

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 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. The CavityComplete[®] Wall System for Steel Stud with Masonry Veneer contains both foam plastic insulation and a combustible water-resistive barrier, therefore it has been evaluated as a system and documented to comply with NFPA 285.

Designing to Comply

The CavityComplete[®] Wall System for Steel Stud with Masonry Veneer construction successfully completed the 30 minute NFPA 285 fire exposure/propagation test. A description of the compliant wall system is provided in Table 1. 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). Common design variations approved via analysis include fire stopping details around wall openings, exterior cladding types, stud depth, type and amount of cavity batt insulation, or thickness of continuous insulation. This design guide explains alternative details for the CavityComplete[®] Wall System for Steel Stud with Masonry Veneer that can be used to comply with NFPA 285.

Testing and Third Party Engineering Analysis

The International Code Council Evaluation Service publishes "AC12, Acceptance Criteria for Foam Plastic Insulation"³. Section 6.6 states, "When recognition includes installation of the foam plastic insulation in exterior walls of Type I through Type IV construction in accordance with Section 2603.5 of the IBC, the evaluation report shall provide details of the assemblies tested in accordance with NFPA 285, and/or NFPA 285 test results extended via a third-party engineering analysis."

This design guide summarizes tested CavityComplete[®] wall system details and it provides additional design options extended via third party engineering analysis⁴.

CavityComplete[®] Wall System NFPA 285 Design Guide

Based on the results of NFPA 285 testing, additional small-scale testing, and third party analysis, the CavityComplete[®] configurations described Table 1 are compliant with NFPA 285. The CavityComplete[®] Wall System is a systemized and limited warranted* wall assembly consisting of:

- Owens Corning — EcoTouch[®] Flame Spread 25 Fiber Glass Insulation (faced), EcoTouch[®] Fiber Glass Insulation (unfaced), FOAMULAR[®] 250 Extruded Polystyrene Insulation and Thermafiber[®] Safing
- Heckman Building Products — Pos-I-Tie[®] masonry veneer anchoring system with ThermalClip[®] and pintle wire tie
- Rodenhouse, Inc. — "ci" fastening system with Grip-Deck[®] screws and Thermal-Grip[®] plastic prong "ci" and brick-tie washers for screws and masonry veneer anchors
- PROSOCO R-Guard[®] Cat 5[®] permeable air/water barrier and accessories
- Mortar Net Solutions[™] — MortarNet[™] and TotalFlash[®] unitized flashing assembly

