

**OBEC DINNER MEETING**

# Don't Do Stupid Things

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# Life is Tough Enough As it Is...

Life is Tough Enough As it Is...  
It's Harder When You Are Stupid

























































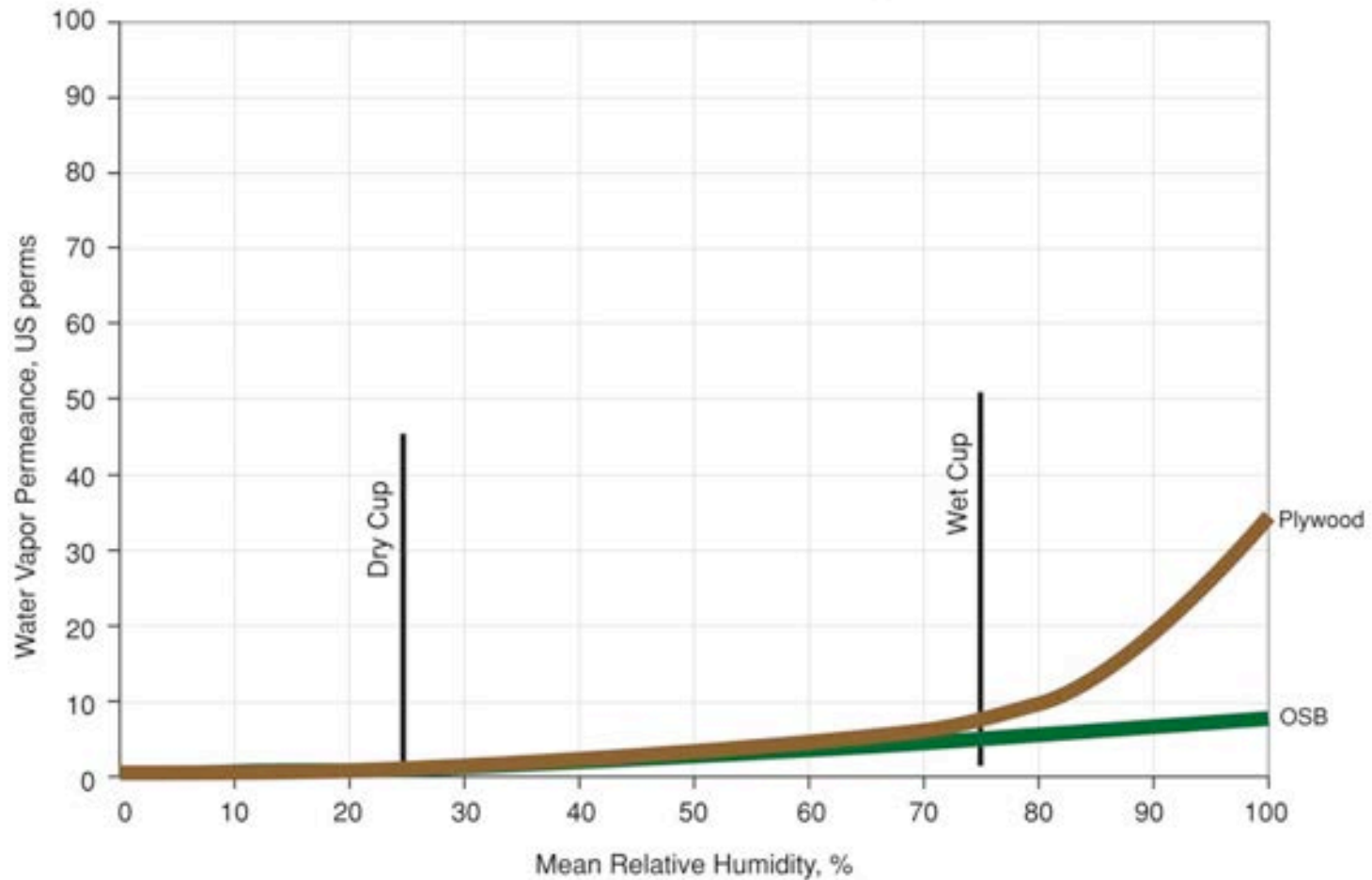






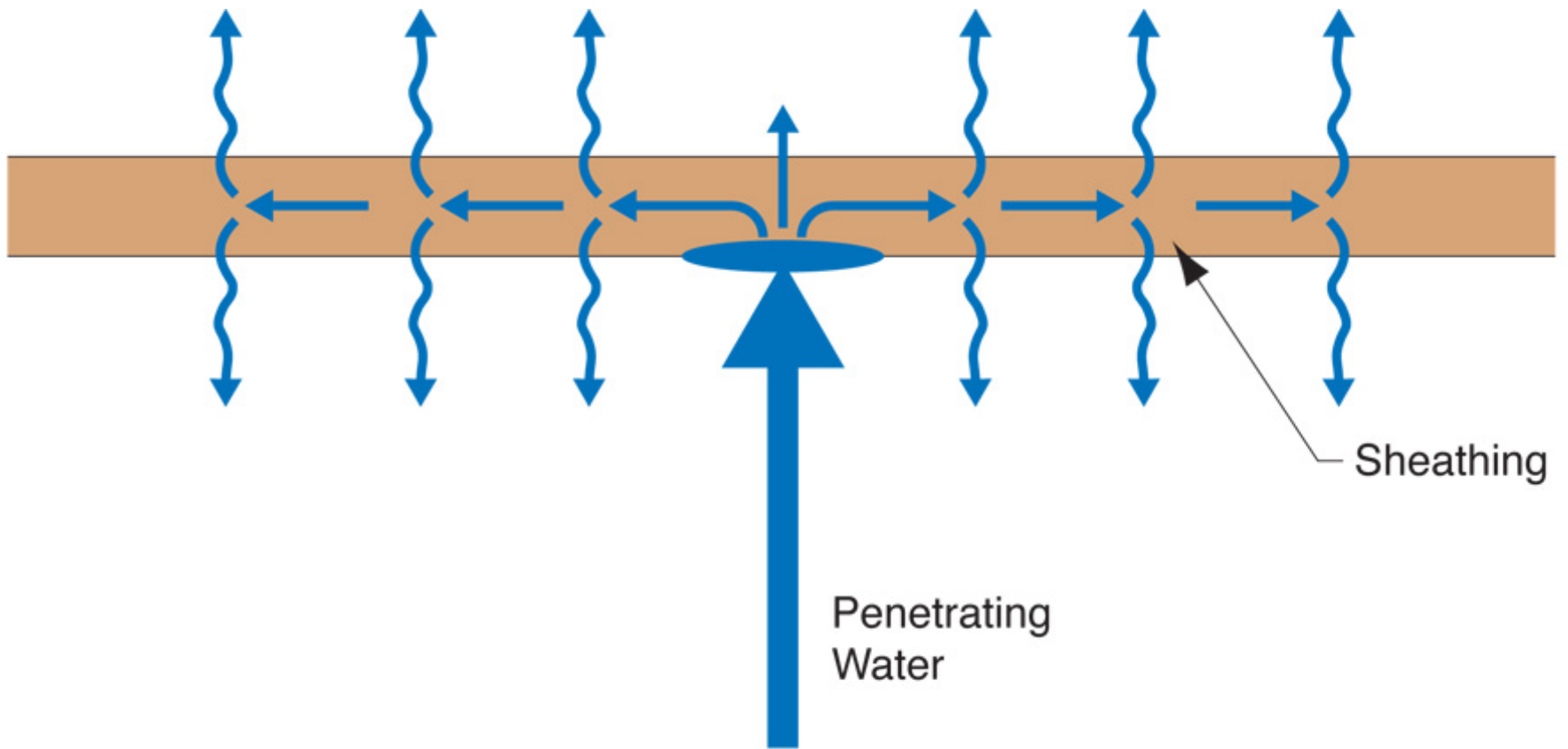


## Water Vapor Permeance of Sheathing Materials

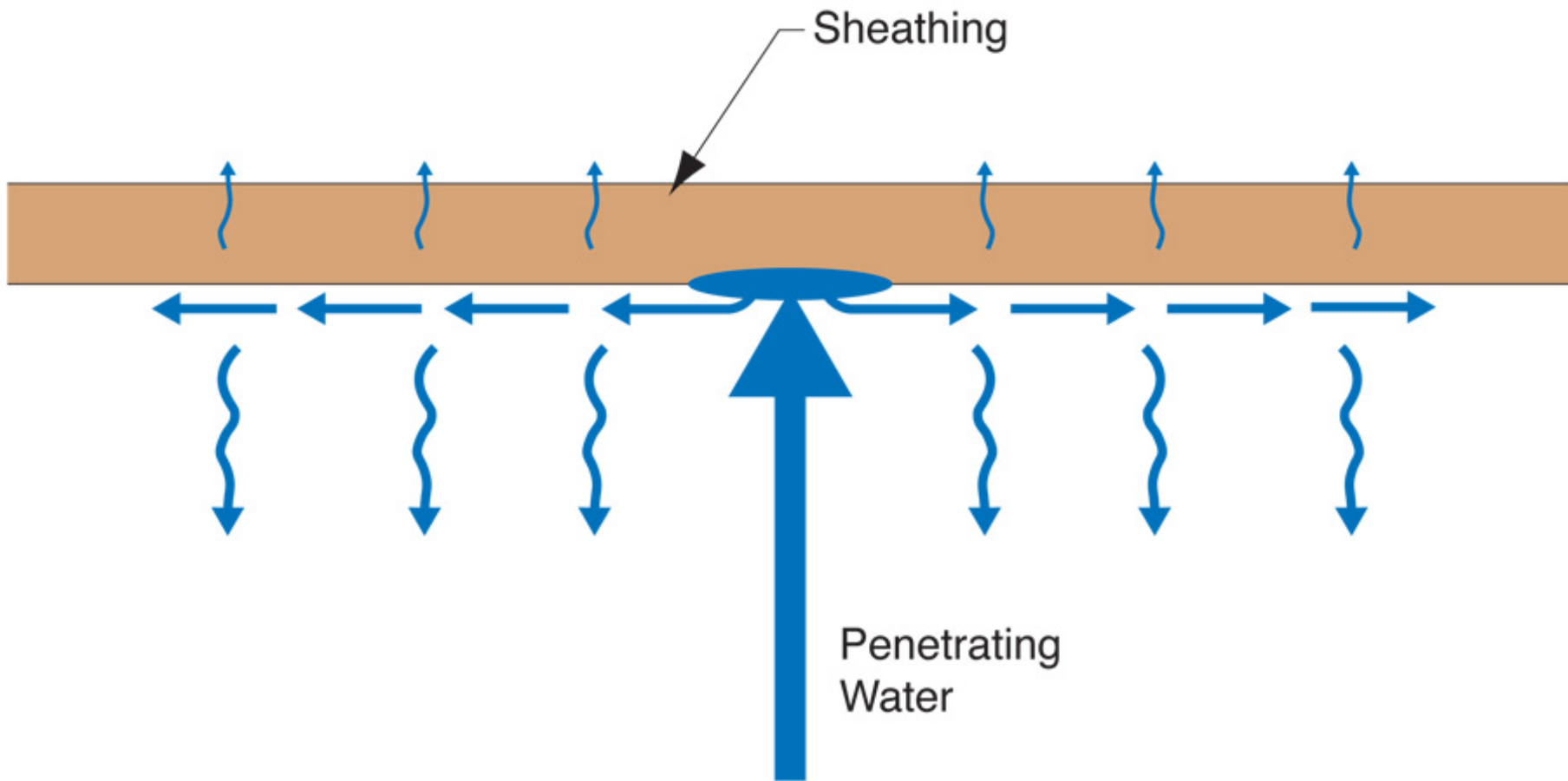


































































































































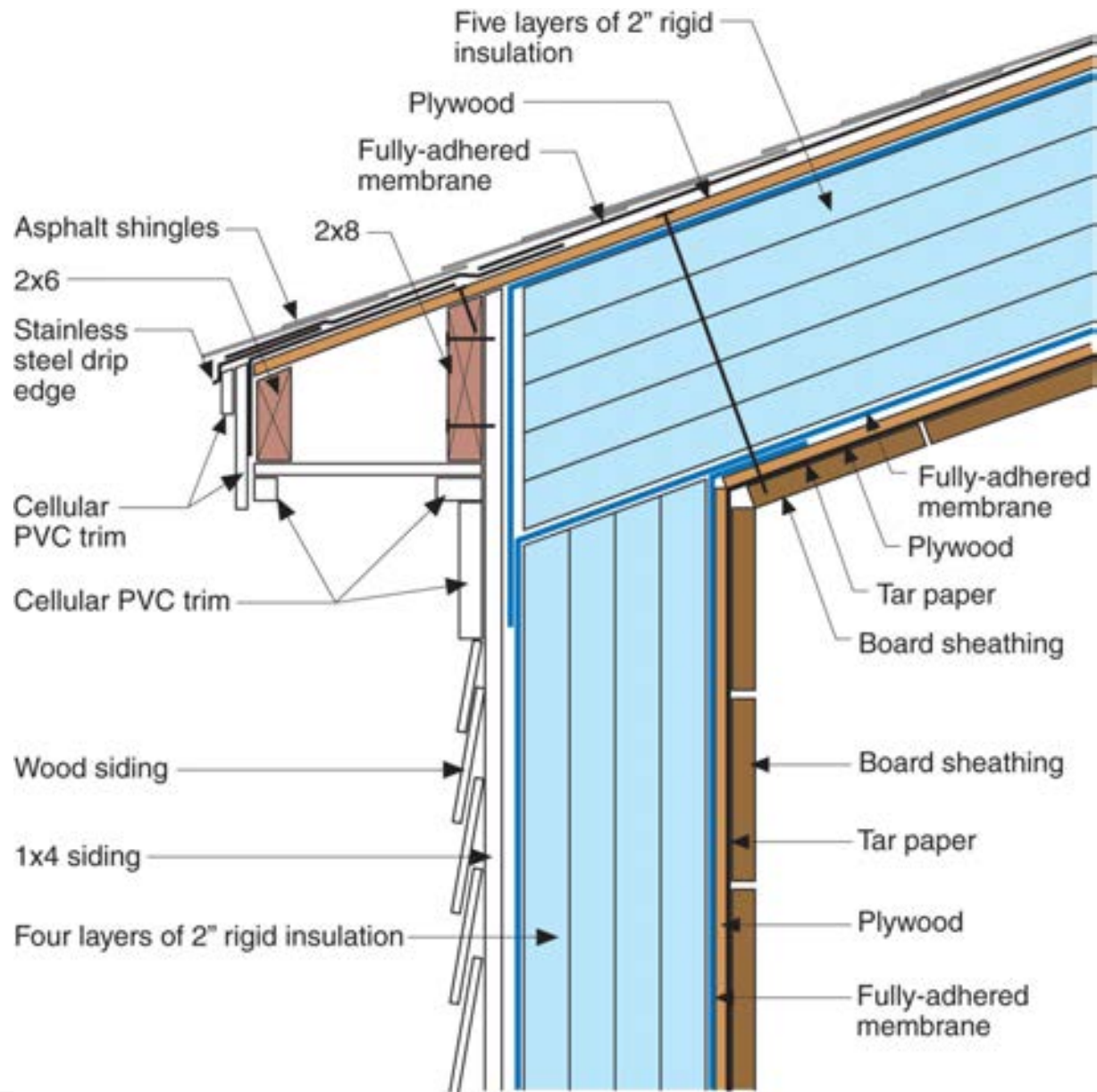








































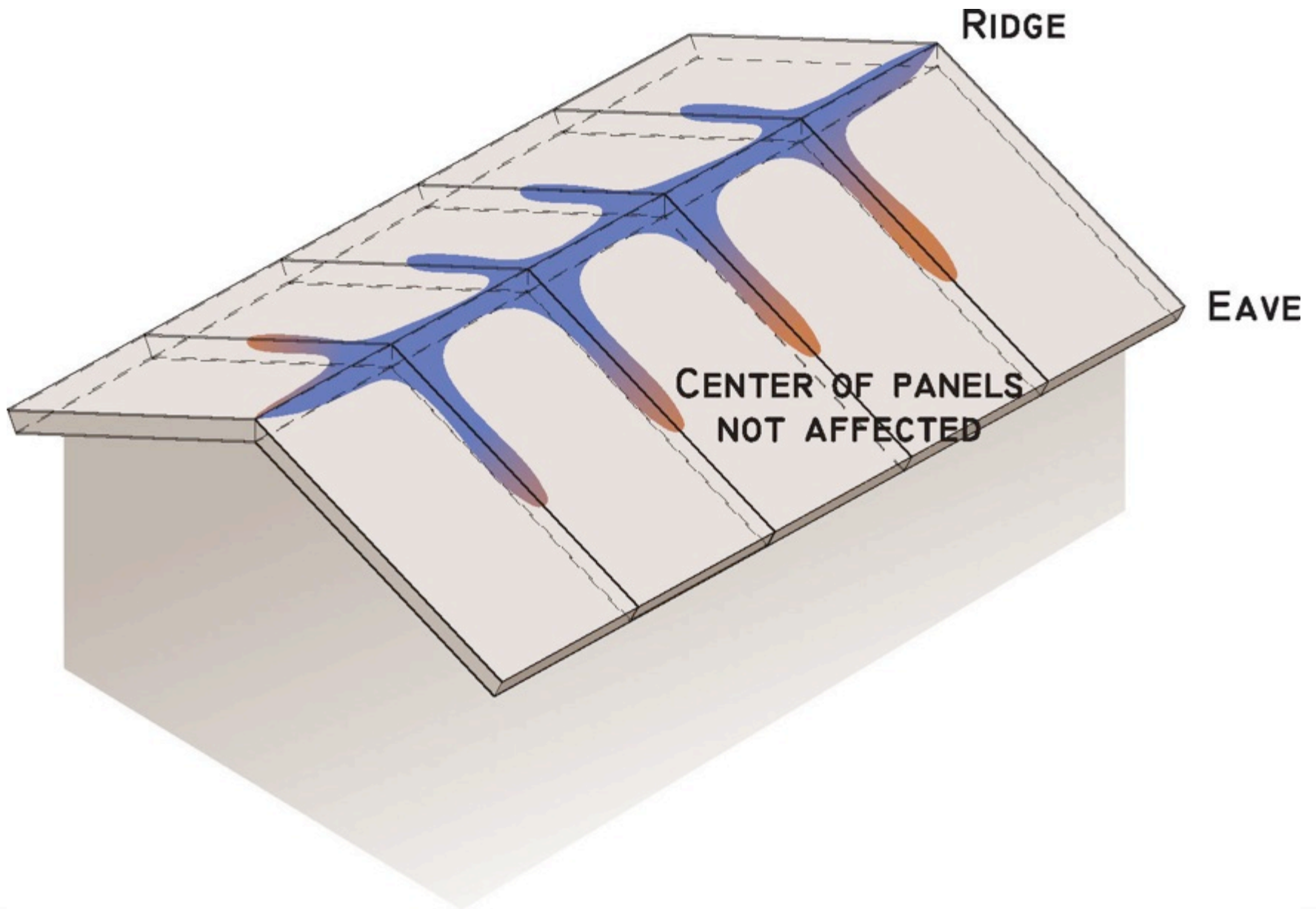


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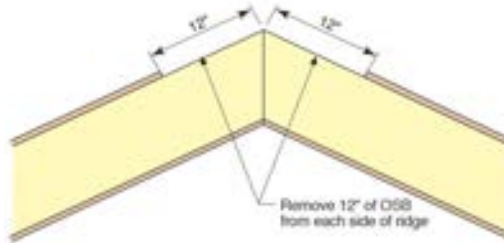






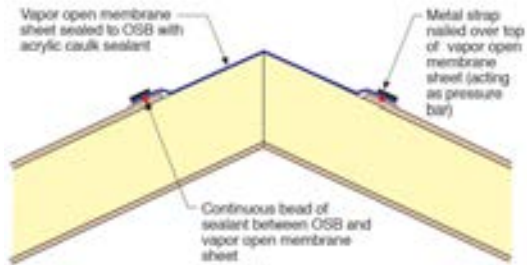
**Step 1**

- Remove strip of OSB from each side of ridge



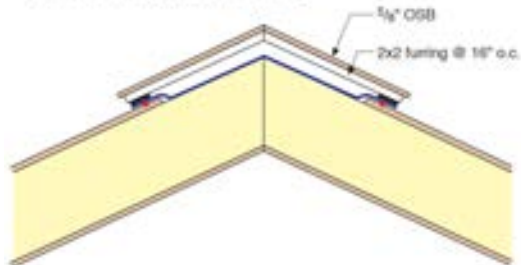
**Step 2**

- Create air seal with strip of vapor open membrane (tape seams)
- Vapor open membrane sheet sealed to OSB with acrylic caulk sealant
- Hold vapor open membrane sheet in place with metal strapping

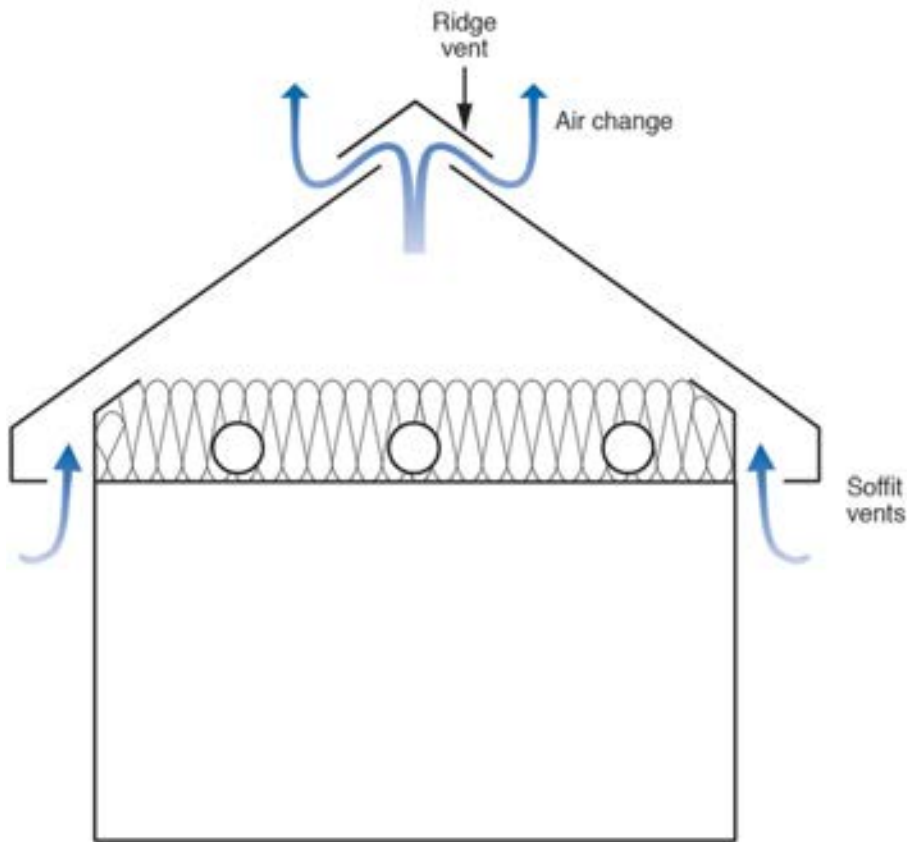


**Step 3**

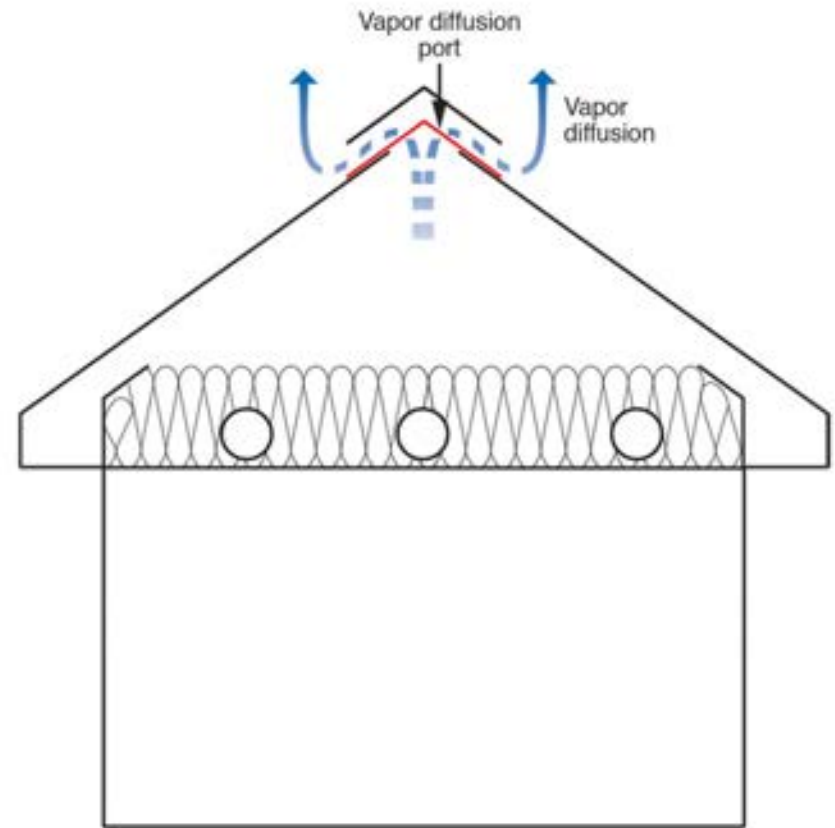
- Construct wood ridge vent with 2x2 furring







Classic vented attic



Unvented attic with vapor diffusion port













# Definition of a Problem

People

Pollutant (hot, wet, UV, ozone)

