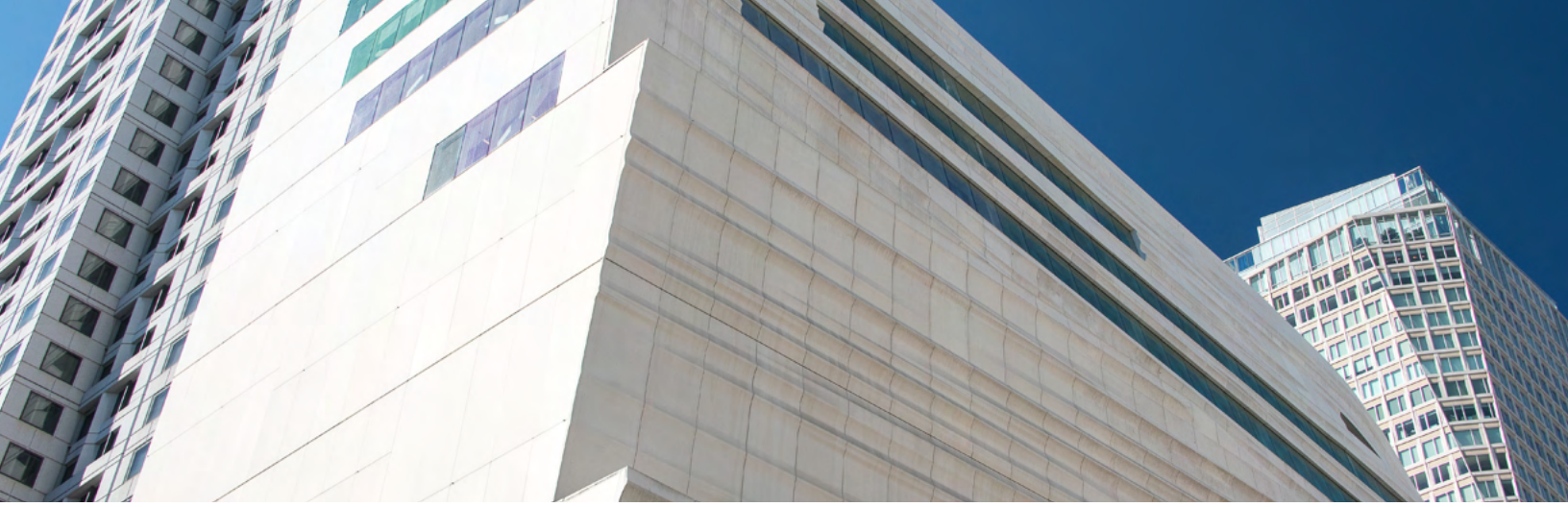


OWENS CORNING® ENCLOSURE SOLUTIONS

NFPA 285 ACCEPTED COMPLETE WALLS

Providing design flexibility to cover any project, any size, any exterior cladding, any climate zone

ENCLOSURE SOLUTIONS

NFPA 285 ACCEPTED COMPLETE WALLS

This brochure provides design guidance for NFPA 285 evaluated wall assemblies and all of the critical details necessary to specify compliant assemblies, including:

- **Structural Options:**
  Concrete, CMU, Fire-Retardant Treated Wood Stud, Steel Stud
- **Owens Corning Insulation Options:**
  FOAMULAR® /FOAMULAR® NGX™ XPS, PINK Next Gen™ Flame Spread 25, PINK Next Gen™ Fiberglas®, Thermafiber® RainBarrier®, Thermafiber® Safing, Thermafiber® UltraBatt™, Thermafiber® SAFB
- **Air/Water Barrier Options:**
  75+ products and manufacturers
- **Owens Corning Accessory Options:**
  JointSealR® Foam Joint Tape, Thermafiber® Impasse® Hanger, Thermafiber® RainBarrier® Clip
- **Exterior Cladding Options:**
  Many, including Masonry, Stone, Stucco, Terra Cotta, Thin Brick, Concrete, CMU, Concrete Panel, Metal Composite Panel, and other tested Veneers
- **CAD Details:**
  Critical head, jamb, sill, and transition details for a variety of insulation and cladding types

NFPA 285[1] Fire-Evaluated Wall Assemblies

With Owens Corning[2] Enclosure Solutions, you now have the design flexibility to cover most any project, of any size, with any exterior cladding, in any climate zone. Owens Corning® Enclosure Solutions have successfully passed NFPA 285[1,2] fire evaluation[2] in many variations, giving architects complete flexibility in exterior wall design. The systems are approved with FOAMULAR® extruded polystyrene continuous insulation under a variety of masonry veneer exterior finishes, or with noncombustible Thermafiber® mineral wool continuous insulation under a variety of non-masonry claddings, including metal panels. All of the continuous insulation options can be used over either steel stud frame, concrete, fire-retardant treated wood frame, or masonry walls with dozens of alternate air/water-resistive barrier products and manufacturers.

Owens Corning® Enclosure Solutions provide you with the construction industry's most complete portfolio of wall system design options. This brochure summarizes NFPA 285 approved assemblies. See the Specification Guide tables in this brochure and the library of Enclosure Solutions publications for more information.

1 NFPA 285, Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; National Fire Protection Association, 1 Batterymarch Park, Quincy, Massachusetts 02169

2 Some systems specified herein have been tested in accordance with NFPA 285. Some systems have been evaluated and acceptance extended via third-party engineering analysis in accordance with ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC 12), Section 6.6.

The Purpose of NFPA 285

NFPA 285 is required in the International Building Code (IBC) in multiple situations. For example, it is required when combustible air barriers are used or when foam plastic insulation is used in the exterior walls of construction types I, II, III, or IV. These construction types, by code definition, have exterior walls constructed of non-combustible materials. The NFPA 285 test is to determine that combustibles, when exposed to fire on the exterior face of the wall, do not spread flame over the surface or through the core of the otherwise noncombustible wall assembly.

The standard NFPA 285 test is referenced in many sections of the IBC, including 1403.5 for water-resistive barriers, and Section 2603.5.5 for foam plastic insulation. NFPA 285, or a variation of it, has been referenced in each edition of the IBC, since its first edition in 2000, and since the 1980s in the three model codes that preceded it. The now defunct ICBO Uniform Building Code first included the concept in the 1988 edition, requiring testing in accordance with the UBC Standard 17-6, a predecessor of NFPA 285.

The other two national model building codes of that era also required full-scale testing for exterior walls. The 1982 SBCCI Standard and the 1984 BOCA National (Basic) Building Codes stated in their foam plastics chapters, "Results of diversified or full-scale fire tests reflecting an end-use condition shall be submitted to the building official, demonstrating that the (wall) assembly in its final form does not show any tendency to propagate flame over the surface or through the core when exposed on the exterior face to a fire source." The intent was that a predecessor of NFPA 285 be utilized, the "Full-Scale Multi-Story Test," as it was called at the time.

The NFPA 285 Methodology

The 30-minute test is conducted on a full-scale two-story wall assembly, built as it would be in the field, on the front side of a three-sided test structure. (See Figures 1 and 2 that are excerpts from NFPA 285.)

The test wall has a window in the center of the lower floor. (See Figures 2 and 3.) The test scenario is that a flashover fire, unrelated to the combustibles in the wall, has occurred in the lower-story room, emitting a fire plume through the window and out of the room of origin. Early in the 30-minute exposure, the fire plume wraps around the window head, extending up the exterior surface of the wall. (See Figure 4.)

To pass, the wall assembly must limit fire spread vertically and horizontally away from the window. The extent of fire spread is determined visually, measured in feet, and by temperature that is measured by thermocouples placed throughout the wall assembly. Figure 5 shows a successful Owens Corning® Enclosure Solutions Wall System test with the brick veneer stripped away just above the window lintel. Note the very limited fire spread and melting of the foam continuous insulation.

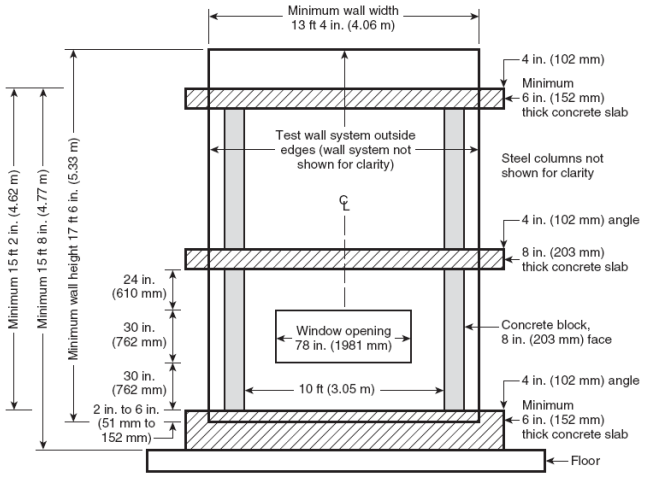


Figure 1: Elevation of test rig, test wall side

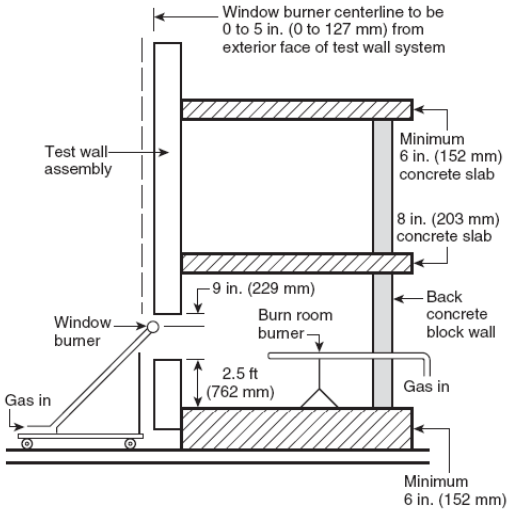


Figure 2: Section of test rig

Figure 3: FOAMULAR® NGX™ test wall under construction

Figure 4: Fire emitting from the test window

Figure 5: FOAMULAR® NGX™ showing limited damage above the test window with brick veneer stripped away after the fire test

Figure 6: Interior of test wall following test showing no intrusion into upper level

Table 1

ENCLOSURE SOLUTIONS WALL SYSTEMS USING HIGH-MASS NONCOMBUSTIBLE EXTERIOR CLADDING	
Wall Component	**Material Options**
Base Wall System: Select one	
	1. Concrete Masonry Wall 2. Concrete Wall 3. Steel Stud Framing: minimum 3 ⅝" depth, minimum 20-gauge thick, maximum 24" o.c., minimum ⅝" type X gypsum wallboard on interior, lateral bracing every 4' vertically 4. Fire Retardant Treated Wood Stud Framing: minimum 2x4 studs, maximum 24" o.c., minimum ⅝" type X gypsum wallboard on both interior and exterior of studs, lateral bracing as required, minimum 2 top plates at floor lines; limited to use with "Exterior Sheathing Item 3"
Floorline Firestopping: Select one	
If a fire-resistance-rated floor assembly IS NOT required, use option 1. If a fire-resistance-rated floor assembly IS required, use option 2.	1. 4 pcf mineral wool attached with z-clips or equivalent continuously at each floor line 2. Install an ASTM E2307 tested or evaluated perimeter fire containment joint assembly; Thermafiber® Safing Insulation, Thermafiber® Impasse® Hanger System
Cavity Insulation: Select one	
	1. None 2. EcoTouch® Fiberglas™ or PINK Next Gen™ Flame Spread 25 Fiberglas™ (faced) 3. EcoTouch® Fiberglas™ or PINK Next Gen™ Fiberglas™ (unfaced) 4. Thermafiber® UltraBatt™ or Thermafiber® SAFB™ Mineral Wool Batt Insulation (faced or unfaced) 5. Any noncombustible insulation (faced or unfaced) 6. Demilec Sealaction 500 (0.5 pcf) spray polyurethane foam, maximum full stud cavity fill; must be used in conjunction with "Exterior Sheathing, Item 3"
Exterior Sheathing: Select one	
	1. None; limited to use with "Exterior Insulation, Item 1" (Max. 3" thickness) 2. ½"-thick glass-mat faced exterior gypsum sheathing 3. ⅝"-thick Type X glass-mat faced exterior gypsum sheathing
Weather-Resistance Barrier Applied to Exterior Sheathing: Select one	
	1. None 2. Any listed in **Appendix A** corresponding to exterior insulation type and thickness with ●, ●, or ●
Drainage Plane: (Optional)	
	Optional filter fabric with polypropylene open mesh drainage material attached; Maximum thickness ¼" (60 mm) thick; must have Class A flame spread rating per ASTM E84
Exterior Continuous Insulation: Select one	
	1. FOAMULAR®/FOAMULAR® NGX™ Type IV or X per ASTM C578 a. **Appendix B** details indicated with ● (≤ 3") b. **Appendix B** details indicated with ● (≤ 3"), ● (≤ 4") c. **Appendix B** details indicated with ● (≤ 3"), ● (≤ 4"), ● (≤ 5") **Note:** FOAMULAR®/FOAMULAR® NGX™ insulation to be mechanically attached to wall using fasteners with air & water sealing washers. **2. Thermafiber® RainBarrier® mineral wool insulation** a. Installed to minimum thickness of 2"; refer to **Appendix A** ● for weather-resistive barrier allowances b. Installed to refer to **Appendix A** ●,●,● for weather-resistive barrier restrictions c. Opening perimeter conditions* for mineral wool insulation thickness to comply with "Opening Conditions, Item 5" **Appendix A** ●
Sealing of Exterior Insulation (optional):	
	Owens Corning does not require joints of XPS boards to be sealed unless the XPS is to function as an air barrier. All exterior insulation joints and veneer tie penetrations may be sealed with: 1. Owens Corning® FlashSealR® Foam Flashing Tape, Max. 4" width

Weather-Resistive Barrier Applied Over Exterior Insulation: Select one	
	1. None 2. Any listed in **Appendix A** identified by orange column as allowed outboard of insulation — ●
Exterior Veneer: Select one	
	1. Brick — standard nominal 4"-thick clay brick; standard brick veneer anchors installed maximum 24" o.c. vertically on each stud; max. 2" air gap between exterior insulation and brick 2. Concrete — 2" thick or greater; max. 2" air gap between exterior insulation and concrete 3. Concrete Masonry Units — 4" thick or greater; max. 2" air gap between exterior insulation and CMU 4. Stone Veneer — Minimum 2"-thick limestone or natural stone veneer or min. 1 ½" thick-cast artificial stone veneer; any standard non-open-joint installation technique such as shiplap, etc. can be used 5. Stucco — Asphalt building paper, metal lath (expanded or woven), mechanically attached using corrosion-resistant steel fasteners and min. ⅞"-thick exterior cement plaster over lath **Stucco Notes:** When AMICO C-I Weep Track (vinyl or steel) is used at the header, then the max. thickness of FOAMULAR®/FOAMULAR® NGX™ Type IV is 2 ¼" or the max. thickness of FOAMULAR®/ FOAMULAR® NGX™ Type X is 2½" a. In lieu of asphalt building paper, it is permitted to use a max. thickness of ¼"-thick filter fabric with polypropylene open mesh drainage material under the metal lath installed per manufacturer's instructions b. In lieu of asphalt building paper and metal lath, it is permitted to use MortarNet Solutions LathNet™ installed per manufacturer's instructions 6. Thin-Set Brick Veneer System — Consisting of max. 10 mm-thick rainscreen drainage mat (optional), min. ½"-thick cement board meeting ASTM C1325, Type A (or equivalent), min. 1/8"-thick polymer modified mortar bond coat meeting ANSI A118.4 or ANSI A118.15, and min. ½"-thick Glen-Gery clay thin brick (or equivalent) meeting ASTM C1088; joints between thin bricks filled with mortar meeting ASTM C270, Type N **Note:** Thin-set brick veneer systems limited to use with maximum 4" FOAMULAR®/FOAMULAR® NGX™ XPS insulation. 7. Thick-Set Brick Veneer System — Consisting of max. 10 mm-thick rainscreen drainage mat (optional), min. ½"-thick polymer modified mortar scratch coat meeting ASNI A118.4 or A118.15 or mortar bond coat meeting ASTM C270 Type S, min. 1/8"-thick polymer modified mortar bond coat or mortar bond coat meeting same standards as scratch coat, and min. ½"-thick Glen-Gery clay thin brick (or equivalent) meeting ASTM C1088 **Thick-Set Brick Veneer Reinforcing Lath Options:** a. ¼" grid glass fiber b. Min. 2.5 lb/yard² self-furring metal lath meeting ASTM C847 c. Welded wire lath meeting ASTM C847 or ASTM C933 d. Min. 18 ga. woven wire lath meeting ASTM C1032 e. Nonmetallic lath meeting ASTM C1788 f. Lath products meeting ICC-ES AC275 **Note:** Thick-set brick veneer systems limited to use with maximum 4" FOAMULAR®/FOAMULAR® NGX™ XPS insulation.
Opening Perimeter Conditions (OPC): Select one	
	1. Header, jamb, and/or sills of window/door openings shall comply with details contained within **Appendix B** details indicated with ● (≤ 3" XPS or min. 1" MW), and/or ● (min. 2" MW) 2. Header, jamb, and/or sills of window/door openings shall comply with details contained within **Appendix B** details indicated with ● (≤ 4" XPS or min. 1" MW or min. 1" MW), and/or ● (min. 2" MW) 3. Header, jamb, and/or sills of window/door openings shall comply with details contained within **Appendix B** details indicated with ● (≤ 3" XPS or min. 1" MW ● ≤ 4" XPS or min. 1" MW), ● (≤ 5" XPS or min. 1" MW), and/or ● (min. 2" MW) 4. Header, jamb, and/or sills of window/door openings shall comply with details contained within **Appendix B** details indicated with ● (≤ 3" XPS or min. 1" MW), and/or ● (min. 2" MW) 5. Header, jamb, and/or sills of window/door openings shall comply with details contained within **Appendix B** details indicated with ● (min. 2" MW)
Flashing of Window, Door, and Other Exterior Wall Penetrations	
	May flash window, door, and other exterior penetrations with limited amounts of acrylic, asphalt, or butyl-based flashing tape, max. 12" width

NOTES:

*"Opening perimeter conditions" refers to protective materials installed at the perimeter of windows or doors where they create openings in the exterior wall.

Table 2

For Enclosure Solutions Wall Systems Using COMBUSTIBLE or LOW-MASS NONCOMBUSTIBLE EXTERIOR CLADDING	
Wall Component	**Material Options**
Base Wall System: Select one	
	1. Concrete Wall 2. Concrete Masonry Wall 3. Steel Stud Framing, min. 3⅝" depth, min. 20 gauge, max. 16" on center spacing, with lateral bracing every 4 ft. vertically; cover on the interior with 1 layer of ⅝"-thick, Type X, gypsum wallboard
Floorline Firestopping: Select one	
If a fire-resistance-rated floor assembly IS NOT required, use option 1. If a fire-resistance-rated floor assembly IS required, use option 2.	1. 4 pcf mineral wool attached with z-clips or equivalent continuously at each floor line 2. Install an ASTM E2307 tested or evaluated perimeter fire containment joint assembly; Thermafiber® Safing Insulation, Thermafiber® Impasse® Hanger System
Stud Cavity Insulation: Select one	
	1. None 2. EcoTouch® Flame Spread 25 or PINK Next Gen™ Flame Spread 25 Fiberglas™ Batt Insulation (faced fiberglass) 3. EcoTouch® or PINK Next Gen™ Fiberglas™ Batt Insulation (unfaced fiberglass) 4. Thermafiber® Ultrabatt™ or Thermafiber® SAFB™ Mineral Wool Batt Insulation (faced or unfaced) 5. Any noncombustible insulation (faced or unfaced) 6. Spray Polyurethane Foam, Demilec Sealaction® 500 (0.5 pcf max, used only with gypsum exterior sheathing)
Exterior Sheathing: Select one	
	1. ½"-thick glass-mat faced exterior gypsum sheathing 2. ⅝"-thick Type X glass-mat faced exterior gypsum sheathing
Air & Water Barrier: Select One	
	1. None 2. Any listed in **Appendix A** corresponding to exterior insulation type and thickness (●, ●, or ●),
Continuous Insulation (CI): Select one	
	• Thermafiber® RainBarrier® 45, HD, HC (80), HC Plus (110), or HC Max, unfaced, min. 2" thick, mechanically attached per manufacturer's recommendations, continuous over air & weather barrier system if selected
Exterior Cladding/Veneer: Select one	
	• Any Combustible Veneer that has been tested and documented to be NFPA 285 compliant • Fiber Cement or Cement Board Siding: Fastened to the structural backup wall or to Z-furring, girts, or other secondary framing as recommended by the cladding manufacturer • Metal Panel: Single-skin steel, aluminum, copper, etc,, fastened to the structural backup wall or to Z-furring, girts, or other secondary framing or clip system as recommended by the cladding manufacturer • Metal Composite Material (MCM): Use any MCM that has been tested and documented to be NFPA 285 compliant; fastened to the structural backup wall or to Z-furring, girts, or other secondary framing or clip system as recommended by the cladding manufacturer • Terra Cotta Panels: Terra cotta cladding system, min. 1¼" thick, with open- or closed-joint installation, such as shiplap, etc.
Opening Perimeter Conditions	
	• **Appendix B** details indicated with ● (min. 2" MW).
Flashing of Window, Door, and Other Exterior Wall Penetrations	
	May flash window, door, and other exterior penetrations with limited amounts of acrylic, asphalt, or butyl-based flashing tape, max. 12" width.

NFPA 285 DESIGN GUIDE

APPENDIX A

Air/Water Barrier Membrane Options for NFPA 285 Compliant Wall Assemblies

The products listed in Tables A-I & A-II are approved as described in Tables 1 & 2 for use in Owens Corning NFPA 285 Compliant Enclosure Solutions Wall Assemblies.

Use of Tables A-I & A-II
Select the appropriate class air/water barrier system for project need:

- Table A-I for Class I vapor-retarding performance
- Table A-I for Class II or III vapor-retarding performance*

Definitions: (International Building Code, Section 1405.3.3, Material Vapor Retarder Class)
Vapor-Permeable Membranes having a water vapor permeance rating of 5 perms or greater when tested in accordance with ASTM E96, dessicant method, Procedure A. Vapor-Permeable Membranes limit the amount of water vapor that passes through a material when tested in accordance with ASTM E96, dessicant method, Procedure A. Permeance Classifications are defined as follows:

- Class I: ≤0.1 perm
- Class II: >0.1 perm ≤1.0 perm
- Class III: >1.0 perm ≤10 perm

For additional air/water barrier code compliance information, consult the following references:

- International Building Code, Section 1404.2, Water-Resistive Barrier
- ANSI/ASHRAE/IES Standard 90.1 Energy Standard for Buildings Except Low Rise Residential Buildings, Section 5.4.3.1.3 (Air Barrier Design)
- International Energy Conservation Code, Section C-402.5.1.2.2, Assemblies (Air Barrier Compliance Options)

*Products with greater than Class III vapor performance stated on their data sheet have been listed here.

Based upon cumulative data, more is known regarding the contribution of air barrier products to overall performance in NFPA 285 Assemblies. Therefore, the contribution of the air barrier to fire may limit the thickness of insulation allowable, the allowable configuration in an assembly, or the use in an assembly or of specific opening details. The following table correlates to the use of each air barrier in detail types with maximum insulation thicknesses:

Table A-I, Class I Vapor Retarder**

MANUFACTURER	AIR BARRIER PRODUCT	≤ 3" FOAMULAR®/ FOAMULAR® NGX™ -OR- 1" MIN. THERMAFIBER® RAINBARRIER® -AND- OPC 1 OR 4 PER TABLE I	≤ 5" FOAMULAR®/ FOAMULAR® NGX™ -OR- 1" MIN. THERMAFIBER® RAINBARRIER® -AND- OPC 2 OR 3 PER TABLE I	≥ 2" THERMAFIBER® RAINBARRIER® -AND- ANY OPENING CONDITIONS SHOWN PER TABLE I	ALLOWED OVER (OUTBOARD) FOAMULAR®/ FOAMULAR® NGX™ XPS INSULATION WHEN USED IN DETAILS PER TABLE I
FLUID-APPLIED MEMBRANES					
Carlisle	Barritech NP™	•	•	•	
GCP Applied Technologies	Perm-A-Barrier® NPL 10			•	
Henry Company	Air-Bloc® 16MR			•	
Henry Company	Air-Bloc® 32MR			•	
Henry Company	Air-Bloc® 21FR	•	•	•	
Hohmann & Barnard	ENVIRO-BARRIER NP™			•	
MasterSeal (Formerly BASF)	AWB 660I (Formerly Enershield® I)		•	•	
Polyguard® Products	Airlok Flex (up to 40 mils wet film thickness)	•	•	•	
Senergy (Formerly BASF)	Senershield-VB	•	•	•	
W. R. Meadows	Air-Shield™ LSR	•	•	•	
MECHANICALLY ATTACHED SHEET MEMBRANES					
N/A					
SELF-ADHERED SHEET MEMBRANES					
3M™	Self-Adhered Air and Vapor Barrier 3015	•	•	•	
Carlisle	CCW-705FR w/ Primers	•	•	•	
GCP Applied Technologies	Perm-A-Barrier® Aluminum Wall Membrane	•	•	•	
Henry Company	Metal Clad™	•	•	•	
Henry Company	Foilskin®***	•	•	•	

Table A-II, Class II and III Vapor Retarder**

MANUFACTURER	AIR BARRIER PRODUCT	≤ 3" FOAMULAR®/ FOAMULAR® NGX™ -OR- 1" MIN. THERMAFIBER® RAINBARRIER® -AND- OPC 1 OR 4 PER TABLE I	≤ 5" FOAMULAR®/ FOAMULAR® NGX™ -OR- 1" MIN. THERMAFIBER® RAINBARRIER® -AND- OPC 2 OR 3 PER TABLE I	≥ 2" THERMAFIBER® RAINBARRIER® -AND- ANY OPENING CONDITIONS SHOWN PER TABLE I	ALLOWED OVER (OUTBOARD) FOAMULAR®/ FOAMULAR® NGX™ XPS INSULATION WHEN USED IN DETAILS PER TABLE I
FLUID-APPLIED MEMBRANES					
Carlisle	Barritech VP™	•	•	•	
Dow Corning®	DefendAir 200	•	•	•	
Dow Corning®	DefendAir 200 LT	•	•	•	
Dryvit	Backstop® NT	•	•	•	
DuPont™	Tyvek® Fluid Applied Weather Barrier (nominal 25 wet mil)		•	•	
GCP Applied Technologies	Perm-A-Barrier® VPL	•	•	•	
GCP Applied Technologies	Perm-A-Barrier® VPL Low Temperature	•	•	•	
Henry Company	Air-Bloc® 17MR		•	•	
Henry Company	Air-Bloc® 31MR	•	•	•	
Henry Company	Air-Bloc® 33MR	•	•	•	
Henry Company	Air-Bloc® All Weather STPE	•	•	•	
Hohmann & Barnard	ENVIRO-BARRIER VP™	•	•	•	
MasterSeal® (Formerly BASF)	AWB 660 (Formerly Enershield HP)		•	•	
Momentive Performance Materials	GE SEC2500 SilShield® AWB***	•	•	•	
Momentive Performance Materials	GE Elemax 2600 (Formerly GE SEC2600 SilShield® AWB)	•	•	•	
Momentive Performance Materials	GE SEC2600-R SilShield® AWB	•	•	•	
Polyguard® Products	Airlok Flex WG (up to 20 mils wet film thickness)	•	•	•	
Polyguard® Products	Airlok Flex VP (up to 32 mils wet film thickness)	•	•	•	
PROSOCO®	R-Guard® Cat 5™ (with R-Guard Fast Flash on joints and fasteners)	•	•	•	
PROSOCO®	R-Guard® MVP		•	•	
Senergy (Formerly BASF)	Senershield-R	•	•	•	
Sto Corp	GoldCoat® with StoGuard Fabric	•	•	•	
Sto Corp	EmeraldCoat® with StoGuard Fabric	•	•	•	
Sto Corp	ExtraSeal™ with StoGuard Mesh	•	•	•	
STS, Inc.	Wall Guardian™ FW-100A	•	•	•	
STS, Inc.	Wall Guardian™ FW-100			•	
Tremco	ExoAir 230		•	•	
Tremco	Securock® ExoAir® 430	•	•	•	
W. R. Meadows	Air-Shield™ LMP (Gray)	•	•	•	
W. R. Meadows	Air-Shield™ LMP (Black)	•	•	•	
W. R. Meadows	Air-Shield™ TMP	•	•	•	

MANUFACTURER	AIR BARRIER PRODUCT	≤ 3" FOAMULAR®/ FOAMULAR® NGX™ -OR- 1" MIN. THERMAFIBER® RAINBARRIER® -AND- OPC 1 OR 4 PER TABLE I	≤ 5" FOAMULAR®/ FOAMULAR® NGX™ -OR- 1" MIN. THERMAFIBER® RAINBARRIER® -AND- OPC 2 OR 3 PER TABLE I	≥ 2" THERMAFIBER® RAINBARRIER® -AND- ANY OPENING CONDITIONS SHOWN PER TABLE I	ALLOWED OVER (OUTBOARD) FOAMULAR®/ FOAMULAR® NGX™ XPS INSULATION WHEN USED IN DETAILS PER TABLE I
MECHANICALLY ATTACHED SHEET MEMBRANES					
Berry Plastics/Typar	BuildingWrap	•	•	•	
Berry Plastics/Typar	MetroWrap	•	•	•	
Dorken Systems, Inc.	Delta®-Foxx	•	•	•	
Dorken Systems, Inc.	Delta®-Foxx Plus	•	•	•	
Dorken Systems, Inc.	Delta®-Fassade S	•	•	•	
Dorken Systems, Inc.	Delta®-Vent S/ Plus	•	•	•	
Dorken Systems, Inc.	Delta®-Maxx Plus	•	•	•	
DuPont™	WeatherMate™ Housewrap	•	•	•	•
DuPont™	WeatherMate™ Plus	•	•	•	•
DuPont™	Tyvek® CommercialWrap®	•	•	•	•
DuPont™	Tyvek® CommercialWrap® D	•	•	•	•
DuPont™	Tyvek® ThermaWrap®	•	•	•	•
ANCI, Inc. JX Alta™	ALTA® Commercial Breathable Housewrap (Formerly Commercial Wrap)	•	•	•	
ANCI, Inc. JX Alta™	ALTA® HP High Perm Breathable Housewrap (Formerly HP Wrap)	•	•	•	
ANCI, Inc. JX Alta™	ALTA® LP Low Perm Breathable Housewrap (Formerly LP Wrap)	•	•	•	
Kingspan®	GREENGUARD® Max™ Building Wrap	•	•	•	•
Kingspan®	GREENGUARD® C2000 Building Wrap	•	•	•	•
Kingspan®	GREENGUARD® Raindrop® 3D Building Wrap	•	•	•	•
Kingspan®	GREENGUARD® HPW® Building Wrap	•	•	•	•
Kingspan®	Everbilt™ Premium Non-Woven Housewrap	•	•	•	•
VaproShield®	WallShield®	•	•	•	
VaproShield®	WrapShield	•	•	•	
VaproShield®	RevealShield™	•	•	•	•
SELF-ADHERED SHEET MEMBRANES					
3M™	Self-Adhered Air and Vapor Barrier 3015VP			•	
GCP Applied Technologies	Perm-A-Barrier® VPS		•	•	
Henry Company	BlueskinVP™ 160			•	
VaproShield®	WrapShield SA™		•	•	
VaproShield®	RevealShield SA™	•	•	•	•

**All Information in Tables A-I and A-II is as published by the manufacturer as of August 2021. It is recommended that the product information shown be verified to be current before including it in project specifications.
***Product may no longer be available but has been included for reference. Links to manufacturer data sheets may not be available at this time.

