Code Compliance Research Report
CCRR-0440

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Revised Date: 06-25-2025
Renewal Date: 06-30-2026

DIVISION: 07 00 00 – THERMAL AND MOISTURE PROTECTION
Section: 07 21 00 – Thermal Insulation

REPORT HOLDER:
DuPont de Nemours, Inc.
1501 Larkin Center Drive
Midland, Michigan 48674
www.dupont.com/building

REPORT SUBJECT:
Thermax™ Brand NH Series Polyisocyanurate Insulation Boards:

Thermax™ Metal Building Board NH Insulation
Thermax™ White Finish NH Insulation
Thermax™ Heavy Duty NH Insulation
Thermax™ Light Duty NH Insulation
Interior / Exterior
Thermax™ Basic NH Insulation

1.0 SCOPE OF EVALUATION

1.1 This Research Report addresses compliance with the following Codes:

- 2024, 2021, 2018, 2015, 2012, 2009 *International Building Code®* (IBC)
- 2024, 2021, 2018, 2015, 2012, 2009 *International Residential Code®* (IRC)
- 2024, 2021, 2018, 2015, 2012, 2009 *International Energy Conservation Code®* (IECC)
- 2021, 2018, 2015, 2012 *International Green Construction Code* (IgCC)
- 2022 California Building Code
- 2022 *California Green Building Standards Code*
- 2014, 2011 ANSI/ASHRAE/USGBC/IES Standard 189.1
- 2020 ICC 700 National Green Building Standard
- 2013 Abu Dhabi International Building Code (ADIBC)

NOTE: This report references the most recent Code editions cited. Section numbers in earlier editions may differ.

1.2 The DuPont™ Thermax™ Brand NH Series insulation boards have been evaluated for the following properties (see also Table 1):

- Physical properties
- Surface-burning characteristics
- Thermal resistance
- Water-vapor permeance
- Air permeability

1.3 The Thermax™ Brand NH series insulation boards have been evaluated for the following uses (see also Table 1):

- Non-structural thermal insulation in wall, ceiling or floor assemblies
- Alternatives to thermal barriers
- Alternatives to ignition barriers in attics and crawl spaces
- Air-impermeable insulation
- Alternatives to water-resistive barriers
- Use in Types I, II, III, IV and V construction

2.0 STATEMENT OF COMPLIANCE

Thermax Brand NH Series Insulation Boards comply with the Codes listed in Section 1.1, for the properties stated in Section 1.2 and uses stated in Section 1.3, when installed as described in this report, including the Conditions of Use stated in Section 6.

2.1 2024 IBC and IRC Evaluation Reports: The Intertek CCRR is an *Evaluation Report* for approval of an alternate material, design, or method of construction in accordance with Section 104.2.3.6.1 of the 2024 IBC and Section R104.2.2.6.1 of the 2024 IRC.

3.0 DESCRIPTION

3.1 Thermax™ Brand NH Series Insulation Boards: Thermax™ Brand NH Series insulation boards (Metal Building Board, White Finish, Heavy Duty, Light Duty, Basic) have a polyisocyanurate foam plastic core, a glass-fiber mat reinforcement, and aluminum facers adhered on both

sides. The boards are available in thicknesses between 0.5 and 4 inches and in various widths and lengths.

4.0 PERFORMANCE CHARACTERISTICS

4.1 Physical Properties: The insulation boards comply with ASTM C1289, Type I, Class 2.

4.2 Surface Burning Characteristics: The insulation boards have a flame spread index of 25 or less and a smoke-developed index of 450 or less when tested (core and faced) at a maximum thickness of 4 inches in accordance with ASTM E84 (UL 723).

4.3 Thermal Resistance: The insulation boards have a thermal resistance (*R*-value) shown in Tables 2A and 2B.

4.4 Water-vapor Permeance: The insulation boards, at a minimum thickness of 1/2 inch, have a water-vapor permeance less than 0.1 perm when tested in accordance with ASTM E96 (Procedure A - desiccant method) and qualify as a Class I vapor retarder.

4.5 Air Permeability: The insulation boards, at a minimum thickness of 1/2 inch, have an air permeance of less than 0.02 L/s-m^2 and are considered air-impermeable based on testing in accordance with ASTM E2178.

5.0 INSTALLATION

5.1 General:

Thermax™ Brand NH Series Insulation Boards must be installed in accordance with the manufacturer's published installation instructions, the applicable Code, and this Research Report. A copy of the manufacturer's instructions must be available on the jobsite during installation.

Thermax™ Brand NH Series insulation boards, at a maximum thickness of 4 inches, may be used as nonstructural insulating material without a thermal barrier on wall and/or floor/ceiling assemblies in any type of structure. For exterior wall applications, the insulation boards must be attached with fasteners spaced a maximum of 16 inches on-center in the field and 12 inches on-center on the perimeter. For cementitious exterior wall coating applications, fasteners for insulation boards thicker than 1-1/2 inches must be considered for lateral resistance to ensure support for the exterior wall coatings. For interior applications, the insulation boards must be attached with fasteners spaced a maximum of 24 inches on-center along the width of the board and a maximum of 48 inches on-center along the length of the board.

5.2 Air Barrier Material: When used as an air barrier material in accordance with IECC Section C402.6.2.3.1, the insulation boards must be installed in accordance with the manufacturer's installation instructions and other applicable requirements of this report.

5.3 Water-resistive Barrier: Thermax™ Brand NH Series insulation boards may be used as an alternative to the water-resistive barrier requirements in IBC Section 1403.2 and IRC Section R703.2, when installed as described in this section.

Insulation boards are installed horizontally or vertically with edges in substantial contact and backed by framing. Fasteners must have minimum 2-inch-diameter plastic caps or washers and fasteners must penetrate framing a minimum of 0.45 inch for steel framing and 0.75 inch for wood framing. Joints must be covered with one of the following:

- Minimum 2-7/8-inch-wide DuPont™ Styrofoam™ Brand Tape
- LiquidArmor™ CM Flashing and Sealant applied at a thickness of 45 wet mils in a minimum 2-inch-wide band centered on the joint.
- LiquidArmor™ LT Flashing and Sealant applied at a thickness of 25 wet mils in a minimum 1-inch-wide band centered on the joint.
- LiquidArmor™ QS Flashing and Sealant applied at a thickness of 45 wet mils in a minimum 2-inch-wide band centered on the joint.
- For all joints:
  - Gaps greater than 1/4 inch must be filled using Great Stuff™ Pro Gaps & Cracks prior to flashing the insulation; other sealants acceptable to Dupont may be used.

Flashing of penetrating items must be sealed with Great Stuff Gaps & Cracks sealant and covered with one of the following:

- LiquidArmor™ CM Flashing
- LiquidArmor™ QS Flashing
- LiquidArmor™ LT Flashing

- An elastomeric sealant

See Figures 8 through 13.

5.4 Thermal Barrier: Thermax Brand NH Series insulation boards may be installed without the thermal barrier required by IBC Section 2603.4 and IRC Section R303.4.