Path

Pressure











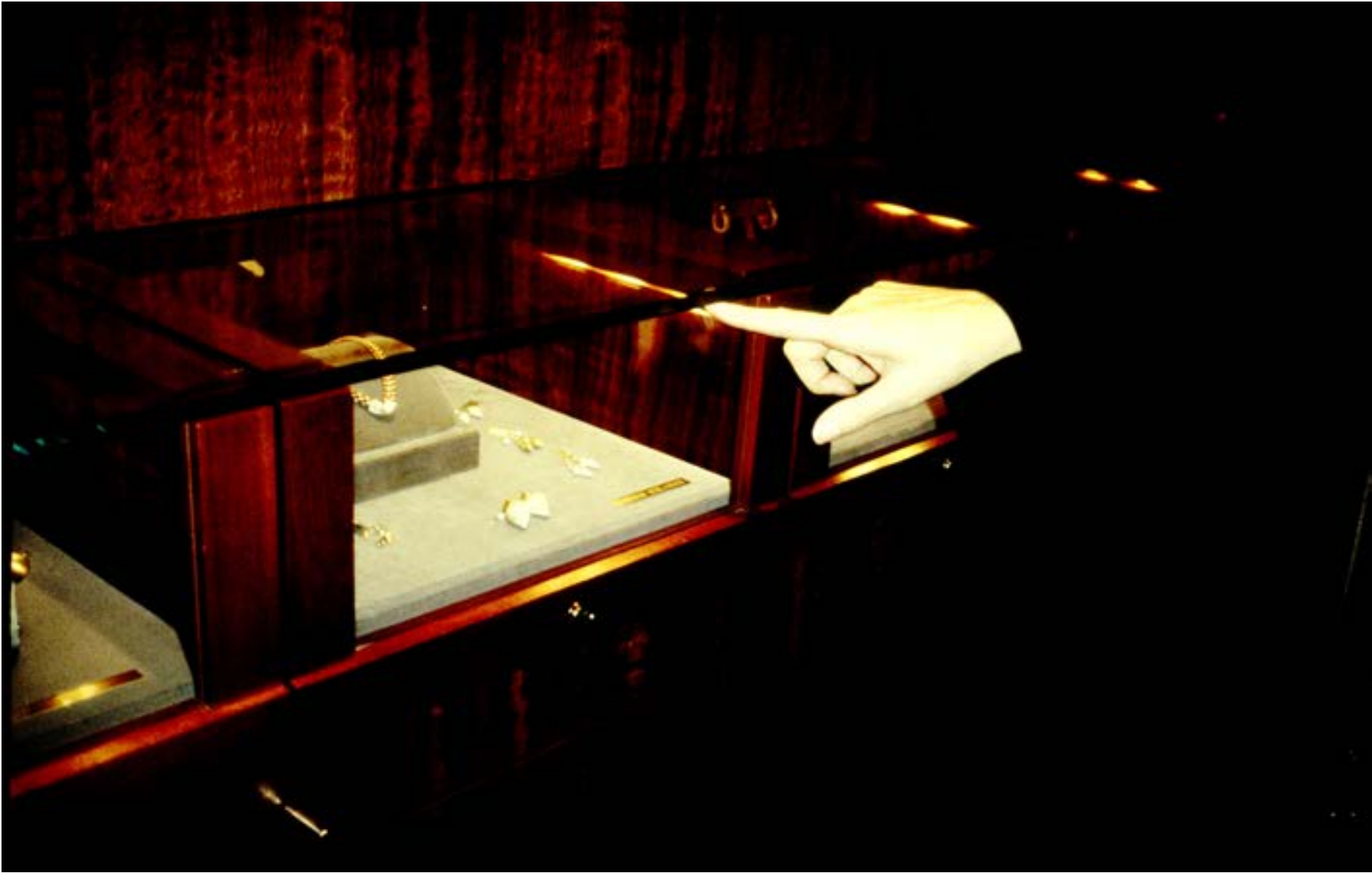




























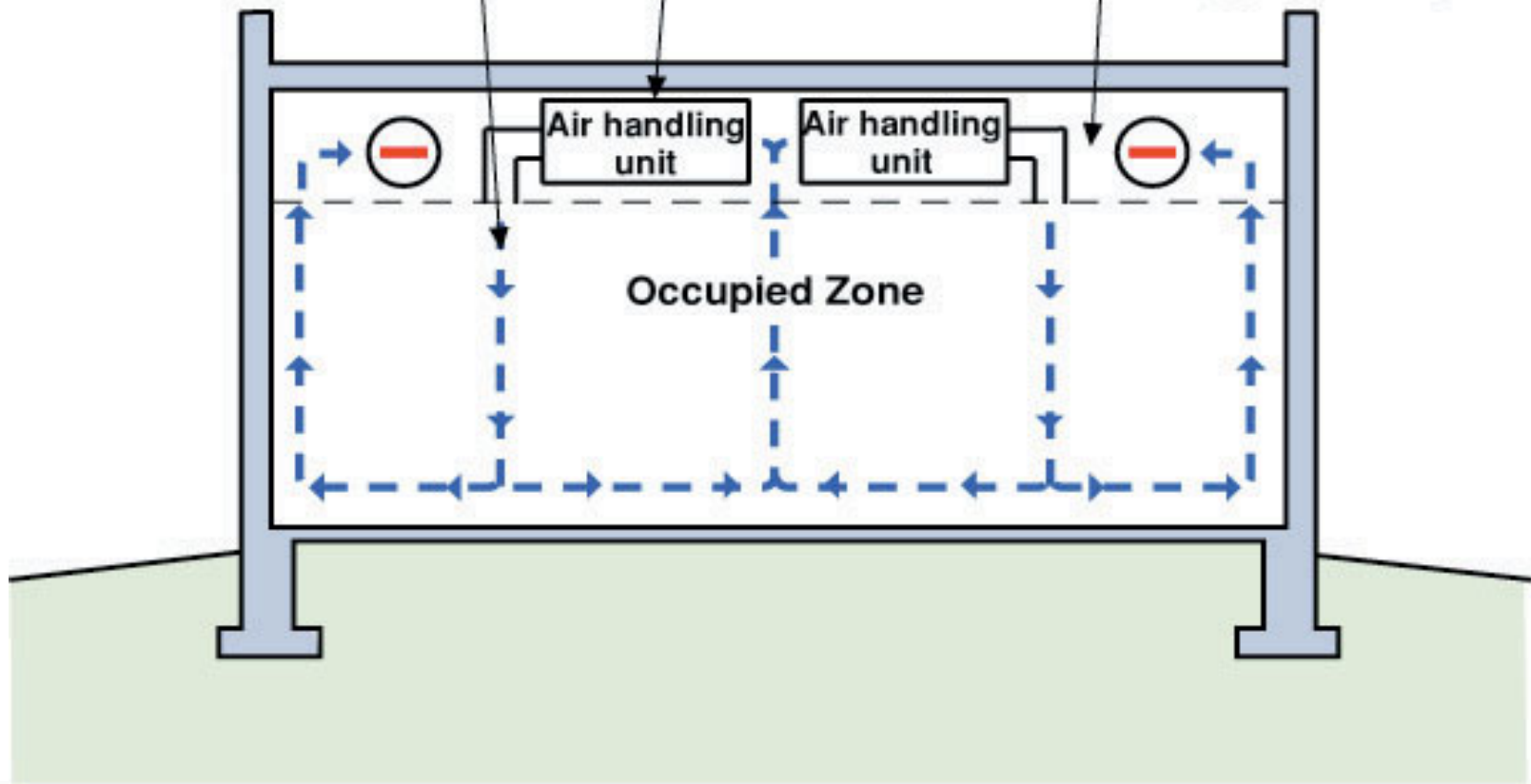




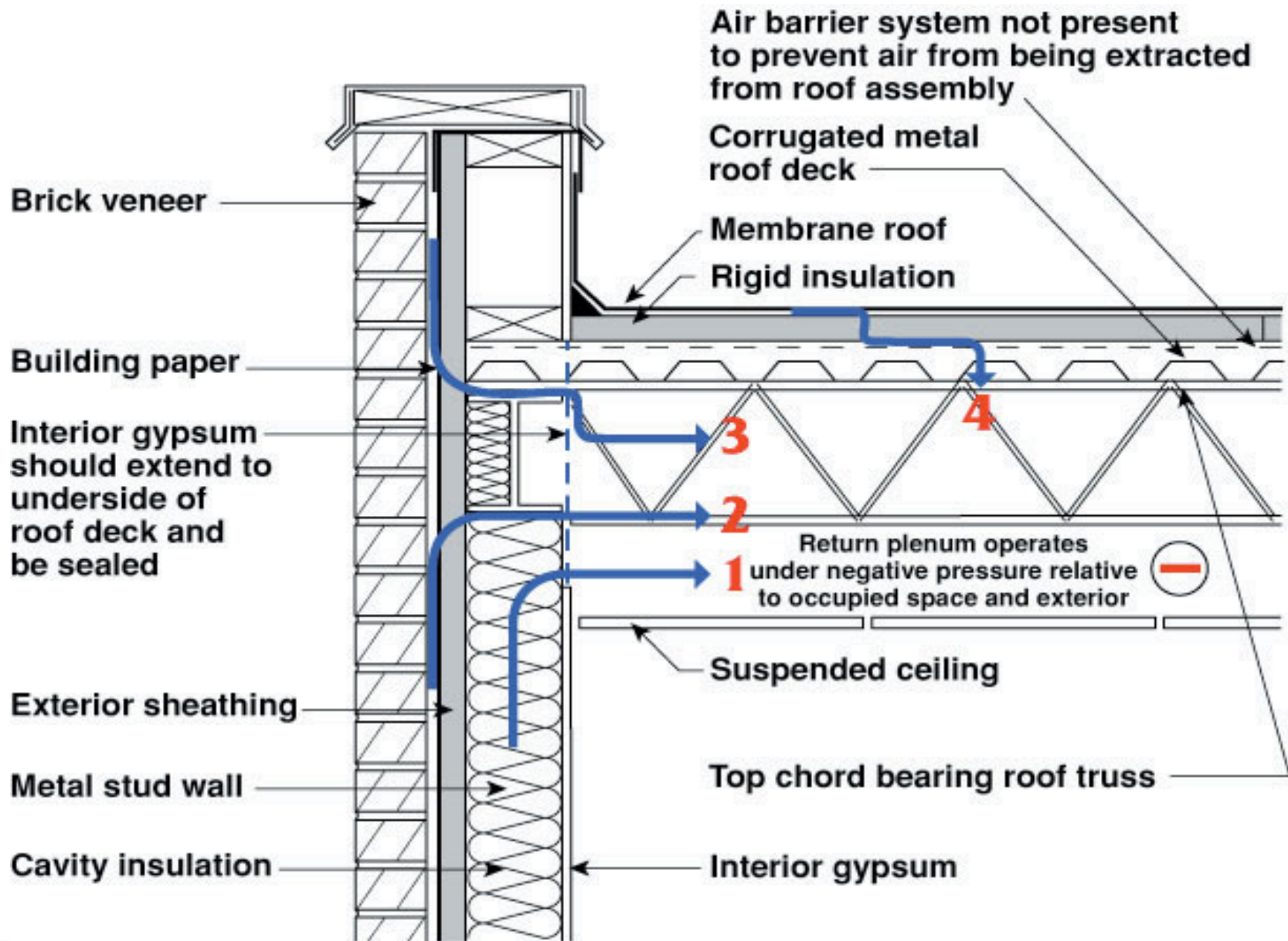
Supply air into occupied zone returns to AHU by passing through deliberately porous dropped ceiling or through return grilles installed in dropped ceiling

Air handling unit extracts air from dropped ceiling, conditions it and injects it into the occupied zones via supply ductwork

Dropped ceiling depressurized by air handling units extracting air from dropped ceiling







