test in accordance with Section AU106.7.
  10. See wall Type A in Table AU106.11(1) for top anchor requirements.

**AU105.4.1 ~~Water-resistant~~ Water-resistive barriers and vapor permeance.** *Cob* walls shall be constructed without a membrane barrier ~~between the~~ *~~cob~~* ~~wall and~~ *~~plaster~~* ~~to facilitate transpiration of water vapor from the wall, and to secure a mechanical bond between the~~*~~cob~~* ~~and~~ *~~plaster~~*~~,~~ except as otherwise required elsewhere in this appendix. Where a~~water-resistant~~ water-resistive barrier is placed behind an exterior *finish*, it shall be considered part of the *finish* system and shall comply with Item 2 of Section AU104.1.2 for the combined vapor permeance rating.

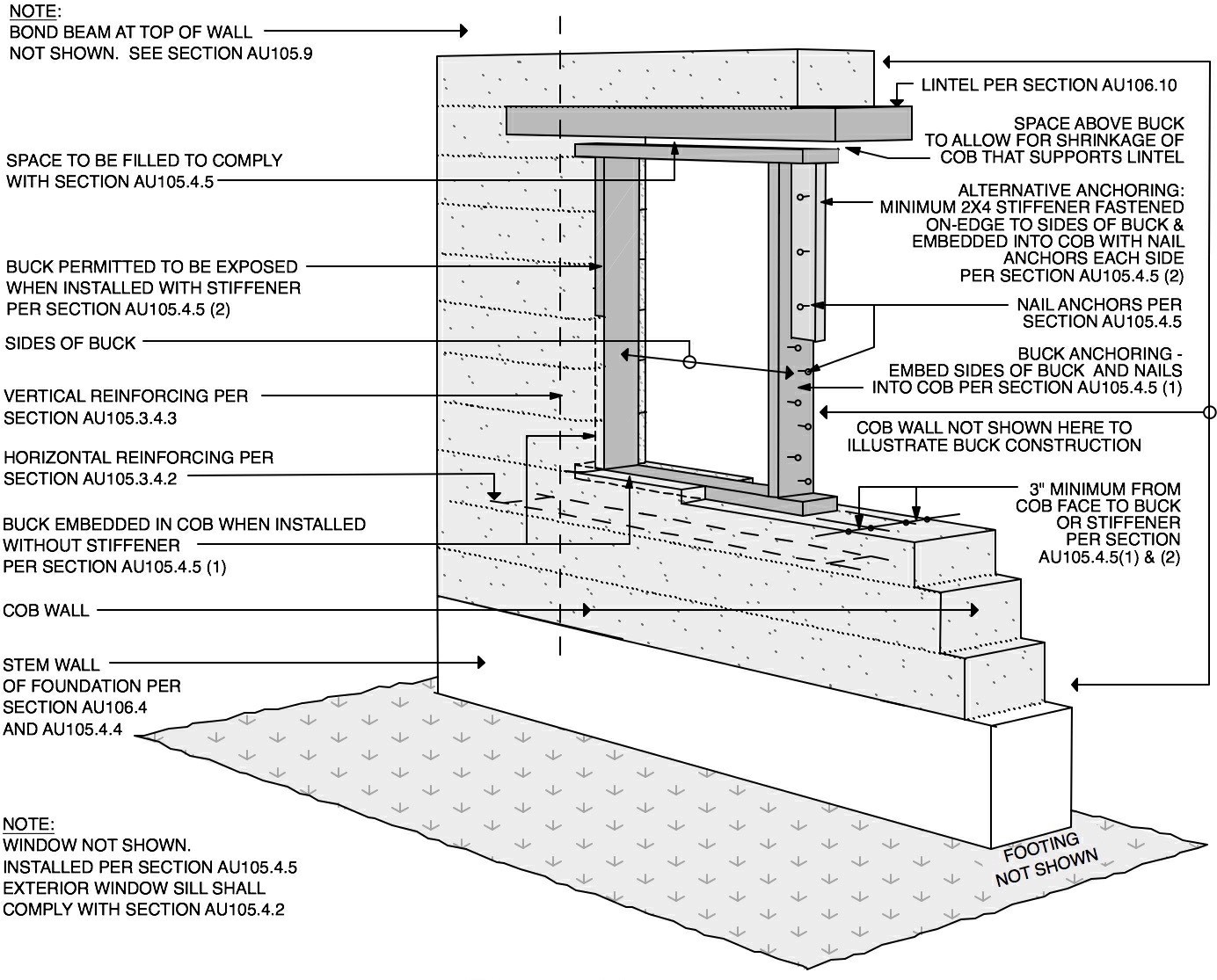
**AU105.4.2 Horizontal surfaces.** *Cob* walls and other *cob* elements shall be provided with a ~~water-resistant~~water-resistive barrier at weather-exposed horizontal surfaces. The ~~water-resistant~~water-resistive barrier shall be of a material and installation that will prevent erosion and prevent water from entering the wall system. Horizontal surfaces, including exterior window sills, sills at exterior niches and exterior buttresses, shall be sloped not less than 1 unit vertical in 12 units horizontal to drain away from *cob* walls or other *cob* elements.