5.5 Attics and Crawl Spaces: Thermax Brand NH Series insulation boards may be installed in attics and crawl spaces without the prescriptive ignition barrier required by IBC Section 2603.4.1.6 or IRC Sections R303.5.3 or R303.5.4, when all of the following conditions are met:

- Attic ventilation is provided when required by IBC Section 1202.2 or IRC Section R806, as applicable.
- Under-floor (crawl space) ventilation is provided that complies with IBC Section 1202.4 or IRC Section R408.1, as applicable.
- Combustion air is provided in accordance with IMC (*International Mechanical Code®*) Section 701.

5.6 Exterior Walls Required to be of Types I, II, III or IV Construction:

Thermax™ Brand NH Series insulation boards may be used in exterior walls of any height when installed as described in Table 3. Thermax™ Brand NH Series insulation boards have a potential heat of 1448 Btu/ft^2 per inch of thickness.

Assemblies described in Table 3 are based on data submitted to Intertek. Other constructions may be considered when justified to the satisfaction of the building official.

5.7 Use as Foam Sheathing:

The Thermax™ Brand NH Series insulation boards are certified by DrJ for compliance with ANSI/FS 100, as referenced in IBC Section 2603.10. See Technical Report TER-1506-03.

6.0 CONDITIONS OF USE

6.1 Installation must comply with this Research Report, the manufacturer's published installation instructions, and the applicable Code. In the event of a conflict, this report governs.

6.2 Exterior walls must be protected by a water-resistive barrier complying with IBC Section 1403.2 or IRC Section R703.2, except when installed in accordance with Section 5.4, and by wall coverings that provide the necessary structural wind and seismic resistance between the wall framing members.

6.3 The insulation boards must not be used as a nailing base for siding materials. All fasteners must penetrate through the insulation into the wall framing or structural sheathing as required by the wall covering manufacturer's instructions or by the applicable code.

6.4 Labeling and installation of the insulation boards must comply with IRC Section N1101.10 and IECC Sections R303.1 and C303.1, as applicable.

6.5 Use of the insulation boards in areas where the probability of termite infestation is "very heavy" must be in accordance with IRC Section R305.4 or IBC Section 2603.8, as applicable.

6.6 Thermax™ Brand NH Series Insulation Boards are manufactured under a quality control program with inspections by Intertek Testing Services NA, Inc.

7.0 SUPPORTING EVIDENCE

7.1 Data in accordance with ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated June 2015 (editorially revised October 2017).

7.2 Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Sheathing Panels Used as Water-resistive Barriers (AC71), dated February 2003 (editorially revised March 2021).

7.3 Reports of tests in accordance with ASTM E96, NFPA 259, NFPA 285, NFPA 286, ASTM E84 (UL 723), and UL 1715.

7.4 Engineering analyses extending results of NFPA 285 testing.

7.5 Intertek Listing Report "DuPont de Nemours, Inc., Thermax™ Brand NH Series Polyisocyanurate Insulation Boards", on the Intertek Directory of Building Products.

8.0 IDENTIFICATION

Thermax™ Brand NH Series Insulation Boards are identified by a label on the packaging with the manufacturer's name (DuPont de Nemours, Inc.), the product name, the plant code or address, the Intertek Mark as shown below, and the Code Compliance Research Report number (CCRR-0440).

9.0 OTHER CODES AND STANDARDS

9.1 2022 California Building Code: When installed in accordance with this report, the Thermax™ Brand NH Series insulation boards comply with the 2022 *California Building Code, California Residential Code* and *California Energy Code*, excluding CBC Chapter 7A and CRC Section R337.

9.2 2022 California Green Building Standard Code, Title 24 Part 11: When installed as described in Section 5.3 of this report for use as a water-resistive barrier, the Thermax™ Brand NH Series insulation boards conform with the provisions of CALGreen Section 5.407.1 for water-resistive barriers.

9.3 2021 International Green Construction Code: When installed as described in Section 5.2 of this report for use as an air barrier, the Thermax™ Brand NH Series insulation boards conform with the provisions of IgCC Section 701.3.1.2 for air barriers.

9.4 2020 ICC 700 National Green Building Standard: When installed as described in Section 5.3 of this report for use as a water-resistive barrier, the Thermax™ Brand NH Series insulation boards conform with the provisions of ICC 700 Sections 602.1.8, 11.602.1. and 11.602.1.8 for water barriers.

9.5 2014 ANSI/ASHRAE/USGBC/IEC Standard 189.1: When installed as described in Section 5.2 of this report for use as an air barrier, the Thermax™ Brand NH Series insulation boards conform with the provisions of Standard 189.1, Section 7.3.1.1 for air barriers.

9.6 2013 Abu Dhabi International Building Code: When installed in accordance with Sections 3 through 8 of this report, the Thermax™ Brand NH Series insulation boards comply with the 2013 Abu Dhabi International Building Code.

10.0 CODE COMPLIANCE RESEARCH REPORT USE

10.1 Approval of building products and/or materials can only be granted by a building official having legal authority in the specific jurisdiction where approval is sought.

10.2 Code Compliance Research Reports shall not be used in any manner that implies an endorsement of the product by Intertek.

10.3 Reference to the https://bpdirectory.intertek.com is recommended to ascertain the current version and status of this report.

TABLE 1 – PROPERTIES EVALUATED

PROPERTY	2024 IBC	2024 IRC	2024 IECC
Physical properties	Table 1508.2 2603.10	R906.2	N/A
Surface burning characteristics	2603.3	R303.3	N/A
Thermal resistance	1301	N1101.10.4 N1102	C303.1 R303.1
Water-resistive barrier	1403.2	R703.2	N/A
Air barrier	1301	R202 N1101.10.5	C402.6.2.3.1 C402.6.2.3.2 R303.1.5
Type I – IV construction	2603.5	N/A	N/A
Thermal barrier / ignition barrier	2603.4	R303.4	N/A

TABLE 2A – THERMAL RESISTANCE

NOMINAL THICKNESS (inches)	*R*-VALUE (°F.ft^2.h/Btu) at 75°F Mean Temperature
0.5	3.7
1.0	6.7
2.0	13
3.0	19
4.0	25

TABLE 2B – THERMAL RESISTANCE

NOMINAL THICKNESS (inches)	*R*-VALUE (°F.ft^2.h/Btu) at 40°F Mean Temperature	*R*-VALUE (°F.ft^2.h/Btu) at 110°F Mean Temperature
1.0	7.1	6.0

