SECTION 1404
INSTALLATION OF WALL COVERINGS

1404.1 General.

Exterior wall coverings shall be designed and constructed in accordance with the applicable provisions of this section.

1404.2 Weather protection.

Exterior walls shall provide weather protection for the building. The materials of the minimum nominal thickness specified in Table 1404.2 shall be acceptable as *approved* weather coverings.

TABLE 1404.2
MINIMUM THICKNESS OF WEATHER COVERINGS

COVERING TYPE	MINIMUM THICKNESS (inches)
Adhered masonry veneer	0.25
Aluminum siding	0.019
Anchored masonry veneer	
Stone (natural)	2.0
Architectural cast stone	2.5
Other	2.0
Asbestos-cement boards	0.125
Asbestos shingles	0.156
Cold-rolled copper[d]	0.0216 nominal
Copper shingles[d]	0.0162 nominal
Exterior plywood (with sheathing)	0.313
Exterior plywood (without sheathing)	See Section 2304.6
Fiber cement lap siding	0.25[c]
Fiber cement panel siding	0.25[c]
Fiberboard siding	0.5
Glass-fiber reinforced concrete panels	0.375
Hardboard siding[c]	0.25
High-yield copper[d]	0.0162 nominal
Lead-coated copper[d]	0.0216 nominal
Lead-coated high-yield copper	0.0162 nominal
Marble slabs	1
Particleboard (with sheathing)	See Section 2304.6
Particleboard (without sheathing)	See Section 2304.6
Porcelain tile	0.125 nominal
Steel (approved corrosion resistant)	0.0149
Structural glass	0.344
Stucco or exterior cement plaster	
Three-coat work over:	
Metal plaster base	0.875[b]
Unit masonry	0.625[b]
Cast-in-place or precast concrete	0.625[b]
Two-coat work over:	
Unit masonry	0.5[b]
Cast-in-place or precast concrete	0.375[b]
Terra cotta (anchored)	1
Terra cotta (adhered)	0.25
Vinyl siding	0.035
Wood shingles	0.375
Wood siding (without sheathing)[a]	0.5

For SI: 1 inch = 25.4 mm, 1 ounce = 28.35 g, 1 square foot = 0.093 m^2.

a. Wood siding of thicknesses less than 0.5 inch shall be placed over sheathing that conforms to Section 2304.6.

b. Exclusive of texture.

c. As measured at the bottom of decorative grooves.

d. 16 ounces per square foot for cold-rolled copper and lead-coated copper, 12 ounces per square foot for copper shingles, high-yield copper and lead-coated high-yield copper.

1404.3 Vapor retarders.

Vapor retarder materials shall be classified in accordance with Table 1404.3(1). A vapor retarder shall be provided on the interior side of frame walls in accordance with Tables 1404.3(2) and 1404.3(3), or an approved design using accepted engineering practice for hygrothermal analysis. The appropriate climate zone shall be selected in accordance with Chapter 3 of the *International Energy Conservation Code*.

Where a Class II vapor retarder is used in combination with foam plastic insulating sheathing installed as continuous insulation on the exterior side of frame walls, the continuous insulation shall comply with Table 1404.3(4) and the Class II vapor retarder shall have a vapor permeance greater than 1 perm when measured by ASTM E96 water method (Procedure B). Use of a Class I interior vapor retarder in frame walls with a Class I vapor retarder on the exterior side shall require an approved design.

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. 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.

