MAY | RIEGLER
PROPERTIES

April 29, 2021

Routt County Regional Building Department
136 6th Street, Suite 201
Steamboat Springs, CO 80477-5088
Attn: Todd Carr

RE: Code Modification Request for Basecamp Apartments re: NFPA 285

Dear Todd,

This code modification request is being submitted in accordance with IBC code section 104.10 Modifications.

The applicant is requesting a code modification to NFPA 285 ("Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components").

Per discussions with RCRBD on 4/20/22, all exterior walls are to be 2-hour rated at the interior side only. Due to the fire protective detail at Area 1A at column line 10, and the two "buildings" being located on the same block, it was agreed that no exterior fire rating is required throughout Area 1B. There are no other buildings located on the block, or within 30' from the proposed structure, so therefore a 0-hour exterior rating is required. The building is equipped with an automatic fire sprinkler system per NFPA 13.

Please see attached engineering judgement from Jensen Hughes, dated February 4, 2022, which determines that the Thermax brand rigid insulation proposed by the Applicant is in compliance with NFPA 285 when implemented within an FRTW exterior wall assembly. The Basecamp Apartment project proposes two layers of type X drywall on the interior face of the exterior stud wall to obtain the 2-hr rating as discussed with RCRBD on 4/20/22. The Jensen Hughes engineering judgement is based upon an FRTW assembly that contains one layer of type X on either side of the stud wall. All other components of the assembly proposed by the applicant are consistent with the engineering judgement, but for the specific location of the type X drywall.

Though not 100% in compliance with NFPA 285 because no testing exists for this specific assembly (most likely due to the relatively new application of FRTW at exterior wall assemblies), the Applicant's proposal to use fire retardant treated sheathing in addition to mineral wool firestopping on the exterior side (in lieu of the type X drywall identified in the engineering judgement) should be acceptable, particularly since there is no fire rating requirement for the exterior side of the exterior stud walls.

Thank you for your consideration regarding this Code Modification request.

Sincerely,

Gabriela Riegler

SEE HIGHLIGHTED SECTIONS OF THIS ENGINEERED JUDGEMENT FOR APPLICABLE EXTERIOR WALL ASSESMBLY AT STEAMBOAT BASECAMP PROJECT

MAY RIEGLER PROPERTIES
KASA
4/28/2022

JENSEN HUGHES
Advancing the Science of Safety

February 4, 2022

DuPont Performance Building Solutions
1501 Larkin Center Drive
Midland, MI 48642

RE: DuPont™ Thermax™ With or Without BASF SPRAYTITE® 81206 or Walltite LWP Spray Polyurethane Foam - Various NFPA 285 Complying Exterior Wall Constructions
JENSEN HUGHES Project No.: 1JJB05306.011

To Whom It May Concern:

This analysis provides a summary of various exterior wall constructions that incorporate one or more of the following products and that will meet the requirements of NFPA 285:

+ Thermax™ Brand Rigid Insulation
+ BASF SPRAYTITE® 81206 or Walltite LWP spray polyurethane foam (SPF) which is a closed cell, nominal 2.0 lb./ft^3 density, spray polyurethane foam plastic insulation materials.

Section 2603.5.5 of the International Building Code (2000 through 2018 Editions) require exterior wall systems incorporating foam plastic insulation materials shall meet the requirements of NFPA 285, *Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components*, (1998, 2002, 2012 or 2019 Editions depending on Code edition).

DuPont™ (previously Dow Chemical) has performed several NFPA 285 fire tests on various exterior wall systems that have incorporated one or more of the above mentioned foam plastic Insulations. These tests include:

1. Brick exterior wall construction – Reported in Southwest Research Institute Final Report No. 01.05805.01.001, dated November 2002.
2. Brick exterior wall construction – Reported in Southwest Research Institute Final Report No. 01.13104.01.001c, dated September 5, 2008.
3. Metal Composite Material Panel exterior wall construction – Reported in Southwest Research Institute Final Report No. 01.13104.01.001d, dated September 5, 2008.
4. Brick exterior wall construction – Reported in Southwest Research Institute Final Report No. 01.15210.01.607a, dated May 24, 2010.
5. Brick exterior wall construction - Reported in Southwest Research Institute Final Report No. 01.15822.01.001, dated September 9, 2010.
6. Aluminum Composite Material (ACM) Panel exterior wall construction – Reported in Intertek Testing Final Report No. J0651.01-121-24-R0, dated April 24, 2019.

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Based on the results of these NFPA 285 tests, additional testing of water-resistive barriers (WRB) materials per ASTM E1354 and our experience with the NFPA 285 fire test, it is our opinion that the various configurations of exterior walls shown in Figures 1 and 2 and described in Tables 1 through 5 will meet the performance requirements of NFPA 285. Additionally, special opening header details shown in Figures 3, 4, 5, and 6 are to be used when the BASF SPRAYTITE® 81206 or Walltite LWP SPF is included in the wall stud cavities. Figures 3 and 4 depict wall assemblies where the wall framing continues past each floor line (infill or curtain wall installation). Figures 5 and 6 depict infill wall construction where the walls are supported on the floor slab and the end of the concrete floor slab extends into the wall construction. Figures 7, 8, and 9 depict the use of one of the DuPont™ Tyvek® WRB materials in conjunction with the Thermax™ foam plastic insulation material.

The header details shown in Figures 7, 8, and 9 (minimum 18 gauge steel opening flashing) are only required at all wall openings when no SPF is included in the exterior wall assembly.

When the interior gypsum wallboard layer is detailed to stop above the finished ceiling line in an exterior wall assembly (see Figure 10), the sprayed thermal barrier material (Item 6b or 6c in Table 1, Layer I, Base wall system) shall be applied directly to the Thermax™ at the following thicknesses:

- GCP Monokote Z3306 – minimum ⅜-inch thickness
- International Cellulose Corporation Ure-K – minimum 1¼-inch thickness

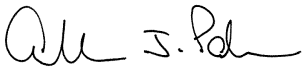
The transition between the gypsum wallboard and the thermal barrier material shall be as shown in Figure 10.

This analysis is based on the specific construction materials installed in the manner described in the referenced test report(s). Changes or modifications to the construction and/or materials used in the tested assembly may result in a different fire performance and may change this analysis.

This analysis does not address performance characteristics such as weatherability, durability, or structural issues.

We trust this information is of assistance and if you have any questions, please feel free to contact me at 443-313-9891 or aparker@jensenhughes.com.

Sincerely,



Arthur J. Parker, P.E.
Sr. Fire Protection Engineer

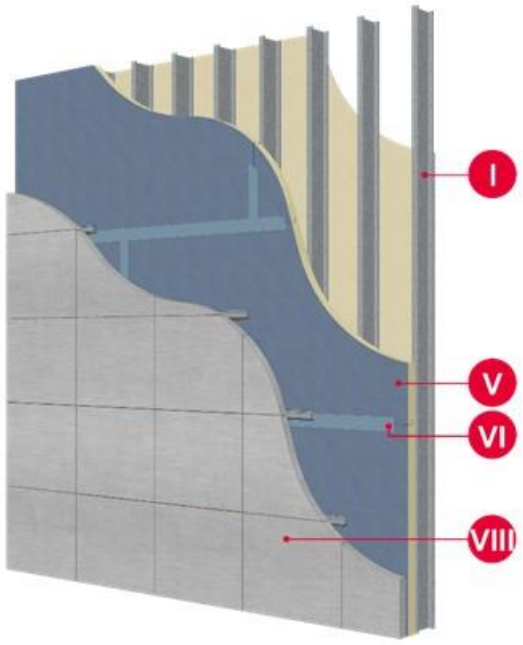


Figure 1 – Typical Layer Assembly

Figure 1 (Left): Typical Layer Assembly

Image shows a typical Thermax™ Wall System assembly with numerals that correspond to Tables 1-5.

Note that not all layers shown here are required in assembly, not all possible layers are shown, and layers have several different material selection options.

See Tables 1-5 for all layer and material selection options, and Figure 2 for examples of other common layer assemblies.

Figure 2 (Below): Example Layer Assemblies

Images in Figures 2-1 through 2-4 show four common layer assemblies. Note that not all assembly options are shown. See Tables 1-5 for layer and assembly options.

