

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 9 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 Walls
6. Mass Walls
7. Wood Frame Construction
8. Balconies and Doors
9. 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 5.1.7 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

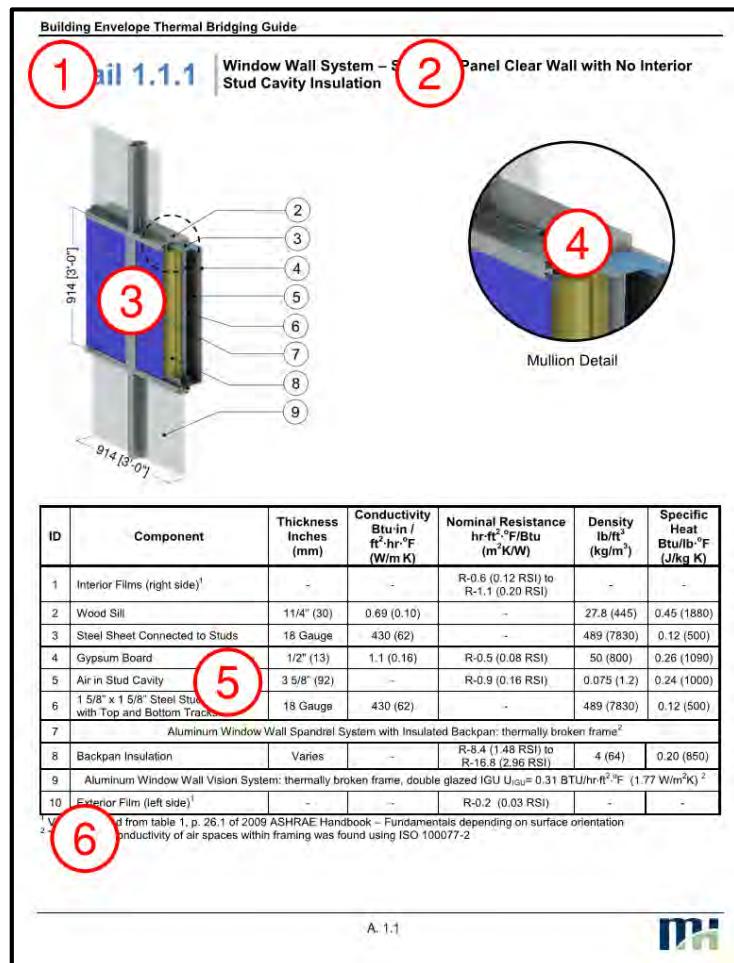
Location	Description of Condition	Heat Transfer Coefficient Btu/h·ft ² ·°F (W/m ² K)
Exterior wall surface with generic cladding	Heat transfer coefficient to account for vented air space and cladding; surface is not directly exposed to wind	1.5 (8.3)
Exterior brick veneer and Precast Concrete surface	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.



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, 7 is Wood Framed 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

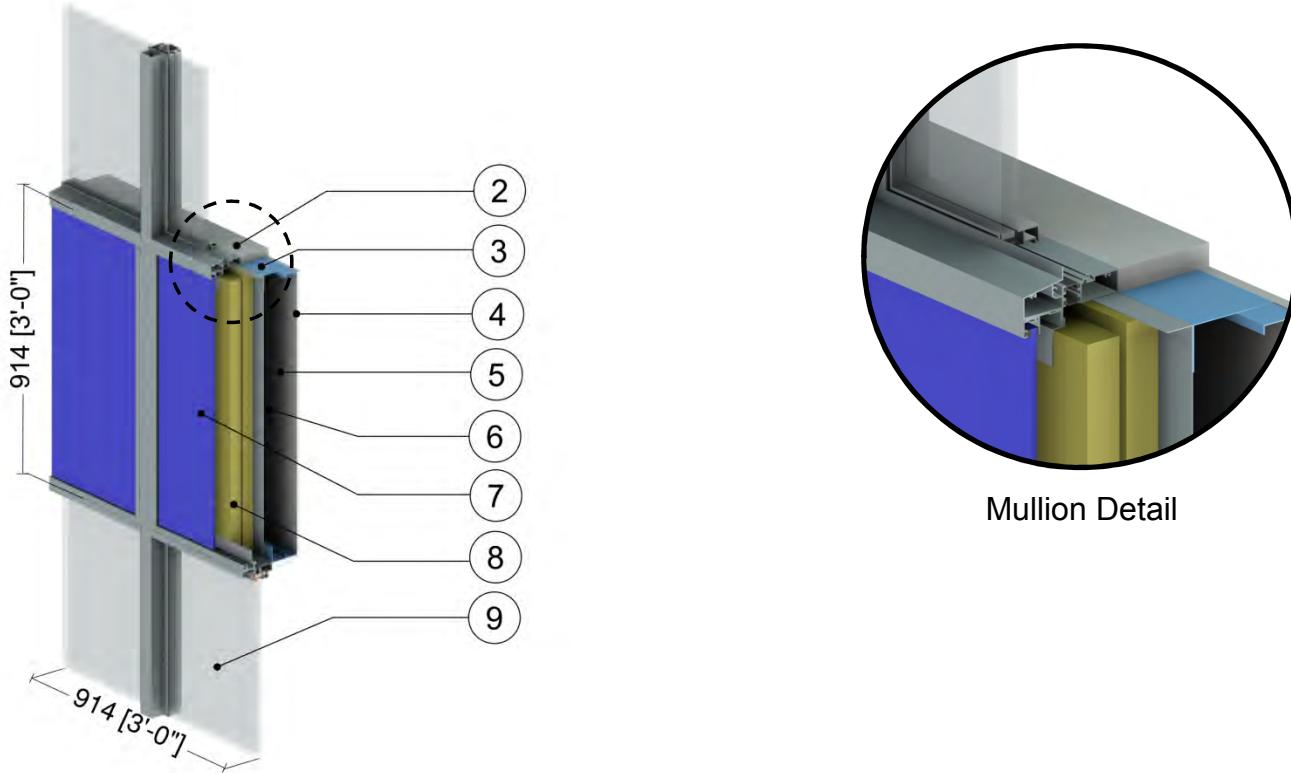
With the PDF version of the catalogue, each entry in the catalogue index is linked to each construction section. Within each section, there is an additional index for the details, which are also linked directly to each detail data sheet. To return to the index, simply click on the Appendix header.

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 Sprayfoam Insulation	
Detail 1.2.1	A.1.3
Window Wall System – Slab Intersection with Spandrel Bypass and no Interior Stud Cavity Insulation	
Detail 1.2.2	A.1.4
Window Wall System – Slab Intersection with Spandrel Bypass and Interior Sprayfoam Insulation	
Detail 1.2.3	A.1.5
Window Wall System with 3' x 3' Spandrel Section – AIM Applications	
Detail 1.3.1	A.1.6
Window Wall System – Uninsulated Concrete Parapet & Roof Intersection	
Detail 1.3.2	A.1.7
Window Wall System – Partially Insulated Concrete Parapet & Roof Intersection	
Detail 1.4.1	A.1.8
Window Wall System – Inside Corner with Spandrel to Vision Transition & No Interior Stud Cavity Insulation	
Detail 1.4.2	A.1.9
Window Wall System – Inside Corner with Spandrel to Vision Transition & Interior Sprayfoam Insulation	
Detail 1.5.1	A.1.10
Window Wall System with Insulated Spandrel Panel – Uninsulated Interior Concrete Wall and Slab Intersection	
Detail 1.5.2	A.1.11
Window Wall System with Insulated Spandrel Panel – Insulated Interior Concrete Wall and Slab Intersection	

Detail 1.1.1

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



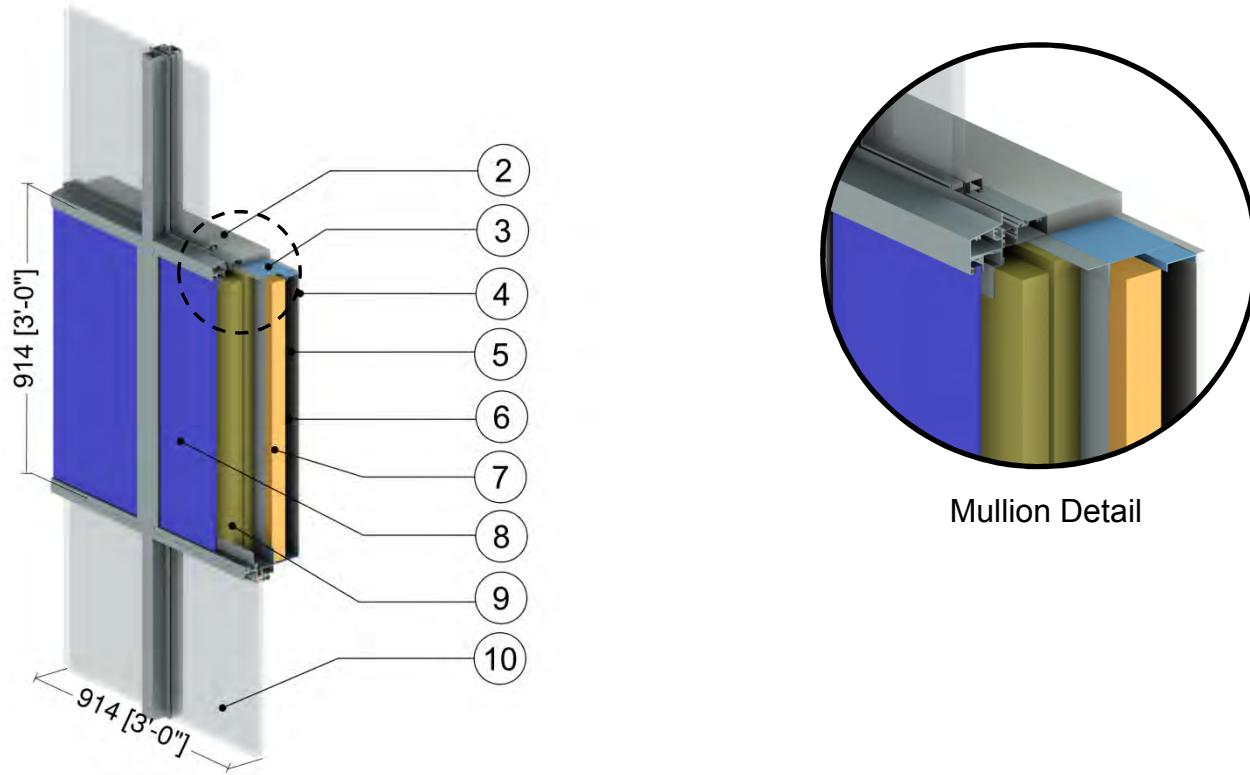
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
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 ²					
8	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 (1.48 RSI) to R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
9	Aluminum Window Wall Vision System: thermally broken frame, double glazed IGU $U_{COG} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W/m}^2\text{K}$) 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 framing was found using ISO 100077-2

Detail 1.1.2

Window Wall System – Spandrel Panel Clear Wall with Interior Sprayfoam Insulation



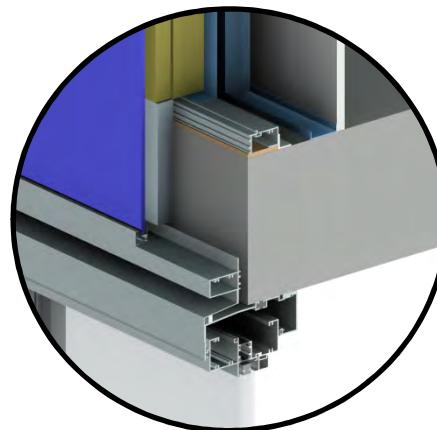
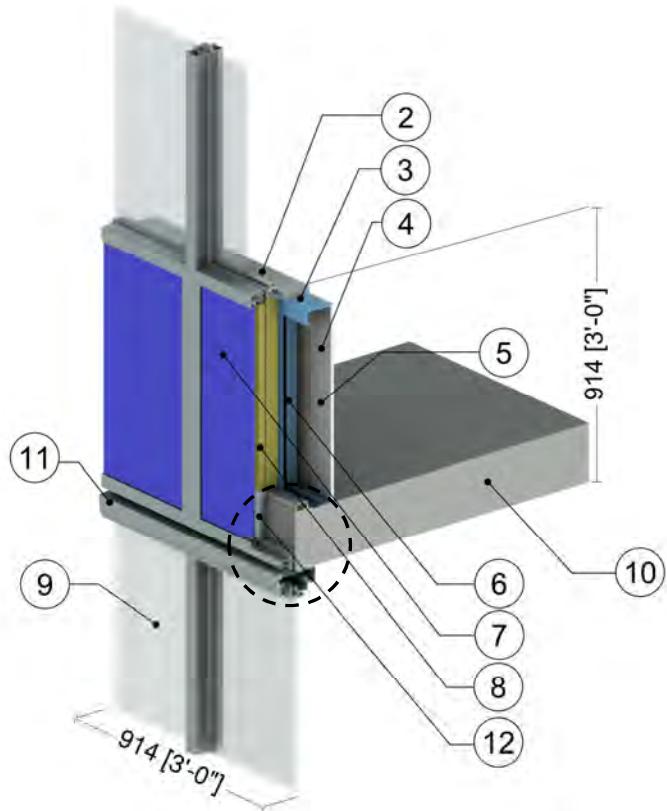
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
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 Sprayfoam 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 ²					
9	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 (1.48 RSI) to R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
10	Aluminum Window Wall Vision System: thermally broken frame, double glazed IGU $U_{COG} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W/m}^2\text{K}$) ²					
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 1.2.1

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



Slab Edge Detail
with Deflection
Header

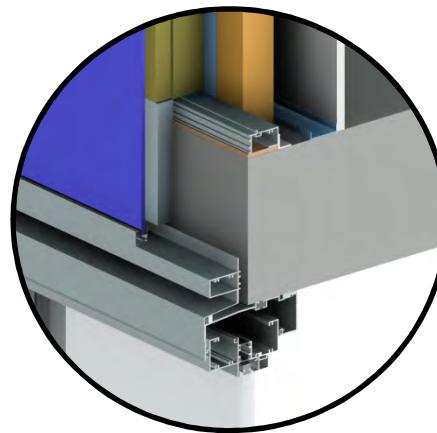
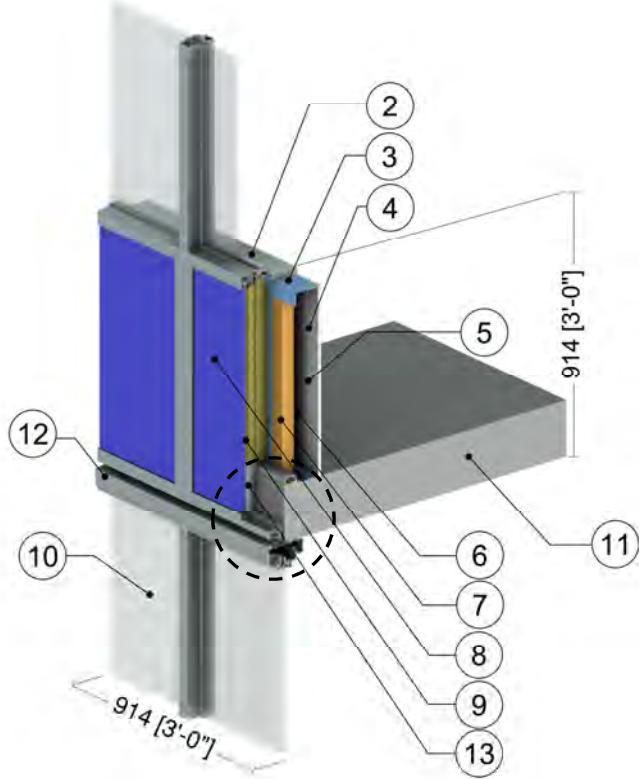
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
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 ²					
8	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 (1.48 RSI) to R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
9	Aluminum Window Wall Vision System: thermally broken frame, double glazed IGU $U_{COG} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W/m}^2\text{K}$) ²					
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	Slab Edge 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)	-	-

¹Value 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 1.2.2

Window Wall System – Slab Intersection with Spandrel Bypass and Interior Sprayfoam Insulation



Slab Edge Detail
with Deflection
Header

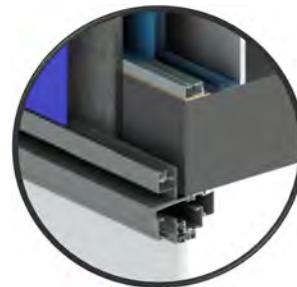
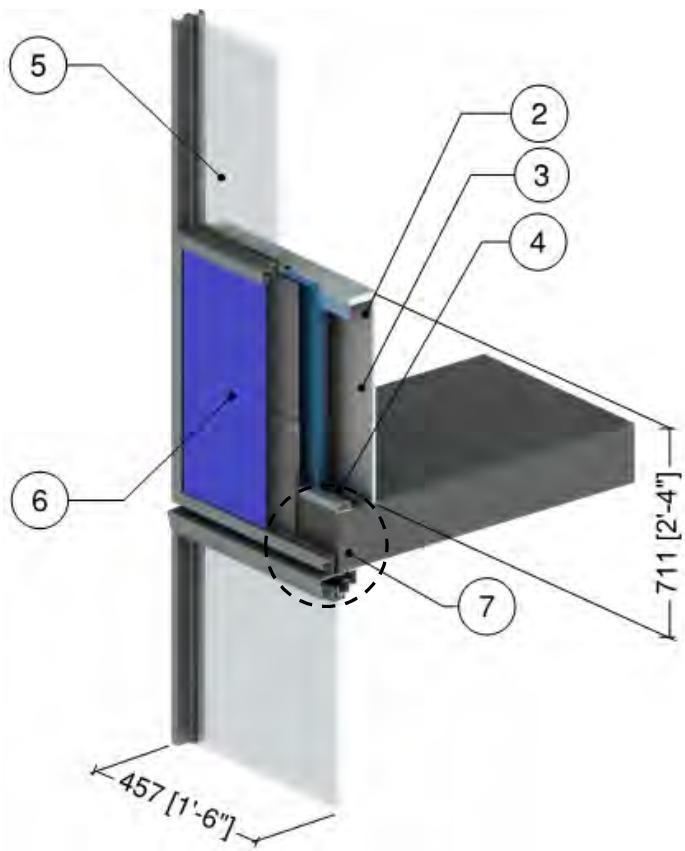
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
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 Sprayfoam 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 ²					
9	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 (1.48 RSI) to R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
10	Aluminum Window Wall Vision System: thermally broken frame, double glazed IGU $U_{COG}=0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W/m}^2\text{K}$) ²					
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	Slab Edge 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

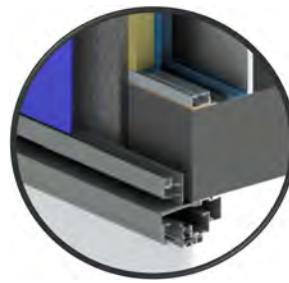
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 1.2.3

Window Wall System with 3' x 3' Spandrel Section – AIM Applications



G1 – 0.75" (19 mm) AIM adhered to Frame without Backpan Insulation



G2 – 0.75" (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 (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	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

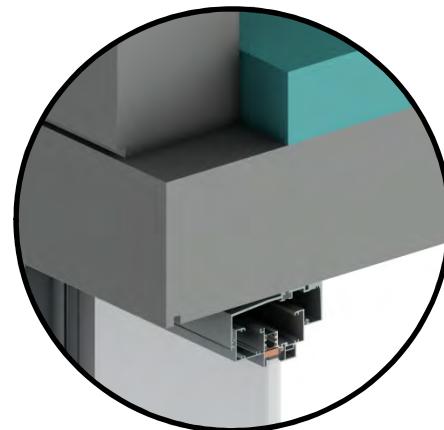
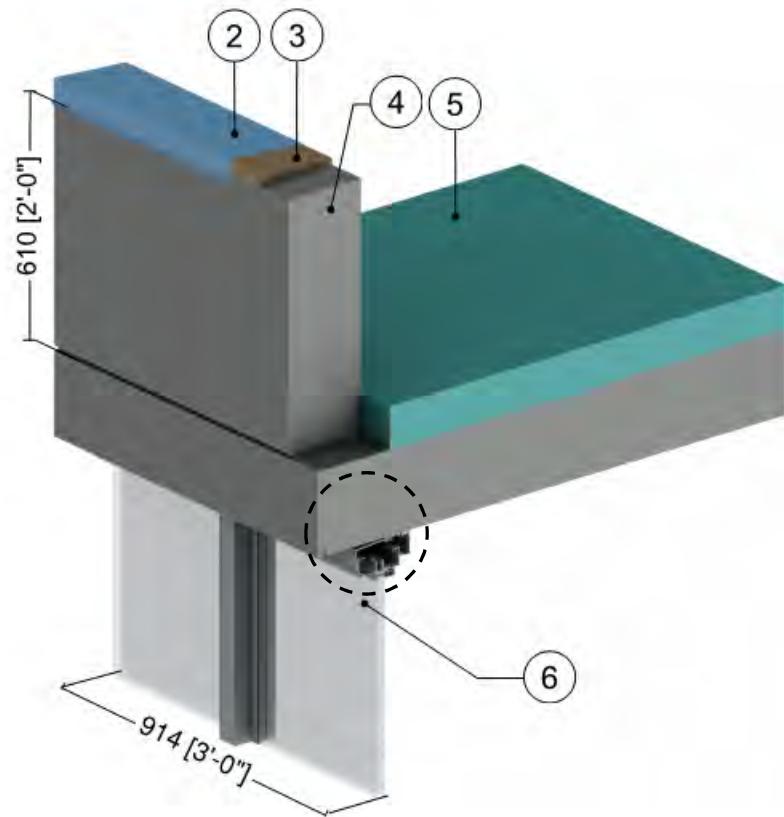
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

³ For a window to wall ratio of 40%

AIM = Architectural Insulation Module

Detail 1.3.1

Window Wall System – Uninsulated Concrete Parapet & Roof Intersection



Parapet Intersection Detail

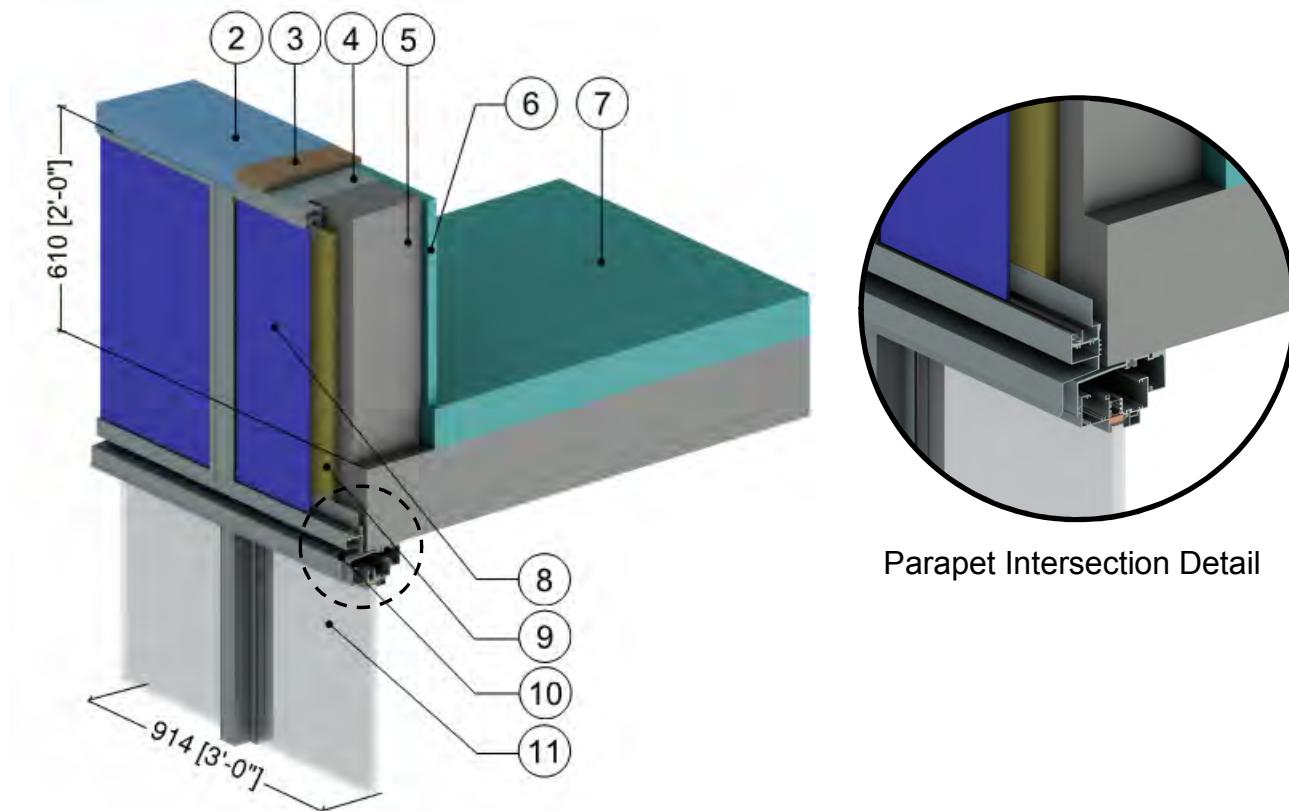
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Parapet Flashing	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
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, double glazed IGU $U_{COG} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W/m}^2\text{K}$) ²					
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



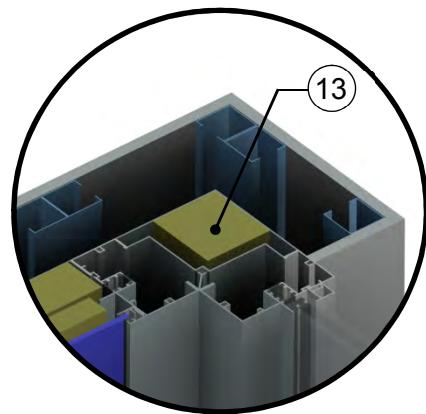
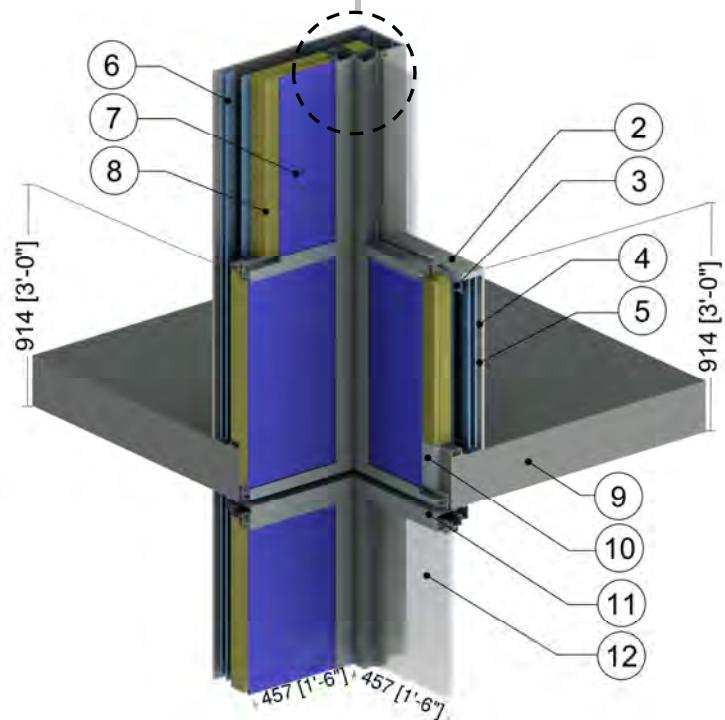
Parapet Intersection Detail

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 (0.12 RSI) to R-1.1 (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 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 ²					
9	Window Wall Insulation	Varies	0.24 (0.034)	R-8.4 (1.48 RSI) to R-16.8 (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, double glazed $IGU\ U_{COG} = 0.32\ BTU/\text{hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82\ W/\text{m}^2\text{K}$) ²					
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 orientation² 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

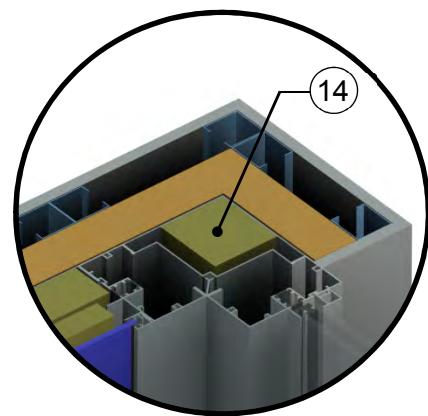
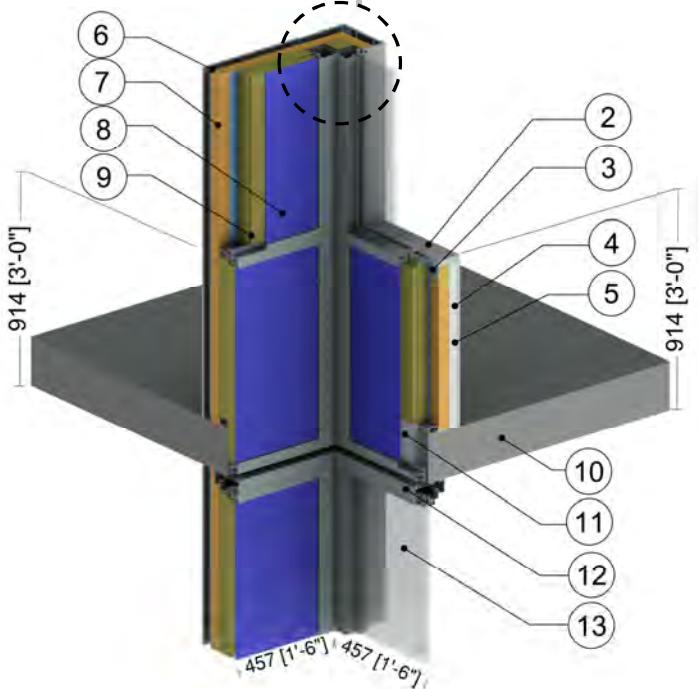
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
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 ²					
8	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 (1.48 RSI) to 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	Slab Edge 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, double glazed	IGU $U_{COG} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W/m}^2\text{K}$) ²				
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 Sprayfoam Insulation



Corner Post Detail

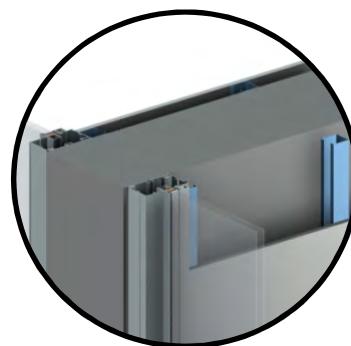
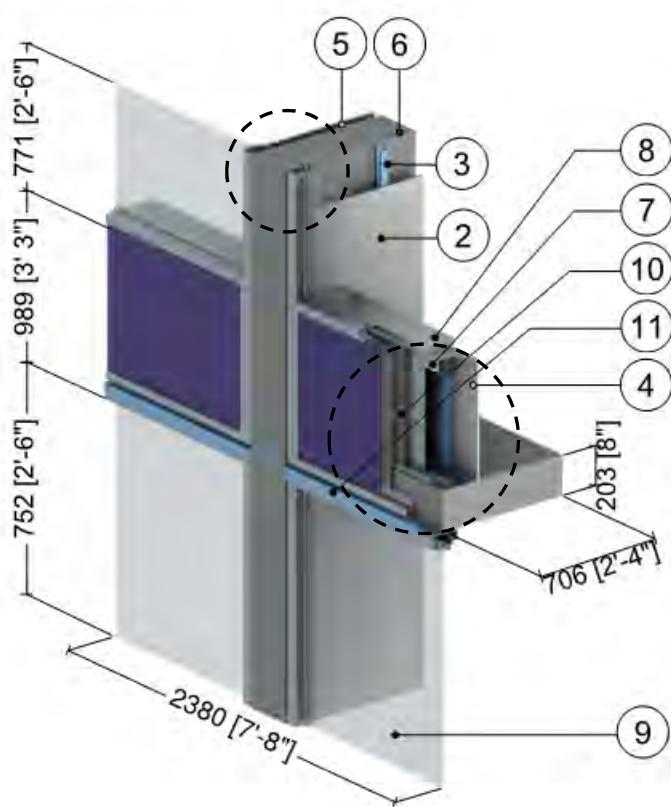
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
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 Sprayfoam 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 ²					
9	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 (1.48 RSI) to R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Slab Edge 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, double glazed IGU $U_{coC} = 0.32 \text{ BTU}/\text{hr}\cdot\text{ft}^2\cdot\text{°F}$ (1.82 W/m ² K) ²					
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

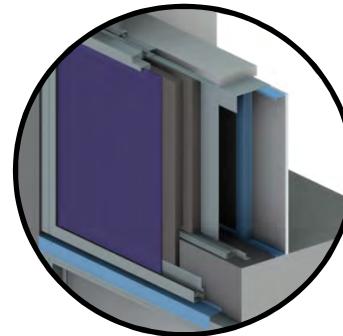
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 1.5.1

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



Interior Concrete Wall



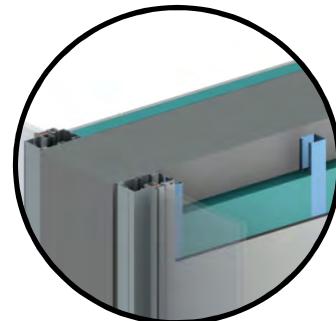
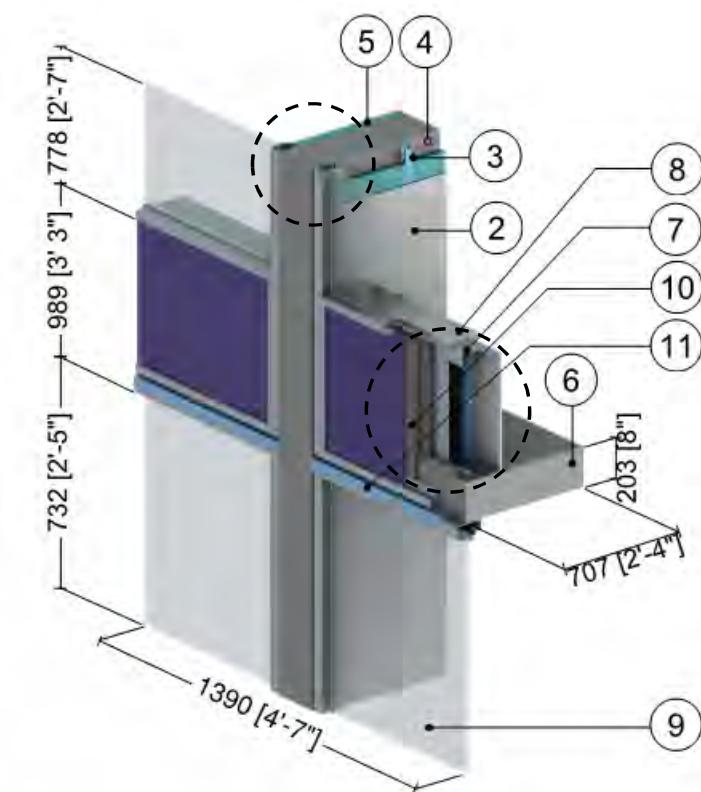
Spandrel Slab

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 Films ¹	-	-	R-0.6 (0.11 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	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, double glazed	IGU $U_{coe} = 0.32 \text{ BTU}/\text{hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W}/\text{m}^2\text{K}$) ²				
10	Backpan insulation	Varies	0.24 (0.034)	R-8.4 (1.48 RSI) to R-16.8 (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)	-	-

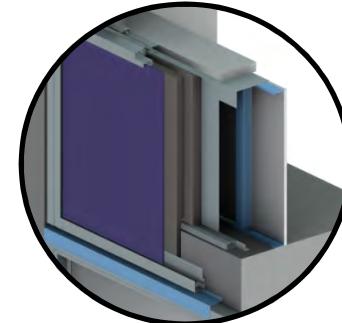
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 1.5.2

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



Interior Concrete Wall Intersection



Spandrel 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 (0.11 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	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, double glazed	$U_{co}= 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W/m}^2\text{K}$) ²				
10	Backpan insulation	Varies	0.24 (0.034)	R-8.4 (1.48 RSI) to R-16.8 (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.) – Slab 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.) – Slab 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

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

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

Detail 2.1.6**A.2.6**

Conventional Curtain Wall System with 5' x 5' Spandrel Section – Alternative Glazing Methods

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

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

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

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

Detail 2.2.1**A.2.11**

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

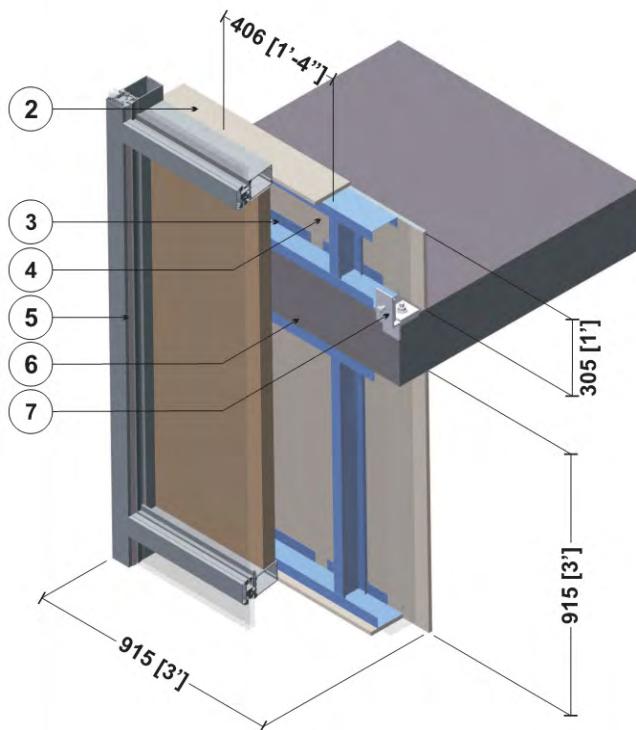
Detail 2.2.2**A.2.12**

Conventional Curtain Wall System – Insulated Spandrel & Roof Intersection

Detail 2.2.3	A.2.13
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.2.14
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.2.15
Conventional Curtain Wall System with Insulated Spandrel Panel– Un-Insulated Jamb Intersection with Vision Section	
Detail 2.3.2	A.2.16
Conventional Curtain Wall System with Insulated Spandrel Panel– Rigid Insulated Jamb Intersection with Insulation and Vision Section	
Detail 2.3.3	A.2.17
Conventional Curtain Wall System with Insulated Spandrel Panel – Aerogel Insulated Jamb Intersection with Vision Section	
Detail 2.4.1	A.2.18
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.2.19
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.2.20
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.2.21
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.2.22
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.) – Slab Intersection & No Interior Insulation in Stud Cavity



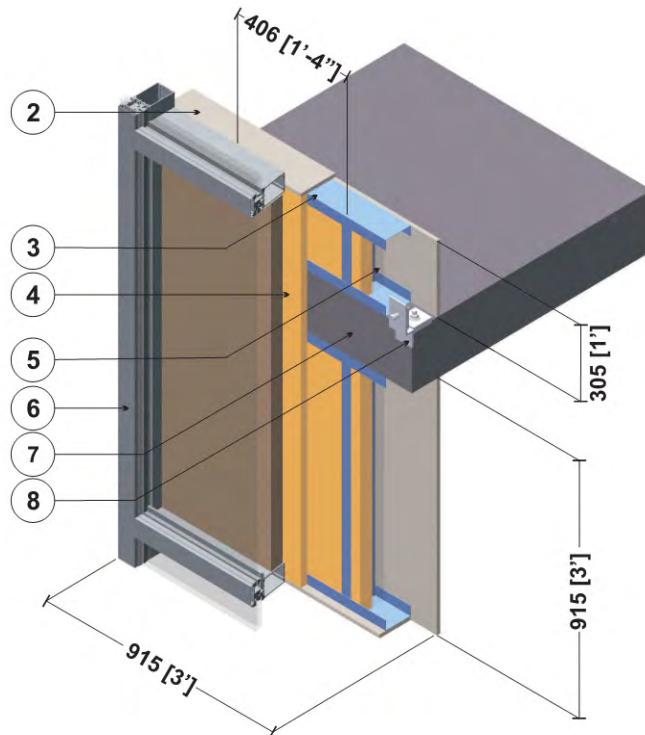
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	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	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	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
7	Steel Anchor at vertical mullions	-	347 (50)	-	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 & 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.) – Slab Intersection & Spray Foam Insulation in Stud Cavity



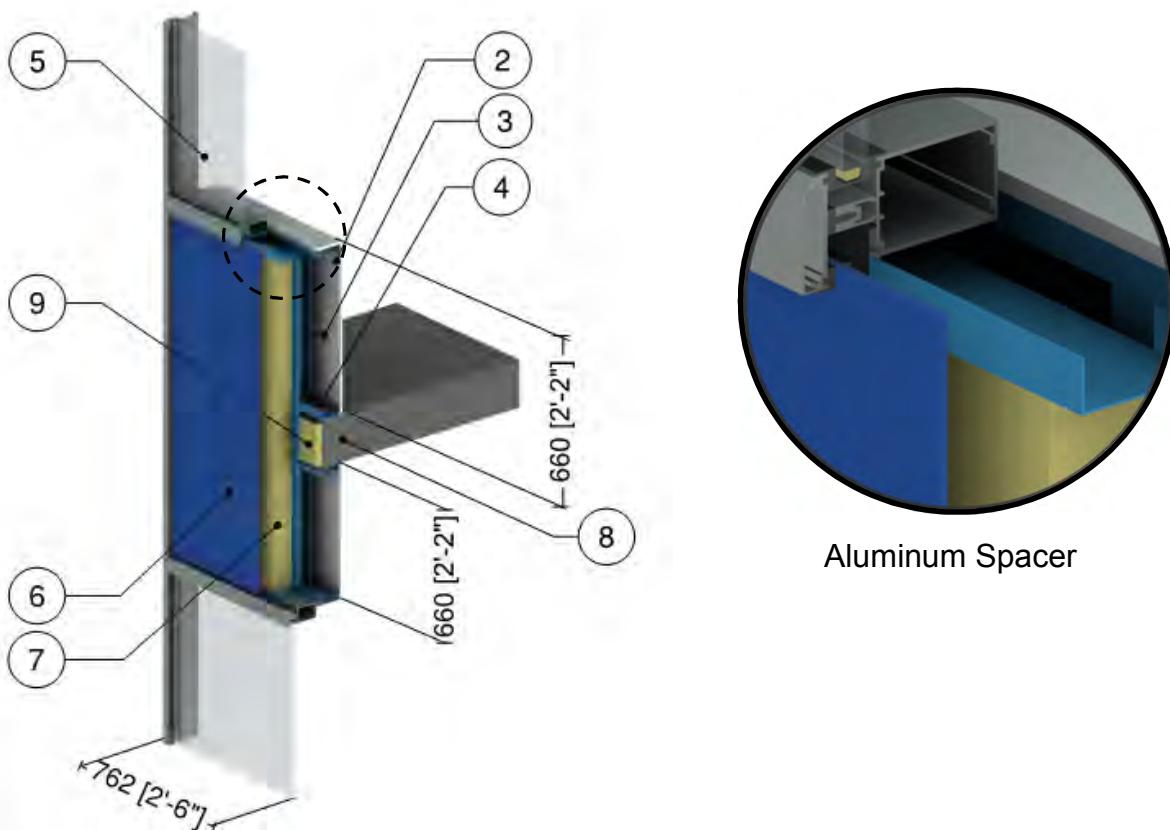
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	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	Spray Foam Insulation in Stud Cavity	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	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
8	Steel Anchor at vertical mullions	-	347 (50)	-	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 & 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



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 (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	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)	-	-

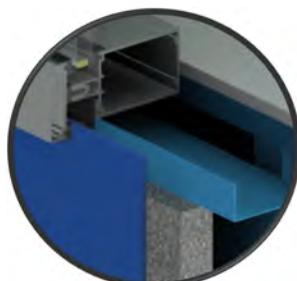
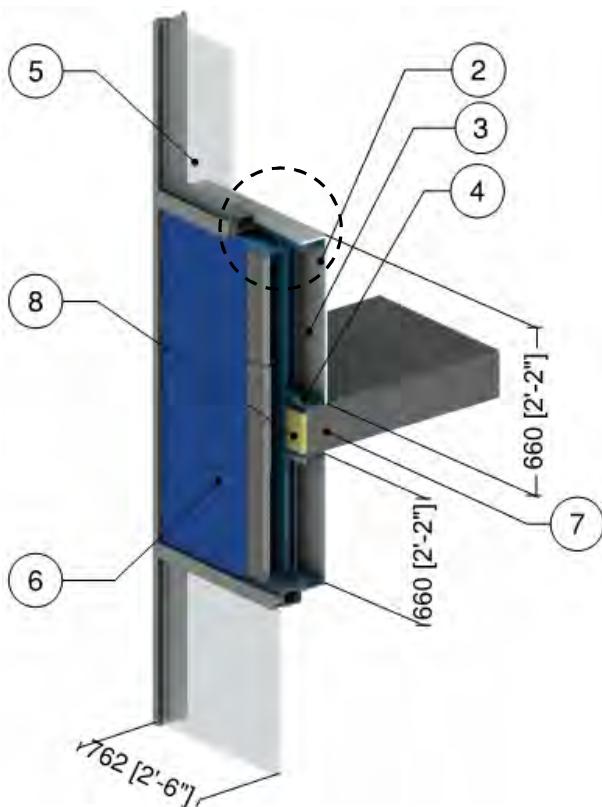
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

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

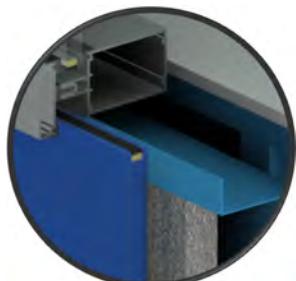
³ For a window to wall ratio of 50%

Detail 2.1.4

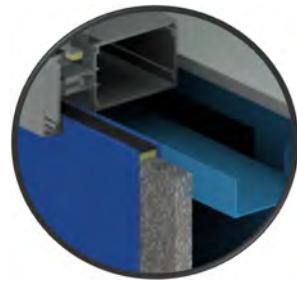
Conventional Curtain Wall System with Vertical and Horizontal Pressure Plates and 5' x 5' Spandrel Section – AIM Applications



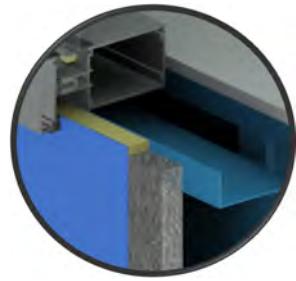
A1 – 1.5" (38 mm) AIM
Adhered to Monolithic Glass



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 (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	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

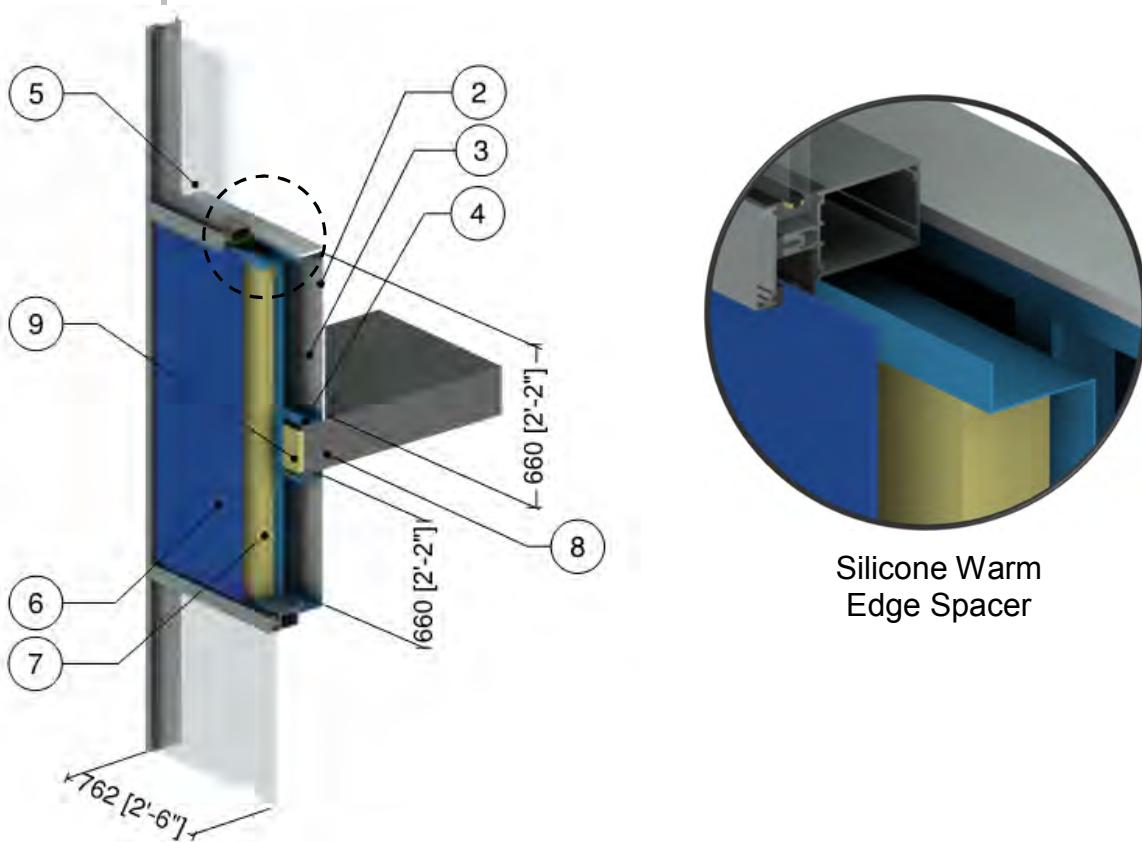
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

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



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft 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	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)	-	-

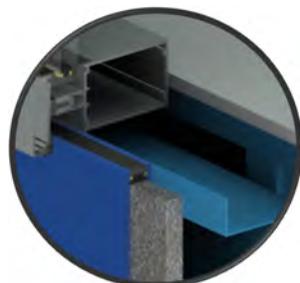
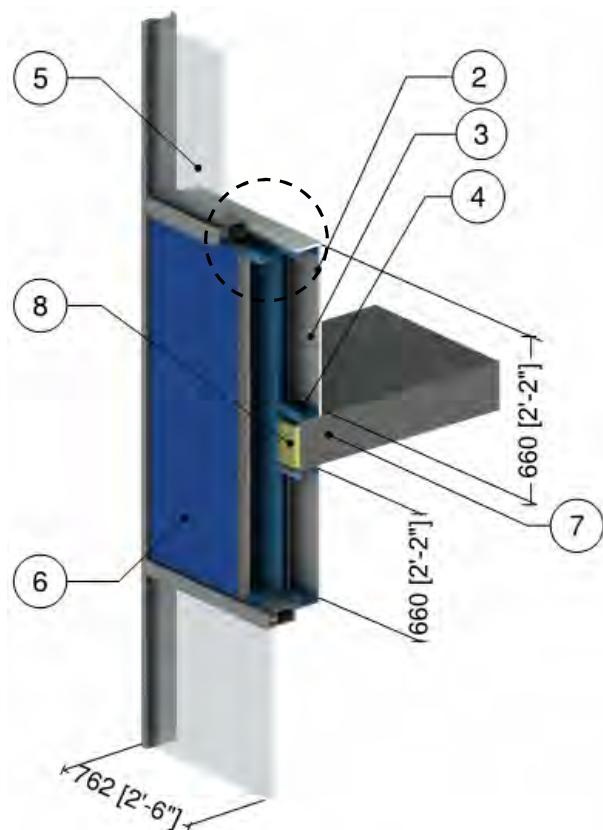
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

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

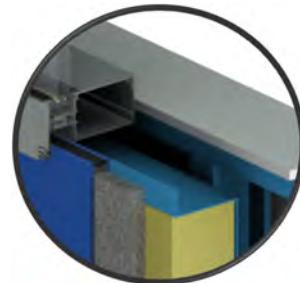
³ For a window to wall ratio of 50%

Detail 2.1.6

Conventional Curtain Wall System with 5' x 5' Spandrel Section – Alternative Glazing Methods



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. ^o F (W/m K)	Nominal Resistance hr.ft ² . ^o F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb. ^o 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	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

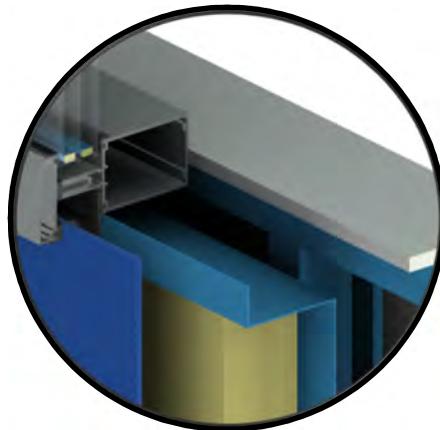
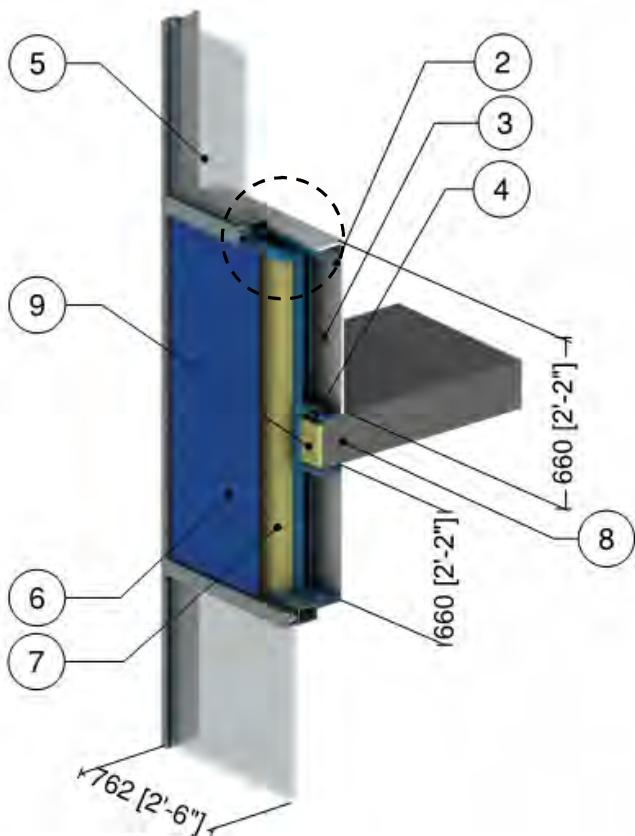
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

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



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 (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	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)	-	-

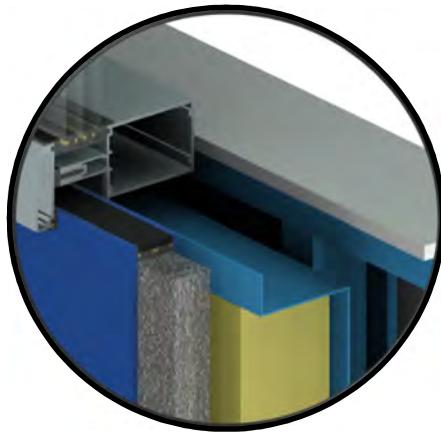
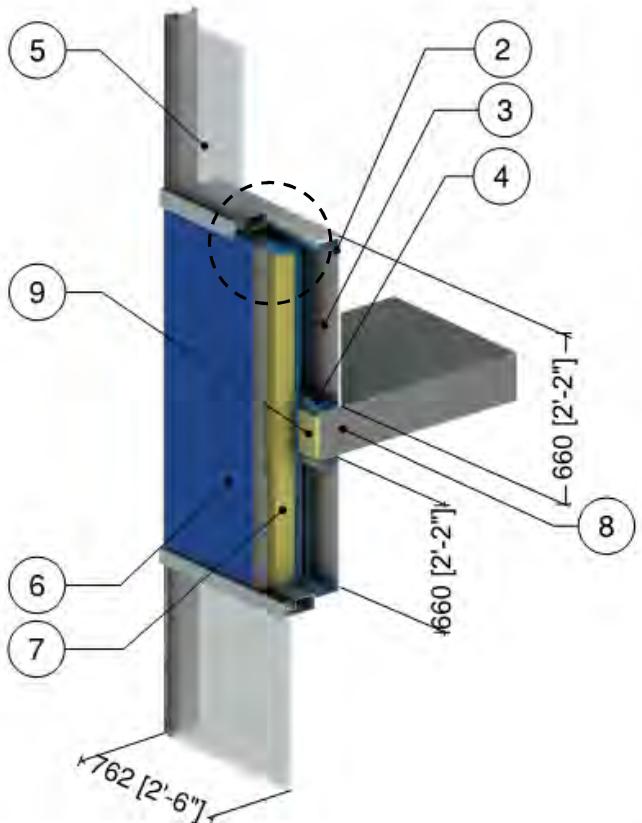
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

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



Triple Glazed IGU with
Silicone Warm Edge Spacer

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² .hr. ^o F (W/m K)	Nominal Resistance hr-ft ² . ^o F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb. ^o 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	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

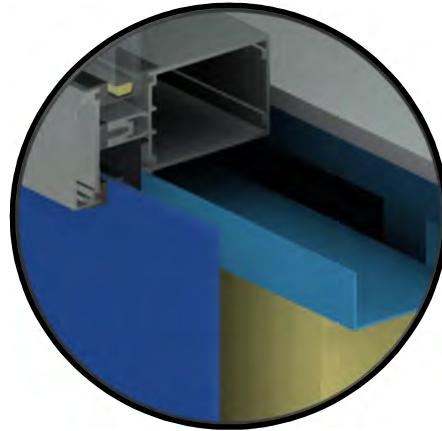
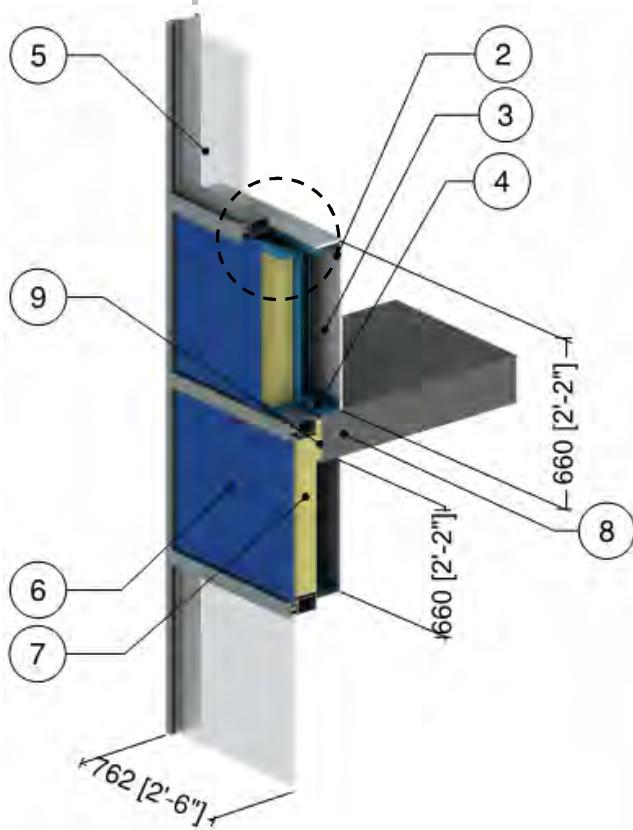
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

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



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 (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	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)	-	-

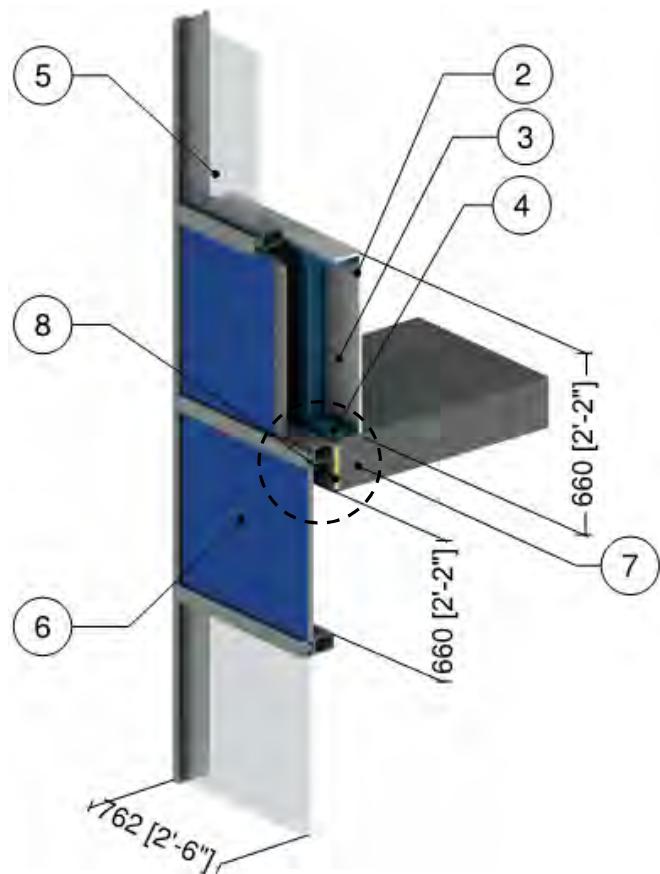
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

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

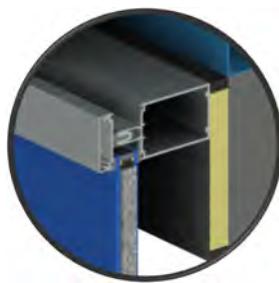
³ For a window to wall ratio of 50%

Detail 2.1.10

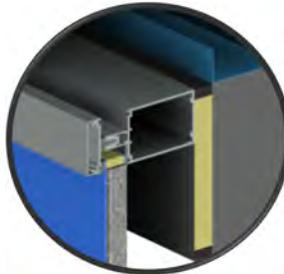
Conventional Curtain Wall System with Vertical and Horizontal Pressure Plates, Intermediate Mullion and 5' x 5' Spandrel Section – AIM Applications



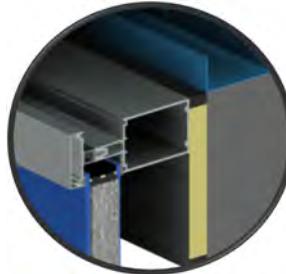
D1 – Vertical & Horizontal Pressure Plates, Warm Edge Spacer, 0.75" (19 mm) AIM Between Glass



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. ^o F (W/m K)	Nominal Resistance hr.ft ² . ^o F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb. ^o 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	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

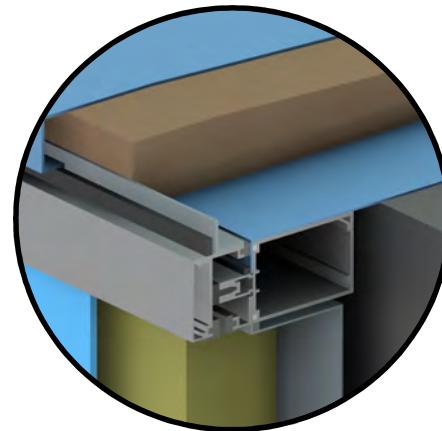
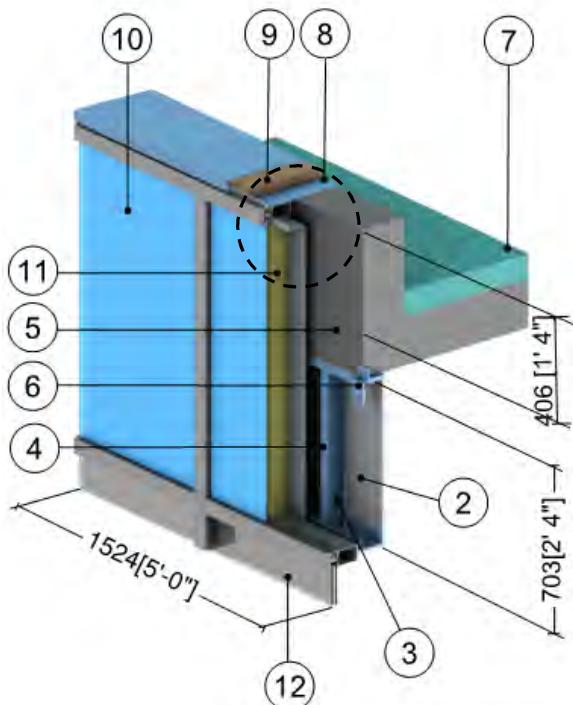
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

³ For a window to wall ratio of 50%

AIM = Architectural Insulation Module

Detail 2.2.1

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

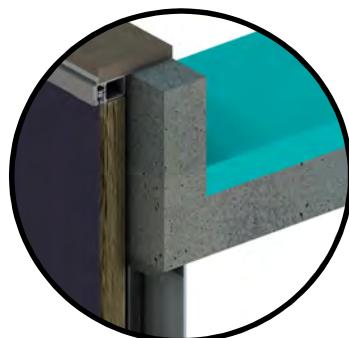
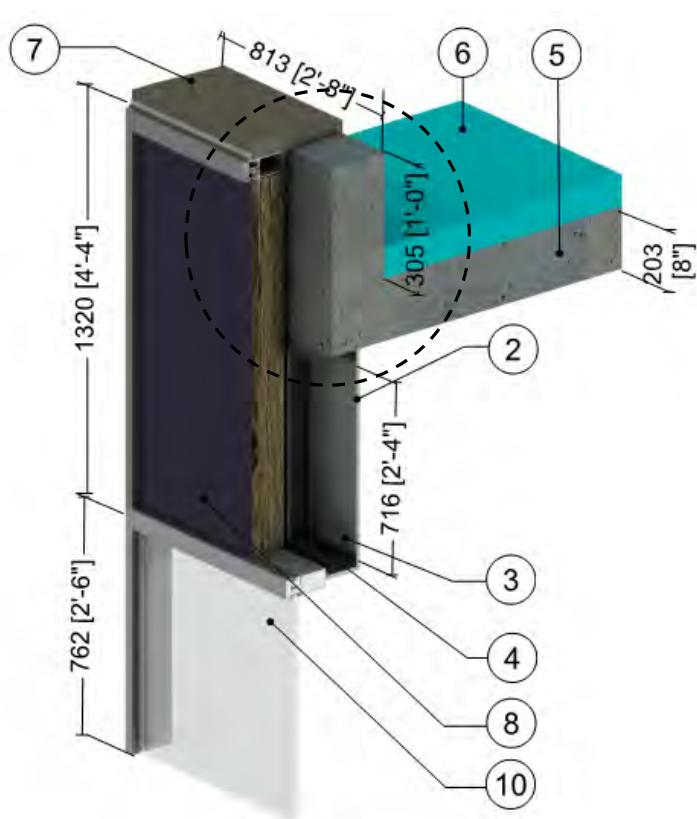
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	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	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 (1.48 RSI) to R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
12	Conventional Curtain Wall Vision System : minimal thermally broken frame, double glazed IGU $U_{co}= 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ (1.82 W/m ² K) ²					
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

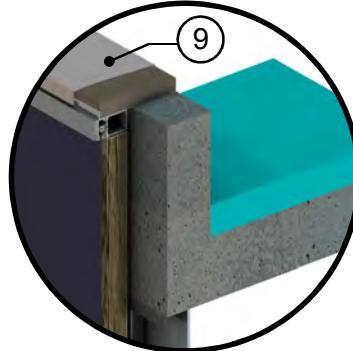
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 2.2.2

Conventional Curtain Wall System – Insulated Spandrel & Roof Intersection



Without Aerogel Detail



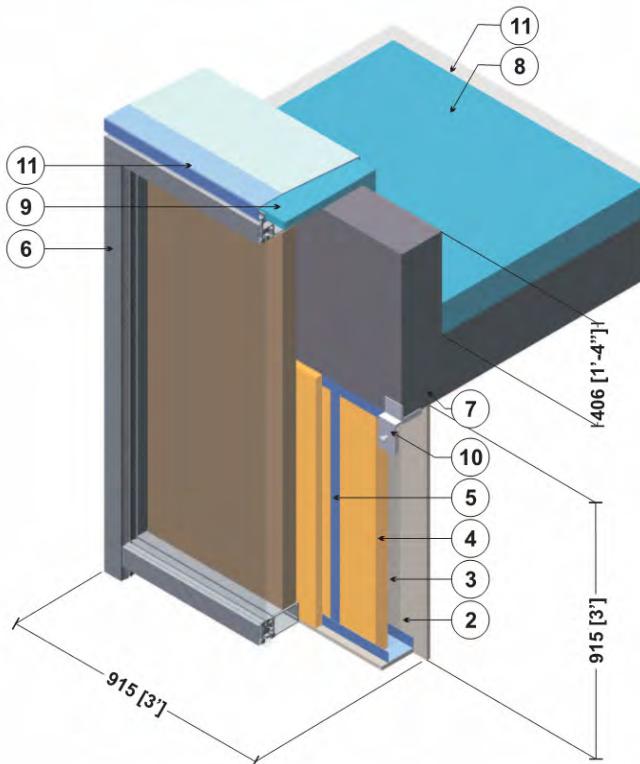
With Aerogel Detail

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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W/m}^2\text{K}$) ²					
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 orientation² 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



