



FOAMULAR®
Energy-Saving, Moisture-Resistant XPS Insulation



Commercial Complete™
Wall System
NFPA 285 Tested

 **AUSTECH**
external building products



INNOVATIONS FOR LIVING®

CommercialComplete™ Wall System

NFPA 285 Tested Wall Assemblies

FOAMULAR® XPS Insulation, Joint SealR™ Foam Joint Tape, Eco Touch™ Flame Spread 25, Eco Touch™ Thermal Batt FIBERGLAS™ Insulation

NFPA 285 Fire Tested Wall Assemblies

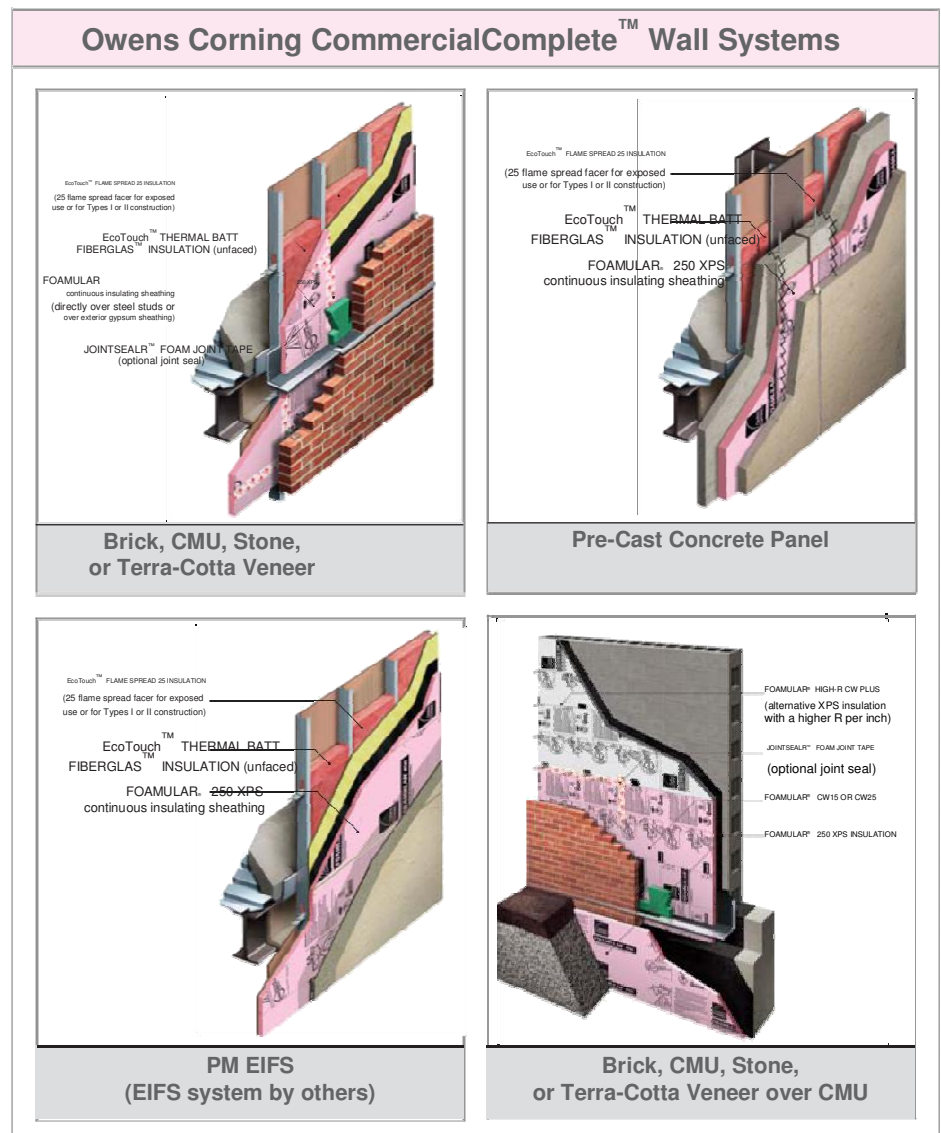
Owens Corning's Commercial Complete™ Wall System has successfully passed the NFPA 285* fire test in many variations giving architects options in exterior wall design. The system is approved with FOAMULAR® extruded polystyrene continuous insulation under a variety of masonry veneer exterior finishes, over either steel stud frame or masonry back-up walls. This brochure summarizes NFPA 285 approved assemblies. See Table 2 and the family of CommercialComplete™ Wall System publications for more information.