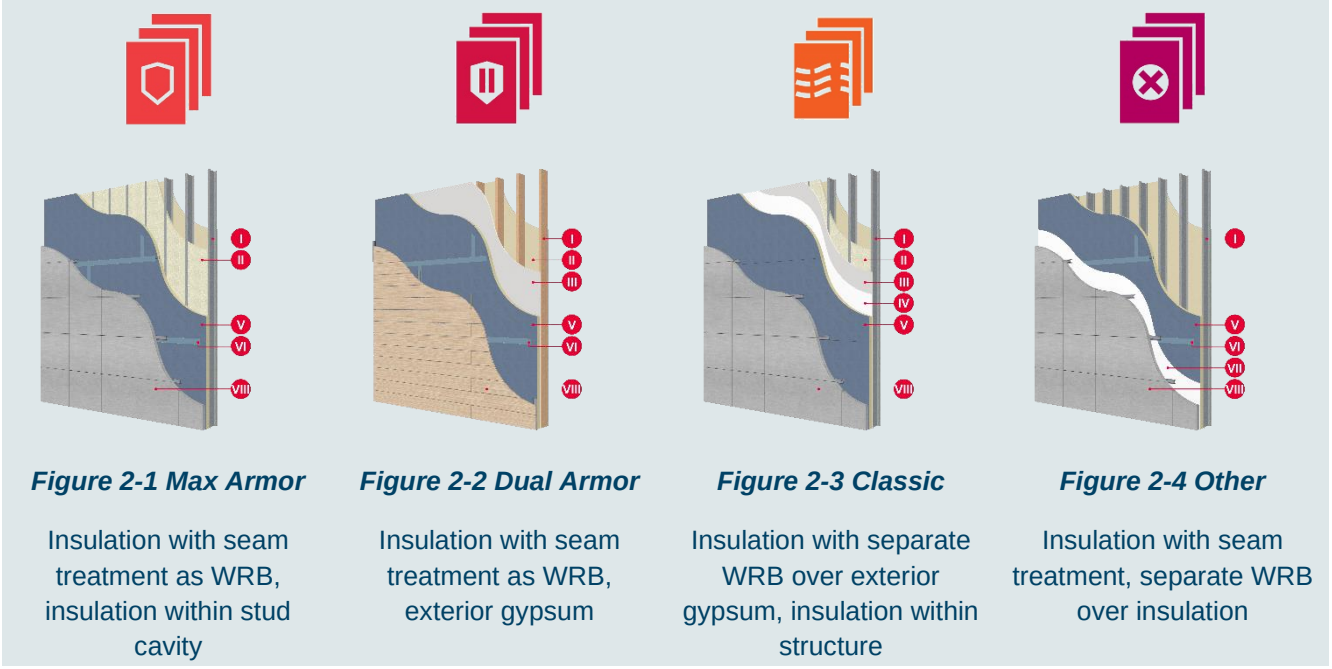


Figure 2-1 Max Armor

Insulation with seam treatment as WRB, insulation within stud cavity

Figure 2-2 Dual Armor

Insulation with seam treatment as WRB, exterior gypsum

Figure 2-3 Classic

Insulation with separate WRB over exterior gypsum, insulation within structure

Figure 2-4 Other

Insulation with seam treatment, separate WRB over insulation

Figure 2 – Example Layer Assemblies

Table 1 – Base Wall Assemblies
(See Tables 2 and 3 for additional wall components)

Layer	*Wall Component*	*Materials*
I	Base wall system – Use either 1, 2, 3, 4, 5 or 6	1. Concrete wall 2. Concrete Masonry Unit (CMU) wall 3. Standard clay brick wall 4. Adobe block wall 5. Wood studs: nominal 2-inch × 4-inch or greater FRTW wood studs spaced at a maximum of 24-inch OC. Wall cavity empty (no insulation) or filled with fiberglass batt insulation (faced or unfaced) or mineral wool insulation (faced or unfaced). One layer of ⅝-inch thick Type X gypsum wallboard installed on interior face of wood studs. One layer of ⅝-inch thick Type X exterior gypsum sheathing installed on exterior face of wood studs. Minimum two top plates at floorlines. As an option, any thickness of plywood or OSB may be installed on exterior face of wood studs under exterior gypsum sheathing. 6. Steel studs: minimum 3⅝-inch depth, minimum 20-gauge at a maximum of 24-inch OC with lateral bracing every 4 ft. vertically with: a) One layer of ⅝-inch 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 ⅜-inch thickness over Thermax™, or c) International Cellulose Corporation's Ure-K Thermal Barrier System installed at a minimum of 1¼-inch thickness over Thermax™. Note: See Figure 10 for transition detail of interior ⅝-inch thick Type X gypsum wallboard to thermal barrier material.
REQUIRED	Floor line firestopping - required in curtain-wall construction	4 lb./cu ft. mineral wool (e.g., Thermafiber) in each stud cavity and at each floor line – friction fit in cavity, attached with Z-clips, or equivalent
NOT SHOWN	Interior Vapor / Moisture barrier for use with Base Wall 5 or 6	1. None 2. Any 6-mil thick polyethylene film

Layer	*Wall Component*	*Materials*
II	Cavity Insulation – Use either 1, 2, or 3 or combination of 2 and 3	1. None – Screw end of fasteners that protrude into the stud cavity can be covered with a maximum of 1½-inch diameter plug of DuPont™ Froth-Pak Class A rated per ASTM E 84 2. Maximum 2-inch thickness of BASF SPRAYTITE® 81206 SPF (covered in Intertek CCRR-1031) or BASF Walltite LWP (covered in Intertek CCRR-0374) applied using sheathing or insulation as substrate and covering the width of the cavity and inside the stud flange. Must cover the SPRAYTITE® 81206 or Walltite LWP above any window, louver or door opening with minimum 2-inch thickness of mineral wool insulation (1½-inch mineral wool cover in 3½-inch deep studs). The mineral wool insulation must be installed from top of opening to bottom of floor deck above. Additionally, a special construction of the header must be used. Options for this construction are as shown in Figures 3, 4, 5, and 6. 3. Fiberglass blown-in or batt insulation (faced or unfaced) or mineral wool blown-in or batt insulation (faced or unfaced)
III	Exterior sheathing – Use either 1, 2 or 3 **OR**	1. None 2. ½-inch thick, exterior gypsum sheathing 3. ⅝-inch thick, Type X exterior gypsum sheathing Note: Exterior sheathing is not required for Base wall systems 1 through 4 above.
	Multi-Function Sheathing & WRB Products	1. USG Securock® ExoAir® 430 System Note: This item replaces the exterior sheathings above. When this item is used the exterior sheathings are not required and WRBs below (Layer IV) shall not be used.
IV	WRB materials applied to exterior sheathing 2 or 3 – Use either 1 or 2	1. None 2. Any shown in Table 4 Note: Any WRB material shown in Table 4 can be applied over Base wall systems 1 through 4 above, where able.
NOT SHOWN	Drainage Mat – Use either 1 or 2	3. None 4. DuPont™ Tyvek® DrainVent™ Rainscreen – Limited to use as: Must be used in conjunction with any WRB shown in Table 5. • Exterior veneers #1 thru #6 in Layer VIII of Table 2 when no air gap is present between the veneer and the DrainVent™. • Exterior veneers #2 thru #15, #16b thru 16m, #17 and #19 in Layer VIII of Table 3 when no air gap is present between the veneer and the DrainVent™.
	Remainder of wall assembly	See Table 2 or Table 3