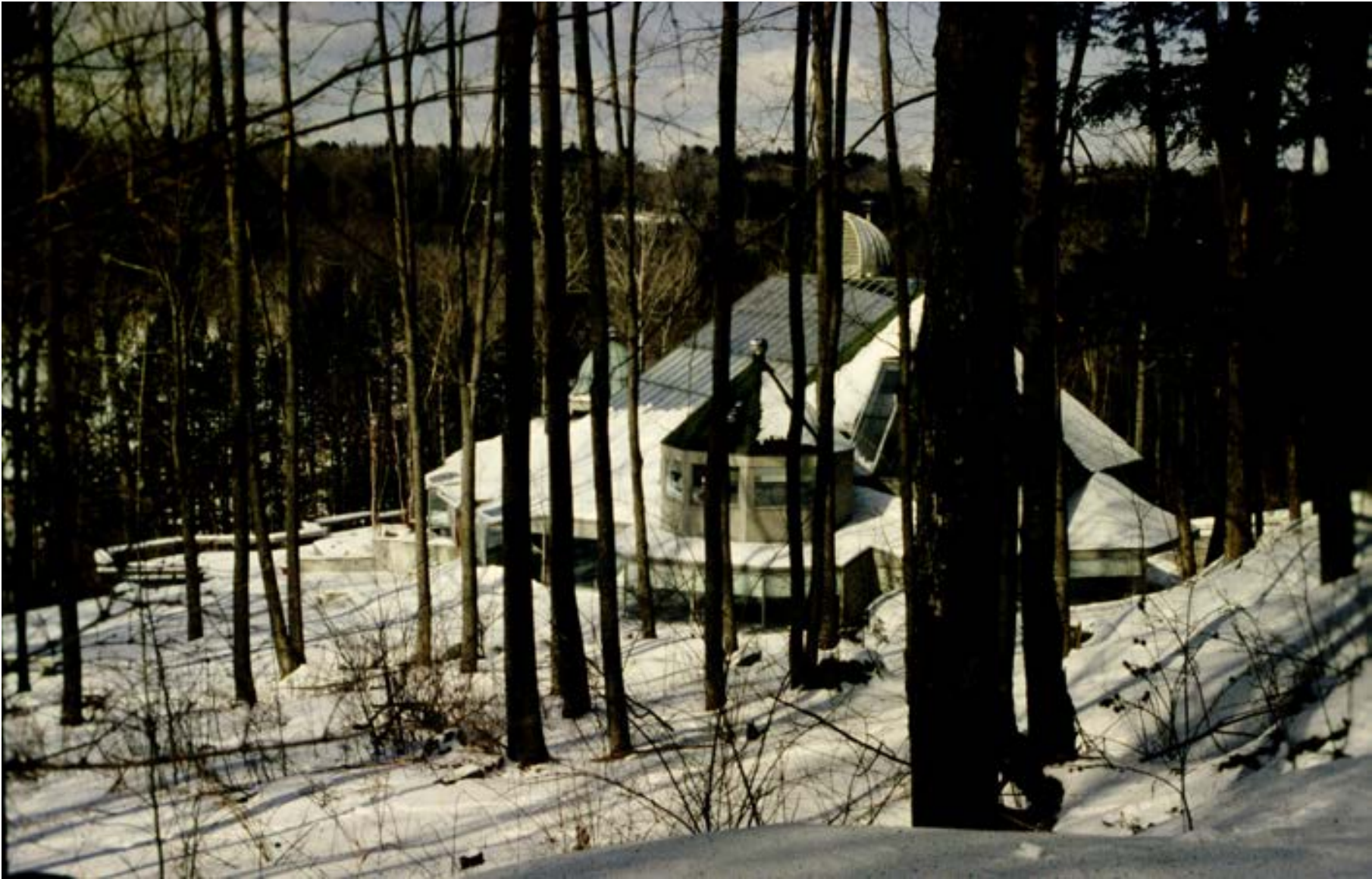


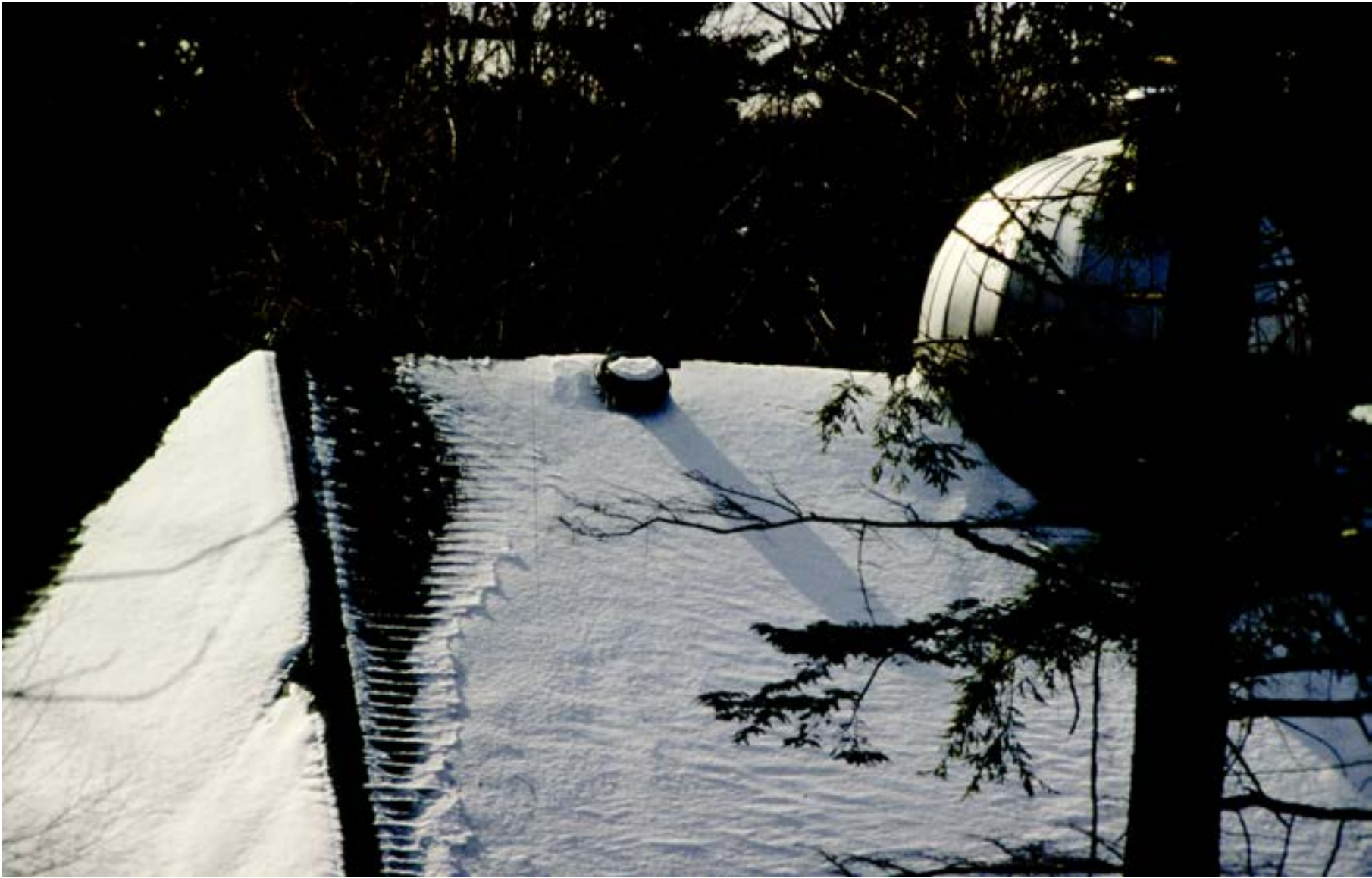


























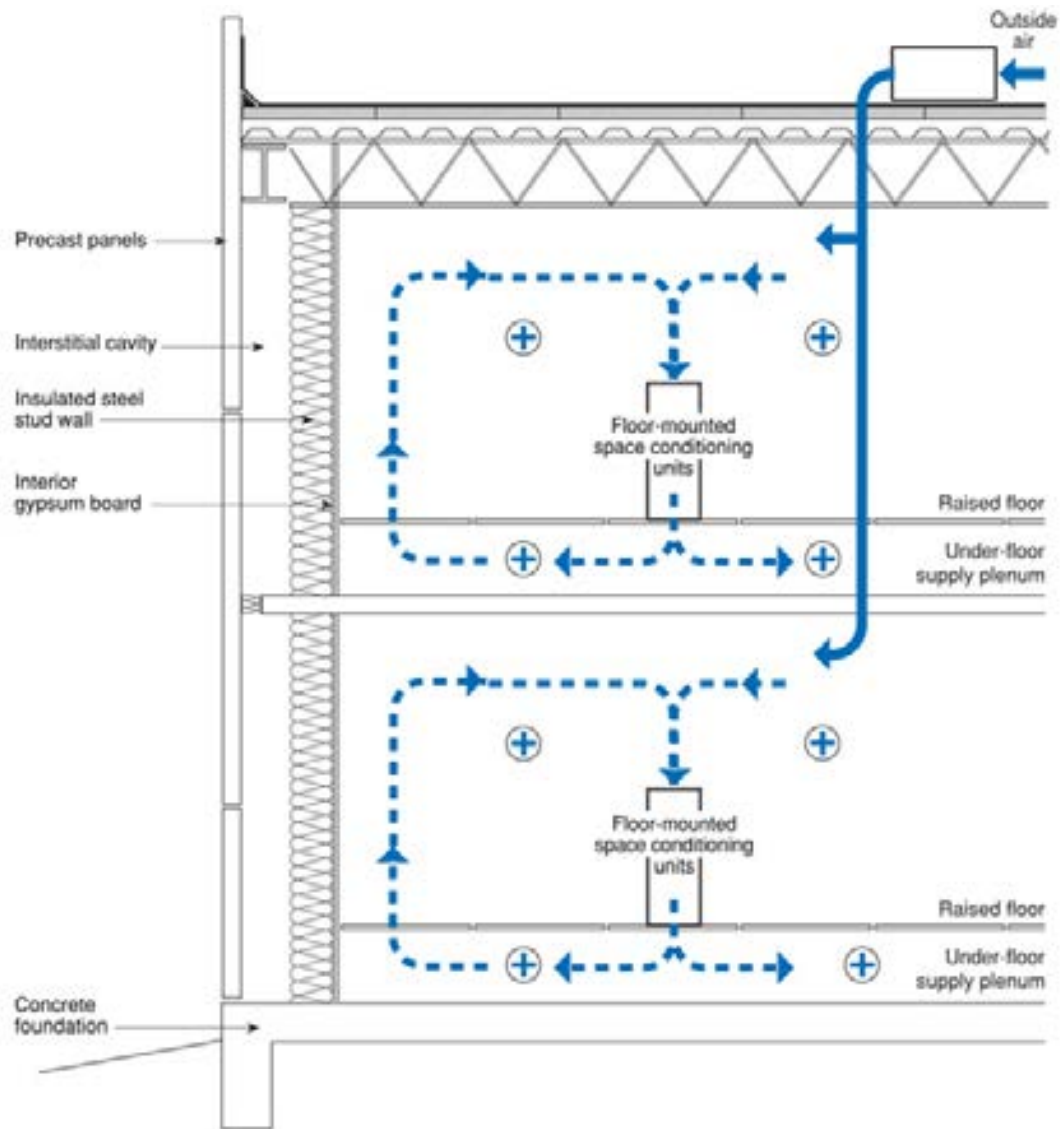


Figure 5.10  
**HVAC System as Designed**

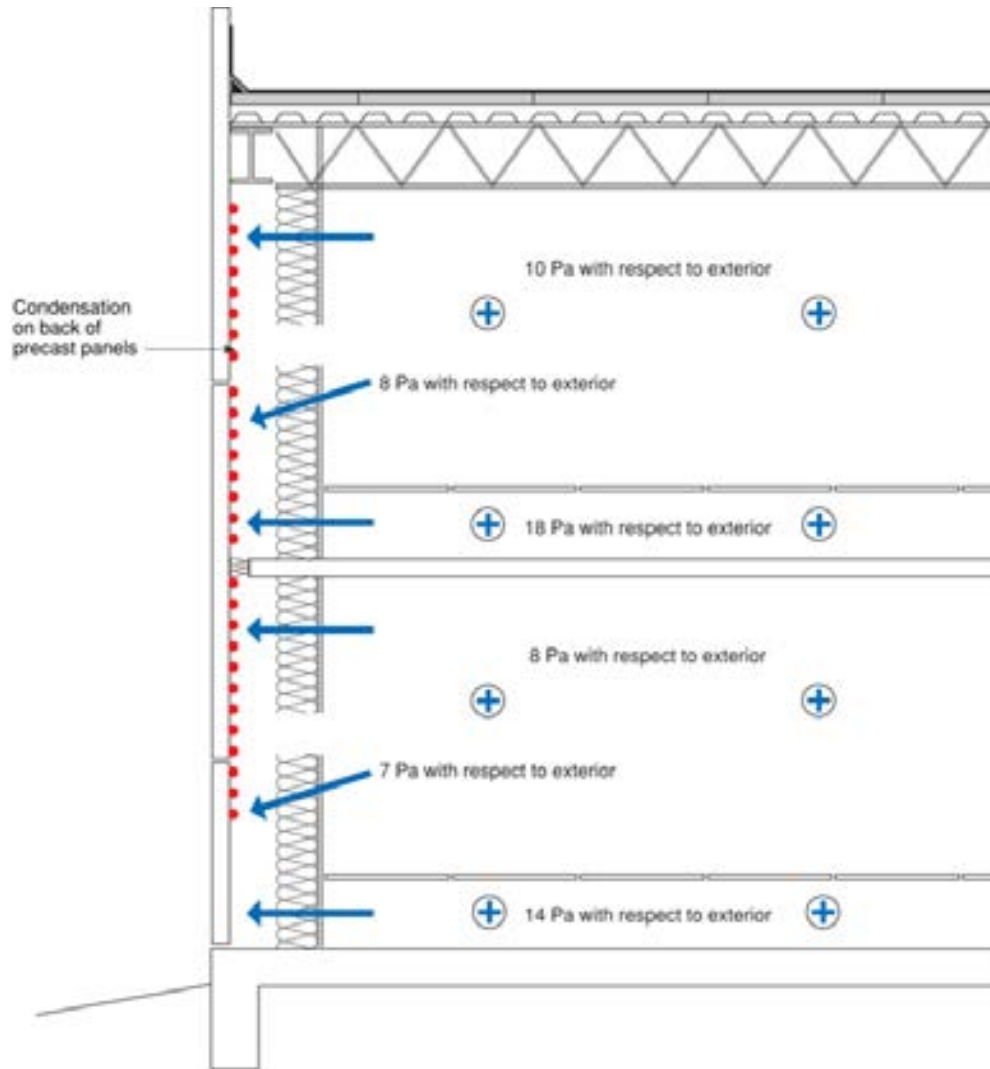


Figure 5.11  
**Unintended Pressurization of Interstitial Cavity**



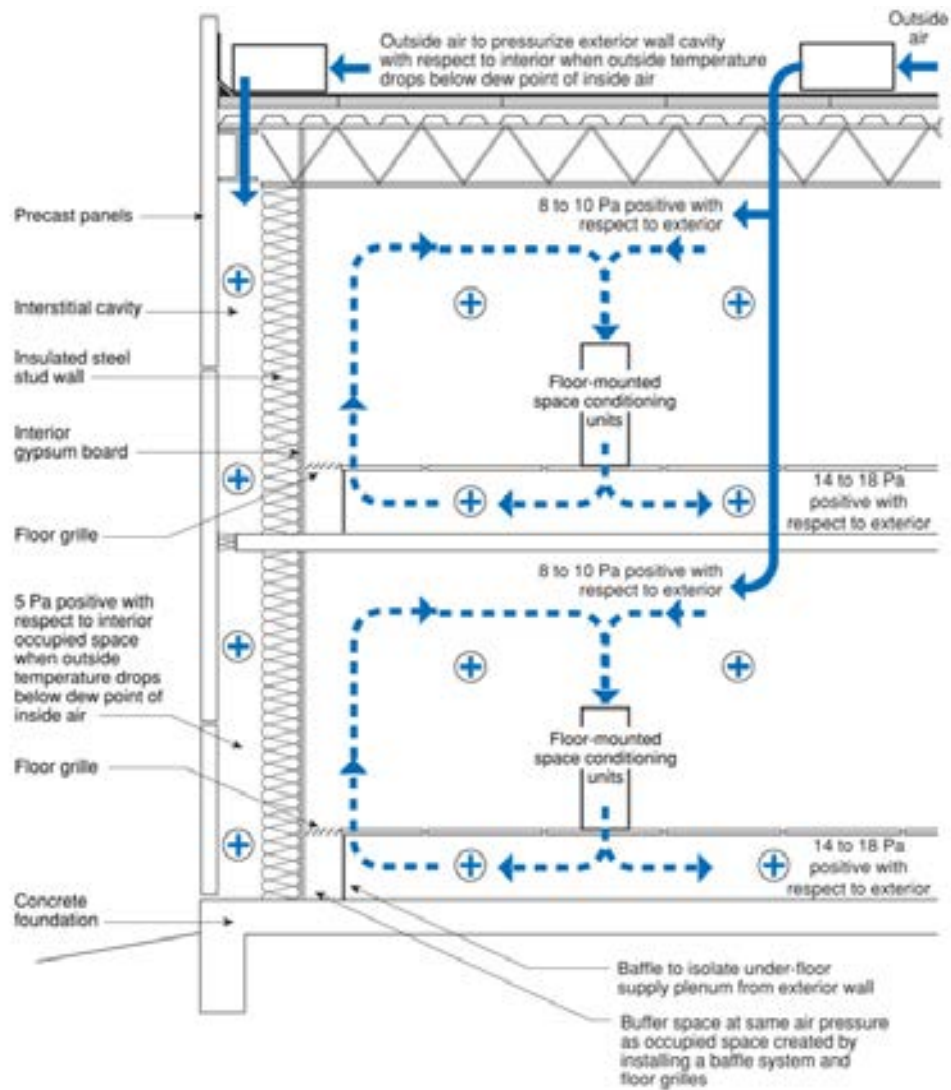


Figure 5.12  