NFPA 285 DESIGN GUIDE

APPENDIX B

Opening Perimeter Conditions for NFPA 285 Compliant Wall Assemblies

Successful NFPA 285 performance is highly dependent on proper detailing around openings (windows, doors, heads, jambs, sills) to ensure that fire and heat are slowed from penetration into cavity spaces behind the exterior cladding. These details vary depending on the type of insulation used (combustible or noncombustible), the air/water barrier, and the type of cladding (high-mass noncombustible, combustible, or low-mass noncombustible). The details provided have successfully passed NFPA 285[1] fire evaluation. This appendix serves as examples of acceptable details per testing and evaluation for the convenience of the design team. Additional compliant examples with variations in cladding, insulation, substrates, and attachements are demonstrated online at www.owenscorning.com/enclosure. Corresponding details, such as foundation, floorline, and roof transitions are also available to complete an entire wall assembly.[2] These and other CAD files can be found at www.owenscorning.com/enclosure.

[1] NFPA 285, Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components; National Fire Protection Association, 1 Batterymarch Park, Quincy, Massachusetts 02169

[2] Some details provided have been tested in accordance with NFPA 285, while others have been evaluated and acceptance extended via third-party engineering analysis in accordance with ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC 12), Section 6.6.

Details are categorized by "Opening Perimeter Condition" per Tables I & II. These conditions indicate the maximum/minimum insulation thickness, depending on insulation selection based upon air barrier selection, wall construction, and method of treating the opening to prevent the propagation of flame.

As previously noted, it is not practical to build and test every possible wall assembly per NFPA 285. Therefore, a handful of consistent tests are performed and then engineers analyze product properties based on performance in these tests to determine if other assemblies would meet requirements. For example, XPS may be tested on a steel stud wall with brick veneer and, because it is impractical to test concrete masonry as the structure in the same combination, but concrete masonry is noncombustible and of higher mass, it is determined to also be compliant based upon steel stud testing. For purposes of transparency, details of actual tested assemblies will be noted here using these symbols:

Please note that not all assemblies may be shown.

- ♣ Southwest Research Institute, Report No. 01.06440.01.001 May 2003.
- ! Underwriters Laboratories, Inc. Project No. 05CA2541, NC2650 January 10, 2005.
- ◊ Southwest Research Instituite, Report N. 01.13537.01.106 September 26, 2008.
- ‡ Intertek Testing Services, NA Inc. Report No. G100222492SAT-003 January 27, 2011.
- ∞ Architectural Testing, Inc. Report No. D4371.01-121-24 March 2014.
- ☭ Intertek Building & Construction, Report No. J3330.01-121-24-R2 June 19, 2019.
- ✺ Intertek Building & Construction, Report No. 18508.01-121-24-R2 November 18, 2019.
- ⁞ Intertek Building & Construction, Report No. J5715.03-121-24-R0 April 27, 2020.

Details depicting compliant assemblies based upon engineering judgement will be depicted using these icons:

- ⸗ Jensen Hughes Use of Mineral Wool Insulation in Exterior Wall Assemblies Project No. 1JJB00116.000 April 26, 2013.
- ᵂᵂ Jensen Hughes Brick Industry Association NFPA 285 and ASTM E119 Insulation Equivalent Thicknesses- 1JJB00060.001 October 23, 2020.
- ¥ Jensen Hughes Analysis and Extension of NFPA 285 1AJP00297.00 April 16, 2021.

INSULATION THICKNESS KEY:
Based upon cumulative data, more is known regarding the contribution of air barrier products to overall performance in NFPA 285 Assemblies. Therefore, the contribution of the air barrier to fire may limit the allowable insulation thickness in an assembly or the use of specific opening details. The following details are color-coded to indicate maximum insulation thickness allowable with air barriers in Appendix B in common configurations. Note that this indicates maximum allowable thickness related to air barrier selected, and the opening detail itself may further limit the maximum insulation thickness as noted in each detail.

Blue
Up to 3" of FOAMULAR®/FOAMULAR® NGX™ XPS Insulation or a minimum of 1" Thermafiber® RainBarrier® Mineral Wool ci Insulation, Opening Perimeter Conditions 1 or 4 from **Table I**

Green
Up to 5" of FOAMULAR®/FOAMULAR® NGX™ XPS Insulation or a minimum of 1" Thermafiber® Opening Perimeter Conditions 2 or 3 from **Table I**

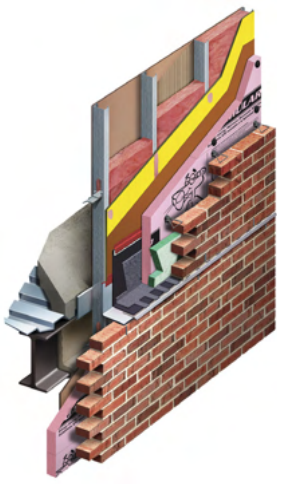
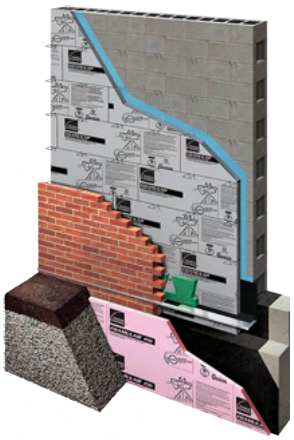
Yellow
Minimum of 2" Thermafiber® RainBarrier® Mineral Wool ci Insulation, any Opening Perimeter Conditions from **Table I** & **II**

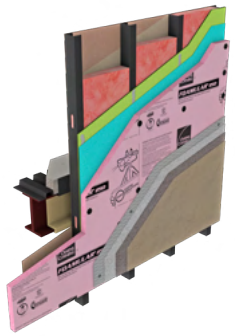
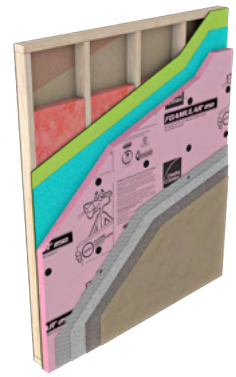
Orange
Allowed OVER (outboard) FOAMULAR®/FOAMULAR® NGX™ XPS Insulation when used in details per **Table I**

Purple
Up to 4" FOAMULAR®/FOAMULAR® NGX™ XPS Insulation or a minimum of 1" Thermafiber® allowed specific to detail selected

Please note that not all assemblies may be shown.
Contact **GETTECH@OwensCorning.com** for more information.

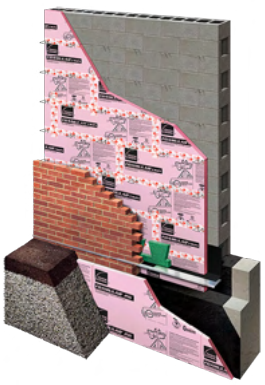
FOAMULAR Extruded Polystyrene (XPS) as ci

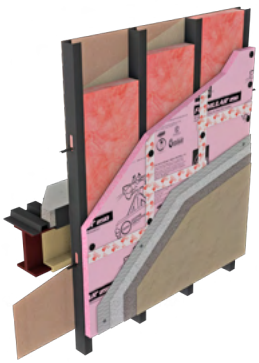
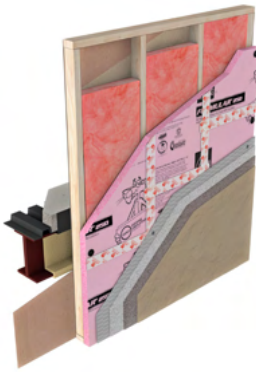
PG.	DETAIL NO.	CONTINUOUS INSULATION DETAILS		RENDERING
BRICK VENEER[1]				
Steel Stud				
Steel Stud Head				
18	ES-SS-03	FOAMULAR/FOAMULAR NGX 250 XPS ci with Steel Angle Cavity Closure	● ¥ ‡	
18	ES-SS-02	FOAMULAR/FOAMULAR NGX 250 XPS ci with FRTW Blocking & Loose Angle Cavity Closure	● ¥ ⋮	
18	ES-SS-29	FOAMULAR/FOAMULAR NGX 250 XPS ci with Mineral Wool Cavity Closure	● ¥	
Steel Stud Jamb				
18	ES-SS-05	FOAMULAR/FOAMULAR NGX 250 XPS ci with Mineral Wool Safing Cavity Closure	● ¥	
18	ES-SS-04	FOAMULAR/FOAMULAR NGX 250 XPS ci with FRTW Cavity Closure	● ¥ ⋮	
18	ES-SS-06	FOAMULAR/FOAMULAR NGX 250 XPS ci with Masonry Return Cavity Closure	● ¥ ‡	
19	ES-SS-27	FOAMULAR/FOAMULAR NGX 250 XPS ci with No Cavity Closure	● ¥	
Steel Stud Sill				
19	ES-SS-08	FOAMULAR/FOAMULAR NGX 250 XPS ci with Mineral Wool Safing Cavity Closure	● ¥	
19	ES-SS-07	FOAMULAR/FOAMULAR NGX 250 XPS ci with Masonry Return & Wash Cavity Closure	● ¥ ‡ ⋮	
19	ES-SS-28	FOAMULAR/FOAMULAR NGX 250 XPS ci with No Cavity Closure	● ¥	
CMU				
CMU Head				
19	ES-CM-03	FOAMULAR/FOAMULAR NGX CW25 XPS ci with Steel Angle Cavity Closure	● ¥	
19	ES-CM-02	FOAMULAR/FOAMULAR NGX CW25 XPS ci with Mineral Wool Cavity Closure	● ¥	
20	ES-CM-26	FOAMULAR/FOAMULAR NGX 250 XPS ci with FRTW Blocking & Loose Angle Cavity Closure	● ¥	
CMU Jamb				
20	ES-CM-05	FOAMULAR/FOAMULAR NGX 250 XPS ci with Mineral Wool Safing Cavity Closure	● ¥	
20	ES-CM-04	FOAMULAR/FOAMULAR NGX 250 XPS ci with FRTW Cavity Closure	● ¥	
20	ES-CM-06	FOAMULAR/FOAMULAR NGX 250 XPS ci with Masonry Return Cavity Closure	● ¥	
20	ES-CM-28	FOAMULAR/FOAMULAR NGX 250 XPS ci with No Cavity Closure	● ¥	
CMU Sill				
20	ES-CM-08	FOAMULAR/FOAMULAR NGX 250 XPS ci with Mineral Wool Safing Cavity Closure	● ¥	
21	ES-CM-07	FOAMULAR/FOAMULAR NGX 250 XPS ci with Masonry Return & Wash Cavity Closure	● ¥	
21	ES-CM-29	FOAMULAR/FOAMULAR NGX 250 XPS ci with No Cavity Closure	● ¥	
Wood Stud				
Wood Stud Head				
21	ES-WS-210	FOAMULAR/FOAMULAR NGX 250 XPS ci with Steel Angle Cavity Closure	● ¥	
21	ES-WS-202	FOAMULAR/FOAMULAR NGX 250 XPS ci with FRTW Blocking & Loose Angle Cavity Closure	● ¥	
21	ES-WS-213	FOAMULAR/FOAMULAR NGX 250 XPS ci with Mineral Wool Cavity Closure	● ¥	
Wood Stud Jamb				
21	ES-WS-221	FOAMULAR/FOAMULAR NGX 250 XPS ci with Mineral Wool Safing Cavity Closure	● ¥	
22	ES-WS-203	FOAMULAR/FOAMULAR NGX 250 XPS ci with FRTW Cavity Closure	● ¥	
22	ES-WS-204	FOAMULAR/FOAMULAR NGX 250 XPS ci with Masonry Return Cavity Closure	● ¥	
22	ES-WS-222	FOAMULAR/FOAMULAR NGX 250 XPS ci with No Cavity Closure	● ¥	
Wood Stud Sill				
22	ES-WS-223	FOAMULAR/FOAMULAR NGX 250 XPS ci with Mineral Wool Safing Cavity Closure	● ¥	
22	ES-WS-205	FOAMULAR/FOAMULAR NGX 250 XPS ci with Masonry Return & Wash Cavity Closure	● ¥	
22	ES-WS-224	FOAMULAR/FOAMULAR NGX 250 XPS ci with No Cavity Closure	● ¥	

PG.	DETAIL NO.	CONTINUOUS INSULATION DETAILS		RENDERING
STUCCO VENEER[5]				
Steel Stud				
Steel Stud Head				
23	ES-SS-71	FOAMULAR/FOAMULAR NGX 250 XPS ci with Recessed Opening Head with Backwrap Cavity Closure Featuring Special Stucco Screed	● ¥	
23	ES-SS-72	FOAMULAR/FOAMULAR NGX 250 XPS ci with Recessed Opening Head with Backwrap Cavity Closure	● ¥	
23	ES-SS-73	FOAMULAR/FOAMULAR NGX 250 XPS ci with Flush Opening Head with Mineral Wool Safing Cavity	● ¥	
Steel Stud Jamb				
23	ES-SS-74	FOAMULAR/FOAMULAR NGX 250 XPS ci with Flush Opening Jamb with Mineral Wool Safing Cavity Closure	● ¥	
23	ES-SS-75	FOAMULAR/FOAMULAR NGX 250 XPS ci with Recessed Opening Jamb with Backwrap Cavity Closure	● ¥	
Steel Stud Sill				
23	ES-SS-76	FOAMULAR/FOAMULAR NGX 250 XPS ci with Recessed Opening Sill with Backwrap Cavity Closure	● ¥	
24	ES-SS-77	FOAMULAR/FOAMULAR NGX 250 XPS ci with Flush Opening Sill	● ¥	
Wood Stud				
Wood Stud Head				
24	ES-WS-231	FOAMULAR/FOAMULAR NGX 250 XPS ci with Recessed Opening Head with Backwrap Cavity Closure Featuring Special Stucco Screed	● ¥ ★	
24	ES-WS-237	FOAMULAR/FOAMULAR NGX 250 XPS ci with Recessed Opening Head with Backwrap Cavity Closure	● ¥	
24	ES-WS-232	FOAMULAR/FOAMULAR NGX 250 XPS ci with Flush Opening Head with Mineral Wool Safing Cavity Closure	● ¥	
Wood Stud Jam				
24	ES-WS-234	FOAMULAR/FOAMULAR NGX 250 XPS ci with Flush Opening Jamb with Mineral Wool Safing Cavity Closure	● ¥	
24	ES-WS-233	FOAMULAR/FOAMULAR NGX 250 XPS ci with Recessed Opening Jamb with Backwrap Cavity Closure	● ¥	
Wood Stud Sill				
25	ES-WS-235	FOAMULAR/FOAMULAR NGX 250 XPS ci with Recessed Opening Sill with Backwrap Cavity Closure	● ¥	
25	ES-WS-236	FOAMULAR/FOAMULAR NGX 250 XPS ci with Flush Opening Sill	● ¥	

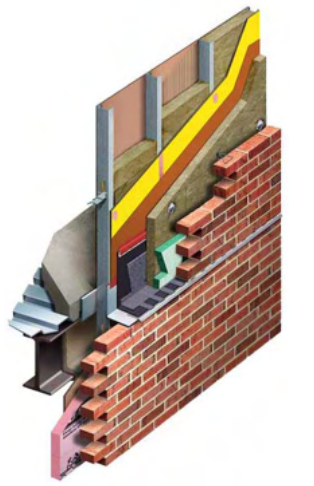
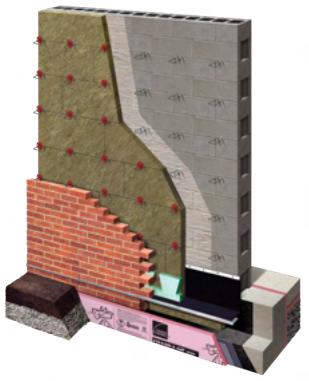
FOAMULAR with Taped Joints as Air/ Weather Barrier

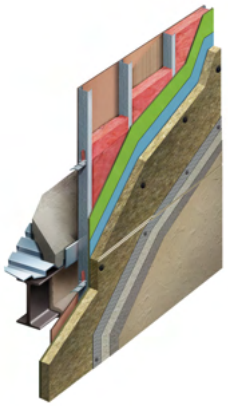
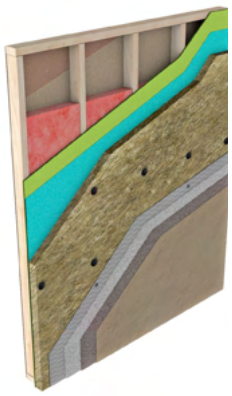
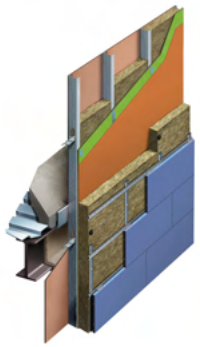
PG.	DETAIL NO.	CONTINUOUS INSULATION DETAILS		RENDERING
BRICK VENEER[1]				
Steel Stud				
Steel Stud Head				
25	ES-SS-32	FOAMULAR 250 XPS ci as AWB & Sheathing with Steel Angle Cavity Closure	● ¥	
25	ES-SS-242	FOAMULAR 250 XPS ci as AWB with Steel Angle Cavity Closure	● ¥ ‡	
25	ES-SS-31	FOAMULAR 250 XPS ci as AWB & Sheathing with FRTW Blocking & Loose Angle Cavity Closure	● ¥	
25	ES-SS-241	FOAMULAR 250 XPS ci as AWB with FRTW Blocking & Loose Angle Cavity Closure	● ¥	
26	ES-SS-33	FOAMULAR 250 XPS ci as AWB & Sheathing with Mineral Wool Cavity Closure	● ¥	
26	ES-SS-243	FOAMULAR 250 XPS ci as AWB with Mineral Wool Cavity Closure	● ¥	
Steel Stud Jamb				
26	ES-SS-35	FOAMULAR 250 XPS ci as AWB & Sheathing with Mineral Wool Safing Cavity Closure	● ¥	
26	ES-SS-245	FOAMULAR 250 XPS ci as AWB with Mineral Wool Safing Cavity Closure	● ¥	
26	ES-SS-34	FOAMULAR 250 XPS ci as AWB & Sheathing with FRTW Cavity Closure	● ¥	
26	ES-SS-244	FOAMULAR 250 XPS ci as AWB with FRTW Cavity Closure	● ¥	
27	ES-SS-36	FOAMULAR 250 XPS ci as AWB & Sheathing with Masonry Return Cavity Closure	● ¥	
27	ES-SS-246	FOAMULAR 250 XPS ci as AWB with Masonry Return Cavity Closure	● ¥ ‡	
27	ES-SS-48	FOAMULAR 250 XPS ci as AWB & Sheathing with No Cavity Closure	● ¥	
27	ES-SS-253	FOAMULAR 250 XPS ci as AWB with No Cavity Closure	● ¥	
Steel Stud Sill				
27	ES-SS-38	FOAMULAR 250 XPS ci as AWB & Sheathing with Mineral Wool Safing Cavity Closure	● ¥	
27	ES-SS-248	FOAMULAR 250 XPS ci as AWB with Mineral Wool Safing Cavity Closure	● ¥	
28	ES-SS-37	FOAMULAR 250 XPS ci as AWB & Sheathing with Masonry Return & Wash Cavity Closure	● ¥	
28	ES-SS-247	FOAMULAR 250 XPS ci as AWB with Masonry Return & Wash Cavity Closure	● ¥ ‡	
28	ES-SS-49	FOAMULAR 250 XPS ci as AWB & Sheathing with No Cavity Closure	● ¥	
28	ES-SS-254	FOAMULAR 250 XPS ci as AWB with No Cavity Closure	● ¥	
CMU				
CMU Head				
28	ES-CM-32	FOAMULAR CW25 XPS ci & AWB with Steel Angle Cavity Closure	● ¥	
28	ES-CM-31	FOAMULAR CW25 XPS ci & AWB with Mineral Wool Cavity Closure	● ¥	
CMU Jamb				
29	ES-CM-35	FOAMULAR CW25 XPS ci & AWB with Mineral Wool Safing Cavity Closure	● ¥	
29	ES-CM-34	FOAMULAR CW25 XPS ci & AWB with FRTW Cavity Closure	● ¥	
29	ES-CM-36	FOAMULAR CW25 XPS ci & AWB with Masonry Return Cavity Closure	● ¥	
29	ES-CM-43	FOAMULAR CW25 XPS ci as AWB with No Cavity Closure	● ¥	
CMU Sill				
29	ES-CM-38	FOAMULAR CW25 XPS ci & AWB with Mineral Wool Safing Cavity Closure	● ¥	
29	ES-CM-37	FOAMULAR CW25 XPS ci & AWB with Masonry Return & Wash Cavity Closure	● ¥	
30	ES-CM-44	FOAMULAR CW25 XPS ci as AWB with No Cavity Closure	● ¥	



PG.	DETAIL NO.	CONTINUOUS INSULATION DETAILS		RENDERING
Wood Stud				
Wood Stud Head				
30	ES-WS-282	FOAMULAR 250 XPS ci & AWB with Steel Angle Cavity Closure	● ¥	
30	ES-WS-281	FOAMULAR 250 XPS ci & AWB with FRTW Blocking & Loose Angle Cavity Closure	● ¥	
30	ES-WS-283	FOAMULAR 250 XPS ci & AWB with Mineral Wool Cavity Closure	● ¥	
Wood Stud Jamb				
30	ES-WS-285	FOAMULAR 250 XPS ci & AWB with Mineral Wool Safing Cavity Closure	● ¥	
30	ES-WS-284	FOAMULAR 250 XPS ci & AWB with FRTW Cavity Closure	● ¥	
31	ES-WS-286	FOAMULAR 250 XPS ci & AWB with Masonry Return Cavity Closure	● ¥	
31	ES-WS-287	FOAMULAR 250 XPS ci as AWB with No Cavity Closure	● ¥	
Wood Stud Sill				
31	ES-WS-288	FOAMULAR 250 XPS ci & AWB with Mineral Wool Safing Cavity Closure	● ¥	
31	ES-WS-289	FOAMULAR 250 XPS ci & AWB with Masonry Return & Wash Cavity Closure	● ¥	
31	ES-WS-290	FOAMULAR 250 XPS ci as AWB with No Cavity Closure	● ¥	
STUCCO VENEER[5]				
Steel Stud				
Steel Stud Head				
31	ES-SS-121	FOAMULAR 250 XPS ci as AWB with Recessed Opening Head with Backwrap Cavity Closure Featuring Special Stucco Weep Screed	● ¥ ★	
32	ES-SS-122	FOAMULAR 250 XPS ci as AWB with Recessed Opening Head with Backwrap Cavity Closure	● ¥	
32	ES-SS-123	FOAMULAR 250 XPS ci as AWB with Flush Opening Head with Mineral Wool Safing Cavity	● ¥	
Steel Stud Jamb				
32	ES-SS-124	FOAMULAR 250 XPS ci as AWB with Flush Opening Jamb with Mineral Wool Safing Cavity Closure	● ¥	
32	ES-SS-125	FOAMULAR 250 XPS ci as AWB with Recessed Opening Jamb with Backwrap Cavity Closure	● ¥	
Steel Stud Sill				
32	ES-SS-126	FOAMULAR 250 XPS ci as AWB with Recessed Opening Sill with Backwrap Cavity Closure	● ¥	
32	ES-SS-127	FOAMULAR 250 XPS ci as AWB with Flush Opening Sill with No Cavity Closure	● ¥	
Wood Stud				
Wood Stud Head				
33	ES-WS-301	FOAMULAR 250 XPS ci as AWB with Recessed Opening Head with Backwrap Cavity Closure Featuring Special Stucco Weep Screed	● ¥ ★	
33	ES-WS-307	FOAMULAR 250 XPS ci as AWB with Recessed Opening Head with Backwrap Cavity Closure	● ¥	
33	ES-WS-302	FOAMULAR 250 XPS ci as AWB with Flush Opening Head with Mineral Wool Safing Cavity Closure	● ¥	
Wood Stud Jamb				
33	ES-WS-304	FOAMULAR 250 XPS ci as AWB with Flush Opening Jamb with Mineral Wool Safing Cavity Closure	● ¥	
33	ES-WS-303	FOAMULAR 250 XPS ci as AWB with Recessed Opening Jamb with Backwrap Cavity Closure	● ¥	
Wood Stud Sill				
33	ES-WS-305	FOAMULAR 250 XPS ci as AWB with Recessed Opening Sill with Backwrap Cavity Closure	● ¥	
34	ES-WS-306	FOAMULAR 250 XPS ci as AWB with Flush Opening Sill with No Cavity Closure	● ¥	

Thermafiber RainBarrier Mineral Wool ci

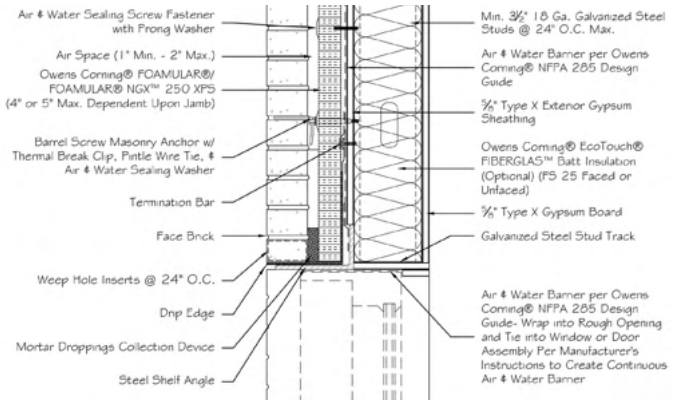
PG.	DETAIL NO.	CONTINUOUS INSULATION DETAILS		RENDERING
BRICK VENEER[1]				
Steel Stud				
Steel Stud Head				
34	ES-SS-16	Thermafiber RainBarrier 45 Mineral Wool ci with Steel Angle Cavity Closure	● ¥ ⌿	
34	ES-SS-15	Thermafiber RainBarrier 45 Mineral Wool ci with FRTW Blocking & Loose Angle Cavity Closure	● ¥ ⌿	
34	ES-SS-26	Thermafiber RainBarrier 45 Mineral Wool ci with Thermafiber Safing Mineral Wool Cavity Closure	● ¥ ⌿	
34	ES-SS-59	Thermafiber RainBarrier 45 Mineral Wool ci with No Cavity Closure	● ¥ ⌿	
Steel Stud Jamb				
34	ES-SS-18	Thermafiber RainBarrier 45 Mineral Wool ci with Thermafiber Safing Mineral Wool Safing Cavity	● ¥ ⌿	
35	ES-SS-17	Thermafiber RainBarrier 45 Mineral Wool ci with FRTW Cavity Closure	● ¥ ⌿	
35	ES-SS-19	Thermafiber RainBarrier 45 Mineral Wool ci with Masonry Return Cavity Closure	● ¥ ⌿	
35	ES-SS-82	Thermafiber RainBarrier 45 Mineral Wool ci with No Cavity Closure	● ¥ ⌿	
Steel Stud Sill				
35	ES-SS-21	Thermafiber RainBarrier 45 Mineral Wool ci with Thermafiber Safing Mineral Wool Safing Cavity Closure	● ¥ ⌿	
35	ES-SS-20	Thermafiber RainBarrier 45 Mineral Wool ci with Masonry Return & Wash Cavity Closure	● ¥ ⌿	
35	ES-SS-83	Thermafiber RainBarrier 45 Mineral Wool ci with No Cavity Closure	● ¥ ⌿	
CMU				
CMU Head				
36	ES-CM-16	Thermafiber RainBarrier 45 Mineral Wool ci with Steel Angle Cavity Closure	● ¥ ⌿	
36	ES-CM-15	Thermafiber RainBarrier 45 Mineral Wool ci with Thermafiber Safing Mineral Wool Cavity Closure	● ¥ ⌿	
36	ES-CM-27	Thermafiber RainBarrier 45 Mineral Wool ci with FRTW Blocking & Loose Angle Cavity Closure	● ¥ ⌿	
CMU Jamb				
36	ES-CM-18	Thermafiber RainBarrier 45 Mineral Wool ci with Mineral Wool Safing Cavity Closure	● ¥ ⌿	
36	ES-CM-17	Thermafiber RainBarrier 45 Mineral Wool ci with FRTW Cavity Closure	● ¥ ⌿	
36	ES-CM-19	Thermafiber RainBarrier 45 Mineral Wool ci with Masonry Return Cavity Closure	● ¥ ⌿	
CMU Sill				
37	ES-CM-21	Thermafiber RainBarrier 45 Mineral Wool ci with Mineral Wool Safing Cavity Closure	● ¥ ⌿	
37	ES-CM-20	Thermafiber RainBarrier 45 Mineral Wool ci with Masonry Return & Wash Cavity Closure	● ¥ ⌿	
Wood Stud				
Wood Stud Head				
37	ES-WS-240	Thermafiber RainBarrier 45 Mineral Wool ci with Steel Angle Cavity Closure	● ¥	
37	ES-WS-212	Thermafiber RainBarrier 45 Mineral Wool ci with FRTW Blocking & Loose Angle Cavity Closure	● ¥	
37	ES-WS-225	Thermafiber RainBarrier 45 Mineral Wool ci with Mineral Wool Cavity Closure	● ¥	
37	ES-WS-241	Thermafiber RainBarrier 45 Mineral Wool ci with No Cavity Closure	● ¥	
Wood Stud Jamb				
38	ES-WS-226	Thermafiber RainBarrier 45 Mineral Wool ci with Mineral Wool Safing Cavity Closure	● ¥	
38	ES-WS-214	Thermafiber RainBarrier 45 Mineral Wool ci with FRTW Cavity Closure	● ¥	
38	ES-WS-215	Thermafiber RainBarrier 45 Mineral Wool ci with Masonry Return Cavity Closure	● ¥	
38	ES-WS-227	Thermafiber RainBarrier 45 Mineral Wool ci with No Cavity Closure	● ¥	
Wood Stud Sill				
38	ES-WS-228	Thermafiber RainBarrier 45 Mineral Wool ci with Mineral Wool Safing Cavity Closure	● ¥	
38	ES-WS-216	Thermafiber RainBarrier 45 Mineral Wool ci with Masonry Return & Wash Cavity Closure	● ¥	
39	ES-WS-229	Thermafiber RainBarrier 45 Mineral Wool ci with No Cavity Closure	● ¥	