SKIP TO TABLE 3

Table 2 – Walls with a Maximum of 4.25-inch Thick Thermax™

Layer	*Wall Component*	*Materials*
V	Exterior insulation – Use either 1, 2, 3, or 4	1. None (Exterior sheathing must be Item 2 or 3 listed in Table 1. 2. DuPont™ Thermax™ Brand Rigid Insulation – Total thickness to be a minimum of ⅝-inch to maximum of 4¼-inches.
VI	Exterior insulation joint flashing – Use either 1 or 2	1. None – Only when a water-resistive barrier is applied to the exterior sheathing per Layer IV in Table 1 or when a water-resistive barrier is applied to the exterior insulation 2. Flash all exterior insulation joints and veneer tie penetrations with one of the following: a) DuPont™ LiquidArmor™ - CM Flashing and Sealant – max. 60-mil wet thickness, max. 5-inch width b) DuPont™ LiquidArmor™ - LT Flashing and Sealant – max. 35-mil wet thickness, max. 5-inch width. c) DuPont™ LiquidArmor™ - QS Flashing and Sealant – max. 60-mil wet thickness, max. 5-inch width d) DuPont™ Tyvek® Fluid Applied Flashing & Joint Compound – max. 25-mil wet thickness, max. 3-inch width e) DuPont™ WeatherMate™ Flashing – max. 4-inch width f) Asphalt, acrylic, or butyl-based flashing tape – max. 4-inch width g) DuPont™ Great Stuff Pro™ - Use on joints that are ≤ ¼-inch, vertical joints must be staggered & remove significant excess from the face of the Thermax™ h) DOWSIL™ DEFENDAIR 200 or DOWSIL™ DEFENDAIR 200C Note: With either e) or f), a small amount of spray primer may be used to aid in adhesion; maximum 4-inch width.
VII	WRB material applied to exterior insulation 2 – Use either 1 or 2	1. None 2. Any shown in Table 5 Note: Any WRB material shown in Table 5 can be applied over Base wall systems 1 through 4 above, where able.
NOT SHOWN	Drainage Mat	1. None 2. DuPont™ Tyvek® DrainVent™ Rainscreen – Limited to use as: Must be used in conjunction with any WRB shown in Table 5 Exterior veneers 1 thru 6 in Layer VIII when no air gap is present between the veneer and the DrainVent™.

Layer	*Wall Component*	*Materials*
VIII	Exterior Veneer – Use either 1, 2, 3, 4, 5 or 6	1. Brick – Standard type brick veneer anchors, installed a maximum of 24-inches OC vertically on each stud. A maximum 2-inch air gap between the exterior insulation and the brick. Use standard nominal 4-inch thick clay bricks 2. Stucco – Minimum ¾-inch thick exterior cement plaster and lath. A secondary water-resistive barrier can be installed between the exterior insulation and the lath. The secondary water-resistive barrier can be 1 or 2 layers of asphalt building paper but shall not be full-coverage asphalt or butyl-based self-adhered membranes. 3. Minimum 2-inch thick limestone or natural stone veneer or minimum 1½-inch thick cast artificial stone veneer. Any standard non-open-joint installation technique such as ship-lap, etc., can be used. 4. Terracotta cladding – Minimum 1¼-inch thick terracotta cladding system. Any non-open-joint installation technique such as ship-lap, etc. can be used. 5. Concrete or precast concrete panels – Minimum 1½-inch thick panel, with a 2-inch maximum air gap between exterior insulation and concrete panel. Any standard non-open-joint installation technique such as ship-lap, etc. can be used 6. Concrete Masonry Units - Minimum 2-inch thick panel with a 2-inch maximum air gap between exterior insulation and the interior face of the exterior CMU. Any standard non-open-joint installation technique can be used
NOT SHOWN	Flashing of window, door, and other exterior wall penetrations.	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-inch width. b) DuPont™ LiquidArmor™ – LT Flashing and Sealant – max. 35-mil wet thickness, max. 12-inch width. c) DuPont™ LiquidArmor™ – QS Flashing and Sealant – max. 60-mil wet thickness, max. 12-inch width. d) DuPont™ Tyvek® Fluid Applied Flashing & Joint Compound – max. 25-mil wet thickness, max. 3-inch width e) DuPont™ DuraGard™ CM Transition Flashing – max. 12-inch width f) Limited amounts of acrylic, asphalt or butyl-based flashing tape – max. 12-inch width. g) Hohmann & Barnard Textroflash™ Flashing h) DOWSIL™ DEFENDAIR 200 or DOWSIL™ DEFENDAIR 200C Note: Flashing tape used in wall openings may extend the wall width plus extend up to a maximum of 4 inches onto the exterior face of the sheathing. Flashing tape may be used on sheathing exterior corners where the flashing tape may extend a maximum of 4 inches onto the sheathing face on either side of the corner.
Not Shown	Mortar Net	As an option, non-full wall coverage mortar drop and drainage nets and meshes can be installed at base of wall and at shelf angles to permit water drainage. Maximum 12-inch high.

Table 3 – Walls with a Maximum of 3-inch Thick Thermax™

Layer	*Wall Component*	*Materials*
V	Exterior insulation – Use either 1 or 2	1. None (Exterior sheathing must be either 2 or 3 listed in Table 1) 2. DuPont™ Thermax™ Brand Rigid Insulation – Total thickness to be a minimum of ⅝-inch to maximum of 3-inches.
VI	Exterior insulation joint flashing – Use either 1 or 2	1. None – Only when a water-resistive barrier is applied to the exterior sheathing per Layer IV in Table 1 or when a water-resistive barrier is applied to the exterior insulation 2. Flash all exterior insulation joints and veneer tie penetrations with one of the following: a) DuPont™ LiquidArmor™ - CM Flashing and Sealant – max. 60-mil wet thickness, max. 5-inch width b) DuPont™ LiquidArmor™ - LT Flashing and Sealant – max. 35-mil wet thickness, max. 5-inch width c) DuPont™ LiquidArmor™ - QS Flashing and Sealant – max. 60-mil wet thickness, max. 5-inch width d) DuPont™ Tyvek® Fluid Applied Flashing & Joint Compound – max. 25-mil wet thickness, max. 3-inch width e) DuPont™ WeatherMate™ Flashing – max. 4-inch width f) Asphalt, acrylic, or butyl-based flashing tape – max. 4-inch width g) DuPont™ Great Stuff Pro™ - Use on joints that are ≤ ¼-inch, vertical joints must be staggered & remove significant excess from the face of the Thermax™ h) DOWSIL™ DEFENDAIR 200 or DOWSIL™ DEFENDAIR 200C Note: With either e) or f), a small amount of spray primer may be used to aid in adhesion; maximum 4-inch width.
VII	WRB material applied to exterior insulation #2 – Use either 1 or 2	1. None 2. Any shown in Table 5 Note: Any WRB material shown in Table 5 can be applied over Base wall systems 1 through 4 above, where able.
NOT SHOWN	Drainage Mat	1. None 2. DuPont™ Tyvek® DrainVent™ Rainscreen – Limited to use as: • Must be used in conjunction with any WRB shown in Table 5. • Exterior veneers #2 thru #15, #16b thru #16m, #17 and #19 in Layer VIII when no air gap is present between the veneer and the DrainVent™.
VIII	Exterior Veneer – Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 or 19	1. ACM System - Use any Aluminum Composite Material (ACM) system 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 of combustible foam insulation (e.g., polyiso) behind the ACM. These ACM panel systems include: ○ Reynobond® FR ACM ○ Alpolic®fr ACM ○ Alucobond® PLUS ACM 2. Terracotta cladding – Use any terracotta cladding system in which terracotta is minimum 1¼-inch thick. Any standard installation technique can be used.

Layer	*Wall Component*	*Materials*
		3. Metal exterior wall coverings such as steel, aluminum, copper, zinc, etc. Any standard installation technique can be used. 4. Fiber-cement siding (noncombustible) – minimum ¼-inch thick. Any standard installation technique with noncombustible furring can be used. A maximum 1½-inch air gap allowed behind the fiber-cement siding. 5. Brick - Standard nominal 4-inch thick, clay brick with standard type brick veneer anchors, installed maximum 24-inches OC vertically on each stud. Air gap between exterior insulation and brick to be a maximum of 2-inches. WRB from Table 5 can be used over the exterior insulation. 6. Stucco – Minimum ¾-inch thick, exterior cement plaster and lath. A secondary water-resistive barrier can be installed between the exterior insulation and the lath. The secondary water-resistive barrier can be 1 or 2 layers of asphalt building paper but shall not be full-coverage asphalt or butyl-based self-adhered membranes. WRB from Table 5 can be used as the secondary water-resistive barrier. 7. Corium™ Thin brick system. 8. Minimum 1¼-inch thick limestone or natural stone veneer or minimum 1¼-inch thick cast artificial stone veneer. Any standard installation technique such as ship-lap, etc. can be used. 9. StoneLite natural stone wall panels by Stone Panels, Inc. 10. Glen-Gery Thin Tech Elite Series – Masonry veneer 11. Concrete or precast concrete panels – Minimum 1½-inch thick panel. Air gap between exterior insulation and concrete panel shall be as per wall design. Any standard installation technique can be used. 12. Ceramic tile (min. ⅜-inch thick) bonded using noncombustible mortar adhesive to minimum ½-inch thick cement board or gypsum sheathing. 13. Thin brick (min. ¾-inch thick clay brick) fully adhered with cementitious mortar (standard or polymer modified) to min. ½-inch thick cement backer board or gypsum sheathing. A secondary water-resistive barrier can 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. 14. Natural stone or artificial stone (min. ¾-inch thick clay brick) fully adhered with cementitious mortar (standard or polymer modified) to min. ½-inch thick cement backer board or gypsum sheathing. A secondary water-resistive barrier can 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 15. Concrete Masonry Units - Minimum 2-inch thick panel, with a 2-inch maximum air gap between exterior insulation and the interior face of the exterior CMU. Any standard non-open-joint installation technique can be used 16. Knight Wall Systems to include: a) ACM System - Use any ACM system that has been successfully tested by the panel manufacturer via the NFPA 285 test method. Any standard installation technique can be used. These ACM panel systems include: Reynobond® FR ACM