**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 Battery March Park, Quincy, Massachusetts 02169*

The Purpose of NFPA 285

The test is required in the International Building Code (IBC) when foam plastic insulation is used in the exterior walls of construction types I, II, III or IV. Those construction types, by code definition, have exterior walls constructed of non-combustible materials. The test is to determine that combustible foam plastic insulation, when exposed to fire on the exterior face of the wall, does not spread flame over the surface or through the core of the otherwise non-combustible wall assembly.

The test standard NFPA 285 is referenced in IBC Section 2603.5.5. That standard, or a variation of it, has been referenced in each edition of the IBC since its first edition in 2000, and since the 1980's 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.



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The other two national model building codes of that era also required full scale testing of this type 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. (Figure 3) The test scenario is that a flashover fire, unrelated to the foam plastic insulation, has occurred in the lower story room emitting a fire plume out of the room of origin through the window. Early in the 30 minute exposure the fire plume wraps around the window head, extending up the exterior surface of the wall. (Figure 4)

To pass, the wall assembly must demonstrate limited 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 FOAMULAR® CommercialComplete™ 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.

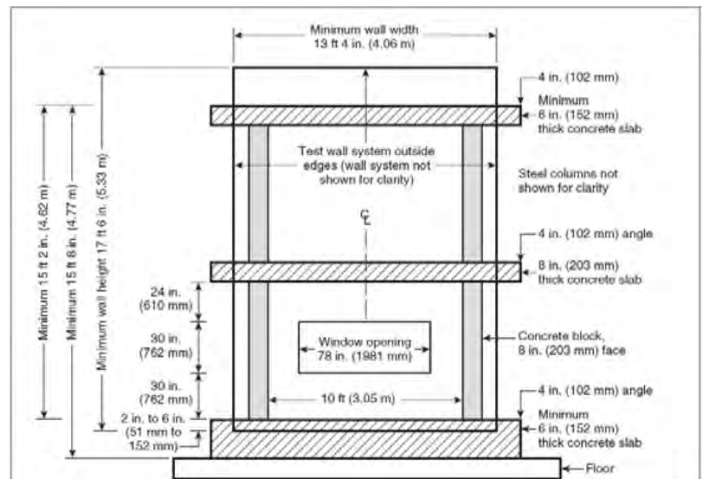


Figure 1: Elevation of test rig, test wall side

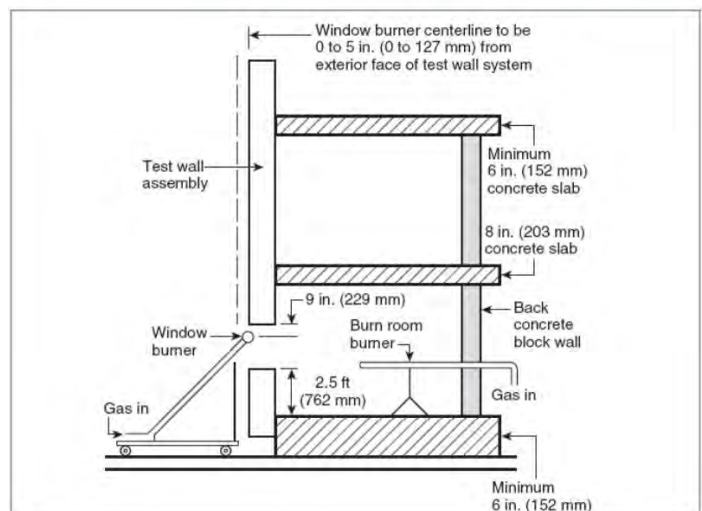


Figure 2: Section of test rig



Figure 3: Test wall under construction



Figure 4: Fire emitting from the test window



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

Table 1

Owens Corning Commercial Complete™ Wall System Product Selection								
Guide FOAMULAR® Extruded Polystyrene Continuous Insulation								
Product Name Application	Thickness (inches)	R-Value ¹ (180 Day)		R-Value ¹ (LTTR)	Size ² (inches)	Compressive Strength (psi)	ASTM C578 Type	Edge Type
		@75°F mean temp.	@40°F mean temp.	@75°F mean temp.				
FOAMULAR® CC Steel Stud Framing	2 2½ 3	10.0 12.5 15.0	10.8 13.5 16.2	10.6 13.4 16.2	2 x 48 x 96 2½ x 48 x 96 3 x 48 x 96	16	X	Ship-lap long edge
FOAMULAR® 250 Steel Stud Framing	¾ 1 1½ 2 2½ 3 4	4.0 5.0 7.5 10.0 12.5 15.0 20.0	4.3 5.4 8.1 10.8 13.5 16.2 21.6	5.0 10.6 13.4 16.2 22.0	¾ x 48 x 96 1 x 48 x 96 1½ x 48 x 96 2 x 48 x 96 2½ x 48 x 96 3 x 48 x 96 4 x 48 x 96 (FOAMULAR® 250 also in 24" wide)	25	IV	Square (or T&G up to 2" thick only)
FOAMULAR® CC High R Steel Stud Framing	1¾ 2⅙ 3	10.0 12.0 17.0	10.8 13 18.4	10.3 12.5	1¾ x 48 x 96 2⅙ x 48 x 96 3 x 48 x 96	25	IV	Ship-lap long edge