**Table 1: CavityComplete[®] Wall System
NFPA 285 Design Options**

Wall Component	Material Options
Base Wall System	
	<ul style="list-style-type: none"> Steel Stud Framing, minimum 3-5/8" depth, minimum 18-gauge, maximum 24" on center spacing. Cover on the interior with 1 layer of 5/8" thick, Type X, gypsum wallboard.
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	<ul style="list-style-type: none"> See CavityComplete[®] Perimeter Fire Containment Joint Assembly. See Detail 1.
If a fire resistance rated floor assembly IS NOT required use this option.	<ul style="list-style-type: none"> Install Thermafiber[®] Safing fire stop, 4 lb/cu ft. density, friction fit or attached, continuously at the floor line and/or in each stud cavity if the stud framing is continuous past the floor line. Similar to Detail 1 except smoke sealant may be omitted and fiberglass insulation may be used in the stud cavities.
Stud Cavity Insulation: Select one	
See CavityComplete [®] Product Data Sheets for product properties, sizes, and facer configurations	<ul style="list-style-type: none"> None Owens Corning[®] EcoTouch[®] PINK[®] FIBERGLAS[™] Insulation (unfaced) Owens Corning[®] EcoTouch[®] Flame Spread 25 FIBERGLAS[™] Insulation (faced) Owens Corning[®] Thermafiber[®] Firespan[®] 40 or 90 Mineral Wool Insulation (faced or unfaced)
Exterior Gypsum Sheathing:	
	<ul style="list-style-type: none"> Gypsum Sheathing, 5/8", Type X, exterior grade. All joints and fastener locations sealed with PROSOCO R-Guard[®] Joint & Seam Filler
Air and Weather Resistive Barrier Layer over Gypsum Sheathing	
Install at recommended application rates and in strict accordance with installation instructions.	<ul style="list-style-type: none"> PROSOCO R-Guard[®] Cat 5[™], fluid applied, permeable
Through Wall Flashing, Mortar Droppings Protection and Weep Holes:	
	<ul style="list-style-type: none"> Mortar Net Solutions[™] TotalFlash[®], MortarNet[™], MPE-1, and WeepVent[™]. See Detail 2.
Continuous Insulation:	
	<ul style="list-style-type: none"> Owens Corning[®] FOAMULAR[®] 250 Extruded Polystyrene (XPS) Rigid Foam Insulation, ASTM C578 Type IV, maximum 4" thick, one or more layers.
Masonry Veneer Anchors and Fasteners:	
	<ul style="list-style-type: none"> Continuous insulation temporarily held in place with appropriate length Rodenhouse, Inc., Grip-Deck[®] self-drilling screws and 2 inch diameter Thermal-Grip[®] "ci" pronged washers. Installed evenly spaced, 2 per 2x8 board. See Detail 8. Continuous insulation and masonry veneer permanently secured with Heckmann Building Products, Inc., Pos-I-Tie[®] with Thermal-Grip[®] brick-tie washer, ThermalClip[®] thermal break head, and pintle wire tie. Installed in each stud and 16" o.c. vertically. See Detail 8.
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, 3 or 4. Jamb Detail: Use either jamb detail 5, 6 or 7.

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



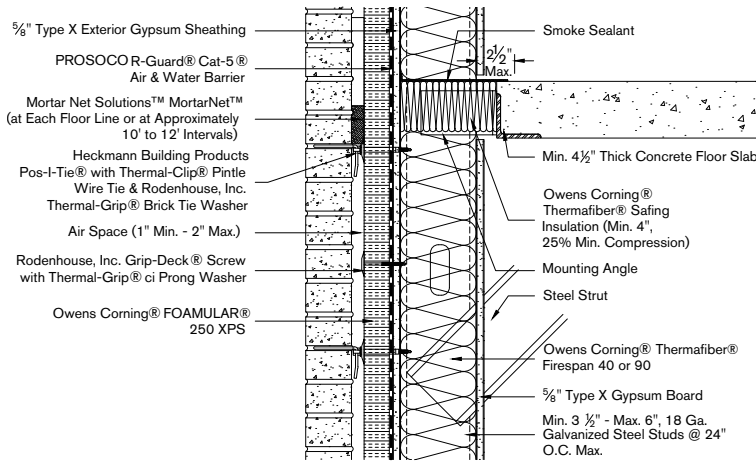
Thermafiber[®] Safing Insulation in jamb and sill with continuous steel lintel at head



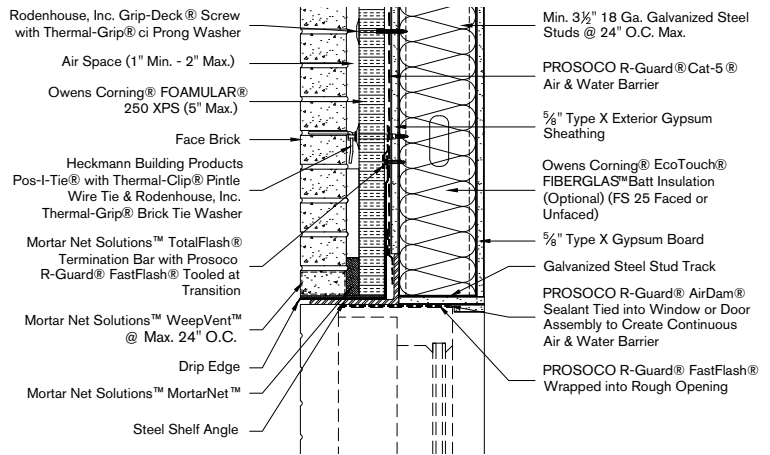
Steel stud cavity and continuous steel brick ledge at floor line where Thermafiber[®] Safing Insulation will be installed



