CONSTRUCT
AEC EDUCATION & EXPO

Glazing System: Innies, Outies and Tweenies

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October 11, 2109

Continuing Education Units (CEUs)

Course Approvals:

BOMI, CSI, ICC, IIBEC, and NARI credits must be **SELF-REPORTED**. AIA credit will be reported on the member's behalf.

Participants will receive a **certificate of attendance** via e-mail in 8 weeks to use for self-reporting.

For questions, contact **jennifer.hughes@informa.com** or visit the Education Office (**National Harbor 15**).

AIA

Credit(s) earned on completion of this course will be reported to AIA CES for AIA members. Certificates of completion for both AIA members and non-AIA members will be available to download after the event. This course is registered with AIA CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product. Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

Course Description & Learning Objectives

- Glazing Systems: Innies, Outies and Tweenies
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- How your exterior wall is water managed with continuous exterior insulation affects how you locate glazing systems in the plane of the wall. Is the glazing system located towards the interior of the assembly (an "innie")? Is the glazing system located towards the exterior of the assembly (an "outie")? Or is it located in the middle of the assembly (a "tweenie")? How are water and air management addressed without causing issues relating to thermal bridging, structure and fire?
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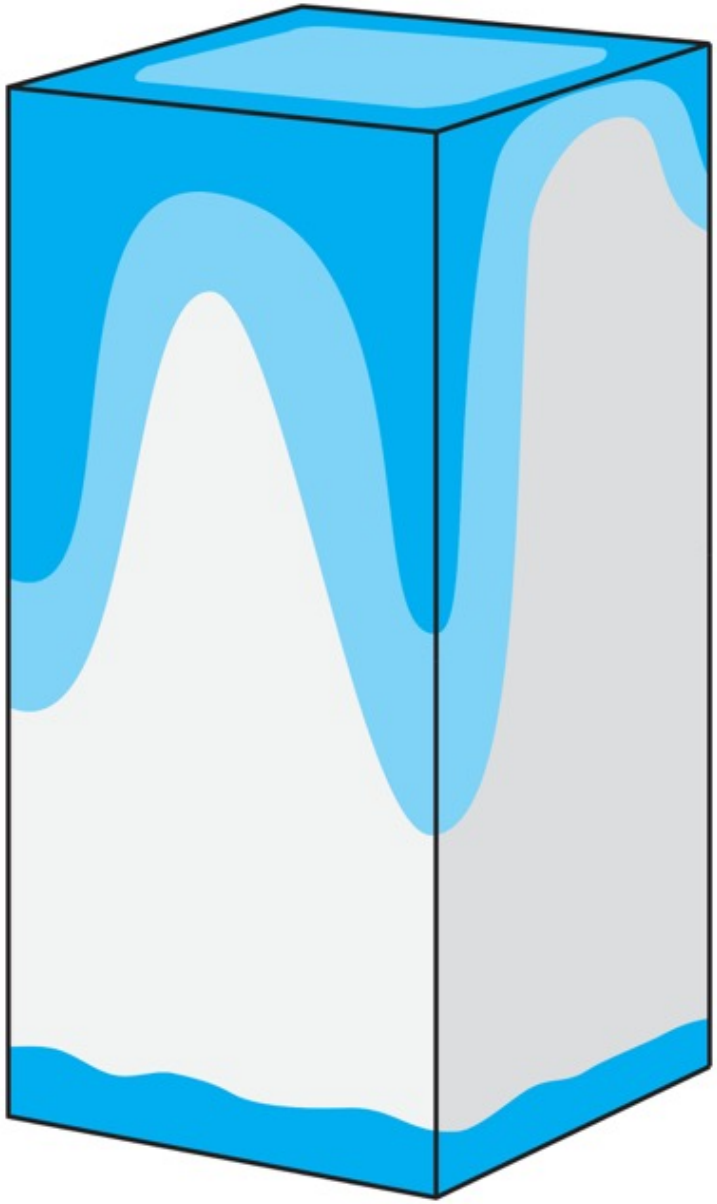
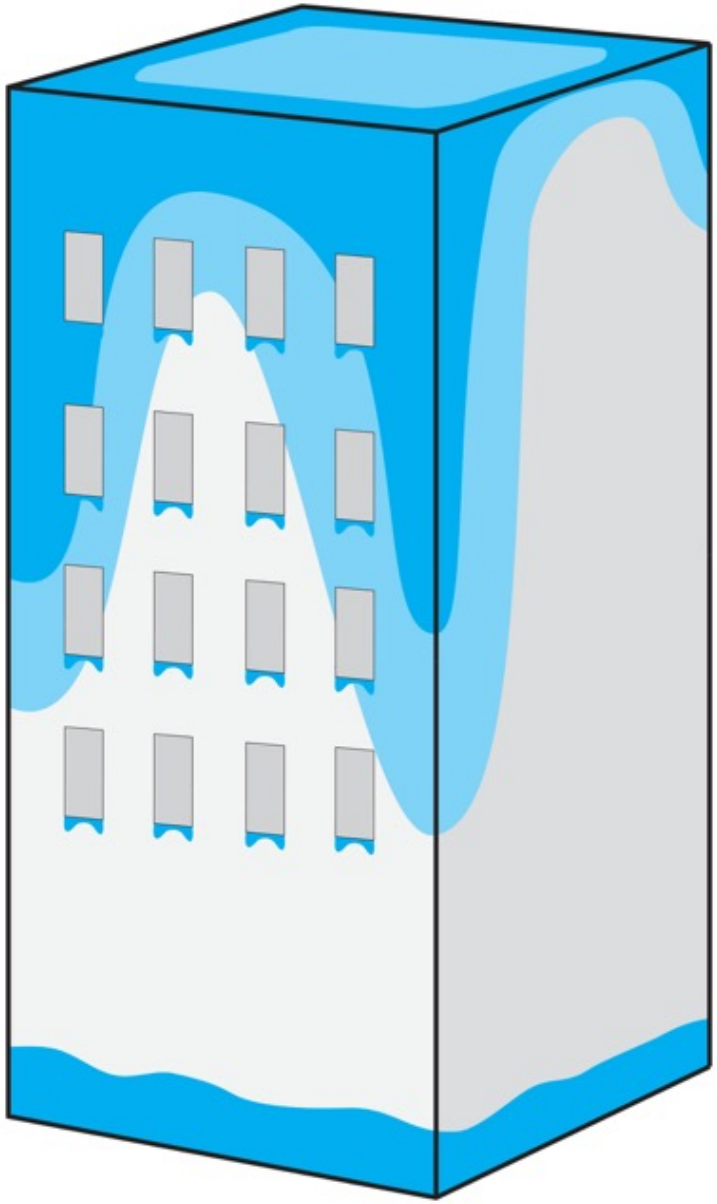
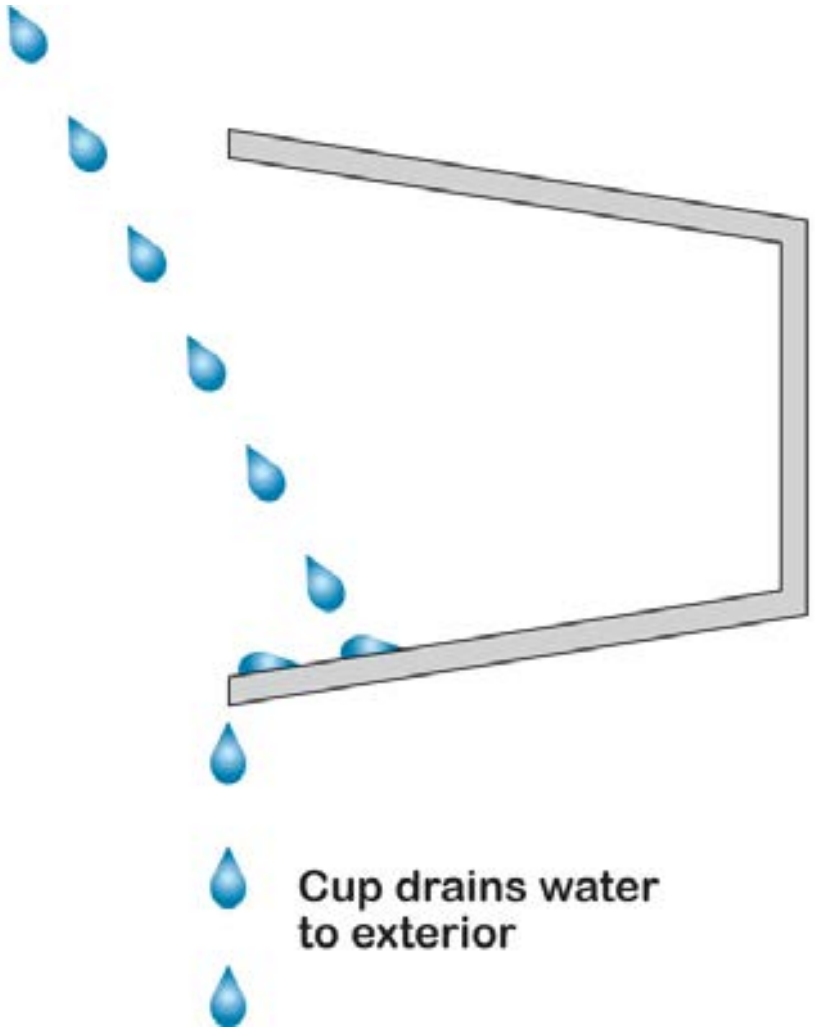
- Upon completion of this session, participants will be able to:
- 1. Undertake water management (ie. flashing) of glazing systems based on their location in the wall assembly
- 2. Recognize how to address air leakage of glazing systems based on their location in the wall assembly
- 3. Discuss how to avoid thermal bridging of glazing systems based on their location in the wall assembly
- 4. Identify structural and fire issues of glazing systems based on their location in the wall assembly

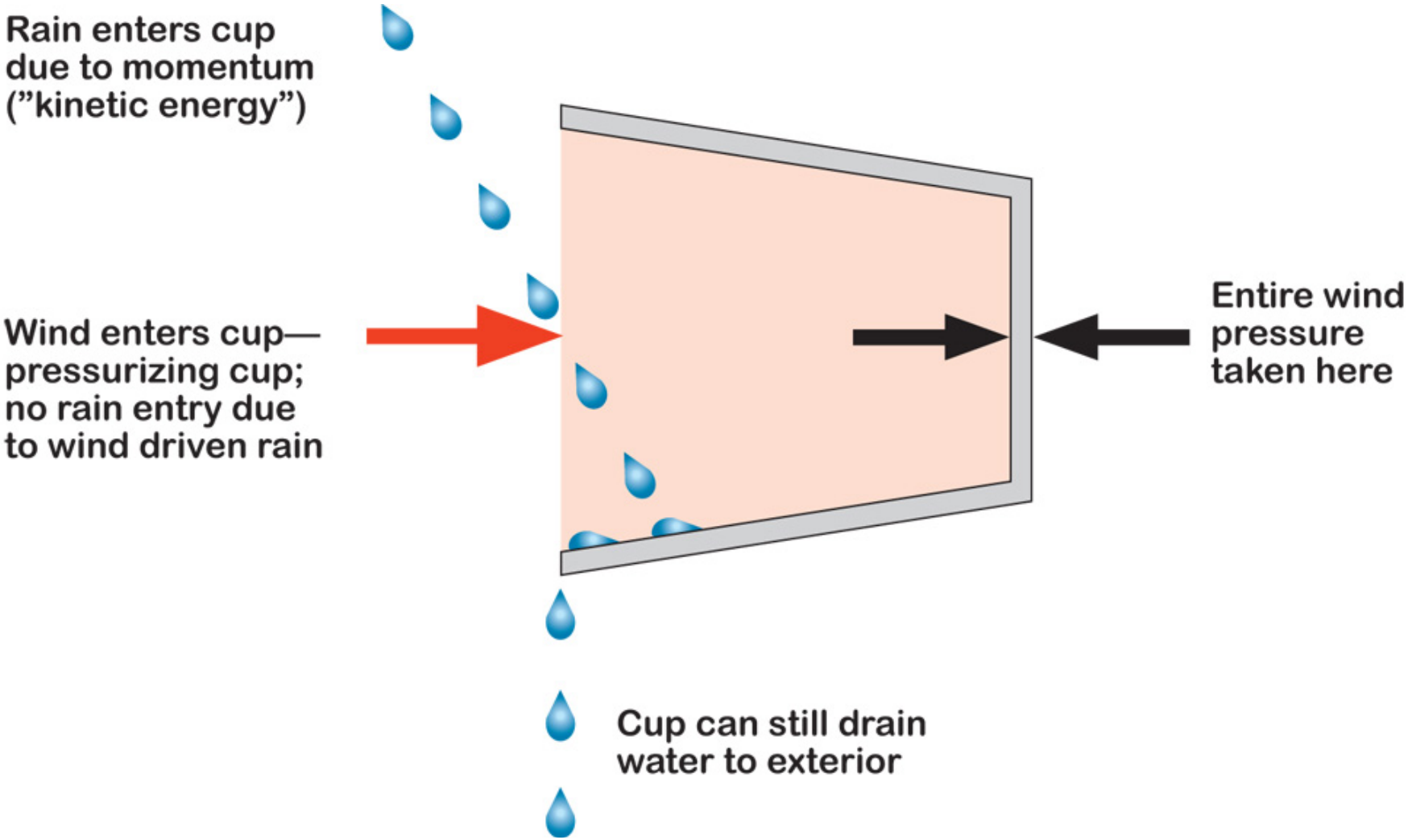


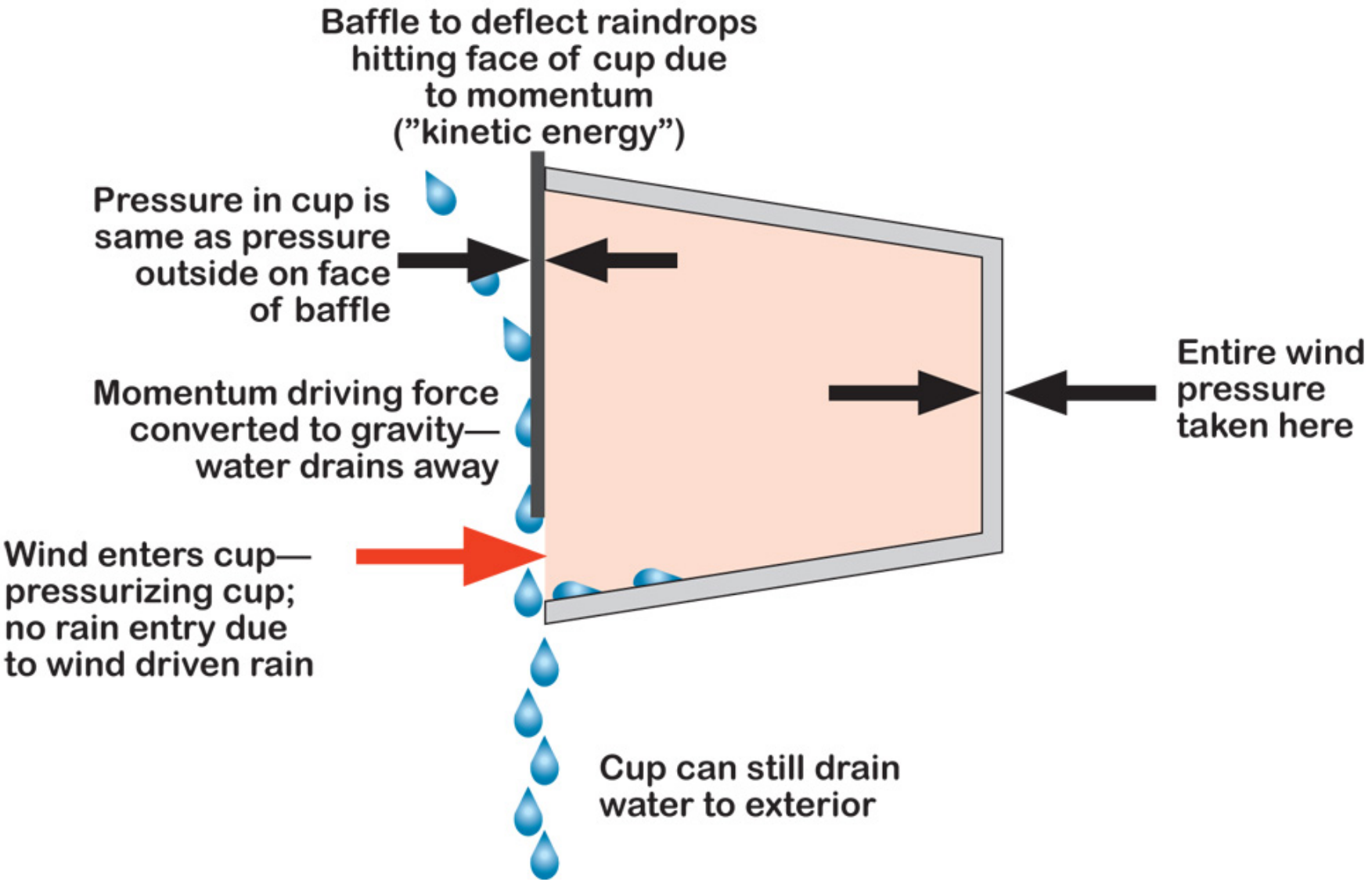


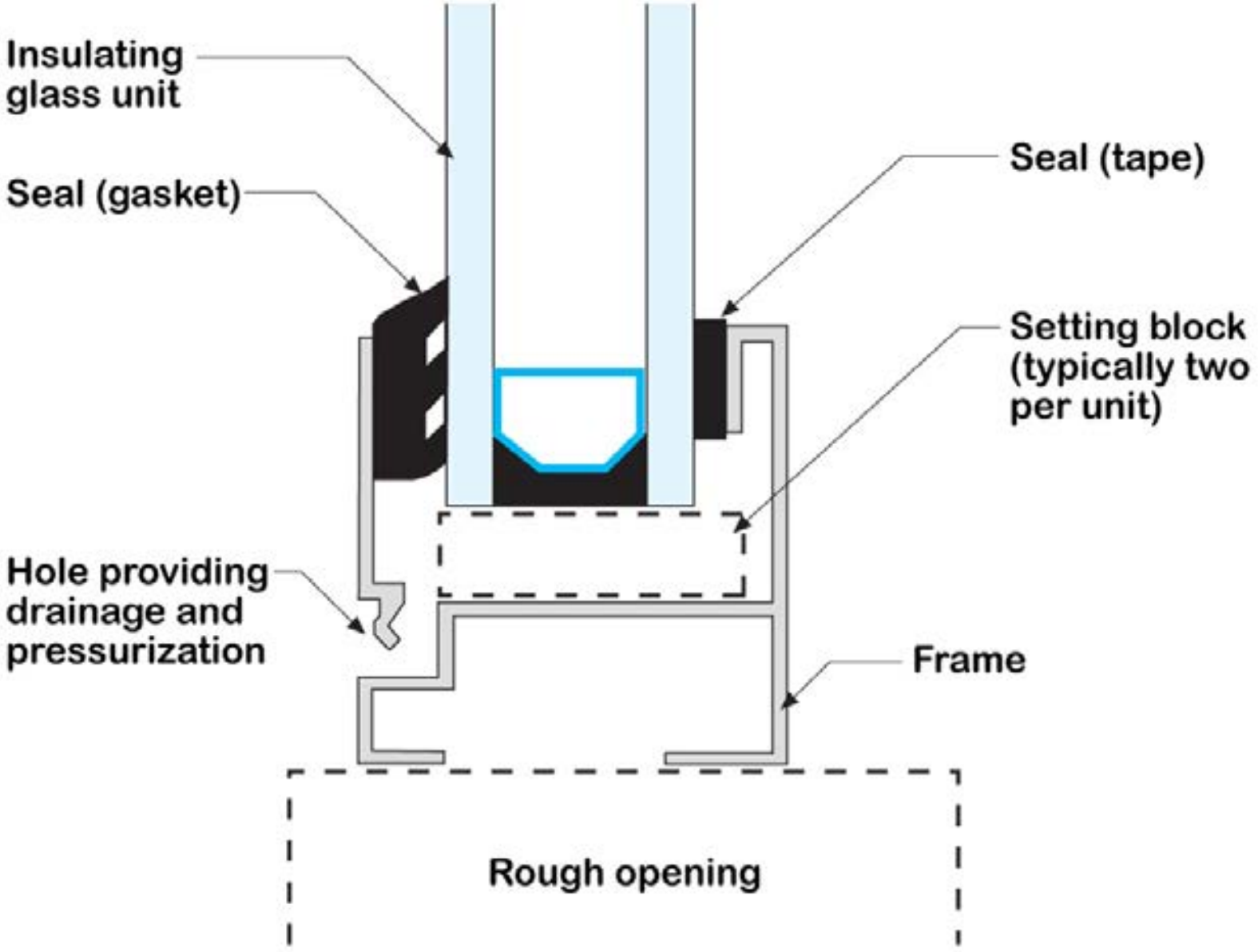
Rain enters cup
due to momentum
("kinetic energy")

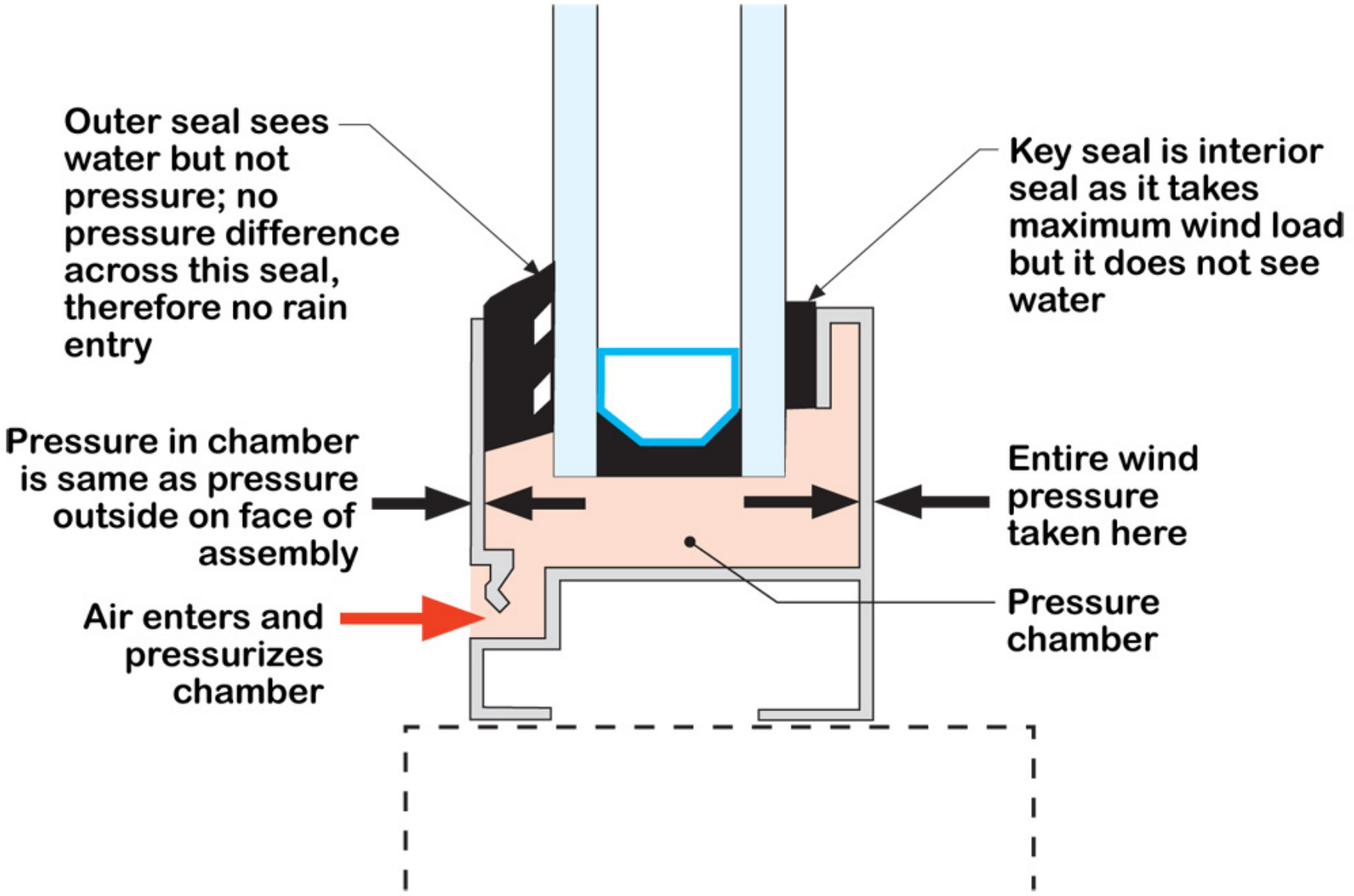


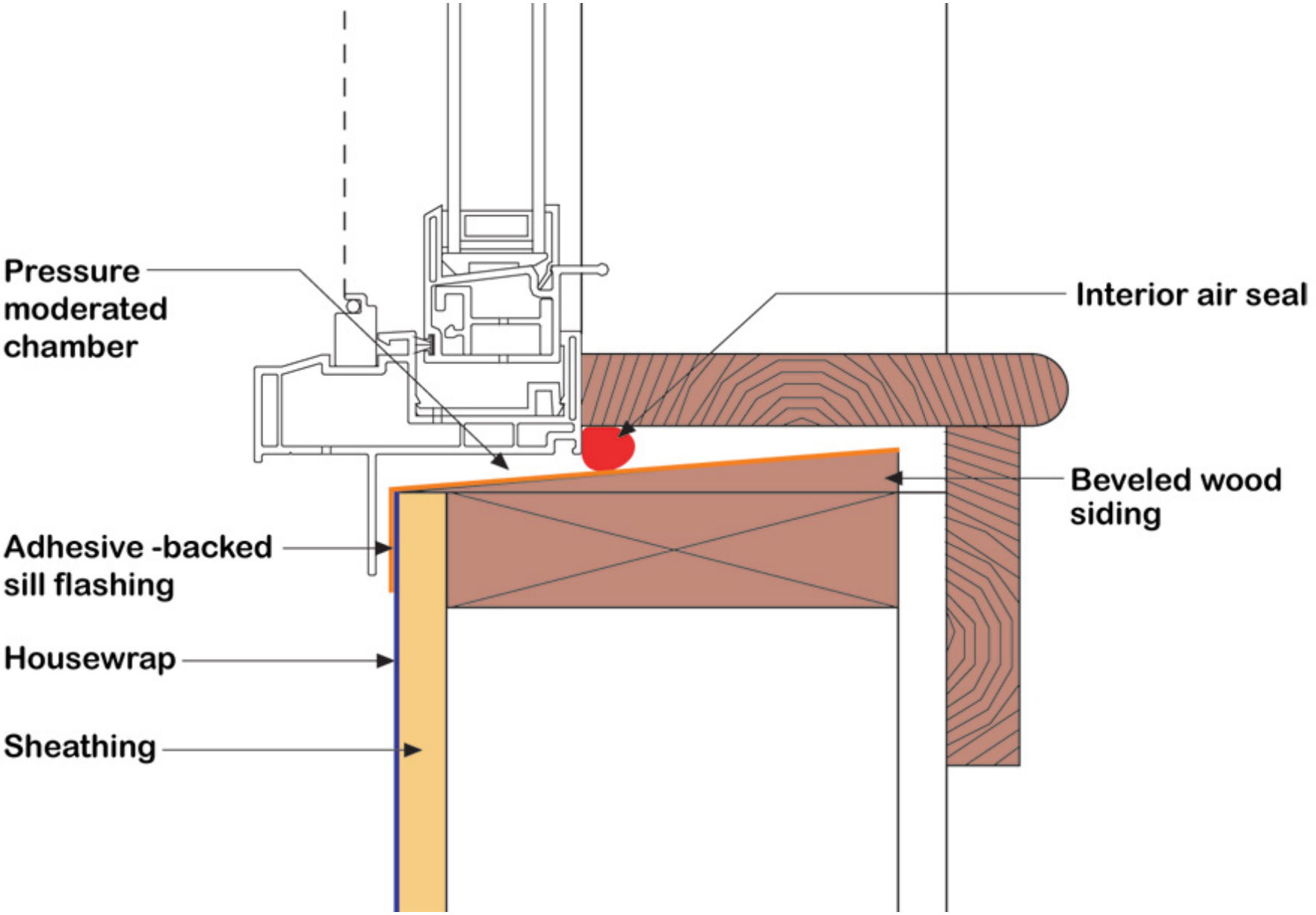
Cup drains water
to exterior


Rain enters cup due to momentum ("kinetic energy")
Wind enters cup— pressurizing cup; no rain entry due to wind driven rain
Entire wind pressure taken here
Cup can still drain water to exterior

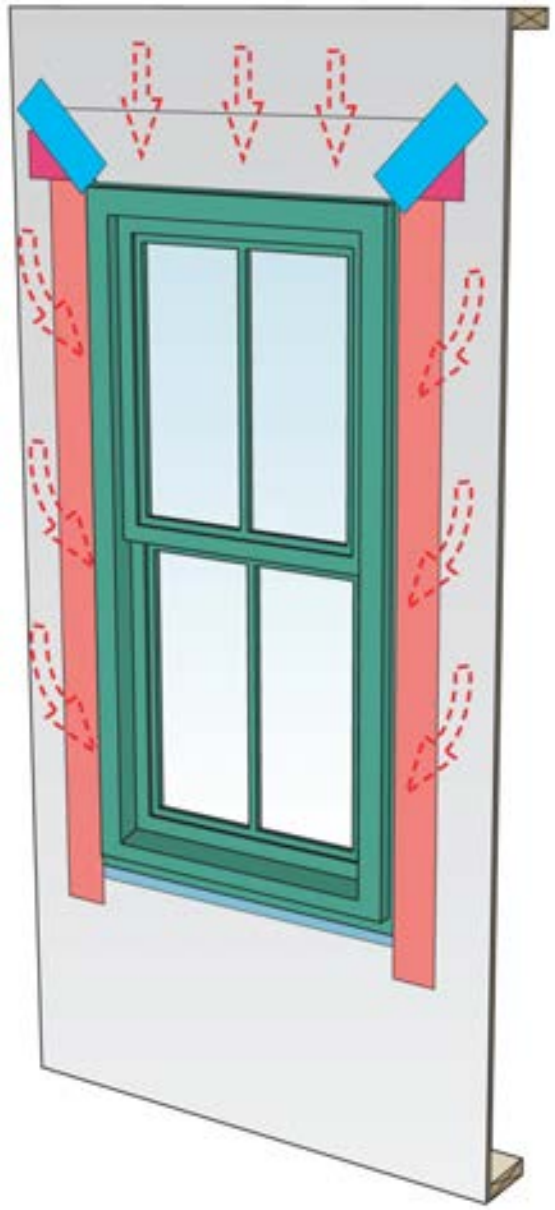

Baffle to deflect raindrops hitting face of cup due to momentum ("kinetic energy")
Pressure in cup is same as pressure outside on face of baffle
Momentum driving force converted to gravity— water drains away
Wind enters cup— pressurizing cup; no rain entry due to wind driven rain
Entire wind pressure taken here
Cup can still drain water to exterior

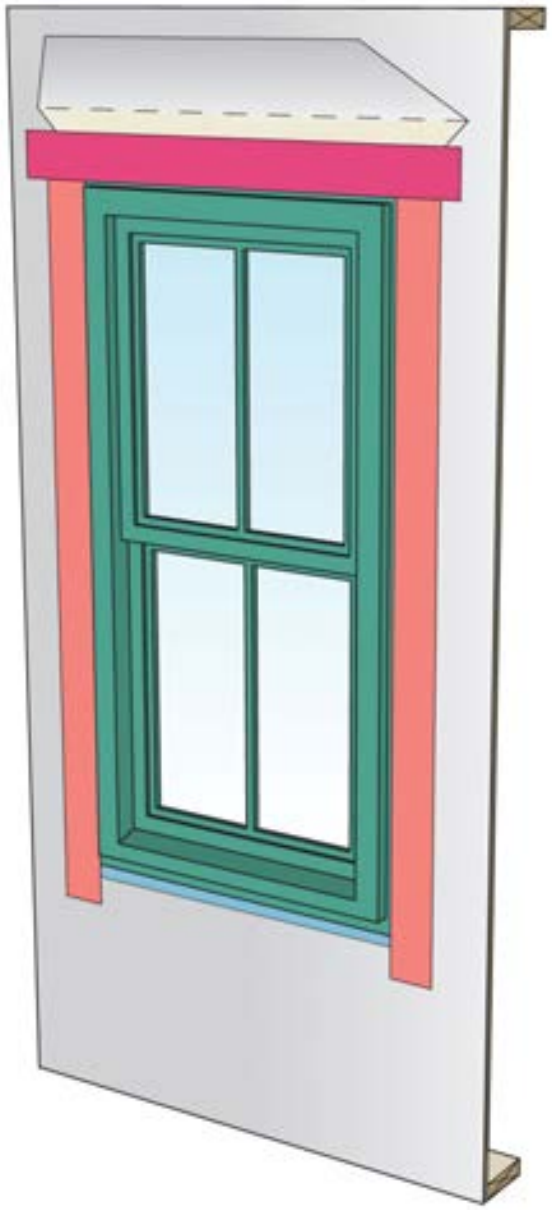

Insulating glass unit
Seal (gasket)
Seal (tape)
Setting block (typically two per unit)
Hole providing drainage and pressurization
Frame
Rough opening

