

NFPA 285 Design Guide

NFPA 285 in the International Building Code

Section 2603.5.5 of the International Building Code (IBC), 2006, 2009, 2012 and 2015 editions, requires that exterior wall systems on buildings of any height, Types I, II, III, or IV construction, that incorporate foam plastic insulation, must meet the requirements of NFPA 285¹. Section 1403.5 of the 2012 and 2015 IBC requires that exterior walls on buildings of Types I through IV construction, that are greater than 40' in height above grade plane, and that contain a combustible water-resistive barrier, must also meet the requirements of NFPA 285. Refer to the 2015 IBC for certain exceptions that differ from the 2012 edition. The CavityComplete™ CMU Wall System with Masonry Veneer contains both foam plastic insulation and a combustible water-resistive barrier, therefore it has been independently evaluated as a system and documented to comply with NFPA 285. See Underwriters Laboratories Online Certifications Directory, UL File No. EWS0022.

Designing to Comply

From building to building, wall system design details may vary from that which was actually tested. Alternate fire resistant details determined through engineering analysis is a method commonly used to accommodate project variations. The practice is accepted in the International Building Code² (IBC) via AC12, "Acceptance Criteria for Foam Plastic Insulation", Section 6.6³. Common design variations approved via analysis include fire stopping details around wall openings. This design guide explains alternative details for the CavityComplete™ CMU Wall System with Masonry Veneer that can be used to comply with NFPA 285^{4,5}.

CavityComplete™ CMU Wall System details can also be viewed at www.ul.com in the Underwriters Laboratories Online Certifications Directory, UL File No. EWS0022.

CavityComplete™ Wall System NFPA 285 Design Guide

Based on the results of NFPA 285 third party analysis, the CavityComplete™ CMU configurations described in the table are compliant with NFPA 285. The CavityComplete™ CMU Wall System is a systemized and limited warrantied* wall assembly consisting of:

- Owens Corning® FOAMULAR® CW25 Extruded Polystyrene Insulation and Thermafiber® Safing
- Heckmann Building Products — #1300 Hook & Ladder Joint Reinforcement and Pintle Wire Ties
- Tremco — ExoAir® 230 vapor-permeable air/water barrier and Dymonic® 100 Sealant
- Mortar Net Solutions™ — MortarNet®, WeepVent, and TotalFlash® unitized flashing assembly

CavityComplete™ CMU Wall System NFPA 285 Design Options

Wall Component	Material Options
Base Wall System	
	• Minimum 8" concrete masonry unit (CMU)
Floorline Firestopping: Select one	
If construction type requires a fire resistance rated floor or floor/ceiling assembly, then Section 715.4 of the IBC requires the installation of a perimeter fire containment joint, rated per ASTM E2307	• See Detail 1 for an example of a typical wall/floor intersection detail that is common in CMU construction and that would qualify as a perimeter fire containment joint. Other commonly used details may also qualify.
Air and Weather Resistive Barrier Layer over CMU	
Install at recommended application rates and in strict accordance with installation instructions.	• Tremco ExoAir® 230, fluid applied, permeable
Through Wall Flashing, Mortar Droppings Protection and Weep Holes:	
	• Mortar Net Solutions™ TotalFlash®, MortarNet®, and WeepVent.™ See Detail 2.
Continuous Insulation:	
	• Owens Corning® FOAMULAR® CW25 Extruded Polystyrene (XPS) Rigid Foam Insulation, ASTM C578 Type IV, maximum 4" thick, one or more layers.
Exterior Cladding, Veneer: Select one	
Air space between continuous insulation and masonry veneer, minimum 1", maximum 2".	<ul style="list-style-type: none"> • Brick Veneer, standard nominal 4" thick, clay face brick. • Limestone or natural stone veneer, minimum 2" thick. Install with non-open joint such as shiplap, etc. • Cast artificial stone veneer, minimum 1-1/2" thick. Install with non-open joint such as shiplap, etc. • Terracotta cladding, minimum 1-1/4" thick. Install with non-open joint such as ship-lap, etc. • Concrete Masonry Units, 4" thick minimum.
Window and Door Opening Details:	
	<ul style="list-style-type: none"> • Head Detail: Use either head detail 2 or 3. • Jamb Detail: Use either jamb detail 4, 5 or 6.