**Modified Pressure Relationship**



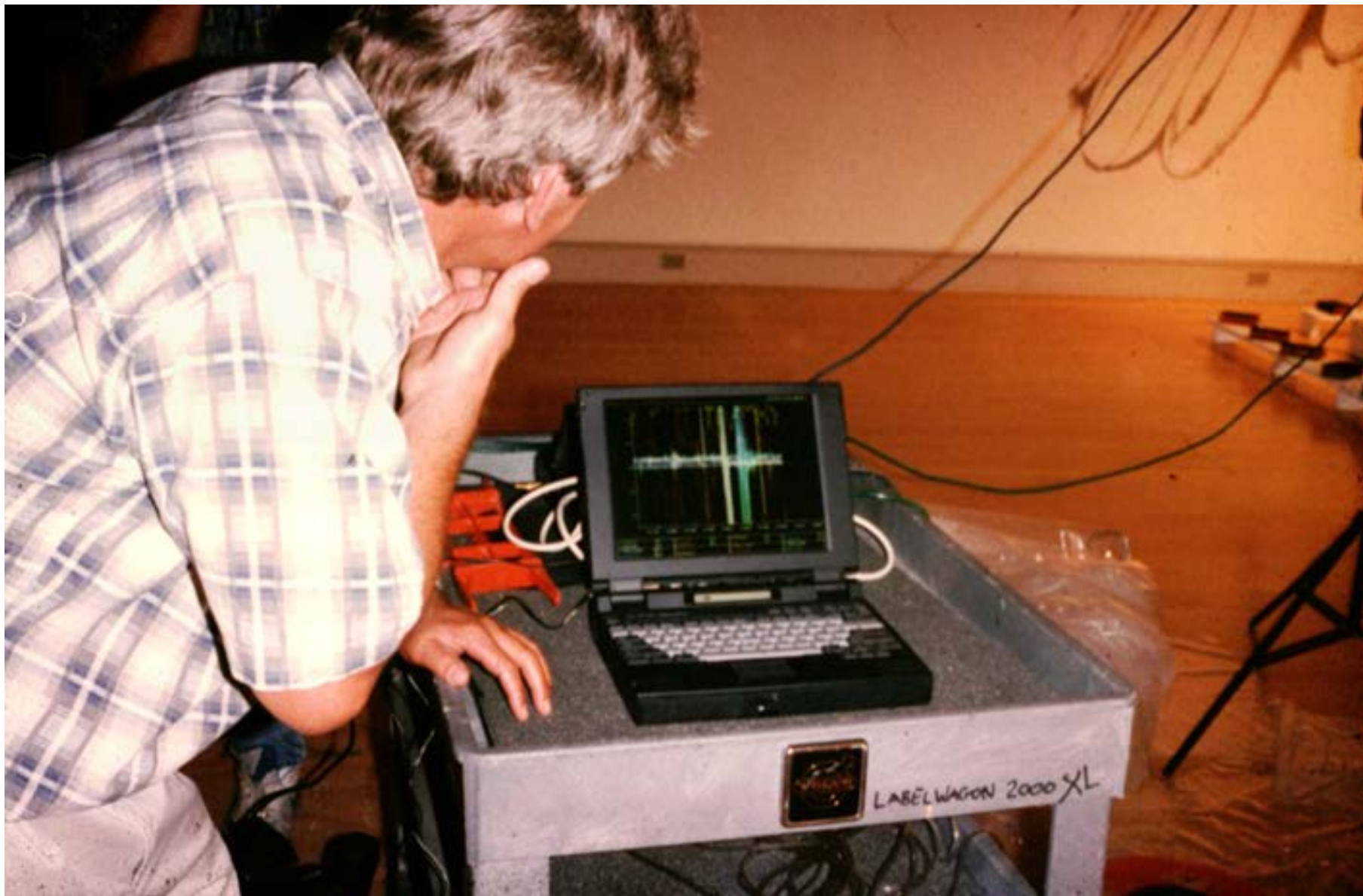






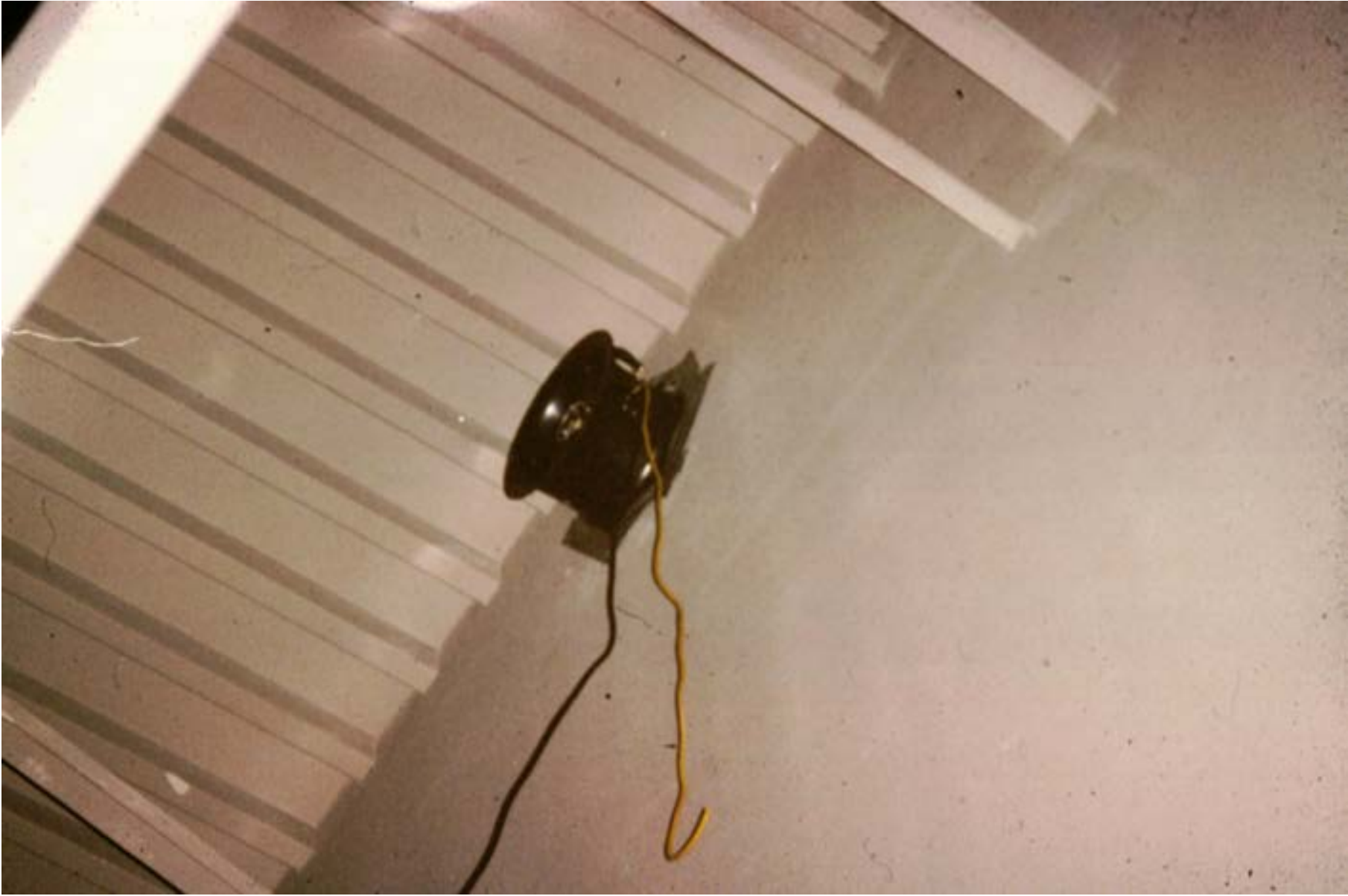












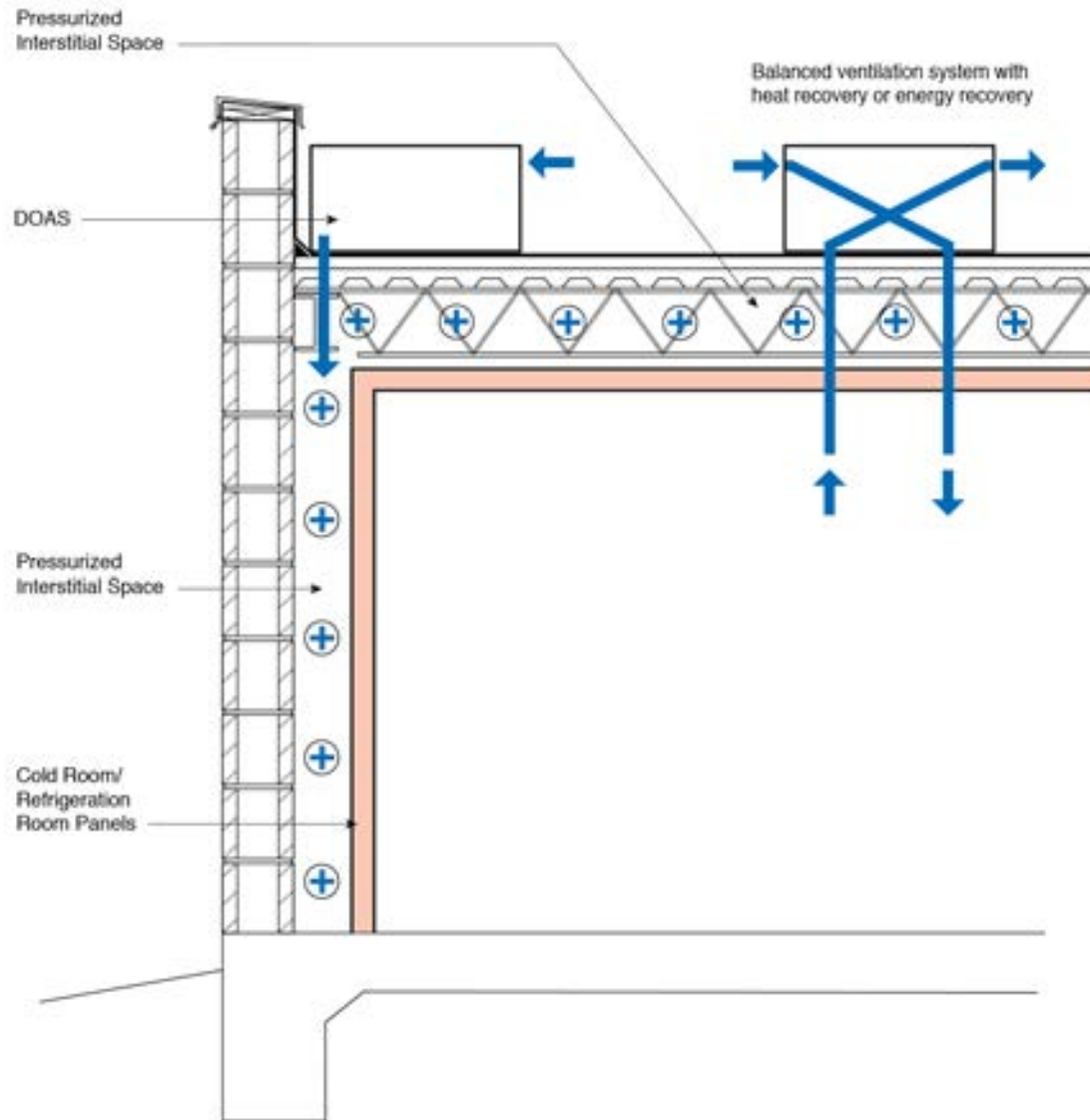






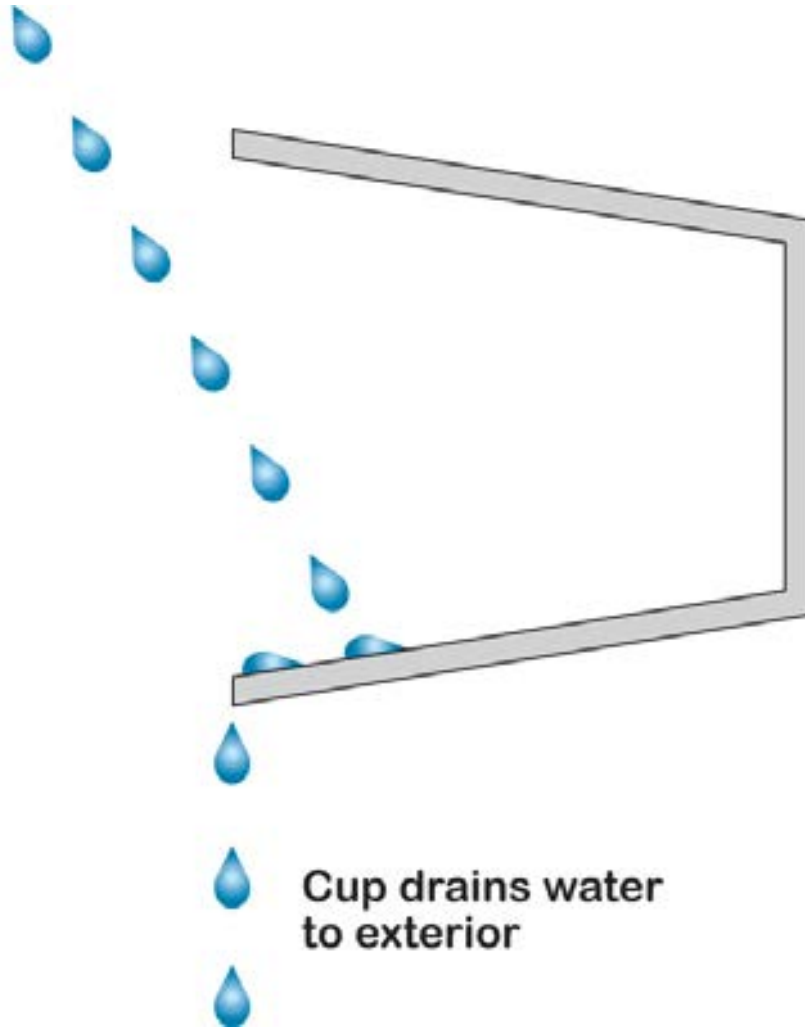








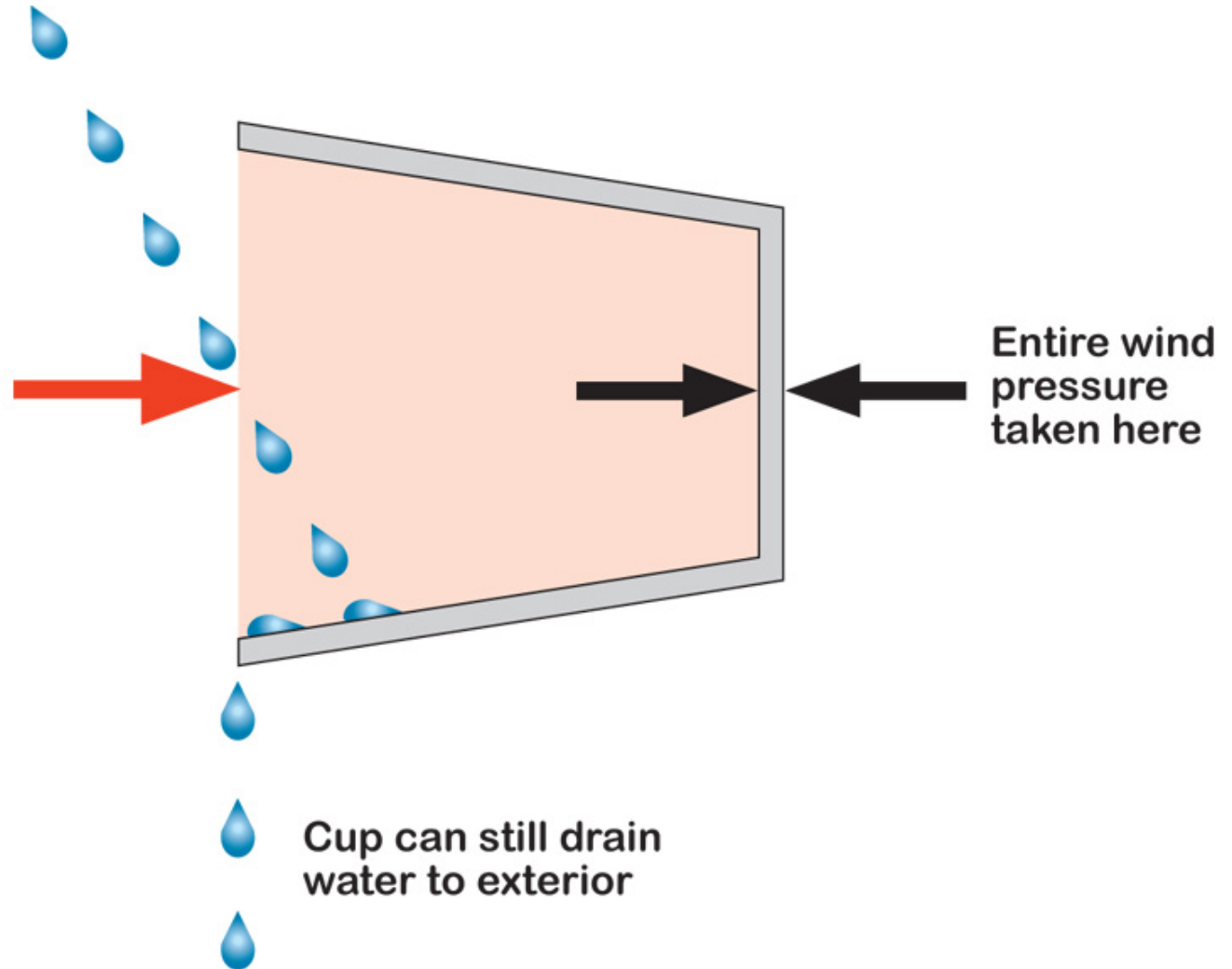
Rain enters cup  
due to momentum  
("kinetic energy")