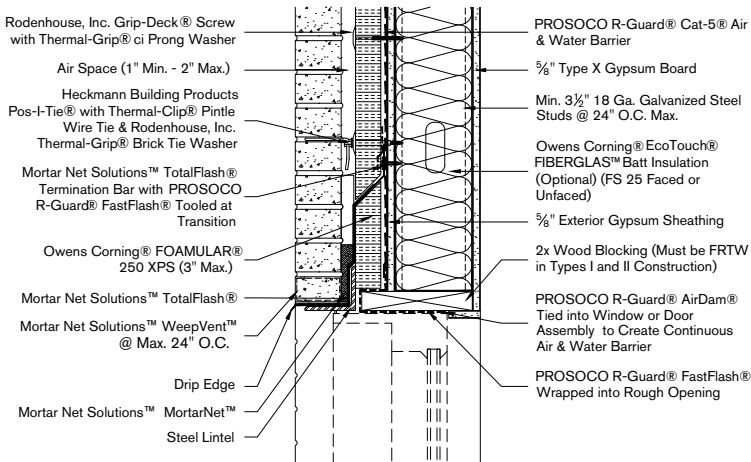
TotalFlash[®] flashing preassembled unitized through wall flashing/drip edge assembly installed over continuous steel brick ledge.



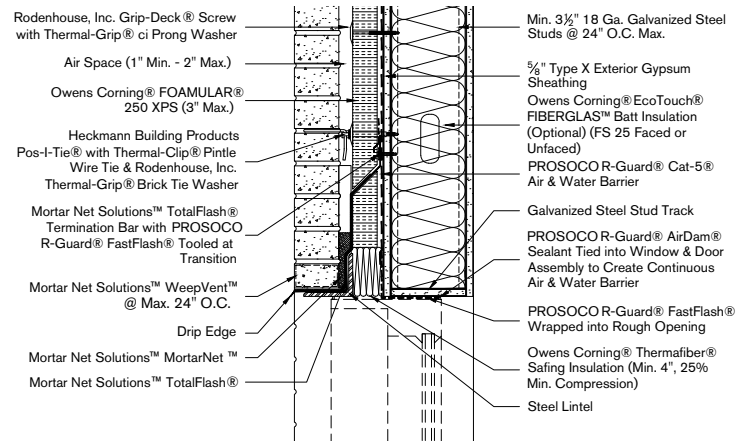
Detail 1:
Perimeter Fire Containment Joint



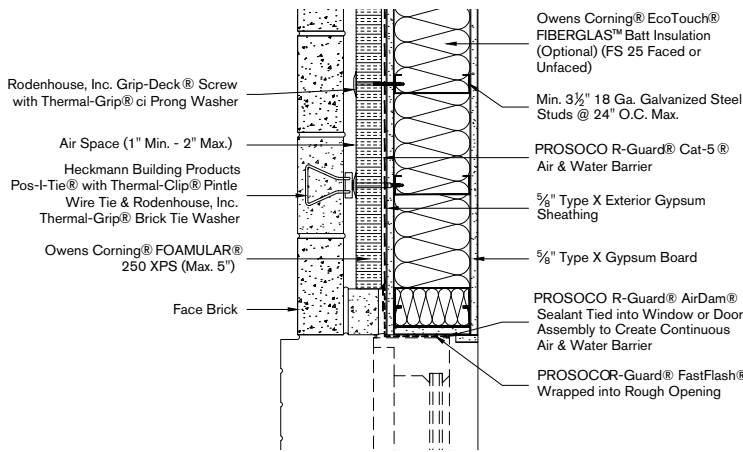
Detail 2:
Head with Steel Lintel Cavity Closure



