

APPENDIX A – CATALOGUE MATERIAL DATA SHEETS

CATALOGUE INDEX

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Introduction

Introduction

Appendix A contains the catalogue of material data information sheets for all the details available for this guide. The purpose is to provide this information such that designers will be able to easily reference their project details to a modeled detail within the catalogue or to be able to make estimations based on the information provided. The catalogue is divided into 10 sections, based on construction type:

Catalogue Index	
1.	Window Wall
2.	Conventional Curtain Wall
3.	Unitized Curtain Wall
4.	High Performance Curtain Wall
5.	Steel-Framed Construction
6.	Metal Buildings
7.	Concrete and Mass Masonry Construction
8.	Wood-Frame and Timber Construction
9.	Balconies and Doors
10.	Roofs

Within each section contains a variety of clear field and interface details. The catalogue contains details modeled by Morrison Hershfield Ltd. for this guide, along with previous modeling, including ASHRAE 1365-RP and other proprietary systems.

Each material data sheet is meant to be standalone and contains all the information needed for that particular detail. For instance, Detail 5.2.5 is a balcony slab detail for a steel stud assembly. That data sheet contains the material information for both the slab detail, and the clear field steel stud assembly above and below it. The clear field steel stud assembly material data sheet 5.1.14 is not additionally required to analyze the slab detail.

It should be noted that, as they are standalone, there are not necessarily a matching clear field data sheet for every detail. Additionally, some assemblies shown in the data sheets contain more than one interface detail, so while they are arranged by major detail type (slab, then parapet etc), there may be other interface details contained within it. The thermal results information in each results data sheet in Appendix B is given for all interface details contained within a single assembly detail.

Air Films and Contact Resistances

In thermal modeling, beyond the assembly material properties, assemblies are also affected by air films and contact resistances. From ASHRAE 1365-RP, the modeling was extensively calibrated with air films and contact resistances and is shown below in Tables A.1 and A.2. More information on assumptions and other modeling parameters can be found in Section 5 of ASHRAE 1365-RP.

Table A.1. Air film resistances

Location	Description of Condition	Heat Transfer Coefficient Btu/h·ft ² ·°F (W/m ² ·K)
Exterior wall surface with generic cladding	Heat transfer coefficient to account for vented air space and cladding; surface is not directly exposed to wind	1.5 (8.3)
Exterior brick veneer and Precast Concrete surface	Surface exposed to 15 mph (24 km/h) wind	6.0 (34)
Exterior roof surface	Horizontal roof surface exposed to 15 mph (24 km/h) wind	6.0 (34)
Interior wall surface	Vertical surface exposed to indoor air and surfaces	1.5 (8.3)
Interior ceiling surface	Horizontal surface exposed to indoor air and surfaces with upward heat flow	1.6 (9.3)
Interior floor surface	Horizontal surface exposed to indoor air and surface with downward heat flow	1.1 (6.1)

Table A.2. Contact resistances

Location	Contact Resistance hr·ft ² ·°F /Btu (m ² ·°C/W)
Steel flanges at sheathing interfaces	0.17 (0.030)
Insulation interfaces	0.057 (0.010)
Steel to concrete interfaces	0.057 (0.010)
Steel to steel interfaces	0.011 (0.0020)

Material Data Sheets

Each material data sheet contains several pieces of information. An example material data sheet is shown below with a description for each section following.

Building Envelope Thermal Bridging Guide

1 Detail 1.1.1 | Window Wall System - 5 Stud Cavity Insulation | **2** Panel Clear Wall with No Interior

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m·K)	Nominal Resistance hr-ft ² -°F/Btu (m ² ·K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg·K)	
1	Interior Film (right side) ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-	
2	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.6 (445)	0.45 (1880)	
3	Steel Sheet Connected to Stud	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)	
4	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)	
5	Air in Stud Cavity	2 5/8" (62)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)	
6	1 5/8" x 1 5/8" Steel Stud with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)	
7	Aluminum Window Wall Spenrd System with Insulated Backpan: thermally broken frame ²						
8	Backpan Insulation	Varies	-	R-8.4 (1.46 RSI) to R-16.8 (2.96 RSI)	4 (64)	0.20 (800)	
9	Aluminum Window Wall Vision System: thermally broken frame, double glazed IGU U _{glaz} 0.31 Btu/hr ft ² ·°F (1.77 W/m ² ·K) ³						
10	Interior Film (left side) ¹	-	-	R-0.2 (0.03 RSI)	-	-	

¹ From table 1, p. 26.1 of 2009 ASHRAE Handbook - Fundamentals depending on surface orientation
² Conductivity of air spaces within framing was found using ISO 100077-2

A. 1.1

1) Detail Name

Each detail is named based on position within the catalogue index. The first number 1.x.x indicates the construction type according to the main index (ie 1 is Window-Wall, 5 is Steel-Framed, 8 is Wood-Framed and Timber, etc). The second number x.1.x indicates detail group (ie. 1 is clear field values, 2 may be all slabs and 3 may be all parapets). The last number x.x.1. is simply the order in which the detail appears within that grouping (ie slab detail 1, slab detail 2 etc).

2) Detail Description

Each material data sheet has a basic description that denotes the construction system or type, along with additional detail identifiers such as limited dimension information, transmittance type and insulation locations

3) Detail Image

An isometric image of each detail is provided that includes cut away sections to view interior portions of the assembly. The images include dimensional information on the modeled assembly, along with ID numbers of key components. Each image is shown from the exterior side.

4) Close Up Image

Some material data sheets also contain close up images for further information on key components in an assembly. These callouts are usually from the same angle as the full assembly, however when an interior feature cannot be seen from that angle, the close up image may indicate it is from an interior view.

5) Material Information

For each component ID number given in the Detail Image, the material data sheets contain a description, thickness, thermal conductivity, nominal resistance (if applicable), material density and specific heat. For full systems that may contain multiple parts, such as window wall, a general description is given. Material properties were taken from standard tabulated values (typically measured at 24°C or 75°F).

6) Additional References

References for the conductivity of air spaces and other information are provided underneath the material tables.

7) PDF Version

With the PDF version of the catalogue, each entry in the catalogue index is linked to each construction section. Within each section, there is an additional index for the details, which are also linked directly to each detail data sheet. To return to the index, simply click on the Building Envelope Thermal Bridging Guide header.

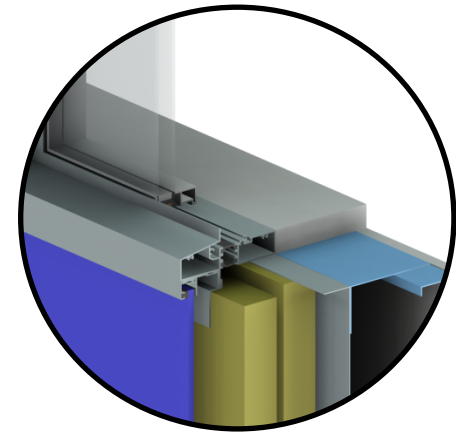
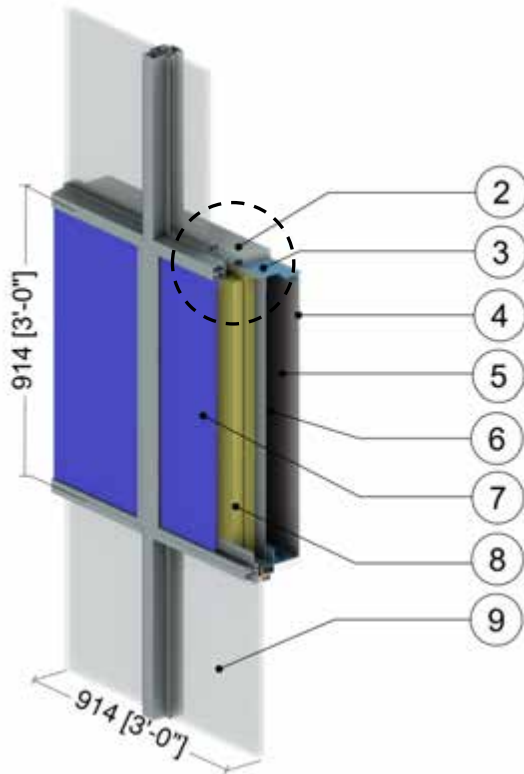
1.0 Window Wall

Detail 1.1.1	A.1.1
Window Wall System – Spandrel Panel Clear Wall with No Interior Stud Cavity Insulation	
Detail 1.1.2	A.1.2
Window Wall System – Spandrel Panel Clear Wall with Interior Spray Foam Insulation	
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Window Wall System – Full Height Insulated Frame at Slab Intersection with Improved Spandrel Bypass & No Interior Stud Cavity Insulation	
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Detail 1.5.2	A.1.18
Window Wall System with Insulated Spandrel Panel – Insulated Interior Concrete Wall and Intermediate Floor Intersection	

Detail 1.1.1

Window Wall System – Spandrel Panel Clear Wall with No Interior Stud Cavity Insulation



Mullion Detail

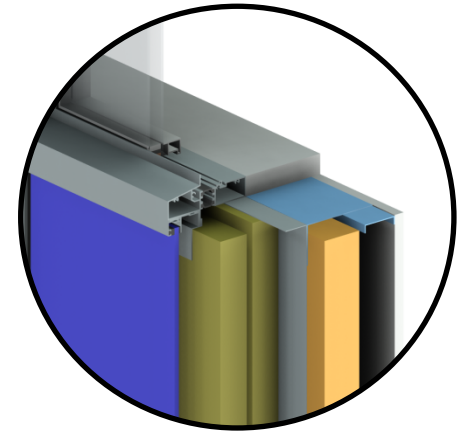
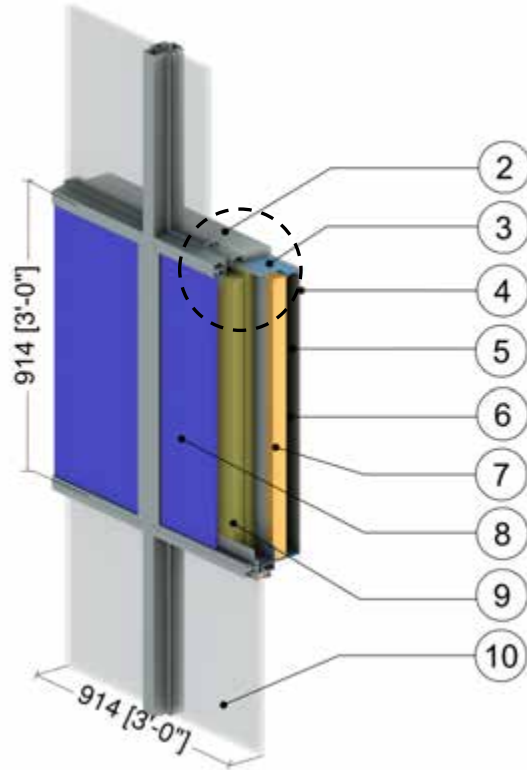
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
3	Steel Sheet Connected to Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
5	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
6	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Aluminum Window Wall Spandrel System with Insulated Backpan: thermally broken frame, no insulation in mullions ²					
8	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
9	Aluminum Window Wall Vision System: thermally broken frame ² , double glazed IGU U _{CoG} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 1.1.2

Window Wall System – Spandrel Panel Clear Wall with Interior Spray Foam Insulation



Mullion Detail

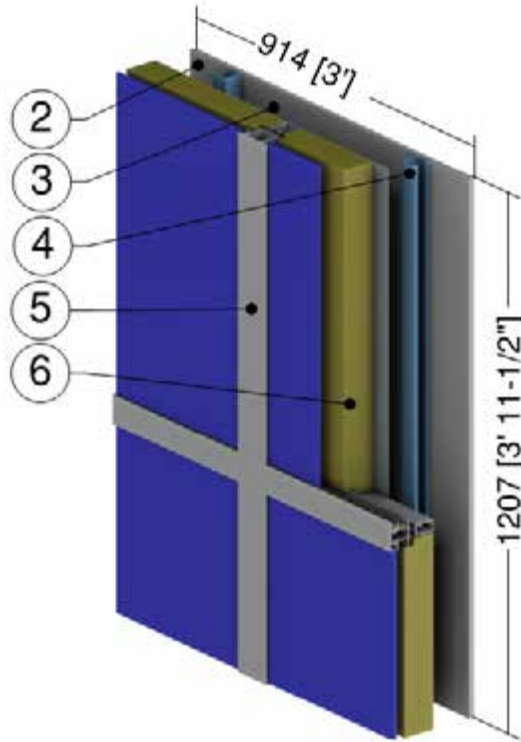
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
3	Metal Sheet Connected to Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
5	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
6	1 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Continuous Spray Foam Insulation	2" (51)	0.17 (0.024)	R-12 (2.11 RSI)	2.8 (39)	0.35 (1470)
8	Aluminum Window Wall Spandrel System with Insulated Backpan: thermally broken frame, no insulation in mullions ²					
9	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
10	Aluminum Window Wall Vision System: thermally broken frame ² , double glazed IGU U _{COG} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 10077-2

Detail 1.1.3

Window Wall System – Full Height Spandrel with no Interior Stud Cavity Insulation



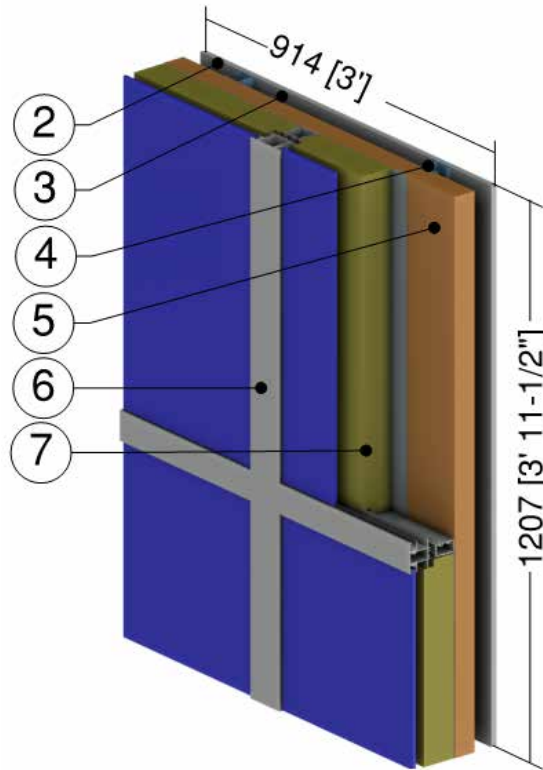
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Full Height Aluminum Window Wall Spandrel System with Insulated Backpan: thermally broken frame, no insulation in mullions ²					
6	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 RSI to 2.96 RSI)	4 (64)	0.20 (850)
7	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 1.1.4

Window Wall System – Full Height Spandrel with Interior Spray Foam Insulation



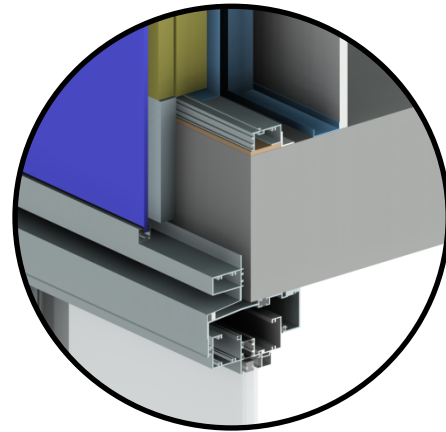
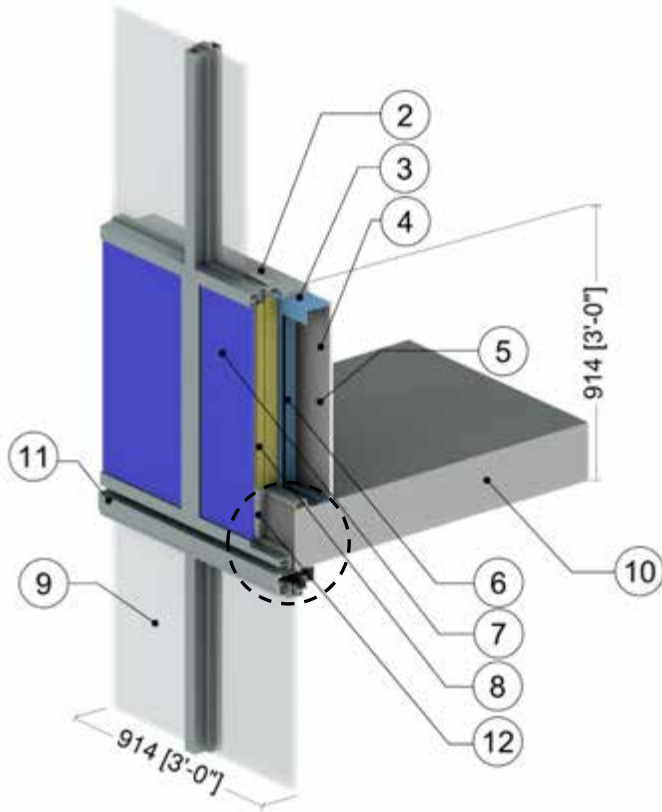
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Continuous Spray Foam Insulation	2" (51)	0.17 (0.024)	R-12 (2.11 RSI)	2.8 (39)	0.35 (1470)
6	Full Height Aluminum Window Wall Spandrel System with Insulated Backpan: thermally broken frame, no insulation in mullions ²					
7	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 RSI to 2.96 RSI)	4 (64)	0.20 (850)
8	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 1.2.1

Window Wall System – Intermediate Floor Intersection with Spandrel Bypass and no Interior Stud Cavity Insulation



Bypass Detail with Deflection Header and 1/2" (12mm) Air Gap Behind Horizontal Mullion

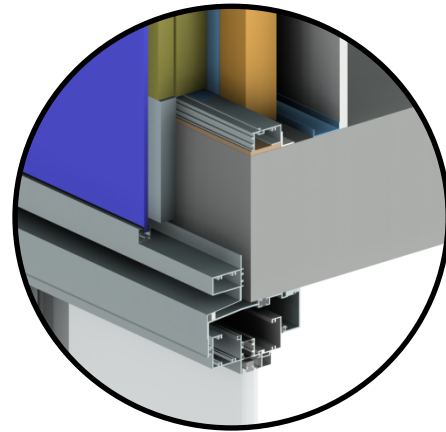
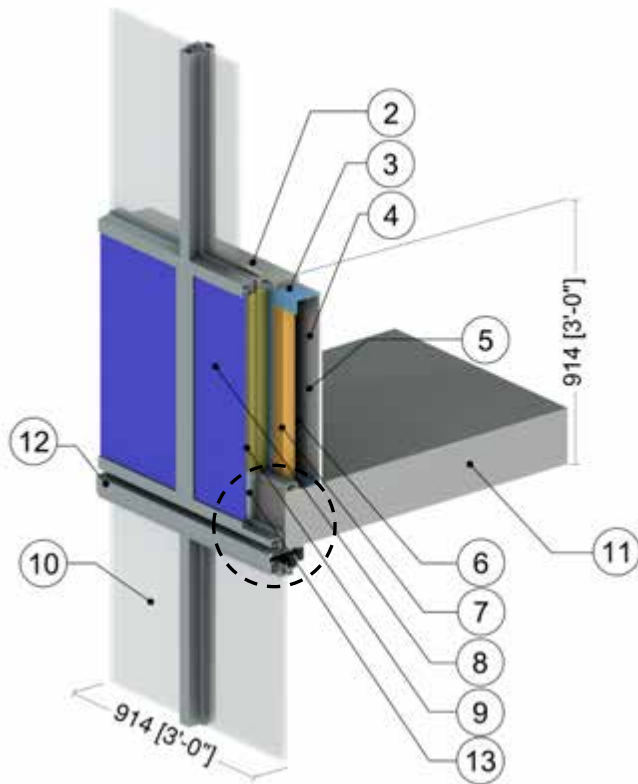
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
3	Steel Sheet Connected to Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
5	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
6	1 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Aluminum Window Wall Spandrel System with Insulated Backpan: thermally broken frame, no insulation in mullions ²					
8	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
9	Aluminum Window Wall Vision System: thermally broken frame ² , double glazed IGU U _{COG} = 0.32 BTU/hr-ft ² -°F (1.82 W/m ² K)					
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Aluminum Flashing	14 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
12	Bypass Insulation	1" (25)	0.20 (0.029)	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 1.2.2

Window Wall System – Intermediate Floor Intersection with Spandrel Bypass and Interior Spray Foam Insulation



Bypass Detail with Deflection Header and 1/2" (12mm) Air Gap Behind Horizontal Mullion

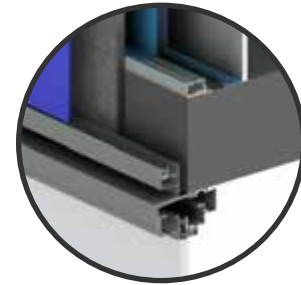
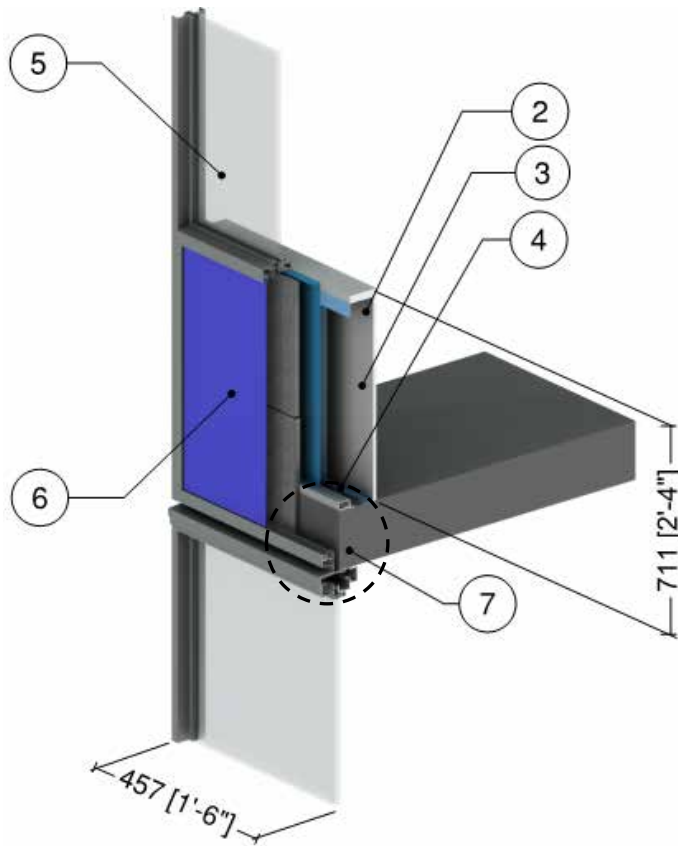
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
3	Steel Sheet Connected to Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
5	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
6	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Continuous Spray Foam Insulation	2" (51)	0.17 (0.024)	R-12 (2.11 RSI)	2.8 (39)	0.35 (1470)
8	Aluminum Window Wall Spandrel System with Insulated Backpan: thermally broken frame, no insulation in mullions ²					
9	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
10	Aluminum Window Wall Vision System: thermally broken frame ² , double glazed IGU U _{CoG} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Aluminum Flashing	14 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
13	Bypass Insulation	1" (25)	0.20 (0.029)	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

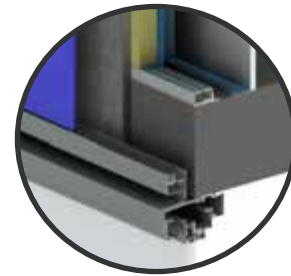
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 1.2.3

Window Wall System with 3' x 3' Spandrel Section – AIM Applications at Intermediate Floor Intersection



G1 – 3/4" (19 mm) AIM adhered to Frame without Backpan Insulation



G2 – 3/4" (19 mm) AIM adhered to Frame with 2" (51 mm) Backpan Insulation

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Window Wall Vision Section: double glazed IGU with silicone warm edge spacer ²					
6	Aluminum Window Wall Spandrel Section with varied insulation (see G1 to G2 above) ^{2,3}					
7	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

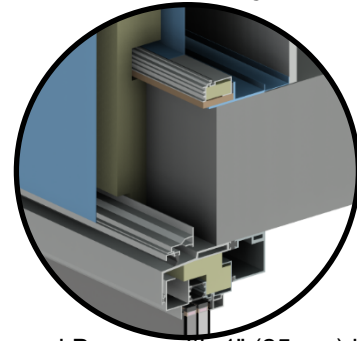
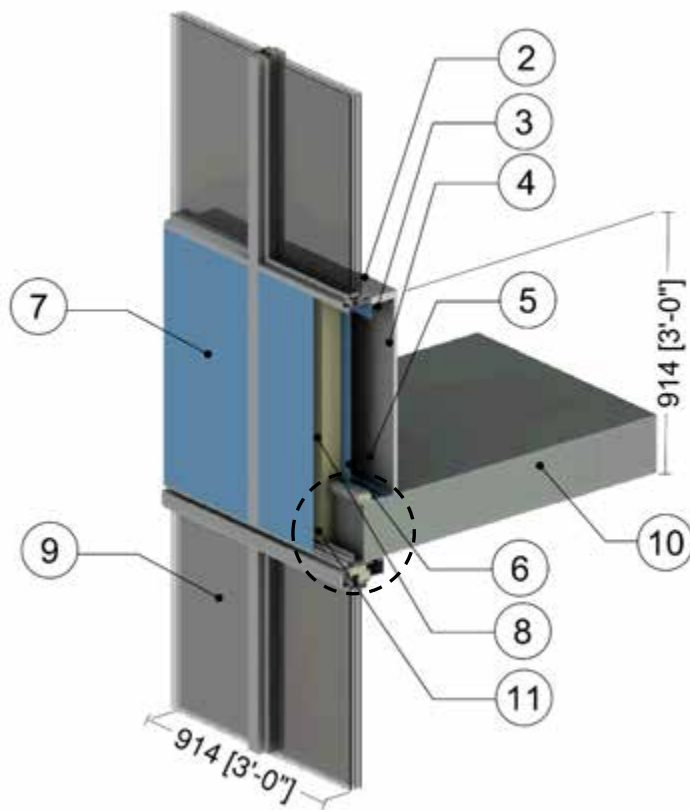
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

³ For a window to wall ratio of 40%

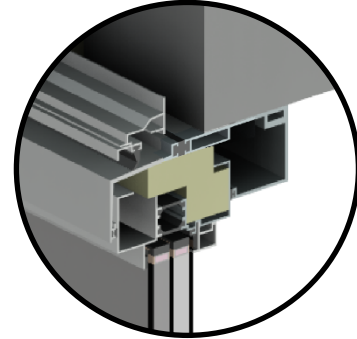
AIM = Architectural Insulation Module

Detail 1.2.4

Window Wall System – Triple Glazed Insulated Frame at Slab Intersection with Improved Spandrel Bypass & No Interior Stud Cavity Insulation



A. Improved Bypass with 1" (25mm) insulation behind horizontal mullion, *Standard* Deflection Header Thermal Break Placement



B. Improved Bypass with 1" (25mm) insulation behind horizontal mullion, and Deflection Header Thermal Break in line with Bypass Insulation

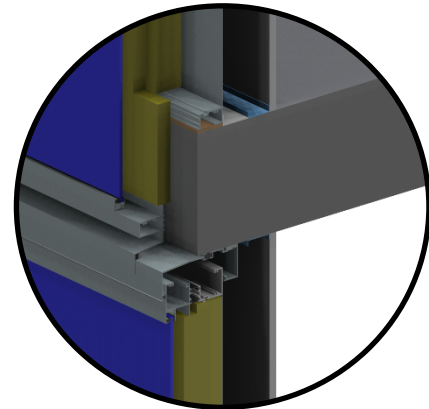
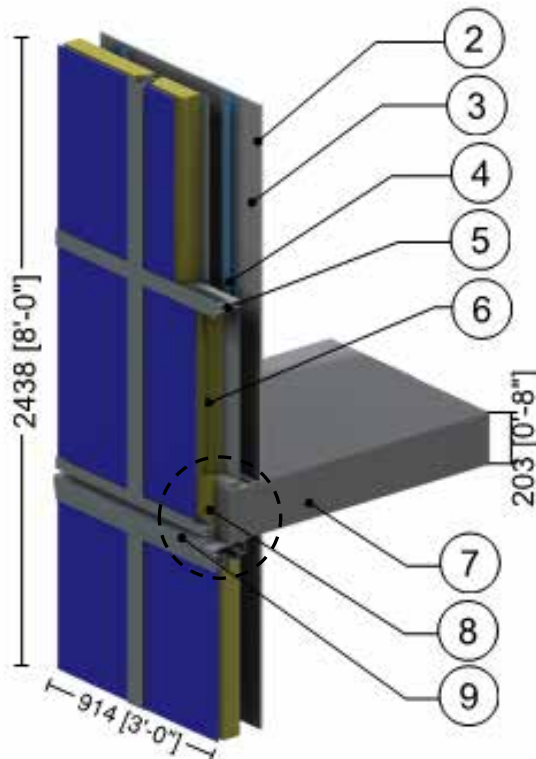
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
3	Steel Sheet Connected to Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
5	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
6	3 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Aluminum Window Wall Spandrel System with Insulated Backpan: thermally broken frame with insulation within mullions, additional bypass insulation and two deflection header thermal break scenarios, A) Standard, B) Inline with Slab Insulation ²					
8	Backpan Insulation	3" (76)	0.24 (0.034)	R-12.6 (2.22 RSI)	4 (64)	0.20 (850)
9	Aluminum Window Wall Vision System: thermally broken frame ² , triple glazed IGU U _{COG} = 0.14 BTU/hr·ft ² ·°F (0.81 W/m ² K)					
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Bypass Insulation	2" (51)	0.24 (0.034)	R-8.4 (1.48 RSI)	4 (64)	0.20 (850)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 1.2.5

Window Wall System – Full Height Spandrel at Slab Intersection with Spandrel Bypass & No Interior Stud Cavity Insulation



Bypass Detail with Deflection Header and 1/2" (12mm) Air Gap Behind Horizontal Mullion

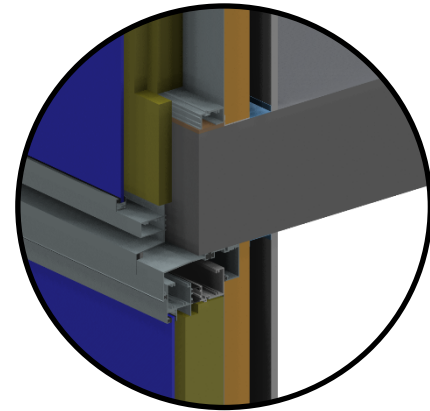
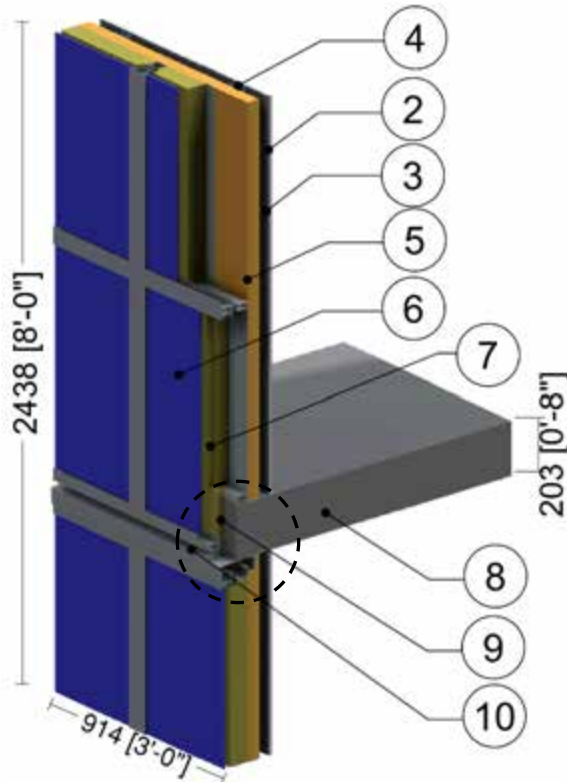
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Full Height Aluminum Window Wall Spandrel System with Insulated Backpan: thermally broken frame, no insulation in mullions ²					
6	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
7	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Bypass Insulation	1" (25)	0.20 (0.029)	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
9	Aluminum Flashing	14 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 1.2.6

Window Wall System – Full Height Spandrel at Slab Intersection with Spandrel Bypass & Interior Spray Foam Insulation



Bypass Detail with Deflection Header and 1/2" (12mm) Air Gap Behind Horizontal Mullion

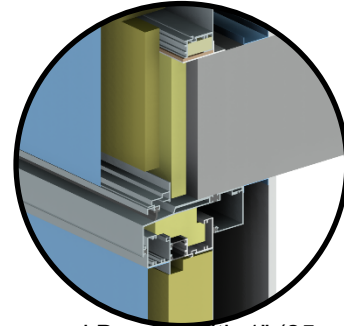
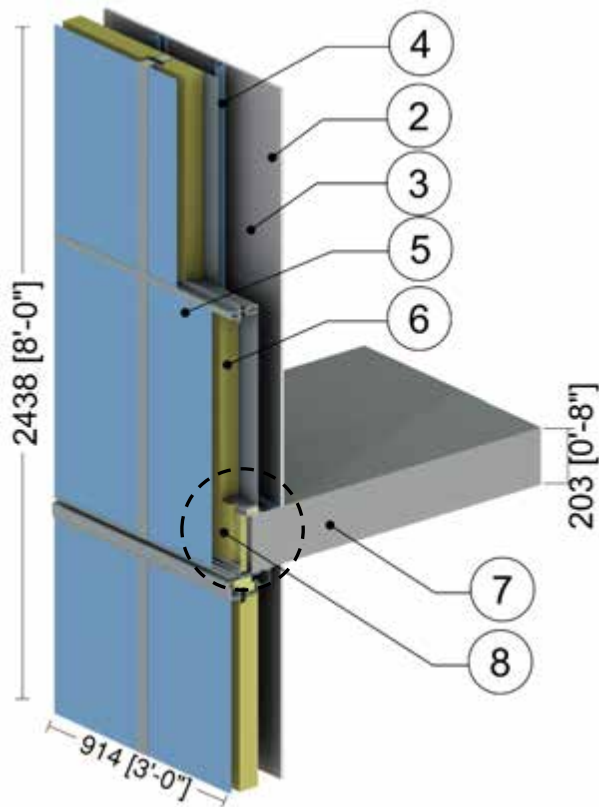
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Continuous Spray Foam Insulation	2" (51)	0.17 (0.024)	R-12 (2.11 RSI)	2.8 (39)	0.35 (1470)
6	Full Height Aluminum Window Wall Spandrel System with Insulated Backpan: thermally broken frame, no insulation in mullions ²					
7	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Bypass Insulation	1" (25)	0.20 (0.029)	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
10	Aluminum Flashing	14 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

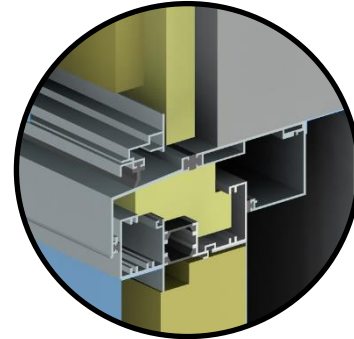
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 1.2.7

Window Wall System – Full Height Insulated Frame at Slab Intersection with Improved Spandrel Bypass & No Interior Stud Cavity Insulation



A. Improved Bypass with 1" (25mm) insulation behind horizontal mullion, *Standard* Deflection Header Thermal Break Placement



B. Improved Bypass with 1" (25mm) insulation behind horizontal mullion, and Deflection Header Thermal Break in line with Bypass Insulation

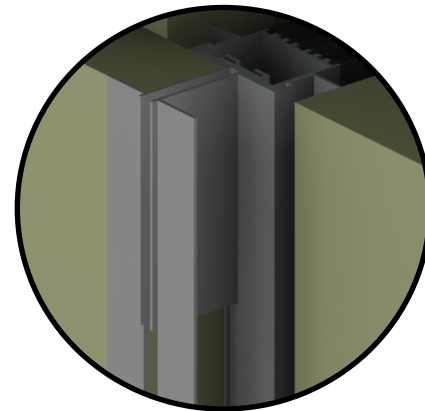
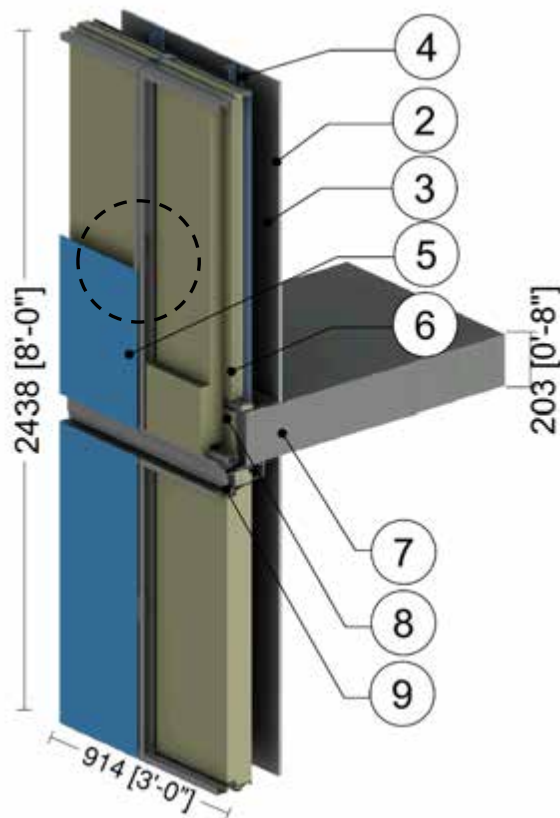
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Full Height Aluminum Window Wall Spandrel System with Insulated Backpan: thermally broken frame with insulation within mullions, additional bypass insulation and two deflection header thermal break scenarios, A) Standard, B) Inline with Slab Insulation ²					
6	Backpan Insulation	3" (76)	0.24 (0.034)	R-12.6 (2.22 RSI)	4 (64)	0.20 (850)
7	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Bypass Insulation	2" (51)	0.24 (0.034)	R-8.4 (1.48 RSI)	4 (64)	0.20 (850)
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 1.2.8

Window Wall System – Full Height Insulated Frame at Slab Intersection with Hybridized Clipped Spandrel & No Interior Stud Cavity Insulation



Spandrel Clip and Insulation outboard of vertical mullions

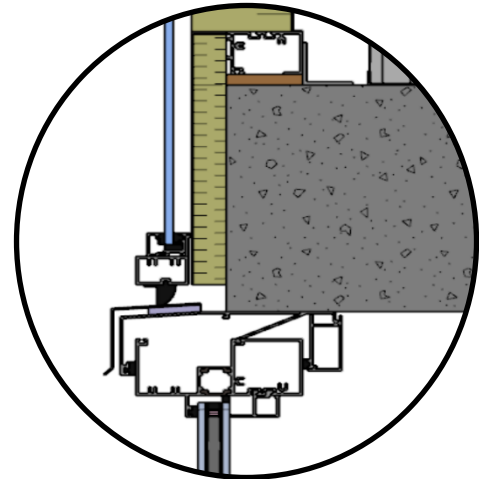
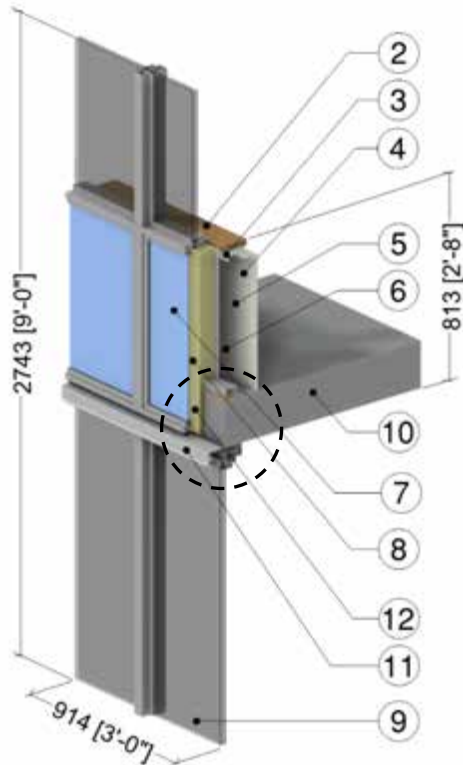
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Full Height Aluminum Window Wall Spandrel System with Insulated Backpan: thermally broken frame with hybrid clip system on mullions holding up metal panel, allowing for extended amounts of insulation in the backpan and 1" of insulation in front of the mullions ²					
6	Backpan Insulation	5.5" (140)	0.24 (0.034)	R-23.1 (4.07 RSI)	4 (64)	0.20 (850)
7	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Bypass Insulation	5.25" (133)	0.24 (0.034)	R-22.1 (3.88 RSI)	4 (64)	0.20 (850)
9	Aluminum Flashing	14 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 1.2.9

Window Wall System with Uprand Spandrel Section – Intermediate Floor Intersection with Spandrel Bypass and no Interior Stud Cavity Insulation



Bypass Detail with Deflection Header

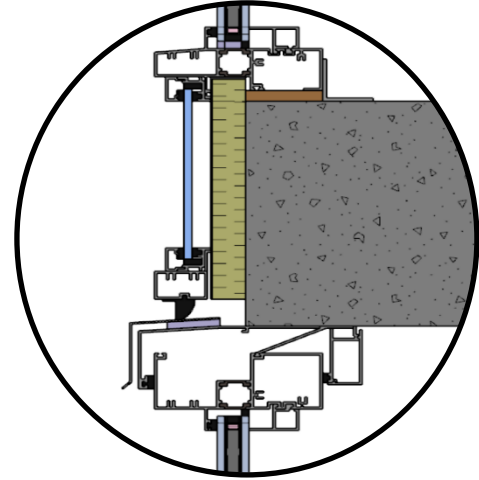
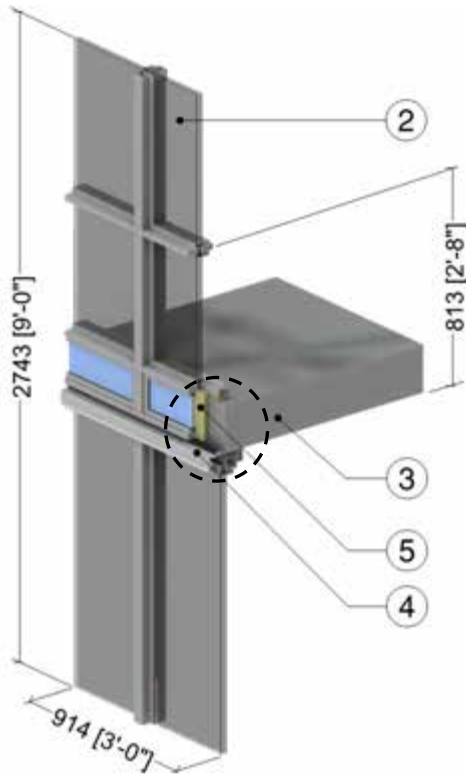
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Wood Sill	1" (25)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
3	Steel Track Connected to Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
5	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
6	1 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Aluminum Window Wall Spandrel System with Insulated Backpan: thermally broken frame, no insulation in mullions ²					
8	Backpan Insulation	3" (76)	0.24 (0.034)	R-12.6 (2.22 RSI)	1.8 (28)	0.29 (1220)
9	Aluminum Window Wall Vision System: thermally broken frame ² , double glazed IGU U _{COG} = 0.242 BTU/hr·ft ² ·°F (1.37 W/m ² K)					
10	Concrete Floor Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Aluminum Flashing	14 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
12	Bypass Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	1.8 (28)	0.29 (1220)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 1.2.10

Window Wall System with Full Height Vision Section – Intermediate Floor Intersection with Spandrel Bypass and no Interior Stud Cavity Insulation



Bypass Detail with Deflection Header

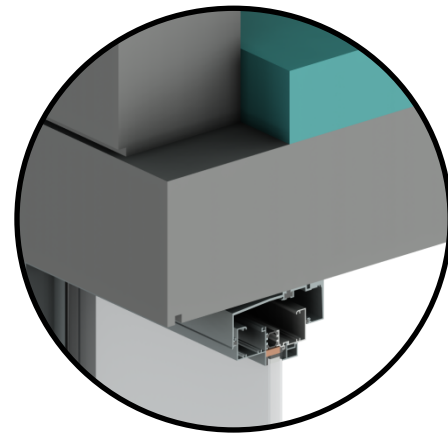
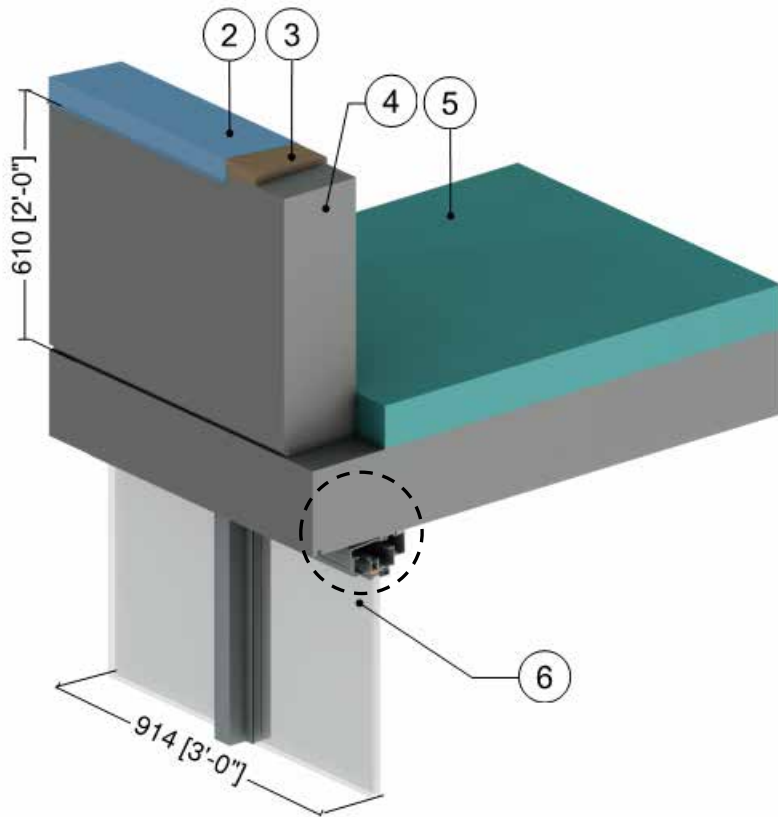
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Aluminum Window Wall Vision System: thermally broken frame ² , double glaze IGU U _{COG} = 0.242 BTU/hr.ft ² ·°F (1.37 W/m ² K)					
3	Concrete Floor Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
4	Aluminum Flashing	14 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
5	Bypass Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	1.8 (28)	0.29 (1220)
6	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 1.3.1

Window Wall System – Uninsulated Concrete Parapet & Roof Intersection



Parapet Intersection Detail

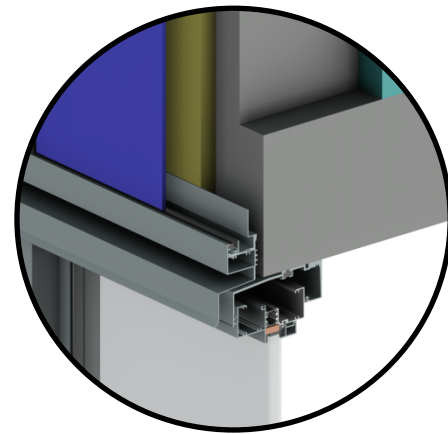
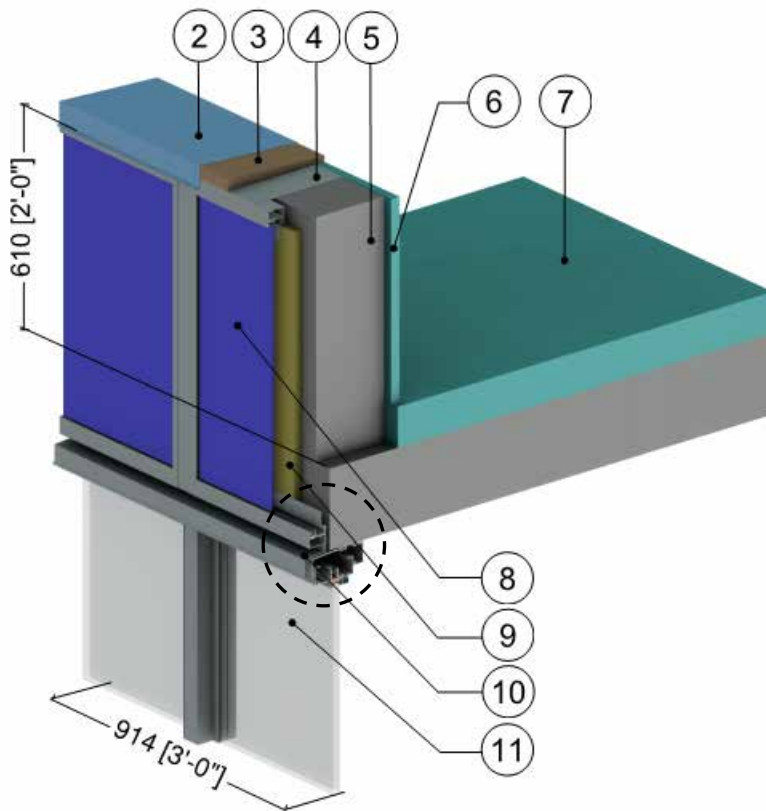
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Parapet Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
3	Wood Blocking	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
4	Concrete Slab and Parapet	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
5	Roof Insulation	4" (102)	0.20 (0.029)	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
6	Aluminum Window Wall Vision System: thermally broken frame ² , no insulation in mullions, double glazed IGU U _{COG} = 0.32 BTU/hr-ft ² -°F (1.82 W/m ² K)					
7	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 1.3.2

Window Wall System – Partially Insulated Concrete Parapet & Roof Intersection



Parapet Intersection Detail

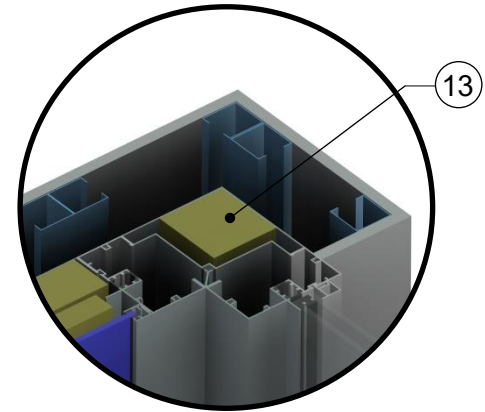
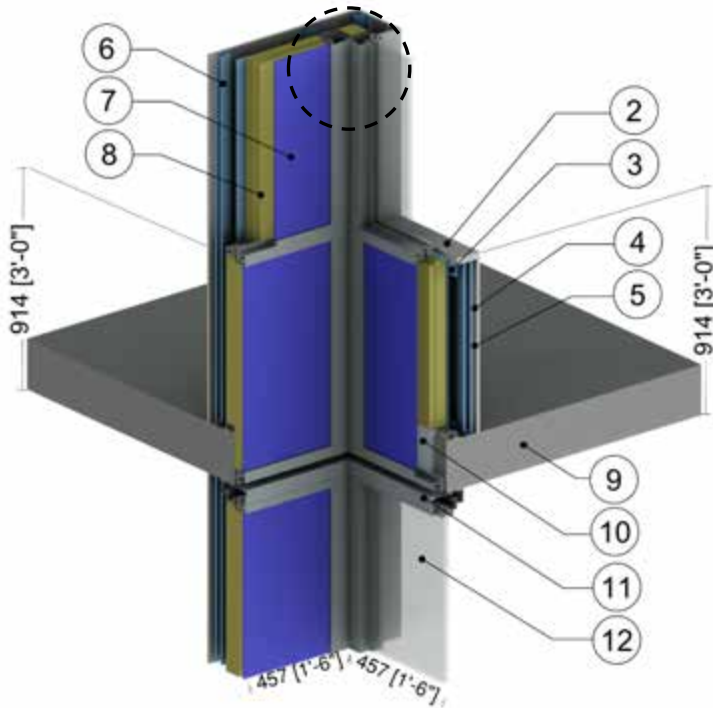
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Parapet Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
3	Wood Blocking	1 1/4" (30)	0.63 (0.09)	-	27.8 (445)	0.45 (1880)
4	Steel Connector Plate	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Concrete Slab and Parapet	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Parapet Bypass Insulation	1" (25)	0.20 (0.029)	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
7	Roof Insulation	4" (102)	0.20 (0.029)	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
8	Aluminum Window Wall Spandrel System with Insulated Backpan: thermally broken frame, no insulation in mullions ²					
9	Window Wall Mineral Wool Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
10	Aluminum Flashing	14 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
11	Aluminum Window Wall Vision System: thermally broken frame ² , no insulation in mullions, double glazed IGU U _{COG} = 0.32 BTU/hr-ft ² -°F (1.82 W/m ² K)					
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 1.4.1

Window Wall System – Inside Corner with Spandrel to Vision Transition & No Interior Stud Cavity Insulation



Corner Post Detail

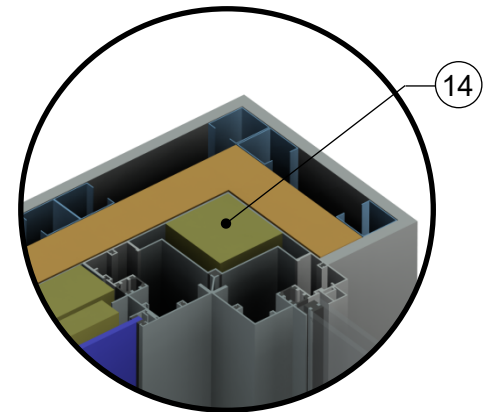
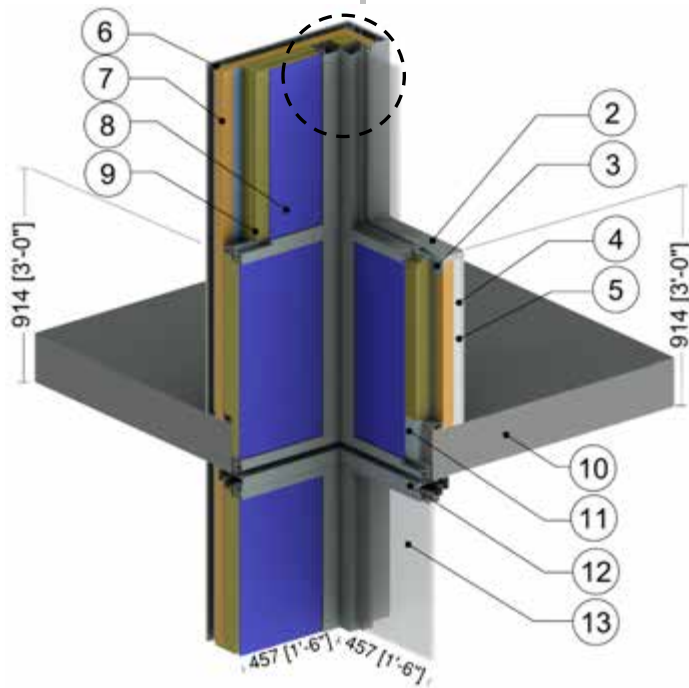
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
3	Steel Sheet Connected to Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
5	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
6	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Full Height Aluminum Window Wall Spandrel System with Insulated Backpan: thermally broken frame, no insulation in mullions ²					
8	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Bypass Insulation	1" (25)	0.20 (0.029)	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
11	Aluminum Flashing	14 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
12	Aluminum Window Wall Vision System: thermally broken frame ² , no insulation in mullions, double glazed IGU U _{COG} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
13	Post Insulation	3" (76)	0.24 (0.034)	R-12.6 (2.22 RSI)	4 (64)	0.20 (850)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 1.4.2

Window Wall System – Inside Corner with Spandrel to Vision Transition & Interior Spray Foam Insulation



Corner Post Detail

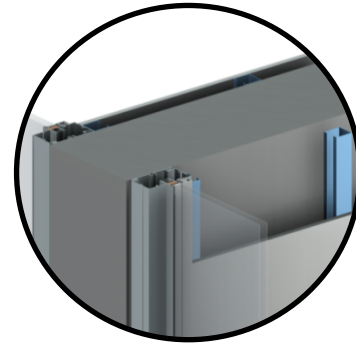
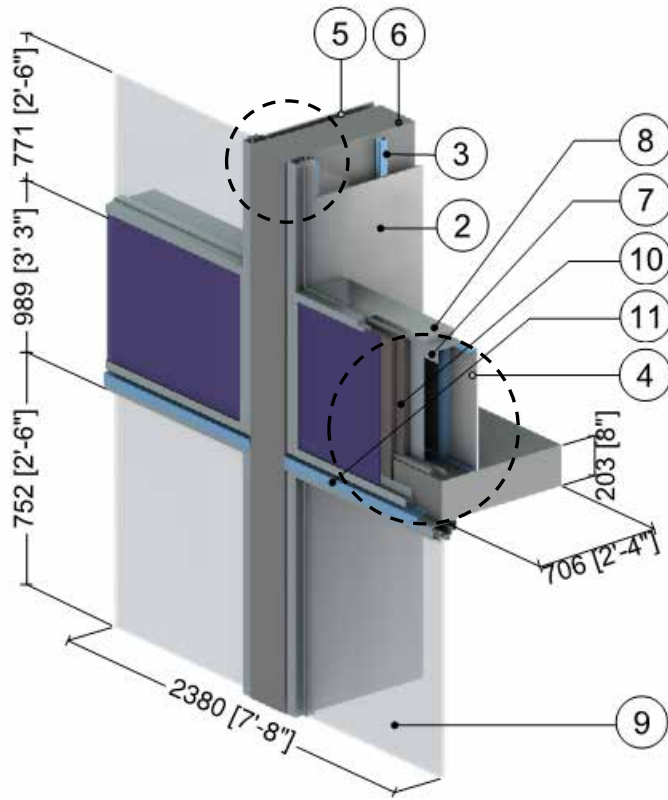
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
3	Steel Sheet Connected to Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
5	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
6	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Continuous Spray Foam Insulation	2" (51)	0.17 (0.024)	R-12 (2.11 RSI)	2.8 (39)	0.35 (1470)
8	Full Height Aluminum Window Wall Spandrel System with Insulated Backpan: thermally broken frame, no insulation in mullions ²					
9	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Bypass Insulation	1" (25)	0.20 (0.029)	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
12	Aluminum Flashing	14 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
13	Aluminum Window Wall Vision System: thermally broken frame ² , no insulation in mullions, double glazed IGU U _{COG} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
14	Post Insulation	3" (76)	0.24 (0.034)	R-12.6 (2.22 RSI)	4 (64)	0.20 (850)
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

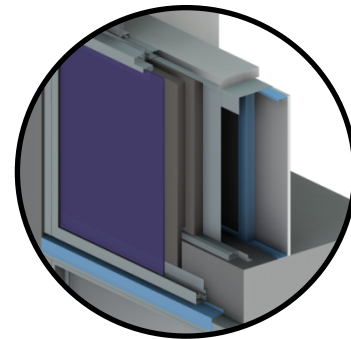
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 1.5.1

Window Wall System with Insulated Spandrel Panel – Uninsulated Interior Concrete Wall and Intermediate Floor Intersection



Concrete Wall Intersection Detail with no Interior Insulation



Spandrel Bypass Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Sill Stud Cavity	3 5/8" (92)	-	R-0.9 (RSI-0.16)	0.075 (1.2)	0.24 (1000)
5	Air in Partition Wall Cavity	1 5/8" (41)	-	R-0.9 (RSI-0.16)	0.075 (1.2)	0.24 (1000)
6	Concrete Wall/Floor Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Steel Sheet Connected to Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Aluminum Window Wall Vision System: thermally broken frame ² , no insulation in mullions, double glazed IGU U _{COG} = 0.32 BTU/hr-ft ² -°F (1.82 W/m ² K)					
10	Backpan insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
11	Aluminum Flashing	14 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
12	Exterior Air Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

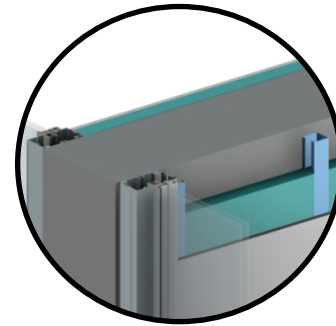
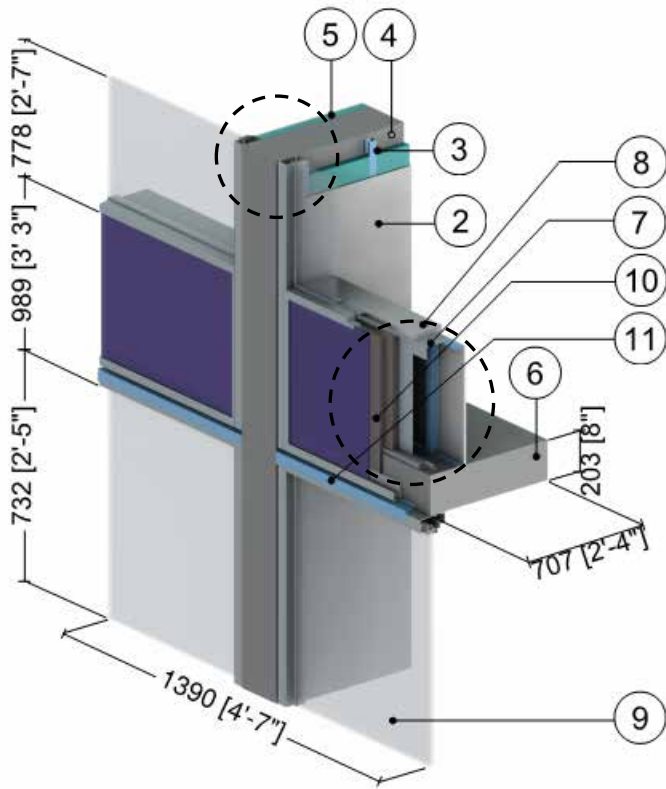
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

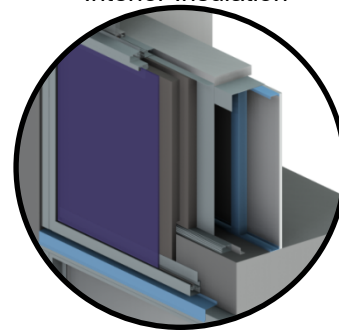


Detail 1.5.2

Window Wall System with Insulated Spandrel Panel – Insulated Interior Concrete Wall and Intermediate Floor Intersection



Interior Concrete Wall Intersection Detail with Interior Insulation



Spandrel Bypass Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Sill Stud Cavity	3 5/8" (92)	-	R-0.9 (RSI-0.16)	0.075 (1.2)	0.24 (1000)
5	Rigid Insulation	1" (25)	-	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
6	Concrete Wall/Floor Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Steel Sheet Connected to Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Aluminum Window Wall Vision System: thermally broken frame ² , no insulation in mullions, double glazed IGU U _{COG} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
10	Backpan insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
11	Aluminum Flashing	14 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

2.0 Conventional Curtain Wall

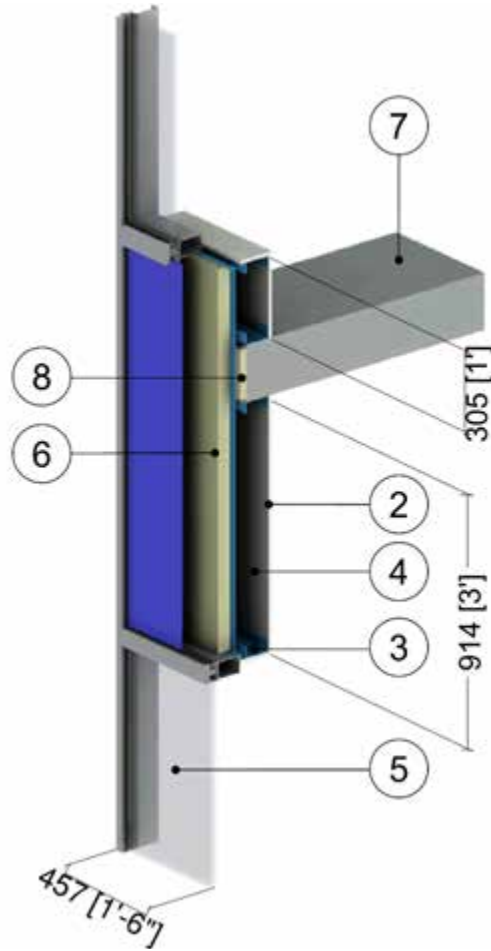
Detail 2.1.1	A.2.1
Conventional Curtain Wall System with Insulated Spandrel Panel and 3 5/8" x 1 5/8" Steel Stud (16" o.c.) – Intermediate Floor Intersection & No Interior Insulation in Stud Cavity	
Detail 2.1.2	A.2.2
Conventional Curtain Wall System with Insulated Spandrel Panel and 3 5/8" x 1 5/8" Steel Stud (16" o.c.) – Intermediate Floor Intersection & Spray Foam Insulation in Stud Cavity	
Detail 2.1.3	A.2.3
Conventional Curtain Wall System with Vertical and Horizontal Pressure Plates and 5' x 5' Spandrel Section – Insulated Metal Backpan and Intermediate Floor Intersection	
Detail 2.1.4	A.2.4
Conventional Curtain Wall System with Vertical and Horizontal Pressure Plates and 5' x 5' Spandrel Section – AIM Applications and Intermediate Floor Intersection	
Detail 2.1.5	A.2.5
Conventional Curtain Wall System with Vertical and Horizontal Pressure Plates and 5' x 5' Spandrel Section – Insulated Metal Backpan and Intermediate Floor Intersection	
Detail 2.1.6	A.2.6
Conventional Curtain Wall System with 5' x 5' Spandrel Section – Alternative Glazing Methods and Intermediate Floor Intersection	
Detail 2.1.7	A.2.7
Conventional Curtain Wall System with Vertical and Horizontal Pressure Plates and 5' x 5' Spandrel Section – Insulated Backpan and Improved Glazing at Intermediate Floor Intersection	
Detail 2.1.8	A.2.8
Conventional Curtain Wall System with Vertical and Horizontal Pressure Plates and 5' x 5' Spandrel Section – AIM Applications and Improved Glazing at Intermediate Floor Intersection	
Detail 2.1.9	A.2.9
Conventional Curtain Wall System with Vertical and Horizontal Pressure Plates – Intermediate Mullion and 5' x 5' Spandrel Section – Insulated Backpan and Intermediate Floor Intersection	
Detail 2.1.10	A.2.10
Conventional Curtain Wall System with Vertical and Horizontal Pressure Plates – Intermediate Mullion and 5' x 5' Spandrel Section – AIM Applications and Intermediate Floor Intersection	

Detail 2.1.11	A.2.11
Conventional Curtain Wall System with Insulated Spandrel Panel and 3 5/8" x 1 5/8" Steel Stud (16" o.c.) – Slab Intersection & Spray Foam Insulation in Stud Cavity with Thermal Break Under Stud Cavity and at Anchors	
Detail 2.1.12	A.2.12
Conventional Curtain Wall System with Insulated Spandrel Panel and 3 5/8" x 1 5/8" Steel Studs (16" o.c.) – Slab Intersection & No Metal Back Pan	
Detail 2.1.13	A.2.13
Conventional Curtain Wall System with Insulated Spandrel Panel and 3 5/8" x 1 5/8" Steel Studs (16" o.c.) – Slab Intersection & Metal Back Pan Connected to Side of Frame	
Detail 2.1.14	A.2.14
Conventional Curtain Wall System with Vertical and Horizontal Pressure Plates and 5' x 5' Spandrel Section – Owens Corning Thermafiber Impasse System and Intermediate Floor Intersection	
Detail 2.2.1	A.2.15
Conventional Curtain Wall System with Insulated Spandrel Panel & 3 5/8" x 1 5/8" Steel Stud (16" o.c.) – Un-insulated Concrete with Spandrel & Roof Intersection	
Detail 2.2.2	A.2.16
Conventional Curtain Wall System – Insulated Spandrel & Roof Intersection	
Detail 2.2.3	A.2.17
Conventional Curtain Wall System with Insulated Spandrel Panel and 3 5/8" x 1 5/8" Steel Stud (16" o.c.) – Concrete Parapet Roof Intersection & Spray Foam Insulation in Stud Cavity	
Detail 2.2.4	A.2.18
Conventional Curtain Wall System with Insulated Spandrel Panel & 3 5/8" x 1 5/8" Steel Stud (16" o.c.) – Insulated Concrete with Spandrel & Roof Intersection	
Detail 2.3.1	A.2.19
Conventional Curtain Wall System with Insulated Spandrel Panel– Uninsulated Jamb Intersection with Vision Section	
Detail 2.3.2	A.2.20
Conventional Curtain Wall System with Insulated Spandrel Panel– Rigid Insulated Jamb Intersection with Vision Section	
Detail 2.3.3	A.2.21
Conventional Curtain Wall System with Insulated Spandrel Panel –Aerogel Insulated Jamb Intersection with Vision Section	
Detail 2.4.1	A.2.22
Conventional Curtain Wall with Insulated Spandrel Panel & 3 5/8" x 1 5/8" Steel Stud (16" o.c.) - Beam Intersection Connected to Concrete Slab	

Detail 2.4.2	A.2.23
Conventional Curtain Wall with Insulated Spandrel Panel & 5 5/8" x 1 5/8" Steel Stud (16" o.c.) - Beam Intersection Connected to Steel Beam	
Detail 2.4.3	A.2.24
Conventional Curtain Wall with Insulated Spandrel Panel & 3 5/8" x 1 5/8" Steel Stud (16" o.c.) - Canopy Beam & Gutter Intersection	
Detail 2.4.4	A.2.25
Conventional Curtain Wall with Insulated Spandrel Panel & 5 5/8" x 1 5/8" Steel Stud (16" o.c.) - Beam Intersection Connected to Steel Beam with Additional Mullions	
Detail 2.5.1	A.2.26
Conventional Curtain Wall System - At-Grade Slab Transition	

Detail 2.1.1

Conventional Curtain Wall System with Insulated Spandrel Panel and 3 5/8" x 1 5/8" Steel Stud (16" o.c.) – Intermediate Floor Intersection & No Interior Insulation in Stud Cavity



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	4 5/8" (118)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Conventional curtain wall system with insulated back pan (Pressure plates with minimal thermal break) ²					
6	Backpan Insulation	Varies	-	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	1.8 (28)	0.29 (1220)
7	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Firestop Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

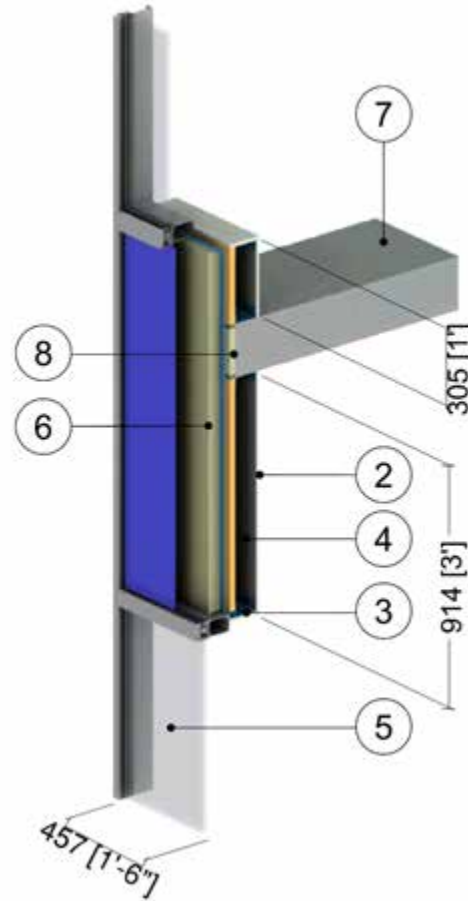
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation & surface emissivity. Window values supplemented by ISO 1007-2, Annex B.

² The thermal conductivity of air spaces within curtain wall framing was found using ISO 10077-2.



Detail 2.1.2

Conventional Curtain Wall System with Insulated Spandrel Panel and 3 5/8" x 1 5/8" Steel Stud (16" o.c.) – Intermediate Floor Intersection & Spray Foam Insulation in Stud Cavity



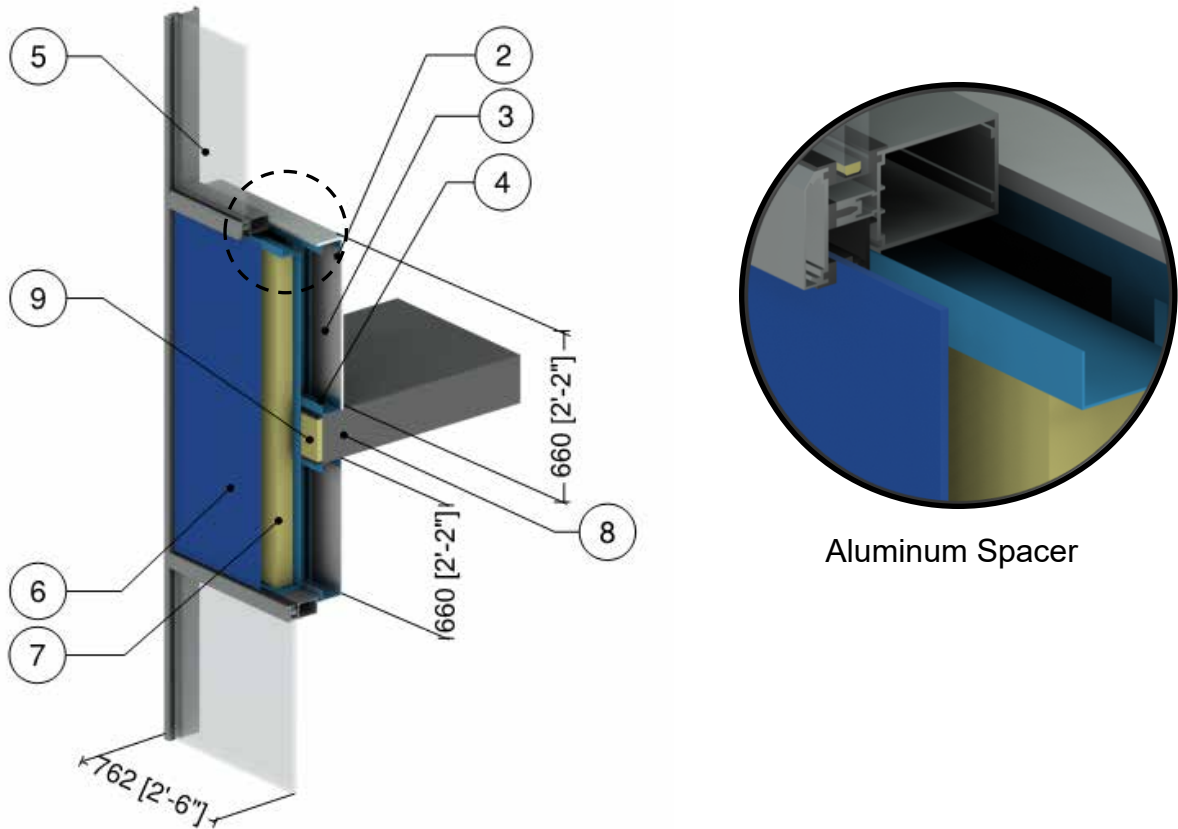
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	2 5/8" (67)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Conventional curtain wall system with insulated back pan (Pressure plates with minimal thermal break) ²					
6	Backpan Insulation	Varies	-	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	1.8 (28)	0.29 (1220)
7	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Firestop Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
9	Spray Foam Insulation	2" (51)	0.17 (0.024)	R-12.0 (2.11 RSI)	2.4 (39)	0.35 (1470)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation & surface emissivity. Window values supplemented by ISO 1007-2, Annex B.

² The thermal conductivity of air spaces within curtain wall framing was found using ISO 10077-2.

Detail 2.1.3

Conventional Curtain Wall System with Vertical and Horizontal Pressure Plates and 5' x 5' Spandrel Section – Insulated Metal Backpan and Intermediate Floor Intersection



Aluminum Spacer

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Conventional Curtain Wall Vision Section: double glazed IGU with aluminum spacer ²					
6	Conventional Curtain Wall Spandrel Section with Backpan Insulation ^{2,3}					
7	Backpan Insulation	4" (100)	0.24 (0.034)	R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Mineral Wool Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

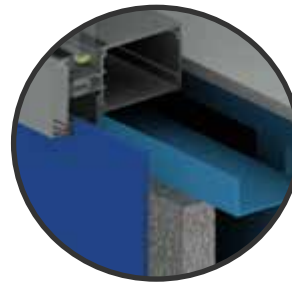
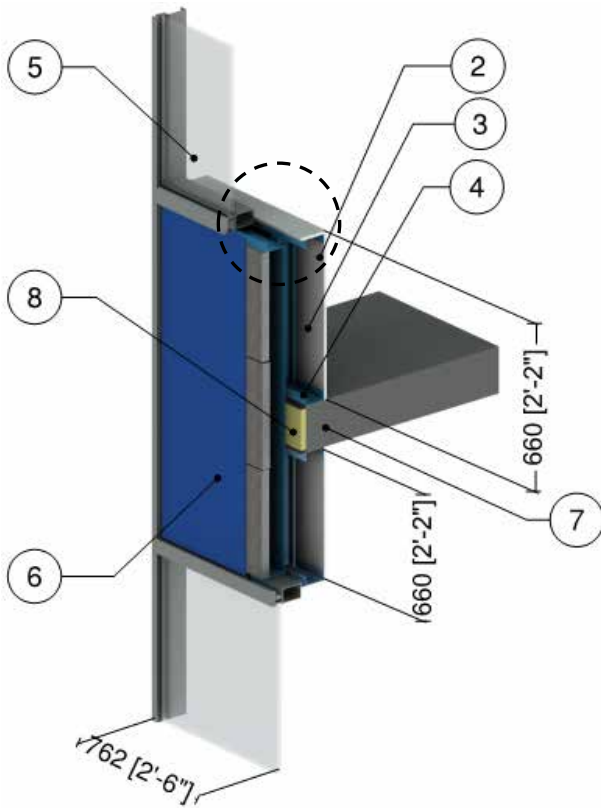
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

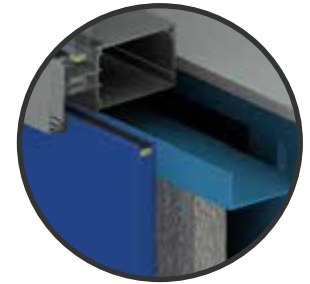
³ For a window to wall ratio of 50%

Detail 2.1.4

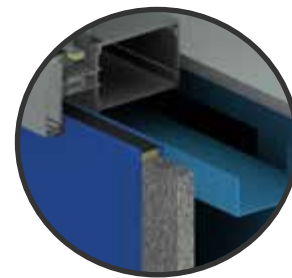
Conventional Curtain Wall System with Vertical and Horizontal Pressure Plates and 5' x 5' Spandrel Section – AIM Applications and Intermediate Floor Intersection



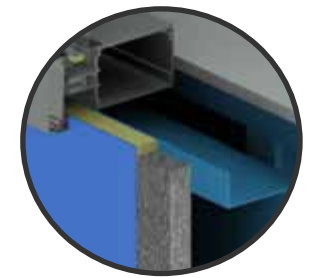
A1 – 1.5" (38 mm) AIM Adhered to Monolithic Glass



A2 – 1.5" (38 mm) AIM Adhered to Double Glazed IGU



A3 – Aluminum Spacer, 0.75" (19 mm) AIM between Glass



A4 – Rigid Insulation Spacer, 1" (25 mm) AIM between Metal Skins

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Conventional Curtain Wall Vision Section: double glazed IGU ²					
6	Conventional Curtain Wall Spandrel Section with varied insulation (see A1 to A4 above) ^{2,3}					
7	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Mineral Wool Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

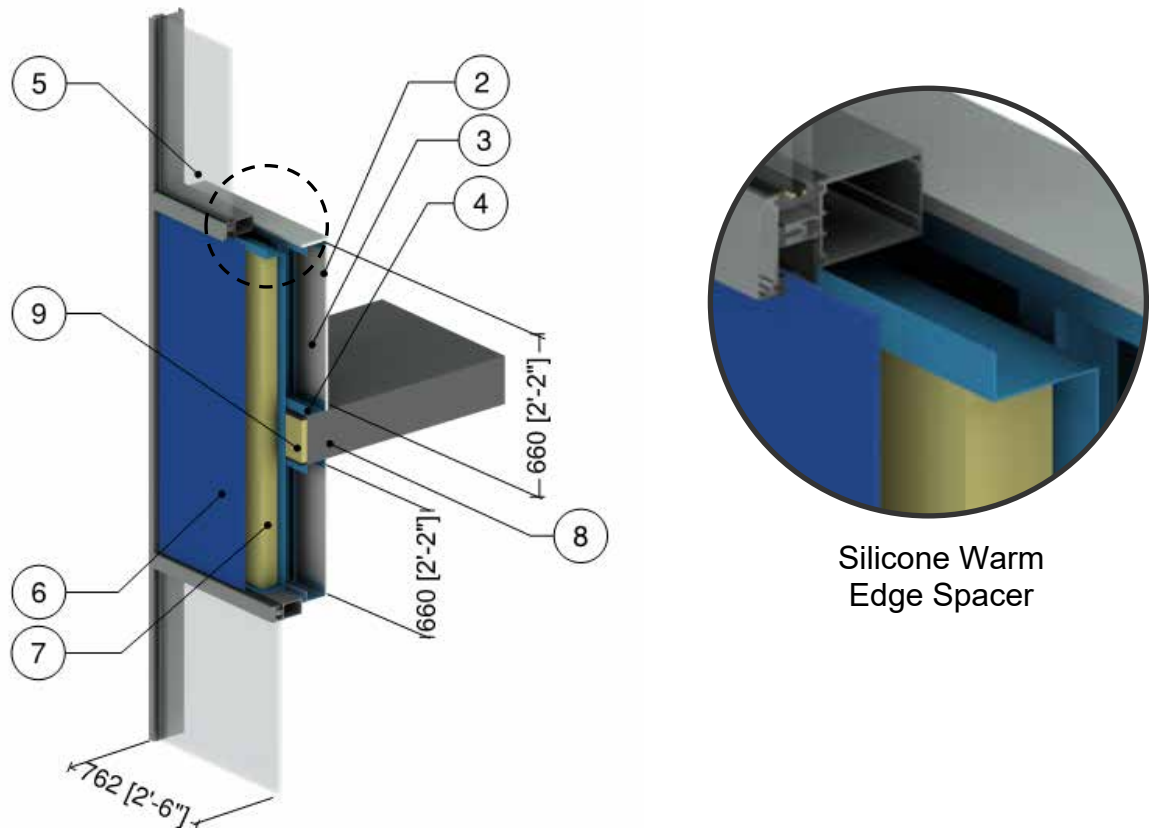
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

³ For a window to wall ratio of 50%

AIM = Architectural Insulation Module

Detail 2.1.5

Conventional Curtain Wall System with Vertical and Horizontal Pressure Plates and 5' x 5' Spandrel Section – Insulated Metal Backpan and Intermediate Floor Intersection



Silicone Warm Edge Spacer

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Conventional Curtain Wall Vision Section: double glazed IGU silicone warm edge spacer ²					
6	Conventional Curtain Wall Spandrel Section with Backpan Insulation ^{2,3}					
7	Backpan Insulation	4" (100)	0.24 (0.034)	R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Mineral Wool Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

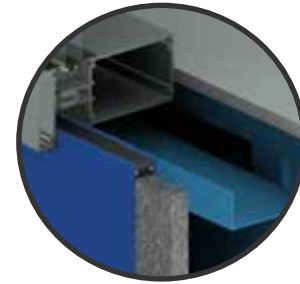
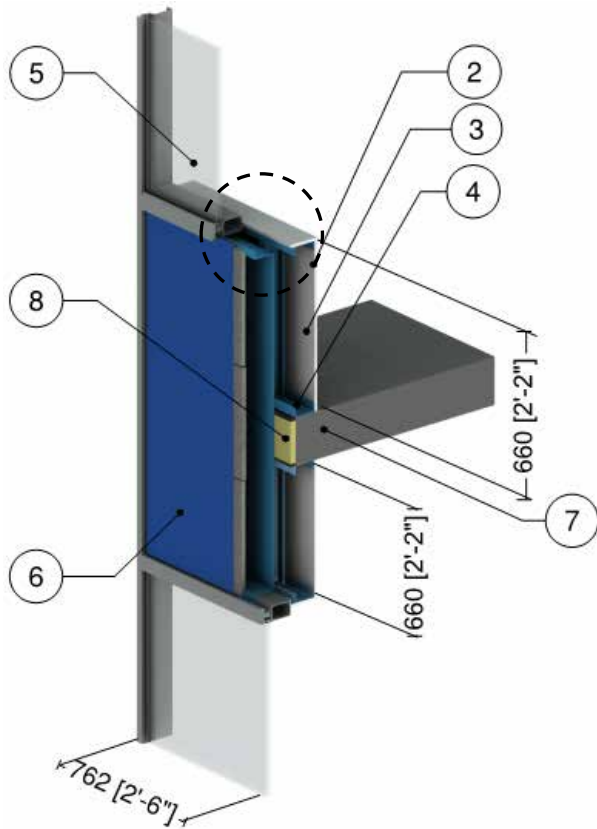
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

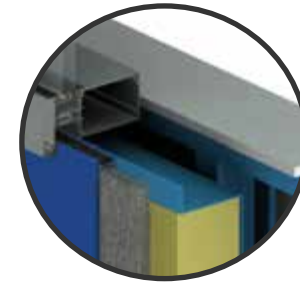
³ For a window to wall ratio of 50%

Detail 2.1.6

Conventional Curtain Wall System with 5' x 5' Spandrel Section – Alternative Glazing Methods and Intermediate Floor Intersection



B1 – Vertical & Horizontal Pressure Plates, Warm Edge Spacer, 0.75" (19 mm) AIM between Glass



B2 – Vertical Structural Silicone & Horizontal Pressure Plates, Warm Edge Spacer, 0.75" (19 mm) AIM between Glass with 4" (100 mm) Backpan Insulation

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Conventional Curtain Wall Vision Section: double glazed IGU with silicone warm edge spacer ²					
6	Conventional Curtain Wall Spandrel Section with varied insulation (see B1 to B2 above) ^{2,3}					
7	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Mineral Wool Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

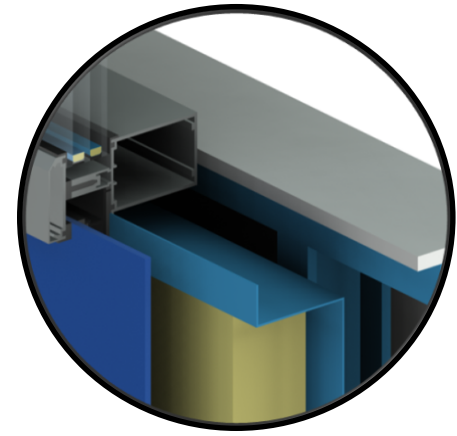
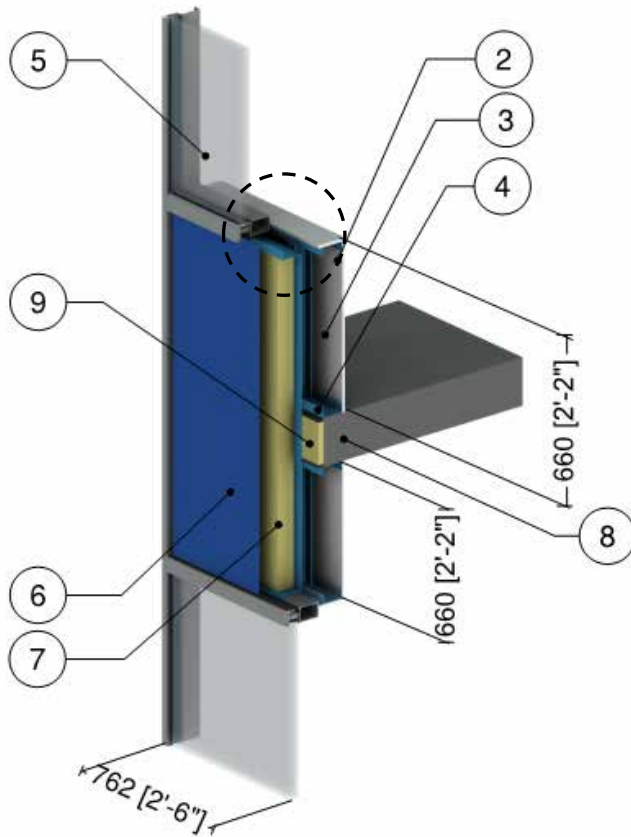
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

³For a window to wall ratio of 50%

AIM = Architectural Insulation Module

Detail 2.1.7

Conventional Curtain Wall System with Vertical and Horizontal Pressure Plates and 5' x 5' Spandrel Section – Insulated Backpan and Improved Glazing at Intermediate Floor Intersection



Triple Glazed IGU with Aluminum Spacer

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Conventional Curtain Wall Vision Section: triple glazed IGU with aluminum spacer ²					
6	Conventional Curtain Wall Spandrel Section with Backpan Insulation ^{2,3}					
7	Backpan Insulation	4" (100)	0.24 (0.034)	R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Mineral Wool Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

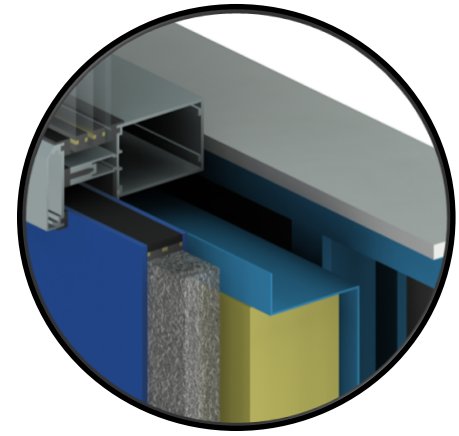
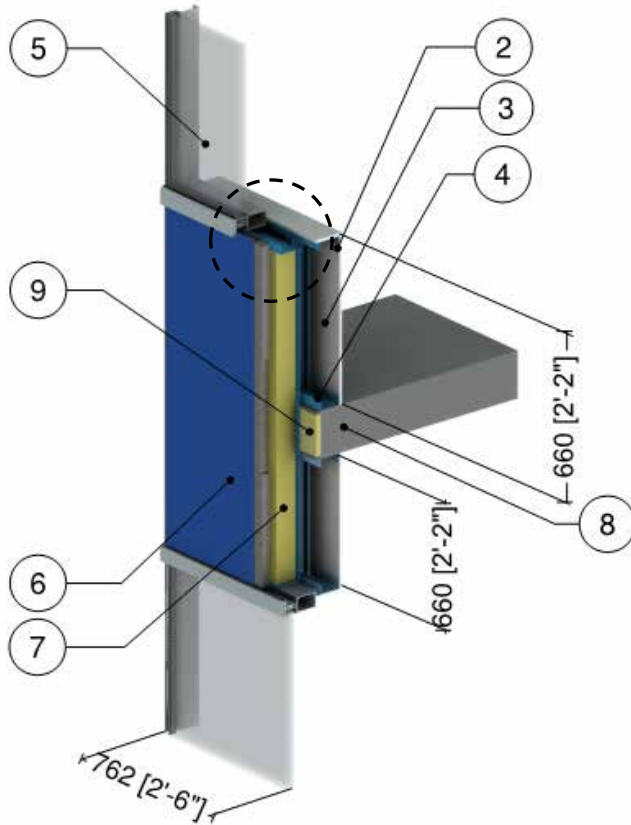
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

³For a window to wall ratio of 50%

Detail 2.1.8

Conventional Curtain Wall System with Vertical and Horizontal Pressure Plates and 5' x 5' Spandrel Section – AIM Applications and Improved Glazing at Intermediate Floor Intersection



Triple Glazed IGU with Silicone Warm Edge Spacer

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Conventional Curtain Wall Vision Section: triple glazed IGU with silicone warm edge spacer ²					
6	Conventional Curtain Wall Spandrel Section with 1.5" (38) AIM between Glass and Backpan Insulation ^{2,3}					
7	Backpan Insulation	4" (100)	0.24 (0.034)	R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Mineral Wool Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

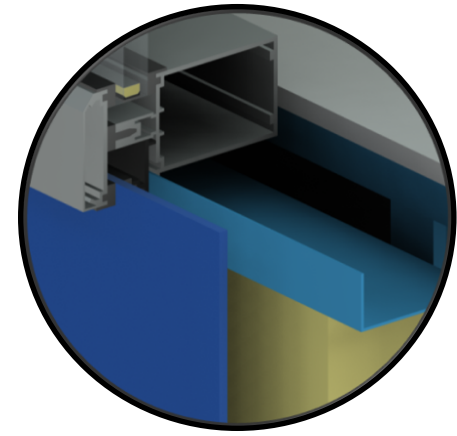
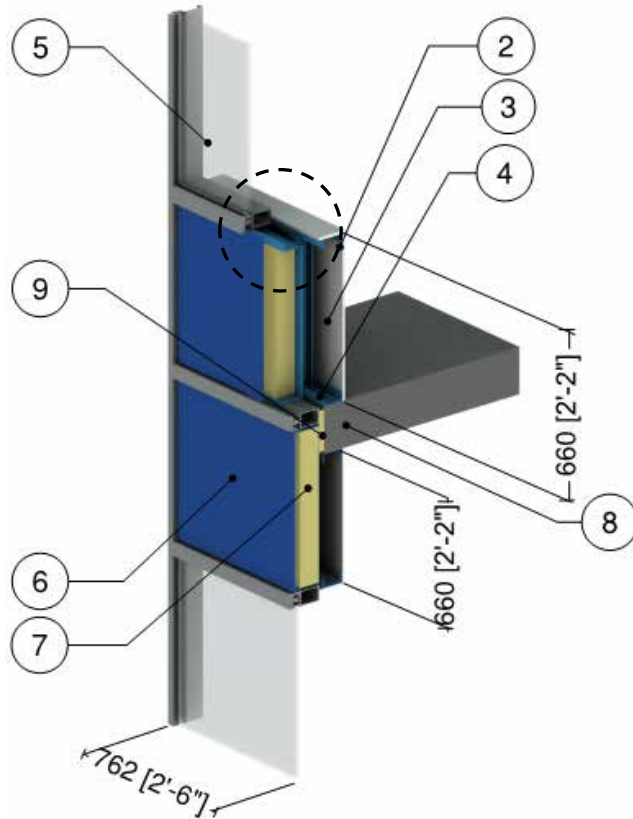
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

³For a window to wall ratio of 50%

AIM = Architectural Insulation Module

Detail 2.1.9

Conventional Curtain Wall System with Vertical and Horizontal Pressure Plates – Intermediate Mullion and 5' x 5' Spandrel Section – Insulated Backpan and Intermediate Floor Intersection



Double Glazed IGU
with Aluminum Spacer

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Conventional Curtain Wall Vision Section: double glazed IGU with aluminum spacer ²					
6	Conventional Curtain Wall Spandrel with Intermediate Mullion Section and Backpan Insulation ^{2,3}					
7	Backpan Insulation	4" (100)	0.24 (0.034)	R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Mineral Wool Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

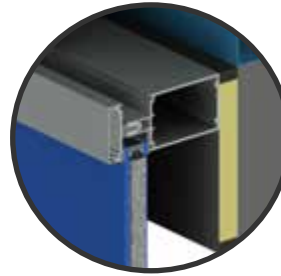
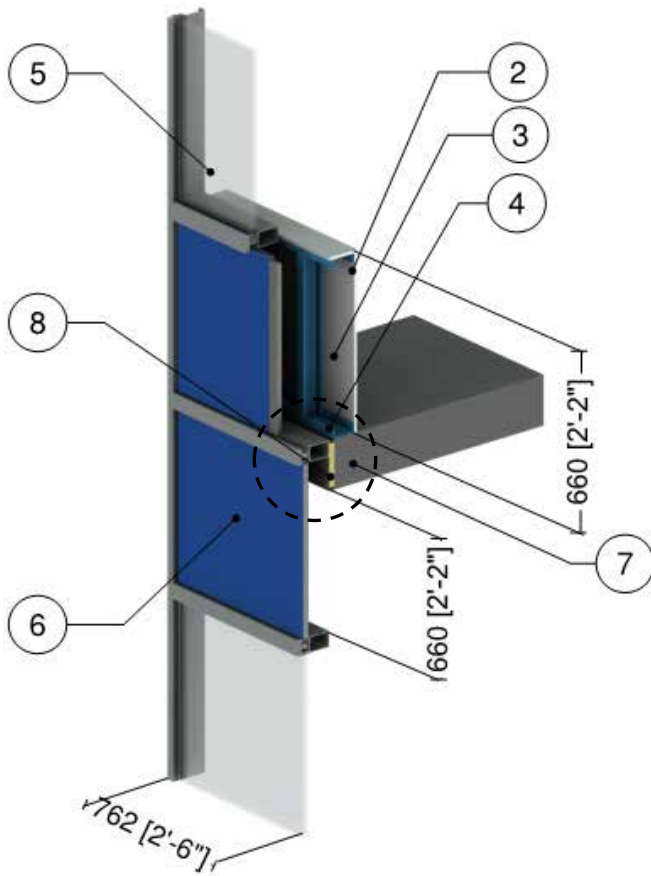
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

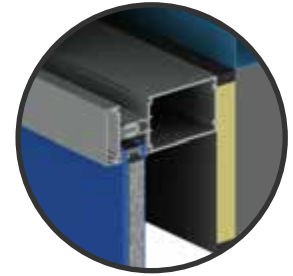
³ For a window to wall ratio of 50%

Detail 2.1.10

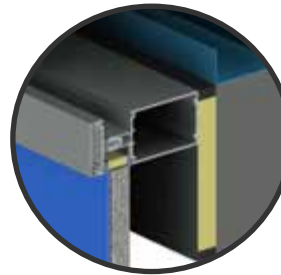
Conventional Curtain Wall System with Vertical and Horizontal Pressure Plates – Intermediate Mullion and 5' x 5' Spandrel Section – AIM Applications and Intermediate Floor Intersection



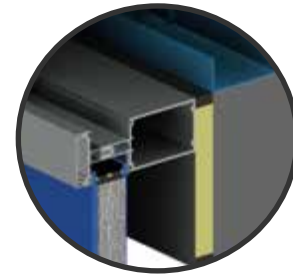
D1 – Vertical & Horizontal Pressure Plates, Warm Edge Spacer, 0.75" (19 mm) AIM Between Glass



D2 – Vertical Structural Silicone & Horizontal Pressure Plates, Warm Edge Spacer, 0.75" (19 mm) AIM between Glass



D3 – Vertical Structural Silicone & Horizontal Pressure Plates, Rigid Insulation Spacer, 1" (25 mm) AIM between Metal Skins



D4 – Vertical Structural Silicone & Horizontal Pressure Plates, Warm Edge Spacer, 1.5" (38 mm) AIM between Glass

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Conventional Curtain Wall Vision Section: double glazed (D1 to D3) or Triple Glazed (D4) IGU ²					
6	Conventional Curtain Wall Spandrel Section with varied insulation (see D1 to D4 above) ^{2,3}					
7	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Mineral Wool Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

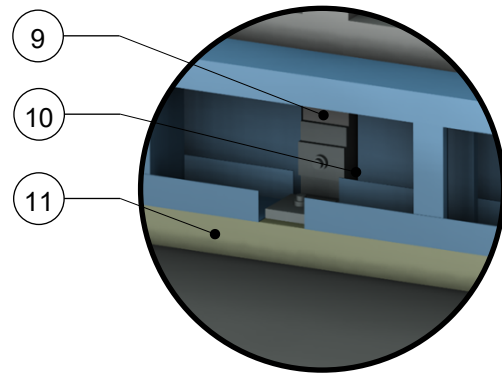
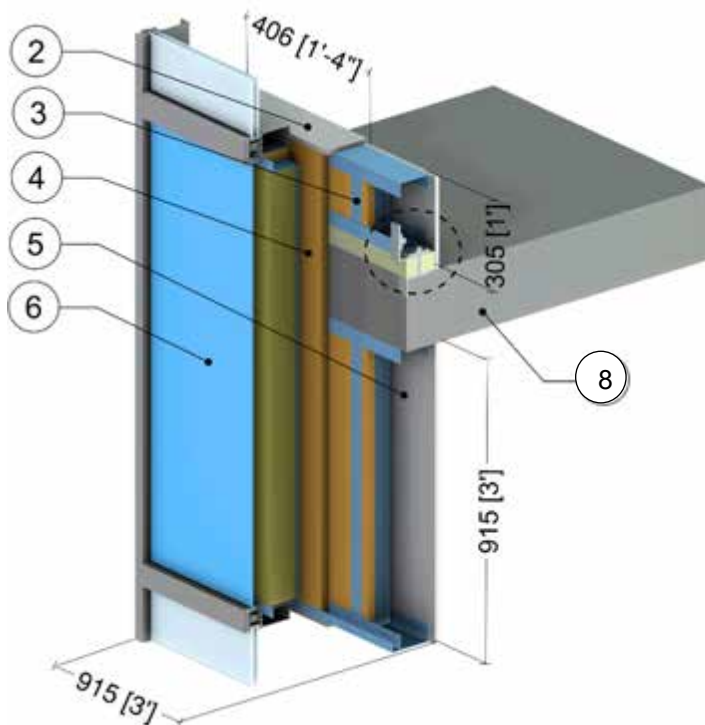
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

³ For a window to wall ratio of 50%

AIM = Architectural Insulation Module

Detail 2.1.11

Conventional Curtain Wall System with Insulated Spandrel Panel and 3 5/8" x 1 5/8" Steel Stud (16" o.c.) – Slab Intersection & Spray Foam Insulation in Stud Cavity with Thermal Break Under Stud Cavity and at Anchors



Anchor Detail

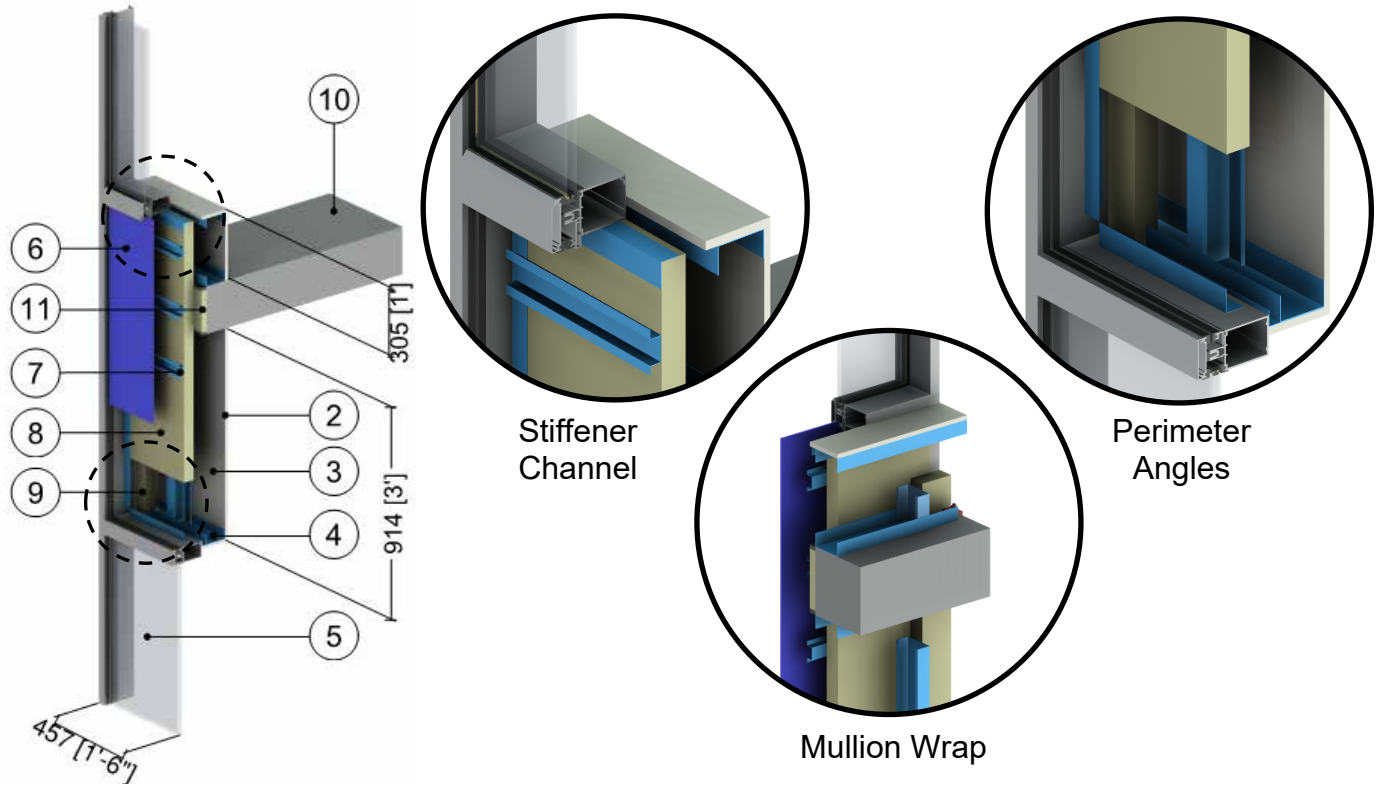
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Spray Foam Insulation	2" (51)	0.17 (0.025)	-	2.4 (39)	0.35 (1470)
5	Air in Stud Cavity	2 5/8" (67)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
6	Conventional curtain wall system with insulated back pan (Pressure plates with minimal thermal break) ²					
7	Backpan Insulation	-	-	R-15.0 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Steel Anchor at vertical mullions	-	347 (50)	-	489 (7830)	0.12 (500)
10	Armatherm FRR	3/8" (10)	1.4 (0.20)	-	85 (5.3)	-
11	Armatherm 500	2" (50)	0.32 (0.05)	R-6.2 (1.09 RSI)	-	-
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation & surface emissivity. Window values supplemented by ISO 1007-2, Annex B.

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 2.1.12

Conventional Curtain Wall System with Insulated Spandrel Panel and 3 5/8" x 1 5/8" Steel Studs (16" o.c.) – Slab Intersection & No Metal Back Pan



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (RSI-0.16)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Conventional Curtain Wall Vision Section: double glazed IGU with warm edge spacer ²					
6	Conventional Curtain Wall Spandrel Section with Spandrel Insulation ²					
7	Spandrel Insulation Stiffeners	22 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Spandrel Insulation	2" (51)	-	R-8.4 (1.48 RSI)	1.8 (28)	0.29 (1220)
9	Mullion Wrap Insulation	With and Without	-	R-8.4 (1.48 RSI)	1.8 (28)	0.29 (1220)
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Mineral Wool Insulation	1"	0.24 (0.034)	-	1.8 (28)	0.29 (1220)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

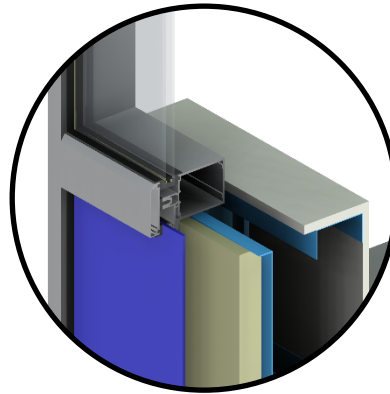
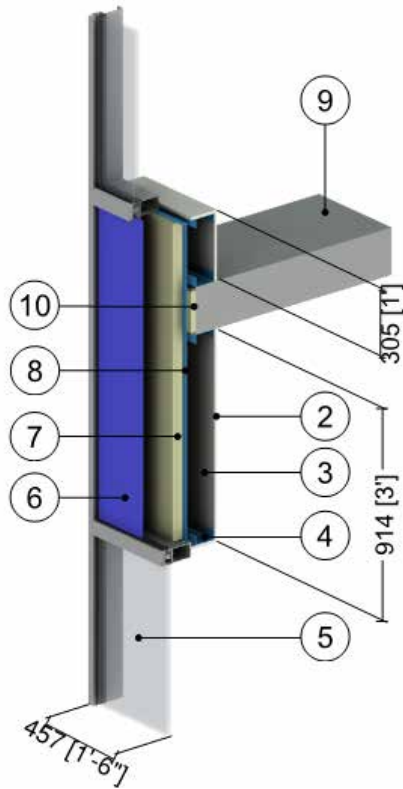
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

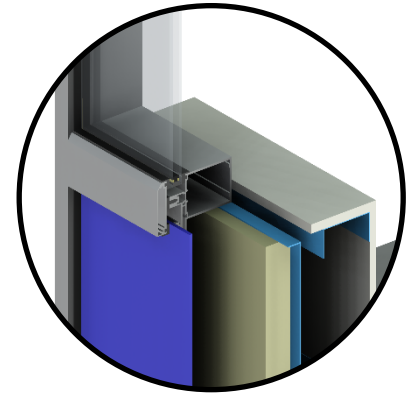


Detail 2.1.13

Conventional Curtain Wall System with Insulated Spandrel Panel and 3 5/8" x 1 5/8" Steel Studs (16" o.c.) – Slab Intersection & Metal Back Pan Connected to Side of Frame



Metal Back Pan Connected Inset in Frame



Metal Back Pan Connected at Interior of Frame

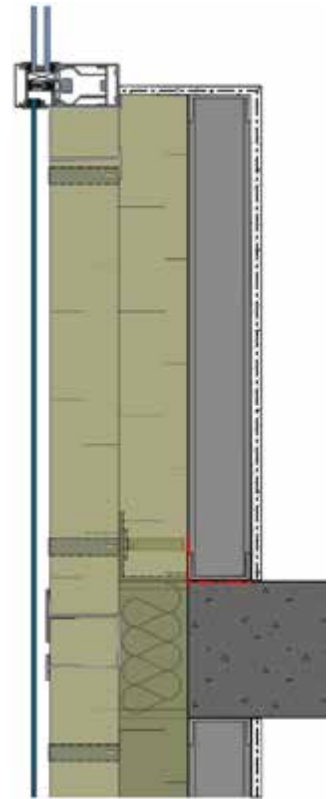
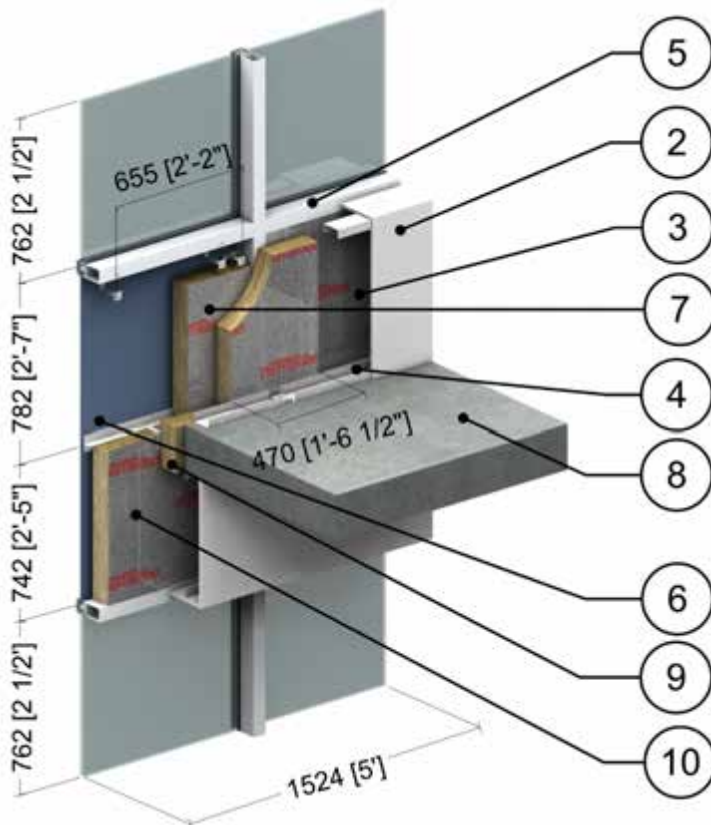
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (RSI-0.16)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Conventional Curtain Wall Vision Section: double glazed IGU with warm edge spacer ²					
6	Conventional Curtain Wall Spandrel Section with Insulated Metal Back Pan ²					
7	Backpan Insulation	Varies	-	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	1.8 (28)	0.29 (1220)
8	Metal Back Pan	22 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Mineral Wool Insulation	1"	0.24 (0.034)	-	1.8 (28)	0.29 (1220)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 2.1.14

Conventional Curtain Wall System with Vertical and Horizontal Pressure Plates and 5' x 5' Spandrel Section – Owens Corning Thermafiber Impasse System and Intermediate Floor Intersection



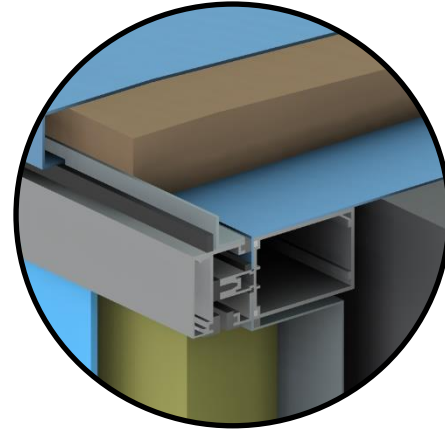
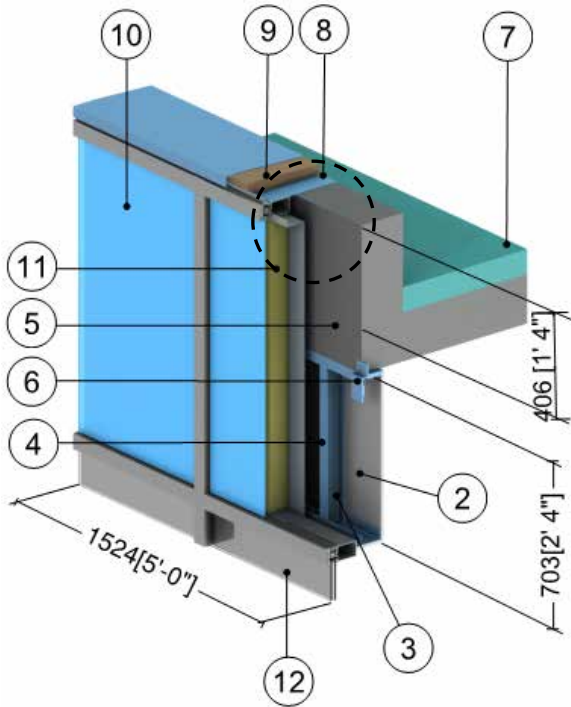
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)
3	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)
4	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)
5	5' (1.5m) x 5' (1.5m) Aluminum window: thermally broken, double glazed IGU ² $U_{IGU} = 0.32 \text{ BTU/hr.ft}^2\text{.}^\circ\text{F (1.82 W/m}^2\text{K)}$				
6	5' (1.5m) x 5' (1.5m) Conventional Curtain Wall Spandrel Section with Thermafiber Impasse System ²				
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Spandrel Insulation	4" (102)	0.24 (0.034)	R-16.8 (2.96 RSI)	4.5 (72)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)
9	Safing Mineral Wool Insulation	3" (76)	0.24 (0.034)	-	4.5 (72)
10	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Mullion Cover Insulation	2" (51)	0.24 (0.034)	R-8.4 (1.48 RSI)	4.5 (72)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 2.2.1

Conventional Curtain Wall System with Insulated Spandrel Panel & 3 5/8" x 1 5/8" Steel Stud (16" o.c.) – Un-insulated Concrete with Spandrel & Roof Intersection



Parapet Cap Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Concrete Slab & Parapet	8" (203)	12.5 (1.8)	R-0.6 (0.11 RSI)	140 (2250)	0.20 (850)
6	Anchor at Vertical Mullions	-	347 (50)	-	489 (7830)	0.12 (500)
7	Roof Insulation	4" (102)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
8	Parapet Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Wood Blocking	-	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
10	Conventional Curtain Wall Spandrel System with Insulated Backpan: minimal thermally broken frame ²					
11	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
12	Conventional Curtain Wall Vision System : minimal thermally broken frame ² , double glazed IGU U _{COG} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
13	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

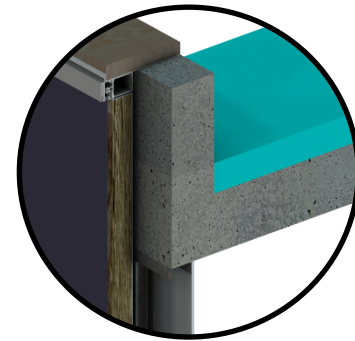
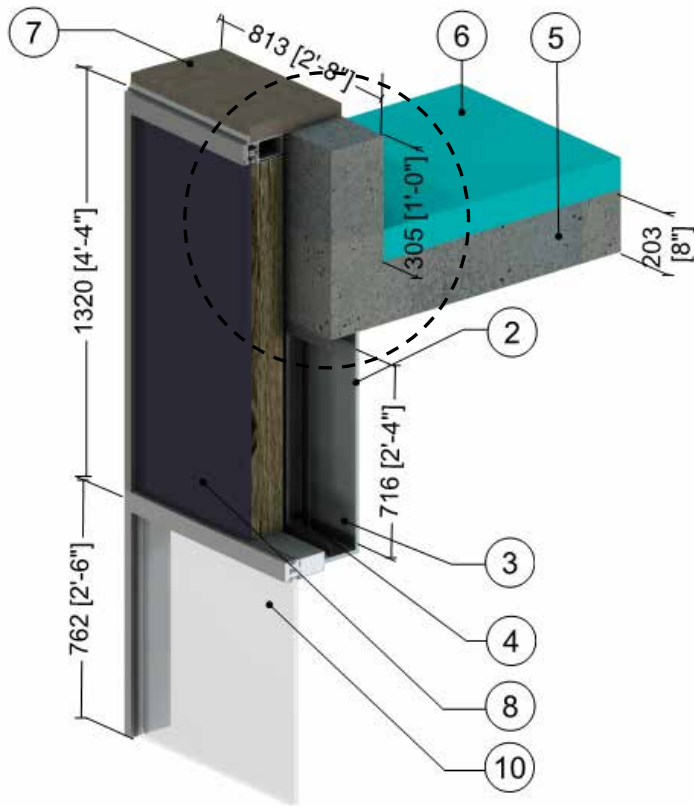
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

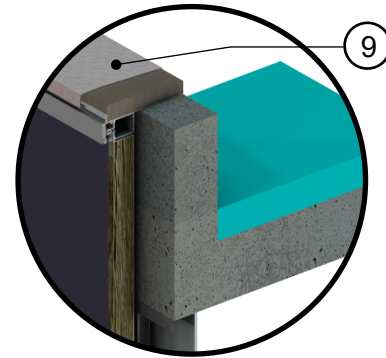


Detail 2.2.2

Conventional Curtain Wall System – Insulated Spandrel & Roof Intersection



Without Aerogel Detail



With Aerogel Detail

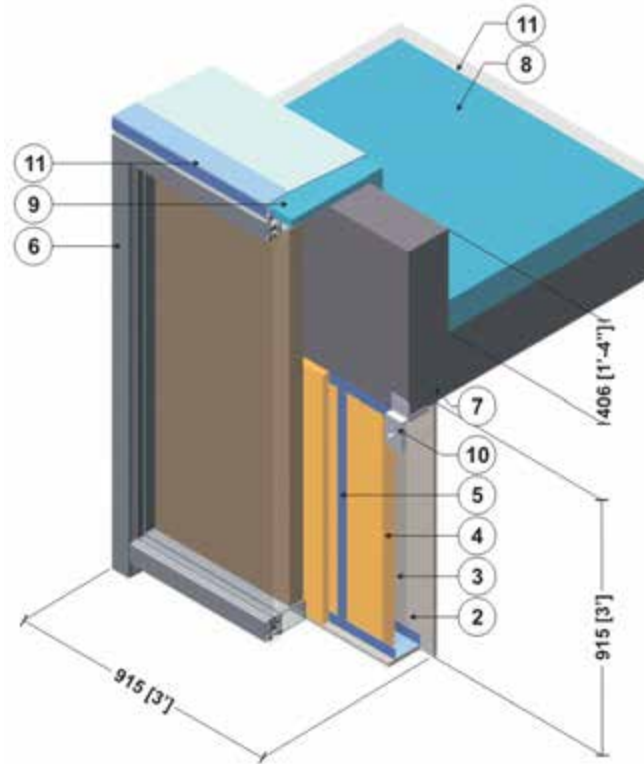
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Concrete Slab & Parapet	8" (203)	12.5 (1.8)	R-0.6 (0.11 RSI)	140 (2250)	0.20 (850)
6	Roof Insulation	4" (102)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
7	Wood Blocking	-	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Conventional Curtain Wall Spandrel System with Insulated Backpan: minimal thermally broken frame ²					
9	Aerogel Blanket	0.4" (10)	0.086 (0.015)	R-3.8 (0.67 RSI)	-	-
10	Conventional Curtain Wall Vision System : minimal thermally broken frame ² , double glazed IGU U _{IGU} = 0.32 BTU/hr-ft ² -°F (1.82 W/m ² K)					
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 2.2.3

Conventional Curtain Wall System with Insulated Spandrel Panel and 3 5/8" x 1 5/8" Steel Stud (16" o.c.) – Concrete Parapet Roof Intersection & Spray Foam Insulation in Stud Cavity



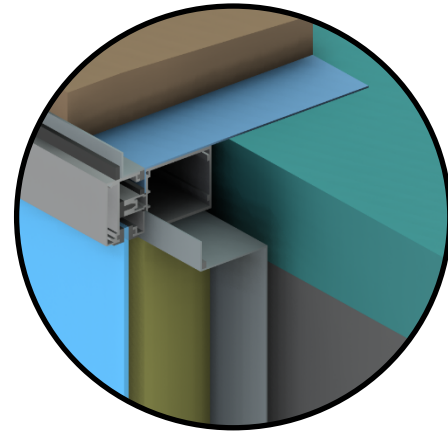
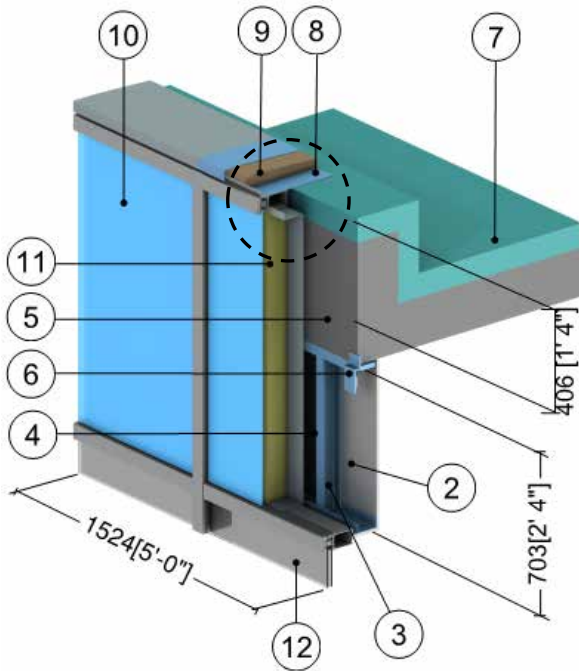
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	2 5/8" (67)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	Spray Foam Insulation	2" (51)	0.17 (0.025)	-	2.8 (39)	0.35 (1470)
5	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	Conventional curtain wall system with insulated back pan (Pressure plates with minimal thermal break) ²					
7	Concrete Slab & Parapet	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Roof Insulation	4" (102)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
9	Parapet Insulation	1" (25)	-	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
10	Steel Anchor at vertical mullions	-	347 (50)	-	489 (7830)	0.12 (500)
11	Metal cap flashing/ finish roof materials is incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation & surface emissivity. Window values supplemented by ISO 1007-2, Annex B.

² The thermal conductivity of air spaces within curtain wall framing was found using ISO 10077-2

Detail 2.2.4

Conventional Curtain Wall System with Insulated Spandrel Panel & 3 5/8" x 1 5/8" Steel Stud (16" o.c.) – Insulated Concrete with Spandrel & Roof Intersection



Parapet Cap Detail

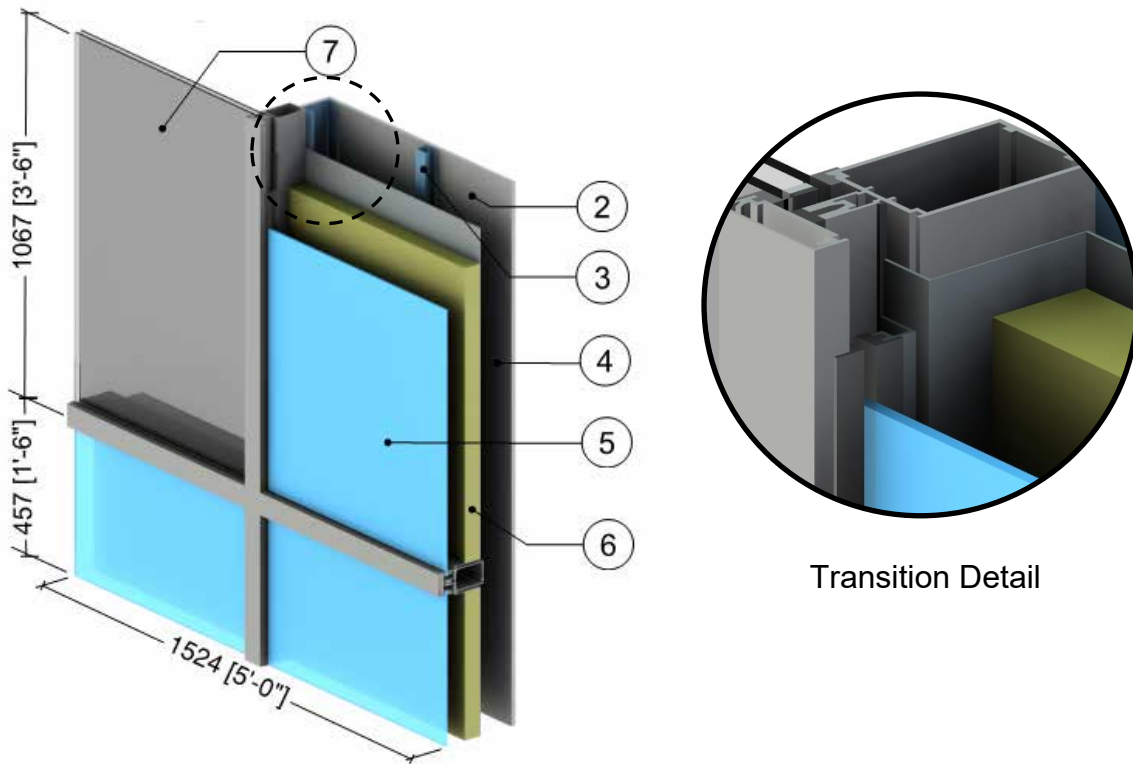
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Concrete Slab & Parapet	8" (203)	12.5 (1.8)	R-0.6 (0.11 RSI)	140 (2250)	0.20 (850)
6	Anchor at Vertical Mullions	-	347 (50)	-	489 (7830)	0.12 (500)
7	Roof Insulation	4" (102)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
8	Parapet Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Wood Blocking		0.69 (0.10)	-	27.8 (445)	0.45 (1880)
10	Conventional Curtain Wall Spandrel System with Insulated Backpan: minimal thermally broken frame ²					
11	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
12	Conventional Curtain Wall Vision System : minimal thermally broken frame ² , double glazed IGU U _{COG} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
13	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 2.3.1

Conventional Curtain Wall System with Insulated Spandrel Panel– Uninsulated Jamb Intersection with Vision Section



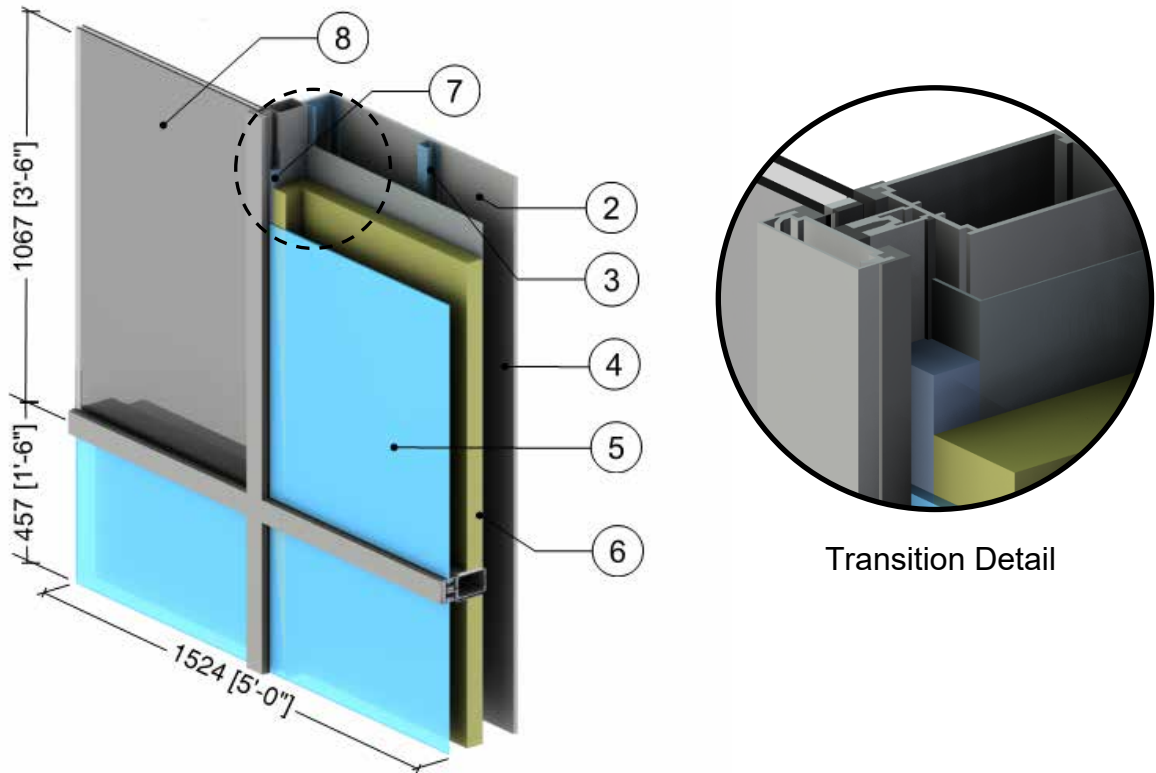
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs (16" o.c.)	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Conventional Curtain Wall Spandrel System with Insulated Backpan: minimal thermally broken frame ²					
6	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
7	Conventional Curtain Wall Vision System : minimal thermally broken frame ² , double glazed IGU U _{COG} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
8	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 2.3.2

Conventional Curtain Wall System with Insulated Spandrel Panel– Rigid Insulated Jamb Intersection with Vision Section



Transition Detail

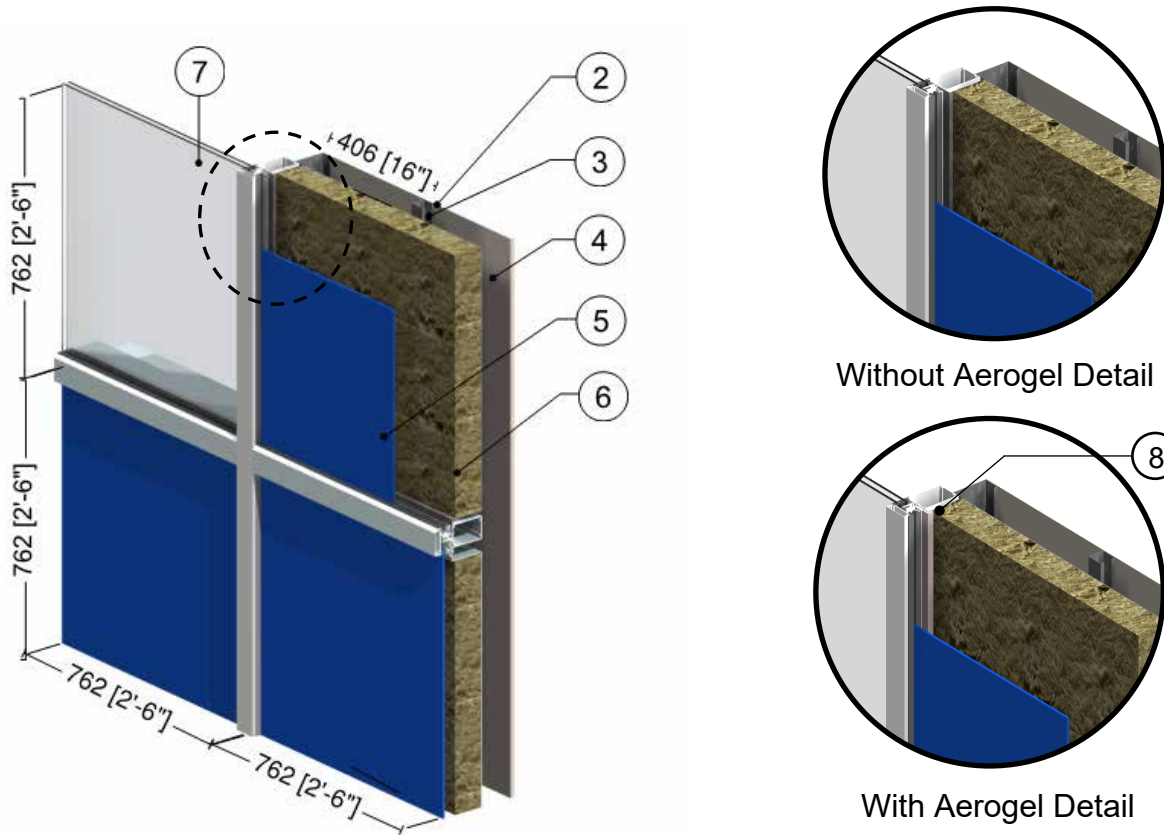
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs (16" o.c.)	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Conventional Curtain Wall Spandrel System with Insulated Backpan: minimal thermally broken frame ²					
6	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
7	Curtain Wall Insulation	1" (25)	0.24 (0.034)	R-4.0 (0.7 RSI)	4 (64)	0.20 (850)
8	Conventional Curtain Wall Vision System : minimal thermally broken frame ² , double glazed IGU U _{COG} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 2.3.3

Conventional Curtain Wall System with Insulated Spandrel Panel – Aerogel Insulated Jamb Intersection with Vision Section



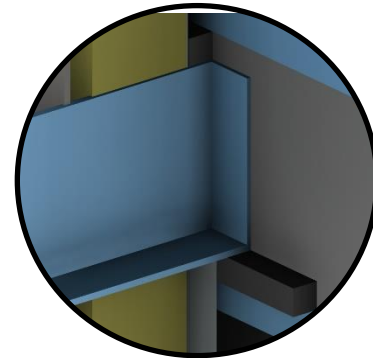
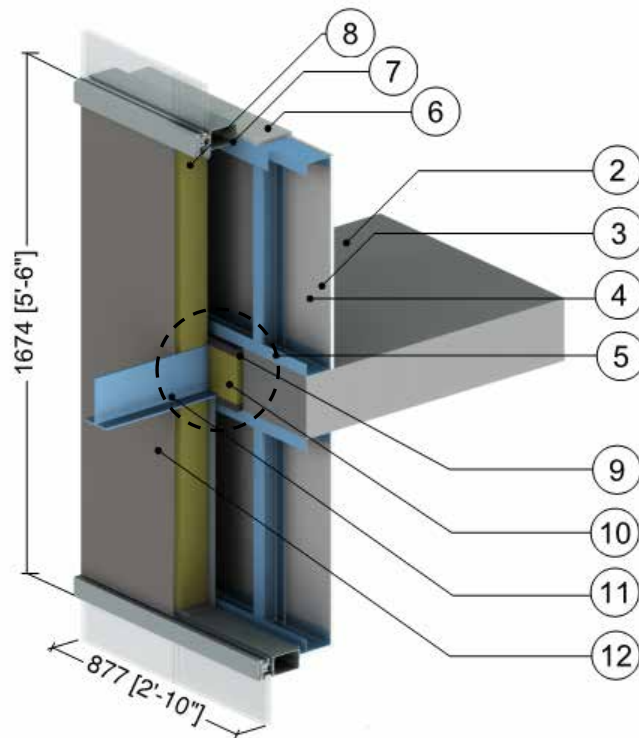
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs (16" o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Conventional Curtain Wall Spandrel System with Insulated Backpan: minimal thermally broken frame ²					
6	Backpan Insulation	4" (100)	0.24 (0.034)	R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
7	Conventional Curtain Wall Vision System : minimal thermally broken frame ² , double glazed IGU U _{COG} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
8	Aerogel Blanket	0.4" (10)	0.086 (0.015)	R-3.8 (0.67 RSI)	-	-
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 2.4.1

Conventional Curtain Wall with Insulated Spandrel Panel & 3 5/8" x 1 5/8" Steel Stud (16" o.c.) - Beam Intersection Connected to Concrete Slab



Beam Intersection Detail
(Insulation on slab not shown)

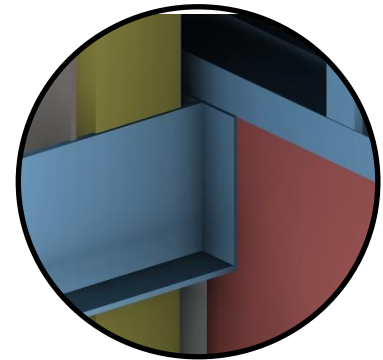
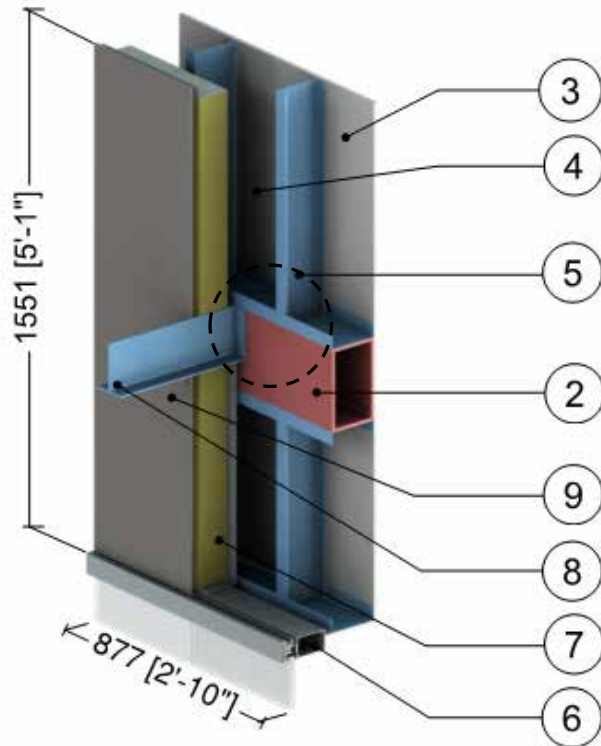
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
3	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
4	Air Cavity	4 5/8" (117)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	3 5/8" x 1 5/8" Steel Studs (16" o.c.) w/ Top & Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	31 (500)	0.45 (1880)
7	Conventional Curtain wall system: minimal thermally broken frame ² , double glazed IGU U _{COG} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
8	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.5 RSI to 3.0 RSI)	4 (64)	0.20 (850)
9	Silicone Sealant	1" (25)	2.4 (0.35)	-	174 (2800)	0.17 (700)
10	Semi-Rigid Insulation	1" (25)	0.24 (0.034)	-	4 (64)	0.20 (850)
11	Steel Beam (W6x12)	-	347 (50)	-	489 (7830)	0.12 (500)
12	Composite Metal Panel	3/16" (4)	347 (50)	-	489 (7830)	0.12 (500)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 2.4.2

Conventional Curtain Wall with Insulated Spandrel Panel & 5 5/8" x 1 5/8" Steel Stud (16" o.c.) - Beam Intersection Connected to Steel Beam



Beam Intersection Detail

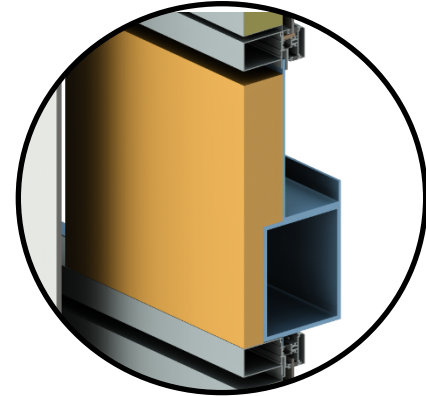
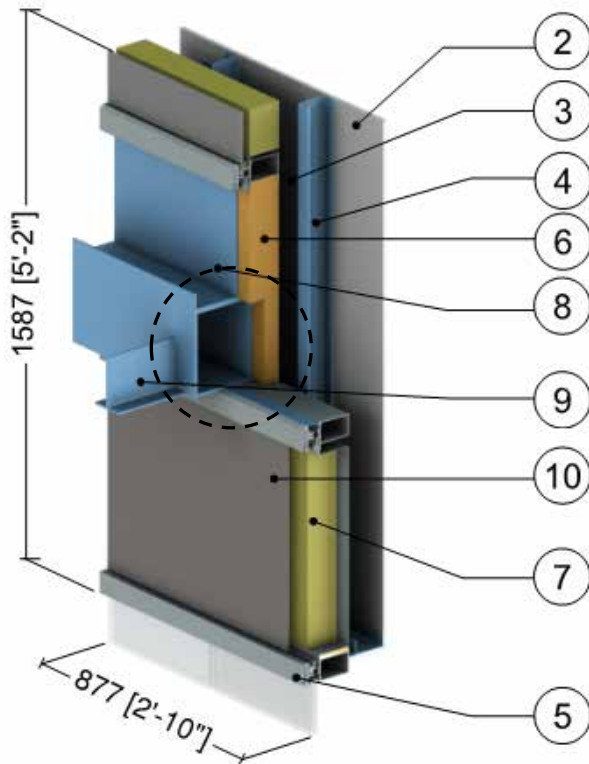
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Structural Steel Beam (10" x 6" x 3/8" HSS)	-	347 (50)	-	489 (7830)	0.12 (500)
3	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
4	Air Cavity	5 5/8" (168)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	5 5/8" x 1 5/8" Steel Studs (16" o.c.) w/ Top & Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	Curtain wall system: minimal thermally broken frame ² , double glazed IGU U _{COG} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
7	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.5 RSI to 3.0 RSI)	4 (64)	0.20 (850)
8	Steel Beam (W6x12)	-	347 (50)	-	489 (7830)	0.12 (500)
9	Composite Metal Panel	3/16" (4)	347 (50)	-	489 (7830)	0.12 (500)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 2.4.3

Conventional Curtain Wall with Insulated Spandrel Panel & 3 5/8" x 1 5/8" Steel Stud (16" o.c.) - Canopy Beam & Gutter Intersection



Gutter Intersection Detail

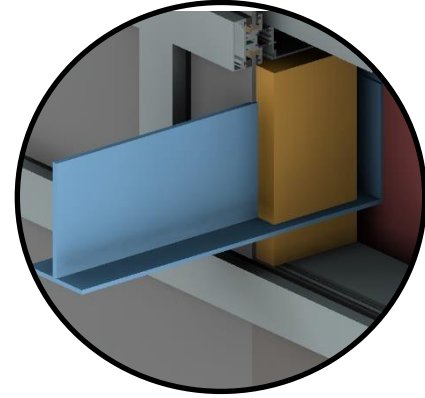
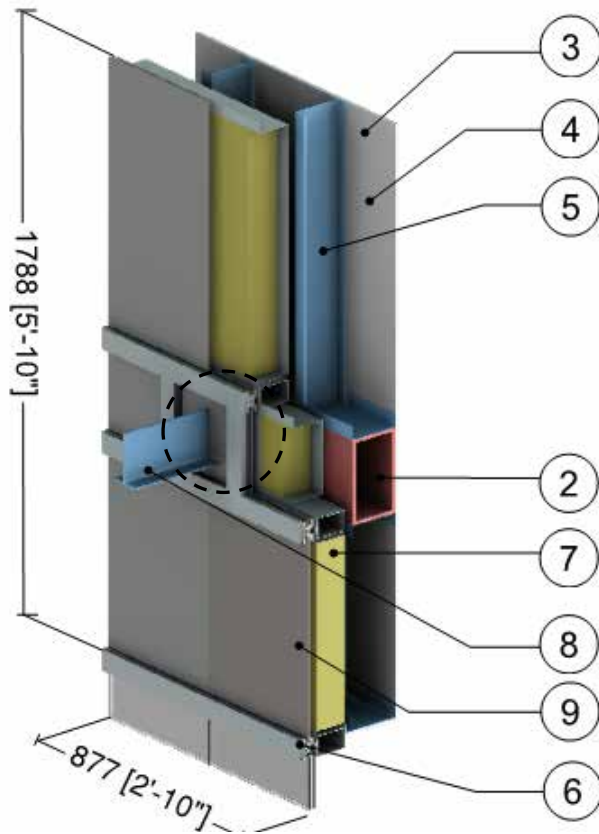
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air Cavity	4 5/8" (117)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs (16" o.c.) w/ Top & Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Curtain wall system: minimal thermally broken frame ² , double glazed IGU U _{COG} = 0.32 BTU/hr-ft ² -°F (1.82 W/m ² K)					
6	Polyurethane Foam Insulation	4" (102)	0.17 (0.024)	R-24 (4.20 RSI)	1.8 (28)	0.29 (1220)
7	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.5 RSI to 3.0 RSI)	4 (64)	0.20 (850)
8	Steel Beam (HSS 8x10x3/8) & Gutter	-	347 (50)	-	489 (7830)	0.12 (500)
9	Steel Beam (W6x12)	-	347 (50)	-	489 (7830)	0.12 (500)
10	Composite Metal Panel	3/16" (4)	347 (50)	-	489 (7830)	0.12 (500)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 2.4.4

Conventional Curtain Wall with Insulated Spandrel Panel & 5 5/8" x 1 5/8" Steel Stud (16" o.c.) - Beam Intersection Connected to Steel Beam with Additional Mullions



Beam Intersection Detail
(Mullions, cladding and insulation not shown)

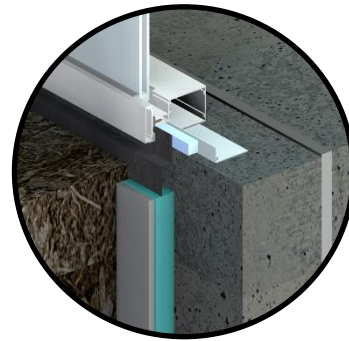
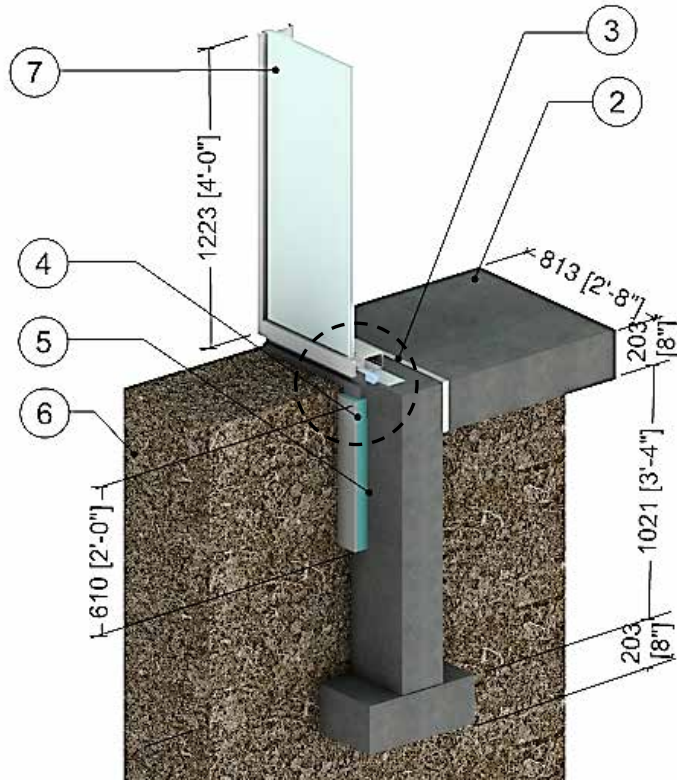
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Structural Steel Beam (10" x 6" x 3/8" HSS)	-	347 (50)	-	489 (7830)	0.12 (500)
3	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
4	Air Cavity	6 5/8" (117)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	5 5/8" x 1 5/8" Steel Studs (16" o.c.) w/ Top & Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	Curtain wall system: minimal thermally broken frame ² , double glazed IGU U _{COG} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
7	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.5 RSI to 3.0 RSI)	4 (64)	0.20 (850)
8	Steel Beam (W6 x12)	-	347 (50)	-	489 (7830)	0.12 (500)
9	Composite Metal Panel	3/16" (4)	347 (50)	-	489 (7830)	0.12 (500)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

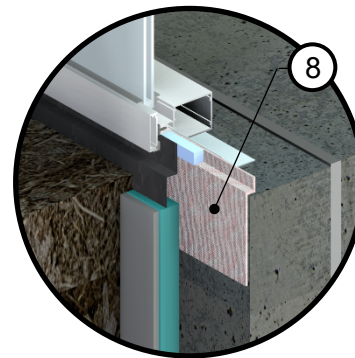
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 2.5.1

Conventional Curtain Wall System - At-Grade Slab Transition



Without Aerogel Detail



With Aerogel Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.12 to 0.16 RSI)	-	-
2	Concrete Slab on Grade	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
3	Silicone Sealant	1/2" (13)	2.4 (3.5)	-	-	-
4	Foundation Insulation	2" (50)	-	R-10 (1.8 RSI)	1.8 (28)	0.29 (1220)
5	Concrete Footing	3 5/8" (92)	12.5 (1.8)	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
6	Soil	-	-	-	-	-
7	Conventional Curtain Wall Vision System : minimal thermally broken frame ² , double glazed IGU U _{COG} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
8	Aerogel Blanket	0.4" (10)	0.086 (0.015)	R-3.8 (0.67 RSI)	-	-
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

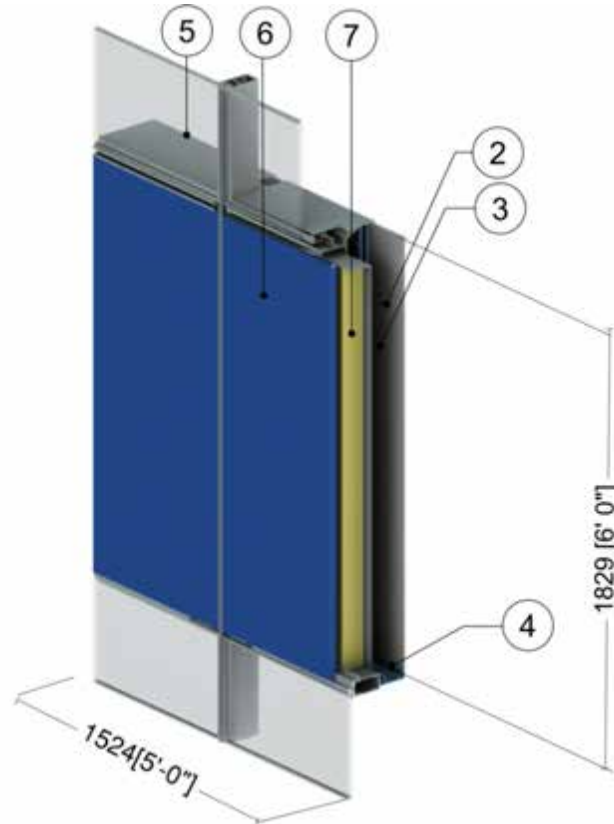
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

3.0 Unitized Curtain Wall

Detail 3.1.1	A.3.1
Unitized Curtain Wall System – Spandrel Clear Wall & No Interior Stud Cavity Insulation	
Detail 3.1.2	A.3.2
Unitized Curtain Wall System – Spandrel Clear Wall & Interior Spray Foam Insulation	
Detail 3.2.1	A.3.3
Unitized Curtain Wall System – Intermediate Floor Intersection & No Interior Stud Cavity Insulation	
Detail 3.2.2	A.3.4
Unitized Curtain Wall System – Intermediate Floor Intersection & Interior Spray Foam Insulation	
Detail 3.2.3	A.3.5
Unitized Curtain Wall System with 4-Sided Structural Silicone Joints and 5' x 5' Spandrel Section – Insulated Backpan and Intermediate Floor Intersection	
Detail 3.2.4	A.3.6
Unitized Curtain Wall System with 4-Sided Structural Silicone Joints and 5' x 5' Spandrel Section – AIM Applications and Intermediate Floor Intersection	
Detail 3.2.5	A.3.7
Unitized Curtain Wall System with 4-Sided Structural Silicone Joints and 5' x 5' Spandrel Section – Insulated Backpan and Improved Glazing at Intermediate Floor Intersection	
Detail 3.2.6	A.3.8
Unitized Curtain Wall System with 4-Sided Structural Silicone Joints and 5' x 5' Spandrel Section – AIM Applications and Improved Glazing at Intermediate Floor Intersection	
Detail 3.3.1	A.3.9
Unitized Curtain Wall System – Window Wall Transition	
Detail 3.3.2	A.3.10
Unitized Curtain Wall System – Window Wall Transition with Foam Insulation	

Detail 3.1.1

Unitized Curtain Wall System – Spandrel Clear Wall & No Interior Stud Cavity Insulation



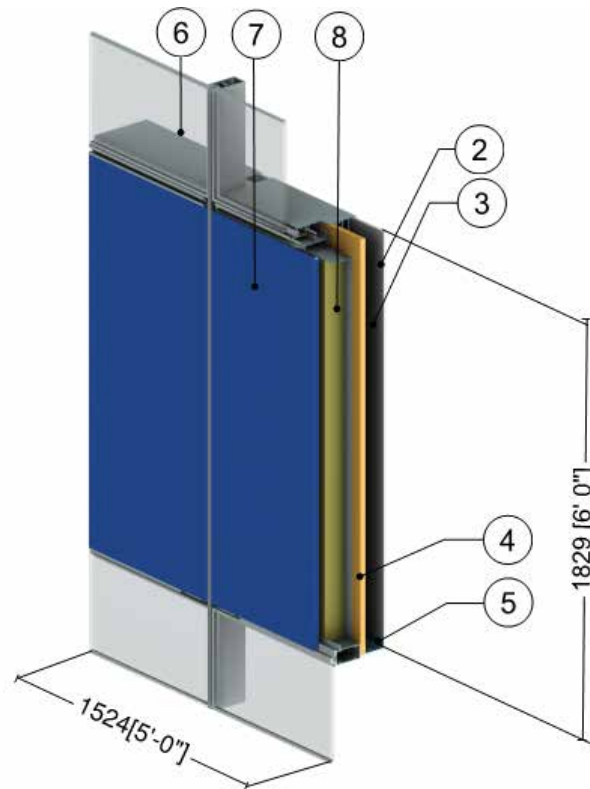
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air Cavity	4 5/8" (117)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs (16"o.c) w/ Top & Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Unitized Curtain Wall Vision System: structural silicone joints ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
6	Unitized Curtain Wall Spandrel System with Insulated Backpan: structural silicone joints ²					
7	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
8	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 3.1.2

Unitized Curtain Wall System – Spandrel Clear Wall & Interior Spray Foam Insulation



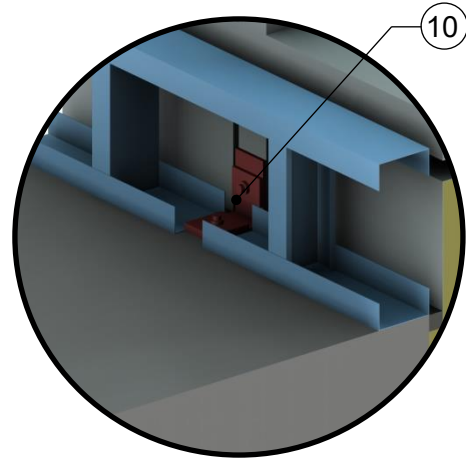
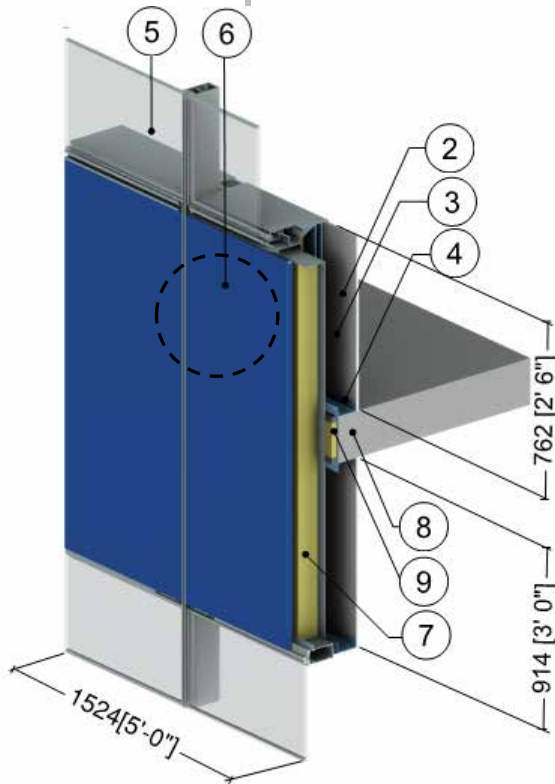
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air Cavity	2 5/8" (67)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	Spray Foam Insulation	2" (51)	0.17 (0.025)	R-11.5 (2.0 RSI)	2.8 (39)	0.35 (1470)
5	3 5/8" x 1 5/8" Steel Studs (16"o.c) w/ Top & Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	Unitized Curtain Wall Vision System: structural silicone joints ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
7	Unitized Curtain Wall Spandrel System with Insulated Backpan: structural silicone joints ²					
8	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 3.2.1

Unitized Curtain Wall System – Intermediate Floor Intersection & No Interior Stud Cavity Insulation



Connection Detail from Interior

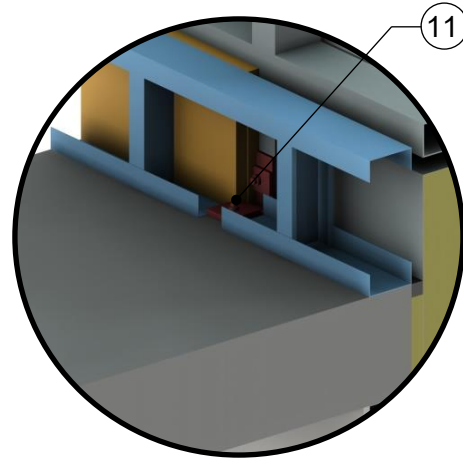
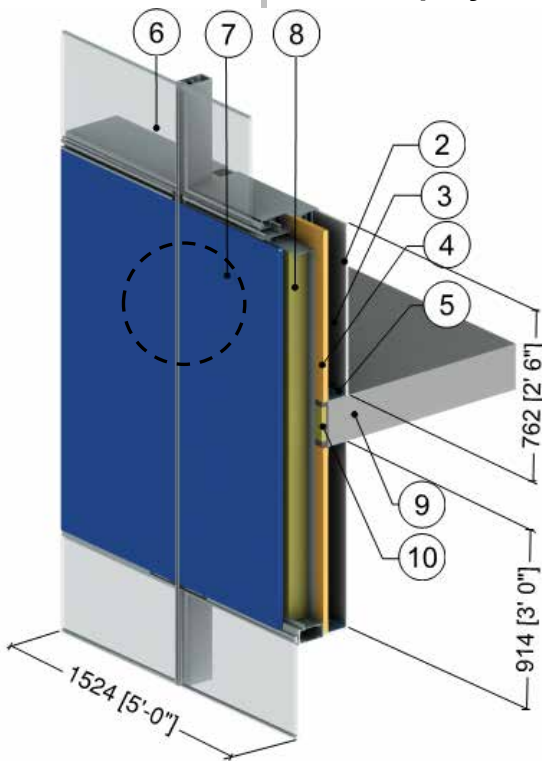
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air Cavity	2 5/8" (67)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs (16"o.c) w/ Top & Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Unitized Curtain Wall Vision System: structural silicone joints ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
6	Unitized Curtain Wall Spandrel System with Insulated Backpan: structural silicone joints ²					
7	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Mineral Wool Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
10	Steel Connection Bracket	-	347 (50)	-	489 (7830)	0.12 (500)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 3.2.2

Unitized Curtain Wall System – Intermediate Floor Intersection & Interior Spray Foam Insulation



Connection Detail from Interior

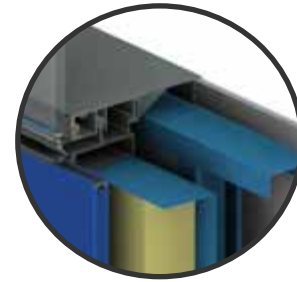
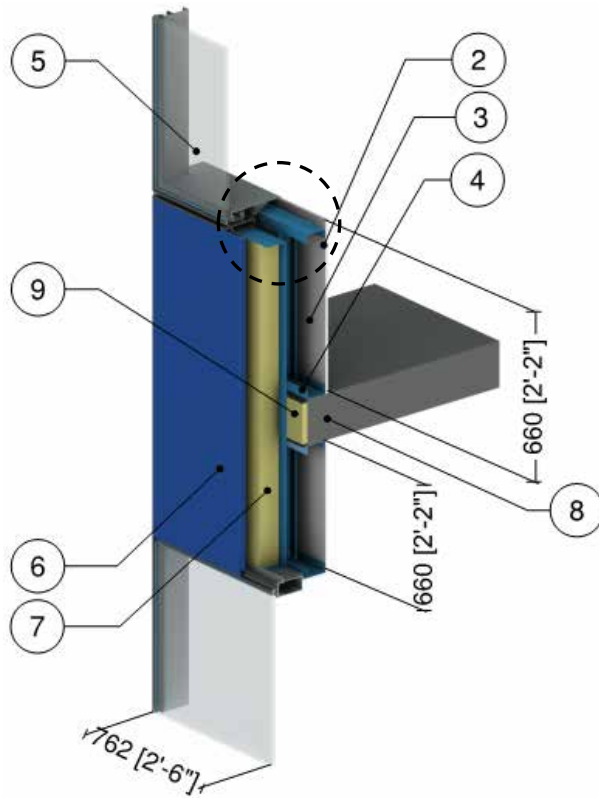
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air Cavity	2 5/8" (67)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	Spray Foam Insulation	2" (51)	0.17 (0.024)	R-12.0 (2.1 RSI)	2.8 (39)	0.35 (1470)
5	3 5/8" x 1 5/8" Steel Studs (16"o.c) w/ Top & Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	Unitized Curtain Wall Vision System: structural silicone joints ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
7	Unitized Curtain Wall Spandrel System with Insulated Backpan: structural silicone joints ²					
8	Backpan Insulation	4" (100)	0.24 (0.034)	R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Mineral Wool Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
11	Steel Connection Bracket	-	347 (50)	-	489 (7830)	0.12 (500)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

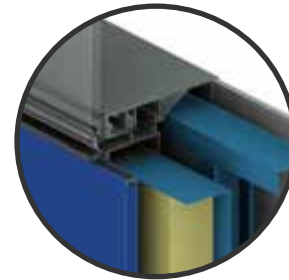
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 3.2.3

Unitized Curtain Wall System with 4-Sided Structural Silicone Joints and 5' x 5' Spandrel Section – Insulated Backpan and Intermediate Floor Intersection



H0.1 – Double Glazed IGU with Aluminum Spacer



H0.2 – Double Glazed IGU with Silicone Warm Edge Spacer

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Unitized Curtain Wall Vision Section: double glazed IGU with aluminum spacer (H0.1) or warm edge spacer (H0.2) ²					
6	Unitized Curtain Wall Spandrel Section with backpan insulation ^{2,3}					
7	Backpan Insulation	4" (100)	0.24 (0.034)	R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Mineral Wool Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

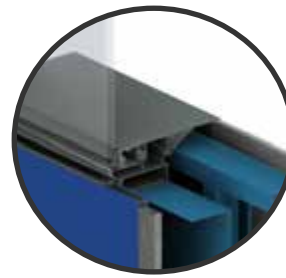
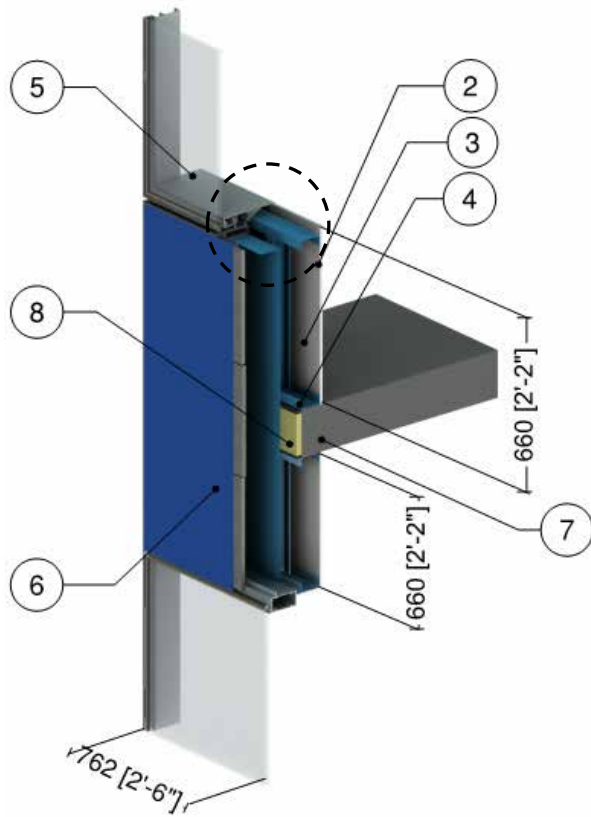
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

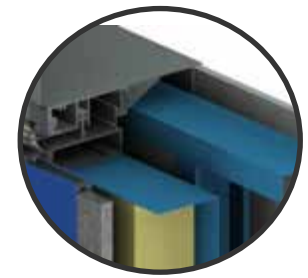
³ For a window to wall ratio of 50%

Detail 3.2.4

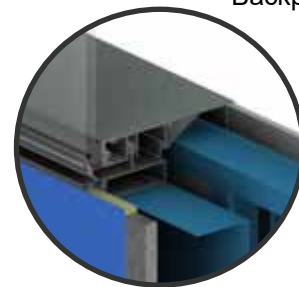
Unitized Curtain Wall System with 4-Sided Structural Silicone Joints and 5' x 5' Spandrel Section – AIM Applications and Intermediate Floor Intersection



H1 – Warm Edge Spacer, 0.75" (19 mm) AIM between Glass



H2 – Warm Edge Spacer, 0.75" (19 mm) AIM between Glass with 4" (100 mm) Backpan Insulation



H3 – Rigid Insulation Spacer, 1" (25 mm) AIM between Metal Skins

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Unitized Curtain Wall Vision Section: double glazed IGU with silicone warm edge spacer ²					
6	Unitized Curtain Wall Spandrel Section with varied insulation (see H1 to H3 above) ^{2,3}					
7	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Mineral Wool Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

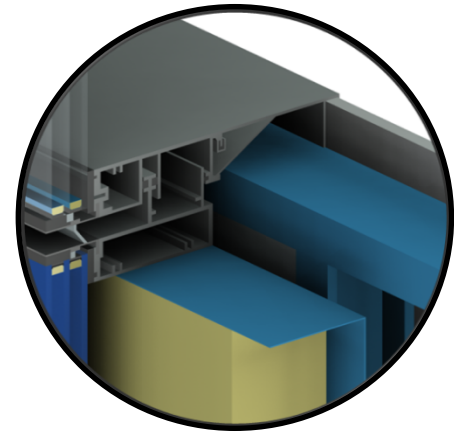
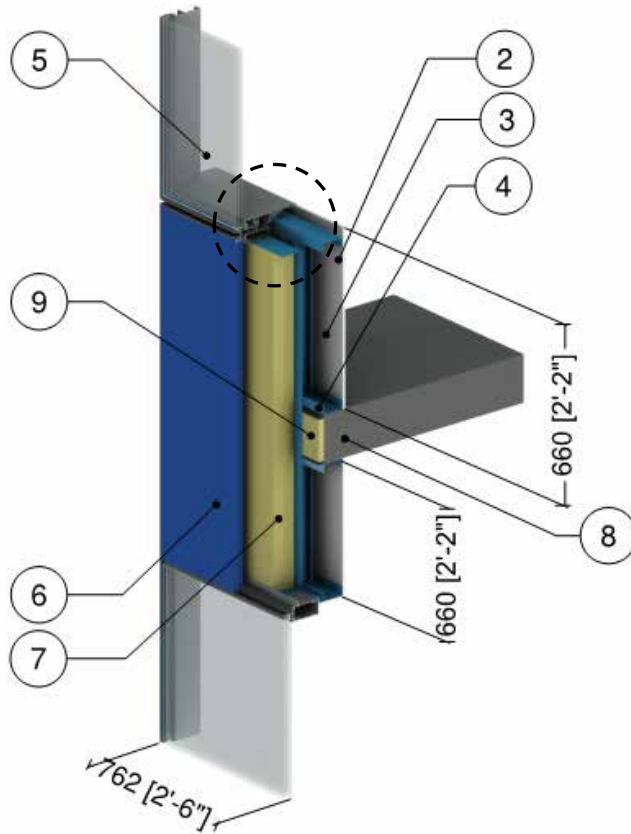
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

³ For a window to wall ratio of 50%

AIM = Architectural Insulation Module

Detail 3.2.5

Unitized Curtain Wall System with 4-Sided Structural Silicone Joints and 5' x 5' Spandrel Section – Insulated Backpan and Improved Glazing at Intermediate Floor Intersection



Triple Glazed IGU with Aluminum Spacer

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Unitized Curtain Wall Vision Section: triple glazed IGU with aluminum spacer ²					
6	Unitized Curtain Wall Spandrel Section with Backpan Insulation ^{2,3}					
7	Backpan Insulation	4" (100)	0.24 (0.034)	R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Mineral Wool Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

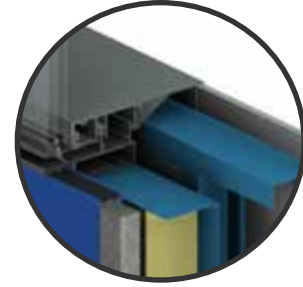
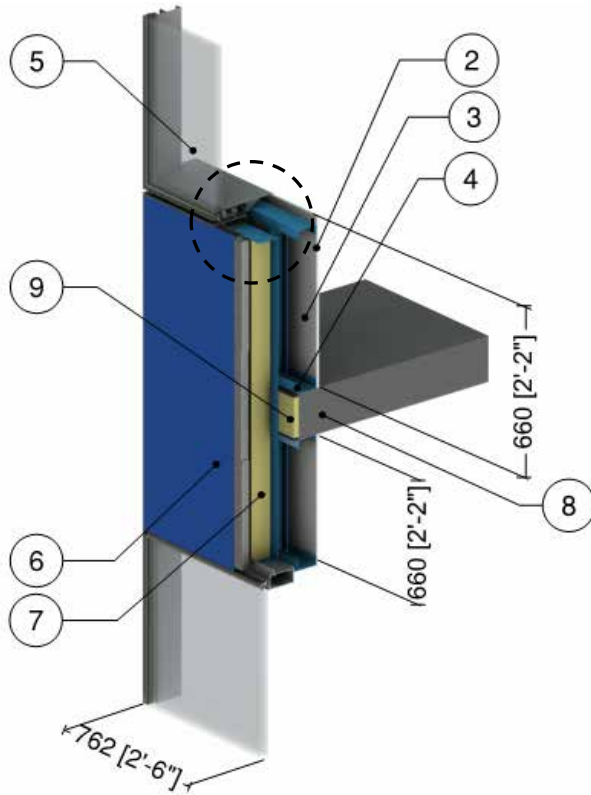
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

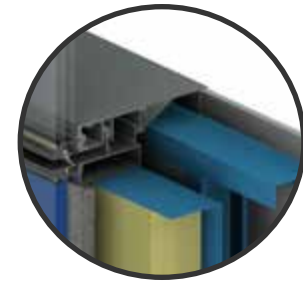
³ For a window to wall ratio of 50%

Detail 3.2.6

Unitized Curtain Wall System with 4-Sided Structural Silicone Joints and 5' x 5' Spandrel Section – AIM Applications and Improved Glazing at Intermediate Floor Intersection



I1 – Warm Edge Spacer, 1.5" (38 mm) AIM between Glass



I2 – Warm Edge Spacer, Shadow AIM with 5/8" (16 mm) AIM between Glass

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Unitized Curtain Wall Vision Section: triple glazed IGU with silicone warm edge spacer ²					
6	Unitized Curtain Wall Spandrel Section with varied insulation (see I1 to I2 above) ^{2,3}					
7	Backpan Insulation	4" (100)	0.24 (0.034)	R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Mineral Wool Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

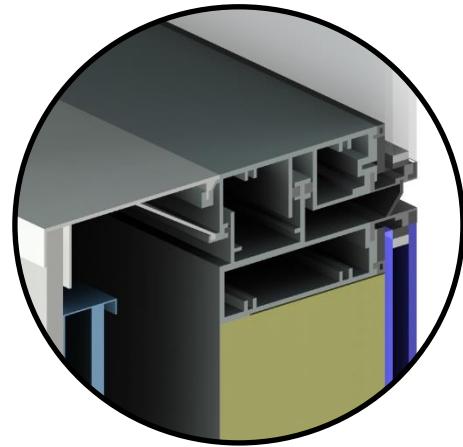
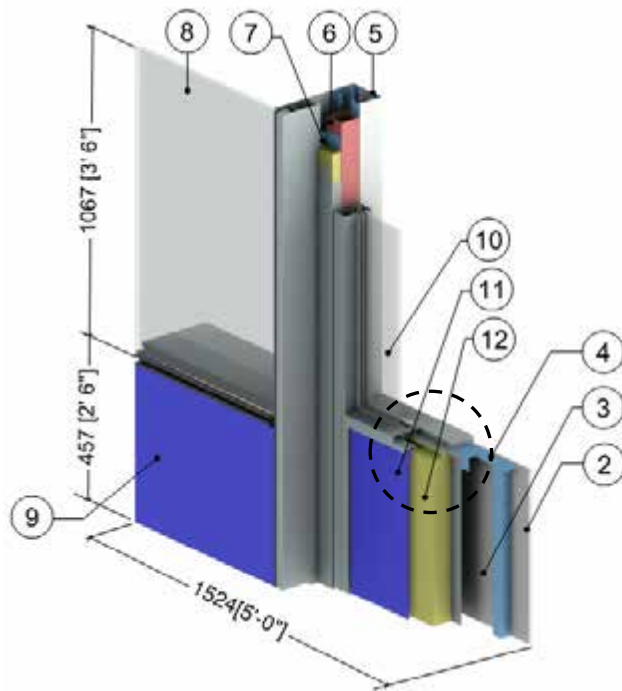
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

³ For a window to wall ratio of 50%

AIM = Architectural Insulation Module

Detail 3.3.1

Unitized Curtain Wall System – Window Wall Transition



Unitized Curtain Wall Detail

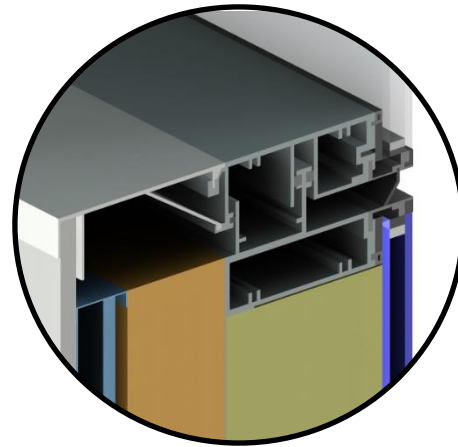
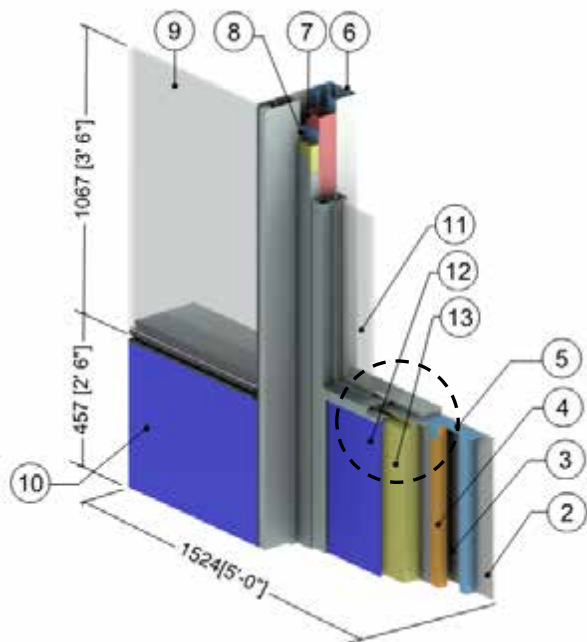
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 1/8" (79)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs (16"o.c.) w/ Top & Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	3" x 3" x 1/8" HSS Column	1/8" (3.2)	430 (62)	-	489 (7830)	0.12 (500)
7	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Unitized Curtain Wall Vision System: structural silicone joints ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
9	Unitized Curtain Wall Spandrel System with Insulated Backpan: structural silicone joints ²					
10	Aluminum Window Wall Vision System: thermally broken frame ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
11	Aluminum Window Wall Spandrel System with Insulated Backpan: thermally broken frame ²					
12	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 3.3.2

Unitized Curtain Wall System – Window Wall Transition with Foam Insulation



Unitized Curtain Wall Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	Continuous Spray Foam Insulation	1 1/2" (38)	0.17 (0.024)	R-9.0 (1.58 RSI)	2.8 (39)	0.35 (1470)
5	1 5/8" x 1 5/8" Steel Studs (16"o.c.) w/ Top & Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	3" x 3" x 1/8" HSS Column	1/8" (3.2)	430 (62)	-	489 (7830)	0.12 (500)
8	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Unitized Curtain Wall Vision System: structural silicone joints ² , double glazed IGU U _{IGU} = 0.32 BTU/hr-ft ² -°F (1.82 W/m ² K)					
10	Unitized Curtain Wall Spandrel System with Insulated Backpan: structural silicone joints ²					
11	Aluminum Window Wall Vision System: thermally broken frame ² , double glazed IGU U _{IGU} = 0.32 BTU/hr-ft ² -°F (1.82 W/m ² K)					
12	Aluminum Window Wall Spandrel System with Insulated Backpan: thermally broken frame ²					
13	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

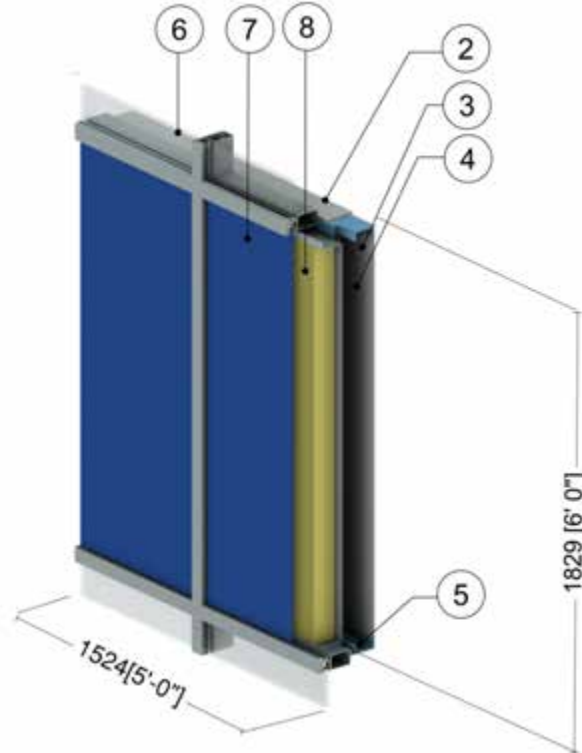
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

4.0 High Performance Curtain Wall

Detail 4.1.1	A.4.1
High Performance Curtain Wall System – Spandrel Clear Wall & No Interior Stud Cavity Insulation	
Detail 4.1.2	A.4.2
High Performance Curtain Wall System – Spandrel Clear Wall & Interior Spray Foam Insulation	
Detail 4.2.1	A.4.3
High Performance Curtain Wall System – Intermediate Floor Intersection & No Interior Stud Cavity Insulation	
Detail 4.2.2	A.4.4
High Performance Curtain Wall System – Intermediate Floor Intersection & Interior Spray Foam Insulation	
Detail 4.2.3	A.4.5
High Performance Curtain Wall System with Vertical and Horizontal Pressure Plates and 5’ x 5’ Spandrel Section – Insulated Backpan and Intermediate Floor Intersection	
Detail 4.2.4	A.4.6
High Performance Curtain Wall System with Vertical and Horizontal Pressure Plates and 5’ x 5’ Spandrel Section – AIM Applications and Intermediate Floor Intersection	
Detail 4.2.5	A.4.7
High Performance Curtain Wall System with Vertical and Horizontal Pressure Plates, Intermediate Mullion and 5’ x 5’ Spandrel Section – Insulated Backpan and Intermediate Floor Intersection	
Detail 4.2.6	A.4.8
High Performance Curtain Wall System with Vertical and Horizontal Pressure Plates, Intermediate Mullion and 5’ x 5’ Spandrel Section – AIM Applications and Intermediate Floor Intersection	

Detail 4.1.1

High Performance Curtain Wall System – Spandrel Clear Wall & No Interior Stud Cavity Insulation



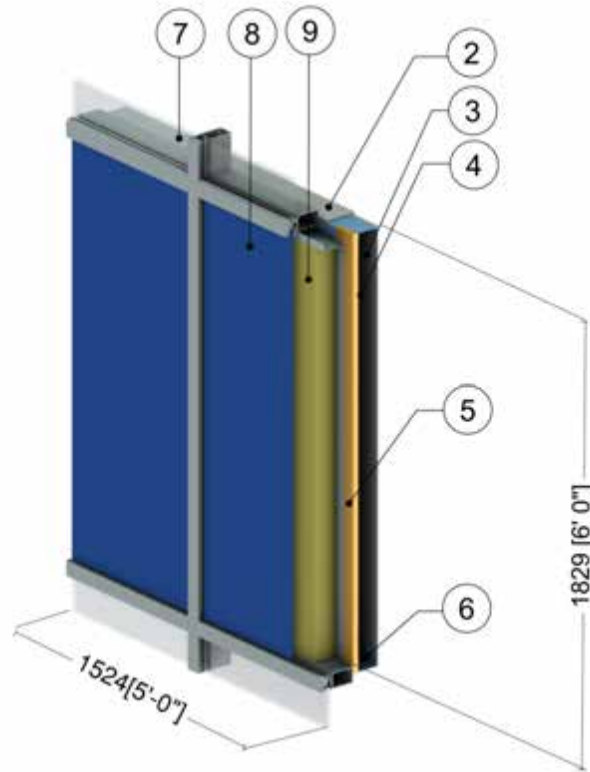
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
3	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
4	Air Cavity	4 5/8" (117)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	3 5/8" x 1 5/8" Steel Studs (16"o.c) w/ Top & Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	High Perf. Curtain Wall Vision System: thermally broken frame ² , double glazed IGU U _{IGU} = 0.32 BTU/hr-ft ² ·°F (1.82W/m ² K)					
7	High Perf. Curtain Wall Spandrel System with Insulated Backpan: thermally broken frame ²					
8	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 4.1.2

High Performance Curtain Wall System – Spandrel Clear Wall & Interior Spray Foam Insulation



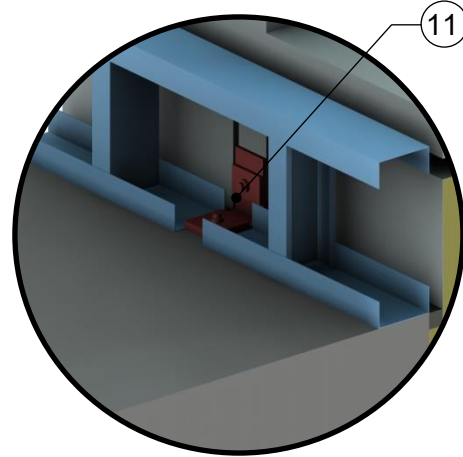
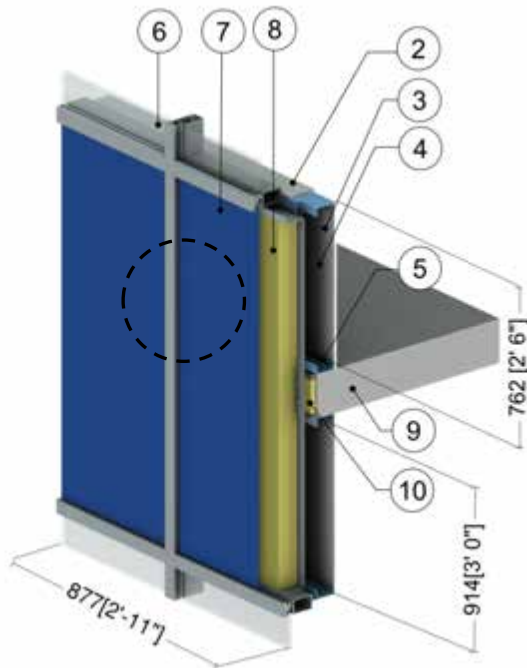
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
3	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
4	Air Cavity	4 5/8" (117)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Spray Foam Insulation	2" (51)	0.17 (0.025)	R-11.5 (2.0 RSI)	2.8 (39)	0.35 (1470)
6	3 5/8" x 1 5/8" Steel Studs (16"o.c.) w/ Top & Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	High Perf. Curtain Wall Vision System: thermally broken frame ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82W/m ² K)					
8	High Perf. Curtain Wall Spandrel System with Insulated Backpan: thermally broken frame ²					
9	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 4.2.1

High Performance Curtain Wall System – Intermediate Floor Intersection & No Interior Stud Cavity Insulation



Connection Detail from Interior

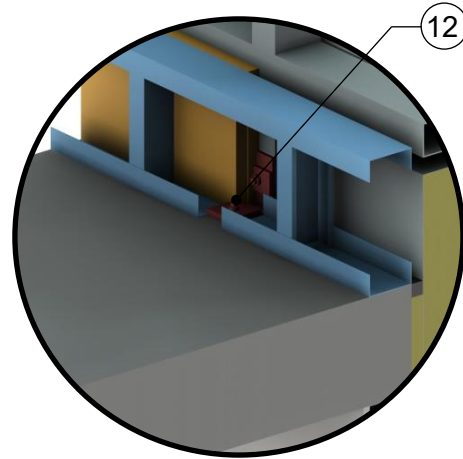
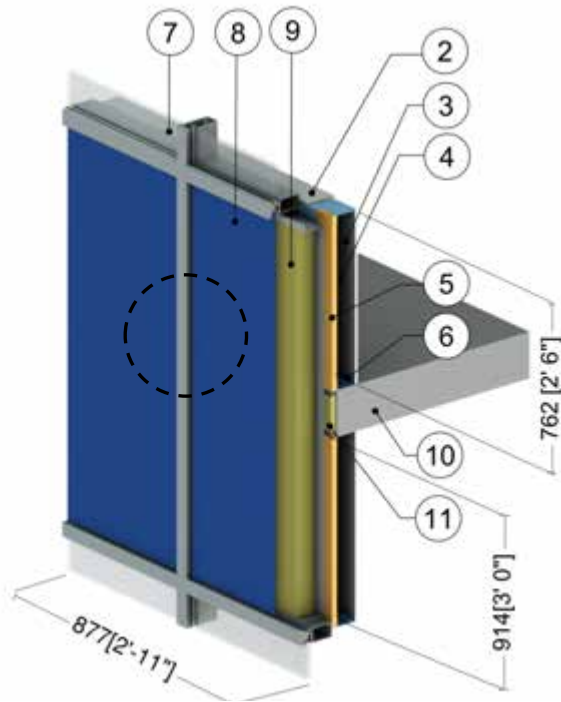
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
3	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
4	Air Cavity	2 5/8" (67)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	3 5/8" x 1 5/8" Steel Studs (16"o.c.) w/ Top & Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	High Perf. Curtain Wall Vision System: thermally broken frame ² , double glazed IGU U _{IGU} = 0.32 BTU/hr-ft ² -°F (1.82W/m ² K)					
7	High Perf. Curtain Wall Spandrel System with Insulated Backpan: thermally broken frame ²					
8	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Mineral Wool Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
11	Steel Connection Bracket	-	347 (50)	-	489 (7830)	0.12 (500)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 4.2.2

High Performance Curtain Wall System – Intermediate Floor Intersection & Interior Spray Foam Insulation



Connection Detail from Interior

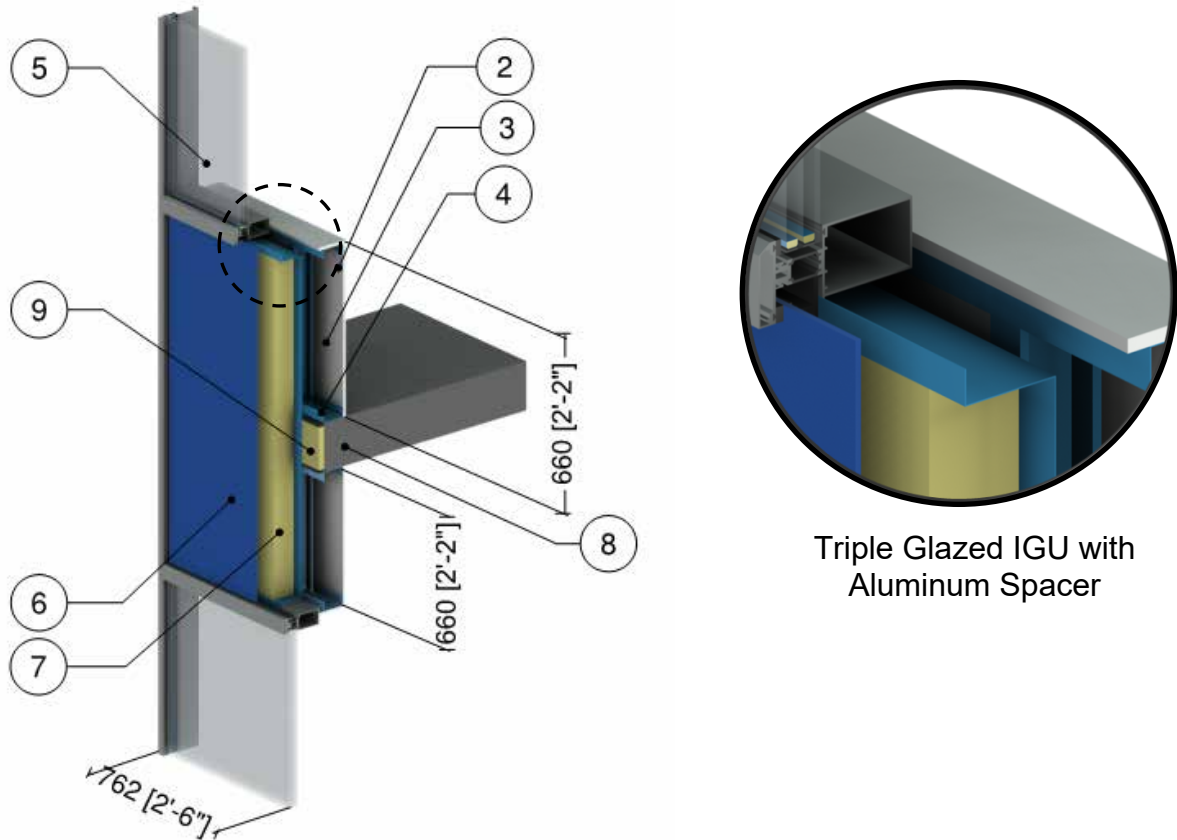
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Wood Sill	1 1/2" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
3	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
4	Air Cavity	2 5/8" (67)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Spray Foam Insulation	2" (51)	0.17 (0.025)	R-11.5 (2.0 RSI)	2.8 (39)	0.35 (1470)
6	3 5/8" x 1 5/8" Steel Studs (16"o.c.) w/ Top & Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	High Perf. Curtain Wall Vision System: thermally broken frame ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82W/m ² K)					
8	High Perf. Curtain Wall Spandrel System with Insulated Backpan: thermally broken frame ²					
9	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 to 2.96 RSI)	4 (64)	0.20 (850)
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Mineral Wool Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
12	Steel Connection Bracket	-	347 (50)	-	489 (7830)	0.12 (500)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 4.2.3

High Performance Curtain Wall System with Vertical and Horizontal Pressure Plates and 5' x 5' Spandrel Section – Insulated Backpan and Intermediate Floor Intersection



Triple Glazed IGU with Aluminum Spacer

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	High Performance Curtain Wall Vision Section: triple glazed IGU with aluminum spacer ²					
6	High Performance Curtain Wall Spandrel Section with Backpan Insulation ^{2,3}					
7	Backpan Insulation	4" (100)	0.24 (0.034)	R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Mineral Wool Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

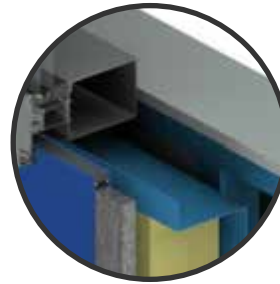
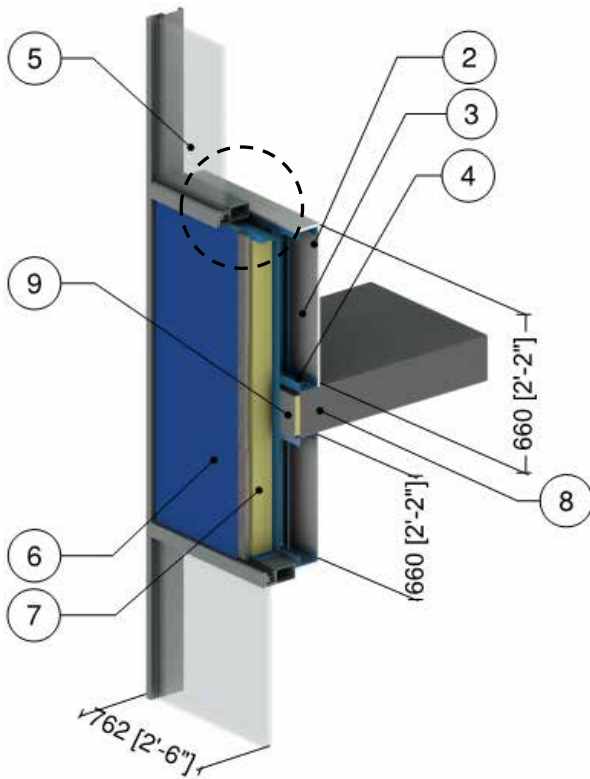
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

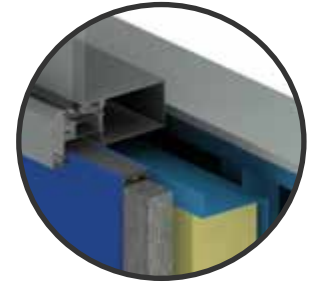
³ For a window to wall ratio of 50%

Detail 4.2.4

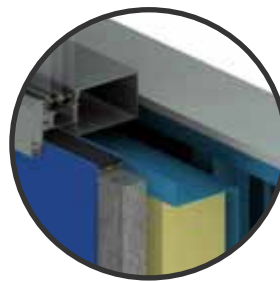
High Performance Curtain Wall System with Vertical and Horizontal Pressure Plates and 5' x 5' Spandrel Section – AIM Applications and Intermediate Floor Intersection



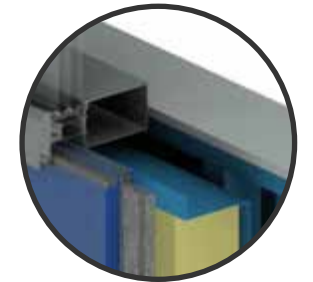
E1 – Warm Edge Spacer, 0.75" (19 mm) AIM between Glass



E2 – Warm Edge Spacer, 1.5" (38 mm) AIM between Glass



E3 – Warm Edge Spacer, 1.5" (38 mm) AIM between Glass



E4 – Warm Edge Saproer, 5/8" (16 mm) AIM in Secondary Unit

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	High Performance Curtain Wall Vision Section: double glazed (E1 & E2) or triple glazed (E3 & E4) IGU with warm edge spacer ²					
6	High Performance Curtain Wall Spandrel Section with varied insulation (see E1 to E4 above) ^{2,3}					
7	Backpan Insulation	4" (100)	0.24 (0.034)	R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Mineral Wool Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

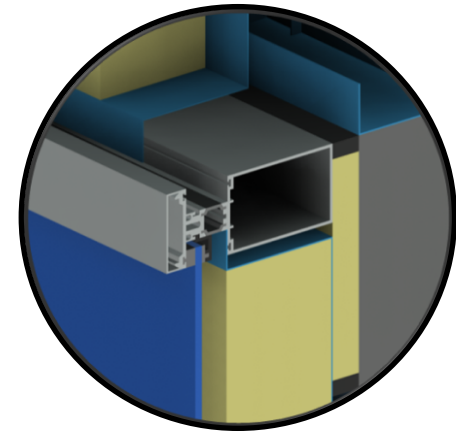
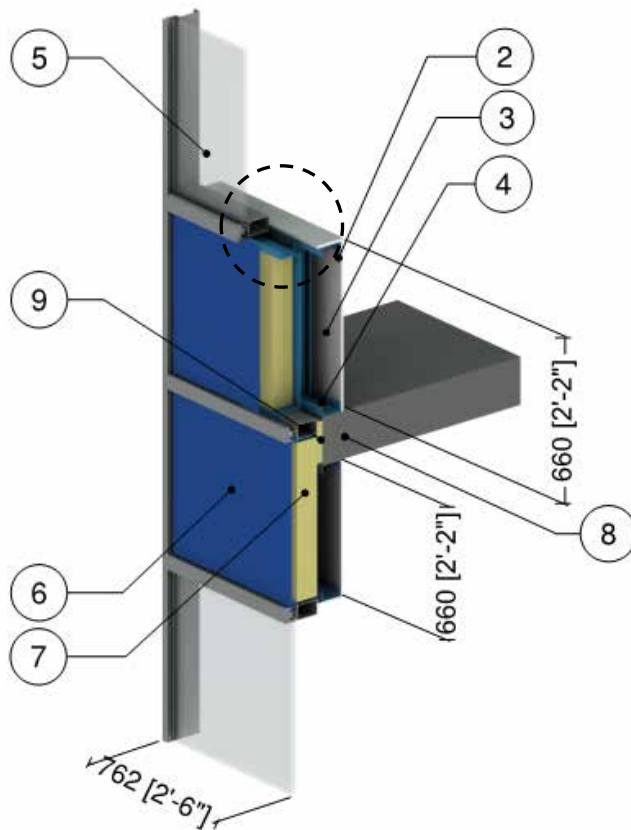
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

³ For a window to wall ratio of 50%

AIM = Architectural Insulation Module

Detail 4.2.5

High Performance Curtain Wall System with Vertical and Horizontal Pressure Plates, Intermediate Mullion and 5' x 5' Spandrel Section – Insulated Backpan and Intermediate Floor Intersection



Double Glazed IGU with Silicone Warm Edge Spacer

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	High Performance Curtain Wall Vision Section: double glazed IGU with silicone warm edge spacer ²					
6	High Performance Curtain Wall Spandrel Section with Backpan Insulation ^{2,3}					
7	Backpan Insulation	4" (100)	0.24 (0.034)	R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Mineral Wool Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

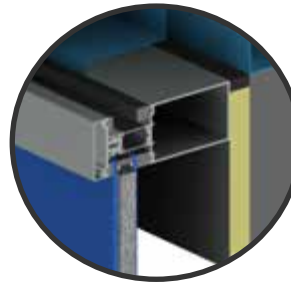
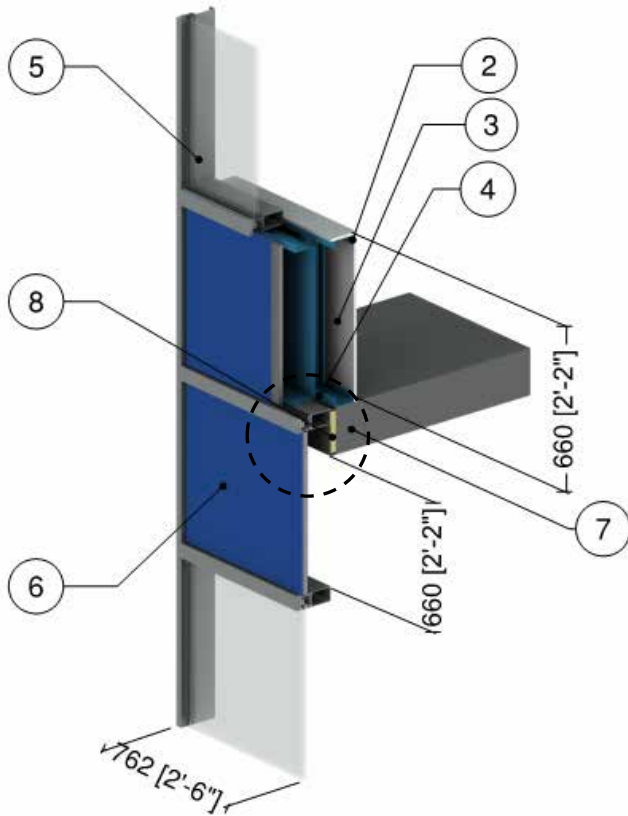
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

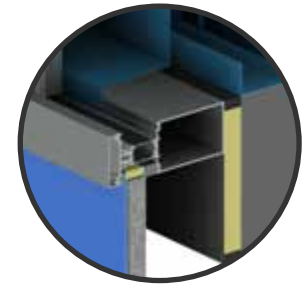
³ For a window to wall ratio of 50%

Detail 4.2.6

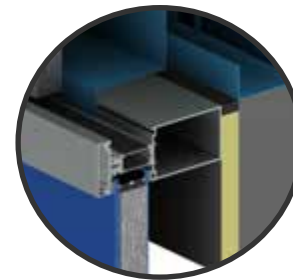
High Performance Curtain Wall System with Vertical and Horizontal Pressure Plates, Intermediate Mullion and 5' x 5' Spandrel Section – AIM Applications and Intermediate Floor Intersection



F1 – Warm Edge Spacer, 0.75" (19 mm) AIM between Glass



F2 – Rigid Insulation Spacer, 1" (25 mm) AIM between Metal Skins



F3 – Warm Edge Spacer, 1.5" (38 mm) AIM between Glass

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	High Performance Curtain Wall Vision Section: double glazed (F1 & F2) or triple glazed (F3) IGU with warm edge spacer ²					
6	High Performance Curtain Wall Spandrel Section with varied insulation (see F1 to F3 above) ^{2,3}					
7	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Mineral Wool Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.74 RSI)	4 (64)	0.20 (850)
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

³ For a window to wall ratio of 50%

AIM = Architectural Insulation Module

5.0 Steel-Frame Construction

Detail 5.1.1	A.5.1
Interior Insulated 3 5/8" x 1 5/8" Steel Stud Wall Assembly – Clear Wall	
Detail 5.1.2	A.5.2
Interior Insulated 6" x 1 5/8" Steel Stud Wall Assembly – Clear Wall	
Detail 5.1.3	A.5.3
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Clear Wall	
Detail 5.1.4	A.5.4
Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly with R-12 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.5	A.5.5
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Vertical Z-Girts (16" o.c.) Supporting Metal Cladding – Clear Wall	
Detail 5.1.6	A.5.6
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Vertical Z-Girts (16" o.c.) Supporting Metal Cladding and R-20 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.7	A.5.7
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Vertical Z-Girts (16" o.c.) and 1 1/2" Spray Foam (R-9.8) in Stud Cavity – Clear Wall	
Detail 5.1.8	A.5.8
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Vertical Z-Girts (16" o.c.) and 2" Spray Foam (R-11.4) in Stud Cavity – Clear Wall	
Detail 5.1.9	A.5.9
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding – Clear Wall	
Detail 5.1.10	A.5.10
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier HC Max Insulation and R-20 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.11	A.5.11
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier HC Plus 110 Insulation and R-20 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.12	A.5.12

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier 45 Insulation and R-20 Batt Insulation in Stud Cavity – Clear Wall

Detail 5.1.13A.5.13

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Vertical Z-girts (16" o.c.) Supporting Stucco Cladding and R-12 Batt Insulation in Stud Cavity – Clear Wall

Detail 5.1.14A.5.14

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Clear Wall

Detail 5.1.15A.5.15

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) and 1 1/2" Spray Foam (R-9.8) in Stud Cavity – Clear Wall

Detail 5.1.16A.5.16

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Vertical Z-Girts (24" o.c.) & Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding – Clear Wall

Detail 5.1.17A.5.17

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Intermittent Vertical Z-Girts (16" o.c.) Supporting Metal Cladding – Clear Wall

Detail 5.1.18A.5.18

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Clips (24" o.c.) Supporting Metal Cladding – Clear Wall

Detail 5.1.19A.5.19

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Clips (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Clear Wall

Detail 5.1.20A.5.20

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Vertical Z Clips (16" o.c.) Supporting Stucco Cladding and R-12 Batt Insulation in Stud Cavity – Clear Wall

Detail 5.1.21A.5.21

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Knight MFI-System (24" o.c.) Supporting Cladding – Clear Wall

Detail 5.1.22A.5.22

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Knight MFI-System (24" o.c.) Supporting Cladding and R-19 Batt Insulation in Stud Cavity – Clear Wall

Detail 5.1.23A.5.23

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with CL-Talon 300 Clip System Supporting Cladding – Clear Wall	
Detail 5.1.24	A.5.24
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Broken Aluminum Clip Supporting Cladding – Clear Wall	
Detail 5.1.25	A.5.25
Exterior Insulated 3 5/8" x 1/58" Steel Stud (16"o.c.) Wall Assembly with TAC Fiber Reinforced Plastic Girts Supporting Cladding – Clear Wall	
Detail 5.1.26	A.5.26
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Broken Aluminum Clip Rail System (24" o.c.) Supporting Cladding – Clear Wall	
Detail 5.1.27	A.5.27
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier HC Max Insulation and R-20 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.28	A.5.28
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier HC Plus 110 Exterior Insulation and R-20 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.29	A.5.29
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier 45 Insulation and R-20 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.30	A.5.30
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier HC Max Insulation and R-22 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.31	A.5.31
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier HC Plus 110 Exterior Insulation and R-22 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.32	A.5.32
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier 45 Insulation and R-22 Batt Insulation in Stud Cavity – Clear Wall	

Detail 5.1.33	A.5.33
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier HC Max Insulation and R-24 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.34	A.5.34
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier HC Plus 110 Exterior Insulation and R-24 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.35	A.5.35
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier 45 Insulation and R-24 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.36	A.5.36
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Knight CI-System (8" o.c.) and 1 1/2" Spray Foam (R-9.8) in Stud Cavity – Clear Wall	
Detail 5.1.37	A.5.37
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Knight CI-System (16" o.c.) and 1 1/2" Spray Foam (R-9.8) in Stud Cavity – Clear Wall	
Detail 5.1.38	A.5.38
Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Knight CI-System (8" o.c.) – Clear Wall	
Detail 5.1.39	A.5.39
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with R-TEC CI Bracket System Supporting Vertical Sub-girts – Clear Wall	
Detail 5.1.40	A.5.40
Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with R-TEC CI Bracket System Supporting Vertical Sub-girts and R-13 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.41	A.5.41
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Broken ISO Clip System Supporting Vertical Sub-girts – Clear Wall	
Detail 5.1.42	A.5.42
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Broken ISO Clip System Supporting Horizontal Sub-girts – Clear Wall	
Detail 5.1.43	A.5.43

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Broken ISO Clip System Supporting Vertical Sub-girts and R-12 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.44	A.5.44
Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Broken ISO Clip System Supporting Horizontal Sub-girts and R-12 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.45	A.5.45
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Broken ISO Clip System (16" o.c.) Supporting Horizontal and Vertical Sub-girts – Clear Wall	
Detail 5.1.46	A.5.46
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Broken ISO Clip System (32" o.c.) Supporting Horizontal and Vertical Sub-girts – Clear Wall	
Detail 5.1.47	A.5.47
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Nvelope – NV1 Clip System Supporting Cladding – Clear Wall	
Detail 5.1.48	A.5.48
Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Nvelope – NV1 Clip System Supporting Cladding and R-12 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.49	A.5.49
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Nvelope – NV1 Clip System Supporting Cladding and R-19 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.50	A.5.50
Exterior and Interior Insulated 6" x 1 5/8" Slotted Steel R-Stud (16" o.c.) Wall Assembly with Nvelope – NV1 Clip System Supporting Cladding and R-19 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.51	A.5.51
Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Nvelope – Eko Thermobacket Clip System Supporting Cladding and R-13 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.52	A.5.52
Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Nvelope – Eko Thermobacket and NV1 Clip System Supporting Cladding and R-13 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.53	A.5.53
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" O.C.) Wall Assembly with Cascadia Clip Fiberglass Thermal Spacers – Clear Wall	

Detail 5.1.54	A.5.54
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c. and 24" o.c.) Wall Assembly with Vertical Clips (24" o.c. and 36" o.c.) Supporting Cladding and Owens Corning R-20 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.55	A.5.55
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c. and 24" o.c.) Wall Assembly with Vertical Clips (24" o.c. and 36" o.c.) Supporting Cladding and Owens Corning R-22.5 Batt Insulation in Stud Cavity– Clear Wall	
Detail 5.1.56	A.5.56
Exterior and Interior Insulated 6" x 1/58" Steel Stud (16" o.c. and 24" o.c.) Wall Assembly with Vertical Clips (24" o.c. and 36" o.c.) Supporting Cladding and Owens Corning R-24 Batt Insulation in Stud Cavity– Clear Wall	
Detail 5.1.57	A.5.57
Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c. and 24" o.c.) Wall Assembly with Vertical Clips (24" o.c. and 36" o.c.) Supporting Cladding – Clear Wall	
Detail 5.1.58	A.5.58
Owens Corning Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding – Clear Wall	
Detail 5.1.59	A.5.59
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c. and 24" o.c.) Wall Assembly with Vertical Clips (24" o.c. and 36" o.c.) Supporting Cladding and R-20 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.60	A.5.60
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c. and 24" o.c.) Wall Assembly with Steel Brick Anchors Supporting Brick Veneer and Owens Corning R-20 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.61	A.5.61
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c. and 24" o.c.) Wall Assembly with Steel Brick Anchors Supporting Brick Veneer and Owens Corning R-22.5 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.62	A.5.62
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c. and 24" o.c.) Wall Assembly with Steel Brick Anchors Supporting Brick Veneer and Owens Corning R-24 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.63	A.5.63
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Heckmann Pos-I-Tie Veneer Anchoring System Supporting Brick Veneer and Owens Corning R-20 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.64	A.5.64

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Heckmann Pos-I-Tie Veneer Anchoring System Supporting Brick Veneer and Owens Corning R-22.5 Batt Insulation in Stud Cavity – Clear Wall

Detail 5.1.65**A.5.65**

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Heckmann Pos-I-Tie Veneer Anchoring System Supporting Brick Veneer and Owens Corning R-24 Batt Insulation in Stud Cavity – Clear Wall

Detail 5.1.66**A.5.66**

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Steel Anchor Supporting Brick Veneer, Owens Corning XPS Exterior Insulation and R-20 Batt Insulation in Stud Cavity – Clear Wall

Detail 5.1.67**A.5.67**

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Zinc 2-Seal Anchor Supporting Brick Veneer – Clear Wall

Detail 5.1.68**A.5.68**

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Stainless Steel 2-Seal Thermal Anchor Supporting Brick Veneer – Clear Wall

Detail 5.1.69**A.5.69**

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Stainless Steel 2-Seal Thermal Wing Nut Anchor Supporting Brick Veneer – Clear Wall

Detail 5.1.70**A.5.70**

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Carbon Steel X-Seal Anchor Supporting Brick Veneer – Clear Wall

Detail 5.1.71**A.5.71**

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Stainless Steel X-Seal Anchor Supporting Brick Veneer – Clear Wall

Detail 5.1.72**A.5.72**

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Carbon Steel HB-213 2X Anchor Supporting Brick Veneer – Clear Wall

Detail 5.1.73**A.5.73**

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Stainless Steel HB-213 2X Anchor Supporting Brick Veneer – Clear Wall

Detail 5.1.74**A.5.74**

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Carbon Steel HB-200-X Anchor Supporting Brick Veneer – Clear Wall	
Detail 5.1.75	A.5.75
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Stainless Steel HB-200-X Anchor Supporting Brick Veneer – Clear Wall	
Detail 5.1.76	A.5.76
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Carbon Steel BL-407 Anchor Supporting Brick Veneer – Clear Wall	
Detail 5.1.77	A.5.77
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Stainless Steel BL-407 Anchor Supporting Brick Veneer – Clear Wall	
Detail 5.1.78	A.5.78
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c. and 24" o.c.) Wall Assembly with Stainless Steel Brick Anchors Supporting Brick Veneer and R-20 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.79	A.5.79
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c. and 24" o.c.) Wall Assembly with Steel Brick Anchors Supporting Brick Veneer and R-20 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.80	A.5.80
Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with ECO Cladding Alpha Vci Vertical System – Clear Wall	
Detail 5.1.81	A.5.81
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with ECO Cladding Alpha Vci Vertical System and R-19 Batt Insulation in Stud Cavity – Clear Wall	
Detail 5.1.82	A.5.82
Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with ECO Cladding Alpha Hci Horizontal System – Clear Wall	
Detail 5.1.83	A.5.83
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Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with EJOT Crossfix Console and Vertical Rail System Supporting Metal Cladding - Clear Wall	
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Exterior Insulated 6" x 1 5/8" Steel Stud (24" o.c.) Wall Assembly with EJOT Crossfix Console and Vertical Rail System Supporting Metal Cladding - Clear Wall	
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Detail 5.1.110	A.5.110
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Detail 5.1.111	A.5.111
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Detail 5.1.112	A.5.112
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Detail 5.1.113	A.5.113
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- Detail 5.2.33****A.5.168**
- Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with FERRO Slotted Rap Ties (24" o.c.) and FERRO FAST Thermal Bracket (48" o.c.) Supporting Brick Veneer – Intermediate Floor Intersection
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- Owens Corning Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding – Intermediate Floor Intersection
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- Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-20 Batt in Stud Cavity – Intermediate Floor Intersection
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- Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-22.5 Batt in Stud Cavity – Intermediate Floor Intersection
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- Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-24 Batt in Stud Cavity – Intermediate Floor Intersection
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Insulation in Stud Cavity – Steel Roof Deck with Open Web Steel Joist & Parapet Intersection

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Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Steel Roof Deck with Open Web Steel Joist & Parapet Intersection with Thermal Break under Parapet Stud Cavity

Detail 5.5.12A.5.227

Owens Corning Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding – Concrete Parapet and Roof Intersection

Detail 5.5.13A.5.228

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-20 Batt in Stud Cavity – Concrete Parapet and Roof Intersection

Detail 5.5.14A.5.229

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-22.5 Batt in Stud Cavity – Concrete Parapet and Roof Intersection

Detail 5.5.15A.5.230

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-24 Batt in Stud Cavity – Concrete Parapet and Roof Intersection

Detail 5.5.16A.5.231

Owens Corning Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding – Concrete Roof Deck at Isokorb AXTI Thermal Broken Concrete Parapet

Detail 5.5.17A.5.232

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-20 Batt in Stud Cavity – Concrete Roof Deck at Isokorb AXTI Thermal Broken Concrete Parapet

Detail 5.5.18A.5.233

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-22.5 Batt in Stud Cavity – Concrete Roof Deck at Isokorb AXTI Thermal Broken Concrete Parapet

Detail 5.5.19A.5.234

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-24 Batt in Stud Cavity – Concrete Roof Deck at Isokorb AXTI Thermal Broken Concrete Parapet	
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Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with FRP and Thermally Broken Vertical Brackets and Rail System Supporting Metal Cladding and R-19 Batt in Stud Cavity – Concrete Roof Deck at Isokorb AXT Thermally Broken Concrete Parapet	
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Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and R-20 Batt in Stud Cavity – Concrete Parapet and Roof Intersection	
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Detail 5.6.4	A.5.244

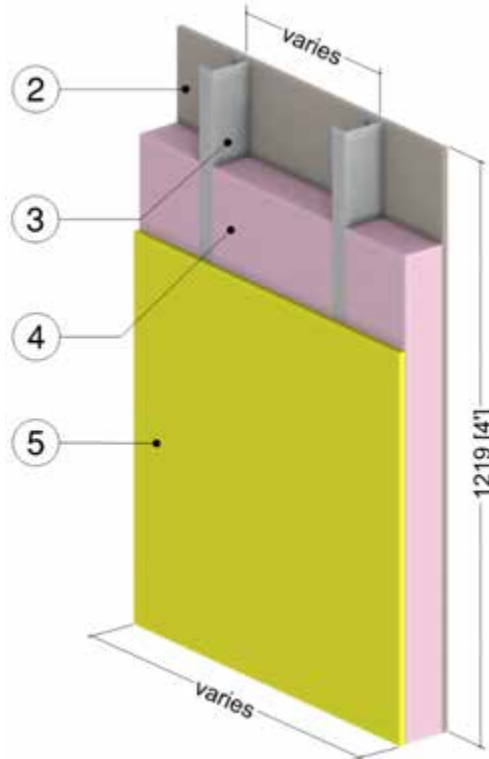
- Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding – Corner Intersection with Alternative Framing
- Detail 5.6.5****A.5.245**
- Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Corner Intersection
- Detail 5.6.6****A.5.246**
- Window Wall System – Transition to Exterior Insulated Steel Stud Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding & No Interior Stud Cavity Insulation
- Detail 5.6.7****A.5.247**
- Window Wall System – Transition to Exterior Insulated Steel Stud Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding & Interior Sprayfoam and Fibreglass Batt Insulation
- Detail 5.7.1****A.5.248**
- Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Structural Steel Column & Cantilever Beam Intersection (Canopy Support)
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- Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Structural Steel Floor Intersection with Uninterrupted Beam
- Detail 5.7.3****A.5.250**
- Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Structural Steel Floor Intersection with Isolator Pad
- Detail 5.7.4****A.5.251**
- Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Structural Steel Floor Intersection with Isokorb S22 Thermally Broken Beam
- Detail 5.7.5****A.5.252**
- Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Intermittent Vertical Z-girts (16" o.c.) Supporting Metal Cladding – Concrete Floor to Steel Beam Connection
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- Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Intermittent Vertical Z-girts (16" o.c.) Supporting Metal Cladding – Concrete Floor to Steel Beam with a Thermal Isolator Pad Connection

Detail 5.7.7	A.5.254
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Intermittent Vertical Z-girts (16" o.c.) Supporting Metal Cladding – Concrete Floor to Steel Beam with Isokorb KS14 Connection	
Detail 5.7.8	A.5.255
Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Structural Steel Floor Intersection with Beam Thermal Break	
Detail 5.7.9	A.5.256
Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Structural Steel Floor Intersection with Aerolon Coating	
Detail 5.7.10	A.5.257
Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with FRP Vertical Brackets and Rail System Supporting Metal Cladding – Structural Steel Column & Knife Edge Cable Support Intersection	
Detail 5.7.11	A.5.258
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with FRP Vertical Brackets and Rail System Supporting Metal Cladding with R-19 Batt in Stud Cavity – Structural Steel Column & Knife Edge Cable Support Intersection	
Detail 5.7.12	A.5.259
Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Structural Steel Floor Intersection with Thermal Isolator Pad	
Detail 5.7.13	A.5.260
Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Structural Steel Floor Intersection with Isokorb KST System Thermally Broken Beam	
Detail 5.8.1	A.5.261
Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Interior Wall Intersection	
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Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with FRP Vertical Brackets and Rail System Supporting Metal Cladding – At-Grade Foundation Wall Intersection	
Detail 5.8.3	A.5.263

**Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly
with FRP Vertical Brackets and Rail System Supporting Metal Cladding and R19
Batt Insulation in Stud Cavity – At-Grade Foundation Wall Intersection**

Detail 5.1.1

Interior Insulated 3 5/8" x 1 5/8" Steel Stud Wall Assembly – Clear Wall

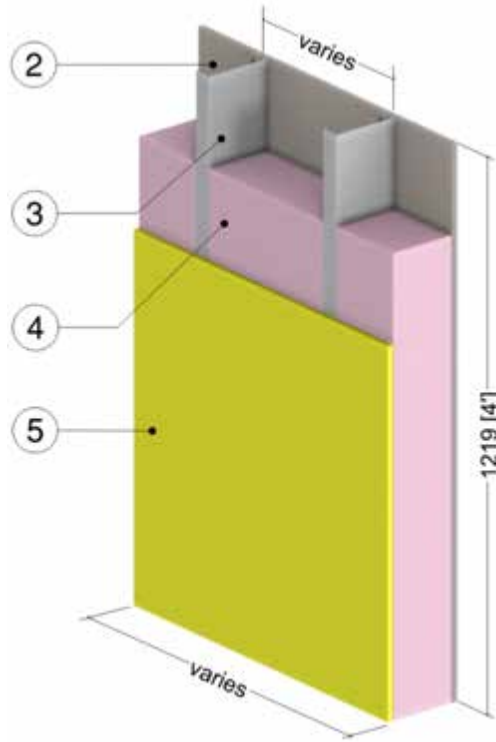


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air or Fiberglass Batt Insulation in Stud Cavity	3 5/8" (92)	-	R-0.9 to R-13 (0.16 to 2.29 RSI)	varies	varies
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Metal cladding with 1/2" (13 mm) vented air space is incorporated into exterior heat transfer coefficient					
7	Exterior Film ¹	-	-	R-0.7 (0.012 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.2

Interior Insulated 6" x 1 5/8" Steel Stud Wall Assembly – Clear Wall

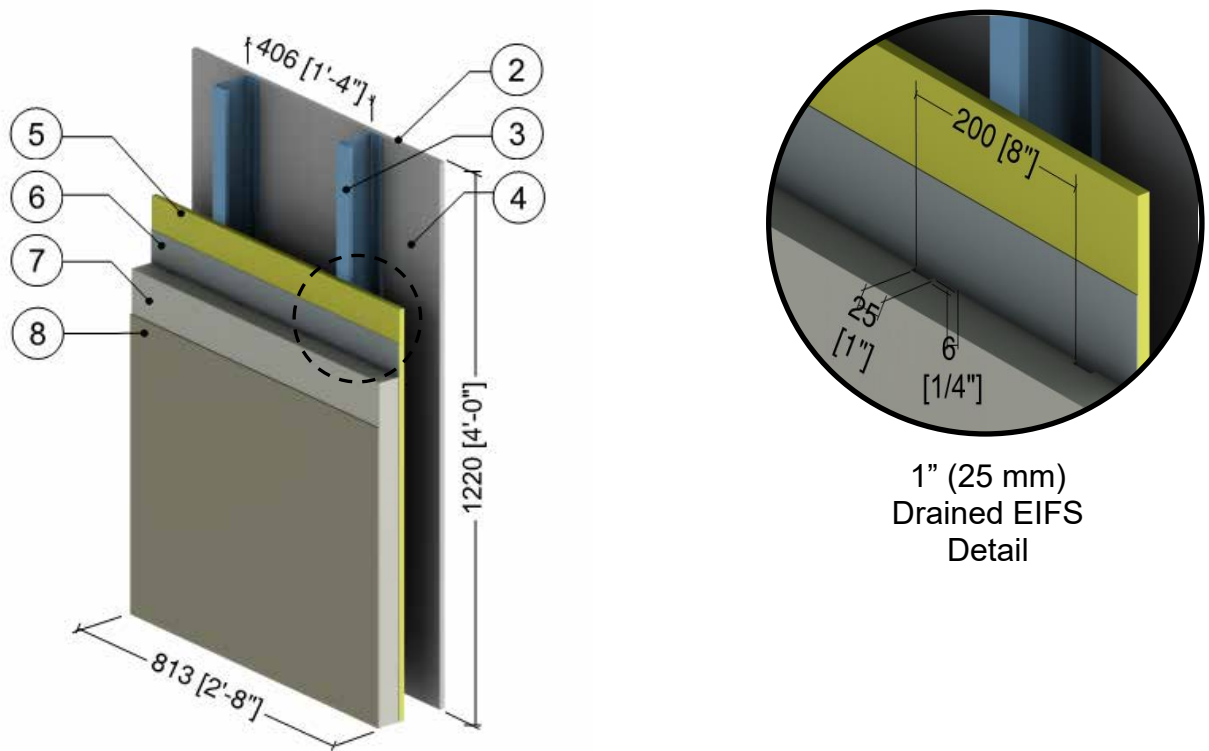


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air or Fiberglass Batt Insulation in Stud Cavity	6" (152)	-	R-0.9 to R-24 (0.16 to 4.23 RSI)	varies	varies
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Metal cladding with 1/2" (13 mm) vented air space is incorporated into exterior heat transfer coefficient					
7	Exterior Film ¹	-	-	R-0.7 (0.012 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.3

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Clear Wall



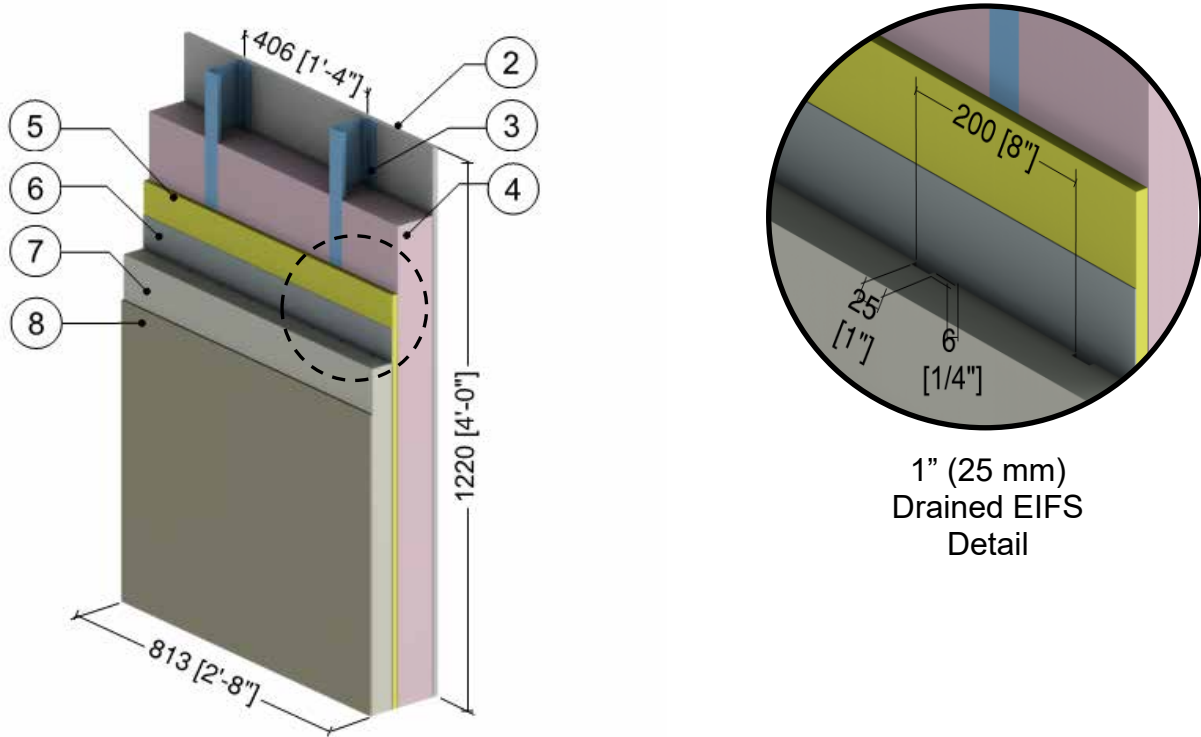
1" (25 mm)
Drained EIFS
Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs (16"o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	2" to 4" (50 to 100)	0.27 (0.039)	R-7.5 to R-15 (1.32 to 2.64 RSI)	1 (16)	0.35 (1470)
8	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.4

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly with R-12 Batt Insulation in Stud Cavity – Clear Wall

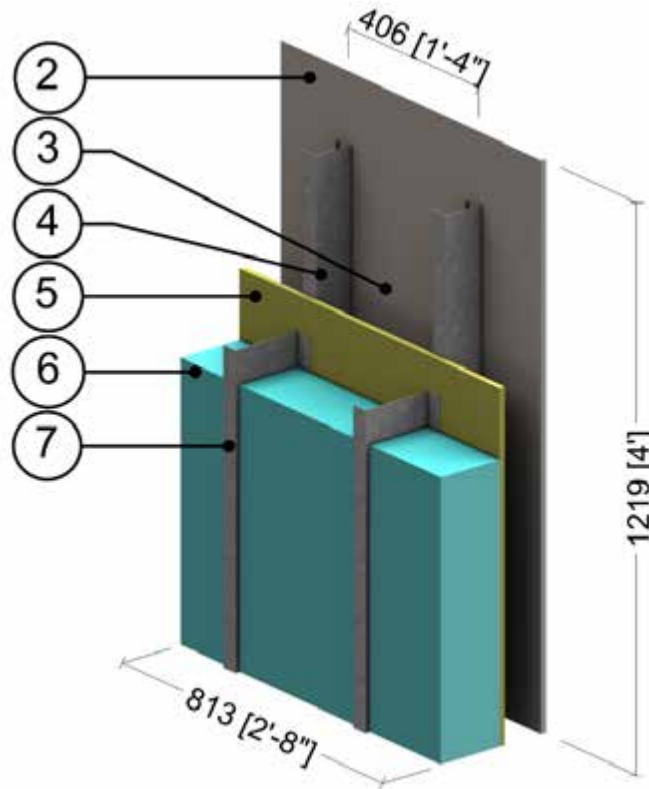


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs (16"o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	2" to 6" (50 to 152)	0.27 (0.038)	R-7.5 to R-22.5 (1.32 to 3.96 RSI)	1 (16)	0.35 (1470)
8	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.5

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Vertical Z-Girts (16" o.c.) Supporting Metal Cladding – Clear Wall

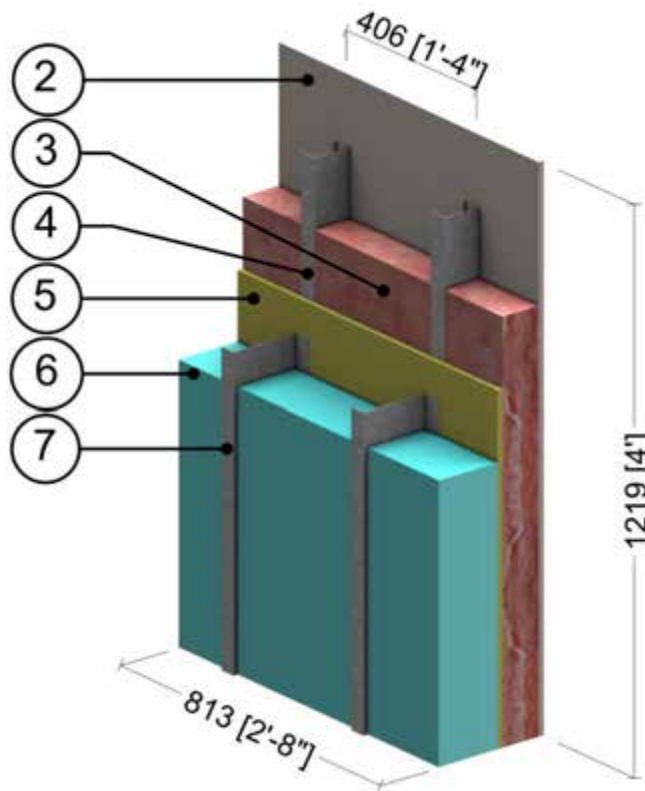


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-5 to R-40 (0.88 to 7.0 RSI)	1.8 (28)	0.29 (1220)
7	Vertical Z-Girts w/ 1 1/2" Flange	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Metal cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
9	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.6

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Vertical Z-Girts (16" o.c.) Supporting Metal Cladding and R-20 Batt Insulation in Stud Cavity – Clear Wall

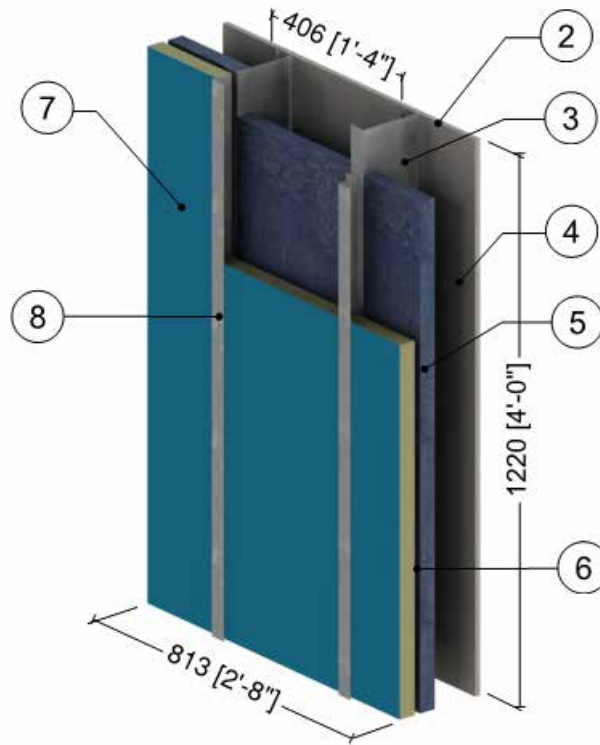


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	6" (152)	0.30 (0.043)	R-20 (3.52 RSI)	0.9 (14)	0.17 (710)
4	6" x 1 5/8" Steel Studs	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	0.20 (0.029)	R-20 to R-30 (3.52 to 5.28 RSI)	1.8 (28)	0.29 (1220)
7	Vertical Z-Girts w/ 1 1/2" Flange	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Metal cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
9	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.7

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Vertical Z-Girts (16" o.c.) and 1 1/2" Spray Foam (R-9.8) in Stud Cavity – Clear Wall

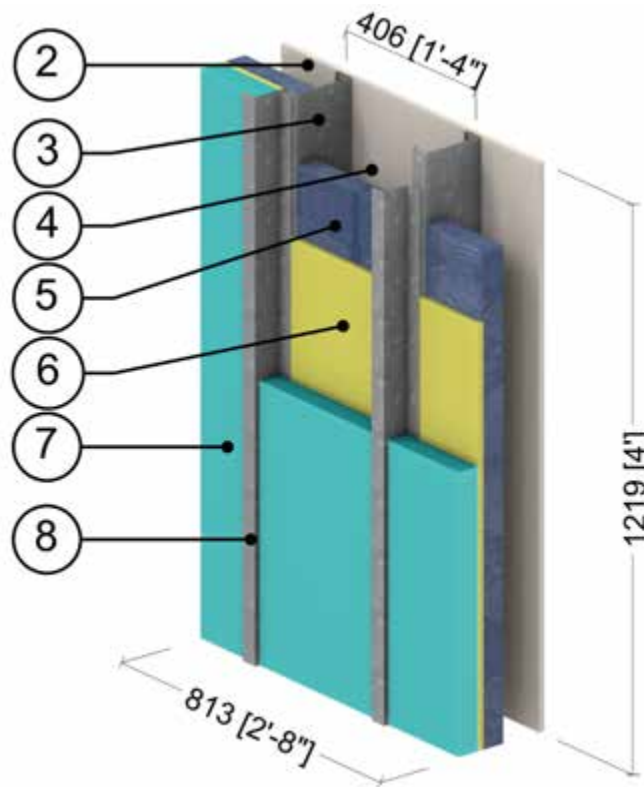


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	0.09 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs (16" o.c.)	18 Gauge	250 (36)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	4 1/2" (114)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Spray Foam Insulation	1 1/2" (38)	-	R-9.8 (1.73 RSI)	-	-
6	Exterior Sheathing	5/8" (16)	0.09 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
7	Exterior Polyisocyanurate Insulation	1 1/2" (38)	-	R-10.1 (1.78 RSI)	-	-
8	Vertical Z-Girts (16" o.c.)	18 Gauge	250 (36)	-	489 (7830)	0.12 (500)
9	Metal Cladding with vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.8

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Vertical Z-Girts (16" o.c.) and 2" Spray Foam (R-11.4) in Stud Cavity – Clear Wall

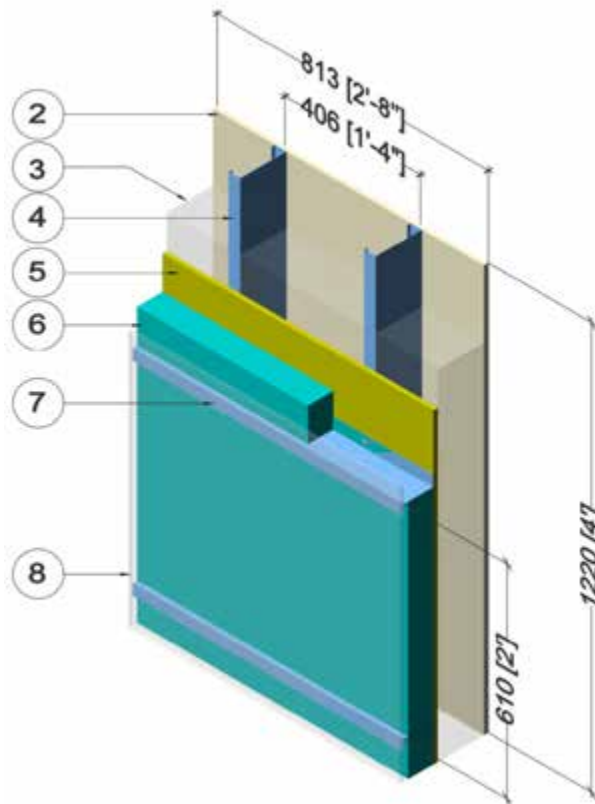


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs (16" o.c.)	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	4" (102)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Spray Foam Insulation	2" (51)	0.17 (0.025)	R-11.4 (2.01 RSI)	2.8 (39)	0.35 (1470)
6	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
7	Exterior Insulation	Varies	0.20 (0.029)	R-10 to R-30 (1.76 to 5.28 RSI)	1.8 (28)	0.29 (1220)
8	Vertical Z-Girts (16" o.c.)	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.9

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding – Clear Wall

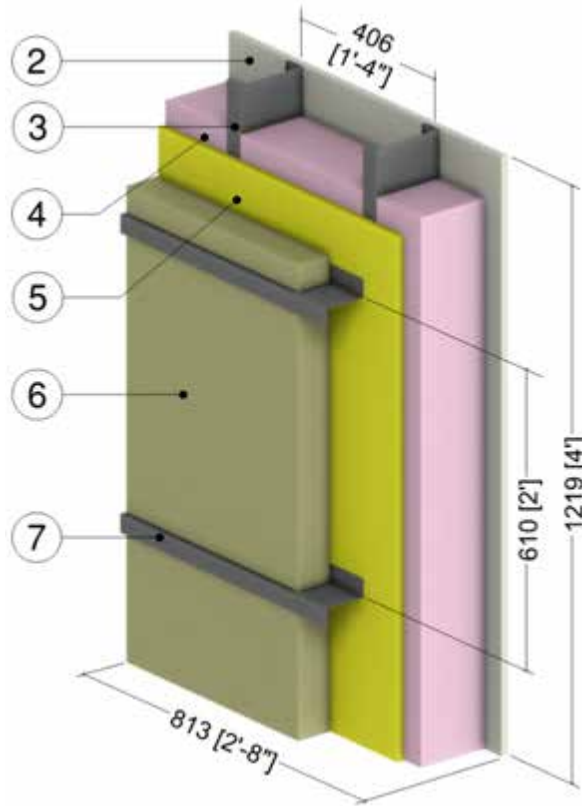


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 to 4.4 RSI)	1.8 (28)	0.29 (1220)
7	Horizontal Z-Girts w/ 1 1/2" Flange	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Metal cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
9	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.10

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier HC Max Insulation and R-20 Batt Insulation in Stud Cavity – Clear Wall

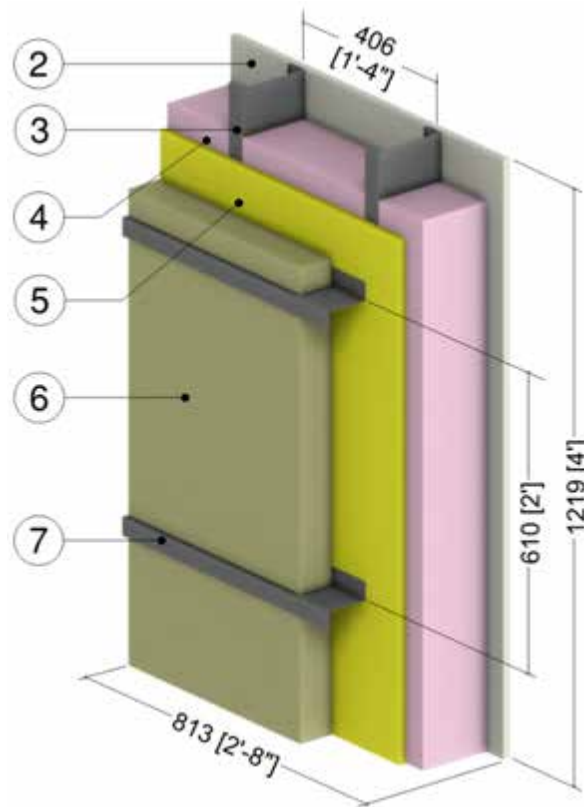


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.30 (0.043)	R-20 (3.52 RSI)	0.55 (8.8)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	ThermaFiber RainBarrier HC Max Mineral Wool Semi Rigid Insulation	Varies	0.25 (0.036)	R-4 to R-24 (0.70 to 4.23 RSI)	11 (176)	0.20 (850)
7	Horizontal Z-Girts with 1-1/2" Flange	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Metal Cladding with 1/2" (13 mm) vented airspace incorporated into exterior heat transfer coefficient					
9	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.11