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



Cup can still drain water to exterior



Baffle to deflect raindrops hitting face of cup due to momentum ("kinetic energy")

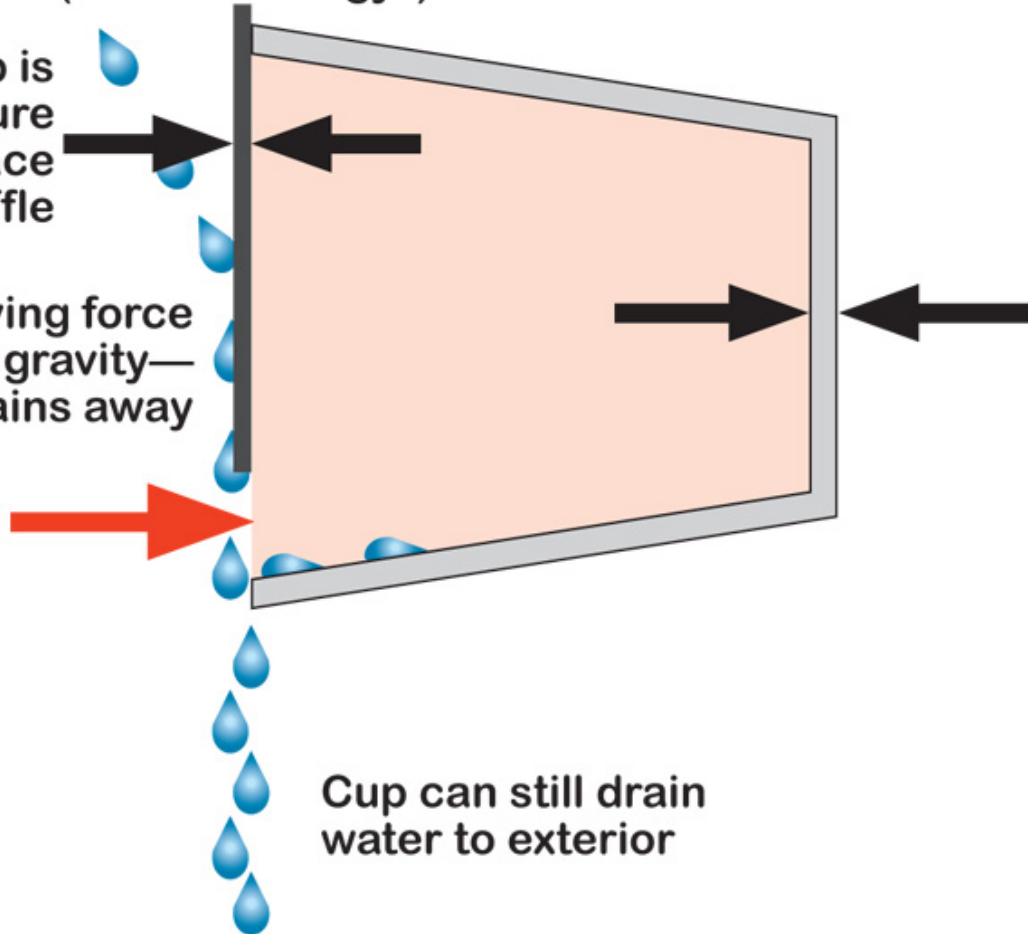
Pressure in cup is same as pressure outside on face of baffle

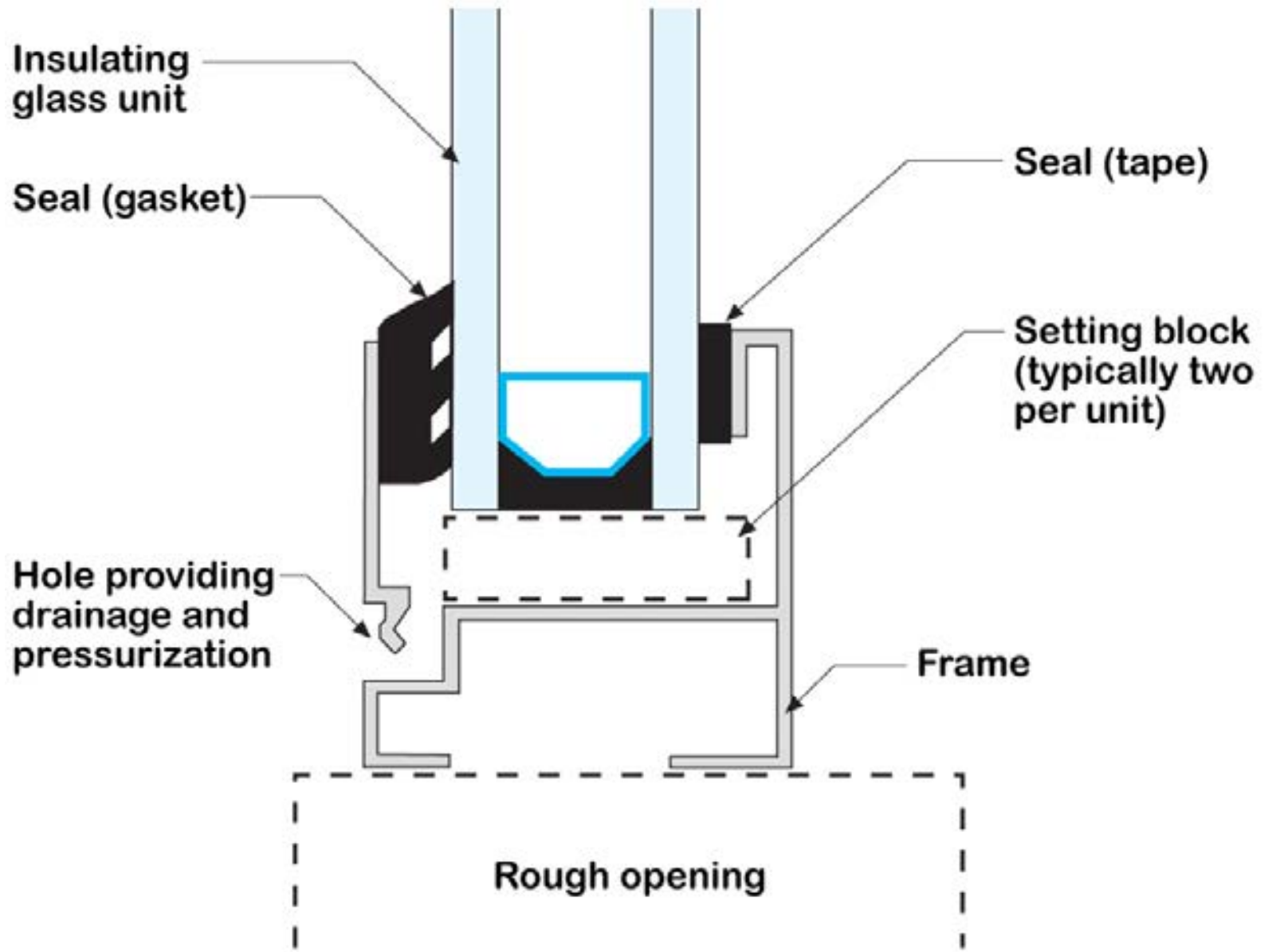
Momentum driving force converted to gravity—water drains away

