



ENCLOSURE SOLUTIONS STRUCTURAL INSULATING BLOCK DESIGN GUIDE

ES-CMU-06

Cellular glass is a high-compressive-strength insulating material composed of foamed glass without the use of fire retardants or blowing agents. Its unique properties make it an ideal product to address thermal bridges and provide continuous insulation in key building areas. FOAMGLAS® Perinsul® SIB Structural Insulating Block is intended for this application. See Figure 1.

This guide is intended to assist the designer and installer in the proper application of this material for thermal bridging applications, such as below low-rise masonry veneer walls. It is recommended that the design team consult a registered design professional and applicable building code to verify this and any other uses of FOAMGLAS® Perinsul® SIB insulation.

Prevent Thermal Bridging

FOAMGLAS® Perinsul® SIB cellular glass is tested to a minimum thermal resistance of R-2.8 per inch thickness in the x direction and R-2.4 per inch thickness in the y direction when measured across a plane in its proper orientation. The slight increase in thermal performance in the x direction (across the width of the wall) is due to a slightly less dense cellular structure in this direction. Along the vertical y axis, the density is increased to increase compressive

strength. See Figure 2.

The R-value and product thickness can be used to calculate anticipated thermal resistance across a thermal bridge. In the case of masonry veneer walls at the foundation, this information may be modeled in energy software by a qualified design professional to document the U-value of a wall assembly, considering the addition of FOAMGLAS® Perinsul® SIB, selected masonry anchors and insulation fasteners, selected cavity wall insulation, structure, and specific climatic conditions.

As an example, the below THERM image was modeled for an example project in the Chicago area, demonstrating a masonry veneer wall with no thermal bridge solutions (A), and FOAMGLAS® Perinsul® SIB insulation (B) used to prevent the loss of heat through the thermal bridge (shown by warmer colored foundation wall).

Fig. 1

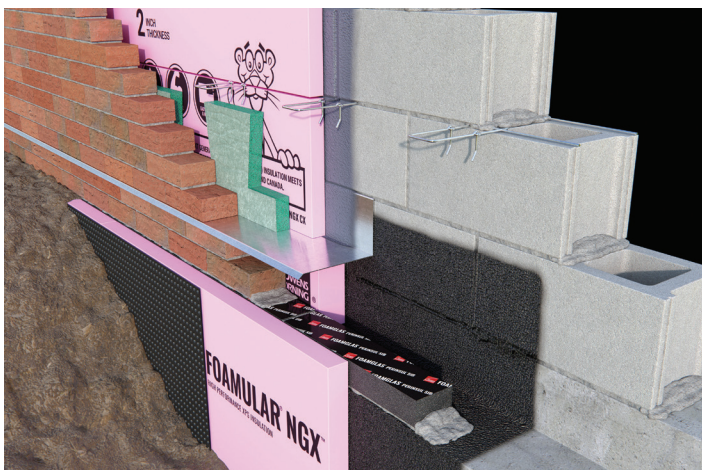


Fig. 3

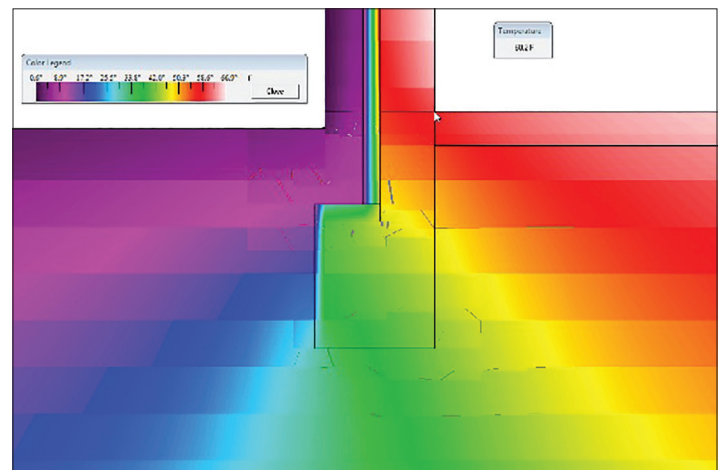
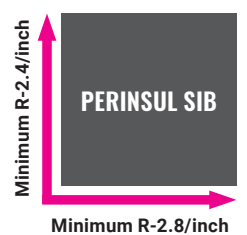


