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Building Science

Adventures In Building Science

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Exterior Insulation Finish Systems

EIFS



Exterior Insulation Finish Systems

EIFS

Barrier System

Face-Sealed Not Water Managed

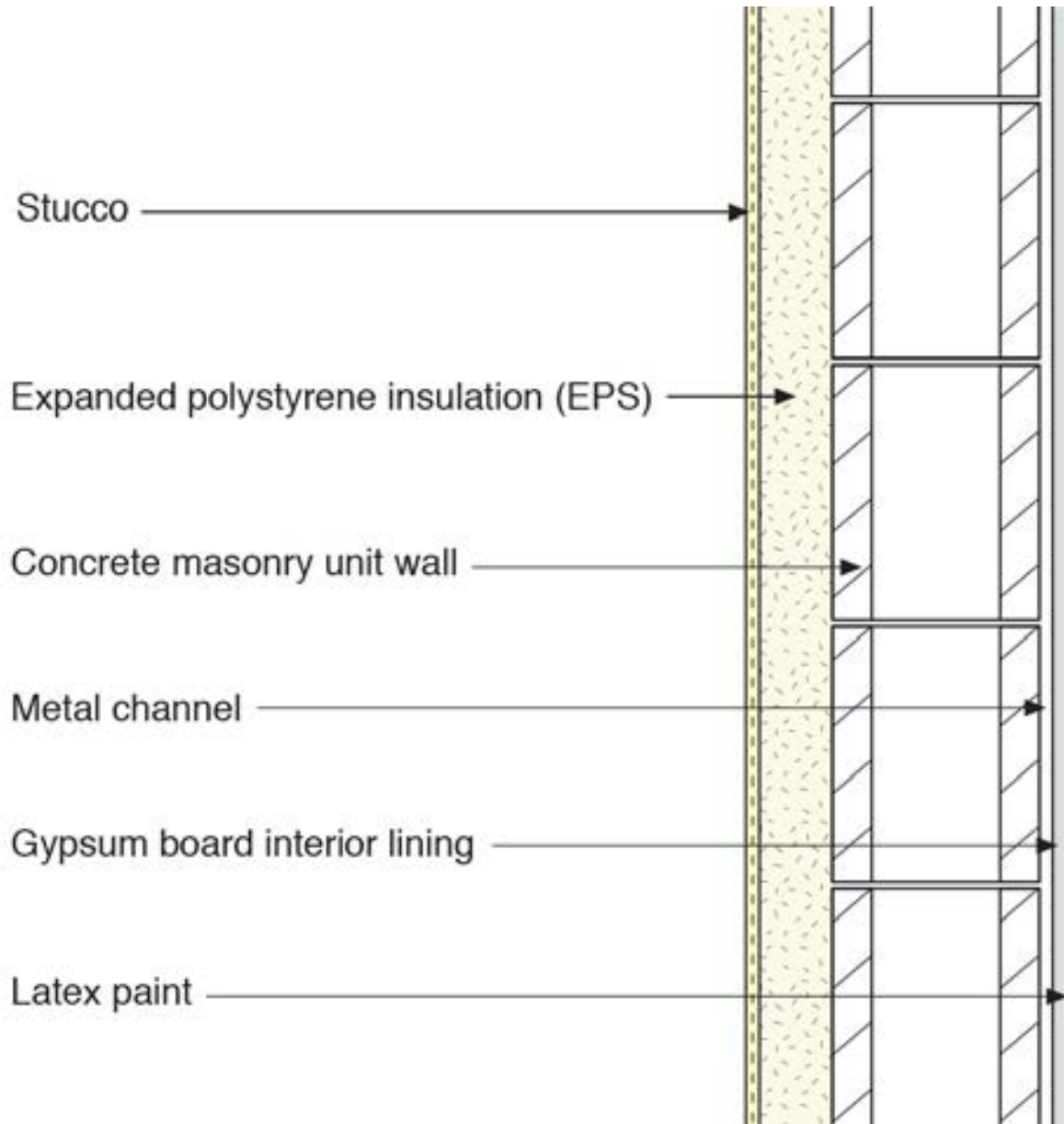


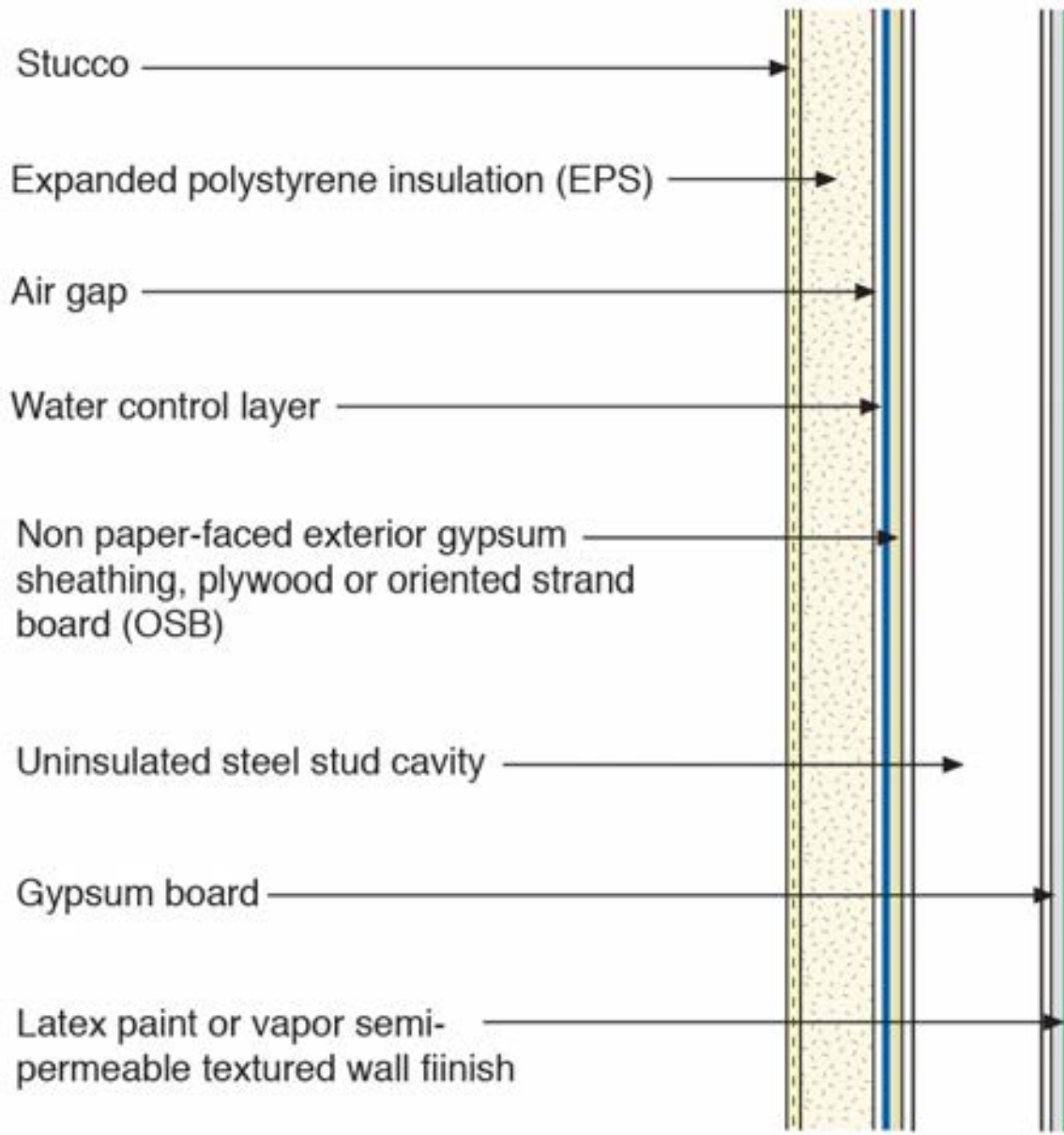


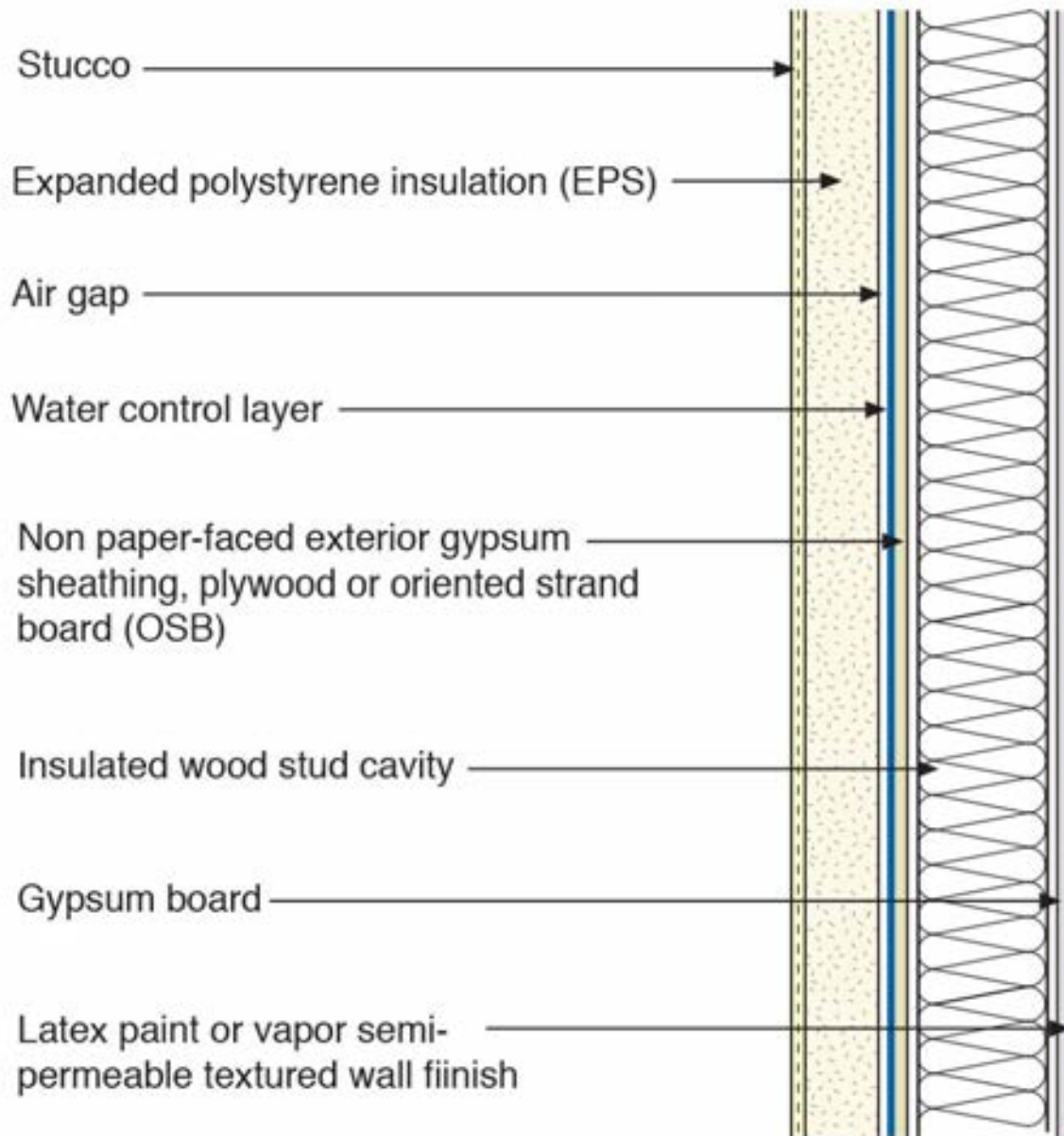