PG.	DETAIL NO.	CONTINUOUS INSULATION DETAILS		RENDERING
STUCCO VENEER[5]				
Steel Stud				
Steel Stud Head				
39	ES-SS-261	Thermafiber RainBarrier HC ci Plus with Recessed Opening Head with Backwrap Cavity Closure Featuring Special Stucco Weep Screed	● ¥ ≠ ★	
39	ES-SS-262	Thermafiber RainBarrier HC ci Plus with Recessed Opening Head with Backwrap Cavity Closure	● ¥ ≠	
39	ES-SS-263	Thermafiber RainBarrier HC ci Plus with Flush Opening Head with Mineral Wool Cavity Closure Cavity	● ¥ ≠	
Steel Stud Jamb				
39	ES-SS-264	Thermafiber RainBarrier HC ci Plus with Flush Opening Jamb with Mineral Wool Safing Cavity Closure	● ¥ ≠	
39	ES-SS-265	Thermafiber RainBarrier HC ci Plus with Recessed Opening Jamb with Backwrap Cavity Closure	● ¥ ≠	
Steel Stud Sill				
40	ES-SS-266	Thermafiber RainBarrier HC ci Plus with Recessed Opening Sill with Backwrap Cavity Closure	● ¥ ≠	
40	ES-SS-267	Thermafiber RainBarrier HC ci Plus with Flush Opening Sill with Mineral Wool Safing Cavity Closure	● ¥ ≠	
Wood Stud				
Wood Stud Head				
40	ES-WS-243	Thermafiber RainBarrier HC ci Plus with Recessed Opening Head with Backwrap Cavity Closure Featuring Special Stucco Weep Screed	● ¥	
40	ES-WS-244	Thermafiber RainBarrier HC ci Plus with Recessed Opening Head with Backwrap Cavity Closure	● ¥ ≠	
40	ES-WS-245	Thermafiber RainBarrier HC ci Plus with Flush Opening Head with Mineral Wool Safing Cavity Closure	● ¥ ≠	
Wood Stud Jamb				
40	ES-WS-246	Thermafiber RainBarrier HC ci Plus with Flush Opening Jamb with Mineral Wool Safing Cavity Closure	● ¥ ≠	
41	ES-WS-247	Thermafiber RainBarrier HC ci Plus with Recessed Opening Jamb with Backwrap Cavity Closure Cavity Closure	● ¥	
Wood Stud Sill				
41	ES-WS-248	Thermafiber RainBarrier HC ci Plus with Recessed Opening Sill with Backwrap Cavity Closure	● ¥	
41	ES-WS-249	Thermafiber RainBarrier HC ci Plus with Flush Opening Sill with Mineral Wool Safing Cavity Closure	● ¥	
PANEL VENEER (SEE TABLE 2)				
Steel Stud				
Steel Stud Head				
41	ES-SS-202	Thermafiber RainBarrier HC ci Plus Opening Head	● ≠	
41	ES-SS-52	Thermafiber RainBarrier HC ci Plus Opening Head	● ≠	
Steel Stud Jamb				
41	ES-SS-203	Thermafiber RainBarrier HC ci Plus Opening Jamb	● ≠	
42	ES-SS-53	Thermafiber RainBarrier HC ci Plus Opening Jamb	● ≠	
Steel Stud Sill				
42	ES-SS-204	Thermafiber RainBarrier HC ci Plus Flush Opening Sill	● ≠	
42	ES-SS-56	Thermafiber RainBarrier HC ci Plus Flush Opening Sill	● ≠	

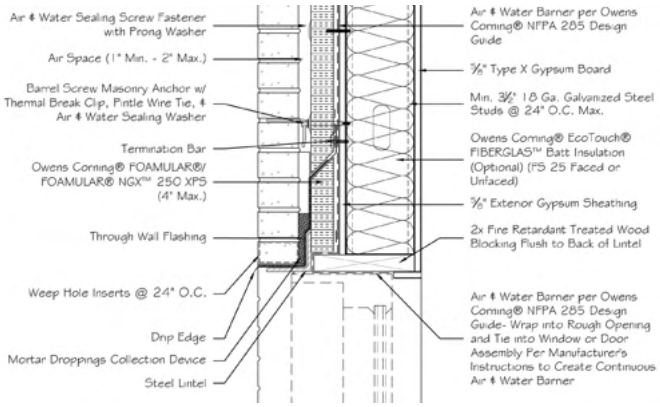
PG.	DETAIL NO.	CONTINUOUS INSULATION DETAILS
TRANSITIONS		
Vertical Transition, Steel Stud		
42	ES-SS-TR-01	Masonry with FOAMULAR/FOAMULAR NGX XPS to MCM w/ Thermafiber RainBarrier Mineral Wool with Thermafiber Safing Cavity Closure
42	ES-SS-TR-03	MCM w/Thermafiber RainBarrier Mineral Wool to Masonry with FOAMULAR/FOAMULAR NGX XPS with Thermafiber Safing Cavity Closure
42	ES-SS-TR-04	Masonry with Thermafiber RainBarrier Mineral Wool to MCM w/Thermafiber RainBarrier Mineral Wool
43	ES-SS-TR-06	MCM w/Thermafiber RainBarrier Mineral Wool to Masonry with RainBarrier Thermafiber Mineral Wool Cavity Closure
Horizontal Transition, Steel Stud		
43	ES-SS-TR-02	Masonry with FOAMULAR/FOAMULAR NGX XPS to MCM w/ Thermafiber RainBarrier Mineral Wool with Thermafiber Safing Cavity Closure
43	ES-SS-TR-05	Masonry with Thermafiber RainBarrier Mineral Wool to MCM w/ Thermafiber RainBarrier Mineral Wool
Vertical Transition, CMU		
43	ES-CM-TR-01	Masonry with FOAMULAR/FOAMULAR NGX XPS to MCM with Thermafiber RainBarrier Mineral Wool with Thermafiber Safing Cavity Closure
43	ES-CM-TR-03	MCM w/Thermafiber RainBarrier Mineral Wool to with FOAMULAR/ FOAMULAR NGX XPS with Thermafiber Safing Cavity Closure
43	ES-CM-TR-04	Masonry with Thermafiber RainBarrier Mineral Wool to MCM with Thermafiber RainBarrier Mineral Wool
44	ES-CM-TR-06	MCM w/Thermafiber RainBarrier Mineral Wool to Masonry with Thermafiber RainBarrier Mineral Wool
Horizontal Transition, CMU		
44	ES-CM-TR-02	Masonry with FOAMULAR/FOAMULAR NGX XPS to MCM w/Thermafiber RainBarrier Mineral Wool with Thermafiber Safing Cavity Closure
44	ES-CM-TR-05	Masonry with Thermafiber RainBarrier Mineral Wool to MCM with Thermafiber RainBarrier Mineral Wool

Transitions between materials are not part of standard NFPA 285 Testing. As a convenience, examples of transitions using safing and considering other building performance layers (moisture, air, thermal, and acoustics) have been demonstrated here.

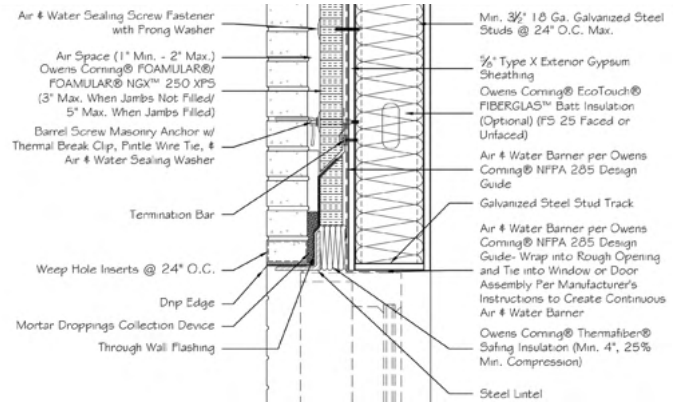
ES-SS-03
FOAMULAR/ FOAMULAR NGX 250 XPS ci with Steel Angle Cavity Closure, Steel Stud Head



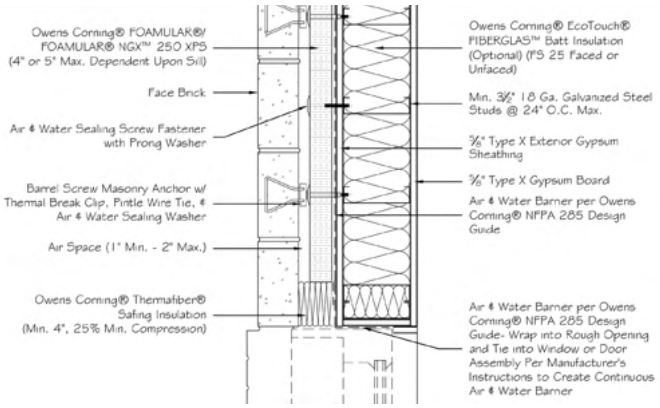
ES-SS-02
FOAMULAR/ FOAMULAR NGX 250 XPS ci with FRTW Blocking & Loose Angle Cavity Closure, Steel Stud Head



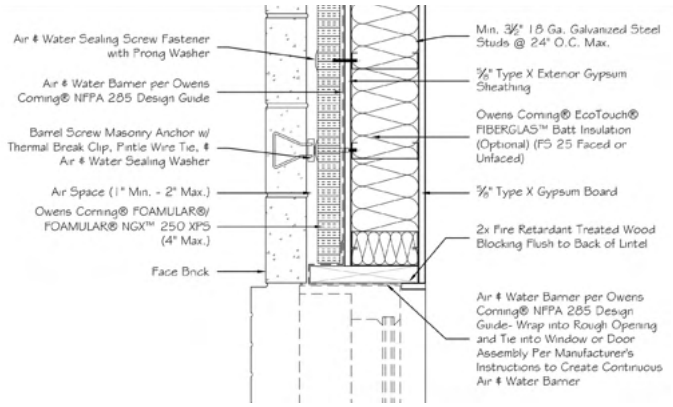
ES-SS-29
FOAMULAR/ FOAMULAR NGX 250 XPS ci with Mineral Wool Cavity Closure, Steel Stud Head



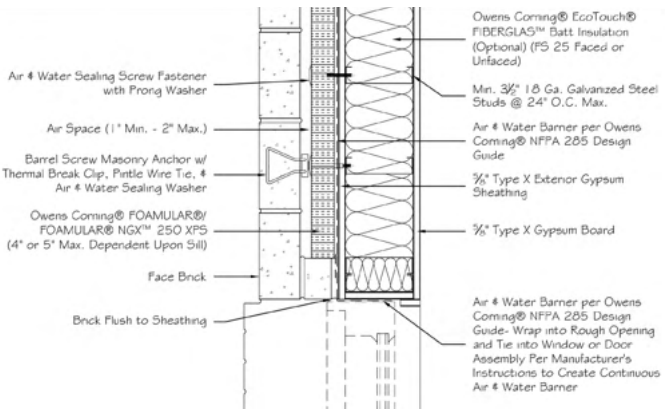
ES-SS-05
FOAMULAR/ FOAMULAR NGX 250 XPS ci with Mineral Wool Safing Cavity Closure, Steel Stud Jamb



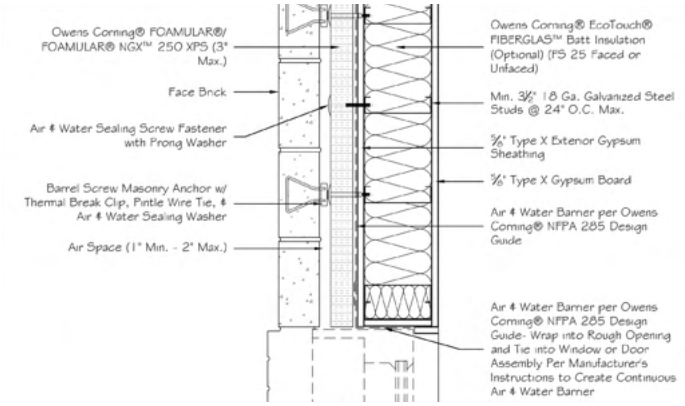
ES-SS-04
FOAMULAR/ FOAMULAR NGX 250 XPS ci with FRTW Cavity Closure, Steel Stud Jamb



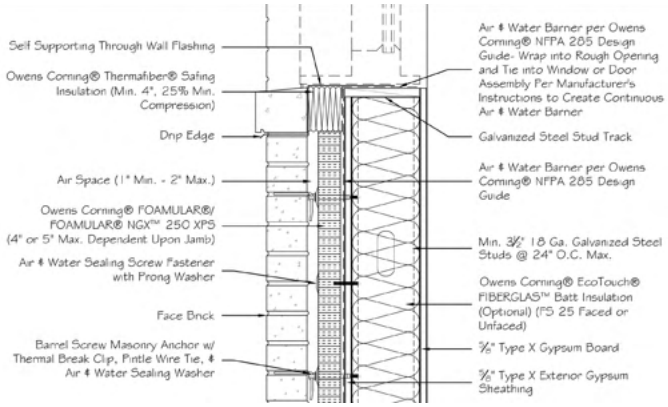
ES-SS-06
FOAMULAR/ FOAMULAR NGX 250 XPS ci with Masonry Return Cavity Closure, Steel Stud Jamb



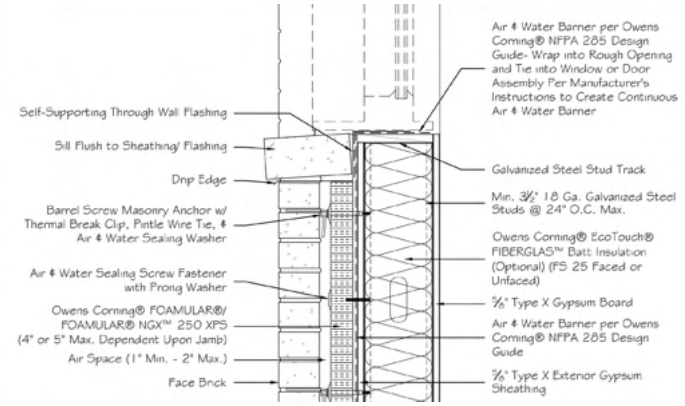
ES-SS-27
FOAMULAR/ FOAMULAR NGX 250 XPS ci with No Cavity Closure, Steel Stud Jamb



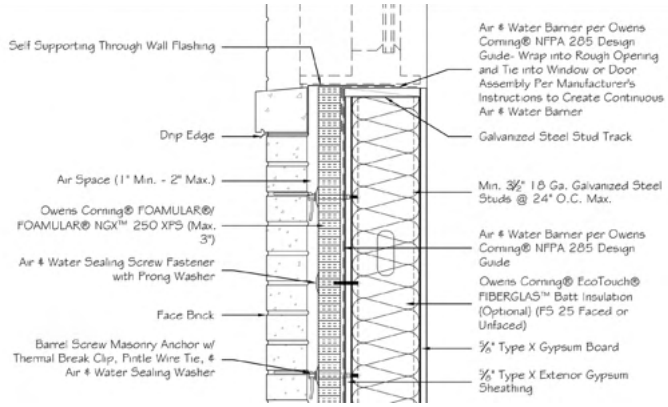
ES-SS-08
FOAMULAR/ FOAMULAR NGX 250 XPS ci with Mineral Wool Safing Cavity Closure, Steel Stud Sill



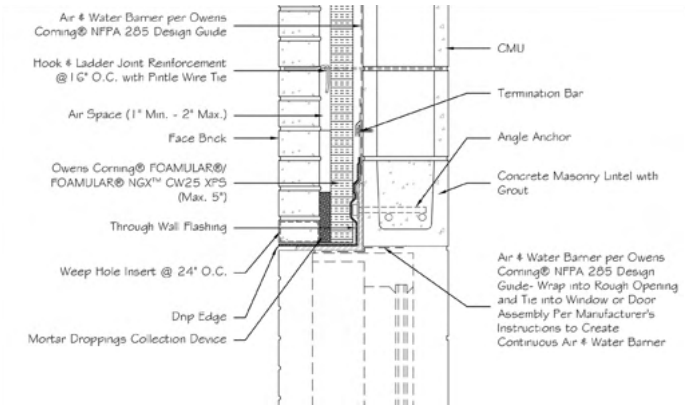
ES-SS-07
FOAMULAR/ FOAMULAR NGX 250 XPS ci with Masonry Return & Wash Cavity Closure, Steel Stud Sill



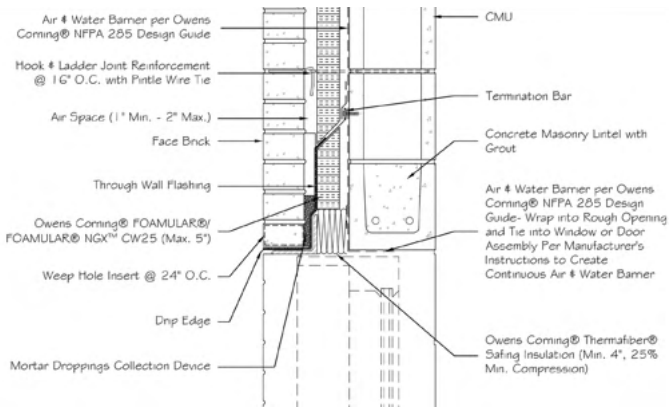
ES-SS-28
FOAMULAR/ FOAMULAR NGX 250 XPS ci with No Cavity Closure, Steel Stud Sill



ES-CM-03
FOAMULAR/ FOAMULAR NGX CW25 XPS ci with Steel Angle Cavity Closure, CMU Head

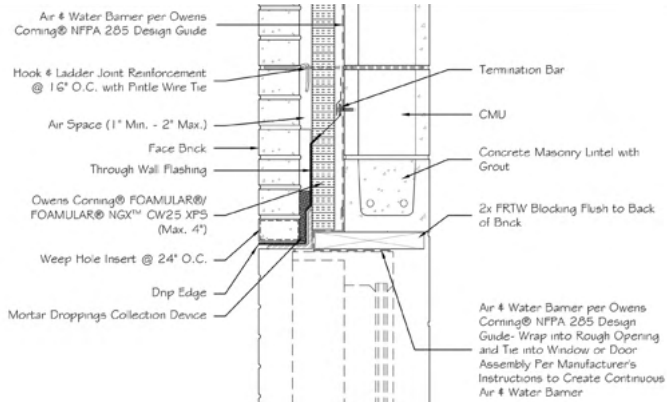


ES-CM-02
FOAMULAR/ FOAMULAR NGX CW25 XPS ci with Mineral Wool Cavity Closure, CMU Head



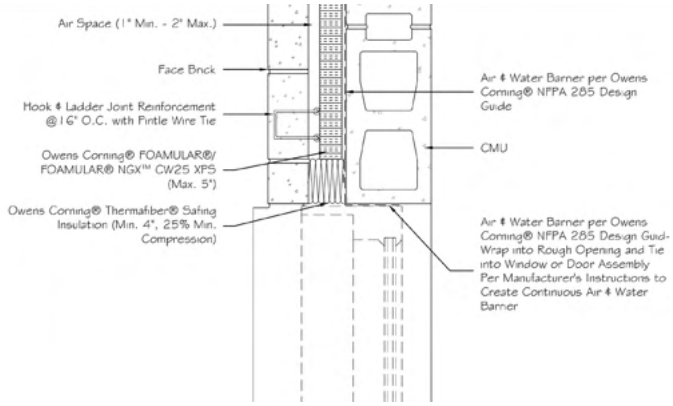
ES-CM-26

FOAMULAR/ FOAMULAR NGX 250 XPS ci with FRTW Blocking & Loose Angle Cavity Closure, CMU Head



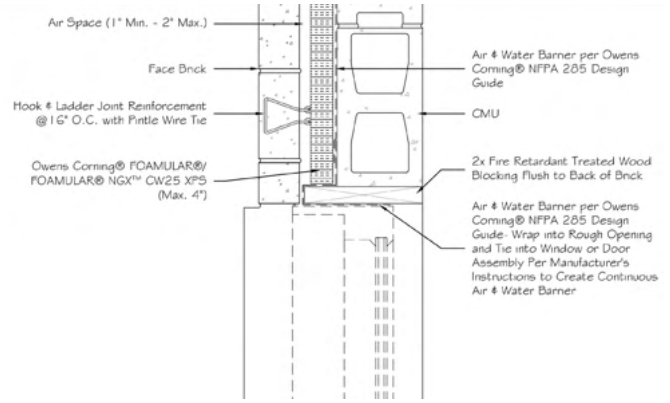
ES-CM-05

FOAMULAR/ FOAMULAR NGX 250 XPS ci with Mineral Wool Safing Cavity Closure, CMU Jamb



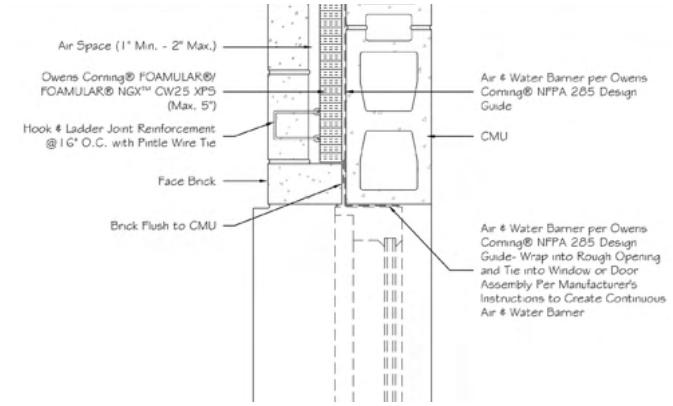
ES-CM-04

FOAMULAR/ FOAMULAR NGX CW25 XPS ci with FRTW Cavity Closure, CMU Jamb



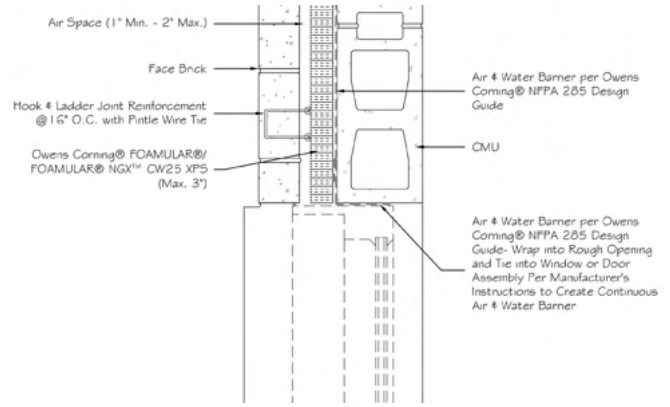
ES-CM-06

FOAMULAR/ FOAMULAR NGX CW25 XPS ci with Masonry Return Cavity Closure, CMU Jamb



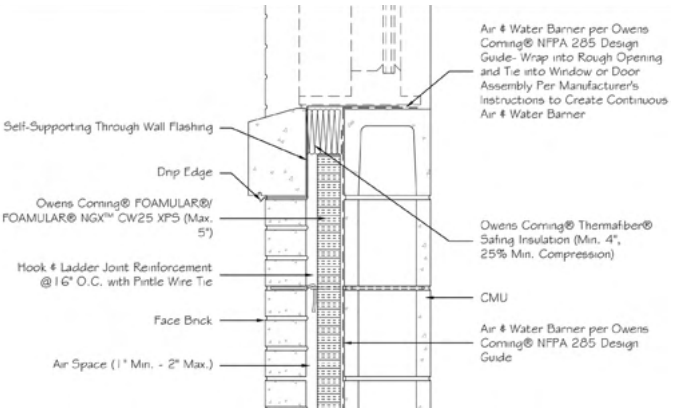
ES-CM-28

FOAMULAR/ FOAMULAR NGX 250 XPS ci with No Cavity Closure, CMU Jamb



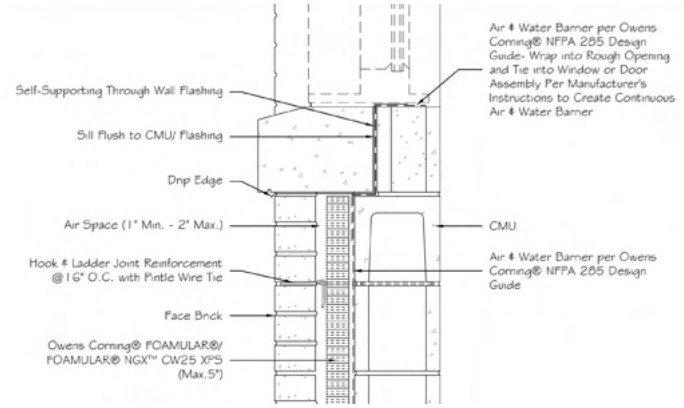
ES-CM-08

FOAMULAR/ FOAMULAR NGX 250 XPS ci with Mineral Wool Safing Cavity Closure, CMU Sill



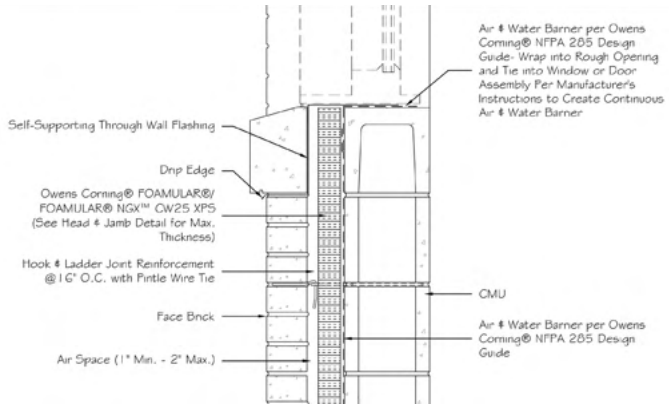
ES-CM-07

FOAMULAR/ FOAMULAR NGX CW25 XPS ci with Masonry Return & Wash Cavity Closure, CMU Sill



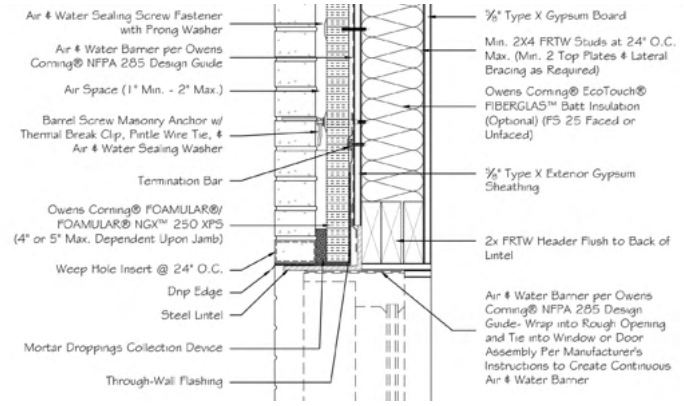
ES-CM-29

FOAMULAR/ FOAMULAR NGX CW25 XPS ci with No Cavity Closure, CMU Sill



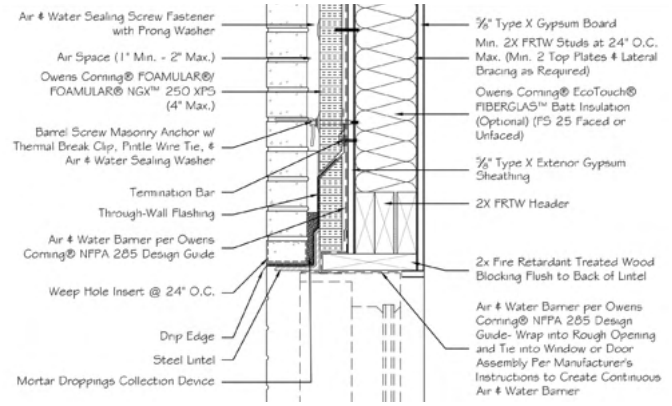
ES-WS-210

FOAMULAR/ FOAMULAR NGX 250 XPS ci with Steel Angle Cavity Closure, Wood Stud Head



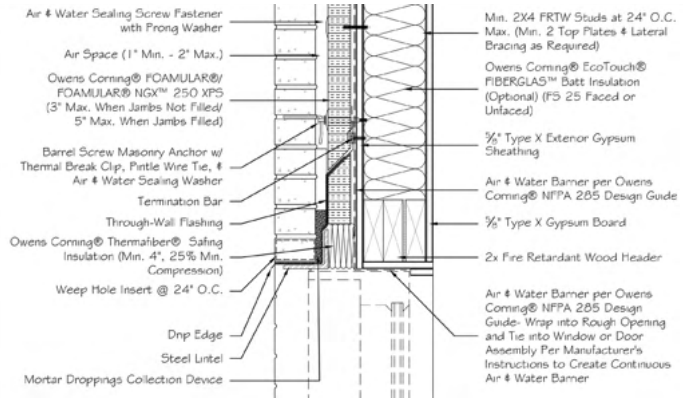
ES-WS-202

FOAMULAR/ FOAMULAR NGX 250 XPS ci with FRTW Blocking & Loose Angle Cavity Closure, Wood Stud Head