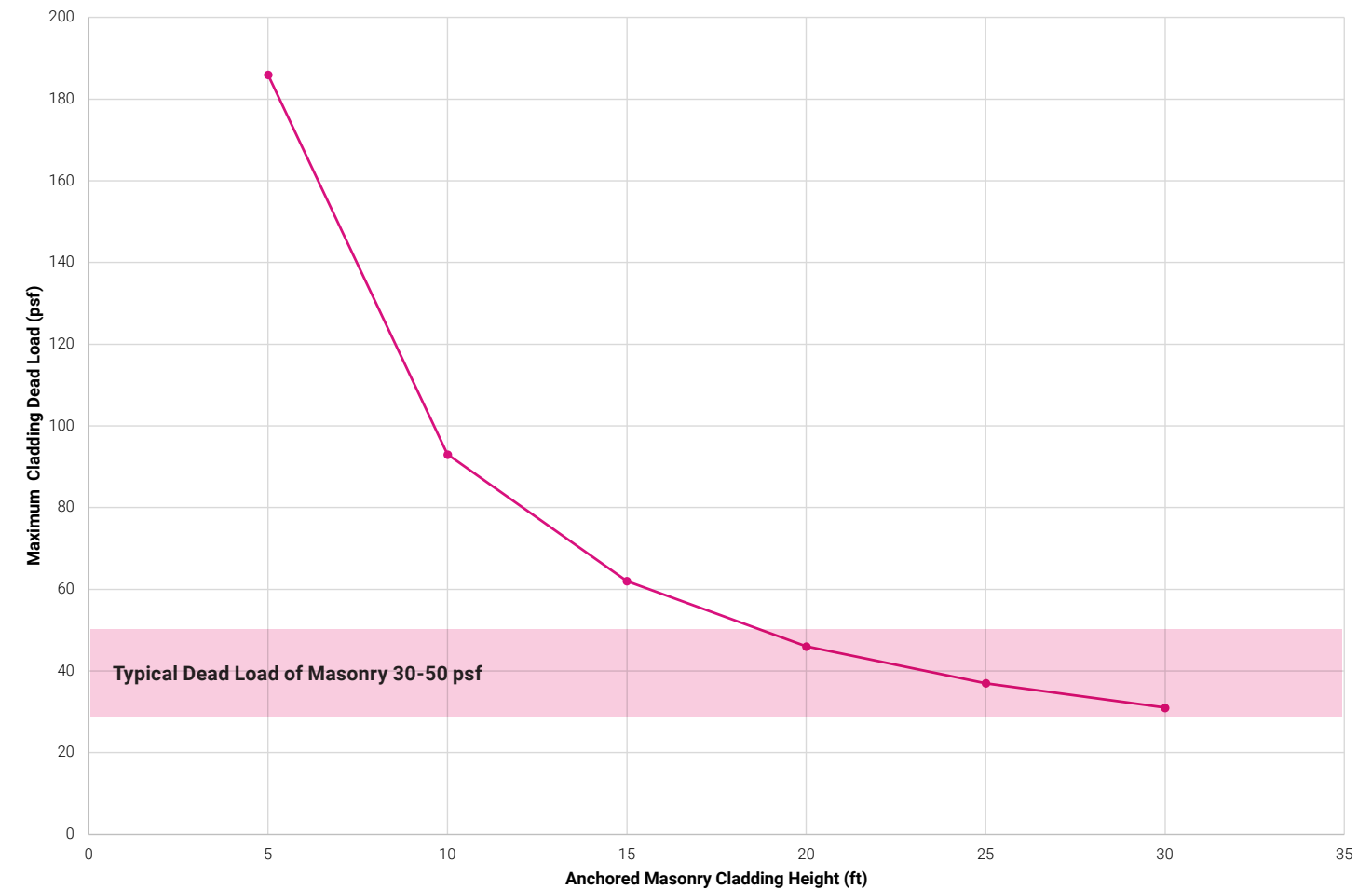
Fig. 2



Loading Information

FOAMGLAS® Perinsul® SIB cellular glass insulation may be used beneath non-load-bearing masonry veneer walls up to 20 feet in height with a recommended dead load of up to 46 psf.

Maximum Anchored Cladding Dead Load



- 1 Long-term compressive strength of 77 psi based on 83% reduction from ASTM C165 testing results
2 Compressive Strength Safety Factor = 4
3 Width of masonry and Perinsul SIB assumed to be equal
4 Maximum deadload can be factored by actual width, using formula:
5 No factors have been applied to the deadload

$$\frac{W_{act}}{4 \cdot \text{Max DL}}$$

W_{act} = Actual width of masonry & Perinsul SIB. Max DL= Maximum Dead Load

Eccentric Loading

Cellular glass should be evenly loaded due to the physical properties of the material. It is not recommended to eccentrically load Perinsul SIB and therefore only brick veneer matching the width of the Perinsul SIB should be placed over the Perinsul SIB. The first layer of masonry installed above Perinsul SIB should be solid to ensure centric loading as well however, hollow masonry may be installed in subsequent courses.

Reinforcement

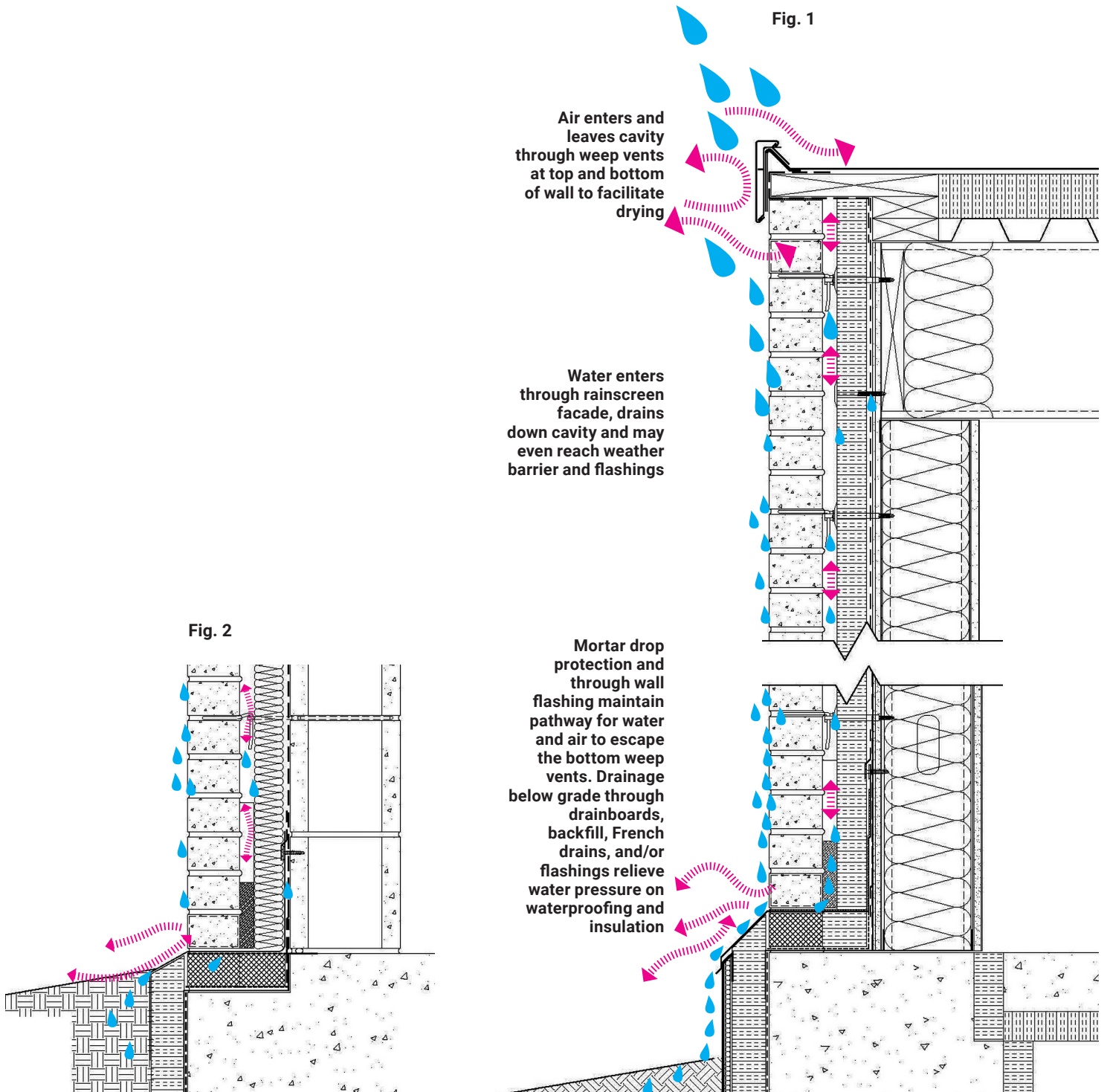
Masonry veneers should be anchored to the structural wall.

Per TMS 402 12.2.2.3.3, horizontally spanning members supporting anchored veneer shall be designed so that the deflection due to allowable stress level (dead plus live load) does not exceed L/600.

Spacing should be per prevailing building code and recommendations of the masonry anchor manufacturer.

Moisture Protection

While cellular glass material is waterproof per ASTM D5385/C1306, all materials in a wall assembly should be protected from standing water risking damage of freeze/thaw. Best practices for all wall materials require proper drainage and flashings integrated with positive slope. Figure 1 depicts ventilation and drainage techniques incorporated into the wall assembly. Fig 2 demonstrates the same concepts with different materials.