FOAMULAR® CW15 Concrete Masonry	1 1½ 2 2½ 3	5.0 7.5 10.0 12.5 15.0	5.4 8.1 10.8 13.5 16.2	5.0 10.6 13.4 16.2	1 x 16 x 96 1½ x 16 x 96 2 x 16 x 96 2½ x 16 x 96 3 x 16 x 96	15	X	Square
FOAMULAR® CW25 Concrete Masonry	1 1½ 2 2½ 3	5.0 7.5 10.0 12.5 15.0	5.4 8.1 10.8 13.5 16.2	5.0 10.6 13.4 16.2	1 x 16 x 96 1½ x 16 x 96 2 x 16 x 96 2½ x 16 x 96 3 x 16 x 96	25	IV	Square
FOAMULAR® High R CW Plus Concrete Masonry	1¾ 2⅙ 3	10.0 12.0 17.0	10.8 13.0 18.4	10.3 12.5	1¾ x 16 x 96 2⅙ x 16 x 96 3 x 16 x 96	25	IV	Square
<div>1. R-values vary depending on many factors including the mean temperature at which the test is conducted, and the age of the sample at the time of testing. Because rigid foam plastic insulation products are not all aged in accordance with the same standards, it is useful to publish comparison R-value data. The R-value for FOAMULAR® XPS is provided from testing at two mean temperatures, 40 °F and 75 °F, and from two aging (conditioning) techniques, 180 day real-time aging (as mandated by ASTM C578), and, a method of artificially accelerating aging sometimes called "Long Term Thermal Resistance" (LTTR, CAN/ULC S770). The R-value at 180 day real-time aged, and 75 °F mean temperature, is commonly used to compare products. It is recommended that the specifier verify testing and conditioning methods with the manufacturer before comparing the R-value of rigid foam plastic insulation products.</div> <div>2. Availability may vary depending on sizes, edge configuration, and/or region. Some items are made to order. Check with your local FOAMULAR® representative for specific information.</div>								
EcoTouch™ Fiberglas™ Insulation								
Product Name Application	Thickness (inches)	R-Value @75° F mean temp.		Perms maximum	Width (inches)	Length (inches)	ASTM C665 Type	
EcoTouch™ Thermal Batt Unfaced	3½ 3½ 6¼	11.0 13.0 19.0		NA NA NA	16 or 24 (Specify full width for steel stud)	48 or 96 48 or 96 48 or 96	Type 1 Type 1 Type 1	
EcoTouch™ Flame Spread 25 Faced	3½ 3½ 6¼ 9½	11.0 13.0 19.0 30.0		Depends on Facer Type	16 or 24 (Specify full width for steel stud)	96 96 96 48	Depends on Facer Type	
Facer Types: FSK (foil) faced PSK (white) faced				0.02 0.02			Type 111, Class A Type 11, Class A	
JointSealR™ Foam Joint Tape for the Commercial Complete™ Wall System								
Function	Roll Widths (inches)	Roll Length (feet)		Backer				
Foam board joint sealing	3.5	90		Acrylic				

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Architects Guide to NFPA 285 Tested Owens Corning Commercial Complete™ Wall Systems

Table 2 summarizes CommercialComplete™ Wall System options that are approved for use in NFPA 285 tested wall assemblies. The table provides information on approved variations including with and without FIBERGLAS™ Batt Insulation in the steel stud cavities, options for air barriers, foam thickness, window head closure details and other important system details.