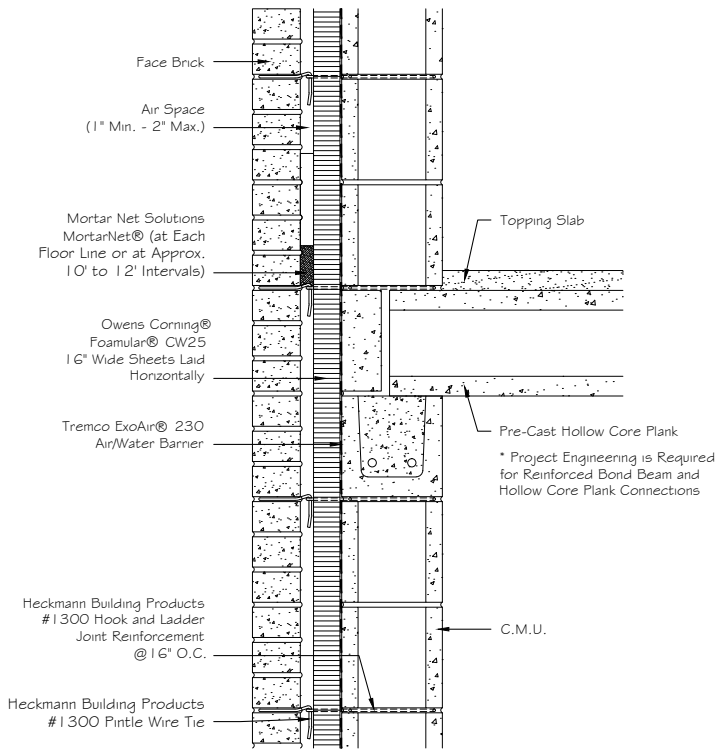
Note: NFPA 285 does not address other performance characteristics such as weatherability, durability, or structural considerations.



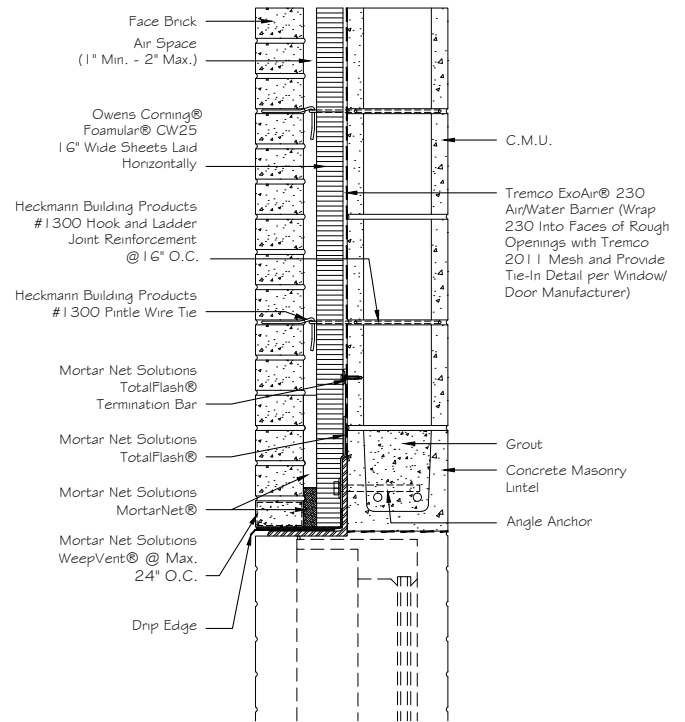
Thermafiber® Safing Insulation in jamb and sill with continuous steel lintel at head