**AU105.4.5 Installation of windows and doors.** Windows and doors shall be installed in accordance with the manufacturer’s instructions to a wood~~en frame~~*buck* of not less than nominal 2-inch by 4-inch (51 mm by 102 mm) wood members. The installation of windows and doors and their bucks shall prevent the passage of air and water into or through the wall system. ~~anchored into the~~ *~~cob~~* ~~wall with 16d galvanized~~ ~~nails half-driven at a maximum 6-inch (152 mm) spacing, with the protruding half embedded in the~~ *~~cob~~*~~. The wood frame shall be embedded~~ ~~not less than 1~~1/2 inches (38 mm) in the *cob* and shall be set in from each face of the wall not less than 3 inches (76 mm). Alternative ~~window and door installation methods shall be capable of resisting the wind loads in Table R301.2.1(1). Windows and doors in~~ *~~cob~~* ~~walls~~ ~~shall be installed so as to mitigate the passage of air or moisture into or through the wall system.~~ Window sills shall comply with Section AU105.4.2.Window and door bucks shall be installed in accordance with Figure AU105.4.5 and one of the following methods:

1. Side members of the *bucks* shall be anchored into the cob wall by embedding the protruding half of half-driven 16d galvanized nails at a maximum 6-inch (152mm) spacing. The buck shall be embedded into the cob not less than 1½ inches (38mm) and set in from each face of the wall not less than 3 inches (76mm).
2. Wood stiffeners not less than nominal 2-inch by 4-inch (51mm by 102mm) shall be attached on-edge to the sides of the*buck* and embedded in the cob wall a minimum of 3½ inches (89mm). Stiffeners shall anchor into the cob wall with the protruding end of half- driven 16d galvanized nails at a maximum 6-inch (152mm) spacing. Stiffeners shall be set back not less than 3 inches (76mm) from each wall face. Bucks are permitted to be exposed and do not require anchoring nails when stiffeners are used with this method.
3. Other *approved* methods satisfying the performance requirements of Section AU105.4.5.

**Exception:** Windows and unframed glass shall be permitted to be embedded directly into a cob wall with an*approved* design.

**Add new text as follows:**



**FIGURE AU105.4.5 WINDOW INSTALLATION (DOOR INSTALLATION SIMILAR)**

**Revise as follows:**

**AU106.1 General.** *Cob* structural walls shall be in accordance with the prescriptive provisions of this section. Designs or portions of designs not complying with this section shall require an *approved* design by a *registered design professional* except where an engineered design is required.

**AU106.6 Compressive strength of cob structural and nonstructural walls.** All *cob* walls shall have a minimum compressive strength of 60 psi (414 kPa)~~. Cob~~, and *cob* in walls used as *braced wall panels* shall have a minimum compressive strength of 85 psi (586 kPa)except with an approved engineered design.

**AU106.8.2 Support of concentrated loads.** Concentrated roof and ceiling loads shall be distributed by structural elements capable of distributing the loads to the *cob load-bearing wall* and within its allowable bearing capacity as determined in accordance with Section AU106.8. Concentrated loads over lintels or over bond beams spanning openings shall require an *approved* ~~engineered~~ design by

a *registered design professional*.

**AU109.2 Thermal resistance.** The unit *R*-value for *cob* walls with a density of 110 pounds per cubic foot (1762 kg/m3) shall be R-0.22 (RSI 0.0387) per inch of *cob* thickness. The unit *R*-value for cob walls with a density of 75 pounds per cubic foot (1762kg/m3) shall be R-0.54 (RSI 0.095) per inch of cob thickness. Linear interpolation is permitted. Extrapolation is not permitted. Walls that vary in thickness along their height or length shall use the average thickness of the wall to determine its *R*-value. The thermal resistance values of air films and

finish materials or additional insulation shall be added to the cob wall's thermal resistance value to determine the *R*-value of the wall assembly. Cob density shall be measured at equilibrium moisture content.

(S11601) (RB309-22 AS)

**Revise as follows:**

**AU108.1 Fire-resistance rating.** *~~Cob~~* ~~walls are not fire-resistance rated.~~ Cob walls that comply with Table AU108.1 shall be considered to provide a two-hour fire-resistance rating.