Layer	*Wall Component*	*Materials*
		Alpolic®fr ACM Alucobond® PLUS ACM b) Terracotta cladding – Use any terracotta cladding system in which terracotta is minimum 1¼-inch thick. Any standard installation technique can be used. c) Metal exterior wall panels or coverings such as steel, aluminum, copper, zinc etc. Any standard installation technique can be used. d) Brick - Standard nominal 4-inch thick, clay brick with standard brick veneer anchors , installed maximum 2-inches OC vertically on each stud. Air gap between exterior insulation and brick to be as per wall design. WRB from Table 5 can be used over the exterior insulation. e) Stucco – Minimum ¾-inch thick, exterior cement plaster and lath attached to minimum ½-inch thick backer board. A secondary water-resistive barrier can be installed between the exterior sheathing and the lath. The secondary water-resistive barrier can be 1 or 2 layers of asphalt building paper but shall not be full coverage asphalt or butyl-based self-adhered membranes. WRB from Table 5 can be used as the secondary water-resistive barrier. f) Corium™ Thin brick system g) Minimum 1¼-inch thick Limestone or natural stone veneer or minimum 1¼-inch thick cast artifical stone veneer. Any standard installation technique such as ship-lap, etc. can be used. h) StoneLite natural stone wall panels by Stone Panels, Inc. i) Glen-Gery Thin Tech Elite Series – Masonry veneer j) Concrete or precast concrete panels. Minimum 1½-inch thick panel. Air gap between exterior insualtion and concrete panel to be as per wall design. Any standard installation technique can be used. k) Ceramic tile (min ⅜-inch thick) bonded using noncombustible mortar adhesive to minimum ½-inch thick cement board or gypsum sheathing. l) Thin brick (minimum ¾-inch thich clay brick) fully adhered with cementitious mortar (standard or polymer modified) to min. ½-inch thick cement backer board or gypsum sheathing. A secondary water-resistive barrier can be installed between the exterior/sheathing and the stone. The secondary water-resistive barrier shall not be full-coverage asphalt or butyl-based self-adhered membranes. m) Natural stone or artificial stone (minimum ¾-inch thich clay brick) fully adhered with cementitious mortar (standard or polymer modified) to min. ½-inch thick cement backer board or gypsum sheathing. A secondary water-resistive barrier can be installed between the exterior/sheathing and the stone. The secondary water-resistive barrier shall not be full-coverage asphalt or butyl-based self-adhered membranes. 17. Cornerstone Building Products to include: • PBR Panel (Exposed fasteners) • PBU Panel (Exposed fasteners) • AVP Panel (Exposed fasteners) • Designer™ Series Panels (Exposed fasteners)

Layer	*Wall Component*	*Materials*
		• Shadow Rib™ Panels (Exposed fasteners) • NuWall® Panels (Exposed fasteners) • MasterLine 16 (Concealed fasteners) 18. FUNDERMAX Gmbh “M Look” panels – 7-mm thick, installed with 1 to 1½-inch air gap behind the panels and using exposed fasteners. 19. Tabs II Plus Wall System w/o Tabs II Plus “RainScreen” with Pre-attached wrap. Must use a WRB from Table 5
NOT SHOWN	Flashing of window, door and other exterior wall penetrations.	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-inch width. b) DuPont™ LiquidArmor™ – LT Flashing and Sealant – max. 35-mil wet thickness, max. 12-inch width. c) DuPont™ LiquidArmor™ – QS Flashing and Sealant – max. 60-mil wet thickness, max. 12-inch width. d) DuPont™ Tyvek® Fluid Applied Flashing & Joint Compound – max. 25-mil wet thickness, max. 3-inch width e) Limited amounts of acrylic, asphalt or butyl-based flashing tape – max. 12-inch width. f) Hohmann & Barnard Textroflash™ Flashing g) DOWSIL™ DEFENDAIR 200 or DOWSIL™ DEFENDAIR 200C h) DuPont™ DuraGard™ CM Transition Flashing – max. 12-inch width Note: Flashing tape used in wall openings may extend the wall width plus extend up to a maximum of 4-inches onto the exterior face of the sheathing. Flashing tape may be used on sheathing exterior corners where the flashing tape may extend a maximum of 4-inches onto the sheathing face on either side of the corner.
Not Shown	Mortar Net	As an option, non-full wall coverage mortar drop and drainage nets and meshes can be installed at base of wall and at shelf angles to permit water drainage. Maximum 12-inch high.

Table 4. Allowed Water-resistive Barriers Applied over Sheathing and Under Foam Insulation – Layer IV

3M™ – 3M™ Self-Adhered Air and Vapor Barrier 3015
BASF • MasterSeal AWB 660 • MasterSeal AWB 660l
Carlisle • CCW-705FR w/ Primers • Barritech™ VP • Barritech™ NP
Dörken Systems • Delta®-Foxx • Delta®-Foxx Plus • Delta®-Fassade S • Delta®-Vent S/Plus • Delta®-Maxx Plus
GCP Applied Technologies • Perm-A-Barrier® Aluminum Wall Membrane • Perm-A-Barrier® VPL • Perm-A-Barrier® VPL LT • Perm-A-Barrier® VPS • Perm-A-Barrier® NPL10 • Perm-A-Barrier® VPL 50RS
DOWSIL™ • DEFENDAIR 200 • DEFENDAIR 200C
Dryvit - Backstop® NT
DuPont™ (see Figures 7, 8, and 9) • DuPont™ Tyvek® CommercialWrap® • DuPont™ Tyvek® CommercialWrap® D • DuPont™ Tyvek® ThermaWrap™ • DuPont™ Tyvek® Fluid Applied WB+ – nominal 25 wet mil thickness • WeatherMate™ • WeatherMate™ Plus
Henry Company • Air-Bloc® 32MR • Air-Bloc® 31MR • Air-Bloc® 33MR • BlueskinVP™ 160 • Air-Bloc® 21 FR • Metal Clad™ • Foilskin® • Air-Bloc® 17MR • Air-Bloc® All Weather STPE

Hohmann & Barnard • Enviro-Barrier™ • Enviro-Barrier™ VP
JX Nippon ANCI, Inc. • JX ALTA Commercial Wrap • JX Alta HP Wrap • X ALTA LP Wrap
Kingspan • Kingspan® GreenGuard® Max™ Building Wrap • Kingspan® GreenGuard® Classic Building Wrap • Kingspan® GreenGuard® C2000 Building Wrap • Kingspan® GreenGuard® Raindrop® 3D Building Wrap • Kingspan® GreenGuard® HPW™ Building Wrap
Momentive Performance Materials • GE SEC2500 SilShield* AWB • GE SEC2600 SilShield* AWB • GE SEC2600-R SilShield* AWB
Sto Corp • Sto Gold Coat® with StoGuard Fabric • Sto Emerald Coat® with StoGuard Fabric • Sto ExtraSeal™ w StoGuard Mesh
STS, Inc. - Wall Guardian™ FW-100A
Tremco, Inc. • ExoAir 230
VaproShield • WallShield® • WrapShield® • RevealShield™ • RevealShield SA™ • PanelShield SA™
W.R. Meadows • Air-Shield™ LMP (Gray) • Air-Shield™ LMP (Black) • Air-Shield™ TMP • Air-Shield™ LSR

Note: all barriers to be installed at indicated or recommended application rates and per manufacturer's installation instructions.