TABLE 1404.3(1)
VAPOR RETARDER MATERIALS AND CLASSES

VAPOR RETARDER CLASS	ACCEPTABLE MATERIALS
I	Sheet polyethylene, nonperforated aluminum foil, or other approved materials with a perm rating of less than or equal to 0.1
II	Kraft-faced fiberglass batts or vapor retarder paint or other approved materials, applied in accordance with the manufacturer's 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 instructions for a perm rating of greater than 1.0 and less than or equal to 10

TABLE 1404.3(2)
VAPOR RETARDER OPTIONS

CLIMATE ZONE	VAPOR RETARDER CLASS		
	I	II	III[a]
1, 2	Not permitted	Not Permitted	Permitted
3	Not permitted	Permitted	Permitted
4 (except Marine)	Not permitted	Permitted	See Table 1404.3(3)
Marine 4, 5, 6, 7, 8	Permitted	Permitted	See Table 1404.3(3)

a. See also Sections 1404.3.1 and 1404.3.2.

TABLE 1404.3(3)
CLASS III VAPOR RETARDERS

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR:[a, b]

4	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R-2.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R-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 ≥ R-5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R-7.5 over 2 × 6 wall
6	Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with R-value ≥ R-7.5 over 2 × 4 wall Continuous insulation with R-value ≥ R-11.25 over 2 × 6 wall
7	Continuous insulation with R-value ≥ R-10 over 2 × 4 wall Continuous insulation with R-value ≥ R-15 over 2 × 6 wall
8	Continuous insulation with R-value ≥ R-12.5 over 2 × 4 wall Continuous insulation with R-value ≥ R-20 over 2 × 6 wall

a . Vented cladding shall include vinyl lap siding, polypropylene, or horizontal aluminum siding, brick veneer with airspace as specified in this code, and other approved vented claddings.

b. 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 the *International Energy Conservation Code.*

TABLE 1404.3(4)
CONTINUOUS INSULATION WITH CLASS II VAPOR RETARDER

CLIMATE ZONE	PERMITTED CONDITIONS[a]
3	Continuous insulation with *R*-value ≥ R-2
4, 5, 6	Continuous insulation with *R*-value ≥ R-3 over 2 × 4 wall Continuous insulation with *R*-value ≥ R-5 over 2 × 6 wall
7	Continuous insulation with *R*-value ≥ R-5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R-7.5 over 2 × 6 wall
8	Continuous insulation with *R*-value ≥ R-7.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R-10 over 2 × 6 wall

a. In addition to the vapor retarder, spray foam with a maximum permeance of 1.5 perms at the installed thickness, applied to the interior cavity side of wood structural panels, fiberboard, insulating sheathing or gypsum is deemed to comply with the continuous insulation requirement only for the moisture control purposes of this table where the spray foam *R*-value plus any continuous insulation *R*-value provided equals or exceeds the specified continuous insulation *R*-value.

1404.3.1 Spray foam plastic insulation for moisture control with Class III vapor retarders.

For purposes of compliance with Table 1404.3(3), spray foam with a maximum permeance of 1.5 perms at the installed thickness applied to the interior cavity side of wood structural panels, fiberboard, insulating sheathing or gypsum shall be deemed to meet the continuous insulation moisture control requirement where the spray foam *R*-value meets or exceeds the specified continuous insulation *R*-value.

1404.3.2 Hybrid insulation for moisture control with Class III vapor retarders.

For the purposes of compliance with Table 1404.3(3), the combined moisture control of spray foam plastic insulation and continuous insulation shall be permitted to be counted toward the continuous Rvalue requirement.

1404.4 Flashing.

Flashing shall be installed in such a manner so as to prevent moisture from entering the wall or to redirect that moisture to the surface of the exterior wall finish or to a *water-resistive barrier* complying with Section 1403.2 and that is part of a means of drainage complying with Section 1402.2. Flashing shall be installed at the perimeters of exterior door and window assemblies, penetrations and terminations of *exterior wall* assemblies, *exterior wall* intersections with roofs, chimneys, porches, decks, balconies and similar projections and at built-in gutters and similar locations where moisture could enter the wall. Flashing with projecting flanges shall be installed on both sides and the ends of copings, under sills and continuously above projecting *trim*. Where self-adhered membranes are used as flashings of *fenestration* in wall assemblies, those self-adhered flashings shall comply with AAMA 711. Where fluid applied membranes are used as flashing for *exterior wall* openings, those fluid applied membrane flashings shall comply with AAMA 714.