TABLE 3 – THERMAX™ BRAND NH SERIES - NFPA 285 COMPLYING WALL ASSEMBLIES

Layer	Wall Component	Materials
I	Base wall system – Use either 1, 2, 3, 4, or 5	1. Concrete wall 2. Concrete Masonry Unit (CMU) wall 3. Standard clay brick wall 4. Fire Retardant Treated Wood studs: nominal 2-inch × 4-inch or greater FRTW wood studs spaced at a maximum of 16-in. o.c. Wall cavity filled with fiberglass batt insulation (faced or unfaced) or mineral wool insulation (faced or unfaced). One layer of 5/8-in. thick Type X gypsum wallboard installed on interior and exterior face of wood studs. Minimum two top plates at floorlines. 5. Steel studs: minimum 3-5/8-in.-depth, minimum 18-gauge, spaced maximum 24-in. o.c. with lateral bracing every 4 ft. vertically with: a) One layer of 5/8-in.-thick Type X gypsum wallboard on interior face of studs. Gypsum wallboard joints shall receive at a minimum a Level 2 finish with all fasteners covered with joint compound, or b) GCP Applied Technologies Monokote Z-3306 installed at a minimum 3/8-in. thickness over Thermax™ Brand NH Series Insulation, or c) International Cellulose Corporation's Ure-K Thermal Barrier System installed at a minimum of 1-1/4-in. thickness over Thermax ™ Brand NH Series Insulation. As an option, when steel studs are used exterior gypsum sheathing is not required. Base wall system must be designed for applicable loads due to cladding and wind loads. Fasteners for cladding must be to the structural system. Note: See Figure 7 for transition detail of interior 5/8-in. thick Type X gypsum wallboard to thermal barrier material.
Required	Floor line firestopping - required in curtain-wall construction	4 pcf mineral wool in each stud cavity and at each floor line – friction fit in cavity, attached with Z-clips, or equivalent. See Figure 14.
II	Cavity Insulation – Use either 1, 2, or 3 or combination of 2 and 3	1. None – This option is permitted only when exterior gypsum sheathing is used. 2. Fiberglass batt insulation (faced or unfaced) 3. Mineral wool batt insulation (faced or unfaced) Note: Screw end of fasteners that protrude into the stud cavity can be covered with a maximum of 1-1/2-inch-diameter plug of DuPont™ Froth-Pak Class A rated per ASTM E84.

III	Exterior sheathing – Items 1, 2 or 3 depending on base wall requirements	1. No exterior sheathing required when base wall assemblies 1 through 3 are used. 2. 5/8-in.-thick, Type X exterior gypsum sheathing, attached directly to framing, is required with Base wall system 4. 3. Exterior gypsum sheathing (any thickness) is optional with Base wall system 5 when Cavity Insulation 2 or 3 are included in Base Wall stud cavity. Min. 5/8-in.-thick, Type X exterior gypsum sheathing, attached directly to framing, is required when Base wall system 5 wall stud cavities do not utilize Cavity Insulation (Layer II).
IV	Exterior insulation	DuPont™ Thermax™ Brand NH Series Insulation, such as Thermax™ Basic NH Exterior Insulation – installed at a minimum thickness of 5/8-in. and a maximum thickness of 3 in. a) When installed at a maximum thickness of 2 in., any cladding material in layer VII may be used. b) When installed at a maximum thickness of 3 in., cladding material in layer VII may be used, **excluding the following**: - Metal Composite Material (MCM) panel systems - Sheet metal claddings or wall coverings (e.g., steel, aluminum, copper)
V	Exterior insulation joint flashing	Flash all exterior insulation joints and veneer tie penetrations with one of the following: a) DuPont™ LiquidArmor™ - CM Flashing and Sealant – max. 50-mil wet thickness, max. 3-in. width b) DuPont™ LiquidArmor™ - LT Flashing and Sealant – max. 35-mil wet thickness, max. 3-in. width. c) DuPont™ LiquidArmor™ - QS Flashing and Sealant – max. 60-mil wet thickness, max. 3-in. width d) DuPont™ Tyvek® Fluid Applied Flashing and Joint Compound+ – max. 25-mil wet thickness, max. 3-in. width e) Asphalt, acrylic, or butyl-based flashing tape – max. 4-inch width f) DuPont™ Great Stuff Pro™ - Use on joints that are greater than 1/4-in., vertical joints must be staggered & remove significant excess from the face of the Thermax™ Note: With e), a small amount of spray primer may be used to aid in adhesion; maximum 4-in. width.
VI	Weather-resistive Barrier (WRB) - Either 1 or 2	1. None (when Thermax NH is the WRB per Section 5.3 of this report) 2. Any water-resistive barrier complying with IBC Section 1403.2 or IRC Section 703.2 and shown to have both of the following: • a peak heat release rate of less than 150 W/m^2, a total heat release of less than 20 MJ/m^2 and an effective heat of combustion of less than 18 MJ/kg when tested on specimens at the thickness intended for use, in accordance with ASTM E1354, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m^2 • a flame spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84 of UL 723, with test specimen preparation in accordance with ASTM E2404 The WRB may be installed either over the exterior insulation (Layer IV), or behind the exterior insulation and over the exterior sheathing (Layer III).

VII	Exterior Veneer – Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12, except where limited by insulation thickness per Exterior Insulation item (Layer IV)	1. MCM System - Use any MCM, including Aluminum Composite Material (ACM) systems, that has been successfully tested by the panel manufacturer via the NFPA 285 test method. Acceptable NFPA 285 testing shall consist of successful NFPA 285 test results on a wall assembly incorporating a comparable thickness and potential heat of combustible foam insulation. Max. air gap between insulation and MCM panels is 2-3/4 in. 2. Terracotta cladding – Use any non-open jointed terracotta cladding system in which terracotta is minimum 1-1/4-in. thick. Any standard installation technique such as shiplap, etc. may be used. 3. Sheet metal exterior wall coverings including steel (minimum 0.0179-in. thick), aluminum (minimum 0.080-in. thick), or copper (minimum 0.0179-in. thick). Any standard installation technique may be used. 4. James Hardie® Plank Lap Siding, min. 5/16-in.-thick, installed per manufacturer's instructions with a 1-1/4-in. overlap. 5/4 in. x 4 in. Hardie window trim fastened around the perimeter of openings. 5. Brick - Standard nominal 4-in.-thick, clay brick with standard type brick veneer anchors, installed maximum 24 inches o.c. vertically on each stud. Air gap between exterior insulation and brick to be a maximum of 2-in. Minimum 18-gauge steel flashing installed around openings to close off air cavity at exterior wall openings. 6. Stucco – Minimum 3/4-in.-thick, exterior cement plaster and lath. A secondary water-resistive barrier may be installed between the exterior insulation and the lath. The secondary water-resistive barrier may be 1 or 2 layers of asphalt building paper but shall not be full-coverage asphalt or butyl-based self-adhered membranes. 7. Limestone or natural stone veneer or cast artificial stone veneer, min. 1-1/4-inch thick. Any standard installation technique such as shiplap, etc. may be used. Air gap between exterior insulation and stone to be a maximum of 2 in. Minimum 18-gauge steel flashing installed around openings to close off air cavity. 8. Natural stone or cast artificial stone, min. 3/4-in.-thick, fully adhered with cementitious mortar (standard or polymer modified) to min. 1/2-in. thick cement backer board or gypsum sheathing. A secondary water-resistive barrier may be installed between the board/sheathing and the stone. The secondary water-resistive barrier shall not be full-coverage asphalt or butyl-based self-adhered membranes 9.Concrete or precast concrete panels, min. 1-1/2-in.-thick. Any standard installation technique may be used. Air gap between exterior insulation and concrete panel to be a maximum of 2 in. Minimum 18-gauge steel flashing installed around openings to close off air cavity at exterior wall openings. 10. Ceramic tile, min. 3/8-in.-thick, bonded using noncombustible mortar adhesive to minimum 1/2-in.-thick cement board or gypsum sheathing.