Availability

FOAMGLAS® Perinsul® SIB cellular glass insulation is designed for use under standard non-load-bearing masonry veneer walls. As the masonry should bear completely and evenly across the upper face without cantilevering or point loading, three common sizes are available. Select the size that corresponds with the masonry units to be installed above:

TYPICAL MASONRY UNIT SIZE	THICKNESS X WIDTH X LENGTH (IN)	PIECES PER BOX	LINEAL FEET PER BOX
Standard/Normal	2.25 x 3.63 x 17.717 to 17.72	24	35.4
Jumbo	2.75 x 3.63 x 17.717 to 17.72	20	29.5
Economy	3.63 x 3.63 x 17.717 to 17.72	16	23.6

Installation

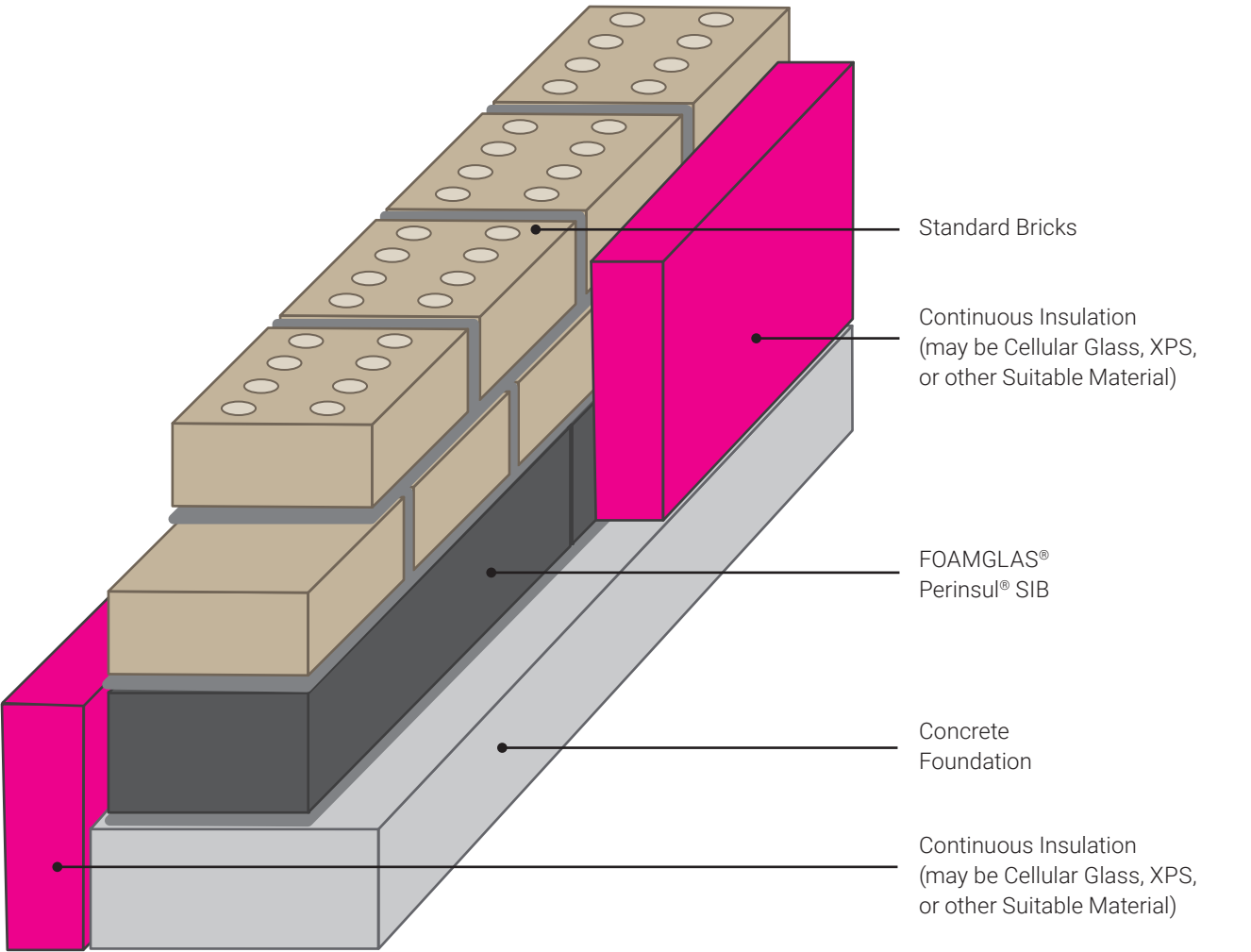
For step-by-step instructions, please see the [Owens Corning® FOAMGLAS® Perinsul® SIB Installation Instructions](#).

Cellular glass must be evenly loaded and bear evenly on solid surfaces. It is not intended to span openings or joints and load should not cantilever on the material. The first course of masonry above the Perinsul should be solid brick or block with no holes.

Spacing

FOAMGLAS® Perinsul® SIB blocks should be butted tightly with no mortar joints to ensure continuous thermal resistance.