1404.4.1 Exterior wall pockets.

In *exterior walls* of buildings or structures, wall pockets or crevices in which moisture can accumulate shall be avoided or protected with caps or drips, or other *approved* means shall be provided to prevent water damage.

1404.4.2 Masonry.

Flashing and weep holes in anchored veneer designed in accordance with Section 1404.6 shall be located not more than 10 inches (245 mm) above finished ground level above the foundation wall or slab. At other points of support including structural floors, shelf angles and lintels, flashing and weep holes shall be located in the first course of masonry above the support.

1404.5 Wood veneers.

Wood *veneers* on *exterior walls* of buildings of Types I, II, III and IV construction shall be not less than 1 inch (25 mm) nominal thickness, 0.438-inch (11.1 mm) exterior *hardboard* siding or 0.375-inch (9.5 mm) exterior-type wood *structural panels* or particleboard and shall conform to the following:

1. The *veneer* shall not exceed 40 feet (12 190 mm) in height above grade. Where *fire-retardant-treated wood* is used, the height shall not exceed 60 feet (18 290 mm) in height above grade.
2. The *veneer* is attached to or furred from a noncombustible backing that is fire-resistance rated as required by other provisions of this code.
3. Where open or spaced wood *veneers* (without concealed spaces) are used, they shall not project more than 24 inches (610 mm) from the building wall.

[BS] 1404.6 Anchored masonry veneer.

Anchored masonry veneer shall comply with the provisions of Sections 1404.6 through 1404.9 and Sections 12.1 and 12.2 of TMS 402.

[BS] 1404.6.1 Tolerances.

Anchored masonry veneers in accordance with Chapter 14 are not required to meet the tolerances in Article 3.3 F1 of TMS 602.

[BS] 1404.6.2 Seismic requirements.

Anchored masonry veneer located in *Seismic Design Category* C, D, E or F shall conform to the requirements of Section 12.2.2.11 of TMS 402.

[BS] 1404.7 Stone veneer.

Anchored stone *veneer* units not exceeding 10 inches (254 mm) in thickness shall be anchored directly to masonry, concrete or to stud construction by one of the following methods:

1. With concrete or masonry backing, anchor ties shall be not less than 0.1055-inch (2.68 mm) corrosion-resistant wire, or *approved* equal, formed beyond the base of the backing. The legs of the loops shall be not less than 6 inches (152 mm) in length bent at right angles and laid in the *mortar* joint, and spaced so that the eyes or loops are 12 inches (305 mm) maximum on center in both directions. There shall be provided not less than a 0.1055-inch (2.68 mm) corrosion-resistant wire tie, or *approved* equal, threaded through the exposed loops for every 2 square feet (0.2 m^2) of stone *veneer*. This tie shall be a loop having legs not less than 15 inches (381 mm) in length bent so that the tie will lie in the *stone veneer mortar* joint. The last 2 inches (51 mm) of each wire leg shall have a right-angle bend. One-inch (25 mm) minimum thickness of cement grout shall be placed between the backing and the stone *veneer*.
2. With wood stud backing, a 2-inch by 2-inch (51 by 51 mm) 0.0625-inch (1.59 mm) zinc-coated or nonmetallic coated wire mesh with two layers of *water-resistive barrier* in accordance with Section 1403.2 shall be applied directly to wood studs spaced not more than 16 inches (406 mm) on center. On studs, the mesh shall be attached with 2-inch-long (51 mm) corrosion-resistant steel wire furring nails at 4 inches (102 mm) on center providing a minimum 1.125-inch (29 mm) penetration into each stud and with 8d annular threaded nails at 8 inches (203 mm) on center. into top and bottom plates or with equivalent wire ties. There shall be not less than a 0.1055-inch (2.68 mm) zinc-coated or nonmetallic coated wire, or approved equal, attached to the stud with not smaller than an 8d (0.120 in. diameter) annular threaded nail for every 2 square feet (0.2 m^2) of stone veneer. This tie shall be a loop

having legs not less than 15 inches (381 mm) in length, so bent that the tie will lie in the stone *veneer mortar* joint. The last 2 inches (51 mm) of each wire leg shall have a right-angle bend. One-inch (25 mm) minimum thickness of cement grout shall be placed between the backing and the stone *veneer*.