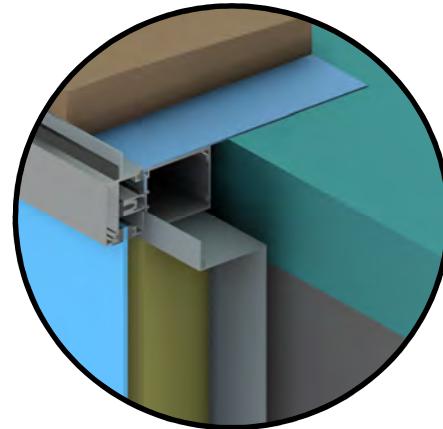
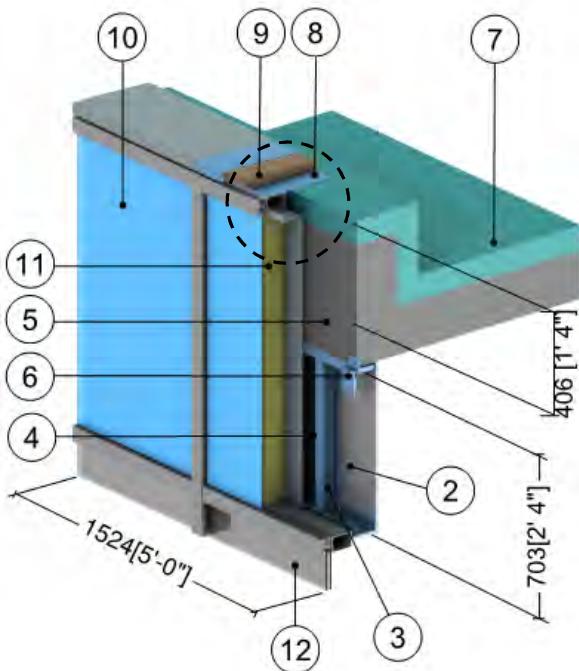
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 in Stud Cavity	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

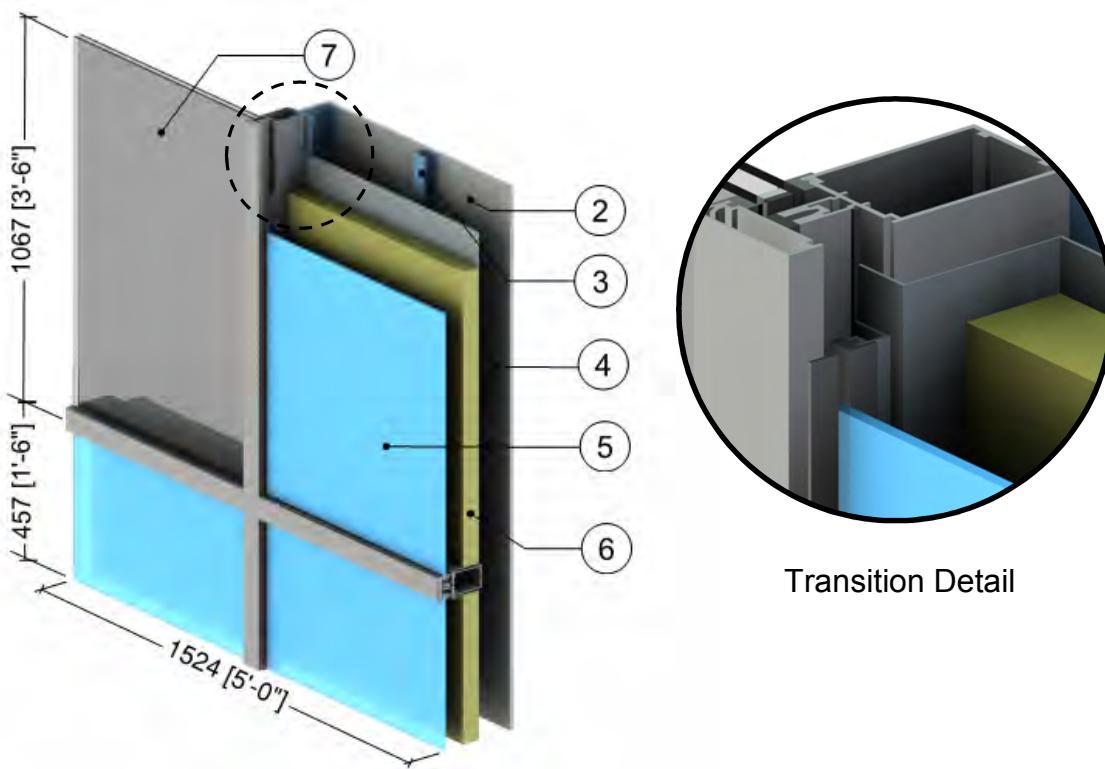
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	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	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 (1.48 RSI) to R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
12	Conventional Curtain Wall Vision System : minimal thermally broken frame, double glazed IGU $U_{co}= 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ (1.82 W/m ² K) ²					
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



Transition Detail

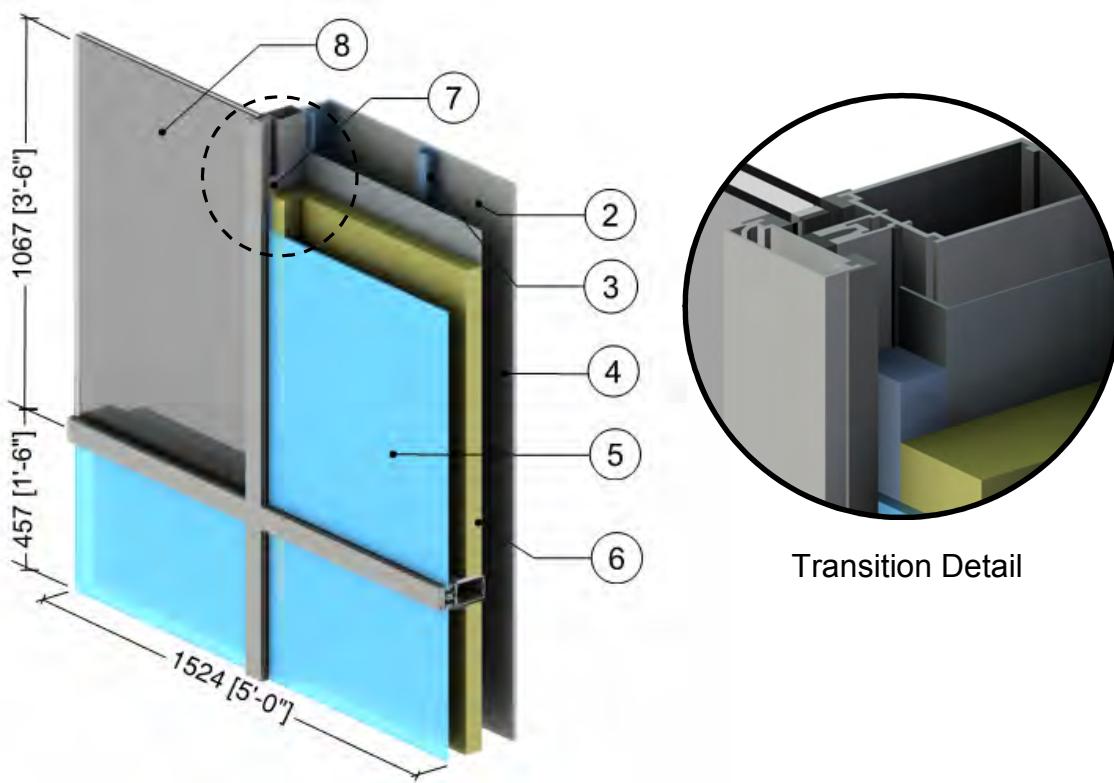
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (1.48 RSI) to R-16.8 (2.96 RSI)	4 (64)	0.20 (850)
7	Conventional Curtain Wall Vision System : minimal thermally broken frame, double glazed IGU $U_{coo} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W/m}^2\text{K}$) ²					
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

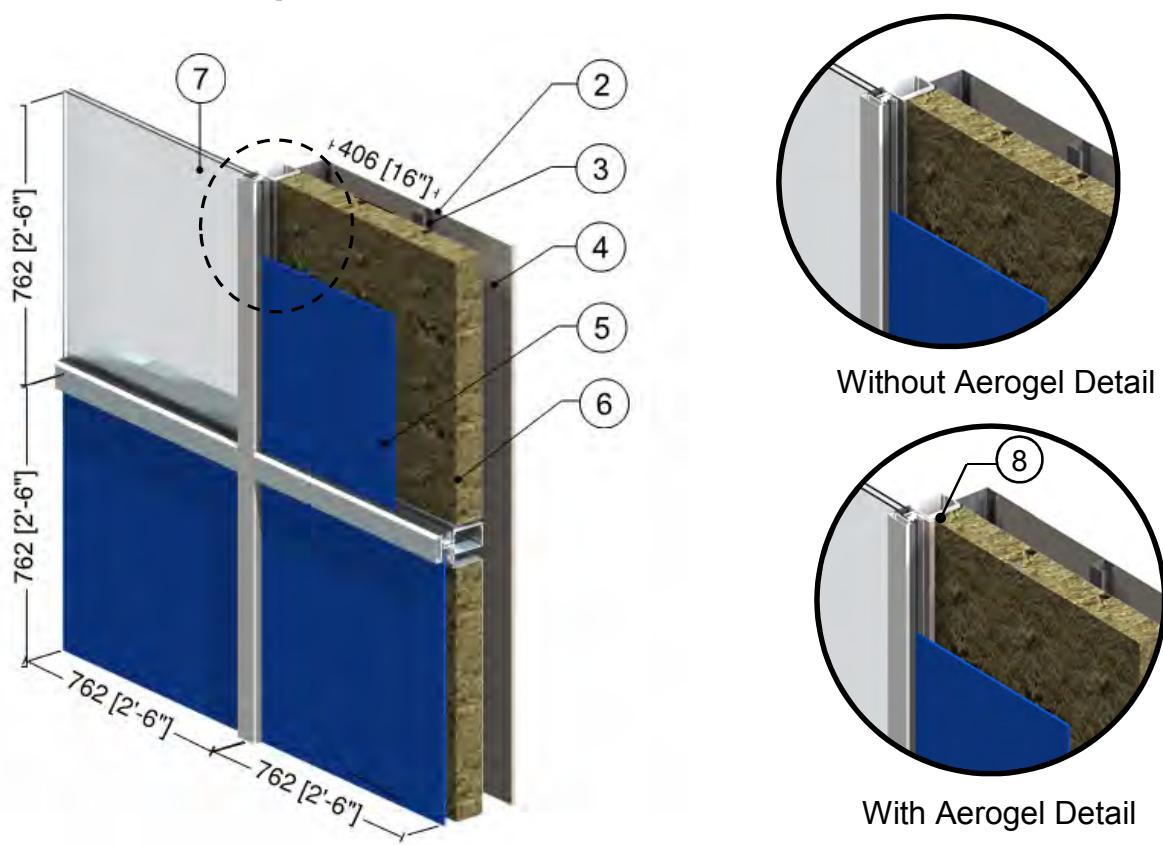
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (1.48 RSI) to R-16.8 (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, double glazed IGU $U_{co} = 0.32 \text{ BTU}/\text{hr}\cdot\text{ft}^2\cdot\text{°F}$ (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 2.3.3

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



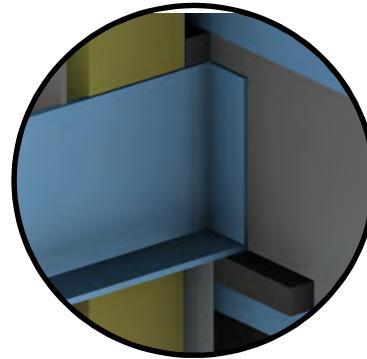
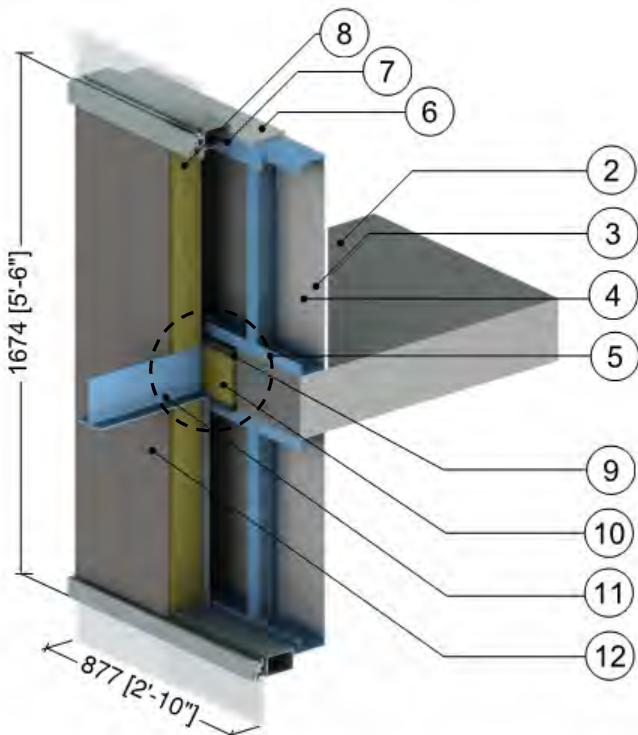
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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, double glazed IGU $U_{co}= 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W/m}^2\text{K}$) ²					
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)

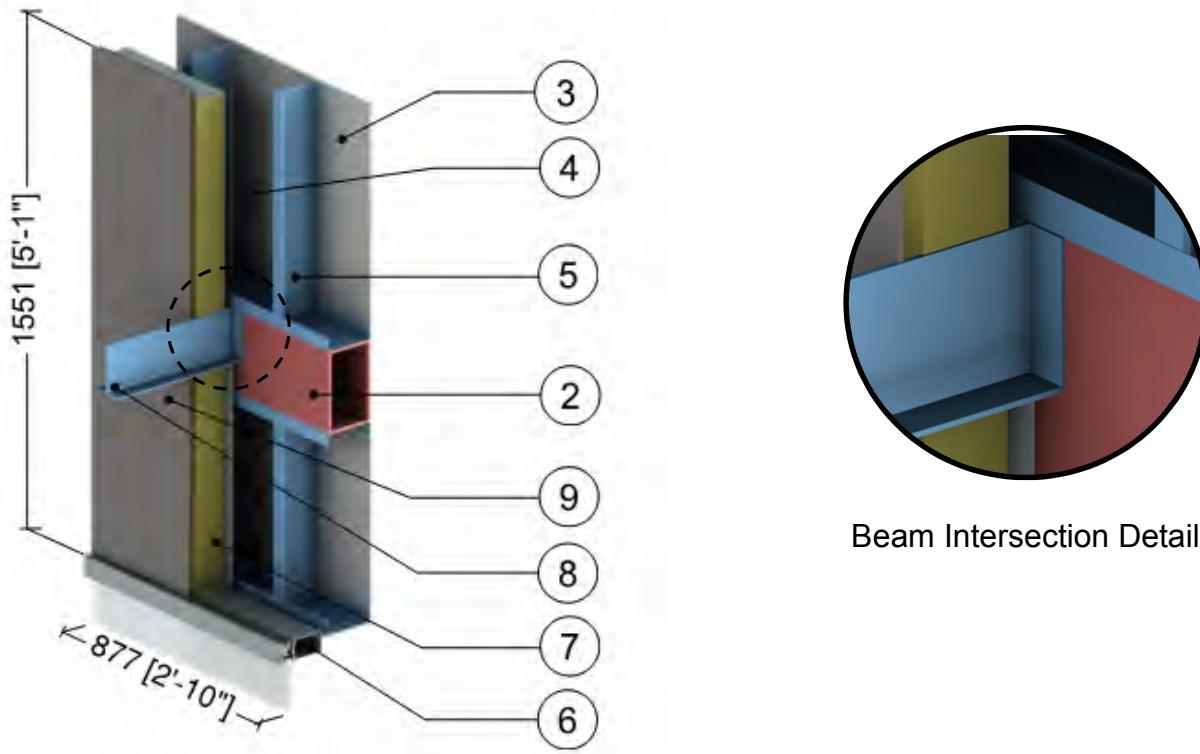
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
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, double glazed IGU U _{COG} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K) ²					
8	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 (1.5 RSI) to R-16.8 (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

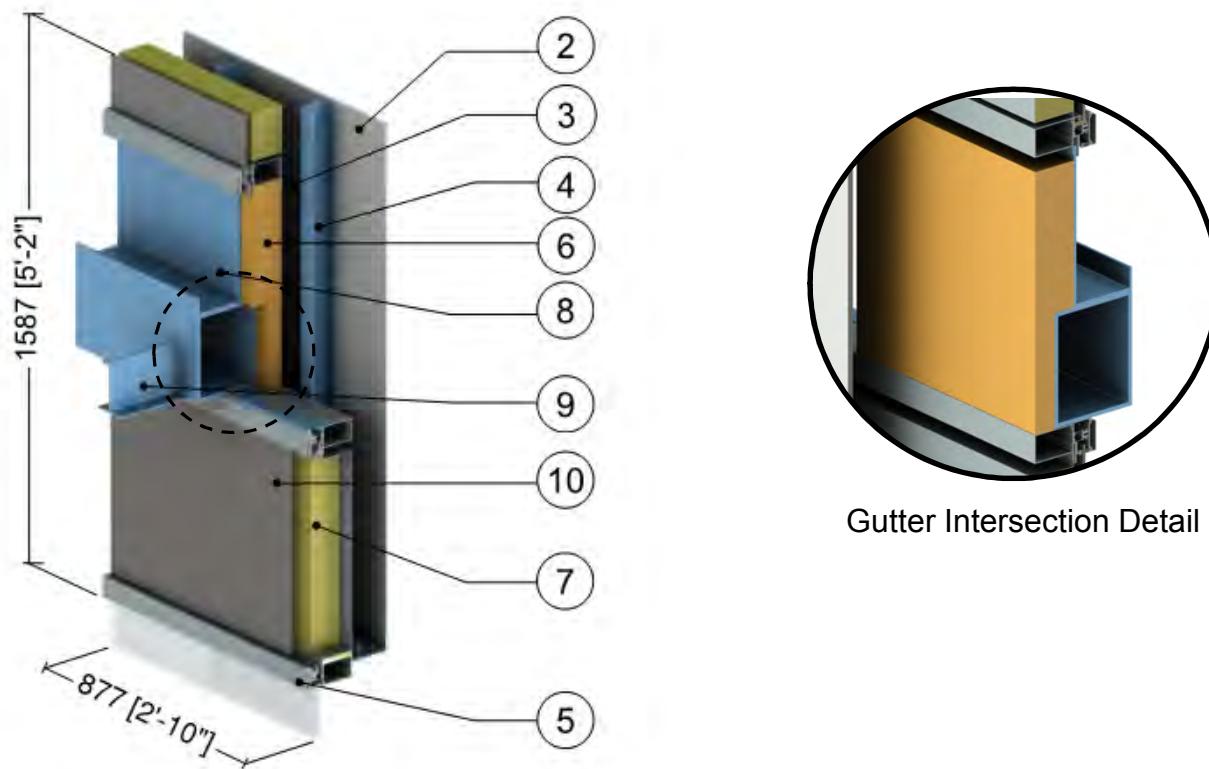
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² .hr. ^o F (W/m K)	Nominal Resistance hr-ft ² . ^o F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb. ^o F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Structural Steel Beam (10" x 6" x 3/8" HSS)	-	347 (50)	-	489 (7830)	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, double glazed IGU U _{COG} = 0.32 BTU/hr·ft ² . ^o F (1.82 W/m ² K)					
7	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 (1.5 RSI) to R-16.8 (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

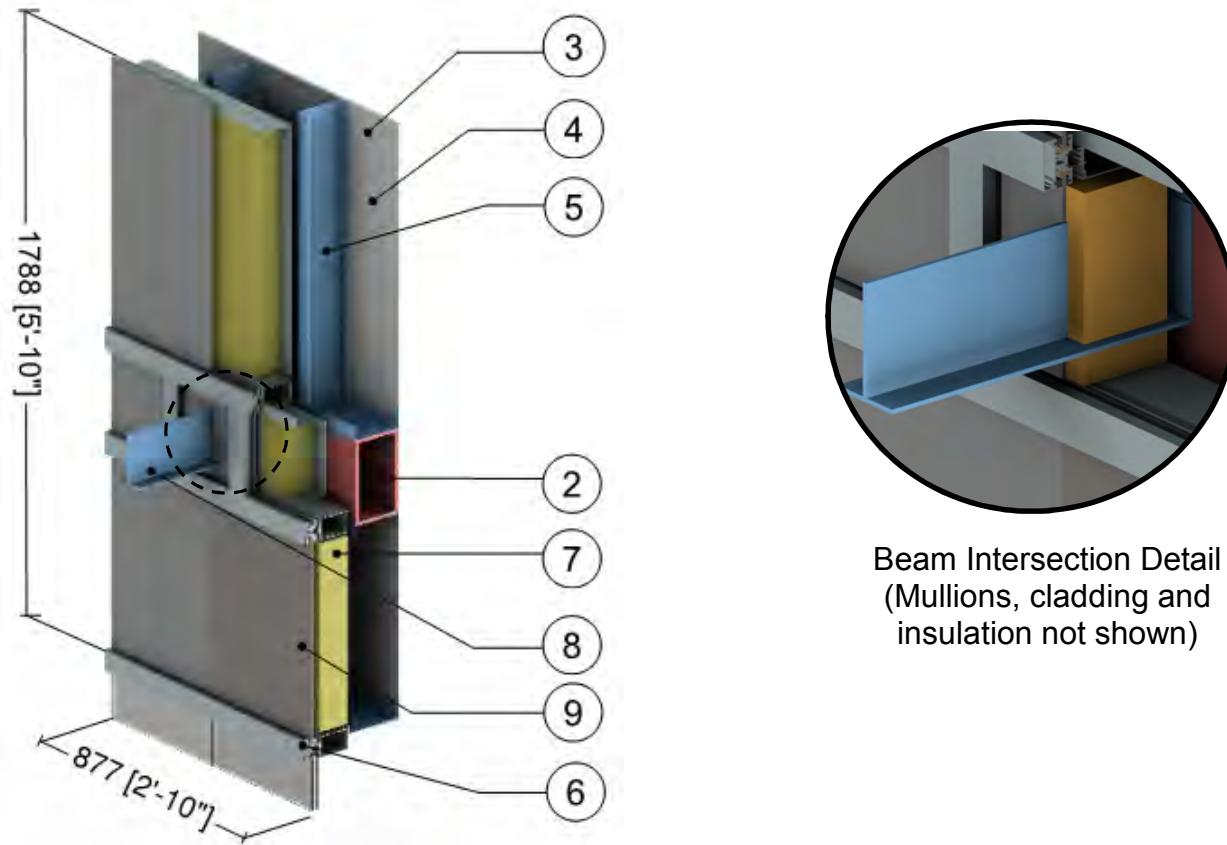
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air 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, double glazed IGU U _{COG} = 0.32 BTU/hr·ft ² ·°F (1.82 W/m ² K) ²					
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 (1.48 RSI) to R-16.8 (2.96 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)

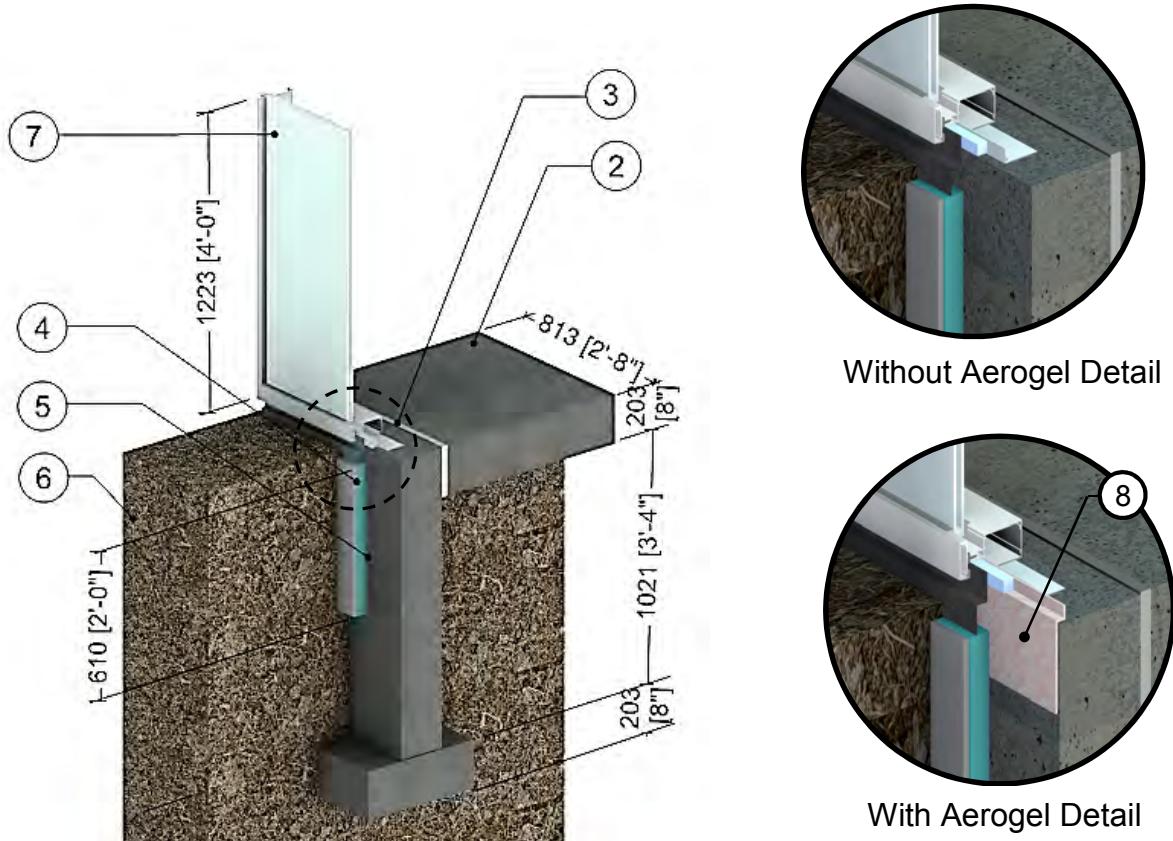
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² .hr. ^o F (W/m K)	Nominal Resistance hr-ft ² . ^o F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb. ^o F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Structural Steel Beam (10" x 6" x 3/8" HSS)	-	347 (50)	-	489 (7830)	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, double glazed IGU U _{cog} = 0.32 BTU/hr-ft ² . ^o F (1.82 W/m ² K) ²					
7	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 (1.48 RSI) to R-16.8 (2.96 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



ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft 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	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, double glazed IGU $U_{coo} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W/m}^2\text{K}$) ²					
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

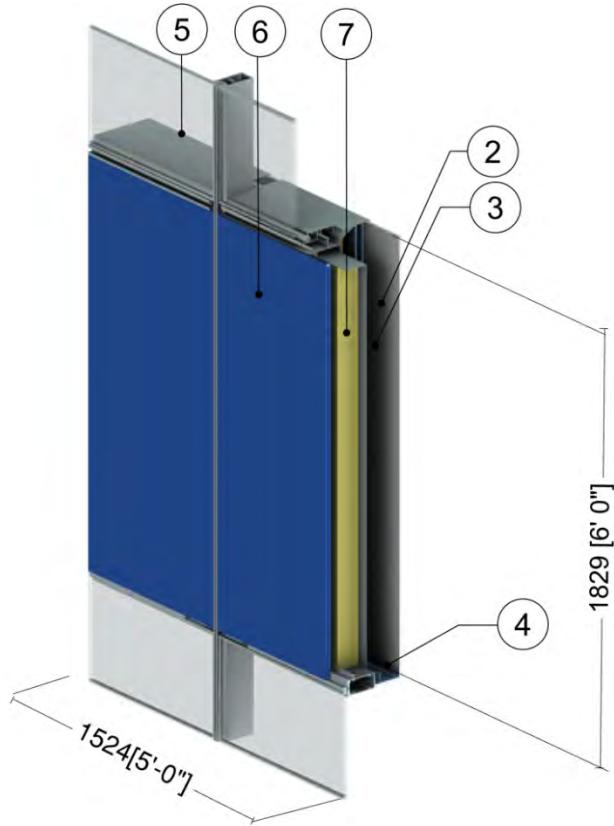
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

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 Sprayfoam Insulation
- Detail 3.2.1** **A.3.3**
Unitized Curtain Wall System – Slab Intersection & No Interior Stud Cavity Insulation
- Detail 3.2.2** **A.3.4**
Unitized Curtain Wall System – Slab Intersection & Interior Sprayfoam 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
- 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
- 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
- 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
- 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



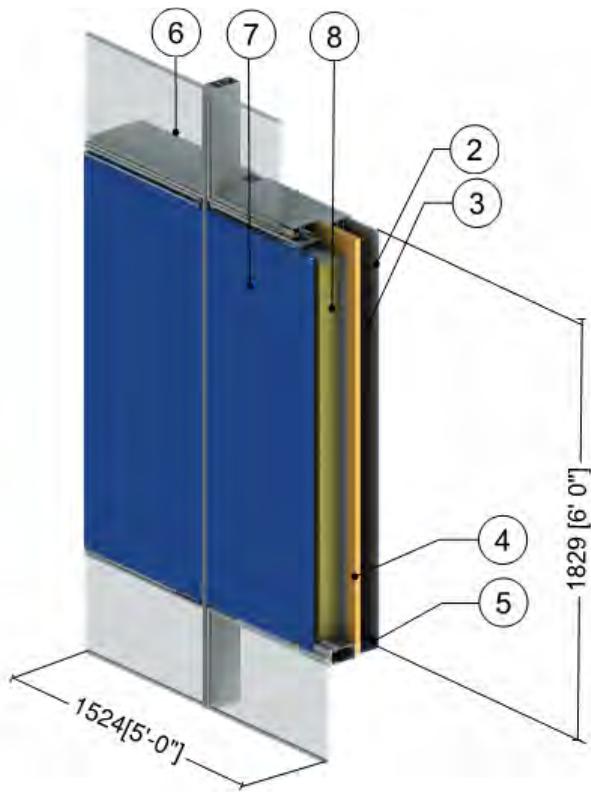
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air 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, double glazed IGU	$U_{IGU} = 0.32 \text{ BTU}/\text{hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W}/\text{m}^2\text{K}$) ²				
6	Unitized Curtain Wall Spandrel System with Insulated Backpan: structural silicone joints ²					
7	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 (1.48 RSI) to R-16.8 (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 Sprayfoam Insulation



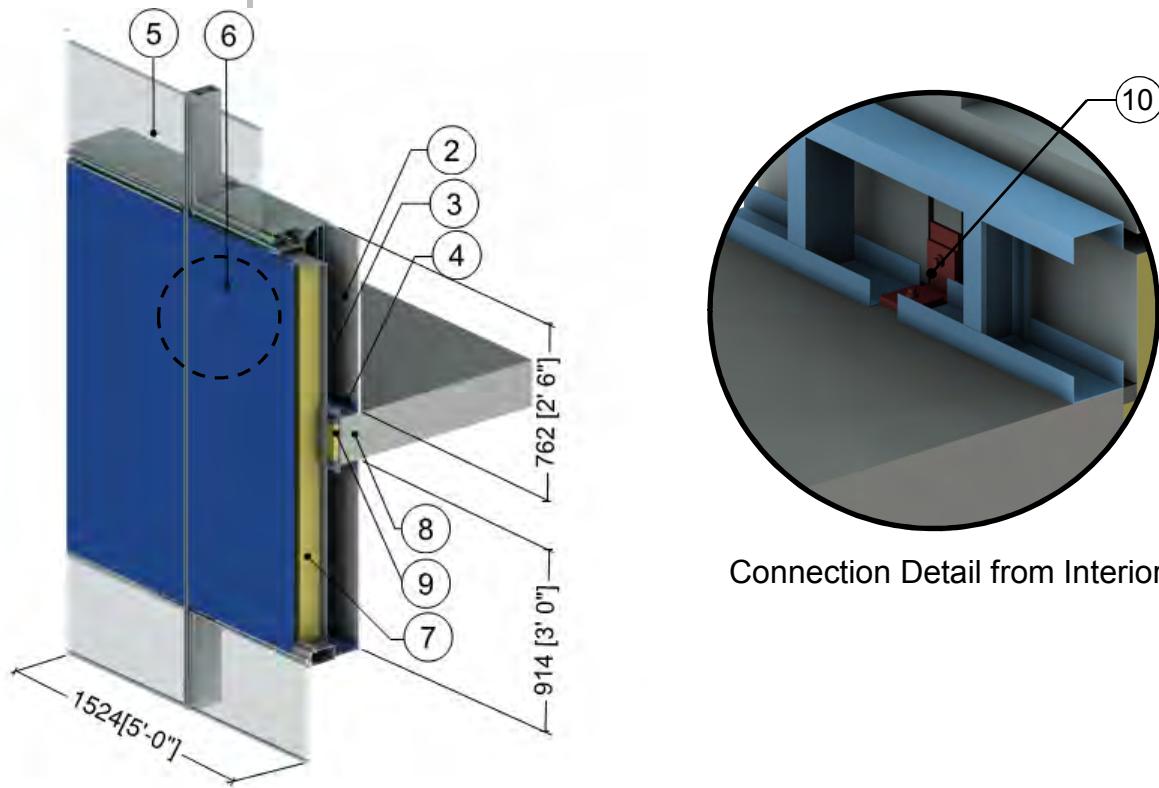
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air 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, double glazed IGU	$U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W/m}^2\text{K}$) ²				
7	Unitized Curtain Wall Spandrel System with Insulated Backpan: structural silicone joints ²					
8	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 (1.48 RSI) to R-16.8 (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 – Slab Intersection & No Interior Stud Cavity Insulation



Connection Detail from Interior

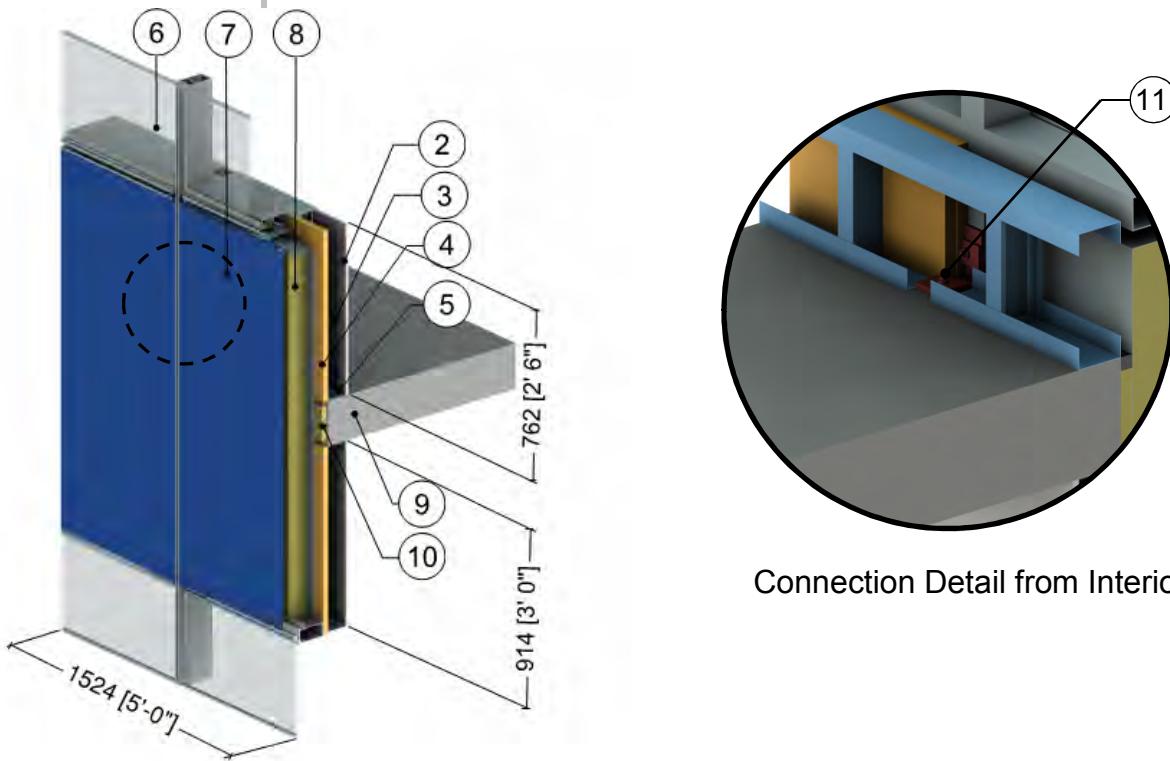
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air 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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W/m}^2\text{K}$) ²					
6	Unitized Curtain Wall Spandrel System with Insulated Backpan: structural silicone joints ²					
7	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 (1.48 RSI) to 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	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 – Slab Intersection & Interior Sprayfoam Insulation



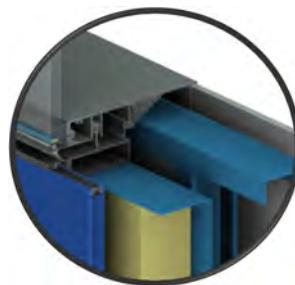
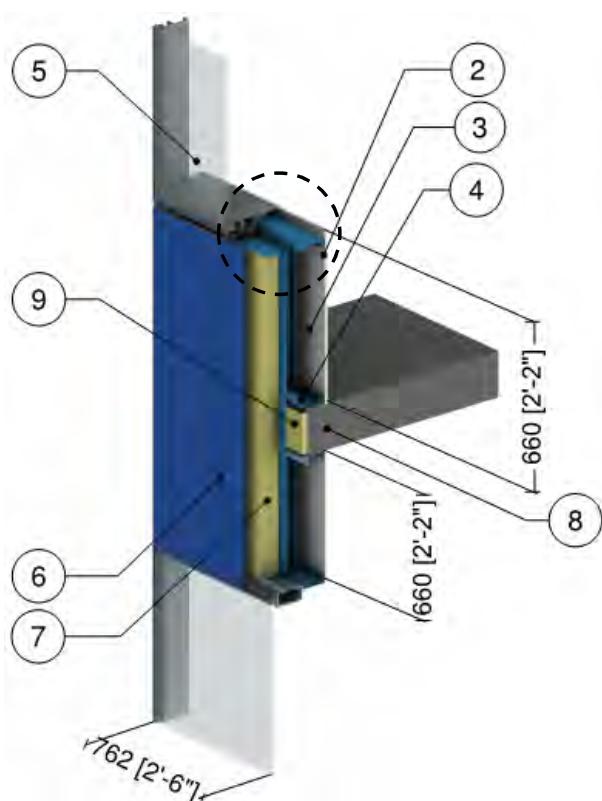
Connection Detail from Interior

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 (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 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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W/m}^2\text{K}$) ²					
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)	-	-

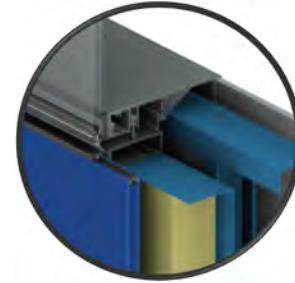
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 3.2.3

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



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 (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	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)	-	-

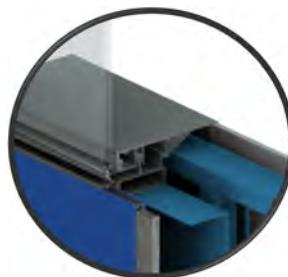
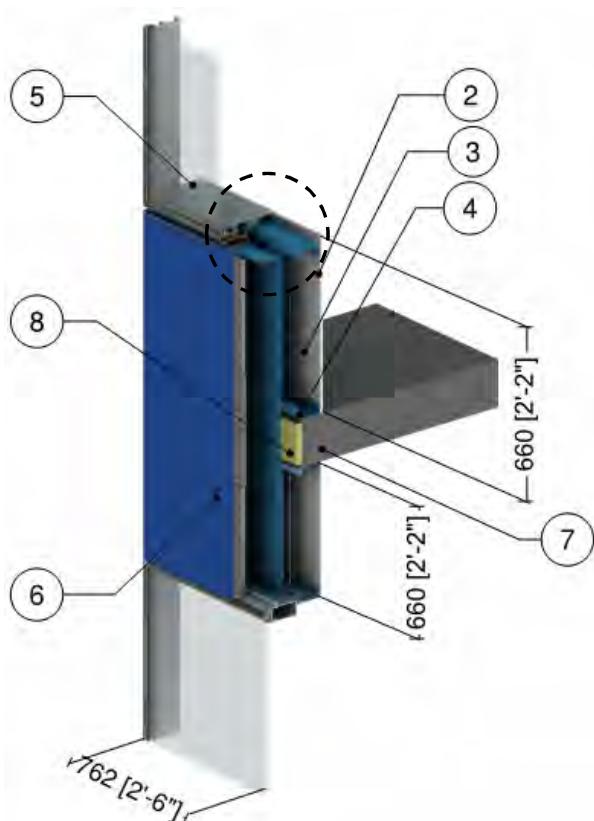
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

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

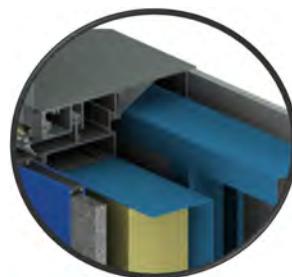
³ For a window to wall ratio of 50%

Detail 3.2.4

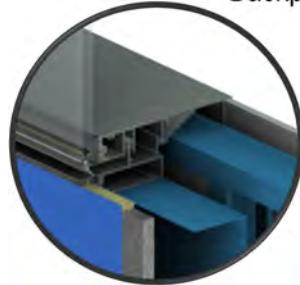
Unitized Curtain Wall System with 4-Sided Structural Silicone Joints and 5' x 5' Spandrel Section – AIM Applications



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 (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	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

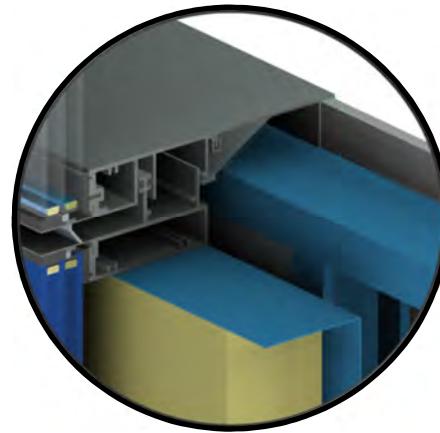
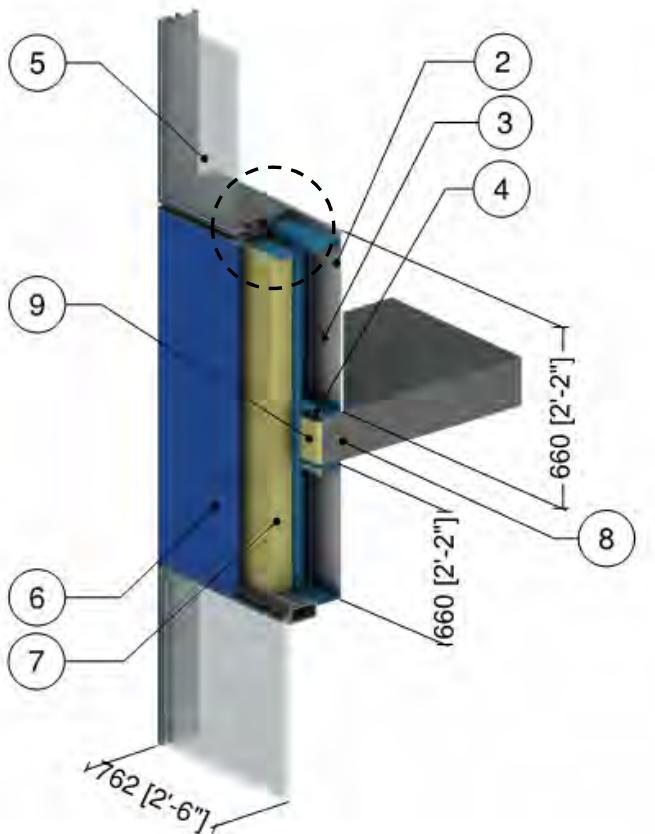
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

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



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 (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	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)	-	-

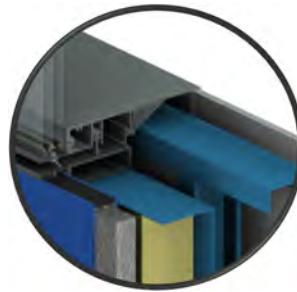
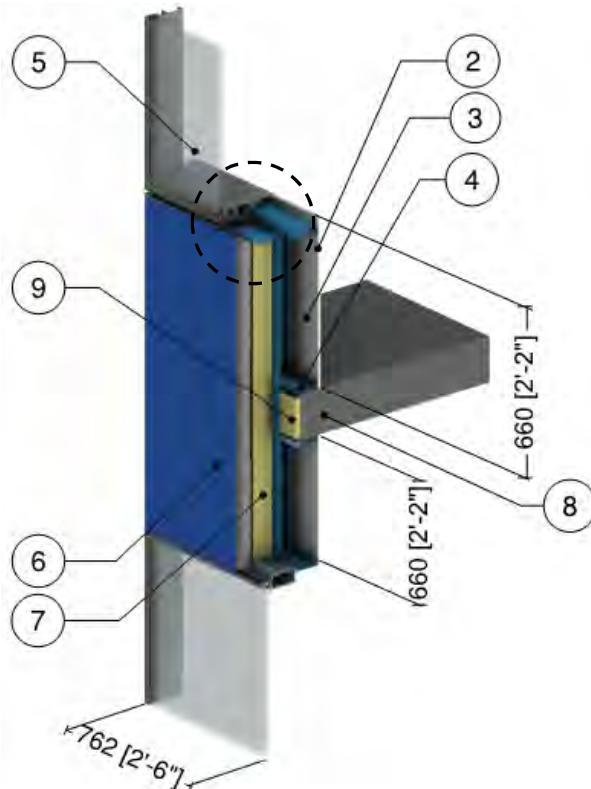
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

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

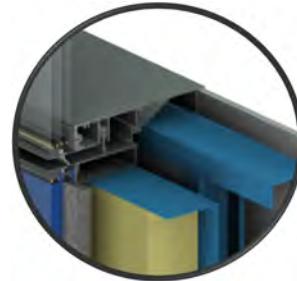
³ For a window to wall ratio of 50%

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



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 (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	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

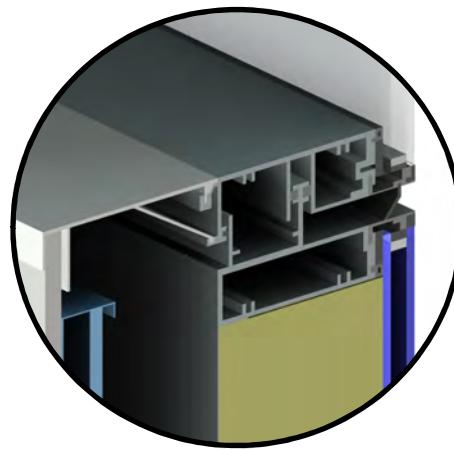
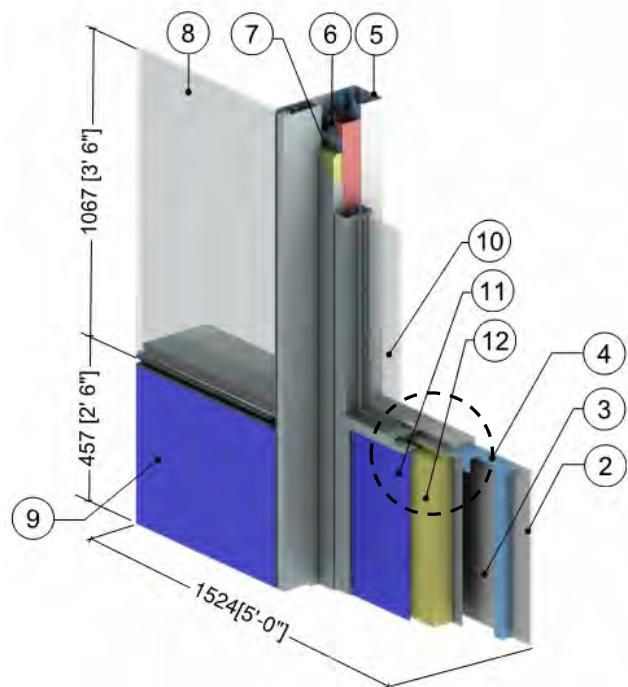
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

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

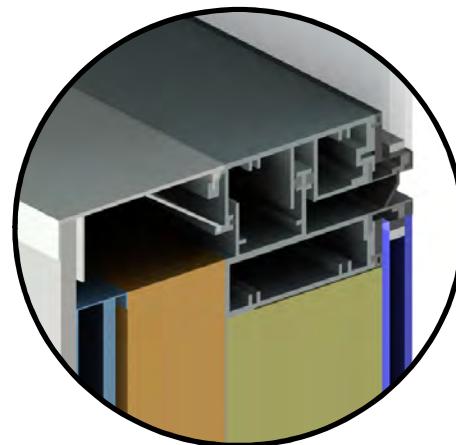
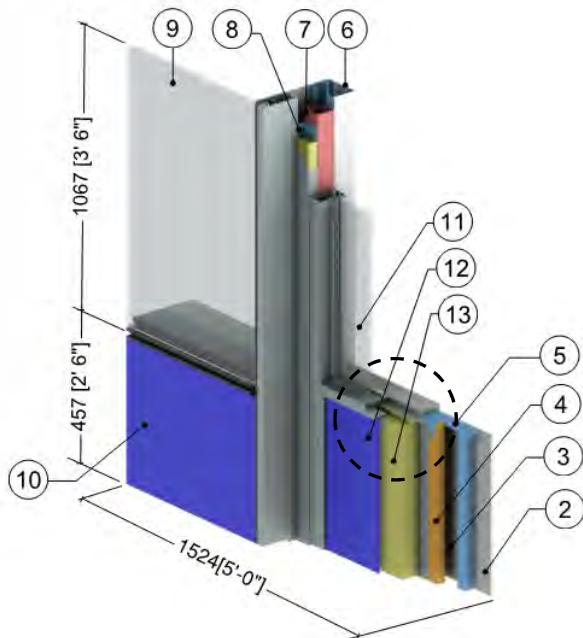
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air 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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W/m}^2\text{K}$) ²					
9	Unitized Curtain Wall Spandrel System with Insulated Backpan: structural silicone joints ²					
10	Aluminum Window Wall Vision System: thermally broken frame, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W/m}^2\text{K}$) ²					
11	Aluminum Window Wall Spandrel System with Insulated Backpan: thermally broken frame ²					
12	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 (1.48 RSI) to R-16.8 (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 (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	1 5/8" (41)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
4	Continuous Sprayfoam 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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W/m}^2\text{K}$) ²					
10	Unitized Curtain Wall Spandrel System with Insulated Backpan: structural silicone joints ²					
11	Aluminum Window Wall Vision System: thermally broken frame, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W/m}^2\text{K}$) ²					
12	Aluminum Window Wall Spandrel System with Insulated Backpan: thermally broken frame ²					
13	Backpan Insulation	Varies	0.24 (0.034)	R-8.4 (1.48 RSI) to R-16.8 (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 Sprayfoam Insulation

Detail 4.2.1 **A.4.3**

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

Detail 4.2.2 **A.4.4**

High Performance Curtain Wall System – Slab Intersection & Interior Sprayfoam 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

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

Detail 4.2.5 **A.4.7**

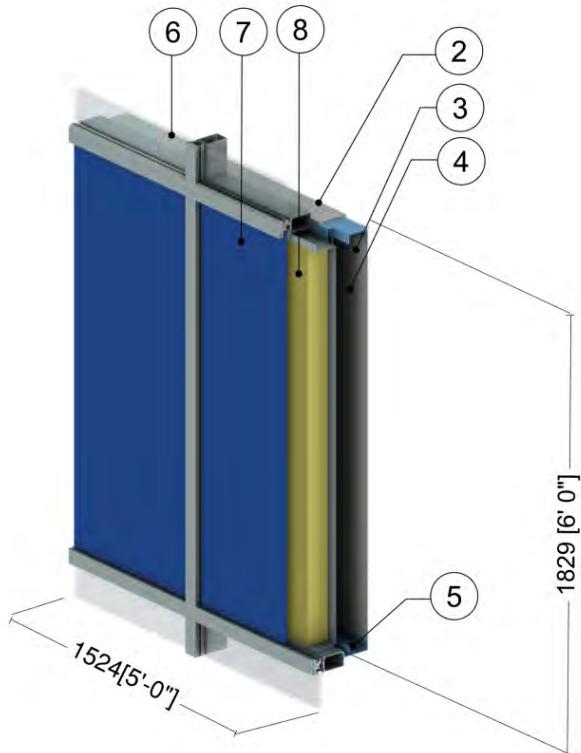
High Performance Curtain Wall System with Vertical and Horizontal Pressure Plates, Intermediate Mullion and 5' x 5' Spandrel Section – Insulated Backpan

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

Detail 4.1.1

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



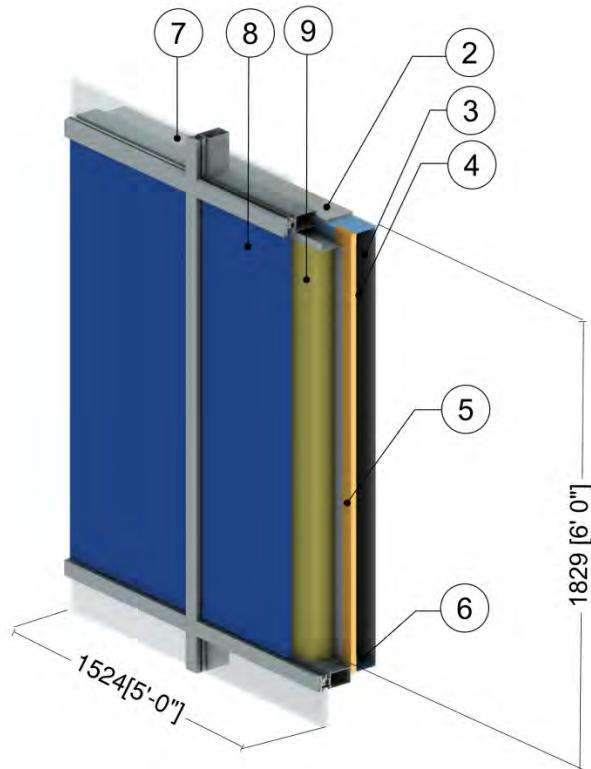
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82\text{W/m}^2\text{K}$) ²					
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 (1.48 RSI) to R-16.8 (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 Sprayfoam Insulation



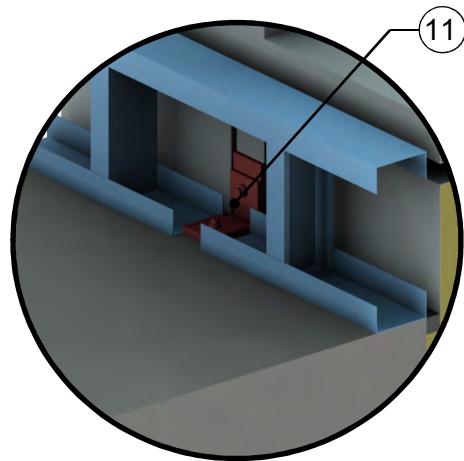
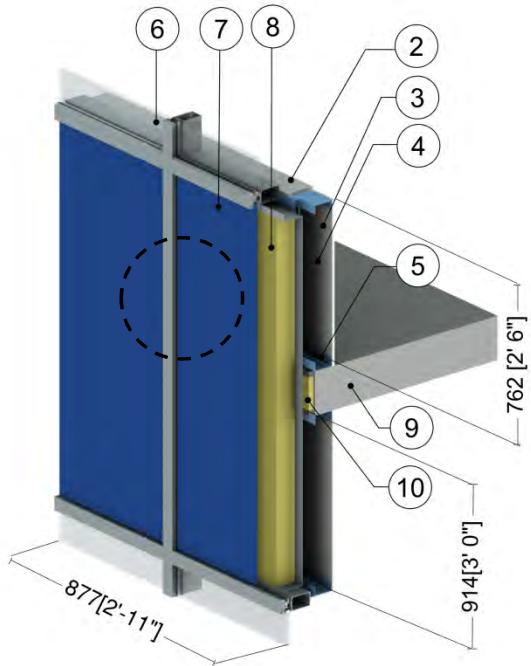
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82\text{W/m}^2\text{K}$) ²					
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 (1.48 RSI) to R-16.8 (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 – Slab Intersection & No Interior Stud Cavity Insulation



Connection Detail from Interior

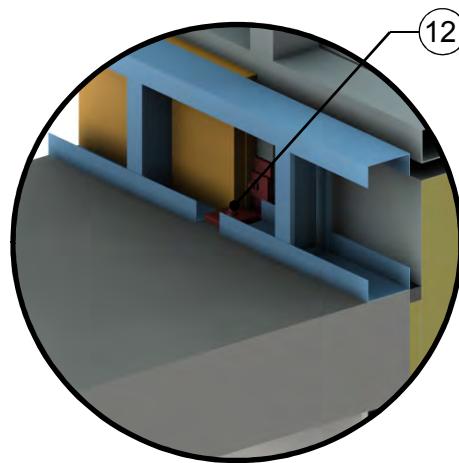
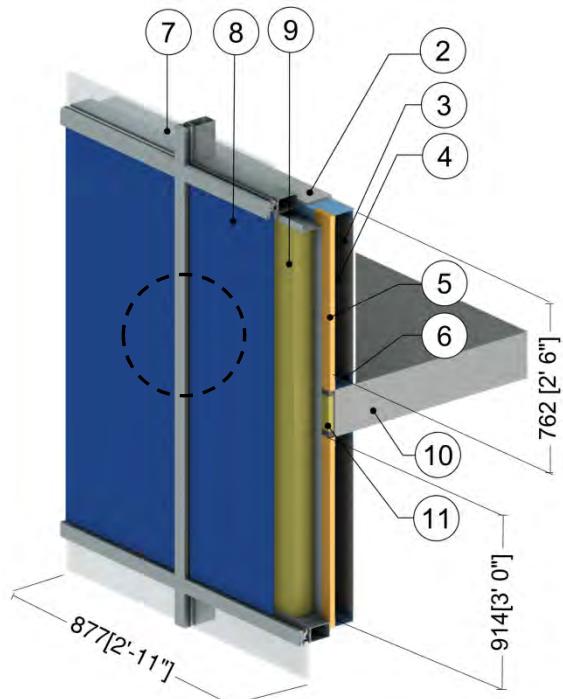
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Wood Sill	1 1/4" (30)	0.69 (0.10)	-	27.8 (445)	0.45 (1880)
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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82\text{W/m}^2\text{K}$) ²					
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 (1.48 RSI) to 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 4.2.2

High Performance Curtain Wall System – Slab Intersection & Interior Sprayfoam Insulation



Connection Detail from Interior

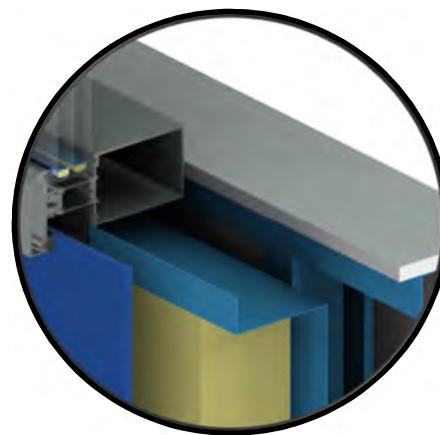
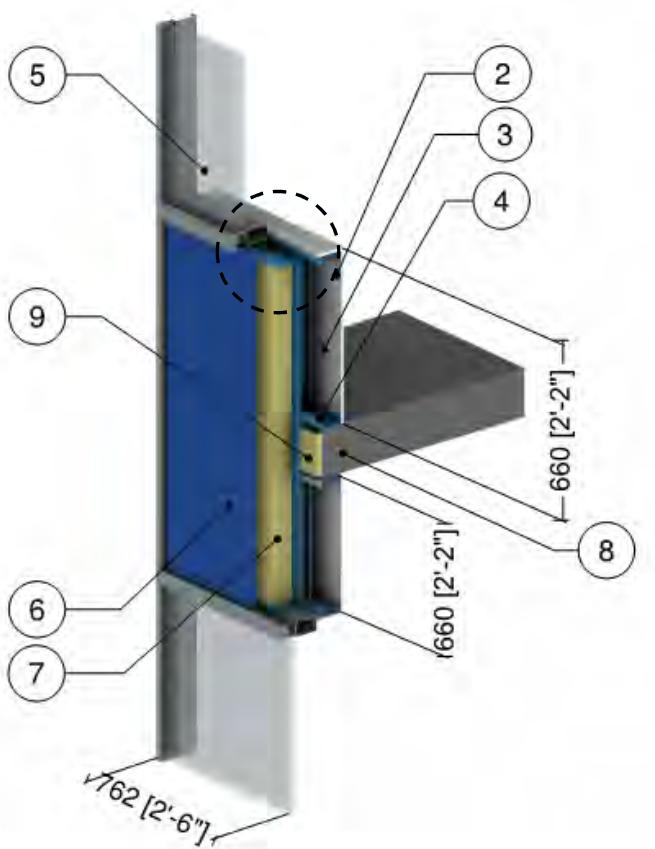
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² .hr. ^o F (W/m K)	Nominal Resistance hr·ft ² . ^o F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb. ^o F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Wood Sill	1 1/2" (30)	0.69 (0.10)	-	27.8 (445)	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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot{}^{\circ}\text{F}$ ($1.82 \text{ W/m}^2\text{K}$) ²					
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 (1.48 RSI) to R-16.8 (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



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 (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: 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)	-	-

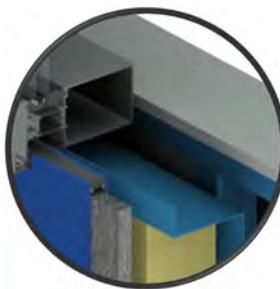
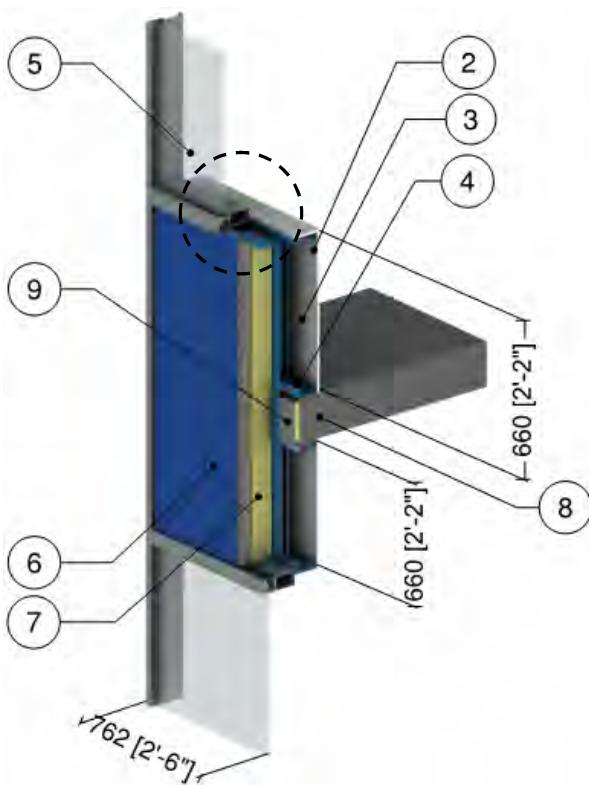
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

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

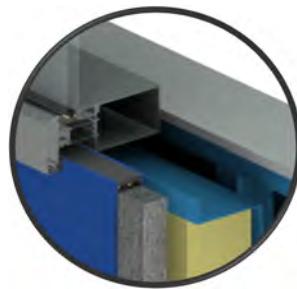
³ For a window to wall ratio of 50%

Detail 4.2.4

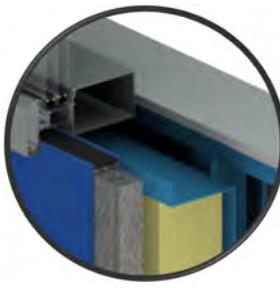
High Performance Curtain Wall System with Vertical and Horizontal Pressure Plates and 5' x 5' Spandrel Section – AIM Applications



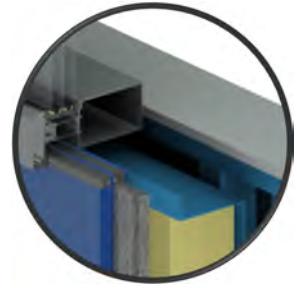
E1 – Warm Edge Spacer,
0.75" (19 mm) AIM between
Glass



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 Spacer,
Shadow AIM with 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 (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 (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

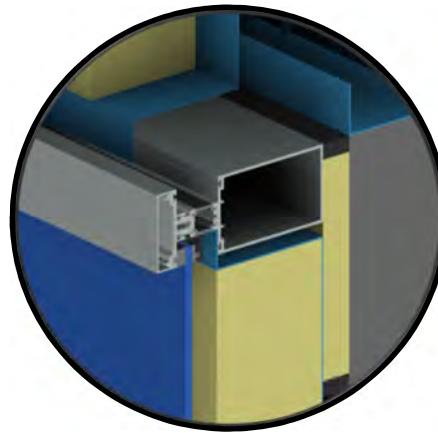
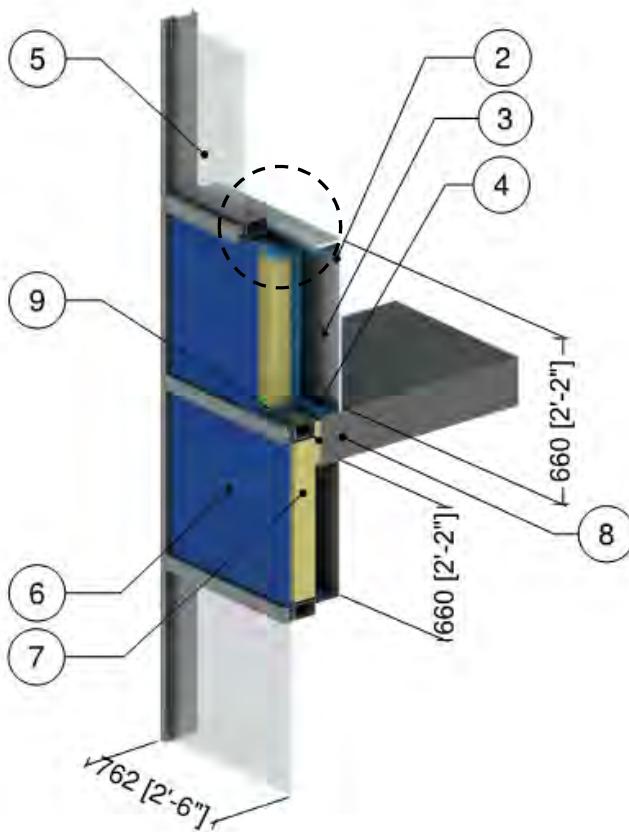
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

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



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 (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 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)	-	-

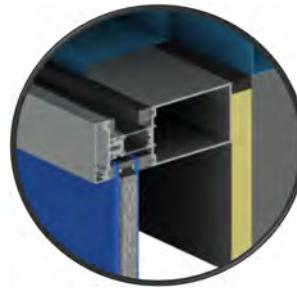
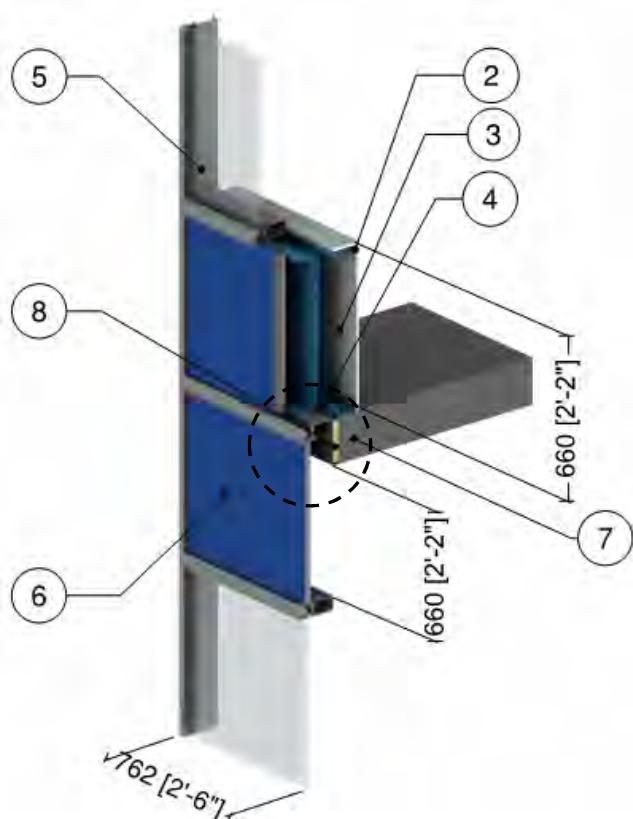
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

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

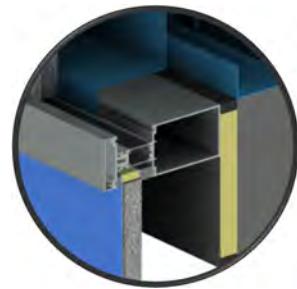
³ For a window to wall ratio of 50%

Detail 4.2.6

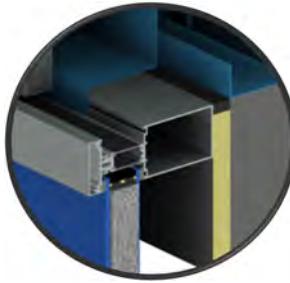
High Performance Curtain Wall System with Vertical and Horizontal Pressure Plates, Intermediate Mullion and 5' x 5' Spandrel Section – AIM Applications