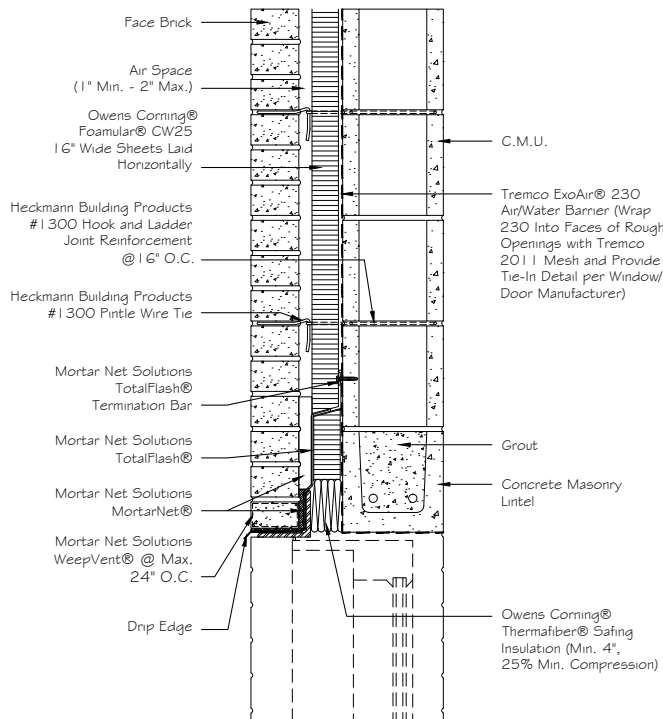
TotalFlash® flashing preassembled unitized through wall flashing/drip edge assembly installed over continuous steel brick ledge.



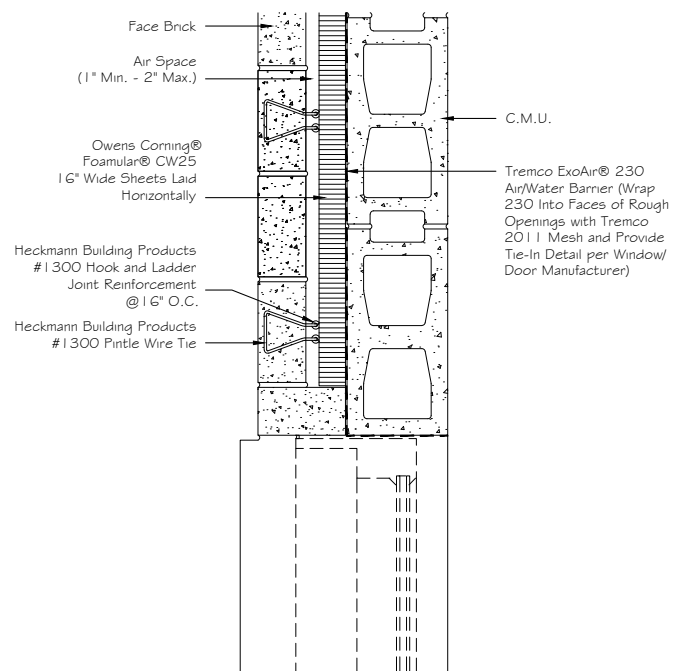
*Detail 1:
Perimeter Fire Containment Joint*



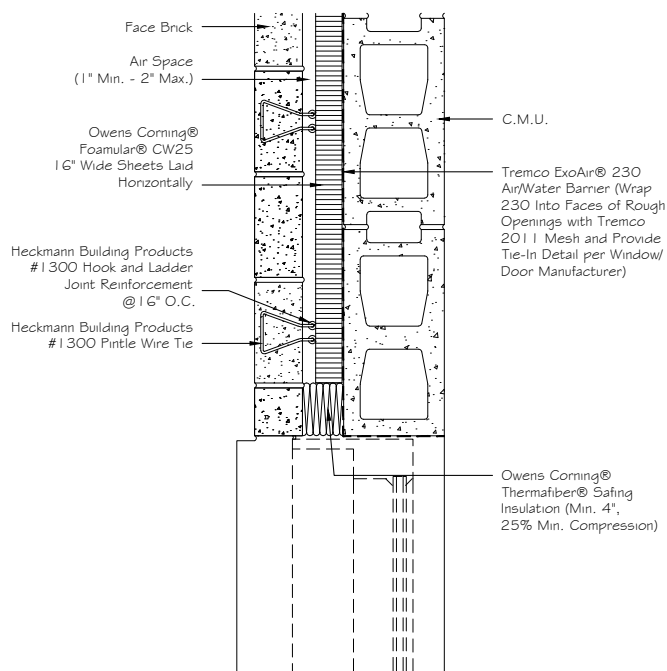
*Detail 2:
Head with Steel Angle Cavity Closure*