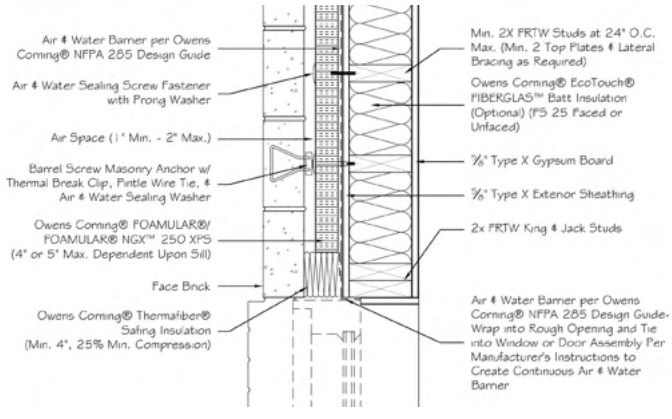
ES-WS-213

FOAMULAR/ FOAMULAR NGX 250 XPS ci with Mineral Wool Cavity Closure, Wood Stud Head

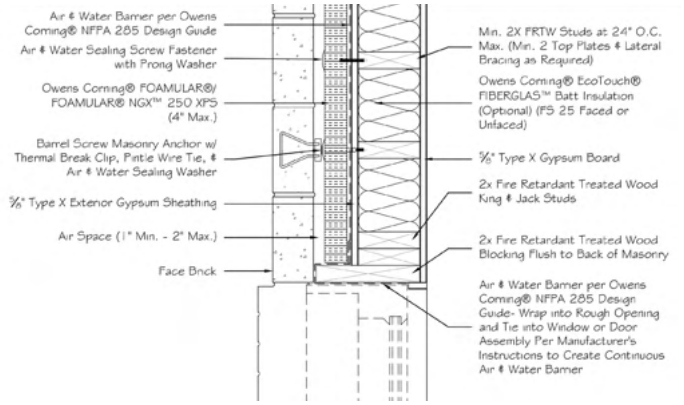


ES-WS-221

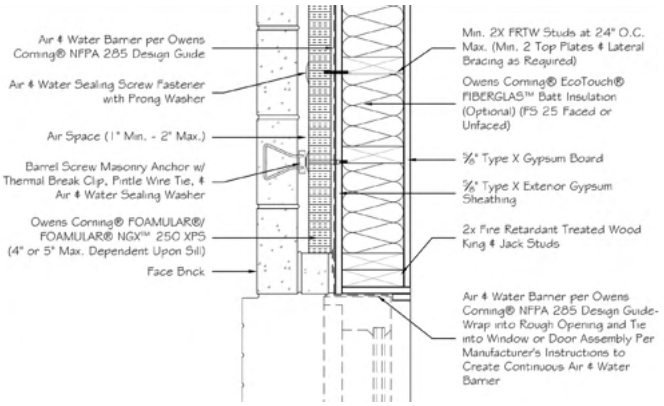
FOAMULAR/ FOAMULAR NGX 250 XPS ci with Mineral Wool Safing Cavity Closure, Wood Stud Jamb



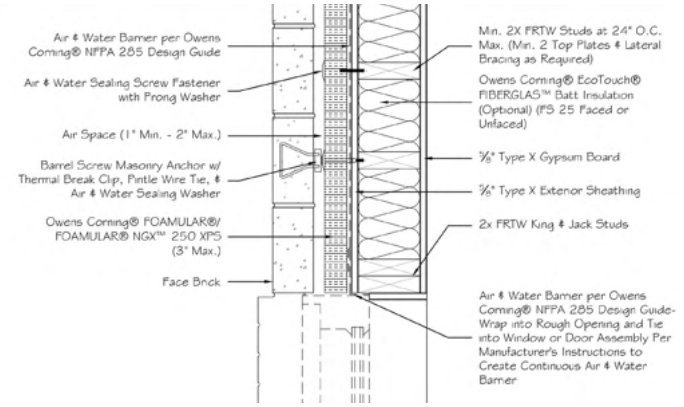
ES-WS-203
FOAMULAR/ FOAMULAR NGX 250 XPS ci with FRTW Cavity Closure, Wood Stud Jamb



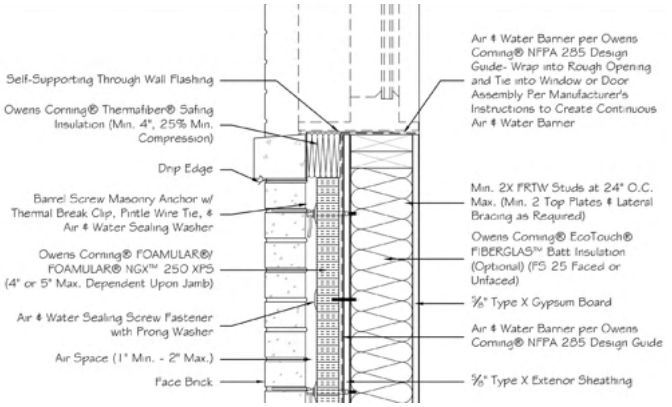
ES-WS-204
FOAMULAR/ FOAMULAR NGX 250 XPS ci with Masonry Return Cavity Closure, Wood Stud Jamb



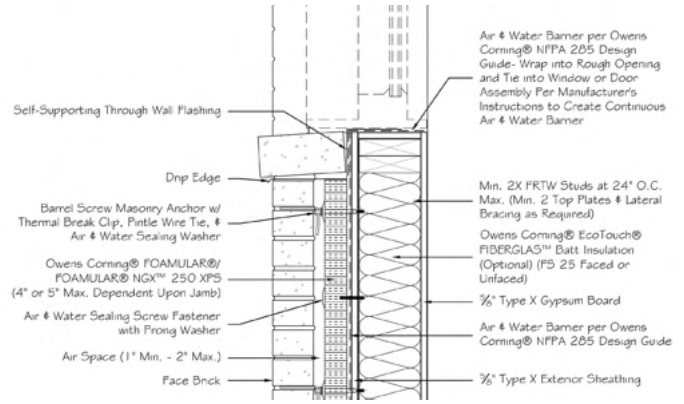
ES-WS-222
FOAMULAR/ FOAMULAR NGX 250 XPS ci with No Cavity Closure, Wood Stud Jamb



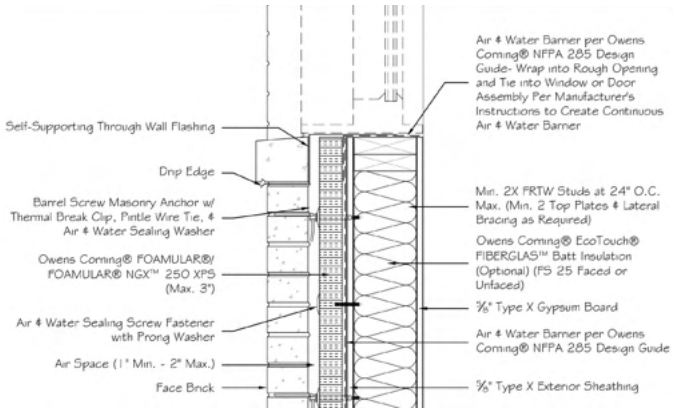
ES-WS-223
FOAMULAR/ FOAMULAR NGX 250 XPS ci with Cavity Closure, Wood Stud Sill



ES-WS-205
FOAMULAR/ FOAMULAR NGX 250 XPS ci with Masonry Return & Wash Cavity Closure, Wood Stud Sill

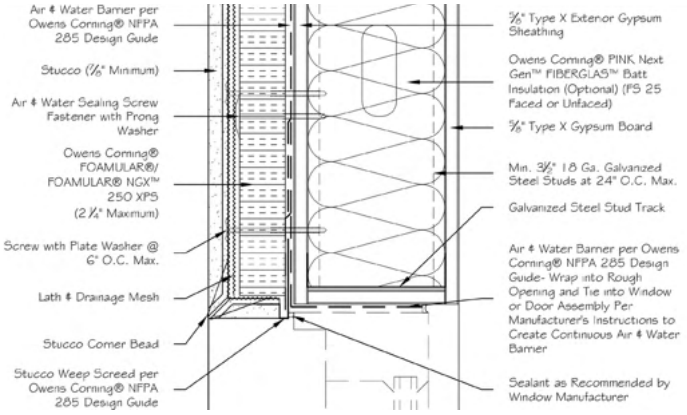


ES-WS-224
FOAMULAR/ FOAMULAR NGX 250 XPS ci with No Cavity Closure, Wood Stud Sill



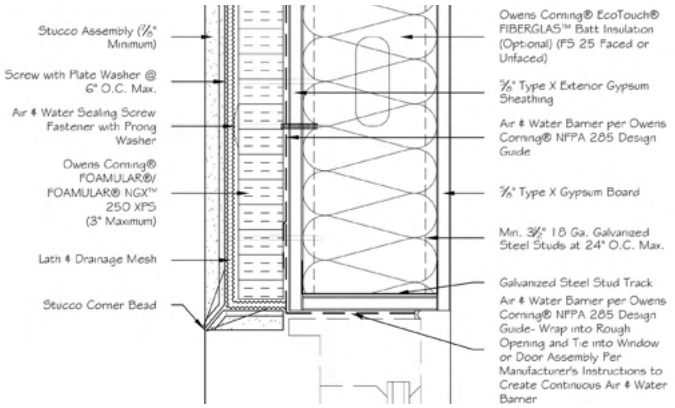
ES-SS-71

FOAMULAR/ FOAMULAR NGX 250 XPS ci with Recessed Opening Head with Backwrap Cavity Closure Featuring Special Stucco Weep Screed, Steel Stud Head



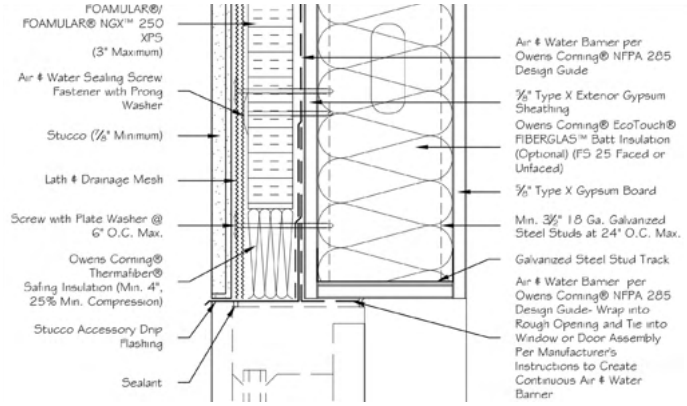
ES-SS-72

FOAMULAR/ FOAMULAR NGX 250 XPS ci with Recessed Opening Head with Backwrap Cavity Closure, Steel Stud Head



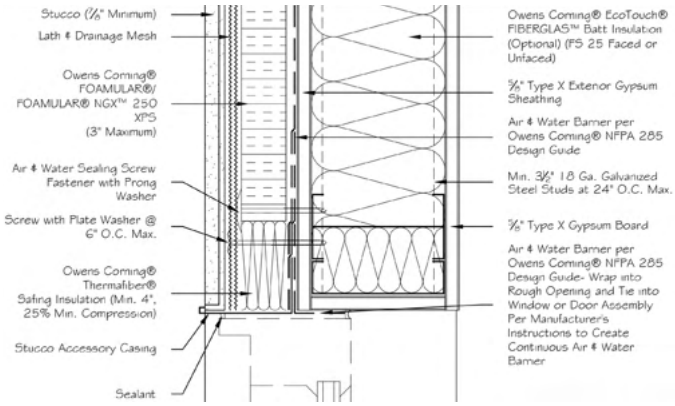
ES-SS-73

FOAMULAR/ FOAMULAR NGX 250 XPS ci with Flush Opening Head with Mineral Wool Safing Cavity Closure, Steel Stud Head



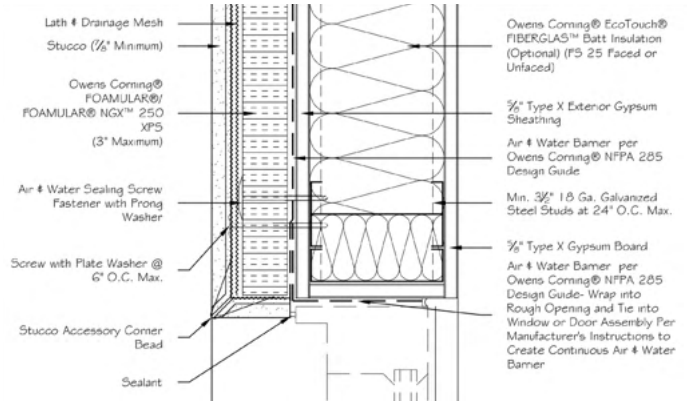
ES-SS-74

FOAMULAR/ FOAMULAR NGX 250 XPS ci with Flush Opening Jamb with Mineral Wool Cavity Closure, Steel Stud Jamb



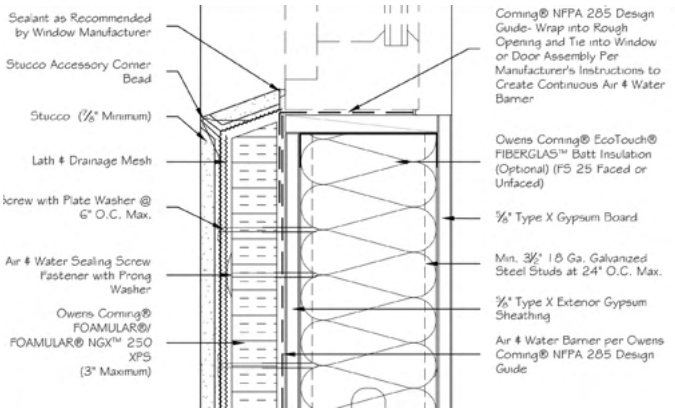
ES-SS-75

FOAMULAR/ FOAMULAR NGX 250 XPS ci with Recessed Opening Jamb with Backwrap Cavity Closure, Steel Stud Jamb

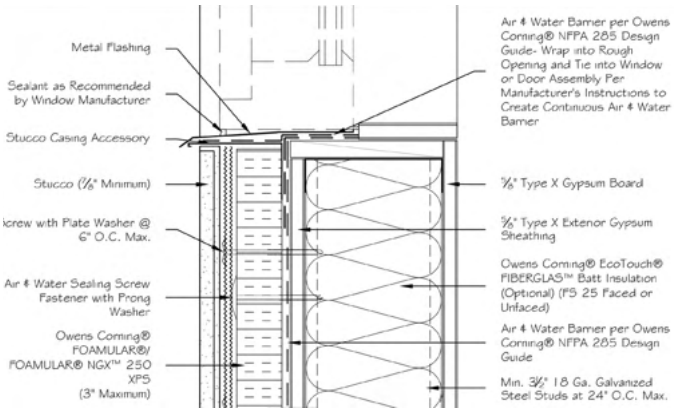


ES-SS-76

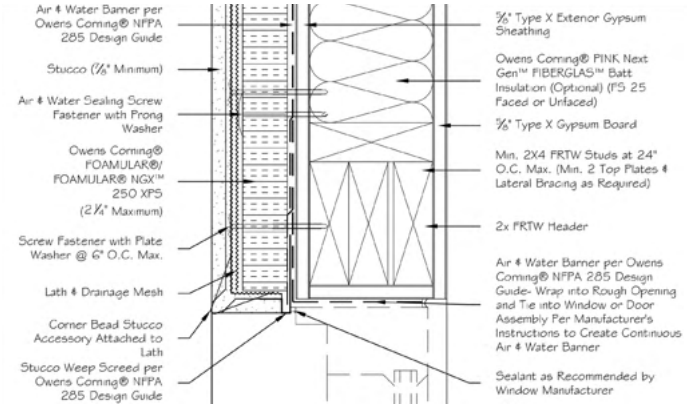
FOAMULAR/ FOAMULAR NGX 250 XPS ci with Recessed Opening Sill with Backwrap Cavity Closure, Steel Stud Sill



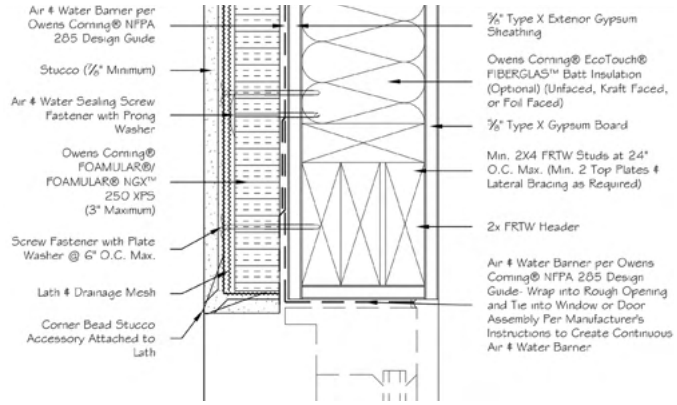
ES-SS-77
FOAMULAR/FOAMULAR NGX 250 XPS ci with Flush Opening Sill



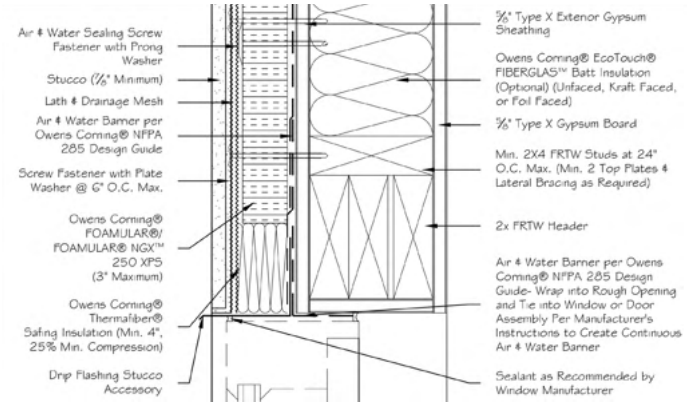
ES-WS-231
FOAMULAR/ FOAMULAR NGX 250 XPS ci with Recessed Opening Head with Backwrap Cavity Closure Featuring Special Stucco Weep Screed, Wood Stud Head



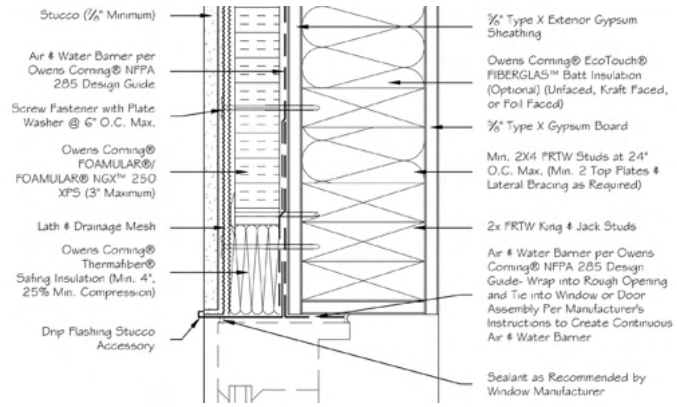
ES-WS-237
FOAMULAR/ FOAMULAR NGX 250 XPS ci with Recessed Opening Head with Backwrap Cavity Closure, Wood Stud Head



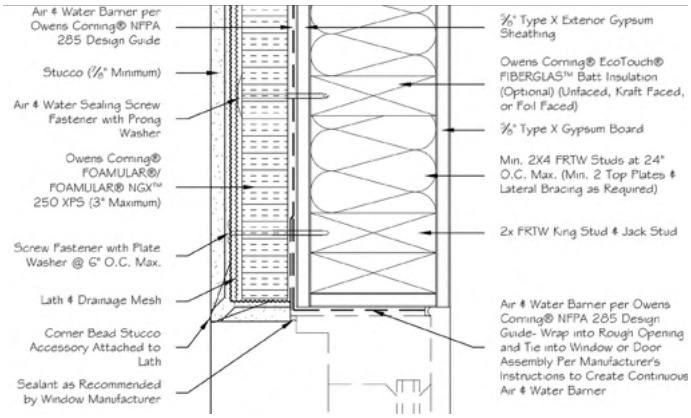
ES-WS-232
FOAMULAR/ FOAMULAR NGX 250 XPS ci with Flush Opening Head with Mineral Wool Safing Cavity Closure, Wood Stud Head



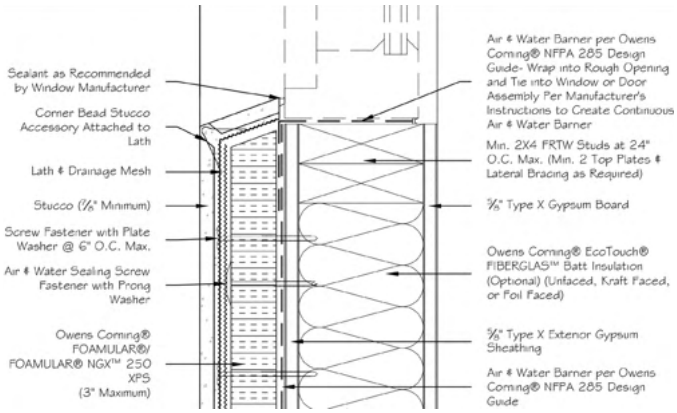
ES-WS-234
FOAMULAR/ FOAMULAR NGX 250 XPS ci with Flush Opening Jamb with Mineral Wool Safing Cavity Closure, Wood Stud Jamb



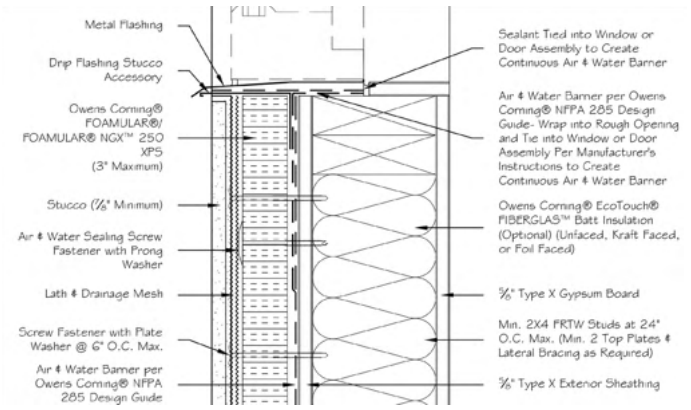
ES-WS-233
FOAMULAR/ FOAMULAR NGX 250 XPS ci with Recessed Opening Jamb with Backwrap Cavity Closure, Wood Stud Jamb



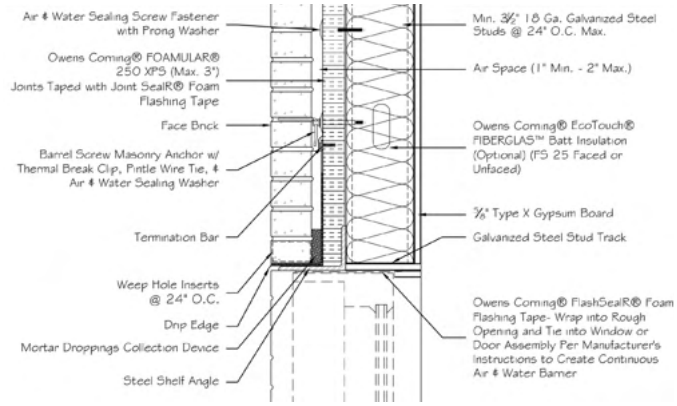
ES-WS-235
FOAMULAR/ FOAMULAR NGX 250 XPS ci with Recessed Opening Sill with Backwrap Cavity Closure, Wood Stud Sill



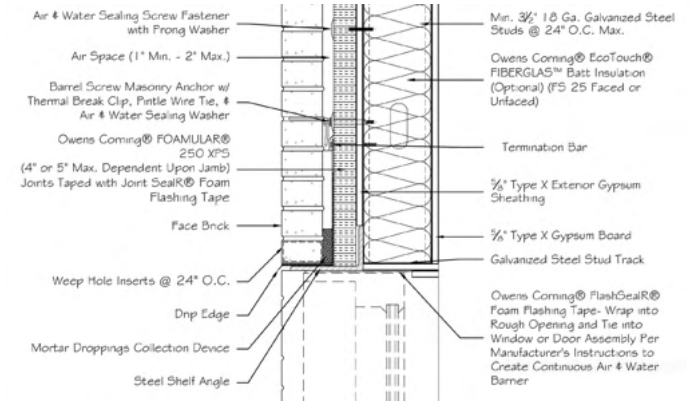
ES-WS-236
FOAMULAR/ FOAMULAR NGX 250 XPS ci with Flush Opening Sill, Wood Stud Sill



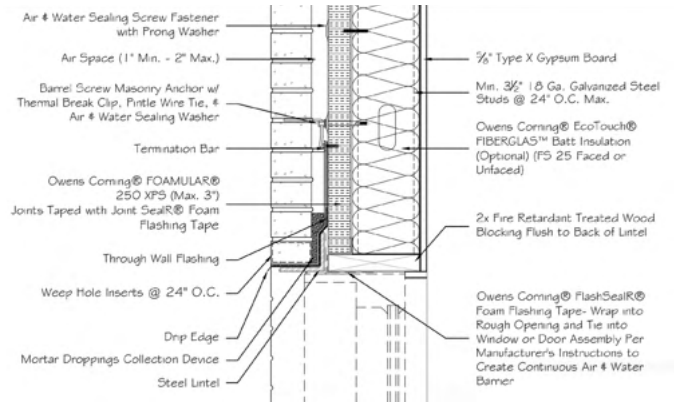
ES-SS-32
FOAMULAR 250 XPS ci as AWB & Sheathing with Steel Angle Cavity Closure, Steel Stud Head



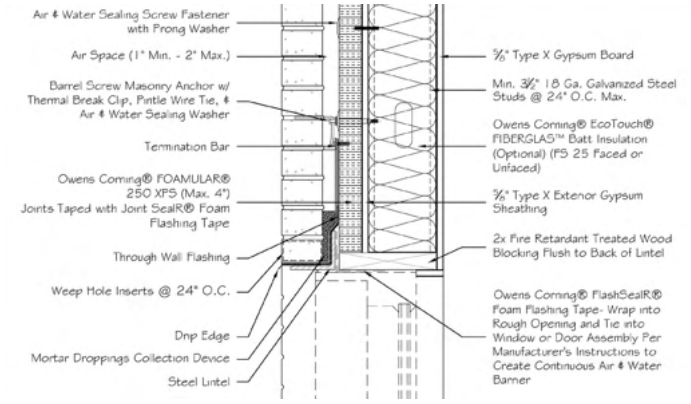
ES-SS-242
FOAMULAR 250 XPS ci as AWB with Steel Angle Cavity Closure, Steel Stud Head



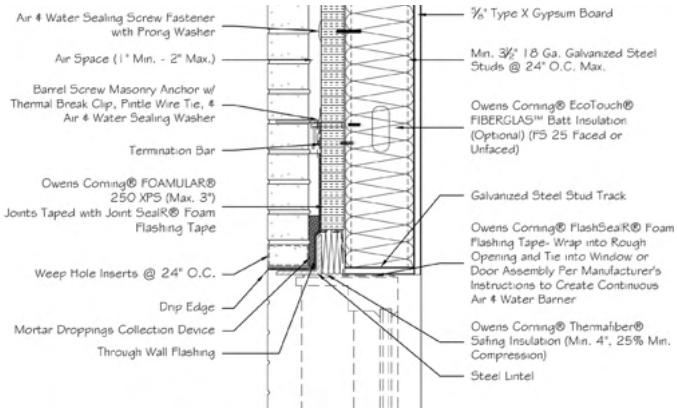
ES-SS-31
FOAMULAR 250 XPS ci as AWB & Sheathing with FRTW Blocking & Loose Angle Cavity Closure, Steel Stud Head



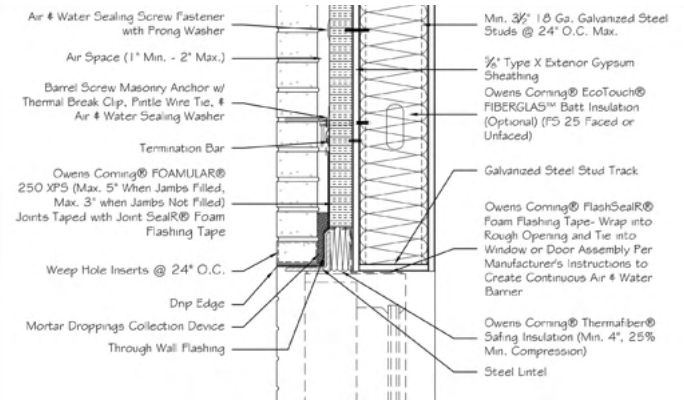
ES-SS-241
FOAMULAR 250 XPS ci as AWB with FRTW Blocking & Loose Angle Cavity Closure, Steel Stud Head



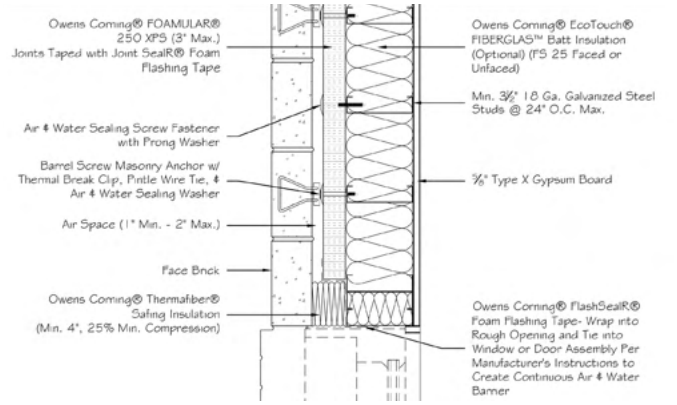
ES-SS-33
FOAMULAR 250 XPS ci as AWB & Sheathing with Mineral Wool Cavity Closure, Steel Stud Head