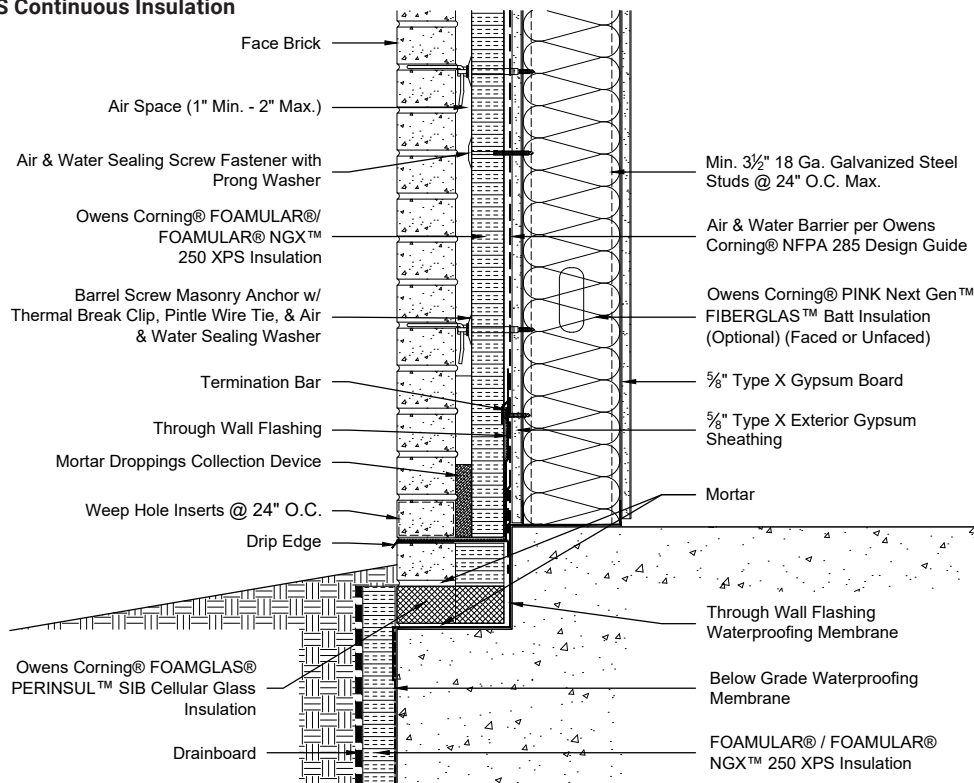
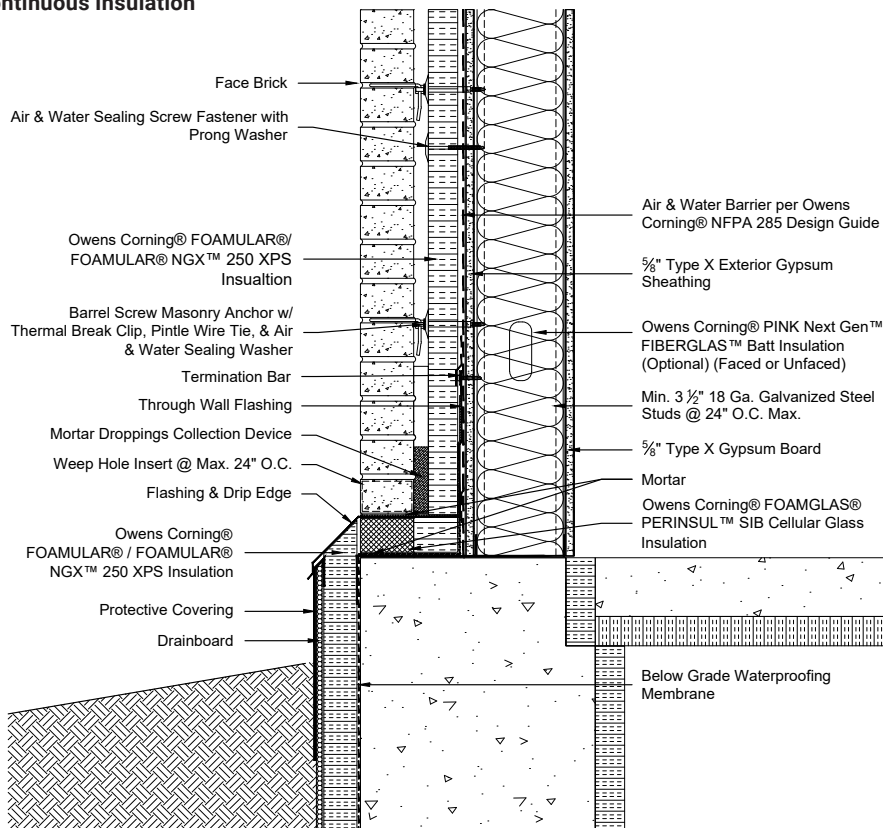
Additional FOAMGLAS material may be inserted in cavity space adjacent to Perinsul® SIB when load-bearing is not required but additional insulation is needed. See [installation instructions](#) for more information.

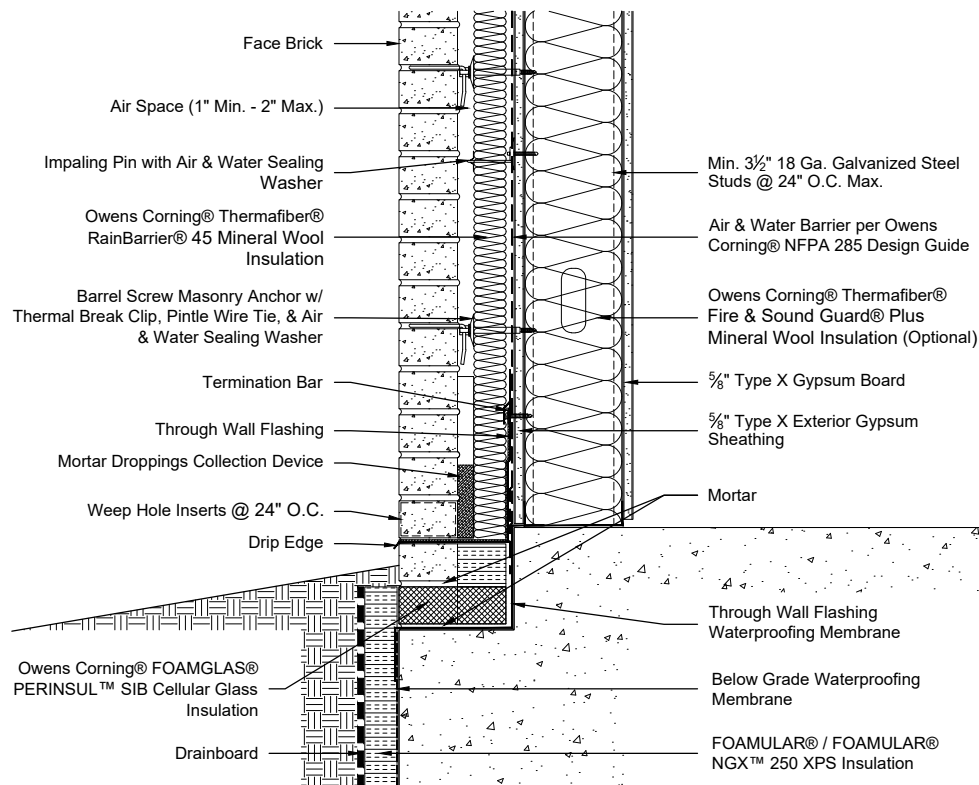
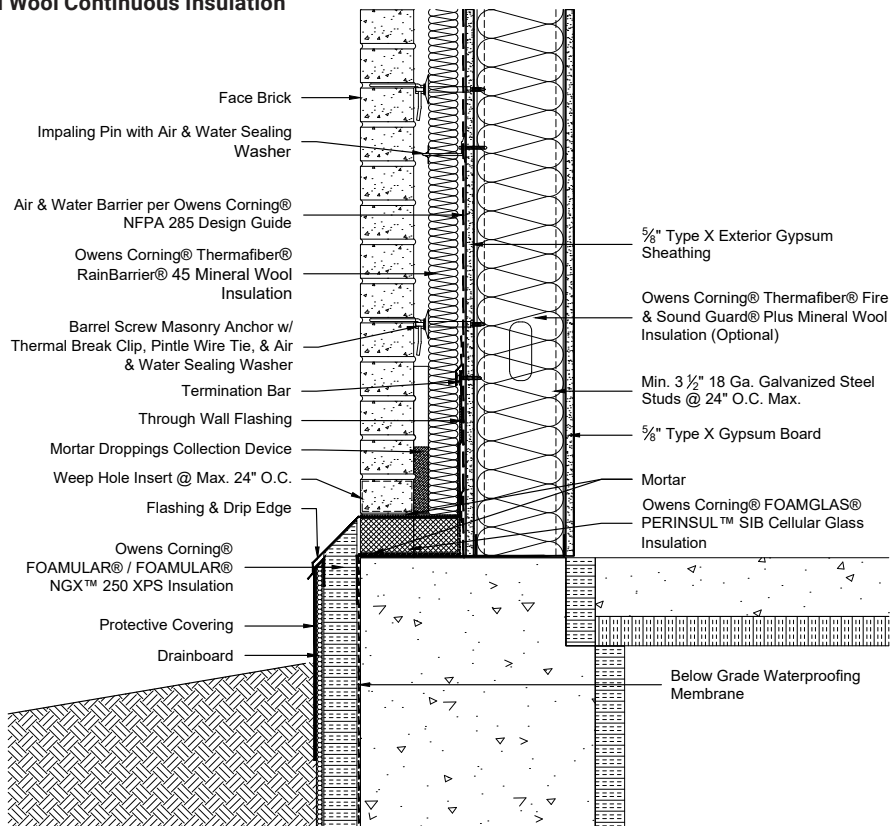