3. With cold-formed steel stud backing, a 2-inch by 2-inch (51 by 51 mm) 0.0625-inch (1.59 mm) zinc-coated or nonmetallic coated wire mesh with two layers of *water-resistive barrier* in accordance with Section 1403.2 shall be applied directly to steel studs spaced a not more than 16 inches (406 mm) on center. The mesh shall be attached with corrosion-resistant #8 self-drilling, tapping screws at 4 inches (102 mm) on center, and at 8 inches (203 mm) on center into top and bottom tracks or with equivalent wire ties. Screws shall extend through the steel connection not fewer than three exposed threads. There shall be not less than a 0.1055-inch (2.68 mm) corrosion-resistant wire, or approved equal, attached to the stud with not smaller than a #8 self-drilling, tapping screw extending through the steel framing not fewer than three exposed threads for every 2 square feet (0.2 m^2) of stone *veneer*. This tie shall be a loop having legs not less than 15 inches (381 mm) in length, so bent that the tie will lie in the stone *veneer mortar joint*. The last 2 inches (51 mm) of each wire leg shall have a right-angle bend. Cement grout not less than 1 inch (25 mm) in thickness shall be placed between the backing and the stone *veneer*. The cold-formed steel framing members shall have a minimum bare steel thickness of 0.0428 inches (1.087 mm).

[BS] 1404.8 Slab-type veneer.

Anchored slab-type *veneer* units not exceeding 2 inches (51 mm) in thickness shall be anchored directly to masonry, concrete or *light-frame construction*. For *veneer* units of marble, travertine, granite or other stone units of slab form, ties of corrosion-resistant dowels in drilled holes shall be located in the middle third of the edge of the units, spaced not more than 24 inches (610 mm) apart around the periphery of each unit with not less than four ties per *veneer* unit. Units shall not exceed 20 square feet (1.9 m^2) in area. If the dowels are not tight fitting, the holes shall be drilled not more than 0.063 inch (1.6 mm) larger in diameter than the dowel, with the hole countersunk to a diameter and depth equal to twice the diameter of the dowel in order to provide a tight-fitting key of cement *mortar* at the dowel locations where the *mortar* in the joint has set. *Veneer* ties shall be corrosion-resistant metal capable of resisting, in tension or compression, a force equal to two times the weight of the attached *veneer*. If made of sheet metal, *veneer* ties shall be not smaller in area than 0.0336 by 1 inch (0.853 by 25 mm) or, if made of wire, not smaller in diameter than 0.1483-inch (3.76 mm) wire.

[BS] 1404.9 Terra cotta.

Anchored terra cotta or ceramic units not less than $1^5/_8$ inches (41 mm) thick shall be anchored directly to masonry, concrete or stud construction. Tied terra cotta or ceramic *veneer* units shall be not less than $1^5/_8$ inches (41 mm) thick with projecting dovetail webs on the back surface spaced approximately 8 inches (203 mm) on center. The facing shall be tied to the backing wall with corrosion-resistant metal anchors of not less than No. 8 gage wire installed at the top of each piece in horizontal *bed joints* not less than 12 inches (305 mm) nor more than 18 inches (457 mm) on center; these anchors shall be secured to $^1/_4$-inch (6.4 mm) corrosion-resistant pencil rods that pass through the vertical aligned loop anchors in the backing wall. The *veneer* ties shall have sufficient strength to support the full weight of the *veneer* in tension. The facing shall be set with not less than a 2-inch (51 mm) space from the backing wall and the space shall be filled solidly with Portland cement grout and pea gravel. Immediately prior to setting, the backing wall and the facing shall be drenched with clean water and shall be distinctly damp when the grout is poured.