Table 5. Allowed Water-Resistive Barriers Installed over the Foam Insulation – Layer VII

DuPont™ • WeatherMate™ • WeatherMate™ Plus
DuPont™ (see Figures 7, 8, and 9) • DuPont™ Tyvek® CommercialWrap® • DuPont™ Tyvek® CommercialWrap® D • DuPont™ Tyvek® ThermaWrap™
Kingspan • Kingspan® GreenGuard® Max™ Building Wrap • Kingspan® GreenGuard® C500 Building Wrap • Kingspan® GreenGuard® Raindrop® 3D Building Wrap
VaproShield • RevealShield™ • RevealShield SA™ • PanelShield SA™

Note: all barriers to be installed at indicated or recommended application rates and per manufacturer's installation instructions.

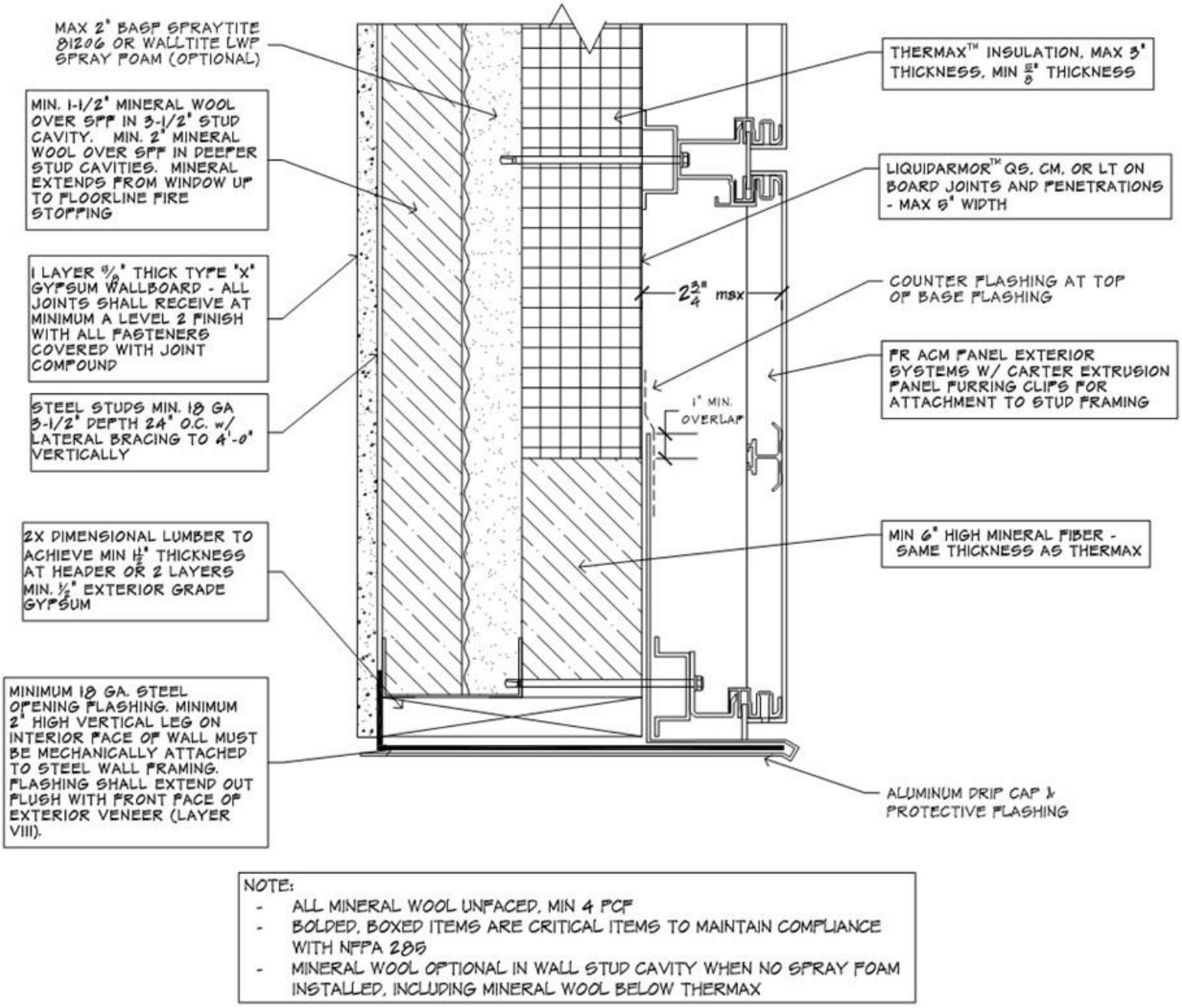


Figure 3 – Required Opening Head Protection When BASF SPRAYTITE® 81206 or Walltite LWP Spray Foam Is Used in the Cavity – OPTION 1

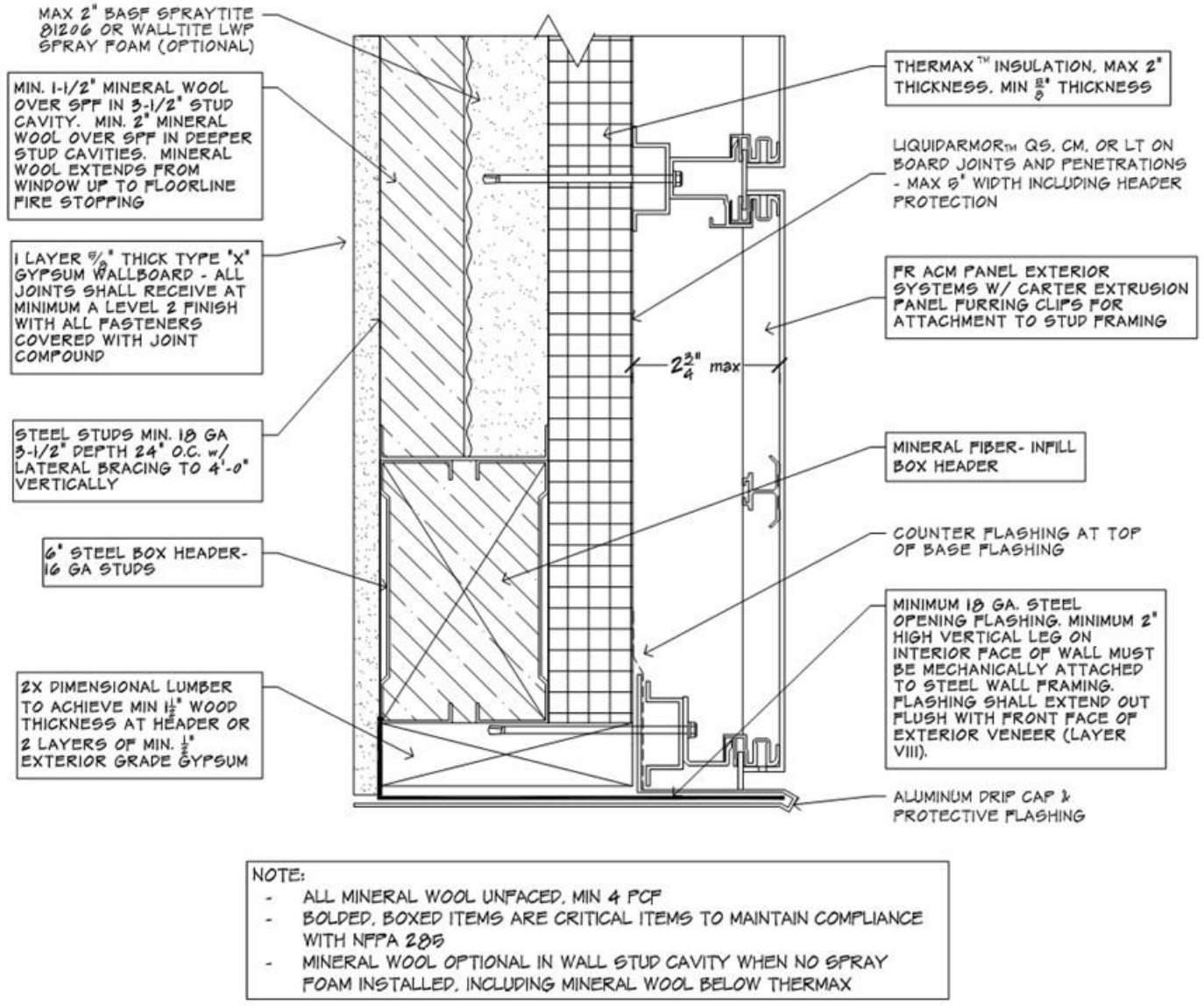


Figure 4 – Required Opening Head Protection When BASF SPRAYTITE® 81206 or Walltite LWP Spray Foam Is Used in the Cavity – OPTION 2