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier HC Plus 110 Insulation and R-20 Batt Insulation in Stud Cavity – Clear Wall

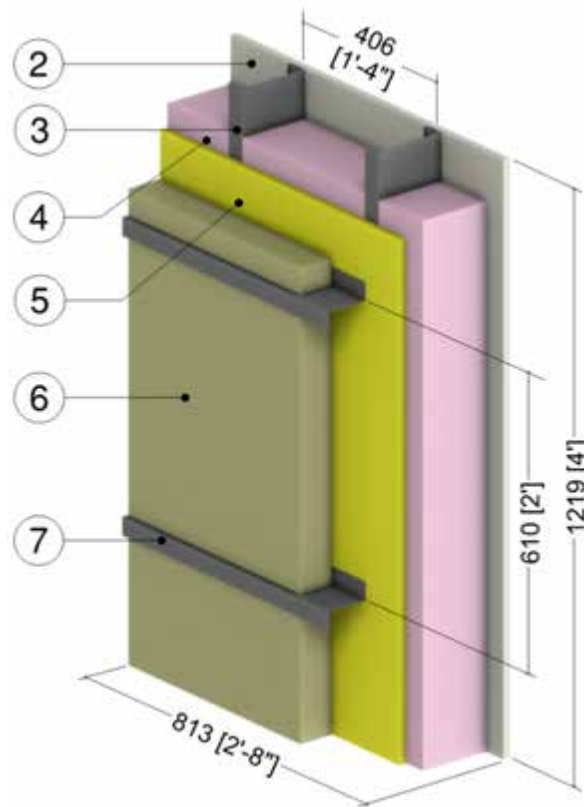


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.30 (0.043)	R-20 (3.52 RSI)	0.55 (8.8)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	ThermaFiber RainBarrier HC Plus 110 Mineral Wool Semi Rigid Insulation	Varies	0.24 (0.035)	R-4.1 to R-24.6 (0.72 to 4.33 RSI)	8 (128)	0.20 (850)
7	Horizontal Z-Girts with 1-1/2" Flange	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Metal Cladding with 1/2" (13 mm) vented airspace incorporated into exterior heat transfer coefficient					
9	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.12

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier 45 Insulation and R-20 Batt Insulation in Stud Cavity – Clear Wall

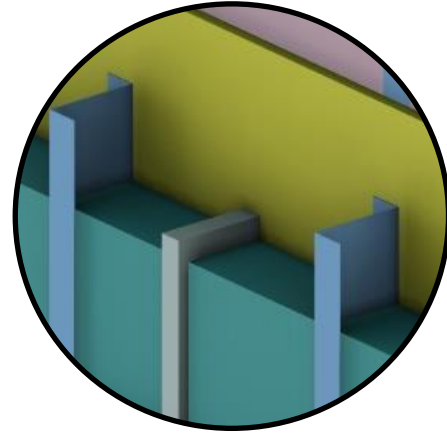
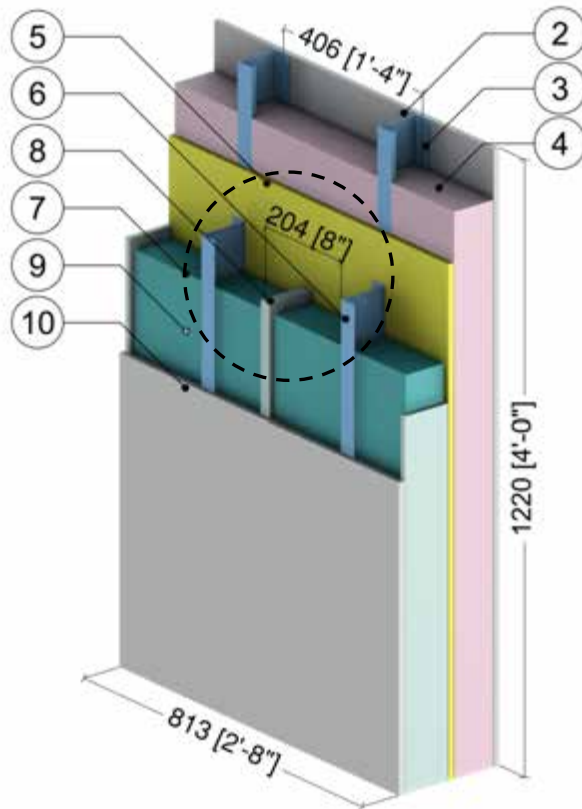


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.30 (0.043)	R-20 (3.52 RSI)	0.55 (8.8)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	ThermaFiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	Varies	0.24 (0.034)	R-4.2 to R-25.2 (0.74 to 4.44 RSI)	4.5 (72)	0.20 (850)
7	Horizontal Z-Girts with 1-1/2" Flange	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Metal Cladding with 1/2" (13 mm) vented airspace incorporated into exterior heat transfer coefficient					
9	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.13

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Vertical Z-girts (16" o.c.) Supporting Stucco Cladding and R-12 Batt Insulation in Stud Cavity – Clear Wall



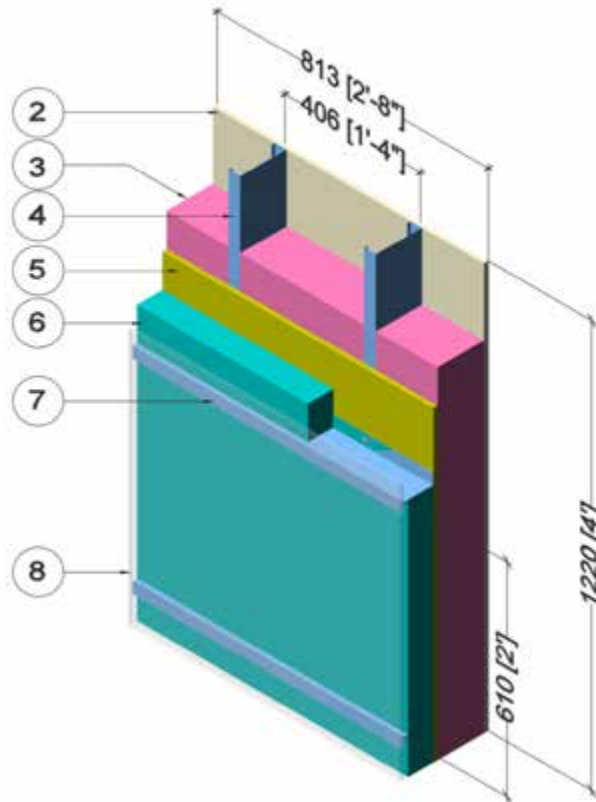
Bracing Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Vertical Z-Girts with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	Varies	-	R-10 to R-20 (1.76 to 3.52 RSI)	1.8 (28)	0.29 (1220)
8	Rigid Insulation Bracing	Varies	0.2 (0.029)	-	1.8 (28)	0.29 (1220)
9	Rainscreen Cavity	1/2" (13)	-	R-0.5 (0.09 RSI)	0.075 (1.2)	0.24 (1000)
10	Stucco Cement with Breather Board	1/2" (13)	6 (0.9)	R-0.1 (0.01 RSI)	120 (1922)	0.20 (850)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.14

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Clear Wall

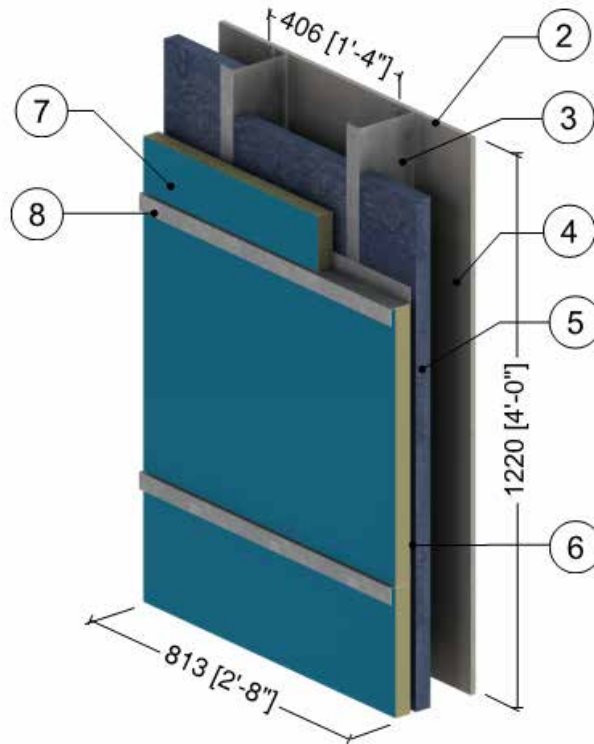


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
4	3 5/8" x 1 5/8" Steel Studs	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 to 4.4 RSI)	1.8 (28)	0.29 (1220)
7	Horizontal Z-girts w/ 1 1/2" Flange	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Metal cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
9	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.15

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) and 1 1/2" Spray Foam (R-9.8) in Stud Cavity – Clear Wall

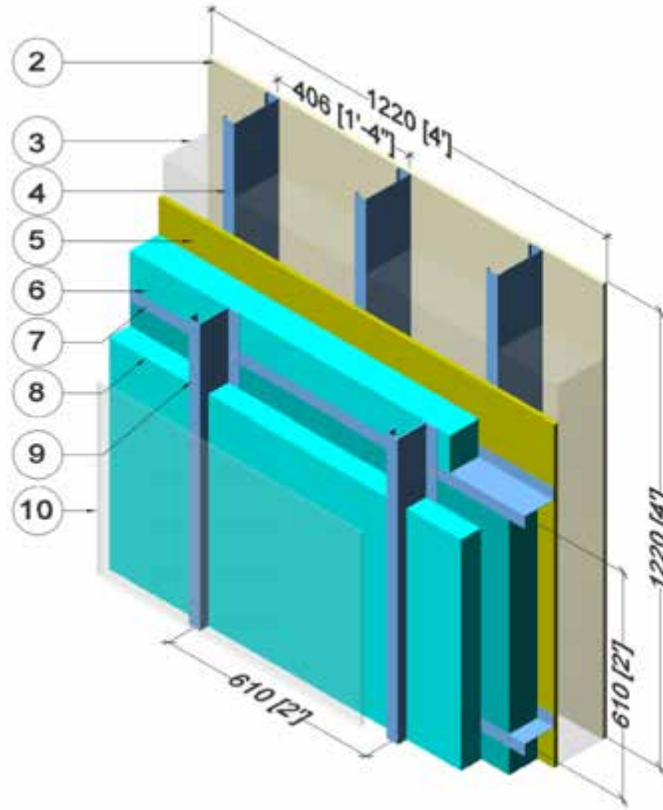


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs (16" o.c.)	18 Gauge	250 (36)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	4 1/2" (114)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Spray Foam Insulation	1 1/2" (38)	-	R-9.8 (1.73 RSI)	-	-
6	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
7	Exterior Polyisocyanurate Insulation	1 1/2" (38)	-	R-10.1 (1.78 RSI)	-	-
8	Horizontal Z-Girts (24" o.c.)	18 Gauge	250 (36)	-	489 (7830)	0.12 (500)
9	Metal Cladding with vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.16

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Vertical Z-Girts (24" o.c.) & Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding – Clear Wall

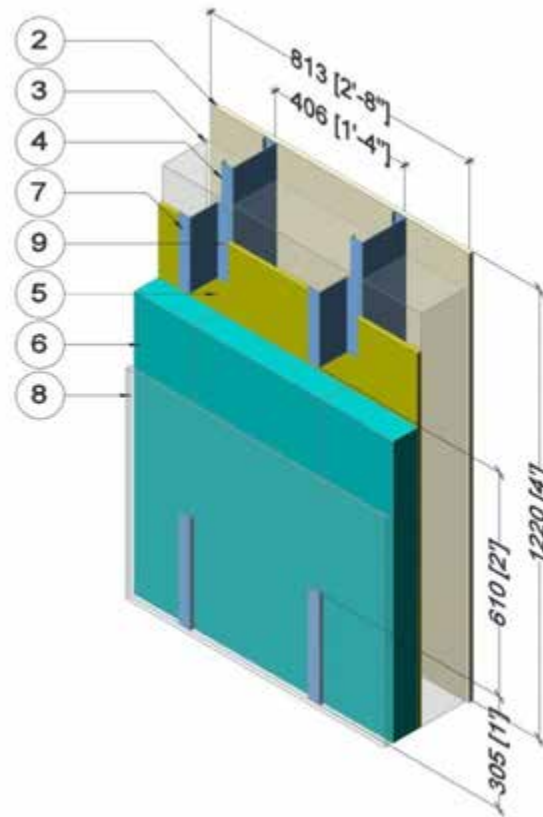


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation – Horizontal Z-Girts	Varies	-	R-5 to R-25 (0.88 to 4.4 RSI)	1.8 (28)	0.29 (1220)
7	Horizontal Z-Girts w/ 1 1/2" flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Exterior Insulation – Vertical Z-girts	1" (25)	-	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
9	Vertical Z-Girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
10	Metal cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.17

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Intermittent Vertical Z-Girts (16" o.c.) Supporting Metal Cladding – Clear Wall



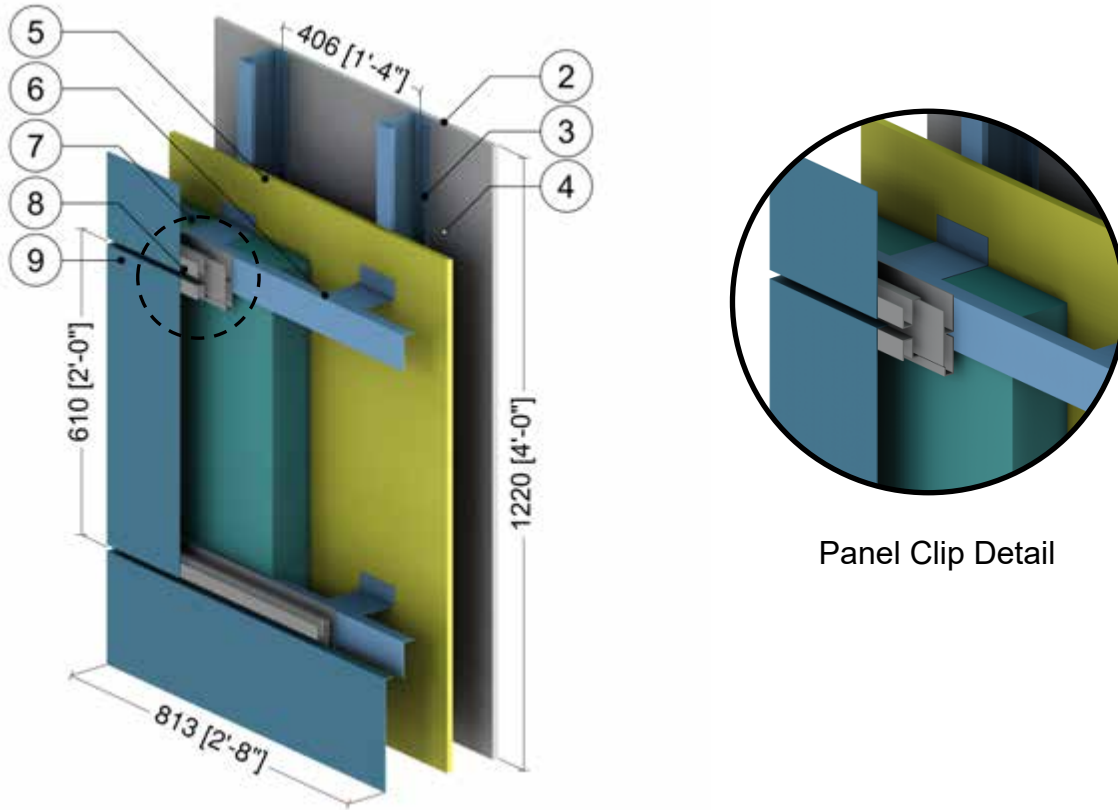
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 to 4.4 RSI)	1.8 (28)	0.29 (1220)
7	Intermittent vertical Z-Girts w/ 1 1/2" Flange ²	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Metal cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
9	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² Vertical spacing of the girts Varies at 12" (304mm), 24" (610mm) & 36" (915mm)

Detail 5.1.18

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Clips (24" o.c.) Supporting Metal Cladding – Clear Wall

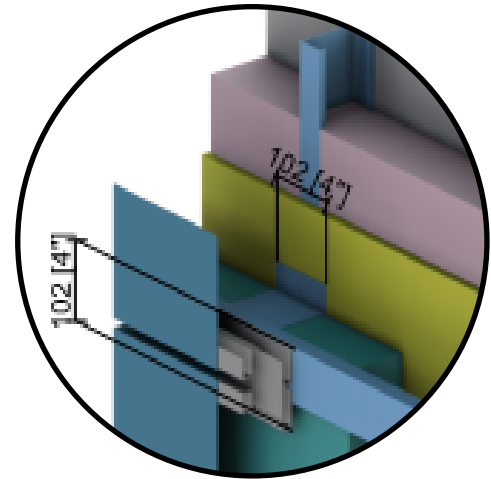
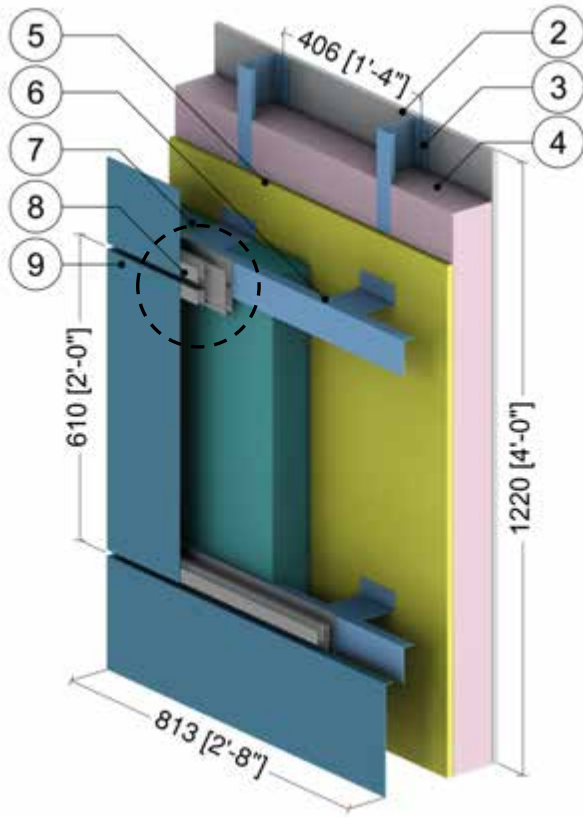


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	Horizontal Clips w/ 1 1/2" Horizontal Rail	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	Varies	-	R-15 to R-25 (2.64 to 4.4 RSI)	1.8 (28)	0.29 (1220)
8	Panel Clip	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.19

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Clips (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Clear Wall



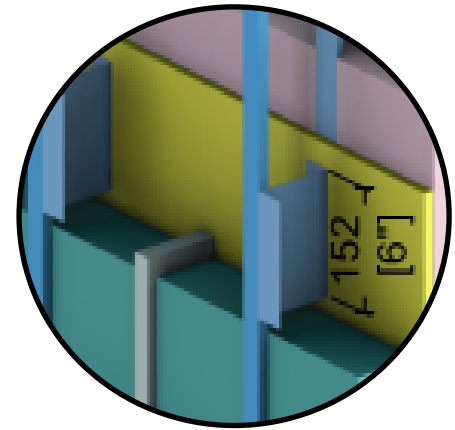
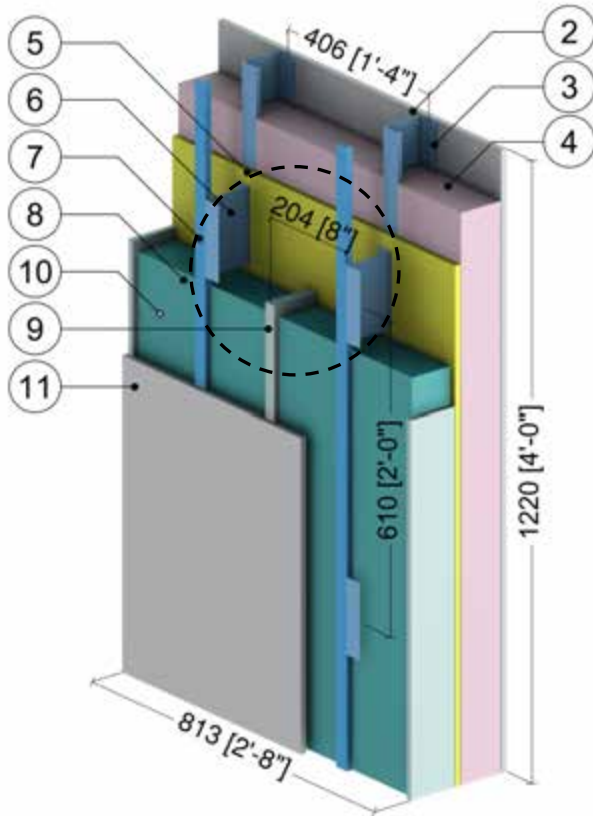
Panel Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Clips w/ 1 1/2" Horizontal Rail	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	Varies	-	R-10 to R-20 (1.76 to 3.5 RSI)	1.8 (28)	0.29 (1220)
8	Panel Clip	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.20

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Vertical Z Clips (16" o.c.) Supporting Stucco Cladding and R-12 Batt Insulation in Stud Cavity – Clear Wall



Bracing Detail

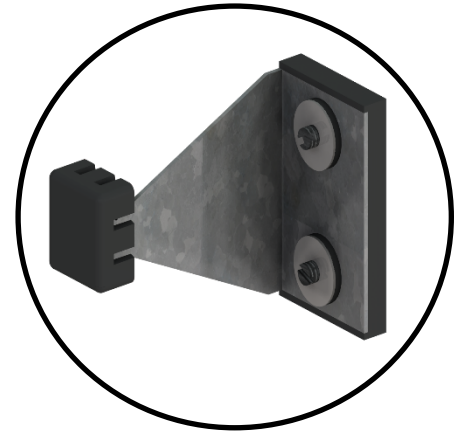
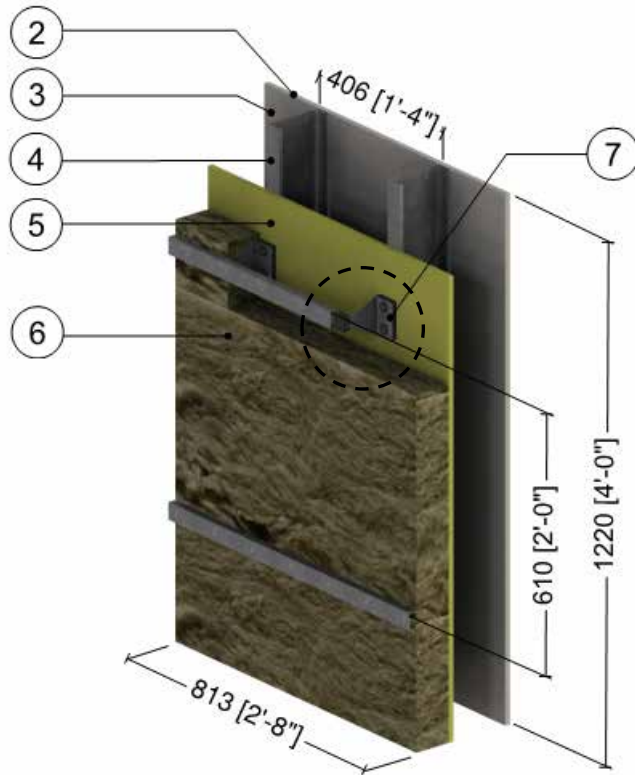
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Vertical Z-Clips with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Vertical Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Exterior Insulation	Varies	-	R-10 to R-20 (1.76 to 3.52 RSI)	1.8 (28)	0.29 (1220)
9	Rigid Insulation Bracing	Varies	0.2 (0.029)	-	1.8 (28)	0.29 (1220)
10	Rainscreen Cavity	1/2" (13)	-	R-0.5 (0.09 RSI)	0.075 (1.2)	0.24 (1000)
11	Stucco Cement with Breather Board	1/2" (13)	6 (0.9)	R-0.1 (0.01 RSI)	120 (1922)	0.20 (850)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 5.1.21

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Knight MFI-System (24" o.c.) Supporting Cladding – Clear Wall



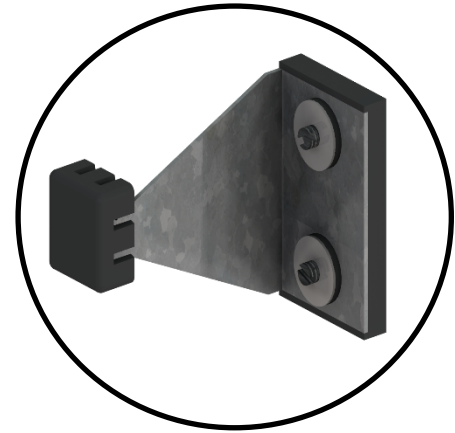
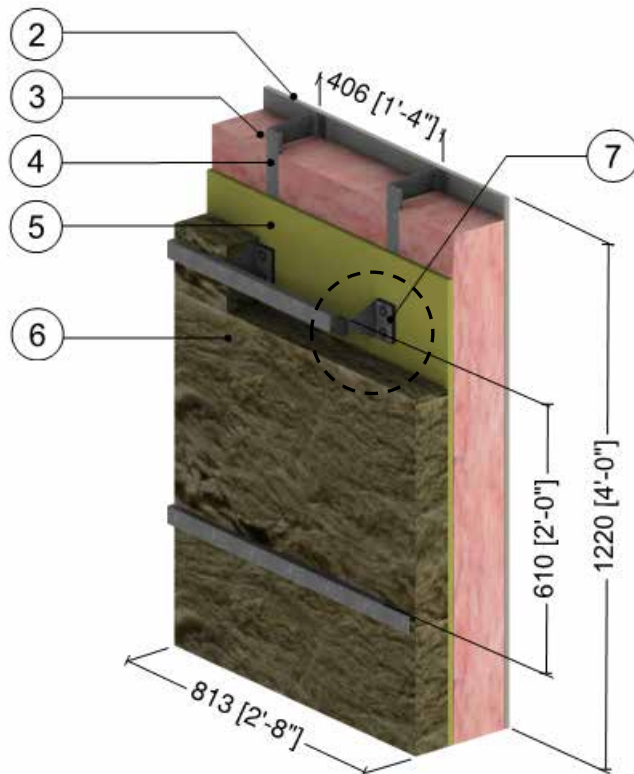
ThermaBracket Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs (16" o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	0.24 (0.034)	R-8.4 to R-25.2 (1.48 to 4.44 RSI)	1.8 (28)	0.29 (1220)
7	ThermaBrackets (24" o.c. vertically)	18 Gauge	347 (50)	-	489 (7830)	0.12 (500)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.22

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Knight MFI-System (24" o.c.) Supporting Cladding and R-19 Batt Insulation in Stud Cavity – Clear Wall

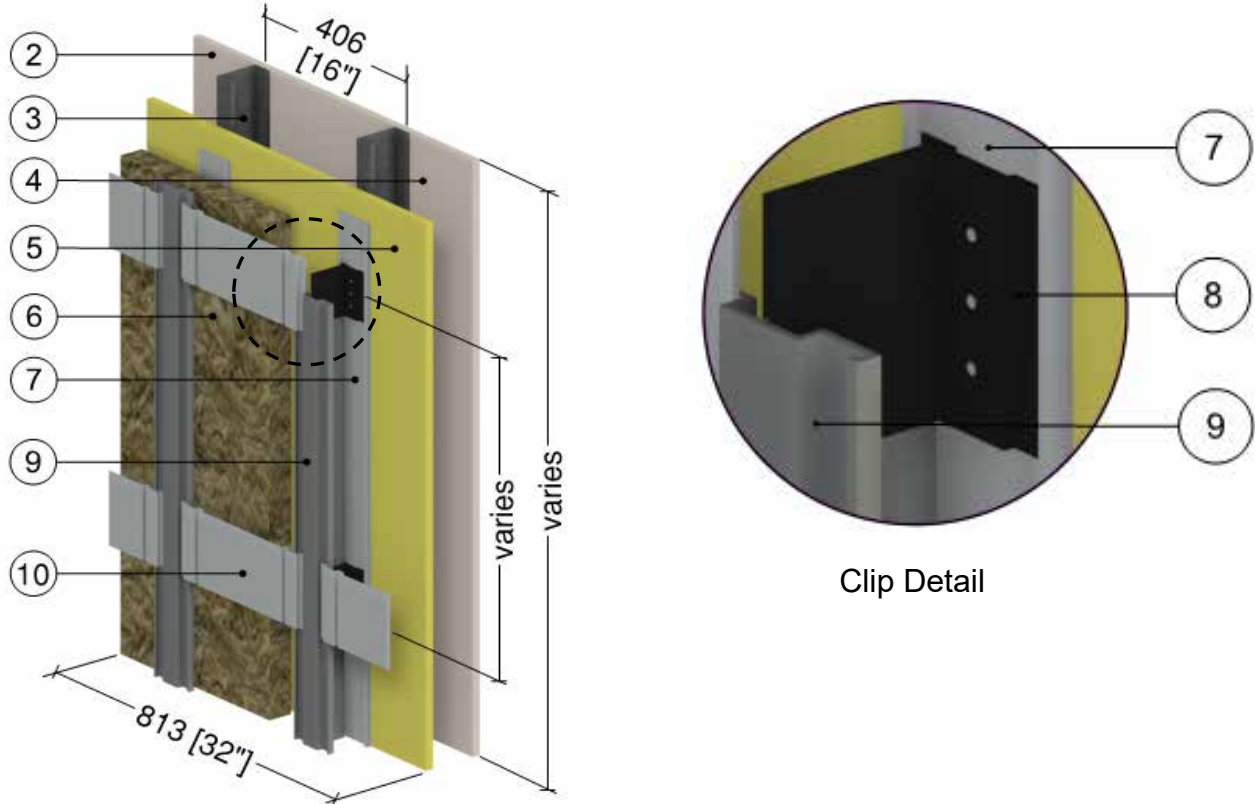


ThermaBracket Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	6" (152)	-	R-19 (3.35 RSI)	0.9 (14)	0.17 (710)
4	6" x 1 5/8" Steel Studs (16" o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	0.24 (0.034)	R-8.4 to R-25.2 (1.48 to 4.44 RSI)	1.8 (28)	0.29 (1220)
7	ThermaBrackets (24" o.c. vertically)	18 Gauge	347 (50)	-	489 (7830)	0.12 (500)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.23 Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with CL-Talon 300 Clip System Supporting Cladding – Clear Wall

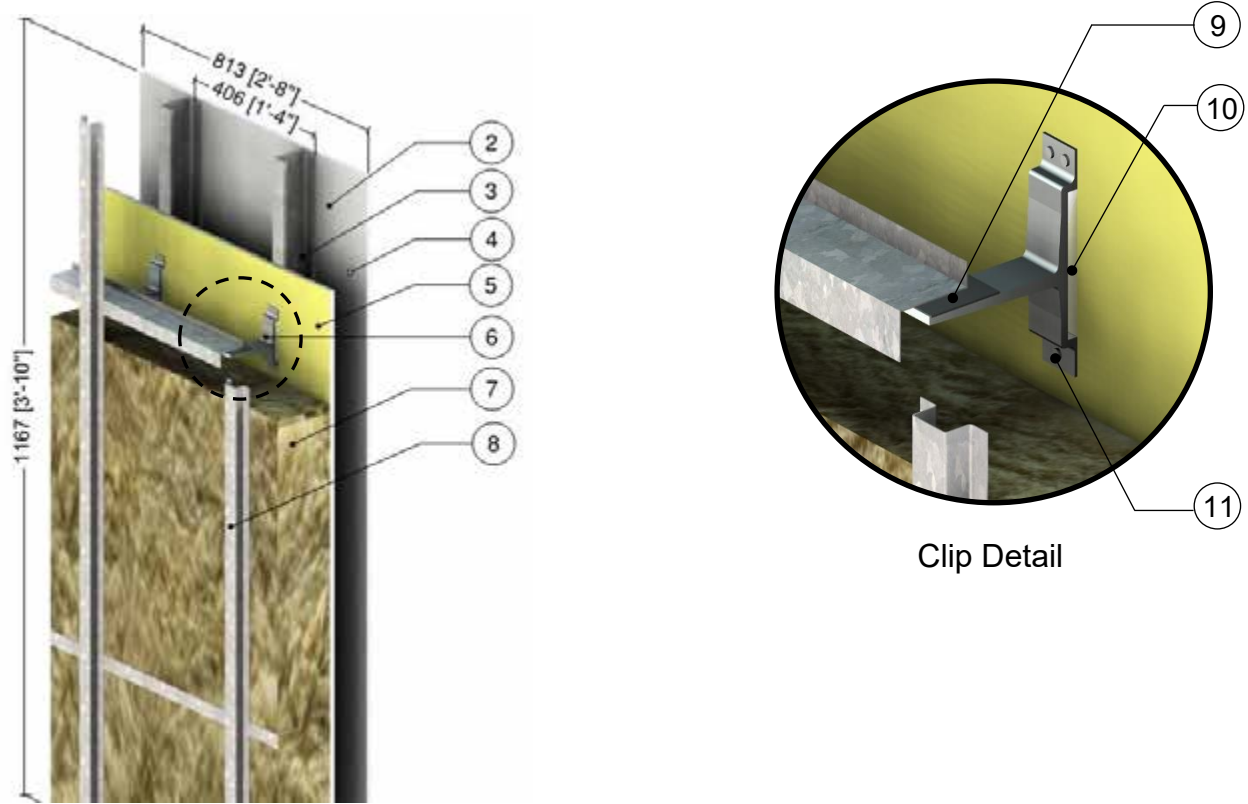


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	2" to 4" (51 to 102)	0.24 (0.034)	R-8.4 to R-16.8 (1.48 RSI to 2.96 RSI)	4 (64)	0.20 (850)
7	Aluminum Base Track, 16" o.c. horizontally	1/8" (3.3)	1422 (205)	-	171 (2739)	0.21 (900)
8	Therme Polyamide Clip	-	1.73 (0.25)	-	-	-
9	Aluminum T-Track, 16" o.c. horizontally	1/8" (3.3)	1422 (205)	-	171 (2739)	0.21 (900)
10	Aluminum Wall Mount Supports	1/8" (3.3)	1422 (205)	-	171 (2739)	0.21 (900)
11	Generic Cladding with 1" (25mm) vented air space is incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.24

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Broken Aluminum Clip Supporting Cladding – Clear Wall

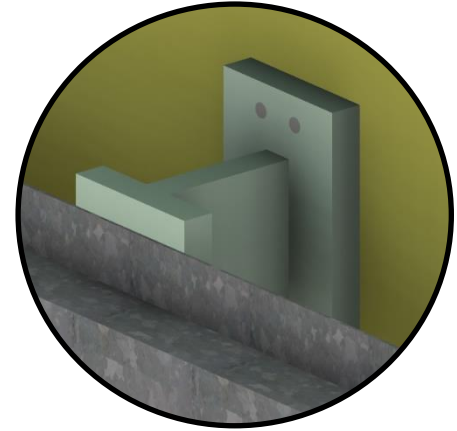
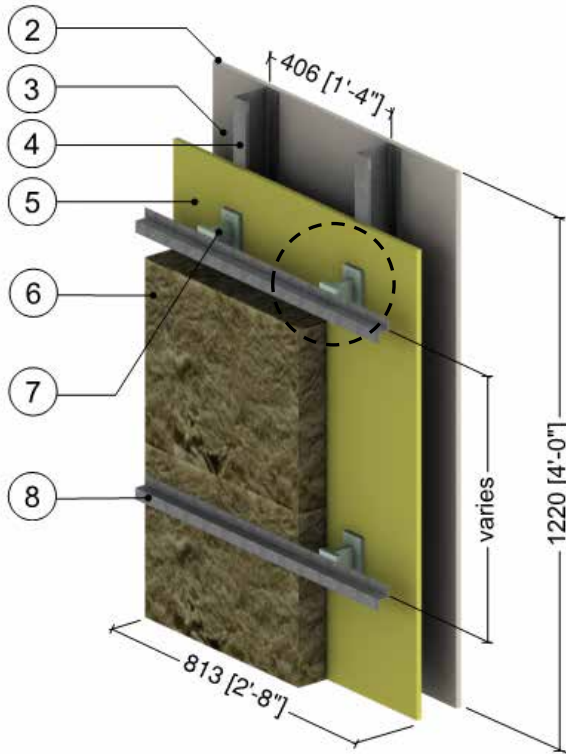


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Engineered Assemblies Aluminum Panel Clip (models T100 T125 150)	1/5" to 3/8" (5 to 10)	1110 (160)	-	-	-
7	Exterior Insulation	Varies	0.24 (0.034)	R-16.8 to R-25.2 (2.96 to 4.44 RSI)	1.8 (28)	0.29 (1220)
8	Vertical/Horizontal Steel Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Cork/Neoprene pad	1/16" (1.5)	0.329 (0.058)	R-0.15 (0.03 RSI)	-	-
10	Aerogel	3/8" (10)	0.086 (0.015)	R-3.9 (0.68 RSI)		
11	Steel Fasteners	5/16" (8) Ø	347 (50)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.25

Exterior Insulated 3 5/8" x 1/58" Steel Stud (16"o.c.) Wall Assembly with TAC Fiber Reinforced Plastic Girts Supporting Cladding – Clear Wall



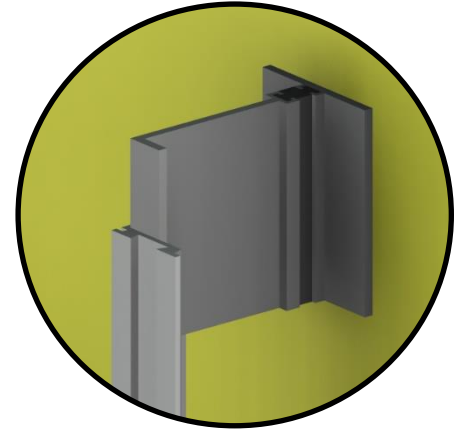
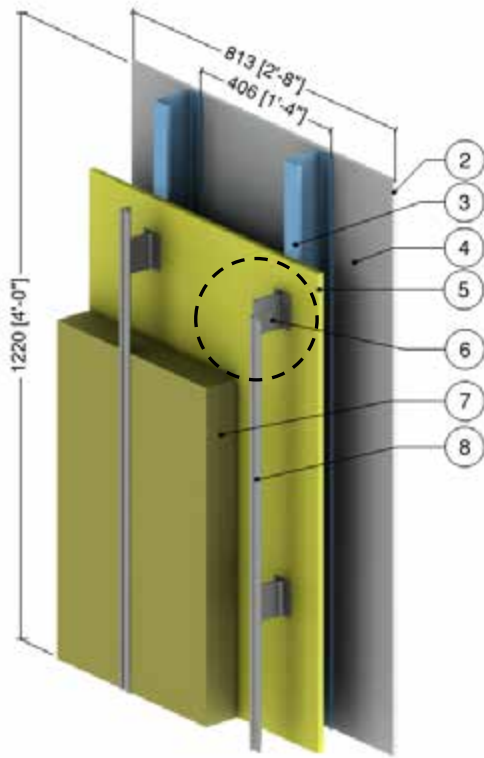
Fiber Reinforced
Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs (16"o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	0.24 (0.034)	R-12.6 to R-25.2 (2.22 to 4.40 RSI)	489 (7830)	0.12 (500)
7	Fiber Reinforced Plastic (FRP) Girts	-	2.4 (0.35)	-	-	-
8	Horizontal Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.26

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Broken Aluminum Clip Rail System (24" o.c.) Supporting Cladding – Clear Wall



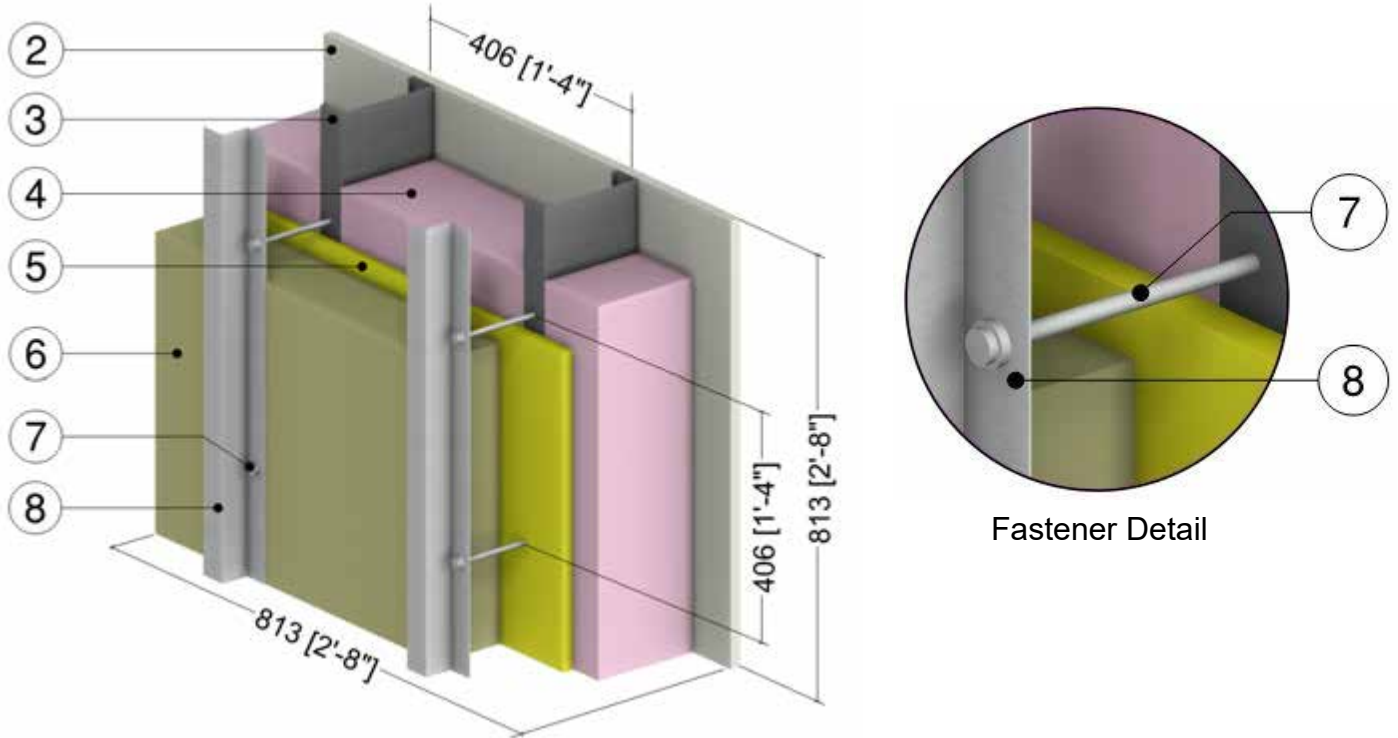
Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Longboard Aluminum Panel Clip	1/5" to 3/8" (5 to 10)	1110 (160)	-	-	-
7	Exterior Insulation	Varies	-	R-12.6 to R-25.2 (2.22 to 4.44 RSI)	1.8 (28)	0.29 (1220)
8	Vertical Steel Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.27

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier HC Max Insulation and R-20 Batt Insulation in Stud Cavity – Clear Wall



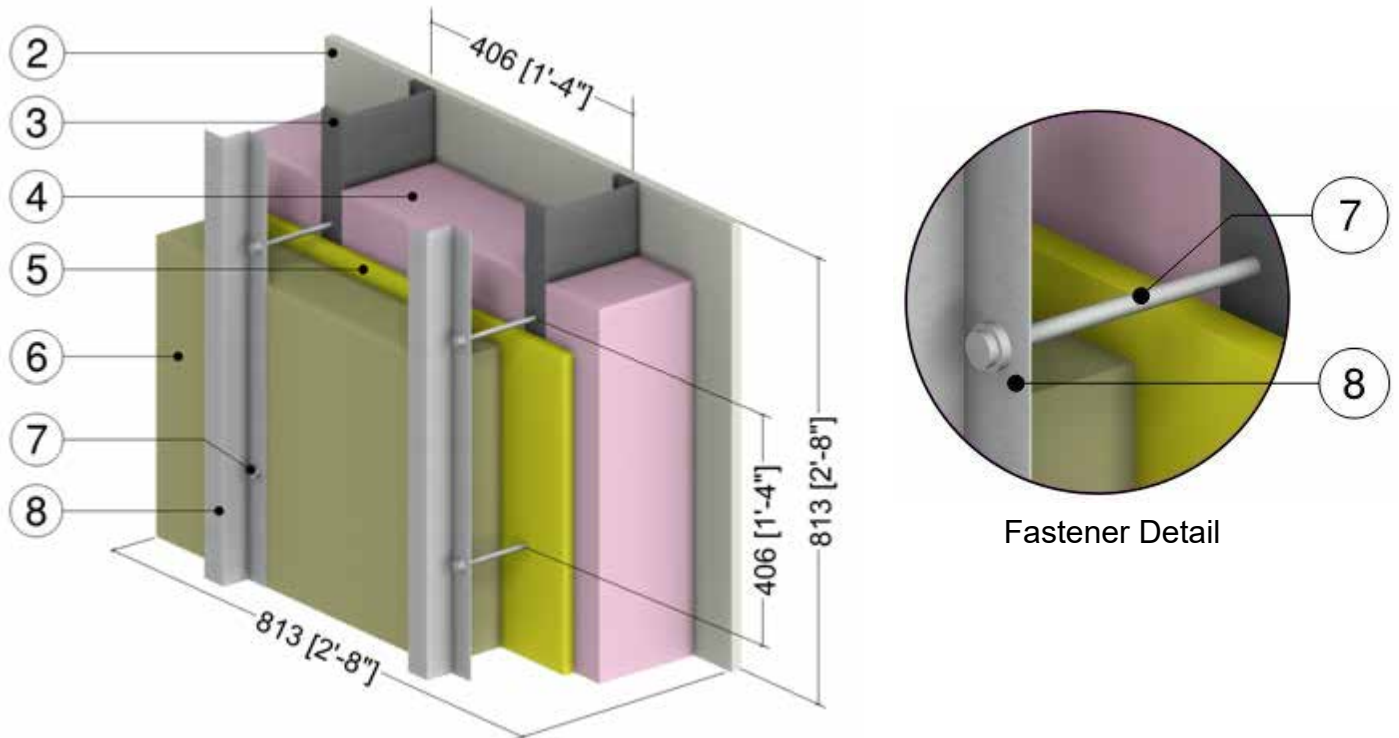
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.28 (0.041)	R-20 (3.52 RSI)	0.55 (8.8)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	ThermaFiber RainBarrier HC Max Mineral Wool Semi Rigid Insulation	Varies	0.25 (0.036)	R-4.0 to R-16.0 (0.70 to 2.82 RSI)	11 (176)	0.20 (850)
7	#12 Steel Fasteners (12" o.c.)	0.21" (5.3) Ø	430 (62)	-	489 (7830)	0.12 (500)
8	Vertical Z-Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" (13 mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 5.1.28

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier HC Plus 110 Exterior Insulation and R-20 Batt Insulation in Stud Cavity – Clear Wall

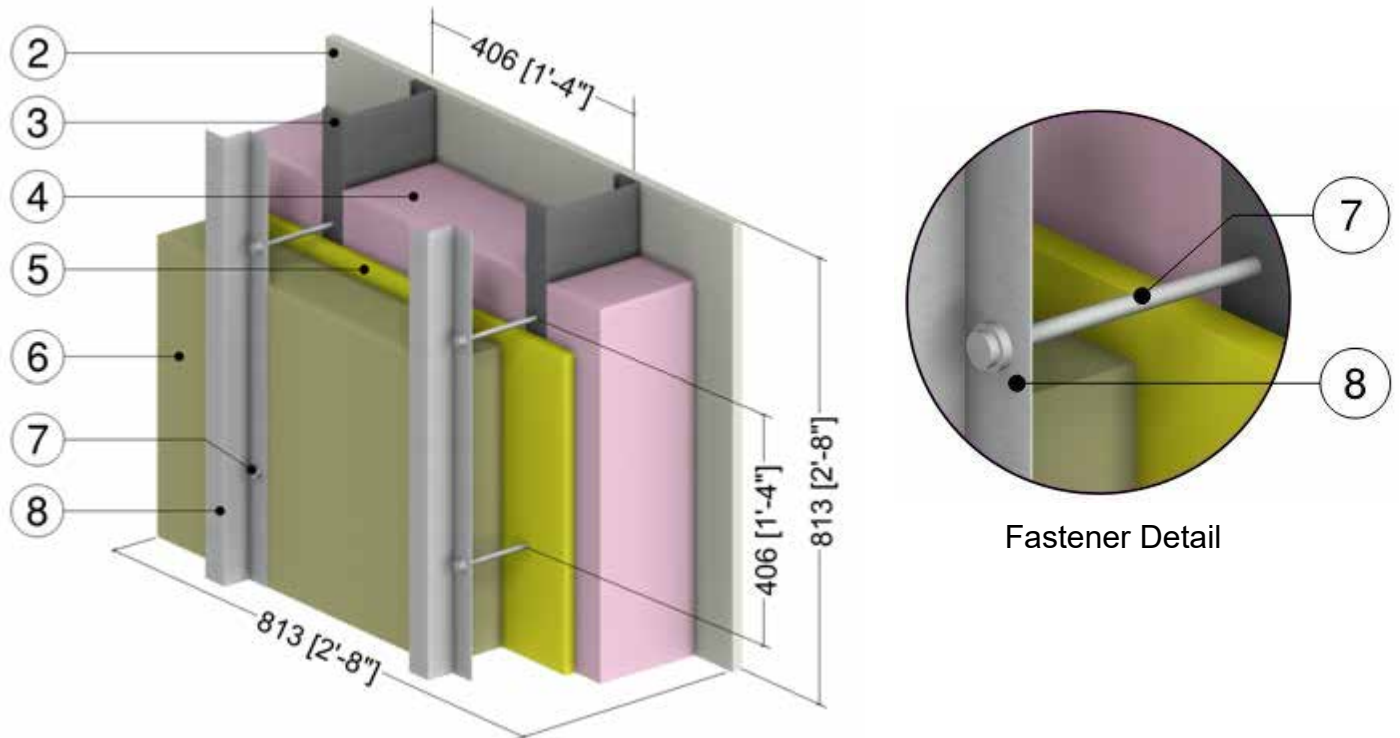


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.28 (0.041)	R-20 (3.52 RSI)	0.55 (8.8)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	ThermaFiber RainBarrier HC Plus 110 Mineral Wool Semi Rigid Insulation	Varies	0.24 (0.035)	R-4.1 to R-16.4 (0.72 to 2.89 RSI)	8 (128)	0.20 (850)
7	#12 Steel Fasteners (12" o.c.)	0.21" (5.3) Ø	430 (62)	-	489 (7830)	0.12 (500)
8	Vertical Z-Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" (13 mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.29

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier 45 Insulation and R-20 Batt Insulation in Stud Cavity – Clear Wall

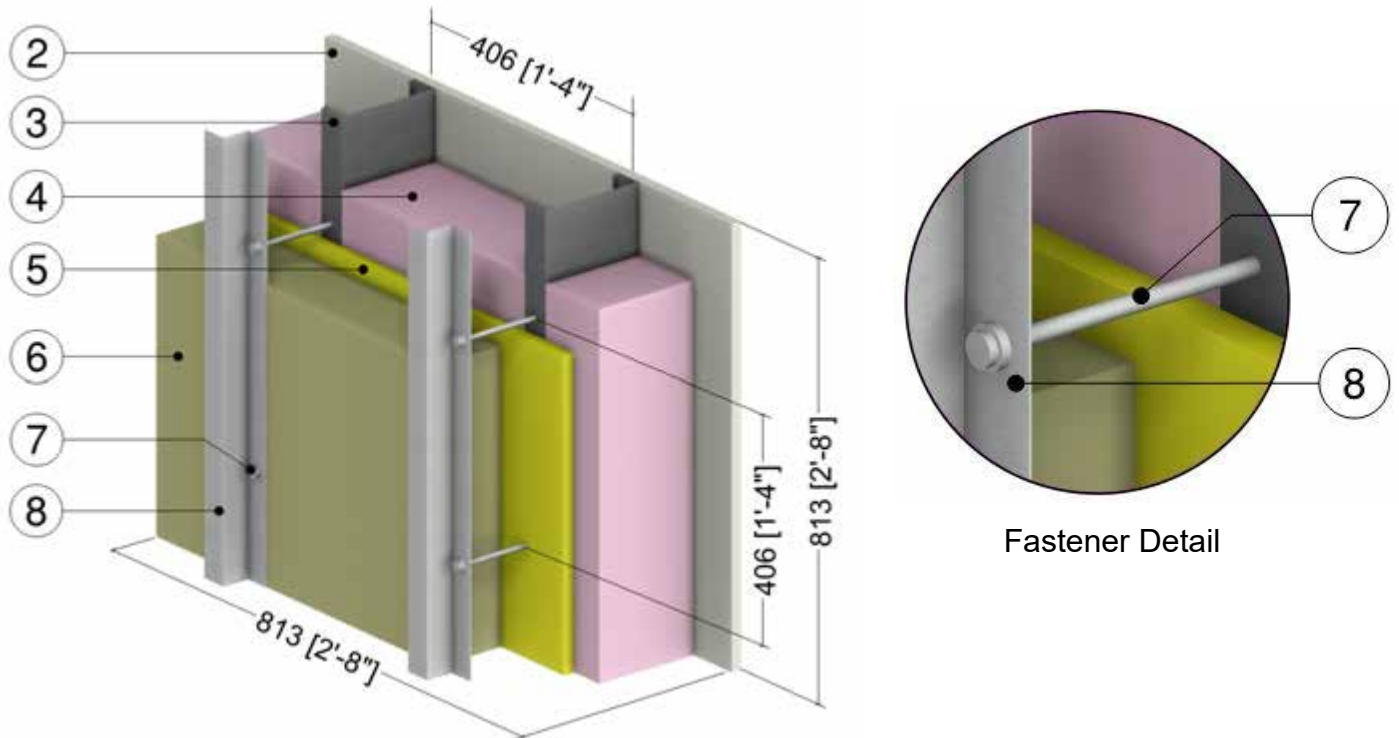


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.28 (0.041)	R-20 (3.52 RSI)	0.55 (8.8)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	ThermaFiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	Varies	0.24 (0.034)	R-4.2 to R-16.8 (0.74 to 2.96 RSI)	4.5 (72)	0.20 (850)
7	#12 Steel Fasteners (12" o.c.)	0.21" (5.3) Ø	430 (62)	-	489 (7830)	0.12 (500)
8	Vertical Z-Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" (13 mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.30

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier HC Max Insulation and R-22 Batt Insulation in Stud Cavity – Clear Wall

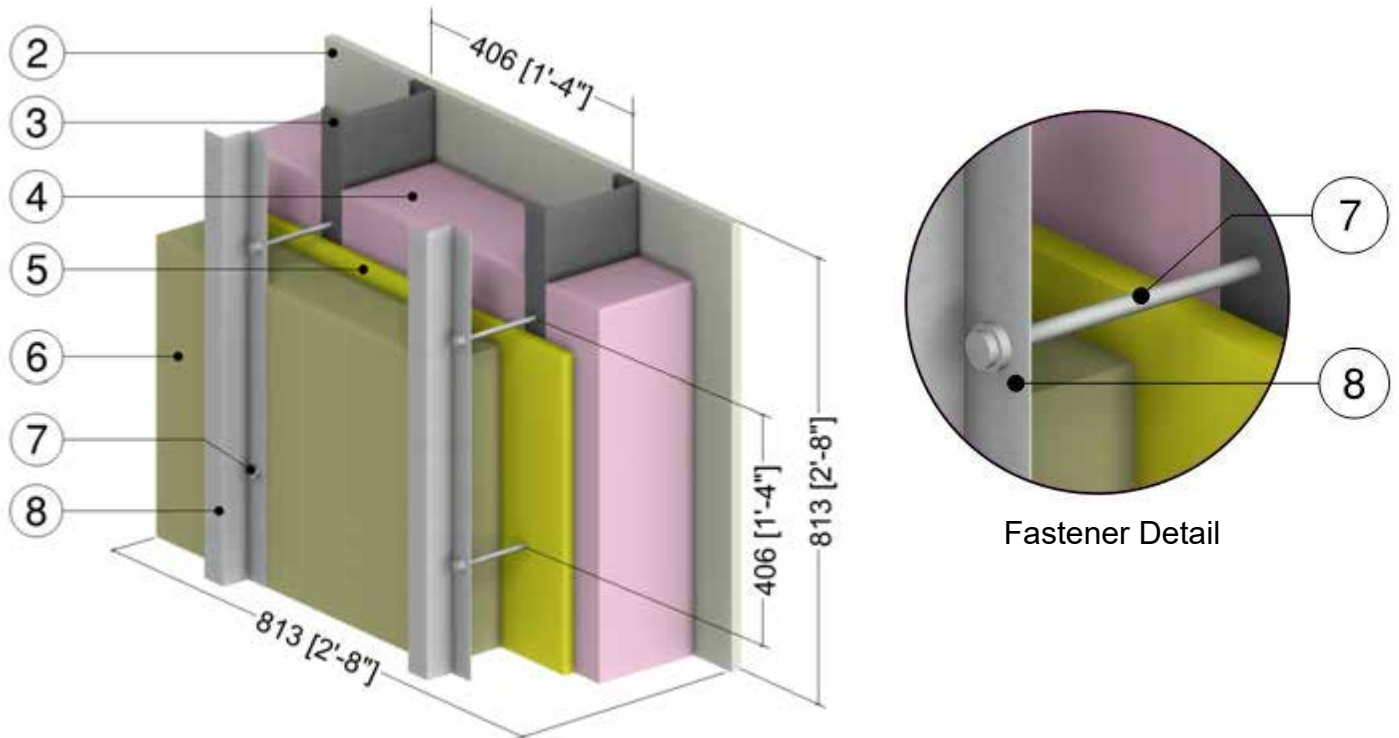


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.27 (0.039)	R-22 (3.87 RSI)	0.91 (14.5)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	ThermaFiber RainBarrier HC Max Mineral Wool Semi Rigid Insulation	Varies	0.25 (0.036)	R-4.0 to R-16.0 (0.70 to 2.82 RSI)	11 (176)	0.20 (850)
7	#12 Steel Fasteners (12" o.c.)	0.21" (5.3) Ø	430 (62)	-	489 (7830)	0.12 (500)
8	Vertical Z-Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" (13 mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.31

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier HC Plus 110 Exterior Insulation and R-22 Batt Insulation in Stud Cavity – Clear Wall

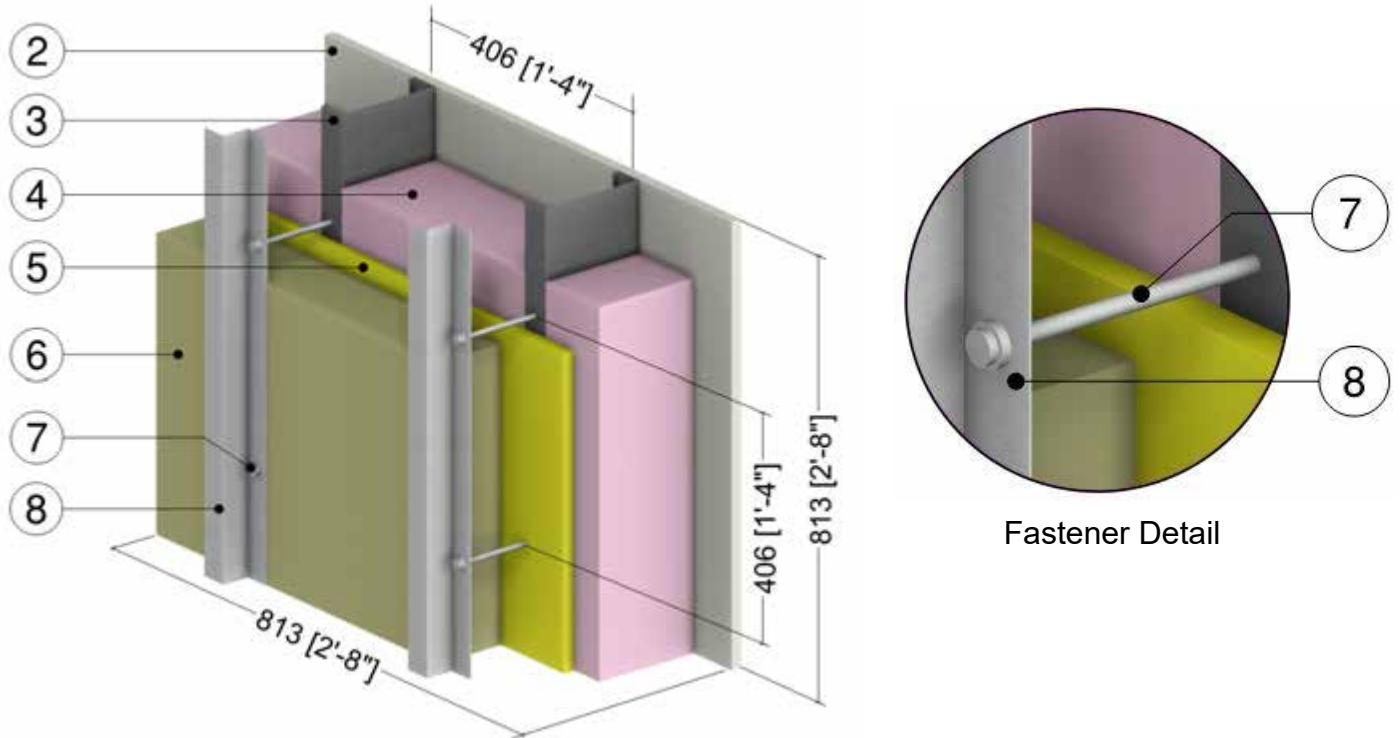


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.27 (0.039)	R-22 (3.87 RSI)	0.91 (14.5)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	ThermaFiber RainBarrier HC Plus 110 Mineral Wool Semi Rigid Insulation	Varies	0.24 (0.035)	R-4.1 to R-16.4 (0.72 to 2.89 RSI)	8 (128)	0.20 (850)
7	#12 Steel Fasteners (12" o.c.)	0.21" (5.3) Ø	430 (62)	-	489 (7830)	0.12 (500)
8	Vertical Z-Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" (13 mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.32

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier 45 Insulation and R-22 Batt Insulation in Stud Cavity – Clear Wall

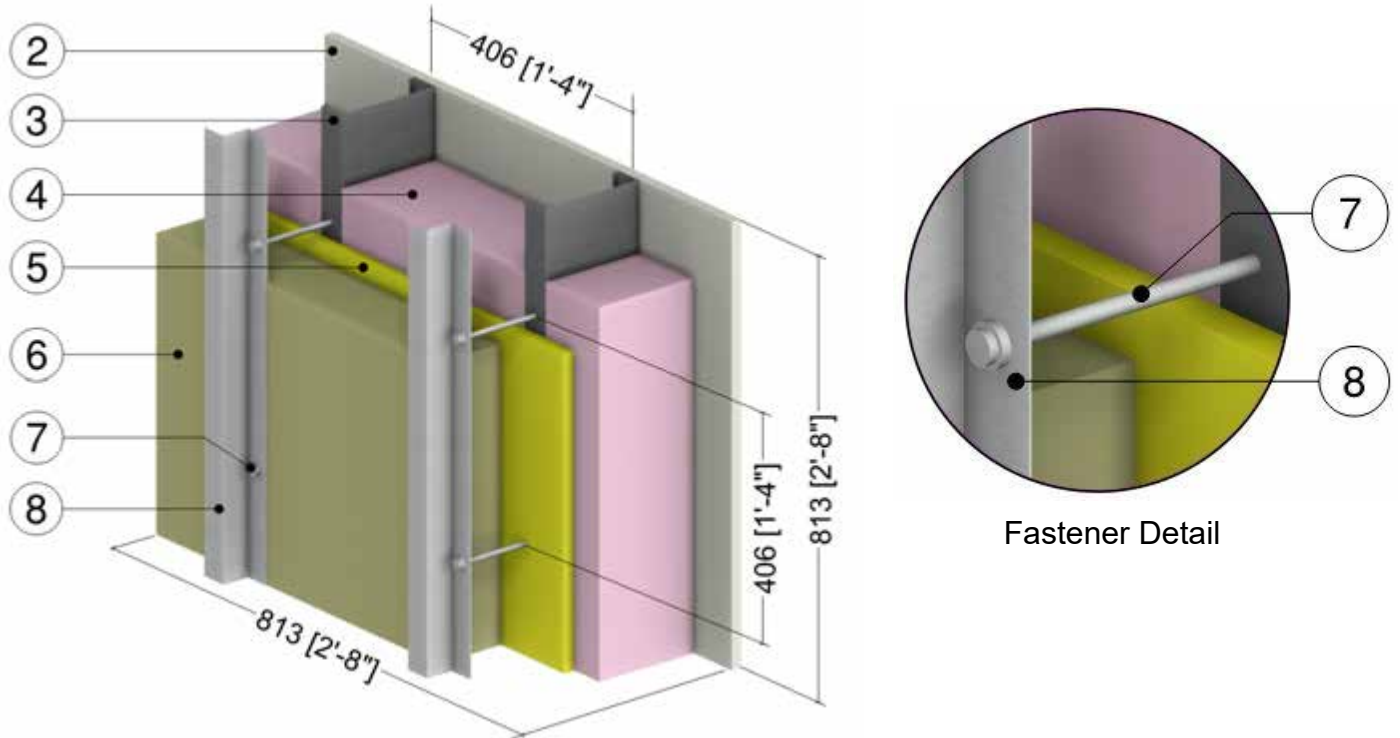


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.27 (0.039)	R-22 (3.87 RSI)	0.91 (14.5)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	ThermaFiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	Varies	0.24 (0.034)	R-4.2 to R-16.8 (0.74 to 2.96 RSI)	4.5 (72)	0.20 (850)
7	#12 Steel Fasteners (12" o.c.)	0.21" (5.3) Ø	430 (62)	-	489 (7830)	0.12 (500)
8	Vertical Z-Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" (13 mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.33

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier HC Max Insulation and R-24 Batt Insulation in Stud Cavity – Clear Wall

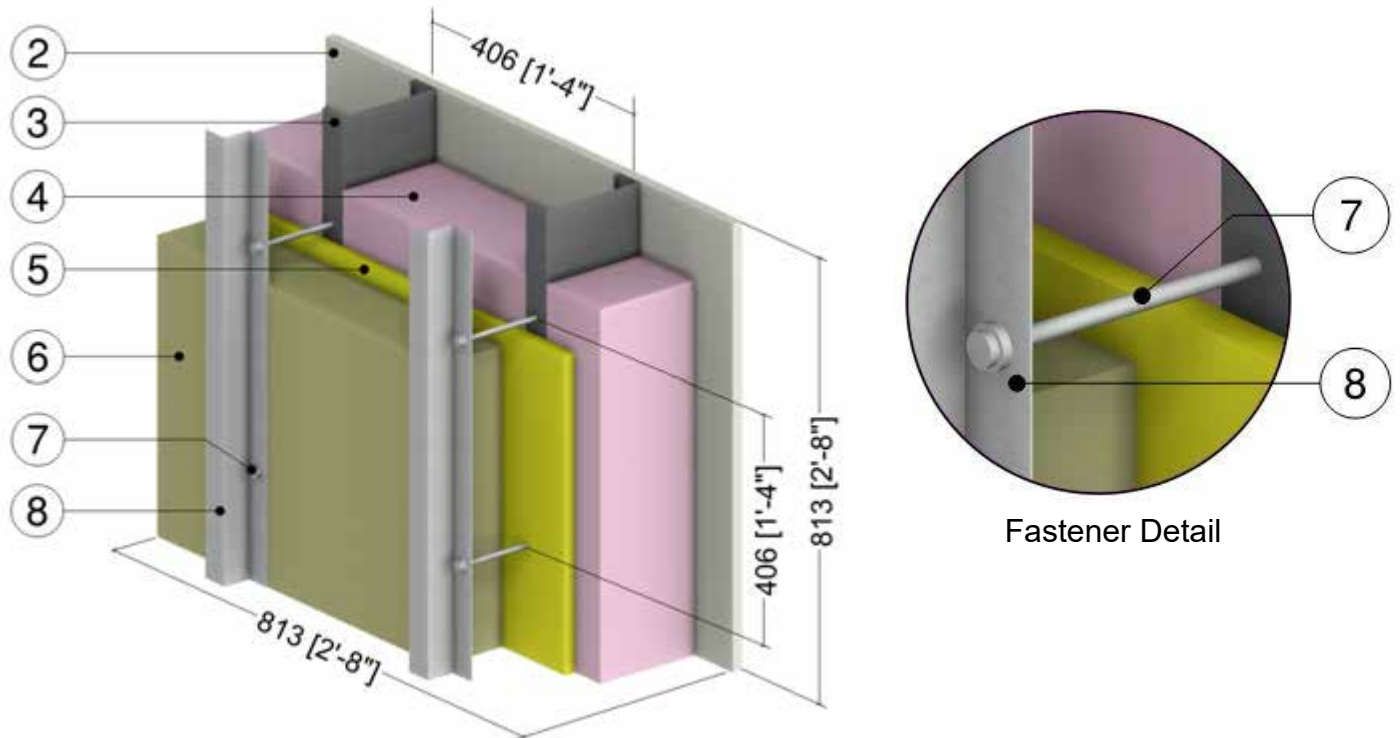


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.25 (0.036)	R-24 (4.23 RSI)	1.42 (22.7)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	ThermaFiber RainBarrier HC Max Mineral Wool Semi Rigid Insulation	Varies	0.25 (0.036)	R-4.0 to R-16.0 (0.70 to 2.82 RSI)	11 (176)	0.20 (850)
7	#12 Steel Fasteners (12" o.c.)	0.21" (5.3) Ø	430 (62)	-	489 (7830)	0.12 (500)
8	Vertical Z-Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" (13 mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.34

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier HC Plus 110 Exterior Insulation and R-24 Batt Insulation in Stud Cavity – Clear Wall

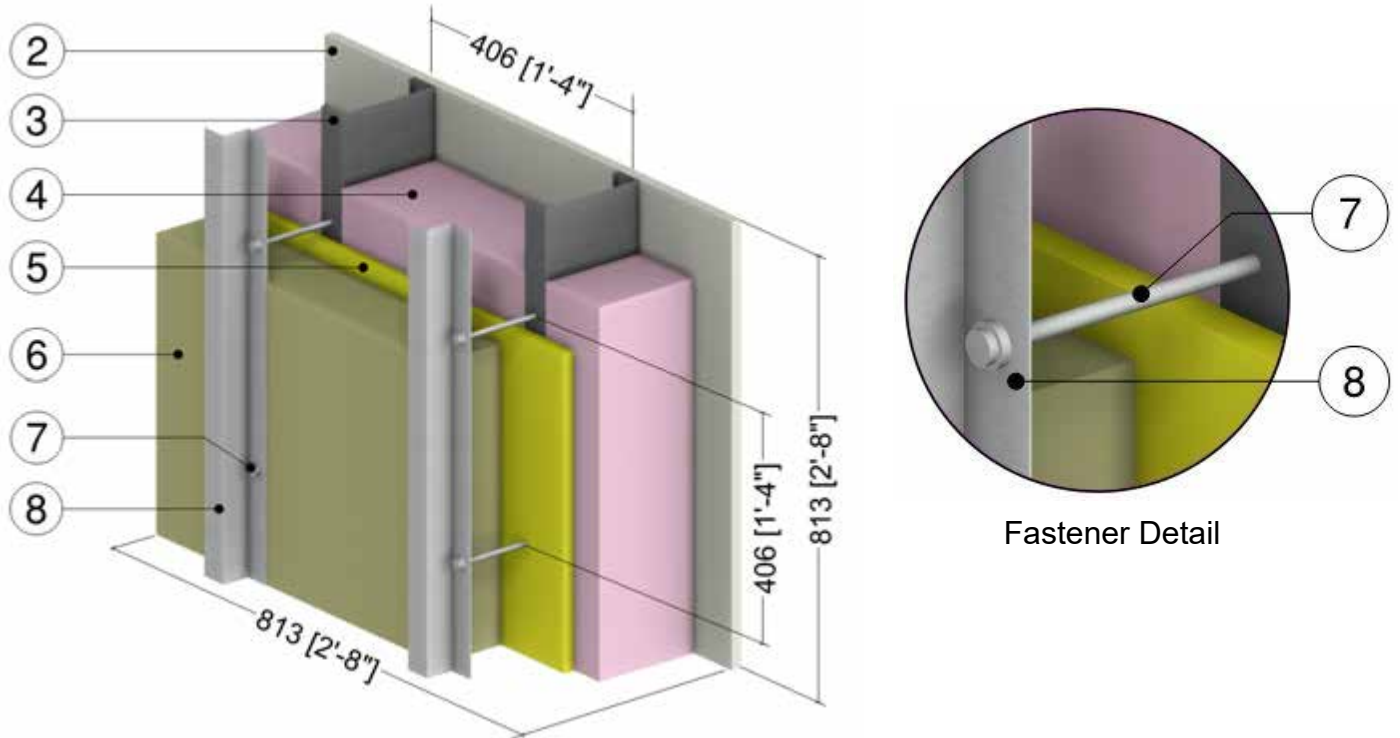


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.25 (0.036)	R-24 (4.23 RSI)	1.42 (22.7)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	ThermaFiber RainBarrier HC Plus 110 Mineral Wool Semi Rigid Insulation	Varies	0.24 (0.035)	R-4.1 to R-16.4 (0.72 to 2.89 RSI)	8 (128)	0.20 (850)
7	#12 Steel Fasteners (12" o.c.)	0.21" (5.3) Ø	430 (62)	-	489 (7830)	0.12 (500)
8	Vertical Z-Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" (13 mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.35

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier 45 Insulation and R-24 Batt Insulation in Stud Cavity – Clear Wall

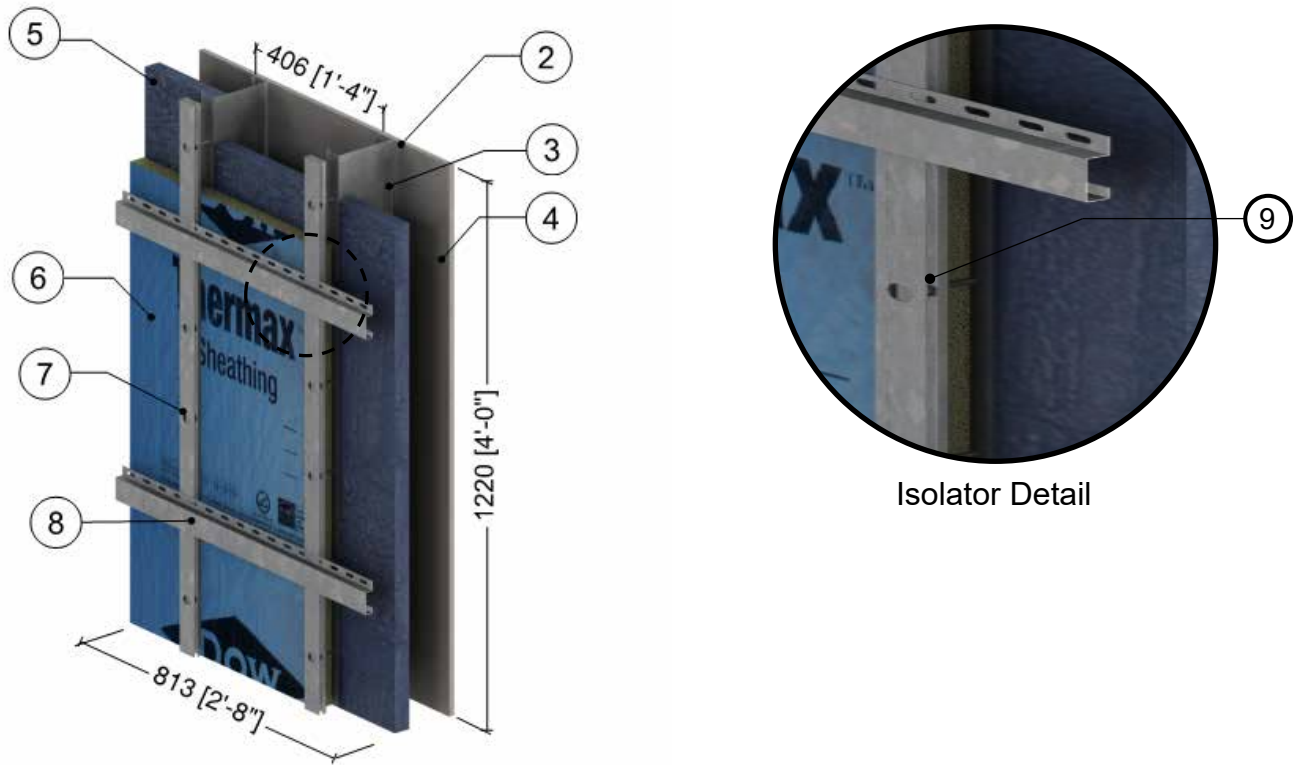


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.25 (0.036)	R-24 (4.23 RSI)	1.42 (22.7)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	ThermaFiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	Varies	0.24 (0.034)	R-4.2 to R-16.8 (0.74 to 2.96 RSI)	4.5 (72)	0.20 (850)
7	#12 Steel Fasteners (12" o.c.)	0.21" (5.3) Ø	430 (62)	-	489 (7830)	0.12 (500)
8	Vertical Z-Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" (13 mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.36

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Knight CI-System (8" o.c.) and 1 1/2" Spray Foam (R-9.8) in Stud Cavity – Clear Wall

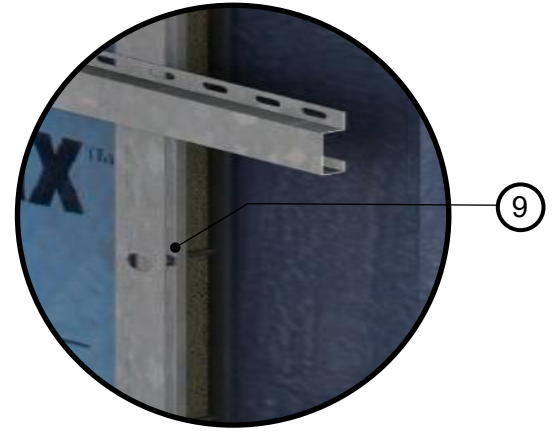
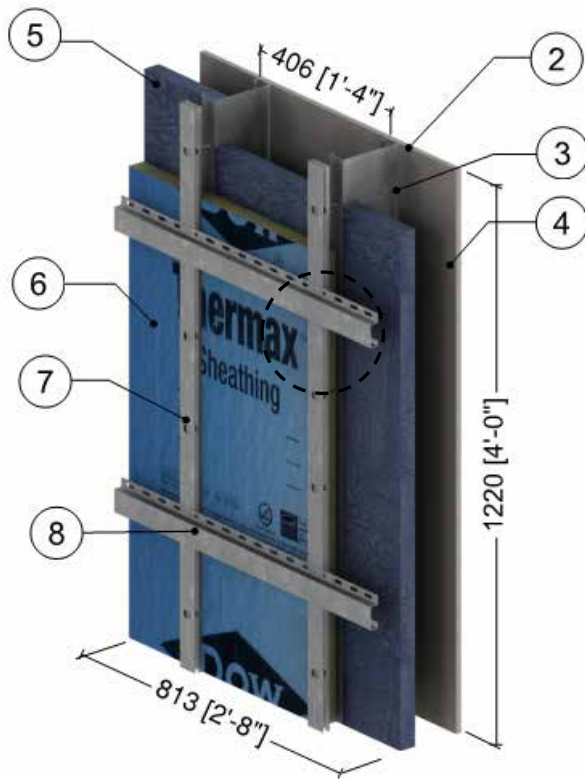


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs (16"o.c.)	18 Gauge	250 (36)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	4 1/2" (114)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Spray Foam Insulation	1 1/2" (38)	-	R-9.8 (1.73 RSI)	-	-
6	Exterior Polyisocyanurate Insulation	Varies	-	R-10.1 to R-19.0 (1.78 to 3.35 RSI)	-	-
7	#12 Stainless Steel Fasteners (8" o.c.)	0.21" (5.3) Ø	12 (20)	-	489 (7830)	0.12 (500)
8	Steel Vertical and Horizontal Rails	18 Gauge	250 (36)	-	489 (7830)	0.12 (500)
9	Isolator	3/16" (4)	0.12 (0.21)	-	-	-
10	Metal Cladding with vented airspace incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.37

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Knight CI-System (16" o.c.) and 1 1/2" Spray Foam (R-9.8) in Stud Cavity – Clear Wall



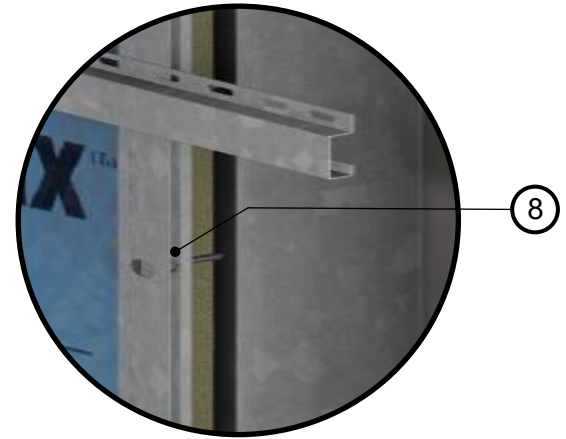
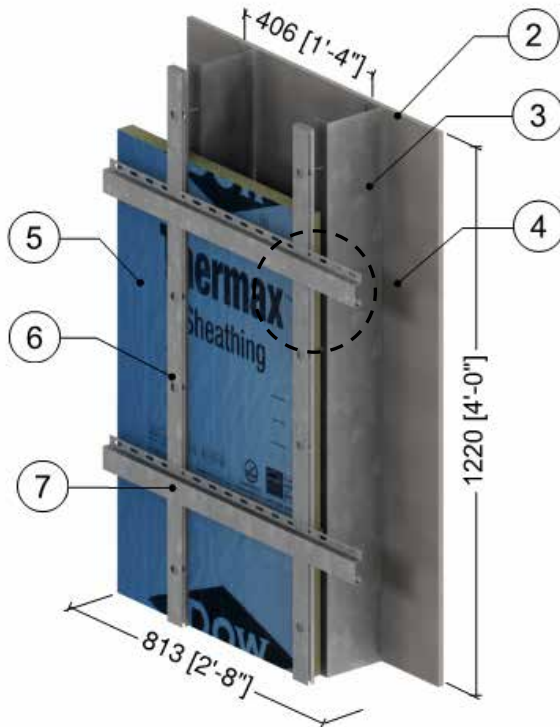
Isolator Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs (16" o.c.)	18 Gauge	250 (36)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	4 1/2" (114)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Spray Foam Insulation	1 1/2" (38)	-	R-9.8 (1.73 RSI)	-	-
6	Exterior Polyisocyanurate Insulation	Varies	-	R-10.1 to R-19.0 (1.78 to 3.35 RSI)	-	-
7	#12 Stainless Steel Fasteners (16" o.c.)	0.21" (5.3) Ø	12 (20)	-	489 (7830)	0.12 (500)
8	Steel Vertical and Horizontal Rails	18 Gauge	250 (36)	-	489 (7830)	0.12 (500)
9	Isolator	3/16" (4)	0.12 (0.21)	-	-	-
10	Metal Cladding with vented airspace incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.38

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Knight CI-System (8" o.c.) – Clear Wall



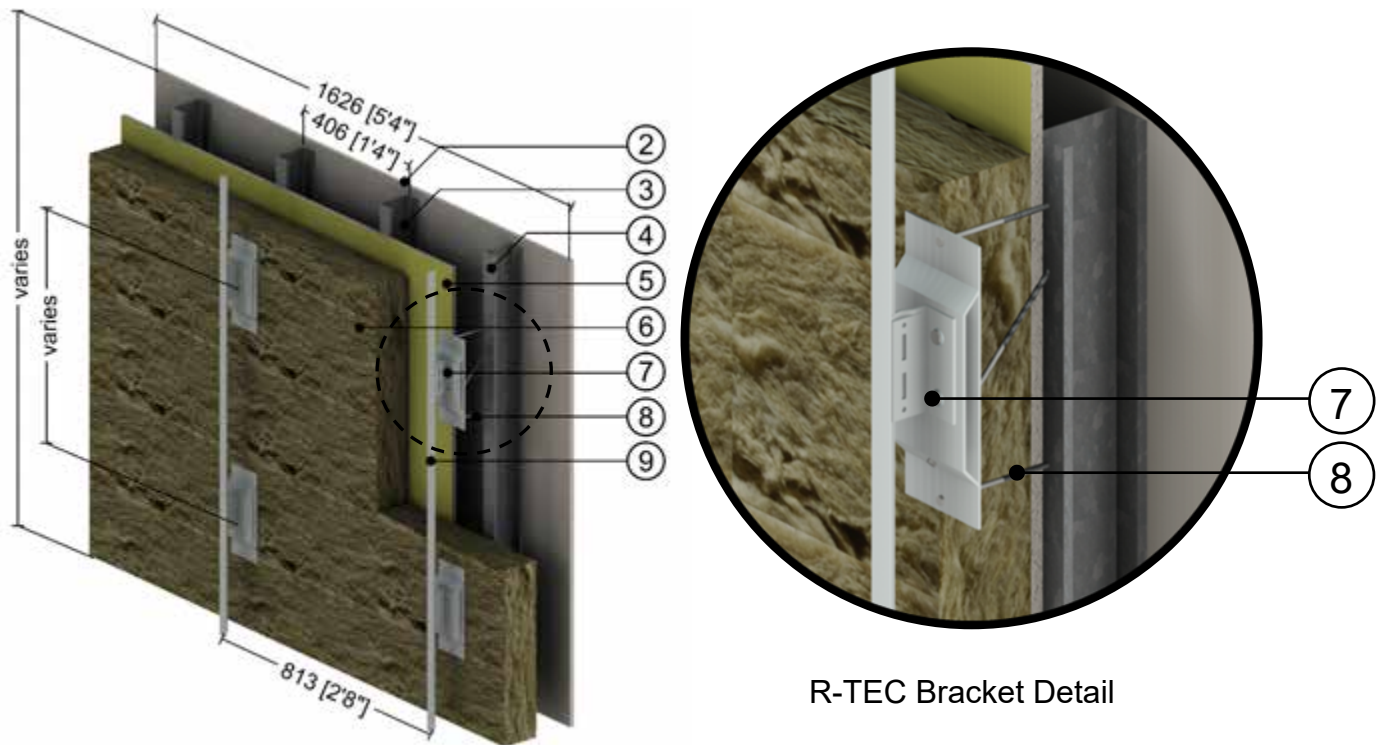
Isolator Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs (16" o.c.)	18 Gauge	250 (36)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	4 1/2" (114)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Polyisocyanurate Insulation	Varies	-	R-10.1 to R-19.0 (1.78 to 3.35 RSI)	-	-
6	#12 Stainless Steel Fasteners (8" o.c.)	0.21" (5.3) Ø	12 (20)	-	489 (7830)	0.12 (500)
7	Steel Vertical and Horizontal Rails	18 Gauge	250 (36)	-	489 (7830)	0.12 (500)
8	Isolator	3/16" (4)	0.12 (0.21)	-	-	-
9	Metal Cladding with vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.39

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with R-TEC CI Bracket System Supporting Vertical Sub-girts – Clear Wall



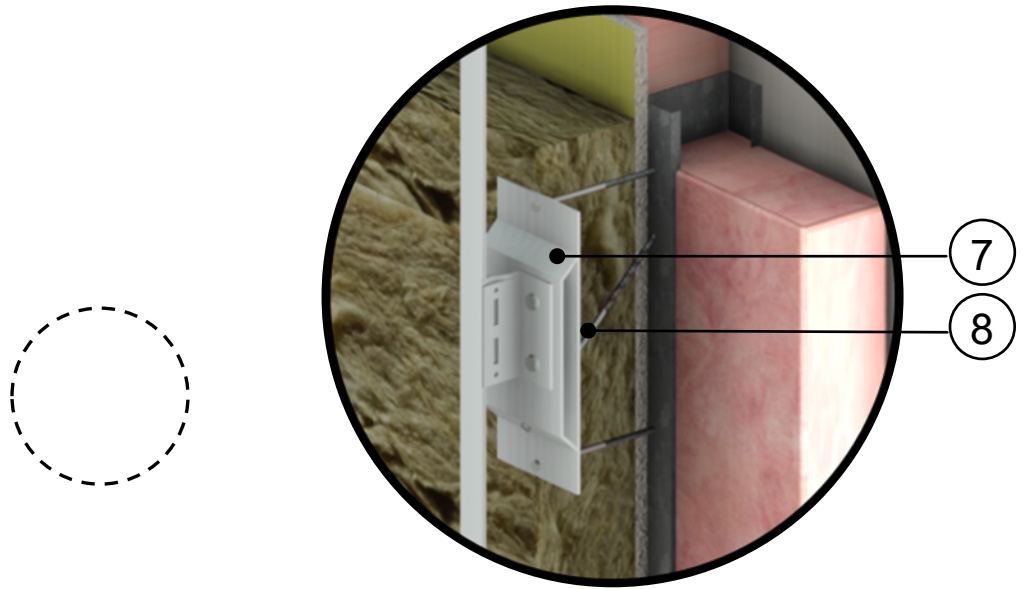
R-TEC Bracket Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	3" to 6" (76 to 152)	0.24 (0.034)	R-12.6 to R-25.2 (2.22 RSI to 4.44 RSI)	4 (64)	0.20 (850)
7	R-TEC CI Bracket Aluminum 6063	-	1390 (200)	-	168 (2700)	0.22 (900)
8	#14 Stainless Steel Fasteners	1/4" (6) Ø	118 (17)	-	500 (8000)	0.13 (530)
9	Vertical Sub-girt	0.09" (2.2)	1390 (200)	-	168 (2700)	0.22 (900)
10	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.40

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with R-TEC CI Bracket System Supporting Vertical Sub-girts and R-13 Batt Insulation in Stud Cavity – Clear Wall



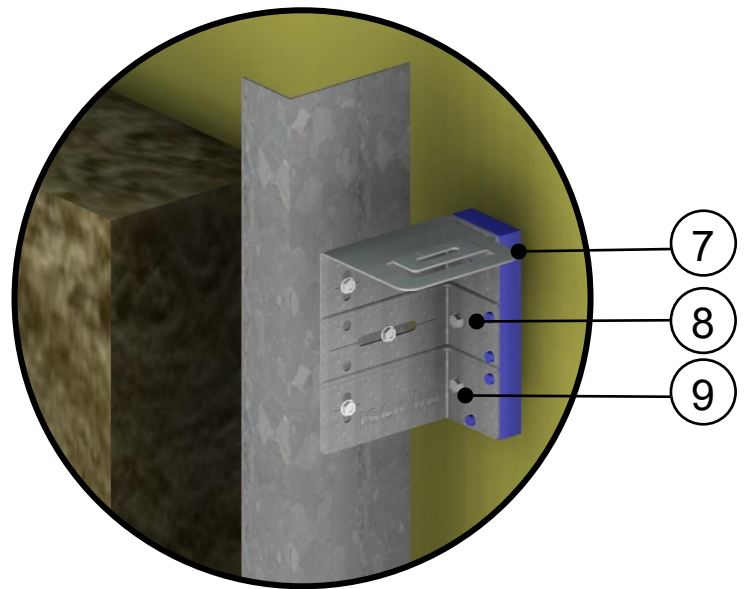
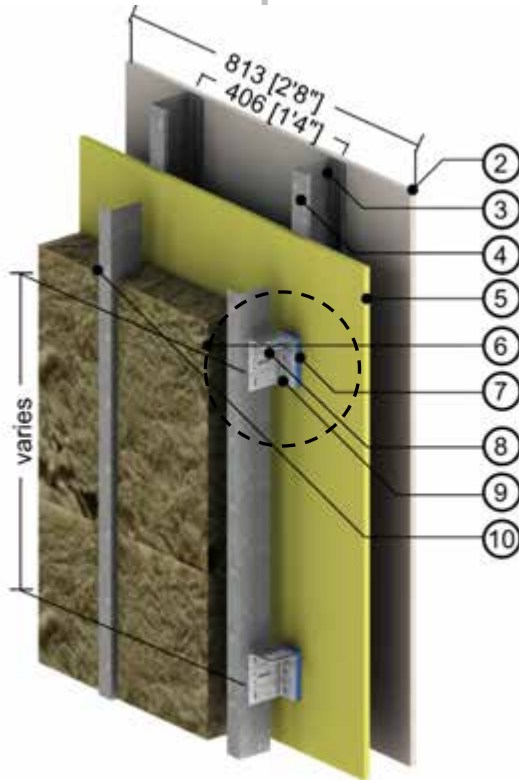
R-TEC Bracket Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (92)	0.28 (0.040)	R-13 (2.29 RSI)	0.9 (14)	0.17 (710)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	3" to 6" (76 to 152)	0.24 (0.034)	R-12.6 to R-25.2 (2.22 RSI to 4.44 RSI)	4 (64)	0.20 (850)
7	R-TEC CI Bracket Aluminum 6063	-	1390 (200)	-	168 (2700)	0.22 (900)
8	#14 Stainless Steel Fasteners	1/4" (6) Ø	118 (17)	-	500 (8000)	0.13 (530)
9	Vertical Sub-girt	0.09" (2.2)	1390 (200)	-	168 (2700)	0.22 (900)
10	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.41

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Broken ISO Clip System Supporting Vertical Sub-girts – Clear Wall



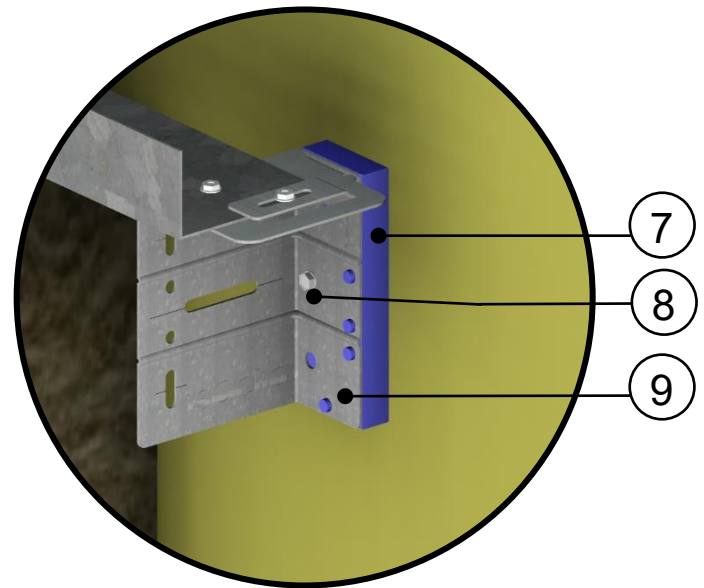
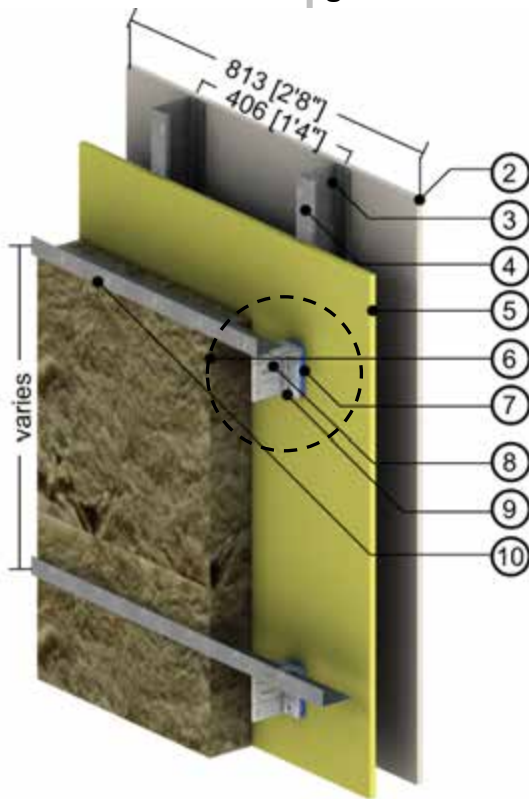
ISO Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	4" to 6" (102 to 152)	0.24 (0.034)	R-16.8 to R-25.2 (2.96 RSI to 4.44 RSI)	4 (64)	0.20 (850)
7	ISO Clip - HDPE Isolator	1/2" (12.7)	3.1 (0.45)	-	-	-
8	ISO Clip - Galvanized Metal	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	#14 Steel Fasteners	1/4" (6) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	Vertical Sub-girt	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.42

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Broken ISO Clip System Supporting Horizontal Sub-girts – Clear Wall



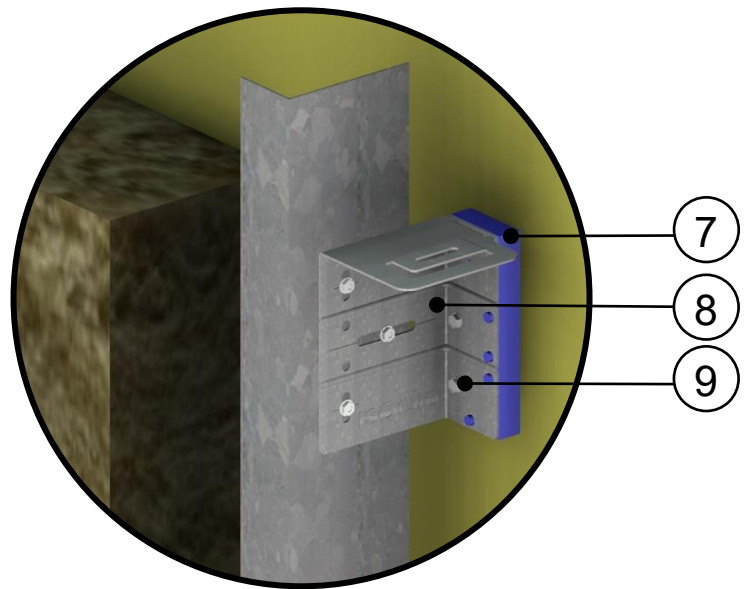
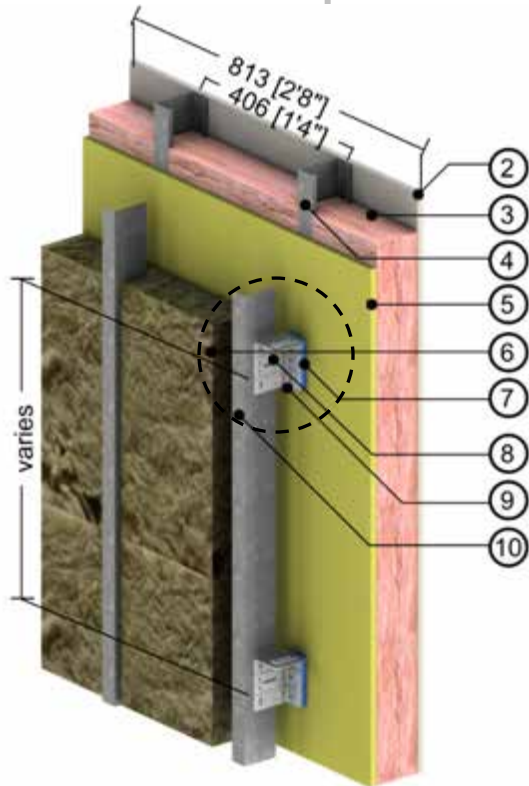
ISO Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	4" to 6" (102 to 152)	0.24 (0.034)	R-16.8 to R-25.2 (2.96 RSI to 4.44 RSI)	4 (64)	0.20 (850)
7	ISO Clip - HDPE Isolator	1/2" (12.7)	3.1 (0.45)	-	-	-
8	#14 Steel Fasteners	1/4" (6) Ø	347 (50)	-	489 (7830)	0.12 (500)
9	ISO Clip - Galvanized Metal	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
10	Horizontal Sub-girt	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.43

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Broken ISO Clip System Supporting Vertical Sub-girts and R-12 Batt Insulation in Stud Cavity – Clear Wall



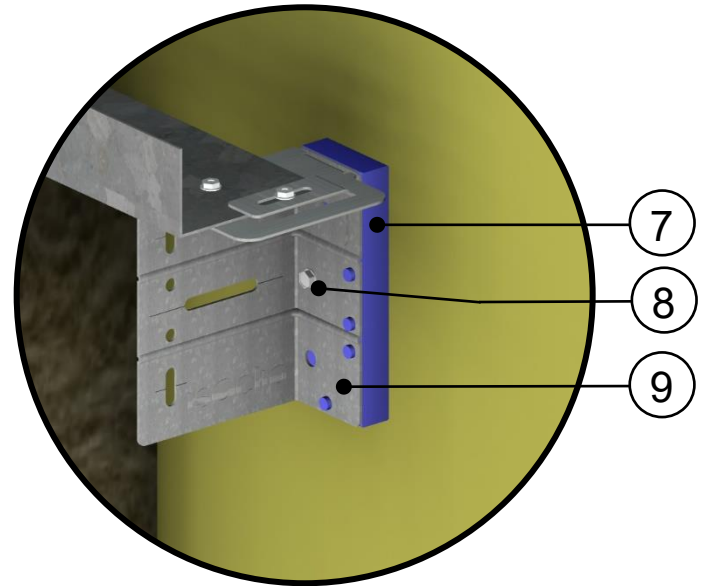
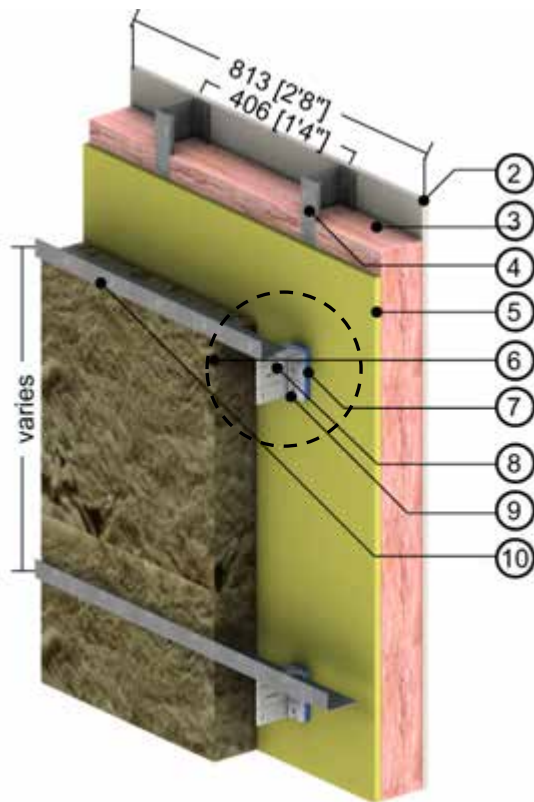
ISO Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12 (2.2 RSI)	0.9 (14)	0.17 (710)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	4" to 6" (102 to 152)	0.24 (0.034)	R-16.8 to R-25.2 (2.96 RSI to 4.44 RSI)	4 (64)	0.20 (850)
7	ISO Clip - HDPE Isolator	1/2" (12.7)	3.1 (0.45)	-	-	-
8	ISO Clip - Galvanized Metal	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	#14 Steel Fasteners	1/4" (6) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	Vertical Sub-girt	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.44

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Broken ISO Clip System Supporting Horizontal Sub-girts and R-12 Batt Insulation in Stud Cavity – Clear Wall



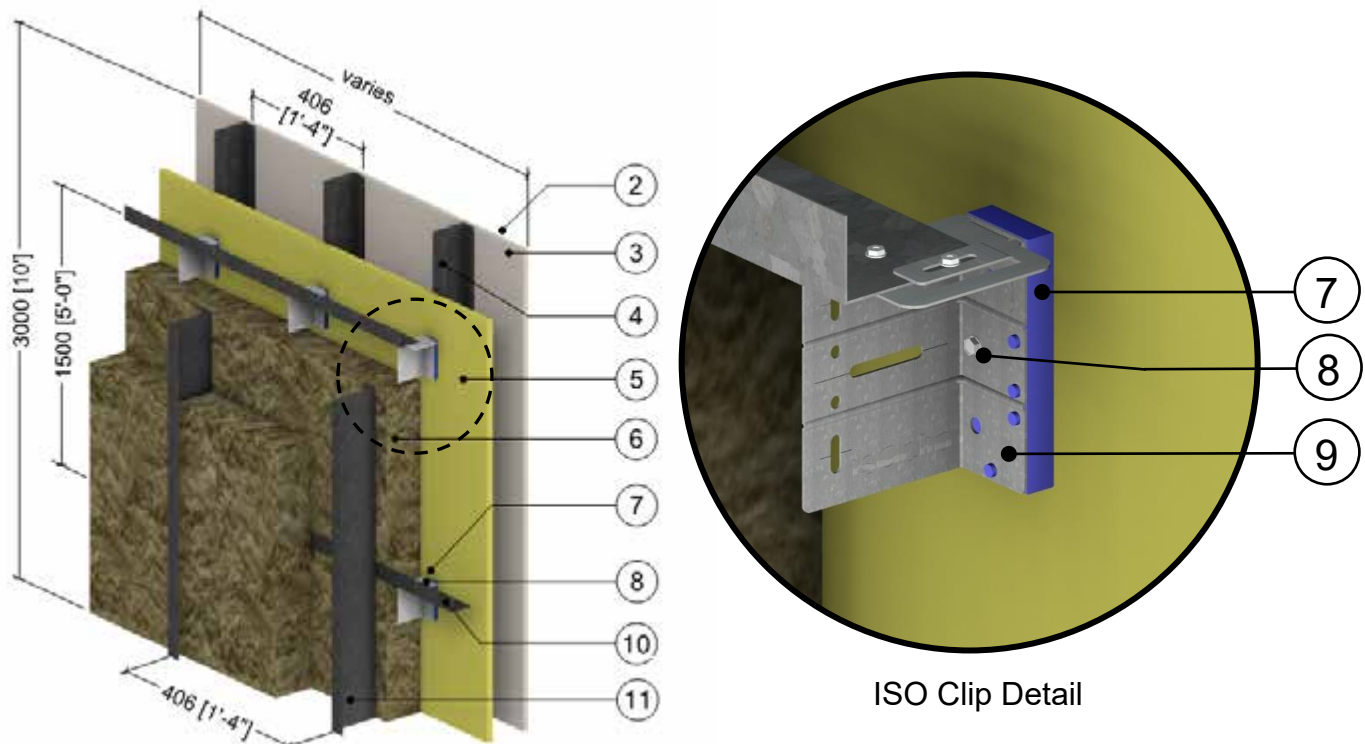
ISO Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12 (2.2 RSI)	0.9 (14)	0.17 (710)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	4" to 6" (102 to 152)	0.24 (0.034)	R-16.8 to R-25.2 (2.96 RSI to 4.44 RSI)	4 (64)	0.20 (850)
7	ISO Clip - HDPE Isolator	1/2" (12.7)	3.1 (0.45)	-	-	-
8	#14 Steel Fasteners	1/4" (6) Ø	347 (50)	-	489 (7830)	0.12 (500)
9	ISO Clip - Galvanized Metal	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
10	Horizontal Sub-girt	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.45

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Broken ISO Clip System (16" o.c.) Supporting Horizontal and Vertical Sub-girts – Clear Wall

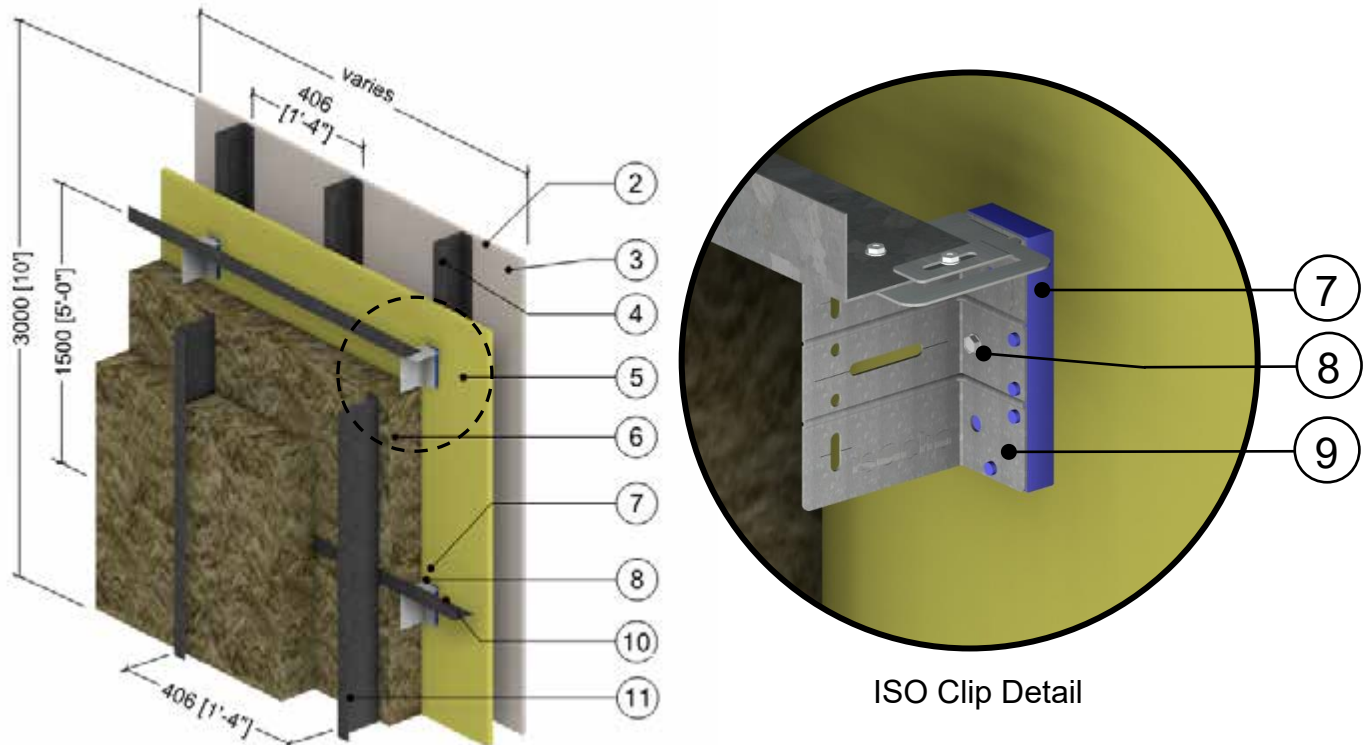


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	4" to 6" (102 to 152)	0.24 (0.034)	R-16.8 to R-25.2 (2.96 RSI to 4.44 RSI)	4 (64)	0.20 (850)
7	ISO Clip - HDPE Isolator	1/2" (12.7)	3.1 (0.45)	-	-	-
8	Fasteners	1/4" (6) ∅	347 (50)	-	489 (7830)	0.12 (500)
9	ISO Clip - Galvanized Metal	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
10	Horizontal Sub-girt	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Vertical Sub-girt	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.46

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Broken ISO Clip System (32" o.c.) Supporting Horizontal and Vertical Sub-girts – Clear Wall

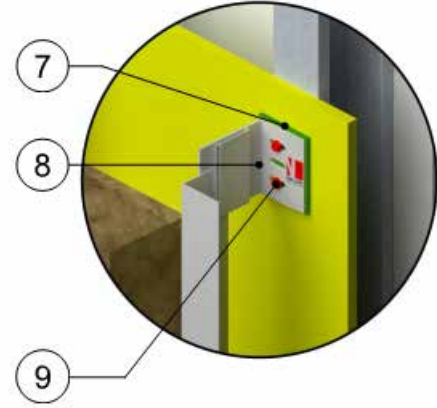
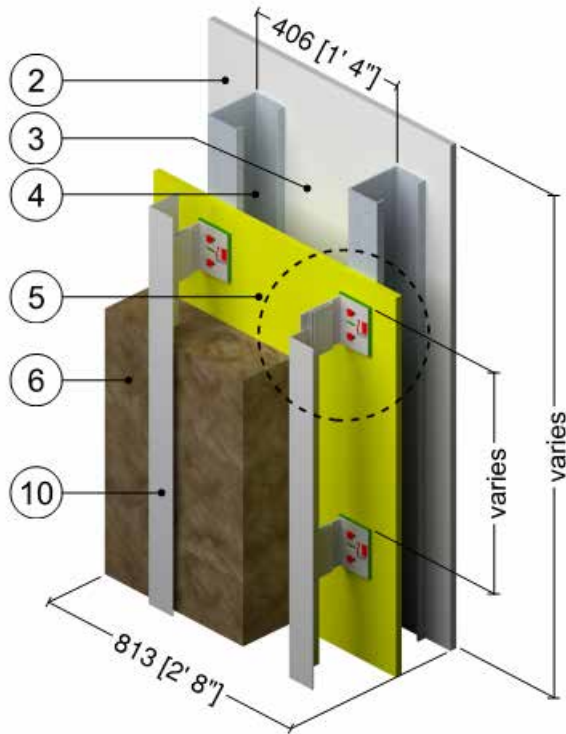


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	4" to 6" (102 to 152)	0.24 (0.034)	R-16.8 to R-25.2 (2.96 RSI to 4.44 RSI)	4 (64)	0.20 (850)
7	ISO Clip - HDPE Isolator	1/2" (12.7)	3.1 (0.45)	-	-	-
8	Fasteners	1/4" (6) ∅	347 (50)	-	489 (7830)	0.12 (500)
9	ISO Clip - Galvanized Metal	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
10	Horizontal Sub-girt	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Vertical Sub-girt	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.47

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Nvelope – NV1 Clip System Supporting Cladding – Clear Wall



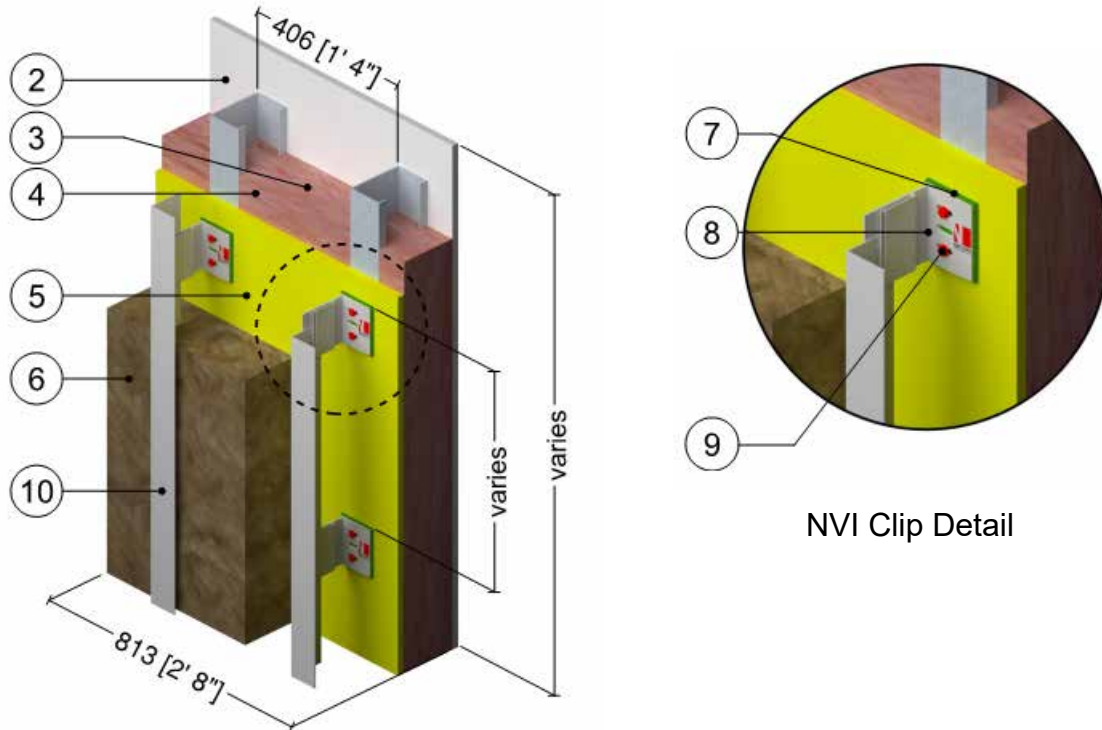
NV1 Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	3" to 6" (76 to 152)	0.24 (0.034)	R-12.6 to R-25.2 (2.22 RSI to 4.44 RSI)	4 (64)	0.20 (850)
7	NV1 Clip Isolator	0.2" (5)	0.82 (0.117)	-	87 (1400)	0.20 (840)
8	NV1 Clip Extrusion – Aluminum 6005A alloy	Varies	1340 (193)	-	169 (2700)	0.22 (900)
9	#14 Stainless Steel Fasteners	1/4" (6) Ø	118 (17)	-	500 (8000)	0.12 (500)
10	Vertical Sub-girt	0.09" (2.2)	1340 (193)	-	169 (2700)	0.22 (900)
11	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.48

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Nvelope – NV1 Clip System Supporting Cladding and R-12 Batt Insulation in Stud Cavity – Clear Wall

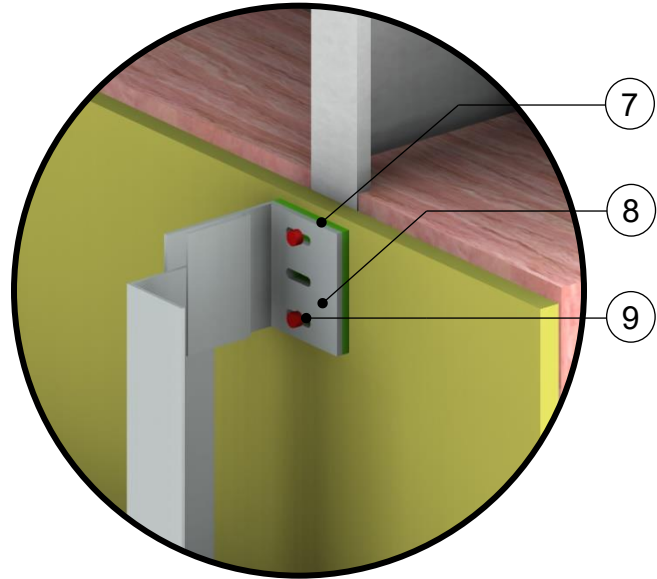
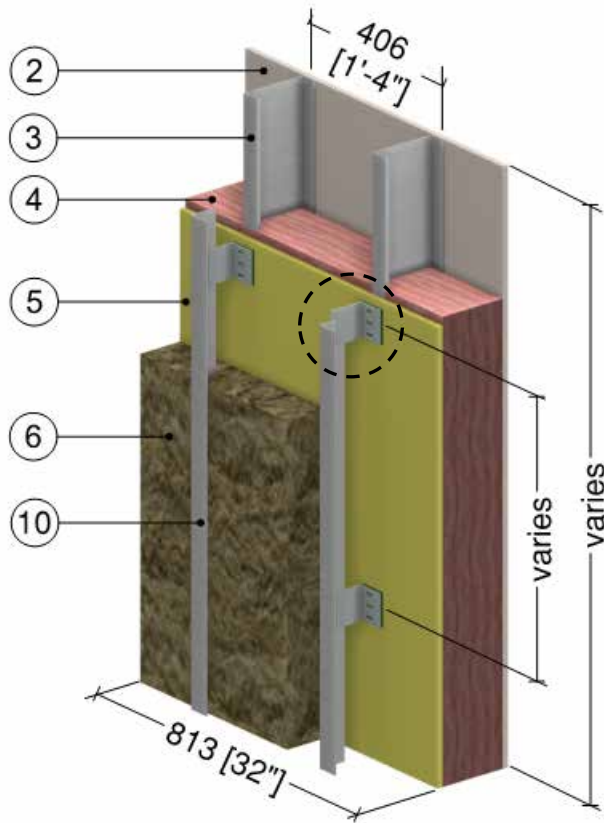


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12 (2.2 RSI)	0.9 (14)	0.17 (710)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	2" to 6" (50 152)	0.24 (0.034)	R-8.4 to R-25.2 (1.48 RSI to 4.44 RSI)	4 (64)	0.20 (850)
7	NV1 Clip Isolator	0.2" (5)	0.82 (0.117)	-	87 (1400)	0.20 (840)
8	NV1 Clip Extrusion – Aluminum 6005A alloy	Varies	1340 (193)	-	169 (2700)	0.22 (900)
9	#14 Stainless Steel Fasteners	1/4" (6) Ø	118 (17)	-	500 (8000)	0.12 (500)
10	Vertical Sub-girt	0.09" (2.2)	1340 (193)	-	169 (2700)	0.22 (900)
11	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.49

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Nvelope – NV1 Clip System Supporting Cladding and R-19 Batt Insulation in Stud Cavity – Clear Wall



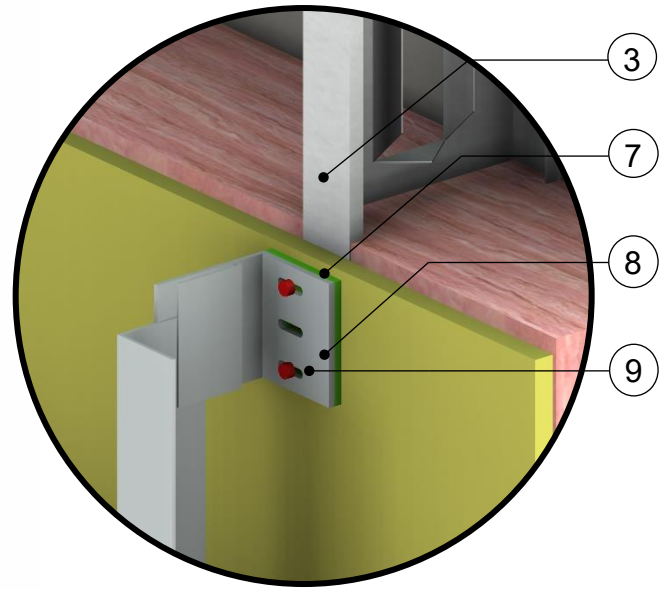
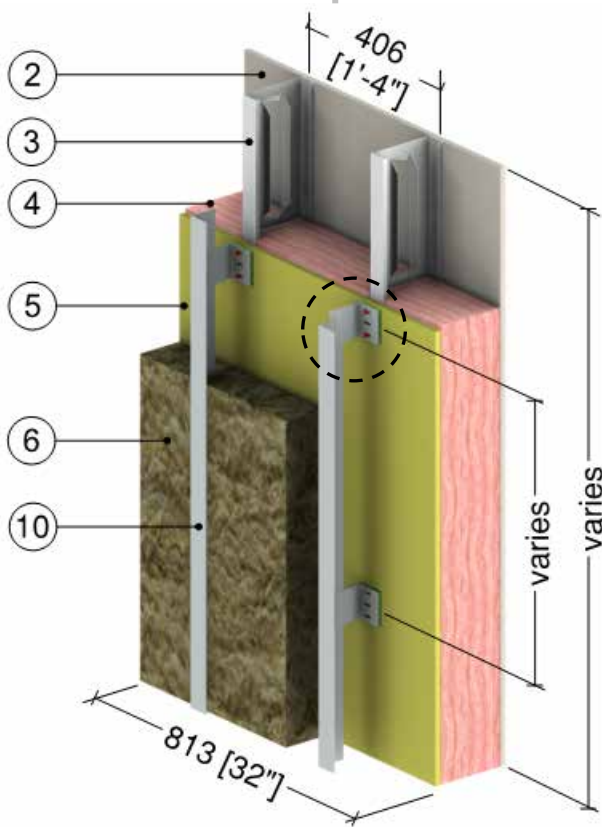
Nvelope NVI Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	6" (152)	0.31 (0.045)	R-19 (3.35 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	1.5" to 4" (38 to 102)	0.24 (0.034)	R-6.3 to R-16.8 (1.11 RSI to 2.96 RSI)	4 (64)	0.20 (850)
7	Nvelope Clip Isolator	0.2" (5)	0.82 (0.117)	-	-	-
8	Nvelope Clip Extrusion – Aluminum 6005A alloy	Varies	1340 (193)	-	169 (2700)	0.22 (900)
9	#14 Stainless Steel Fastener	1/4" (6) ∅	118 (17)	-	500 (8000)	0.13 (530)
10	Vertical Aluminum Sub-girt	0.09" (2.2)	1340 (193)	-	169 (2700)	0.22 (900)
11	Generic Cladding with 1" (25mm) vented air space is incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.50

Exterior and Interior Insulated 6" x 1 5/8" Slotted Steel R-Stud (16" o.c.) Wall Assembly with Nvelope – NV1 Clip System Supporting Cladding and R-19 Batt Insulation in Stud Cavity – Clear Wall



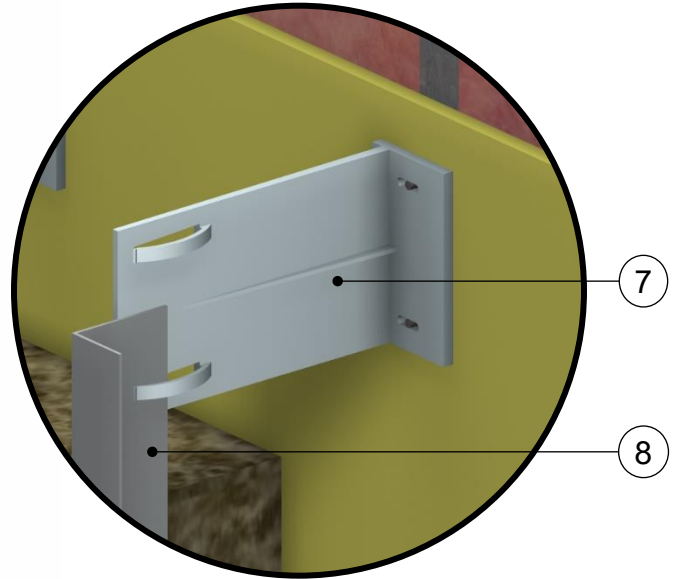
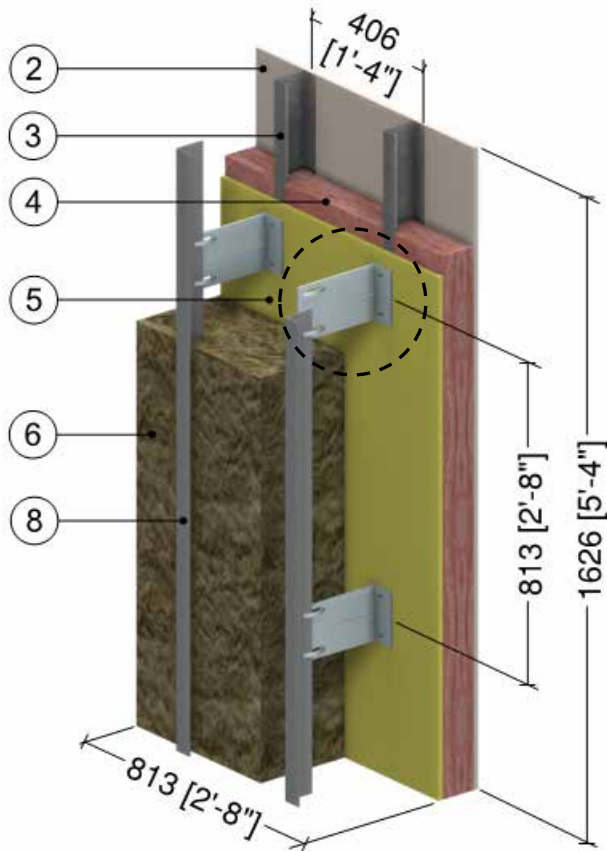
Nvelope NVI Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Slotted Steel R-Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	6" (152)	0.31 (0.045)	R-19 (3.35 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	1.5" to 4" (38 to 102)	0.24 (0.034)	R-6.3 to R-16.8 (1.11 RSI to 2.96 RSI)	4 (64)	0.20 (850)
7	Nvelope Clip Isolator	0.2" (5)	0.82 (0.117)	-	-	-
8	Nvelope Clip Extrusion – Aluminum 6005A alloy	Varies	1340 (193)	-	169 (2700)	0.22 (900)
9	#14 Stainless Steel Fastener	1/4" (6) ∅	118 (17)	-	500 (8000)	0.13 (530)
10	Vertical Aluminum Sub-girt	0.09" (2.2)	1340 (193)	-	169 (2700)	0.22 (900)
11	Generic Cladding with 1" (25mm) vented air space is incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.51

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Nvelope – Eko Thermobacket Clip System Supporting Cladding and R-13 Batt Insulation in Stud Cavity – Clear Wall



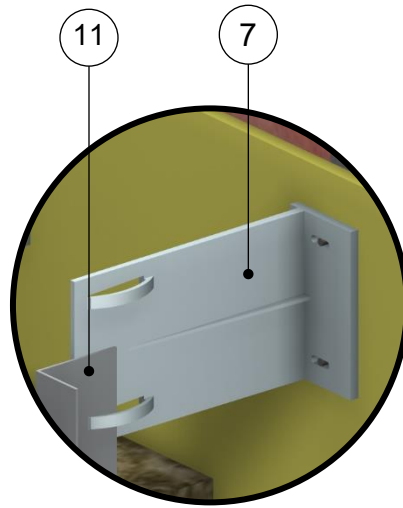
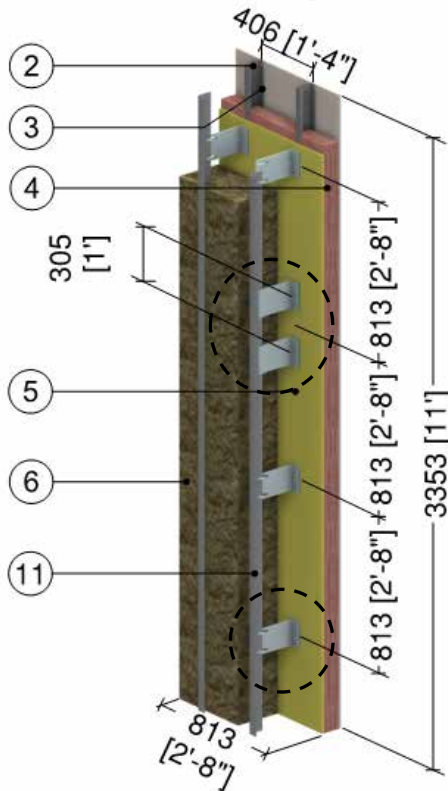
Nvelope Eko Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.28 (0.040)	R-13 (2.29 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	10" (254)	0.24 (0.034)	R-42.0 (7.40 RSI)	4 (64)	0.20 (850)
7	Nvelope Eko Thermobacket (Polymer Composite)	-	4.86 (0.70)	-	-	-
8	Vertical Aluminum Sub-girt	0.09" (2.2)	1340 (193)	-	169 (2700)	0.22 (900)
9	Generic Cladding with 1" (25mm) vented air space is incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

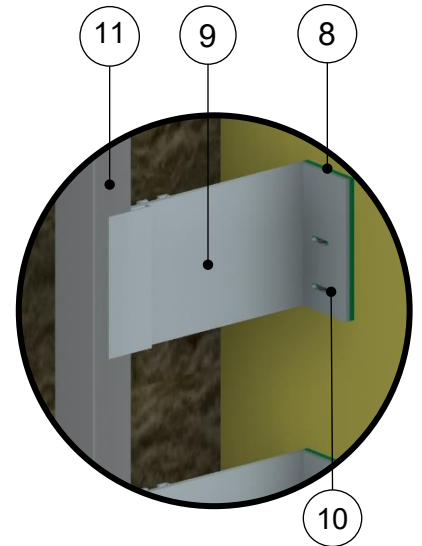
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.52

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Nvelope – Eko Thermobacket and NV1 Clip System Supporting Cladding and R-13 Batt Insulation in Stud Cavity – Clear Wall



Nvelope Eko Thermobacket Clip Detail



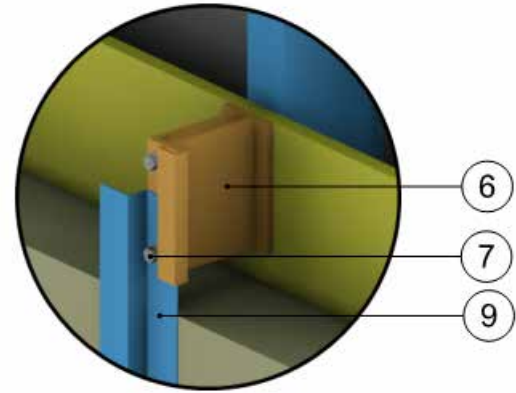
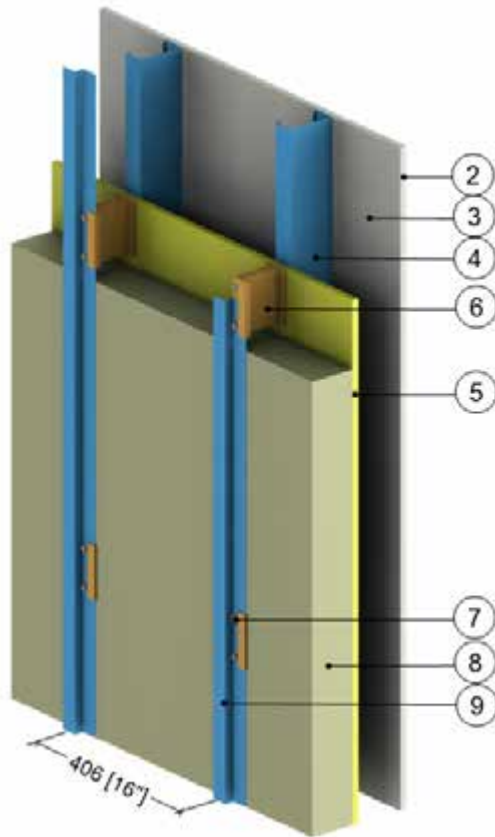
Nvelope NV1 Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.28 (0.040)	R-13 (2.29 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	10" (254)	0.24 (0.034)	R-42.0 (7.40 RSI)	4 (64)	0.20 (850)
7	Nvelope Eko Thermobacket (Polymer Composite)	-	4.86 (0.70)	-	-	-
8	Nvelope Clip Isolator	0.2" (5)	0.82 (0.117)	-	-	-
9	Nvelope Clip Extrusion – Aluminum 6005A alloy	Varies	1340 (193)	-	169 (2700)	0.22 (900)
10	#14 Stainless Steel Fastener	1/4" (6) ∅	118 (17)	-	-	-
11	Vertical Aluminum Sub-girt	0.09" (2.2)	1340 (193)	-	169 (2700)	0.22 (900)
12	Generic Cladding with 1" (25mm) vented air space is incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.53

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" O.C.) Wall Assembly with Cascadia Clip Fiberglass Thermal Spacers – Clear Wall



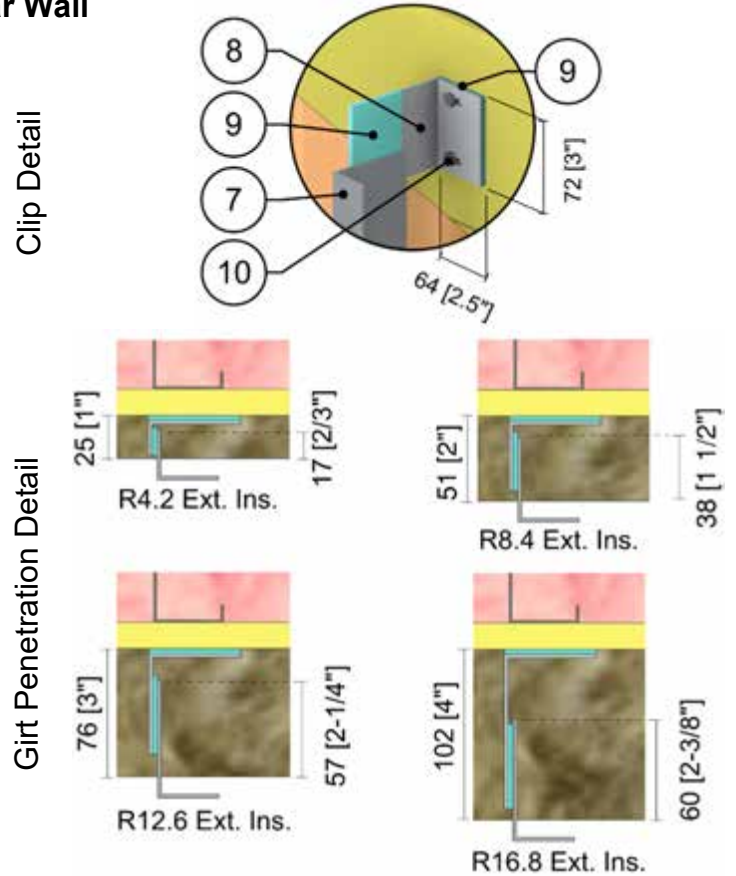
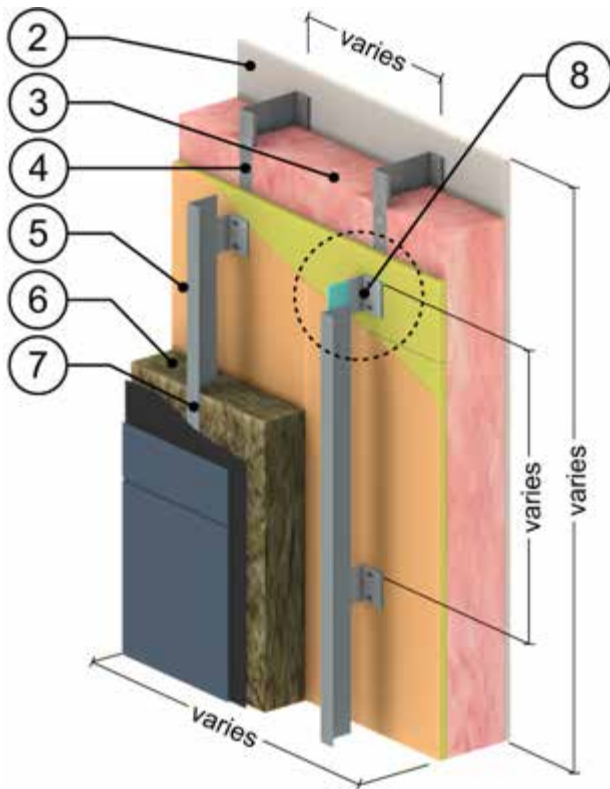
Cascadia Clip
Fiberglass Thermal
Spacer Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	Cascadia Clip	Varies	2.07 (0.299)	-	-	-
7	#14 Stainless Steel Fasteners	1/4" (6) ∅	118 (17)	-	500 (8000)	0.12 (500)
8	Exterior Mineral Wool Insulation	Varies	-	R-8.4 to R-33.6 (1.48 to 5.92 RSI)	4 (64)	0.20 (850)
9	Vertical Z-girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
10	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.54

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c. and 24" o.c.) Wall Assembly with Vertical Clips (24" o.c. and 36" o.c.) Supporting Cladding and Owens Corning R-20 Batt Insulation in Stud Cavity – Clear Wall

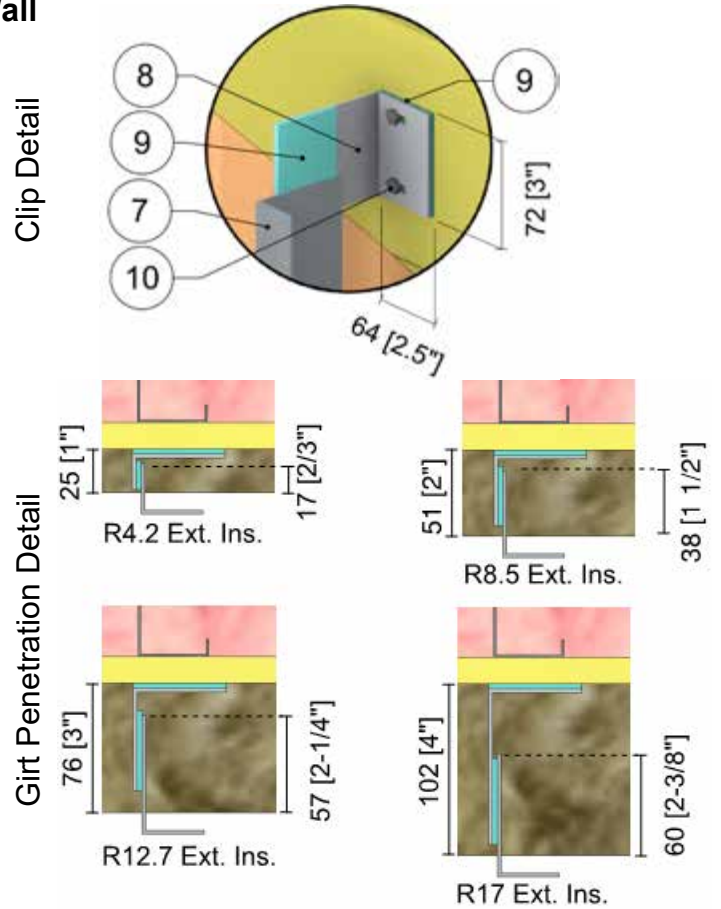
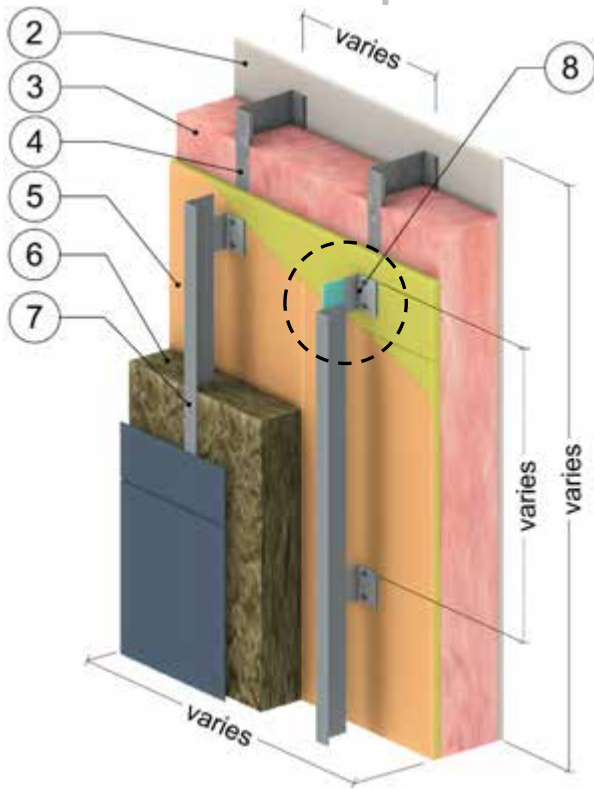


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Ecotouch Pink Fiberglass Batt	6" (152)	0.30 (0.043)	R-20 (3.5 RSI)	0.55 (8.8)	0.17 (710)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	Varies	0.24 (0.034)	R-4.2 to R-16.8 (0.75 to 3.0 RSI)	4.5 (72)	0.20 (850)
7	Vertical Aluminum L-girt	0.09" (2.2)	1340 (193)	-	169 (2700)	0.22 (900)
8	Aluminum Clip	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	HDPE Isolator	1/8" (3)	3.5 (0.5)	-	59 (950)	0.48 (2000)
10	#14 Stainless Steel Fasteners	1/4" (6) Ø	118 (17)	-	500 (8000)	0.12 (500)
11	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.55

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c. and 24" o.c.) Wall Assembly with Vertical Clips (24" o.c. and 36" o.c.) Supporting Cladding and Owens Corning R-22.5 Batt Insulation in Stud Cavity– Clear Wall

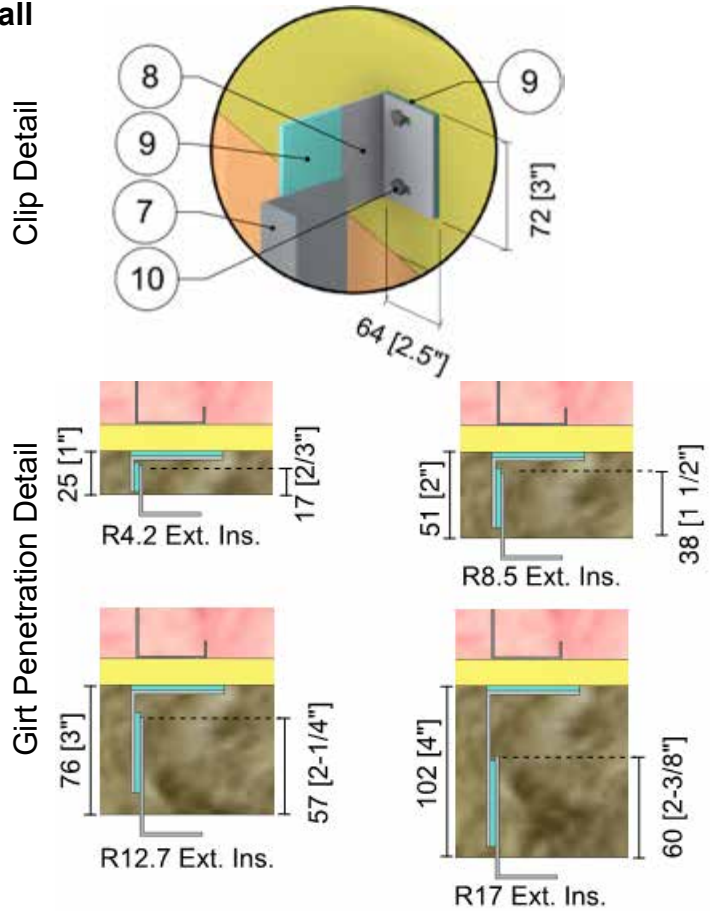
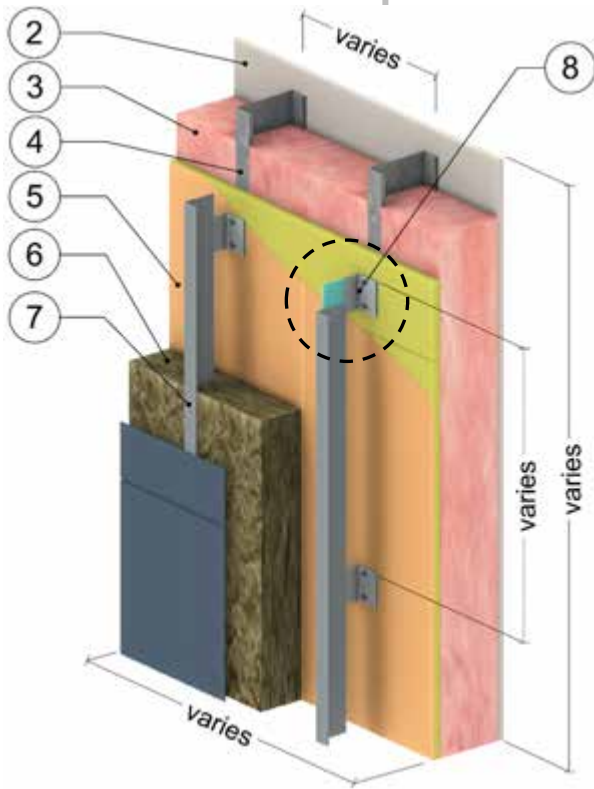


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Ecotouch Pink Fiberglass Batt	6" (152)	0.26 (0.038)	R-22.5 (4.0 RSI)	0.99 (15.9)	0.17 (710)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	Varies	0.24 (0.034)	R-4.2 to R-16.8 (0.75 to 2.96 RSI)	4.5 (72)	0.20 (850)
7	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.21 (900)
8	Aluminum Clip	0.09" (2.2)	1110 (160)	-	171 (2739)	0.21 (900)
9	HDPE Isolator	1/8" (3)	3.5 (0.5)	-	59 (950)	0.48 (2000)
10	Stainless Steel Fastener	1/4" (6) ∅	118 (17)	-	500 (8000)	0.12 (500)
11	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.56

Exterior and Interior Insulated 6" x 1/8" Steel Stud (16" o.c. and 24" o.c.) Wall Assembly with Vertical Clips (24" o.c. and 36" o.c.) Supporting Cladding and Owens Corning R-24 Batt Insulation in Stud Cavity– Clear Wall

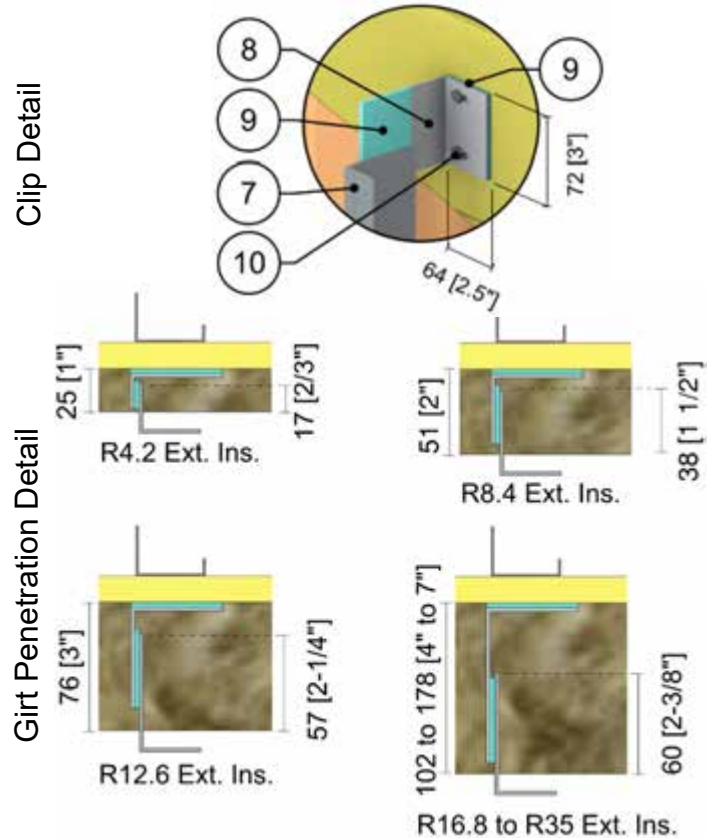
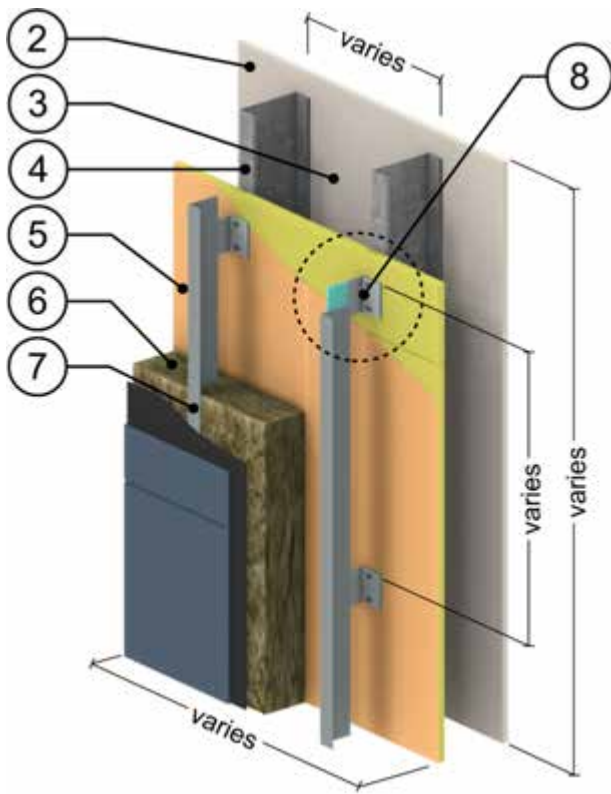


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Ecotouch Pink Fiberglass Batt	6" (152)	0.25 (0.036)	R-24 (4.2 RSI)	1.42 (22.7)	0.17 (710)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulating Sheathing	Varies	0.24 (0.034)	R-4.2 (0.75) to R-16.8 (2.96 RSI)	4.5 (72)	0.20 (850)
7	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.21 (900)
8	Aluminum Clip	0.09" (2.2)	1110 (160)	-	171 (2739)	0.21 (900)
9	HDPE Isolator	1/8" (3)	3.5 (0.5)	-	59 (950)	0.48 (2000)
10	#14 Stainless Steel Fasteners	1/4" (6) Ø	118 (17)	-	500 (8000)	0.12 (500)
11	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.57

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c. and 24" o.c.) Wall Assembly with Vertical Clips (24" o.c. and 36" o.c.) Supporting Cladding – Clear Wall



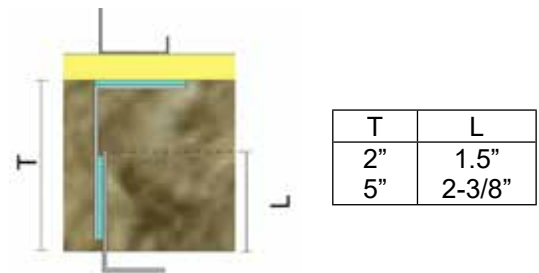
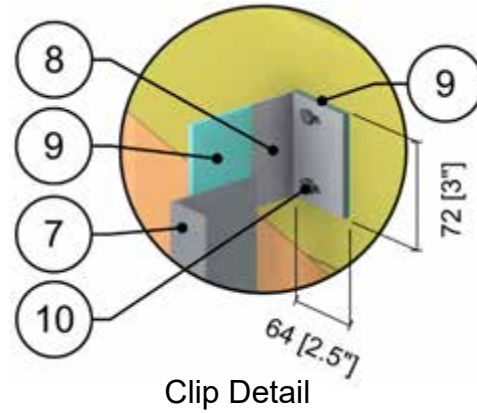
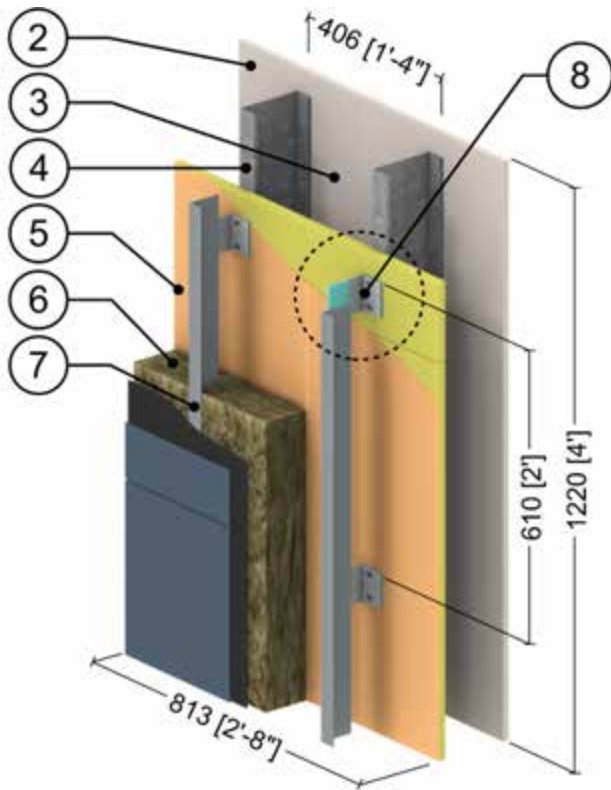
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	0.24 (0.034)	R-4.2 to R-29.4 (0.74 to 5.18 RSI)	4 (64)	0.20 (850)
7	Vertical Aluminum L-girt – Aluminum 6005A alloy	0.09" (2.2)	1340 (193)	-	169 (2700)	0.22 (900)
8	Aluminum Bracket	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	HDPE Isolator	1/8" (3)	3.5 (0.5)	-	59 (950)	0.48 (2000)
10	#14 Stainless Steel Fasteners	1/4" (6) Ø	118 (17)	-	500 (8000)	0.12 (500)
11	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 5.1.58

Owens Corning Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding – Clear Wall



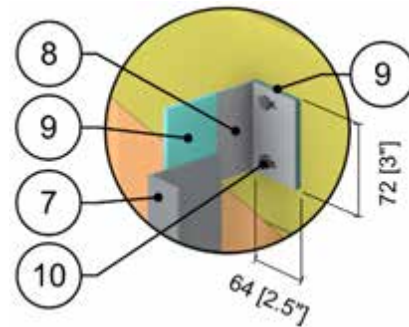
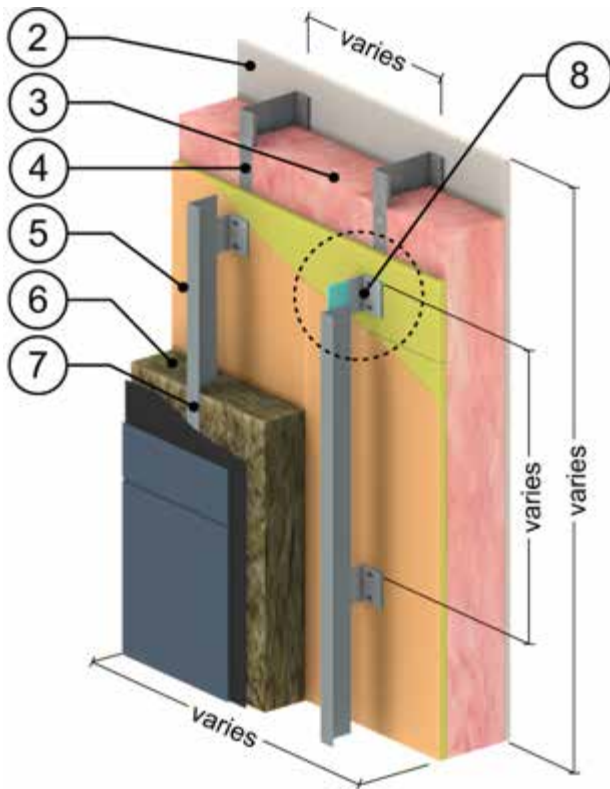
Girt Penetration Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	Varies	0.24 (0.034)	R-8.4 to R-21.0 (1.11 to 3.70 RSI)	4.5 (72)	0.20 (850)
7	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
8	Aluminum Bracket	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	HDPE Isolator	1/8" (3)	3.5 (0.5)	-	59 (950)	0.48 (2000)
10	#14 Stainless Steel Fastener	1/4" (6) Ø	118 (17)	-	500 (8000)	0.12 (500)
11	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

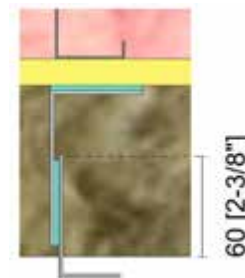
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.59

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c. and 24" o.c.) Wall Assembly with Vertical Clips (24" o.c. and 36" o.c.) Supporting Cladding and R-20 Batt Insulation in Stud Cavity – Clear Wall



Clip Detail



Girt Penetration Detail

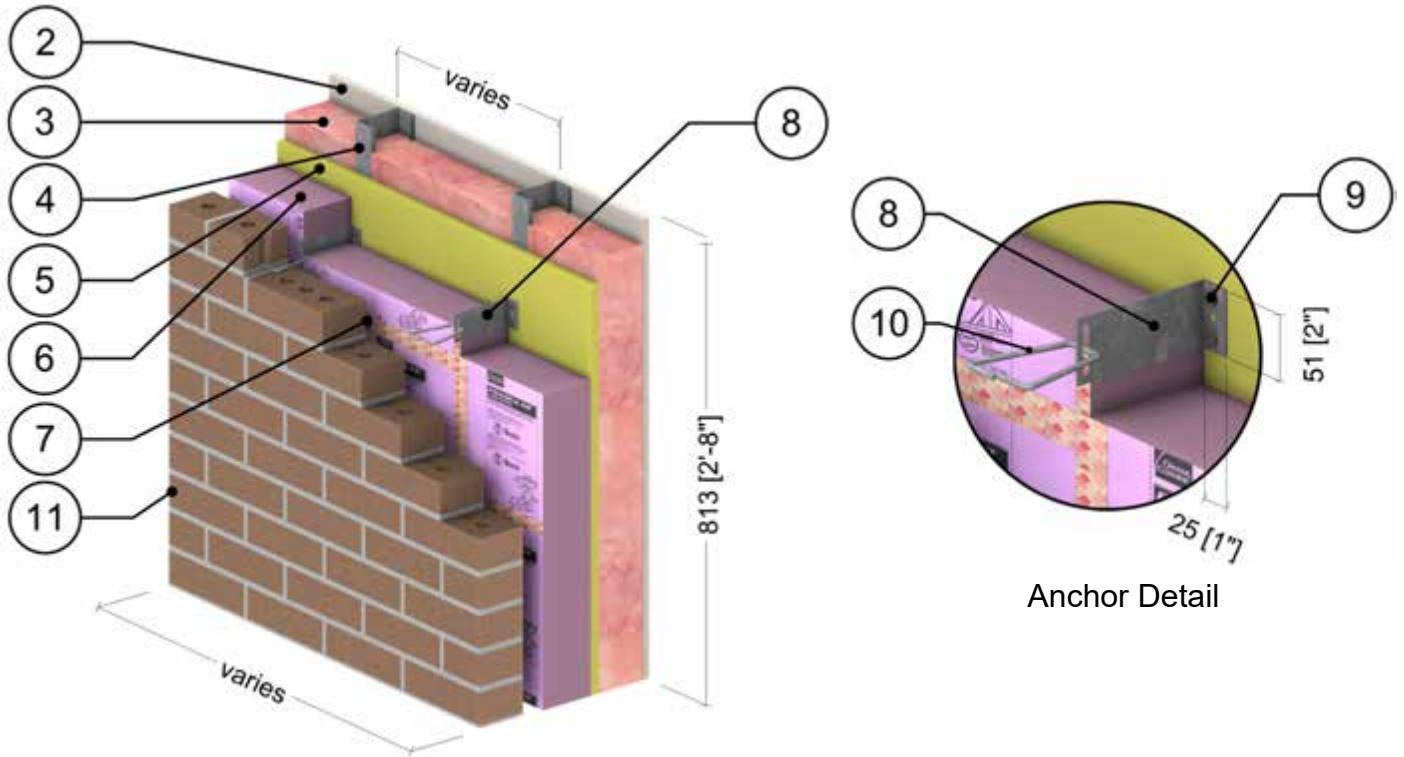
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	6" (152)	0.30(0.043)	R-20 (3.5 RSI)	0.55 (8.8)	0.17 (710)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-16.8 to R-29.4 (2.96 to 5.18 RSI)	4 (64)	0.20 (850)
7	Vertical Aluminum L-girt – Aluminum 6005A alloy	0.09" (2.2)	1340 (193)	-	169 (2700)	0.22 (900)
8	Aluminum Bracket	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	HDPE Isolator	1/8" (3)	3.5 (0.5)	-	59 (950)	0.48 (2000)
10	#14 Stainless Steel Fasteners	1/4" (6) Ø	118 (17)	-	500 (8000)	0.12 (500)
11	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 5.1.60

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c. and 24" o.c.) Wall Assembly with Steel Brick Anchors Supporting Brick Veneer and Owens Corning R-20 Batt Insulation in Stud Cavity – Clear Wall

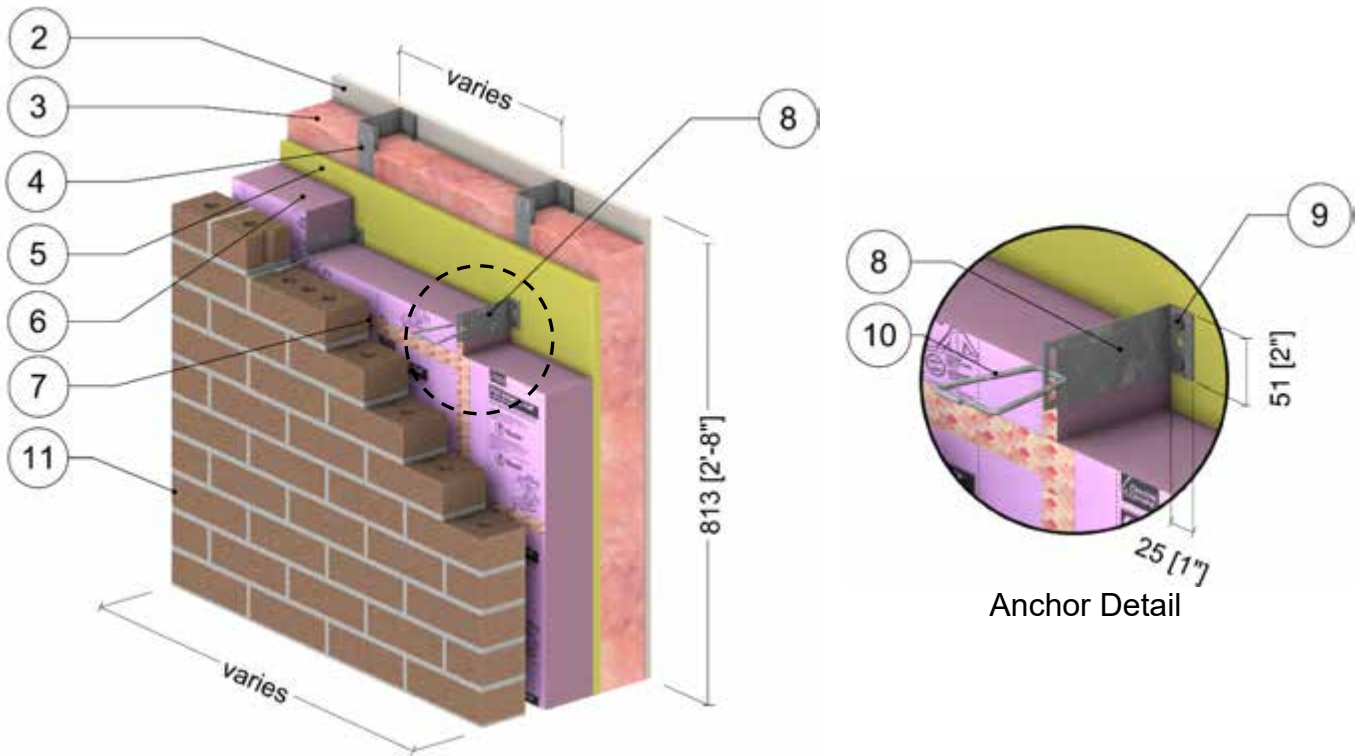


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Ecotouch Pink Fiberglass Batt	6" (152)	0.30 (0.043)	R-20 (3.5 RSI)	0.55 (8.8)	0.17 (710)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Foamular CodeBord/C-200 Extruded Polystyrene Rigid Insulation (XPS) Type 3	Varies	0.20 (0.029)	R-5 to R-15 (0.88 to 2.64 RSI)	Varies	0.29 (1220)
7	Vented Air Cavity	1 1/2" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
8	Galvanized Steel Veneer Anchor	Varies	430 (62)	-	489 (7830)	0.12 (500)
9	Galvanized Steel Fasteners	0.28" (7) Ø	430 (62)	-	489 (7830)	0.12 (500)
10	Galvanized Steel Wire Pinto	-	430 (62)	-	489 (7830)	0.12 (500)
11	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.61

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c. and 24" o.c.) Wall Assembly with Steel Brick Anchors Supporting Brick Veneer and Owens Corning R-22.5 Batt Insulation in Stud Cavity – Clear Wall

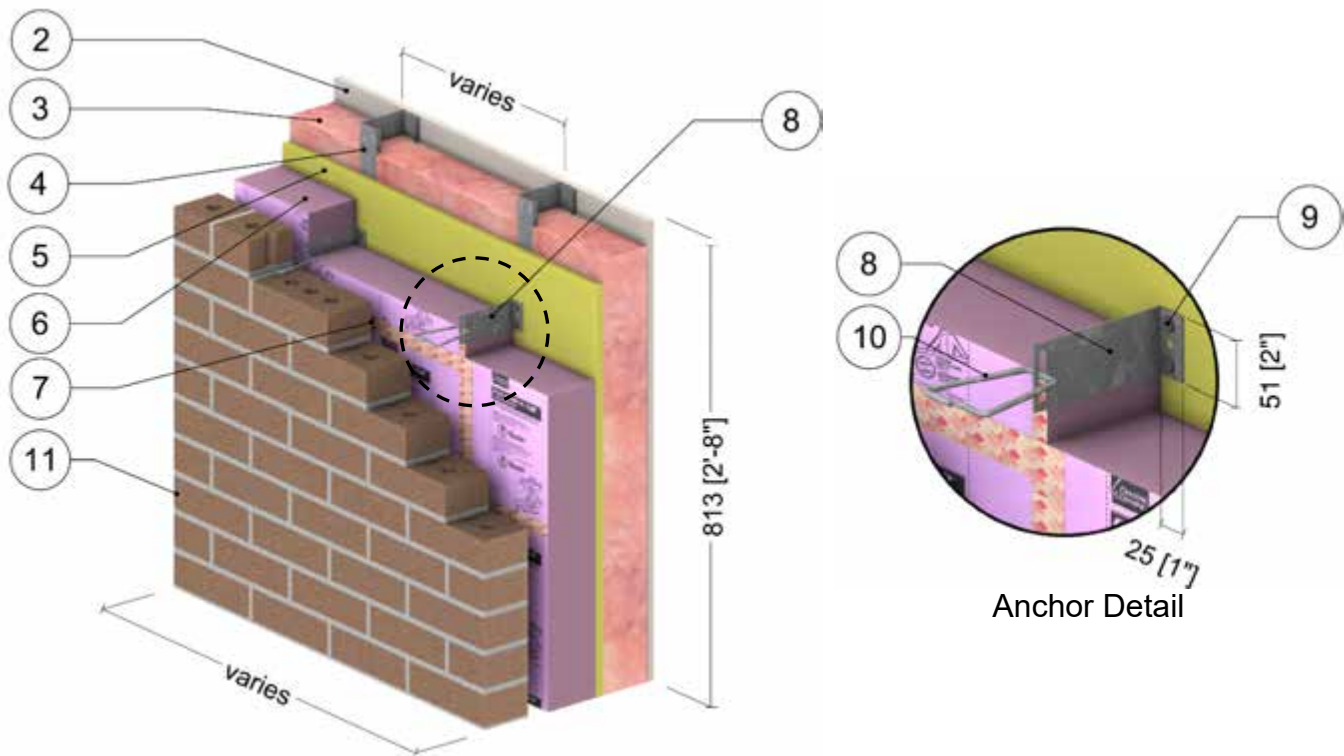


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Ecotouch Pink Fiberglass Batt	6" (152)	0.26 (0.038)	R-22.5 (4.0 RSI)	0.99 (15.9)	0.17 (710)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Foamular CodeBord/C-200 Extruded Polystyrene Rigid Insulation (XPS) Type 3	Varies	0.20 (0.029)	R-5 to R-15 (0.88 to 2.64 RSI)	Varies	0.29 (1220)
7	Vented Air Cavity	1 1/2" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
8	Galvanized Steel Veneer Anchor	Varies	430 (62)	-	489 (7830)	0.12 (500)
9	Galvanized Steel Fasteners	0.28" (7) Ø	430 (62)	-	489 (7830)	0.12 (500)
10	Galvanized Steel Wire Pintle	-	430 (62)	-	489 (7830)	0.12 (500)
11	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.62

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c. and 24" o.c.) Wall Assembly with Steel Brick Anchors Supporting Brick Veneer and Owens Corning R-24 Batt Insulation in Stud Cavity – Clear Wall

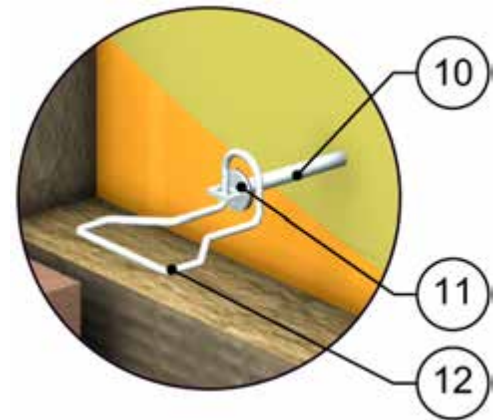
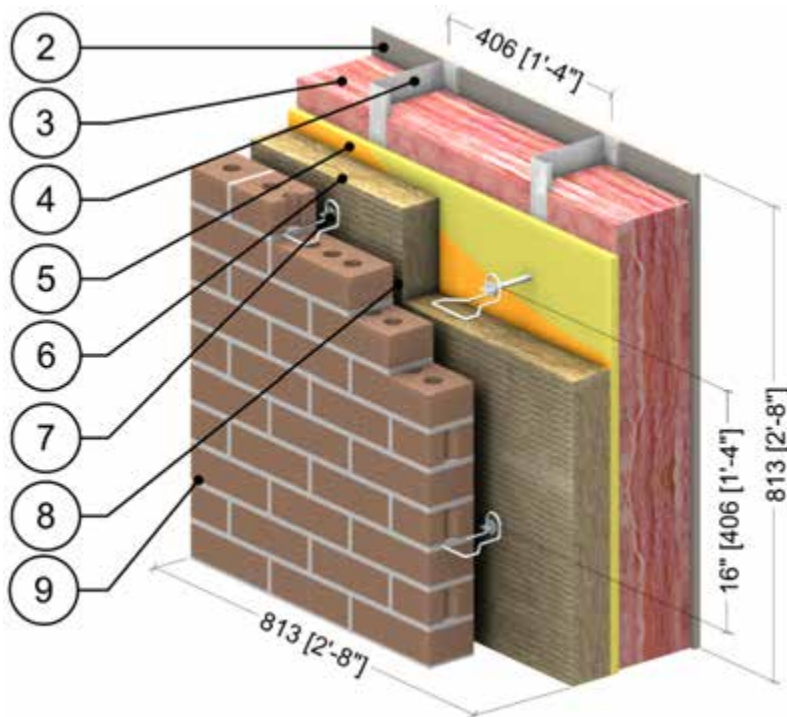


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Ecotouch Pink Fiberglass Batt	6" (152)	0.25 (0.036)	R-24 (4.2 RSI)	1.42 (22.7)	0.17 (710)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Foamular CodeBord/C-200 Extruded Polystyrene Rigid Insulation (XPS) Type 3	Varies	0.20 (0.029)	R-5 to R-15 (0.88 to 2.64 RSI)	Varies	0.29 (1220)
7	Vented Air Cavity	1 1/2" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
8	Galvanized Steel Veneer Anchor	Varies	430 (62)	-	489 (7830)	0.12 (500)
9	Galvanized Steel Fasteners	0.28" (7) Ø	430 (62)	-	489 (7830)	0.12 (500)
10	Galvanized Steel Wire Pintle	-	430 (62)	-	489 (7830)	0.12 (500)
11	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.63

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Heckmann Pos-I-Tie Veneer Anchoring System Supporting Brick Veneer and Owens Corning R-20 Batt Insulation in Stud Cavity – Clear Wall



Anchor Detail

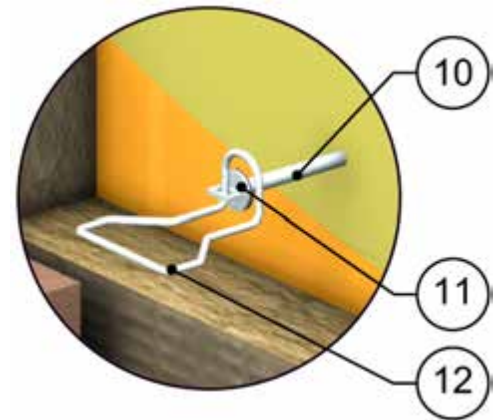
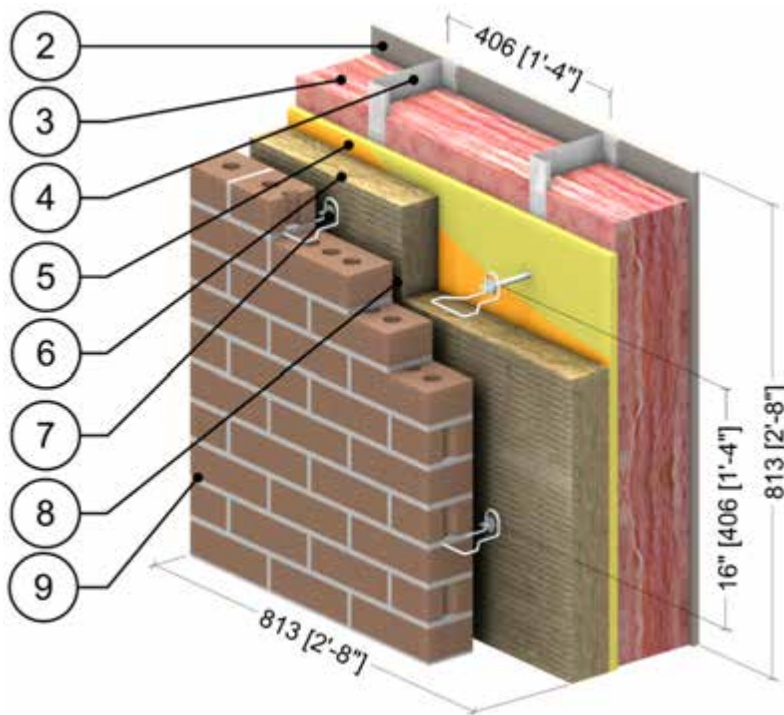
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Ecotouch Pink Fiberglass Batt	6" (152)	0.30 (0.043)	R-20 (3.5 RSI)	0.55 (8.8)	0.17 (710)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	Varies	0.24 (0.034)	R-6.3 to R-21.0 (1.11 to 3.70 RSI)	4.5 (72)	0.29 (1220)
7	Heckmann Pos-I-Tie Masonry Tie 16" (406) o.c.	Varies	-	-	-	-
8	Vented Air Cavity ²	1.5" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Zinc Barrel	-	726 (105)	-	412 (6600)	-
11	Rubber Washer (EPDM)	1/16" (1.59)	1.7 (0.25)	-	62 (997)	-
12	Galvanized Steel Wire Pintle	3/16" (5) Ø	645 (93)	-	489 (7830)	0.12 (500)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 5.1.64

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Heckmann Pos-I-Tie Veneer Anchoring System Supporting Brick Veneer and Owens Corning R-22.5 Batt Insulation in Stud Cavity – Clear Wall



Anchor Detail

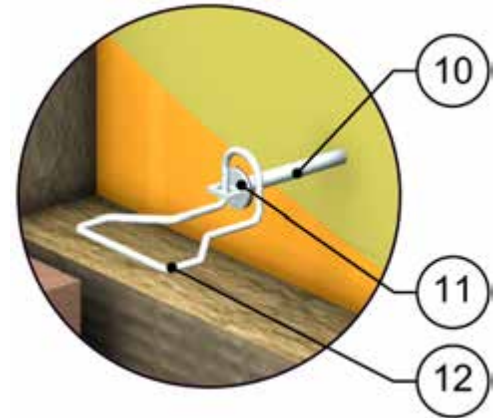
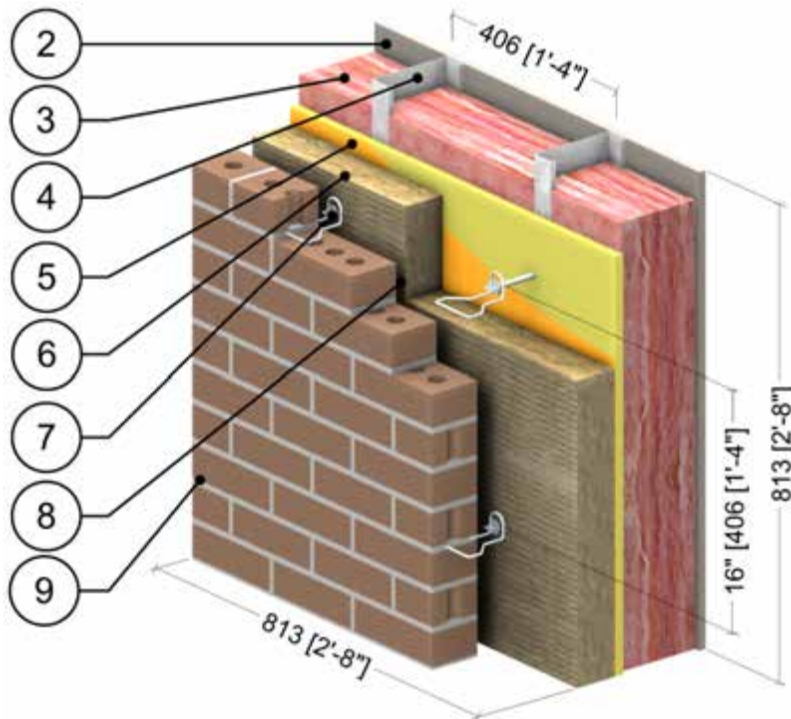
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Ecotouch Pink Fiberglass Batt	6" (152)	0.26 (0.038)	R-22.5 (4.0 RSI)	0.99 (15.9)	0.17 (710)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	Varies	0.24 (0.034)	R-6.3 to R-21.0 (1.11 to 3.70 RSI)	4.5 (72)	0.29 (1220)
7	Heckmann Pos-I-Tie Masonry Tie 16" (406) o.c.	Varies	-	-	-	-
8	Vented Air Cavity ²	1.5" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Zinc Barrel	-	726 (105)	-	412 (6600)	-
11	Rubber Washer (EPDM)	1/16" (1.59)	1.7 (0.25)	-	62 (997)	-
12	Galvanized Steel Wire Pintle	3/16" (5) Ø	645 (93)	-	489 (7830)	0.12 (500)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 5.1.65

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Heckmann Pos-I-Tie Veneer Anchoring System Supporting Brick Veneer and Owens Corning R-24 Batt Insulation in Stud Cavity – Clear Wall



Anchor Detail

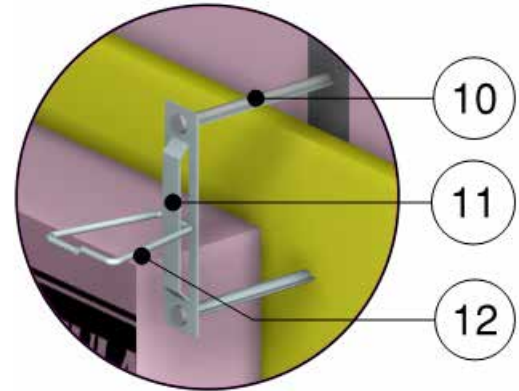
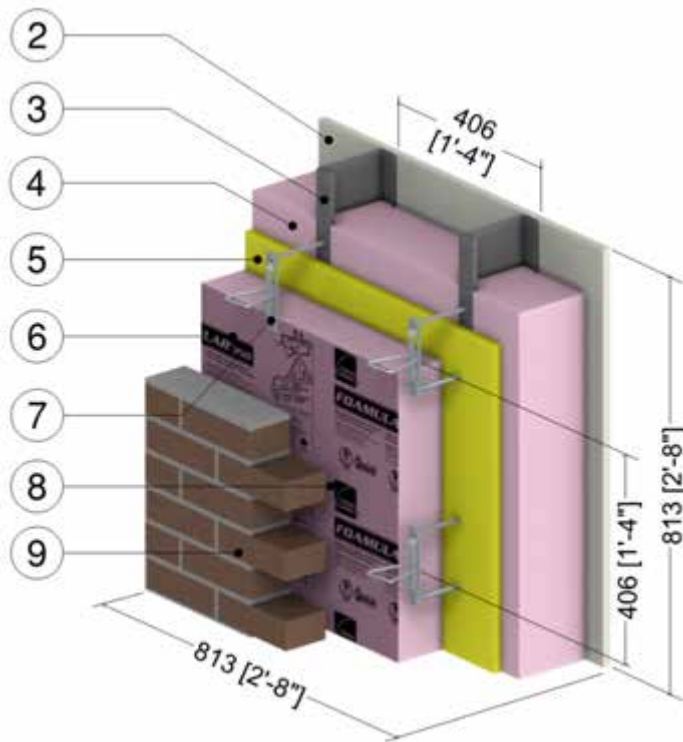
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Ecotouch Pink Fiberglass Batt	6" (152)	0.25 (0.036)	R-24 (4.2 RSI)	1.42 (22.7)	0.17 (710)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	Varies	0.24 (0.034)	R-6.3 to R-21.0 (1.11 to 3.70 RSI)	4.5 (72)	0.29 (1220)
7	Heckmann Pos-I-Tie Masonry Tie 16" (406) o.c.	Varies	-	-	-	-
8	Vented Air Cavity ²	1.5" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Zinc Barrel	-	726 (105)	-	412 (6600)	-
11	Rubber Washer (EPDM)	1/16" (1.59)	1.7 (0.25)	-	62 (997)	-
12	Galvanized Steel Wire Pintle	3/16" (5) Ø	645 (93)	-	489 (7830)	0.12 (500)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 5.1.66

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Steel Anchor Supporting Brick Veneer, Owens Corning XPS Exterior Insulation and R-20 Batt Insulation in Stud Cavity – Clear Wall

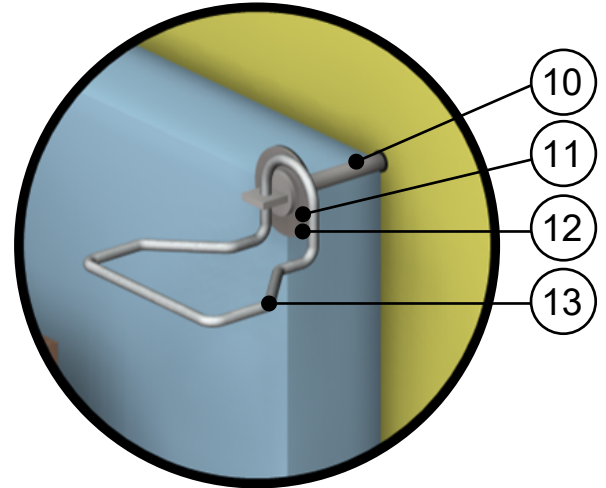
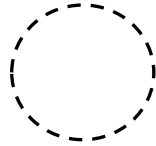


X-Seal Byna-Lok Anchor Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.30 (0.043)	R-20 (3.52 RSI)	0.55 (8.8)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	FOAMULAR 250 extruded polystyrene insulation (XPS, Type IV)	Varies	0.20 (0.029)	R-5 to R-25 (0.88 to 4.40 RSI)	1.55 (25)	0.29 (1220)
7	Hohmann and Barnard X-Seal Byna-Lok Anchor	1" to 4" (25 to 102)	347 (50)	-	-	-
8	Vented Air Cavity	1.5" (38)	-	R-0.4 (0.70 RSI)	0.075 (1.2)	0.24 (1000)
9	Brick Veneer	3-5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	X-Seal Steel Veneer Anchor	0.31" (8) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Byna-Lok Steel Tie	-	347 (50)	-	489 (7830)	0.12 (500)
12	Steel Wire	-	347 (50)	-	489 (7830)	0.12 (500)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.67 Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Zinc 2-Seal Anchor Supporting Brick Veneer – Clear Wall



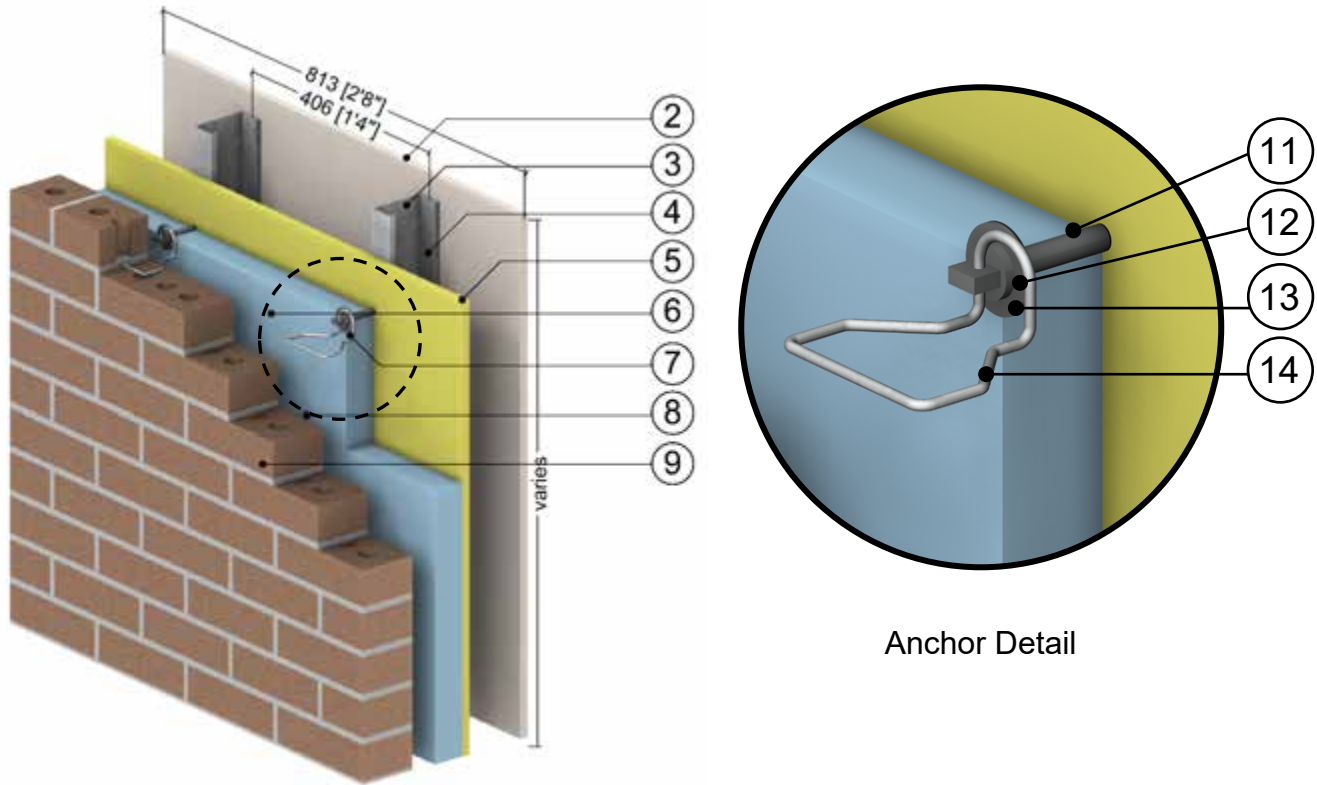
Anchor Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	1" to 4" (25 to 102)	0.24 (0.034)	R-4.2 to R-16.8 (0.74 to 2.96 RSI)	4 (64)	0.20 (850)
7	Brick Tie	1" to 4" (25 to 102)	Varies	-	-	-
8	Vented Air Cavity	1.5" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Zinc Barrel	-	784 (113)	-	-	-
11	Steel Washer	1.5" (38) Ø	347 (50)	-	489 (7830)	0.12 (500)
12	Rubber Washer (EPDM)	-	1.7 (0.25)	-	-	-
13	Galvanized Steel Wire Pintle	3/16" (5) Ø	430 (62)	-	489 (7830)	0.12 (500)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.68

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Stainless Steel 2-Seal Thermal Anchor Supporting Brick Veneer – Clear Wall

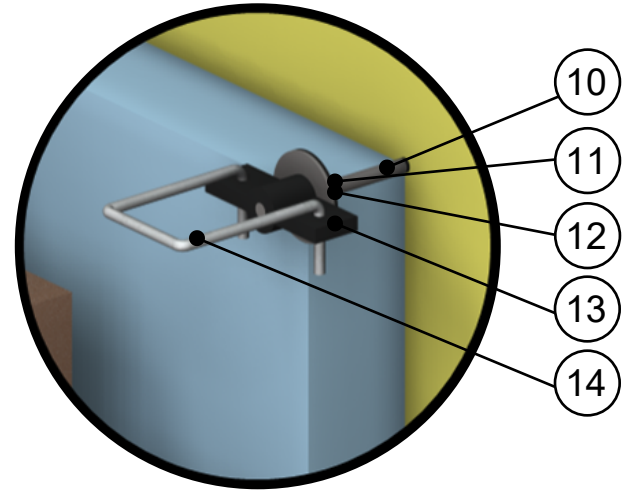
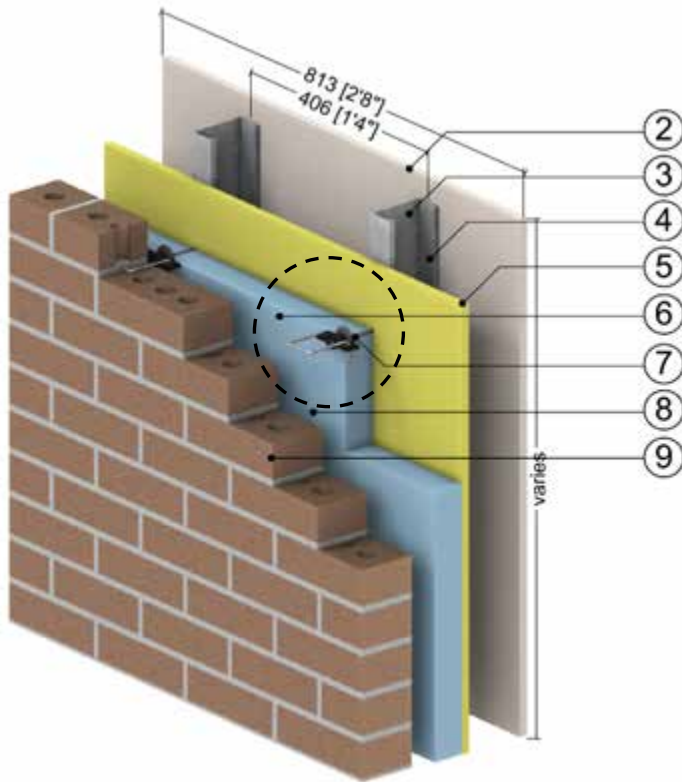


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	1" to 4" (25 to 102)	0.24 (0.034)	R-4.2 to R-16.8 (0.74 to 2.96 RSI)	4 (64)	0.20 (850)
7	Brick Tie	1" to 4" (25 to 102)	Varies	-	-	-
8	Vented Air Cavity	1.5" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Stainless Steel Barrel	-	118 (17)	-	489 (7830)	0.12 (500)
11	Nylon Coating	Varies	1.7 (0.25)	-	-	-
12	Steel Washer	1.5" (38) Ø	347 (50)	-	489 (7830)	0.12 (500)
13	Rubber Washer (EPDM)	-	1.7 (0.25)	-	-	-
14	Galvanized Steel Wire Pintle	3/16" (5) Ø	430 (62)	-	489 (7830)	0.12 (500)
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.69

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Stainless Steel 2-Seal Thermal Wing Nut Anchor Supporting Brick Veneer – Clear Wall

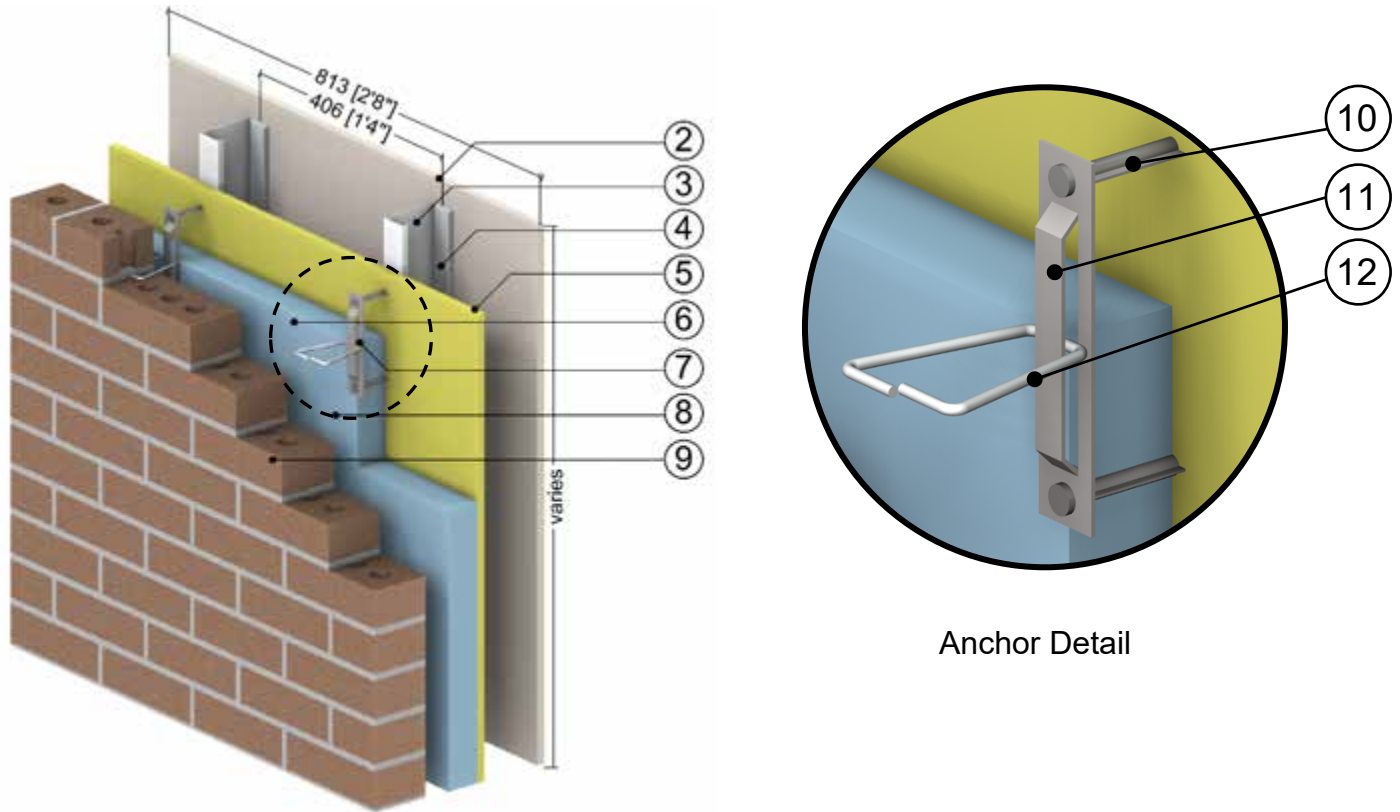


Anchor Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation (Mineral Wool)	1" to 4" (25 to 102)	0.24 (0.034)	R-4.2 to R-16.8 (0.74 to 2.96 RSI)	4 (64)	0.20 (850)
7	Brick Tie	1" to 4" (25 to 102)	Varies	-	-	-
8	Vented Air Cavity	1.5" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Stainless Steel Barrel	-	118 (17)	-	489 (7830)	0.12 (500)
11	Steel Washer	1.5" (38) Ø	347 (50)	-	489 (7830)	0.12 (500)
12	Rubber Washer (EPDM)	-	1.7 (0.25)	-	-	-
13	Steel Wing Nut with Plastic Coating	Varies	347 (50)	-	489 (7830)	0.12 (500)
14	Galvanized Steel Wire Pintle	3/16" (5) Ø	430 (62)	-	489 (7830)	0.12 (500)
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.70 Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Carbon Steel X-Seal Anchor Supporting Brick Veneer – Clear Wall

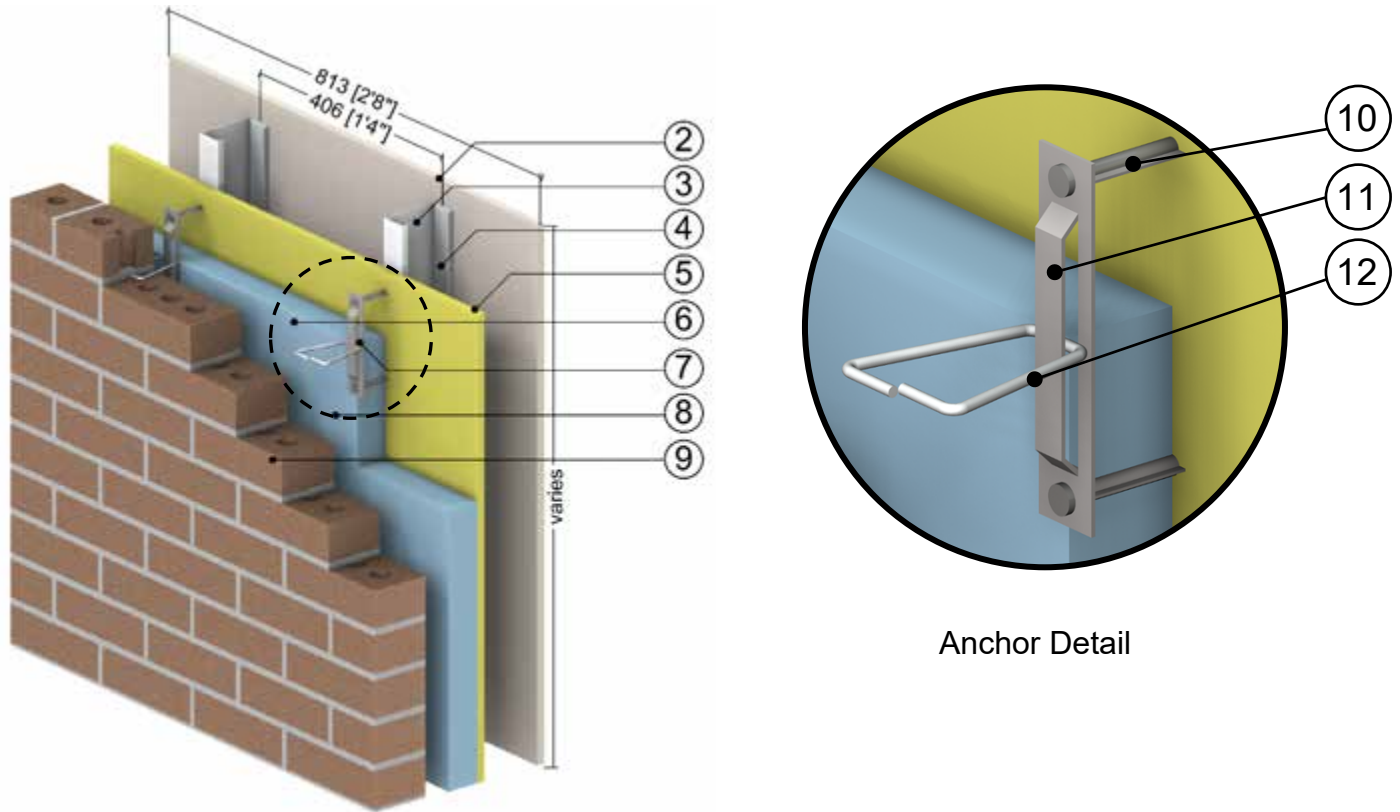


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	1" to 4" (25 to 102)	0.24 (0.034)	R-4.2 to R-16.8 (0.74 to 2.96 RSI)	4 (64)	0.20 (850)
7	Brick Tie	1" to 4" (25 to 102)	Varies	-	-	-
8	Vented Air Cavity	1.5" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Steel Fasteners	0.31" (8) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Steel Veneer Anchor	-	347 (50)	-	489 (7830)	0.12 (500)
12	Steel Triangle Tie	-	347 (50)	-	489 (7830)	0.12 (500)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.71

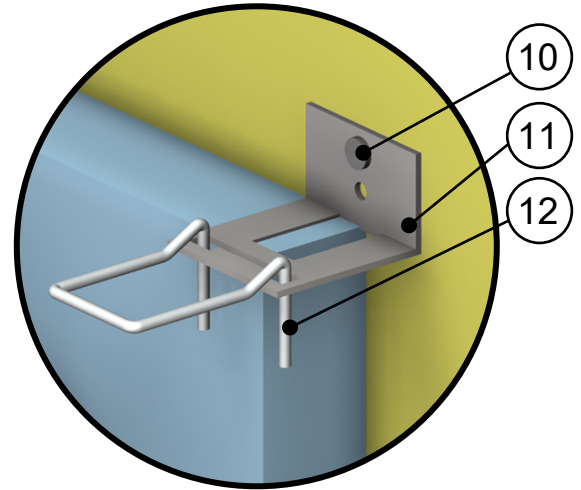
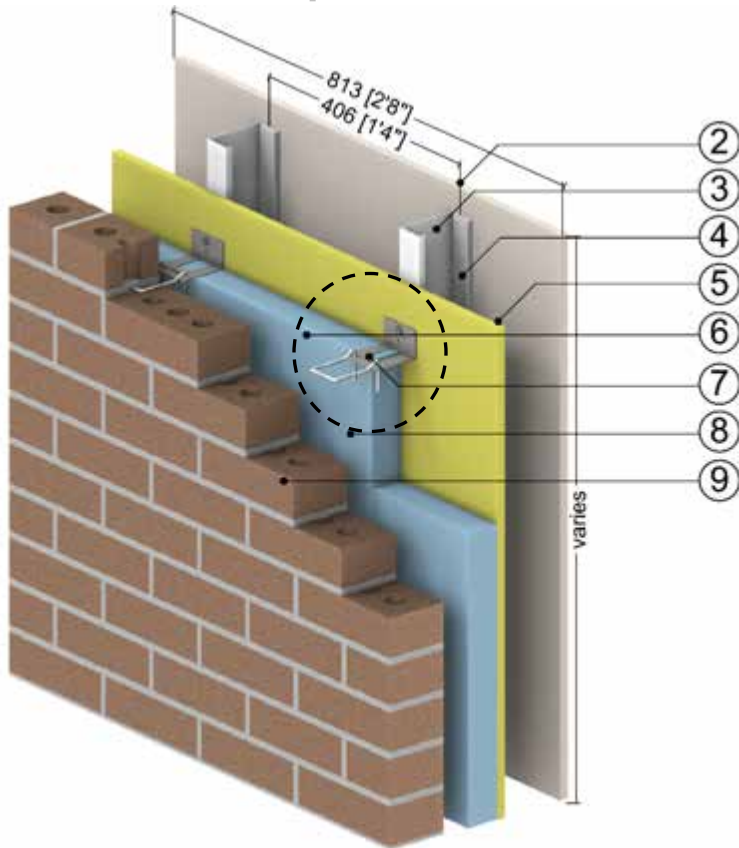
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Stainless Steel X-Seal Anchor Supporting Brick Veneer – Clear Wall



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	1" to 4" (25 to 102)	0.24 (0.034)	R-4.2 to R-16.8 (0.74 to 2.96 RSI)	4 (64)	0.20 (850)
7	Brick Tie	1" to 4" (25 to 102)	Varies	-	-	-
8	Vented Air Cavity	1.5" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Stainless Steel Fasteners	0.31" (8) Ø	118 (17)	-	489 (7830)	0.12 (500)
11	Stainless Steel Tie	-	118 (17)	-	489 (7830)	0.12 (500)
12	Stainless Steel Triangle Tie	-	118 (17)	-	489 (7830)	0.12 (500)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.72 Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Carbon Steel HB-213 2X Anchor Supporting Brick Veneer – Clear Wall



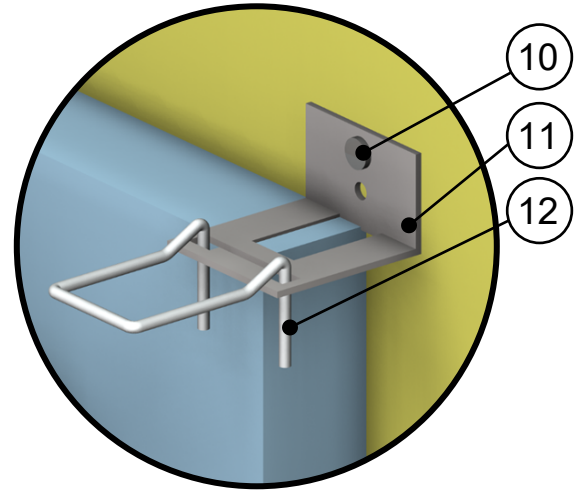
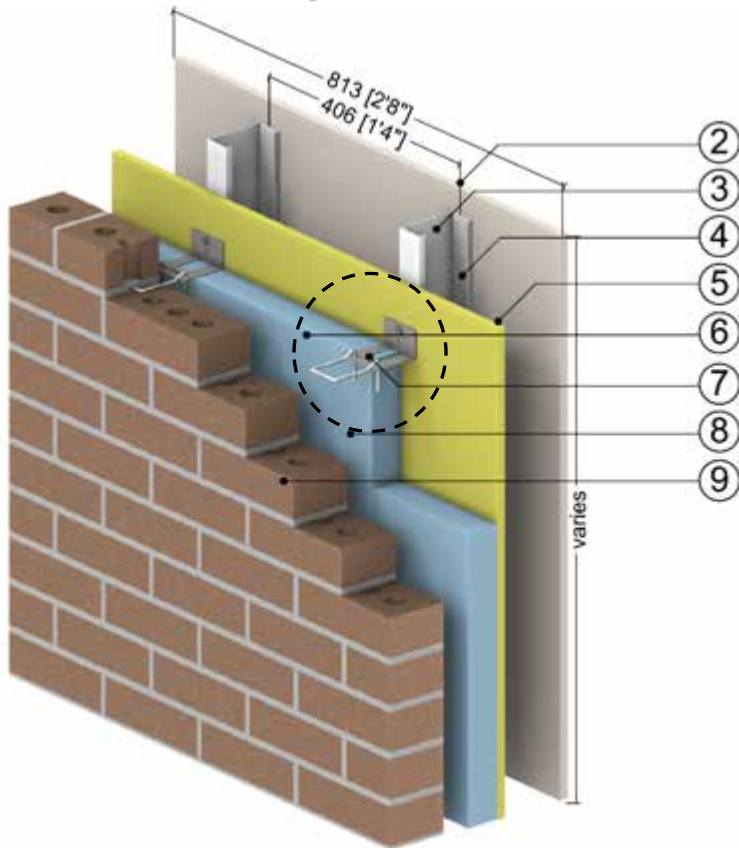
Anchor Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	1" to 4" (25 to 102)	0.24 (0.034)	R-4.2 to R-16.8 (0.74 to 2.96 RSI)	4 (64)	0.20 (850)
7	Brick Tie	1" to 4" (25 to 102)	Varies	-	-	-
8	Vented Air Cavity	1.5" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Steel Fasteners	0.28" (7) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Steel Veneer Anchor	-	347 (50)	-	489 (7830)	0.12 (500)
12	Steel Wire Pintle	-	347 (50)	-	489 (7830)	0.12 (500)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.73

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Stainless Steel HB-213 2X Anchor Supporting Brick Veneer – Clear Wall



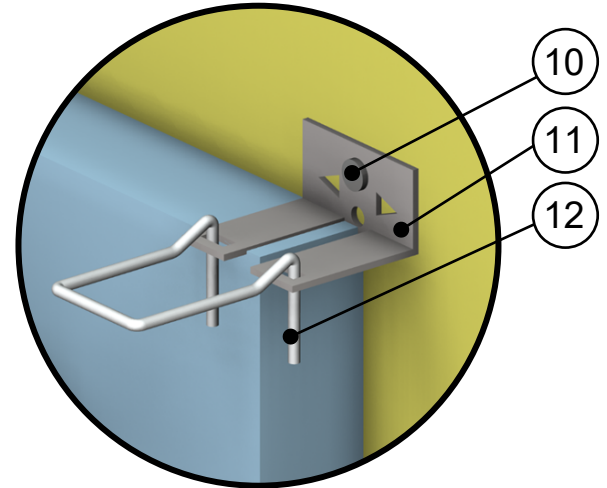
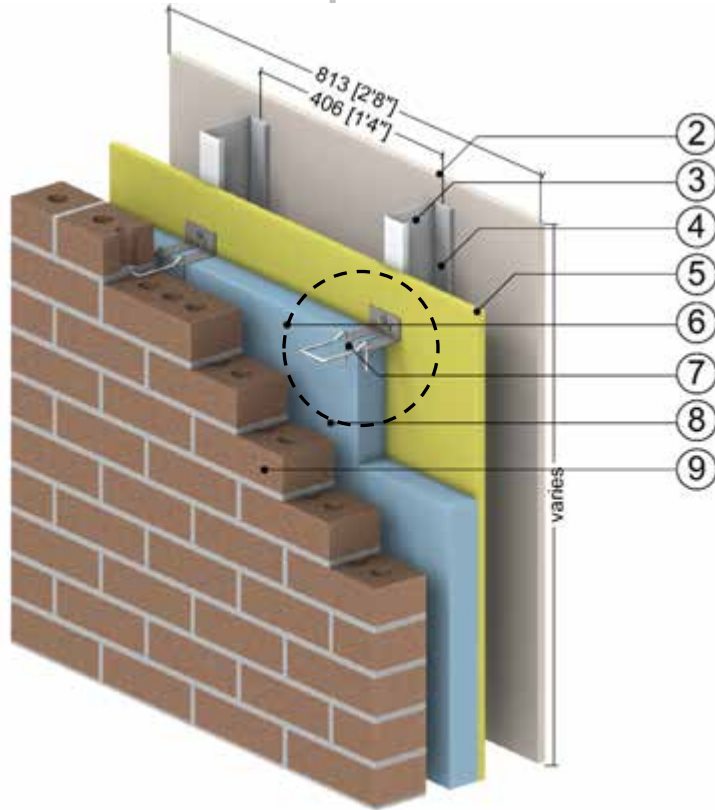
Anchor Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	1" to 4" (25 to 102)	0.24 (0.034)	R-4.2 to R-16.8 (0.74 to 2.96 RSI)	4 (64)	0.20 (850)
7	Brick Tie	1" to 4" (25 to 102)	Varies	-	-	-
8	Vented Air Cavity	1.5" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Stainless Steel Fasteners	0.28" (7) Ø	118 (17)	-	489 (7830)	0.12 (500)
11	Stainless Steel Veneer Anchor	-	118 (17)	-	489 (7830)	0.12 (500)
12	Stainless Steel Wire Pintle	-	118 (17)	-	489 (7830)	0.12 (500)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.74

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Carbon Steel HB-200-X Anchor Supporting Brick Veneer – Clear Wall



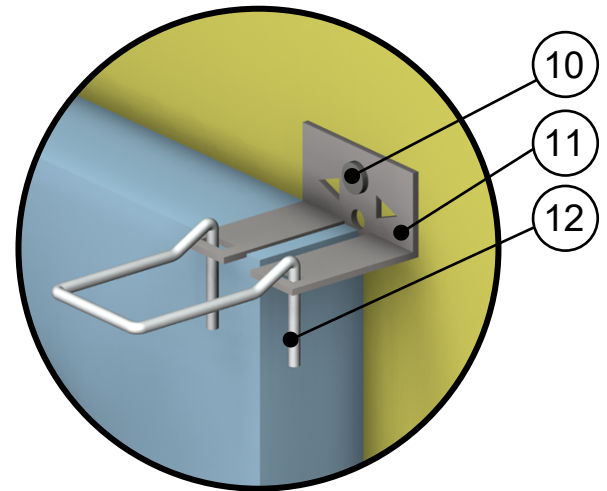
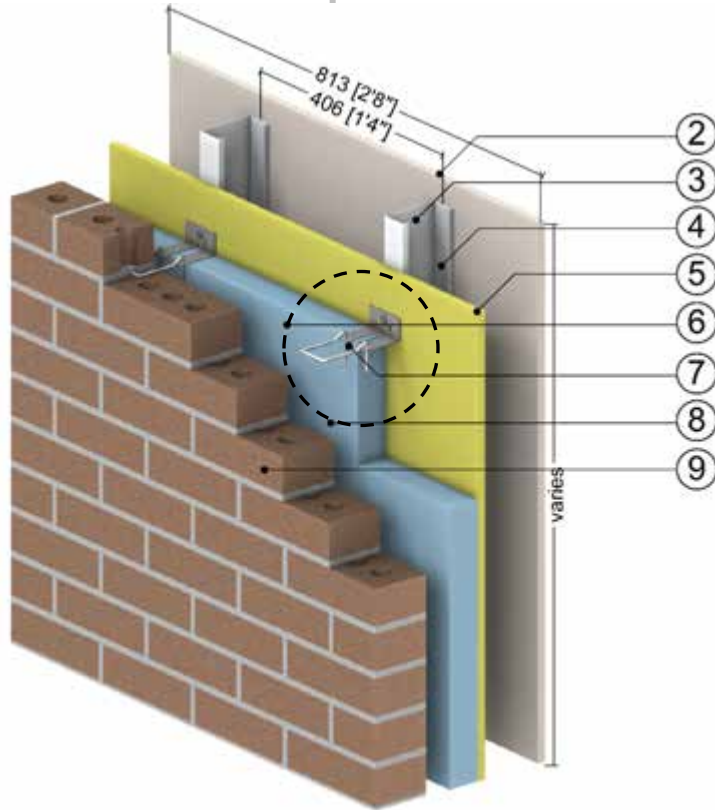
Anchor Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	1" to 4" (25 to 102)	0.24 (0.034)	R-4.2 to R-16.8 (0.74 to 2.96 RSI)	4 (64)	0.20 (850)
7	Brick Tie	1" to 4" (25 to 102)	Varies	-	-	-
8	Vented Air Cavity	1.5" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Steel Fasteners	0.31" (8) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Steel Veneer Anchor	-	347 (50)	-	489 (7830)	0.12 (500)
12	Steel Wire Pintel	-	347 (50)	-	489 (7830)	0.12 (500)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.75

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Stainless Steel HB-200-X Anchor Supporting Brick Veneer – Clear Wall



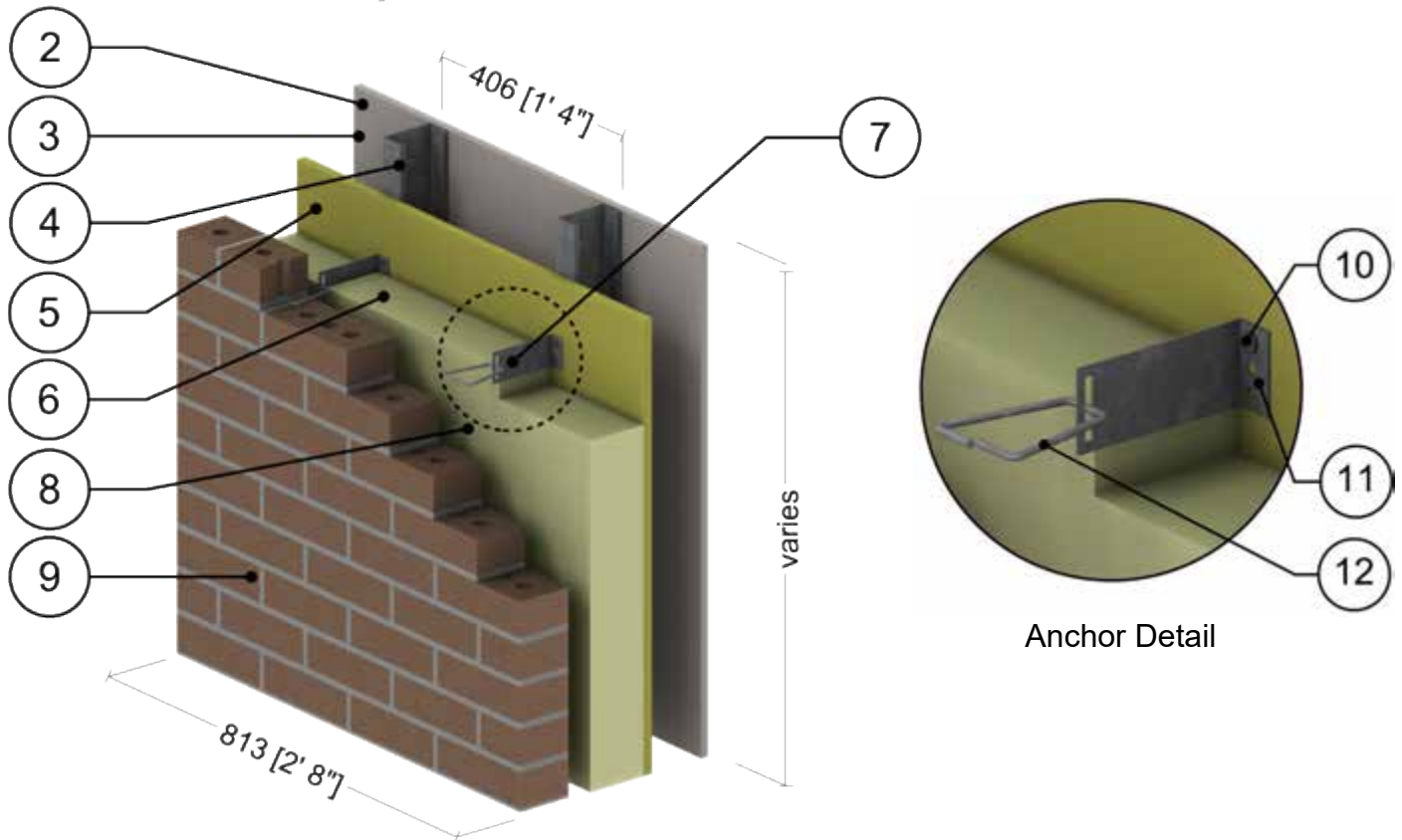
Anchor Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	1" to 4" (25 to 102)	0.24 (0.034)	R-4.2 to R-16.8 (0.74 to 2.96 RSI)	4 (64)	0.20 (850)
7	Brick Tie	1" to 4" (25 to 102)	Varies	-	-	-
8	Vented Air Cavity	1.5" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Stainless Steel Fasteners	0.31" (8) Ø	118 (17)	-	489 (7830)	0.12 (500)
11	Stainless Steel Veneer Anchor	-	118 (17)	-	489 (7830)	0.12 (500)
12	Stainless Steel Wire Pintle	-	118 (17)	-	489 (7830)	0.12 (500)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.76

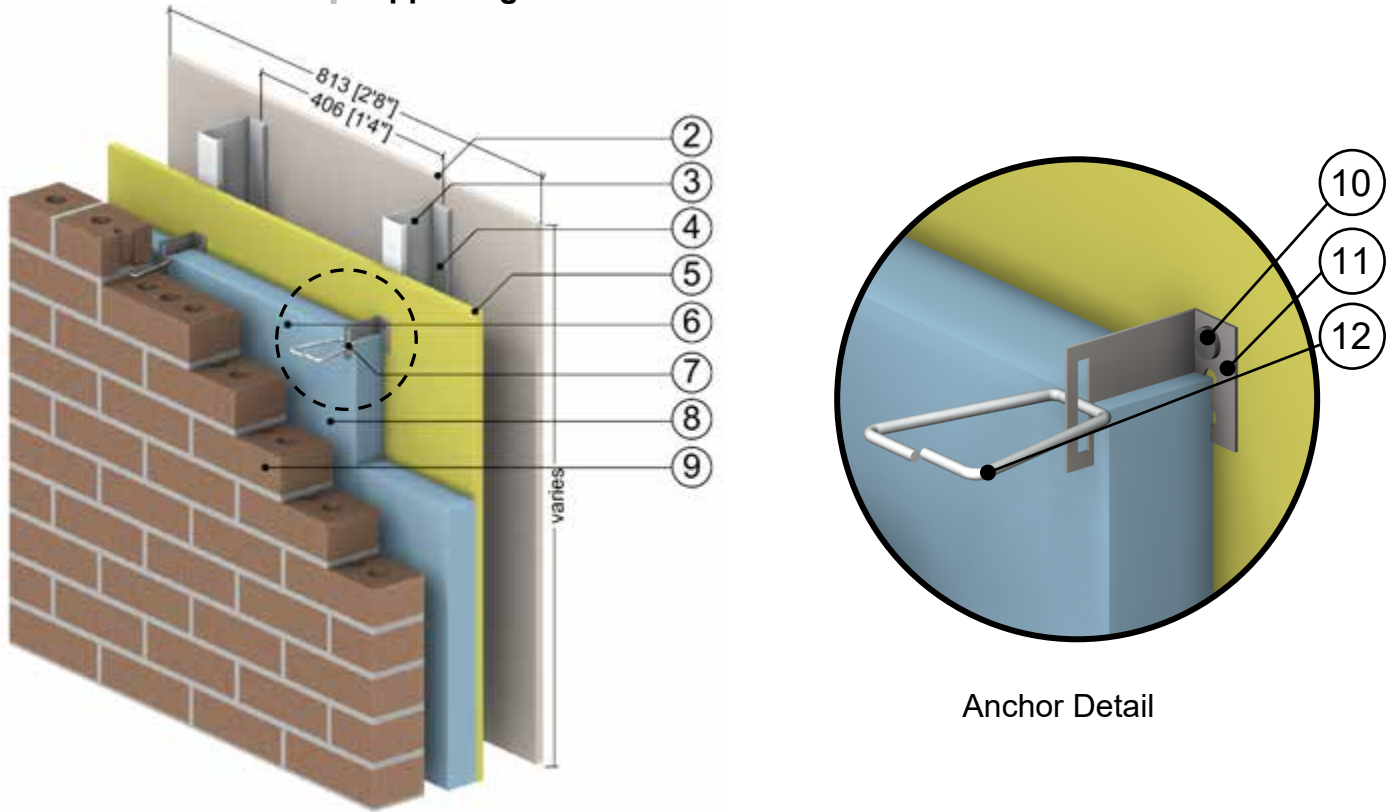
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Carbon Steel BL-407 Anchor Supporting Brick Veneer – Clear Wall



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-4.2 to R-29.4 (0.74 to 5.18 RSI)	4 (64)	0.20 (850)
7	Brick Tie	1" to 7" (25 to 178)	Varies	-	-	-
8	Vented Air Cavity	1.5" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Steel Fasteners	0.28" (7) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Steel Veneer Anchor	-	347 (50)	-	489 (7830)	0.12 (500)
12	Steel Wire Pintle	-	347 (50)	-	489 (7830)	0.12 (500)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.77 Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Hohmann & Barnard Masonry Stainless Steel BL-407 Anchor Supporting Brick Veneer – Clear Wall

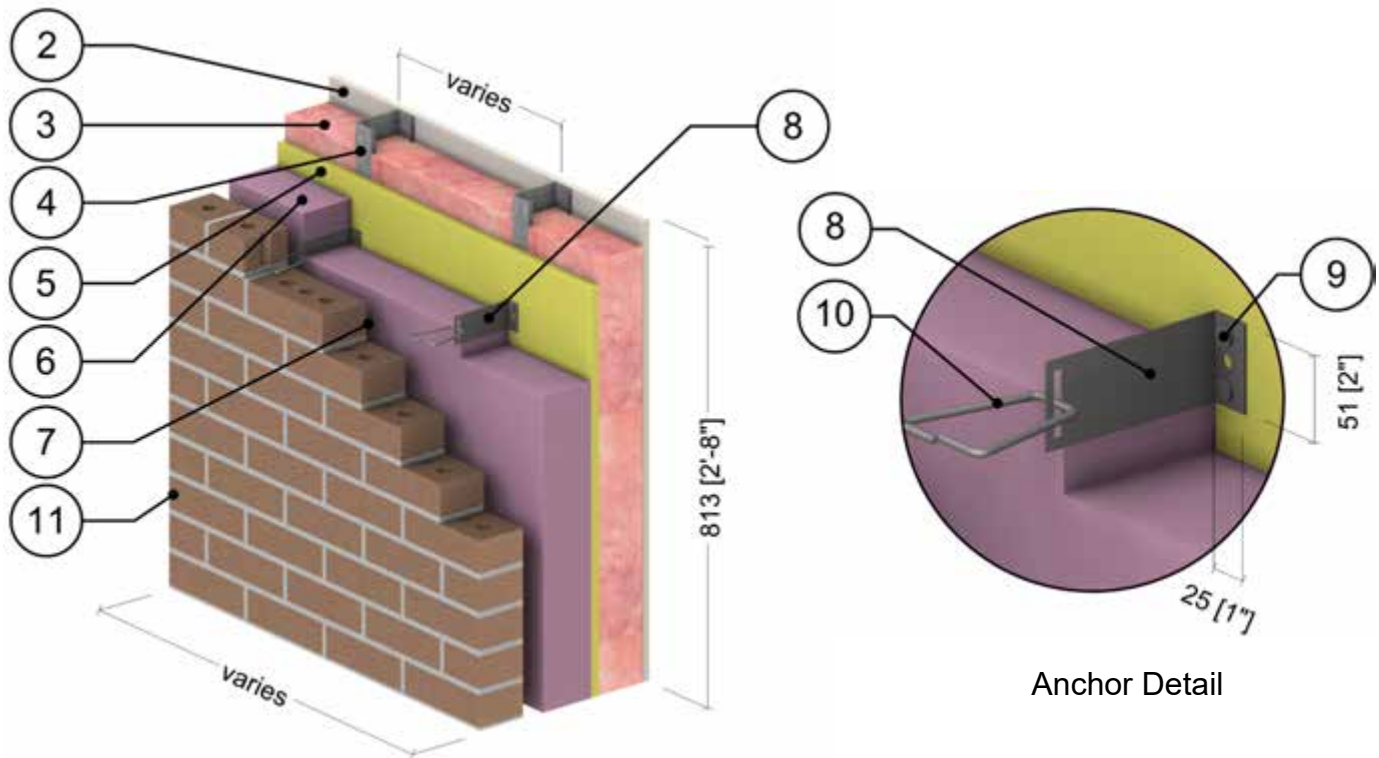


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	1" to 4" (25 to 102)	0.24 (0.034)	R-4.2 to R-16.8 (0.74 to 2.96 RSI)	4 (64)	0.20 (850)
7	Brick Tie	1" to 4" (25 to 102)	Varies	-	-	-
8	Vented Air Cavity	1.5" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Stainless Steel Fasteners	0.28" (7) Ø	118 (17)	-	489 (7830)	0.12 (500)
11	Stainless Steel Veneer Anchor	-	118 (17)	-	489 (7830)	0.12 (500)
12	Stainless Steel Wire Pintle	-	118 (17)	-	489 (7830)	0.12 (500)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.78

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c. and 24" o.c.) Wall Assembly with Stainless Steel Brick Anchors Supporting Brick Veneer and R-20 Batt Insulation in Stud Cavity – Clear Wall

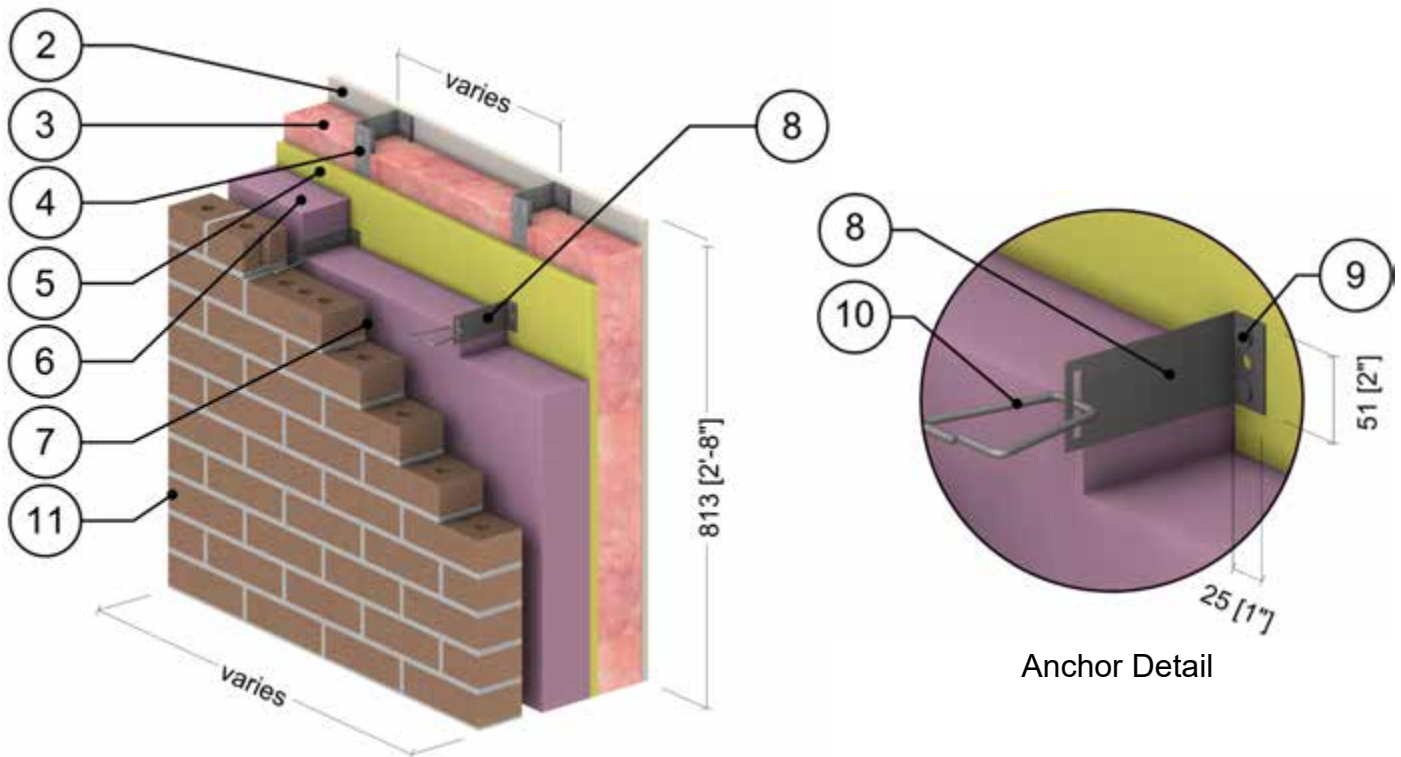


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	6" (152)	0.30 (0.043)	R-20 (3.5 RSI)	0.55 (8.8)	0.17 (710)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	1" to 7" (25 to 178)	0.20 (0.029)	R-5 to R-35 (0.88 to 6.16 RSI)	1.8 (28)	0.29 (1220)
7	Vented Air Cavity	1 1/2" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
8	Stainless Steel Veneer Anchor	Varies	118 (17)	-	500 (8000)	0.12 (500)
9	Stainless Steel Fasteners	0.28" (7) Ø	118 (17)	-	500 (8000)	0.12 (500)
10	Stainless Steel Wire Pintle	-	118 (17)	-	500 (8000)	0.12 (500)
11	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.79

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c. and 24" o.c.) Wall Assembly with Steel Brick Anchors Supporting Brick Veneer and R-20 Batt Insulation in Stud Cavity – Clear Wall

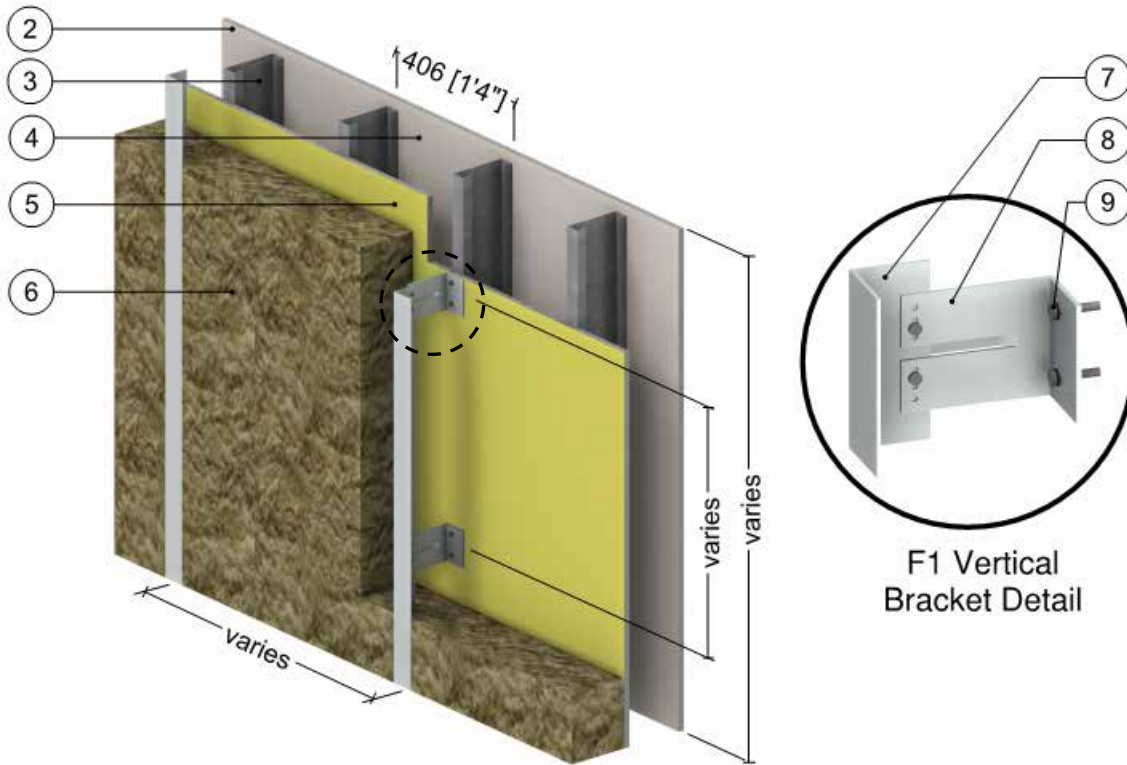


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	6" (152)	0.30 (0.043)	R-20 (3.5 RSI)	0.55 (8.8)	0.17 (710)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Rigid Insulation	Varies	0.20 (0.029)	R-20 to R-35 (3.52 to 6.16 RSI)	Varies	0.29 (1220)
7	Vented Air Cavity	1 1/2" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
8	Galvanized Steel Veneer Anchor	Varies	430 (62)	-	489 (7830)	0.12 (500)
9	Galvanized Steel Fasteners	0.28" (7) Ø	430 (62)	-	489 (7830)	0.12 (500)
10	Galvanized Steel Wire Pintle	-	430 (62)	-	489 (7830)	0.12 (500)
11	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.80

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with ECO Cladding Alpha Vci Vertical System – Clear Wall

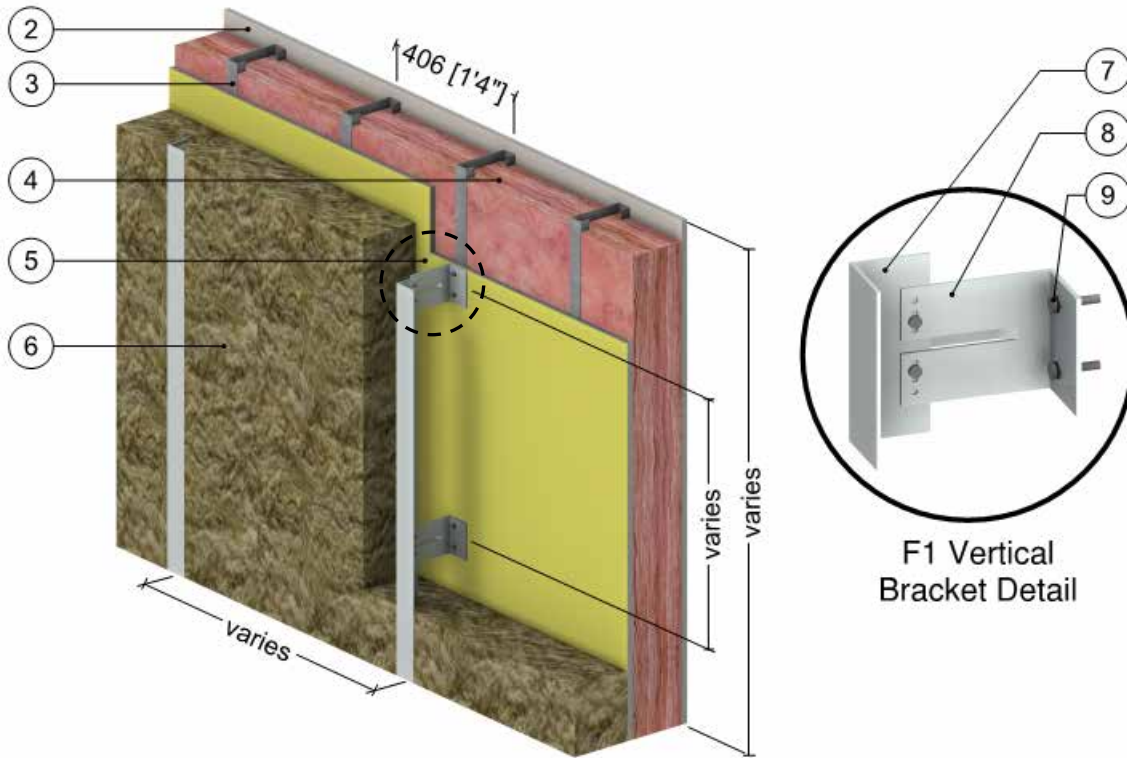


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	5/8" (15)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	2" to 6" (51 to 152)	0.24 (0.034)	R-8.4 to R-25.2 (1.48 RSI to 4.44 RSI)	4 (64)	0.20 (850)
7	L Angle Aluminum 6063	-	1450 (209)	-	168 (2700)	0.22 (900)
8	ECO Cladding Alpha V Bracket Aluminum 6063	-	1450 (209)	-	168 (2700)	0.22 (900)
9	#14 Stainless Steel Fasteners	1/4" (6) ∅	118 (17)	-	500 (8000)	0.13 (530)
10	Generic Cladding with 1" (25mm) vented air space is incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.81