Table 2*

Owens Corning CommercialComplete™ Wall System Specification Guide to Accepted NFPA 285 Options		
Wall Component		Material Options
Base Wall System: <i>Select one</i>		
	<ul style="list-style-type: none">Concrete (cast-in-place, or, pre-cast)Concrete Masonry UnitsSteel Stud Framing, minimum 3⁵/₈" depth, minimum 20 gauge, maximum 16 inches on center spacing, with lateral bracing every 4 ft. vertically. Cover on the interior with 1 layer of ⁵/₈" thick, Type X, gypsum wallboard.	
Floor line Fire stopping: <i>Select one</i>		
<i>If a fire resistance rated floor or floor/ceiling assembly IS required use option 1.</i>	<ol style="list-style-type: none">1. Install an ASTM E2307 tested and rated fire stop joint assembly.2. Install mineral wool fire stop, 4 pcf density, attached with Z-clips or equivalent, continuously at each floor line and/or in each stud cavity if the stud framing is continuous past the floor line.	
<i>If a fire resistance rated floor assembly IS NOT required use option 2.</i>		
Stud Cavity Insulation: <i>Select one</i>		
<i>See Table 1 for product properties, sizes, and facer configurations. Complete product data is available in related Owens Corning publications.</i>	<ul style="list-style-type: none">NoneAny non-combustible insulationEcoTouch™ Flame Spread 25 Batt Insulation (faced)EcoTouch™ Thermal Batt FIBERGLAS™ Insulation (unfaced)Spray Polyurethane Foam, Demilec Sealection 500 (0.5 pcf maximum, used only with gypsum exterior sheathing)	
Exterior Sheathing: <i>Select one</i>		
	<ul style="list-style-type: none">NoneGypsum Sheathing, ½", exterior gradeGypsum Sheathing, ⁵/₈", Type X, exterior grade	
Air & Weather Resistive Barrier Layer Over Base Wall System: <i>Select one</i>		
<i>All barriers are to be installed at recommended application rates and in strict accordance with the manufacturer's installation instructions.</i>	<ul style="list-style-type: none">NoneWall Guardian™ FW-100A, STS CoatingsBarritech™ VP, Carlisle Coatings & WaterproofingFire Resist Barritech NP, Carlisle Coatings & WaterproofingCCW-705FR with CCW-702 WB adhesive, Carlisle Coatings & WaterproofingBackstop® NT, Dryvit Systems Inc.Air-Shield™ LMP (black only), W.R. MeadowsPerm-A-Barrier®, VPS, W.R. Grace & Co.Tyvek® CommercialWrap®, DupontGreenGuard® Max™, Building Wrap, Pactiv	
Continuous Insulation: <i>Select one</i>		
<i>See Table 1 for recommended product applications, and product properties, sizes, and edge configurations. Complete product data is available in related Owens Corning publications.</i>	<ul style="list-style-type: none">FOAMULAR® CCFOAMULAR® 250FOAMULAR® CC High-RFOAMULAR® High-R CW PlusFOAMULAR® CW15FOAMULAR® CW25	<ul style="list-style-type: none">ASTM C578 Type IVASTM C578 Type IVASTM C578 Type IVASTM C578 Type IVASTM C578 Type XASTM C578 Type IV
<i>Options: FOAMULAR® joints may be sealed with Joint SealR™ Foam Joint Tape. FOAMULAR® may be installed directly over steel stud framing.</i>	<i>Thickness: ½" minimum, to 3" maximum, use Window & Door Opening Detail 1. ½" minimum to 5" maximum, use details 2, 3 or 4.</i>	