		11. Thin brick (min. 3/4-in.-thick clay brick) fully adhered with cementitious mortar (standard or polymer modified) to min. 1/2-in.-thick cement backer board or gypsum sheathing. A secondary water-resistive barrier may be installed between the board/sheathing and the brick. The secondary water-resistive barrier shall not be full-coverage asphalt or butyl-based self-adhered membranes. 12. Concrete Masonry Units - Minimum 2-in.-thick panel, with a maximum 2-in. air gap between exterior insulation and the interior face of the exterior CMU. Any standard non-open-joint installation technique may be used. Minimum 18-gauge steel flashing installed around openings to close off air cavity at exterior wall openings.
Not Shown	Flashing of window, door, and other exterior wall penetrations.	Openings must be framed with one layer of 5/8-in. thick Type X exterior gypsum sheathing on header and jambs. Header finished with 18-gauge "L" shaped steel flashing and covered with aluminum drip cap. As an option, flash window, door and other exterior penetrations with either: a) DuPont™ LiquidArmor™ – CM Flashing and Sealant – max. 60-mil wet thickness, max. 12-in. width. b) DuPont™ LiquidArmor™ – LT Flashing and Sealant – max. 35-mil wet thickness, max. 12-in. width. c) DuPont™ LiquidArmor™ – QS Flashing and Sealant – max. 60-mil wet thickness, max. 12-in. width. d) DuPont™ Tyvek® Fluid Applied Flashing and Joint Compound+ – max. 25-mil wet thickness, max. 3-in. width e) DuPont™ DuraGard™ CM Transition Flashing – max. 12-in. width f) Limited amounts of acrylic, asphalt or butyl-based flashing tape – max. 12-in. width. g) Hohmann & Barnard Textroflash™ Flashing Note: Self-adhered flashing membrane used in wall openings may cover the wall width of rough opening plus extend up to a maximum of 4 in. onto the exterior face of the sheathing. Self-adhered flashing membrane may be used on sheathing exterior corners where the flashing tape may extend a maximum of 4 in. onto the sheathing face on either side of the corner.