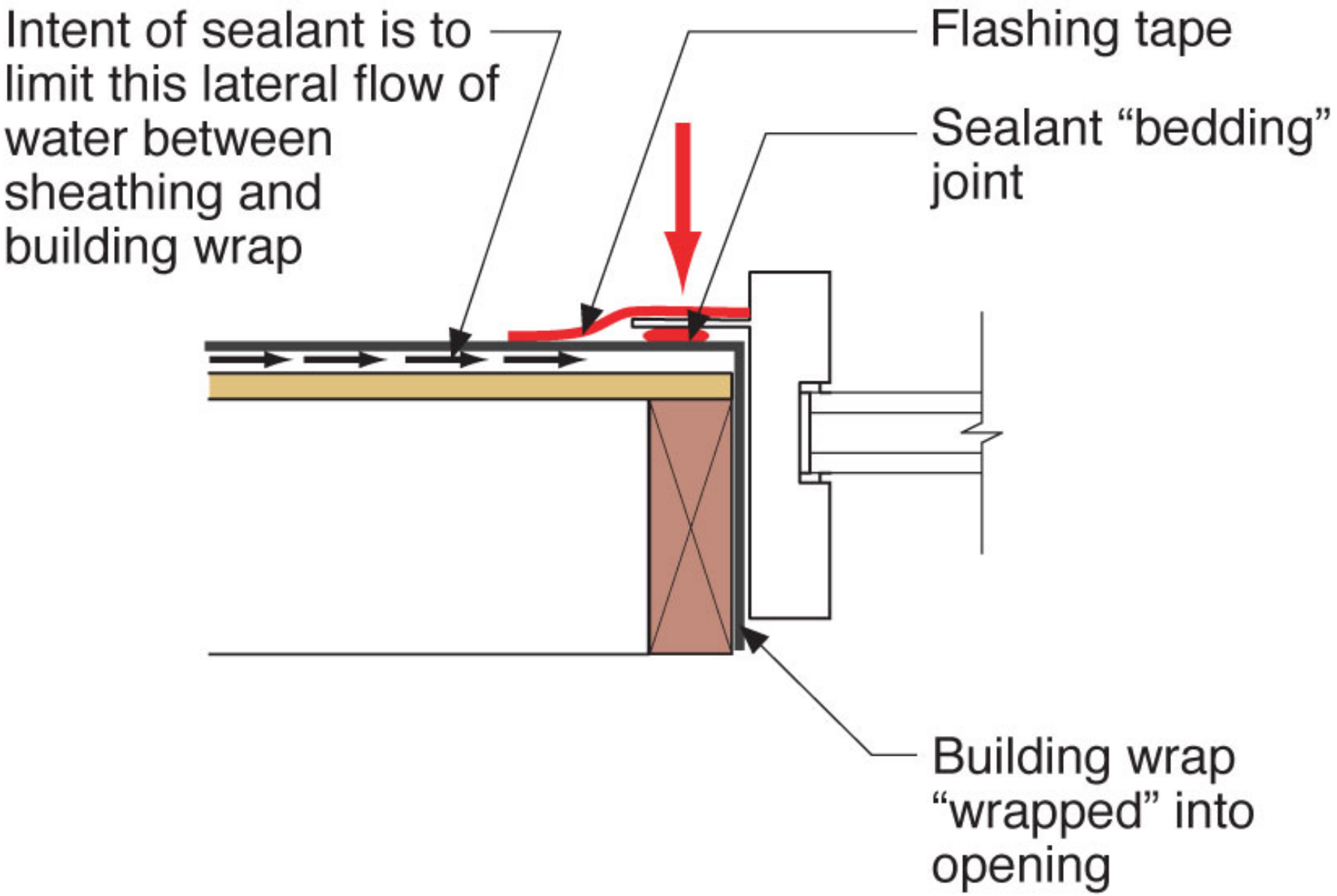

Outer seal sees water but not pressure; no pressure difference across this seal, therefore no rain entry
Key seal is interior seal as it takes maximum wind load but it does not see water
Pressure in chamber is same as pressure outside on face of assembly
Entire wind pressure taken here
Air enters and pressurizes chamber
Pressure chamber

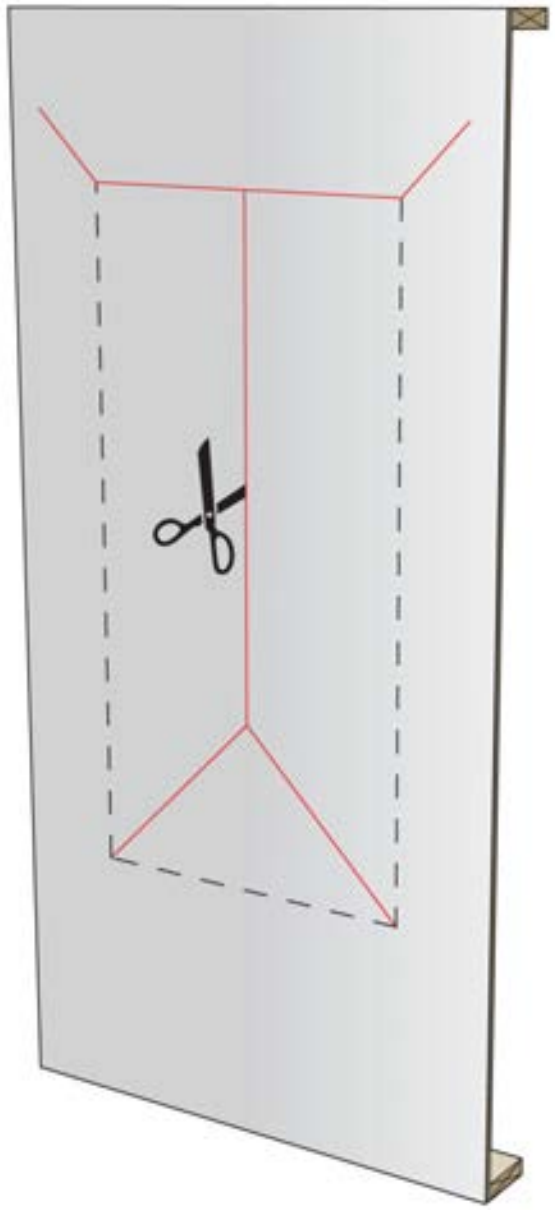

Pressure moderated chamber
Interior air seal
Beveled wood siding
Adhesive -backed sill flashing
Housewrap
Sheathing

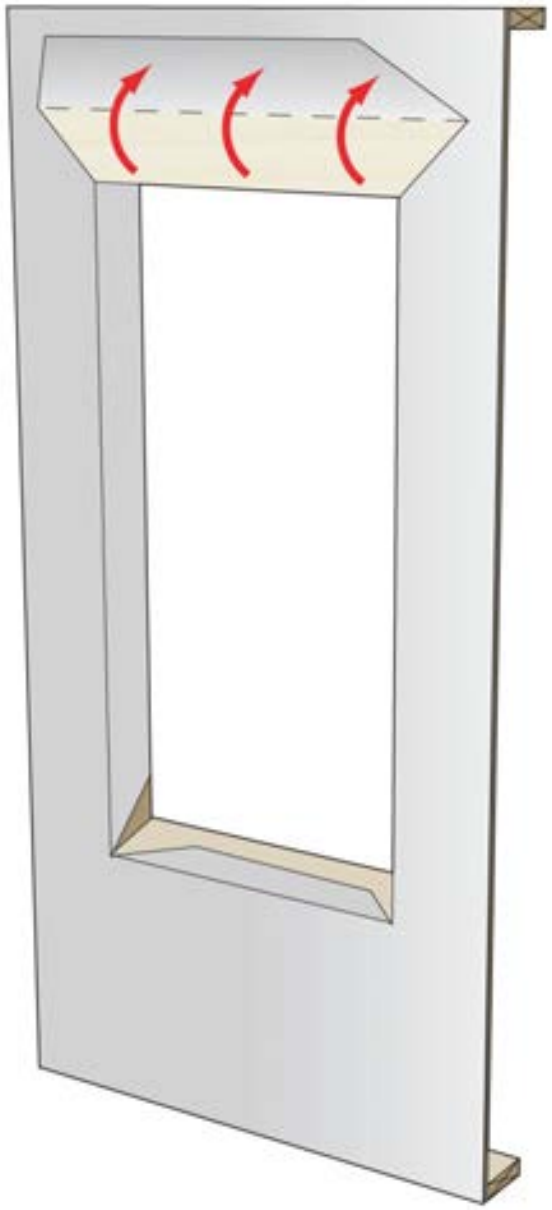

ightFlash

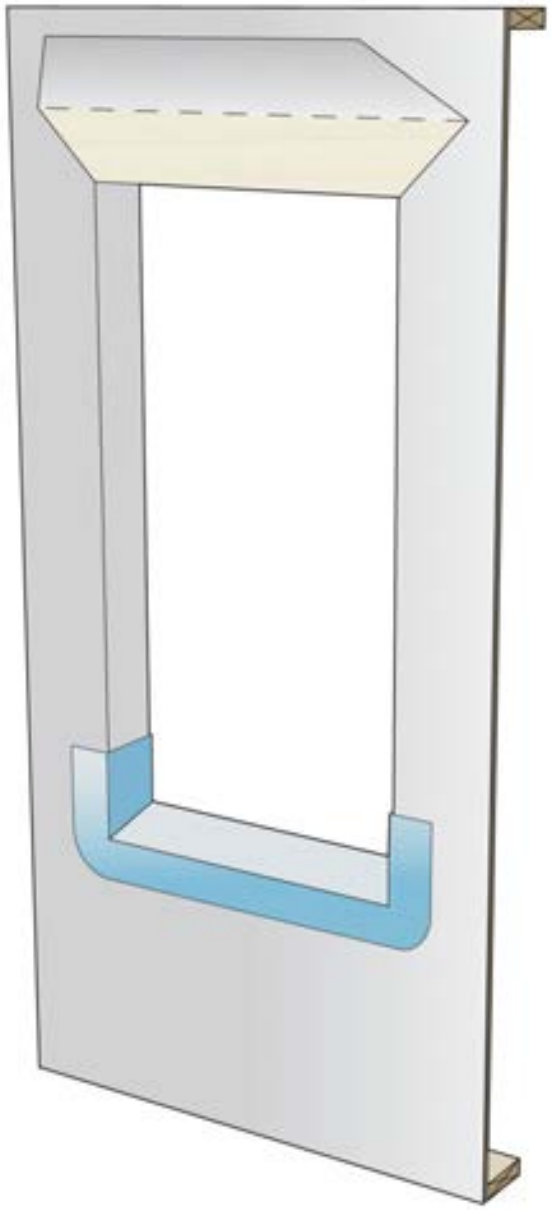


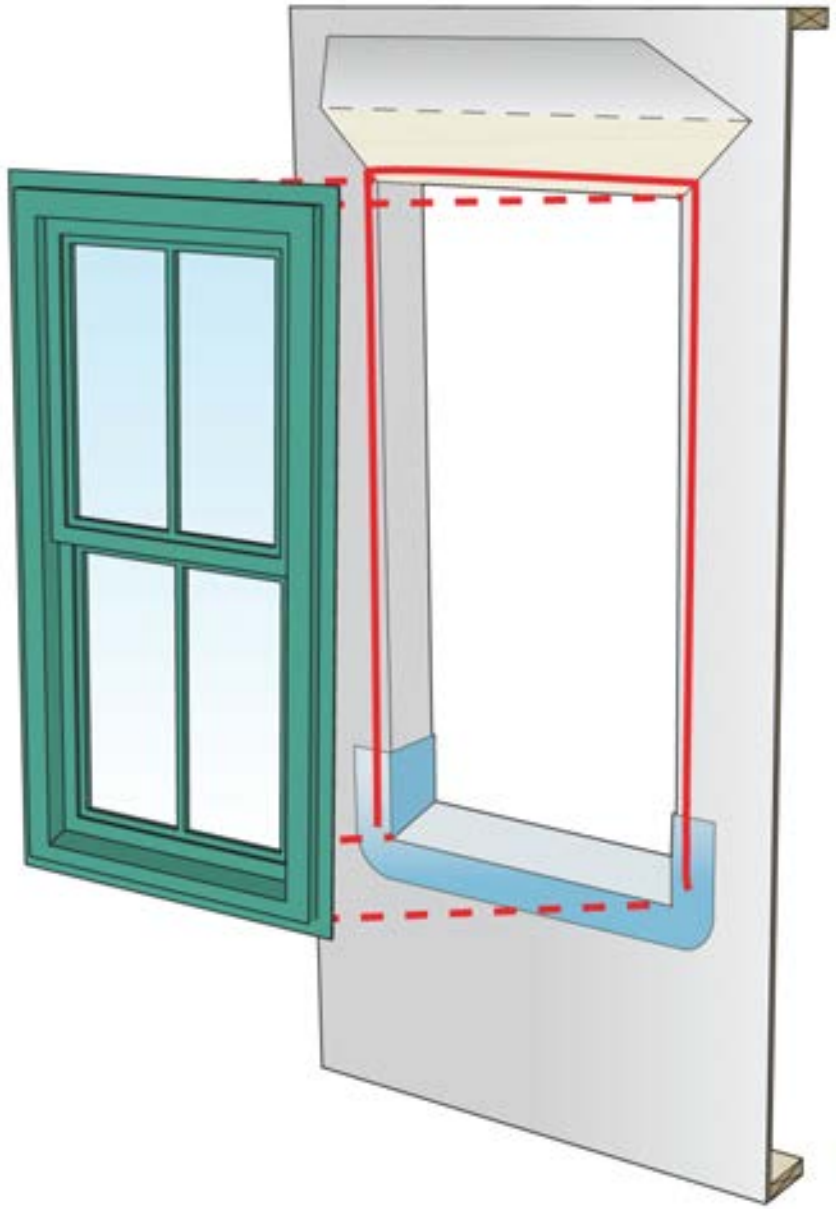


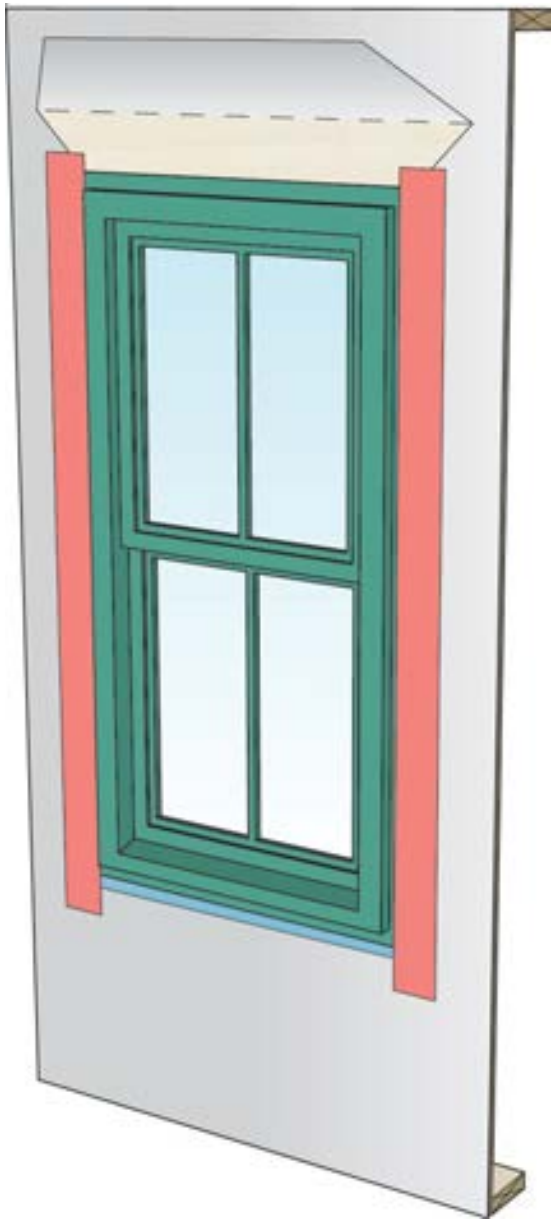

Intent of sealant is to limit this lateral flow of water between sheathing and building wrap
Flashing tape
Sealant “bedding” joint
Building wrap “wrapped” into opening

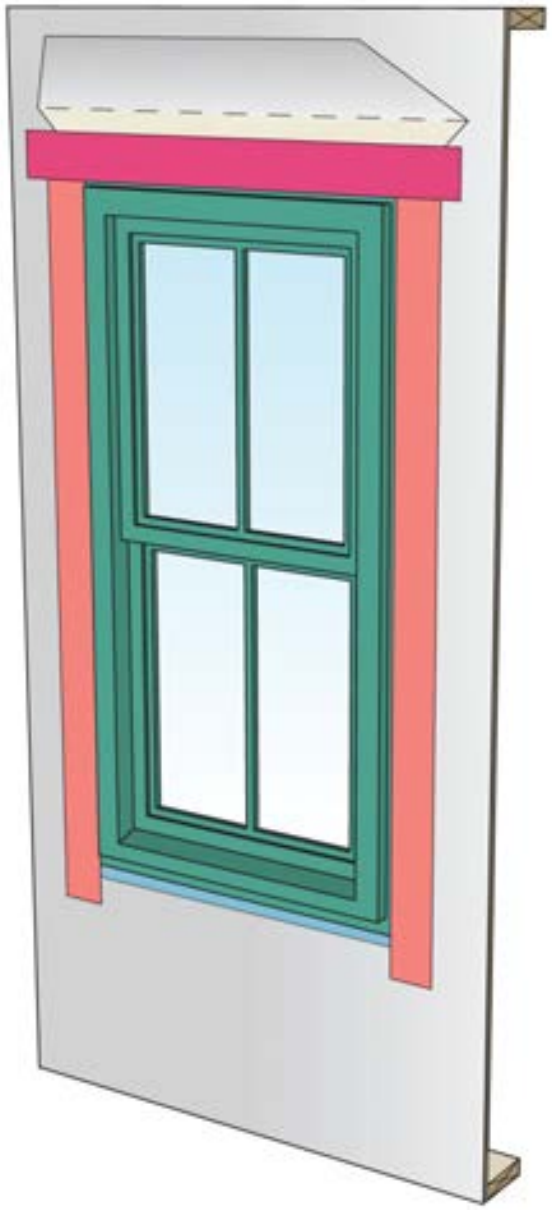


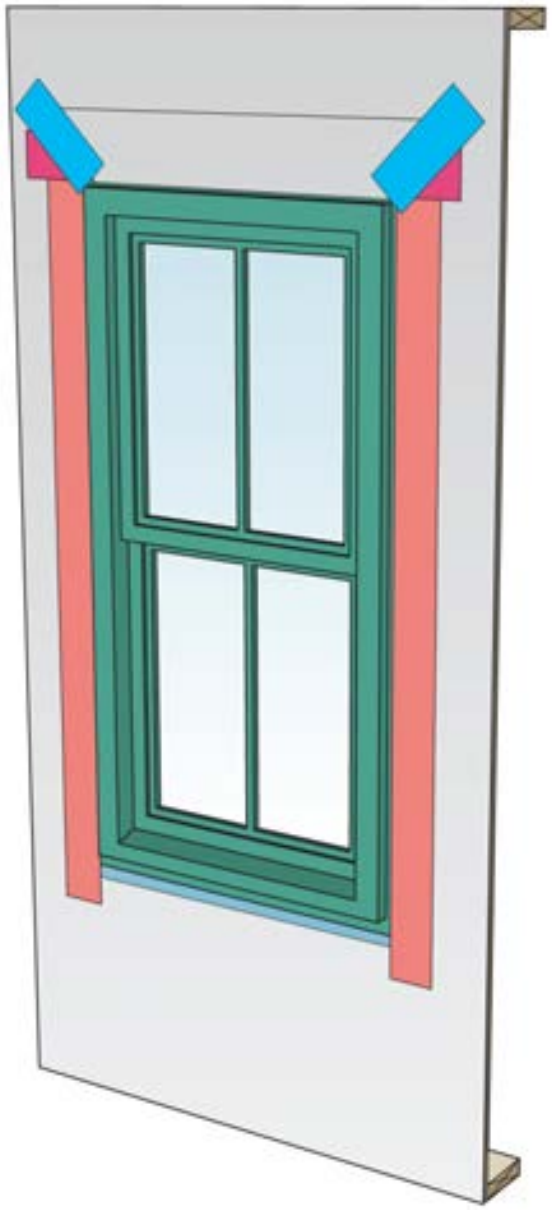


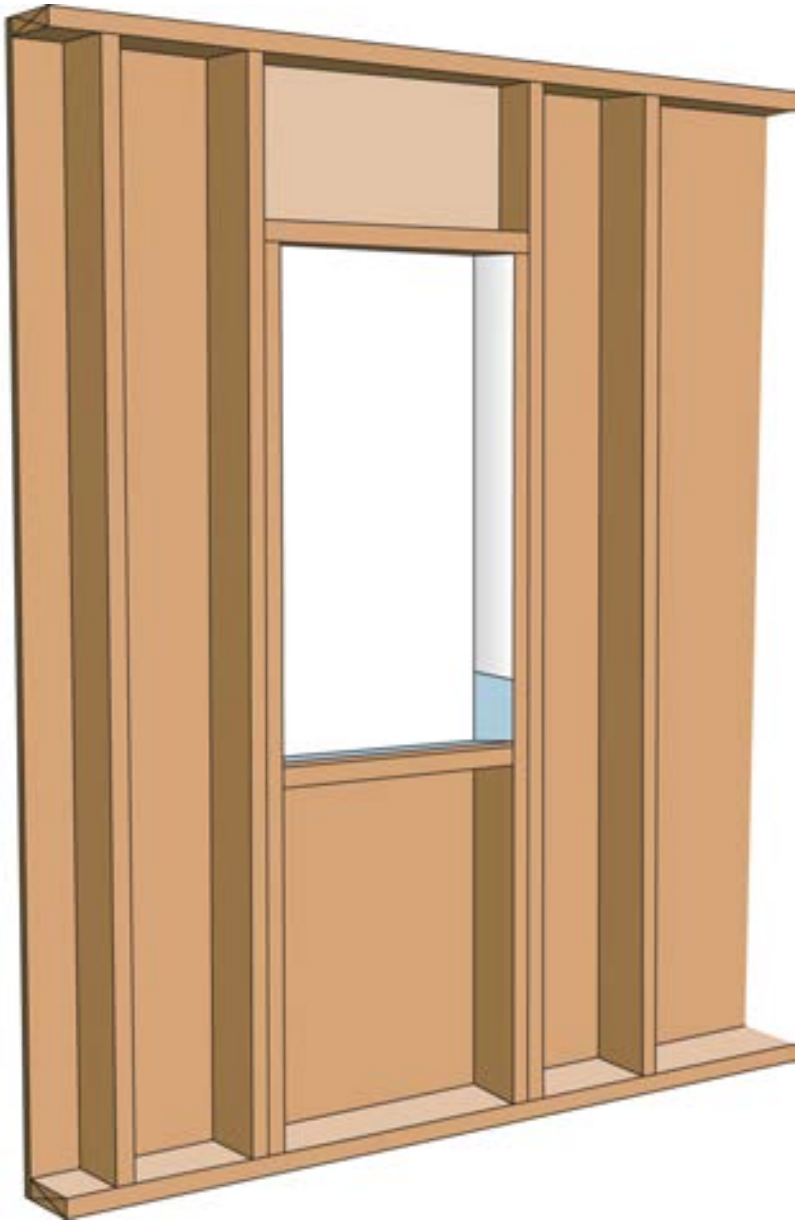


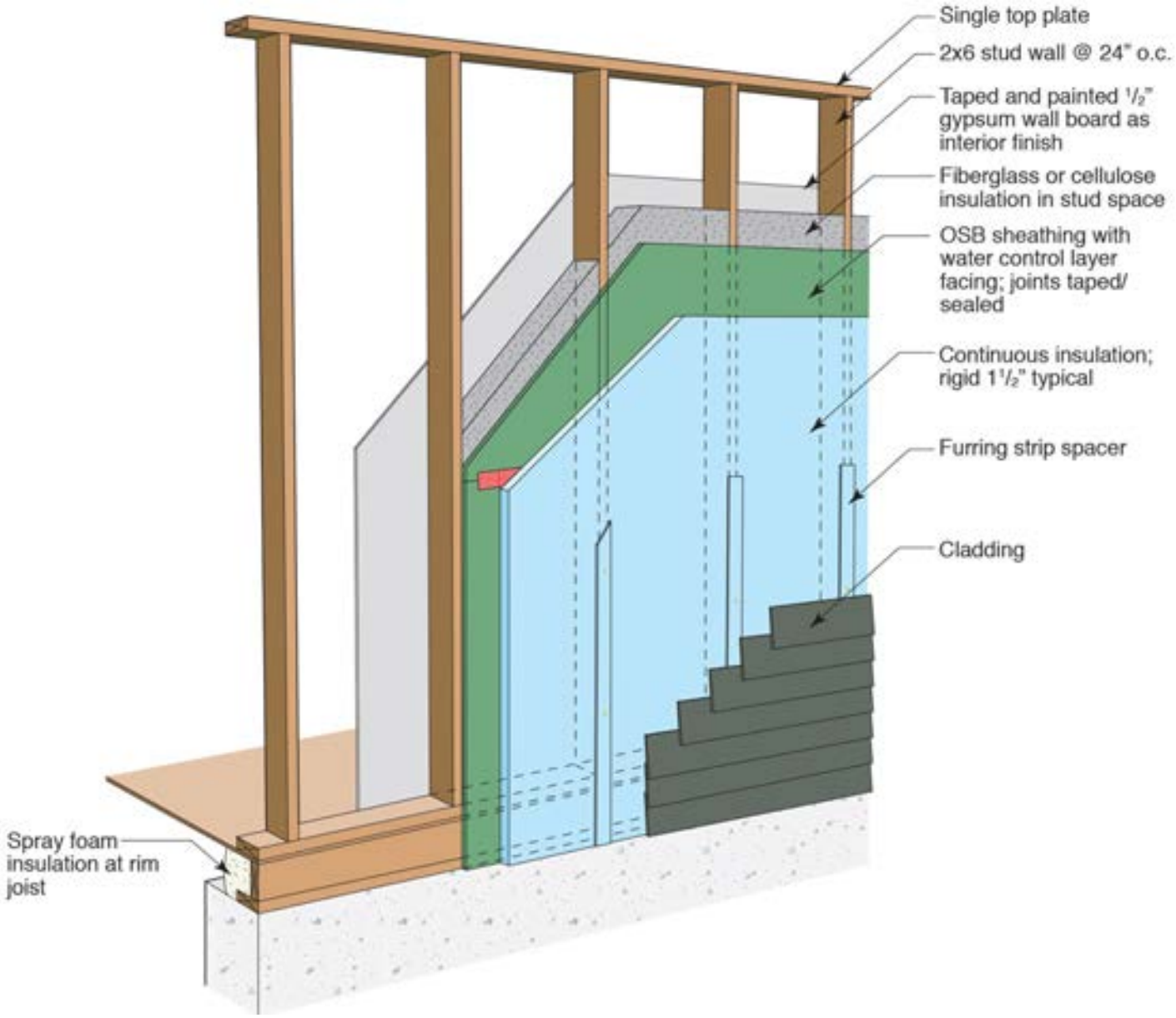


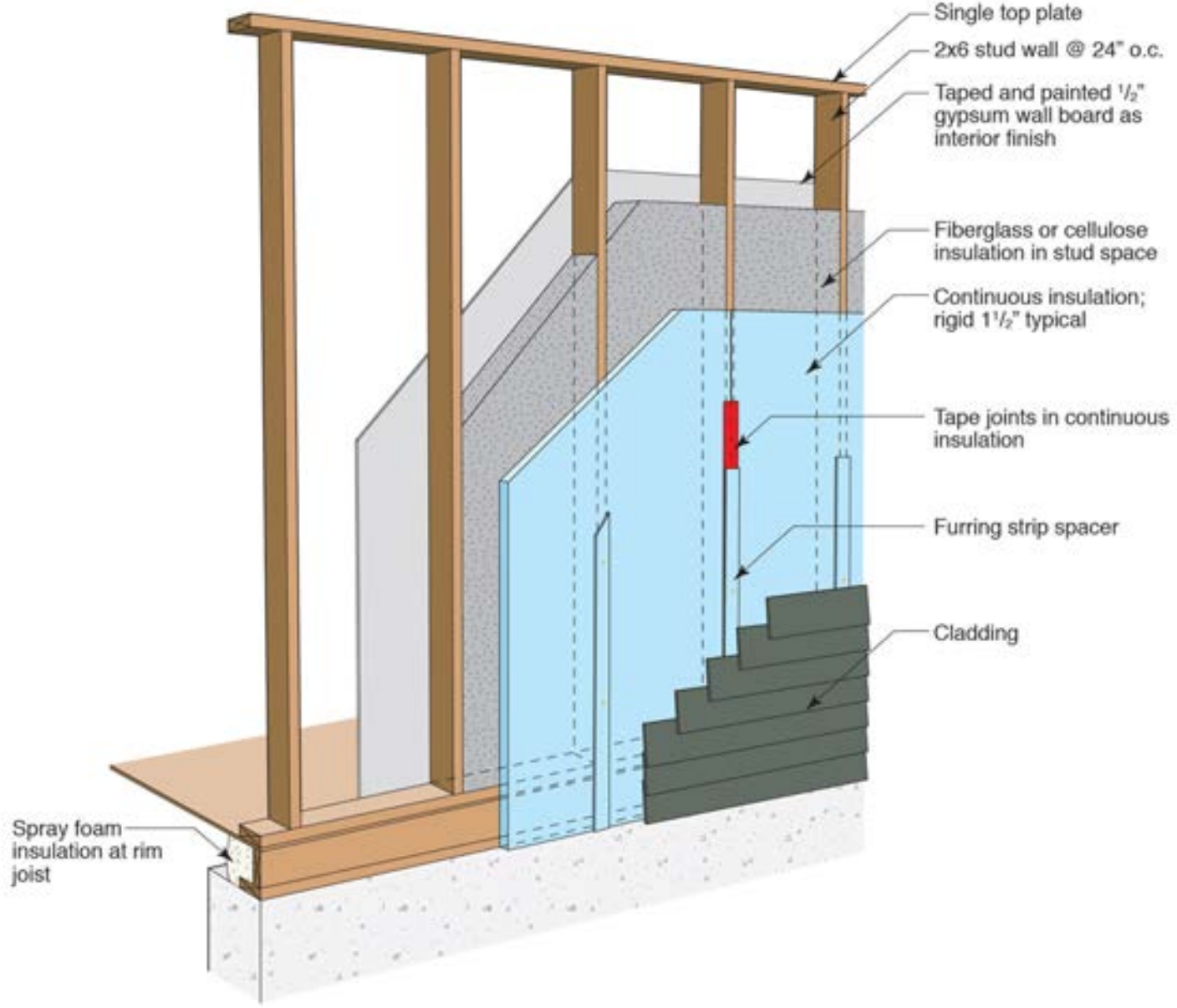









Single top plate
2x6 stud wall @ 24" o.c.
Taped and painted 1/2" gypsum wall board as interior finish
Fiberglass or cellulose insulation in stud space
OSB sheathing with water control layer facing; joints taped/ sealed
Continuous insulation; rigid 1 1/2" typical
Furring strip spacer
Cladding
Spray foam insulation at rim joist


Single top plate
2x6 stud wall @ 24" o.c.
Taped and painted ½" gypsum wall board as interior finish
Fiberglass or cellulose insulation in stud space
Continuous insulation; rigid 1½" typical
Tape joints in continuous insulation
Furring strip spacer
Cladding
Spray foam insulation at rim joist

Where Is The Water Control Layer?

Where Is The Water Control Layer?

Behind The Continuous Insulation?

Or The Face of The Continuous Insulation?

Where Is The Water Control Layer?

Behind The Continuous Insulation?

Or The Face of The Continuous Insulation?

Where Is The Window?