**Add new text as follows:**

**TABLE AU108.1 TWO-HOUR FIRE-RESISTANCE RATED COB WALLS**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Allowable**  **superimposed load (plf)** | **Densitya (pcf)** | | **Minimum compressive strength per Section AU106.6.1 (psi)** | | **Wall type reinforcementper Table AU105.3** | **Minimum thicknessc at top of** | **Minimum thicknessc at bottom of** | |
|  |  | **wall (inches)** | **wall (inches)** | |
|  |
| 1,200 | 100 | | 85 | | E | 9 | 12 | |
| 475 | 50 pcf for the top 40 inches of wall height, maximum | | 40b | | E or F | 8 | 12 |  |
|  |  |  |
| 70 pcf for the top 80 inches of wall height, maximum | | 55b | |
| non load-bearing | 50 to 100d | | >60 psi  <60 psib | | E or F | 9 | 9 | |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound = 0.45 kg

* 1. Density is to be measured at equilibrium moisture content. Average wall density shall be within +/- 5 pcf of the tabulated value.
  2. Requires an *approved* engineered design per Section AU106.6.
  3. Cob thickness only. The interior and exterior cob faces shall be permitted to be unfinished or receive any plaster finish allowed by this appendix.
  4. Cob walls with more than one density shall be built with heavier densities below lighter densities.

**Revise as follows:**

**TABLE AU105.3 OUT-OF-PLANE RESISTANCE METHODS AND UNRESTRAINED WALL HEIGHT LIMITS**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **WALL TYPEa, g, h AND METHOD OF OUT-OF-PLANE LOAD RESISTANCE** | **FOR ULTIMATE DESIGN WIND SPEEDS (mph)** | **FOR SEISMIC DESIGN CATEGORIES** | **UNRESTRAINED COB WALL HEIGHT *H* b, c** | | **TOP ANCHORe SPACING**  **(inches)** | **TENSION TIEf SPACING**  **(inches)** |
| **Absolute Limit (feet)** | **Limit Based on Wall Thickness *T* d (feet)** |
| Wall 1i: no anchors, no steel wall reinforcing | ≤ 110 | A | *H* ≤ 8 | *H* ≤ 6*T* | None | 48 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Wall 2: top anchors,j continuous vertical 6″ × 6″ × 6″ 6-inch x 6-inch 6- gage steel mesh in center of wall embedded in foundation 12 inches | ≤ 140 | A, B, C | *H* ≤ 8 | *H* ≤ 8*T* | 12 | 24 |
| Wall Ai: top anchors, no vertical steel reinforcing | ≤ 120 | A, B | *H* ≤ 8 | *H* ≤ 6*T* | 12 | 48 |
| Wall Bi: top and bottom anchors, no vertical steel reinforcing | ≤ 130 | A, B | *H* ≤ 8 | *H* ≤ 6*T* | 12 | 48 |
| Wall C: top and bottom anchors, continuous vertical threaded rod at 4 feet on center embedded in foundation and connected to bond beam | ≤ 140 | A, B, C | *H* ≤ 8 | *H* ≤ 8*T* | 12 | 24 |
| Wall D: continuous vertical threaded rod at 1 foot on center embedded in foundation and connected to bond beam | ≤ 140 | A, B, C | *H* ≤ 8 | *H* ≤ 8*T* | N/A | 24 |
| Wall E: top anchors, continuous vertical 6″ × 6″ × 6″ 6-inch x 6-inch 6- gage steel mesh 2 inches from each face of wall embedded in foundation | ≤ 140 | A, B, C | *H* ≤ 8 | *H* ≤ 8*T* | 12 | 24 |
| Wall F: top anchors, continuous vertical 6-inch × 6-inch 10-gage steel mesh 2 inches from each face of wall embedded in foundation | ≤ 140 | A, B, C | *H ≤ 8* | *H ≤ 8T* | 12 | 24 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s.

N/A = Not Applicable

1. See Table AU106.11(1) for reinforcing and anchorage specifications for wall Types A, B, C, D and E.
2. *H* = height of the cob portion of the wall only. See Figure AU101.4. The maximum*H* is the absolute limit or the limit based on wall thickness, whichever is more restrictive.
3. Bond beams or other horizontal restraints are capable of separating a wall into more than one unrestrained wall height with an approved engineered design.
4. *T* = Cob wall thickness (in feet) at its minimum, without plaster.
5. 5/8-inch threaded rod anchors at prescribed spacing with 12-inch embedment in cob, full embedment in concrete bond beams or full penetration in wood bond beam with a nut and washer.
6. Attach rafters to bond beam with 4-inch by 3-inch by 3-inch by 18 gage tension tie angles at prescribed spacing. See Figure AU106.9.5. Where rafters are attached to tension ties, roof sheathing shall be edge nailed.
7. All walls shall be tested for compressive strength in accordance with Section AU106.6.
8. For curved walls with an arc length to radius ratio of 1.5:1 or greater, the*H*/*T* factor shall be increased by 1, and the absolute height limit by 1 foot.
9. Wall type requires a modulus of rupture test in accordance with Section AU106.7.
10. See wall Type A in Table AU106.11(1) for top anchor requirements.