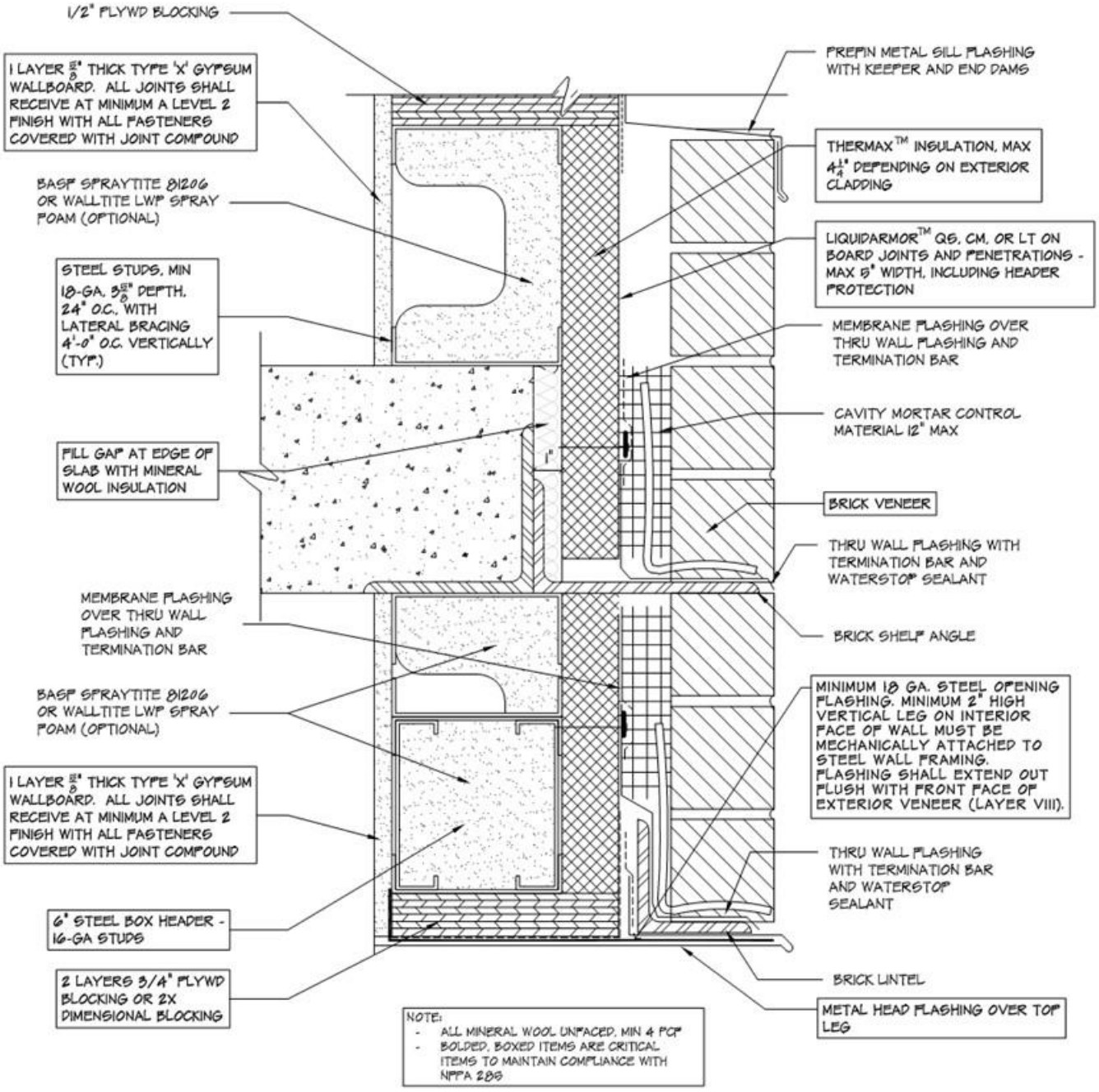


Figure 5. Required Opening Head Protection When BASF SPRAYTITE® 81206 or Walltite LWP Spray Foam Is Used in the Cavity (Infill Wall Construction with Brick Façade)

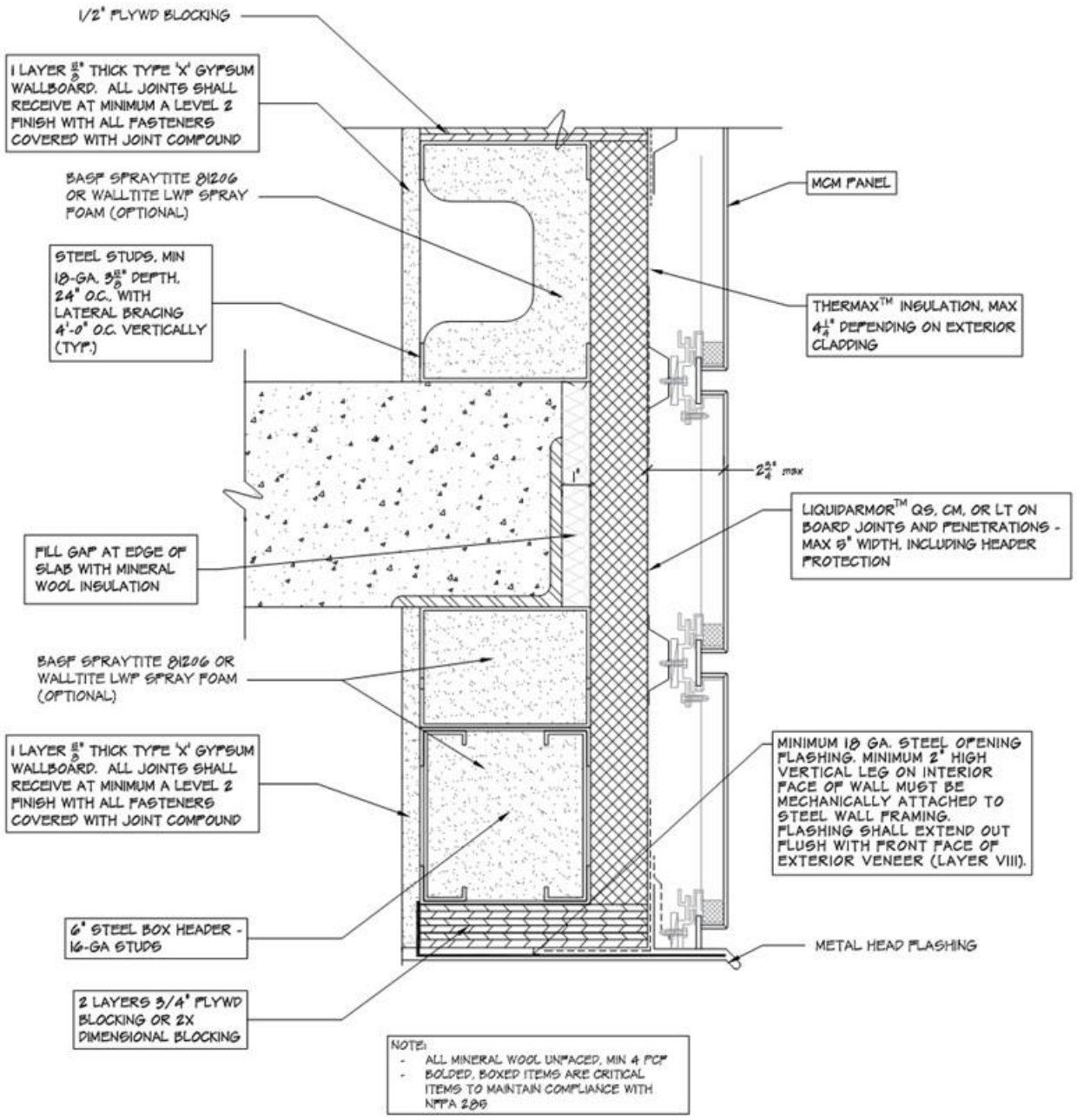


Figure 6. Required Opening Head Protection When BASF SPRAYTITE® 81206 or Walltite LWP Spray Foam Is Used in the Cavity (Infill Wall Construction with ACM Façade)

