with 780 CMR 5315.4.2. During the entire test, the interior finish shall comply with 780 CMR 5315.4.3

1. During the 40 kW exposure, flames shall not spread to the ceiling.

2. During the 160 kW exposure, the interior finish shall comply with the following:

2.1. Flame shall not spread to the outer extremity of the sample on any wall or ceiling.

2.2. Flashover, as defined in NFPA 286, shall not occur.

3. The total smoke released throughout the NFPA 286 test shall not exceed 1,000 m^2.

5315.5 Department of Mental Health Facilities. Any building or structure subject to licensure by the Department of Mental Health (DMH) pursuant to 104 CMR 28.00 or operated by DMH, shall be subject to the interior finish requirements specified in 780 CMR: *The Massachusetts State Building Code* Base Volume for Group R-4.

780 CMR 5316 INSULATION

(also see 780 CMR 61.00 as such relates to energy conservation requirements)

5316.1 Insulation. Insulation materials, including facings, such as vapor retarders or vapor permeable membranes installed within floor-ceiling assemblies, roof-ceiling assemblies, wall assemblies, crawl spaces and attics shall have a flame-spread index not to exceed 25 with an accompanying smoke-developed index not to exceed 450 when tested in accordance with ASTM E 84.

Exceptions:

1. When such materials are installed in concealed spaces, the flame-spread and smoke-developed limitations do not apply to the facings, provided that the facing is installed in substantial contact with the unexposed surface of the ceiling, floor or wall finish.

2. Cellulose loose-fill insulation, which is not spray applied, complying with the requirements of 780 CMR 5316.3, shall only be required to meet the smoke-developed index of not more than 450.

5316.2 Loose-fill Insulation. Loose-fill insulation materials that cannot be mounted in the ASTM E 84 apparatus without a screen or artificial supports shall have a flame-spread rating not to exceed 25 with an accompanying smoke-developed factor not to exceed 450 when tested in accordance with CAN/ULC-S 102.2.

Exception: Cellulose loose-fill insulation shall not be required to comply with this test method provided that such insulation complies with the requirements of 780 CMR 5316.3.

5316.3 Cellulose Loose-fill Insulation. Cellulose loose-fill insulation shall comply with CPSC 16 CFR, Parts 1209 and 1404. Each package of such insulating material shall be clearly labeled in accordance with CPSC 16 CFR, Parts 1209 and 1404.

5316.4 Exposed Attic Insulation. All exposed insulation materials installed on attic floors shall have a critical radiant flux not less than 0.12 watt per square centimeter.

5316.5 Testing. Tests for critical radiant flux shall be made in accordance with ASTM E 970.

780 CMR 5317 DWELLING UNIT SEPARATION

5317.1 Two-family Dwellings. Dwelling units in two-family dwellings shall be separated from each other by wall and/or floor assemblies having not less than one-hour fire-resistance rating when tested in accordance with ASTM E 119. 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.

Exception: A fire resistance rating of ½ hour shall be permitted in buildings equipped throughout with an automatic sprinkler system installed in accordance with NFPA 13.

5317.1.1 Supporting Construction. When floor assemblies are required to be fire-resistance-rated by 780 CMR 5317.1, the supporting construction of such assemblies shall have an equal or greater fire-resistive rating.

5317.2 Townhouses. Dwelling units in townhouses shall be separated from each other by wall/floor or ceiling assemblies having not less than one hour fire resistance rating when tested in accordance with ASTM E-119. Fire resistance rated assemblies shall extend to and be tight against the exterior wall, and wall assemblies shall extend to the underside of the roof sheathing.

Exception. A common two-hour fire-resistance-rated wall is permitted for townhouses if such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. Electrical installations shall be installed in accordance with 527 CMR 12.00: *Massachusetts Electrical Code*. Penetrations of electrical outlet boxes shall be in accordance with 780 CMR 5317.3.

5317.2.1 Continuity. The common wall for townhouses shall be continuous from the foundation to the underside of the roof sheathing, deck or slab and shall extend the full length of the common wall including walls extending through and separating attached accessory structures.

5317.2.2 Parapets. Parapets constructed in accordance with 780 CMR 5317.2.3 shall be provided for townhouses as an extension of common exterior walls in accordance with the following:

1. Where roof surfaces adjacent to the wall or walls are at the same elevation, the parapet shall extend not less than 30 inches (762mm) above the roof surfaces.

2. Where roof surfaces adjacent to the wall or walls are at different elevations and the higher roof is not more than 30 inches (762mm) above the lower roof, the parapet shall extend not less than 30 inches (762mm) above the lower roof surface.

Exception. A parapet is not required in the two cases above when the roof is covered with a minimum class C roof covering, and the roof decking or sheathing is of noncombustible materials or approved fire-retardant-treated wood for a distance of four feet (1219mm) on each side of the wall or walls, or one layer of ⅝-inch (15.9mm) Type X gypsum board is installed directly beneath the roof decking or sheathing for a distance of four feet (1219mm) on each side of the wall or walls.

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 (762mm) above the lower roof. The common wall construction from the lower roof to the underside of the higher roof deck shall not have less than a one hour fire-resistive rating. The wall shall be rated for exposure from both sides.

5317.2.3 Parapet Construction. Parapets shall have the same fire-resistance rating as that required for supporting wall or walls. On any side adjacent to a roof surface, the parapet shall have noncombustible faces for the uppermost 18 inches (457mm), to include counterflashing and coping materials. Where the roof slopes toward a parapet at slopes greater than two units vertical in 12 unit horizontal (16.7% slope), the parapet shall extend to the same height as any portion of the roof within a distance of three feet (914mm), but in no case shall the height be less than 30 inches (762mm).