EXAMPLE DETAILS

These details are intended for reference at the convenience of the design team and demonstrate a variety of insulation and structure types. It is critical to evaluate each transition not only for continuity of the insulation resistance layer but for air and moisture management and structural requirements. Corresponding details, such as foundation, floorline, and roof transitions are also available to complete an entire wall assembly. These and other CAD files can be found at www.owenscorning.com/enclosure in both CAD and PDF format, or by contacting gettech@owenscorning.com or calling 1-800-GET-PINK.

PG.	DETAIL NO.	CONTINUOUS INSULATION DETAILS
MASONRY VENEER TRANSITIONS AT FOUNDATION WALLS		
Steel Stud Structure		
6	ES-SS-111	Steel Stud Wall with XPS Continuous Insulation
6	ES-SS-115	Steel Stud Wall with XPS Continuous Insulation
7	ES-SS-112	Steel Stud Wall with Mineral Wool Continuous Insulation
7	ES-SS-116	Steel Stud Wall with Mineral Wool Continuous Insulation
CMU Structure		
8	ES-CM-113	CMU Wall with XPS Continuous Insulation
8	ES-CM-111	CMU Wall with XPS Continuous Insulation
9	ES-CM-115	CMU Wall with Mineral Wool Continuous Insulation
9	ES-CM-117	CMU Wall with Mineral Wool Continuous Insulation
Wood Stud Structure		
10	ES-WS-111	Wood Stud Wall with XPS Continuous Insulation
10	ES-WS-115	Wood Stud Wall with XPS Continuous Insulation
11	ES-WS-112	Wood Stud Wall with Mineral Wool Continuous Insulation
11	ES-WS-116	Wood Stud Wall with Mineral Wool Continuous Insulation

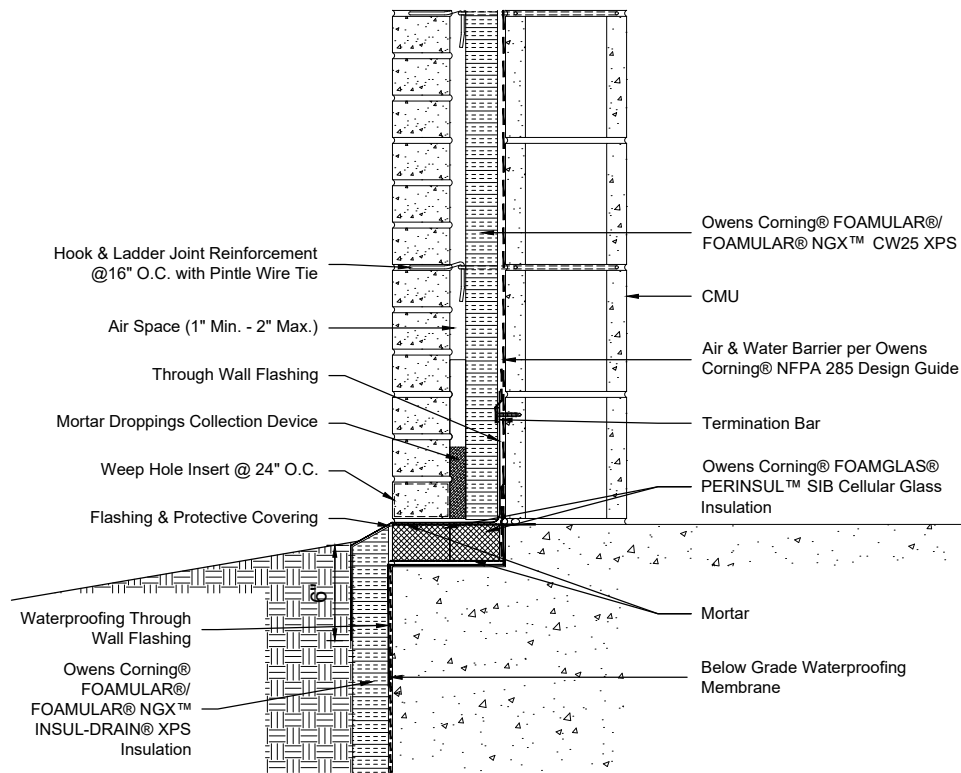
ES-SS-111**Steel Stud Wall with XPS Continuous Insulation****ES-SS-115****Steel Stud Wall with XPS Continuous Insulation**

ES-SS-112**Steel Stud Wall with Mineral Wool Continuous Insulation****ES-SS-116****Steel Stud Wall with Mineral Wool Continuous Insulation**