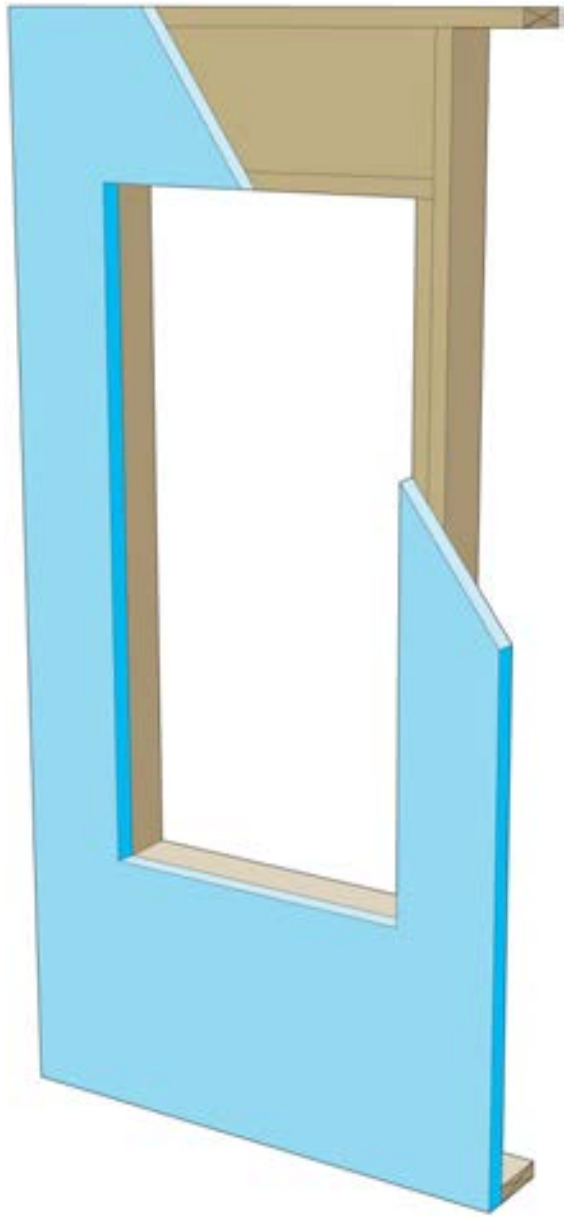
Where Is The Water Control Layer?

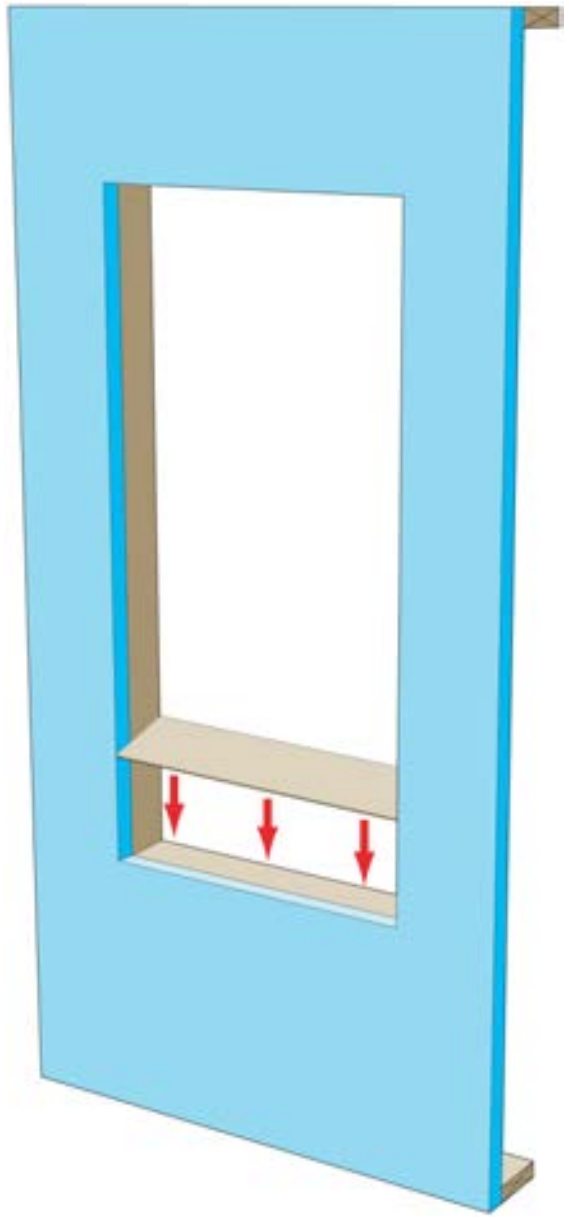
Behind The Continuous Insulation?

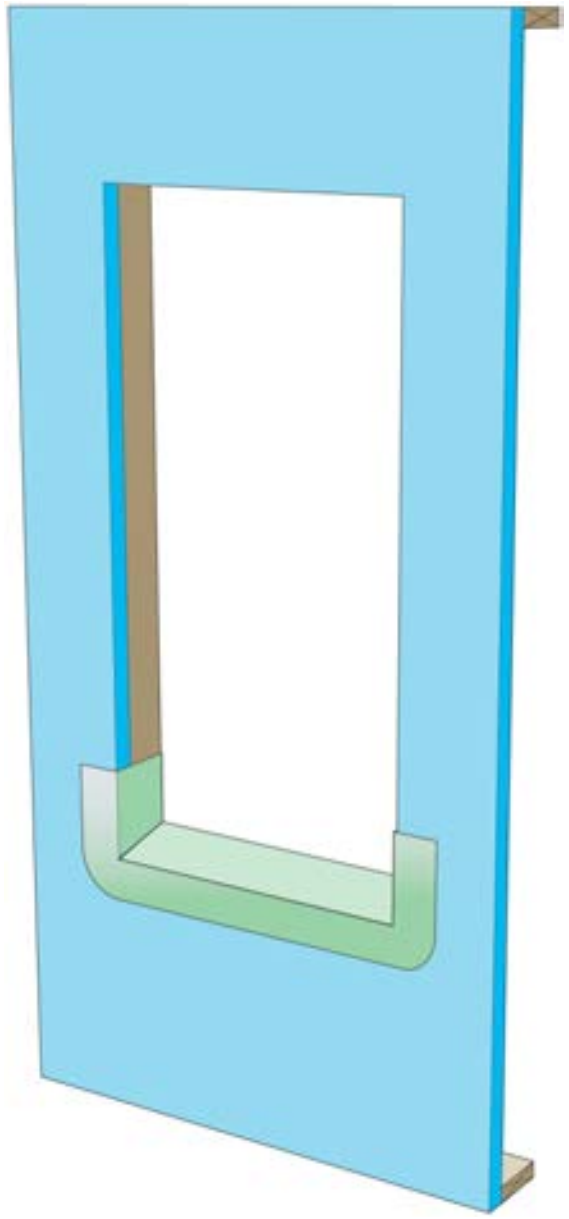
Or The Face of The Continuous Insulation?

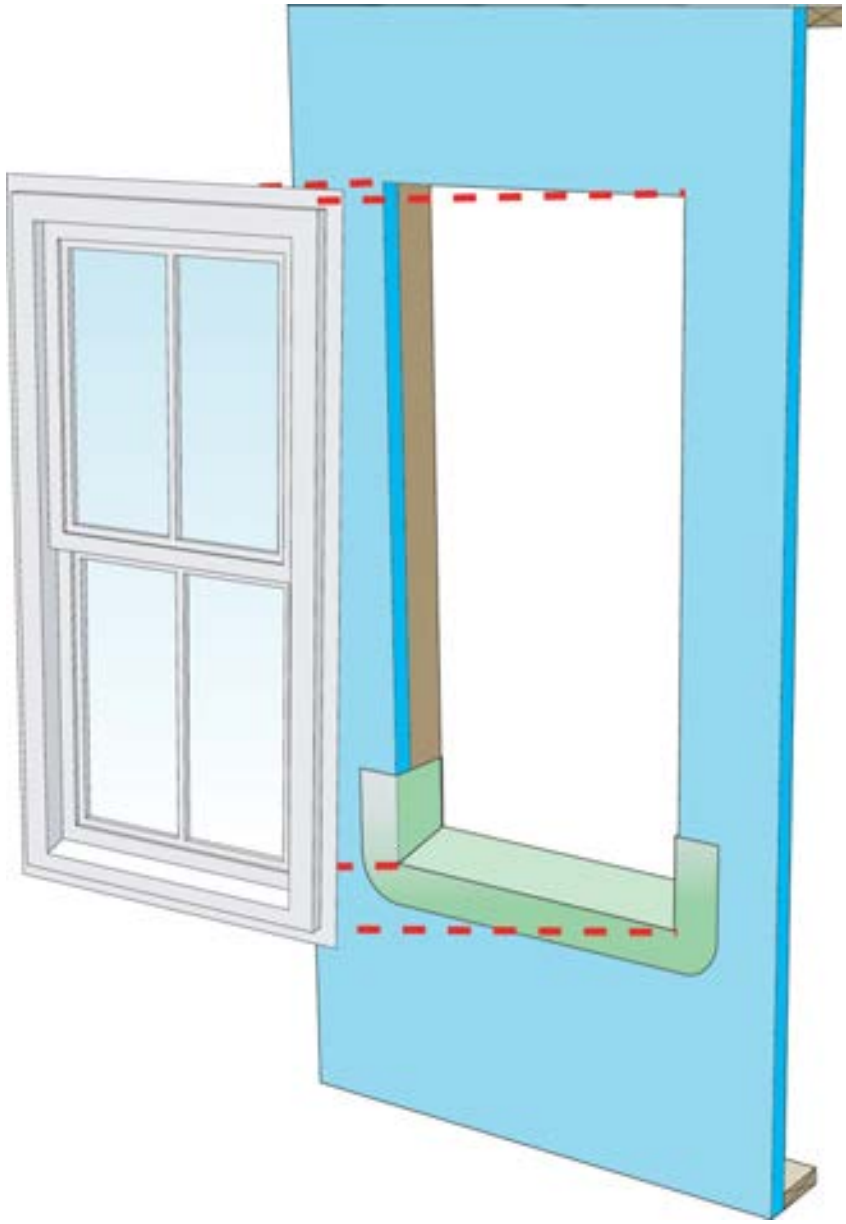
Where Is The Window?

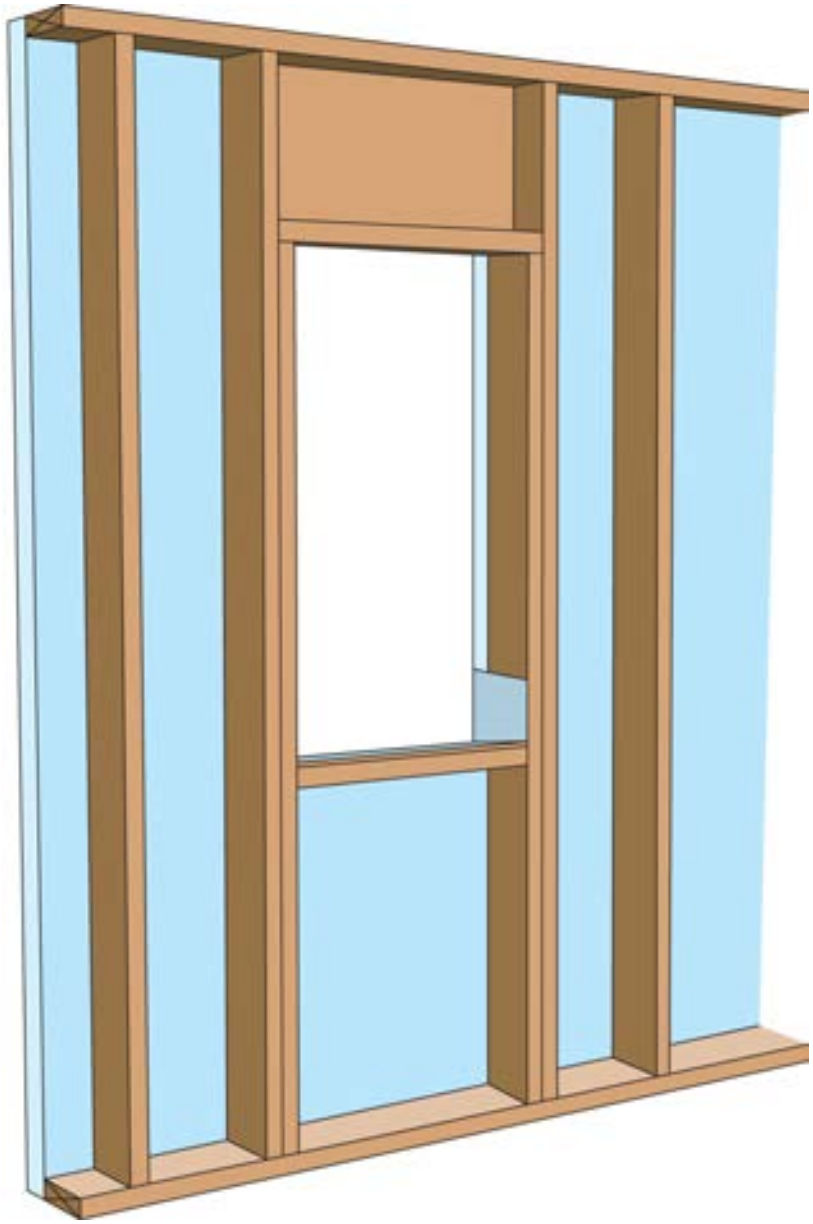
Is It An Innie Or Outie Or Tweeny?