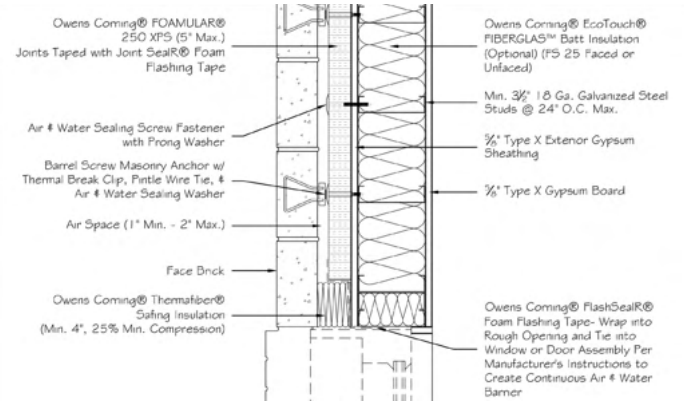
ES-SS-243
FOAMULAR 250 XPS ci as AWB with Mineral Wool Cavity Closure, Steel Stud Head



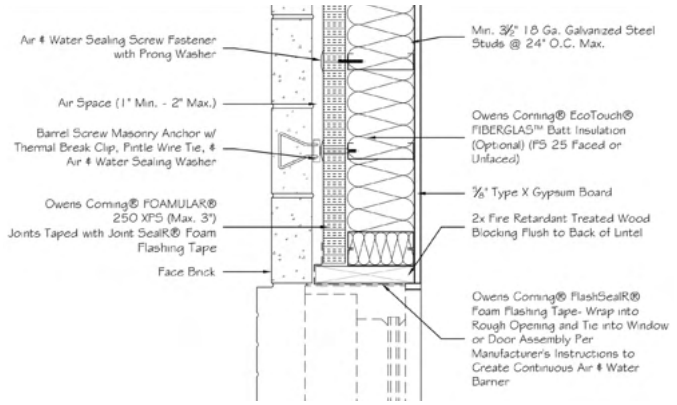
ES-SS-35
FOAMULAR 250 XPS ci as AWB & Sheathing with Mineral Wool Safing Cavity Closure, Steel Stud Jamb



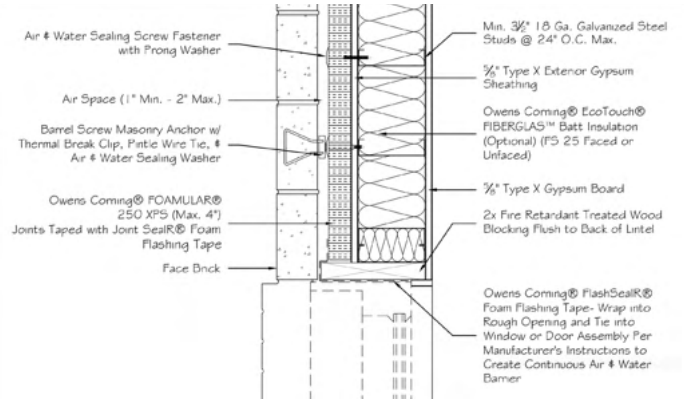
ES-SS-245
FOAMULAR 250 XPS ci as AWB with Mineral Wool Safing Cavity Closure, Steel Stud Jamb



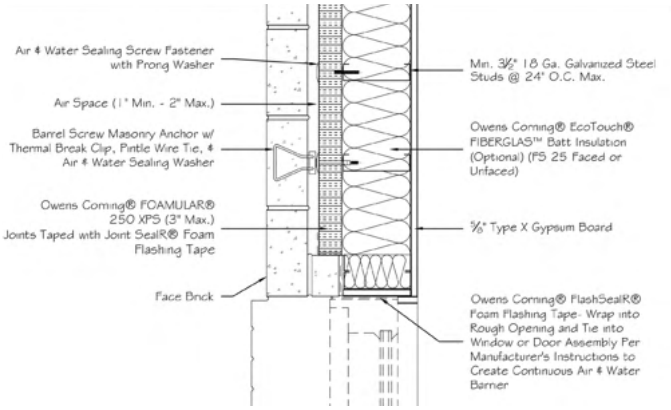
ES-SS-34
FOAMULAR 250 XPS ci as AWB & Sheathing with FRTW Cavity Closure, Steel Stud Jamb



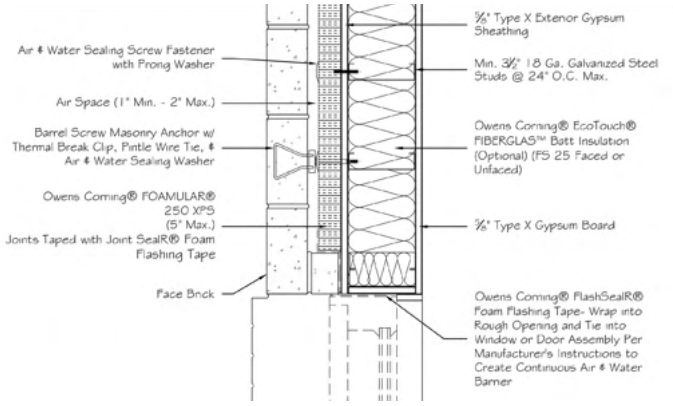
ES-SS-244
FOAMULAR 250 XPS ci as AWB with FRTW Cavity Closure, Steel Stud Jamb



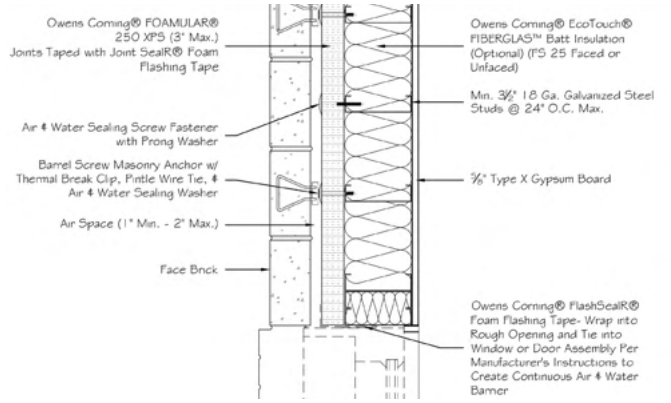
ES-SS-36
FOAMULAR 250 XPS ci as AWB & Sheathing with Masonry Return Cavity Closure, Steel Stud Jamb



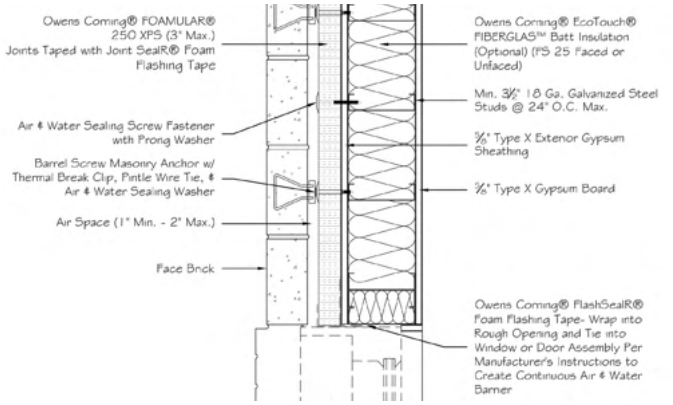
ES-SS-246
FOAMULAR 250 XPS ci as AWB with Masonry Return Cavity Closure, Steel Stud Jamb



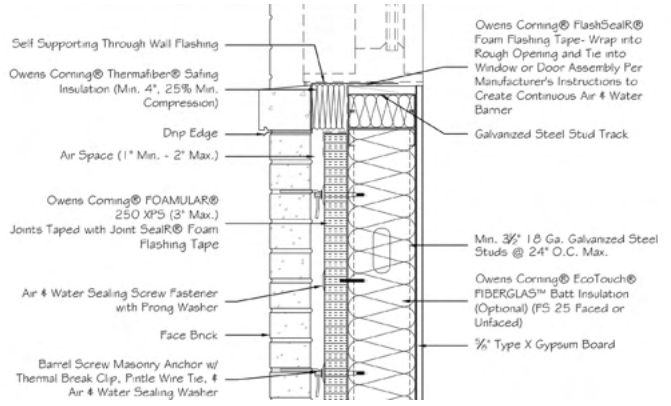
ES-SS-48
FOAMULAR 250 XPS ci as AWB & Sheathing with No Cavity Closure



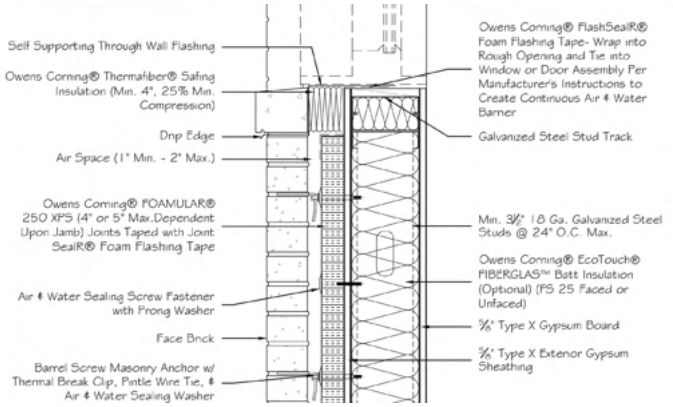
ES-SS-253
FOAMULAR 250 XPS ci as AWB with No Cavity Closure



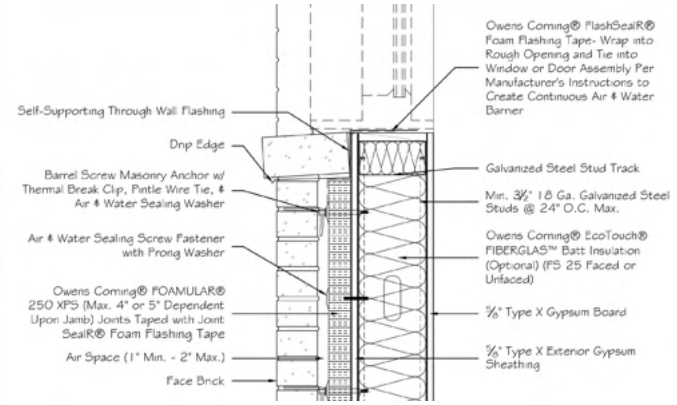
ES-SS-38
FOAMULAR 250 XPS ci as AWB & Sheathing with Mineral Wool Safing Cavity Closure, Steel Stud Sill



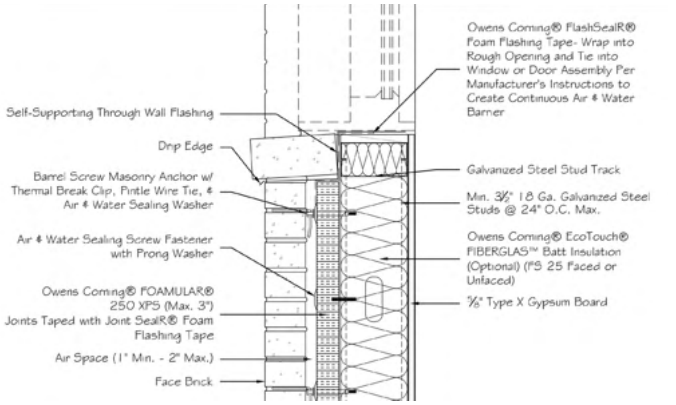
ES-SS-248
FOAMULAR 250 XPS ci as AWB with Mineral Wool Safing Cavity Closure, Steel Stud Sill



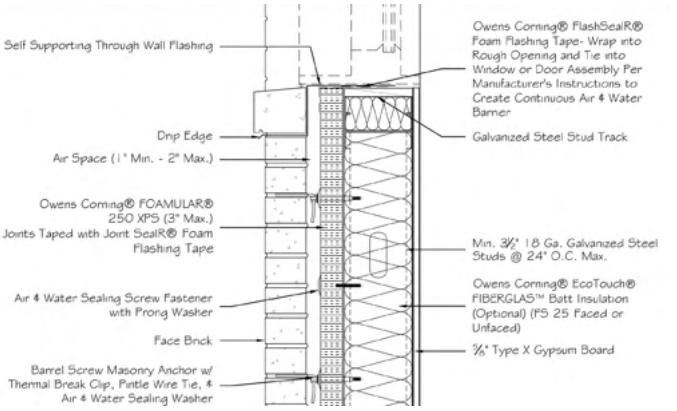
ES-SS-247
FOAMULAR 250 XPS ci as AWB with Masonry Return & Wash Cavity Closure, Steel Stud Sill



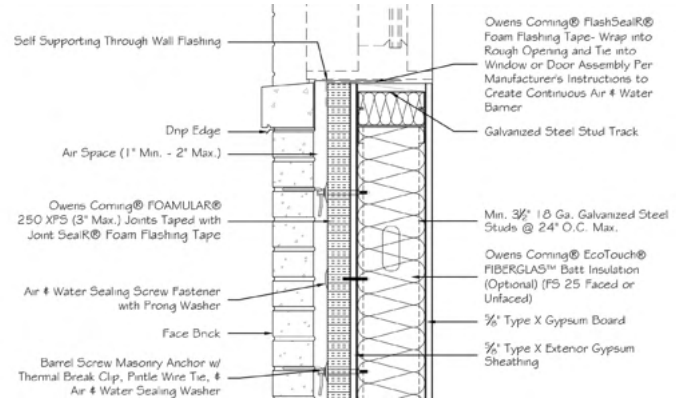
ES-SS-37
FOAMULAR 250 XPS ci as AWB & Sheathing with Masonry Return & Wash Cavity Closure, Steel Stud Sill



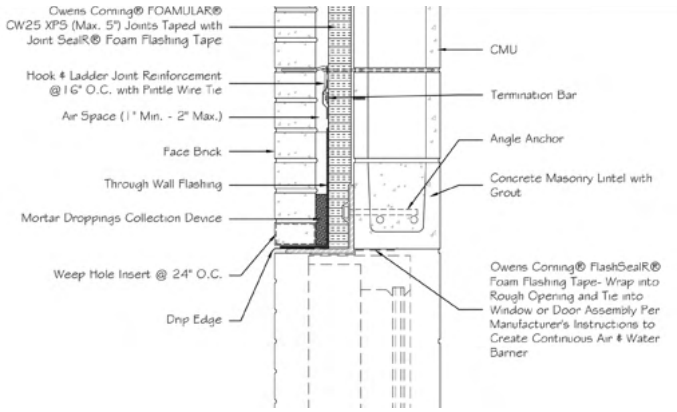
ES-SS-49
FOAMULAR 250 XPS ci as AWB & Sheathing with No Cavity Closure, Steel Stud Sill



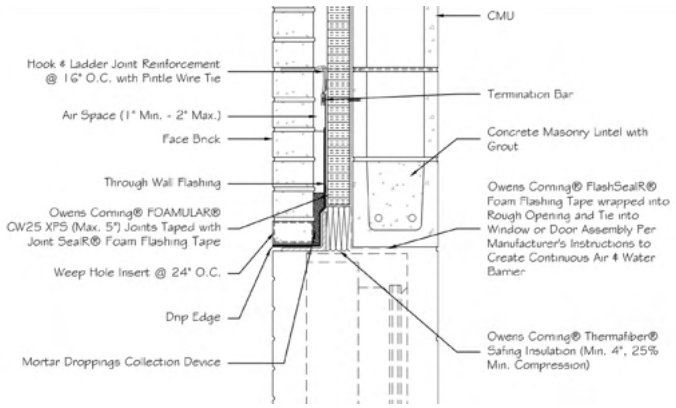
ES-SS-254
FOAMULAR 250 XPS ci as AWB with No Cavity Closure



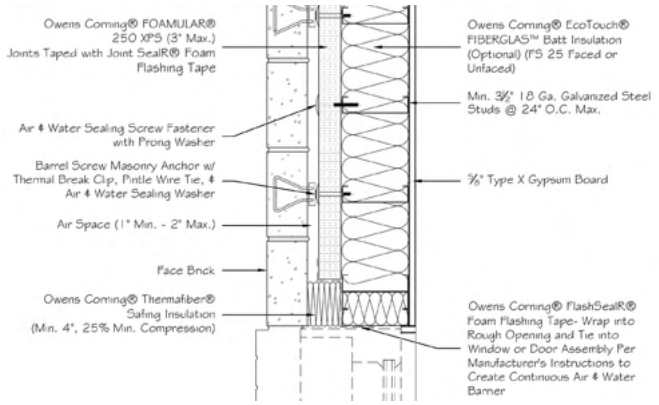
ES-CM-32
FOAMULAR CW25 XPS ci & AWB with Steel Angle Cavity Closure, CMU Head



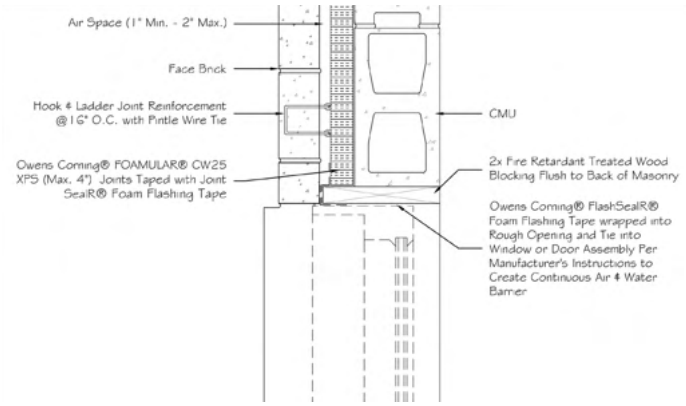
ES-CM-31
FOAMULAR CW25 XPS ci & AWB with Mineral Wool Cavity Closure, CMU Head



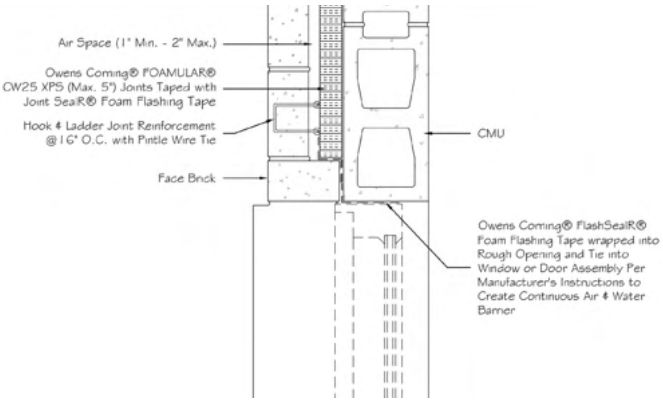
ES-CM-35
FOAMULAR CW25 XPS ci & AWB with Mineral Wool Safing Cavity Closure, CMU Jamb



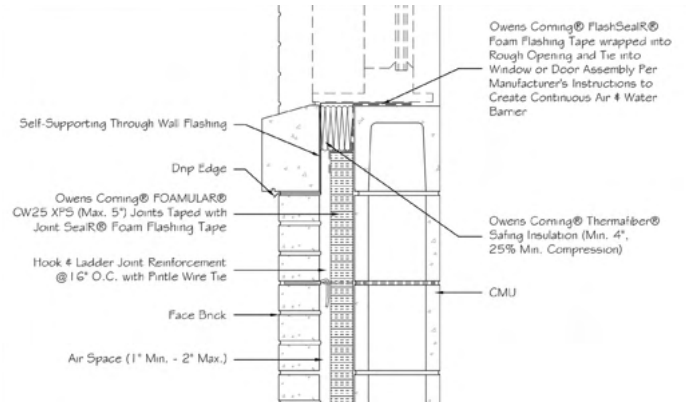
ES-CM-34
FOAMULAR CW25 XPS ci & AWB with FRTW Cavity Closure, CMU Jamb



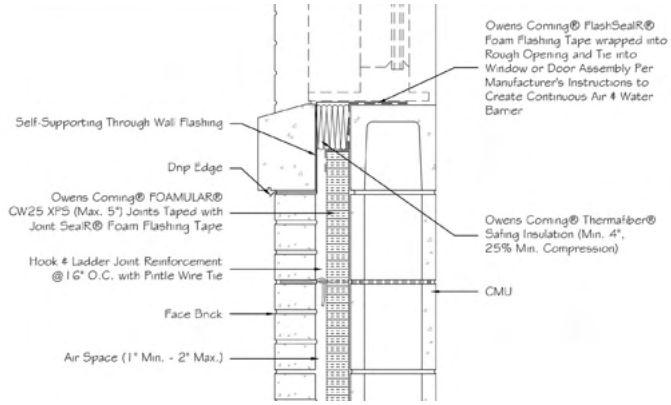
ES-CM-36
FOAMULAR CW25 XPS ci & AWB with Masonry Return Cavity Closure, CMU Jamb



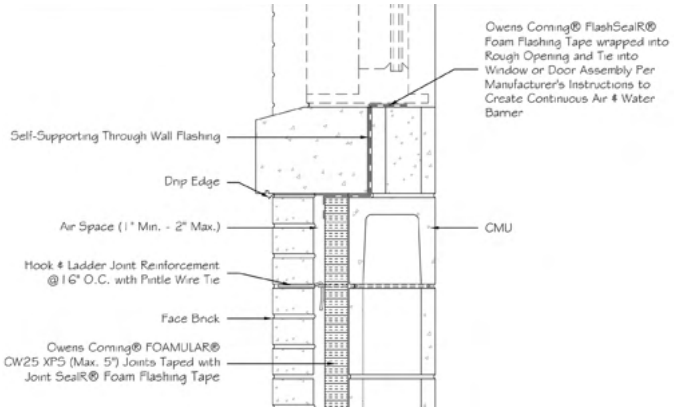
ES-CM-43
FOAMULAR CW25 XPS ci as AWB with No Cavity Closure, CMU Sill



ES-CM-38
FOAMULAR CW25 XPS ci & AWB with Mineral Wool Safing Cavity Closure

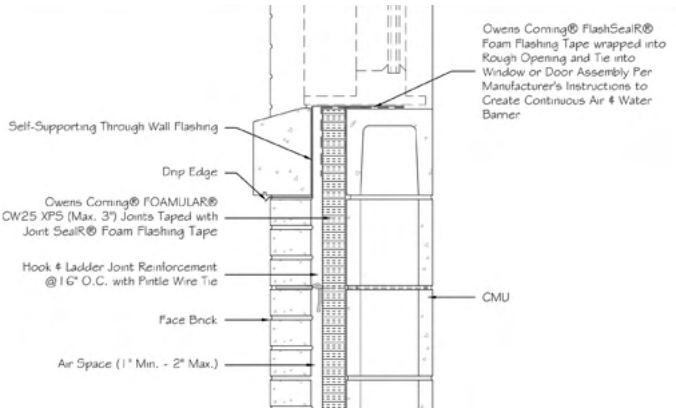


ES-CM-37
FOAMULAR 250 XPS ci as AWB with Masonry Return Cavity Closure, CMU Sill



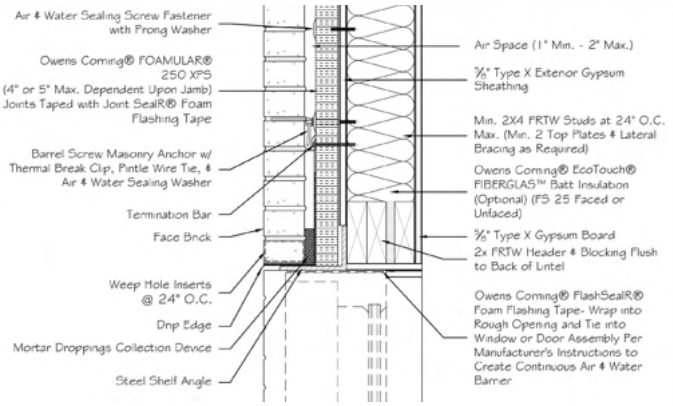
ES-CM-44

FOAMULAR CW25 XPS ci as AWB with No Cavity Closure, CMU Sill



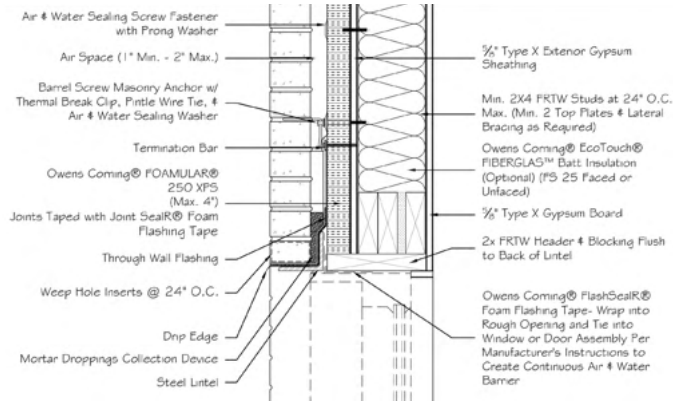
ES-WS-282

FOAMULAR 250 XPS ci & AWB with Steel Angle Cavity Closure, Wood Stud Head



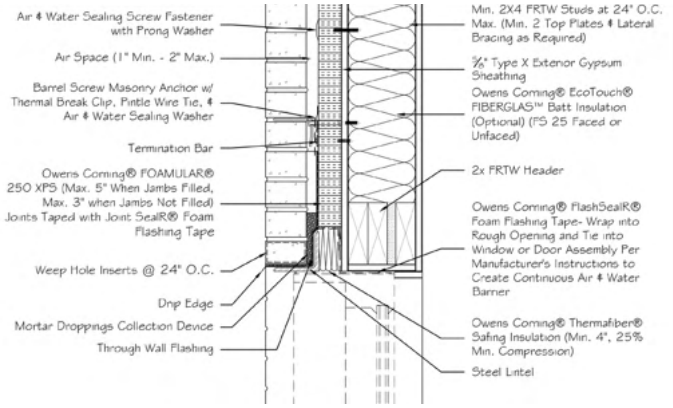
ES-WS-281

FOAMULAR 250 XPS ci & AWB with FRTW Blocking & Loose Angle Cavity Closure, Wood Stud Head



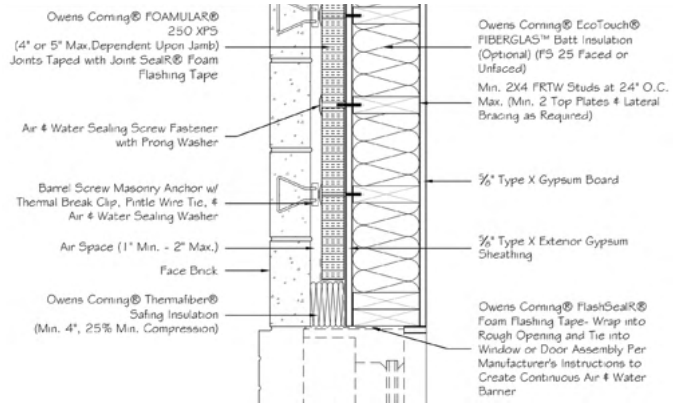
ES-WS-283

FOAMULAR 250 XPS ci & AWB with Mineral Wool Cavity Closure, Wood Stud Head



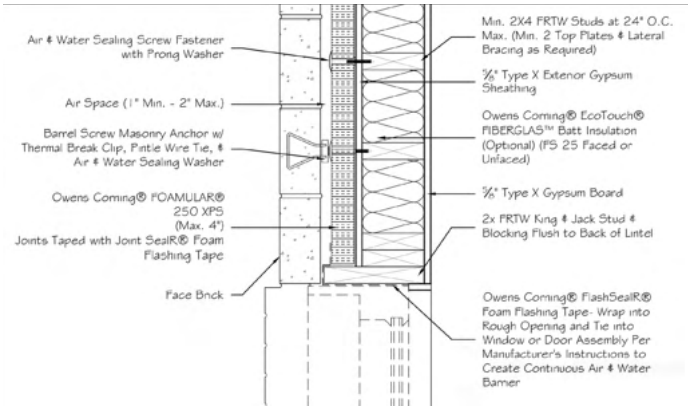
ES-WS-285

FOAMULAR 250 XPS ci & AWB with Mineral Wool Safing Cavity Closure, Wood Stud Jamb

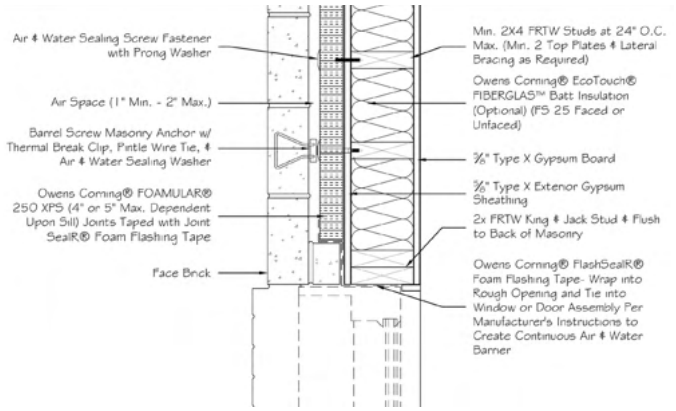


ES-WS-284

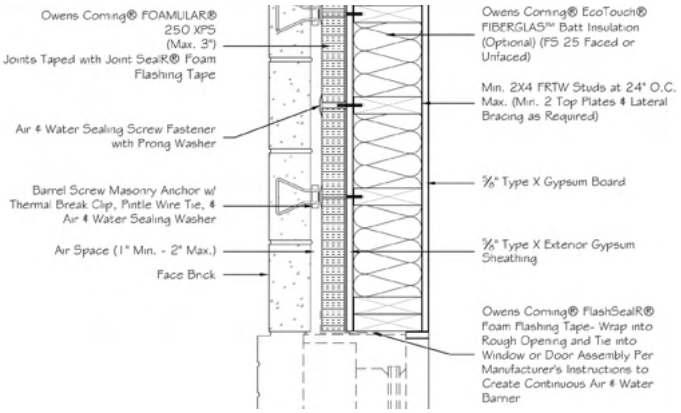
FOAMULAR 250 XPS ci & AWB with FRTW Cavity Closure, Wood Stud Jamb