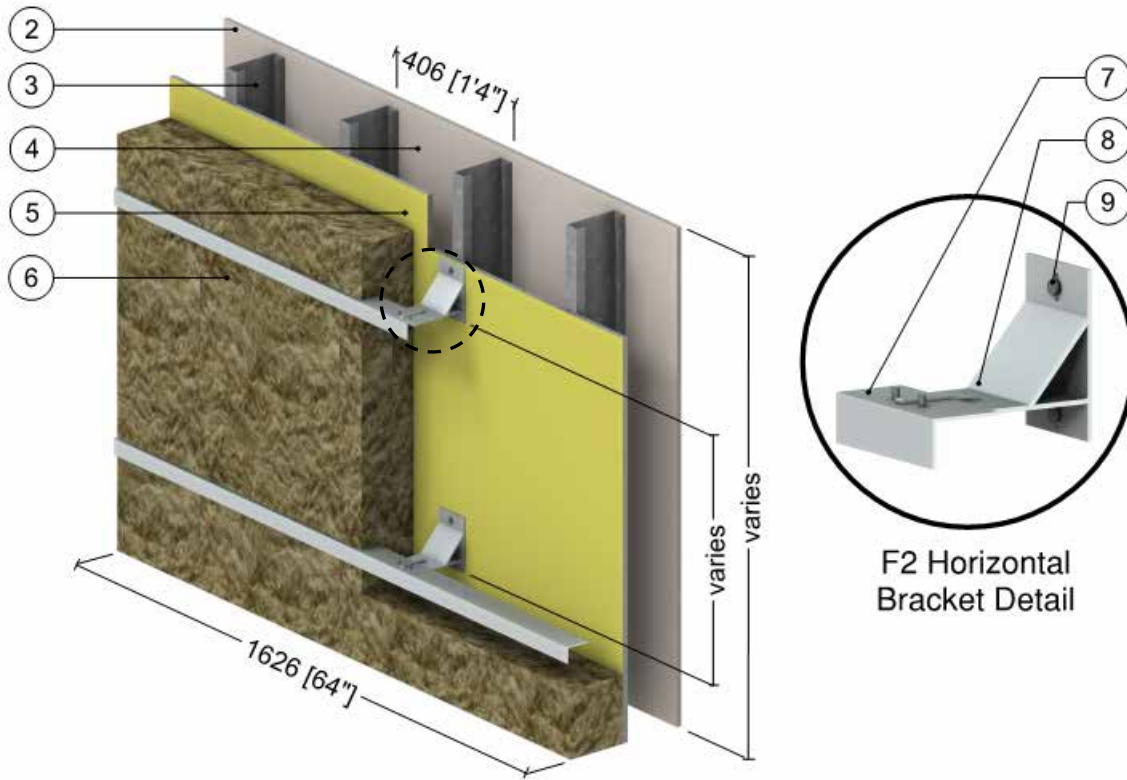
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with ECO Cladding Alpha Vci Vertical System and R-19 Batt Insulation in Stud Cavity – Clear Wall



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	6" (152)	-	R-19 (3.35 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	5/8" (15)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	2" to 6" (51 to 152)	0.24 (0.034)	R-8.4 to R-25.2 (1.48 RSI to 4.44 RSI)	4 (64)	0.20 (850)
7	L Angle Aluminum 6063	-	1450 (209)	-	168 (2700)	0.22 (900)
8	ECO Cladding Alpha V Bracket Aluminum 6063	-	1450 (209)	-	168 (2700)	0.22 (900)
9	#14 Stainless Steel Fasteners	1/4" (6) ∅	118 (17)	-	500 (8000)	0.13 (530)
10	Generic Cladding with 1" (25mm) vented air space is incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.82 Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with ECO Cladding Alpha Hci Horizontal System – Clear Wall

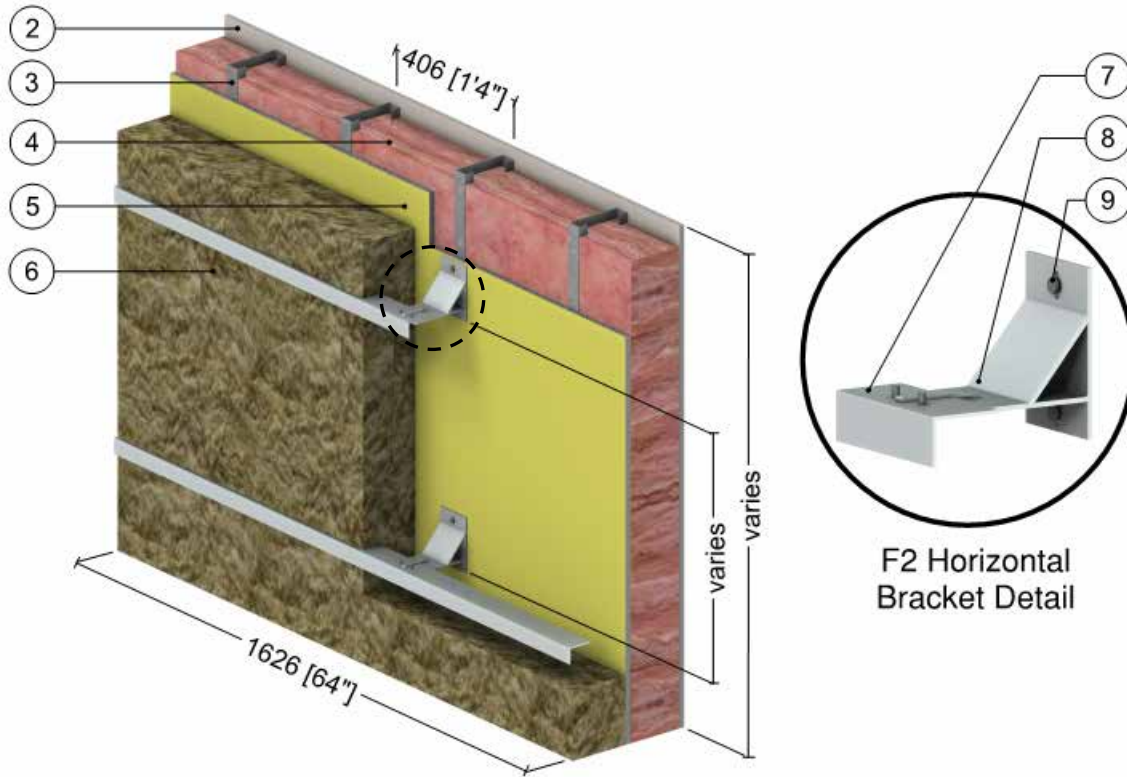


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	5/8" (15)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	2" to 6" (51 to 152)	0.24 (0.034)	R-8.4 to R-25.2 (1.48 RSI to 4.44 RSI)	4 (64)	0.20 (850)
7	L Angle Aluminum 6063	-	1450 (209)	-	168 (2700)	0.22 (900)
8	ECO Cladding Alpha H Bracket Aluminum 6063	-	1450 (209)	-	168 (2700)	0.22 (900)
9	#14 Stainless Steel Fasteners	1/4" (6) ∅	118 (17)	-	500 (8000)	0.13 (530)
10	Generic Cladding with 1" (25mm) vented air space is incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.83

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with ECO Cladding Alpha Hci Horizontal System and R-19 Batt Insulation in Stud Cavity – Clear Wall

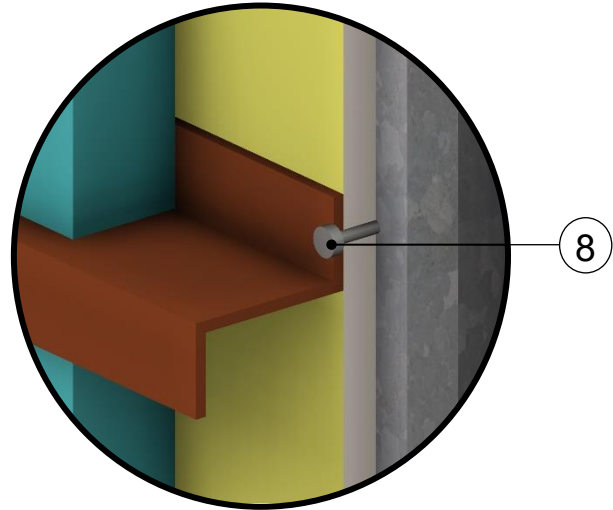
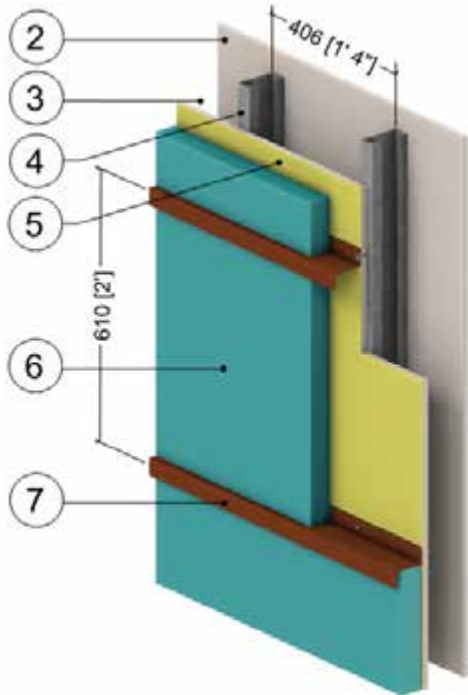


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	6" (152)	-	R-19 (3.35 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	5/8" (15)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	2" to 6" (51 to 152)	0.24 (0.034)	R-8.4 to R-25.2 (1.48 RSI to 4.44 RSI)	4 (64)	0.20 (850)
7	L Angle Aluminum 6063	-	1450 (209)	-	168 (2700)	0.22 (900)
8	ECO Cladding Alpha H Bracket Aluminum 6063	-	1450 (209)	-	168 (2700)	0.22 (900)
9	#14 Stainless Steel Fasteners	1/4" (6) ∅	118 (17)	-	500 (8000)	0.13 (530)
10	Generic Cladding with 1" (25mm) vented air space is incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.84

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" O.C.) Wall Assembly with Armadillo FRR Horizontal Z-Girts Supporting Cladding – Clear Wall



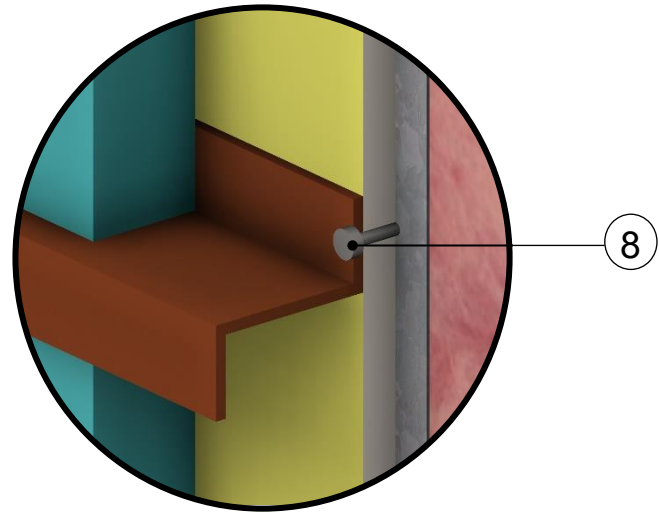
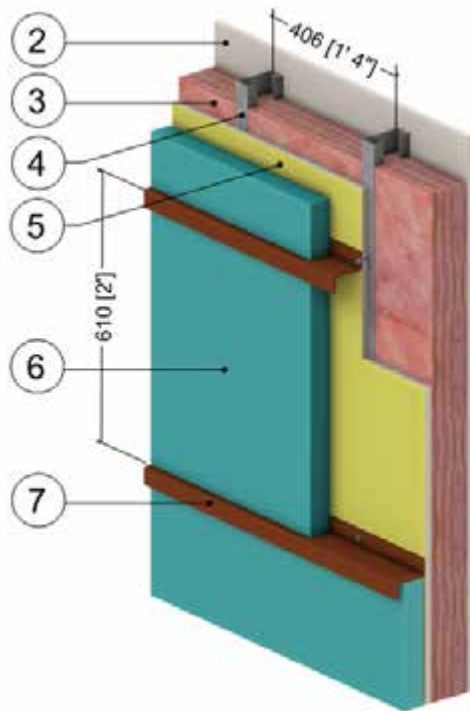
FRR Girt Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-5.0 to R-35.0 (0.88 RSI to 6.16 RSI)	4 (64)	0.20 (850)
7	Armadillo FRR Girt	-	1.4 (0.2)	-	85 (5.3)	-
8	#12 Steel Fasteners (16" o.c.)	7/32" (5.5) ∅	347 (50)	-	489 (7830)	0.12 (500)
9	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.85

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" O.C.) Wall Assembly with Armadillo FRR Horizontal Z-Girts Supporting Cladding and R-13 Batt Insulation in Stud Cavity – Clear Wall



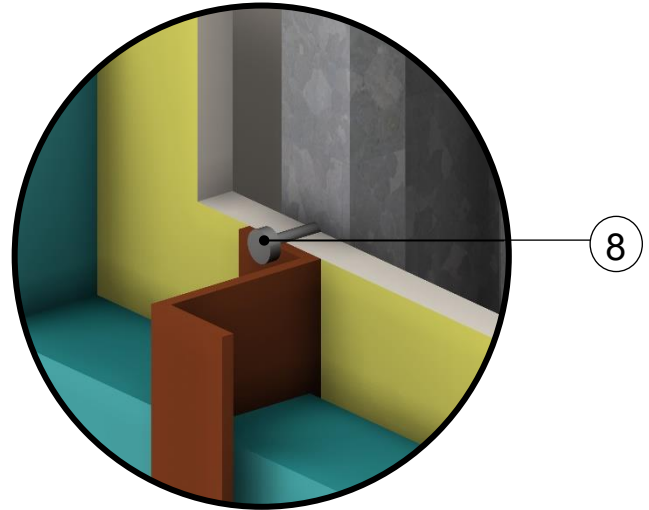
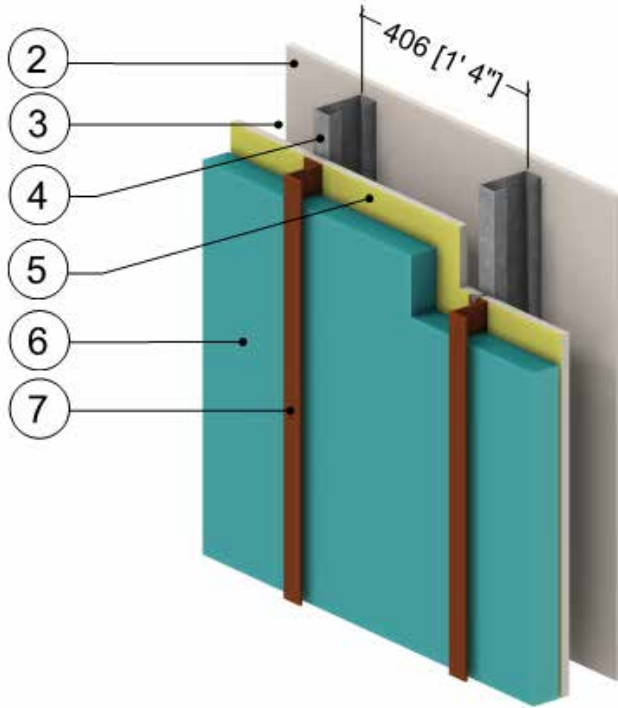
FRR Girt Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (92)	-	R-13.0 (2.29 RSI)	4 (64)	0.20 (850)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-5.0 to R-35.0 (0.88 RSI to 6.16 RSI)	4 (64)	0.20 (850)
7	Armadillo FRR Girt	-	1.4 (0.2)	-	85 (5.3)	-
8	#12 Steel Fasteners (16" o.c.)	7/32" (5.5) ∅	347 (50)	-	489 (7830)	0.12 (500)
9	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.86

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" O.C.) Wall Assembly with Armadillo FRR Vertical Z-Girts Supporting Cladding – Clear Wall



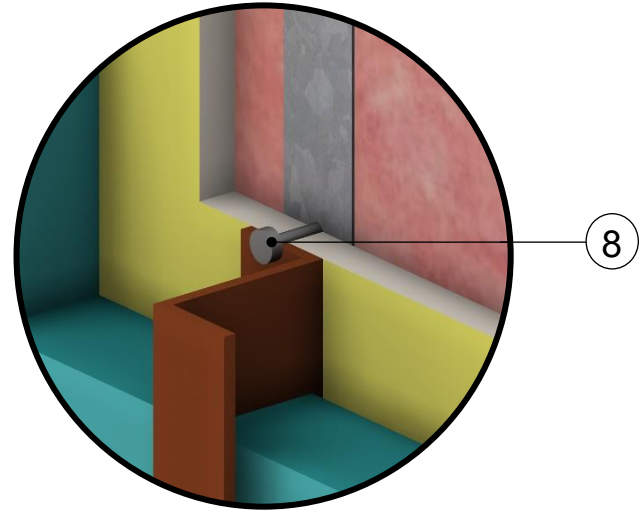
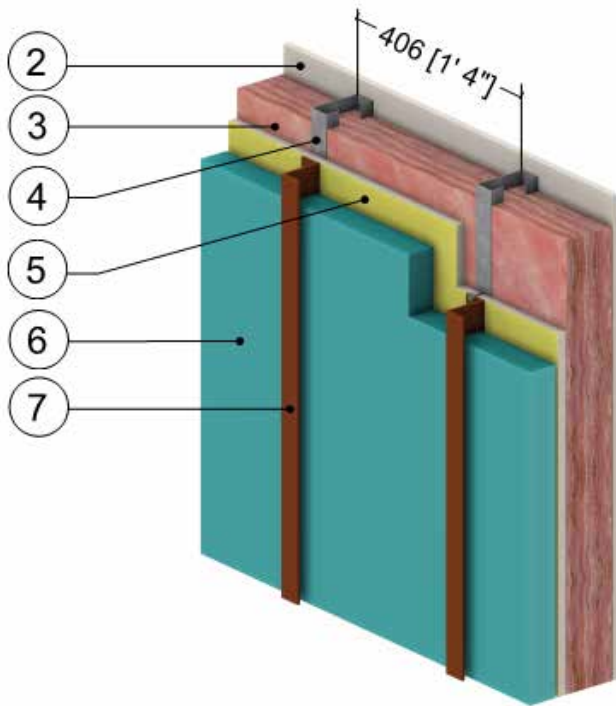
FRR Girt Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-5.0 to R-35.0 (0.88 RSI to 6.16 RSI)	4 (64)	0.20 (850)
7	Armadillo FRR Girt	-	1.4 (0.2)	-	85 (5.3)	-
8	#12 Steel Fasteners (16" o.c.)	7/32" (5.5) ∅	347 (50)	-	489 (7830)	0.12 (500)
9	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.87

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" O.C.) Wall Assembly with Armadillo FRR Vertical Z-Girts Supporting Cladding and R-13 Batt Insulation in Stud Cavity – Clear Wall



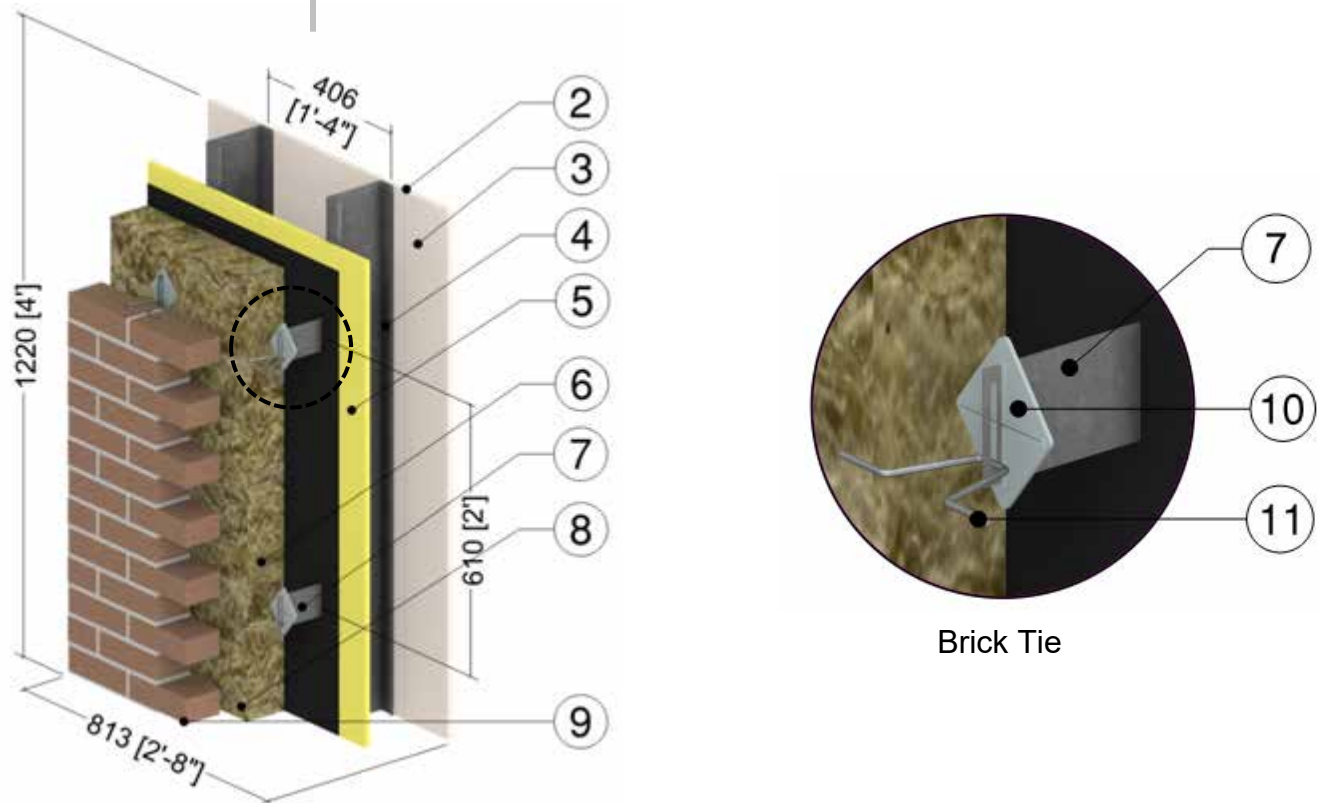
FRR Girt Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (92)	-	R-13.0 (2.29 RSI)	4 (64)	0.20 (850)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-5.0 to R-35.0 (0.88 RSI to 6.16 RSI)	4 (64)	0.20 (850)
7	Armadillo FRR Girt	-	1.4 (0.2)	-	85 (5.3)	-
8	#12 Steel Fasteners (16" o.c.)	7/32" (5.5) ∅	347 (50)	-	489 (7830)	0.12 (500)
9	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.88

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Brick Ties (24" o.c.) Supporting Brick Veneer – Clear Wall

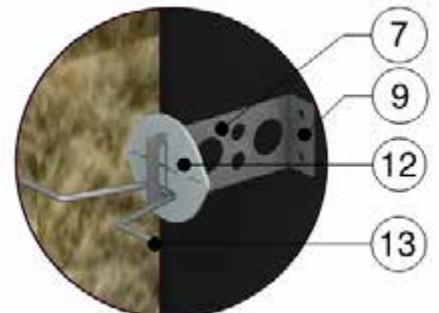
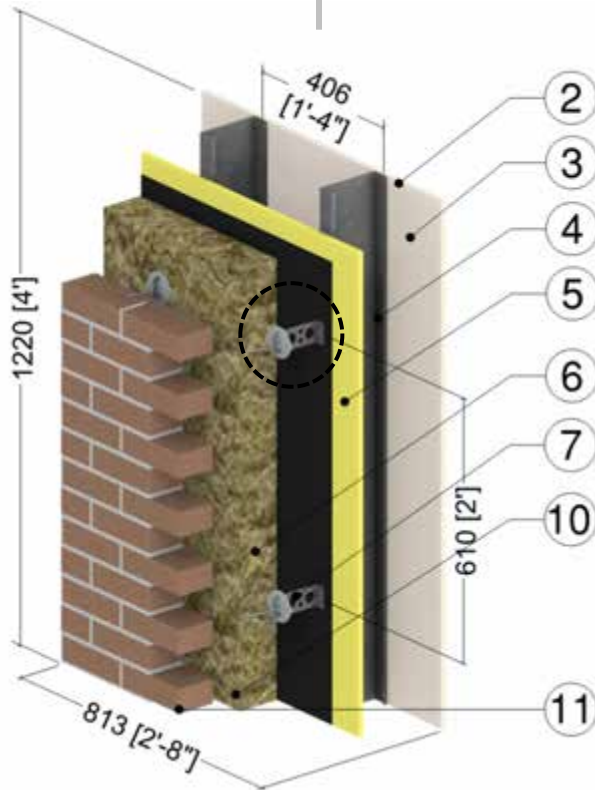


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	4" (102)	varies	R-16.8 (2.96 RSI) to R-24.0 (4.23 RSI)	varies	varies
7	Brick Ties	4" (102)	430 (62)	-	445 (7130)	0.09 (390)
8	Vented Air Cavity	1" (25)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Insulation Support	1/8" (3)	2.9 (0.42)	-	-	-
11	Brick Tie Wire	-	430 (62)	-	445 (7130)	0.09 (390)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

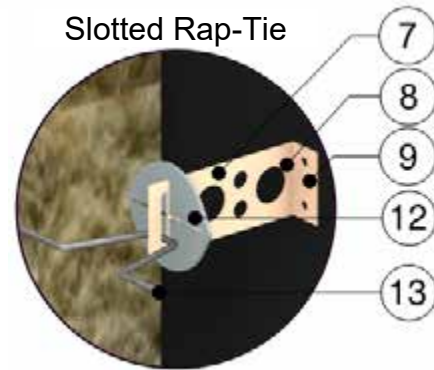
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.89

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with FERO Slotted Rap Ties (24" o.c.) Supporting Brick Veneer – Clear Wall



Slotted Rap-Tie



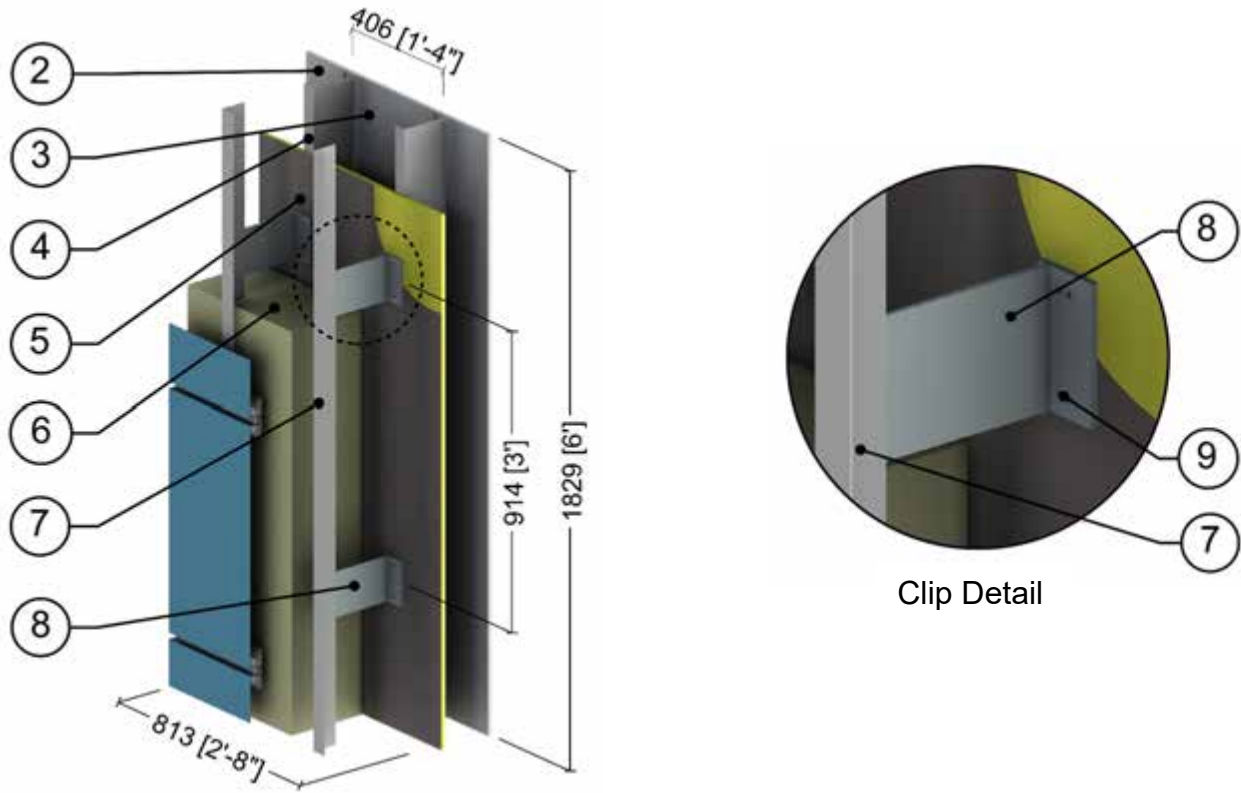
Slotted Rap-Tie with Aerogel Coating

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	4" (102)	varies	R-16.8 (2.96 RSI) to R-24.0 (4.23 RSI)	varies	varies
7	FERO Slotted Rap-Ties	4" (102)	430 (62)	-	445 (7130)	0.09 (390)
8	Aerogel Coating	1/8" (3)	0.24 (0.035)	-	-	-
9	Tie Fastener	5/16" (8) Ø	118 (17)	-	489 (7830)	0.12 (500)
10	Vented Air Cavity	1" (25)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
11	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
12	Insulation Support	1/8" (3)	2.9 (0.42)	-	-	-
13	Brick Tie Wire	-	430 (62)	-	445 (7130)	0.09 (390)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.90

Exterior Insulated 6" x 1 5/8" Steel Stud (16" O.C.) Wall Assembly with Fiber Reinforced Plastic Clip Supporting Cladding – Clear Wall

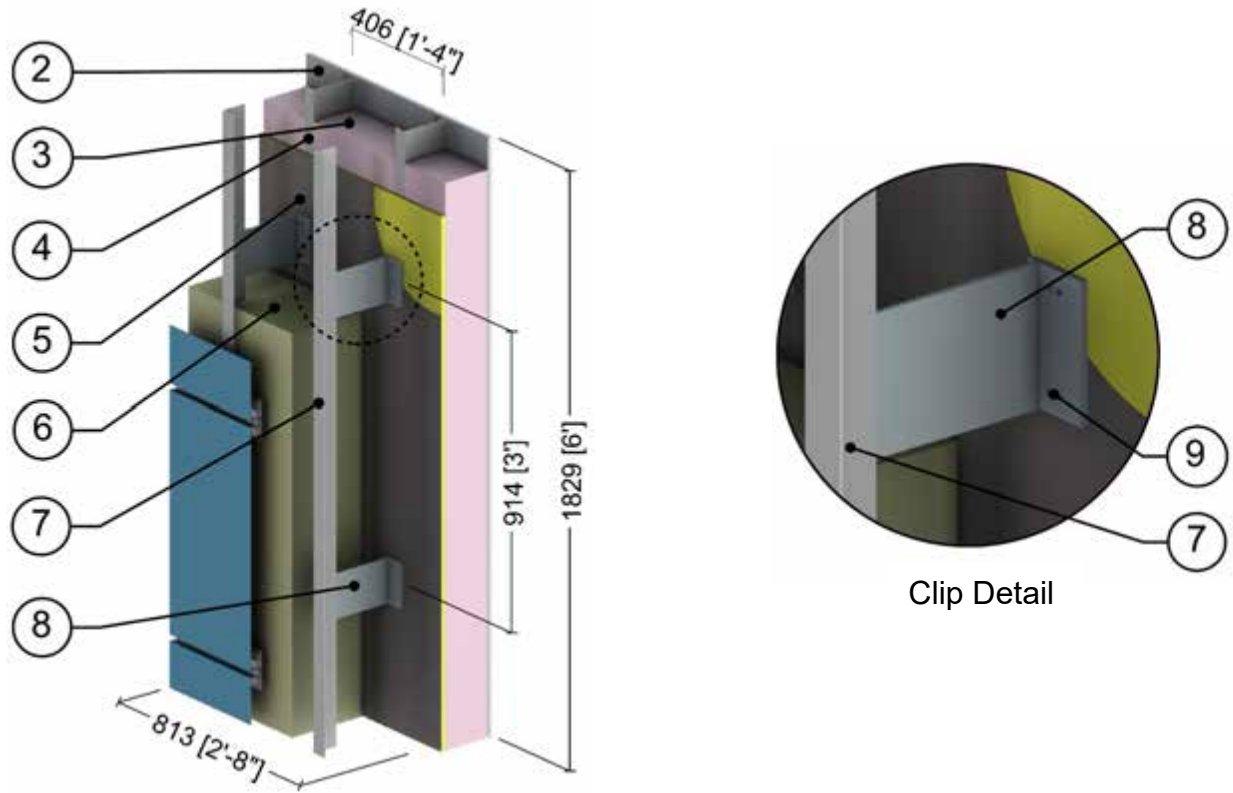


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-25.2 to R-42.0 (4.44 to 7.40 RSI)	4 (64)	0.20 (850)
7	Vertical Aluminum L-girt	0.10" (2.5)	1339 (193)	-	169 (2700)	0.22 (900)
8	Fiber Reinforced Plastic Clip	0.22" (5.5)	4.9 (0.7)	-	-	-
9	#14 Stainless Steel Fasteners	1/4" (6) Ø	118 (17)	-	500 (8000)	0.12 (500)
10	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.91

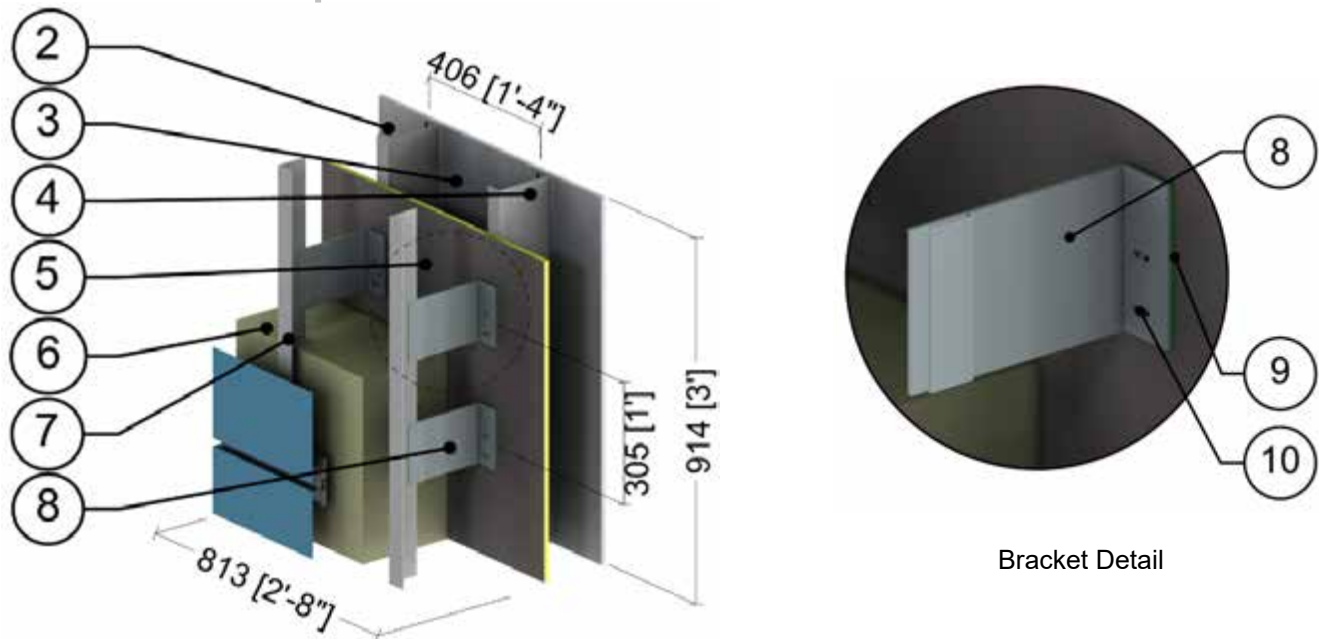
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" O.C.) Wall Assembly with Fiber Reinforced Plastic Clip Supporting Metal Cladding and R-19 Batt in Stud Cavity – Clear Wall



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	6" (152)	0.32 (0.046)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-25.2 to R-42.0 (4.44 to 7.40 RSI)	4 (64)	0.20 (850)
7	Vertical Aluminum L-girt	0.10" (2.5)	1339 (193)	-	169 (2700)	0.22 (900)
8	Fiber Reinforced Plastic Clip	0.22" (5.5)	4.9 (0.7)	-	-	-
9	#14 Stainless Steel Fasteners	1/4" (6) Ø	118 (17)	-	500 (8000)	0.12 (500)
10	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.92 Exterior Insulated 6" x 1 5/8" Steel Stud (16" O.C.) Wall Assembly with Double Aluminum Bracket Supporting Metal Cladding

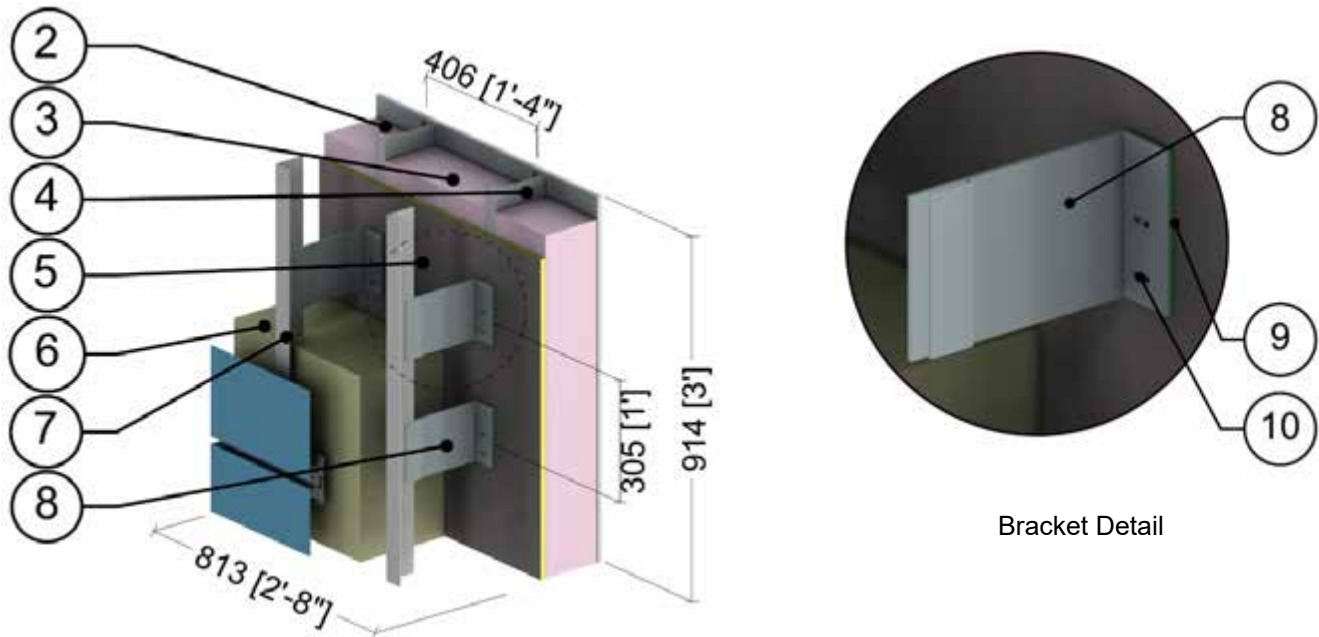


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-25.2 to R-42.0 (4.44 to 7.40 RSI)	4 (64)	0.20 (850)
7	Vertical Aluminum L-girt	0.10" (2.5)	1339 (193)	-	169 (2700)	0.22 (900)
8	Aluminum Bracket	Varies	1339 (193)	-	169 (2700)	0.22 (900)
9	Isolator Pad	0.2" (5)	0.82 (0.117)	-	87 (1400)	0.20 (840)
10	#14 Stainless Steel Fasteners	1/4" (6) Ø	118 (17)	-	500 (8000)	0.12 (500)
11	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.93

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" O.C.) Wall Assembly with Double Aluminum Bracket Supporting Metal Cladding and R-19 Batt Insulation in Stud Cavity

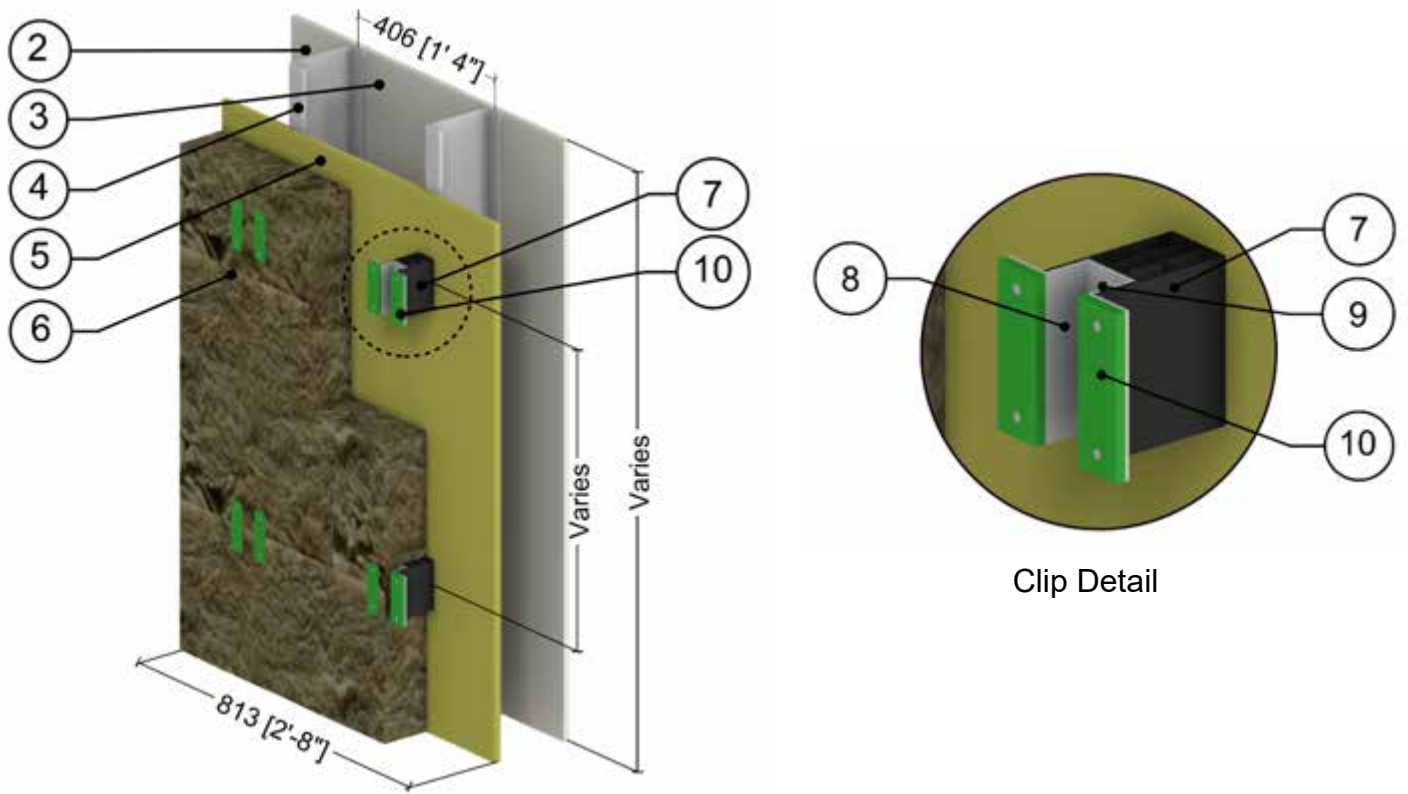


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	6" (152)	0.32 (0.046)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-25.2 to R-42.0 (4.44 to 7.40 RSI)	4 (64)	0.20 (850)
7	Vertical Aluminum L-girt	0.10" (2.5)	1339 (193)	-	169 (2700)	0.22 (900)
8	Aluminum Bracket	Varies	1340 (193)	-	169 (2700)	0.22 (900)
9	Isolator Pad	0.2" (5)	0.82 (0.117)	-	87 (1400)	0.20 (840)
10	#14 Stainless Steel Fasteners	1/4" (6) Ø	118 (17)	-	500 (8000)	0.12 (500)
11	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.94

Exterior Insulated 6" x 1 5/8" Steel Stud (16" O.C.) Wall Assembly with Technoform Clip and Steel Fasteners - Clear Wall

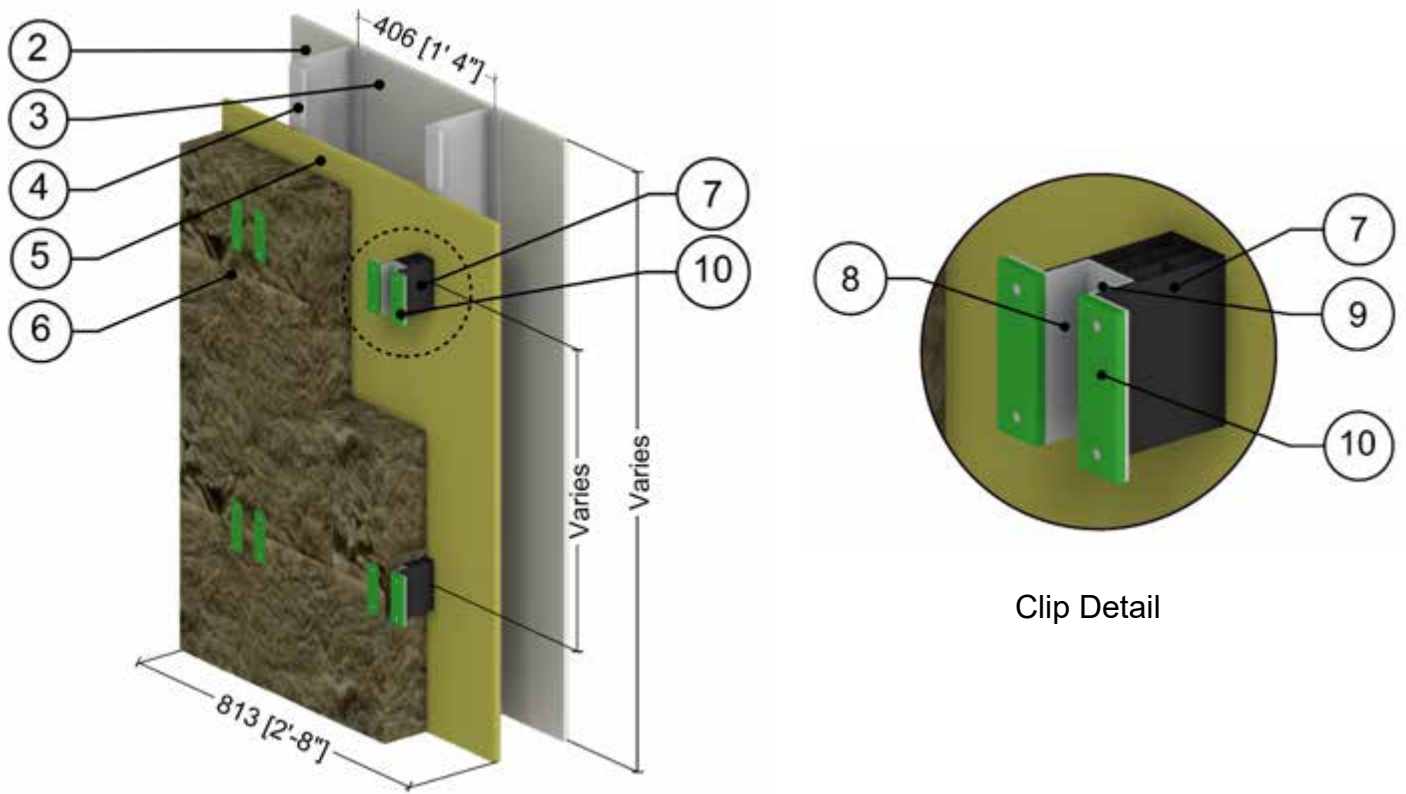


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	Varies	-	R-8.4 to R-33.6 (1.48 to 5.92 RSI)	4 (64)	0.20 (850)
7	Polyamide Thermal Break	Varies	1.7 (0.25)	-	-	-
8	Aluminum C-Channel	-	1390 (200)	-	168 (2700)	0.22 (900)
9	Fasteners	1/4" (6) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	Spacer Shims	1/4" (6)	1.7 (0.25)	-	-	-
11	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.95

Exterior Insulated 6" x 1 5/8" Steel Stud (16" O.C.) Wall Assembly with Technoform Clip and Stainless Steel Fasteners - Clear Wall

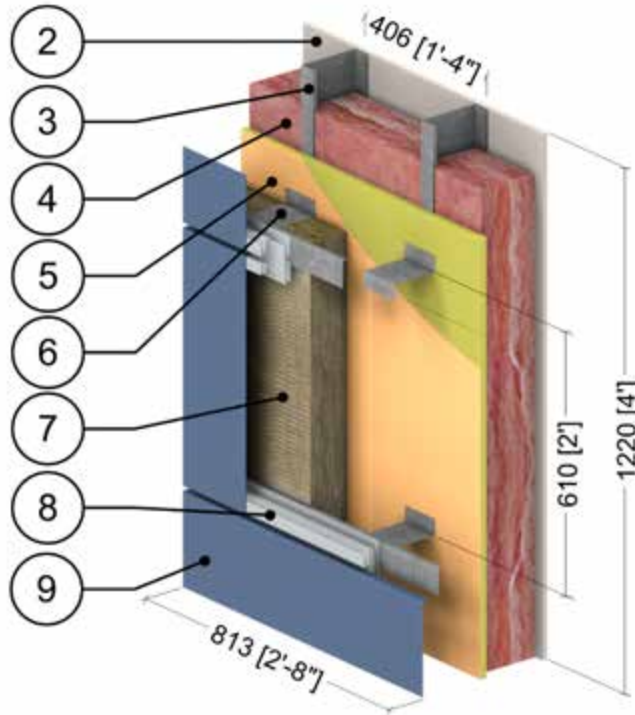


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	Varies	-	R-8.4 to R-33.6 (1.48 to 5.92 RSI)	4 (64)	0.20 (850)
7	Polyamide Thermal Break	Varies	1.7 (0.25)	-	-	-
8	Aluminum C-Channel	-	1390 (200)	-	168 (2700)	0.22 (900)
9	Fasteners	1/4" (6) Ø	111 (16)	-	500 (8000)	0.12 (500)
10	Spacer Shims	1/4" (6)	1.7 (0.25)	-	-	-
11	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.96

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Galvanized Horizontal Intermittent Clips (24" o.c.) Supporting Metal Cladding and Owens Corning R-20 Batt Insulation in Stud Cavity – Clear Wall

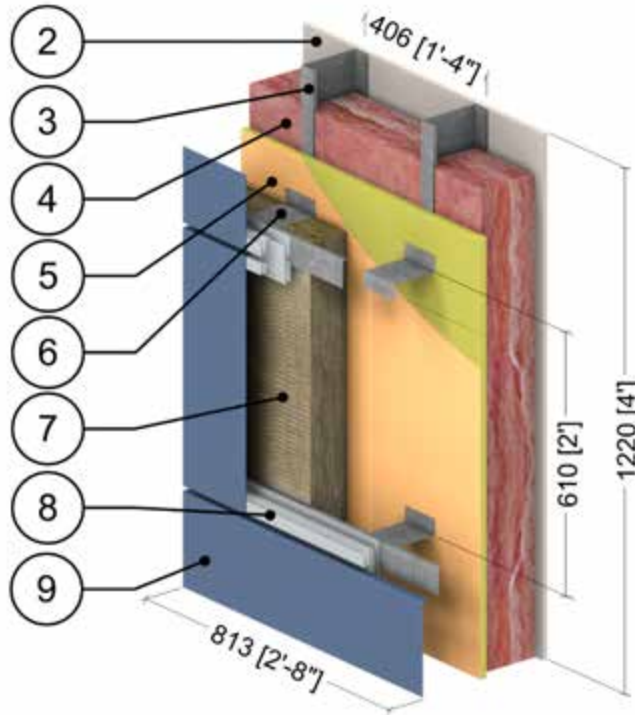


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	-	R-20 (3.52 RSI)	varies	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Horizontal Clips w/ 1 1/2" horizontal rail	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	Varies	0.24 (0.034)	R-6.3 to R-21.0 (1.11 to 3.70 RSI)	4.5 (72)	0.20 (850)
8	Panel Clip	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.97

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Galvanized Horizontal Intermittent Clips (24" o.c.) Supporting Metal Cladding and Owens Corning R-22.5 Batt Insulation in Stud Cavity – Clear Wall

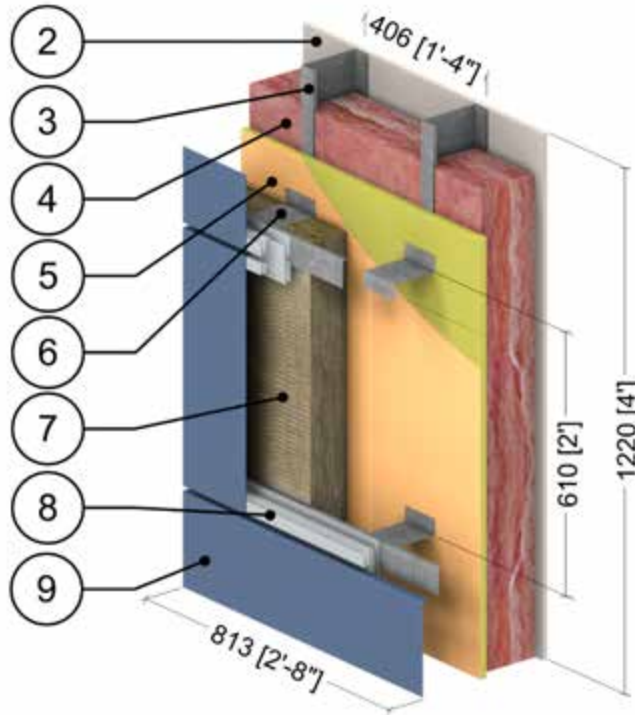


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.26 (0.038)	R-22.5 (4.0 RSI)	0.99 (15.9)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Horizontal Clips w/ 1 1/2" horizontal rail	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	Varies	0.24 (0.034)	R-6.3 to R-21.0 (1.11 to 3.70 RSI)	4.5 (72)	0.20 (850)
8	Panel Clip	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.98

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Galvanized Horizontal Intermittent Clips (24" o.c.) Supporting Metal Cladding and Owens Corning R-24 Batt Insulation in Stud Cavity – Clear Wall

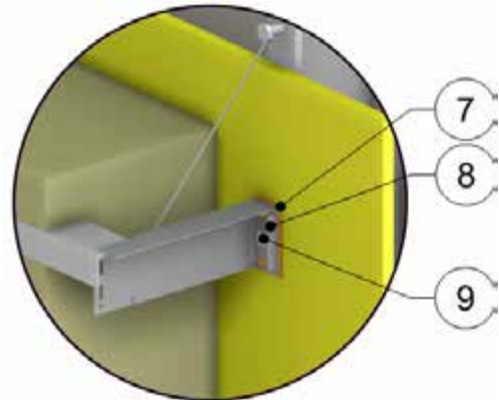
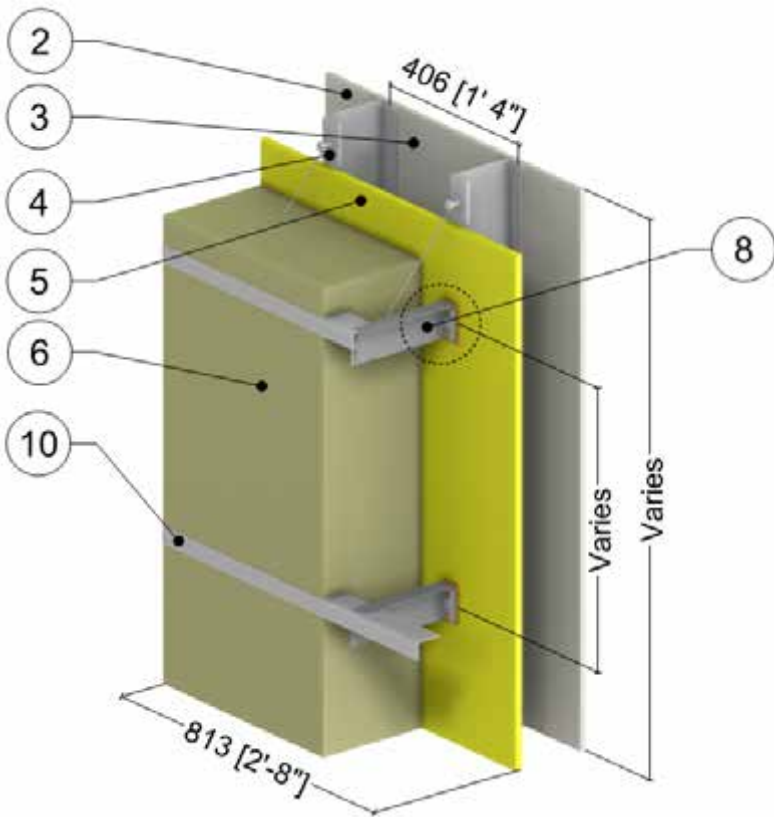


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.25 (0.036)	R-24 (4.2 RSI)	1.42 (22.7)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Horizontal Clips w/ 1 1/2" horizontal rail	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	Varies	0.24 (0.034)	R-6.3 to R-21.0 (1.11 to 3.70 RSI)	4.5 (72)	0.20 (850)
8	Panel Clip	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.99

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with EJOT Crossfix Console and Horizontal Rail System Supporting Metal Cladding - Clear Wall



Console Detail

Exterior Insulation Thickness for Console Sizes

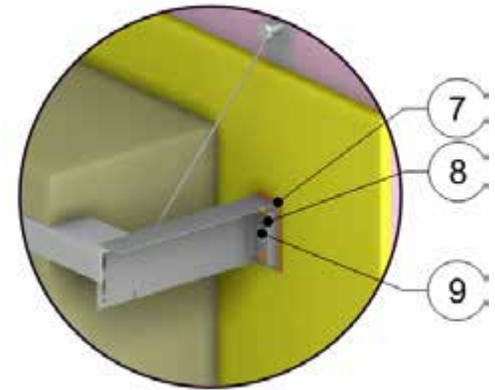
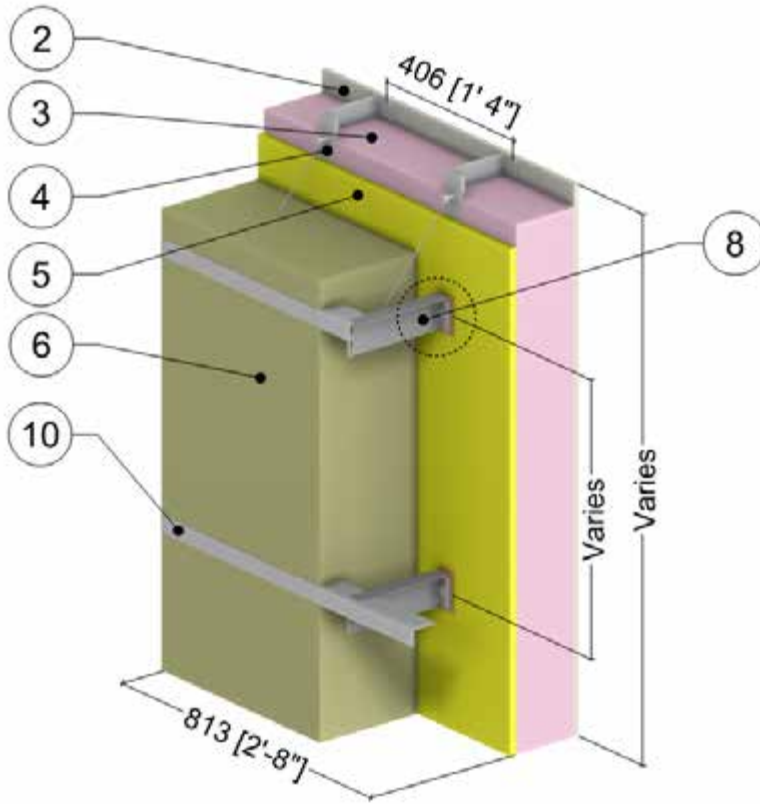
Crossfix Console Size	Exterior Insulation Thickness in (mm)
40	2 (51)
80	3.5 (89)
120	5 (127)
200	8.5 (216)
240	10 (254)
320	13 (330)
400	16 (406)

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-8.4 to R-67.2 (1.48 to 11.84 RSI)	4 (64)	0.20 (850)
7	Thermostop	0.2" (5)	2.2 (0.32)	-	69 (1100)	0.36 (1500)
8	EJOT Console and Components	0.06" (1.5)	112 (16)	-	499 (8000)	0.12 (500)
9	Fastener	0.22" (5.5) Ø	112 (16)	-	499 (8000)	0.12 (500)
10	Rail	0.08" (2)	1110 (160)	-	-	-
11	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.100

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with EJOT Crossfix Console and Horizontal Rail System Supporting Metal Cladding and R-20 Batt Insulation in Stud Cavity - Clear Wall



Console Detail

Exterior Insulation Thickness for Console Sizes

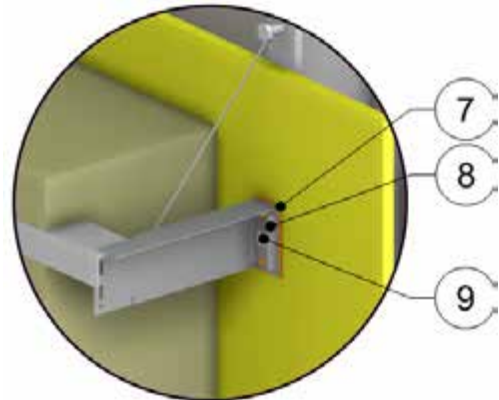
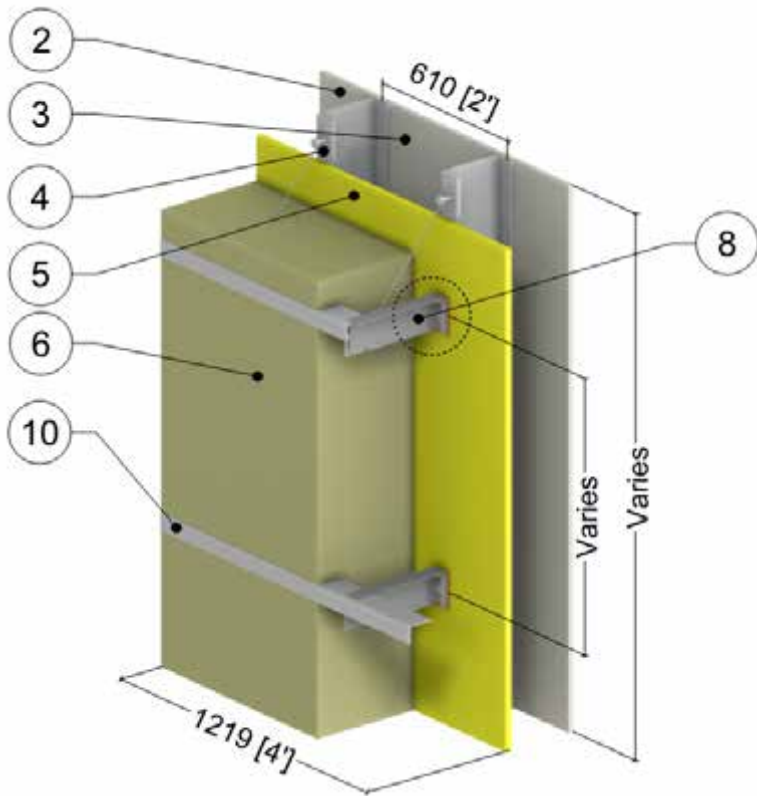
Crossfix Console Size	Exterior Insulation Thickness in (mm)
40	2 (51)
80	3.5 (89)
120	5 (127)
200	8.5 (216)
240	10 (254)
320	13 (330)
400	16 (406)

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	6" (152)	0.30 (0.043)	R-20 (3.5 RSI)	0.55 (8.8)	0.17 (710)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-8.4 to R-67.2 (1.48 to 11.84 RSI)	4 (64)	0.20 (850)
7	Thermostop	0.2" (5)	2.2 (0.32)	-	69 (1100)	0.36 (1500)
8	EJOT Console and Components	0.06" (1.5)	112 (16)	-	499 (8000)	0.12 (500)
9	Fastener	0.22" (5.5) Ø	112 (16)	-	499 (8000)	0.12 (500)
10	Rail	0.08" (2)	1110 (160)	-	-	-
11	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.101

Exterior Insulated 6" x 1 5/8" Steel Stud (24" o.c.) Wall Assembly with EJOT Crossfix Console and Horizontal Rail System Supporting Metal Cladding - Clear Wall



Console Detail

Exterior Insulation Thickness for Console Sizes

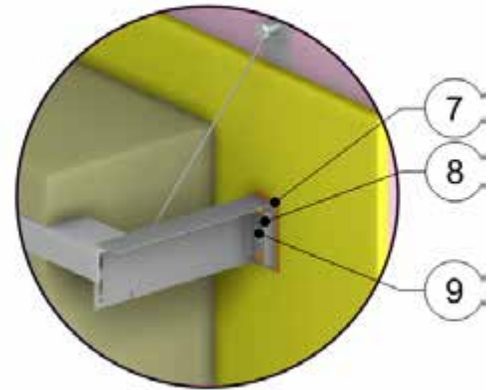
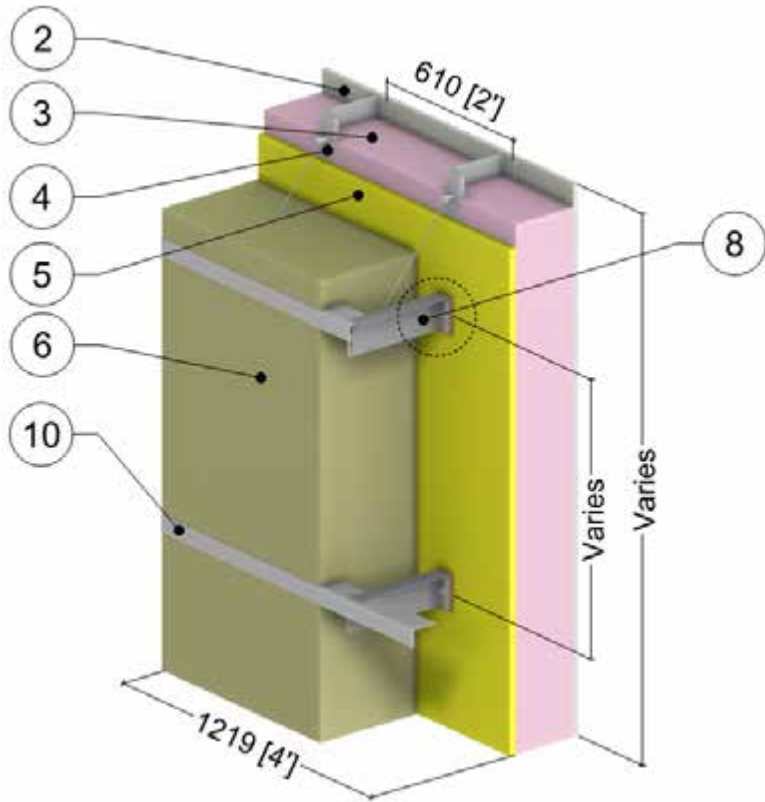
Crossfix Console Size	Exterior Insulation Thickness in (mm)
40	2 (51)
80	3.5 (89)
120	5 (127)
200	8.5 (216)
240	10 (254)
320	13 (330)
400	16 (406)

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-8.4 to R-67.2 (1.48 to 11.84 RSI)	4 (64)	0.20 (850)
7	Thermostop	0.2" (5)	2.2 (0.32)	-	69 (1100)	0.36 (1500)
8	EJOT Console and Components	0.06" (1.5)	112 (16)	-	499 (8000)	0.12 (500)
9	Fastener	0.22" (5.5) Ø	112 (16)	-	499 (8000)	0.12 (500)
10	Rail	0.08" (2)	1110 (160)	-	-	-
11	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.102

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (24" o.c.) Wall Assembly with EJOT Crossfix Console and Horizontal Rail System Supporting Metal Cladding and R-20 Batt Insulation in Stud Cavity - Clear Wall



Console Detail

Exterior Insulation Thickness for Console Sizes

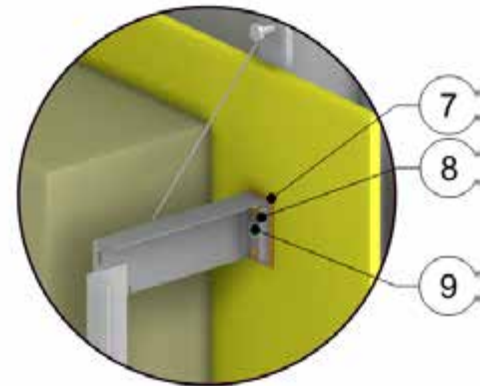
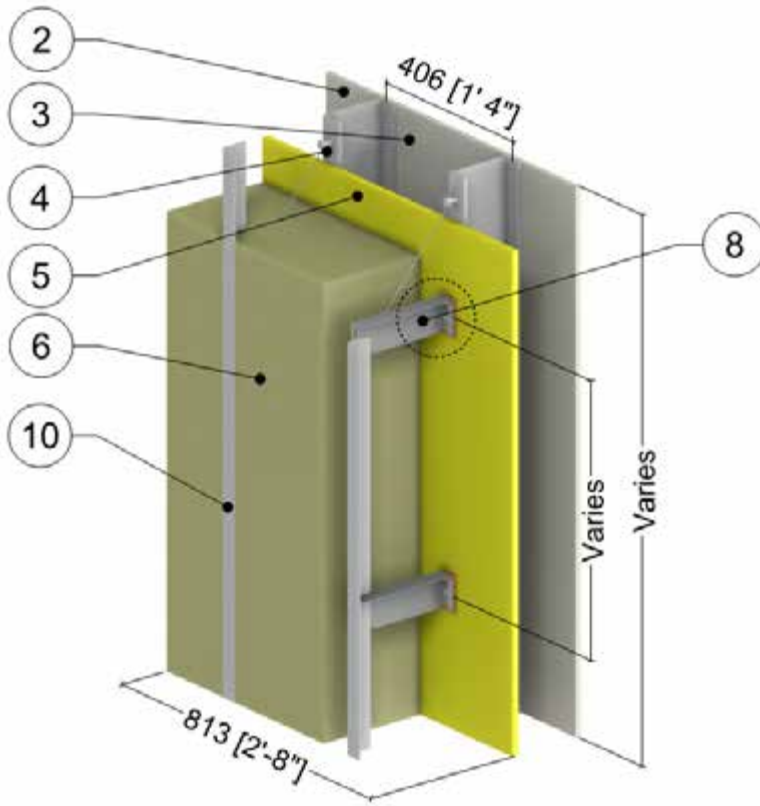
Crossfix Console Size	Exterior Insulation Thickness in (mm)
40	2 (51)
80	3.5 (89)
120	5 (127)
200	8.5 (216)
240	10 (254)
320	13 (330)
400	16 (406)

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	6" (152)	0.30 (0.043)	R-20 (3.5 RSI)	0.55 (8.8)	0.17 (710)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-8.4 to R-67.2 (1.48 to 11.84 RSI)	4 (64)	0.20 (850)
7	Thermostop	0.2" (5)	2.2 (0.32)	-	69 (1100)	0.36 (1500)
8	EJOT Console and Components	0.06" (1.5)	112 (16)	-	499 (8000)	0.12 (500)
9	Fastener	0.22" (5.5) Ø	112 (16)	-	499 (8000)	0.12 (500)
10	Rail	0.08" (2)	1110 (160)	-	-	-
11	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.103

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with EJOT Crossfix Console and Vertical Rail System Supporting Metal Cladding - Clear Wall



Console Detail

Exterior Insulation Thickness for Console Sizes

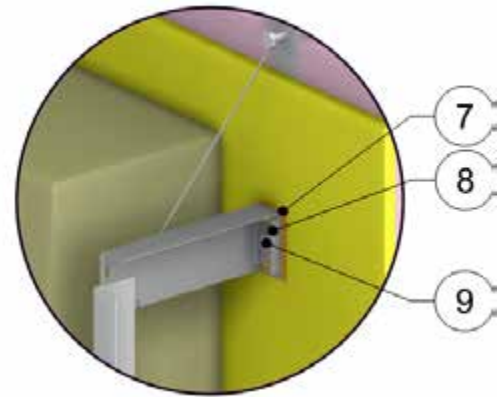
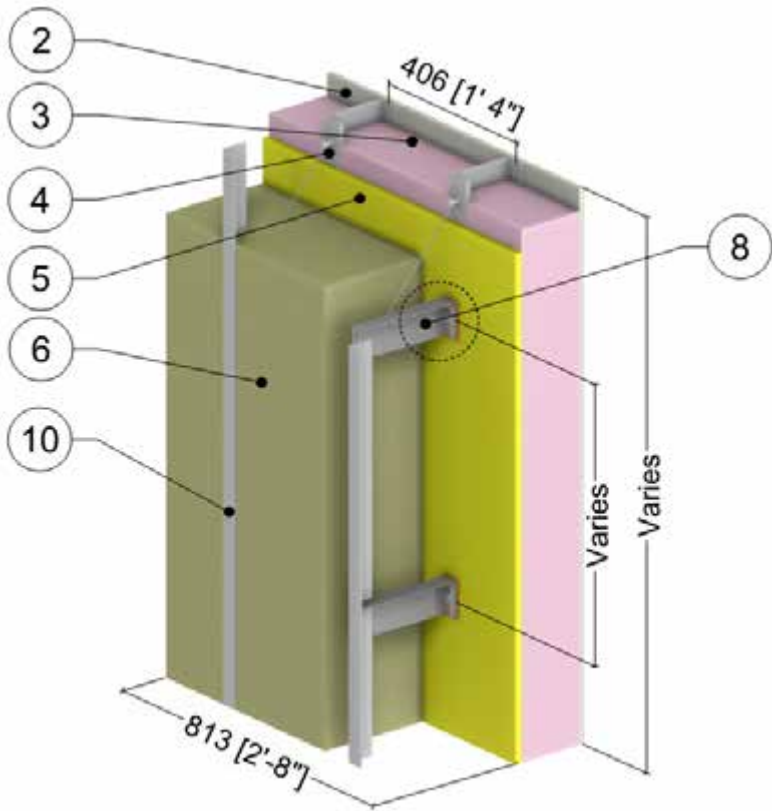
Crossfix Console Size	Exterior Insulation Thickness in (mm)
40	2 (51)
80	3.5 (89)
120	5 (127)
200	8.5 (216)
240	10 (254)
320	13 (330)
400	16 (406)

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-8.4 to R-67.2 (1.48 to 11.84 RSI)	4 (64)	0.20 (850)
7	Thermostop	0.2" (5)	2.2 (0.32)	-	69 (1100)	0.36 (1500)
8	EJOT Console and Components	0.06" (1.5)	112 (16)	-	499 (8000)	0.12 (500)
9	Fastener	0.22" (5.5) Ø	112 (16)	-	499 (8000)	0.12 (500)
10	Rail	0.08" (2)	1110 (160)	-	-	-
11	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.104

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with EJOT Crossfix Console and Vertical Rail System Supporting Metal Cladding and R-20 Batt Insulation in Stud Cavity - Clear Wall



Console Detail

Exterior Insulation Thickness for Console Sizes

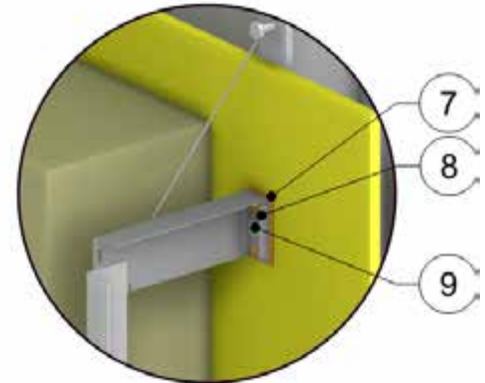
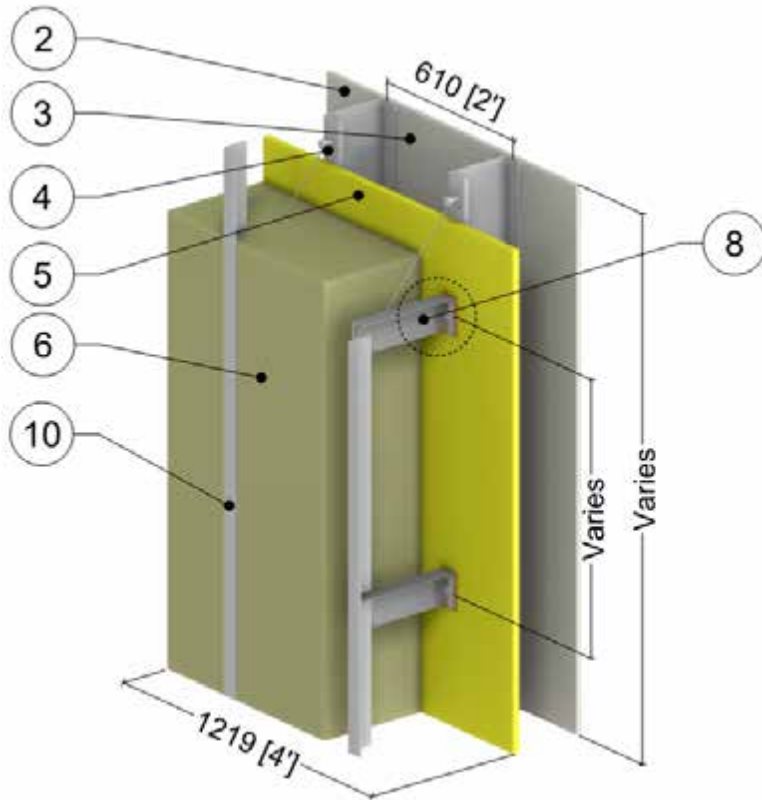
Crossfix Console Size	Exterior Insulation Thickness in (mm)
40	2 (51)
80	3.5 (89)
120	5 (127)
200	8.5 (216)
240	10 (254)
320	13 (330)
400	16 (406)

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	6" (152)	0.30 (0.043)	R-20 (3.5 RSI)	0.55 (8.8)	0.17 (710)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-8.4 to R-67.2 (1.48 to 11.84 RSI)	4 (64)	0.20 (850)
7	Thermostop	0.2" (5)	2.2 (0.32)	-	69 (1100)	0.36 (1500)
8	EJOT Console and Components	0.06" (1.5)	112 (16)	-	499 (8000)	0.12 (500)
9	Fastener	0.22" (5.5) Ø	112 (16)	-	499 (8000)	0.12 (500)
10	Rail	0.08" (2)	1110 (160)	-	-	-
11	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.105

Exterior Insulated 6" x 1 5/8" Steel Stud (24" o.c.) Wall Assembly with EJOT Crossfix Console and Vertical Rail System Supporting Metal Cladding - Clear Wall



Console Detail

Exterior Insulation Thickness for Console Sizes

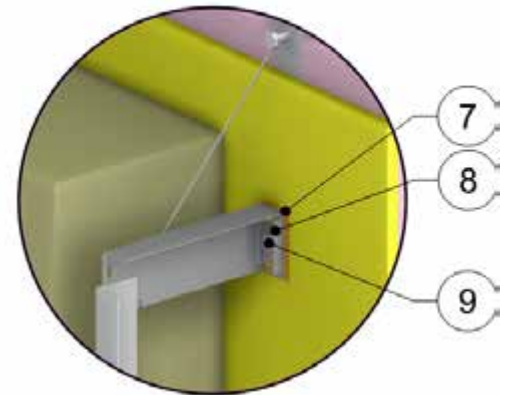
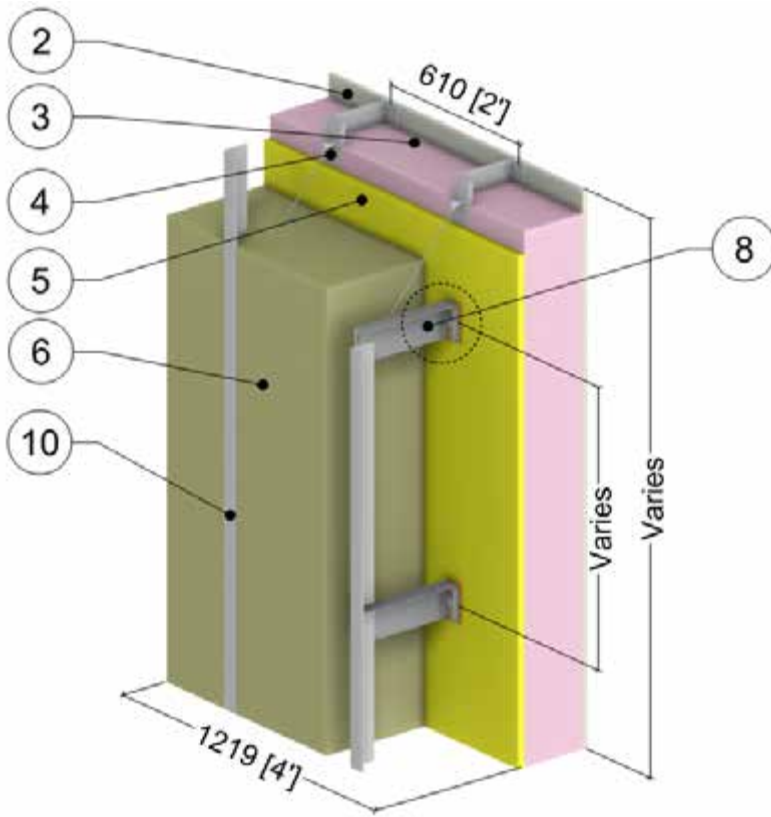
Crossfix Console Size	Exterior Insulation Thickness in (mm)
40	2 (51)
80	3.5 (89)
120	5 (127)
200	8.5 (216)
240	10 (254)
320	13 (330)
400	16 (406)

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-8.4 to R-67.2 (1.48 to 11.84 RSI)	4 (64)	0.20 (850)
7	Thermostop	0.2" (5)	2.2 (0.32)	-	69 (1100)	0.36 (1500)
8	EJOT Console and Components	0.06" (1.5)	112 (16)	-	499 (8000)	0.12 (500)
9	Fastener	0.22" (5.5) Ø	112 (16)	-	499 (8000)	0.12 (500)
10	Rail	0.08" (2)	1110 (160)	-	-	-
11	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.106

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (24" o.c.) Wall Assembly with EJOT Crossfix Console and Vertical Rail System Supporting Metal Cladding and R-20 Batt Insulation in Stud Cavity - Clear Wall



Console Detail

Exterior Insulation Thickness for Console Sizes

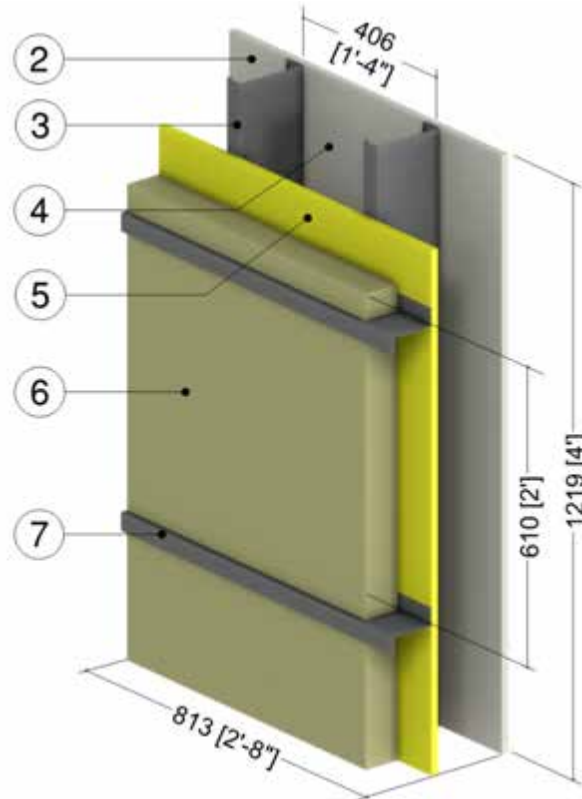
Crossfix Console Size	Exterior Insulation Thickness in (mm)
40	2 (51)
80	3.5 (89)
120	5 (127)
200	8.5 (216)
240	10 (254)
320	13 (330)
400	16 (406)

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	6" (152)	0.30 (0.043)	R-20 (3.5 RSI)	0.55 (8.8)	0.17 (710)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-8.4 to R-67.2 (1.48 to 11.84 RSI)	4 (64)	0.20 (850)
7	Thermostop	0.2" (5)	2.2 (0.32)	-	69 (1100)	0.36 (1500)
8	EJOT Console and Components	0.06" (1.5)	112 (16)	-	499 (8000)	0.12 (500)
9	Fastener	0.22" (5.5) Ø	112 (16)	-	499 (8000)	0.12 (500)
10	Rail	0.08" (2)	1110 (160)	-	-	-
11	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.107

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Cladding and Owens Corning ThermaFiber RainBarrier HC Max Insulation – Clear Wall

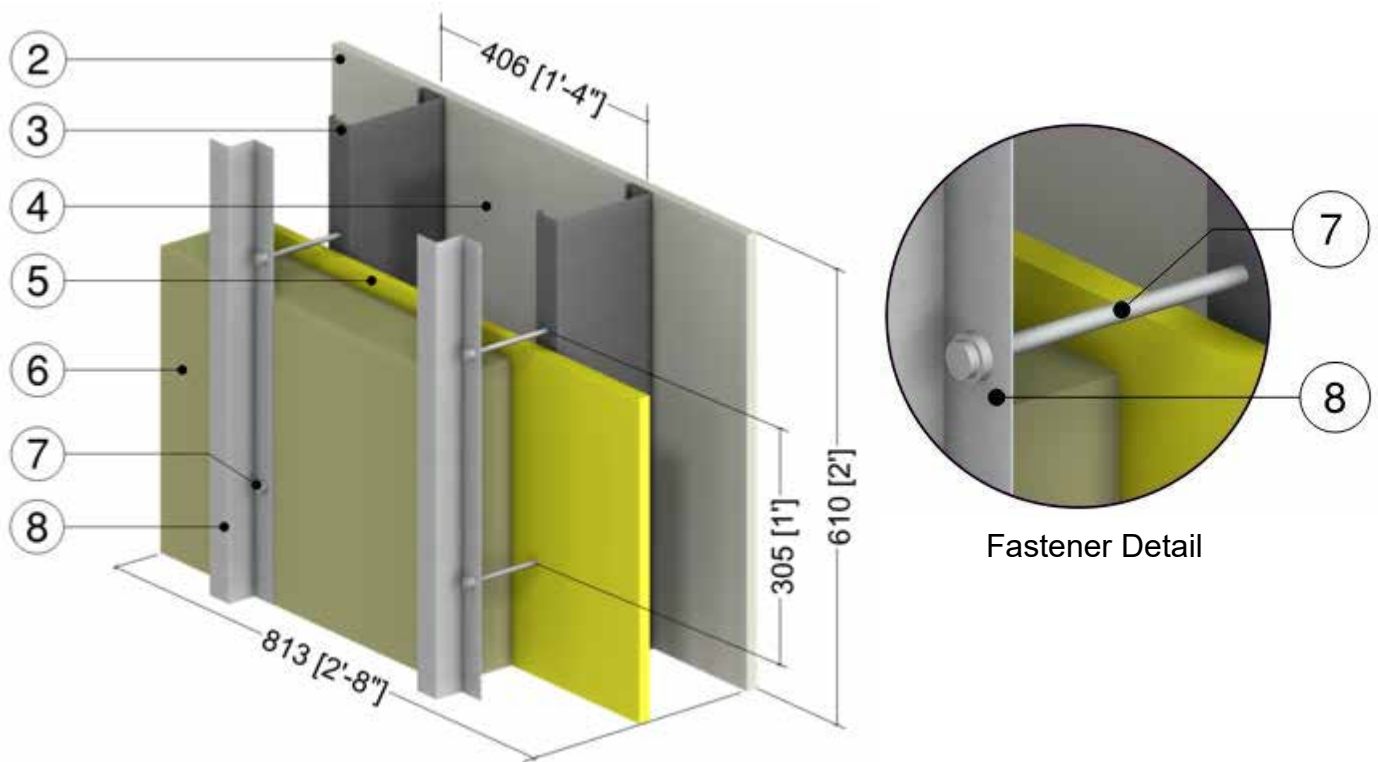


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	ThermaFiber RainBarrier HC Max Mineral Wool Semi Rigid Insulation	Varies	0.25 (0.036)	R-4 to R-24 (0.70 to 4.23 RSI)	11 (176)	0.20 (850)
7	Horizontal Z-Girts with 1-1/2" Flange	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Metal Cladding with 1/2" (13 mm) vented airspace incorporated into exterior heat transfer coefficient					
9	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.108

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier HC Max Insulation – Clear Wall

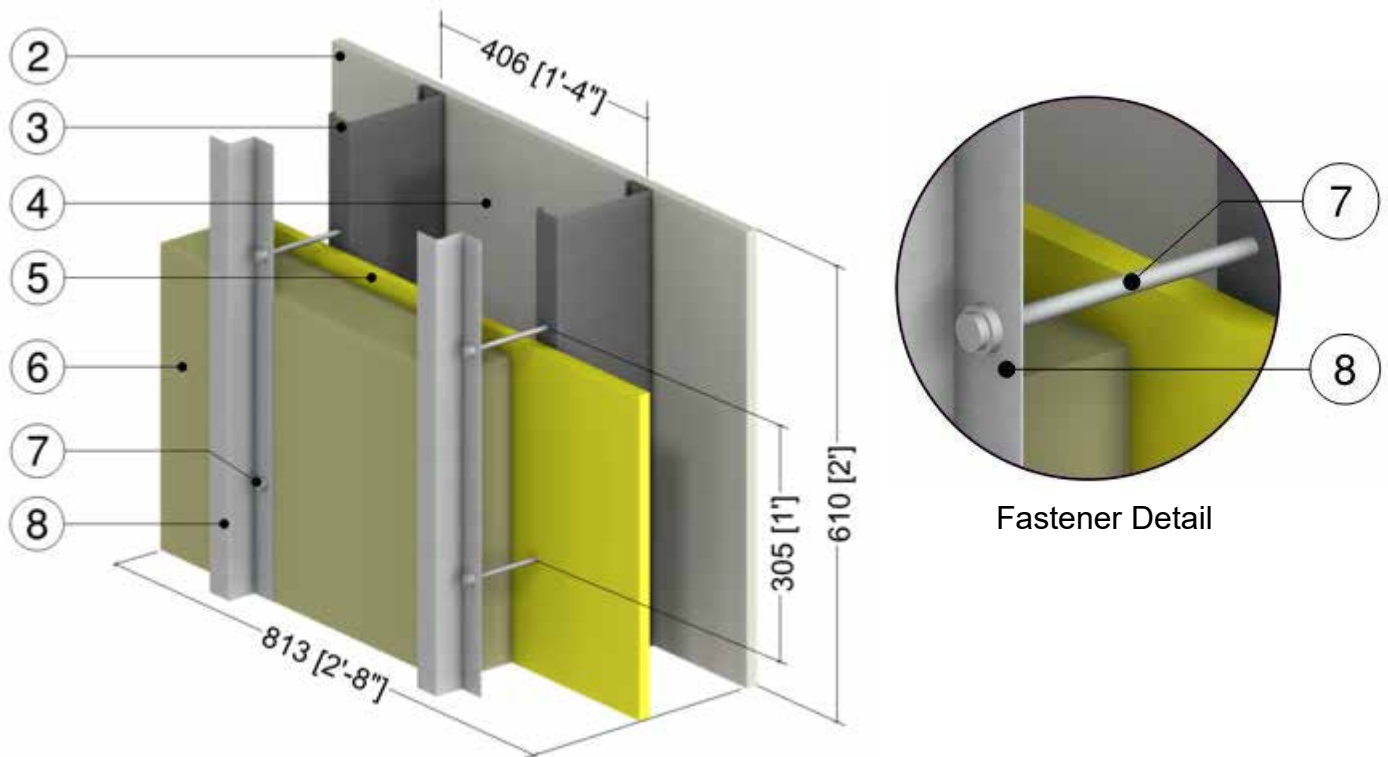


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	ThermaFiber RainBarrier HC Max Mineral Wool Semi Rigid Insulation	Varies	0.25 (0.036)	R-4.0 to R-16.0 (0.70 to 2.82 RSI)	11 (176)	0.20 (850)
7	#12 Steel Fasteners (12" o.c.)	0.21" (5.3) Ø	430 (62)	-	489 (7830)	0.12 (500)
8	Vertical Z-Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" (13 mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.109

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier Ci HC 80/45 Insulation – Clear Wall

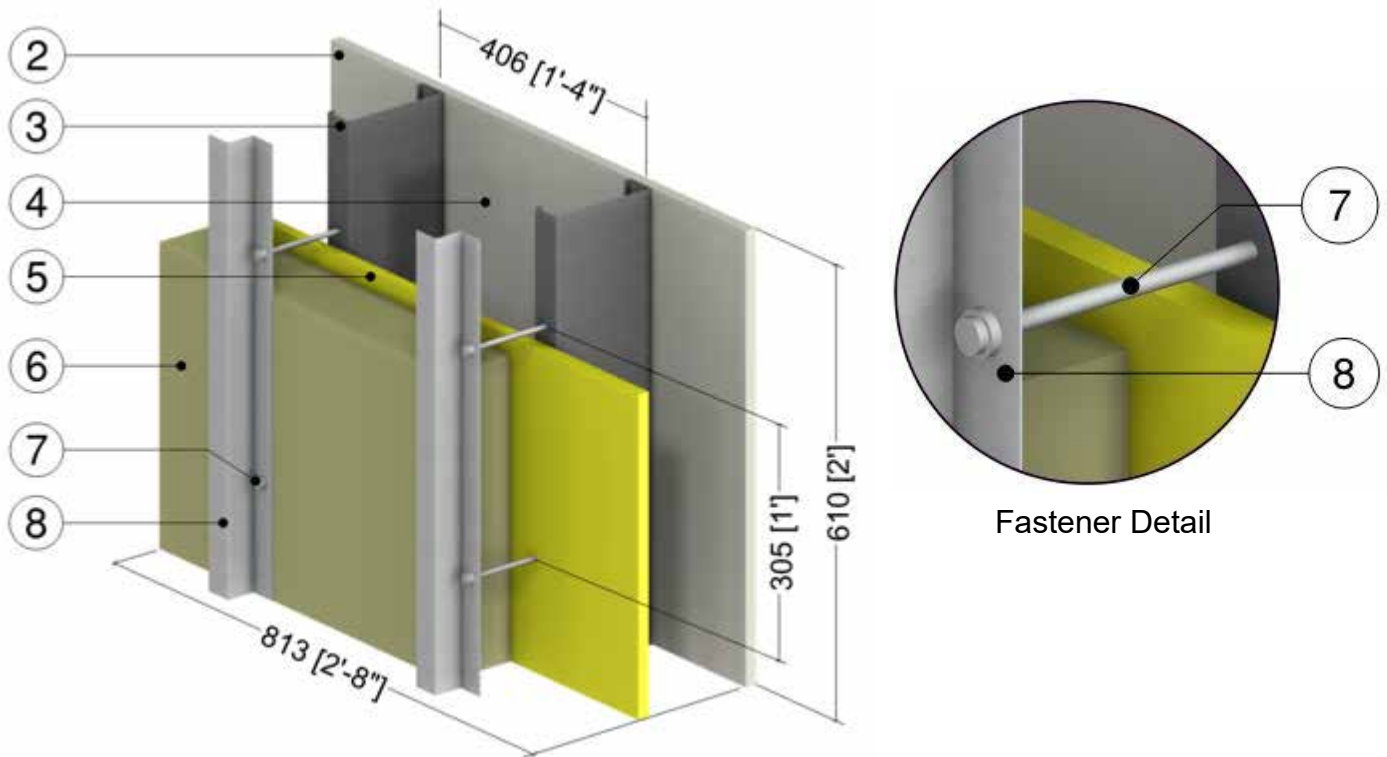


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	ThermaFiber RainBarrier Ci HC 80/45 Mineral Wool Semi Rigid Insulation	Varies	0.24 (0.034)	R-4.2 to R-16.8 (0.74 to 2.96 RSI)	4.5 (72)	0.20 (850)
7	#12 Steel Fasteners (12" o.c.)	0.21" (5.3) Ø	430 (62)	-	489 (7830)	0.12 (500)
8	Vertical Z-Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" (13 mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.110

**Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation
Stainless Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier HC Max Insulation – Clear Wall**

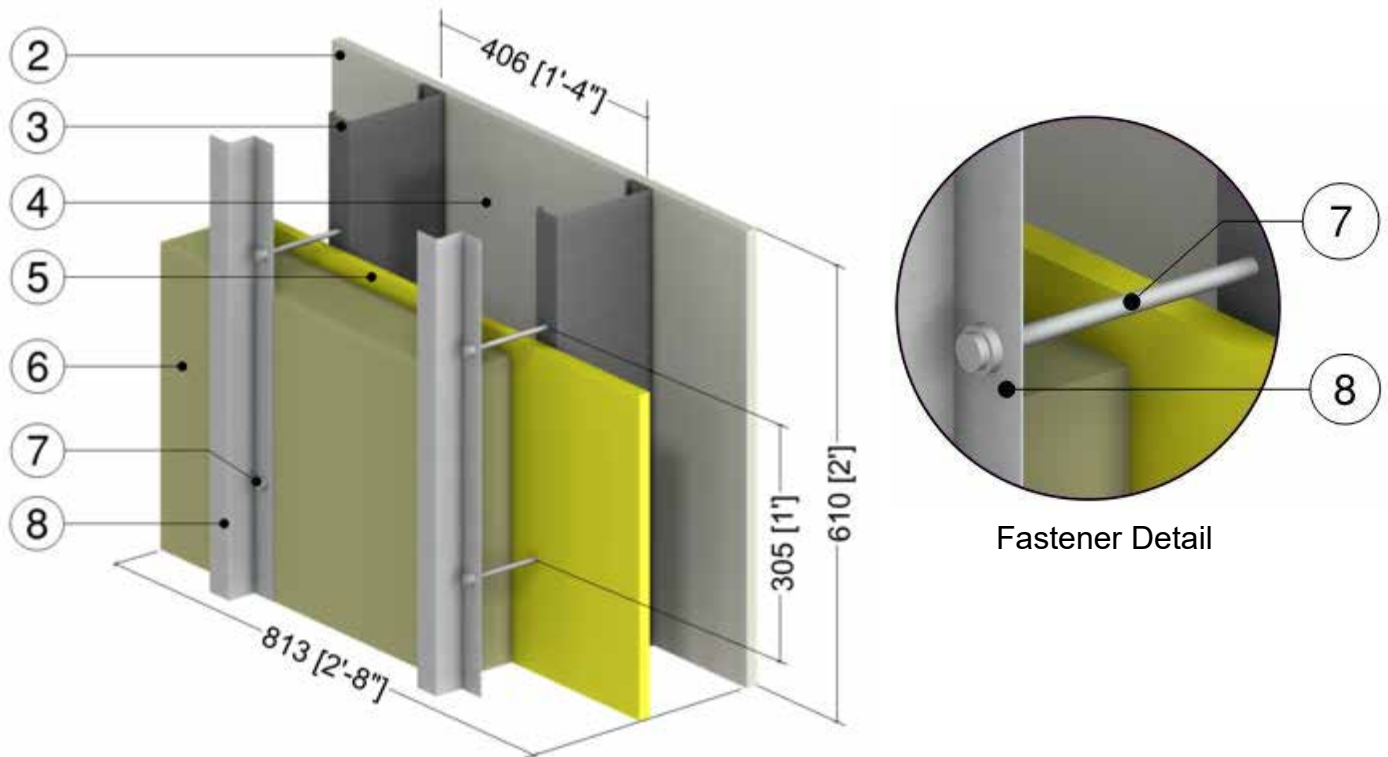


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	ThermaFiber RainBarrier HC Max Mineral Wool Semi Rigid Insulation	Varies	0.25 (0.036)	R-4.0 to R-16.0 (0.70 to 2.82 RSI)	11 (176)	0.20 (850)
7	#12 Stainless Steel Fasteners (12" o.c.)	0.21" (5.3) Ø	118 (17)	-	500 (8000)	0.12 (500)
8	Vertical Z-Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" (13 mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.111

**Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation
Stainless Steel Fasteners (12" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier Ci HC 80/45 Insulation – Clear Wall**

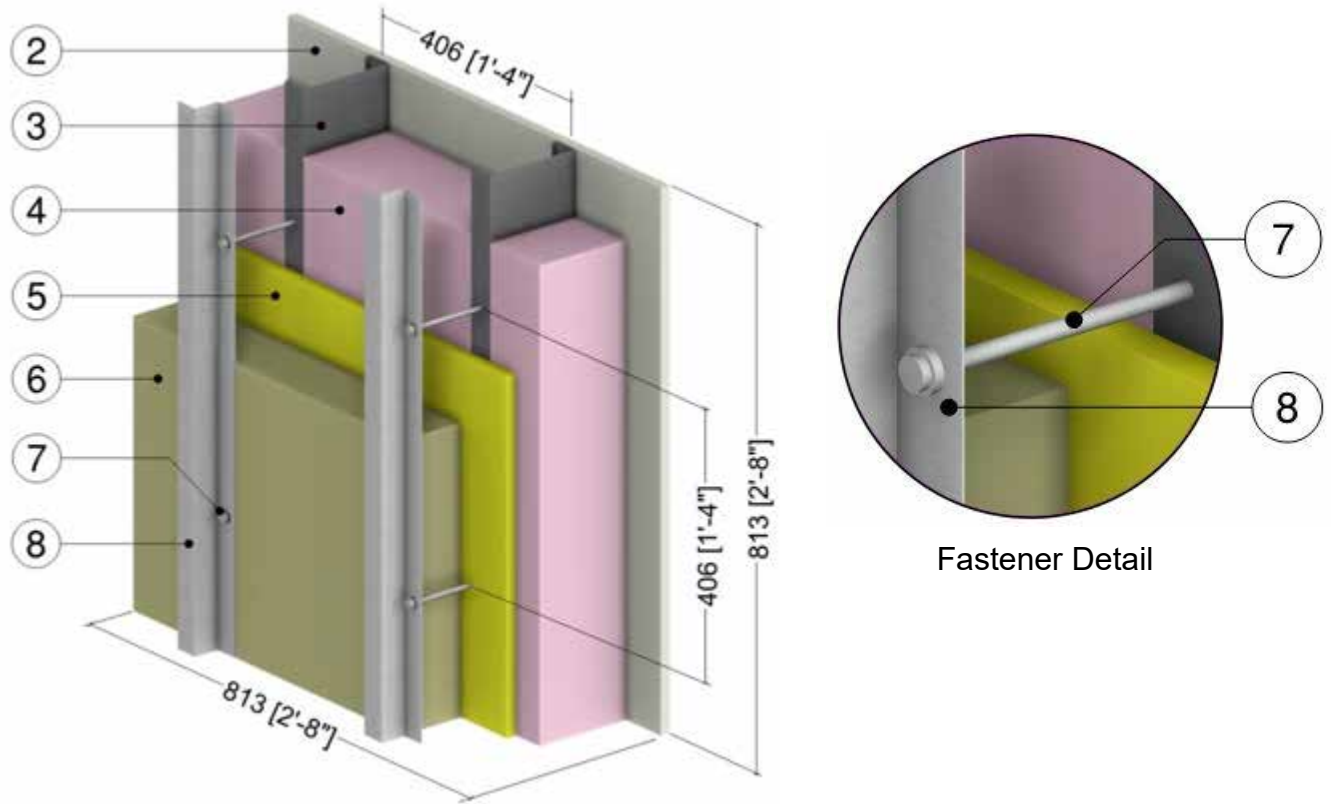


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	ThermaFiber RainBarrier Ci HC 80/45 Mineral Wool Semi Rigid Insulation	Varies	0.24 (0.034)	R-4.2 to R-16.8 (0.74 to 2.96 RSI)	4.5 (72)	0.20 (850)
7	#12 Stainless Steel Fasteners (12" o.c.)	0.21" (5.3) Ø	118 (17)	-	500 (8000)	0.12 (500)
8	Vertical Z-Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" (13 mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.112

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Stainless Steel Fasteners (16" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier HC Max Insulation and R-20 Batt Insulation in Stud Cavity – Clear Wall

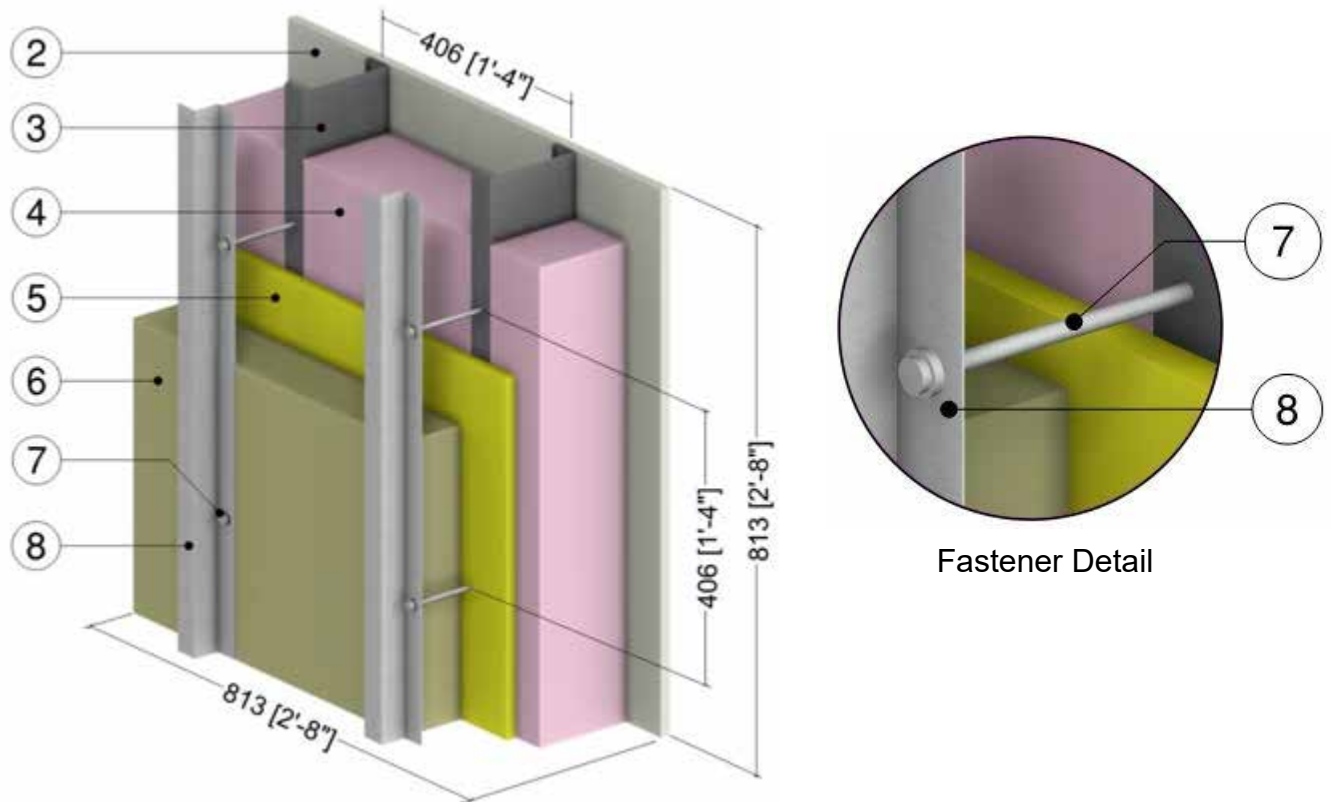


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.28 (0.041)	R-20 (3.52 RSI)	0.55 (8.8)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	ThermaFiber RainBarrier HC Max Mineral Wool Semi Rigid Insulation	Varies	0.25 (0.036)	R-4.0 to R-16.0 (0.70 to 2.82 RSI)	11 (176)	0.20 (850)
7	#12 Stainless Steel Fasteners (16" o.c.)	0.21" (5.3) Ø	118 (17)	-	500 (8000)	0.12 (500)
8	Vertical Z-Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" (13 mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.113

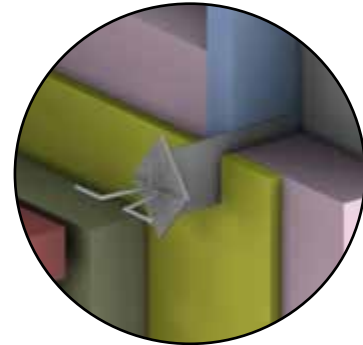
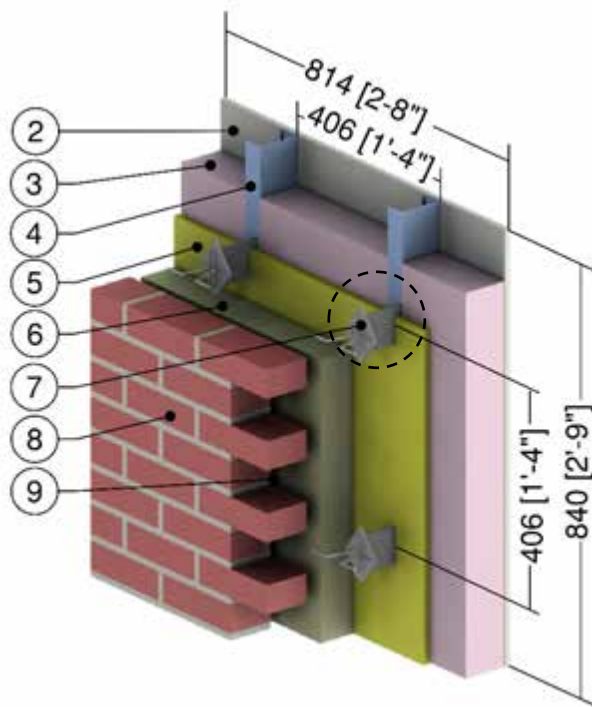
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with High Compression Insulation and Through Insulation Stainless Steel Fasteners (16" o.c.) Supporting Cladding, Owens Corning ThermaFiber RainBarrier Ci HC 80/45 Insulation and R-20 Batt Insulation in Stud Cavity – Clear Wall



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.28 (0.041)	R-20 (3.52 RSI)	0.55 (8.8)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	ThermaFiber RainBarrier Ci HC 80/45 Mineral Wool Semi Rigid Insulation	Varies	0.24 (0.034)	R-4.2 to R-16.8 (0.74 to 2.96 RSI)	4.5 (72)	0.20 (850)
7	#12 Stainless Steel Fasteners (16" o.c.)	0.21" (5.3) Ø	118 (17)	-	500 (8000)	0.12 (500)
8	Vertical Z-Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" (13 mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.114 Exterior and Interior Insulated Wall Assembly with Brick Ties Supporting Brick Veneer and R-12 Batt Insulation in Stud Cavity – Clear Wall



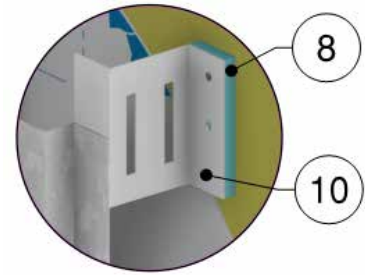
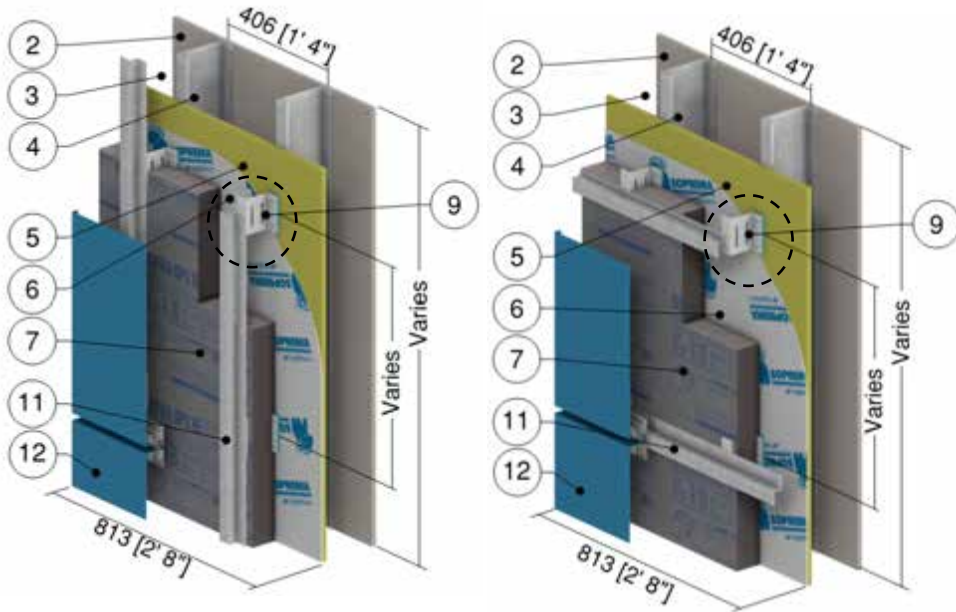
Brick Tie Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
7	Brick Ties	14 Gauge	347 (50)	-	489 (7830)	0.12 (500)
8	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
9	Air Gap	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

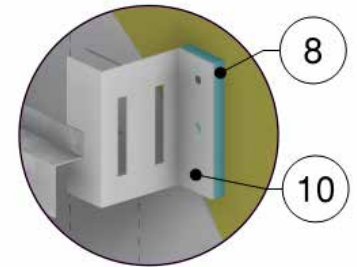
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.115

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with SOPREMA SOPRA-XPS 20 and ACS-S Thermal Clip Supporting Metal Cladding - Clear Wall



Vertical Girt: ACS Clip Detail



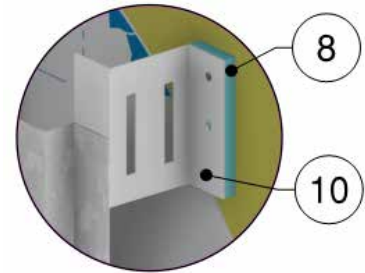
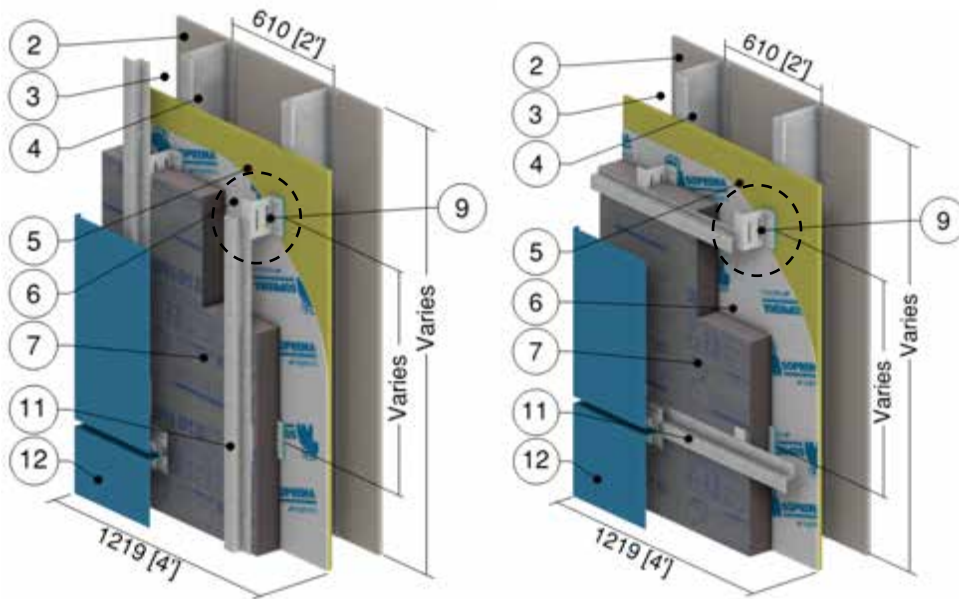
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	SOPREMA SOPRASEAL STICK 1100T membrane installed with SOPRASEAL STICK PRIMER	-	-	-	-	-
7	SOPRA-XPS 20 Exterior Insulation	Varies	0.20 (0.029)	R-15.0 to R-35.0 (2.64 RSI to 6.16 RSI)	2.5 (40)	0.29 (1220)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

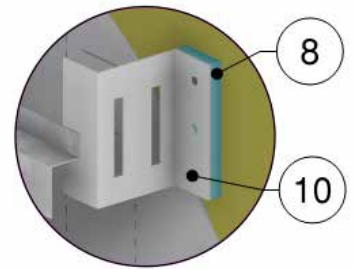
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.116

Exterior Insulated 6" x 1 5/8" Steel Stud (24" o.c.) Wall Assembly with SOPREMA SOPRA-XPS 20 and ACS-S Thermal Clip Supporting Metal Cladding - Clear Wall



Vertical Girt: ACS Clip Detail



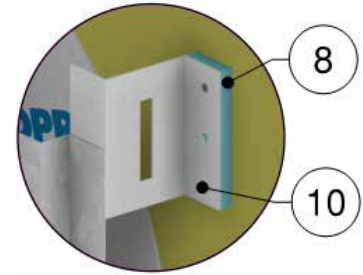
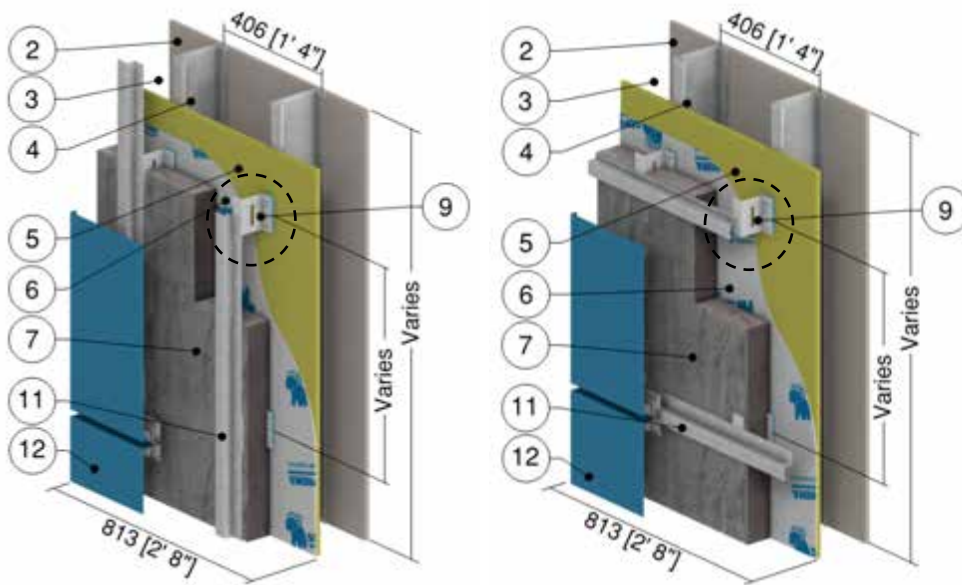
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	SOPREMA SOPRASEAL STICK 1100T membrane installed with SOPRASEAL STICK PRIMER	-	-	-	-	-
7	SOPRA-XPS 20 Exterior Insulation	Varies	0.20 (0.029)	R-15.0 to R-35.0 (2.64 RSI to 6.16 RSI)	2.5 (40)	0.29 (1220)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

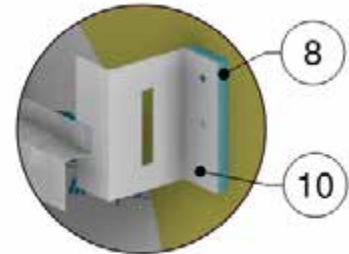
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.117

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with SOPREMA SOPRA-SPF 202 and ACS-S Thermal Clip Supporting Metal Cladding - Clear Wall



Vertical Girt: ACS Clip Detail



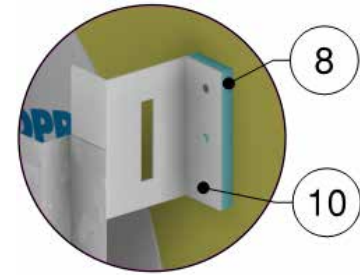
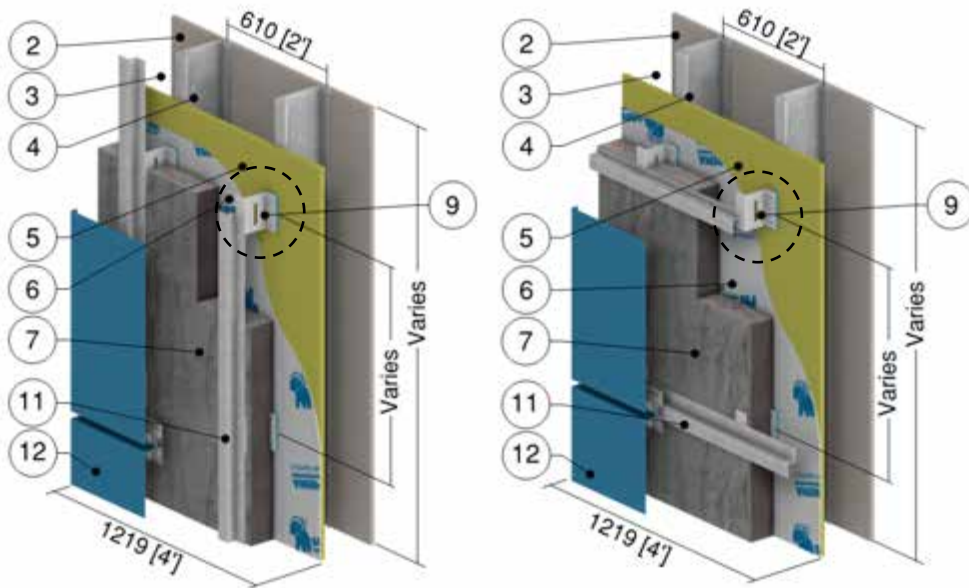
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	SOPREMA SOPRASEAL STICK 1100T membrane installed with SOPRASEAL STICK PRIMER	-	-	-	-	-
7	SOPRA-SPF 202 Exterior Insulation	Varies	0.16 (0.023)	R-6.2 to R-37.2 (1.09 RSI to 6.55 RSI)	1.8 (28)	0.29 (1220)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

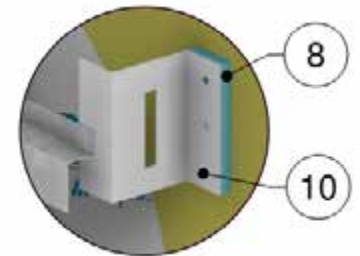
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.118

Exterior Insulated 6" x 1 5/8" Steel Stud (24" o.c.) Wall Assembly with SOPREMA SOPRA-SPF 202 and ACS-S Thermal Clip Supporting Metal Cladding - Clear Wall



Vertical Girt: ACS Clip Detail



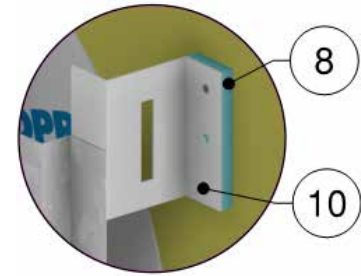
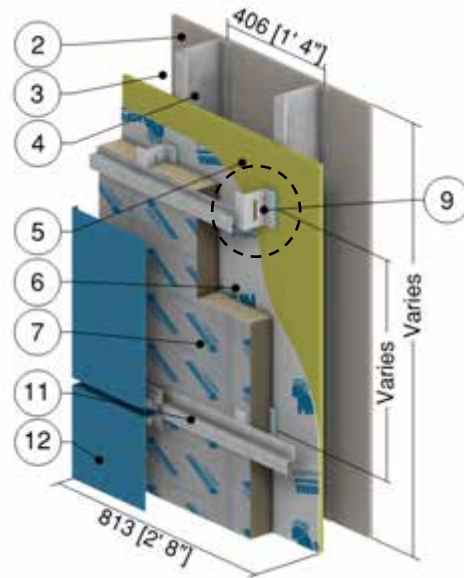
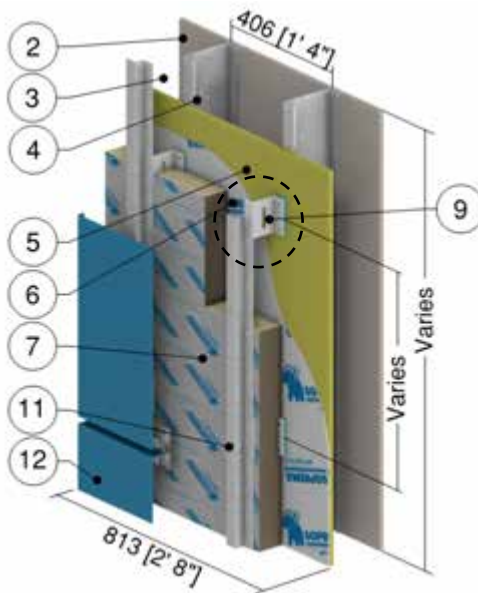
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	SOPREMA SOPRASEAL STICK 1100T membrane installed with SOPRASEAL STICK PRIMER	-	-	-	-	-
7	SOPRA-SPF 202 Exterior Insulation	Varies	0.16 (0.023)	R-6.2 to R-37.2 (1.09 RSI to 6.55 RSI)	1.8 (28)	0.29 (1220)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

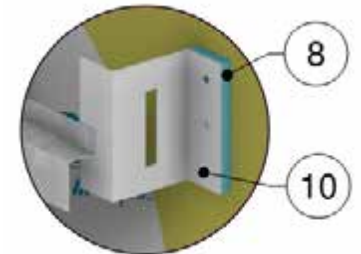
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.119

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with SOPREMA SOPRA-ISO V ALU and ACS-S Thermal Clip Supporting Metal Cladding - Clear Wall



Vertical Girt: ACS Clip Detail



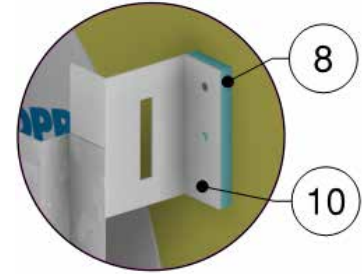
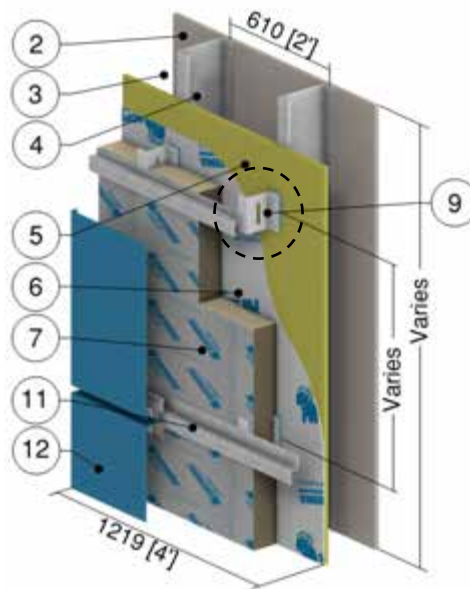
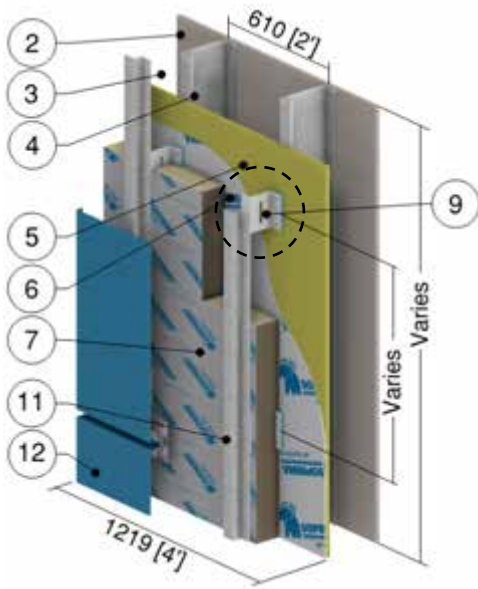
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	SOPREMA SOPRASEAL STICK 1100T membrane installed with SOPRASEAL STICK PRIMER	-	-	-	-	-
7	SOPRA-ISO V ALU Exterior Insulation	Varies	0.15 (0.022)	R-6.5 to R-39.0 (1.14 RSI to 6.87 RSI)	1.9 (30)	0.36 (1500)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

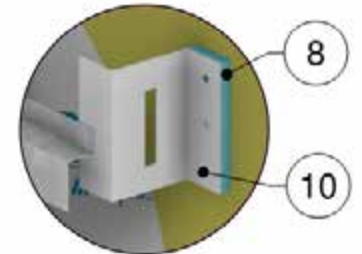
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.120

Exterior Insulated 6" x 1 5/8" Steel Stud (24" o.c.) Wall Assembly with SOPREMA SOPRA-ISO V ALU and ACS-S Thermal Clip Supporting Metal Cladding - Clear Wall



Vertical Girt: ACS Clip Detail



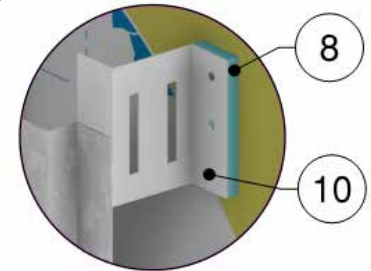
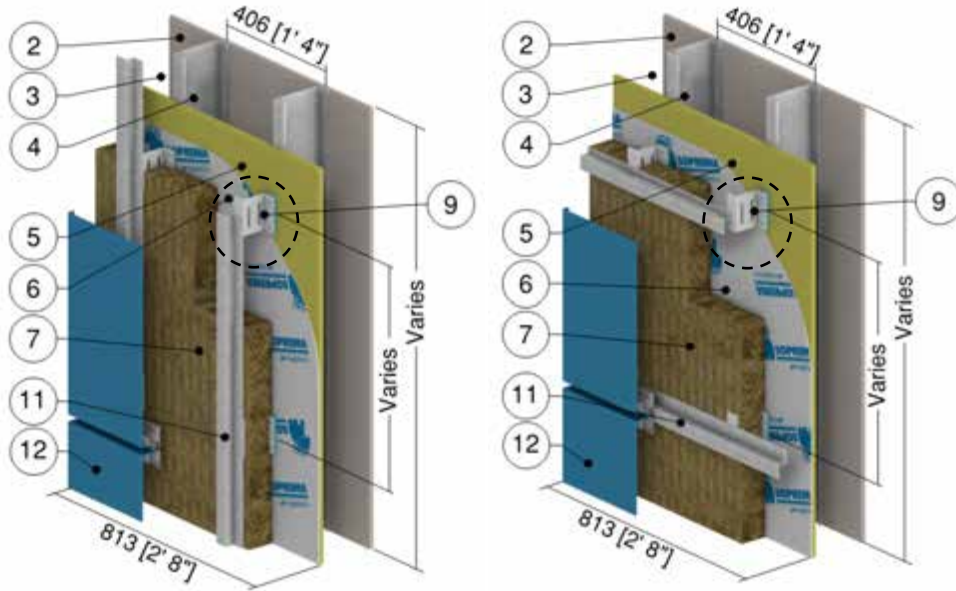
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	SOPREMA SOPRASEAL STICK 1100T membrane installed with SOPRASEAL STICK PRIMER	-	-	-	-	-
7	SOPRA-ISO V ALU Exterior Insulation	Varies	0.15 (0.022)	R-6.5 to R-39.0 (1.14 RSI to 6.87 RSI)	1.9 (30)	0.36 (1500)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

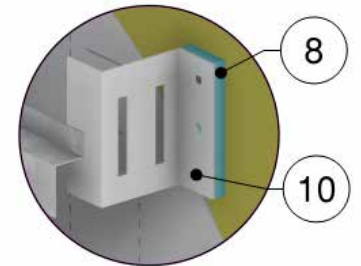
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.121

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Mineral Wool and ACS-S Thermal Clip Supporting Metal Cladding - Clear Wall



Vertical Girt: ACS Clip Detail



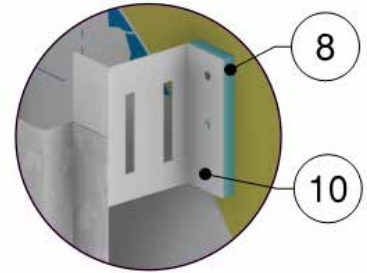
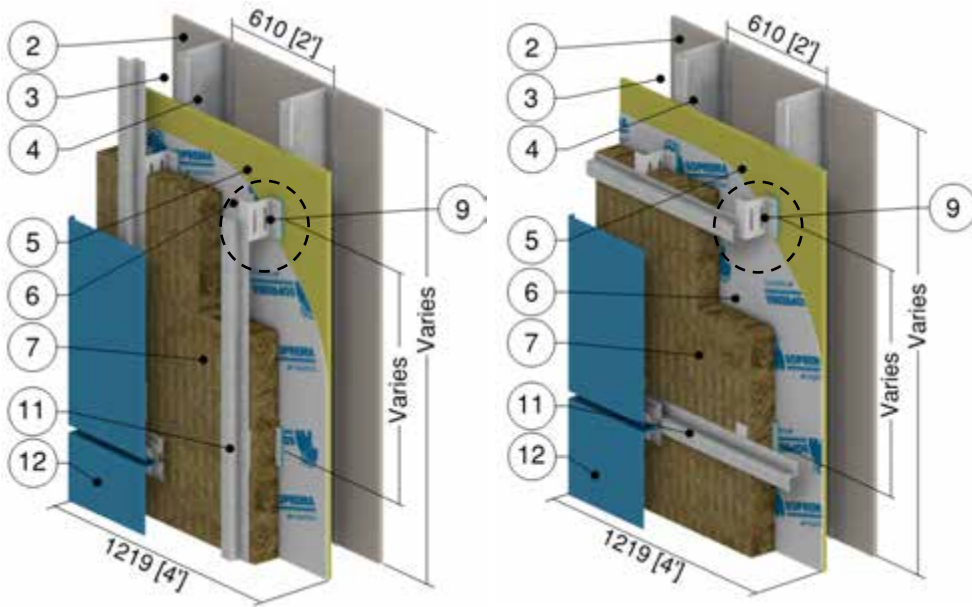
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	SOPREMA SOPRASEAL STICK 1100T membrane installed with SOPRASEAL STICK PRIMER	-	-	-	-	-
7	Exterior Mineral Wool Insulation	Varies	0.23 (0.034)	R-12.9 to R-34.4 (2.27 RSI to 6.06 RSI)	1.8 (28)	0.29 (1220)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

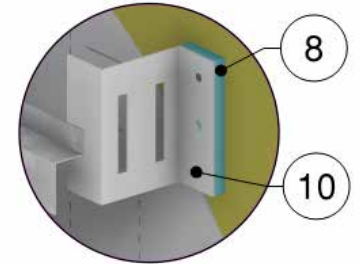
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.122

Exterior Insulated 6" x 1 5/8" Steel Stud (24" o.c.) Wall Assembly with Mineral Wool and ACS-S Thermal Clip Supporting Metal Cladding - Clear Wall



Vertical Girt: ACS Clip Detail



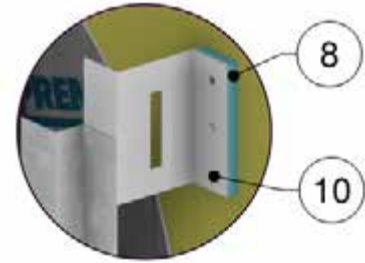
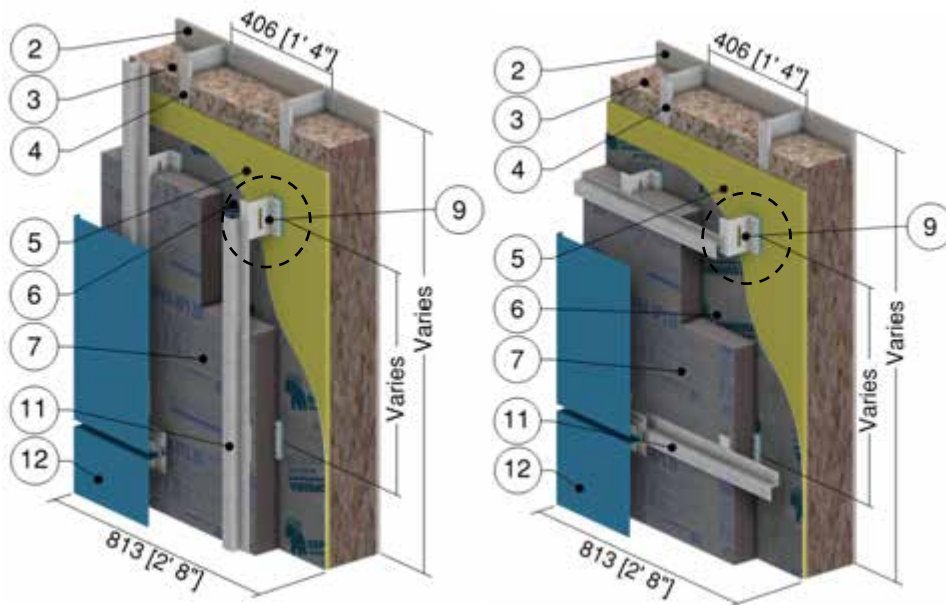
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	SOPREMA SOPRASEAL STICK 1100T membrane installed with SOPRASEAL STICK PRIMER	-	-	-	-	-
7	Exterior Mineral Wool Insulation	Varies	0.23 (0.034)	R-12.9 to R-34.4 (2.27 RSI to 6.06 RSI)	1.8 (28)	0.29 (1220)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

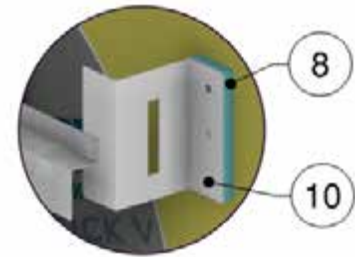
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.123

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with SOPREMA SOPRA-XPS 20 and ACS-S Thermal Clip Supporting Metal Cladding with R-20 Cellulose Insulation in Stud Cavity - Clear Wall



Vertical Girt: ACS Clip Detail



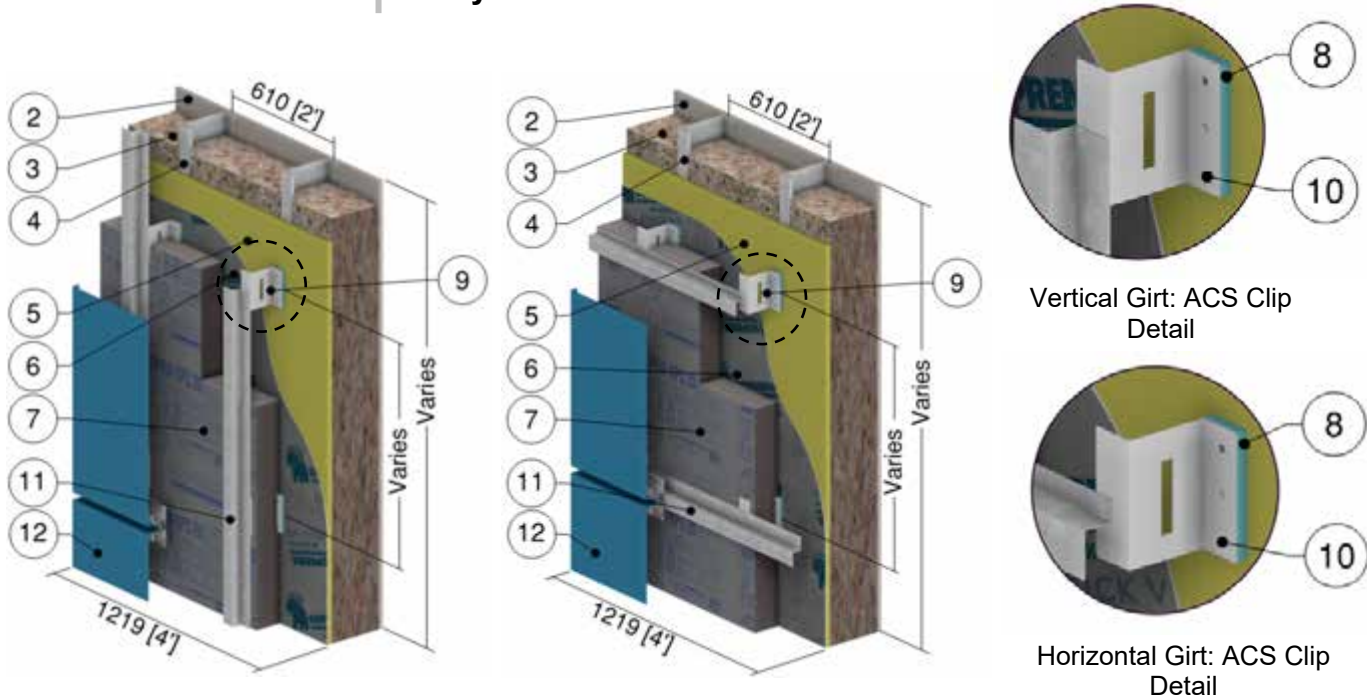
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	6" (152)	0.30 (0.043)	R-20.0 (3.52 RSI)	1.2 (19)	0.33 (1400)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	SOPRA-XPS 20 Exterior Insulation	Varies	0.20 (0.029)	R-5.0 to R-35.0 (0.88 RSI to 6.16 RSI)	2.5 (40)	0.29 (1220)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.124

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (24" o.c.) Wall Assembly with SOPREMA SOPRA-XPS 20 and ACS-S Thermal Clip Supporting Metal Cladding with R-20 Cellulose Insulation in Stud Cavity - Clear Wall

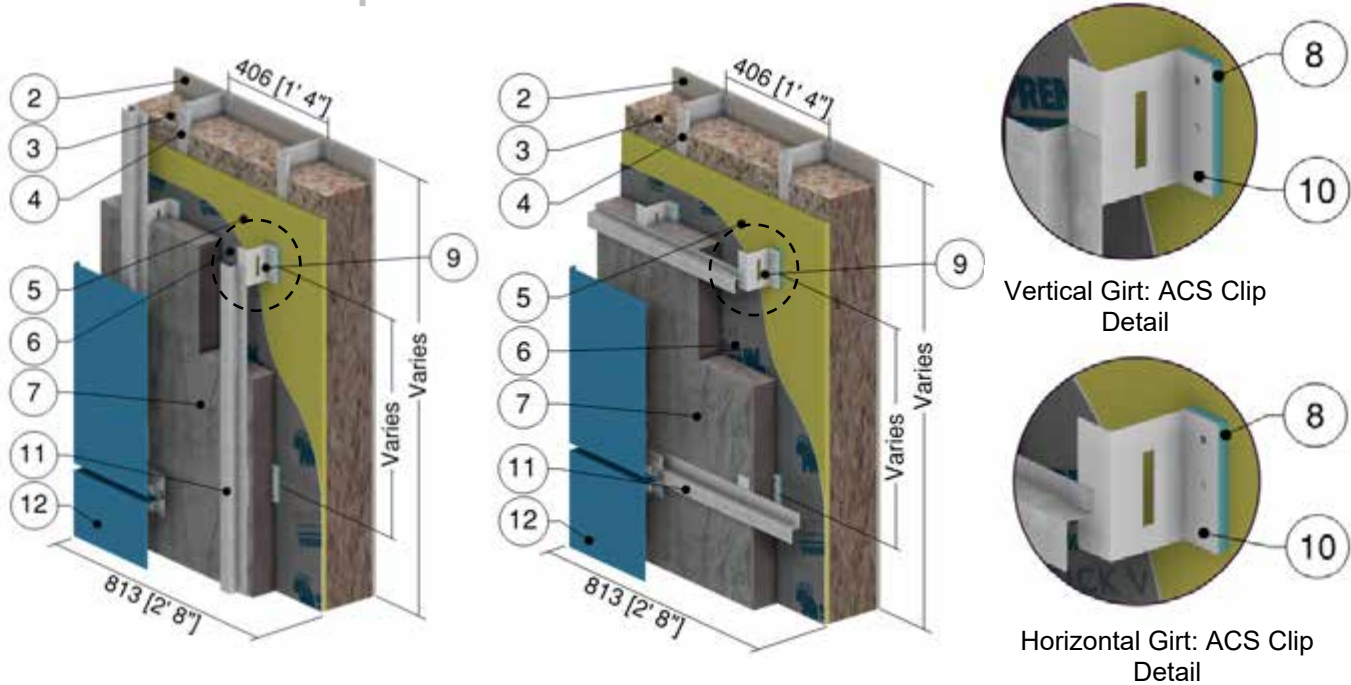


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	6" (152)	0.30 (0.043)	R-20.0 (3.52 RSI)	1.2 (19)	0.33 (1400)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	SOPRA-XPS 20 Exterior Insulation	Varies	0.20 (0.029)	R-5.0 to R-35.0 (0.88 RSI to 6.16 RSI)	2.5 (40)	0.29 (1220)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.125

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with SOPREMA SOPRA-SPF 202 and ACS-S Thermal Clip Supporting Metal Cladding with R-20 Cellulose Insulation in Stud Cavity - Clear Wall

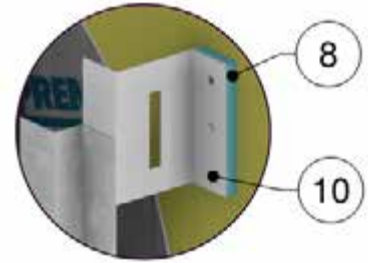
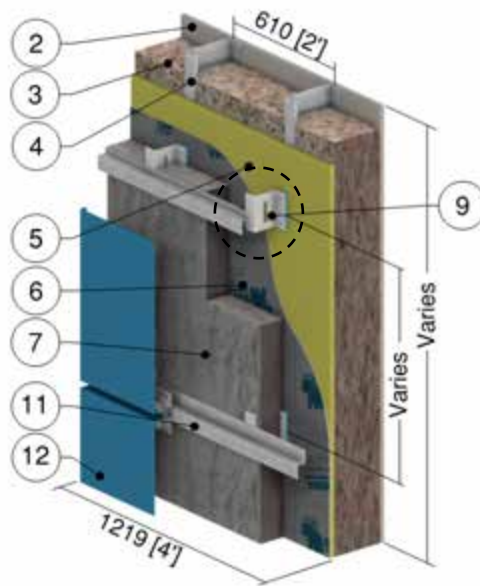
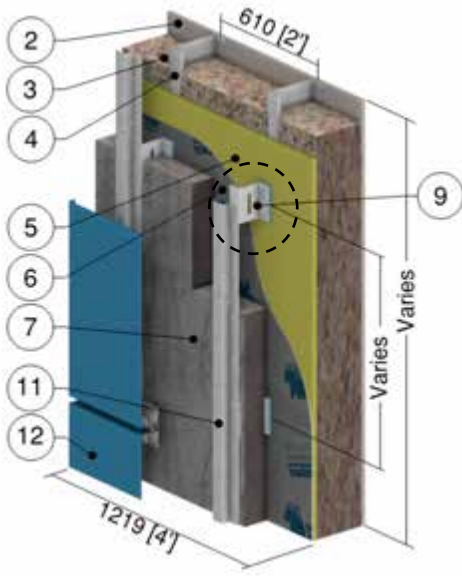


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	6" (152)	0.30 (0.043)	R-20.0 (3.52 RSI)	1.2 (19)	0.33 (1400)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	SOPRA-SPF 202 Exterior Insulation	Varies	0.16 (0.023)	R-6.2 to R-43.4 (1.09 RSI to 7.64 RSI)	1.8 (28)	0.29 (1220)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

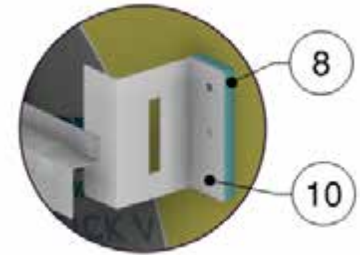
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.126

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (24" o.c.) Wall Assembly with SOPREMA SOPRA-SPF 202 and ACS-S Thermal Clip Supporting Metal Cladding with R-20 Cellulose Insulation in Stud Cavity - Clear Wall



Vertical Girt: ACS Clip Detail



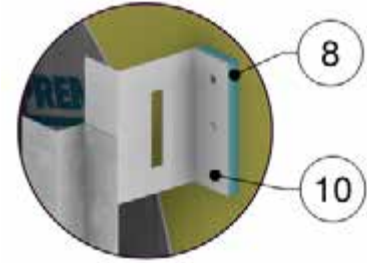
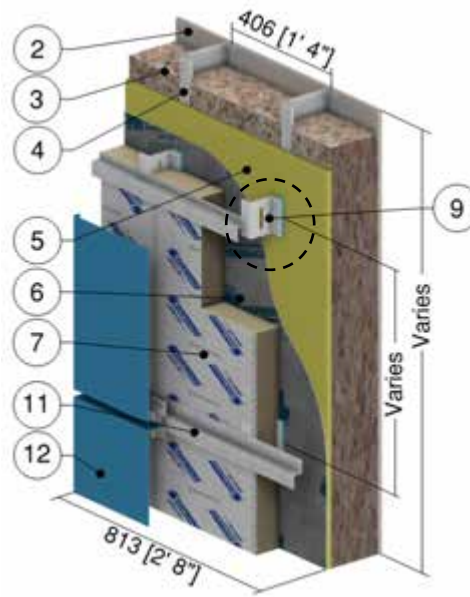
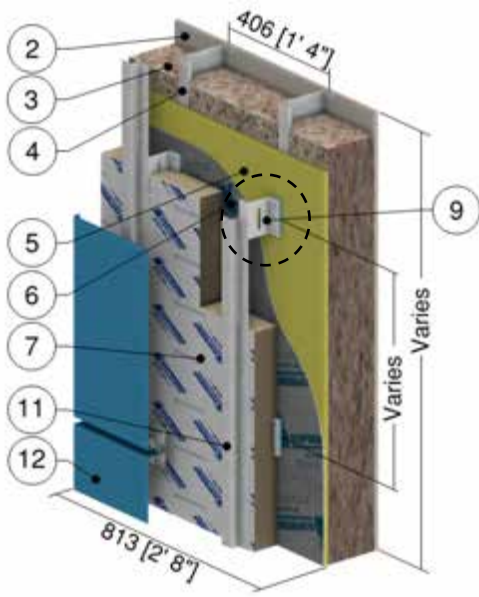
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	6" (152)	0.30 (0.043)	R-20.0 (3.52 RSI)	1.2 (19)	0.33 (1400)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	SOPRA-SPF 202 Exterior Insulation	Varies	0.16 (0.023)	R-6.2 to R-43.4 (1.09 RSI to 7.64 RSI)	1.8 (28)	0.29 (1220)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

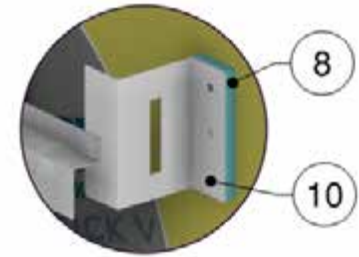
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.127

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with SOPREMA SOPRA-ISO V PLUS and ACS-S Thermal Clip Supporting Metal Cladding with R-20 Cellulose Insulation in Stud Cavity - Clear Wall



Vertical Girt: ACS Clip Detail



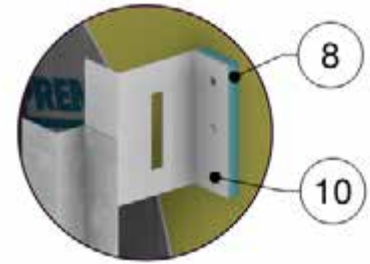
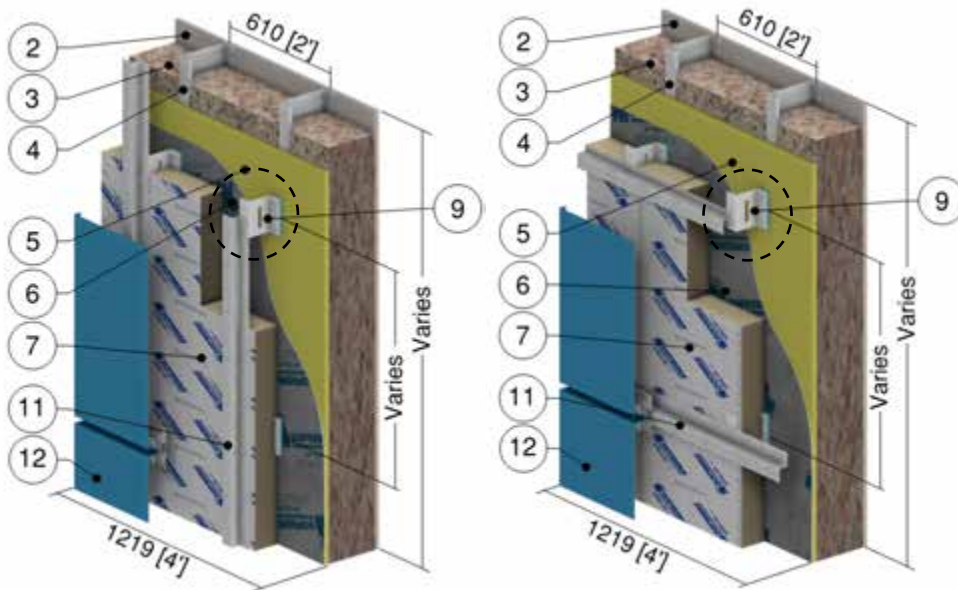
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	6" (152)	0.30 (0.043)	R-20.0 (3.52 RSI)	1.2 (19)	0.33 (1400)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	SOPRA-ISO V PLUS Exterior Insulation	Varies	0.17 (0.024)	R-6.0 to R-42.0 (1.06 RSI to 7.40 RSI)	1.9 (30)	0.36 (1500)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

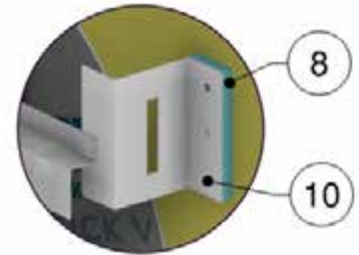
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.128

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (24" o.c.) Wall Assembly with SOPREMA SOPRA-ISO V PLUS and ACS-S Thermal Clip Supporting Metal Cladding with R-20 Cellulose Insulation in Stud Cavity - Clear Wall



Vertical Girt: ACS Clip Detail



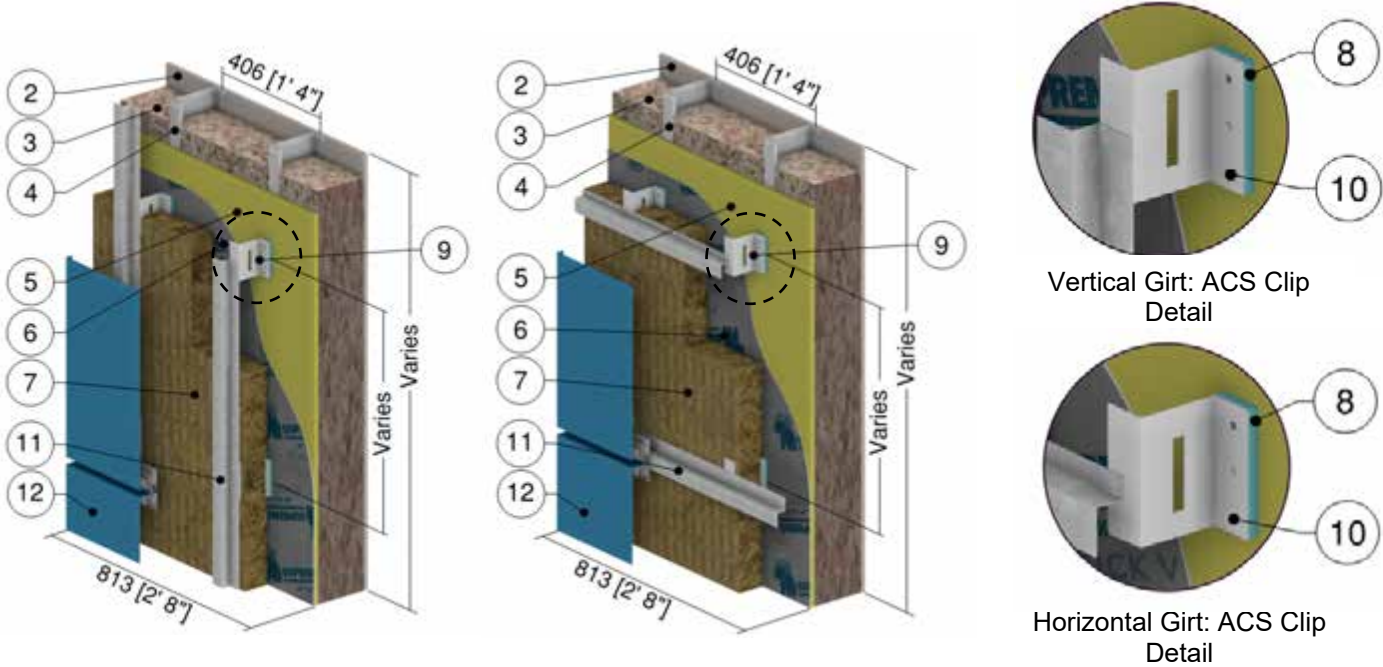
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	6" (152)	0.30 (0.043)	R-20.0 (3.52 RSI)	1.2 (19)	0.33 (1400)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	SOPRA-ISO V PLUS Exterior Insulation	Varies	0.17 (0.024)	R-6.0 to R-42.0 (1.06 RSI to 7.40 RSI)	1.9 (30)	0.36 (1500)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.129

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Mineral Wool and ACS-S Thermal Clip Supporting Metal Cladding with R-20 Cellulose Insulation in Stud Cavity - Clear Wall

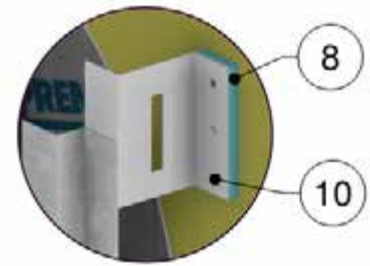
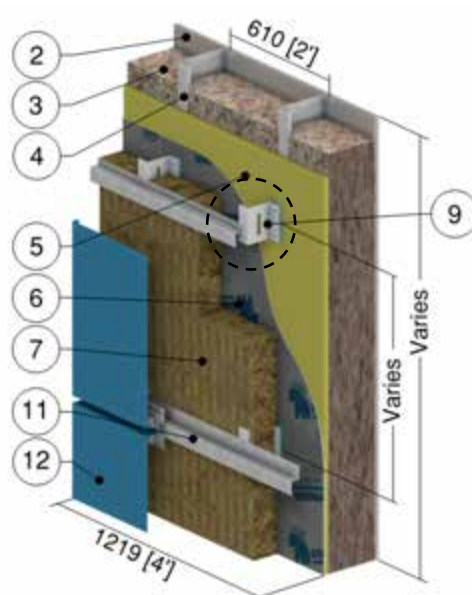
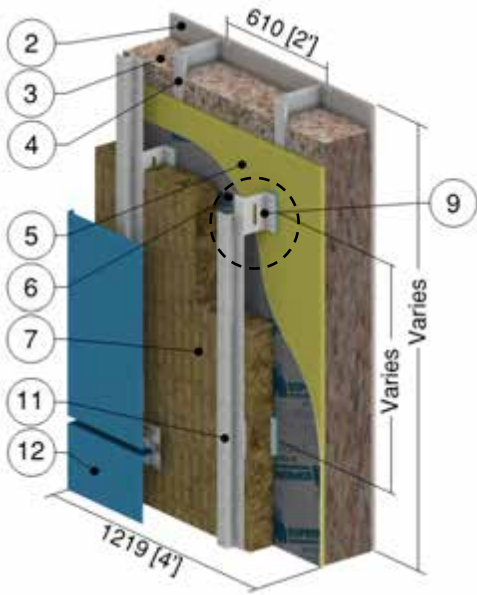


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	6" (152)	0.30 (0.043)	R-20.0 (3.52 RSI)	1.2 (19)	0.33 (1400)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	Exterior Mineral Wool Insulation	Varies	0.23 (0.034)	R-4.3 to R-34.4 (0.76 RSI to 6.06 RSI)	1.8 (28)	0.29 (1220)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

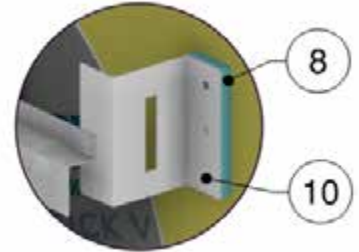
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.130

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (24" o.c.) Wall Assembly with Mineral Wool and ACS-S Thermal Clip Supporting Metal Cladding with R-20 Cellulose Insulation in Stud Cavity - Clear Wall



Vertical Girt: ACS Clip Detail



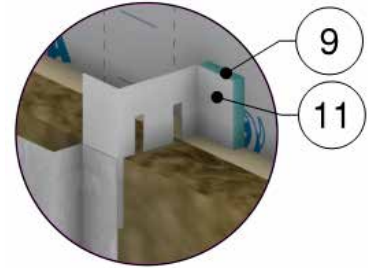
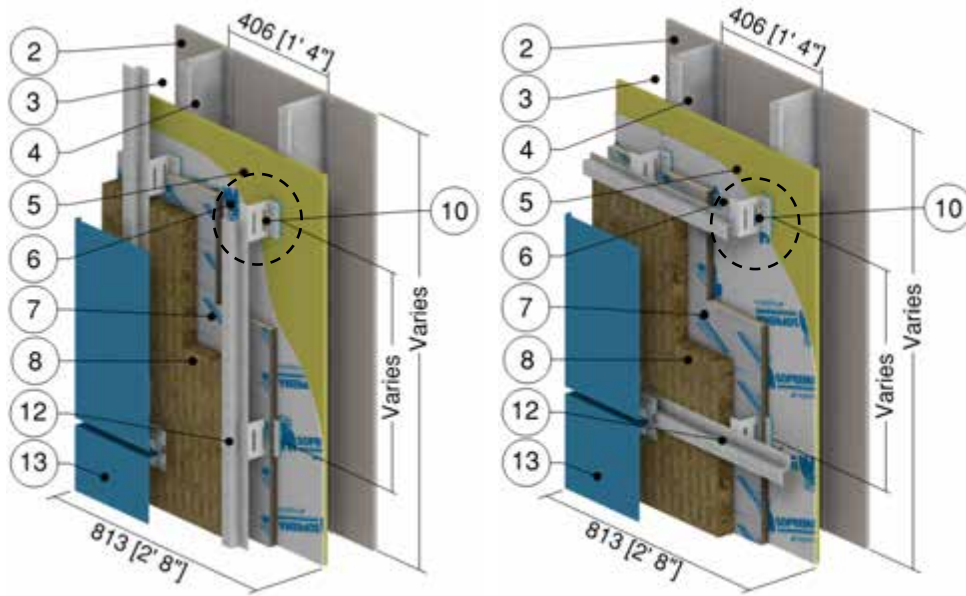
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	6" (152)	0.30 (0.043)	R-20.0 (3.52 RSI)	1.2 (19)	0.33 (1400)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	Exterior Mineral Wool Insulation	Varies	0.23 (0.034)	R-4.3 to R-34.4 (0.76 RSI to 6.06 RSI)	1.8 (28)	0.29 (1220)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

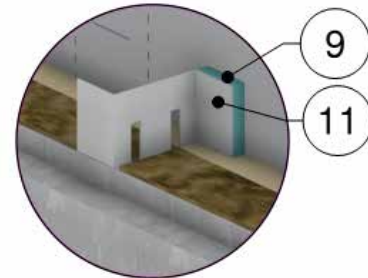
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.131

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Protected SOPREMA SOPRA-ISO V ALU and ACS-S Thermal Clip Supporting Metal Cladding - Clear Wall



Vertical Girt: ACS Clip Detail



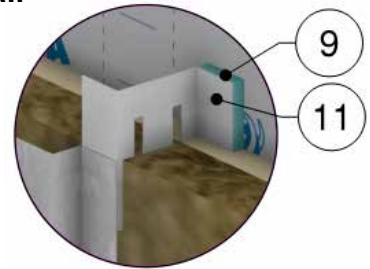
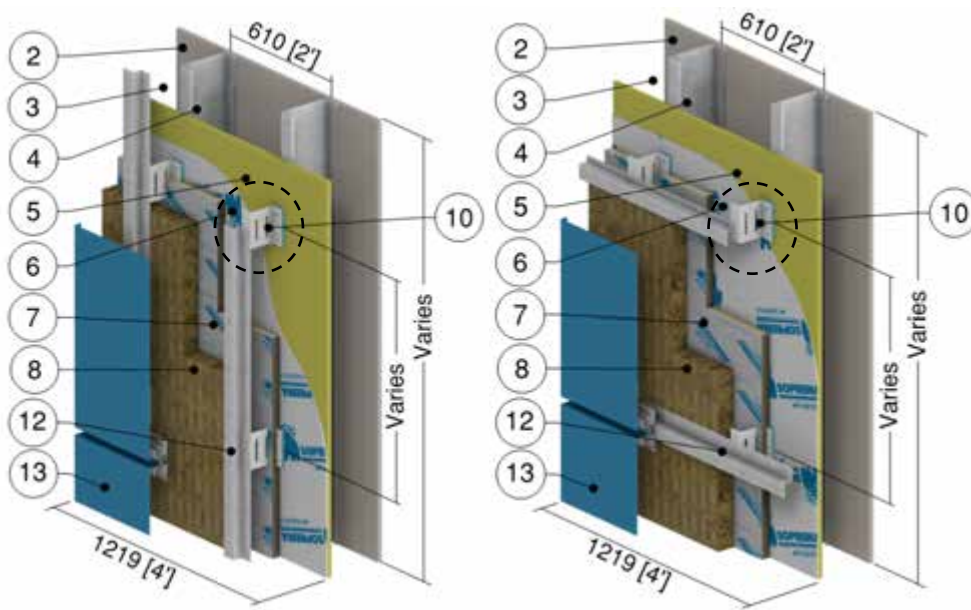
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	SOPREMA SOPRASEAL STICK 1100T membrane installed with SOPRASEAL STICK PRIMER	-	-	-	-	-
7	SOPRA-ISO V ALU Exterior Insulation	Varies	0.15 (0.022)	R-6.5 to R-39.0 (1.14 RSI to 6.87 RSI)	1.9 (30)	0.36 (1500)
8	Exterior Mineral Wool Insulation	2" (50)	0.23 (0.034)	R-8.6 (1.51 RSI)	1.8 (28)	0.29 (1220)
9	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
10	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
11	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
12	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
14	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

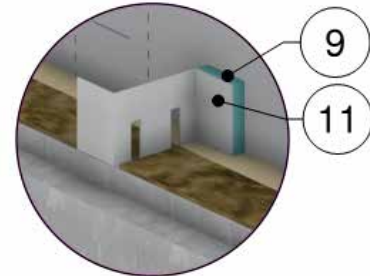
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.132

Exterior Insulated 6" x 1 5/8" Steel Stud (24" o.c.) Wall Assembly with Protected SOPREMA SOPRA-ISO V ALU and ACS-S Thermal Clip Supporting Metal Cladding - Clear Wall



Vertical Girt: ACS Clip Detail



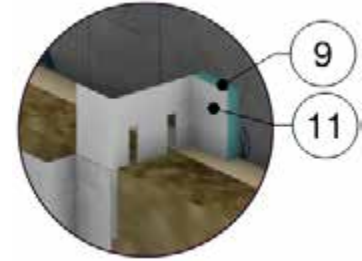
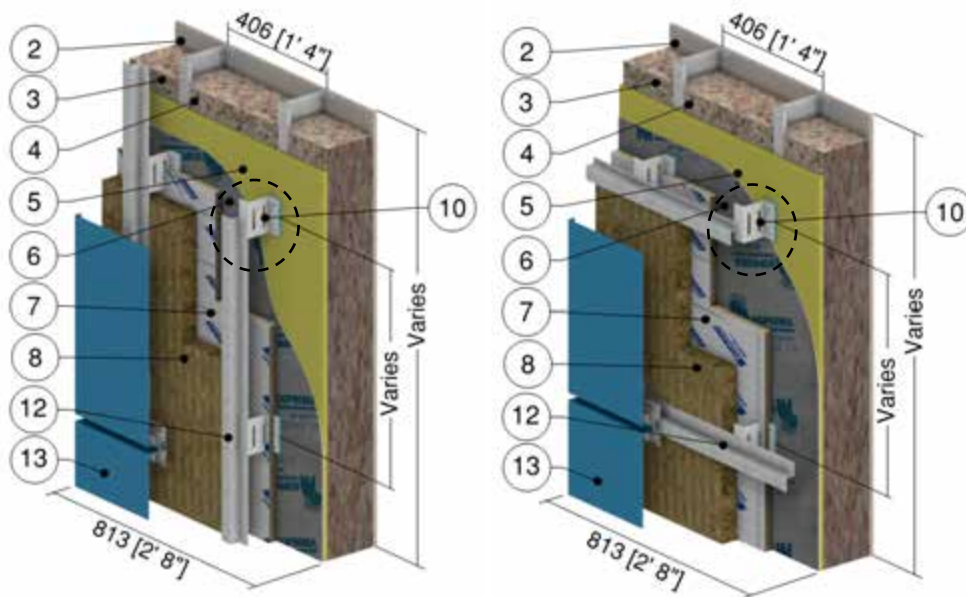
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	SOPREMA SOPRASEAL STICK 1100T membrane installed with SOPRASEAL STICK PRIMER	-	-	-	-	-
7	SOPRA-ISO V ALU Exterior Insulation	Varies	0.15 (0.022)	R-6.5 to R-39.0 (1.14 RSI to 6.87 RSI)	1.9 (30)	0.36 (1500)
8	Exterior Mineral Wool Insulation	2" (50)	0.23 (0.034)	R-8.6 (1.51 RSI)	1.8 (28)	0.29 (1220)
9	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
10	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
11	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
12	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
14	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

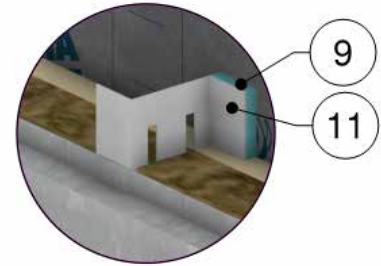
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.133

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Protected SOPREMA SOPRA-ISO V PLUS and ACS-S Thermal Clip Supporting Metal Cladding with R-20 Cellulose Insulation in Stud Cavity - Clear Wall



Vertical Girt: ACS Clip Detail



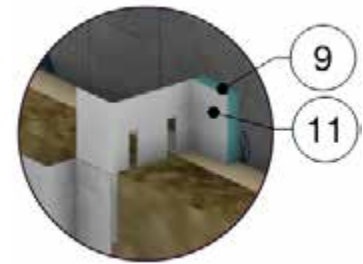
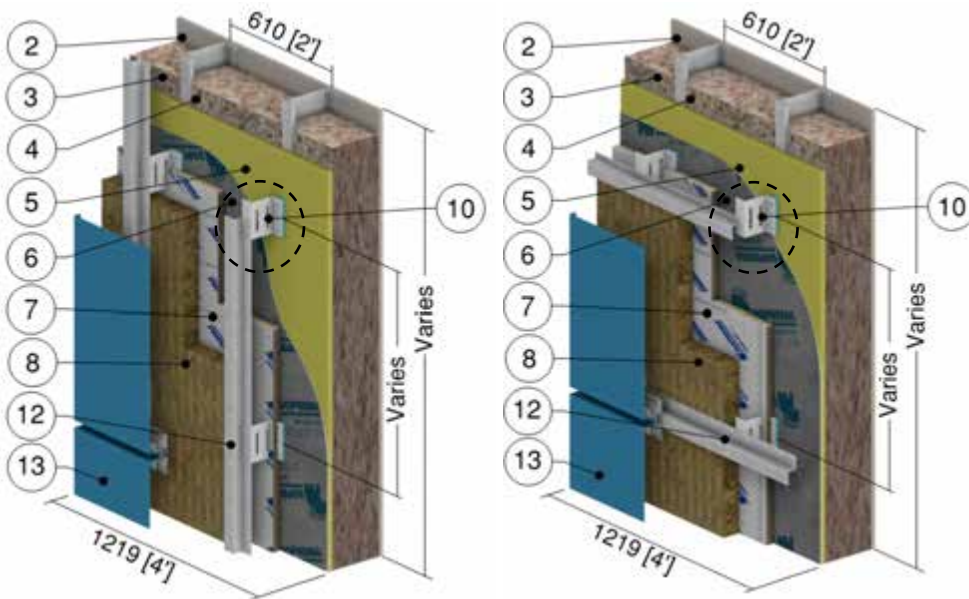
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	6" (152)	0.30 (0.043)	R-20.0 (3.52 RSI)	1.2 (19)	0.33 (1400)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	SOPRA-ISO V PLUS Exterior Insulation	Varies	0.17 (0.024)	R-6.0 to R-30.0 (1.06 RSI to 5.28 RSI)	1.9 (30)	0.36 (1500)
8	Exterior Mineral Wool Insulation	2" (50)	0.23 (0.034)	R-8.6 (1.51 RSI)	1.8 (28)	0.29 (1220)
9	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
10	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
11	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
12	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
14	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

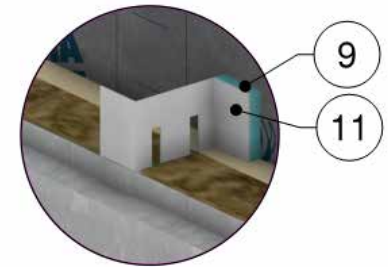
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.134

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (24" o.c.) Wall Assembly with Protected SOPREMA SOPRA-ISO V PLUS and ACS-S Thermal Clip Supporting Metal Cladding with R-20 Cellulose Insulation in Stud Cavity - Clear Wall



Vertical Girt: ACS Clip Detail



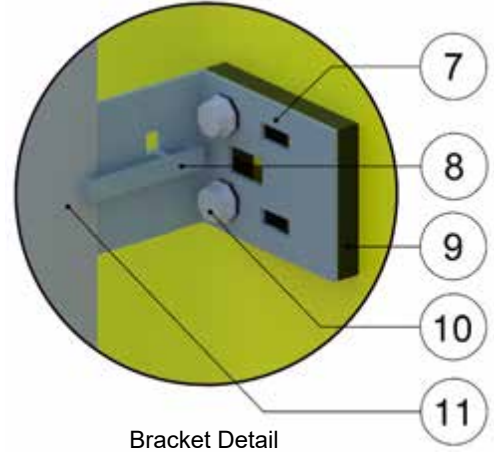
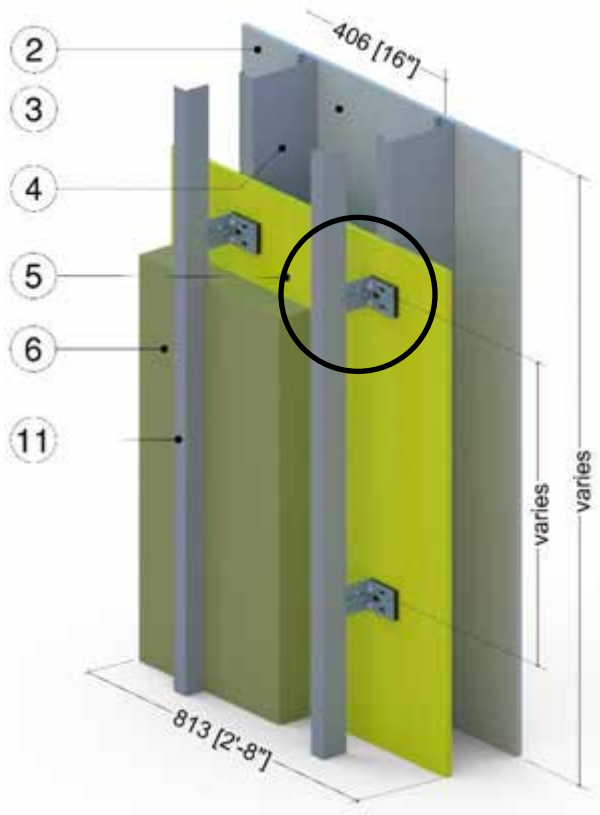
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	6" (152)	0.30 (0.043)	R-20.0 (3.52 RSI)	1.2 (19)	0.33 (1400)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	SOPRA-ISO V PLUS Exterior Insulation	Varies	0.17 (0.024)	R-6.0 to R-30.0 (1.06 RSI to 5.28 RSI)	1.9 (30)	0.36 (1500)
8	Exterior Mineral Wool Insulation	2" (50)	0.23 (0.034)	R-8.6 (1.51 RSI)	1.8 (28)	0.29 (1220)
9	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
10	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
11	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
12	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
14	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.135

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with U-Kon ND-062 Brackets and Vertical Rail System Supporting Metal Cladding - Clear Wall



Exterior Insulation Thickness for Bracket Sizes

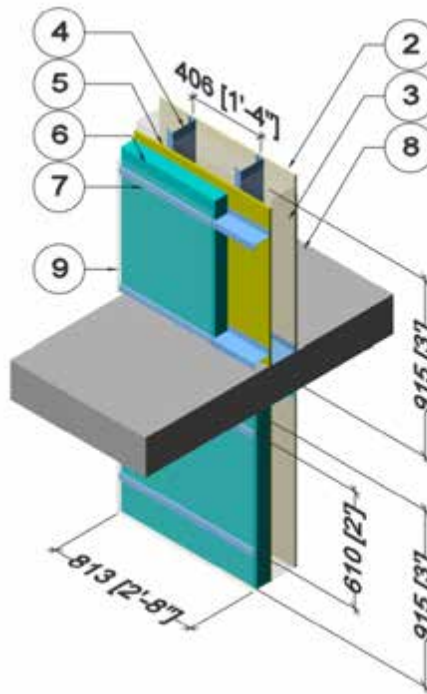
Bracket Size	Exterior Insulation Thickness in (mm)
80	3 (76)
100	4 (102)
120	5 (127)
150	6 (152)
250	10 (254)

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-12.6 to R-42.0 (2.22 to 7.40 RSI)	4 (64)	0.20 (850)
7	U-Kon ND-062 Bracket	14 Gauge	118 (17)	-	499 (8000)	0.12 (500)
8	U-Kon Bracket to Rail Thumb	18 Gauge	430 (147)	-	-	-
9	Thermal Isolator	3/8" (10)	0.11 (0.12)	-	-	-
10	Fastener	3/8" (10) Ø	118 (17)	-	499 (8000)	0.12 (500)
11	Vertical Rail	18 Gauge	430 (147)	-	-	-
12	Cladding with vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.1

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding – Intermediate Floor Intersection

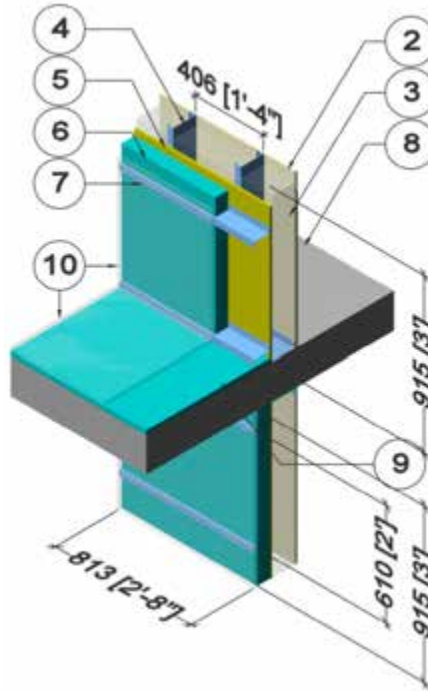


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 to 4.4 RSI)	1.8 (28)	0.29 (1220)
7	Horizontal Z-Girts w/ 1 1/2" Flange	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Metal cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.2

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding – Intermediate Floor Intersection with Top Side Insulation



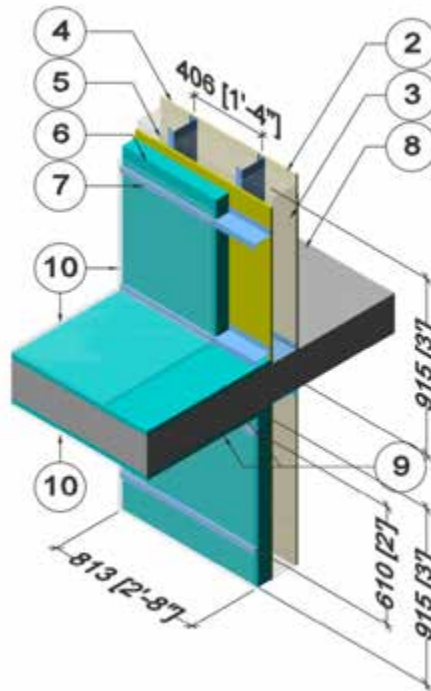
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
7	Horizontal Z-Girts w/ 1 1/2" Flange	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Concrete Slab	8" (203)	12 (1.8)	-	140 (2250)	0.20 (850)
9	Exterior Balcony Insulation ²	1" (25)	-	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
10	Metal cladding/flashing/ finished soffit/pavers with vented air space is incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² Exterior Balcony Insulation Length varies at 0" (0mm), 7 7/8" (200mm), 15 3/4" (400mm), 31 1/2" (800mm) from wall

Detail 5.2.3

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding – Intermediate Floor Intersection with Top & Under Side Insulation



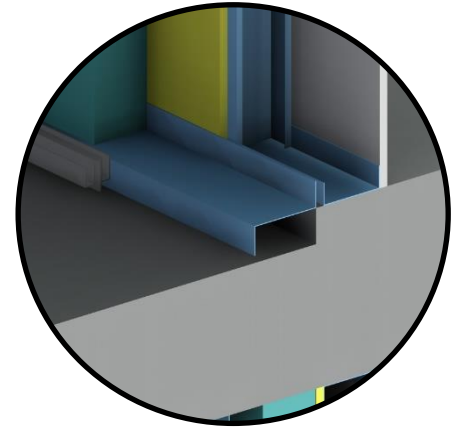
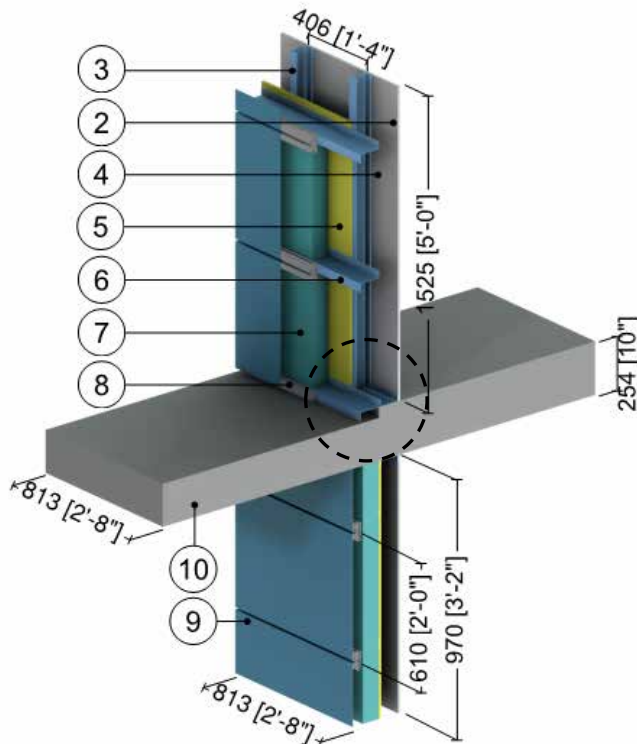
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
7	Horizontal Z-Girts w/ 1 1/2" Flange	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Exterior Balcony & Soffit Insulation ²	1" (25)	-	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
10	Metal cladding/finishing/ soffit/pavers with vented air space is incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² Exterior Balcony Insulation Length varies at 0" (0mm), 7 7/8" (200mm), 15 3/4" (400mm), 31 1/2" (800mm) from wall

Detail 5.2.4

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding – Uninsulated Intermediate Floor Intersection with Uninsulated Curb



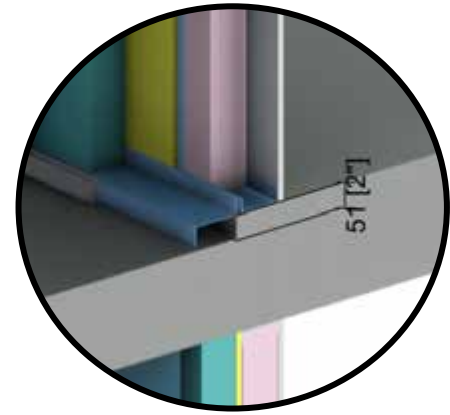
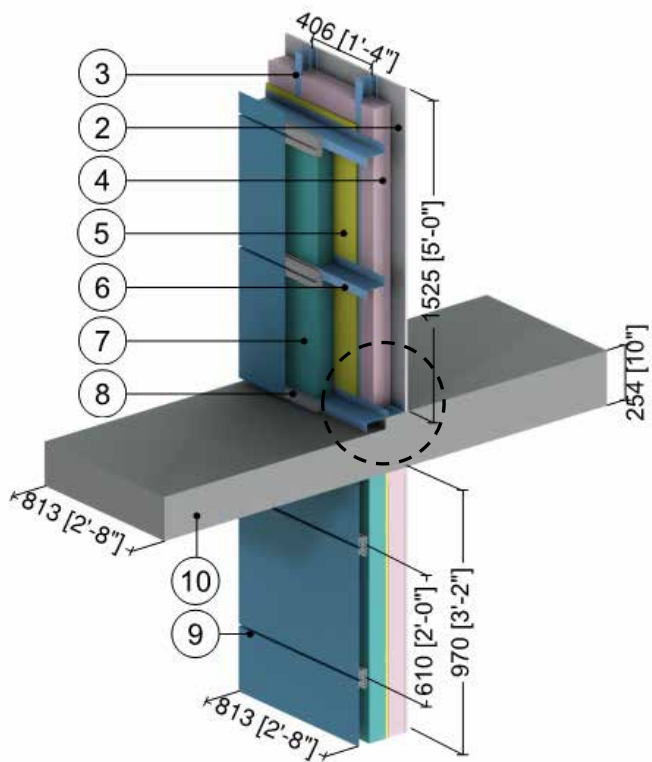
Balcony Stepdown Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-Girt with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Panel Clip	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	Concrete Slab	8" (204)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.5

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Uninsulated Intermediate Floor Intersection with Uninsulated Curb



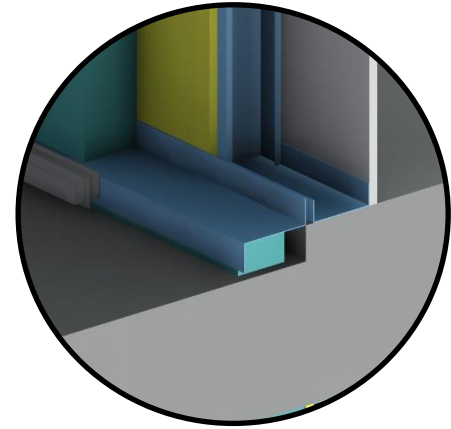
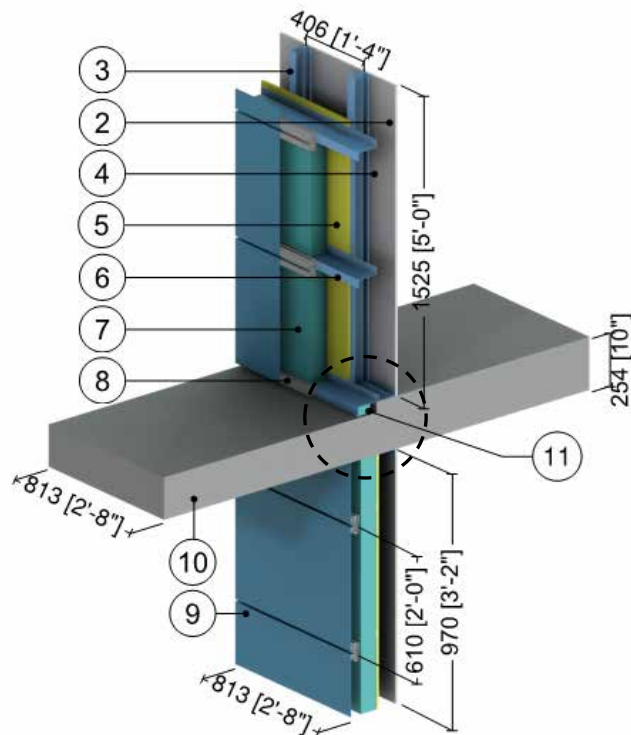
Balcony Stepdown Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12 (2.11 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-Girt with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Panel Clip	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	Concrete Slab	8" (204)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.6

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding – Uninsulated Intermediate Floor Intersection with Insulated Curb



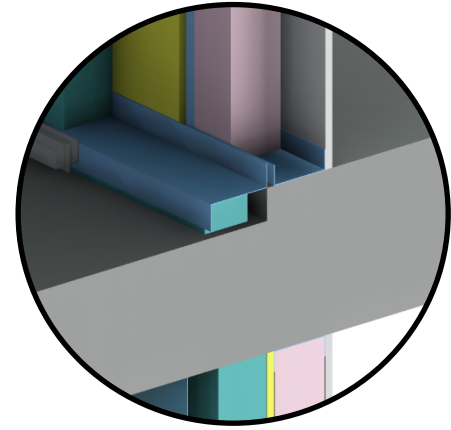
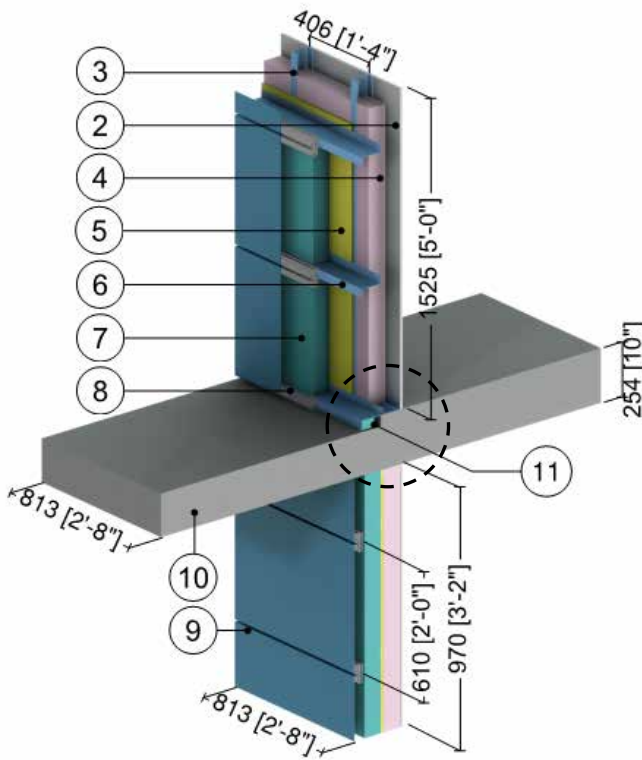
Balcony Stepdown Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-Girt with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Panel Clip	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	Concrete Slab	8" (204)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Curb Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
12	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.7

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Uninsulated Intermediate Floor Intersection with Insulated Curb



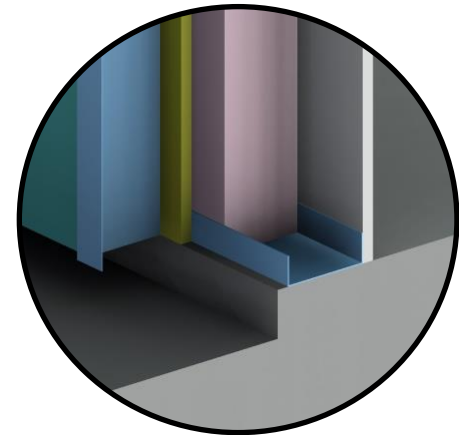
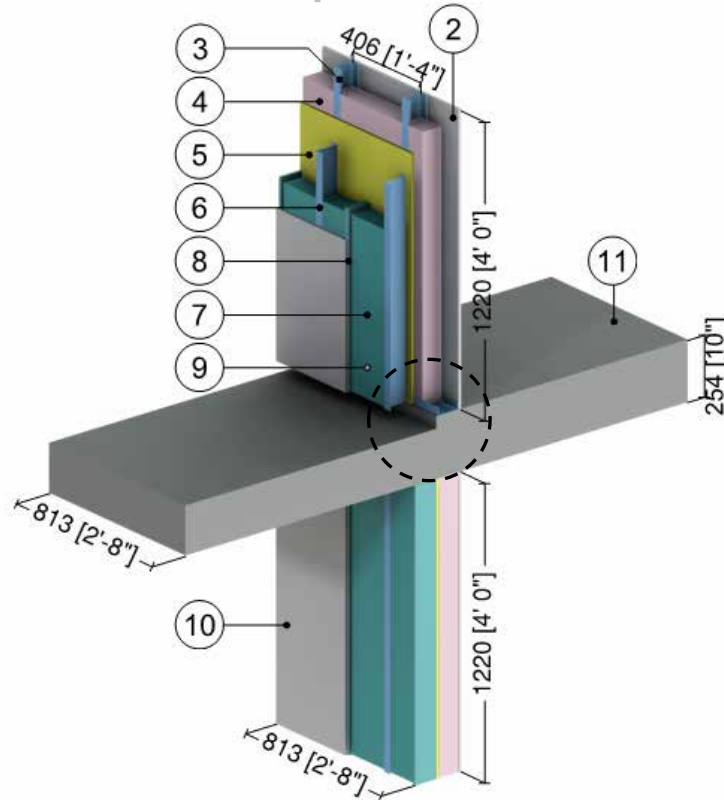
Balcony Stepdown Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12.0 (2.11 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-Girt with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Panel Clip	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	Concrete Slab	8" (204)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Curb Insulation	-	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
12	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.8

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Vertical Z Girts (16" o.c.) Supporting Stucco Cladding and R-12 Batt Insulation in Stud Cavity – Uninsulated Intermediate Floor Intersection



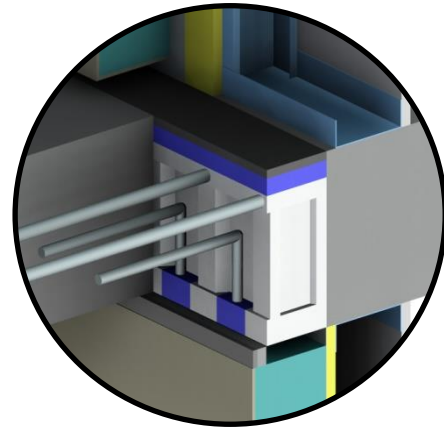
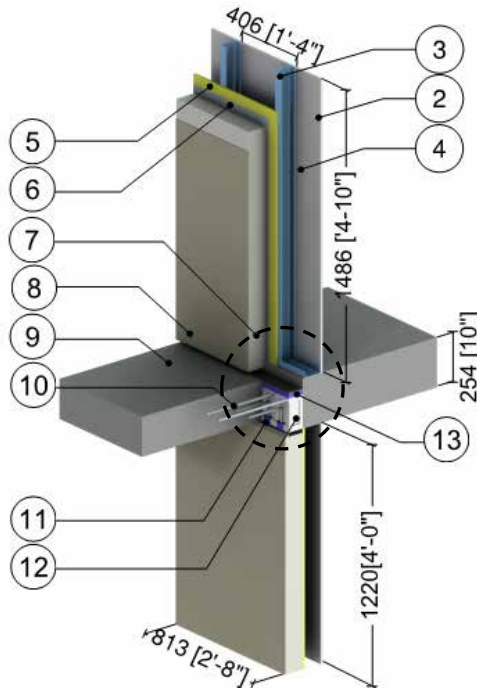
Balcony Stepdown Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Vertical Z-Girts with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	Varies	-	R-10 to R-15 (1.76 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
8	Rigid Insulation Bracing	Varies	0.2 (0.29)	-	1.8 (28)	0.29 (1220)
9	Rainscreen Cavity	1/2" (13)	-	R-0.5 (0.09 RSI)	0.075 (1.2)	0.24 (1000)
10	Stucco Cement with Breather Board	1/2" (13)	6 (0.9)	R-0.1 (0.01 RSI)	120 (1922)	0.20 (850)
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.9

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Isokorb CM20 Thermally Broken Slab Projection without Concrete Curb



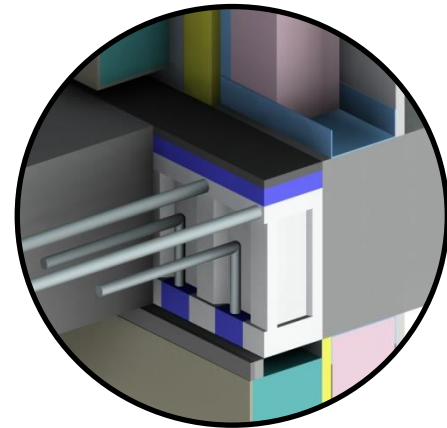
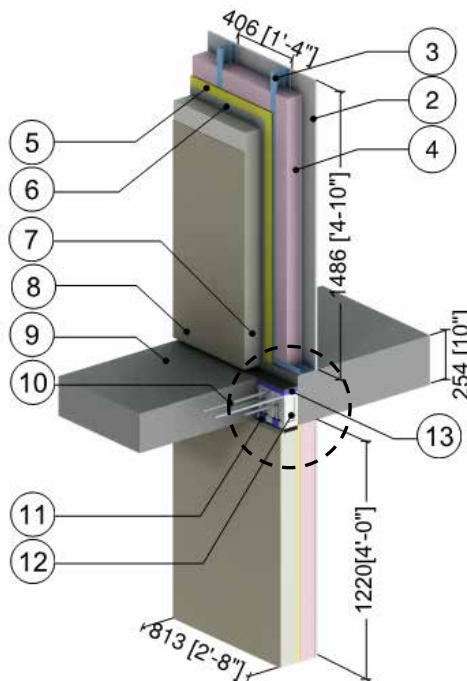
Thermally Broken Slab Detail
(Isokorb CM20)

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Weather Resistant Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	4" (100)	0.27 (0.039)	R-14.6 (2.56 RSI)	1.0 (16)	0.35 (1470)
8	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
11	HDPE Plastic Sleeve	-	1.7 (0.25)	-	59 (950)	0.48 (2000)
	UHPC Concrete Mix	-	5.5 (0.80)	-	140 (2250)	0.20 (850)
12	Polystyrene Hard Foam Insulation	3 1/8" (80)	0.217 (0.031)	R-14.7 (2.58 RSI)	66 (1060)	0.35 (1500)
13	Cement Board	1/2" (13)	1.7 (0.25)	-	72 (1150)	0.20 (850)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.10

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly with R-12 Batt Insulation in Stud Cavity – Isokorb CM20 Thermally Broken Slab Projection without Concrete Curb



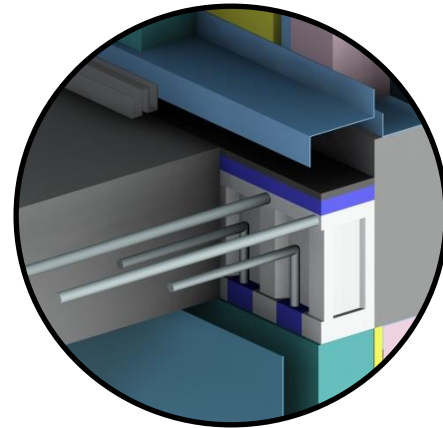
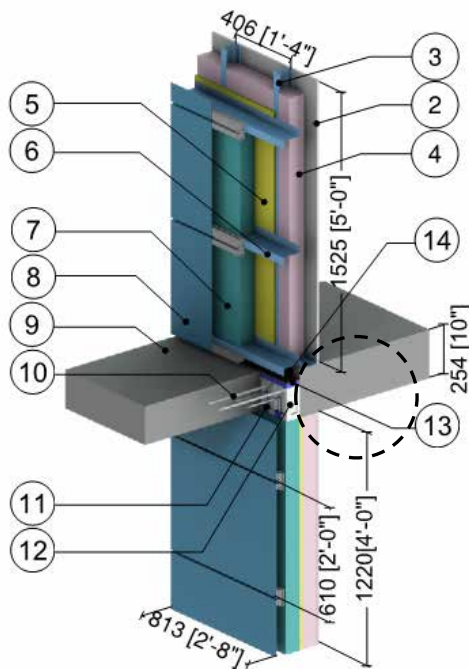
Thermally Broken Slab Detail
(Isokorb CM20)

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fibreglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12.0 (2.10 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	4" (100)	0.27 (0.039)	R-14.6 (2.56 RSI)	1.0 (16)	0.35 (1470)
8	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
11	HDPE Plastic Sleeve	-	1.7 (0.25)	-	59 (950)	0.48 (2000)
	UHPC Concrete Mix	-	5.5 (0.80)	-	140 (2250)	0.20 (850)
12	Polystyrene Hard Foam Insulation	3 1/8" (80)	0.217 (0.031)	R-14.7 (2.58 RSI)	66 (1060)	0.35 (1500)
13	Cement Board	1/2" (13)	1.7 (0.25)	-	72 (1150)	0.20 (850)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.11

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Isokorb CM20 Thermally Broken Slab Projection with Uninsulated Curb



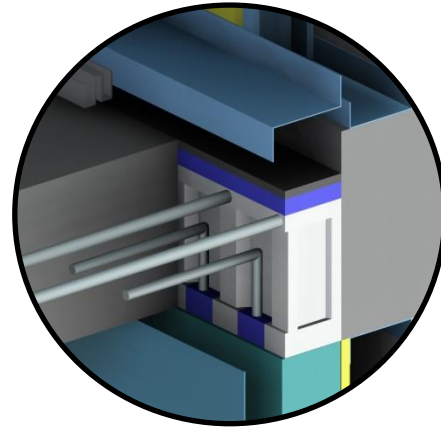
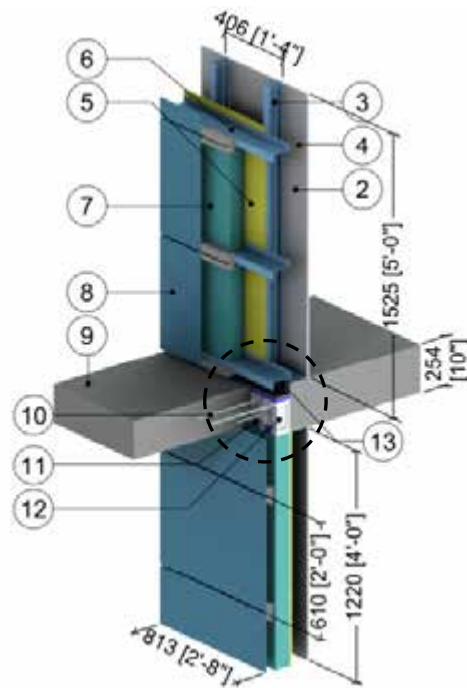
Thermally Broken Slab Detail
(Isokorb CM20)

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fibreglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12.0 (2.11 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	-	R-15.0 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
11	HDPE Plastic Sleeve	-	1.7 (0.25)	-	59 (950)	0.48 (2000)
	UHPC Concrete Mix	-	5.5 (0.80)	-	140 (2250)	0.20 (850)
12	Polystyrene Hard Foam Insulation	3 1/8" (80)	0.2 (0.031)	R-14.7 (2.58 RSI)	66 (1060)	0.35 (1500)
13	Cement Board	1/2" (13)	1.7 (0.25)	-	72 (1150)	0.20 (850)
14	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.12

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding – Isokorb CM20 Thermally Broken Slab Projection with Uninsulated Curb



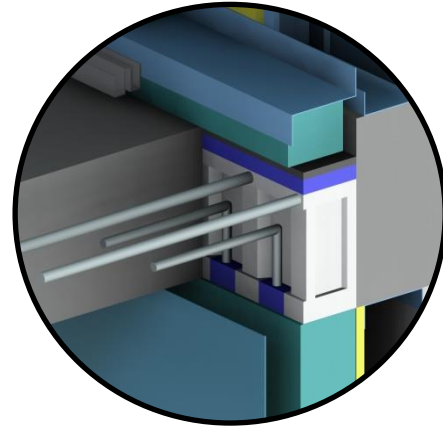
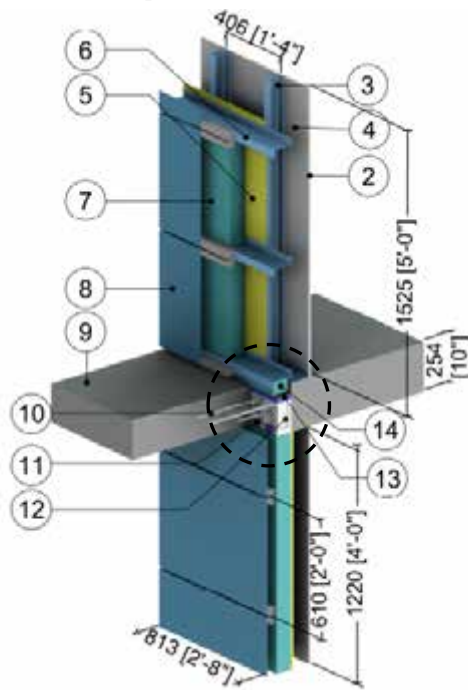
Thermally Broken Slab Detail
(Isokorb CM20)

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	-	R-15.0 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
11	HDPE Plastic Sleeve	-	1.7 (0.25)	-	59 (950)	0.48 (2000)
	UHPC Concrete Mix	-	5.5 (0.80)	-	140 (2250)	0.20 (850)
12	Polystyrene Hard Foam Insulation	3" (76)	0.217 (0.031)	R-14.7 (2.58 RSI)	66 (1060)	0.35 (1500)
13	Cement Board	1/2" (13)	1.7 (0.25)	-	72 (1150)	0.20 (850)
14	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.13

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding – Isokorb CM20 Thermally Broken Slab Projection with Insulated Curb



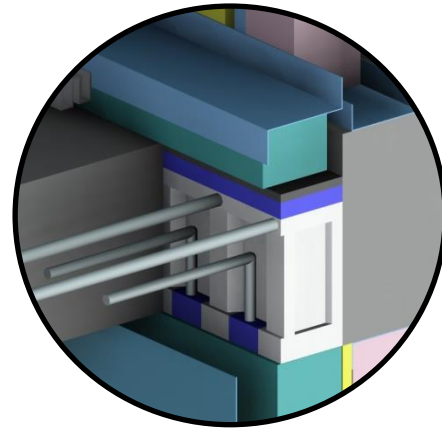
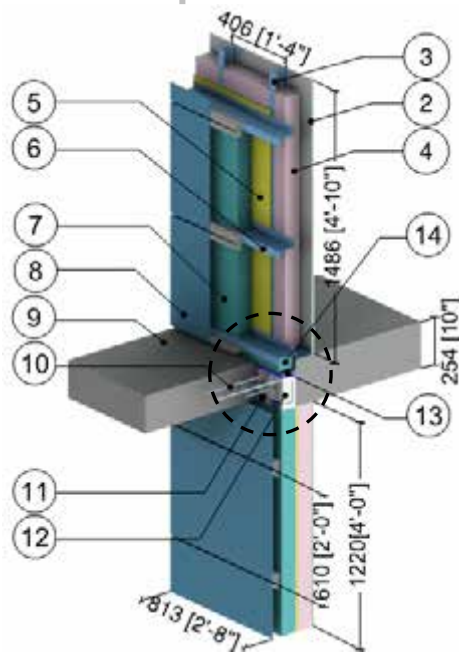
Thermally Broken Slab Detail
(Isokorb CM20)

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	-	R-15.0 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
11	HDPE Plastic Sleeve	-	1.7 (0.25)	-	59 (950)	0.48 (2000)
	UHPC Concrete Mix	-	5.5 (0.80)	-	140 (2250)	0.20 (850)
12	Polystyrene Hard Foam Insulation	3 1/8" (80)	0.217 (0.031)	R-14.7 (2.58 RSI)	66 (1060)	0.35 (1500)
13	Cement Board	1/2" (13)	1.7 (0.25)	-	72 (1150)	0.20 (850)
14	Curb Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
15	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.14

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Isokorb CM20 Thermally Broken Slab Projection with Insulated Curb



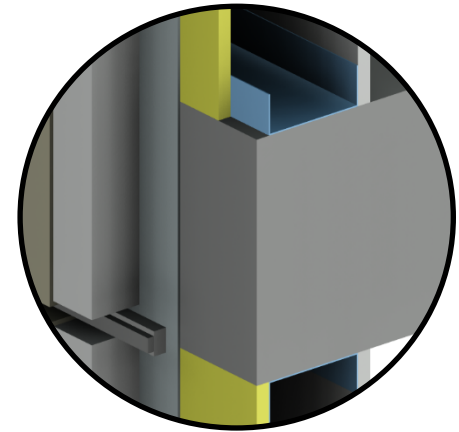
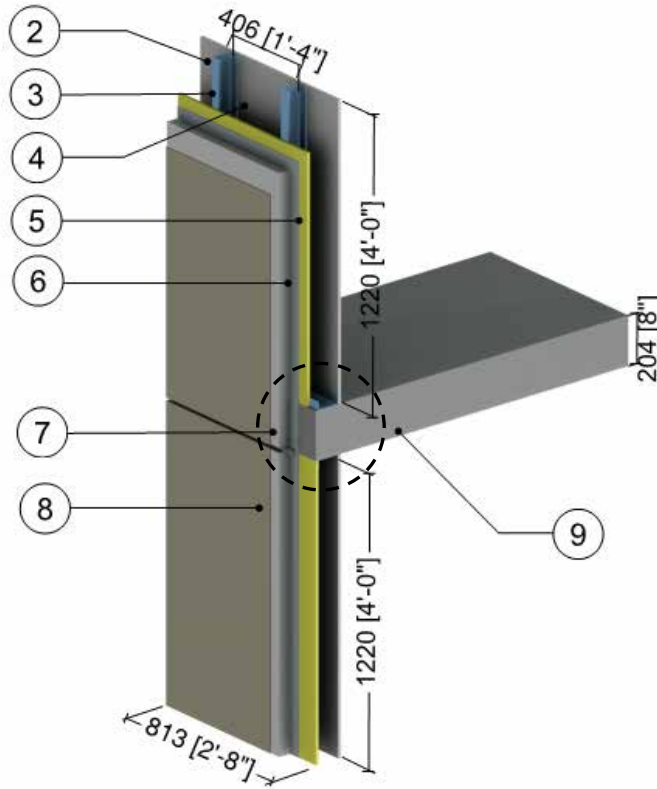
Thermally Broken Slab Detail
(Isokorb CM20)

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fibreglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12.0 (2.11 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
11	HDPE Plastic Sleeve	-	1.7 (0.25)	-	59 (950)	0.48 (2000)
	UHPC Concrete Mix	-	5.5 (0.80)	-	140 (2250)	0.20 (850)
12	Polystyrene Hard Foam Insulation	3 1/8" (80)	0.217 (0.031)	R-14.7 (2.58 RSI)	66 (1060)	0.35 (1500)
13	Cement Board	1/2" (13)	1.7 (0.25)	-	72 (1150)	0.20 (850)
14	Curb Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
15	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.15

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Intermediate Floor Intersection



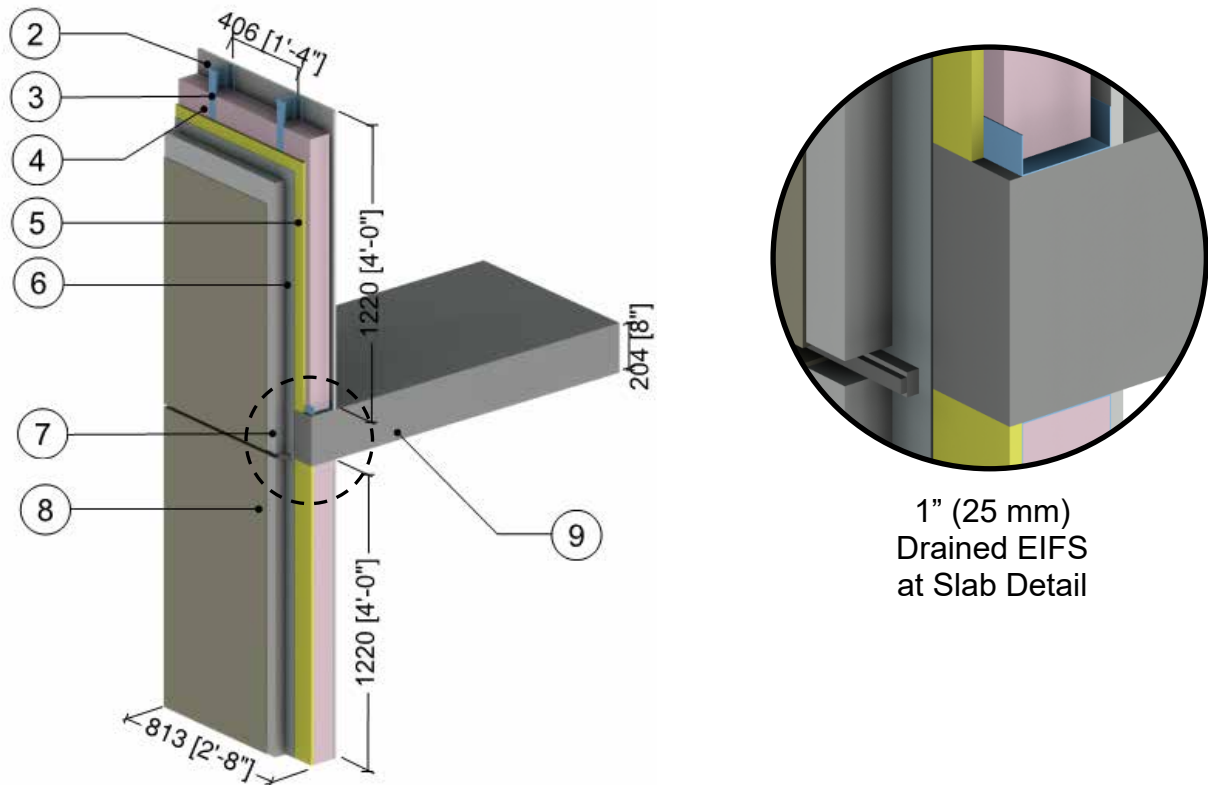
1" (25 mm)
Drained EIFS
at Slab Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	2" to 4" (50 to 100)	0.27 (0.039)	R-7.5 to R-15 (1.32 RSI to 2.64 RSI)	1 (16)	0.35 (1470)
8	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.16

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly with R-12 Batt Insulation in Stud Cavity – Intermediate Floor Intersection

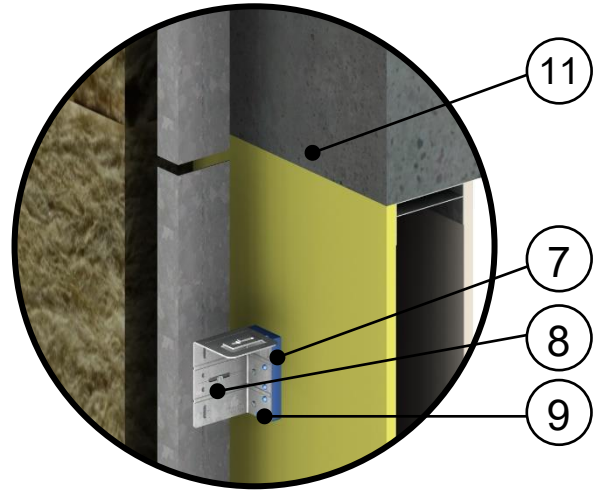
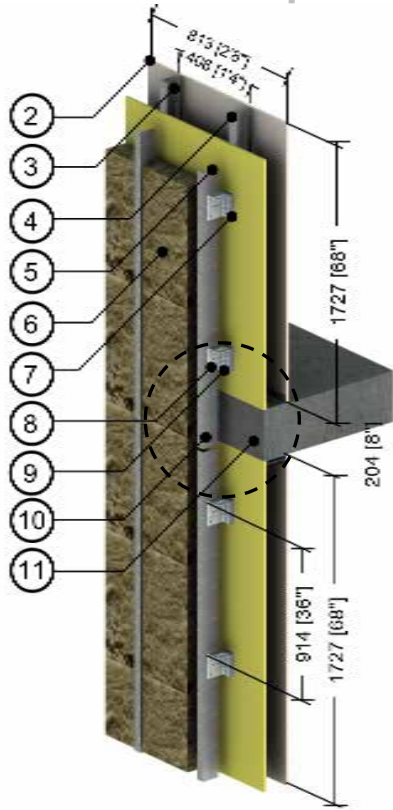


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 3 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12.0 (2.1 RSI)	0.9 (1.1)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	2" to 4" (50 to 100)	0.27 (0.039)	R-7.5 to R-15 (1.32 RSI to 2.64 RSI)	1 (16)	0.35 (1470)
8	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
9	Concrete Slab	8" (203)	12 (1.8)	-	140 (2250)	0.20 (850)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.17

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Broken ISO Clip System Supporting Vertical Sub-girts – Intermediate Concrete Floor Intersection



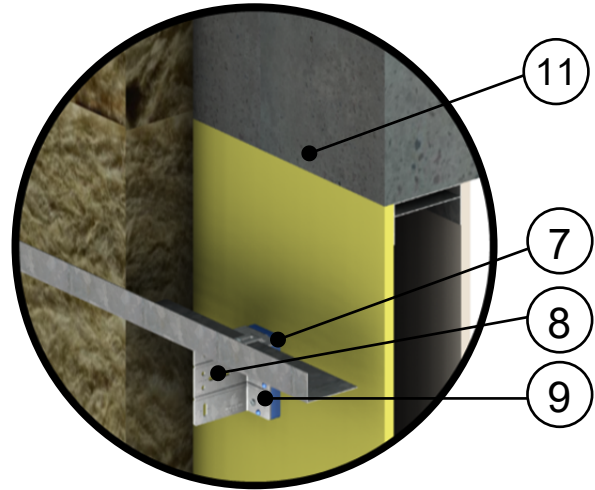
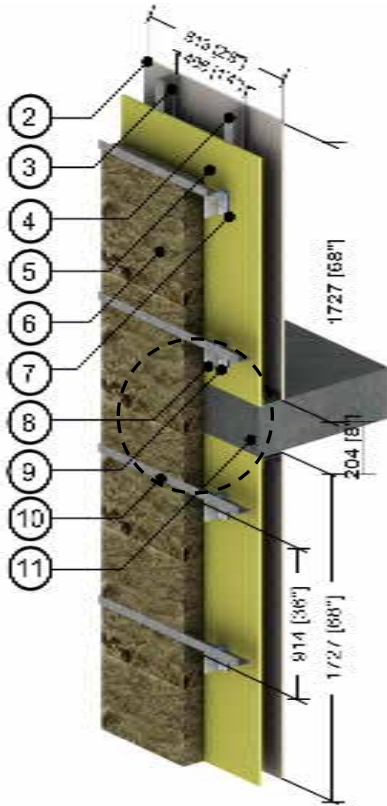
Concrete Floor Intersection

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	4" to 6" (102 to 152)	0.24 (0.034)	R-16.8 to R-25.2 (2.96 RSI to 4.44 RSI)	4 (64)	0.20 (850)
7	ISO Clip - HDPE Isolator	1/2" (12.7)	3.1 (0.45)	-	-	-
8	ISO Clip - Galvanized Metal	14 gauge	430 (62)	-	489 (7830)	0.12 (500)
9	#14 Steel Fasteners	1/4" (6) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	Vertical Sub-girt	16 gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.18

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Broken ISO Clip System Supporting Horizontal Sub-girts – Intermediate Concrete Floor Intersection



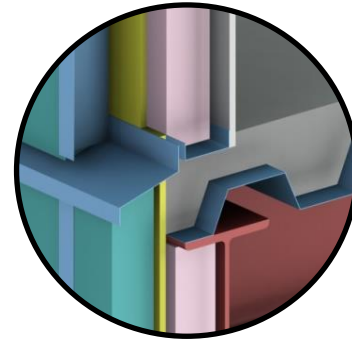
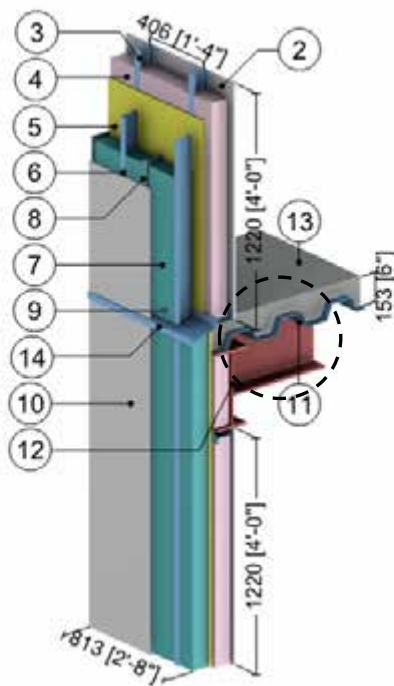
Concrete Floor Intersection

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	4" to 6" (102 to 152)	0.24 (0.034)	R-16.8 to R-25.2 (2.96 RSI to 4.44 RSI)	4 (64)	0.20 (850)
7	ISO Clip - HDPE Isolator	1/2" (12.7)	3.1 (0.45)	-	-	-
8	ISO Clip - Galvanized Metal	14 gauge	430 (62)	-	489 (7830)	0.12 (500)
9	#14 Steel Fasteners	1/4" (6) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	Horizontal Sub-girt	16 gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.19

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Vertical Z-girts (16" o.c.) Supporting Stucco Cladding and R-12 Batt Insulation in Stud Cavity – Steel Framed Floor with Cross Cavity Flashing



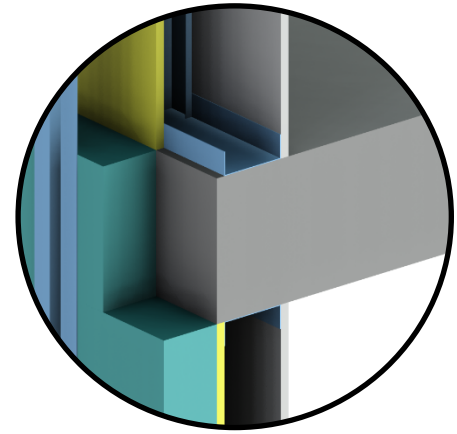
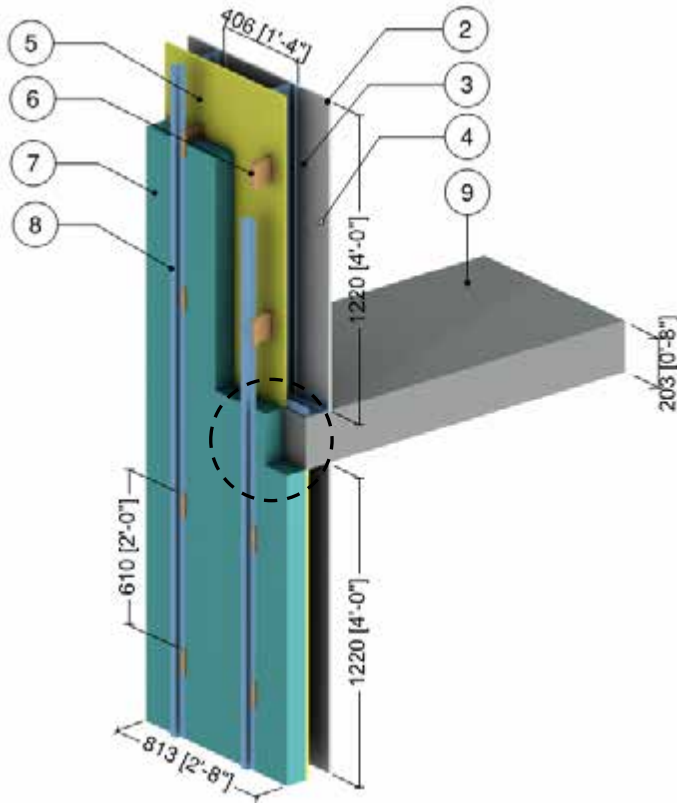
Slab Edge Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Vertical Z-girts with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	Varies	-	R-10 to R-15 (1.76 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
8	Rigid Insulation Bracing	Varies	0.2 (0.029)	-	1.8 (28)	0.29 (1220)
9	Rainscreen Cavity	1/2" (13)	-	R-0.5 (0.09 RSI)	0.075 (1.2)	0.24 (1000)
10	Stucco Cement with Breather Board	1/2" (13)	6.3 (0.9)	R-0.1 (0.01 RSI)	120 (1922)	0.20 (850)
11	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
12	Steel Beam (W410)	-	347 (50)	-	489 (7830)	0.12 (500)
13	Concrete Topping	6" (203)	6.3 (0.9)	-	120 (1920)	0.20 (850)
14	Cross Cavity Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.20

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Fiberglass Spacer and Through Insulation Fasteners Supporting Cladding – Insulated Intermediate Floor Intersection



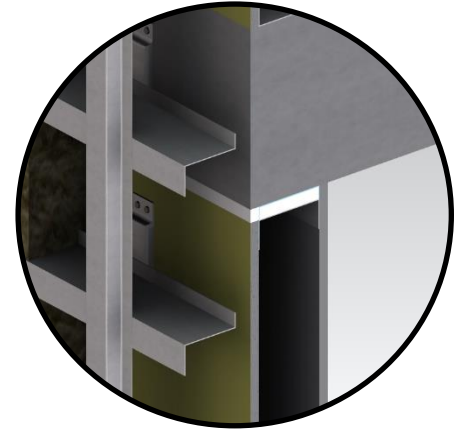
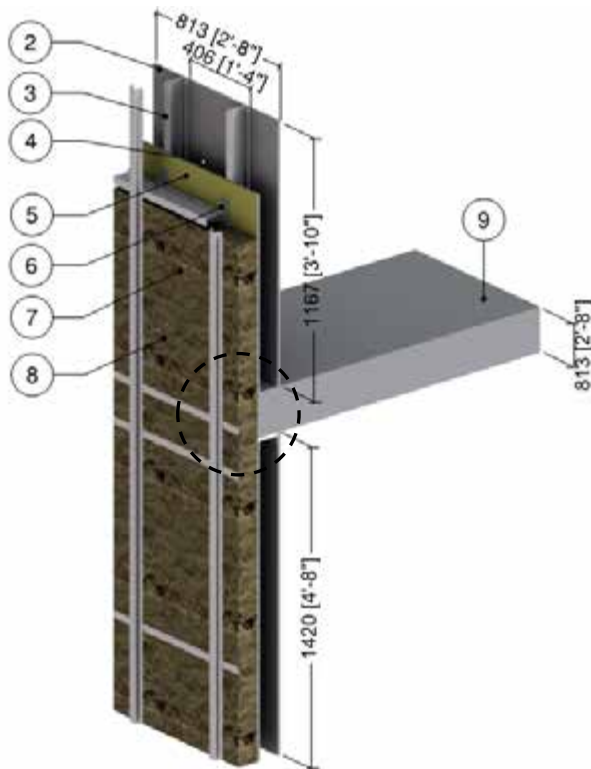
Slab Edge Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Fiberglass Spacer	3 1/2" (89)	1.7 (0.299)			
6	#14 Stainless Steel Fasteners	1/4" (6) Ø	118 (17)	-	500 (8000)	0.12 (500)
7	Exterior Insulation	3 1/2" (89)	-	R-15 (2.59 RSI)	1.8 (28)	0.29 (1220)
8	Vertical Steel Z-girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.21

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Aluminum Clip Horizontal Sub-girt System Supporting Cladding – Intermediate Floor Intersection



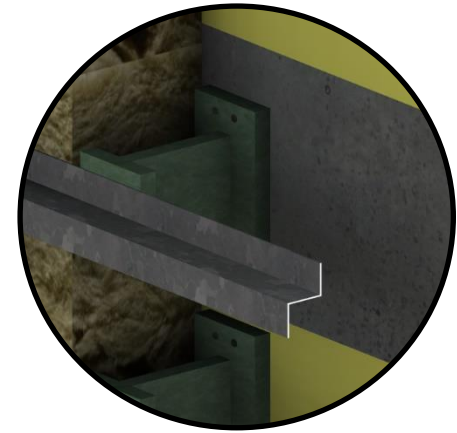
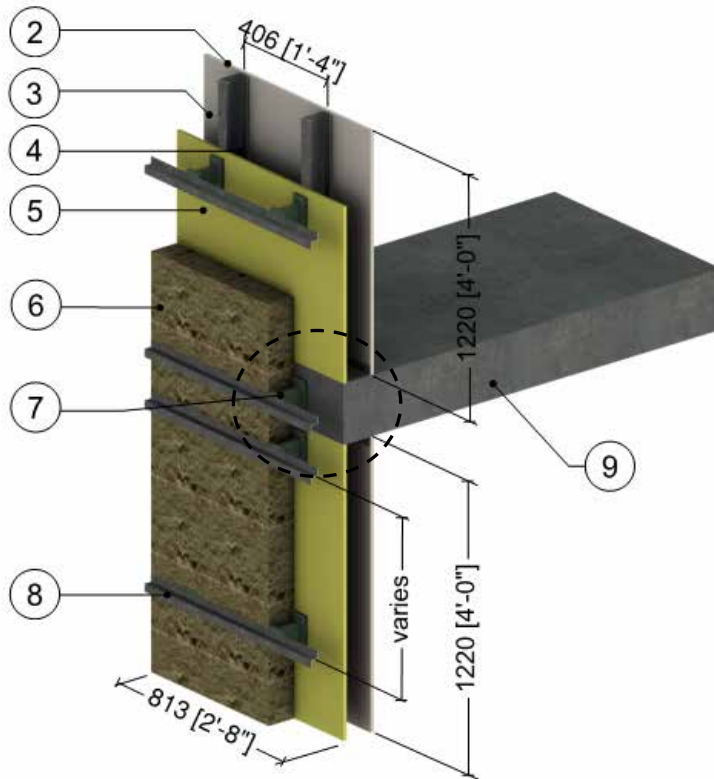
Slab Edge Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Engineered Assemblies Aluminum Panel Clip (models T100 T125 150)	1/5" to 3/8" (5 to 10)	1109 (160)			
7	Exterior Insulation	Varies	-	R-16.8 to R-25.2 (2.96 RSI to 4.44 RSI)	1.8 (28)	0.29 (1220)
8	Vertical/Horizontal Steel Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Cork/Neoprene pad	1/16" (1.5)	0.329 (0.058)	R-0.15 (0.03 RSI)	-	-
11	Aerogel	3/8" (10)	0.086 (0.015)	R-3.9 (0.68 RSI)		
12	Steel Fasteners	5/16" (8) Ø	347 (50)	-	489 (7830)	0.12 (500)
13	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
14	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.22

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16"o.c.) Wall Assembly with TAC Fiber Reinforced Plastic Girts Supporting Cladding – Intermediate Floor Intersection



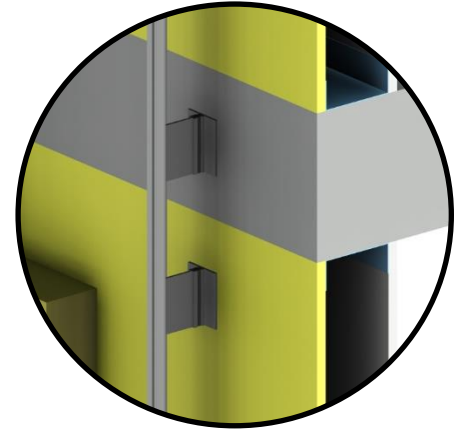
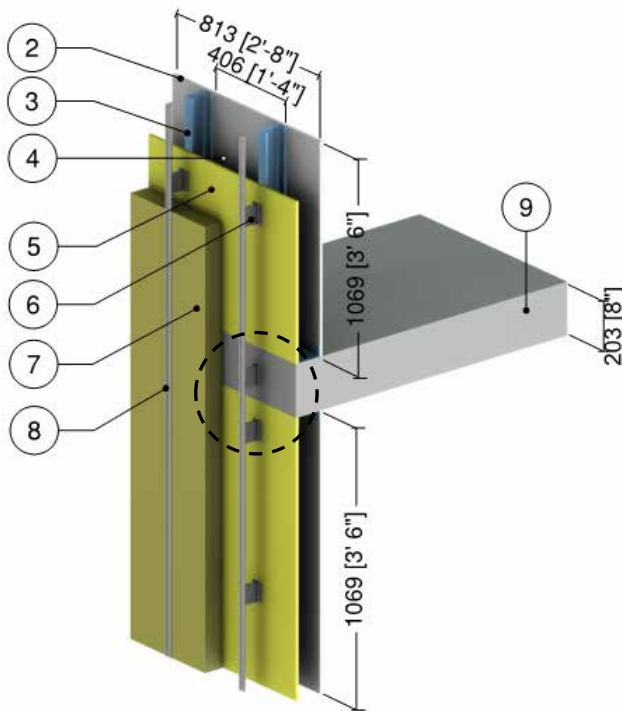
Slab Edge Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.12 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs (16"o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	0.24 (0.034)	R-12.6 to R-25.2 (2.22 RSI to 4.40 RSI)	489 (7830)	0.12 (500)
7	Fiber Reinforced Plastic (FRP) Girts	-	2.4 (0.35)	-	-	-
8	Horizontal Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Concrete Slab	8" (203)	12 (1.8)	-	140 (2250)	0.20 (850)
10	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.23

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Broken Aluminum Clip Rail System (24" o.c.) Supporting Cladding – Intermediate Floor Intersection



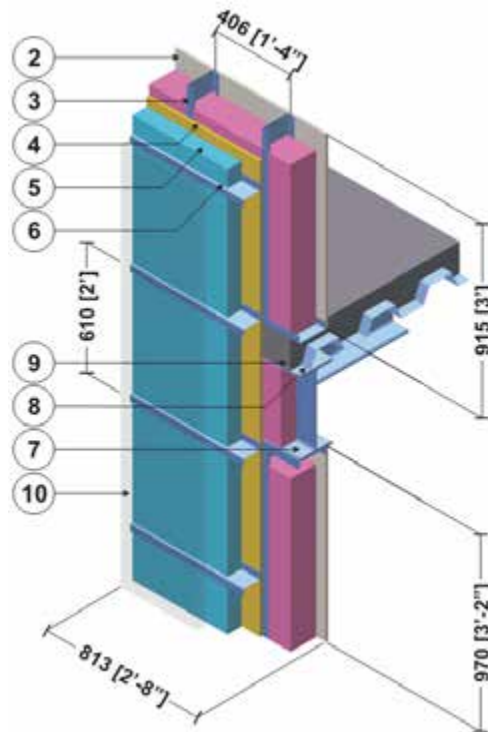
Slab Edge Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Longboard Aluminum Panel Clip	1/5" to 3/8" (5 to 10)	1109 (160)	-	-	-
7	Exterior Insulation	Varies	0.24 (0.034)	R-12.6 to R-25.2 (2.22 RSI to 4.44 RSI)	1.8 (28)	0.29 (1220)
8	Vertical Steel Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.24

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Structural Steel Framed Floor Intersection

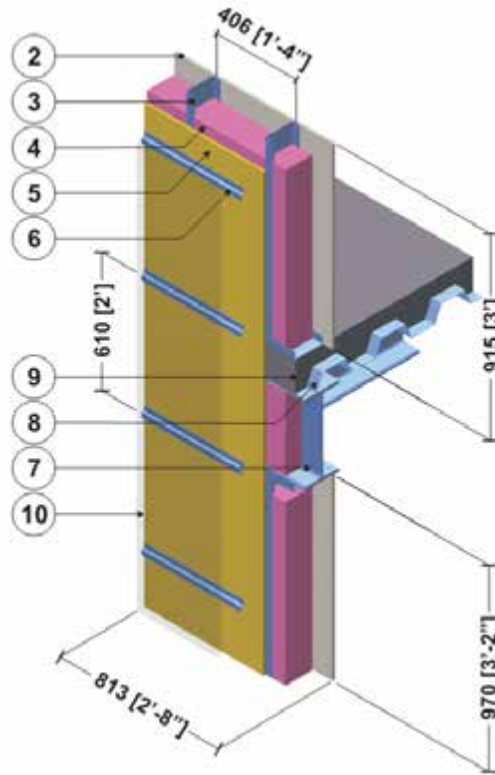


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
5	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
6	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Steel Beam (W410)	-	347 (50)	-	489 (7830)	0.12 (500)
8	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
9	Concrete Topping	6" (152)	6.3 (0.9)	-	120 (1920)	0.20 (850)
10	Metal cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.25

Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Structural Steel Framed Floor Intersection

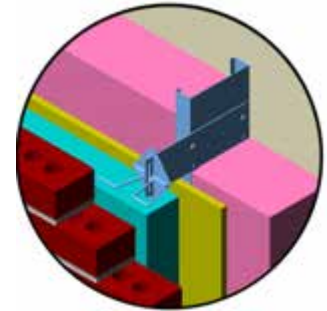
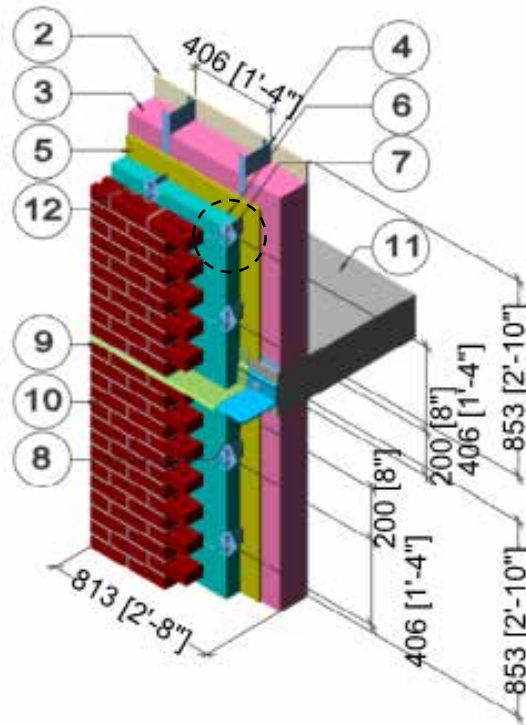


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Metal Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Steel Beam (W410)	-	347 (50)	-	489 (7830)	0.12 (500)
8	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
9	Concrete Topping	6" (152)	6.3 (0.9)	-	120 (1920)	0.20 (850)
10	Metal cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.26

Exterior and Interior Insulated Wall Assembly with Shelf Angle & Brick Ties Supporting Brick Veneer and R-12 Batt Insulation in Stud Cavity – Intermediate Floor Intersection



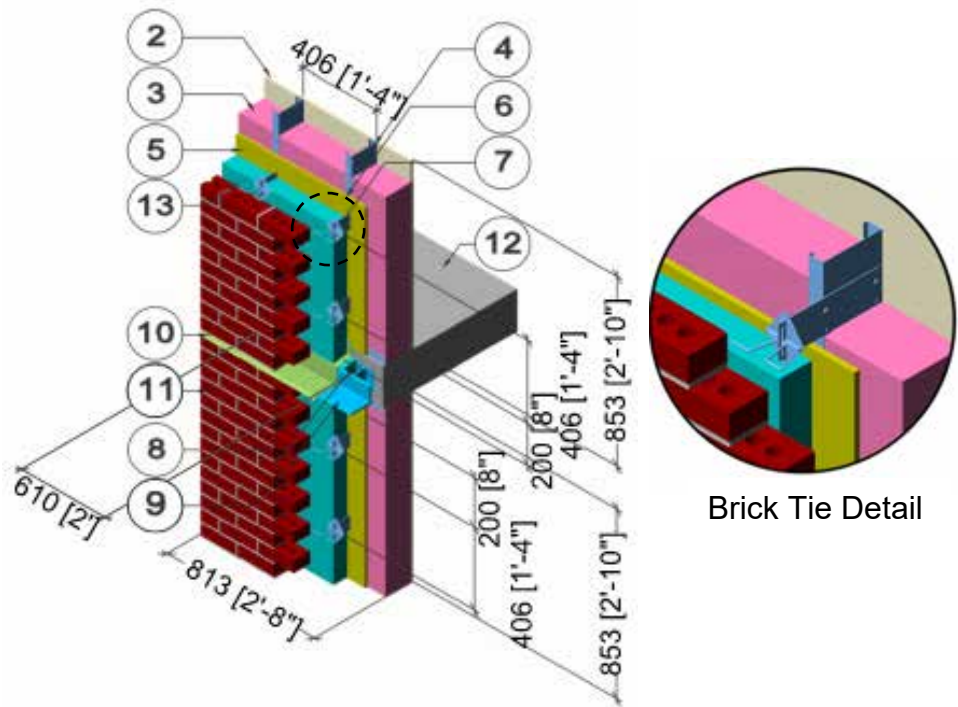
Brick Tie Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
7	Brick Ties	14 Gauge	347 (50)	-	489 (7830)	0.12 (500)
8	Shelf Angle	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
9	Flashing	20 Gauge	347 (50)	-	489 (7830)	0.12 (500)
10	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Air Gap	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.27

Exterior and Interior Insulated Wall Assembly with Spaced Shelf Angle & Brick Ties Supporting Brick Veneer and R-12 Batt Insulation in Stud Cavity – Intermediate Floor Intersection