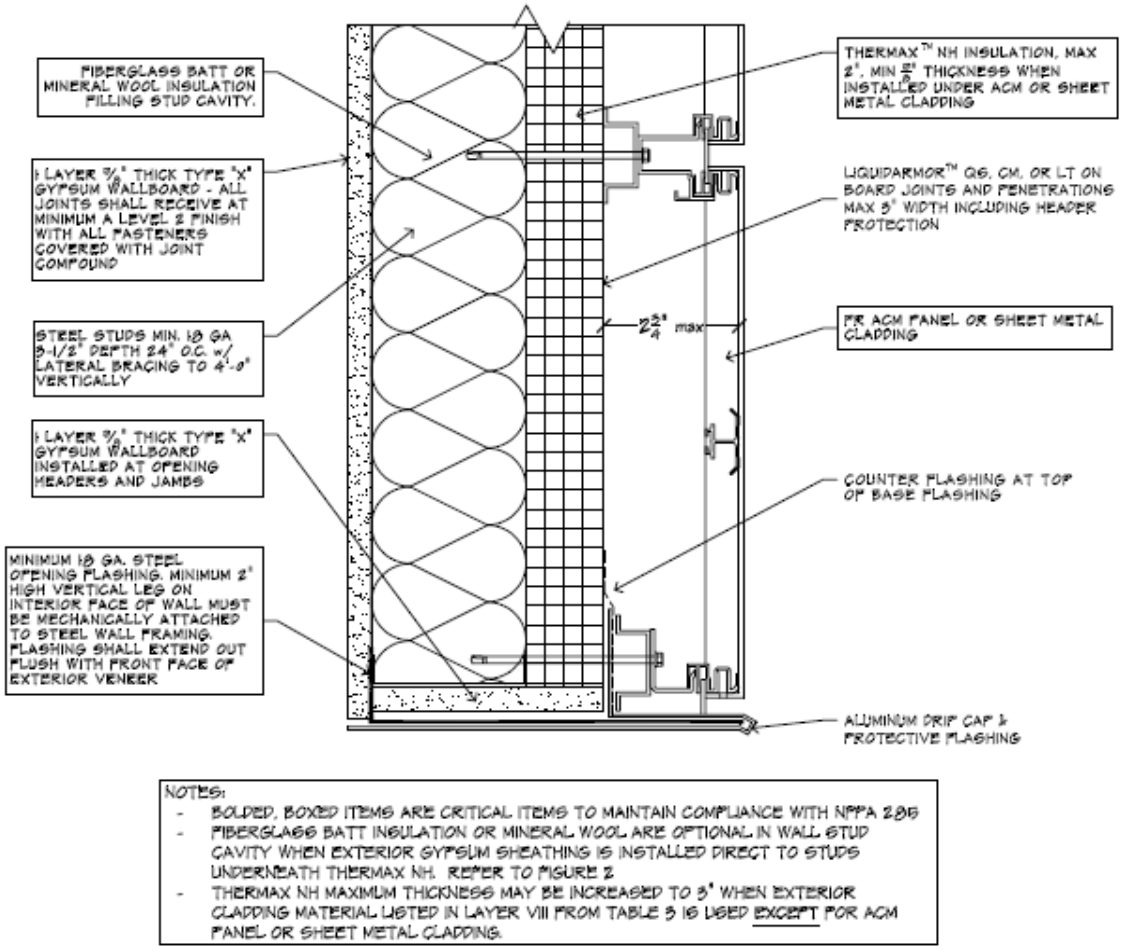

Figure 1 - Exterior wall construction with ACM exterior veneer

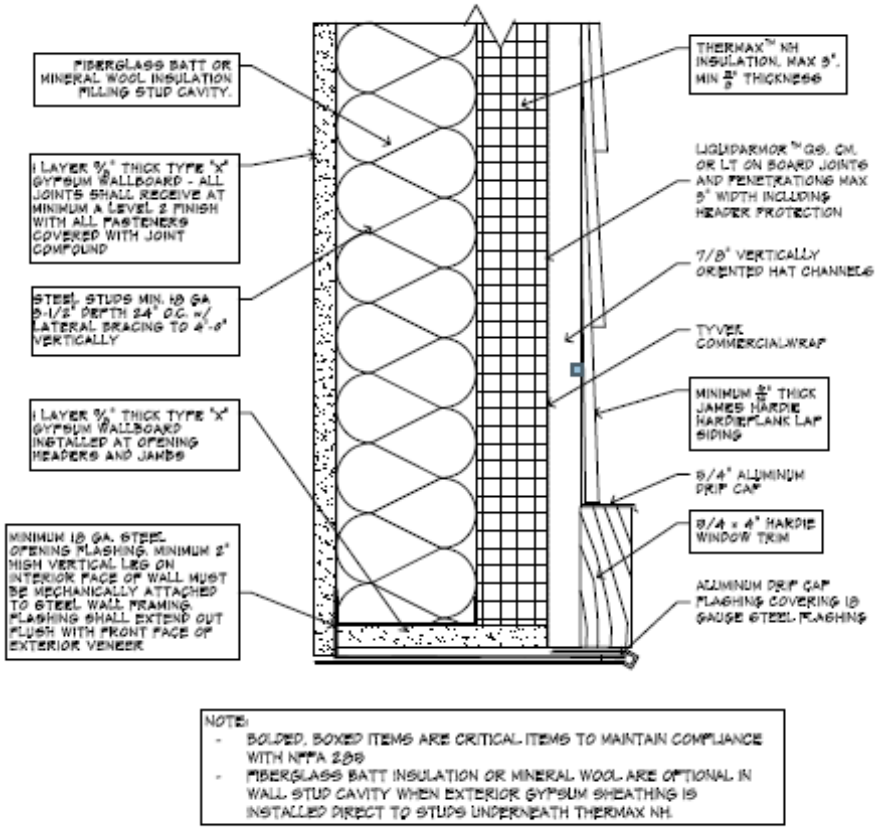

Figure 2 - Exterior wall construction with James Hardi® Plank Lap Siding exterior veneer

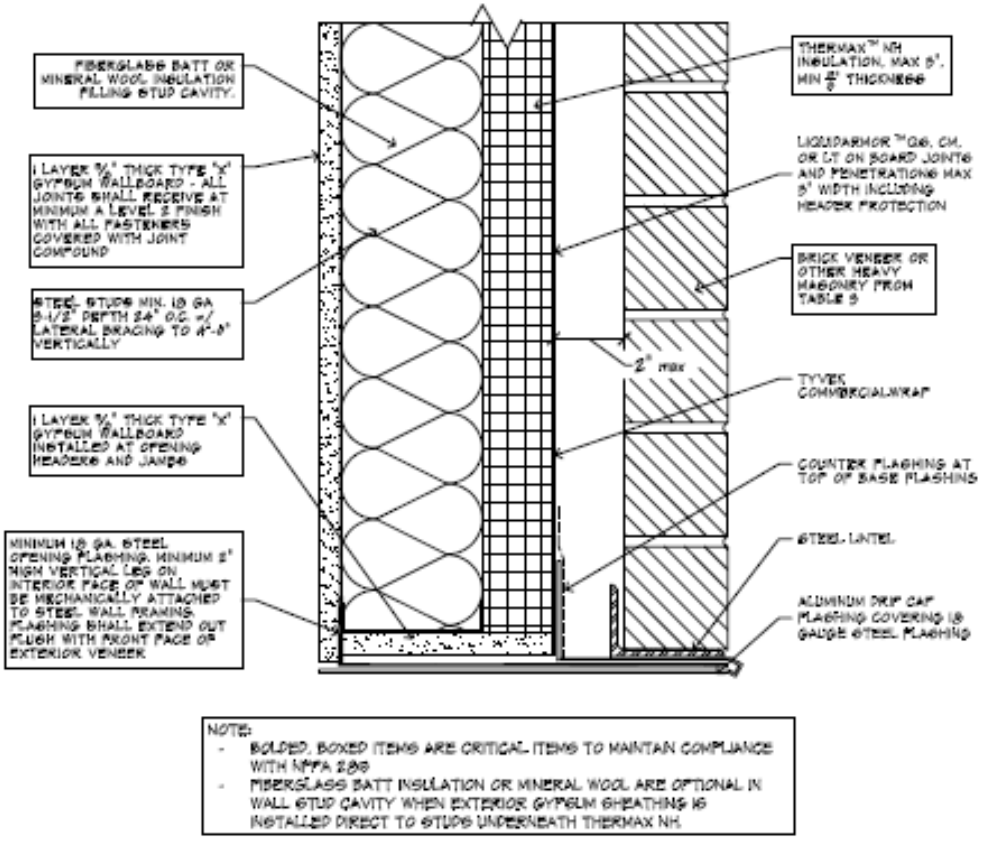

Figure 3 - Exterior wall construction with brick exterior (depicts exterior veneer systems other than Hardie® Plank where air cavity space exists between insulation and exterior veneer)