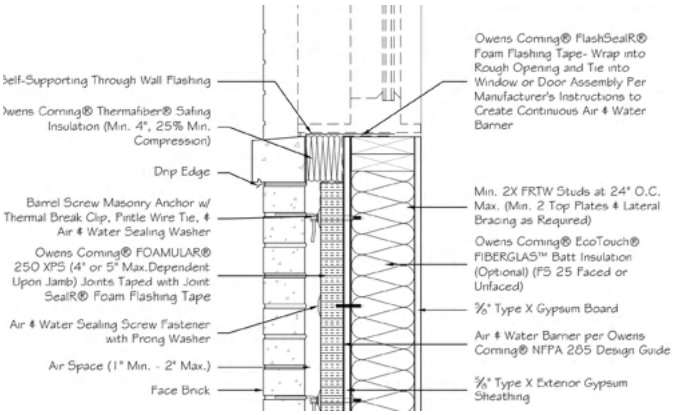
ES-WS-286
FOAMULAR 250 XPS ci & AWB with Masonry Return Cavity Closure, Wood Stud Jamb



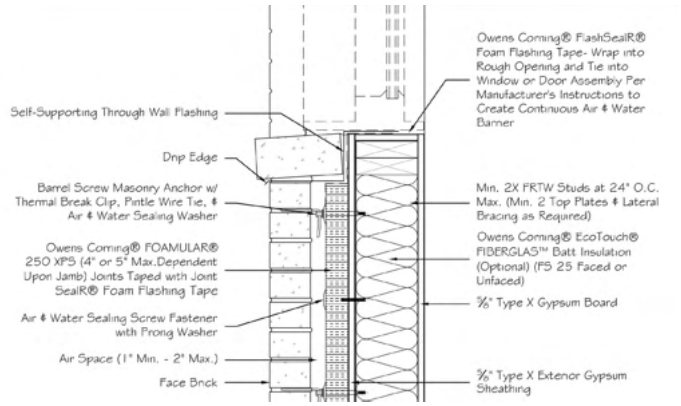
ES-WS-287
FOAMULAR 250 XPS ci as AWB with No Cavity Closure



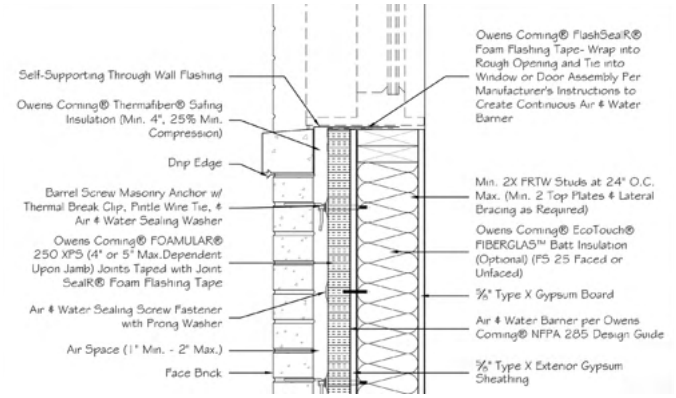
ES-WS-288
FOAMULAR 250 XPS ci & AWB with Mineral Wool Safing Cavity Closure, Wood Stud Sill



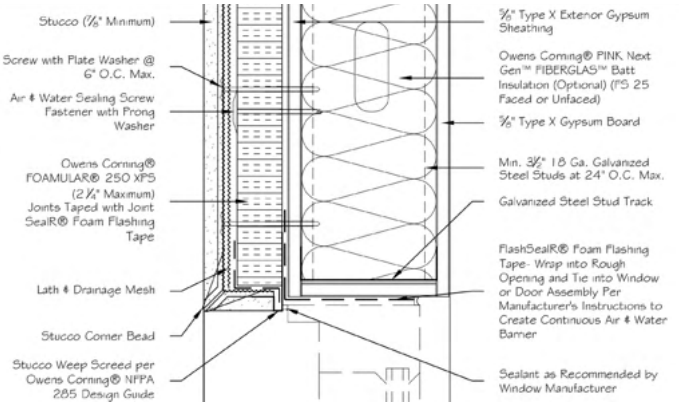
ES-WS-289
FOAMULAR 250 XPS ci & AWB with Masonry Return & Wash Cavity Closure, Wood Stud Sill



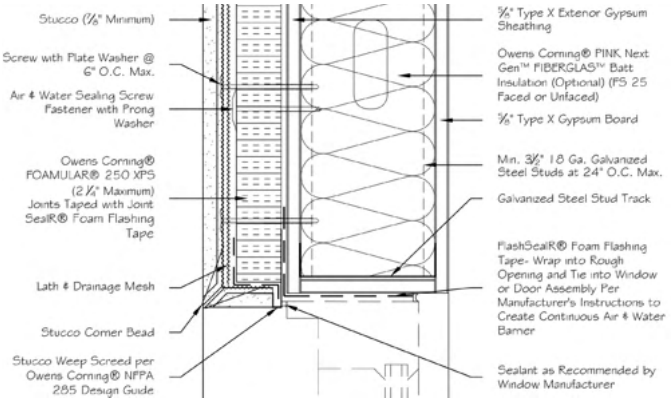
ES-WS-290
FOAMULAR 250 XPS ci as AWB with No Cavity Closure



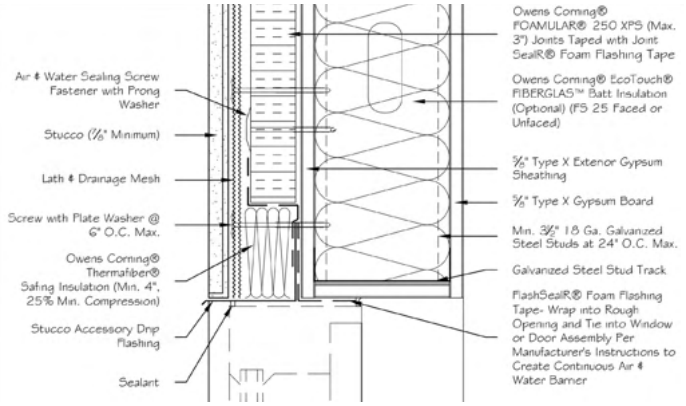
ES-SS-121
FOAMULAR 250 XPS ci as AWB with Recessed Opening Head with Backwrap Cavity Closure Featuring Special Stucco Weep Screed, Steel Stud Head



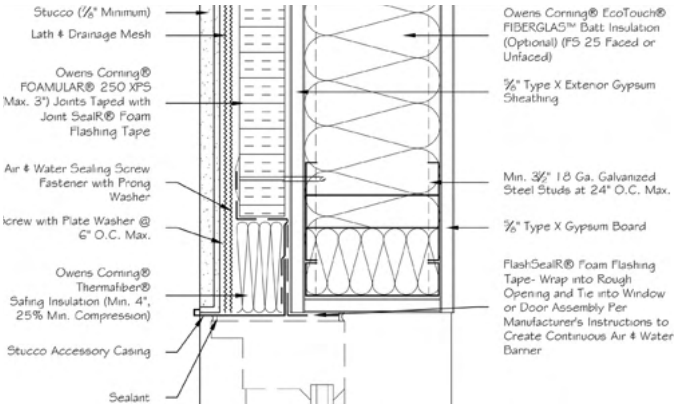
ES-SS-122
FOAMULAR 250 XPS ci as AWB with Recessed Opening Head with Backwrap Cavity Closure, Steel Stud Head



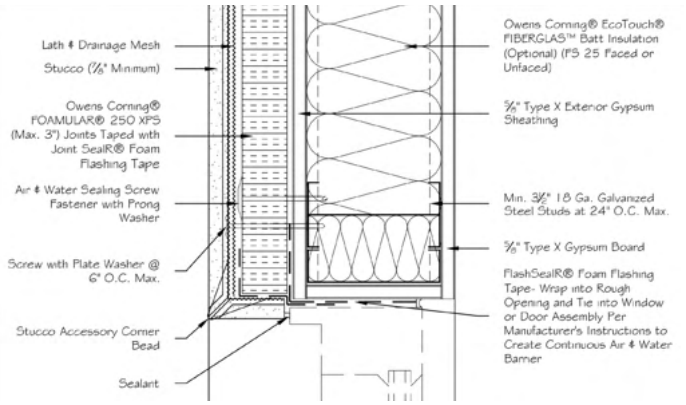
ES-SS-123
FOAMULAR 250 XPS ci as AWB with Flush Opening Head with Mineral Wool Safing Cavity Closure, Steel Stud Head



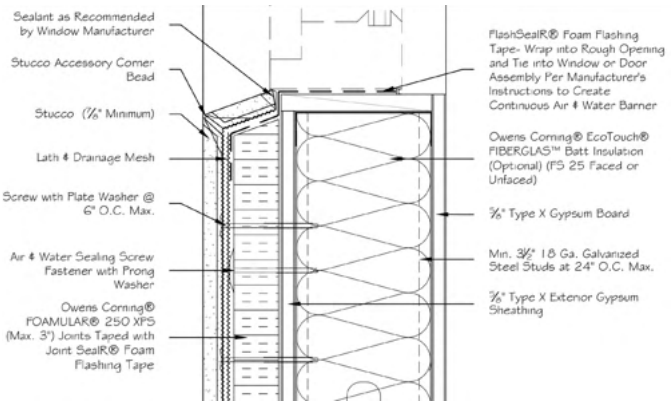
ES-SS-124
FOAMULAR 250 XPS ci as AWB with Flush Opening Jamb with Mineral Wool Safing Cavity Closure, Steel Stud Jamb



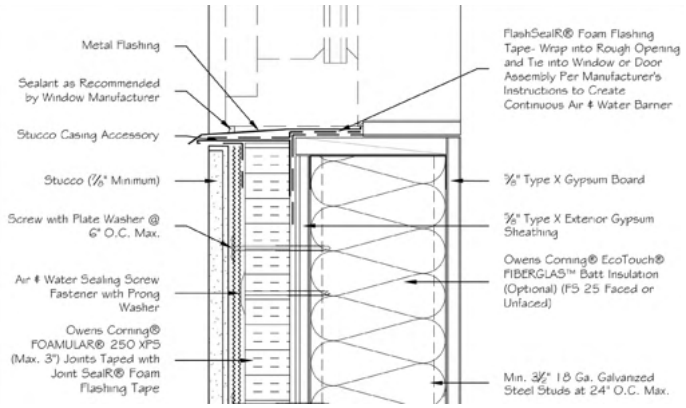
ES-SS-125
FOAMULAR 250 XPS ci as AWB with Recessed Opening Jamb with Backwrap Cavity Closure, Steel Stud Jamb



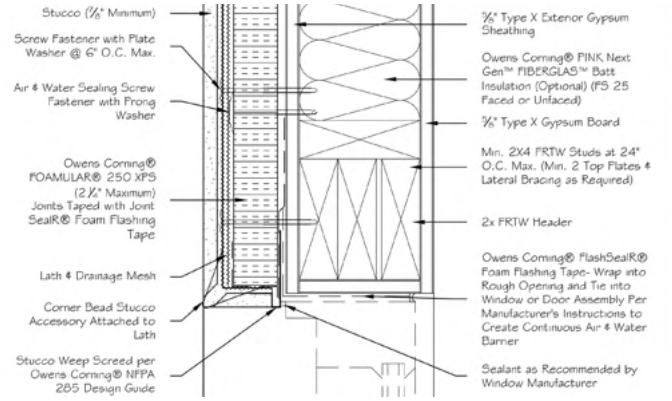
ES-SS-126
FOAMULAR 250 XPS ci as AWB with Recessed Opening Sill with Backwrap Cavity Closure, Steel Stud Sill



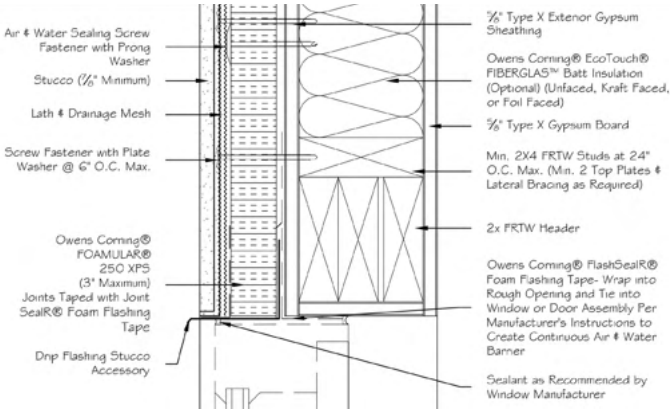
ES-SS-127
FOAMULAR 250 XPS ci as AWB with Flush Opening Sill with No Cavity Closure, Steel Stud Sill



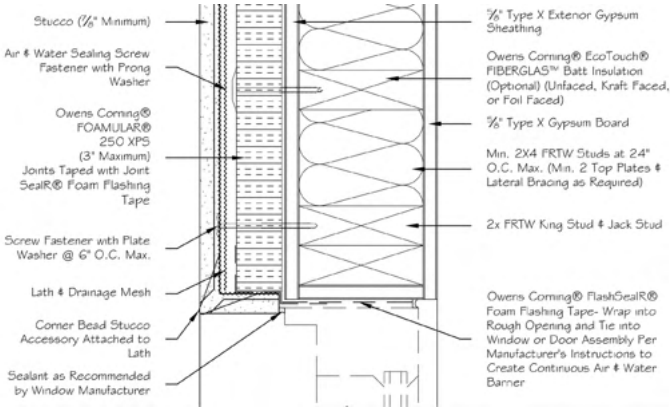
ES-WS-301
FOAMULAR 250 XPS ci as AWB with Recessed Opening Head with Backwrap Cavity Closure Featuring Special Stucco Weep Screed, Wood Stud Head



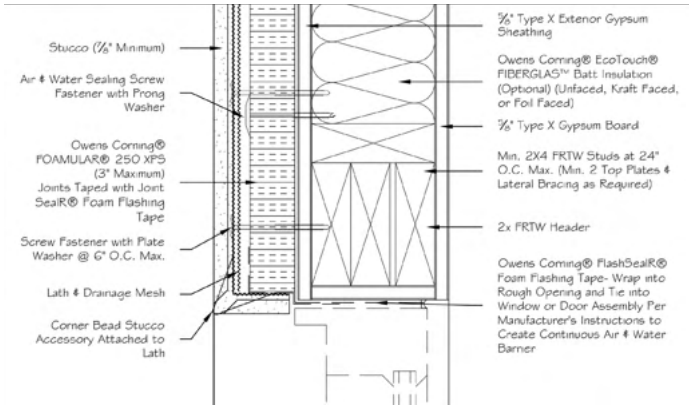
ES-WS-302
FOAMULAR 250 XPS ci as AWB with Flush Opening Head with Mineral Wool Safing Cavity Closure, Wood Stud Head



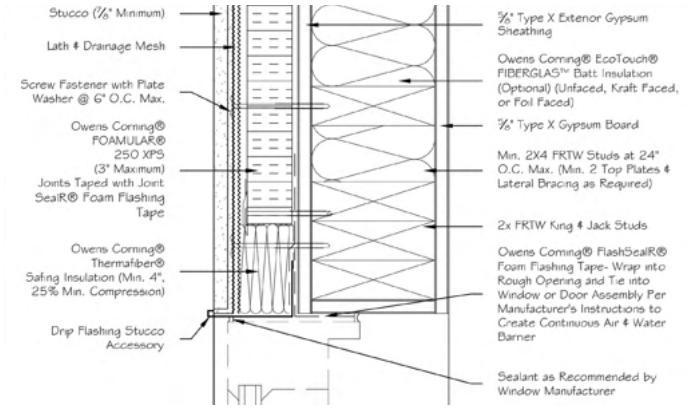
ES-WS-303
FOAMULAR 250 XPS ci as AWB with Recessed Opening Jamb with Backwrap Cavity Closure, Wood Stud Jamb



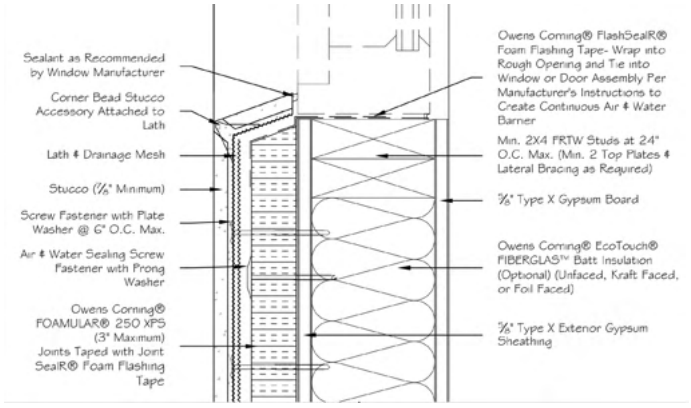
ES-WS-307
FOAMULAR 250 XPS ci as AWB with Recessed Opening Head with Backwrap Cavity Closure, Wood Stud Head



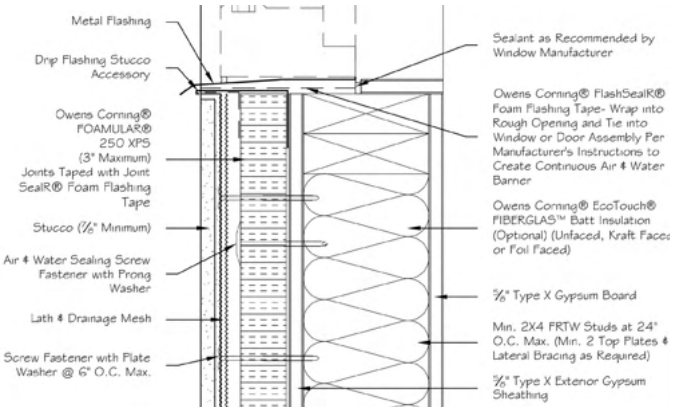
ES-WS-304
FOAMULAR 250 XPS ci as AWB with Flush Opening Jamb with Mineral Wool Safing Cavity Closure, Wood Stud Jamb



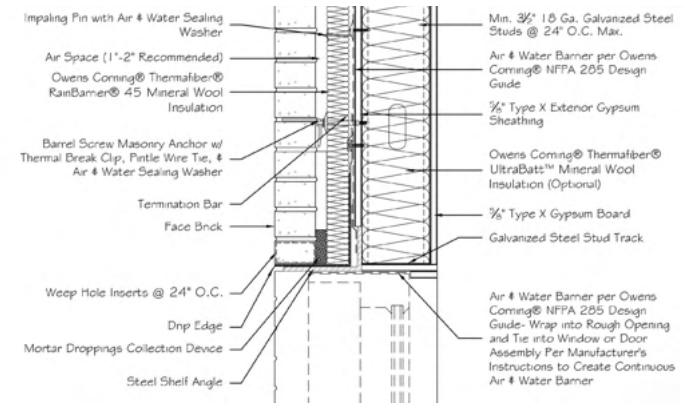
ES-WS-305
FOAMULAR 250 XPS ci as AWB with Recessed Opening Sill with Backwrap Cavity Closure, Wood Stud Sill



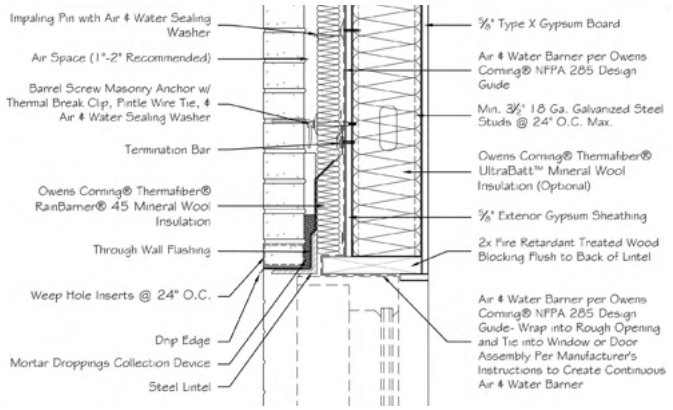
ES-WS-306
FOAMULAR 250 XPS ci as AWB with Flush Opening Sill with No Cavity Closure, Wood Stud Sill



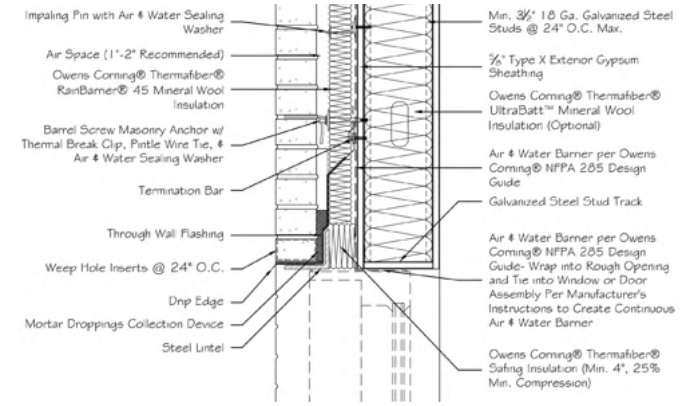
ES-SS-16
Thermafiber RainBarrier Mineral Wool ci with Steel Angle Cavity Closure, Steel Stud Head



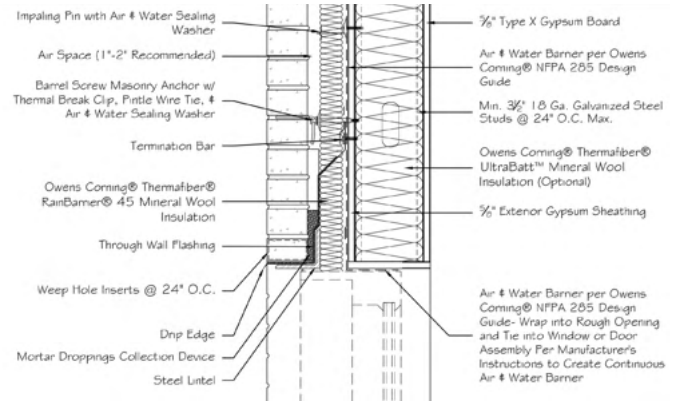
ES-SS-15
Thermafiber RainBarrier Mineral Wool ci with FRTW Blocking & Loose Angle Cavity Closure, Steel Stud Head



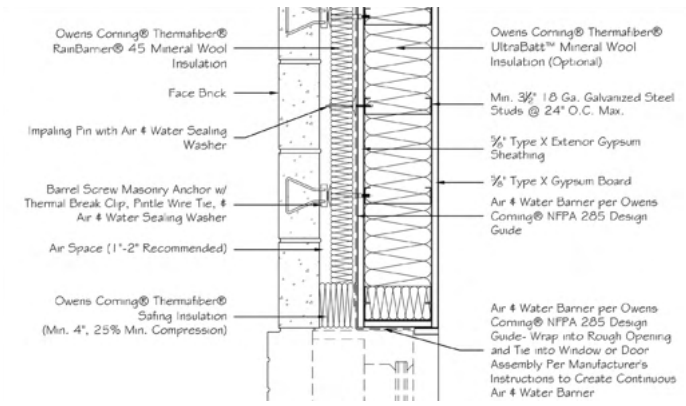
ES-SS-26
Thermafiber RainBarrier Mineral Wool ci with Thermafiber Safing Mineral Wool Cavity Closure, Steel Stud Head



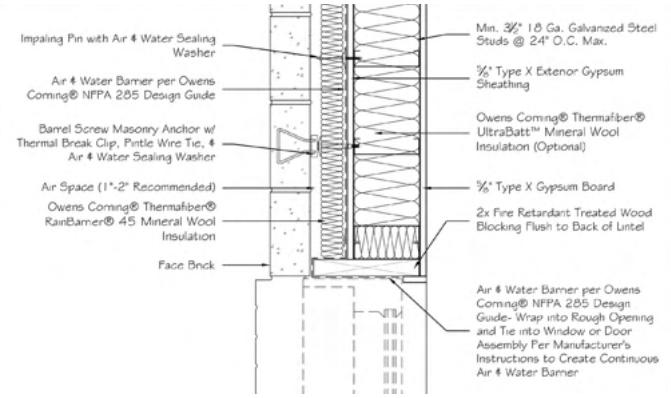
ES-SS-59
Thermafiber RainBarrier Mineral Wool ci with No Cavity Closure, Steel Stud Head



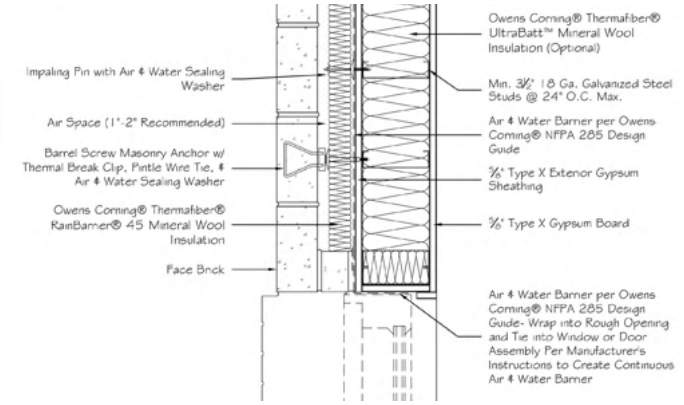
ES-SS-18
Thermafiber RainBarrier Mineral Wool ci with Thermafiber Safing Mineral Wool Safing Cavity Closure, Steel Stud Jamb



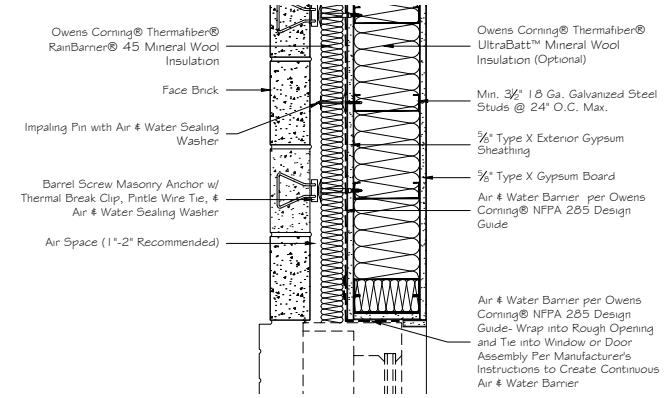
ES-SS-17
Thermafiber RainBarrier Mineral Wool ci with FRTW Cavity Closure, Steel Stud Jamb



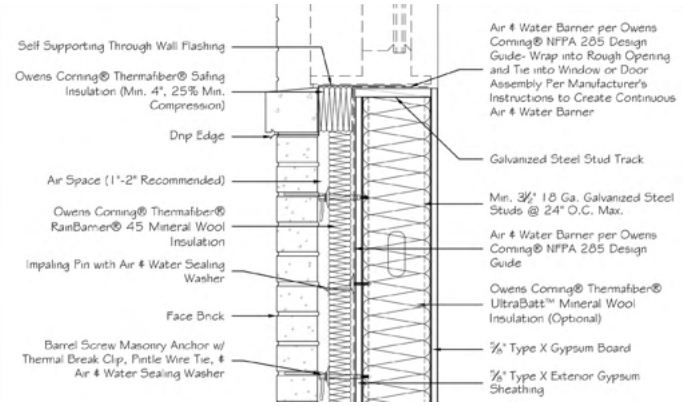
ES-SS-19
Thermafiber RainBarrier Mineral Wool ci with Masonry Return Cavity Closure, Steel Stud Jamb



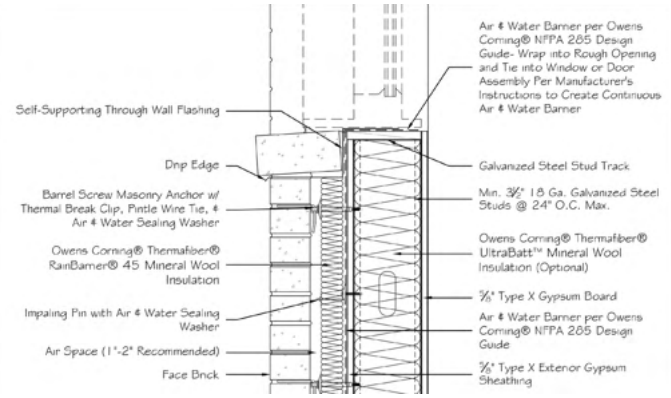
ES-SS-82
Thermafiber RainBarrier Mineral Wool ci with No Cavity Closure, Steel Stud Jamb



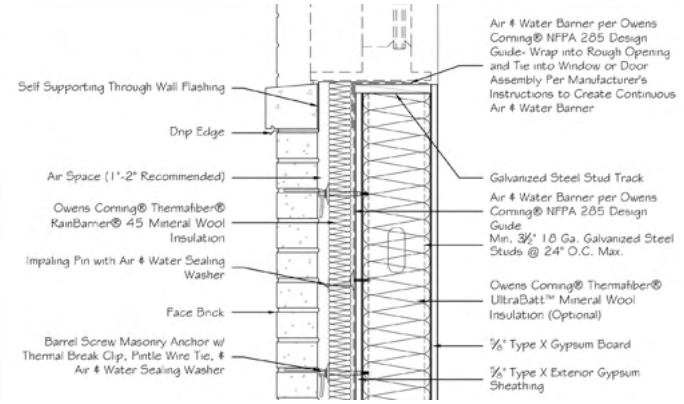
ES-SS-21
Thermafiber RainBarrier Mineral Wool ci with Thermafiber Safing Mineral Wool Safing Cavity Closure, Steel Stud Sill



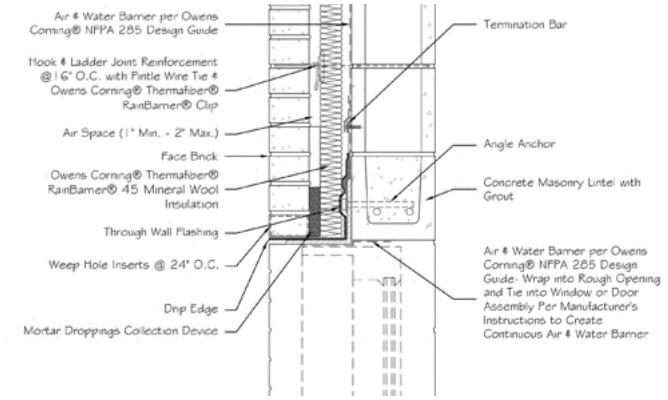
ES-SS-20
Thermafiber RainBarrier Mineral Wool ci with Masonry Return & Wash Cavity Closure, Steel Stud Sill