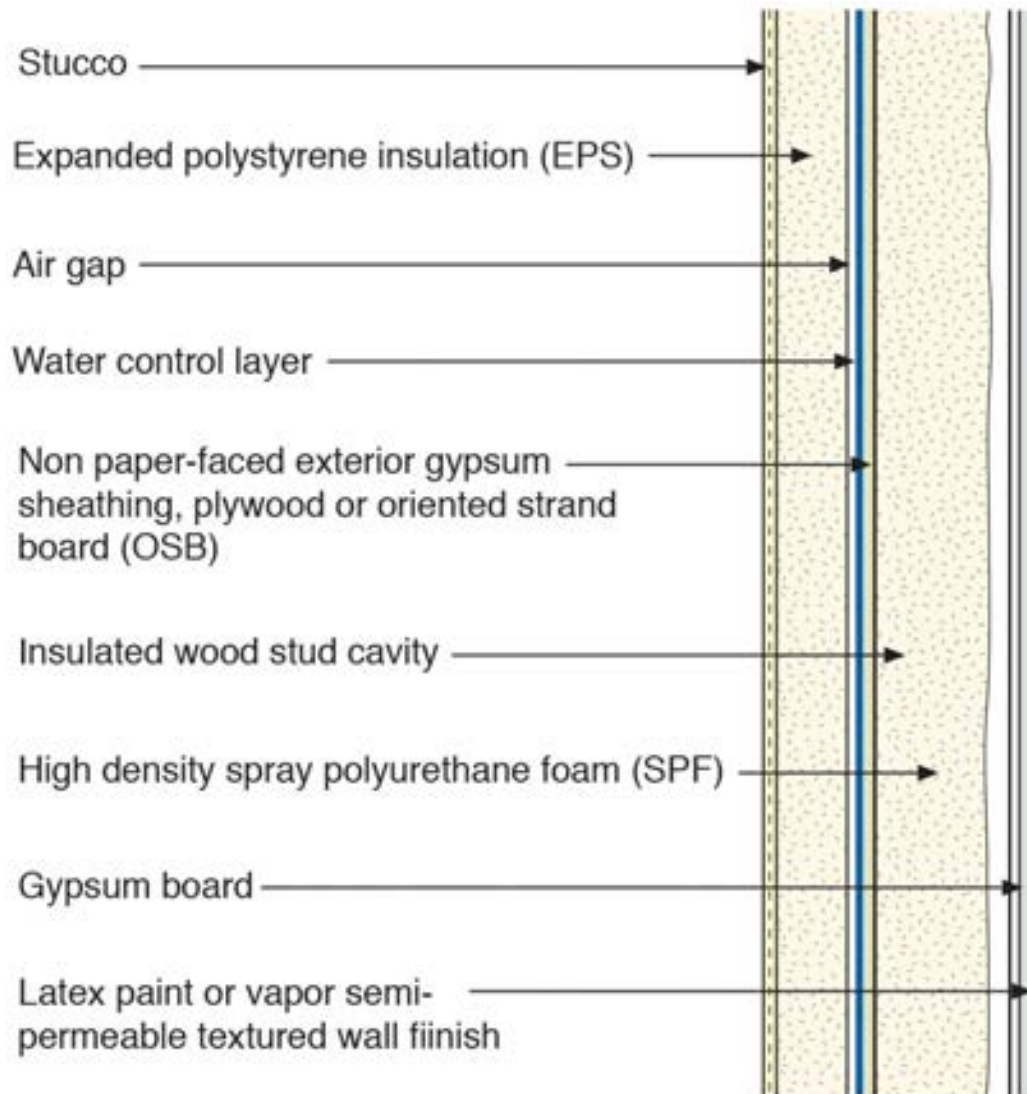


EIFS No Longer Has Issues









Life Is Hard Enough As It Is

It's Harder When You Are Stupid

Don't Do Stupid Things







Side Trip To Vancouver....