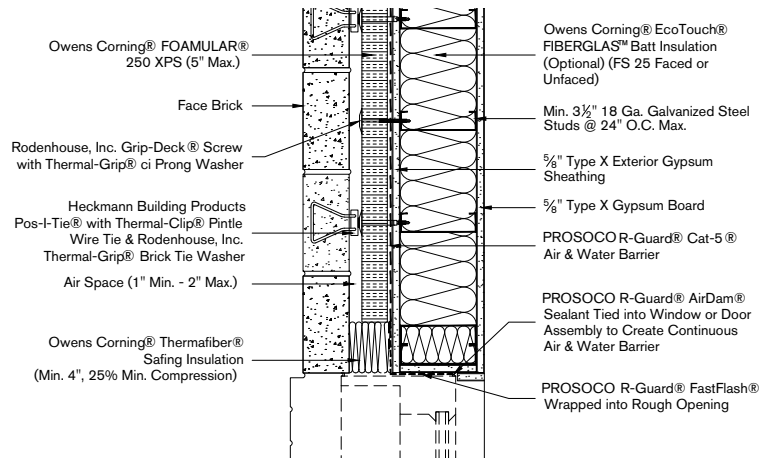
Detail 3:
Head with 2x Wood Cavity Closure



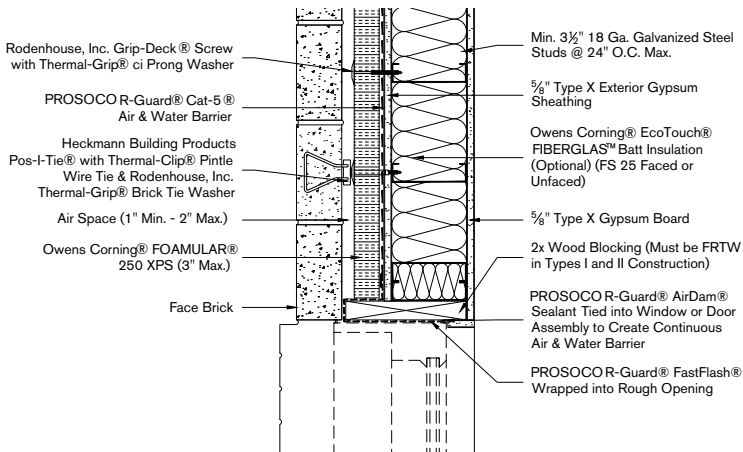
Detail 4:
Head with Mineral Wool Cavity Closure



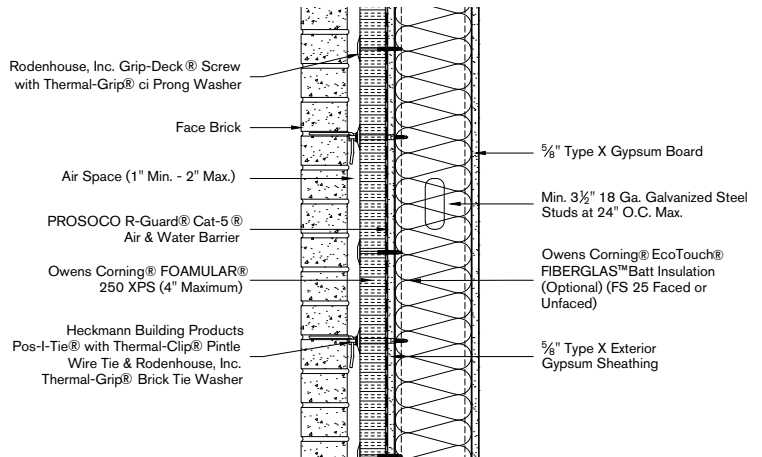
Detail 5:
Jamb with Masonry Cavity Closure



Detail 6:
Jamb with Mineral Wool Fire Saving Cavity Closure



Detail 7:
Jamb with 2x Wood Cavity Closure



Detail 8:
CavityComplete® 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

The CavityComplete® Wall System excludes the masonry veneer, steel studs and interior and exterior gypsum board. A detailed list of the components is available at www.CavityComplete.com.