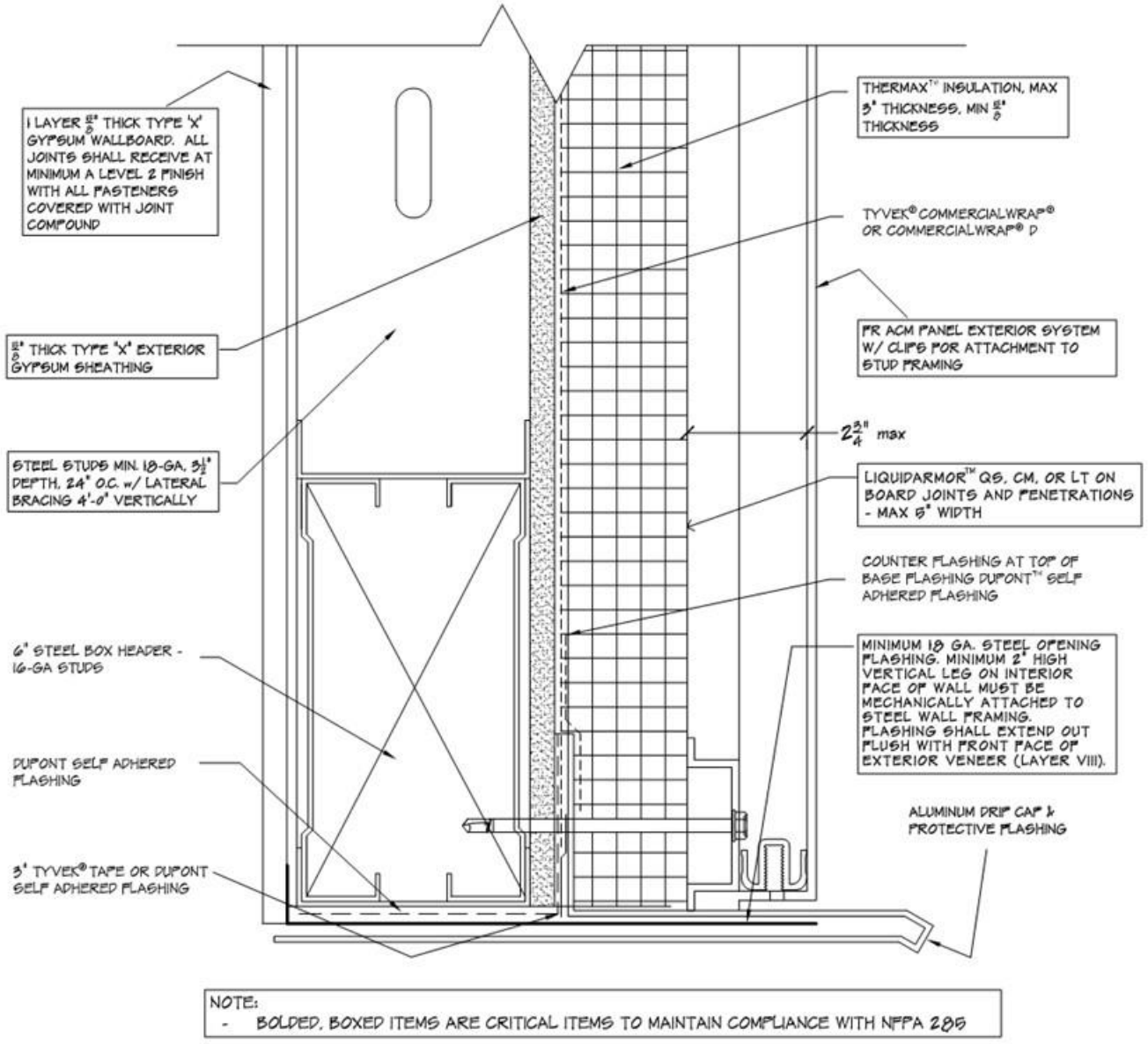


Figure 7. Use of Tyvek® CommercialWrap® or CommercialWrap® D WRB behind Thermax™ insulation

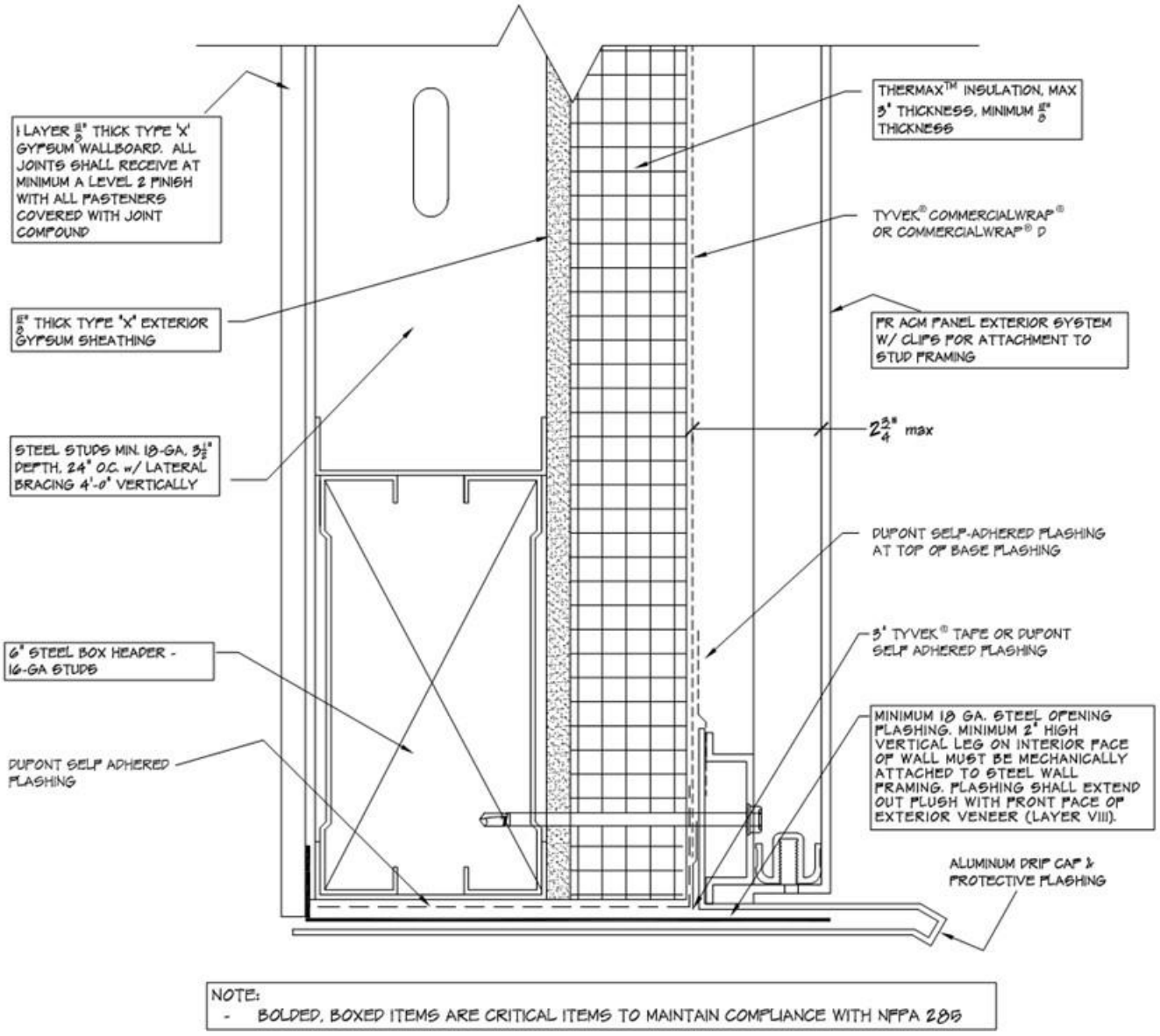


Figure 8. Use of Tyvek® CommercialWrap® or CommercialWrap® D WRB over Thermax™ insulation