Side Trip To Vancouver....

Vancouver Condo Crisis....

Should Have Put Everyone on Notice



















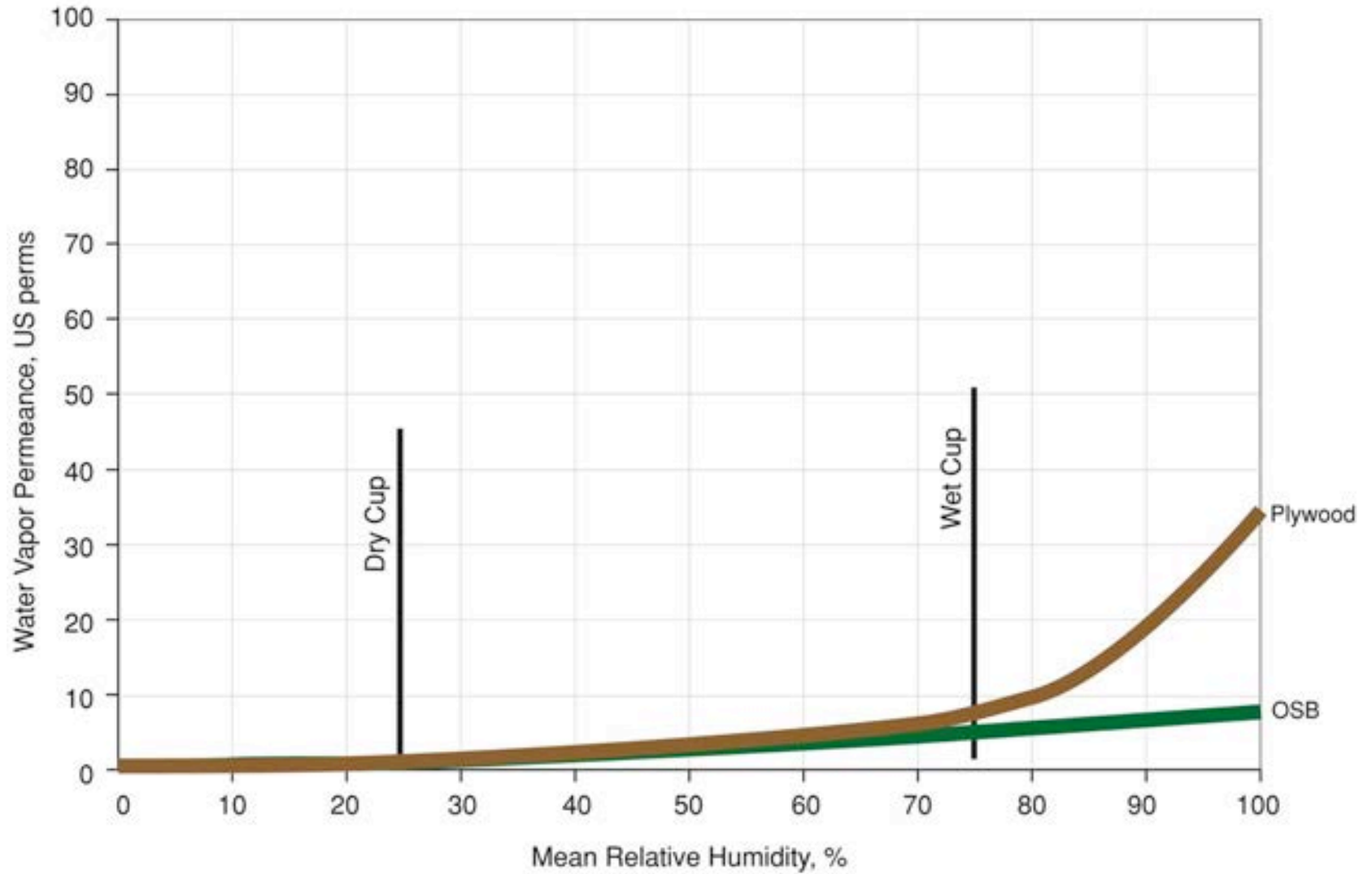
What Happened In Vancouver?
OSB Instead of Plywood
Non Traditional Building Wraps
Interior Vapor Barriers
Increased Thermal Resistance
Portland Cement Instead of Lime