Wind enters cup—pressurizing cup; no rain entry due to wind driven rain

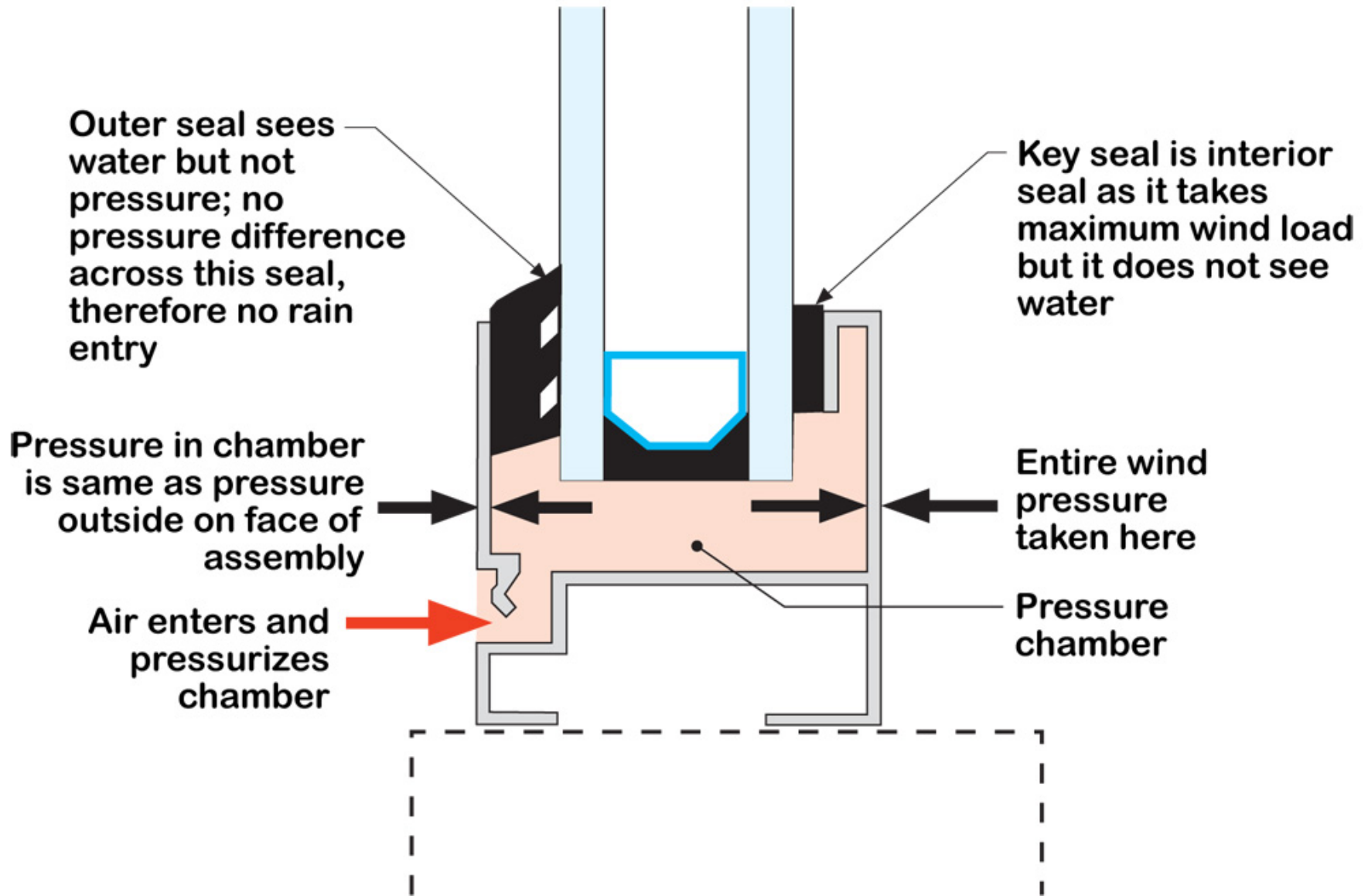
Cup can still drain water to exterior

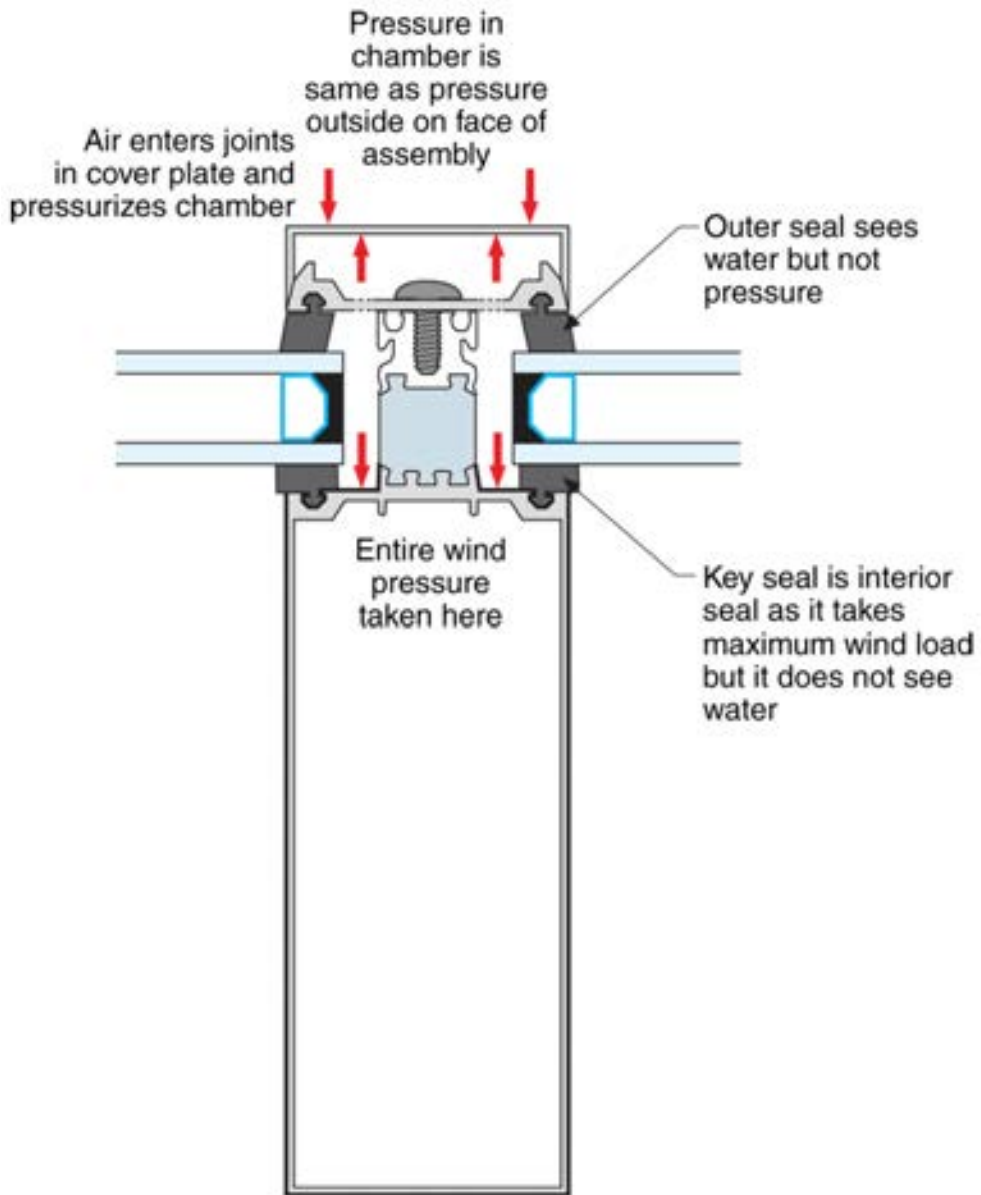
Entire wind pressure taken here













Pressure moderated chamber

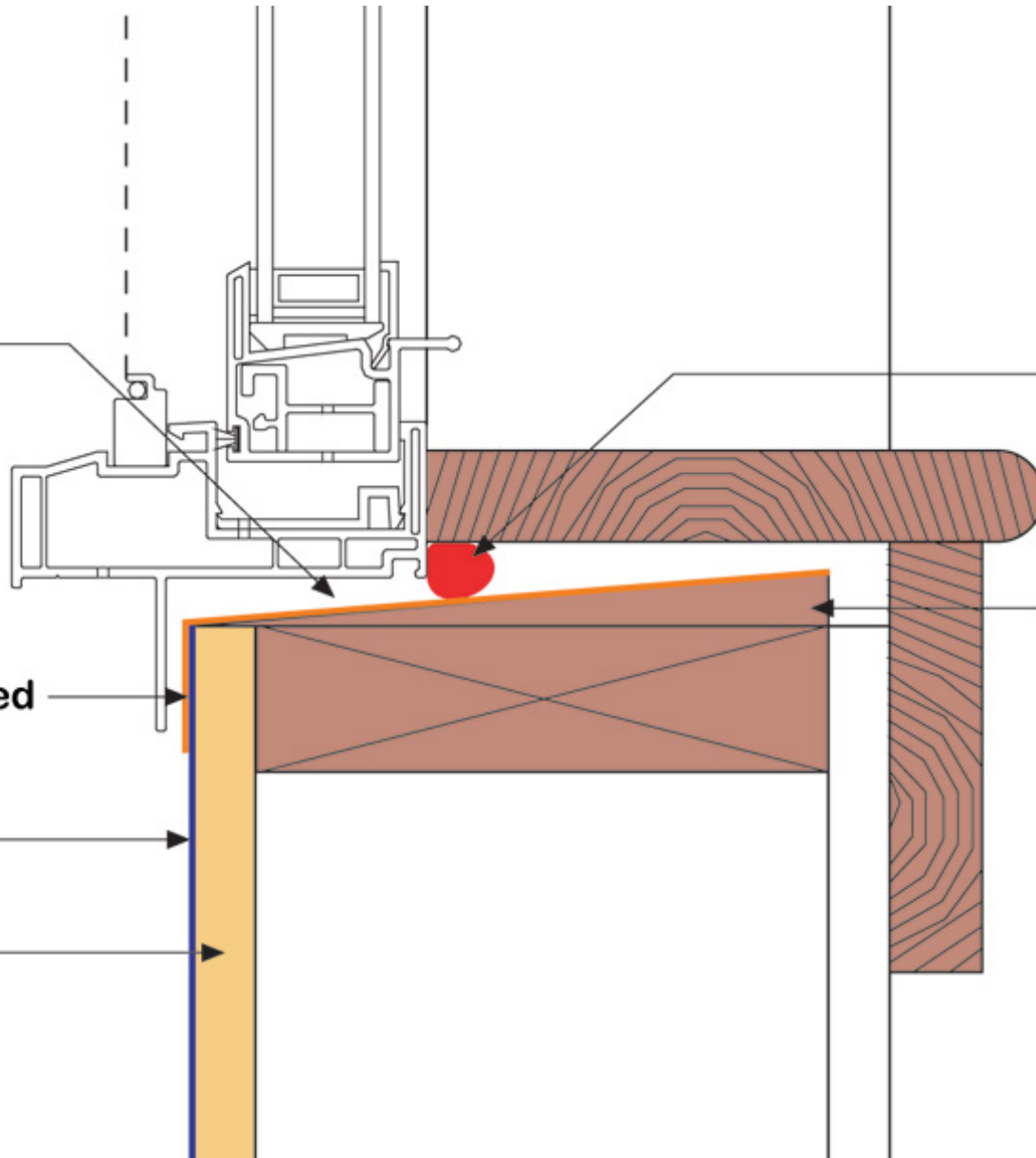
Interior air seal

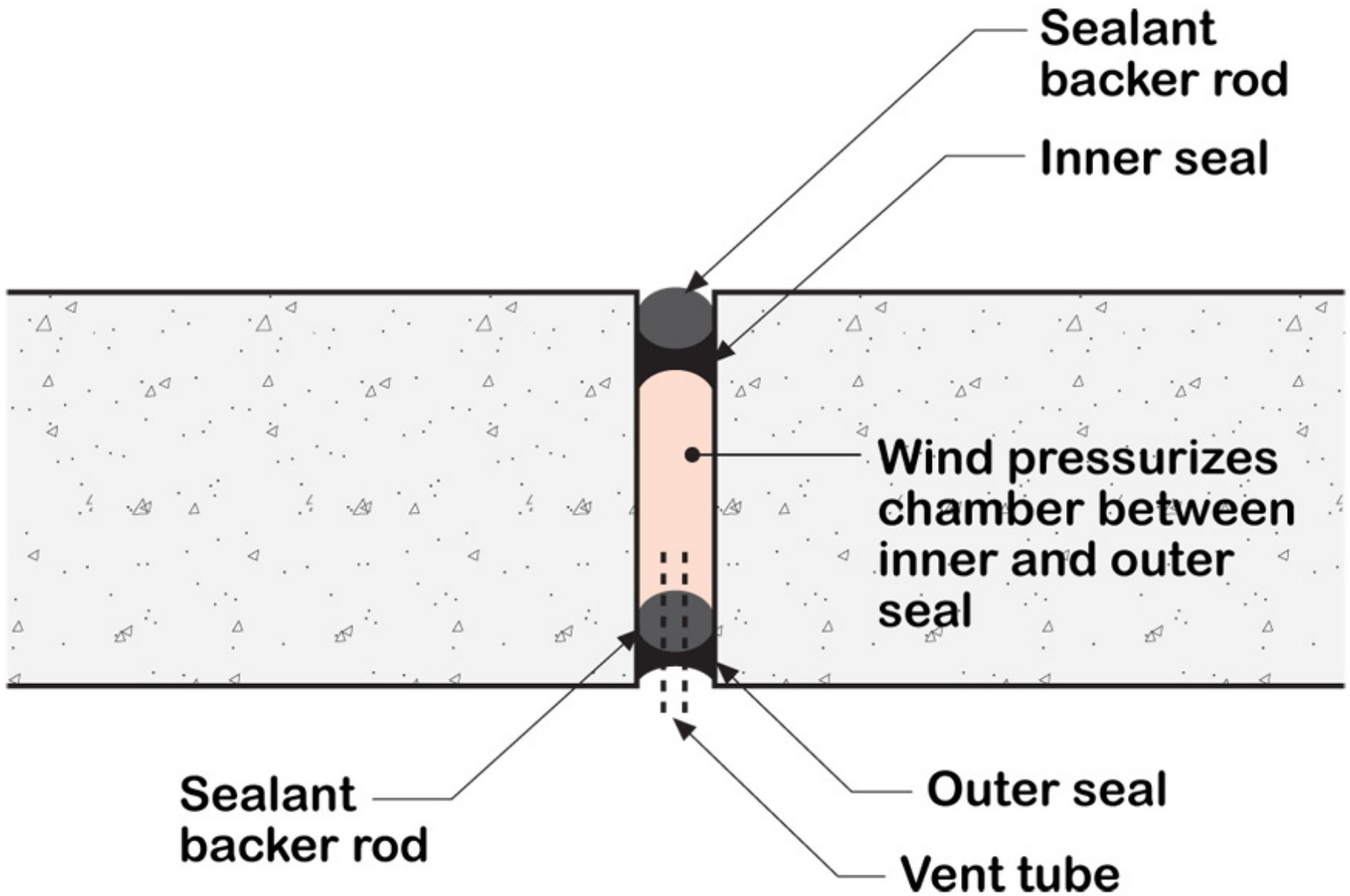
Adhesive-backed sill flashing

Beveled wood siding

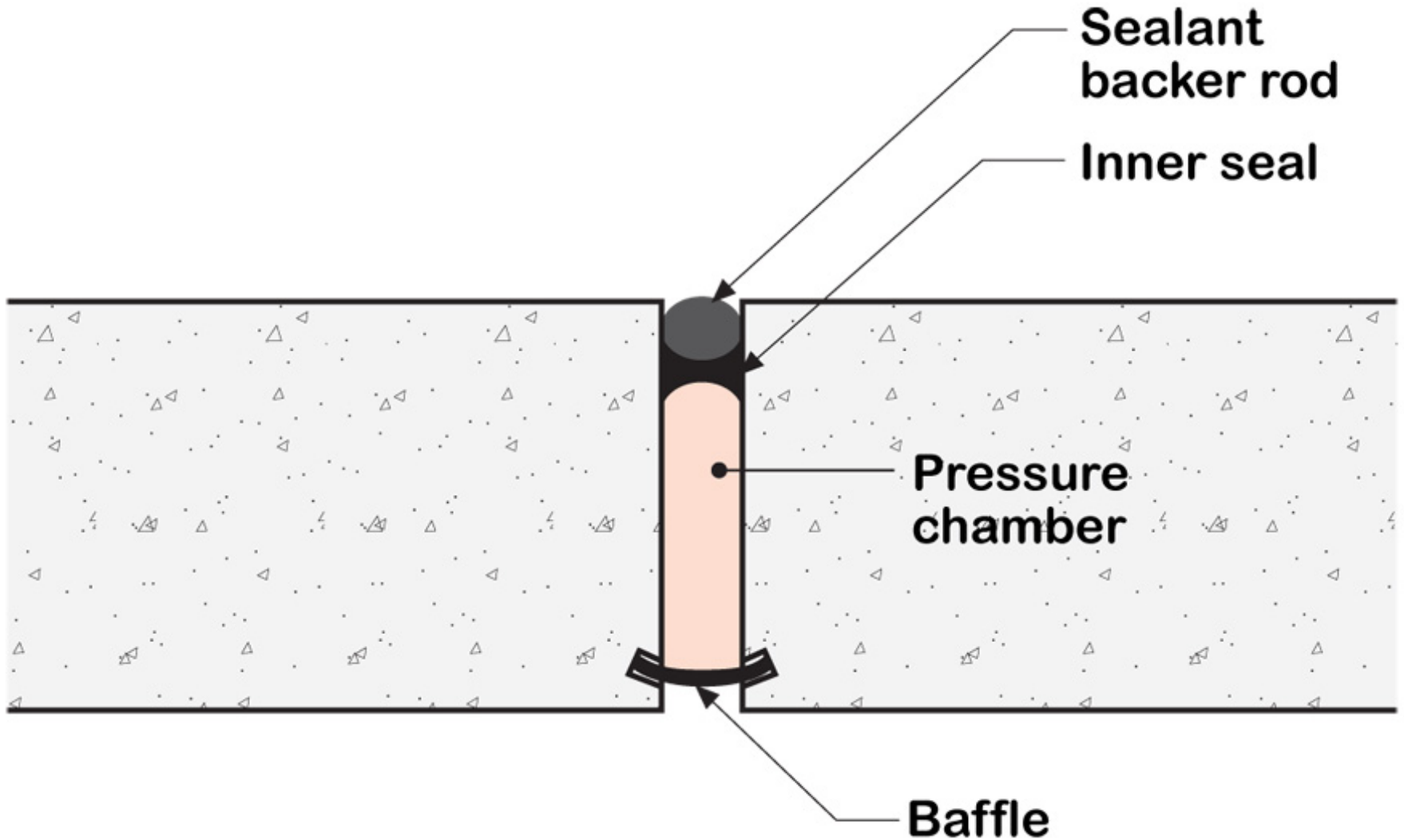
Housewrap

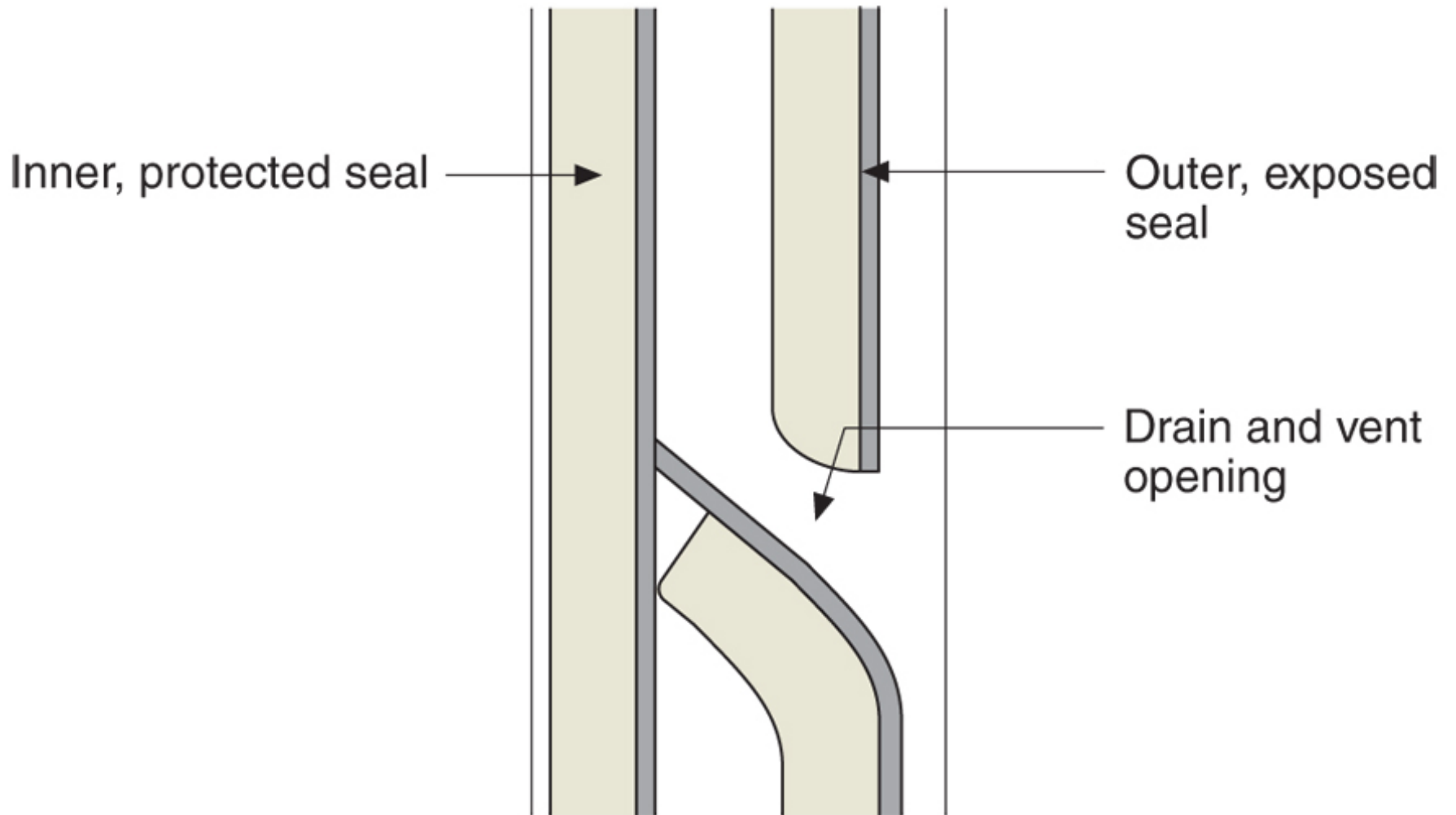
Sheathing



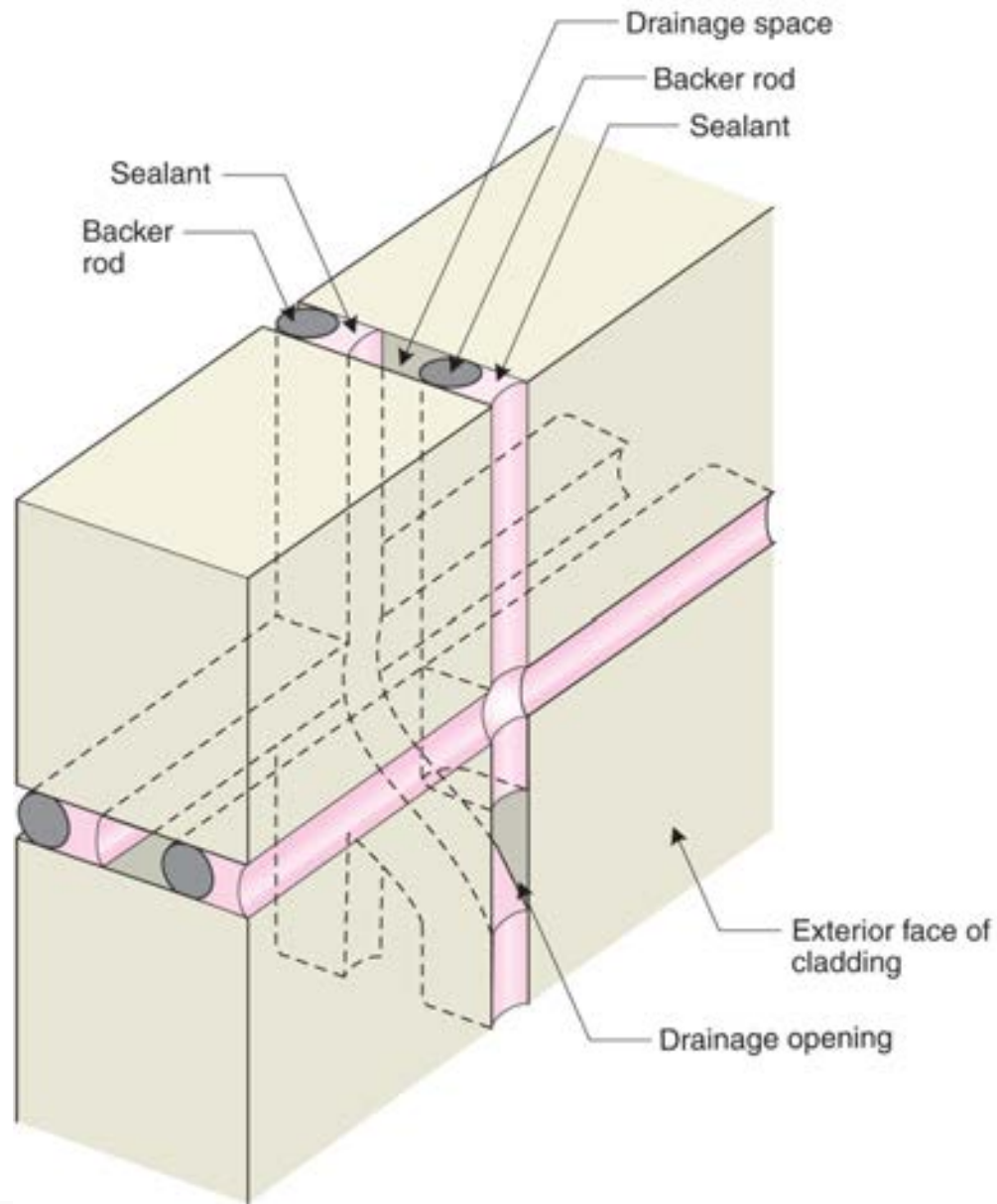










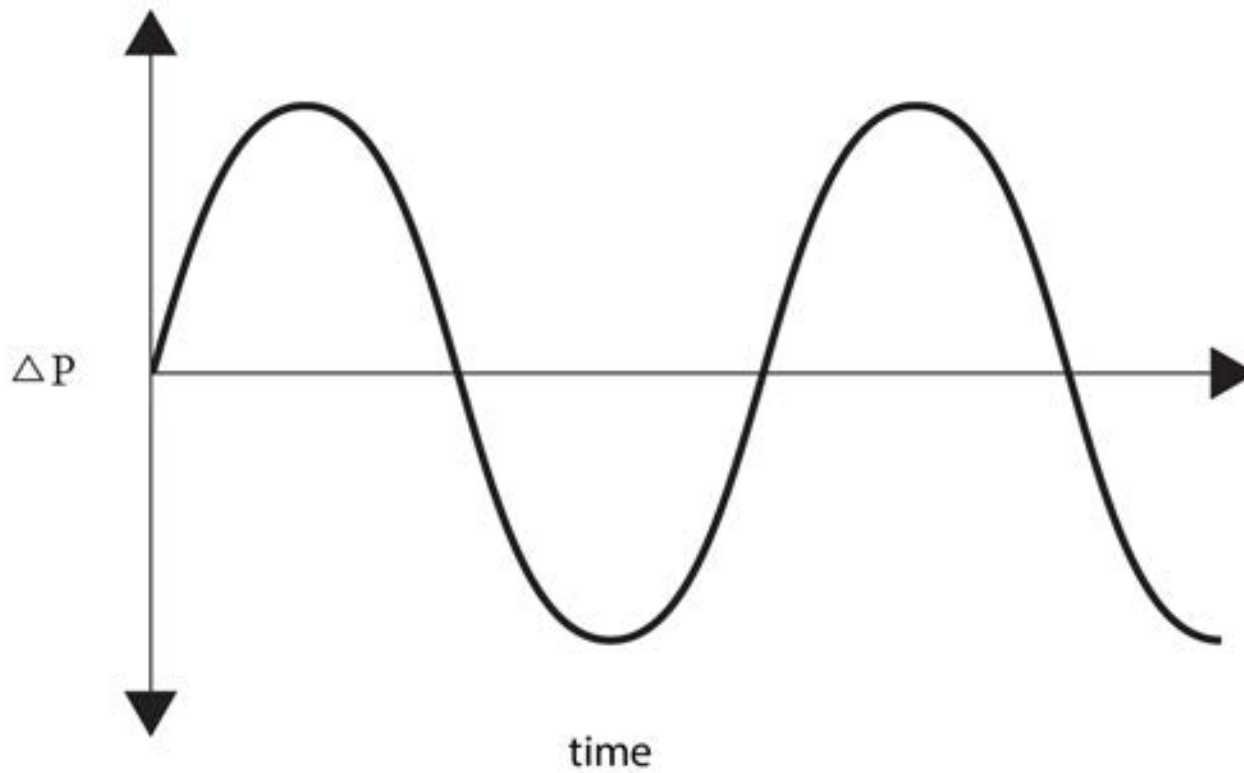