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 Stud Construction

Detail 5.1.1 **A.5.1**

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

Detail 5.1.2 **A.5.2**

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

Detail 5.1.4 **A.5.4**

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

Detail 5.1.6 **A.5.6**

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 – Clear Wall

Detail 5.1.7 **A.5.7**

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 – Clear Wall

Detail 5.1.8 **A.5.8**

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

Detail 5.1.10 **A.5.10**

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 5.1.11 **A.5.11**

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 5.1.12 **A.5.12**

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 – Clear Wall

Detail 5.1.13 **A.5.13**

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 – Clear Wall

Detail 5.1.14 **A.5.14**

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 5.1.15 **A.5.15**

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 – Clear Wall

Detail 5.1.16 **A.5.16**

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 – Clear Wall

Detail 5.1.17 **A.5.17**

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 5.1.18 **A.5.18**

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

Detail 5.1.19 **A.5.19**

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 5.1.20 **A.5.20**

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

Detail 5.1.21 **A.5.21**

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

Detail 5.1.22 **A.5.22**

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

Detail 5.1.23 **A.5.23**

Vertical Insulated Metal Panel – Clear Wall with Vertical Connection Joint and Support Girt/Hat Track Backup Wall

Detail 5.1.24 **A.5.24**

Vertical Insulated Metal Panel – Metal Stack Joint and Support Girt Back/Hat Track Backup Wall

Detail 5.1.25 **A.5.25**

Horizontal Insulated Metal Panel – Clear Wall with Horizontal Connection Joint and Steel Stud Backup Wall

Detail 5.1.26 **A.5.26**

Horizontal Insulated Metal Panel – Vertical Gasket Joint with Steel Stud Backup Wall

Detail 5.2.1 **A.5.27**

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 – Slab Intersection

Detail 5.2.2 **A.5.28**

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 – Slab Intersection with Top Side Insulation

Detail 5.2.3 **A.5.29**

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 – Slab Intersection with Top & Under Side Insulation

Detail 5.2.4 **A.5.30**

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 Concrete Slab Intersection with Uninsulated Curb

Detail 5.2.5 **A.5.31**

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 – Uninsulated Concrete Slab Intersection with Uninsulated Curb

Detail 5.2.6 **A.5.32**

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 Concrete Slab Intersection with Insulated Curb

Detail 5.2.7 **A.5.33**

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 – Uninsulated Concrete Slab Intersection with Insulated Curb

Detail 5.2.8 **A.5.34**

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 – Uninsulated Slab Intersection

Detail 5.2.9 **A.5.35**

Exterior and Interior Insulated Wall Assembly with Shelf Angle & Brick Ties Supporting Brick Veneer – Slab Intersection

Detail 5.2.10	A.5.36
Exterior and Interior Insulated Wall Assembly with Spaced Shelf Angle & Brick Ties Supporting Brick Veneer – Slab Intersection	
Detail 5.2.11	A.5.37
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	
Detail 5.2.12	A.5.38
Exterior and Interior 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	
Detail 5.2.13	A.5.39
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 – Isokorb CM20 Thermally Broken Slab Projection with Uninsulated Curb	
Detail 5.2.14	A.5.40
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 CM20 Thermally Broken Slab Projection with Uninsulated Curb	
Detail 5.2.15	A.5.41
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 CM20 Thermally Broken Slab Projection with Insulated Curb	
Detail 5.2.16	A.5.42
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 – Isokorb CM20 Thermally Broken Slab Projection with Insulated Curb	
Detail 5.2.17	A.5.43
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Floor Slab Intersection	
Detail 5.2.18	A.5.44
Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Floor Slab Intersection	
Detail 5.2.19	A.5.45
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 – Steel Framed Floor with Cross Cavity Flashing	
Detail 5.2.20	A.5.46
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 Slab Intersection	

Detail 5.2.21 **A.5.47**

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

Detail 5.2.22 **A.5.48**

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

Detail 5.2.23 **A.5.49**

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 – Slab Intersection

Detail 5.2.24 **A.5.50**

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 – Structural Steel Framed Floor Intersection

Detail 5.2.25 **A.5.51**

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 – Structural Steel Framed Floor Intersection

Detail 5.2.26 **A.5.52**

Vertical Insulated Metal Panel - Corrugated Slab Intersection with I-beam, Open Web Steel Joist and Support Girt/Hat Track Backup Wall

Detail 5.2.27 **A.5.53**

Horizontal Insulated Metal Panel – Corrugated Slab Intersection with I-beam, Open Web Steel Joist and Steel Stud Backup Wall

Detail 5.3.1 **A.5.54**

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Window and Floor Slab Intersection

Detail 5.3.2 **A.5.55**

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Window and Floor Slab Intersection

Detail 5.3.3 **A.5.56**

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 & Slab Intersection

Detail 5.3.4 **A.5.57**

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 – Window and Floor Slab Intersection

Detail 5.3.5	A.5.58
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 – Window and Slab Intersection	
Detail 5.3.6	A.5.59
Vertical Insulated Metal Panel – Window Glazing Transition with Steel Support Framing	
Detail 5.3.7	A.5.60
Horizontal Insulated Metal Panel – Window Glazing Transition with Steel Support Framing	
Detail 5.3.8	A.5.61
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Window with Aerogel and Floor Slab Intersection	
Detail 5.3.9	A.5.62
Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Window with Aerogel and Floor Slab Intersection	
Detail 5.4.1	A.5.63
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Conventional Curtain Wall Transition	
Detail 5.4.2	A.5.64
Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Conventional Curtain Wall Transition	
Detail 5.4.3	A.5.65
Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly – Curtain Wall Transition	
Detail 5.4.4	A.5.66
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 – Conventional Curtain Wall Intersection	
Detail 5.4.5	A.5.67
Exterior Insulated Concrete Wall and Steel Stud Assembly Supporting Metal Cladding – Curtain Wall Transition Intersection	
Detail 5.4.6	A.5.68
Exterior Insulated Concrete Wall and Steel Stud Assembly Supporting Metal Cladding with Cavity Insulation – Curtain Wall Transition Intersection	
Detail 5.5.1	A.5.69
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Concrete Parapet & Slab Intersection	

Detail 5.5.2 **A.5.70**

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Insulated Concrete Parapet & Slab Intersection

Detail 5.5.3 **A.5.71**

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Concrete Parapet & Slab Intersection

Detail 5.5.4 **A.5.72**

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Insulated Concrete Parapet & Slab Intersection

Detail 5.5.5 **A.5.73**

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

Detail 5.5.6 **A.5.74**

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 – Concrete Parapet and Slab Intersection

Detail 5.5.7 **A.5.75**

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 – Concrete Parapet & Slab Intersection

Detail 5.5.8 **A.5.76**

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 – Concrete Roof Deck at Continuous Concrete Parapet

Detail 5.5.9 **A.5.77**

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 – Steel Roof Deck with Open Web Steel Joist & Parapet Intersection

Detail 5.5.10 **A.5.78**

Vertical Insulated Metal Panel – Steel Roof Deck with Open Web Steel Joist & Parapet Intersection

Detail 5.5.11 **A.5.80**

Horizontal Insulated Metal Panel – Steel Roof Deck with Open Web Steel Joist & Parapet Intersection

Detail 5.5.12 **A.5.81**

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 – Concrete Roof Deck at Isokorb AXT1 Thermally Broken Concrete Parapet

Detail 5.6.1	A.5.82
Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Corner Intersection	
Detail 5.6.2	A.5.83
Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Corner Intersection	
Detail 5.6.3	A.5.84
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	
Detail 5.6.4	A.5.85
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, Alternative Framing	
Detail 5.6.5	A.5.86
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 – Corner Intersection	
Detail 5.6.6	A.5.87
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.5.88
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 5.6.8	A.5.89
Vertical Insulated Metal Panel – Corner Intersection, with Post and Support Girt/Hat Track Backup Wall	
Detail 5.6.9	A.5.90
Horizontal Insulated Metal Panel – Corner Intersection, with Post and Steel Stud Backup Wall	
Detail 5.7.1	A.5.91
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 – Structural Steel Column & Cantilever Beam Intersection (Canopy Support)	
Detail 5.7.2	A.5.92
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 – Structural Steel Floor Intersection with Uninterrupted Beam	

Detail 5.7.3 **A.5.93**

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 – Structural Steel Floor Intersection with Isokorb S22 Thermally Broken Beam

Detail 5.7.4 **A.5.94**

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 – Structural Steel Floor Intersection with Isokorb S22 Thermally Broken Beam

Detail 5.7.5 **A.5.95**

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

Detail 5.7.6 **A.5.96**

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.5.97**

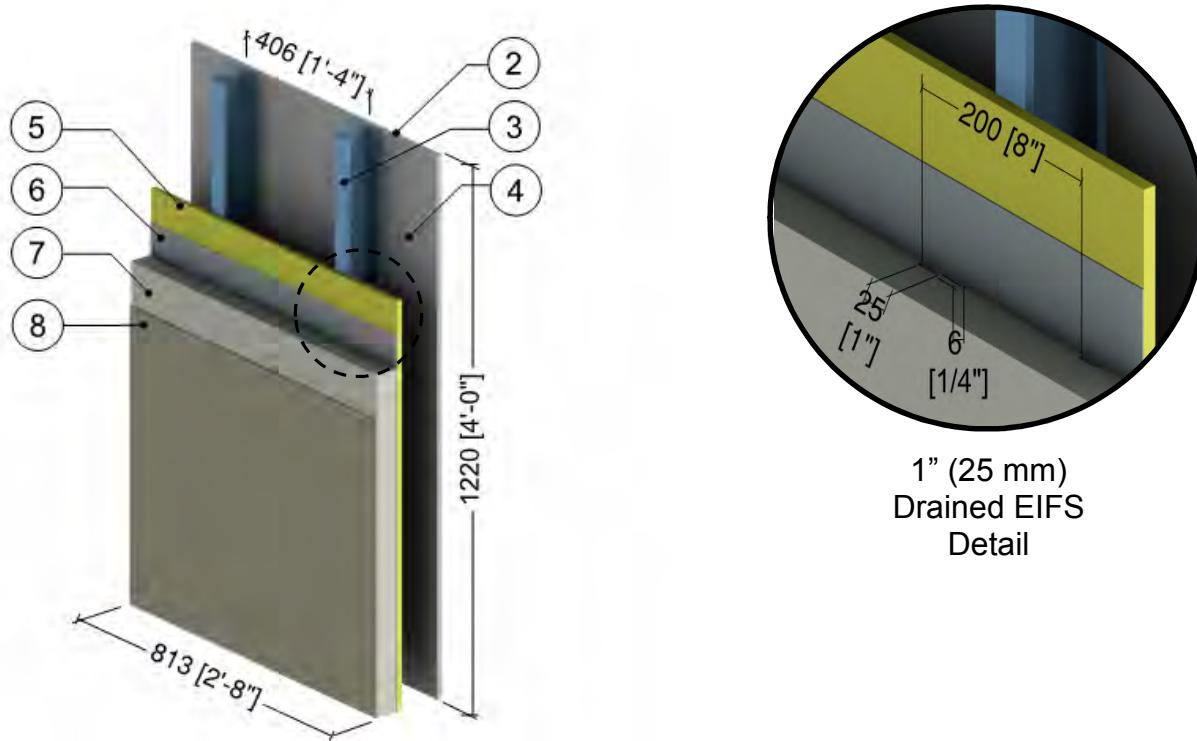
Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Intermittent Vertical Z-girts (16" o.c.) Supporting Metal Cladding – Concrete Floor to Steel Beam with Isokorb KS14 Connection

Detail 5.8.1 **A.5.98**

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 – Interior Wall Intersection

Detail 5.1.1

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

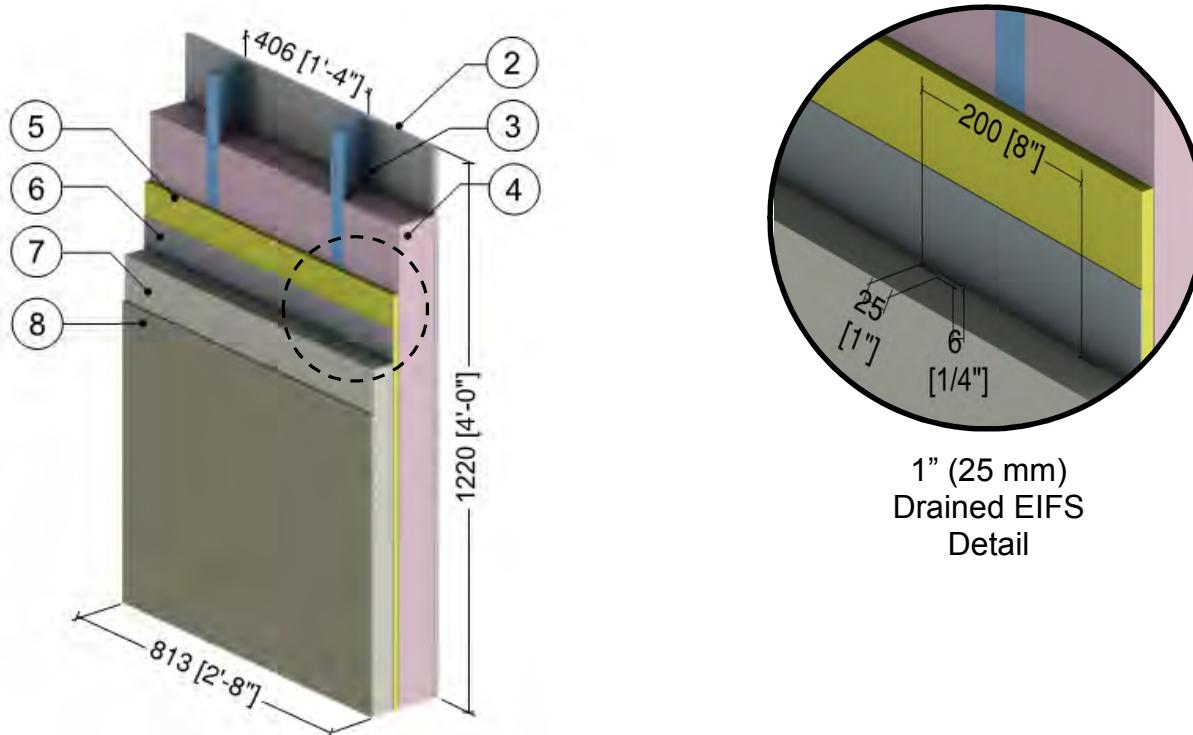


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 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 (0.09 RSI)	50 (800)	0.26 (1090)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	2" (50) to 4" (100)	0.27 (0.039)	R-7.5 (1.32 RSI) to 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 5.1.2

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

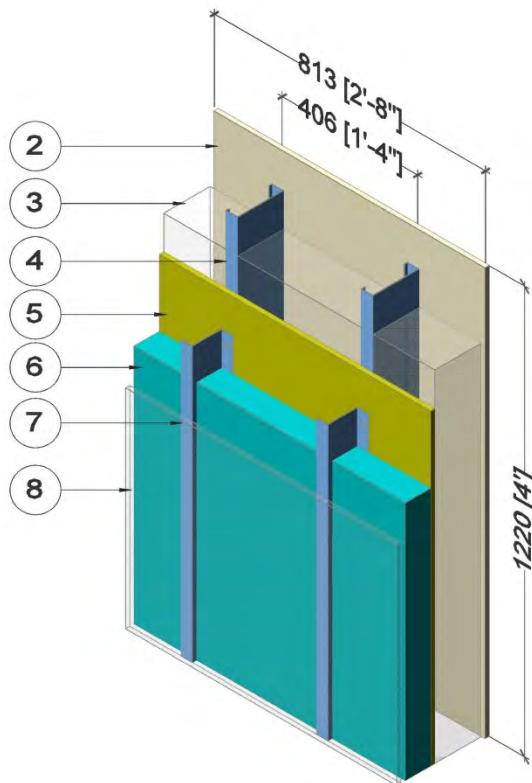


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 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)	0.29 (0.042)	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 (0.09 RSI)	50 (800)	0.26 (1090)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	2" (50) to 4" (100)	0.27 (0.039)	R-7.5 (1.32 RSI) to 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 5.1.3

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

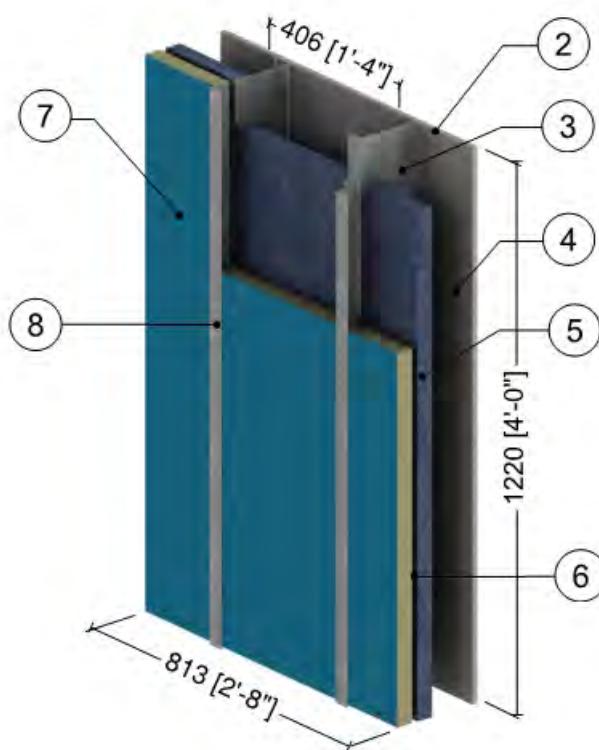


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air 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	-	R5 to R25 (0.88 to 4.4 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 5.1.4

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

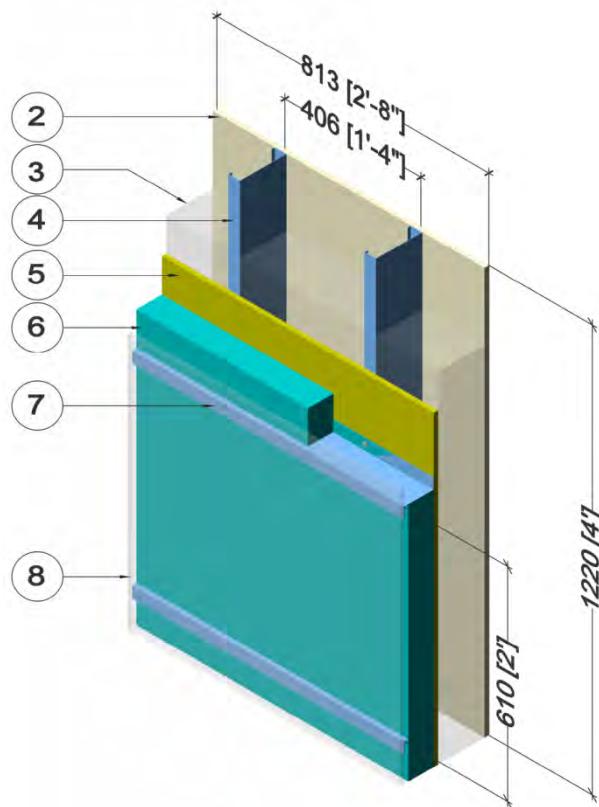


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	0.09 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	5 5/8" x 1 5/8" Steel Studs (16"o.c.)	18 Gauge	250 (36)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	4 1/8" (105)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Sprayfoam Stud Cavity 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	Polyisocyanurate Exterior 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 5.1.5

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 – Clear Wall

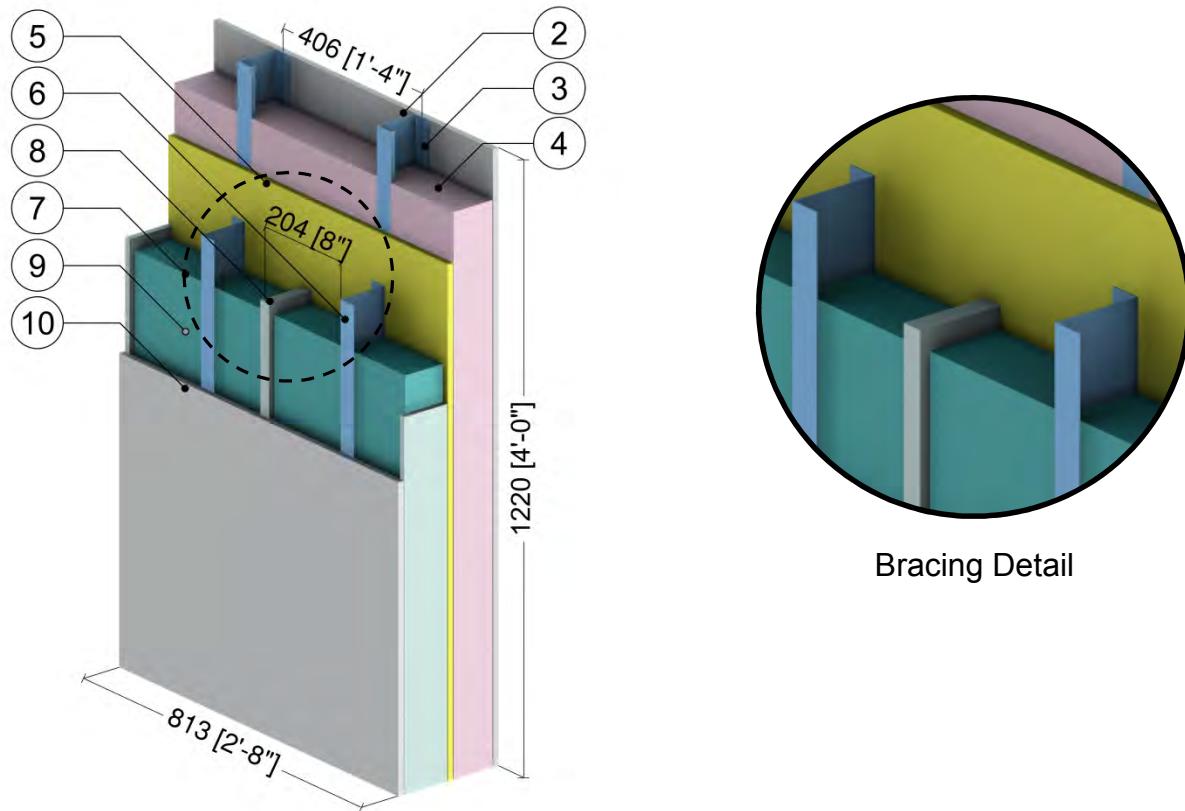


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air 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	-	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	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 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly with Vertical Z-girts (16" o.c.) Supporting Stucco Cladding – Clear Wall



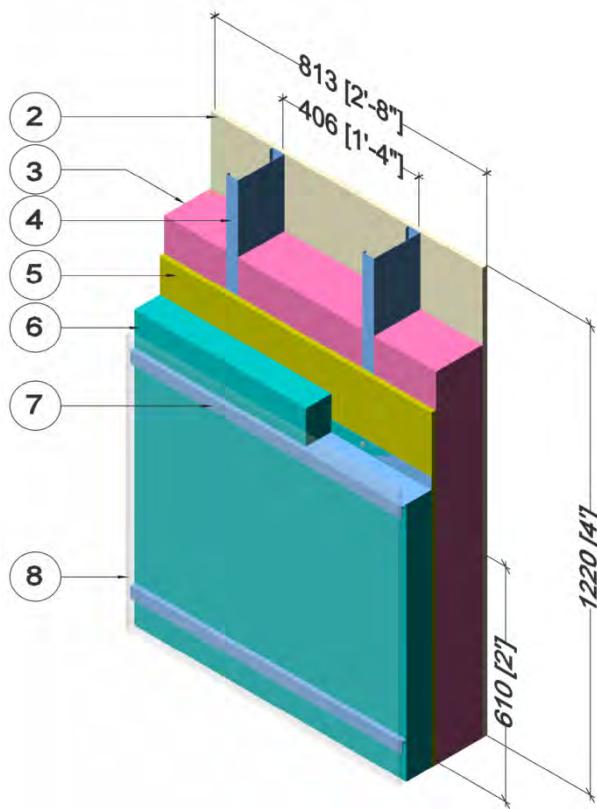
Bracing Detail

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)	0.29 (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	Vertical Z-Girts with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	Varies	-	R-10 (1.76 RSI) to R-20 (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 5.1.7

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 – Clear Wall

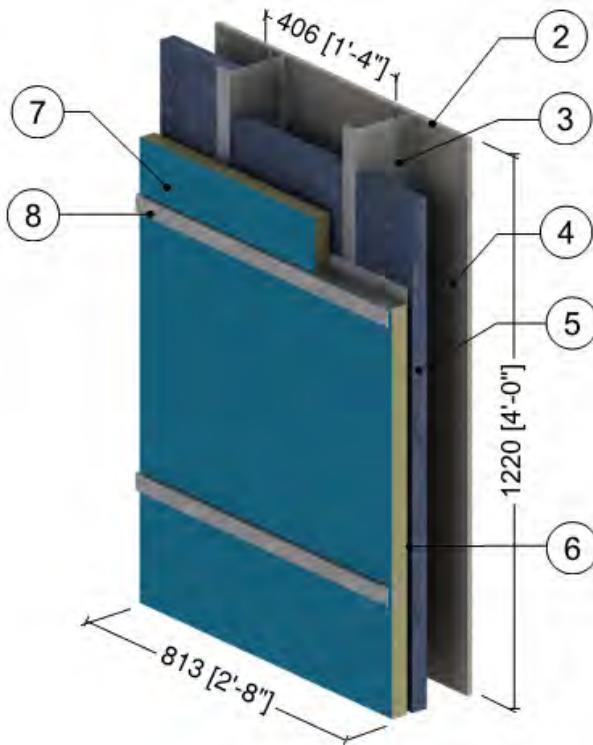


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation in Stud Cavity	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	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	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 5.1.8

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

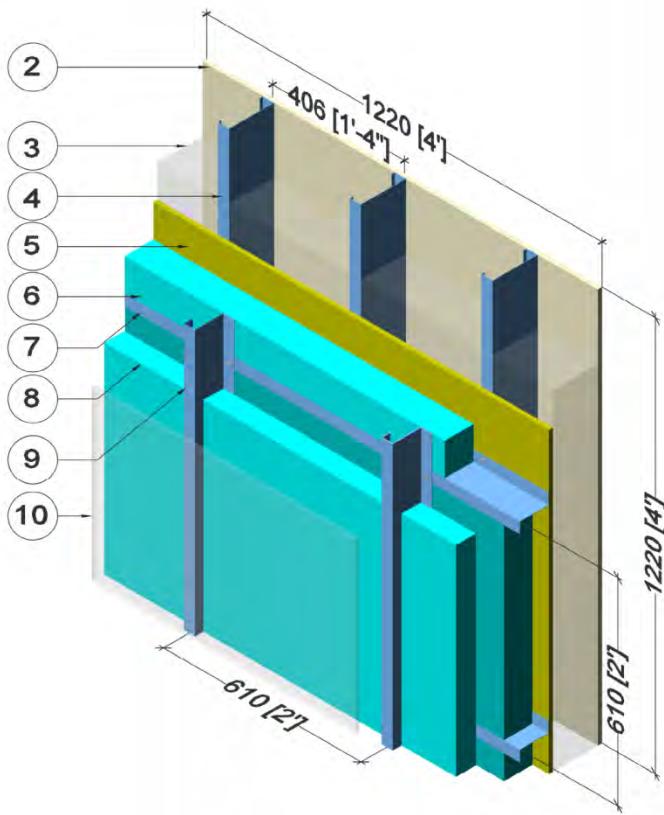


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	0.09 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	5 5/8" x 1 5/8" Steel Studs (16"o.c.)	18 Gauge	250 (36)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	4 1/8" (105)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Sprayfoam Stud Cavity 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	Polyisocyanurate Exterior 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 5.1.9

**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**

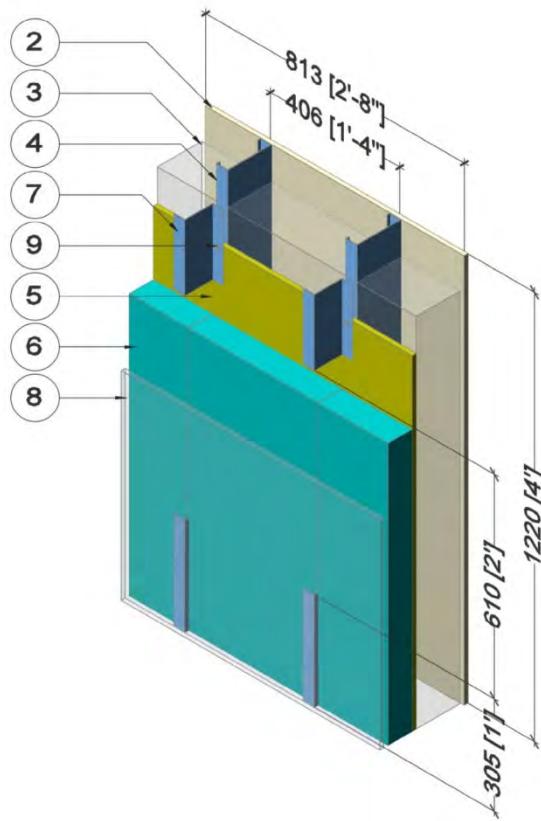


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air 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	-	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	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 5.1.10

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



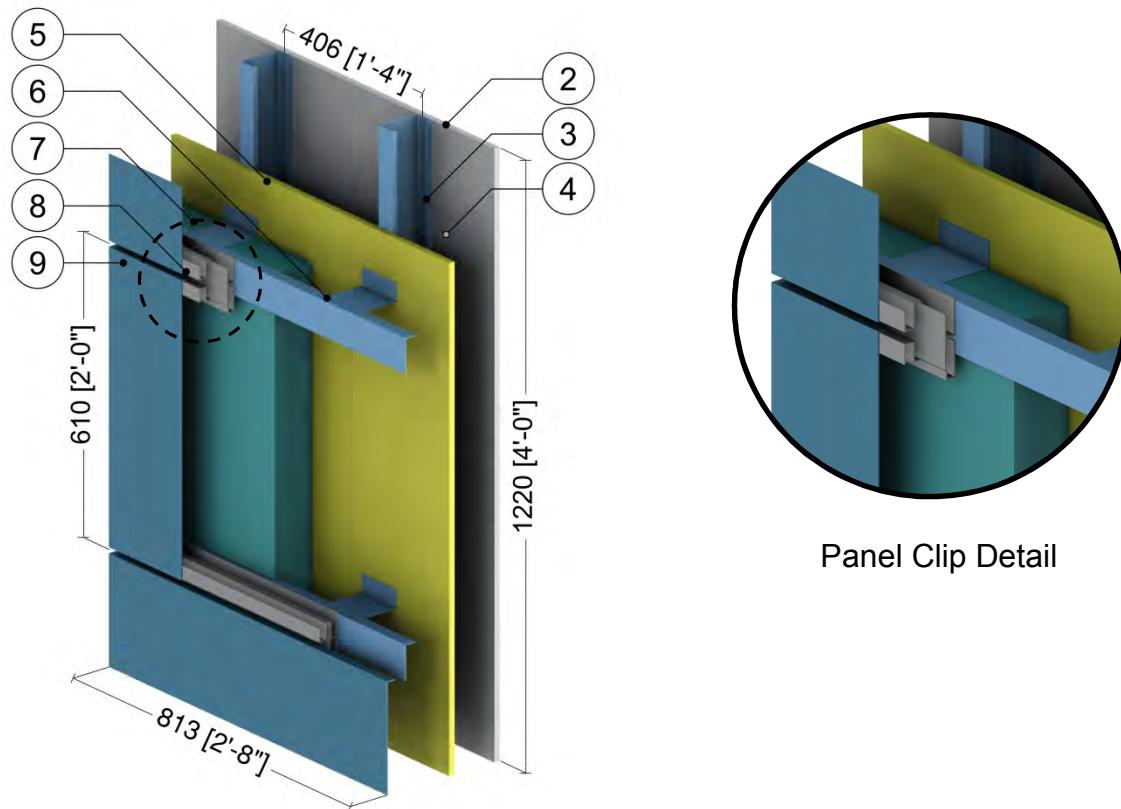
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air 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	-	R5 to R25 (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 5.1.11

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



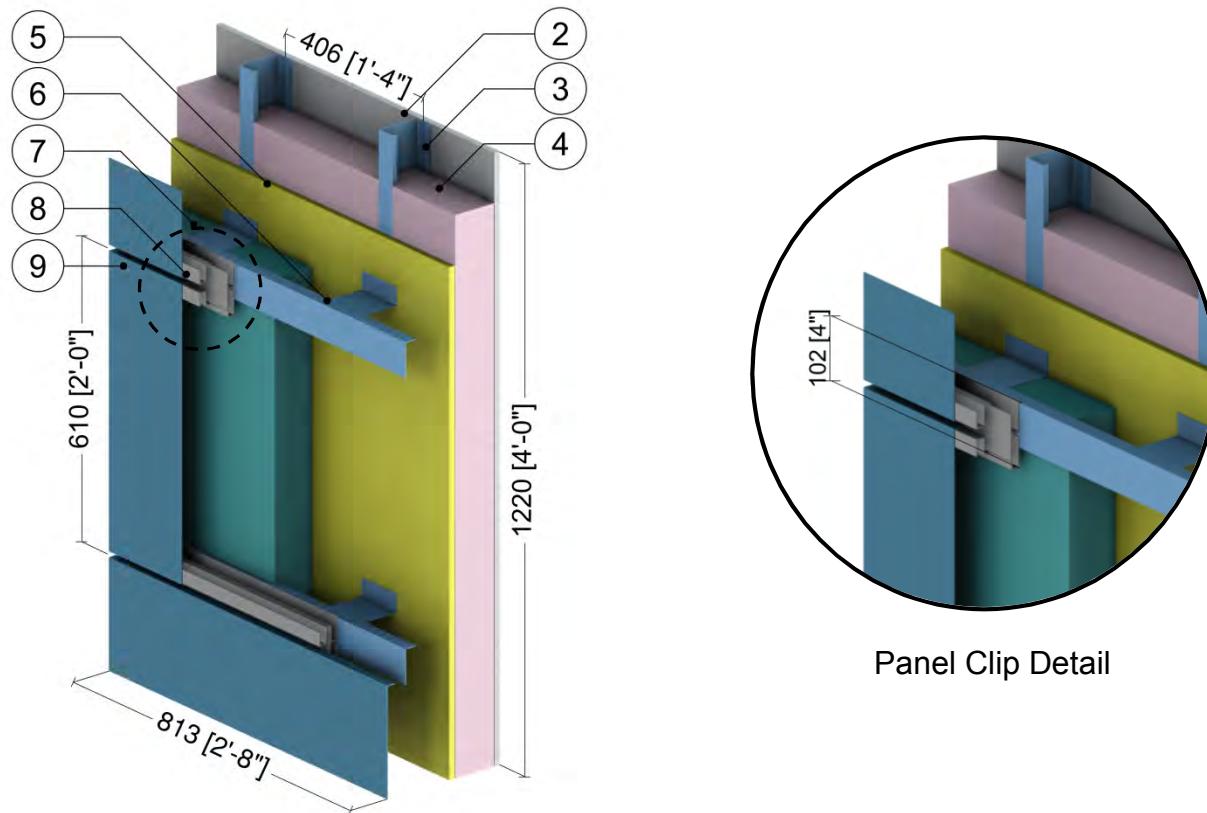
Panel Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² .hr. ^o F (W/m K)	Nominal Resistance hr.ft ² . ^o F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb. ^o 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 (2.64 RSI) to R-25 (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 5.1.12

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 – Clear Wall



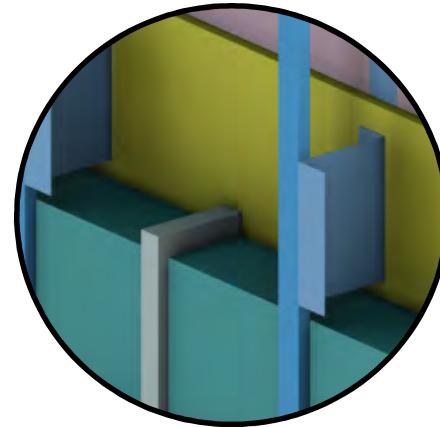
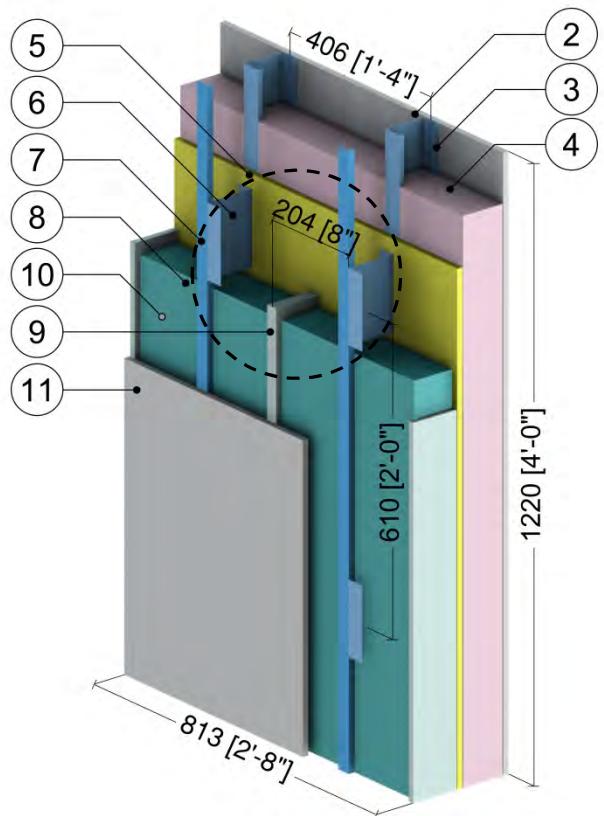
Panel Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² .hr. ^o F (W/m K)	Nominal Resistance hr.ft ² . ^o F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb. ^o 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)	0.29 (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	Horizontal Clips w/ 1 1/2" horizontal rail	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	Varies	-	R-10 (1.76 RSI) to R-20 (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 5.1.13

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 – Clear Wall



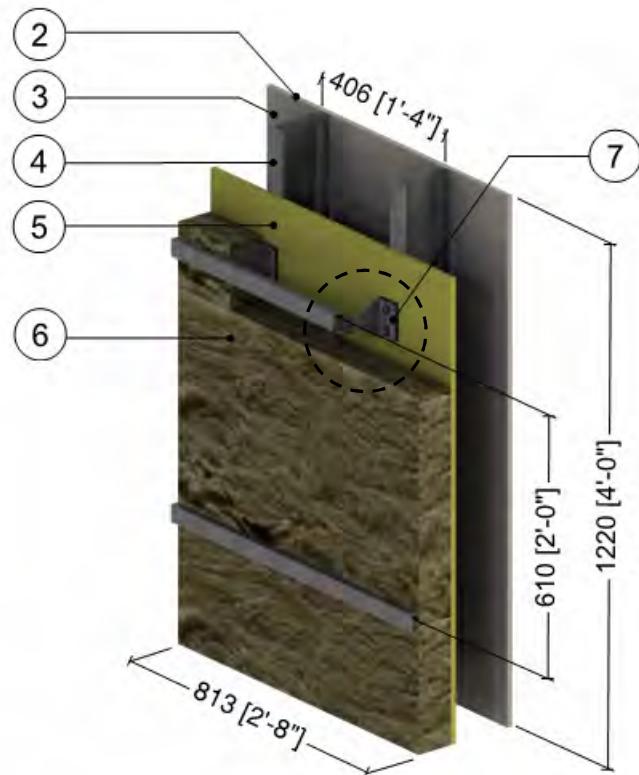
Bracing Detail

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)	0.29 (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	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 (1.76 RSI) to R-20 (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 5.1.14

**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**



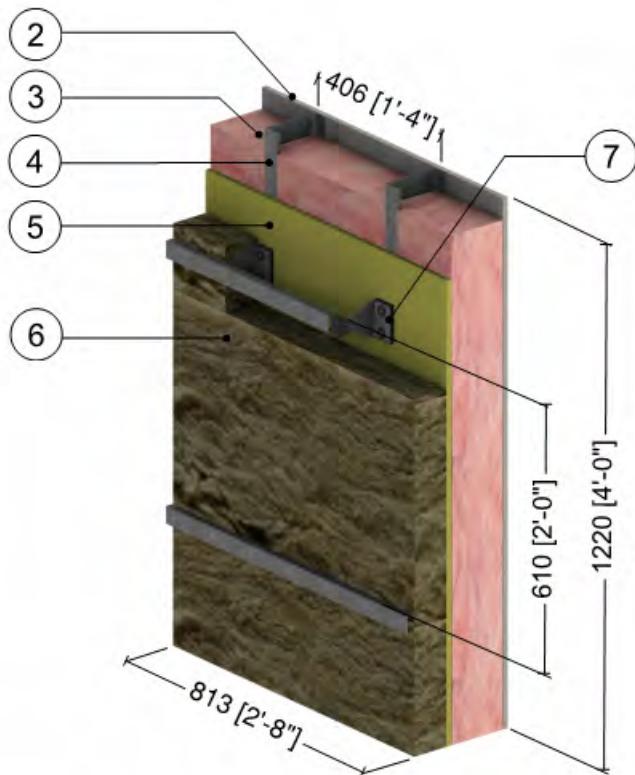
ThermaBracket Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² .hr. ^o F (W/m K)	Nominal Resistance hr.ft ² . ^o F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb. ^o 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 (1.48 RSI) to R-25.2 (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 5.1.15

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 – Clear Wall



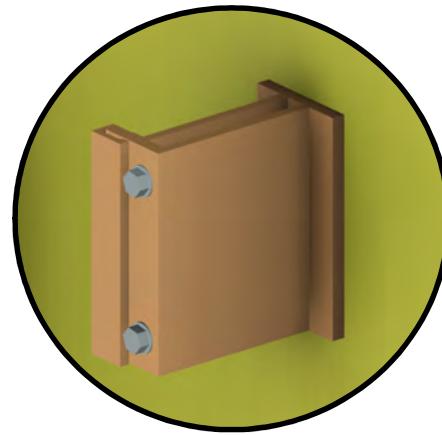
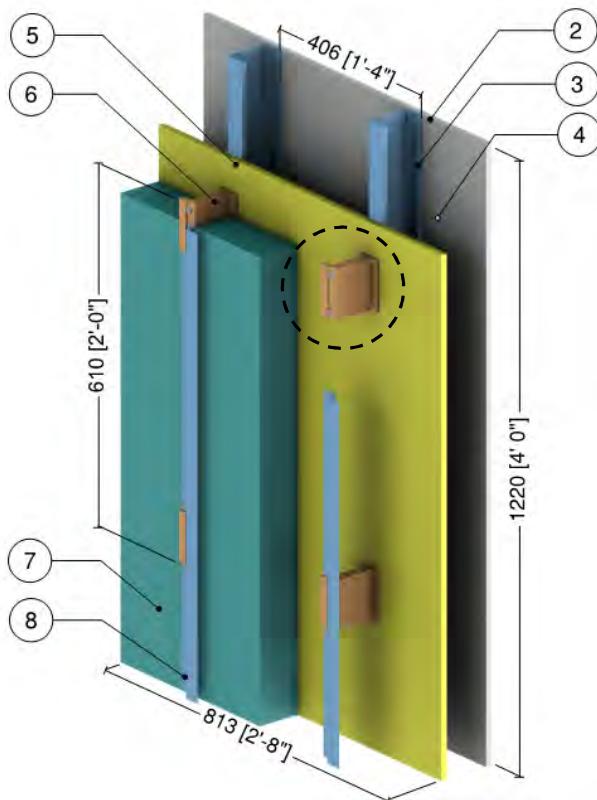
ThermaBracket Detail

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 (1.48 RSI) to R-25.2 (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 5.1.16

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 – Clear Wall



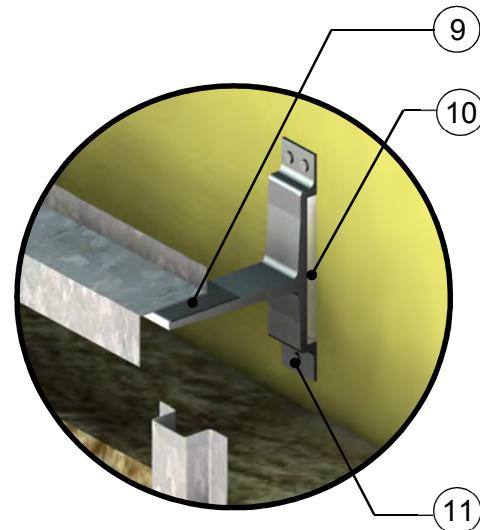
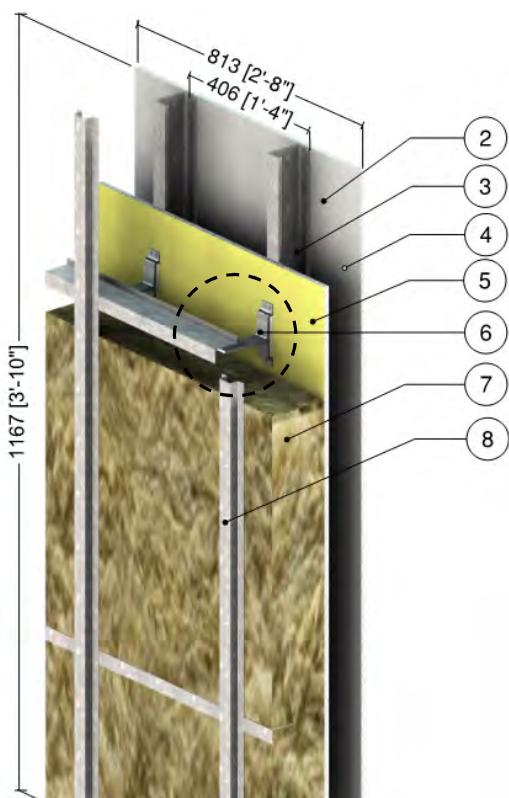
Clip Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² .hr. ^o F (W/m K)	Nominal Resistance hr·ft ² . ^o F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb. ^o 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	Fiberglass Spacer with Steel Bolts	3 1/2" (89)	1.7 (0.299)	-	-	-
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	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 5.1.17

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



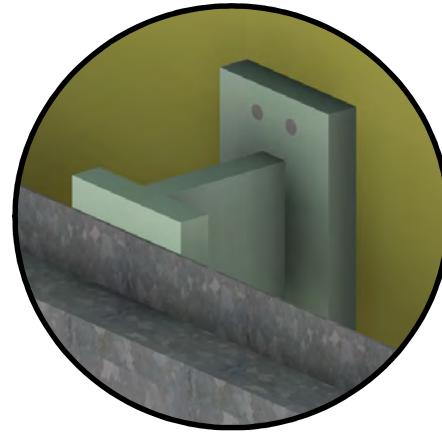
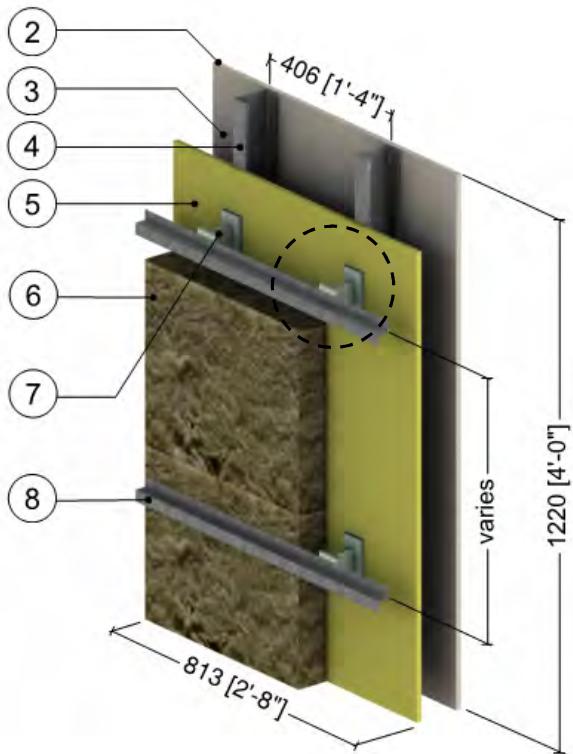
Clip Detail

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 (0.09 RSI)	50 (800)	0.26 (1090)
6	Engineered Assemblies Aluminum Panel Clip (models T100 T125 150)	1/5" (5) to 3/8" (10)	1109 (160)	-	-	-
7	Exterior Insulation	Varies	0.24 (0.034)	R-16.8 (2.96 RSI) to R-25.2 (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 5.1.18

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



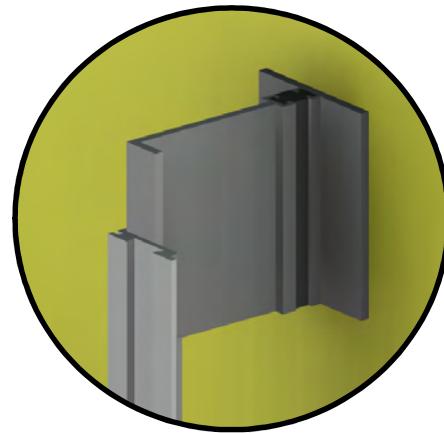
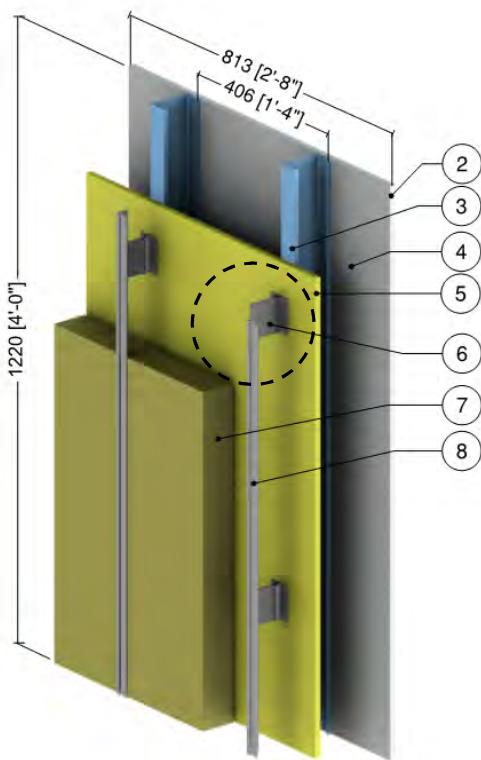
Fiber Reinforced
Clip Detail

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 (2.22 RSI) to R-25.2 (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 5.1.19

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



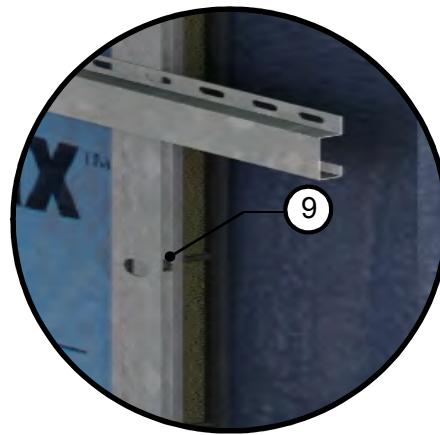
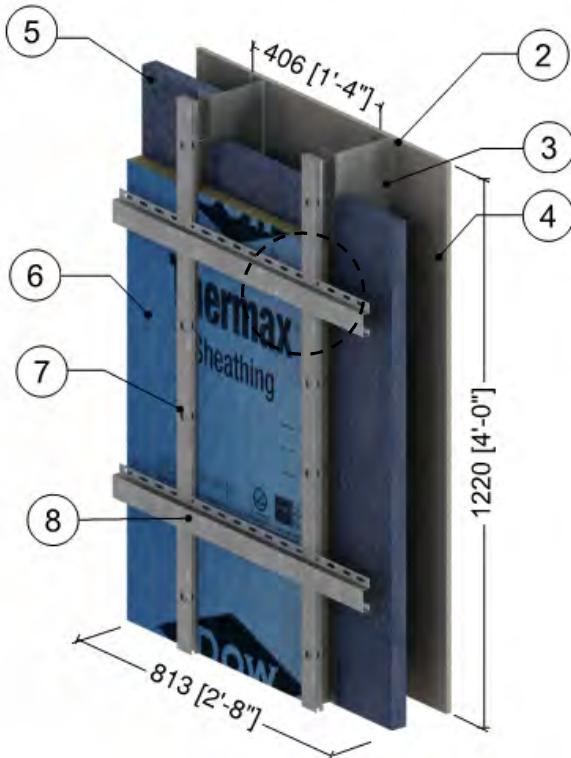
Clip Detail

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 (0.09 RSI)	50 (800)	0.26 (1090)
6	Longboard Aluminum Panel Clip	1/5" (5) to 3/8" (10)	1109 (160)	-	-	-
7	Exterior Insulation	Varies	-	R-12.6 (2.22 RSI) to R-25.2 (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 5.1.20

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



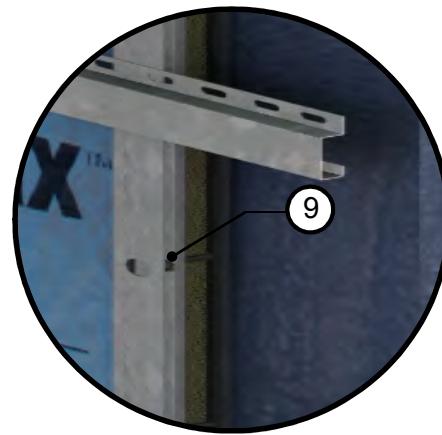
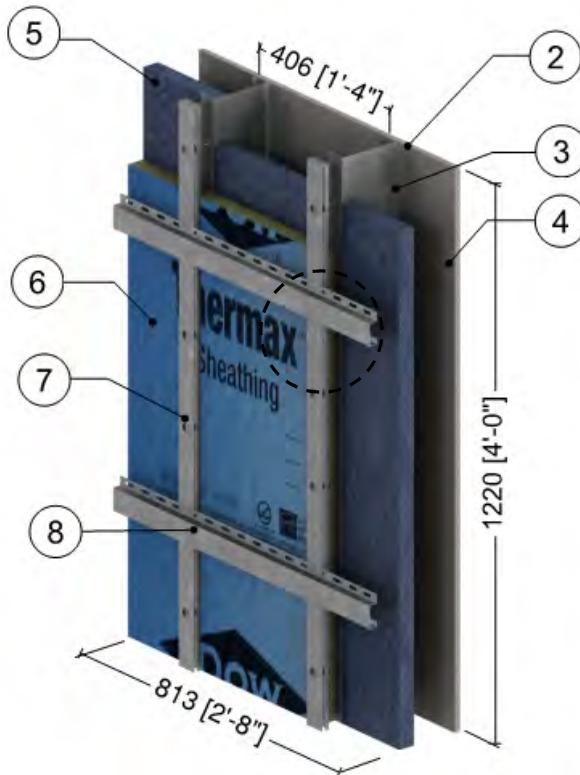
Isolator Detail

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	5/8" (16)	0.09 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	5 5/8" x 1 5/8" Steel Studs (16"o.c.)	18 Gauge	250 (36)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	4 1/8" (105)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Sprayfoam Stud Cavity Insulation	1 1/2" (38)	-	R-9.8 (1.73 RSI)	-	-
6	Polyisocyanurate Exterior Insulation	Varies	-	R-10.1 (1.78 RSI) to R-19.0 (3.35 RSI)	-	-
7	Stainless Steel Fasteners (8" o.c.)	-	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 5.1.21

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



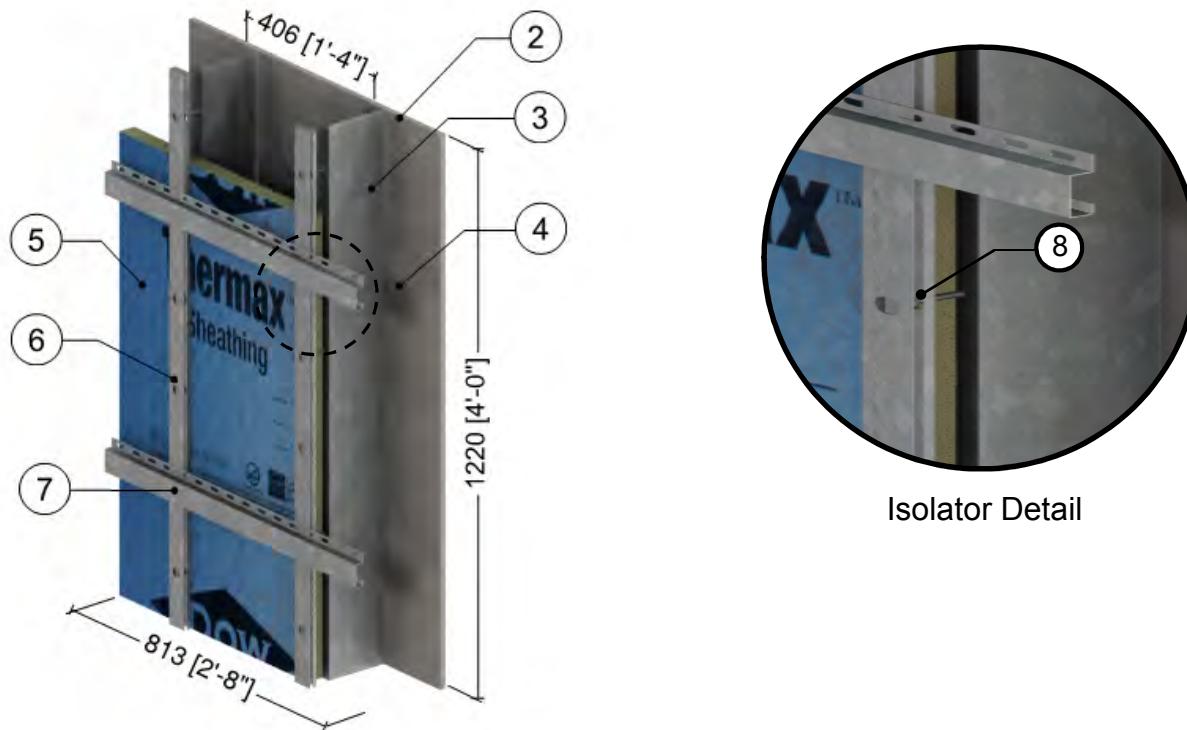
Isolator Detail

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	5/8" (16)	0.09 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	5 5/8" x 1 5/8" Steel Studs (16"o.c.)	18 Gauge	250 (36)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	4 1/8" (105)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Sprayfoam Stud Cavity Insulation	1 1/2" (38)	-	R-9.8 (1.73 RSI)	-	-
6	Polyisocyanurate Exterior Insulation	Varies	-	R-10.1 (1.78 RSI) to R-19.0 (3.35 RSI)	-	-
7	Stainless Steel Fasteners (16" o.c.)	-	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 5.1.22

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

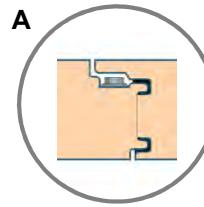
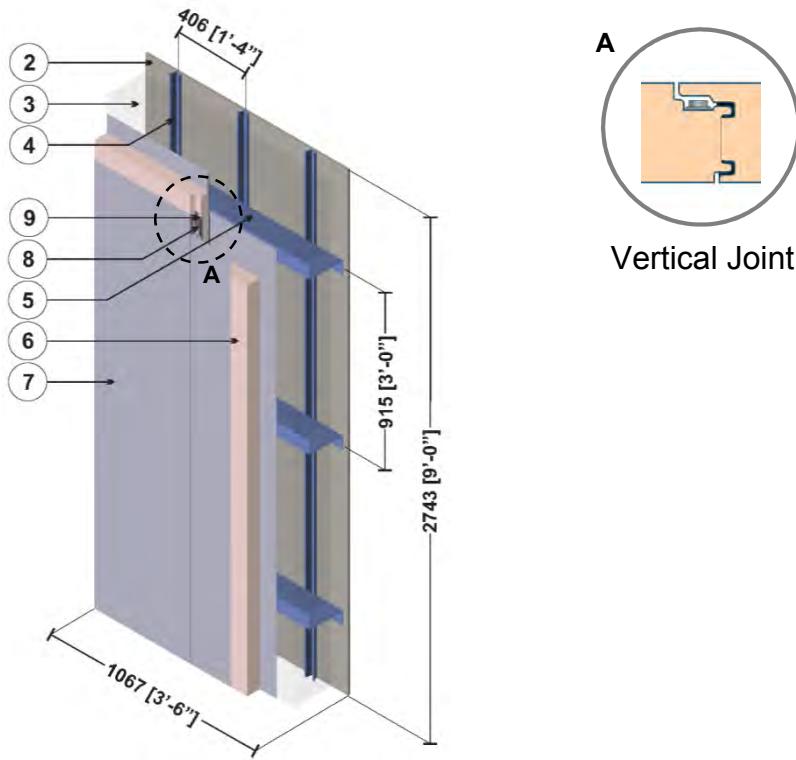


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	0.09 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	5 5/8" x 1 5/8" Steel Studs (16"o.c.)	18 Gauge	250 (36)	-	489 (7830)	0.12 (500)
4	Air in Stud Cavity	4 1/8" (105)	-	R-0.9 (0.16 RSI)	0.075 (1.2)	0.24 (1000)
5	Polyisocyanurate Exterior Insulation	Varies	-	R-10.1 (1.78 RSI) to R-19.0 (3.35 RSI)	-	-
6	Stainless Steel Fasteners (8" o.c.)	-	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 5.1.23

Vertical Insulated Metal Panel – Clear Wall with Vertical Connection Joint and Support Girt/Hat Track Backup Wall



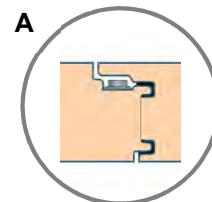
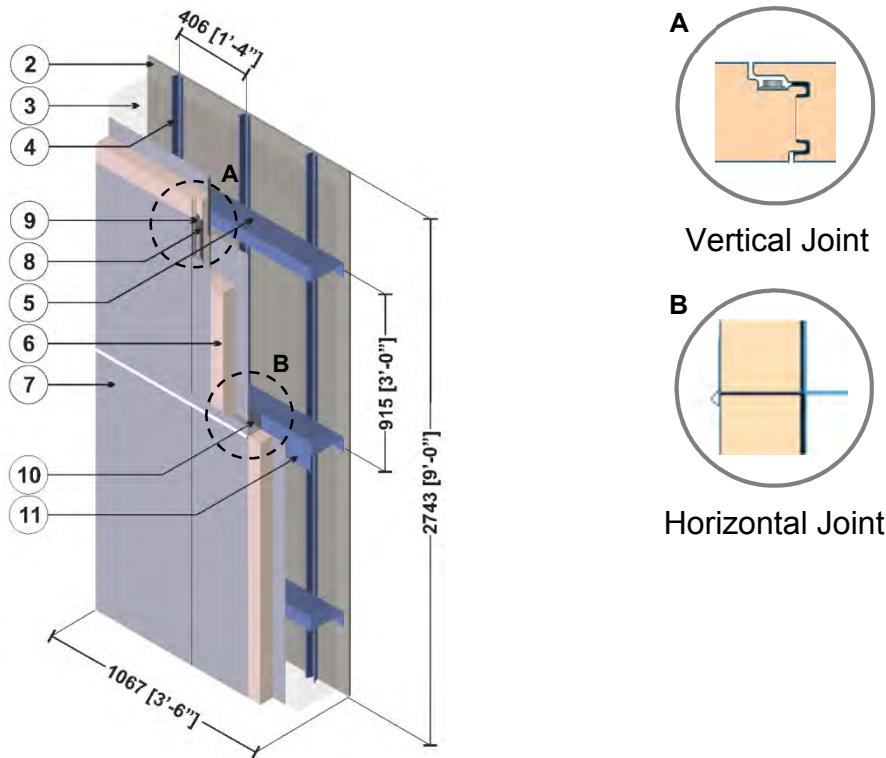
Vertical Joint

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 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	Steel Bolt	1/4" (6) Ø	314 (45)	-	489 (7830)	0.12 (500)
10	Exterior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-

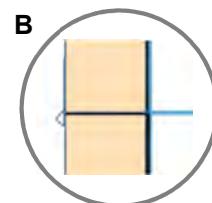
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.1.24

Vertical Insulated Metal Panel – Metal Stack Joint and Support Girt Back/Hat Track Backup Wall



Vertical Joint



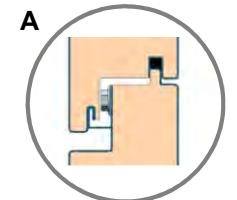
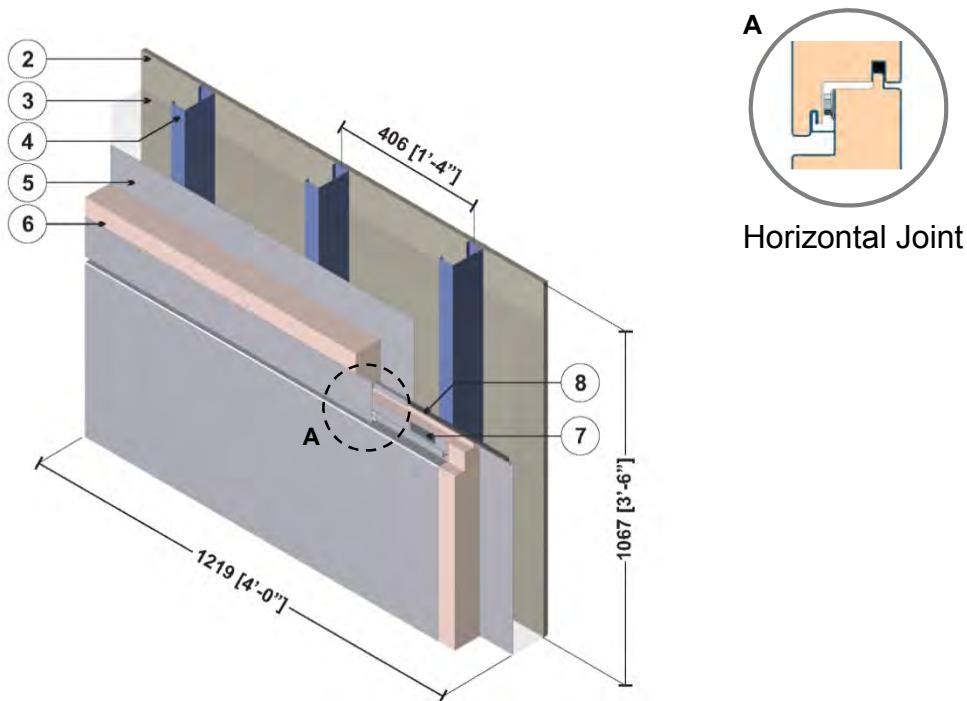
Horizontal Joint

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 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	Steel Bolt	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-0.7 (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

Horizontal Insulated Metal Panel – Clear Wall with Horizontal Connection Joint and Steel Stud Backup Wall



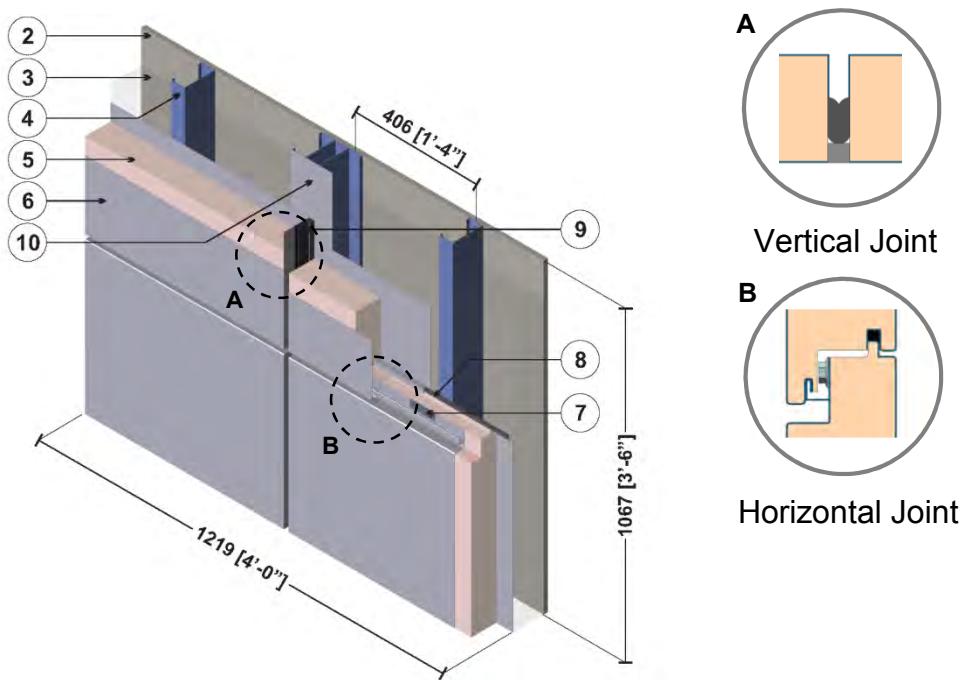
Horizontal Joint

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 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	Steel Bolt	1/4" (6) Ø	314 (45)	-	489 (7830)	0.12 (500)
8	Sealant	Varies	2.4 (0.35)	-	-	-
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 5.1.26

Horizontal Insulated Metal Panel – Vertical Gasket Joint with Steel Stud Backup Wall