Materials
Inward Drive
Energy

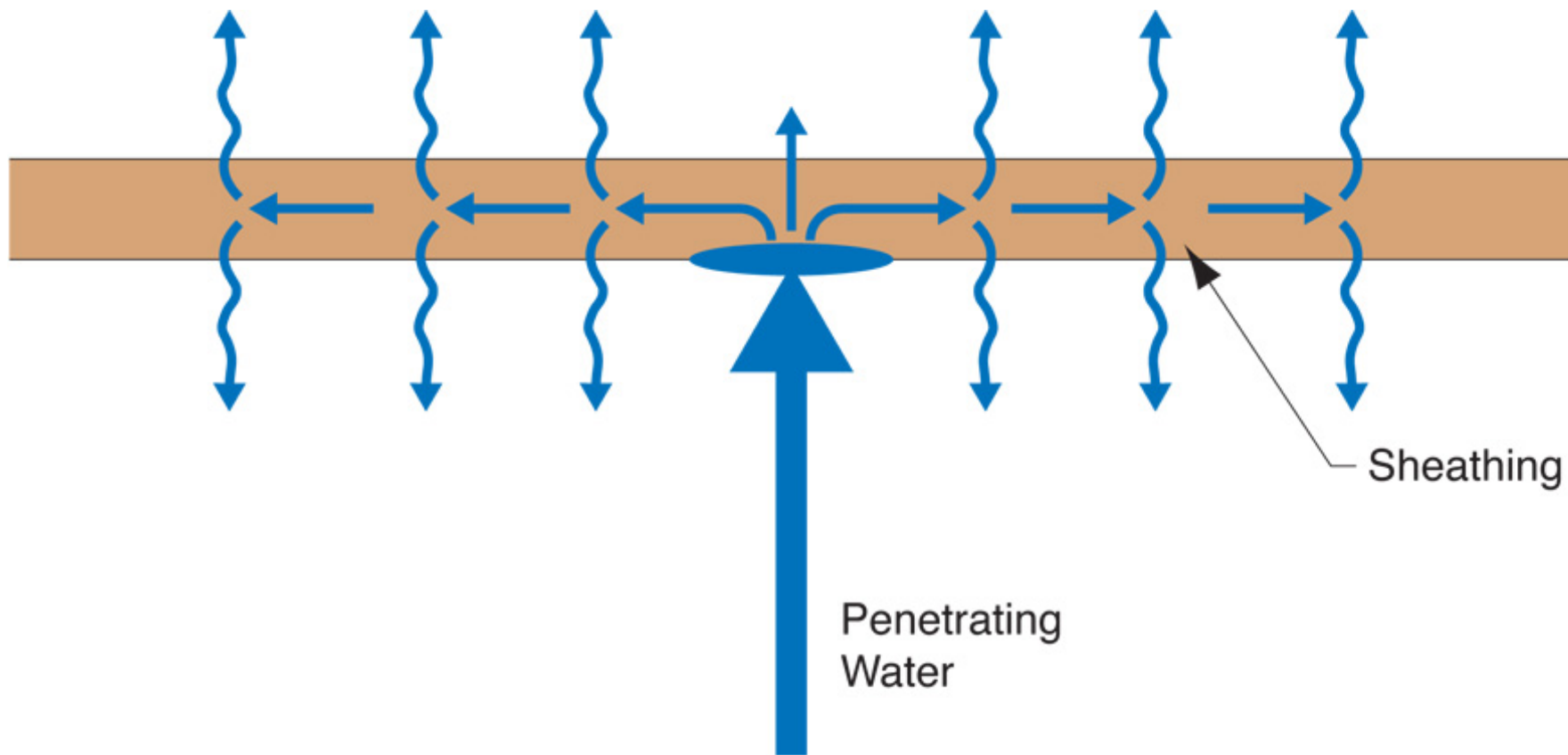