# Open Joints vs Closed Joints

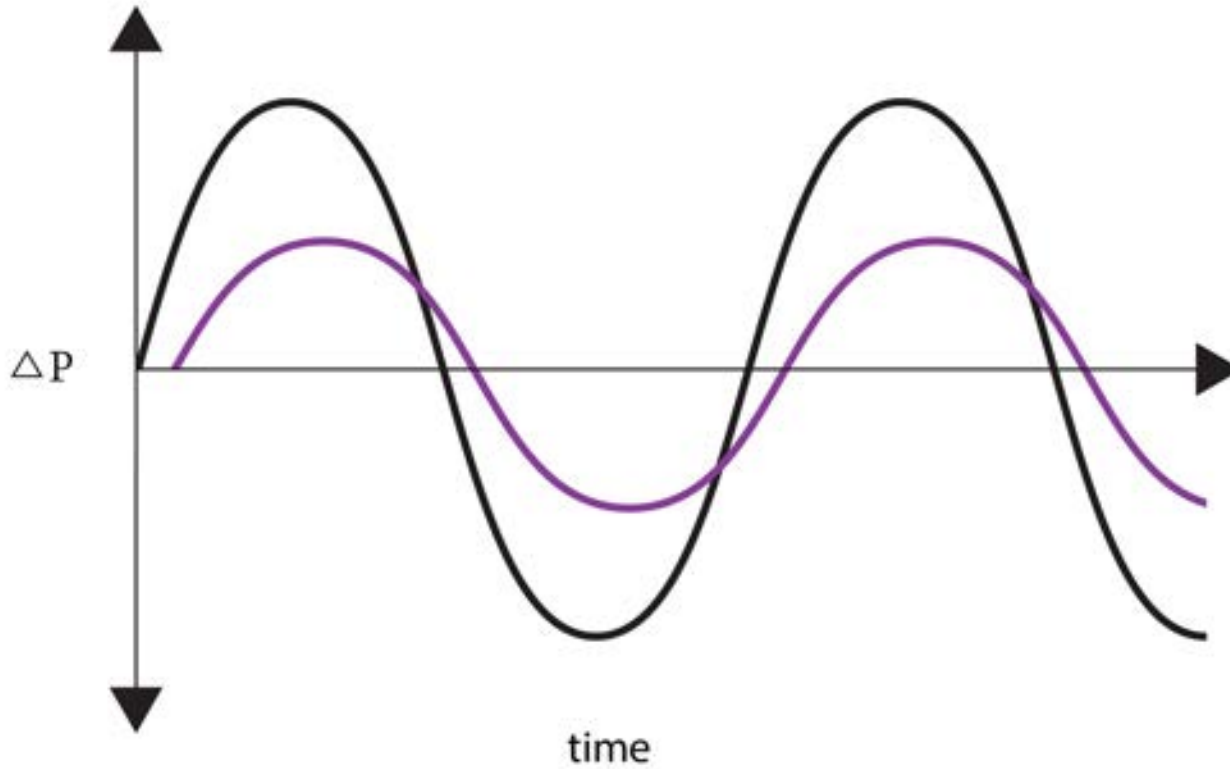


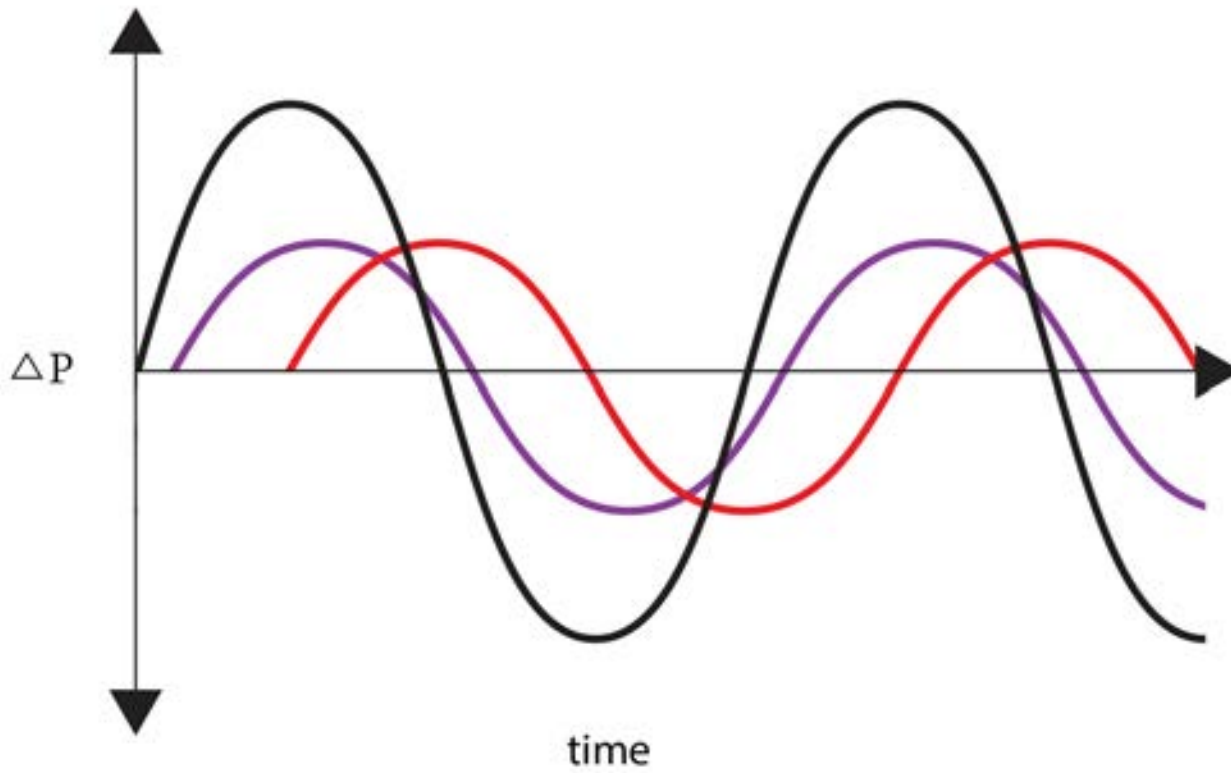
# Open Joints vs Closed Joints

## Limits of Pressure Equalization

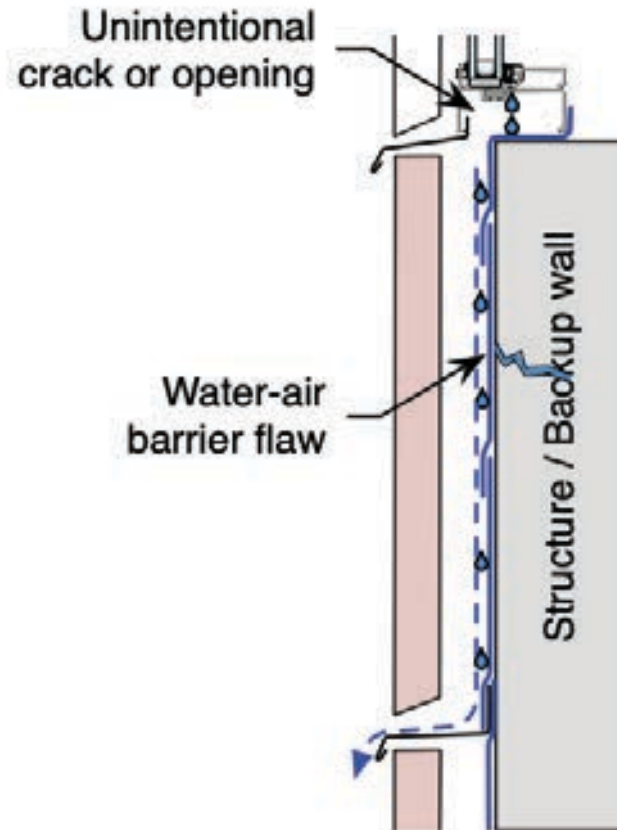












With 100% pressure equalization, gravity will drive leakage. If leaks deposit water on the water-air barrier, air pressure will encourage it to penetrate AWB. Drainage no longer can manage this leakage.

Pressure Equalization Needs to be Perfect

Pressure Equalization Reduces Drying

Prevention of Wetting Is Not As Important As  
Drying

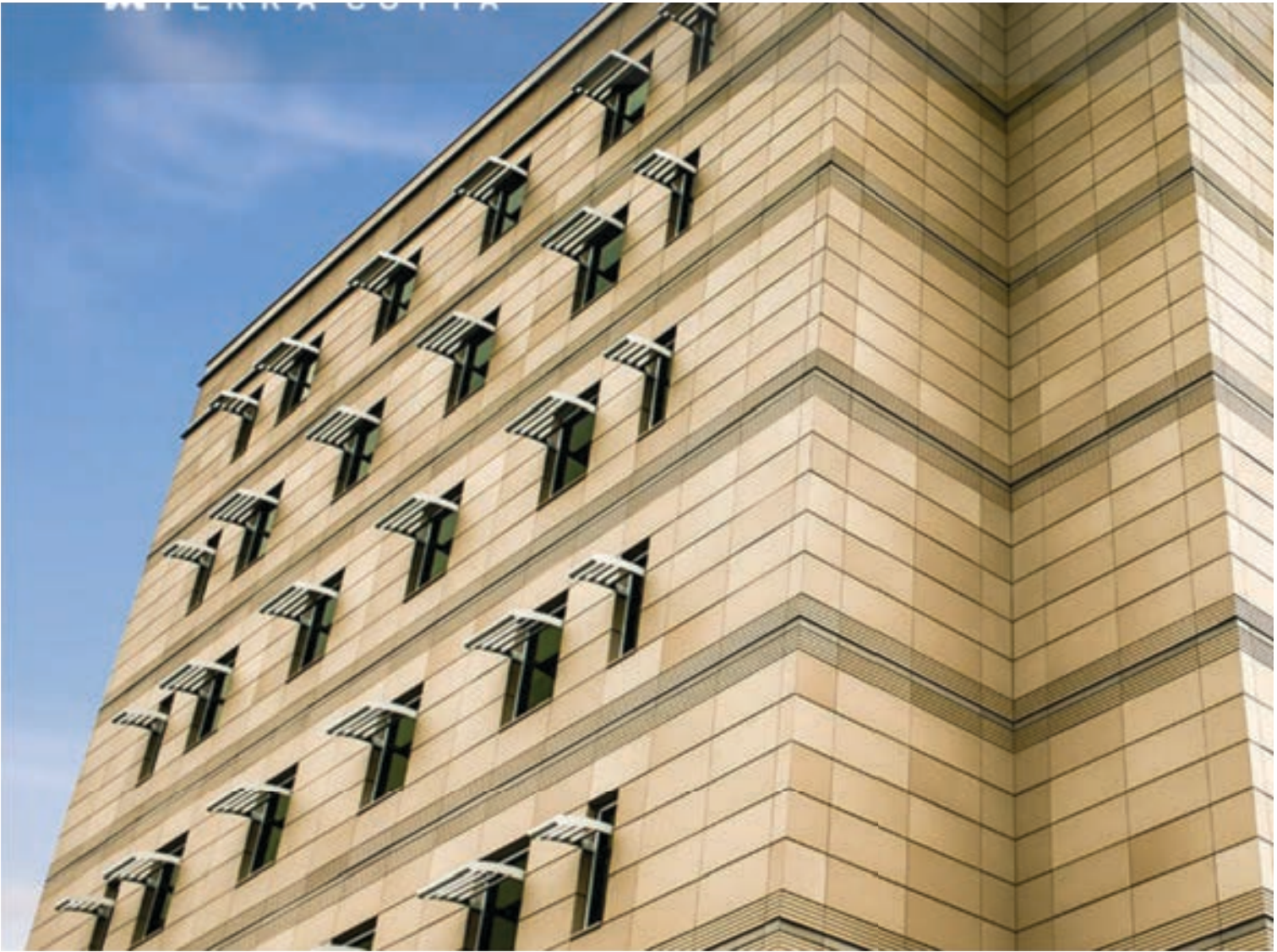
Assume Things Get Wet...Design Them to Dry