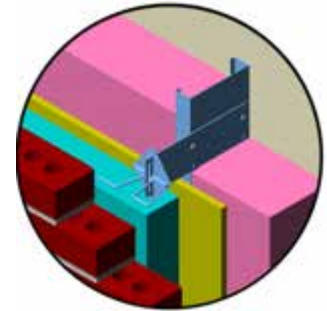
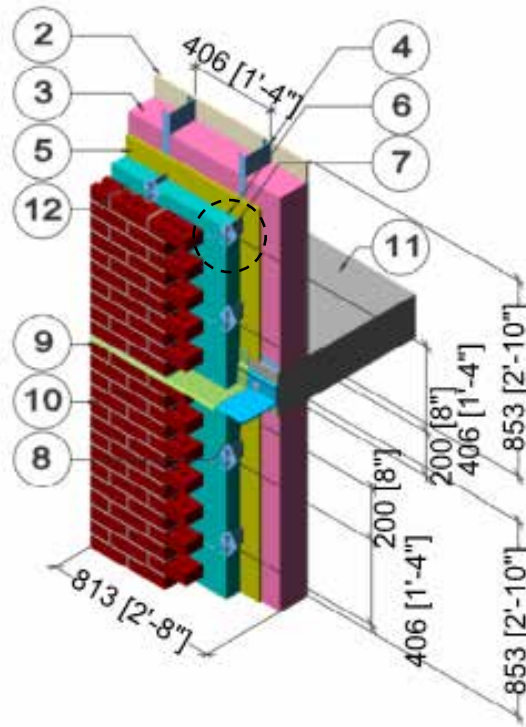


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
7	Brick Ties	14 Gauge	347 (50)	-	489 (7830)	0.12 (500)
8	Exterior Insulation Behind Shelf Angle	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
9	Spaced Shelf Angle	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
10	Flashing	20 Gauge	347 (50)	-	489 (7830)	0.12 (500)
11	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
12	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
13	Air Gap	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.28

Exterior and Interior Insulated Wall Assembly with Stainless Steel Shelf Angle & Brick Ties Supporting Brick Veneer and R-12 Batt Insulation in Stud Cavity – Intermediate Floor Intersection



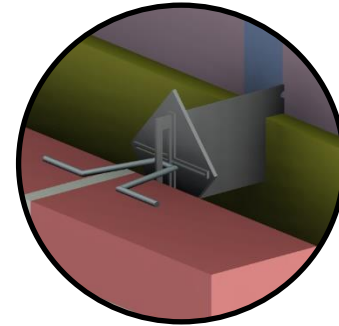
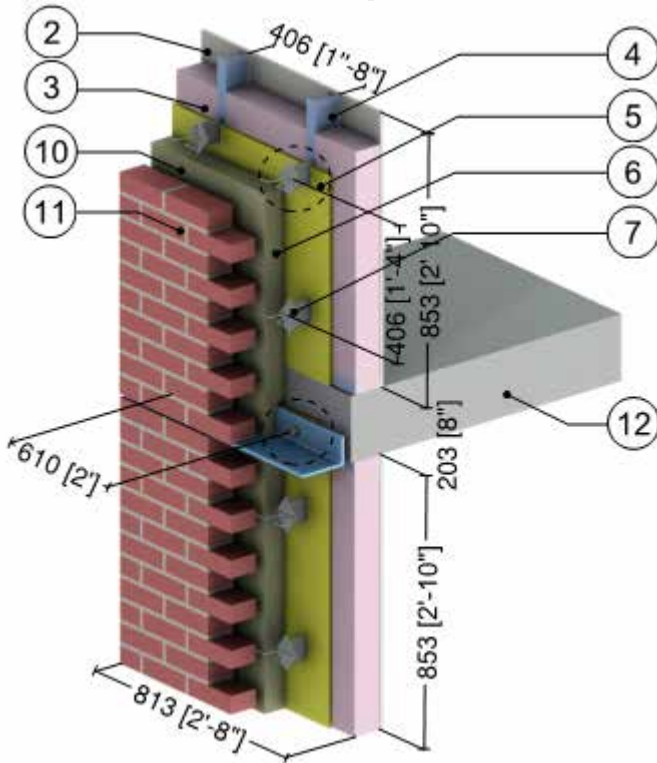
Brick Tie Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
7	Brick Ties	14 Gauge	347 (50)	-	489 (7830)	0.12 (500)
8	Stainless Steel Shelf Angle	3/8" (10)	118 (17)	-	500 (8000)	0.12 (500)
9	Flashing	20 Gauge	347 (50)	-	489 (7830)	0.12 (500)
10	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Air Gap	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

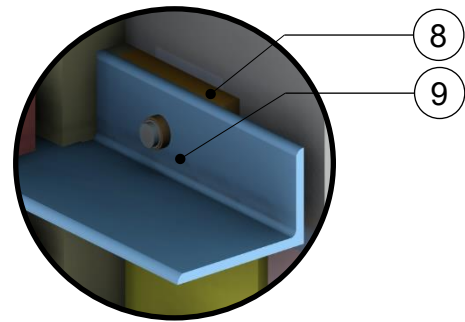
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.29

Exterior and Interior Insulated Wall Assembly with Thermally Broken Steel Shelf Angle & Brick Ties Supporting Brick Veneer and R-12 Batt Insulation in Stud Cavity – Slab Intersection



Brick Tie Detail



Shelf Angle Detail

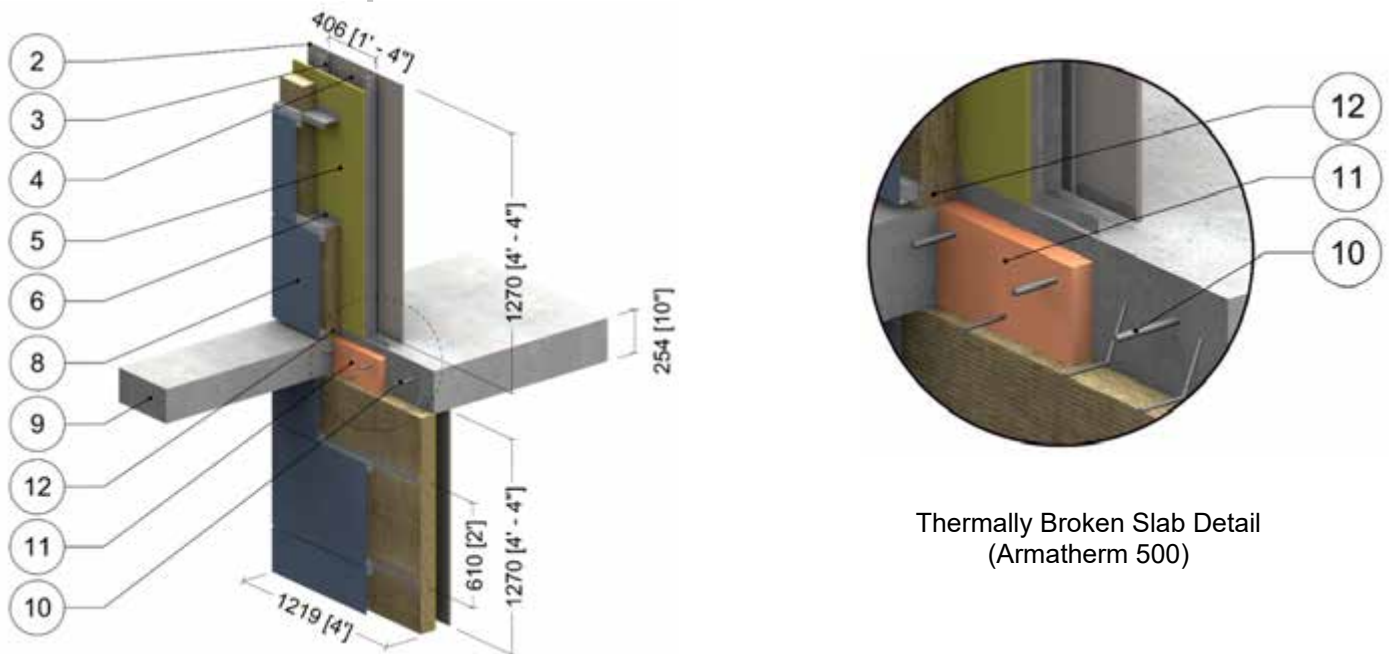
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	-	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
7	Brick Ties	14 Gauge	347 (50)	-	489 (7830)	0.12 (500)
8	Armatherm FRR Thermal Break	1" (25)	1.4 (0.20)	-	85 (5.3)	-
9	Steel Shelf Angle and Bolts	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
10	Air Gap ²	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
11	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
12	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 5.2.30

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud Wall Assembly with Horizontal Z-girts Supporting Metal Cladding – Armatherm 500 Thermally Broken Slab Projection with Insulated Curb



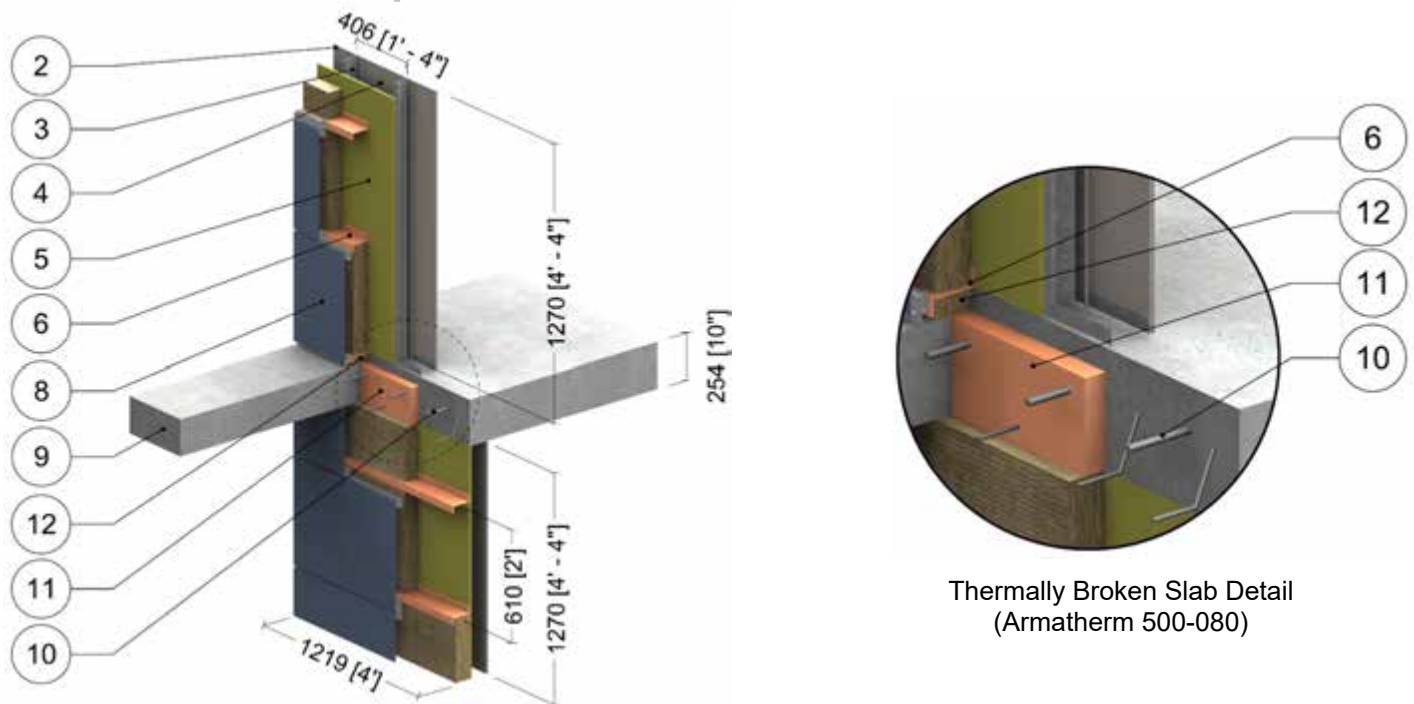
Thermally Broken Slab Detail (Armatherm 500)

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air Cavity	3 5/8" (92)	-	R-0.9 (2.11 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Mineral Wool Insulation	3 1/2" (89)	-	R-14.7 (2.59 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Concrete Slab	10" (254)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Carbon Steel Rebar	-	430 (62)	-	489 (7830)	0.12 (500)
	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
11	Armatherm 500-280 Thermal Break	2" (51)	0.53 (0.08)	-	-	-
	Armatherm 500-080 Thermal Break	2" (51)	0.26 (0.04)	-	-	-
12	Curb Insulation	3 1/2" (89)	-	R-14.7 (2.59 RSI)	1.8 (28)	0.29 (1220)
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.31

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud Wall Assembly with Armatherm Z-girts Supporting Metal Cladding – Armatherm 500-080 Thermally Broken Slab Projection with Insulated Curb



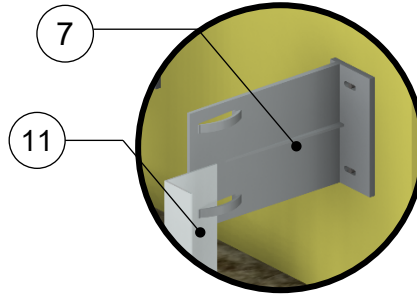
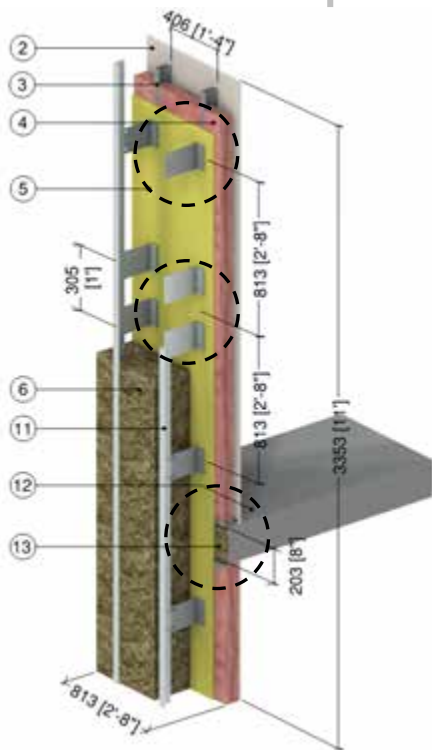
Thermally Broken Slab Detail
(Armatherm 500-080)

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air Cavity	3 5/8" (92)	-	R-0.9 (2.11 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Armatherm Z-girts (24" o.c.)	0.2 (5)	1.4 (0.2)	-	-	-
7	Exterior Mineral Wool Insulation	3 1/2" (89)	-	R-14.7 (2.59 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Concrete Slab	10" (254)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
11	Armatherm 500-080 Thermal Break	2" (51)	0.26 (0.04)	-	-	-
12	Curb Insulation	3 1/2" (89)	-	R-14.7 (2.59 RSI)	1.8 (28)	0.29 (1220)
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

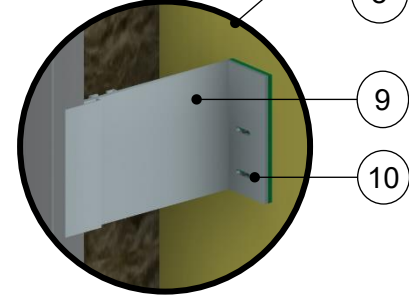
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.32

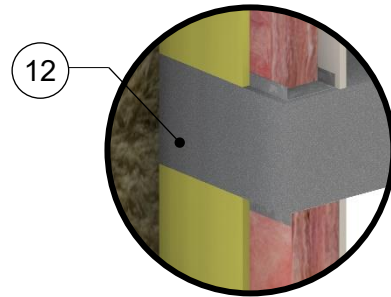
Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Nvelope – Eko Thermobacket and NV1 Clip System Supporting Cladding and R-13 Batt Insulation in Stud Cavity – Intermediate Floor Intersection



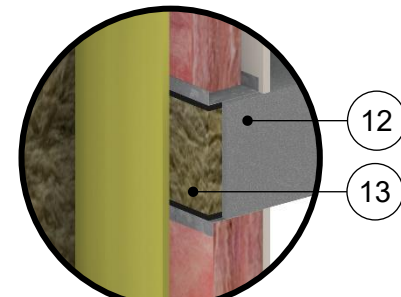
Eko Thermobacket Clip



NV1 Clip



Uninsulated Floor Intersection



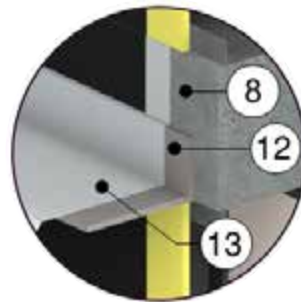
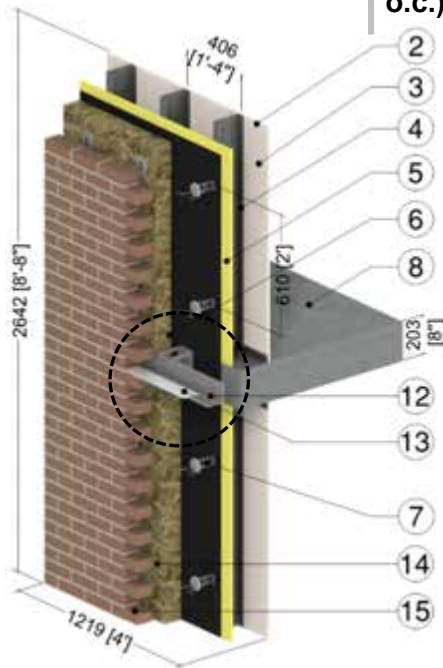
Insulated Floor Intersection

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.28 (0.040)	R-13 (2.29 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	1.5" to 4" (38 to 102)	0.24 (0.034)	R-6.3 to R-16.8 (1.11 RSI to 2.96 RSI)	4 (64)	0.20 (850)
7	Nvelope Eko Thermobacket (Polymer Composite)	-	4.86 (0.70)	-	-	-
8	Nvelope Clip Isolator	0.2" (5)	0.82 (0.117)	-	-	-
9	Nvelope Clip Extrusion – Aluminum 6005A alloy	Varies	1340 (193)	-	-	-
10	#14 Stainless Steel Fastener	1/4" (6) ∅	118 (17)	-	-	-
11	Vertical Aluminum Sub-girt	0.09" (2.2)	1340 (193)	-	-	-
12	Concrete Floor Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
13	Insulation at Floor Slab	1" (25)	0.24 (0.034)	-	4 (64)	0.20 (850)
14	Generic Cladding with 1" (25mm) vented air space is incorporated into exterior heat transfer coefficient					
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.33

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with FERO Slotted Rap Ties (24" o.c.) and FERO FAST Thermal Bracket (48" o.c.) Supporting Brick Veneer – Intermediate Floor Intersection



Direct Anchor Shelf Angle



FERO FAST Thermal Bracket System



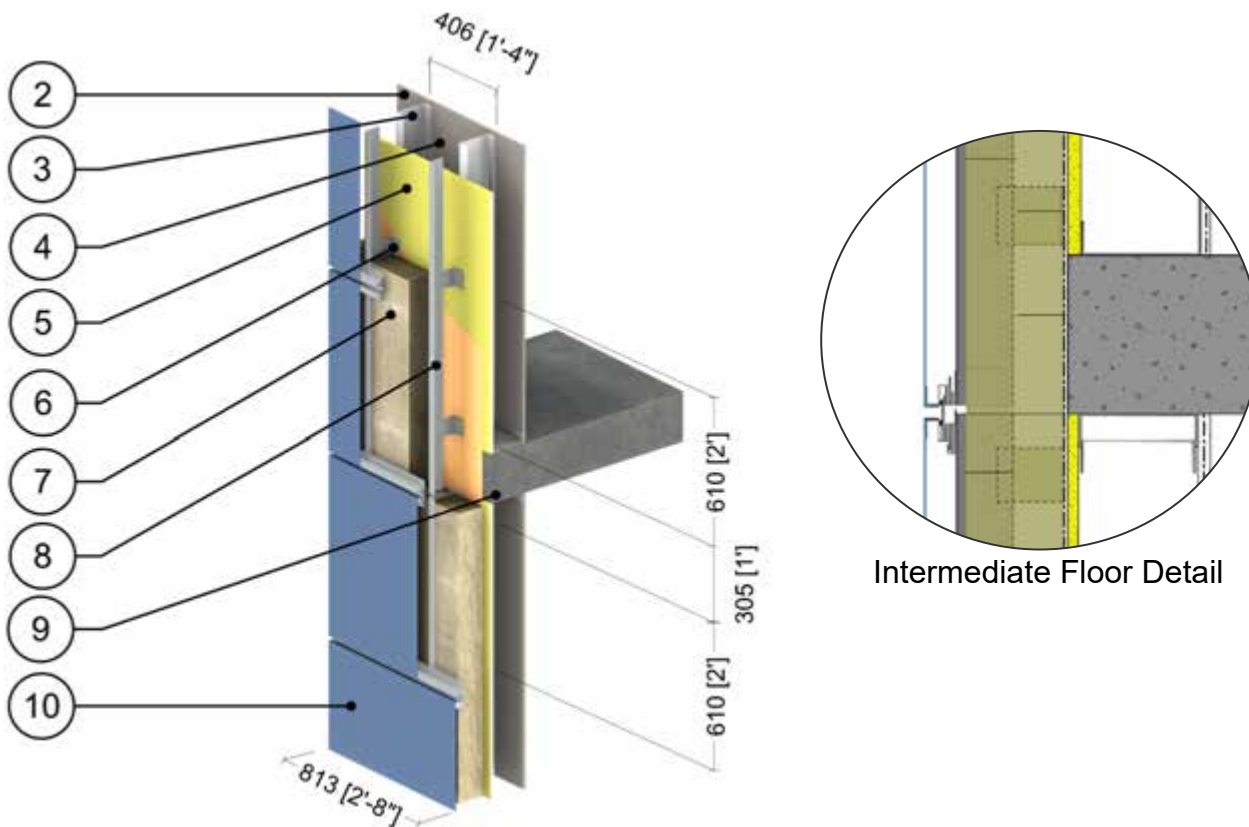
FERO FAST Thermal Bracket System with Aerogel Coating

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	4" (102)	varies	R-16.8 (2.96 RSI) to R-24.0 (4.23 RSI)	varies	varies
7	Brick Ties	4" (102)	430 (62)	-	445 (7130)	0.09 (390)
8	Intermediate Concrete Floor	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	FERO FAST Bracket	3/16" (5)	347 (50)	-	489 (7830)	0.12 (500)
10	Anchor Bolt	5/8" (16) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Aerogel Coating	1/8" (3)	0.24 (0.035)	-	-	-
12	Shelf Angle	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
13	Flashing	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
14	Vented Air Cavity	1" (25)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
15	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
16	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.34

Owens Corning Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding – Intermediate Floor Intersection

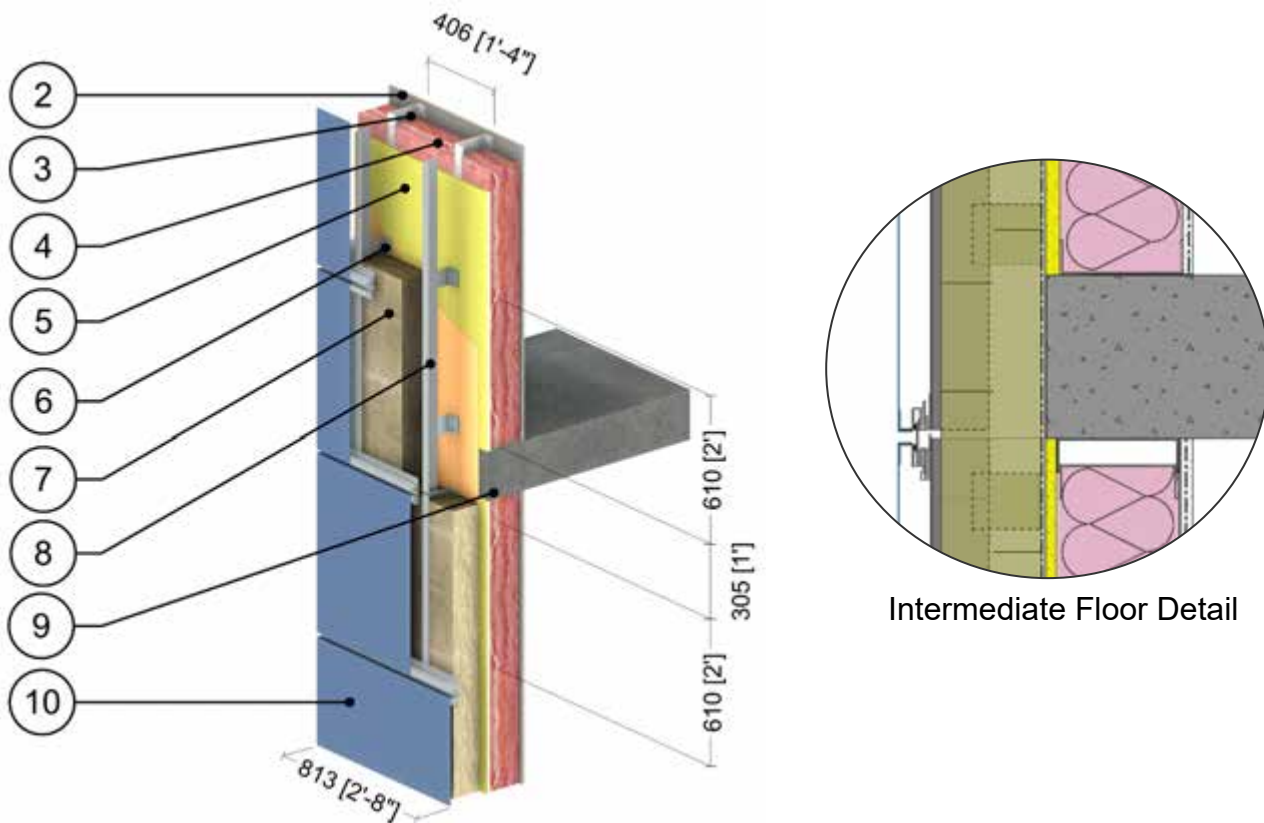


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.16 to (0.11 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	varies	-	-	-	-
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	varies	0.24 (0.034)	R-8.4 to R-21.0 (1.48 to 3.70 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.35

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-20 Batt in Stud Cavity – Intermediate Floor Intersection

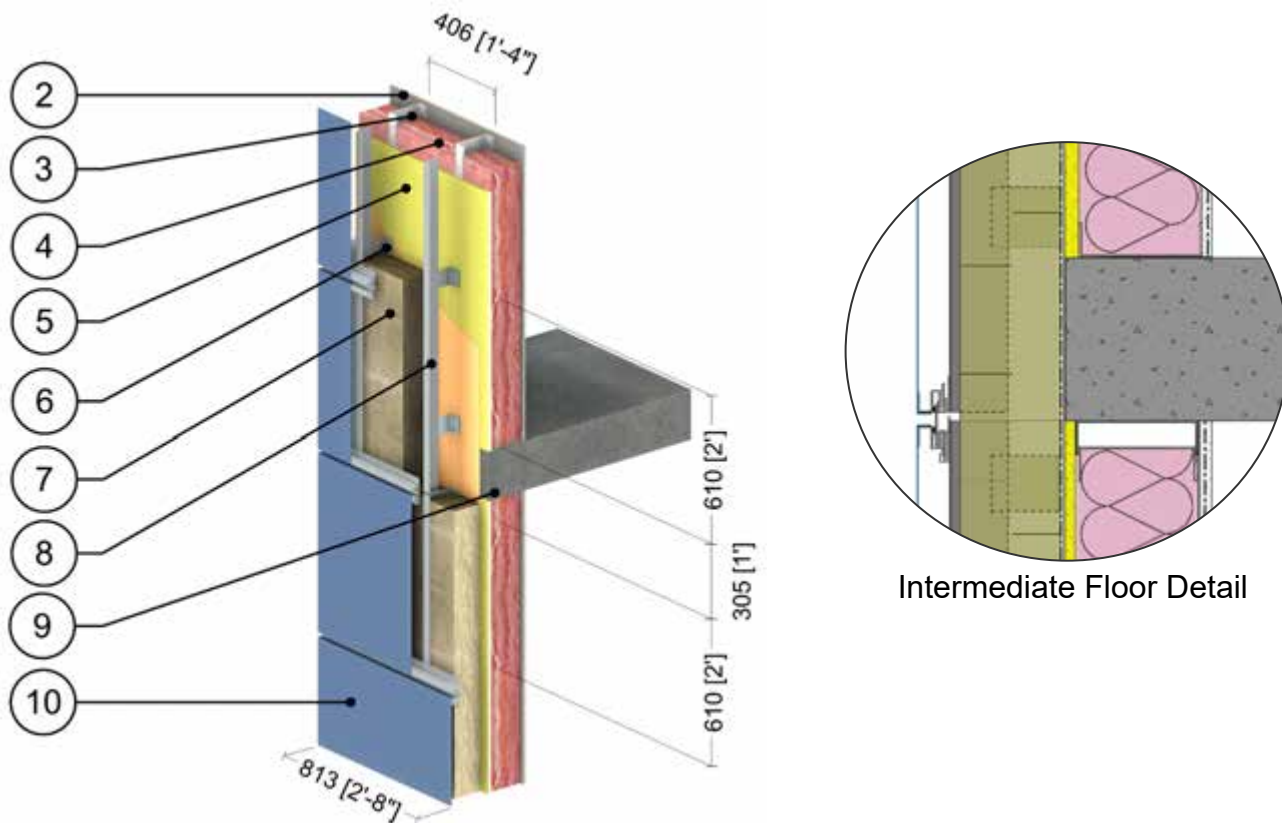


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.16 to (0.11 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.30 (0.043)	R-20 (3.52 RSI)	0.55 (8.8)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	varies	-	-	-	-
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	varies	0.24 (0.034)	R-8.4 to R-21.0 (1.48 to 3.70 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.36

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-22.5 Batt in Stud Cavity – Intermediate Floor Intersection



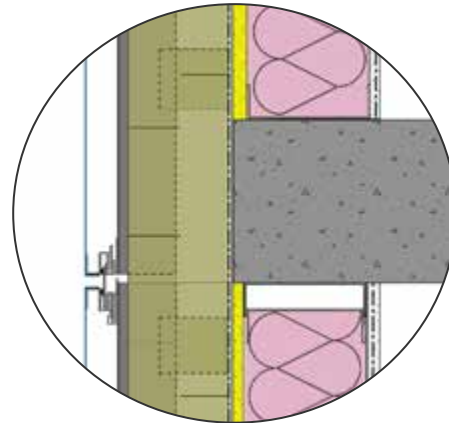
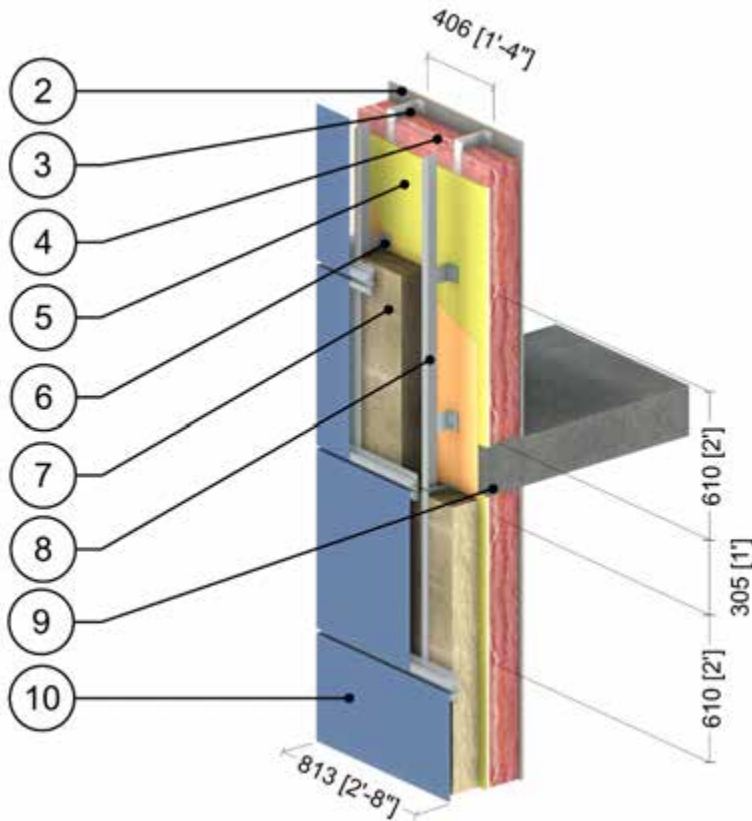
Intermediate Floor Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.16 to (0.11 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.26 (0.038)	R-22.5 (3.96 RSI)	0.99 (15.9)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	varies	-	-	-	-
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	varies	0.24 (0.034)	R-8.4 to R-21.0 (1.48 to 3.70 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.37

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-24 Batt in Stud Cavity – Intermediate Floor Intersection



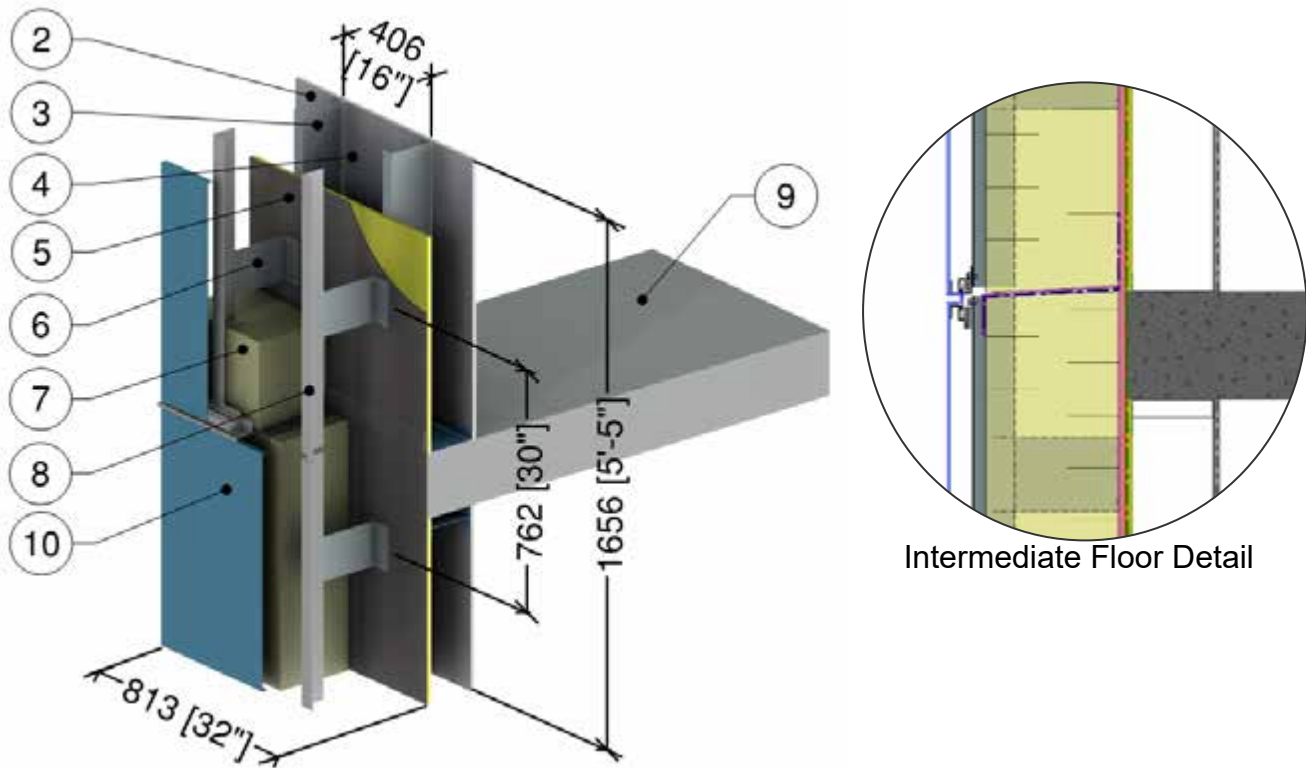
Intermediate Floor Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.16 to 0.11 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.25 (0.036)	R-24 (4.23 RSI)	1.42 (22.7)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	varies	-	-	-	-
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	varies	0.24 (0.034)	R-8.4 to R-21.0 (1.48 to 3.70 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.38

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with FRP Vertical Brackets and Rail System Supporting Metal Cladding – Intermediate Floor Intersection

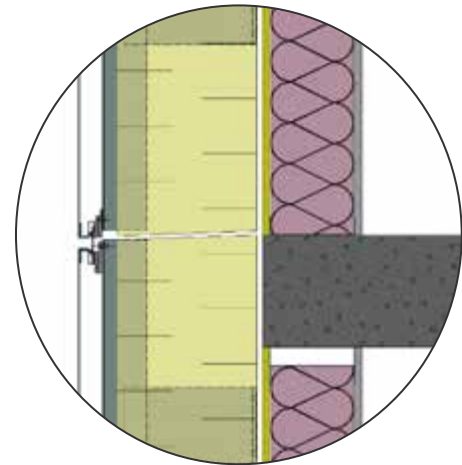
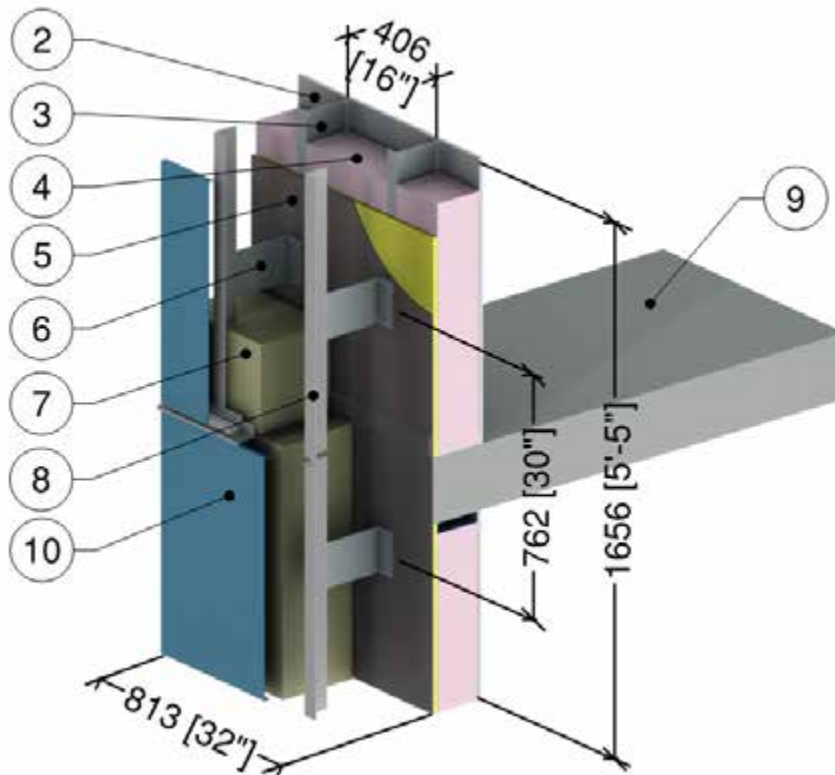


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	FRP Bracket	-	4.9 (0.70)	-	110 (1760)	-
7	Exterior Mineral Wool Insulation	10" (254)	0.24 (0.034)	R-42 (7.40 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-Rail	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.39

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with FRP Vertical Brackets and Rail System Supporting Metal Cladding and R-19 Batt in Stud Cavity – Intermediate Floor Intersection



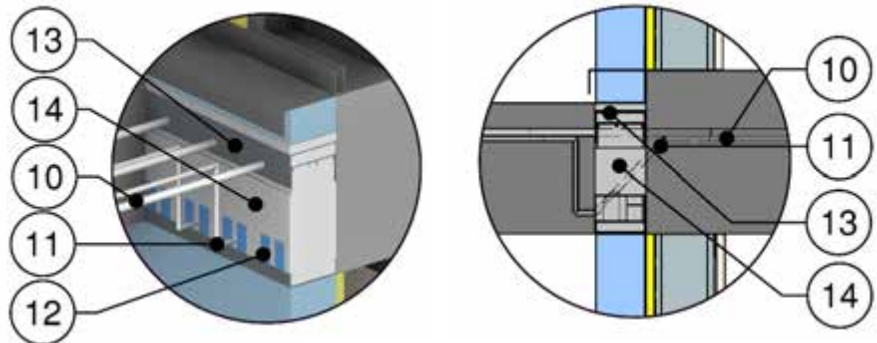
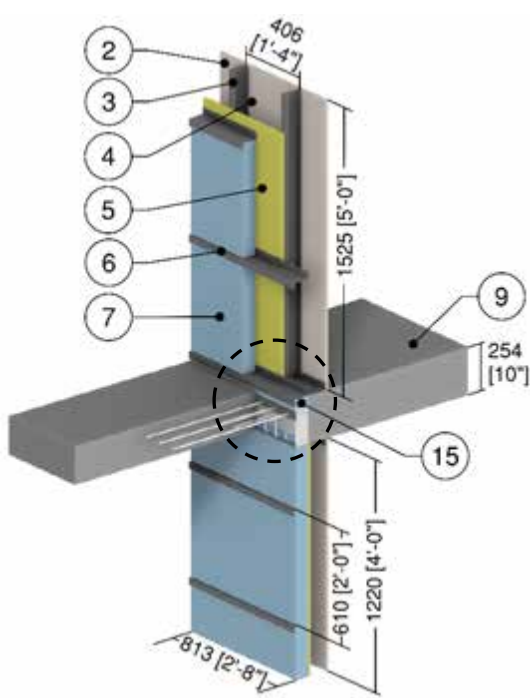
Intermediate Floor Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	6" (152)	-	R-19 (3.35 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	FRP Bracket	-	4.9 (0.70)	-	110 (1760)	-
7	Exterior Mineral Wool Insulation	10" (254)	0.24 (0.034)	R-42 (7.40 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-Rail	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

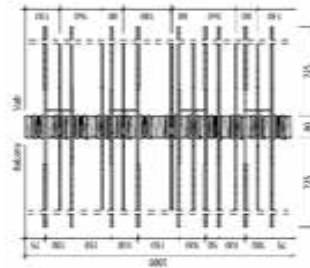
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.40

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding – Isokorb K65-V8 Thermally Broken Slab Projection with Insulated Curb



Isokorb K65-V8 Detail



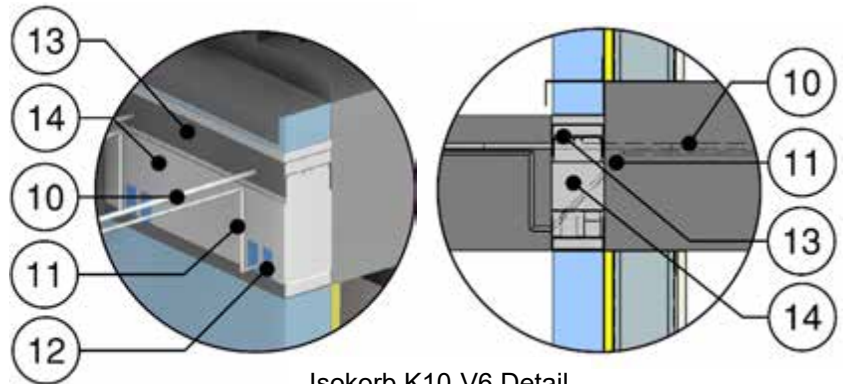
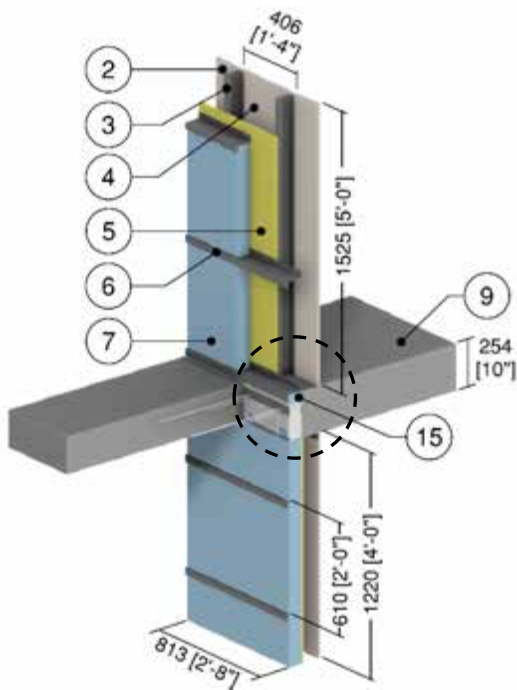
Isokorb K65-V8 Rebar Arrangement

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	-	R-15.0 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Concrete Slab	10" (254)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Steel Rebar	-	347 (50)	-	489 (7830)	0.12 (500)
11	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
12	Plastic Sleeve	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
13	Isokorb Frame	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
14	Polystyrene Insulation	3.2" (80)	0.22 (0.031)	R-15 (2.58 RSI)	1.3 (20)	0.35 (1500)
15	Curb Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
16	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

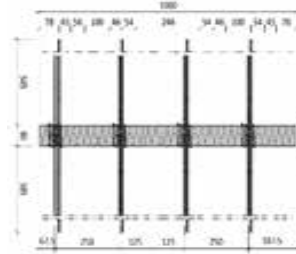
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.41

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding – Isokorb K10-V6 Thermally Broken Slab Projection with Insulated Curb



Isokorb K10-V6 Detail



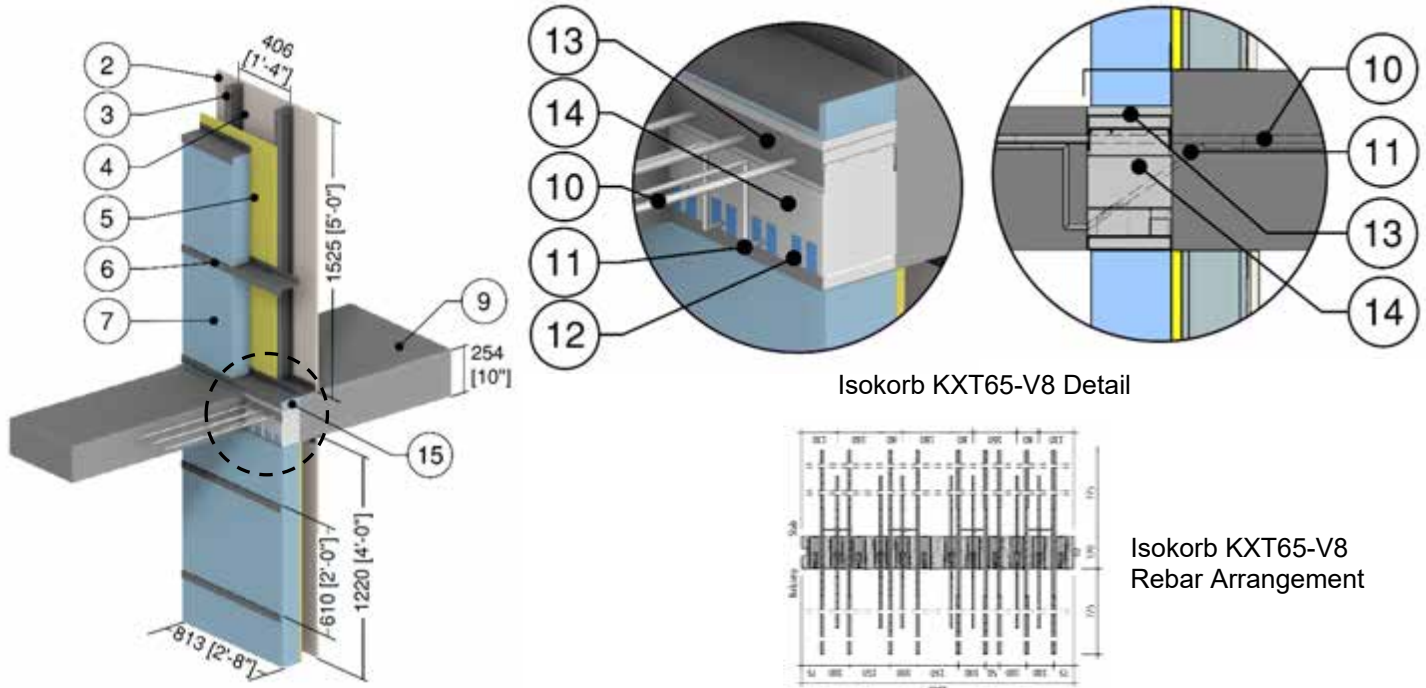
Isokorb K10-V6 Rebar Arrangement

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	-	R-15.0 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Concrete Slab	10" (254)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Steel Rebar	-	347 (50)	-	489 (7830)	0.12 (500)
11	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
12	Plastic Sleeve	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
13	Isokorb Frame	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
14	Polystyrene Insulation	3.2" (80)	0.22 (0.031)	R-15 (2.58 RSI)	1.3 (20)	0.35 (1500)
15	Curb Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
16	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.42

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding – Isokorb KXT65-V8 Thermally Broken Slab Projection with Insulated Curb

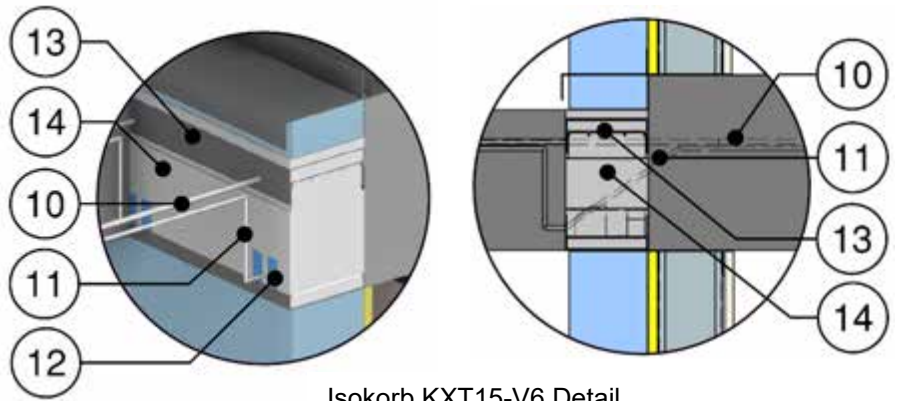
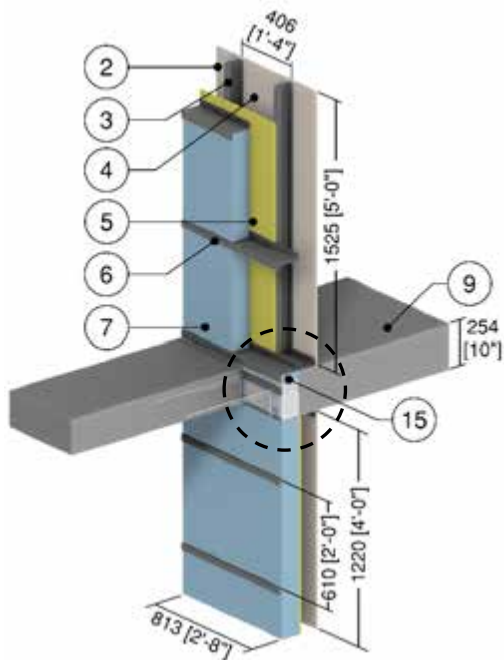


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	4.5" (114)	-	R-22.5 (3.96 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Concrete Slab	10" (254)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Steel Rebar	-	347 (50)	-	489 (7830)	0.12 (500)
11	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
12	Plastic Sleeve	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
13	Isokorb Frame	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
14	Polystyrene Insulation	4.7" (120)	0.22 (0.031)	R-21.7 (3.83 RSI)	1.3 (20)	0.35 (1500)
15	Curb Insulation	4.5" (114)	-	R-22.5 (3.96 RSI)	1.8 (28)	0.29 (1220)
16	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

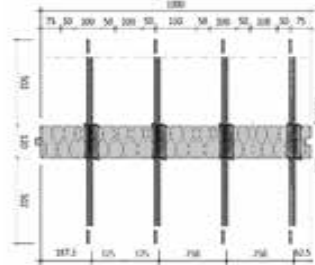
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.43

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding – Isokorb KXT15-V6 Thermally Broken Slab Projection with Insulated Curb



Isokorb KXT15-V6 Detail



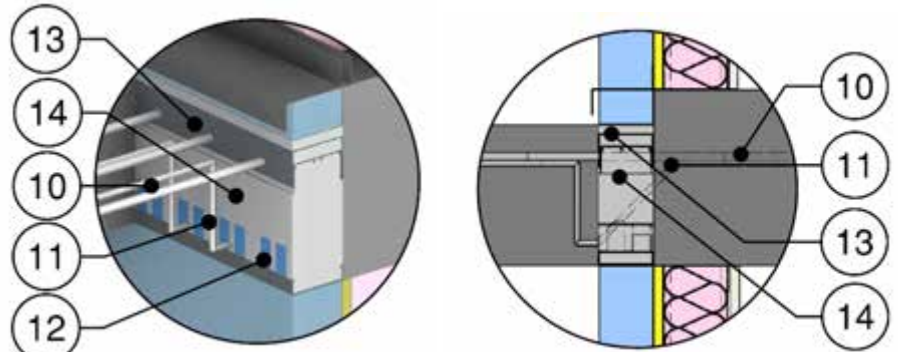
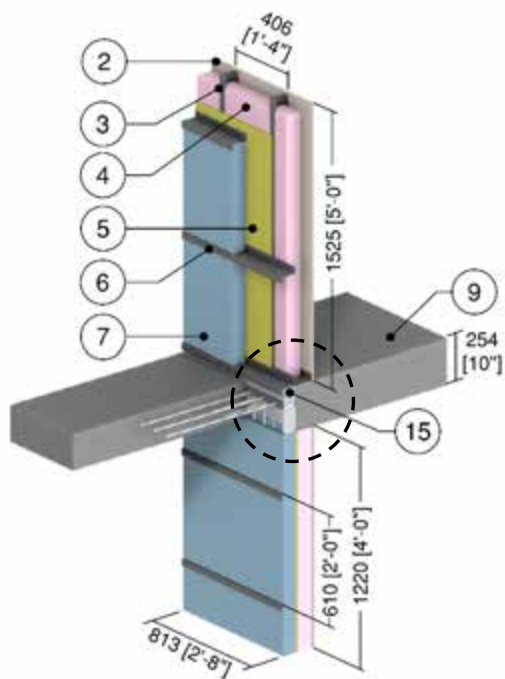
Isokorb KXT15-V6 Rebar Arrangement

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	4.5" (114)	-	R-22.5 (3.96 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Concrete Slab	10" (254)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Steel Rebar	-	347 (50)	-	489 (7830)	0.12 (500)
11	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
12	Plastic Sleeve	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
13	Isokorb Frame	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
14	Polystyrene Insulation	4.7" (120)	0.22 (0.031)	R-21.7 (3.83 RSI)	1.3 (20)	0.35 (1500)
15	Curb Insulation	4.5" (114)	-	R-22.5 (3.96 RSI)	1.8 (28)	0.29 (1220)
16	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

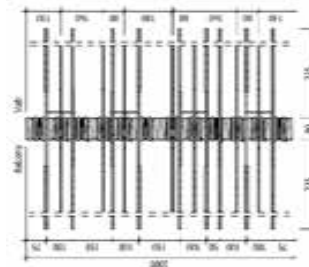
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.44

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Isokorb K65-V8 Thermally Broken Slab Projection with Insulated Curb



Isokorb K65-V8 Detail



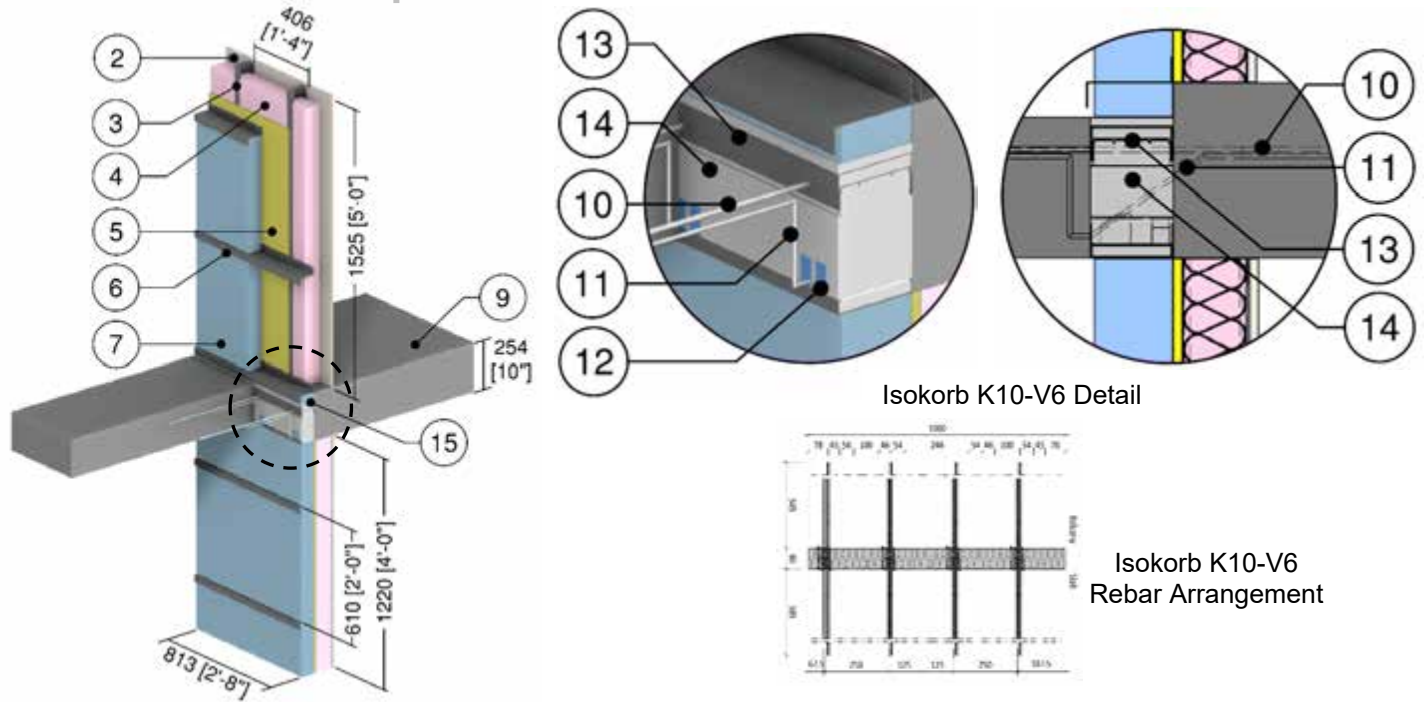
Isokorb K65-V8 Rebar Arrangement

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	-	R-15.0 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Concrete Slab	10" (254)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Steel Rebar	-	347 (50)	-	489 (7830)	0.12 (500)
11	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
12	Plastic Sleeve	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
13	Isokorb Frame	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
14	Polystyrene Insulation	3.2" (80)	0.22 (0.031)	R-15 (2.58 RSI)	1.3 (20)	0.35 (1500)
15	Curb Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
16	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.45

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Isokorb K10-V6 Thermally Broken Slab Projection with Insulated Curb

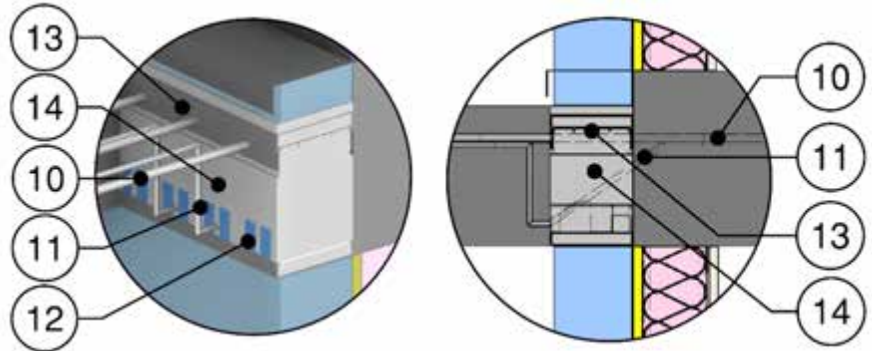
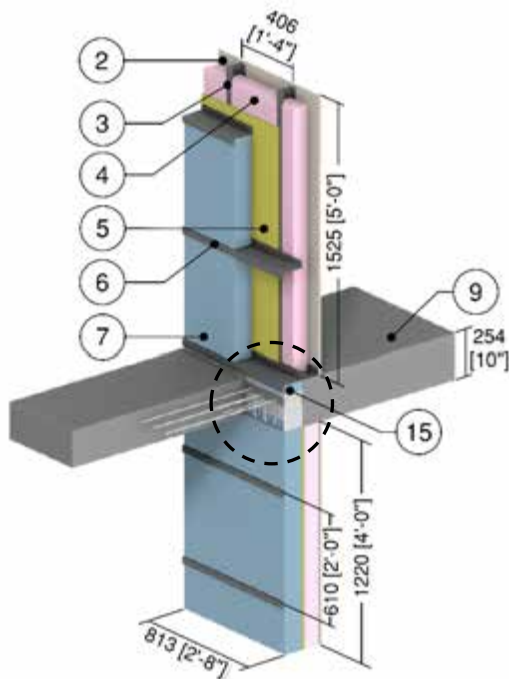


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	-	R-15.0 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Concrete Slab	10" (254)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Steel Rebar	-	347 (50)	-	489 (7830)	0.12 (500)
11	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
12	Plastic Sleeve	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
13	Isokorb Frame	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
14	Polystyrene Insulation	3.2" (80)	0.22 (0.031)	R-15 (2.58 RSI)	1.3 (20)	0.35 (1500)
15	Curb Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
16	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

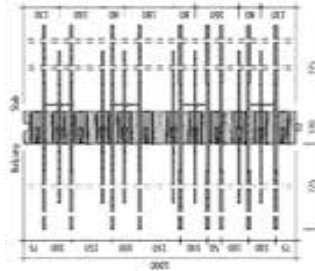
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.46

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Isokorb KXT65-V8 Thermally Broken Slab Projection with Insulated Curb



Isokorb KXT65-V8 Detail



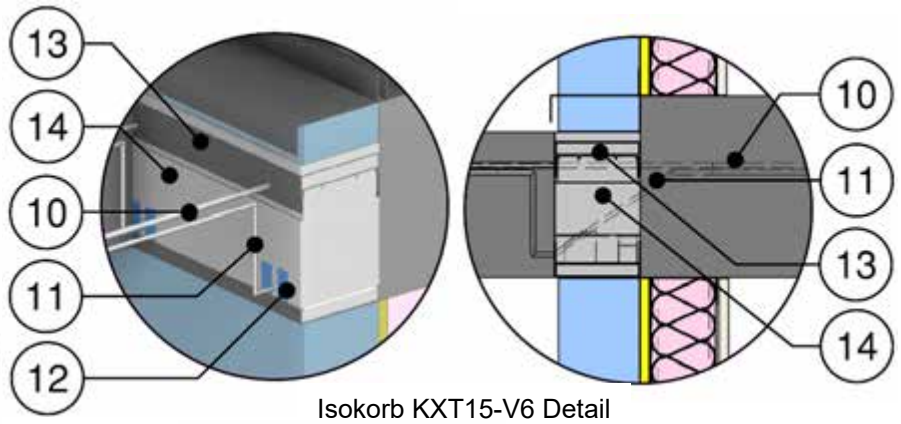
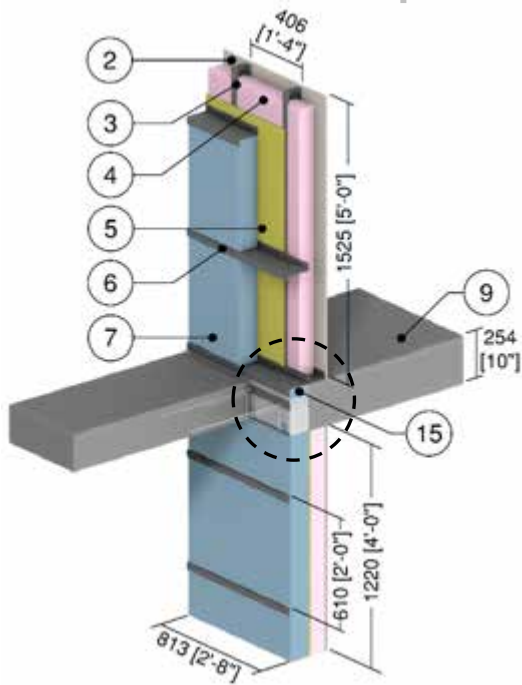
Isokorb KXT65-V8 Rebar Arrangement

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	4.5" (114)	-	R-22.5 (3.96 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Concrete Slab	10" (254)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Steel Rebar	-	347 (50)	-	489 (7830)	0.12 (500)
11	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
12	Plastic Sleeve	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
13	Isokorb Frame	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
14	Polystyrene Insulation	4.7" (120)	0.22 (0.031)	R-21.7 (3.83 RSI)	1.3 (20)	0.35 (1500)
15	Curb Insulation	4.5" (114)	-	R-22.5 (3.96 RSI)	1.8 (28)	0.29 (1220)
16	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

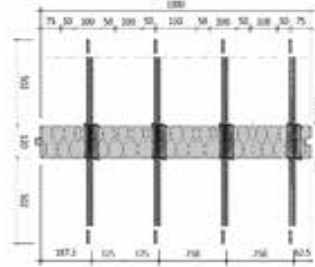
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.47

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Isokorb KXT15-V6 Thermally Broken Slab Projection with Insulated Curb



Isokorb KXT15-V6 Detail



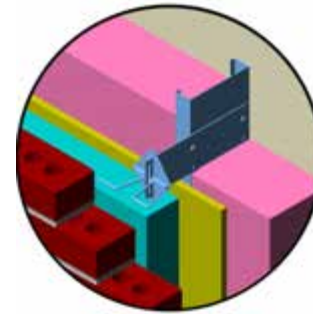
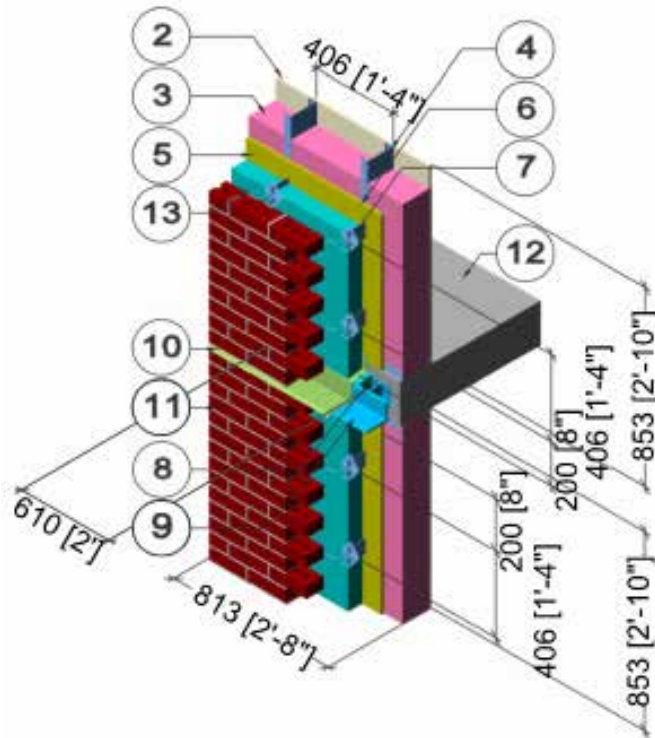
Isokorb KXT15-V6 Rebar Arrangement

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	4.5" (114)	-	R-22.5 (3.96 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Concrete Slab	10" (254)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Steel Rebar	-	347 (50)	-	489 (7830)	0.12 (500)
11	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
12	Plastic Sleeve	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
13	Isokorb Frame	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
14	Polystyrene Insulation	4.7" (120)	0.22 (0.031)	R-21.7 (3.83 RSI)	1.3 (20)	0.35 (1500)
15	Curb Insulation	4.5" (114)	-	R-22.5 (3.96 RSI)	1.8 (28)	0.29 (1220)
16	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.48

Exterior and Interior Insulated Wall Assembly with Stainless Steel Spaced Shelf Angle & Brick Ties Supporting Brick Veneer and R-12 Batt Insulation in Stud Cavity – Intermediate Floor Intersection



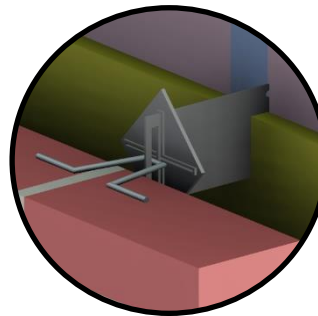
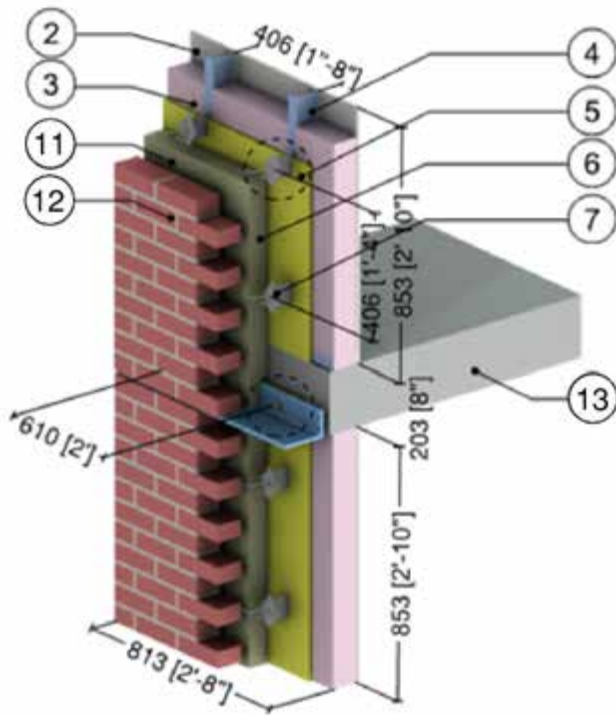
Brick Tie Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
7	Brick Ties	14 Gauge	347 (50)	-	489 (7830)	0.12 (500)
8	Exterior Insulation Behind Shelf Angle	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
9	Stainless Steel Spaced Shelf Angle	3/8" (10)	118 (17)	-	500 (8000)	0.12 (500)
10	Flashing	20 Gauge	347 (50)	-	489 (7830)	0.12 (500)
11	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
12	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
13	Air Gap	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

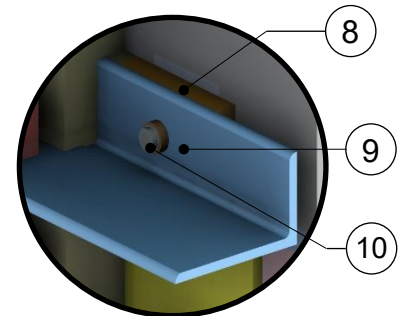
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.49

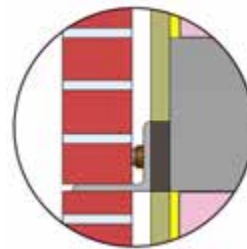
Exterior and Interior Insulated Wall Assembly with Thermally Broken Stainless Steel Shelf Angle & Brick Ties Supporting Brick Veneer and R-12 Batt Insulation in Stud Cavity – Slab Intersection



Brick Tie Detail



Shelf Angle Detail



Shelf angle outboard of R-5 insulation



Insulation covers shelf angle for scenarios R-10+

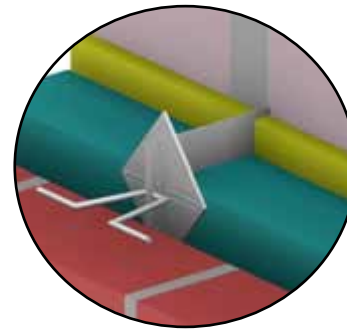
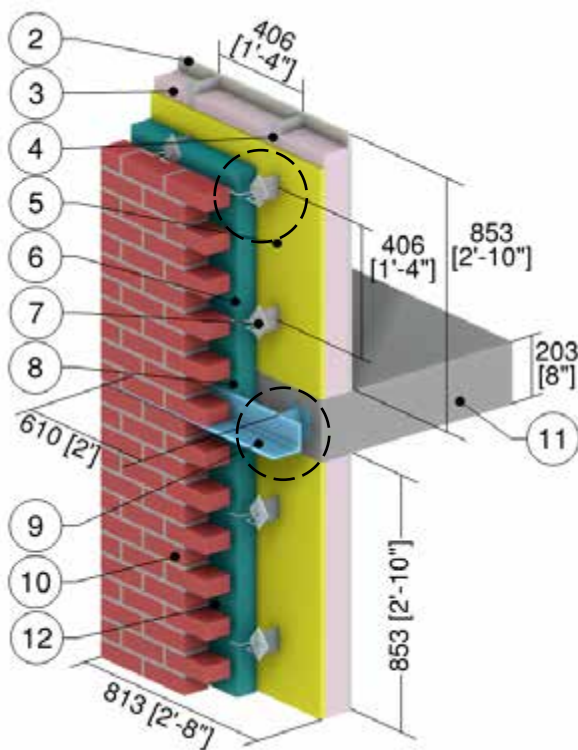
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
7	Brick Ties	14 Gauge	347 (50)	-	489 (7830)	0.12 (500)
8	Armatherm FRR Thermal Break	1" (25)	1.4 (0.20)	-	85 (5.3)	-
9	Stainless Steel Shelf Angle	3/8" (10)	118 (17)	-	500 (8000)	0.12 (500)
10	Steel Bolts	1/2" (13) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Air Gap ²	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
12	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
13	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

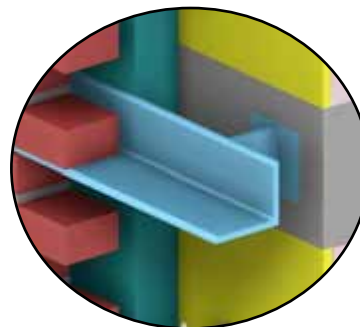
² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 5.2.50

Exterior and Interior Insulated Wall Assembly with Stainless Steel Spaced Shelf Angle Without Flashing & Brick Ties Supporting Brick Veneer – Intermediate Floor Intersection



Brick Tie Detail



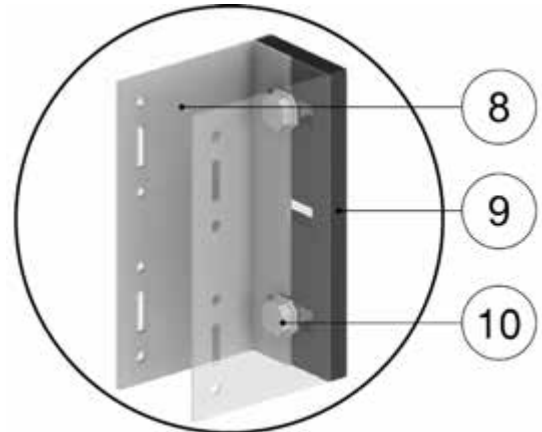
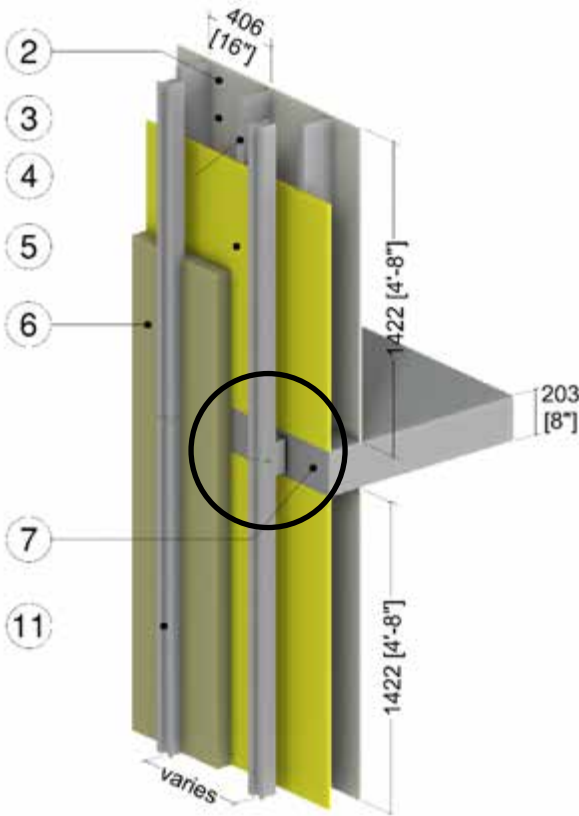
Shelf Angle Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
7	Brick Ties	14 Gauge	347 (50)	-	489 (7830)	0.12 (500)
8	Exterior Insulation Behind Shelf Angle	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
9	Stainless Steel Spaced Shelf Angle	3/8" (10)	118 (17)	-	500 (8000)	0.12 (500)
10	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Air Gap	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.2.51

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with U-Kon ND 0-33 Bracket and Vertical Rail System Supporting Metal Cladding – Intermediate Floor Intersection



Bracket Detail

Exterior Insulation Thickness for Bracket Sizes

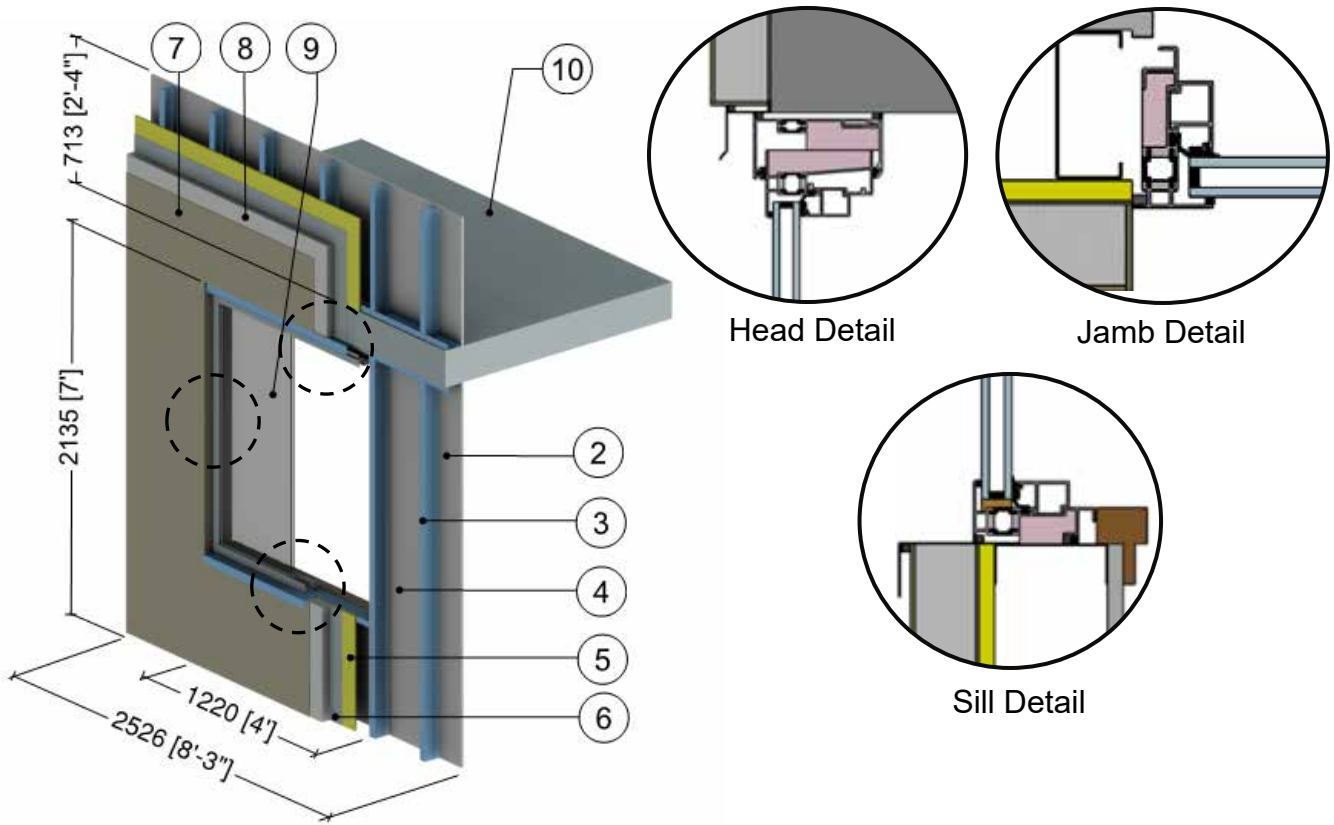
Bracket Size	Exterior Insulation Thickness in (mm)
80	3 (76)
100	4 (102)
120	5 (127)
150	6 (152)
250	10 (254)

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	6" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-12.6 to R-42.0 (2.22 to 7.40 RSI)	4 (64)	0.20 (850)
7	Intermediate Concrete Floor	8 (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	U-Kon ND-033 Bracket	14 to 16 Gauge	118 (17)	-	499 (8000)	0.12 (500)
9	Thermal Isolator	3/8" (10)	0.11 (0.12)	-	-	-
10	Fastener	3/8" (10) Ø	118 (17)	-	499 (8000)	0.12 (500)
11	Vertical Rail	18 Gauge	430 (147)	-	-	-
12	Cladding with vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.3.1

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Window and Intermediate Floor Intersection



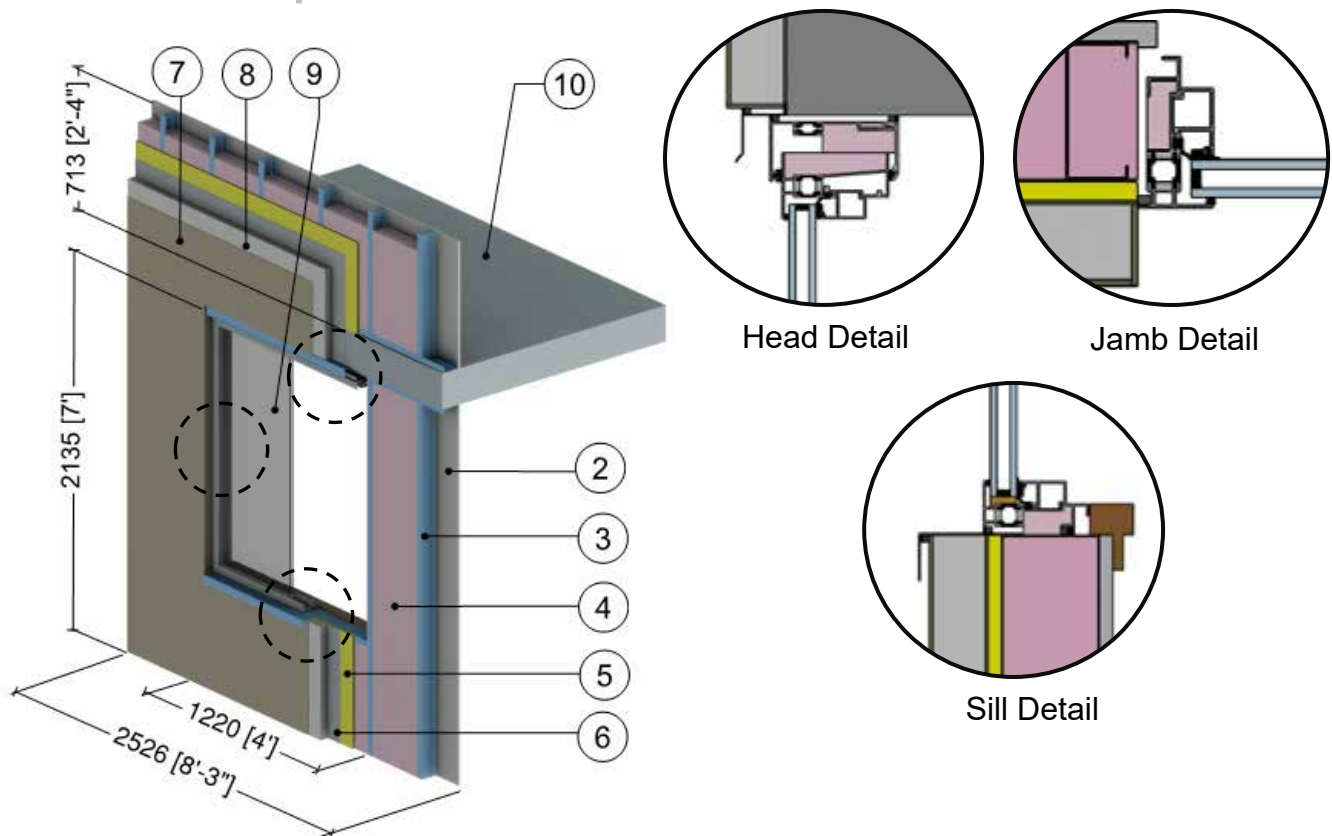
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
8	Insulation Board	Varies	0.27 (0.039)	R-7.5 to R-15 (1.32 RSI to 2.64 RSI)	1 (16)	0.35 (1470)
9	5' (1.5m) x 6' (1.8m) Aluminum window: double glazed & thermally broken ² , double glazed IGU U _{IGU} = 0.32 BTU/hr.ft ² .°F (1.82 W/m ² K)					
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 5.3.2

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly with R-12 Batt Insulation in Stud Cavity – Window and Intermediate Floor Intersection



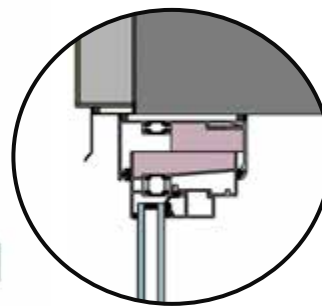
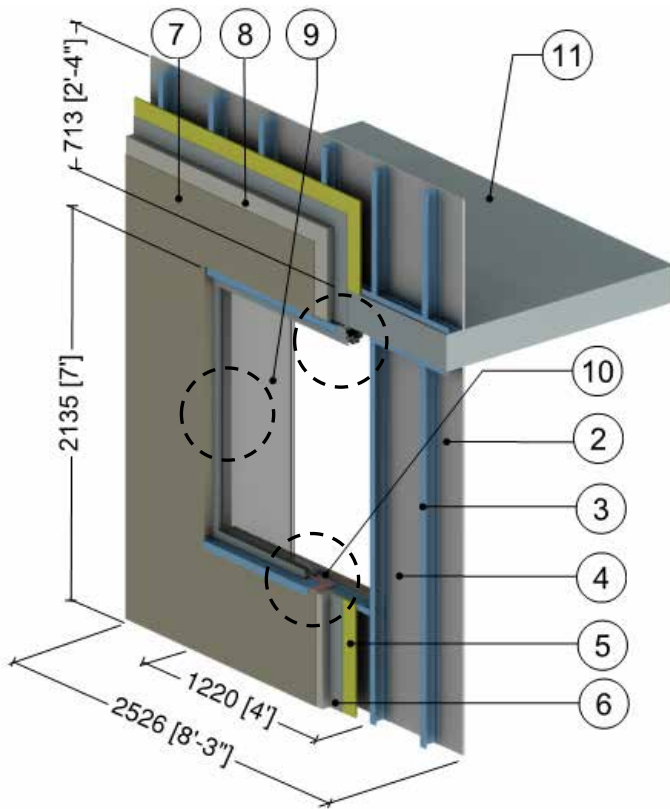
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12 (2.1 RSI)	0.9 (1.1)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Weather Resistant Barrier with Adhesive	-	-	-	-	-
7	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
8	Insulation Board	Varies	0.27 (0.039)	R-7.5 to R-15 (1.32 RSI to 2.64 RSI)	1 (16)	0.35 (1470)
9	5' (1.5m) x 6' (1.8m) Aluminum window: double glazed & thermally broken ² , double glazed IGU U _{IGU} = 0.32 BTU/hr.ft ² ·°F (1.82 W/m ² K)					
10	Concrete Slab	8" (203)	12 (1.8)	-	140 (2250)	0.20 (850)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

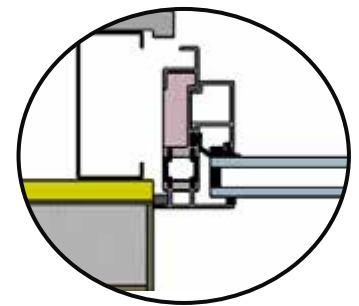
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 5.3.3

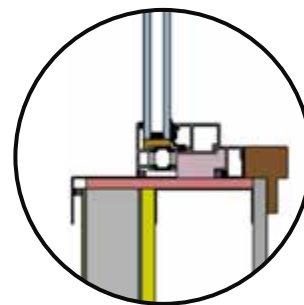
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Window with Aerogel and Intermediate Floor Intersection



Head Detail



Jamb Detail



Sill Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
8	Insulation Board	Varies	0.27 (0.039)	R-7.5 to R-15 (1.32 RSI to 2.64 RSI)	1 (16)	0.35 (1470)
9	5' (1.5m) x 6' (1.8m) Aluminum window: double glazed & thermally broken ² , double glazed IGU U _{IGU} = 0.32 BTU/hr.ft ² ·°F (1.82 W/m ² K)					
10	Aerogel Blanket	3/8" (10)	0.086 (0.015)	R-3.8 (0.67 RSI)	-	-
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

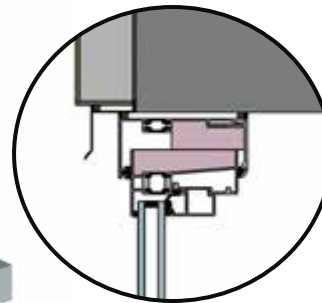
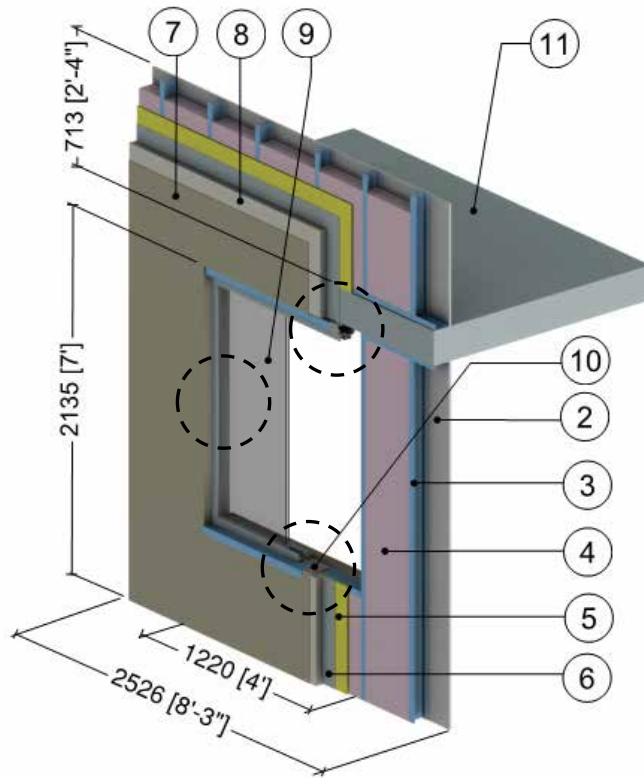
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

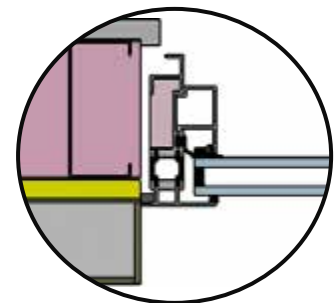


Detail 5.3.4

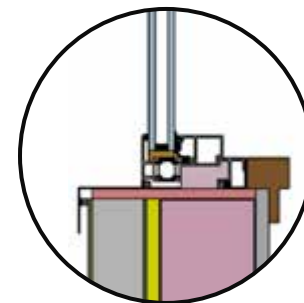
Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly with R-12 Batt Insulation in Stud Cavity – Window with Aerogel and Floor Slab Intersection



Head Detail



Jamb Detail



Sill Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12 (2.1 RSI)	0.9 (1.1)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
8	Insulation Board	Varies	0.27 (0.039)	R-7.5 (1.32 RSI) to R-15 (2.64 RSI)	1 (16)	0.35 (1470)
9	5' (1.5m) x 6' (1.8m) Aluminum window: double glazed & thermally broken ² , double glazed IGU U _{IGU} = 0.32 BTU/hr.ft ² ·°F (1.82 W/m ² K)					
10	Aerogel Blanket	3/8" (10)	0.086 (0.015)	R-3.8 (0.67 RSI)	-	-
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

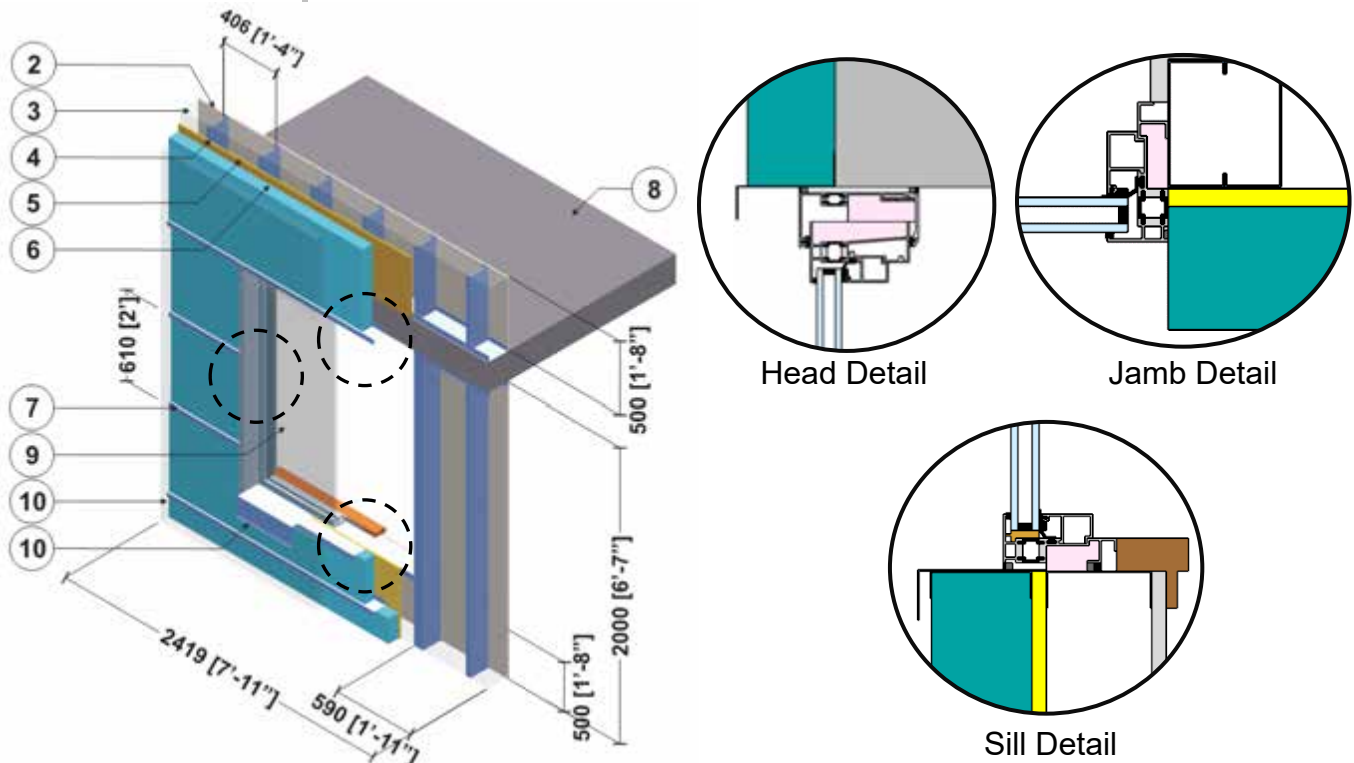
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 5.3.5

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding – Window & Intermediate Floor Intersection



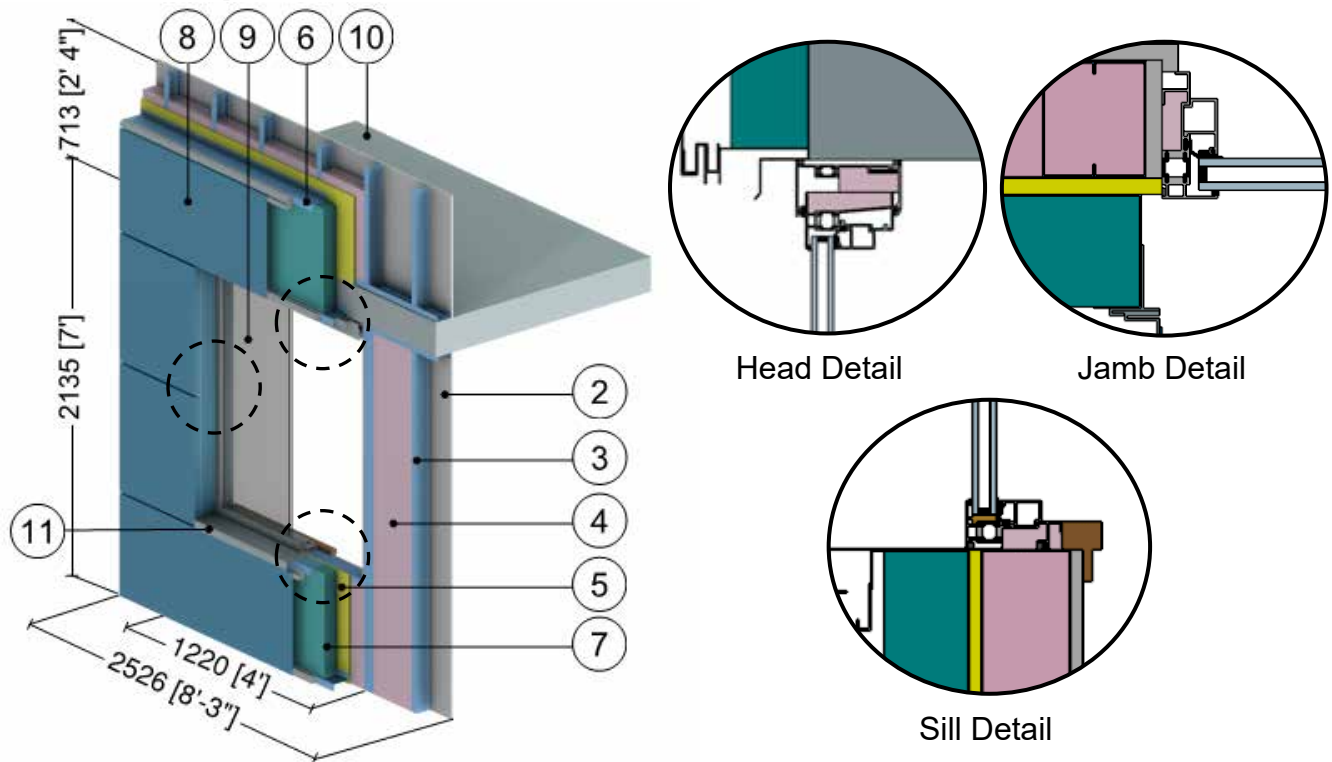
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
7	Horizontal Z-Girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	5' (1.5m) x 6' (1.8m) Aluminum window: double glazed & thermally broken ² , double glazed IGU U _{IGU} = 0.32 BTU/hr.ft ² .°F (1.82 W/m ² K)					
10	Metal cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient, sill flashing & interior finish materials					
11	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity for air spaces within window framing was found using ISO 10077-2

Detail 5.3.6

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Window and Intermediate Floor Intersection



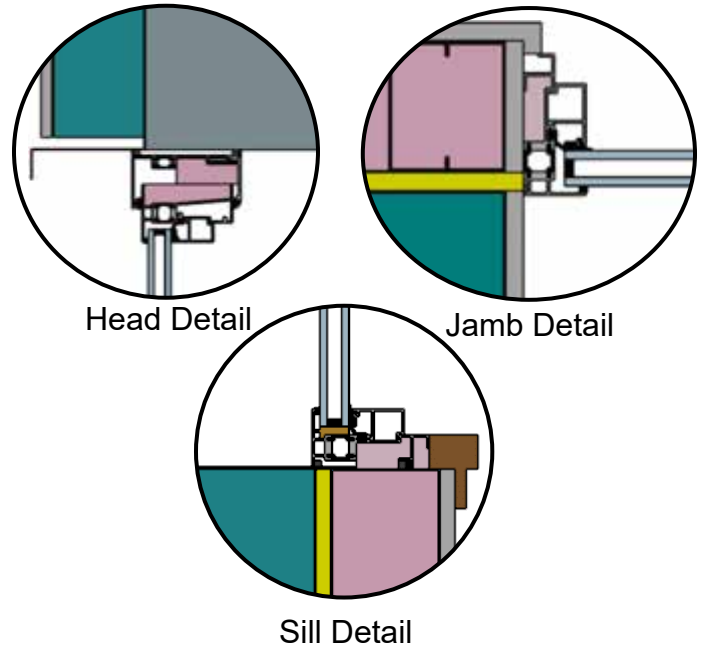
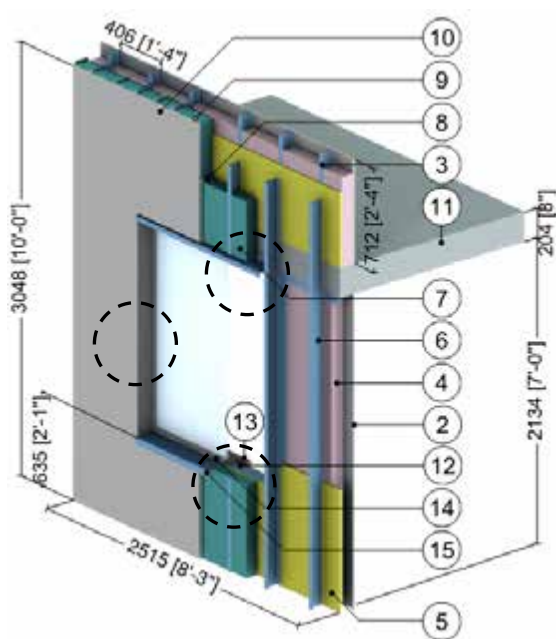
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	Varies	-	R-10 to R-15 (1.76 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	5' (1.5m) x 6' (1.8m) Aluminum window: double glazed & thermally broken ² , double glazed IGU U _{IGU} = 0.32 BTU/hr.ft ² ·°F (1.82 W/m ² K)					
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Aluminum Flashing	18 Gauge	1110 (160)	-	171(2739)	0.21 (900)
12	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity for air spaces within window framing was found using ISO 10077-2

Detail 5.3.7

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Vertical Z Girts (16" o.c.) Supporting Stucco Cladding and R-12 Batt Insulation in Stud Cavity – Window and Intermediate Floor Intersection



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Vertical Z-Girts with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	Varies	-	R-10 to R-15 (1.76 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
8	Rigid Insulation Bracing	Varies	0.2 (0.29)	-	1.8 (28)	0.29 (1220)
9	Rainscreen Cavity	1/2" (13)	-	R-0.5 (0.09 RSI)	0.075 (1.2)	0.24 (1000)
10	Stucco Cement with Breather Board	1/2" (13)	6 (0.9)	R-0.1 (0.01 RSI)	120 (1922)	0.20 (850)
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Metal sheet connected to studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Wood Sill	1.5" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
14	5' (1.5m) x 6' (1.8m) Aluminum window: double glazed & thermally broken ² , double glazed IGU U _{IGU} = 0.32 BTU/hr.ft ² ·°F (1.82 W/m ² K)					
15	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
16	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

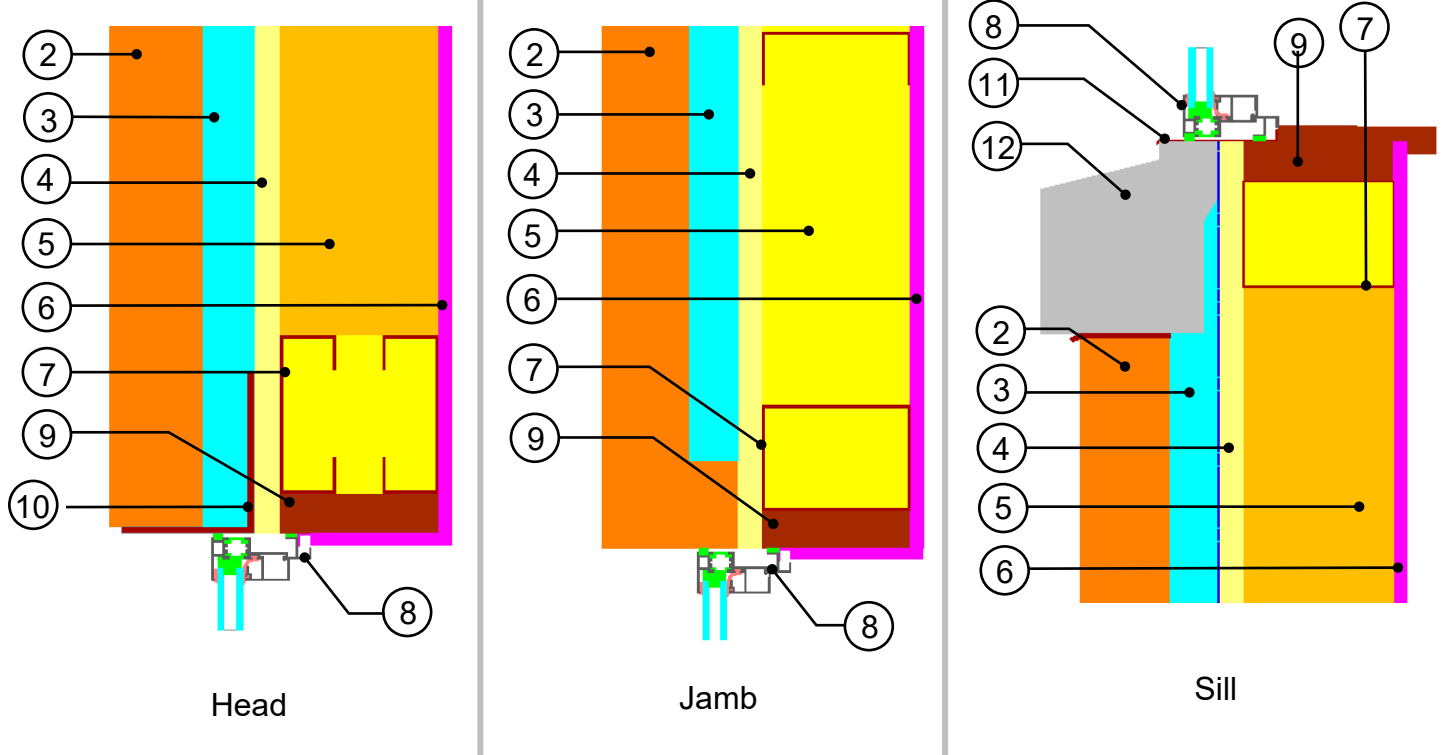
² The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 5.3.8

Interior Insulated Steel Frame Wall Assembly with Brick Cladding – Window Intersection

Detail referenced from work done by Passive House Academy



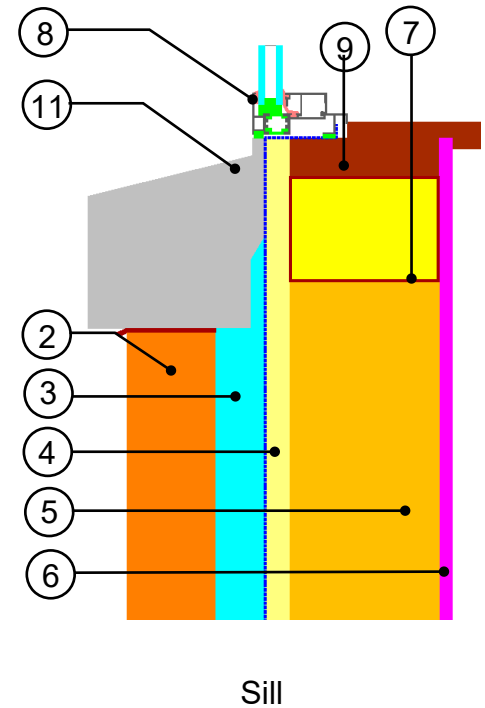
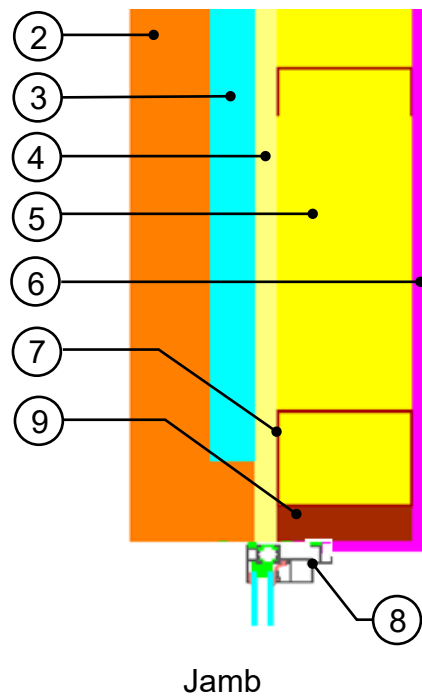
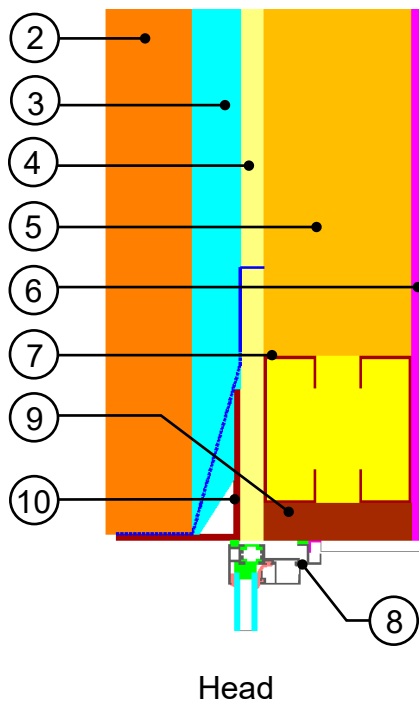
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.74 (0.13 RSI)	-	-
2	Brick	3 5/8" (92)	0.578 (1.0)	R-0.523 (0.092 RSI)	110 (1800)	-
3	Air Cavity	2" (51)	0.132 (0.23)	R-1.261 (0.222 RSI)	-	-
4	Insulation	1" (25)	0.0139 (0.024)	R-6 (1.055 RSI)	-	-
5	Mineral Wool Insulation with Steel Studs	6 3/8" (162)	0.0370 (0.064)	R-14.36 (2.53 RSI)	-	-
6	Gypsum Board	1/2" (13)	0.092 (0.16)	R-0.5 (0.08 RSI)	50 (800)	-
7	Steel Studs	-	27.7 (48)	-	-	-
8	5500 ISOWEB Window	-	-	-	-	-
9	Timber Buck	-	0.006 (0.10)	-	-	-
10	Steel Lintel	-	27.7 (48)	-	-	-
11	Aluminum Sill Pan	-	92.45 (160)	-	-	-
12	Concrete Sill	-	1.4 (2.4)	-	-	-
13	Exterior Film ¹	-	-	R-0.23 (0.04 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.3.9

Interior Insulated Steel Frame Wall Assembly with Brick Cladding – Window Intersection Aligned with Insulation

Detail referenced from work done by Passive House Academy

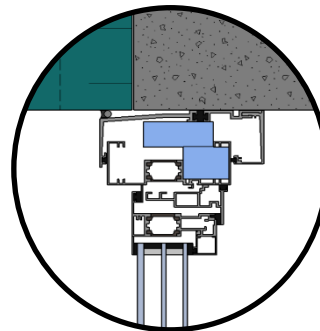
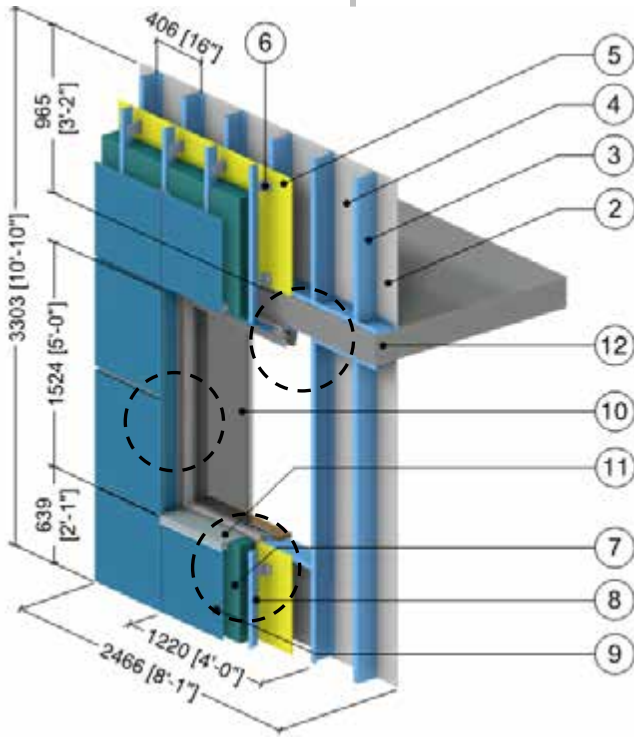


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.74 (0.13 RSI)	-	-
2	Brick	3 5/8" (92)	0.578 (1.0)	R-0.523 (0.092 RSI)	110 (1800)	-
3	Air Cavity	2" (51)	0.132 (0.23)	R-1.261 (0.222 RSI)	-	-
4	Insulation	1" (25)	0.0139 (0.024)	R-6 (1.055 RSI)	-	-
5	Mineral Wool Insulation with Steel Studs	6 3/8" (162)	0.0370 (0.064)	R-14.36 (2.53 RSI)	-	-
6	Gypsum Board	1/2" (13)	0.092 (0.16)	R-0.5 (0.08 RSI)	50 (800)	-
7	Steel Studs	-	27.7 (48)	-	-	-
8	5500 ISOWEB Window	-	-	-	-	-
9	Timber Buck	-	0.006 (0.10)	-	-	-
10	Steel Lintel	-	27.7 (48)	-	-	-
11	Concrete Sill	-	1.4 (2.4)	-	-	-
12	Exterior Film ¹	-	-	R-0.23 (0.04 RSI)	-	-

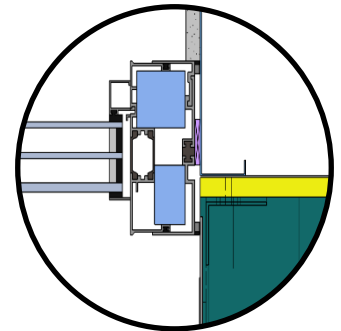
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.3.10

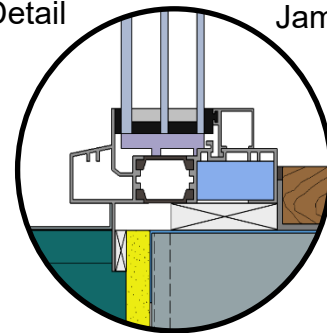
Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding – Triple Glazed Aluminum Window & Intermediate Floor Intersection with Window Thermal Break Positioned in Steel Framing



Head Detail



Jamb Detail



Sill Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	0.09" (2.2)	1110 (160)	-	171 (2739)	0.21 (900)
7	Exterior Insulation	Varies	-	R-10 to R-25 (1.76 RSI to 4.40 RSI)	1.8 (28)	0.29 (1220)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.21 (900)
9	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
10	5' (1.5m) x 4' (1.2m) Aluminum window: triple glazed & thermally broken ² , IGU U _{IGU} = 0.14 BTU/hr.ft ² ·°F (0.81 W/m ² K)					
11	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
12	Concrete Floor Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI) to R-0.7 (0.12 RSI)	-	-

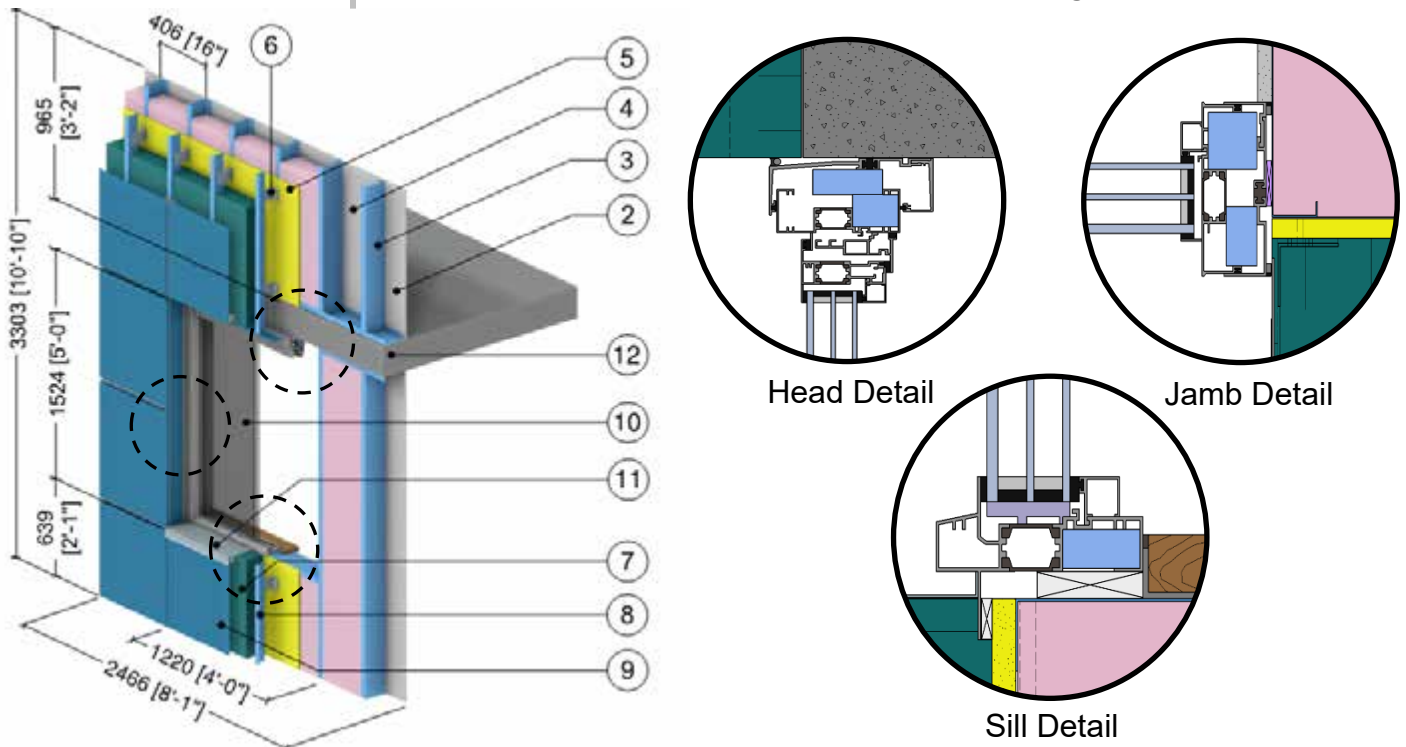
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 5.3.11

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and R-19 Batt Insulation in Stud Cavity – Triple Glazed Aluminum Window & Intermediate Floor Intersection with Window Thermal Break Positioned in Steel Framing



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglas Batt Insulation	6" (152)	0.32 (0.046)	R-19 (3.35 RSI)	0.9 (1.1)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	0.09" (2.2)	1110 (160)	-	171 (2739)	0.21 (900)
7	Exterior Insulation	Varies	-	R-10 to R-25 (1.76 RSI to 4.40 RSI)	1.8 (28)	0.29 (1220)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.21 (900)
9	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
10	5' (1.5m) x 4' (1.2m) Aluminum window: triple glazed & thermally broken, IGU U _{IGU} = 0.14 BTU/hr.ft ² ·°F (0.81 W/m ² K) ²					
11	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
12	Concrete Floor Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI) to R-0.7 (0.12 RSI)	-	-

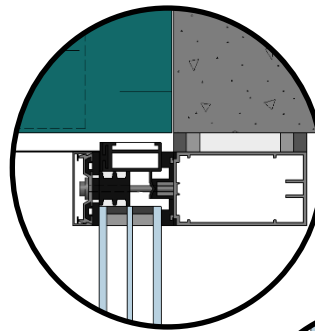
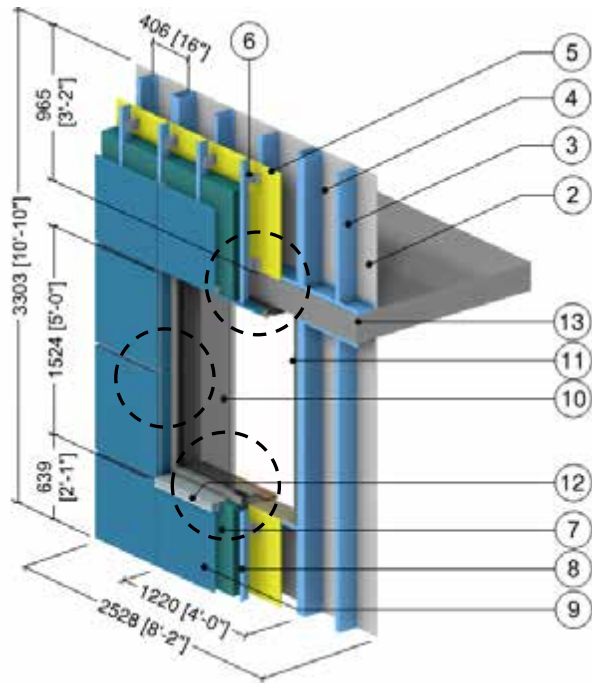
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

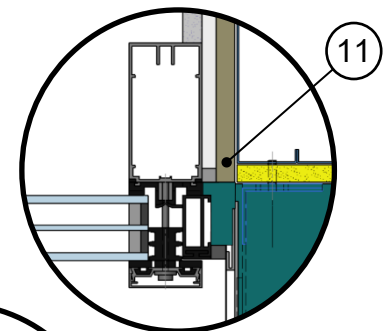


Detail 5.3.12

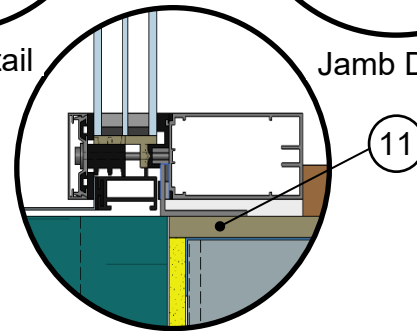
Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding – Triple Glazed Aluminum Curtain Wall & Intermediate Floor Intersection with Window Thermal Break Positioned in the Exterior Insulation



Head Detail



Jamb Detail



Sill Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistor hr-ft ² -°F/Btu (m ² K/W)	Sill Detail Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	0.09" (2.2)	1110 (160)	-	171 (2739)	0.21 (900)
7	Exterior Insulation	Varies	-	R-10 to R-25 (1.76 RSI to 4.40 RSI)	1.8 (28)	0.29 (1220)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.21 (900)
9	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
10	5' (1.5m) x 4' (1.2m) Aluminum curtain wall (Passive House certified): triple glazed & thermally broken ² , IGU U _{IGU} = 0.14 BTU/hr.ft ² .°F (0.81 W/m ² K)					
11	Wood Liner	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
12	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
13	Concrete Floor Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI) to R-0.7 (0.12 RSI)	-	-

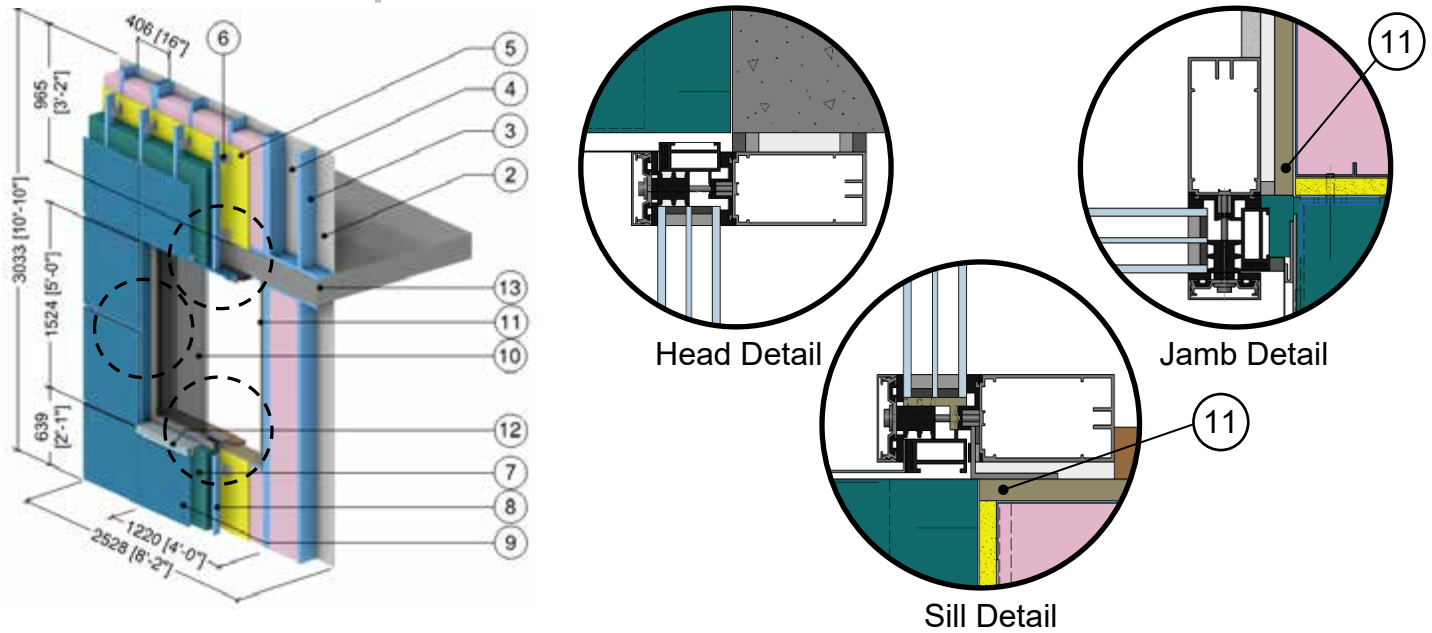
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 5.3.13

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and R-19 Batt Insulation in Stud Cavity – Triple Glazed Aluminum Curtain Wall & Intermediate Floor Intersection with Window Thermal Break Positioned in the Exterior Insulation



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglas Batt Insulation	6" (152)	0.32 (0.046)	R-19 (3.35 RSI)	0.9 (1.1)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	0.09" (2.2)	1110 (160)	-	171 (2739)	0.21 (900)
7	Exterior Insulation	Varies	-	R-10 to R-25 (1.76 RSI to 4.40 RSI)	1.8 (28)	0.29 (1220)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.21 (900)
9	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
10	5' (1.5m) x 4' (1.2m) Aluminum curtain wall (Passive House certified): triple glazed & thermally broken ² , IGU U _{IGU} = 0.14 BTU/hr.ft ² .°F (0.81 W/m ² K)					
11	Wood Liner	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
12	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
13	Concrete Floor Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI) to R-0.7 (0.12 RSI)	-	-

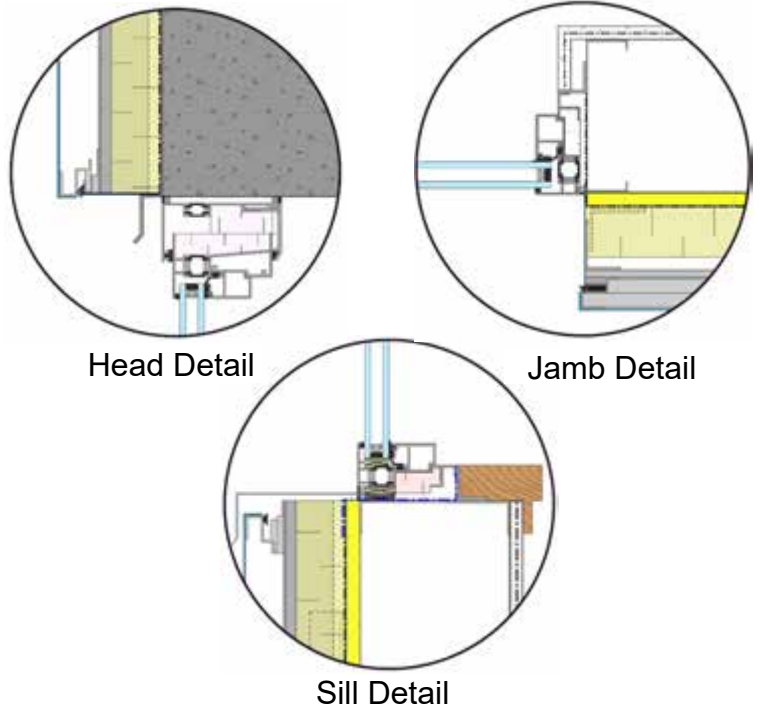
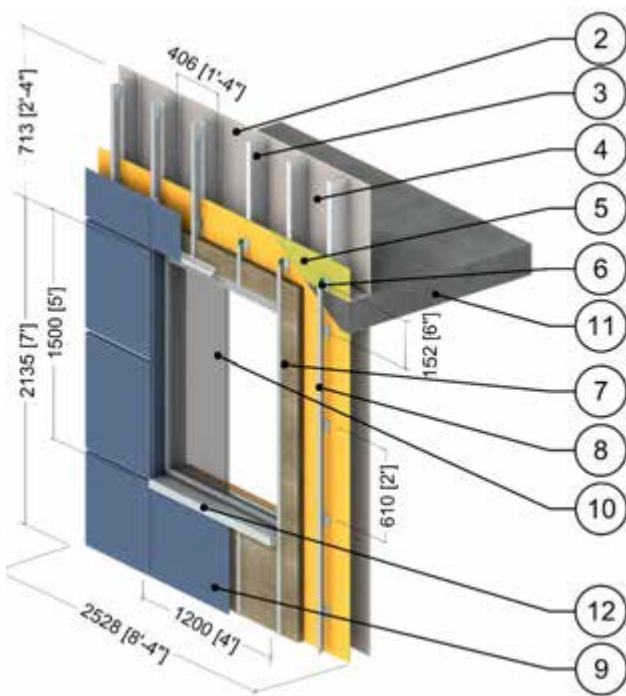
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 5.3.14

Owens Corning Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding – Double Glazed Aluminum Window and Intermediate Floor Intersection



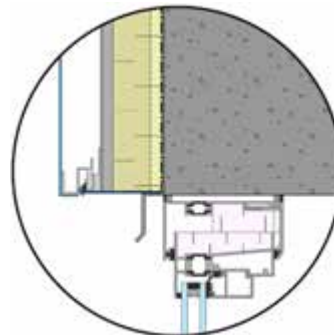
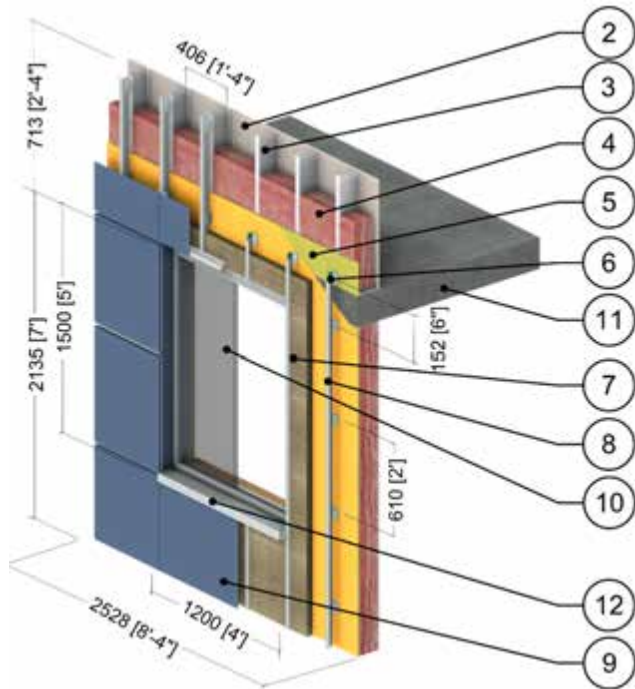
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	varies	-	-	-	-
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	varies	0.24 (0.034)	R-8.4 to R-21.0 (1.48 to 3.70 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	5' (1.5m) x 4' (1.2m) Aluminum window: thermally broken, double glazed IGU ² U _{IGU} = 0.32 BTU/hr.ft ² ·°F (1.82 W/m ² K)					
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Aluminum Flashing	18 gauge	1110 (160)	-	171 (2739)	0.22 (900)
13	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

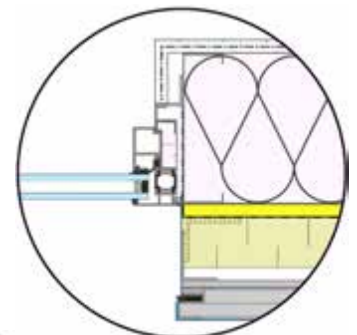
² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 5.3.15

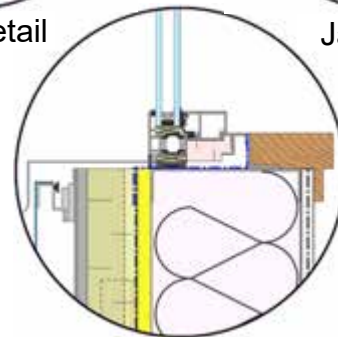
Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-20 Batt in Stud Cavity – Double Glazed Aluminum Window and Intermediate Floor Intersection



Head Detail



Jamb Detail



Sill Detail

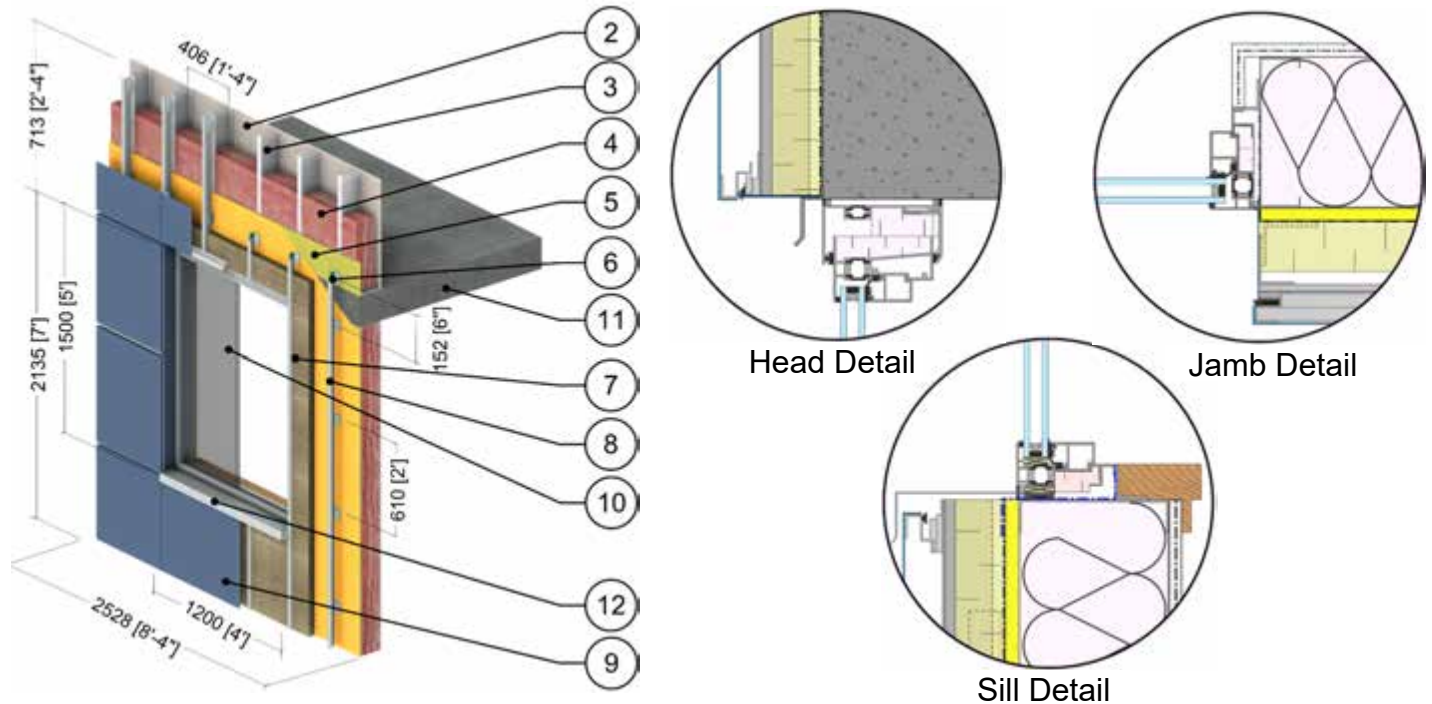
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.30 (0.043)	R-20 (3.52 RSI)	0.55 (8.8)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	varies	-	-	-	-
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	varies	0.24 (0.034)	R-8.4 to R-21.0 (1.48 to 3.70 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	5' (1.5m) x 4' (1.2m) Aluminum window: thermally broken, double glazed IGU ² U _{IGU} = 0.32 BTU/hr.ft ² ·°F (1.82 W/m ² K)					
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Aluminum Flashing	18 gauge	1110 (160)	-	171 (2739)	0.22 (900)
13	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 5.3.16

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-22.5 Batt in Stud Cavity – Double Glazed Aluminum Window and Intermediate Floor Intersection



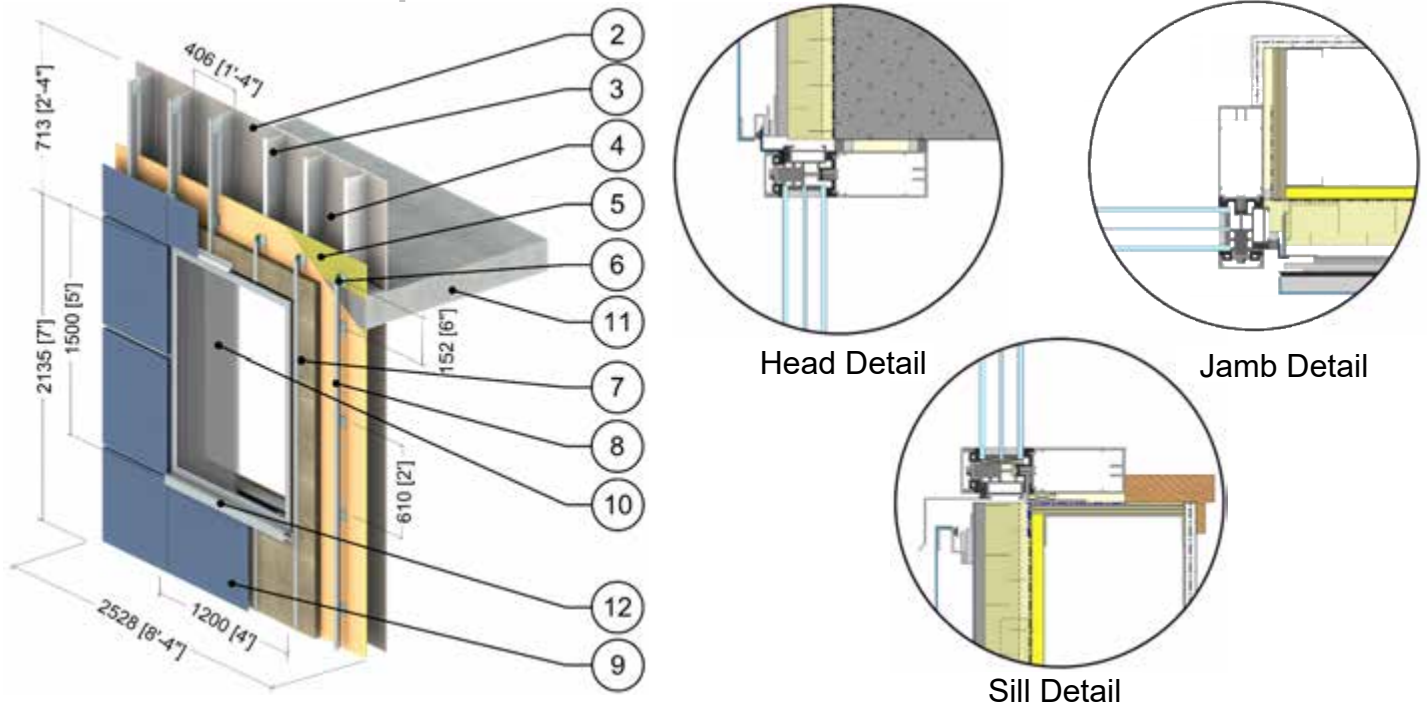
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.26 (0.038)	R-22.5 (3.96 RSI)	0.99 (15.9)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	varies	-	-	-	-
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	varies	0.24 (0.034)	R-8.4 to R-21.0 (1.48 to 3.70 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	5' (1.5m) x 4' (1.2m) Aluminum window: thermally broken, double glazed IGU ² $U_{IGU} = 0.32 \text{ BTU/hr.ft}^2\text{.}^{\circ}\text{F}$ (1.82 W/m ² K)					
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Aluminum Flashing	18 gauge	1110 (160)	-	171 (2739)	0.22 (900)
13	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 5.3.17

Owens Corning Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding – Triple Glazed Aluminum Window and Intermediate Floor Intersection



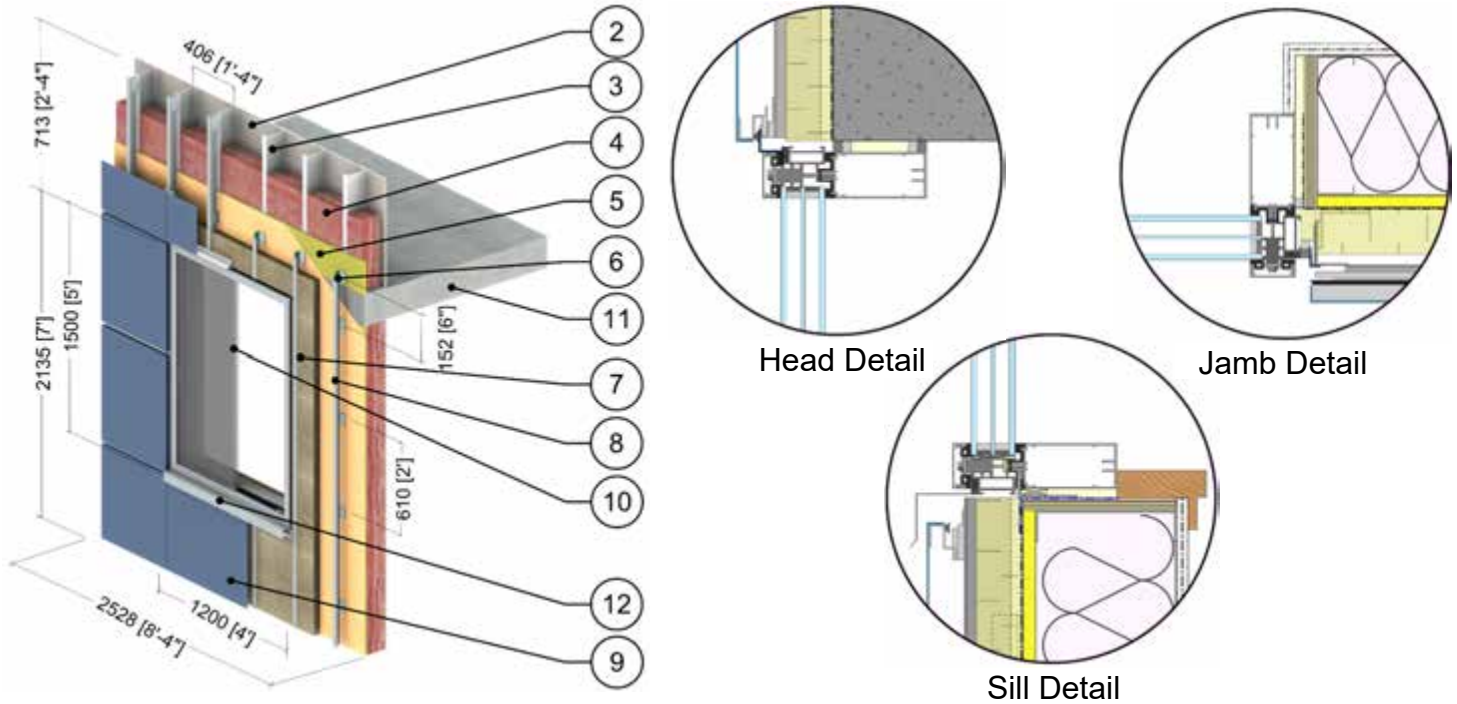
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	varies	-	-	-	-
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	varies	0.24 (0.034)	R-8.4 to R-21.0 (1.48 to 3.70 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	5' (1.5m) x 4' (1.2m) Aluminum window: thermally broken, triple glazed IGU ² U _{IGU} = 0.220 BTU/hr.ft ² .°F (1.25 W/m ² K)					
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Aluminum Flashing	18 gauge	1110 (160)	-	171 (2739)	0.22 (900)
13	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 5.3.18

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-20 Batt in Stud Cavity – Triple Glazed Aluminum Window and Intermediate Floor Intersection



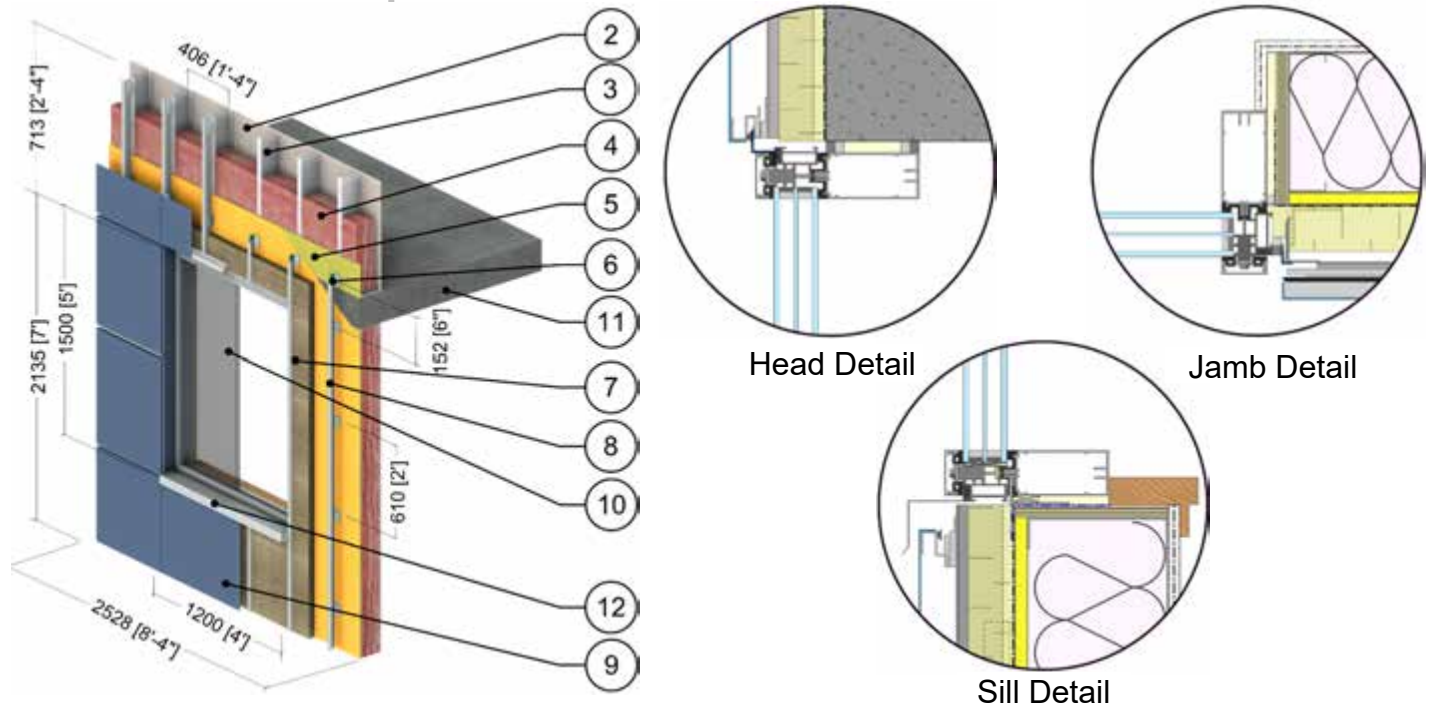
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.30 (0.043)	R-20 (3.52 RSI)	0.55 (8.8)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	varies	-	-	-	-
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	varies	0.24 (0.034)	R-8.4 to R-21.0 (1.48 to 3.70 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	5' (1.5m) x 4' (1.2m) Aluminum window: thermally broken, double glazed IGU ² U _{IGU} = 0.220 BTU/hr.ft ² ·°F (1.25 W/m ² K)					
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Aluminum Flashing	18 gauge	1110 (160)	-	171 (2739)	0.22 (900)
13	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 5.3.19

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-22.5 Batt in Stud Cavity – Triple Glazed Aluminum Window and Intermediate Floor Intersection



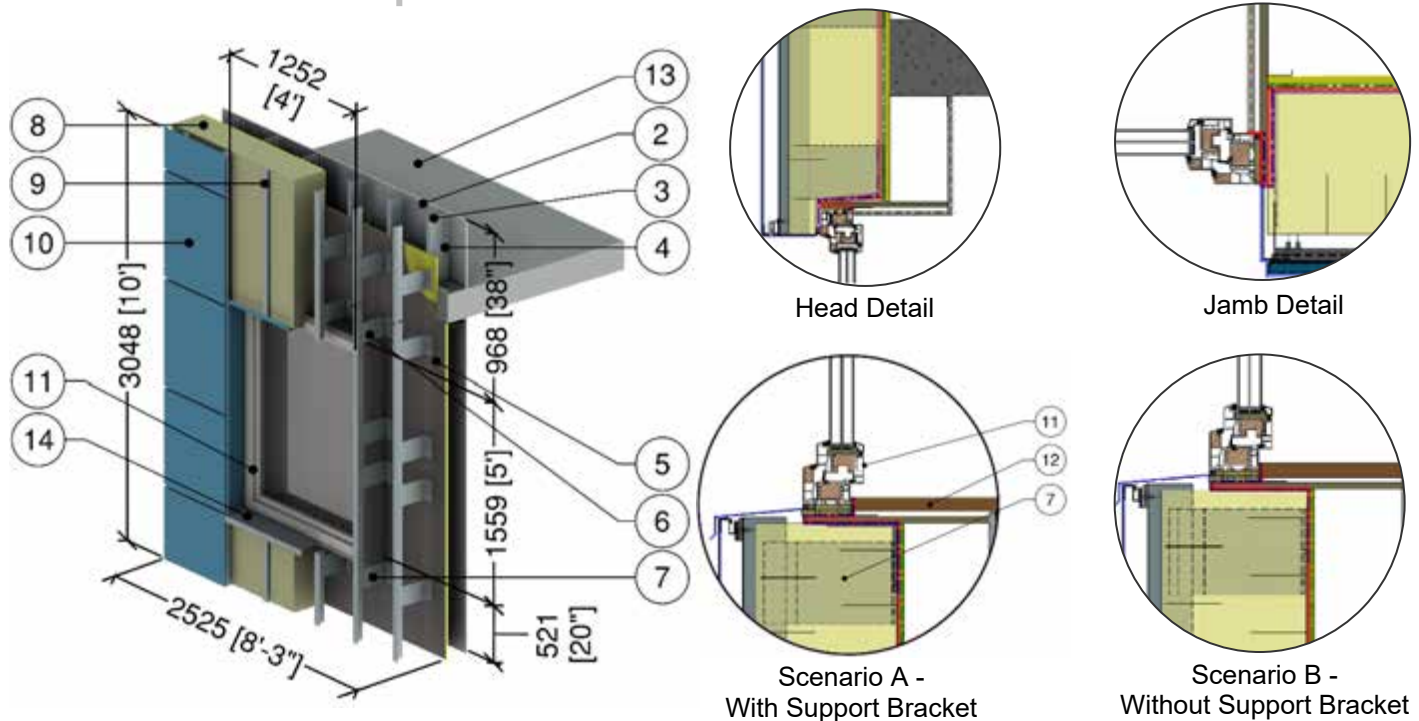
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.26 (0.038)	R-22.5 (3.96 RSI)	0.99 (15.9)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	varies	-	-	-	-
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	varies	0.24 (0.034)	R-8.4 to R-21.0 (1.48 to 3.70 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	5' (1.5m) x 4' (1.2m) Aluminum window: thermally broken, double glazed IGU ² U _{IGU} = 0.220 BTU/hr.ft ² ·°F (1.25 W/m ² K)					
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Aluminum Flashing	18 gauge	1110 (160)	-	171 (2739)	0.22 (900)
13	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 5.3.20

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with FRP and Thermally Broken Vertical Brackets and Rail System Supporting Metal Cladding – Triple Glazed Vinyl Window and Intermediate Floor Intersection



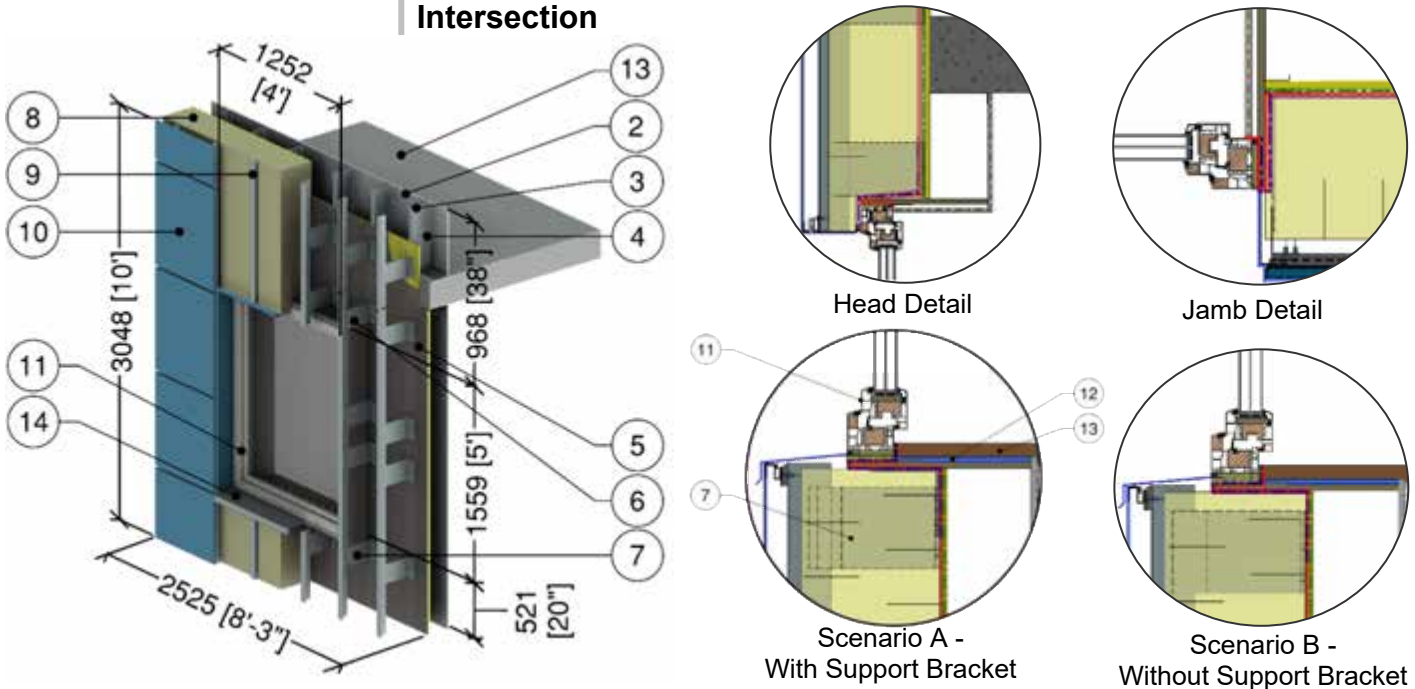
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	FRP Bracket	-	4.85 (0.7)	-	110 (1760)	-
7	Aluminum Bracket	-	1110 (160)	-	171 (2739)	0.22 (900)
8	Exterior Mineral Wool Insulation	10" (254)	0.24 (0.034)	R-42 (7.40 RSI)	4.5 (72)	0.20 (850)
9	Vertical Aluminum L-Rail	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
10	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
11	5' (1.5m) x 4' (1.2m) Vinyl window: thermally broke, triple glazed IGU ² U _{IGU} = 0.13 BTU/hr·ft ² ·°F (0.72 W/m ² K)					
12	Wood Liner	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
14	Aluminum Flashing	18 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
15	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 5.3.21

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with FRP and Thermally Broken Vertical Brackets and Rail System Supporting Metal Cladding with Aerogel Insulation Blanket – Triple Glazed Vinyl Window and Intermediate Floor Intersection



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	FRP Bracket	-	4.85 (0.7)	-	110 (1760)	-
7	Aluminum Bracket	-	1110 (160)	-	171 (2739)	0.22 (900)
8	Exterior Mineral Wool Insulation	10" (254)	0.24 (0.034)	R-42 (7.40 RSI)	4.5 (72)	0.20 (850)
9	Vertical Aluminum L-Rail	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
10	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
11	5' (1.5m) x 4' (1.2m) Vinyl window: thermally broke, triple glazed IGU ² U _{IGU} = 0.13 BTU/hr·ft ² ·°F (0.72 W/m ² K)					
12	Aerogel Insulation Blanket	3/8" (10)	0.10 (0.014)	R-4.1 (0.71 RSI)	12.5 (200)	-
13	Wood Liner	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
14	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
15	Aluminum Flashing	18 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
16	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

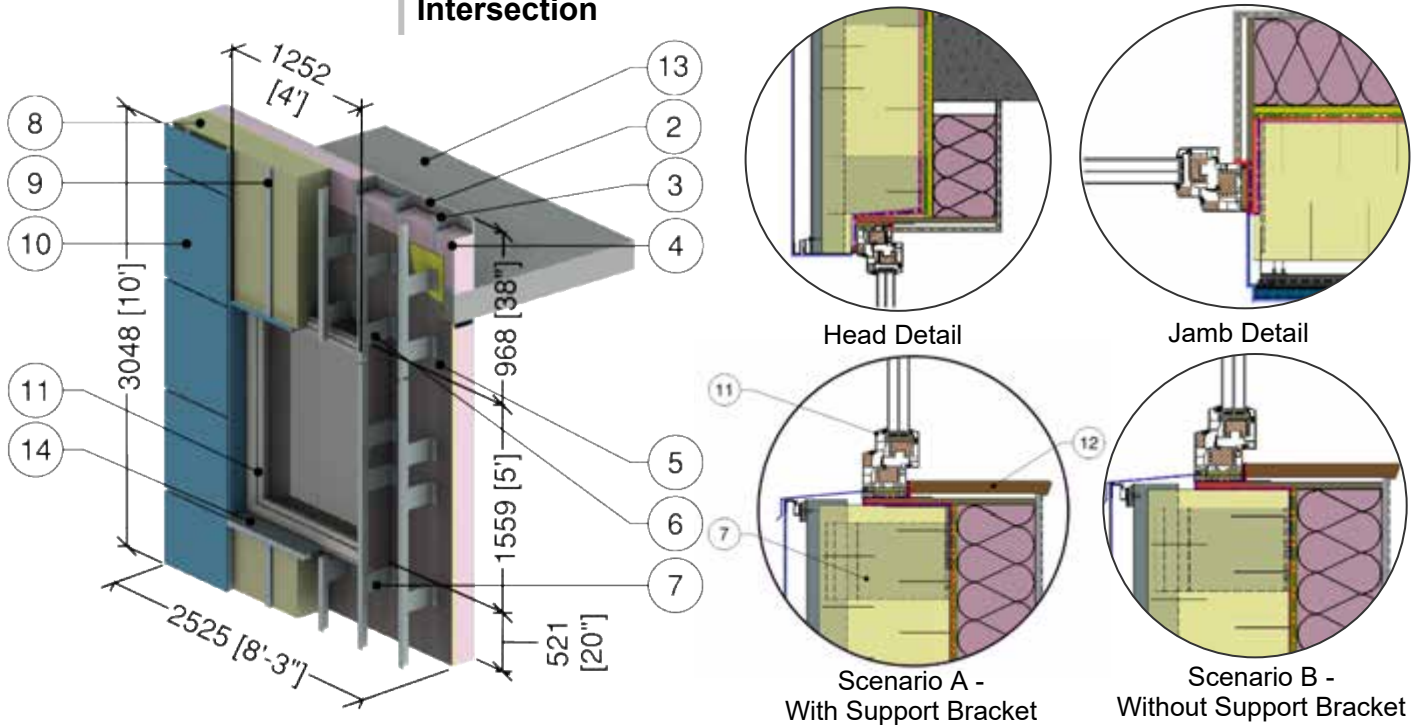
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2



Detail 5.3.22

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with FRP and Thermally Broken Vertical Brackets and Rail System Supporting Metal Cladding and R-19 Batt in Stud Cavity – Triple Glazed Vinyl Window and Intermediate Floor Intersection



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	6" (152)	0.32 (0.046)	R-19 (3.35 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	FRP Bracket	-	4.85 (0.7)	-	110 (1760)	-
7	Aluminum Bracket	-	1110 (160)	-	171 (2739)	0.22 (900)
8	Exterior Mineral Wool Insulation	10" (254)	0.24 (0.034)	R-42 (7.40 RSI)	4.5 (72)	0.20 (850)
9	Vertical Aluminum L-Rail	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
10	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
11	5' (1.5m) x 4' (1.2m) Vinyl window: thermally broke, triple glazed IGU ² U _{IGU} = 0.13 BTU/hr-ft ² -°F (0.72 W/m ² K)					
12	Wood Liner	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
14	Aluminum Flashing	18 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
15	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

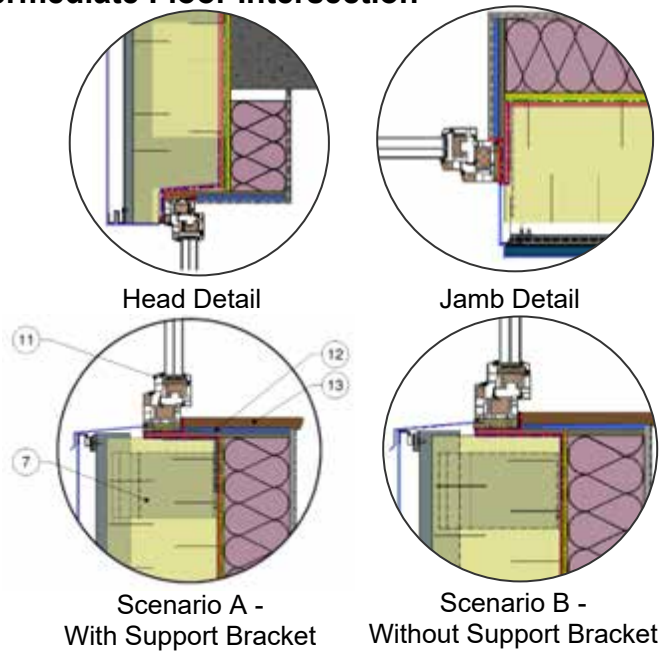
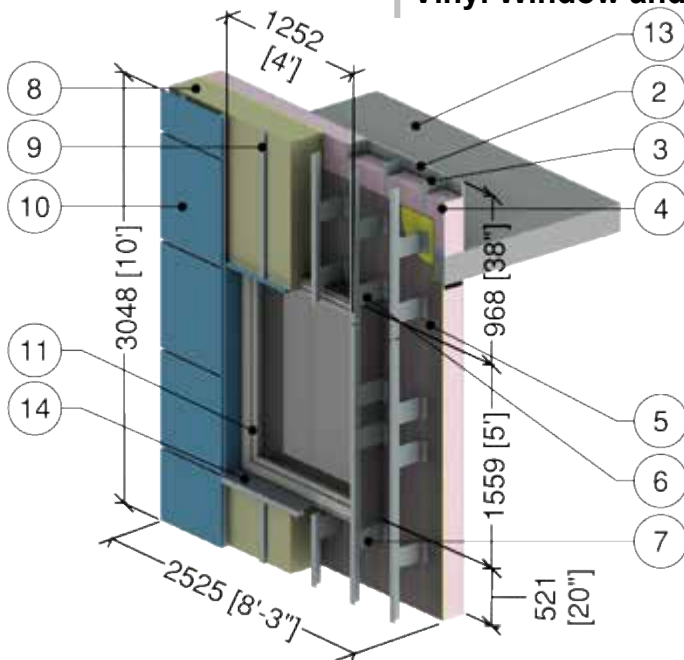
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2



Detail 5.3.23

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with FRP and Thermally Broken Vertical Brackets and Rail System Supporting Metal Cladding with Aerogel Insulation Blanket and R-19 Batt in Stud Cavity– Triple Glazed Vinyl Window and Intermediate Floor Intersection



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	6" (152)	0.32 (0.046)	R-19 (3.35 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	FRP Bracket	-	4.85 (0.7)	-	110 (1760)	-
7	Aluminum Bracket	-	1110 (160)	-	171 (2739)	0.22 (900)
8	Exterior Mineral Wool Insulation	10" (254)	0.24 (0.034)	R-42 (7.40 RSI)	4.5 (72)	0.20 (850)
9	Vertical Aluminum L-Rail	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
10	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
11	5' (1.5m) x 4' (1.2m) Vinyl window: thermally broke, triple glazed IGU ² U _{IGU} = 0.13 BTU/hr·ft ² ·°F (0.72 W/m ² K)					
12	Aerogel Insulation Blanket	3/8" (10)	0.10 (0.014)	R-4.1 (0.71 RSI)	12.5 (200)	-
13	Wood Liner	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
14	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
15	Aluminum Flashing	18 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
16	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

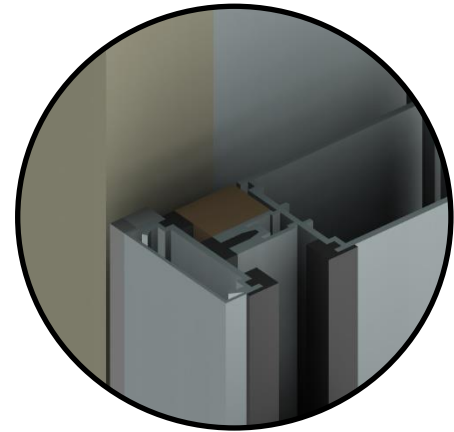
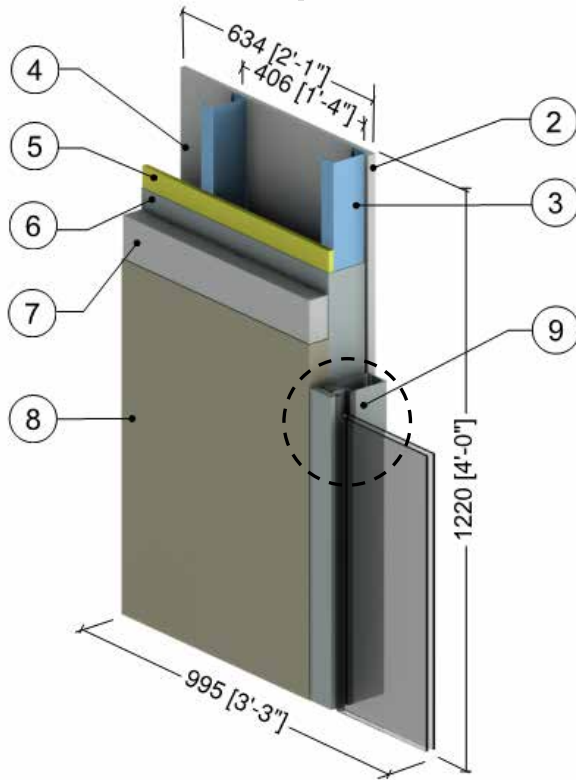
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2



Detail 5.4.1

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Conventional Curtain Wall Transition



Curtain Wall Jamb Detail

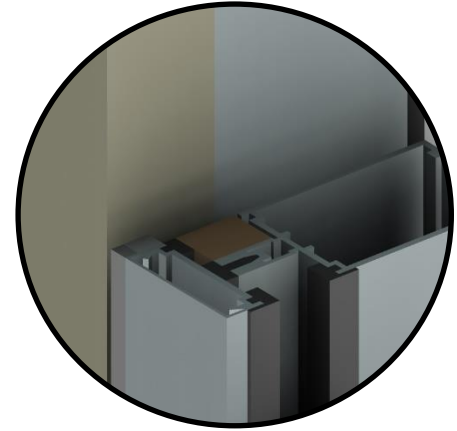
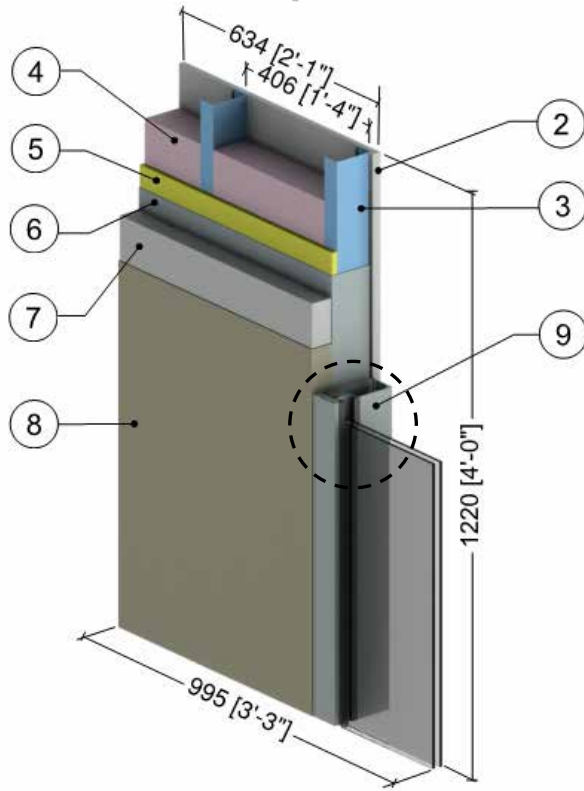
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs (16"o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Weather Resistant Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	Varies	0.27 (0.039)	R-7.5 to R-15 (1.32 RSI to 2.64 RSI)	1 (16)	0.35 (1470)
8	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
9	Conventional curtain wall system: double glazed with minimal thermal break ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² °F (1.82 W/m ² K)					
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 5.4.2

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly with R-12 Batt Insulation in Stud Cavity – Conventional Curtain Wall Transition



Curtain Wall
Jamb Detail

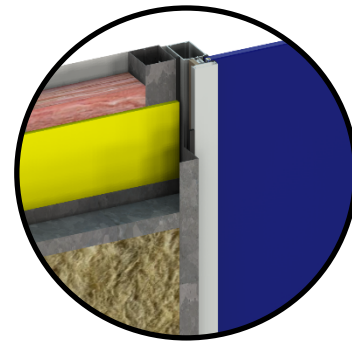
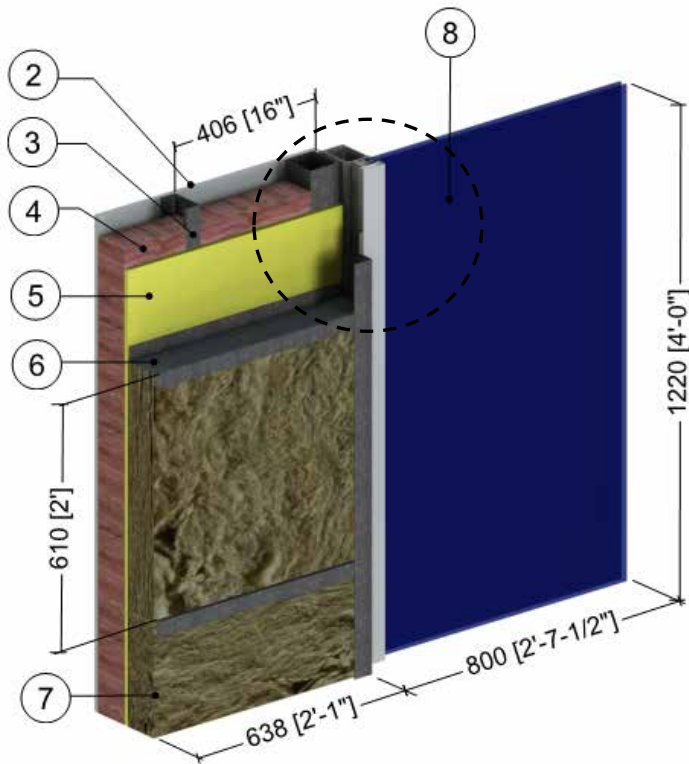
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs (16"o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12 (2.1 RSI)	0.9 (1.1)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	Varies	0.27 (0.039)	R-7.5 to R-15 (1.32 RSI to 2.64 RSI)	1 (16)	0.35 (1470)
8	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
9	Conventional curtain wall system: double glazed with minimal thermal break ² , double glazed IGU U _{IGU} = 0.32 BTU/hr-ft ² ·°F (1.82 W/m ² K)					
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

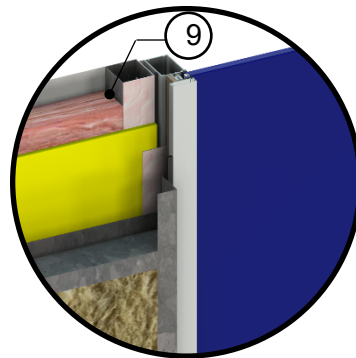
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 5.4.3

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with R-12 Batt Insulation in Stud Cavity – Curtain Wall Transition



Without Aerogel Detail



With Aerogel Detail

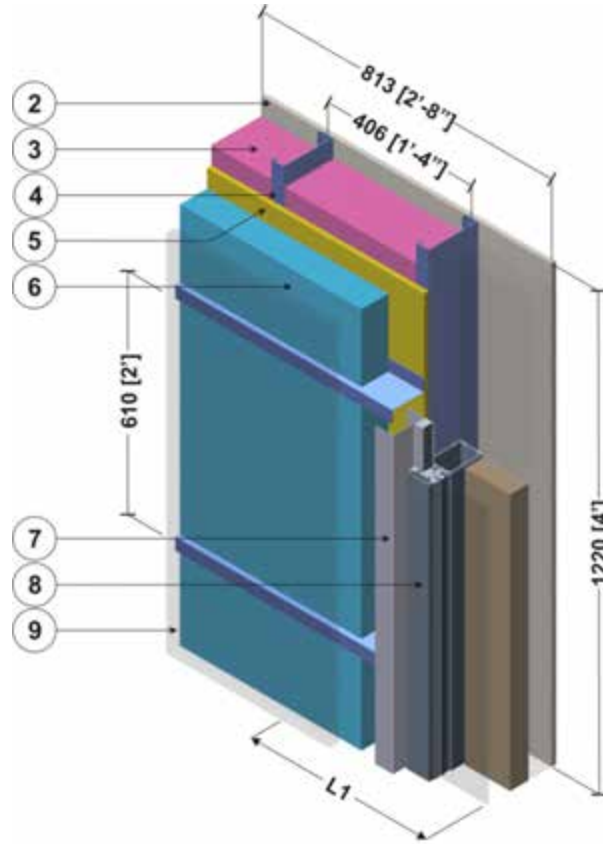
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3 1/2" (89)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Conventional curtain wall system: double glazed with minimal thermal break ² , double glazed IGU U _{IGU} = 0.32 BTU/hr-ft ² -°F (1.82 W/m ² K)					
9	Aerogel Blanket	0.4" (10)	0.086 (0.015)	R-3.8 (0.67 RSI)	-	-
10	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 5.4.4

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Conventional Curtain Wall Intersection



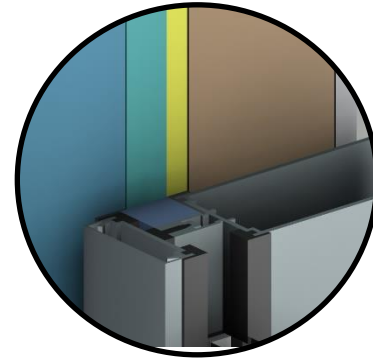
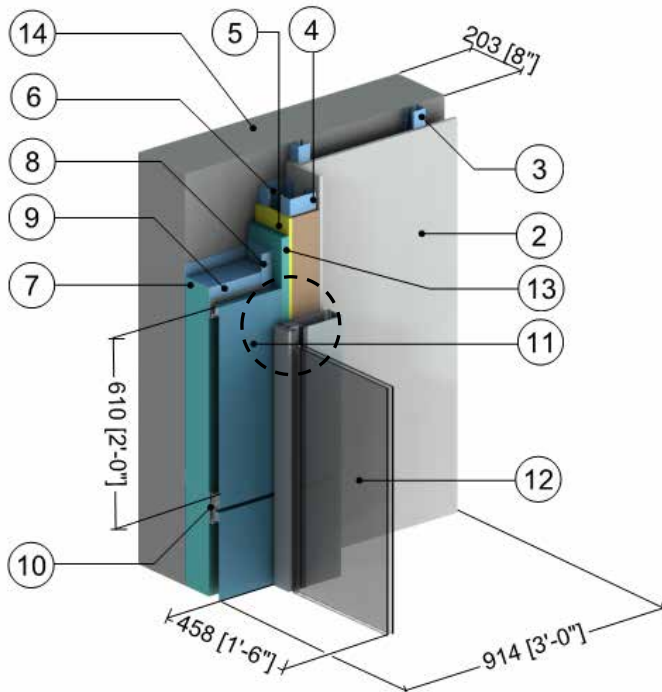
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (90)	0.31 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
7	Horizontal Z-girts w/ 1 1/2" Flange with Closure Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Conventional curtain wall system with insulated back pan (Pressure plates with minimal thermal break) ²					
9	Metal cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI) to R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within curtain wall framing was found using ISO 10077-2

Detail 5.4.5

Exterior Insulated Concrete Wall and Steel Stud Assembly Supporting Metal Cladding – Curtain Wall Transition Intersection



Jamb Detail

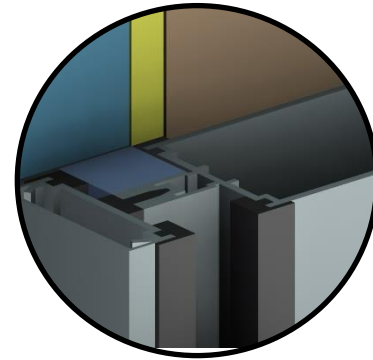
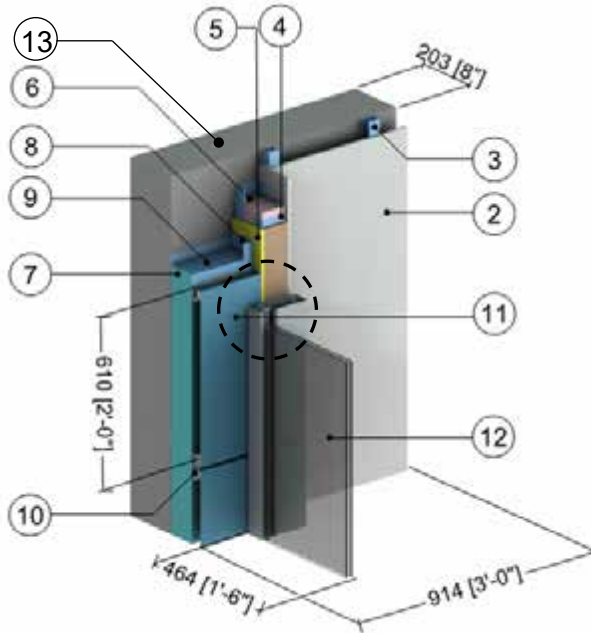
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Air Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
7	Exterior Insulation	Varies	-	R-15 to R-25 (2.64 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
8	Vertical Z-Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Horizontal Z-Girt (24" o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
10	Panel Clip	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Metal Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
12	Conventional curtain wall system: double glazed with minimal thermal break ² , double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F} \text{ (1.82 W/m}^2\text{K)}$					
13	Rigid Insulation	1" (25)	-	R-5.0 (0.88 RSI)	1.8 (28)	0.29 (1220)
14	Concrete Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
15	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 5.4.6

Exterior Insulated Concrete Wall and Steel Stud Assembly Supporting Metal Cladding with Cavity Insulation – Curtain Wall Transition Intersection



Jamb Detail

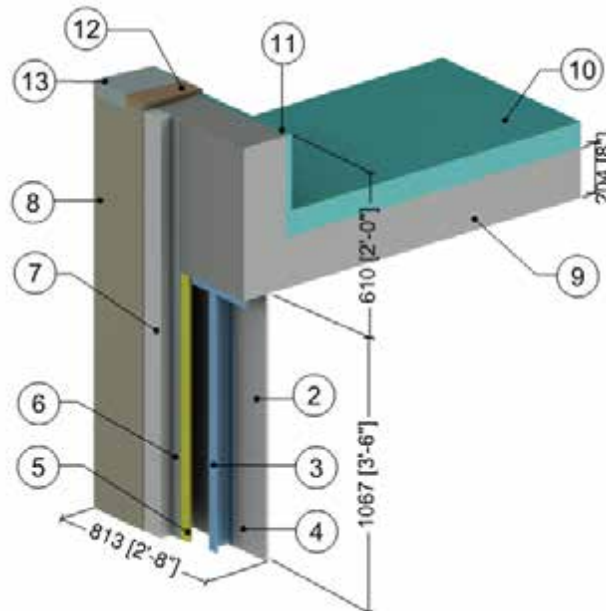
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Fiberglass Batt Insulation	3 5/8" (92)	0.29 (0.042)	R-12.0 (2.1 RSI)	0.9 (14)	0.17 (710)
7	Exterior Insulation	Varies	-	R-15 to R-25 (2.64 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
8	Vertical Z-Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Horizontal Z-Girt (24" o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
10	Panel Clip	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Metal Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
12	Conventional curtain wall system: double glazed with minimal thermal break ² , double glazed IGU U _{IGU} = 0.32 BTU/hr-ft ² -°F (1.82 W/m ² K)					
13	Concrete Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
14	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 5.5.1

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Concrete Parapet & Slab Intersection

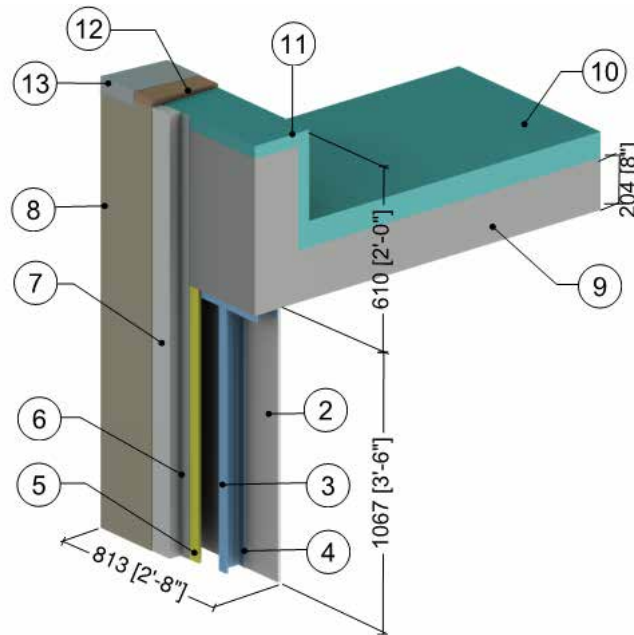


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	Varies	0.27 (0.039)	R-7.5 to R-15 (1.32 RSI to 2.64 RSI)	1 (16)	0.35 (1470)
8	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
9	Concrete Slab & Parapet	8" (203)	12 (1.8)	-	140 (2250)	0.20 (850)
10	Roof Insulation	4" (100)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
11	Parapet Insulation	1" (25)	-	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
12	Wood Blocking	5/8" (16)	0.63 (0.09)	-	27.8 (445)	0.45 (1880)
13	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
14	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.2

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Insulated Concrete Parapet & Slab Intersection

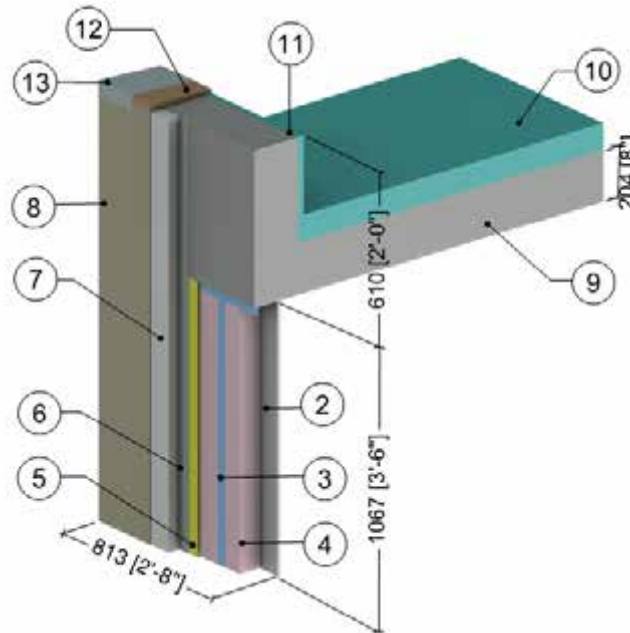


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.12 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	Varies	0.27 (0.039)	R-7.5 to R-15 (1.32 RSI to 2.64 RSI)	1 (16)	0.35 (1470)
8	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
9	Concrete Slab & Parapet	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Roof Insulation	4" (100)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
11	Parapet Insulation	Varies	-	R-10 to R-20 (1.76 RSI to 3.52 RSI)	1.8 (28)	0.29 (1220)
12	Wood Blocking	5/8" (16)	0.63 (0.09)	-	27.8 (445)	0.45 (1880)
13	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
14	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.3

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly with R-12 Batt Insulation in Stud Cavity – Concrete Parapet & Slab Intersection

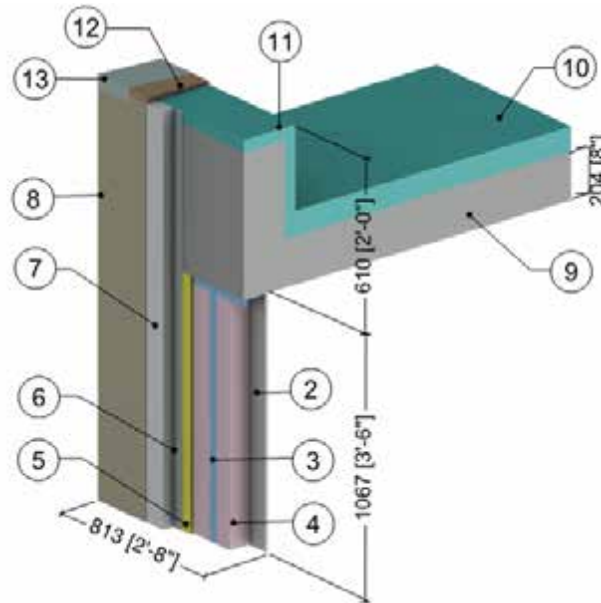


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12 (2.1 RSI)	0.9 (1.1)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	Varies	0.27 (0.039)	R-7.5 to R-15 (1.32 RSI to 2.64 RSI)	1 (16)	0.35 (1470)
8	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
9	Concrete Slab & Parapet	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Roof Insulation	4" (100)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
11	Parapet Insulation	1" (25)	-	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
12	Wood Blocking	5/8" (16)	0.63 (0.09)	-	27.8 (445)	0.45 (1880)
13	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
14	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.4

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly with R-12 Batt Insulation in Stud Cavity – Insulated Concrete Parapet & Slab Intersection

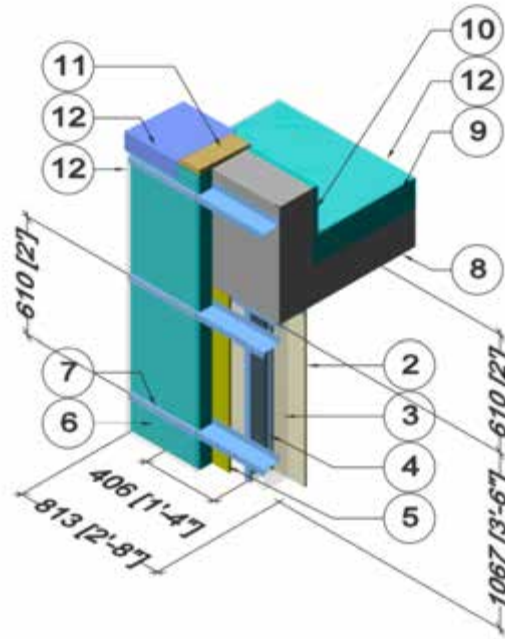


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.12 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12 (2.1 RSI)	0.9 (1.1)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	Varies	0.27 (0.039)	R-7.5 to R-15 (1.32 RSI to 2.64 RSI)	1 (16)	0.35 (1470)
8	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
9	Concrete Slab & Parapet	8" (203)	12 (1.8)	-	140 (2250)	0.20 (850)
10	Roof Insulation	4" (100)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
11	Parapet Insulation	Varies	-	R-10 to R-20 (1.76 RSI to 3.52 RSI)	1.8 (28)	0.29 (1220)
12	Wood Blocking	5/8" (16)	0.63 (0.09)	R-1 (0.18 RSI)	27.8 (445)	0.45 (1880)
13	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
14	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.5

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding – Concrete Parapet & Slab Intersection

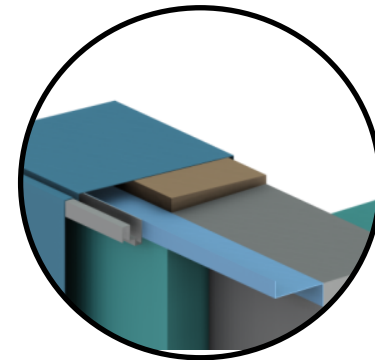
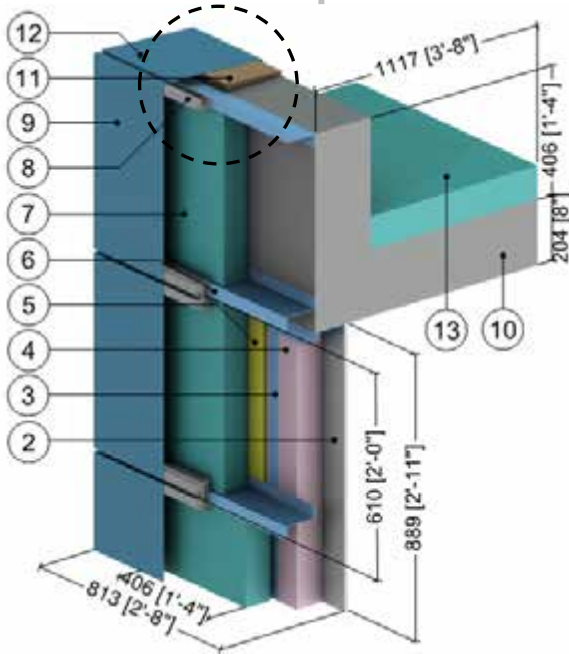


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Track	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R5 to R25 (0.88 to 4.4 RSI)	1.8 (28)	0.29 (1220)
7	Horizontal Z-Girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Concrete Slab & Parapet	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Roof Insulation	4" (102)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
10	Parapet Insulation	1" (25)	-	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
11	Wood Blocking	5/8" (16)	0.63 (0.09)	R-1 (0.18 RSI)	27.8 (445)	0.45 (1880)
12	Metal cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient, metal cap flashing & finish roof materials					
13	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.6

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Concrete Parapet and Slab Intersection



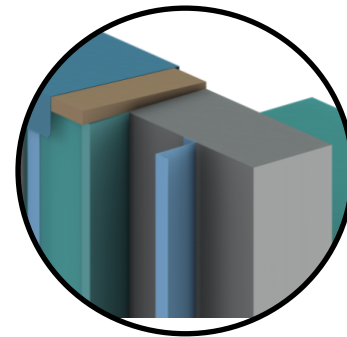
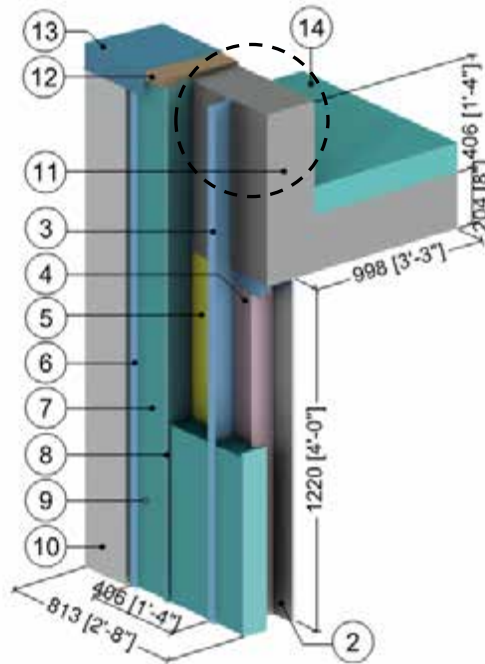
Parapet Cap Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	Varies	-	R-10 to R-15 (1.76 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
8	Panel Clip	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	Concrete Slab and Parapet	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Wood Blocking	5/8" (16)	0.69 (0.10)	R-1 (RSI-0.18)	31 (500)	0.45 (1880)
12	Steel Cap Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Roof Insulation	4" (102)	0.20 (0.029)	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
14	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.7

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Vertical Z Girts (16" o.c.) Supporting Stucco Cladding and R-12 Batt Insulation in Stud Cavity – Concrete Parapet & Slab Intersection



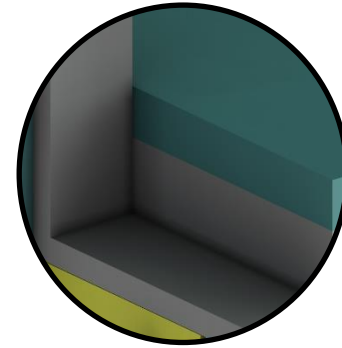
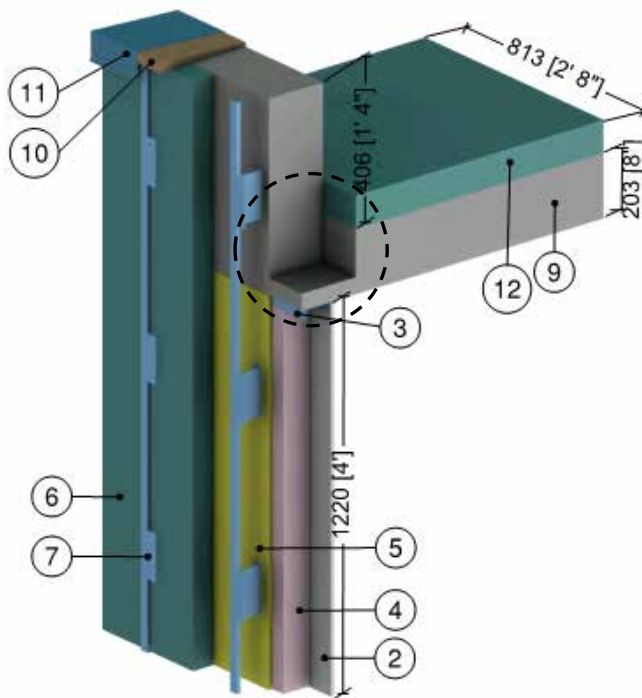
Parapet Cap Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Vertical Z-Girts with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	Varies	-	R-10 to R-15 (1.76 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
8	Rigid Insulation Bracing	Varies	0.2 (0.029)	-	1.8 (28)	0.29 (1220)
9	Rainscreen Cavity	1/2" (13)	-	R-0.5 (0.09 RSI)	0.075 (1.2)	0.24 (1000)
10	Stucco Cement with Breather Board	1/2" (13)	6 (0.9)	R-0.1 (0.01 RSI)	120 (1922)	0.20 (850)
11	Concrete Slab and Parapet	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Wood Blocking	5/8" (16)	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	Steel Cap Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
14	Roof Insulation	4 (102)	0.20 (0.029)	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.8

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Intermittent Vertical Z Girts (16" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Concrete Roof Deck at Continuous Concrete Parapet



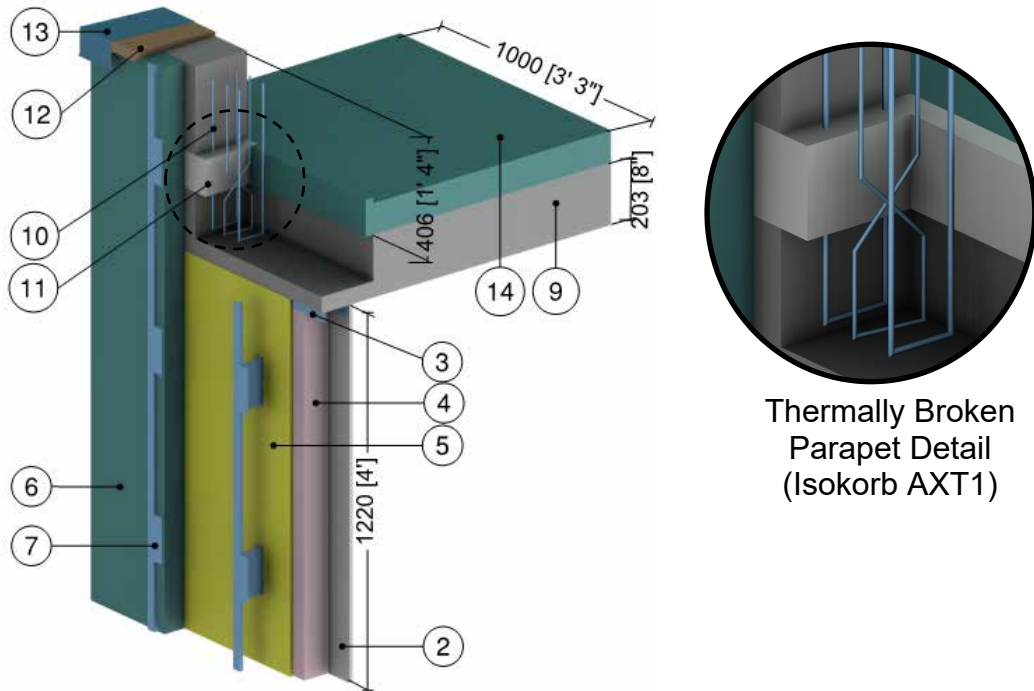
Continuous Concrete Parapet Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12.0 (2.11 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
7	Intermittent Vertical Z-Girts with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Concrete Slab and Parapet	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Wood Blocking	5/8" (16)	0.69 (0.10)	R-1.0 (0.18 RSI)	31 (500)	0.45 (1880)
11	Steel Cap Flashing	18 Gauge	347 (50)	-	489 (7830)	0.12 (500)
12	Roof Insulation	4 (102)	0.20 (0.029)	R-20 (3.50 RSI)	1.8 (28)	0.29 (1220)
13	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
14	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.9

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Intermittent Vertical Z Girts (16" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Concrete Roof Deck at Isokorb AXT1 Thermally Broken Concrete Parapet



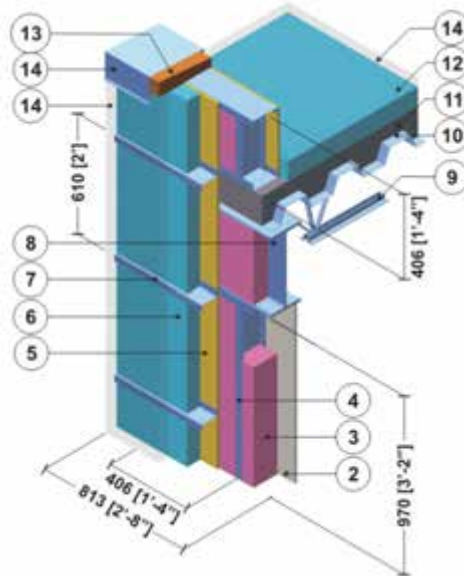
Thermally Broken Parapet Detail (Isokorb AXT1)

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12.0 (2.11 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
7	Intermittent Vertical Z-Girts with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Concrete Slab and Parapet	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
11	Polystyrene Hard Foam Insulation	4 3/4" (120)	0.217 (0.031)	R-22.0 (3.87 RSI)	66 (1060)	0.35 (1500)
12	Wood Blocking	5/8" (16)	0.69 (0.10)	R-1.0 (0.18 RSI)	31 (500)	0.45 (1880)
13	Steel Cap Flashing	18 Gauge	347 (50)	-	489 (7830)	0.12 (500)
14	Roof Insulation	4 (102)	0.20 (0.029)	R-20 (3.50 RSI)	1.8 (28)	0.29 (1220)
15	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
16	Exterior Film ¹	-	-	R-0.2 (0.03 RSI) to R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.10

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Steel Roof Deck with Open Web Steel Joist & Parapet Intersection

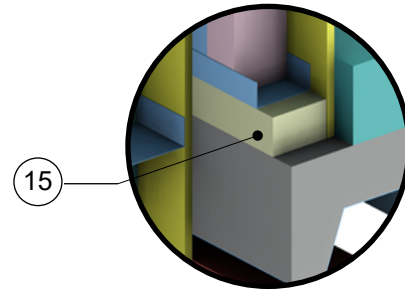
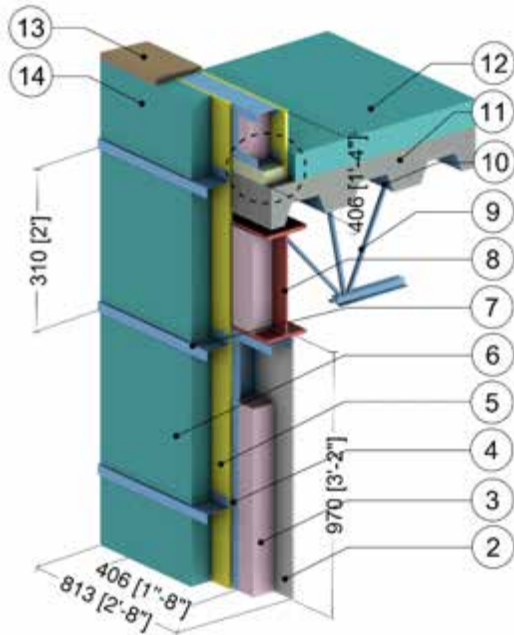


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (92)	0.29 (0.042)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	varies	-	R5 to R25 (0.88 to 4.4 RSI)	1.8 (28)	0.29 (1220)
7	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Steel Beam (W410)	-	347 (50)	-	489 (7830)	0.12 (500)
9	Open Web Steel Joist	-	347 (50)	-	489 (7830)	0.12 (500)
10	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
11	Concrete Topping	6" (152)	6.3 (0.9)	-	120 (1920)	0.20 (850)
12	Roof Insulation	4" (102)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
13	Wood Blocking	5/8" (16)	0.63 (0.09)	R-1 (0.18 RSI)	27.8 (445)	0.45 (1880)
14	Metal cladding with 1/2" (13mm) vented air space/ metal cap flashing/ finish roof materials is incorporated into exterior heat transfer coefficient					
15	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.11

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Steel Roof Deck with Open Web Steel Joist & Parapet Intersection with Thermal Break under Parapet Stud Cavity



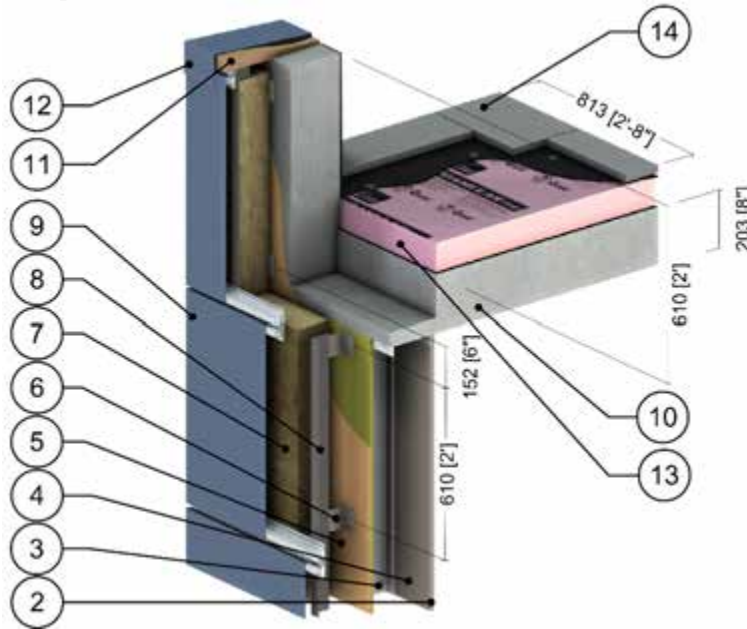
Parapet Thermal Break

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	varies	-	R15 (2.64 RSI)	1.8 (28)	0.29 (1220)
7	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Steel Beam (W410)	-	347 (50)	-	489 (7830)	0.12 (500)
9	Open Web Steel Joist	-	347 (50)	-	489 (7830)	0.12 (500)
10	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
11	Concrete Topping	6" (152)	6.3 (0.9)	-	120 (1920)	0.20 (850)
12	Roof Insulation	4" (102)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
13	Wood Blocking	5/8" (16)	0.63 (0.09)	R-1 (0.18 RSI)	27.8 (445)	0.45 (1880)
14	Metal cladding with vented air space/ cap flashing/ finish roof materials is incorporated into exterior heat transfer coefficient					
15	Armatherm 500	2" (50)	0.32 (0.05)	R-6.2 (1.09 RSI)	-	-
16	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.12

Owens Corning Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding – Concrete Parapet and Roof Intersection

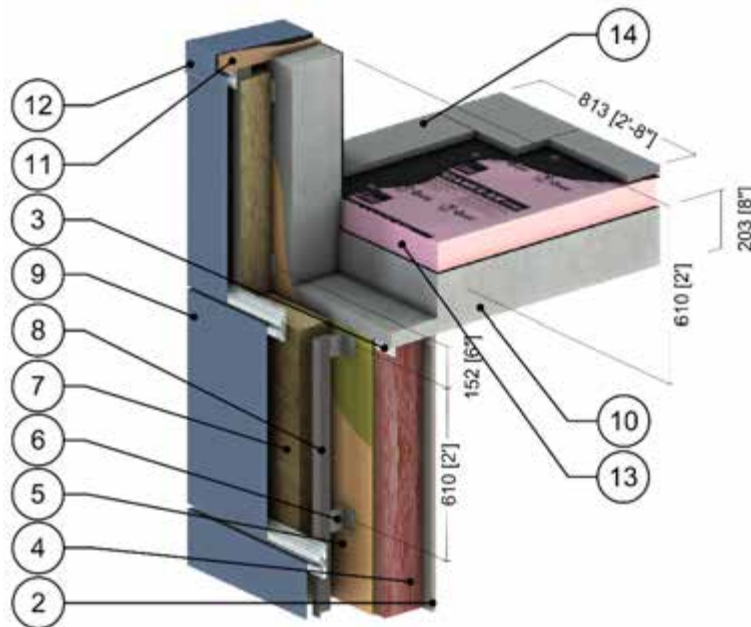


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	varies	-	-	-	-
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	varies	0.24 (0.034)	R-8.4 to R-21.0 (1.48 to 3.70 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Wood Blocking	5/8" (16)	0.69 (0.10)	R-1.0 (0.18 RSI)	31 (500)	0.45 (1880)
12	Cap Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Foamular XPS Rigid Insulation	4" (102)	0.20 (0.029)	R-20 (3.52 RSI)	1.8 (28)	0.29 (1220)
14	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
15	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.13

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-20 Batt in Stud Cavity – Concrete Parapet and Roof Intersection

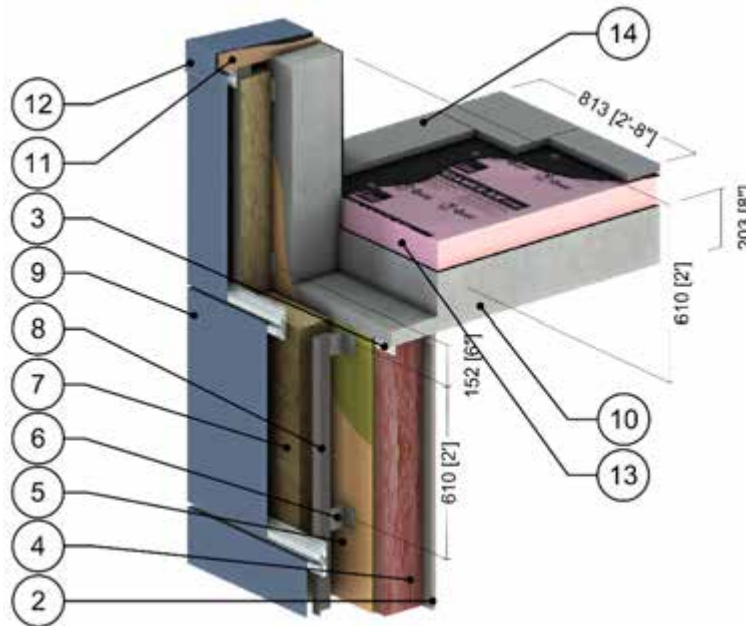


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.30 (0.043)	R-20 (3.52 RSI)	0.55 (8.8)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	varies	-	-	-	-
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	varies	0.24 (0.034)	R-8.4 to R-21.0 (1.48 to 3.70 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Wood Blocking	5/8" (16)	0.69 (0.10)	R-1.0 (0.18 RSI)	31 (500)	0.45 (1880)
12	Cap Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Foamular XPS Rigid Insulation	4" (102)	0.20 (0.029)	R-20 (3.52 RSI)	1.8 (28)	0.29 (1220)
14	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
15	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.14

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-22.5 Batt in Stud Cavity – Concrete Parapet and Roof Intersection

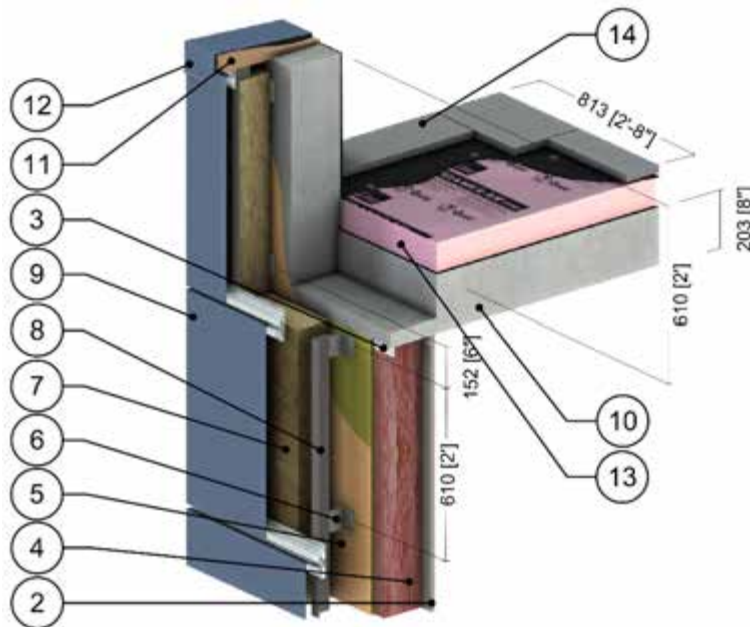


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.26 (0.038)	R-22.5 (3.96 RSI)	0.99 (15.9)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	varies	-	-	-	-
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	varies	0.24 (0.034)	R-8.4 to R-21.0 (1.48 to 3.70 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Wood Blocking	5/8" (16)	0.69 (0.10)	R-1.0 (0.18 RSI)	31 (500)	0.45 (1880)
12	Cap Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Foamular XPS Rigid Insulation	4" (102)	0.20 (0.029)	R-20 (3.52 RSI)	1.8 (28)	0.29 (1220)
14	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
15	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.15

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-24 Batt in Stud Cavity – Concrete Parapet and Roof Intersection

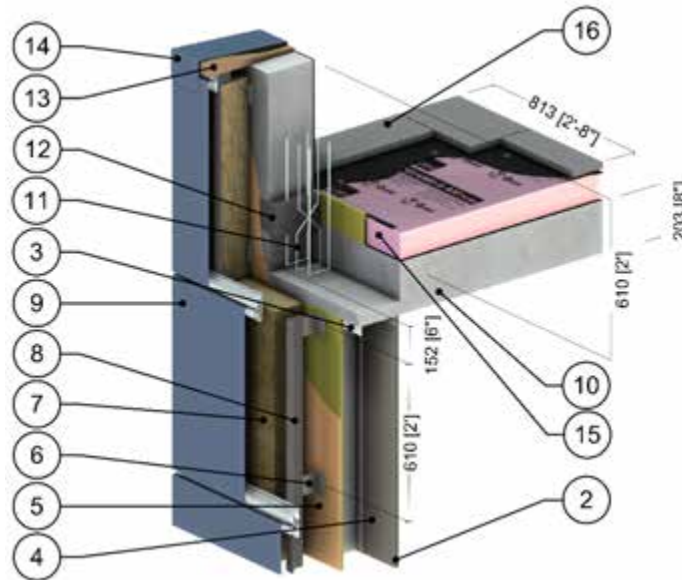


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.25 (0.036)	R-24 (4.23 RSI)	1.42 (22.7)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	varies	-	-	-	-
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	varies	0.24 (0.034)	R-8.4 to R-21.0 (1.48 to 3.70 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Wood Blocking	5/8" (16)	0.69 (0.10)	R-1.0 (0.18 RSI)	31 (500)	0.45 (1880)
12	Cap Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Foamular XPS Rigid Insulation	4" (102)	0.20 (0.029)	R-20 (3.52 RSI)	1.8 (28)	0.29 (1220)
14	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
15	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.16

Owens Corning Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding – Concrete Roof Deck at Isokorb AXTI Thermal Broken Concrete Parapet

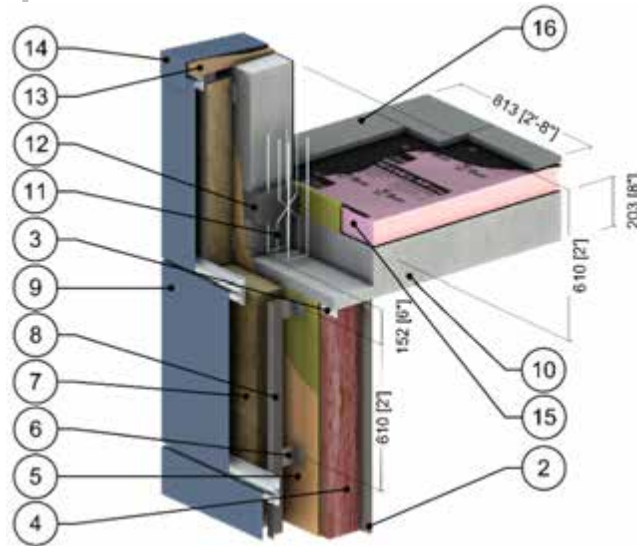


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	varies	-	-	-	-
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	varies	0.24 (0.034)	R-8.4 to R-21.0 (1.48 to 3.70 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
12	Polystyrene Rigid Foam Insulation	4 3/4" (120)	0.217 (0.031)	R-22.0 (3.87 RSI)	66 (1060)	0.35 (1500)
13	Wood Blocking	5/8" (16)	0.69 (0.10)	R-1.0 (0.18 RSI)	31 (500)	0.45 (1880)
14	Cap Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
15	Foamular XPS Rigid Insulation	4" (102)	0.20 (0.029)	R-20 (3.52 RSI)	1.8 (28)	0.29 (1220)
16	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
17	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.17

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-20 Batt in Stud Cavity – Concrete Roof Deck at Isokorb AXTI Thermal Broken Concrete Parapet

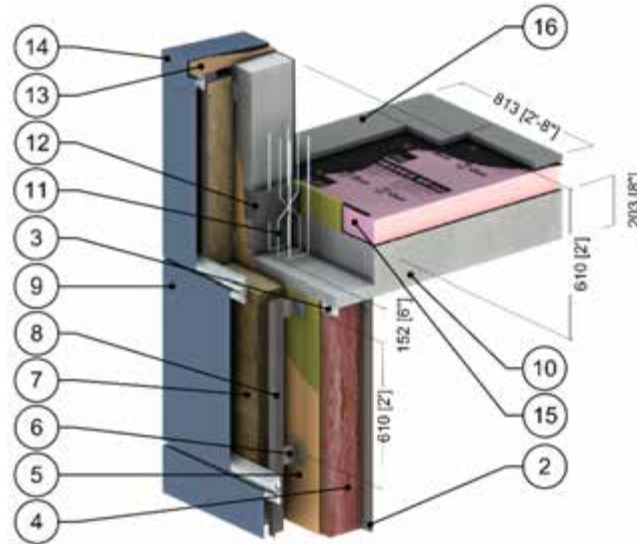


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.30 (0.043)	R-20 (3.52 RSI)	0.55 (8.8)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	varies	-	-	-	-
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	varies	0.24 (0.034)	R-8.4 to R-21.0 (1.48 to 3.70 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
12	Polystyrene Rigid Foam Insulation	4 3/4" (120)	0.217 (0.031)	R-22.0 (3.87 RSI)	66 (1060)	0.35 (1500)
13	Wood Blocking	5/8" (16)	0.69 (0.10)	R-1.0 (0.18 RSI)	31 (500)	0.45 (1880)
14	Cap Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
15	Foamular XPS Rigid Insulation	4" (102)	0.20 (0.029)	R-20 (3.52 RSI)	1.8 (28)	0.29 (1220)
16	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
17	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.18

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-22.5 Batt in Stud Cavity – Concrete Roof Deck at Isokorb AXTI Thermal Broken Concrete Parapet

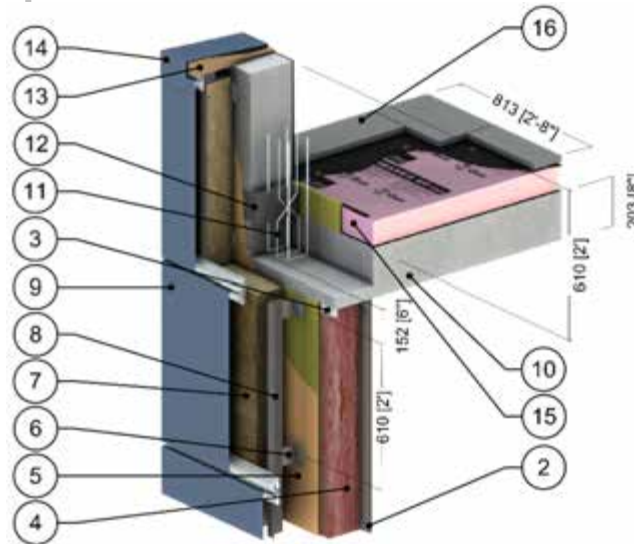


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.26 (0.038)	R-22.5 (3.96 RSI)	0.99 (15.9)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	varies	-	-	-	-
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	varies	0.24 (0.034)	R-8.4 to R-21.0 (1.48 to 3.70 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
12	Polystyrene Rigid Foam Insulation	4 3/4" (120)	0.217 (0.031)	R-22.0 (3.87 RSI)	66 (1060)	0.35 (1500)
13	Wood Blocking	5/8" (16)	0.69 (0.10)	R-1.0 (0.18 RSI)	31 (500)	0.45 (1880)
14	Cap Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
15	Foamular XPS Rigid Insulation	4" (102)	0.20 (0.029)	R-20 (3.52 RSI)	1.8 (28)	0.29 (1220)
16	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
17	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.19

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and Owens Corning R-24 Batt in Stud Cavity – Concrete Roof Deck at Isokorb AXTI Thermal Broken Concrete Parapet

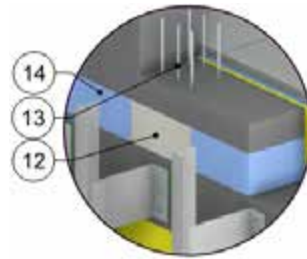
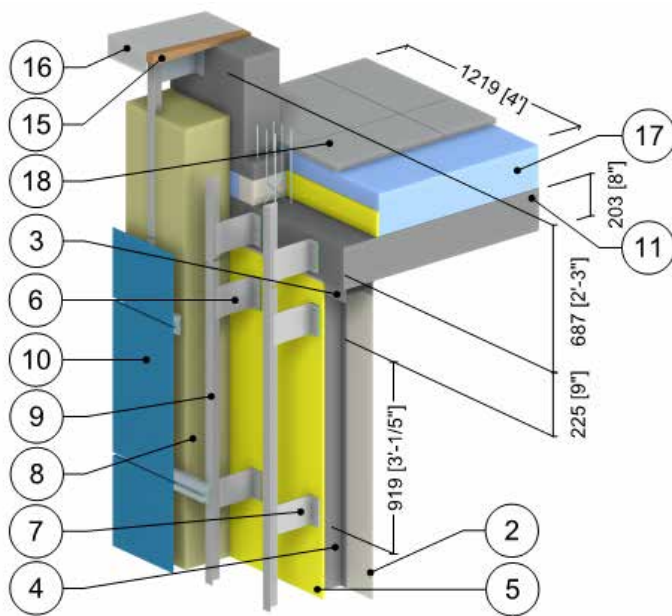


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Ecotouch Pink Fiberglass Batt	6" (152)	0.25 (0.036)	R-24 (4.23 RSI)	1.42 (22.7)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	varies	-	-	-	-
7	Thermafiber RainBarrier 45 Mineral Wool Semi Rigid Insulation	varies	0.24 (0.034)	R-8.4 to R-21.0 (1.48 to 3.70 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-girt	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
12	Polystyrene Rigid Foam Insulation	4 3/4" (120)	0.217 (0.031)	R-22.0 (3.87 RSI)	66 (1060)	0.35 (1500)
13	Wood Blocking	5/8" (16)	0.69 (0.10)	R-1.0 (0.18 RSI)	31 (500)	0.45 (1880)
14	Cap Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
15	Foamular XPS Rigid Insulation	4" (102)	0.20 (0.029)	R-20 (3.52 RSI)	1.8 (28)	0.29 (1220)
16	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
17	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

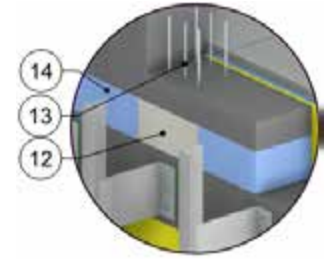
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.20

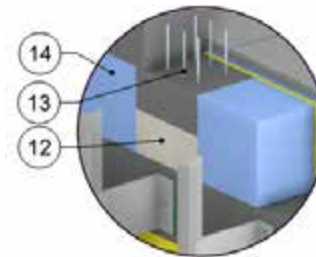
Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with FRP and Thermally Broken Vertical Brackets and Rail System Supporting Metal Cladding – Concrete Roof Deck at Isokorb AXT Thermally Broken Concrete Parapet



Scenario A - Sloped Roof



Scenario B - Concrete Topping



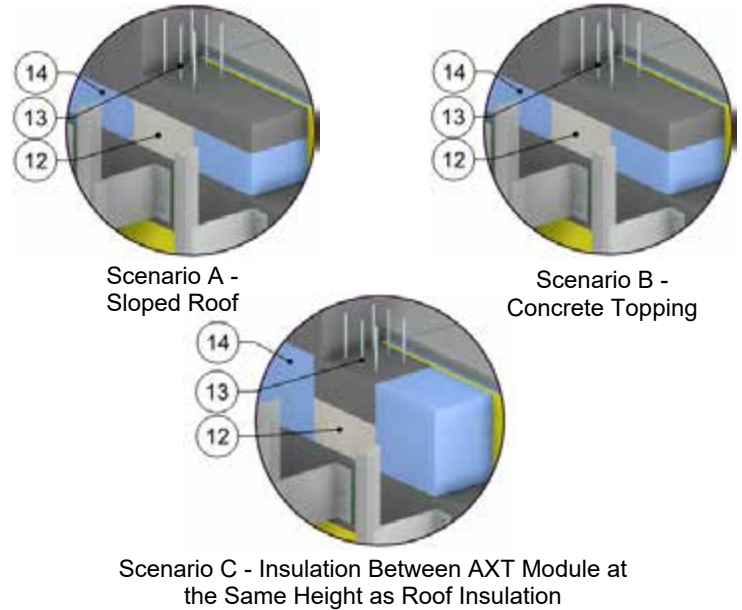
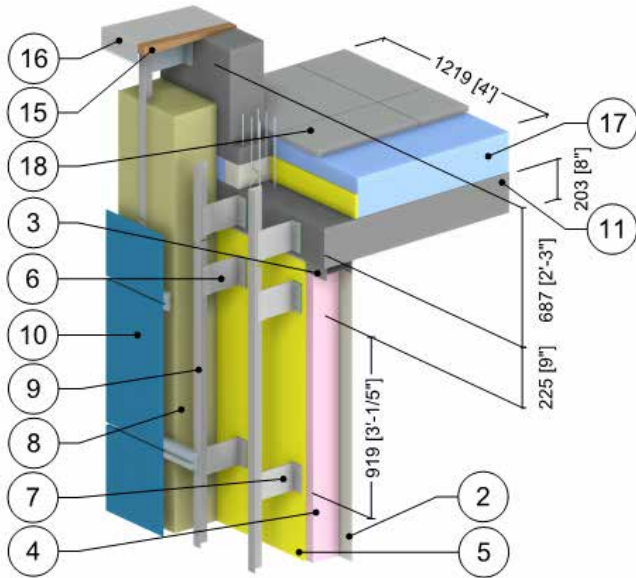
Scenario C - Insulation Between AXT Module at the Same Height as Roof Insulation

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Top Track	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	-	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	FRP Bracket	-	4.9 (0.70)	-	-	-
7	Aluminum Bracket	-	1110 (160)	-	171 (2739)	0.22 (900)
8	Exterior Mineral Wool Insulation	10" (254)	0.24 (0.034)	R-42 (7.40 RSI)	4.5 (72)	0.20 (850)
9	Vertical Aluminum L-Rail	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
10	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
11	Concrete Slab and Parapet	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Isokorb AXT Module	-	-	-	-	-
13	Stainless Steel Rebar	-	118 (17)	-	48.1 (7700)	0.12 (500)
14	Polystyrene Foam Insulation	4.7" (120)	0.22 (0.031)	R-22 (3.87 RSI)	66 (1060)	0.35 (1500)
15	Wood Blocking	-	0.69 (0.10)	-	31 (500)	0.45 (1880)
16	Aluminum Cap Flashing	18 Gauge	1110 (160)	-	171 (2739)	0.12 (500)
17	Rigid Roof Insulation	8" (203)	0.20 (0.029)	R-40 (7.01 RSI)	1.8 (28)	0.29 (1220)
18	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
19	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.21

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with FRP and Thermally Broken Vertical Brackets and Rail System Supporting Metal Cladding and R-19 Batt in Stud Cavity – Concrete Roof Deck at Isokorb AXT Thermally Broken Concrete Parapet



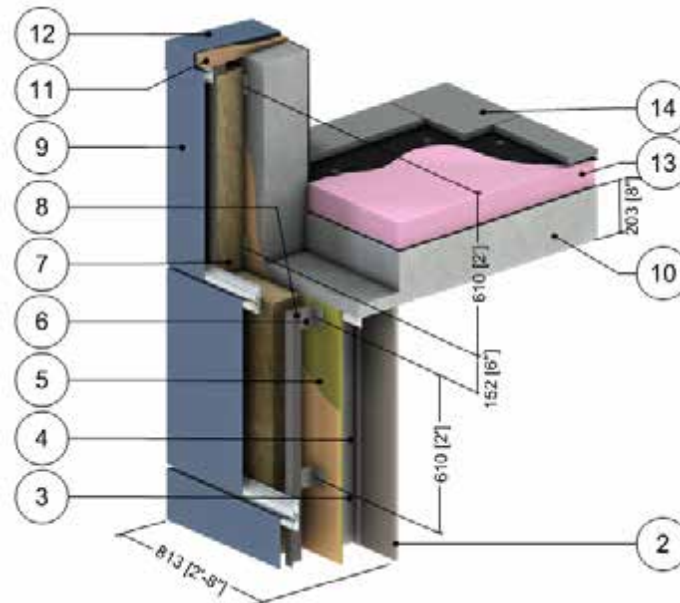
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Top Track	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	6" (152)	0.32 (0.046)	R-19 (3.35 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	FRP Bracket	-	4.9 (0.70)	-	-	-
7	Aluminum Bracket	-	1110 (160)	-	171 (2739)	0.22 (900)
8	Semi Rigid Exterior Insulation	10" (254)	0.24 (0.034)	R-42 (7.40 RSI)	4.5 (72)	0.20 (850)
9	Vertical Aluminum L-Rail	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
10	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
11	Concrete Slab and Parapet	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Isokorb AXT Module	-	-	-	-	-
13	Stainless Steel Rebar	-	118 (17)	-	48.1 (7700)	0.12 (500)
14	Polystyrene Foam Insulation	4.7" (120)	0.22 (0.031)	R-22 (3.87 RSI)	66 (1060)	0.35 (1500)
15	Wood Blocking	-	0.69 (0.10)	-	31 (500)	0.45 (1880)
16	Aluminum Cap Flashing	18 Gauge	1110 (160)	-	171 (2739)	0.12 (500)
17	Rigid Roof Insulation	8" (203)	0.20 (0.029)	R-40 (7.01 RSI)	1.8 (28)	0.29 (1220)
18	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
19	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 5.5.22

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding – Concrete Parapet and Roof Intersection

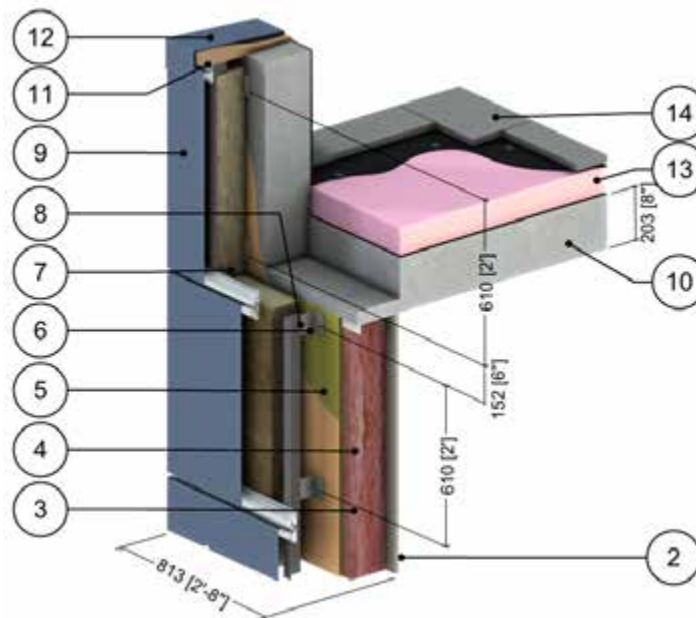


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	Varies	-	-	-	-
7	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-16.8 to R-29.4 (2.96 RSI to 5.18 RSI)	4 (64)	0.20 (850)
8	Vertical Aluminum L-girt – Aluminum 6005A alloy	0.09" (2.2)	1340 (193)	-	169 (2700)	0.22 (900)
9	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Wood Blocking	5/8" (16)	0.69 (0.10)	R-1.0 (0.18 RSI)	31 (500)	0.45 (1880)
12	Cap Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	XPS Rigid Insulation	Varies	0.20 (0.029)	R-20 to R-40 (3.52 RSI to 7.04 RSI)	1.8 (28)	0.29 (1220)
14	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
15	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.23

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and R-20 Batt in Stud Cavity – Concrete Parapet and Roof Intersection

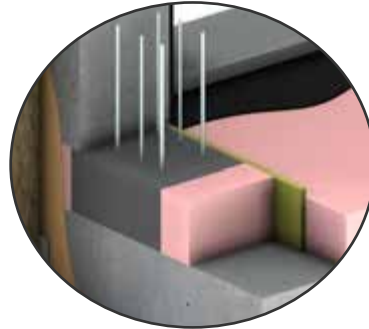
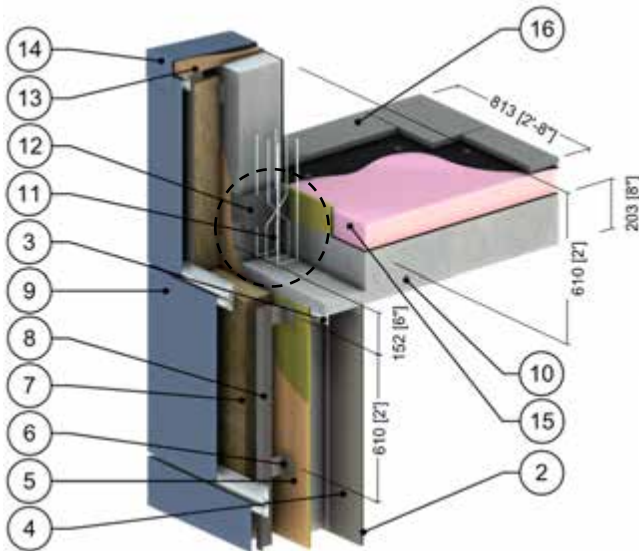


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt	6" (152)	0.30 (0.043)	R-20 (3.52 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	Varies	-	-	-	-
7	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-16.8 to R-29.4 (2.96 RSI to 5.18 RSI)	4 (64)	0.20 (850)
8	Vertical Aluminum L-girt – Aluminum 6005A alloy	0.09" (2.2)	1340 (193)	-	169 (2700)	0.22 (900)
9	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Wood Blocking	5/8" (16)	0.69 (0.10)	R-1.0 (0.18 RSI)	31 (500)	0.45 (1880)
12	Cap Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	XPS Rigid Insulation	Varies	0.20 (0.029)	R-20 to R-40 (3.52 RSI to 7.04 RSI)	1.8 (28)	0.29 (1220)
14	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
15	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

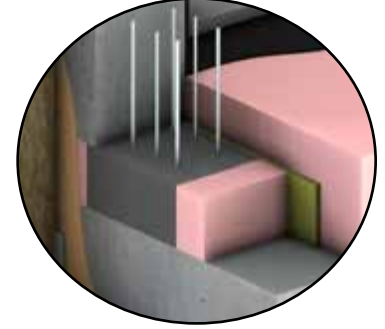
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.5.24

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding – Concrete Roof Deck at Isokorb AXTI Thermal Broken Concrete Parapet



Roof Intersection with R-20 Roof Insulation



Roof Intersection with R-40 Roof Insulation

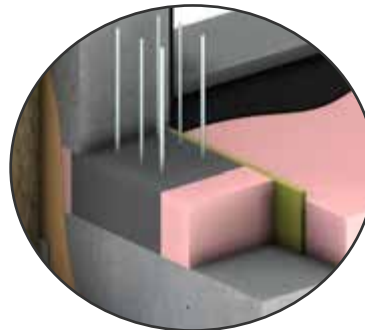
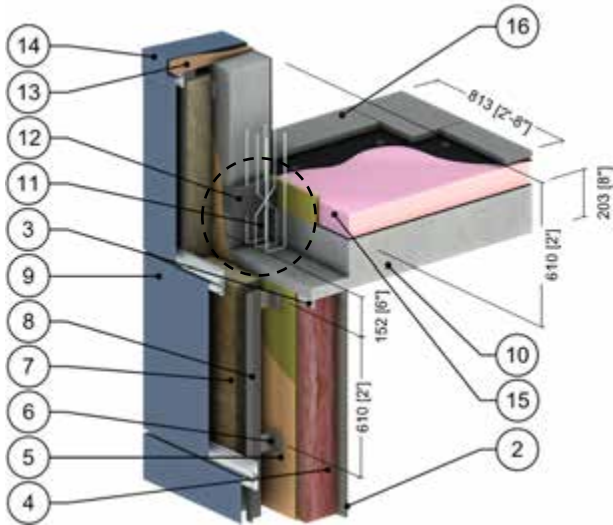
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	Varies	-	-	-	-
7	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-16.8 to R-29.4 (2.96 RSI to 5.18 RSI)	4 (64)	0.20 (850)
8	Vertical Aluminum L-girt – Aluminum 6005A alloy	0.09" (2.2)	1340 (193)	-	169 (2700)	0.22 (900)
9	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
12	Polystyrene Rigid Foam Insulation	4 3/4" (120)	0.217 (0.031)	R-22.0 (3.87 RSI)	66 (1060)	0.35 (1500)
13	Wood Blocking	5/8" (16)	0.69 (0.10)	R-1.0 (0.18 RSI)	31 (500)	0.45 (1880)
14	Cap Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
15	XPS Rigid Insulation	Varies	0.20 (0.029)	R-20 to R-40 (3.52 RSI to 7.04 RSI)	1.8 (28)	0.29 (1220)
16	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
17	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

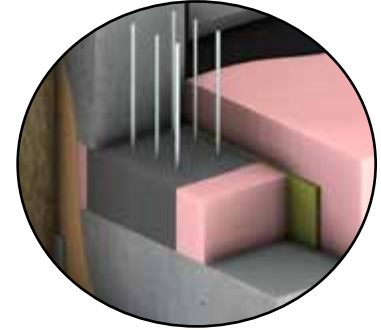


Detail 5.5.25

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding and R-20 Batt in Stud Cavity – Concrete Roof Deck at Isokorb AXTI Thermal Broken Concrete Parapet



Roof Intersection with R-20 Roof Insulation



Roof Intersection with R-40 Roof Insulation

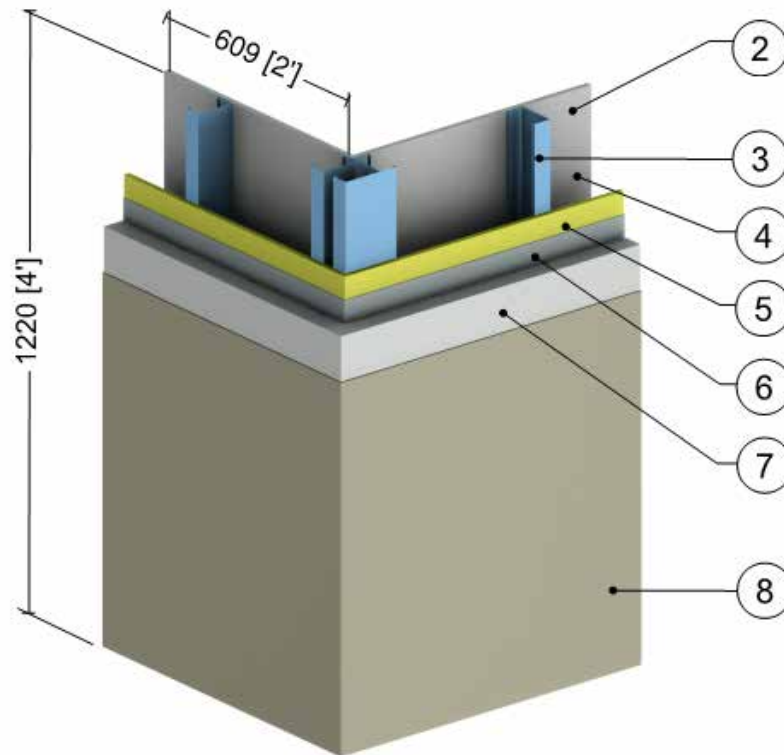
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt	6" (152)	0.30 (0.043)	R-20 (3.52 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	Varies	-	-	-	-
7	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-16.8 to R-29.4 (2.96 RSI to 5.18 RSI)	4 (64)	0.20 (850)
8	Vertical Aluminum L-girt – Aluminum 6005A alloy	0.09" (2.2)	1340 (193)	-	169 (2700)	0.22 (900)
9	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
12	Polystyrene Rigid Foam Insulation	4 3/4" (120)	0.217 (0.031)	R-22.0 (3.87 RSI)	66 (1060)	0.35 (1500)
13	Wood Blocking	5/8" (16)	0.69 (0.10)	R-1.0 (0.18 RSI)	31 (500)	0.45 (1880)
14	Cap Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
15	XPS Rigid Insulation	Varies	0.20 (0.029)	R-20 to R-40 (3.52 RSI to 7.04 RSI)	1.8 (28)	0.29 (1220)
16	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
17	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 5.6.1

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Corner Intersection

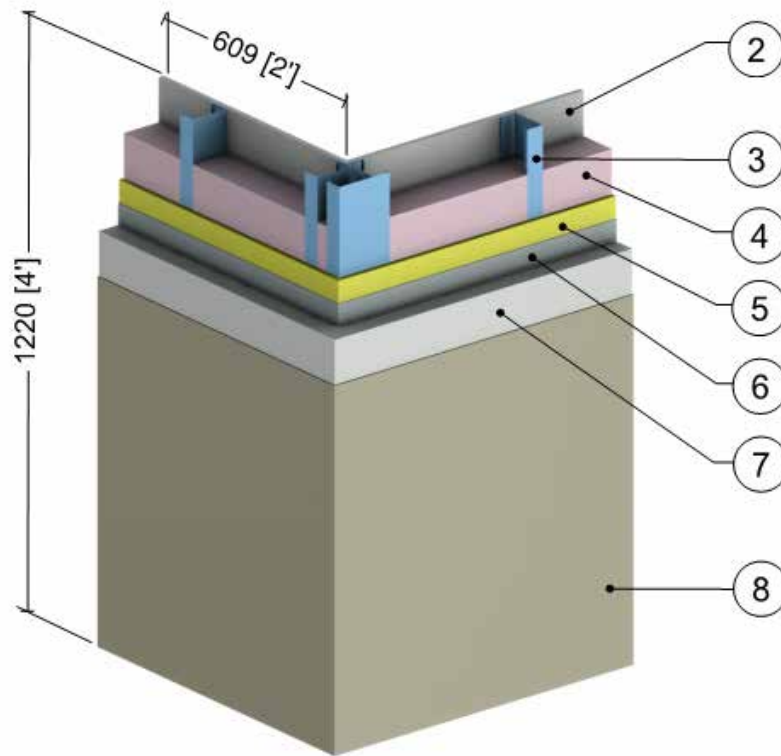


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs (16"o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	Varies	0.27 (0.039)	R-7.5 to R-15 (1.32 RSI to 2.64 RSI)	1 (16)	0.35 (1470)
8	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.6.2