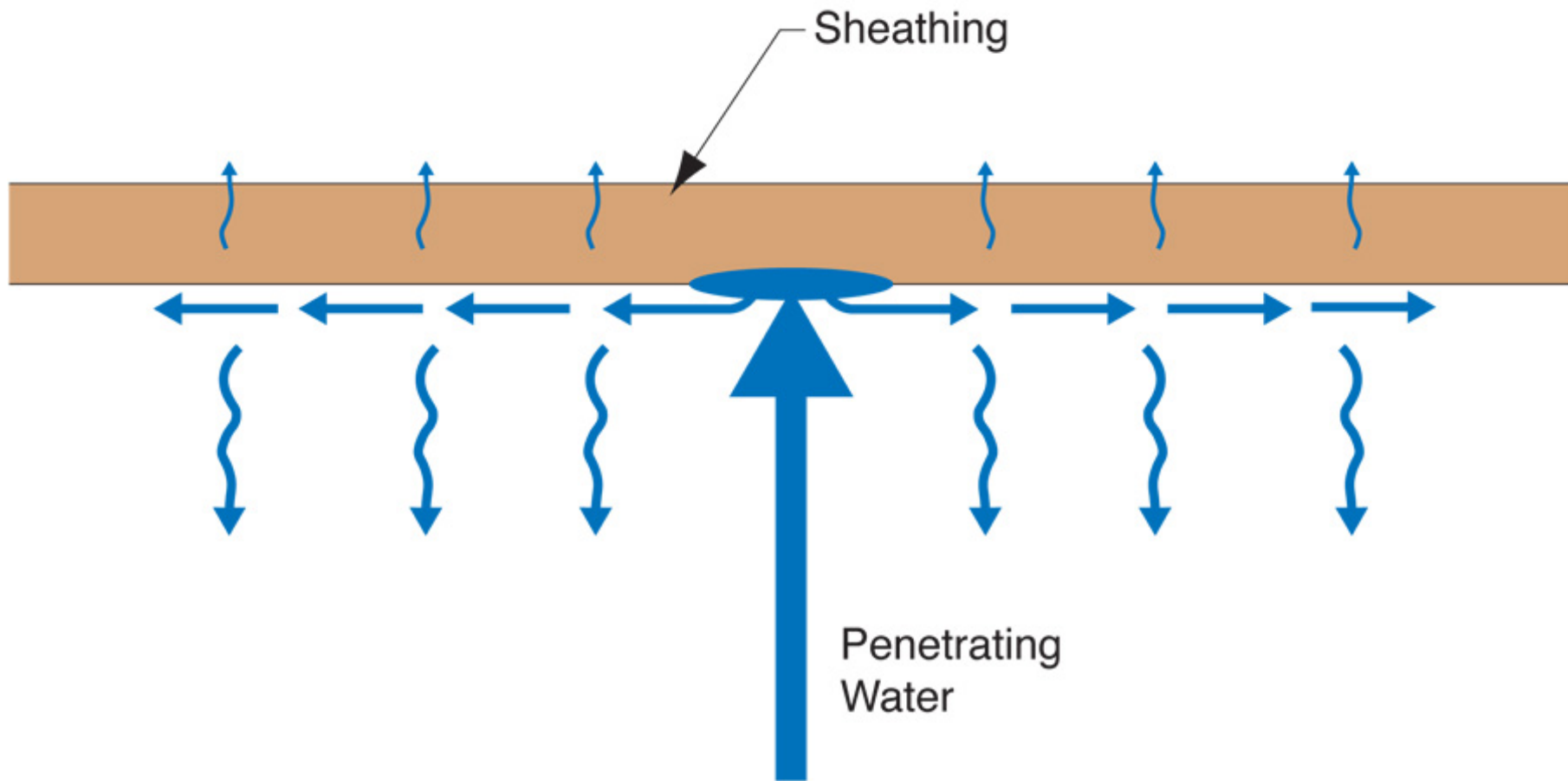


Water Vapor Permeance of Sheathing Materials