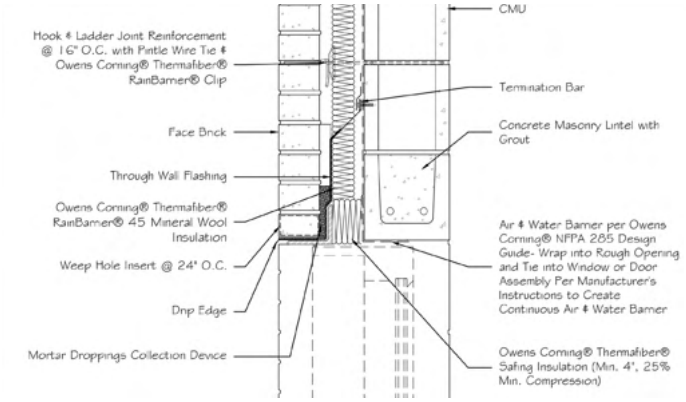
ES-SS-83
Thermafiber RainBarrier Mineral Wool ci with No Cavity Closure, Steel Stud Sill



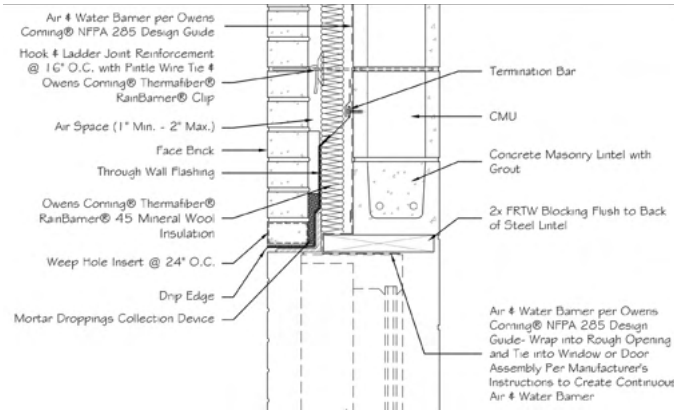
ES-CM-16
Thermafiber RainBarrier Mineral Wool ci with Steel Angle Cavity Closure, CMU Head



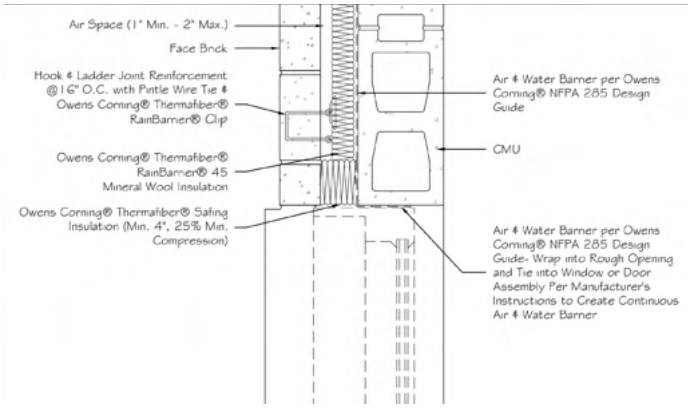
ES-CM-15
Thermafiber RainBarrier Mineral Wool ci with Thermafiber Safing Mineral Wool Cavity Closure, CMU Head



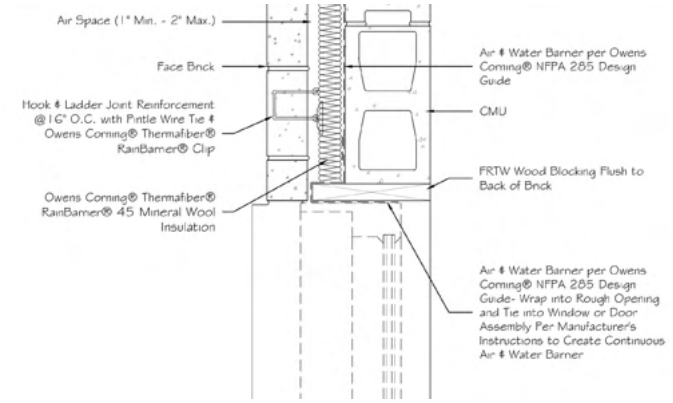
ES-CM-27
Thermafiber RainBarrier Mineral Wool ci with FRTW Blocking & Loose Angle Cavity Closure, CMU Head



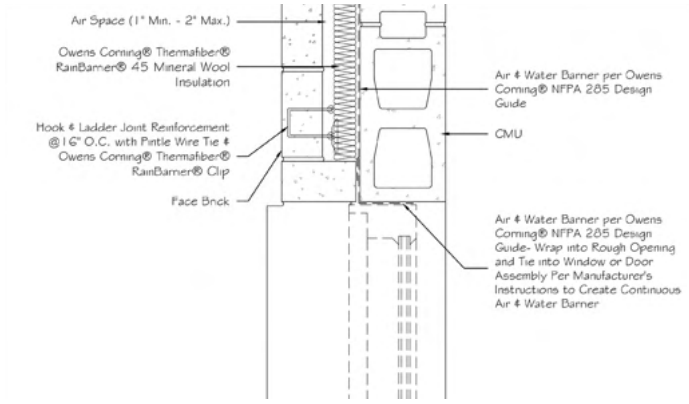
ES-CM-18
Thermafiber RainBarrier Mineral Wool ci with Mineral Wool Safing Cavity Closure, CMU Jamb



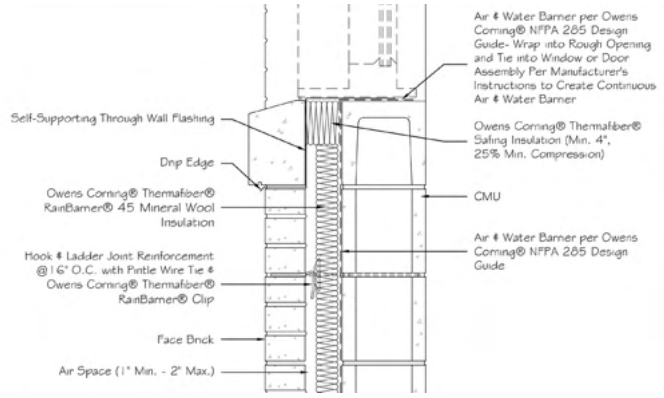
ES-CM-17
Thermafiber RainBarrier Mineral Wool ci with FRTW Cavity Closure, CMU Jamb



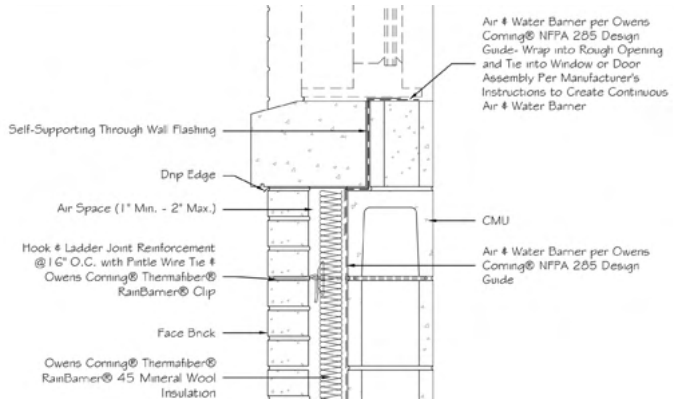
ES-CM-19
Thermafiber RainBarrier Mineral Wool ci with Masonry Return Cavity Closure, CMU Jamb



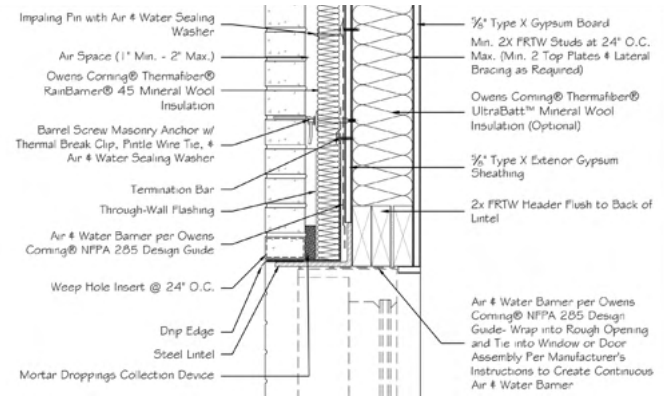
ES-CM-21
Thermafiber RainBarrier Mineral Wool ci with Mineral Wool Safing Cavity Closure, CMU Sill



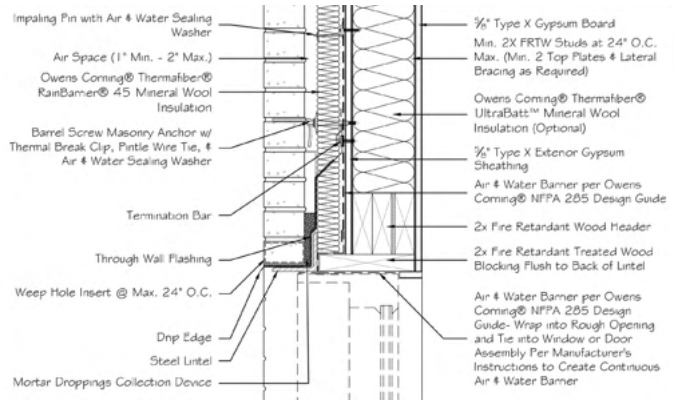
ES-CM-20
Thermafiber RainBarrier Mineral Wool ci with Masonry Return & Wash Cavity Closure, CMU Sill



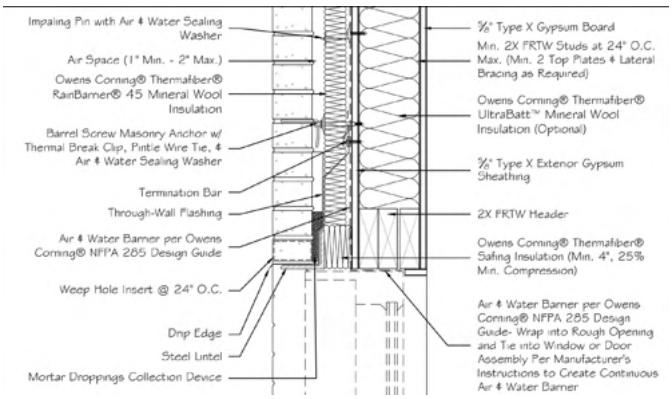
ES-WS-240
Thermafiber RainBarrier Mineral Wool ci with Steel Angle Cavity Closure, Wood Stud Head



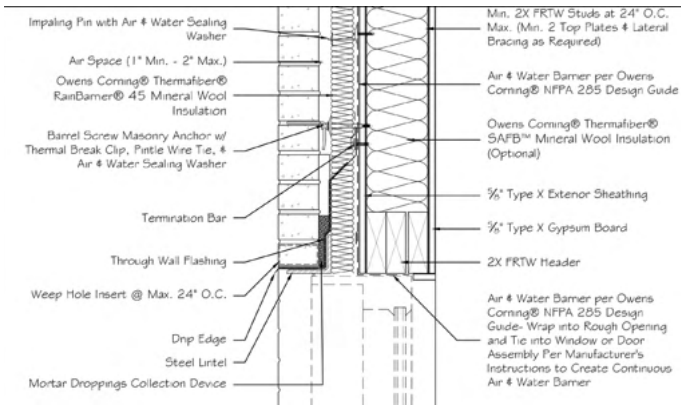
ES-WS-212
Thermafiber RainBarrier Mineral Wool ci with FRTW Blocking & Loose Angle Cavity Closure, Wood Stud Head



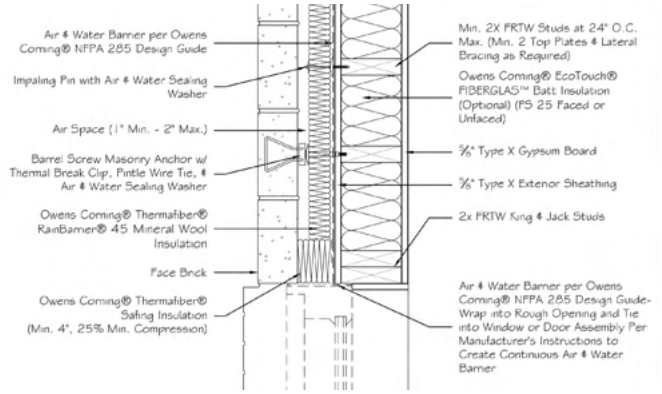
ES-WS-225
Thermafiber RainBarrier Mineral Wool ci with Mineral Wool Cavity Closure, Wood Stud Head



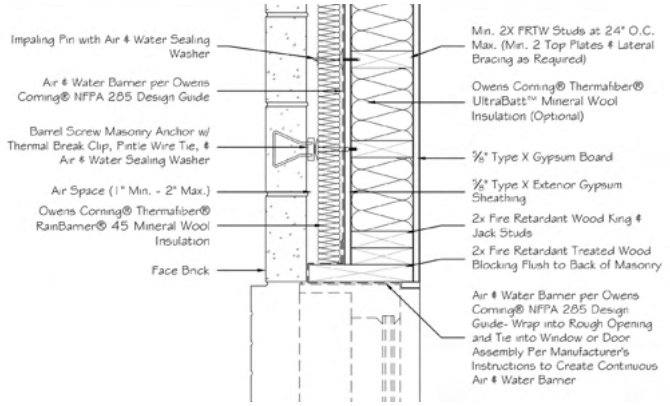
ES-WS-241
Thermafiber RainBarrier Mineral Wool ci with No Cavity Closure, Wood Stud Head



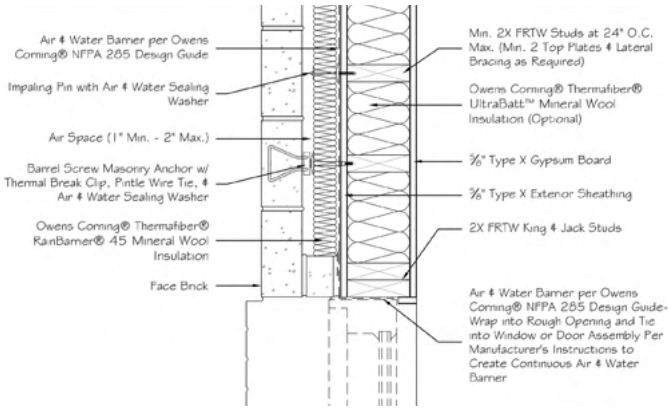
ES-WS-226
Thermafiber RainBarrier HC ci Plus with Mineral Wool Safing Cavity Closure, Wood Stud Jamb



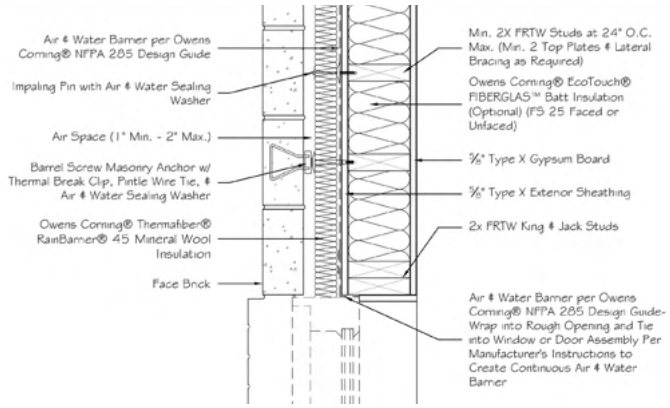
ES-WS-214
Thermafiber RainBarrier Mineral Wool ci with FRTW Cavity Closure, Wood Stud Jamb



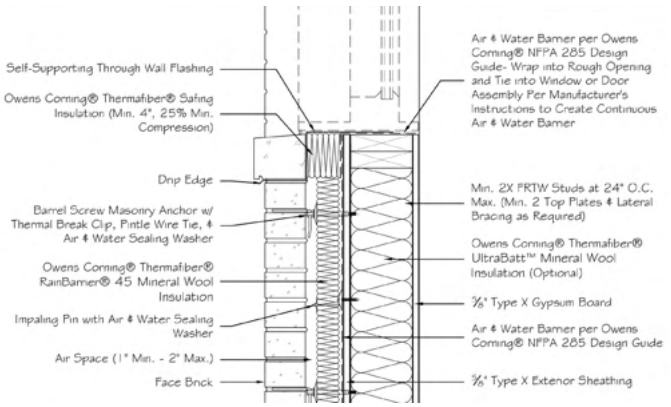
ES-WS- 215
Thermafiber RainBarrier Mineral Wool ci with Masonry Return Cavity Closure, Wood Stud Jamb



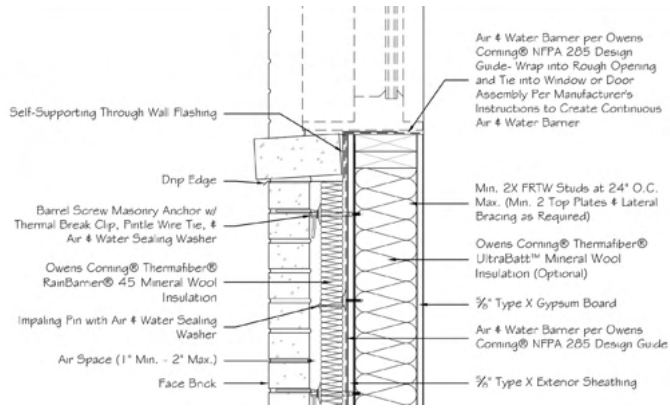
ES-WS-227
Thermafiber RainBarrier Mineral Wool ci with No Cavity Closure, Wood Stud Jamb



ES-WS-228
Thermafiber RainBarrier Mineral Wool ci with Mineral Wool Safing Cavity Closure, Wood Stud Sill

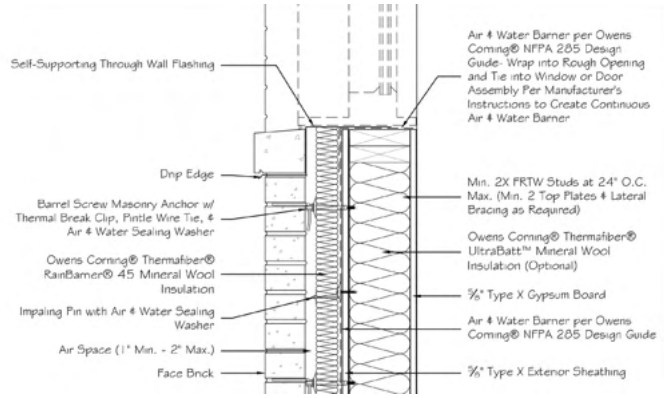


ES-WS-216
Thermafiber RainBarrier Mineral Wool ci with Masonry Return & Wash Cavity Closure, Wood Stud Sill



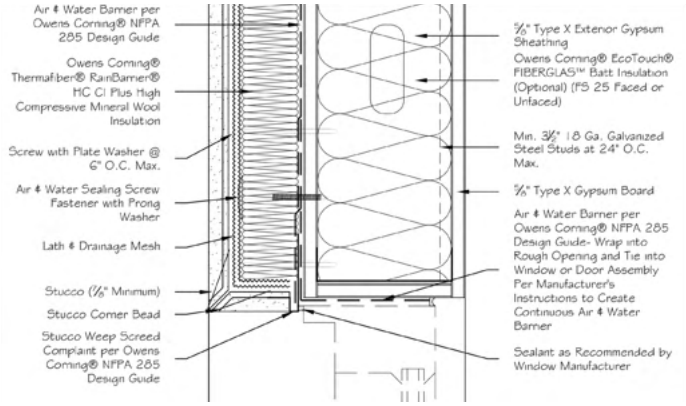
ES-WS-229

Thermafiber RainBarrier Mineral Wool ci with No Cavity Closure, Wood Stud Sill



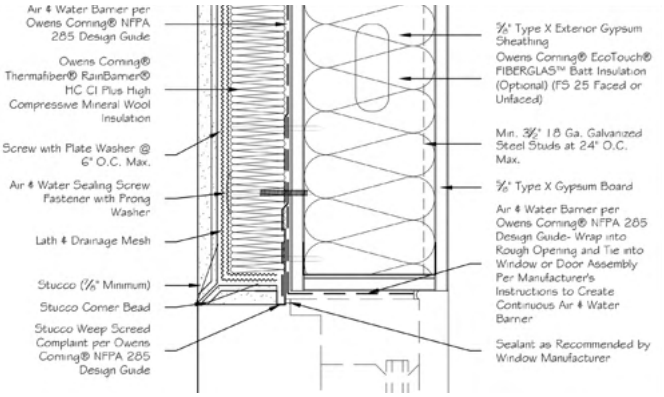
ES-SS-261

Thermafiber RainBarrier HC ci Plus Mineral Wool ci with Recessed Opening Head with Backwrap Cavity Closure Featuring Special Stucco Weep Screed, Steel Stud Head



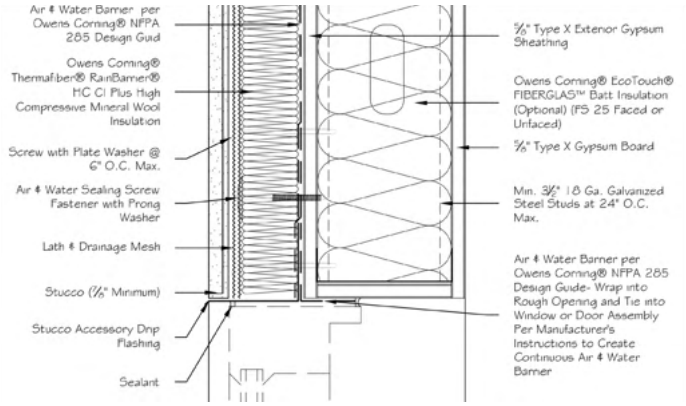
ES-SS-262

Thermafiber RainBarrier HC ci Plus Mineral Wool ci with Recessed Opening Head with Backwrap Cavity Closure, Steel Stud Head



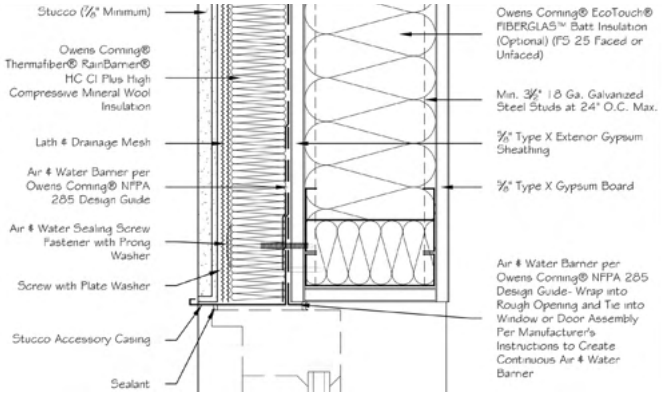
ES-SS-263

Thermafiber RainBarrier HC ci Plus Mineral Wool ci with Flush Opening Head with Mineral Wool Cavity Closure, Steel Stud Head



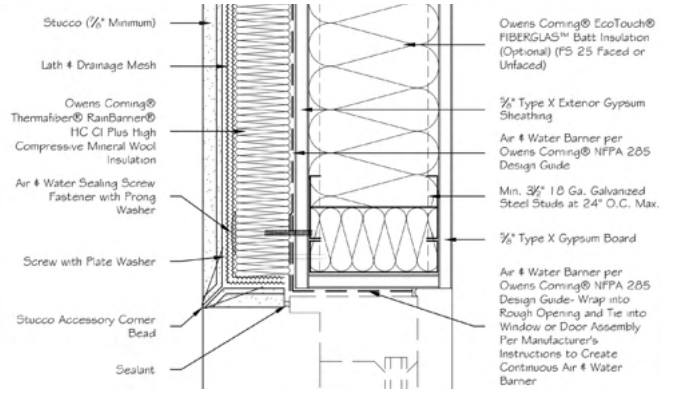
ES-SS-264

Thermafiber RainBarrier HC ci Plus Mineral Wool ci with Flush Opening Jamb with Mineral Wool Safing Cavity Closure, Steel Stud Head



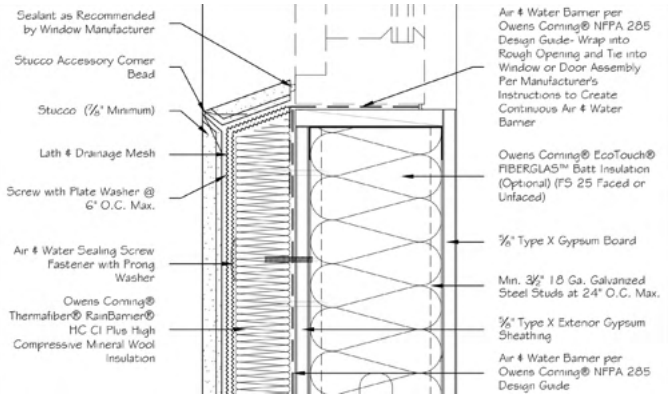
ES-SS-265

Thermafiber RainBarrier HC ci Plus Mineral Wool ci with Recessed Opening Jamb with Backwrap Cavity Closure, Steel Stud Jamb



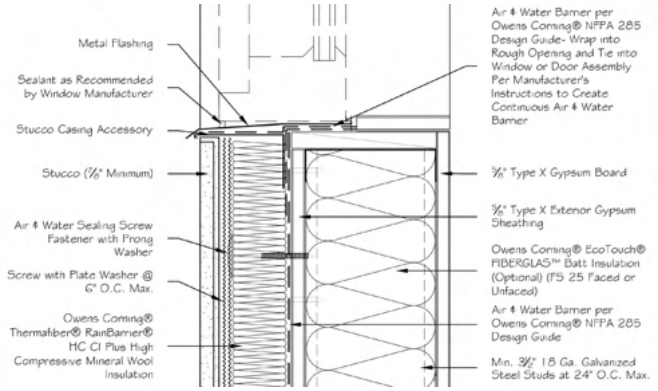
ES-SS-266

Thermafiber RainBarrier HC ci Plus Mineral Wool ci with Recessed Opening Sill with Backwrap Cavity Closure, Steel Stud Sill



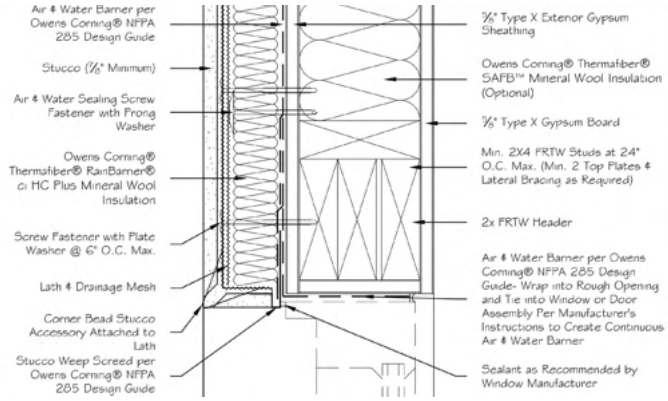
ES-SS-267

Thermafiber RainBarrier HC ci Plus Mineral Wool ci with Flush Opening Sill with Mineral Wool Safing Cavity Closure, Steel Stud Sill



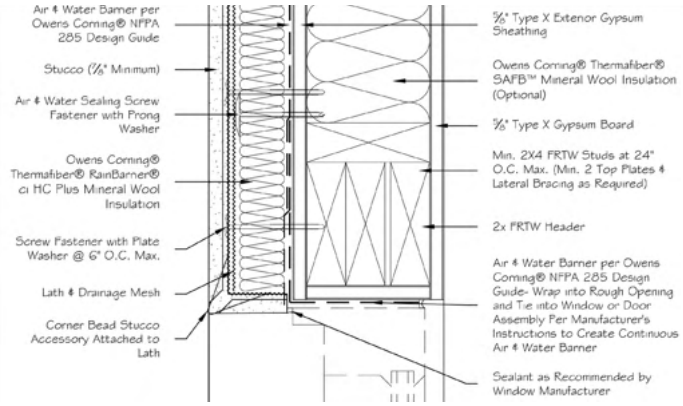
ES-WS-243

Thermafiber RainBarrier HC ci Plus Mineral Wool ci with Recessed Opening Head with Backwrap Cavity Closure Featuring Special Stucco Weep Screed, Wood Stud Head



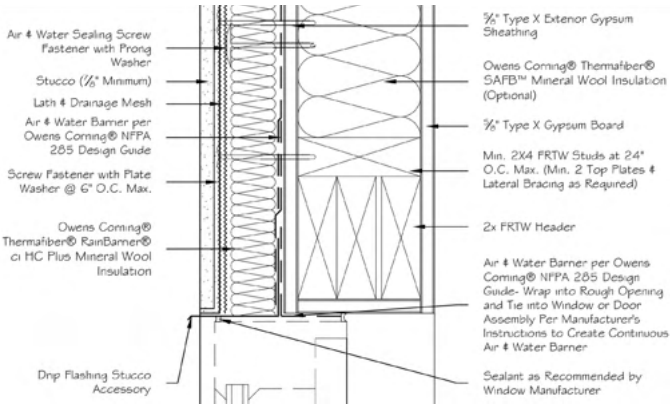
ES-WS-244

Thermafiber RainBarrier HC ci Plus Mineral Wool ci with Recessed Opening Head with Backwrap Cavity Closure, Wood Stud Head



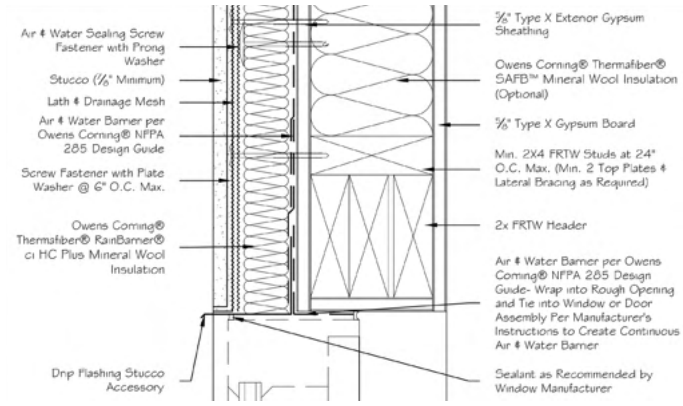
ES-WS-245

Thermafiber RainBarrier HC ci Plus Mineral Wool ci with Flush Opening Head, Wood Stud Head