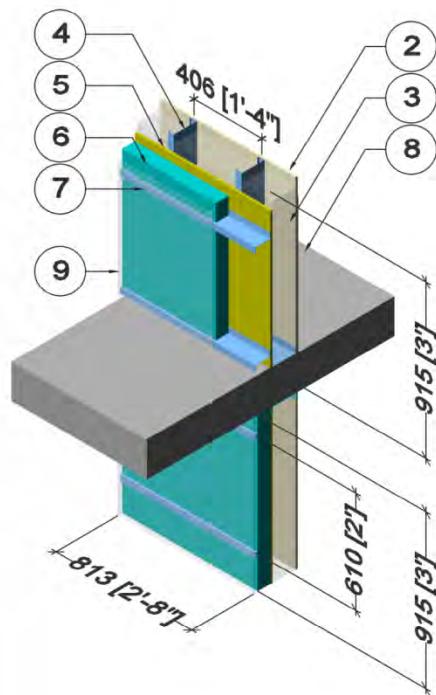


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Cavity	-	-	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	Steel Bolt	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-0.7 (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 – Slab Intersection

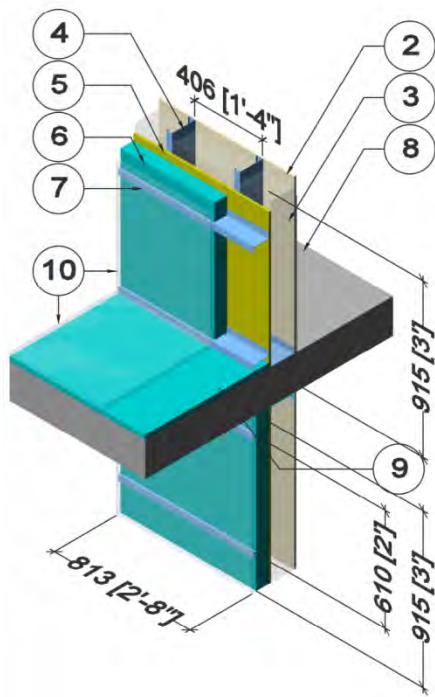


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (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 5.2.2

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 – Slab Intersection with Top Side Insulation



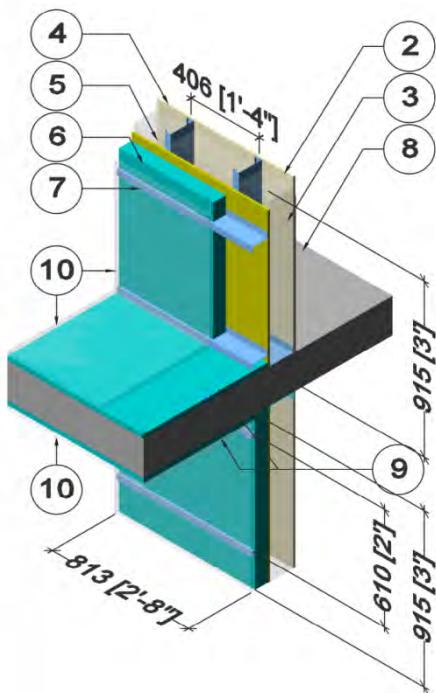
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 Insulation, Balcony ²	1" (25)	-	R5 (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 (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 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 – Slab Intersection with Top & Under Side Insulation



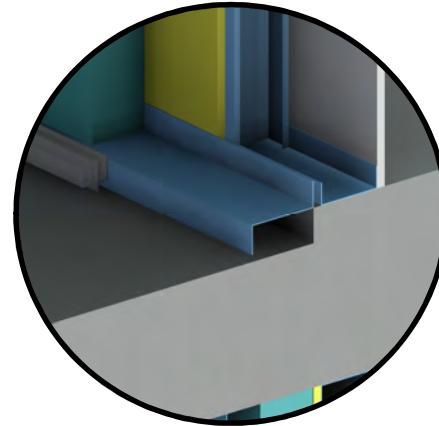
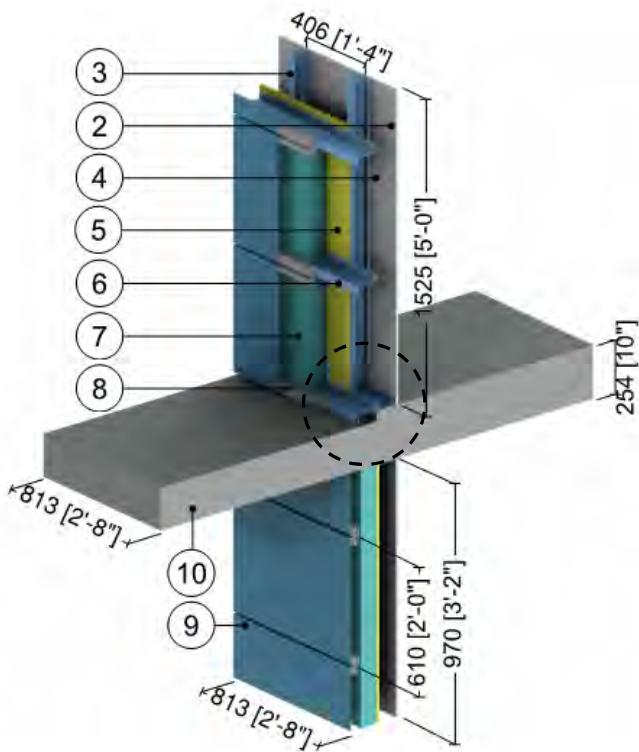
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 Insulation, Balcony & Soffit ²	1" (25)	-	R5 (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 (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 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 Concrete Slab Intersection with Uninsulated Curb



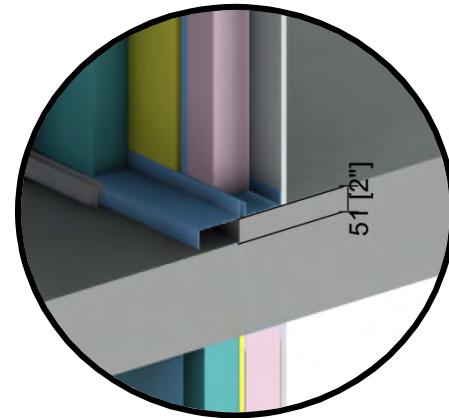
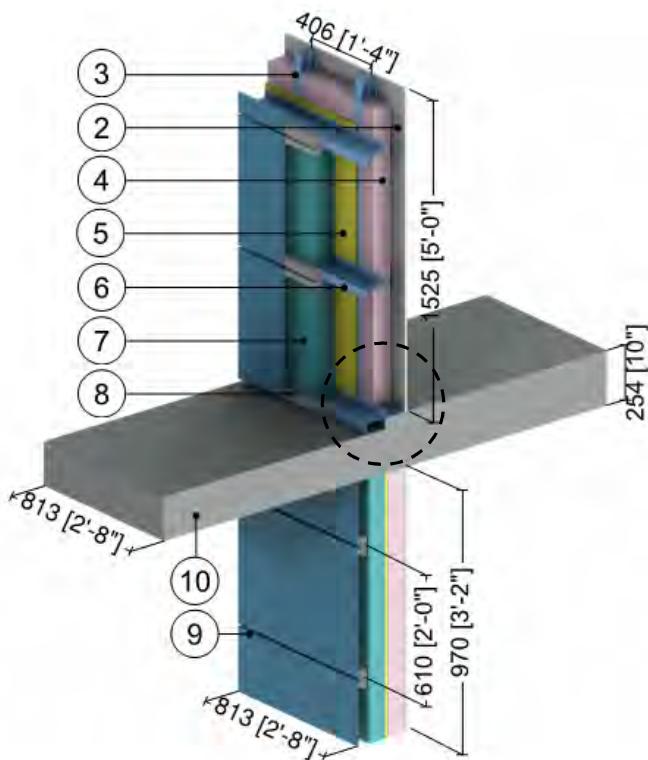
Balcony Stepdown Detail

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 (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	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 (0.09 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 (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 5.2.5

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 – Uninsulated Concrete Slab Intersection with Uninsulated Curb



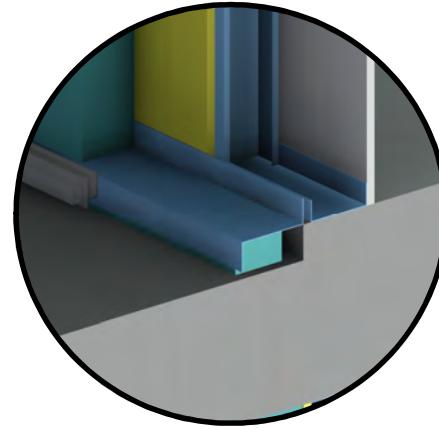
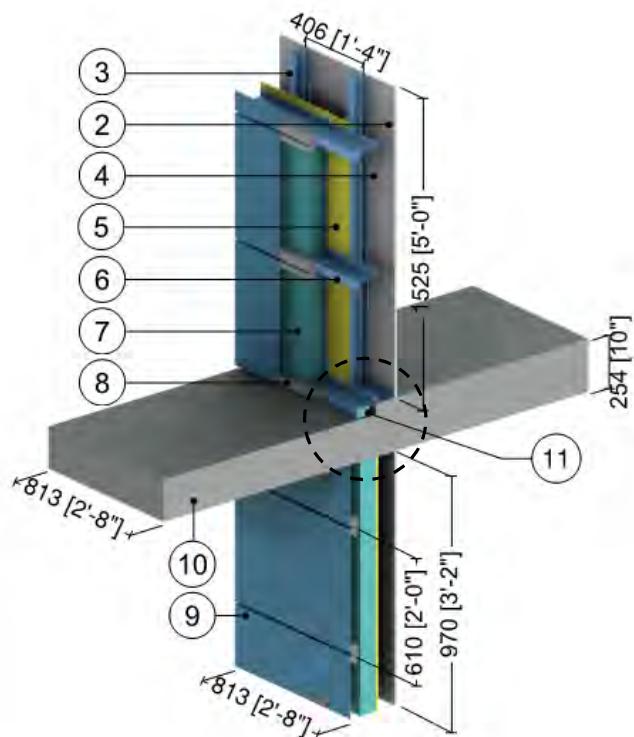
Balcony Stepdown Detail

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 (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	Fiberglass Batt Insulation	3 5/8" (92)	0.29 (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 (0.09 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 (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 5.2.6

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 Concrete Slab Intersection with Insulated Curb



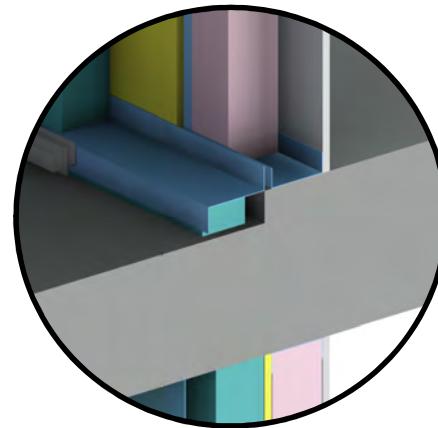
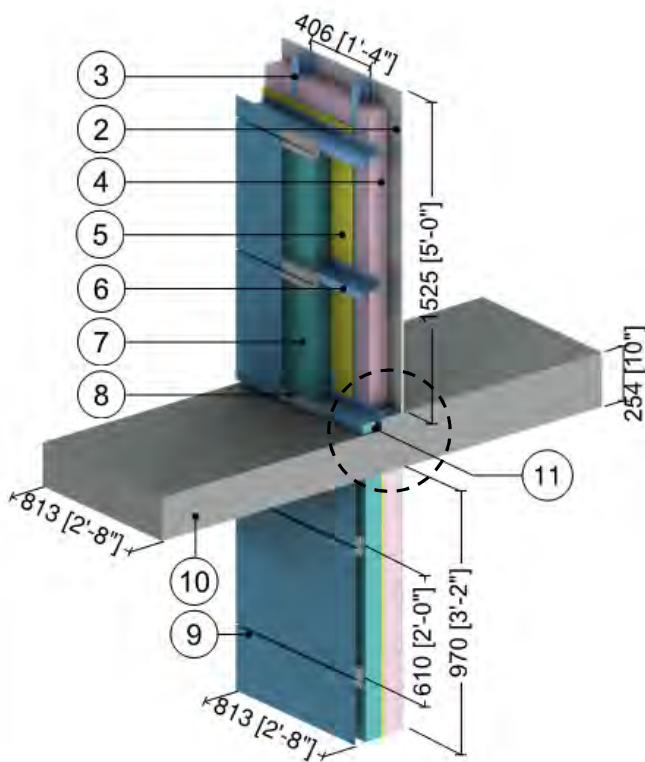
Balcony Stepdown Detail

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 (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	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 (0.09 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 (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 5.2.7

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 – Uninsulated Concrete Slab Intersection with Insulated Curb



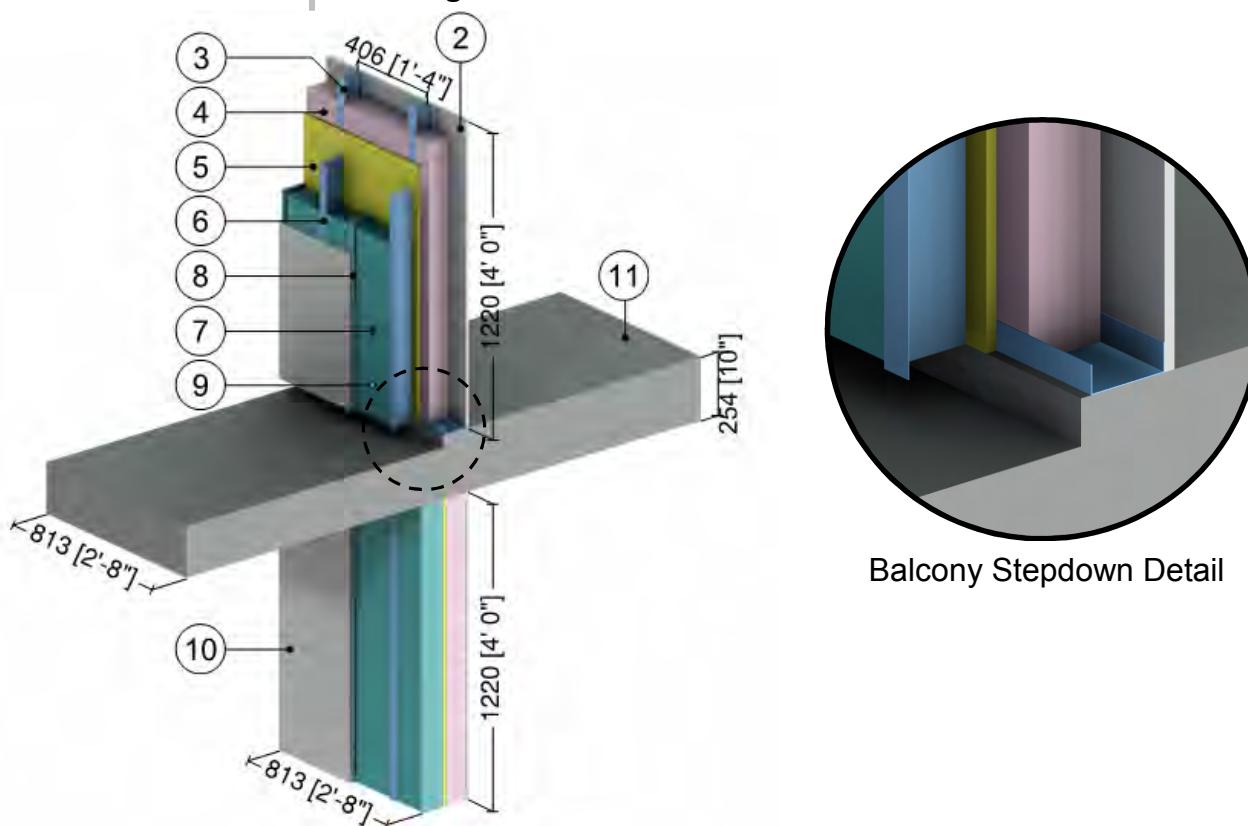
Balcony Stepdown Detail

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 (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	Fiberglass Batt Insulation	3 5/8" (92)	0.29 (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 (0.09 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 (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 5.2.8

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 – Uninsulated Slab Intersection



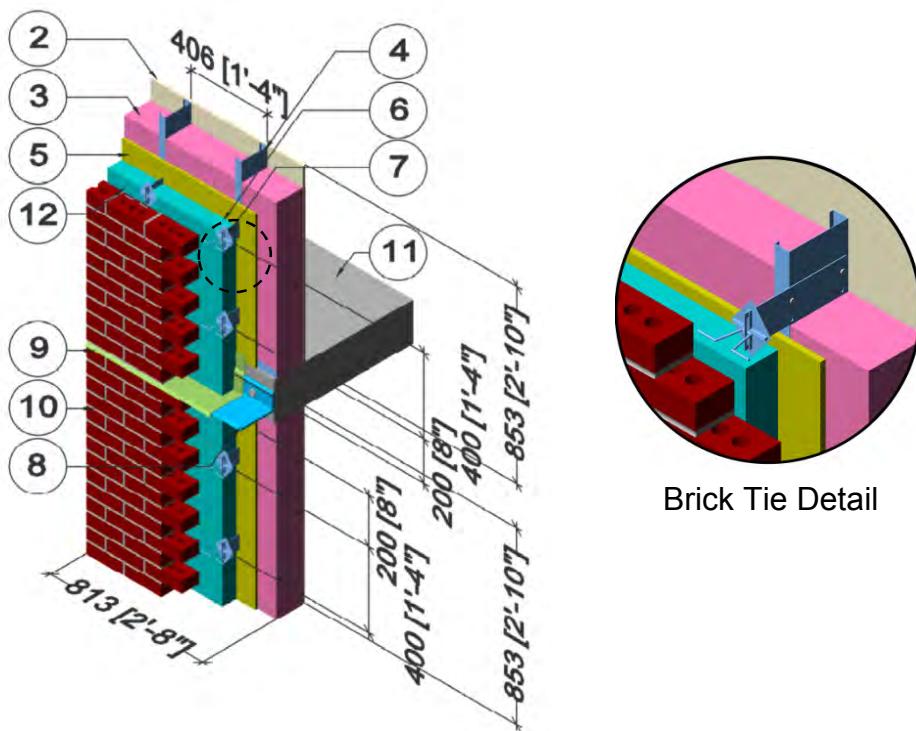
Balcony Stepdown Detail

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 (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	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	Vertical Z-Girts with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	Varies	-	R-10 (1.76 RSI) to R-15 (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 and Interior Insulated Wall Assembly with Shelf Angle & Brick Ties Supporting Brick Veneer – Slab Intersection



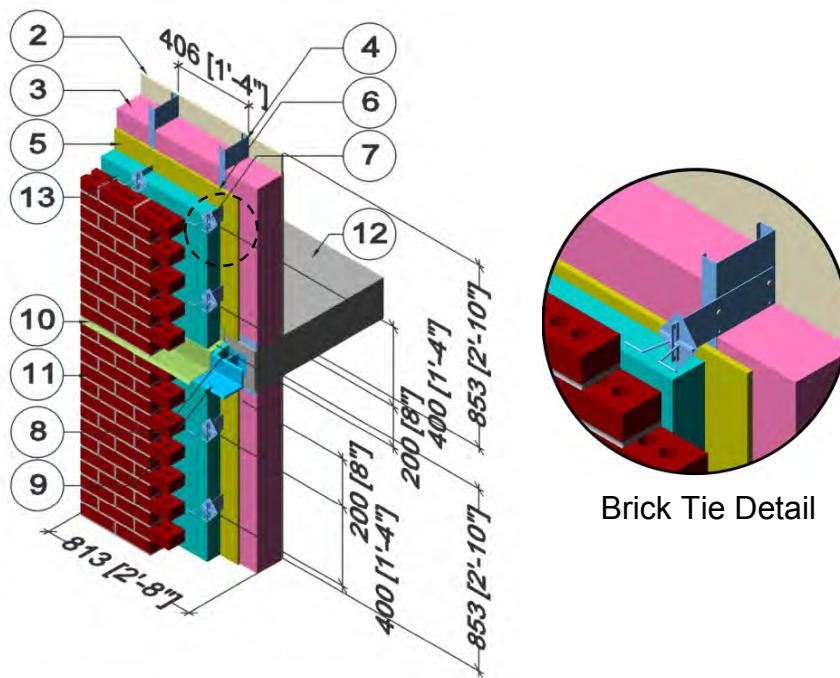
Brick Tie Detail

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 (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	Fiberglass Batt Insulation in Stud Cavity	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	-	R-5 (0.88 RSI) to R-25 (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 5.2.10

Exterior and Interior Insulated Wall Assembly with Spaced Shelf Angle & Brick Ties Supporting Brick Veneer – Slab Intersection

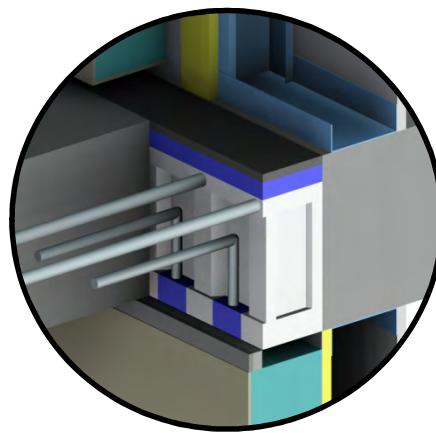
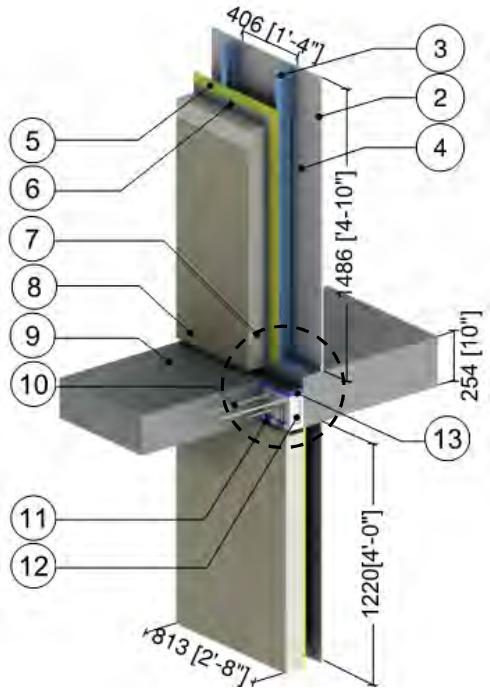


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² -hr-°F (W/m K)	Nominal Resistance hr-ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation in Stud Cavity	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	-	R-5 (0.88 RSI) to R-25 (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 (0.88 RSI) to R-25 (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 5.2.11

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



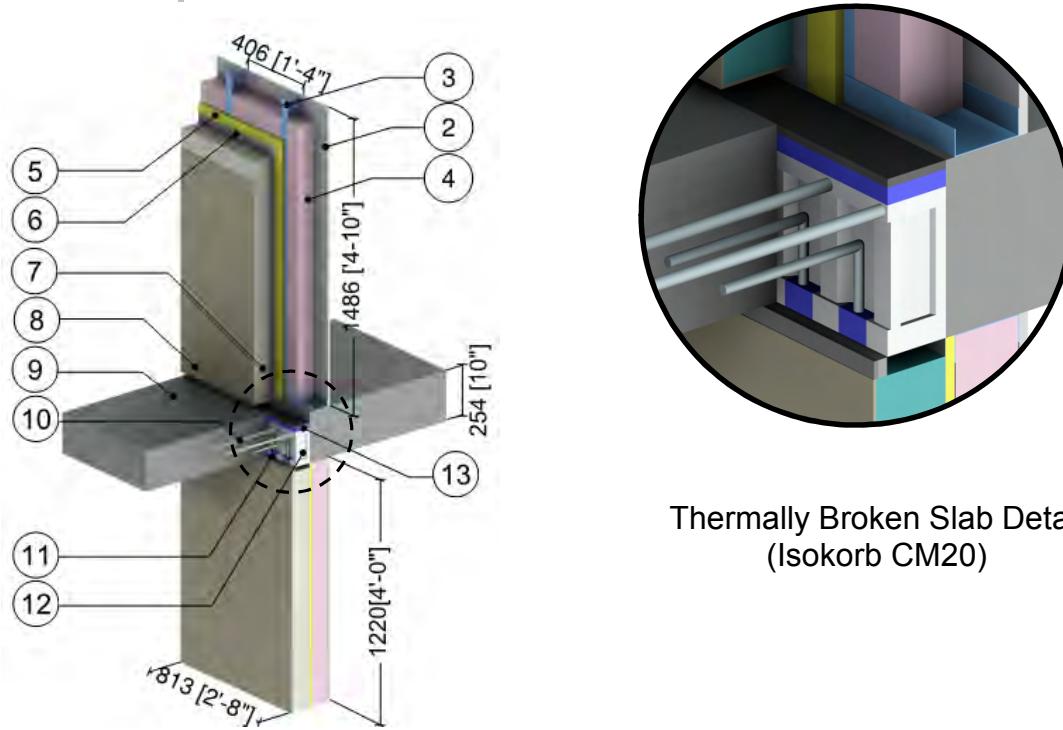
Thermally Broken Slab Detail
(Isokorb CM20)

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 (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	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 (0.09 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 5.2.12

Exterior and Interior 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



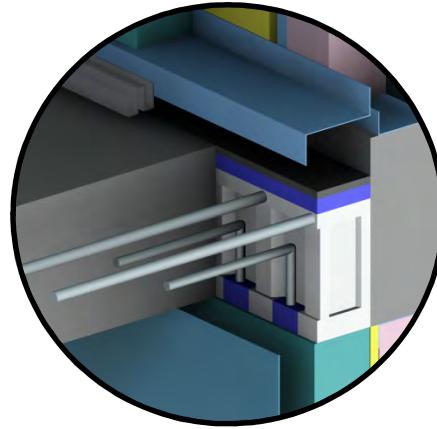
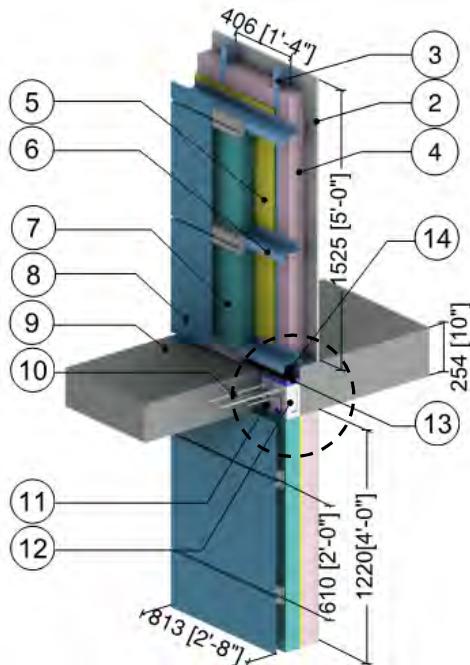
Thermally Broken Slab Detail
(Isokorb CM20)

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² .hr. ^o F (W/m K)	Nominal Resistance hr-ft ² . ^o F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb. ^o F (J/kg K)
1	Interior Films 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)	0.29 (0.042)	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	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 5.2.13

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 – Isokorb CM20 Thermally Broken Slab Projection with Uninsulated Curb



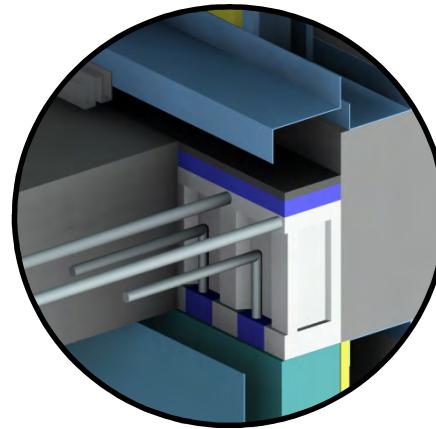
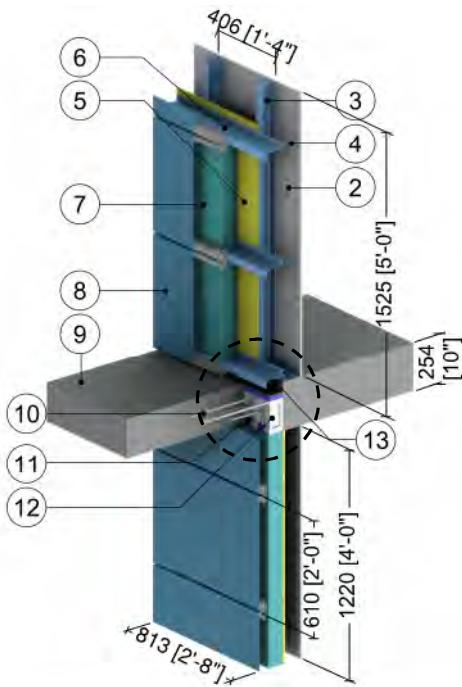
Thermally Broken Slab Detail
(Isokorb CM20)

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 (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	Fiberglass Batt Insulation	3 5/8" (92)	0.29 (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 (0.09 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)	0.2 (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 (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 5.2.14

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



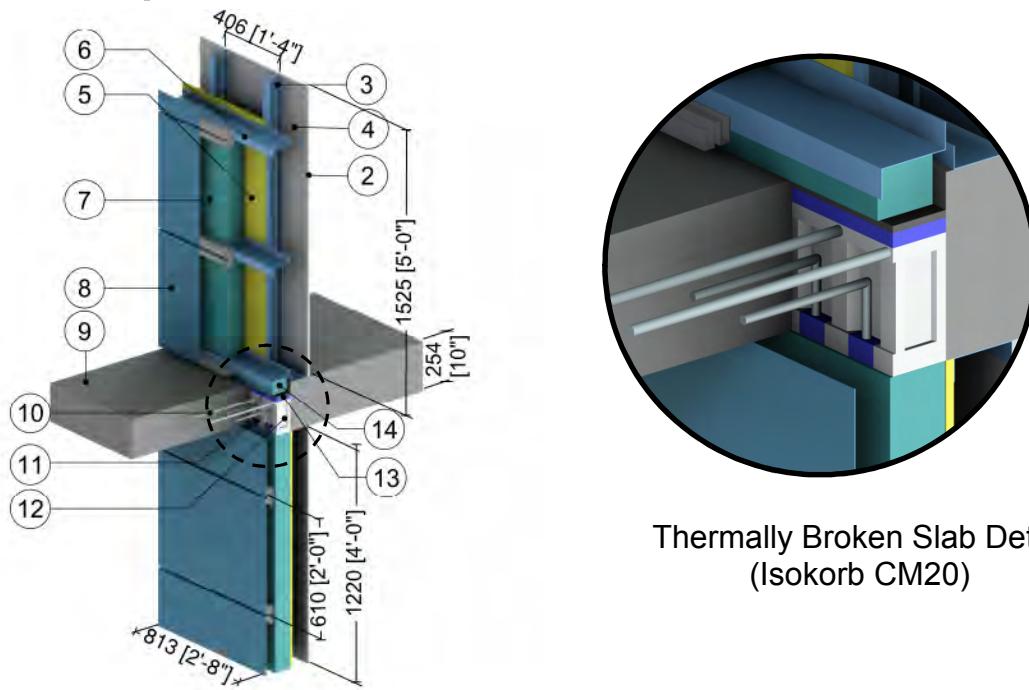
Thermally Broken Slab Detail
(Isokorb CM20)

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² .hr. ^o F (W/m K)	Nominal Resistance hr-ft ² . ^o F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb. ^o F (J/kg K)
1	Interior Films 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	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 (0.09 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" (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 (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 5.2.15

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



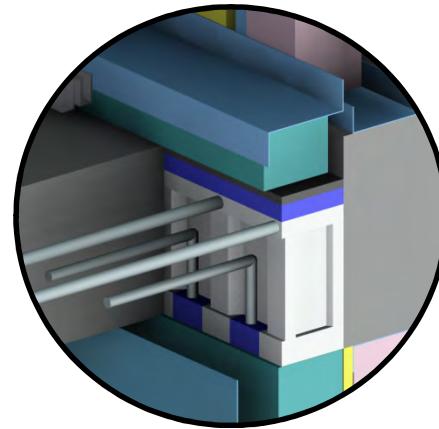
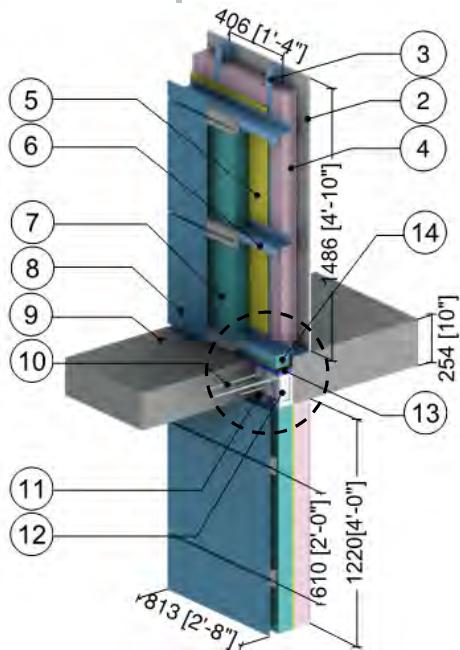
Thermally Broken Slab Detail
(Isokorb CM20)

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 (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	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 (0.09 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 (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 5.2.16

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 – Isokorb CM20 Thermally Broken Slab Projection with Insulated Curb



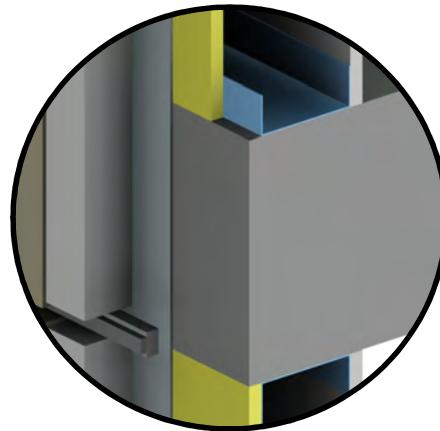
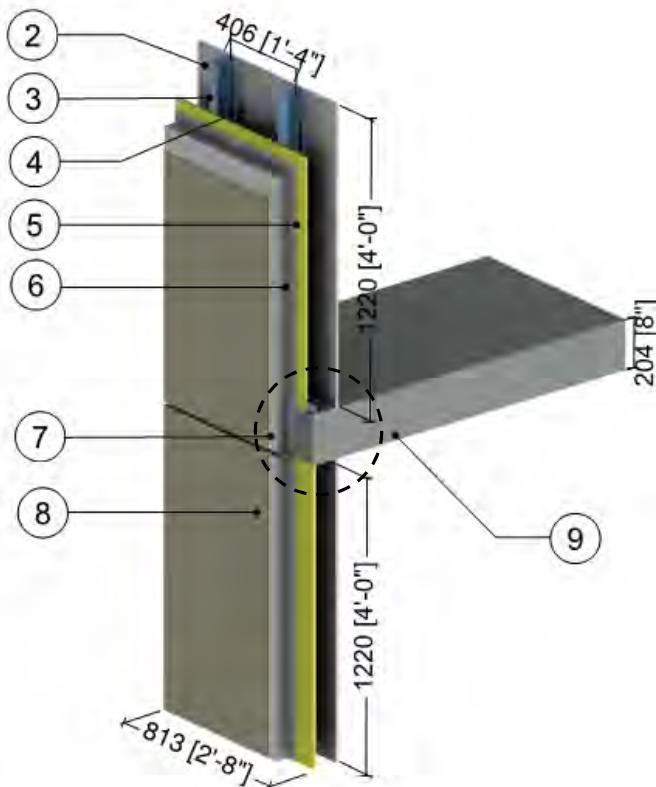
Thermally Broken Slab Detail
(Isokorb CM20)

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² .hr. ^o F (W/m K)	Nominal Resistance hr·ft ² . ^o F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb. ^o F (J/kg K)
1	Interior Films 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)	0.29 (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 (0.09 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 (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 5.2.17

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



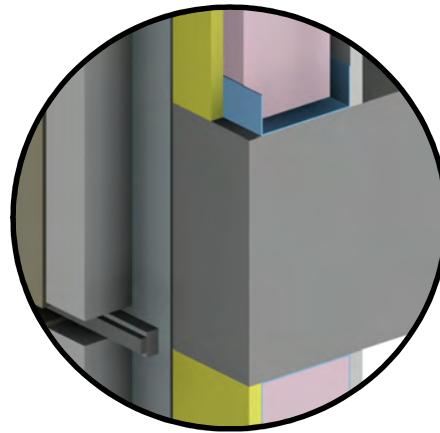
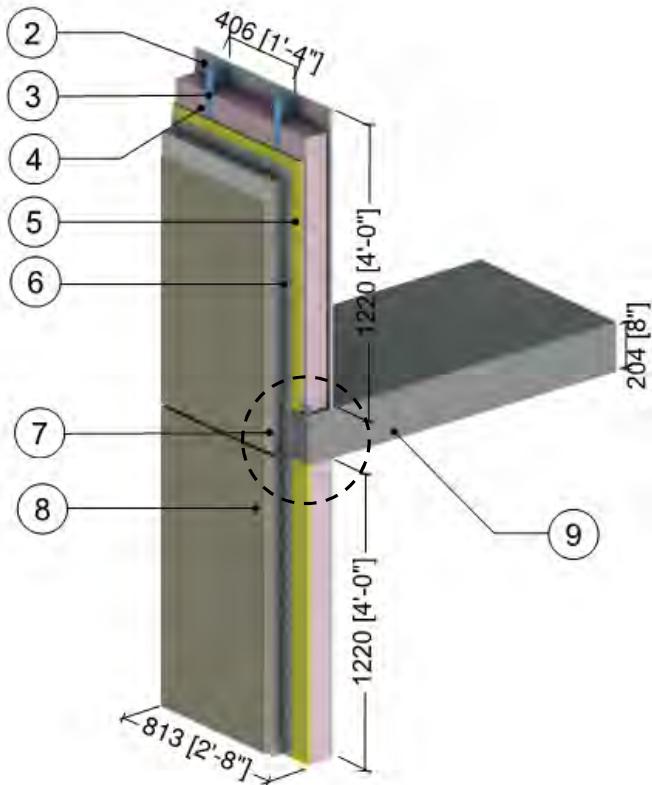
1" (25 mm)
Drained EIFS
at Slab Detail

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 (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 3 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 (0.09 RSI)	50 (800)	0.26 (1090)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	2" (50) to 4" (100)	0.27 (0.039)	R-7.5 (1.32 RSI) to 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 5.2.18

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Floor Slab Intersection



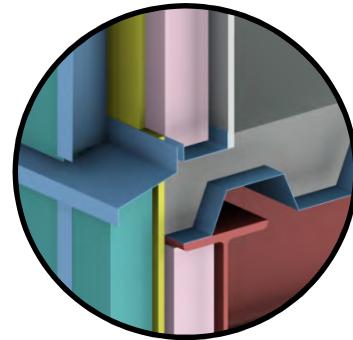
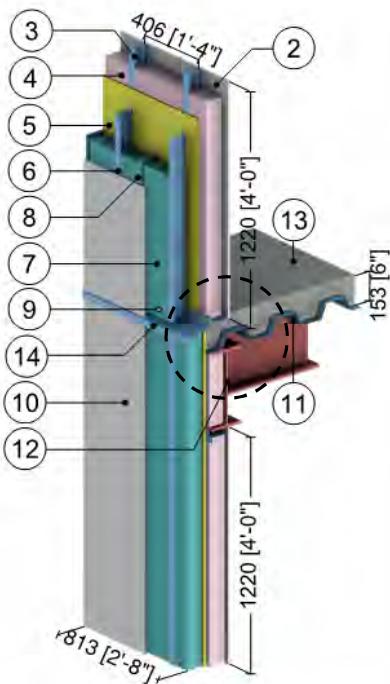
1" (25 mm)
Drained EIFS
at Slab Detail

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 (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 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)	0.29 (0.042)	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 (0.09 RSI)	50 (800)	0.26 (1090)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	2" (50) to 4" (100)	0.27 (0.039)	R-7.5 (1.32 RSI) to 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 (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 5.2.19

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 – Steel Framed Floor with Cross Cavity Flashing



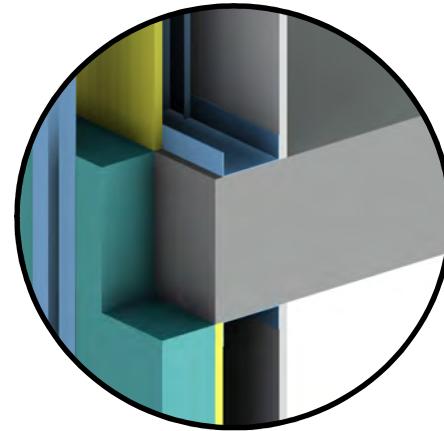
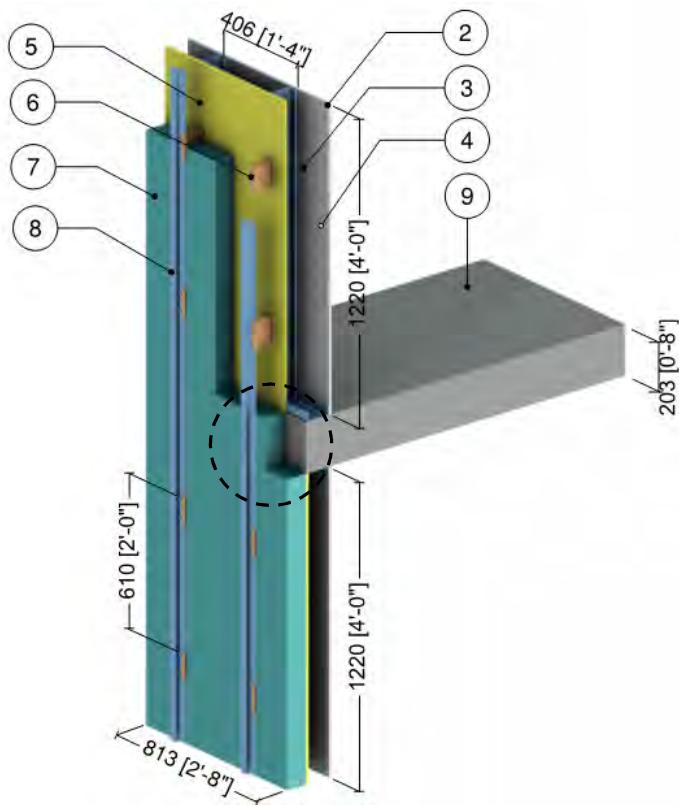
Slab Edge Detail

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 (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	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	Vertical Z-girts with 11/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	Varies	-	R-10 (1.76 RSI) to R-15 (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 Slab Intersection



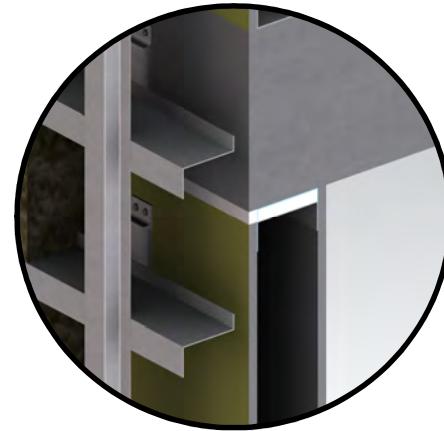
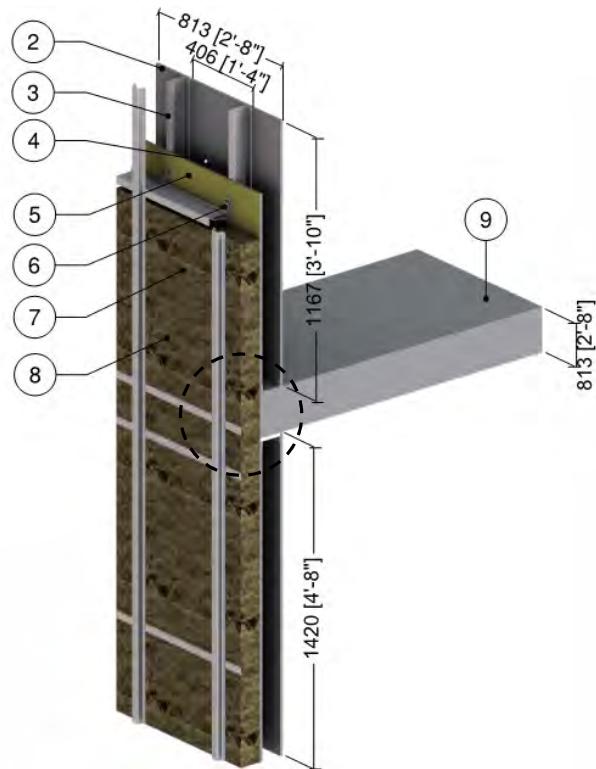
Slab Edge Detail

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-0.7 (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	Fiberglass Spacer with Steel Bolts	3 1/2" (89)	1.7 (0.299)	-	-	-
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 Broken Aluminum Clip Supporting Cladding – Slab Intersection



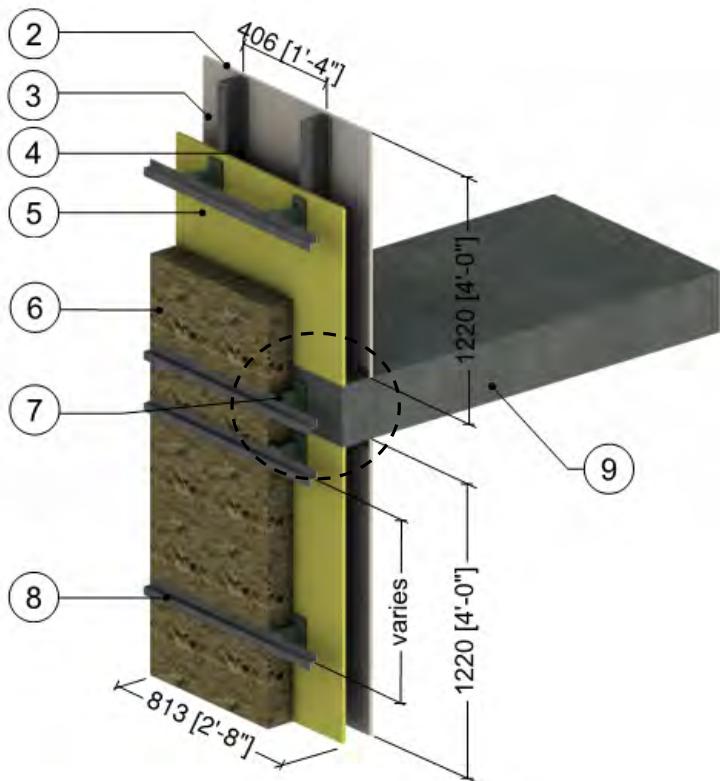
Slab Edge Detail

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-0.7 (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	Engineered Assemblies Aluminum Panel Clip (models T100 T125 150)	1/5" (5) to 3/8" (10)	1109 (160)			
7	Exterior Insulation	Varies	-	R-16.8 (2.96 RSI) to R-25.2 (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 – Slab Intersection



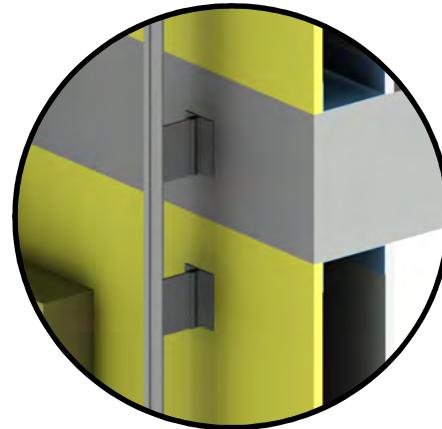
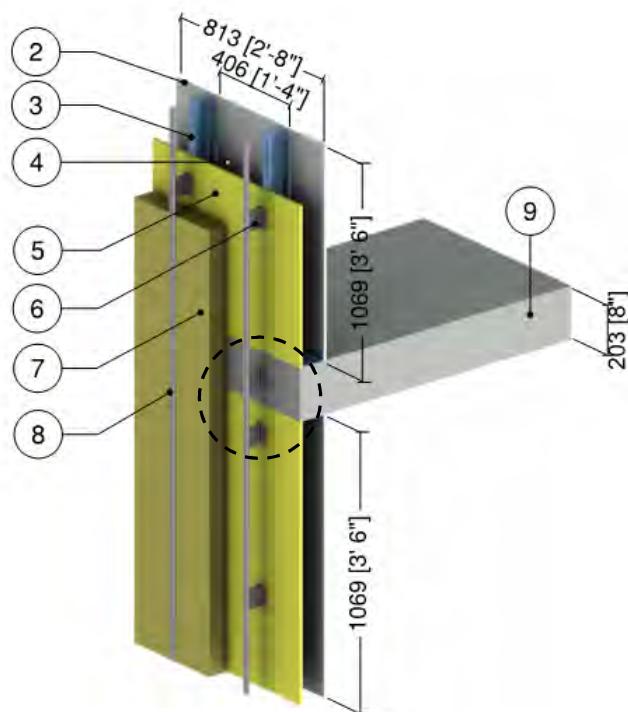
Slab Edge Detail

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 (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 (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 (2.22 RSI) to R-25.2 (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 – Slab Intersection



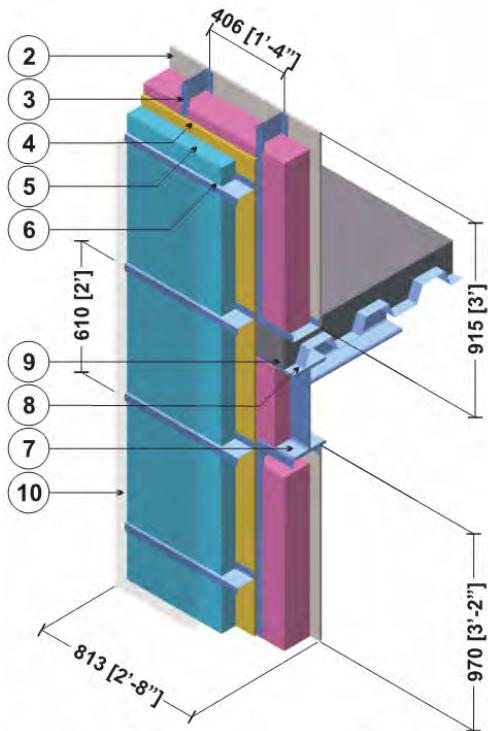
Slab Edge Detail

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-0.7 (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	Longboard Aluminum Panel Clip	1/5" (5) to 3/8" (10)	1109 (160)	-	-	-
7	Exterior Insulation	Varies	0.24 (0.034)	R-12.6 (2.22 RSI) to R-25.2 (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 – Structural Steel Framed Floor Intersection

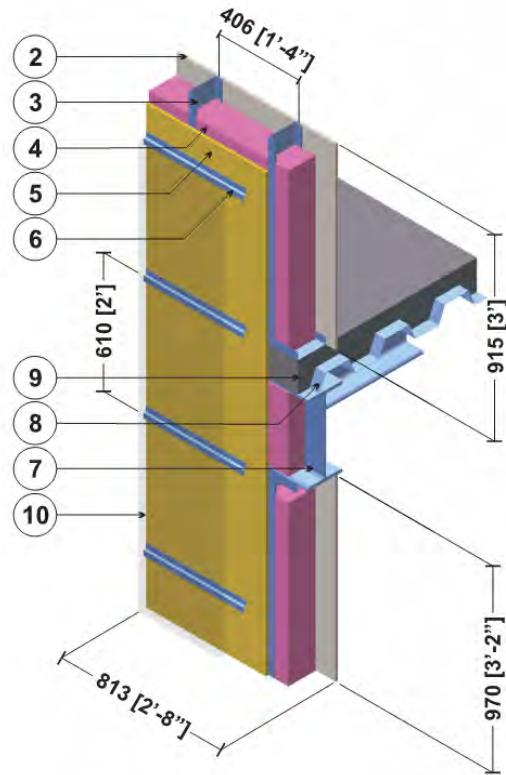


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
	Fiberglass Batt Insulation	3 5/8" (92)	0.29 (0.042)	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 (0.88 RSI) to R-25 (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 – Structural Steel Framed Floor Intersection

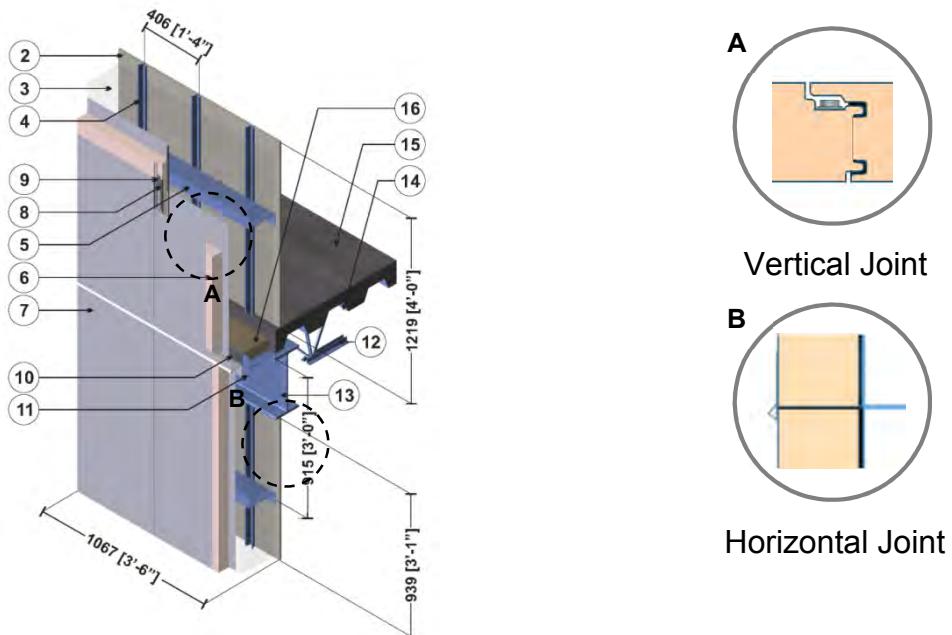


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs with Metal Tracks	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation in Stud Cavity	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 (0.08 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

Vertical Insulated Metal Panel - Corrugated Slab Intersection with I-beam, Open Web Steel Joist and Support Girt/Hat Track Backup Wall

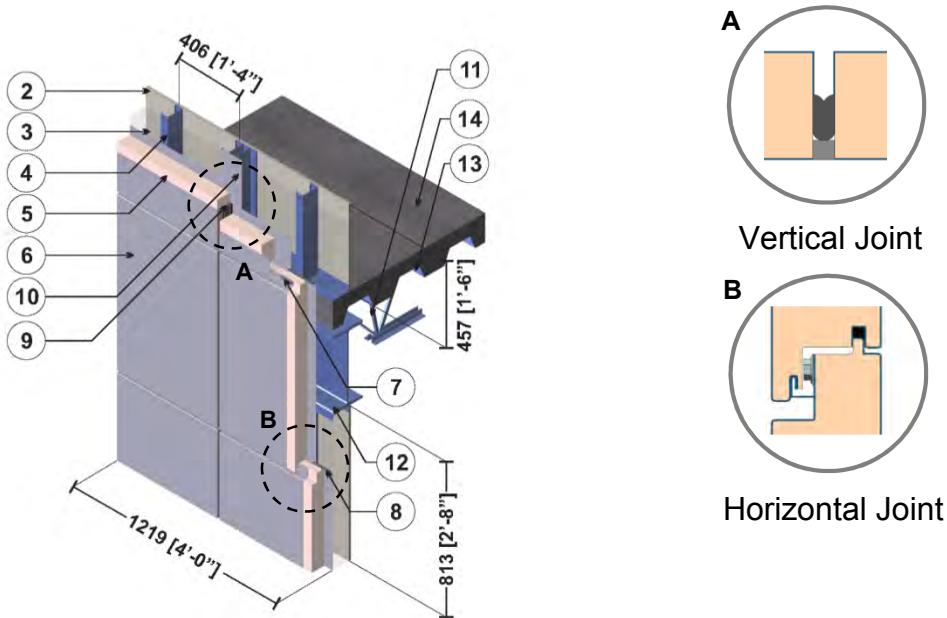


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (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	Steel Bolt	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 5.2.27

Horizontal Insulated Metal Panel – Corrugated Slab Intersection with I-beam, Open Web Steel Joist and Steel Stud Backup Wall

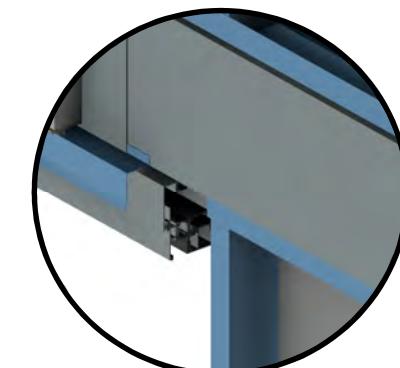
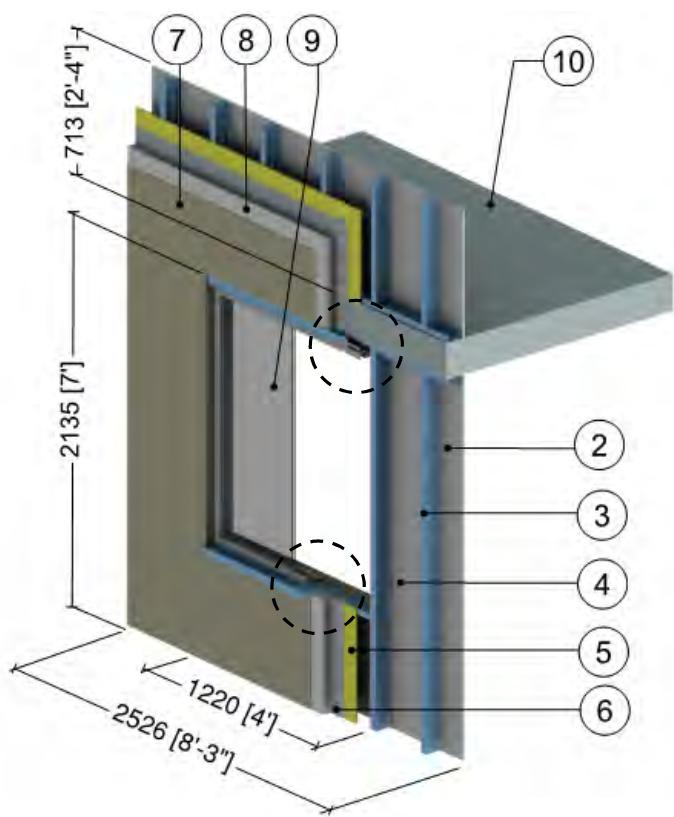


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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	Polyiso 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	Steel Bolt	1/4" (0.25) 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)	-	-

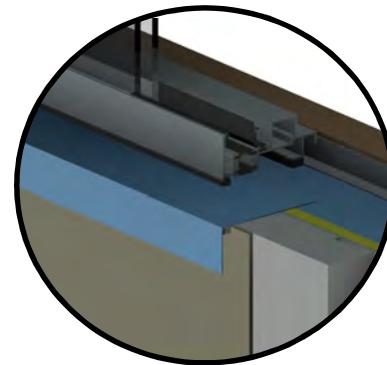
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 5.3.1

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Window and Floor Slab Intersection



Window Head Detail



Window Sill Detail

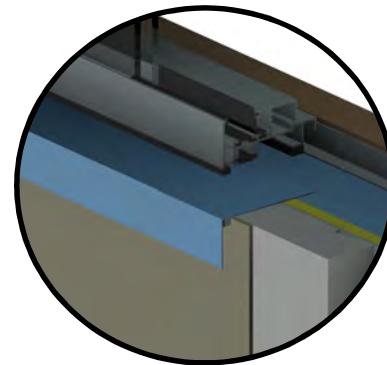
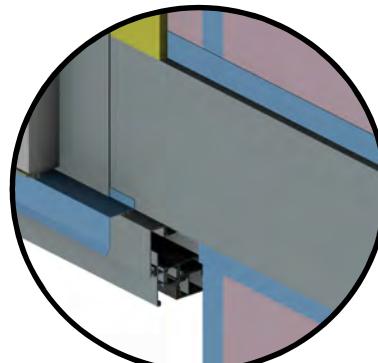
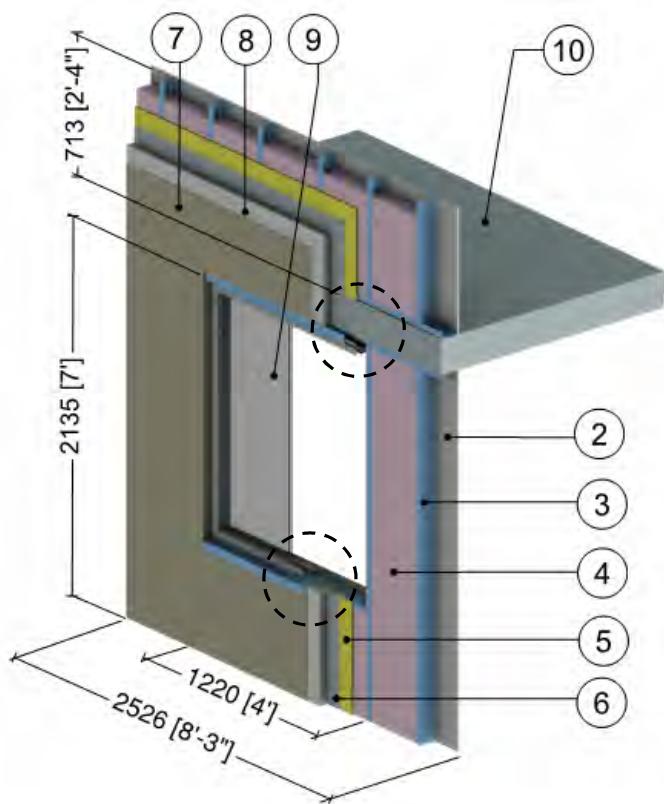
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI) to R-1.1 (0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr.ft}^2\cdot\text{°F}$ ($1.82 \text{ W/m}^2\text{K}$) ²					
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 – Window and Floor Slab Intersection



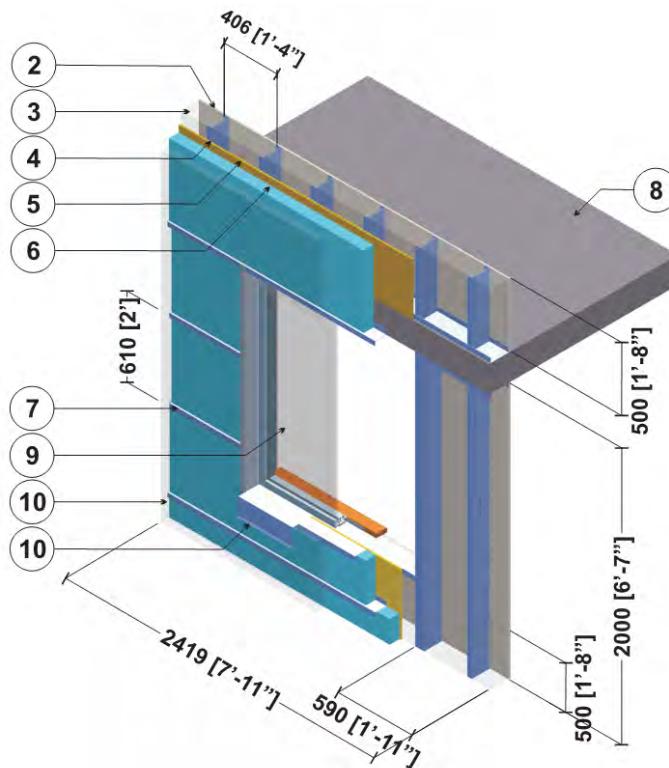
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI) to R-1.1 (0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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)	0.29 (0.042)	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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr.ft}^2\cdot\text{°F}$ (1.82 W/m ² K) ²					
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.) Wall Assembly with Horizontal Z-Girts (24" o.c.) Supporting Metal Cladding – Window & Slab Intersection



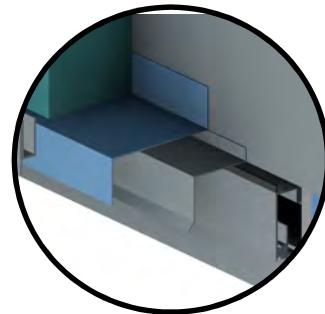
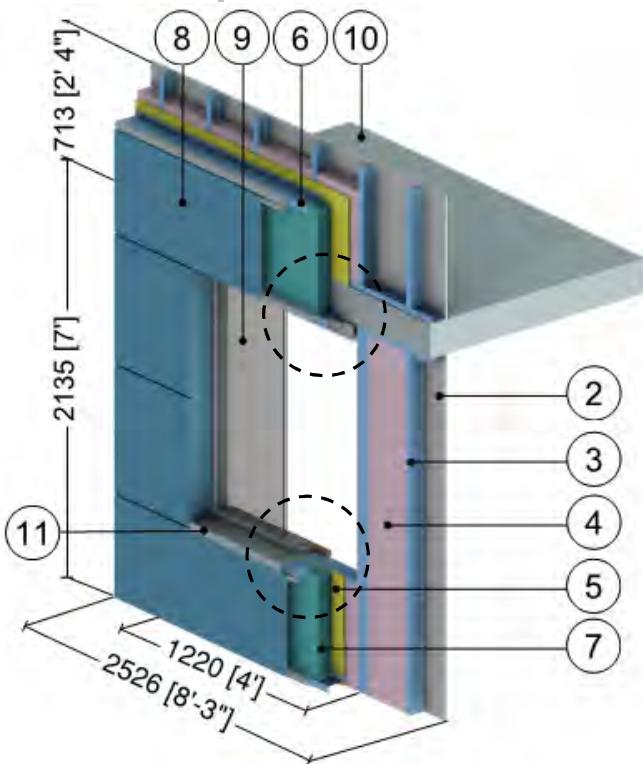
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (0.88 RSI) to R-25 (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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU}/\text{hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W}/\text{m}^2\text{K}$) ²					
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 (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

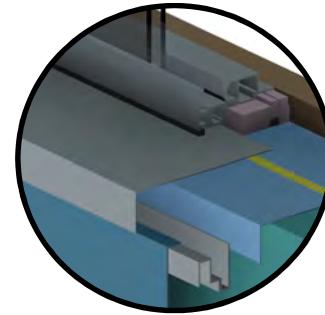
² The thermal conductivity for air spaces within window framing was found using ISO 10077-2.

Detail 5.3.4

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 – Window and Floor Slab Intersection



Window Head Detail



Window Sill Detail

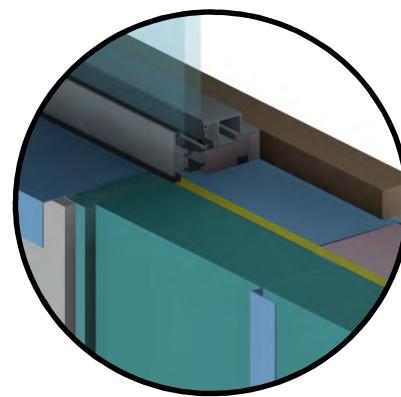
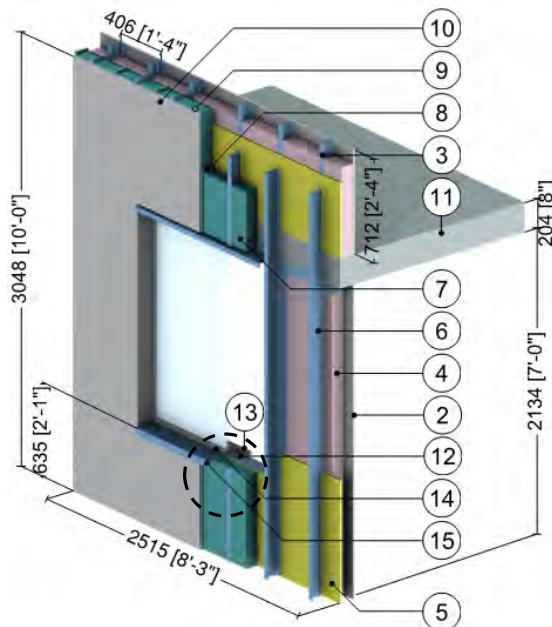
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² .hr. ^o F (W/m K)	Nominal Resistance hr·ft ² . ^o F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb. ^o F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	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)	0.29 (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	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	Varies	-	R-10 (1.76 RSI) to 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	5' (1.5m) x 6' (1.8m) Aluminum window: double glazed & thermally broken, double glazed IGU $U_{IGU} = 0.32 \text{ BTU}/\text{hr.ft}^2.\text{ }^{\circ}\text{F}$ (1.82 W/m ² K) ²					
10	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
11	Aluminum Flashing	18 gauge	1109 (160)	-	171(2739)	0.21 (900)
12	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 for air spaces within window framing was found using ISO 10077-2.

Detail 5.3.5

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 – Window and Slab Intersection



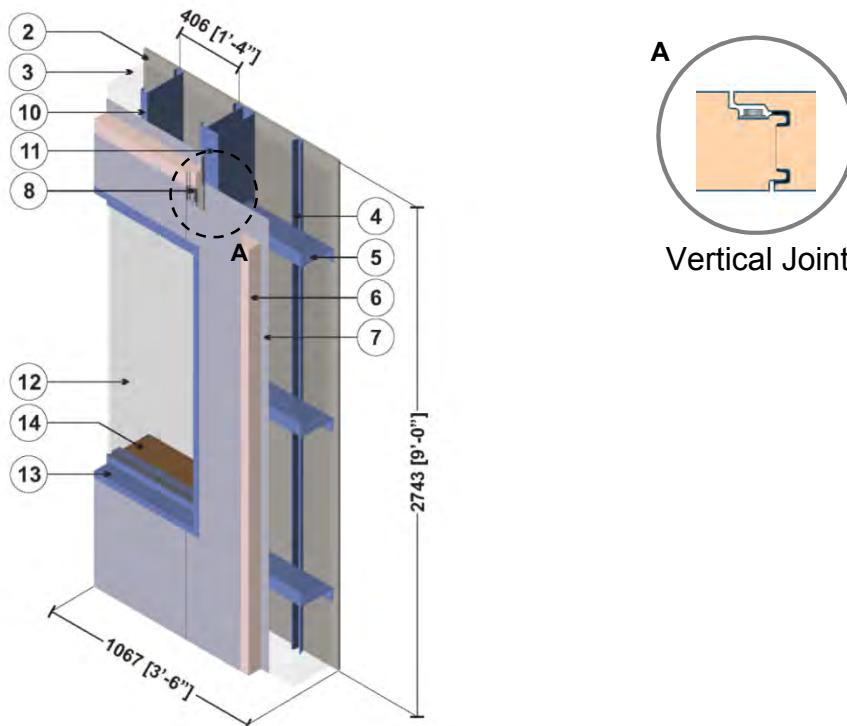
Window Sill Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² .hr. ^o F (W/m K)	Nominal Resistance hr.ft ² . ^o F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb. ^o F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 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	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	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 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 (1.76 RSI) to R-15 (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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU}/\text{hr.ft}^2.\text{F}$ (1.82 W/m ² K) ²					
15	Aluminum Flashing	14 Gauge	1109 (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 orientation² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 5.3.6

Vertical Insulated Metal Panel – Window Glazing Transition with Steel Support Framing



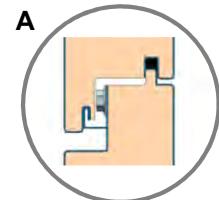
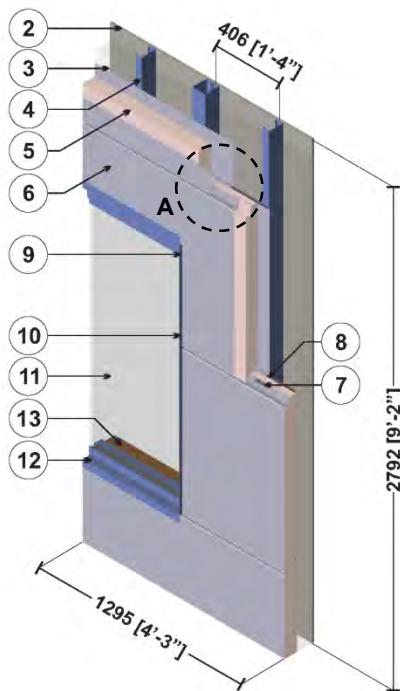
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in 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	Polyiso 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	Steel Bolt	1/4" (0.25) 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 5.3.7

Horizontal Insulated Metal Panel – Window Glazing Transition with Steel Support Framing



Horizontal Joint

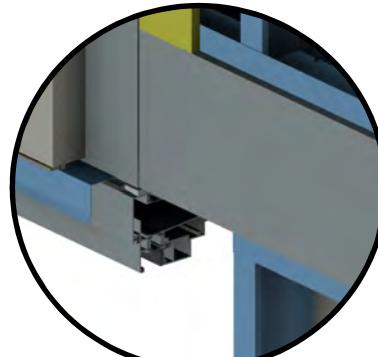
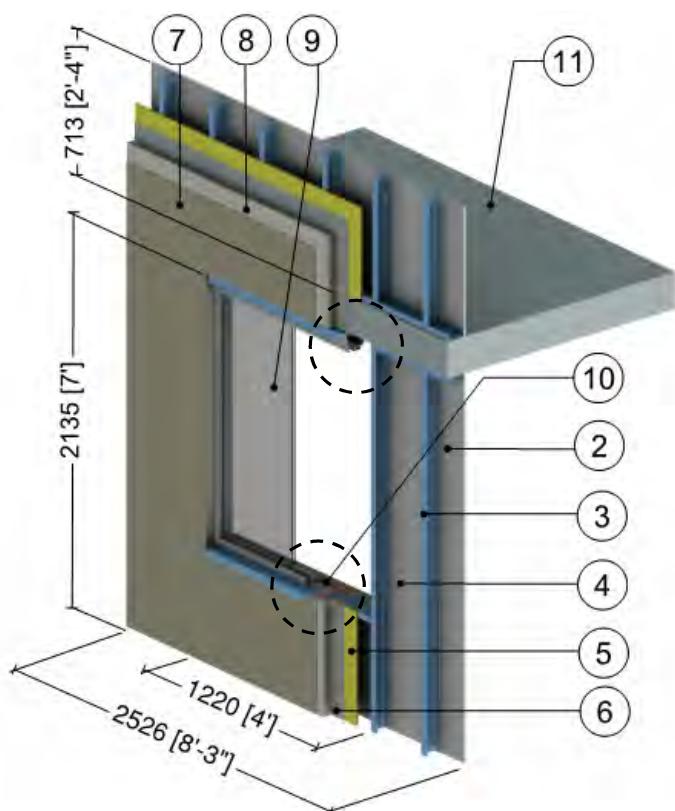
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in 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	Steel Bolt	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.

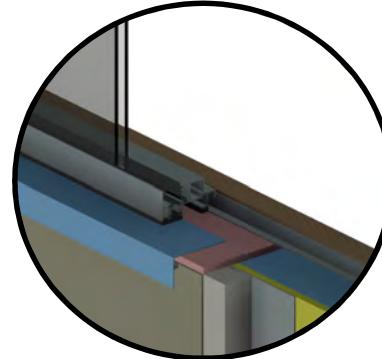
² The thermal conductivity of air spaces within curtain wall framing was found using ISO 10077-2

Detail 5.3.8

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Window with Aerogel and Floor Slab Intersection



Window Head Detail



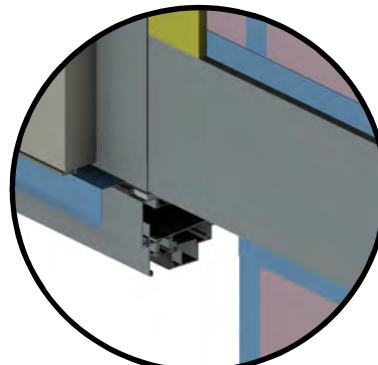
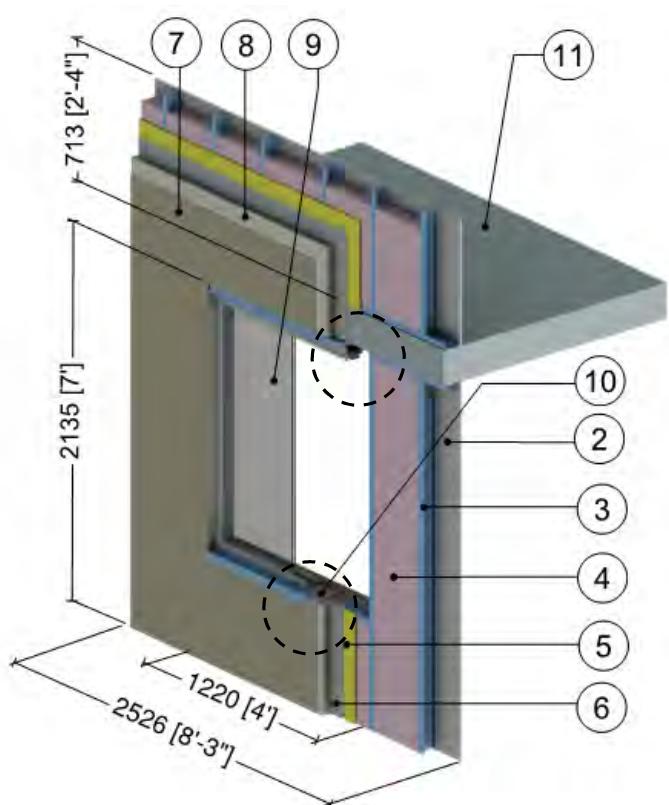
Window Sill Detail

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 Films ¹	-	-	R-0.6 (0.11 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	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 (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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr.ft}^2\cdot\text{°F}$ (1.82 W/m ² K) ²					
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)	-	-

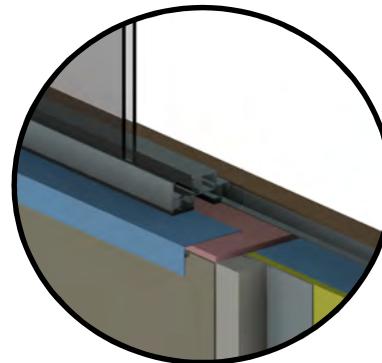
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 5.3.9

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Window with Aerogel and Floor Slab Intersection



Window Head Detail



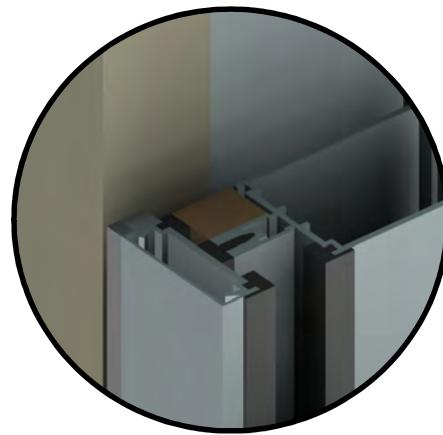
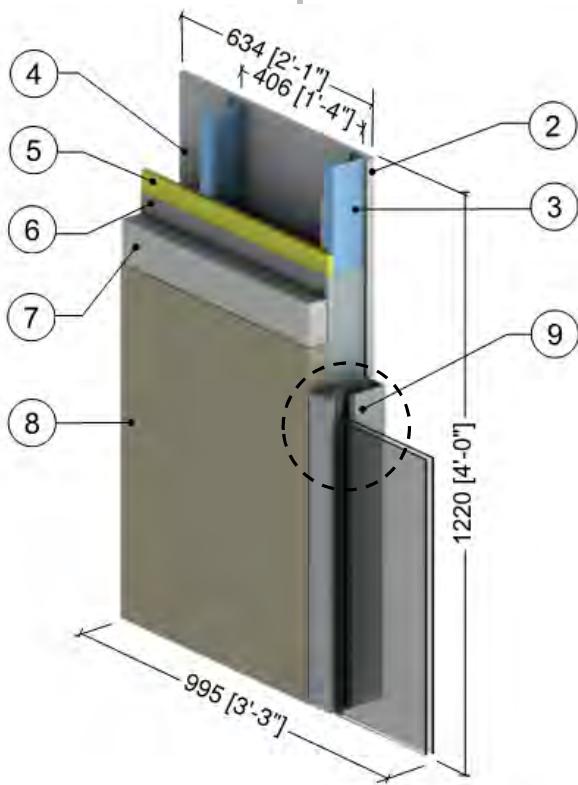
Window Sill Detail

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 Films ¹	-	-	R-0.6 (0.11 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	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)	0.29 (0.042)	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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU}/\text{hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W}/\text{m}^2\text{K}$) ²					
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 orientation² The thermal conductivity of air spaces within framing 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

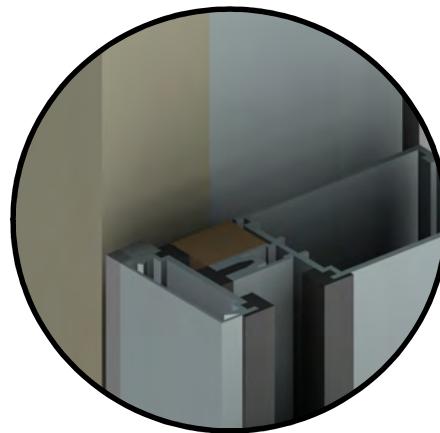
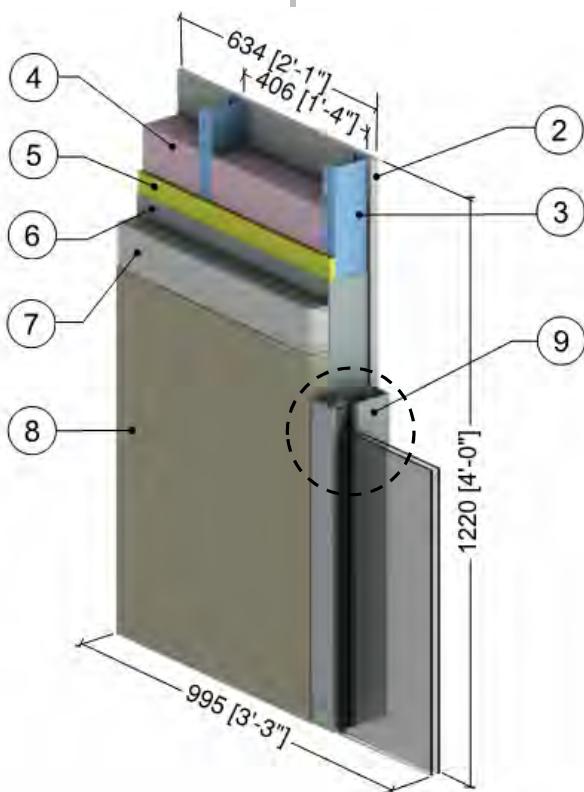
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI) to R-1.1 (0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (1.32 RSI) to 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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr-ft}^2\cdot^\circ\text{F}$ (1.82 W/m ² K) 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 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 – Conventional Curtain Wall Transition



Curtain Wall
Jamb Detail

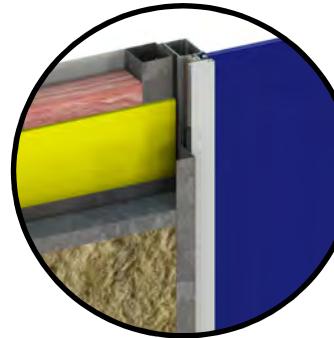
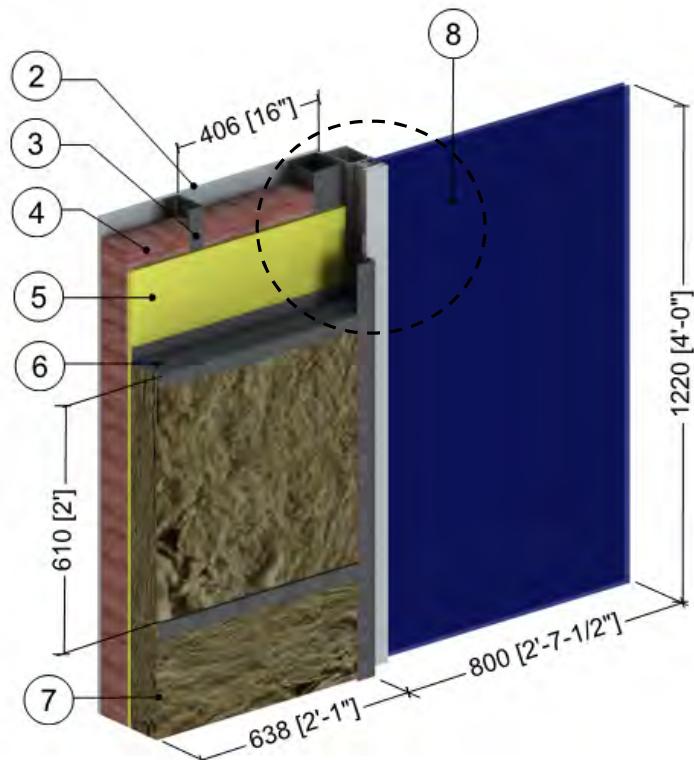
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI) to R-1.1 (0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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)	0.29 (0.042)	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 (1.32 RSI) to 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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU}/\text{hr}\cdot\text{ft}^2\cdot\text{°F}$ (1.82 W/m ² K) 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

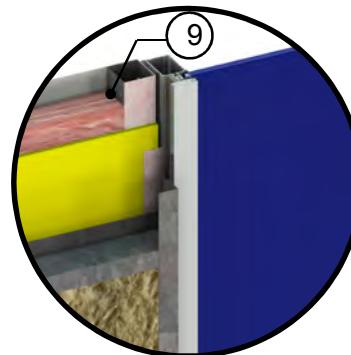
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 5.4.3

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly – Curtain Wall Transition



Without Aerogel Detail



With Aerogel Detail

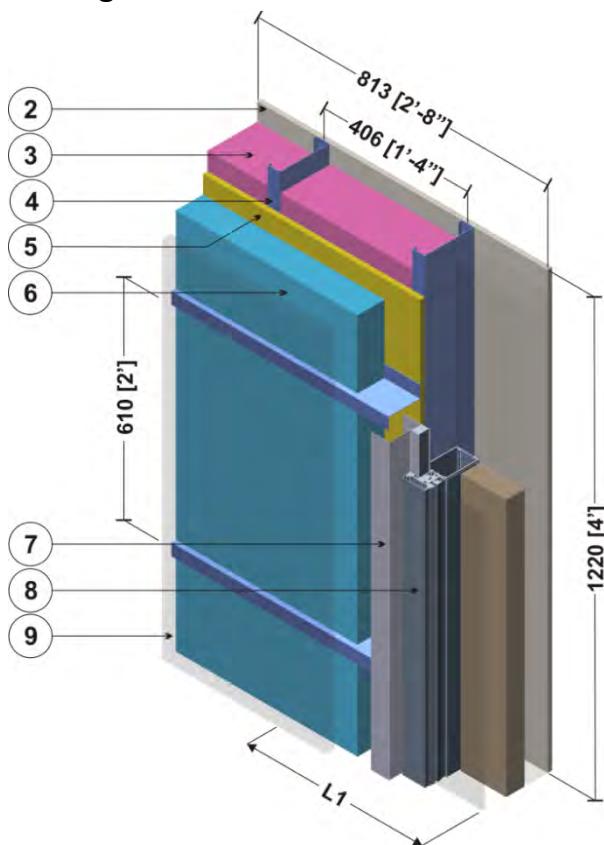
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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)	0.29 (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 (0.08 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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU}/\text{hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W}/\text{m}^2\text{K}$) ²					
9	Aerogel Blanket	0.4" (10)	0.086 (0.015)	R-3.8 (0.67 RSI)	-	-
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 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 – Conventional Curtain Wall Intersection



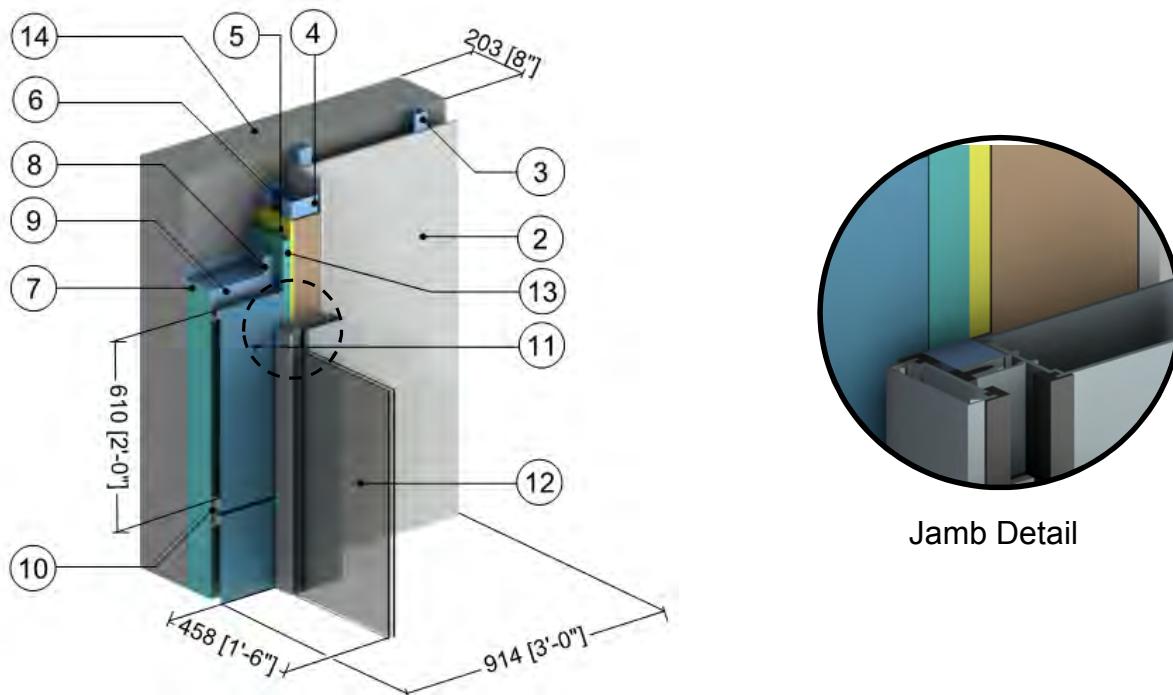
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation in Stud Cavity	3 5/8" (90)	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	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 (0.88 RSI) to R-25 (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 & surface emissivity

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



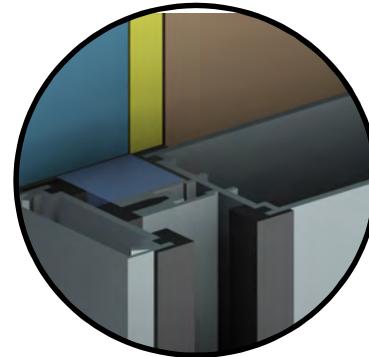
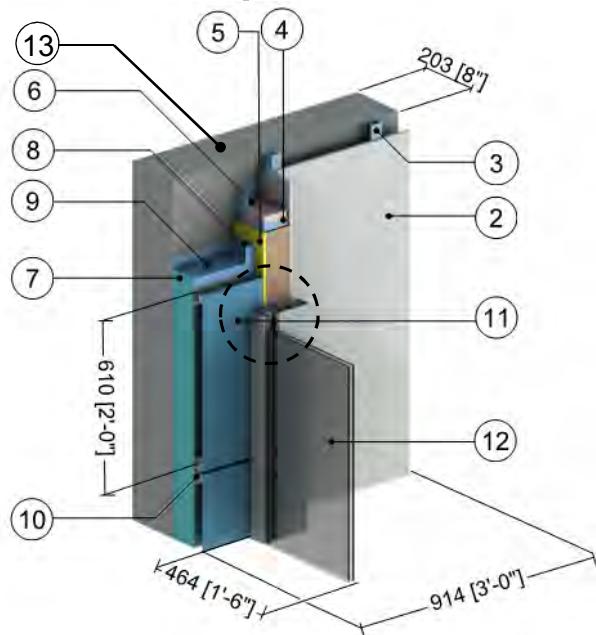
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 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 (0.09 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 (2.64 RSI) to R-25 (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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU}/\text{hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W}/\text{m}^2\text{K}$) ²					
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



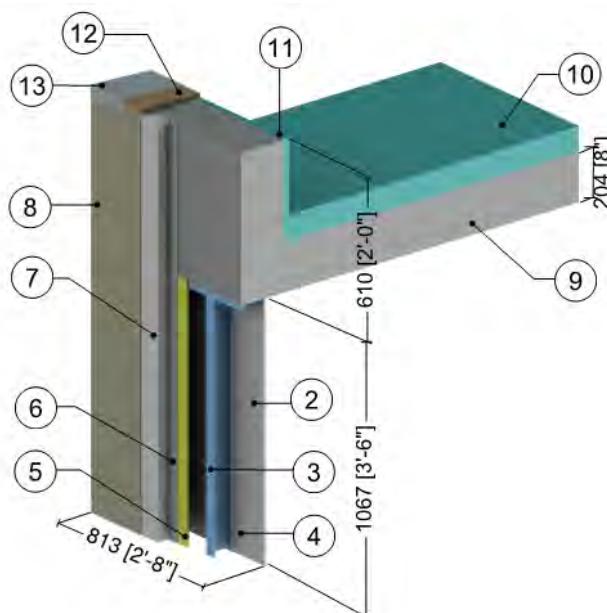
Jamb Detail

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 (0.09 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 (2.64 RSI) to R-25 (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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ (1.82 W/m ² K) ²					
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 orientation² 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

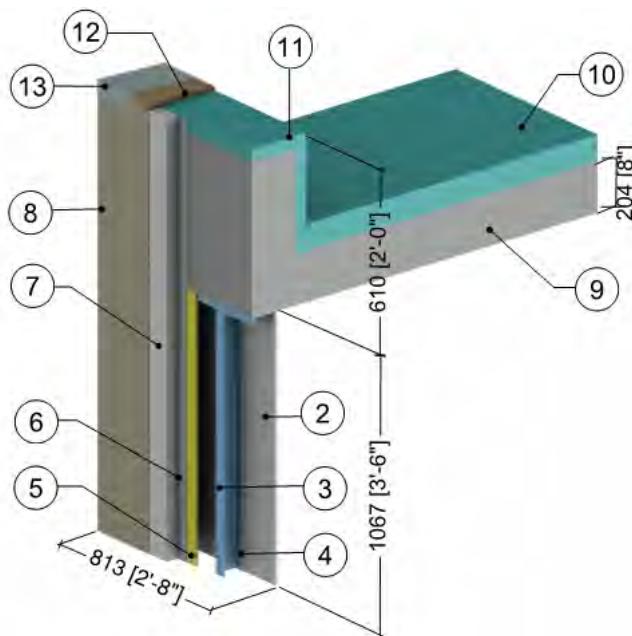


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs (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 (1.32 RSI) to 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 (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 (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 5.5.2

Exterior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Insulated Concrete Parapet & Slab Intersection

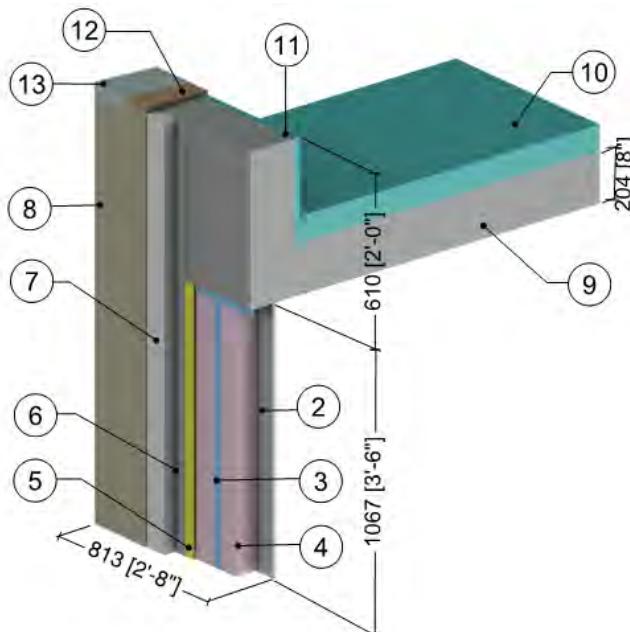


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (1.32 RSI) to 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 (1.76 RSI) to R-20 (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 (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 5.5.3

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Concrete Parapet & Slab Intersection

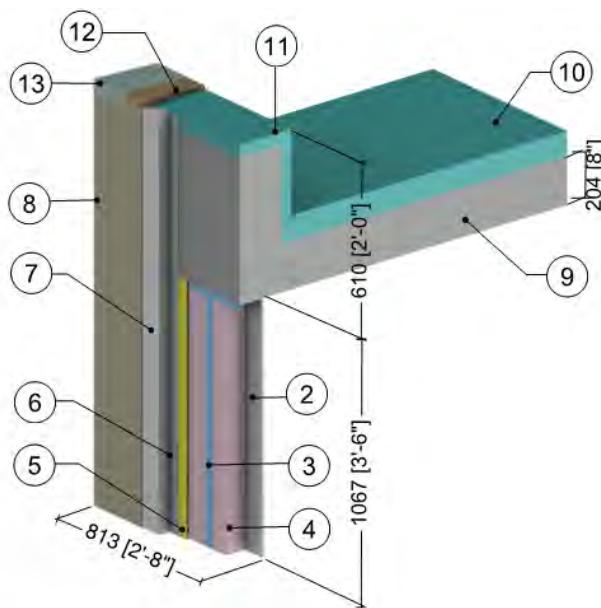


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft²·hr·°F (W/m K)	Nominal Resistance hr·ft²·°F/Btu (m²K/W)	Density lb/ft³ (kg/m³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs (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 (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 (1.32 RSI) to 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 (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 5.5.4

Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Drained EIFS Wall Assembly – Insulated Concrete Parapet & Slab Intersection

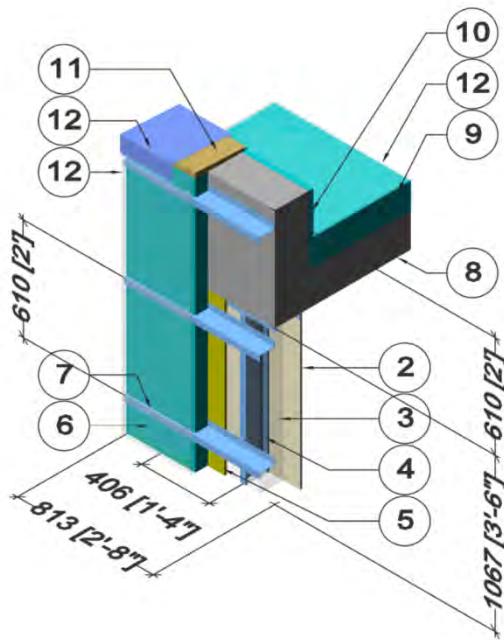


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.12 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (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 (1.32 RSI) to 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 (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 (1.76 RSI) to R-20 (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 (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 5.5.5

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

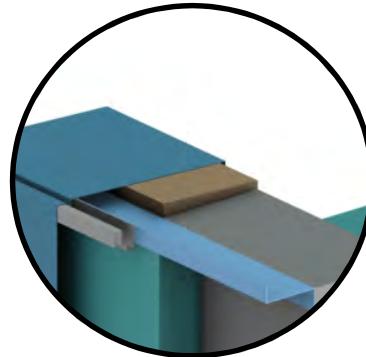
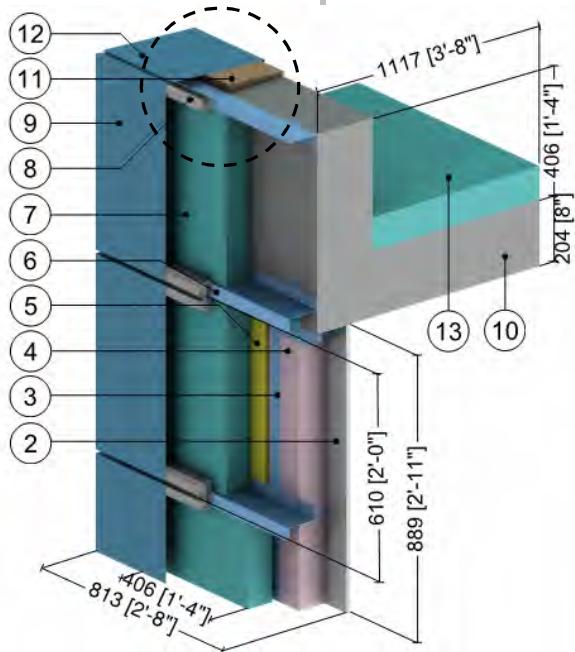


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (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 5.5.6

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 – Concrete Parapet and Slab Intersection



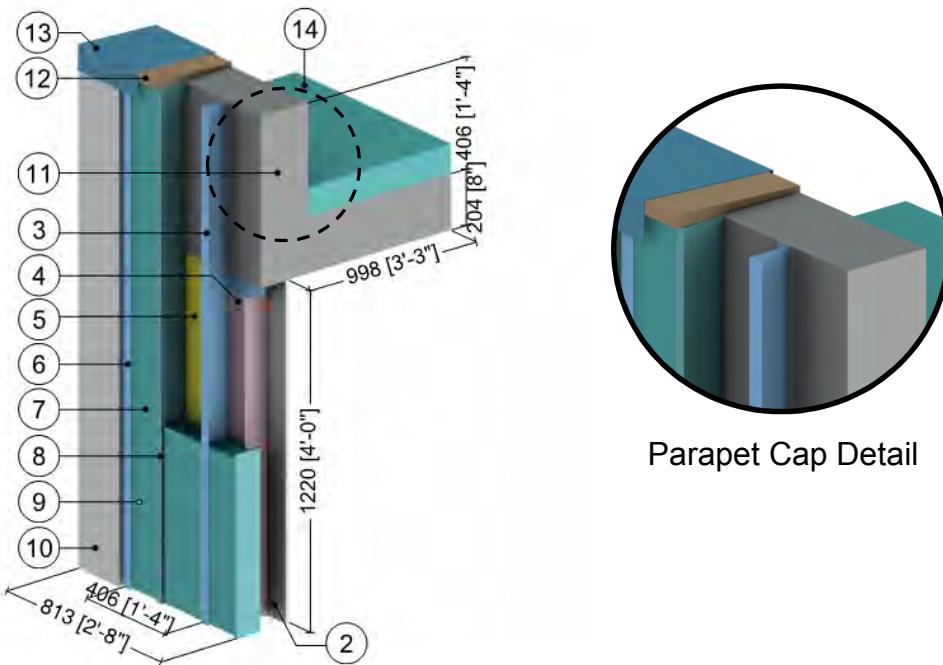
Parapet Cap Detail

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 (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)	0.29 (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	Horizontal Z-girts w/ 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	Varies	-	R-10 (1.76 RSI) to 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 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	Rigid 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 (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 5.5.7

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 – Concrete Parapet & Slab Intersection

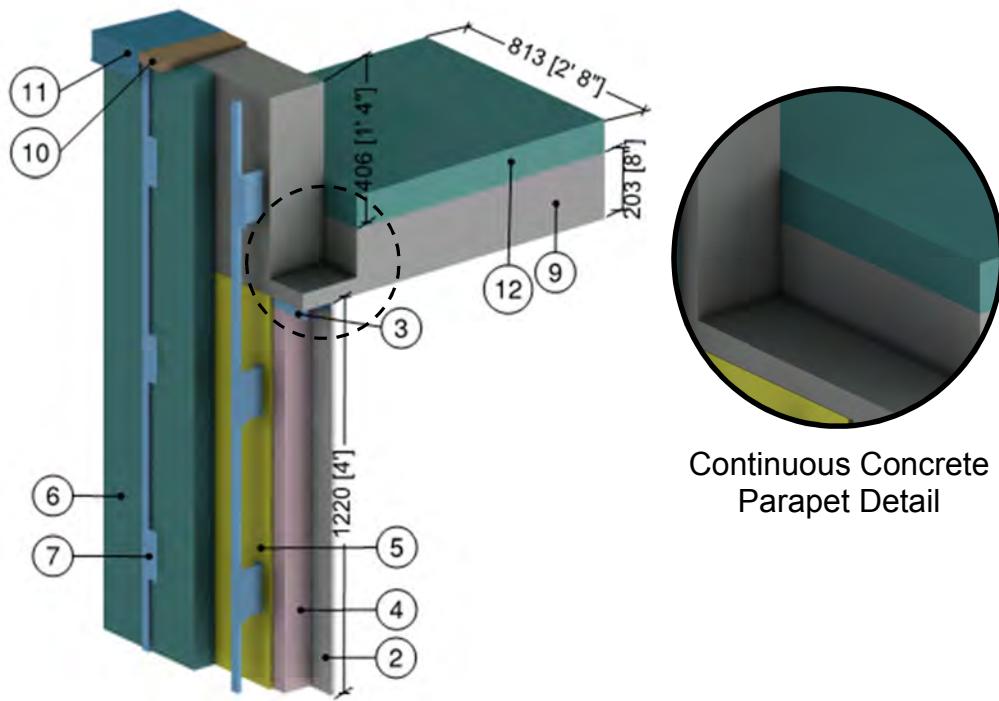


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	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)	0.29 (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	Vertical Z-Girts with 1 1/2" Flange	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Exterior Insulation	Varies	-	R-10 (1.76 RSI) to R-15 (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	Rigid 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 – Concrete Roof Deck at Continuous Concrete Parapet



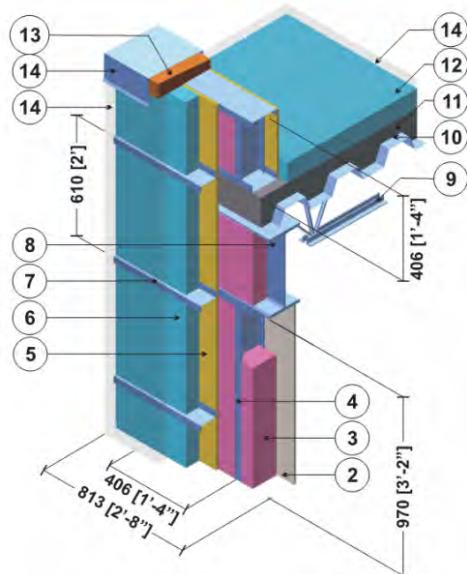
Continuous Concrete
Parapet Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² .hr. ^o F (W/m K)	Nominal Resistance hr-ft ² . ^o F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb. ^o 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)	0.29 (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 (0.09 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	Rigid 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 (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 5.5.9

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 – Steel Roof Deck with Open Web Steel Joist & Parapet Intersection

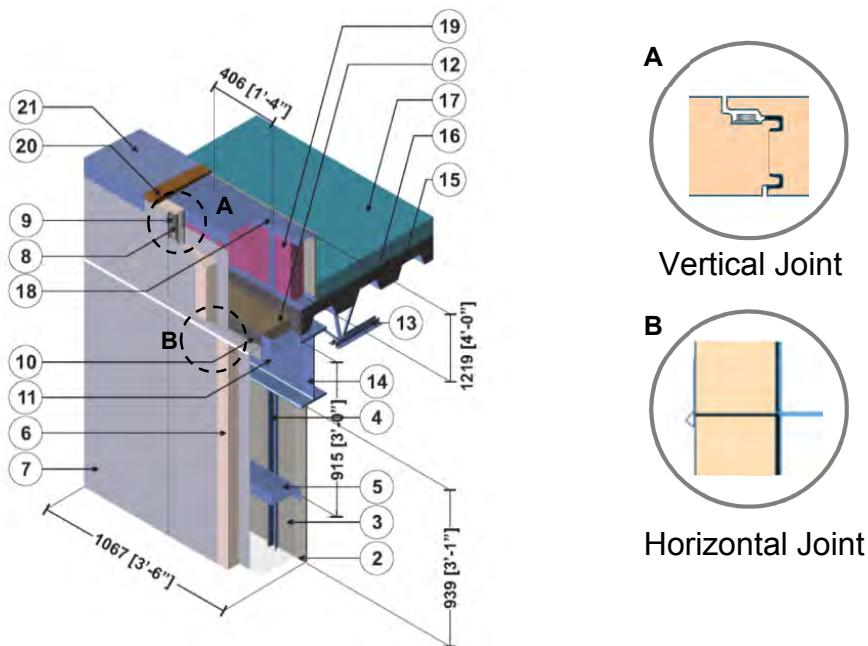


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation in Stud Cavity	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	Exterior Insulation, Roof	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 (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

Vertical Insulated Metal Panel – Steel Roof Deck with Open Web Steel Joist & Parapet Intersection



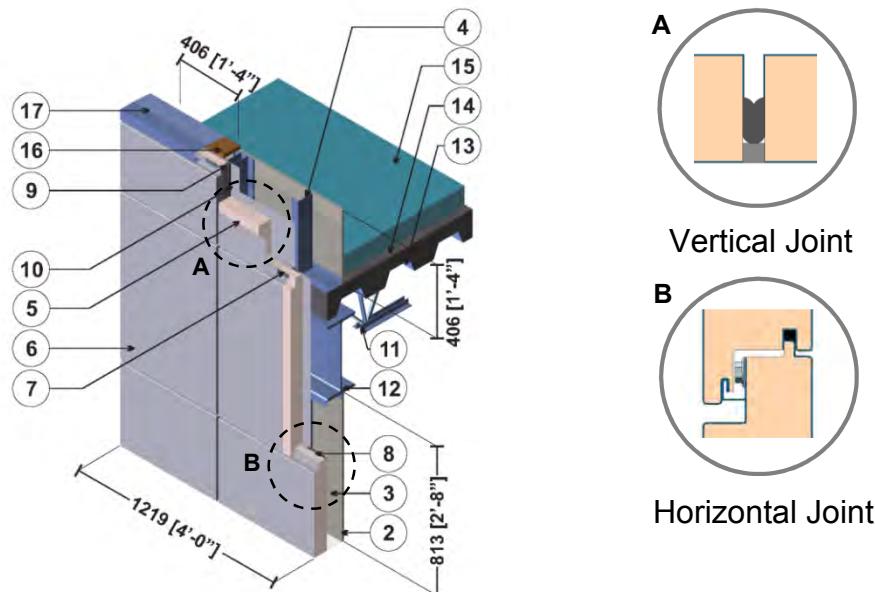
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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	Steel Bolt	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 5.5.11

Horizontal Insulated Metal Panel – Steel Roof Deck with Open Web Steel Joist & Parapet Intersection

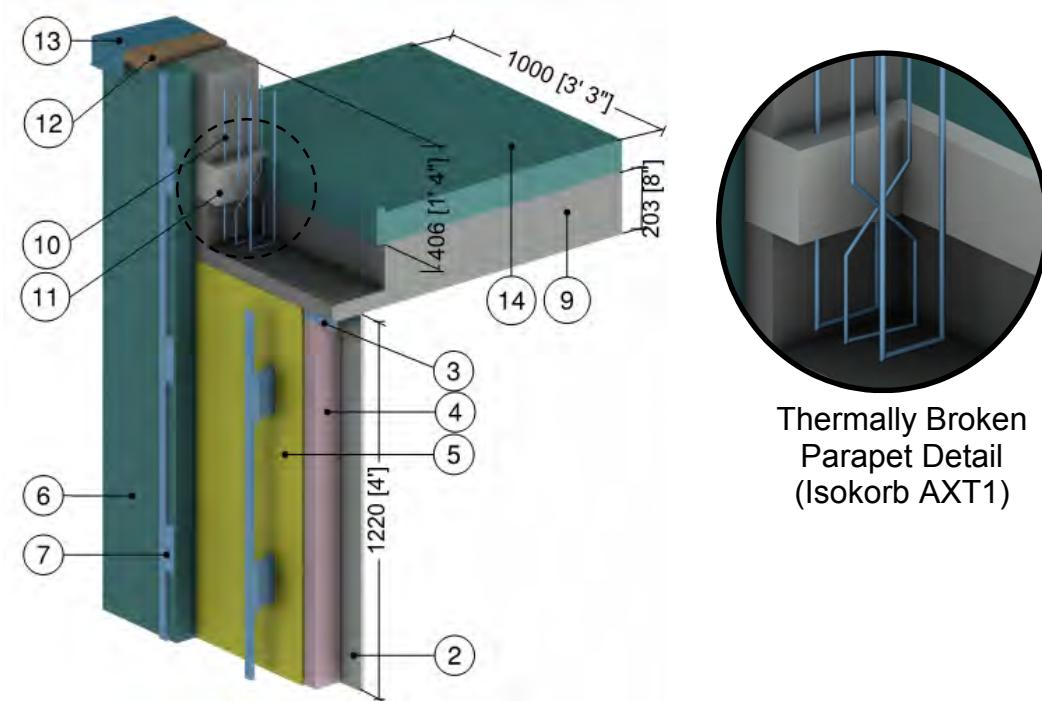


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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	Steel Bolt	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 5.5.12

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 – Concrete Roof Deck at Isokorb AXT1 Thermally Broken Concrete Parapet

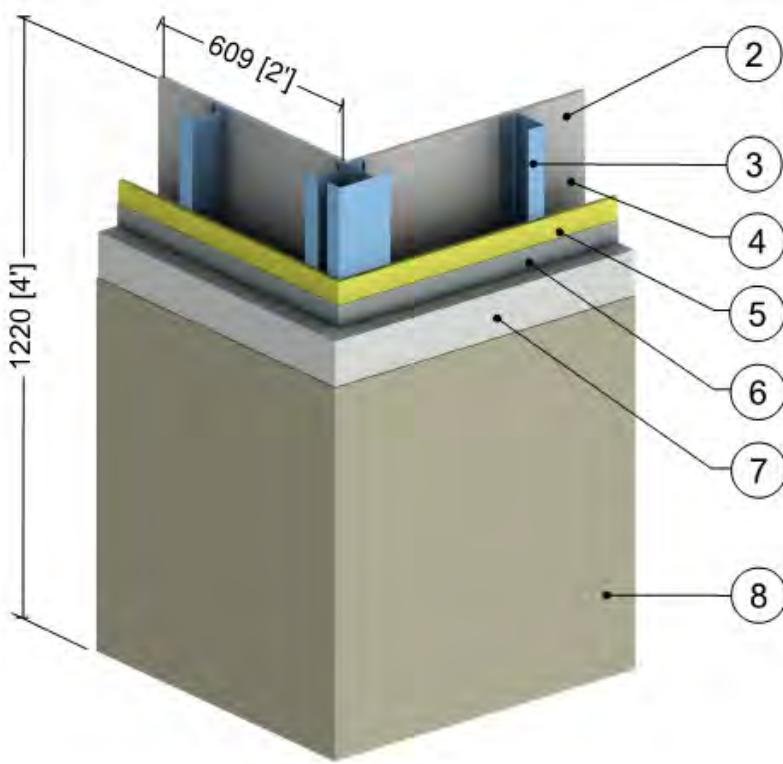


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² .hr. ^o F (W/m K)	Nominal Resistance hr-ft ² . ^o F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb. ^o F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	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)	0.29 (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 (0.09 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	Rigid 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 5.6.1

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

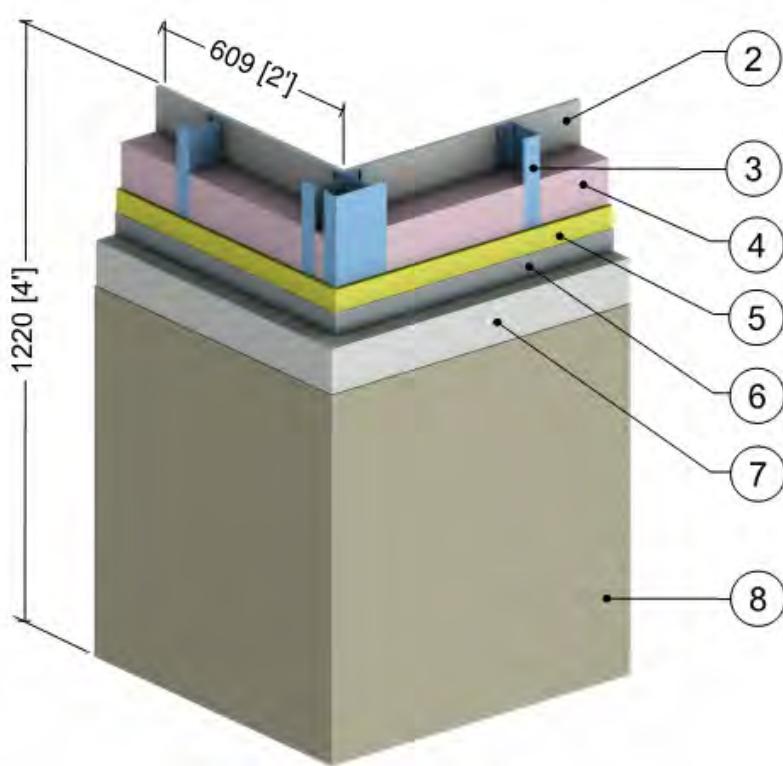


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 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 (0.09 RSI)	50 (800)	0.26 (1090)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	Varies	0.27 (0.039)	R-7.5 (1.32 RSI) to 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 5.6.2

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

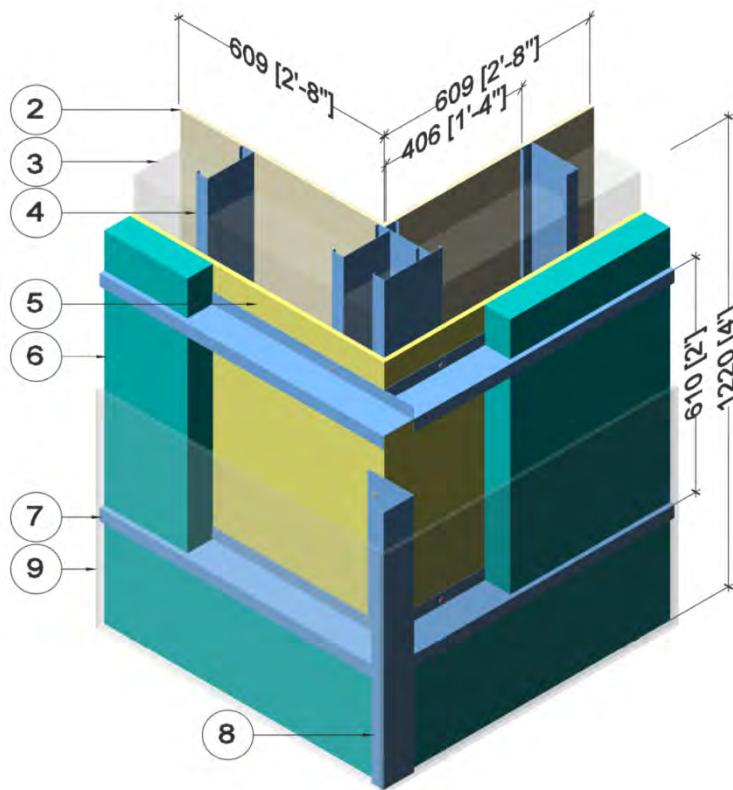


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 5/8" x 1 5/8" Steel Studs (16"o.c.)	18 Gauge	430 (62)	-	489 (7830)	0.12 (500)
4	Fiberglass Batt Insulation	3 5/8" (92)	0.29 (0.042)	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 (0.09 RSI)	50 (800)	0.26 (1090)
6	Weather Resistive Barrier with Adhesive	-	-	-	-	-
7	Insulation Board	Varies	0.27 (0.039)	R-7.5 (1.32 RSI) to 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 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

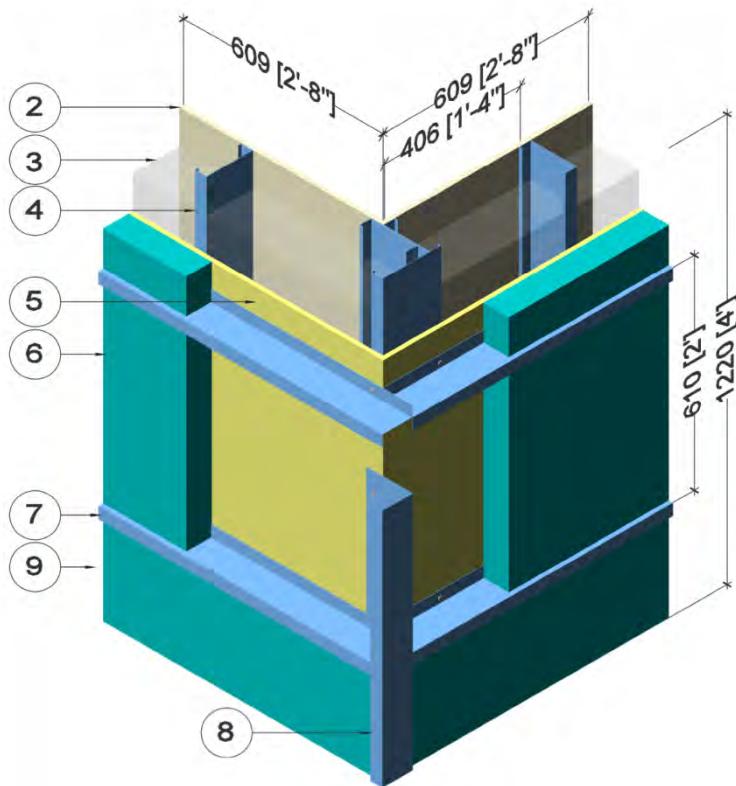


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air 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 (0.88 RSI) to R-25 (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, Alternative Framing

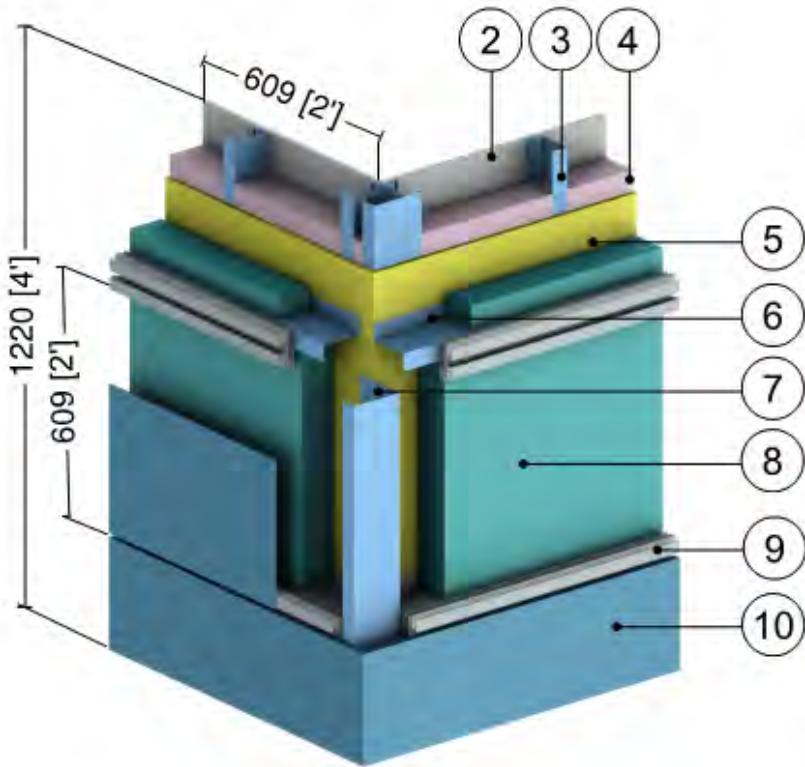


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air 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 (0.88 RSI) to R-25 (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 – Corner Intersection

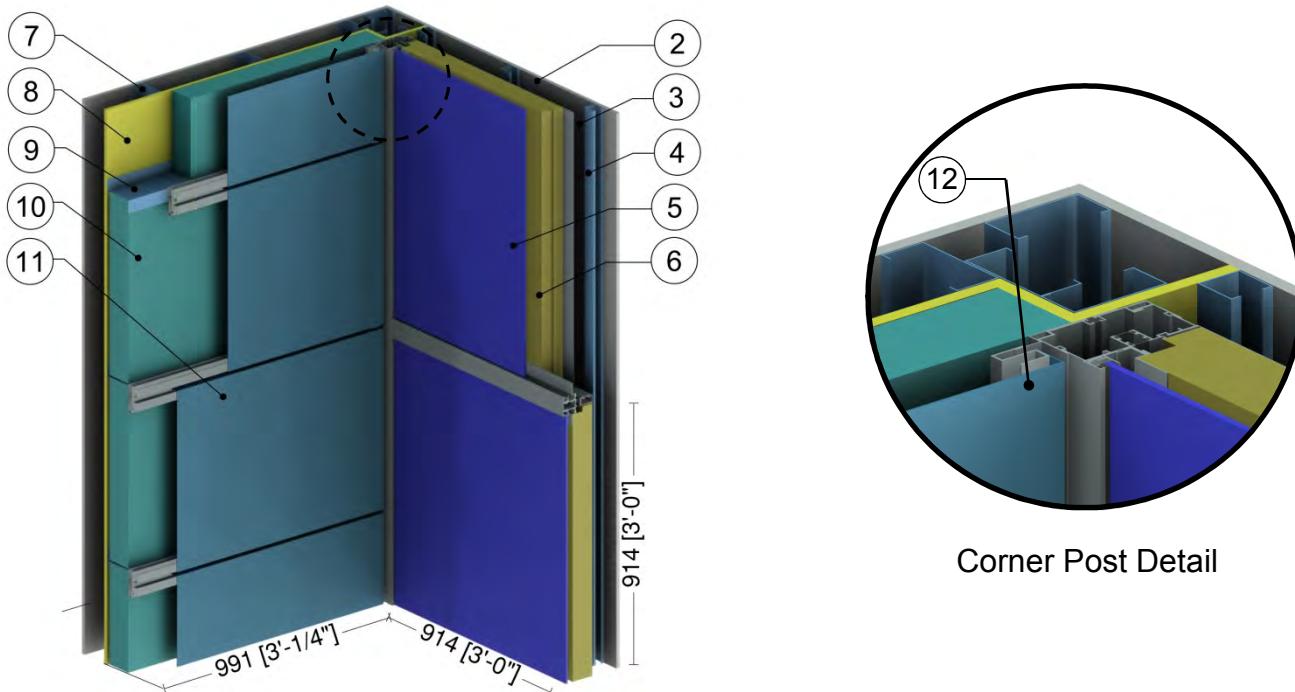


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	3 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)	0.29 (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	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 (1.76 RSI) to R-15 (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

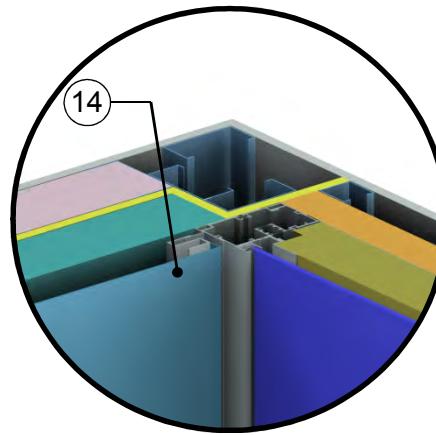
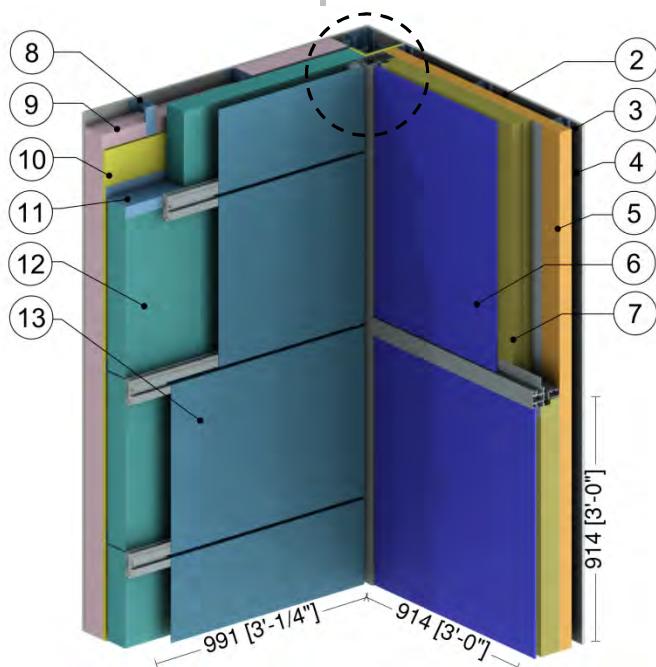
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air 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 (0.09 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 (2.64 RSI) to R-25 (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



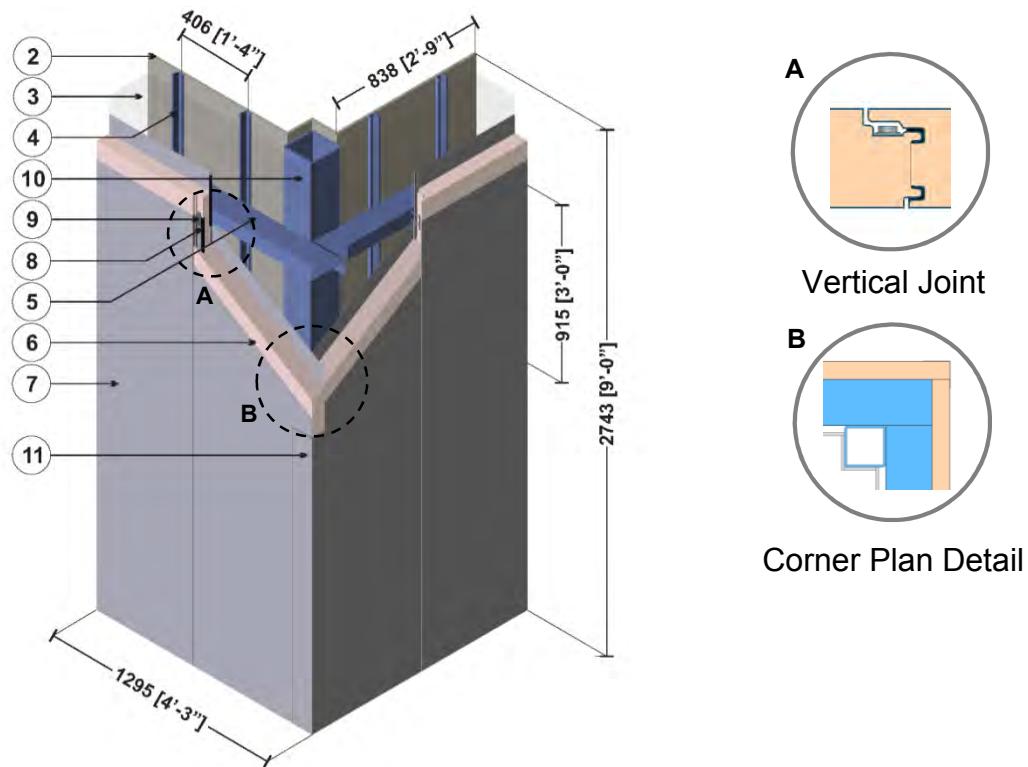
Corner Post Detail

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 (1.48 RSI) to R-16.8 (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)	0.29 (0.042)	R-12 (2.1 RSI)	0.9 (14)	0.17 (710)
10	Exterior Sheathing	1/2" (13)	1.1 (0.16)	R-0.5 (0.09 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 (2.64 RSI) to R-25 (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 orientation² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 5.6.8

Vertical Insulated Metal Panel – Corner Intersection, with Post and Support Girt/Hat Track Backup Wall

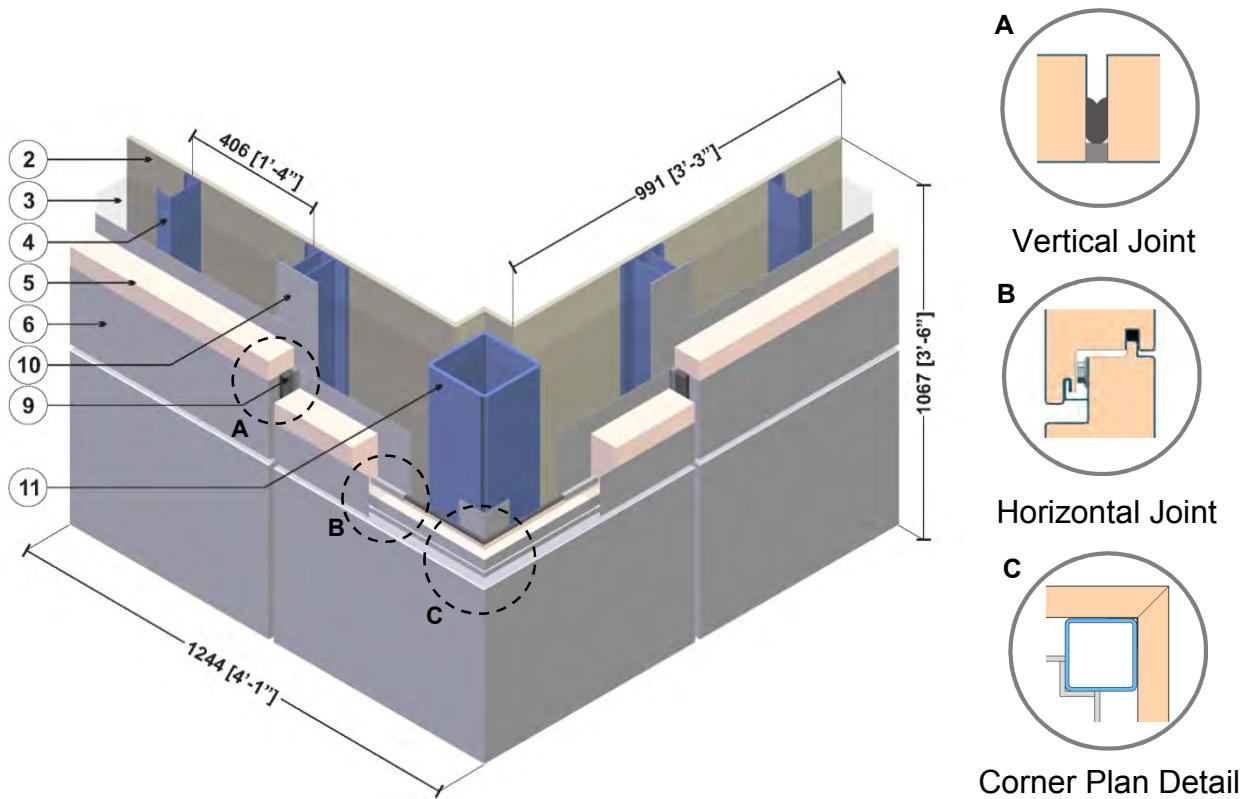


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Cavity	-	-	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	Steel Bolt	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 5.6.9

Horizontal Insulated Metal Panel – Corner Intersection, with Post and Steel Stud Backup Wall

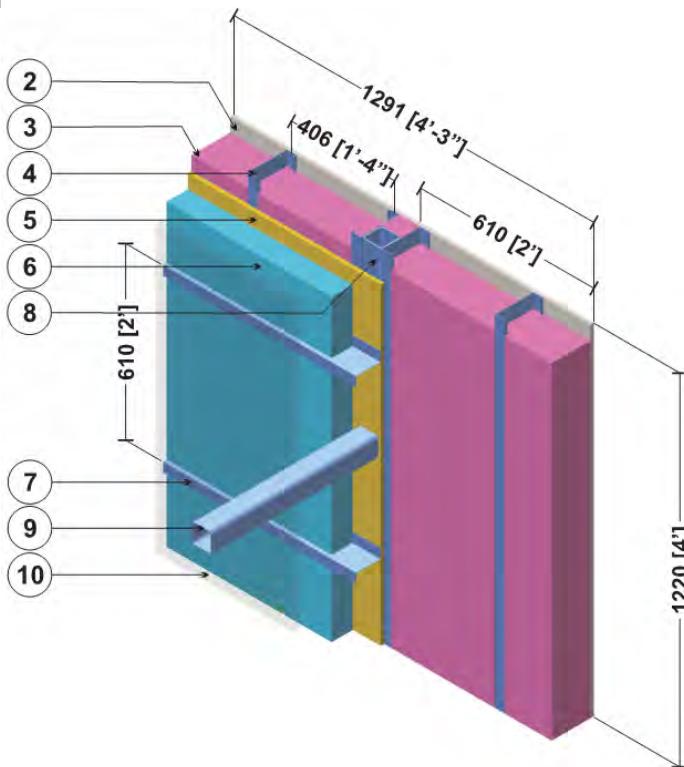


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Cavity	-	-	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	Steel Bolt	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

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 – Structural Steel Column & Cantilever Beam Intersection (Canopy Support)

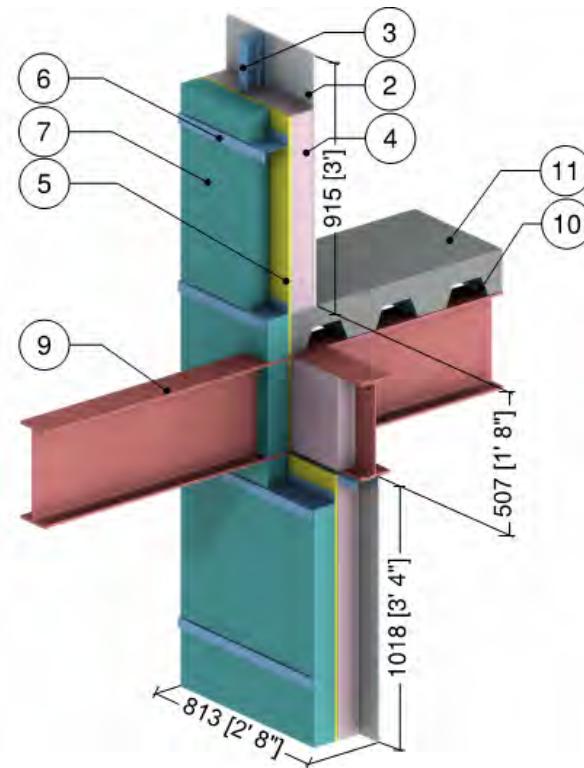


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation in Stud Cavity	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	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 (0.88 RSI) to R-25 (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 (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 5.7.2

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 – Structural Steel Floor Intersection with Uninterrupted Beam

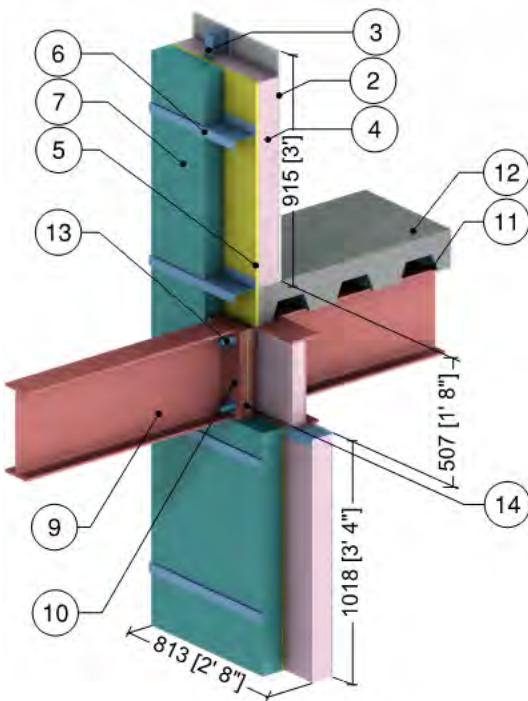


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	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)	0.29 (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 (0.09 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)	-	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	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	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 – Structural Steel Floor Intersection with Isolator Pad

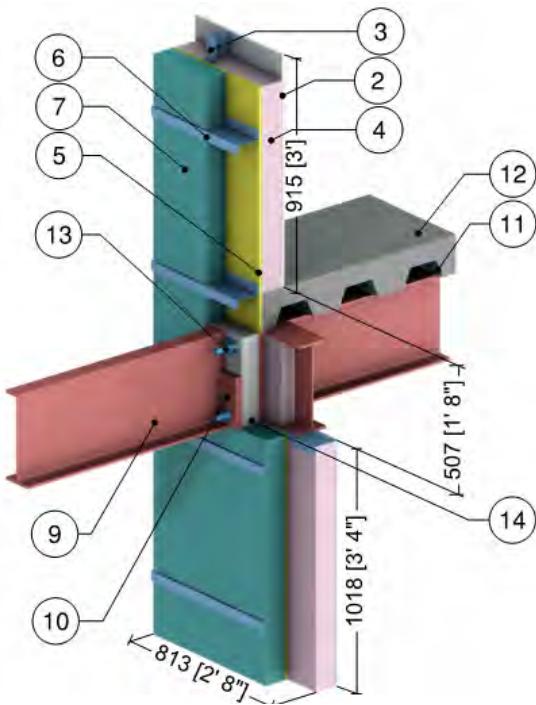


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	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)	0.29 (0.042)	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	Polymer Thermal Isolator Pad	3/16"(5) to 3/8"(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 – Structural Steel Floor Intersection with Isokorb S22 Thermally Broken Beam

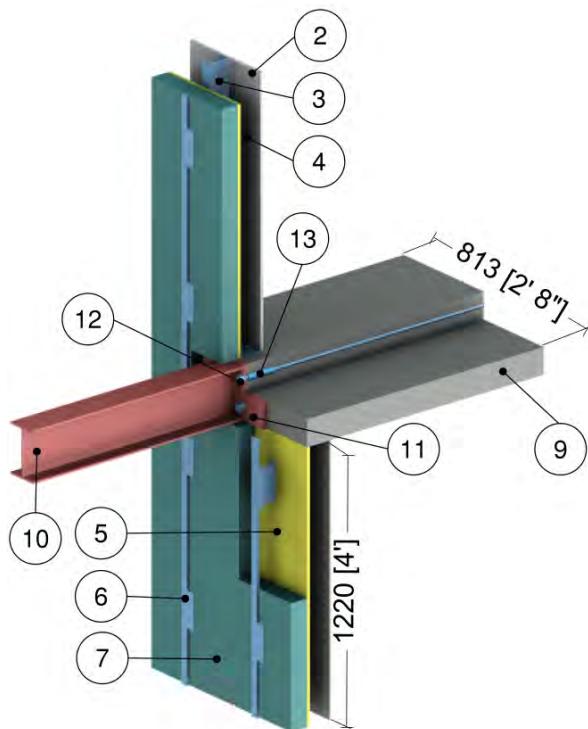


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² .hr. ^o F (W/m K)	Nominal Resistance hr·ft ² . ^o F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb. ^o F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	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)	0.29 (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 (0.09 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)	-	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	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)
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

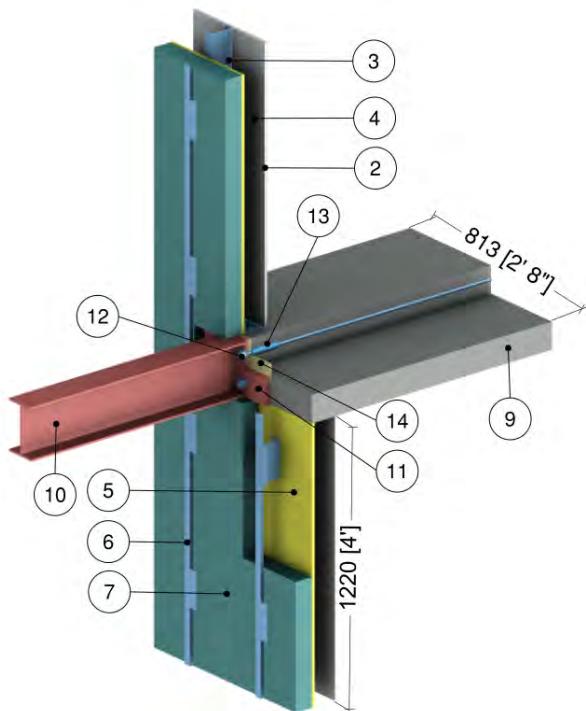


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² .hr. ^o F (W/m K)	Nominal Resistance hr·ft ² . ^o F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb. ^o F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	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	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 (0.09 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 (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 5.7.6

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

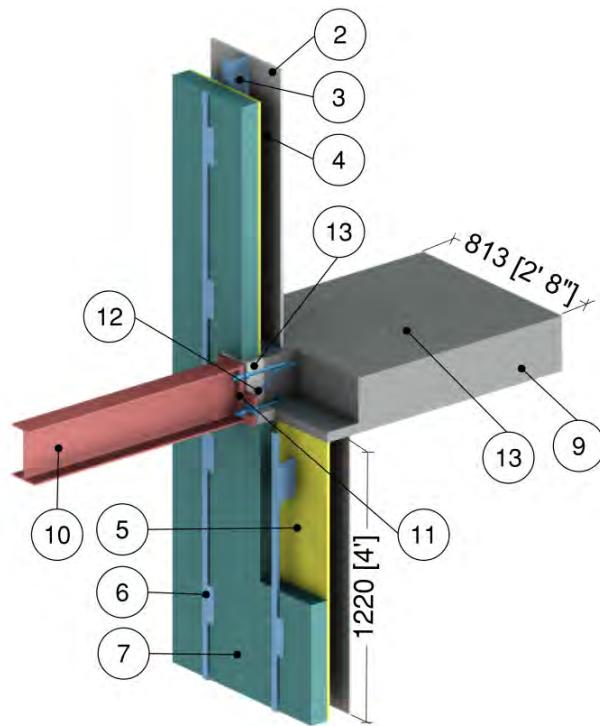


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	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	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 (0.09 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 (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 5.7.7

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

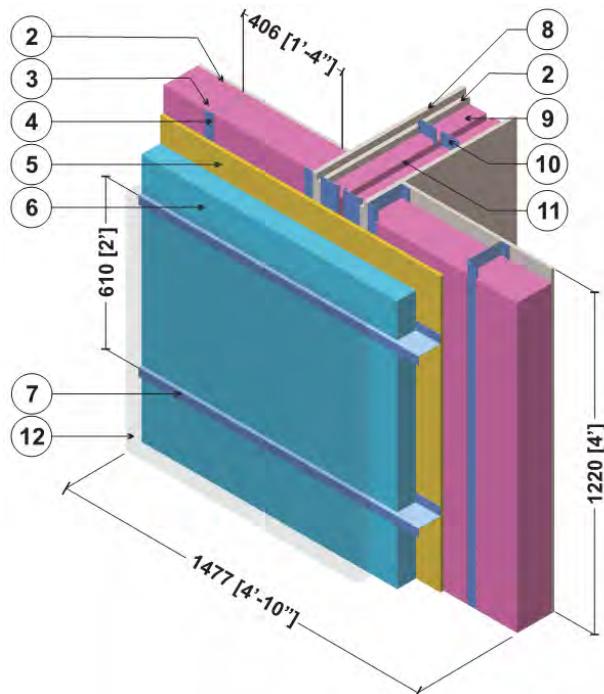


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² .hr. ^o F (W/m K)	Nominal Resistance hr. ^o F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb. ^o F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (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	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 (0.09 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 (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 5.8.1

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 – 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 in Stud Cavity	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	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 (0.88 RSI) to R-25 (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

6.0 Concrete Construction

Detail 6.1.1	A.6.1
Exterior Insulated Concrete Drained EIFS Wall Assembly – Clear Wall	
Detail 6.1.2	A.6.2
Exterior Insulated Concrete Block Wall Assembly with Thermally Broken Aluminum Clip Rail System (24" o.c.) Supporting Cladding – Clear Wall	
Detail 6.2.1	A.6.3
Exterior Insulated Concrete Drained EIFS Wall Assembly – Floor Slab Intersection	
Detail 6.2.2	A.6.4
Interior Insulated Concrete Mass Wall with 1 5/8" Steel Stud (16"o.c.) Supporting Interior Finish – Non-Insulated Interior Wall and Non-insulated Slab Intersection	
Detail 6.2.3	A.6.5
Interior Insulated Concrete Mass Wall with 1 5/8" Steel Stud (16" o.c.) Supporting Interior Finish – Insulated Interior Wall and Non-insulated Slab Intersection	
Detail 6.2.4	A.6.6
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	
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Interior Insulated Concrete Mass Wall with 1 5/8" x 1 5/8" Steel Studs (16" o.c.) Supporting Interior Finish – Continuous Concrete Floor Slab Intersection	
Detail 6.2.6	A.6.8
Precast Wall Assembly with 3 5/8" x 1 5/8" Steel Stud (16" o.c.) and Insulation in Stud Cavity – Slab Intersection	
Detail 6.2.7	A.6.9
Precast Wall Assembly with 3 5/8" x 1 5/8" Steel Stud (16" o.c.) and Rigid Insulation Outboard of Studs – Slab Intersection	
Detail 6.2.8	A.6.10
Precast Sandwich Panel Wall Assembly with 3 5/8" x 1 5/8" Steel Stud (16" o.c.) – Slab Intersection	
Detail 6.2.9	A.6.11
Precast Sandwich Panel Wall Assembly with Concrete at Panel Perimeter and Steel Connectors at 24" o.c. – Slab Intersection	
Detail 6.2.10	A.6.12
Precast Sandwich Panel Wall Assembly with Steel Connectors at 16" o.c. – Slab Intersection	
Detail 6.2.11	A.6.13
Precast Sandwich Panel Wall Assembly with Steel Connectors at 36" o.c. – Slab Intersection	

Detail 6.2.12	A.6.14
Precast Sandwich Panel Wall Assembly with Steel Connectors at 48" o.c. – Slab Intersection	
Detail 6.2.13	A.6.15
Precast Sandwich Panel Wall Assembly with Fiber-Reinforced Composite Connections at 16" o.c. – Slab Intersection	
Detail 6.2.14	A.6.16
Exterior Insulated Concrete Block Wall Assembly with Shelf Angle & Brick Ties Supporting Brick Veneer – Slab Intersection	
Detail 6.2.15	A.6.17
Exterior Insulated Concrete Block Wall Assembly with Spaced Shelf Angle & Brick Ties Supporting Brick Veneer – Slab Intersection	
Detail 6.2.16	A.6.18
Exterior Insulated Concrete Block Wall Assembly with Masonry Ties Supporting Brick Veneer – Balcony Slab Intersection	
Detail 6.2.17	A.6.19
Exterior Insulated Concrete Block Wall Assembly with Masonry Ties Supporting Brick Veneer – Angle Supported Slab & Slab Intersection	
Detail 6.2.18	A.6.20
Exterior Insulated Concrete Block Wall Assembly with Masonry Ties Supporting Brick Veneer – Balcony Slab Intersection	
Detail 6.2.19	A.6.21
Interior Insulated Concrete Mass Wall with 1 5/8" x 1 5/8" Steel Studs (16" o.c.) Supporting Interior Finish – Thermally Broken Concrete Floor Slab Intersection	
Detail 6.3.1	A.6.22
Exterior Insulated Concrete Drained EIFS Wall Assembly – Window and Floor Slab Intersection	
Detail 6.3.2	A.6.23
Interior Insulated Concrete Mass Wall with 1 5/8" x 1 5/8" Steel Studs (16" o.c.) Supporting Interior Finish – Window & Slab Intersection	
Detail 6.3.3	A.6.24
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	
Detail 6.3.4	A.6.25
Precast Sandwich Panel Wall Assembly with Concrete at Panel Perimeter and Steel Connectors at 24" (o.c.) – Window Intersection	
Detail 6.3.5	A.6.26
Precast Sandwich Panel Wall Assembly with 3 5/8" Steel Stud (16" o.c.) – Window Intersection	

Detail 6.3.6	A.6.27
Exterior Insulated Concrete Drained EIFS Wall Assembly – Window with Aerogel and Floor Slab Intersection	
Detail 6.4.1	A.6.28
Exterior Insulated Concrete Drained EIFS Wall Assembly – Conventional Curtain Wall Transition	
Detail 6.4.2	A.6.29
Precast Sandwich Panel Wall Assembly with 3 5/8" Steel Stud (16" o.c.) – Curtain Wall Transition	
Detail 6.4.3	A.6.30
Interior Insulated Concrete Mass Wall – Conventional Curtain Wall Transition	
Detail 6.4.4	A.6.31
Interior Insulated Concrete Mass Wall – Thermally Broken Curtain Wall Transition	
Detail 6.5.1	A.6.32
Exterior Insulated Concrete Drained EIFS Wall Assembly – Concrete Parapet & Slab Intersection	
Detail 6.5.2	A.6.33
Exterior Insulated Concrete Drained EIFS Wall Assembly – Insulated Concrete Parapet & Slab Intersection	
Detail 6.5.3	A.6.34
Interior Insulated Concrete Mass Wall with 1 5/8" Steel Stud (16" o.c.) Supporting Interior Finish – Concrete Parapet & Roof Intersection	
Detail 6.5.4	A.6.35
Precast Sandwich Panel Wall Assembly with 3 5/8" Steel Stud (16" o.c.) – Steel Roof Deck with Open Web Steel Joist & Parapet Intersection	
Detail 6.5.5	A.6.36
Precast Sandwich Panel – Steel Roof Deck with Open Web Steel Joist & Parapet Intersection	
Detail 6.5.6	A.6.38
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	
Detail 6.5.7	A.6.39
Exterior Insulated Concrete Block Wall Assembly with Masonry Ties Supporting Brick Veneer – Parapet & Roof Intersection	
Detail 6.6.1	A.6.40
Exterior Insulated Concrete Drained EIFS Wall Assembly – Corner Intersection	

Detail 6.7.1 **A.6.41**

Interior Insulated Concrete Mass Wall with 3 5/8" x 1 5/8" Steel Studs (16" o.c.)
Supporting Interior Finish – Floor Slab above Parking Garage

Detail 6.7.2 **A.6.42**

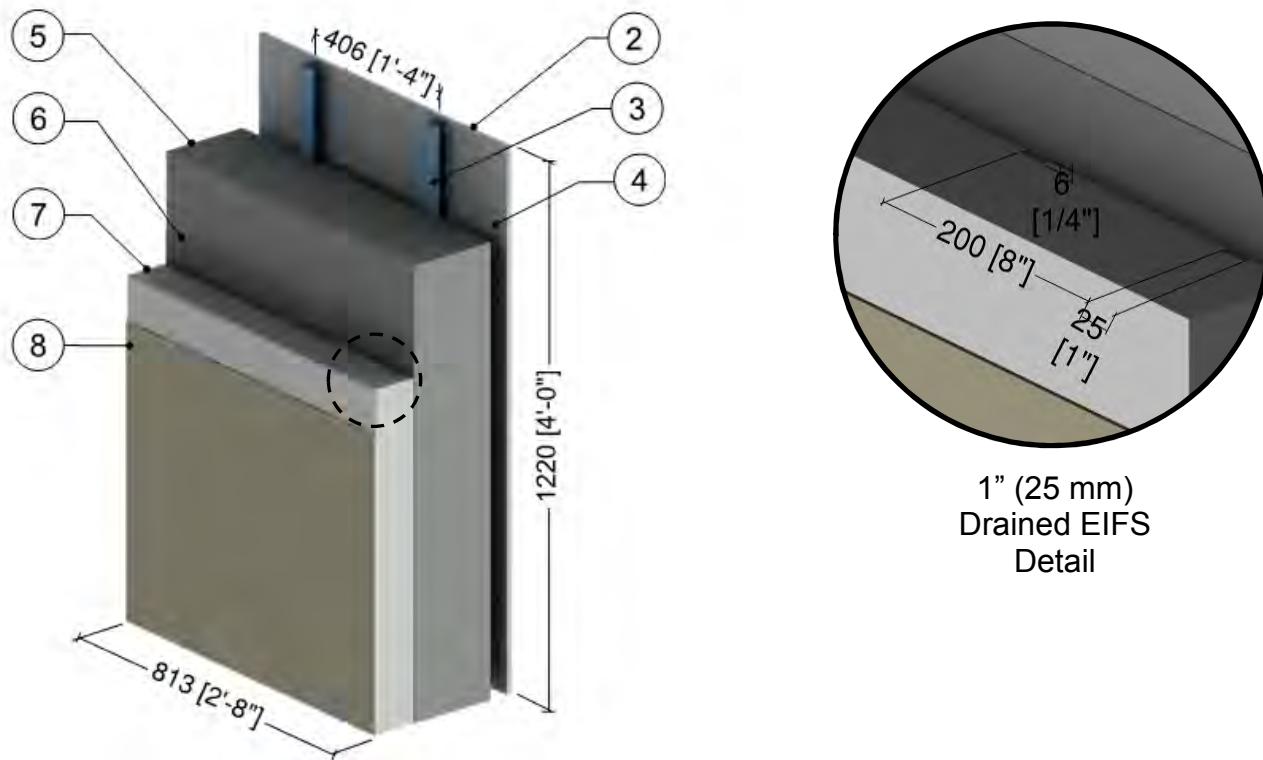
Precast Sandwich Wall Assembly Slab and Foundation Intersection

Detail 6.7.3 **A.6.43**

Precast Sandwich Panel with 3 5/8" Steel Stud (16" o.c.) – Concrete Slab and
Foundation Wall

Detail 6.1.1

Exterior Insulated Concrete Drained EIFS Wall Assembly – Clear Wall

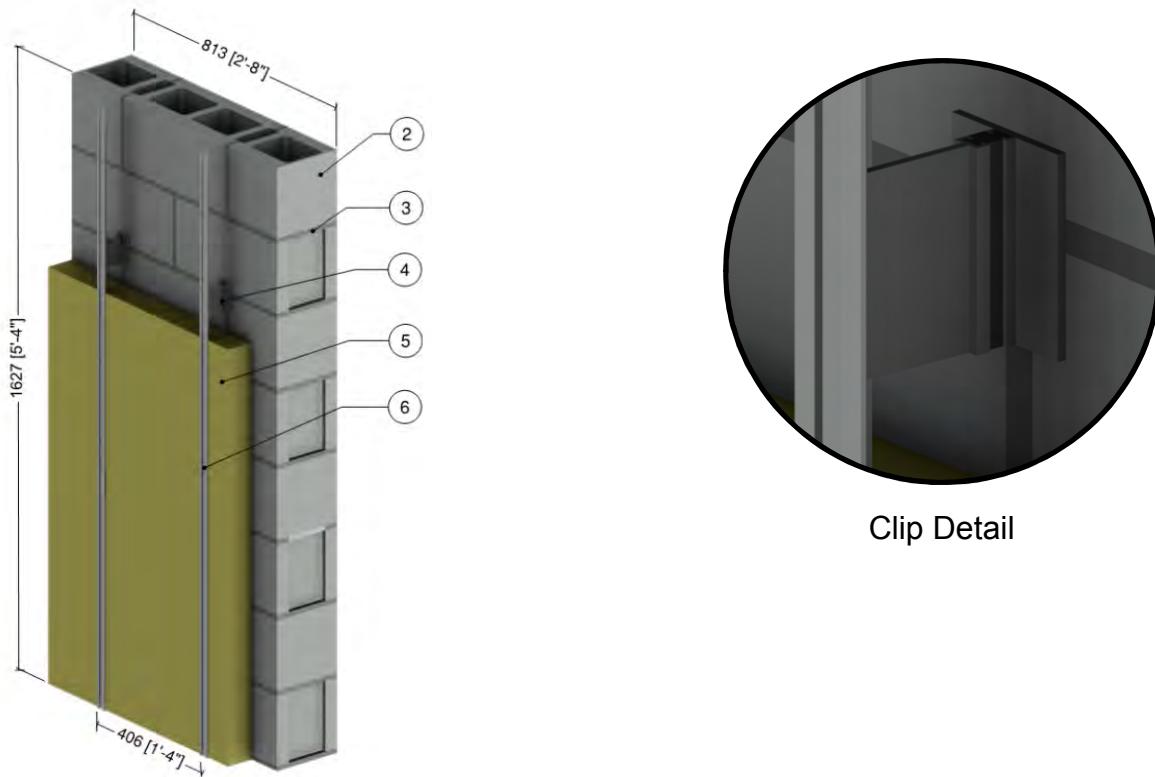


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 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 6.1.2

Exterior Insulated Concrete Block Wall Assembly with Thermally Broken Aluminum Clip Rail System (24" o.c.) Supporting Cladding – Clear Wall

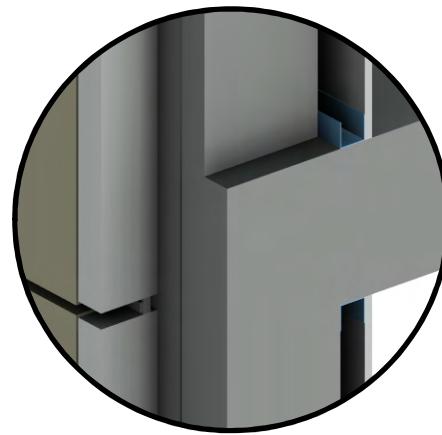
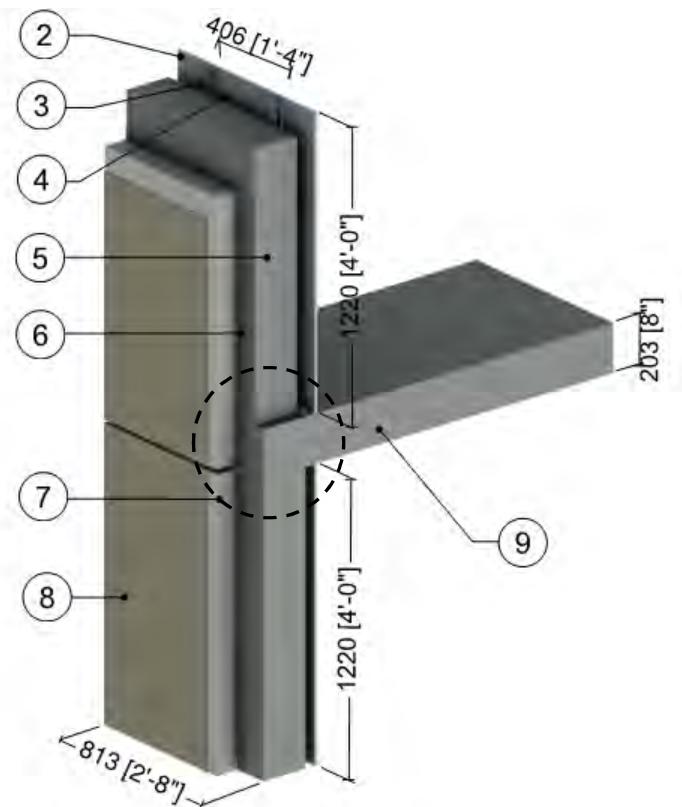


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Standard Concrete Block	7 5/8" (190)	3.5 (0.5)	-	119 (1900)	0.19 (800)
3	Cement Mortar	-	3.5 (0.5)	-	119 (1900)	0.19 (800)
4	Longboard Aluminum Panel Clip	1/5" (5) to 3/8" (10)	1109 (160)	-	-	-
5	Exterior Insulation	3" (76)	-	R-12.6 (2.22 RSI)	1.8 (28)	0.29 (1220)
6	Vertical Steel Girts	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
7	Cladding with 1/2" (13mm) 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 6.2.1

Exterior Insulated Concrete Drained EIFS Wall Assembly – Floor Slab Intersection



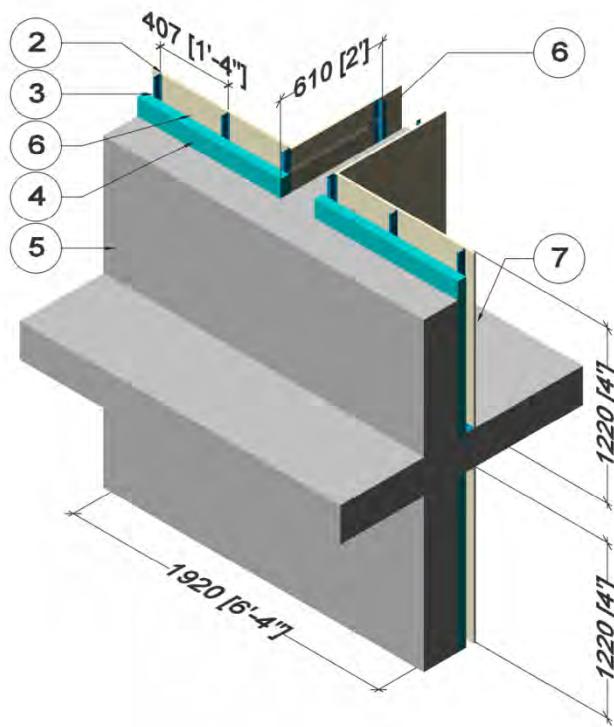
1" (25 mm)
Drained EIFS
at Slab Detail

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 (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	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 6.2.2

Interior Insulated Concrete Mass Wall with 1 5/8" Steel Stud (16"o.c.) Supporting Interior Finish – Non-Insulated Interior Wall and Non-insulated Slab Intersection

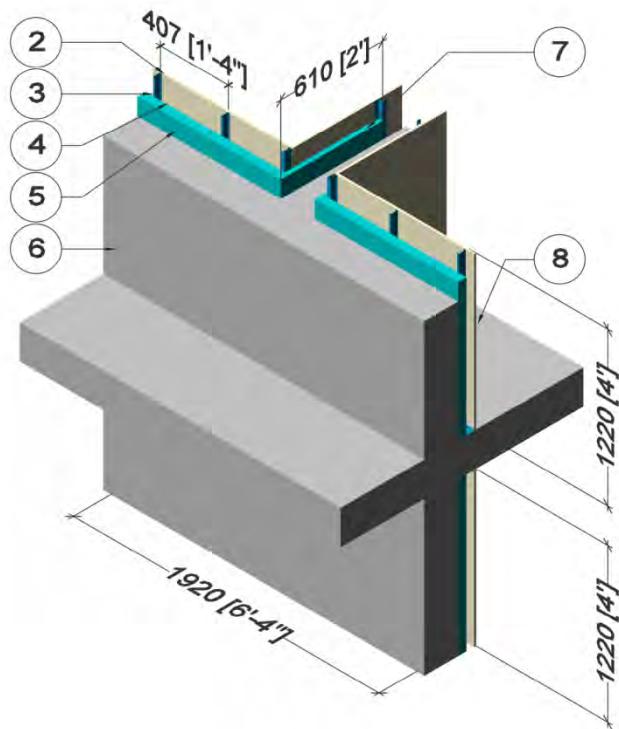


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 6.2.3

Interior Insulated Concrete Mass Wall with 1 5/8" Steel Stud (16" o.c.) Supporting Interior Finish – Insulated Interior Wall and Non-insulated Slab Intersection

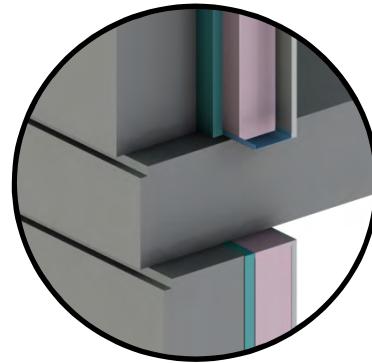
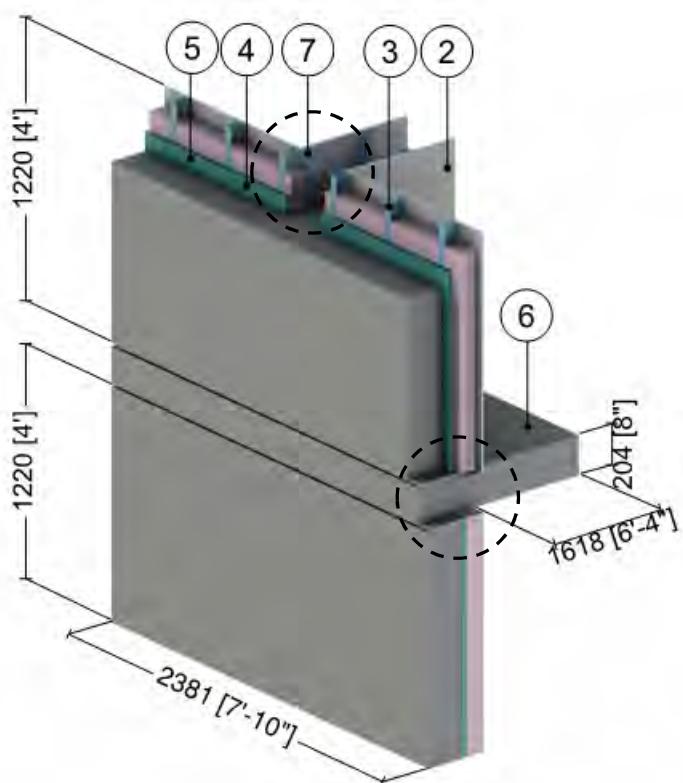


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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)	-	-

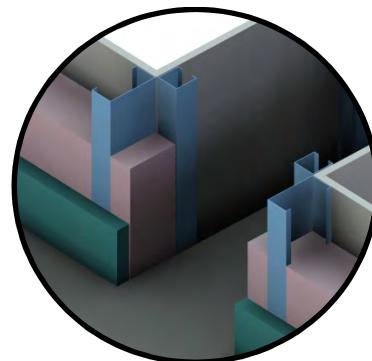
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 6.2.4

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



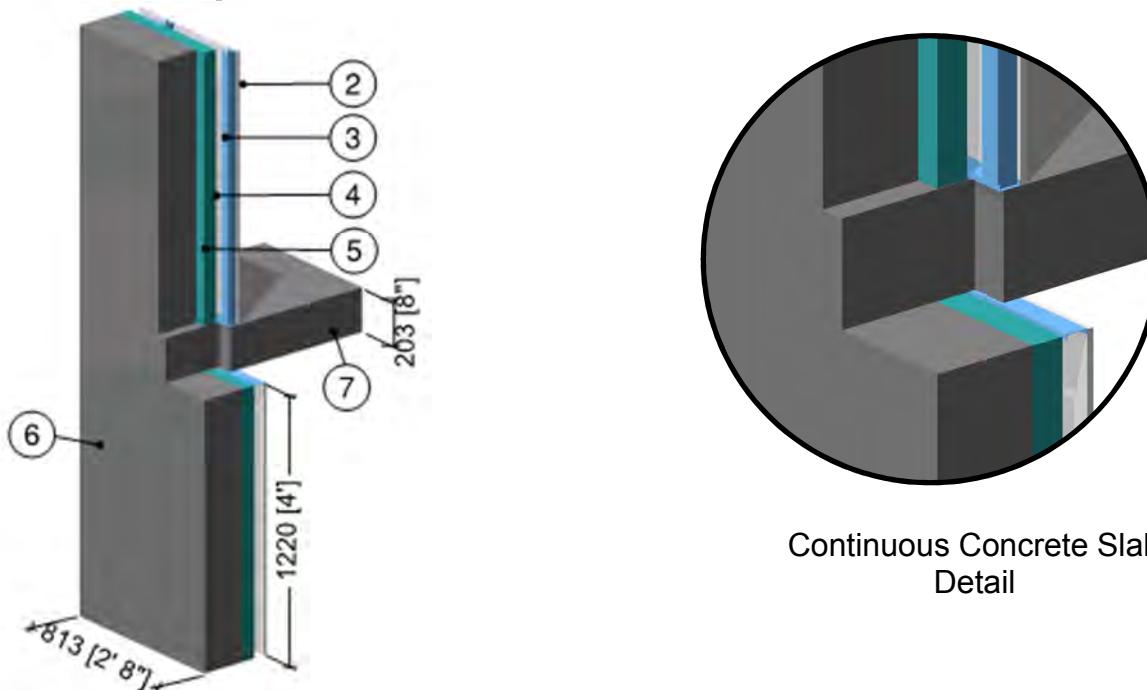
Partition Detail

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 (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	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 (1.76 RSI) to R-15 (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 6.2.5

Interior Insulated Concrete Mass Wall with 1 5/8" x 1 5/8" Steel Studs (16" o.c.) Supporting Interior Finish – Continuous Concrete Floor Slab Intersection



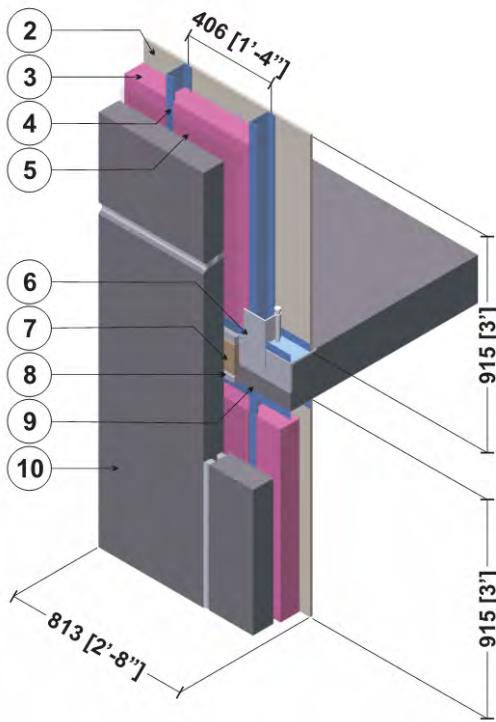
Continuous Concrete Slab Detail

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 (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	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)	0.25 (0.04)	R-10.0 (1.76 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 6.2.6

Precast Wall Assembly with 3 5/8" x 1 5/8" Steel Stud (16" o.c.) and Insulation in Stud Cavity – Slab Intersection

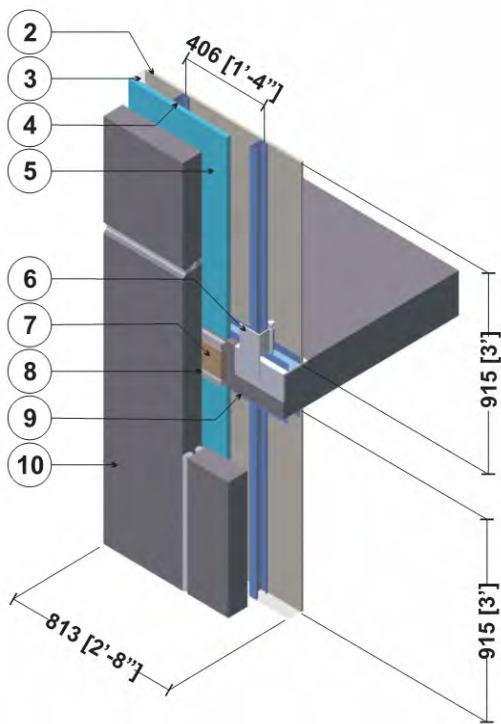


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass Batt Insulation in Stud Cavity	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 6.2.7

Precast Wall Assembly with 3 5/8" x 1 5/8" Steel Stud (16" o.c.) and Rigid Insulation Outboard of Studs – Slab Intersection

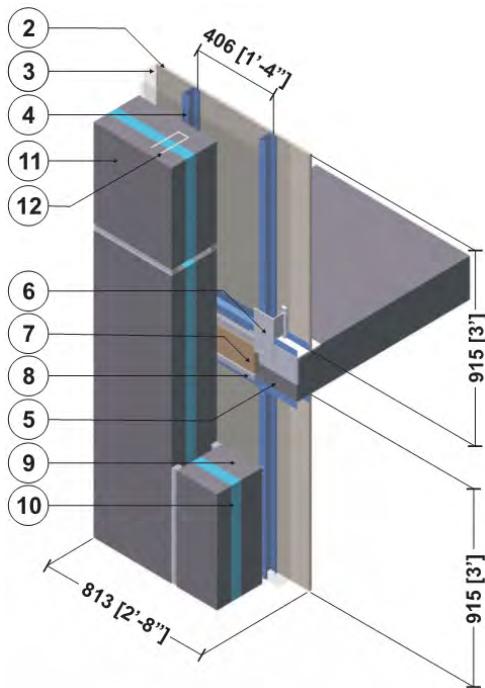


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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)	-	-

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

Detail 6.2.8

Precast Sandwich Panel Wall Assembly with 3 5/8" x 1 5/8" Steel Stud (16" o.c.) – Slab Intersection

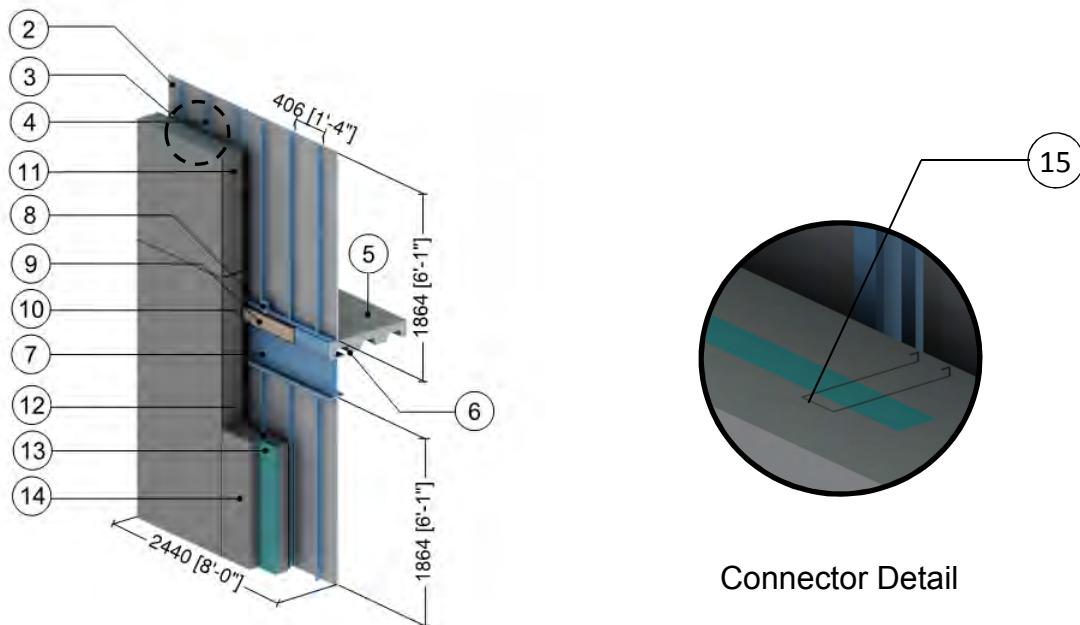


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 6.2.9

Precast Sandwich Panel Wall Assembly with Concrete at Panel Perimeter and Steel Connectors at 24" o.c. – Slab Intersection



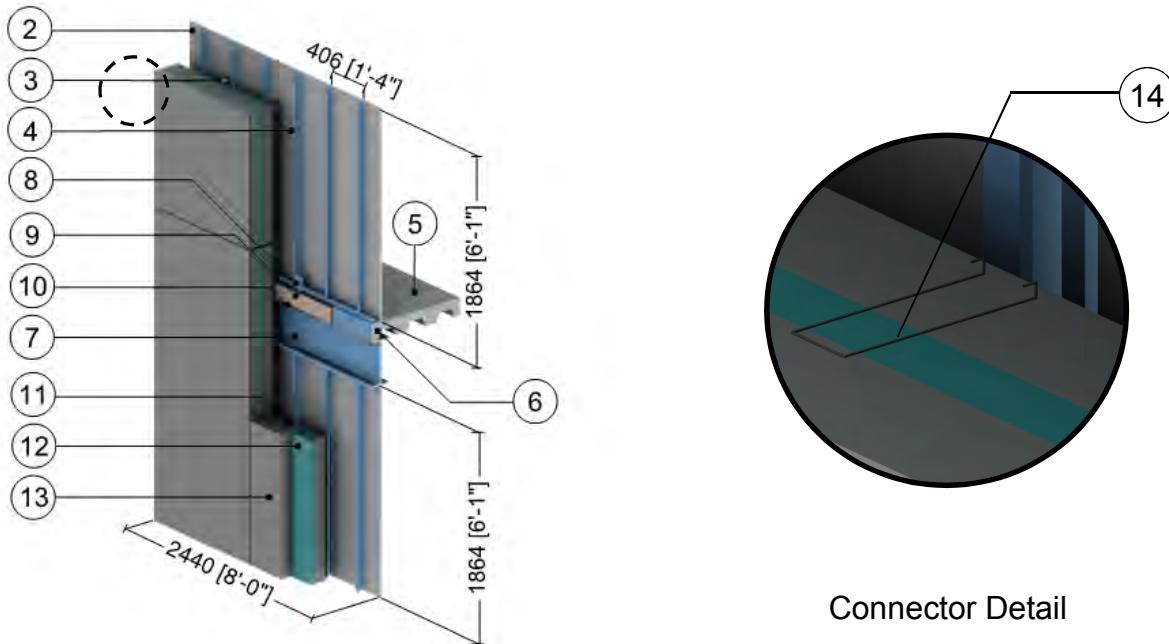
Connector Detail

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 (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	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 6.2.10

Precast Sandwich Panel Wall Assembly with Steel Connectors at 16" o.c. – Slab Intersection



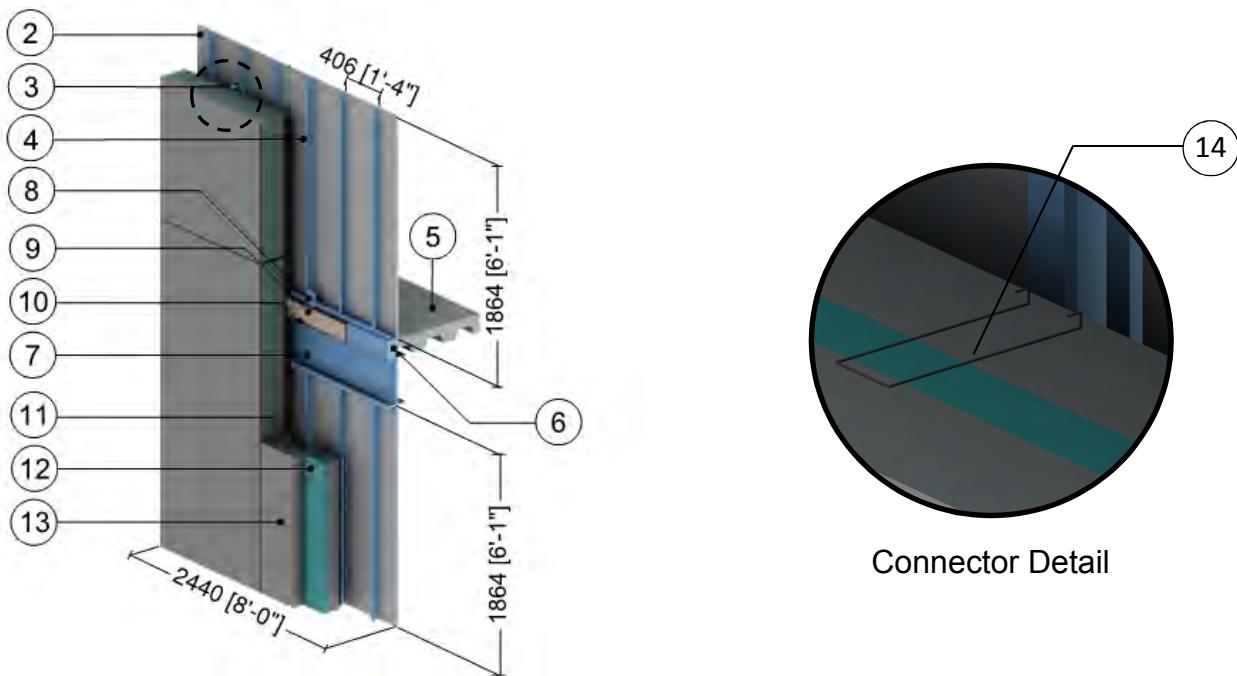
Connector Detail

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 (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	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 6.2.11

Precast Sandwich Panel Wall Assembly with Steel Connectors at 36" o.c. – Slab Intersection



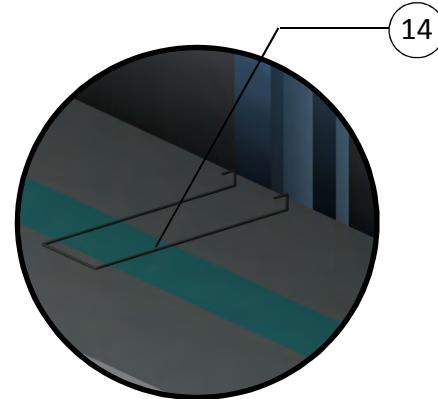
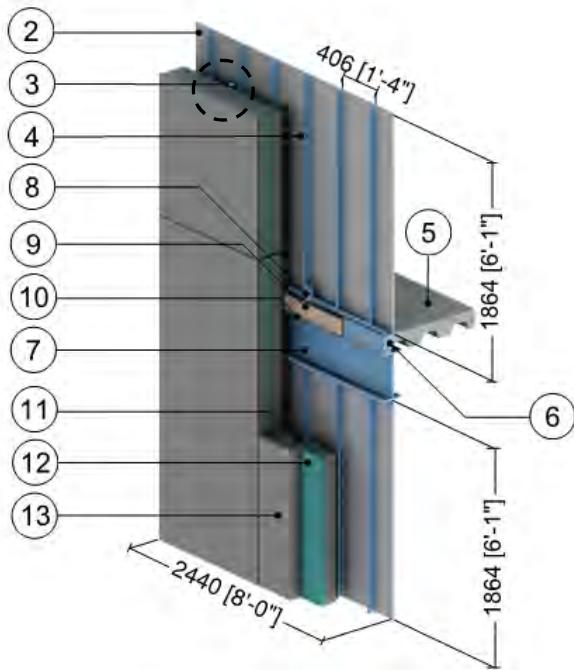
Connector Detail

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 (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	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 6.2.12

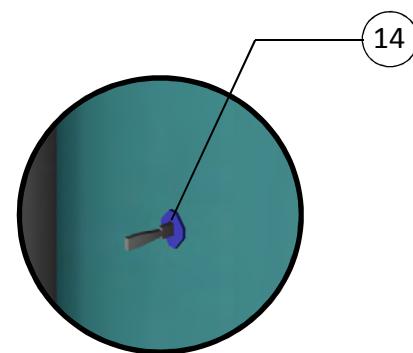
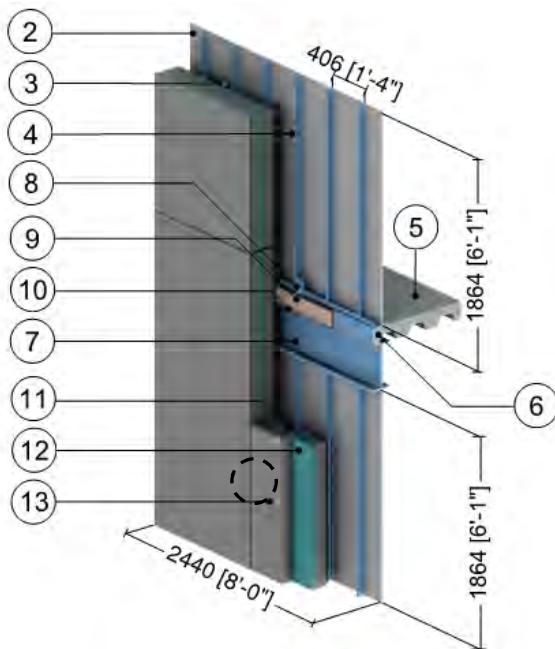
Precast Sandwich Panel Wall Assembly with Steel Connectors at 48" o.c. – Slab Intersection



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 (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	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 6.2.13**Precast Sandwich Panel Wall Assembly with Fiber-Reinforced Composite Connections at 16" o.c. – Slab Intersection**

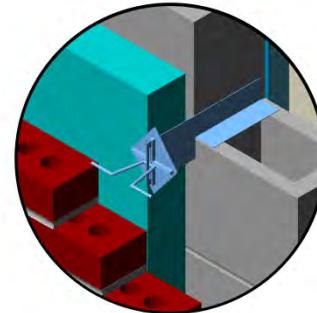
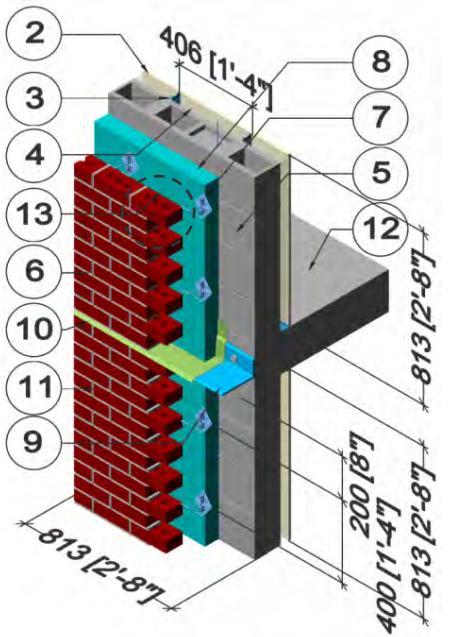
Connector Detail

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 (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	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 6.2.14

Exterior Insulated Concrete Block Wall Assembly with Shelf Angle & Brick Ties Supporting Brick Veneer – Slab Intersection



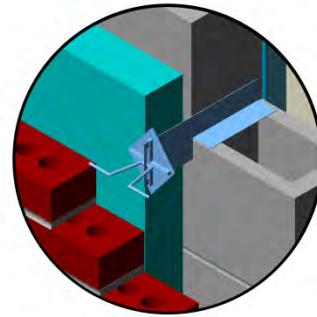
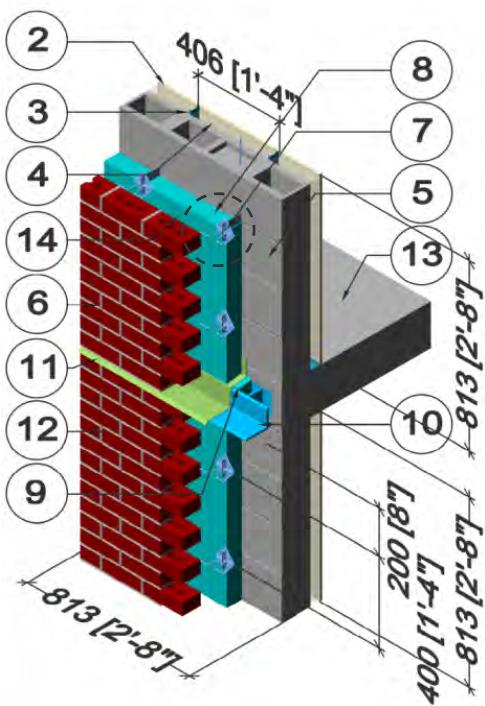
Brick Tie Detail

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 (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	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	Insulation	Varies	-	R-5 (0.88 RSI) to R-25 (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 6.2.15

Exterior Insulated Concrete Block Wall Assembly with Spaced Shelf Angle & Brick Veneer – Slab Intersection



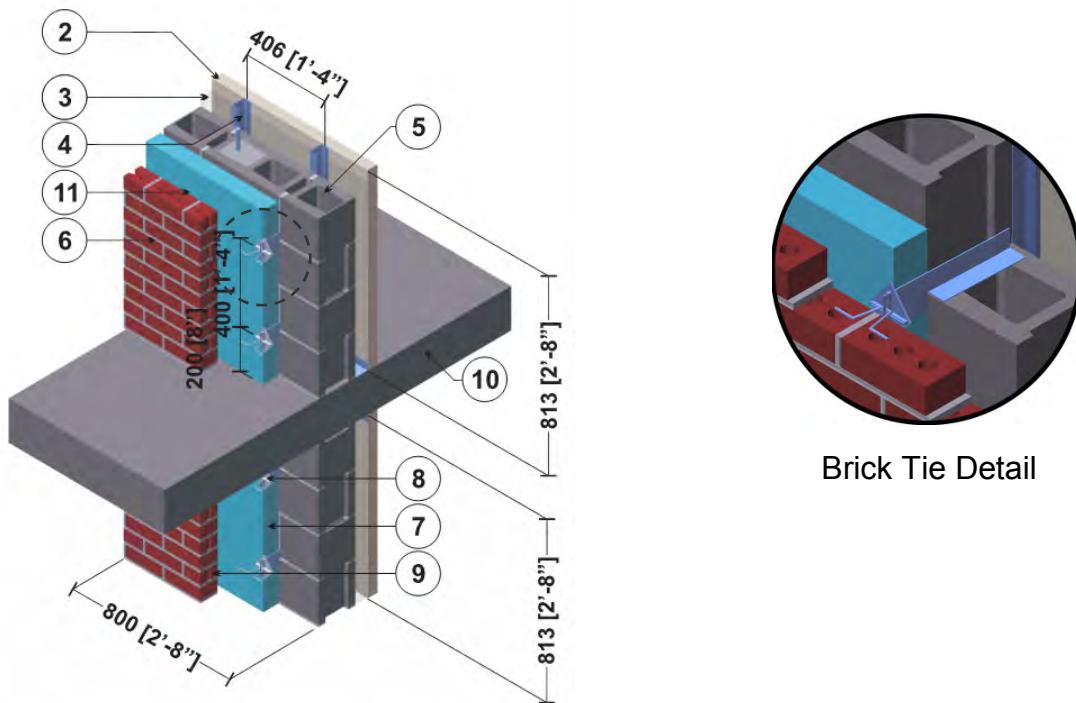
Brick Tie Detail

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 (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	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	Insulation	Varies	-	R-5 (0.88 RSI) to R-25 (4.4 RSI)	1.8 (28)	0.29 (1220)
9	Insulation Behind Shelf Angle	Varies	-	R-5 (0.88 RSI) to R-25 (4.4 RSI)	1.8 (28)	0.29 (1220)
10	Spaced 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 6.2.16

Exterior Insulated Concrete Block Wall Assembly with Masonry Ties Supporting Brick Veneer – Balcony Slab Intersection



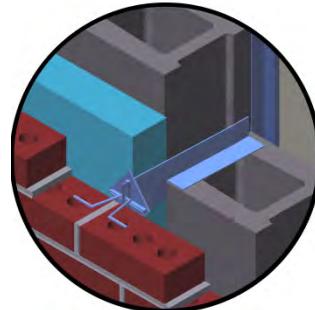
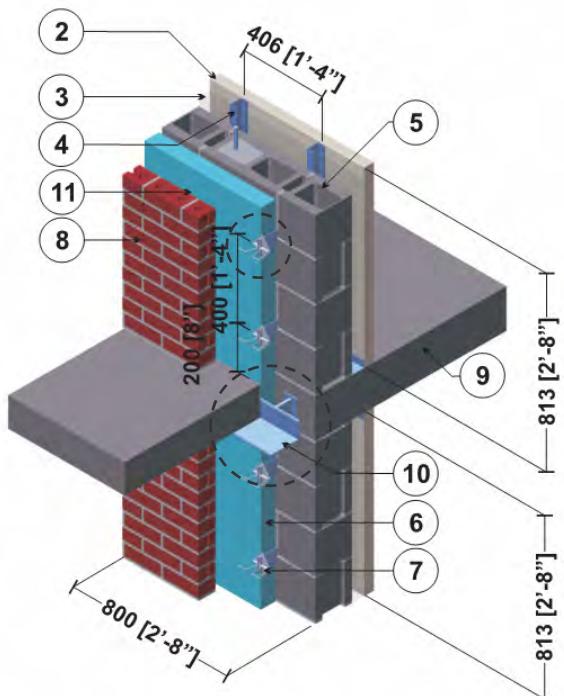
Brick Tie Detail

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 (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	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 (0.88 RSI) to R-25 (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)	-	-

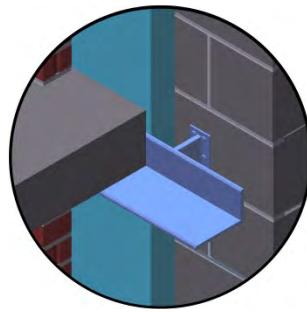
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 6.2.17

Exterior Insulated Concrete Block Wall Assembly with Masonry Ties Supporting Brick Veneer – Angle Supported Slab & Slab Intersection



Brick Tie Detail



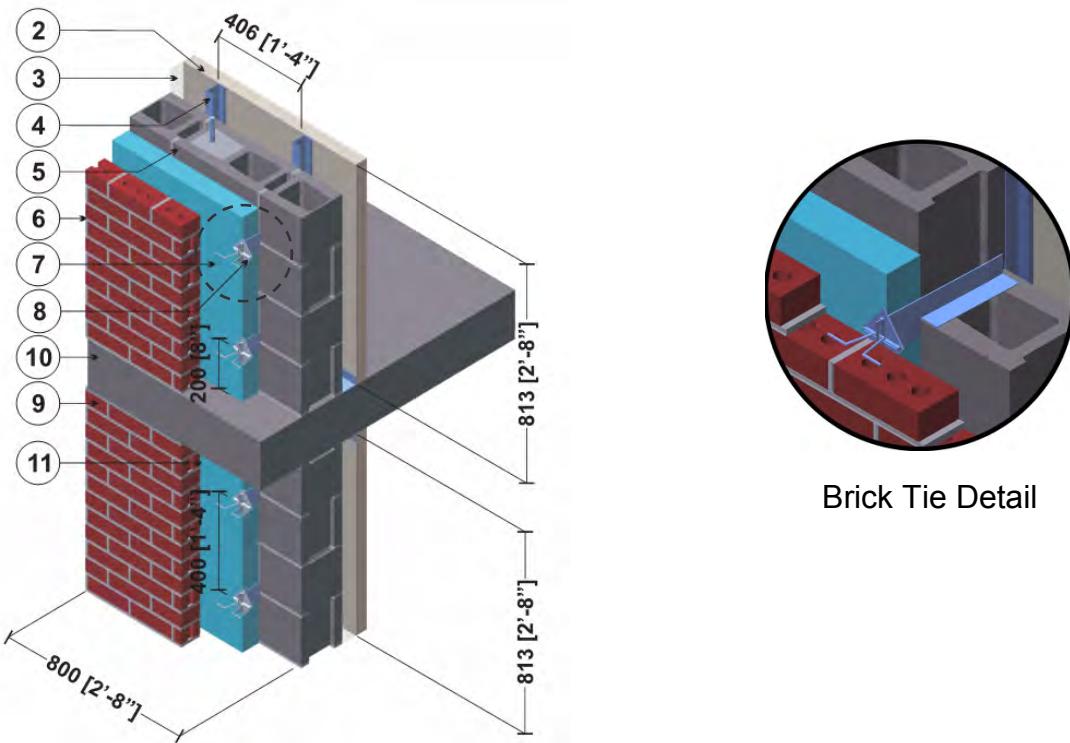
Shelf Angle Detail

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 (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	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	Insulation	Varies	-	R-5 (0.88 RSI) to R-25 (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 6.2.18

Exterior Insulated Concrete Block Wall Assembly with Masonry Ties Supporting Brick Veneer – Balcony Slab Intersection



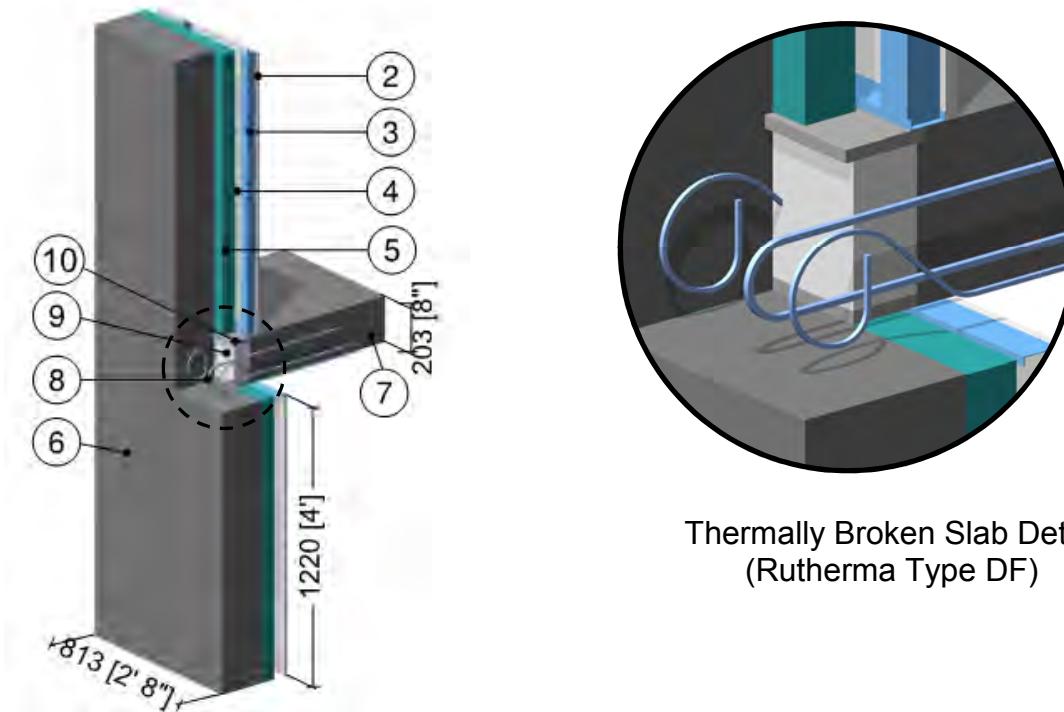
Brick Tie Detail

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 (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	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 (0.88 RSI) to R-25 (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 6.2.19

Interior Insulated Concrete Mass Wall with 1 5/8" x 1 5/8" Steel Studs (16" o.c.) Supporting Interior Finish – Thermally Broken Concrete Floor Slab Intersection



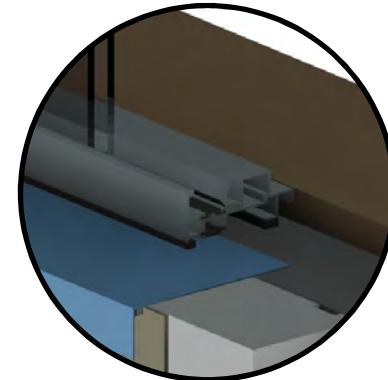
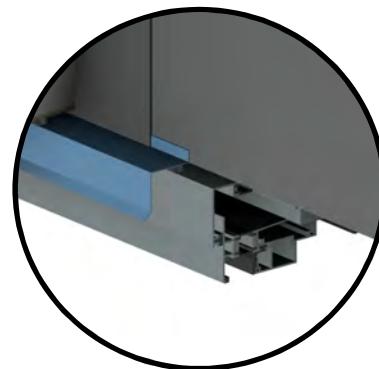
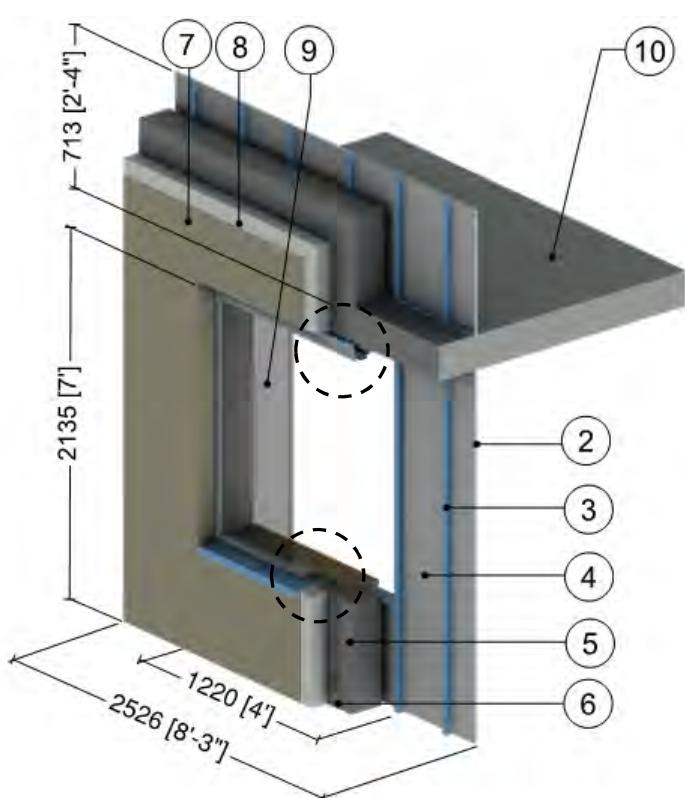
Thermally Broken Slab Detail
(Rutherford Type DF)

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 (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	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)	0.03 (0.2)	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)	-	500 (8000)	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 6.3.1

Exterior Insulated Concrete Drained EIFS Wall Assembly – Window and Floor Slab Intersection



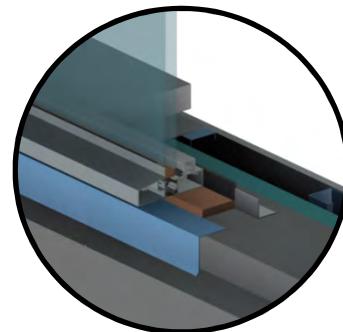
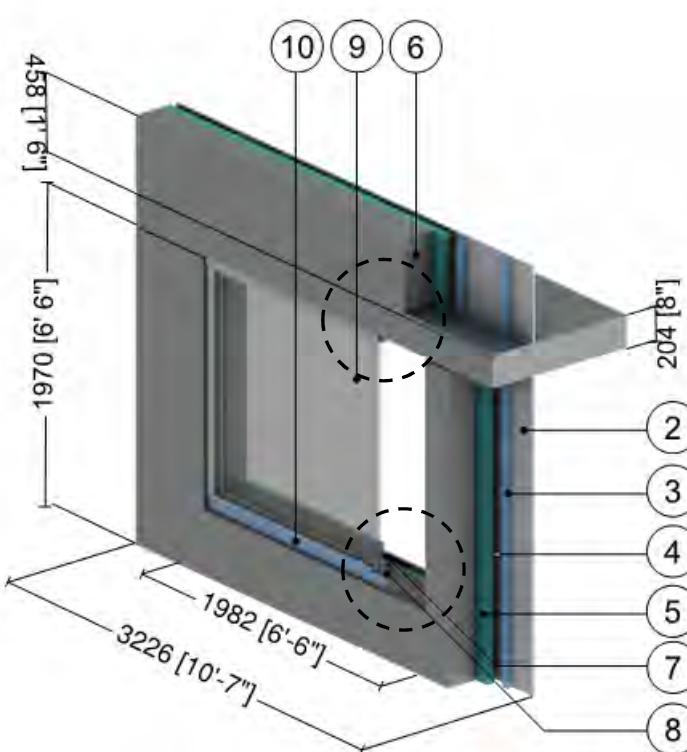
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr.ft}^2\text{.}^\circ\text{F}$ $(1.82 \text{ W/m}^2\text{K})^2$					
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 6.3.2

Interior Insulated Concrete Mass Wall with 1 5/8" x 1 5/8" Steel Studs (16" o.c.) Supporting Interior Finish – Window & Slab Intersection



Window Sill Detail



Window Head Detail

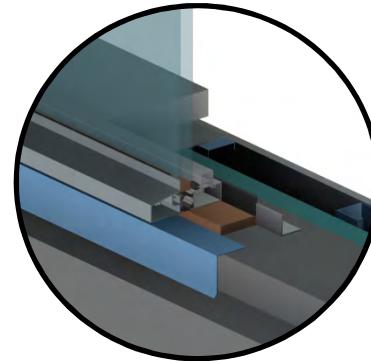
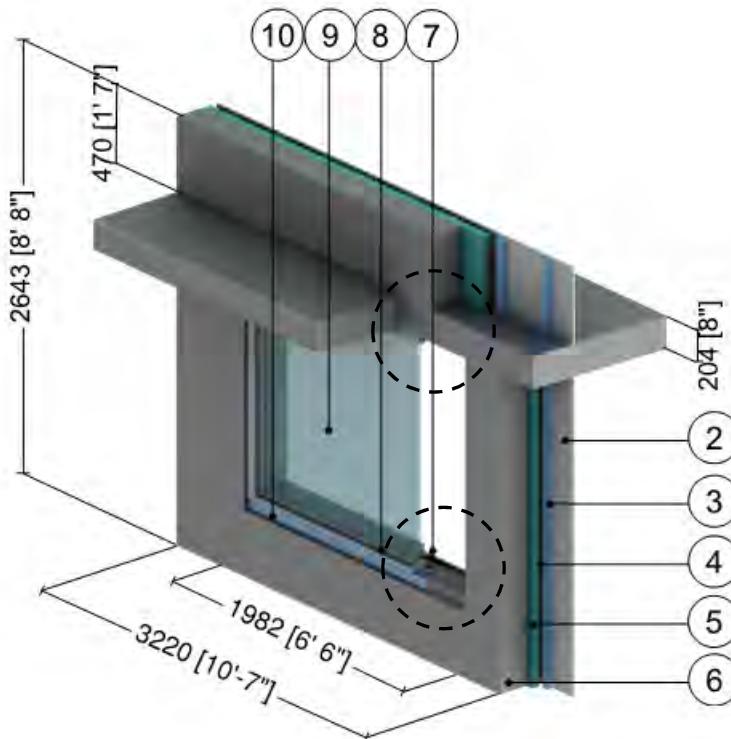
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (1.76 RSI) to R-15 (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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr.ft}^2\cdot\text{°F}$ $(1.82 \text{ W/m}^2\text{K})^2$					
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 6.3.3

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



Window Sill Detail



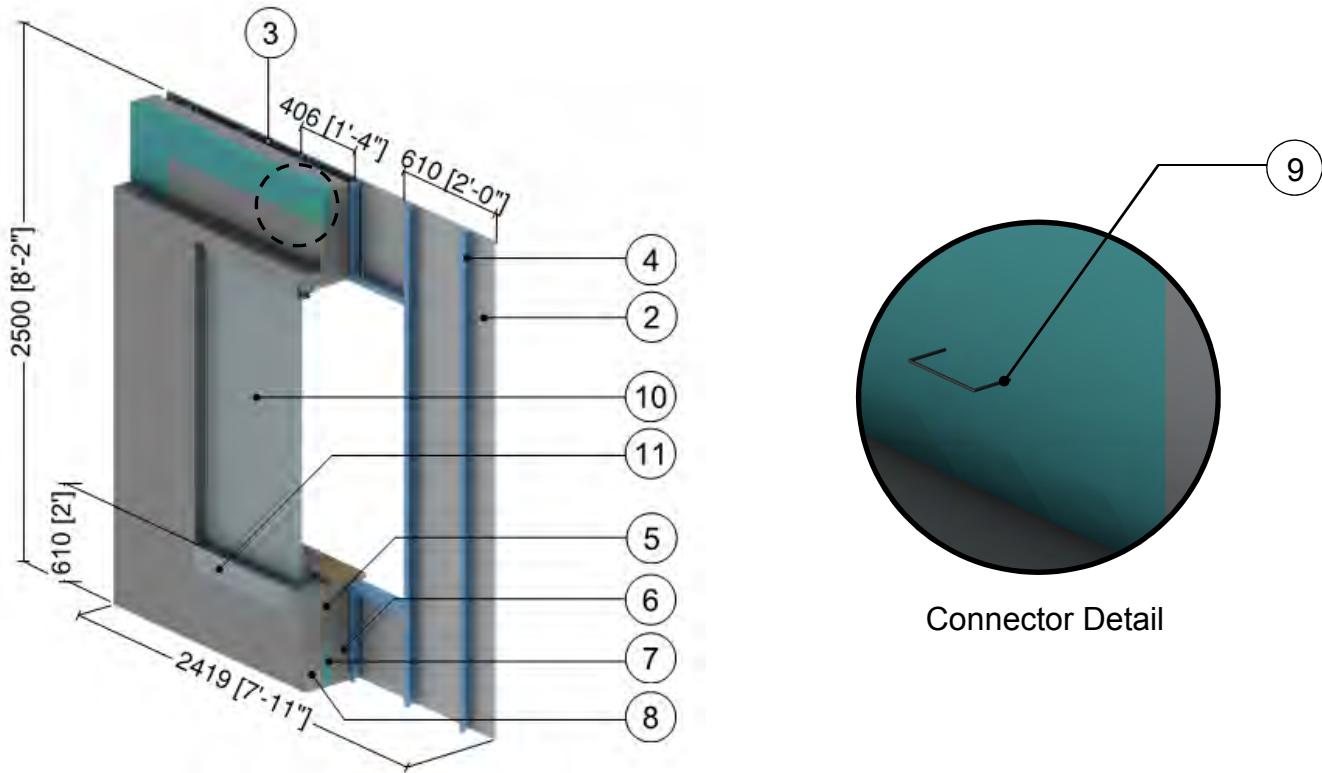
Window Head Detail

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-0.6 (0.11 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	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 (1.76 RSI) to R-15 (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	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, double glazed IGU U _{IGU} = 0.32 BTU/hr.ft ² .°F (1.82 W/m ² K) ²					
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 orientation² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 6.3.4

Precast Sandwich Panel Wall Assembly with Concrete at Panel Perimeter and Steel Connectors at 24" (o.c.) – Window Intersection



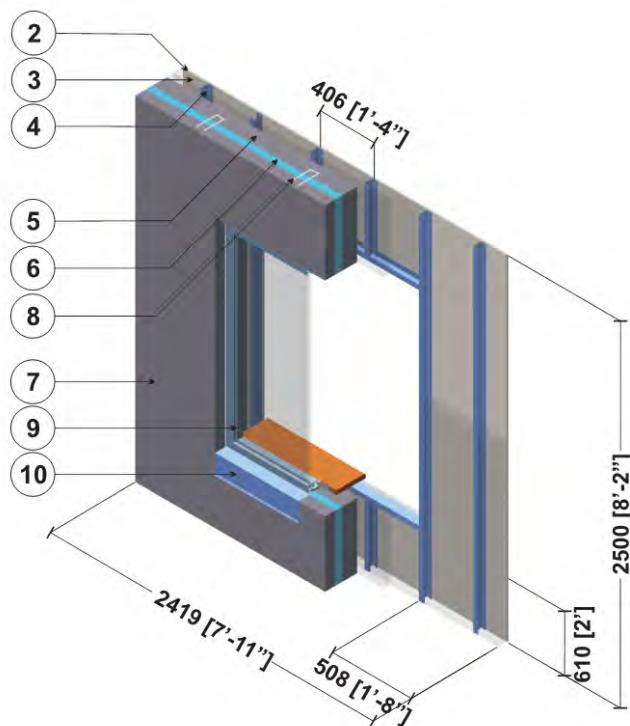
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	3 5/8" (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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr.ft}^2\text{.}^\circ\text{F}$ $(1.82 \text{ W/m}^2\text{K})^2$					
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 6.3.5

Precast Sandwich Panel Wall Assembly with 3 5/8" Steel Stud (16" o.c.) – Window Intersection



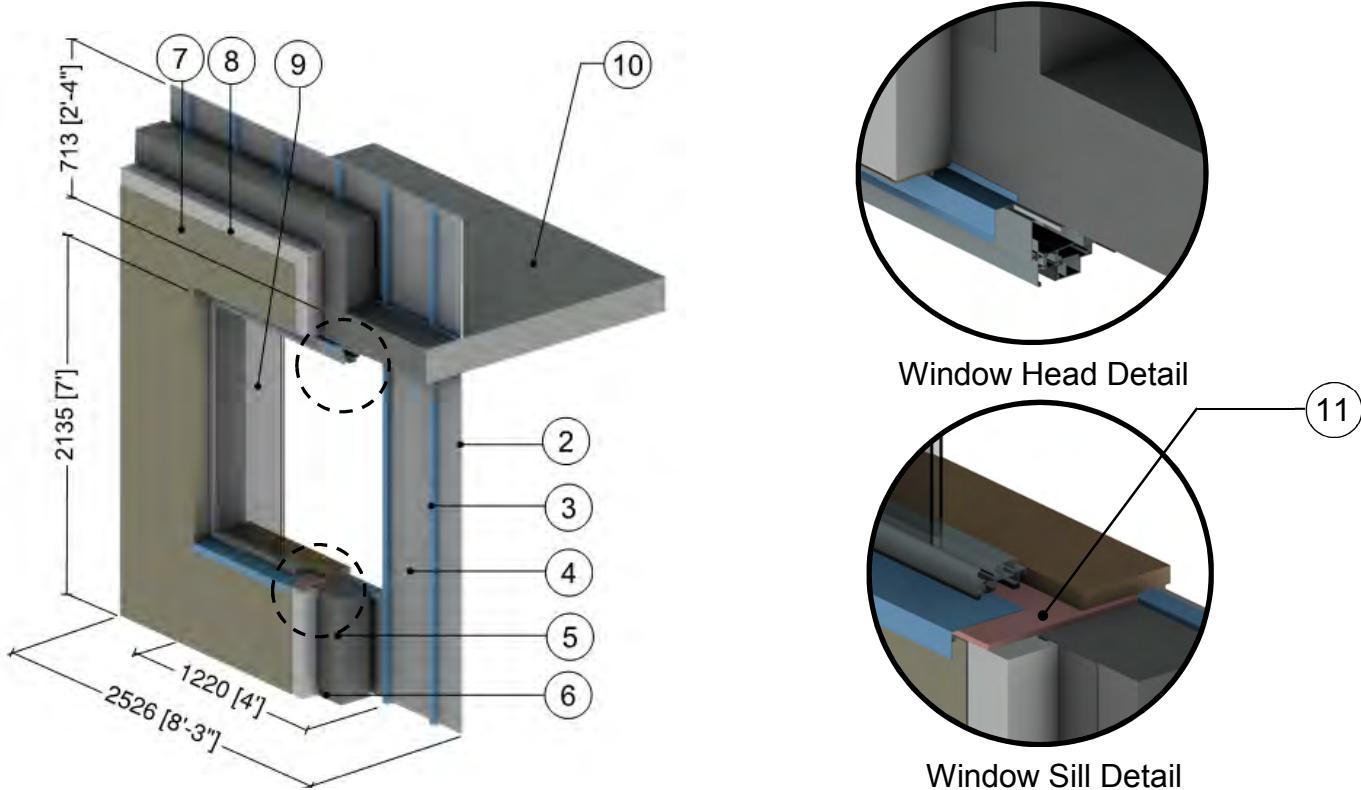
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air in Stud Cavity	6 5/8" (168)	-	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	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, 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	Flashing/ finish material is incorporated into exterior heat transfer coefficient					
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 for air spaces within window framing was found using ISO 10077-2.