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly with R-12 Batt Insulation in Stud Cavity – Corner Intersection

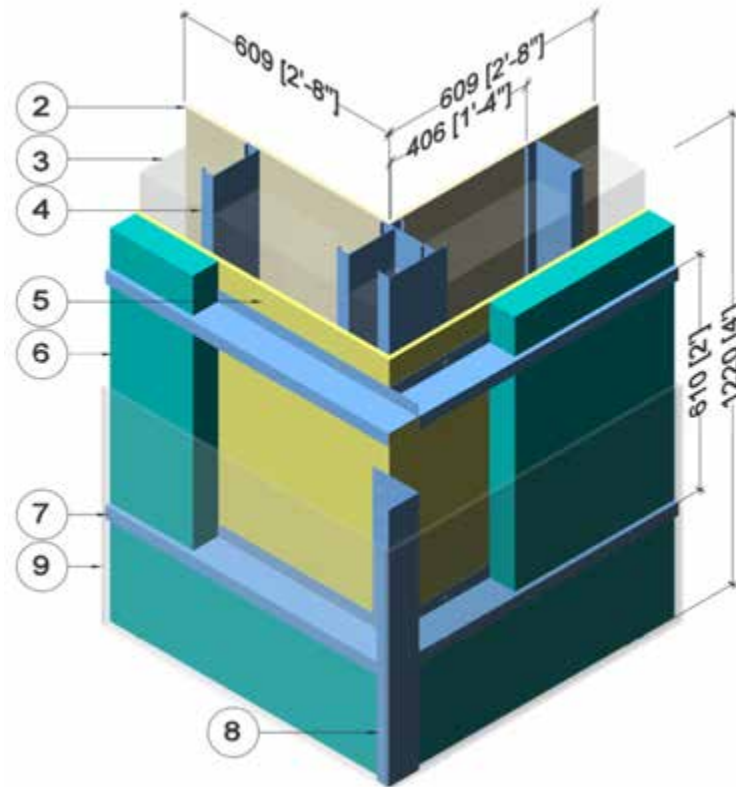


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs (16"o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.043)	R-12 (2.1 RSI)	0.9 (1.1)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	Varies	0.27 (0.039)	R-7.5 to R-15 (1.32 RSI to 2.64 RSI)	1 (16)	0.35 (1470)
8	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.6.3

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding – Corner Intersection

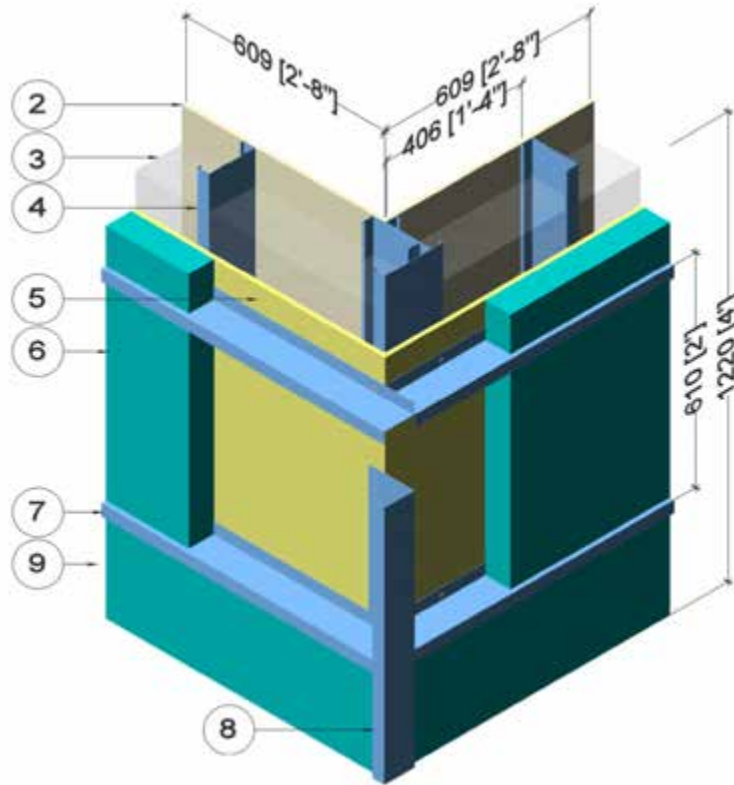


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
7	Horizontal Z-Girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Corner Break Shape w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.6.4

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding – Corner Intersection with Alternative Framing

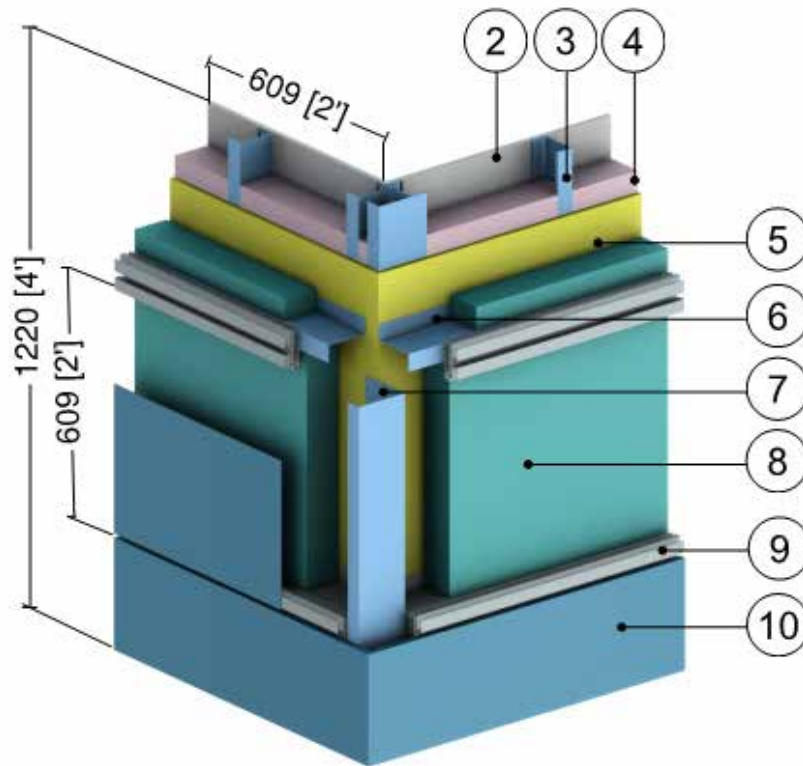


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
7	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Corner Break Shape w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Metal cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.6.5

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Corner Intersection

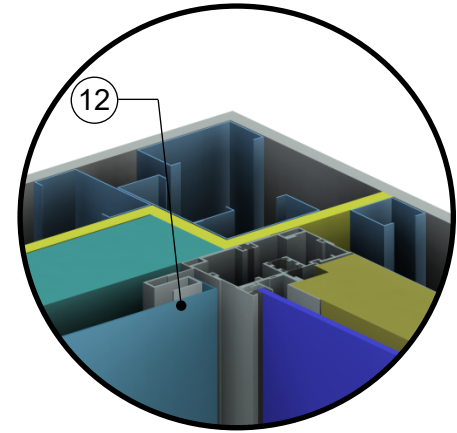
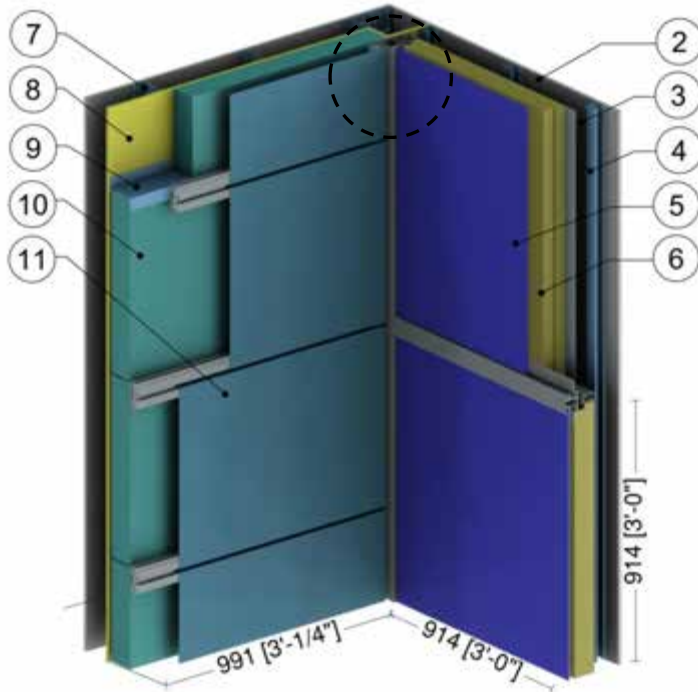


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.043)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-Girt with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Corner Break Shape w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Exterior Insulation	Varies	-	R-10 to R-15 (1.76 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
9	Panel Clip	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
10	Metal Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.6.6

Window Wall System – Transition to Exterior Insulated Steel Stud Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding & No Interior Stud Cavity Insulation



Corner Post Detail

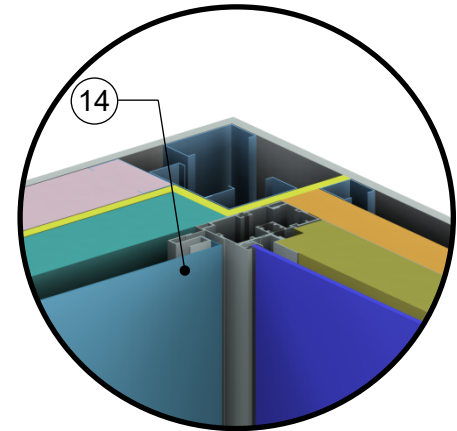
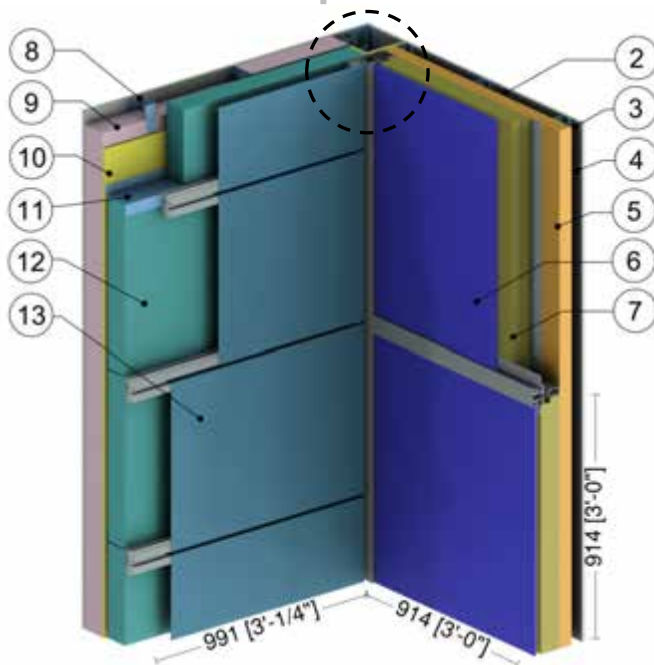
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs (16" o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Aluminum Window Wall Spandrel System with Insulated Backpan: thermally broken frame ²					
6	Backpan Insulation	-	-	R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
7	3 5/8" x 1 5/8" Steel Studs (16" o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
9	Horizontal Z-girts (24" o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
10	Exterior Insulation	Varies	-	R-15 to R-25 (2.64 RSI) to 4.40 RSI)	1.8 (28)	0.29 (1220)
11	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
12	Aluminum Flashing	14 Gauge	1109 (16)	-	171 (2739)	0.21 (900)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 5.6.7

Window Wall System – Transition to Exterior Insulated Steel Stud Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding & Interior Sprayfoam and Fibreglass Batt Insulation



Corner Post Detail

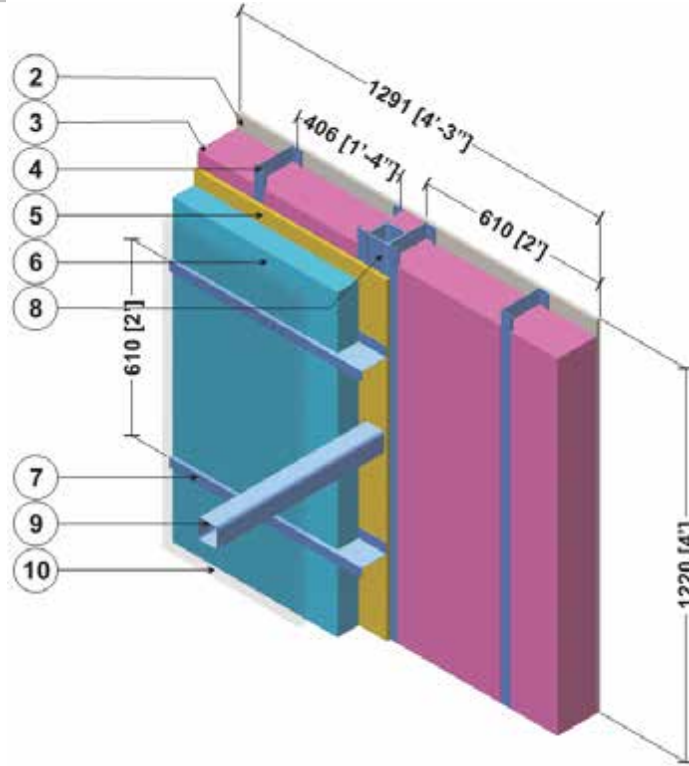
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs (16" o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Continuous Sprayfoam Insulation	2" (51)	0.17 (0.024)	R-12 (2.11 RSI)	2.8 (39)	0.35 (1470)
6	Aluminum Window Wall Spandrel System with Insulated Backpan: thermally broken frame ²					
7	Backpan Insulation	Varies	-	R-8.4 to R-16.8 (1.48 RSI to 2.96 RSI)	4 (64)	0.20 (850)
8	3 5/8" x 1 5/8" Steel Studs (16" o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.043)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
10	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
11	Horizontal Z-girts (24" o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Exterior Insulation	Varies	-	R-15 to R-25 (2.64 RSI to 4.40 RSI)	1.8 (28)	0.29 (1220)
13	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
14	Aluminum Flashing	14 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 5.7.1

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Structural Steel Column & Cantilever Beam Intersection (Canopy Support)

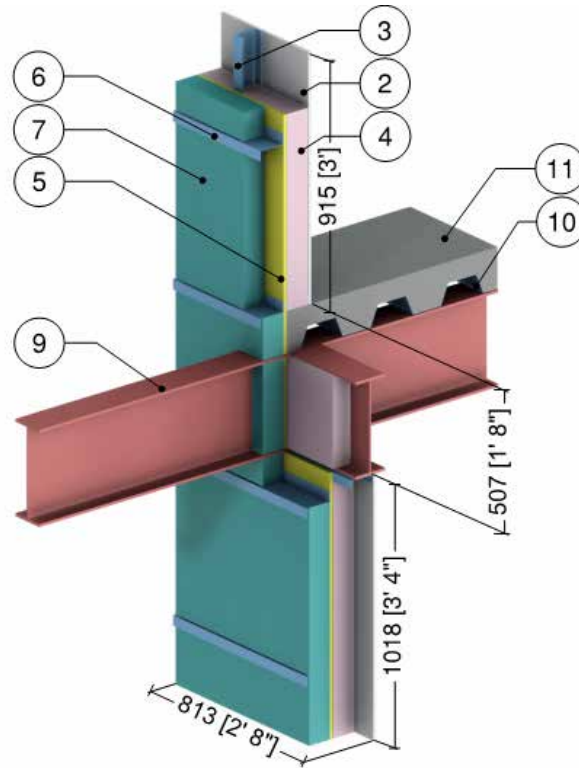


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (92)	0.30 (0.043)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
7	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Steel Post (HSS 76x76x3.2)	1/8" (3)	347 (50)	-	489 (7830)	0.12 (500)
9	Steel Beam (HSS 76x76x3.2)	1/8" (3)	347 (50)	-	489 (7830)	0.12 (500)
10	Metal cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.7.2

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Structural Steel Floor Intersection with Uninterrupted Beam

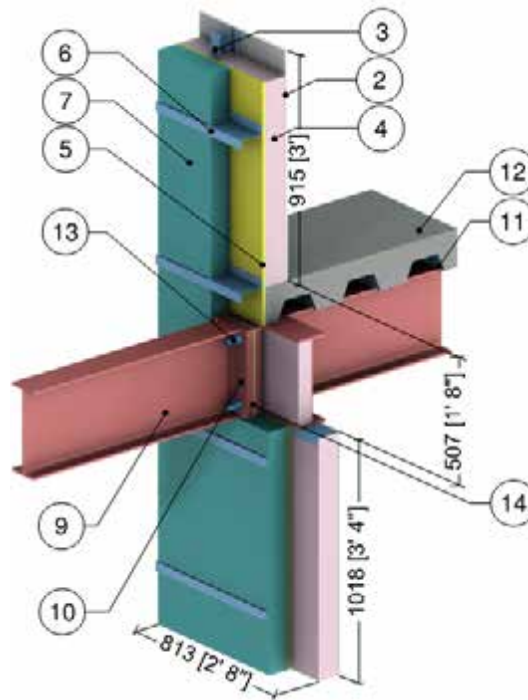


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fibreglass Batt Insulation	3 5/8" (92)	0.30 (0.043)	R-12.0 (2.11 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Steel Through Beam W14x26 (W360x39)	-	347 (50)	-	489 (7830)	0.12 (500)
10	Steel Deck	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Concrete Topping	6" (152)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.7.3

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Structural Steel Floor Intersection with Isolator Pad

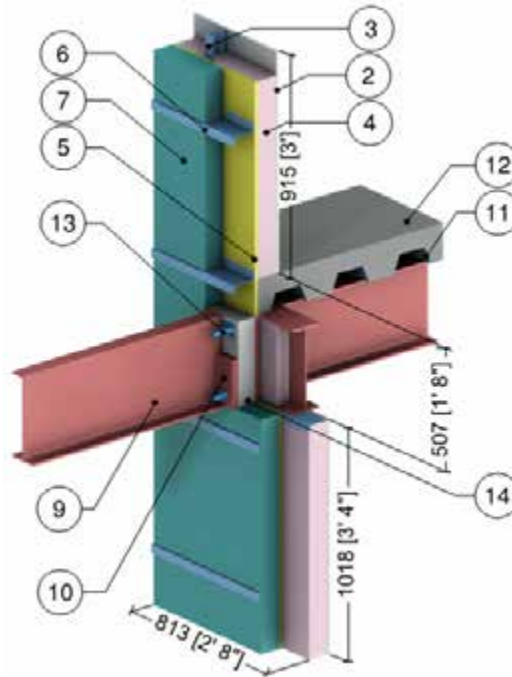


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fibreglass Batt Insulation	3 5/8" (92)	0.30 (0.043)	R-12.0 (2.10 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	0.2 (0.029)	R-15.0 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Steel Beam W14x26 (W360x39)	-	347 (50)	-	489 (7830)	0.12 (500)
10	Steel Bearing Plates	1 3/16" (30)	347 (50)	-	489 (7830)	0.12 (500)
11	Steel Deck	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Concrete Topping	6" (152)	12.5 (1.8)	-	140 (2250)	0.20 (850)
13	Steel or Stainless Steel Bolts	-	347 to 118 (50 to 17)	-	500 (8000)	0.12 (500)
14	Polymer Thermal Isolator Pad	3/16" to 3/8" (5 to 10)	1.7 (0.25)	-	137 (2200)	0.31 (1300)
15	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.7.4

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Structural Steel Floor Intersection with Isokorb S22 Thermally Broken Beam

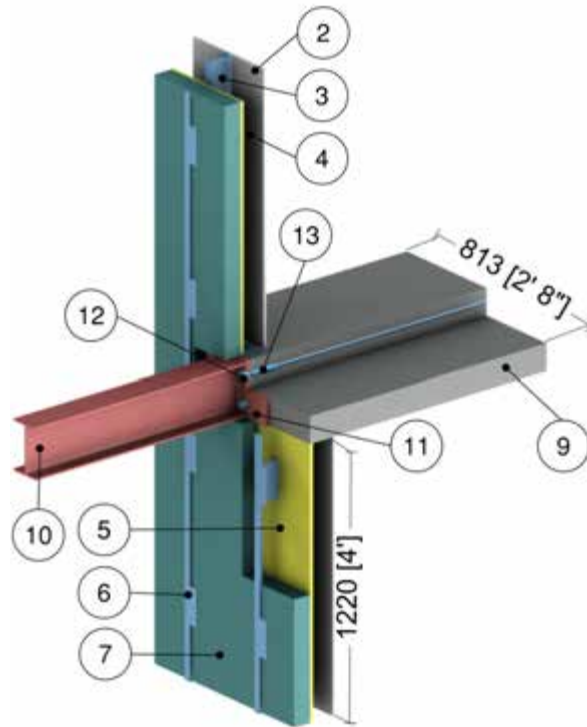


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fibreglass Batt Insulation	3 5/8" (92)	0.30 (0.043)	R-12.0 (2.11 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Steel Beam W14x26 (W360x39)	-	347 (50)	-	489 (7830)	0.12 (500)
10	Steel Bearing Plates	1 3/16" (30)	347 (50)	-	489 (7830)	0.12 (500)
11	Steel Deck	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Concrete Topping	6" (152)	12.5 (1.8)	-	140 (2250)	0.20 (850)
Isokorb S22 Thermal Break						
13	Stainless Steel Bolts, Plates and HSS	-	118 (17)	-	500 (8000)	0.12 (500)
14	Polystyrene Hard Foam Insulation	3 1/8" (80)	0.217 (0.031)	R-14.5 (2.6 RSI)	66 (1060)	0.35 (1500)
15	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.7.5

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Intermittent Vertical Z-girts (16" o.c.) Supporting Metal Cladding – Concrete Floor to Steel Beam Connection

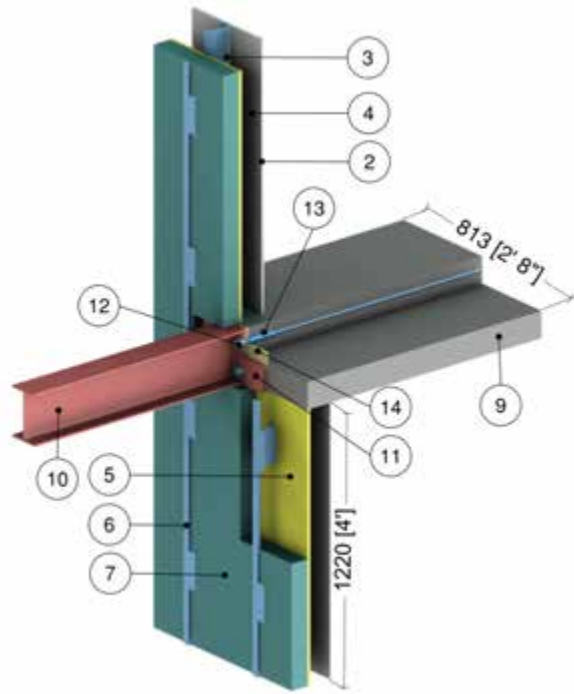


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Intermittent Vertical Z-Girts with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Concrete Slab	8 5/8" (220)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Steel Beam W8x18 (W200x27)	-	347 (50)	-	489 (7830)	0.12 (500)
11	Steel Bearing Plates	3/4" (20)	347 (50)	-	489 (7830)	0.12 (500)
12	Steel Bolts and Rebar	-	347 (50)	-	489 (7830)	0.12 (500)
13	Stainless Steel Anchors	-	118 (17)	-	500 (8000)	0.12 (500)
14	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.7.6

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Intermittent Vertical Z-girts (16" o.c.) Supporting Metal Cladding – Concrete Floor to Steel Beam with a Thermal Isolator Pad Connection

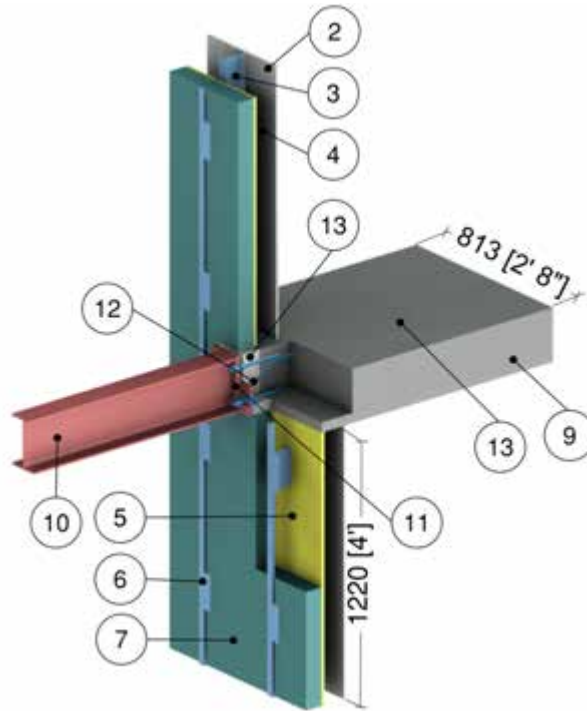


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Intermittent Vertical Z-Girts with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Concrete Slab	8 5/8" (220)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Steel Beam W8x18 (W200x27)	-	347 (50)	-	489 (7830)	0.12 (500)
11	Steel Bearing Plates	3/4" (20)	347 (50)	-	489 (7830)	0.12 (500)
12	Steel Bolts and Rebar	-	347 (50)	-	489 (7830)	0.12 (500)
13	Stainless Steel Anchors	-	118 (17)	-	500 (8000)	0.12 (500)
14	Polymer Thermal Isolator Pad	3/8" (10)	1.7 (0.25)	-	137 (2200)	0.31 (1300)
15	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.7.7

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Intermittent Vertical Z-girts (16" o.c.) Supporting Metal Cladding – Concrete Floor to Steel Beam with Isokorb KS14 Connection

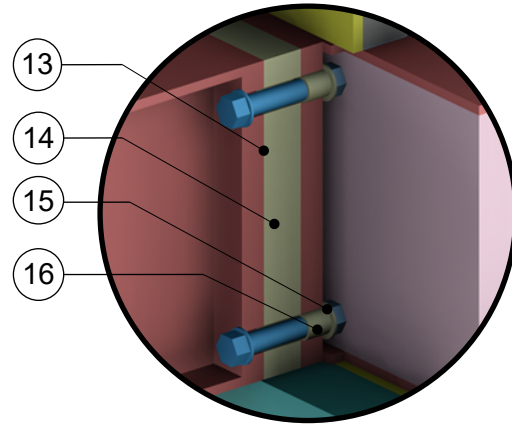
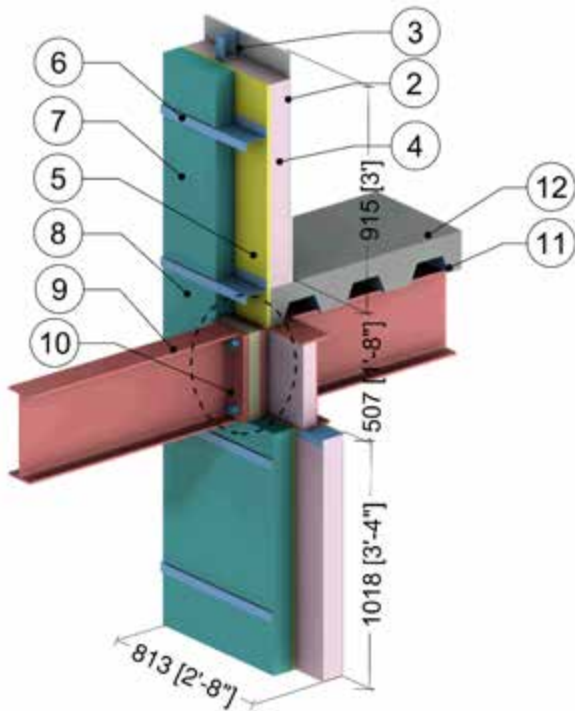


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Intermittent Vertical Z-Girts with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Concrete Slab	8 5/8" (220)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Steel Beam W8x18 (W200x27)	-	347 (50)	-	489 (7830)	0.12 (500)
11	Steel Bearing Plate with Butt Stop	3/4" (20)	347 (50)	-	489 (7830)	0.12 (500)
Isokorb KS14 Thermal Break						
12	Stainless Steel Reinforcement	-	118 (17)	-	500 (8000)	0.12 (500)
13	Polystyrene Hard Foam Insulation	3 1/8" (80)	0.217 (0.031)	R-14.5 (2.6 RSI)	66 (1060)	0.35 (1500)
14	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.7.8

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Structural Steel Floor Intersection with Beam Thermal Break



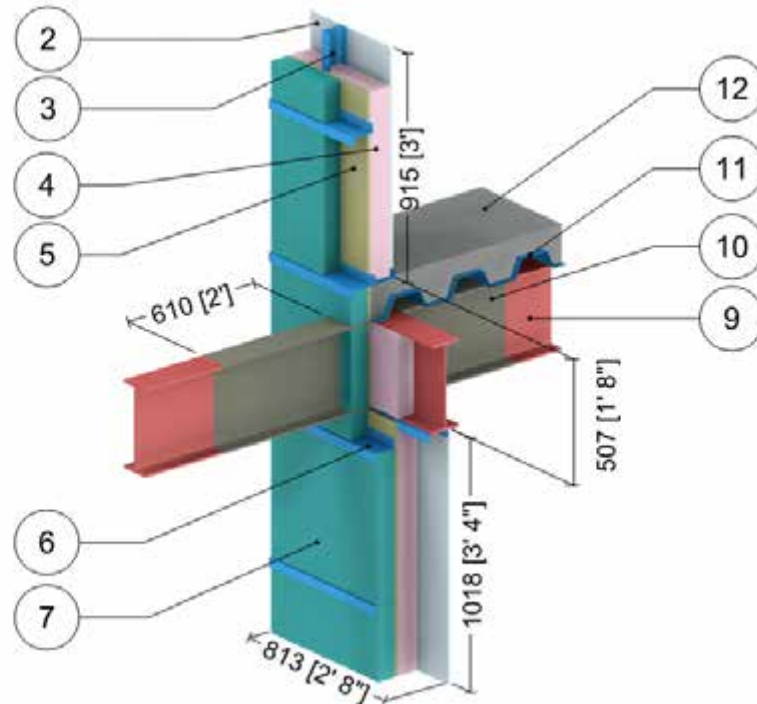
Beam Thermal Break

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fibreglass Batt Insulation	3 5/8" (92)	0.30 (0.043)	R-12.0 (2.10 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	0.2 (0.029)	R-15.0 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Steel Beam W14x26 (W360x39)	-	347 (50)	-	489 (7830)	0.12 (500)
10	Steel Bearing Plates	1 3/16" (30)	347 (50)	-	489 (7830)	0.12 (500)
11	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
12	Concrete Topping	6" (152)	6.3 (0.9)	-	120 (1920)	0.20 (850)
13	Steel or Stainless Steel Bolts	-	347 (50) to 118 (17)	-	500 (8000)	0.12 (500)
14	Armatherm FRR Break	1" to 2" (25 to 50)	1.4 (0.20)	-	85 (5.3)	-
15	Armatherm FRR Washer	3/8" (10)	1.4 (0.20)	-	85 (5.3)	-
16	Armatherm FRR Bushing	1.2" (30)	1.4 (0.20)	-	85 (5.3)	-
17	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.7.9

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Structural Steel Floor Intersection with Aerolon Coating

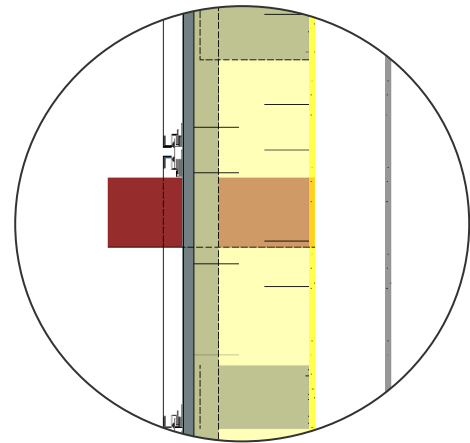
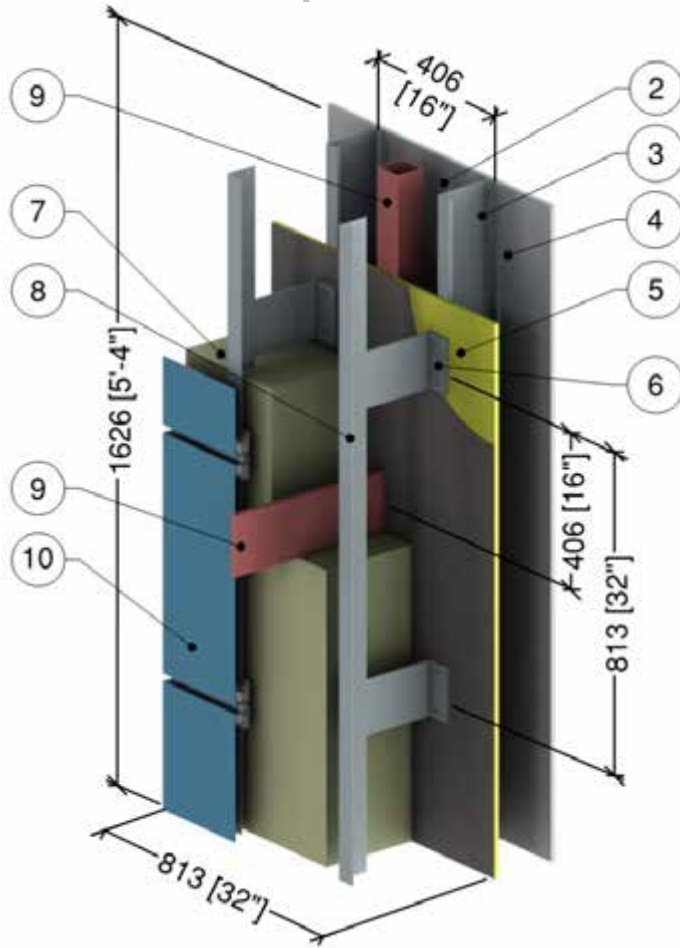


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fibreglass Batt Insulation	3 5/8" (92)	0.30 (0.043)	R-12.0 (2.10 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	0.2 (0.029)	R-15.0 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Steel Beam W14x26 (W360x39)	-	347 (50)	-	489 (7830)	0.12 (500)
10	Aerolon Coating	0.098" (2.5)	-	R-0.4 (0.07 RSI)	-	-
11	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
12	Concrete Topping	6" (152)	6.3 (0.9)	-	120 (1920)	0.20 (850)
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.7.10

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with FRP Vertical Brackets and Rail System Supporting Metal Cladding – Structural Steel Column & Knife Edge Cable Support Intersection



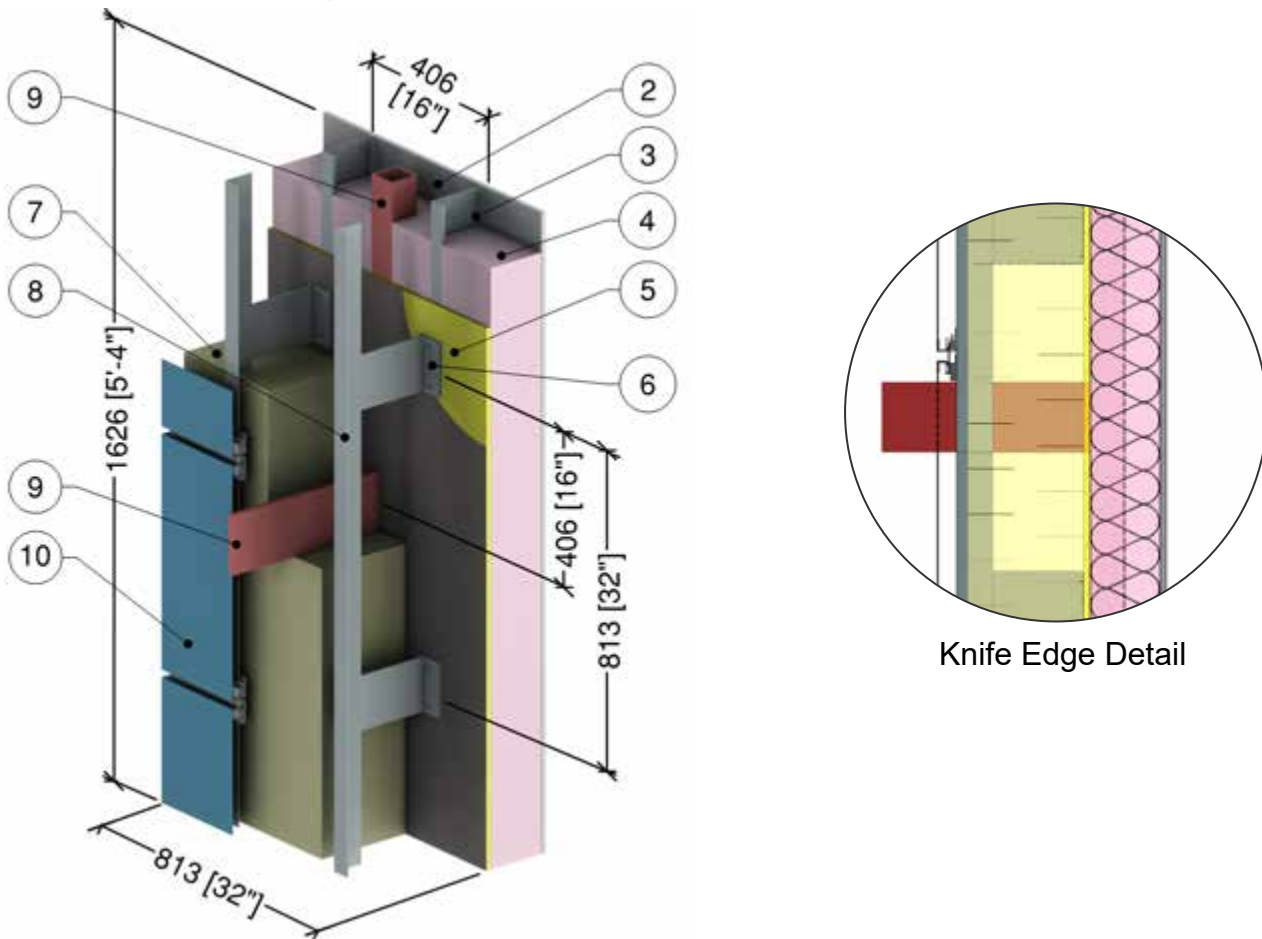
Knife Edge Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	-	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	FRP Bracket	-	4.85 (0.7)	-	110 (1760)	-
7	Exterior Mineral Wool Insulation	10" (254)	0.24 (0.034)	R-42 (7.40 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-Rail	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Steel Column and Knife Edge	5/8" (16)	430 (62)	-	489 (7830)	0.12 (500)
10	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.7.11

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with FRP Vertical Brackets and Rail System Supporting Metal Cladding with R-19 Batt in Stud Cavity – Structural Steel Column & Knife Edge Cable Support Intersection



Knife Edge Detail

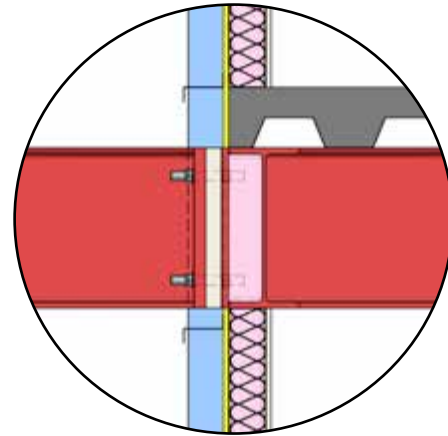
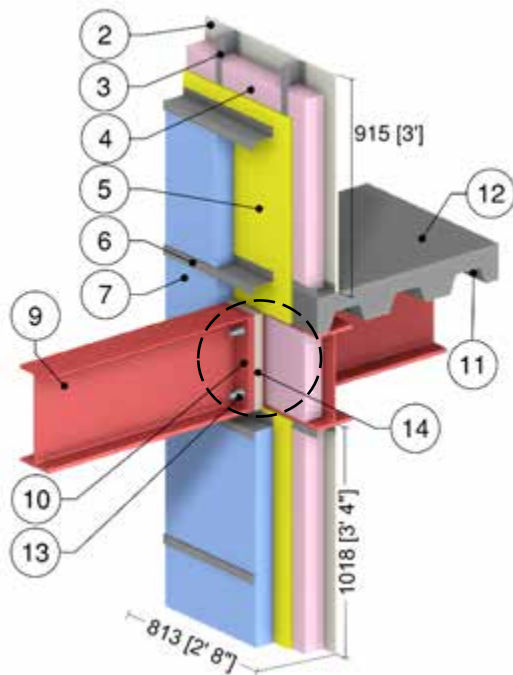
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	6" (152)	0.32 (0.046)	R-19 (3.35 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	FRP Bracket	-	4.85 (0.7)	-	110 (1760)	-
7	Exterior Mineral Wool Insulation	10" (254)	0.24 (0.034)	R-42 (7.40 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-Rail	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Steel Column and Knife Edge	5/8" (16)	430 (62)	-	489 (7830)	0.12 (500)
10	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 5.7.12

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Structural Steel Floor Intersection with Thermal Isolator Pad



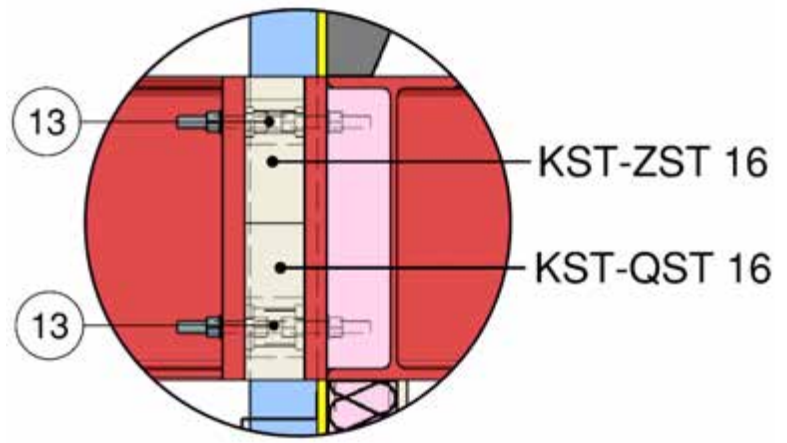
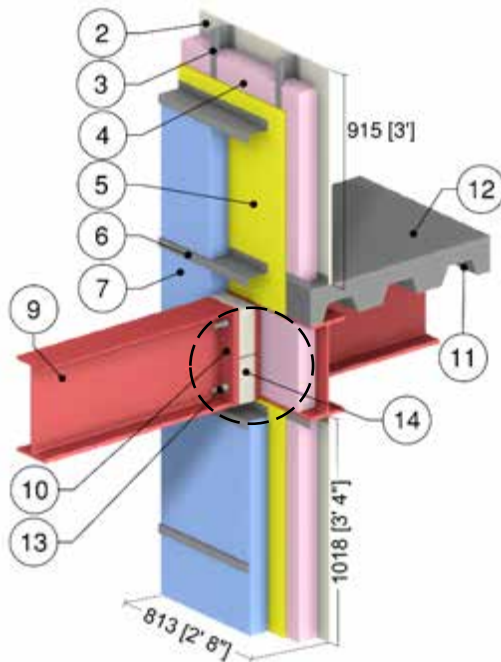
Structural Steel
Beam Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fibreglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12.0 (2.10 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	0.20 (0.029)	R-15.0 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Steel Beam W14x26 (W360x39)	-	347 (50)	-	489 (7830)	0.12 (500)
10	Steel Bearing Plates	1 3/16" (30)	347 (50)	-	489 (7830)	0.12 (500)
11	Steel Deck	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Concrete Topping	6" (152)	12.5 (1.8)	-	140 (2250)	0.20 (850)
13	Stainless Steel or Steel Bolts and Bushings	-	118 to 347 (17 to 50)	-	500 (8000)	0.12 (500)
14	Polymer Thermal Isolator Pad	1" to 2" (25 to 50)	1.7 (0.25)	-	137 (2200)	0.31 (1300)
15	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.7.13

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Structural Steel Floor Intersection with Isokorb KST System Thermally Broken Beam



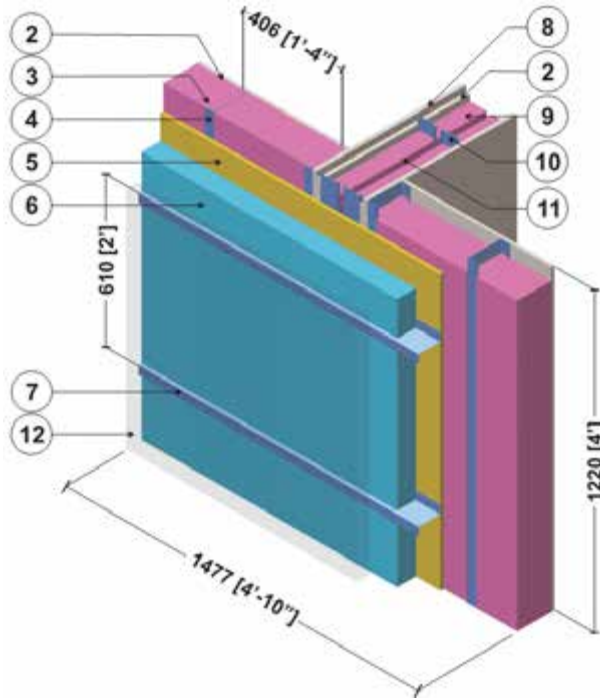
KST System Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fibreglass Batt Insulation	3 5/8" (92)	0.30 (0.044)	R-12.0 (2.10 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Horizontal Z-girts with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	3" (76)	0.20 (0.029)	R-15.0 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Steel Beam W14x26 (W360x39)	-	347 (50)	-	489 (7830)	0.12 (500)
10	Steel Bearing Plates	1 3/16" (30)	347 (50)	-	489 (7830)	0.12 (500)
11	Steel Deck	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Concrete Topping	6" (152)	12.5 (1.8)	-	140 (2250)	0.20 (850)
Isokorb KST System Thermal Break						
13	Stainless Steel Bolts, Plates and HSS	-	118 (17)	-	500 (8000)	0.12 (500)
14	Polystyrene Insulation	3.2" (80)	0.22 (0.031)	R-15 (2.58 RSI)	1.3 (20)	0.35 (1500)
15	Exterior Film ¹	-	-	R-0.2 to R-0.7 .2 to (0.03RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.8.1

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding and R-12 Batt Insulation in Stud Cavity – Interior Wall Intersection



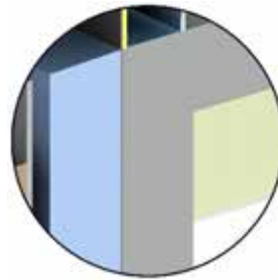
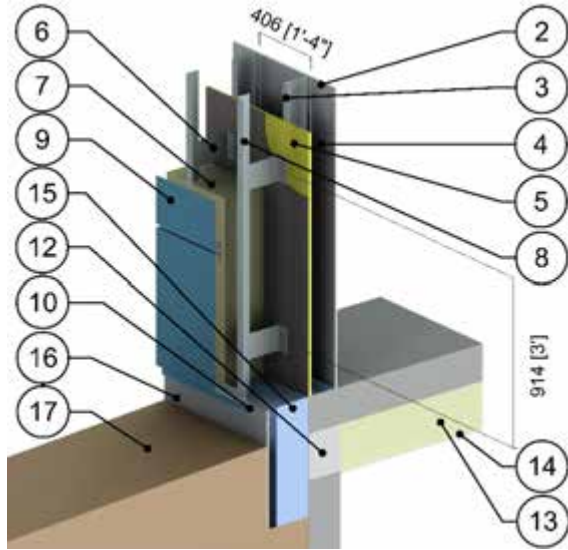
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (92)	0.31 (0.044)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
4	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
7	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
9	Acoustic Batt Insulation	2 5/8" (67)	0.29 (0.042)	-	0.9 (14)	0.17 (710)
10	2 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Air Gap	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
12	Metal cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

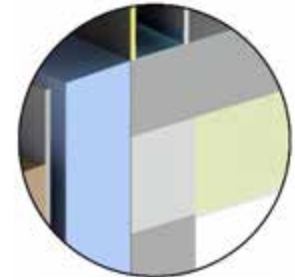


Detail 5.8.2

Exterior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with FRP Vertical Brackets and Rail System Supporting Metal Cladding – At-Grade Foundation Wall Intersection



Scenario A - Without Thermal Break



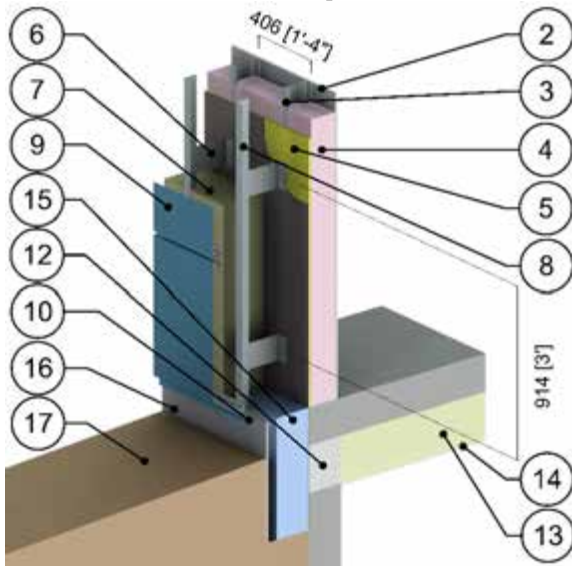
Scenario B - With Thermal Break

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 to R-0.9 (0.12 to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	-	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	FRP Bracket	-	4.9 (0.70)	-	110 (1760)	-
7	Exterior Mineral Wool Insulation	10" (254)	0.24 (0.034)	R-42 (7.40 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-Rail	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	Aluminum Flashing	18 Gauge	1110 (160)	-	171 (2739)	0.22 (900)
11	Concrete Foundation	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Foundation Thermal Block	8" (203)	0.20 (0.029)	R-40 (7.04 RSI)	1.8 (28)	0.29 (1220)
13	Slab Insulation	10" (254)	0.24 (0.034)	R-42 (7.40 RSI)	4.5 (72)	0.20 (850)
14	Gypsum Thermal Protection Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
15	Below Grade Rigid Insulation	8" (203)	0.20 (0.029)	R-40 (7.04 RSI)	1.8 (28)	0.29 (1220)
16	Cement Protection Board	1/2" (13)	12.5 (1.8)	-	140 (2250)	0.20 (850)
17	Soil	-	15.6 (2.25)	-	-	-
18	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.8.3

Exterior and Interior Insulated 6" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with FRP Vertical Brackets and Rail System Supporting Metal Cladding and R19 Batt Insulation in Stud Cavity – At-Grade Foundation Wall Intersection



Scenario A - Without Thermal Break



Scenario B - With Thermal Break

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 to R-0.9 (0.12 to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	6" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	6" (152)	0.32 (0.046)	R-19 (3.35 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	FRP Bracket	-	4.9 (0.70)	-	110 (1760)	-
7	Exterior Mineral Wool Insulation	10" (254)	0.24 (0.034)	R-42 (7.40 RSI)	4.5 (72)	0.20 (850)
8	Vertical Aluminum L-Rail	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
9	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	Aluminum Flashing	18 Gauge	1110 (160)	-	171 (2739)	0.22 (900)
11	Concrete Foundation	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Foundation Thermal Block	8" (203)	0.20 (0.029)	R-40 (7.04 RSI)	1.8 (28)	0.29 (1220)
13	Slab Insulation	10" (254)	0.24 (0.034)	R-42 (7.40 RSI)	4.5 (72)	0.20 (850)
14	Gypsum Thermal Protection Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
15	Below Grade Rigid Insulation	8" (203)	0.20 (0.029)	R-40 (7.04 RSI)	1.8 (28)	0.29 (1220)
16	Cement Protection Board	1/2" (13)	12.5 (1.8)	-	140 (2250)	0.20 (850)
17	Soil	-	15.6 (2.25)	-	-	-
18	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

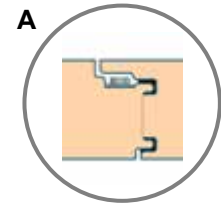
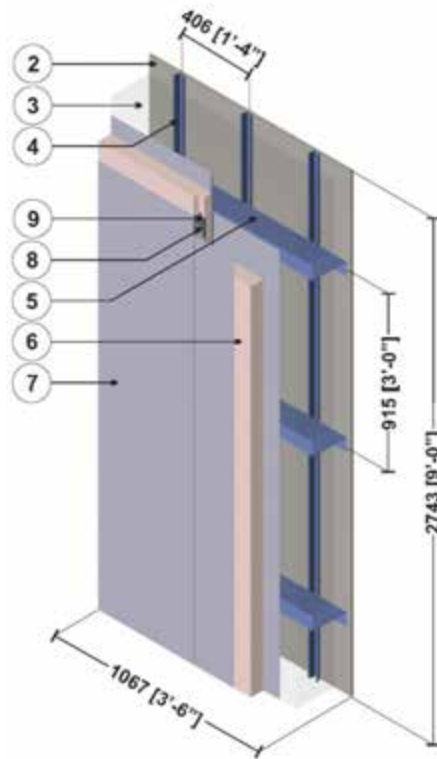
6.0 Metal Buildings

Detail 6.1.1	A.6.1
Vertical Insulated Metal Panel – Clear Wall with Vertical Connection Joint and Support Girt/Hat Track Backup Wall	
Detail 6.1.2	A.6.2
Vertical Insulated Metal Panel – Metal Stack Joint and Support Girt Back/Hat Track Backup Wall	
Detail 6.1.3	A.6.3
Horizontal Insulated Metal Panel – Clear Wall with Horizontal Connection Joint and Steel Stud Backup Wall	
Detail 6.1.4	A.6.4
Horizontal Insulated Metal Panel – Vertical Gasket Joint with Steel Stud Backup Wall	
Detail 6.1.5	A.6.5
Structural Sheet Steel Wall with Cladding Supported by Notched Z-Bar for Baseline System – Clear Wall	
Detail 6.1.6	A.6.6
Structural Sheet Steel Wall with Cladding Supported by Intermittent Notched Z-Bar – Clear Wall	
Detail 6.1.7	A.6.7
Structural Sheet Steel Wall with Cladding Supported by Thermal Chairs – Clear Wall	
Detail 6.1.8	A.6.8
2 Hour Fire Rated Structural Steel Sheet Wall with Cladding Supported by Notched Z-bar with Ceramic Blanket – Clear Wall	
Detail 6.2.1	A.6.9
Vertical Insulated Metal Panel - Corrugated Slab Intersection with I-beam – Open Web Steel Joist and Support Girt/Hat Track Backup Wall	
Detail 6.2.2	A.6.10
Horizontal Insulated Metal Panel – Corrugated Slab Intersection with I-beam – Open Web Steel Joist and Steel Stud Backup Wall	
Detail 6.3.1	A.6.11
Vertical Insulated Metal Panel – Window Glazing Transition with Steel Support Framing	
Detail 6.3.2	A.6.12
Horizontal Insulated Metal Panel – Window Glazing Transition with Steel Support Framing	
Detail 6.4.1	A.6.13
Vertical Insulated Metal Panel – Steel Roof Deck with Open Web Steel Joist & Parapet Intersection	

Detail 6.4.2	A.6.14
Horizontal Insulated Metal Panel – Steel Roof Deck with Open Web Steel Joist & Parapet Intersection	
Detail 6.5.1	A.6.15
Vertical Insulated Metal Panel – Corner Intersection with Post and Support Girt/Hat Track Backup Wall	
Detail 6.5.2	A.6.16
Horizontal Insulated Metal Panel – Corner Intersection with Post and Steel Stud Backup Wall	

Detail 6.1.1

Vertical Insulated Metal Panel – Clear Wall with Vertical Connection Joint and Support Girt/Hat Track Backup Wall



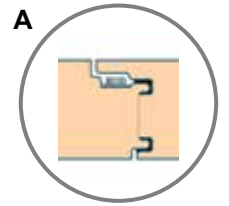
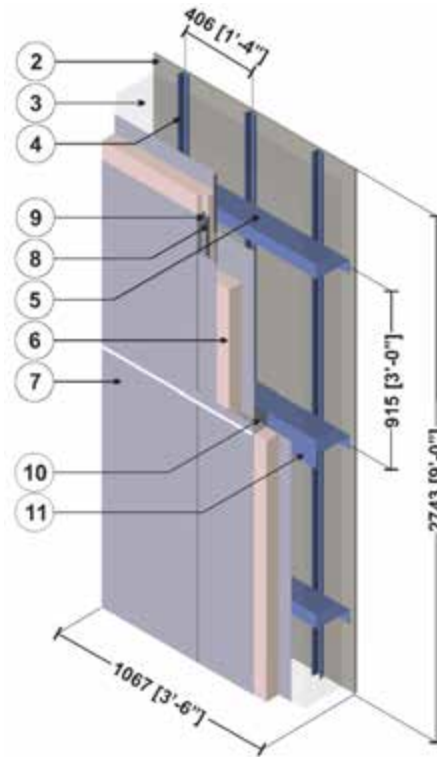
Vertical Joint

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	-	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	Hat Tracks @ 16" o.c.	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Z-Girts with 1 1/2" Flange	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	Polyisocyanurate Insulation	3" (76)	0.143 (0.02)	R-21 (3.70)	1.8 (28)	0.29 (1220)
7	Steel Facer Skin	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Sealant	Varies	2.4 (0.35)	-	-	-
9	#14 Steel Fasteners	1/4" (6) Ø	314 (45)	-	489 (7830)	0.12 (500)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

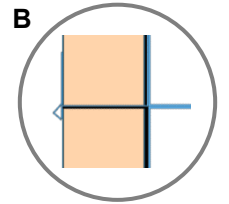
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 6.1.2

Vertical Insulated Metal Panel – Metal Stack Joint and Support Girt Back/Hat Track Backup Wall



Vertical Joint



Horizontal Joint

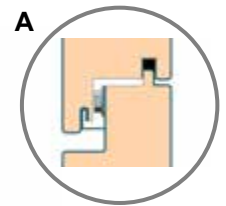
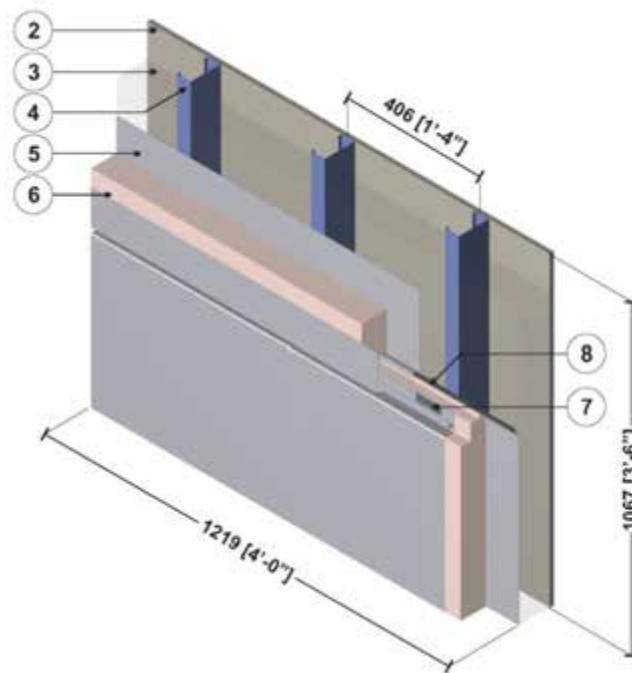
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	-	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	Hat Tracks @ 16" o.c.	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Z-Girts with 1 1/2" Flange	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	Polyisocyanurate Insulation	3" (76)	0.143 (0.020)	R-21 (3.70)	1.8 (28)	0.29 (1220)
7	Steel Facer Skin	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Sealant	Varies	2.4 (0.35)	-	-	-
9	#14 Steel Fasteners	1/4" (6) Ø	314 (45)	-	489 (7830)	0.12 (500)
10	Steel Flashing & Trim	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Steel Angle	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 6.1.3

Horizontal Insulated Metal Panel – Clear Wall with Horizontal Connection Joint and Steel Stud Backup Wall



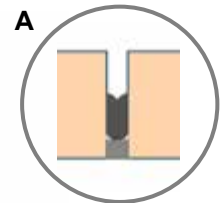
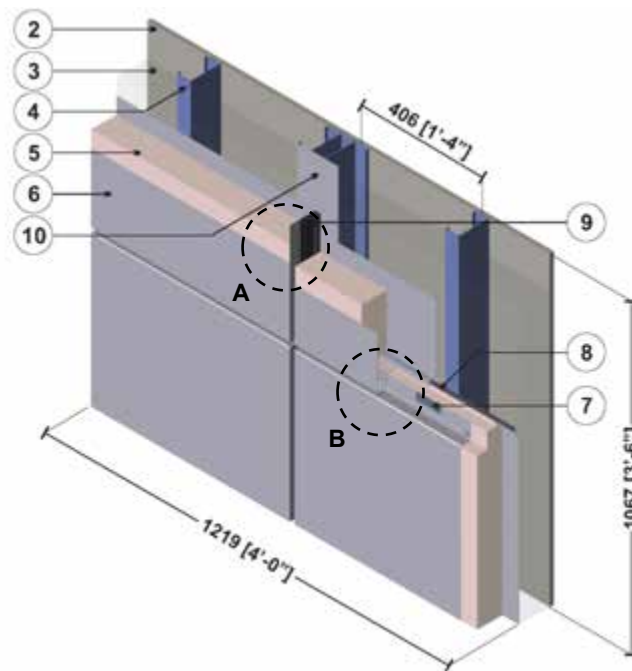
Horizontal Joint

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	-	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs (16" o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Polyisocyanurate Insulation	3" (76)	0.143 (0.02)	R-21.0 (3.70)	1.8 (28)	0.29 (1220)
6	Steel Facer Skin	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	#14 Steel Fasteners	1/4" (6) Ø	314 (45)	-	489 (7830)	0.12 (500)
8	Sealant	Varies	2.4 (0.35)	-	-	-
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

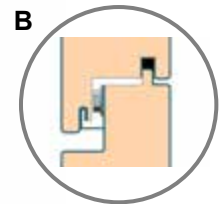
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 6.1.4

Horizontal Insulated Metal Panel – Vertical Gasket Joint with Steel Stud Backup Wall



Vertical Joint



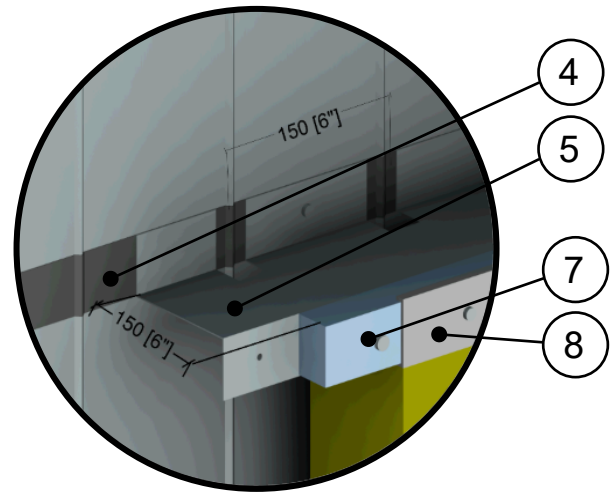
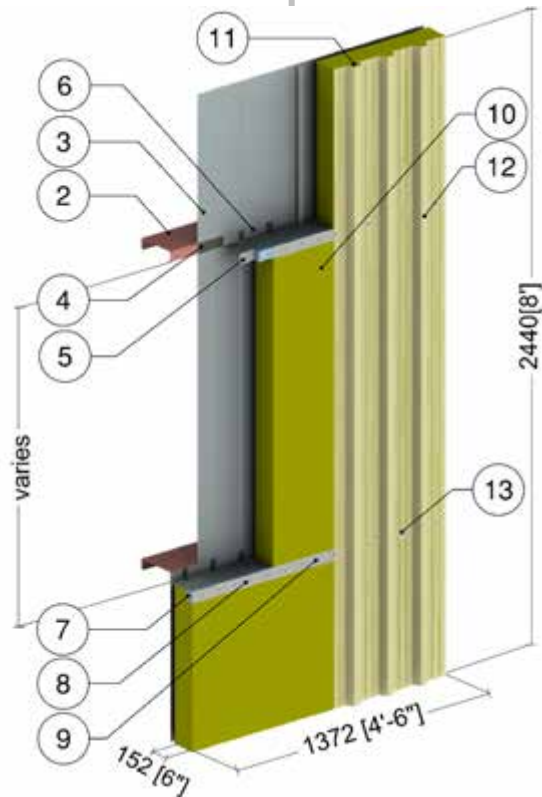
Horizontal Joint

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	-	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs (16" o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Polyisocyanurate Insulation	3" (76)	0.143 (0.02)	R-21.0 (3.70)	1.8 (28)	0.29 (1220)
6	Steel Facer Skin	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	#14 Steel Fasteners	1/4" (6) Ø	314 (45)	-	489 (7830)	0.12 (500)
8	Sealant	Varies	2.4 (0.35)	-	-	-
9	Gasket	1 1/3" (33)	0.966 (0.14)	-	-	-
10	Steel Plate	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 6.1.5

Structural Sheet Steel Wall with Cladding Supported by Notched Z-Bar for Baseline System – Clear Wall



Notched Z-Bar with Thermal Block and U-Bar

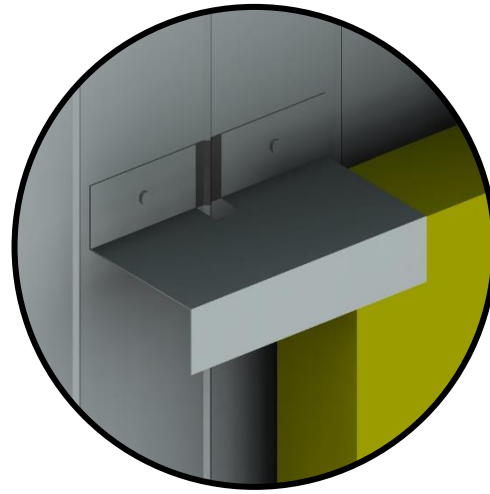
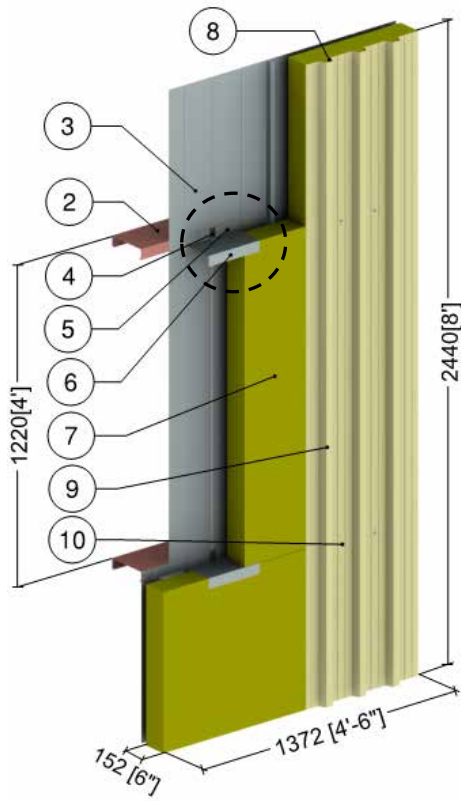
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films (left side) ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	8 x 2 Steel Girts @ 48" o.c.	0.10" (2.6)	347 (50)	-	489 (7830)	0.12 (500)
3	Galvanized Steel Liner Panel	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Thermal Tape	1/8" (3.2)	0.097 (0.014)	-	-	-
5	Galvanized Steel Notched Z-Bar	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	#12 Galvanized Steel Fasteners	0.21" (5) Ø	430 (62)	-	489 (7830)	0.12 (500)
7	Thermal Block Insulation	2" (50)	0.200 (0.029)	R-10 (1.76 RSI)	9.4 (150)	0.23 (1000)
8	Galvanized Steel U-Bar	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	#12 Galvanized Steel Fasteners (7.5" o.c.)	0.21" (5) Ø	430 (62)	-	489 (7830)	0.12 (500)
10	Exterior Mineral Wool Insulation	6" (152)	0.238 (0.034)	R-25 (4.4 RSI)	1.8 (28)	0.29 (1090)
11	Air Gap ²	-	Varies	-	0.075 (1.2)	0.24 (1000)
12	Galvanized Steel Cladding	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	#12 Galvanized Steel Fasteners	0.21" (5) Ø	430 (62)	-	489 (7830)	0.12 (500)
14	Exterior Film (right side) ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 6.1.6

Structural Sheet Steel Wall with Cladding Supported by Intermittent Notched Z-Bar – Clear Wall



Intermittent
Notched Z-Bar

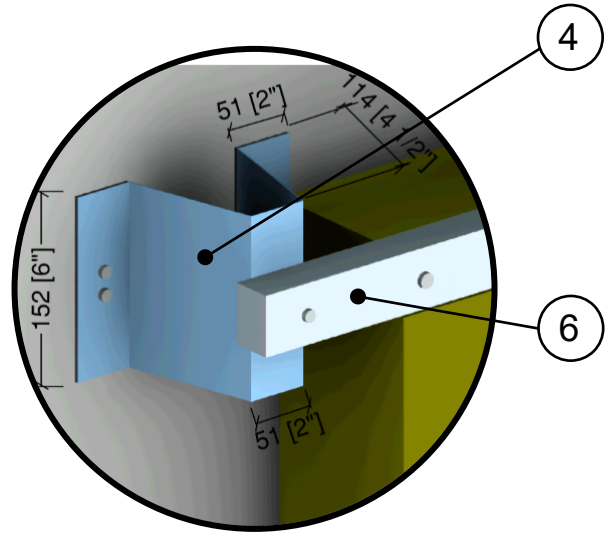
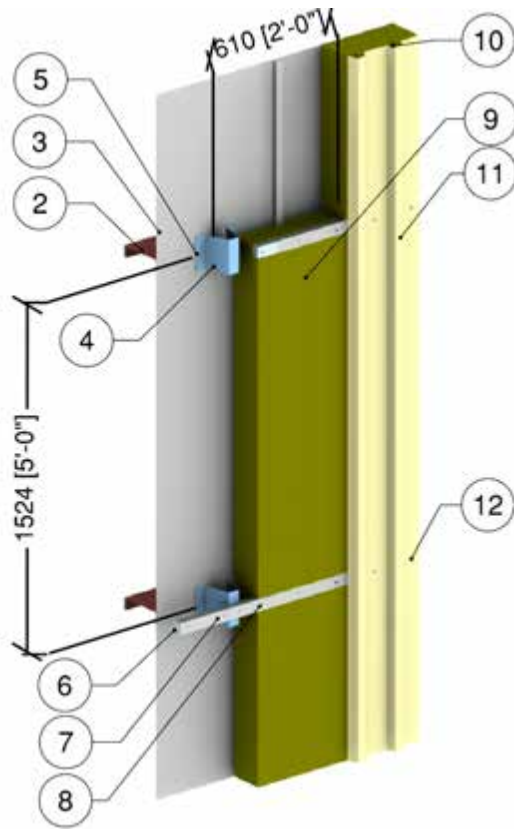
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films (left side) ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	8 x 2 Steel Girts @ 48" o.c.	0.10" (2.6)	347 (50)	-	489 (7830)	0.12 (500)
3	Galvanized Steel Liner Panel	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Thermal Tape	1/8" (3.2)	0.097 (0.014)	-	-	-
5	#12 Galvanized Steel Fasteners	0.21" (5) Ø	430 (62)	-	489 (7830)	0.12 (500)
6	Galvanized Steel Notched Z-Bar	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Mineral Wool Insulation	6" (152)	0.238 (0.034)	R-25 (4.4 RSI)	1.8 (28)	0.29 (1090)
8	Air Gap ²	-	Varies	-	0.075 (1.2)	0.24 (1000)
9	Galvanized Steel Cladding	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
10	#12 Galvanized Steel Fasteners (7.5" o.c.)	0.21" (5) Ø	430 (62)	-	489 (7830)	0.12 (500)
11	Exterior Film (right side) ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 6.1.7

Structural Sheet Steel Wall with Cladding Supported by Thermal Chairs – Clear Wall



Thermal Chair with Thermal Block and U-Bar

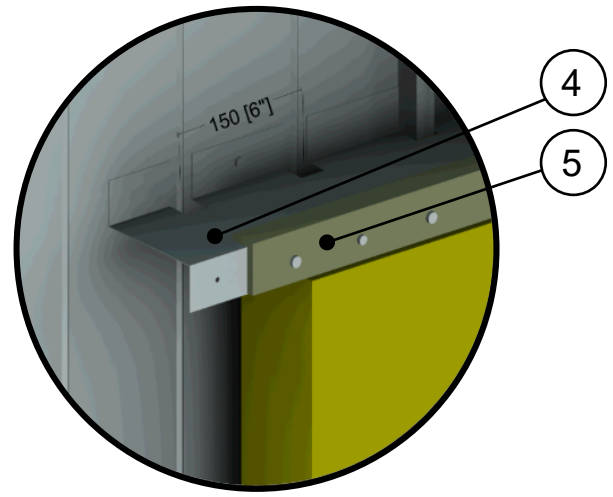
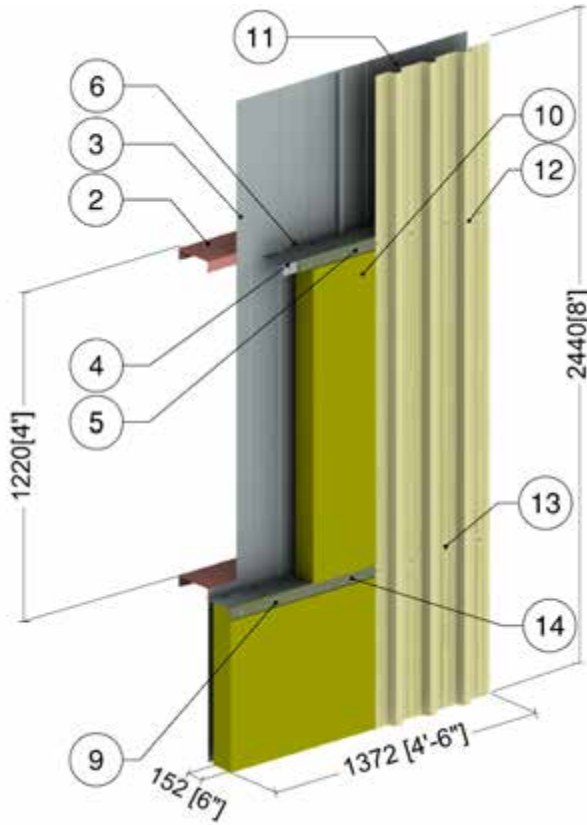
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films (left side) ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	8 x 2 Steel Girts @ 48" o.c.	0.10" (2.6)	347 (50)	-	489 (7830)	0.12 (500)
3	Galvanized Steel Liner Panel	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Thermal chairs	18 Gauge	430 (62)	-	-	-
5	#12 Galvanized Steel Fasteners	0.21" (5) Ø	430 (62)	-	489 (7830)	0.12 (500)
6	Thermal Block Insulation	2" (50)	0.200 (0.029)	R-10 (1.76 RSI)	9.4 (150)	0.23 (1000)
7	Galvanized Steel U-Bar	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	#12 Galvanized Steel Fasteners (7.5" o.c.)	0.21" (5) Ø	430 (62)	-	489 (7830)	0.12 (500)
9	Exterior Mineral Wool Insulation	6" (152)	0.238 (0.034)	R-25 (4.4 RSI)	1.8 (28)	0.29 (1090)
10	Air Gap ²	-	Varies	-	0.075 (1.2)	0.24 (1000)
11	Galvanized Steel Cladding	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	#12 Galvanized Steel Fasteners (7.5" o.c.)	0.21" (5) Ø	430 (62)	-	489 (7830)	0.12 (500)
13	Exterior Film (right side) ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 10077-2

Detail 6.1.8

2 Hour Fire Rated Structural Steel Sheet Wall with Cladding Supported by Notched Z-bar with Ceramic Blanket – Clear Wall



Notched Z-Bar with Ceramic Blanket

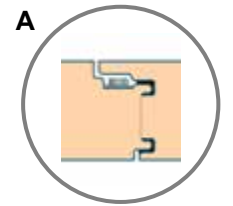
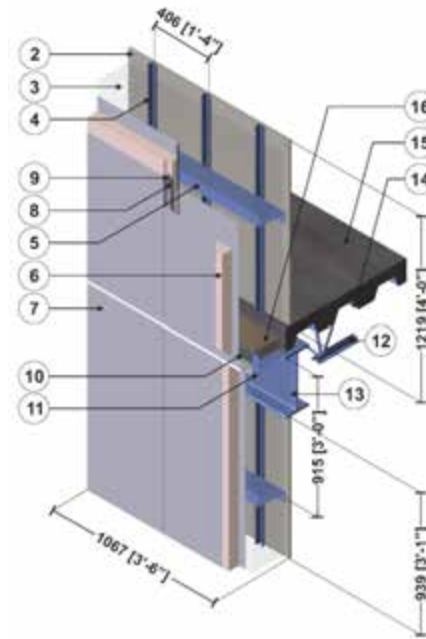
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films (left side) ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	8 x 2 Steel Girts @ 48" o.c.	0.10" (2.6)	347 (50)	-	489 (7830)	0.12 (500)
3	Galvanized Steel Liner Panel	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Galvanized Steel Notched Z-Bar	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Ceramic Fibre strip	-	-	-	-	-
6	#12 Galvanized Steel Fasteners	0.21" (5) Ø	430 (62)	-	489 (7830)	0.12 (500)
7	#12 Galvanized Steel Fasteners	0.21" (5) Ø	430 (62)	-	489 (7830)	0.12 (500)
8	Exterior Mineral Wool Insulation	6" (152)	0.238 (0.034)	R-25 (4.4 RSI)	1.8 (28)	0.29 (1090)
9	Air Gap ²	-	Varies	-	0.075 (1.2)	0.24 (1000)
10	Galvanized Steel Cladding	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	#12 Galvanized Steel Fasteners (7.5" o.c.)	0.21" (5) Ø	430 (62)	-	489 (7830)	0.12 (500)
12	Ceramic Blanket	1/2" (13)	0.62 (0.09)	R-0.8 (0.14)	-	-
13	Exterior Film (right side) ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

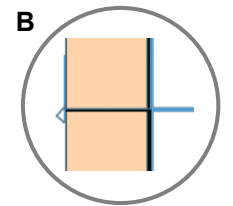
² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 6.2.1

Vertical Insulated Metal Panel - Corrugated Slab Intersection with I-beam – Open Web Steel Joist and Support Girt/Hat Track Backup Wall



Vertical Joint



Horizontal Joint

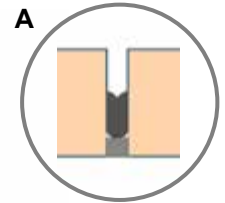
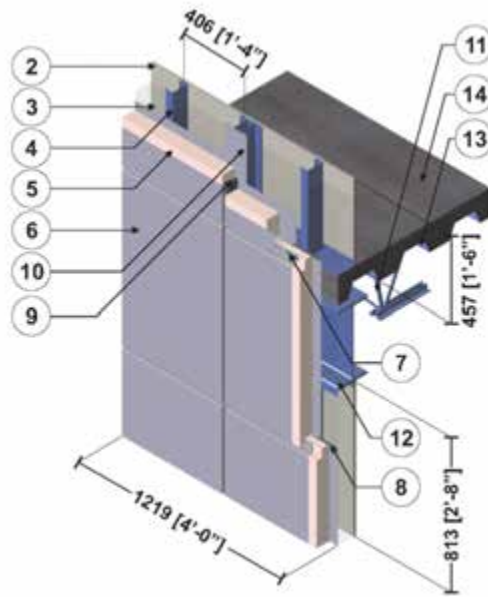
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	-	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	Hat Tracks @ 16" o.c.	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Z-Girts with 1 1/2" Flange	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	Polyisocyanurate Insulation	3" (76)	0.143 (0.02)	R-21 (3.70)	1.8 (28)	0.29 (1220)
7	Steel Facer Skin	24 gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Sealant	-	2.4 (0.35)	-	-	-
9	#14 Steel Fasteners	1/4" (6) Ø	314 (45)	-	489 (7830)	0.12 (500)
10	Steel Flashing & Trim	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Steel Angle	16 gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Open Web Steel Joist	-	314 (45)	-	489 (7830)	0.12 (500)
13	Steel Beam (W410)	-	314 (45)	-	489 (7830)	0.12 (500)
14	Steel Deck	1/16" (1.6)	314 (45)	-	489 (7830)	0.12 (500)
15	Concrete Topping	6" (152)	6 (0.9)	-	120 (1920)	0.20 (850)
16	Semi-Rigid Insulation	-	0.28 (0.04)	-	4.5 (72)	0.17 (710)
17	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

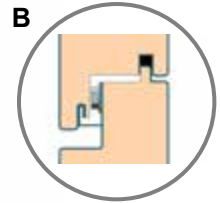


Detail 6.2.2

Horizontal Insulated Metal Panel – Corrugated Slab Intersection with I-beam – Open Web Steel Joist and Steel Stud Backup Wall



Vertical Joint



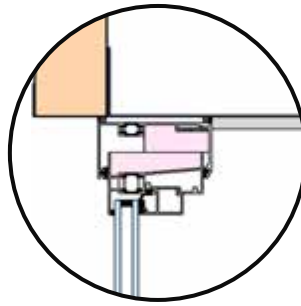
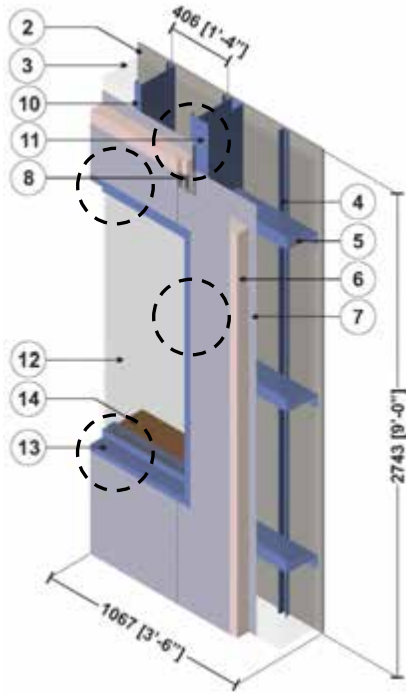
Horizontal Joint

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	-	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs (16" o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Polyisocyanurate Insulation	3" (76.2)	0.143 (0.02)	R-21.0 (3.70)	1.8 (28)	0.29 (1220)
6	Steel Facer Skin	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	#14 Steel Fasteners	1/4" (6) Ø	314 (45)	-	489 (7830)	0.12 (500)
8	Sealant	-	2.4 (0.35)	-	-	-
9	Gasket	1 1/3" (33)	0.966 (0.14)	-	-	-
10	Steel Plate	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Open Web Steel Joist	-	314 (45)	-	489 (7830)	0.12 (500)
12	Steel Beam (W410)	-	314 (45)	-	489 (7830)	0.12 (500)
13	Steel Deck	1/16" (1.6)	314 (45)	-	489 (7830)	0.12 (500)
14	Concrete Topping	6" (152)	6.3 (0.9)	-	120 (1920)	0.20 (850)
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

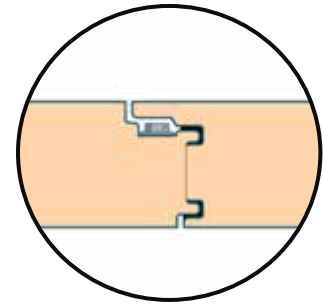
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 6.3.1

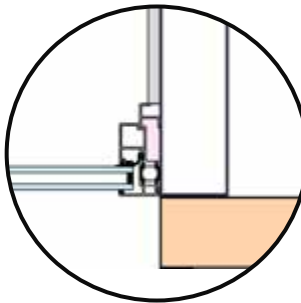
Vertical Insulated Metal Panel – Window Glazing Transition with Steel Support Framing



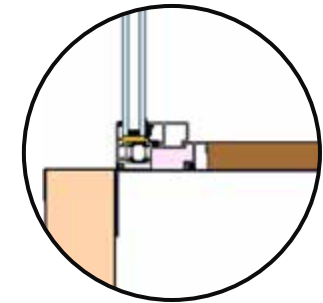
Head Detail



Vertical Joint



Jamb Detail



Sill Detail

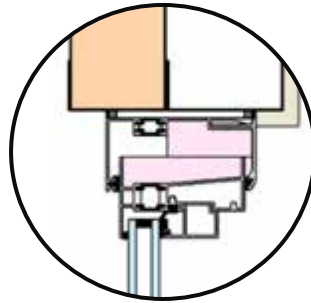
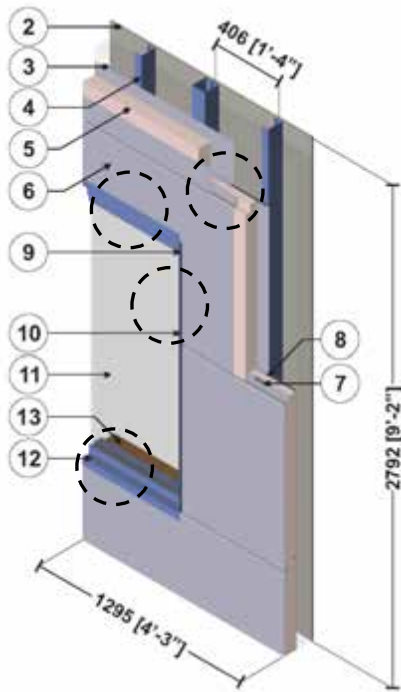
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	-	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	Hat Tracks @ 16" o.c.	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Z-Girts with 1 1/2" Flange	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	Polyisocyanurate Insulation	3" (76.2)	0.143 (0.02)	R-21.0 (3.70)	1.8 (28)	0.29 (1220)
7	Steel Facer Skin	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Sealant	-	2.4 (0.35)	-	-	-
9	#14 Steel Fasteners	1/4" (6) Ø	314 (45)	-	489 (7830)	0.12 (500)
10	Steel Studs @ 16" o.c. with Track	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Steel Support Post	1/8" (3.2)	314 (45)	-	489 (7830)	0.12 (500)
12	5' (1.5m) High aluminum window: double glazed & thermally broken ²					
13	Window Trim and Sill Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
14	Wood Sill	5/8" (16)	0.6 (0.09)	-	27.8 (445)	0.45 (1880)
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation & surface emissivity. Window values supplemented by ISO 1007-2, Annex B.

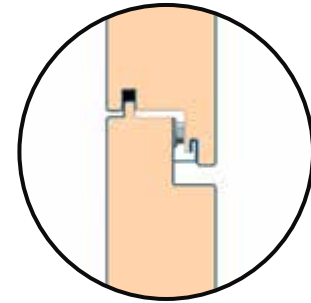
² The thermal conductivity of air spaces within window framing was found using ISO 10077-2

Detail 6.3.2

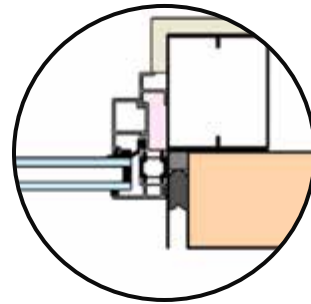
Horizontal Insulated Metal Panel – Window Glazing Transition with Steel Support Framing



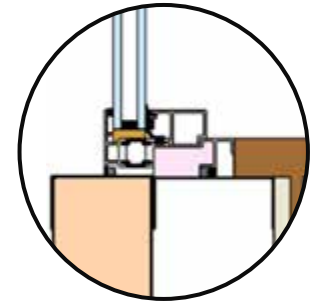
Head Detail



Horizontal Joint



Jamb Detail



Sill Detail

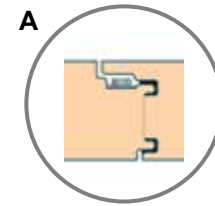
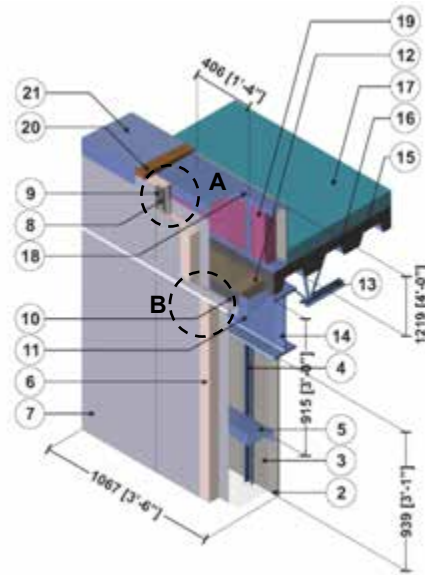
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	-	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs (16" o.c.) with Track	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Polyisocyanurate Insulation	3" (76)	0.143 (0.02)	R-21.0 (3.70)	1.8 (28)	0.29 (1220)
6	Steel Facer Skin	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	#14 Steel Fasteners	1/4" (6) Ø	314 (45)	-	489 (7830)	0.12 (500)
8	Sealant	-	2.4 (0.35)	-	-	-
9	Gasket	-	0.966 (0.14)	-	-	-
10	Steel Plate	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	5' (1.5m) High aluminum window: double glazed & thermally broken ²					
12	Steel Window Trim and Sill Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Wood Sill	5/8" (16)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation & surface emissivity. Window values supplemented by ISO 1007-2, Annex B.

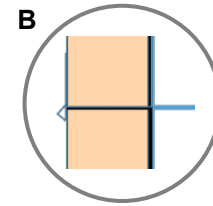
² The thermal conductivity of air spaces within curtain wall framing was found using ISO 10077-2

Detail 6.4.1

Vertical Insulated Metal Panel – Steel Roof Deck with Open Web Steel Joist & Parapet Intersection



Vertical Joint



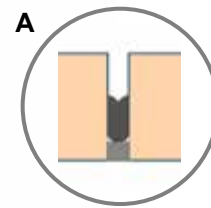
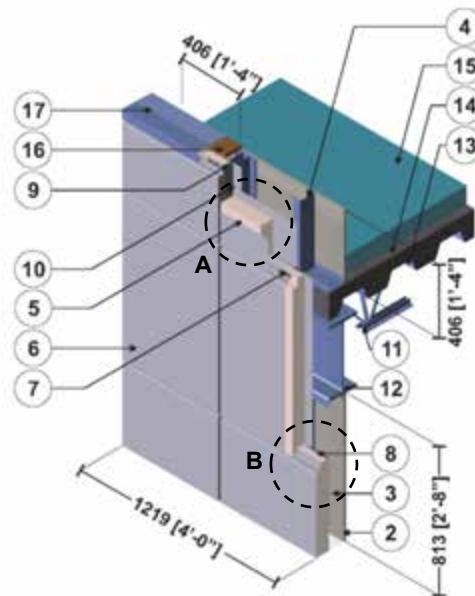
Horizontal Joint

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Cavity	-	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	Hat Tracks @ 16" o.c.	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Z-Girts with 1 1/2" Flange	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	Polyisocyanurate Insulation	3" (76)	0.143 (0.02)	R-21.0 (3.70)	1.8 (28)	0.29 (1220)
7	Steel Facer Skin	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Sealant	-	2.4 (0.35)	-	-	-
9	#14 Steel Fasteners	1/4" (6) Ø	314 (45)	-	489 (7830)	0.12 (500)
10	Steel Flashing & Trim	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Steel Angle	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Semi-Rigid Insulation	-	0.28 (0.04)	-	4.5 (72)	0.17 (710)
13	Open Web Steel Joist	-	314 (45)	-	489 (7830)	0.12 (500)
14	Steel Beam (W410)	-	314 (45)	-	489 (7830)	0.12 (500)
15	Steel Deck	1/16" (2)	314 (45)	-	489 (7830)	0.12 (500)
16	Concrete Topping	6" (152)	6.3 (0.9)	-	120 (1920)	0.20 (850)
17	Roof Insulation	4" (102)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
18	3 5/8" x 1 5/8" Steel Studs with Track	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
19	Parapet Insulation	-	0.29 (0.042)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
20	Wood Block	5/8" (16)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
21	Flashing & roof finish materials are incorporated into exterior heat transfer coefficient.					
22	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

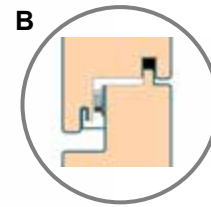
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 6.4.2

Horizontal Insulated Metal Panel – Steel Roof Deck with Open Web Steel Joist & Parapet Intersection



Vertical Joint



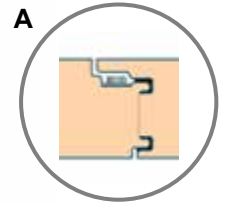
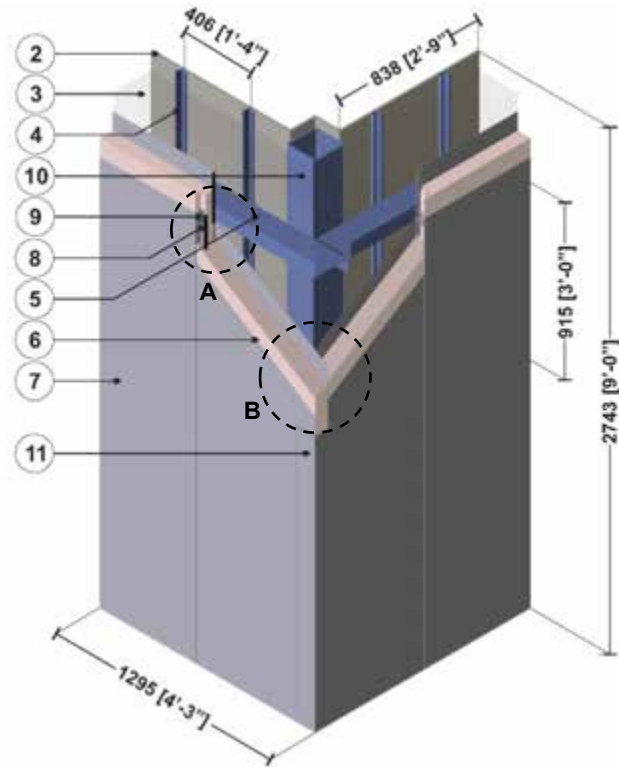
Horizontal Joint

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Cavity	-	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs (16" o.c.) with Track	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Polyisocyanurate Insulation	3" (76)	0.143 (0.02)	R-21.0 (3.70)	1.8 (28)	0.29 (1220)
6	Steel Facer Skin	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	#14 Steel Fasteners	1/4" (6) Ø	314 (45)	-	489 (7830)	0.12 (500)
8	Sealant	-	2.4 (0.35)	-	-	-
9	Gasket	-	0.966 (0.14)	-	-	-
10	Steel Plate	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Open Web Steel Joist	-	314 (45)	-	489 (7830)	0.12 (500)
12	Steel Beam (W410)	-	314 (45)	-	489 (7830)	0.12 (500)
13	Steel Deck	1/16" (1.6)	314 (45)	-	489 (7830)	0.12 (500)
14	Concrete Topping	6" (152)	6.3 (0.9)	-	120 (1920)	0.20 (850)
15	Roof Insulation	4" (102)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
16	Wood Block	5/8" (16)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
17	Flashing & roof finish materials are incorporated into exterior heat transfer coefficient.					
18	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

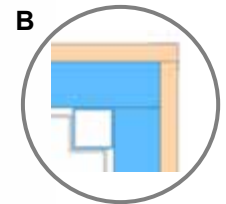
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 6.5.1

Vertical Insulated Metal Panel – Corner Intersection with Post and Support Girt/Hat Track Backup Wall



Vertical Joint



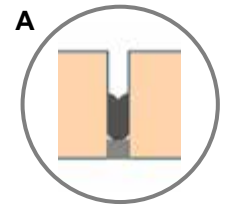
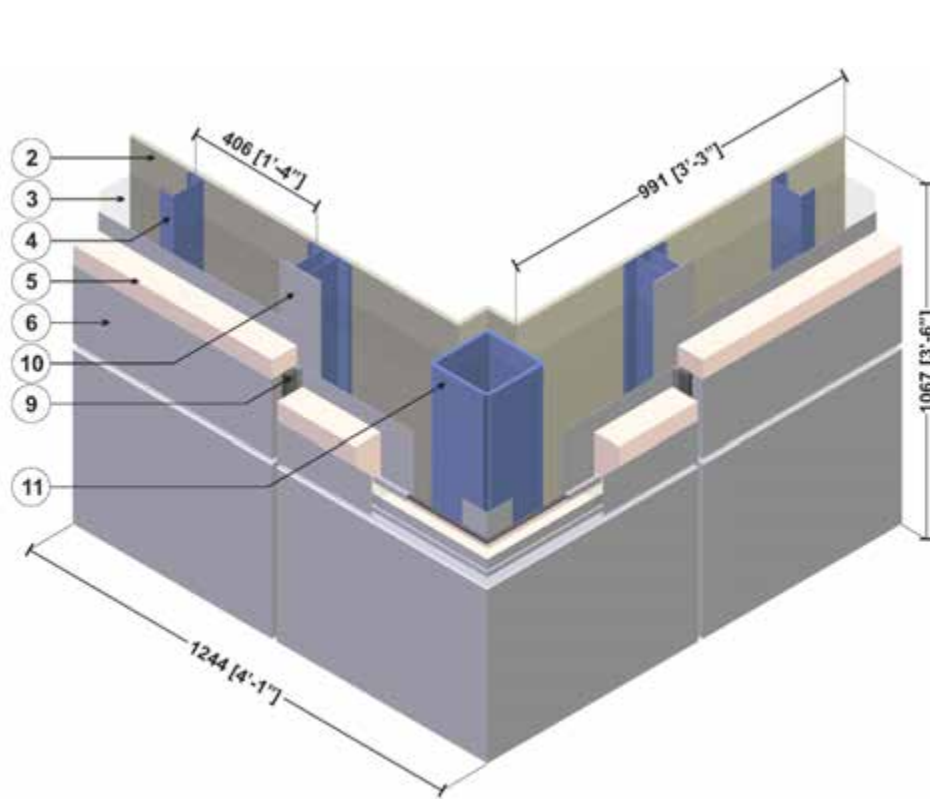
Corner Plan Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Cavity	-	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	Hat Tracks @ 16" o.c.	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Z-Girts with 1 1/2" Flange	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	Polyisocyanurate Insulation	3" (76)	0.143 (0.02)	R-21.0 (3.70)	1.8 (28)	0.29 (1220)
7	Steel Facer Skin	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Sealant	-	2.4 (0.35)	-	-	-
9	#14 Steel Fasteners	1/4" (6) Ø	314 (45)	-	489 (7830)	0.12 (500)
10	HSS Steel Post	1/8" (3)	314 (45)	-	489 (7830)	0.12 (500)
11	Steel Corner Trim	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

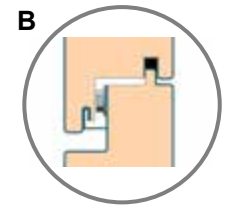
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 6.5.2

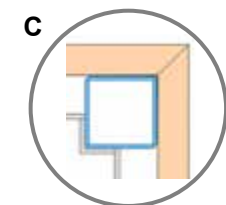
Horizontal Insulated Metal Panel – Corner Intersection with Post and Steel Stud Backup Wall



Vertical Joint



Horizontal Joint



Corner Plan Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Cavity	-	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs (16" o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Polyisocyanurate Insulation	3" (76)	0.143 (0.02)	R-21.0 (3.70)	1.8 (28)	0.29 (1220)
6	Steel Facer Skin	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	#14 Steel Fasteners	1/4" (6) Ø	314 (45)	-	489 (7830)	0.12 (500)
8	Sealant	-	2.4 (0.35)	-	-	-
9	Gasket	-	0.966 (0.14)	-	-	-
10	Steel Plate	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	HSS Steel Post	1/8" (3)	314 (45)	-	489 (7830)	0.12 (500)
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

7.0 Concrete and Mass Masonry Construction

Detail 7.1.1	A.7.1
Exterior Insulated Concrete Drained EIFS Wall Assembly – Clear Wall	
Detail 7.1.2	A.7.2
Exterior Insulated Concrete Mass Wall Assembly with 1/4 inch (6 mm) Stainless Steel Brackets Supporting 1-1/4” Stone Panels – Clear Wall	
Detail 7.1.3	A.7.3
Exterior Insulated Concrete Block Wall with Thermally Broken ISO Clip System with Horizontal Sub-Girt Supporting Cladding – Clear Wall	
Detail 7.1.4	A.7.4
Exterior Insulated Concrete Assembly with Nvelope – NV1 Clip System Supporting Cladding – Clear Wall	
Detail 7.1.5	A.7.5
Exterior Insulated Concrete Block Wall Assembly with Nvelope – NV1 Clip System Supporting Cladding – Clear Wall	
Detail 7.1.6	A.7.6
Exterior Insulated Concrete Mass Wall Assembly with Hohmann & Barnard Masonry Zinc 2-Seal Anchor Supporting Brick Veneer – Clear Wall	
Detail 7.1.7	A.7.7
Exterior Insulated Concrete Mass Wall Assembly with Hohmann & Barnard Masonry Stainless Steel 2-Seal Thermal Wing Nut Anchor Supporting Brick Veneer – Clear Wall	
Detail 7.1.8	A.7.8
Precast Sandwich Panel Wall Assembly with Concrete Panel Joints – Clear Wall	
Detail 7.1.9	A.7.9
Precast Sandwich Panel Wall Assembly with Tigerloc Thermally Broken Panel Joints – Clear Wall	
Detail 7.1.10	A.7.10
Precast Concrete Sandwich Panel Wall Assembly with FRP Connectors – Clear Wall	
Detail 7.1.11	A.7.11
Exterior Insulated Concrete Block Wall with Armadillo FRR Horizontal Z-Girts Supporting Cladding – Clear Wall	
Detail 7.1.12	A.7.12
Exterior Insulated Concrete Block Wall with Vertical Clips Supporting Cladding – Clear Wall	
Detail 7.1.13	A.7.13
Exterior Insulated Concrete Block Wall Assembly with Brick Ties Supporting Brick Veneer – Clear Wall	
Detail 7.1.14	A.7.14

Interior Insulated Concrete Mass Wall with 1 5/8" Steel Stud (16" o.c.) Supporting Interior Finish Wall Assembly – Clear Wall	
Detail 7.1.15	A.7.15
Precast Sandwich Panel Wall Assembly with Steel Connectors and 3 5/8" x 1 5/8" Steel Stud (16" o.c.) – Clear Wall	
Detail 7.1.16	A.7.16
Exterior Insulated Concrete Mass Wall Assembly with 3/8 inch (9.5 mm Stainless Steel Brackets Supporting 3" Stone Panels – Clear Wall	
Detail 7.1.17	A.7.17
Exterior Insulated Concrete Block Wall Assembly with SOPREMA SOPRA-XPS 20 and ACS-S Thermal Clip (16" o.c. Horizontal) Supporting Metal Cladding - Clear Wall	
Detail 7.1.18	A.7.18
Exterior Insulated Concrete Block Wall Assembly with SOPREMA SOPRA-XPS 20 and ACS-S Thermal Clip (24" o.c. Horizontal) Supporting Metal Cladding - Clear Wall	
Detail 7.1.19	A.7.19
Exterior Insulated Concrete Block Wall Assembly with SOPREMA SOPRA-SPF 202 and ACS-S Thermal Clip (16" o.c. Horizontal) Supporting Metal Cladding - Clear Wall	
Detail 7.1.20	A.7.20
Exterior Insulated Concrete Block Wall Assembly with SOPREMA SOPRA-SPF 202 and ACS-S Thermal Clip (24" o.c. Horizontal) Supporting Metal Cladding - Clear Wall	
Detail 7.1.21	A.7.21
Exterior Insulated Concrete Block Wall Assembly with SOPREMA SOPRA-ISO V ALU and ACS-S Thermal Clip (16" o.c. Horizontal) Supporting Metal Cladding - Clear Wall	
Detail 7.1.22	A.7.22
Exterior Insulated Concrete Block Wall Assembly with SOPREMA SOPRA-ISO V ALU and ACS-S Thermal Clip (24" o.c. Horizontal) Supporting Metal Cladding - Clear Wall	
Detail 7.1.23	A.7.23
Exterior Insulated Concrete Block Wall Assembly with Mineral Wool and ACS-S Thermal Clip (16" o.c. Horizontal) Supporting Metal Cladding - Clear Wall	
Detail 7.1.24	A.7.24
Exterior Insulated Concrete Block Wall Assembly with Mineral Wool and ACS-S Thermal Clip (24" o.c. Horizontal) Supporting Metal Cladding - Clear Wall	
Detail 7.1.25	A.7.25

Exterior Insulated Concrete Block Wall Assembly with Protected SOPREMA SOPRA-ISO V ALU and ACS-S Thermal Clip (16" o.c. Horizontal) Supporting Metal Cladding - Clear Wall	
Detail 7.1.26	A.7.26
Exterior Insulated Concrete Block Wall Assembly with Protected SOPREMA SOPRA-ISO V ALU and ACS-S Thermal Clip (24" o.c. Horizontal) Supporting Metal Cladding - Clear Wall	
Detail 7.1.27	A.7.27
Exterior Insulated Concrete Mass Wall with 1 5/8" x 1 5/8" Steel Stud (16" o.c.) and Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding – Clear Wall	
Detail 7.2.1	A.7.28
Exterior Insulated Concrete Drained EIFS Wall Assembly – Intermediate Floor Intersection	
Detail 7.2.2	A.7.29
Interior Insulated Concrete Mass Wall with 1 5/8" Steel Stud (16" o.c.) Supporting Interior Finish – Non-Insulated Interior Wall and Non-insulated Intermediate Floor Intersection	
Detail 7.2.3	A.7.30
Interior Insulated Concrete Mass Wall with 1 5/8" Steel Stud (16" o.c.) Supporting Interior Finish – Insulated Interior Wall and Non-insulated Intermediate Floor Intersection	
Detail 7.2.4	A.7.31
Interior Insulated Concrete Mass Wall with 3 5/8" x 1 5/8" Steel Studs (16" o.c.) Supporting Interior Finish – Interior Insulated Wall and Non-Insulated Partition Wall Intersection	
Detail 7.2.5	A.7.32
Interior Insulated Concrete Mass Wall with 1 5/8" x 1 5/8" Steel Studs (16" o.c.) Supporting Interior Finish – Continuous Concrete Intermediate Floor Intersection	
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<i>Detail referenced from work done by Passive House Academy</i>	

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Detail 7.7.10A.7.110

Owens Corning Exterior Insulated Concrete Block Wall Assembly with Stainless Steel Stand-off Shelf Angle and Heckmann Pos-I-Tie Veneer Anchoring System Supporting Brick Veneer and Insulation Below Floor – Slab on Grade and Foundation Intersection

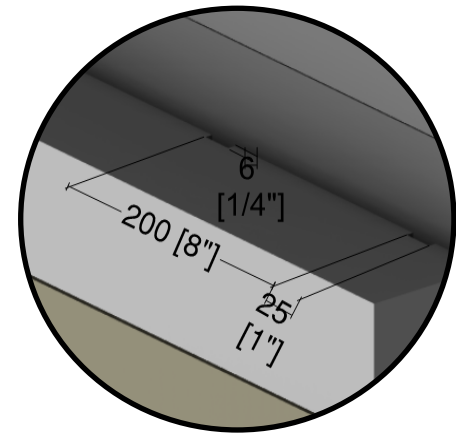
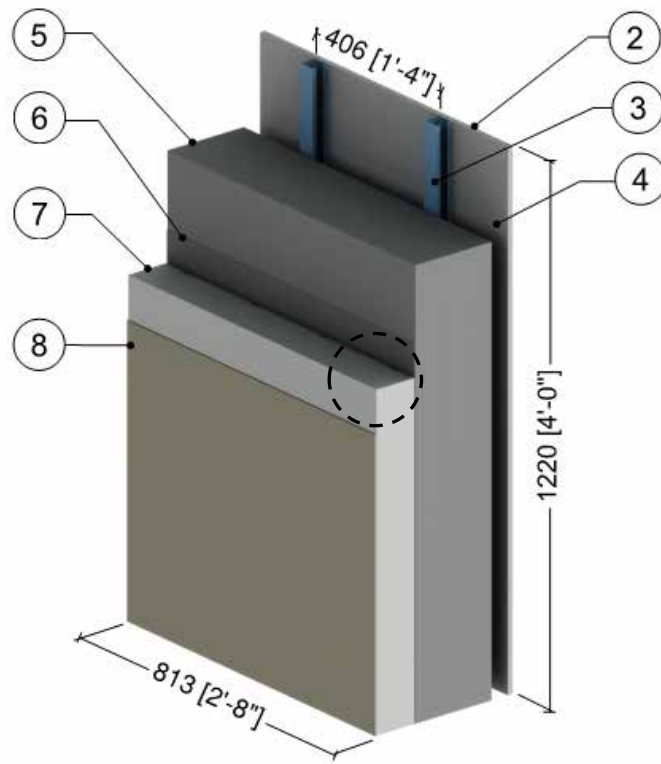
Detail 7.8.1A.7.111

Precast Sandwich Panel Wall Assembly – Emloc Thermally Broken Embedment Detail



Detail 7.1.1

Exterior Insulated Concrete Drained EIFS Wall Assembly – Clear Wall



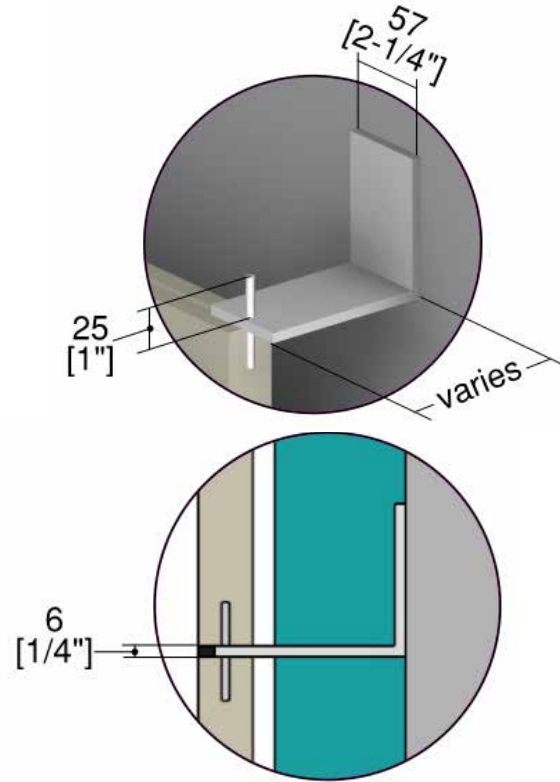
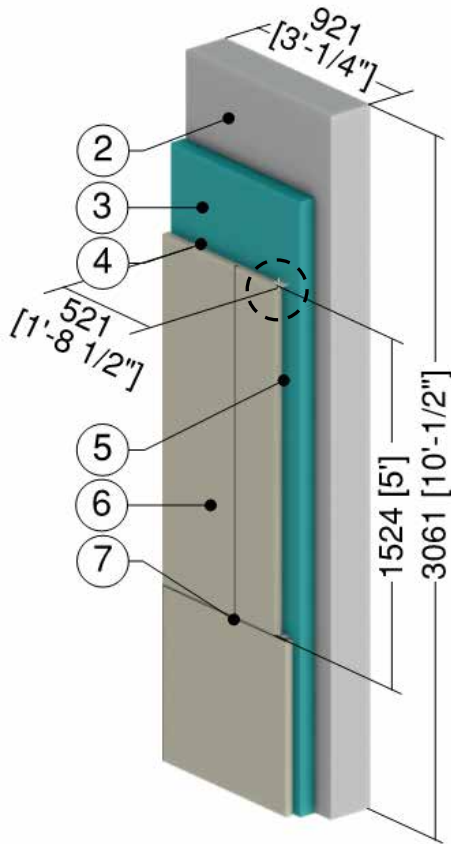
1" (25 mm)
Drained EIFS
Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs (16" o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Concrete Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	4" (100)	0.27 (0.039)	R-15 (2.64 RSI)	1 (16)	0.35 (1470)
8	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.2

Exterior Insulated Concrete Mass Wall Assembly with 1/4 inch (6 mm) Stainless Steel Brackets Supporting 1-1/4" Stone Panels – Clear Wall



Stainless Steel Bracket Detail

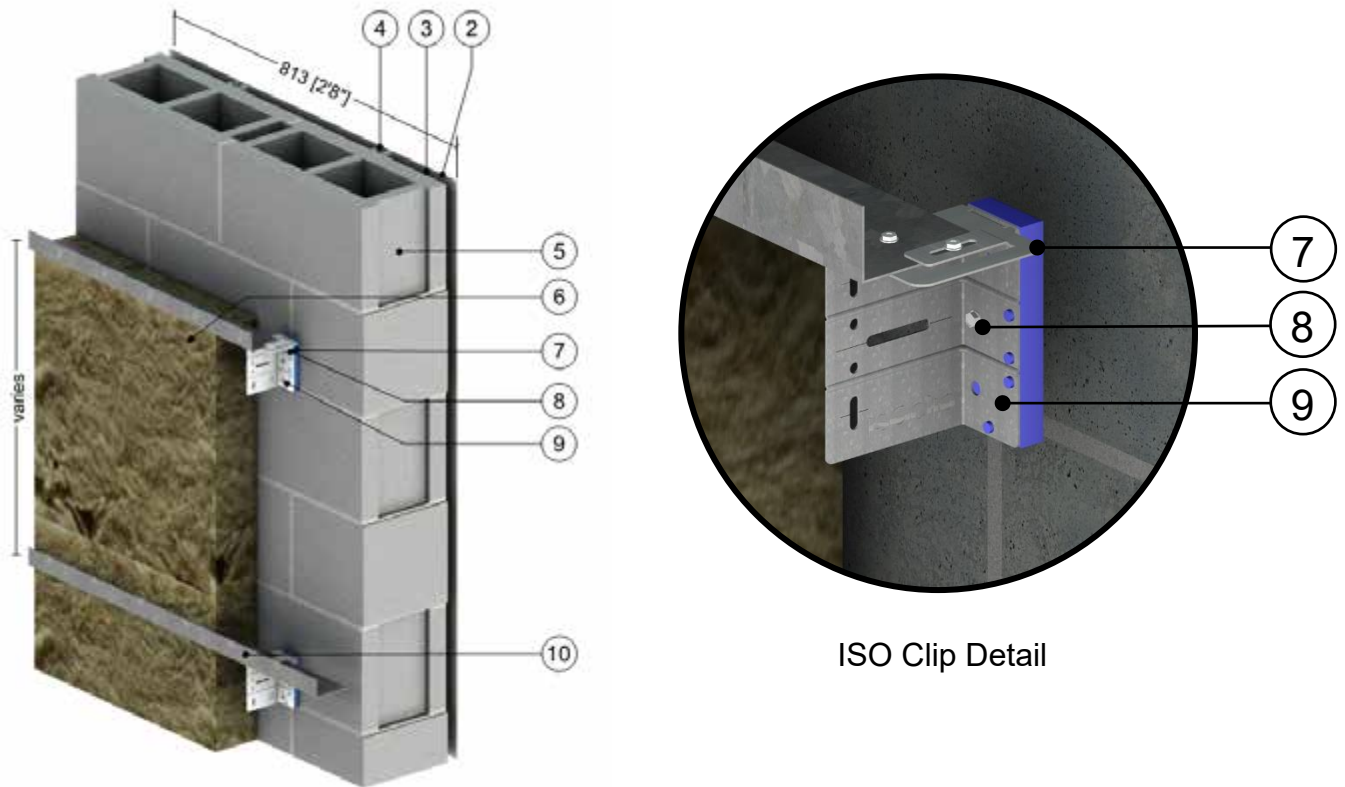
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Concrete Mass Wall	8" (203)	12.5 (1.80)	R-0.6 (0.11 RSI)	140 (2250)	0.20 (850)
3	Rigid Insulation	Varies	0.20 (0.029)	R-5 to R-25 (0.88 to 4.40 RSI)	1.8 (28)	0.29 (1220)
4	Stainless Steel Bracket	1/4 (6.3)	118 (17)	-	503 (8060)	0.12 (500)
5	Vented Air Cavity	1/2 (13)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
6	Stone Panel	1-1/4 (32)	43 (6.2)	R-0.03 (0.01 RSI)	160 (2560)	0.21 (880)
7	Panel Sealant	-	1.7 (0.25)	-	-	-
8	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 7.1.3

Exterior Insulated Concrete Block Wall with Thermally Broken ISO Clip System with Horizontal Sub-Girt Supporting Cladding – Clear Wall



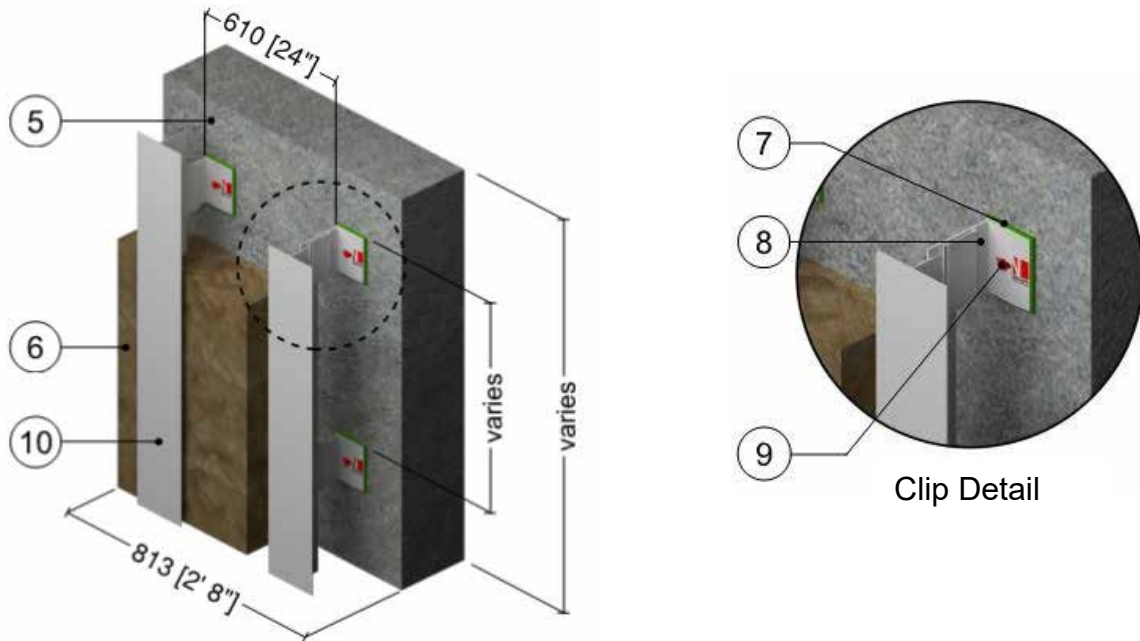
ISO Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	1 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Standard Concrete Blocks	8" (203)	10.3 (1.5)	-	119 (1900)	0.19 (800)
6	Exterior Mineral Wool Insulation	4" to 6" (102 to 152)	0.24 (0.034)	R-16.8 to R-25.2 (2.96 RSI to 4.44 RSI)	4 (64)	0.20 (850)
7	ISO Clip - HDPE Isolator	1/2" (12.7)	3.1 (0.45)	-	-	-
8	#14 Steel Fasteners	1/4" (6) ∅	347 (50)	-	489 (7830)	0.12 (500)
9	ISO Clip - Galvanized Metal	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
10	Horizontal Sub-girt	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.4

Exterior Insulated Concrete Assembly with Nvelope – NV1 Clip System Supporting Cladding – Clear Wall

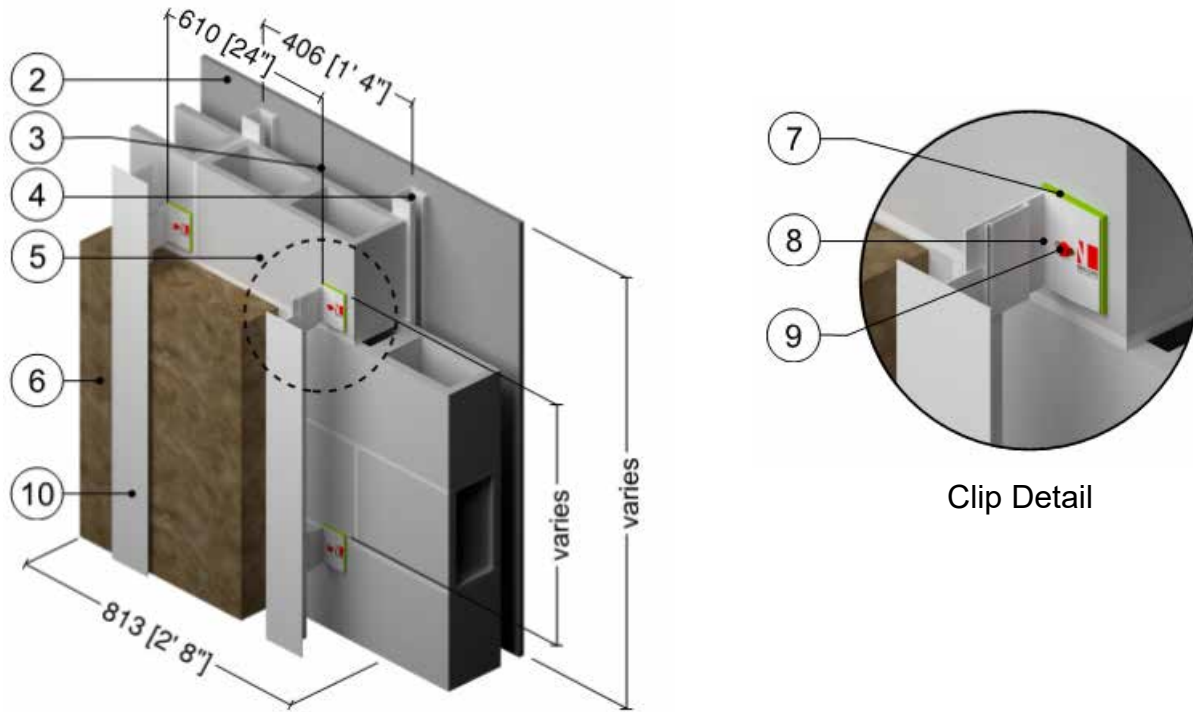


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Concrete Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Exterior Mineral Wool Insulation	2" to 6" (50 to 152)	0.24 (0.034)	R-8.4 to R-25.2 (1.48 RSI to 4.44 RSI)	4 (64)	0.20 (850)
7	NV1 Clip Isolator	0.2" (5)	0.82 (0.117)	-	87 (1400)	0.20 (840)
8	NV1 Clip Extrusion – Aluminum 6005A alloy	Varies	1340 (193)	-	171 (2739)	0.21 (900)
9	#14 Stainless Steel Fasteners	1/4" (6) ∅	118 (17)	-	503 (8060)	0.12 (500)
10	Vertical Sub-girt	0.09" (2.2)	1340 (193)	-	171 (2739)	0.21 (900)
11	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.5

Exterior Insulated Concrete Block Wall Assembly with Nvelope – NV1 Clip System Supporting Cladding – Clear Wall

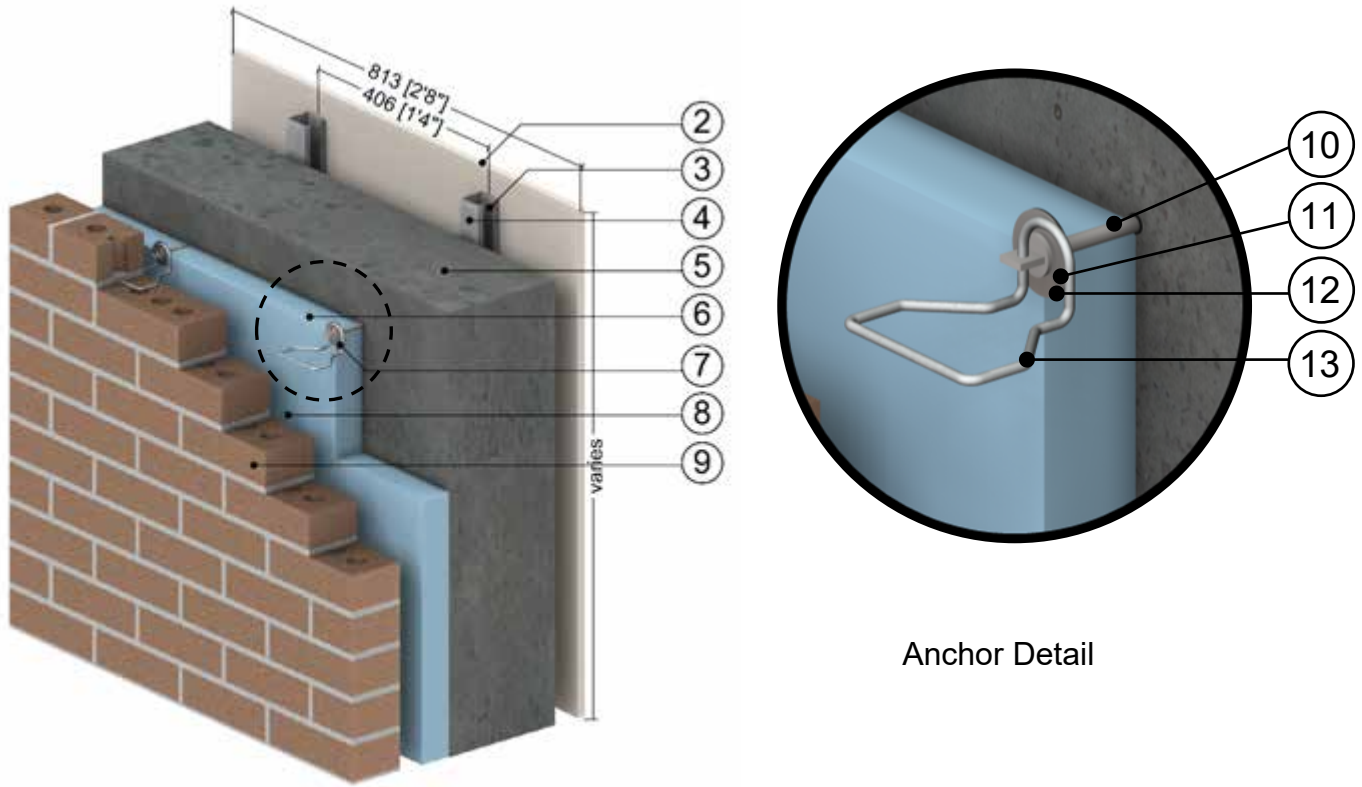


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Standard Concrete Block	7-5/8" (190)	10.3 (1.5)	-	119 (1900)	0.19 (800)
6	Exterior Mineral Wool Insulation	2" to 6" (50 to 152)	0.24 (0.034)	R-8.4 to R-25.2 (1.48 RSI to 4.44 RSI)	4 (64)	0.20 (850)
7	NV1 Clip Isolator	0.2" (5)	0.82 (0.117)	-	87 (1400)	0.20 (840)
8	NV1 Clip Extrusion – Aluminum 6005A alloy	Varies	1340 (193)	-	171 (2739)	0.21 (900)
9	#14 Stainless Steel Fasteners	1/4" (6) Ø	118 (17)	-	503 (8060)	0.12 (500)
10	Vertical Sub-girt	0.09" (2.2)	1340 (193)	-	171 (2739)	0.21 (900)
11	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.6

Exterior Insulated Concrete Mass Wall Assembly with Hohmann & Barnard Masonry Zinc 2-Seal Anchor Supporting Brick Veneer – Clear Wall



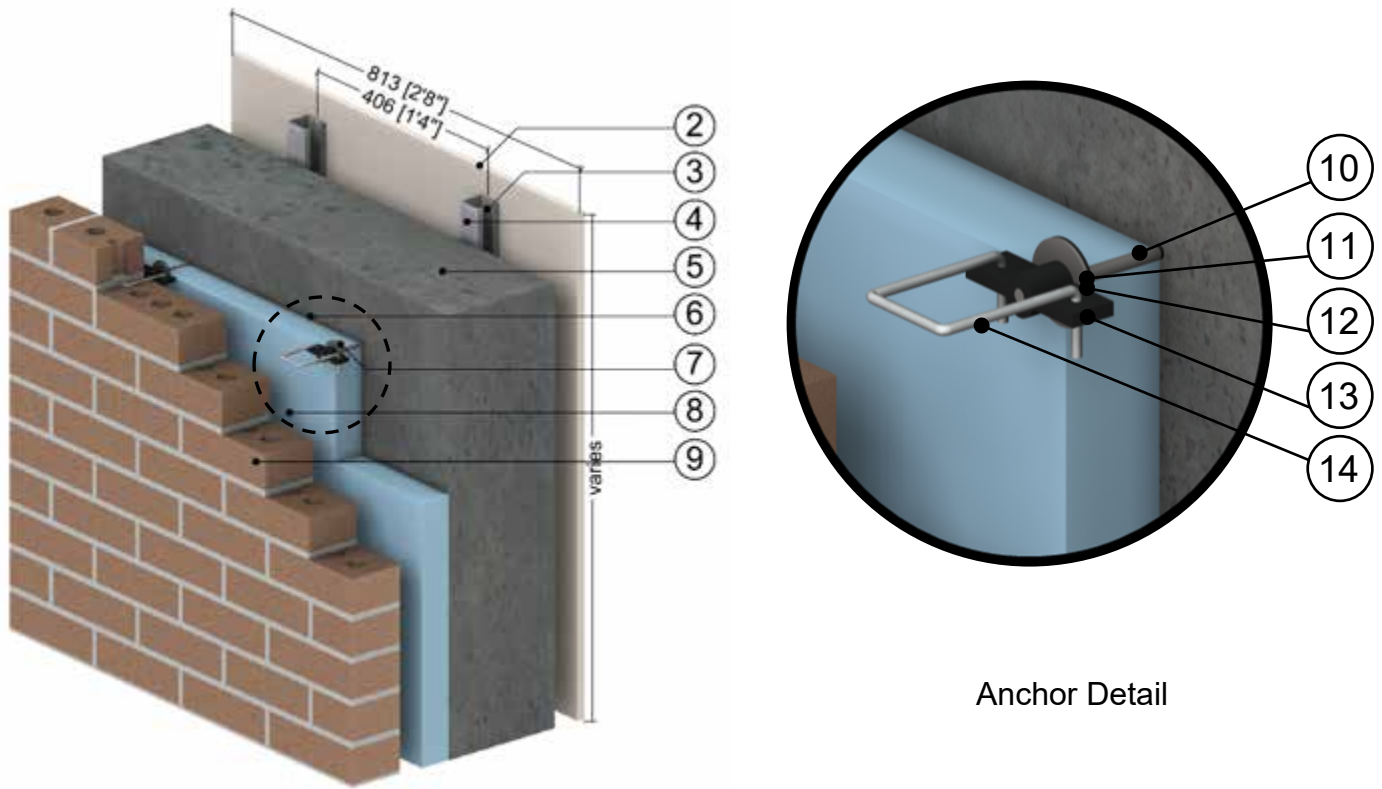
Anchor Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Concrete Mass Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Exterior Mineral Wool Insulation	1" to 4" (25 to 102)	0.24 (0.034)	R-4.2 to R-16.8 (0.74 RSI to 2.96 RSI)	4 (64)	0.20 (850)
7	Brick Tie	1" to 4" (25 to 102)	784 (113)	-	445 (7130)	0.09 (390)
8	Vented Air Cavity	1.5" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Zinc Barrel	-	784 (113)	-	-	-
11	Steel Washer	1.5" (38) ∅	347 (50)	-	489 (7830)	0.12 (500)
12	Rubber Washer (EPDM)	-	1.7 (0.25)	-	-	-
13	Galvanized Steel Wire Pintle	3/16" (5) ∅	430 (62)	-	489 (7830)	0.12 (500)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.7

Exterior Insulated Concrete Mass Wall Assembly with Hohmann & Barnard Masonry Stainless Steel 2-Seal Thermal Wing Nut Anchor Supporting Brick Veneer – Clear Wall



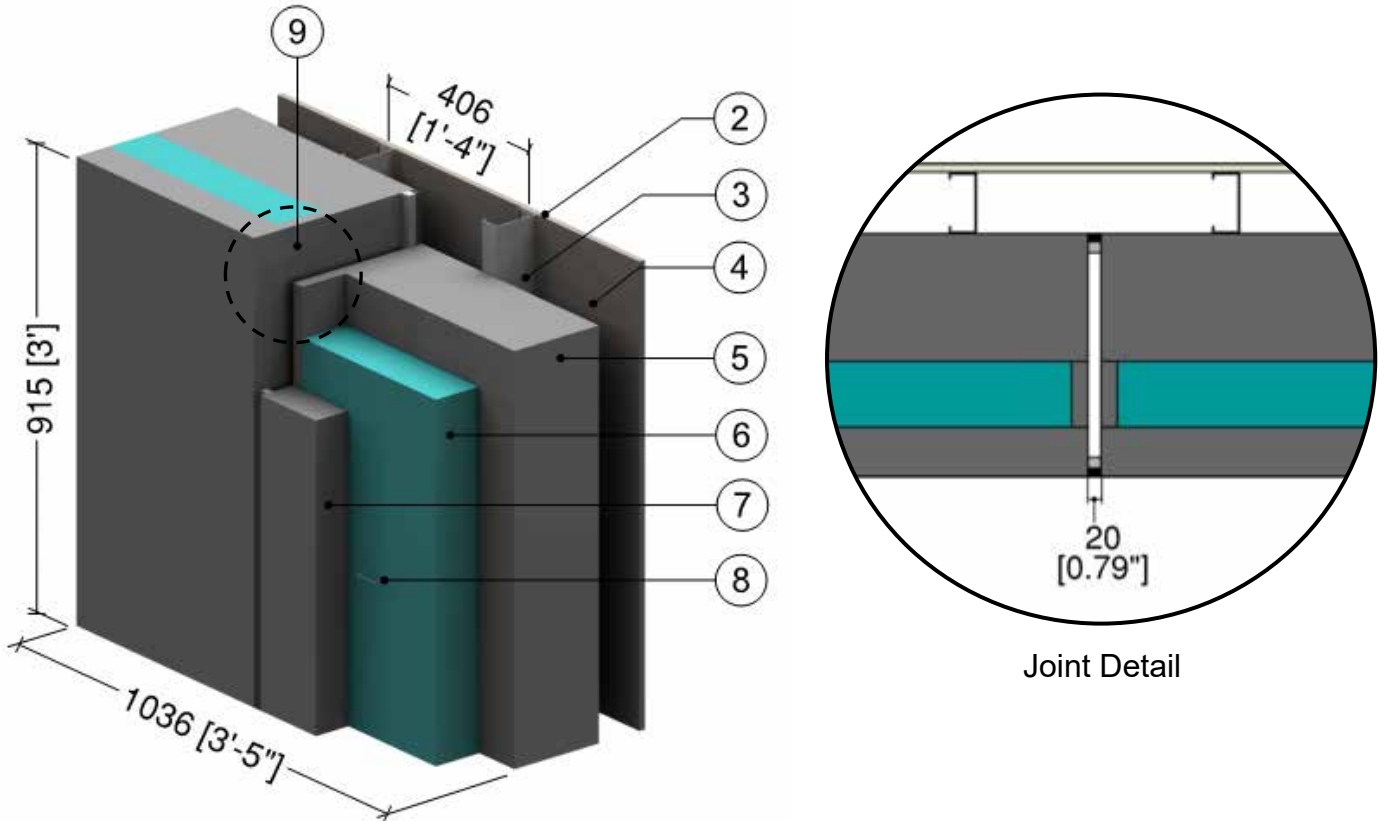
Anchor Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Concrete Mass Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Exterior Mineral Wool Insulation	1" to 4" (25 to 102)	0.24 (0.034)	R-4.2 to R-16.8 (0.74 RSI to 2.96 RSI)	4 (64)	0.20 (850)
7	Brick Tie	1" to 4" (25 to 102)	784 (113)	-	445 (7130)	0.09 (390)
8	Vented Air Cavity	1.5" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Stainless Steel Barrel	-	118 (17)	-	503 (8060)	0.12 (500)
11	Steel Washer	1.5" (38) ∅	347 (50)	-	489 (7830)	0.12 (500)
12	Rubber Washer (EPDM)	-	1.7 (0.25)	-	-	-
13	Steel Wing Nut with Plastic Coating	Varies	347 (50)	-	489 (7830)	0.12 (500)
14	Galvanized Steel Wire Pintle	3/16" (5) ∅	430 (62)	-	489 (7830)	0.12 (500)
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.8

Precast Sandwich Panel Wall Assembly with Concrete Panel Joints – Clear Wall

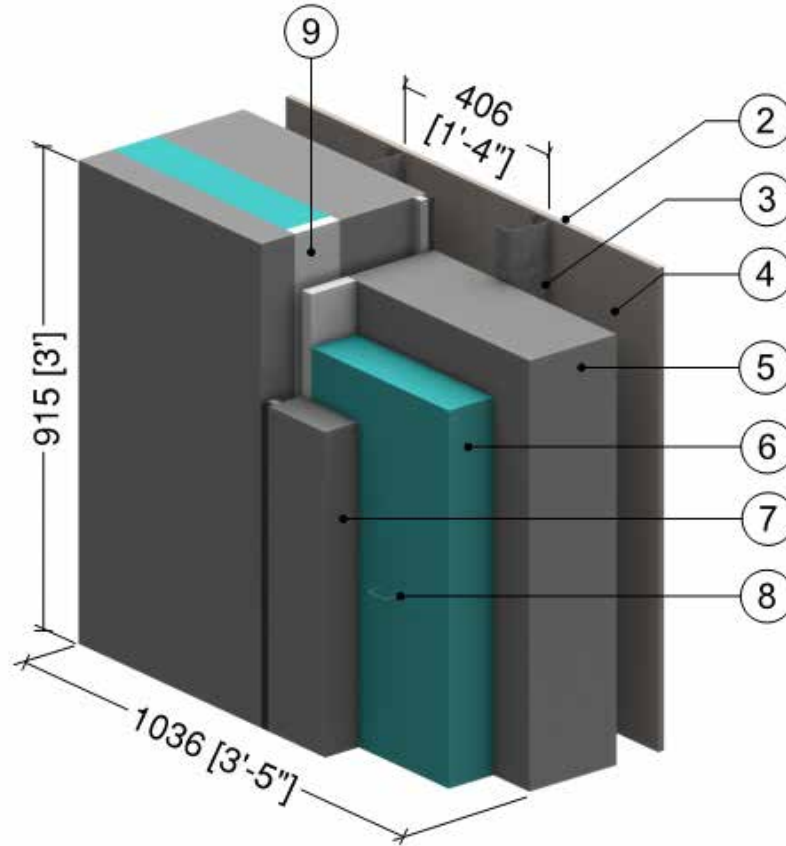


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	4 1/8" (130)	-	R-0.9 (RSI-0.16)	0.075 (1.2)	0.24 (1000)
5	Precast Sandwich Panel, Interior Concrete Panel	7 3/4" (197)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Precast Sandwich Panel Insulation	2" to 4" (51 to 102)	-	R-10 to R-20 (1.8 to 3.5 RSI)	1.8 (28)	0.29 (1220)
7	Precast Sandwich Panel, Exterior Concrete Panel	3" (76)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Precast Sandwich Panel, Structural Ties @ 24" (610) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Concrete Panel Joint	1" (25)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.9

Precast Sandwich Panel Wall Assembly with Tigerloc Thermally Broken Panel Joints – Clear Wall

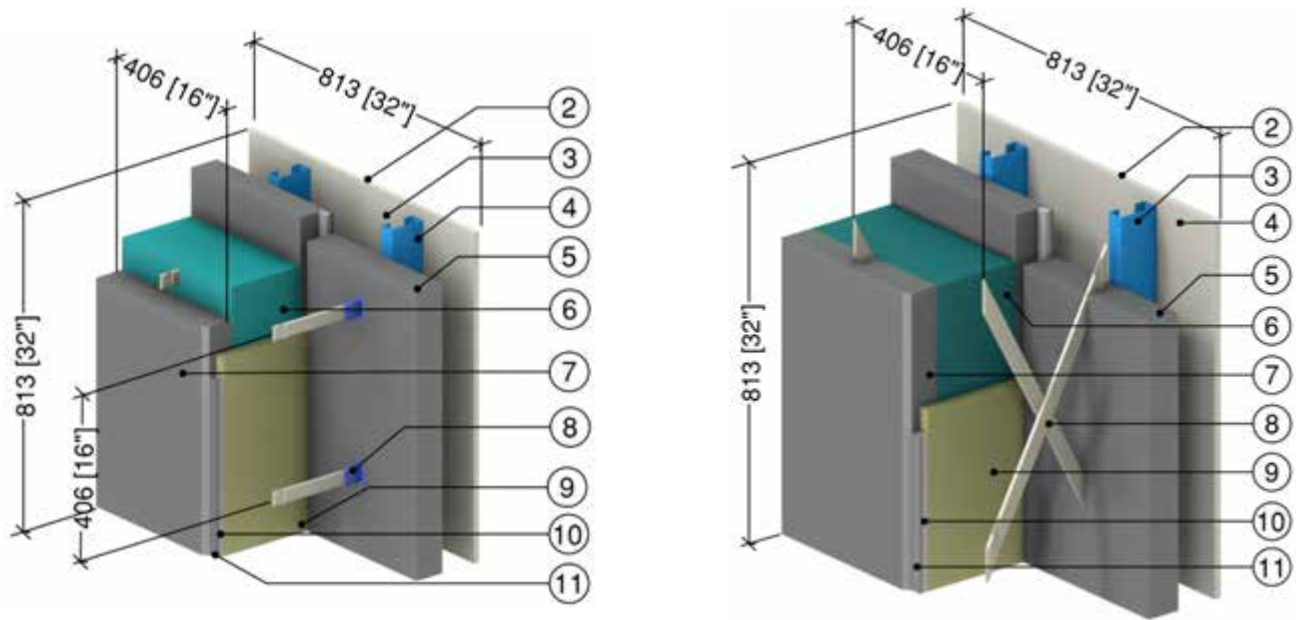


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	4 1/8" (130)	-	R-0.9 (RSI-0.16)	0.075 (1.2)	0.24 (1000)
5	Precast Sandwich Panel, Interior Concrete Panel	7 3/4" (197)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Precast Sandwich Panel Insulation	2" to 4" (51 to 102)	-	R-10 to R-20 (1.8 to 3.5 RSI)	1.8 (28)	0.29 (1220)
7	Precast Sandwich Panel, Exterior Concrete Panel	3" (76)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Precast Sandwich Panel, Structural Ties @ 24" (610) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Tigerloc, PVC Foam	1" (25)	0.42 (0.06)	-	-	-
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.10

Precast Concrete Sandwich Panel Wall Assembly with FRP Connectors – Clear Wall

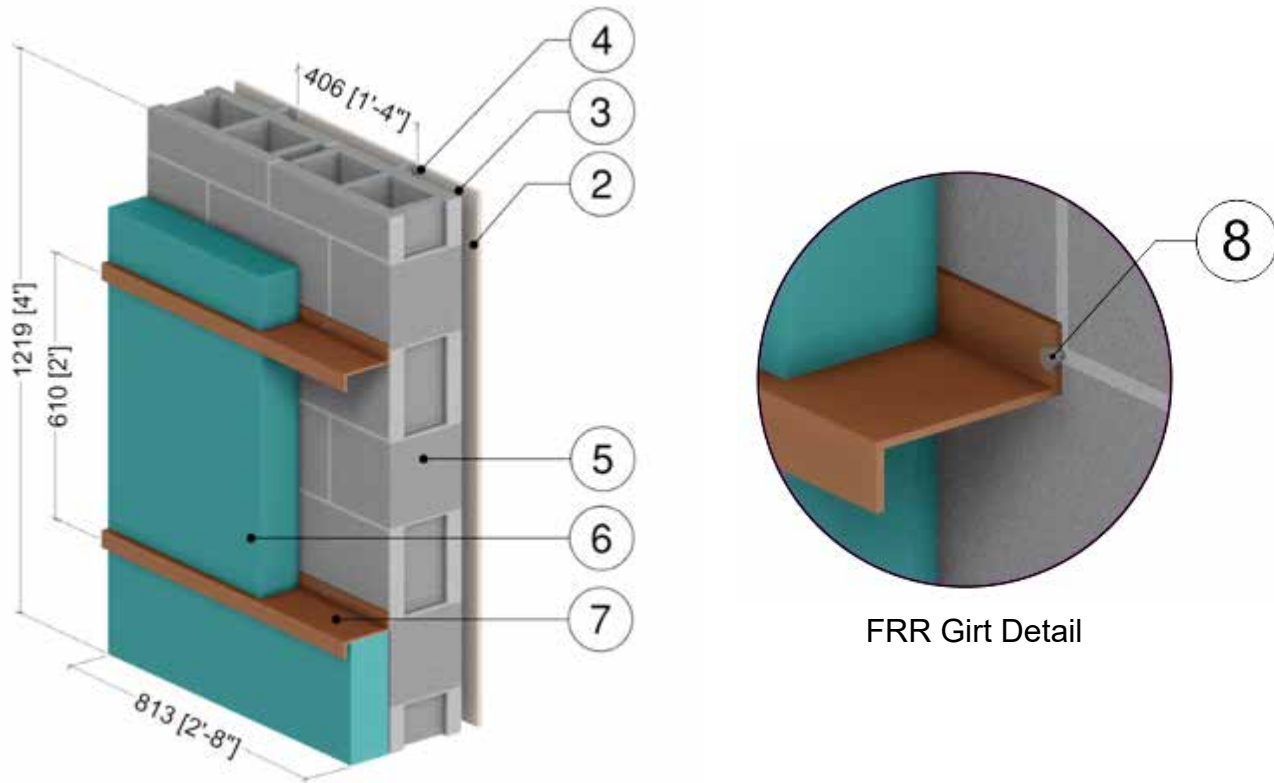


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (15)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Precast Sandwich Panel, Interior Concrete Panel	3" (76)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Precast Sandwich Panel Insulation	8" (203)	-	R-40 (7.04 RSI) to R-56 (9.86 RSI)	1.8 (28)	0.29 (1220)
7	Precast Sandwich Panel, Exterior Concrete Panel	3" (76)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Precast Sandwich Panel, FRP Connectors	-	6.93 (1)	-	-	-
9	Mineral Wool Insulation	-	0.238 (0.034)	-	4 (64)	0.20 (850)
10	Backer Rod	-	0.25 (0.036)	-	-	-
11	Sealant	-	1.73 (0.25)	-	-	-
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.11

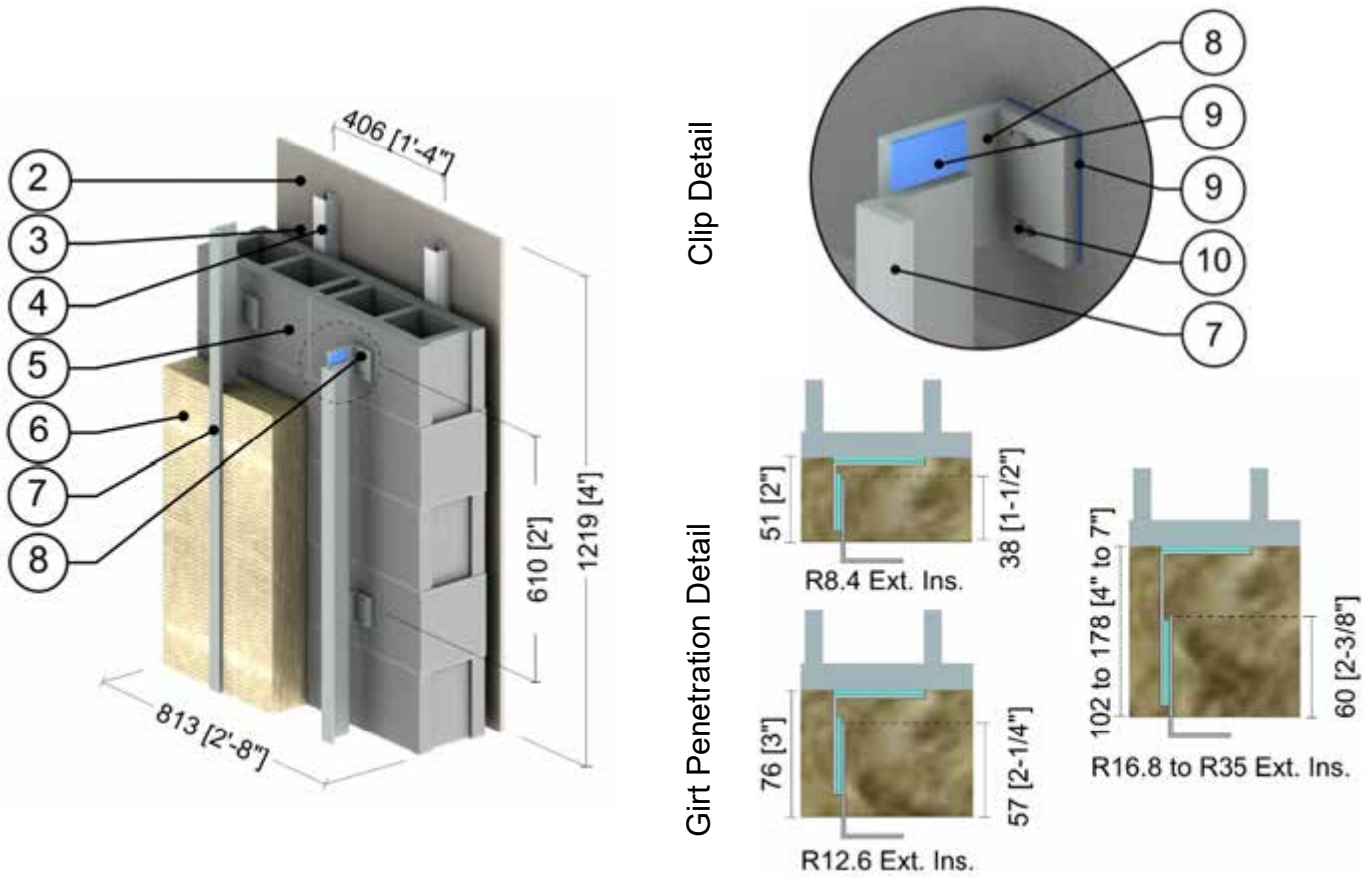
Exterior Insulated Concrete Block Wall with Armadillo FRR Horizontal Z-Girts Supporting Cladding – Clear Wall



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Standard Concrete Blocks	8" (203)	10.3 (1.5)	-	119 (1900)	0.19 (800)
6	Exterior Insulation	Varies	-	R-10.0 to R-25.0 (1.76 RSI to 4.40 RSI)	4 (64)	0.20 (850)
7	Armadillo FRR Girt	-	1.4 (0.2)	-	85 (5.3)	-
8	#12 Steel Fasteners (16" o.c.)	7/32" (5.5) ∅	347 (50)	-	489 (7830)	0.12 (500)
9	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.12 Exterior Insulated Concrete Block Wall with Vertical Clips Supporting Cladding – Clear Wall

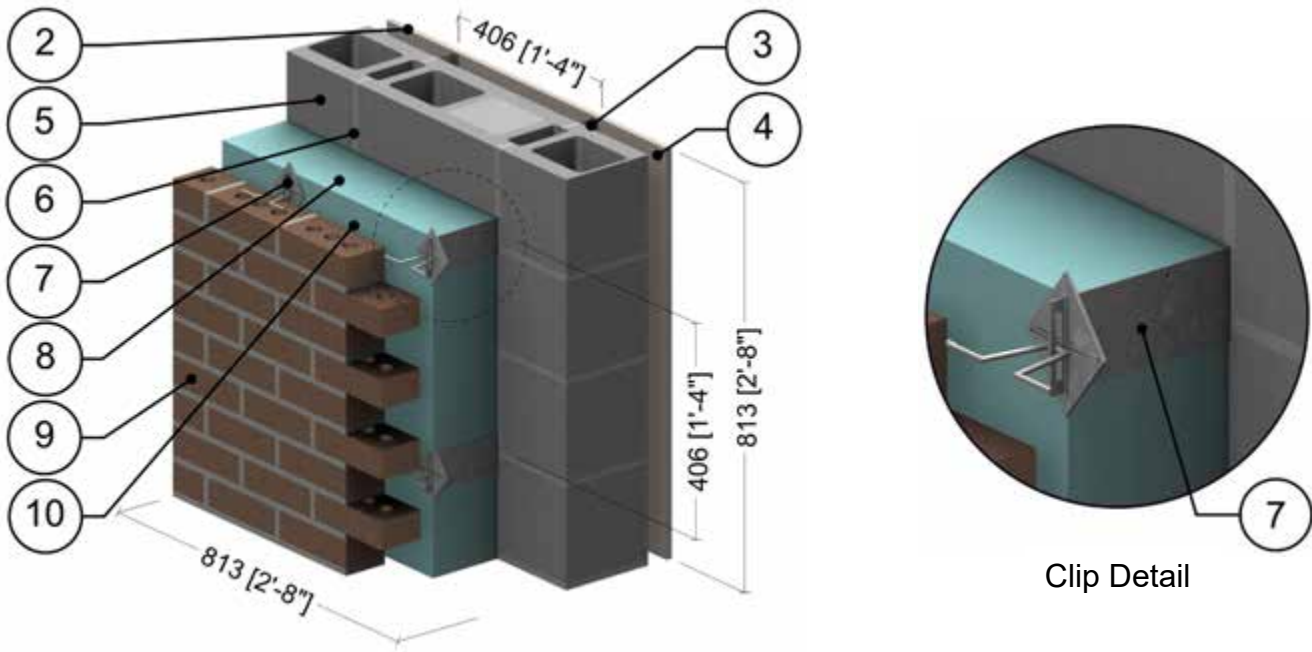


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Standard Concrete Blocks	8" (203)	10.3 (1.5)	-	119 (1900)	0.19 (800)
6	Exterior Mineral Wool Insulation	varies	0.24 (0.034)	R-4.2 to R-29.4 (0.74 to 5.18 RSI)	4 (64)	0.20 (850)
7	Vertical Aluminum L-girt	0.09" (2.2)	1339 (193)	-	169 (2700)	0.22 (900)
8	Aluminum Clip	0.09" (2.2)	1110 (160)	-	171 (2739)	0.21 (900)
9	HDPE Isolator	1/8" (3)	3.5 (0.5)	-	59 (950)	0.48 (2000)
10	#14 Stainless Steel Fasteners	1/4" (6) Ø	118 (17)	-	500 (8000)	0.12 (500)
11	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.13

Exterior Insulated Concrete Block Wall Assembly with Brick Ties Supporting Brick Veneer – Clear Wall



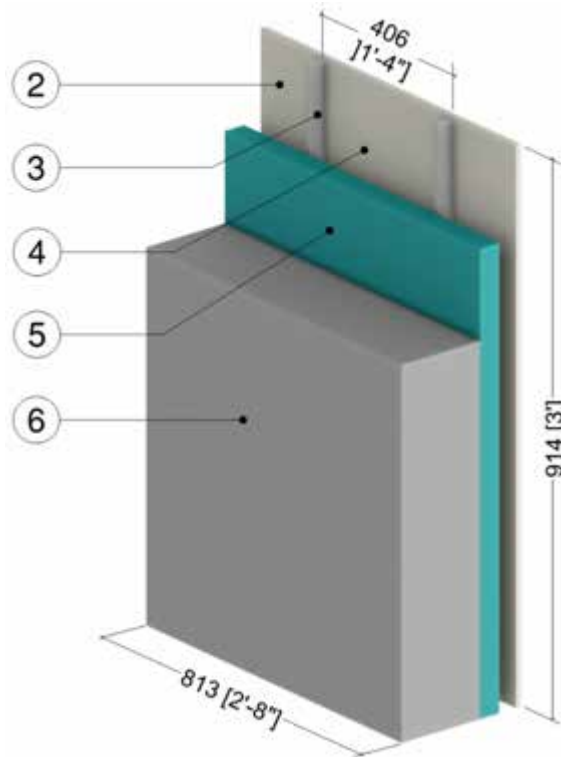
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" Steel Studs with Metal Tracks	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Standard Concrete Block	7 5/8" (190)	3.5 (0.5)	-	119 (1900)	0.19 (800)
6	Cement Mortar	-	3.5 (0.5)	-	113 (1800)	0.12 (500)
7	Masonry Ties @ 16" (406) o.c.	14 Gauge	347 (50)	-	489 (7830)	0.12 (500)
8	Exterior Insulation	Varies	-	R-5 to R-35 (0.88 RSI to 6.2 RSI)	1.8 (28)	0.29 (1220)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Air Gap	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 7.1.14

Interior Insulated Concrete Mass Wall with 1 5/8" Steel Stud (16" o.c.) Supporting Interior Finish Wall Assembly – Clear Wall

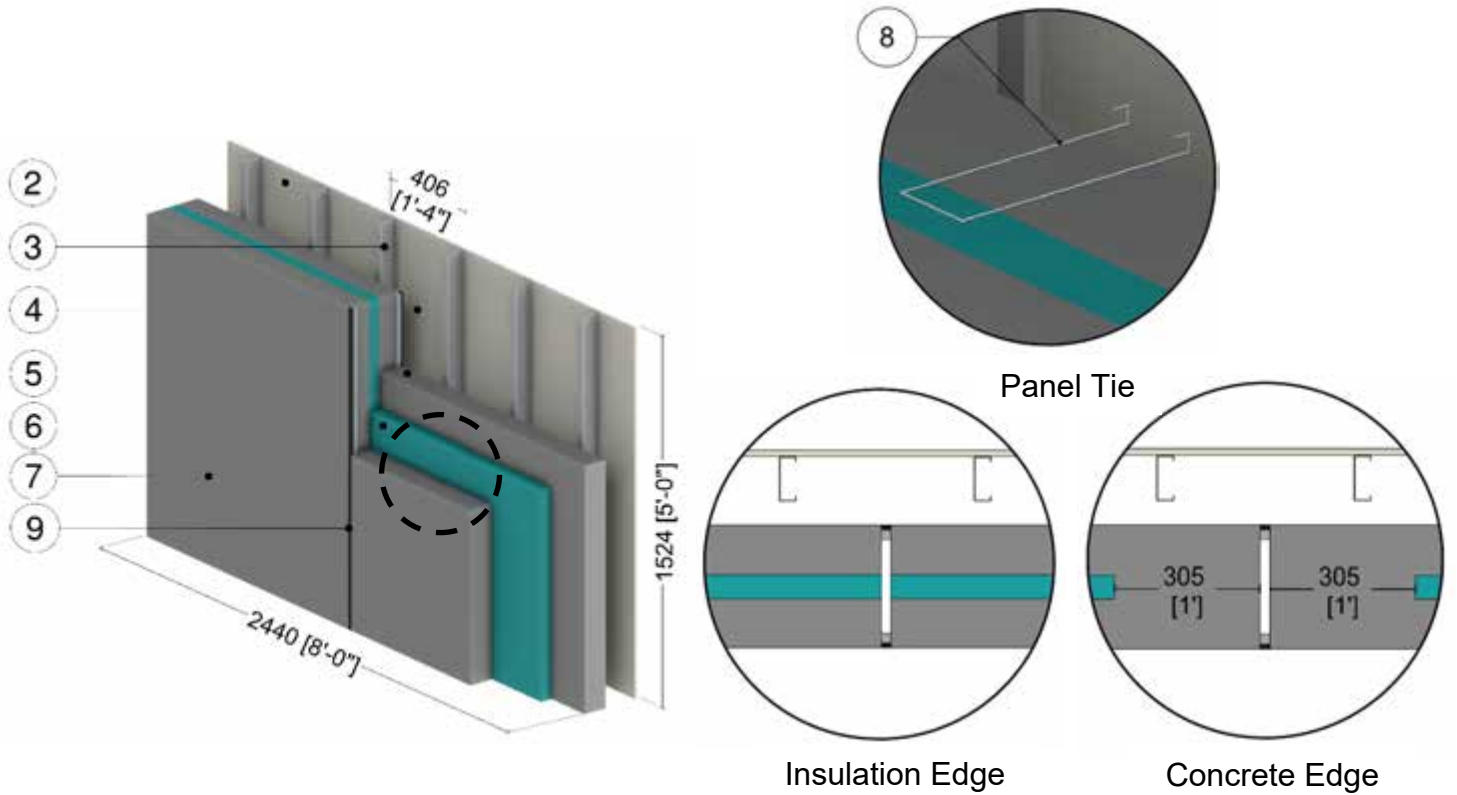


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Interior Insulation	Varies	-	R-10 to R-15 (1.76 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
6	Exterior Concrete Mass Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.15

Precast Sandwich Panel Wall Assembly with Steel Connectors and 3 5/8" x 1 5/8" Steel Stud (16" o.c.) – Clear Wall

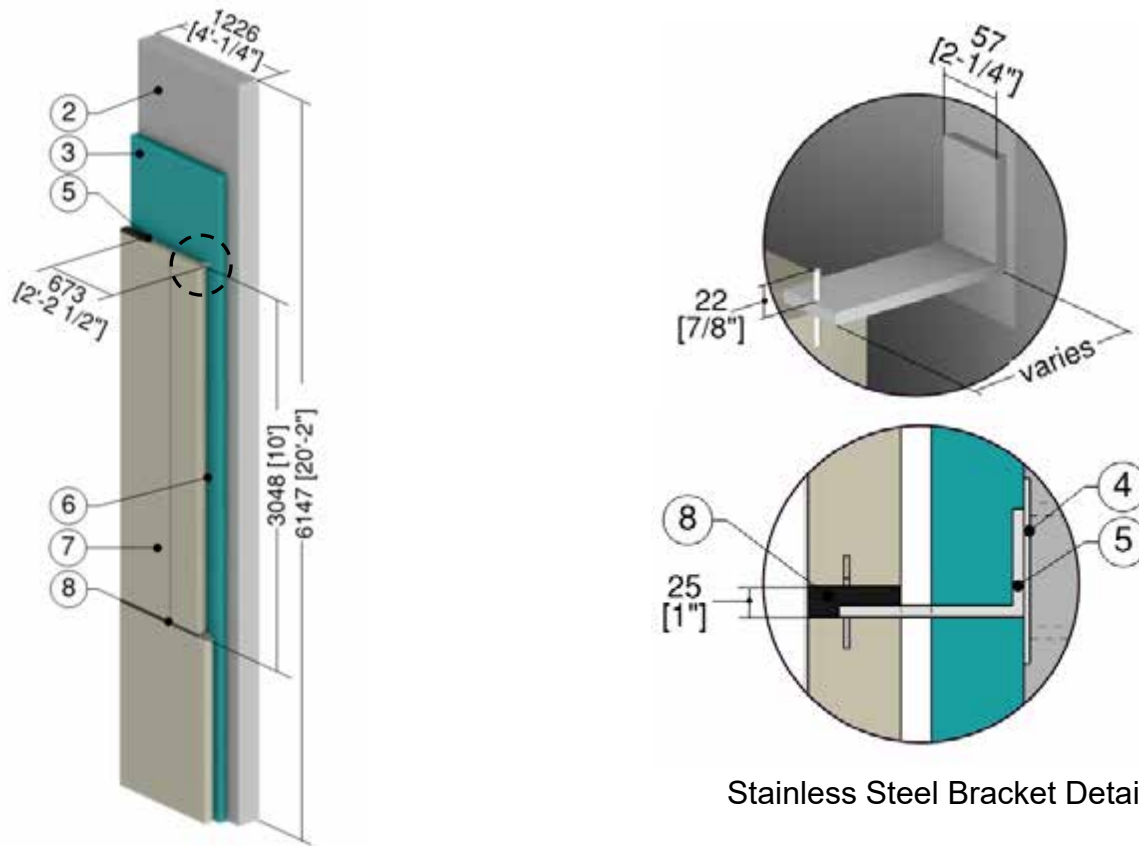


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	5 5/8" (143)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Precast Sandwich Panel, Interior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Precast Sandwich Panel, Insulation	Varies	-	R-10 to R-20 (1.76 RSI to 3.52 RSI)	1.8 (28)	0.29 (1220)
7	Precast Sandwich Panel, Exterior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Precast Sandwich Panel, Steel Connectors at various spacing	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Sealant	-	2.4 (3.5)	-	174 (2800)	0.17 (700)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.16

Exterior Insulated Concrete Mass Wall Assembly with 3/8 inch (9.5 mm) Stainless Steel Brackets Supporting 3" Stone Panels – Clear Wall



Stainless Steel Bracket Detail

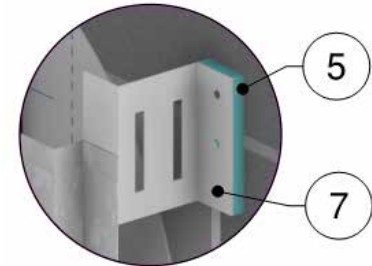
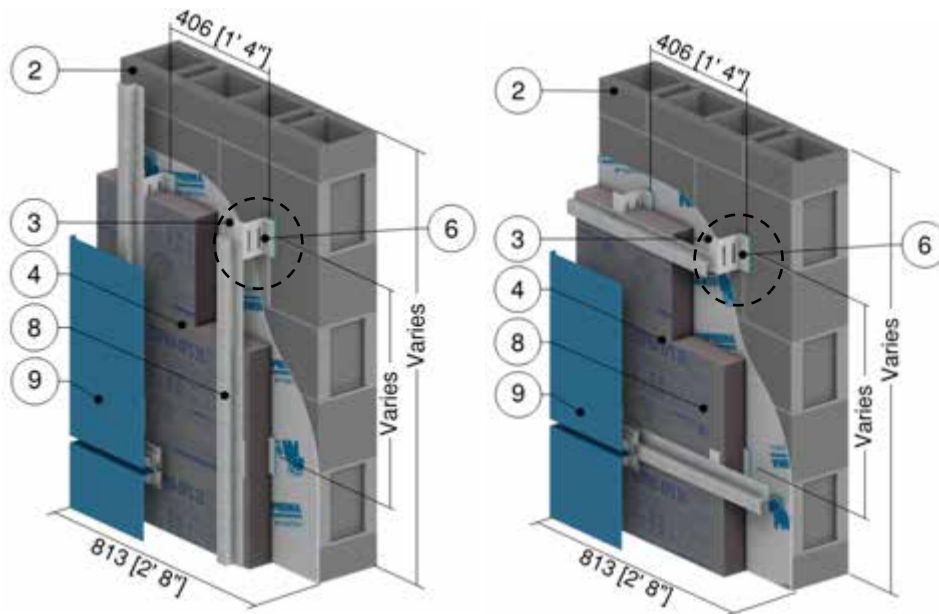
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Concrete Mass Wall	8 (203)	12.5 (1.80)	R-0.6 (0.11 RSI)	140 (2250)	0.20 (850)
3	Rigid Insulation	Varies	0.20 (0.029)	R-5.0 to R-25.0 (0.88 to 4.40 RSI)	1.8 (28)	0.29 (1220)
4	Bracket Mount	3/16 (4.8)	347 (50)	-	489 (7830)	0.12 (500)
5	Stainless Steel Bracket	3/8 (9.5)	118 (17)	-	503 (8060)	0.12 (500)
6	Vented Air Cavity	1.0 (25)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
7	Stone Panel	3 (76)	43 (6.2)	R-0.07 (0.01 RSI)	160 (2560)	0.21 (880)
8	Panel Sealant	-	1.7 (0.25)	-	-	-
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

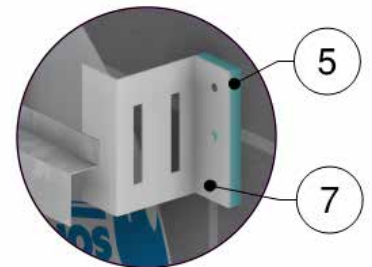


Detail 7.1.17

Exterior Insulated Concrete Block Wall Assembly with SOPREMA SOPRA-XPS 20 and ACS-S Thermal Clip (16" o.c. Horizontal) Supporting Metal Cladding - Clear Wall



Vertical Girt: ACS Clip Detail



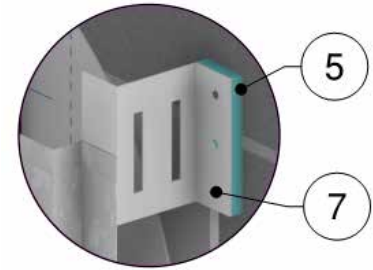
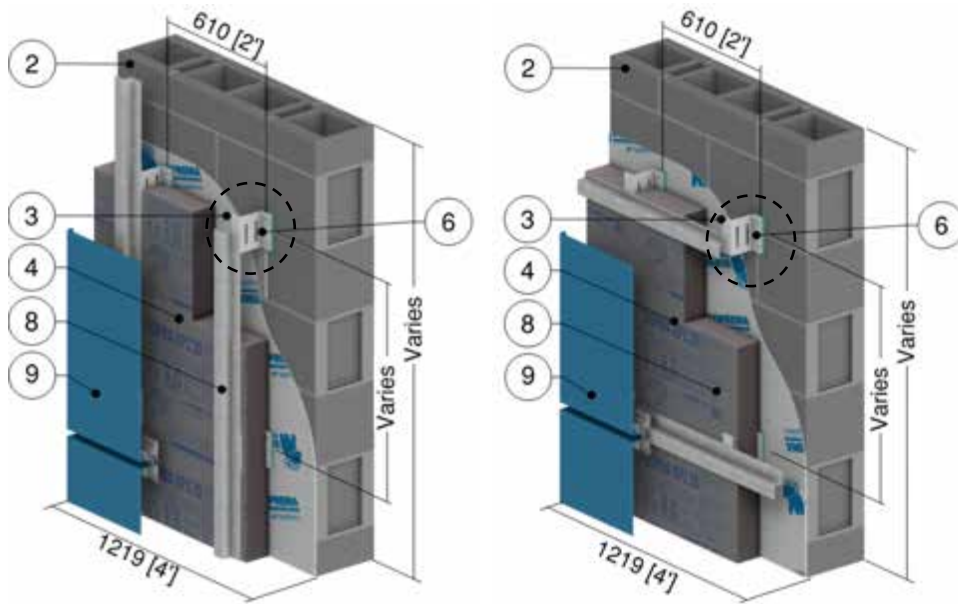
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Standard Concrete Blocks	8" (203)	10.4 (1.50)	-	119 (1900)	0.19 (800)
3	SOPREMA SOPRASEAL STICK 1100T membrane installed with SOPRASEAL STICK PRIMER	-	-	-	-	-
4	SOPRA-XPS 20 Exterior Insulation	Varies	0.20 (0.029)	R-15.0 to R-35.0 (2.64 RSI to 6.16 RSI)	2.5 (40)	0.29 (1220)
5	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
6	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
7	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
8	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

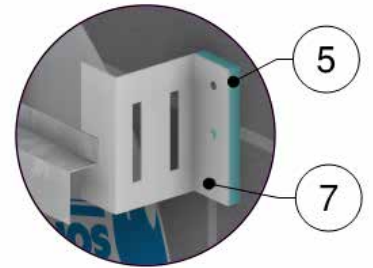
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.18

Exterior Insulated Concrete Block Wall Assembly with SOPREMA SOPRA-XPS 20 and ACS-S Thermal Clip (24" o.c. Horizontal) Supporting Metal Cladding - Clear Wall



Vertical Girt: ACS Clip Detail



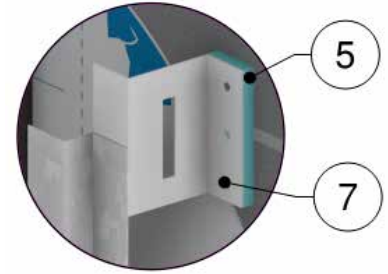
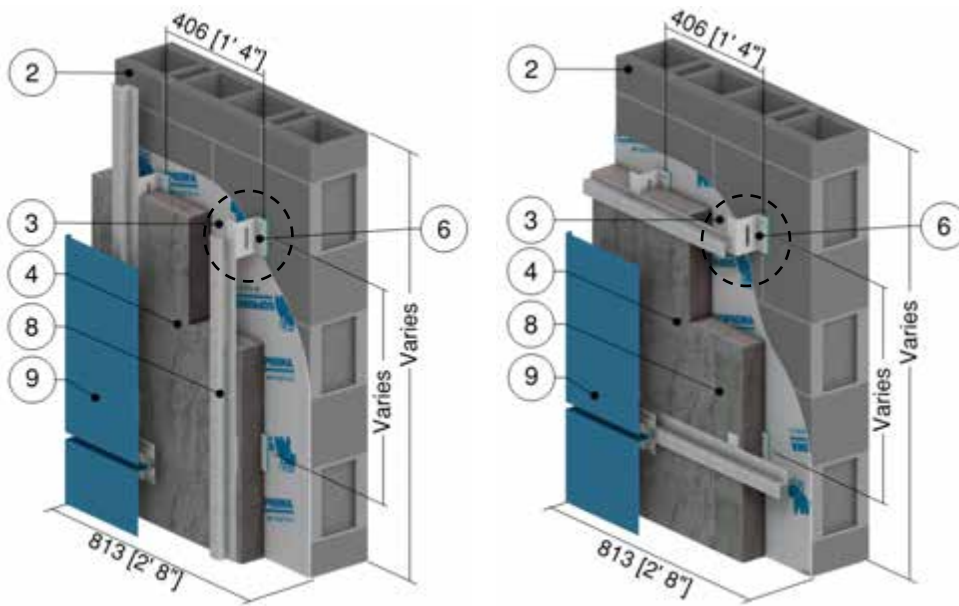
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Standard Concrete Blocks	8" (203)	10.4 (1.50)	-	119 (1900)	0.19 (800)
3	SOPREMA SOPRASEAL STICK 1100T membrane installed with SOPRASEAL STICK PRIMER	-	-	-	-	-
4	SOPRA-XPS 20 Exterior Insulation	Varies	0.20 (0.029)	R-15.0 to R-35.0 (2.64 RSI to 6.16 RSI)	2.5 (40)	0.29 (1220)
5	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
6	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
7	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
8	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

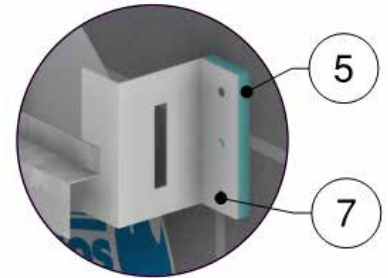
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.19

Exterior Insulated Concrete Block Wall Assembly with SOPREMA SOPRA-SPF 202 and ACS-S Thermal Clip (16" o.c. Horizontal) Supporting Metal Cladding - Clear Wall



Vertical Girt: ACS Clip Detail



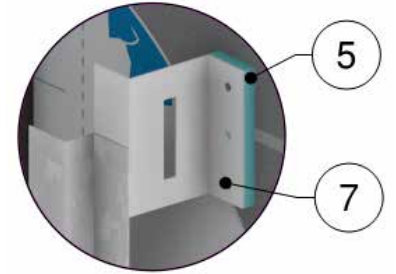
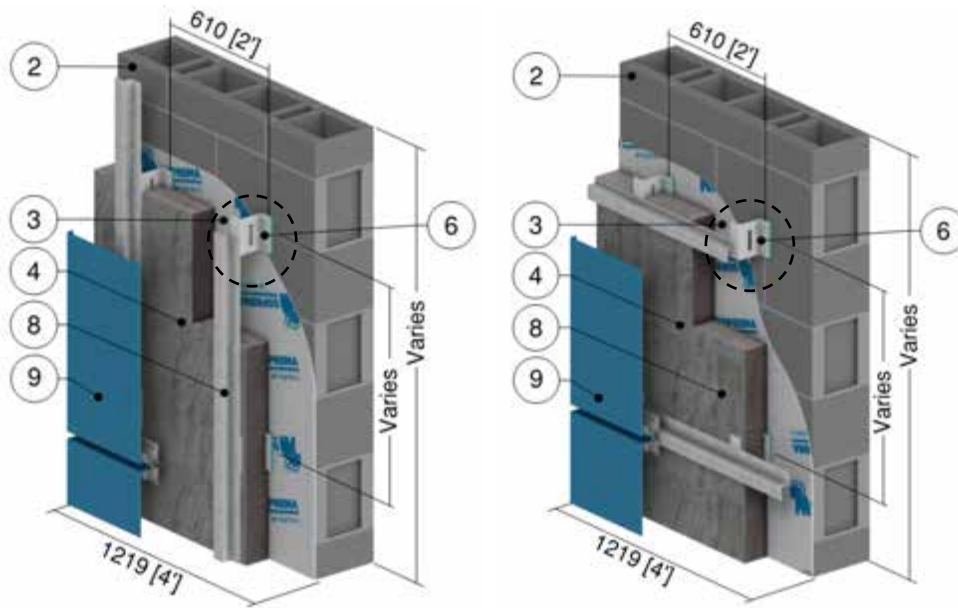
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Standard Concrete Blocks	8" (203)	10.4 (1.50)	-	119 (1900)	0.19 (800)
3	SOPREMA SOPRASEAL STICK 1100T membrane installed with SOPRASEAL STICK PRIMER	-	-	-	-	-
4	SOPRA-SPF 202 Exterior Insulation	Varies	0.16 (0.023)	R-6.2 to R-37.2 (1.09 RSI to 6.55 RSI)	1.8 (28)	0.29 (1220)
5	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
6	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
7	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
8	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

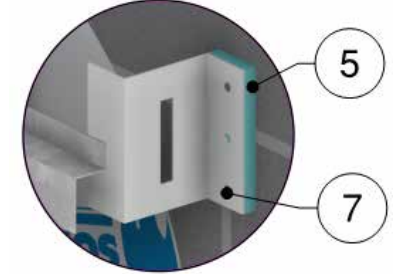
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.20

Exterior Insulated Concrete Block Wall Assembly with SOPREMA SOPRA-SPF 202 and ACS-S Thermal Clip (24" o.c. Horizontal) Supporting Metal Cladding - Clear Wall



Vertical Girt: ACS Clip Detail



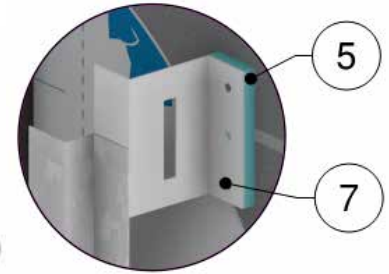
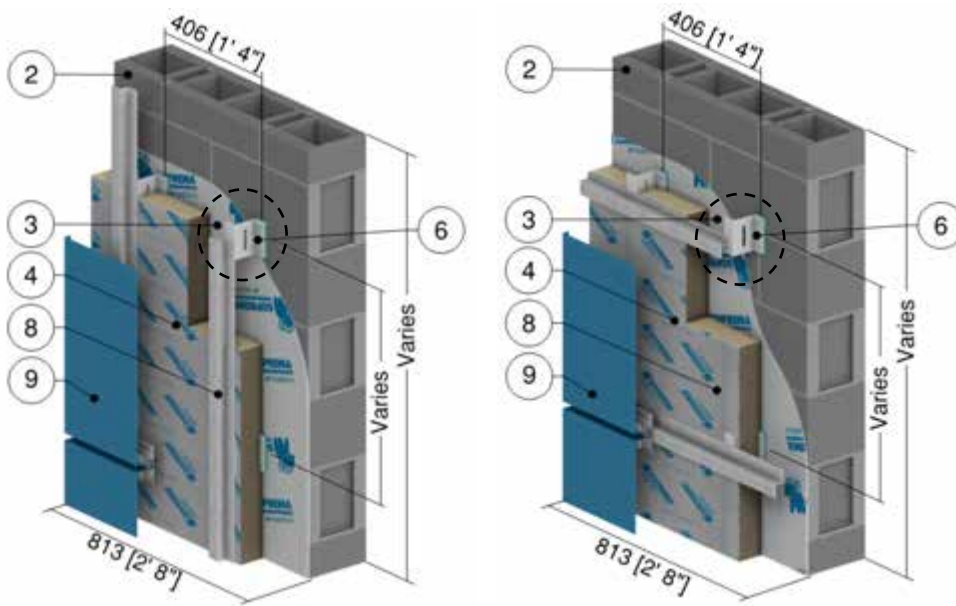
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Standard Concrete Blocks	8" (203)	10.4 (1.50)	-	119 (1900)	0.19 (800)
3	SOPREMA SOPRASEAL STICK 1100T membrane installed with SOPRASEAL STICK PRIMER	-	-	-	-	-
4	SOPRA-SPF 202 Exterior Insulation	Varies	0.16 (0.023)	R-6.2 to R-37.2 (1.09 RSI to 6.55 RSI)	1.8 (28)	0.29 (1220)
5	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
6	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
7	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
8	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

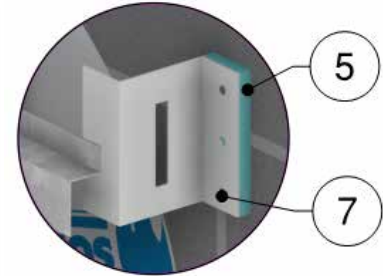
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.21

Exterior Insulated Concrete Block Wall Assembly with SOPREMA SOPRA-ISO V ALU and ACS-S Thermal Clip (16" o.c. Horizontal) Supporting Metal Cladding - Clear Wall



Vertical Girt: ACS Clip Detail



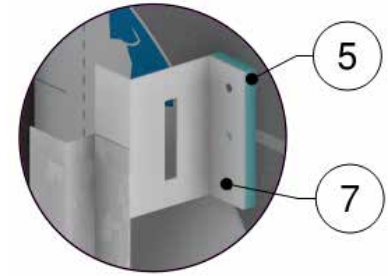
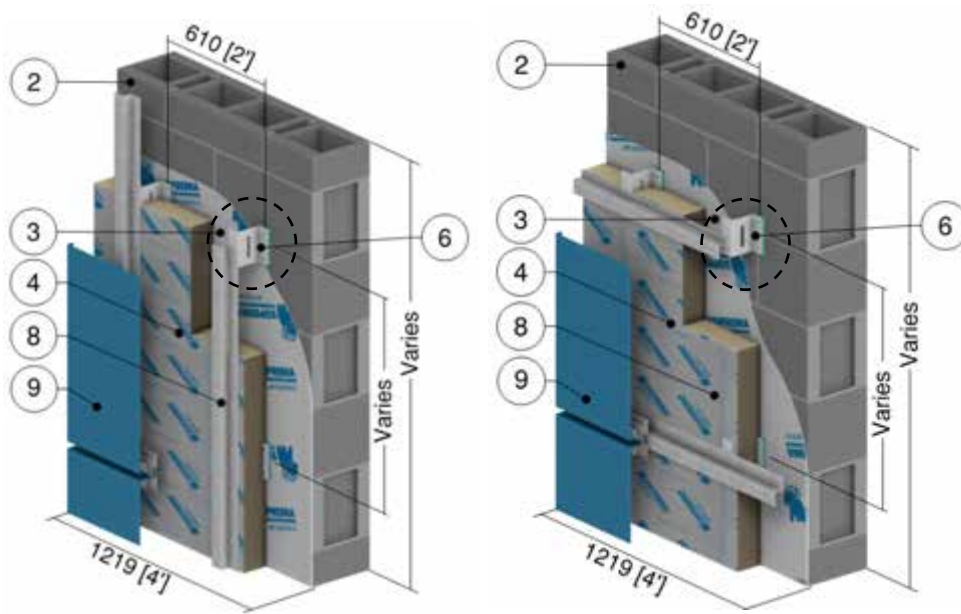
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Standard Concrete Blocks	8" (203)	10.4 (1.50)	-	119 (1900)	0.19 (800)
3	SOPREMA SOPRASEAL STICK 1100T membrane installed with SOPRASEAL STICK PRIMER	-	-	-	-	-
4	SOPRA-ISO V ALU Exterior Insulation	Varies	0.15 (0.022)	R-6.5 to R-39.0 (1.14 RSI to 6.87 RSI)	1.9 (30)	0.36 (1500)
5	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
6	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
7	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
8	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

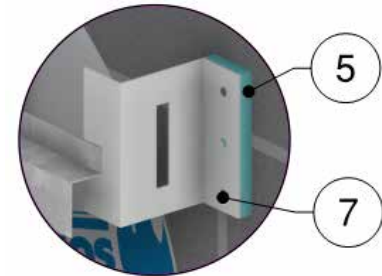
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.22

Exterior Insulated Concrete Block Wall Assembly with SOPREMA SOPRA-ISO V ALU and ACS-S Thermal Clip (24" o.c. Horizontal) Supporting Metal Cladding - Clear Wall



Vertical Girt: ACS Clip Detail



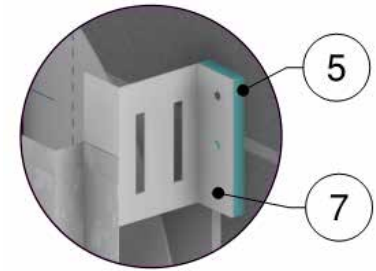
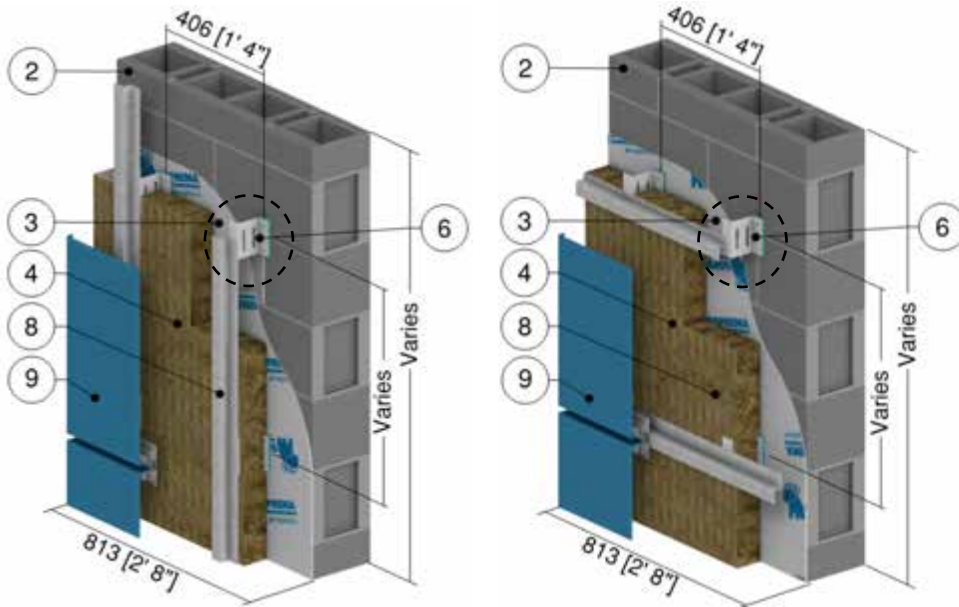
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Standard Concrete Blocks	8" (203)	10.4 (1.50)	-	119 (1900)	0.19 (800)
3	SOPREMA SOPRASEAL STICK 1100T membrane installed with SOPRASEAL STICK PRIMER	-	-	-	-	-
4	SOPRA-ISO V ALU Exterior Insulation	Varies	0.15 (0.022)	R-6.5 to R-39.0 (1.14 RSI to 6.87 RSI)	1.9 (30)	0.36 (1500)
5	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
6	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
7	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
8	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

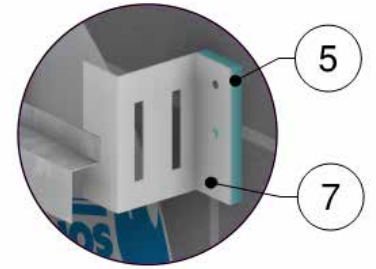
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.23

Exterior Insulated Concrete Block Wall Assembly with Mineral Wool and ACS-S Thermal Clip (16" o.c. Horizontal) Supporting Metal Cladding - Clear Wall



Vertical Girt: ACS Clip Detail



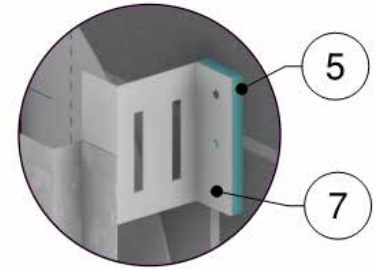
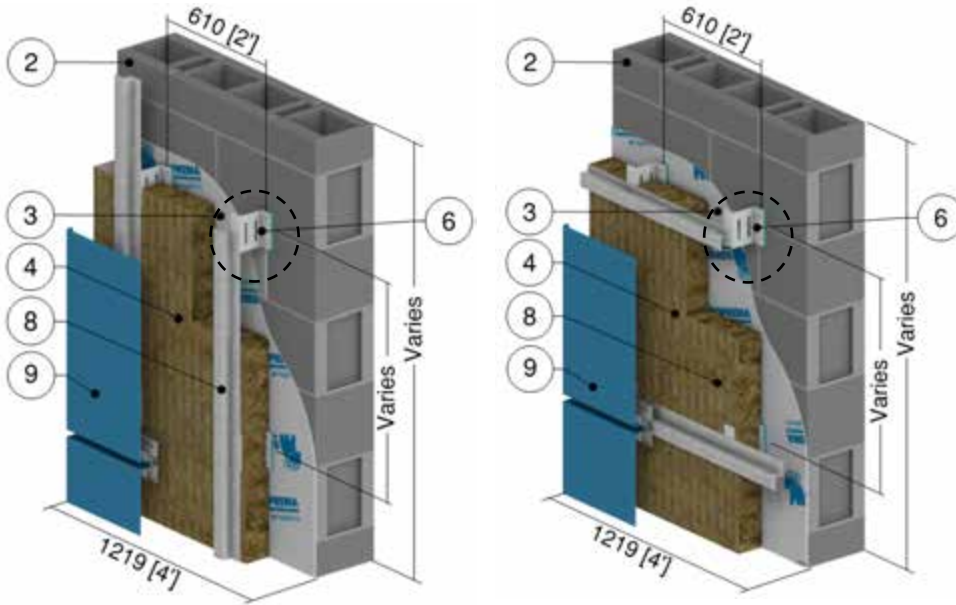
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Standard Concrete Blocks	8" (203)	10.4 (1.50)	-	119 (1900)	0.19 (800)
3	SOPREMA SOPRASEAL STICK 1100T membrane installed with SOPRASEAL STICK PRIMER	-	-	-	-	-
4	Exterior Mineral Wool Insulation	Varies	0.23 (0.034)	R-12.9 to R-34.4 (2.27 RSI to 6.06 RSI)	1.8 (28)	0.29 (1220)
5	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
6	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
7	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
8	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

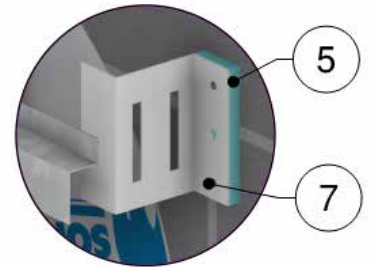
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.24

Exterior Insulated Concrete Block Wall Assembly with Mineral Wool and ACS-S Thermal Clip (24" o.c. Horizontal) Supporting Metal Cladding - Clear Wall



Vertical Girt: ACS Clip Detail



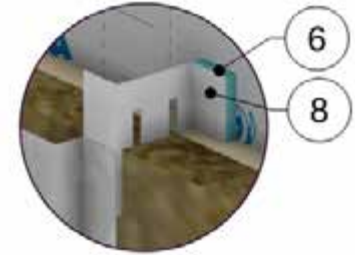
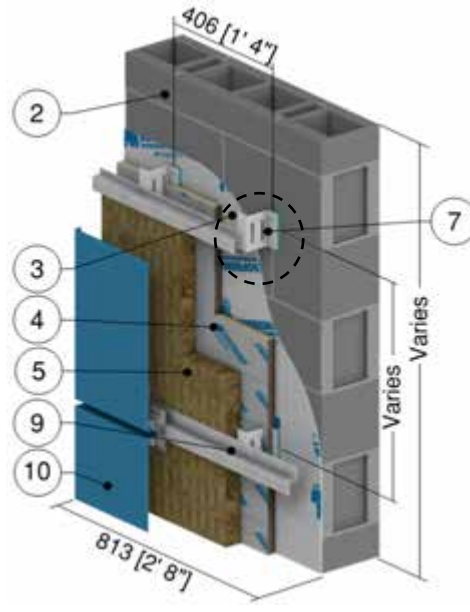
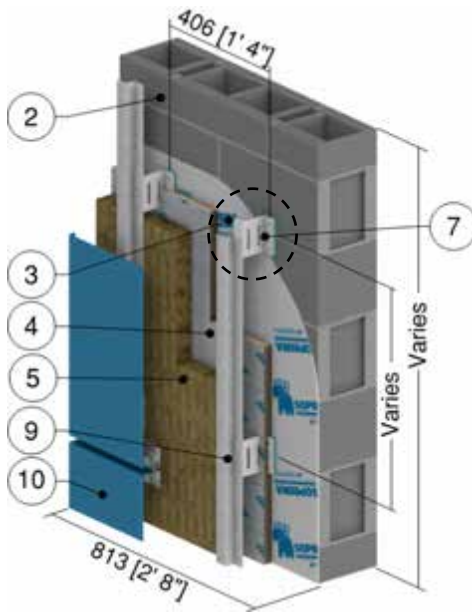
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Standard Concrete Blocks	8" (203)	10.4 (1.50)	-	119 (1900)	0.19 (800)
3	SOPREMA SOPRASEAL STICK 1100T membrane installed with SOPRASEAL STICK PRIMER	-	-	-	-	-
4	Exterior Mineral Wool Insulation	Varies	0.23 (0.034)	R-12.9 to R-34.4 (2.27 RSI to 6.06 RSI)	1.8 (28)	0.29 (1220)
5	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
6	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
7	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
8	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

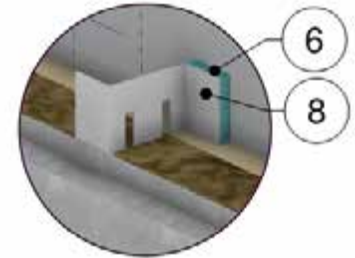
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.25

Exterior Insulated Concrete Block Wall Assembly with Protected SOPREMA SOPRA-ISO V ALU and ACS-S Thermal Clip (16" o.c. Horizontal) Supporting Metal Cladding - Clear Wall



Vertical Girt: ACS Clip Detail



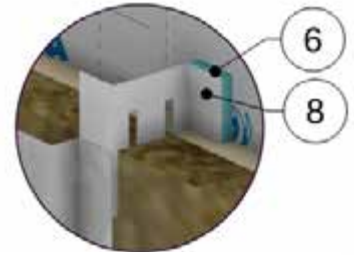
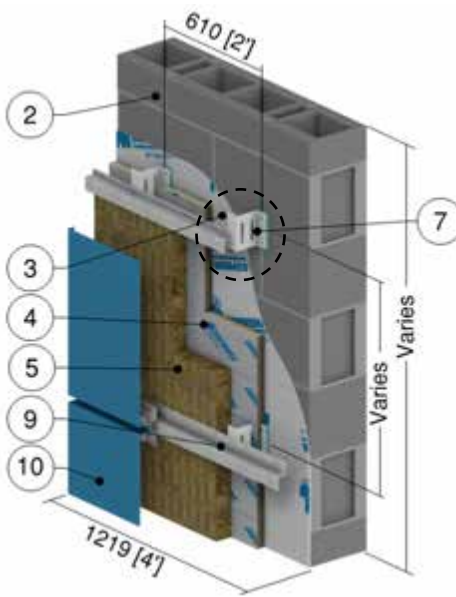
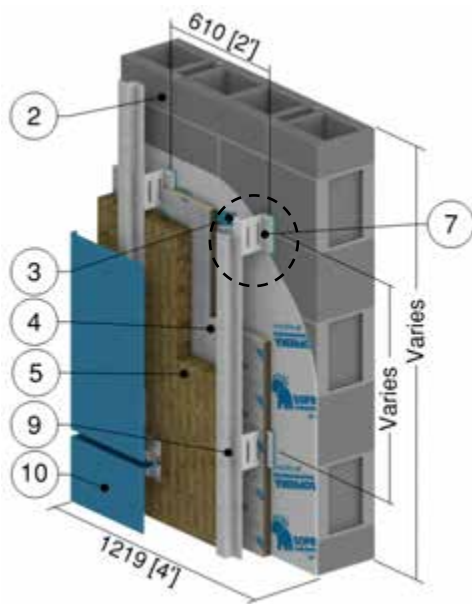
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Standard Concrete Blocks	8" (203)	10.4 (1.50)	-	119 (1900)	0.19 (800)
3	SOPREMA SOPRASEAL STICK 1100T membrane installed with SOPRASEAL STICK PRIMER	-	-	-	-	-
4	SOPRA-ISO V ALU Exterior Insulation	Varies	0.15 (0.022)	R-6.5 to R-32.5 (1.14 RSI to 5.72 RSI)	1.9 (30)	0.36 (1500)
5	Exterior Mineral Wool Insulation	2" (50)	0.23 (0.034)	R-8.6 (1.51 RSI)	1.8 (28)	0.29 (1220)
6	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
7	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
8	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
9	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
10	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

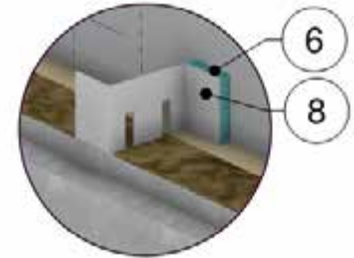
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.26

Exterior Insulated Concrete Block Wall Assembly with Protected SOPREMA SOPRA-ISO V ALU and ACS-S Thermal Clip (24" o.c. Horizontal) Supporting Metal Cladding - Clear Wall



Vertical Girt: ACS Clip Detail



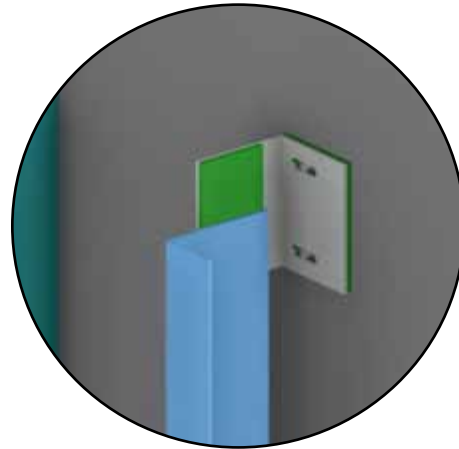
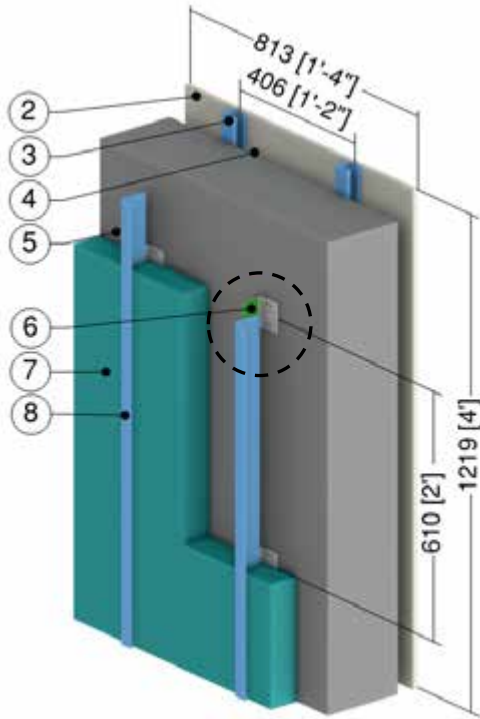
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Standard Concrete Blocks	8" (203)	10.4 (1.50)	-	119 (1900)	0.19 (800)
3	SOPREMA SOPRASEAL STICK 1100T membrane installed with SOPRASEAL STICK PRIMER	-	-	-	-	-
4	SOPRA-ISO V ALU Exterior Insulation	Varies	0.15 (0.022)	R-6.5 to R-32.5 (1.14 RSI to 5.72 RSI)	1.9 (30)	0.36 (1500)
5	Exterior Mineral Wool Insulation	2" (50)	0.23 (0.034)	R-8.6 (1.51 RSI)	1.8 (28)	0.29 (1220)
6	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
7	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
8	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
9	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
10	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.1.27

Exterior Insulated Concrete Mass Wall with 1 5/8" x 1 5/8" Steel Stud (16" o.c.) and Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding – Clear Wall



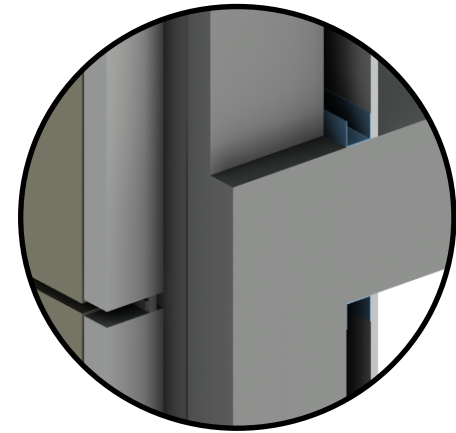
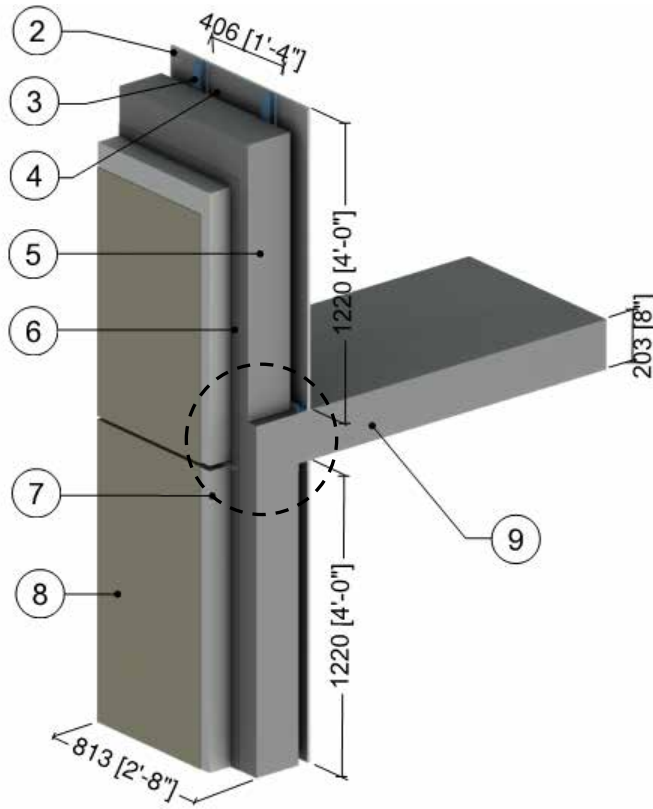
Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Concrete Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Thermally Isolated Aluminum Bracket	0.09" (2.2)	1109 (160)	-	171 (2739)	0.21 (900)
7	Exterior Insulation	Varies	-	R-10 to R-25 (1.76 RSI to 4.40 RSI)	1.8 (28)	0.29 (1220)
8	Vertical Aluminum L-girt	0.09" (2.2)	1109 (160)	-	171 (2739)	0.21 (900)
9	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.2.1

Exterior Insulated Concrete Drained EIFS Wall Assembly – Intermediate Floor Intersection



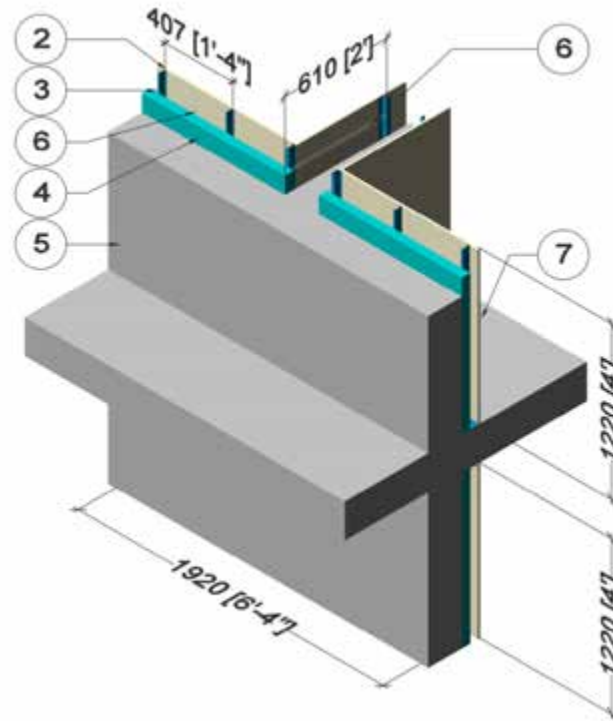
1" (25 mm)
Drained EIFS
at Slab Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Concrete Wall	8" (203)	12 (1.8)	-	140 (2250)	0.20 (850)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	4" (100)	0.27 (0.039)	R-15 (2.64 RSI)	1 (16)	0.35 (1470)
8	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.2.2

Interior Insulated Concrete Mass Wall with 1 5/8" Steel Stud (16"o.c.) Supporting Interior Finish – Non-Insulated Interior Wall and Non-insulated Intermediate Floor Intersection

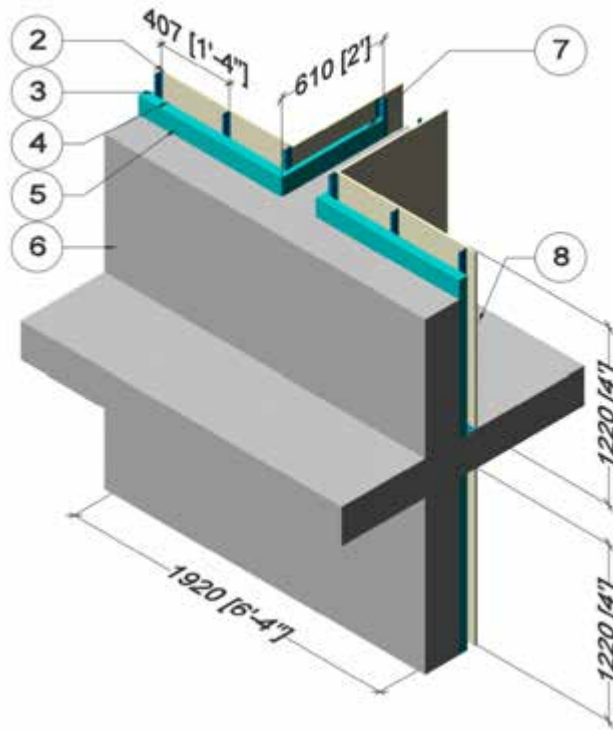


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" Steel Studs with Metal Tracks	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Interior Insulation	2" (51)	0.2 (0.03)	R-11 (1.9 RSI)	1.8 (28)	0.29 (1220)
5	Exterior Concrete Mass Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Air in Stud Cavity and Interior Partition	Varies	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
7	Concrete Slab, Floor & Balcony	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.2.3

Interior Insulated Concrete Mass Wall with 1 5/8" Steel Stud (16" o.c.) Supporting Interior Finish – Insulated Interior Wall and Non-insulated Intermediate Floor Intersection

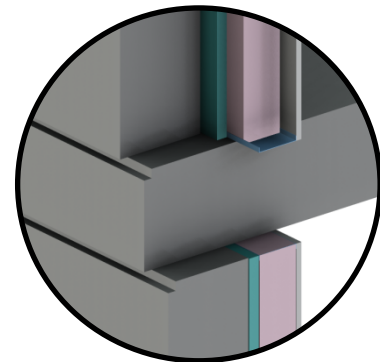
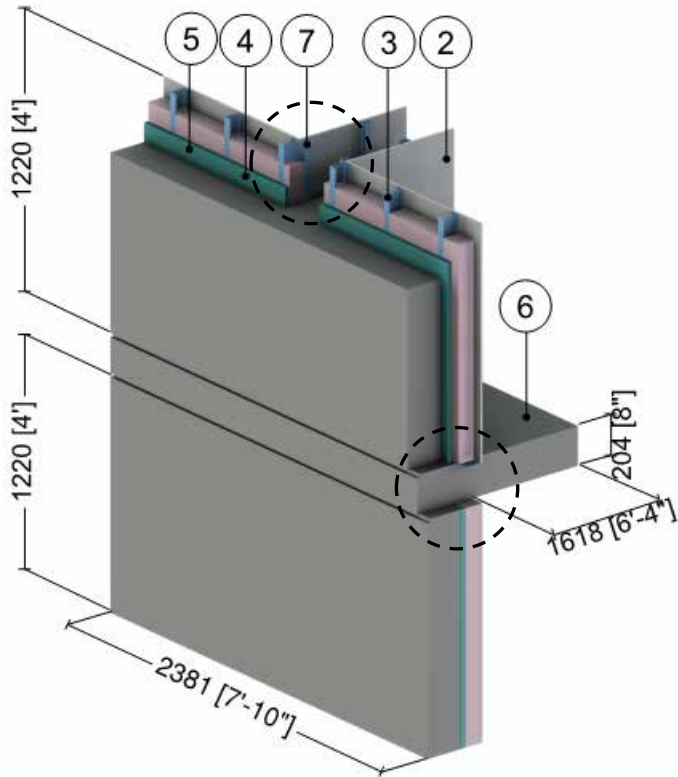


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" Steel Studs with Top and Bottom Tracks	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Interior Insulation	2" (51)	0.2 (0.03)	R-11 (1.9 RSI)	1.8 (28)	0.29 (1220)
6	Exterior Concrete Mass Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Interior Partition Insulation	1" (25)	-	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
8	Concrete Slab, Floor & Balcony	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

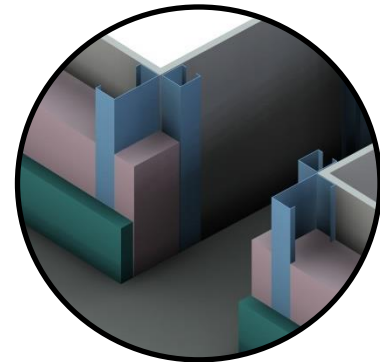
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.2.4

Interior Insulated Concrete Mass Wall with 3 5/8" x 1 5/8" Steel Studs (16" o.c.) Supporting Interior Finish – Interior Insulated Wall and Non-Insulated Partition Wall Intersection



Slab Edge Detail



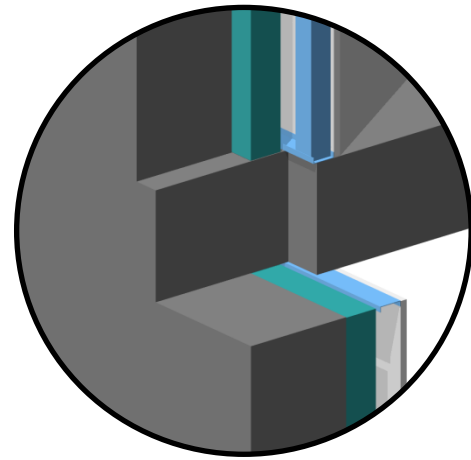
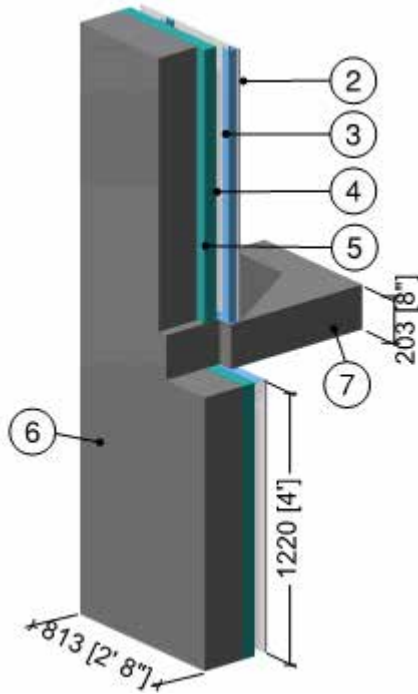
Partition Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.29 (0.042)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
5	Continuous Insulation	Varies	-	R-10 to R-15 (1.76 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
6	Concrete Wall/Floor Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	1 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.2.5

Interior Insulated Concrete Mass Wall with 1 5/8" x 1 5/8" Steel Studs (16" o.c.) Supporting Interior Finish – Continuous Concrete Intermediate Floor Intersection



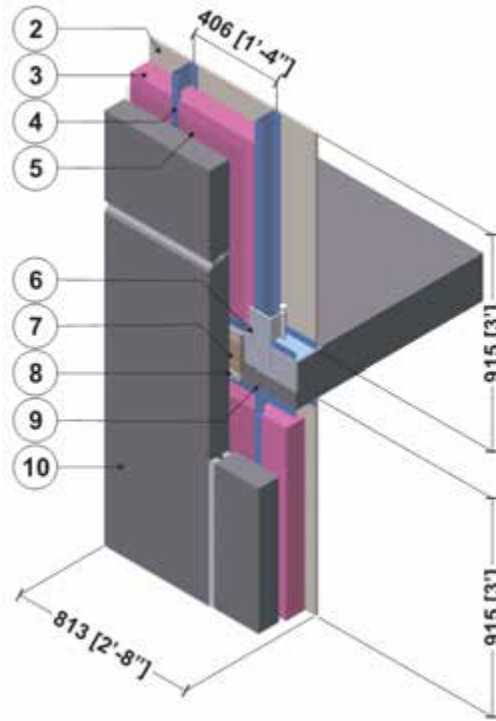
Continuous Concrete Slab Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Continuous Insulation	2 1/2" (64)	0.2 (0.029)	R-12.5 (2.20 RSI)	1.8 (28)	0.29 (1220)
6	Concrete Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.2.6

Precast Wall Assembly with 3 5/8" x 1 5/8" Steel Stud (16" o.c.) and Insulation in Stud Cavity – Intermediate Floor Intersection

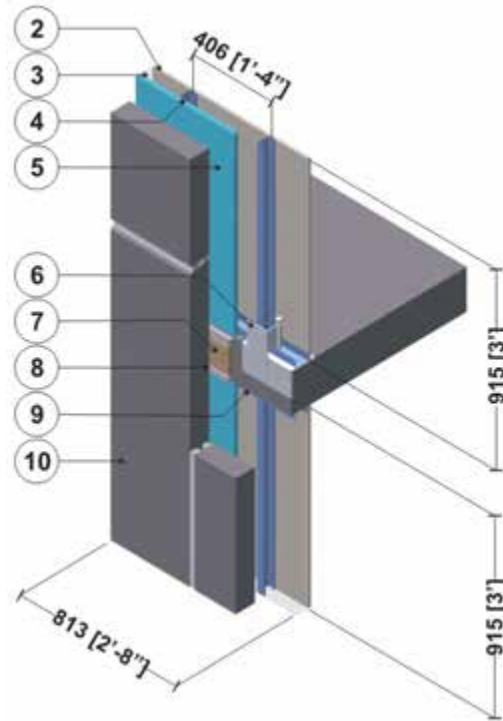


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (92)	0.29 (0.042)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Air in Stud Cavity	2" (51)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
6	Gravity and Slot Anchors at Slab	-	347 (50)	-	489 (7830)	0.12 (500)
7	Semi Rigid Insulation	1" (25)	0.28 (0.04)	R-3.6 (0.64 RSI)	4.5 (72)	0.17 (710)
8	Silicone Sealant	-	2.4 (0.35)	-	-	-
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Precast Wall Panel	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.2.7

Precast Wall Assembly with 3 5/8" x 1 5/8" Steel Stud (16" o.c.) and Rigid Insulation Outboard of Studs – Intermediate Floor Intersection

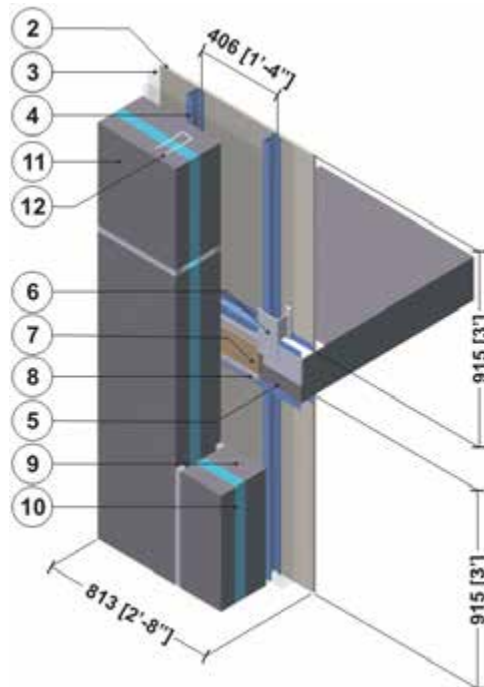


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Rigid Insulation	2" (51)	-	R-10 (1.8 RSI)	1.8 (28)	0.29 (1220)
6	Gravity and Slot Anchors at Slab	-	347 (50)	-	489 (7830)	0.12 (500)
7	Semi Rigid Insulation	1" (25)	0.28 (0.04)	R-3.6 (0.64 RSI)	4.5 (72)	0.17 (710)
8	Silicone Sealant	-	2.4 (0.35)	-	-	-
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Precast Wall Panel	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.2.8

Precast Sandwich Panel Wall Assembly with 3 5/8" x 1 5/8" Steel Stud (16" o.c.) – Intermediate Floor Intersection

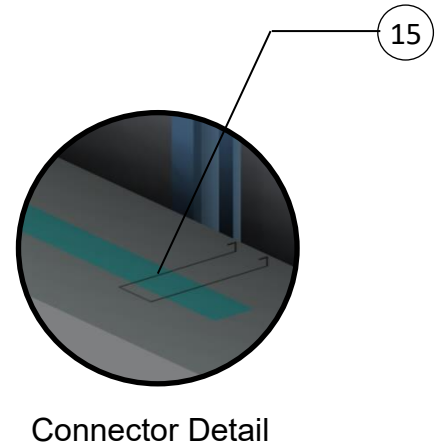
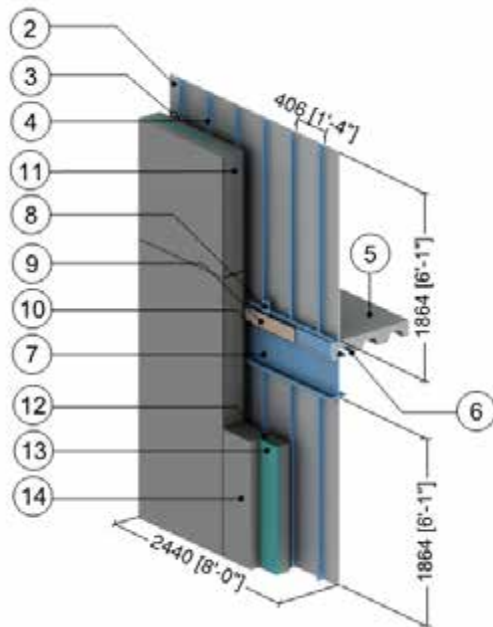


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	5 5/8" (143)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Gravity and Slot Anchors at Slab	-	347 (50)	-	489 (7830)	0.12 (500)
7	Semi Rigid Insulation	1" (25)	0.28 (0.04)	R-3.6 (0.64 RSI)	4.5 (72)	0.17 (710)
8	Silicone Sealant	-	2.4 (0.35)	-	-	-
9	Precast Sandwich Panel, Interior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Precast Sandwich Panel, Insulation	2" (51)	-	R-10 (1.8 RSI)	1.8 (28)	0.29 (1220)
11	Precast Sandwich Panel, Exterior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Precast Sandwich Panel, Structural Ties @ 24" (610) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.2.9

Precast Sandwich Panel Wall Assembly with Concrete at Panel Perimeter and Steel Connectors at 24" o.c. – Intermediate Floor Intersection



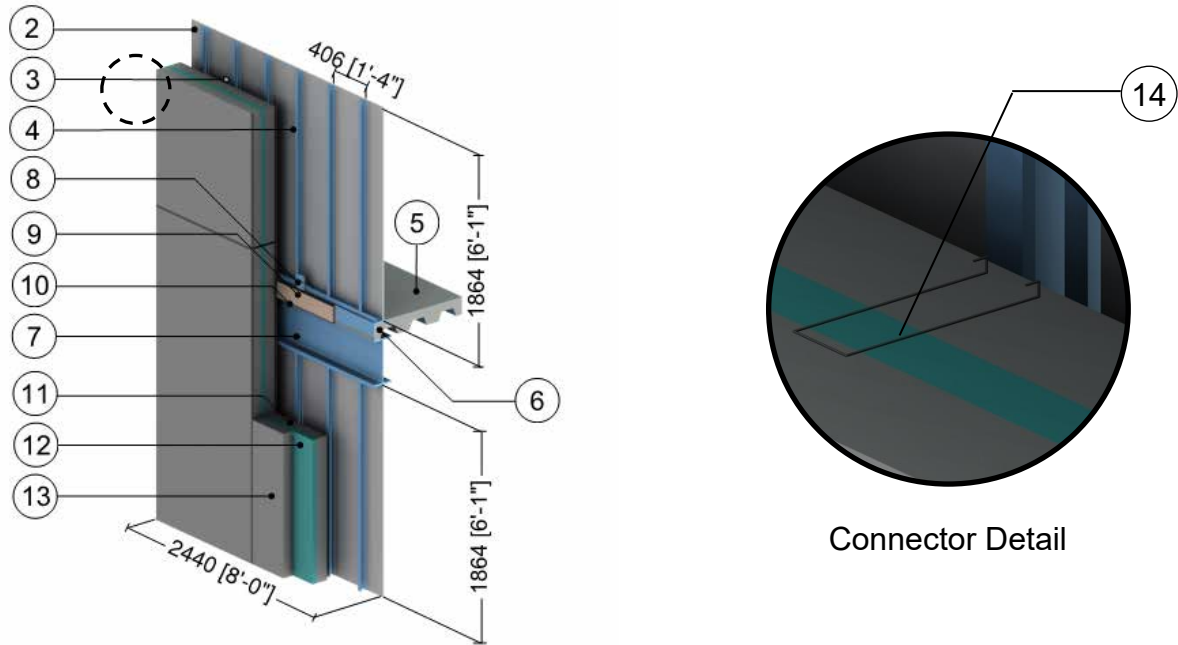
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film (bottom) ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	5 5/8" (143)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Concrete Topping	6" (152)	6.3 (0.9)	-	120 (1920)	0.20 (850)
6	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
7	Steel Beam (W410)	-	347 (50)	-	489 (7830)	0.12 (500)
8	Gravity and Slot Anchors at Slab	-	347 (50)	-	489 (7830)	0.12 (500)
9	Semi Rigid Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.75 RSI)	4 (64)	0.20 (850)
10	Silicone Sealant	-	2.4 (0.35)	-	174 (2800)	0.17 (700)
11	Concrete at Panel Edges	12" (305)	12.5 (1.8)	-	140 (2250)	.20 (850)
12	Precast Sandwich Panel, Interior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
13	Precast Sandwich Panel, Insulation	2" (51)	-	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
14	Precast Sandwich Panel, Exterior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
15	Precast Sandwich Panel, Steel Connectors @ 24" (610) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
16	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 7.2.10

Precast Sandwich Panel Wall Assembly with Steel Connectors at 16" o.c. – Intermediate Floor Intersection



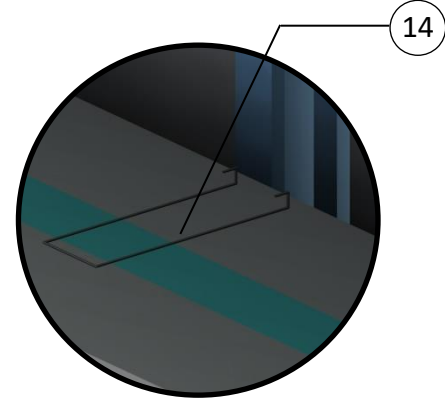
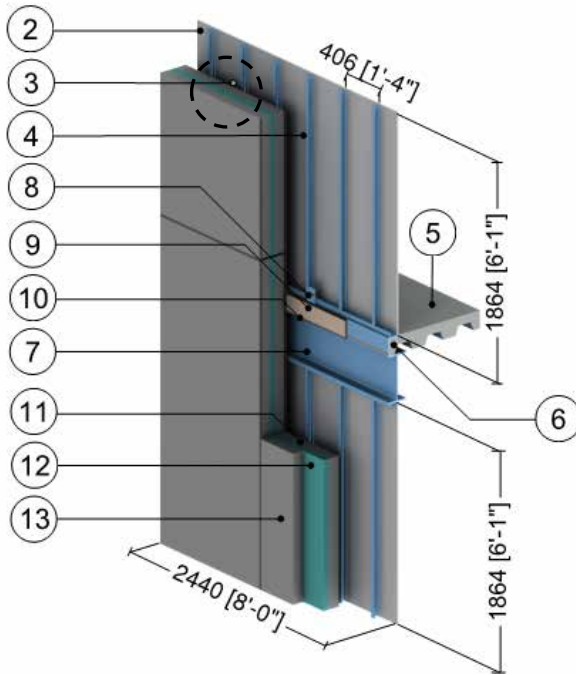
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film (bottom) ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	5 5/8" (143)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Concrete Topping	6" (152)	6.3 (0.9)	-	120 (1920)	0.20 (850)
6	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
7	Steel Beam (W410)	-	347 (50)	-	489 (7830)	0.12 (500)
8	Gravity and Slot Anchors at Slab	-	347 (50)	-	489 (7830)	0.12 (500)
9	Semi Rigid Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.75 RSI)	4 (64)	0.20 (850)
10	Silicone Sealant	-	2.4 (0.35)	-	174 (2800)	0.17 (700)
11	Precast Sandwich Panel, Interior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Precast Sandwich Panel, Insulation	2" (51)	-	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
13	Precast Sandwich Panel, Exterior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
14	Precast Sandwich Panel, Steel Connectors @ 16" (406) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 7.2.11

Precast Sandwich Panel Wall Assembly with Steel Connectors at 36" o.c. – Intermediate Floor Intersection



Connector Detail

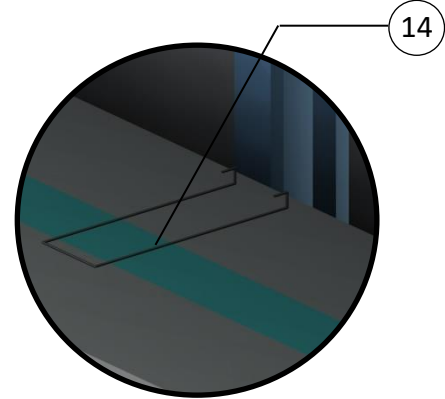
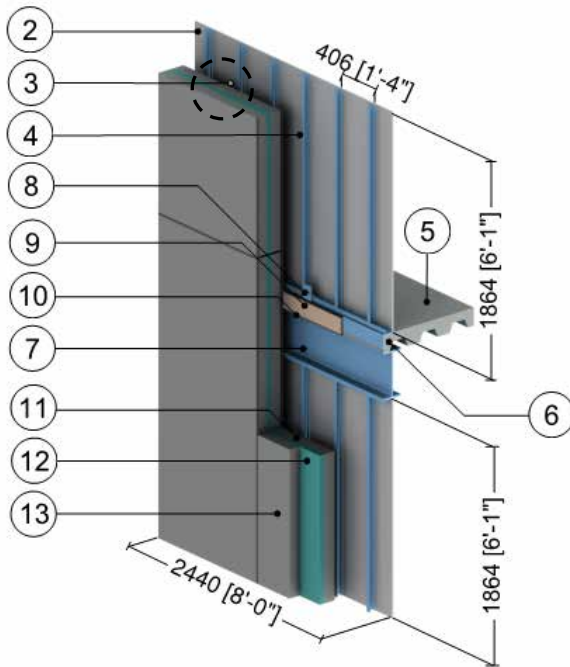
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film (bottom) ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	5 5/8" (143)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Concrete Topping	6" (152)	6.3 (0.9)	-	120 (1920)	0.20 (850)
6	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
7	Steel Beam (W410)	-	347 (50)	-	489 (7830)	0.12 (500)
8	Gravity and Slot Anchors at Slab	-	347 (50)	-	489 (7830)	0.12 (500)
9	Semi Rigid Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.75 RSI)	4 (64)	0.20 (850)
10	Silicone Sealant	-	2.4 (0.35)	-	-	-
11	Precast Sandwich Panel, Interior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Precast Sandwich Panel, Insulation	2" (51)	-	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
13	Precast Sandwich Panel, Exterior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
14	Precast Sandwich Panel, Steel Connectors @ 36" (914) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 7.2.12

Precast Sandwich Panel Wall Assembly with Steel Connectors at 48" o.c. – Intermediate Floor Intersection



Connector Detail

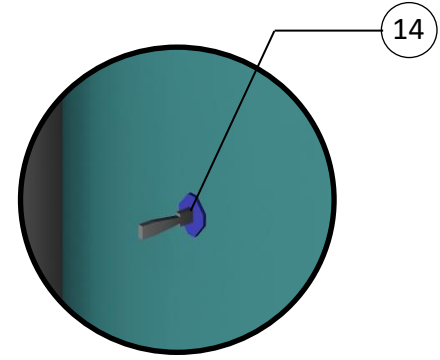
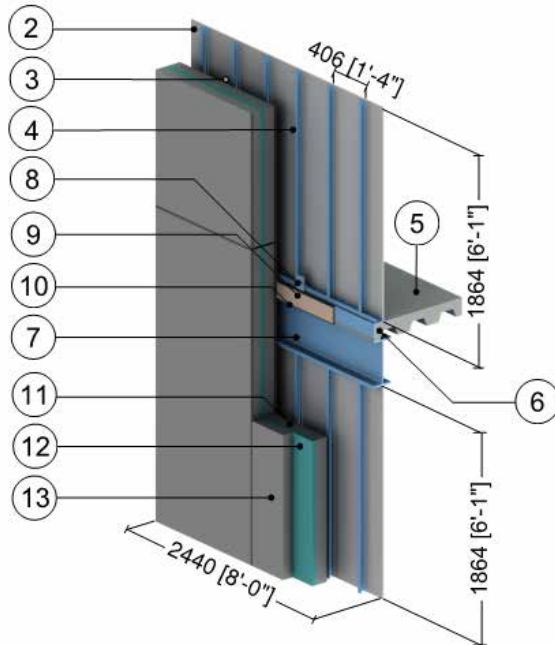
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film (bottom) ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (143)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Concrete Topping	6" (152)	6.3 (0.9)	-	120 (1920)	0.20 (850)
6	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
7	Steel Beam (W410)	-	347 (50)	-	489 (7830)	0.12 (500)
8	Gravity and Slot Anchors at Slab	-	347 (50)	-	489 (7830)	0.12 (500)
9	Semi Rigid Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.75 RSI)	4 (64)	0.20 (850)
10	Silicone Sealant	-	2.4 (0.35)	-	-	-
11	Precast Sandwich Panel, Interior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Precast Sandwich Panel, Insulation	2" (51)	-	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
13	Precast Sandwich Panel, Exterior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
14	Precast Sandwich Panel, Steel Connectors @ 48" (1220) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 7.2.13

Precast Sandwich Panel Wall Assembly with Fiber-Reinforced Composite Connections at 16" o.c. – Intermediate Floor Intersection



Connector Detail

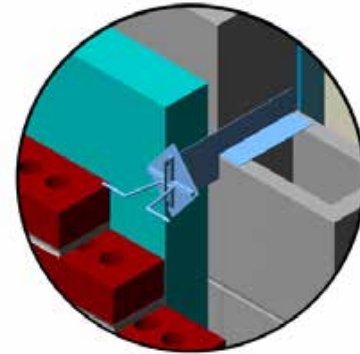
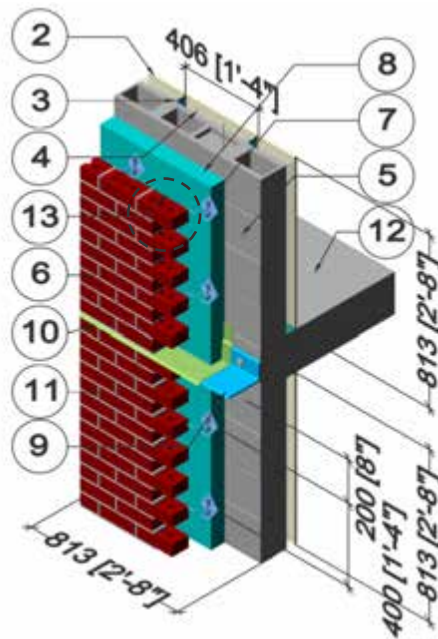
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film (bottom) ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	5 5/8" (143)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Concrete Topping	6" (152)	6.3 (0.9)	-	120 (1920)	0.20 (850)
6	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
7	Steel Beam (W410)	-	347 (50)	-	489 (7830)	0.12 (500)
8	Gravity and Slot Anchors at Slab	-	347 (50)	-	489 (7830)	0.12 (500)
9	Semi Rigid Insulation	1" (25)	0.24 (0.034)	R-4.2 (0.75 RSI)	4 (64)	0.20 (850)
10	Silicone Sealant	-	2.4 (0.35)	-	-	-
11	Precast Sandwich Panel, Interior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Precast Sandwich Panel, Insulation	2" (51)	-	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
13	Precast Sandwich Panel, Exterior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
14	Precast Sandwich Panel, Fiber-Reinforced Composite Connectors @ 16" (406) o.c.	-	6.9 (1.0)	-	-	-
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 7.2.14

Exterior Insulated Concrete Block Wall Assembly with Shelf Angle & Brick Ties Supporting Brick Veneer – Intermediate Floor Intersection



Brick Tie Detail

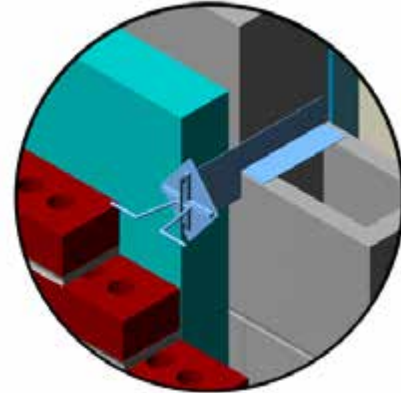
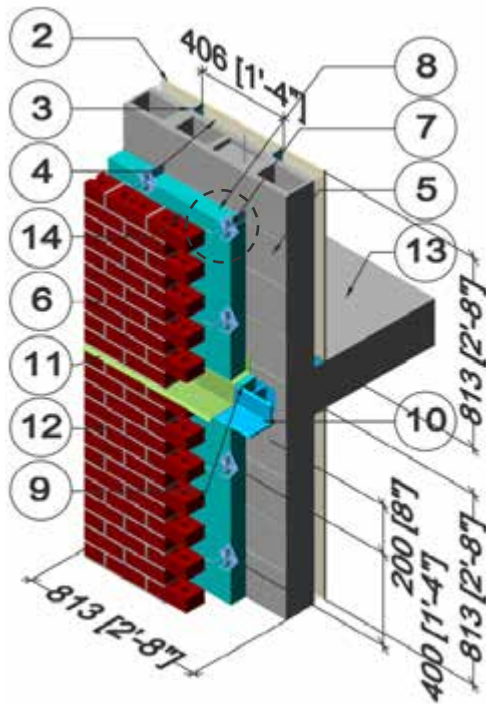
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" Steel Studs with Metal Tracks	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Standard Concrete Block	7 5/8" (190)	3.5 (0.5)	-	119 (1900)	0.19 (800)
6	Cement Mortar	-	3.5 (0.5)	-	113 (1800)	0.12 (500)
7	Masonry Ties @ 16" (406) o.c.	14 Gauge	347 (50)	-	489 (7830)	0.12 (500)
8	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
9	Shelf Angle	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
10	Flashing	20 Gauge	347 (50)	-	489 (7830)	0.12 (500)
11	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
12	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
13	Air Gap	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 7.2.15

Exterior Insulated Concrete Block Wall Assembly with Stand-Off Shelf Angle & Brick Ties Supporting Brick Veneer – Intermediate Floor Intersection



Brick Tie Detail

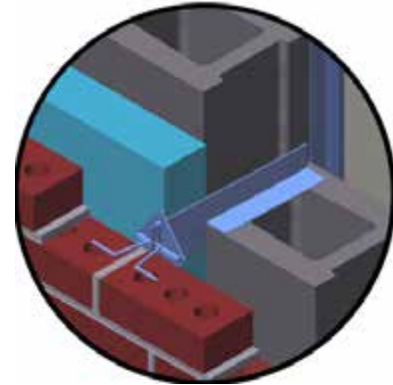
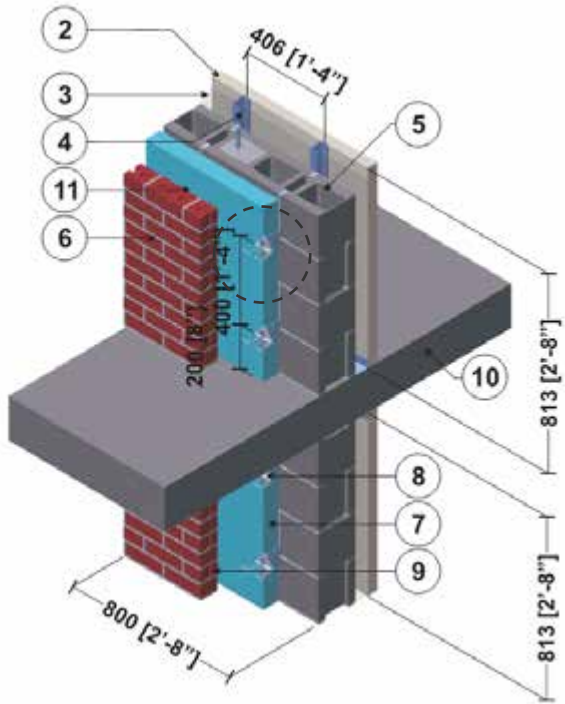
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" Steel Studs with Metal Tracks	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Standard Concrete Block	7 5/8" (190)	3.5 (0.5)	-	119 (1900)	0.19 (800)
6	Cement Mortar	-	3.5 (0.5)	-	113 (1800)	0.12 (500)
7	Masonry Ties @ 16" (406) o.c.	14 Gauge	347 (50)	-	489 (7830)	0.12 (500)
8	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 RS) to 4.4 RSI)	1.8 (28)	0.29 (1220)
9	Insulation Behind Shelf Angle	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
10	Stand-Off Shelf Angle	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
11	Flashing	20 Gauge	347 (50)	-	489 (7830)	0.12 (500)
12	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
13	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
14	Air Gap	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 7.2.16

Exterior Insulated Concrete Block Wall Assembly with Masonry Ties Supporting Brick Veneer – Intermediate Floor Intersection at Balcony



Brick Tie Detail

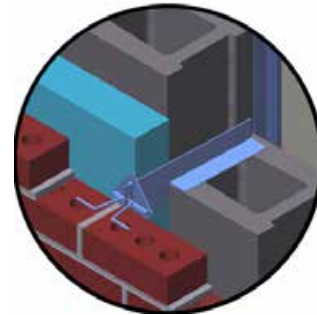
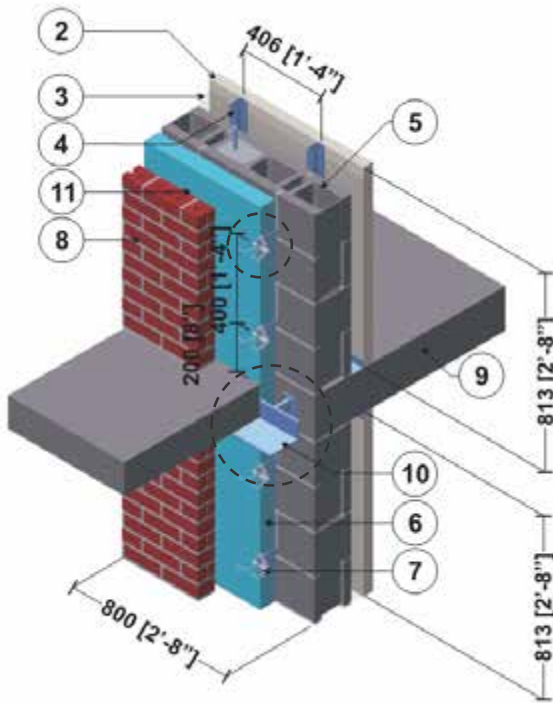
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" Steel Studs with Metal Tracks	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Standard Concrete Block	7 5/8" (190)	3.5 (0.5)	-	119 (1900)	0.19 (800)
6	Cement Mortar	-	3.5 (0.5)	-	113 (1800)	0.12 (500)
7	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
8	Masonry Ties @ 16" (406) o.c.	14 Gauge	347 (50)	-	489 (7830)	0.12 (500)
9	Brick Veneer	3 5/8" (90)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Air Gap	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

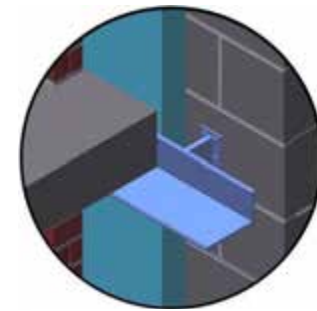


Detail 7.2.17

Exterior Insulated Concrete Block Wall Assembly with Masonry Ties Supporting Brick Veneer – Angle Supported Slab & Intermediate Floor Intersection



Brick Tie Detail



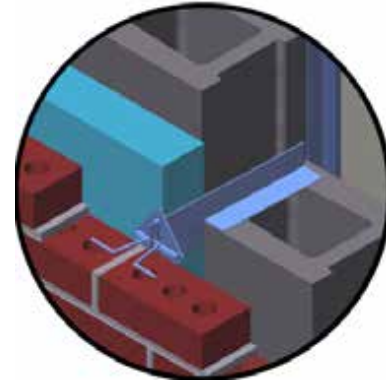
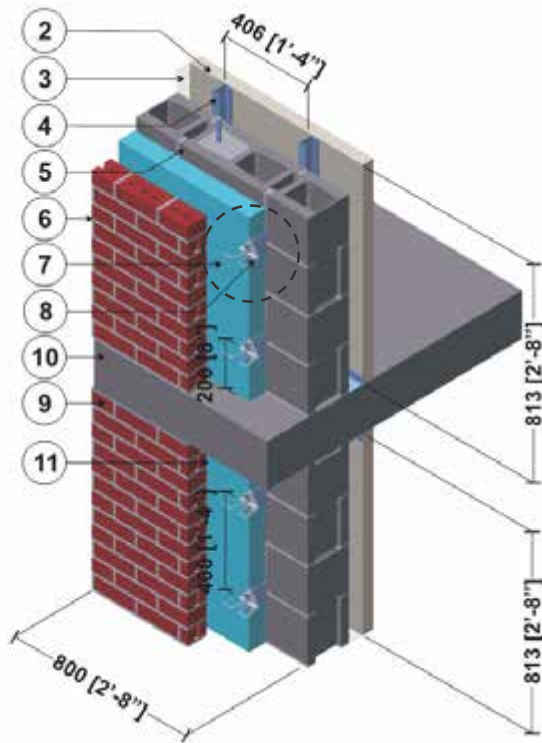
Shelf Angle Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" Steel Studs with Metal Tracks	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Standard Concrete Block	7 5/8" (190)	3.5 (0.5)	-	119 (1900)	0.19 (800)
6	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
7	Masonry Ties @ 16" (406) o.c.	14 Gauge	347 (50)	-	489 (7830)	0.12 (500)
8	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
9	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Slab & Brick (Anchored to Slab at 16" o.c.) Support Angle	-	347 (50)	-	489 (7830)	0.12 (500)
11	Air Gap	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.2.18

Exterior Insulated Concrete Block Wall Assembly with Masonry Ties Supporting Brick Veneer – Intermediate Floor Intersection at Balcony



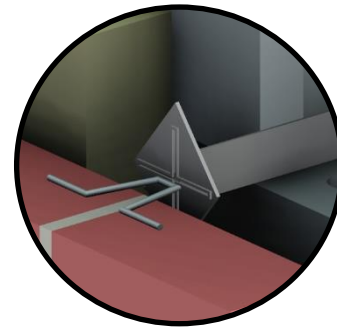
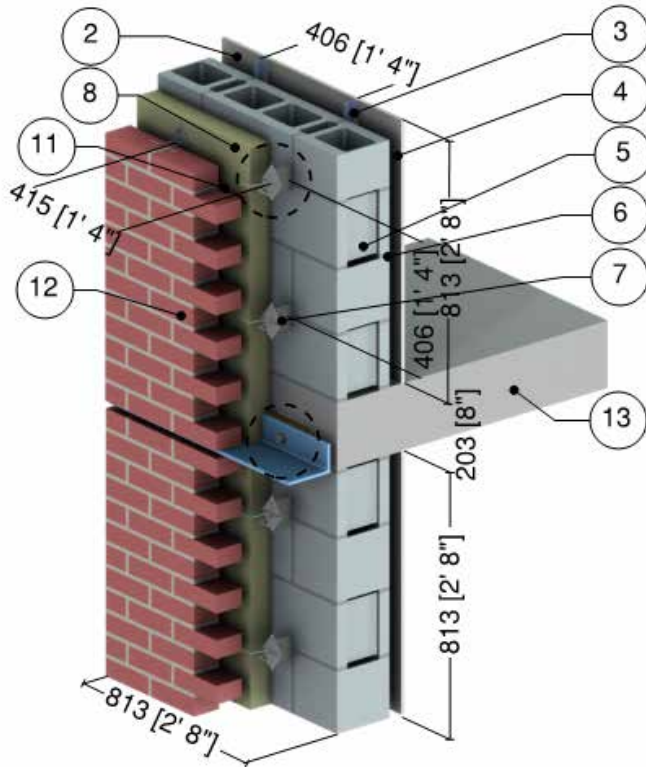
Brick Tie Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" Steel Studs with Metal Tracks	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Standard Concrete Block	7 5/8" (190)	3.5 (0.5)	-	119 (1900)	0.19 (800)
6	Cement Mortar	-	3.5 (0.5)	-	113 (1800)	0.12 (500)
7	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
8	Masonry Ties @ 16" (406) o.c.	14 Gauge	347 (50)	-	489 (7830)	0.12 (500)
9	Brick Veneer	3 5/8" (90)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Air Gap	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

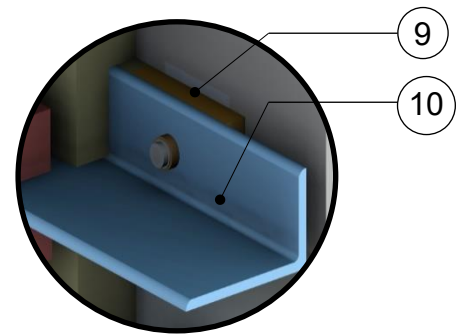
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.2.19

Exterior Insulated Concrete Block Wall Assembly with Thermally Broken Shelf Angle & Brick Ties Supporting Brick Veneer – Slab Intersection



Brick Tie Detail



Shelf Angle Detail

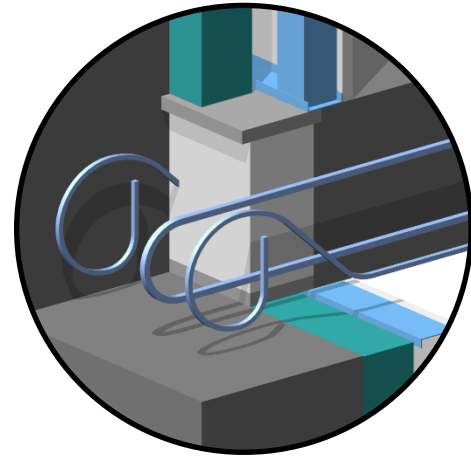
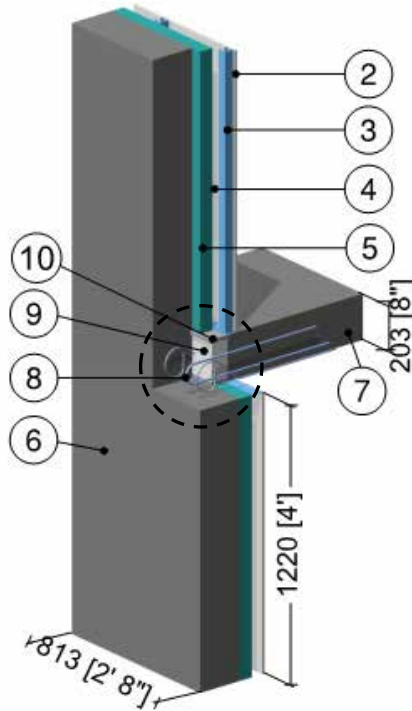
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" Steel Studs with Metal Tracks	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Standard Concrete Block	7 5/8" (190)	3.5 (0.5)	-	119 (1900)	0.19 (800)
6	Cement Mortar	-	3.5 (0.5)	-	113 (1800)	0.12 (500)
7	Masonry Ties @ 16" (406) o.c.	14 Gauge	347 (50)	-	489 (7830)	0.12 (500)
8	Exterior Insulation	-	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
9	Armatherm FRR Thermal Break	1" (25)	1.4 (0.20)	-	85 (5.3)	-
10	Steel Shelf Angle and Bolts	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
10	Stainless Steel Shelf Angle and Bolts	3/8" (10)	118 (17)	-	503 (8060)	0.12 (500)
11	Air Gap ²	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
12	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
13	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 7.2.20

Interior Insulated Concrete Mass Wall with 1 5/8" x 1 5/8" Steel Studs (16" o.c.) Supporting Interior Finish – Isokorb Rutherma DF Thermally Broken Concrete Intermediate Floor Intersection



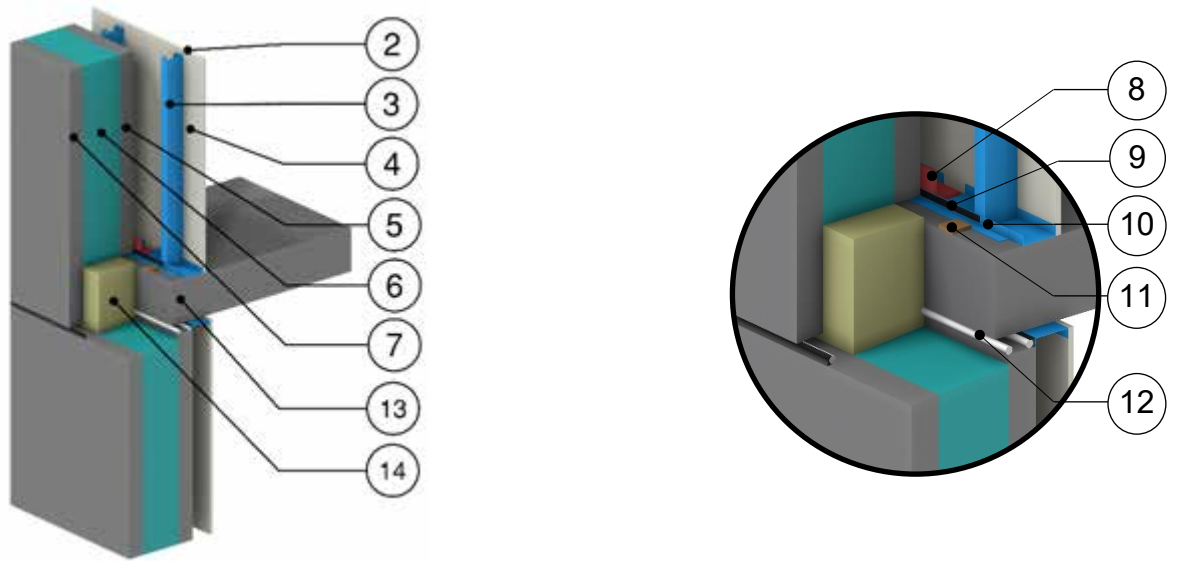
Thermally Broken Slab Detail (Rutherma Type DF)

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Continuous Insulation	2 1/2" (64)	0.2 (0.029)	R-12.5 (2.20 RSI)	1.8 (28)	0.29 (1220)
6	Concrete Wall	8" (203)	12.5 (1.8)	R-0.64 (0.11 RSI)	140 (2250)	0.20 (850)
7	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Stainless Steel Reinforcement	-	118 (17)	-	503 (8060)	0.12 (500)
9	Polystyrene Hard Foam Insulation	2 3/8" (60)	0.217 (0.031)	R-10.9 (1.93 RSI)	66 (1060)	0.35 (1500)
10	Cement Board	1/2" (13)	1.7 (0.25)	-	72 (1150)	0.20 (850)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.2.21

Highly Insulated Precast Concrete Sandwich Panel Wall Assembly – Intermediate Floor Intersection with Inner Wythe Supported by Concrete Floor

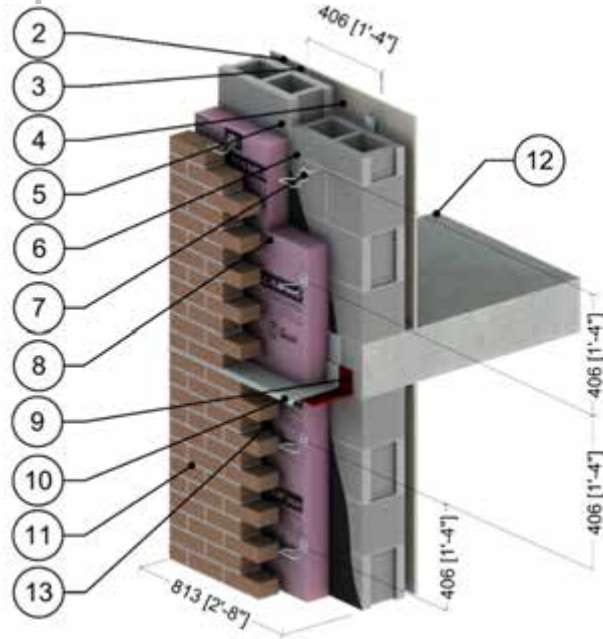


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (15)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Precast Sandwich Panel, Interior Concrete Panel	3" (76)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Precast Sandwich Panel Insulation	8" (203)	-	R-40 (7.04 RSI) to R-56 (9.86 RSI)	1.8 (28)	0.29 (1220)
7	Precast Sandwich Panel, Exterior Concrete Panel	3" (76)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Anchor	-	347 (50)	-	489 (7830)	0.12 (500)
9	Sealant	-	1.73 (0.25)	-	-	-
10	Angle	-	430 (62)	-	489 (7830)	0.12 (500)
11	Shims	-	0.69 (0.1)	-	-	-
12	Backer Rod	-	0.25 (0.036)	-	-	-
13	Concrete Floor Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
14	Mineral Wool Slab Insulation	8" (203)	0.238 (0.034)	R-33.6 (5.92 RSI)	4 (64)	0.20 (850)
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.2.22

Owens Corning Exterior Insulated Concrete Block Wall Assembly with Shelf Angle and Heckmann Pos-I-Tie Veneer Anchoring System Supporting Brick Veneer – Intermediate Floor Intersection



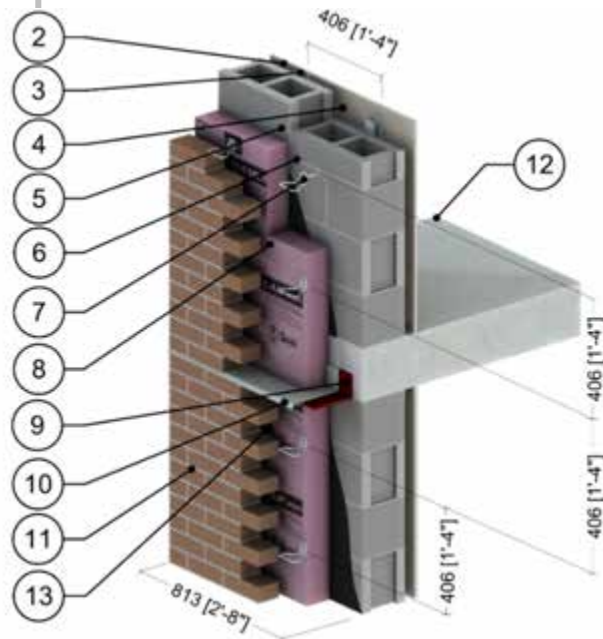
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" Steel Studs with Metal Tracks	20 gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Standard Concrete Block	7 5/8" (190)	3.5 (0.5)	-	119 (1900)	0.19 (800)
6	Cement Mortar	-	3.5 (0.5)	-	113 (1800)	0.12 (500)
7	Heckmann Pos-I-Tie Masonry Tie @ 16" (406) o.c.	varies	-	-	-	-
8	Foamular CodeBord/C-200 Extruded Polystyrene (XPS) Rigid Insulation Type 3	varies	0.20 (0.029)	R-10 to R-20 (1.76 to 3.52 RSI)	1.8 (28)	0.29 (1220)
9	Steel Shelf Angle	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
10	Metal Flashing	20 gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
12	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
13	Vented Air Gap ²	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 7.2.23

Owens Corning Exterior Insulated Concrete Block Wall Assembly with Stainless Steel Stand-off Shelf Angle and Heckmann Pos-I-Tie Veneer Anchoring System Supporting Brick Veneer – Intermediate Floor Intersection



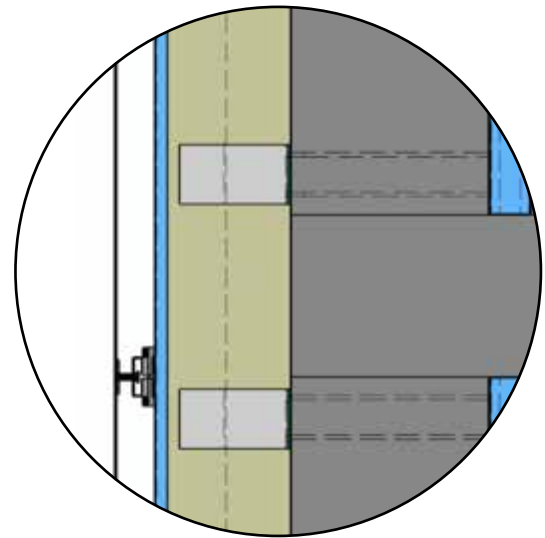
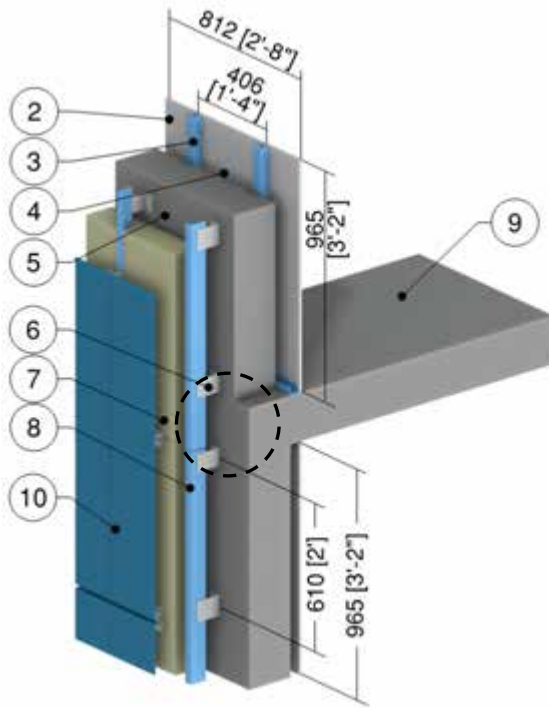
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" Steel Studs with Metal Tracks	20 gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Standard Concrete Block	7 5/8" (190)	3.5 (0.5)	-	119 (1900)	0.19 (800)
6	Cement Mortar	-	3.5 (0.5)	-	113 (1800)	0.12 (500)
7	Heckmann Pos-I-Tie Masonry Tie @ 16" (406) o.c.	varies	-	-	-	-
8	Foamular CodeBord/C-200 Extruded Polystyrene (XPS) Rigid Insulation Type 3	varies	0.20 (0.029)	R-10 to R-20 (1.76 to 3.52 RSI)	1.8 (28)	0.29 (1220)
9	Stainless Steel Stand-off Shelf Angle	3/8" (10)	118 (17)	-	503 (8060)	0.12 (500)
10	Flashing	20 gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
12	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
13	Vented Air Gap ²	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 7.2.24

Exterior Insulated Concrete Mass Wall with 1 5/8" x 1 5/8" Steel Stud (16" o.c.) and Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding – Intermediate Floor Intersection



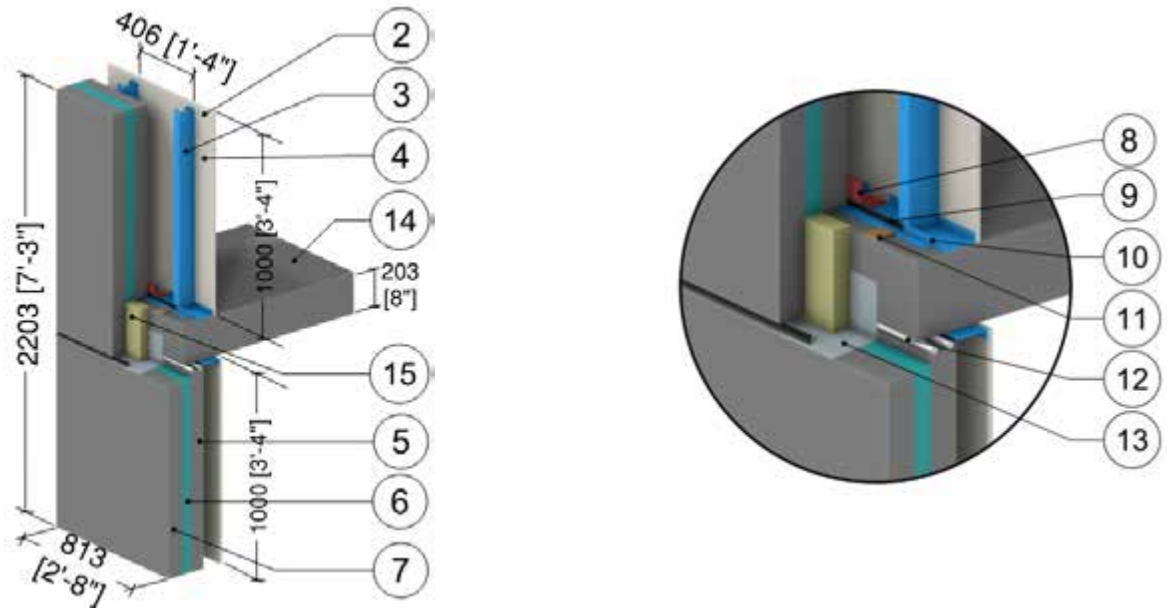
Slab Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Concrete Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Thermally Isolated Aluminum Bracket	0.09" (2.2)	1109 (160)	-	171 (2739)	0.21 (900)
7	Exterior Insulation	Varies	-	R-10 to R-25 (1.76 RSI to 4.40 RSI)	1.8 (28)	0.29 (1220)
8	Vertical Aluminum L-girt	0.09" (2.2)	1109 (160)	-	171 (2739)	0.21 (900)
9	Concrete Floor Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.2.25

Highly Insulated Precast Concrete Sandwich Panel Wall Assembly – Intermediate Floor Intersection with Inner Wythe Supported by Concrete Floor



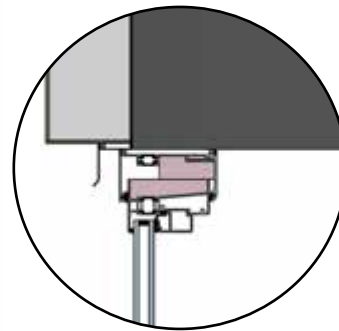
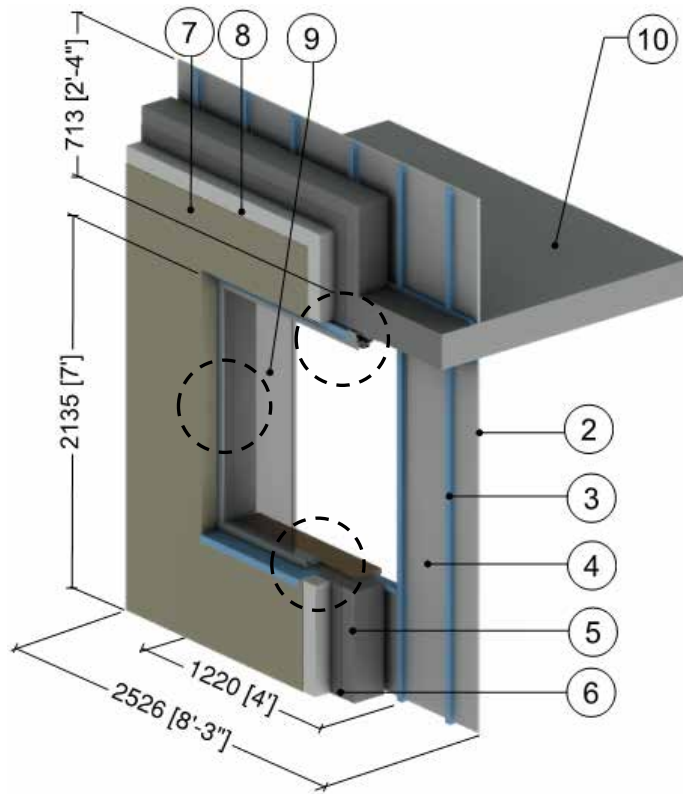
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (15)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Precast Sandwich Panel, Interior Concrete Panel	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Precast Sandwich Panel Insulation	Varies	-	R-10 to R-20 (1.76 RSI to 3.52 RSI)	1.8 (28)	0.29 (1220)
7	Precast Sandwich Panel, Exterior Concrete Panel	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Anchor	-	347 (50)	-	489 (7830)	0.12 (500)
9	Sealant	-	1.73 (0.25)	-	-	-
10	Angle	-	430 (62)	-	489 (7830)	0.12 (500)
11	Shims	-	0.69 (0.1)	-	-	-
12	Backer Rod	-	0.25 (0.036)	-	-	-
13	Flashing	18 Gauge	1110 (160)	-	171 (2739)	0.22 (900)
14	Concrete Floor Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
15	Mineral Wool Slab Insulation	Varies	0.238 (0.034)	R-8.4 to R-16.8 (1.48 RSI to 2.96 RSI)	4 (64)	0.20 (850)
16	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

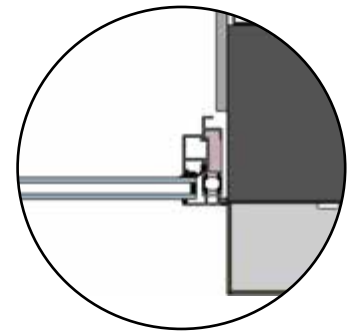


Detail 7.3.1

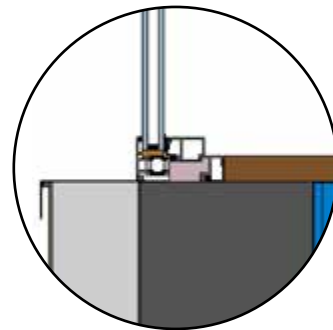
Exterior Insulated Concrete Drained EIFS Wall Assembly – Window and Intermediate Floor Intersection



Head Detail



Jamb Detail



Sill Detail

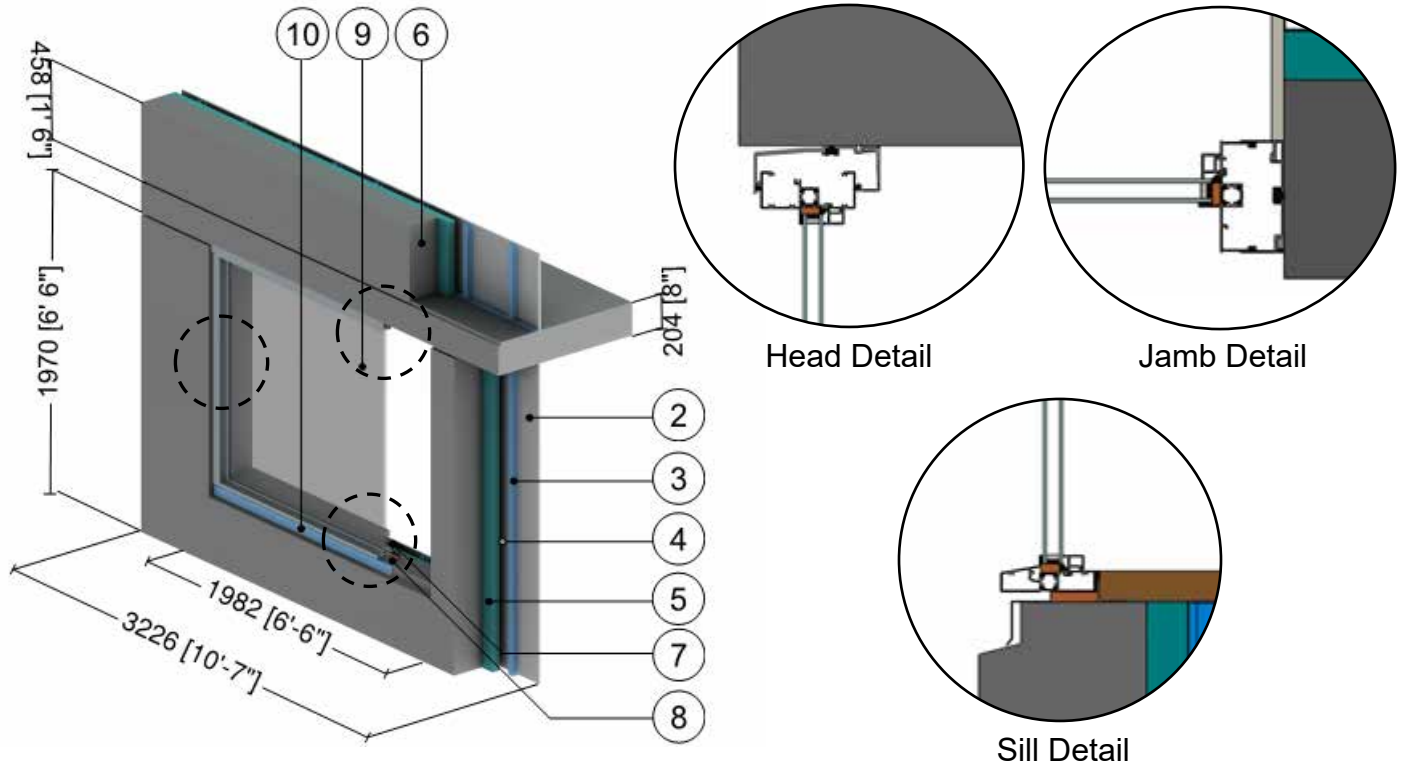
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Concrete Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
8	Insulation Board	4" (100)	0.27 (0.039)	R-15 (2.64 RSI)	1.2 (20)	0.35 (1470)
9	5' (1.5m) x 6' (1.8m) Aluminum window: double glazed & thermally broken ² , double glazed IGU U _{IGU} = 0.32 BTU/hr.ft ² ·°F (1.82 W/m ² K)					
10	Concrete Slab	8" (203)	12 (1.8)	-	140 (2250)	0.20 (850)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 7.3.2

Interior Insulated Concrete Mass Wall with 1 5/8" x 1 5/8" Steel Studs (16" o.c.) Supporting Interior Finish – Window & Intermediate Floor Intersection



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (92)	-	R-0.9 (RSI-0.16)	0.075 (1.2)	0.24 (1000)
5	Continuous Insulation	Varies	-	R-10 to R-15 (1.76 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
6	Concrete Wall/Floor Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Steel Sheet Connected to Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
9	5' (1.5m) x 6' (1.8m) Aluminum window: double glazed & thermally broken ² , double glazed IGU U _{IGU} = 0.32 BTU/hr.ft ² ·°F (1.82 W/m ² K)					
10	Aluminum Flashing	16 Gauge	1109 (160)	-	171(2739)	0.21 (900)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

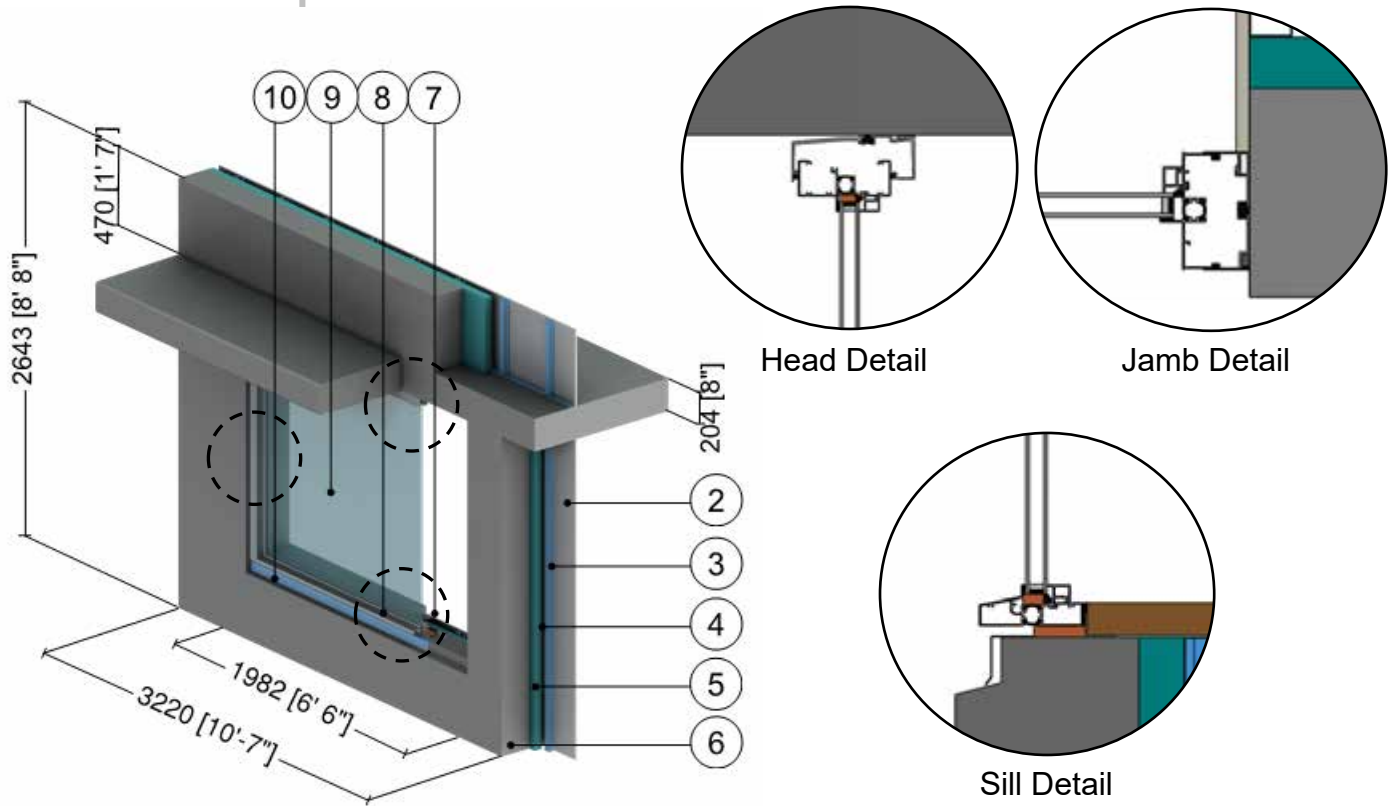
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2.