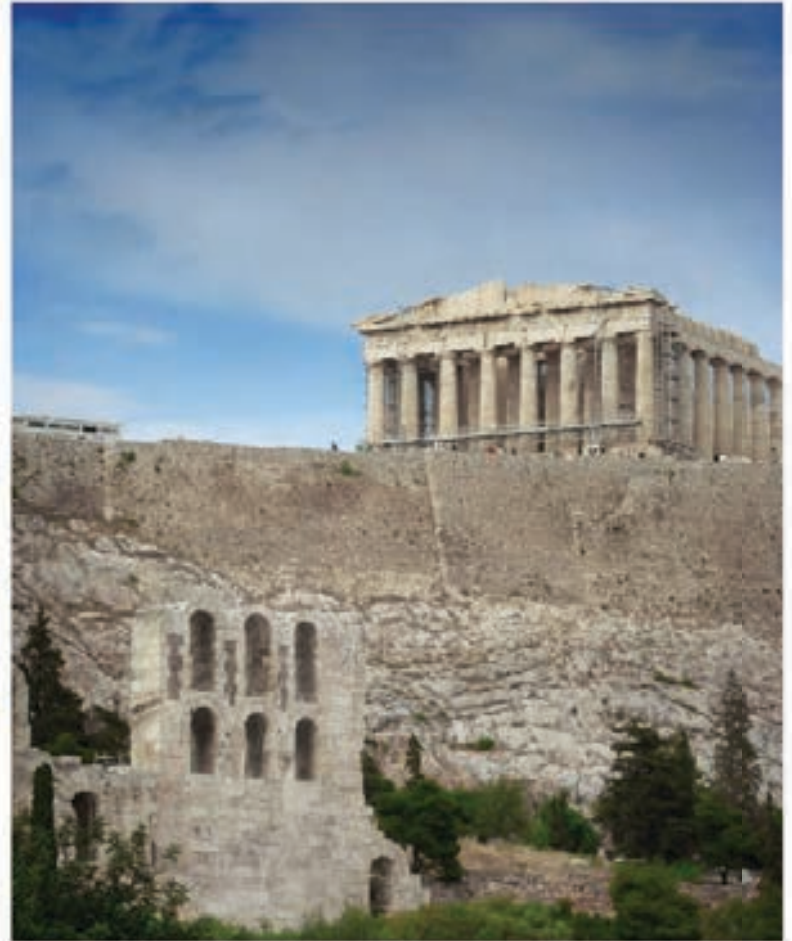












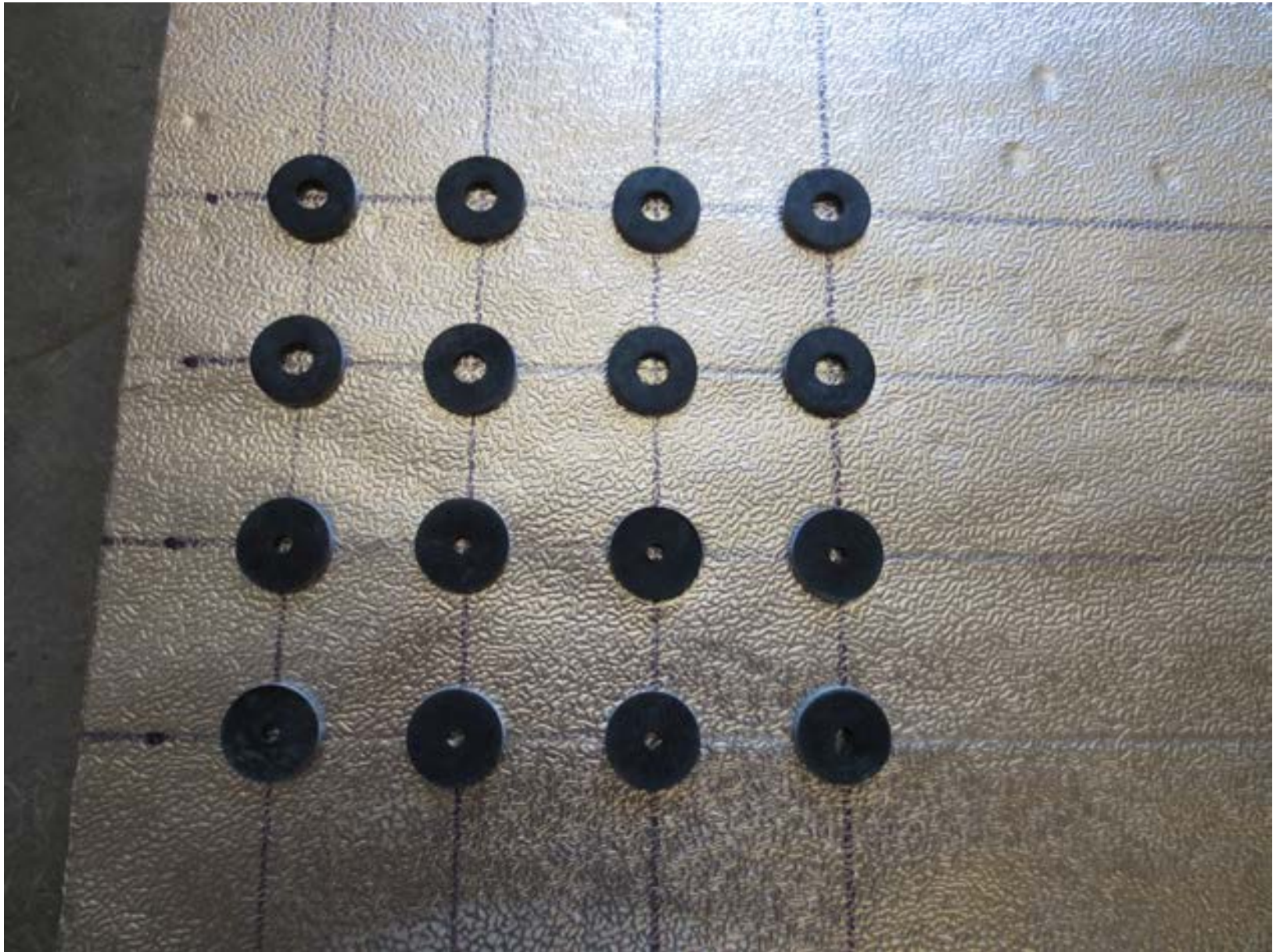