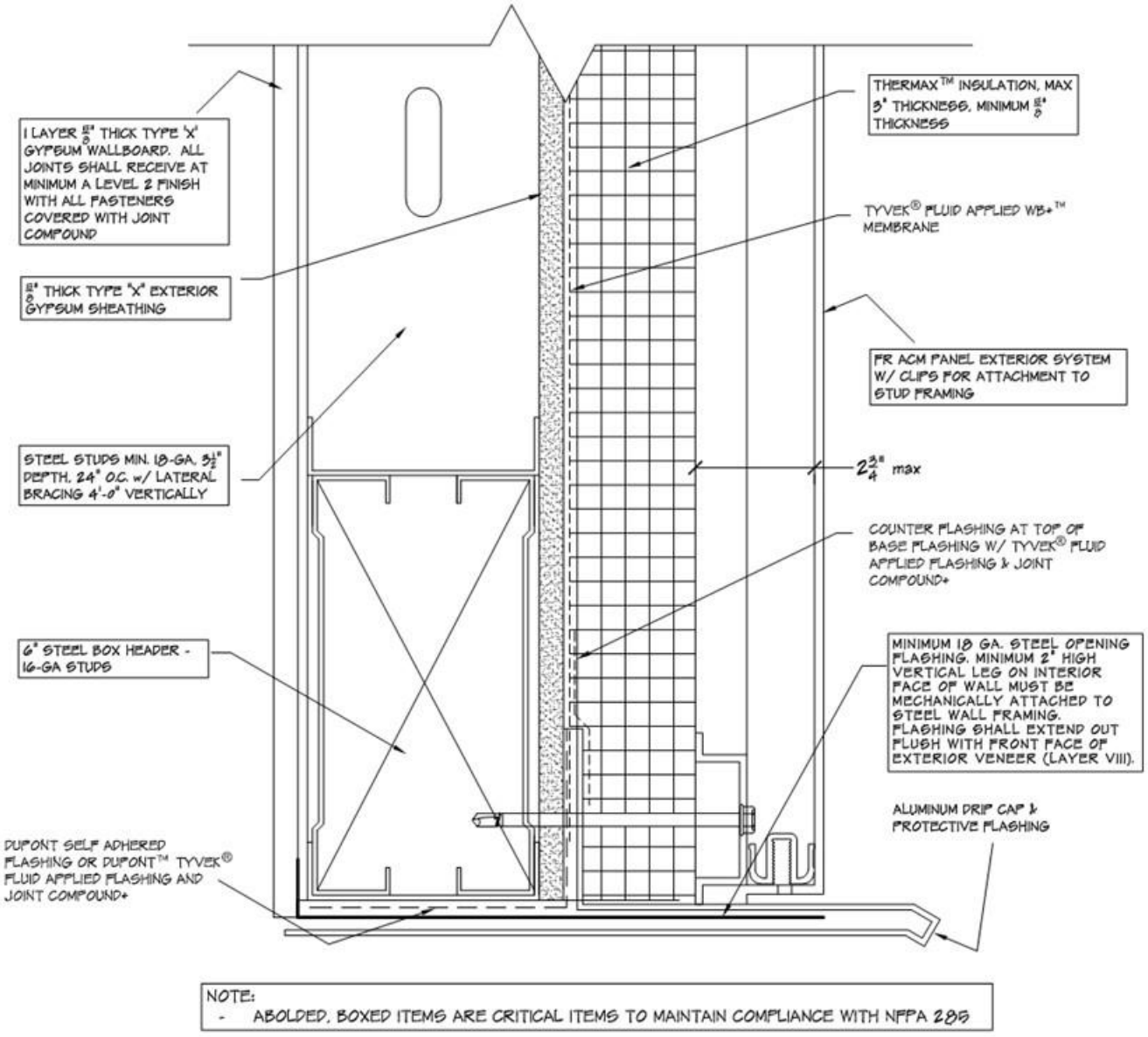


Figure 9. Use of Tyvek® Fluid Applied WB+® WRB behind Thermax™ insulation.

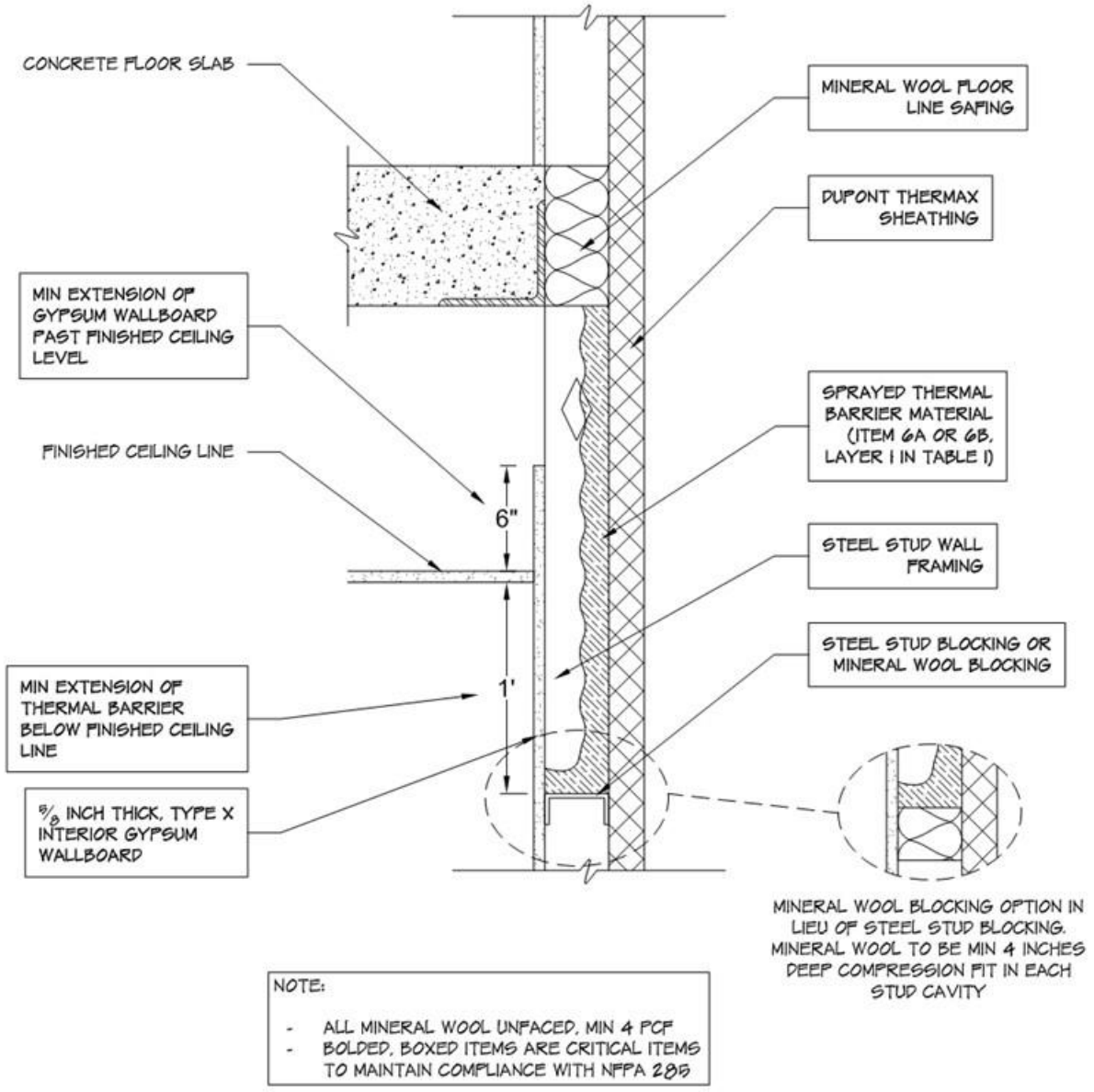


Figure 10. Transition detail from interior gypsum wallboard to sprayed thermal barrier material above ceiling line.