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

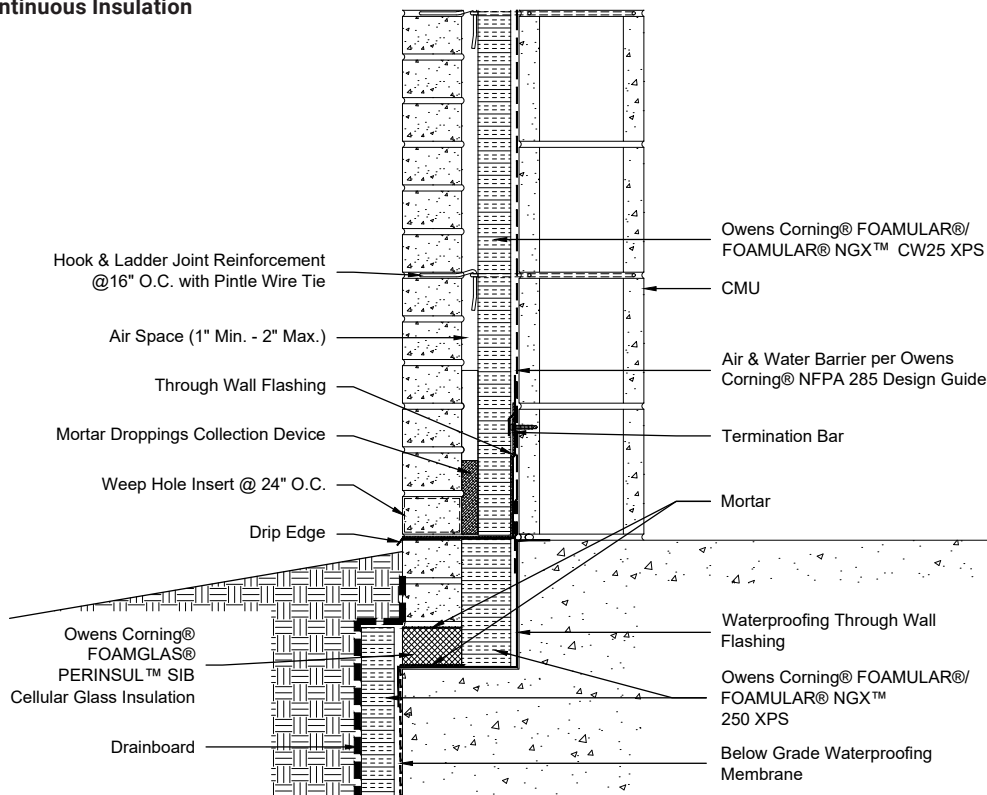
ES-CM-113

CMU Wall with XPS Continuous Insulation



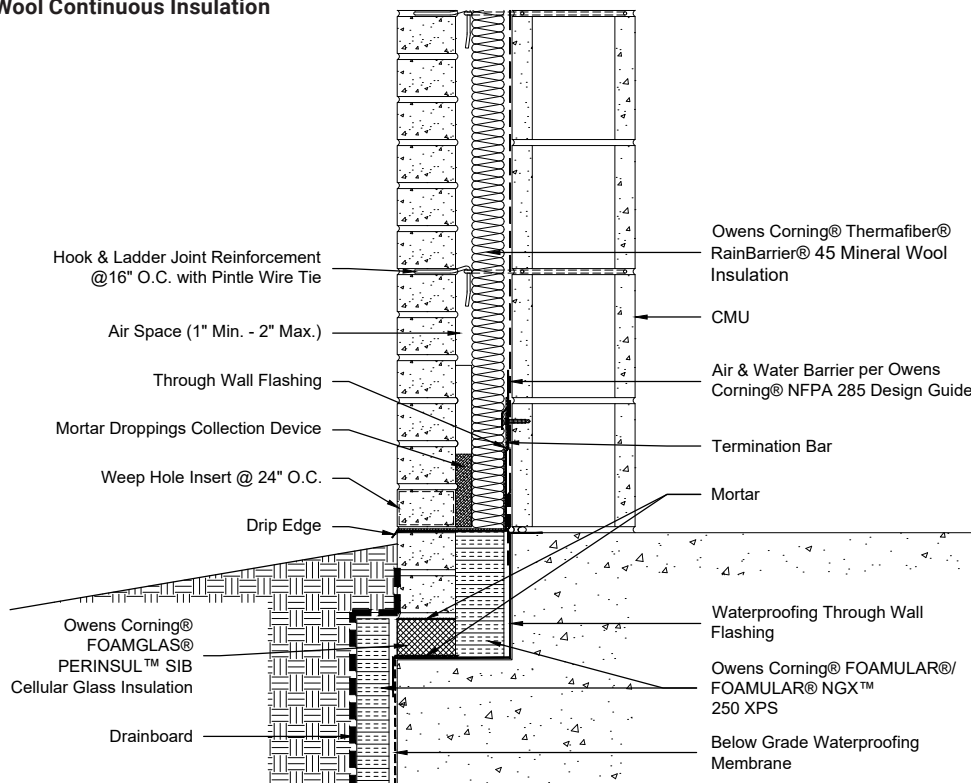
ES-CM-111