*Public Comment 1*

**Modify as follows:**

2021 International Residential Code

**AU108.1 Fire-resistance rating.** Cob walls that comply with Table AU108.1 ~~shall be considered to provide~~ have a two-hour fire-resistance rating.

**TABLE AU108.1 TWO-HOUR FIRE-RESISTANCE RATED COB WALLS**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Allowable superimposed load**  **(plf)** | **Densitya, d (pcf)** | **Minimum compressive strength per Section AU106.6.1 (psi)** | | **Wall type reinforcement per Table AU105.3** | **Minimum thicknessc, e,f at**  **top of wall (inches)** | **Minimum thicknessc, e, f at**  **bottom of wall (inches)** |
| 1,200 | 100 | 85 | | E | 9 | 12 |
| 475 | ≥ 50 pcf: top of wall to for the top 40 inches from top of  wall height, maximum. | 40b | | E or F | 8 | 12 |
| ≥ 70 pcf: 40 inches from for the top of wall to 80 inches from top of wall height, maximum. | 55b | |
| ≥ 90 pcf: 80 inches from top of wall to bottom of wall. | 85 |  |
|  |
| non load-bearing | 50 to 100d | >≥ 60 psi  < 60 psib | | E or F | 9 | 9 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound = 0.45 kg

1. Density is to be measured at equilibrium moisture content. Average wall density shall be within +/- 5 pcf of the tabulated value.
2. Requires an *approved* engineered design per Section AU106.6.
3. Cob thickness only. The interior and exterior cob faces shall be permitted to be unfinished or receive any plaster finish allowed by this appendix.
4. Cob walls with more than one density shall be built with heavier densities below lighter densities.
5. Minimum cob wall thickness shall be whichever is greater in Table AU105.3, Table AU106.11(1) and Table AU108.1.
6. Wall thicknesses less than 10" require an engineered design.

(S11602) (RB310-22 AMPC1) Review

**Revise as follows:**

**AU105.3.4.2 Horizontal reinforcing.** Two-inch by 2-inch (51 mm by 51 mm) 14-gage galvanized steel mesh shall be embedded 4 inches (102 mm) in the *cob* ~~above the rough opening and~~ below the rough opening for windows, and shall extend 12 inches (305 mm) beyond the sides of the opening. Walls below rough window openings greater than 4 feet 6 inches (1372 mm) in height shall be provided with additional horizontal reinforcing at midheight.

**AU106.6.1 Demonstration of compressive strength.** The compressive strength of the *cob* mix to be used in structural walls and *nonstructural walls* as required in Section AU106.6 shall be demonstrated to the building official before the placement of *cob* onto walls, with compressive strength tests and an associated report by an *approved* laboratory or with an *approved* on-site test as follows:

* 1. Five samples of the proposed cob mix shall be placed moist to completely fill a 4-inch by 4-inch by~~4-inch~~8-inch (102 mm by 102 mm by ~~102~~ 203 mm) form and dried to ambient moisture conditions.
  2. Samples shall not be oven dried.
  3. ~~Any opposite~~ The 4-inch by 4-inch (102 mm by 102 mm) faces shall be ~~faced~~ capped with plaster of paris i~~f needed~~ to achieve smooth, parallel faces, after which the sample shall reach ambient moisture conditions before testing.
  4. Samples shall be constructed, dried, and tested with the long dimension vertical.
  5. ~~4.~~ The horizontal cross section of the dried sample as tested, and the maximum applied load at failure shall be used to calculate the sample’s compressive strength.
  6. ~~5.~~ The fourth-lowest value shall be used to determine the mix’s compressive strength.

**AU106.8 Bearing capacity.** The allowable bearing capacity for *cob load-bearing walls* supporting vertical roof and/or ceiling loads imposed in accordance with Section R301 shall not exceed 2200 plf and shall be determined by Equation AU-2. Use of bearing capacities determined with Equation AU-2 exceeding 2200 plf requires an *approved* design prepared by a *registered design professional* that accounts for buckling.



*BC* = Allowable bearing capacity of wall (in pounds per lineal foot of wall).

*C* = Compressive strength (in psi) as determined in accordance with Section AU106.6.

*Tmin* = Thickness of wall (in ~~feet~~inches) at its minimum.

*H* = Height of *cob* portion of wall (in feet).

*Tavg* = Average thickness of wall (in ~~feet~~inches).

*D* = Density of *cob* = 110 (in pounds per cubic foot), unless a lesser value at equilibrium moisture content is demonstrated.

**(Equation AU-**

**2)**

(S11600) (RB308-22 AS)