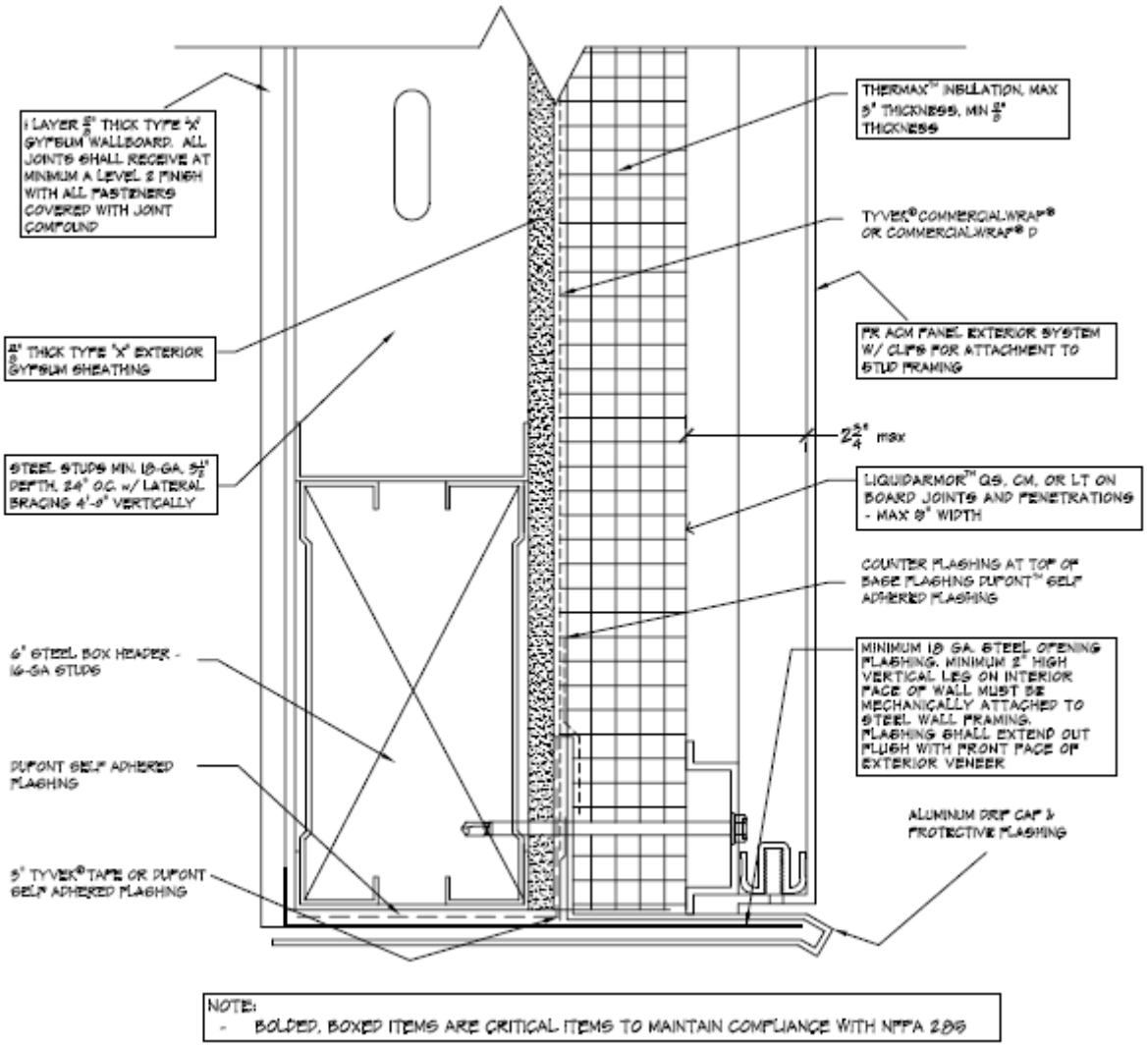

Figure 4 - Use of Tyvek® CommercialWrap® or CommercialWrap® D WRB behind Thermax™ Insulation

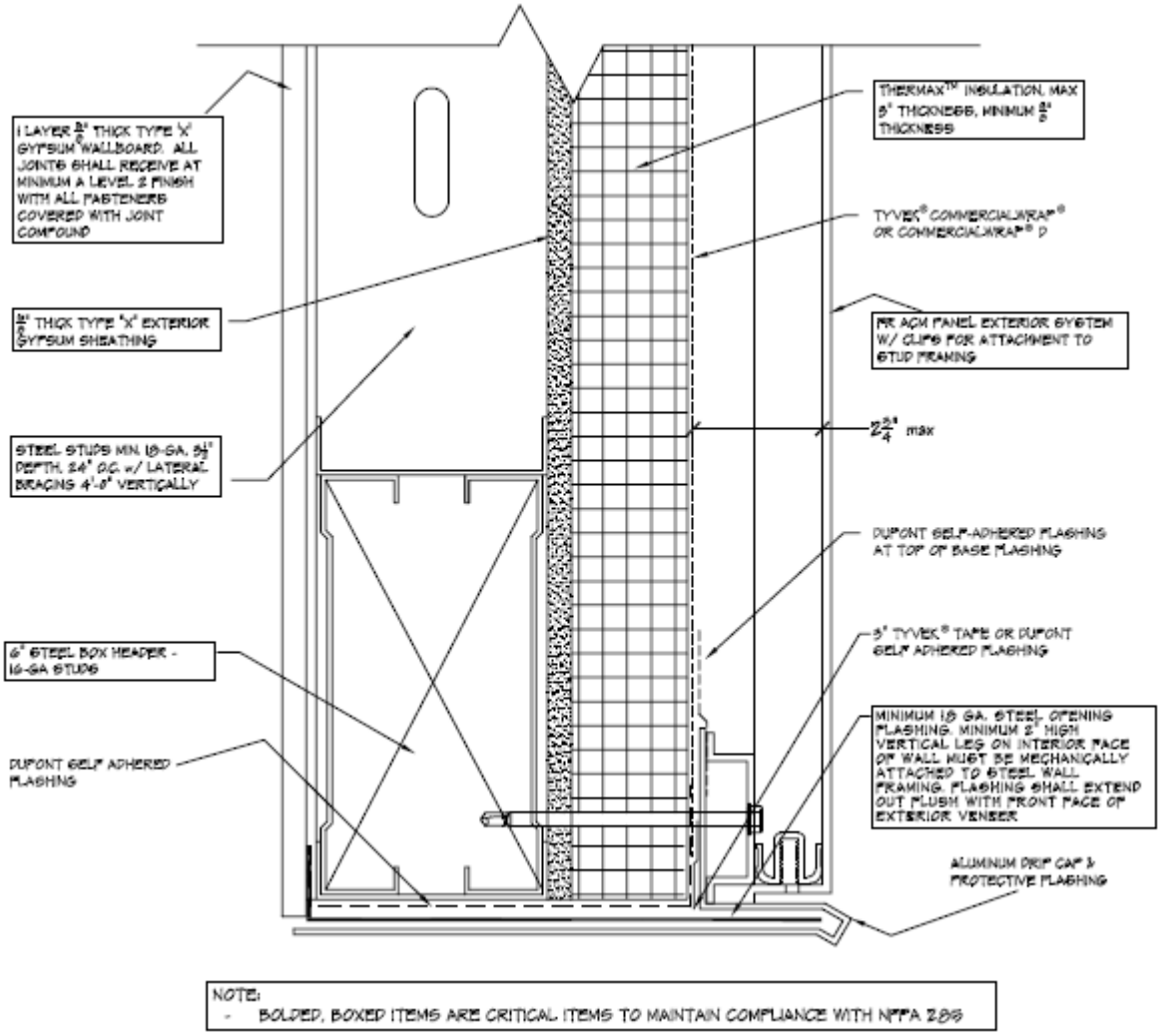

Figure 5 - Use of Tyvek® CommercialWrap® or CommercialWrap® D WRB over Thermax™ Insulation