Ventilated Claddings Promote Drying









# 2<sup>nd</sup> Law of Thermodynamics



In an isolated system, a process can occur only if it increases the total entropy of the system

Rudolf Clausius

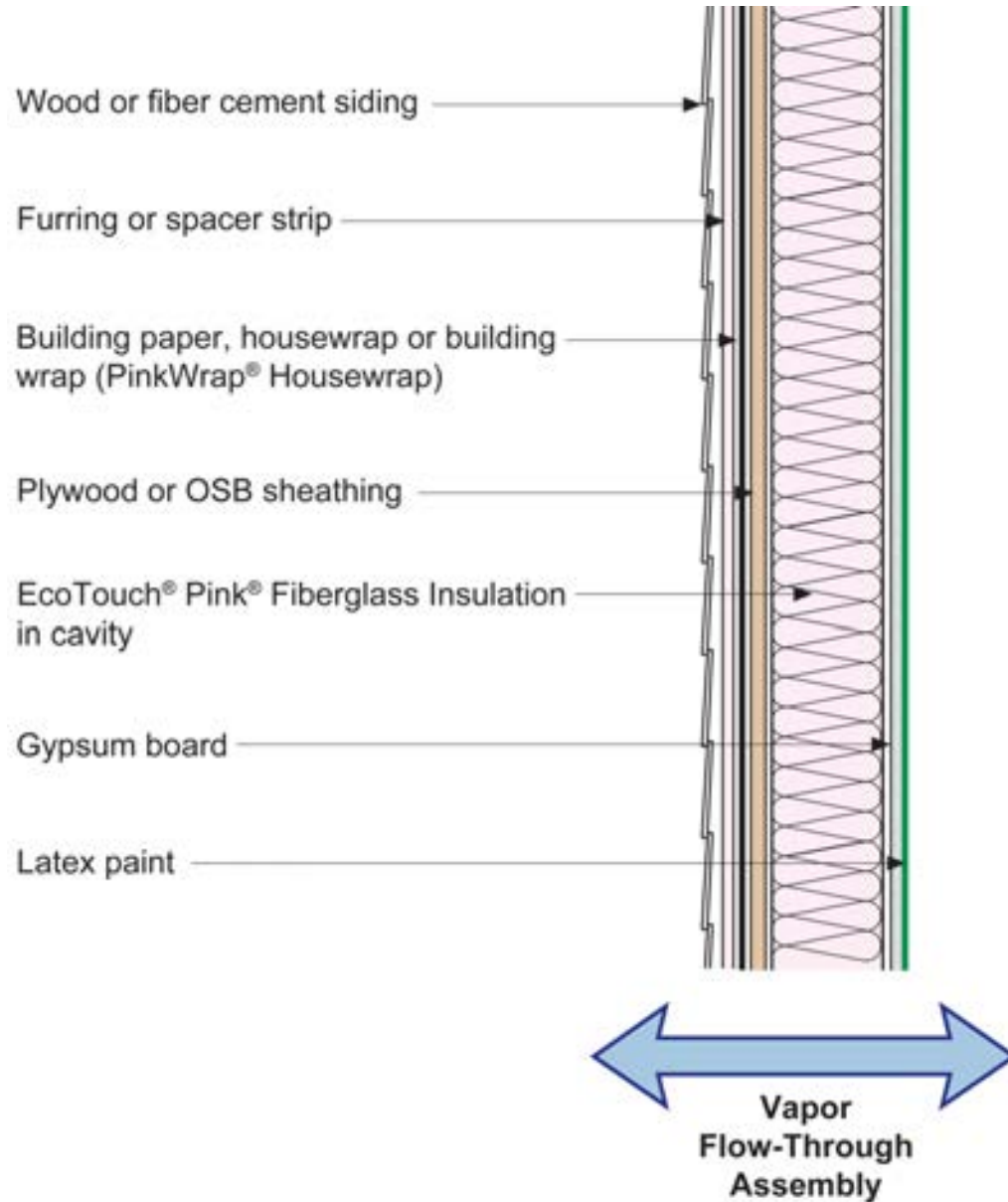
Heat Flow Is From Warm To Cold  
Moisture Flow Is From Warm To Cold  
Moisture Flow Is From More To Less  
Air Flow Is From A Higher Pressure to a  
Lower Pressure



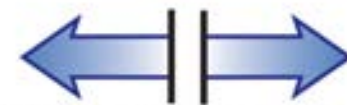
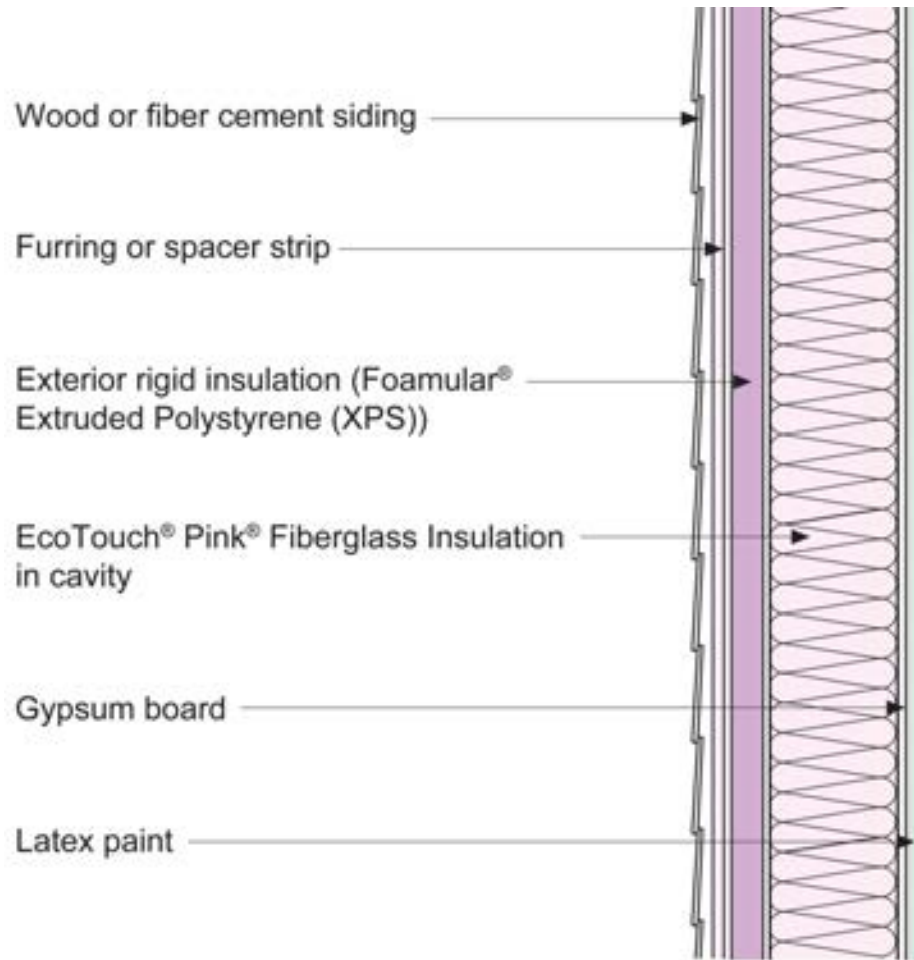




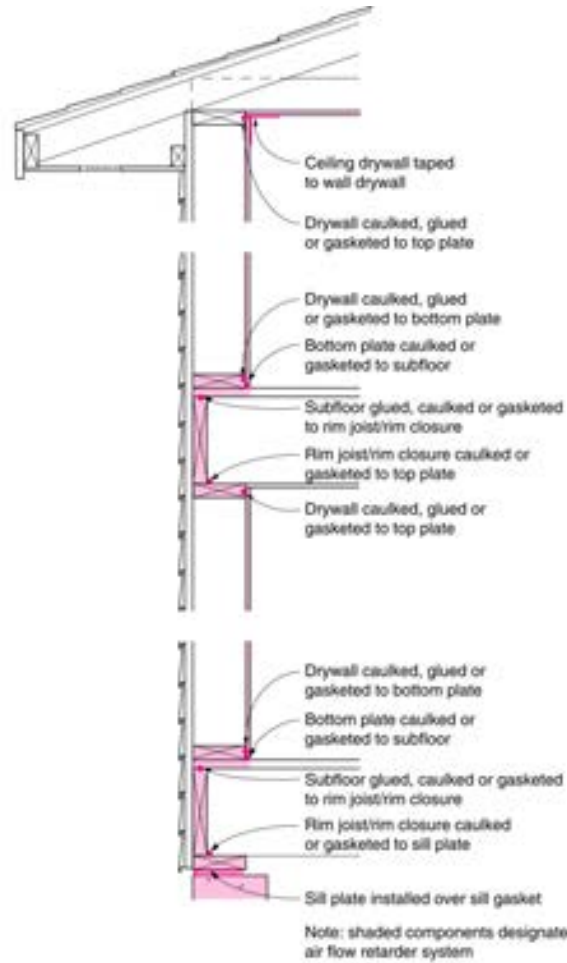








**Control of Condensing  
Surface Temperature  
Assembly**



## Interior Air Flow Retarder Using Drywall and Framing