Detail 6.3.6

Exterior Insulated Concrete Drained EIFS Wall Assembly – Window with Aerogel and Floor Slab Intersection



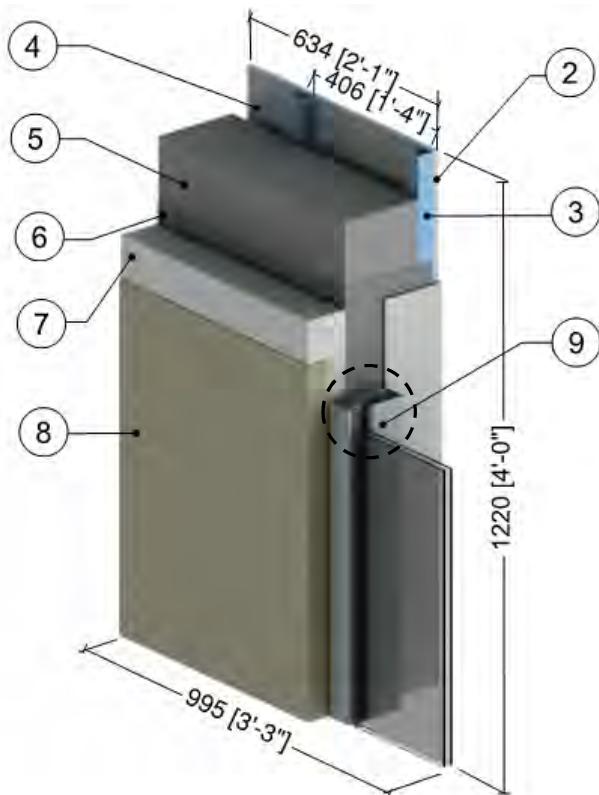
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr.ft}^2\text{.}^{\circ}\text{F}$ $(1.82 \text{ W/m}^2\text{K})^2$					
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 6.4.1

Exterior Insulated Concrete Drained EIFS Wall Assembly – Conventional Curtain Wall Transition



Curtain Wall Jamb Detail

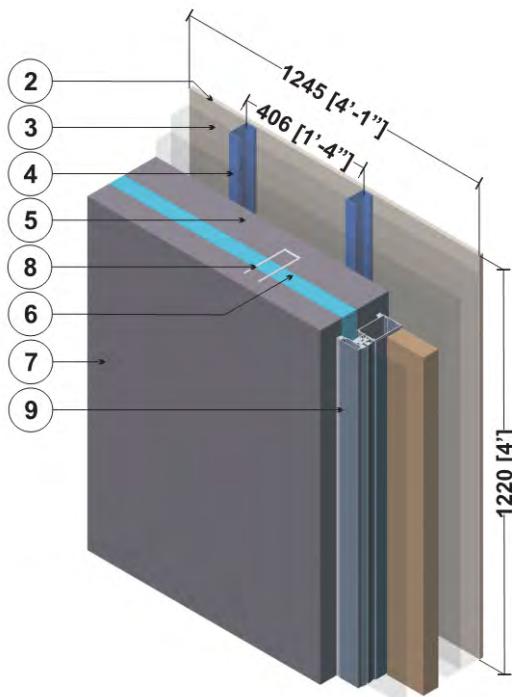
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI) to R-1.1 (0.20 RSI)	-	-
2	Gypsum Board	1/2" (30)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr ft}^2 \text{ F}$ $(1.82 \text{ W/m}^2 \text{ K})$ 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 framing was found using ISO 100077-2

Detail 6.4.2

Precast Sandwich Panel Wall Assembly with 3 5/8" Steel Stud (16" o.c.) – Curtain Wall Transition



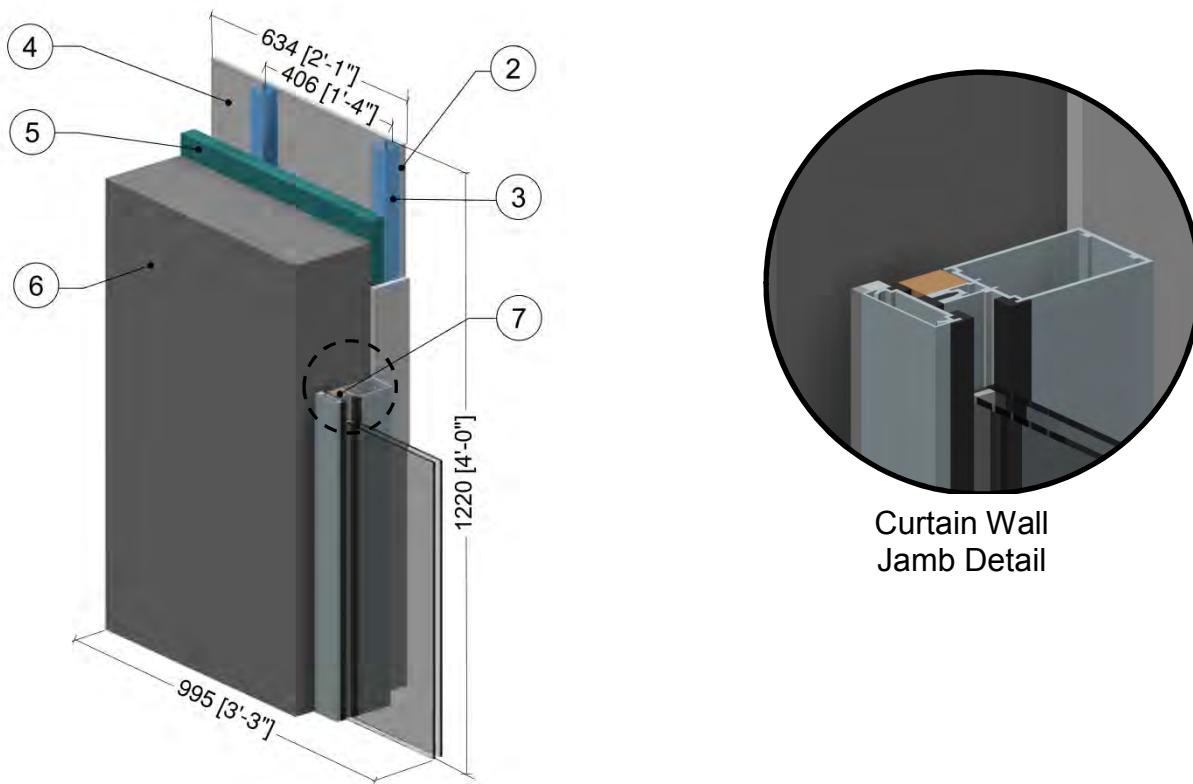
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Air 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 6.4.3

Interior Insulated Concrete Mass Wall – Conventional Curtain Wall Transition



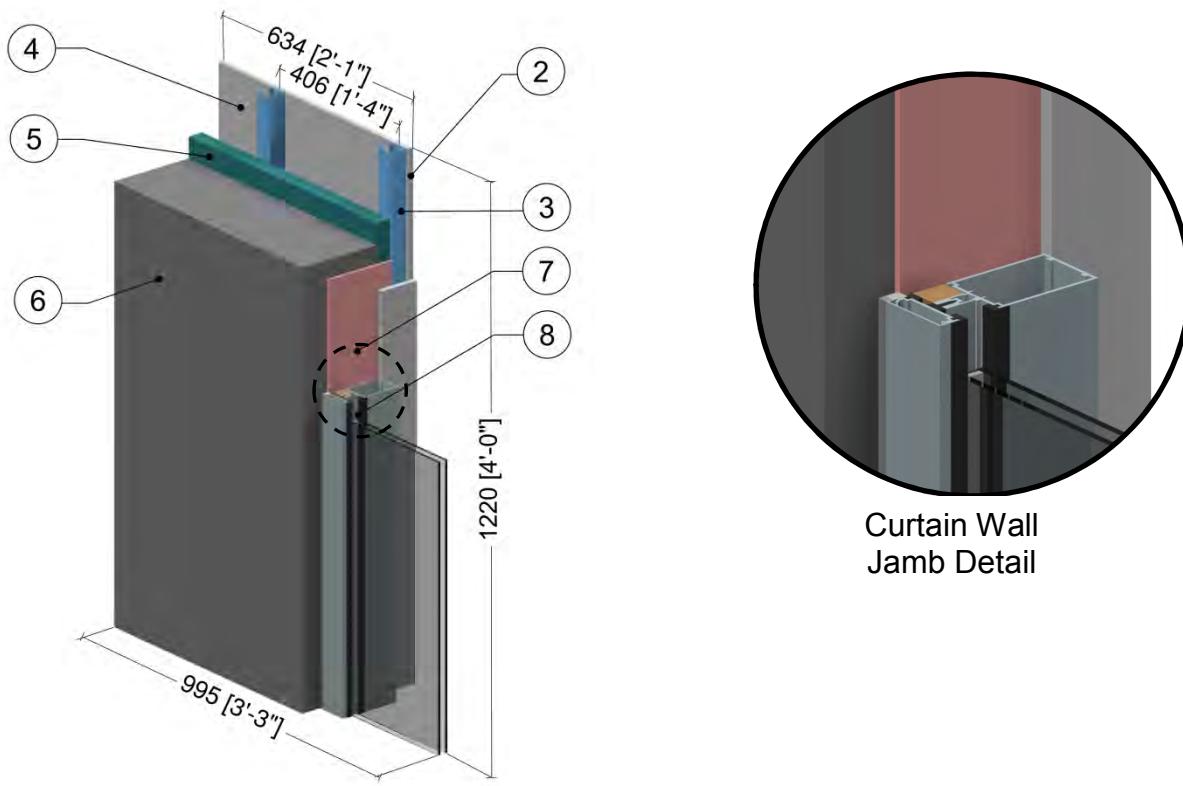
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI) to R-1.1 (0.20 RSI)	-	-
2	Gypsum Board	1/2" (30)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	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, double glazed IGU	$U_{IGU} = 0.32 \text{ BTU/hr ft}^2\text{F}$ $(1.82 \text{ W/m}^2\text{K})^2$				
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 6.4.4

Interior Insulated Concrete Mass Wall – Thermally Broken Curtain Wall Transition



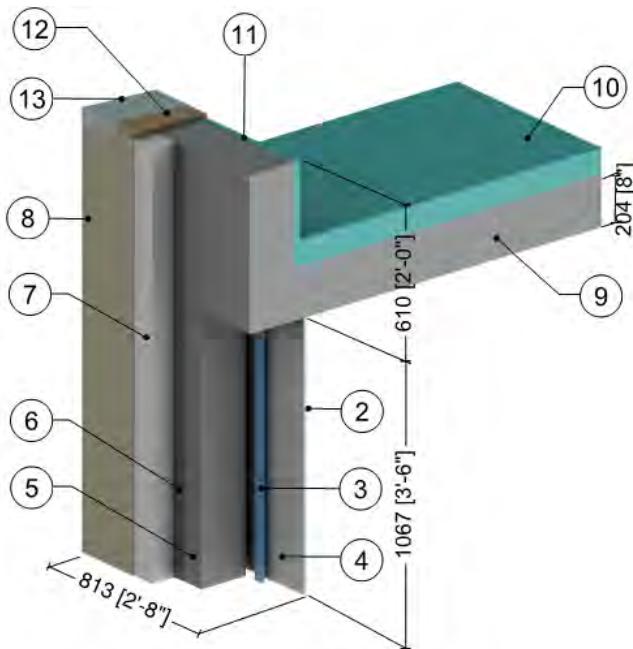
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI) to R-1.1 (0.20 RSI)	-	-
2	Gypsum Board	1/2" (30)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	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, 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 6.5.1

Exterior Insulated Concrete Drained EIFS Wall Assembly – Concrete Parapet & Slab Intersection

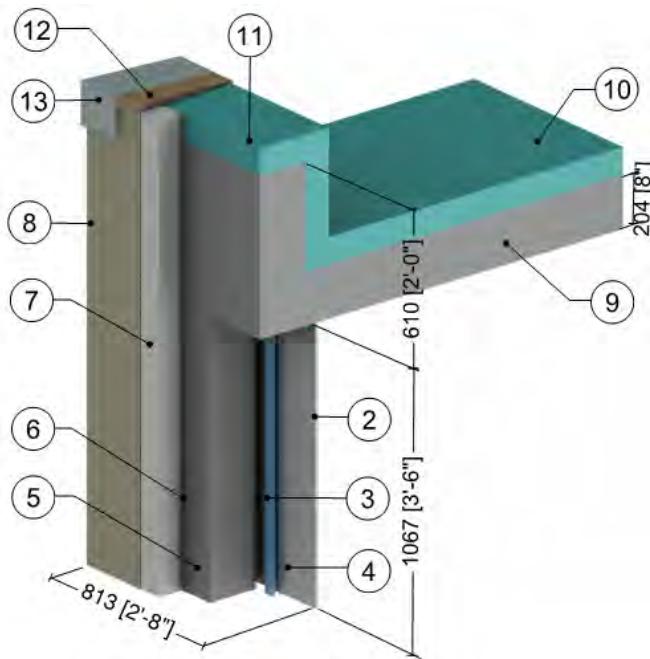


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI) to R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (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 6.5.2

Exterior Insulated Concrete Drained EIFS Wall Assembly – Insulated Concrete Parapet & Slab Intersection

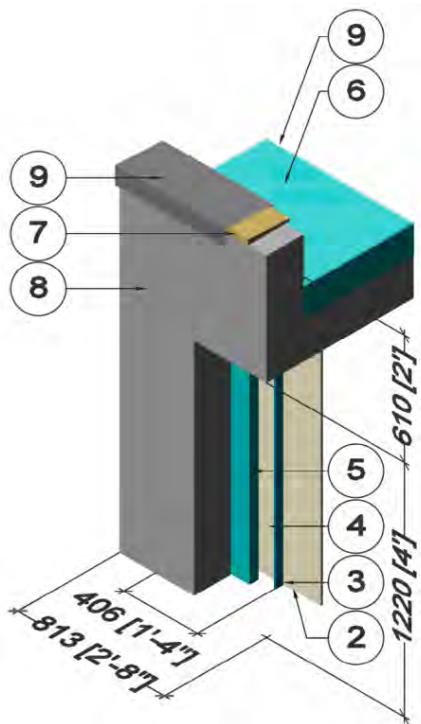


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI) to R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (1.76 RSI) to R-20 (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 (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 6.5.3

Interior Insulated Concrete Mass Wall with 1 5/8" Steel Stud (16" o.c.) Supporting Interior Finish – Concrete Parapet & Roof Intersection

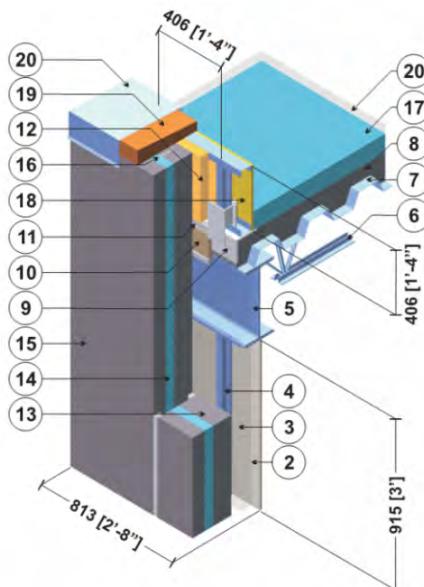


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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)	0.18 (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 6.5.4

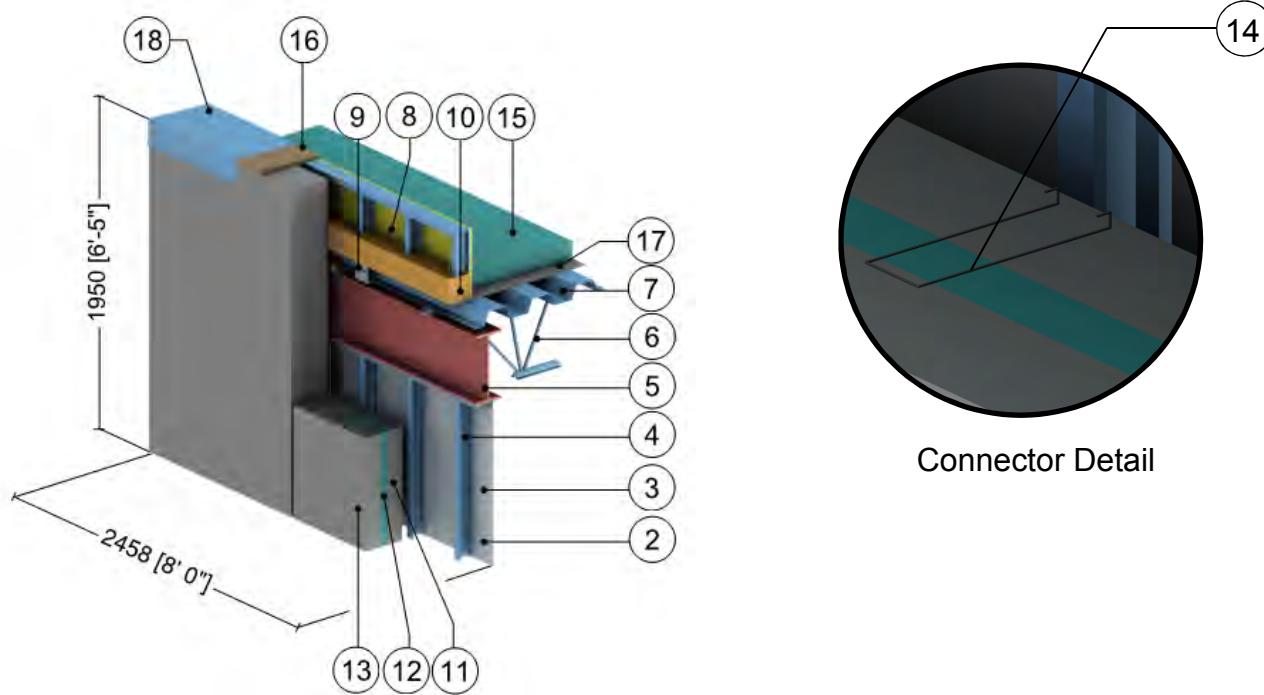
Precast Sandwich Panel Wall Assembly with 3 5/8" Steel Stud (16" o.c.) – Steel Roof Deck with Open Web Steel Joist & Parapet Intersection



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 (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	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 6.5.5 | Precast Sandwich Panel – Steel Roof Deck with Open Web Steel Joist & Parapet Intersection



Connector Detail

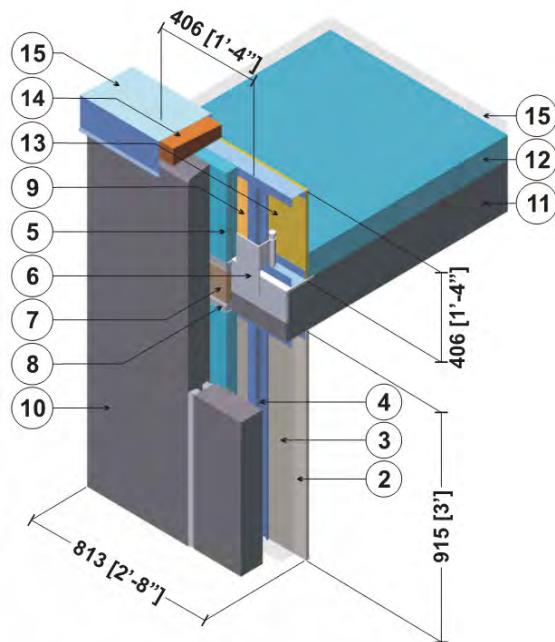
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 6.5.6

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

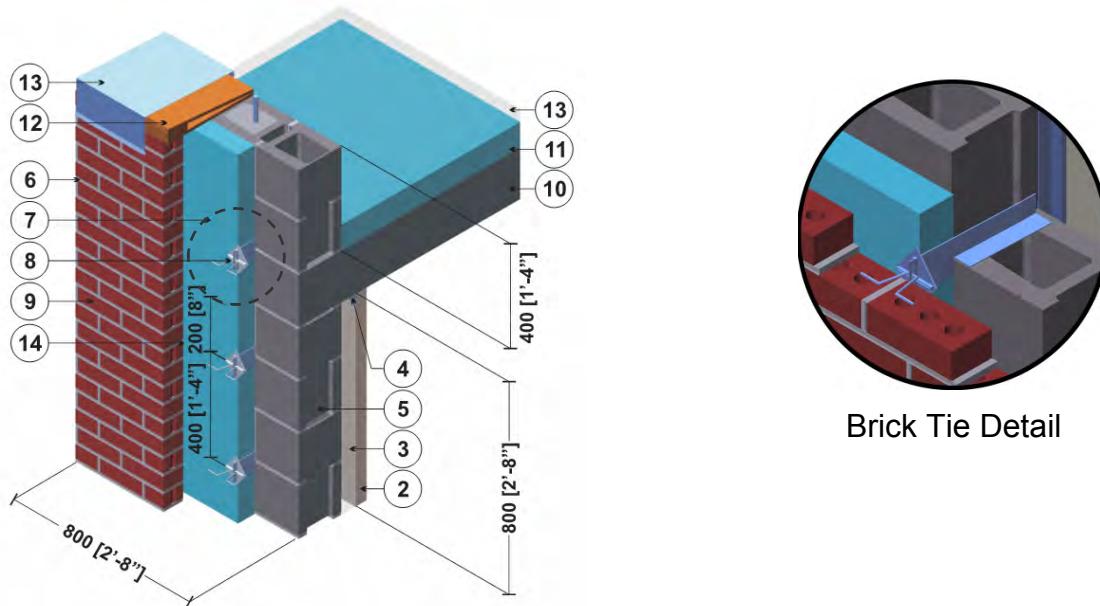


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 in Stud Cavity	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 6.5.7

Exterior Insulated Concrete Block Wall Assembly with Masonry Ties Supporting Brick Veneer – Parapet & Roof Intersection



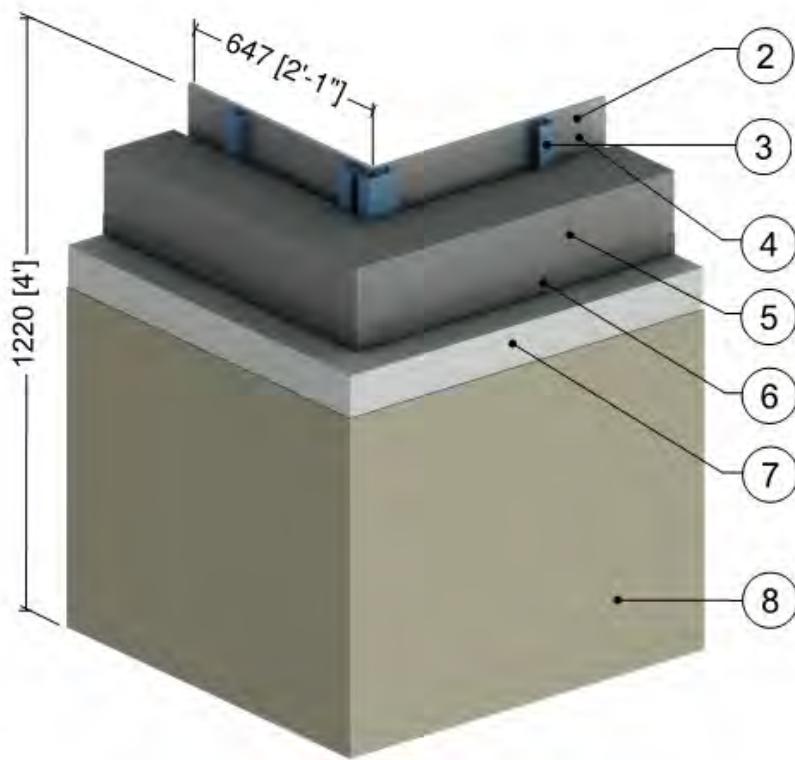
Brick Tie Detail

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 (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	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 (0.88 RSI) to R-25 (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 6.6.1

Exterior Insulated Concrete Drained EIFS Wall Assembly – Corner Intersection

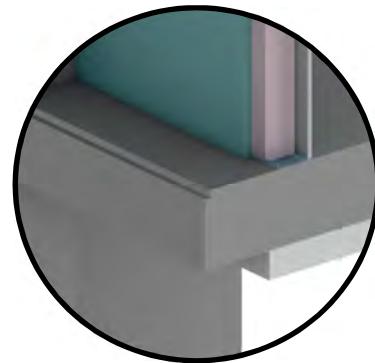
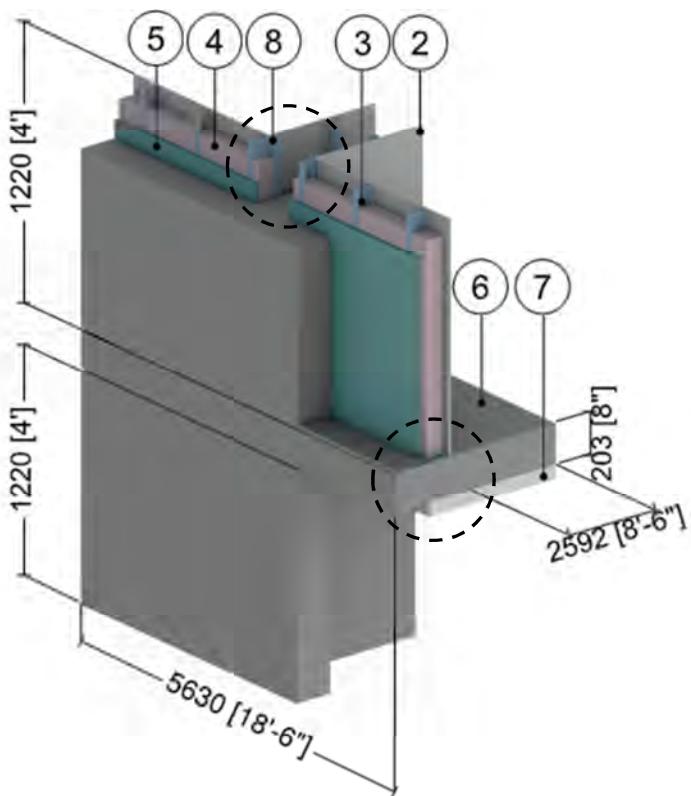


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	1 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)	-	-

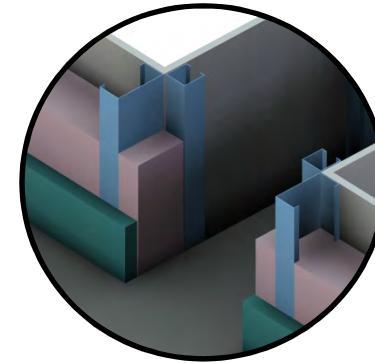
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 6.7.1

**Interior Insulated Concrete Mass Wall with 3 5/8" x 1 5/8" Steel Studs
(16" o.c.) Supporting Interior Finish – Floor Slab above Parking Garage**



Slab Edge Detail



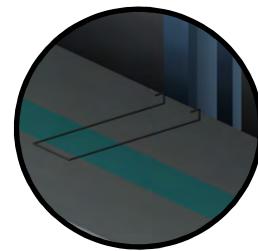
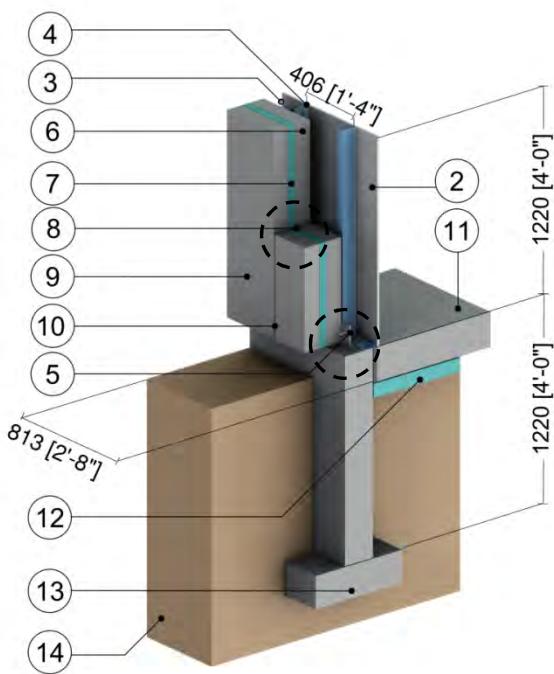
Partition Detail

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 (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 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 (1.76 RSI) to R-15 (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)	-	-

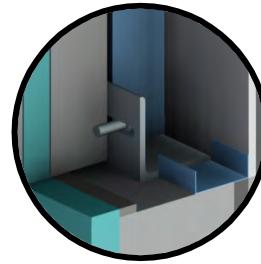
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 6.7.2

Precast Sandwich Wall Assembly Slab and Foundation Intersection



Connector Detail



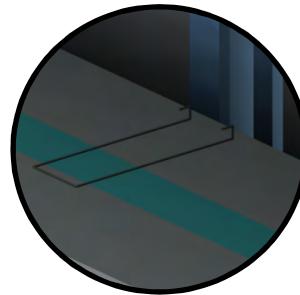
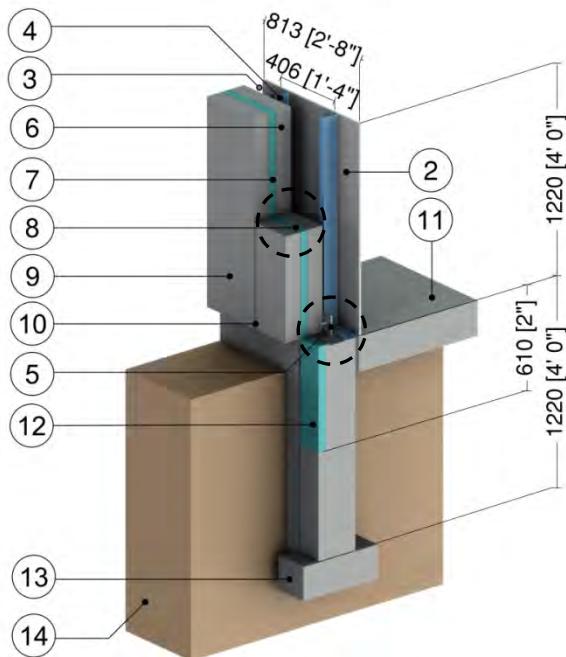
Gravity and Slot Anchor Detail

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 (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	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 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)	-	-

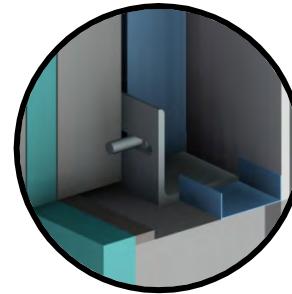
¹Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 6.7.3

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 (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	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

7.0 Wood Frame Construction

Detail 7.1.1 **A.7.1**

Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board – Clear Wall

Detail 7.1.2 **A.7.2**

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board – Clear Wall

Detail 7.1.3 **A.7.3**

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Continuous Rigid Insulation Supporting Fiber Cement Board – Clear Wall

Detail 7.1.4 **A.7.4**

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Horizontal Metal Z-Girts (24" o.c.) Supporting Fiber Cement Board – Clear Wall

Detail 7.1.5 **A.7.5**

Exterior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Knight MFI-System (24" o.c.) Supporting Cladding – Clear Wall

Detail 7.1.6 **A.7.6**

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Knight MFI-System (24" o.c.) Supporting Cladding – Clear Wall

Detail 7.1.7 **A.7.7**

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 7.2.1 **A.7.8**

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board - Rim Joist and Floor Intersection with Metal Flashing Bypassing Exterior Insulation

Detail 7.2.2 **A.7.9**

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board - Rim Joist and Floor Intersection without Metal Flashing Bypassing Exterior Insulation

Detail 7.2.3 **A.7.10**

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board - Cantilevered Wood Joist Balcony Intersection

Detail 7.2.4 **A.7.11**

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board – Independently Supported Balcony Intersection

Detail 7.2.5 **A.7.12**

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Fiber Cement Board – Cantilevered Floor Intersection

Detail 7.3.1 **A.7.13**

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 7.3.2 **A.7.14**

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 7.4.1 **A.7.15**

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board – Vented Low-slope Roof & Parapet Intersection

Detail 7.4.2 **A.7.16**

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Fiber Cement Board – Sloped Wood Framed Roof & Wall Intersection with Insulation at Ceiling

Detail 7.4.3 **A.7.17**

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board – Sloped Wood Framed Roof & Wall Intersection with Insulation at Roof Sheathing

Detail 7.4.4 **A.7.18**

Ventilated Wood Frame Low Slope Roof - Masonry Firewall Intersection

Detail 7.5.1 **A.7.19**

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting and Continuous Insulation Fiber Cement Board – Corner Intersection

Detail 7.6.1 **A.7.20**

Wood-frame Sliding Door – Concrete Floor Intersection for Unheated Spaces (Parking Garages)

Detail 7.6.2 **A.7.21**

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Continuous Insulation and Wood Strapping Supporting Fiber Cement Board – Rim Joist and Interior Insulated At-Grade Foundation Wall Intersection

Detail 7.6.3 **A.7.22**

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Continuous Insulation and Wood Strapping Supporting Fiber Cement Board – Rim Joist and Exterior Insulated At-Grade Foundation Wall Intersection

Detail 7.6.4 **A.7.23**

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Shelf Angle & Brick Ties Supporting Brick Veneer – Exterior Insulated At-Grade Foundation Wall Intersection

Detail 7.7.1 **A.7.24**

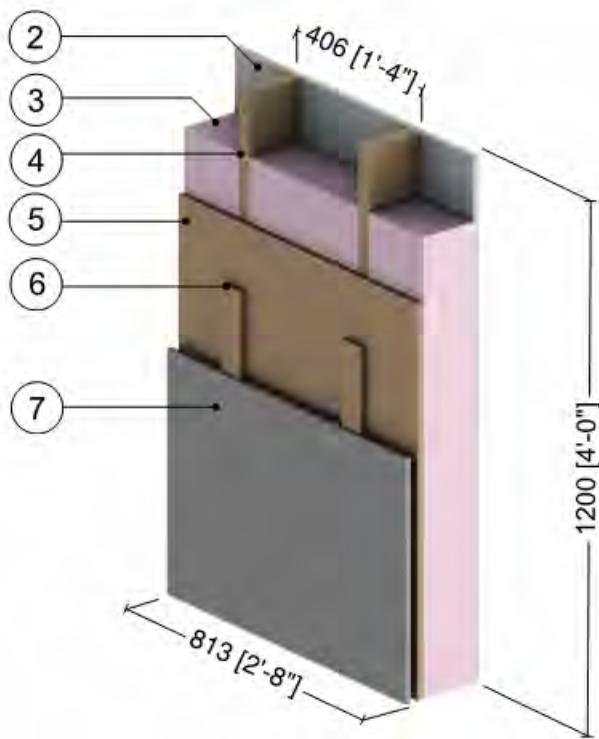
Exterior Insulated Wood Infill Wall Assembly with Wood Strapping and Continuous Insulation Supporting Fiber Cement Board – Concrete Wall and Floor Intersection with Flashing Bypassing Exterior Insulation

Detail 7.7.2 **A.7.25**

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 7.1.1

Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board – Clear Wall

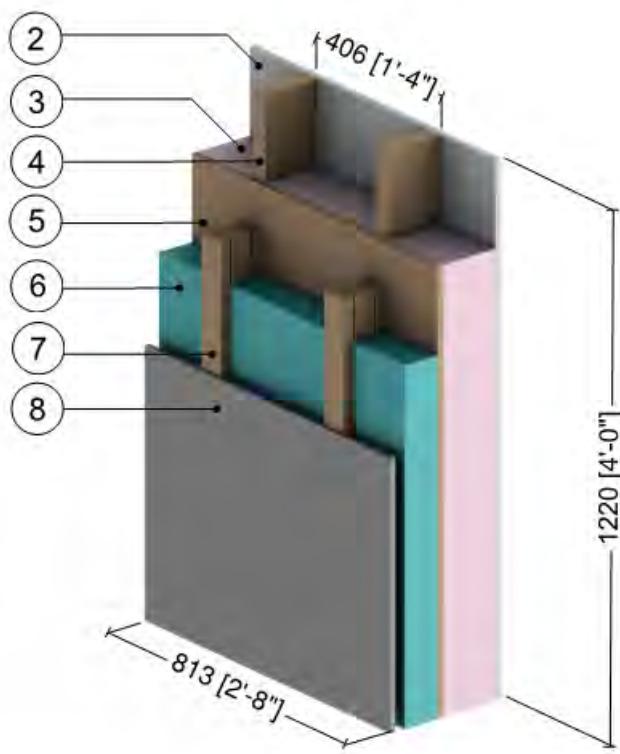


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	Fiberglass 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 7.1.2

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board – Clear Wall

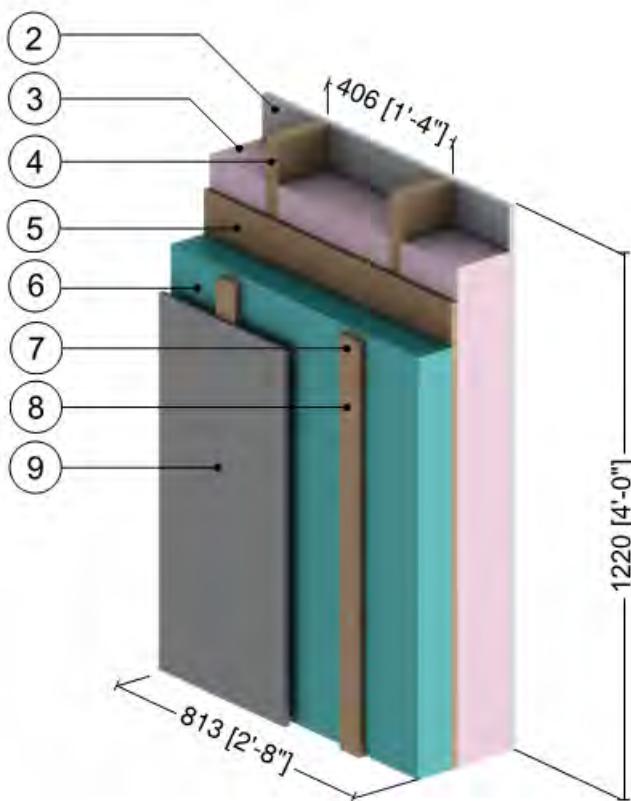


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	5/8" (16)	1.1 (0.16)	R-0.6 (0.10 RSI)	50 (800)	0.26 (1090)
3	Fiberglass 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 (0.88 RSI) to R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
7	1x3 Wood Strapping	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 7.1.3

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Continuous Rigid Insulation Supporting Fiber Cement Board – Clear Wall

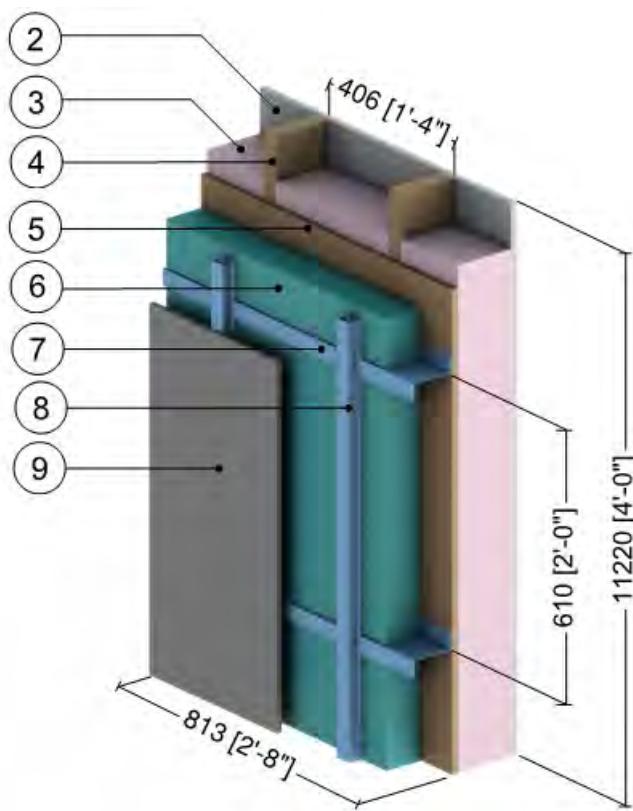


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	Fiberglass 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 (0.88 RSI) to R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
7	Wood Strapping (1" x 3")	1 1/2" (38.1)	0.69 (0.10)	-	31 (500)	0.45 (1880)
8	Fasteners (No. 14 screws) @ 16" (406) 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	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 and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Horizontal Metal Z-Girts (24" o.c.) Supporting Fiber Cement Board – Clear Wall

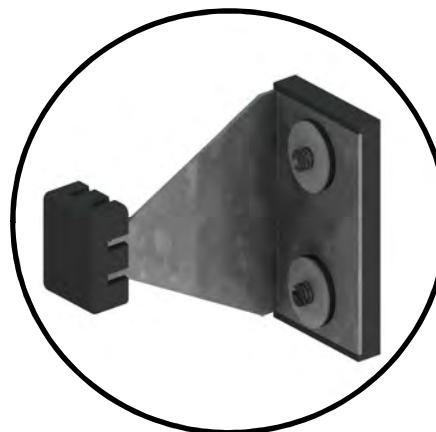
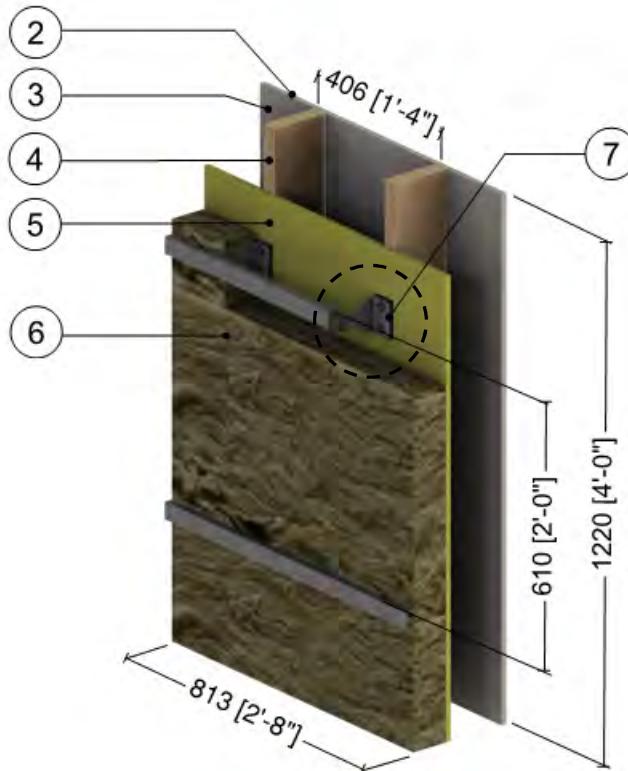


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film (right side) ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (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 (0.88 RSI) to R-15 (2.64 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 7.1.5

Exterior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Knight MFI-System (24" o.c.) Supporting Cladding – Clear Wall



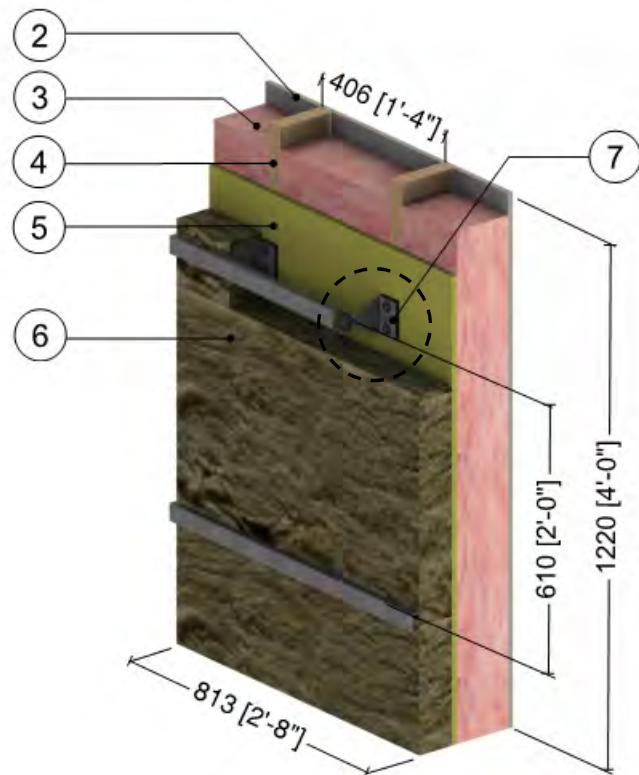
ThermaBracket Detail

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 (1.48 RSI) to R-25.2 (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 7.1.6

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Knight MFI-System (24" o.c.) Supporting Cladding – Clear Wall



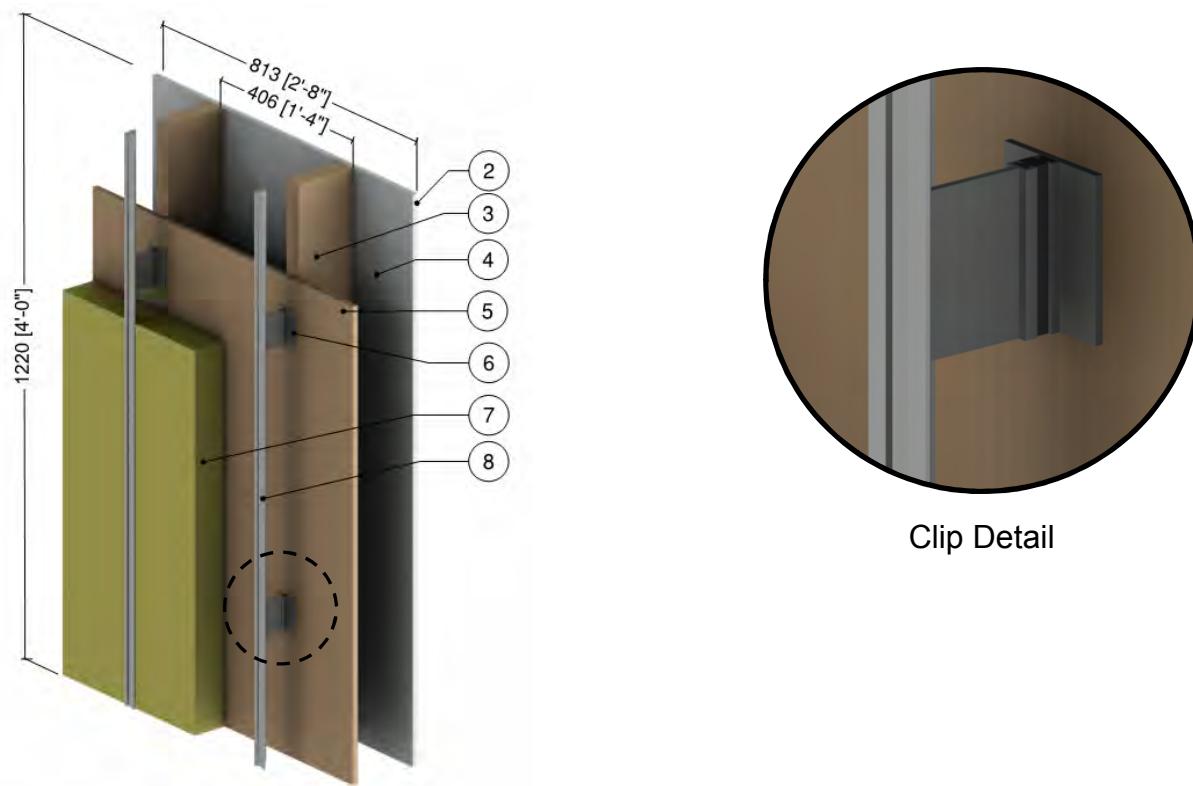
ThermaBracket Detail

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	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 (1.48 RSI) to R-25.2 (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 7.1.7

Exterior Insulated 2x6 Wood Stud (16"o.c.) Wall Assembly with Thermally Broken Aluminum Clip Rail System (24" o.c.) Supporting Cladding – Clear Wall

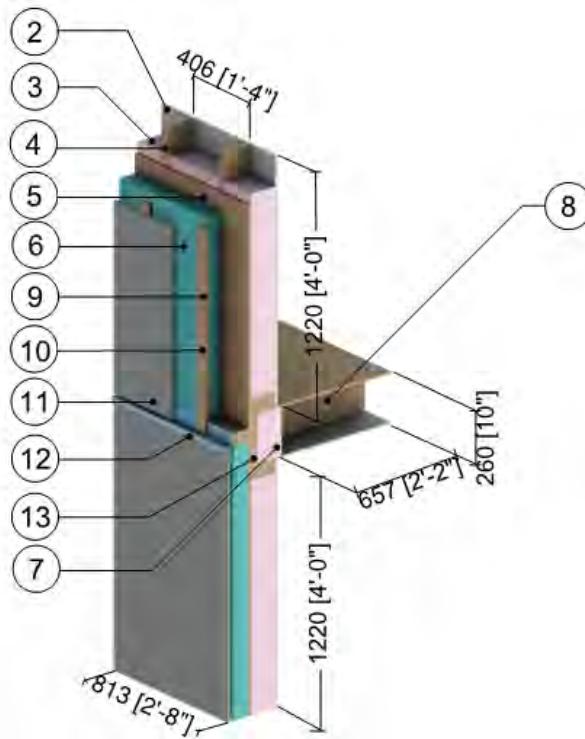


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	2x6 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" (5) to 3/8" (10)	1109 (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 7.2.1

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board - Rim Joist and Floor Intersection with Metal Flashing Bypassing Exterior Insulation

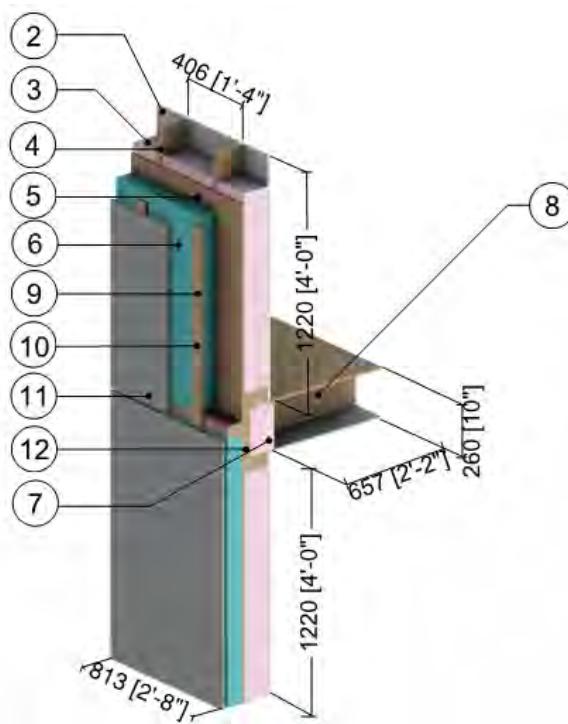


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (0.88 RSI) to R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
7	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	Fasteners (No. 14 screws) @ 16" (406) 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	Steel Flashing	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
13	2x10 Rim Board	1 1/2" (38)	0.69 (0.10)	-	31 (510)	0.45 (1880)
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 7.2.2

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board - Rim Joist and Floor Intersection without Metal Flashing Bypassing Exterior Insulation

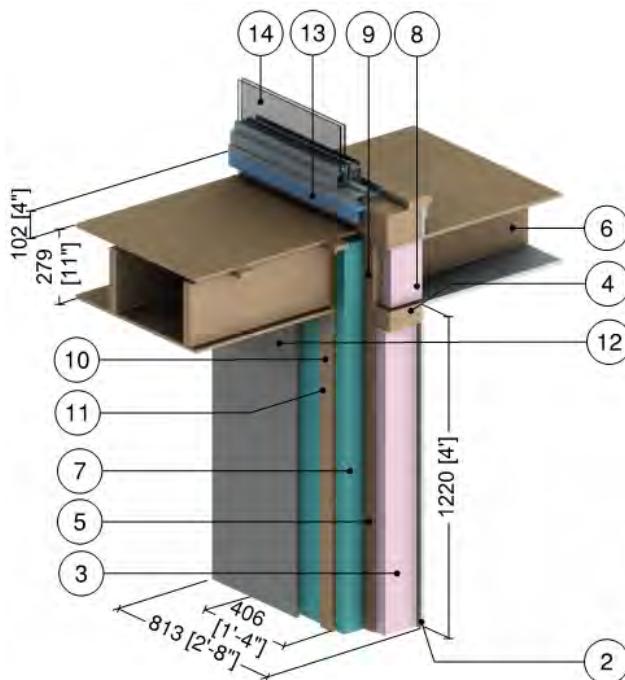


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (0.88 RSI) to R-15 (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	Fasteners (No. 14 screws) @ 16" (406) 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	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 7.2.3

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board - Cantilevered Wood Joist Balcony Intersection



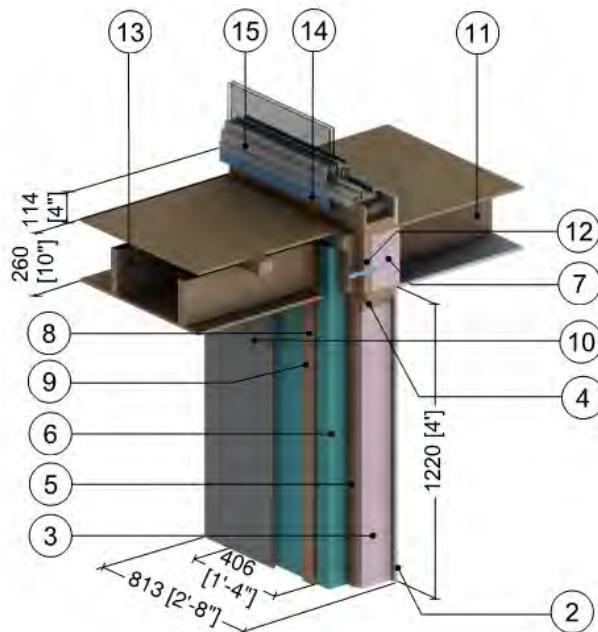
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (1.76 RSI) to R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
8	Fiberglass Batt Insulation at Joists	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	Fasteners (No. 14 screws) @ 16" (406) 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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU}/\text{hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W}/\text{m}^2\text{K}$) ²					
15	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 7.2.4

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting Fiber Cement Board – Independently Supported Balcony Intersection



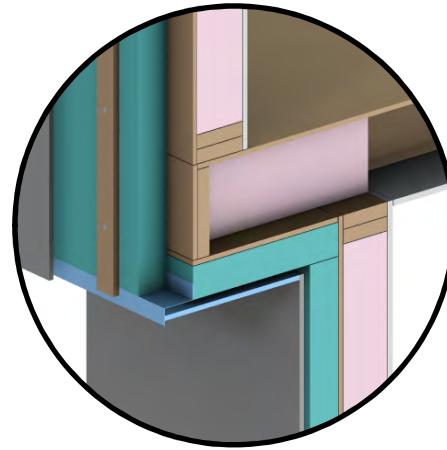
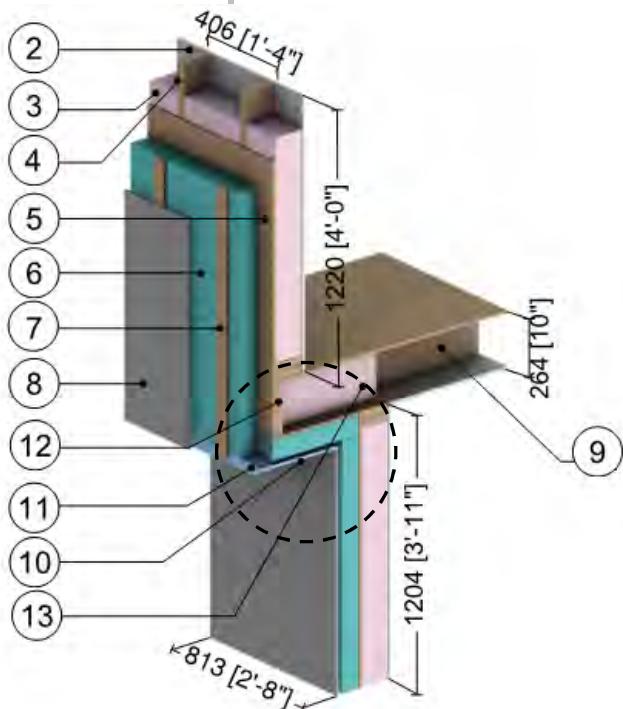
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (1.76 RSI) to R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
7	Fiberglass Batt Insulation at Joists	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	Fasteners (No. 14 screws) @ 16" (406) 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, double glazed IGU $U_{IGU} = 0.32 \text{ BTU}/\text{hr}\cdot\text{ft}^2\cdot\text{°F}$ (1.82 W/m ² K) ²					
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

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

Detail 7.2.5

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Fiber Cement Board – Cantilevered Floor Intersection



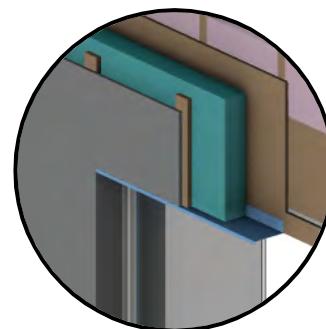
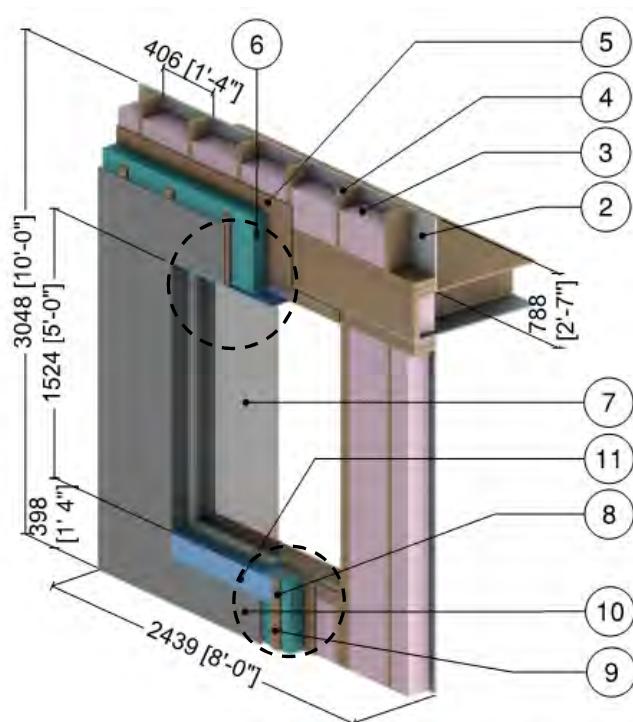
Soffit/Intersection Detail

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 (0.11 RSI) to R-0.9 (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 (1.76 RSI) to R-15 (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)	-	-

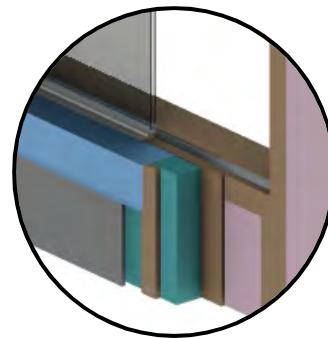
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

Detail 7.3.1

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 and Jamb Detail



Sill Detail

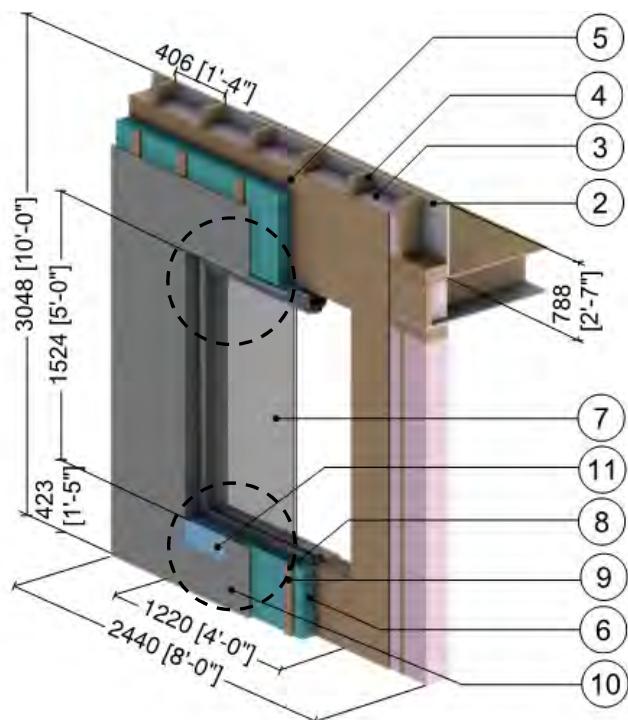
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (0.88 RSI) to R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
7	5' (1.5m) x 6' (1.8m) Vinyl window: double glazed & thermally broken, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr.ft}^2 \cdot ^\circ\text{F}$ $(1.82 \text{ W/m}^2 \text{K})^2$					
8	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Fasteners (No. 14 screws) @ 16" (406) 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 (0.03 RSI)	-	-