Detail 7.3.3

Interior Insulated Concrete Mass Wall with 1 5/8" x 1 5/8" Steel Studs (16" o.c.) Supporting Interior Finish – Window & Intermediate Floor Intersection with Project Slab



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (92)	-	R-0.9 (RSI-0.16)	0.075 (1.2)	0.24 (1000)
5	Continuous Rigid Insulation	Varies	-	R-10 to R-15 (1.76 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
6	Concrete Wall/ Projected Floor Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Steel Sheet Connected to Studs ³	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Wood Sill	1 1/4" (30)	0.69 (0.1)	-	27.8 (445)	0.45 (1880)
9	5' (1.5m) x 6' (1.8m) Aluminum window: double glazed & thermally broken ² , double glazed IGU U _{IGU} = 0.32 BTU/hr.ft ² ·°F (1.82 W/m ² K)					
10	Aluminum Flashing	14 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

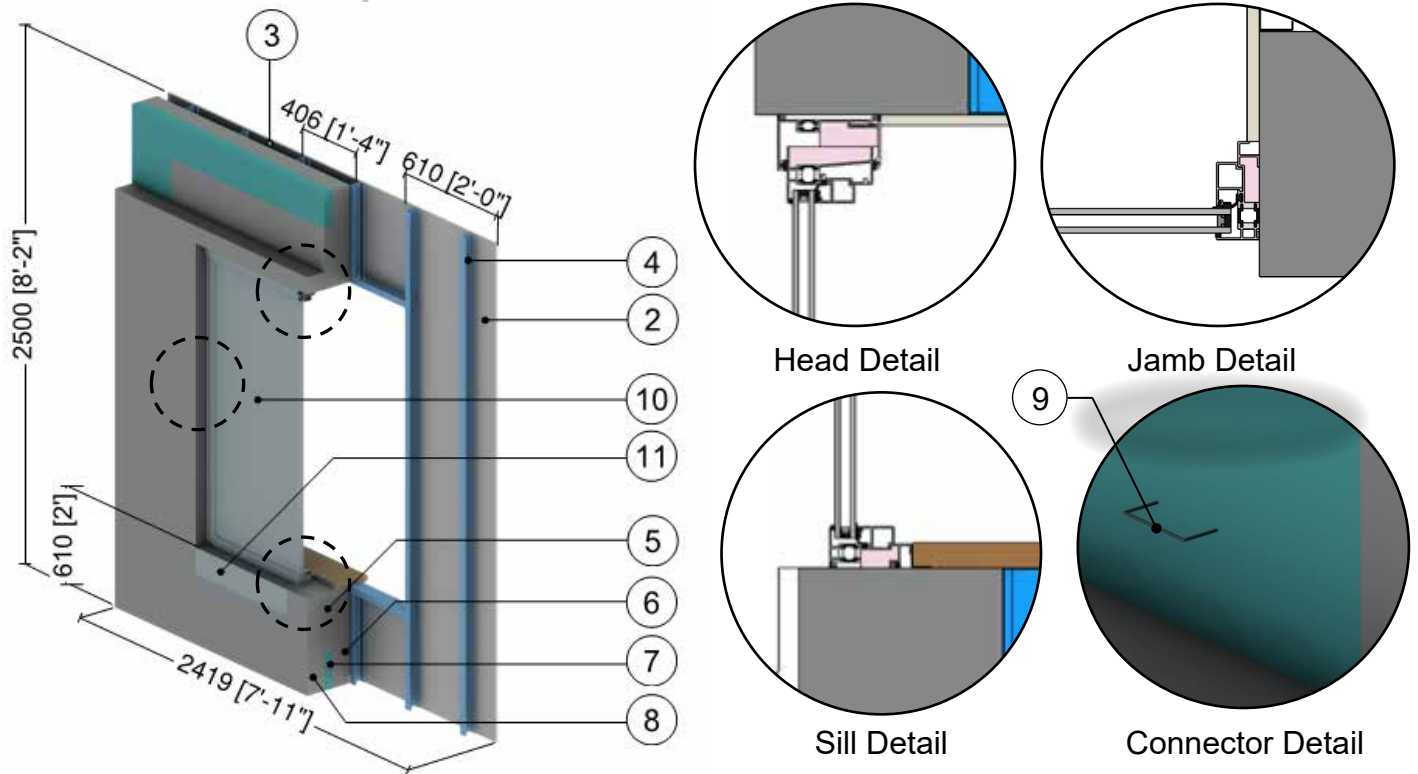
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

³ Scenarios C and D include sheet steel, Scenarios A and B do not.



Detail 7.3.4

Precast Sandwich Panel Wall Assembly with Concrete at Panel Perimeter and Steel Connectors at 24" (o.c.) – Window Intersection



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film	-	-	R-0.7 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (143)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Concrete at Window Perimeter	12" (304)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Precast Sandwich Panel, Interior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Precast Sandwich Panel, Insulation	2" (51)	-	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
8	Precast Sandwich Panel, Exterior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Precast Sandwich Panel, Steel Structural Ties @ 24" (914) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
10	5' (1.5m) x 6' (1.8m) Aluminum window: double glazed & thermally broken ² , double glazed IGU U _{IGU} = 0.32 BTU/hr.ft ² .°F (1.82 W/m ² K)					
11	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Exterior Film	-	-	R-0.2 (0.03 RSI)	-	-

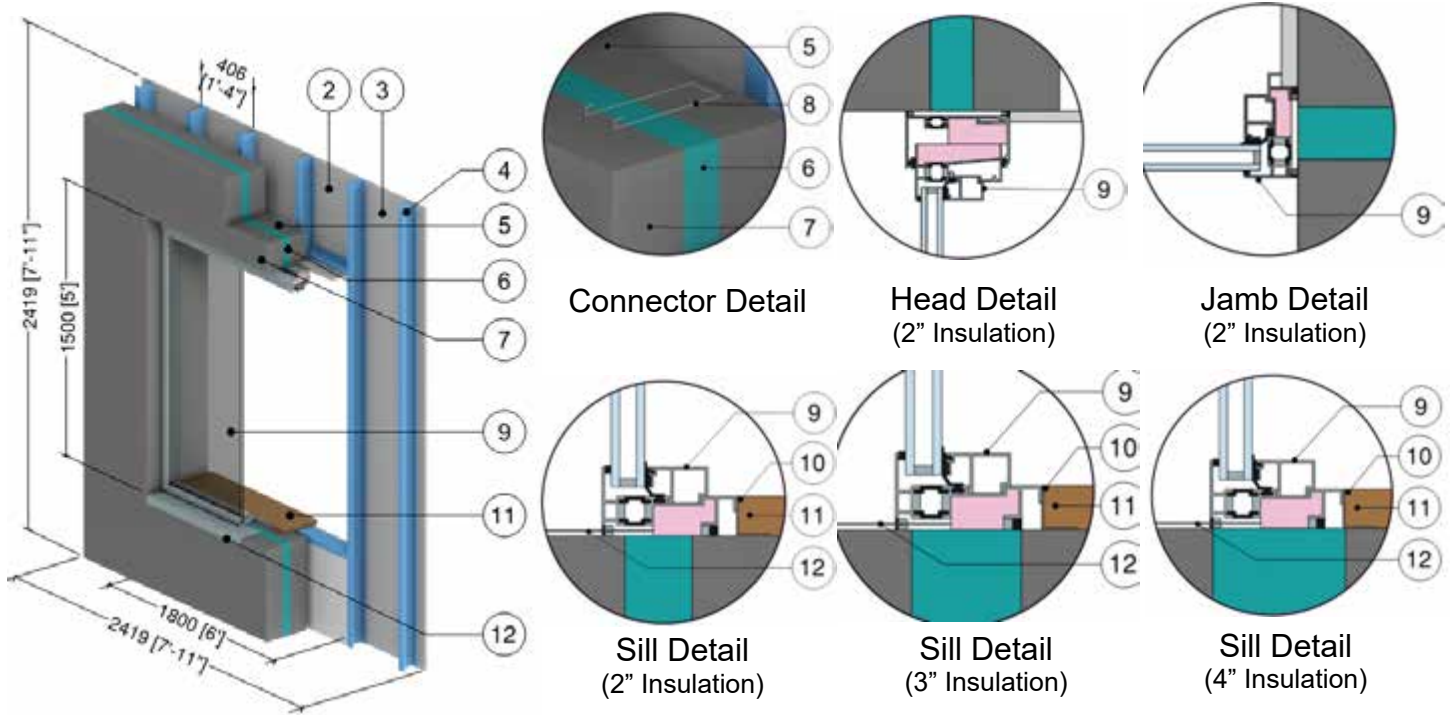
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 7.3.5

Precast Sandwich Panel Wall Assembly with Steel Connectors at 24" (o.c.), and 3 5/8" Steel Stud (16" o.c.) – Window Intersection



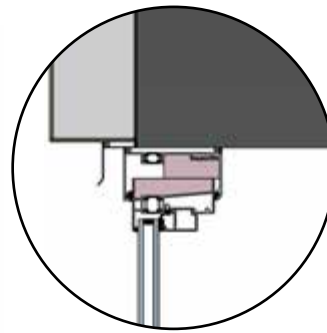
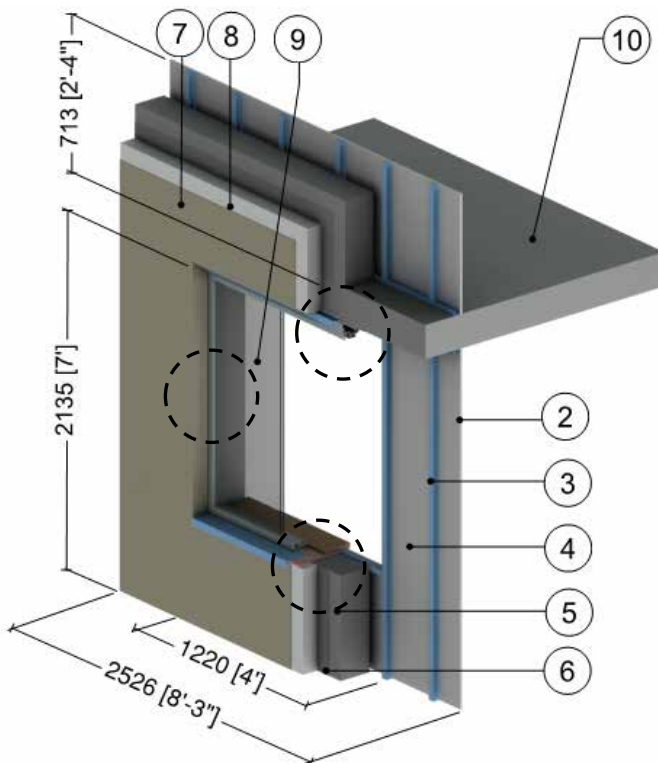
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	4.7" (120)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" Steel Studs with Metal Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Precast Sandwich Panel, Interior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Precast Sandwich Panel, Insulation	Varies	-	R-10 to R-20 (1.76 RSI to 3.52 RSI)	1.8 (28)	0.29 (1220)
7	Precast Sandwich Panel, Exterior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Precast Sandwich Panel, Steel Connectors @ 24" (610) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	1.5m (H) x 1.2m (W) Aluminum window: double glazed & thermally broken ²					
10	Sill Angle	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
12	Flashing	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

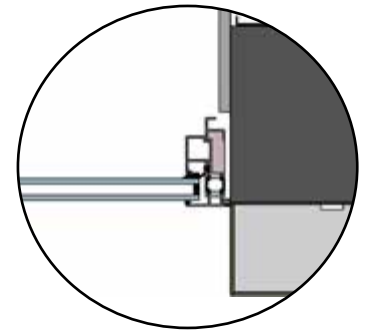
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 7.3.6

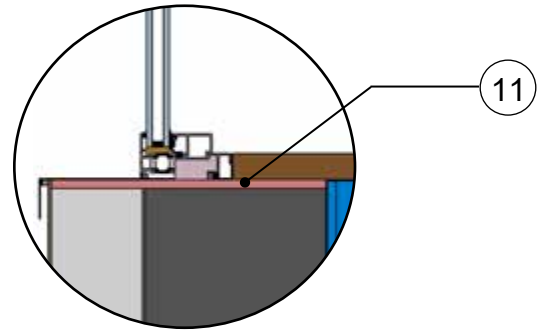
Exterior Insulated Concrete Drained EIFS Wall Assembly – Window with Aerogel and Intermediate Floor Intersection



Head Detail



Jamb Detail



Sill Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Concrete Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
8	Insulation Board	4" (100)	0.27 (0.039)	R-15 (2.64 RSI)	1.2 (20)	0.35 (1470)
9	5' (1.5m) x 6' (1.8m) Aluminum window: double glazed & thermally broken ² , double glazed IGU U _{IGU} = 0.32 BTU/hr.ft ² ·°F (1.82 W/m ² K)					
10	Concrete Slab	8" (203)	12 (1.8)	-	140 (2250)	0.20 (850)
11	Aerogel Blanket	3/8" (10)	0.1 (0.015)	R-3.8 (0.67 RSI)	-	-
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

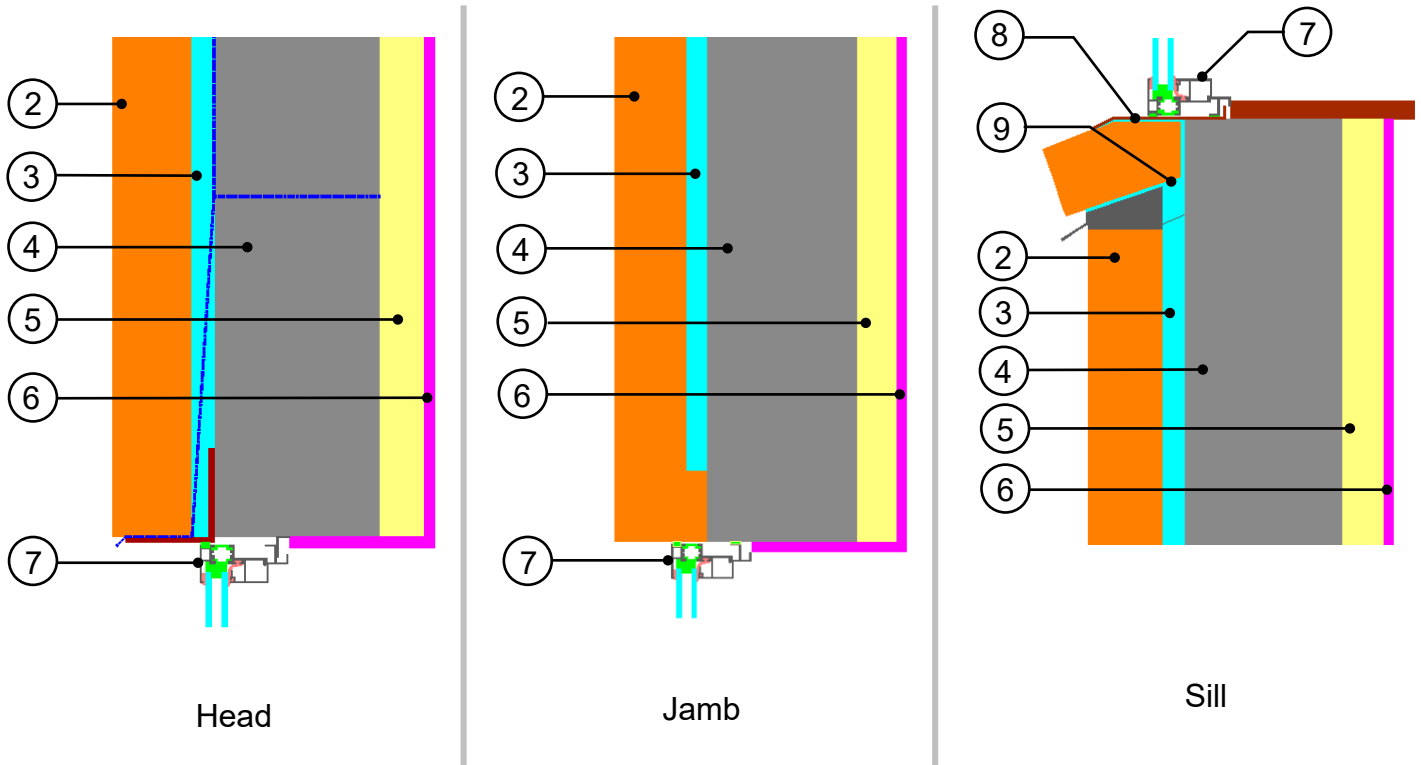
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 7.3.7

Interior Insulated Concrete Block or Concrete Wall Assembly with Brick Cladding – Window Intersection

Detail referenced from work done by Passive House Academy



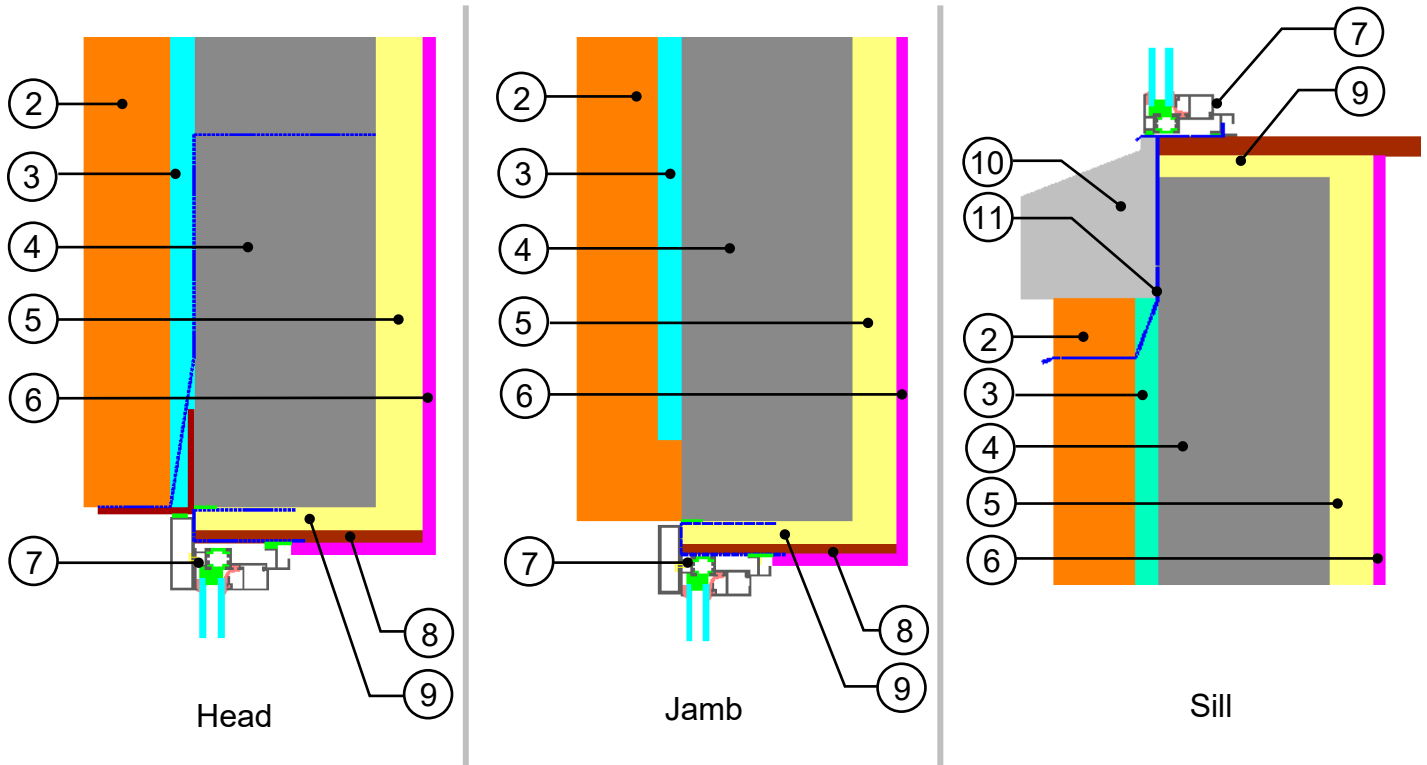
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.74 (0.13 RSI)	-	-
2	Brick	3 5/8" (92)	0.578 (1.0)	R-0.523 (0.092 RSI)	110 (1800)	-
3	Air Cavity	1" (25)	0.070 (0.122)	R-1.185 (0.209 RSI)	-	-
4	Concrete Block (CMU)	7 5/8" (194)	0.069 (1.2)	R-0.916 (0.161 RSI)	130 (2100)	-
5	Interior Insulation	2" (51)	0.0139 (0.024)	R12 (2.11 RSI)	-	-
6	Gypsum Board	1/2" (13)	0.092 (0.16)	R-0.5 (0.08 RSI)	50 (800)	-
7	5500 ISOWEB Window	-	-	-	-	-
8	Aluminum Sill Flashing	12 Gauge	92.45 (160)	-	-	-
9	Brick Sill	3 5/8" (92)	0.578 (1.0)	-	110 (1800)	-
10	Exterior Film ¹	-	-	R-0.23 (0.04 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.3.8

Interior Insulated Concrete Block or Concrete Wall Assembly with Brick Cladding – Window Intersection Aligned with Insulation

Detail referenced from work done by Passive House Academy

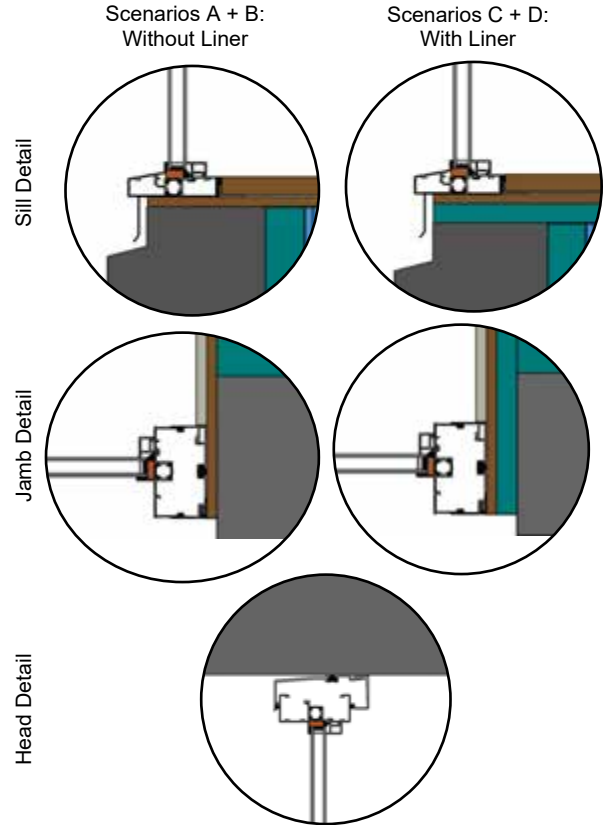
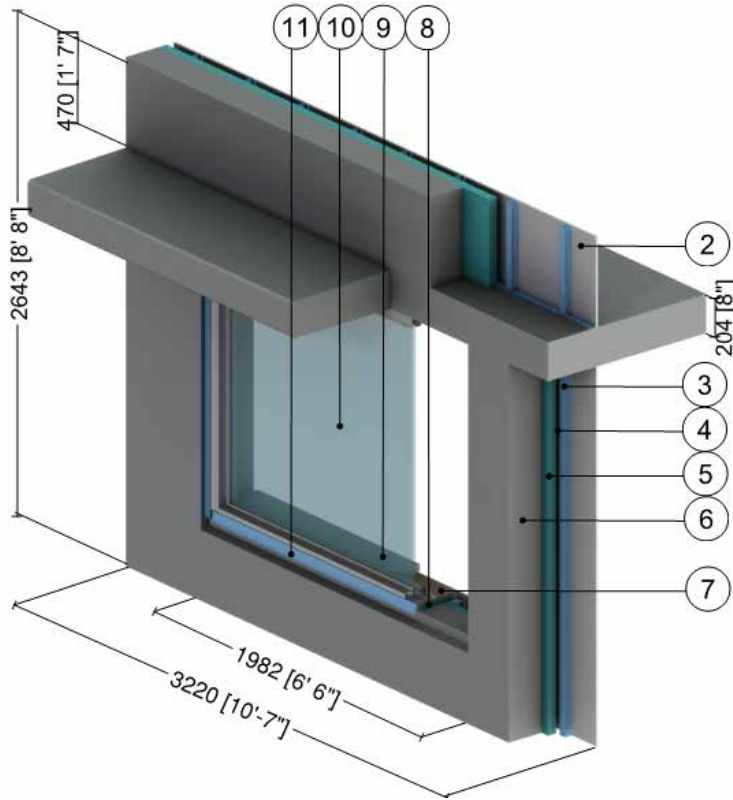


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.74 (0.13 RSI)	-	-
2	Brick	3 5/8" (92)	0.578 (1.0)	R-0.523 (0.092 RSI)	110 (1800)	-
3	Air Cavity	1" (25)	0.070 (0.122)	R-1.185 (0.209 RSI)	-	-
4	Concrete Block (CMU)	7 5/8" (194)	0.069 (1.2)	R-0.916 (0.161 RSI)	130 (2100)	-
5	Interior Insulation	2" (51)	0.0139 (0.024)	R12 (2.11 RSI)	-	-
6	Gypsum Board	1/2" (13)	0.092 (0.16)	R-0.5 (0.08 RSI)	50 (800)	-
7	5500 ISOWEB Window	-	-	-	-	-
8	Plywood Liner	3/4" (19)	0.058 (0.1)	-	-	-
9	Rigid Insulation	1" (25)	0.0139 (0.024)	-	-	-
10	Concrete Sill	-	1.4 (2.4)	-	110 (1800)	-
11	Aluminum Sill Flashing	12 Gauge	92.45 (160)	-	-	-
12	Exterior Film ¹	-	-	R-0.23 (0.04 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.3.9

Interior Insulated Concrete Mass Wall with 1 5/8" x 1 5/8" Steel Studs (16" o.c.) Supporting Interior Finish – Window & Projected Slab Intersection with Plywood and Insulation Liner



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (92)	-	R-0.9 (RSI-0.16)	0.075 (1.2)	0.24 (1000)
5	Continuous Rigid Insulation	Varies	-	R-10 to R-15 (1.76 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
6	Concrete Wall/ Projected Floor Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Plywood Liner	1/2" (13)	0.69 (0.1)	-	27.8 (445)	0.45 (1880)
8	Liner Insulation	Optional	-	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
9	Wood Sill	1 1/4" (30)	0.69 (0.1)	-	27.8 (445)	0.45 (1880)
10	5' (1.5m) x 6' (1.8m) Aluminum window: double glazed & thermally broken ² , IGU U _{IGU} = 0.32 BTU/hr.ft ² ·°F (1.82 W/m ² K)					
11	Aluminum Flashing	14 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

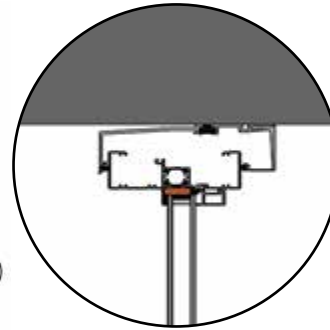
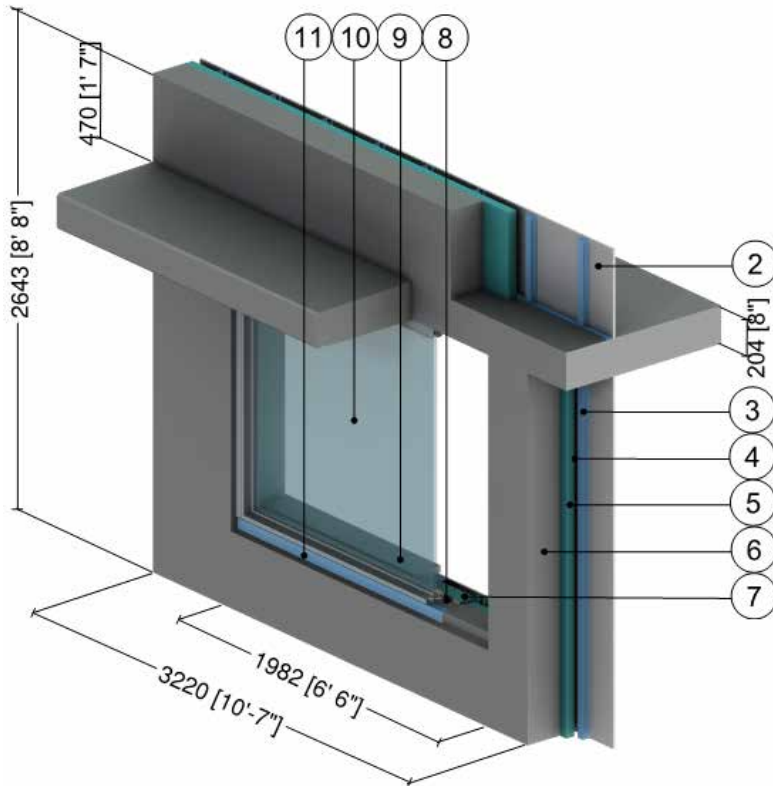
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

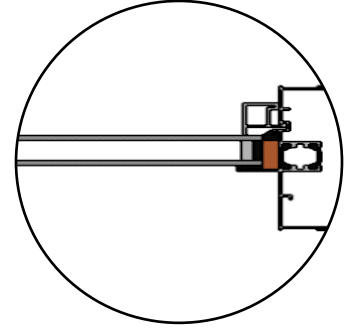


Detail 7.3.10

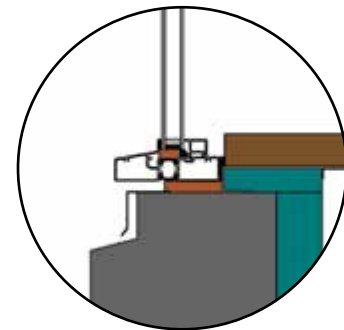
Interior Insulated Concrete Mass Wall with 1 5/8" x 1 5/8" Steel Studs (16" o.c.) Supporting Interior Finish – Window & Projected Slab Intersection with Wall Insulation Wrapped into Opening



Head Detail



Jamb Detail



Sill Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (92)	-	R-0.9 (RSI-0.16)	0.075 (1.2)	0.24 (1000)
5	Continuous Rigid Insulation	Varies	-	R-10 to R-15 (1.76 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
6	Concrete Wall/ Projected Floor Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Opening Insulation	Varies	-	R-5 to R-10 (0.88 RSI to 1.76 RSI)	27.8 (445)	0.45 (1880)
8	Shim Insulation	Optional	0.24 (0.034)	-	1.8 (28)	0.29 (1220)
9	Wood Sill	1 1/4" (30)	0.69 (0.1)	-	27.8 (445)	0.45 (1880)
10	5' (1.5m) x 6' (1.8m) Aluminum window: double glazed & thermally broken ² , IGU U _{IGU} = 0.32 BTU/hr.ft ² ·°F (1.82 W/m ² K)					
11	Aluminum Flashing	14 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

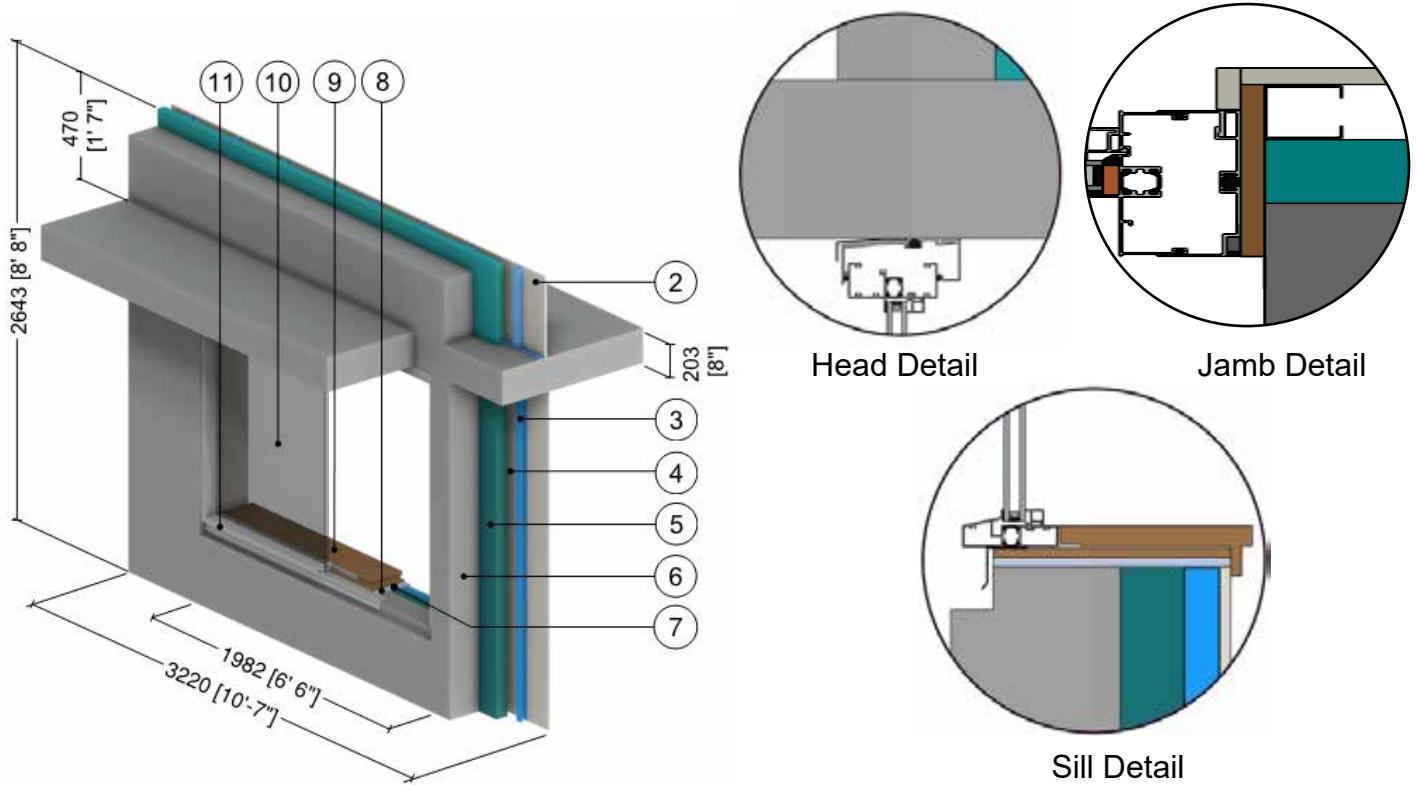
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 7.3.11

Interior Insulated Concrete Mass Wall with 1 5/8" x 1 5/8" Steel Studs (16" o.c.) Supporting Interior Finish – Window & Projected Slab Intersection – Plywood Liner and Glazing Aligned with Wall Insulation



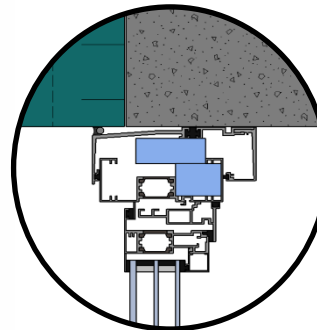
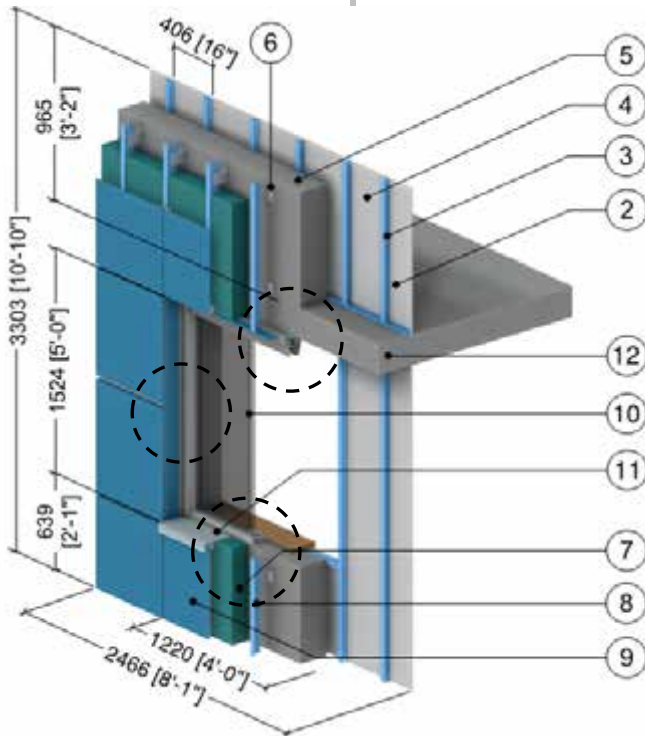
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (92)	-	R-0.9 (RSI-0.16)	0.075 (1.2)	0.24 (1000)
5	Continuous Rigid Insulation	Varies	-	R-10 to R-15 (1.76 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
6	Concrete Wall/ Projected Floor Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Plywood Liner	1/2" (13)	0.69 (0.1)	-	27.8 (445)	0.45 (1880)
8	Shim Insulation	Optional	0.24 (0.034)	-	1.8 (28)	0.29 (1220)
9	Wood Sill	1 1/4" (30)	0.69 (0.1)	-	27.8 (445)	0.45 (1880)
10	5' (1.5m) x 6' (1.8m) Aluminum window: double glazed & thermally broken ² , IGU U _{IGU} = 0.32 BTU/hr.ft ² .°F (1.82 W/m ² K)					
11	Aluminum Flashing	14 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

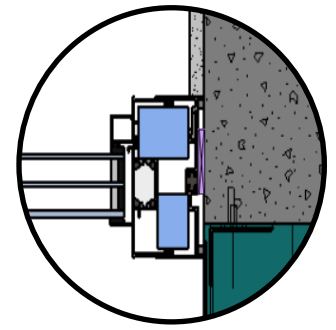


Detail 7.3.12

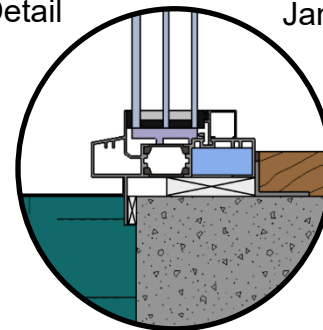
Exterior Insulated Concrete Mass Wall with 1 5/8" x 1 5/8" Steel Stud (16" o.c.) and Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding – Triple Glazed Aluminum Window & Intermediate Floor Intersection with Window Thermal Break Positioned in Concrete Opening



Head Detail



Jamb Detail



Sill Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Concrete Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Thermally Isolated Aluminum Bracket	0.09" (2.2)	1109 (160)	-	171 (2739)	0.21 (900)
7	Exterior Insulation	Varies	-	R-10 to R-25 (1.76 RSI to 4.40 RSI)	1.8 (28)	0.29 (1220)
8	Vertical Aluminum L-girt	0.09" (2.2)	1109 (160)	-	171 (2739)	0.21 (900)
9	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
10	5' (1.5m) x 4' (1.2m) Aluminum window: triple glazed & thermally broken ² , IGU U _{IGU} = 0.14 BTU/hr.ft ² ·°F (0.81 W/m ² K)					
11	Aluminum Flashing	14 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
12	Concrete Floor Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

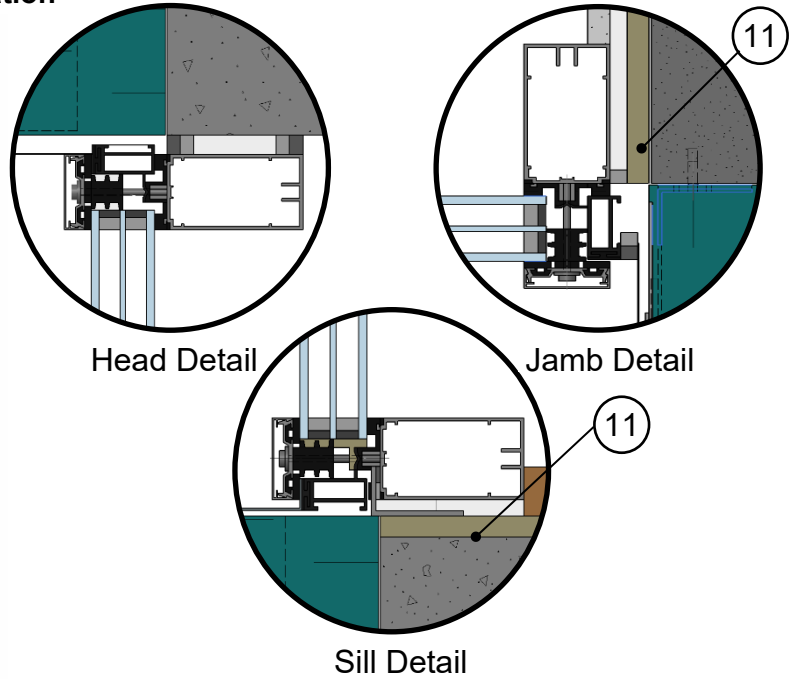
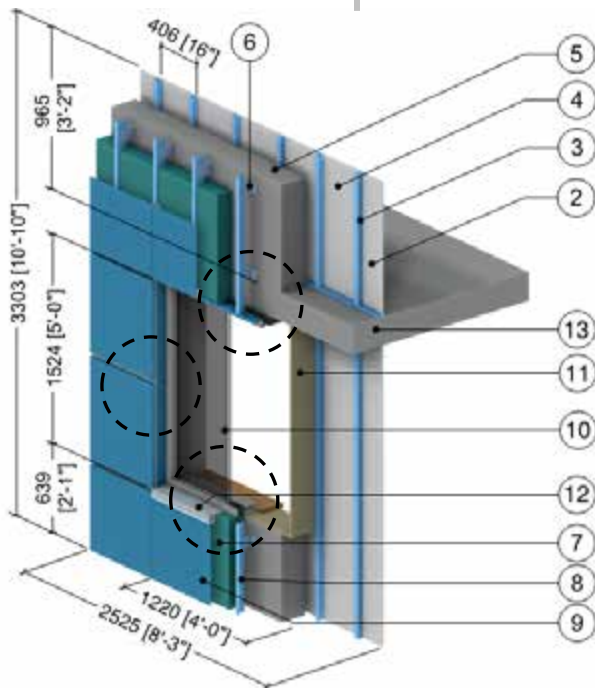
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 7.3.13

Exterior Insulated Concrete Mass Wall with 1 5/8" x 1 5/8" Steel Stud (16" o.c.) and Thermally Isolated Vertical Brackets and Rail System (24" o.c.) Supporting Metal Cladding – Triple Glazed Aluminum Curtain Wall & Intermediate Floor Intersection with Window Thermal Break Positioned in the Exterior Insulation



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Concrete Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Thermally Isolated Aluminum Bracket	0.09" (2.2)	1109 (160)	-	171 (2739)	0.21 (900)
7	Exterior Insulation	Varies	-	R-10 to R-25 (1.76 RSI to 4.40 RSI)	1.8 (28)	0.29 (1220)
8	Vertical Aluminum L-girt	0.09" (2.2)	1109 (160)	-	171 (2739)	0.21 (900)
9	Generic Cladding with 1/2" (13mm) vented air space is incorporated into exterior heat transfer coefficient					
10	5' (1.5m) x 4' (1.2m) Aluminum curtain wall (Passive House certified): triple glazed & thermally broken ² , IGU U _{IGU} = 0.14 BTU/hr.ft ² .°F (0.81 W/m ² K)					
11	Wood Liner	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
12	Aluminum Flashing	14 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
13	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

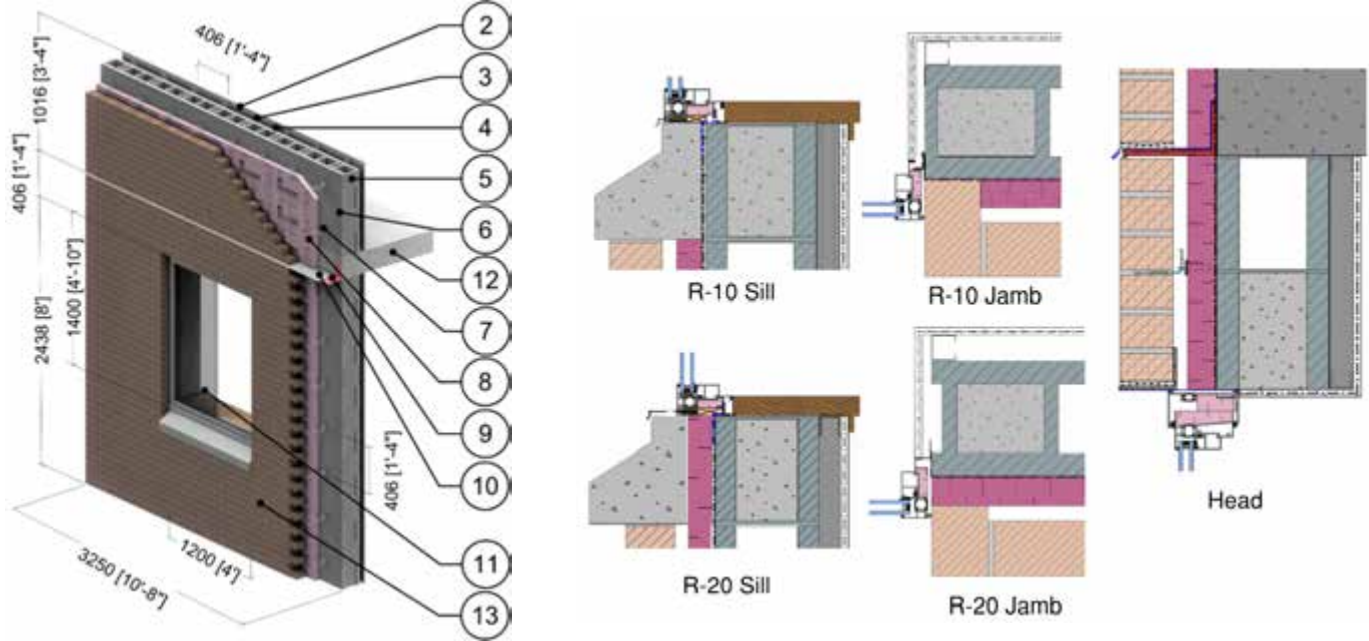
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 7.3.14

Owens Corning Exterior Insulated Concrete Block Wall Assembly with Heckmann Pos-I-Tie Vener Anchoring System Supporting Brick Veneer with Insulation Interrupted at Window Perimeter – Double Glazed Aluminum Window and Intermediate Floor Intersection



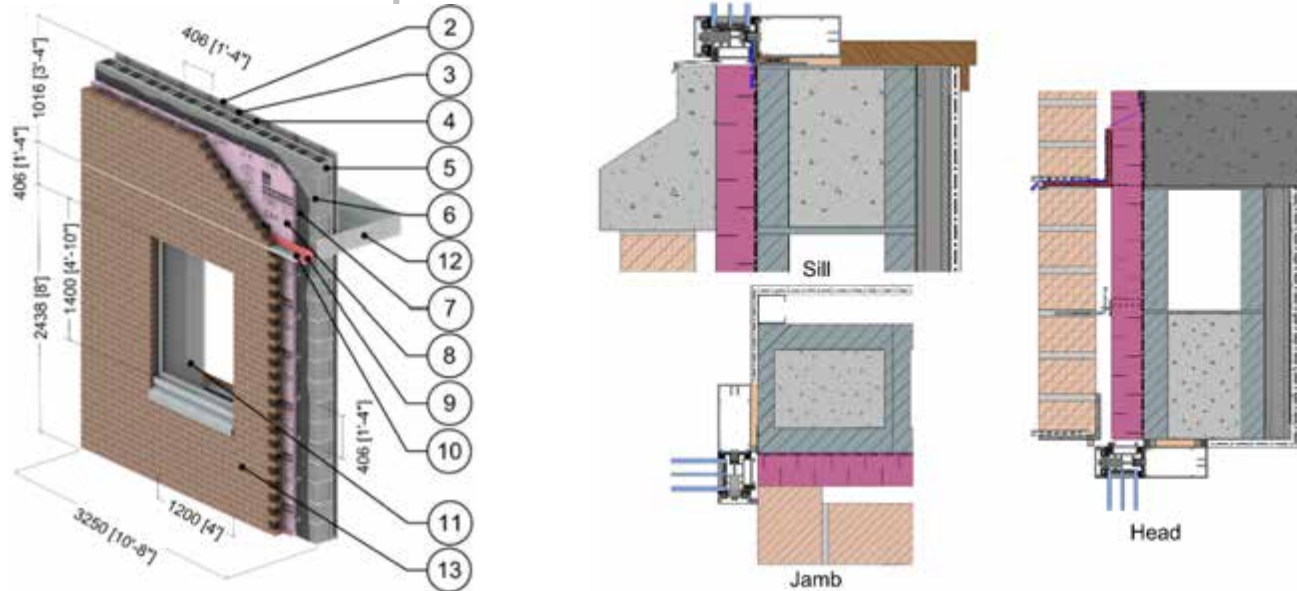
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Standard Concrete Block	7 5/8" (190)	3.5 (0.5)	-	119 (1900)	0.19 (800)
6	Cement Mortar	-	3.5 (0.5)	-	119 (1900)	0.12 (500)
7	Heckmann Pos-I-Tie Masonry Tie @ 16" (406) o.c.	varies	-	-	-	-
8	Foamular CodeBord/C-200 Extruded Polystyrene (XPS) Rigid Insulation Type 3	varies	0.20 (0.029)	R-10 to R-20 (1.76 to 3.52 RSI)	1.8 (28)	0.29 (1220)
9	Steel Shelf Angle	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
10	Steel Lintel	1/4" (6)	347 (50)	-	489 (7830)	0.12 (500)
11	4'8 (1.4m) x 4' (1.2m) Aluminum window: thermally broken, double glazed IGU ² U _{IGU} = 0.321 BTU/hr.ft ² .°F (1.82 W/m ² K)					
12	Concrete Slab	8" (203)	12 (1.8)	-	140 (2250)	0.20 (850)
13	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 7.3.15

Owens Corning Exterior Insulated Concrete Block Wall Assembly with Heckmann Pos-I-Tie Vener Anchoring System Supporting Brick Veneer with Reduced Insulation at Jamb – Triple Glazed Aluminum High Performance Window and Intermediate Floor Intersection



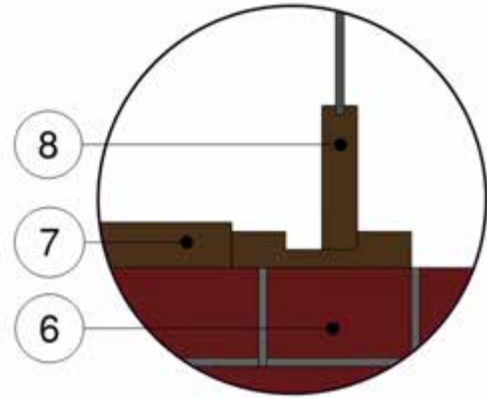
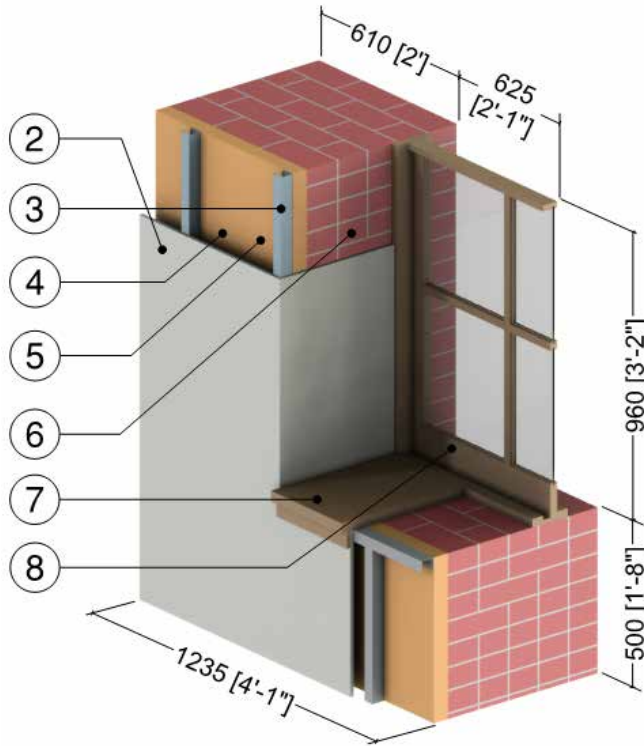
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Standard Concrete Block	7 5/8" (190)	3.5 (0.5)	-	119 (1900)	0.19 (800)
6	Cement Mortar	-	3.5 (0.5)	-	119 (1900)	0.12 (500)
7	Heckmann Pos-I-Tie Masonry Tie @ 16" (406) o.c.	varies	-	-	-	-
8	Foamular CodeBord/C-200 Extruded Polystyrene (XPS) Rigid Insulation Type 3	varies	0.20 (0.029)	R-10 to R-20 (1.76 to 3.52 RSI)	1.8 (28)	0.29 (1220)
9	Stainless Steel Shelf Angle	3/8" (10)	118 (17)	-	503 (8060)	0.12 (500)
10	Steel Lintel	1/4" (6)	347 (50)	-	489 (7830)	0.12 (500)
11	4'8" (1.5m) x 4' (1.2m) Aluminum window: thermally broken, triple glazed IGU ² U _{IGU} = 0.22 BTU/hr.ft ² .°F (1.25 W/m ² K)					
12	Concrete Slab	8" (203)	12 (1.8)	-	140 (2250)	0.20 (850)
13	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
14	Spray Foam Insulation	3/8" (10)	0.17 (0.024)	-	2.8 (39)	0.35 (1470)
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 7.3.16

Interior Insulated Multi-Wythe Brick Masonry Wall with 1 5/8" x 1 5/8" Steel Studs (16" o.c.) Supporting Interior Finish – Wood Window Intersection with Un-Insulated Window Perimeter



Single Glazed Wood Window on Brick Detail

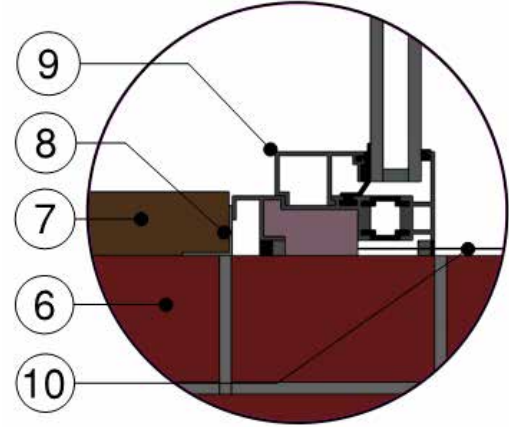
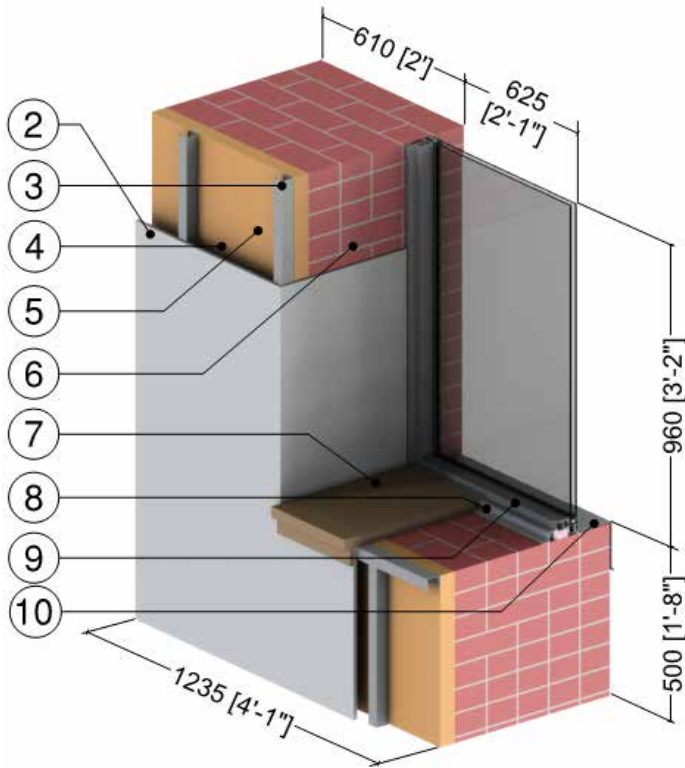
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Spray Foam Insulation	Varies	0.17 (0.024)	R-6 to R-12 (1.06 RSI to 2.11 RSI)	2.4 (39)	0.35 (1470)
6	5-Wythe Brick Wall	21" (540)	6.24 (0.9)	R-3.4 (0.60 RSI)	120 (1920)	0.19 (720)
7	Wood Sill	1 1/4" (32)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
8	6' (1.9 m) x 4' (1.2 m) Wood window: single glazed vision U _{IGU} = 1.04 Btu/hr ft ² °F (5.92 W/m ² K)					
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 7.3.17

Interior Insulated Multi-Wythe Brick Masonry Wall with 1 5/8" x 1 5/8" Steel Studs (16" o.c.) Supporting Interior Finish – Aluminum Window Intersection with Un-Insulated Window Perimeter



Double Glazed Aluminum Window on Brick Detail

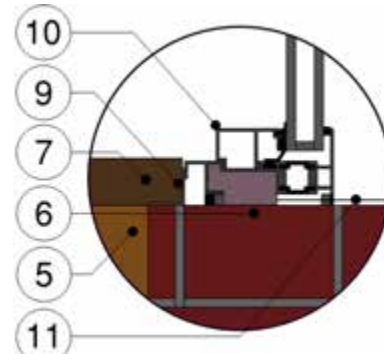
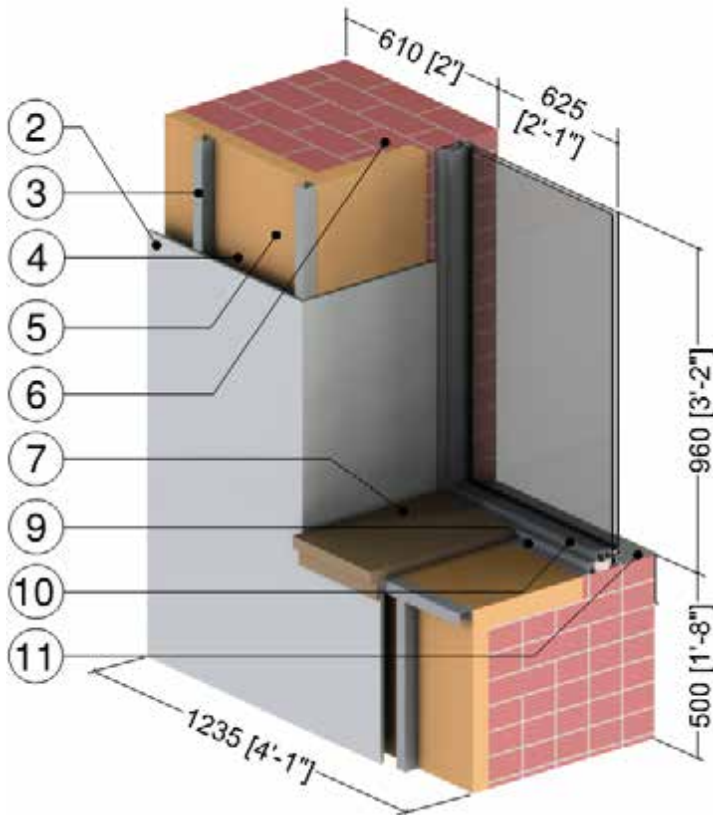
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Spray Foam Insulation	Varies	0.17 (0.024)	R-6 to R-12 (1.06 RSI to 2.11 RSI)	2.4 (39)	0.35 (1470)
6	5-Wythe Brick Wall	21" (540)	6.24 (0.9)	R-3.4 (0.60 RSI)	120 (1920)	0.19 (720)
7	Wood Sill	1 1/4" (32)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
8	Sill Angle	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	6' (1.9 m) x 4' (1.2 m) Aluminum window: double glazed IGU U _{IGU} = 0.321 Btu/hr ft ² °F (1.82 W/m ² K)					
10	Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

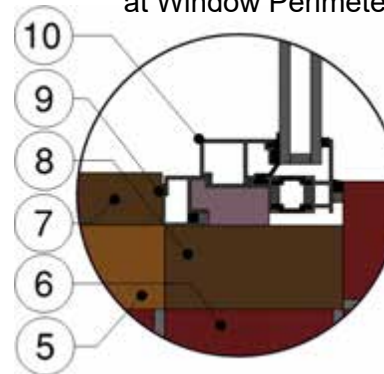


Detail 7.3.18

Interior Insulated Multi-Wythe Brick Masonry Wall with 1 5/8" x 1 5/8" Steel Studs (16" o.c.) Supporting Interior Finish – Aluminum Window Intersection with Insulation at Window Perimeter



Case A: Window on Brick with Insulation at Window Perimeter



Case B: Window on Wood Block with Insulation at Window Perimeter

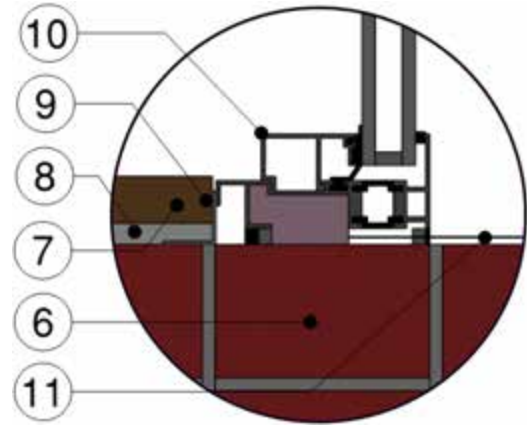
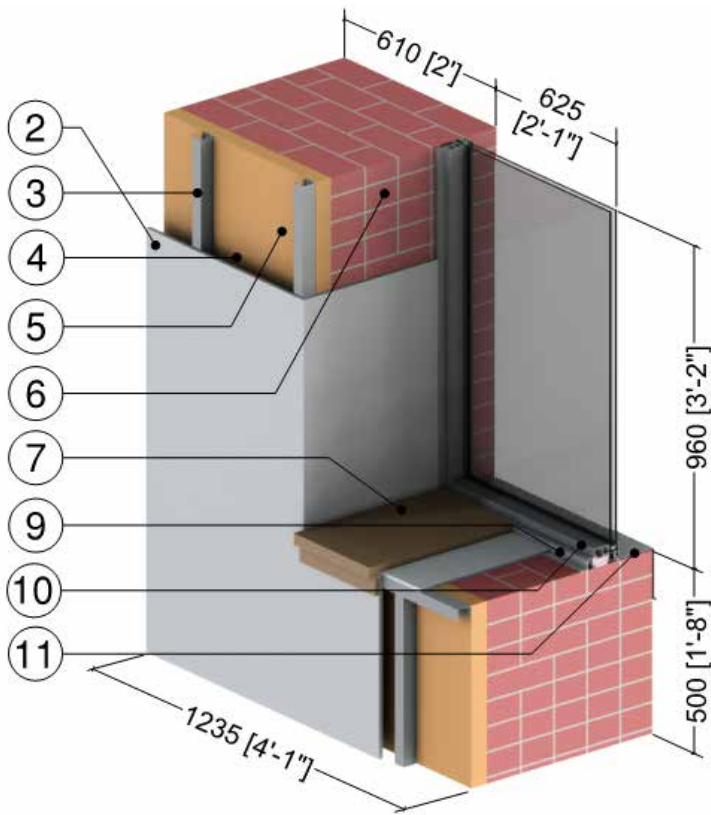
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Spray Foam Insulation	2" (51)	0.17 (0.024)	R-12 (2.11 RSI)	2.4 (39)	0.35 (1470)
6	5-Wythe Brick Wall	21" (540)	6.24 (0.9)	R-3.4 (0.60 RSI)	120 (1920)	0.19 (720)
7	Wood Sill	1 1/4" (32)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
8	Wood Block	2" (51)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
9	Sill Angle	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
10	6' (1.9 m) x 4' (1.2 m) Aluminum window: double glazed IGU U _{IGU} = 0.321 Btu/hr ft ² °F (1.82 W/m ² K)					
11	Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 7.3.19

Interior Insulated Multi-Wythe Brick Masonry Wall with 1 5/8" x 1 5/8" Steel Studs (16" o.c.) Supporting Interior Finish – Aluminum Window Intersection with Aerogel Blanket at Window Perimeter



Aerogel Blanket at Window Perimeter

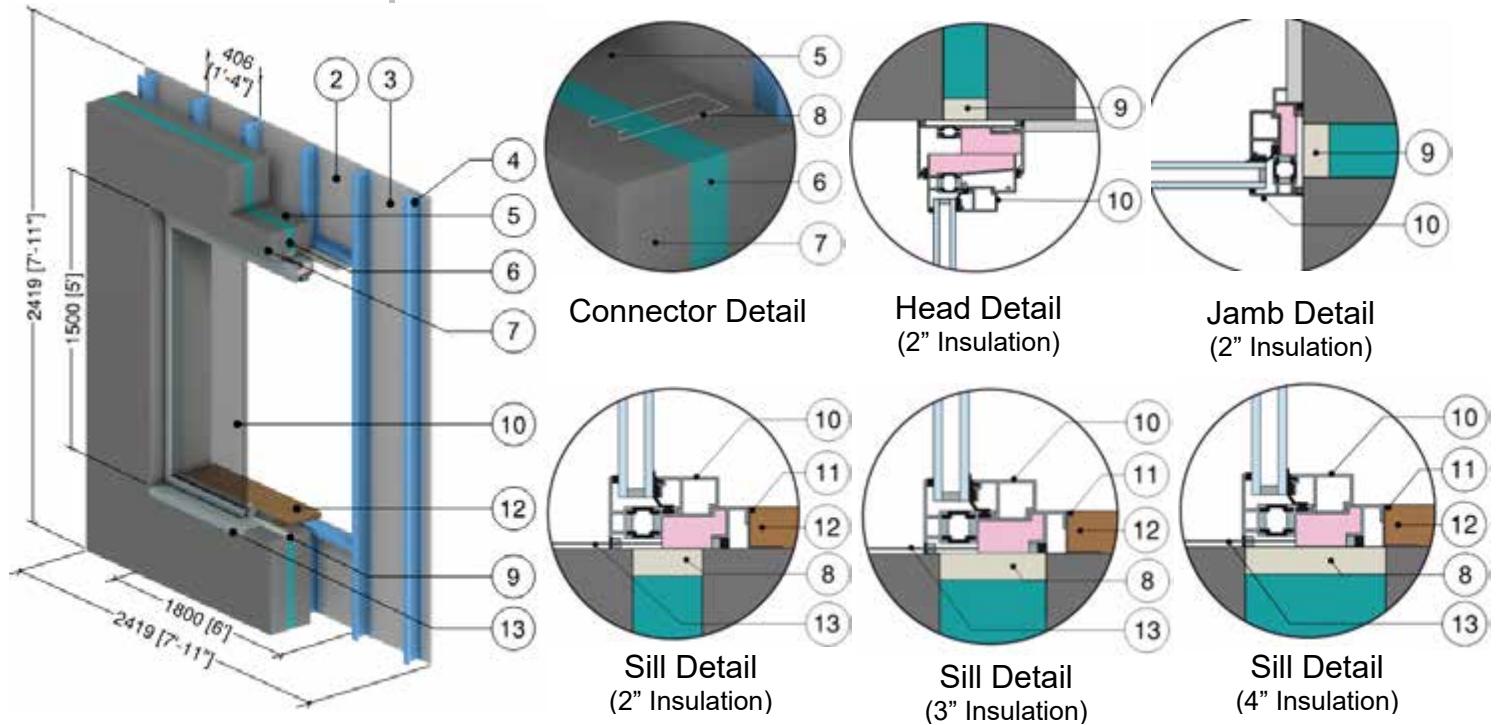
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Spray Foam Insulation	2" (51)	0.17 (0.024)	R-12 (2.11 RSI)	2.4 (39)	0.35 (1470)
6	5-Wythe Brick Wall	21" (540)	6.24 (0.9)	R-3.4 (0.60 RSI)	120 (1920)	0.19 (720)
7	Wood Sill	1 1/4" (32)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
8	Aerogel Blanket	0.4" (10)	0.1 (0.015)	-	-	-
9	Sill Angle	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
10	6' (1.9 m) x 4' (1.2 m) Aluminum window: double glazed IGU U _{IGU} = 0.321 Btu/hr ft ² °F (1.82 W/m ² K)					
11	Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 7.3.20

Precast Sandwich Panel Wall Assembly with PVC at Panel Perimeter, Steel Connectors at 24" (o.c.), and 3 5/8" Steel Stud (16" o.c.) – Window Intersection



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	4.7" (120)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" Steel Studs with Metal Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Precast Sandwich Panel, Interior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Precast Sandwich Panel, Insulation	Varies	-	R-10 to R-20 (1.76 RSI to 3.52 RSI)	1.8 (28)	0.29 (1220)
7	Precast Sandwich Panel, Exterior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Precast Sandwich Panel, Steel Connectors @ 24" (610) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	PVC Foam Perimeter Thermal Break	1" (25)	0.42 (0.06)	-	14 (223)	0.45 (1884)
10	1.5m (H) x 1.2m (W) Aluminum window: double glazed & thermally broken ²					
11	Sill Angle	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
13	Flashing	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

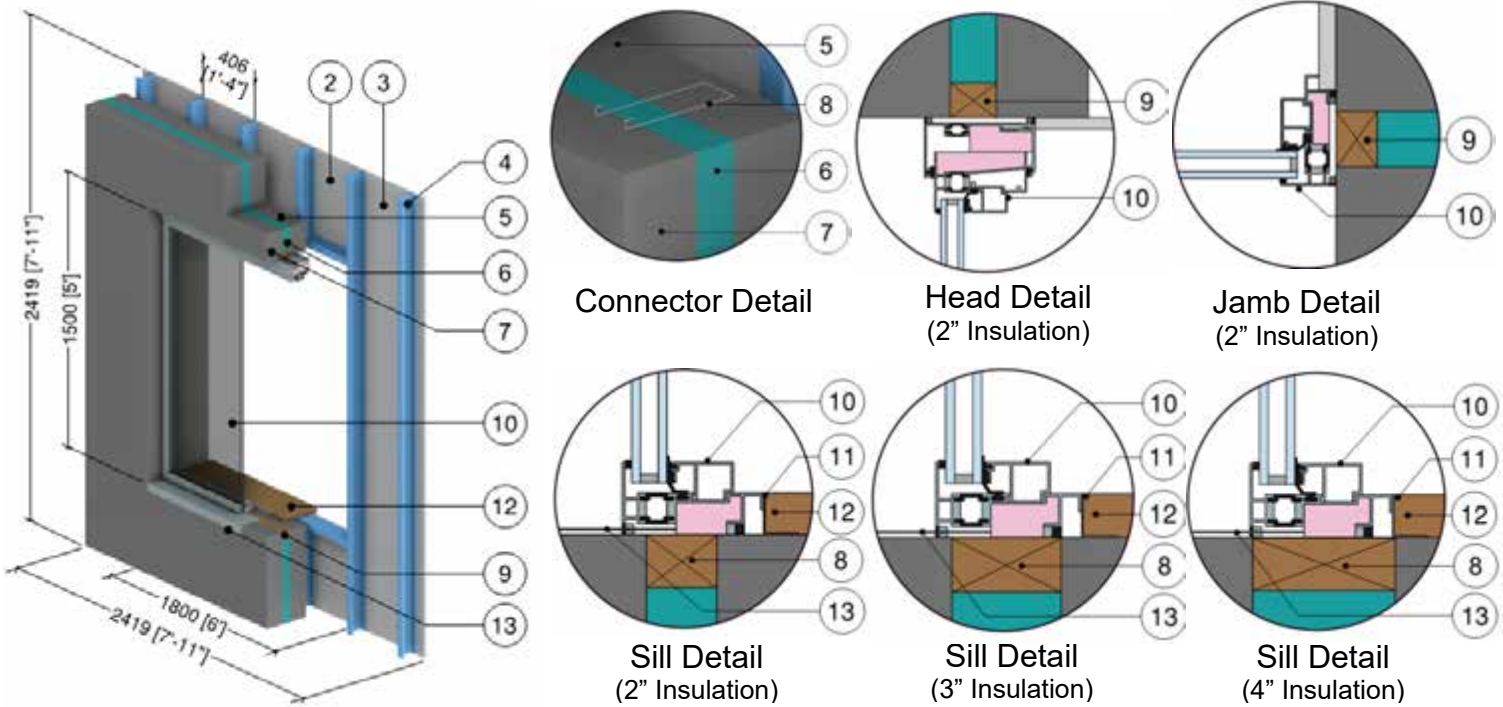
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 7.3.21

Precast Sandwich Panel Wall Assembly with Wood at Panel Perimeter, Steel Connectors at 24" (o.c.), and 3 5/8" Steel Stud (16" o.c.) – Window Intersection



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	4.7" (120)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" Steel Studs with Metal Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Precast Sandwich Panel, Interior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Precast Sandwich Panel, Insulation	Varies	-	R-10 to R-20 (1.76 RSI to 3.52 RSI)	1.8 (28)	0.29 (1220)
7	Precast Sandwich Panel, Exterior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Precast Sandwich Panel, Steel Connectors @ 24" (610) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Wood Perimeter Thermal Break	1 1/2" (38)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
10	1.5m (H) x 1.2m (W) Aluminum window: double glazed & thermally broken ²					
11	Sill Angle	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
13	Flashing	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

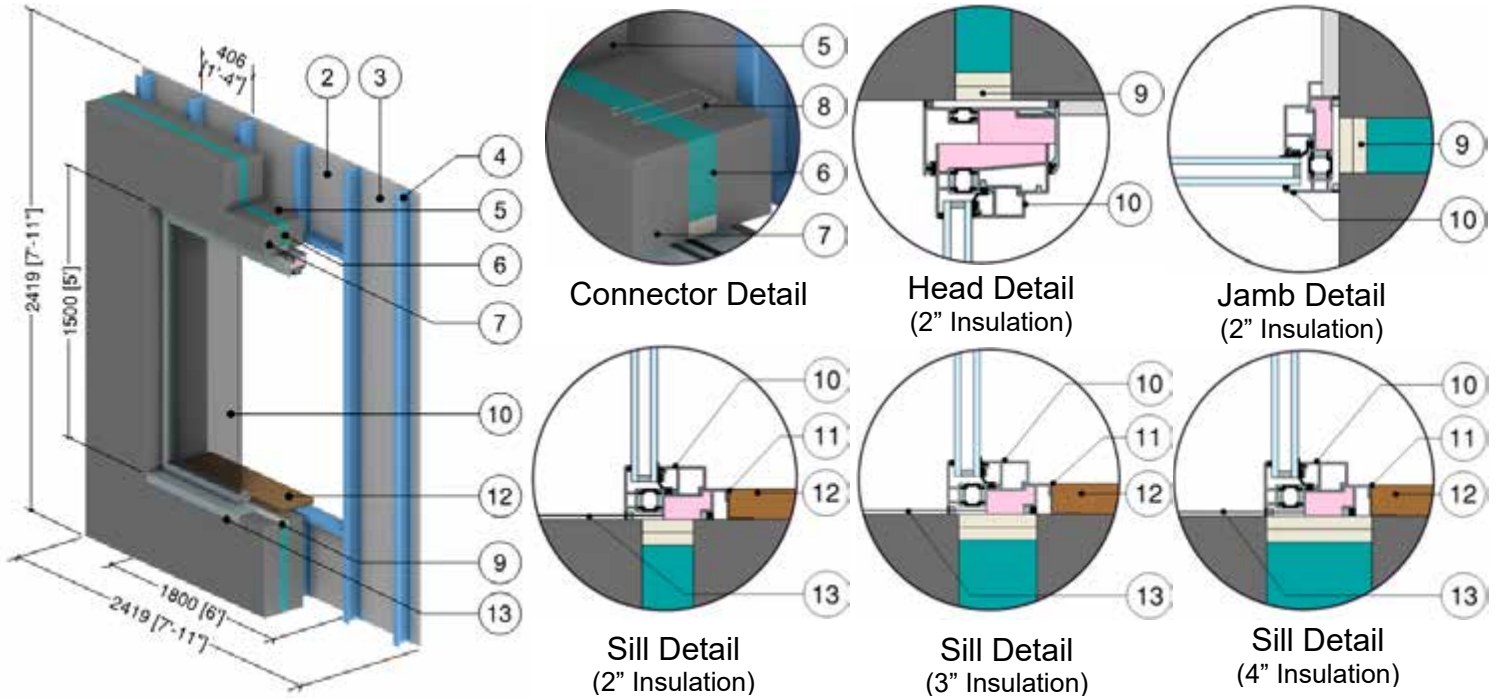
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 7.3.22

Precast Sandwich Panel Wall Assembly with Gypsum Board at Panel Perimeter, Steel Connectors at 24" (o.c.), and 3 5/8" Steel Stud (16" o.c.) – Window Intersection



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	4.7" (120)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" Steel Studs with Metal Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Precast Sandwich Panel, Interior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Precast Sandwich Panel, Insulation	Varies	-	R-10 to R-20 (1.76 RSI to 3.52 RSI)	1.8 (28)	0.29 (1220)
7	Precast Sandwich Panel, Exterior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Precast Sandwich Panel, Steel Connectors @ 24" (610) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Gypsum Perimeter Thermal Break (2 layers)	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
10	1.5m (H) x 1.2m (W) Aluminum window: double glazed & thermally broken ²					
11	Sill Angle	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
13	Flashing	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

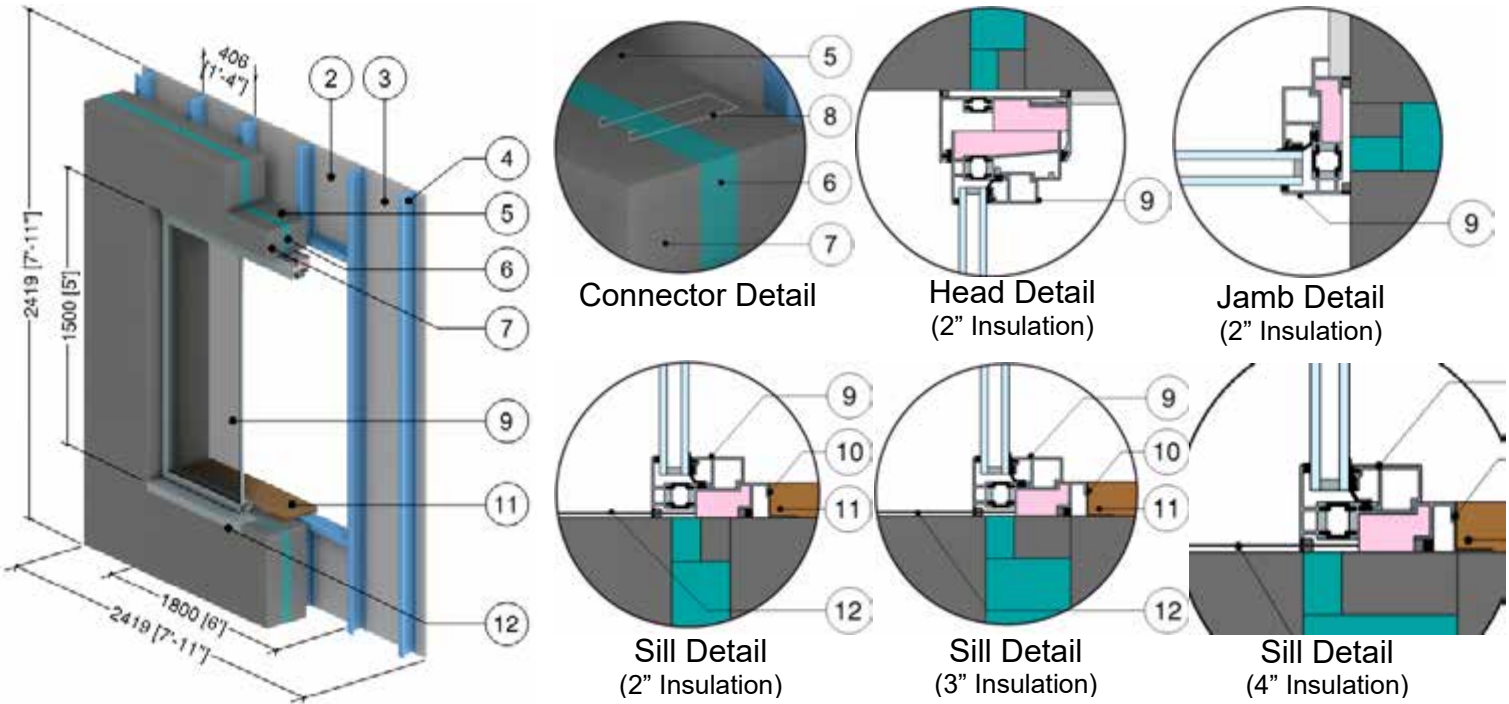
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 7.3.23

Precast Sandwich Panel Wall Assembly, Steel Connectors at 24" (o.c.), and 3 5/8" Steel Stud (16" o.c.) – Window Intersection



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	4.7" (120)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" Steel Studs with Metal Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Precast Sandwich Panel, Interior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Precast Sandwich Panel, Insulation	Varies	-	R-10 to R-20 (1.76 RSI to 3.52 RSI)	1.8 (28)	0.29 (1220)
7	Precast Sandwich Panel, Exterior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Precast Sandwich Panel, Steel Connectors @ 24" (610) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	1.5m (H) x 1.2m (W) Aluminum window: double glazed & thermally broken ²					
10	Sill Angle	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
12	Flashing	14 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

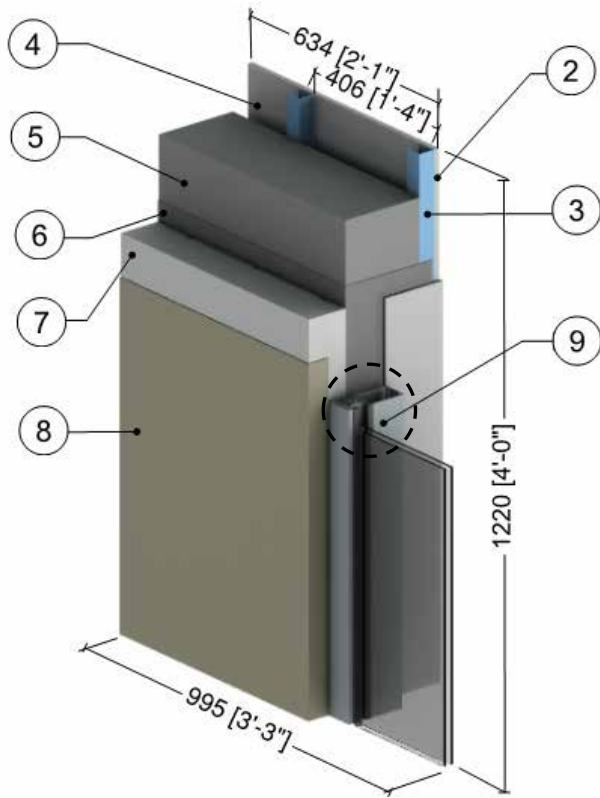
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 7.4.1

Exterior Insulated Concrete Drained EIFS Wall Assembly – Conventional Curtain Wall Transition



Curtain Wall Jamb Detail

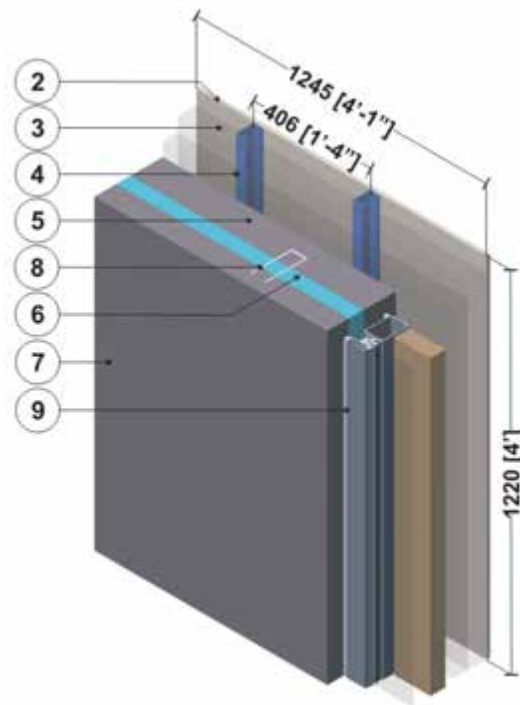
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (30)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs (16" o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Concrete Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	4" (100)	0.27 (0.039)	R-15 (2.64 RSI)	1 (16)	0.35 (1470)
8	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
9	Conventional curtain wall system: double glazed with minimal thermal break ² , double glazed IGU U _{IGU} = 0.32 BTU/hrft ² F (1.82 W/m ² K)					
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 7.4.2

Precast Sandwich Panel Wall Assembly with 3 5/8" Steel Stud (16" o.c.) – Curtain Wall Spandrel Transition



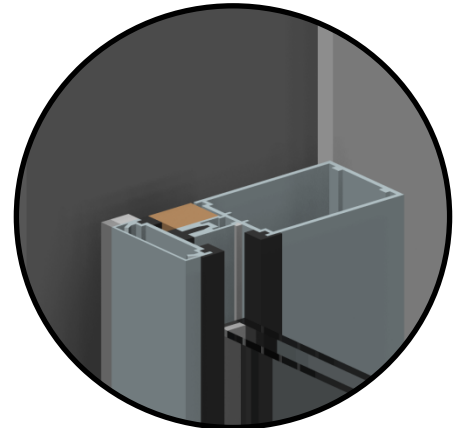
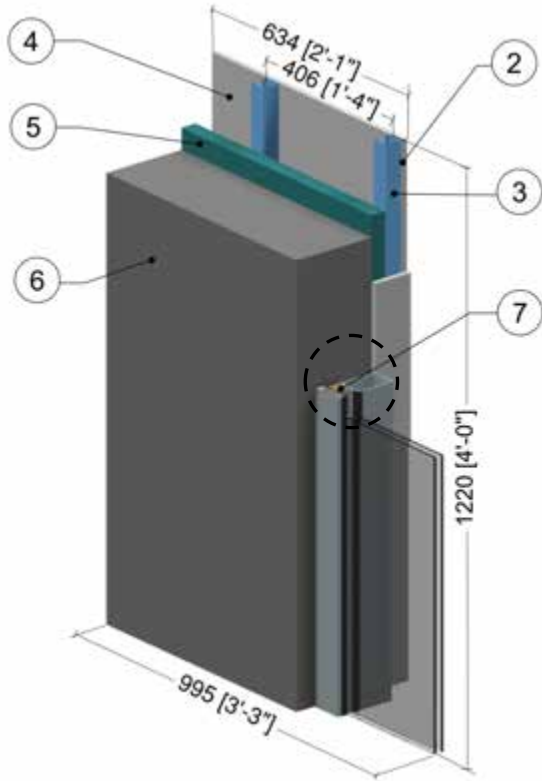
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	5 5/8" (143)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" Steel Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Precast Sandwich Panel, Interior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Precast Sandwich Panel, Insulation	2" (50)	-	R-10 (1.8 RSI)	1.8 (28)	0.29 (1220)
7	Precast Sandwich Panel, Exterior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Precast Sandwich Panel, Structural Ties @ 24" (610) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Conventional curtain wall system with insulated back pan (Pressure plates with minimal thermal break) ²					
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within curtain wall framing was found using ISO 10077-2.

Detail 7.4.3

Interior Insulated Concrete Mass Wall – Conventional Curtain Wall Transition



Curtain Wall Jamb Detail

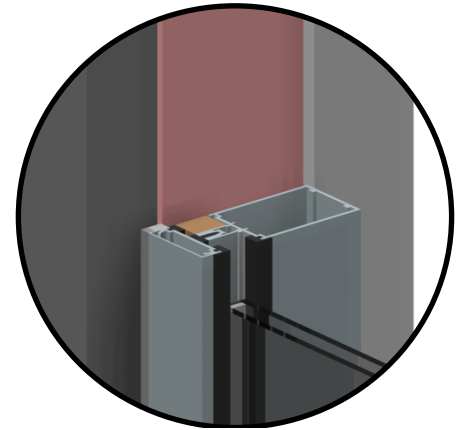
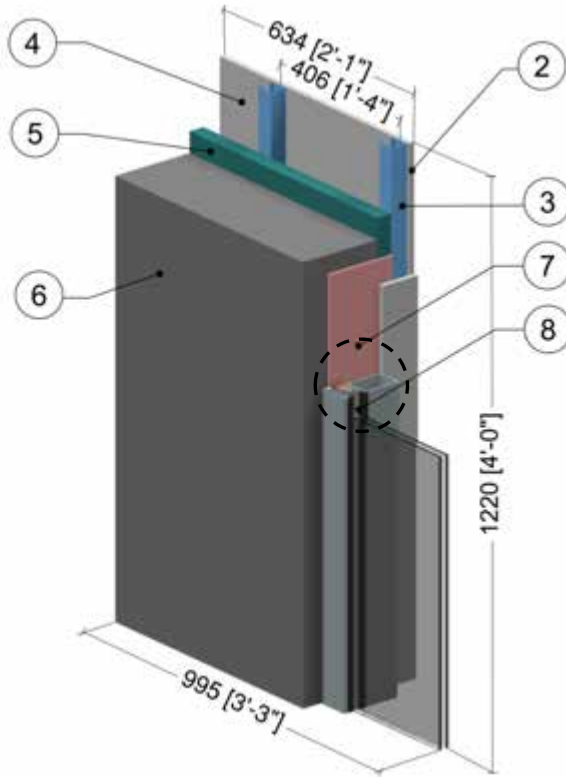
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (30)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs (16" o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Interior Insulation	2" (51)	-	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
6	Concrete Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Conventional curtain wall system: double glazed with minimal thermal break ² , double glazed IGU U _{IGU} = 0.32 BTU/hrft ² F (1.82 W/m ² K)					
8	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 7.4.4

Interior Insulated Concrete Mass Wall – Thermally Broken Curtain Wall Transition



Curtain Wall Jamb Detail

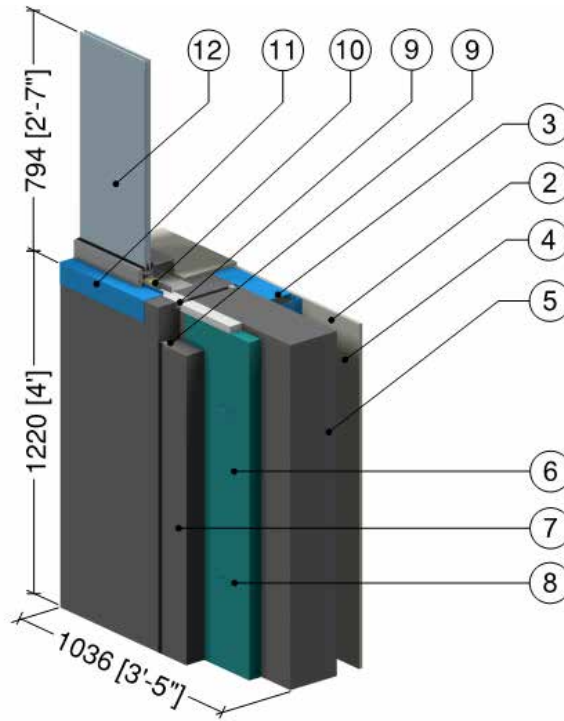
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (30)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs (16" o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Interior Insulation	2" (51)	-	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
6	Concrete Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Aerogel Blanket	0.4" (10)	0.1 (0.015)	R-3.8 (0.67 RSI)	-	-
8	Conventional curtain wall system: double glazed with minimal thermal break ² , double glazed IGU U _{IGU} = 0.32 BTU/hrft ² F (1.82 W/m ² K)					
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 7.4.5

Precast Sandwich Panel Wall Assembly – Tigerloc Thermally Broken Curtain Wall Transition



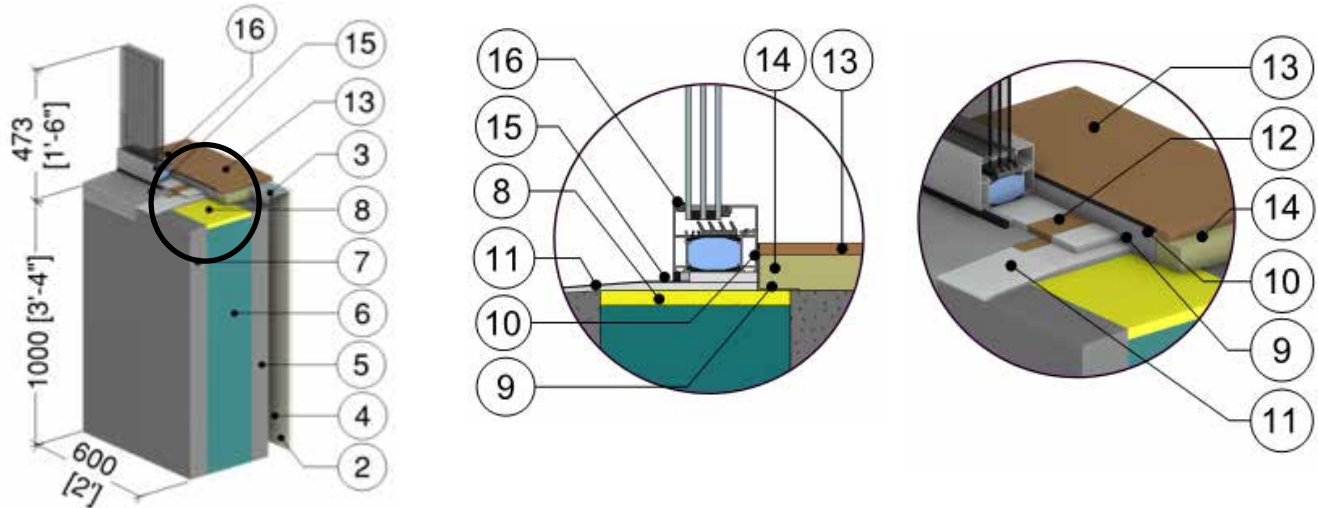
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	4 1/8" (130)	-	R-0.9 (RSI-0.16)	0.075 (1.2)	0.24 (1000)
5	Precast Sandwich Panel, Interior Concrete Panel	7 3/4" (197)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Precast Sandwich Panel Insulation	2" to 4" (51 to 102)	-	R-10 to R-20 (1.8 RSI to 3.5 RSI)	1.8 (28)	0.29 (1220)
7	Precast Sandwich Panel, Exterior Concrete Panel	3" (76)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Precast Sandwich Panel, Structural Ties @ 24" (610) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Tigerloc, PVC Foam	1" (25)	0.42 (0.06)	-	-	-
10	Mineral Wool Sill Insulation	-	0.24 (0.034)	-	4 (64)	0.20 (850)
11	Sill Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Conventional curtain wall system with insulated back pan (Pressure plates with minimal thermal break) ²					
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 7.4.6

Highly Insulated Precast Concrete Sandwich Panel Wall Assembly – High Performance Aluminum Window Sill Detail



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI) to R-1.1 (0.2 RSI)	-	-
2	Gypsum Board	5/8" (15)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Precast Sandwich Panel, Interior Concrete Panel	3" (76)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Precast Sandwich Panel Insulation	8" (203)	-	R-40 (7.04 RSI) to R-56 (9.86 RSI)	1.8 (28)	0.29 (1220)
7	Precast Sandwich Panel, Exterior Concrete Panel	3" (76)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Exterior Gypsum Closure	5/8" (15)	1.1 (0.16)	-	50 (800)	0.26 (1090)
9	Angle	-	430 (62)	-	489 (7830)	0.12 (500)
10	Sealant	-	1.73 (0.25)	-	-	-
11	Sill Insulation Below Frame, Spray Foam or Aerogel	-	0.167 (0.024) to 0.1 (0.014)	-	2.4 (39)	0.35 (1470)
12	Shims	-	0.69 (0.1)	-	-	-
13	Wood Sill	1/2" (13)	0.69 (0.1)	-	31 (500)	0.45 (1880)
14	Sill Insulation Behind Frame, Mineral Wool	-	0.238 (0.034)	-	4 (64)	0.20 (850)
15	Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
16	Raico Frame+ Aluminum Frame, triple glazed thermally broken window triple glazed IGU U _{IGU} = 0.12 Btu/hr·ft ² ·°F (0.7 W/m ² K) ²					
17	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

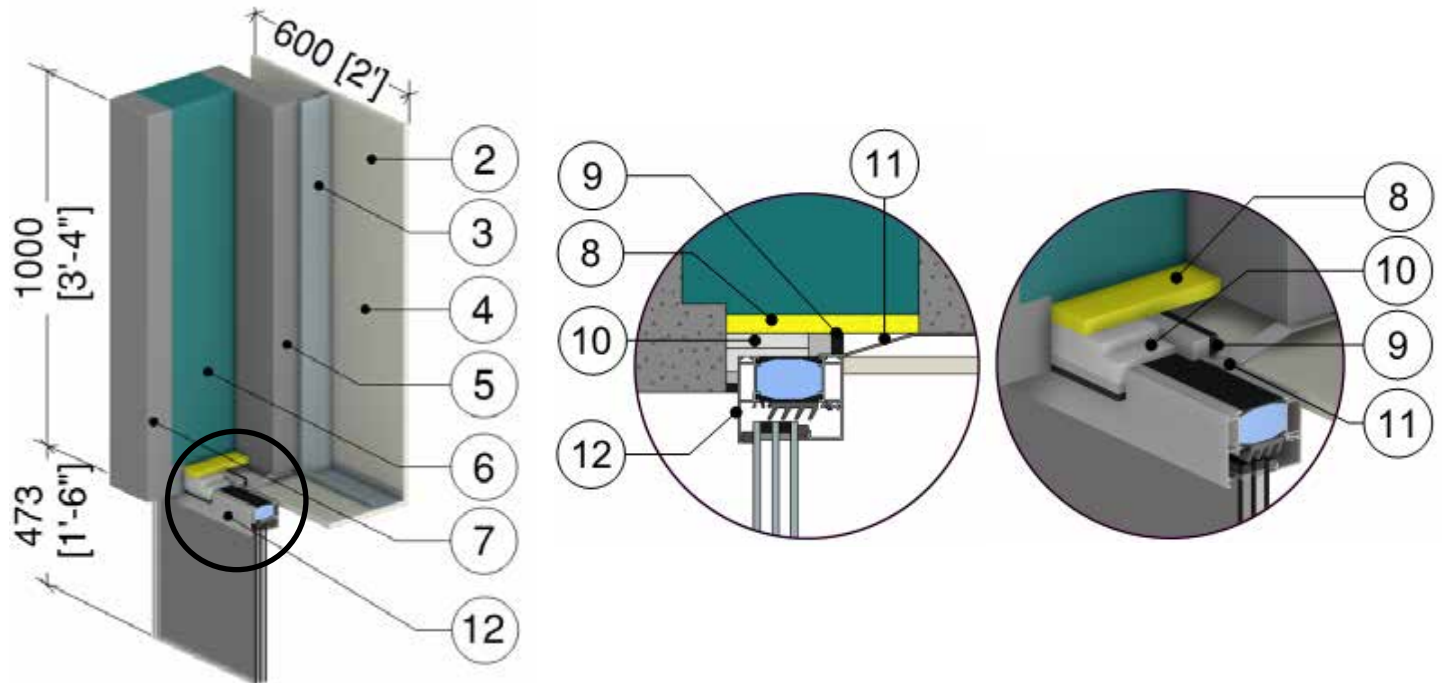
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of airspaces within framing was found using ISO 100077-2



Detail 7.4.7

Highly Insulated Precast Concrete Sandwich Panel Wall Assembly – High Performance Aluminum Window Head Detail



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI) to R-1.1 (0.2 RSI)	-	-
2	Gypsum Board	5/8" (15)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Precast Sandwich Panel, Interior Concrete Panel	3" (76)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Precast Sandwich Panel Insulation	8" (203)	-	R-40 (7.04 RSI) to R-56 (9.86 RSI)	1.8 (28)	0.29 (1220)
7	Precast Sandwich Panel, Exterior Concrete Panel	3" (76)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Exterior Gypsum Closure	5/8" (15)	1.1 (0.16)	-	50 (800)	0.26 (1090)
9	Sealant	-	1.73 (0.25)	-	-	-
10	Opening Insulation, Spray Foam or Aerogel	-	0.167 (0.024) to 0.1 (0.014)	-	2.4 (39)	0.35 (1470)
11	Window Straps	-	430 (62)	-	489 (7830)	0.12 (500)
12	Raico Frame+ Aluminum Frame, triple glazed thermally broken window triple glazed IGU U _{IGU} = 0.12 Btu/hr·ft ² ·°F (0.7 W/m ² K) ²					
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

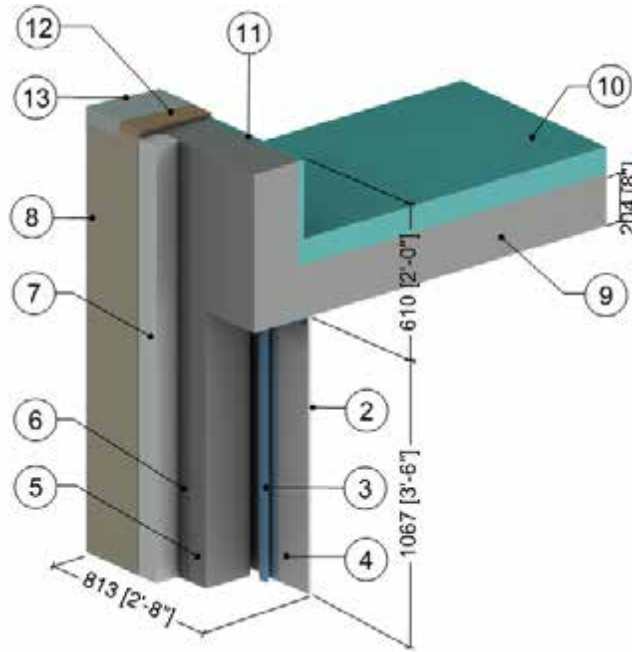
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of airspaces within framing was found using ISO 10077-2



Detail 7.5.1

Exterior Insulated Concrete Drained EIFS Wall Assembly – Concrete Parapet & Slab Intersection

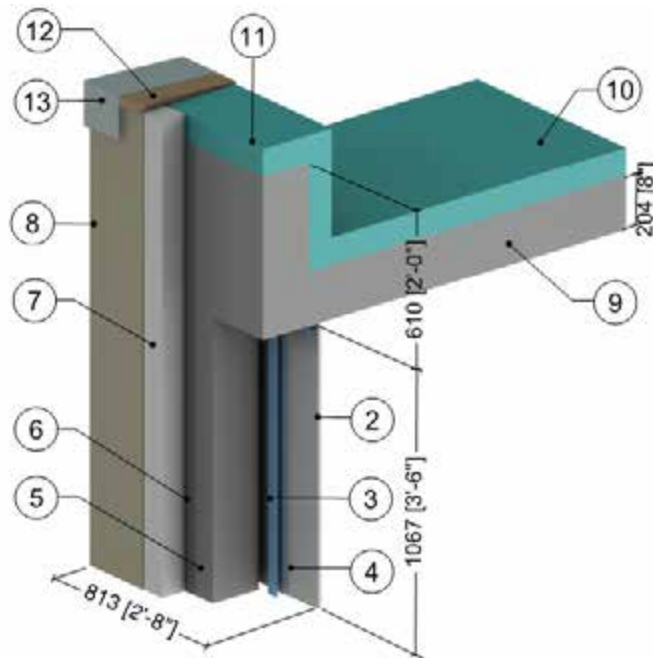


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Concrete Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	4" (100)	0.27 (0.039)	R-15 (2.64 RSI)	1 (16)	0.35 (1470)
8	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
9	Concrete Slab & Parapet	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Roof Insulation	4" (100)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
11	Parapet Insulation	1" (25)	-	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
12	Wood Blocking	5/8" (16)	0.63 (0.09)	-	27.8 (445)	0.45 (1880)
13	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
14	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.5.2

Exterior Insulated Concrete Drained EIFS Wall Assembly – Insulated Concrete Parapet & Slab Intersection

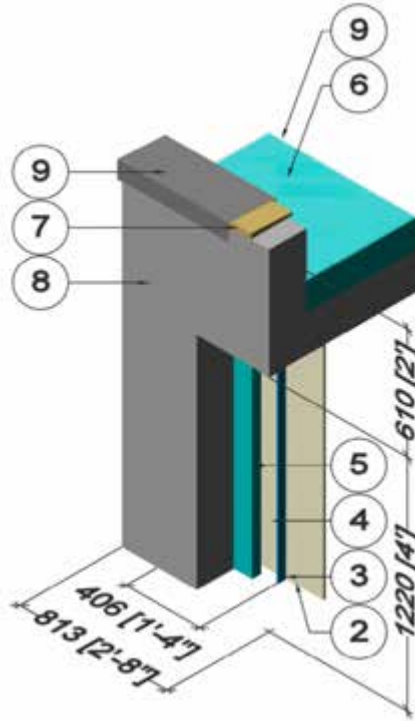


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs (16"o.c.) with Top Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Concrete	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	4" (100)	0.27 (0.039)	R-15 (2.64 RSI)	1 (16)	0.35 (1470)
8	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
9	Concrete Slab & Parapet	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Roof Insulation	4" (100)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
11	Parapet Insulation	Varies	-	R-10 to R-20 (1.76 RSI to 3.52 RSI)	1.8 (28)	0.29 (1220)
12	Wood Blocking	5/8" (16)	0.63 (0.09)	-	27.8 (445)	0.45 (1880)
13	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
14	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.5.3

Interior Insulated Concrete Mass Wall with 1 5/8" Steel Stud (16" o.c.) Supporting Interior Finish – Concrete Parapet & Roof Intersection



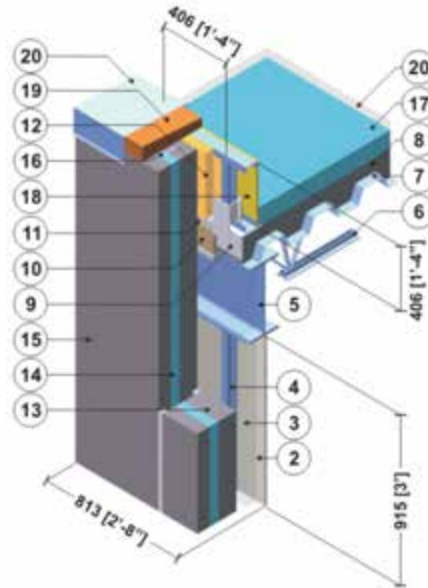
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" Steel Studs with Top Tracks	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (42)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Interior Insulation	2" (51)	0.2 (0.03)	R-11 (1.9 RSI)	1.8 (28)	0.29 (1220)
6	Roof Insulation	4" (102)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
7	Wood Blocking	5/8" (16)	0.63 (0.09)	-	27.8 (445)	0.45 (1880)
8	Concrete Slab & Parapet	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Metal cap flashing/ finish roof material is incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 7.5.4

Precast Sandwich Panel Wall Assembly with 3 5/8" Steel Stud (16" o.c.) – Steel Roof Deck with Open Web Steel Joist & Parapet Intersection



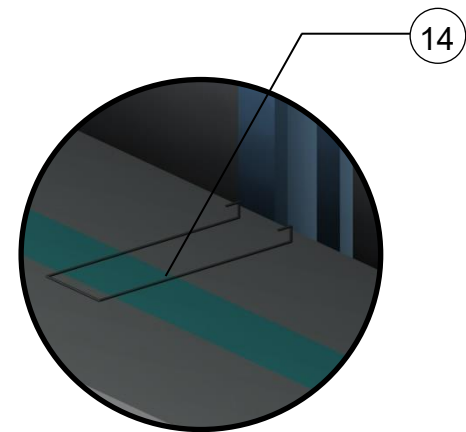
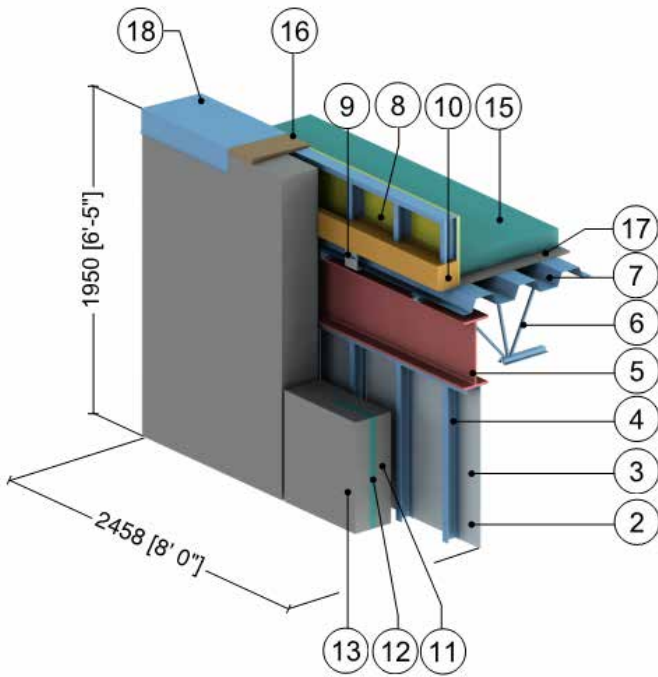
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	5 5/8" (143)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Steel Beam (W410)	-	347 (50)	-	489 (7830)	0.12 (500)
6	Open Web Steel Joist (550C)	-	347 (50)	-	489 (7830)	0.12 (500)
7	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
8	Concrete Topping	6" (152)	6.3 (0.9)	-	120 (1920)	0.20 (850)
9	Gravity and Slot Anchors at Slab	-	347 (50)	-	489 (7830)	0.12 (500)
10	Semi Rigid Insulation	1" (25)	0.28 (0.04)	R-3.6 (0.64 RSI)	4.5 (72)	0.17 (710)
11	Silicone Sealant	-	2.4 (0.35)	-	-	-
12	Spray Foam Insulation	2" (51)	0.17 (0.025)	R-11.5 (2.0 RSI)	2.8 (39)	0.35 (1470)
13	Precast Sandwich Panel, Interior Concrete Panel	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
14	Precast Sandwich Panel, Insulation	2" (51)	-	R-10 (1.8 RSI)	1.8 (28)	0.29 (1220)
15	Precast Sandwich Panel, Exterior Concrete Panel	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
16	Precast Sandwich Panel, Structural Ties @ 24" (610) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
17	Roof Insulation	4" (102)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
18	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
19	Wood Blocking	5/8" (16)	0.63 (0.09)	-	27.8 (445)	0.45 (1880)
20	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
21	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 7.5.5

Precast Sandwich Panel – Steel Roof Deck with Open Web Steel Joist & Parapet Intersection



Connector Detail

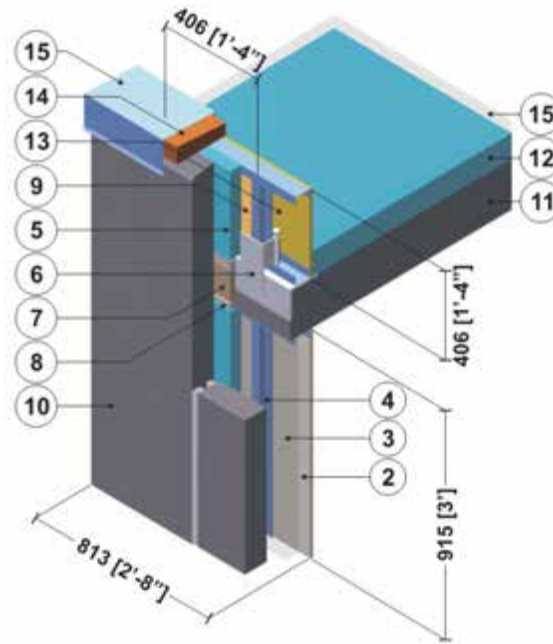
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	5 5/8" (143)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Steel Beam (W410)	-	347 (50)	-	489 (7830)	0.12 (500)
6	Open Web Steel Joist (550C)	-	347 (50)	-	489 (7830)	0.12 (500)
7	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
8	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
9	Gravity and Slot Anchors at Slab	-	347 (50)	-	489 (7830)	0.12 (500)
10	Polyurethane Foam Insulation	5 2/3" (144)	0.17 (0.024)	R-34 (6.0 RSI)	2.8 (30)	0.35 (1470)
11	Precast Sandwich Panel, Interior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Precast Sandwich Panel, Insulation	2" (51)	-	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
13	Precast Sandwich Panel, Exterior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
14	Precast Sandwich Panel, Steel Structural Ties @ 24" (610) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
15	Roof Insulation	4" (102)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
16	Wood Blocking	5/8" (16)	0.69 (0.10)	-	31 (500)	0.45 (1880)
17	Roof Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
18	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
19	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 7.5.6

Precast Wall Assembly with 3 5/8" x 1 5/8" Steel Stud (16" o.c.) and Rigid Insulation Outboard of Studs – Parapet & Roof Intersection

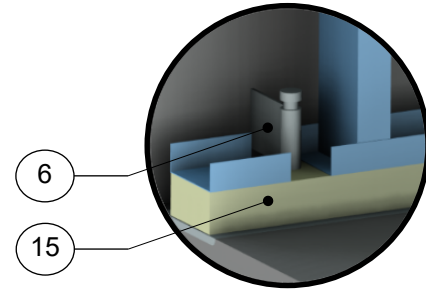
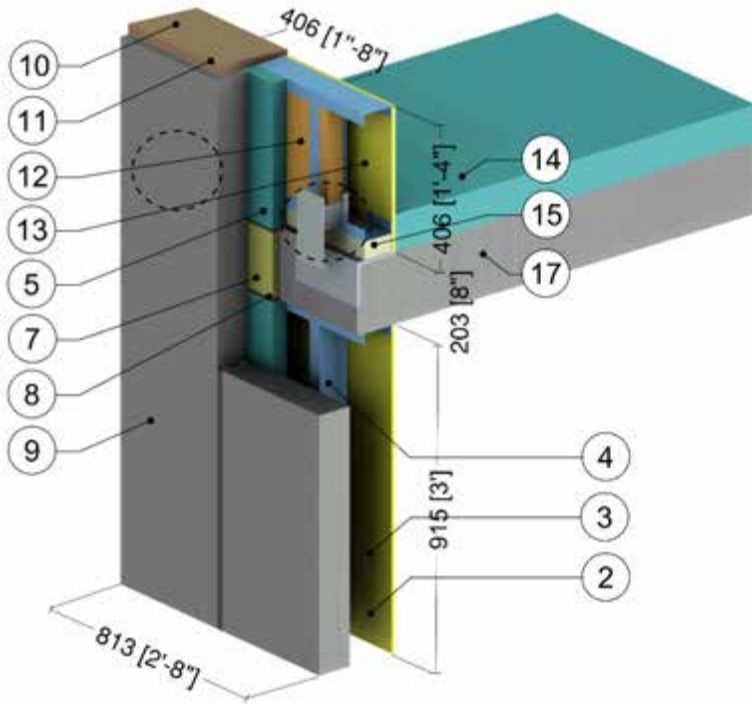


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Rigid Insulation	2" (51)	-	R-10 (1.8 RSI)	1.8 (28)	0.29 (1220)
6	Gravity and Slot Anchors at Roof	-	347 (50)	-	489 (7830)	0.12 (500)
7	Semi Rigid Insulation	1" (25)	0.28 (0.04)	R-3.6 (0.64 RSI)	4.5 (72)	0.17 (710)
8	Silicone Sealant	-	2.4 (0.35)	-	-	-
9	Spray Foam Insulation	1" (25)	0.17 (0.025)	R-5.8 (1.02 RSI)	2.8 (39)	0.35 (1470)
10	Precast Wall Panel	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Roof Insulation	4" (102)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
13	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
14	Wood Blocking	5/8" (16)	0.63 (0.09)	-	27.8 (445)	0.45 (1880)
15	Flashing & roof finish materials are incorporated into exterior heat transfer coefficient					
16	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

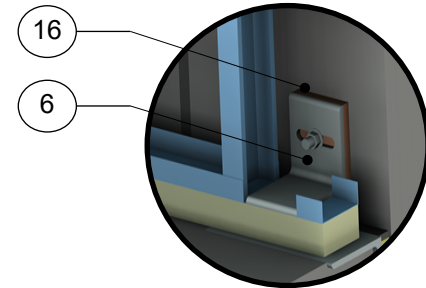
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.5.7

Precast Wall Assembly with 3 5/8" x 1 5/8" Steel Stud (16" o.c.) and Rigid Insulation Outboard of Studs – Parapet & Roof Intersection with Thermal Break under Parapet Stud Cavity and At Anchors



Gravity Anchor Detail



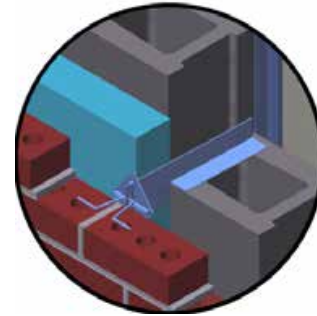
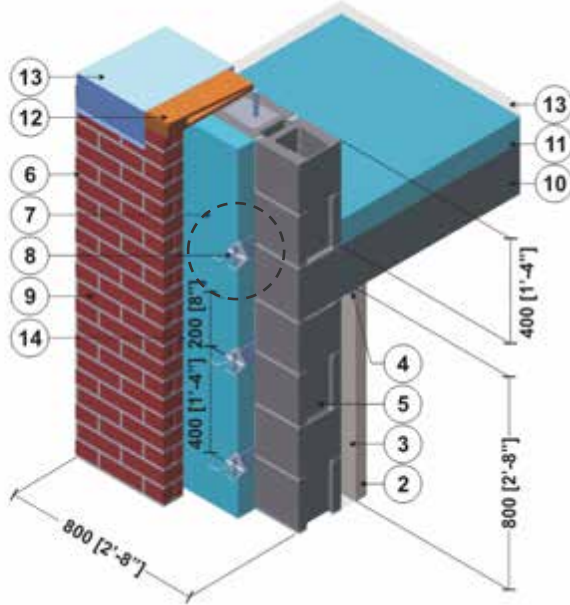
Slot Anchor Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Rigid Insulation	2" (51)	-	R-10 (1.8 RSI)	1.8 (28)	0.29 (1220)
6	Gravity and Slot Anchors at Roof	-	347 (50)	-	489 (7830)	0.12 (500)
7	Semi Rigid Insulation	1" (25)	0.28 (0.04)	R-3.6 (0.64 RSI)	4.5 (72)	0.17 (710)
8	Silicone Sealant	-	2.4 (0.35)	-	-	-
9	Precast Wall Panel	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Flashing & roof finish materials are incorporated into exterior heat transfer coefficient					
11	Wood Blocking	5/8" (16)	0.63 (0.09)	-	27.8 (445)	0.45 (1880)
12	Spray Foam Insulation	1" (25)	0.17 (0.025)	R-5.8 (1.02 RSI)	2.8 (39)	0.35 (1470)
13	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
14	Roof Insulation	4" (102)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
15	Armatherm 500	2" (50)	0.32 (0.05)	R-6.2 (1.09 RSI)	-	-
16	Armatherm FRR	3/8" (10)	1.4 (0.20)	-	85 (5.3)	-
17	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
18	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.5.8

Exterior Insulated Concrete Block Wall Assembly with Masonry Ties Supporting Brick Veneer – Parapet & Roof Intersection



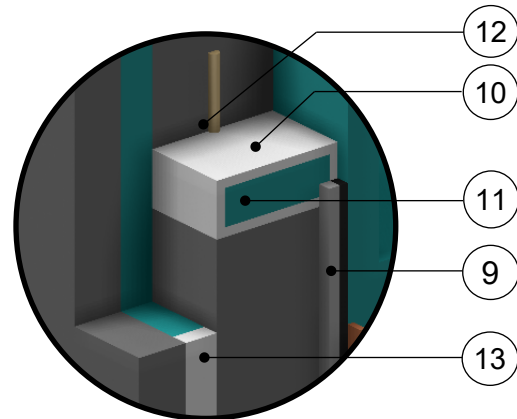
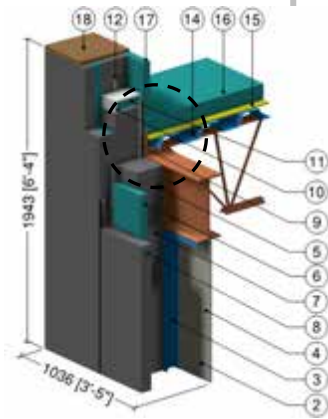
Brick Tie Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" Steel Studs with Metal Tracks	20 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Standard Concrete Block	7 5/8" (190)	3.5 (0.5)	-	119 (1900)	0.19 (800)
6	Cement Mortar	-	3.5 (0.5)	-	113 (1800)	0.12 (500)
7	Insulation	Varies	-	R-5 to R-25 (0.88 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
8	Masonry Ties @ 16" (406) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Roof Insulation	4" (102)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
12	Wood Blocking	5/8" (16)	0.63 (0.09)	-	27.8 (445)	0.45 (1880)
13	Flashing & roof finish materials are incorporated into exterior heat transfer coefficient					
14	Air Gap	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.5.9

Precast Sandwich Panel – Steel Roof Deck with Open Web Steel Joist & Paroloc Thermally Broken Parapet Intersection

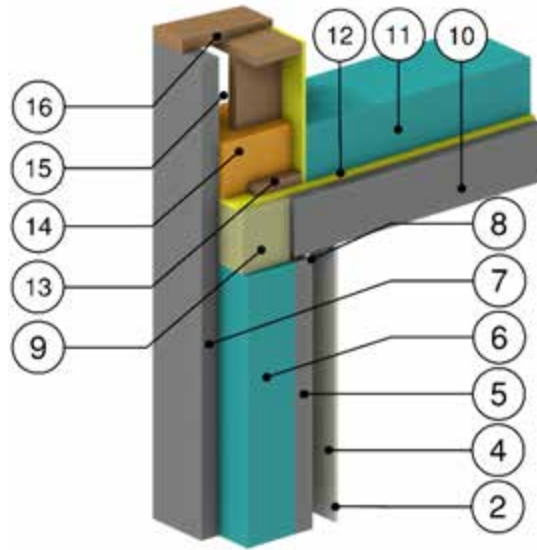


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	4 1/8" (130)	-	R-0.9 (RSI-0.16)	0.075 (1.2)	0.24 (1000)
5	Precast Sandwich Panel, Interior Concrete Panel	7 3/4" (197)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Precast Sandwich Panel Insulation	2" to 4" (51 to 102)	-	R-10 (1.8 RSI) to R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
7	Precast Sandwich Panel, Exterior Concrete Panel	3" (76)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Precast Sandwich Panel, Structural Ties @ 24" (610) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Silicone Sealant	-	1.7 (0.25)	-	-	-
10	Paraloc, PVC Foam	1/2" (13)	0.42 (0.06)	-	-	-
11	Paraloc, Insulation	2" to 4" (51 to 102)	-	R-10 to R-20 (1.8 RSI to 3.5 RSI)	1.8 (28)	0.29 (1220)
12	FRP rebar @ 10" (254) o.c.	#5 (16M)	2.4 (0.35)	-	-	-
13	Tigerloc, PVC Foam	1" (25)	0.42 (0.06)	-	-	-
14	Open Web Steel Joist, Beam, Angle, and Deck	-	347 (50)	-	489 (7830)	0.12 (500)
15	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.1 RSI)	50 (800)	0.26 (1090)
16	Roof Insulation	4" (102)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
17	Parapet Insulation	2" to 4" (51 to 102)	-	R-10 to R-20 (1.8 RSI to 3.5 RSI)	1.8 (28)	0.29 (1220)
18	Wood Blocking	5/8" (16)	0.63 (0.09)	-	27.8 (445)	0.45 (1880)
19	Flashing and roof finish material are incorporated into exterior heat transfer coefficient					
20	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.5.10

Highly Insulated Precast Concrete Sandwich Panel Wall Assembly – Roof to Wall Intersection with Wood-Framed Parapet



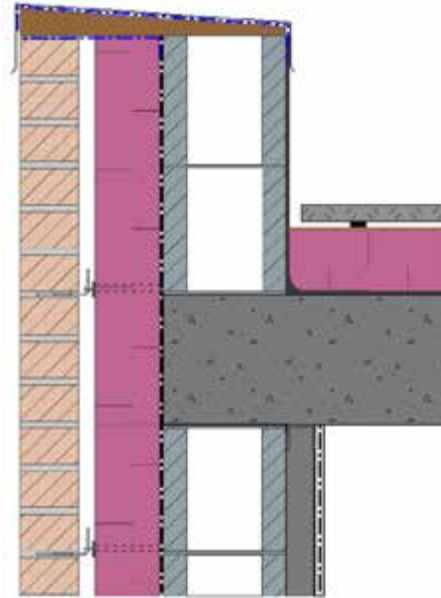
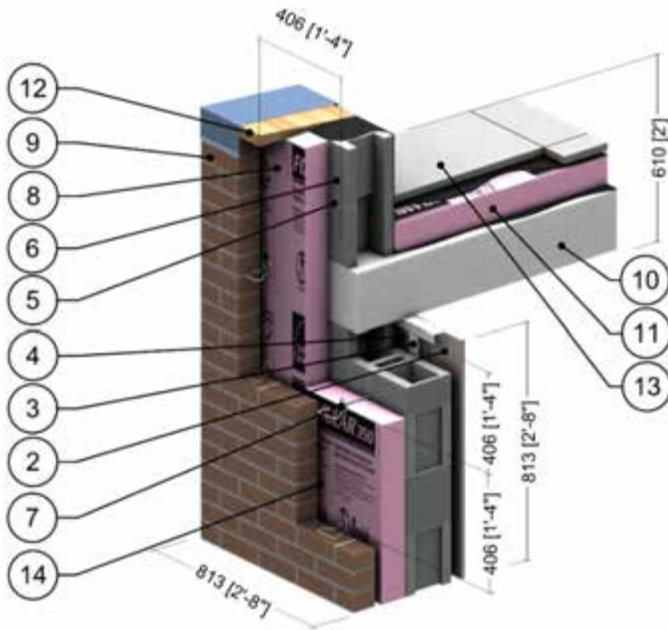
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (15)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Precast Sandwich Panel, Interior Concrete Panel	3" (76)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Precast Sandwich Panel Insulation	8" (203)	-	R-40 (7.04 RSI) to R-56 (9.86 RSI)	1.8 (28)	0.29 (1220)
7	Precast Sandwich Panel, Exterior Concrete Panel	3" (76)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Sealant	-	1.73 (0.25)	-	-	-
9	Mineral Wool Slab Insulation	8" (203)	0.238 (0.034)	R-33.6 (5.92 RSI)	4 (64)	0.20 (850)
10	Concrete Roof Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Roof Insulation	8" (203)	0.167 (0.024)	R-48 (8.45 RSI)	1.8 (28)	0.29 (1220)
12	Exterior Gypsum	5/8" (15)	12.5 (1.8)	-	140 (2250)	0.20 (850)
13	2x8 Wood Stud (16" o.c.)	7 1/4" (184)	0.69 (0.1)	-	31 (500)	0.45 (1880)
14	Spray Foam Insulation in Parapet Cavity	8" (203)	0.167 (0.024)	-	2.4 (39)	0.35 (1470)
15	Air in Parapet Cavity	12" (305)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
16	Wood Cap	1" (25)	0.69 (0.1)	-	31 (500)	0.45 (1880)
17	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 7.5.11

Owens Corning Exterior Insulated Concrete Block Wall Assembly with Heckmann Pos-I-Tie Veneer Anchoring System Supporting Brick Veneer – Parapet & Roof Intersection with Uninsulated Parapet

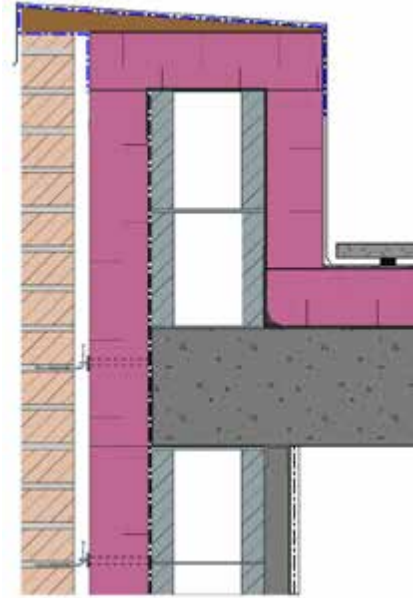
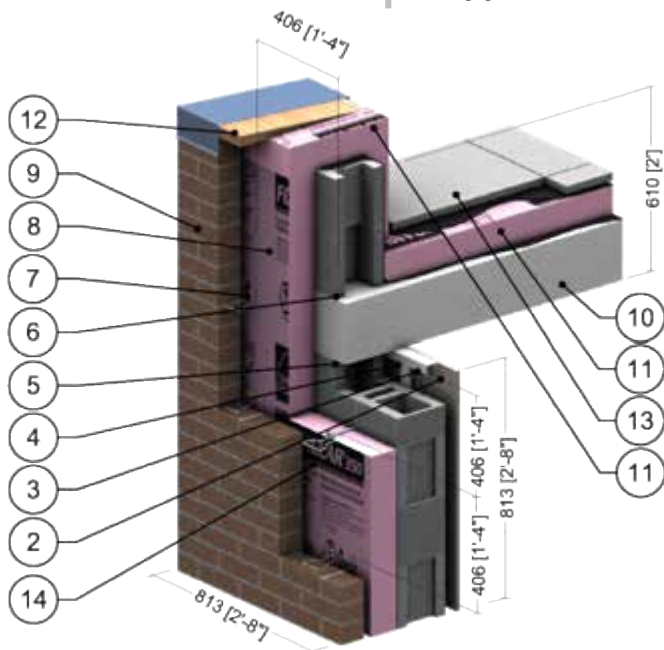


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" Steel Studs with Metal Tracks	20 gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Standard Concrete Block	7 5/8" (190)	3.5 (0.5)	-	119 (1900)	0.19 (800)
6	Cement Mortar	-	3.5 (0.5)	-	113 (1800)	0.12 (500)
7	Heckmann Pos-I-Tie Masonry Tie @ 16" (406) o.c.	varies	-	-	-	-
8	Foamular CodeBord/C-200 Extruded Polystyrene (XPS) Rigid Insulation Type 3	varies	0.20 (0.029)	R-10 to R-20 (1.76 to 3.52 RSI)	1.8 (28)	0.29 (1220)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Foamular XPS Rigid Insulation	4" (102)	0.20 (0.029)	R-20 (3.52 RSI)	1.8 (28)	0.29 (1220)
12	Wood Blocking	5/8" (16)	0.69 (0.10)	R-1.0 (0.18 RSI)	31 (500)	0.45 (1880)
13	Flashing & roof finish materials are incorporated into exterior heat transfer coefficient					
14	Air Gap	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
15	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.5.12

Owens Corning Exterior Insulated Concrete Block Wall Assembly with Heckmann Pos-I-Tie Veneer Anchoring System Supporting Brick Veneer – Parapet & Roof Intersection with Insulation Wrapped Around Parapet

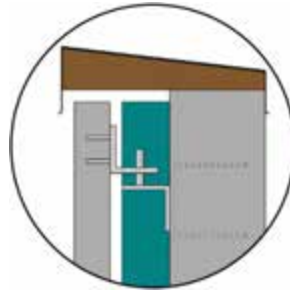
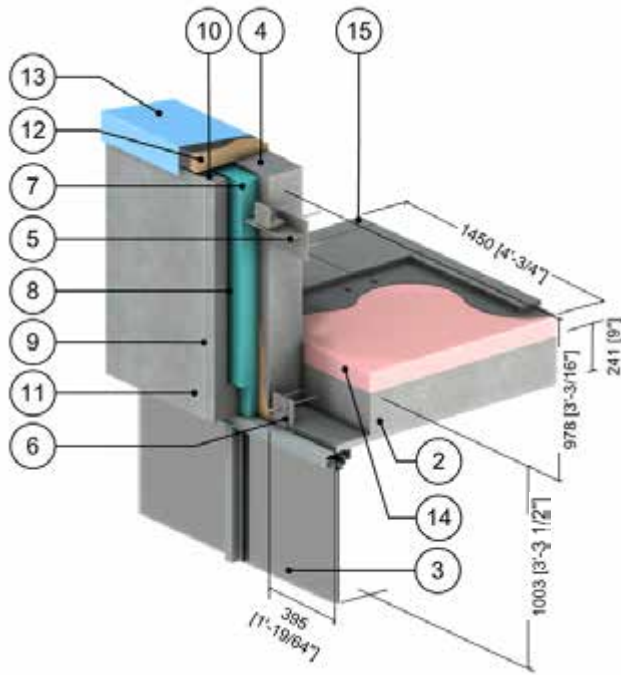


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" Steel Studs with Metal Tracks	20 gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Standard Concrete Block	7 5/8" (190)	3.5 (0.5)	-	119 (1900)	0.19 (800)
6	Cement Mortar	-	3.5 (0.5)	-	113 (1800)	0.12 (500)
7	Heckmann Pos-I-Tie Masonry Tie @ 16" (406) o.c.	varies	-	-	-	-
8	Foamular CodeBord/C-200 Extruded Polystyrene (XPS) Rigid Insulation Type 3	varies	0.20 (0.029)	R-10 to R-20 (1.76 to 3.52 RSI)	1.8 (28)	0.29 (1220)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Foamular XPS Rigid Insulation	4" (102)	0.20 (0.029)	R-20 (3.52 RSI)	1.8 (28)	0.29 (1220)
12	Wood Blocking	5/8" (16)	0.69 (0.10)	R-1.0 (0.18 RSI)	31 (500)	0.45 (1880)
13	Flashing & roof finish materials are incorporated into exterior heat transfer coefficient					
14	Air Gap	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
15	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

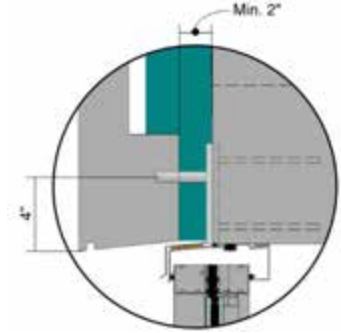
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.5.13

Window Wall System – Double Glazed Insulated Frame at Concrete Precast Panel Parapet & Roof Intersection



Stainless Steel Clip Mount: Bearing Connection Detail¹



Stainless Steel Clip Mount: Lateral Connection Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ²	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Concrete Slab	9 1/2" (241)	12.5 (1.8)	-	140 (2250)	0.20 (850)
3	Aluminum Window Wall Vision System: thermally broken frame ³ , no insulation in mullions, double glazed IGU U _{COG} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
4	Parapet	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
5	Stainless Steel Bearing Clip Mount	Varies	118 (17)	-	500 (8000)	0.12 (500)
6	Stainless Steel Lateral Clip Mount	Varies	118 (17)	-	500 (8000)	0.12 (500)
7	Parapet Rigid Insulation	Varies	0.20 (0.029)	R-10.0 to R-20.0 (1.76 RSI to 3.52 RSI)	1.8 (28)	0.29 (1220)
8	Vented Air Cavity	1" (25)	-	R-0.4 (0.07)	0.075 (1.2)	0.24 (1000)
9	Sealant	-	1.73 (0.25)	-	-	-
10	Backer Rod	-	0.25 (0.036)	-	-	-
11	Concrete Precast Panel	3" (76)	43 (6.2)	-	160 (2560)	0.21 (880)
12	Wood Blocking	5/8" (16)	0.69 (0.10)	R-1.0 (0.18 RSI)	31 (500)	0.45 (1880)
13	Cap Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
14	Roof Insulation	Varies	0.20 (0.029)	R-20 to R-40 (3.52 RSI to 7.04 RSI)	1.8 (28)	0.29 (1220)
15	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
16	Exterior Film ²	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹Cladding mounting hardware horizontal dimension varies equivalent to insulation thickness

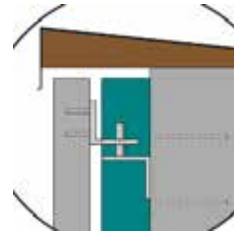
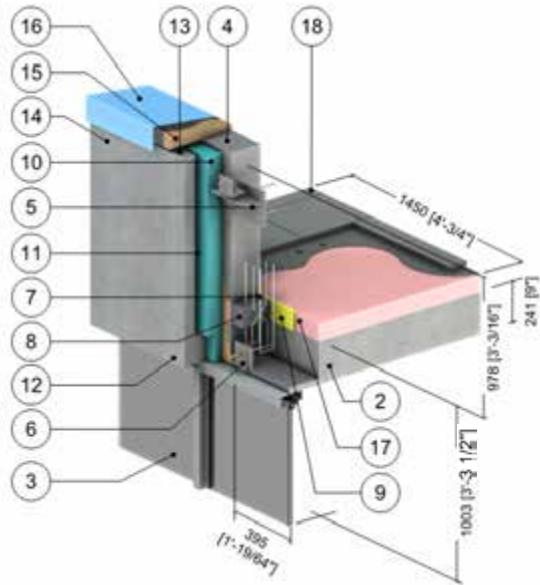
² Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

³The thermal conductivity of air spaces within framing was found using ISO 100077-2

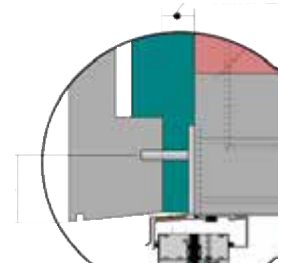


Detail 7.5.14

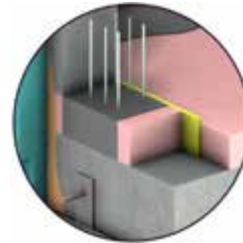
Window Wall System – Double Glazed Insulated Frame at Isokorb AXTI Thermally Broken Concrete Parapet & Roof Intersection



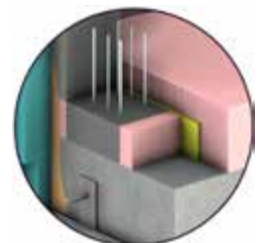
Stainless Steel Clip Mount:
Bearing Connection Detail¹



Stainless Steel Clip Mount:
Lateral Connection Detail



Roof Intersection with R-20 Roof
Insulation



Roof Intersection with R-40 Roof
Insulation

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ²	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Concrete Slab	9 1/2" (241)	12.5 (1.8)	-	140 (2250)	0.20 (850)
3	Aluminum Window Wall Vision System: thermally broken frame ³ , no insulation in mullions, double glazed IGU U _{COG} = 0.32 BTU/hr-ft ² -°F (1.82 W/m ² K)					
4	Parapet	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
5	Stainless Steel Bearing Clip Mount	Varies	118 (17)	-	500 (8000)	0.12 (500)
6	Stainless Steel Lateral Clip Mount	Varies	118 (17)	-	500 (8000)	0.12 (500)
7	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
8	Polystyrene Rigid Foam Insulation	4 3/4" (120)	0.217 (0.031)	R-22.0 (3.87 RSI)	66 (1060)	0.35 (1500)
9	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
10	Parapet Rigid Insulation	Varies	0.20 (0.029)	R-10.0 to R-20.0 (1.76 RSI to 3.52 RSI)	1.8 (28)	0.29 (1220)
11	Vented Air Cavity	1" (25)	-	R-0.4 (0.07)	0.075 (1.2)	0.24 (1000)
12	Sealant	-	1.73 (0.25)	-	-	-
13	Backer Rod	-	0.25 (0.036)	-	-	-
14	Concrete Precast Panel	3" (76)	43 (6.2)	-	160 (2560)	0.21 (880)
15	Wood Blocking	5/8" (16)	0.69 (0.10)	R-1.0 (0.18 RSI)	31 (500)	0.45 (1880)
16	Cap Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
17	Roof Insulation	Varies	0.20 (0.029)	R-20 to R-40 (3.52 RSI to 7.04 RSI)	1.8 (28)	0.29 (1220)
18	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
19	Exterior Film ²	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Cladding mounting hardware horizontal dimension varies equivalent to insulation thickness

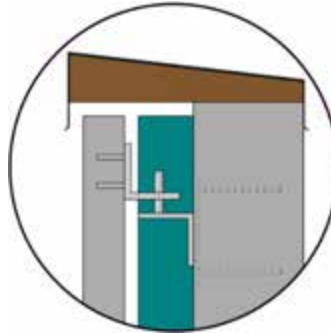
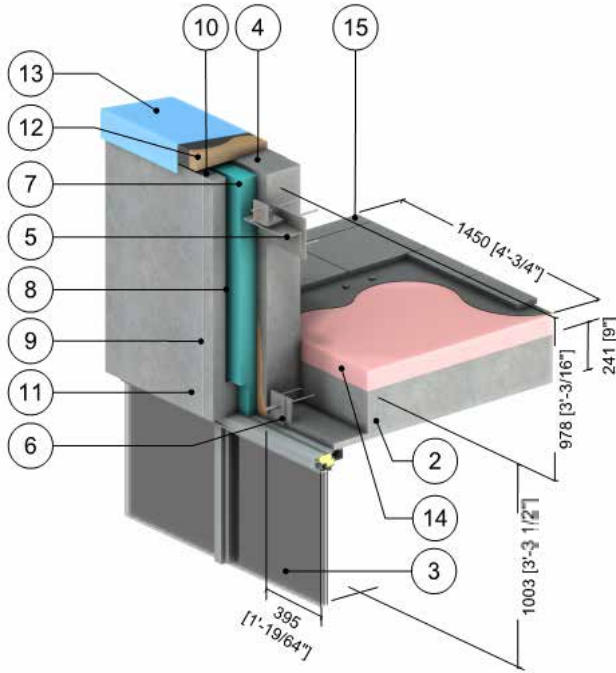
² Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

³ The thermal conductivity of air spaces within framing was found using ISO 100077-2

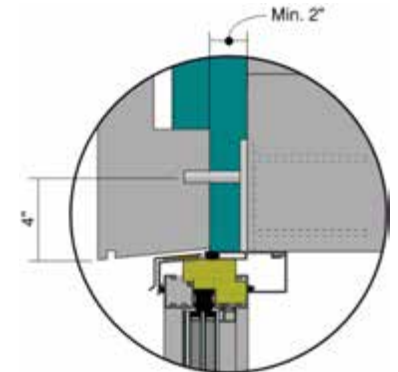


Detail 7.5.15

Window Wall System – Triple Glazed Insulated Frame at Concrete Precast Panel Parapet & Roof Intersection



Stainless Steel Clip Mount: Bearing Connection Detail¹



Stainless Steel Clip Mount: Lateral Connection Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ²	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Concrete Slab	9 1/2" (241)	12.5 (1.8)	-	140 (2250)	0.20 (850)
3	Aluminum Window Wall Vision System: thermally broken frame with insulation in mullions ² , triple glazed IGU U _{COG} = 0.14 BTU/hr·ft ² ·°F (0.81 W/m ² K)					
4	Parapet	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
5	Stainless Steel Bearing Clip Mount	Varies	118 (17)	-	500 (8000)	0.12 (500)
6	Stainless Steel Lateral Clip Mount	Varies	118 (17)	-	500 (8000)	0.12 (500)
7	Parapet Rigid Insulation	Varies	0.20 (0.029)	R-10.0 to R-20.0 (1.76 RSI to 3.52 RSI)	1.8 (28)	0.29 (1220)
8	Vented Air Cavity	1" (25)	-	R-0.4 (0.07)	0.075 (1.2)	0.24 (1000)
9	Sealant	-	1.73 (0.25)	-	-	-
10	Backer Rod	-	0.25 (0.036)	-	-	-
11	Concrete Precast Panel	3" (76)	43 (6.2)	-	160 (2560)	0.21 (880)
12	Wood Blocking	5/8" (16)	0.69 (0.10)	R-1.0 (0.18 RSI)	31 (500)	0.45 (1880)
13	Cap Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
14	Roof Insulation	Varies	0.20 (0.029)	R-20 to R-40 (3.52 RSI to 7.04 RSI)	1.8 (28)	0.29 (1220)
15	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
16	Exterior Film ²	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

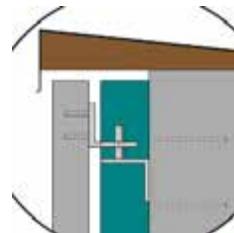
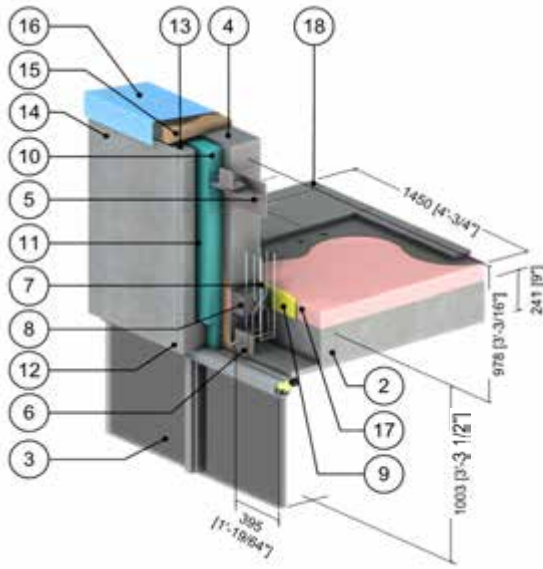
¹Cladding mounting hardware horizontal dimension varies equivalent to insulation thickness

² Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

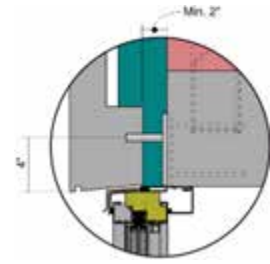
³The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 7.5.16

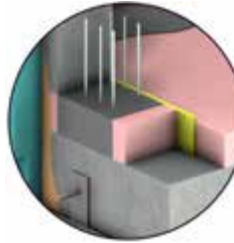
Window Wall System – Triple Glazed Insulated Frame at Isokorb AXTI Thermally Broken Concrete Parapet & Roof Intersection



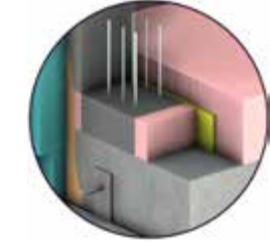
Stainless Steel Clip Mount:
Bearing Connection Detail¹



Stainless Steel Clip Mount:
Lateral Connection Detail



Roof Intersection with R-20 Roof
Insulation



Roof Intersection with R-40 Roof
Insulation

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ²	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Concrete Slab	9 1/2" (241)	12.5 (1.8)	-	140 (2250)	0.20 (850)
3	Aluminum Window Wall Vision System: thermally broken frame with insulation in mullions ² , triple glazed IGU U _{COG} = 0.14 BTU/hr-ft ² -°F (0.81 W/m ² K)					
4	Parapet	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
5	Stainless Steel Bearing Clip Mount	Varies	118 (17)	-	500 (8000)	0.12 (500)
6	Stainless Steel Lateral Clip Mount	Varies	118 (17)	-	500 (8000)	0.12 (500)
7	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
8	Polystyrene Rigid Foam Insulation	4 3/4" (120)	0.217 (0.031)	R-22.0 (3.87 RSI)	66 (1060)	0.35 (1500)
9	Exterior Sheathing	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
10	Parapet Rigid Insulation	Varies	0.20 (0.029)	R-10.0 to R-20.0 (1.76 RSI to 3.52 RSI)	1.8 (28)	0.29 (1220)
11	Vented Air Cavity	1" (25)	-	R-0.4 (0.07)	0.075 (1.2)	0.24 (1000)
12	Sealant	-	1.73 (0.25)	-	-	-
13	Backer Rod	-	0.25 (0.036)	-	-	-
14	Concrete Precast Panel	3" (76)	43 (6.2)	-	160 (2560)	0.21 (880)
15	Wood Blocking	5/8" (16)	0.69 (0.10)	R-1.0 (0.18 RSI)	31 (500)	0.45 (1880)
16	Cap Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
17	Roof Insulation	Varies	0.20 (0.029)	R-20 to R-40 (3.52 RSI to 7.04 RSI)	1.8 (28)	0.29 (1220)
18	Flashing & roof finish material are incorporated into exterior heat transfer coefficient					
19	Exterior Film ²	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Cladding mounting hardware horizontal dimension varies equivalent to insulation thickness

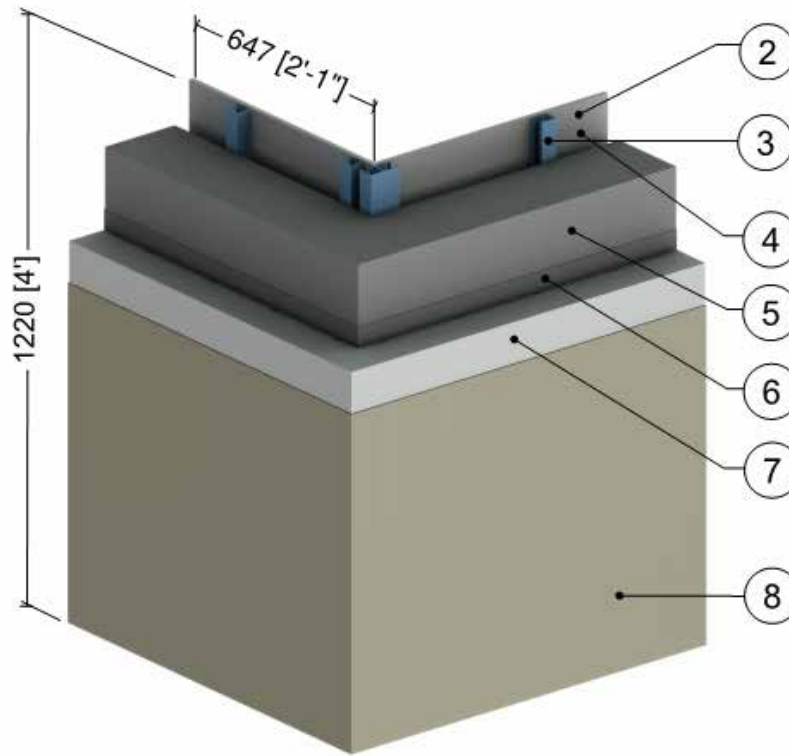
² Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

³ The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 7.6.1

Exterior Insulated Concrete Drained EIFS Wall Assembly – Corner Intersection

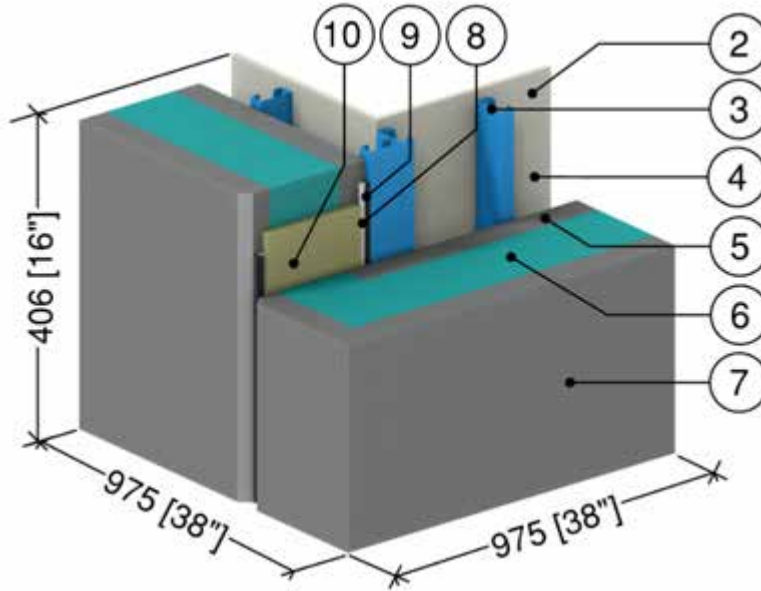


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" x 1 5/8" Steel Studs (16"o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Concrete Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	4" (100)	0.27 (0.039)	R-15 (2.64 RSI)	1 (16)	0.35 (1470)
8	Lamina	1/8" (4)	6 (0.9)	R-0.04 (0.01 RSI)	120 (1922)	0.20 (850)
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.6.2

Highly Insulated Precast Concrete Sandwich Panel Wall Assembly – Outside Corner

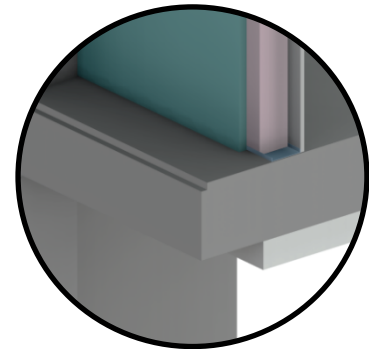
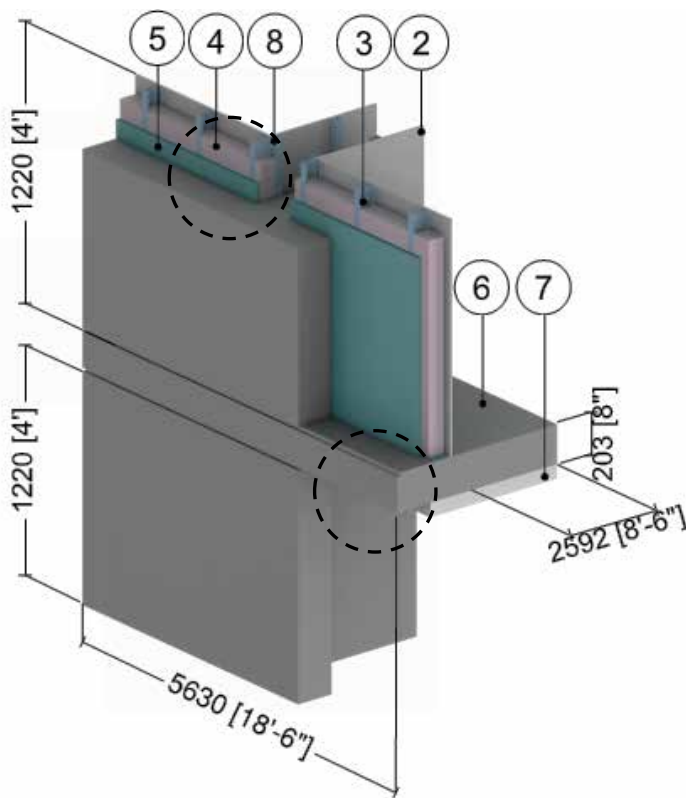


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (15)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Precast Sandwich Panel, Interior Concrete Panel	3" (76)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Precast Sandwich Panel Insulation	8" (203)	-	R-40 (7.04 RSI) to R-56 (9.86 RSI)	1.8 (28)	0.29 (1220)
7	Precast Sandwich Panel, Exterior Concrete Panel	3" (76)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Sealant	-	1.73 (0.25)	-	-	-
9	Backer Rod	-	0.25 (0.036)	-	-	-
10	Mineral Wool Insulation	-	0.238 (0.034)	-	4 (64)	0.20 (850)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

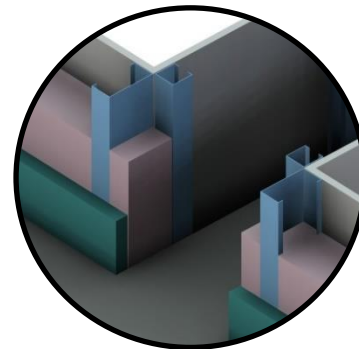
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.7.1

Interior Insulated Concrete Mass Wall with 3 5/8" x 1 5/8" Steel Studs (16" o.c.) Supporting Interior Finish – Intermediate Floor Intersection above Parking Garage



Slab Edge Detail



Partition Detail

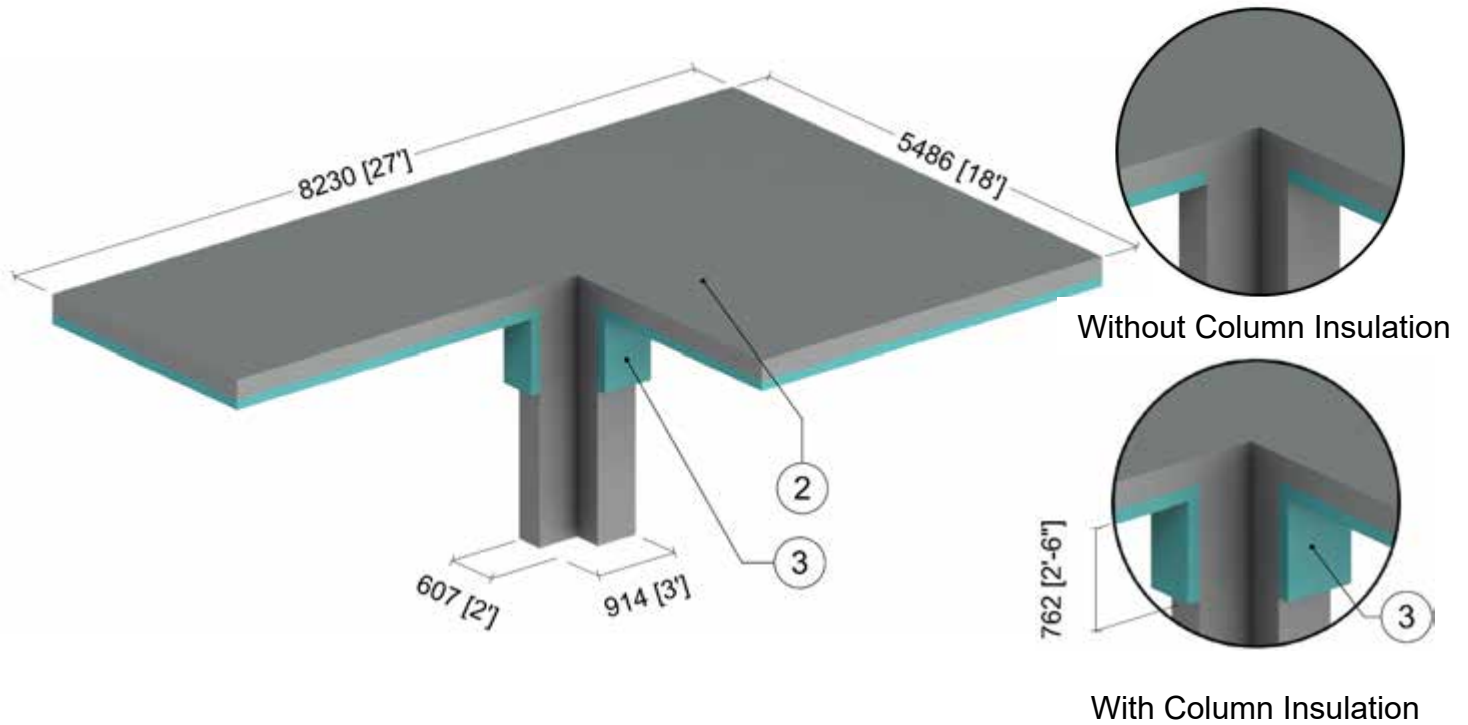
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.29 (0.042)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
5	Continuous Insulation	Varies	-	R-10 to R-15 (1.76 RS to 2.64 RSI)	1.8 (28)	0.29 (1220)
6	Concrete Wall & Floor Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Spray Applied Fiberglass Insulation	4" (102)	0.20 (0.029)	R-20 (3.5 RSI)	0.9 (14)	0.12 (500)
8	1 5/8" x 1 5/8" Steel Studs with Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 7.7.2

Insulated Concrete Floor Slab – Concrete Column Intersection

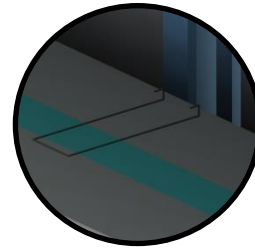
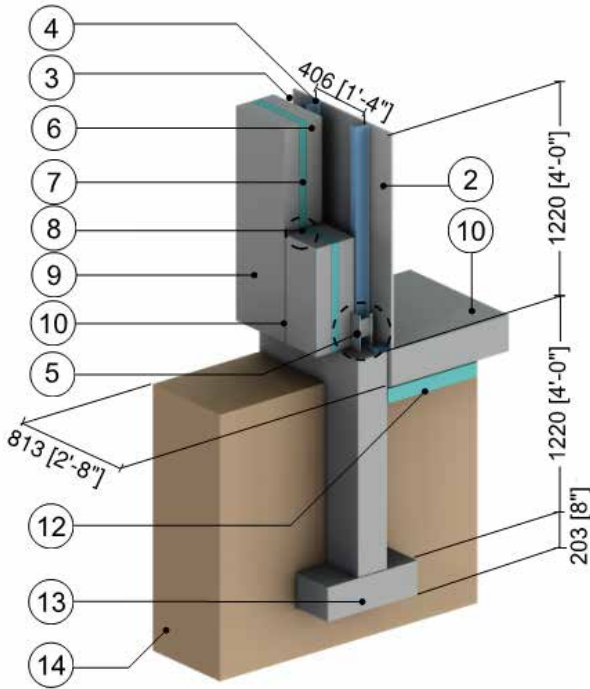


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.9 (0.16 RSI)	-	-
2	Concrete Floor	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
3	Spray Applied Fiberglass Insulation	4" (101)	0.2 (0.029)	R-20 (3.5 RSI)	0.9 (14)	0.12 (500)
4	Exterior Film ¹	-	-	R-0.6 (0.11 RSI)	-	-

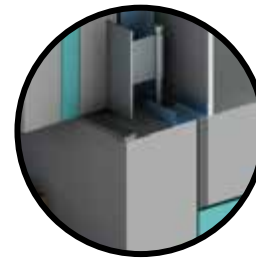
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.7.3

Precast Sandwich Wall Assembly Slab and Foundation Intersection



Connector Detail



Gravity and Slot Anchor Detail

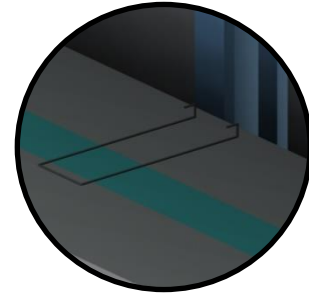
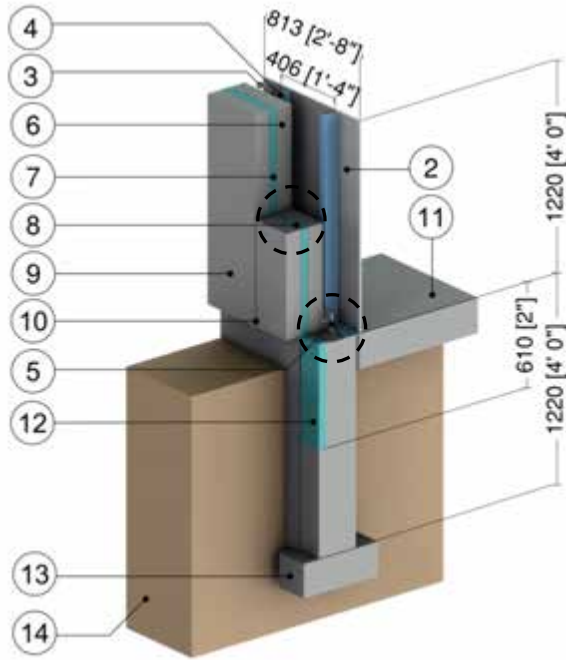
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 to R-0.9 (0.12 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	5" (127)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" Steel Studs with Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Gravity and Slot Anchors at Slab	-	347 (50)	-	489 (7830)	0.12 (500)
6	Precast Sandwich Panel, Interior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Precast Sandwich Panel, Insulation	2" (51)	-	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
8	Precast Sandwich Panel, Structural Ties @ 24" (610) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Precast Sandwich Panel, Exterior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Silicone Sealant	-	2.4 (3.5)	-	174 (2800)	0.17 (700)
11	Concrete Slab on Grade	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Foundation Insulation	3 1/2" (89)	0.24 (0.0343)	R-15 (2.6 RSI)	1.8 (28)	0.29 (1220)
13	Concrete Footing	12" (305)	12.5 (1.8)	-	140 (2250)	0.20 (850)
14	Soil	-	15.6 (2.25)	-	-	-
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 7.7.4

Precast Sandwich Panel with 3 5/8" Steel Stud (16" o.c.) – Concrete Slab and Foundation Wall



Connector Detail



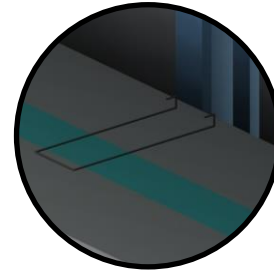
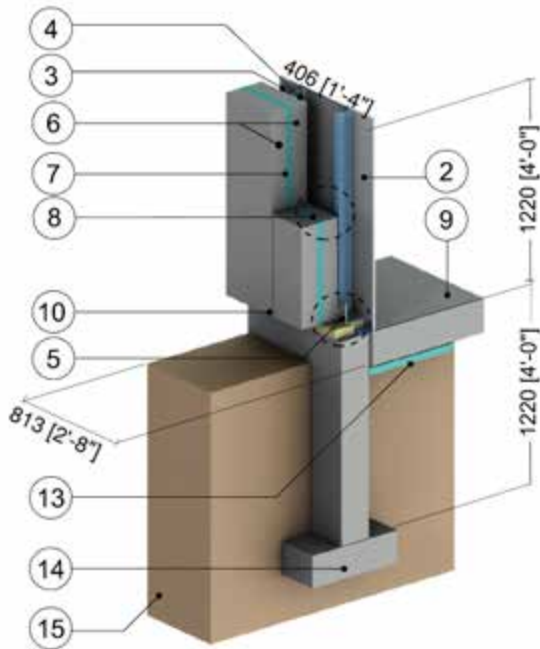
Gravity and Slot Anchor Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 to R-0.9 (0.12 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	5 5/8" (143)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Gravity and Slot Anchors at Slab	-	347 (50)	-	489 (7830)	0.12 (500)
6	Precast Sandwich Panel, Interior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Precast Sandwich Panel, Insulation	2" (51)	-	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
8	Precast Sandwich Panel, Structural Ties @ 24" o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Precast Sandwich Panel, Exterior Concrete	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Silicone Sealant	-	2.4 (3.5)	-	174 (2800)	0.17 (700)
11	Concrete Slab on Grade	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Foundation Insulation	2" (50)	0.2 (0.028)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
13	Concrete Footing	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
14	Soil	-	15.6 (2.25)	-	-	-
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

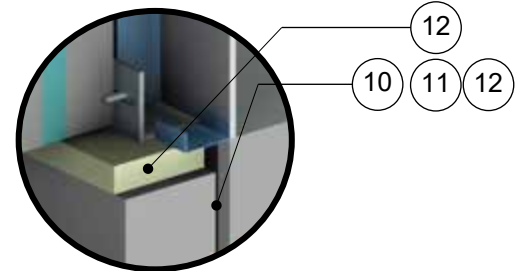
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.7.5

Precast Sandwich Panel with 3 5/8" Steel Stud (16" o.c.) – Thermally Broken Concrete Slab and Foundation Intersection



Connector Detail



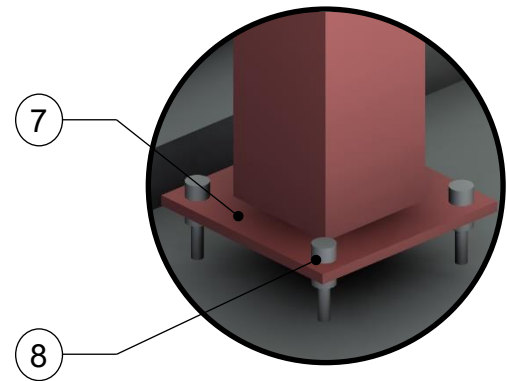
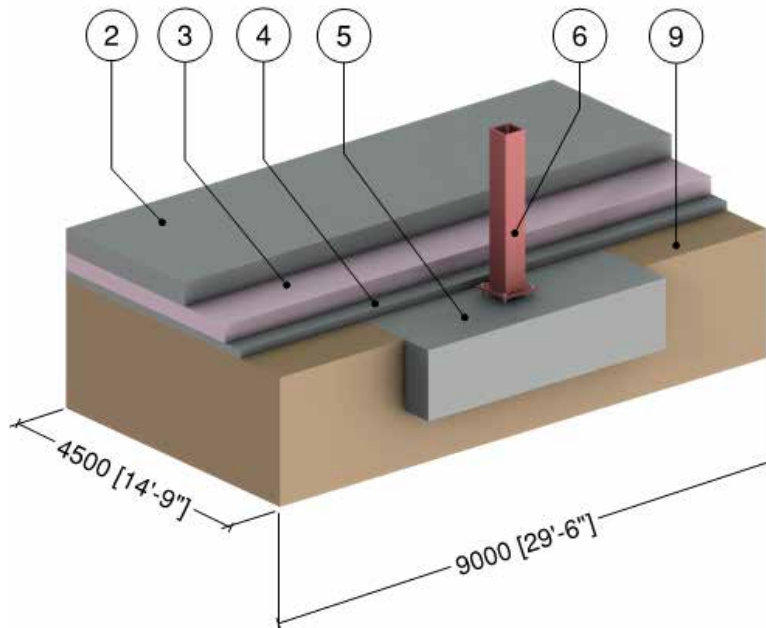
Gravity and Slot Anchor Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 to R-0.9 (0.12 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	5" (127)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	3 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Gravity and Slot Anchors at Slab	-	347 (50)	-	489 (7830)	0.12 (500)
6	Precast Sandwich Panels	4" (102)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Precast Sandwich Panel, Insulation	2" (51)	-	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
8	Precast Sandwich Panel, Structural Ties @ 24" (610) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Concrete Slab on Grade	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Sealant	-	2.4 (3.5)	-	174 (2800)	0.17 (700)
11	Fibreboard	1" (25)	0.38 (0.055)	R-2.6 (0.47 RSI)	16 (254)	0.50 (2100)
12	Armatherm 500	2" (50)	0.32 (0.05)	R-6.2 (1.09 RSI)	-	-
13	Foundation Insulation	3 1/2" (89)	0.24 (0.0343)	R-15 (2.6 RSI)	1.8 (28)	0.29 (1220)
14	Concrete Footing	12" (305)	12.5 (1.8)	-	140 (2250)	0.20 (850)
15	Soil	-	15.6 (2.25)	-	-	-
16	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.7.6

Insulated Slab on Grade – Steel Column



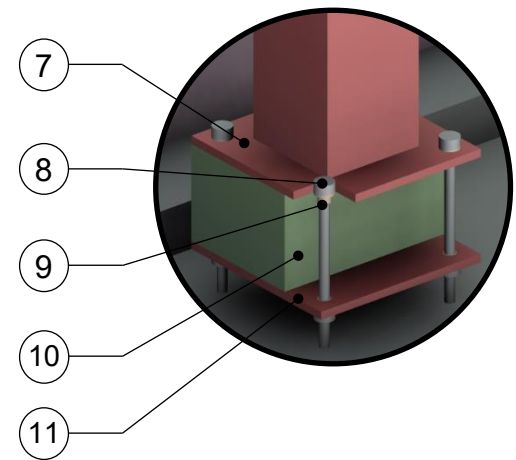
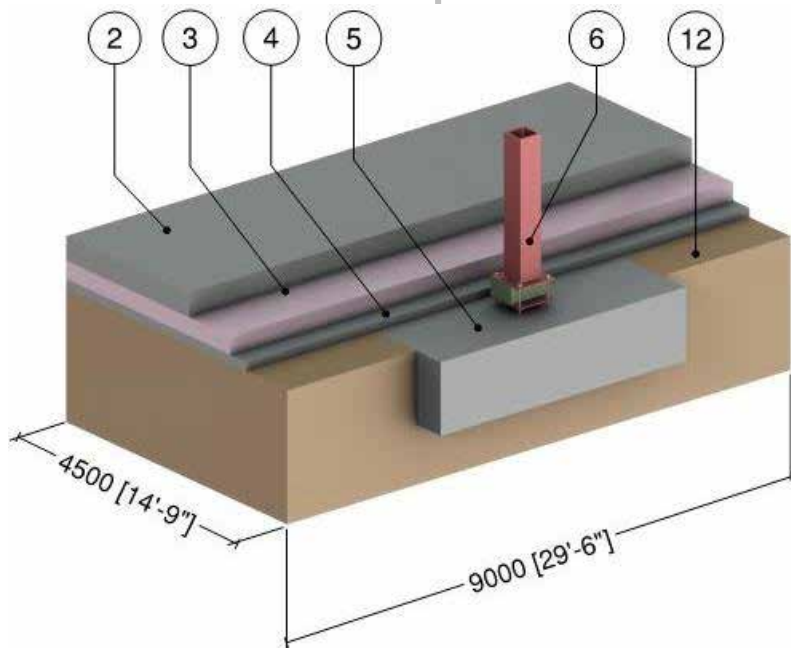
Column Connection

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 to R-0.9 (0.12 RSI to 0.16 RSI)	-	-
2	Concrete Slab on Grade	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
3	Extruded Polystyrene Insulation (XPS)	6" (152)	0.20 (0.029)	R-30 (5.28 RSI)	1.8 (28)	0.29 (1220)
4	Concrete Sub Slab	3" (76)	12.5 (1.8)	-	140 (2250)	0.20 (850)
5	Concrete Footing	24" (610)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	8" x 8" HSS Column	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
7	14" x 14" x 1/2" Base Plate	1/2" (13)	430 (62)	-	489 (7830)	0.12 (500)
8	Stainless Steel Bolts	3/4" (6) ∅	117 (17)	-	489 (7830)	0.12 (500)
9	Soil	-	10.4 (1.5)	-	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.7.7

Insulated Slab on Grade – Armatherm 500 Thermal Break under Column



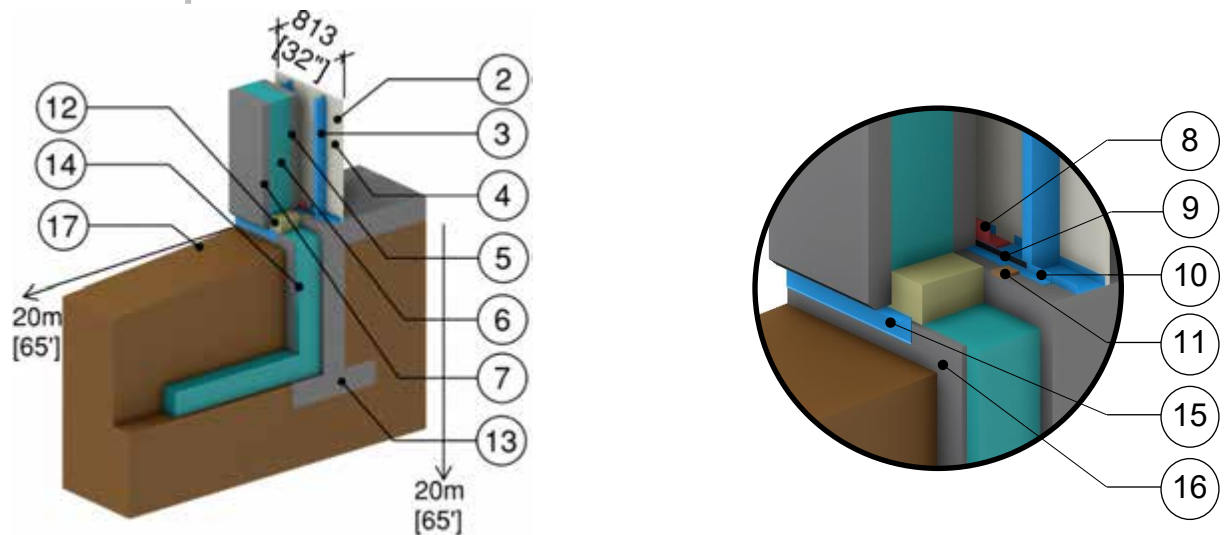
Armatherm 500 Column
Thermal Break

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Concrete Slab on Grade	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
3	Extruded Polystyrene Insulation (XPS)	6" (152)	0.20 (0.029)	R-30 (5.28 RSI)	1.8 (28)	0.29 (1220)
4	Concrete Sub Slab	3" (76)	12.5 (1.8)	-	140 (2250)	0.20 (850)
5	Concrete Footing	24" (610)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	8" x 8" HSS Column	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
7	14" x 14" x 1/2" Base Plate	1/2" (13)	430 (62)	-	489 (7830)	0.12 (500)
8	Stainless Steel Bolts	3/4" (6) ϕ	117 (17)	-	489 (7830)	0.12 (500)
9	Armatherm FRR Washers and Bushing	-	1.4 (0.2)	-	85 (1362)	-
10	Armatherm 500 Thermal Break	6" (152)	0.32 (0.05)	-	-	-
11	14" x 14" x 1/2" Base Plate	1/2" (13)	430 (62)	-	489 (7830)	0.12 (500)
12	Soil	-	10.4 (1.5)	-	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.7.8

Highly Insulated Precast Concrete Sandwich Panel Wall Assembly – Base of Wall at Foundation with Insulation Skirt

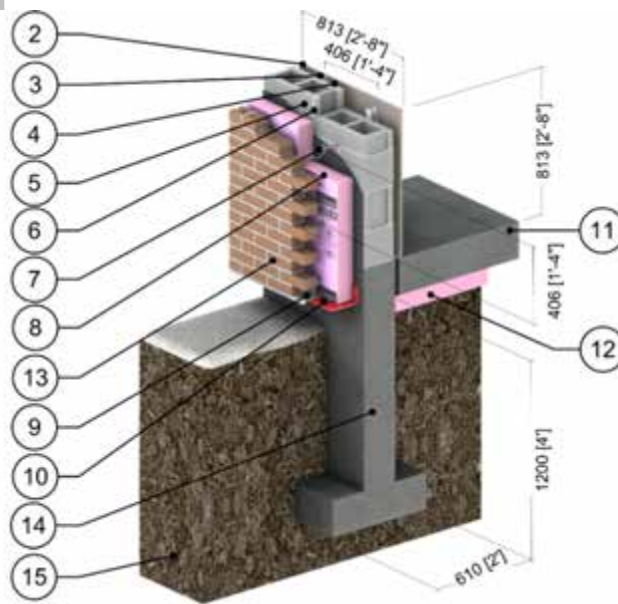


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	5/8" (15)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Precast Sandwich Panel, Interior Concrete Panel	3" (76)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Precast Sandwich Panel Insulation	8" (203)	-	R-40 (7.04 RSI) to R-56 (9.86 RSI)	1.8 (28)	0.29 (1220)
7	Precast Sandwich Panel, Exterior Concrete Panel	3" (76)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Anchor	-	347 (50)	-	489 (7830)	0.12 (500)
9	Sealant	-	1.73 (0.25)	-	-	-
10	Angle	-	430 (62)	-	489 (7830)	0.12 (500)
11	Shims	-	0.69 (0.1)	-	-	-
12	Mineral Wool Slab Insulation	8" (203)	0.238 (0.034)	R-33.6 (5.92 RSI)	4 (64)	0.20 (850)
13	Concrete Footing and Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
14	Foundation Insulation	8" (203)	0.167 (0.024)	R-48 (8.45 RSI)	1.8 (28)	0.29 (1220)
15	Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
16	Cover Board	5/8" (15)	12.5 (1.8)	-	140 (2250)	0.20 (850)
17	Soil	-	13.9 (2)	-	-	-
18	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.7.9

Owens Corning Exterior Insulated Concrete Block Wall Assembly with Steel Shelf Angle and Heckmann Pos-I-Tie Vener Anchoring System Supporting Brick Veneer and Insulation Below Floor – Slab on Grade and Foundation Intersection

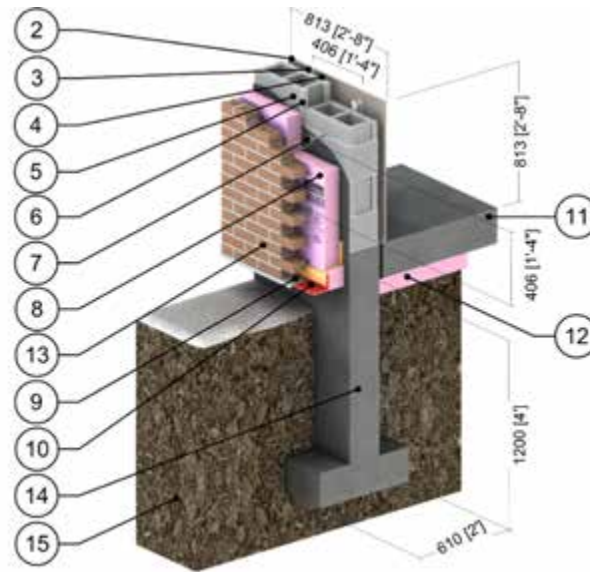


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 to R-0.9 (0.12 to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" Steel Studs with Bottom Track	20 gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Standard Concrete Block	7 5/8" (190)	3.5 (0.5)	-	119 (1900)	0.19 (800)
6	Cement Mortar	-	3.5 (0.5)	-	113 (1800)	0.12 (500)
7	Heckmann Pos-I-Tie Masonry Tie @ 16" (406) o.c.	varies	-	-	-	-
8	Foamular CodeBord/C-200 Extruded Polystyrene (XPS) Rigid Insulation Type 3	varies	0.20 (0.029)	R-10 to R-20 (1.76 to 3.52 RSI)	1.8 (28)	0.29 (1220)
9	Steel Shelf Angle	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
10	Metal Flashing	20 gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Concrete Slab on Grade	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Foamular XPS Insulation	3 1/2" (89)	0.20 (0.029)	R-17.5 (3.08 RSI)	1.8 (28)	0.29 (1220)
13	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
14	Concrete Footing	24" (610)	12.5 (1.8)	-	140 (2250)	0.20 (850)
15	Soil	-	15.6 (2.25)	-	-	-
16	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.7.10

Owens Corning Exterior Insulated Concrete Block Wall Assembly with Stainless Steel Stand-off Shelf Angle and Heckmann Pos-I-Tie Veneer Anchoring System Supporting Brick Veneer and Insulation Below Floor – Slab on Grade and Foundation Intersection

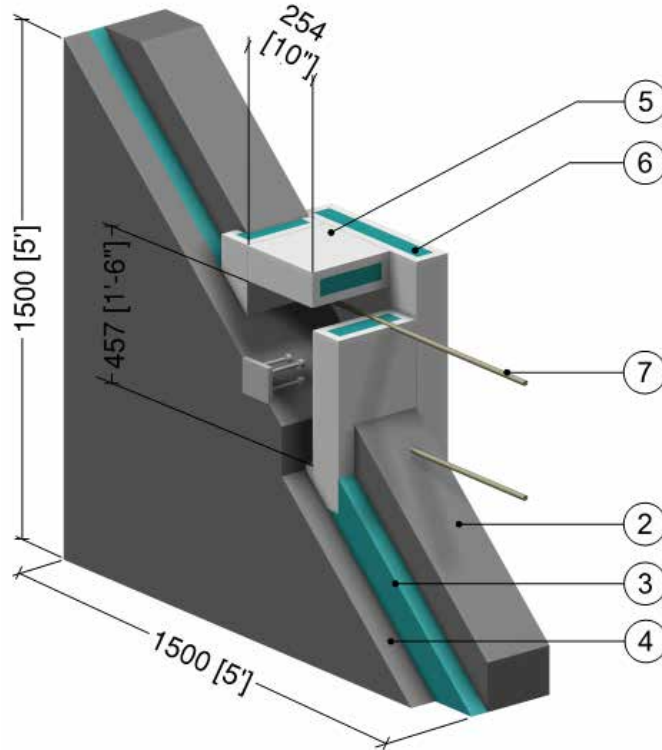


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 to R-0.9 (0.12 to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 5/8" Steel Studs with Bottom Track	20 gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Standard Concrete Block	7 5/8" (190)	3.5 (0.5)	-	119 (1900)	0.19 (800)
6	Cement Mortar	-	3.5 (0.5)	-	113 (1800)	0.12 (500)
7	Heckmann Pos-I-Tie Masonry Tie @ 16" (406) o.c.	varies	-	-	-	-
8	Foamular CodeBord/C-200 Extruded Polystyrene (XPS) Rigid Insulation Type 3	varies	0.20 (0.029)	R-10 to R-20 (1.76 to 3.52 RSI)	1.8 (28)	0.29 (1220)
9	Stainless Steel Stand-off Shelf Angle	3/8" (10)	118 (17)	-	503 (8060)	0.12 (500)
10	Metal Flashing	20 gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Concrete Slab on Grade	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Foamular XPS Insulation	3 1/2" (89)	0.20 (0.029)	R-17.5 (3.08 RSI)	1.8 (28)	0.29 (1220)
13	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
14	Concrete Footing	24" (610)	12.5 (1.8)	-	140 (2250)	0.20 (850)
15	Soil	-	15.6 (2.25)	-	-	-
16	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.8.1

Precast Sandwich Panel Wall Assembly – Emloc Thermally Broken Embedment Detail



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Precast Sandwich Panel, Interior Concrete Panel	7 3/4" (197)	12.5 (1.8)	-	140 (2250)	0.20 (850)
3	Precast Sandwich Panel Insulation	2" to 4" (51 to 102)	-	R-10 to R-20 (1.8 RSI to 3.5 RSI)	1.8 (28)	0.29 (1220)
4	Precast Sandwich Panel, Exterior Concrete Panel	3" (76)	12.5 (1.8)	-	140 (2250)	0.20 (850)
5	Emloc, PVC Foam	1" (25)	0.42 (0.06)	-	-	-
6	Emloc, Insulation	2" to 4" (51 to 102)	-	R-10 to R-20 (1.8 RSI to 3.5 RSI)	1.8 (28)	0.29 (1220)
7	FRP rebar	#5 (16M)	2.4 (0.35)	-	-	-
8	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

8.0 Wood-Frame and Timber Construction

Detail 8.1.1	A.8.1
Interior Insulated 2x4 Wood Stud Wall Assembly – Clear Wall	
Detail 8.1.2	A.8.2
Interior Insulated 2x6 Wood Stud Wall Assembly – Clear Wall	
Detail 8.1.3	A.8.3
Interior Insulated 2x6 Wood Stud (16” o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Clear Wall	
Detail 8.1.4	A.8.4
Exterior and Interior Insulated 2x6 Wood Stud (16” o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Clear Wall	
Detail 8.1.5	A.8.5
Exterior and Interior Insulated 2x6 Wood Stud (16” o.c.) Wall Assembly with Continuous Rigid Insulation Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Clear Wall	
Detail 8.1.6	A.8.6
Exterior and Interior Insulated 2x6 Wood Stud (16” o.c.) Wall Assembly with Horizontal Metal Z-Girts (24” o.c.) Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Clear Wall	
Detail 8.1.7	A.8.7
Exterior Insulated 2x6 Wood Stud (16” o.c.) Wall Assembly with Knight MFI-System (24” o.c.) Supporting Cladding – Clear Wall	
Detail 8.1.8	A.8.8
Exterior and Interior Insulated 2x6 Wood Stud (16” o.c.) Wall Assembly with Knight MFI-System (24” o.c.) Supporting Cladding and R-19 Batt Insulation in Stud Cavity – Clear Wall	
Detail 8.1.9	A.8.9
Exterior Insulated 2x6 Wood Stud (16”o.c.) Wall Assembly with Thermally Broken Aluminum Clip Rail System (24” o.c.) Supporting Cladding – Clear Wall	
Detail 8.1.10	A.8.10
Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16” o.c.) Wall Assembly with 2” Gap – Clear Wall	
Detail 8.1.11	A.8.11
Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16” o.c.) Wall Assembly with 3” Gap – Clear Wall	
Detail 8.1.12	A.8.12
Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16” o.c.) Wall Assembly with 4” Gap – Clear Wall	
Detail 8.1.13	A.8.13

Interior Insulated Cross Laminated Timber (CLT) Spandrel with ISO-CONNECT Anchor – Anchor Point Transmittance	
Detail 8.1.14	A.8.14
Exterior and Interior Insulated 2"x6" Wood Stud (16" o.c. and 24" o.c.) Wall Assembly with Heckmann Pos-I-Tie Veneer Anchoring System Supporting Brick Veneer and Owens Corning R-19 Batt Insulation in Stud Cavity – Clear Wall	
Detail 8.1.15	A.8.15
Exterior and Interior Insulated 2"x6" Wood Stud (16" o.c. and 24" o.c.) Wall Assembly with Heckmann Pos-I-Tie Veneer Anchoring System Supporting Brick Veneer and Owens Corning R-22 Batt Insulation in Stud Cavity – Clear Wall	
Detail 8.1.16	A.8.16
Exterior and Interior Insulated 2"x6" Wood Stud (16" o.c. and 24" o.c.) Wall Assembly with Heckmann Pos-I-Tie Veneer Anchoring System Supporting Brick Veneer and Owens Corning R-24 Batt Insulation in Stud Cavity – Clear Wall	
Detail 8.1.17	A.8.17
Exterior Insulated Cross Laminated Timber (CLT) Wall Assembly with Continuous Rigid Insulation Supporting Fiber Cement Board – Clear Wall	
Detail 8.1.18	A.8.18
Exterior Insulated Cross Laminated Timber (CLT) Wall Assembly with Wood Strapping and Continuous Rigid Insulation Supporting Fiber Cement Board	
Detail 8.1.19	A.8.19
Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Brick Ties Supporting Brick Veneer and R-19 Batt Insulation in Stud Cavity – Clear Wall	
Detail 8.1.20	A.8.20
Exterior Insulated 2x6 Wood Stud (16" o.c.) Wall with Interior OSB and Wood Furring Assembly & Brick Ties Supporting Brick Veneer – Clear Wall	
Detail 8.1.21	A.8.21
Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall with Interior OSB and Wood Furring Assembly & Brick Ties Supporting Brick Veneer – Clear Wall	
Detail 8.1.22	A.8.22
Exterior Insulated 2x6 Wood Stud (16" o.c.) Wall with Interior Wood Furring Assembly & Brick Ties Supporting Brick Veneer – Clear Wall	
Detail 8.1.23	A.8.23
Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall with Interior Wood Furring Assembly & Brick Ties Supporting Brick Veneer – Clear Wall	
Detail 8.1.24	A.8.24
Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 1" Gap – Clear Wall	
Detail 8.1.25	A.8.25

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with SOPREMA SOPRA-XPS 20 and ACS-S Thermal Clip Supporting Metal Cladding with R-19 Cellulose Insulation in Stud Cavity - Clear Wall	
Detail 8.1.26	A.8.26
Exterior and Interior Insulated 2x6 Wood Stud (24" o.c.) Wall Assembly with SOPREMA SOPRA-XPS 20 and ACS-S Thermal Clip Supporting Metal Cladding with R-19 Cellulose Insulation in Stud Cavity - Clear Wall	
Detail 8.1.27	A.8.27
Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with SOPREMA SOPRA-SPF 202 and ACS-S Thermal Clip Supporting Metal Cladding with R-19 Cellulose Insulation in Stud Cavity - Clear Wall	
Detail 8.1.28	A.8.28
Exterior and Interior Insulated 2x6 Wood Stud (24" o.c.) Wall Assembly with SOPREMA SOPRA-SPF 202 and ACS-S Thermal Clip Supporting Metal Cladding with R-19 Cellulose Insulation in Stud Cavity - Clear Wall	
Detail 8.1.29	A.8.29
Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with SOPREMA SOPRA-ISO V PLUS and ACS-S Thermal Clip Supporting Metal Cladding with R-19 Cellulose Insulation in Stud Cavity - Clear Wall	
Detail 8.1.30	A.8.30
Exterior and Interior Insulated 2x6 Wood Stud (24" o.c.) Wall Assembly with SOPREMA SOPRA-ISO V PLUS and ACS-S Thermal Clip Supporting Metal Cladding with R-19 Cellulose Insulation in Stud Cavity - Clear Wall	
Detail 8.1.31	A.8.31
Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Mineral Wool and ACS-S Thermal Clip Supporting Metal Cladding with R-19 Cellulose Insulation in Stud Cavity - Clear Wall	
Detail 8.1.32	A.8.32
Exterior and Interior Insulated 2x6 Wood Stud (24" o.c.) Wall Assembly with Mineral Wool and ACS-S Thermal Clip Supporting Metal Cladding with R-19 Cellulose Insulation in Stud Cavity - Clear Wall	
Detail 8.1.33	A.8.33
Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Protected SOPREMA SOPRA-ISO V PLUS and ACS-S Thermal Clip Supporting Metal Cladding with R-19 Cellulose Insulation in Stud Cavity - Clear Wall	
Detail 8.1.34	A.8.34
Exterior and Interior Insulated 2x6 Wood Stud (24" o.c.) Wall Assembly with Protected SOPREMA SOPRA-ISO V PLUS and ACS-S Thermal Clip Supporting Metal Cladding with R-19 Cellulose Insulation in Stud Cavity - Clear Wall	
Detail 8.1.35	A.8.35

Exterior and Interior Insulated 2x4 Wood Stud (16" o.c.) Wall Assembly with Protected SOPREMA SOPRA-ISO V PLUS and ACS-S Thermal Clip Supporting Metal Cladding with R-13 Cellulose Insulation in Stud Cavity - Clear Wall	
Detail 8.1.36	A.8.36
Exterior and Interior Insulated 2x4 Wood Stud (24" o.c.) Wall Assembly with Protected SOPREMA SOPRA-ISO V PLUS and ACS-S Thermal Clip Supporting Metal Cladding with R-13 Cellulose Insulation in Stud Cavity - Clear Wall	
Detail 8.1.37	A.8.37
Exterior and Interior Insulated 2x6 Wood Stud (8" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Clear Wall	
Detail 8.2.1	A.8.38
Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity - Rim Joist and Floor Intersection with Metal Flashing Bypassing Exterior Insulation	
Detail 8.2.2	A.8.39
Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity - Rim Joist and Floor Intersection without Metal Flashing Bypassing Exterior Insulation	
Detail 8.2.3	A.8.40
Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity - Cantilevered Wood Joist Balcony Intersection	
Detail 8.2.4	A.8.41
Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Independently Supported Balcony Intersection	
Detail 8.2.5	A.8.42
Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Cantilevered Floor Intersection	
Detail 8.2.6	A.8.43
Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap – Rim Joist and Floor Intersection	
Detail 8.2.7	A.8.44
Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 3" Gap – Rim Joist and Floor Intersection	
Detail 8.2.8	A.8.45

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 4" Gap – Rim Joist and Floor Intersection	
Detail 8.2.9	A.8.46
Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap – Insulated Rim Joist and Floor Intersection	
Detail 8.2.10	A.8.47
Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 3" Gap – Insulated Rim Joist and Floor Intersection	
Detail 8.2.11	A.8.48
Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 4" Gap – Insulated Rim Joist and Floor Intersection	
Detail 8.2.12	A.8.49
Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Shelf Angle & Brick Ties Supporting Brick Veneer and R-19 Batt Insulation in Stud Cavity – Rim Joist and Floor Intersection	
Detail 8.2.13	A.8.50
Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Stand-off (Knife Plate) Shelf Angle & Brick Ties Supporting Brick Veneer and R-19 Batt Insulation in Stud Cavity – Rim Joist and Floor Intersection	
Detail 8.2.14	A.8.51
Exterior Insulated 2x6 Wood Stud (16" o.c.) Wall with Interior OSB and Wood Furring Assembly with Stand-off (Knife Plate) Shelf Angle & Brick Ties Supporting Brick Veneer – CLT and Wood Truss Floor Intersection	
Detail 8.2.15	A.8.52
Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall with Interior OSB and Wood Furring Assembly with Stand-off (Knife Plate) Shelf Angle & Brick Ties Supporting Brick Veneer – CLT and Wood Truss Floor Intersection	
Detail 8.2.16	A.8.53
Exterior Insulated 2x6 Wood Stud (16" o.c.) Wall with Interior Wood Furring Assembly with Stand-off (Knife Plate) Shelf Angle & Brick Ties Supporting Brick Veneer – CLT and Wood Truss Floor Intersection	
Detail 8.2.17	A.8.54
Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall with Interior Wood Furring Assembly with Stand-off (Knife Plate) Shelf Angle & Brick Ties Supporting Brick Veneer – CLT and Wood Truss Floor Intersection	
Detail 8.2.18	A.8.55
Exterior and Interior Insulated 2x6 Wood Stud (8" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Intermediate Floor Intersection	
Detail 8.2.19	A.8.56

- Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Intermediate Floor Intersection
- Detail 8.3.1****A.8.57**
- Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board – Vinyl Window Intersection
- Detail 8.3.2****A.8.58**
- Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board – Aluminum Window Intersection
- Detail 8.3.3****A.8.59**
- Exterior and Interior Insulated 2x6 Wood Stud (8" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board – Vinyl Window Intersection
- Detail 8.3.4****A.8.60**
- Exterior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board – Triple Glazed Flange Mounted Vinyl Window Intersection with Window Positioned in Wood Framing
- Detail 8.3.5****A.8.61**
- Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Triple Glazed Flange Mounted Vinyl Window Intersection with Window Positioned in Wood Framing
- Detail 8.3.6****A.8.62**
- Exterior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping (16" o.c.) and Continuous Insulation Supporting Rainscreen Fiber Cement Board – Triple Glazed High Performance Vinyl Window Intersection (Insulated Frames)
- Detail 8.3.7****A.8.63**
- Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping (16" o.c.) and Continuous Insulation Supporting Rainscreen Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Triple Glazed High Performance Vinyl Window Intersection (Insulated Frames)
- Detail 8.3.8****A.8.64**
- Interior Insulated Cross Laminated Timber (CLT) Spandrel at Window and Dowel Laminated Timber (DLT) – Intermediate Floor Intersection with Edge of Floor and Glulam Beam Aligned
- Detail 8.3.9****A.8.65**
- Full Height Interior Insulated Cross Laminated Timber (CLT) Spandrel at Window and Dowel Laminated Timber (DLT) – Intermediate Floor Intersection with Edge of Floor and Glulam Beam Aligned

Detail 8.3.10	A.8.66
Interior Insulated Cross Laminated Timber (CLT) Spandrel at Window and Dowel Laminated Timber (DLT) – Intermediate Floor Intersection with Edge of Floor and Glulam Beam Not Aligned	
Detail 8.3.11	A.8.67
Double Framed Wall with 2x6 and 2x4 Wood Studs (16” o.c.) and 2” Gap – Triple Glazed Flanged Fiberglass Window Intersection with Wood Blocking and Un-insulated Perimeter	
Detail 8.3.12	A.8.68
Double Framed Wall with 2x6 and 2x4 Wood Studs (16” o.c.) and 3” Gap – Triple Glazed Flanged Fiberglass Window Intersection with Wood Blocking and Un-insulated Perimeter	
Detail 8.3.13	A.8.69
Double Framed Wall with 2x6 and 2x4 Wood Studs (16” o.c.) and 4” Gap – Triple Glazed Flanged Fiberglass Window Intersection with Wood Blocking and Un-insulated Perimeter	
Detail 8.3.14	A.8.70
Double Framed Wall with 2x6 and 2x4 Wood Studs (16” o.c.) and 2” Gap – Triple Glazed Flanged Fiberglass Window Intersection with Wood Blocking and Insulated Perimeter	
Detail 8.3.15	A.8.71
Double Framed Wall with 2x6 and 2x4 Wood Studs (16” o.c.) and 3” Gap – Triple Glazed Flanged Fiberglass Window Intersection with Wood Blocking and Insulated Perimeter	
Detail 8.3.16	A.8.72
Double Framed Wall with 2x6 and 2x4 Wood Studs (16” o.c.) and 4” Gap – Triple Glazed Flanged Fiberglass Window Intersection with Wood Blocking and Insulated Perimeter	
Detail 8.3.17	A.8.73
Double Framed Wall with 2x6 and 2x4 Wood Studs (16” o.c.) Wall and 2” Gap – Triple Glazed Rebated Fiberglass Window Intersection and Un-Insulated Perimeter	
Detail 8.3.18	A.8.74
Double Framed Wall with 2x6 and 2x4 Wood Studs (16” o.c.) Wall and 3” Gap – Triple Glazed Rebated Fiberglass Window Intersection and Un-Insulated Perimeter	
Detail 8.3.19	A.8.75
Double Framed Wall with 2x6 and 2x4 Wood Studs (16” o.c.) Wall and 4” Gap – Triple Glazed Rebated Fiberglass Window Intersection and Un-Insulated Perimeter	
Detail 8.3.20	A.8.76

	Double Framed Wall with 2x6 and 2x4 Wood Studs (16" o.c.) Wall and 2" Gap – Triple Glazed Rebated Fiberglass Window Intersection with Insulation at Window Perimeter	
Detail 8.3.21	.....	A.8.77
	Double Framed Wall with 2x6 and 2x4 Wood Studs (16" o.c.) Wall and 3" Gap – Triple Glazed Rebated Fiberglass Window Intersection with Insulation at Window Perimeter	
Detail 8.3.22	.....	A.8.78
	Double Framed Wall with 2x6 and 2x4 Wood Studs (16" o.c.) Wall and 4" Gap – Triple Glazed Rebated Fiberglass Window Intersection with Insulation at Window Perimeter	
Detail 8.3.23	.....	A.8.79
	Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board – Double Glazed Aluminum Window Intersection Aligned with Exterior Insulation	
Detail 8.4.1	.....	A.8.80
	Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Vented Low-slope Roof & Parapet Intersection	
Detail 8.4.2	.....	A.8.81
	Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Sloped Wood Framed Roof & Wall Intersection with Insulation at Ceiling	
Detail 8.4.3	.....	A.8.82
	Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Sloped Wood Framed Roof & Wall Intersection with Insulation at Roof Sheathing	
Detail 8.4.4	.....	A.8.83
	Ventilated Wood Frame Low Slope Roof - Masonry Firewall Intersection	
Detail 8.4.5	.....	A.8.84
	Exterior Insulated Cross Laminated Timber (CLT) Wall Assembly with Continuous Rigid Insulation Supporting Fiber Cement Board –Low-Slope Roof & Parapet Intersection	
Detail 8.5.1	.....	A.8.85
	Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting and Continuous Insulation Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Corner Intersection	
Detail 8.5.2	.....	A.8.86

	Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 1" Gap – Corner Intersection	
Detail 8.6.1	.....	A.8.87
	Wood-frame Sliding Door – Concrete Floor Intersection for Unheated Spaces (Parking Garages)	
Detail 8.6.2	.....	A.8.88
	Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Continuous Insulation and Wood Strapping Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Rim Joist and Interior Insulated At-Grade Foundation Wall Intersection	
Detail 8.6.3	.....	A.8.89
	Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Continuous Insulation and Wood Strapping Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Rim Joist and Exterior Insulated At-Grade Foundation Wall Intersection	
Detail 8.6.4	.....	A.8.90
	Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Shelf Angle & Brick Ties Supporting Brick Veneer and R-19 Batt Insulation in Stud Cavity – Exterior Insulated At-Grade Foundation Wall Intersection	
Detail 8.6.5	.....	A.8.91
	Exterior Insulated Cross Laminated Timber (CLT) Wall Assembly with Continuous Rigid Insulation Supporting Fiber Cement Board – Concrete Slab and Exterior Insulated At-Grade Foundation Wall Intersection	
Detail 8.6.6	.....	A.8.93
	Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap – Rim Joist and Split Insulated At-Grade Foundation Wall Intersection	
Detail 8.6.7	.....	A.8.94
	Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap – Insulated Rim Joist and Split Insulated At-Grade Foundation Wall Intersection	
Detail 8.6.8	.....	A.8.95
	Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap and R28 ICF Foundation Wall – Rim Joist and Split Insulated At-Grade Foundation Wall Intersection	
Detail 8.6.9	.....	A.8.96
	Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap and R43 ICF Foundation Wall – Rim Joist and Split Insulated At-Grade Foundation Wall Intersection	
Detail 8.6.10	.....	A.8.97

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap and Partially Wrapped R-22.5 Raft Slab Insulation – Slab on Grade Foundation Intersection

Detail 8.6.11**A.8.98**

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap and Partially Wrapped R-45 Raft Slab Insulation – Slab on Grade Foundation Intersection

Detail 8.6.12**A.8.99**

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap and Fully Wrapped R-22.5 Raft Slab Insulation – Slab on Grade Foundation Intersection

Detail 8.6.13**A.8.100**

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap and Fully Wrapped R-45 Raft Slab Insulation – Slab on Grade Foundation Intersection

Detail 8.6.14**A.8.101**

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap and R-22.5 Slab Insulation with Gravel Base – Slab on Grade Foundation Intersection

Detail 8.6.15**A.8.102**

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap and R-45 Slab Insulation with Gravel Base – Slab on Grade Foundation Intersection

Detail 8.7.1**A.8.103**

Exterior and Interior Insulated Wood Infill Wall Assembly with Wood Strapping and Continuous Insulation Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Concrete Wall and Intermediate Floor Intersection with Flashing Bypassing Exterior Insulation

Detail 8.7.2**A.8.104**

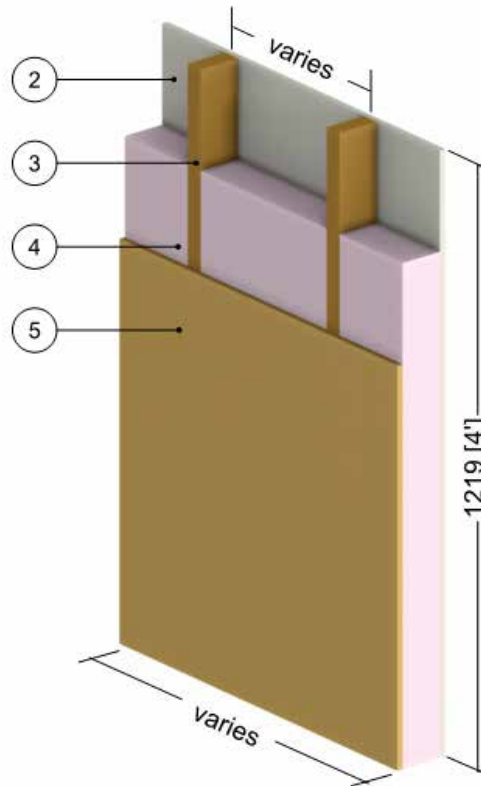
Exterior Insulated Cross Laminated Timber (CLT) Wall Assembly with Wood Strapping and Continuous Rigid Insulation Supporting Fiber Cement Board – Cross Laminated Timber Floor Intersection with Flashing Bypassing Exterior Insulation

Detail 8.7.3**A.8.105**

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – One-Hour Fire Wall Intersection

Detail 8.1.1

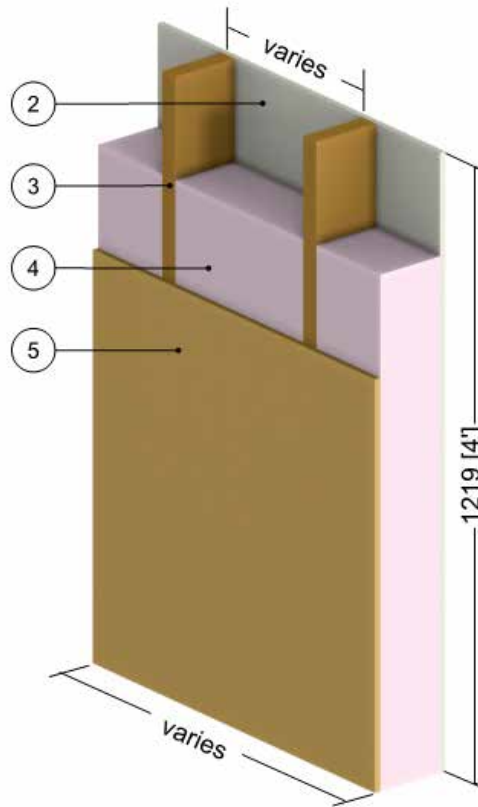
Interior Insulated 2x4 Wood Stud Wall Assembly – Clear Wall



ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
4	Air or Fibreglass Batt Insulation in Stud Cavity	3 1/2" (89)	-	R-0.9 to R-13 (0.16 RSI to 2.28 RSI)	Varies	varies
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	Cladding with 1/2" (13 mm) vented air space is incorporated into exterior heat transfer coefficient					
7	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

Detail 8.1.2

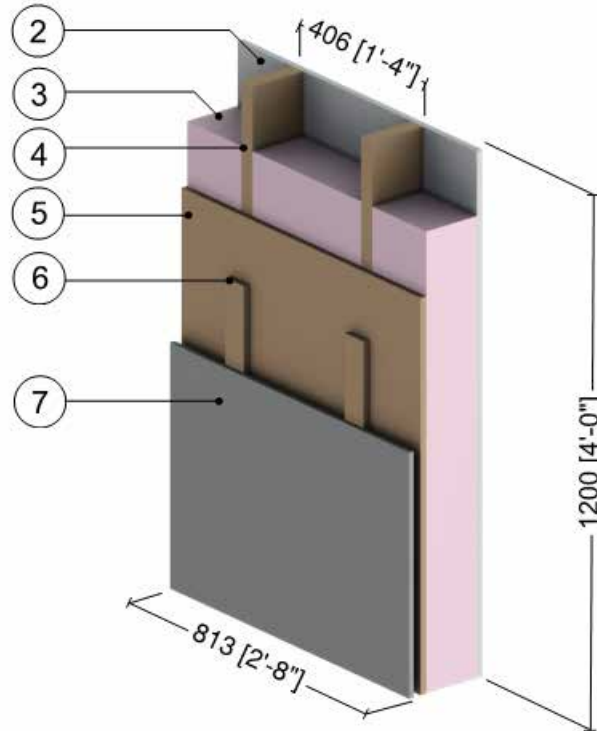
Interior Insulated 2x6 Wood Stud Wall Assembly – Clear Wall



ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
4	Air or Fibreglass Batt Insulation in Stud Cavity	5 1/2" (140)	-	R-0.9 to R-30 (0.16 RSI to 5.28 RSI)	Varies	varies
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	Metal cladding with 1/2" (13 mm) vented air space is incorporated into exterior heat transfer coefficient					
7	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

Detail 8.1.3

Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Clear Wall

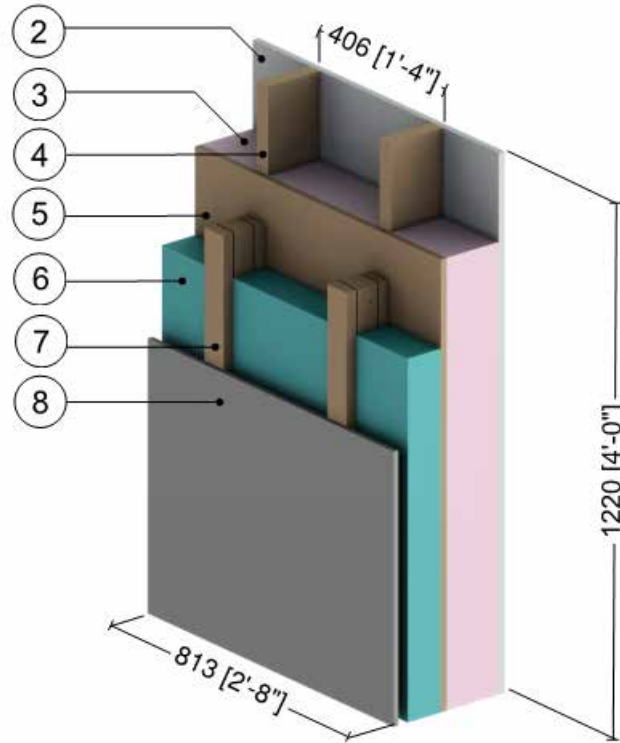


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
7	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
8	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.4

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Clear Wall

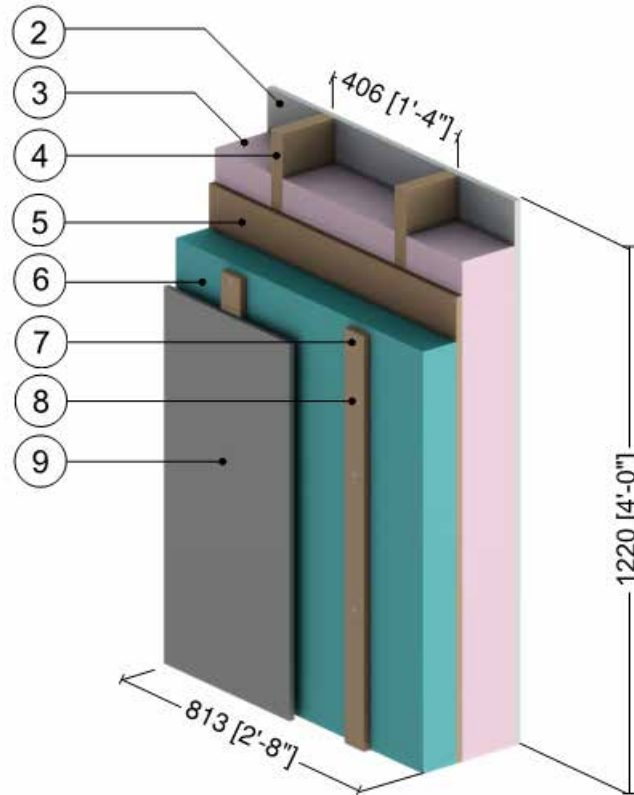


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 RSI to 4.40 RSI)	1.8 (28)	0.29 (1220)
7	1x3 Wood Strapping (16" o.c.)	Varies	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
9	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.5

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Continuous Rigid Insulation Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Clear Wall

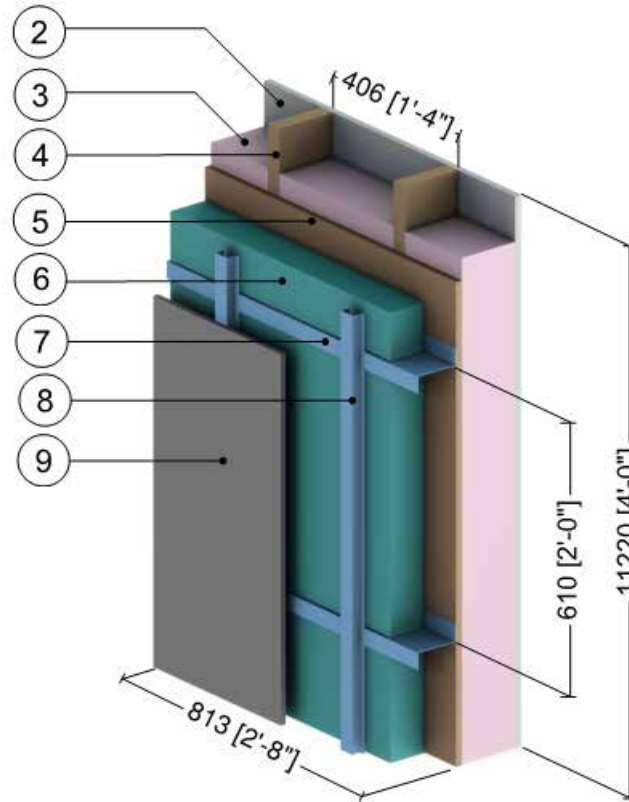


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 RSI to 4.40 RSI)	1.8 (28)	0.29 (1220)
7	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Steel Fasteners (12" o.c.)	0.44" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
9	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.6

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Horizontal Metal Z-Girts (24" o.c.) Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Clear Wall

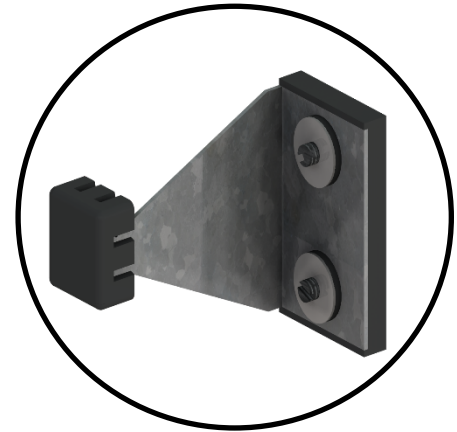
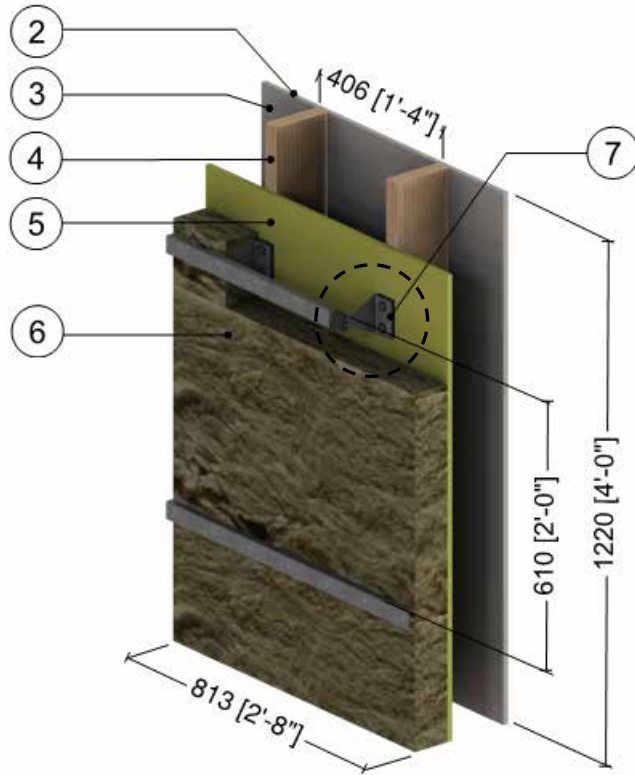


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film (right side) ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-5 to R-25 (0.88 RSI to 4.40 RSI)	1.8 (28)	0.29 (1220)
7	Horizontal Z-Girt with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Steel Furring Hat Track (16" o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film (left side) ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.7

Exterior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Knight MFI-System (24" o.c.) Supporting Cladding – Clear Wall



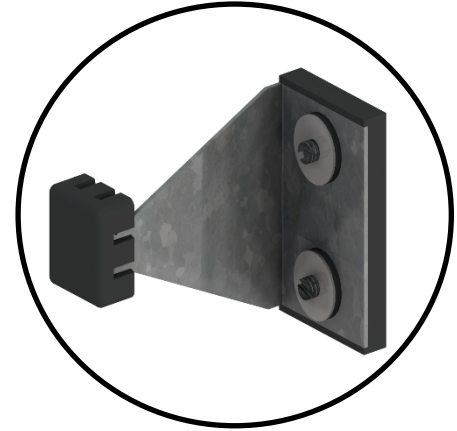
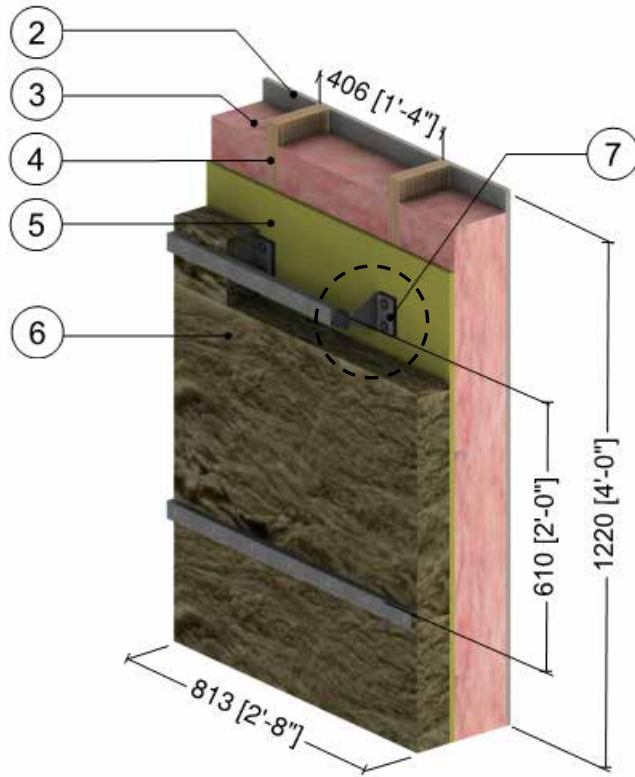
ThermaBracket Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	5 1/2" (140)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	2x6 Wood Stud (16"o.c.)	5 1/2" (140)	0.83 (0.12)	-	31 (500)	0.45 (1880)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	0.24 (0.03)	R-8.4 to R-25.2 (1.48 RSI to 4.44 RSI)	1.8 (28)	0.29 (1220)
7	ThermaBrackets (24" o.c. vertically)	18 Gauge	347 (50)	-	489 (7830)	0.12 (500)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.8

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Knight MFI-System (24" o.c.) Supporting Cladding and R-19 Batt Insulation in Stud Cavity – Clear Wall



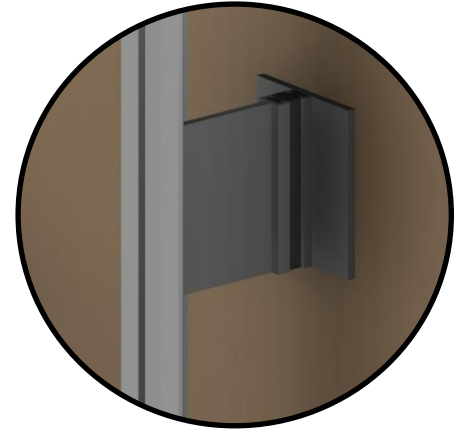
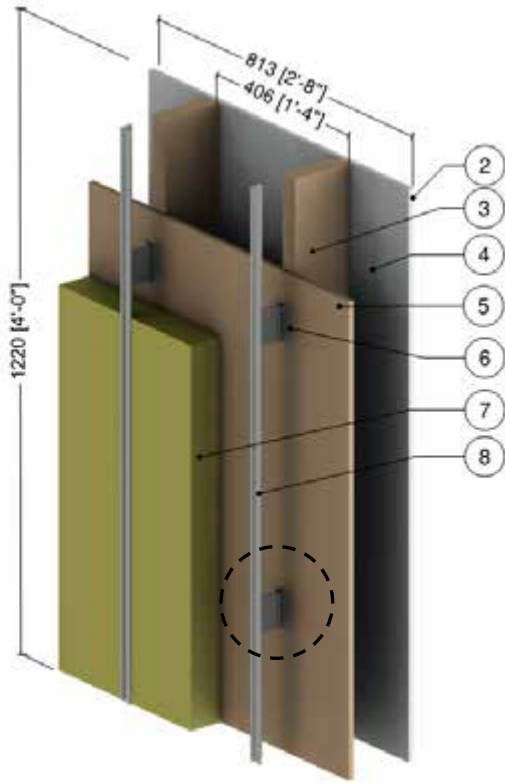
ThermaBracket Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.35 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16"o.c.)	5 1/2" (140)	0.83 (0.12)	-	31 (500)	0.45 (1880)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	0.24 (0.03)	R-8.4 to R-25.2 (1.48 RSI to 4.44 RSI)	1.8 (28)	0.29 (1220)
7	ThermaBrackets (24" o.c. vertically)	18 Gauge	347 (50)	-	489 (7830)	0.12 (500)
8	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
9	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.9

Exterior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Thermally Broken Aluminum Clip Rail System (24" o.c.) Supporting Cladding – Clear Wall



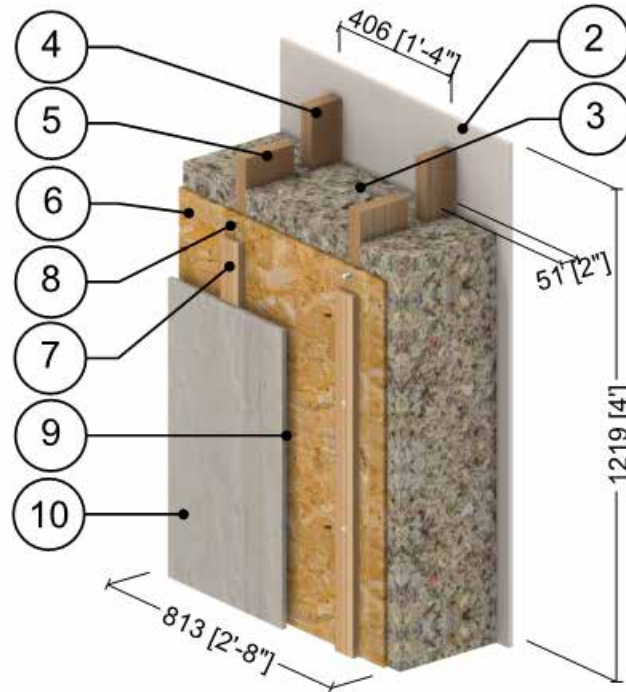
Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.7 (0.10)	-	31 (500)	0.45 (1880)
4	Air in Stud Cavity	5 1/2" (140)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Wood Sheathing	1/2" (13)	0.7 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	Longboard Aluminum Panel Clip	1/5" to 3/8" (5 to 10)	1110 (160)	-	-	-
7	Exterior Insulation	3" (76)	0.24 (0.03)	R-12.6 (2.22 RSI)	1.8 (28)	0.29 (1220)
8	Vertical Steel Girts	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Cladding with 1/2" (13mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.10

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap – Clear Wall

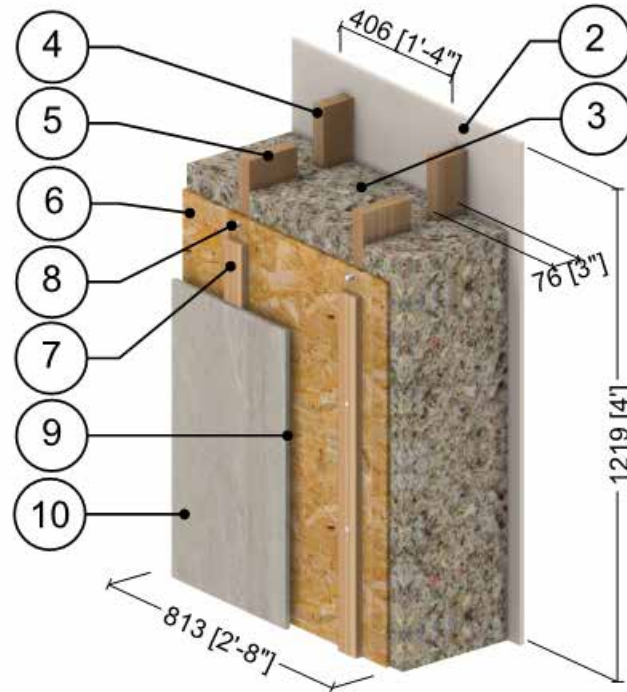


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	11" (279)	0.17 (0.024) to 0.29 (0.041)	R-38.5 to R-66.0 (6.78 RSI to 11.62 RSI)	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Steel Fasteners (12" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
9	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
10	Fiber Cement Board	1/2" (13)	4.86 (0.7)	R-0.1 (0.02 RSI)	-	-
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.11

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 3" Gap – Clear Wall

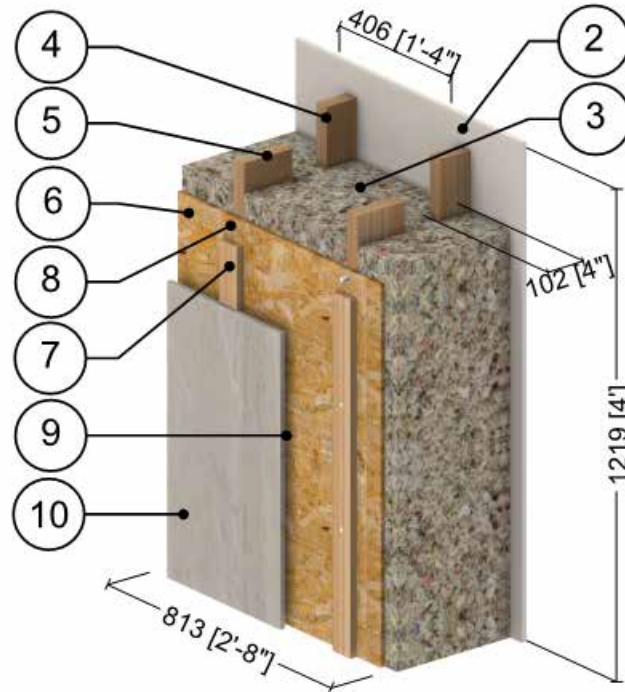


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	12" (305)	0.17 (0.024) to 0.29 (0.041)	R-42.0 to R-72.0 (7.40 RSI to 12.68 RSI)	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Steel Fasteners (12" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
9	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
10	Fiber Cement Board	1/2" (13)	4.86 (0.7)	R-0.1 (0.02 RSI)	-	-
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.12

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 4" Gap – Clear Wall

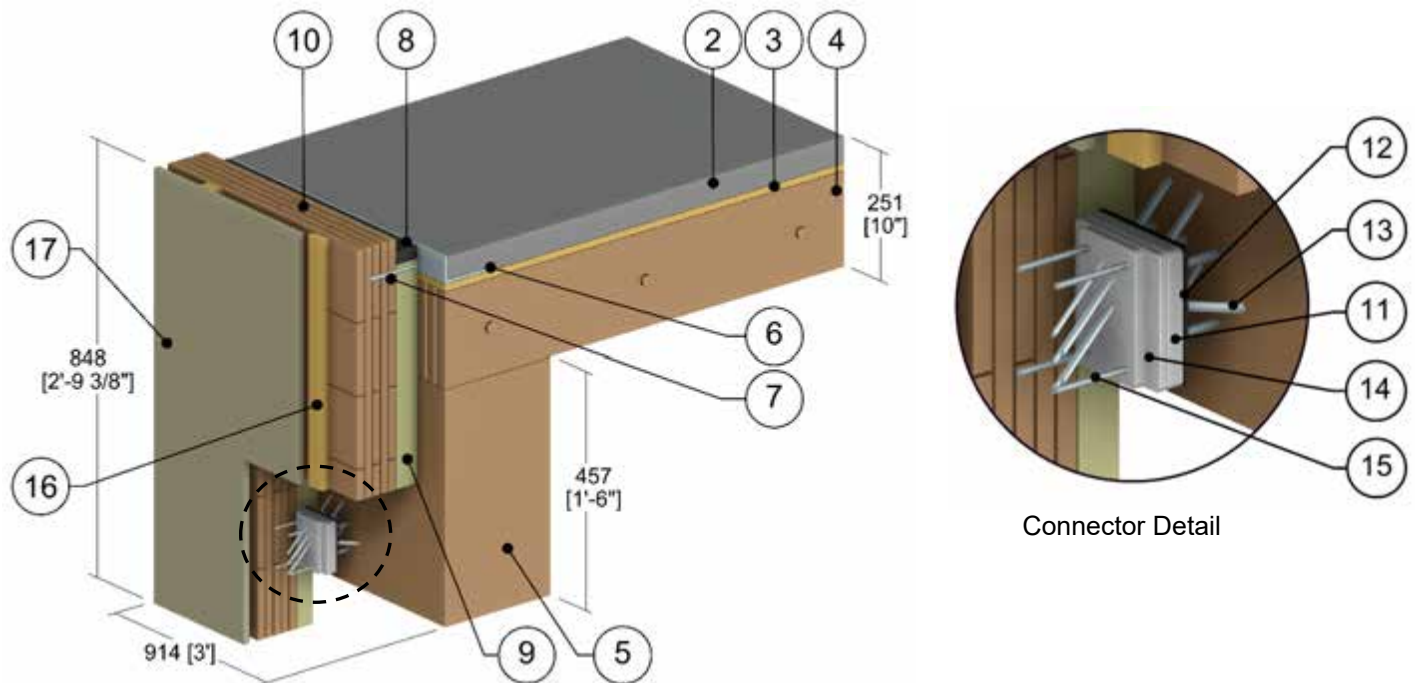


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	13" (330)	0.17 (0.024) to 0.29 (0.041)	R-45.5 to R-78.0 (8.01 RSI to 13.74 RSI)	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Steel Fasteners (12" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
9	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
10	Fiber Cement Board	1/2" (13)	4.86 (0.7)	R-0.1 (0.02 RSI)	-	-
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.13

Interior Insulated Cross Laminated Timber (CLT) Spandrel with ISO-CONNECT Anchor – Anchor Point Transmittance

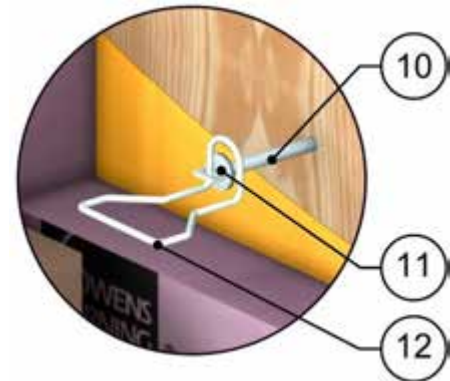
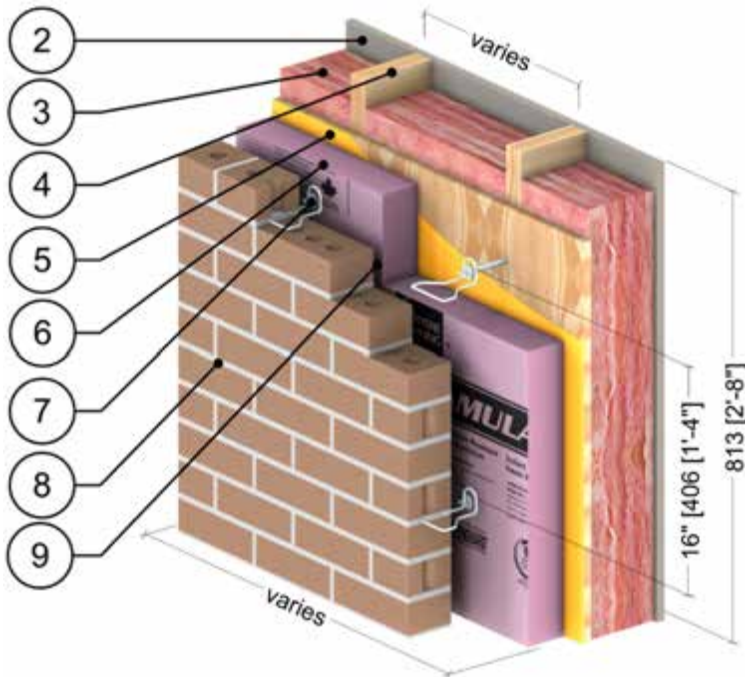


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Concrete Topping	2" (51)	12.5 (1.8)	-	140 (2250)	0.20 (850)
3	Plywood	5/8" (16)	0.69 (0.10)	-	31 (500)	0.45 (1880)
4	DLT Floor	7 1/4" (184)	0.83 (0.12)	-	31 (500)	0.45 (1880)
5	Glulam Beam	9.5" (241)	0.97 (0.14)	R-9.8 (1.73 RSI)	31 (500)	0.45 (1880)
6	L-Angle	1/4" (6)	347 (50)	-	489 (7830)	0.12 (500)
7	Structural Screws 18" o.c.	∅ 5/16" (8)	347 (50)	-	489 (7830)	0.12 (500)
8	Firestop Sealant	1" (25)	2.4 (0.35)	-	174 (2800)	0.17 (700)
9	Mineral Wool Insulation	Varies	0.24 (0.034)	R-8.4 to R-33.6 (1.48 RSI to 5.92 RSI)	4 (64)	0.20 (850)
10	CLT Panel	3.5" (89)	0.83 (0.12)	R-4.2 (0.79 RSI)	31 (500)	0.45 (1880)
11	ISO-CONNECT Plate	19/32" (15)	1110 (160)	-	171 (2740)	0.21 (900)
12	ISO-CONNECT Rubber Pad	1/8" (3)	1.7 (0.25)	-	-	-
13	ISO-CONNECT Fasteners x12	∅ 5/16" (8)	347 (50)	-	489 (7830)	0.12 (500)
14	HVP Coupling Plates	19/32" (15)	1110 (160)	-	171 (2740)	0.21 (900)
15	HVP Fasteners x9	∅ 3/16" (5)	347 (50)	-	489 (7830)	0.12 (500)
16	1" x 3" Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
17	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
18	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.14

Exterior and Interior Insulated 2"x6" Wood Stud (16" o.c. and 24" o.c.) Wall Assembly with Heckmann Pos-I-Tie Veneer Anchoring System Supporting Brick Veneer and Owens Corning R-19 Batt Insulation in Stud Cavity – Clear Wall



Anchor Detail

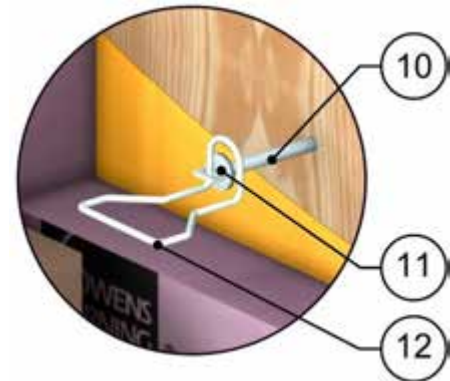
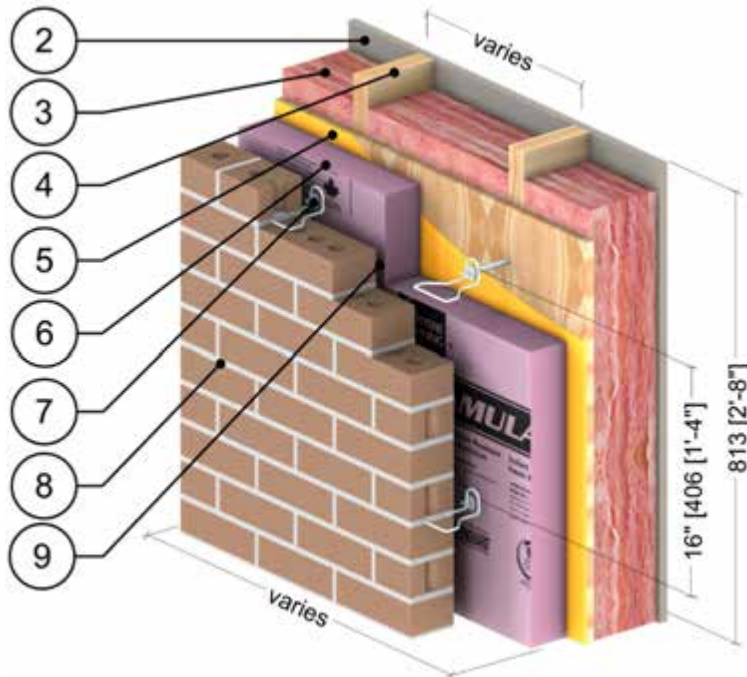
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Ecotouch Pink Fiberglass Batt	5 1/2" (140)	-	R-19 (3.35 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c. and 24" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Wood Sheathing	1/2" (16)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
6	Foamular CodeBord/C-200 Extruded Polystyrene (XPS) Rigid Insulation Type 3	varies	0.20 (0.029)	R-10 to R-20 (1.76 to 3.52 RSI)	1.8 (28)	0.29 (1220)
7	Heckmann Pos-I-Tie Masonry Tie @ 16" (406) o.c.	varies	-	-	-	-
8	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
9	Vented Air Cavity ²	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
10	Zinc Barrel	-	726 (105)	-	412 (6600)	-
11	Rubber Washer (EPDM)	1/16" (1.59)	1.7 (0.25)	-	62 (997)	-
12	Galvanized Steel Wire Pintle	3/16" (5) Ø	645 (93)	-	489 (7830)	0.12 (500)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 8.1.15

Exterior and Interior Insulated 2"x6" Wood Stud (16" o.c. and 24" o.c.) Wall Assembly with Heckmann Pos-I-Tie Veneer Anchoring System Supporting Brick Veneer and Owens Corning R-22 Batt Insulation in Stud Cavity – Clear Wall



Anchor Detail

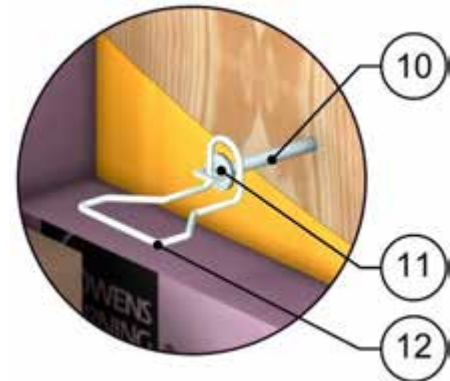
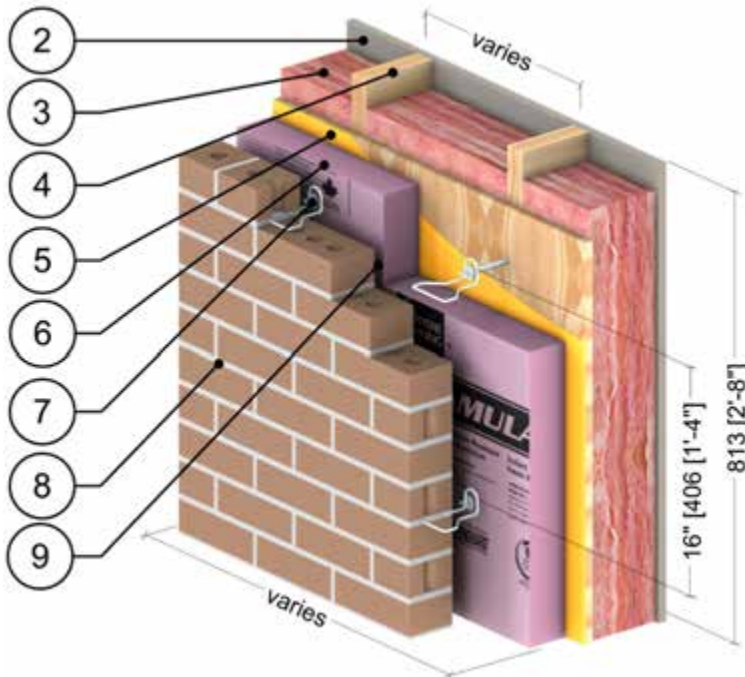
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Ecotouch Pink Fiberglass Batt	5 1/2" (140)	-	R-22 (3.87 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c. and 24" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Wood Sheathing	1/2" (16)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
6	Foamular CodeBord/C-200 Extruded Polystyrene (XPS) Rigid Insulation Type 3	varies	0.20 (0.029)	R-10 to R-20 (1.76 to 3.52 RSI)	1.8 (28)	0.29 (1220)
7	Heckmann Pos-I-Tie Masonry Tie @ 16" (406) o.c.	varies	-	-	-	-
8	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
9	Vented Air Cavity ²	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
10	Zinc Barrel	-	726 (105)	-	412 (6600)	-
11	Rubber Washer (EPDM)	1/16" (1.59)	1.7 (0.25)	-	62 (997)	-
12	Galvanized Steel Wire Pintle	3/16" (5) Ø	645 (93)	-	489 (7830)	0.12 (500)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 8.1.16

Exterior and Interior Insulated 2"x6" Wood Stud (16" o.c. and 24" o.c.) Wall Assembly with Heckmann Pos-I-Tie Veneer Anchoring System Supporting Brick Veneer and Owens Corning R-24 Batt Insulation in Stud Cavity – Clear Wall



Anchor Detail

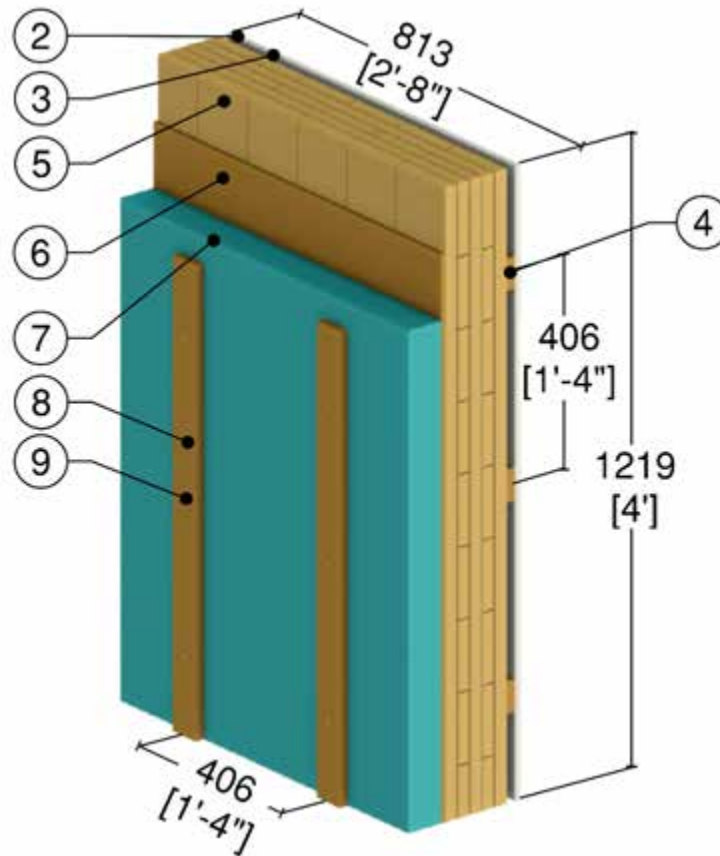
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Ecotouch Pink Fiberglass Batt	5 1/2" (140)	-	R-24 (4.23 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c. and 24" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Wood Sheathing	1/2" (16)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
6	Foamular CodeBord/C-200 Extruded Polystyrene (XPS) Rigid Insulation Type 3	varies	0.20 (0.029)	R-10 to R-20 (1.76 to 3.52 RSI)	1.8 (28)	0.29 (1220)
7	Heckmann Pos-I-Tie Masonry Tie @ 16" (406) o.c.	varies	-	-	-	-
8	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
9	Vented Air Cavity ²	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
10	Zinc Barrel	-	726 (105)	-	412 (6600)	-
11	Rubber Washer (EPDM)	1/16" (1.59)	1.7 (0.25)	-	62 (997)	-
12	Galvanized Steel Wire Pintle	3/16" (5) Ø	645 (93)	-	489 (7830)	0.12 (500)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 8.1.17

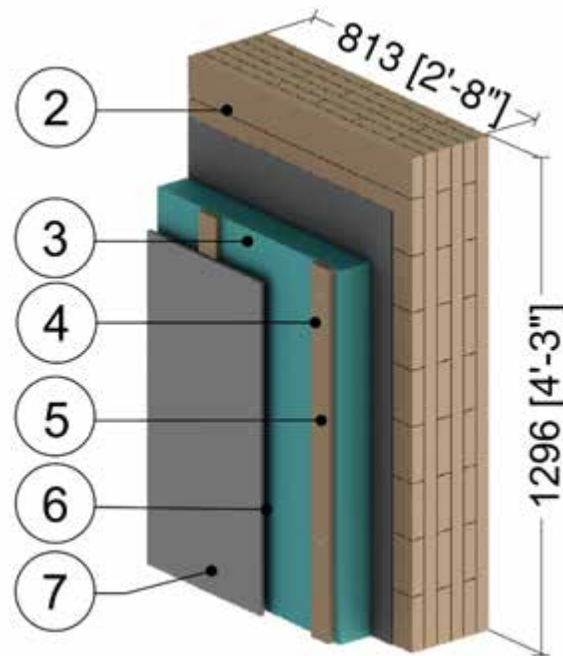
Exterior Insulated Cross Laminated Timber (CLT) Wall Assembly with Continuous Rigid Insulation Supporting Fiber Cement Board – Clear Wall



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Cavity	3/4" (19)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1x3 Wood Strapping (16" o.c.)	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Cross Laminated Timber Wall	5 1/2" (140)	0.83 (0.12)	R-6.6 (1.16 RSI)	31 (500)	0.45 (1880)
6	Plywood Sheathing	3/8" (9.5)	0.69 (0.10)	R-0.5 (0.10 RSI)	31 (500)	0.45 (1880)
7	Exterior Insulation	Varies	-	R-15 to R-25 (2.64 to 4.40 RSI)	1.8 (28)	0.29 (1220)
8	1x3 Wood Strapping (16" o.c.)	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	#14 Steel Fasteners (12" o.c.)	0.24" (6.2) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
11	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

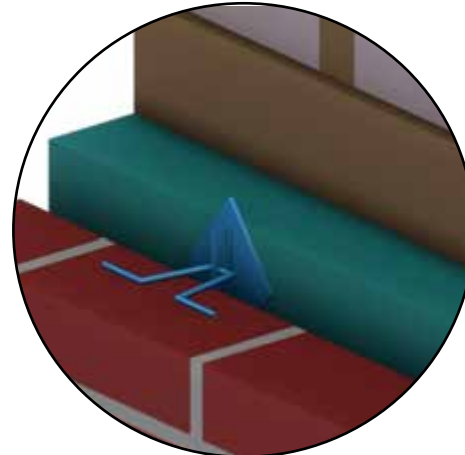
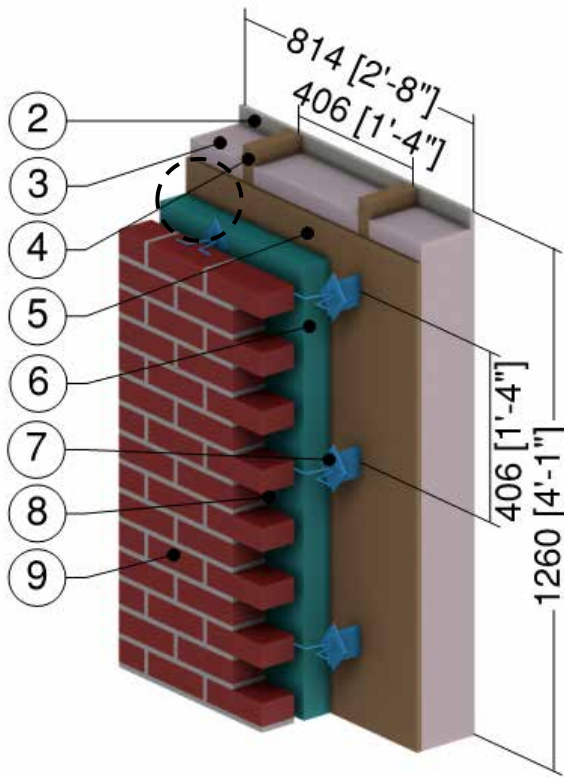
Detail 8.1.18 Exterior Insulated Cross Laminated Timber (CLT) Wall Assembly with Wood Strapping and Continuous Rigid Insulation Supporting Fiber Cement Board



ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Cross Laminated Timber Wall	7 1/2" (191)	0.83 (0.12)	R-9 (1.59 RSI)	31 (500)	0.45 (1880)
3	Exterior Insulation	Varies	-	R-15 to R-25 (2.64 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
4	1x3 Wood Strapping (16" o.c.)	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Steel Fasteners (12" o.c.)	0.44" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
6	Rainscreen Cavity	3/4" (19)	-	R-0.5 (0.09 RSI)	0.075 (1.2)	0.24 (1000)
7	Fiber Cement Board Cladding	1/2" (13)	4.9 (0.7)	R-0.1 (0.02 RSI)	112 (1800)	0.20 (840)
8	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.19 Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Brick Ties Supporting Brick Veneer and R-19 Batt Insulation in Stud Cavity – Clear Wall



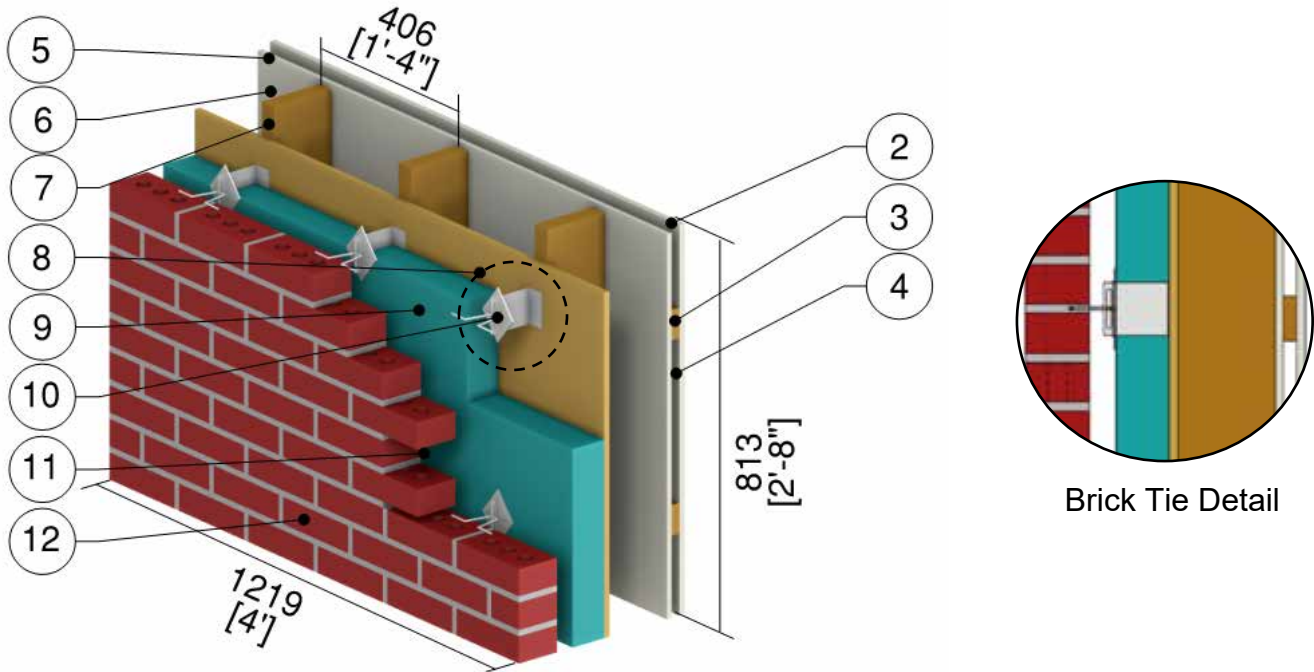
Brick Tie Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation in Stud Cavity	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-0 to R-15 (0.00 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	Brick Ties	14 gauge	347 (50)	-	489 (7830)	0.12 (500)
8	Air Cavity	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
9	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	140 (2250)	0.20 (850)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.20

Exterior Insulated 2x6 Wood Stud (16" o.c.) Wall with Interior OSB and Wood Furring Assembly & Brick Ties Supporting Brick Veneer – Clear Wall

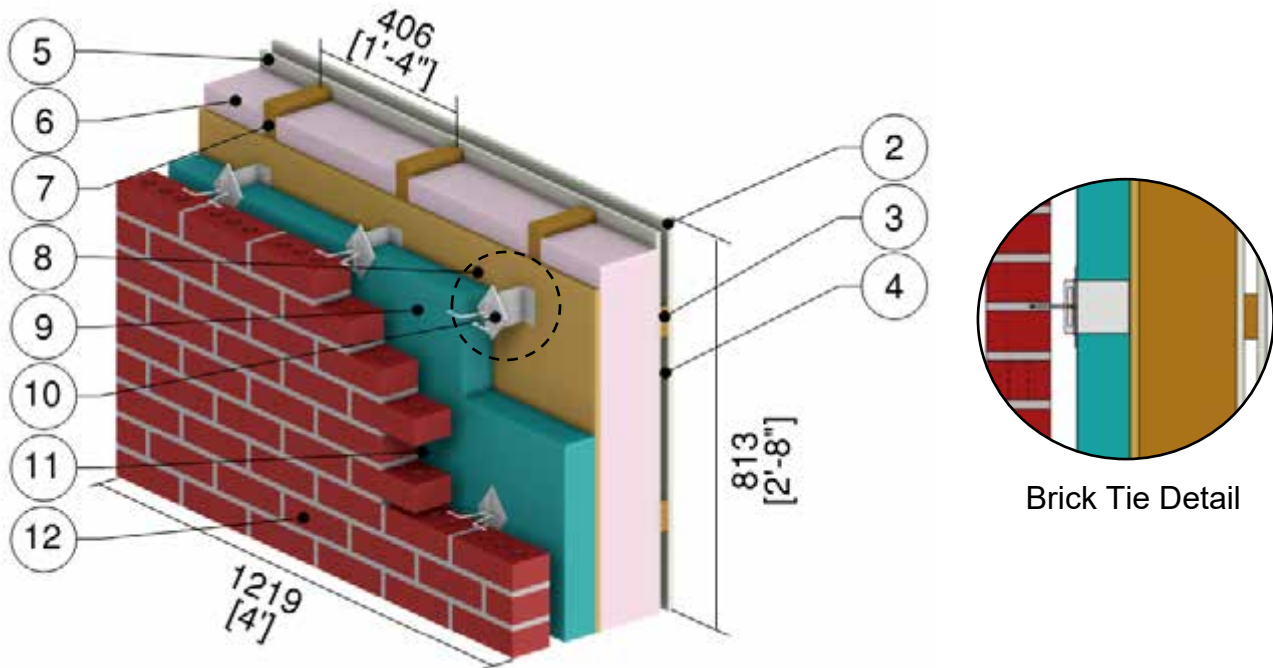


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum	1/2"(13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1x3 Wood Furring	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
4	Air in Furring Cavity	3/4"(19)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	OSB	7/16" (11)	1.1 (0.16)	R-0.4 (0.07 RSI)	31 (500)	0.45 (1880)
6	Air in Stud Cavity	5 1/2" (140)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
7	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Exterior Plywood Sheathing	1/2"(13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Exterior Insulation	Varies	-	R-10 to R-30 (1.76 to 5.28 RSI)	1.8 (28)	0.29 (1220)
10	Brick Ties	14 gauge	347 (50)	-	489 (7830)	0.12 (500)
11	Air Cavity	1 1/2" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
12	Brick Veneer	3 5/8" (92)	5.4 (0.78)	R-0.7 (0.12 RSI)	140 (2250)	0.20 (850)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.21

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall with Interior OSB and Wood Furring Assembly & Brick Ties Supporting Brick Veneer – Clear Wall

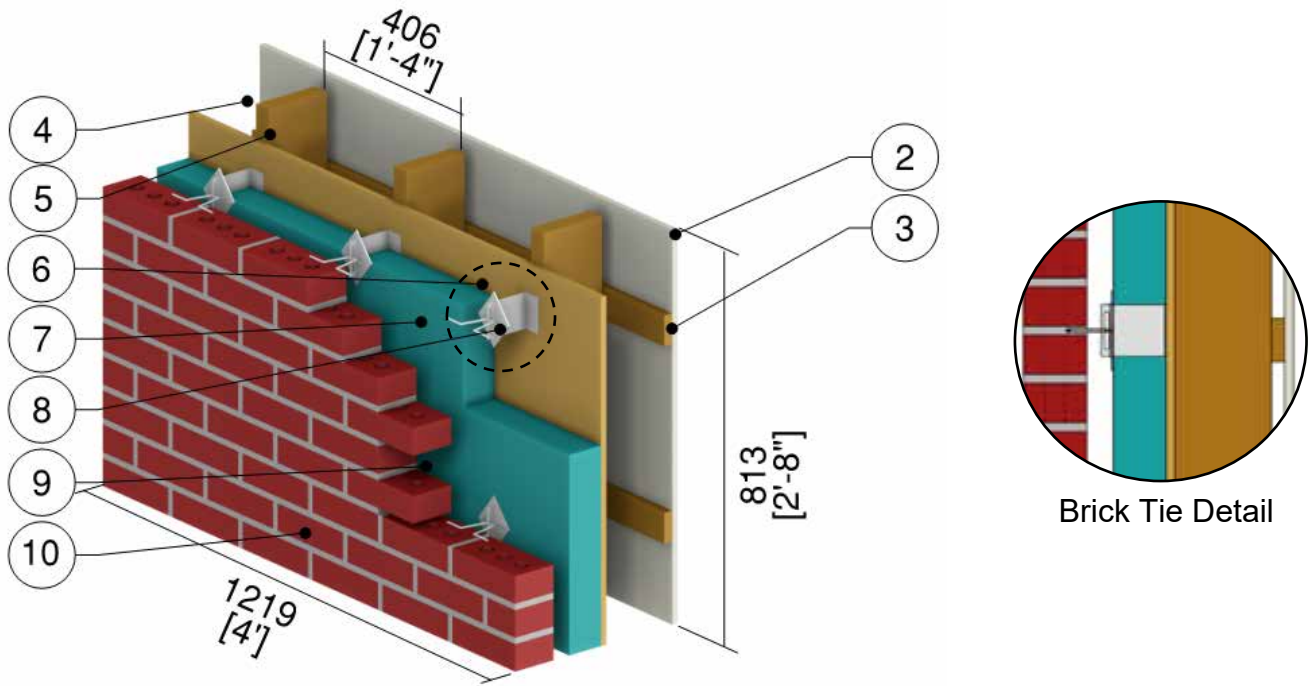


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1x3 Wood Furring	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
4	Air in Furring Cavity	3/4" (19)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	OSB	7/16" (11)	1.1 (0.16)	R-0.4 (0.07 RSI)	31 (500)	0.45 (1880)
6	Fiberglass Batt Insulation in Stud Cavity	5 1/2" (140)	0.29 (0.042)	R-19.0 (3.35 RSI)	0.9 (14)	0.17 (710)
7	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Exterior Insulation	Varies	-	R-5 to R-30 (0.88 to 5.28 RSI)	1.8 (28)	0.29 (1220)
10	Brick Ties	14 gauge	347 (50)	-	489 (7830)	0.12 (500)
11	Air Cavity	1 1/2" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
12	Brick Veneer	3 5/8" (92)	5.4 (0.78)	R-0.7 (0.12 RSI)	140 (2250)	0.20 (850)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.22

Exterior Insulated 2x6 Wood Stud (16" o.c.) Wall with Interior Wood Furring Assembly & Brick Ties Supporting Brick Veneer – Clear Wall

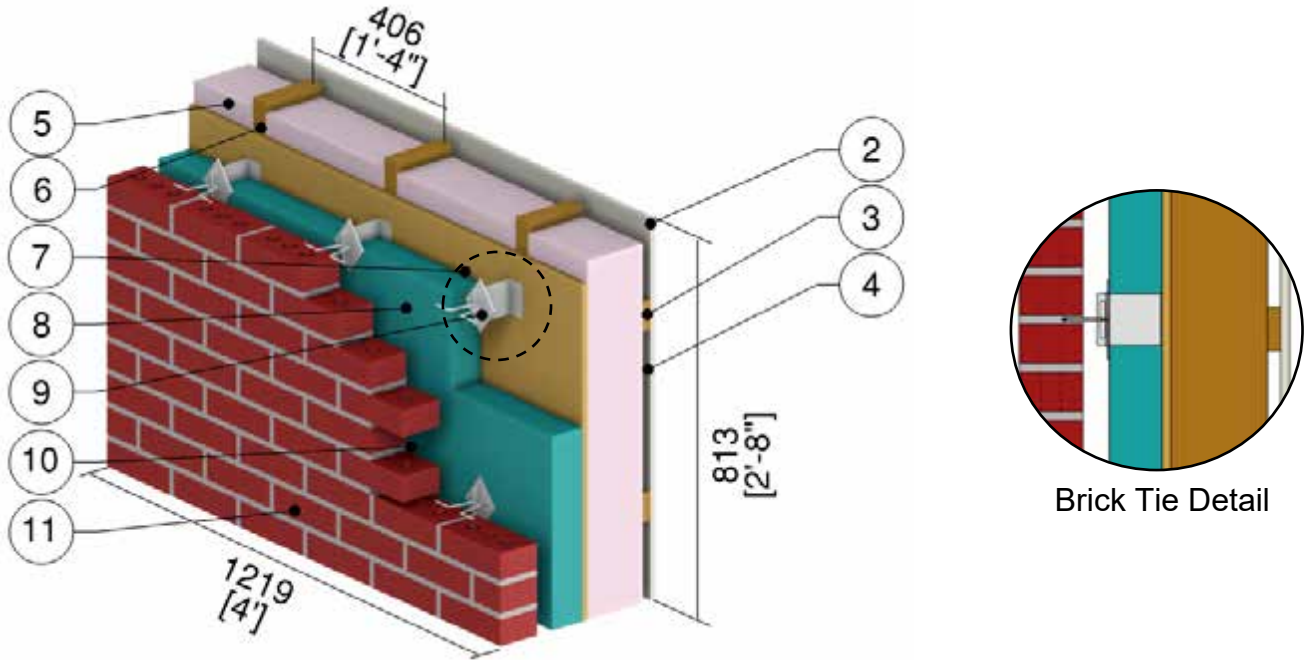


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1x3 Wood Furring	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
4	Air in Stud Cavity	6 1/4" (159)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
7	Exterior Insulation	Varies	-	R-10 to R-30 (1.76 to 5.28 RSI)	1.8 (28)	0.29 (1220)
8	Brick Ties	14 gauge	347 (50)	-	489 (7830)	0.12 (500)
9	Air Cavity	1 1/2" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
10	Brick Veneer	3 5/8" (92)	5.4 (0.78)	R-0.7 (0.12 RSI)	140 (2250)	0.20 (850)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.23

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall with Interior Wood Furring Assembly & Brick Ties Supporting Brick Veneer – Clear Wall

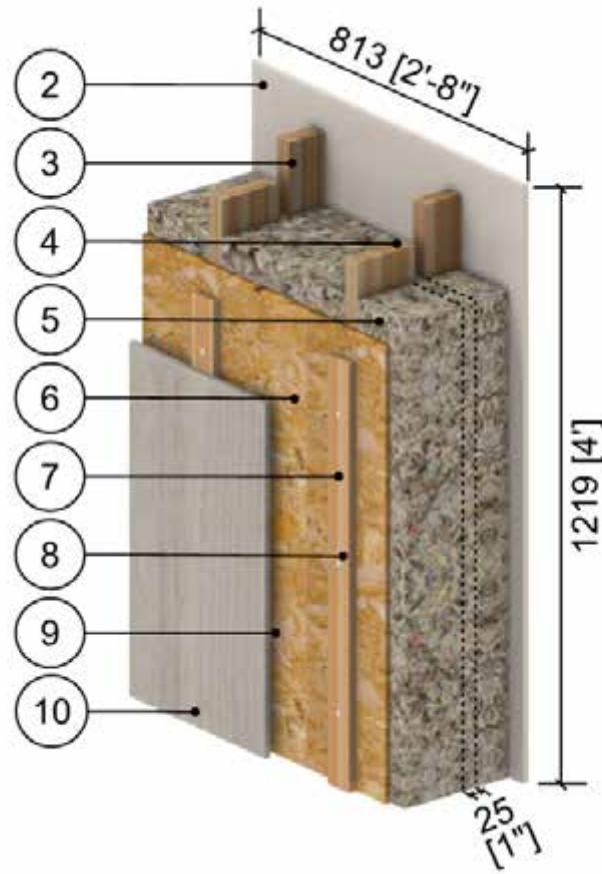


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1x3 Wood Furring	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
4	Air in Furring Cavity	3/4" (19)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Fiberglass Batt Insulation in Stud Cavity	5 1/2" (140)	0.29 (0.042)	R-19.0 (3.35 RSI)	0.9 (14)	0.17 (710)
6	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
7	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Exterior Insulation	Varies	-	R-5 to R-30 (0.88 to 5.28 RSI)	1.8 (28)	0.29 (1220)
9	Brick Ties	14 gauge	347 (50)	-	489 (7830)	0.12 (500)
10	Air Cavity	1 1/2" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
11	Brick Veneer	3 5/8" (92)	5.4 (0.78)	R-0.7 (0.12 RSI)	140 (2250)	0.20 (850)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.24

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 1" Gap – Clear Wall

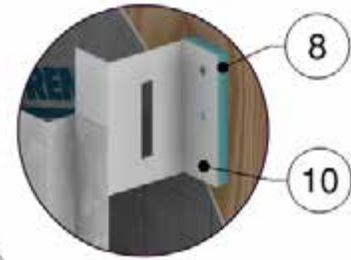
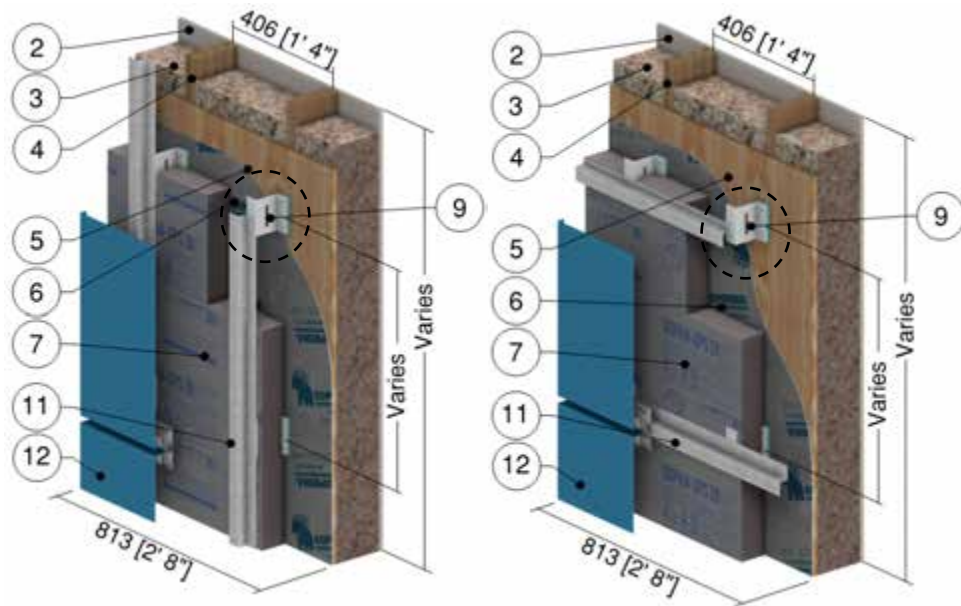


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	10" (305)	Varies	R-35.0 to R-60.0 (6.16 RSI to 10.57 RSI)	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Steel Fasteners (12" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
9	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
10	Fiber Cement Board	1/2" (13)	4.86 (0.7)	R-0.1 (0.02 RSI)	-	-
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

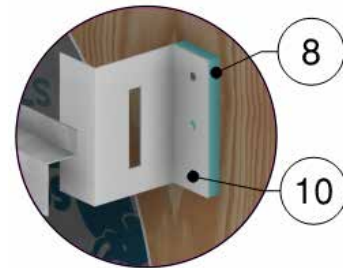
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.25

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with SOPREMA SOPRA-XPS 20 and ACS-S Thermal Clip Supporting Metal Cladding with R-19 Cellulose Insulation in Stud Cavity - Clear Wall



Vertical Girt: ACS Clip Detail



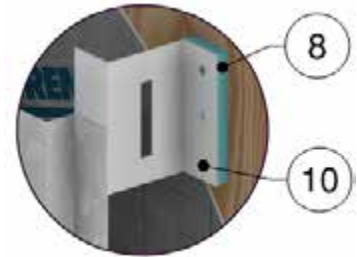
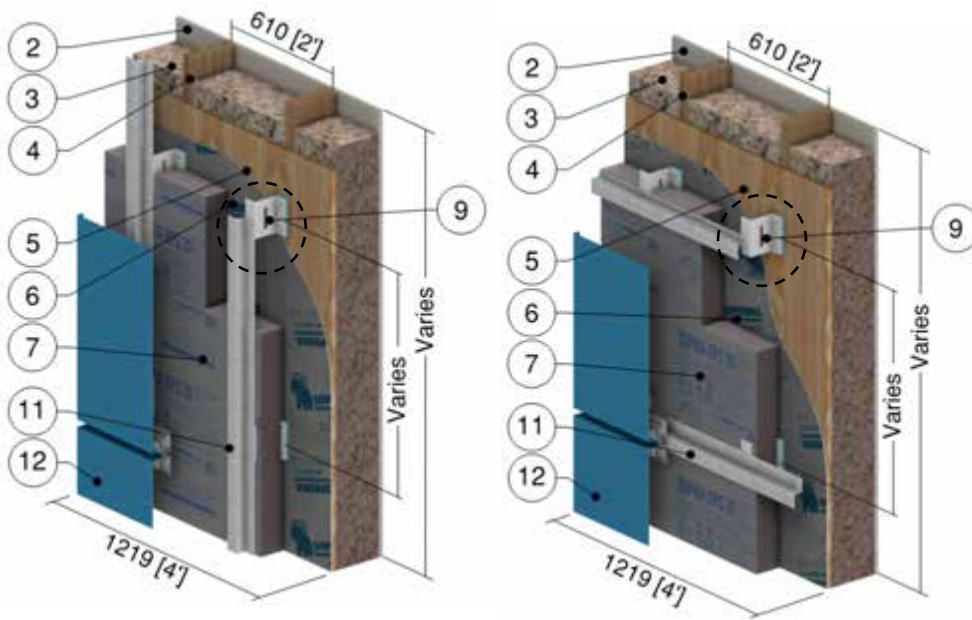
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	5-1/2" (140)	0.29 (0.042)	R-19.0 (3.35 RSI)	1.2 (19)	0.33 (1400)
4	2x6 Wood Stud	5-1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	SOPRA-XPS 20 Exterior Insulation	Varies	0.20 (0.029)	R-5.0 to R-35.0 (0.88 to RSI 6.16 RSI)	2.5 (40)	0.29 (1220)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

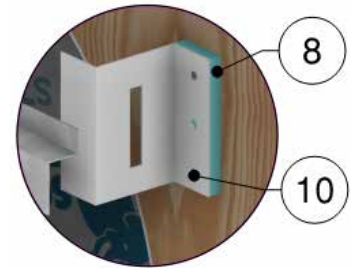
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.26

Exterior and Interior Insulated 2x6 Wood Stud (24" o.c.) Wall Assembly with SOPREMA SOPRA-XPS 20 and ACS-S Thermal Clip Supporting Metal Cladding with R-19 Cellulose Insulation in Stud Cavity - Clear Wall



Vertical Girt: ACS Clip Detail



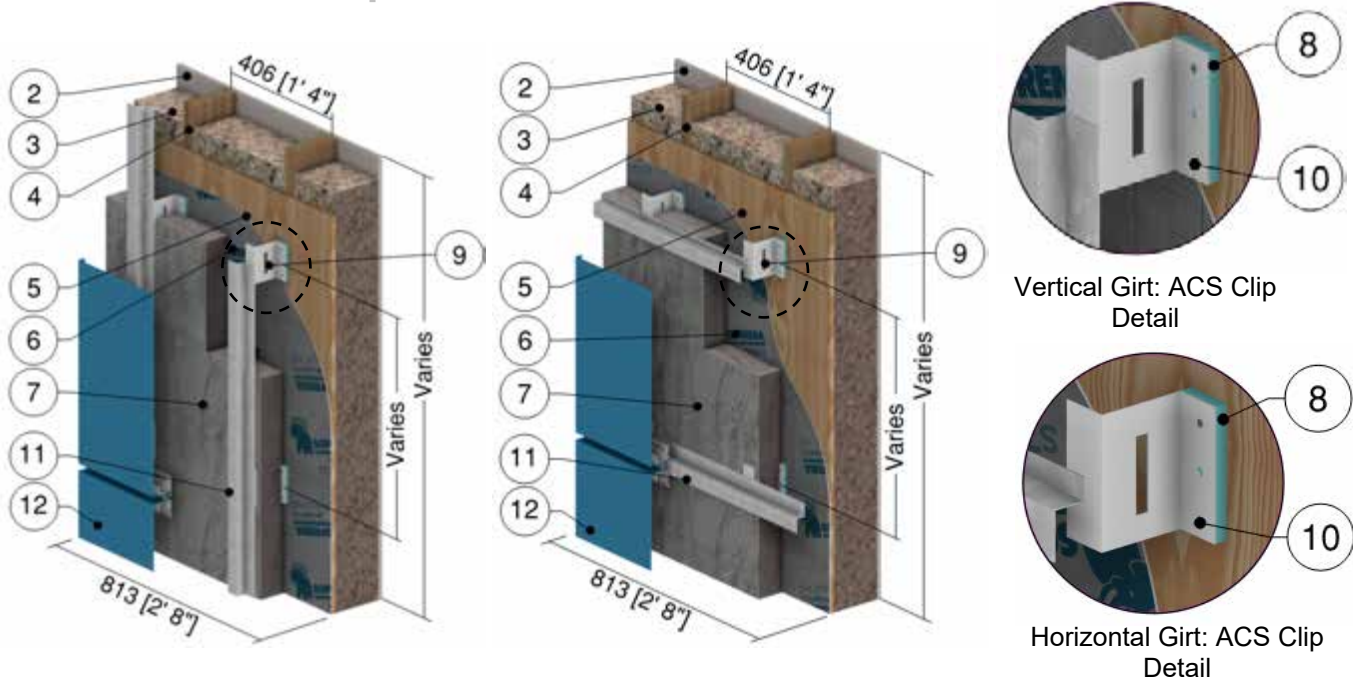
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	5-1/2" (140)	0.29 (0.042)	R-19.0 (3.35 RSI)	1.2 (19)	0.33 (1400)
4	2x6 Wood Stud	5-1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	SOPRA-XPS 20 Exterior Insulation	Varies	0.20 (0.029)	R-5.0 to R-35.0 (0.88 RSI to 6.16 RSI)	2.5 (40)	0.29 (1220)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.27

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with SOPREMA SOPRA-SPF 202 and ACS-S Thermal Clip Supporting Metal Cladding with R-19 Cellulose Insulation in Stud Cavity - Clear Wall

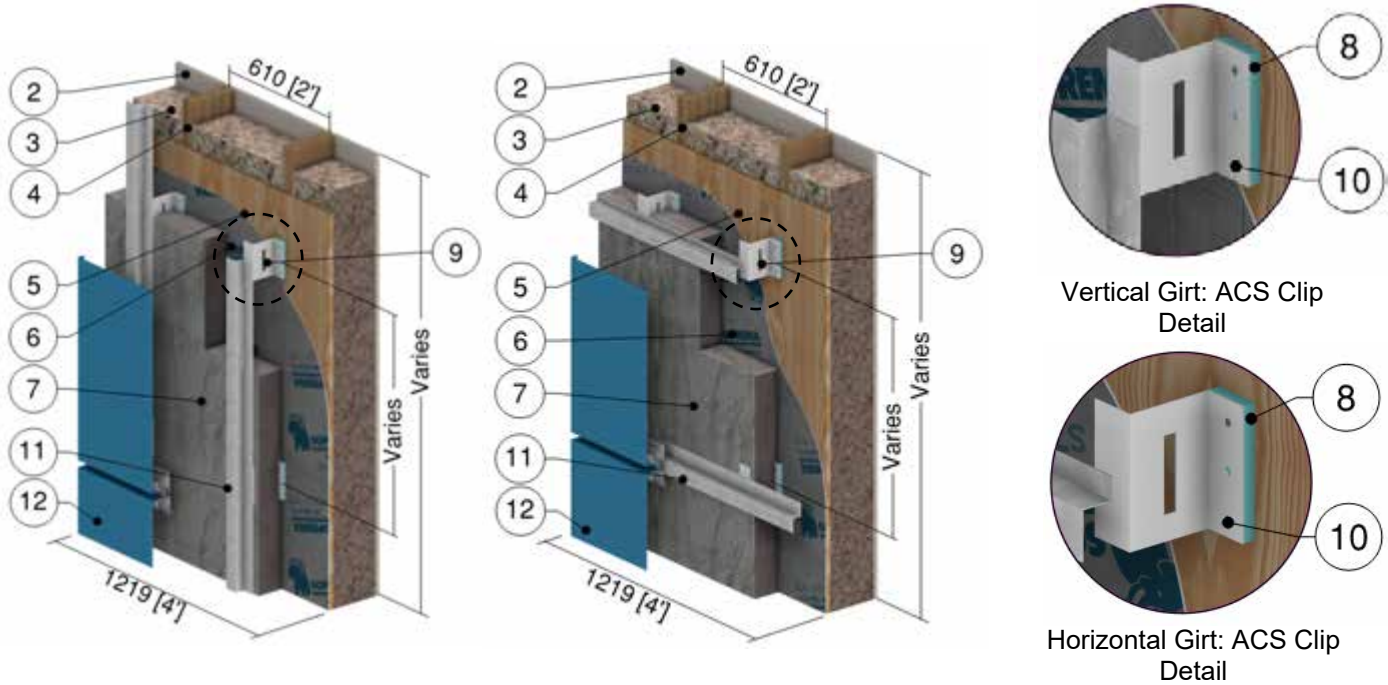


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	5-1/2" (140)	0.29 (0.042)	R-19.0 (3.35 RSI)	1.2 (19)	0.33 (1400)
4	2x6 Wood Stud	5-1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	SOPRA-SPF 202 Exterior Insulation	Varies	0.16 (0.023)	R-6.2 to R-43.4 (1.09 RSI to 7.64 RSI)	1.8 (28)	0.29 (1220)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.28

Exterior and Interior Insulated 2x6 Wood Stud (24" o.c.) Wall Assembly with SOPREMA SOPRA-SPF 202 and ACS-S Thermal Clip Supporting Metal Cladding with R-19 Cellulose Insulation in Stud Cavity - Clear Wall

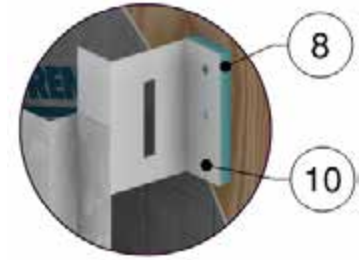
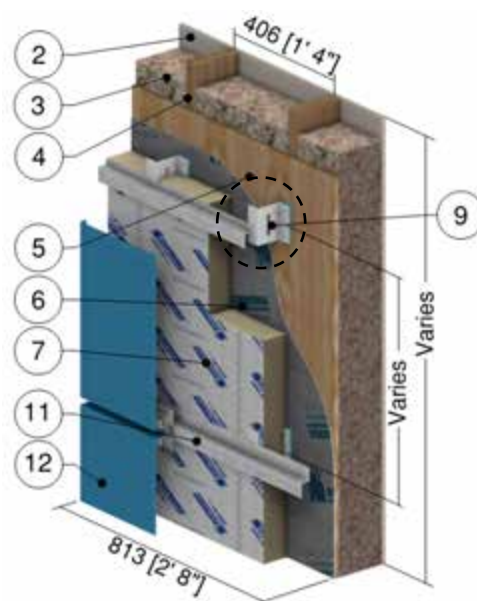
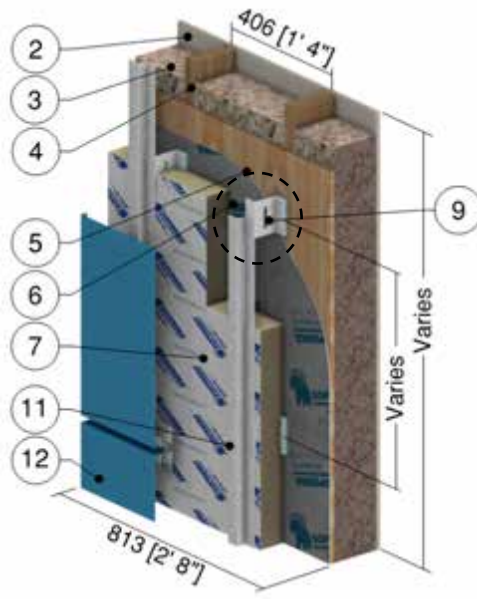


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	5-1/2" (140)	0.29 (0.042)	R-19.0 (3.35 RSI)	1.2 (19)	0.33 (1400)
4	2x6 Wood Stud	5-1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	SOPRA-SPF 202 Exterior Insulation	Varies	0.16 (0.023)	R-6.2 to R-43.4 (1.09 RSI to 7.64 RSI)	1.8 (28)	0.29 (1220)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

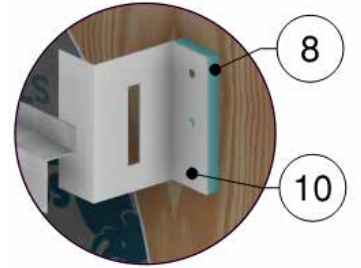
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.29

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with SOPREMA SOPRA-ISO V PLUS and ACS-S Thermal Clip Supporting Metal Cladding with R-19 Cellulose Insulation in Stud Cavity - Clear Wall



Vertical Girt: ACS Clip Detail



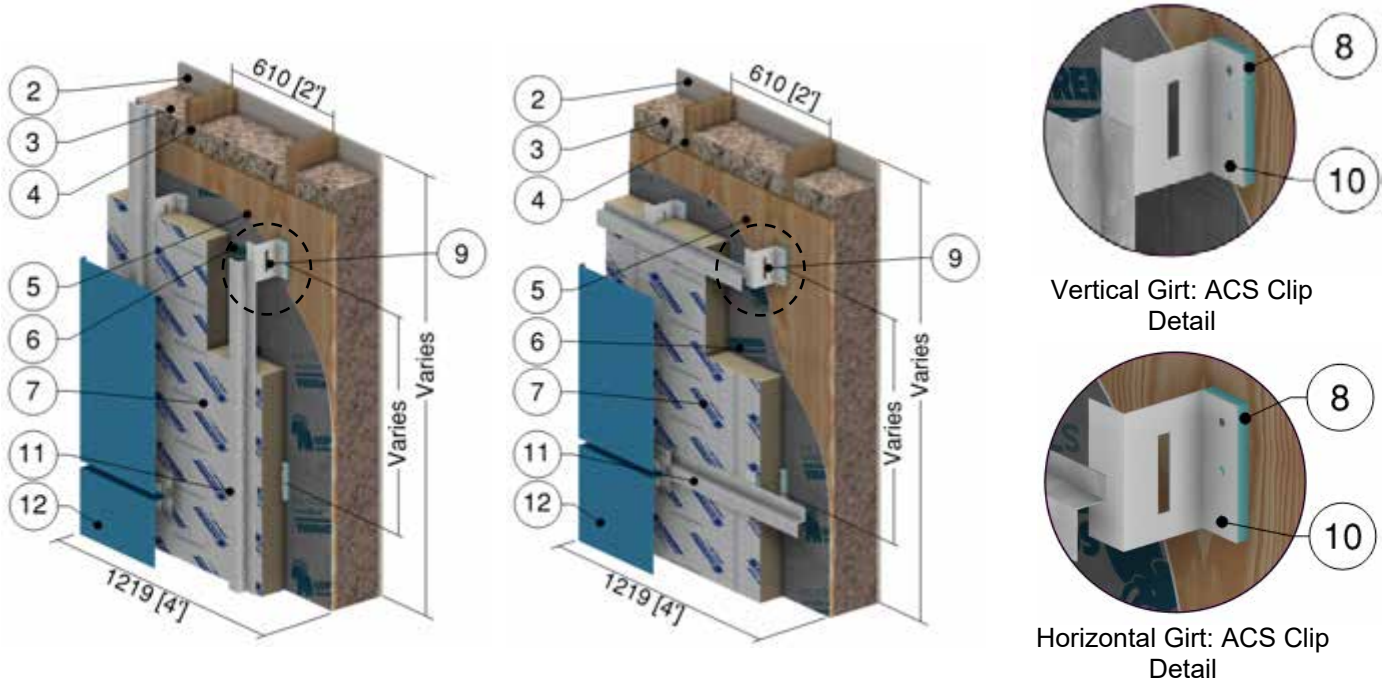
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	5-1/2" (140)	0.29 (0.042)	R-19.0 (3.35 RSI)	1.2 (19)	0.33 (1400)
4	2x6 Wood Stud	5-1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	SOPRA-ISO V PLUS Exterior Insulation	Varies	0.17 (0.024)	R-6.0 to R-42.0 (1.06 RSI to 7.40 RSI)	1.9 (30)	0.36 (1500)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.30

Exterior and Interior Insulated 2x6 Wood Stud (24" o.c.) Wall Assembly with SOPREMA SOPRA-ISO V PLUS and ACS-S Thermal Clip Supporting Metal Cladding with R-19 Cellulose Insulation in Stud Cavity - Clear Wall

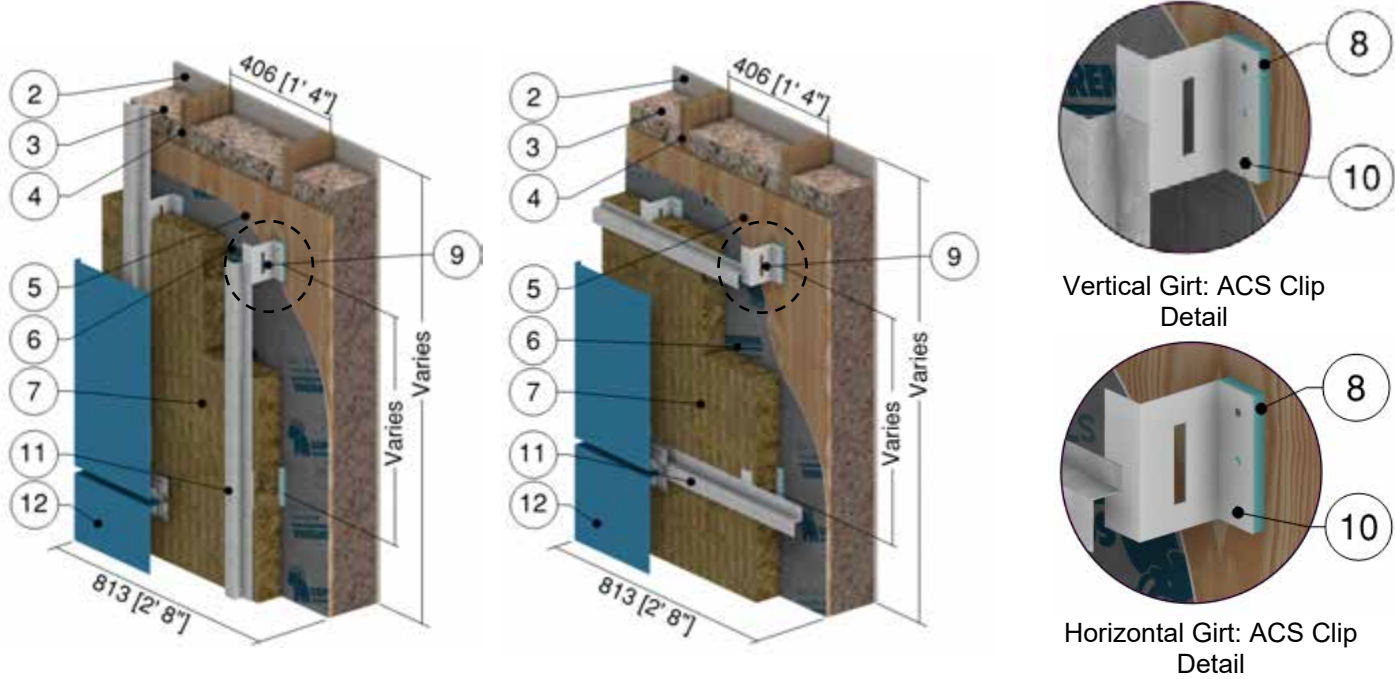


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	5-1/2" (140)	0.29 (0.042)	R-19.0 (3.35 RSI)	1.2 (19)	0.33 (1400)
4	2x6 Wood Stud	5-1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	SOPRA-ISO V PLUS Exterior Insulation	Varies	0.17 (0.024)	R-6.0 to R-42.0 (1.06 RSI to 7.40 RSI)	1.9 (30)	0.36 (1500)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.31

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Mineral Wool and ACS-S Thermal Clip Supporting Metal Cladding with R-19 Cellulose Insulation in Stud Cavity - Clear Wall

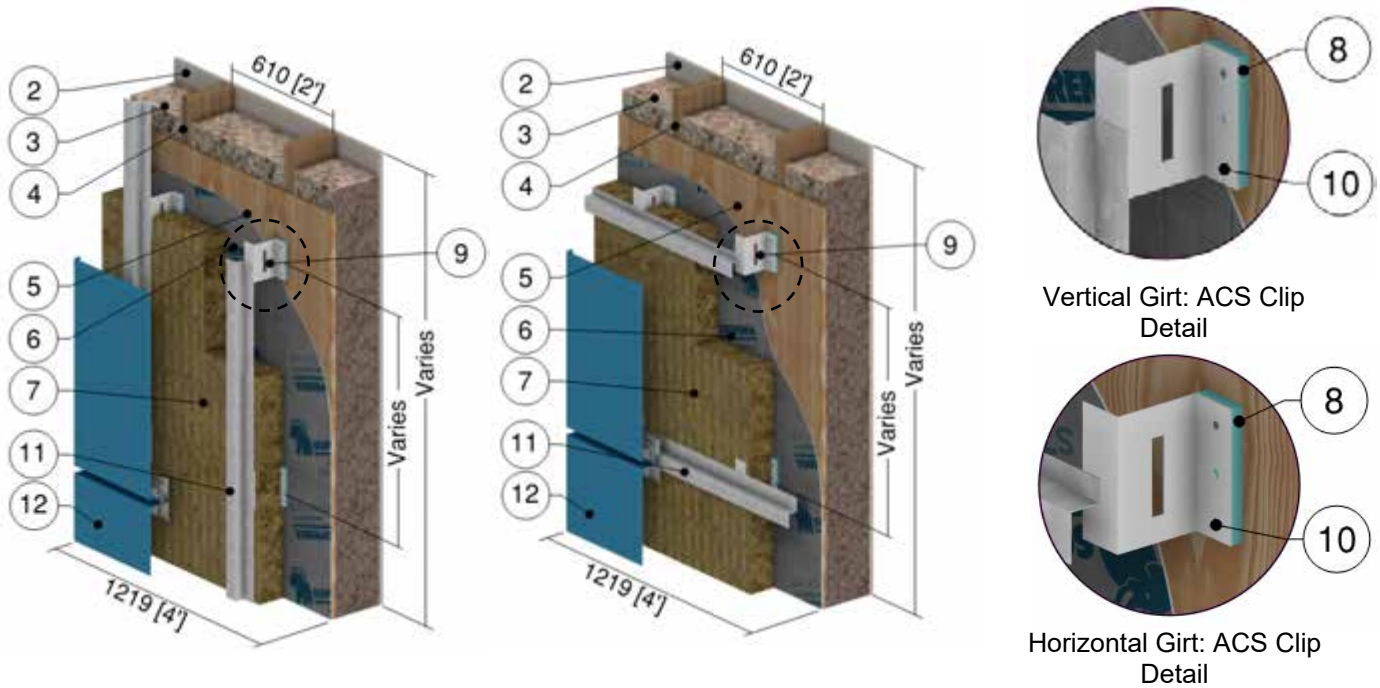


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	5-1/2" (140)	0.29 (0.042)	R-19.0 (3.35 RSI)	1.2 (19)	0.33 (1400)
4	2x6 Wood Stud	5-1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	Exterior Mineral Wool Insulation	Varies	0.23 (0.034)	R-4.3 to R-34.4 (0.76 RSI to 6.06 RSI)	1.8 (28)	0.29 (1220)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.32

Exterior and Interior Insulated 2x6 Wood Stud (24" o.c.) Wall Assembly with Mineral Wool and ACS-S Thermal Clip Supporting Metal Cladding with R-19 Cellulose Insulation in Stud Cavity - Clear Wall

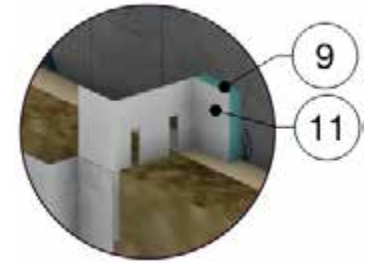
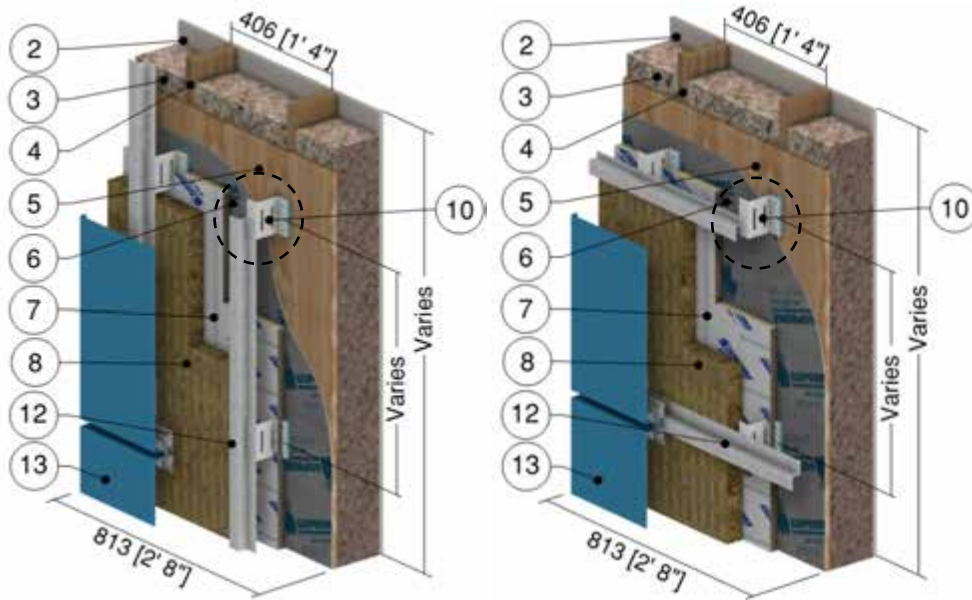


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	5-1/2" (140)	0.29 (0.042)	R-19.0 (3.35 RSI)	1.2 (19)	0.33 (1400)
4	2x6 Wood Stud	5-1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	Exterior Mineral Wool Insulation	Varies	0.23 (0.034)	R-4.3 to R-34.4 (0.76 RSI to 6.06 RSI)	1.8 (28)	0.29 (1220)
8	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
9	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
10	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

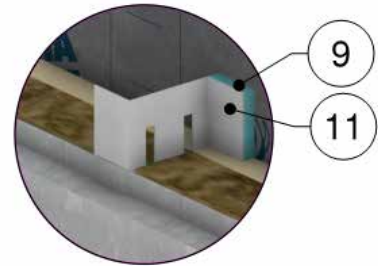
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.33

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Protected SOPREMA SOPRA-ISO V PLUS and ACS-S Thermal Clip Supporting Metal Cladding with R-19 Cellulose Insulation in Stud Cavity - Clear Wall



Vertical Girt: ACS Clip Detail



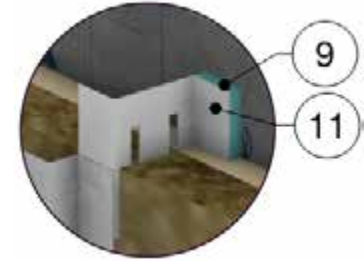
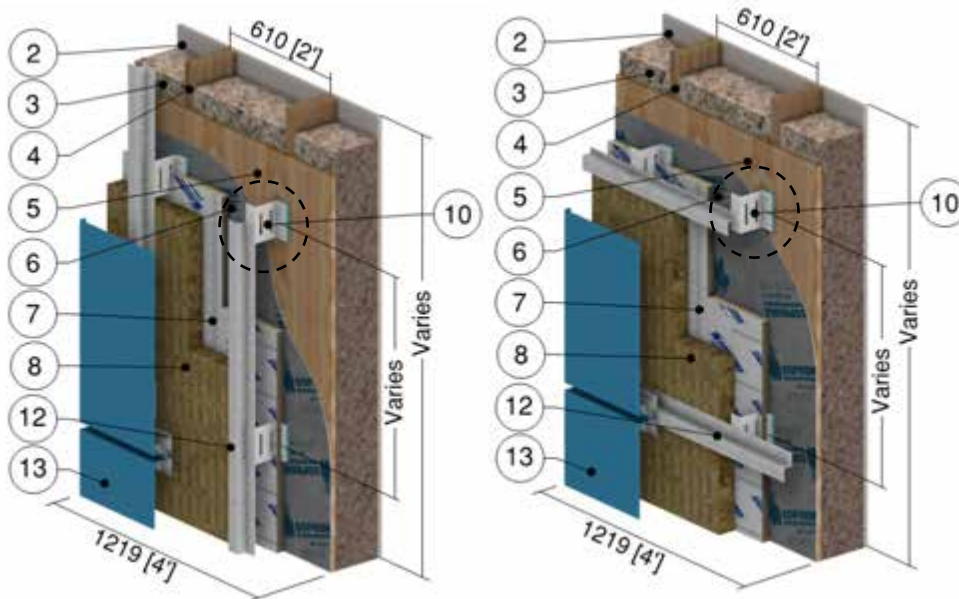
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	5-1/2" (140)	0.29 (0.042)	R-19.0 (3.35 RSI)	1.2 (19)	0.33 (1400)
4	2x6 Wood Stud	5-1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	SOPRA-ISO V PLUS Exterior Insulation	Varies	0.17 (0.024)	R-6.0 to R-30.0 (1.06 RSI to 5.28 RSI)	1.9 (30)	0.36 (1500)
8	Exterior Mineral Wool Insulation	2" (50)	0.23 (0.034)	R-8.6 (1.51 RSI)	1.8 (28)	0.29 (1220)
9	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
10	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
11	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
12	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
14	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

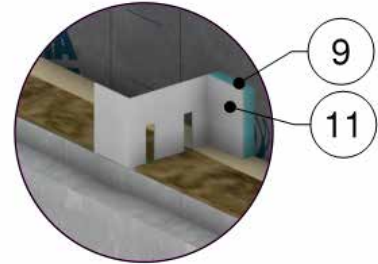
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.34

Exterior and Interior Insulated 2x6 Wood Stud (24" o.c.) Wall Assembly with Protected SOPREMA SOPRA-ISO V PLUS and ACS-S Thermal Clip Supporting Metal Cladding with R-19 Cellulose Insulation in Stud Cavity - Clear Wall



Vertical Girt: ACS Clip Detail



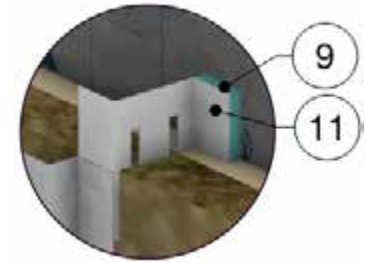
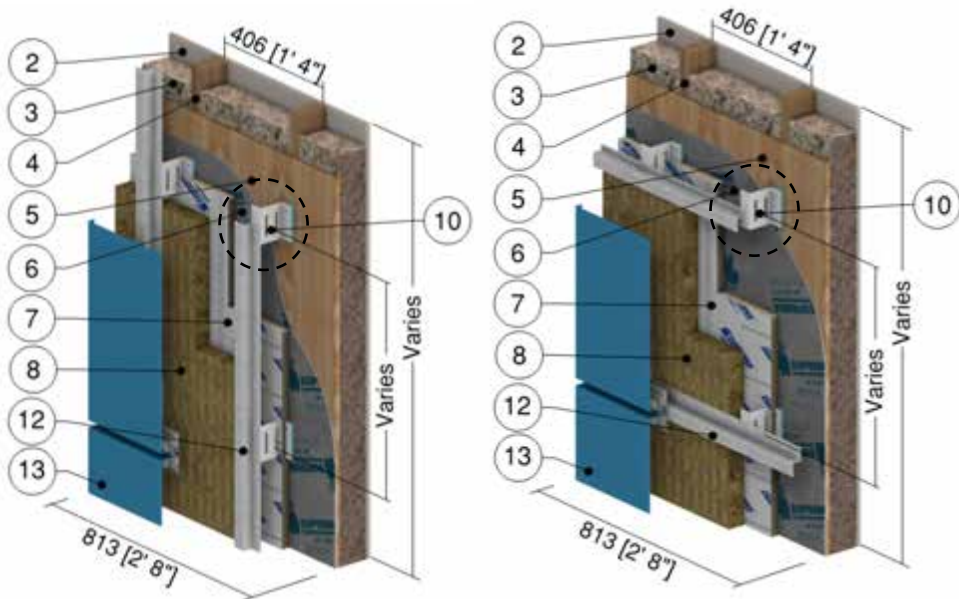
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	5-1/2" (140)	0.29 (0.042)	R-19.0 (3.35 RSI)	1.2 (19)	0.33 (1400)
4	2x6 Wood Stud	5-1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	SOPRA-ISO V PLUS Exterior Insulation	Varies	0.17 (0.024)	R-6.0 to R-30.0 (1.06 RSI to 5.28 RSI)	1.9 (30)	0.36 (1500)
8	Exterior Mineral Wool Insulation	2" (50)	0.23 (0.034)	R-8.6 (1.51 RSI)	1.8 (28)	0.29 (1220)
9	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
10	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
11	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
12	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
14	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

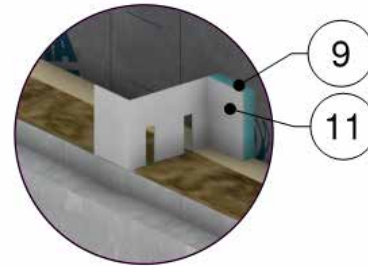
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.35

Exterior and Interior Insulated 2x4 Wood Stud (16" o.c.) Wall Assembly with Protected SOPREMA SOPRA-ISO V PLUS and ACS-S Thermal Clip Supporting Metal Cladding with R-13 Cellulose Insulation in Stud Cavity - Clear Wall



Vertical Girt: ACS Clip Detail



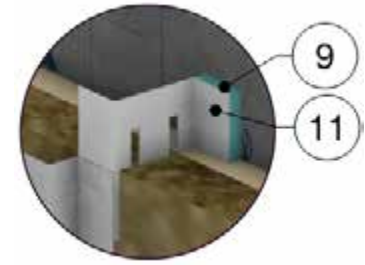
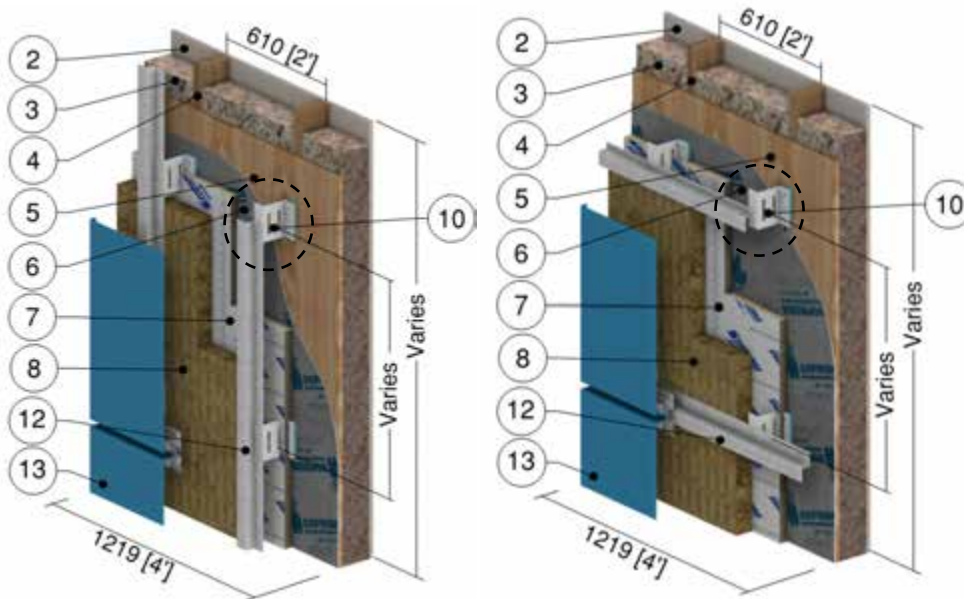
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	3-1/2" (89)	0.27 (0.039)	R-13.0 (2.29 RSI)	1.2 (19)	0.33 (1400)
4	2x4 Wood Stud	3-1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	SOPRA-ISO V PLUS Exterior Insulation	Varies	0.17 (0.024)	R-6.0 to R-30.0 (1.06 RSI to 5.28 RSI)	1.9 (30)	0.36 (1500)
8	Exterior Mineral Wool Insulation	2" (50)	0.23 (0.034)	R-8.6 (1.51 RSI)	1.8 (28)	0.29 (1220)
9	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
10	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
11	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
12	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
14	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

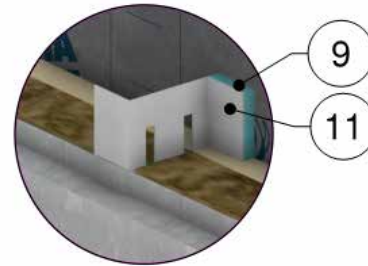
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.36

Exterior and Interior Insulated 2x4 Wood Stud (24" o.c.) Wall Assembly with Protected SOPREMA SOPRA-ISO V PLUS and ACS-S Thermal Clip Supporting Metal Cladding with R-13 Cellulose Insulation in Stud Cavity - Clear Wall



Vertical Girt: ACS Clip Detail



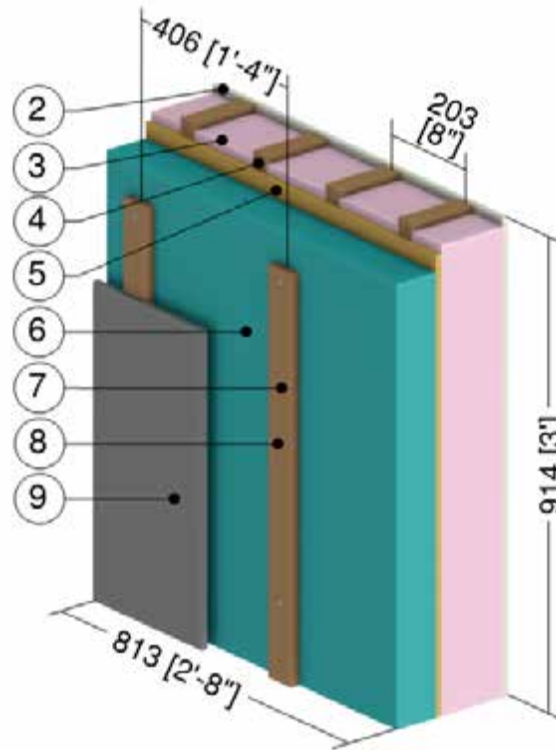
Horizontal Girt: ACS Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
3	Cellulose Insulation in Stud Cavity	3-1/2" (89)	0.27 (0.039)	R-13.0 (2.29 RSI)	1.2 (19)	0.33 (1400)
4	2x4 Wood Stud	3-1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	SOPREMA SOPRASEAL STICK VP membrane	-	-	-	-	-
7	SOPRA-ISO V PLUS Exterior Insulation	Varies	0.17 (0.024)	R-6.0 to R-30.0 (1.06 RSI to 5.28 RSI)	1.9 (30)	0.36 (1500)
8	Exterior Mineral Wool Insulation	2" (50)	0.23 (0.034)	R-8.6 (1.51 RSI)	1.8 (28)	0.29 (1220)
9	Thermal Break	1/2" (13)	0.13 (0.019)	-	2.1 (33)	0.50 (2100)
10	ACS-S Thermal Clip	16 Gauge	118 (17)	-	500 (8000)	0.13 (530)
11	Fastener	1/4" (6.4) Ø	347 (50)	-	489 (7830)	0.12 (500)
12	Girt	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
14	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.1.37

Exterior and Interior Insulated 2x6 Wood Stud (8" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Clear Wall

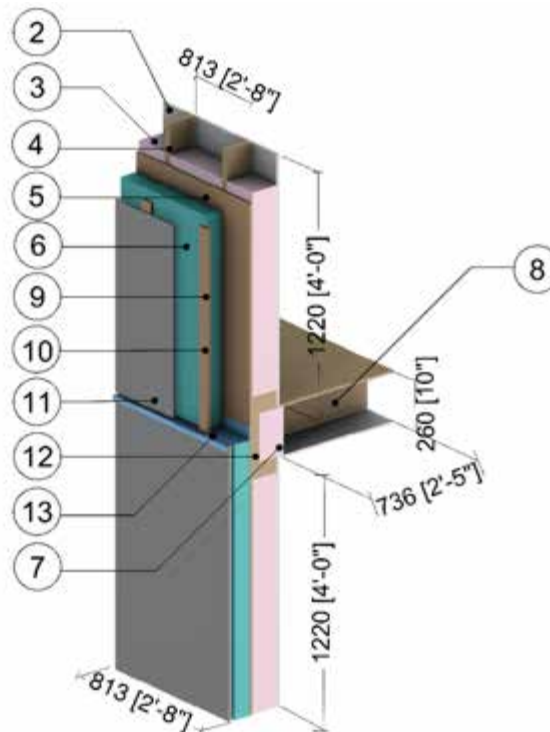


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (8" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Wood Sheathing	1/2" (16)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-0 to R-15 (0 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Steel Fasteners (12" o.c.)	0.44" (11) ∅	347 (50)	-	489 (7830)	0.12 (500)
9	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.2.1

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity - Rim Joist and Floor Intersection with Metal Flashing Bypassing Exterior Insulation

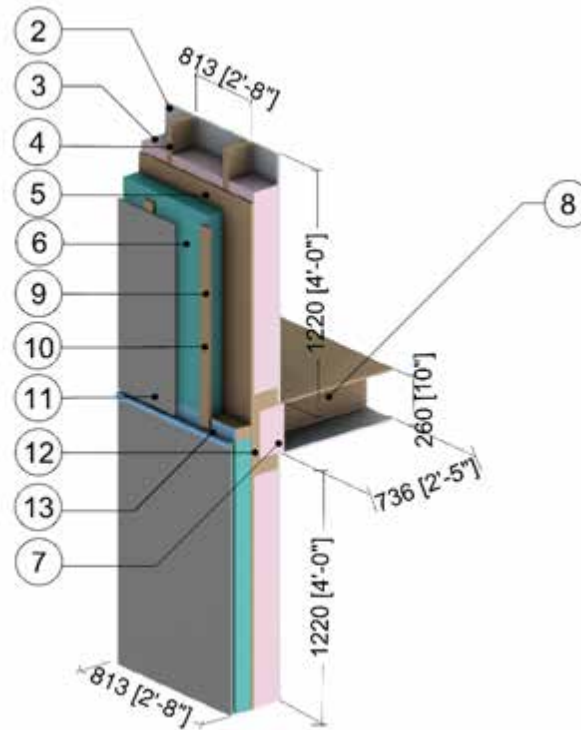


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	varies	-	R-5 to R-15 (0.88 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	Fiberglass Batt Insulation at Joist	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
8	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Wood Strapping (1" x 3")	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
10	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
12	2x10 Rim Board	1 1/2" (38)	0.69 (0.10)	-	31 (510)	0.45 (1880)
13	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
14	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.2.2

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity - Rim Joist and Floor Intersection without Metal Flashing Bypassing Exterior Insulation

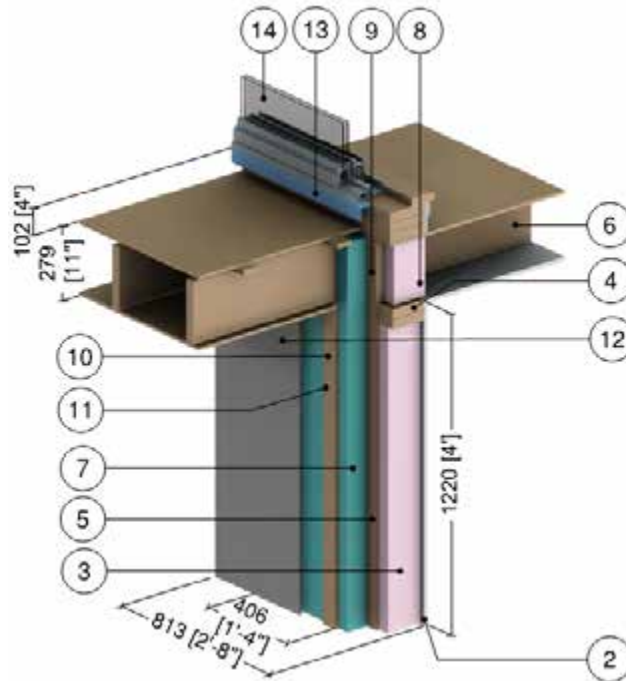


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-5 to R-15 (0.88 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	Fiberglass Batt Insulation at Joist	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
8	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
10	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
12	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (510)	0.45 (1880)
13	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
14	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.2.3

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity - Cantilevered Wood Joist Balcony Intersection



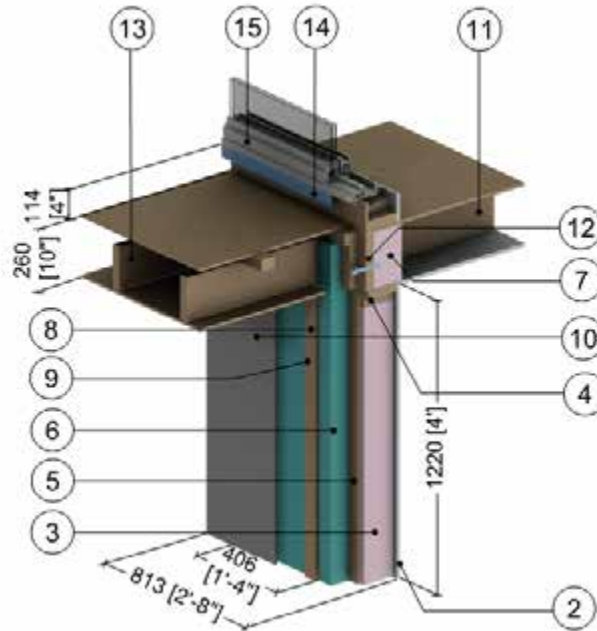
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" OC)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.26 (1090)
6	2x10 Wood Joist (16" OC)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
7	Exterior Insulation	Varies	-	R-10 to R-15 (1.76 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
8	Fiberglass Batt Insulation at Joist	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
9	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
10	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
12	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
13	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
14	Aluminum Sliding Door: double glazed & thermally broken ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
15	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 8.2.4

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Independently Supported Balcony Intersection



ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)		31 (500)	0.45 (1880)
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-10 to R-15 (1.76 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	Fiberglass Batt Insulation at Joist	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
8	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
11	2x10 Wood Joist (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	32 (510)	0.45 (1880)
12	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	2x8 Wood Balcony Joists (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
14	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
15	Aluminum Sliding Door: double glazed & thermally broken ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
16	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

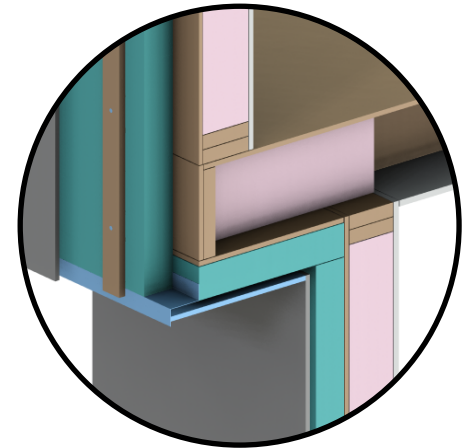
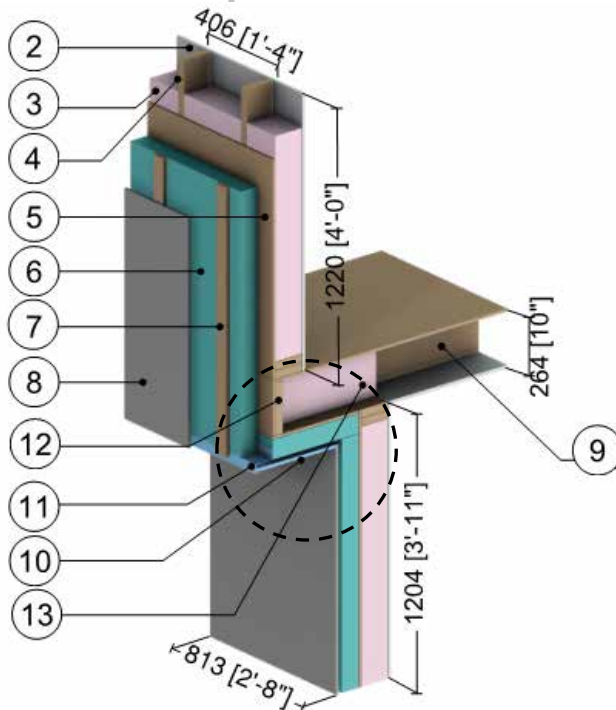
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077



Detail 8.2.5

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Cantilevered Floor Intersection



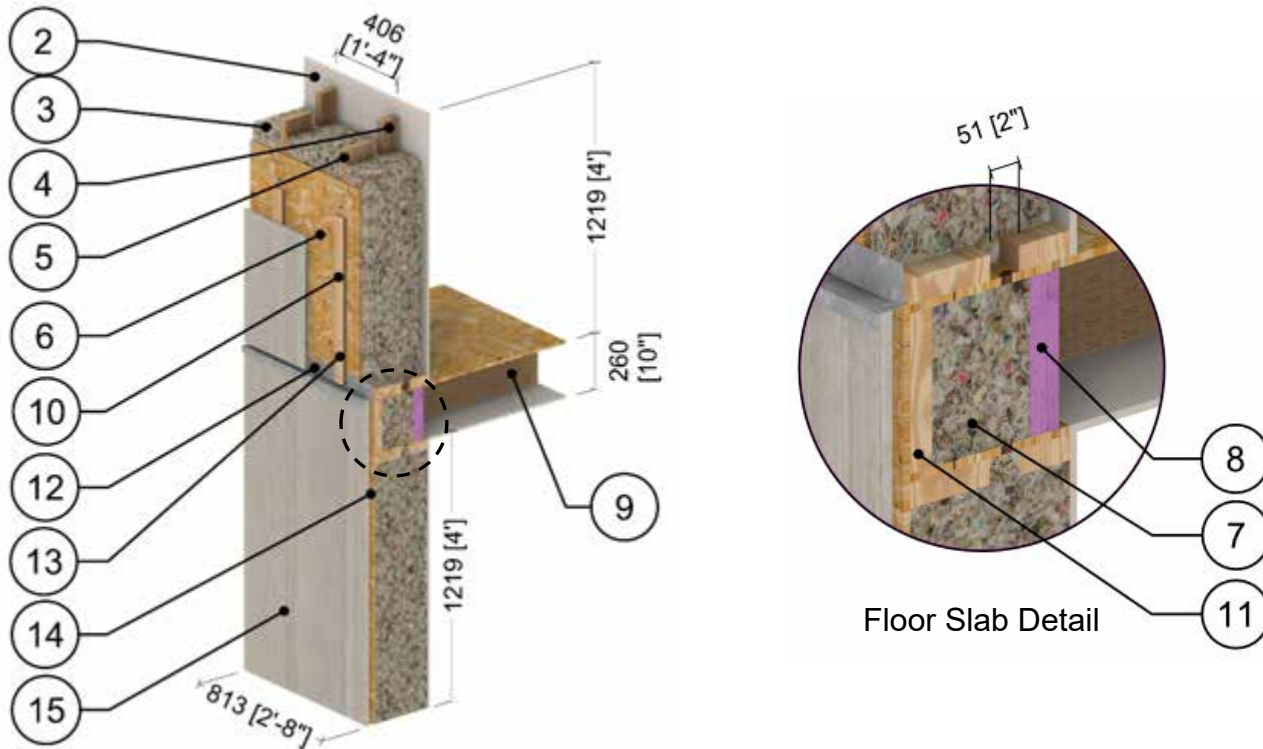
Soffit/Intersection Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.20 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Wood Sheathing	5/8" (16)	0.69 (0.10)	R-0.6 (0.10 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	0.24 (0.0343)	R-10 to R-15 (1.76 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
9	2x10 Wood Joist (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
10	Vented Aluminum Soffit Panel is incorporated into the exterior heat transfer coefficient					
11	Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	2x10 Rim Joist	1 1/2"	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	Fiberglass Batt Insulation in Floor	9 1/4" (235)	0.33 (0.048)	R-28 (4.9 RSI)	0.9 (14)	0.17 (710)
14	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.2.6

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap – Rim Joist and Floor Intersection

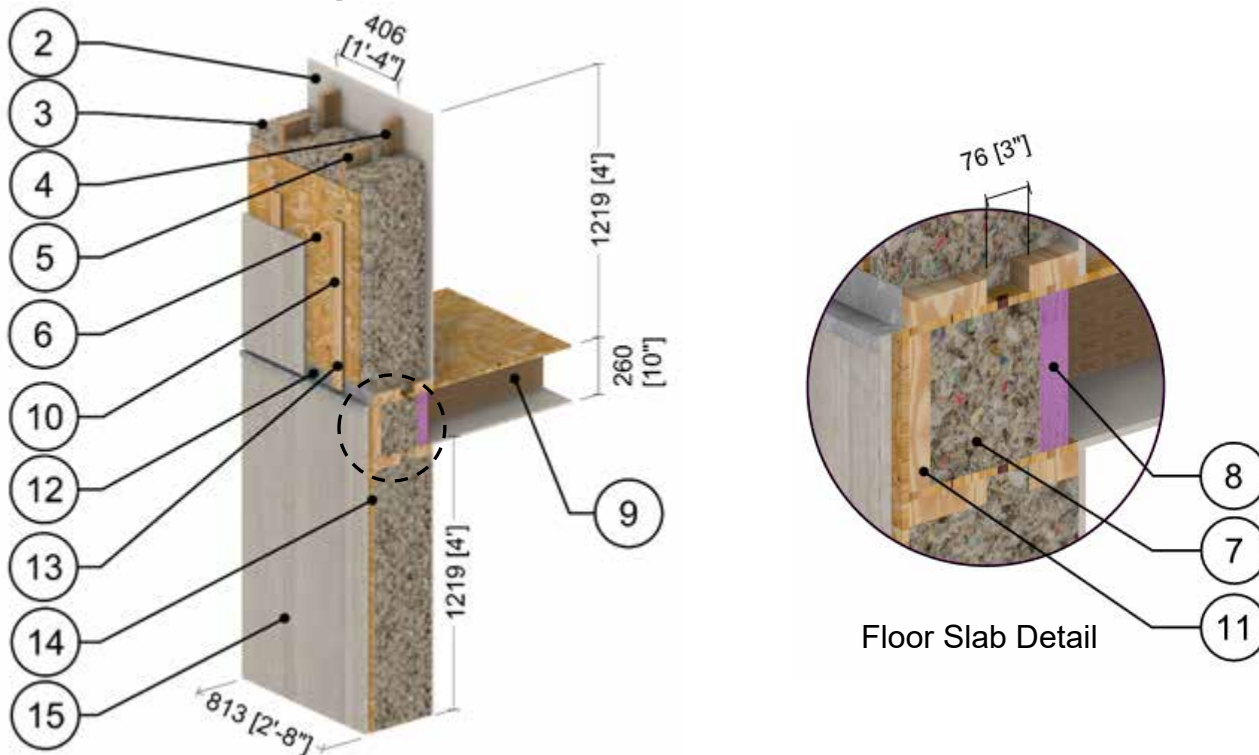


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	11" (279)	Varies	-	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	Fill Insulation at Joist	6 3/4" (171)	Varies	-	-	-
8	XPS Insulation	2" (51)	0.20 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
9	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
10	Steel Fasteners (12" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (510)	0.45 (1880)
12	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
14	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
15	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
16	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.2.7

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 3" Gap – Rim Joist and Floor Intersection

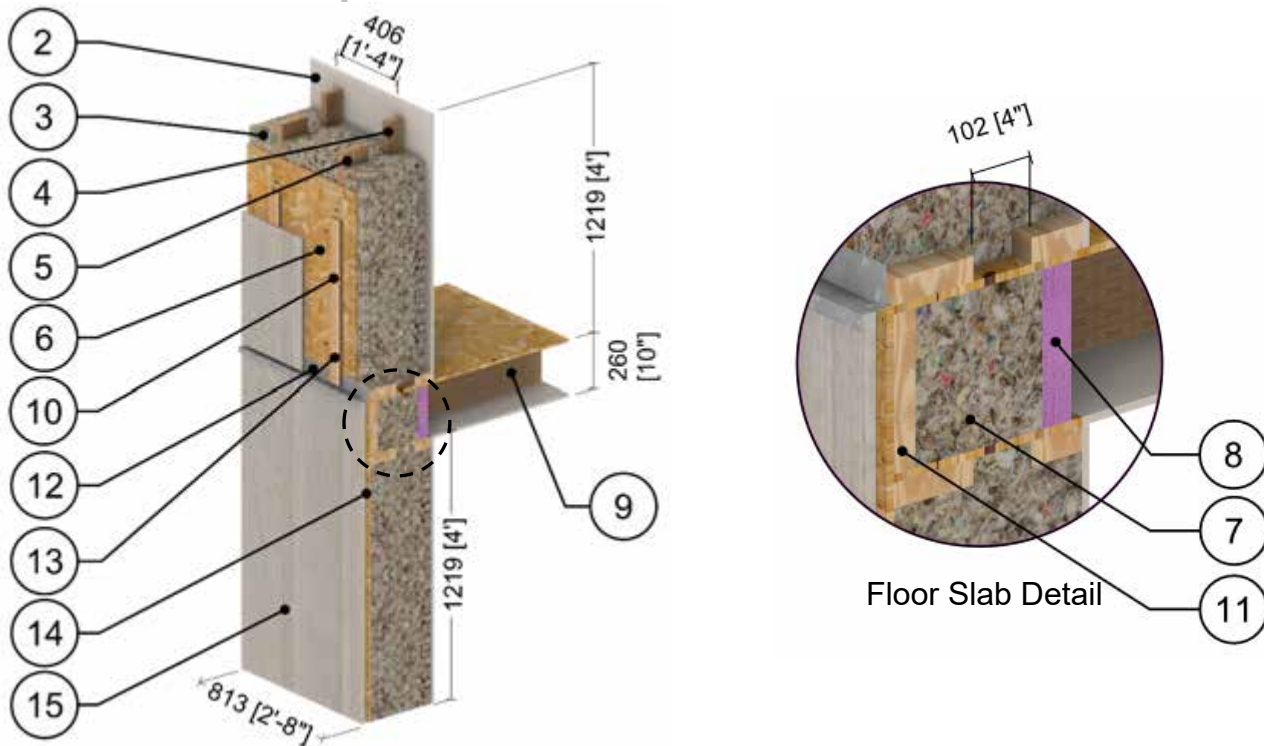


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	12" (305)	Varies	-	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	Fill Insulation at Joist	6 3/4" (171)	Varies	-	-	-
8	XPS Insulation	2" (51)	0.20 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
9	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
10	Steel Fasteners (12" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (510)	0.45 (1880)
12	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
14	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
15	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
16	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.2.8

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 4" Gap – Rim Joist and Floor Intersection

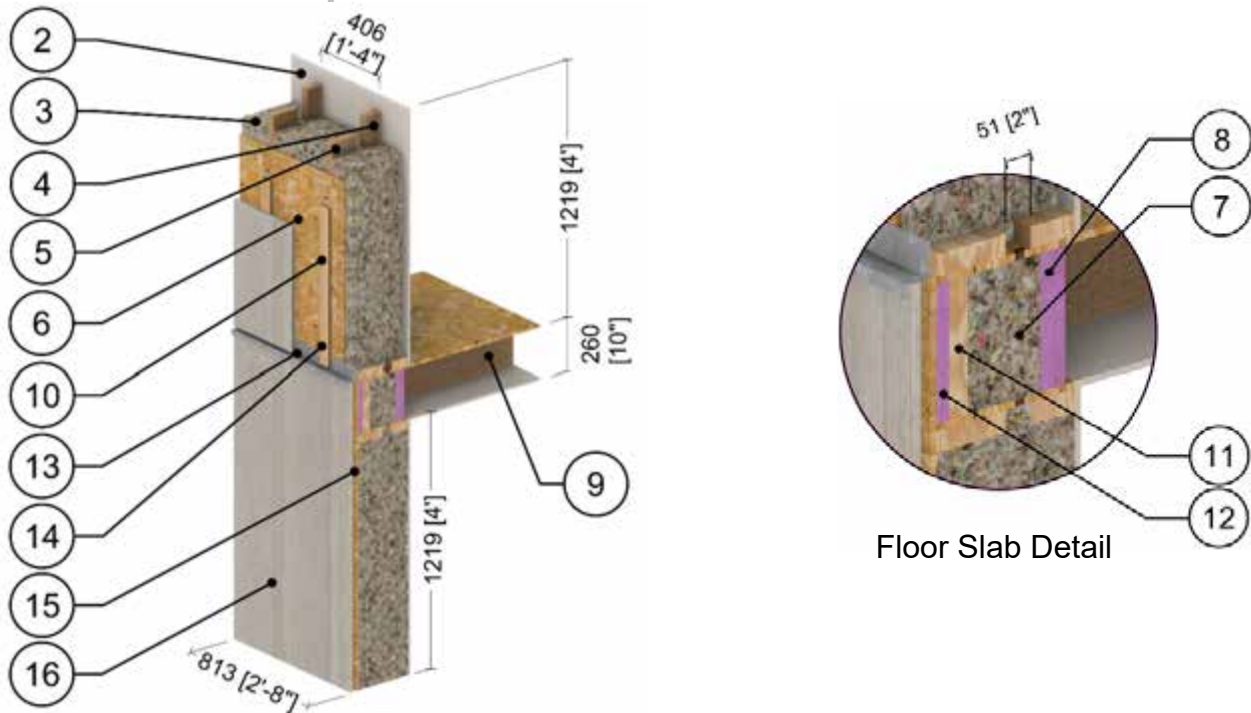


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	13" (330)	Varies	-	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	Fill Insulation at Joist	6 3/4" (171)	Varies	-	-	-
8	XPS Insulation	2" (51)	0.20 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
9	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
10	Steel Fasteners (12" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (510)	0.45 (1880)
12	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
14	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
15	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
16	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.2.9

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap – Insulated Rim Joist and Floor Intersection

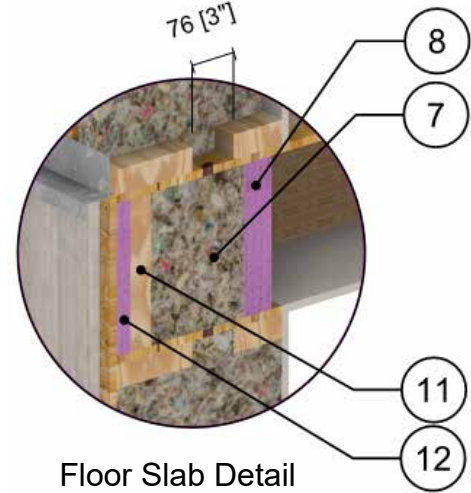
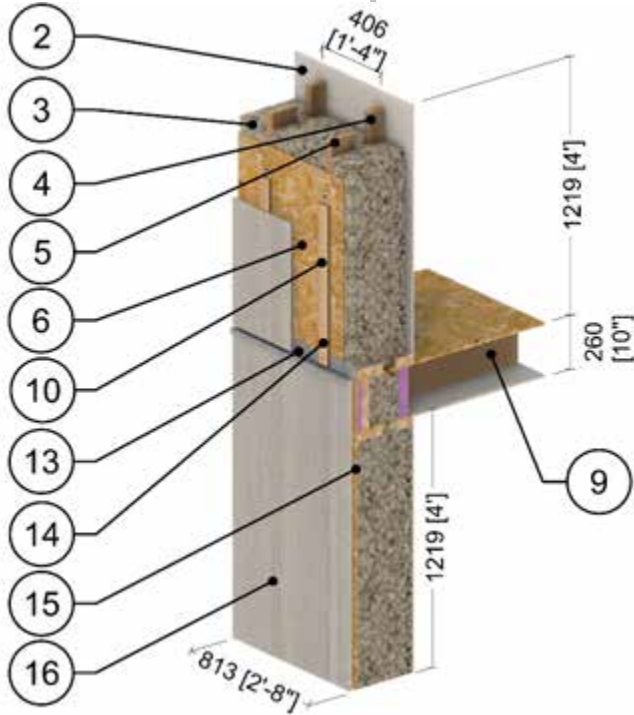


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	11" (279)	Varies	-	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	Fill Insulation at Joist	6 3/4" (171)	Varies	-	-	-
8	XPS Insulation	2" (51)	0.20 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
9	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
10	Steel Fasteners (12" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (510)	0.45 (1880)
12	Rim Joist Insulation	1" (25)	0.20 (0.029)	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
13	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
14	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
15	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
16	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
17	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.2.10

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 3" Gap – Insulated Rim Joist and Floor Intersection

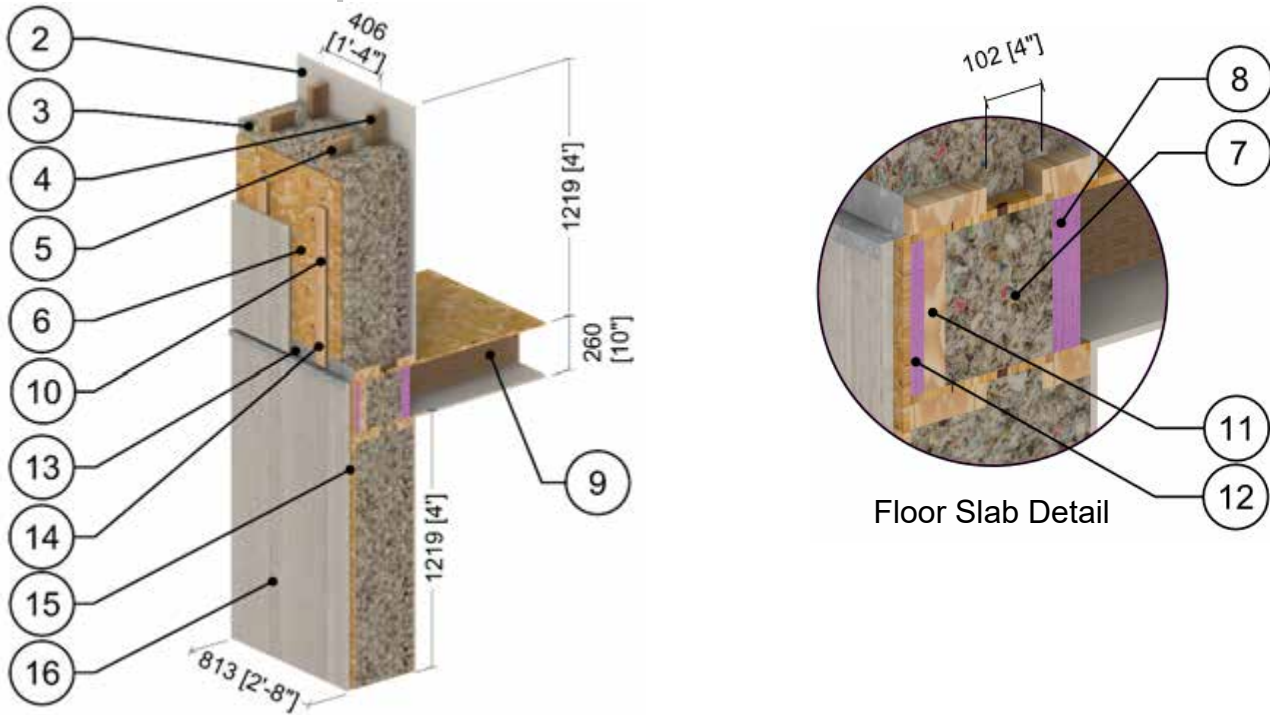


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	12" (305)	Varies	-	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	Fill Insulation at Joist	6 3/4" (171)	Varies	-	-	-
8	XPS Insulation	2" (51)	0.20 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
9	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
10	Steel Fasteners (12" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (510)	0.45 (1880)
12	Rim Joist Insulation	1" (25)	0.20 (0.029)	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
13	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
14	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
15	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
16	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
17	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.2.11

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 4" Gap – Insulated Rim Joist and Floor Intersection

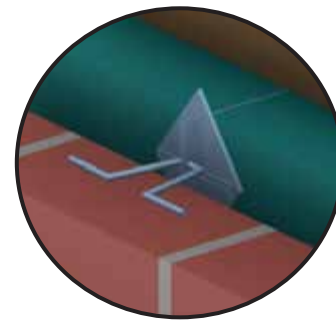
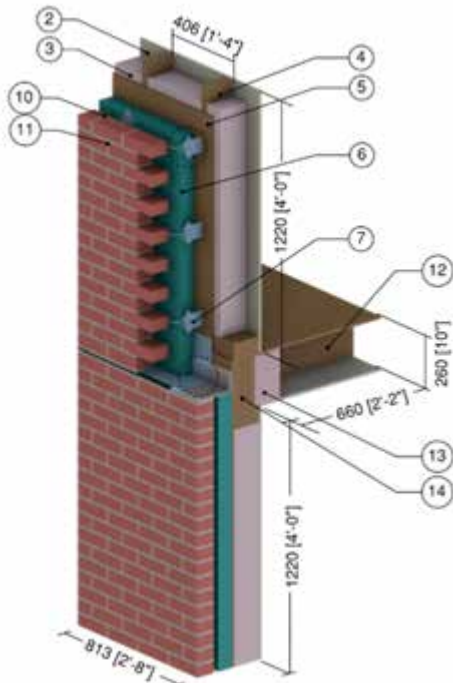


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	13" (330)	Varies	-	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	Fill Insulation at Joist	6 3/4" (171)	Varies	-	-	-
8	XPS Insulation	2" (51)	0.20 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
9	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
10	Steel Fasteners (12" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (510)	0.45 (1880)
12	Rim Joist Insulation	1" (25)	0.20 (0.029)	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
13	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
14	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
15	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
16	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
17	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

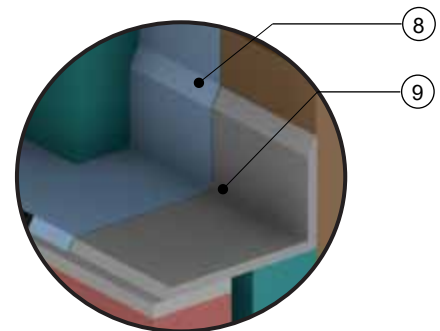
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.2.12

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Shelf Angle & Brick Ties Supporting Brick Veneer and R-19 Batt Insulation in Stud Cavity – Rim Joist and Floor Intersection



Brick Tie Detail



Shelf Angle Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation in Stud Cavity	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-0 to R-10 (0.00 RSI to 1.76 RSI)	1.8 (28)	0.29 (1220)
7	Brick Ties	14 gauge	347 (50)	-	489 (7830)	0.12 (500)
8	Flashing	20 gauge	347 (50)	-	489 (7830)	0.12 (500)
9	Steel Shelf Angle	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
10	Air Cavity ²	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
11	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	140 (2250)	0.20 (850)
12	2x10 Wood Joists (16"o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	Fiberglass Batt Insulation at Joists	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
14	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

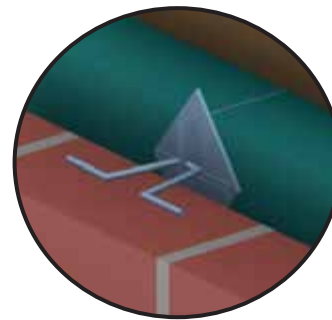
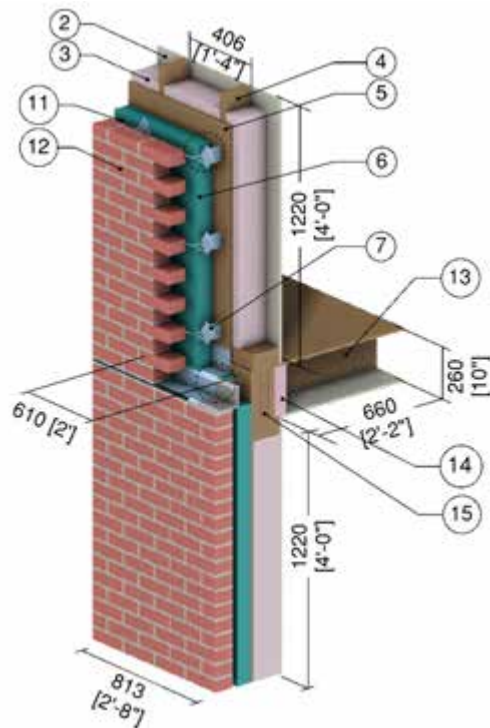
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

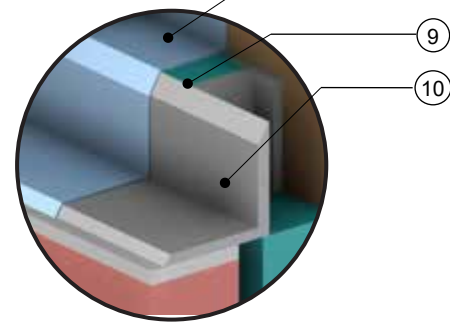


Detail 8.2.13

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Stand-off (Knife Plate) Shelf Angle & Brick Ties Supporting Brick Veneer and R-19 Batt Insulation in Stud Cavity – Rim Joist and Floor Intersection



Brick Tie Detail 8



Shelf Angle Detail

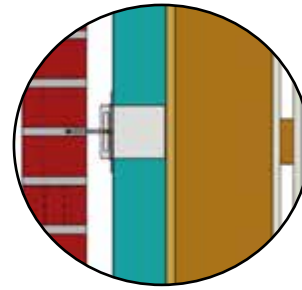
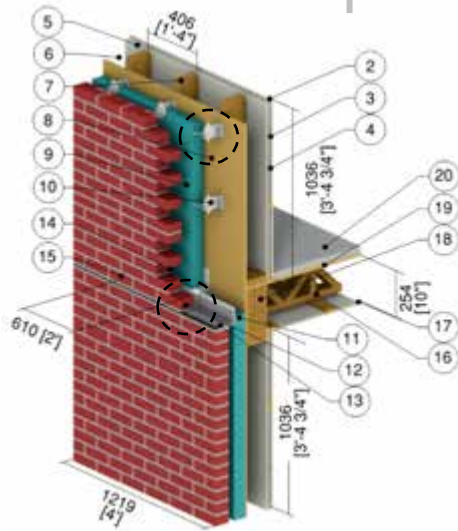
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation in Stud Cavity	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-0 to R-10 (0.00 RSI to 1.76 RSI)	1.8 (28)	0.29 (1220)
7	Brick Ties	14 gauge	347 (50)	-	489 (7830)	0.12 (500)
8	Exterior Insulation Behind Shelf Angle	Varies	-	R-0 to R-10 (0.00 RSI to 1.76 RSI)	1.8 (28)	0.29 (1220)
9	Flashing	20 gauge	347 (50)	-	489 (7830)	0.12 (500)
10	Spteel Shelf Angle	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
11	Air Cavity ²	1" (25)	-	R-0.9 (0.16RSI)	0.075 (1.2)	0.24 (1000)
12	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	140 (2250)	0.20 (850)
13	2x10 Wood Joists (16"o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
14	Fiberglass Batt Insulation at Joists	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
15	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
16	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

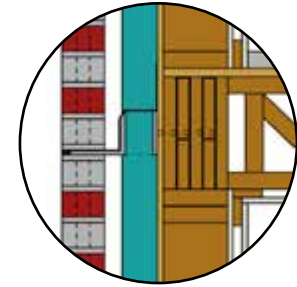
² The thermal conductivity of air spaces was found using ISO 100077-2



Detail 8.2.14 Exterior Insulated 2x6 Wood Stud (16" o.c.) Wall with Interior OSB and Wood Furring Assembly with Stand-off (Knife Plate) Shelf Angle & Brick Ties Supporting Brick Veneer – CLT and Wood Truss Floor Intersection



Brick Tie Detail



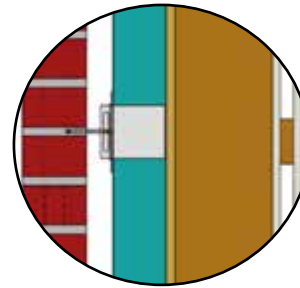
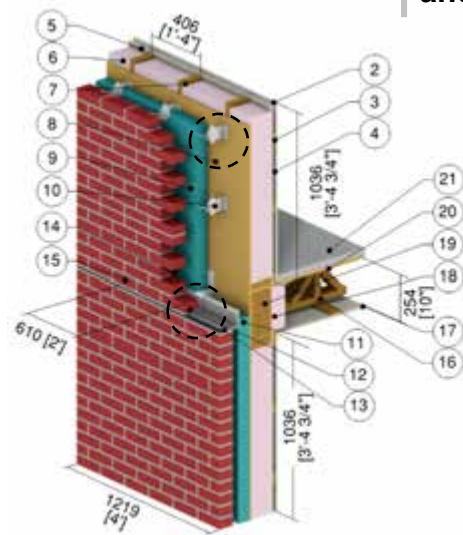
Shelf Angle Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1x3 Wood Furring	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
4	Air in Furring Cavity	3/4" (19)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	OSB	7/16" (11)	1.1 (0.16)	R-0.4 (0.07 RSI)	31 (500)	0.45 (1880)
6	Air in Stud Cavity	5 1/2" (140)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
7	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Exterior Insulation	Varies	-	R-10 to R-30 (1.76 to 5.28 RSI)	1.8 (28)	0.29 (1220)
10	Brick Ties	14 gauge	347 (50)	-	489 (7830)	0.12 (500)
11	Exterior Insulation Behind Shelf Angle	Varies	-	R-10 to R-30 (1.76 to 5.28 RSI)	1.8 (28)	0.29 (1220)
12	Flashing	20 gauge	347 (50)	-	489 (7830)	0.12 (500)
13	Steel Shelf Angle	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
14	Air Cavity	1 1/2" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
15	Brick Veneer	3 5/8" (92)	5.4 (0.78)	R-0.7 (0.12 RSI)	140 (2250)	0.20 (850)
16	2x4 Wood Truss (16" o.c.)	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
17	Air in Floor Cavity	10 3/4" (273)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
18	CLT	5 1/2" (140)	0.83 (0.12)	-	31 (500)	0.45 (1880)
19	Plywood Floor	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
20	Concrete Topping	1 1/2" (38)	12 (1.8)	-	140 (2250)	0.20 (850)
21	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

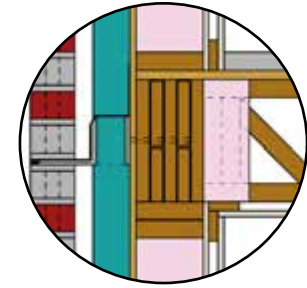
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.2.15

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall with Interior OSB and Wood Furring Assembly with Stand-off (Knife Plate) Shelf Angle & Brick Ties Supporting Brick Veneer – CLT and Wood Truss Floor Intersection



Brick Tie Detail



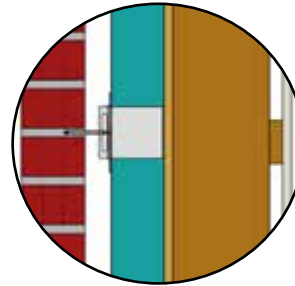
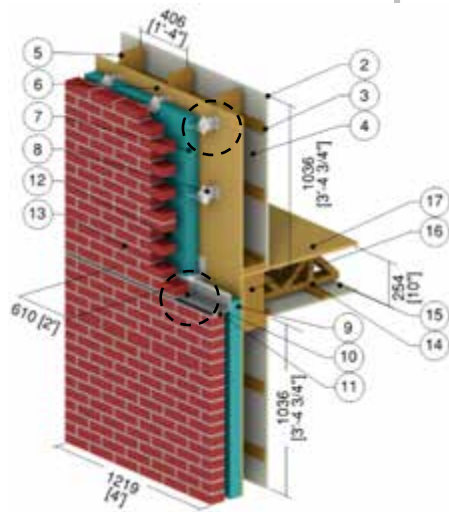
Shelf Angle Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1x3 Wood Furring	3/4" (19)	0.7 (0.10)	-	31 (500)	0.45 (1880)
4	Air in Furring Cavity	3/4" (19)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	OSB	7/16" (11)	1.1 (0.16)	R-0.4 (0.07 RSI)	31 (500)	0.45 (1880)
6	Fiberglass Batt Insulation in Stud Cavity	5 1/2" (140)	0.29 (0.042)	R-19.0 (3.35 RSI)	0.9 (14)	0.17 (710)
7	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Exterior Insulation	Varies	-	R-5 to R-30 (0.88 to 5.28 RSI)	1.8 (28)	0.29 (1220)
10	Brick Ties	14 gauge	347 (50)	-	489 (7830)	0.12 (500)
11	Exterior Insulation Behind Shelf Angle	Varies	-	R-5 to R-30 (0.88 to 5.28 RSI)	1.8 (28)	0.29 (1220)
12	Flashing	20 gauge	347 (50)	-	489 (7830)	0.12 (500)
13	Steel Shelf Angle	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
14	Air Cavity	1 1/2" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
15	Brick Veneer	3 5/8" (92)	5.4 (0.78)	R-0.7 (0.12 RSI)	140 (2250)	0.20 (850)
16	2x4 Wood Truss (16" o.c.)	1 1/2" (38)	0.7 (0.10)	-	31 (500)	0.45 (1880)
17	Air in Floor Cavity	10 3/4" (273)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
18	Fiberglass Batt Insulation at CLT	3 3/4" (95)	0.30 (0.044)	R-12.4 (2.19 RSI)	0.9 (14)	0.17 (710)
19	CLT	10" (254)	0.83 (0.12)	-	31 (500)	0.45 (1880)
20	Plywood Floor	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
21	Concrete Topping	1 1/2" (38)	12 (1.8)	-	140 (2250)	0.20 (850)
22	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

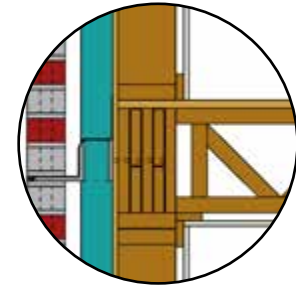
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.2.16

Exterior Insulated 2x6 Wood Stud (16" o.c.) Wall with Interior Wood Furring Assembly with Stand-off (Knife Plate) Shelf Angle & Brick Ties Supporting Brick Veneer – CLT and Wood Truss Floor Intersection



Brick Tie Detail



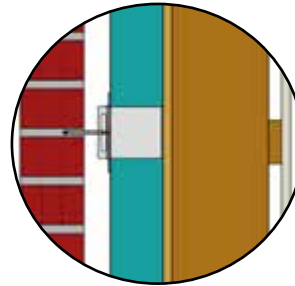
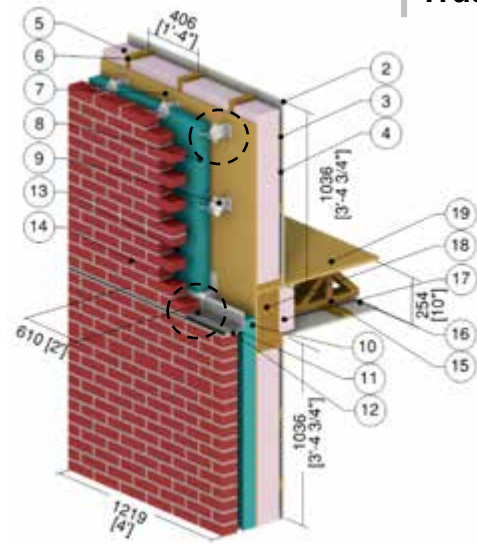
Shelf Angle Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1x3 Wood Furring	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
4	Air in Stud Cavity	6 1/4" (159)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
7	Exterior Insulation	Varies	-	R-10 to R-30 (1.76 to 5.28 RSI)	1.8 (28)	0.29 (1220)
8	Brick Ties	14 gauge	347 (50)	-	489 (7830)	0.12 (500)
9	Exterior Insulation Behind Shelf Angle	Varies	-	R-10 to R-30 (1.76 to 5.28 RSI)	1.8 (28)	0.29 (1220)
10	Flashing	20 gauge	347 (50)	-	489 (7830)	0.12 (500)
11	Steel Shelf Angle	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
12	Air Cavity	1 1/2" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
13	Brick Veneer	3 5/8" (92)	5.4 (0.78)	R-0.7 (0.12 RSI)	140 (2250)	0.20 (850)
14	2x4 Wood Truss (16" o.c.)	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
15	Air in Floor Cavity	10 3/4" (273)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
16	CLT	10" (254)	0.83 (0.12)	-	31 (500)	0.45 (1880)
17	Plywood Floor	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
18	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

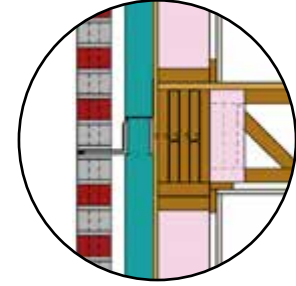
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.2.17

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall with Interior Wood Furring Assembly with Stand-off (Knife Plate) Shelf Angle & Brick Ties Supporting Brick Veneer – CLT and Wood Truss Floor Intersection



Brick Tie Detail



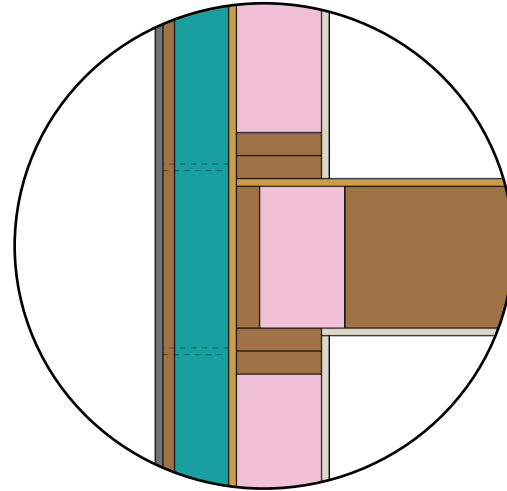
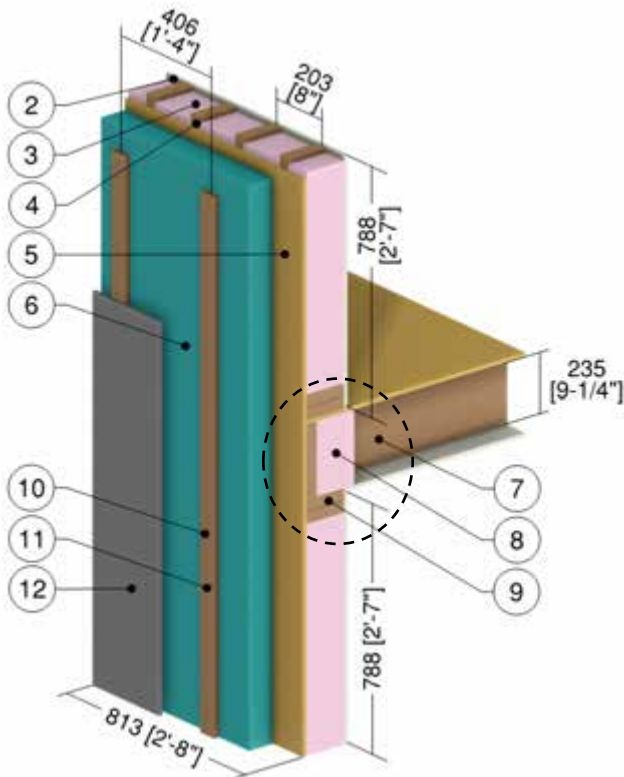
Shelf Angle Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1x3 Wood Furring	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
4	Air in Furring Cavity	3/4" (19)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Fiberglass Batt Insulation in Stud Cavity	5 1/2" (140)	0.29 (0.042)	R-19.0 (3.35 RSI)	0.9 (14)	0.17 (710)
6	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
7	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Exterior Insulation	Varies	-	R-5 to R-30 (0.88 to 5.28 RSI)	1.8 (28)	0.29 (1220)
9	Brick Ties	14 gauge	347 (50)	-	489 (7830)	0.12 (500)
10	Exterior Insulation Behind Shelf Angle	Varies	-	R-5 to R-30 (0.88 to 5.28 RSI)	1.8 (28)	0.29 (1220)
11	Flashing	20 gauge	347 (50)	-	489 (7830)	0.12 (500)
12	Steel Shelf Angle	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
13	Air Cavity	1 1/2" (38)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
14	Brick Veneer	3 5/8" (92)	5.4 (0.78)	R-0.7 (0.12 RSI)	140 (2250)	0.20 (850)
15	2x4 Wood Truss (16" o.c.)	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
16	Air in Floor Cavity	10 3/4" (273)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
17	Fiberglass Batt Insulation at CLT	3 3/4" (95)	0.30 (0.044)	R-12.4 (2.19 RSI)	0.9 (14)	0.17 (710)
18	CLT	10" (254)	0.83 (0.12)	-	31 (500)	0.45 (1880)
19	Plywood Floor	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
20	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.2.18

Exterior and Interior Insulated 2x6 Wood Stud (8" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Intermediate Floor Intersection



Floor Detail

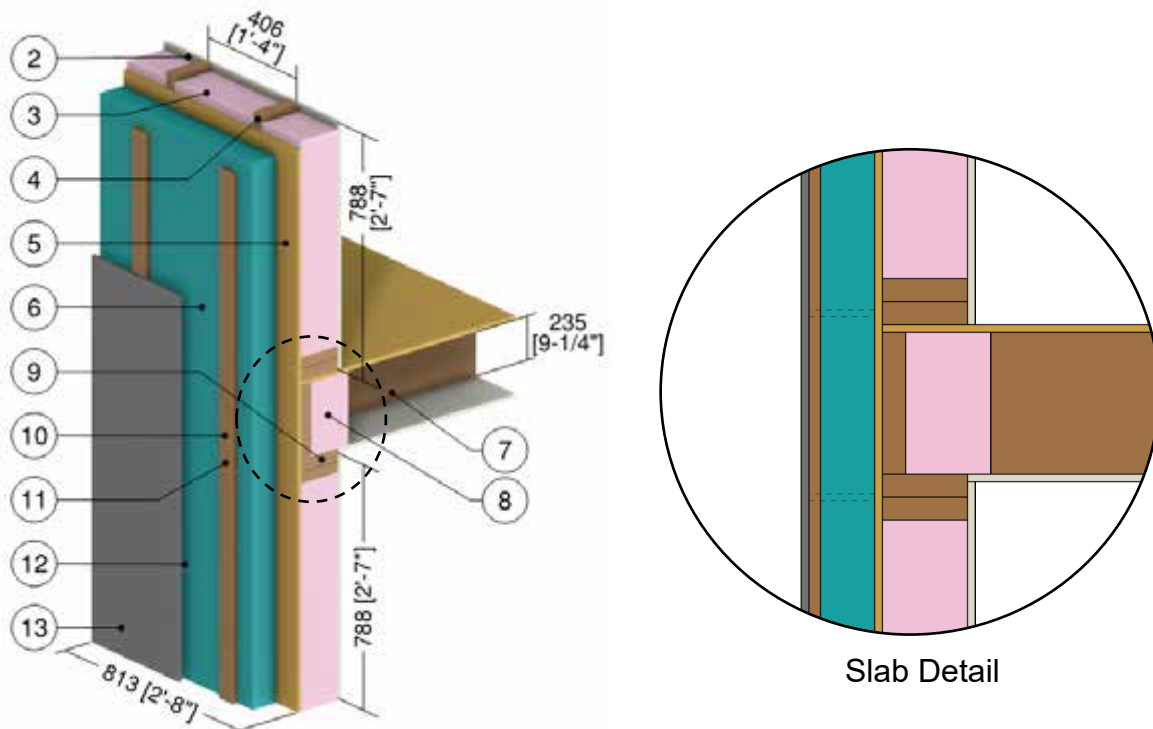
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (8" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Wood Sheathing	1/2" (16)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-0 to R-15 (0 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	2x10 Wood Joist (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Fiberglass Batt Insulation at Joist	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
9	2x10 Rim Joist	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
10	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Steel Fasteners (12" o.c.)	0.44" (11) ∅	347 (50)	-	489 (7830)	0.12 (500)
12	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 8.2.19

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Intermediate Floor Intersection



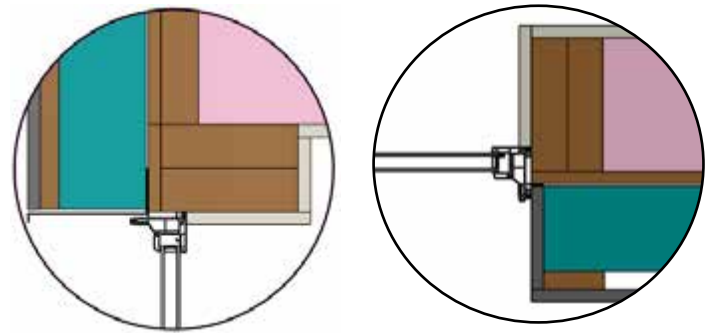
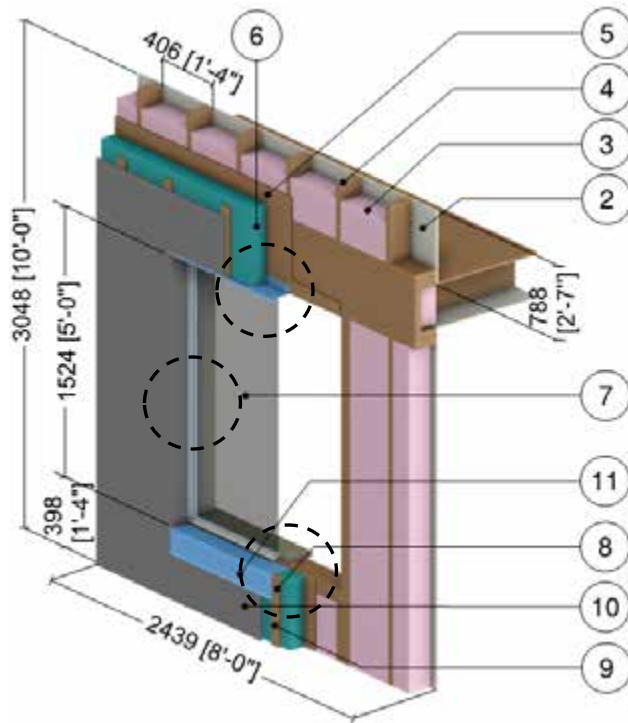
Slab Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Wood Sheathing	1/2" (16)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-0 to R-15 (0 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	2x10 Wood Joist (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Fiberglass Batt Insulation at Joist	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
9	2x10 Rim Joist	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
10	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Steel Fasteners (12" o.c.)	0.44" (11) ∅	347 (50)	-	489 (7830)	0.12 (500)
12	Rainscreen Cavity	3/4" (19)	-	R-0.5 (0.09 RSI)	0.075 (1.2)	0.24 (1000)
13	Fiber Cement Board Cladding	1/2" (13)	4.9 (0.7)	R-0.1 (0.02 RSI)	112 (1800)	0.20 (840)
14	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

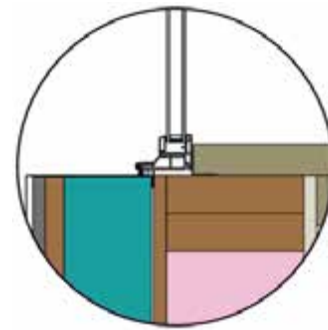
Detail 8.3.1

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board – Vinyl Window Intersection



Head Detail

Jamb Detail



Sill Detail

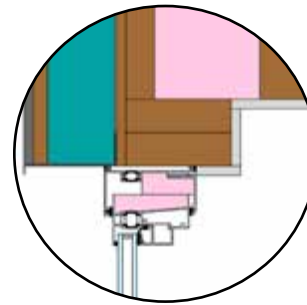
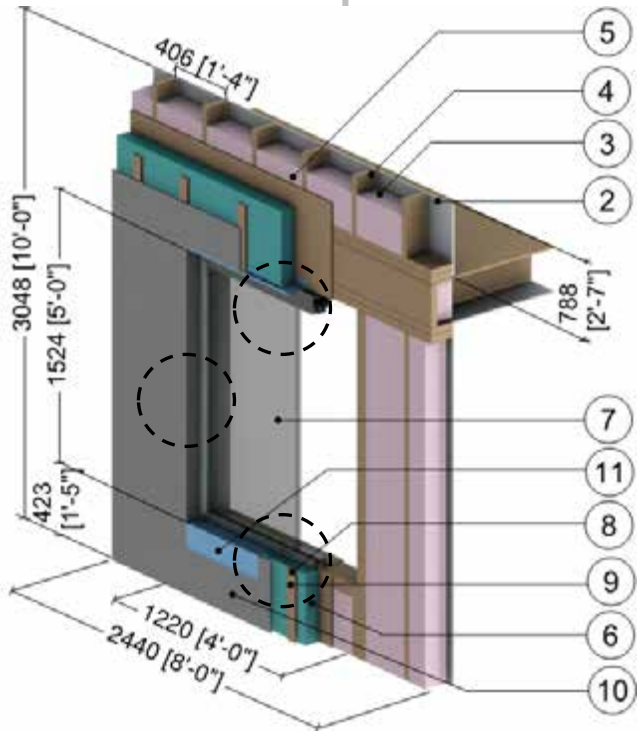
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Wood Sheathing	1/2" (16)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-5 to R-15 (0.88 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	5' (1.5m) x 6' (1.8m) Vinyl window: double glazed & thermally broken ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
8	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Steel Fasteners (16" o.c.)	0.35" (9) Ø	430 (50)	-	489 (7830)	0.12 (500)
10	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
11	Aluminum Flashing	18 Gauge	1109 (160)	-	171(2739)	0.21 (900)
12	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

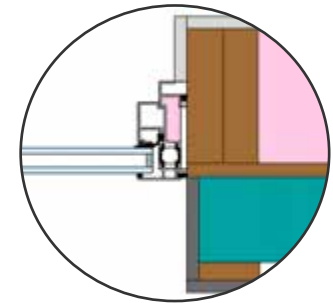
² The thermal conductivity for air spaces within window framing was found using ISO 10077-2

Detail 8.3.2

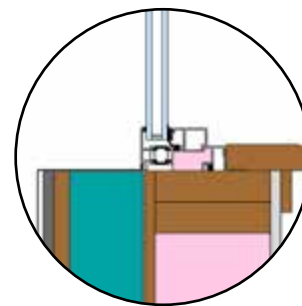
Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board – Aluminum Window Intersection



Head Detail



Jamb Detail



Sill Detail

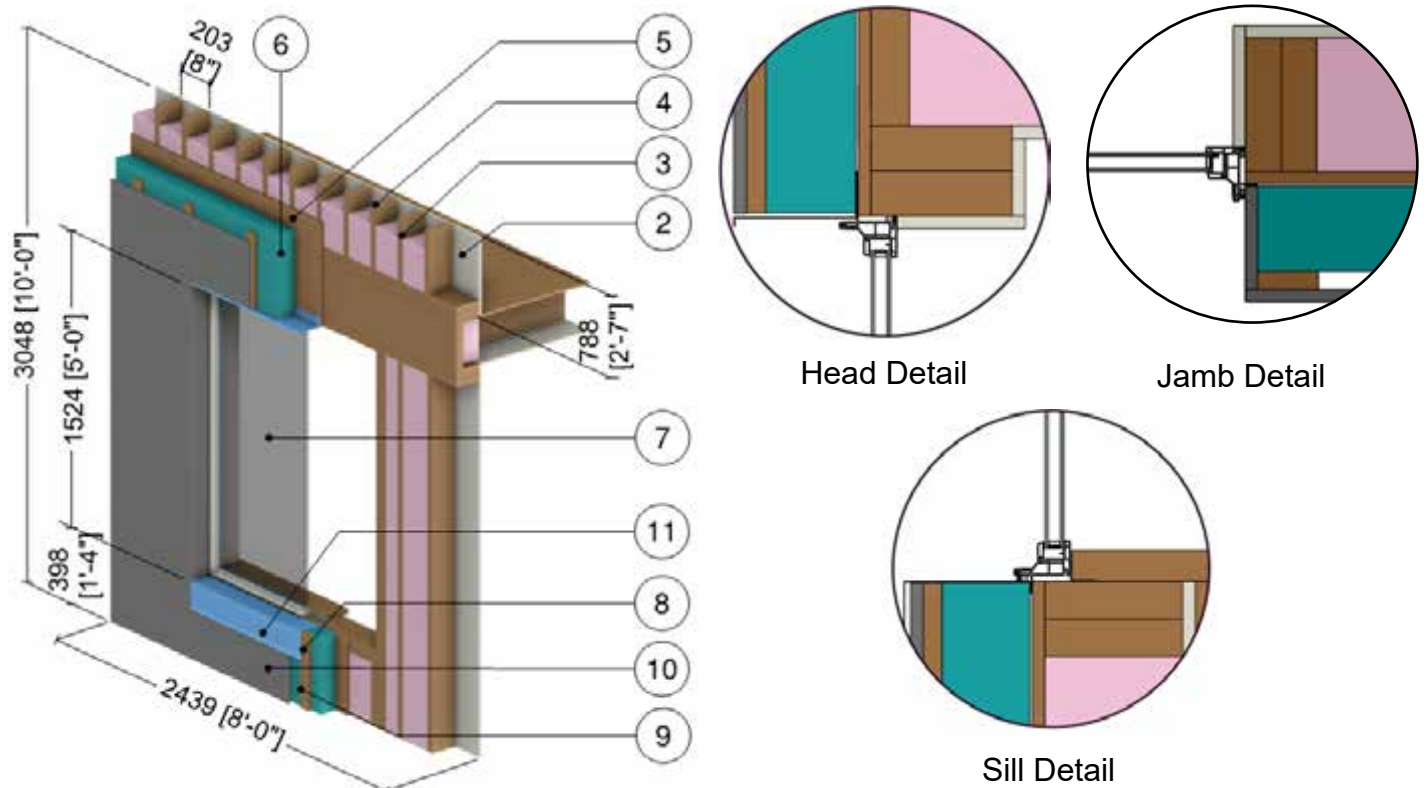
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	-	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-0 to R-15 (0 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	5' (1.5m) x 6' (1.8m) Aluminum window: double glazed & thermally broken ² , double glazed IGU UIGU = 0.32 BTU/hr.ft ² ·°F (1.82 W/m ² K)					
8	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
11	Aluminum Flashing	18 Gauge	1109 (160)	-	171(2739)	0.21 (900)
12	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity for air spaces within window framing was found using ISO 10077-2

Detail 8.3.3

Exterior and Interior Insulated 2x6 Wood Stud (8" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board – Vinyl Window Intersection



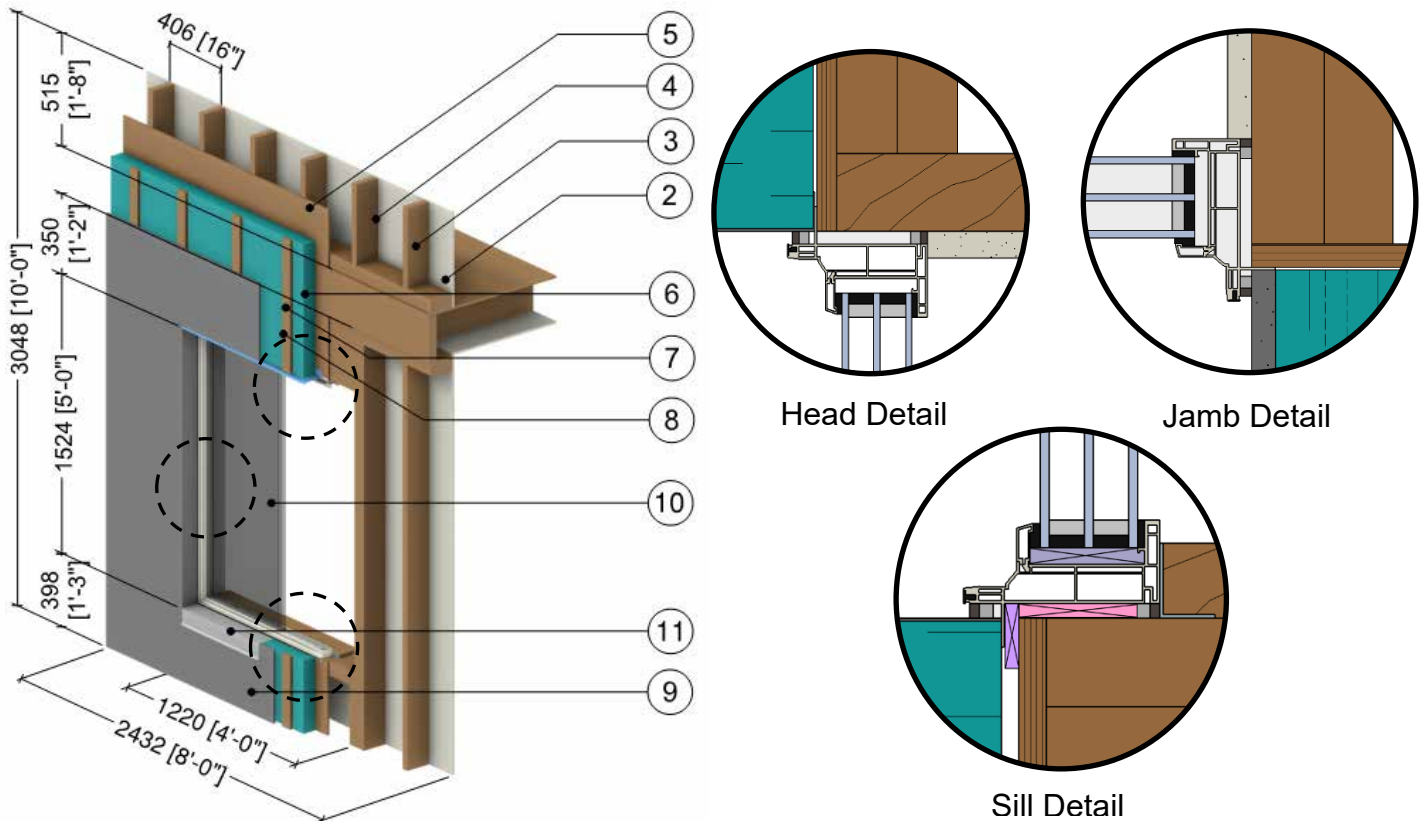
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.9 to R-1.1 (0.16 RSI to 0.2 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (8" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Wood Sheathing	1/2" (16)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-0 to R-15 (0 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	5' (1.5m) x 6' (1.8m) Vinyl window: double glazed & thermally broken ² , double glazed IGU U _{IGU} = 0.32 BTU/hr-ft ² -°F (1.82 W/m ² K)					
8	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Steel Fasteners (16" o.c.)	0.35" (9) ∅	347 (50)	-	489 (7830)	0.12 (500)
10	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
11	Aluminum Flashing	18 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
12	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 8.3.4

Exterior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board – Triple Glazed Flange Mounted Vinyl Window Intersection with Window Positioned in Wood Framing



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
4	Air in Stud Cavity	5 1/2" (140)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Wood Sheathing	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-5 to R-15 (0.88 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Steel Fasteners (16" o.c.)	0.35" (9) ∅	347 (50)	-	489 (7830)	0.12 (500)
9	Fiber Cement Board Cladding with 3/4" (19mm) vented air space is incorporated into exterior heat transfer coefficient					
10	5' (1.5m) x 4' (1.2m) Vinyl window: triple glazed ² , IGU U _{IGU} = 0.14 BTU/hr.ft ² ·°F (0.81 W/m ² K)					
11	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
12	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

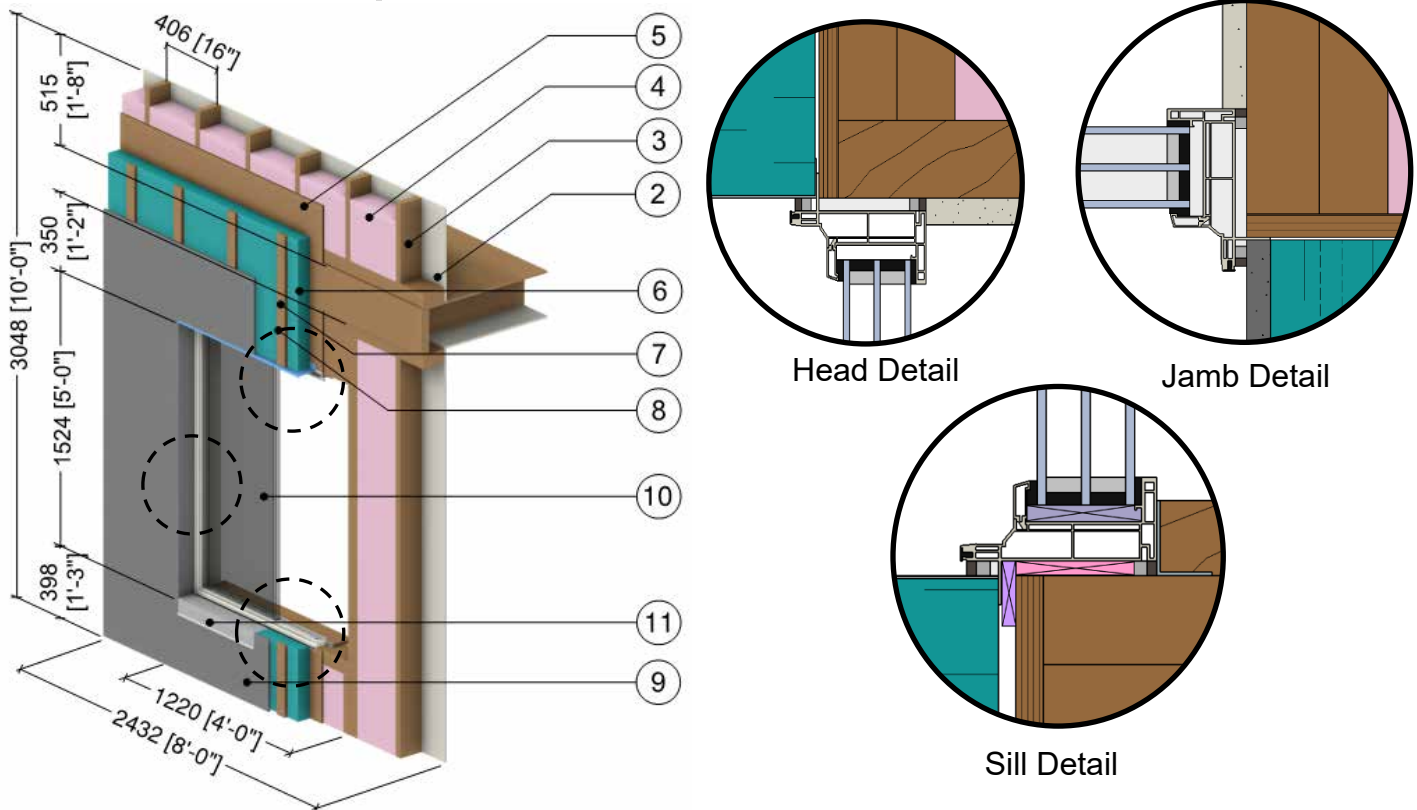
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 8.3.5

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Triple Glazed Flange Mounted Vinyl Window Intersection with Window Positioned in Wood Framing



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
4	Fiberglass Batt Insulation	5 1/2" (140)	-	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
5	Exterior Wood Sheathing	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-5 to R-15 (0.88 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Steel Fasteners (16" o.c.)	0.35" (9) ∅	347 (50)	-	489 (7830)	0.12 (500)
9	Fiber Cement Board Cladding with 3/4" (19mm) vented air space is incorporated into exterior heat transfer coefficient					
10	5' (1.5m) x 4' (1.2m) Vinyl window: triple glazed ² , IGU U _{IGU} = 0.14 BTU/hr.ft ² ·°F (0.81 W/m ² K)					
11	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
12	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

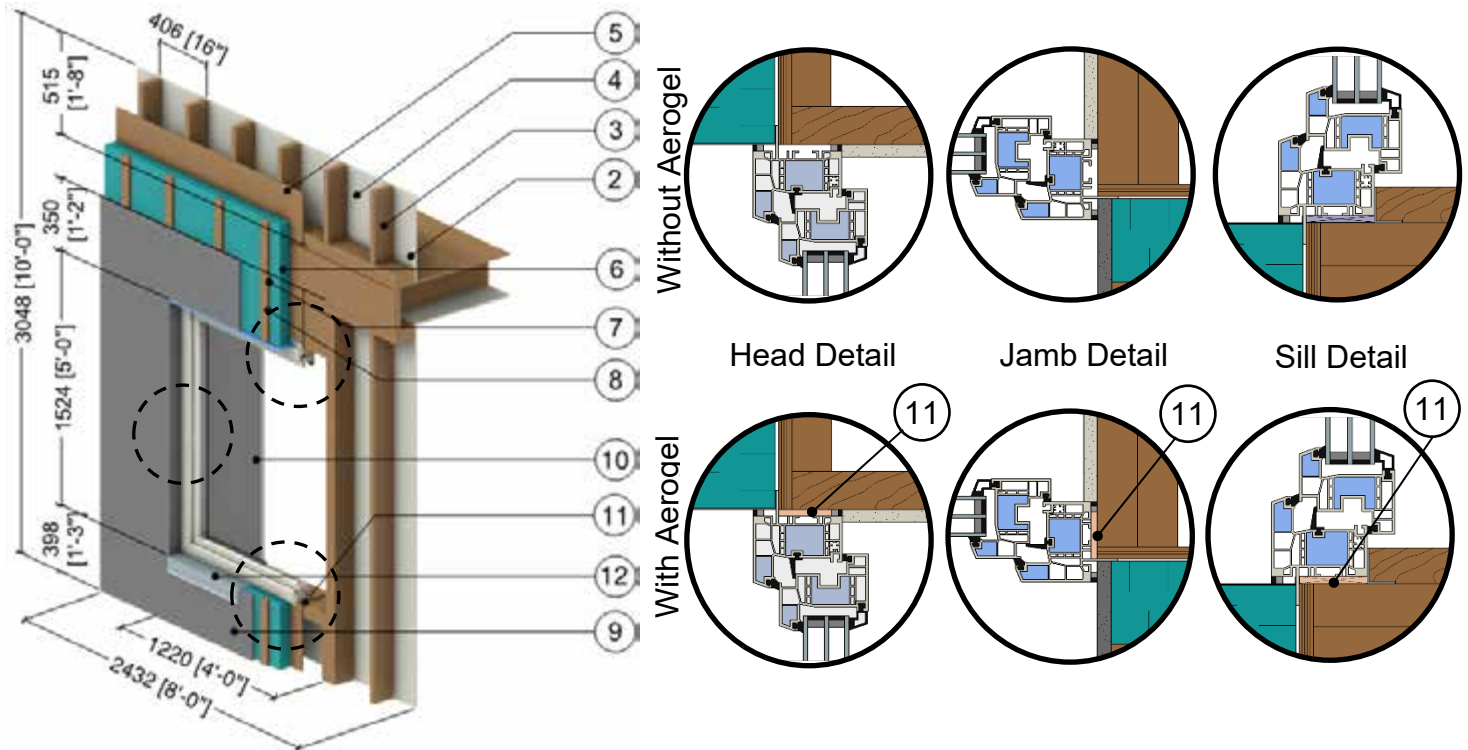
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 8.3.6

Exterior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping (16" o.c.) and Continuous Insulation Supporting Rainscreen Fiber Cement Board – Triple Glazed High Performance Vinyl Window Intersection (Insulated Frames)



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
4	Air in Stud Cavity	5 1/2" (140)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Exterior Wood Sheathing	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-5 to R-15 (0.88 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Steel Fasteners (16" o.c.)	0.35" (9) ∅	347 (50)	-	489 (7830)	0.12 (500)
9	Fiber Cement Board Cladding with 3/4" (19mm) vented air space is incorporated into exterior heat transfer coefficient					
10	5' (1.5m) x 4' (1.2m) Vinyl window (Passive House certified) ² : triple glazed, IGU U _{IGU} = 0.14 BTU/hr.ft ² .°F (0.81 W/m ² K)					
11	Aerogel Blanket	0.4" (10)	0.086 (0.015)	R-3.8 (0.67 RSI)	-	-
12	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
13	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

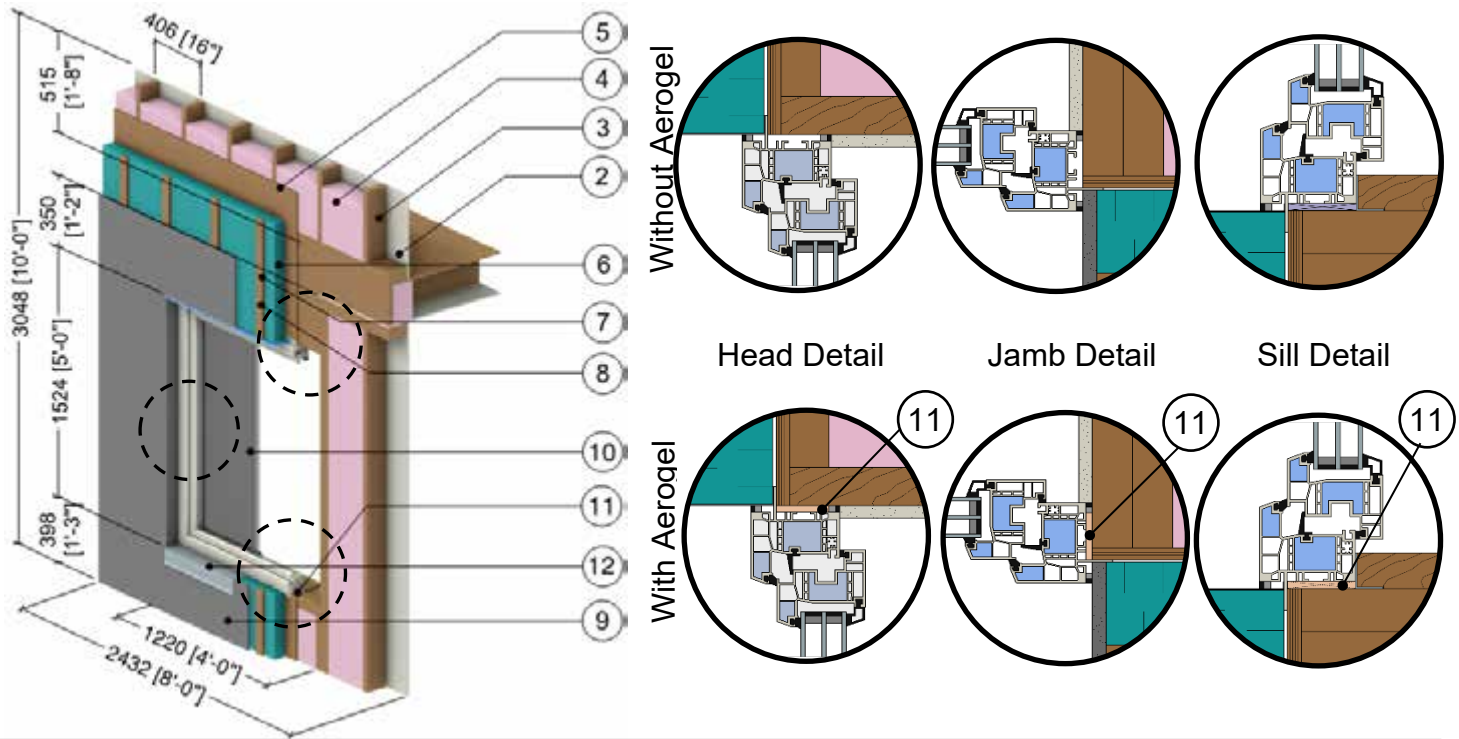
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 8.3.7

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping (16" o.c.) and Continuous Insulation Supporting Rainscreen Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Triple Glazed High Performance Vinyl Window Intersection (Insulated Frames)



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
4	Fiberglass Batt Insulation	5 1/2" (140)	-	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
5	Exterior Wood Sheathing	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-5 to R-15 (0.88 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Steel Fasteners (16" o.c.)	0.35" (9) ∅	347 (50)	-	489 (7830)	0.12 (500)
9	Fiber Cement Board Cladding with 3/4" (19mm) vented air space is incorporated into exterior heat transfer coefficient					
10	5' (1.5m) x 4' (1.2m) Vinyl window (Passive House certified) ² : triple glazed, IGU U _{IGU} = 0.14 BTU/hr.ft ² ·°F (0.81 W/m ² K)					
11	Aerogel Blanket	0.4" (10)	0.086 (0.015)	R-3.8 (0.67 RSI)	-	-
12	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
13	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

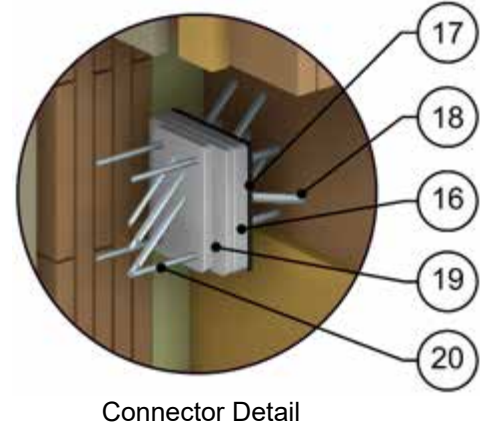
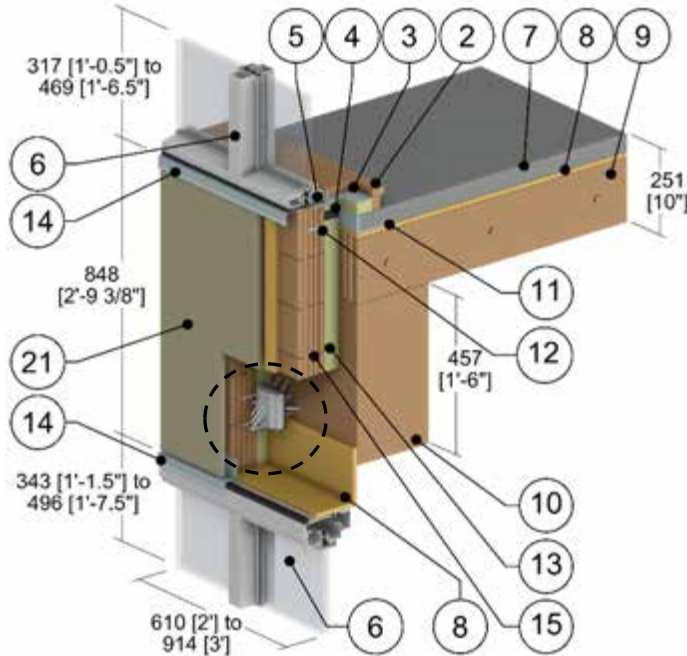
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 8.3.8

Interior Insulated Cross Laminated Timber (CLT) Spandrel at Window and Dowel Laminated Timber (DLT) – Intermediate Floor Intersection with Edge of Floor and Glulam Beam Aligned



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Wood Sill	1" (25)	0.69 (0.10)	-	31 (500)	0.45 (1880)
3	Support Angle	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Firestop Sealant	1" (25)	2.4 (0.35)	-	174 (2800)	0.17 (700)
5	Window Mounting Angle	1/8" (3)	1110 (160)	-	171 (2740)	0.21 (900)
6	Aluminum Window Wall Vision System ² : thermally broken frame, double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
7	Concrete Topping	2" (51)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Plywood	5/8" (16)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	DLT Floor	7 1/4" (184)	0.83 (0.12)	-	31 (500)	0.45 (1880)
10	Glulam Beam	9.5" (241)	0.97 (0.14)	R-9.8 (1.73 RSI)	31 (500)	0.45 (1880)
11	L-angle	1/4" (6)	347 (50)	-	489 (7830)	0.12 (500)
12	Structural Screws 18" o.c.	ø 5/16" (8)	347 (50)	-	489 (7830)	0.12 (500)
13	Mineral Wool Insulation	Varies	0.24 (0.034)	R-8.4 to R-33.6 (1.48 RSI to 5.92 RSI)	4 (64)	0.20 (850)
14	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2740)	0.21 (900)
15	CLT Panel	3.5" (89)	0.83 (0.12)	R-4.2 (0.79 RSI)	31 (500)	0.45 (1880)
16	ISO-CONNECT Plate	19/32" (15)	1110 (160)	-	171 (2740)	0.21 (900)
17	ISO-CONNECT Rubber Pad	1/8" (3)	1.7 (0.25)	-	-	-
18	ISO-CONNECT Fasteners x12	ø 5/16" (8)	347 (50)	-	489 (7830)	0.12 (500)
19	HVP Coupling Plates	19/32" (15)	1110 (160)	-	171 (2740)	0.21 (900)
20	HVP Fasteners x9	ø 3/16" (5)	347 (50)	-	489 (7830)	0.12 (500)
21	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
22	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

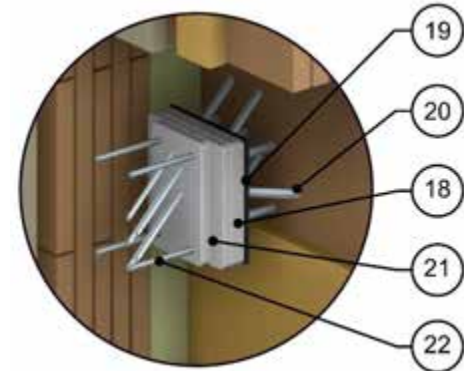
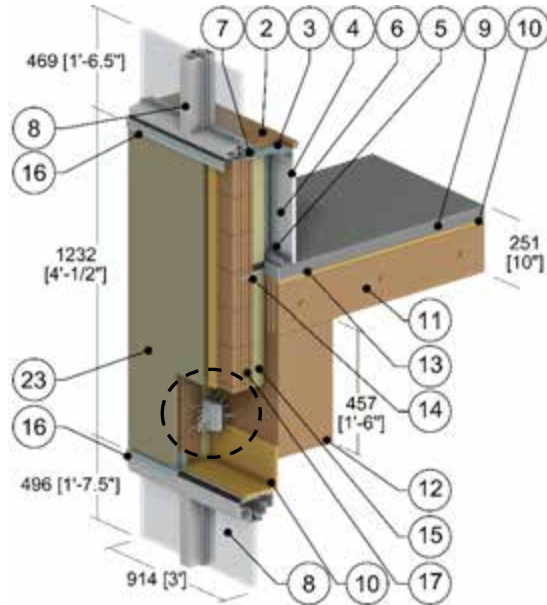
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 8.3.9

Full Height Interior Insulated Cross Laminated Timber (CLT) Spandrel at Window and Dowel Laminated Timber (DLT) – Intermediate Floor Intersection with Edge of Floor and Glulam Beam Aligned



Connector Detail

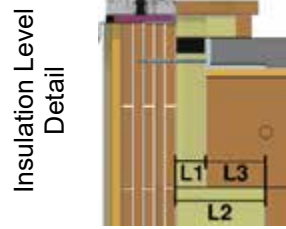
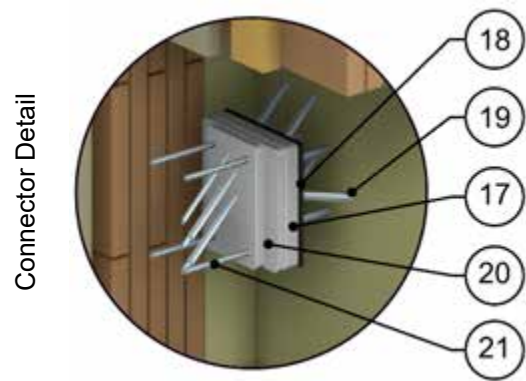
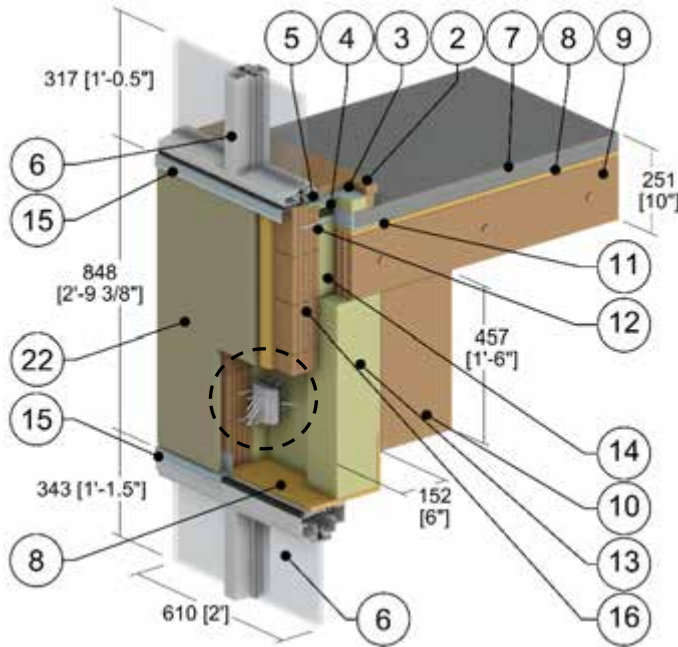
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Wood Sill	1" (25)	0.69 (0.10)	-	31 (500)	0.45 (1880)
3	Support Angle	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
5	Steel Studs (16" o.c.) and Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	Air Cavity	2.5" (64)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
7	Window Mounting Angle	1/8" (3)	1110 (160)	-	171 (2740)	0.21 (900)
8	Aluminum Window Wall Vision System ² : thermally broken frame, double glazed IGU U _{IGU} = 0.32 BTU/hr-ft ² -°F (1.82 W/m ² K)					
9	Concrete Topping	2" (51)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Plywood	5/8" (16)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	DLT Floor	7 1/4" (184)	0.83 (0.12)	-	31 (500)	0.45 (1880)
12	Glulam Beam	9.5" (241)	0.97 (0.14)	R-9.8 (1.73 RSI)	31 (500)	0.45 (1880)
13	L-Angle	1/4" (6)	347 (50)	-	489 (7830)	0.12 (500)
14	Structural Screws 18" o.c.	ø 5/16" (8)	347 (50)	-	489 (7830)	0.12 (500)
15	Mineral Wool Insulation	Varies	0.24 (0.034)	R-8.4 to R-33.6 (1.48 RSI to 5.92 RSI)	4 (64)	0.20 (850)
16	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2740)	0.21 (900)
17	CLT Panel	3.5" (89)	0.83 (0.12)	R-4.2 (0.79 RSI)	31 (500)	0.45 (1880)
18	ISO-CONNECT Plate	19/32" (15)	1110 (160)	-	171 (2740)	0.21 (900)
19	ISO-CONNECT Rubber Pad	1/8" (3)	1.7 (0.25)	-	-	-
20	ISO-CONNECT Fasteners x12	ø 5/16" (8)	347 (50)	-	489 (7830)	0.12 (500)
21	HVP Coupling Plates	19/32" (15)	1110 (160)	-	171 (2740)	0.21 (900)
22	HVP Fasteners x9	ø 3/16" (5)	347 (50)	-	489 (7830)	0.12 (500)
23	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
24	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 8.3.10

Interior Insulated Cross Laminated Timber (CLT) Spandrel at Window and Dowel Laminated Timber (DLT) – Intermediate Floor Intersection with Edge of Floor and Glulam Beam Not Aligned



L1	L2	L3
in (mm)	in (mm)	in (mm)
2" (51)	6" (152)	4" (102)
3" (76)	6" (152)	3" (76)
4" (102)	6" (152)	2" (51)

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Wood Sill	1" (25)	0.69 (0.10)	-	31 (500)	0.45 (1880)
3	Support Angle	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Firestop Sealant	1" (25)	2.4 (0.35)	-	174 (2800)	0.17 (700)
5	Window Mounting Angle	1/8" (3)	1110 (160)	-	171 (2740)	0.21 (900)
6	Aluminum Window Wall Vision System ² : thermally broken frame, double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
7	Concrete Topping	2" (51)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Plywood	5/8" (16)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	DLT Floor	7 1/4" (184)	0.83 (0.12)	-	31 (500)	0.45 (1880)
10	Glulam Beam	9.5" (241)	0.97 (0.14)	R-9.8 (1.73 RSI)	31 (500)	0.45 (1880)
11	L-angle	1/4" (6)	347 (50)	-	489 (7830)	0.12 (500)
12	Structural Screws 18" o.c.	ø 5/16" (8)	347 (50)	-	489 (7830)	0.12 (500)
13	Mineral Wool Insulation	6" (152)	0.24 (0.034)	R-25.2 (4.44 RSI)	4 (64)	0.20 (850)
14	Floor Mineral Wool Insulation	Varies	0.24 (0.034)	R-8.4 to R-16.8 (1.48 RSI to 2.96 RSI)	4 (64)	0.20 (850)
15	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2740)	0.21 (900)
16	CLT Panel	3.5" (89)	0.83 (0.12)	R-4.2 (0.79 RSI)	31 (500)	0.45 (1880)
17	ISO-CONNECT Plate	19/32" (15)	1110 (160)	-	171 (2740)	0.21 (900)
18	ISO-CONNECT Rubber Pad	1/8" (3)	1.7 (0.25)	-	-	-
19	ISO-CONNECT Fasteners x12	ø 5/16" (8)	347 (50)	-	489 (7830)	0.12 (500)
20	HVP Coupling Plates	19/32" (15)	1110 (160)	-	171 (2740)	0.21 (900)
21	HVP Fasteners x9	ø 3/16" (5)	347 (50)	-	489 (7830)	0.12 (500)
22	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
23	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

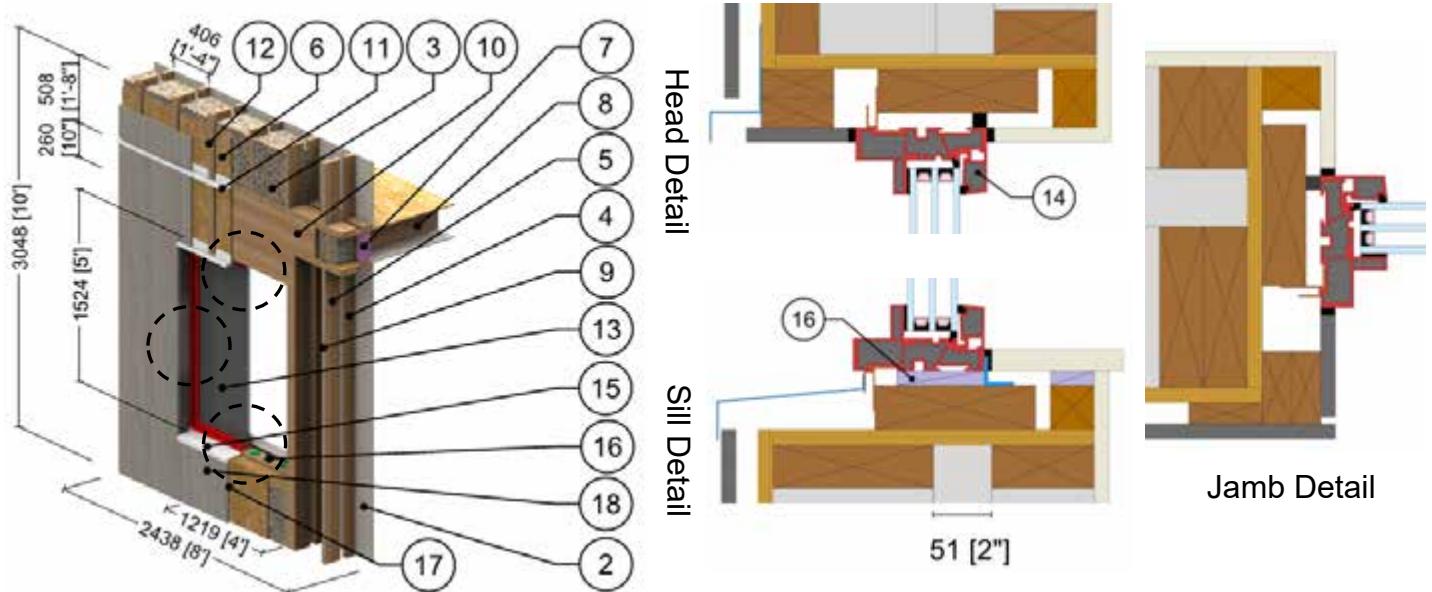
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 8.3.11

Double Framed Wall with 2x6 and 2x4 Wood Studs (16" o.c.) and 2" Gap – Triple Glazed Flanged Fiberglass Window Intersection with Wood Blocking and Un-insulated Perimeter



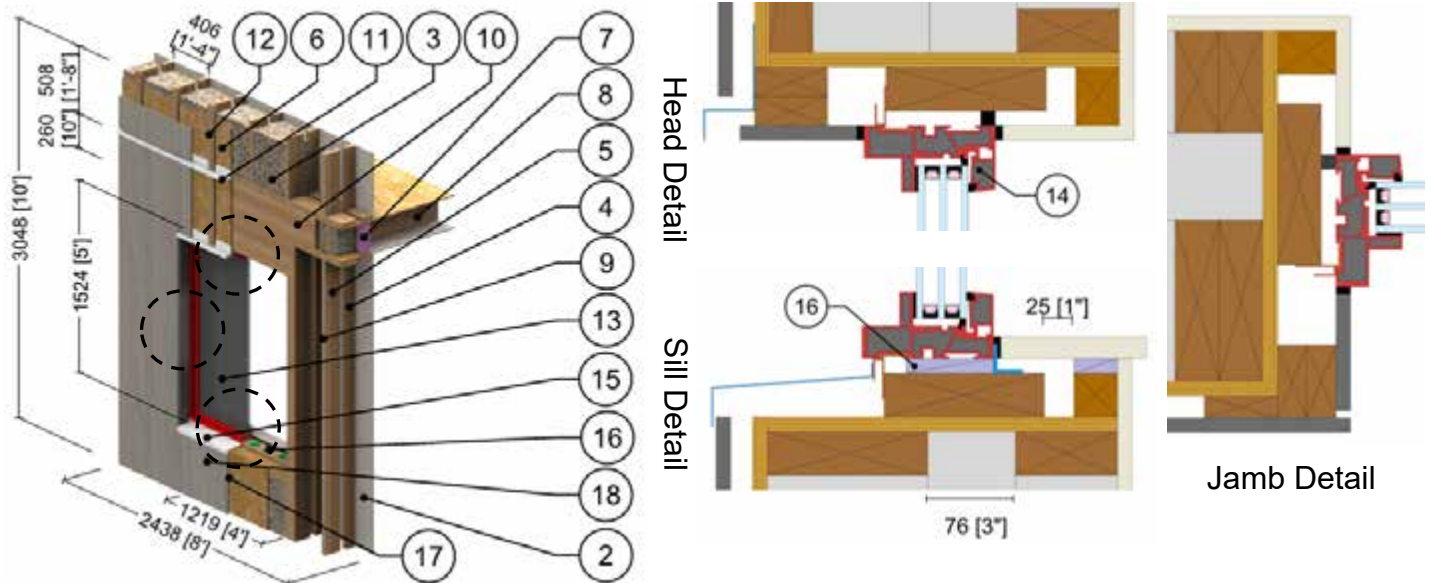
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	11" (279)	Varies	R-38.5 to R-66.0 (6.78 RSI to 11.62 RSI)	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	XPS Insulation	2" (51)	0.20 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
8	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Fasteners (6" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	5' (1.5m) x 4' (1.2m) Fiberglass window: triple glazed ² , IGU U _{IGU} = 0.156 BTU/hr.ft ² ·°F (0.888 W/m ² K)					
14	Frame Insulation	-	0.16 (0.023)	-	-	-
15	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
16	Shims	-	1.7 (0.25)	-	-	-
17	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
18	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
19	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 8.3.12

Double Framed Wall with 2x6 and 2x4 Wood Studs (16" o.c.) and 3" Gap – Triple Glazed Flanged Fiberglass Window Intersection with Wood Blocking and Un-insulated Perimeter



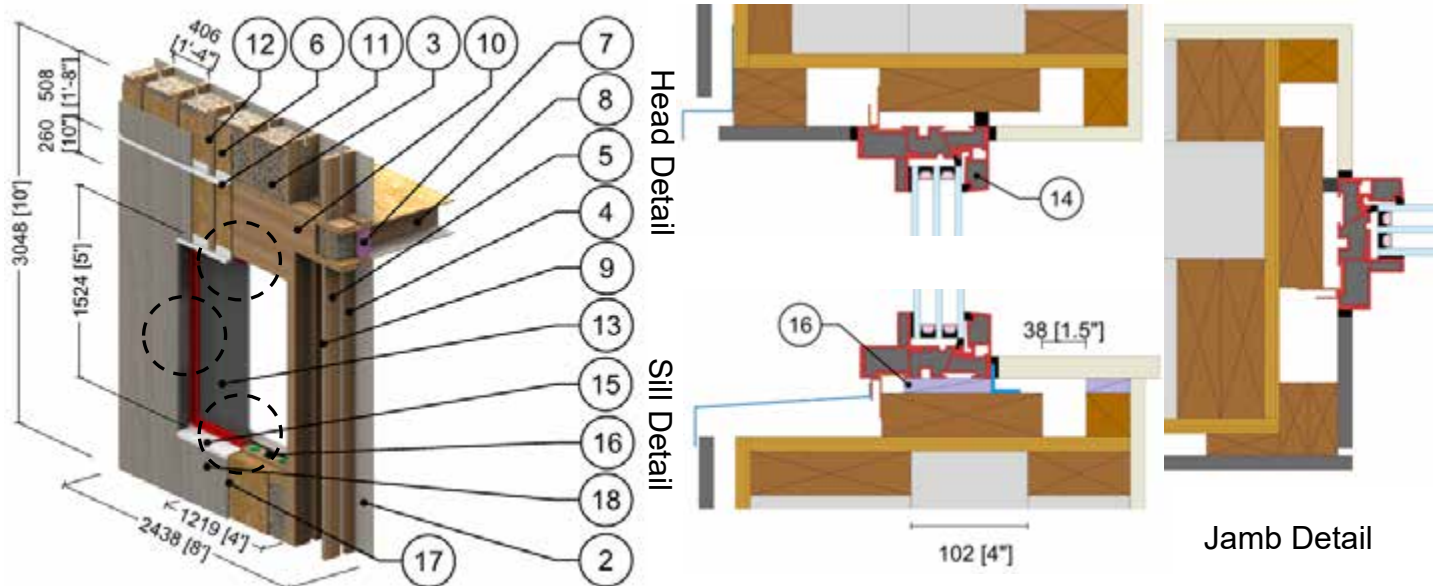
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	12" (305)	Varies	R-42.0 to R-72.0 (7.40 RSI to 12.68 RSI)	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	XPS Insulation	2" (51)	0.20 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
8	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Fasteners (6" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	5' (1.5m) x 4' (1.2m) Fiberglass window: triple glazed ² , IGU U _{IGU} = 0.156 BTU/hr.ft ² ·°F (0.888 W/m ² K)					
14	Frame Insulation	-	0.16 (0.023)	-	-	-
15	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
16	Shims	-	1.7 (0.25)	-	-	-
17	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
18	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
19	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 8.3.13

Double Framed Wall with 2x6 and 2x4 Wood Studs (16" o.c.) and 4" Gap – Triple Glazed Flanged Fiberglass Window Intersection with Wood Blocking and Un-insulated Perimeter



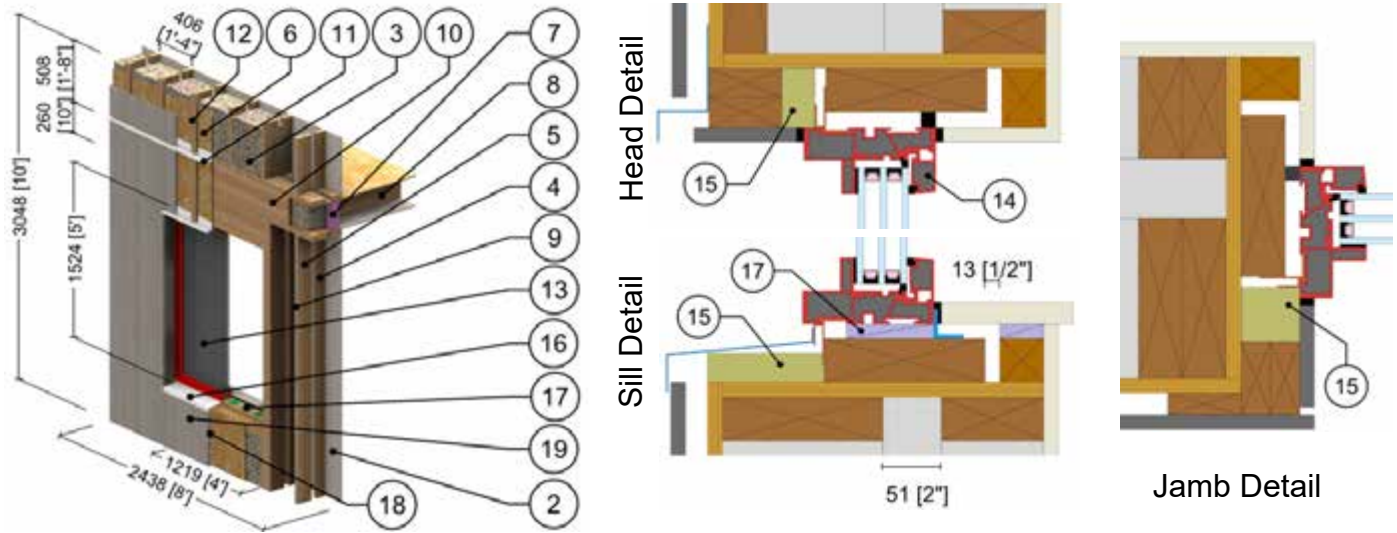
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	13" (330)	Varies	R-45.5 to R-78.0 (8.01 RSI to 13.74 RSI)	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	XPS Insulation	2" (51)	0.20 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
8	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Fasteners (6" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	5' (1.5m) x 4' (1.2m) Fiberglass window: triple glazed ² , IGU U _{IGU} = 0.156 BTU/hr·ft ² ·°F (0.888 W/m ² K)					
14	Frame Insulation	-	0.16 (0.023)	-	-	-
15	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
16	Shims	-	1.7 (0.25)	-	-	-
17	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
18	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
19	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 8.3.14

Double Framed Wall with 2x6 and 2x4 Wood Studs (16" o.c.) and 2" Gap – Triple Glazed Flanged Fiberglass Window Intersection with Wood Blocking and Insulated Perimeter



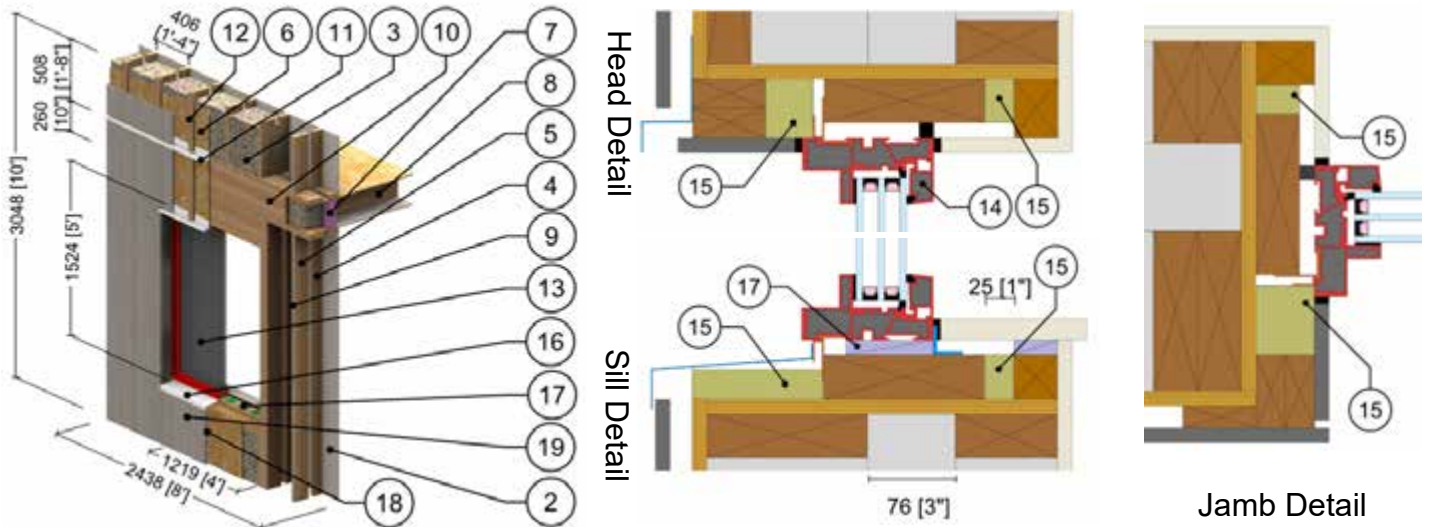
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	11" (279)	Varies	R-38.5 to R-66.0 (6.78 RSI to 11.62 RSI)	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	XPS Insulation	2" (51)	0.20 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
8	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Fasteners (6" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	5' (1.5m) x 4' (1.2m) Fiberglass window: triple glazed ² , IGU U _{IGU} = 0.156 BTU/hr.ft ² ·°F (0.888 W/m ² K)					
14	Frame Insulation	-	0.16 (0.023)	-	-	-
15	Mineral Wool	-	0.24 (0.034)	-	4 (64)	0.20 (850)
16	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
17	Shims	-	1.7 (0.25)	-	-	-
18	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
19	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
20	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 8.3.15

Double Framed Wall with 2x6 and 2x4 Wood Studs (16" o.c.) and 3" Gap – Triple Glazed Flanged Fiberglass Window Intersection with Wood Blocking and Insulated Perimeter



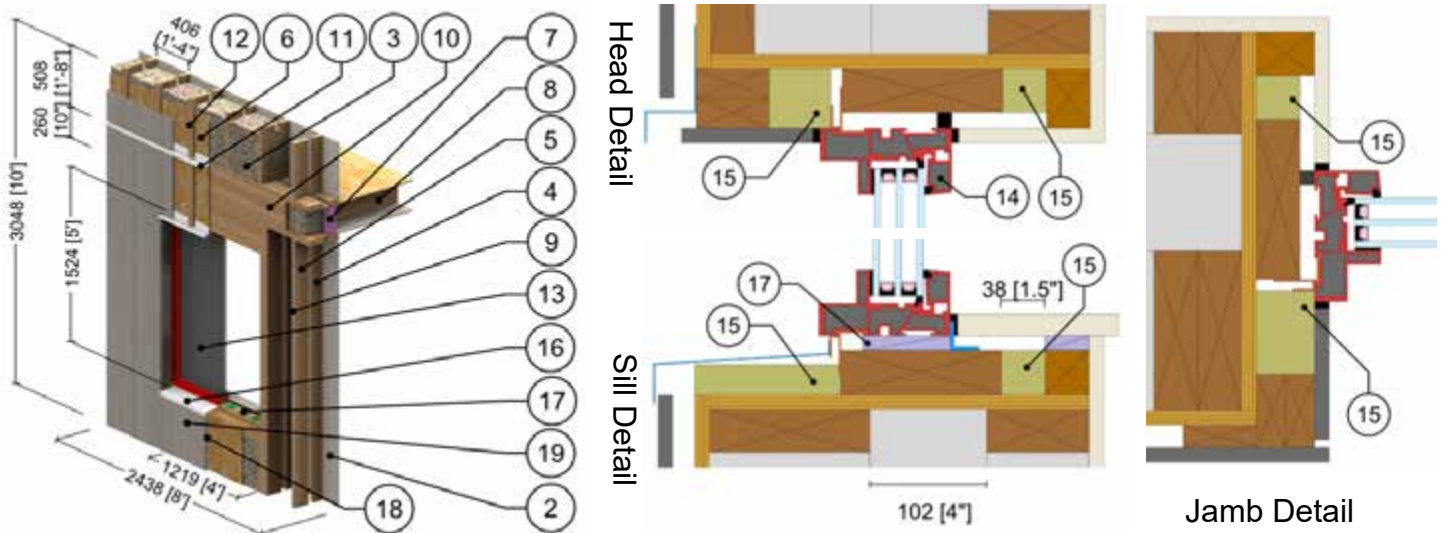
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	12" (305)	Varies	R-42.0 to R-72.0 (7.40 RSI to 12.68 RSI)	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	XPS Insulation	2" (51)	0.20 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
8	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Fasteners (6" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	5' (1.5m) x 4' (1.2m) Fiberglass window: triple glazed ² , IGU U _{IGU} = 0.156 BTU/hr.ft ² -°F (0.888 W/m ² K)					
14	Frame Insulation	-	0.16 (0.023)	-	-	-
15	Mineral Wool	-	0.24 (0.034)	-	4 (64)	0.20 (850)
16	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
17	Shims	-	1.7 (0.25)	-	-	-
18	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
19	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
20	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 8.3.16

Double Framed Wall with 2x6 and 2x4 Wood Studs (16" o.c.) and 4" Gap – Triple Glazed Flanged Fiberglass Window Intersection with Wood Blocking and Insulated Perimeter



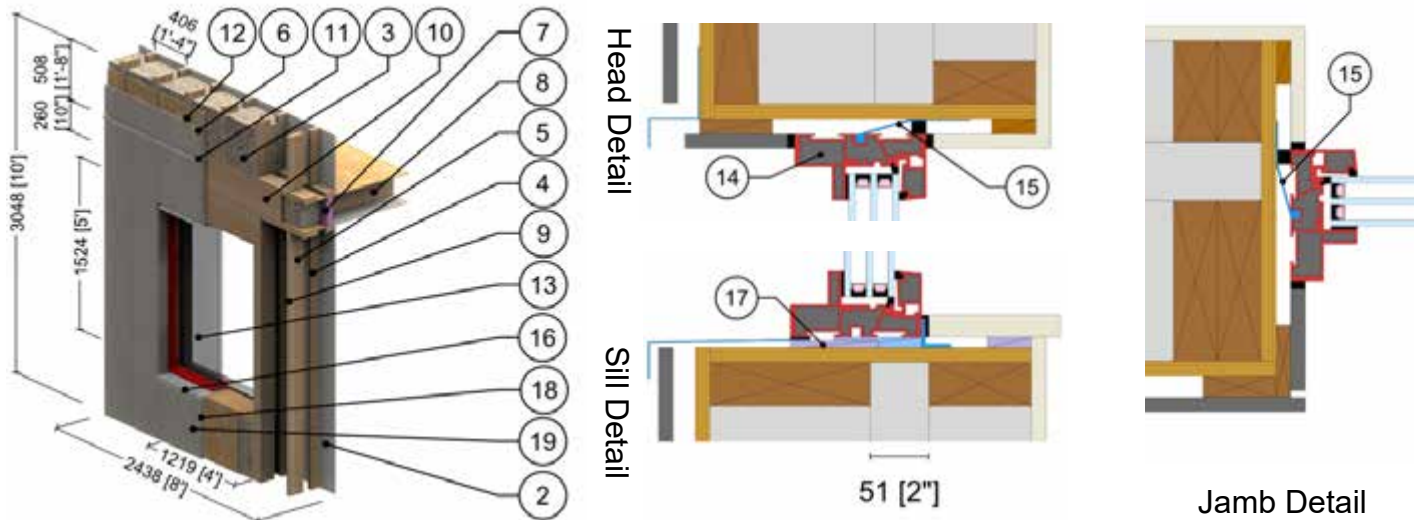
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	13" (330)	Varies	R-45.5 to R-78.0 (8.01 RSI to 13.74 RSI)	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	XPS Insulation	2" (51)	0.20 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
8	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Fasteners (6" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	5' (1.5m) x 4' (1.2m) Fiberglass window: triple glazed ² , IGU U _{IGU} = 0.156 BTU/hr.ft ² ·°F (0.888 W/m ² K)					
14	Frame Insulation	-	0.16 (0.023)	-	-	-
15	Mineral Wool	-	0.24 (0.034)	-	4 (64)	0.20 (850)
16	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
17	Shims	-	1.7 (0.25)	-	-	-
18	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
19	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
20	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 8.3.17

Double Framed Wall with 2x6 and 2x4 Wood Studs (16" o.c.) Wall and 2" Gap – Triple Glazed Rebated Fiberglass Window Intersection and Un-Insulated Perimeter



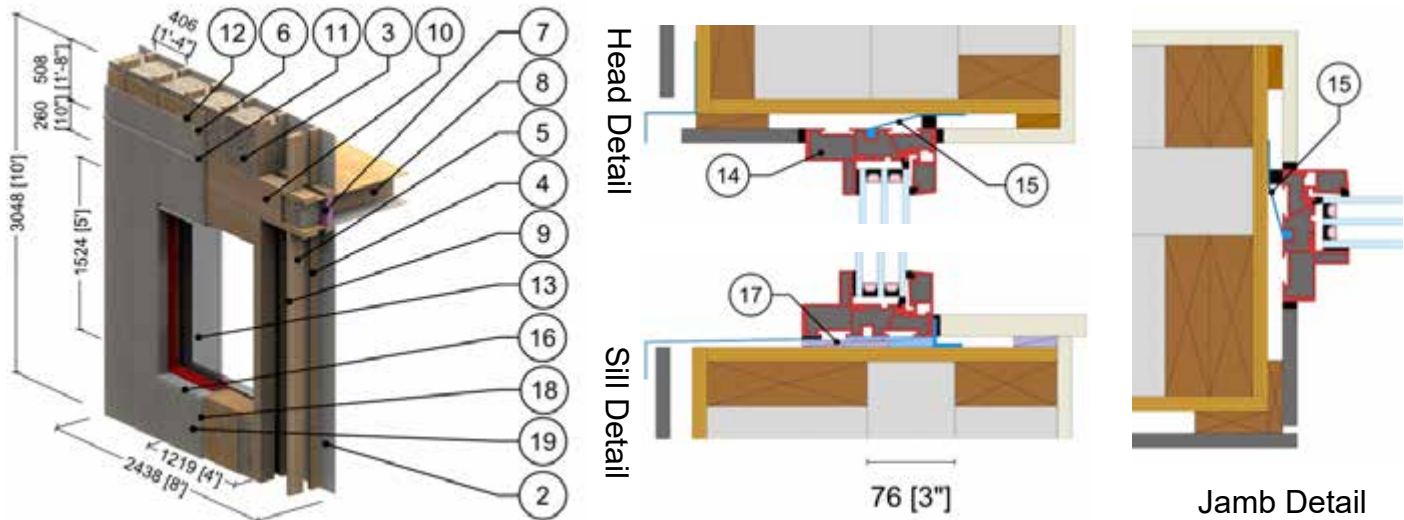
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.2 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	11" (279)	Varies	R-38.5 to R-66.0 (6.78 RSI to 11.62 RSI)	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	XPS Insulation	2" (51)	0.20 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
8	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Fasteners (6" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	5' (1.5m) x 4' (1.2m) Fiberglass window: triple glazed ² , IGU U _{IGU} = 0.156 BTU/hr.ft ² .°F (0.89 W/m ² K)					
14	Window Frame Insulation	-	0.16 (0.023)	-	-	-
15	Strap Anchor	-	430 (62)	-	489 (7830)	0.12 (500)
16	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
17	Shims	-	1.7 (0.25)	-	-	-
18	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
19	Fiber Cement	1/2" (13)	4.86 (0.7)	-	-	-
20	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 8.3.18

Double Framed Wall with 2x6 and 2x4 Wood Studs (16" o.c.) Wall and 3" Gap – Triple Glazed Rebated Fiberglass Window Intersection and Un-Insulated Perimeter



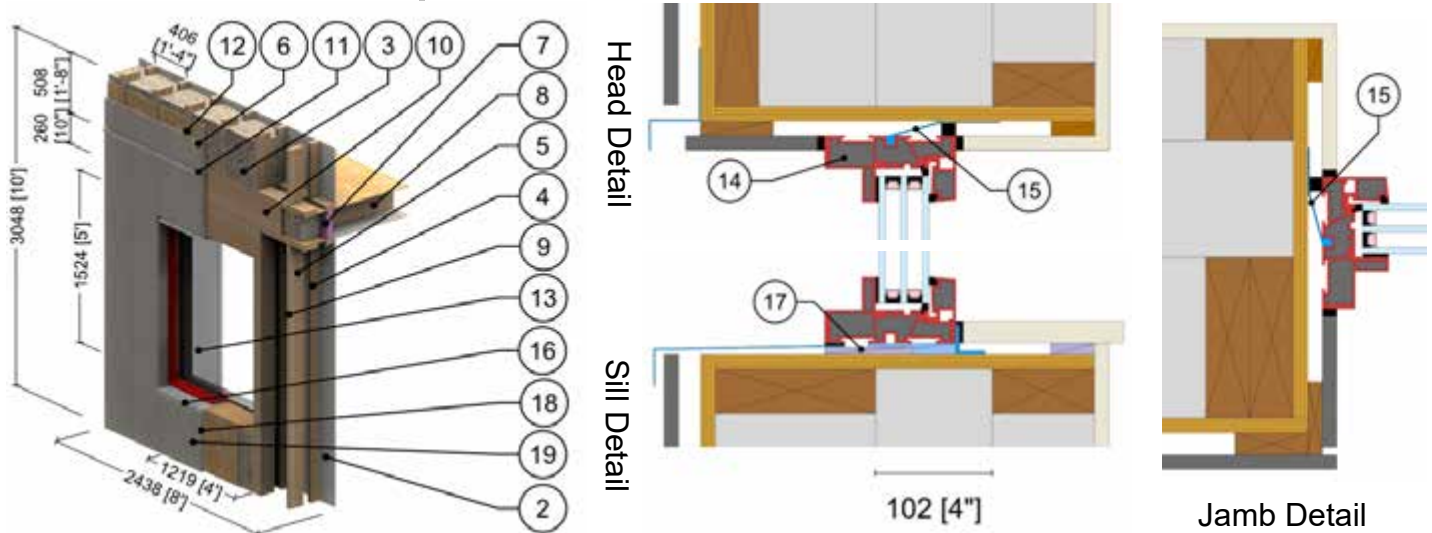
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.2 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	12" (305)	Varies	R-42.0 to R-72.0 (7.40 RSI to 12.68 RSI)	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	XPS Insulation	2" (51)	0.20 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
8	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Fasteners (6" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	5' (1.5m) x 4' (1.2m) Fiberglass window: triple glazed ² , IGU U _{IGU} = 0.156 BTU/hr.ft ² .°F (0.89 W/m ² K)					
14	Window Frame Insulation	-	0.16 (0.023)	-	-	-
15	Strap Anchor	-	430 (62)	-	489 (7830)	0.12 (500)
16	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
17	Shims	-	1.7 (0.25)	-	-	-
18	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
19	Fiber Cement	1/2" (13)	4.86 (0.7)	-	-	-
20	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 8.3.19

Double Framed Wall with 2x6 and 2x4 Wood Studs (16" o.c.) Wall and 4" Gap – Triple Glazed Rebated Fiberglass Window Intersection and Un-Insulated Perimeter



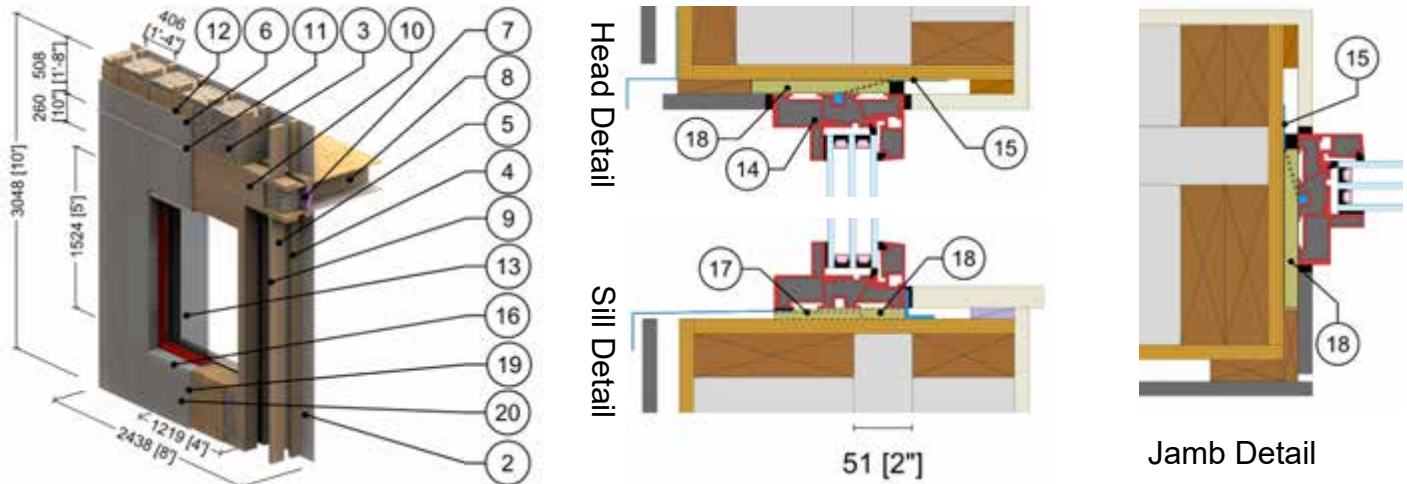
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.2 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	13" (330)	Varies	R-45.5 to R-78.0 (8.01 RSI to 13.74 RSI)	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	XPS Insulation	2" (51)	0.20 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
8	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Fasteners (6" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	5' (1.5m) x 4' (1.2m) Fiberglass window: triple glazed ² , IGU U _{IGU} = 0.156 BTU/hr.ft ² .°F (0.89 W/m ² K)					
14	Window Frame Insulation	-	0.16 (0.023)	-	-	-
15	Strap Anchor	-	430 (62)	-	489 (7830)	0.12 (500)
16	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
17	Shims	-	1.7 (0.25)	-	-	-
18	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
19	Fiber Cement	1/2" (13)	4.86 (0.7)	-	-	-
20	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 8.3.20

Double Framed Wall with 2x6 and 2x4 Wood Studs (16" o.c.) Wall and 2" Gap – Triple Glazed Rebated Fiberglass Window Intersection with Insulation at Window Perimeter



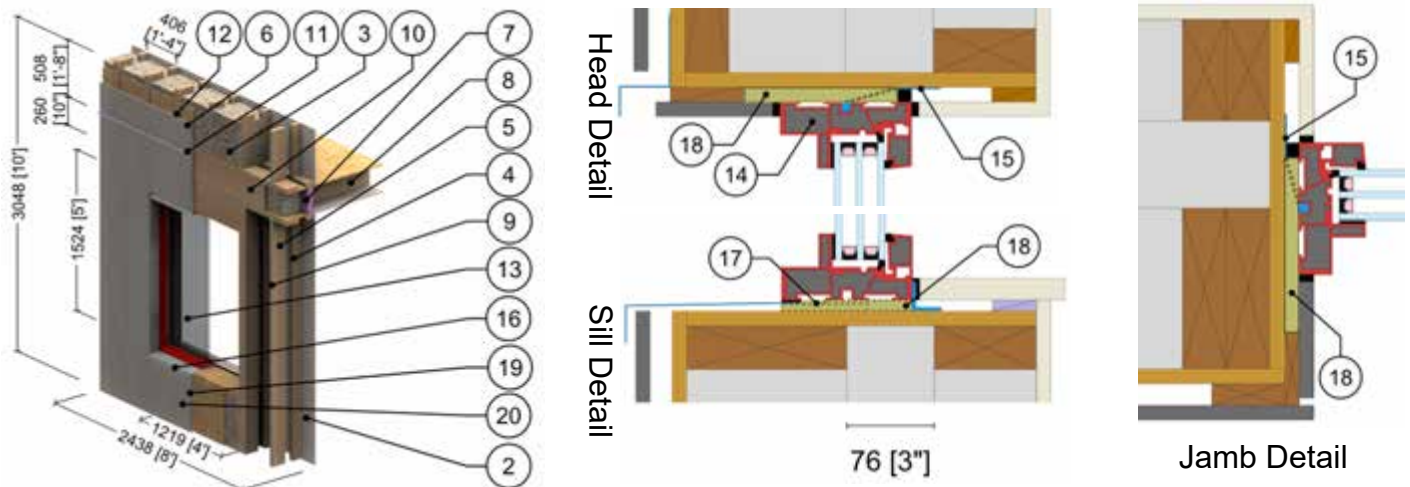
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.2 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	11" (279)	Varies	R-38.5 to R-66.0 (6.78 RSI to 11.62 RSI)	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	XPS Insulation	2" (51)	0.20 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
8	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Fasteners (6" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	5' (1.5m) x 4' (1.2m) Fiberglass window: triple glazed ² , IGU U _{IGU} = 0.156 BTU/hr.ft ² .°F (0.89 W/m ² K)					
14	Frame Insulation	-	0.16 (0.023)	-	-	-
15	Strap Anchor	-	430 (62)	-	489 (7830)	0.12 (500)
16	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
17	Shims	-	1.7 (0.25)	-	-	-
18	Compressed Mineral Wool	1/2" (13)	0.22 (0.032)	R-2.2 (0.39 RSI)	-	-
19	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
20	Fiber Cement	1/2" (13)	4.86 (0.7)	-	-	-
21	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 8.3.21

Double Framed Wall with 2x6 and 2x4 Wood Studs (16" o.c.) Wall and 3" Gap – Triple Glazed Rebated Fiberglass Window Intersection with Insulation at Window Perimeter



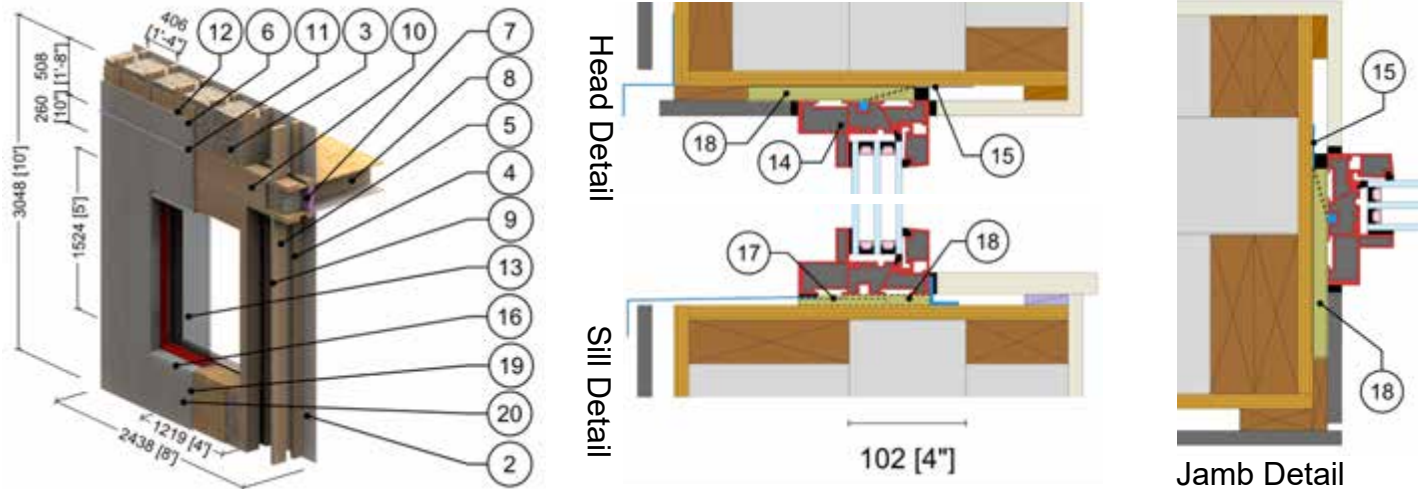
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.2 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	12" (305)	Varies	R-42.0 to R-72.0 (7.40 RSI to 12.68 RSI)	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	XPS Insulation	2" (51)	0.20 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
8	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Fasteners (6" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	5' (1.5m) x 4' (1.2m) Fiberglass window: triple glazed ² , IGU U _{IGU} = 0.156 BTU/hr.ft ² ·°F (0.89 W/m ² K)					
14	Frame Insulation	-	0.16 (0.023)	-	-	-
15	Strap Anchor	-	430 (62)	-	489 (7830)	0.12 (500)
16	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
17	Shims	-	1.7 (0.25)	-	-	-
18	Compressed Mineral Wool	1/2" (13)	0.22 (0.032)	R-2.2 (0.39 RSI)	-	-
19	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
20	Fiber Cement	1/2" (13)	4.86 (0.7)	-	-	-
21	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 8.3.22

Double Framed Wall with 2x6 and 2x4 Wood Studs (16" o.c.) Wall and 4" Gap – Triple Glazed Rebated Fiberglass Window Intersection with Insulation at Window Perimeter



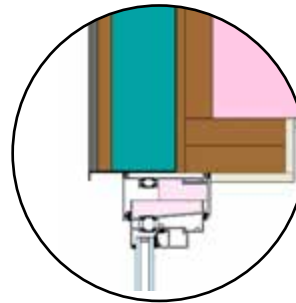
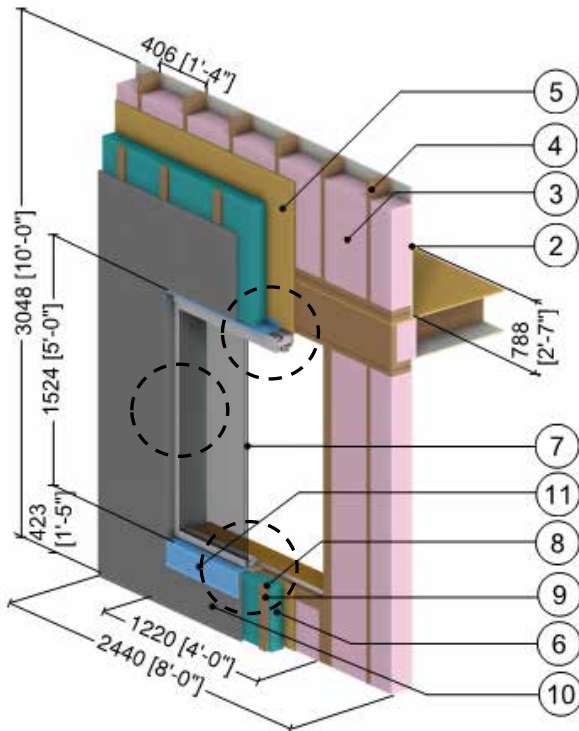
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.2 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	13" (330)	Varies	R-45.5 to R-78.0 (8.01 RSI to 13.74 RSI)	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	XPS Insulation	2" (51)	0.20 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
8	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Fasteners (6" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	5' (1.5m) x 4' (1.2m) Fiberglass window: triple glazed ² , IGU U _{IGU} = 0.156 BTU/hr.ft ² .°F (0.89 W/m ² K)					
14	Frame Insulation	-	0.16 (0.023)	-	-	-
15	Strap Anchor	-	430 (62)	-	489 (7830)	0.12 (500)
16	Aluminum Flashing	14 Gauge	1110 (160)	-	171 (2739)	0.21 (900)
17	Shims	-	1.7 (0.25)	-	-	-
18	Compressed Mineral Wool	1/2" (13)	0.22 (0.032)	R-2.2 (0.39 RSI)	-	-
19	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
20	Fiber Cement	1/2" (13)	4.86 (0.7)	-	-	-
21	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

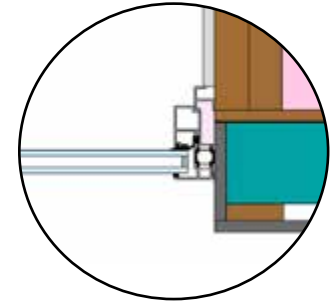
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 8.3.23

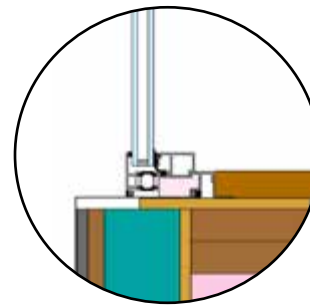
Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board – Double Glazed Aluminum Window Intersection Aligned with Exterior Insulation



Head Detail



Jamb Detail



Sill Detail

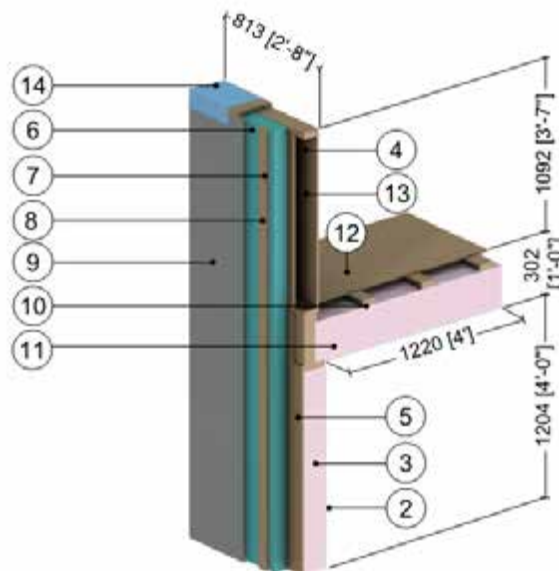
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	-	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-5 to R-15 (0.88 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	5' (1.5m) x 6' (1.8m) Aluminum window: double glazed & thermally broken ² , double glazed IGU UIGU = 0.32 BTU/hr.ft ² ·°F (1.82 W/m ² K)					
8	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
11	Aluminum Flashing	18 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
12	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity for air spaces within window framing was found using ISO 10077-2

Detail 8.4.1

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Vented Low-slope Roof & Parapet Intersection