[BS] 1404.10 Adhered masonry veneer.

Adhered masonry veneer shall comply with the applicable requirements in this section and Sections 12.1 and 12.3 of TMS 402.

[BS] 1404.10.1 Exterior adhered masonry veneer.

Exterior *adhered masonry veneer* shall be installed in accordance with Section 1404.10 and the manufacturer's instructions.

[BS] 1404.10.1.1 Water-resistive barriers.

Water-resistive barriers shall be installed as required in Section 2510.6.

[BS] 1404.10.1.2 Flashing.

Flashing shall comply with the applicable requirements of Sections 1404.4 and 1404.10.1.2.1.

[BS] 1404.10.1.2.1 Flashing at foundation.

A corrosion-resistant screed or flashing of a minimum 0.019-inch (0.48 mm) or 26 gage galvanized or plastic with a minimum vertical attachment flange of $3^1/_2$ inches (89 mm) shall be installed to extend not less than 1 inch (25 mm) below the foundation plate line on exterior stud walls in accordance with Section 1404.4. The *water-resistive barrier* shall lap over the exterior of the attachment flange of the screed or flashing.

[BS] 1404.10.1.3 Clearances.

On exterior stud walls, *adhered masonry veneer* shall be installed not less than 4 inches (102 mm) above the earth, or not less than 2 inches (51 mm) above paved areas, or not less than $^1/_2$ inch (12.7 mm) above exterior walking surfaces that are supported by the same foundation that supports the *exterior wall*.

[BS] 1404.10.1.4 Adhered masonry veneer installed with lath and mortar.

Exterior *adhered masonry veneer* installed with lath and *mortar* shall comply with the following.

[BS] 1404.10.1.4.1 Lathing.

Lathing shall comply with the requirements of Section 2510.

[BS] 1404.10.1.4.2 Scratch coat.

A nominal $^1/_2$-inch-thick (12.7 mm) layer of *mortar* complying with the material requirements of Sections 2103 and 2512.2 shall be applied, encapsulating the lathing. The surface of this *mortar* shall be scored horizontally, resulting in a scratch coat.

[BS] 1404.10.1.4.3 Adhering veneer.

The masonry *veneer* units shall be adhered to the *mortar* scratch coat with a nominal $^1/_2$-inch-thick (12.7 mm) setting bed of *mortar* complying with Sections 2103 and 2512.2 applied to create a full setting bed for the back of the masonry *veneer* units. The masonry *veneer* units shall be worked into the setting bed resulting in a nominal $^3/_8$-inch (9.5 mm) setting bed after the masonry *veneer* units are applied.

[BS] 1404.10.1.5 Adhered masonry veneer applied directly to masonry and concrete.

Adhered masonry veneer applied directly to masonry or concrete shall comply with the applicable requirements of Section 1404.10 and with the requirements of Section 1404.10.1.4 or 2510.7.

[BS] 1404.10.1.6 Cold weather construction.

Cold weather construction of *adhered masonry veneer* shall comply with the requirements of Sections 2104 and 2512.4.

[BS] 1404.10.1.7 Hot weather construction.

Hot weather construction of *adhered masonry veneer* shall comply with the requirements of Section 2104.

[BS] 1404.10.2 Exterior adhered masonry veneers—porcelain tile.

Adhered units weighing more than 3.5 pounds per square foot (0.17 kN/m^2) shall not exceed 48 inches (1219 mm) in any face dimension nor more than 9 square feet (0.8 m^2) in total face area and shall not weigh more than 6 pounds per square foot (0.29 kN/m^2). Adhered units weighing less than or equal to 3.5 pounds per square foot (0.17 kN/m^2) shall not exceed 72 inches (1829 mm) in any face dimension nor more than 17.5 square feet (1.6 m^2) in total face area. Porcelain tile shall be adhered to an approved backing system.

[BS] 1404.10.3 Interior adhered masonry veneers.

Interior *adhered masonry veneers* shall have a maximum weight of 20 psf (0.958 kg/m^2) and shall be installed in accordance with Section 1404.10. Where the interior *adhered masonry veneer* is supported by wood construction, the supporting members shall be designed to limit deflection to $^1/_{600}$ of the span of the supporting members.

[BS] 1404.11 Metal veneers.

Veneers of metal shall be fabricated from *approved* corrosion-resistant materials or shall be protected front and back with porcelain enamel, or otherwise be treated to render the metal resistant to corrosion. Such *veneers* shall be not less than 0.0149-inch (0.378 mm) nominal thickness sheet steel mounted on wood or metal furring strips or approved sheathing on *light-frame construction*.

[BS] 1404.11.1 Attachment.

Exterior metal *veneer* shall be securely attached to the supporting masonry or framing members with corrosion-resistant fastenings, metal ties or by other *approved* devices or methods. The spacing of the fastenings or ties shall not exceed 24 inches (610 mm) either vertically or horizontally, but where units exceed 4 square feet (0.4 m^2) in area there shall be not less than four attachments per unit. The metal attachments shall have a cross-sectional area not less than provided by W 1.7 wire. Such attachments and their supports shall be designed and constructed to resist the wind *loads* as specified in Section 1609 for components and cladding.

1404.11.2 Weather protection.

Metal supports for exterior metal *veneer* shall be protected by painting, galvanizing or by other equivalent coating or treatment. Wood studs, furring strips or other wood supports for exterior metal *veneer* shall be *approved* pressure-treated wood or protected as required in Section 1402.2. Joints and edges exposed to the weather shall be caulked with *approved* durable waterproofing material or by other *approved* means to prevent penetration of moisture.

1404.11.3 Backup.

Masonry backup shall not be required for metal *veneer* unless required by the fire-resistance requirements of this code.

1404.11.4 Grounding.

Grounding of metal *veneers* on buildings shall comply with the requirements of Chapter 27 of this code.

[BS] 1404.12 Glass veneer.

The area of a single section of thin exterior structural glass *veneer* shall not exceed 10 square feet (0.93 m^2) where that

section is not more than 15 feet (4572 mm) above the level of the sidewalk or grade level directly below, and shall not exceed 6 square feet (0.56 m^2) where it is more than 15 feet (4572 mm) above that level.

[BS] 1404.12.1 Length and height.

The length or height of any section of thin exterior structural glass *veneer* shall not exceed 48 inches (1219 mm).

[BS] 1404.12.2 Thickness.

The thickness of thin exterior structural glass *veneer* shall be not less than 0.344 inch (8.7 mm).

[BS] 1404.12.3 Application.

Thin exterior structural glass *veneer* shall be set only after backing is thoroughly dry and after application of an *approved* bond coat uniformly over the entire surface of the backing so as to effectively seal the surface. Glass shall be set in place with an *approved* mastic cement in sufficient quantity so that not less than 50 percent of the area of each glass unit is directly bonded to the backing by mastic not less than $^1/_4$ inch (6.4 mm) thick and not more than $^5/_8$ inch (15.9 mm) thick. The bond coat and mastic shall be evaluated for compatibility and shall bond firmly together.

[BS] 1404.12.4 Installation at sidewalk level.

Where glass extends to a sidewalk surface, each section shall rest in an *approved* metal molding, and be set not less than $^1/_4$ inch (6.4 mm) above the highest point of the sidewalk. The space between the molding and the sidewalk shall be thoroughly caulked and made watertight.

[BS] 1404.12.4.1 Installation above sidewalk level.

Where thin exterior structural glass *veneer* is installed above the level of the top of a bulkhead facing, or at a level more than 36 inches (914 mm) above the sidewalk level, the mastic cement binding shall be supplemented with *approved* nonferrous metal shelf angles located in the horizontal joints in every course. Such shelf angles shall be not less than 0.0478-inch (1.2 mm) thick and not less than 2 inches (51 mm) long and shall be spaced at *approved* intervals, with not less than two angles for each glass unit. Shelf angles shall be secured to the wall or backing with expansion bolts, toggle bolts or by other *approved* methods.

[BS] 1404.12.5 Joints.

Unless otherwise specifically *approved* by the *building official*, abutting edges of thin exterior structural glass *veneer* shall be ground square. Mitered joints shall not be used except where specifically *approved* for wide angles. Joints shall be uniformly buttered with an *approved* jointing compound and horizontal joints shall be held to not less than 0.063 inch (1.6 mm) by an *approved* nonrigid substance or device. Where thin exterior structural glass *veneer* abuts nonresilient material at sides or top, expansion joints not less than $^1/_4$ inch (6.4 mm) wide shall be provided.

[BS] 1404.12.6 Mechanical fastenings.

Thin exterior structural glass *veneer* installed above the level of the heads of show windows and *veneer* installed more than 12 feet (3658 mm) above sidewalk level shall, in addition to the mastic cement and shelf angles, be held in place by the use of fastenings at each vertical or horizontal edge, or at the four corners of each glass unit. Fastenings shall be secured to the wall or backing with expansion bolts, toggle bolts or by other methods. Fastenings shall be so designed as to hold the glass *veneer* in a vertical plane independent of the mastic cement. Shelf angles providing both support and fastenings shall be permitted.

[BS] 1404.12.7 Flashing.

Exposed edges of thin exterior structural glass *veneer* shall be flashed with overlapping corrosion-resistant metal flashing and caulked with a waterproof compound in a manner to effectively prevent the entrance of moisture between the glass *veneer* and the backing.

1404.13 Exterior windows and doors.

Windows and doors installed in *exterior walls* shall conform to the testing and performance requirements of Section 1709.5.

1404.13.1 Installation.

Windows and doors shall be installed in accordance with *approved* manufacturer's instructions. Fastener size and spacing shall be provided in such instructions and shall be calculated based on maximum *loads* and spacing used in the tests.

[BS] 1404.14 Vinyl siding.

Vinyl siding conforming to the requirements of this section and complying with ASTM D3679 shall be permitted on *exterior walls* where the design wind pressure determined in accordance with Section 1609 does not exceed 30 pounds per square foot (1.44 kN/m^2). Where the design wind pressure exceeds 30 pounds per square foot (1.44 kN/m^2), tests or calculations indicating compliance with Chapter 16 shall be submitted. Vinyl siding shall be secured to the building so as to provide weather protection for the *exterior walls* of the building.

[BS] 1404.14.1 Application.

The siding shall be applied over sheathing or materials listed in Section 2304.6. Siding shall be applied to conform to the

water-resistive barrier requirements in Section 1402. Siding and accessories shall be installed in accordance with the *approved* manufacturer's instructions.

1404.14.1.1 Fasteners and fastener penetration for wood construction.

Unless otherwise specified in the approved manufacturer's instructions, nails used to fasten the siding and accessories shall be corrosion resistant and have not less than a 0.313-inch (7.9 mm) head diameter and $^{1}/_{8}$-inch (3.18 mm) shank diameter. The penetration into nailable substrate shall be not less than $1^{1}/_{4}$ inches (32 mm).

1404.14.1.2 Fasteners and fastener penetration for cold-formed steel light-fame construction.

For coldformed steel light-frame construction, corrosion-resistant fasteners shall be used. Screw fasteners shall penetrate through the steel with not fewer than three exposed threads. Other fasteners shall be installed in accordance with the approved construction documents and manufacturer's instructions.