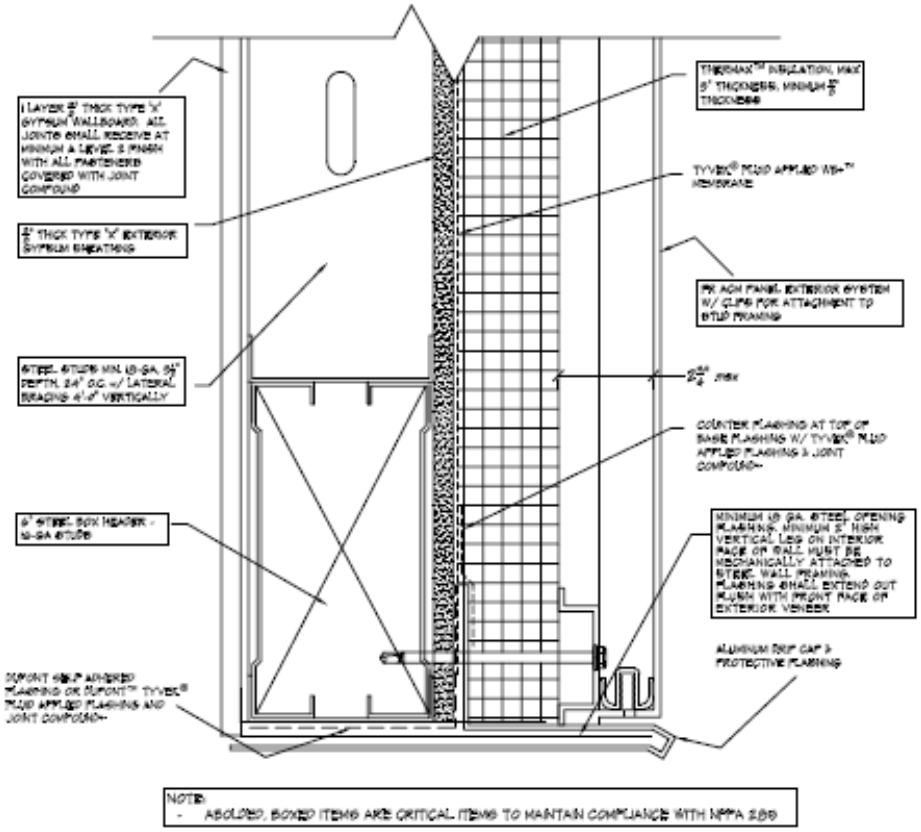

Figure 6 - Use of Tyvek® Fluid Applied WB+® WRB behind Thermax™ Insulation

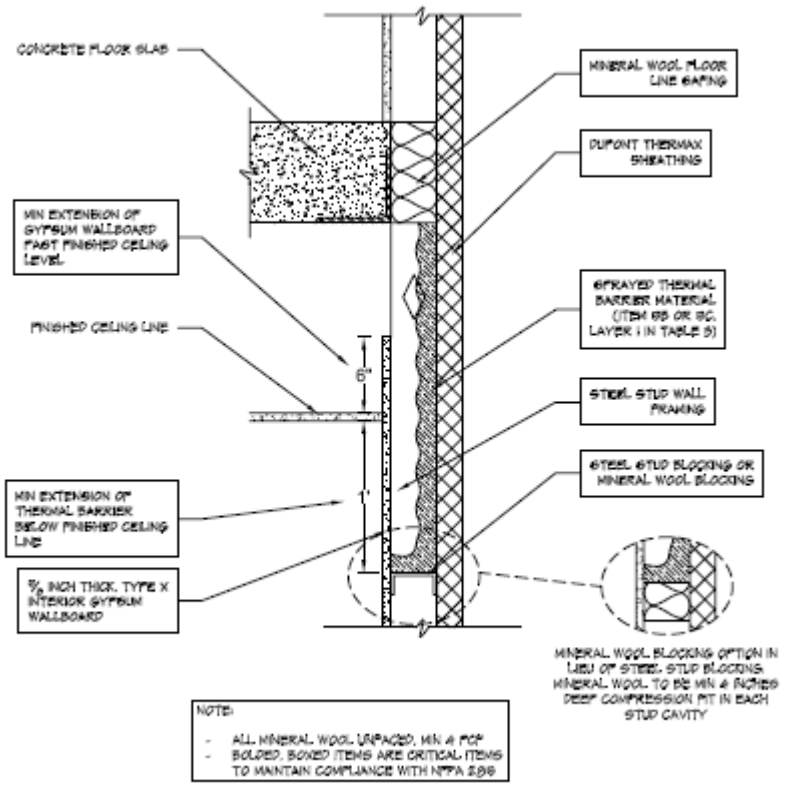

Figure 7 - Transition detail from interior gypsum wallboard to sprayed thermal barrier material above ceiling line