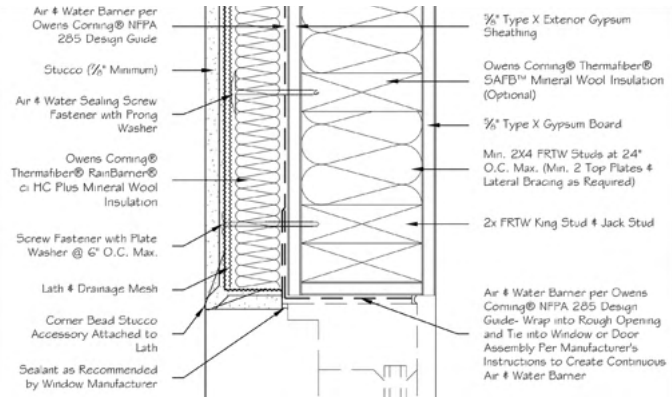
ES-WS-246

Thermafiber RainBarrier HC ci Plus Mineral Wool ci with Flush Opening Jamb, Wood Stud Jamb



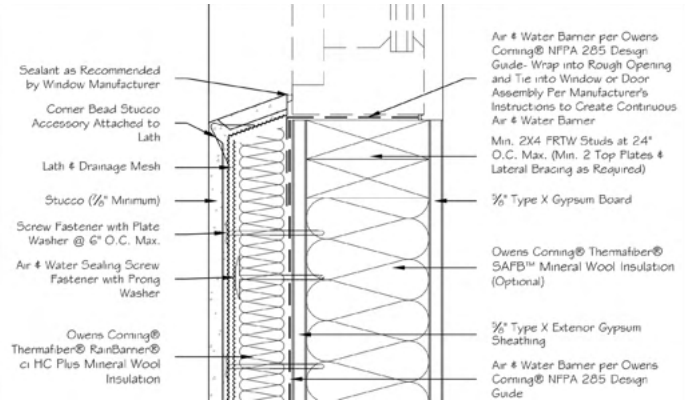
ES-WS-247

Thermafiber RainBarrier HC ci Plus Mineral Wool ci with Recessed Opening Jamb with Backwrap Cavity Closure, Wood Stud Jamb



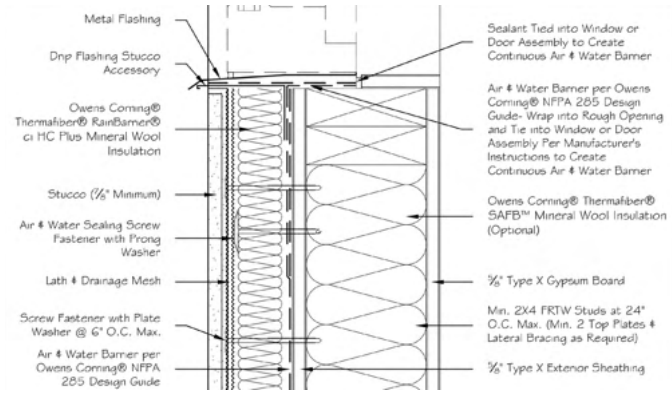
ES-WS-248

Thermafiber RainBarrier HC ci Plus Mineral Wool ci with Recessed Opening Sill with Backwrap Cavity Closure, Wood Stud Sill



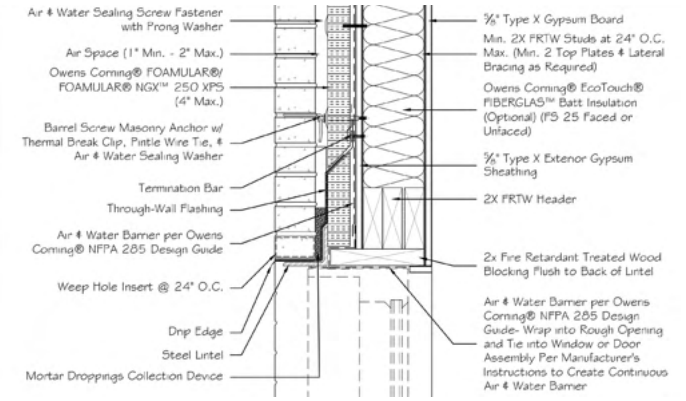
ES-WS-249

Thermafiber RainBarrier HC ci Plus Mineral Wool ci with Flush Opening Sill, Wood Stud Sill



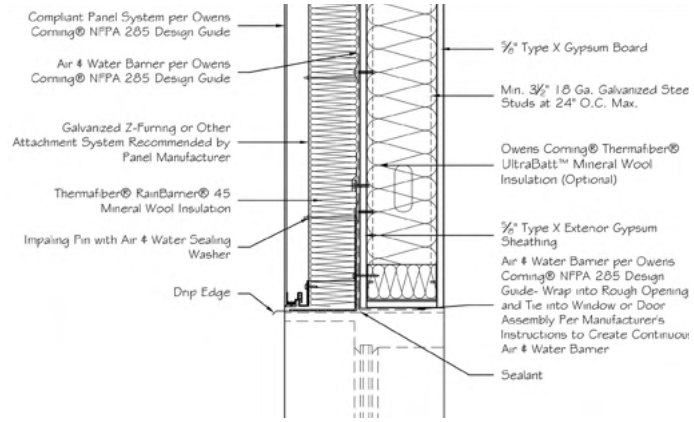
ES-WS-202

Thermafiber RainBarrier HC ci Plus Mineral Wool ci Opening Head, Steel Stud Head



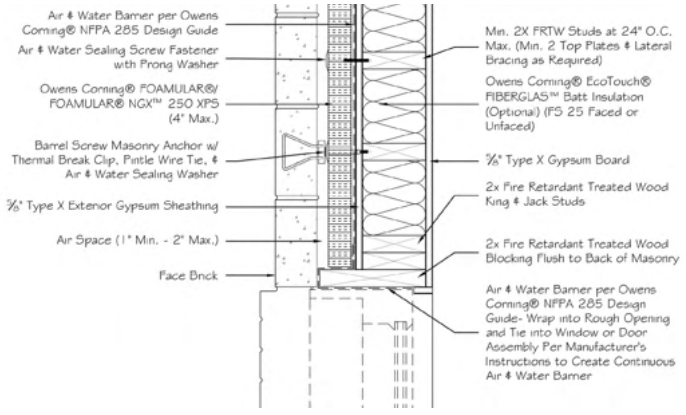
ES-SS-52

Thermafiber RainBarrier 45 Mineral Wool ci Opening Head, Steel Stud Head

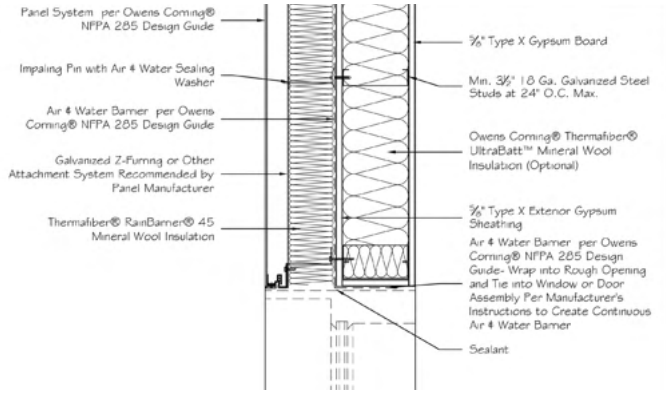


ES-WS-203

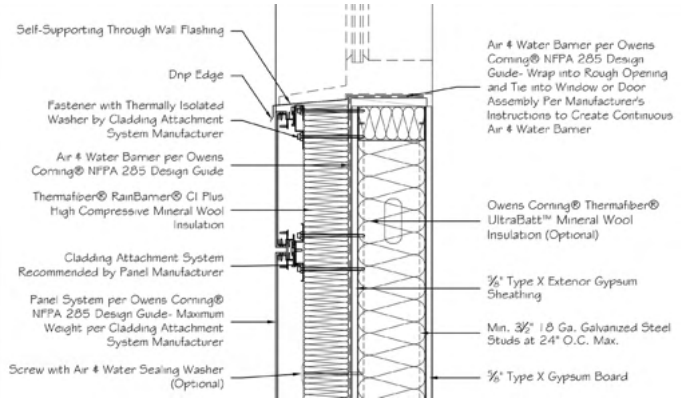
Thermafiber RainBarrier HC ci Plus Mineral Wool ci Plus Opening Jamb, Steel Stud Jamb



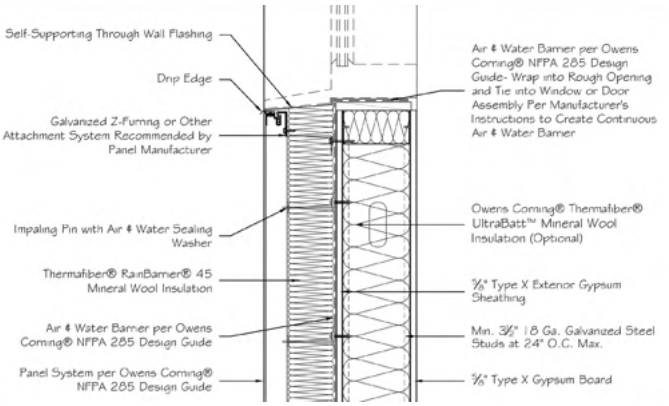
ES-SS-53
Thermafiber RainBarrier 45 Mineral Wool ci Opening Jamb, Steel Stud Jamb



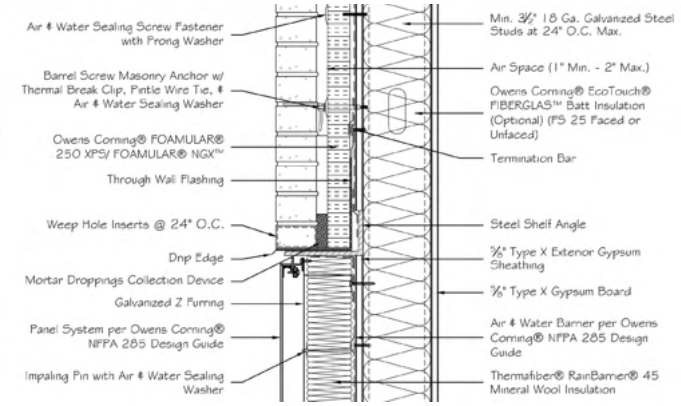
ES-SS-204
Thermafiber RainBarrier HC ci Plus Mineral Wool ci Flush Opening Sill, Steel Stud Sill



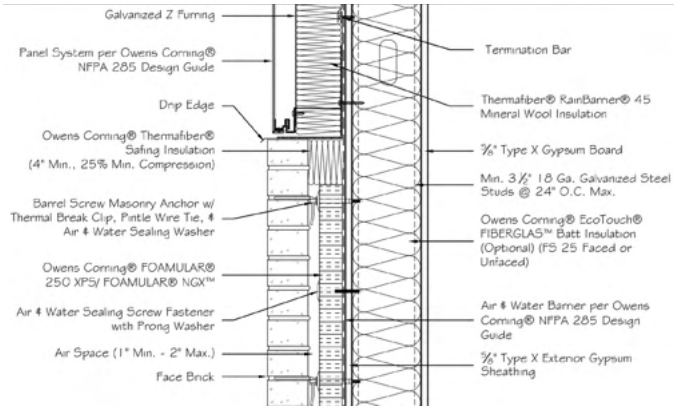
ES-SS-56
Thermafiber RainBarrier HC Mineral Wool ci with Flush Opening Sill, Steel Stud Sill



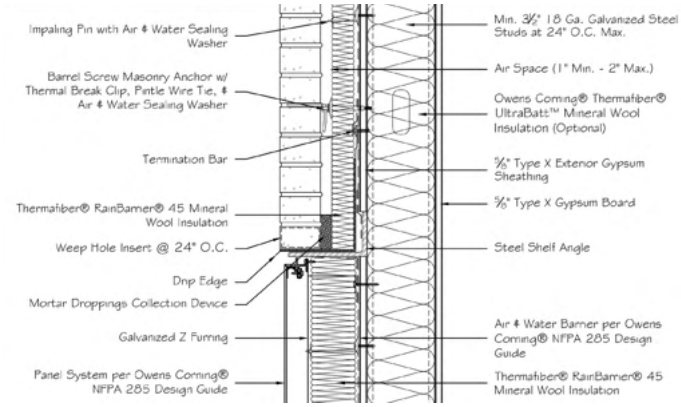
ES-SS-TR-01
Masonry with FOAMULAR/ FOAMULAR NGX XPS to MCM w/ Thermafiber RainBarrier Mineral Wool, Vertical Transition, Steel Stud



ES-SS-TR-03
MCM w/ Thermafiber RainBarrier Mineral Wool to MCM with FOAMULAR/ FOAMULAR NGX XPS, Vertical Transition, Steel Stud

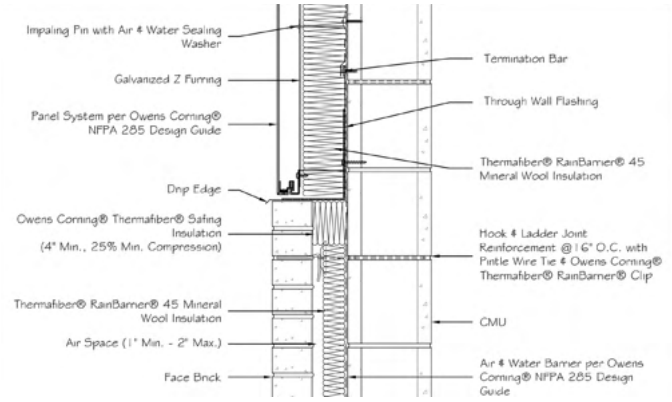


ES-SS-TR-04
Masonry with Thermafiber RainBarrier Mineral Wool to MCM w/ Thermafiber RainBarrier Mineral Wool, Vertical Transition, Steel Stud



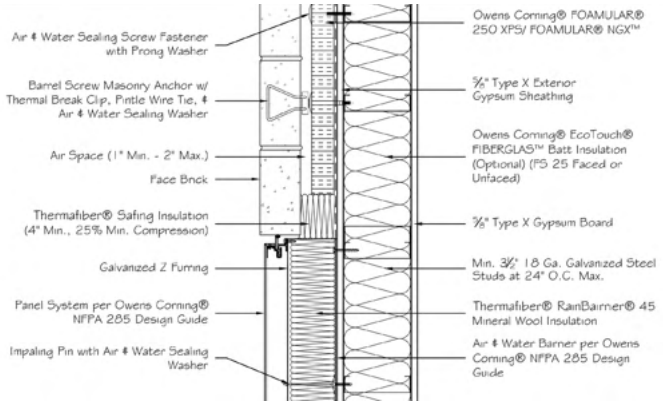
ES-SS-TR-06

MCM w/ Thermafiber RainBarrier Mineral Wool to MCM with Thermafiber RainBarrier Thermafiber Mineral Wool, Horizontal Transition, Steel Stud



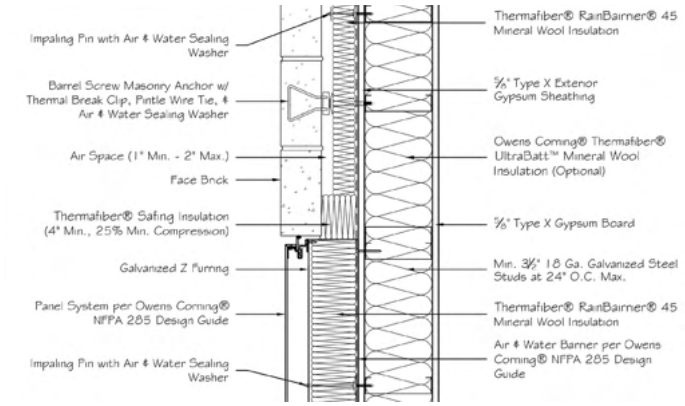
ES-SS-TR-02

Masonry with FOAMULAR/ FOAMULAR NGX XPS to MCM w/ Thermafiber RainBarrier Mineral Wool, Horizontal Transition, Steel Stud



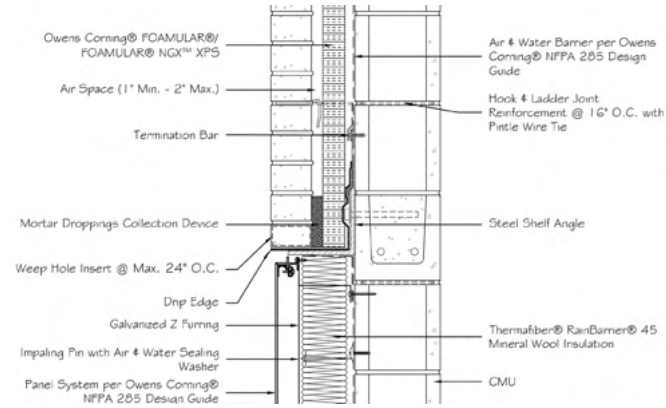
ES-SS-TR-05

Masonry with Thermafiber RainBarrier Mineral Wool to MCM w/ Thermafiber RainBarrier Mineral Wool, Horizontal Transition, Steel Stud



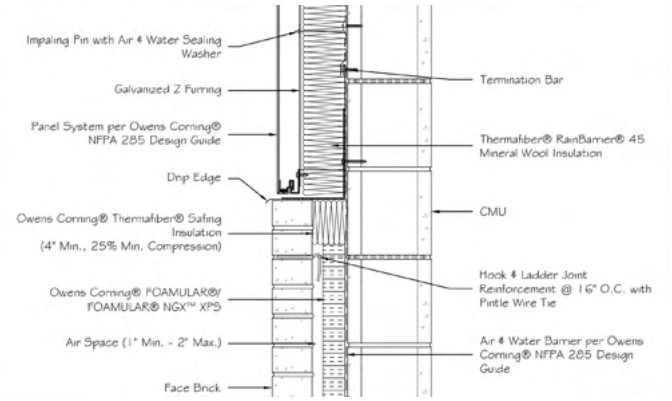
ES-CM-TR-01

Masonry with FOAMULAR/ FOAMULAR NGX XPS to MCM with Thermafiber RainBarrier Mineral Wool, Vertical Transition, CMU



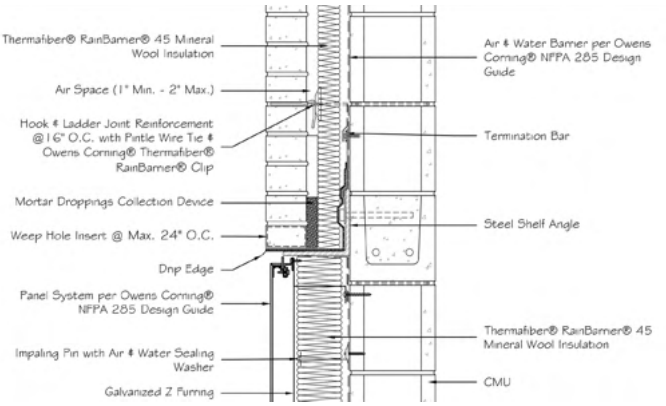
ES-CM-TR-03

MCM w/ Thermafiber RainBarrier Mineral Wool to MCM with FOAMULAR/ FOAMULAR NGX XPS, Vertical Transition, CMU



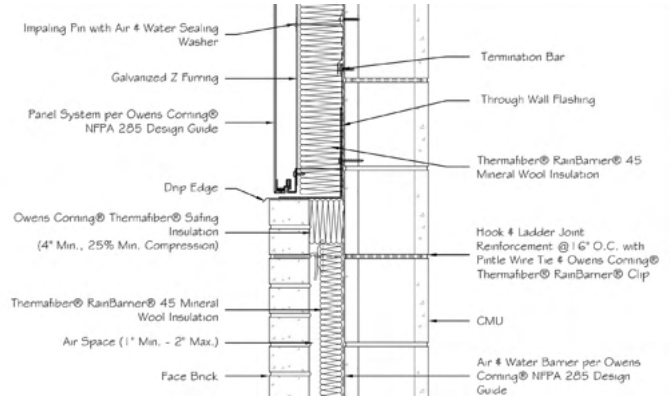
ES-CM-TR-04

Masonry with Thermafiber RainBarrier Mineral Wool to MCM with Thermafiber RainBarrier Mineral Wool, Vertical Transition, CMU



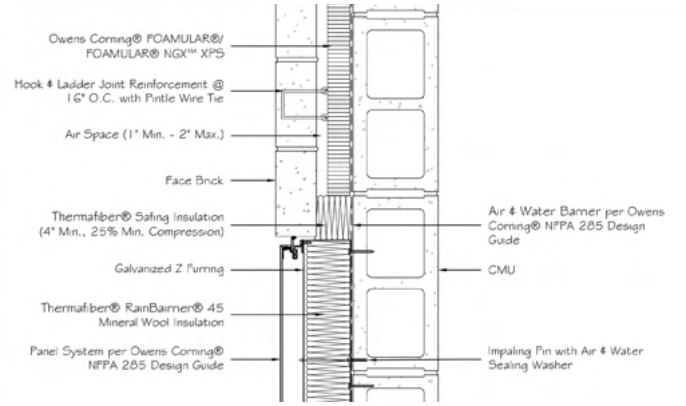
ES-CM-TR-06

MCM w/ Thermafiber RainBarrier Mineral Wool to Masonry with Thermafiber RainBarrier Mineral Wool, Vertical Transition, CMU



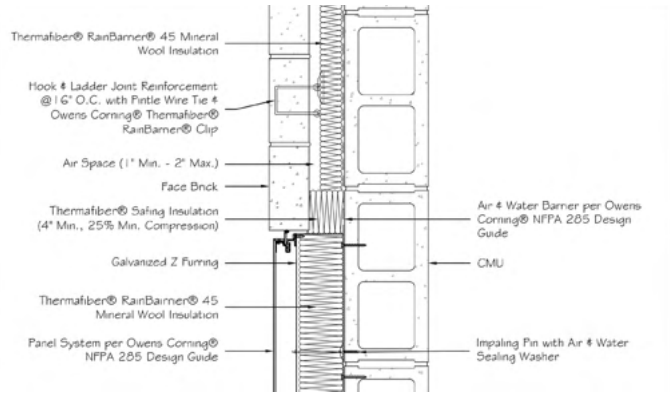
ES-CM-TR-02

Masonry with FOAMULAR/ FOAMULAR NGX XPS to MCM w/ Thermafiber RainBarrier Mineral Wool, Horizontal Transition, CMU



ES-CM-TR-05

Masonry with Thermafiber RainBarrier Mineral Wool to MCM with Thermafiber RainBarrier Mineral Wool, Horizontal Transition, CMU



ENCLOSURE SOLUTIONS

NFPA 285 ACCEPTED COMPLETE WALLS

Underwriters Laboratories Listings for NONCOMBUSTIBLE HIGH-MASS EXTERIOR CLADDING

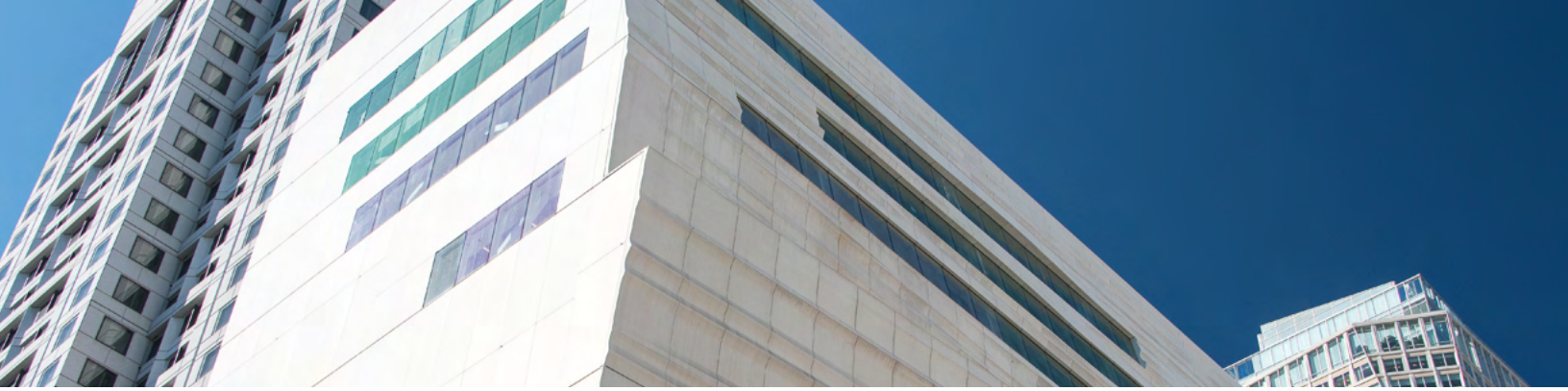
Many Owens Corning Enclosure Solutions Wall Systems are also listed in the Underwriters Laboratories Online Certifications Directory for NFPA 285 Tested Exterior Wall Systems (see Table 1a), which is an alternate to Table 1 for additional NFPA 285 approved assembly specifications. Established in 2013, the "FWFO" Exterior Wall Systems listing category at UL is relatively new; therefore, the number of assemblies and products listed are limited but growing. The International Building Code (IBC) recognizes two methods for determining compliance with NFPA 285:

1. Testing at an "approved agency" in accordance with NFPA 285, which is the source of the assemblies in Table 1a and for some of the assembly options in Table 1. (See IBC Section 2603.5.5.) OR,

2. Evaluation and acceptance extended via third-party engineering analysis that is extrapolated based on actual testing and performance data, which is the source for some of the assembly options in Table 1. (See ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC 12), Section 6.6.)

UL Exterior Wall System (EWS) Listings For Noncombustible High-Mass Exterior Cladding

UL System Listings	Base Wall System	Cladding	Exterior Sheathing	Water-Resistive Barrier (WRB)	Continuous Insulation (CI)	Header Fire Stop Detail	Jamb Fire Stop Detail	UL Listed for: ASTM E2357 (Air) ASTM E331 (Water)
EWS0001	Steel Stud	Brick	Gypsum	**ExoAir® 230**	**2.5" FOAMULAR/ FOAMULAR NGX 250 XPS**	Steel w/Mineral Wool	Steel Flashing	Yes
EWS0002	Steel Stud	Brick	Gypsum	**ExoAir® 230**	**2.5" FOAMULAR/ FOAMULAR NGX 250 XPS**	Steel w/ Mineral Wool	Mineral Wool & Aluminum Flashing/Frame	Yes
EWS0003	Steel Stud	Brick	Gypsum	**ExoAir® 230**	**2.5" FFOAMULAR/ FOAMULAR NGX 250 XPS**	Steel Lintel	Brick Return	Yes
EWS0006	Steel Stud	Brick	**2.5" FOAMULAR® 250 XPS**	Tape Sealed Joints	**2.5" FOAMULAR/ FOAMULAR NGX 250 XPS**	Steel w/Mineral Wool	Aluminum Flashing/Frame	**Refer to Enclosure Solutions Technical Bulletin SS-02**
EWS0008	Steel Stud	Brick	Gypsum	**ExoAir® 230**	**4" FOAMULAR/ FOAMULAR NGX 250 XPS**	Steel w/Mineral Wool	Mineral Wool	Yes
EWS0016	Steel Stud	Brick	Gypsum	**Securock® ExoAir® 430 Panel**	**4" FOAMULAR/ FOAMULAR NGX 250 XPS**	Steel Lintel	Mineral Wool & Steel Flashing	Yes
EWS0017	Steel Stud	Brick	Gypsum	**Securock® ExoAir® 430 Panel**	**2.5" FOAMULAR® 250 XPS**	Steel w/ Mineral Wool	Mineral Wool & Aluminum Flashing/Frame	Yes
EWS0018	Steel Stud	Brick	Gypsum	**Securock® ExoAir® 430 Panel**	**2.5" FOAMULAR/ FOAMULAR NGX 250 XPS**	Steel Lintel	Brick Return	Yes
EWS0021	Steel Stud or Concrete	Brick, Concrete, CMU, Stone, Terra Cotta, or Stucco	Gypsum	**ExoAir® 220**	**4" FFOAMULAR/ FOAMULAR NGX 250 XPS**	Steel w/Mineral Wool & Fire-Resistant Wood	Mineral Wool & Fire Retardant-Treated Wood	**Refer to Tremco Data Sheet**
EWS0022	CMU or Concrete	Brick	N/A	**ExoAir® 230**	**4" FOAMULAR/ FOAMULAR NGX CW25 XPS**	Steel w/Mineral Wool	Mineral Wool	Yes
EWS0023	CMU	Brick	N/A	**JointSealR® Foam Joint Tape** **FlashSealR® Foam Flashing Tape**	**4" FOAMULAR CW25 XPS**	Steel Lintel	Mineral Wool	Yes
EWS0024	Steel Stud, Concrete, or CMU	Brick, Concrete, CMU, Stone, Terra Cotta, or Stucco	Gypsum	**Pecora XL- Perm Ultra VP**	**4" FOAMULAR/ FOAMULAR NGX 250 XPS**	Steel w/ Fire-Resistant Wood	Fire Retardant-Treated Wood & Aluminum Flashing/Frame	**Refer to Pecora Data Sheet**
EWS0027	Steel Stud, Concrete, or CMU	Brick, Concrete, CMU, Stone, Terra Cotta, or Stucco	Gypsum	**ExoAir® 130**	**4" FOAMULAR® 250 XPS**	Steel w/ Mineral Wool & Fire-Resistant Wood	Fire Retardant Treated Wood & Mineral Wool	**Refer to Tremco Data Sheet**



Owens Corning Enclosure Solutions Resources:

For more information on Owens Corning® Enclosure Solutions, visit owenscorning.com/enclosure or call 1-800-GET-PINK®

OWENS CORNING FOAM INSULATION, LLC
ONE OWENS CORNING PARKWAY
TOLEDO, OH 43659 USA

1-800-GET-PINK®
www.owenscorning.com

THERMAFIBER, INC.
ONE OWENS CORNING PARKWAY
TOLEDO, OH 43659 USA

888-TFIBER1 [834-2371]
www.owenscorning.com/thermafiber

OWENS CORNING INSULATING SYSTEMS, LLC
ONE OWENS CORNING PARKWAY
TOLEDO, OH 43659 USA
1-800-GET-PINK®
www.owenscorning.com

Pub. No. 10020919-F. Printed in U.S.A. November 2021.