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**DISCLAIMER: The sole purpose of the information provided in Table 2 is to identify certain Material Options, in assemblies, that have been shown by independent testing, as of the initial date of this publication, to be compliant with the NFPA 285 fire test. By providing this information, Owens Corning is not making, and specifically disclaims, any recommendations, warranties, or guarantees with respect to any of the listed Material Options. Complete product data for the Owens Corning products is available in related Owens Corning publications. Product data for non-Owens Corning products, including verification that such products continue to meet the NFPA 285 standards, must be obtained directly from the relevant manufacturer.*

Table 2* Continued

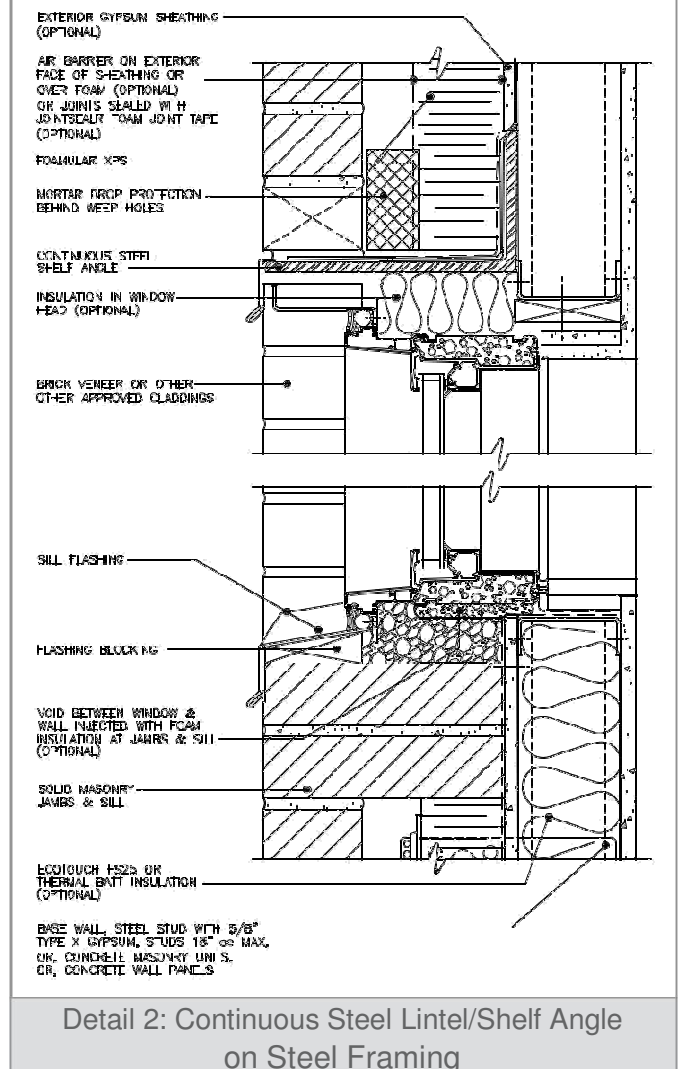
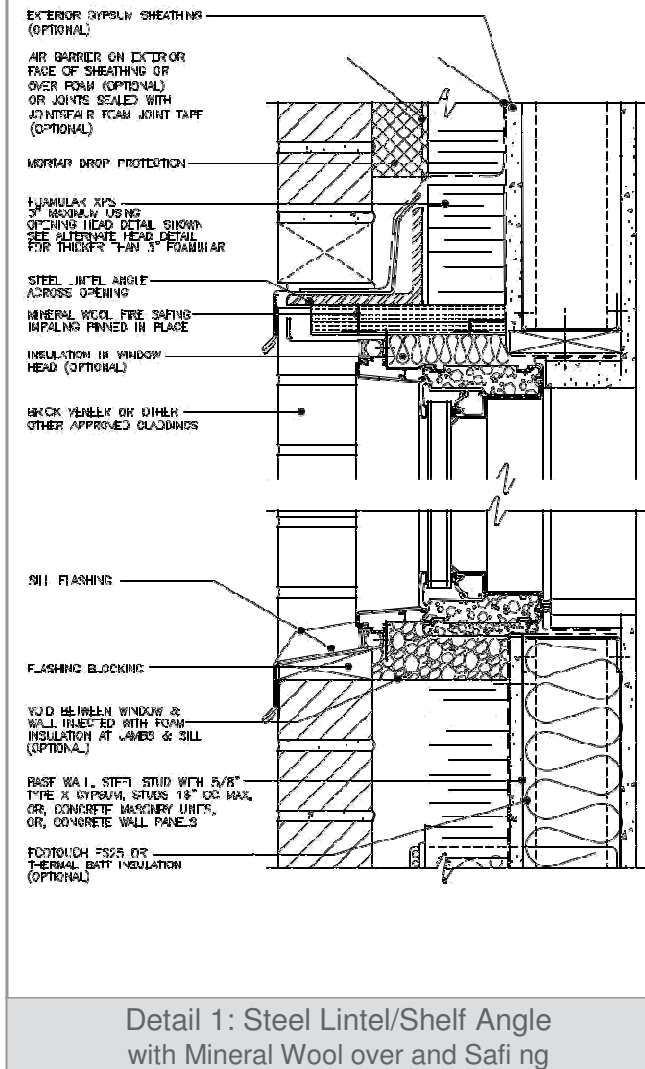
Wall Component	Material Options
Air & Weather Resistive Barrier over Continuous Insulation: Select one	
Install in accordance with manufacturers instructions.	<ul style="list-style-type: none"> • None • JointSealR™ Foam Joint Tape, Owens Corning • Tyvek® CommercialWrap®, Dupont • GreenGuard® Max™, Building Wrap, Pactiv
Exterior Cladding, Veneer: Select one	
	<ul style="list-style-type: none"> • Brick Veneer: Nominal 4" thick, clay brick. Veneer anchors, standard types, installed maximum 24" o.c. vertically on each stud, or, continuous ladder tie type if CMU backup is utilized. Maximum 2" air space between continuous insulation and brick. • Concrete Panels: Minimum 2" thick. Maximum 2" air space between continuous insulation and concrete. • Insulated Concrete Sandwich Panels: Minimum 2" thick outer face wythe. • Concrete Masonry Units: Minimum 4" thick. Maximum 