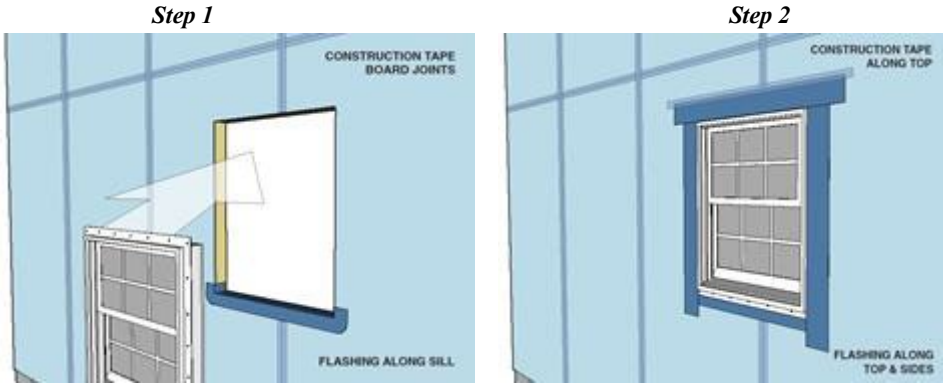

FIGURE 8—TYPICAL WINDOW FLASHING DETAIL

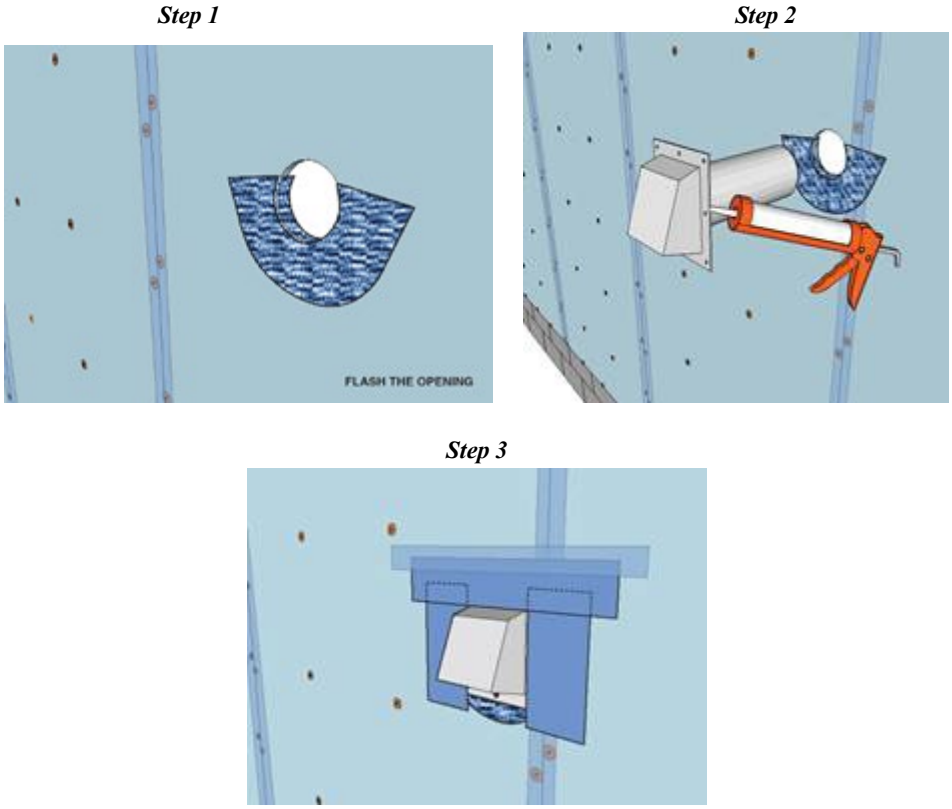

FIGURE 9—TYPICAL PENETRATION FLASHING DETAIL—FLANGED

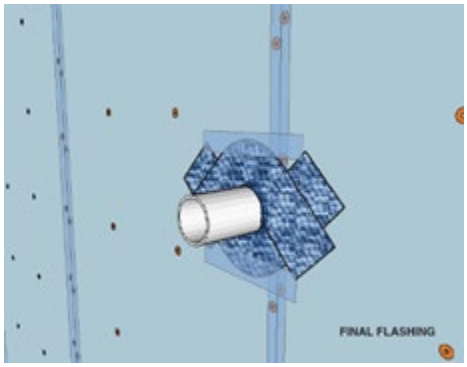

FIGURE 10—TYPICAL FLASHING DETAIL—UNFLANGED

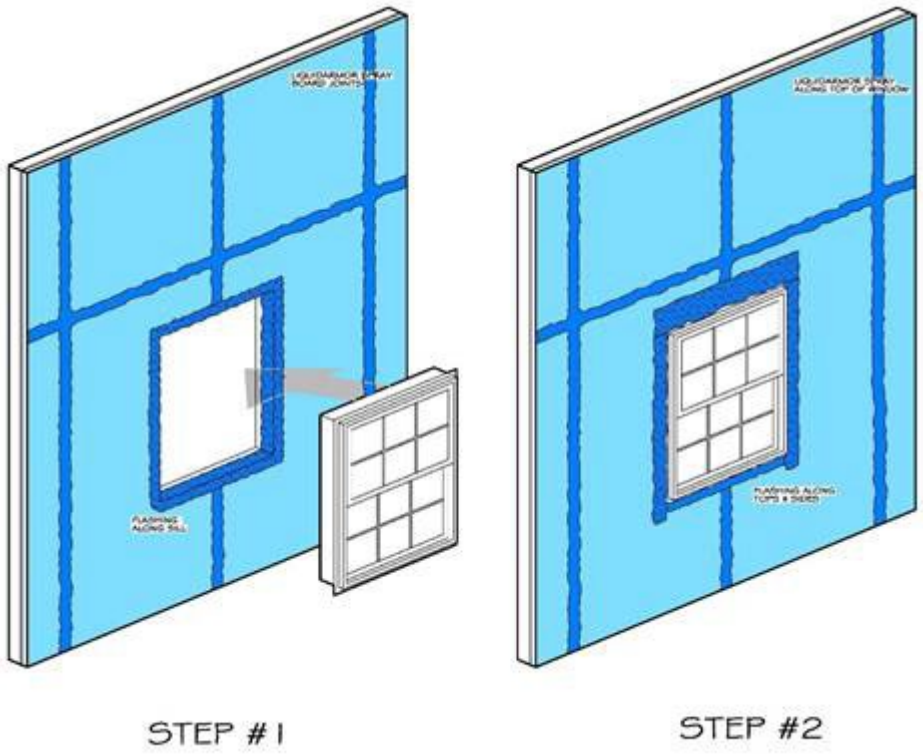

FIGURE 11—TYPICAL WINDOW FLASHING DETAIL

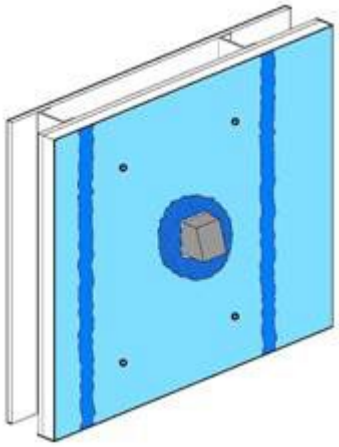

FIGURE 12—TYPICAL PENETRATION FLASHING DETAIL—FLANGED

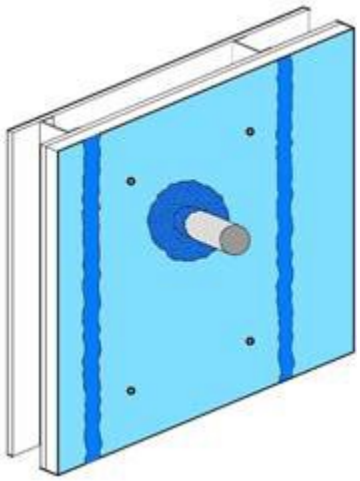

FIGURE 13—TYPICAL FLASHING DETAIL—UNFLANGED

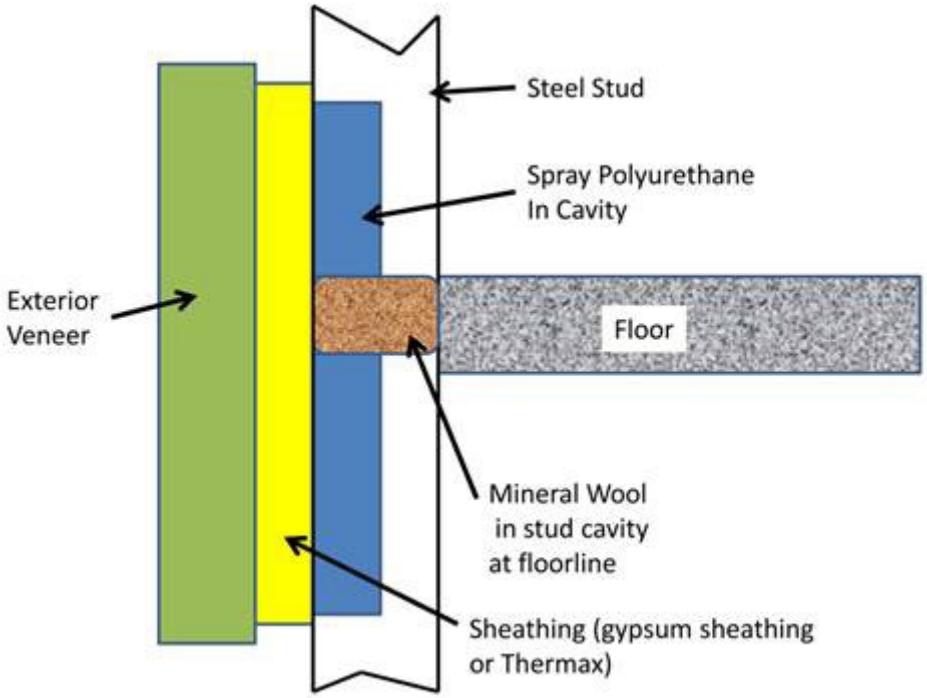

FIGURE 14—FIRESTOPPING DETAIL AT FLOOR LINES FOR TYPES I–IV CONSTRUCTION