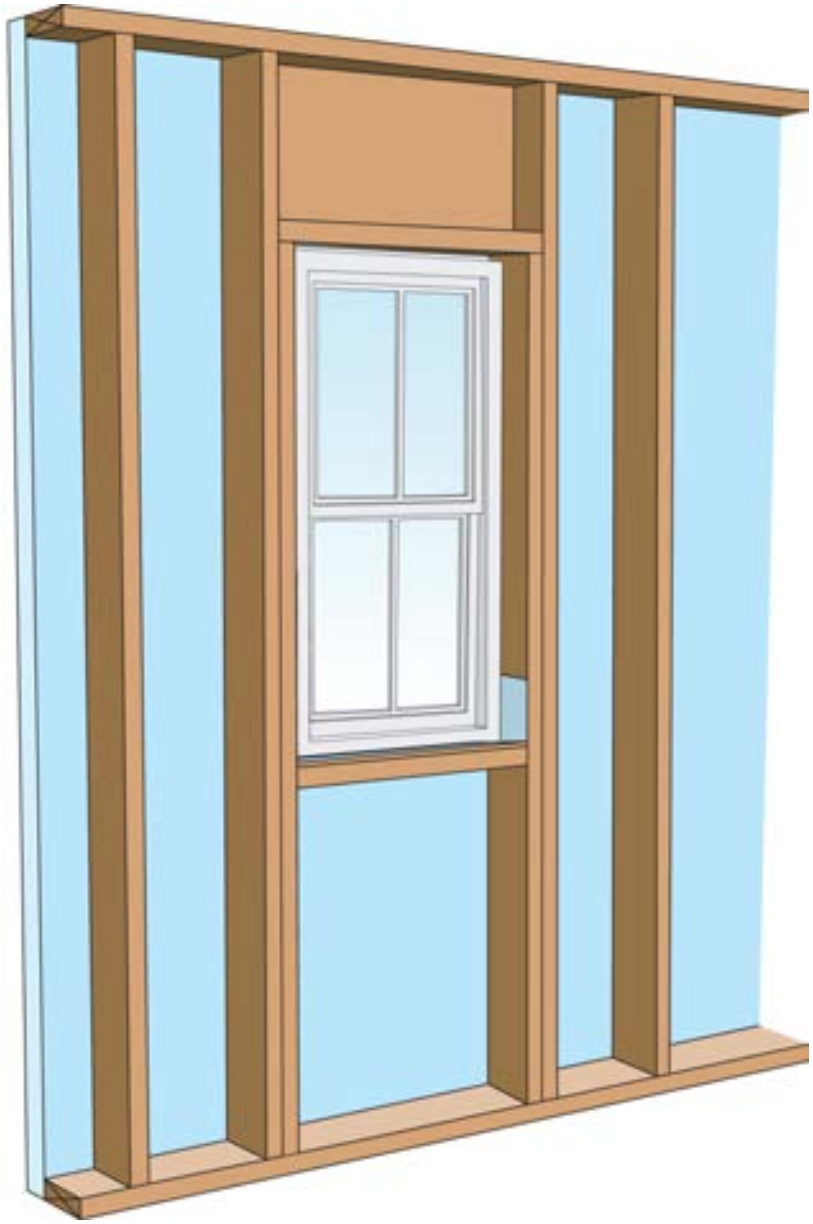


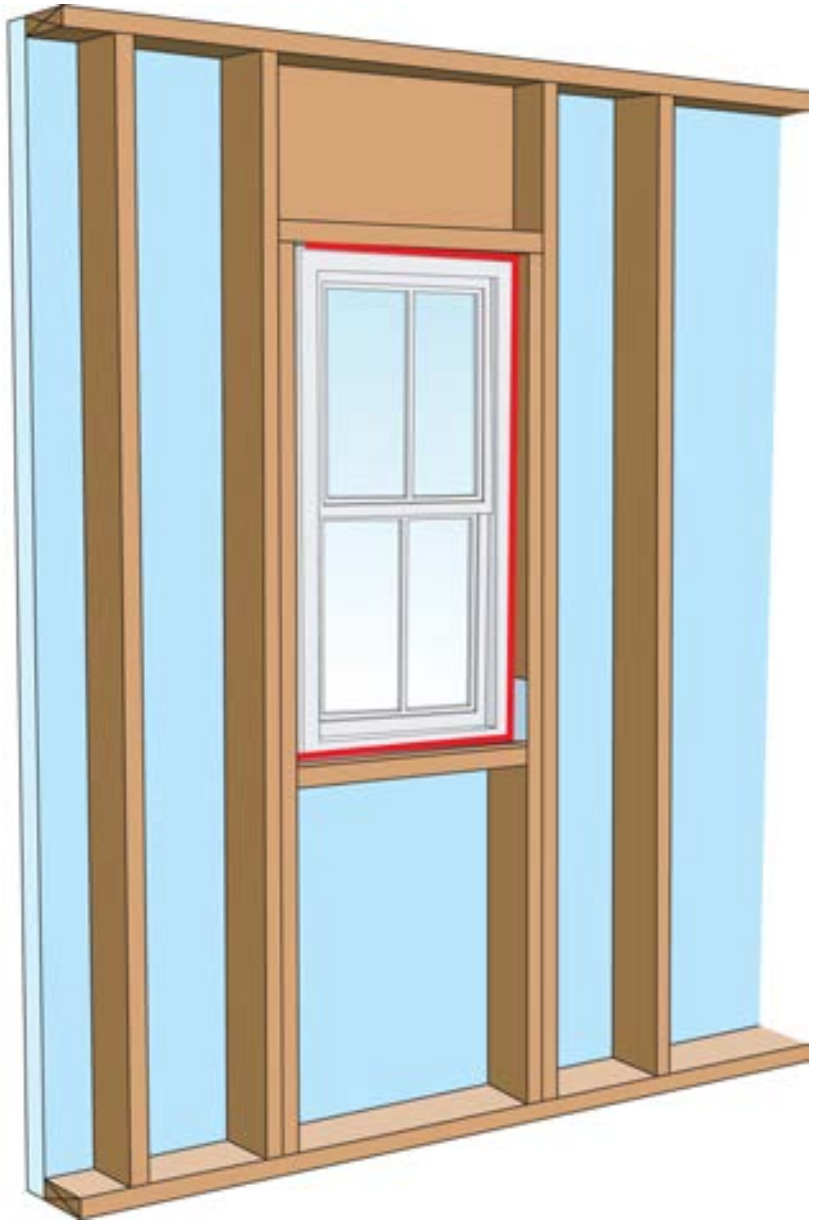


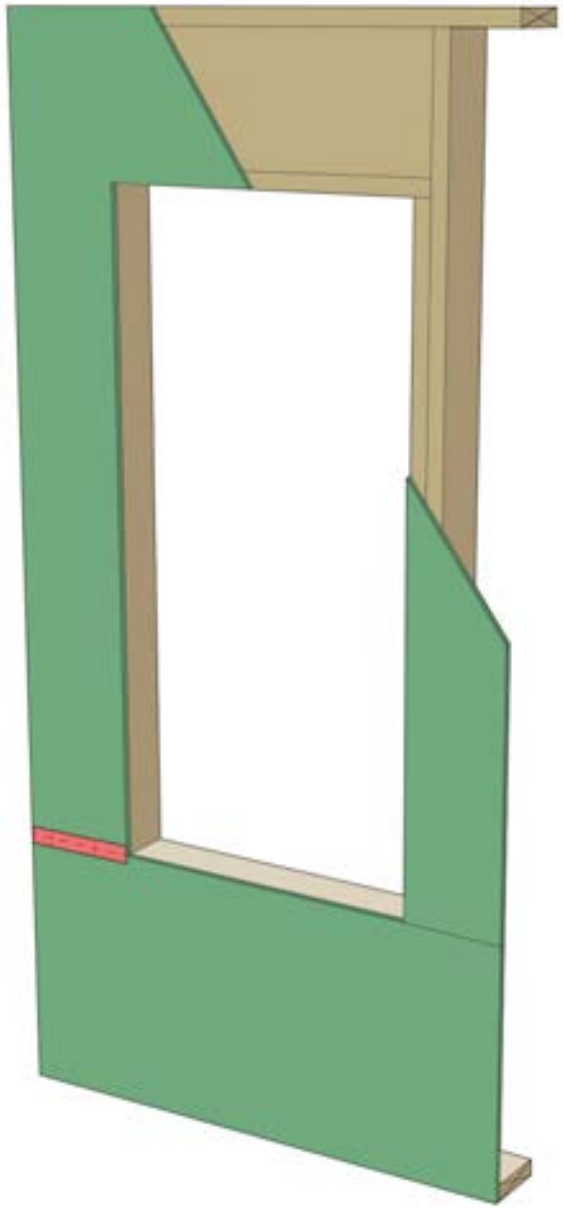


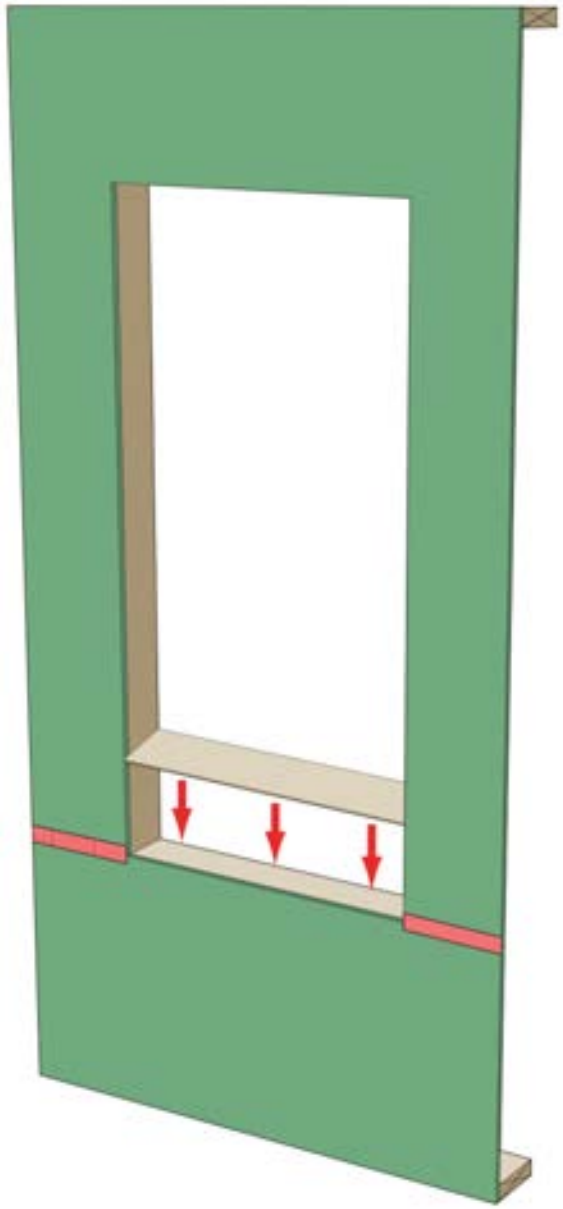


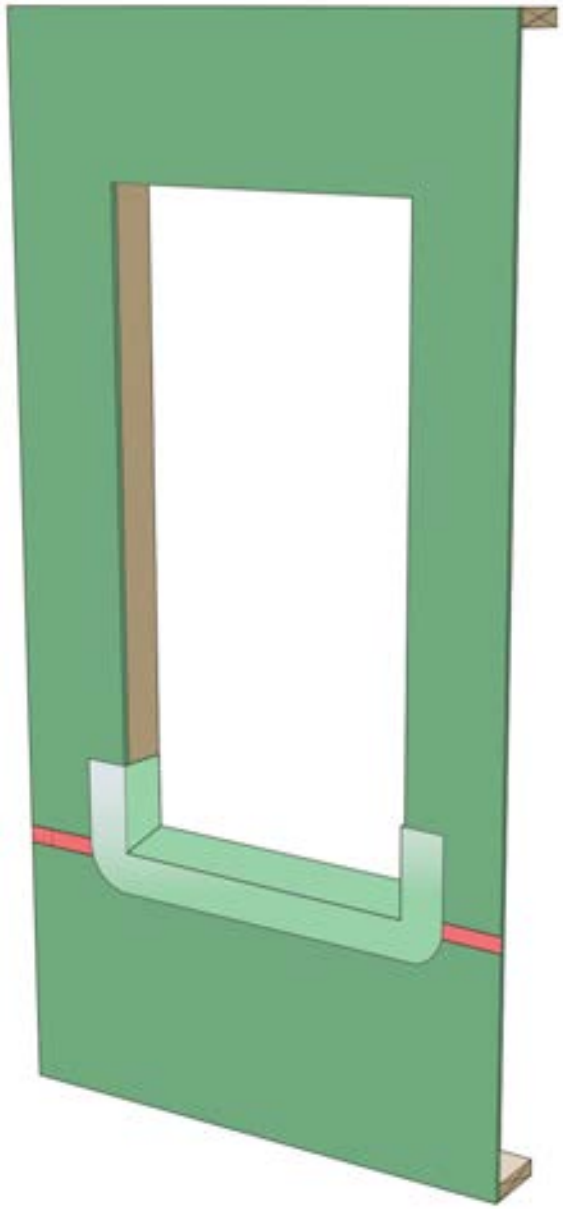


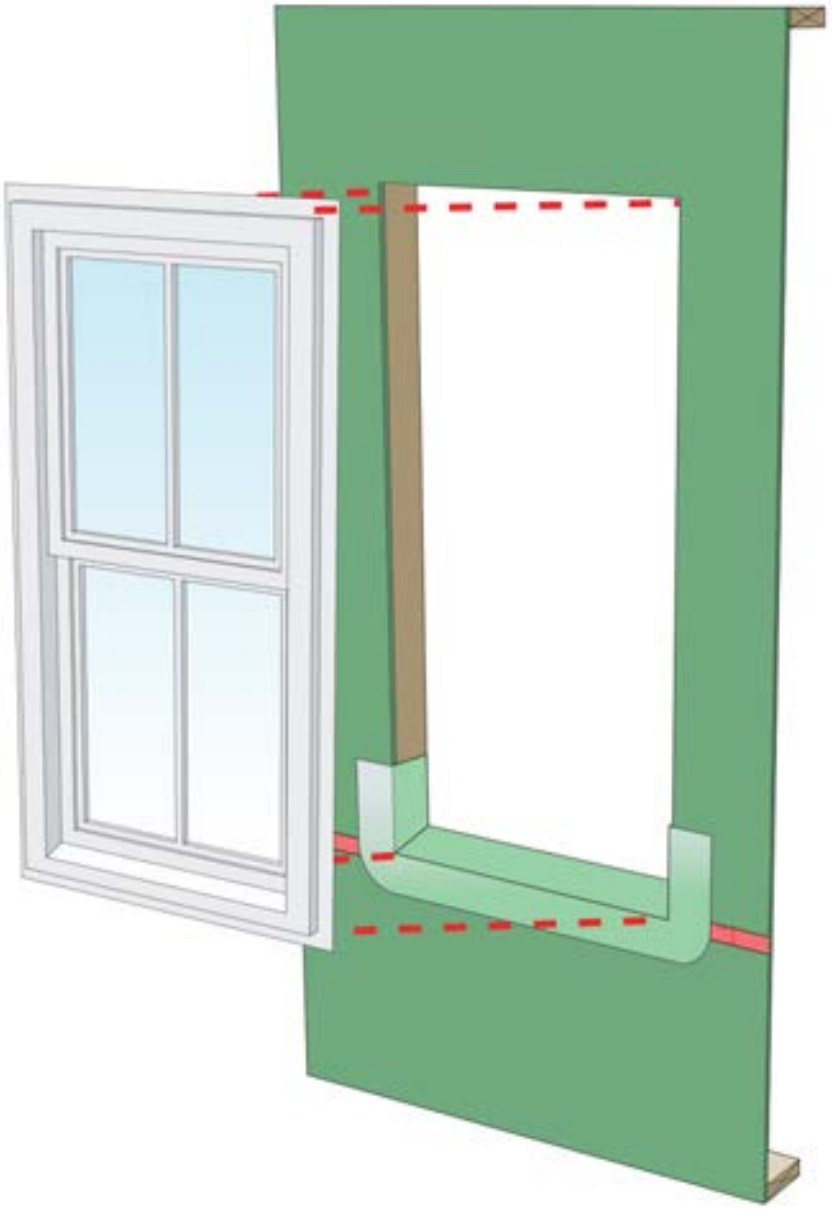


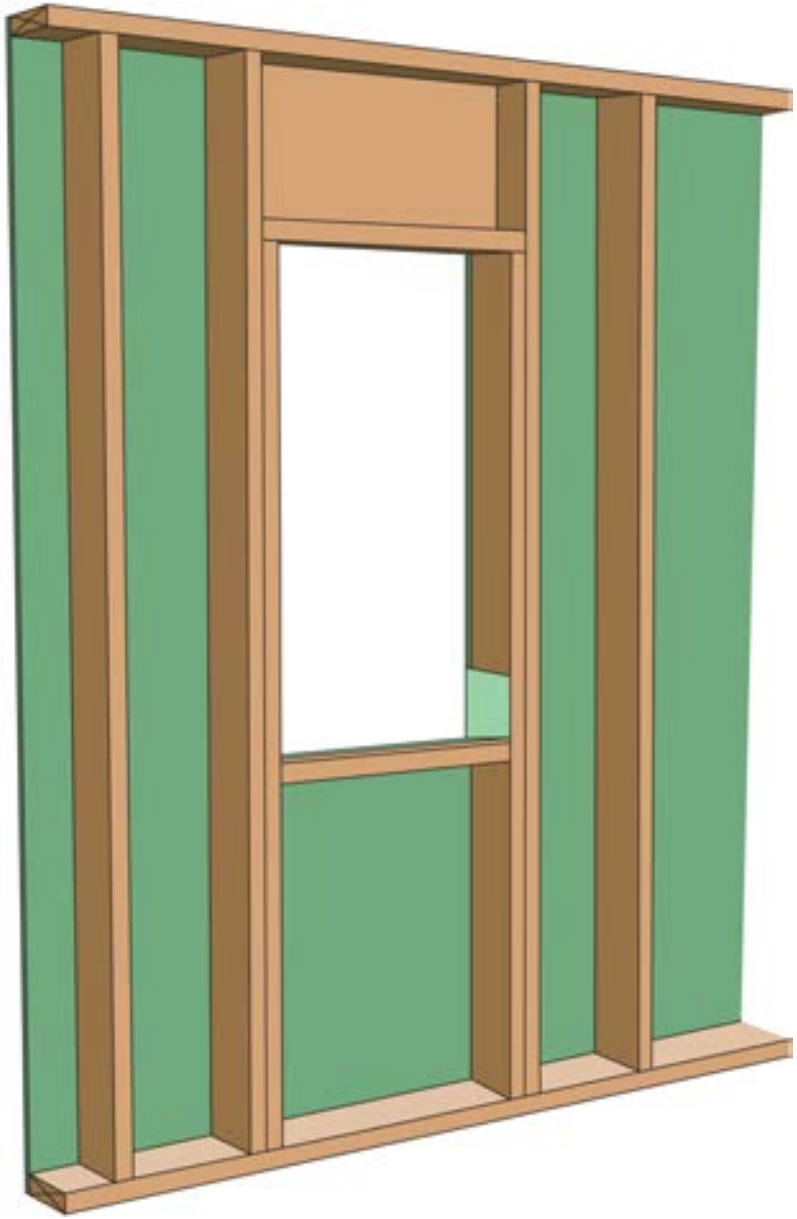


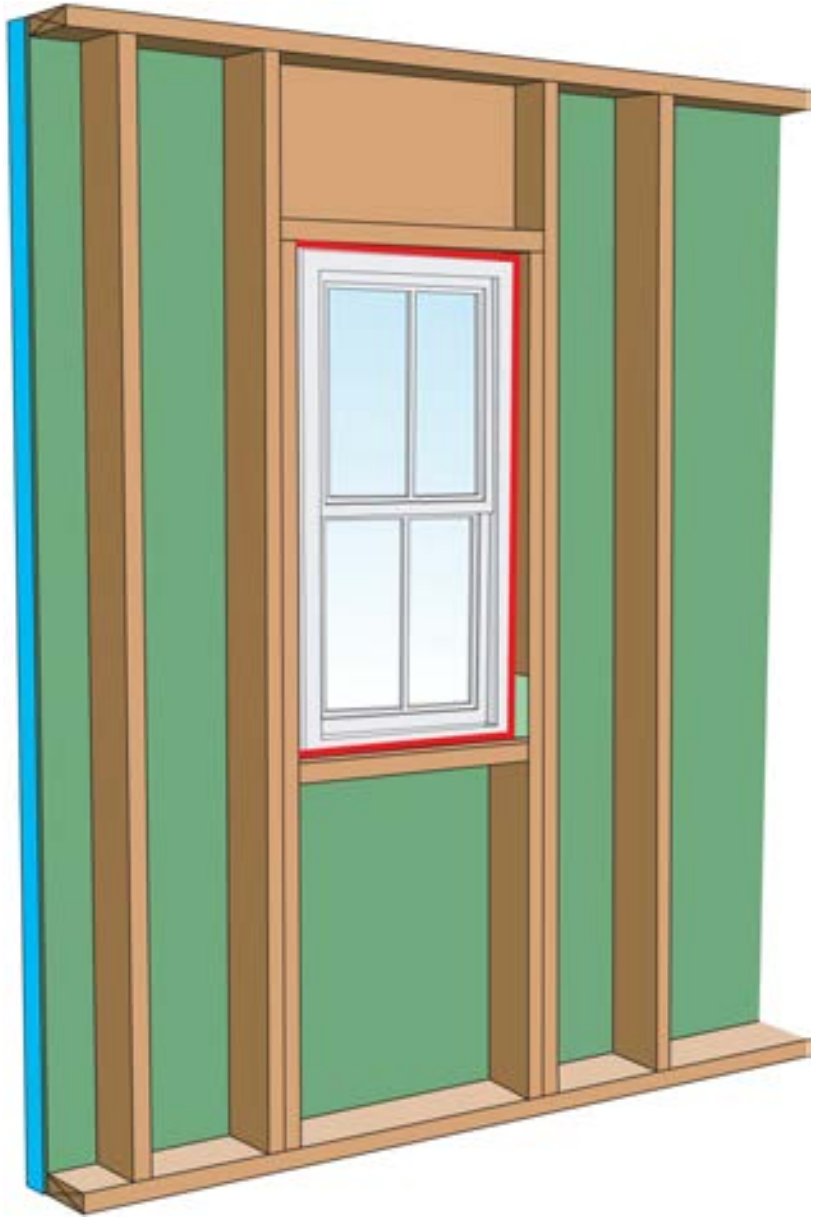


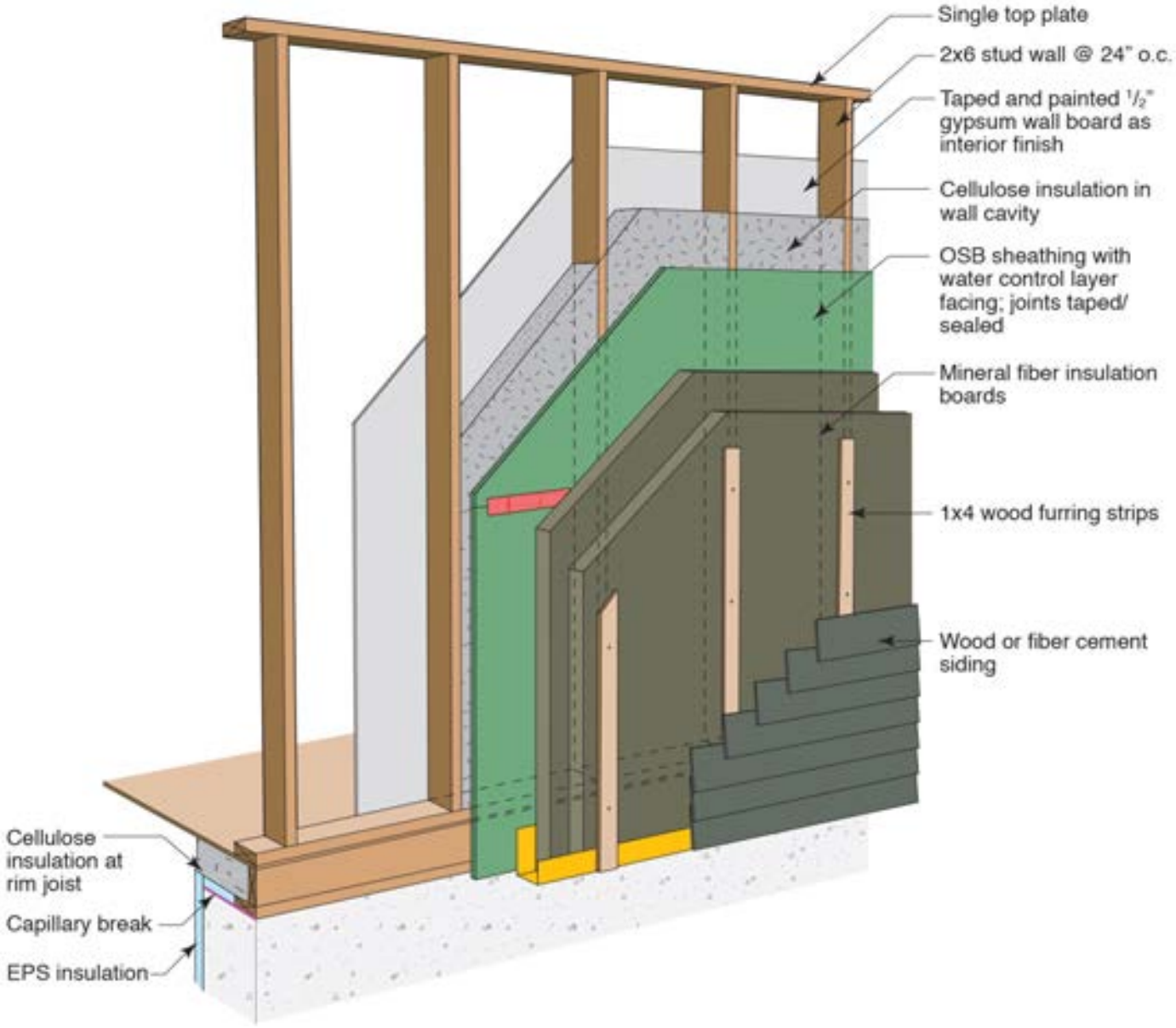


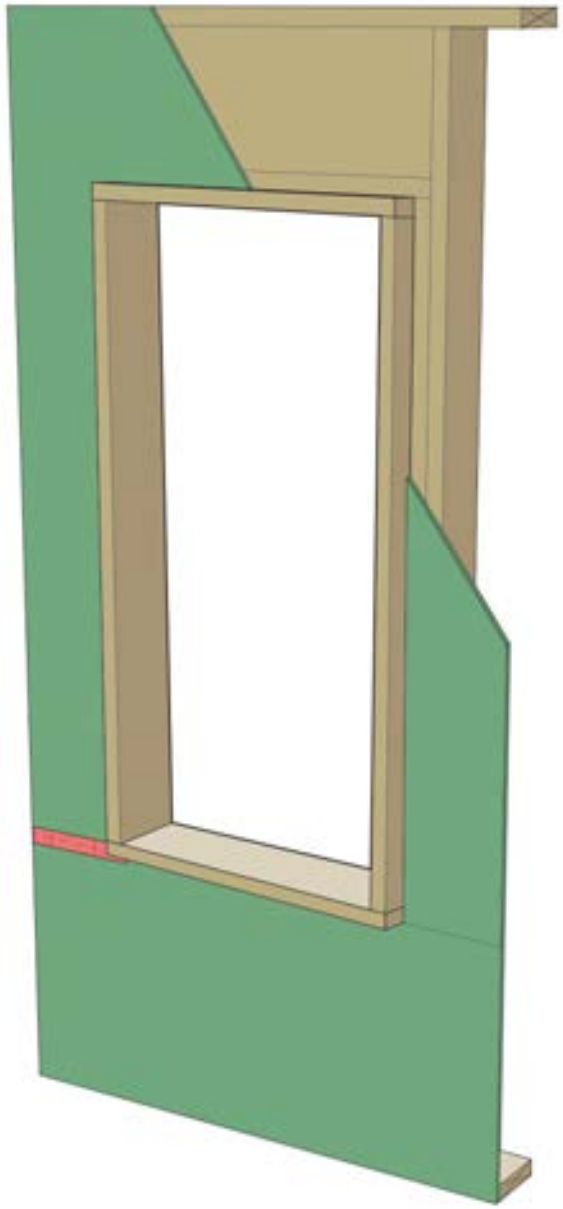


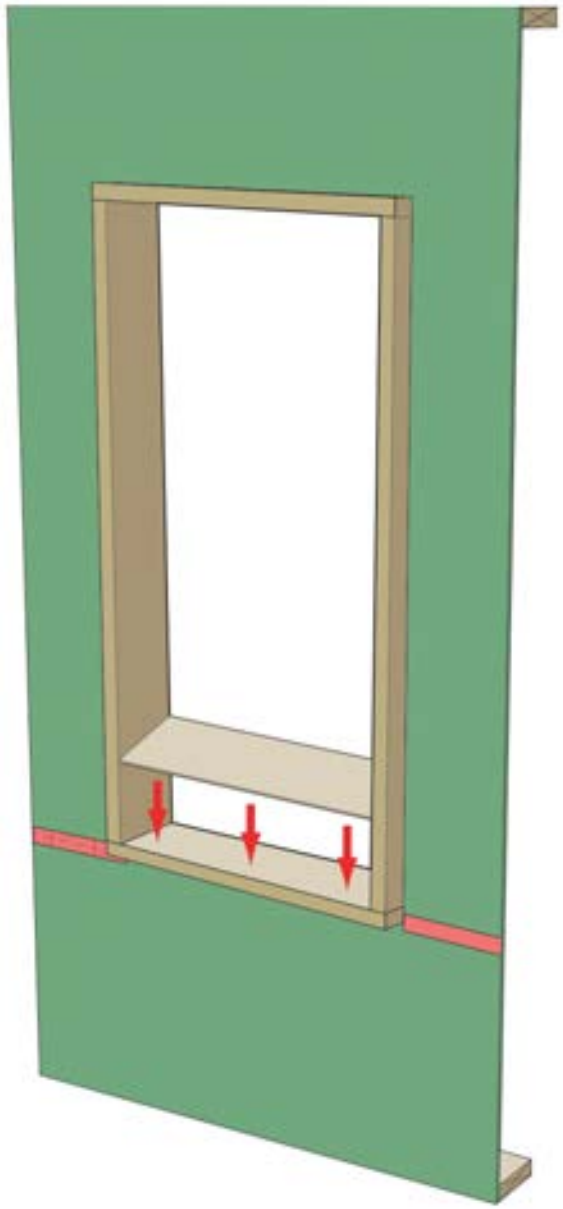


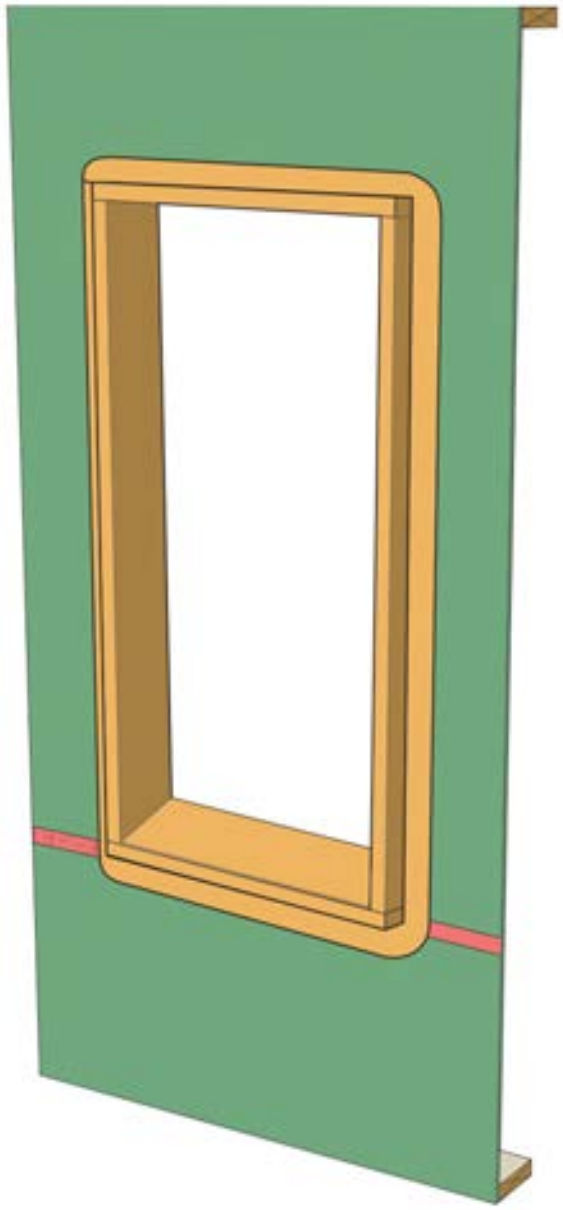


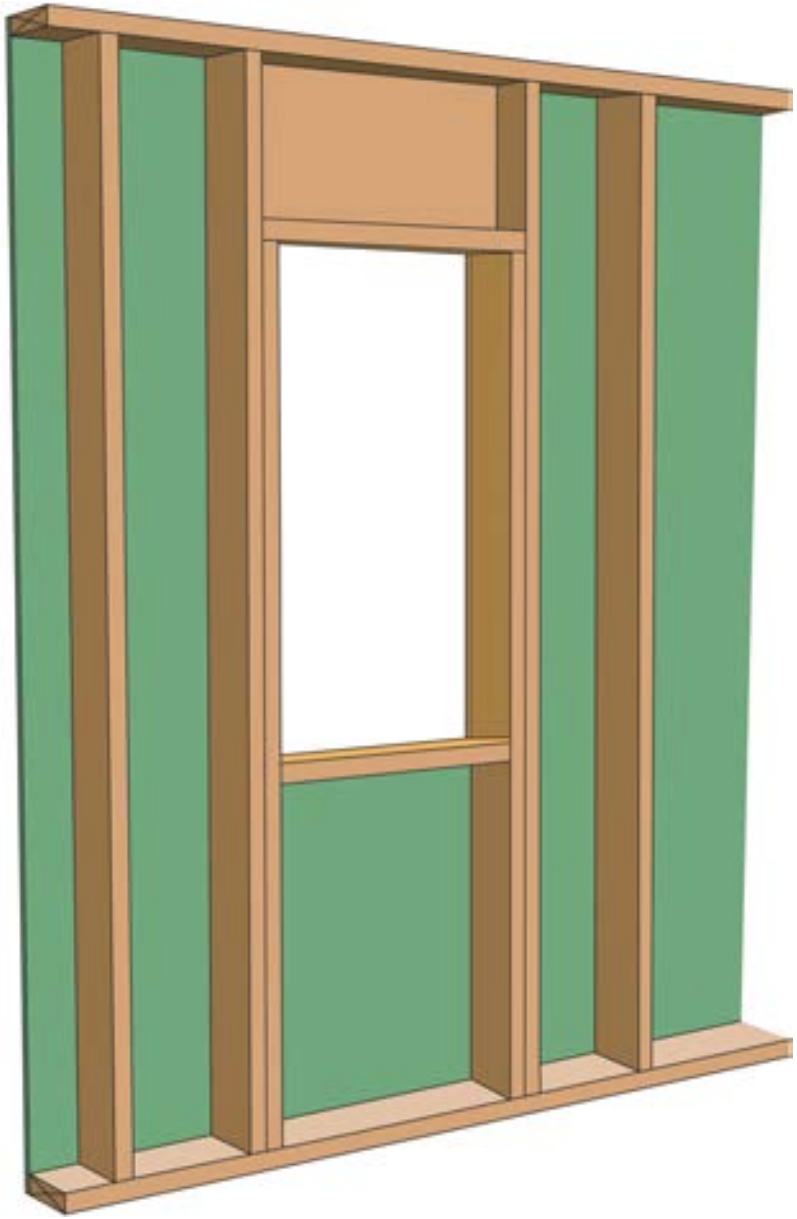


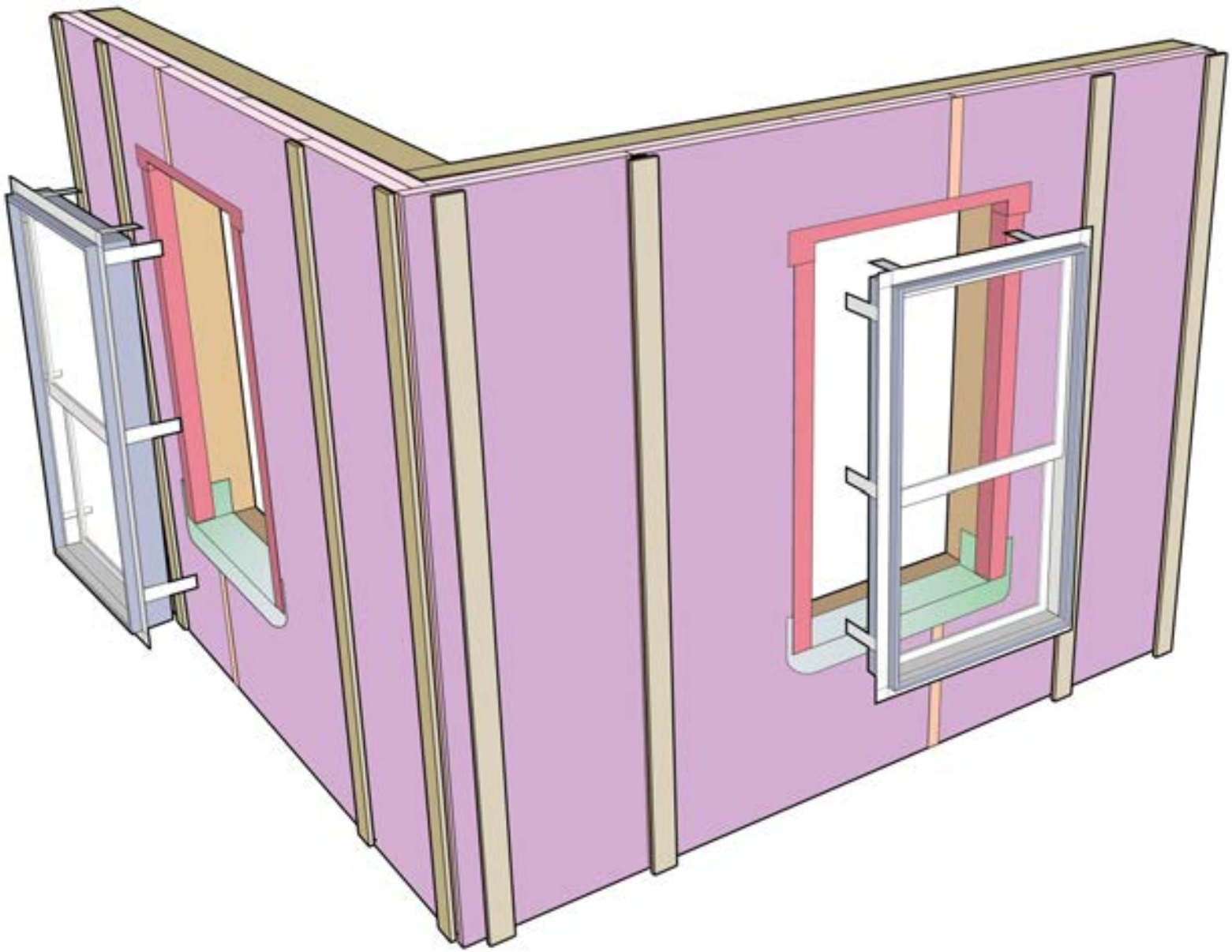

Single top plate
2x6 stud wall @ 24" o.c.
Taped and painted 1/2" gypsum wall board as interior finish
Cellulose insulation in wall cavity
OSB sheathing with water control layer facing; joints taped/ sealed
Mineral fiber insulation boards
1x4 wood furring strips
Wood or fiber cement siding
Cellulose insulation at rim joist
Capillary break
EPS insulation

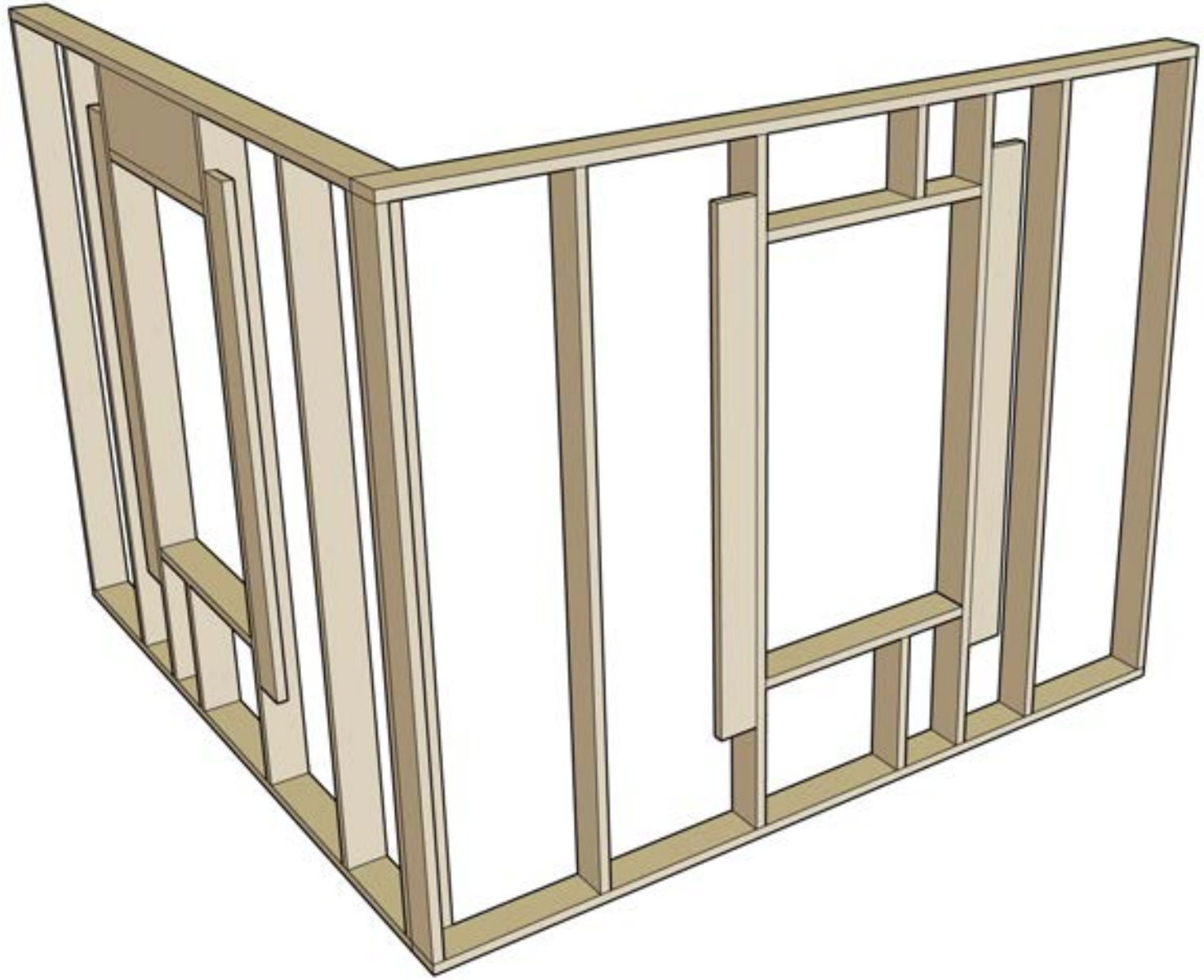


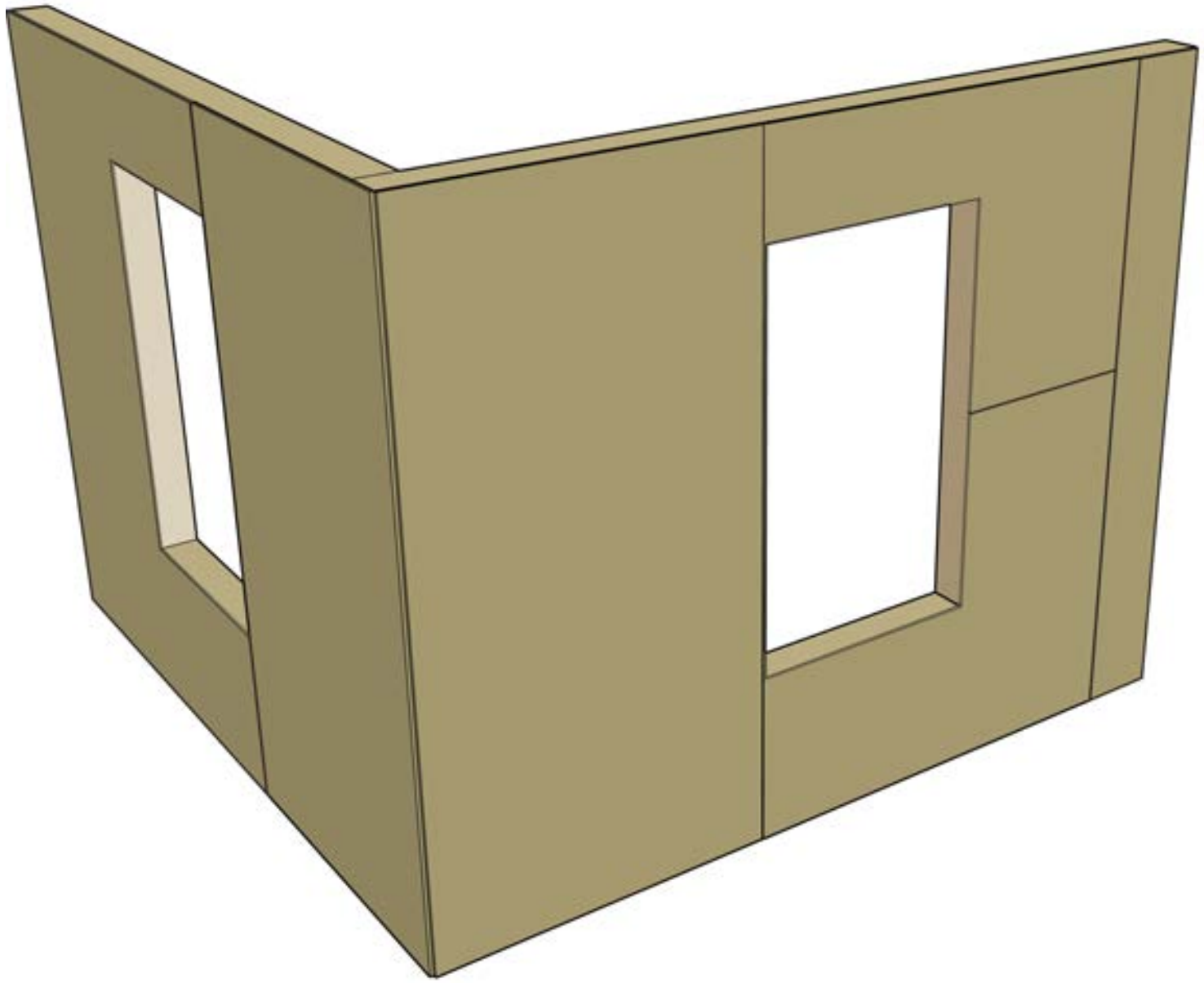


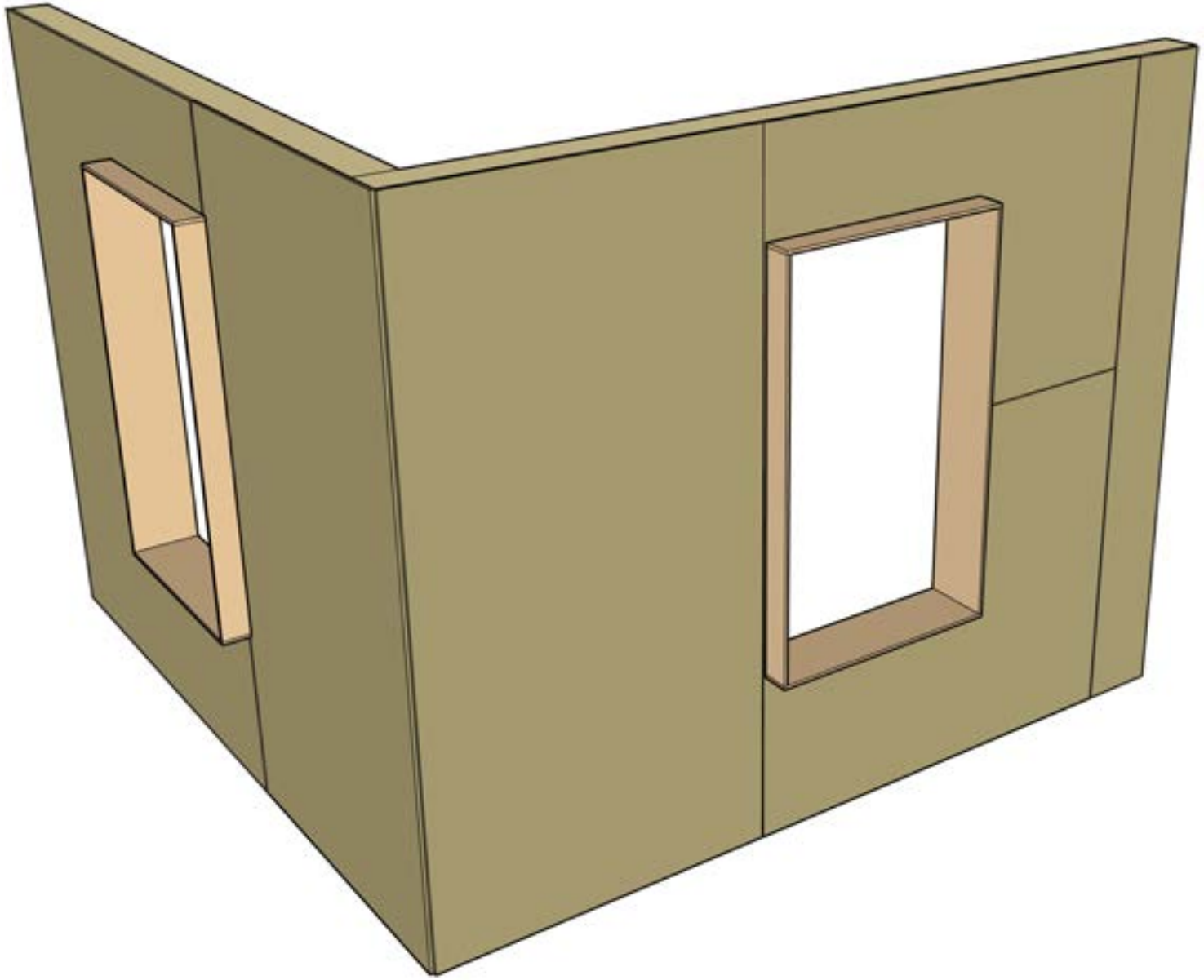


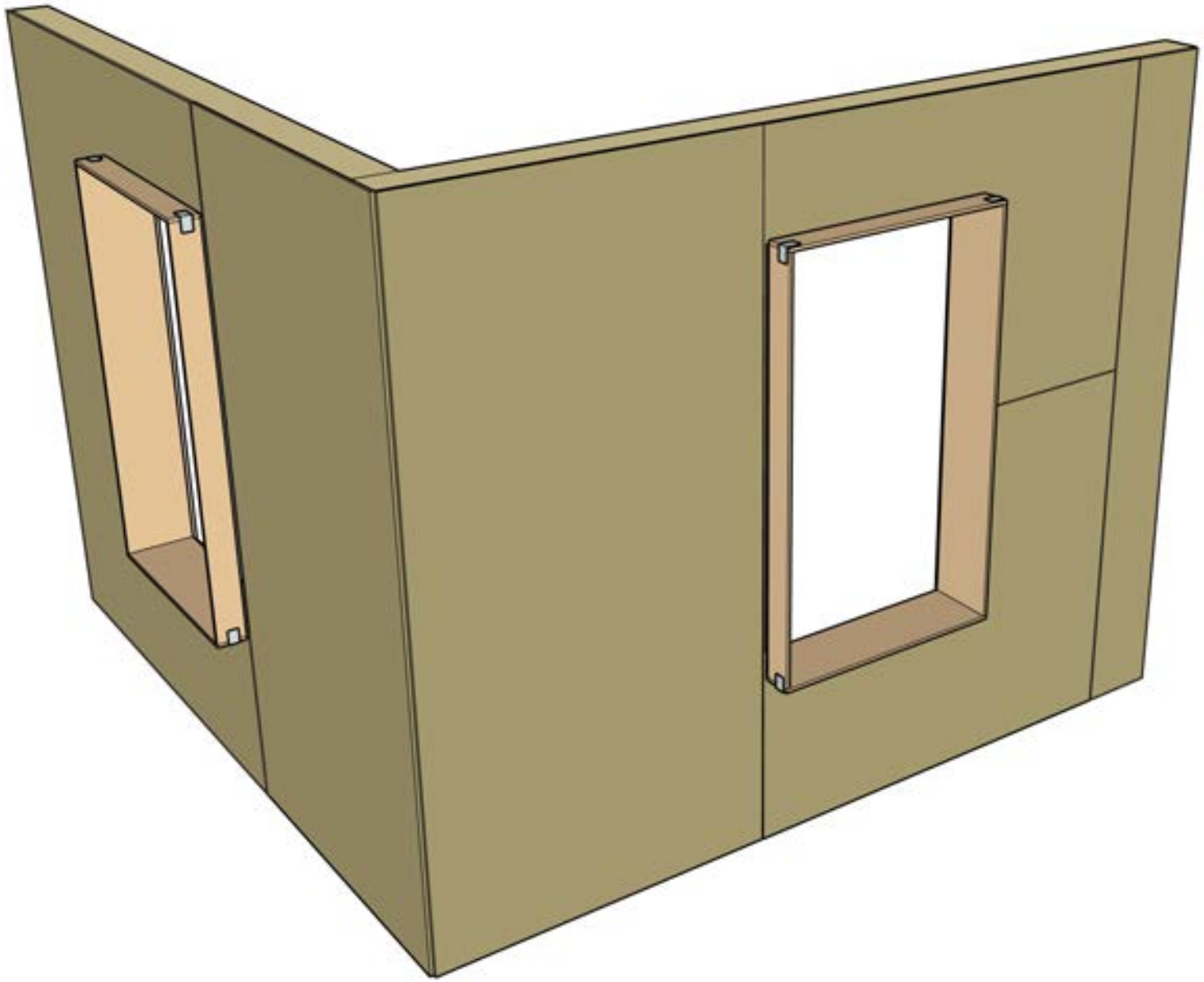


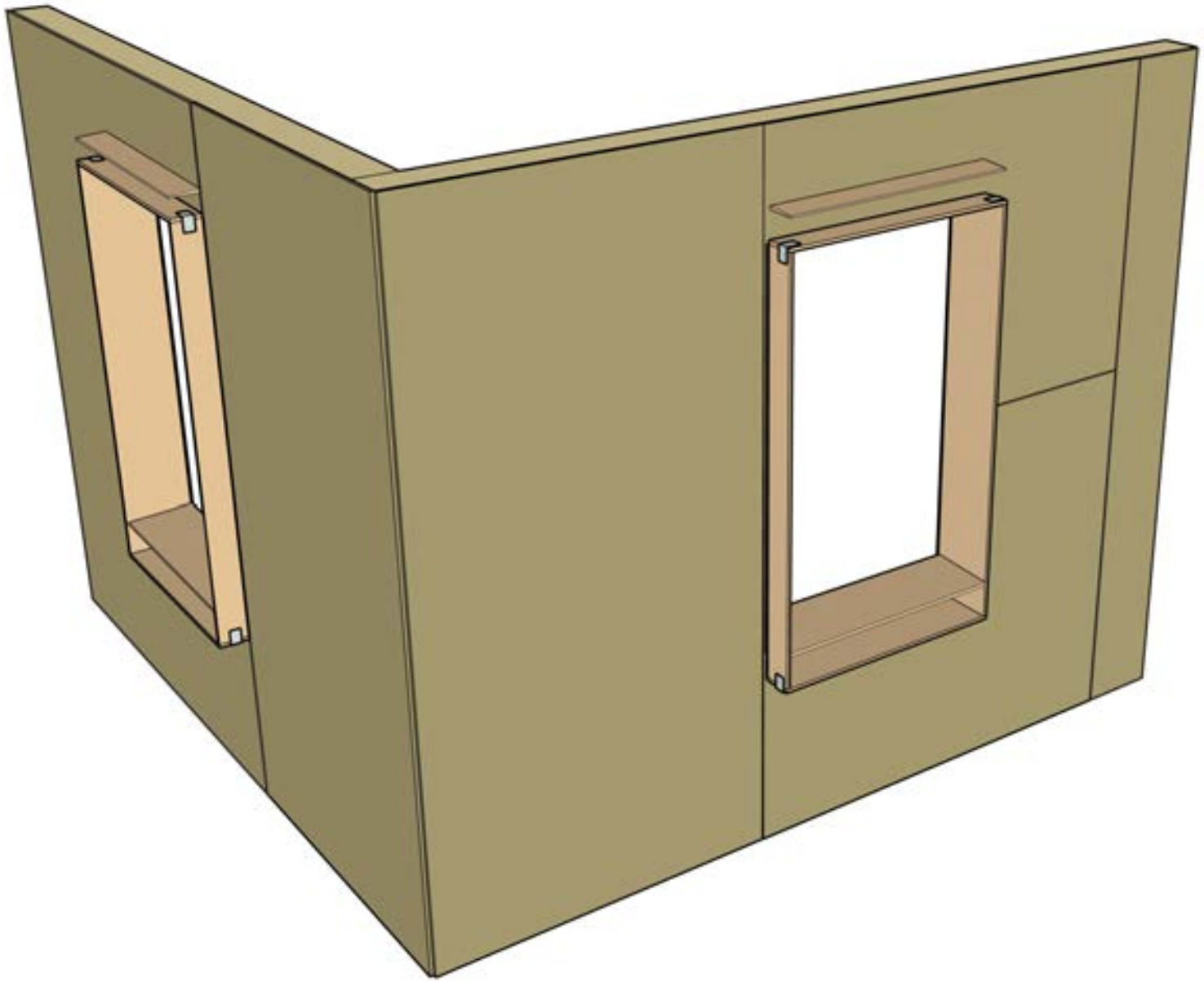


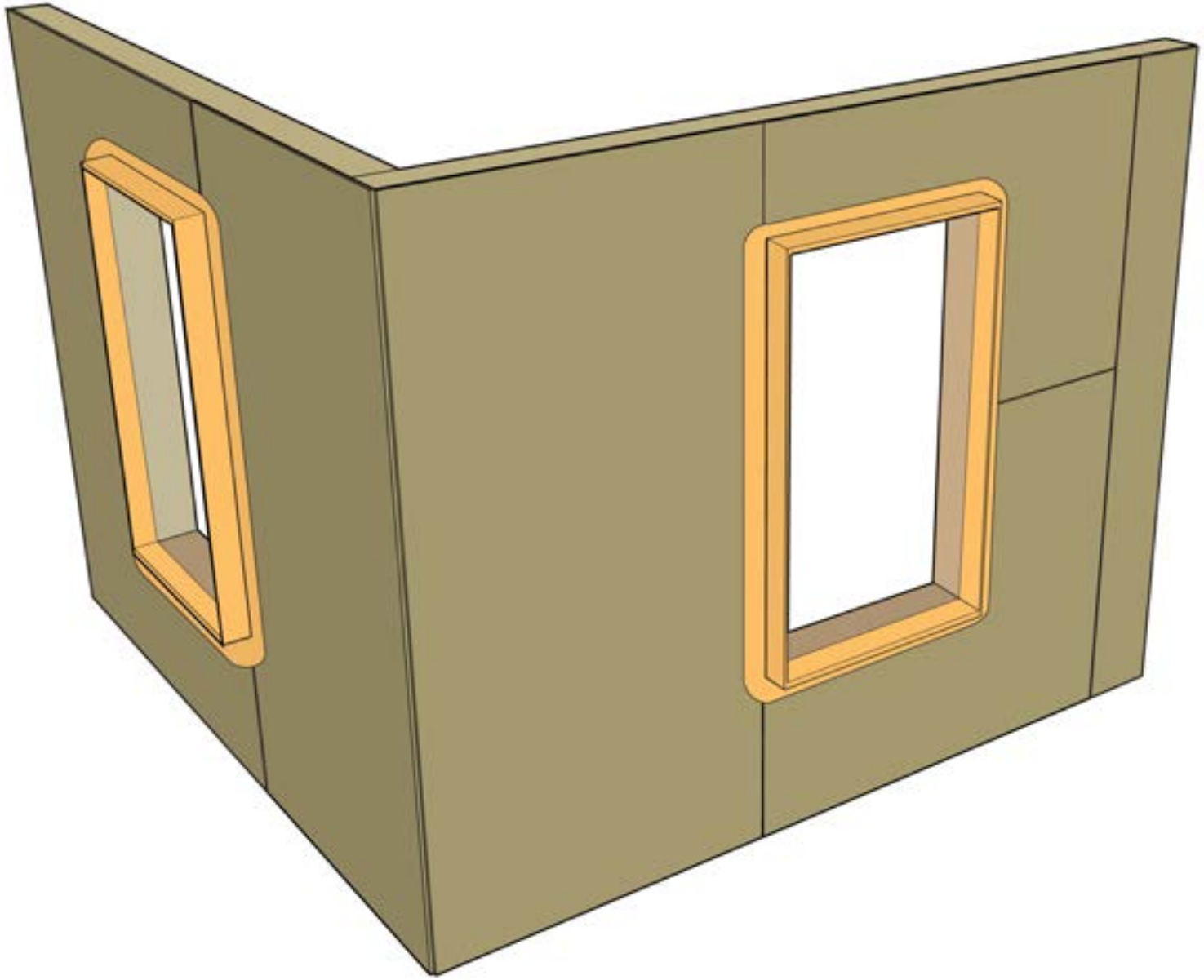


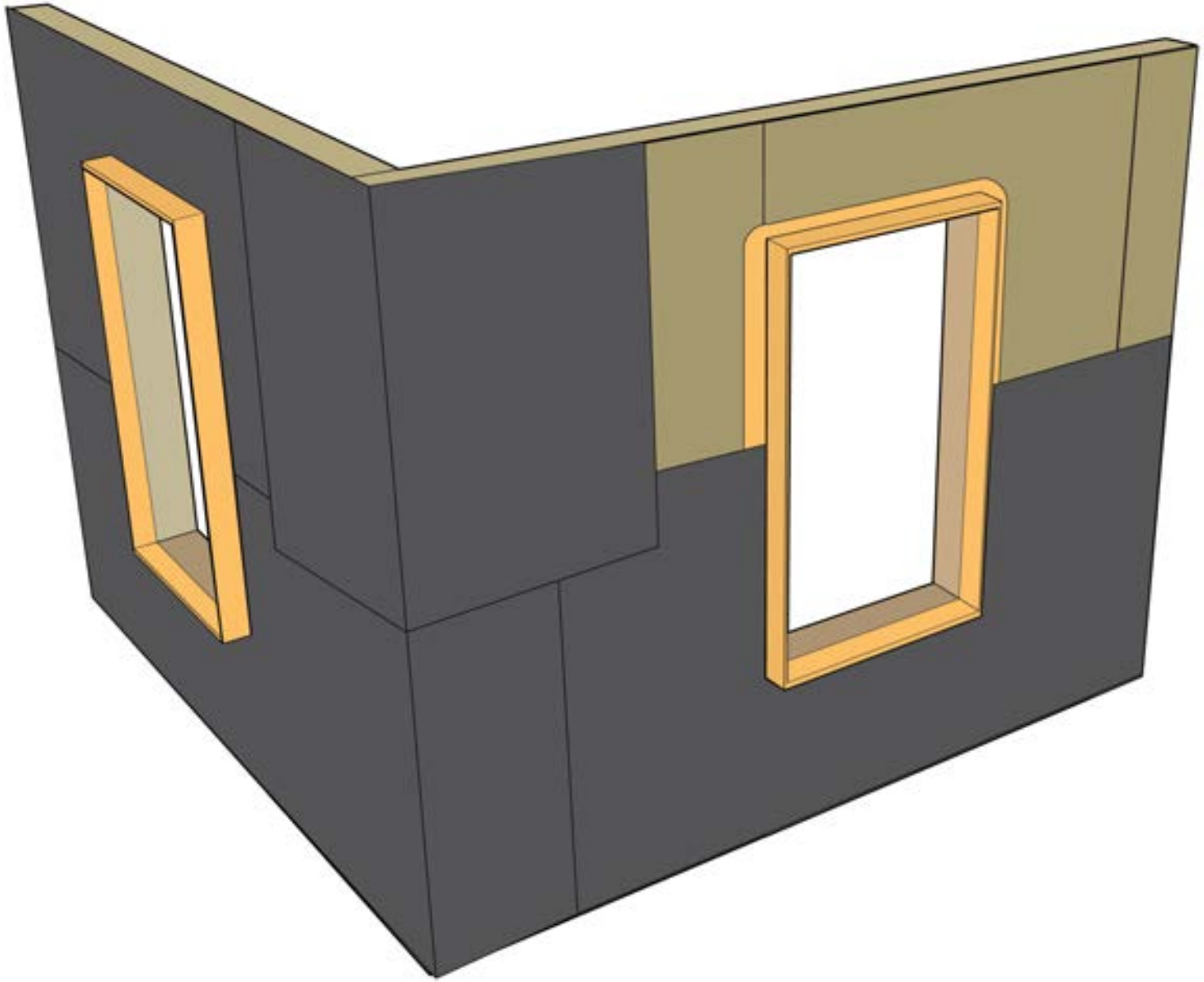


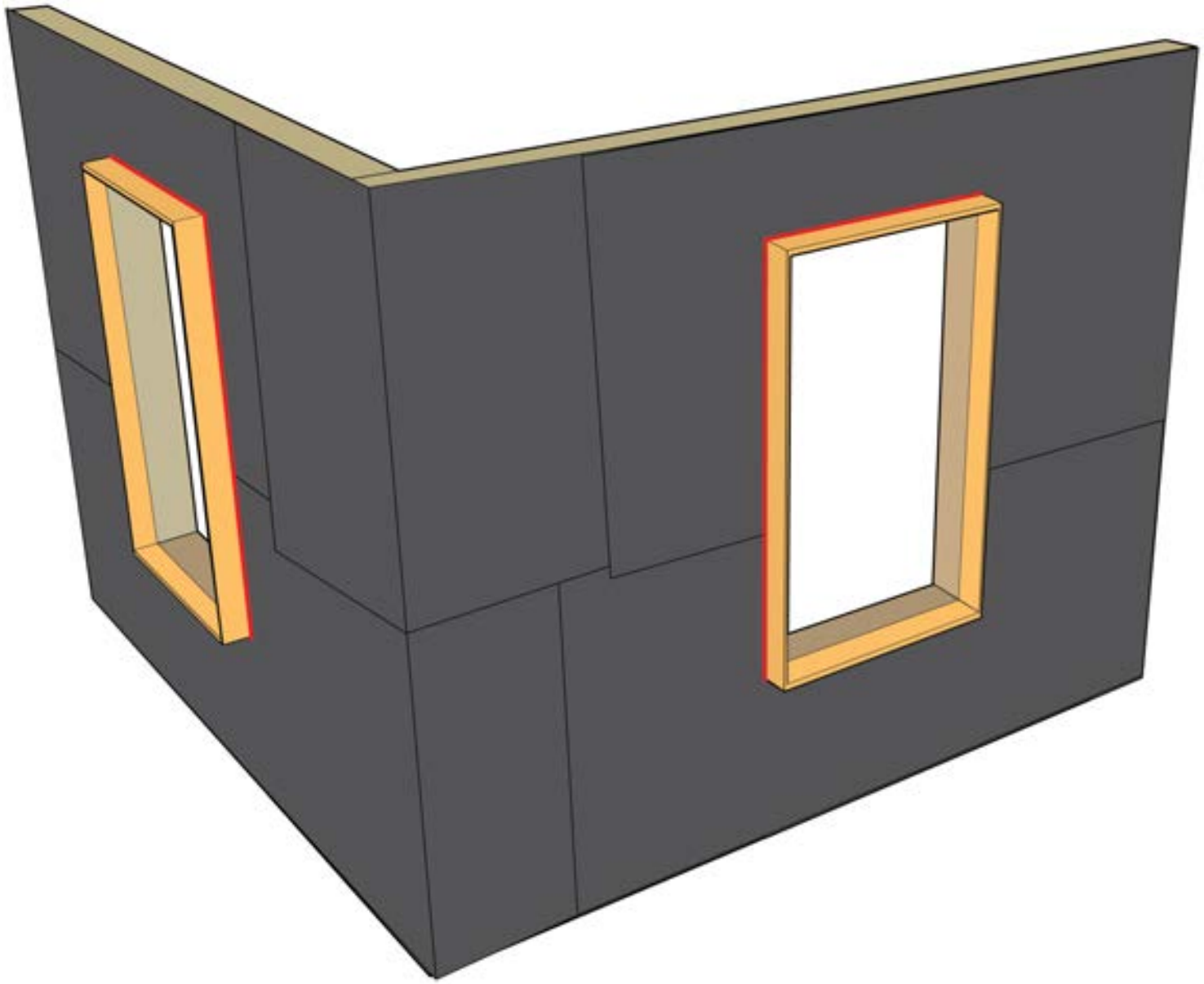


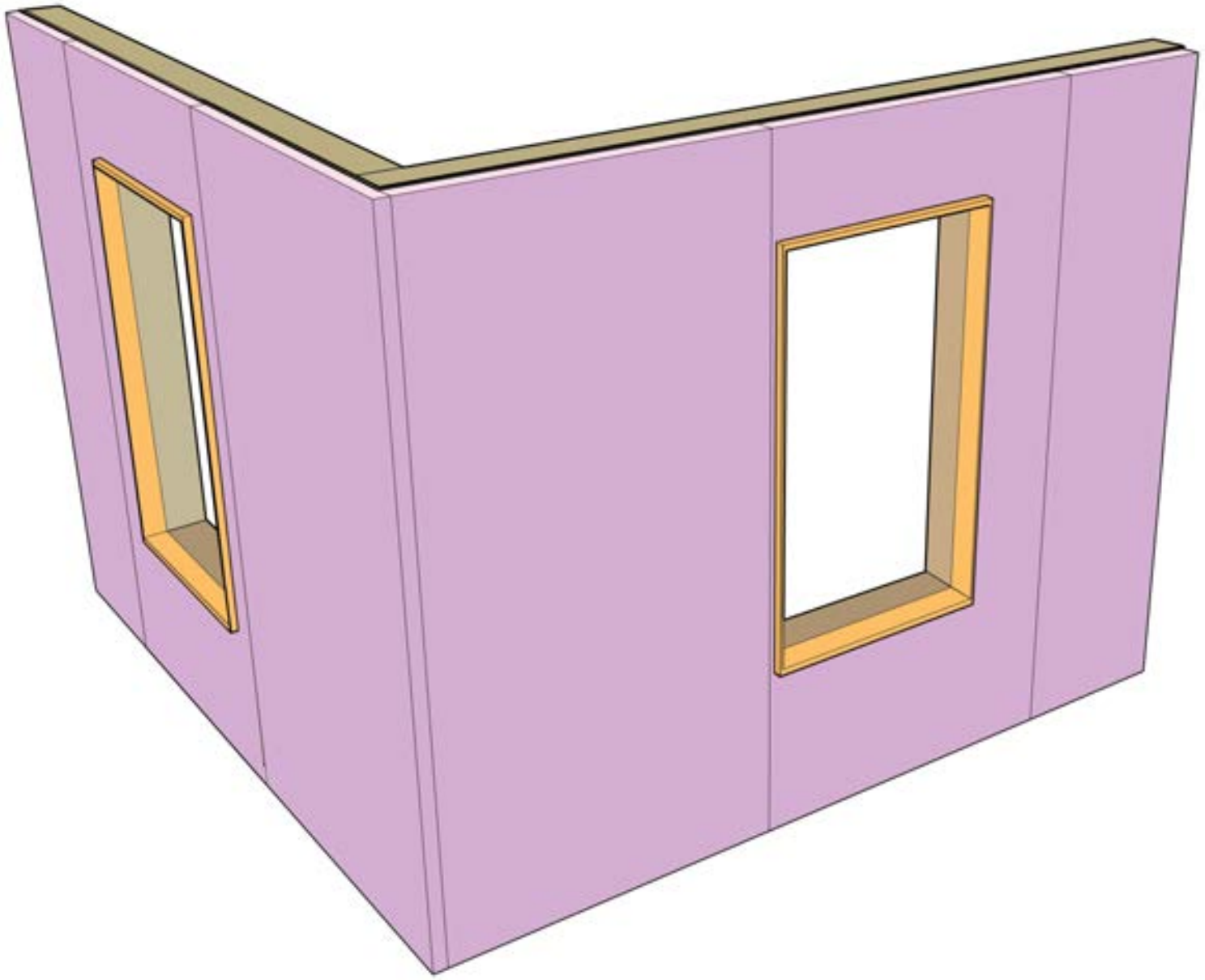


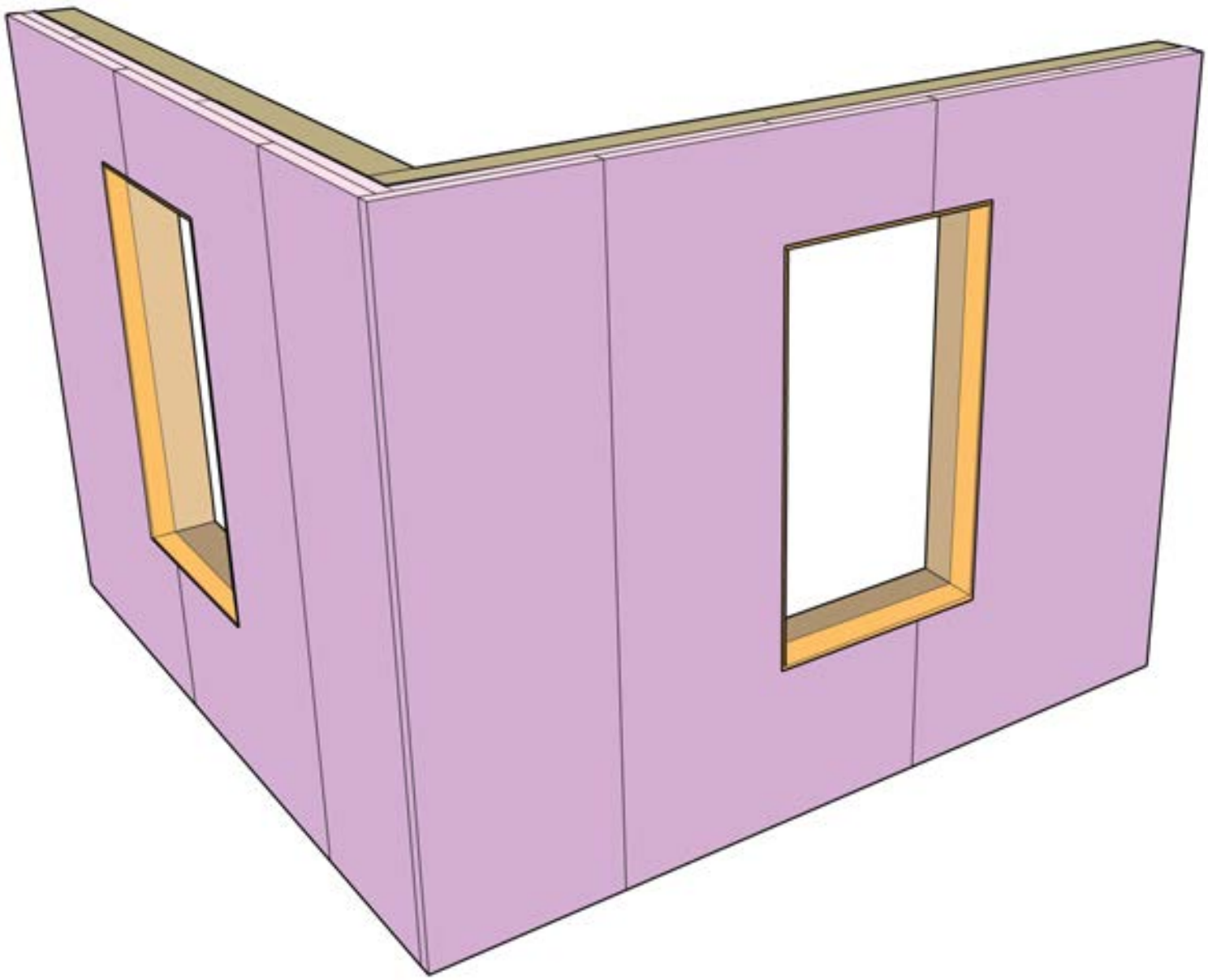


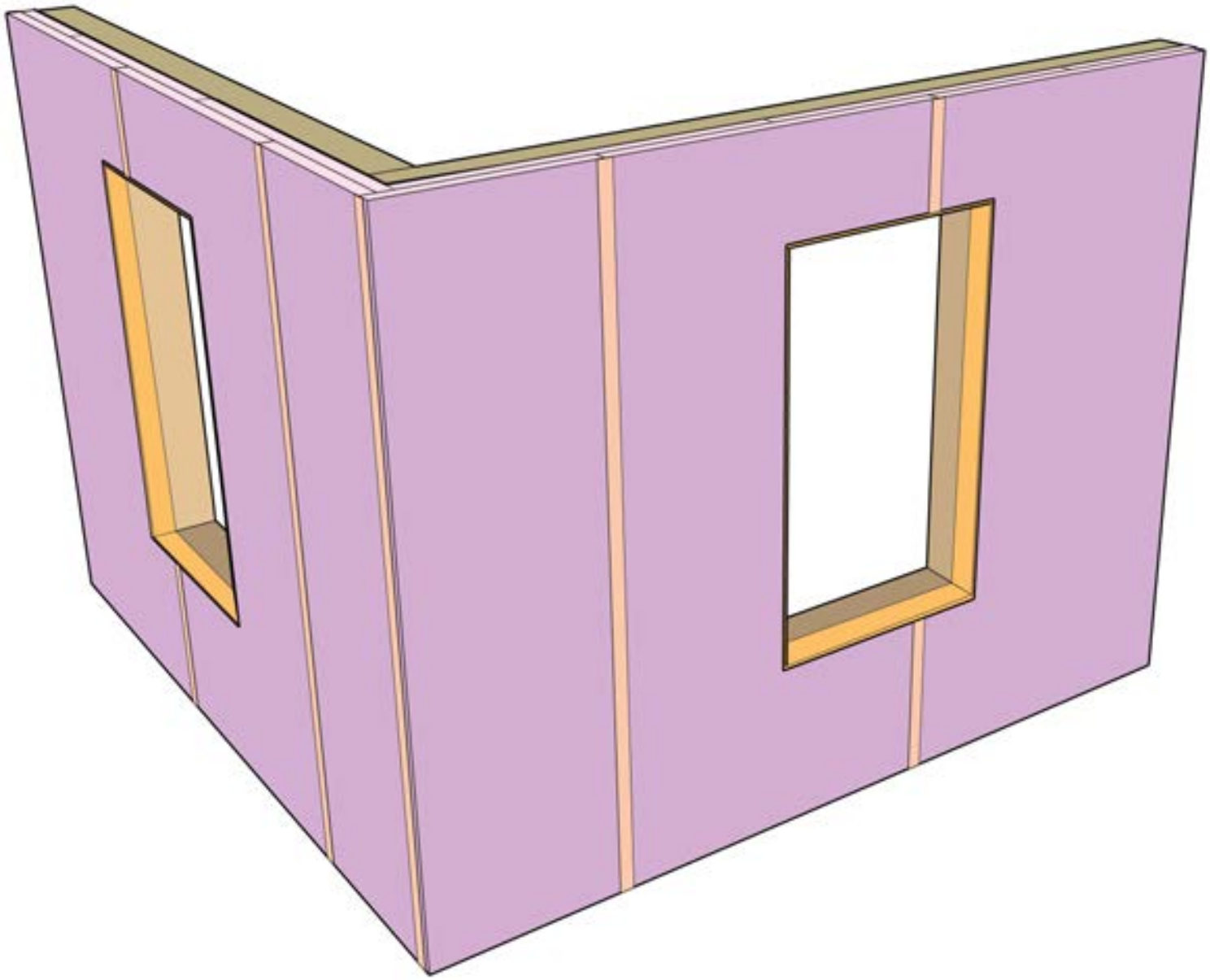


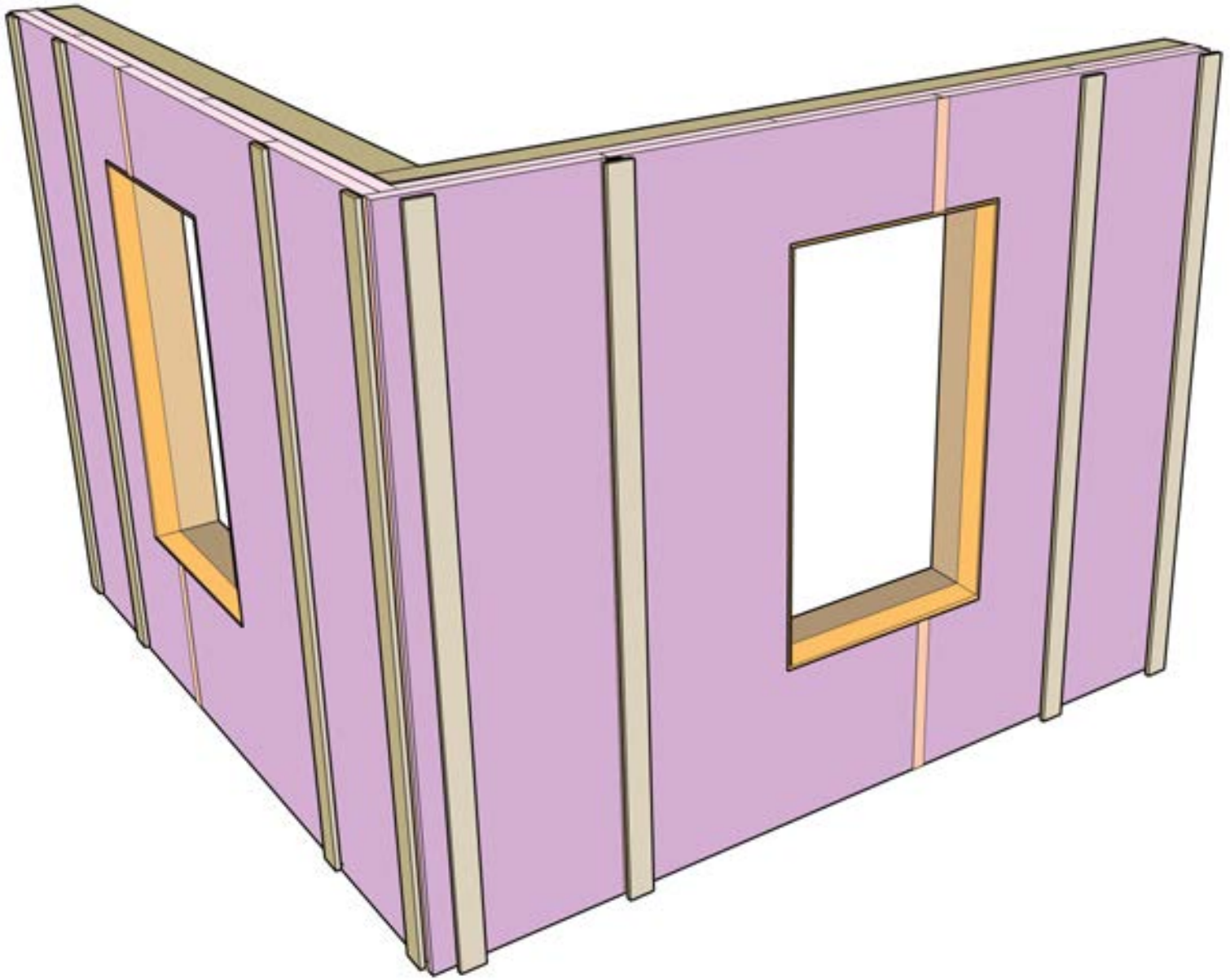


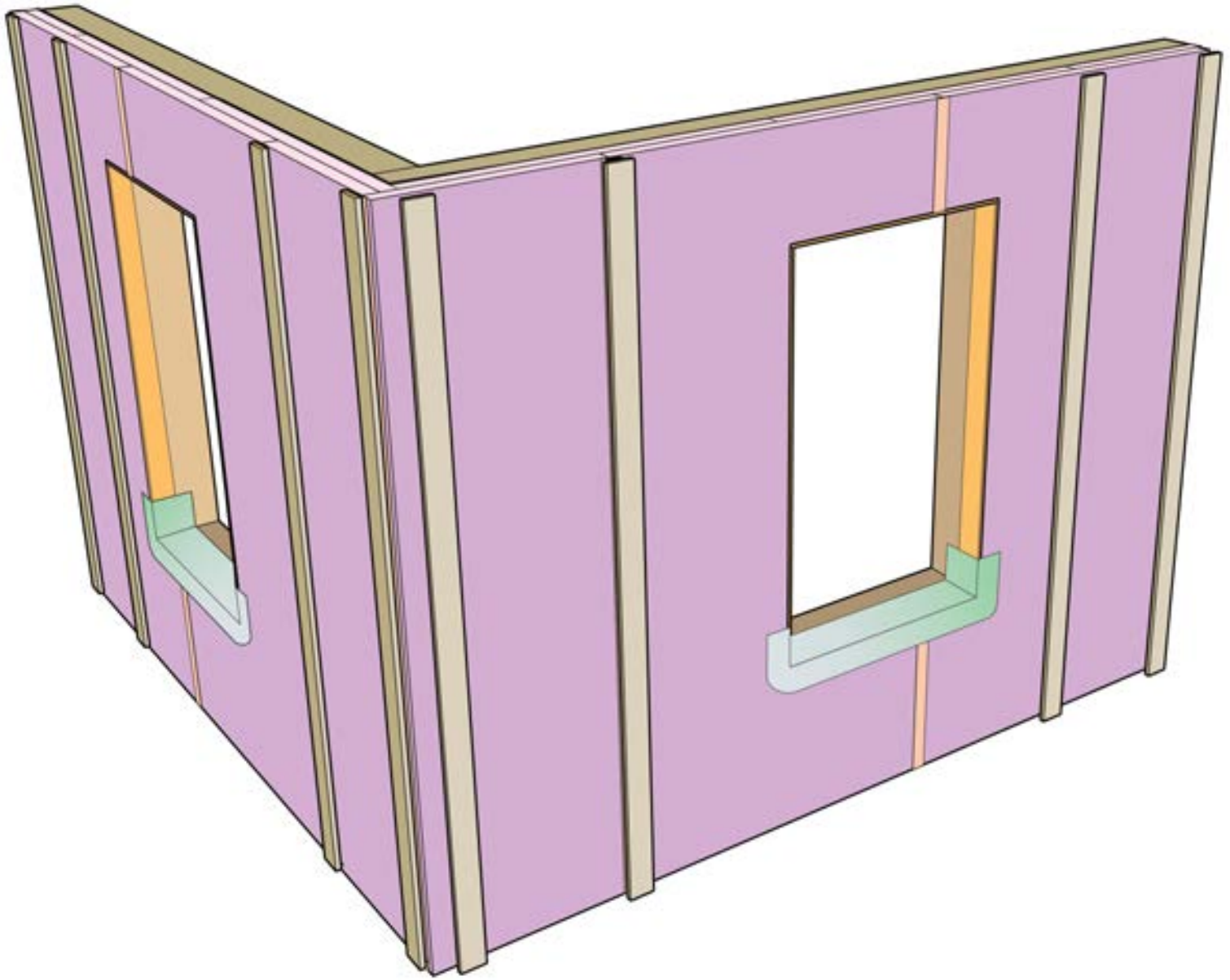


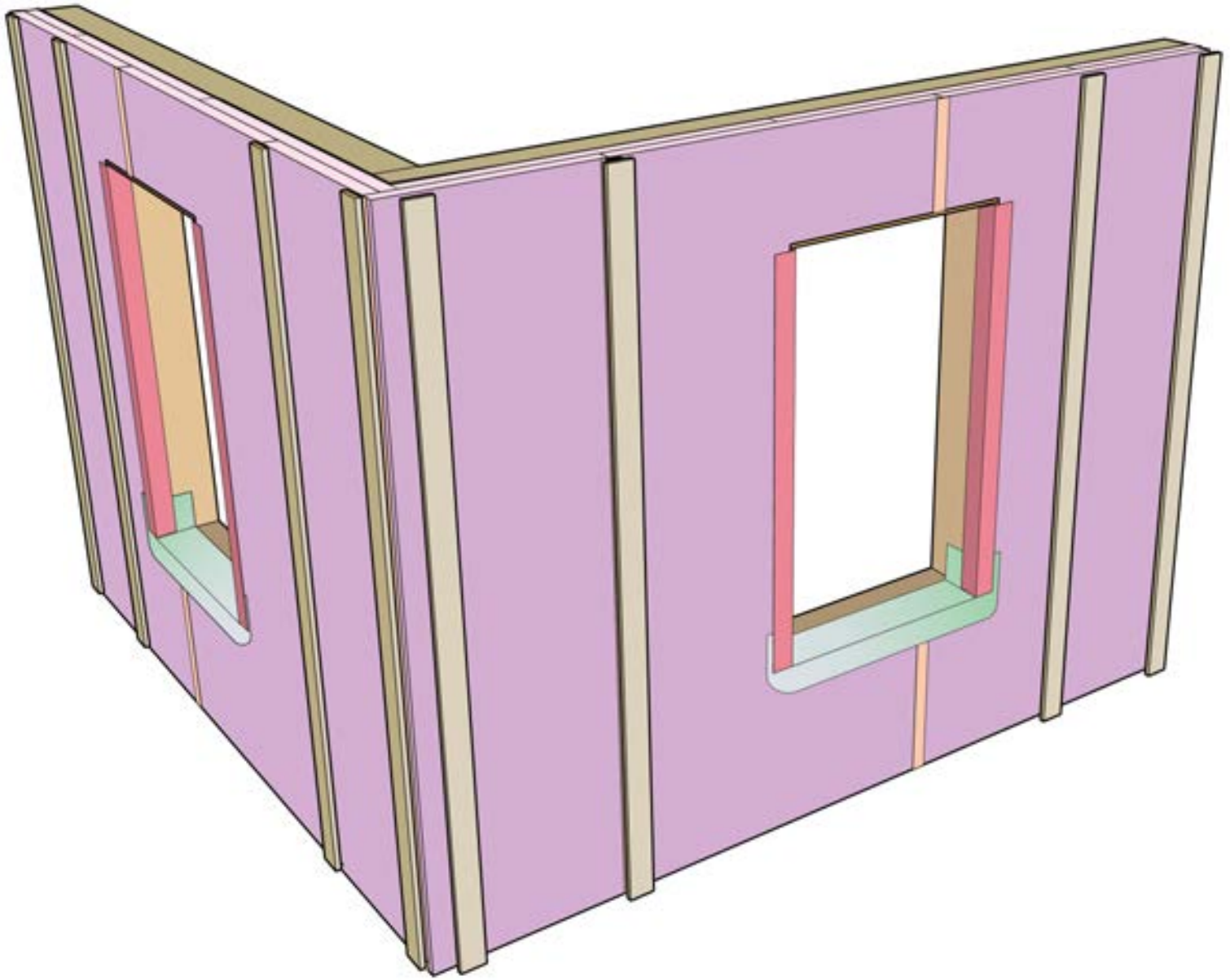


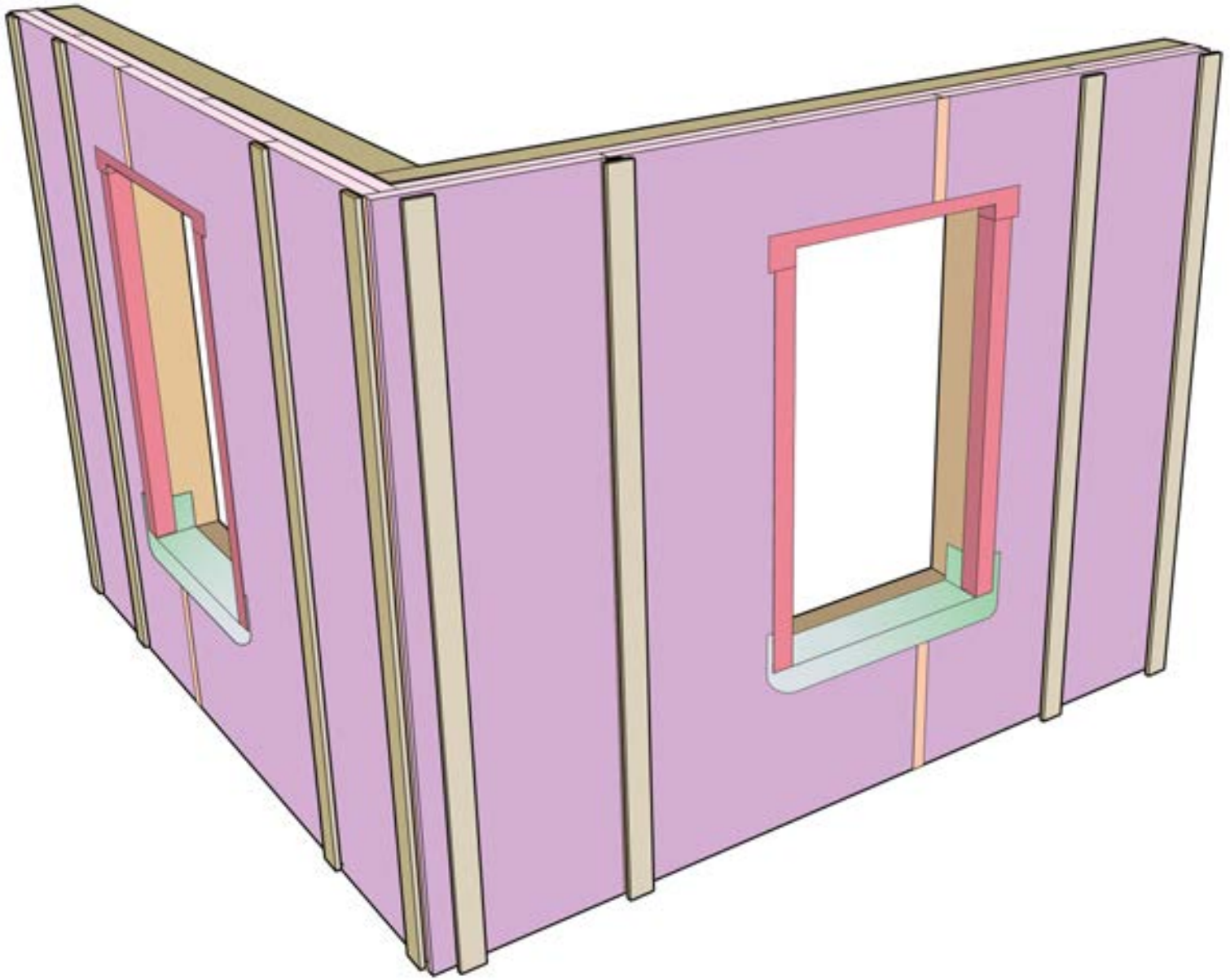


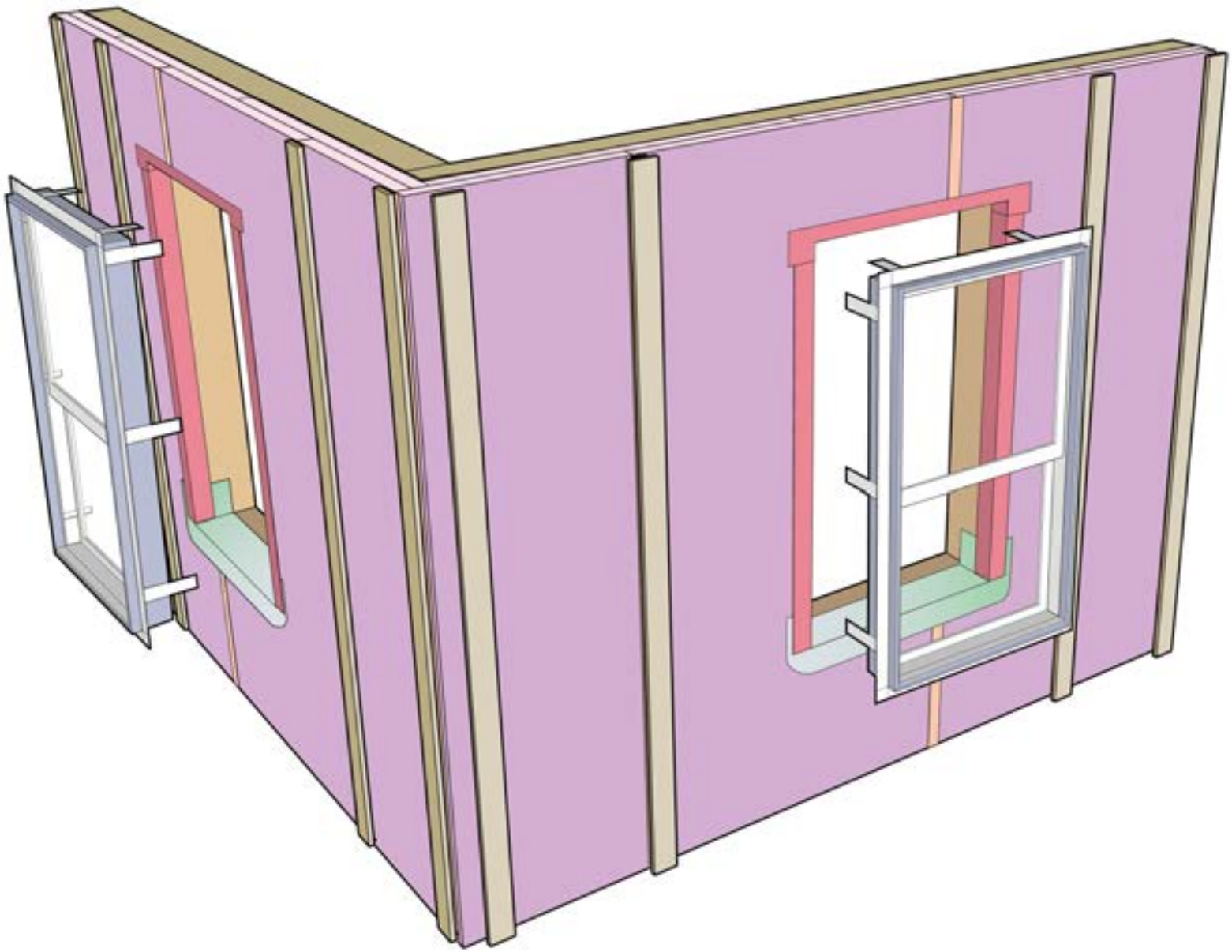


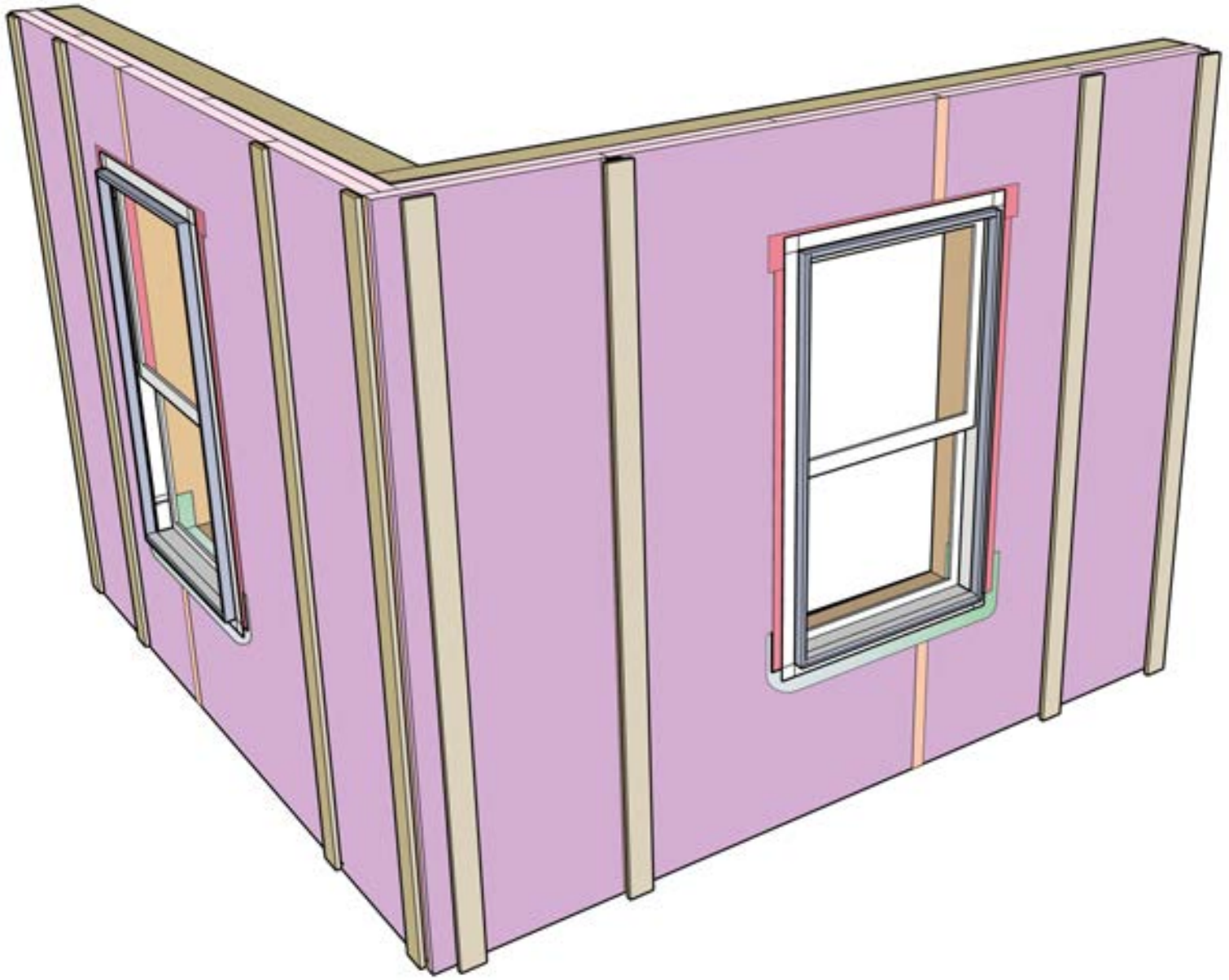


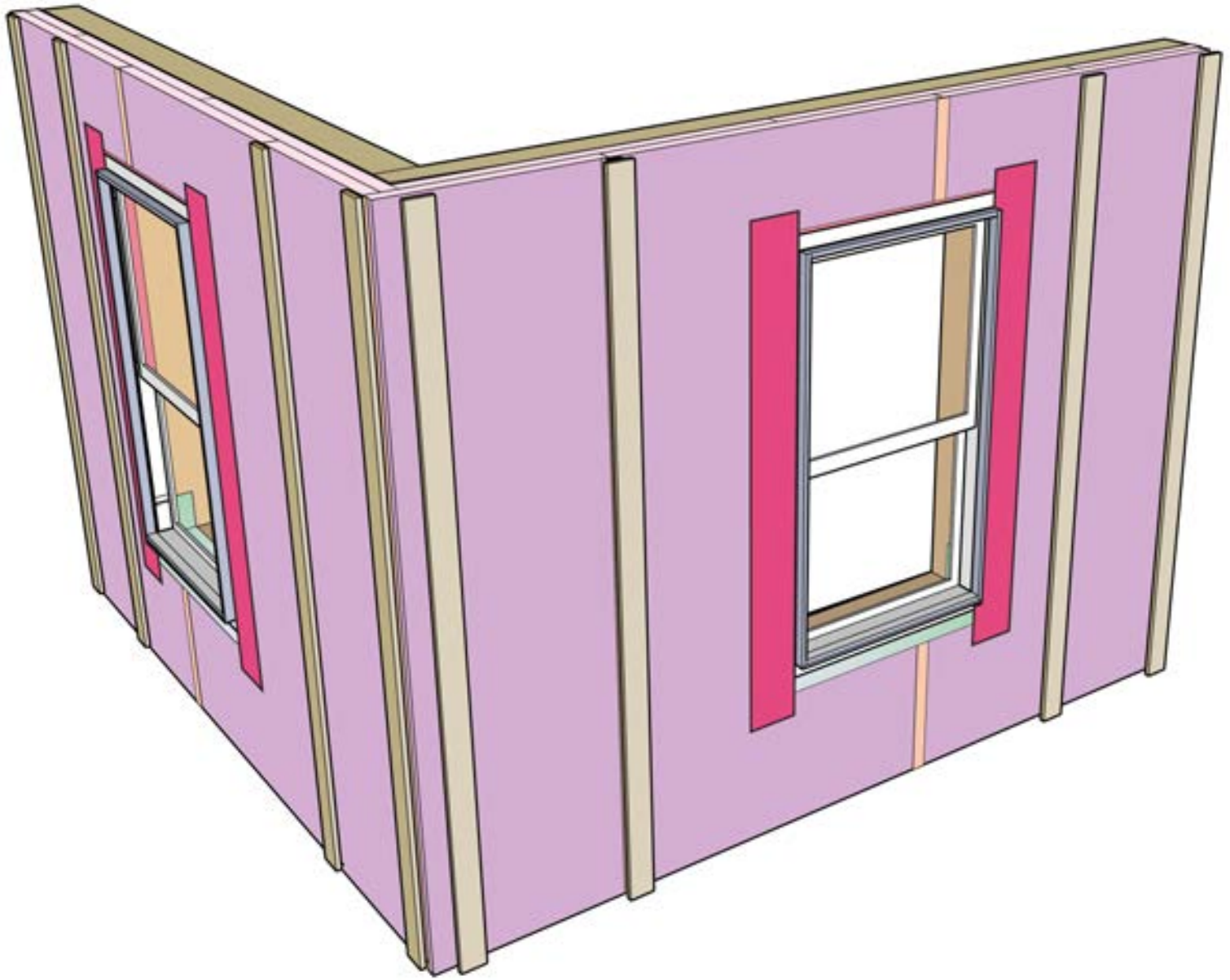


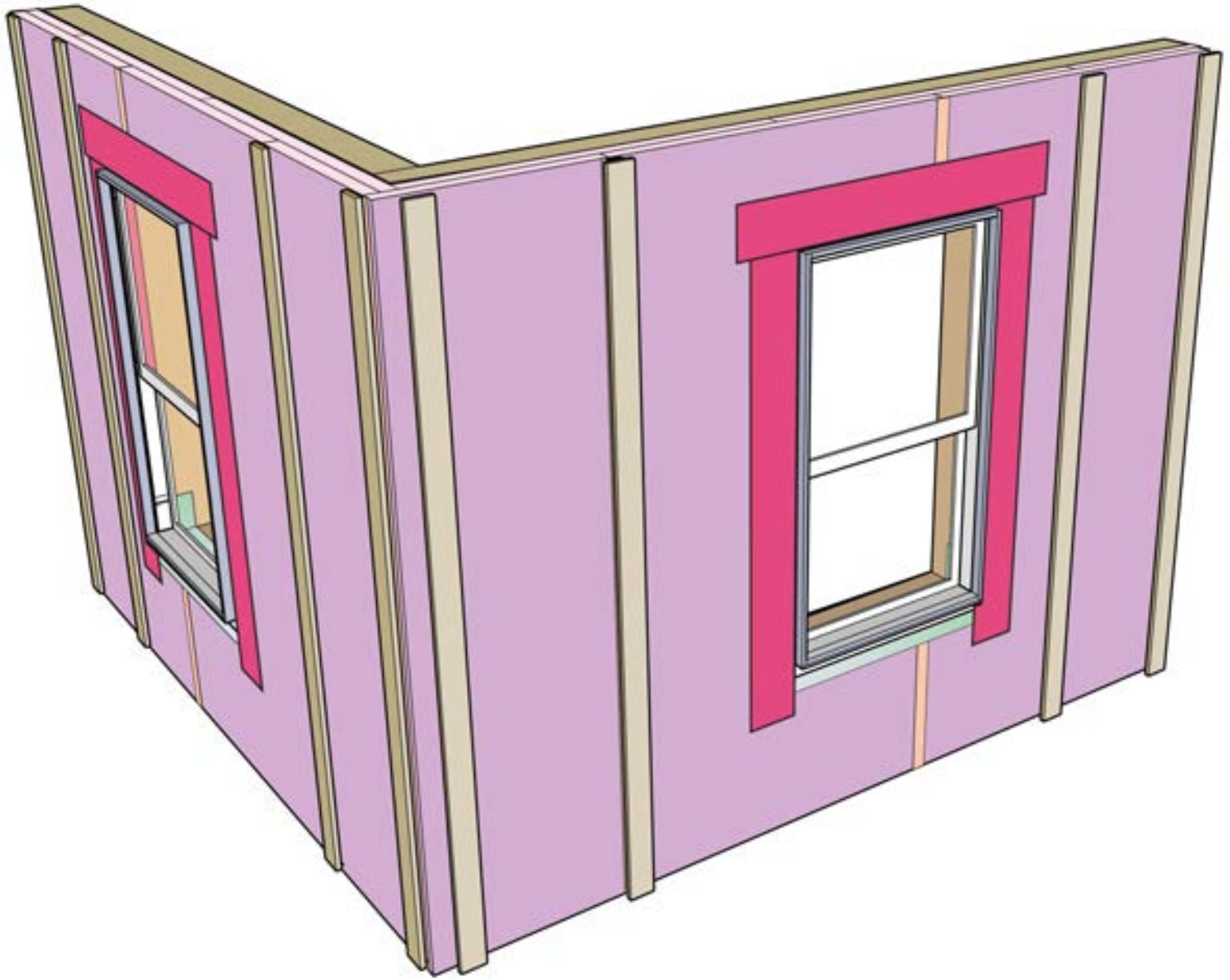


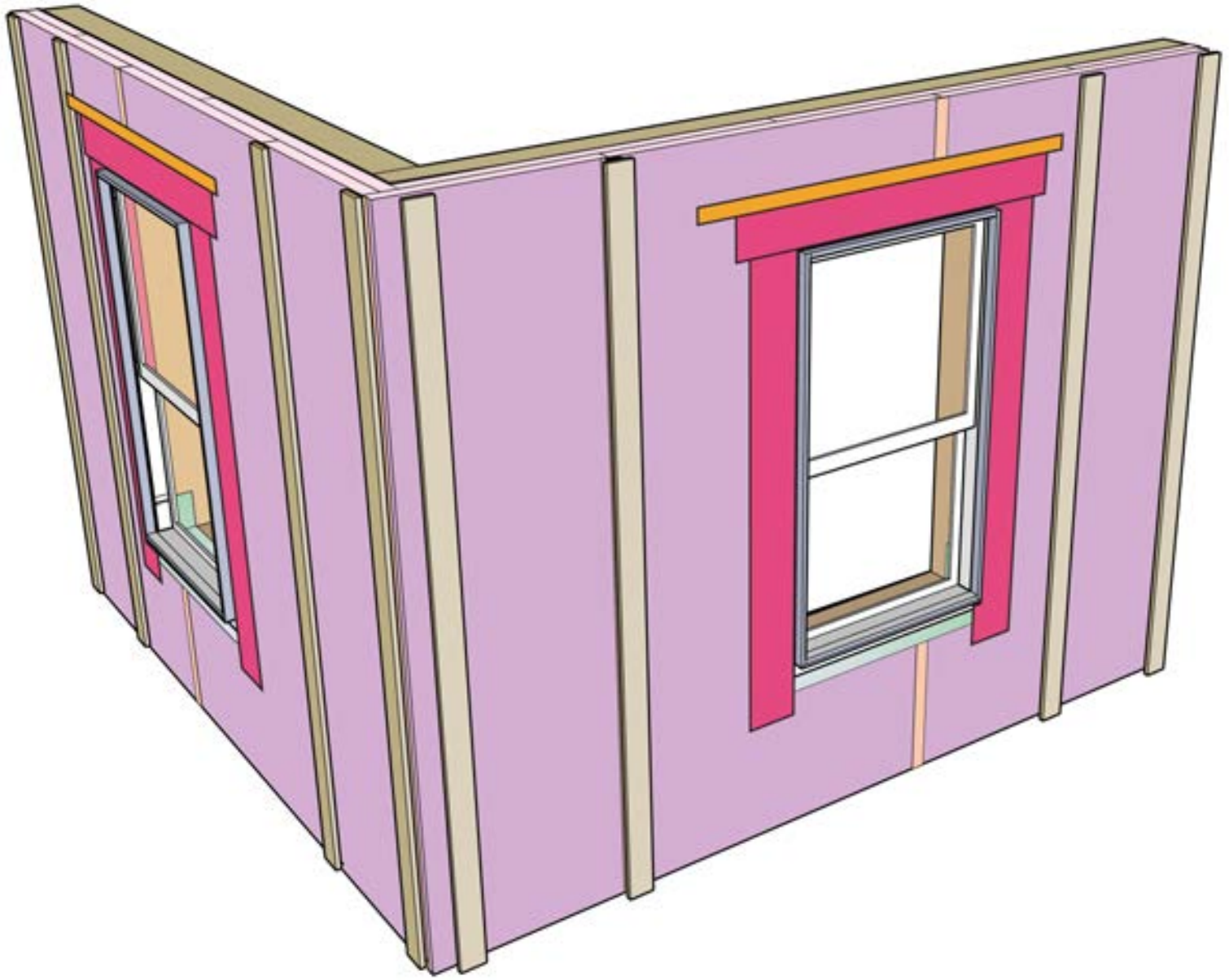


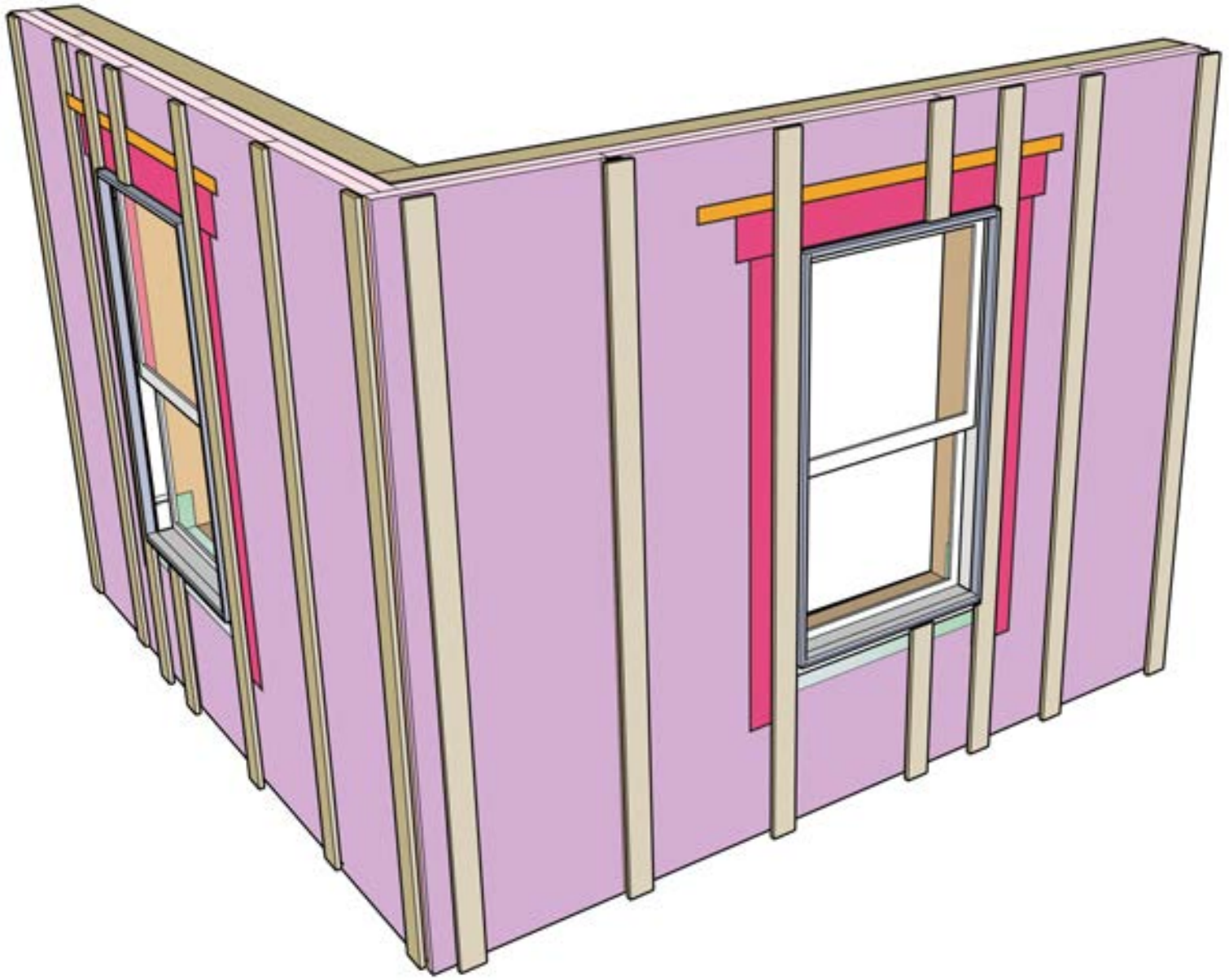


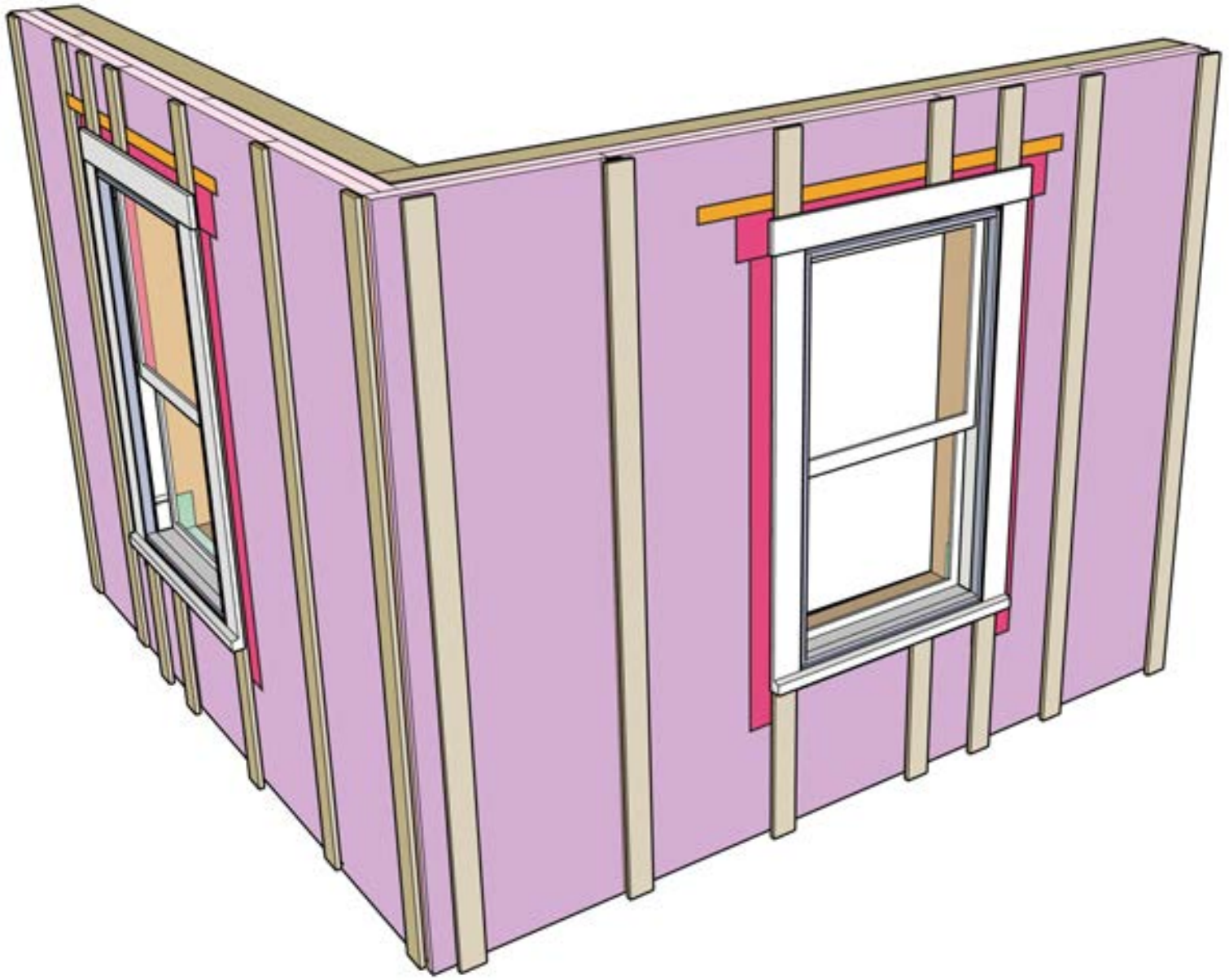


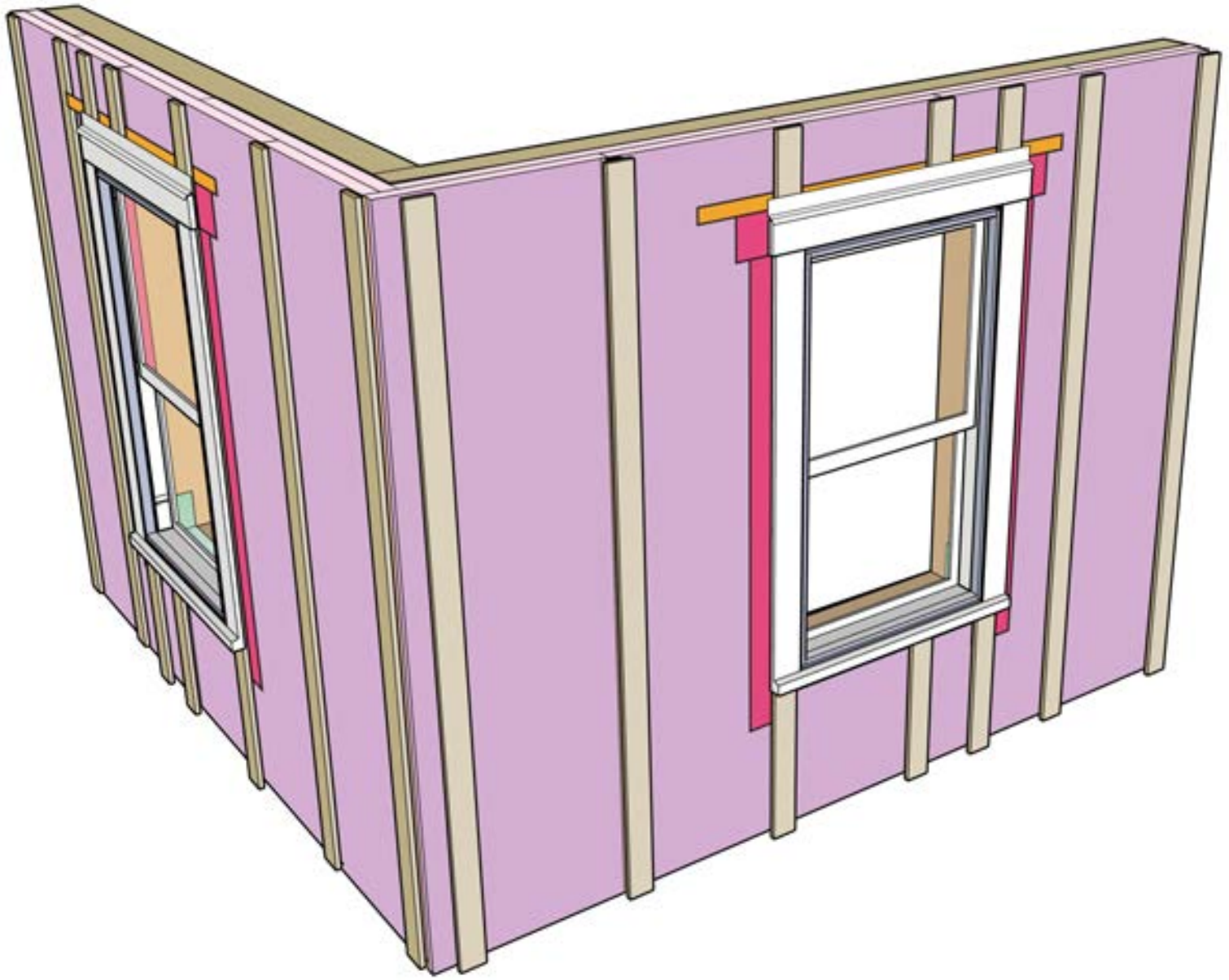


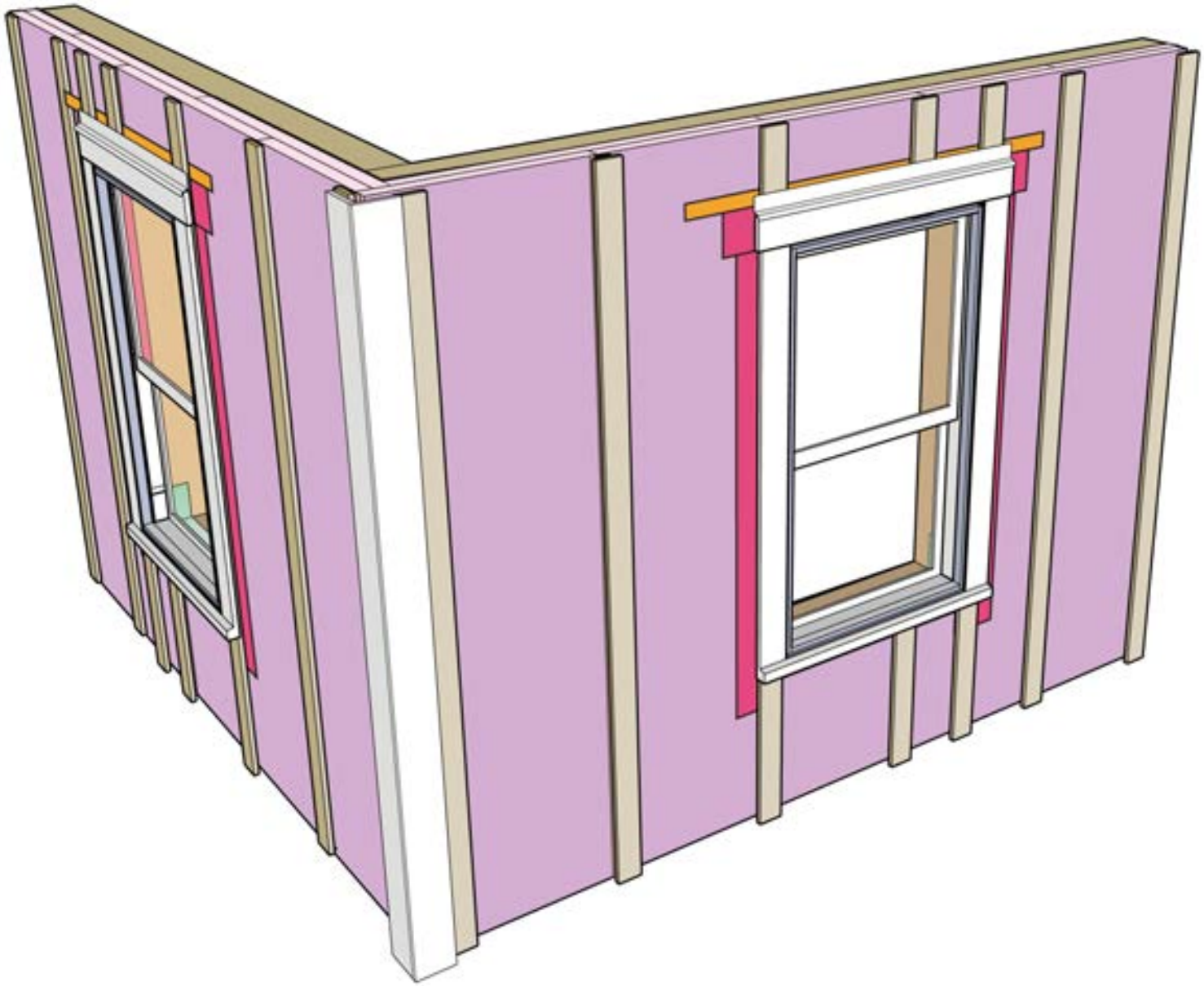










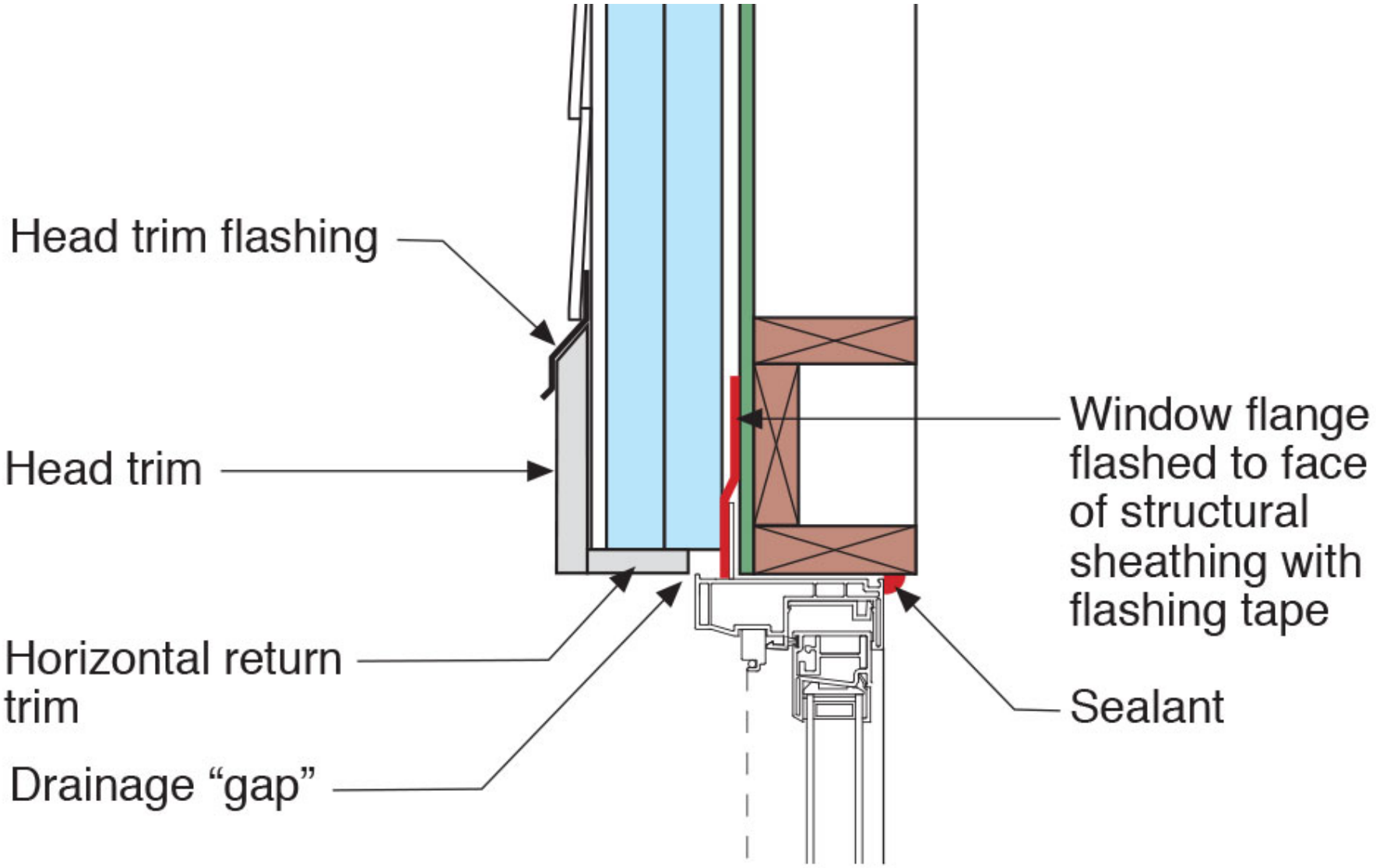



GRACE
Perm-A


ALS UNLIMITED INC.


DOW
DOW
TUFF-R

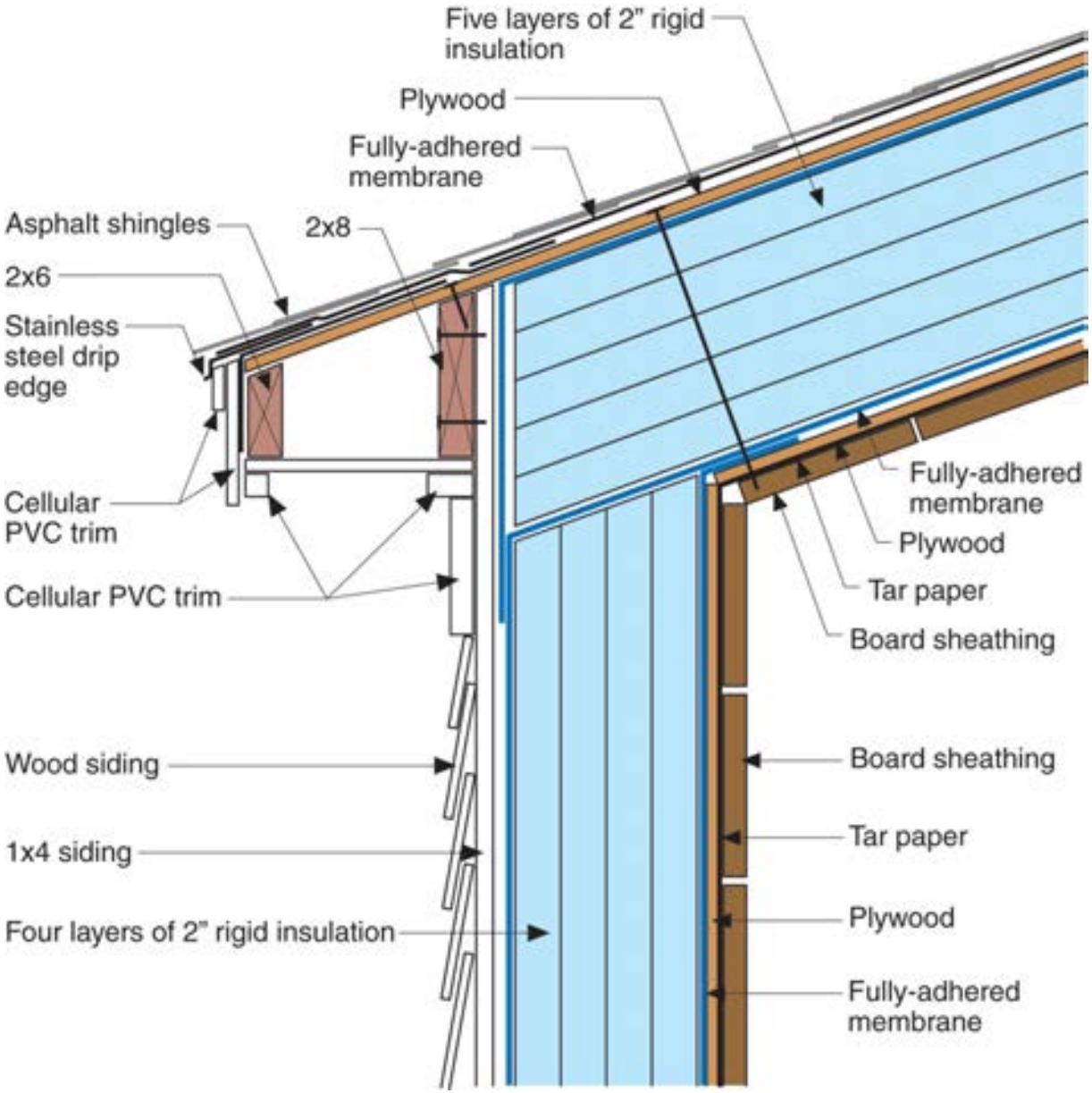

Anders


Head trim flashing
Head trim
Horizontal return trim
Drainage “gap”
Window flange flashed to face of structural sheathing with flashing tape
Sealant


GRACE VYCOR® PLUS
GRACE VYCOR® PLUS


0.32
0.33
0.54
DP25


DU PONT
DrainWra

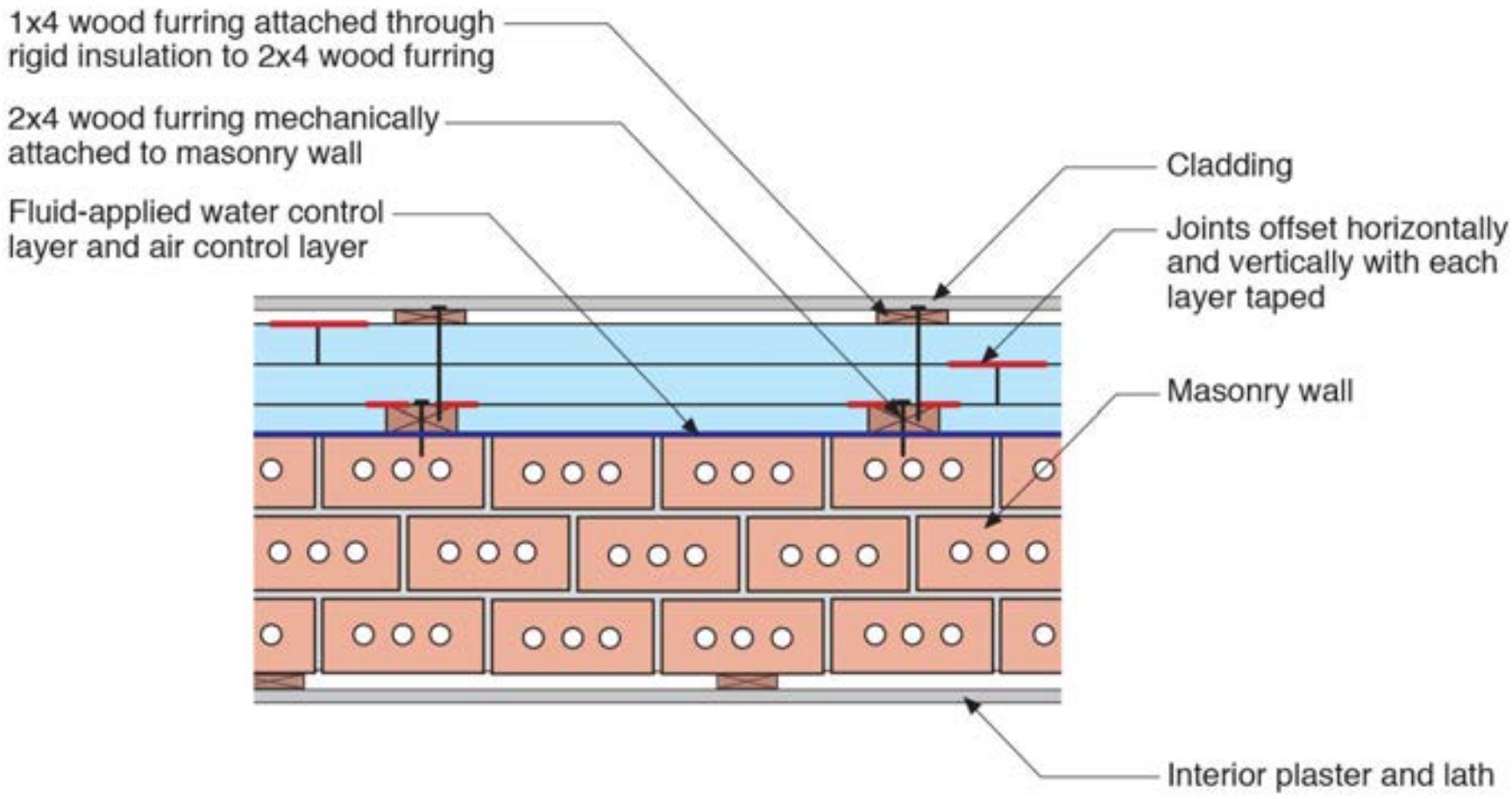

Five layers of 2" rigid insulation
Plywood
Fully-adhered membrane
Asphalt shingles
2x8
2x6
Stainless steel drip edge
Cellular PVC trim
Cellular PVC trim
Wood siding
1x4 siding
Four layers of 2" rigid insulation
Fully-adhered membrane
Plywood
Tar paper
Board sheathing
Board sheathing
Tar paper
Plywood
Fully-adhered membrane

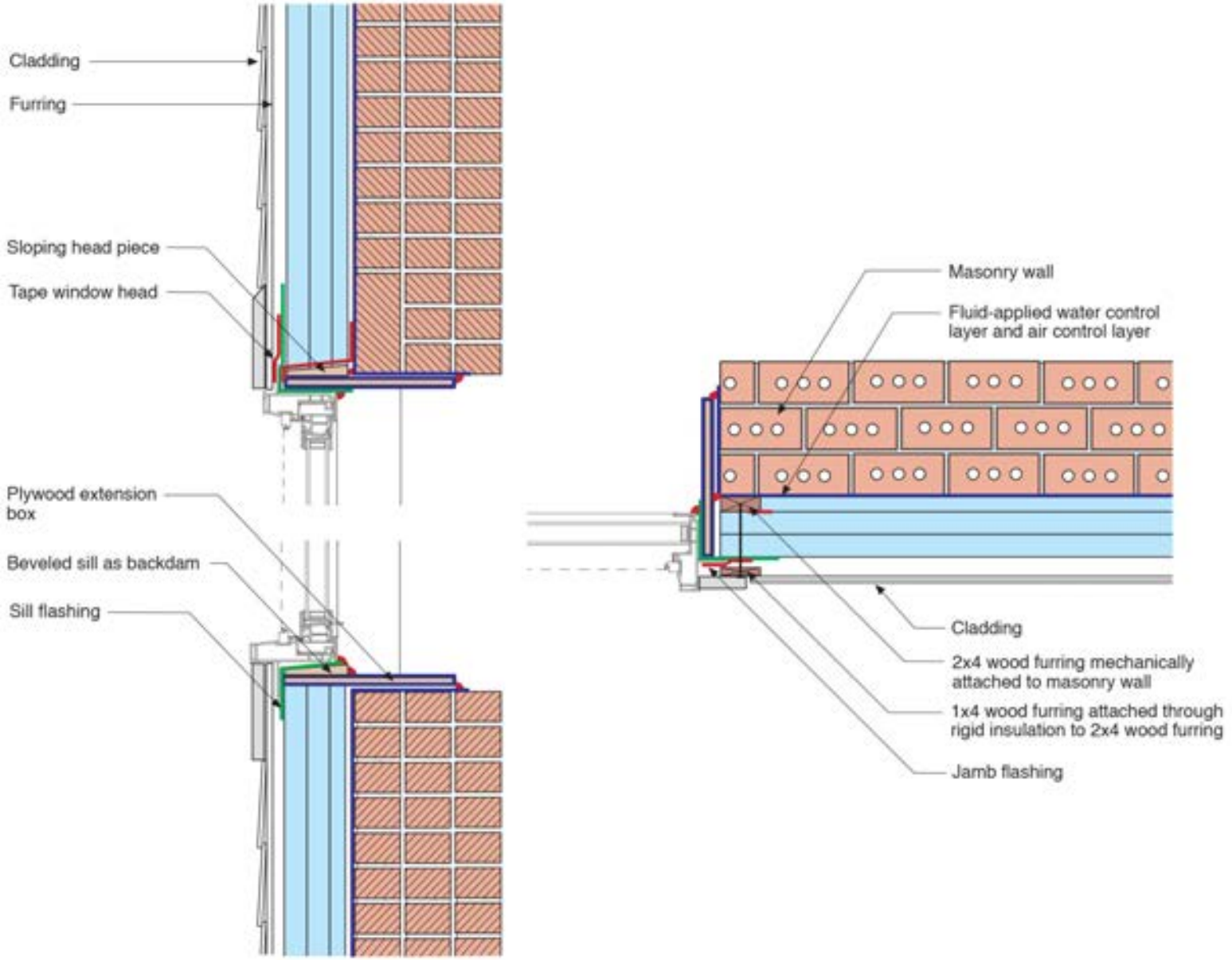

DOW
DOW
DOW
Sup
Comm


Super TUFF-R
DOW


DOW
Super TUFF-R
Commercial Insulation
DOW
Super TUFF-R
Commercial Insulation
DOW
Super TUFF-R
Commercial Insulation


JLG
Lull

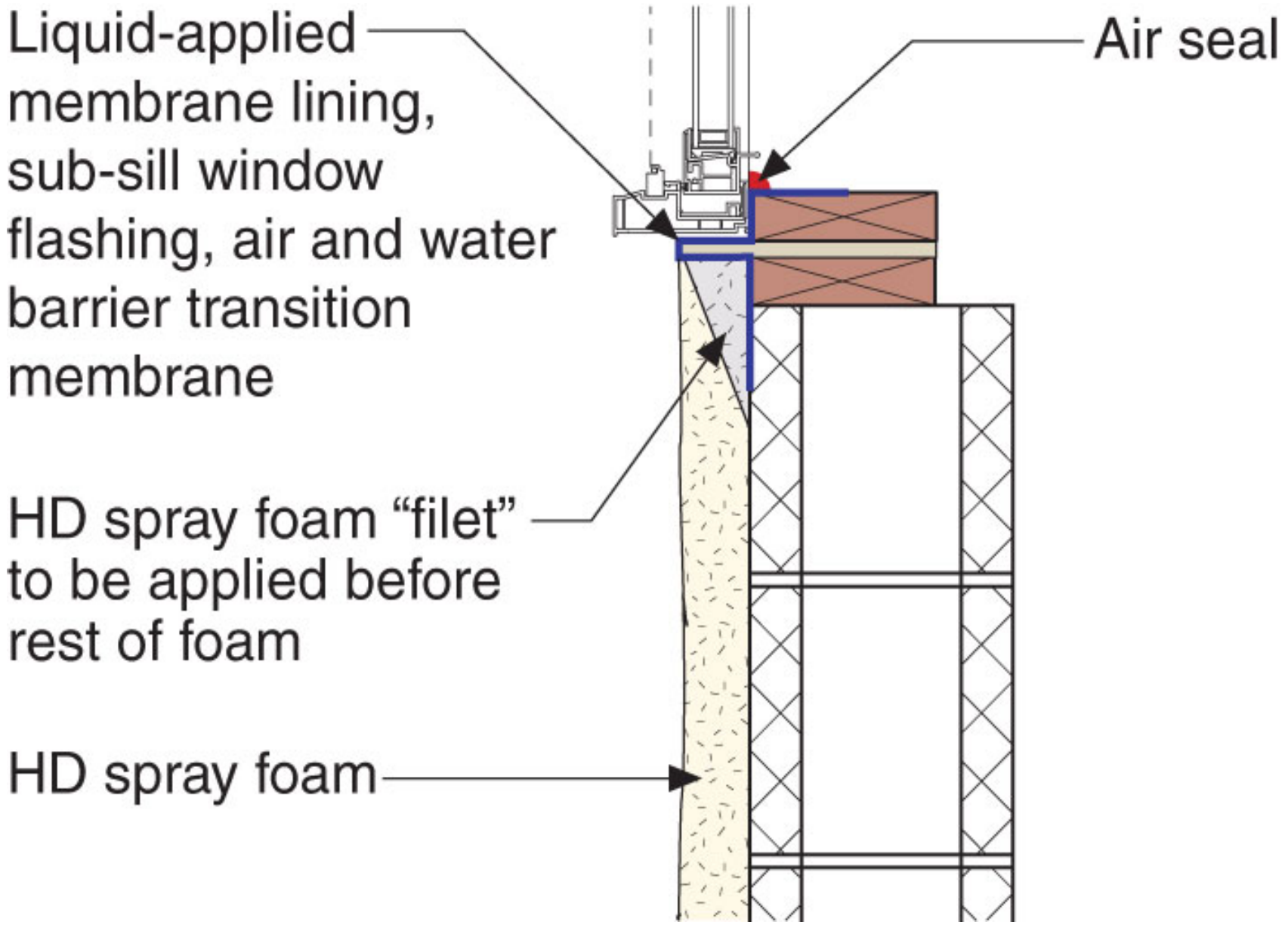

1x4 wood furring attached through rigid insulation to 2x4 wood furring
2x4 wood furring mechanically attached to masonry wall
Fluid-applied water control layer and air control layer
Cladding
Joints offset horizontally and vertically with each layer taped
Masonry wall
Interior plaster and lath

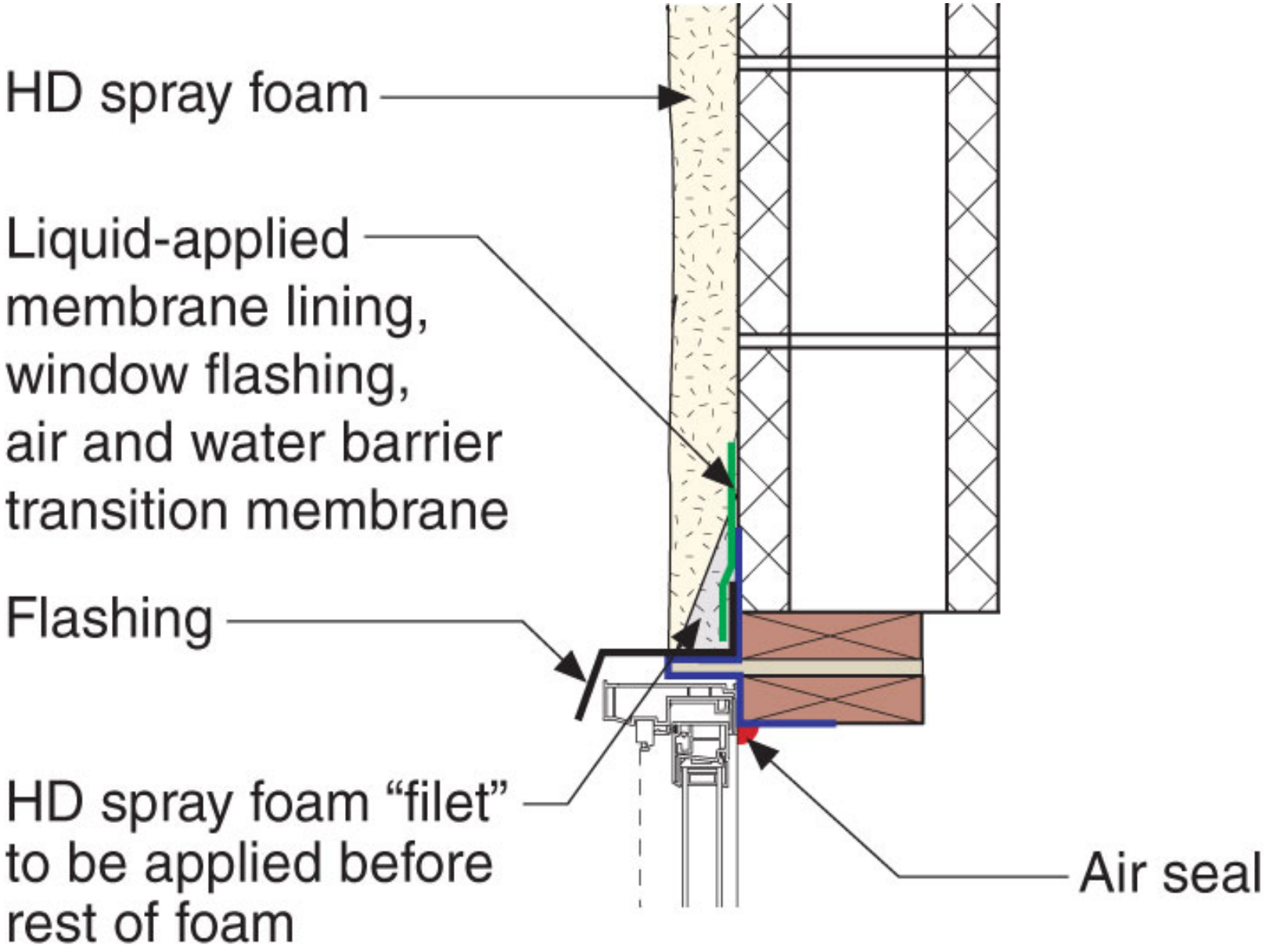

Cladding
Furring
Sloping head piece
Tape window head
Plywood extension box
Beveled sill as backdam
Sill flashing
Masonry wall
Fluid-applied water control layer and air control layer
Cladding
2x4 wood furring mechanically attached to masonry wall
1x4 wood furring attached through rigid insulation to 2x4 wood furring
Jamb flashing

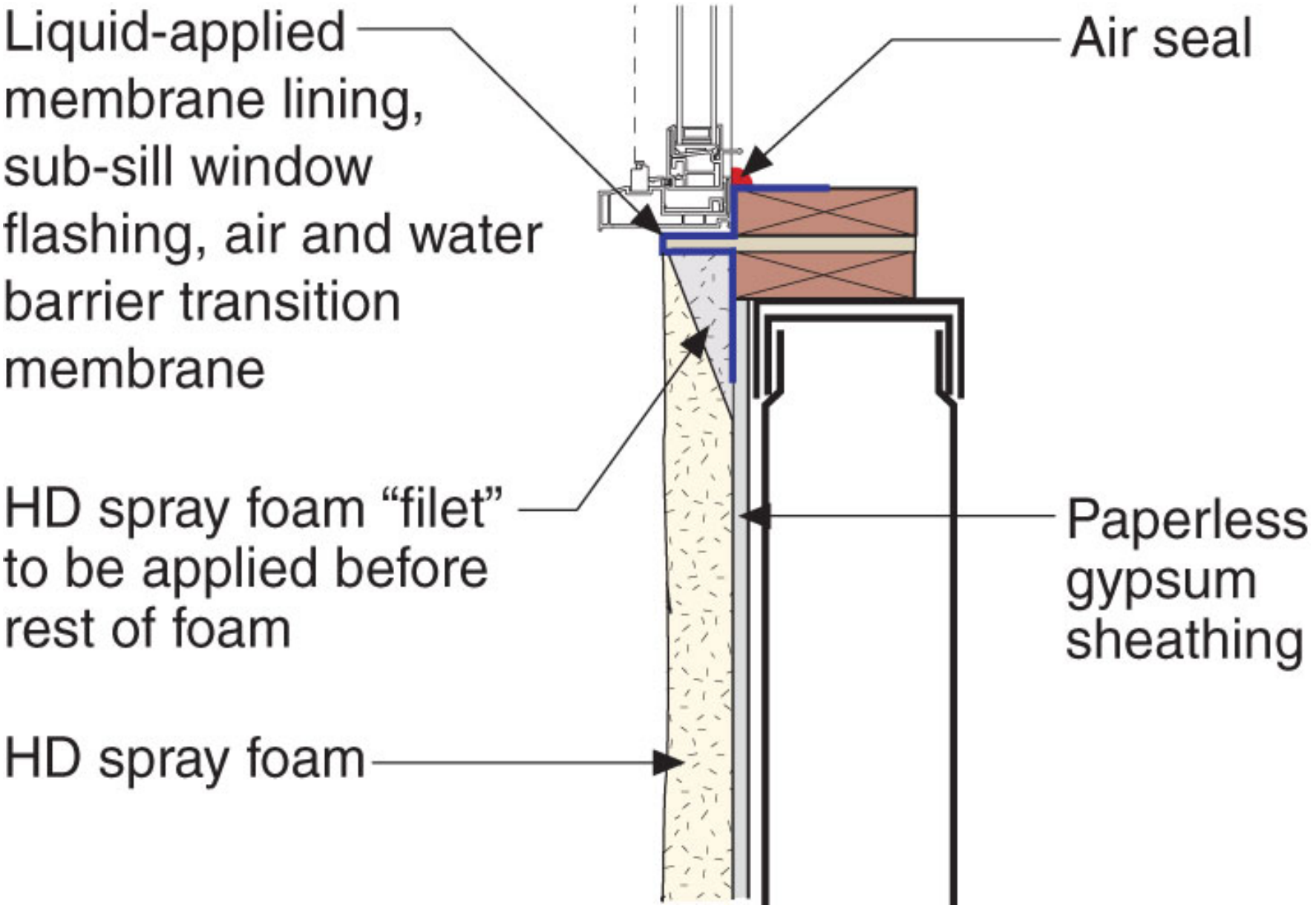

with ENERGY STAR
R-10
2
Seal and Insulate
with ENERGY STAR

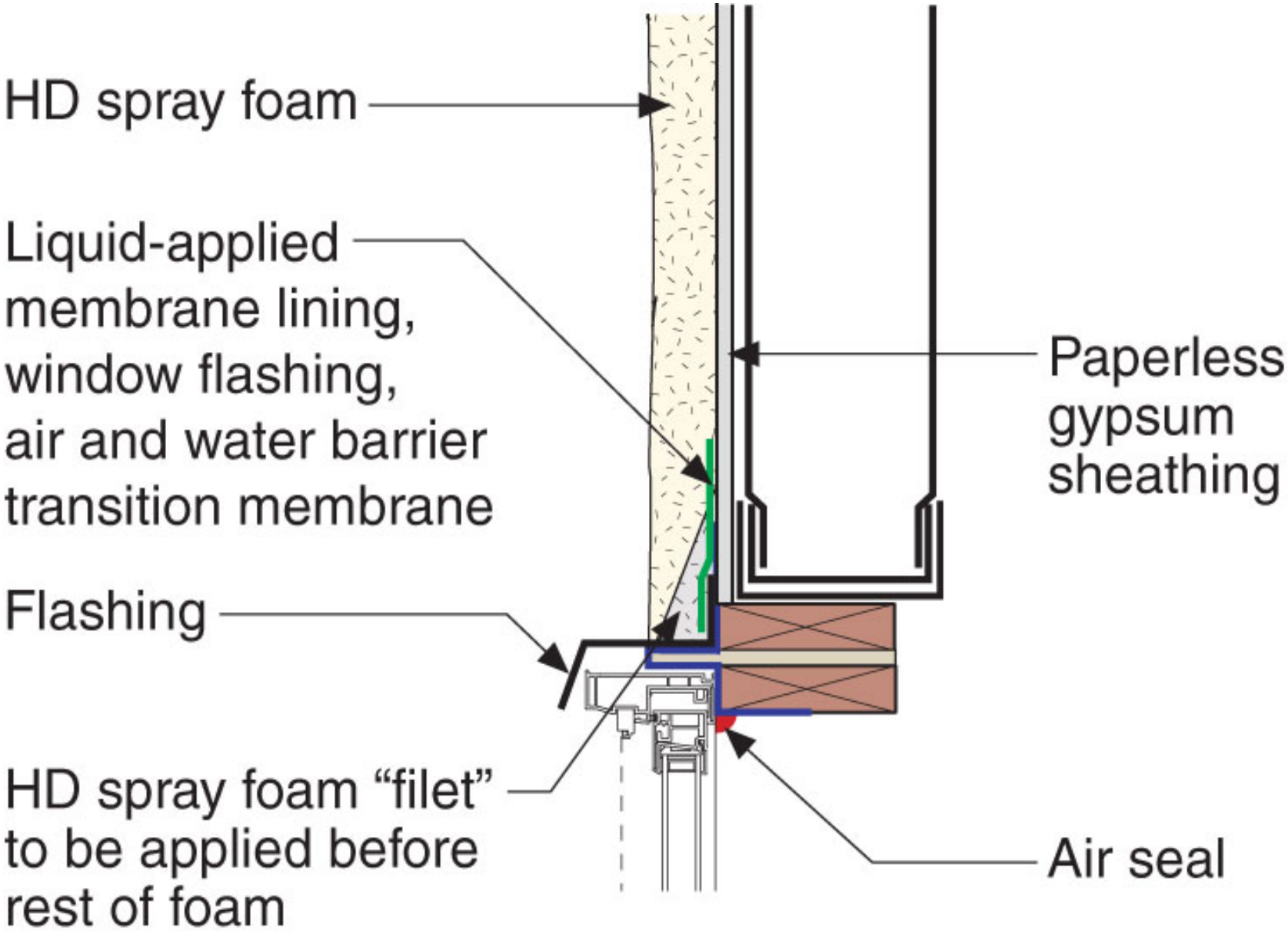

SPEED
HUMP

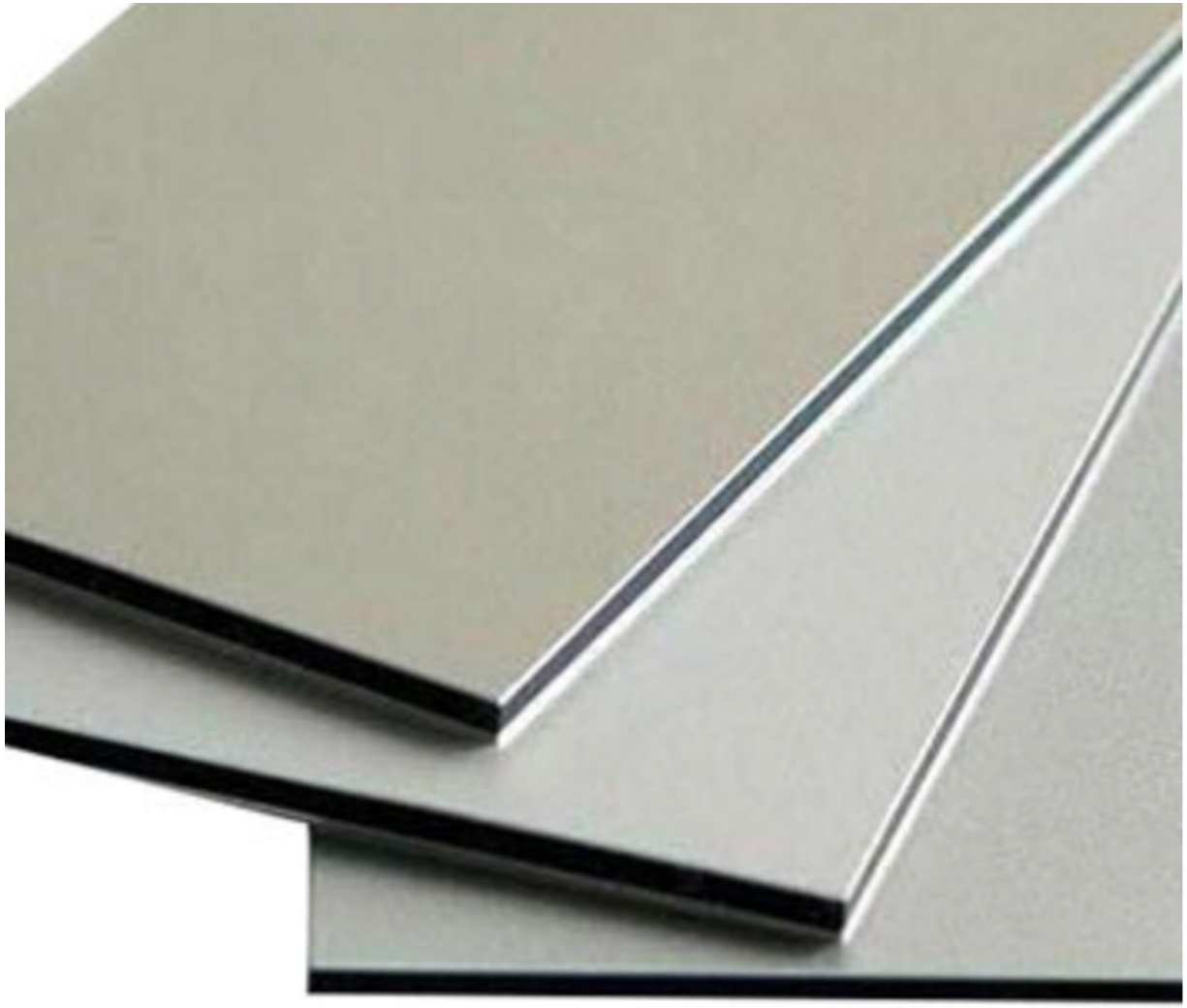

SPEED
HUMP

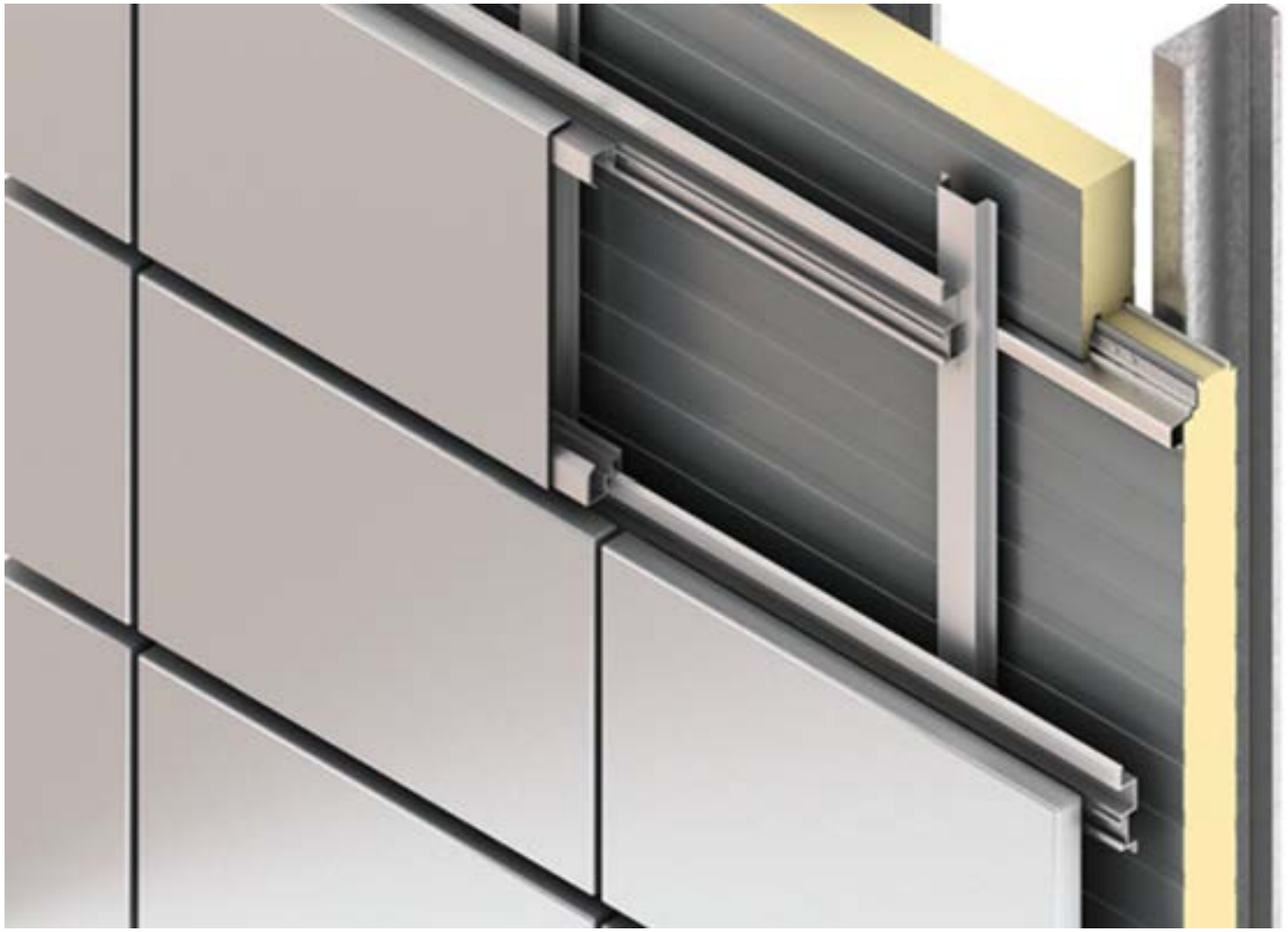

Liquid-applied membrane lining, sub-sill window flashing, air and water barrier transition membrane
Air seal
HD spray foam "filet" to be applied before rest of foam
HD spray foam

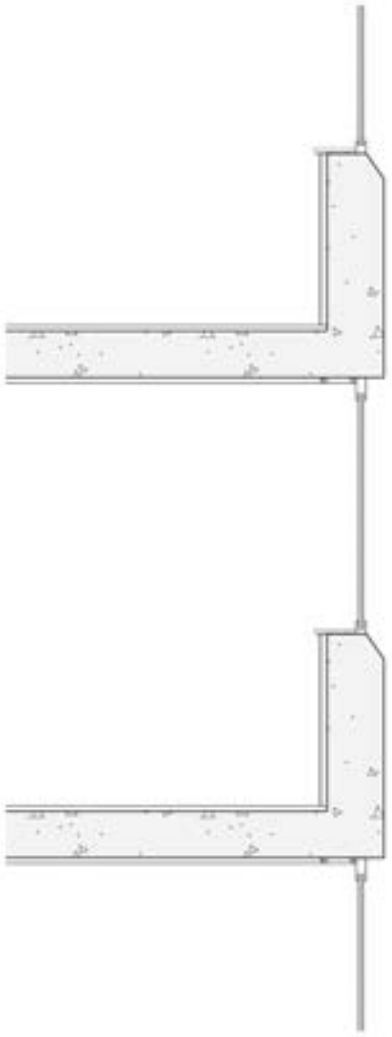

HD spray foam
Liquid-applied membrane lining, window flashing, air and water barrier transition membrane
Flashing
HD spray foam “filet” to be applied before rest of foam
Air seal

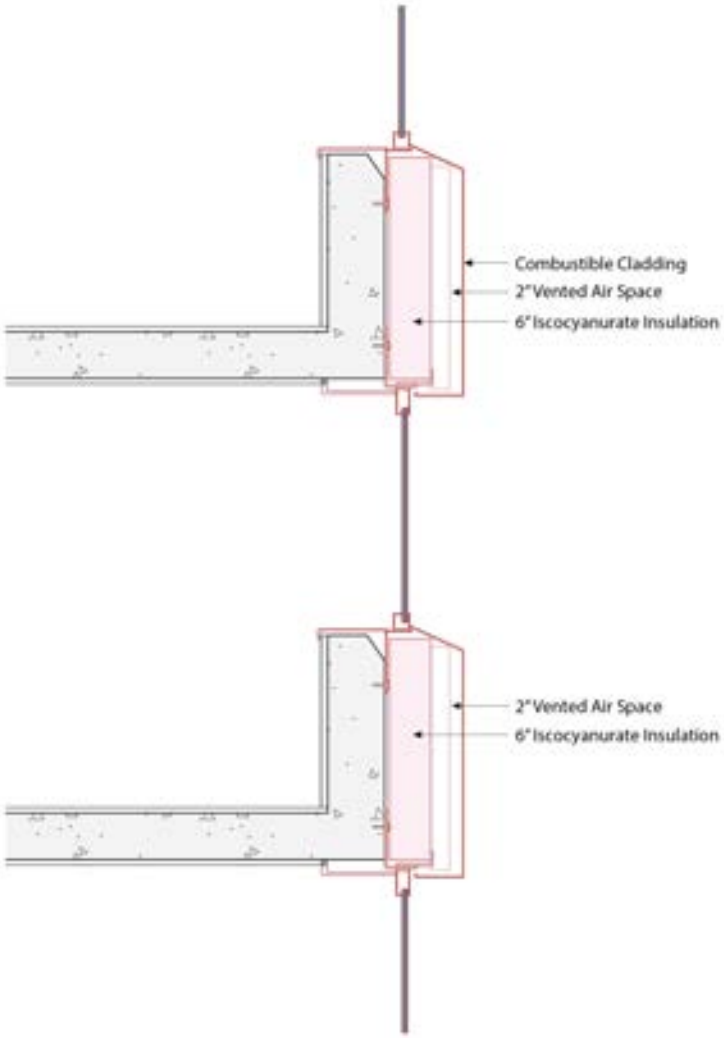

Liquid-applied membrane lining, sub-sill window flashing, air and water barrier transition membrane
Air seal
HD spray foam "filet" to be applied before rest of foam
Paperless gypsum sheathing
HD spray foam

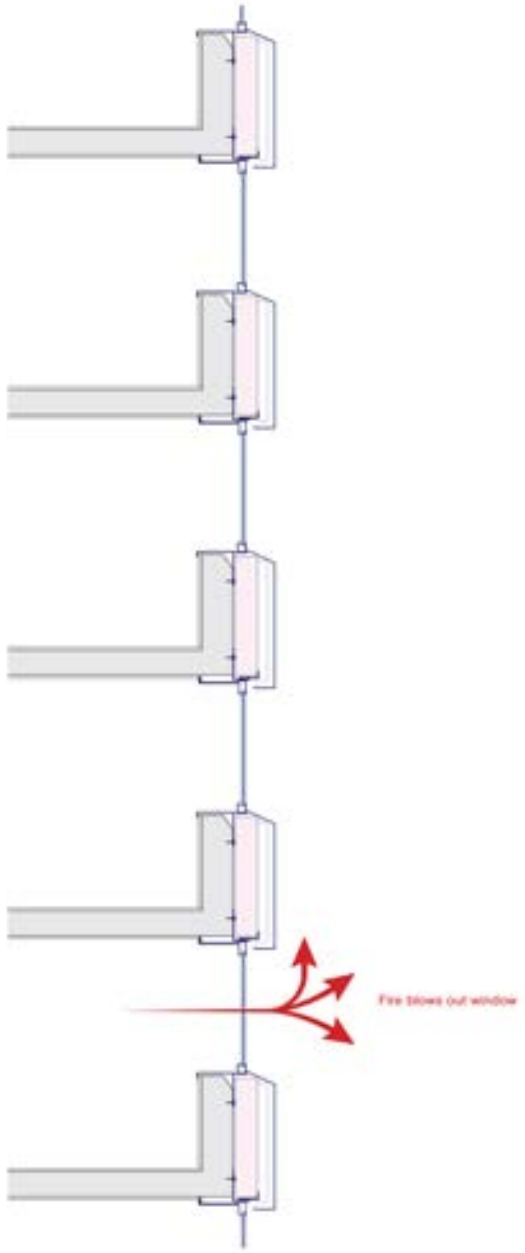

HD spray foam
Liquid-applied membrane lining, window flashing, air and water barrier transition membrane
Flashing
HD spray foam “filet” to be applied before rest of foam
Paperless gypsum sheathing
Air seal

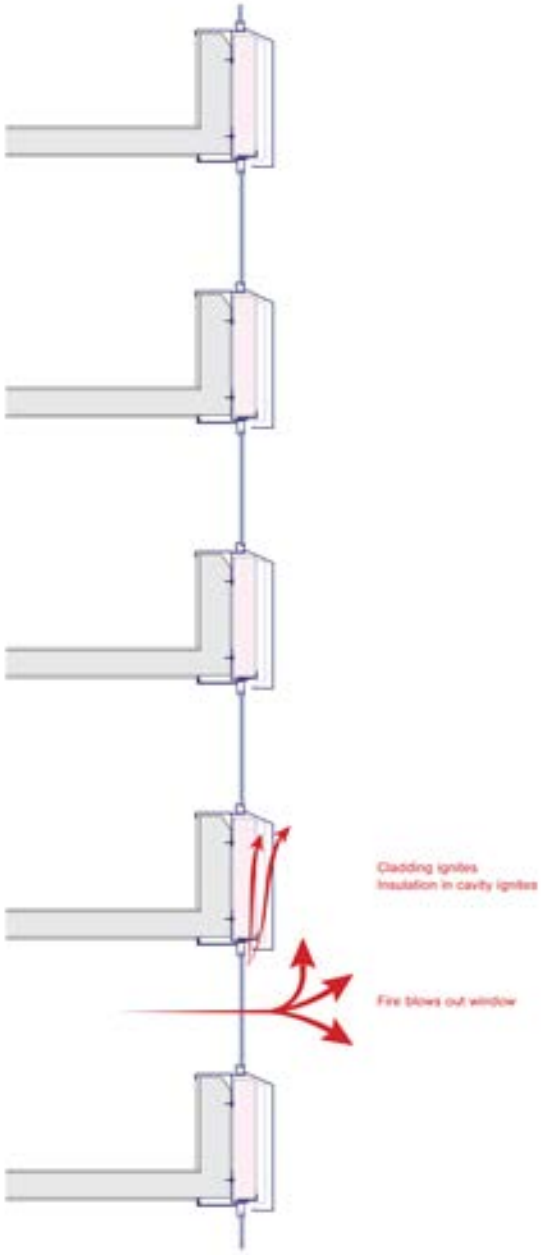


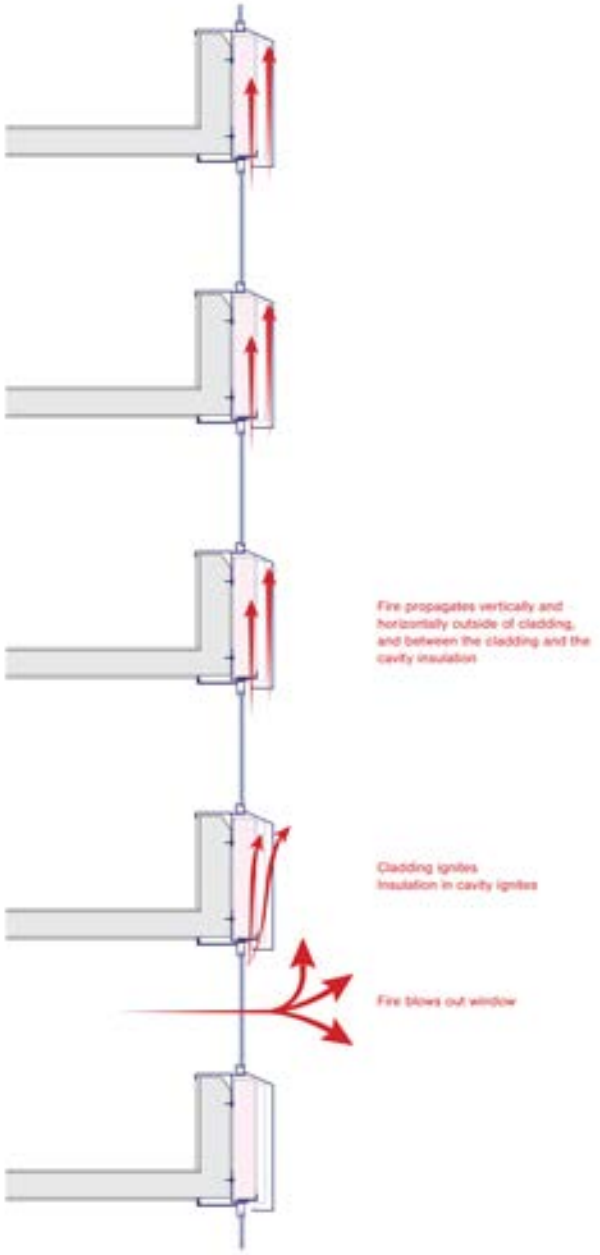


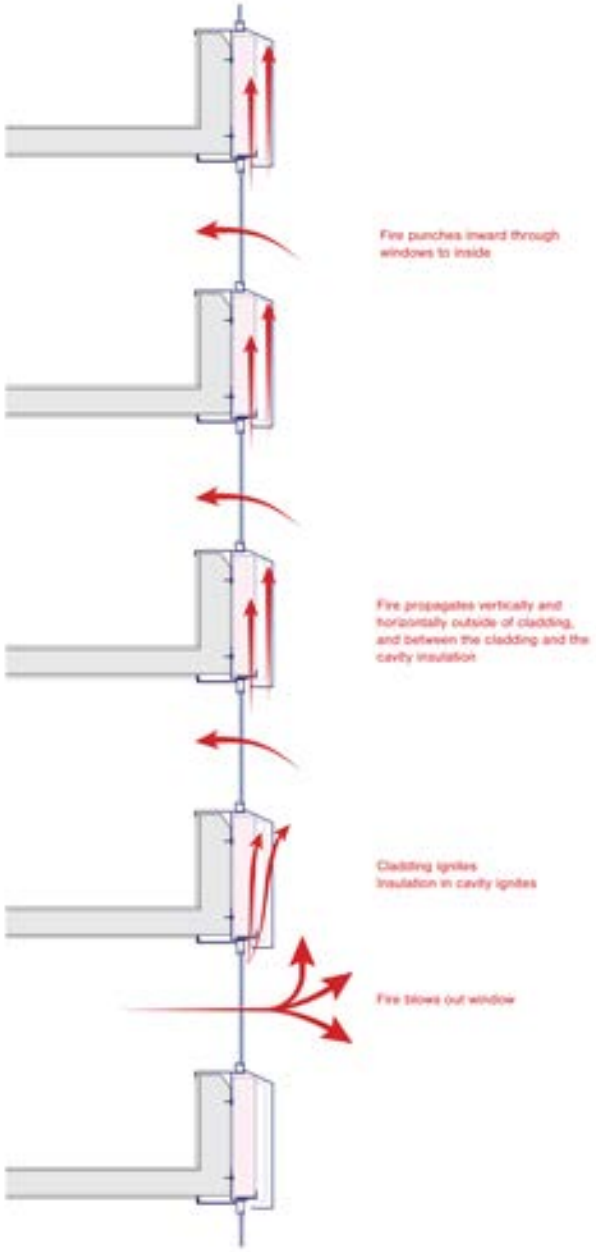



Combustible Cladding
2" Vented Air Space
6" Iscocyanurate Insulation
2" Vented Air Space
6" Iscocyanurate Insulation


Fire blows out window


Cladding ignites
Insulation in cavity ignites
Fire blows out window


Fire propagates vertically and horizontally outside of cladding, and between the cladding and the cavity insulation
Cladding ignites
Insulation in cavity ignites
Fire blows out window


Fire punches inward through windows to inside
Fire propagates vertically and horizontally outside of cladding, and between the cladding and the cavity insulation
Cladding ignites
Insulation in cavity ignites
Fire blows out window

NFPA 285

Image Courtesy Payette

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Thank You!

This concludes The American Institute of Architects Continuing Education Systems Course.

Your feedback is **important** to us, please complete the **session evaluation** before you leave.

Joseph Lstiburek

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