1404.14.1.3 Fastener spacing.

Unless specified otherwise by the approved manufacturer's instructions, fasteners shall be installed in the middle third of the slots of the nail hem and spacing between fasteners shall be not greater than 16 inches (406 mm) for horizontal siding and 12 inches (305 mm) for vertical siding.

[BS] 1404.15 Cement plaster.

Cement plaster applied to *exterior walls* shall conform to the requirements specified in Chapter 25.

[BS] 1404.16 Fiber-cement siding.

Fiber-cement siding complying with Section 1403.10 shall be permitted on *exterior walls* of Types I, II, III, IV and V construction for wind pressure resistance or wind speed exposures as indicated by the manufacturer's listing and *label* and *approved* installation instructions. Where specified, the siding shall be installed over sheathing or materials *listed* in Section 2304.6 and shall be installed to conform to the *water-resistive barrier* requirements in Section 1402. Siding and accessories shall be installed in accordance with *approved* manufacturer's instructions. Unless otherwise specified in the *approved* manufacturer's instructions, nails used to fasten the siding to wood studs shall be corrosion-resistant round head smooth shank and shall be long enough to penetrate the studs not less than 1 inch (25 mm). For cold-formed steel *light-frame construction*, corrosion-resistant fasteners shall be used. Screw fasteners shall penetrate the cold-formed steel framing not fewer than three exposed full threads. Other fasteners shall be installed in accordance with the approved construction documents and manufacturer's instructions.

[BS] 1404.16.1 Panel siding.

Fiber-cement panels shall comply with the requirements of ASTM C1186, Type A, minimum Grade II (or ISO 8336, Category A, minimum Class 2). Panels shall be installed with the long dimension either parallel or perpendicular to framing. Vertical and horizontal joints shall occur over framing members and shall be protected with caulking, with battens or flashing, or be vertical or horizontal shiplap or otherwise designed to comply with Section 1402.2. Panel siding shall be installed with fasteners in accordance with the *approved* manufacturer's instructions.

[BS] 1404.16.2 Lap siding.

Fiber-cement lap siding having a maximum width of 12 inches (305 mm) shall comply with the requirements of ASTM C1186, Type A, minimum Grade II (or ISO 8336, Category A, minimum Class 2). Lap siding shall be lapped not less than $1^{1}/_{4}$ inches (32 mm) and lap siding not having tongue-and-groove end joints shall have the ends protected with caulking, covered with an H-section joint cover, located over a strip of flashing or shall be otherwise designed to comply with Section 1402.2. Lap siding courses shall be installed with the fastener heads exposed or concealed in accordance with the *approved* manufacturer's instructions.

[BS] 1404.17 Fastening.

Weather boarding and wall coverings shall be securely fastened with aluminum, copper, zinc, zinc-coated or other *approved* corrosion-resistant fasteners in accordance with the nailing schedule in Table 2304.10.2 or the *approved* manufacturer's instructions. Shingles and other weather coverings shall be attached with appropriate standard-shingle nails to furring strips securely nailed to studs, or with *approved* mechanically bonding nails, except where sheathing is of wood not less than 1-inch (25 mm) nominal thickness or of *wood structural panels* as specified in Table 2308.6.3(3).

[BS] 1404.18 Polypropylene siding.

Polypropylene siding conforming to the requirements of this section and complying with Section 1403.12 shall be limited to *exterior walls* located in areas where the wind speed specified in Chapter 16 does not exceed 100 miles per hour (45 m/s) and the building height is less than or equal to 40 feet (12 192 mm) in Exposure C. Where construction is located in areas where the basic wind speed exceeds 100 miles per hour (45 m/s), or building heights are in excess of 40 feet (12 192 mm), tests or calculations indicating compliance with Chapter 16 shall be submitted. *Polypropylene siding* shall be installed in accordance with the manufacturer's instructions. *Polypropylene siding* shall be secured to the building so as to provide weather protection for the *exterior walls* of the building.