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

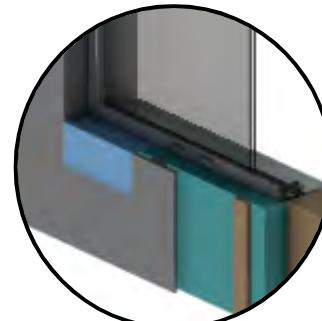
² The thermal conductivity for air spaces within window framing was found using ISO 10077-2

Detail 7.3.2

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



Jamb and Head Detail



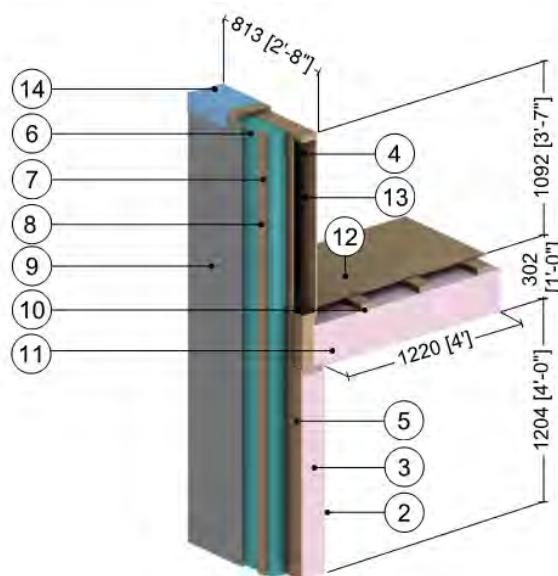
Sill Detail

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 (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	Batt Insulation in Stud Cavity	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 (0.88 RSI) to R-15 (2.64 RSI)	1.8 (28)	0.29 (1220)
7	5' (1.5m) x 6' (1.8m) Aluminum window: double glazed & thermally broken, double glazed IGU UIGU = 0.32 BTU/hr.ft ² ·°F (1.82 W/m ² K) ²					
8	1x3 Wood Strapping	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
9	Fasteners (No. 14 screws) @ 16" (406) 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 (0.03 RSI)	-	-

¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation² The thermal conductivity for air spaces within window framing was found using ISO 10077-2

Detail 7.4.1

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board – Vented Low-slope Roof & Parapet Intersection

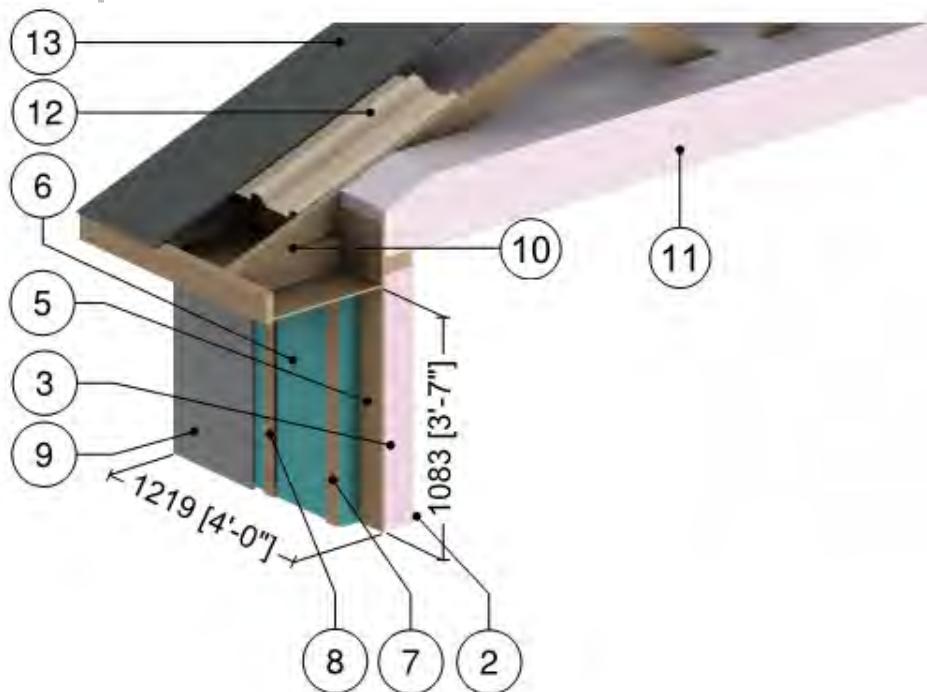


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (0.00 RSI) to R-15 (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	Fasteners (No. 14 screws) @ 16" (406) 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-0.2 (0.03 RSI)	-	-

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

Detail 7.4.2

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Fiber Cement Board – Sloped Wood Framed Roof & Wall Intersection with Insulation at Ceiling

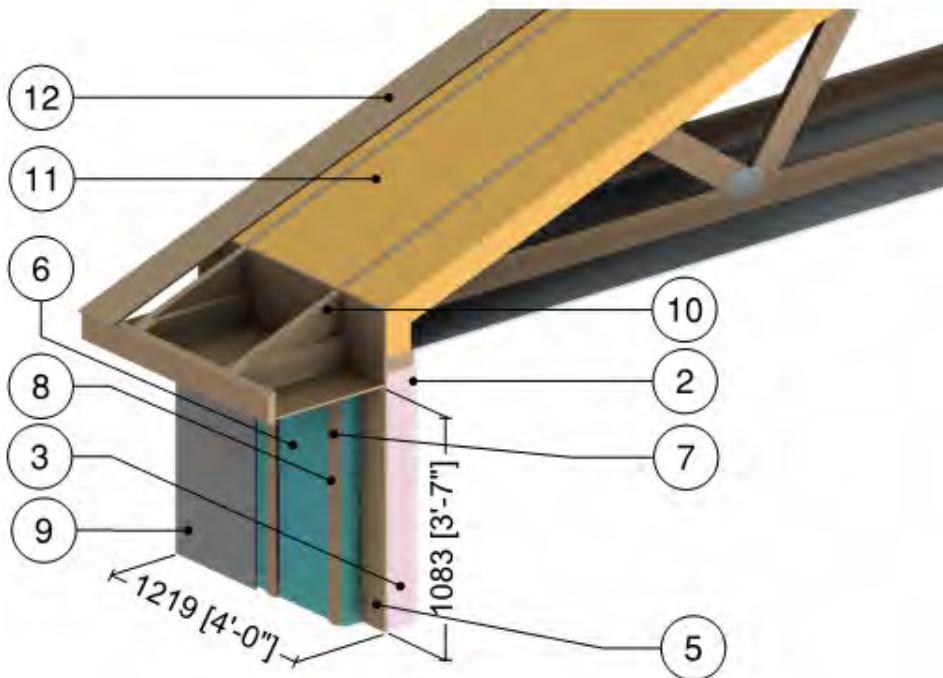


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.12 RSI) to R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (0.00 RSI) to R-15 (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	Fasteners (No. 14 screws) @ 16" (406) 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	Roof Sheathing	1/2" (13)	0.69 (0.10)	R-0.7 (0.12 RSI)	31 (500)	0.45 (1880)
13	Asphalt Shingles	-	-	R-0.45 (0.08 RSI)	57 (920)	0.3 (1260)
14	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 7.4.3

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping and Continuous Insulation Supporting Rainscreen Fiber Cement Board – Sloped Wood Framed Roof & Wall Intersection with Insulation at Roof Sheathing

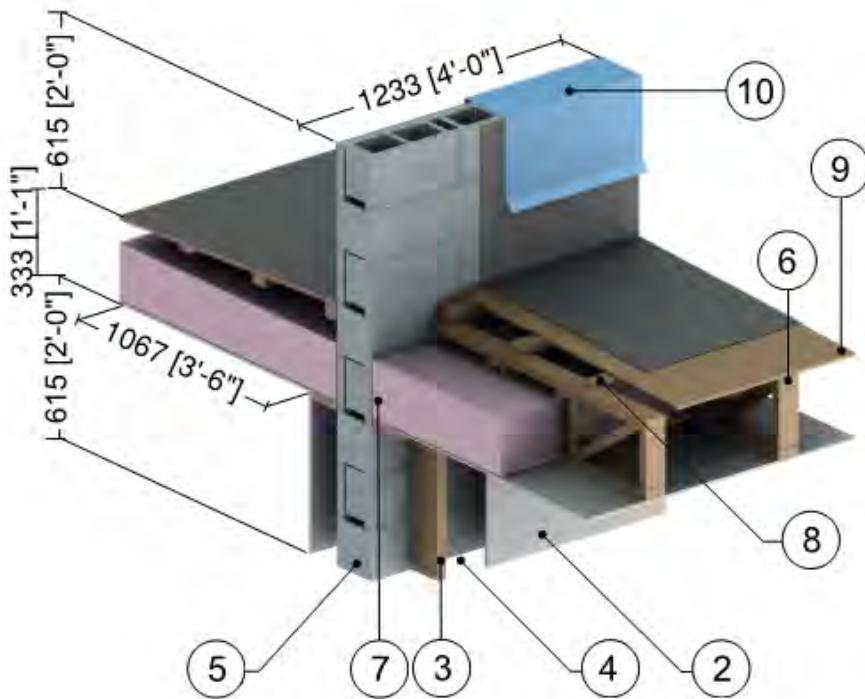


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.12 RSI) to R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (0.00 RSI) to R-15 (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	Fasteners (No. 14 screws) @ 16" (406) 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) 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 7.4.4

Ventilated Wood Frame Low Slope Roof - Masonry Firewall Intersection



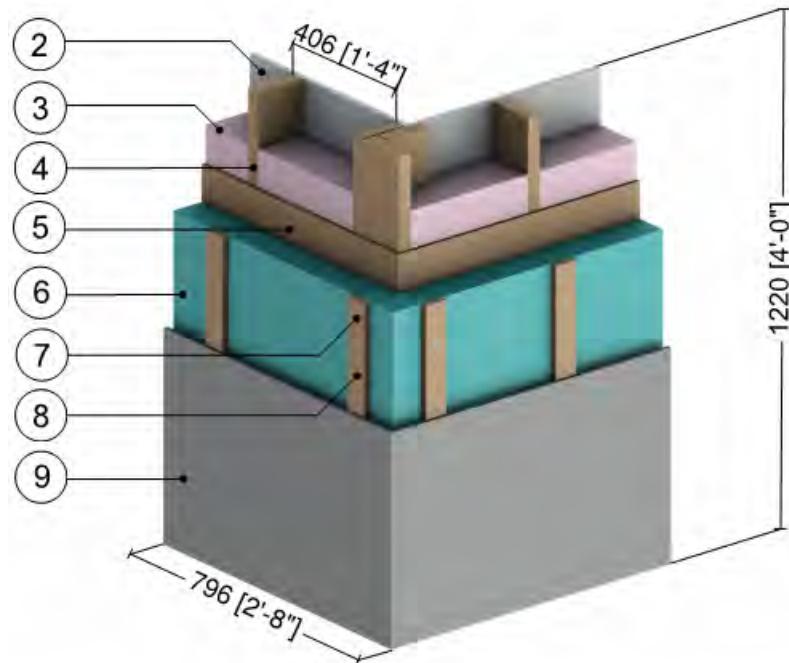
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 7.5.1

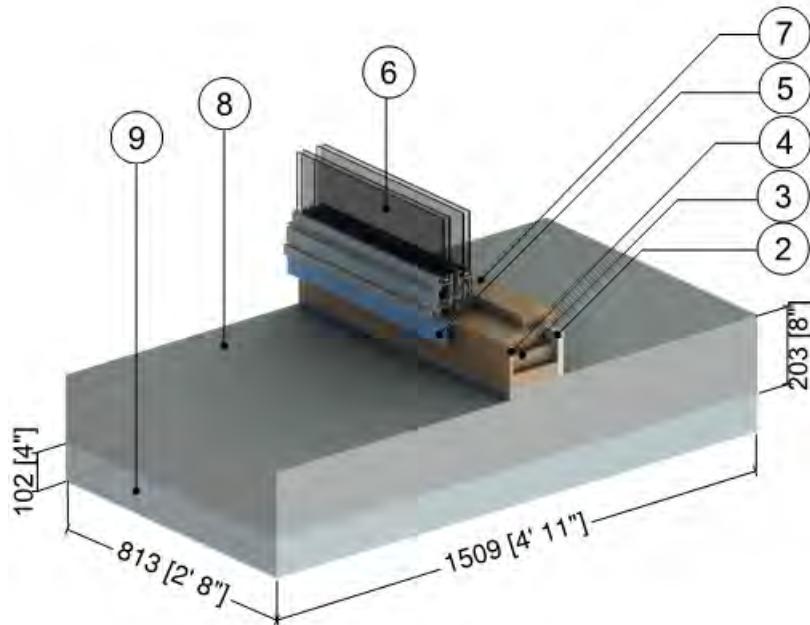
Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Wood Strapping Supporting and Continuous Insulation Fiber Cement Board – Corner Intersection



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 (0.00 RSI) to R-15 (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	Fasteners (No. 14 screws) @ 16" (406) 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-0.2 (0.03 RSI)	-	-

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

Detail 7.6.1 | Wood-frame Sliding Door – Concrete Floor Intersection for Unheated Spaces (Parking Garages)



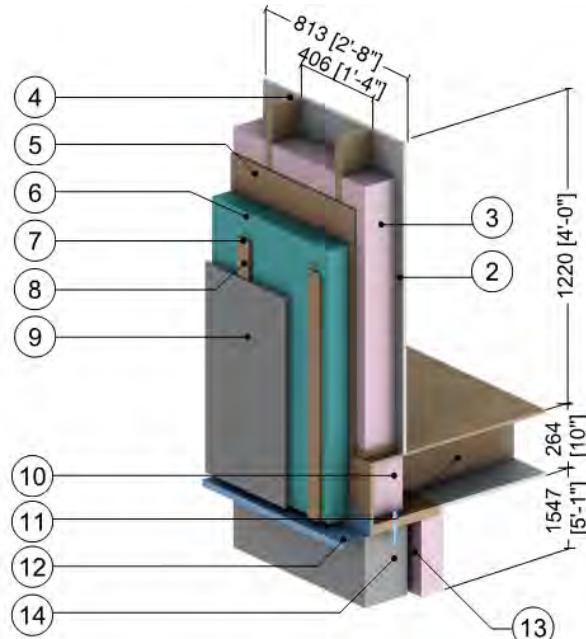
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	2x6 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, double glazed IGU UIGU = 0.32 BTU/hr.ft ² .°F (1.82 W/m ² K) ²					
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 (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 for air spaces within window framing was found using ISO 10077-2

Detail 7.6.2

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Continuous Insulation and Wood Strapping Supporting Fiber Cement Board – Rim Joist and Interior Insulated At-Grade Foundation Wall Intersection



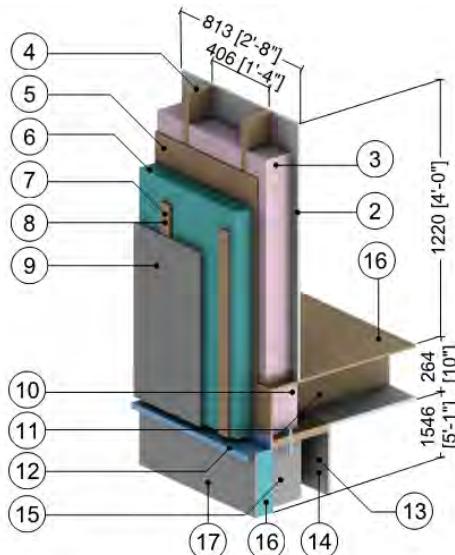
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI) to R 0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (0.88 RSI) to R-15 (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	Fasteners (No. 14 screws) @ 16" (406) 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 7.6.3

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Continuous Insulation and Wood Strapping Supporting Fiber Cement Board – Rim Joist and Exterior Insulated At-Grade Foundation Wall Intersection



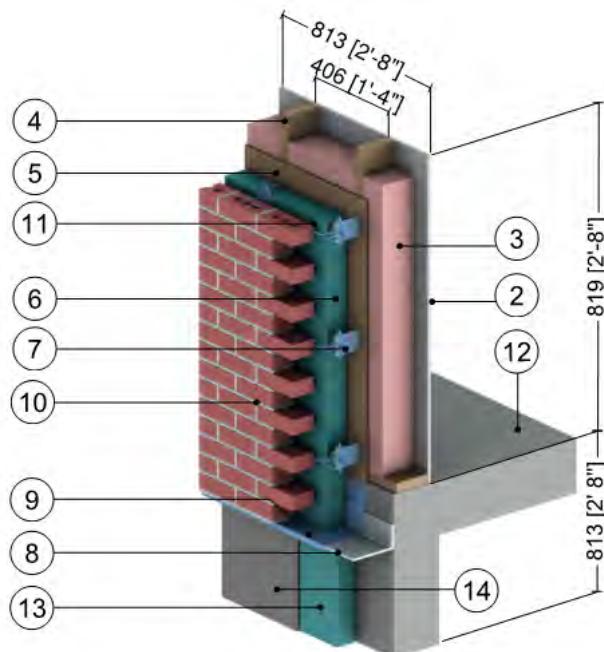
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (0.88 RSI) to R-15 (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	Fasteners (No. 14 screws) @ 16" (406) 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 7.6.4

Exterior and Interior Insulated 2x6 Wood Stud (16" o.c.) Wall Assembly with Shelf Angle & Brick Ties Supporting Brick Veneer – Exterior Insulated At-Grade Foundation Wall Intersection



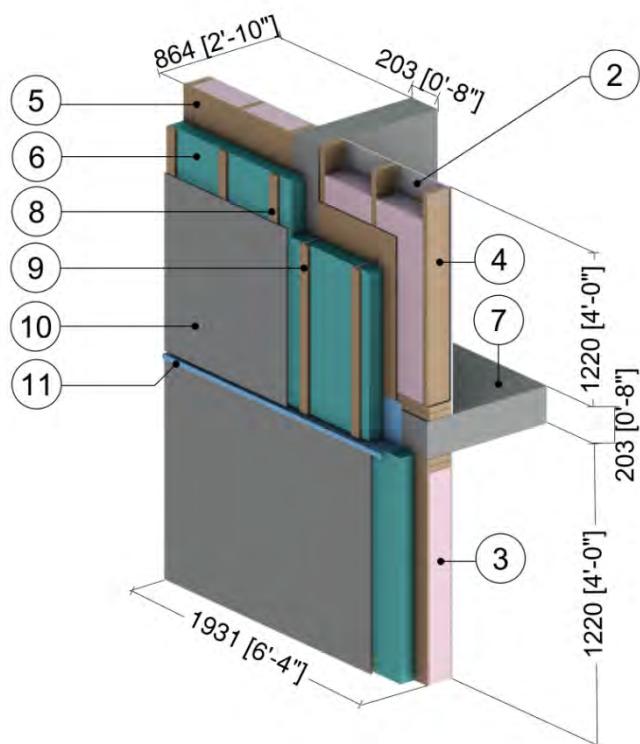
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.7 (0.12 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (0.88 RSI) to R-15 (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 7.7.1

Exterior Insulated Wood Infill Wall Assembly with Wood Strapping and Continuous Insulation Supporting Fiber Cement Board – Concrete Wall and Floor Intersection with Flashing Bypassing Exterior Insulation

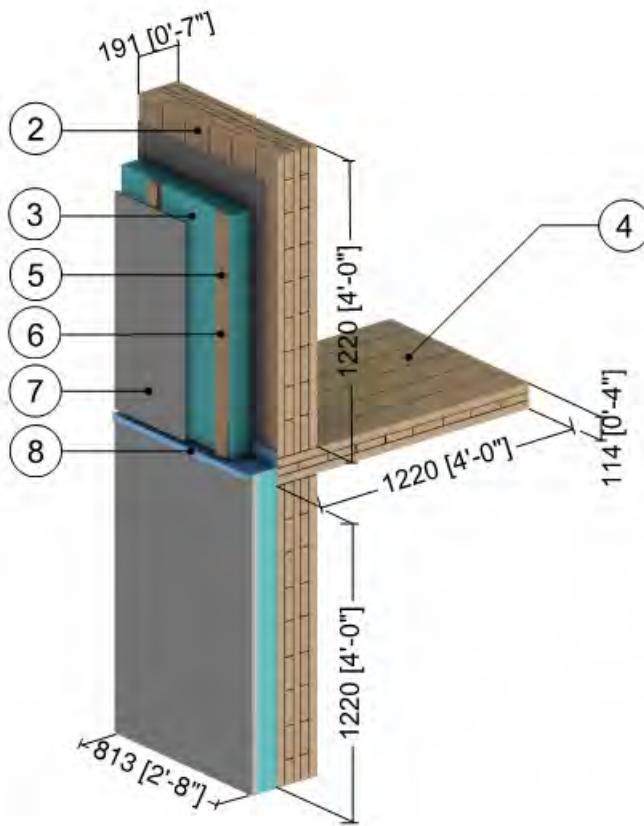


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 (0.88 RSI) to R-15 (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	Fasteners (No. 14 screws) @ 16" (406) 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-0.2 (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

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 (0.11 RSI) to R-0.9 (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 (2.64 RSI) to R-25 (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	3/4" (19)	0.69 (0.10)	-	31 (500)	0.45 (1880)
6	Fasteners (No. 14 screws) @ 16" (406) o.c.	0.35" (9) Ø	347 (50)	-	489 (7830)	0.12 (500)
7	Fiber Cement Board Cladding with 3/4" (19mm) vented airspace incorporated into exterior heat transfer coefficient					
8	Steel Flashing	18 gauge	430 (62)	-	489 (7830)	0.12 (500)
9	Galvanized Steel L-clips	3/8" (9.5)	430 (62)		489 (7830)	0.12 (500)
10	Exterior Film ¹	-	-	R-0.2 (0.03 RSI)	-	-

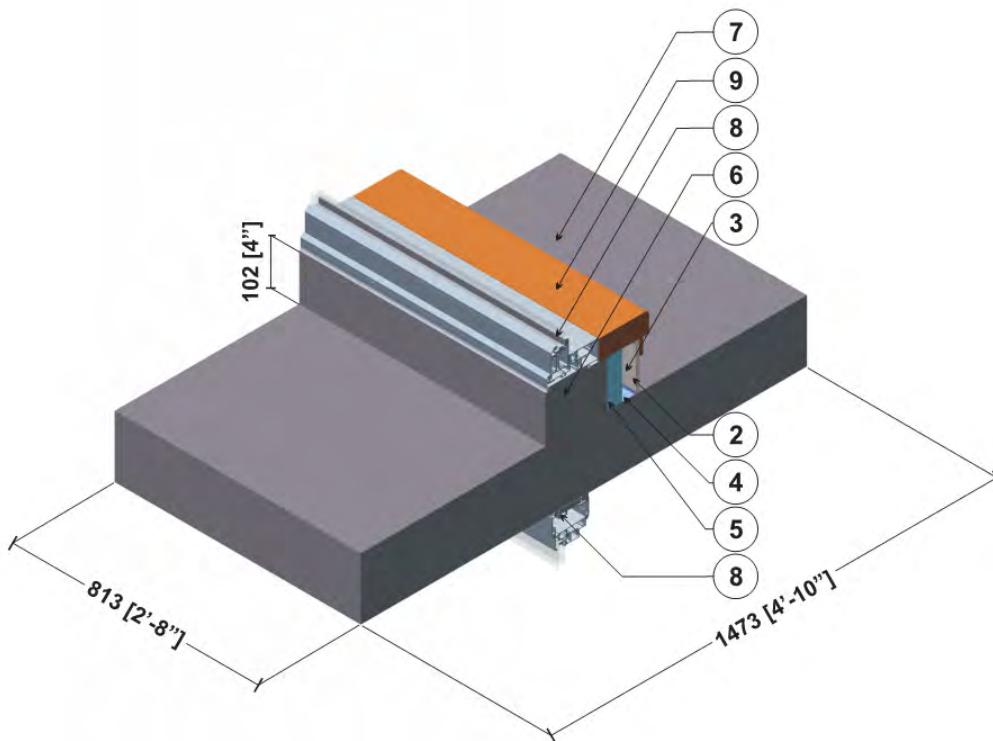
¹ Value selected from table 1, p. 26.1 of 2009 ASHRAE Handbook – Fundamentals depending on surface orientation

8.0 Doors and Balconies

Detail 8.1.1	A.8.1
Interior Insulated Concrete Curb at Sliding Door Sill and Window Head – Slab Intersection	
Detail 8.1.2	A.8.2
Exterior Insulated Concrete Curb at Sliding Door Sill and Window Head – Slab Intersection	
Detail 8.1.3	A.8.3
Interior Insulated Concrete Curb – Window-Wall and Slab Intersection	
Detail 8.1.4	A.8.4
Exterior Insulated Concrete Curb at Sliding Door Sill and Head- Slab Intersection	
Detail 8.1.5	A.8.5
Exterior Insulated Concrete Curb – Window-Wall and Recessed Slab Intersection	
Detail 8.1.6	A.8.6
Window Wall System with Spandrel Panels and Sliding Door - Concrete Balcony and Curb Intersection	
Detail 8.1.7	A.8.7
Window-wall with Sliding Door and Insulated Spandrel Section – Concrete Floor Slab Intersection without Concrete Curb for Alternative Balcony Slab Connections	
Detail 8.1.8	A.8.8
Window Wall System with Spandrel Panels and Sliding Door - Thermally Broken Concrete Balcony and Curb Intersection	
Detail 8.1.9	A.8.9
Window Wall System with Spandrel Panels - Concrete Balcony and Bypass Intersection	
Detail 8.1.10	A.8.10
Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly - Door Sill with Exterior Slab Insulation	
Detail 8.1.11	A.8.11
Exterior and Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly - Door Sill with Exterior Slab Insulation	

Detail 8.1.1

Interior Insulated Concrete Curb at Sliding Door Sill and Window Head – Slab Intersection



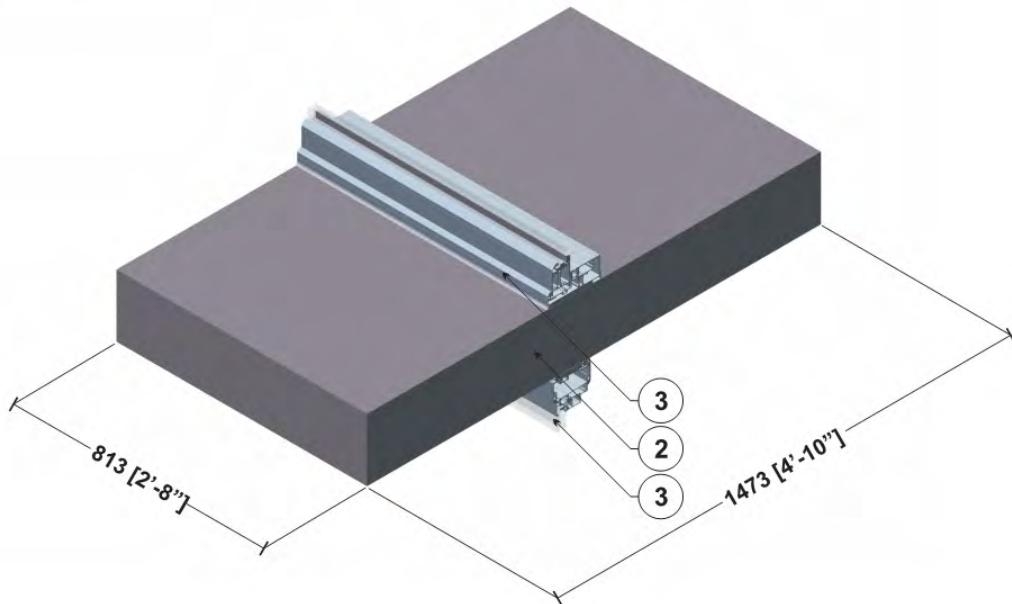
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	½" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	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 8.1.2

Exterior Insulated Concrete Curb at Sliding Door Sill and Window Head – Slab Intersection



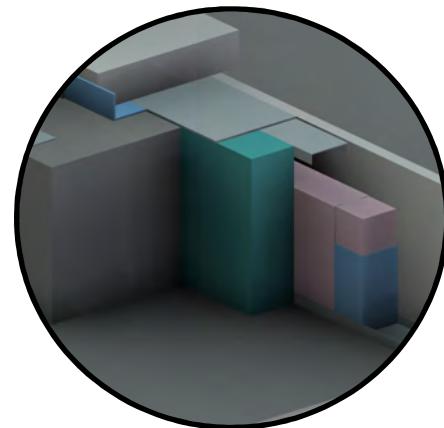
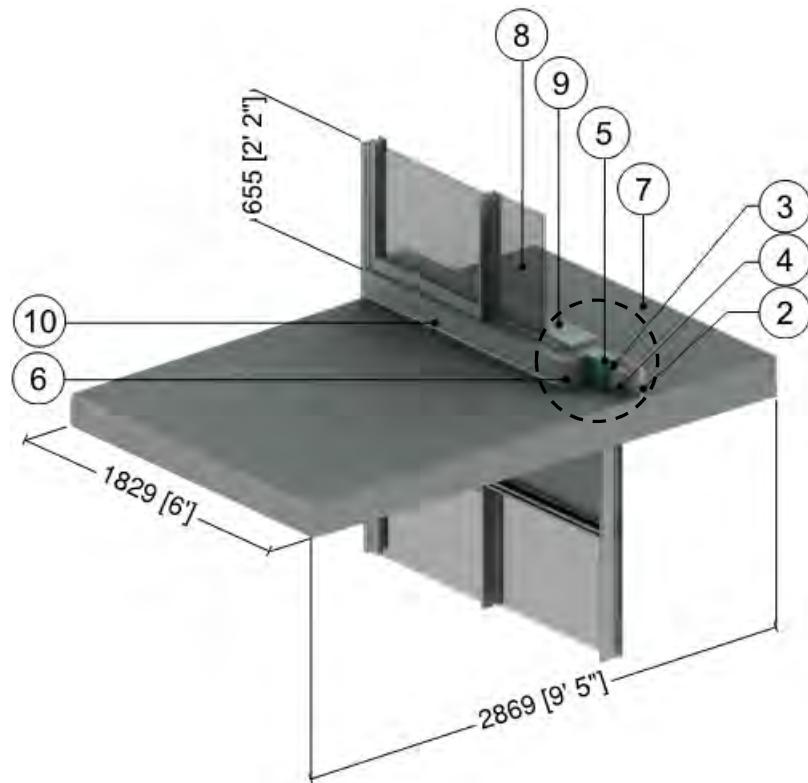
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Concrete Slab	8" (203)	12.5 (1.8)	-	140 (2250)	0.20 (850)
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 8.1.3

Interior Insulated Concrete Curb – Window-Wall and Slab Intersection



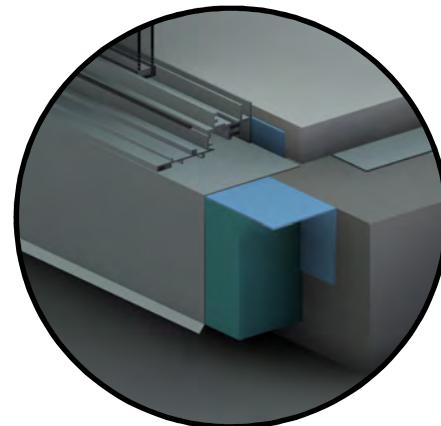
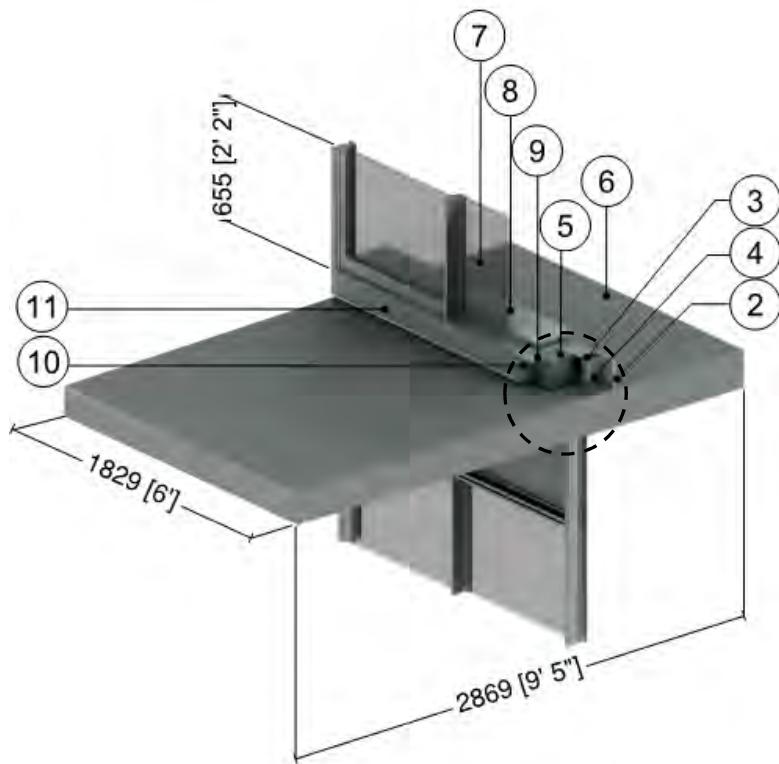
Curb Detail

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 (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	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 $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ (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 (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 orientation² The thermal conductivity of air spaces within sliding door framing was found using ISO 10077-2

Detail 8.1.4

Exterior Insulated Concrete Curb at Sliding Door Sill and Head-Slab Intersection



Curb Detail

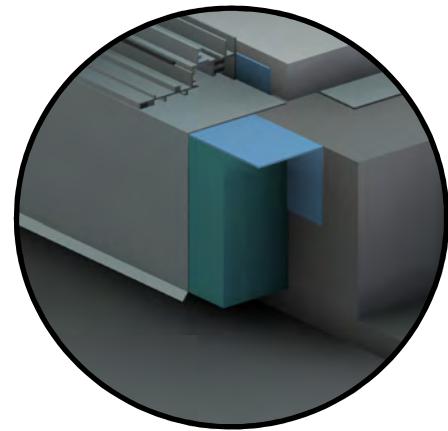
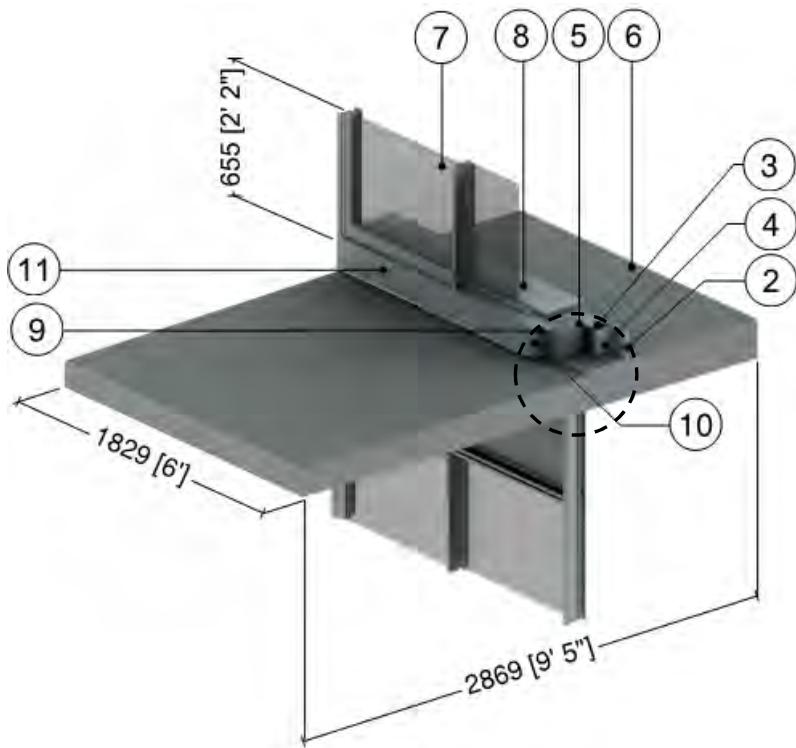
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Films ¹	-	-	R-0.6 (0.11 RSI) to R-0.9 (0.16 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W/m}^2\text{K}$)					
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	Insulation	Varies	-	R-10 (1.76 RSI) to R-15 (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 (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 sliding door framing was found using ISO 10077-2

Detail 8.1.5

Exterior Insulated Concrete Curb – Window-Wall and Recessed Slab Intersection



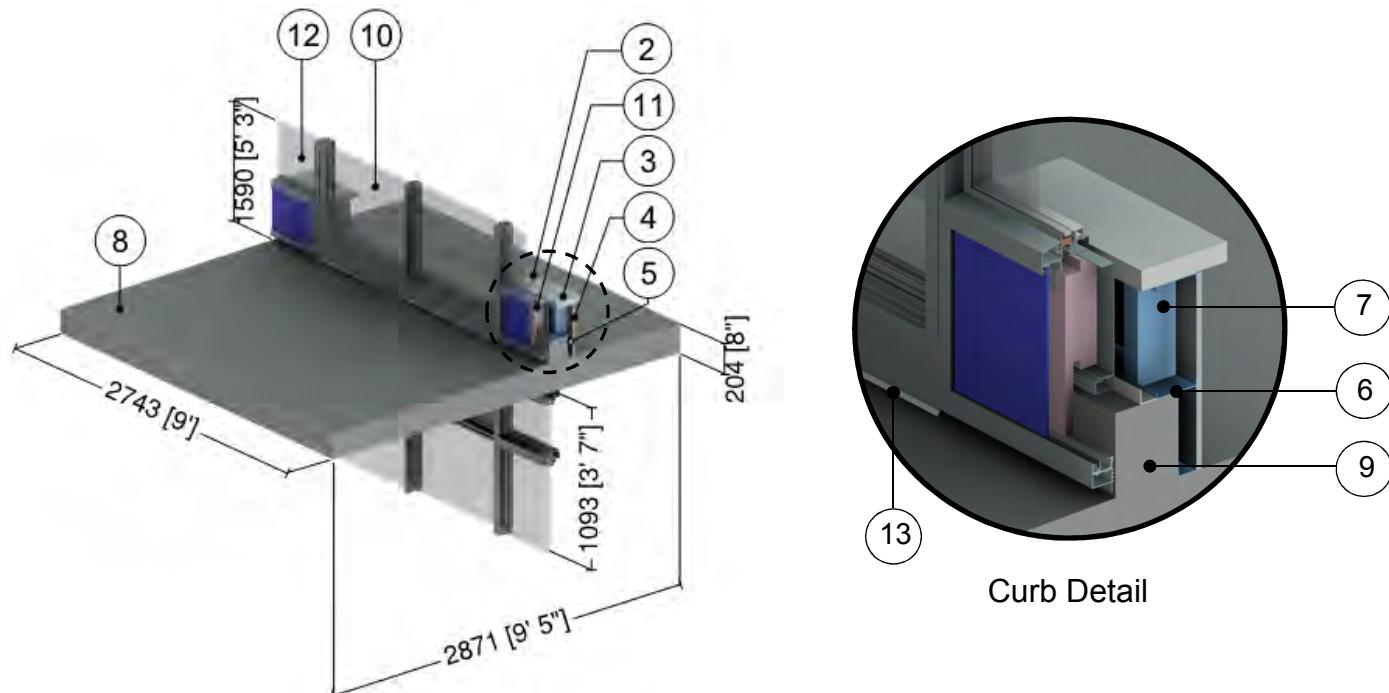
Curb Detail

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 (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	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	Insulation	Varies	-	R-10 (1.76 RSI) to R-15 (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 (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 orientation² The thermal conductivity of air spaces within sliding door framing was found using ISO 10077-2

Detail 8.1.6

Window Wall System with Spandrel Panels and Sliding Door - Concrete Balcony and Curb Intersection



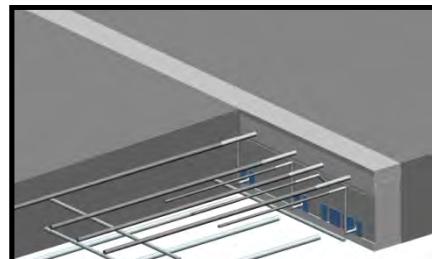
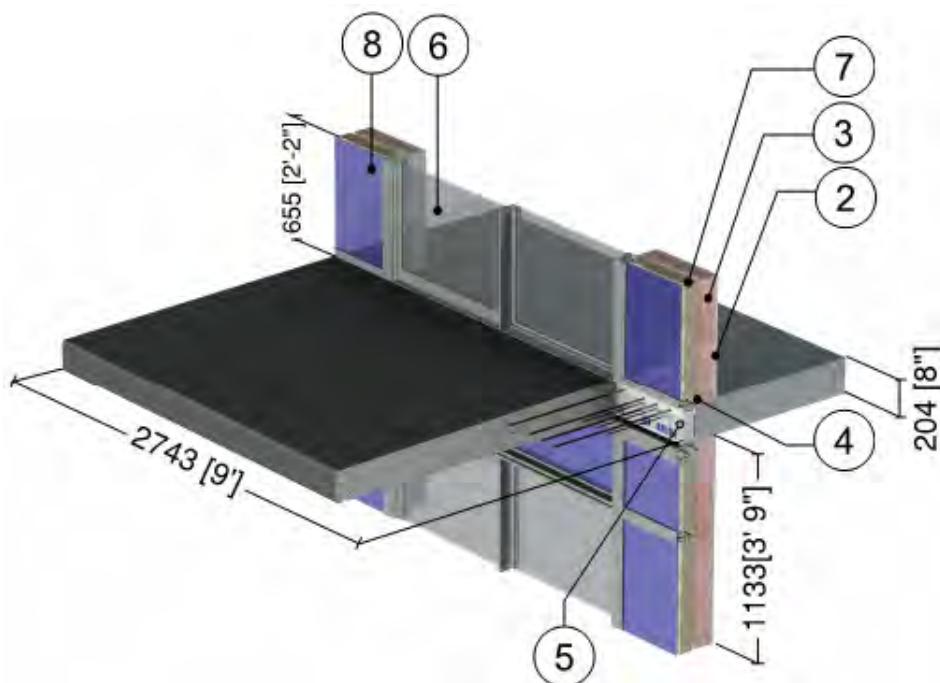
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Wood Sill	2" (50)	0.69 (0.1)	-	31 (500)	0.45 (1880)
3	Steel 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 $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ (1.82 W/m ² K)					
11	Back Pan Insulation	Varies	0.24 (0.034)	R-6.3 (1.11 RSI) to R-12.6 (2.22 RSI)	4 (64)	0.20 (850)
12	Aluminum Window Wall Vision System: thermally broken frame, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ (1.82 W/m ² K) ²					
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

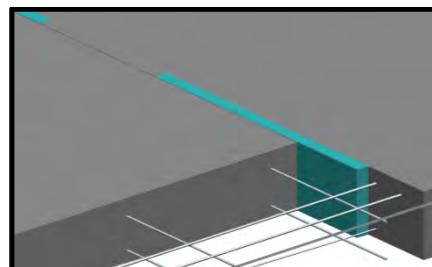
² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 8.1.7

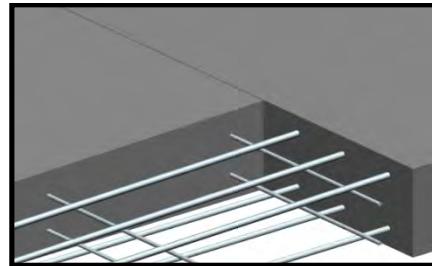
Window-wall with Sliding Door and Insulated Spandrel Section – Concrete Floor Slab Intersection without Concrete Curb for Alternative Balcony Slab Connections



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

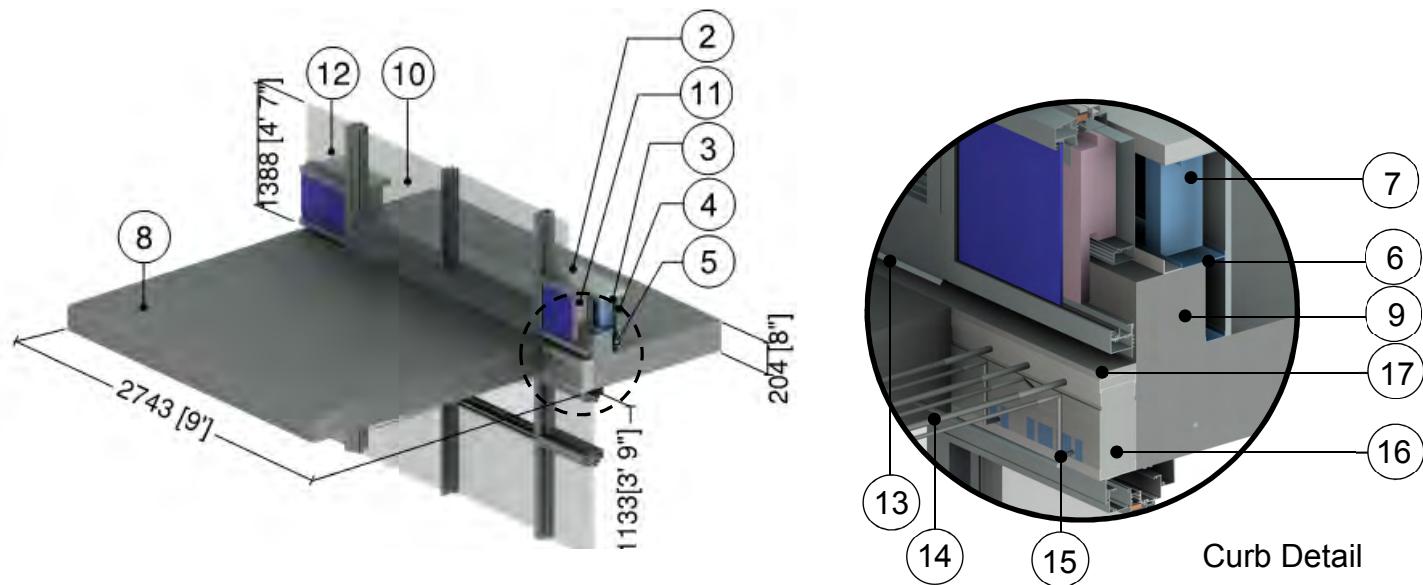
ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Gypsum Board	1/2" (13)	1.1 (0.16)	R-0.5 (0.08 RSI)	50 (800)	0.26 (1090)
3	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 $U_{IGU} = 0.32 \text{ BTU}/\text{hr}\cdot\text{ft}^2\cdot\text{°F}$ (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, $U_{IGU} = 0.32 \text{ BTU}/\text{hr}\cdot\text{ft}^2\cdot\text{°F}$ (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 8.1.8

Window Wall System with Spandrel Panels and Sliding Door - Thermally Broken Concrete Balcony and Curb Intersection



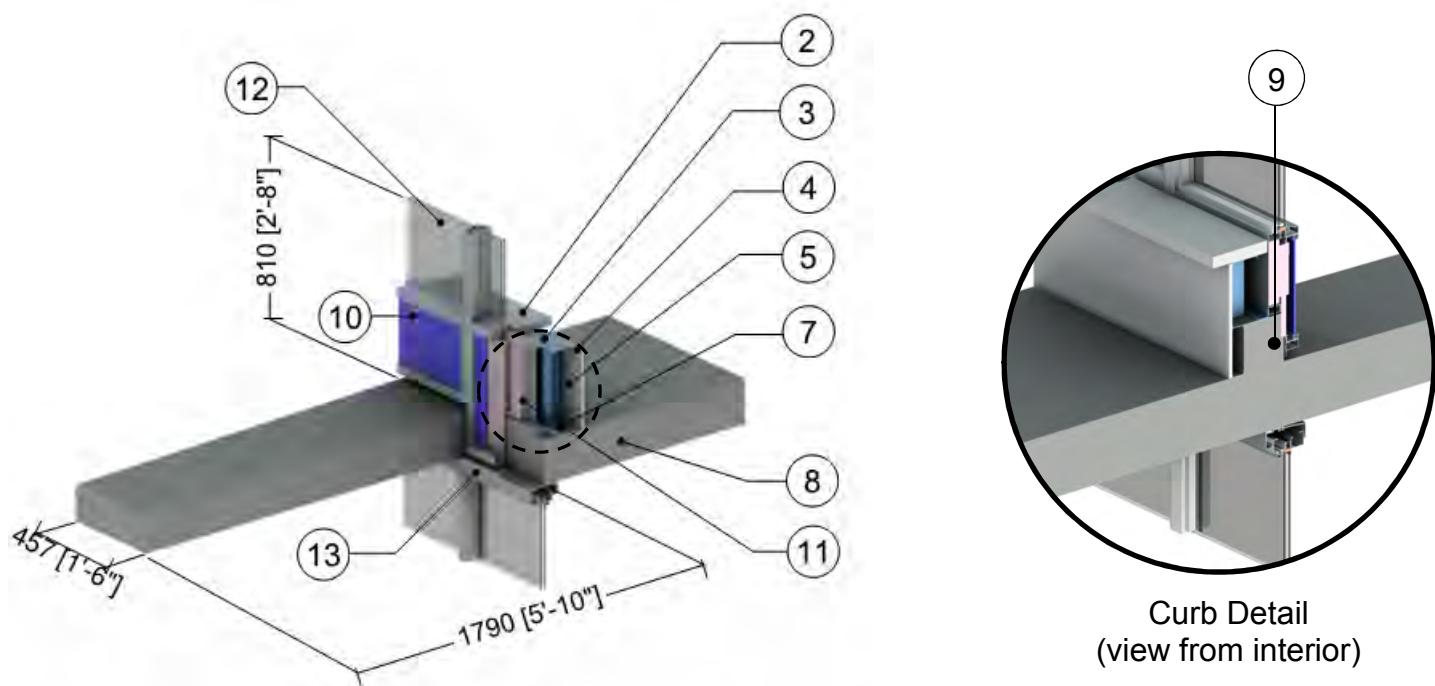
Curb Detail

ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² .hr. ^o F (W/m K)	Nominal Resistance hr·ft ² . ^o F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb. ^o F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (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 $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot{}^{\circ}\text{F}$ (1.82 W/m ² K)					
11	Back Pan Insulation	Varies	0.24 (0.034)	R-6.3 (1.11 RSI) to R-12.6 (2.22 RSI)	4 (64)	0.20 (850)
12	Aluminum Window Wall Vision System ² : thermally broken frame, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot{}^{\circ}\text{F}$ (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 orientation² The thermal conductivity of air spaces within framing was found using ISO 100077-2

Detail 8.1.9

Window Wall System with Spandrel Panels - Concrete Balcony and Bypass Intersection



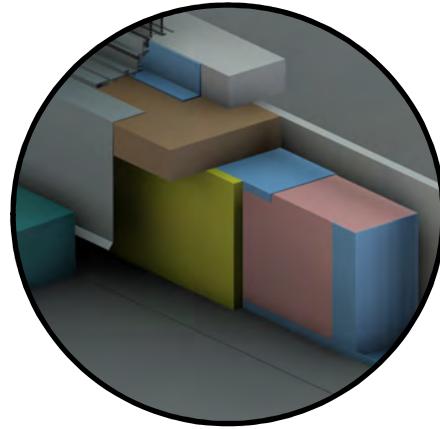
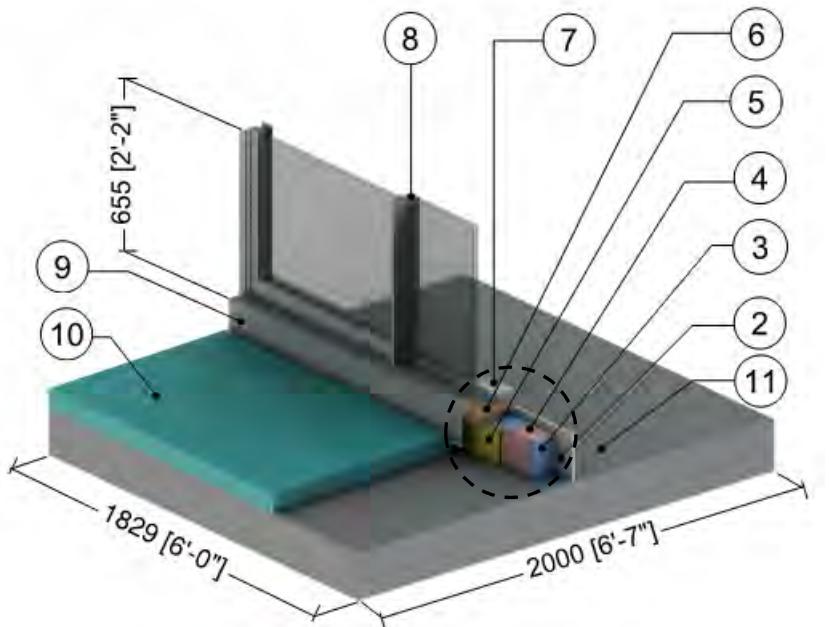
ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.12 RSI) to R-1.1 (0.20 RSI)	-	-
2	Wood Sill	2" (50)	0.69 (0.10)	-	31 (500)	0.45 (1880)
3	Steel 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 $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ (1.82 W/m ² K)					
11	Back Pan Insulation	Varies	0.24 (0.034)	R-6.4 (1.13 RSI) to R-12.8 (2.25 RSI)	4 (64)	0.20 (850)
12	Aluminum Window Wall Vision System ² : thermally broken frame, double glazed IGU $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ (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 8.1.10

Interior Insulated 3 5/8" x 1 5/8" Steel Stud (16" o.c.) Wall Assembly - Door Sill with Exterior Slab Insulation



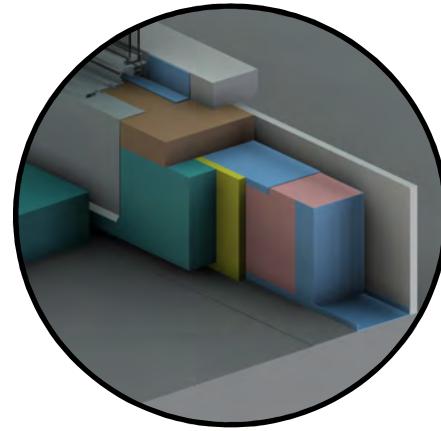
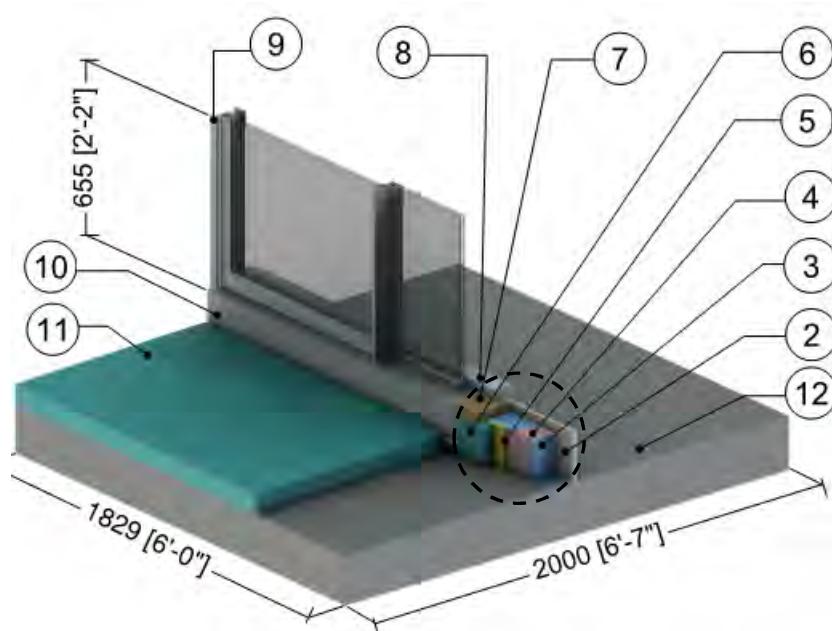
Curb Detail

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 (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 (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 $U_{IGU} = 0.32 \text{ BTU/hr}\cdot\text{ft}^2\cdot\text{°F}$ ($1.82 \text{ W/m}^2\text{K}$)					
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 (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 orientation² The thermal conductivity of air spaces within sliding door framing was found using ISO 10077-2

Detail 8.1.11

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 (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 (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 (1.76 RSI) to R-15 (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 (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 sliding door framing was found using ISO 10077-2

9.0 Roofs

Detail 9.1.1 **A.9.1**

Exterior Insulated Sloped Metal Roof with Metal Sub-Girts (12" o.c.) Supporting Standing Seam Metal Roof – Clear Roof

Detail 9.1.2 **A.9.2**

Exterior Insulated Sloped Metal Roof with Metal Sub-Girts (24" o.c.) Supporting Standing Seam Metal Roof – Clear Roof

Detail 9.1.3 **A.9.3**

Exterior Insulated Sloped Metal Roof with Metal Sub-Girts (36" o.c.) Supporting Standing Seam Metal Roof – Clear Roof

Detail 9.2.1 **A.9.4**

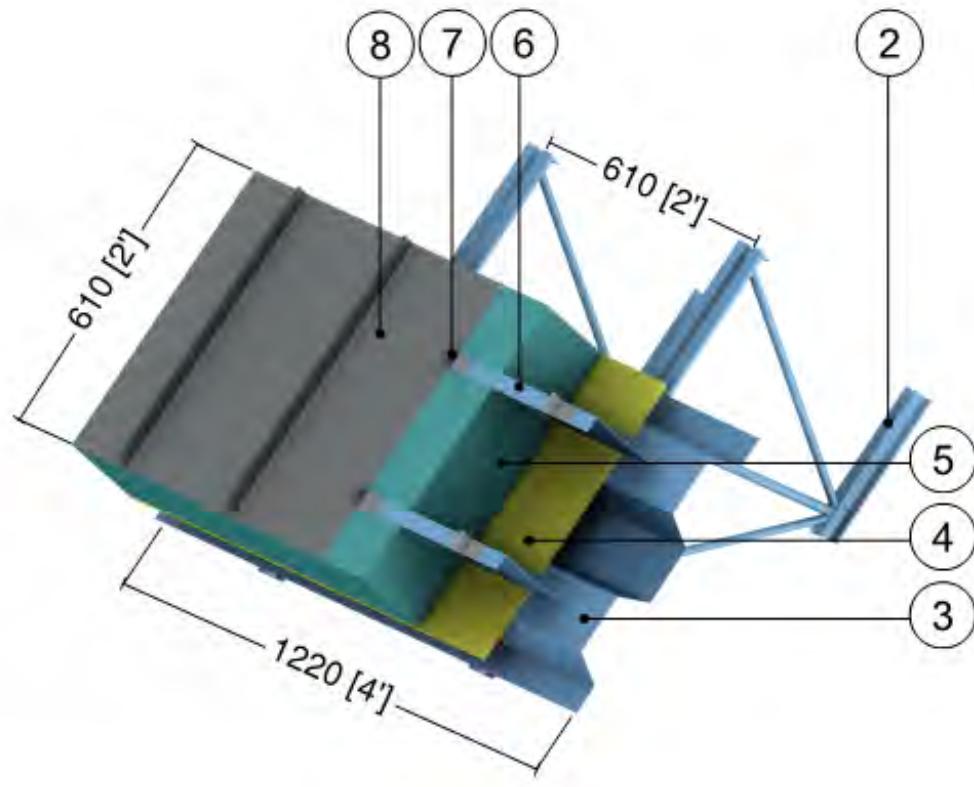
Exterior Insulated Sloped Metal Roof with Metal Sub-Girts (24" o.c.) Supporting Metal Roof – Ridge Intersection

Detail 9.2.2 **A.9.5**

Insulated Concrete Slab – Concrete Curb or Wall Intersection

Detail 9.1.1

Exterior Insulated Sloped Metal Roof with Metal Sub-Girts (12" o.c.) Supporting Standing Seam Metal Roof – Clear Roof

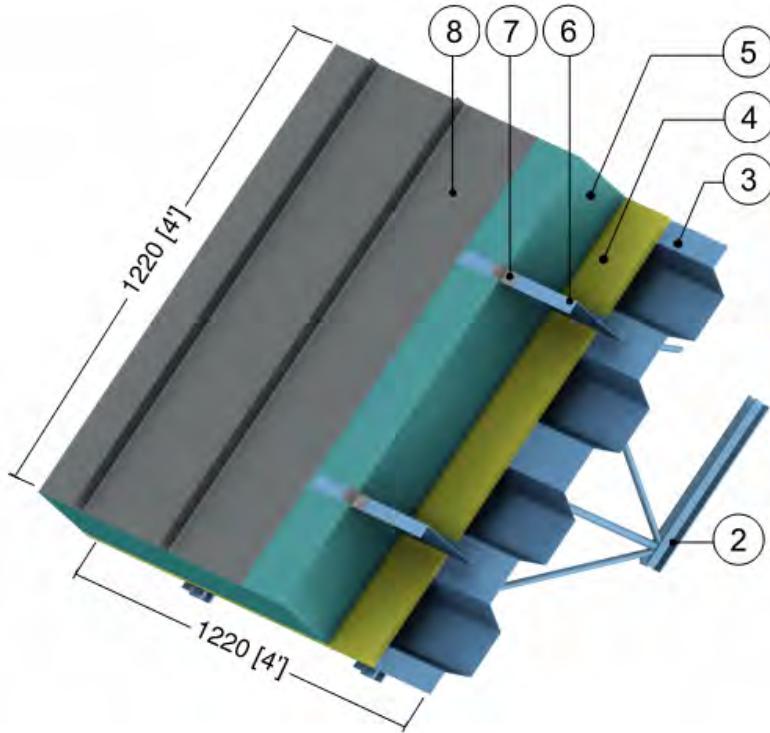


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI)	-	-
2	Open Web Steel Joist (550C) @ 24" (610) o.c.	-	347 (50)	-	489 (7830)	0.12 (500)
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 (3.52 RSI) to R-40 (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 9.1.2

Exterior Insulated Sloped Metal Roof with Metal Sub-Girts (24" o.c.) Supporting Standing Seam Metal Roof – Clear Roof

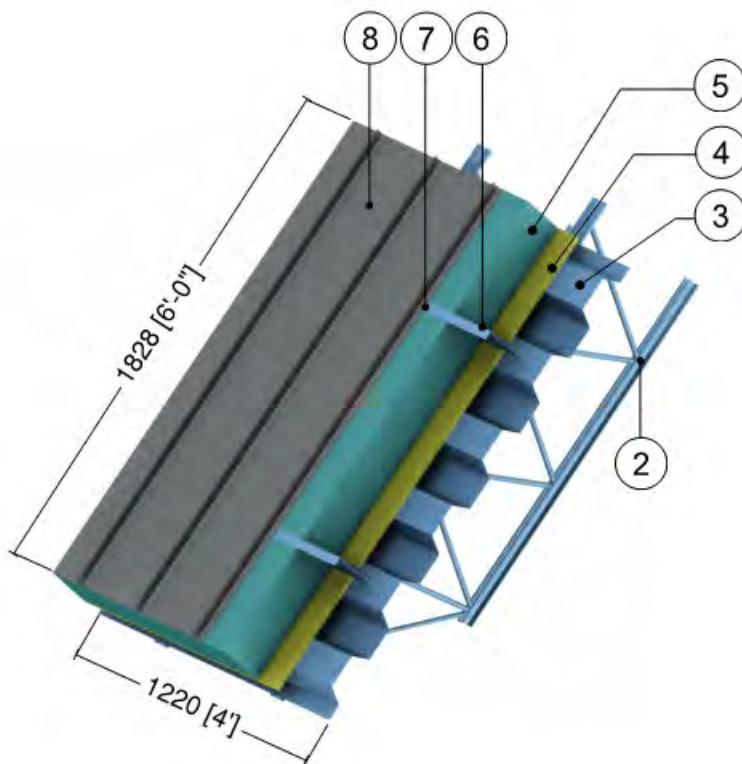


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI)	-	-
2	Open Web Steel Joist (550C) @ 24" (610) o.c.	-	347 (50)	-	489 (7830)	0.12 (500)
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 (3.52 RSI) to R-40 (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 9.1.3

Exterior Insulated Sloped Metal Roof with Metal Sub-Girts (36" o.c.) Supporting Standing Seam Metal Roof – Clear Roof

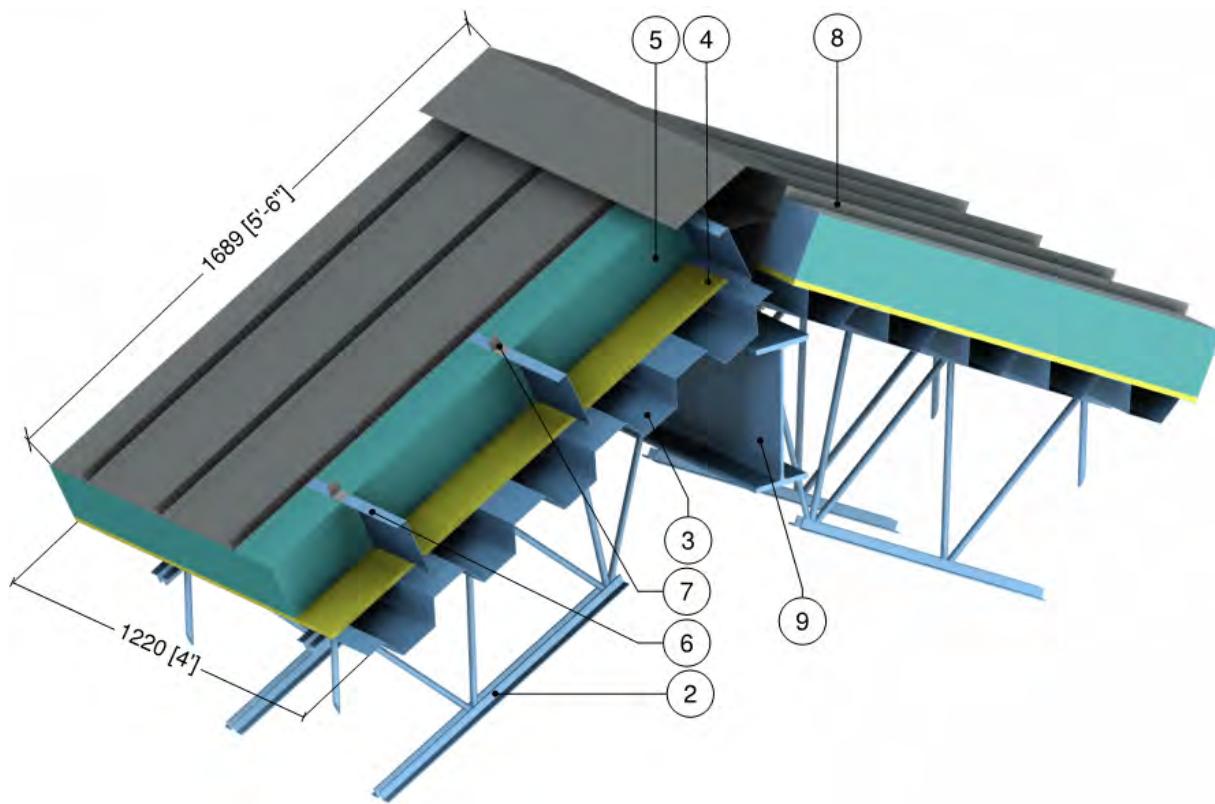


ID	Component	Thickness Inches (mm)	Conductivity Btu·in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-0.6 (0.11 RSI)	-	-
2	Open Web Steel Joist (550C)@ 24" (610) o.c.	-	347 (50)	-	489 (7830)	0.12 (500)
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 (3.52 RSI) to R-40 (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 9.2.1

Exterior Insulated Sloped Metal Roof with Metal Sub-Girts (24" o.c.) Supporting Metal Roof – Ridge Intersection

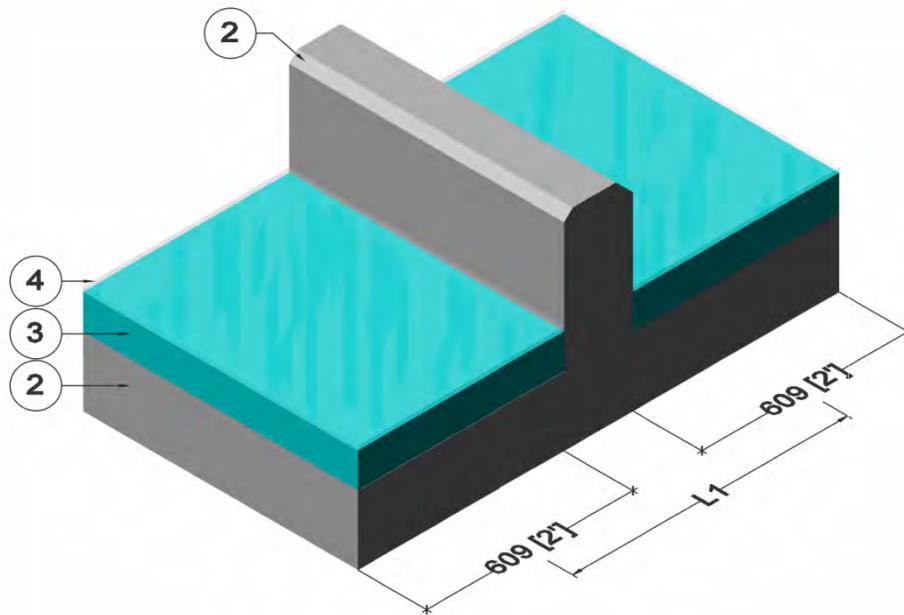


ID	Component	Thickness Inches (mm)	Conductivity Btu-in / ft ² ·hr·°F (W/m K)	Nominal Resistance hr·ft ² ·°F/Btu (m ² K/W)	Density lb/ft ³ (kg/m ³)	Specific Heat Btu/lb·°F (J/kg K)
1	Interior Film ¹	-	-	R-1.1 (0.2 RSI)	-	-
2	Open Web Steel Joist (550C) @ 24" (610) o.c.	-	347 (50)	-	489 (7830)	0.12 (500)
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 (3.52 RSI) to R-30 (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 9.2.2

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