2" air space between continuous insulation and CMU. • Stone Veneer: Minimum 2" thick, limestone or natural stone veneer, or minimum 1½" thick manufactured stone veneer. May use any standard closed joint installation technique such as ship-lap, etc. • Terracotta Panels: Terracotta cladding system, minimum 1¼" thick, with closed joint installation such as ship-lap, etc. • Stucco: Minimum 7/8" thick, exterior cement plaster and lath. Lath mechanically attached. • EIFS: Polymer Modified (PM) Exterior Insulation Finish Systems, with XPS base. Details as NFPA 285 tested and specified by PM EIFS manufacturer.
Window and Door Opening Details	
See Table 3 for window and door opening details.	<ul style="list-style-type: none"> • Detail 1: Window and door header openings must be fire stopped with mineral safing as shown. Maximum 3" thick FOAMULAR® continuous insulation. • Detail 2: Window and door header openings must be fire stopped with a continuous steel lintel or shelf angle as shown. Maximum 5" thick FOAMULAR® continuous insulation. • Detail 3: Steel stand-off window lintel or shelf angle. The void behind the lintel must be tightly filled with 4 pcf density mineral wool fire safing packed to 25% compression inside standoff shelf angle. Maximum 5" thick FOAMULAR® continuous insulation. • Detail 4: Same condition as detail 3, but, may be located at a floor line as shown. Maximum 5" thick FOAMULAR® continuous insulation. • Jambs and Sill: For details 2, 3 and 4, must be solid masonry returned to the face of the gypsum sheathing or the face of the steel stud if gypsum sheathing is not used. • EIFS: Details as required by EIFS manufacturer. • Stucco: Heads and Jambs must be stucco back wrapped to gypsum sheathing or steel framing.