CMU Wall with XPS Continuous Insulation



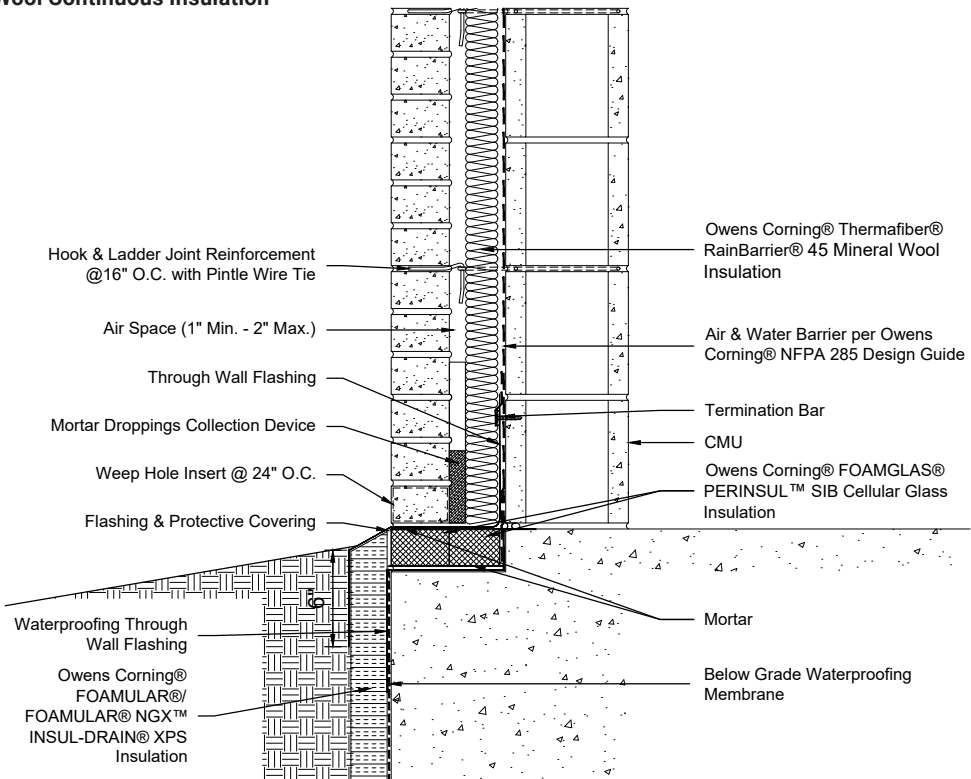
ES-CM-115

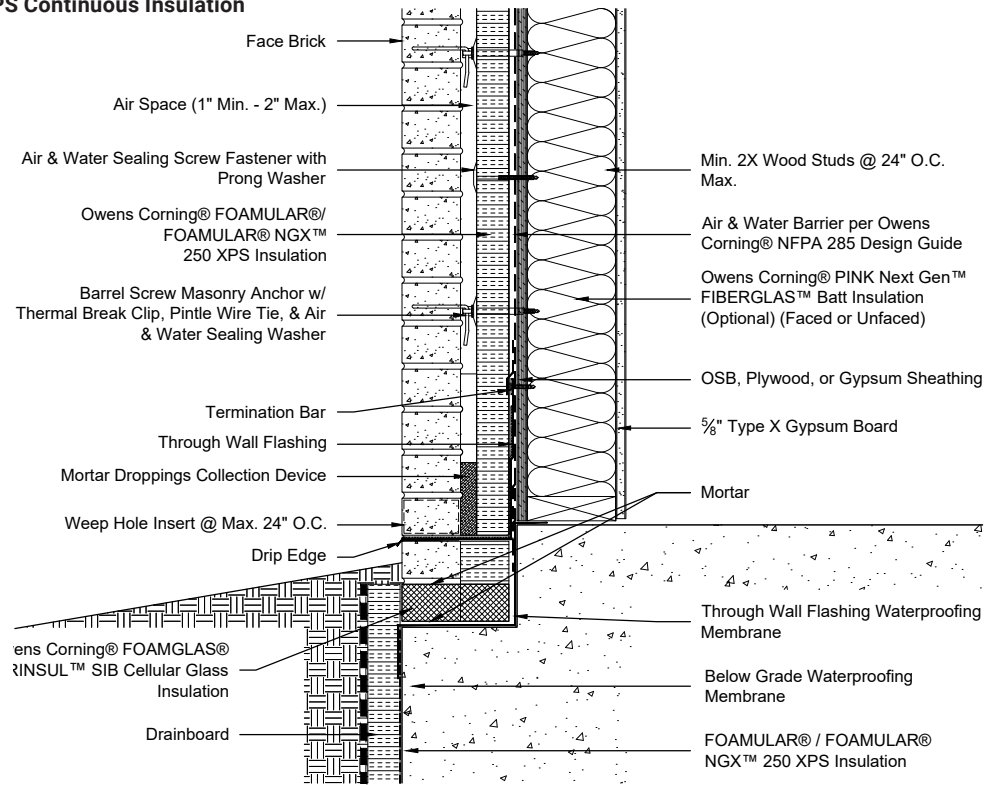
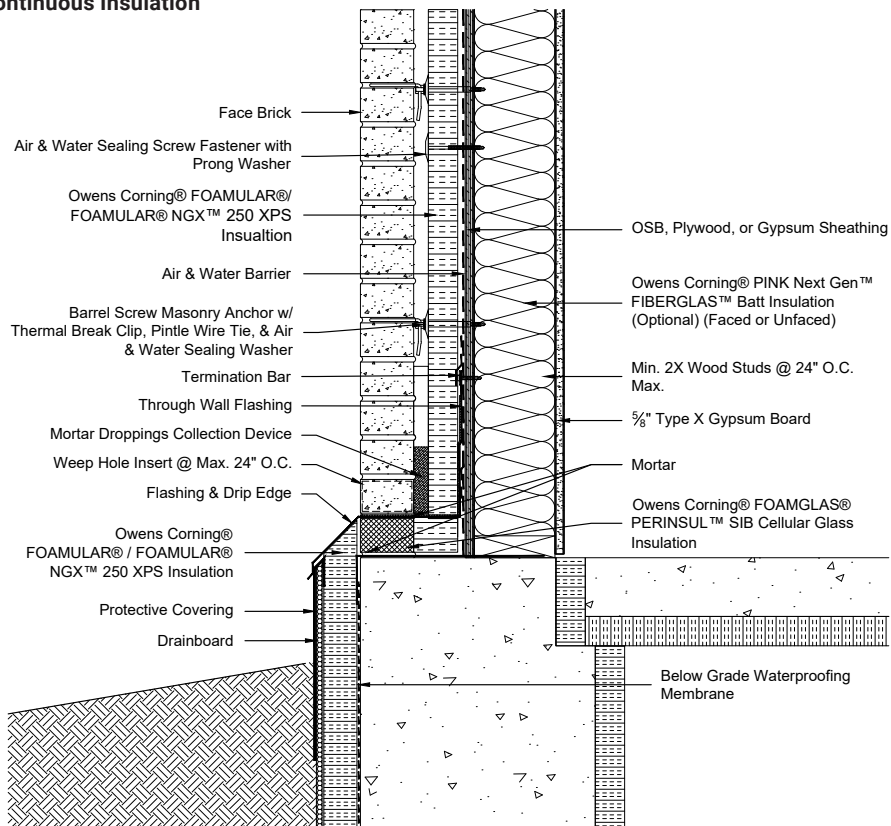
CMU Wall with Mineral Wool Continuous Insulation