5317.2.4 Structural Independence. Each individual townhouse shall be structurally independent.

Exceptions:

1. Foundations supporting exterior walls or common walls.
2. Structural roof and wall sheathing from each unit may fasten to the common wall framing.
3. Nonstructural wall coverings.
4. Flashing at termination of roof covering over common wall.
5. Townhouses separated by common two-hour fire-resistance-rated wall as provided in 780 CMR 5317.2

5317.3 Rated Penetrations. Penetrations of wall or floor/ceiling assemblies required to be fire-resistance-rated in accordance with 780 CMR 5317.1 or 5317.2 shall be protected in accordance with 780 CMR 5317.3.

5317.3.1 Through Penetrations. Through penetrations of fire-resistance-rated wall or floor assemblies shall comply with 780 CMR 5317.3.1.1 or 5317.3.1.2.

Exception: Where the penetrating items are steel, ferrous or copper pipes or steel conduits, the annular space shall be permitted to be protected as follows:

1. In concrete or masonry wall or floor assemblies where the penetrating item is a maximum six inches (152 mm) nominal diameter and the opening is a maximum 144 square inches (92 900 mm^2), concrete, grout or mortar shall be permitted where installed to the full thickness of the wall or floor assembly or the thickness required to maintain the fire-resistance rating.

2. The material used to fill the annular space shall prevent the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 time temperature fire conditions under a minimum positive pressure differential of 0.01 inch of water (3 Pa) at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated.

5317.3.1.1 Fire-resistance-rated Assembly. Penetrations shall be installed as tested in the approved fire-resistance-rated assembly.

5317.3.1.2 Penetration Firestop System. Penetrations shall be protected by an approved penetration firestop system installed as tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water (3 Pa) and shall have an F rating of not less than the required fire-resistance rating of the wall or floor/ceiling assembly penetrated.

5317.3.2 Membrane Penetrations. Membrane penetrations shall comply with 780 CMR 5317.3.1. Where walls are required to have a minimum one-hour fire resistance rating, recessed light fixtures shall be so installed such that the required fire resistance will not be reduced.

Exceptions:

1. Steel electrical boxes that do not exceed 16 square inches (0.0103m^2) in area provided the total area of such openings does not exceed 100 square inches (0.0645 m^2 for any 100 square feet (9.29 m^2) of wall area. Outlet boxes on opposite sides of the wall shall be separated as follows:

1.1. By a horizontal distance of not less than 24 inches (610 mm);

1.2. By a horizontal distance of not less than the depth of the wall cavity when the wall cavity is filled with cellulose loose-fill, rockwool or slag mineral wool insulation;

1.3. By solid fire blocking in accordance with 780 CMR 5602.8.1;

1.4. By protecting both outlet boxes by listed putty pads; or

1.5. By other listed materials and methods.

2. Membrane penetrations for listed electrical outlet boxes of any materials are permitted provided such boxes have been tested for use in fire resistance-rated assemblies and are installed in accordance with the instructions included in the listing. Outlet boxes on opposite sides of the wall shall be separated as follows:

2.1. By a horizontal distance of not less than 24 inches (610 mm);

2.2. By solid fire-blocking in accordance with 780 CMR 5602.8;

2.3. By protecting both outlet boxes by listed putty pads; or

2.4. By other listed materials and methods.

3. The annular space created by the penetration of a fire sprinkler provided it is covered by a metal escutcheon plate.

5317.4 Department of Mental Health Facilities. Any building or structure subject to licensure by the Department of Mental Health (DMH) pursuant to 104 CMR 28.00 or operated by DMH, shall be subject to the vertical openings requirements specified in 780 CMR: *The Massachusetts State Building Code* Base Volume for Group I.

780 CMR 5318 MOISTURE VAPOR RETARDERS

5318.1 Moisture Control. In all framed walls, floors and roof/ ceilings comprising elements of the building thermal envelope, a vapor retarder shall be installed on the warm-in-winter side of the insulation.

Exceptions:

1. ***See the vapor retarder requirements of 780 CMR 61.00.***

2. Where the framed cavity or space is ventilated to allow moisture to escape.

780 CMR 5319 PROTECTION AGAINST DECAY

5319.1 Location Required. *The* following locations shall require the use of an approved species and grade of lumber, pressure treated in accordance with AWPA C1, C2, C3, C4, C9, C15, C18, C22, C23, C24, C28, C31, C33, P1, P2 and P3, or decay-resistant heartwood of redwood, black locust, or cedars.

1. Wood joists or the bottom of a wood structural floor when closer than 18 inches (457 mm) or wood girders when closer than 12 inches (305 mm) to the exposed ground in crawl spaces or unexcavated area located within the periphery of the building foundation.

2. All wood framing members that rest on concrete or masonry exterior foundation walls and are less than eight inches (203 mm) from the exposed ground.

3. Sills and sleepers on a concrete or masonry slab that is in direct contact with the ground unless separated from such slab by an impervious moisture barrier.

4. The ends of wood girders entering exterior masonry or concrete walls having clearances of less than 0.5 inch (12.7 mm) on tops, sides and ends.

5. Wood siding, sheathing and wall framing on the exterior of a building having a clearance of less than six inches (152 mm) from the ground.

6. Wood structural members supporting moisture-permeable floors or roofs that are exposed to the weather, such as concrete or masonry slabs, unless separated from such floors or roofs by an impervious moisture barrier.

7. Wood furring strips or other wood framing

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