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Table 3

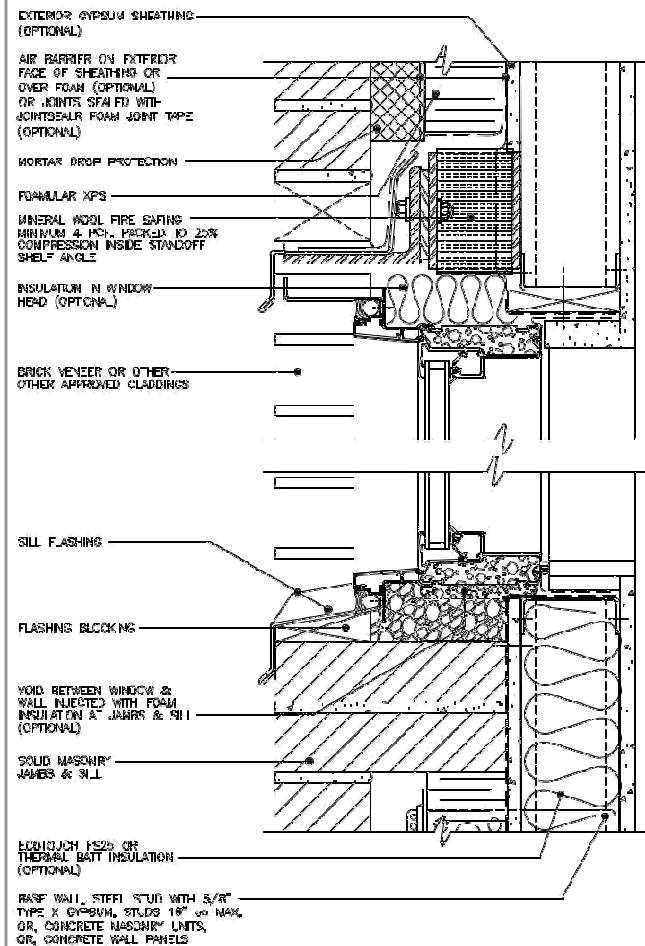
Window and Door Opening Details^{1,2,3}, NFPA 285



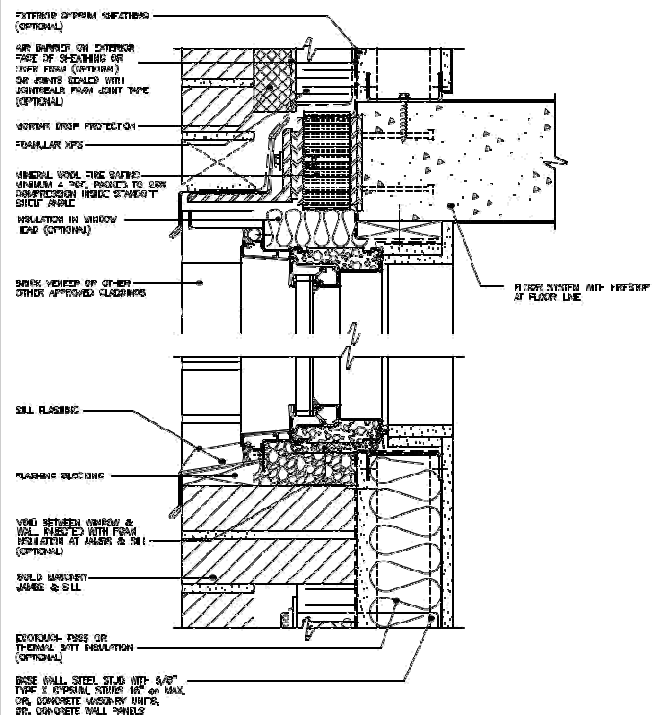
1. The base wall is shown in Table 3, Details 1 through 4, as a steel stud assembly for illustration purposes only. Note that it may be any of the "Base Wall System" options described at the beginning of Table 2.
2. Window unit details as glass type, extruded aluminum shapes and foam filled voids are not critical to NFPA 285 compliance. The actual NFPA 285 test is conducted with no window unit in the opening. However, it is critical to match the approved FOAMULAR® insulation thickness with approved details for the opening head (continuous steel, or, steel with mineral wool fire safing), and, jamb/sill details (not solid in Detail 1, solid masonry in Details 2, 3 and 4).
3. As an option, flash window, door and other exterior penetrations with limited amounts of acrylic, asphalt or butyl based flashing tape, maximum 12" width.

Table 3 Continued

Window and Door Opening Details^{1,2}, NFPA 285



Detail 3: Standoff Lintel/Shelf Angle
on Steel Framing



Detail 4: Standoff Shelf Angle
at Floor Line

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