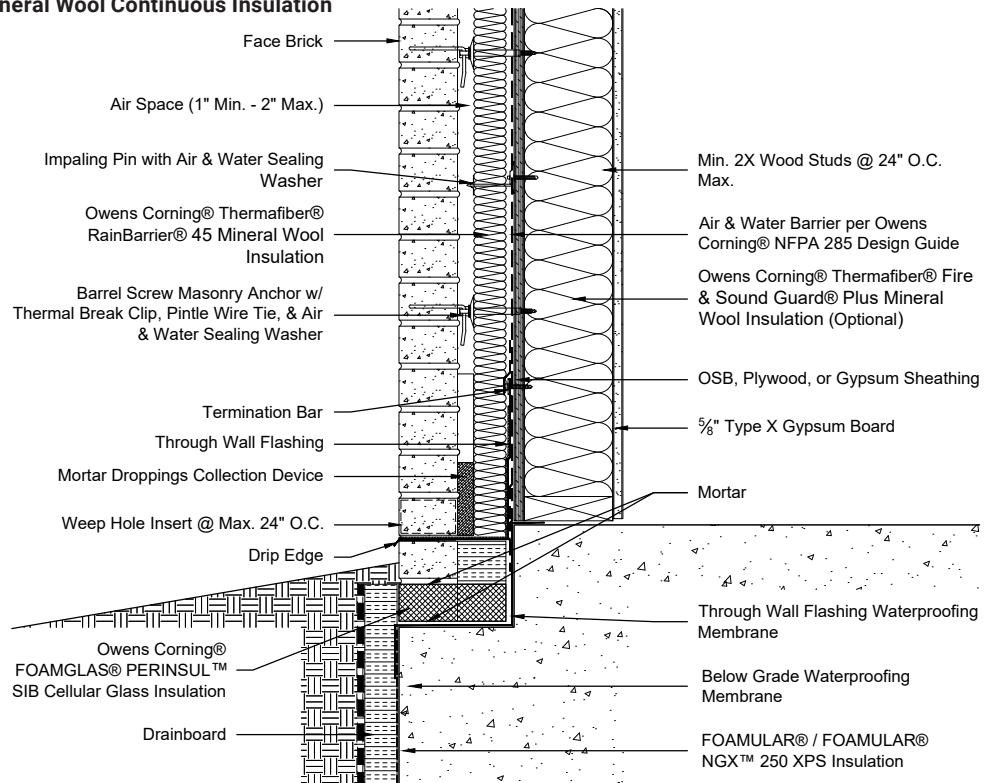
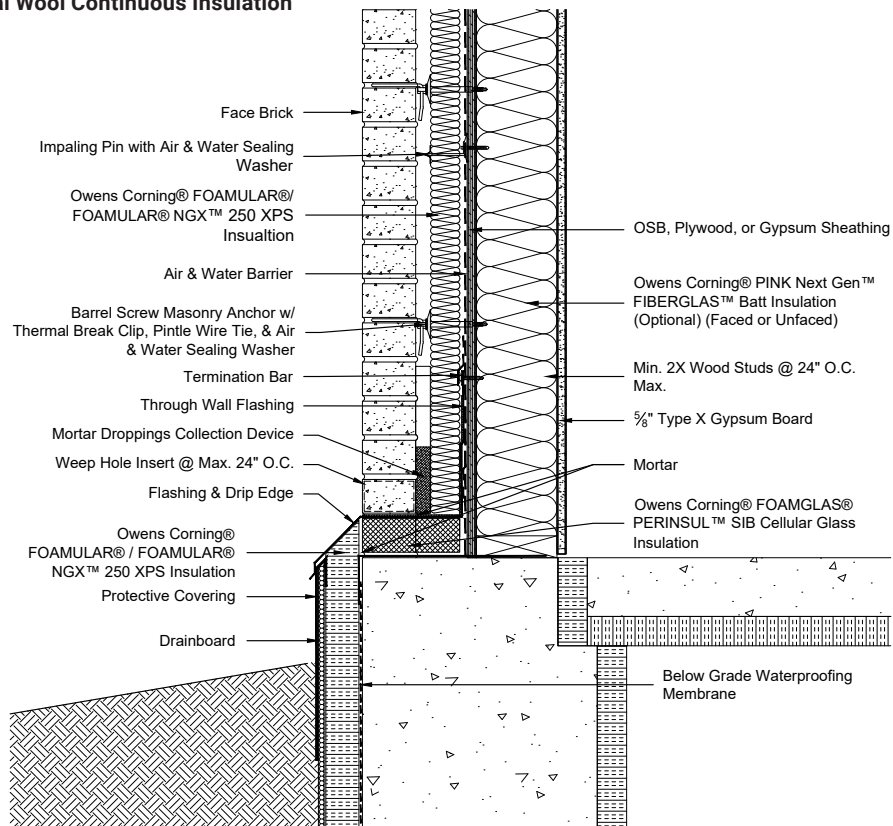
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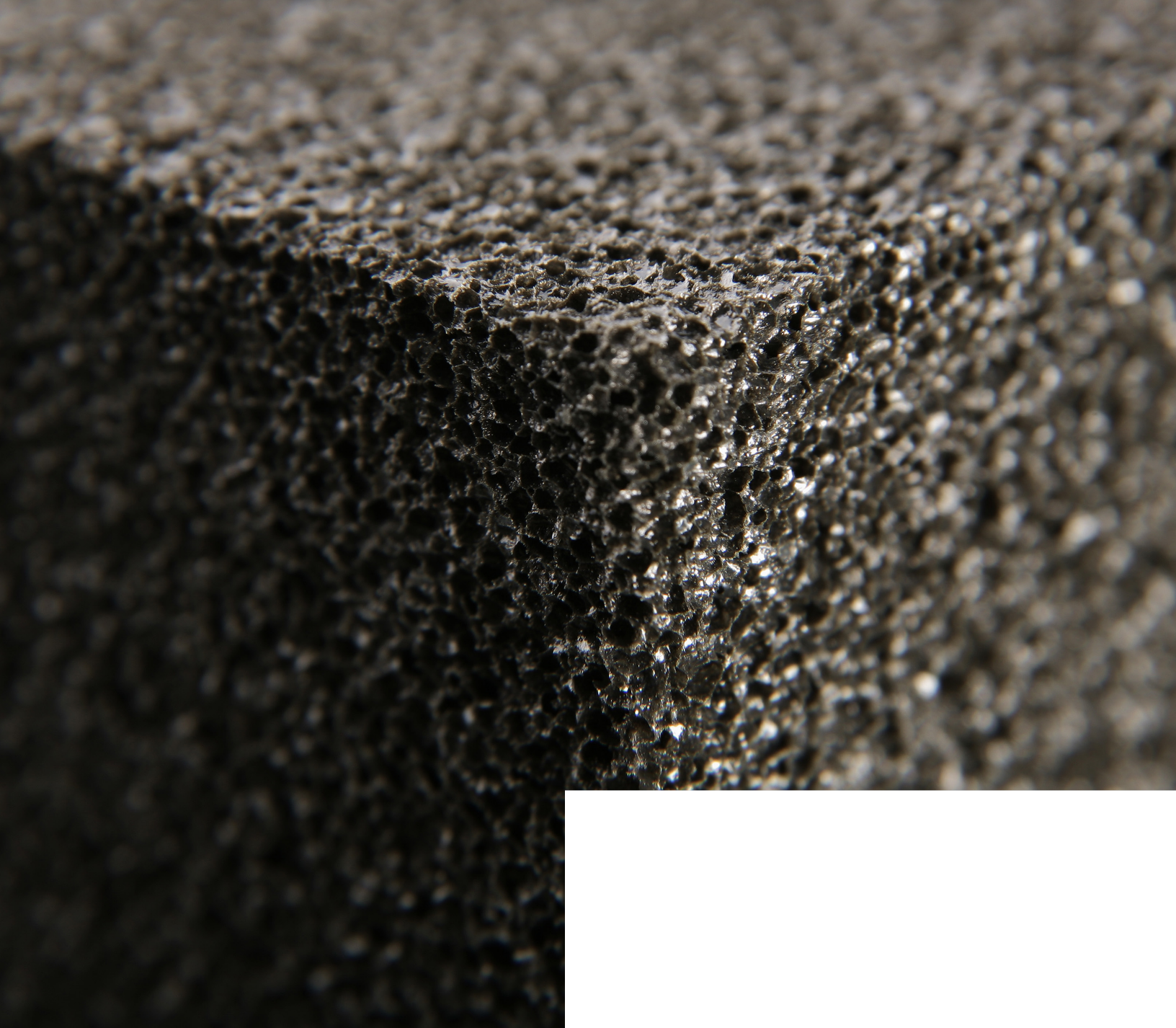
CMU Wall with Mineral Wool Continuous Insulation



ES-WS-111**Wood Stud Wall with XPS Continuous Insulation****ES-WS-115****Wood Stud Wall with XPS Continuous Insulation**

Please note that not all assemblies may be shown.
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ES-WS-112**Wood Stud Wall with Mineral Wool Continuous Insulation****ES-WS-116****Wood Stud Wall with Mineral Wool Continuous Insulation**



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