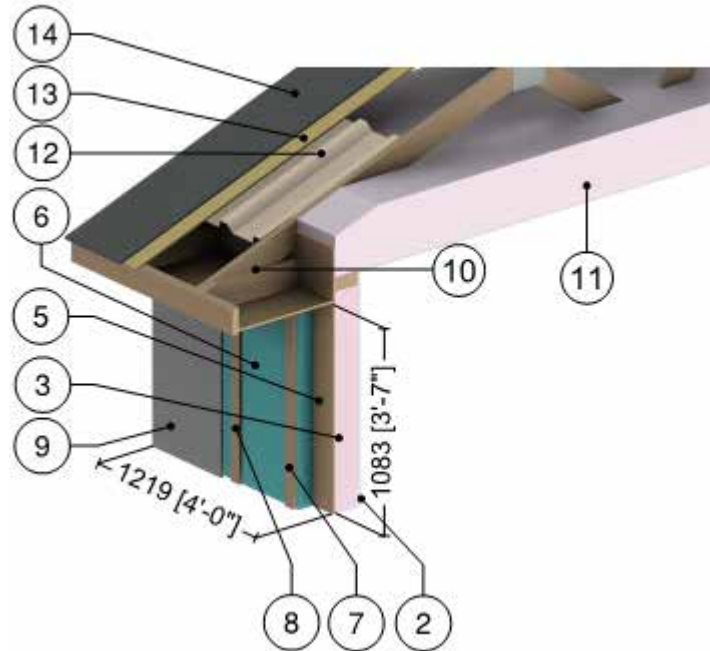


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	3 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-0 to R-15 (0.00 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
9	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Roof Wood Framing	-	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Fiberglass Roof Insulation	9 1/4" (235)	0.3 (0.04)	R-30 (5.28 RSI)	0.9 (14)	0.17 (710)
12	Roof Wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
13	Air Cavity	3 1/2" (89)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
14	Steel Cap Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
Flashing & roof material are incorporated into exterior heat transfer coefficient						
15	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.4.2

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Sloped Wood Framed Roof & Wall Intersection with Insulation at Ceiling

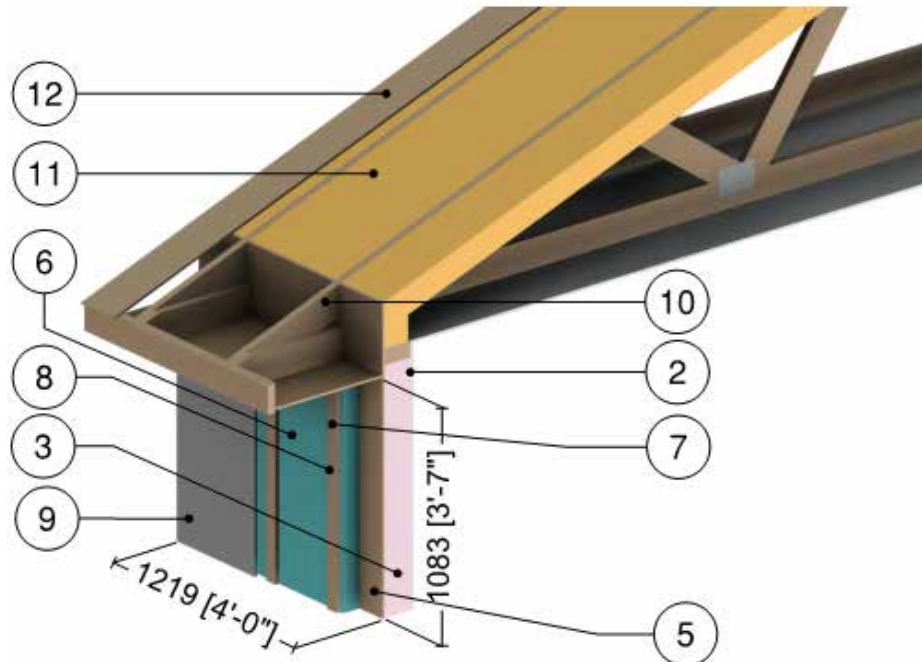


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.12 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-0 to R-15 (0.00 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
9	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Roof Truss (24" o.c.)	-	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Attic Insulation	9" (228)	0.29 (0.042)	R-30 (5.3 RSI)	0.9 (14)	0.17 (710)
12	Baffle	0.050" (1.3)	1.2 (0.17)	-	86 (1390)	0.24 (1000)
12	Roof Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
14	Asphalt Shingles	-	-	R-0.45 (0.08 RSI)	57 (920)	0.3 (1260)
15	Exterior Film (left side) ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.4.3

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Sloped Wood Framed Roof & Wall Intersection with Insulation at Roof Sheathing

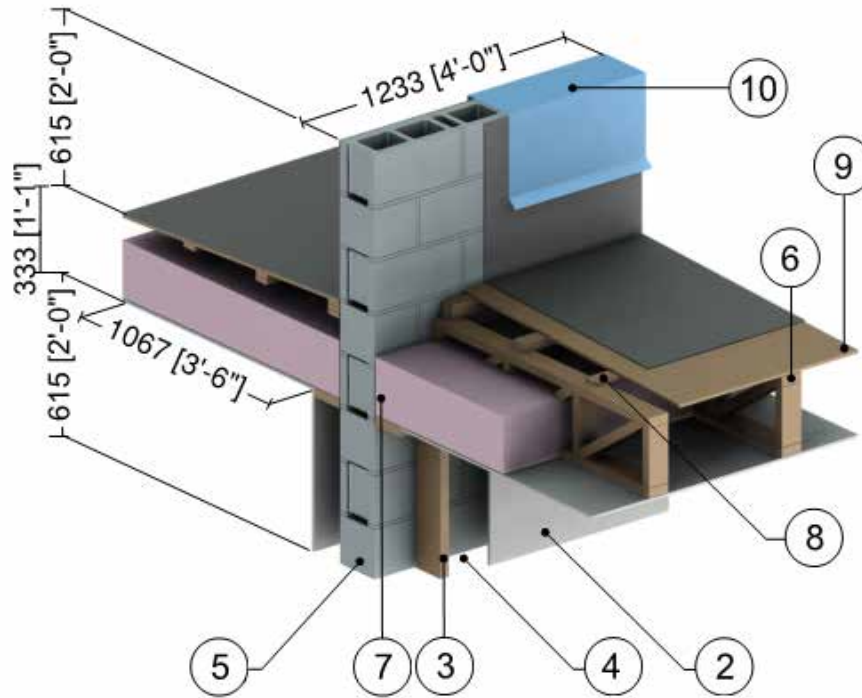


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.12 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	R-7.9 (1.4 RSI)	31 (500)	0.45 (1880)
5	Exterior Wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-0 to R-15 (0.00 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
9	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Roof Truss (24" o.c.)	-	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Polyurethane Foam Insulation	5" (127)	0.17 (0.024)	R-30 (5.3 RSI)	1.8 (28)	0.29 (1220)
12	Roof Wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.4.4

Ventilated Wood Frame Low Slope Roof - Masonry Firewall Intersection



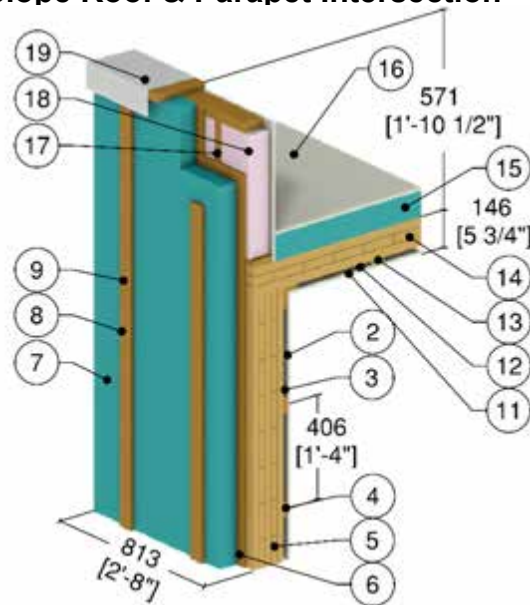
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	2x6 Wood Studs (16" o.c.) and Top Plate	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
4	Air Cavity	5 1/2" (140)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Standard Concrete Block	8" (203)	3.5 (0.5)	-	119 (1900)	0.19 (800)
6	2x4 Parallel Wood Truss	-	0.69 (0.10)	-	31 (500)	0.45 (1880)
7	Roof Insulation	8 3/4" (222)	0.29 (0.04)	R-30 (5.3 RSI)	0.9 (14)	0.17 (710)
8	Wood Purlins (16" o.c.)	-	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Roof Wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
10	Steel Cap Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 8.4.5

Exterior Insulated Cross Laminated Timber (CLT) Wall Assembly with Continuous Rigid Insulation Supporting Fiber Cement Board – Low-Slope Roof & Parapet Intersection

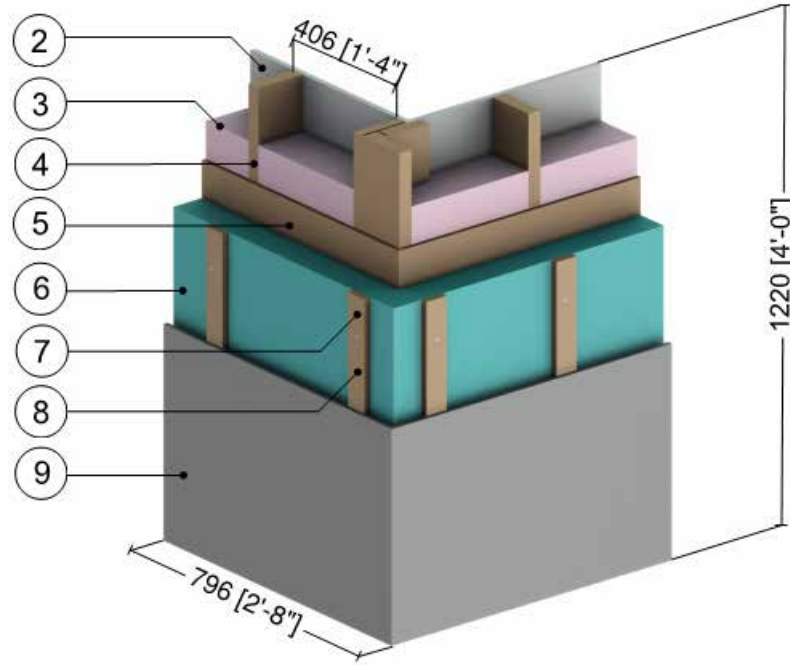


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Cavity	3/4" (19)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1x3 Wood Strapping (16" o.c.)	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Cross Laminated Timber Wall	5 1/2" (140)	0.83 (0.12)	R-6.6 (1.16 RSI)	31 (500)	0.45 (1880)
6	Plywood Sheathing	3/8" (9.5)	0.69 (0.10)	R-0.5 (0.10 RSI)	31 (500)	0.45 (1880)
7	Exterior Insulation	Varies	-	R-15 to R-25 (2.64 to 4.40 RSI)	1.8 (28)	0.29 (1220)
8	1x3 Wood Strapping (16" o.c.)	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	#14 Steel Fasteners (12" o.c.)	0.24" (6.2) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
11	Roof Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
12	Air in Roof Cavity	3/4" (19)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
13	1x3 Wood Strapping (16" o.c.)	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
14	Cross Laminated Timber Roof	4 1/2" (114)	0.83 (0.12)	R-5.4 (0.95 RSI)	31 (500)	0.45 (1880)
15	Roof Insulation	Varies	-	R-20 to R-50 (3.52 to 8.81 RSI)	1.8 (28)	0.29 (1220)
16	Gypsum Top Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
17	2x4 Roof Wood Framing	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
18	Fiberglass Batt Insulation	3 1/2" (89)	0.042 (0.29)	R-12 (2.11 RSI)	0.9 (14)	0.17 (710)
19	Steel Cap Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
20	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.5.1

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting and Continuous Insulation Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Corner Intersection

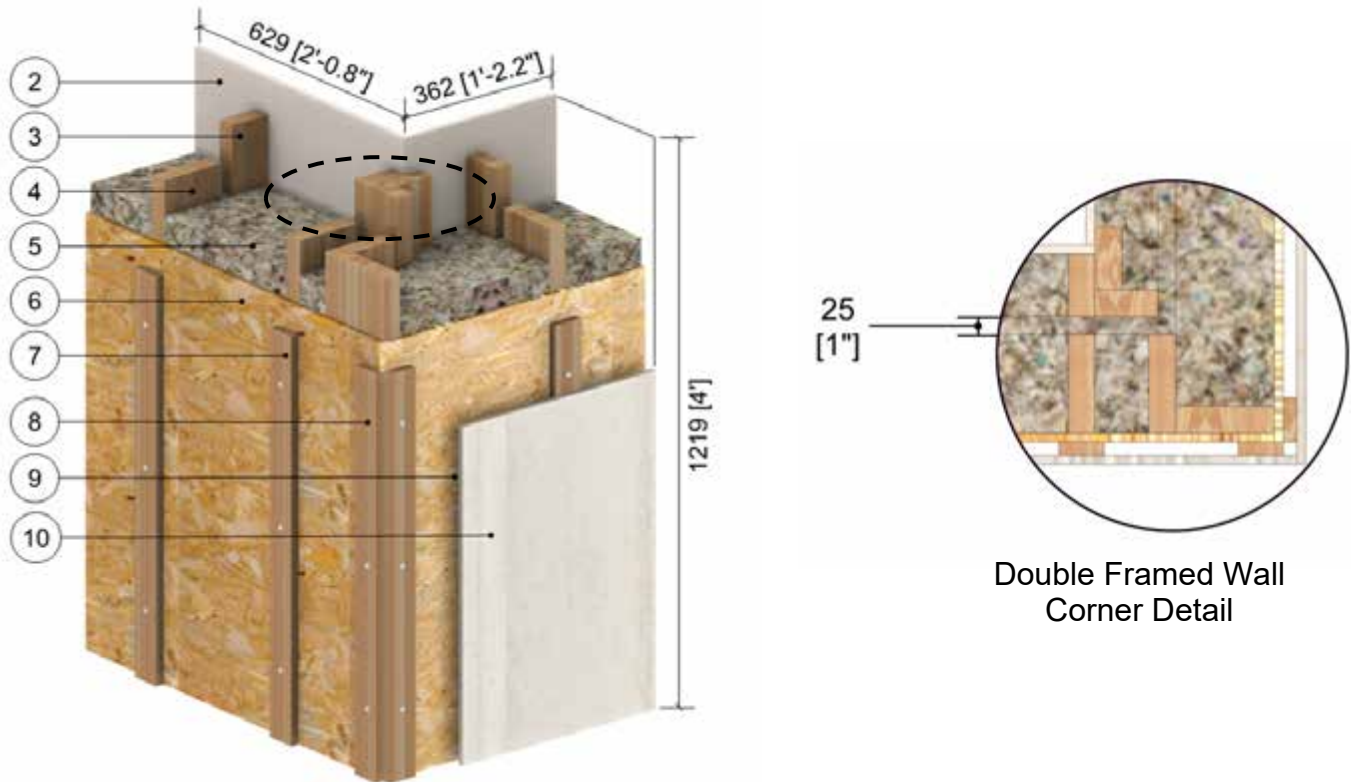


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (16)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Wood Sheathing	1/2" (16)	0.69 (0.10)	R-0.6 (0.10 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-0 to R-15 (0.00 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Steel Fasteners (16" o.c.)	-	347 (50)	-	489 (7830)	0.12 (500)
9	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.5.2

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 1" Gap – Corner Intersection

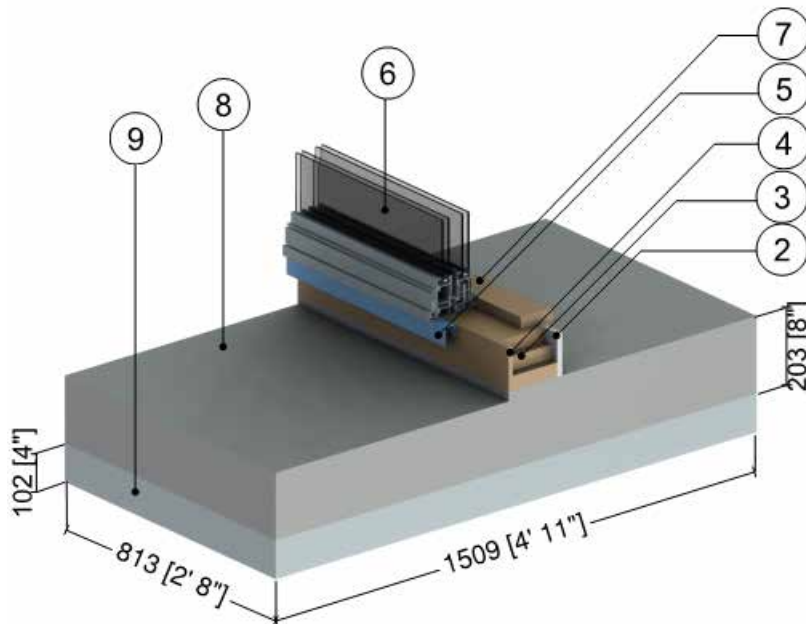


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Fill Insulation	10" (305)	Varies	R-35.0 to R-60.0 (6.16 RSI to 10.57 RSI)	-	-
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Steel Fasteners (12" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
9	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
10	Fiber Cement Board	1/2" (13)	4.86 (0.7)	R-0.1 (0.02 RSI)	-	-
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.6.1

Wood-frame Sliding Door – Concrete Floor Intersection for Unheated Spaces (Parking Garages)



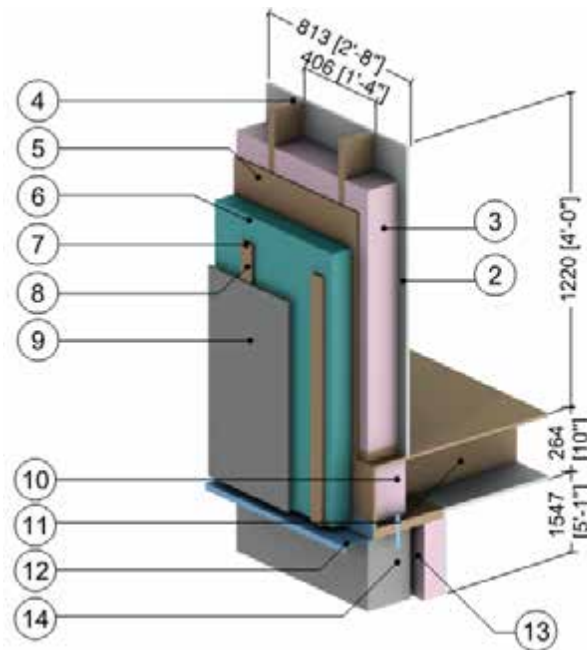
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	2x6 Wood Plates	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
4	Exterior Wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.26 (1090)
5	Steel Flashing	28 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	Aluminum Sliding Door: double glazed and thermally broken ² , double glazed IGU UIGU = 0.32 BTU/hr.ft ² .°F (1.82 W/m ² K)					
7	Wood Sill	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	141 (2250)	0.20 (850)
9	Spray Applied Fiberglass insulation	4" (102)	0.20 (0.029)	R-20 (3.5 RSI)	0.9 (14)	0.12 (500)
10	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity for air spaces within window framing was found using ISO 10077-2

Detail 8.6.2

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Continuous Insulation and Wood Strapping Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Rim Joist and Interior Insulated At-Grade Foundation Wall Intersection



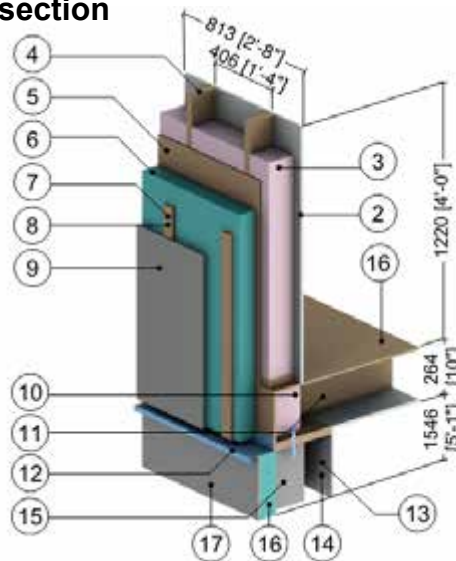
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 to R-0.9 (0.12 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-5 to R-15 (0.88 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	1x3 Wood Strapping	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
9	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Fiberglass Batt Insulation at Joist	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
11	2x10 Wood Joist (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
12	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
14	Concrete Foundation Wall	8" (203)	12.5 (1.8)	R-0.6 (0.11 RSI)	140 (2250)	0.20 (850)
15	Exterior Film ^{1,2}	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² Except at foundation wall adjacent soil

Detail 8.6.3

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Continuous Insulation and Wood Strapping Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Rim Joist and Exterior Insulated At-Grade Foundation Wall Intersection



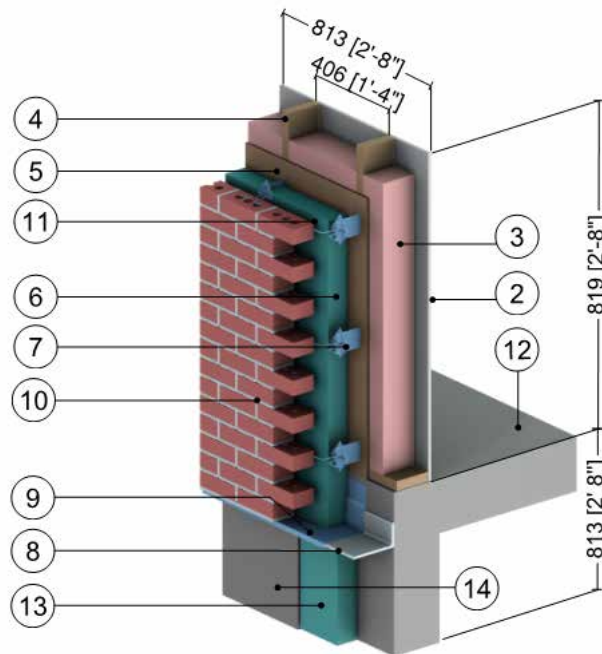
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 to R-0.9 (0.12 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.5 (0.08 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-5 to R-15 (0.88 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
9	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
10	Fiberglass Batt Insulation at Joists	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
11	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
12	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	2x4 Wood Stud (16" OC)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
14	Air Cavity	3 1/2" (89)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
15	Concrete Foundation Wall	8" (203)	12.5 (1.8)	R-0.6 (0.11 RSI)	140 (2250)	0.20 (850)
16	Rigid Exterior Insulation	2 1/2" (64)	-	R-12.5 (2.2 RSI)	1.8 (28)	0.29 (1220)
17	Protective Coating or Flashing	-	-	-	-	-
18	Exterior Film ^{1,2}	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² Except at foundation wall adjacent soil

Detail 8.6.4

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Shelf Angle & Brick Ties Supporting Brick Veneer and R-19 Batt Insulation in Stud Cavity – Exterior Insulated At-Grade Foundation Wall Intersection



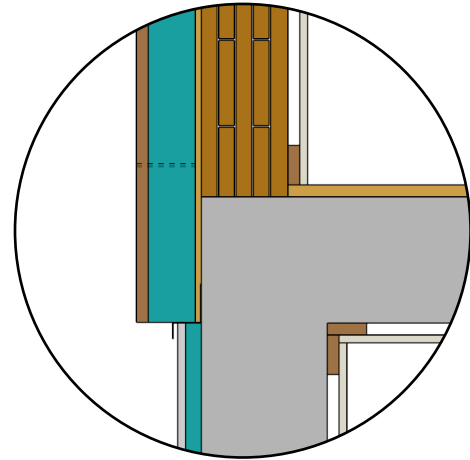
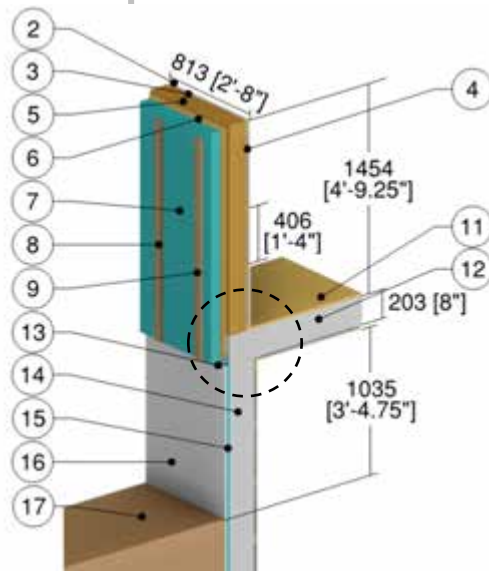
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 to R-0.9 (0.12 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.04)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.) with Bottom Plate	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Wood Sheathing	1/2" (16)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-5 to R-15 (0.88 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	Masonry Ties @ 16" (406) o.c.	14 Gauge	347 (50)	-	489 (7830)	0.12 (500)
8	Steel Shelf Angle	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
9	Steel Flashing	20 Gauge	347 (50)	-	489 (7830)	0.12 (500)
10	Brick Veneer	3 5/8" (92)	5.4 (0.78)	-	120 (1920)	0.19 (720)
11	Air Cavity	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
12	Concrete Slab & Foundation Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
13	Rigid Exterior Insulation	2 1/2" (64)	0.2 (0.03)	R-12.5 (2.2 RSI)	1.8 (28)	0.29 (1220)
14	Protective Coating or Flashing	-	-	-	-	-
15	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² Except at foundation wall adjacent soil

Detail 8.6.5

Exterior Insulated Cross Laminated Timber (CLT) Wall Assembly with Continuous Rigid Insulation Supporting Fiber Cement Board – Concrete Slab and Exterior Insulated At-Grade Foundation Wall Intersection



Concrete Slab and Wall Assembly Intersection

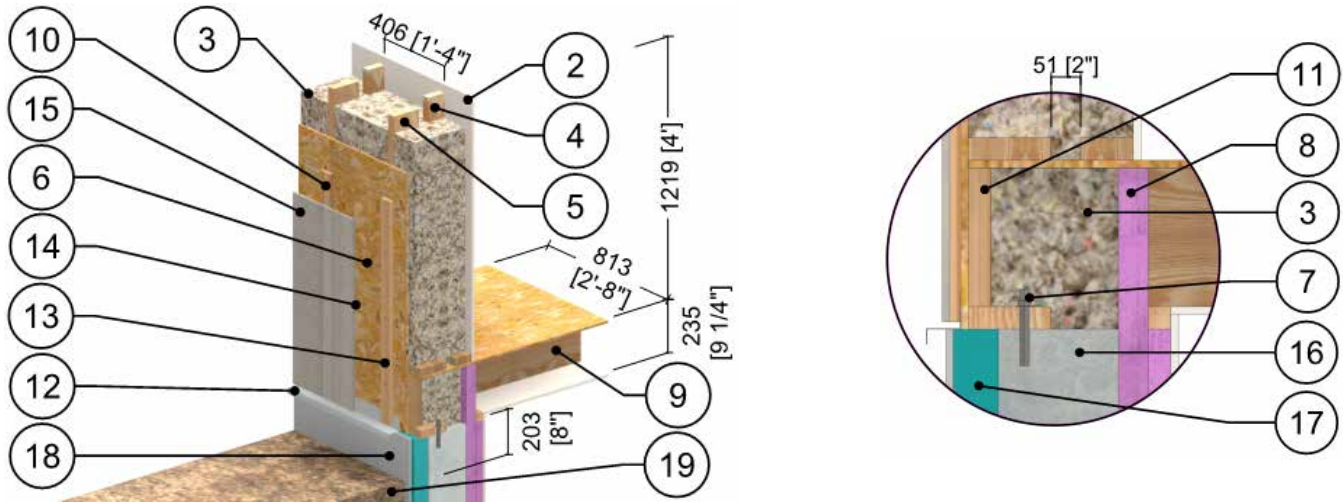
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Cavity	3/4" (19)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1x3 Wood Strapping (16" o.c.)	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Cross Laminated Timber Wall	5 1/2" (140)	0.83 (0.12)	R-6.6 (1.16 RSI)	31 (500)	0.45 (1880)
6	Plywood Sheathing	3/8" (9.5)	0.69 (0.10)	R-0.5 (0.10 RSI)	31 (500)	0.45 (1880)
7	Exterior Insulation	Varies	-	R-15 to R-25 (2.64 to 4.40 RSI)	1.8 (28)	0.29 (1220)
8	1x3 Wood Strapping (16" o.c.)	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	#14 Steel Fasteners (12" o.c.)	0.24" (6.2) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
11	Plywood Floor	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
12	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
13	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
14	Concrete Foundation Wall	8" (203)	12.5 (1.8)	R-0.6 (0.11 RSI)	140 (2250)	0.20 (850)
15	Foundation Wall Exterior Insulation	Varies	-	R-5 to R-20 (0.88 to 3.52 RSI)	1.8 (28)	0.29 (1220)
16	Cement Board	1/2" (13)	1.7 (0.25)	R-0.3 (0.051 RSI)	72 (1150)	0.20 (850)
17	Soil	-	14 (2.0)	-	-	-
18	Exterior Film ^{1,2}	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² Except at foundation wall adjacent soil

Detail 8.6.6

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap – Rim Joist and Split Insulated At-Grade Foundation Wall Intersection



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	11" (279)	Varies	-	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	Stainless Steel Foundation Bolt	5/8" (16) Ø	118 (17)	-	500 (8000)	0.12 (500)
8	XPS Insulation	3 1/2" (89)	0.20 (0.029)	R-17.5 (3.08 RSI)	1.8 (28)	0.29 (1220)
9	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
10	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (510)	0.45 (1880)
12	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
14	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
15	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
16	Foundation Wall Concrete	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
17	Foundation Wall Exterior Insulation	3" (76)	0.20 (0.029)	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
18	Cement Protection Board	1/2" (13)	1.7 (0.25)	R-0.3 (0.051 RSI)	72 (1150)	0.20 (850)
19	Soil	-	14 (2.0)	-	-	-
20	Exterior Film ^{1,2}	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

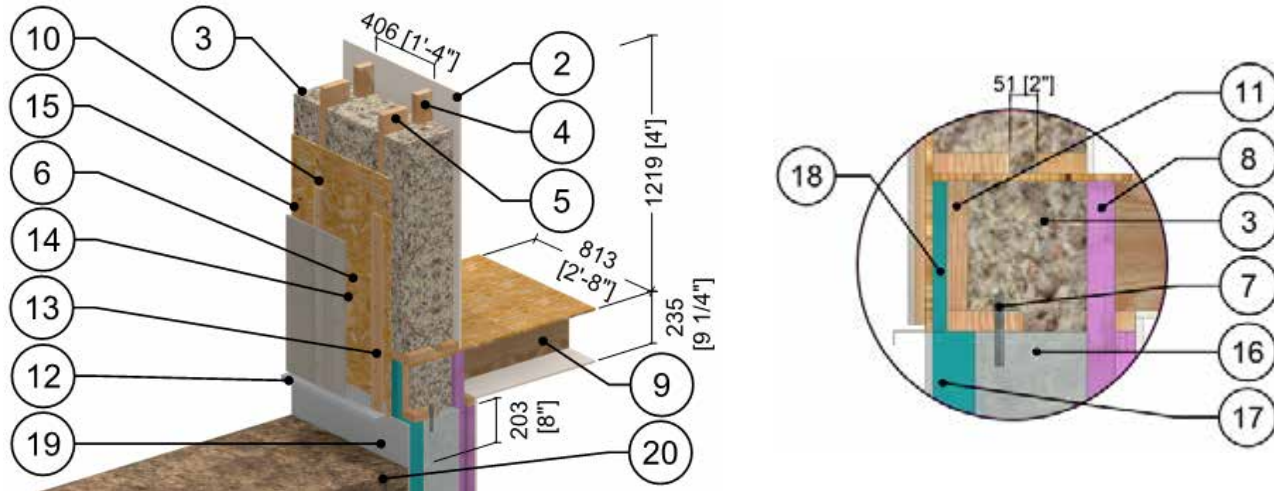
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² Except at foundation wall adjacent soil



Detail 8.6.7

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap – Insulated Rim Joist and Split Insulated At-Grade Foundation Wall Intersection



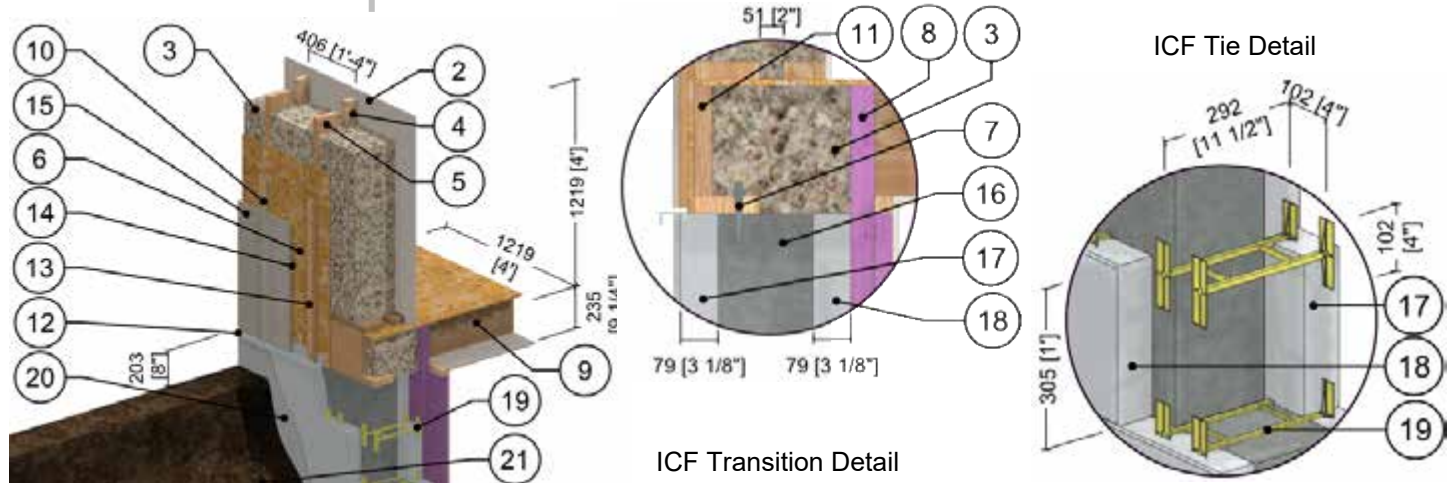
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	11" (279)	Varies	-	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	Stainless Steel Foundation Bolt	1/2" (13) Ø	118 (17)	-	500 (8000)	0.12 (500)
8	XPS Insulation	3 1/2" (89)	0.20 (0.029)	R-17.5 (3.08 RSI)	1.8 (28)	0.29 (1220)
9	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
10	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (510)	0.45 (1880)
12	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
14	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
15	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
16	Foundation Wall Concrete	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
17	Foundation Wall Exterior Insulation	3" (76)	0.20 (0.029)	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
18	Rim Joist Insulation	1" (25)	0.20 (0.029)	R-5 (0.88 RSI)	1.8 (28)	0.29 (1220)
19	Cement Protection Board	1/2" (13)	1.7 (0.25)	R-0.3 (0.051 RSI)	72 (1150)	0.20 (850)
20	Soil	-	14 (2.0)	-	-	-
21	Exterior Film ^{1,2}	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² Except at foundation wall adjacent soil

Detail 8.6.8

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap and R28 ICF Foundation Wall – Rim Joist and Split Insulated At-Grade Foundation Wall Intersection



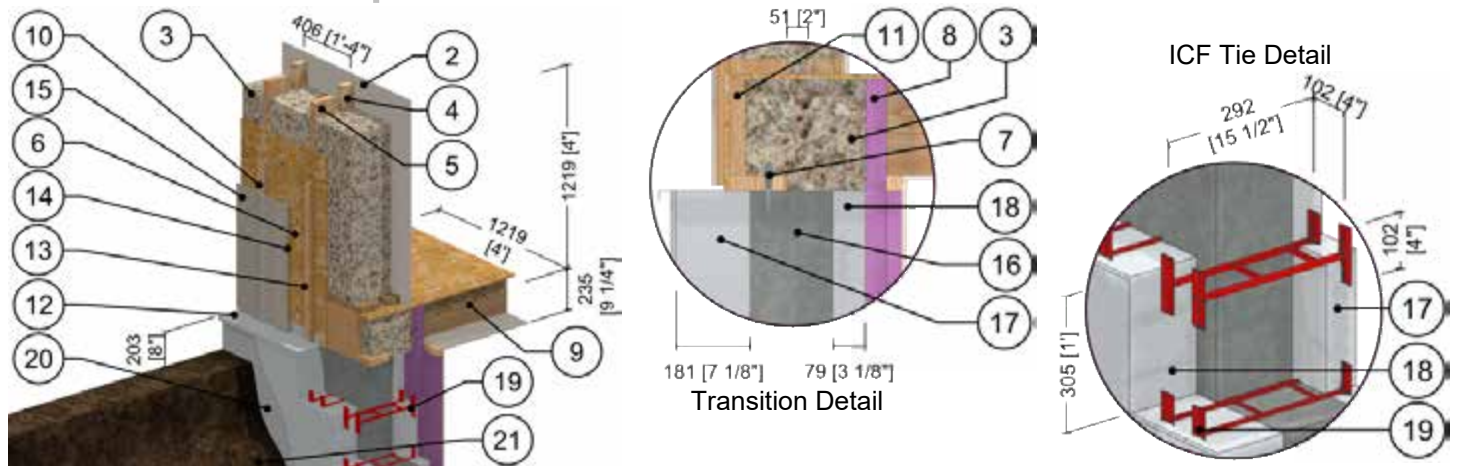
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	11" (279)	Varies	-	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	Stainless Steel Foundation Bolt	1/2" (13) Ø	118 (17)	-	500 (8000)	0.12 (500)
8	XPS Insulation	3 1/2" (89)	0.20 (0.029)	R-17.5 (3.08 RSI)	1.8 (28)	0.29 (1220)
9	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
10	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (510)	0.45 (1880)
12	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
14	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
15	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
16	Foundation Wall Concrete	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
17	ICF Insulation (Inboard)	3 1/8" (79)	0.25 (0.036)	R-12.5 (2.20 RSI)	66 (1060)	0.35 (1500)
18	ICF Insulation (Outboard)	3 1/8" (79)	0.25 (0.036)	R-12.5 (2.20 RSI)	66 (1060)	0.35 (1500)
19	ICF HDPE Tie (12" o.c.)	11 1/2" (292)	1.7 (0.25)	-	59 (950)	0.48 (2000)
20	Cement Protection Board	1/2" (13)	1.7 (0.25)	R-0.3 (0.051 RSI)	72 (1150)	0.20 (850)
21	Soil	-	14 (2.0)	-	-	-
22	Exterior Film ^{1,2}	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² Except at foundation wall adjacent soil

Detail 8.6.9

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap and R43 ICF Foundation Wall – Rim Joist and Split Insulated At-Grade Foundation Wall Intersection



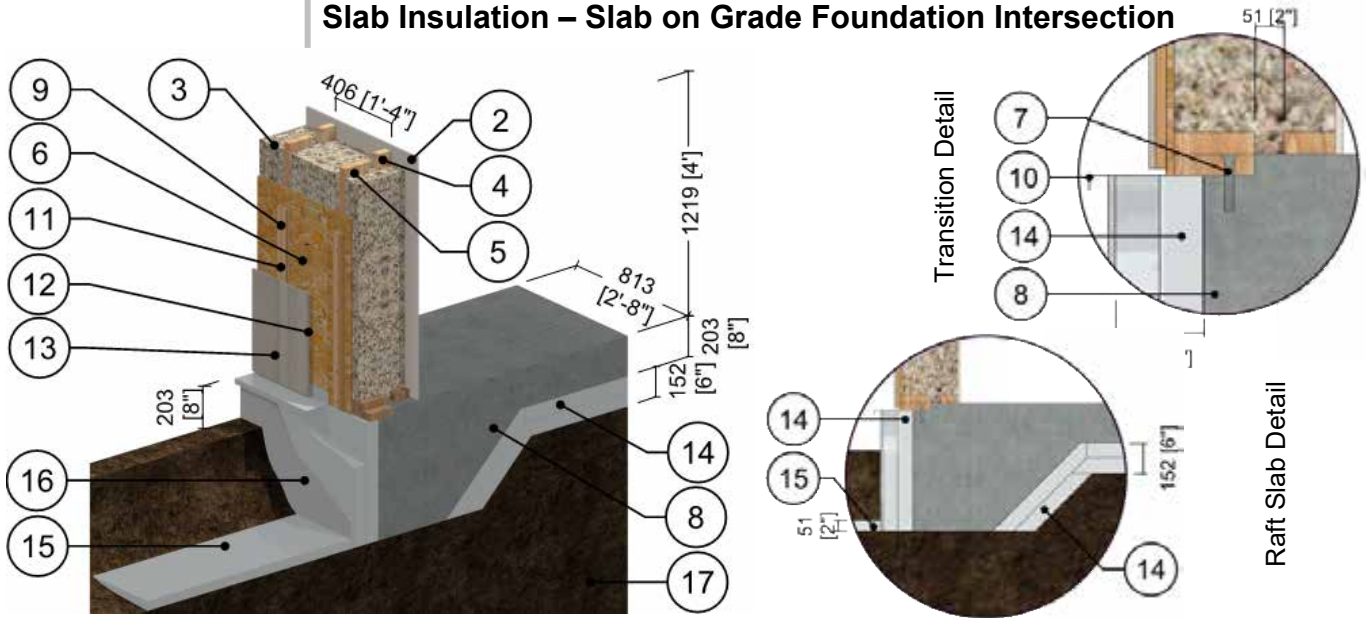
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	11" (279)	Varies	-	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	Stainless Steel Foundation Bolt	1/2" (13) Ø	118 (17)	-	500 (8000)	0.12 (500)
8	XPS Insulation	3 1/2" (89)	0.20 (0.029)	R-17.5 (3.08 RSI)	1.8 (28)	0.29 (1220)
9	2x10 Wood Joists (16" o.c.)	9 1/4" (235)	0.69 (0.10)	-	31 (500)	0.45 (1880)
10	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
11	2x10 Rim Joist	1 1/2" (38)	0.69 (0.10)	-	31 (510)	0.45 (1880)
12	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
14	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
15	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
16	Foundation Wall Concrete	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
17	ICF Insulation (Inboard)	3 1/8" (79)	0.25 (0.036)	R-12.5 (2.20 RSI)	66 (1060)	0.35 (1500)
18	ICF Insulation (Outboard)	7 1/8" (181)	0.25 (0.036)	R-28.5 (5.02 RSI)	66 (1060)	0.35 (1500)
19	ICF HDPE Tie (12" o.c.)	15 1/2" (292)	1.7 (0.25)	-	59 (950)	0.48 (2000)
20	Cement Protection Board	1/2" (13)	1.7 (0.25)	R-0.3 (0.051 RSI)	72 (1150)	0.20 (850)
21	Soil	-	14 (2.0)	-	-	-
22	Exterior Film ^{1,2}	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² Except at foundation wall adjacent soil

Detail 8.6.10

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap and Partially Wrapped R-22.5 Raft Slab Insulation – Slab on Grade Foundation Intersection



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	11" (279)	Varies	-	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	Stainless Steel Foundation Bolt	1/2" (13) Ø	118 (17)	-	500 (8000)	0.12 (500)
8	Concrete Slab on Grade	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
12	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
13	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
14	Slab Insulation	6" (152)	0.27 (0.038)	R-22.5 (3.96 RSI)	1 (16)	0.35 (1470)
15	Skirt Insulation	2" (51)	0.27 (0.038)	R-7.5 (1.32 RSI)	1 (16)	0.35 (1470)
16	Cement Protection Board	1/2" (13)	1.7 (0.25)	R-0.3 (0.051 RSI)	72 (1150)	0.20 (850)
17	Soil	-	14 (2.0)	-	-	-
18	Exterior Film ^{1,2}	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

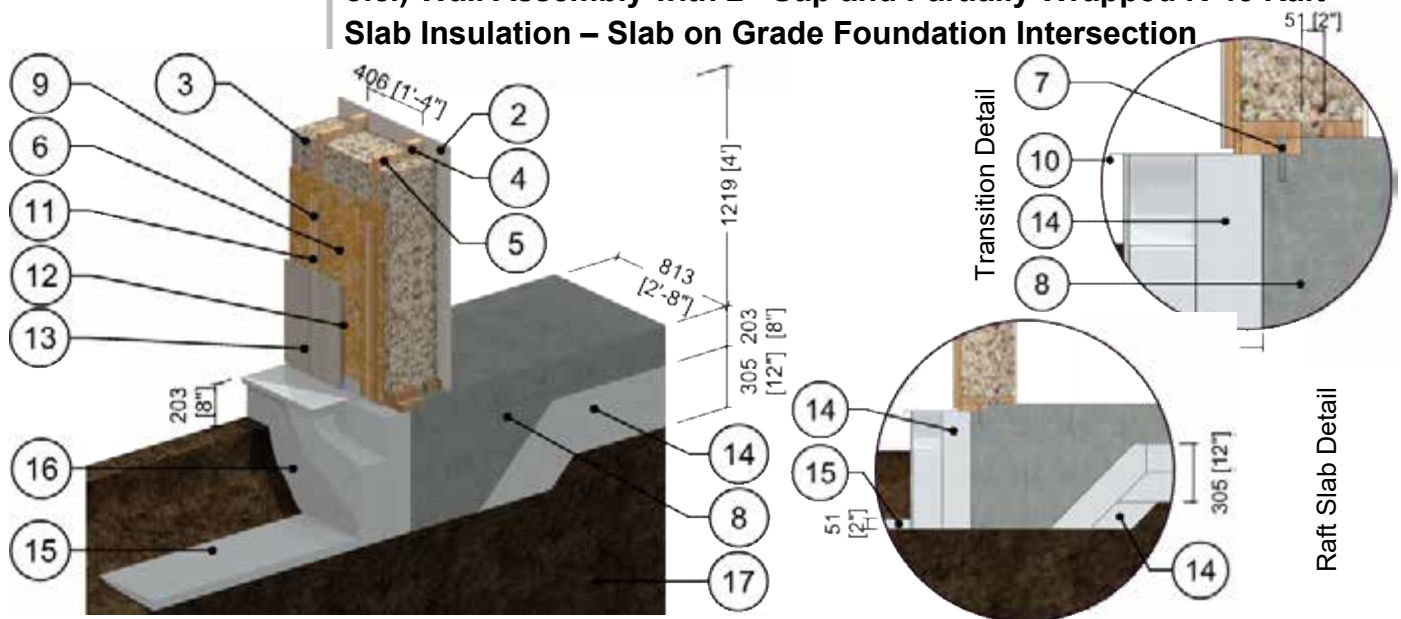
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² Except at foundation wall adjacent soil



Detail 8.6.11

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap and Partially Wrapped R-45 Raft Slab Insulation – Slab on Grade Foundation Intersection



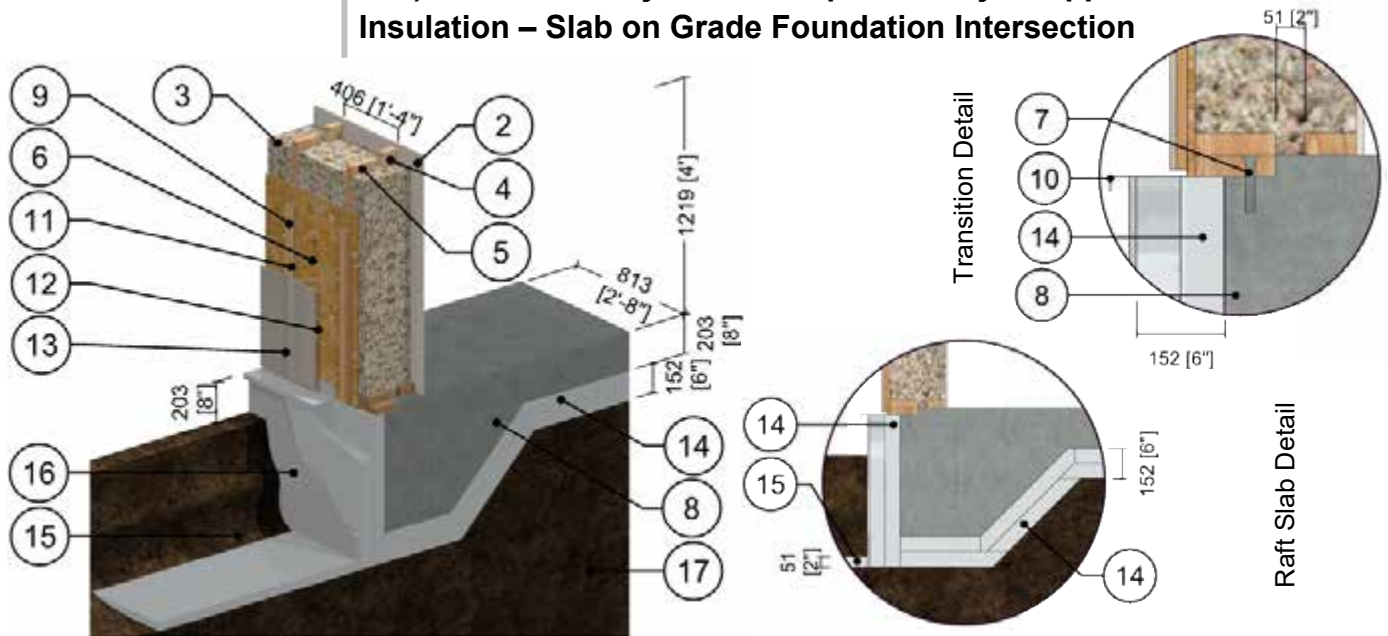
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	11" (279)	Varies	-	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	Stainless Steel Foundation Bolt	1/2" (13) Ø	118 (17)	-	500 (8000)	0.12 (500)
8	Concrete Slab on Grade	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
12	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
13	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
14	Slab Insulation	12" (305)	0.27 (0.038)	R-45 (7.93 RSI)	1 (16)	0.35 (1470)
15	Skirt Insulation	2" (51)	0.27 (0.038)	R-7.5 (1.32 RSI)	1 (16)	0.35 (1470)
16	Cement Protection Board	1/2" (13)	1.7 (0.25)	R-0.3 (0.051 RSI)	72 (1150)	0.20 (850)
17	Soil	-	14 (2.0)	-	-	-
18	Exterior Film ^{1,2}	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² Except at foundation wall adjacent soil



Detail 8.6.12 Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap and Fully Wrapped R-22.5 Raft Slab Insulation – Slab on Grade Foundation Intersection



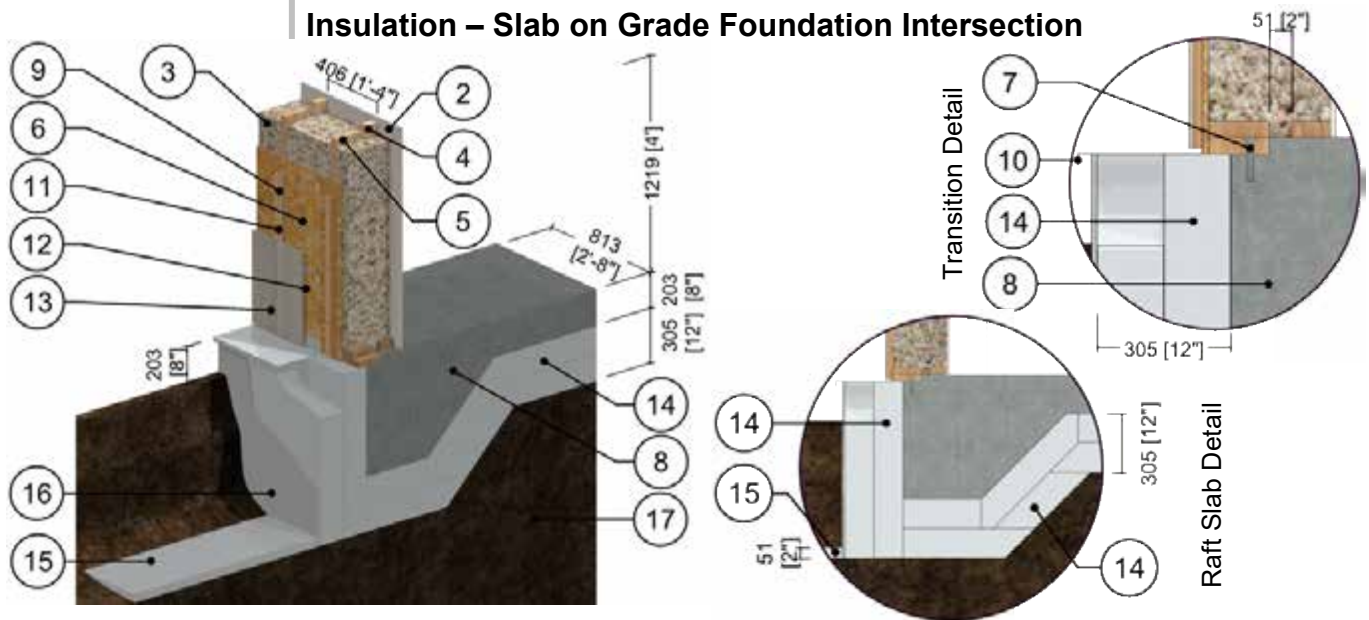
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	11" (279)	Varies	-	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	Stainless Steel Foundation Bolt	1/2" (13) Ø	118 (17)	-	500 (8000)	0.12 (500)
8	Concrete Slab on Grade	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
12	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
13	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
14	Slab Insulation	6" (152)	0.27 (0.038)	R-22.5 (3.96 RSI)	1 (16)	0.35 (1470)
15	Skirt Insulation	2" (51)	0.27 (0.038)	R-7.5 (1.32 RSI)	1 (16)	0.35 (1470)
16	Cement Protection Board	1/2" (13)	1.7 (0.25)	R-0.3 (0.051 RSI)	72 (1150)	0.20 (850)
17	Soil	-	14 (2.0)	-	-	-
18	Exterior Film ^{1,2}	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² Except at foundation wall adjacent soil

Detail 8.6.13

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap and Fully Wrapped R-45 Raft Slab Insulation – Slab on Grade Foundation Intersection



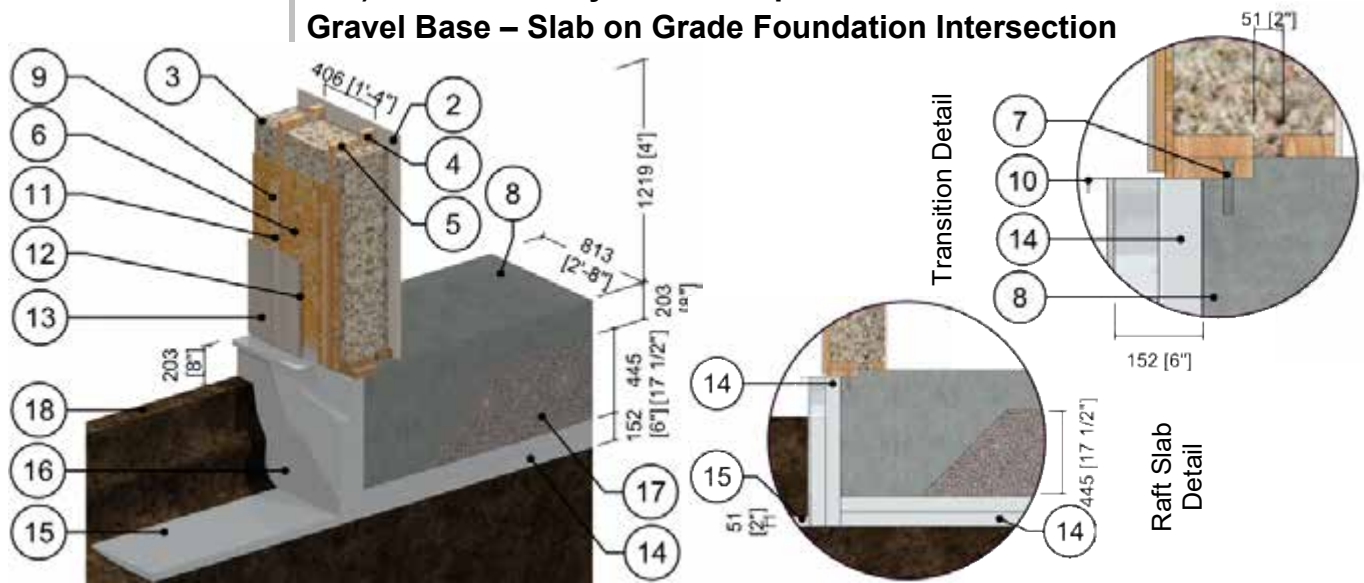
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	11" (279)	Varies	-	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	Stainless Steel Foundation Bolt	1/2" (13) Ø	118 (17)	-	500 (8000)	0.12 (500)
8	Concrete Slab on Grade	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
12	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
13	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
14	Slab Insulation	12" (305)	0.27 (0.038)	R-45 (7.93 RSI)	1 (16)	0.35 (1470)
15	Skirt Insulation	2" (51)	0.27 (0.038)	R-7.5 (1.32 RSI)	1 (16)	0.35 (1470)
16	Cement Protection Board	1/2" (13)	1.7 (0.25)	R-0.3 (0.051 RSI)	72 (1150)	0.20 (850)
17	Soil	-	14 (2.0)	-	-	-
18	Exterior Film ^{1,2}	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² Except at foundation wall adjacent soil



Detail 8.6.14 Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap and R-22.5 Slab Insulation with Gravel Base – Slab on Grade Foundation Intersection



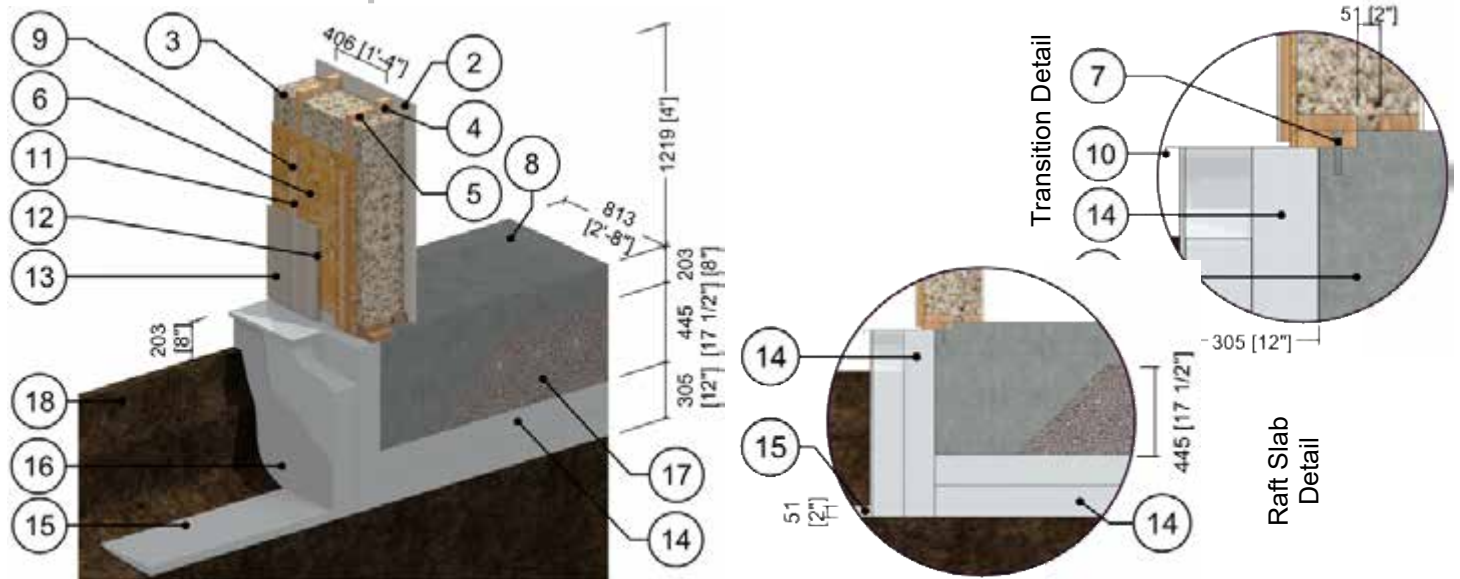
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	11" (279)	Varies	-	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	Stainless Steel Foundation Bolt	1/2" (13) Ø	118 (17)	-	500 (8000)	0.12 (500)
8	Concrete Slab on Grade	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
12	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
13	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
14	Slab Insulation	6" (152)	0.27 (0.038)	R-22.5 (3.96 RSI)	1 (16)	0.35 (1470)
15	Skirt Insulation	2" (51)	0.27 (0.038)	R-7.5 (1.32 RSI)	1 (16)	0.35 (1470)
16	Cement Protection Board	1/2" (13)	1.7 (0.25)	R-0.3 (0.051 RSI)	72 (1150)	0.20 (850)
17	Sand/Gravel	-	14 (2.0)	-	-	-
18	Soil	-	14 (2.0)	-	-	-
19	Exterior Film ^{1,2}	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² Except at foundation wall adjacent soil

Detail 8.6.15

Interior Insulated Double Framed Wall 2x6 and 2x4 Wood Stud (16" o.c.) Wall Assembly with 2" Gap and R-45 Slab Insulation with Gravel Base – Slab on Grade Foundation Intersection



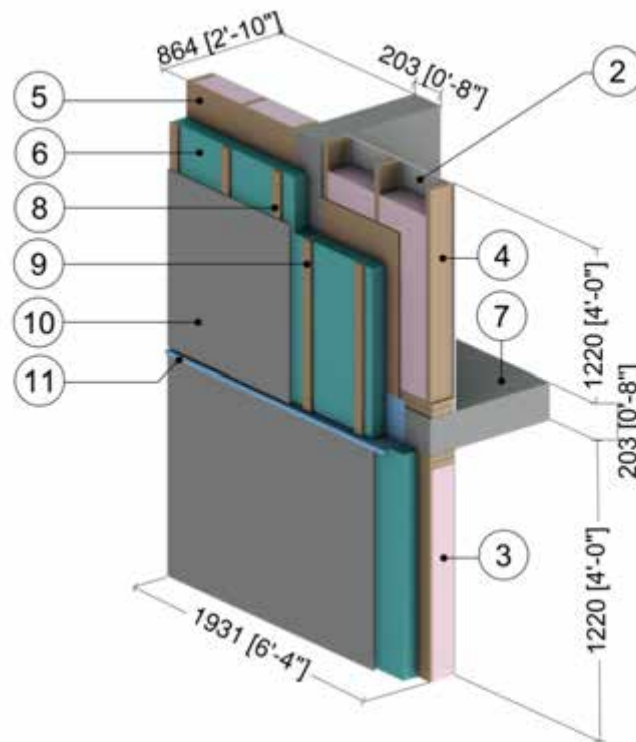
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fill Insulation	11" (279)	Varies	-	-	-
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
7	Stainless Steel Foundation Bolt	1/2" (13) Ø	118 (17)	-	500 (8000)	0.12 (500)
8	Concrete Slab on Grade	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
10	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
12	Rainscreen Cavity	3/4" (19)	-	R-0.4 (0.07 RSI)	0.075 (1.2)	0.24 (1000)
13	Fiber Cement Board	1/2" (13)	4.86 (0.7)	-	-	-
14	Slab Insulation	12" (305)	0.27 (0.038)	R-45 (7.93 RSI)	1 (16)	0.35 (1470)
15	Skirt Insulation	2" (51)	0.27 (0.038)	R-7.5 (1.32 RSI)	1 (16)	0.35 (1470)
16	Cement Protection Board	1/2" (13)	1.7 (0.25)	R-0.3 (0.051 RSI)	72 (1150)	0.20 (850)
17	Sand/Gravel	-	14 (2.0)	-	-	-
18	Soil	-	14 (2.0)	-	-	-
19	Exterior Film ^{1,2}	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² Except at foundation wall adjacent soil

Detail 8.7.1

Exterior and Interior Insulated Wood Infill Wall Assembly with Wood Strapping and Continuous Insulation Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – Concrete Wall and Intermediate Floor Intersection with Flashing Bypassing Exterior Insulation

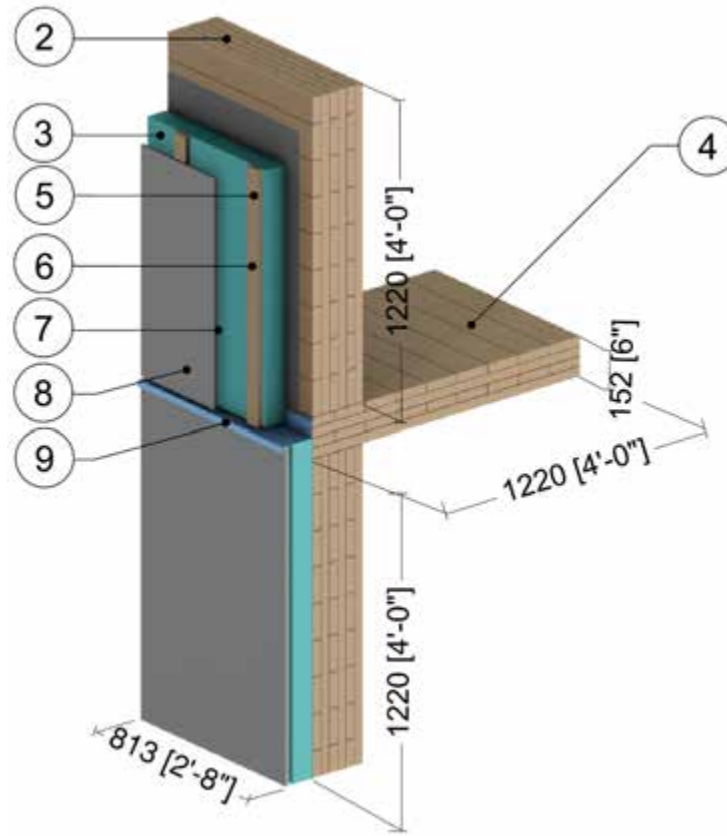


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
4	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Exterior Wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
6	Exterior Insulation	Varies	-	R-5 to R-15 (0.88 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	Concrete Wall & Floor Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Steel Fasteners (16" o.c.)	0.35" (9) Ø	347(50)	-	489 (7830)	0.12 (500)
10	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
11	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.7.2

Exterior Insulated Cross Laminated Timber (CLT) Wall Assembly with Wood Strapping and Continuous Rigid Insulation Supporting Fiber Cement Board – Cross Laminated Timber Floor Intersection with Flashing Bypassing Exterior Insulation

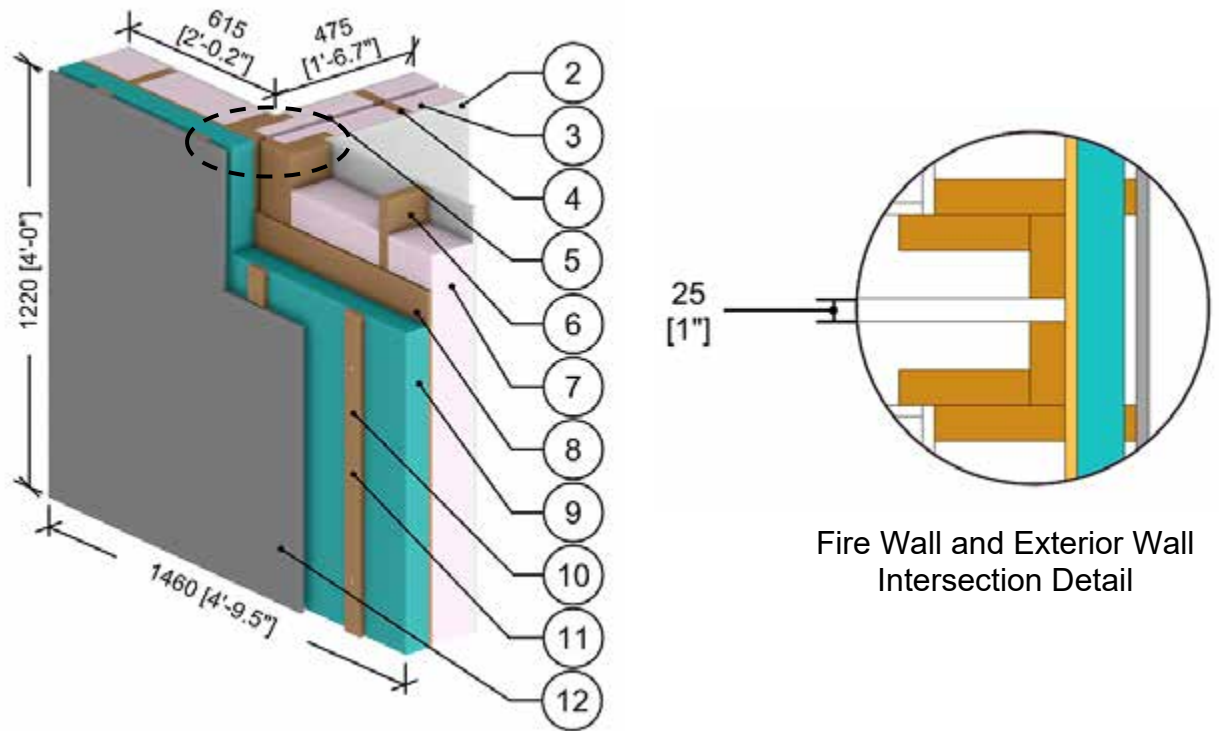


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Cross Laminated Timber Wall	7 1/2" (191)	0.83 (0.12)	R-9 (1.59 RSI)	31 (500)	0.45 (1880)
3	Exterior Insulation	Varies	-	R-15 to R-25 (2.64 RSI to 4.4 RSI)	1.8 (28)	0.29 (1220)
4	Cross Laminated Timber Floor	4 1/2" (114)	0.83 (0.12)	R-5.4 (0.95 RSI)	31 (500)	0.45 (1880)
5	1x3 Wood Strapping (16" o.c.)	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Steel Fasteners (12" o.c.)	0.44" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
7	Rainscreen Cavity	3/4" (19)	-	R-0.5 (0.09 RSI)	0.075 (1.2)	0.24 (1000)
8	Fiber Cement Board Cladding	1/2" (13)	4.9 (0.7)	R-0.1 (0.02 RSI)	112 (1800)	0.20 (840)
9	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
10	Galvanized Steel L-clips	3/8" (9.5)	430 (62)	-	489 (7830)	0.12 (500)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 8.7.3

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Fiber Cement Board and R-19 Batt Insulation in Stud Cavity – One-Hour Fire Wall Intersection



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation in 2x4 Stud Cavity	3 1/2" (89)	0.29 (0.042)	R-12 (2.11 RSI)	0.9 (14)	0.17 (710)
4	2x4 Wood Stud (16" o.c.)	3 1/2" (89)	0.69 (0.10)	-	31 (500)	0.45 (1880)
5	Air Gap	1" (25)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
6	Fiberglass Batt Insulation in 2x6 Stud Cavity	5 1/2" (140)	0.29 (0.042)	R-19 (3.3 RSI)	0.9 (14)	0.17 (710)
7	2x6 Wood Stud (16" o.c.)	5 1/2" (140)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Exterior Plywood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	31 (500)	0.45 (1880)
9	Exterior Insulation	Varies	-	R-5 to R-15 (0.88 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
10	Wood Strapping (1" x 3")	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Steel Fasteners (12" o.c.)	0.43" (11) Ø	347 (50)	-	489 (7830)	0.12 (500)
12	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
13	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



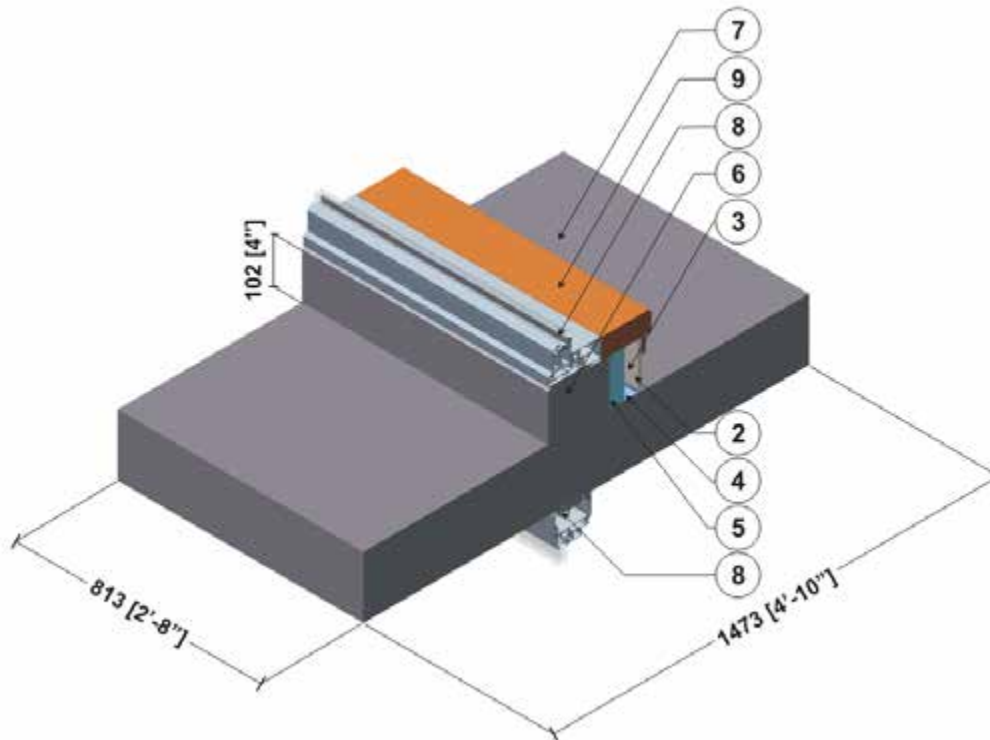
9.0 Doors and Balconies

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Window Wall System with Spandrel Panels and Sliding Door - Schöck Isokorb K10-V6 Thermal Break at Concrete Balcony and Curb Intersection	
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Detail 9.1.1

Interior Insulated Concrete Curb at Sliding Door Sill and Window Head – Intermediate Floor Intersection



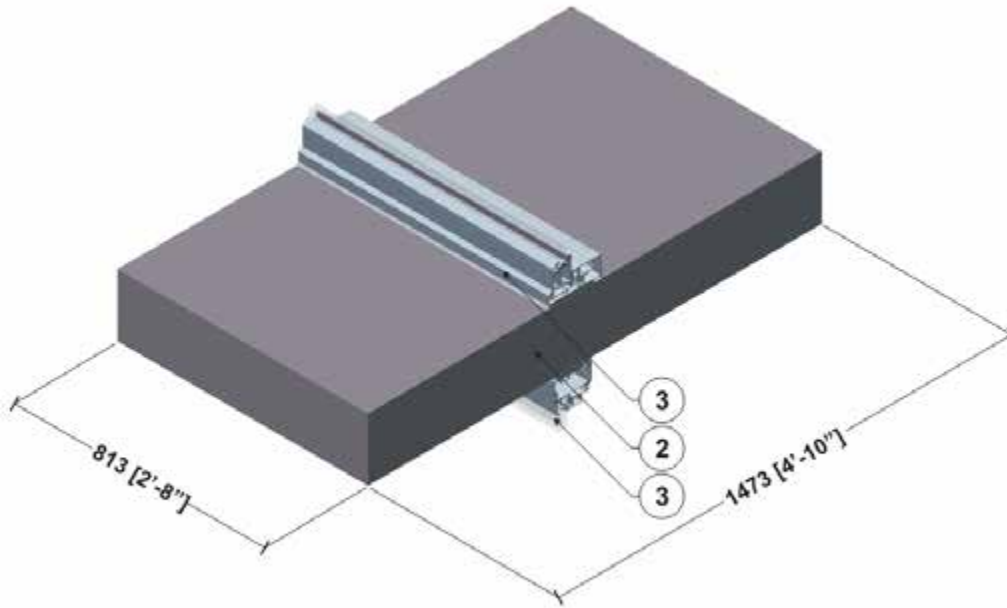
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	2 5/8" (67)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	2 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Interior Insulation	2" (50)	-	R-10 (1.8 RSI)	1.8 (28)	0.29 (1220)
6	Concrete Curb	6" (152)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Thermally Broken Aluminum Window & Sliding Door ²					
9	Wood Sill	2" (50)	0.63 (0.09)	-	1.8 (28)	0.29 (1220)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within sliding door and window framing was found using ISO 10077-2.

Detail 9.1.2

Exterior Insulated Concrete Curb at Sliding Door Sill and Window Head – Intermediate Floor Intersection



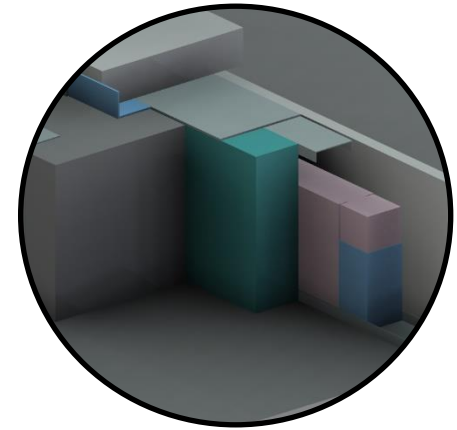
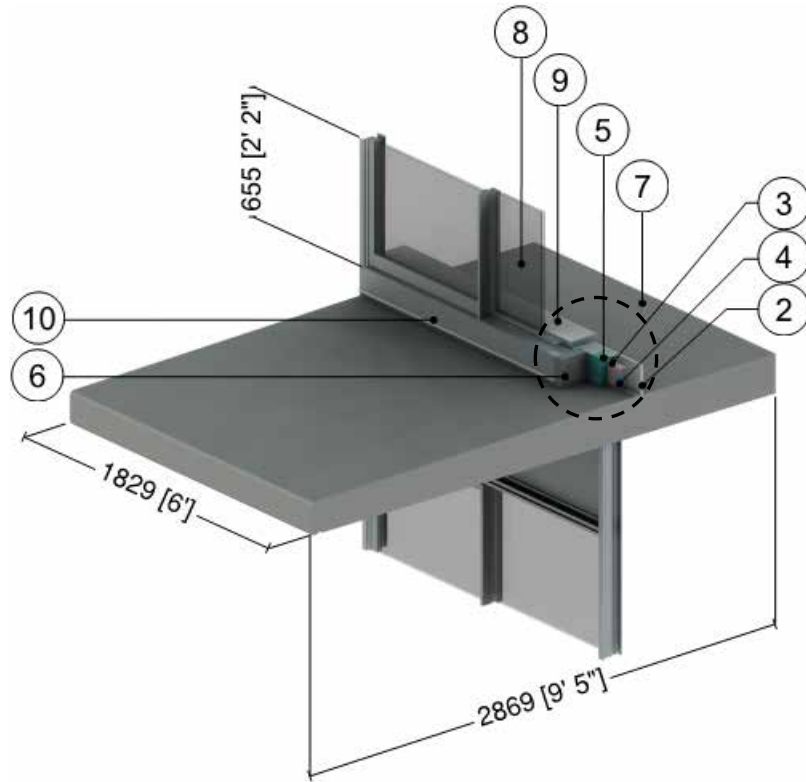
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
3	Thermally Broken Aluminum Window & Sliding Door ²					
4	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within sliding door and window framing was found using ISO 10077-2.

Detail 9.1.3

Interior Insulated Concrete Curb – Window-Wall and Intermediate Floor Intersection



Curb Detail

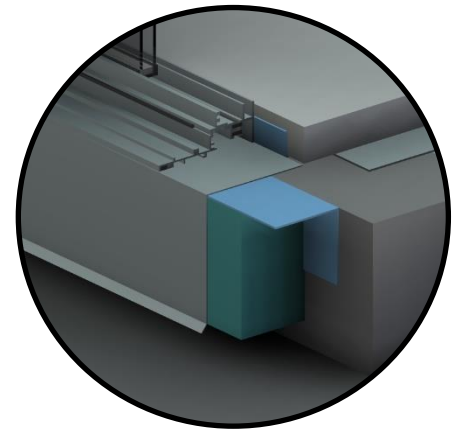
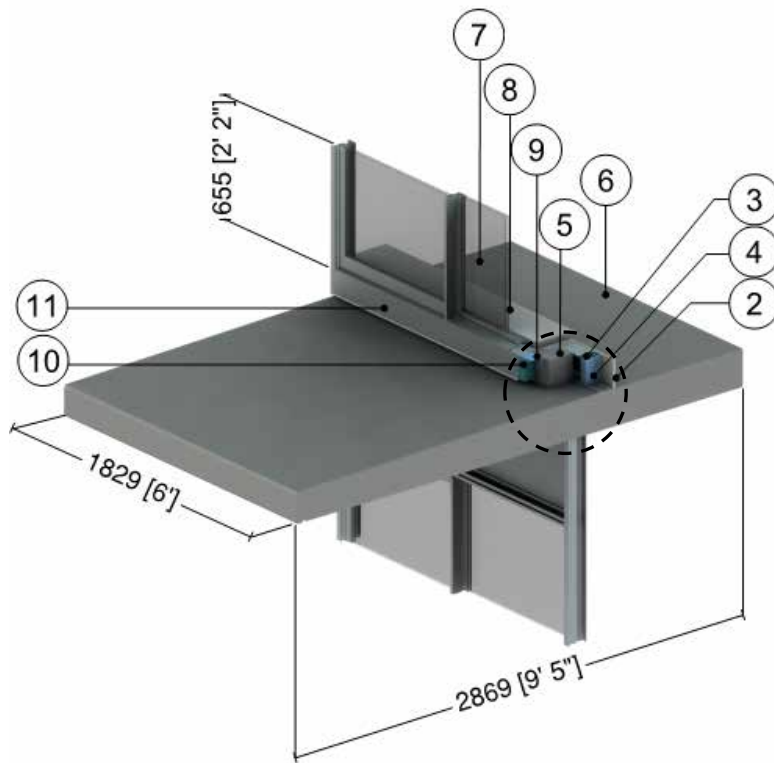
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	1 5/8" (41)	0.29 (0.042)	R-5.5 (0.98 RSI)	0.9 (14)	0.17 (710)
4	1 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Continuous Rigid Insulation	2" (51)	0.24 (0.034)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
6	Concrete Curb	6" (152)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Thermally Broken Aluminum Sliding Door ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
9	Wood Sill	2" (50)	0.69 (0.10)	-	31 (500)	0.45 (1880)
10	Steel Flashing	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within sliding door framing was found using ISO 10077-2

Detail 9.1.4

Exterior Insulated Concrete Curb at Sliding Door Sill and Head-Intermediate Floor Intersection



Curb Detail

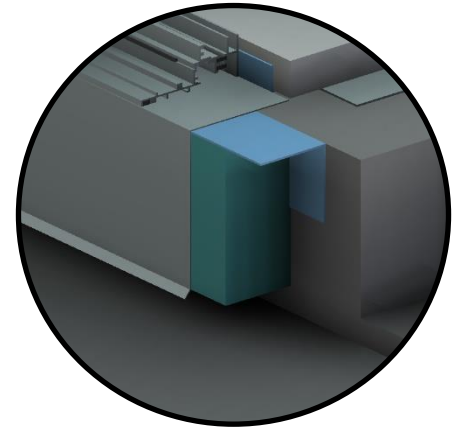
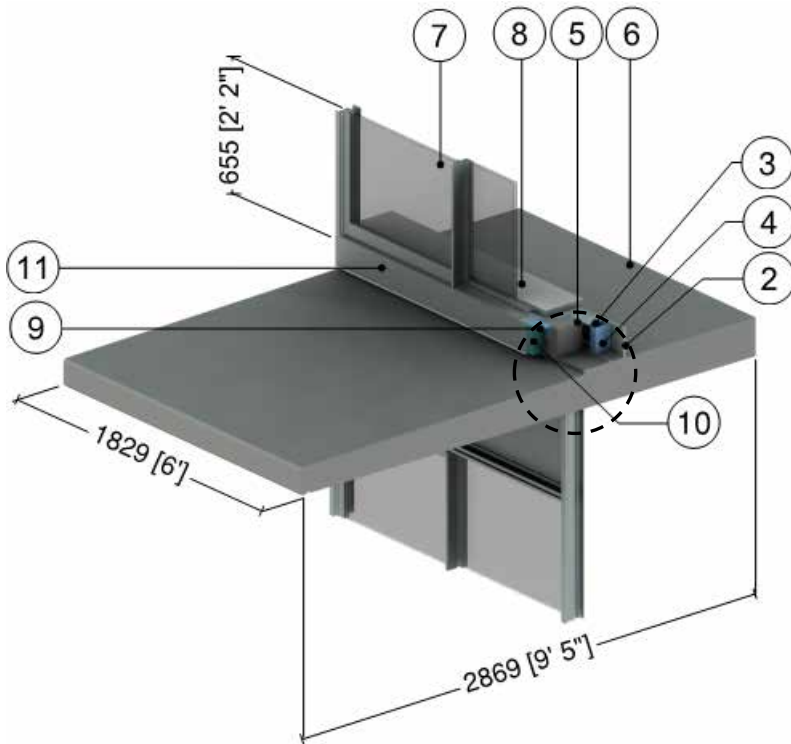
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air In Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Concrete Curb	6" (152)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Thermally Broken Aluminum Sliding Door ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
8	Wood Sill	2" (50)	0.69 (0.1)	-	31 (500)	0.45 (1880)
9	Support Angle	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
10	Exterior Insulation	Varies	-	R-10 to R-15 (1.76 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
11	Steel Flashing	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within sliding door framing was found using ISO 10077-2

Detail 9.1.5

Exterior Insulated Concrete Curb – Window-Wall and Recessed Intermediate Floor Intersection



Curb Detail

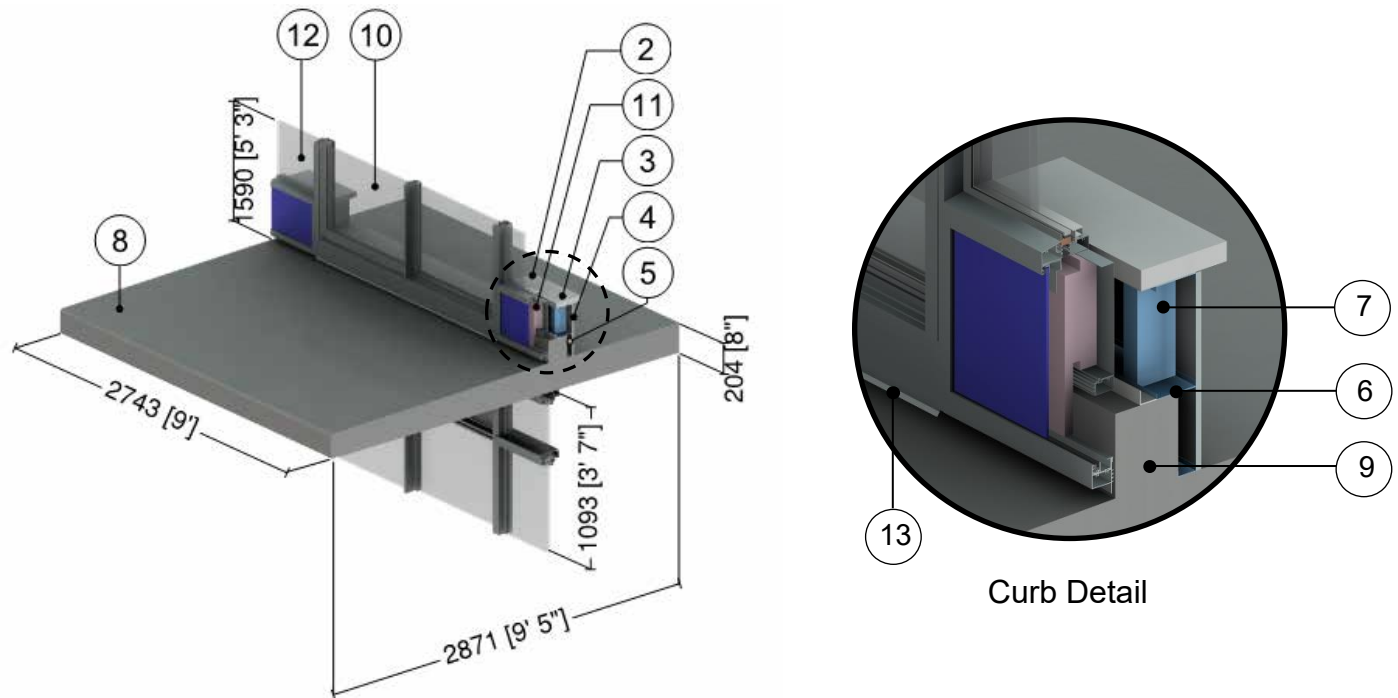
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.9 (0.11 RSI to 0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air In Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	1 5/8" x 1 5/8" Steel Studs with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Concrete Curb	6" (152)	12.5 (1.8)	-	140 (2250)	0.20 (850)
6	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Thermally Broken Aluminum Sliding Door ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
8	Wood Sill	2" (50)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Support Angle	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
10	Exterior Insulation	Varies	-	R-10 to R-15 (1.76 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
11	Steel Flashing	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within sliding door framing was found using ISO 10077-2

Detail 9.1.6

Window Wall System with Spandrel Panels and Sliding Door - Concrete Balcony and Curb Intersection



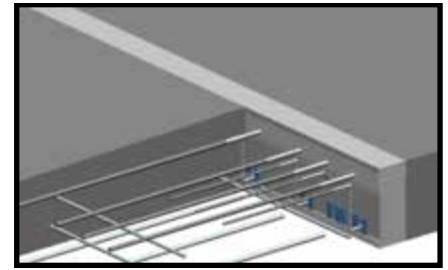
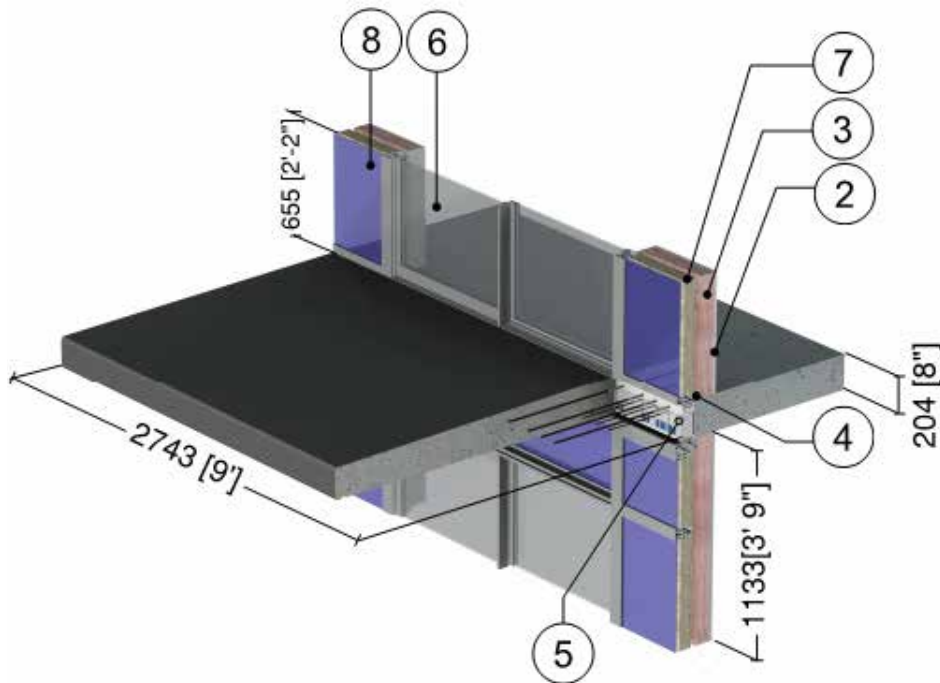
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Wood Sill	2" (50)	0.69 (0.1)	-	31 (500)	0.45 (1880)
3	Steel Sheet Connected to Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
5	Air in Stud Cavity	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
6	1 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	3 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Concrete Curb	6" (152)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Thermally Broken Aluminum Sliding Door ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
11	Back Pan Insulation	Varies	0.24 (0.034)	R-6.3 to R-12.6 (1.11 RSI to 2.22 RSI)	4 (64)	0.20 (850)
12	Aluminum Window Wall Vision System ² : thermally broken frame, double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
13	Aluminum Flashing	16 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

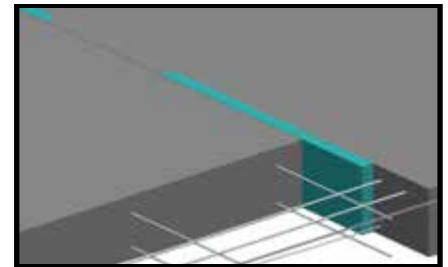
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 9.1.7

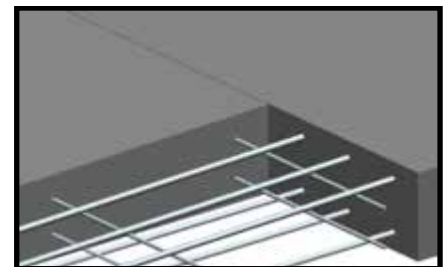
Window-wall with Sliding Door and Insulated Spandrel Section – Concrete Intermediate Floor Intersection without Concrete Curb for Alternative Balcony Slab Connections



A – Thermally Broken Slab with 3" (80 mm) thick Isokorb CM20



B – Thermally Broken Slab with 1.5" (40 mm) Intermittent Slab Insulation



C – Continuous Slab

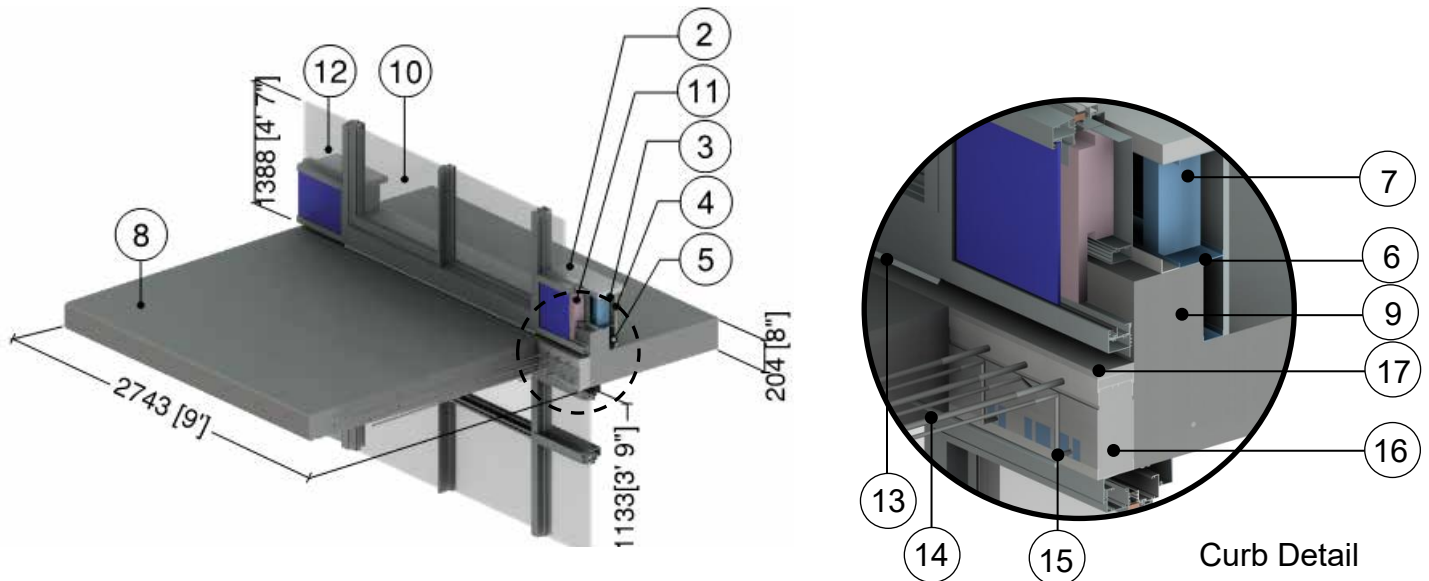
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation	3 5/8" (92)	0.29 (0.042)	R-12.4 (2.2 RSI)	0.9 (14)	0.17 (710)
4	3 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	8" (203 mm) Concrete Slab with various slab balcony connections shown in A, B, or C above					
6	Thermally Broken Aluminum Sliding Door ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
7	Back Pan Insulation	3" (75)	0.24 (0.034)	R-12.6 (2.2 RSI)	1.8 (28)	0.29 (1220)
8	Aluminum Window Wall Vision System: thermally broken frame, double glazed IGU, U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K) ²					
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 9.1.8

Window Wall System with Spandrel Panels and Sliding Door - Thermally Broken Concrete Balcony and Curb Intersection



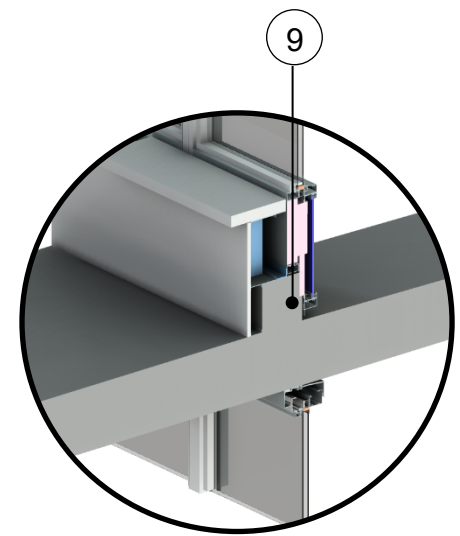
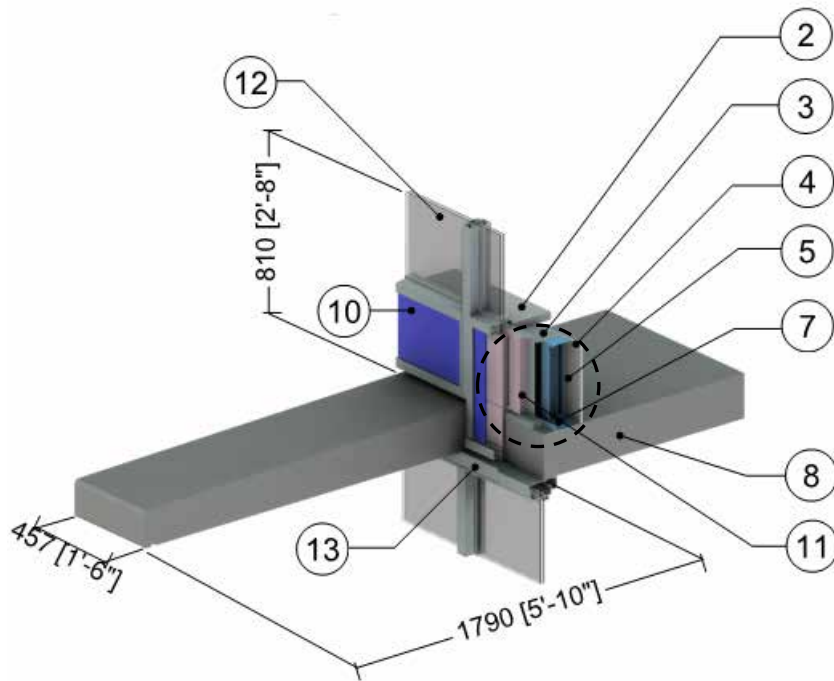
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Wood Sill	2" (50)	0.69 (0.10)	-	31 (500)	0.45 (1880)
3	Steel Sheet Connected to Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
5	Air in Stud Cavity	Varies	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
6	1 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	3 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Concrete Curb	6" (152)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Thermally Broken Aluminum Sliding Door ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
11	Back Pan Insulation	Varies	0.24 (0.034)	R-6.3 to R-12.6 (1.11 RSI to 2.22 RSI)	4 (64)	0.20 (850)
12	Aluminum Window Wall Vision System ² : thermally broken frame, double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
13	Aluminum Flashing	14 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
14	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
15	HDPE Plastic Sleeve	-	3.5 (0.5)	-	59 (950)	0.48 (2000)
16	Polystyrene Hard Foam Insulation	3" (76)	0.24 (0.035)	R-12 (2.1 RSI)	66 (1060)	0.35 (1500)
17	Cement Board	1" (25)	1.7 (0.25)	-	72 (1150)	0.20 (850)
18	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 9.1.9

Window Wall System with Spandrel Panels - Concrete Balcony and Bypass Intersection



Curb Detail
(view from interior)

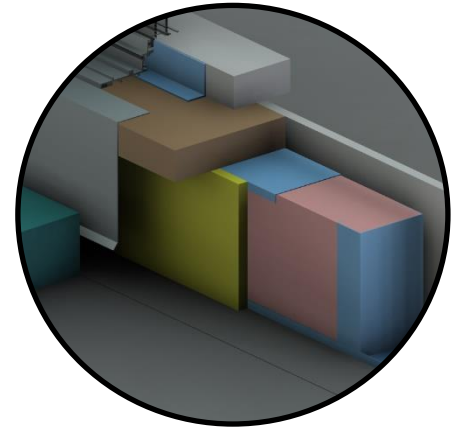
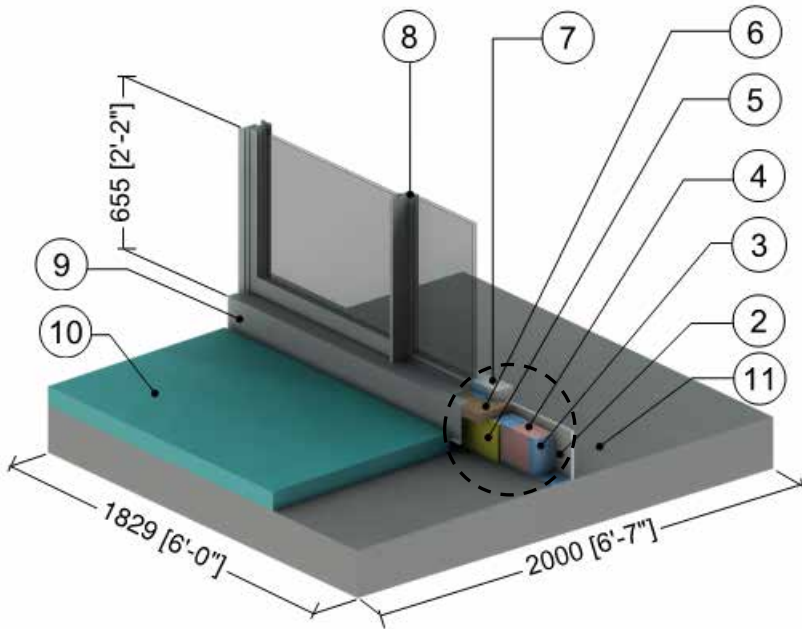
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Wood Sill	2" (50)	0.69 (0.10)	-	31 (500)	0.45 (1880)
3	Steel Sheet Connected to Studs	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
5	Air in Stud Cavity	Varies	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
6	1 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	3 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
9	Concrete Curb	6" (152)	12.5 (1.8)	-	140 (2250)	0.20 (850)
10	Thermally Broken Aluminum Sliding Door ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
11	Back Pan Insulation	Varies	0.24 (0.034)	R-6.4 to R-12.8 (1.13 RSI to 2.25 RSI)	4 (64)	0.20 (850)
12	Aluminum Window Wall Vision System ² : thermally broken frame, double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
13	Aluminum Flashing	14 Gauge	1109 (160)	-	171 (2739)	0.21 (900)
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 9.1.10

Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly - Door Sill with Exterior Slab Insulation



Curb Detail

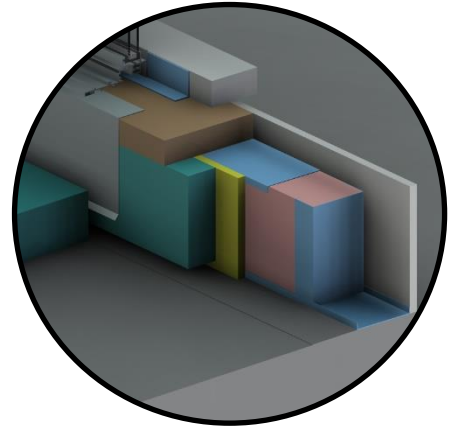
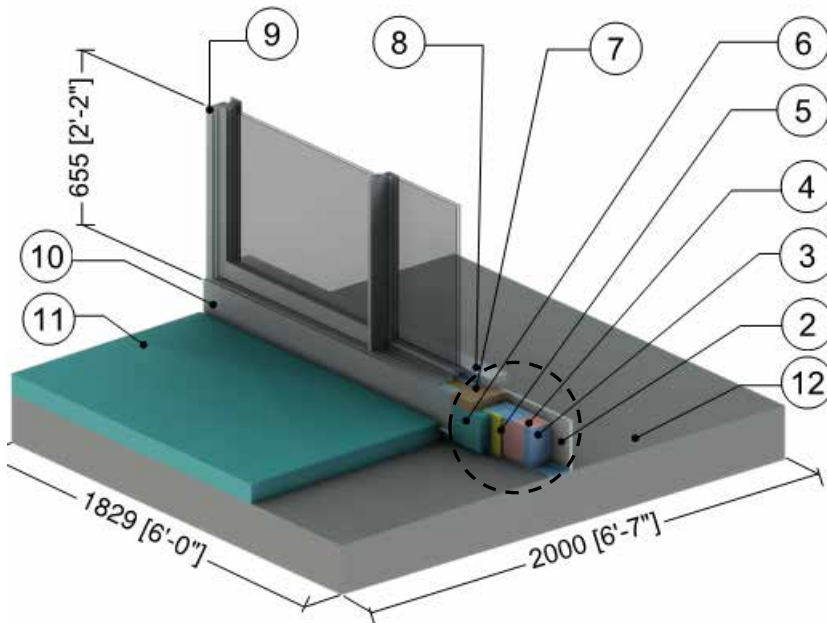
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.29 (0.042)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	Wood Blocking	1 5/8" (161)	0.69 (0.1)	-	31 (500)	0.45 (1880)
7	Wood Sill	3 1/4" (82)	0.69 (0.1)	-	31 (500)	0.45 (1880)
8	Thermally Broken Aluminum Sliding Door ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
9	Aluminum Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
10	Deck Insulation	3" (75)	0.20 (0.029)	R-15 (2.6 RSI)	1.8 (28)	0.29 (1220)
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within sliding door framing was found using ISO 10077-2

Detail 9.1.11

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly - Door Sill with Exterior Slab Insulation



Curb Detail

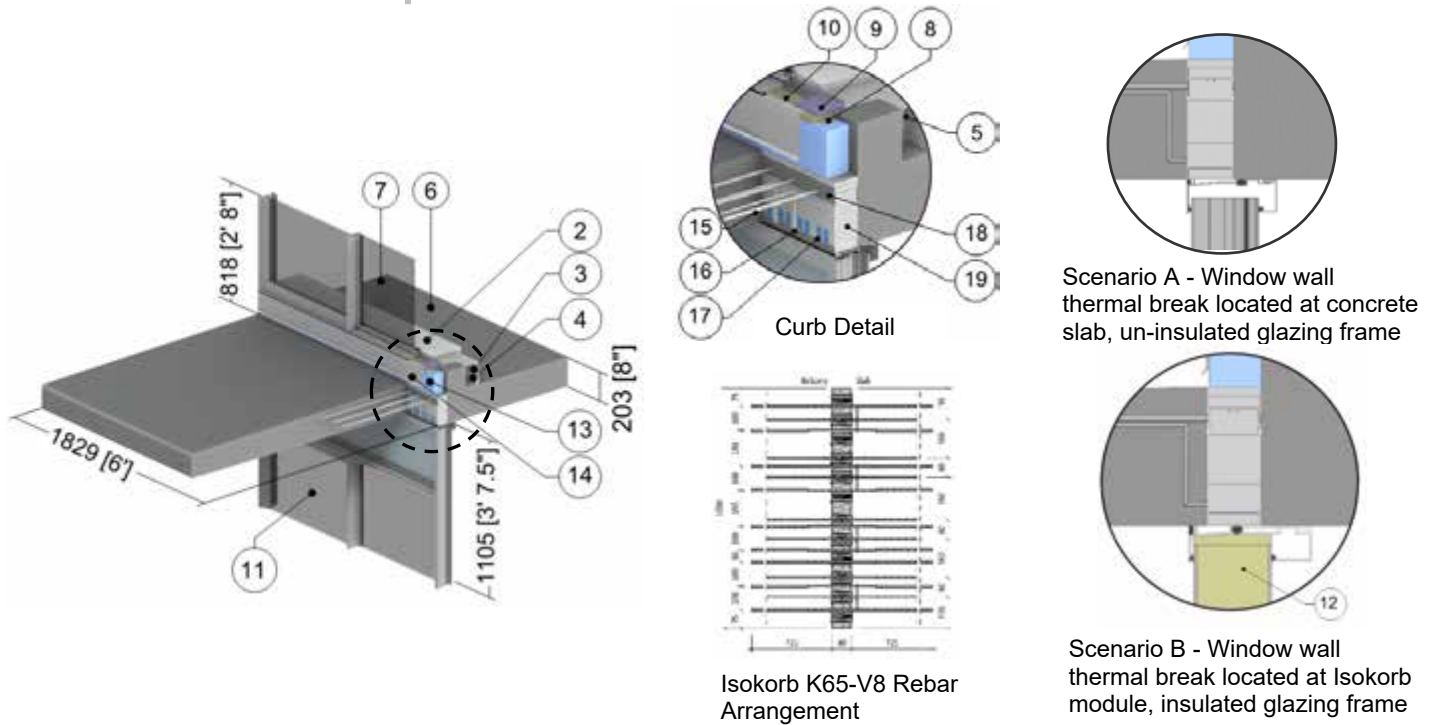
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-0.7 (0.11 RSI to 0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top Track	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.29 (0.042)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 RSI)	50 (800)	0.26 (1090)
6	Exterior Insulation	Varies	-	R-10 to R-15 (1.76 RSI to 2.64 RSI)	1.8 (28)	0.29 (1220)
7	Wood Blocking	1 5/8" (161)	0.69 (0.1)	-	27.8 (445)	0.45 (1880)
8	Wood Sill	3 1/4" (82)	0.69 (0.1)	-	27.8 (445)	0.45 (1880)
9	Thermally Broken Aluminum Sliding Door ² , double glazed IGU U _{IGU} = 0.32 BTU/hr-ft ² -°F (1.82 W/m ² K)					
10	Steel Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Deck Insulation	3" (75)	0.20 (0.029)	R-15 (2.6 RSI)	1.8 (28)	0.29 (1220)
12	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
13	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within sliding door framing was found using ISO 10077-2

Detail 9.1.12

Window Wall System with Spandrel Panels and Sliding Door - Schöck Isokorb K65-V8 Thermal Break at Concrete Balcony and Curb Intersection



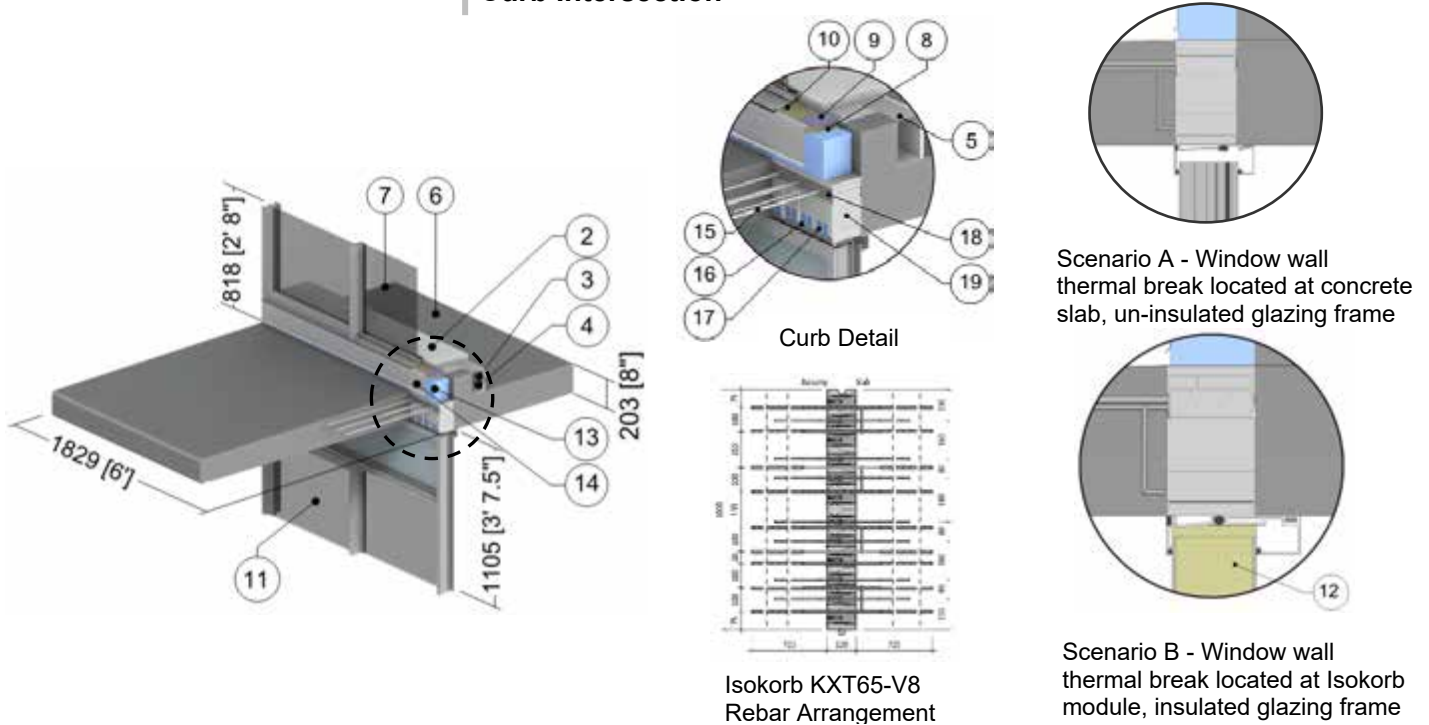
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Wood Sill	1.4" (36)	0.69 (0.10)	-	31 (500)	0.45 (1880)
3	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
4	Air in Stud Cavity	Varies	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	1 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	Concrete Curb and Slab	-	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Thermally Broken Aluminum Sliding Door ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
8	Support Angle	1/2" (13)	347 (50)	-	489 (7830)	0.12 (500)
9	Support Shims	3/8" (10)	1.7 (0.25)	-	72 (1150)	0.20 (850)
10	Wood Liner	5/8" (16)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Aluminum Window Wall Vision System ² : thermally broken frame, double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
12	Deflection Header Frame Insulation	Varies	0.24 (0.034)	-	4 (64)	0.20 (850)
13	Exterior Insulation	3" (76)	-	R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
14	Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
15	Steel Rebar	-	347 (50)	-	489 (7830)	0.12 (500)
16	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
17	Plastic Sleeve	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
18	Isokorb Frame	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
19	Polystyrene Insulation	3.2" (80)	0.22 (0.031)	R-15 (2.58 RSI)	1.3 (20)	0.35 (1500)
20	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 9.1.14

Window Wall System with Spandrel Panels and Sliding Door - Schöck Isokorb KXT65-V8 Thermal Break at Concrete Balcony and Curb Intersection



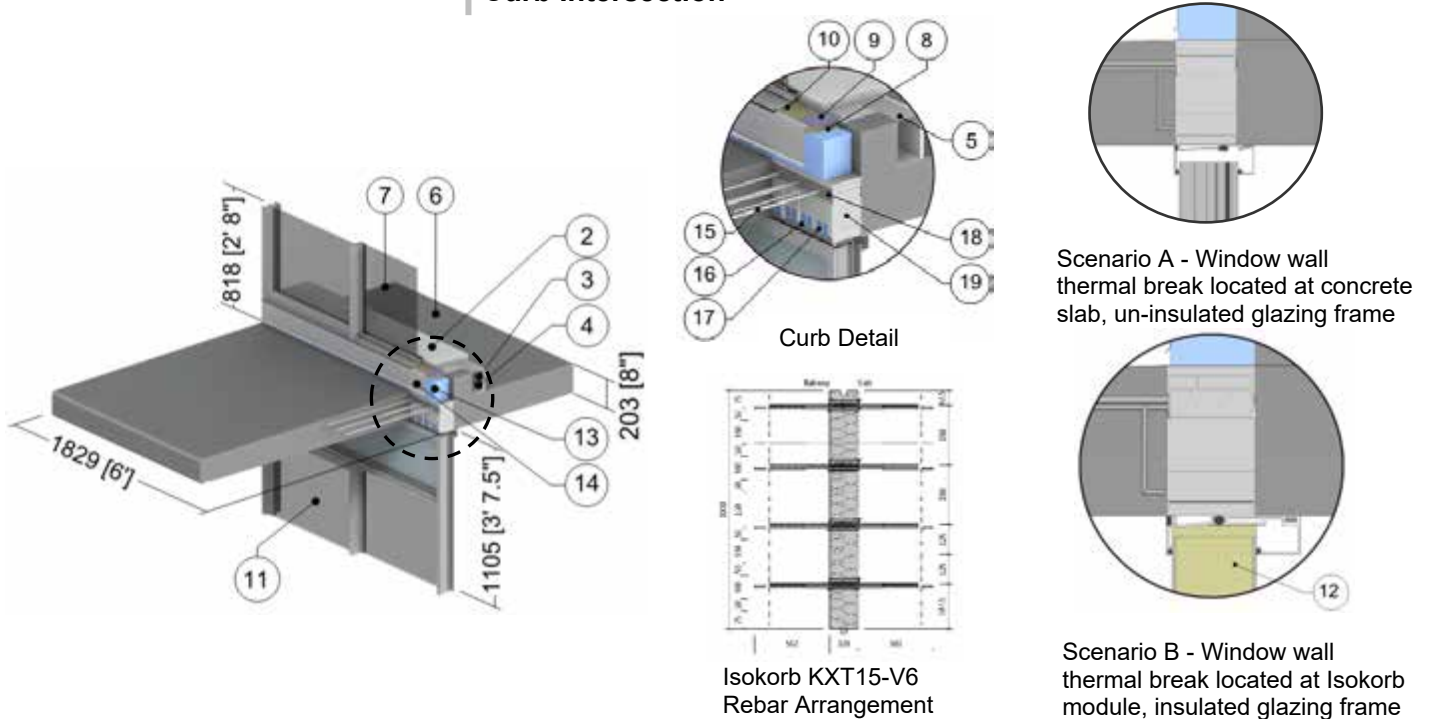
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Wood Sill	1.4" (36)	0.69 (0.10)	-	31 (500)	0.45 (1880)
3	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
4	Air in Stud Cavity	Varies	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	1 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	Concrete Curb and Slab	-	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Thermally Broken Aluminum Sliding Door ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
8	Support Angle	1/2" (13)	347 (50)	-	489 (7830)	0.12 (500)
9	Support Shims	3/8" (10)	1.7 (0.25)	-	72 (1150)	0.20 (850)
10	Wood Liner	5/8" (16)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Aluminum Window Wall Vision System ² : thermally broken frame, double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
12	Deflection Header Frame Insulation	Varies	0.24 (0.034)	-	4 (64)	0.20 (850)
13	Exterior Insulation	4.5" (114)	-	R-22.5 (3.96 RSI)	1.8 (28)	0.29 (1220)
14	Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
15	Steel Rebar	-	347 (50)	-	489 (7830)	0.12 (500)
16	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
17	Plastic Sleeve	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
18	Isokorb Frame	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
19	Polystyrene Insulation	4.7" (120)	0.22 (0.031)	R-21.7 (3.83 RSI)	1.3 (20)	0.35 (1500)
20	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 9.1.15

Window Wall System with Spandrel Panels and Sliding Door - Schöck Isokorb KXT15-V6 Thermal Break at Concrete Balcony and Curb Intersection



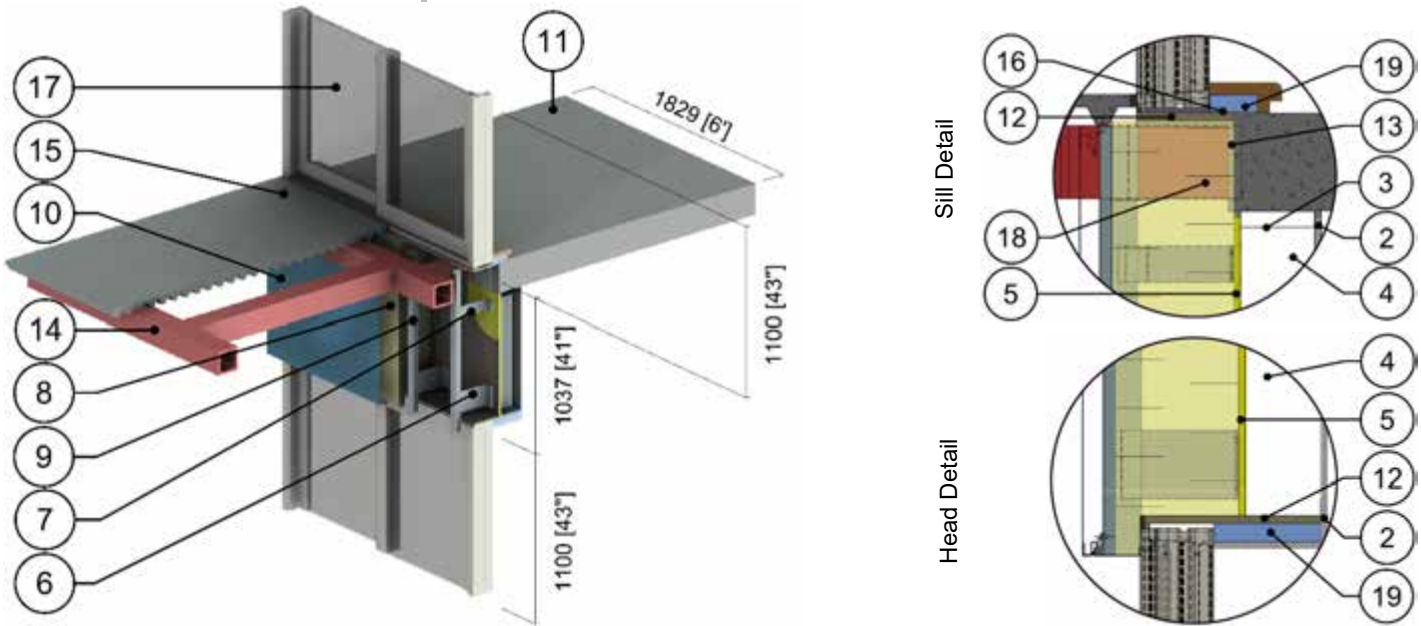
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Wood Sill	1.4" (36)	0.69 (0.10)	-	31 (500)	0.45 (1880)
3	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
4	Air in Stud Cavity	Varies	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	1 5/8" x 1 5/8" Steel Studs (16" o.c.) with Top and Bottom Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	Concrete Curb and Slab	-	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Thermally Broken Aluminum Sliding Door ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
8	Support Angle	1/2" (13)	347 (50)	-	489 (7830)	0.12 (500)
9	Support Shims	3/8" (10)	1.7 (0.25)	-	72 (1150)	0.20 (850)
10	Wood Liner	5/8" (16)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Aluminum Window Wall Vision System ² : thermally broken frame, double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
12	Deflection Header Frame Insulation	Varies	0.24 (0.034)	-	4 (64)	0.20 (850)
13	Exterior Insulation	4.5" (114)	-	R-22.5 (3.96 RSI)	1.8 (28)	0.29 (1220)
14	Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
15	Steel Rebar	-	347 (50)	-	489 (7830)	0.12 (500)
16	Stainless Steel Rebar	-	118 (17)	-	500 (8000)	0.12 (500)
17	Plastic Sleeve	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
18	Isokorb Frame	-	1.7 (0.25)	-	72 (1150)	0.20 (850)
19	Polystyrene Insulation	4.7" (120)	0.22 (0.031)	R-21.7 (3.83 RSI)	1.3 (20)	0.35 (1500)
20	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 9.1.16

Exterior Insulated 2"x6" Steel Stud (16" o.c.) Wall Assembly with FRP Vertical Brackets and Rail System Supporting Metal Cladding and Sliding Door – Intermittently Attached Balcony and Sliding Door Intersection



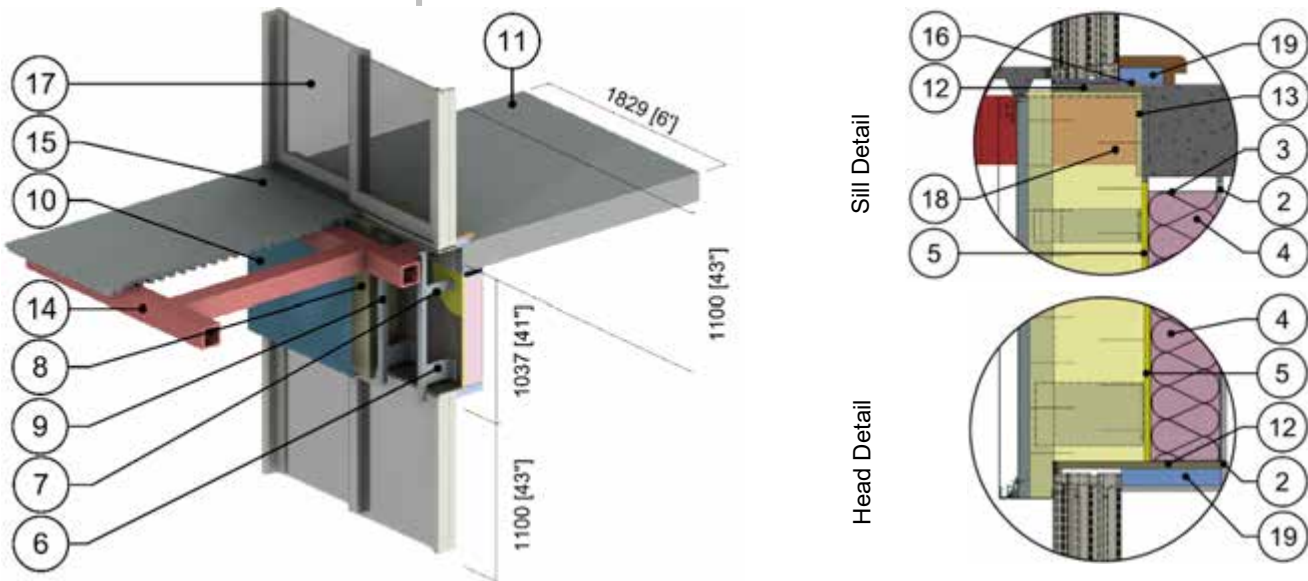
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	2" x 6" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	-	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	FRP Bracket	-	4.85 (0.7)	-	110 (1760)	-
7	Aluminum Bracket	-	1110 (160)	-	171 (2739)	0.22 (900)
8	Exterior Mineral Wool Insulation	10" (254)	0.24 (0.034)	R-42 (7.40 RSI)	4.5 (72)	0.20 (850)
9	Vertical Aluminum L-Rail	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
10	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Wood Liner	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	Steel Support Angle	1/2" (13)	430 (62)	-	489 (7830)	0.12 (500)
14	Steel Balcony Framing	5/8" (16)	430 (62)	-	489 (7830)	0.12 (500)
15	Concrete Balcony Topping	2.5" (64)	12.5 (1.8)	-	140 (2250)	0.20 (850)
16	Aluminum Back Angle	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
17	Thermally broken vinyl sliding door ² , triple glazed IGU U _{IGU} = 0.13 BTU/hr·ft ² ·°F (0.72 W/m ² K)					
18	Steel Column and Knife Edge	5/8" (16)	430 (62)	-	489 (7830)	0.12 (500)
19	Rigid Insulation	-	0.20 (0.029)	-	1.8 (28)	0.29 (1220)
20	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 9.1.17

Exterior and Interior Insulated 2"x6" Steel Stud (16" o.c.) Wall Assembly with FRP Vertical Brackets and Rail System Supporting Metal Cladding with R-19 Batt in Stud Cavity and Sliding Door – Intermittently Attached Balcony and Sliding Door Intersection



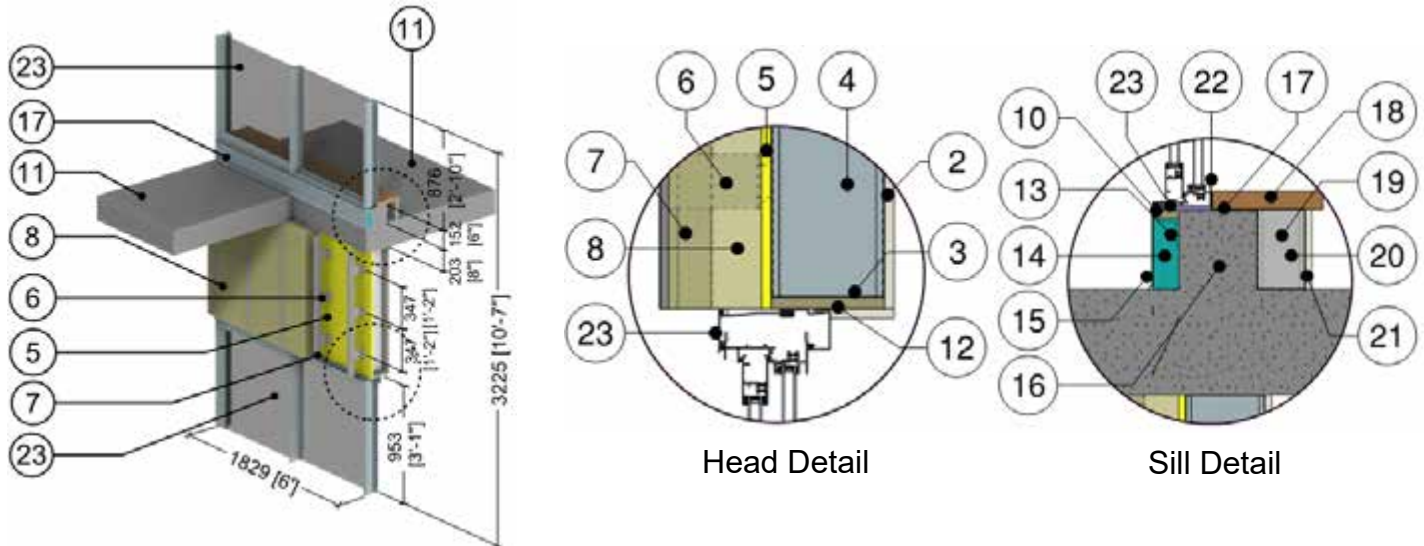
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	2" x 6" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	6" (152)	-	R-19 (3.35 RSI)	0.9 (14)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	FRP Bracket	-	4.85 (0.7)	-	110 (1760)	-
7	Aluminum Bracket	-	1110 (160)	-	171 (2739)	0.22 (900)
8	Exterior Mineral Wool Insulation	10" (254)	0.24 (0.034)	R-42 (7.40 RSI)	4.5 (72)	0.20 (850)
9	Vertical Aluminum L-Rail	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
10	Metal Cladding with 1/2" vented airspace incorporated into exterior heat transfer coefficient					
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Wood Liner	1/2" (13)	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	Steel Support Angle	1/2" (13)	430 (62)	-	489 (7830)	0.12 (500)
14	Steel Balcony Framing	5/8" (16)	430 (62)	-	489 (7830)	0.12 (500)
15	Concrete Balcony Topping	2.5" (64)	12.5 (1.8)	-	140 (2250)	0.20 (850)
16	Aluminum Back Angle	0.09" (2.2)	1110 (160)	-	171 (2739)	0.22 (900)
17	Thermally broken vinyl sliding door ² , triple glazed IGU U _{IGU} = 0.13 BTU/hr·ft ² ·°F (0.72 W/m ² K)					
18	Steel Column and Knife Edge	5/8" (16)	430 (62)	-	489 (7830)	0.12 (500)
19	Rigid Insulation	-	0.20 (0.029)	-	1.8 (28)	0.29 (1220)
20	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 9.1.18

Exterior Insulated 2" x 6" Steel Stud (16" o.c.) Wall Assembly with Vertical Clips (24" o.c.) Supporting Cladding and Sliding Door – Concrete Balcony and Curb Intersection



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	2" x 6" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	-	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	0.09" (2.2)	-	-	-	-
7	Vertical Aluminum L-girt	0.09" (2.2)	1340 (193)	-	169 (2700)	0.22 (900)
8	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-4.2 to R-21 (0.74 to 3.70 RSI)	-	-
9	Generic Cladding with 1/2" (13 mm) vented air space incorporated into exterior heat transfer coefficient					
10	Wood Buck	5/8" (16)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Wood Liner	1/2" (16)	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	Steel Support Angle	1/4" (6)	430 (62)	-	489 (7830)	0.12 (500)
14	XPS Curb Insulation	2" (51)	0.02 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
15	Aluminum Flashing	18 Gauge	1110 (160)	-	171 (2739)	0.22 (900)
16	Concrete Curb	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
17	Steel Back Angle	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
18	Wood Sill	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
19	3 5/8" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
20	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	-	0.24 (1000)
21	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
22	Thermally broken aluminum sliding door ² , double glazed IGU U _{IGU} = 0.32 BTU/hr-ft ² -°F (1.82 W/m ² K)					
23	Polyamide Shim	1/2" (10)	1.73 (0.25)	-	-	-
24	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

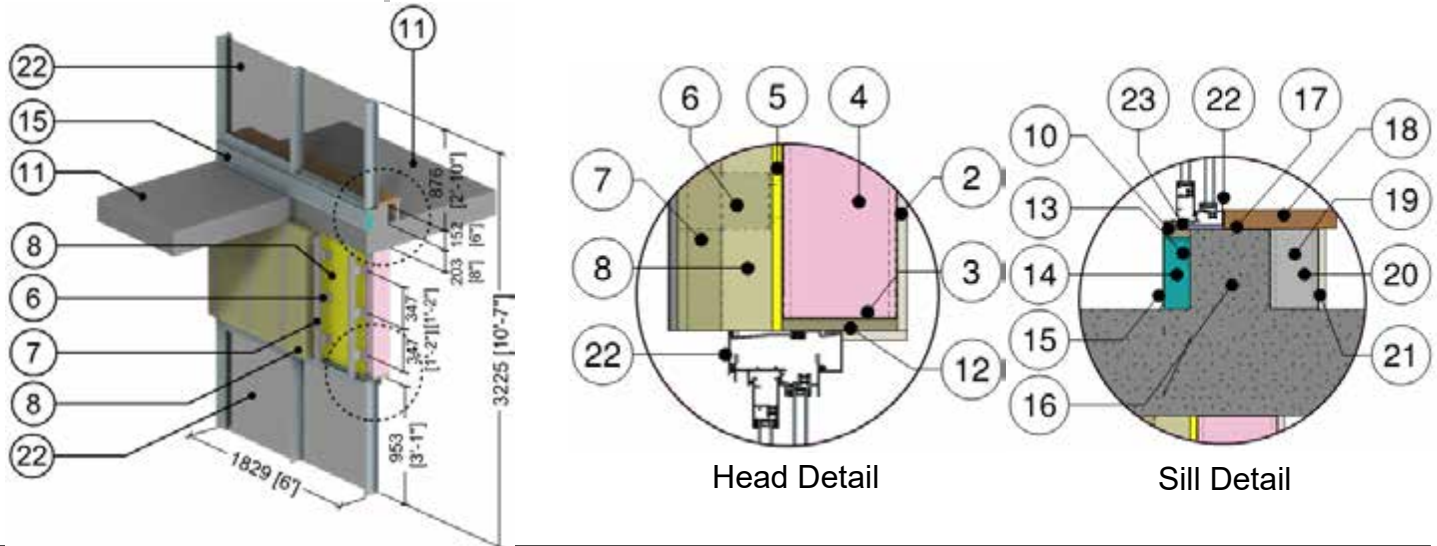
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

²The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 9.1.19

Exterior and Interior Insulated 2" x 6" Steel Stud (16" o.c.) Wall Assembly with Vertical Clips (24" o.c.) Supporting Cladding with R-19 Batt in Stud Cavity and Sliding Door – Concrete Balcony and Curb Intersection



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	2" x 6" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	6" (152)	0.32 (0.046)	R-19 (0.16 RSI)	0.9 (1.4)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	0.09" (2.2)	-	-	-	-
7	Vertical Aluminum L-girt	0.09" (2.2)	1340 (193)	-	169 (2700)	0.22 (900)
8	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-4.2 to R-21 (0.74 to 3.70 RSI)	-	-
9	Generic Cladding with 1/2" (13 mm) vented air space incorporated into exterior heat transfer coefficient					
10	Wood Buck	5/8" (16)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Wood Liner	1/2" (16)	0.69 (0.10)	-	31 (500)	0.45 (1880)
13	Steel Support Angle	1/4" (6)	430 (62)	-	489 (7830)	0.12 (500)
14	XPS Curb Insulation	2" (51)	0.02 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
15	Aluminum Flashing	18 Gauge	1110 (160)	-	171 (2739)	0.22 (900)
16	Concrete Curb	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
17	Steel Back Angle	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
18	Wood Sill	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
19	3 5/8" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
20	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	-	0.24 (1000)
21	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
22	Thermally broken aluminum sliding door ² , double glazed IGU U _{IGU} = 0.32 BTU/hr-ft ² -°F (1.82 W/m ² K)					
23	Polyamide Shim	1/2" (10)	1.73 (0.25)	-	-	-
24	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

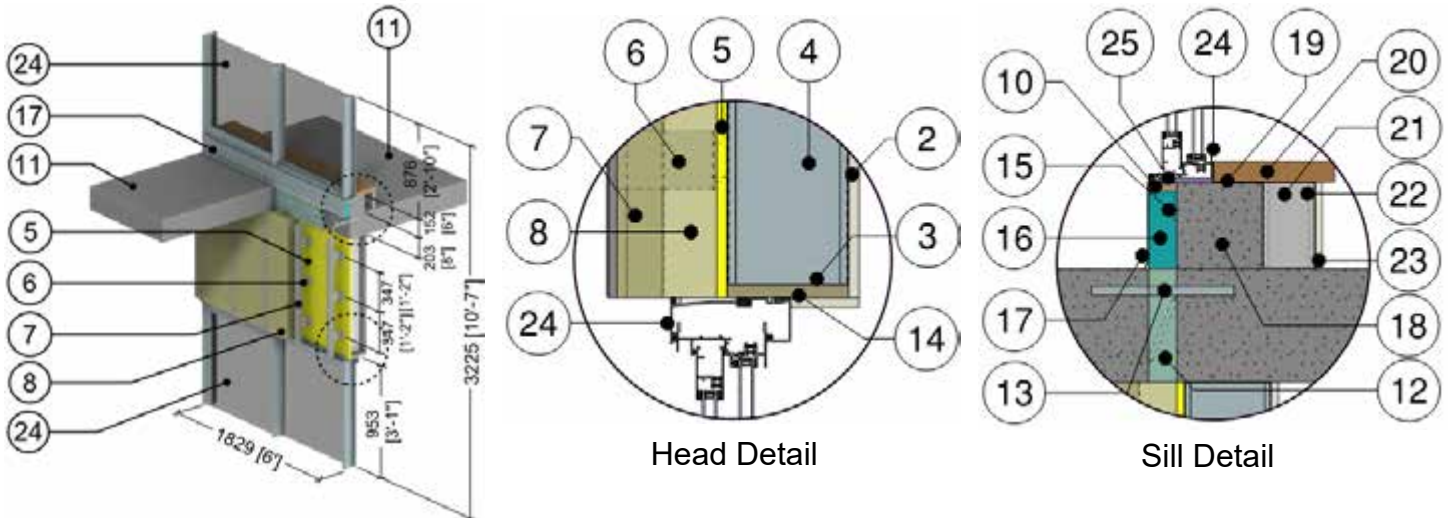
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

²The thermal conductivity of air spaces within framing was found using ISO 100077-2



Detail 9.1.20

Exterior Insulated 2" x 6" Steel Stud (16" o.c.) Wall Assembly with Vertical Clips (24" o.c.) Supporting Cladding and Sliding Door – Structural Thermal Break at Concrete Balcony and Curb Intersection



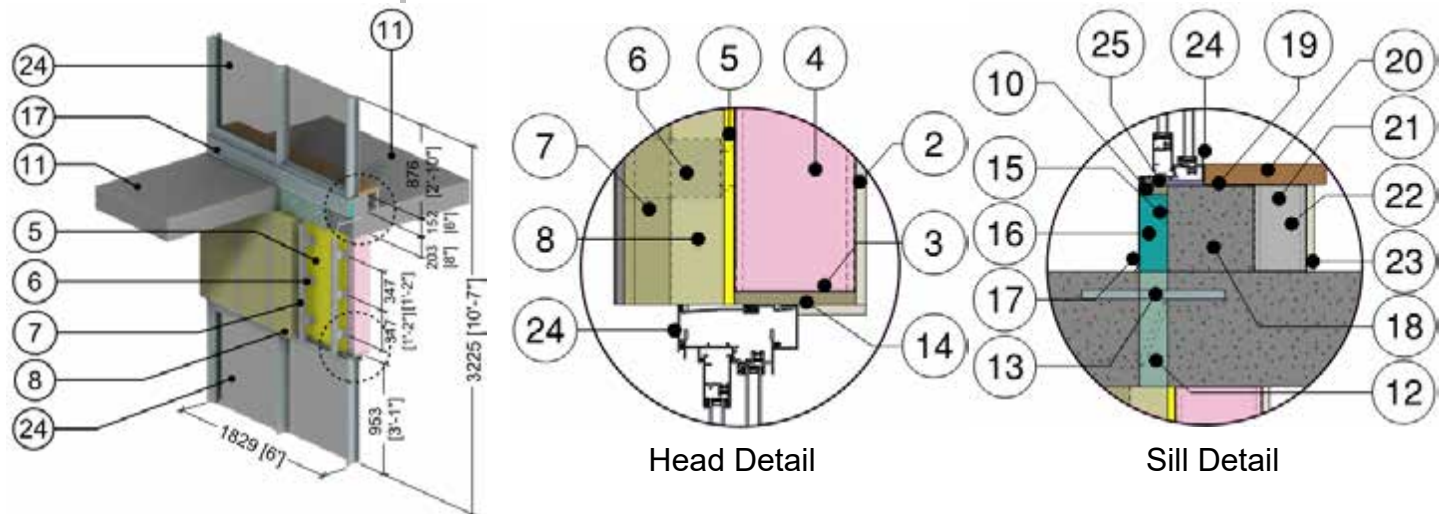
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	2" x 6" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	6" (152)	-	R-0.9 (0.16 RSI)	-	0.24 (1000)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	0.09" (2.2)	-	-	-	-
7	Vertical Aluminum L-girt	0.09" (2.2)	1340 (193)	-	169 (2700)	0.22 (900)
8	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-4.2 to R-21 (0.74 to 3.70 RSI)	-	-
9	Generic Cladding with 1/2" (13 mm) vented air space is incorporated into exterior heat transfer coefficient					
10	Wood Buck	5/8" (16)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Structural Thermal Break	2" (51)	0.53 (0.076)	-	-	-
13	#5 Steel Rebar	5/8" (16) Ø	347 (50)	-	489 (7830)	0.12 (500)
14	Wood Liner	1/2" (16)	0.69 (0.10)	-	31 (500)	0.45 (1880)
15	Steel Support Angle	1/4" (6)	430 (62)	-	489 (7830)	0.12 (500)
16	XPS Curb Insulation	2" (51)	0.02 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
17	Aluminum Flashing	18 Gauge	1110 (160)	-	171 (2739)	0.22 (900)
18	Concrete Curb	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
19	Steel Back Angle	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
20	Wood Sill	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
21	3 5/8" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
22	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	-	0.24 (1000)
23	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
24	Thermally broken aluminum sliding door ² , double glazed IGU U _{IGU} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K)					
25	Polyamide Shim	1/2" (10)	1.73 (0.25)	-	-	-
26	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

²The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 9.1.21

Exterior and Interior Insulated 2" x 6" Steel Stud (16" o.c.) Wall Assembly with Vertical Clips (24" o.c.) Supporting Cladding with R-19 Batt in Stud Cavity and Sliding Door – Structural Thermal Break at Concrete Balcony and Curb Intersection



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 to R-1.1 (0.11 to 0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	2" x 6" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	6" (152)	0.32 (0.046)	R-19 (0.16 RSI)	0.9 (1.4)	0.17 (710)
5	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Thermally Isolated Aluminum Bracket	0.09" (2.2)	-	-	-	-
7	Vertical Aluminum L-girt	0.09" (2.2)	1340 (193)	-	169 (2700)	0.22 (900)
8	Exterior Mineral Wool Insulation	Varies	0.24 (0.034)	R-4.2 to R-21 (0.74 to 3.70 RSI)	-	-
9	Generic Cladding with 1/2" (13 mm) vented air space is incorporated into exterior heat transfer coefficient					
10	Wood Buck	5/8" (16)	0.69 (0.10)	-	31 (500)	0.45 (1880)
11	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
12	Structural Thermal Break	2" (51)	0.53 (0.076)	-	-	-
13	#5 Steel Rebar	5/8" (16) Ø	347 (50)	-	489 (7830)	0.12 (500)
14	Wood Liner	1/2" (16)	0.69 (0.10)	-	31 (500)	0.45 (1880)
15	Steel Support Angle	1/4" (6)	430 (62)	-	489 (7830)	0.12 (500)
16	XPS Curb Insulation	2" (51)	0.02 (0.029)	R-10 (1.76 RSI)	1.8 (28)	0.29 (1220)
17	Aluminum Flashing	18 Gauge	1110 (160)	-	171 (2739)	0.22 (900)
18	Concrete Curb	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
19	Steel Back Angle	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
20	Wood Sill	1 1/2" (38)	0.69 (0.10)	-	31 (500)	0.45 (1880)
21	3 5/8" x 1 5/8" Steel Studs with Tracks	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
22	Air in Stud Cavity	3 5/8" (92)	-	R-0.9 (0.16 RSI)	-	0.24 (1000)
23	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
24	Thermally broken aluminum sliding door ² , double glazed IGU U _{IGU} = 0.32 BTU/hr-ft ² -°F (1.82 W/m ² K)					
25	Polyamide Shim	1/2" (10)	1.73 (0.25)	-	-	-
26	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

²The thermal conductivity of air spaces within framing was found using ISO 100077-2

10.0 Roofs

Detail 10.1.1	A.10.1
Exterior Insulated Sloped Metal Roof with Metal Sub-Girts (12" o.c.) Supporting Standing Seam Metal Roof – Clear Roof	
Detail 10.1.2	A.10.2
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Exterior Insulated Conventional Flat Roof – Armatherm Thermal Break under Roof Anchor	
Detail 10.3.3	A.10.27
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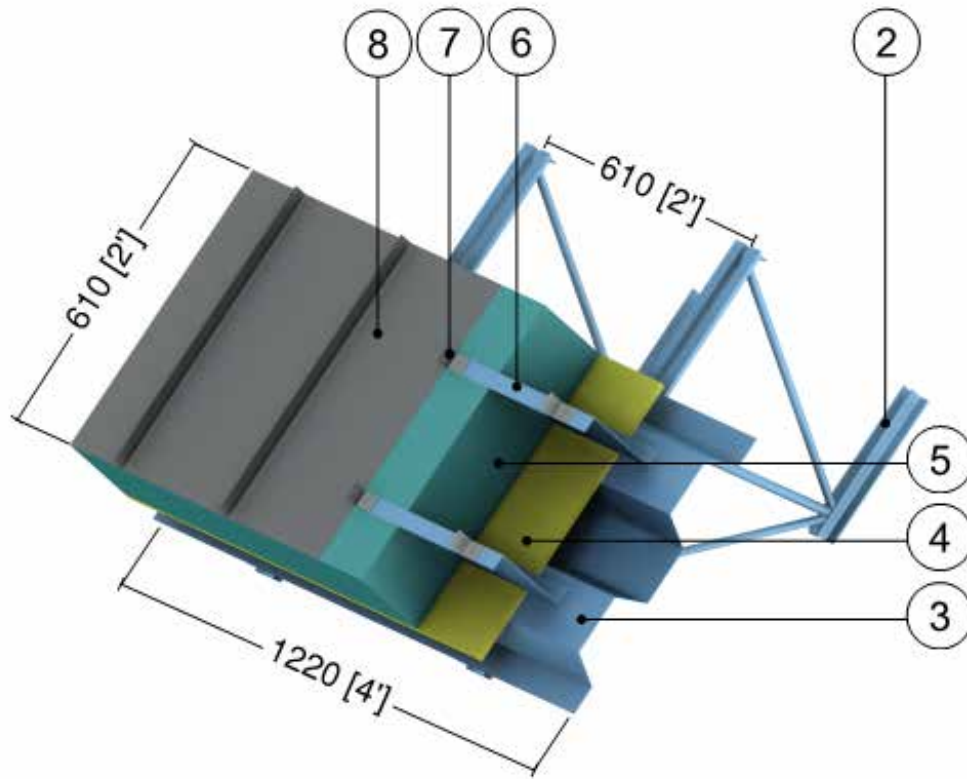
Detail 10.3.4**A.10.28**
Exterior Insulated Conventional Low-Sloped Roof – Thermal Break in Roof Anchor

Detail 10.4.1**A.10.29**
Exterior Insulated Low Sloped Roof with Fully Adhered Roof Membrane and Mineral Wool Insulation - Flange-Style Drain Penetration

Detail 10.4.2**A.10.30**
Exterior Insulated Low Sloped Roof with Fully Adhered Roof Membrane and Mineral Wool and Polyisocyanurate Insulation - Flange-Style Drain Penetration

Detail 10.1.1

Exterior Insulated Sloped Metal Roof with Metal Sub-Girts (12" o.c.) Supporting Standing Seam Metal Roof – Clear Roof

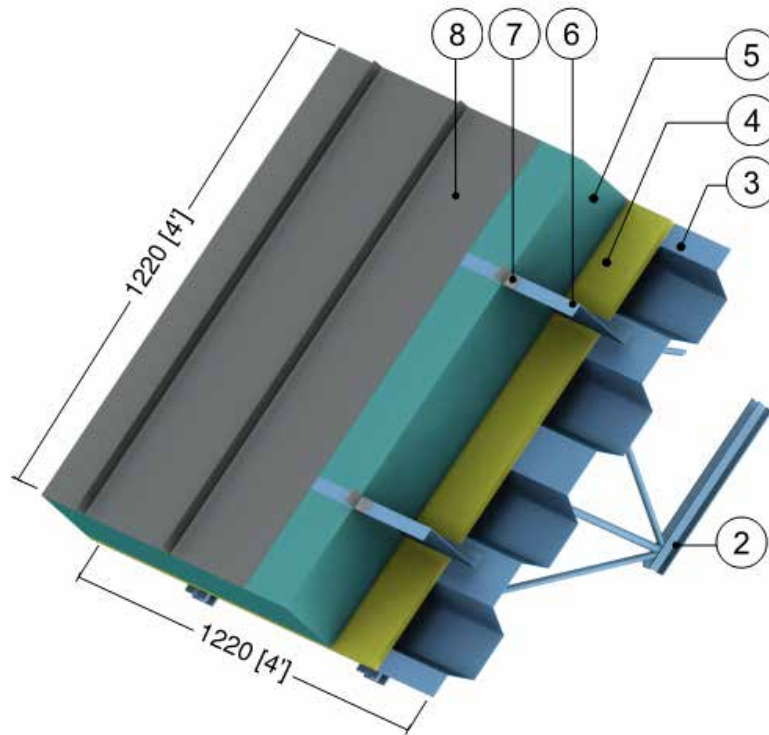


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-1.1 (0.20 RSI)	-	-
2	Open Web Steel Joist (550C) @ 24" (610) o.c.	-	347 (50)	-	489 (7830)	0.12 (500)
3	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
4	Roof Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
5	Rigid Roof Insulation	Varies	-	R-20 to R-40 (3.52 RSI to 7.04 RSI)	1.8 (28)	0.29 (1220)
6	Sub-Girt with 1 1/2" Flange @ 12" (305) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Roof Clip (1 1/2" x 1 1/2")	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Metal Roof	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 10.1.2

Exterior Insulated Sloped Metal Roof with Metal Sub-Girts (24" o.c.) Supporting Standing Seam Metal Roof – Clear Roof

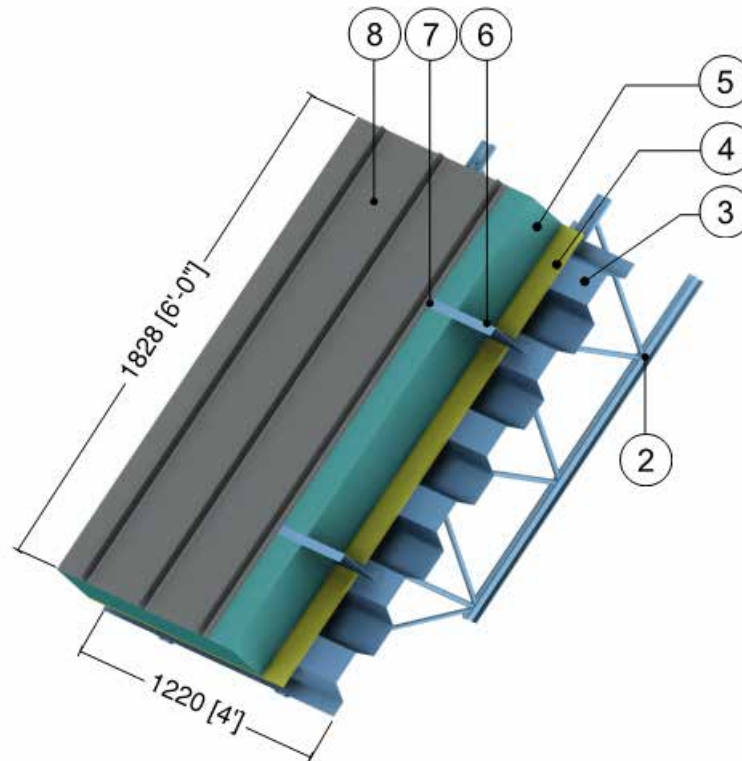


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-1.1 (0.20 RSI)	-	-
2	Open Web Steel Joist (550C) @ 24" (610) o.c.	-	347 (50)	-	489 (7830)	0.12 (500)
3	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
4	Roof Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
5	Rigid Roof Insulation	Varies	-	R-20 to R-40 (3.52 RSI to 7.04 RSI)	1.8 (28)	0.29 (1220)
6	Sub-Girt with 1 1/2" Flange @ 24" (610) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Roof Clip (1 1/2" x 1 1/2")	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Metal Roof	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 10.1.3

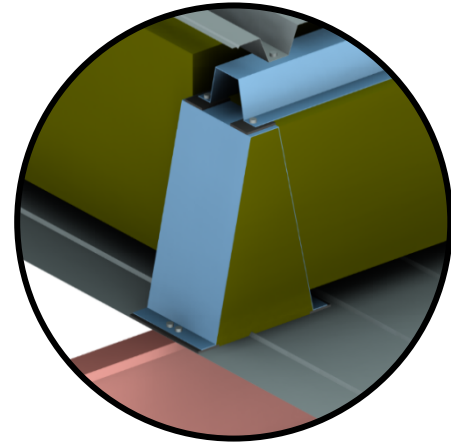
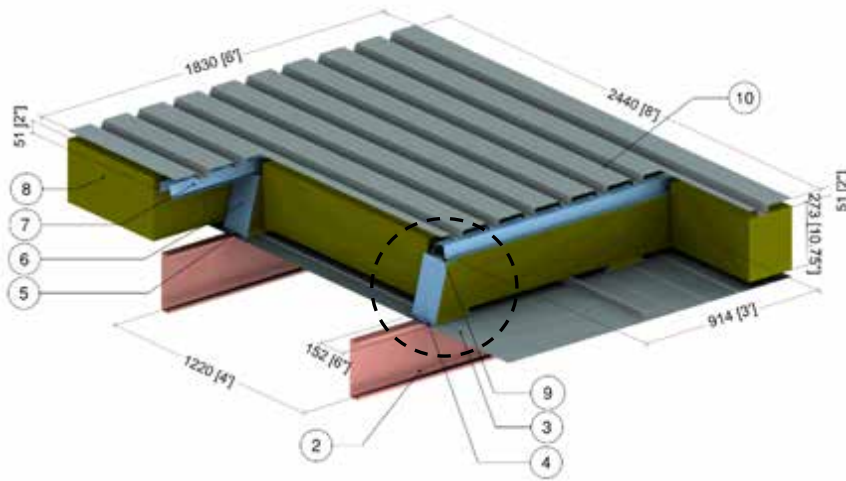
Exterior Insulated Sloped Metal Roof with Metal Sub-Girts (36" o.c.) Supporting Standing Seam Metal Roof – Clear Roof



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-1.1 (0.20 RSI)	-	-
2	Open Web Steel Joist (550C)@ 24" (610) o.c.	-	347 (50)	-	489 (7830)	0.12 (500)
3	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
4	Roof Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
5	Rigid Roof Insulation	Varies	-	R-20 to R-40 (3.52 RSI to 7.04 RSI)	1.8 (28)	0.29 (1220)
6	Sub-Girt with 1 1/2" Flange @ 36" (914) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Roof Clips (1 1/2" x 1 1/2")	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Metal Roof	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 10.1.4 Insulated Sheet Steel Roof Supported by Thermal Chairs – Baseline System – Clear Roof



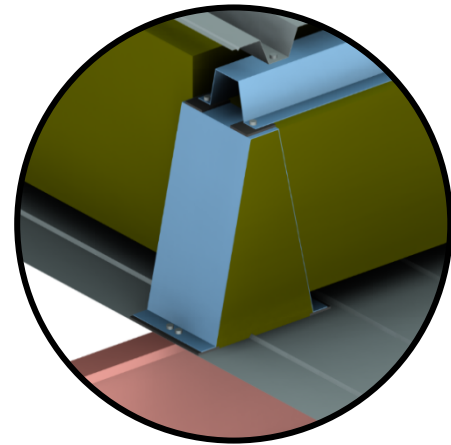
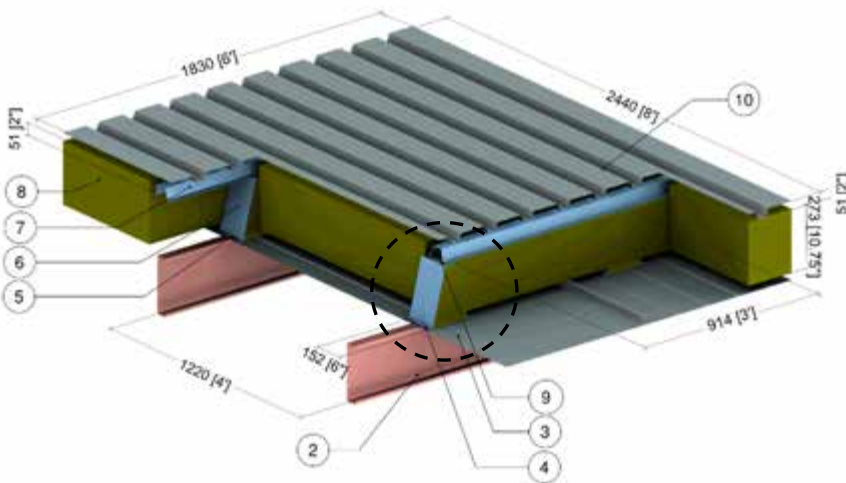
Bracket Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-1.1 (0.20 RSI)	-	-
2	10 x 2 Galvanized Steel Purlin @ 48" o.c.	1/10" (2.6)	430 (62)	-	489 (7830)	0.12 (500)
3	Galvanized Steel Liner	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Thermal Tape	1/8" (3.18)	0.097 (0.014)	-	-	-
5	#12 Steel Fasteners	0.22" (5.50) ∅	430 (62)	-	489 (7830)	0.12 (500)
6	10-in Galvanized Steel Hat Section (Thermal Chair)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	2-in Galvanized Steel Hat Section (Outer Rail)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Mineral Wool Insulation	10 3/4" (273)	0.240 (0.034)	R-45 (7.93 RSI)	1.8 (28)	0.29 (1090)
9	Air Gap ²	-	Varies	-	0.075 (1.2)	0.24 (1000)
10	Galvanized Steel Cladding	22 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 10.1.5 Insulated Sheet Steel Roof Supported by Thermal Chairs – Additional Scenarios – Clear Roof



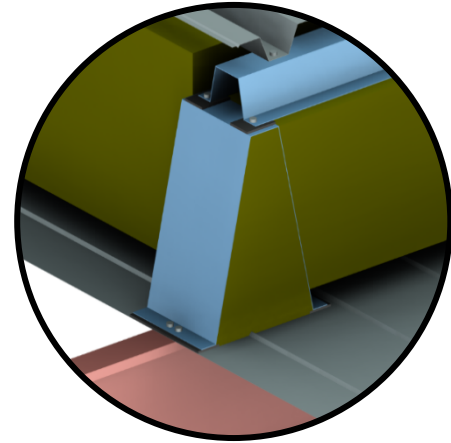
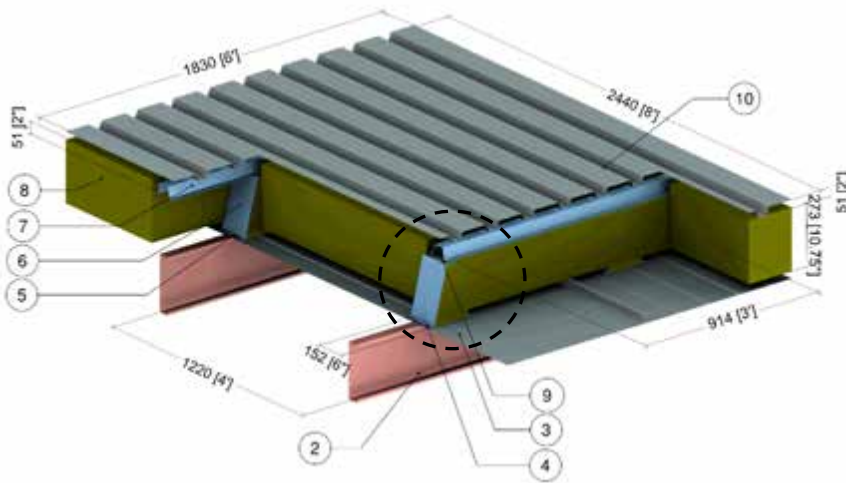
Bracket Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films (left side) ¹	-	-	R-1.1 (0.20 RSI)	-	-
2	10 x 2 Galvanized Steel Purlin @ 48" o.c.	1/10" (2.6)	430 (62)	-	489 (7830)	0.12 (500)
3	Galvanized Steel Liner	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Thermal Tape	1/8" (3.18)	0.097 (0.014)	-	-	-
5	#12 Steel Fasteners	0.22" (5.50) ∅	430 (62)	-	489 (7830)	0.12 (500)
6	10-in Galvanized Steel Hat Section (Thermal Chair)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	2-in Galvanized Steel Hat Section (Outer Rail)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Mineral Wool Insulation	10 3/4" (273)	0.240 (0.034)	R-45 (7.93 RSI)	1.8 (28)	0.29 (1090)
9	Air Gap ²	-	Varies	-	0.075 (1.2)	0.24 (1000)
10	Galvanized Steel Cladding	22 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Exterior Film (right side) ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 10.1.6 Insulated Sheet Steel Roof Supported by Thermal Chairs – Additional Insulation Type Scenarios – Clear Roof



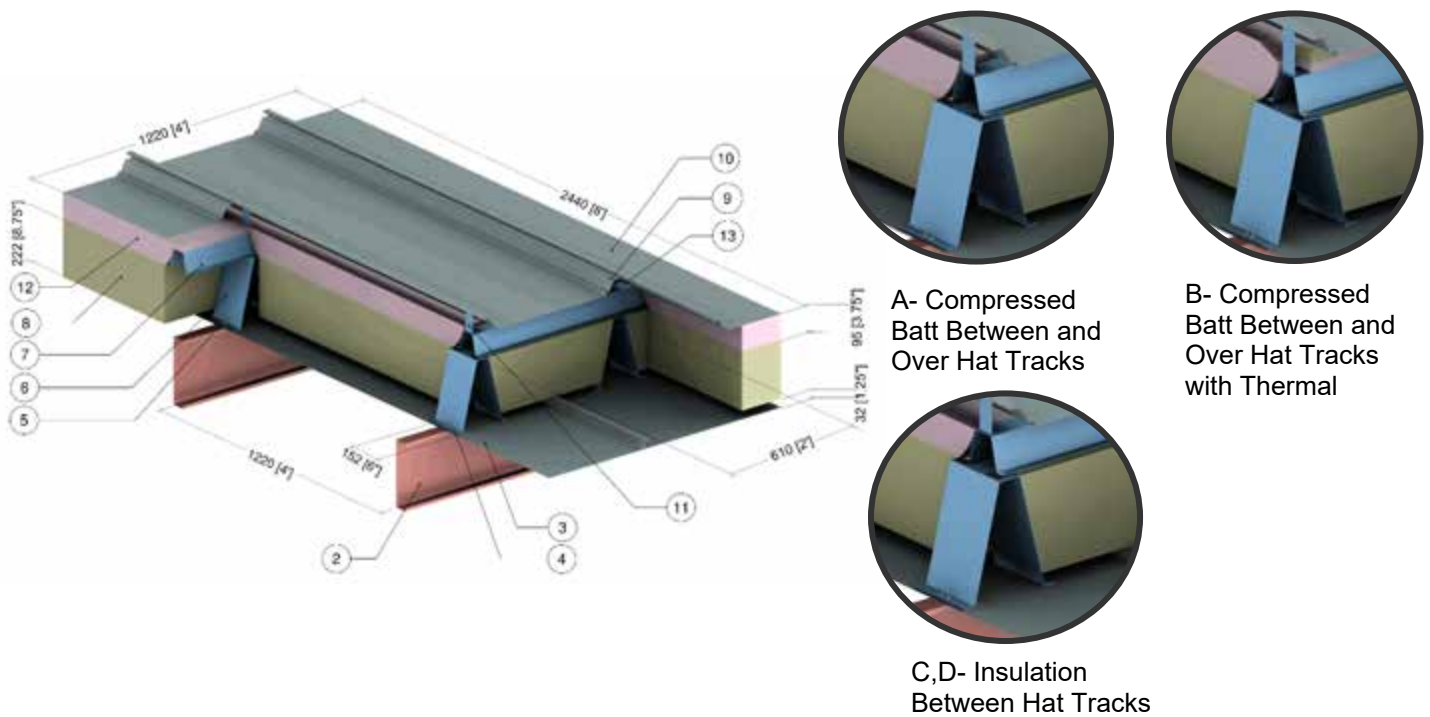
Bracket Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films (left side) ¹	-	-	R-1.1 (0.20 RSI)	-	-
2	10 x 2 Galvanized Steel Purlin @ 48" o.c.	1/10" (2.6)	430 (62)	-	489 (7830)	0.12 (500)
3	Galvanized Steel Liner	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Thermal Tape	1/8" (3.18)	0.097 (0.014)	-	-	-
5	#12 Steel Fasteners	0.22" (5.50) ∅	430 (62)	-	489 (7830)	0.12 (500)
6	10-in Galvanized Steel Hat Section (Thermal Chair)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	2-in Galvanized Steel Hat Section (Outer Rail)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Mineral Wool Insulation	10 3/4" (273)	0.240 (0.034)	R-45 (7.93 RSI)	1.8 (28)	0.29 (1090)
9	Air Gap ²	-	Varies	-	0.075 (1.2)	0.24 (1000)
10	Galvanized Steel Cladding	22 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Exterior Film (right side) ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 10.1.7 Insulated Standing Seam Roof Supported by Thermal Chairs – Clear Wall

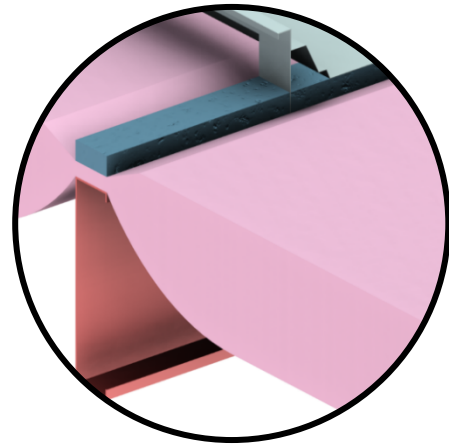
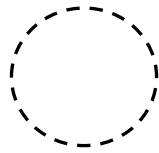


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films (left side) ¹	-	-	R-1.1 (0.20 RSI)	-	-
2	10 x 2 Galvanized Steel Purlin @ 48" o.c.	1/10" (2.6)	430 (62)	-	489 (7830)	0.12 (500)
3	Galvanized Steel Liner	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Thermal Tape	1/8" (3.18)	0.097 (0.014)	-	-	-
5	#12 Steel Fasteners	0.22" (5.50) ∅	430 (62)	-	489 (7830)	0.12 (500)
6	10-in Galvanized Steel Hat Section (Thermal Chair)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	2-in Galvanized Steel Hat Section (Outer Rail)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Mineral Wool Insulation	10 3/4" (273)	0.240 (0.034)	R-45 (7.93 RSI)	1.8 (28)	0.29 (1090)
9	Air Gap ²	-	Varies	-	0.075 (1.2)	0.24 (1000)
10	Galvanized Steel Cladding	22 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Steel Clips	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Fiberglass Batt Insulation	6" (152)	0.30 (0.043)	R-19 (3.35 RSI)	0.9 (14)	0.17 (710)
13	Thermal Block	1" (25)	0.20 (0.029)	R-5 (0.88 RSI)	9.4 (150)	0.23 (1000)
14	Exterior Film (right side) ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces was found using ISO 10077-2

Detail 10.1.8 | Standing Seam Roof with Draped Insulation – Clear Wall



Bracket Detail

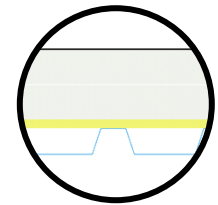
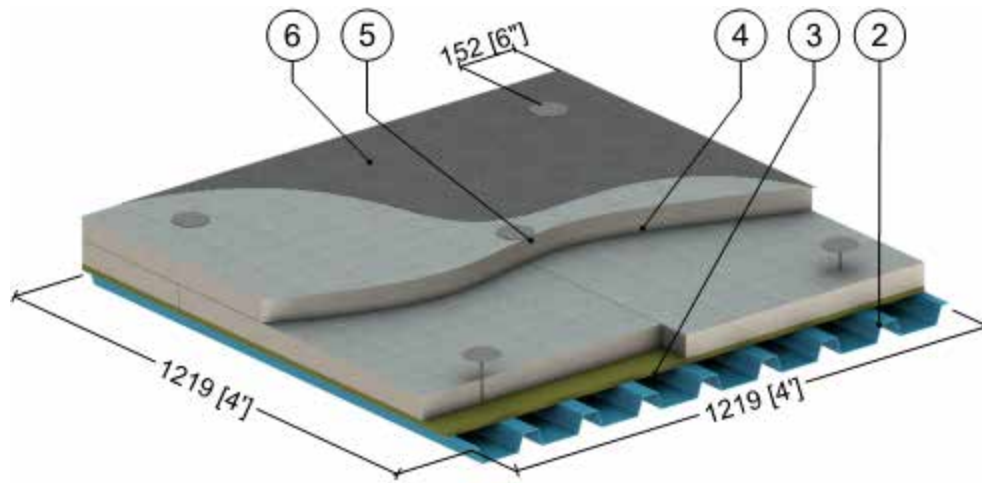
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films (left side) ¹	-	-	R-0.6 (0.11 RSI)	-	-
2	10 x 2 Galvanized Steel Purlin @ 48" o.c.	1/10" (2.6)	430 (62)	-	489 (7830)	0.12 (500)
3	Air Gap ²	-	Varies	-	0.075 (1.2)	0.24 (1000)
4	Galvanized Steel Cladding	22 Gauge	430 (62)	-	489 (7830)	0.12 (500)
5	Steel Clips	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
6	Fiberglass Batt Insulation	6" (152)	0.30 (0.043)	R-19 (3.35 RSI)	0.9 (14)	0.17 (710)
7	Thermal Block	1" (25)	0.20 (0.029)	R-5 (0.88 RSI)	9.4 (150)	0.23 (1000)
8	Exterior Film (right side) ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

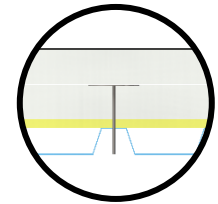
² The thermal conductivity of air spaces was found using ISO 100077-2

Detail 10.1.9

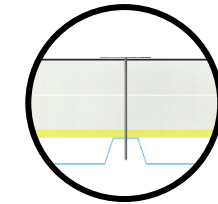
Exterior Insulated Low Sloped Roof (3.4 fasteners/m², 0.3 fasteners/ft²)– Clear Roof Assembly



Fully Adhered



Partially Fastened

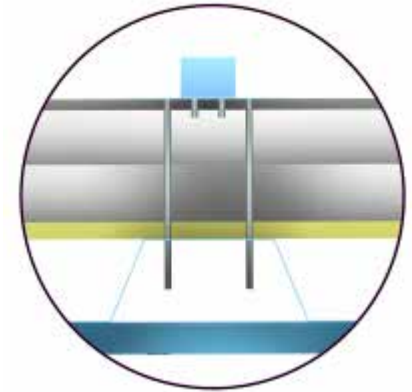
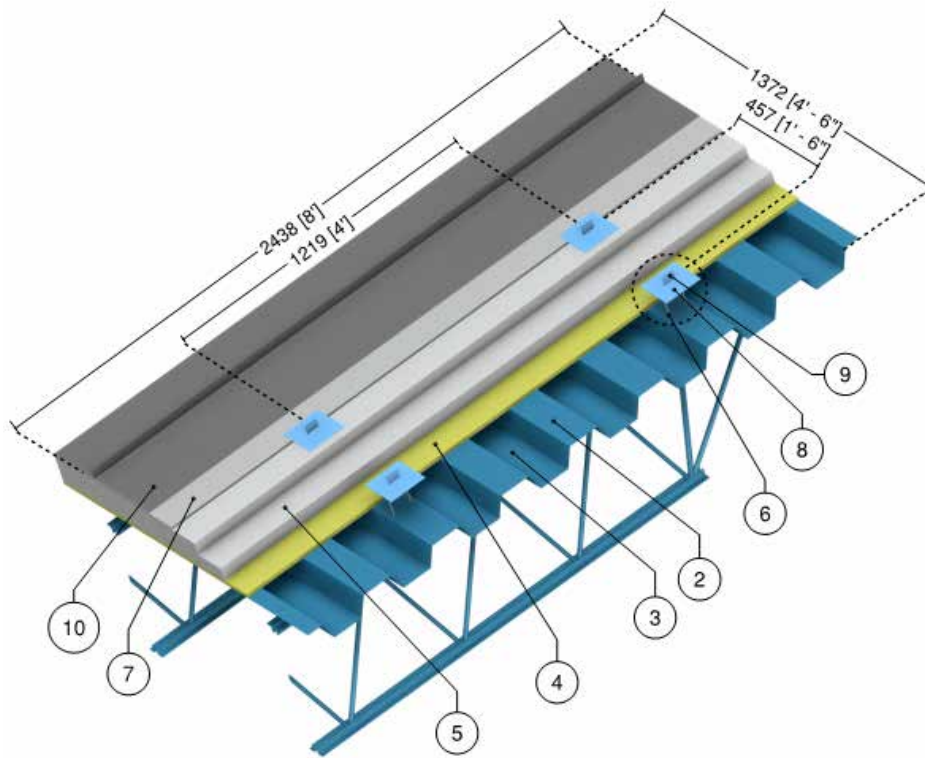


Fully Fastened

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-1.1 (0.19 RSI)	-	-
2	Steel Deck	1/16" (1.6)	430 (62)	-	489 (7830)	0.12 (500)
3	Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
4	2 Layer Polyisocyanurate Insulation	Varies	Varies	R-22.8 to R-39.9 (4.02 to 7.03 RSI)	1.8 (28)	0.29 (1220)
5	#10 or #14 Steel Fasteners	3/16" (4.8) ∅, 1/4" (6.1) ∅	430 (62)	-	489 (7830)	0.12 (500)
6	Asphalt Cover Board and Roof Membrane	1/2" (12)	3 (0.43)	R-0.2 (0.03 RSI)	100 (1600)	100 (1500)
7	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 10.1.10 Exterior Insulated Sloped Metal Roof with Polyisocyanurate Insulation and Bearing Plates 18" x 48" spacing – Clear Roof Assembly



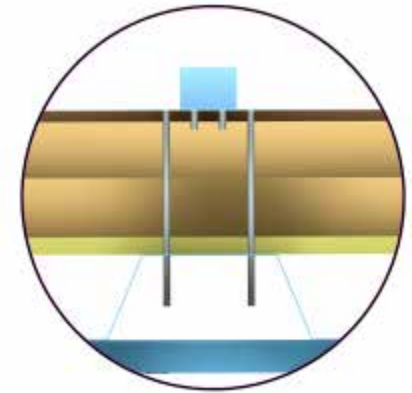
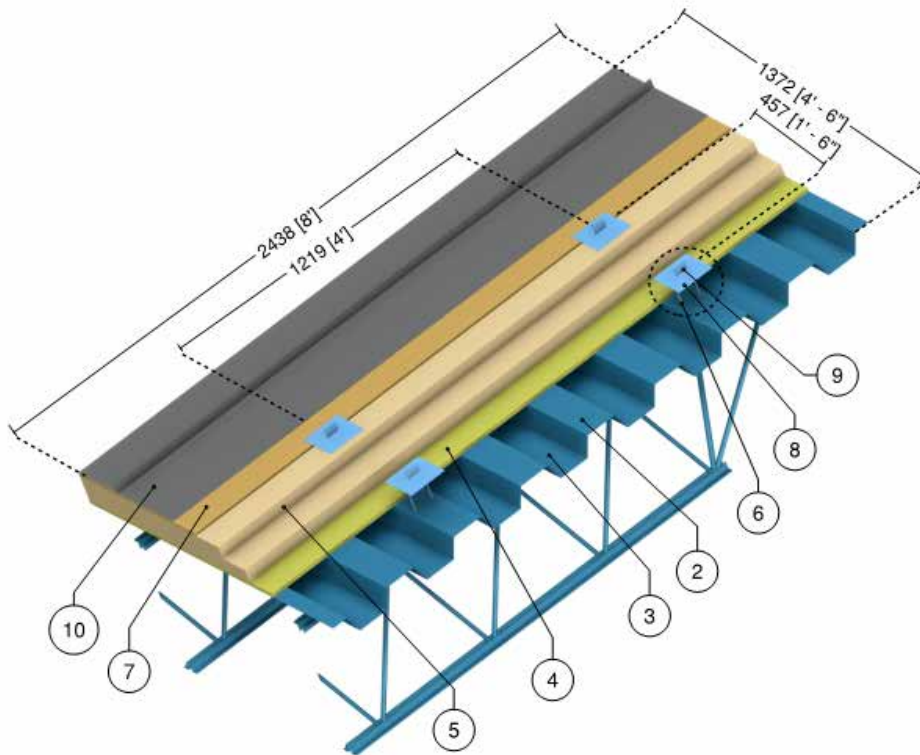
Bearing Plate and Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-1.1 (0.2 RSI)	-	-
2	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
3	Air in Steel Deck Flute ²	3" (76)	0.87 (0.13)	R-3.5 (0.6 RSI)	0.075 (1.2)	0.24 (1000)
4	Gypsum Board	5/8" (16)	1.11 (0.16)	R-0.6 (0.1 RSI)	50 (800)	0.26 (1090)
5	2 Layer Polyisocyanurate Insulation	Varies	0.18 (0.025)	R-22.8 to R-45.6 (4.02 RSI to 8.03 RSI)	1.8 (28)	0.29 (1220)
6	#14 Steel Fasteners	1/4" (6.1) ∅	347 (50)	-	489 (7830)	0.12 (500)
7	Polyisocyanurate Cover Board	1/2" (12)	0.18 (0.025)	R-2.9 (0.5 RSI)	1.8 (28)	100 (1500)
8	Galvanized Steel Bearing Plates	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Roof Panel Clip (1 1/2" x 3/4")	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
10	Standing Seam Roof Panel	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within the assembly was found using ISO 100077-2

Detail 10.1.11 Exterior Insulated Sloped Metal Roof with High Compressive Strength Mineral Wool Insulation and Bearing Plates 18" x 48" spacing – Clear Roof Assembly



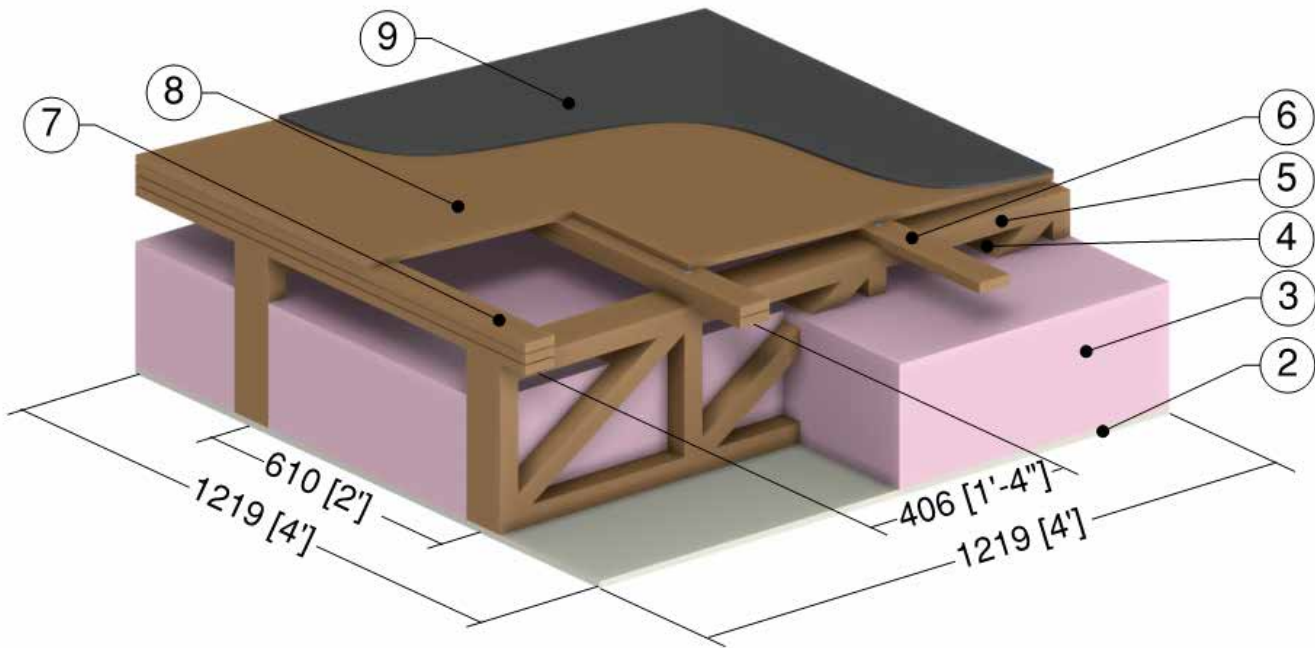
Bearing Plate and Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-1.1 (0.2 RSI)	-	-
2	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
3	Air in Steel Deck Flute ²	3" (76)	0.87 (0.13)	R-3.5 (0.6 RSI)	0.075 (1.2)	0.24 (1000)
4	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.1 RSI)	50 (800)	0.26 (1090)
5	High Compressive Strength Mineral Wool Insulation	Varies	0.26 (0.038)	R-15.2 to R-30.4 (2.68 RSI to 5.35 RSI)	9 (150)	0.29 (1220)
6	#14 Steel Fasteners	1/4" (6.1) ∅	347 (50)	-	489 (7830)	0.12 (500)
7	Insulating cover board	1/2" (12)	0.26 (0.038)	R-1.9 (0.33 RSI)	14 (220)	0.29 (1220)
8	Galvanized Steel Bearing Plates	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Roof Panel Clip (1 1/2" x 3/4")	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
10	Standing Seam Roof Panel	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within the assembly was found using ISO 100077-2

Detail 10.1.12 | Ventilated Wood Frame Low Sloped Roof – Clear Roof Assembly

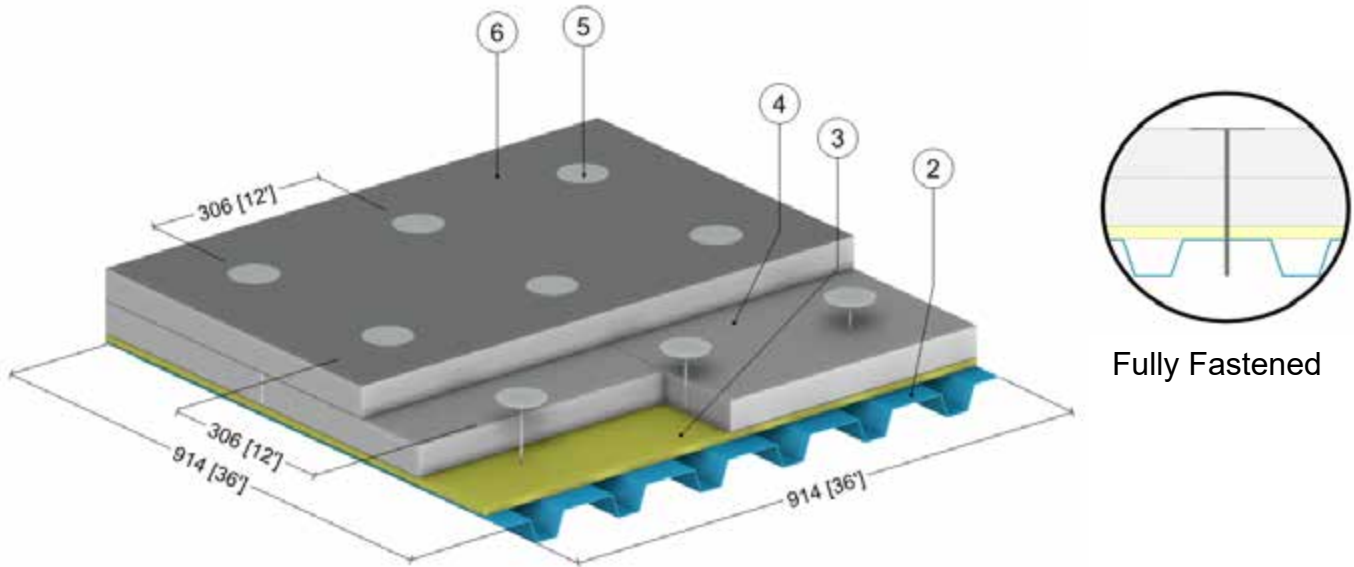


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Roof Insulation	Varies	-	R-20 to R-40 (3.52 RSI to 7.04 RSI)	0.9 (14)	0.17 (710)
4	Air Cavity	Varies	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	2x4 Parallel Wood Truss (24" o.c.)	-	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Wood Purlins (16" o.c.)	-	0.69 (0.10)	-	31 (500)	0.45 (1880)
7	Fasteners	0.44" (11) Ø	430 (62)	-	489 (7830)	0.12 (500)
8	Roof Wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.13 RSI)	50 (800)	0.26 (1090)
9	Roof Cover	1/4" (6.3)	1.1 (0.16)	R-0.2 (0.04 RSI)	50 (800)	0.26 (1090)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 10.1.13

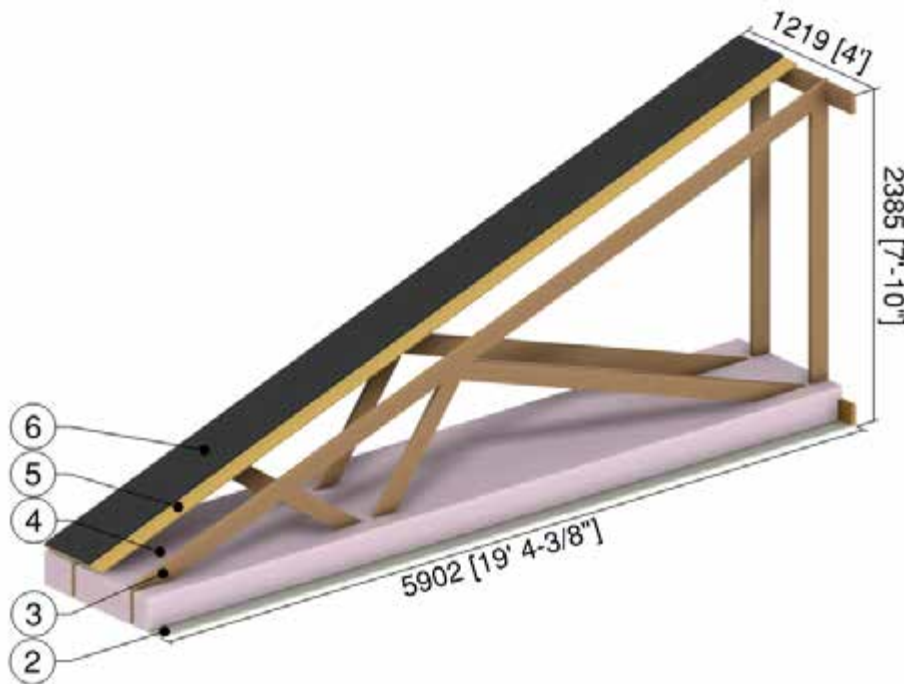
Exterior Insulated Low Sloped Roof (10.8 fasteners/m², 1 fasteners/ft²) – Clear Roof Assembly



ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-1.1 (0.19 RSI)	-	-
2	Steel Deck	1/16" (1.6)	430 (62)	-	489 (7830)	0.12 (500)
3	Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
4	2 Layer Polyisocyanurate Insulation	Varies	-	R-22.8 to R-39.9 (4.02 to 7.03 RSI)	1.8 (28)	0.29 (1220)
5	#14 Steel Fasteners	1/4" (6.1) ∅	430 (62)	-	489 (7830)	0.12 (500)
6	Asphalt Cover Board and Roof Membrane	1/2" (12)	3 (0.43)	R-0.2 (0.03 RSI)	100 (1600)	100 (1500)
7	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 10.1.14 | Sloped Wood Framed Roof with Insulation at Ceiling



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Roof Truss (24" o.c.)	-	0.69 (0.10)	-	31 (500)	0.45 (1880)
4	Attic Insulation	9" (228)	0.29 (0.042)	R-30 (5.3 RSI)	0.9 (14)	0.17 (710)
5	Roof Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
6	Asphalt Shingles	-	-	R-0.45 (0.08 RSI)	57 (920)	0.3 (1260)
7	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 10.1.15 | Sloped Wood Framed Roof with Insulation at Roof Sheathing

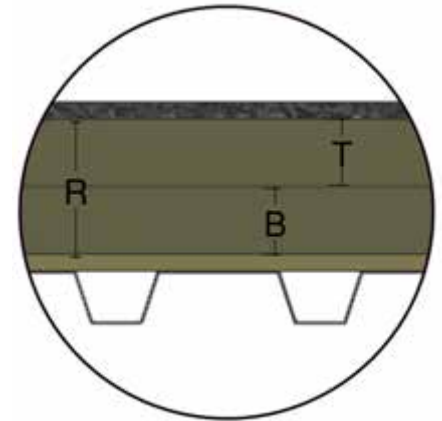
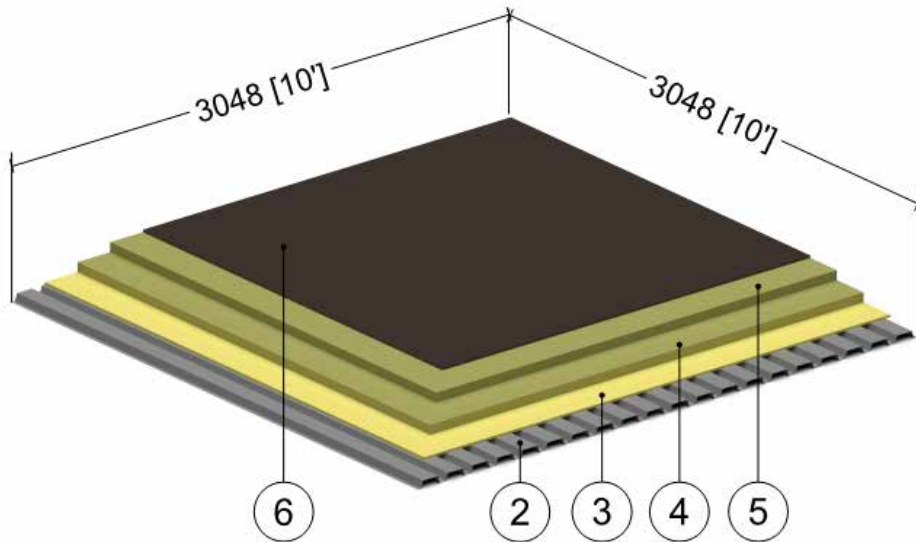


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Roof Truss (24" o.c.)	-	0.69 (0.10)	-	31 (500)	0.45 (1880)
4	Polyurethane Foam Insulation	5" (127)	0.17 (0.024)	R-30 (5.3 RSI)	1.8 (28)	0.29 (1220)
5	Roof Wood Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
6	Asphalt Shingles	-	-	R-0.45 (0.08 RSI)	57 (920)	0.3 (1260)
7	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 10.1.16

Exterior Insulated Low Sloped Roof with Fully Adhered Roof Membrane and Mineral Wool Insulation – Clear Roof Assembly



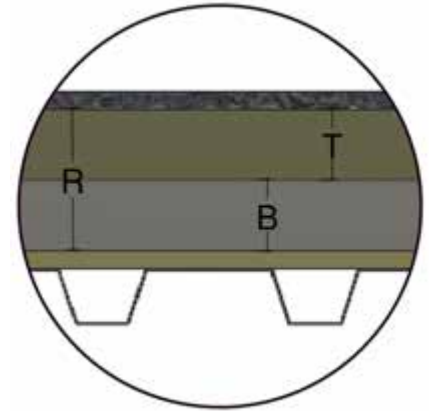
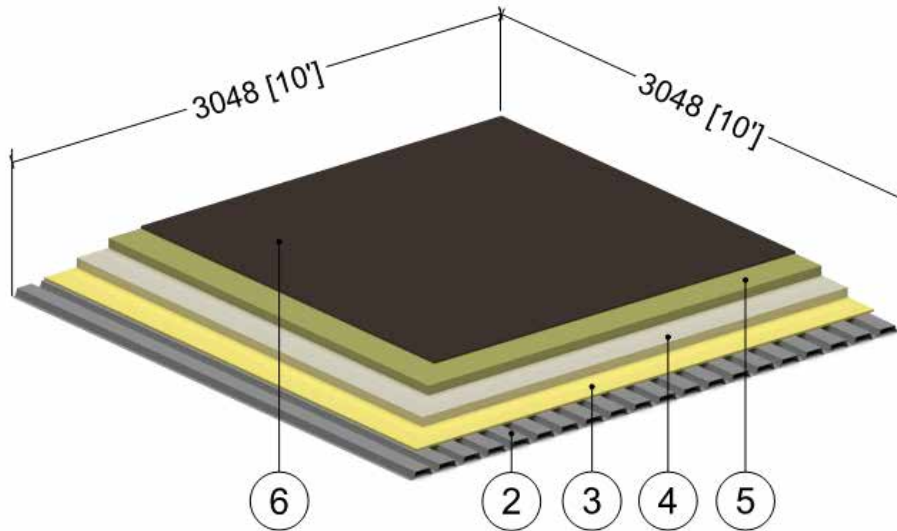
Total Roof Insulation R	Bottom Roof Insulation B	Top Roof Insulation T
R-19.8	R-9.9	R-9.9
R-29.7	R-19.9	R-9.9
R-39.7	R-29.8	R-9.9
R-49.7	R-39.8	R-9.9

ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-1.1 (0.19 RSI)	-	-
2	Steel Deck	1/16" (1.6)	430 (62)	-	489 (7830)	0.12 (500)
3	Gypsum board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
4	Bottom Layer Mineral Wool Insulation	Varies	-	R-9.9 to R-39.8 (1.74 to 7.01 RSI)	1.8 (28)	0.29 (1220)
5	Top Layer Mineral Wool Insulation	2" (51)	-	R-9.9 (1.74 RSI)	-	-
6	Asphalt Cover Board and Roof Membrane	1/2" (12)	3 (0.43)	R-0.2 (0.03 RSI)	100 (1600)	100 (1500)
7	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 10.1.17

Exterior Insulated Low Sloped Roof with Fully Adhered Roof Membrane and Mineral Wool and Polyisocyanurate Insulation – Clear Roof Assembly



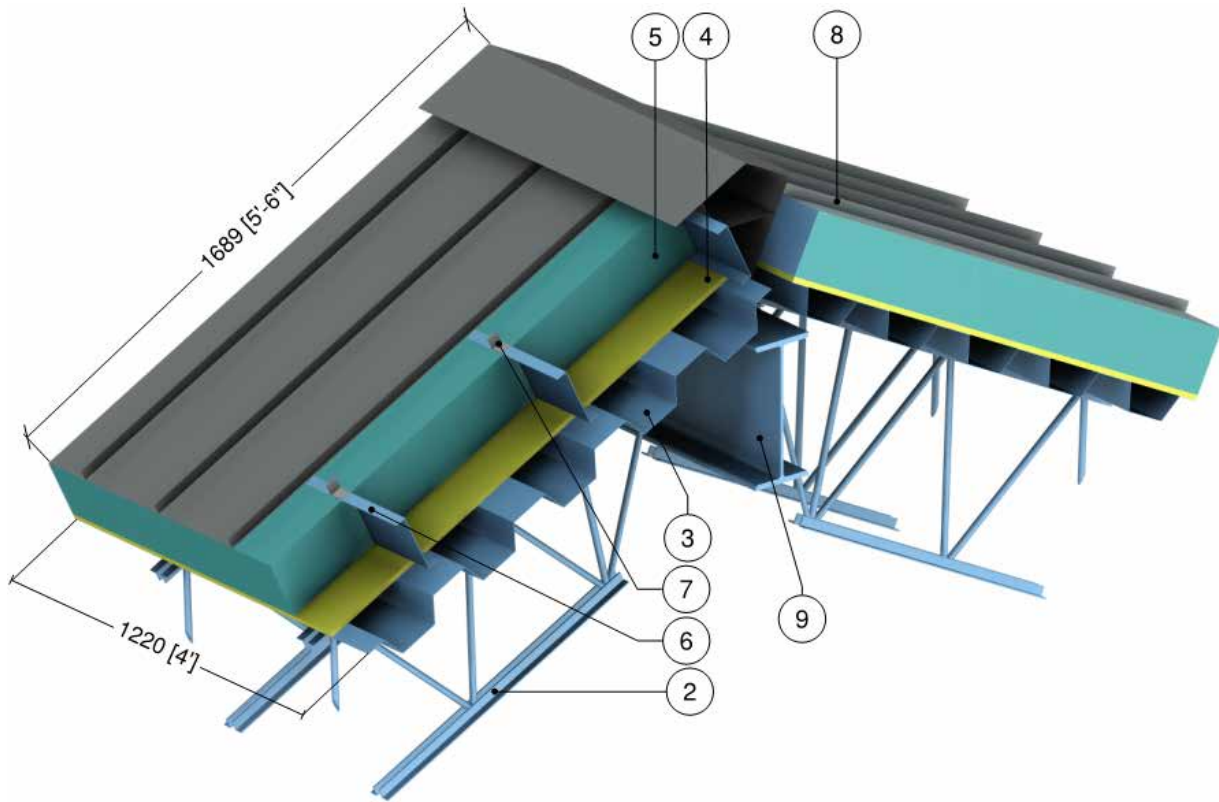
Total Roof Insulation R	Bottom Roof Insulation B	Top Roof Insulation T
R-21.3	R-11.4	R-9.9
R-32.7	R-22.8	R-9.9
R-44.1	R-34.2	R-9.9
R-55.5	R-45.6	R-9.9

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-1.1 (0.19 RSI)	-	-
2	Steel Deck	1/16" (1.6)	430 (62)	-	489 (7830)	0.12 (500)
3	Gypsum board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
4	Bottom Layer Polyisocyanurate Insulation	Varies	-	R-9.9 to R-39.8 (2.01 to 8.03 RSI)	1.8 (28)	0.29 (1220)
5	Top Layer Mineral Wool Insulation	2" (51)	-	R-9.9 (1.74 RSI)		
6	Asphalt Cover Board and Roof Membrane	1/2" (12)	3 (0.43)	R-0.2 (0.03 RSI)	100 (1600)	100 (1500)
7	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 10.2.1

Exterior Insulated Sloped Metal Roof with Metal Sub-Girts (24" o.c.) Supporting Metal Roof – Ridge Intersection



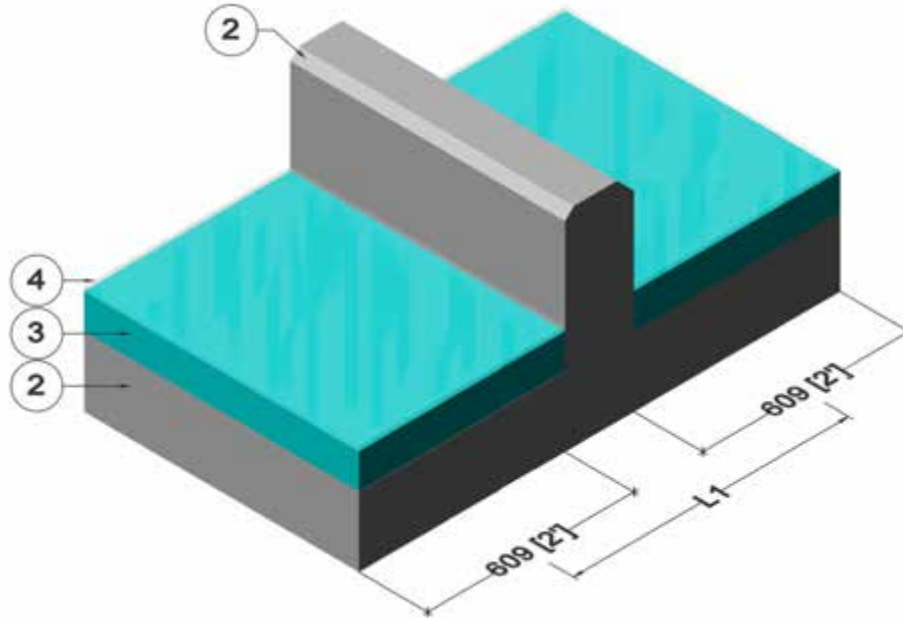
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-1.1 (0.2 RSI)	-	-
2	Open Web Steel Joist (550C) @ 24" (610) o.c.	-	347 (50)	-	489 (7830)	0.12 (500)
3	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
4	Roof Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
5	Rigid Roof Insulation	Varies	-	R-20 to R-30 (3.52 RSI to 5.28 RSI)	1.8 (28)	0.29 (1220)
6	Sub-Girt with 1 1/2" Flange @ 24" (610) o.c.	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Roof Clips (1 1/2" x 1 1/2")	16 Gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Metal Roof with Ridge Flashing	24 Gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Steel Beam (W410)	-	347 (50)	-	489 (7830)	0.12 (500)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation



Detail 10.2.2

Insulated Concrete Slab – Concrete Curb or Wall Intersection

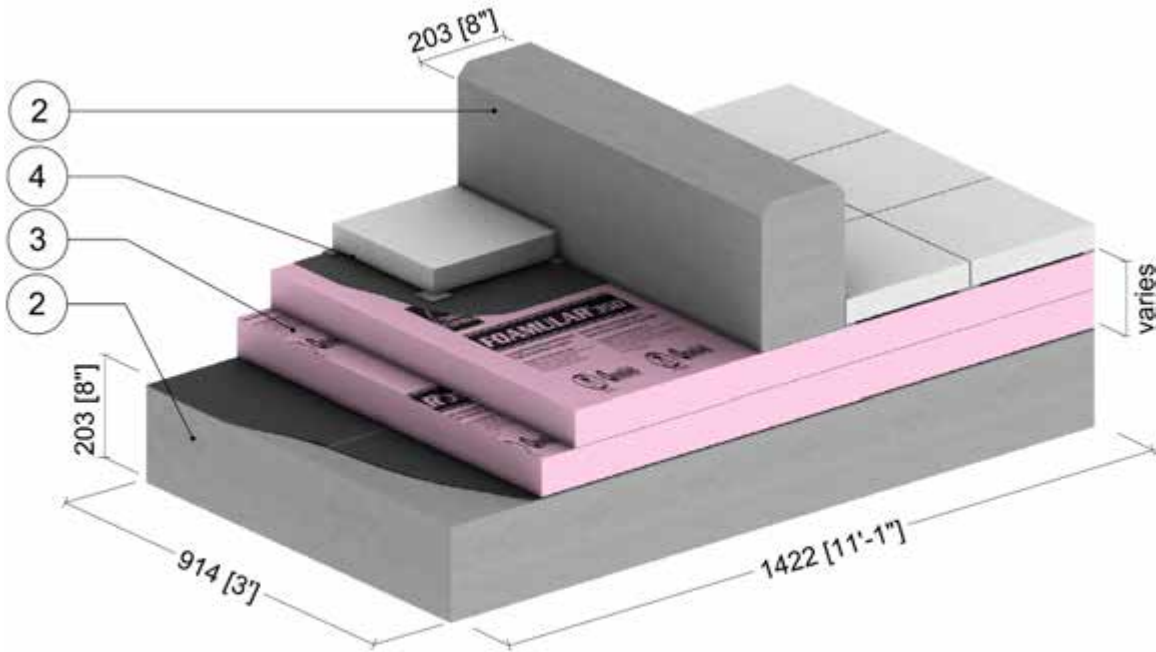


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI)	-	-
2	Concrete Slab, Curb or Wall	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
3	Roof Insulation	4" (102)	-	R-20 (3.5 RSI)	1.8 (28)	0.29 (1220)
4	Finish roof material is incorporated into exterior heat transfer coefficient					
5	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 10.2.3

Owens Corning Insulated Projected Membrane Roof – Floating Concrete Wall Intersection

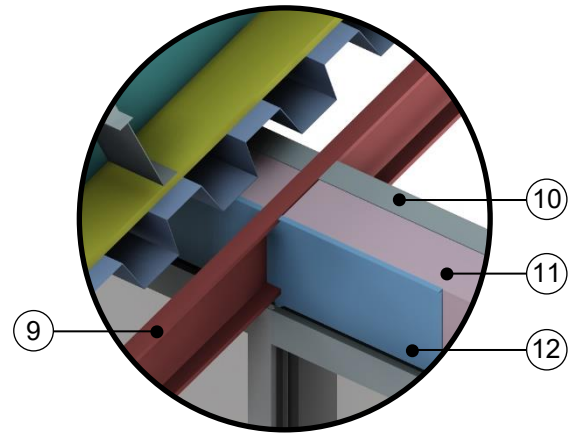
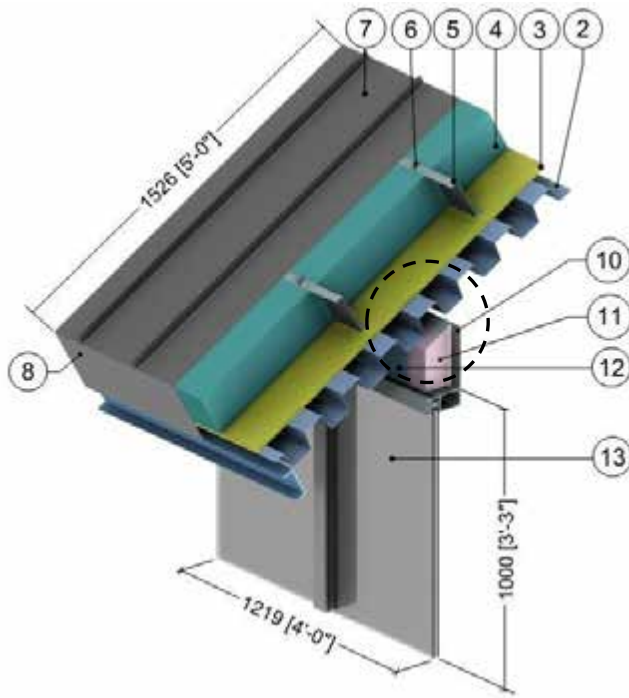


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI)	-	-
2	Concrete	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
3	Fomular 350 Extruded Polystyrene Rigid Insulation Type 4	Varies	-	R-20 to R-40 (3.52 RSI to 7.04 RSI)	varies	-
4	Finish roof material is incorporated into exterior heat transfer coefficient					
5	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 10.2.4

Exterior Insulated Sloped Metal Roof with Metal Sub-Girts (24" o.c.) Supporting Standing Seam Metal Roof and Curtain Wall – Roof to Wall Intersection with Through Wall Structural Beam and Continuous Through Wall Structural Metal Deck



Through Beam and Metal Deck at Curtain Wall

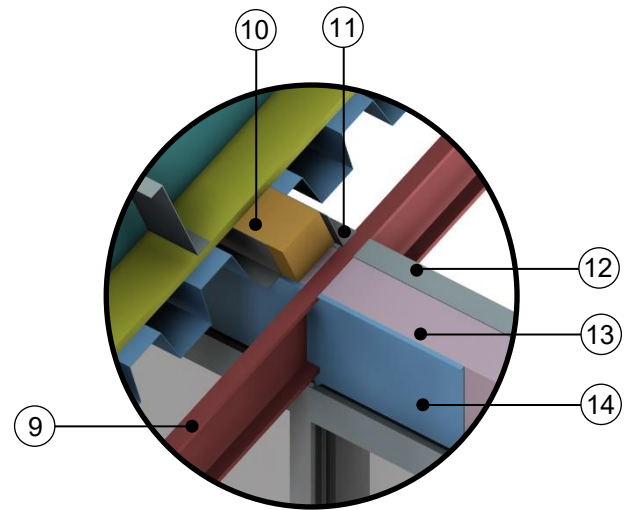
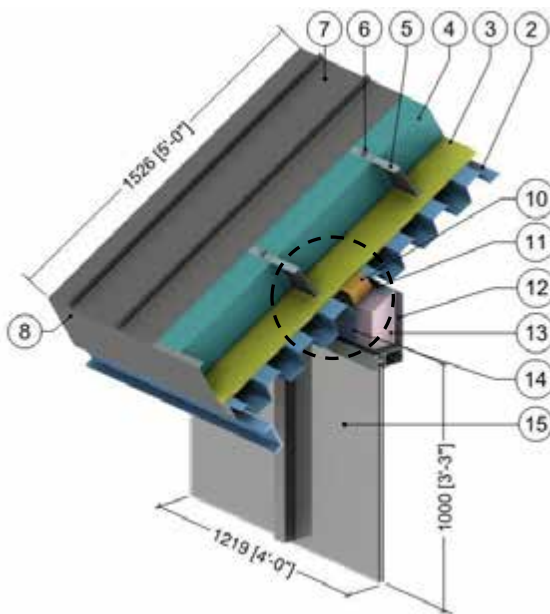
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
3	Roof Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
4	Rigid Roof Insulation	7" (183)	0.2 (0.03)	R-35 (6.16 RSI)	1.8 (28)	0.29 (1220)
5	Sub-Girt with 1 1/2" Flange @ 24" (610) o.c.	16 gauge	430 (62)	-	489 (7830)	0.12 (500)
6	Roof Clips (1 1/2" x 1 1/2")	16 gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Metal Roof	24 gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Roof Closure Panel	16 gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Steel Beam (W410)	-	347 (50)	-	489 (7830)	0.12 (500)
10	Interior Closure Panel	12 gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Fiberglass Insulation	4 1/2" (118)	0.24 (0.034)	R-19 (3.35 RSI)	4 (64)	0.20 (850)
12	Exterior Closure Panel	12 gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Aluminum Curtain Wall Vision System: thermally broken frame, double glazed IGU U _{COG} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K) ²					
14	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 10.2.5

Exterior Insulated Sloped Metal Roof with Metal Sub-Girts (24" o.c.) Supporting Standing Seam Metal Roof and Curtain Wall – Roof to Wall Intersection with Through Wall Structural Beam and Thermally Broken Structural Metal Deck



Through Beam and Thermally Broken Metal Deck

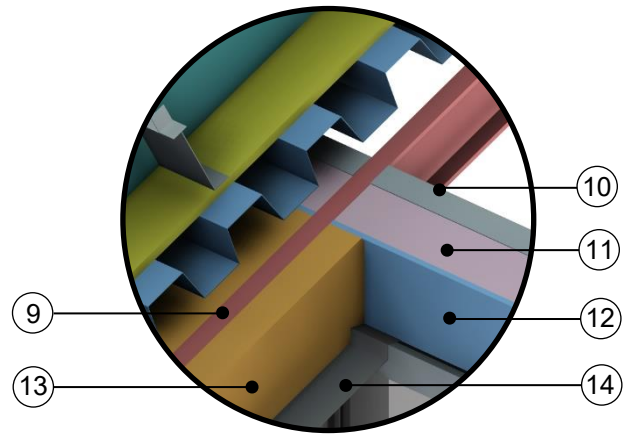
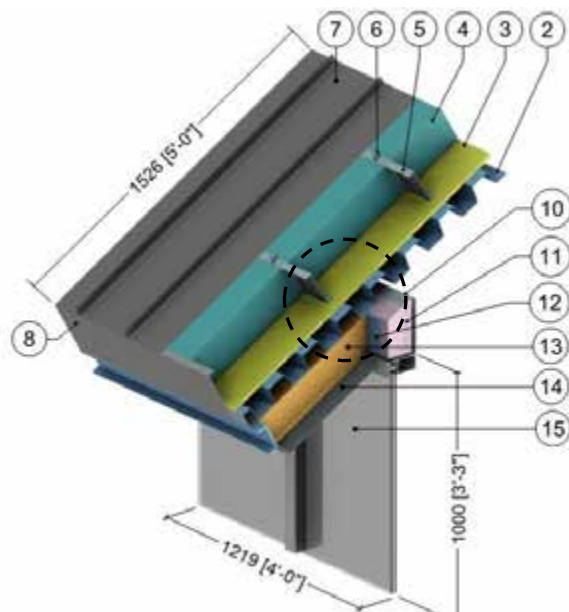
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
3	Roof Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
4	Rigid Roof Insulation	7" (183)	0.2 (0.03)	R-35 (6.16 RSI)	1.8 (28)	0.29 (1220)
5	Sub-Girt with 1 1/2" Flange @ 24" (610) o.c.	16 gauge	430 (62)	-	489 (7830)	0.12 (500)
6	Roof Clips (1 1/2" x 1 1/2")	16 gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Metal Roof	24 gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Roof Closure Panel	16 gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Steel Beam (W410)	-	347 (50)	-	489 (7830)	0.12 (500)
10	Continuous Spray Foam Insulation	4" (100)	0.17 (0.024)	R-24 (4.23 RSI)	2.8 (39)	0.35 (1470)
11	Stiffening Brackets	16 gauge	430 (62)	-	489 (7830)	0.12 (500)
12	Interior Closure Panel	12 gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Fiberglass Insulation	4 1/2" (118)	0.24 (0.034)	R-19 (3.35 RSI)	4 (64)	0.20 (850)
14	Exterior Closure Panel	12 gauge	430 (62)	-	489 (7830)	0.12 (500)
15	Aluminum Curtain Wall Vision System: thermally broken frame, double glazed IGU U _{COG} = 0.32 BTU/hr-ft ² -°F (1.82 W/m ² K) ²					
16	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 10.2.6

Exterior Insulated Sloped Metal Roof with Metal Sub-Girts (24" o.c.) Supporting Standing Seam Metal Roof and Curtain Wall – Roof to Wall Intersection with Through Wall Structural Beam and Fully Insulated Soffit



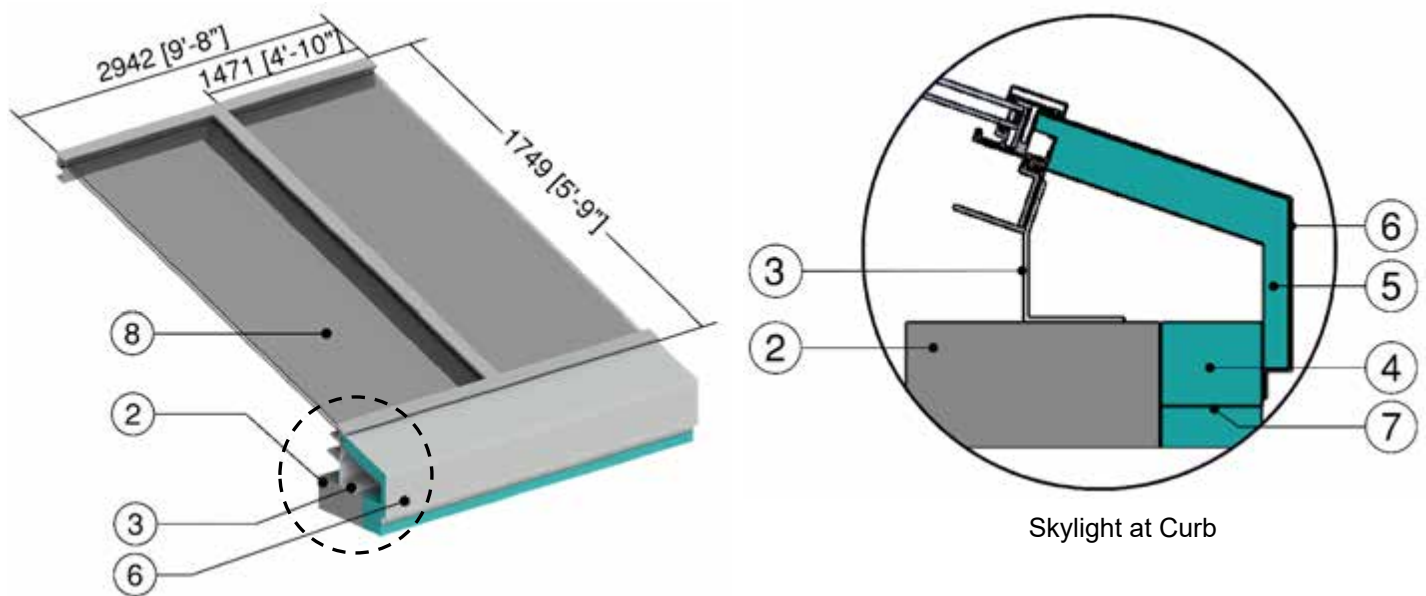
Through Beam and Metal Deck at Soffit

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.1 (0.12 RSI to 0.20 RSI)	-	-
2	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
3	Roof Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
4	Rigid Roof Insulation	7" (183)	0.2 (0.03)	R-35 (6.16 RSI)	1.8 (28)	0.29 (1220)
5	Sub-Girt with 1 1/2" Flange @ 24" (610) o.c.	16 gauge	430 (62)	-	489 (7830)	0.12 (500)
6	Roof Clips (1 1/2" x 1 1/2")	16 gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Metal Roof	24 gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Roof Closure Panel	16 gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Steel Beam	-	347 (50)	-	489 (7830)	0.12 (500)
10	Curtain Wall Bracket and Closure Panel	12 gauge	430 (62)	-	489 (7830)	0.12 (500)
11	Curtain Wall Fill Insulation	4 1/2" (118)	0.24 (0.034)	R-19 (3.35 RSI)	4 (64)	0.20 (850)
12	Curtain Wall Closure Panel	12 gauge	430 (62)	-	489 (7830)	0.12 (500)
13	Rigid Soffit Insulation	6" (150)	0.17 (0.024)	R-36 (6.34 RSI)	2.8 (39)	0.35 (1470)
14	Metal Soffit Panel	24 gauge	430 (62)	-	489 (7830)	0.12 (500)
15	Aluminum Curtain Wall Vision System: thermally broken frame, double glazed IGU U _{COG} = 0.32 BTU/hr-ft ² -°F (1.82 W/m ² K) ²					
16	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 10.2.7 Aluminum Framed Double Glazed Skylight – Exterior Insulated Concrete Curb Intersection



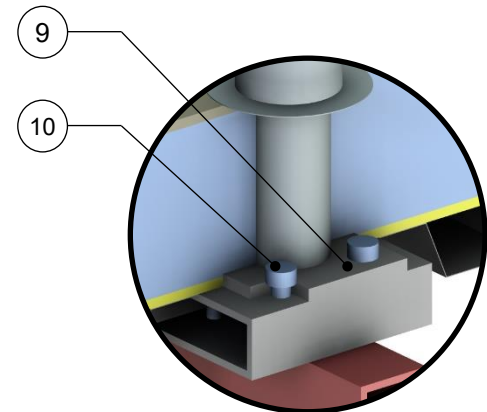
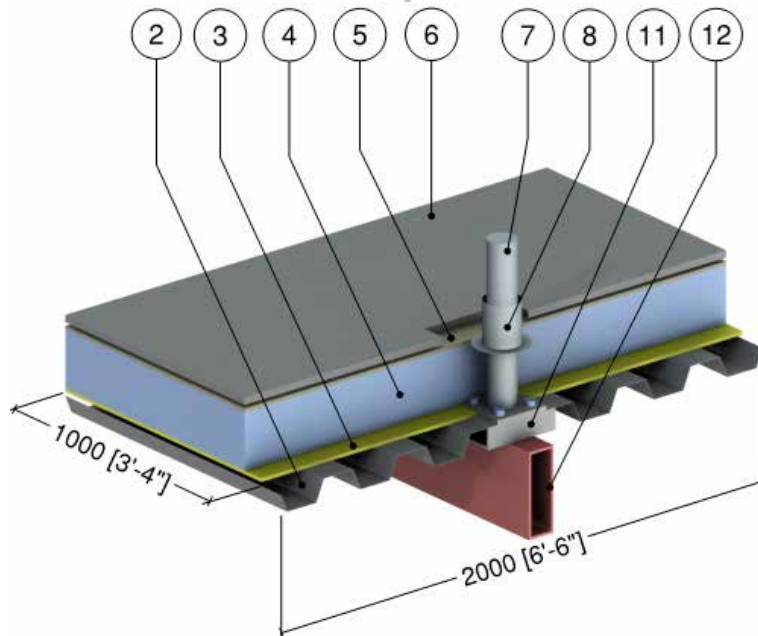
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 to R-1.2 (0.11 RSI to 0.22 RSI)	-	-
2	Curb	5" (127)	12.5 (1.8)	-	140 (2250)	0.20 (850)
3	Frame Angle	0.19" (5)	347 (50)	-	489 (7830)	0.12 (500)
4	Curb Insulation	4" (102)	0.20 (0.029)	-	1.8 (28)	0.29 (1220)
5	Flashing Insulation	Varies	0.20 (0.029)	-	1.8 (28)	0.29 (1220)
6	Flashing	20 gauge	1109 (160)	-	171 (2739)	0.21 (900)
7	Horizontal Z-Girt	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
8	Aluminum Curtain Wall Vision System: thermally broken frame, double glazed IGU $U_{COG} = 0.45 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ (1.33 W/m ² K) ²					
9	Exterior Film ¹	-	-	R-0.2 to R-0.7 (0.03 RSI to 0.12 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 10.3.1

Exterior Insulated Conventional Flat Roof – Roof Anchor



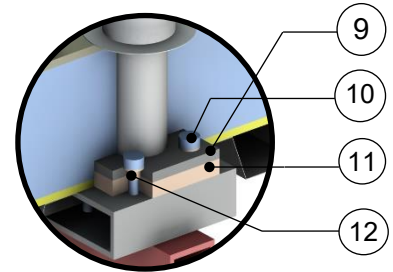
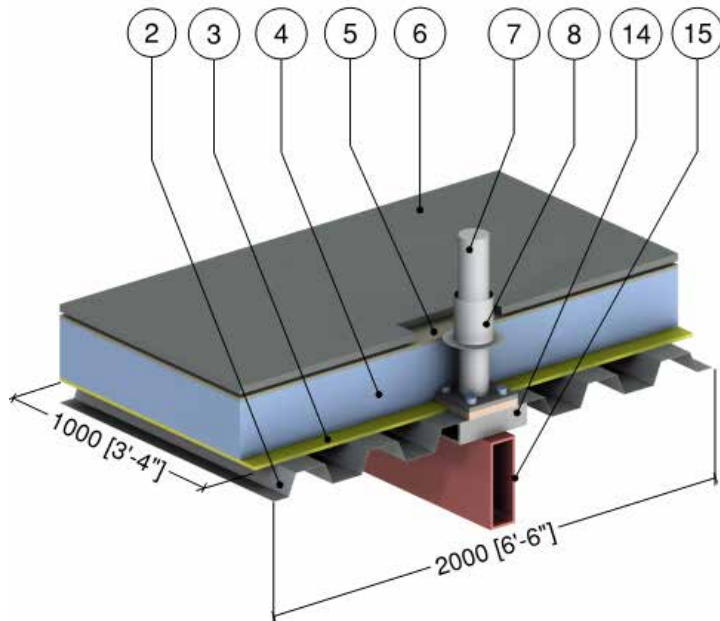
Roof Anchor

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-1.1 (0.19 RSI)	-	-
2	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
3	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
4	Extruded Polystyrene Insulation (XPS)	8" (203)	0.20 (0.029)	R-40 (7.04 RSI)	1.8 (28)	0.29 (1220)
5	Asphalt Cover Board and Roof Membrane	1/2" (13)	3 (0.43)	R-0.2 (0.03 RSI)	100 (1600)	100 (1500)
6	Concrete Pavers	1" (25)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Roof Anchor	1/4" (6)	430 (62)	-	489 (7830)	0.12 (500)
8	Roof Anchor Flashing	18 Gauge	1100 (160)	-	171 (2739)	0.21 (900)
9	8" x 8" x 5/8" Base Plate	5/8" (16)	430 (62)	-	489 (7830)	0.12 (500)
10	Stainless Steel Bolts	3/4" (6) ∅	117 (17)	-	489 (7830)	0.12 (500)
11	3" x 8" x 11" HSS	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
12	Structural Steel	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
13	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

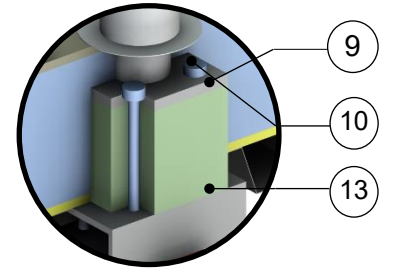
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 10.3.2

Exterior Insulated Conventional Flat Roof – Armatherm Thermal Break under Roof Anchor



Armatherm FRR Roof Anchor Thermal Break



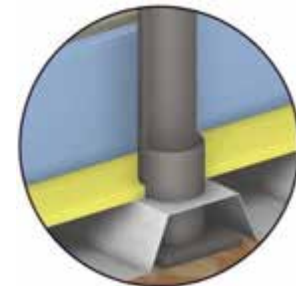
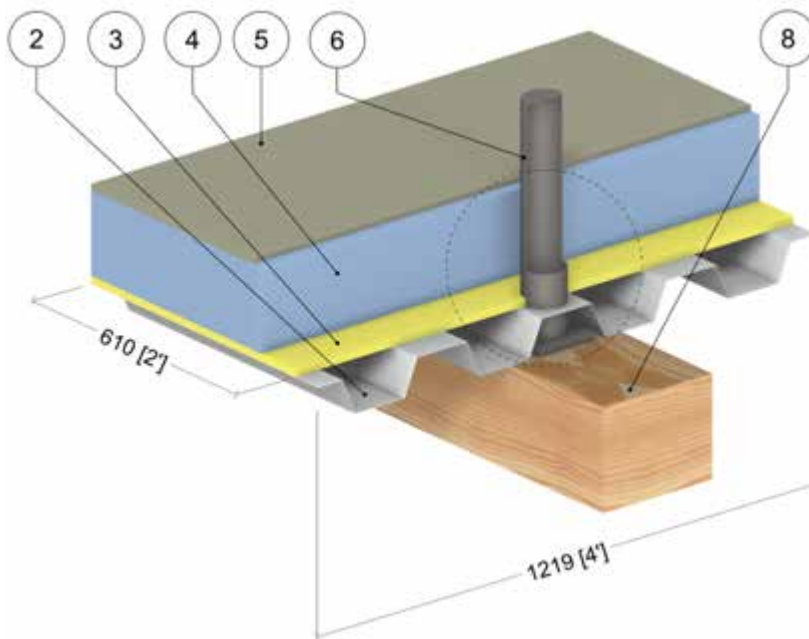
Armatherm 500 Roof Anchor Thermal Break

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-1.1 (0.19 RSI)	-	-
2	Steel Deck	1/16" (1.6)	347 (50)	-	489 (7830)	0.12 (500)
3	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
4	Extruded Polystyrene Insulation (XPS)	8" (203)	0.20 (0.029)	R-40 (7.04 RSI)	1.8 (28)	0.29 (1220)
5	Asphalt Cover Board and Roof Membrane	1/2" (13)	3 (0.43)	R-0.2 (0.03 RSI)	100 (1600)	100 (1500)
6	Concrete Pavers	1" (25)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Roof Anchor	1/4" (6)	430 (62)	-	489 (7830)	0.12 (500)
8	Roof Anchor Flashing	18 Gauge	1100 (160)	-	171 (2739)	0.21 (900)
9	8" x 8" x 5/8" Base Plate	5/8" (16)	430 (62)	-	489 (7830)	0.12 (500)
10	Stainless Steel Bolts	3/4" (6) ∅	117 (17)	-	489 (7830)	0.12 (500)
11	Armatherm FRR Thermal Break	1/2" (13)	1.4 (0.2)	-	85 (1362)	-
12	Armatherm FRR Washers and Bushing	-	1.4 (0.2)	-	85 (1362)	-
13	Armatherm 500 Thermal Break	6" (152)	0.32 (0.05)	-	-	-
14	3" x 8" x 11" HSS	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
15	Structural Steel	3/8" (10)	347 (50)	-	489 (7830)	0.12 (500)
16	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

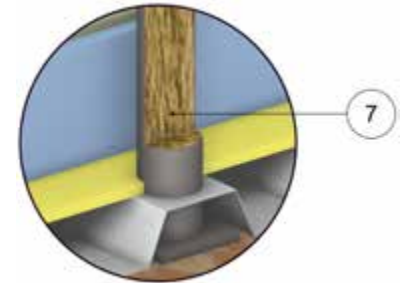
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 10.3.3

Exterior Insulated Conventional Low-Sloped Roof – Roof Anchor



Without Fill Insulation



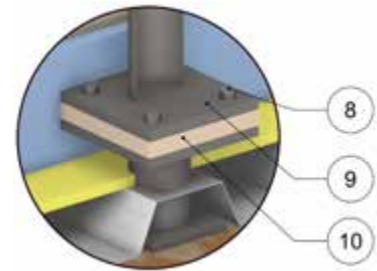
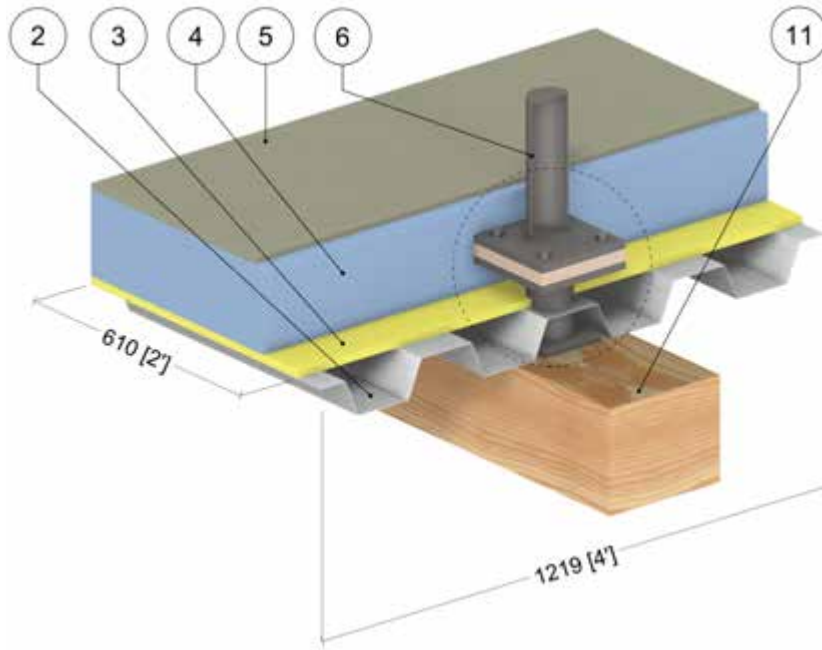
With Fill Insulation

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-1.1 (0.19 RSI)	-	-
2	Steel Deck	1/32" (1.1)	430 (62)	-	489 (7830)	0.12 (500)
3	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
4	Extruded Polystyrene Insulation (XPS)	6-7/8" (175)	0.20 (0.029)	R-34.3 (6.03 RSI)	1.8 (28)	0.29 (1220)
5	Sheathing Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Roof Anchor	3/16" (4.8)	347 (50)	-	489 (7830)	0.12 (500)
7	Mineral Wool Insulation	-	0.24 (0.034)	-	4 (64)	0.20 (850)
8	Glulam Beam	8-1/2" (216)	0.97 (0.14)	-	31 (500)	0.45 (1880)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

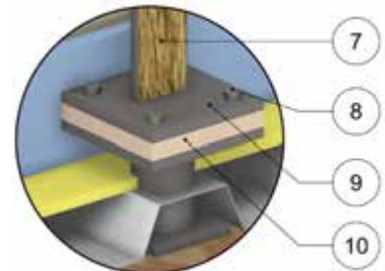
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 10.3.4

Exterior Insulated Conventional Low-Sloped Roof – Thermal Break in Roof Anchor



Without Fill Insulation



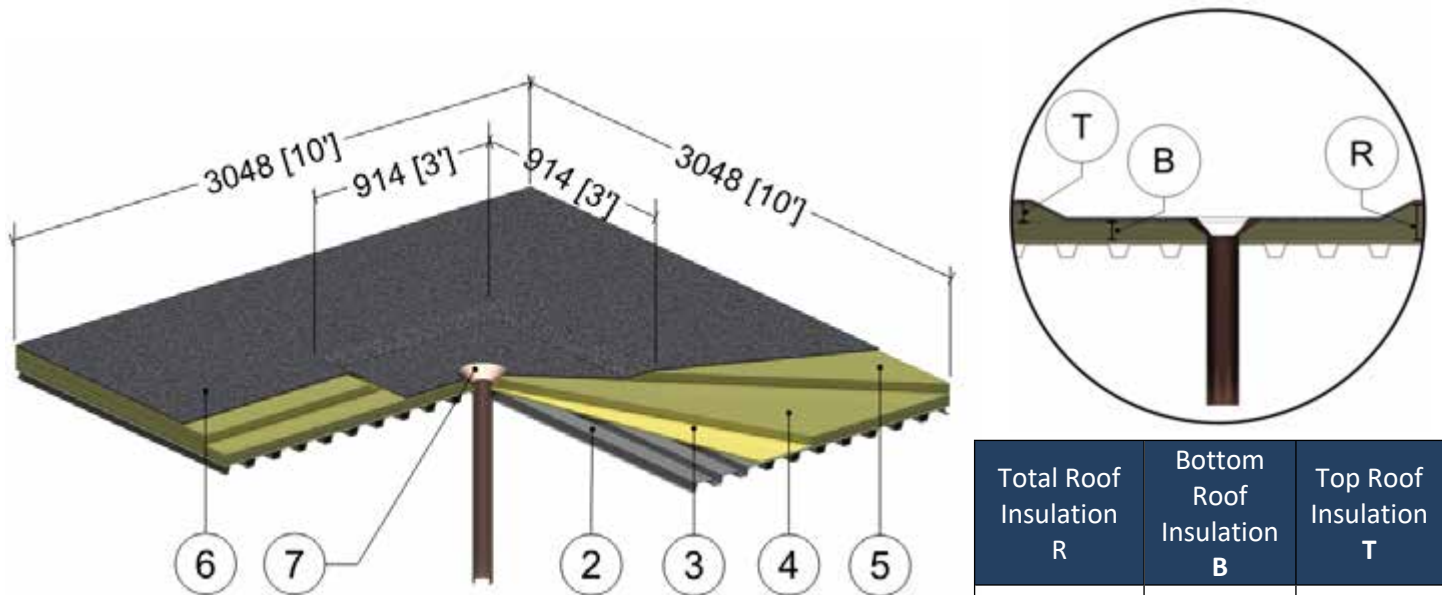
With Fill Insulation

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² -°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb-°F (J/kg K)
1	Interior Film ¹	-	-	R-1.1 (0.19 RSI)	-	-
2	Steel Deck	1/32" (1.1)	430 (62)	-	489 (7830)	0.12 (500)
3	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
4	Extruded Polystyrene Insulation (XPS)	6-7/8" (175)	0.20 (0.029)	R-34.3 (6.03 RSI)	1.8 (28)	0.29 (1220)
5	Sheathing Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
6	Roof Anchor	3/16" (4.8)	347 (50)	-	489 (7830)	0.12 (500)
7	Mineral Wool Insulation	-	0.24 (0.034)	-	4 (64)	0.20 (850)
8	Fasteners	1/2" (13) ∅	430 (62)	-	489 (7830)	0.12 (500)
9	8" x 8" x 5/8" Base Plate	5/8" (16)	347 (50)	-	489 (7830)	0.12 (500)
10	Thermal Break	1" (25)	1.8 (0.26)	-	108 (1730)	-
11	Glulam Beam	8-1/2" (216)	0.97 (0.14)	-	31 (500)	0.45 (1880)
12	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 10.4.1

Exterior Insulated Low Sloped Roof with Fully Adhered Roof Membrane and Mineral Wool Insulation - Flange-Style Drain Penetration



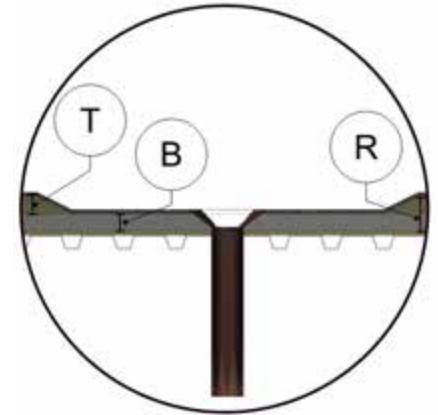
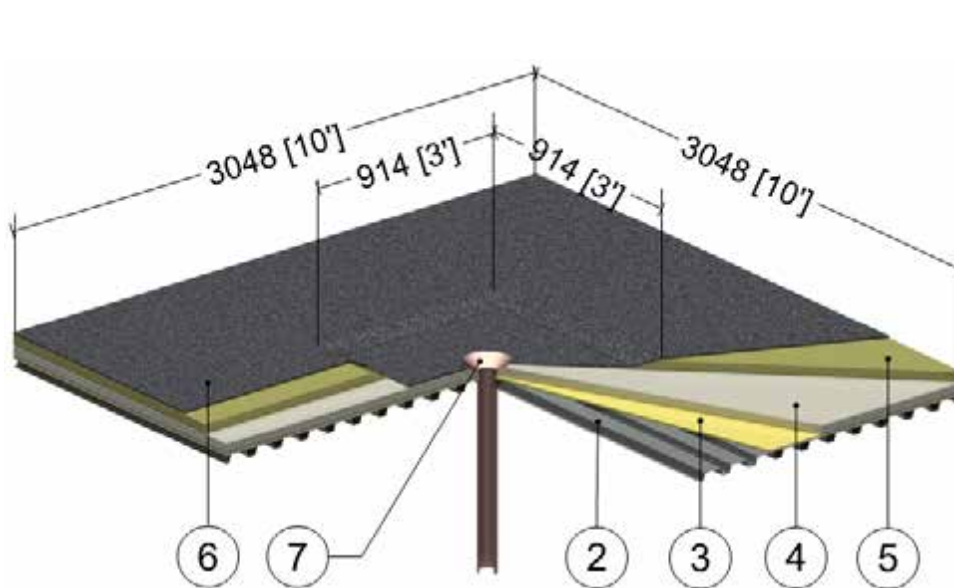
Total Roof Insulation R	Bottom Roof Insulation B	Top Roof Insulation T
R-19.8	R-9.9	R-9.9
R-29.7	R-19.9	R-9.9
R-39.7	R-29.8	R-9.9
R-49.7	R-39.8	R-9.9

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-1.1 (0.19 RSI)	-	-
2	Steel Deck	1/16" (1.6)	430 (62)	-	489 (7830)	0.12 (500)
3	Gypsum board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
4	Bottom Layer Mineral Wool Insulation	Varies	-	R-9.9 to R-39.8 (1.74 to 7.01 RSI)	1.8 (28)	0.29 (1220)
5	Top Layer Mineral Wool Insulation	2" (51)	-	R-9.9 (1.74 RSI)		
6	Asphalt Cover Board and Roof Membrane	1/2" (12)	3 (0.43)	R-0.2 (0.03 RSI)	100 (1600)	100 (1500)
7	Flanged Copper Drain	16 ga.	2672 (385)	-	559 (8940)	0.092 (385)
8	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 10.4.2

Exterior Insulated Low Sloped Roof with Fully Adhered Roof Membrane and Mineral Wool and Polyisocyanurate Insulation - Flange-Style Drain Penetration



Total Roof Insulation R	Bottom Roof Insulation B	Top Roof Insulation T
R-21.3	R-11.4	R-9.9
R-32.7	R-22.8	R-9.9
R-44.1	R-34.2	R-9.9
R-55.5	R-45.6	R-9.9

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-1.1 (0.19 RSI)	-	-
2	Steel Deck	1/16" (1.6)	430 (62)	-	489 (7830)	0.12 (500)
3	Gypsum board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
4	Bottom Layer Polyisocyanurate Insulation	Varies	-	R-9.9 to R-39.8 (2.01 to 8.03 RSI)	1.8 (28)	0.29 (1220)
5	Top Layer Mineral Wool Insulation	2" (51)	-	R-9.9 (1.74 RSI)		
6	Asphalt Cover Board and Roof Membrane	1/2" (12)	3 (0.43)	R-0.2 (0.03 RSI)	100 (1600)	100 (1500)
7	Flanged Copper Drain	16 ga.	2672 (385)	-	559 (8940)	0.092 (385)
8	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation