



**abaa** 2026 building  
enclosure  
conference

# From the Window to the Wall: Bringing Together Heat, Air, and Moisture Control at Openings in the Enclosure

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DMAC Architecture & Interiors

# From the Window to the Wall: Bringing Together Heat, Air, and Moisture Control at Openings in the Enclosure



## Jessica Saravia

Jessica's career has delved into every phase of design and construction, and led to her current role as Technical Director at DMAC where she leads construction documentation, administration, and specification writing across project types, sizes, and programs. Jessica is passionate about building performance and building science. She is the past Chair of the Leadership Group for the National AIA Building Performance Knowledge Community. In addition, she serves on the National AIA Codes and Standards Committee and as Chair of the Chicago Chapter of the Building Enclosure Council. She lives in a 100-year-old house in Evanston with her husband, three kids, and two dogs.

## Learning Objectives

1. Learn how cladding type affects air and vapor control layers as well as cavity requirements for drainage and drying.
2. Understand best practice for where to locate the line of glazing within the wall assembly and how to support glazing and cladding in both combustible and non-combustible construction types.
3. Learn the difference between an air barrier, a vapor barrier, a vapor retarder, and a water resistive barrier; and understand how to determine when more than one control layer is desirable and where they should be located.
4. Understand best practices for how to flash openings to shed water while creating air tight openings for various claddings (ie: rainscreens vs. reservoir claddings, etc).



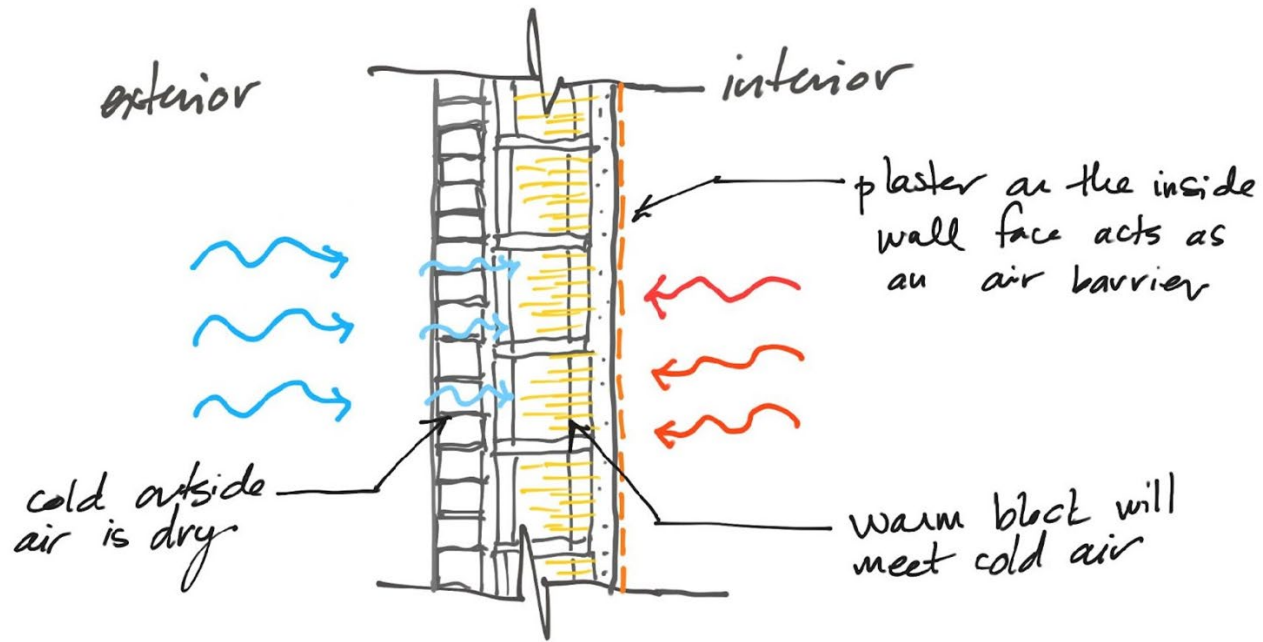
[https://en.wikipedia.org/wiki/Dowse\\_Sod\\_House](https://en.wikipedia.org/wiki/Dowse_Sod_House)

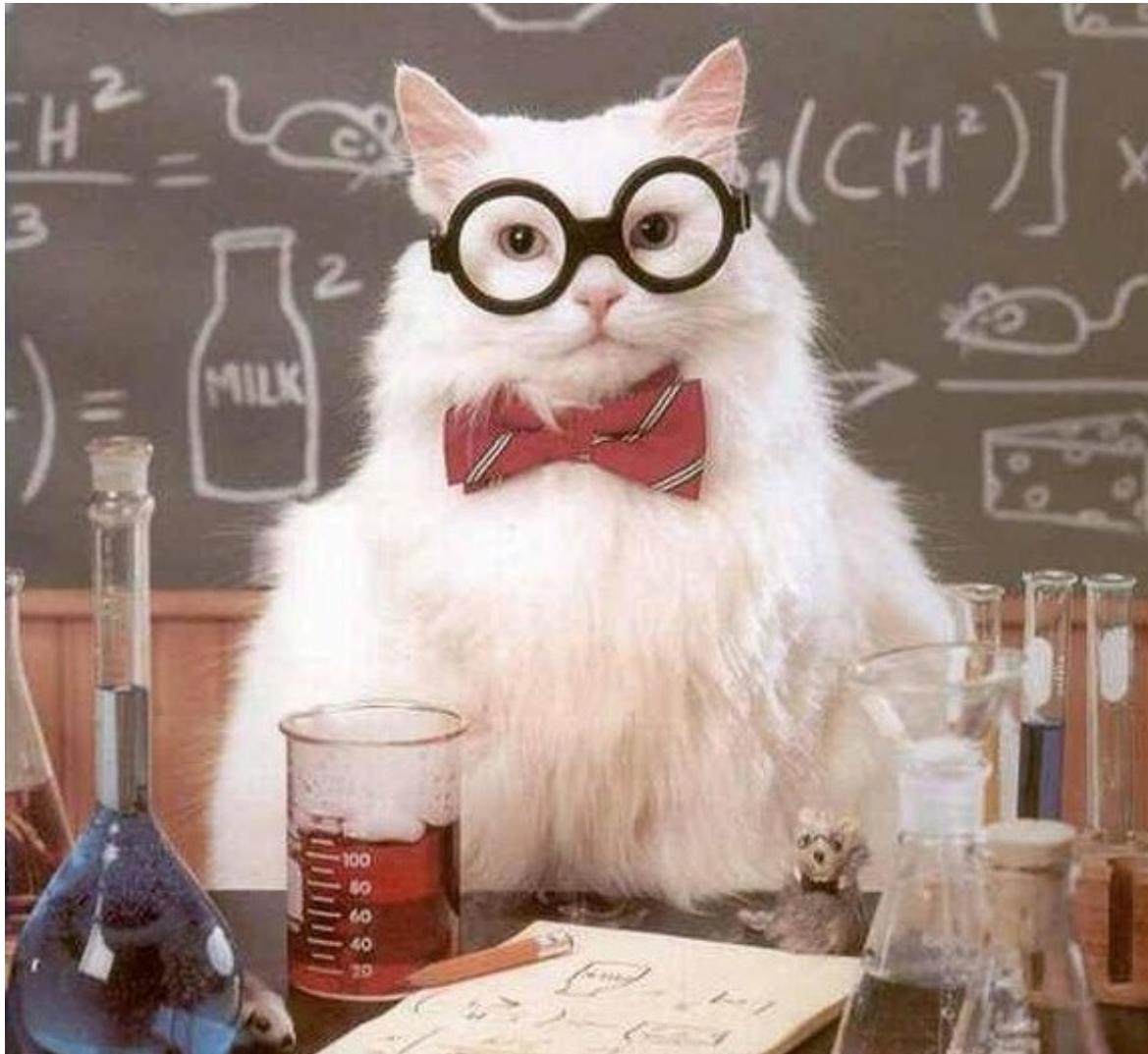


On the left:  
<https://www.nps.gov/places/cathlapotle-plankhouse.htm>—  
photo by A. Davey

On the right:  
<https://www.nps.gov/band/index.htm> - Picture of Talus House by Sally King







### **All Stars**

- Envelope air tightness
- Super insulated envelope
- No thermal bridges

### **Rookie First team**

- Responsive to climate zone
- Build-able by local sub-contractors

### **Wild Cards**

- Construction type
- Project budget

Envelope air tightness

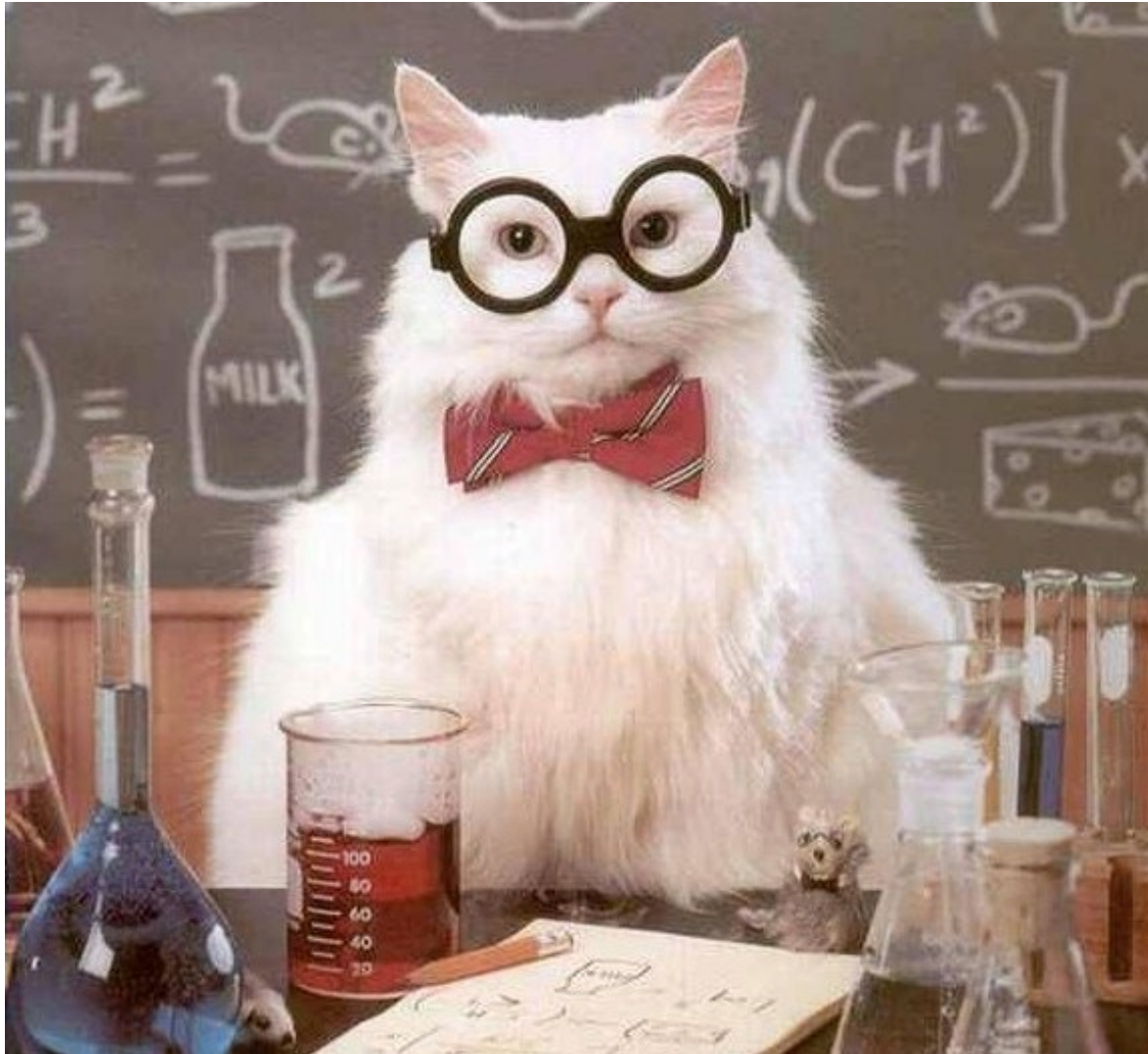


Super insulated envelope





Thermal bridge free detailing



## All Stars

Envelope air tightness  
Super insulated envelope  
No thermal bridges

## Rookie First team

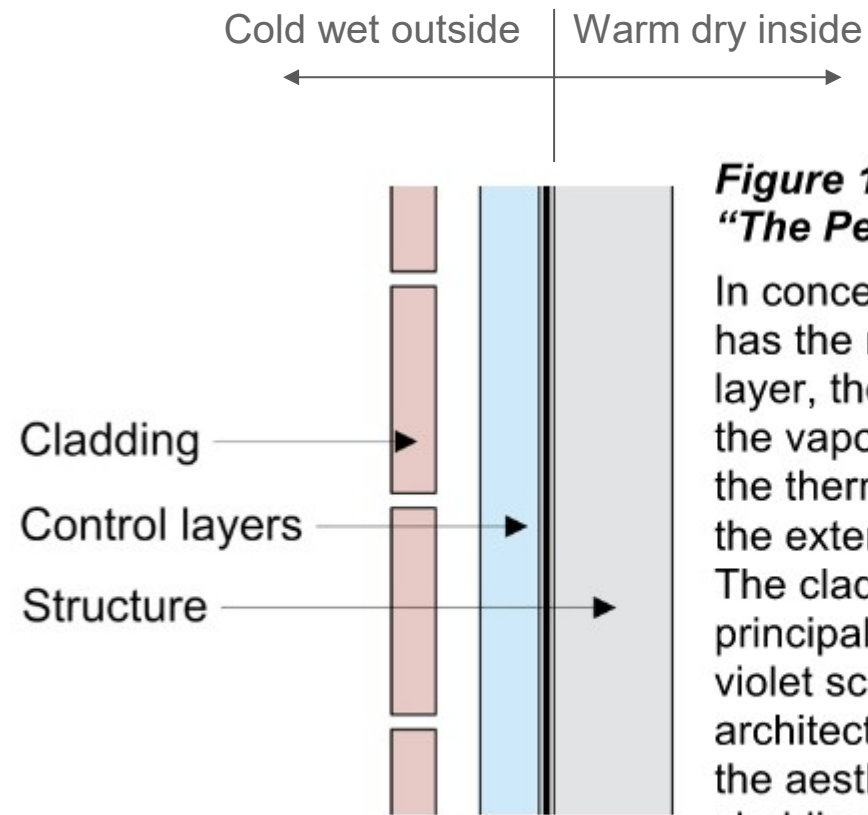
Responsive to climate zone  
Build-able by local sub-contractors

## Wild Cards

Construction type  
Project budget

In the perfect wall, the insulation on the outside of the structure keeps everything inboard of that at similar temperature, which helps prevent condensation.

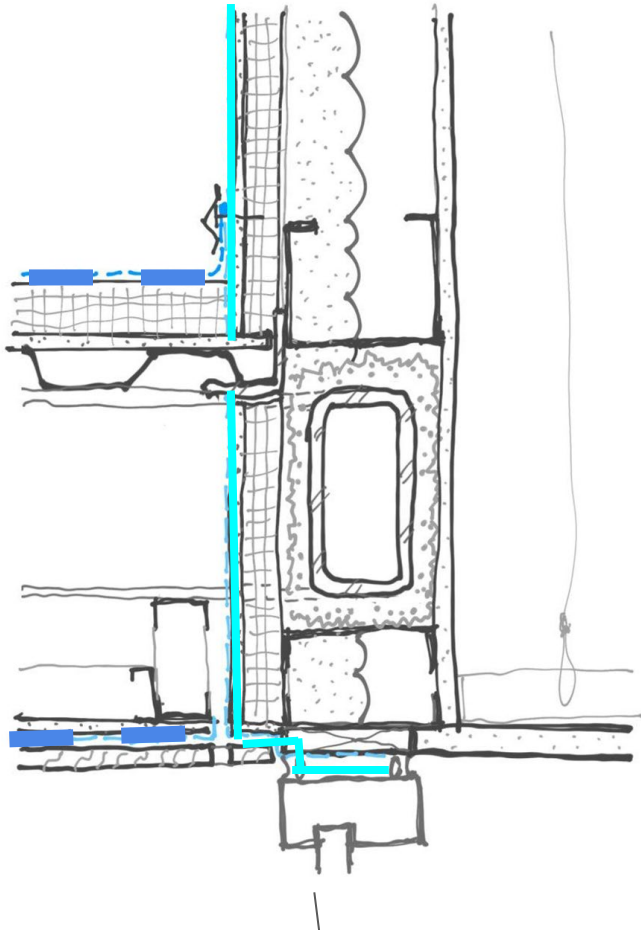
Also your water / air / vapor control layers protect your structure as well and both of those things extend the longevity of your building.



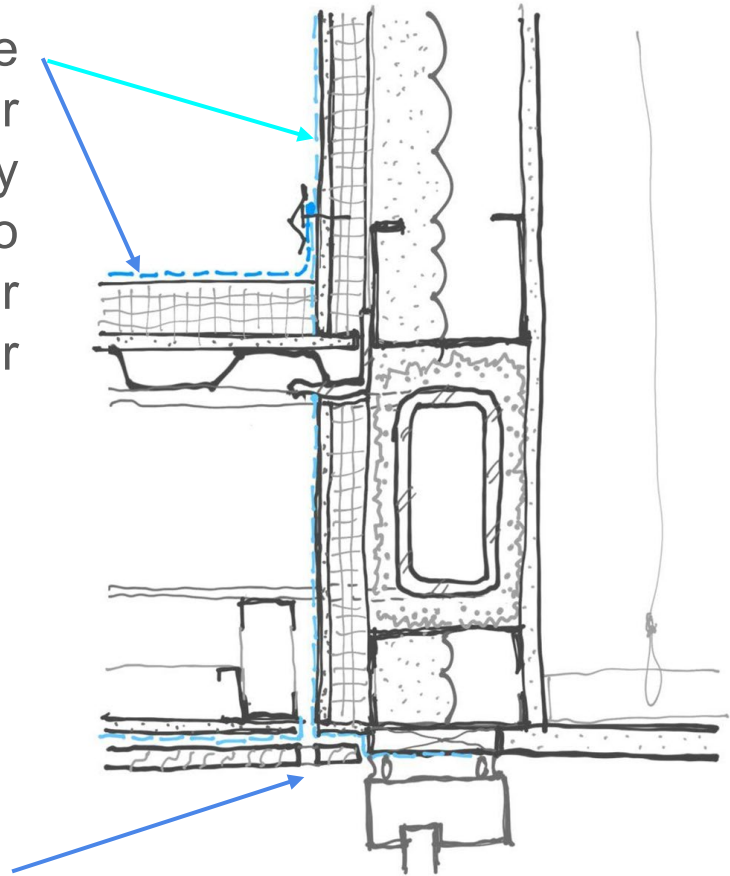
**Figure 1:**  
**“The Perfect Wall”**

In concept the perfect wall has the rainwater control layer, the air control layer, the vapor control layer and the thermal control layer on the exterior of the structure. The claddings function is principally to act as an ultra-violet screen. Oh, and architects might consider the aesthetics of the cladding to be important.

Image from ‘The Perfect Wall’ paper on [BuildingScience.com](https://www.buildingscience.com) by Dr. Joseph Lstiburek



The air layer line follows the exterior wall but the canopy structure is also protected by an air barrier



The soffit is vented because it is not connected to the conditioned area of the building

Control layers (most to least permeable)

WRB - Water Resistive Barrier

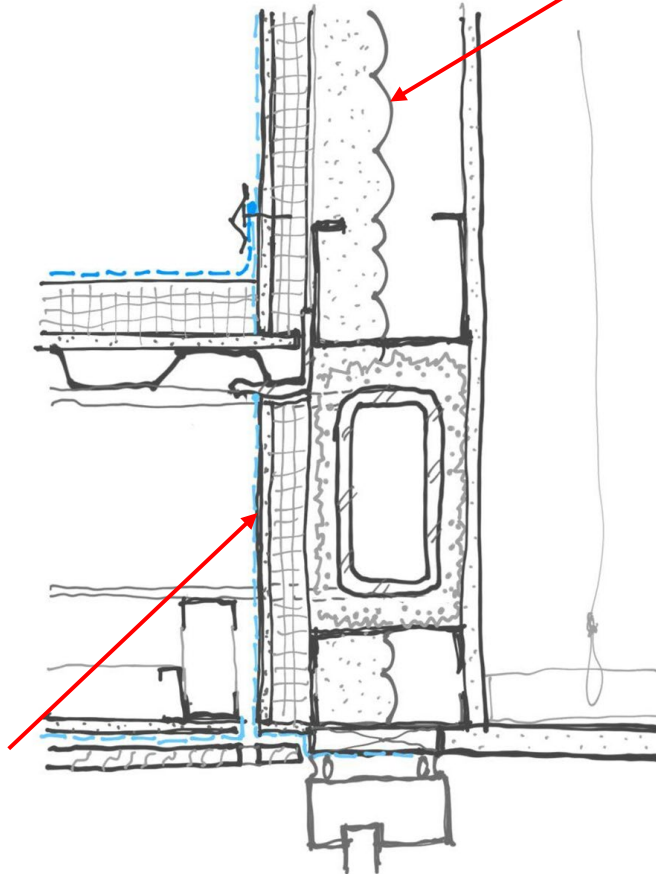
Air Barrier

Vapor Retarder - Class 1, 2, 3

Vapor Barrier



Vapor permeable air barrier  
(to stop water and damp air  
from reaching the interior)



Class 1 or 2 vapor  
retarder (to stop  
warm humid air from  
reaching any cold  
surfaces due to vapor  
drive in cold weather)

Control layers (most to least permeable)

WRB - Water Resistive Barrier

Air Barrier

Vapor Retarder - Class 1, 2, 3

Vapor Barrier

WRB



Air Barrier



Vapor Retarder



WRB - Water Resistive Barrier - Tyvek, building paper, untaped



Air Barrier - Roll on or peel and stick, air tight



## Vapor Retarders - Levels of permeability

Class 3 - 10 perms +

Class 2 - 1-10 perms

Class 1 - 0.1-1 perm

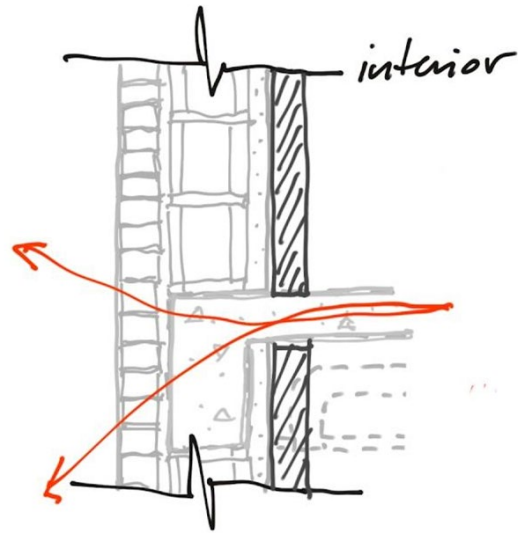
Anything Class 1 or less permeable can be called a Vapor Barrier

It's basically a plastic bag at that point

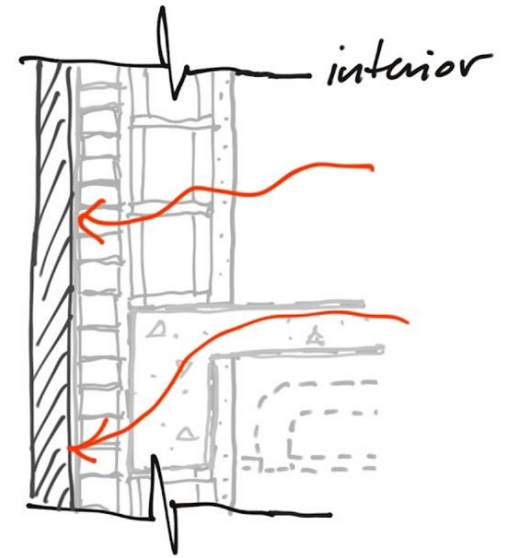




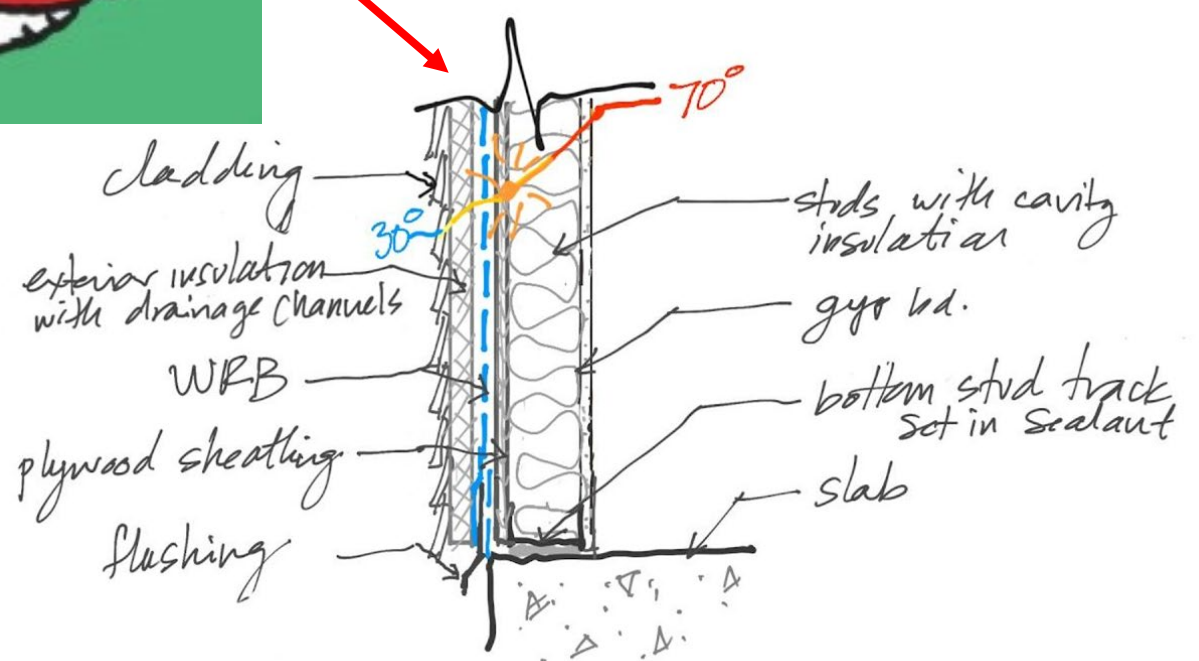
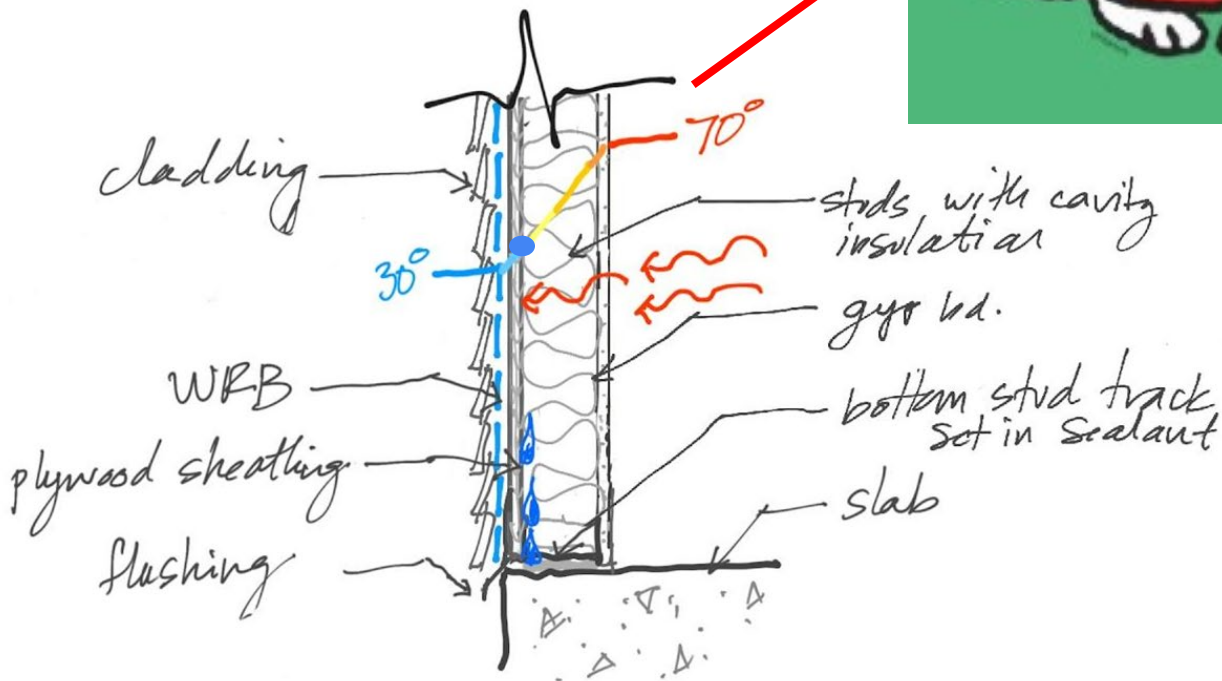
exterior

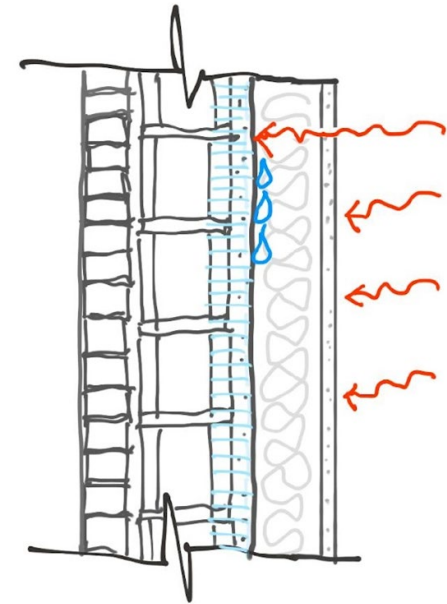
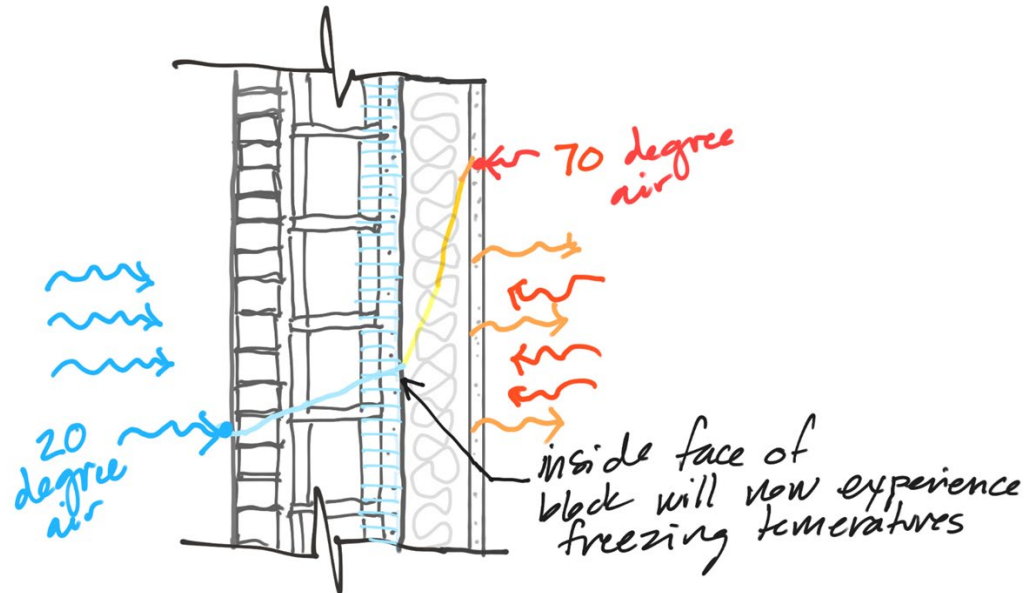
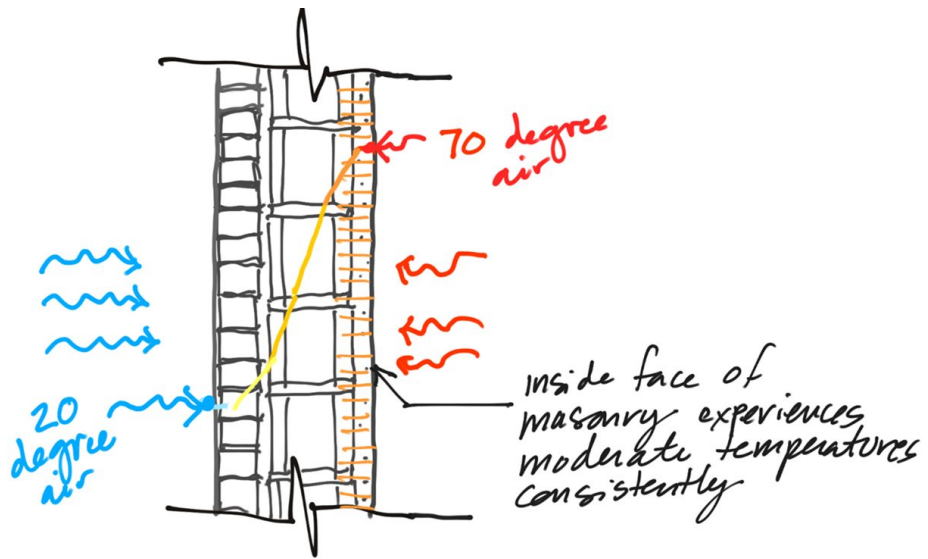


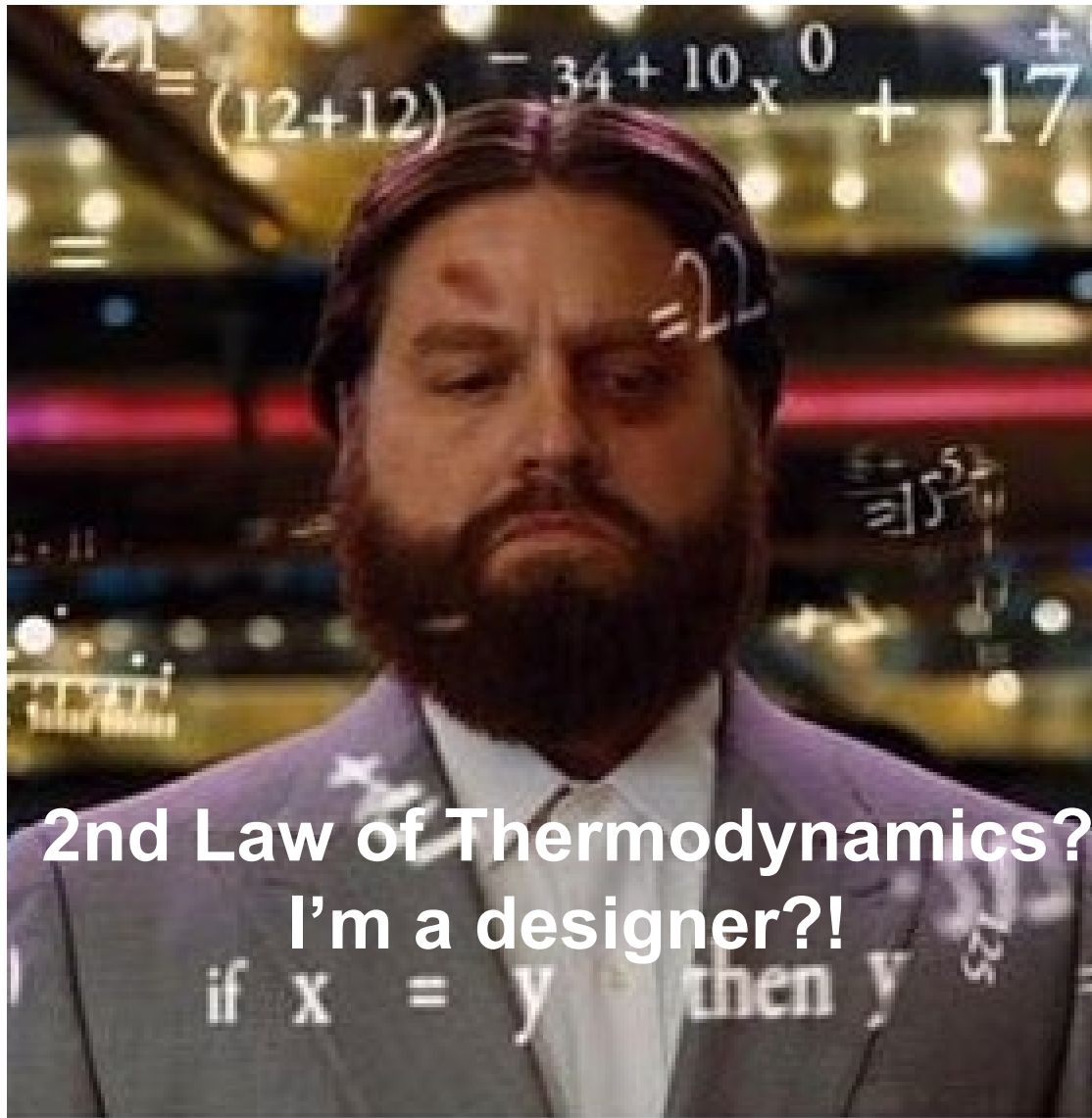
exterior



That baby is a thermal bridge







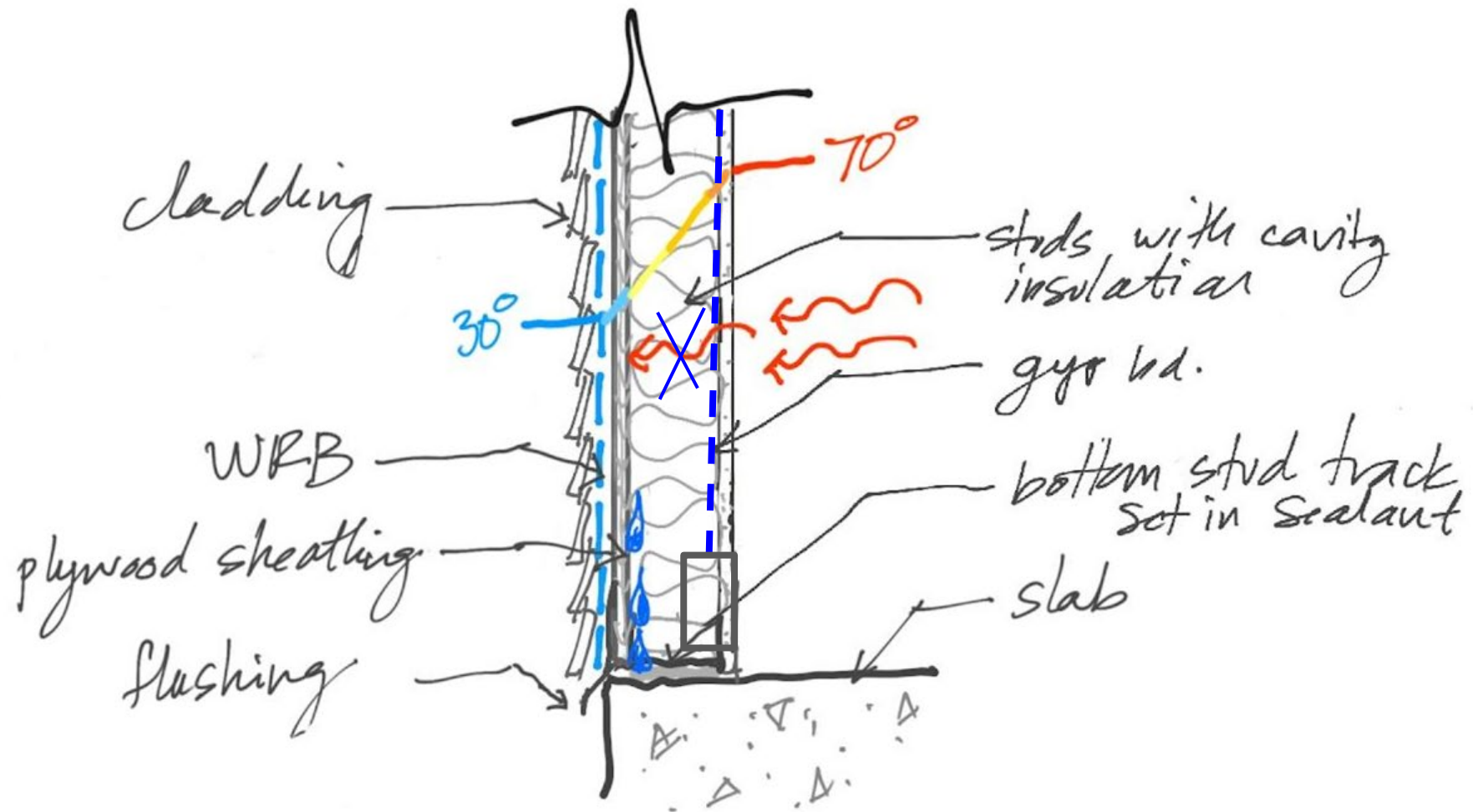
2nd Law of Thermodynamics -  
high energy travels to low energy  
Heat seeks Cold

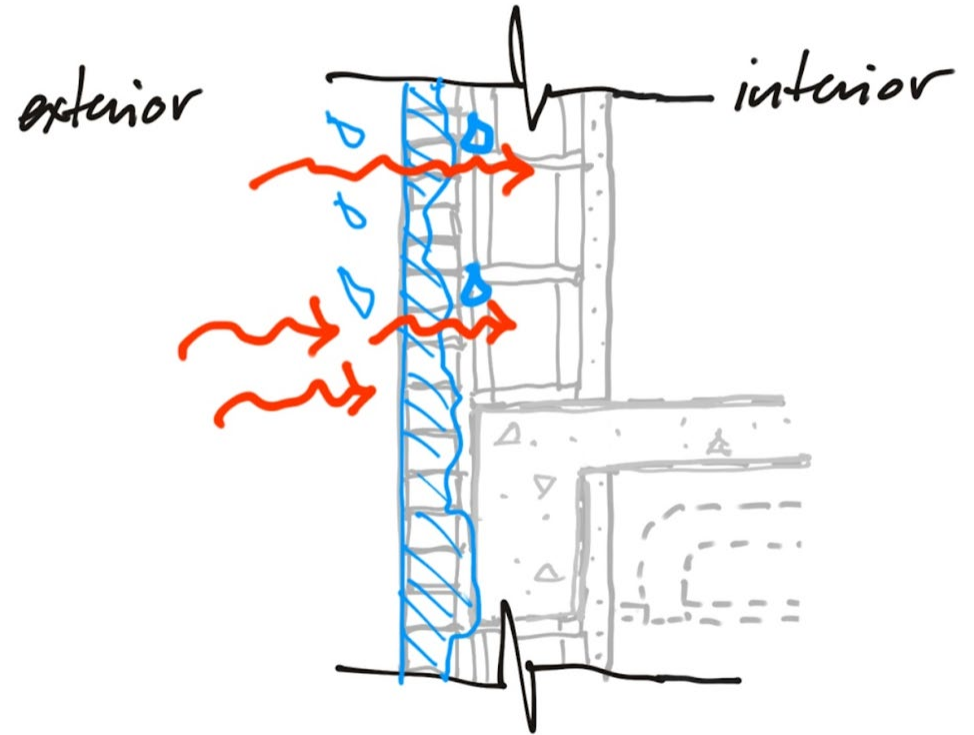
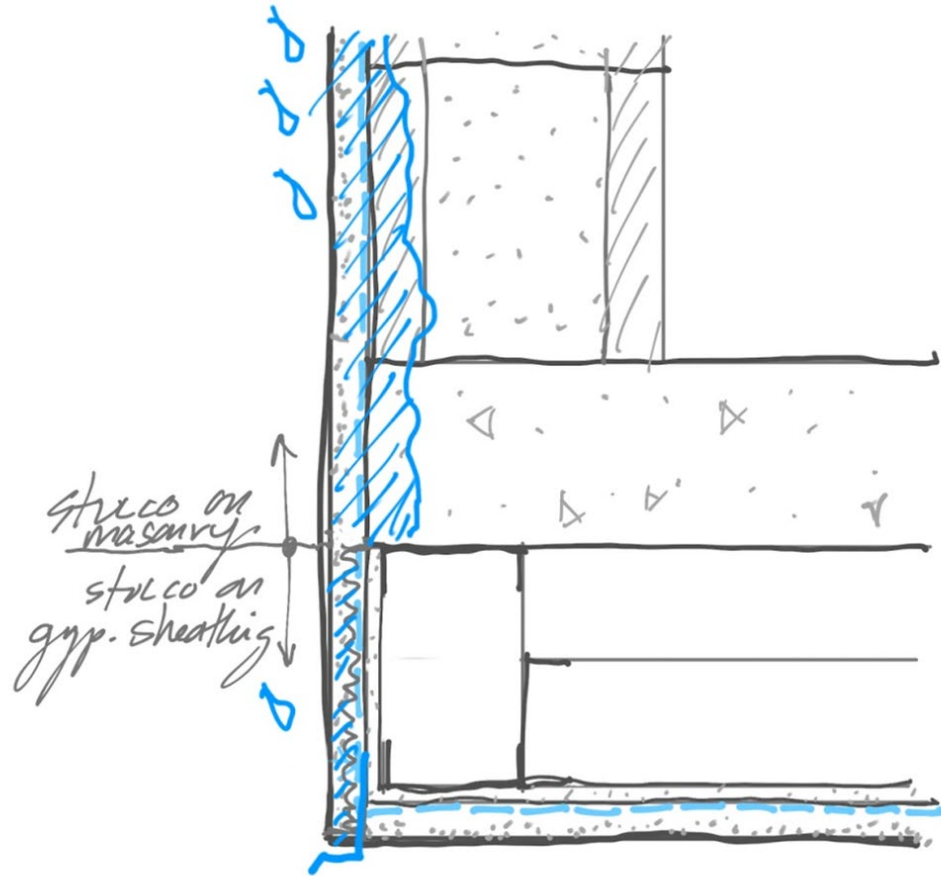
3 methods of heat transfer -

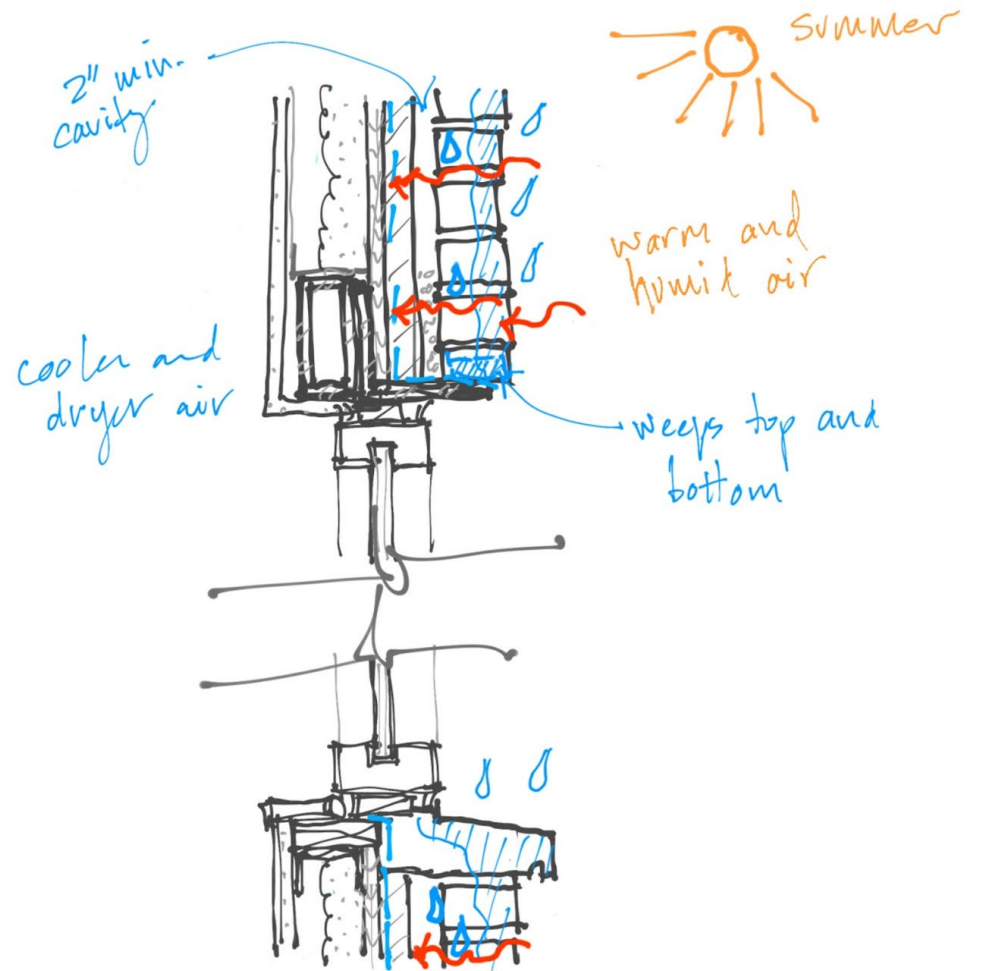
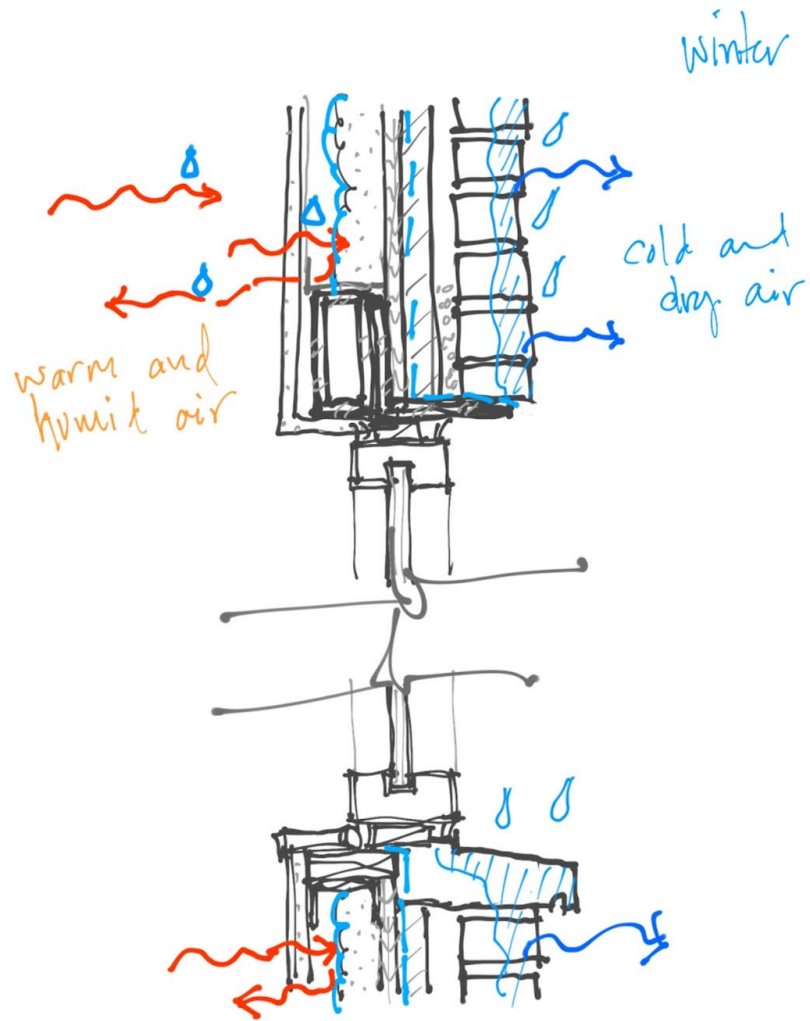
Conduction - your dog finds the  
sunny spot on the floor

Convection - air moves past a hot  
surface and draws heat into the air as  
it moves

Radiation - heat waves travel  
\*through\* the air without heating the  
air - heating surfaces

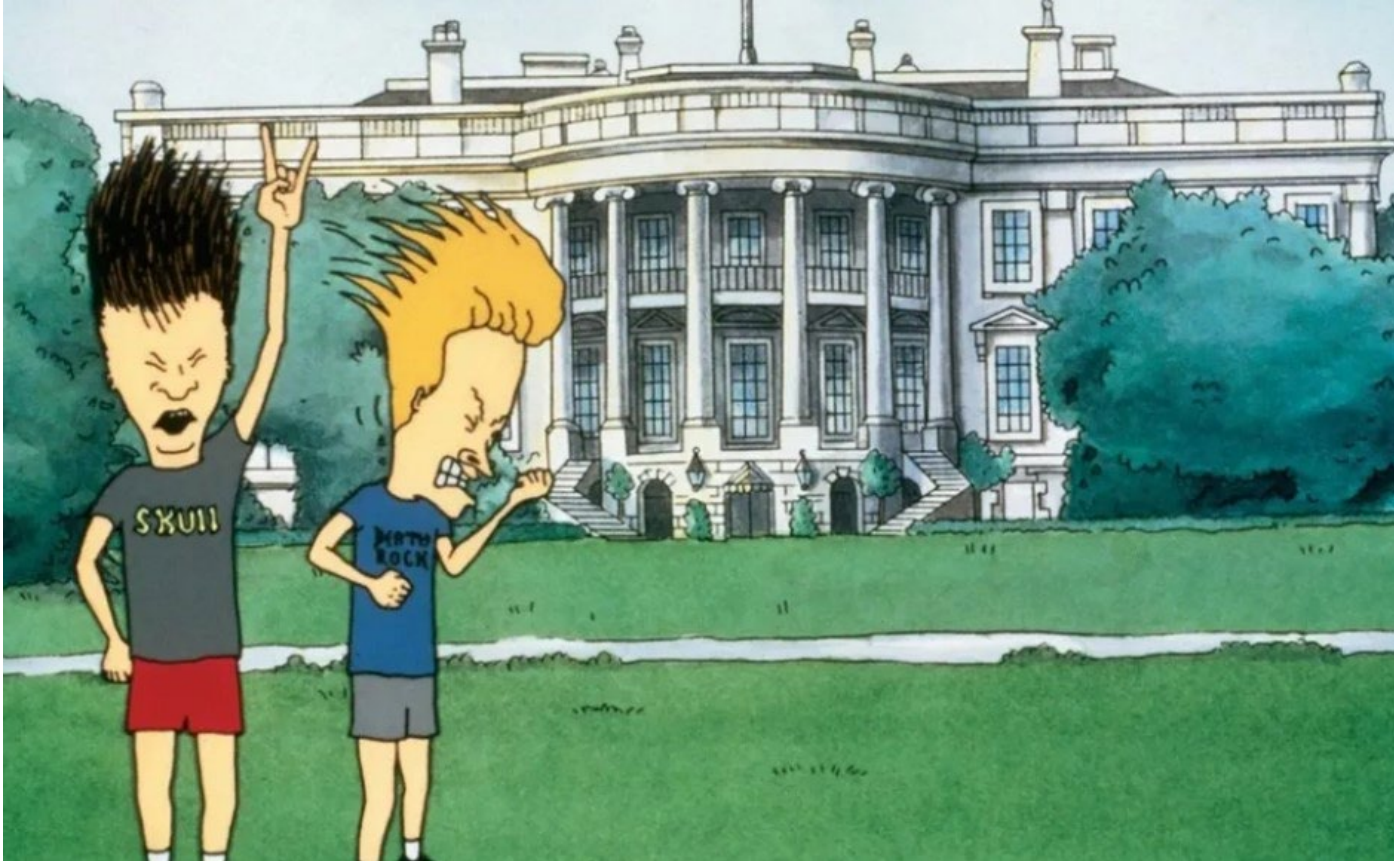






# Climate zone and Construction type





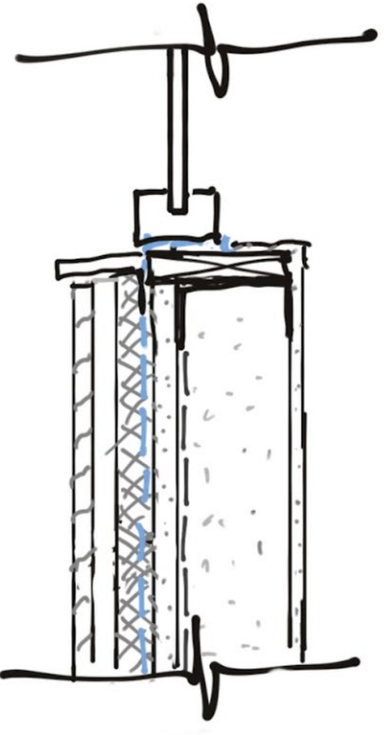
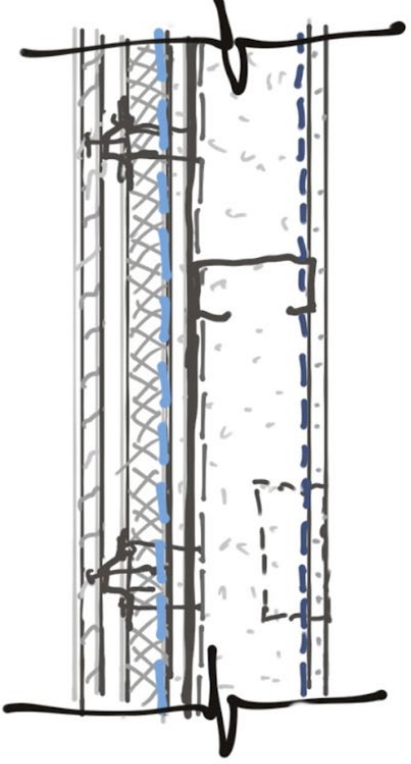
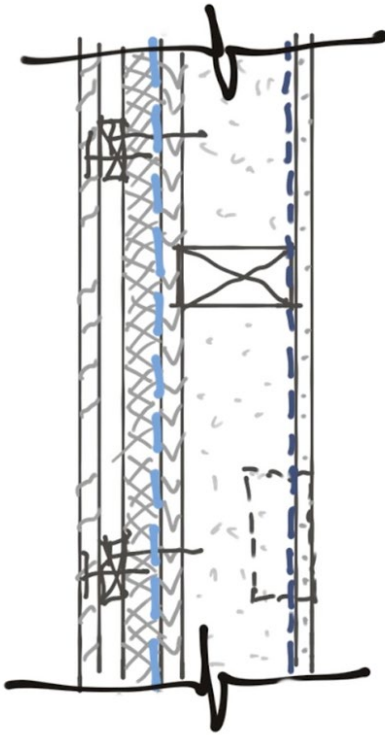
## Type V Combustible Construction

- Wood is less conductive than metal
- Plywood sheathing is structural and can be used to support cladding as well as act as a substrate for WRB
- Some types of insulation or insulating sheathing are combustible and can only be used in combustible construction types

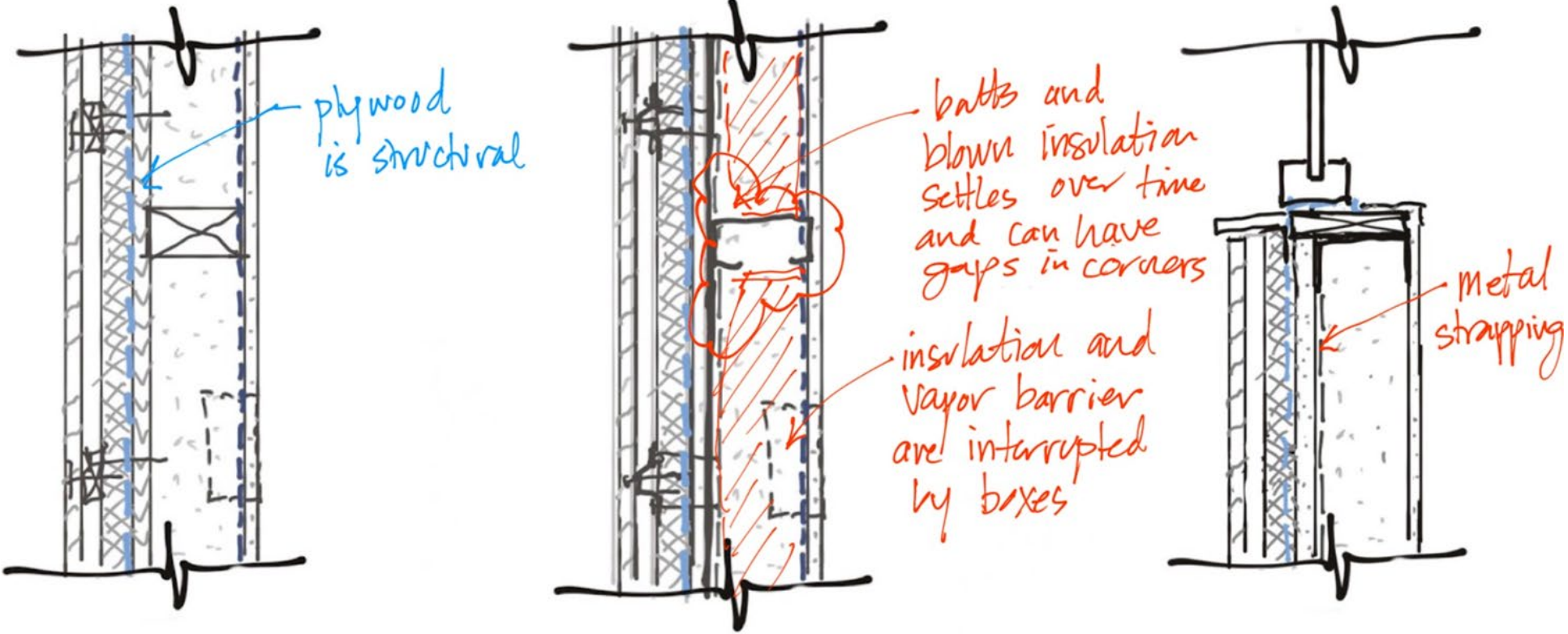
## Types I and II Non- Combustible Construction

- Metal conducts heat and cold and leads to thermal bridging
- Gypsum based sheathing is not structural and must use metal strapping or other types of furring to support cladding and provide lateral stiffness in the wall
- Not all insulation and sheathing meet requirements for non-combustible construction

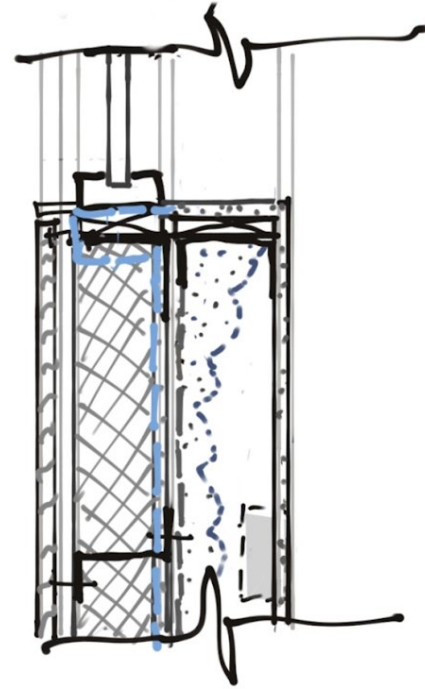
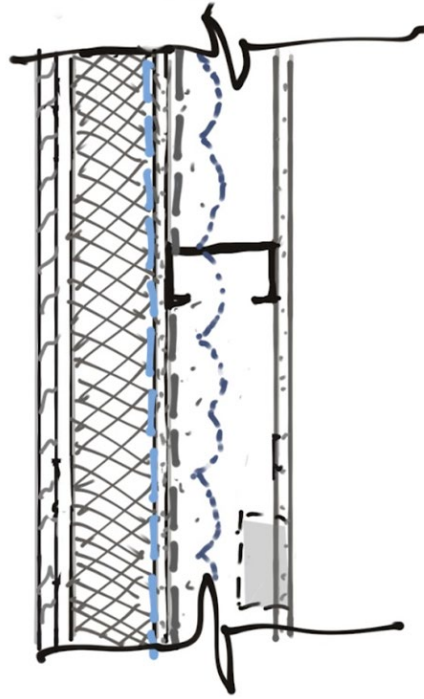
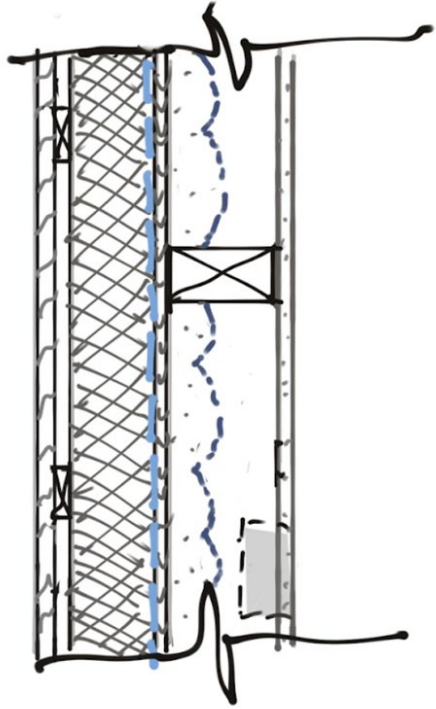
# High Performance Enclosures - Wall 1 - Good



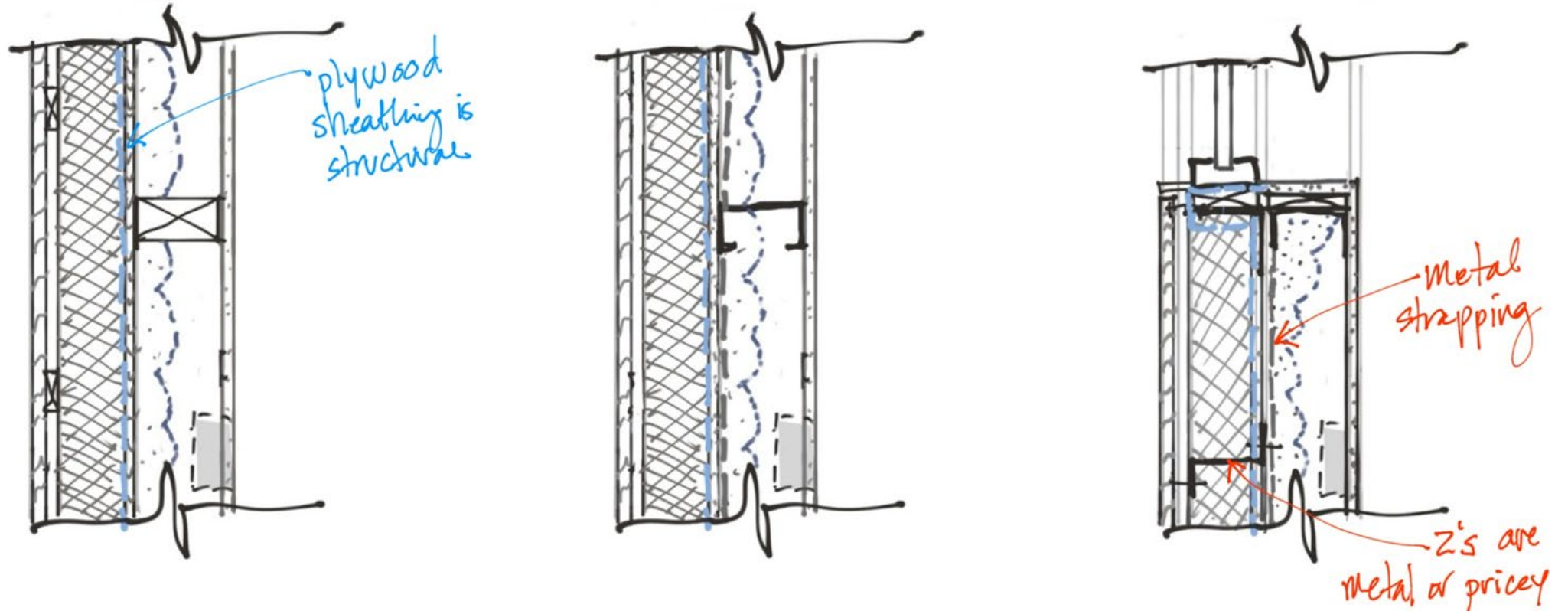
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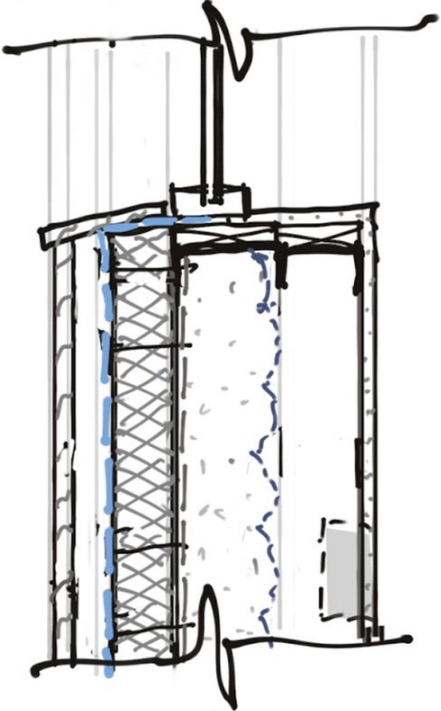
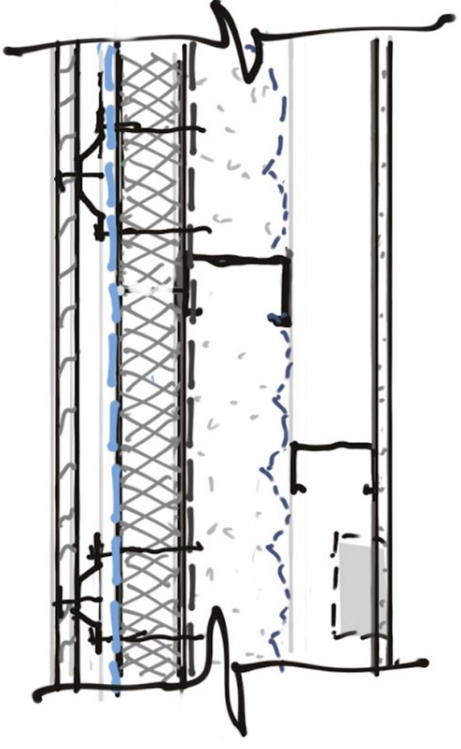
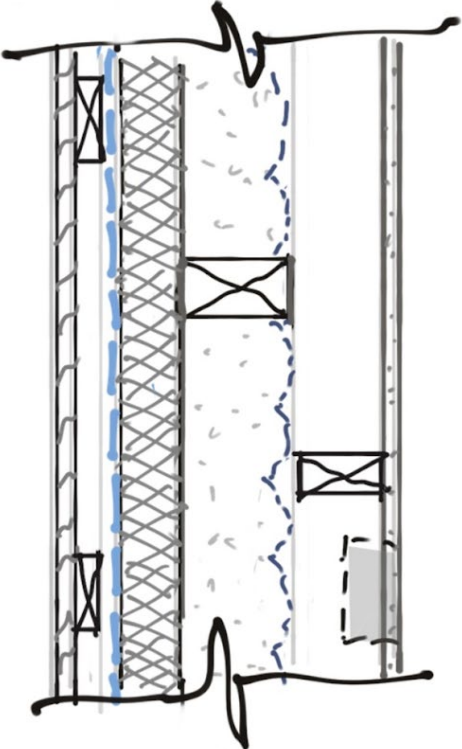
# High Performance Enclosures - Wall 2 - Better



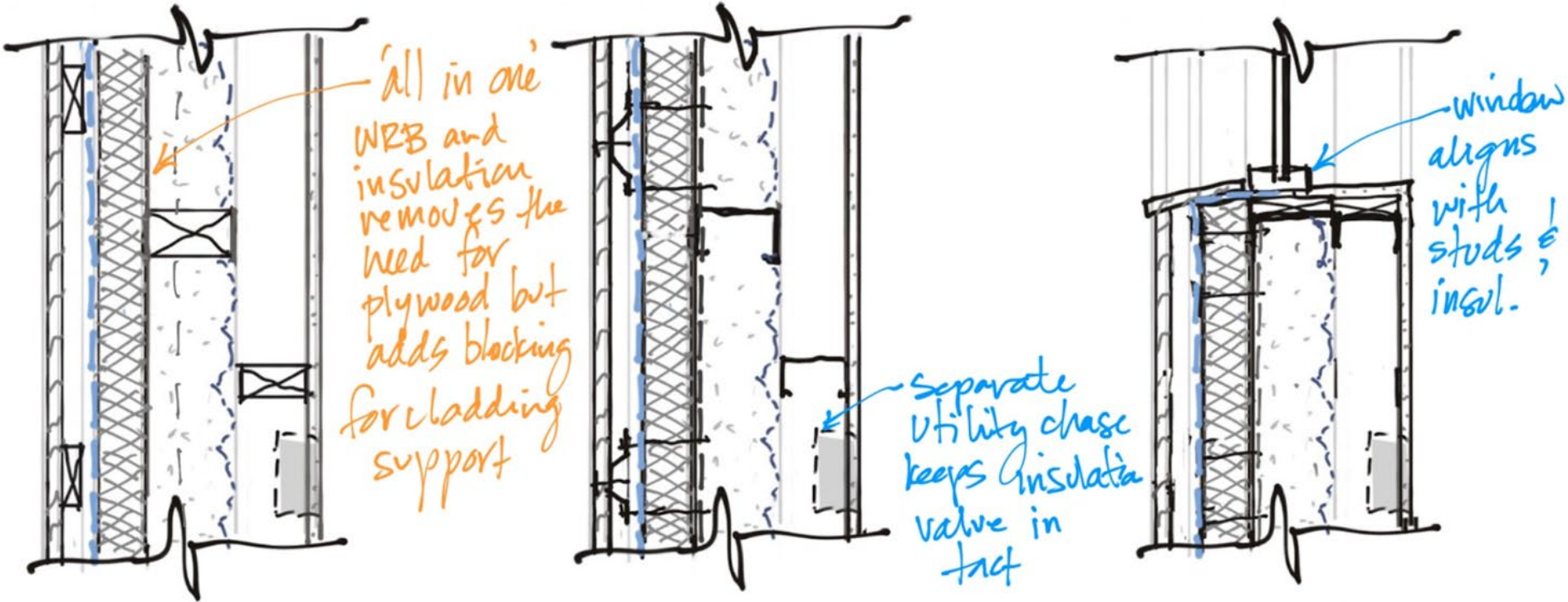
# High Performance Enclosures - Wall 2 - Better



# High Performance Enclosures - Wall 3 - Best



# High Performance Enclosures - Wall 3 - Best





the owner spending  
money on fiberglass  
rainscreen clips



the owner spending  
money on custom  
carpet with their logo  
on it

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