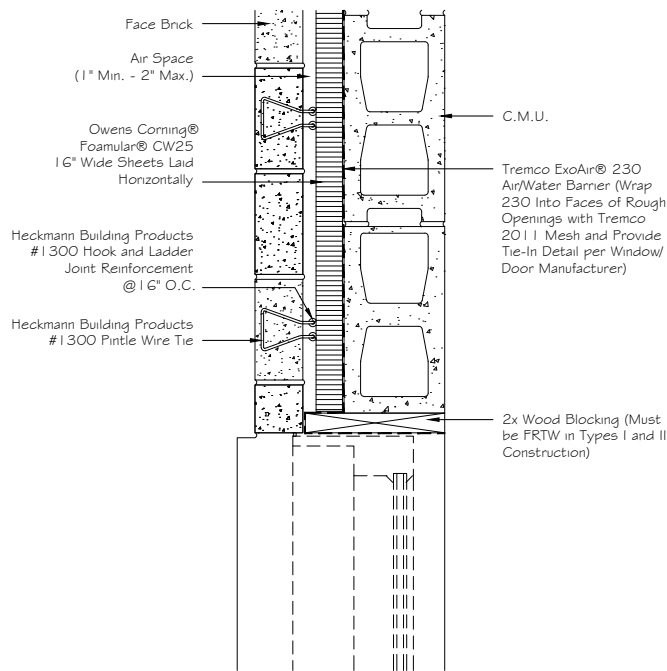
*Detail 3:
Head with Steel/Mineral Wool Safing Closure*



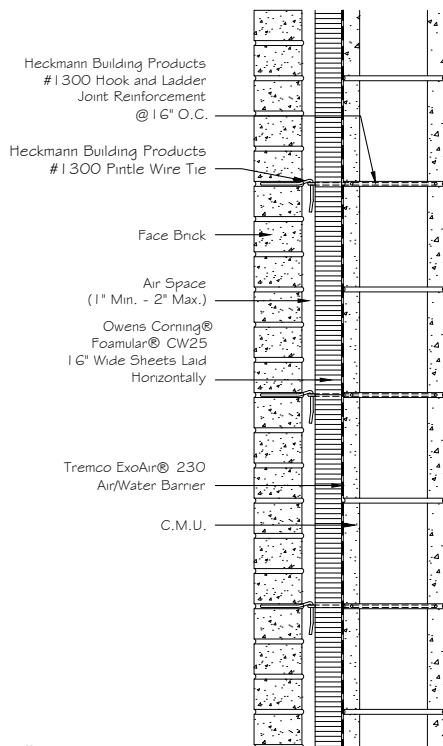
*Detail 4:
Jamb with Masonry Cavity Closure*



Detail 5:
Jamb with Mineral Wool Fire Safing Cavity Closure



Detail 6:
Jamb with 2x Wood Cavity Closure



Detail 7:
CavityComplete™ CMU Wall Section

*See actual warranty for complete details, limitations and requirements.

References

- 1 NFPA 285, Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components, 2012; National Fire Protection Association, 1 Batterymarch Park, Quincy, Massachusetts 02169
- 2 International Building Code; International Code Council, Inc., 4051 West Flossmoor Road, Country Club Hills, IL 60478-5795
- 3 Acceptance Criteria for Foam Plastic Insulation, AC12; International Code Council Evaluation Service; 5360 Workman Mill Road, Whittier, CA 90601
- 4 Various NFPA 285 Complying CavityComplete™ Exterior Wall Systems, Project No. 1JJB05347.007, Hughes Associates, 3610 Commerce Drive, Suite 817, Baltimore, MD 21227
- 5 Analysis and Extension of NFPA 285 Tests, FOAMULAR® XPS, Project No. 1JJB05347.003, Hughes Associates, 3610 Commerce Drive, Suite 817, Baltimore, MD 21227

The CavityComplete™ Concrete Masonry Unit (CMU) Wall System excludes the masonry veneer and concrete masonry units. A detailed list of the components is available at www.CavityComplete.com.