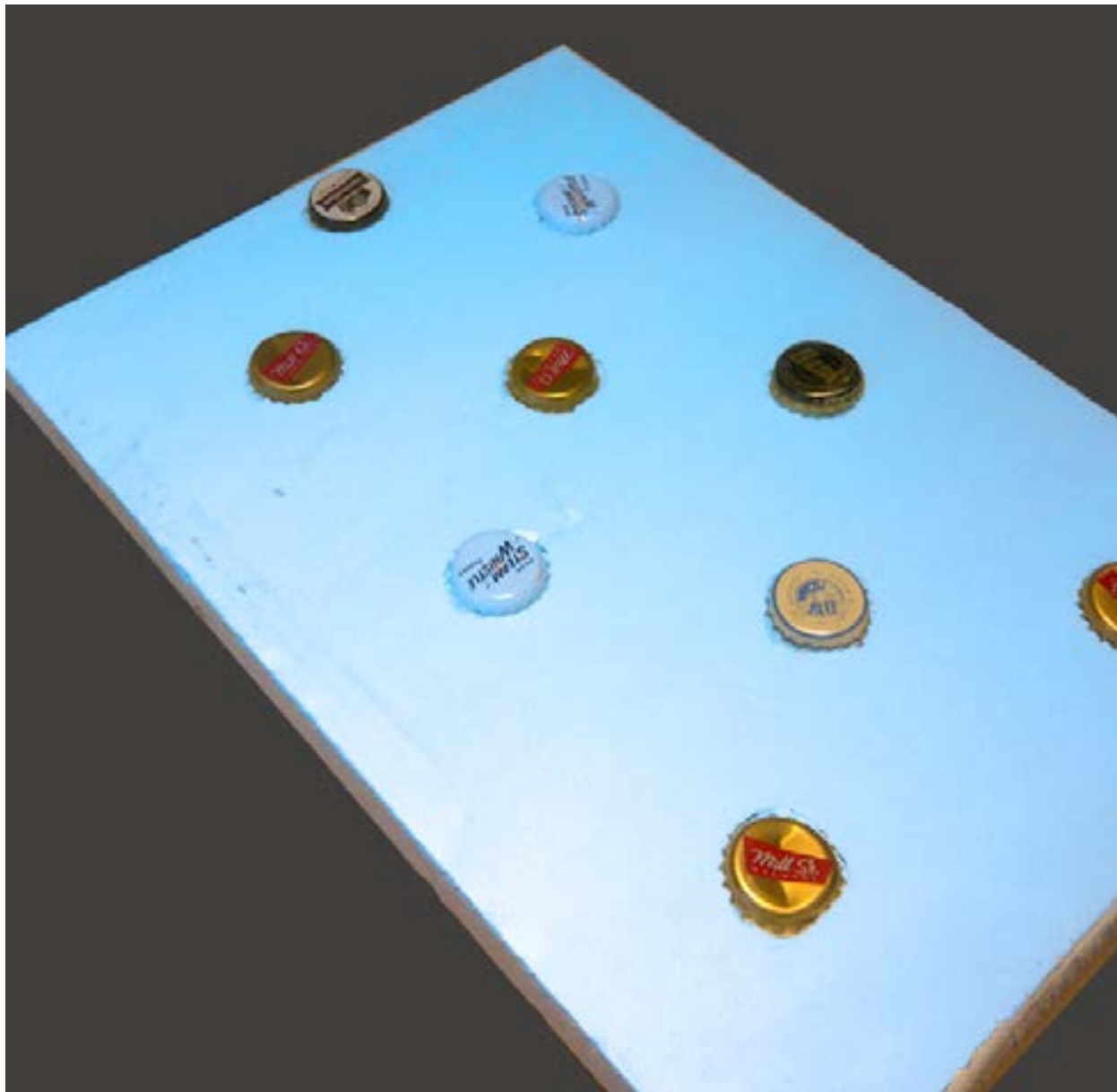


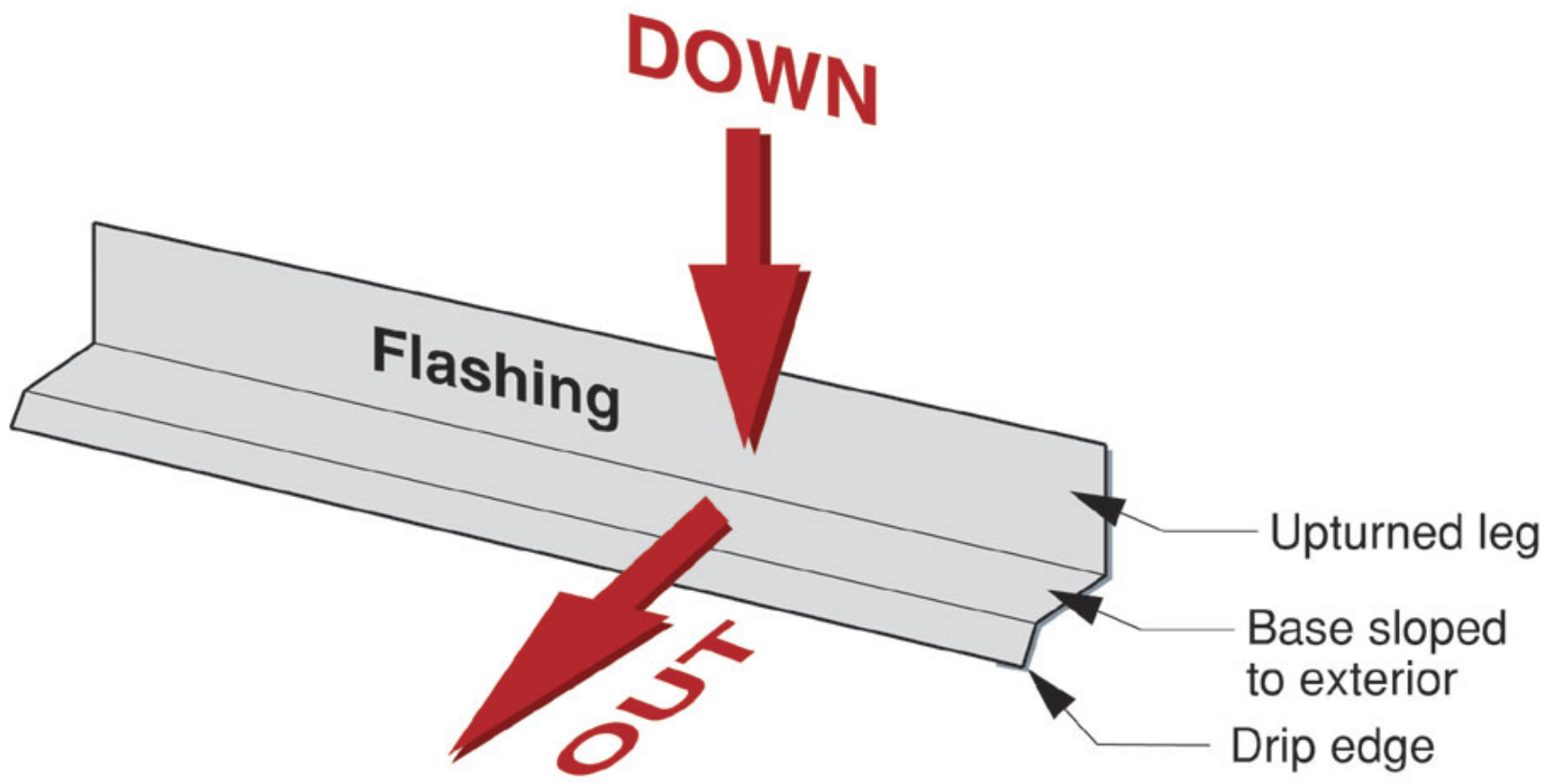


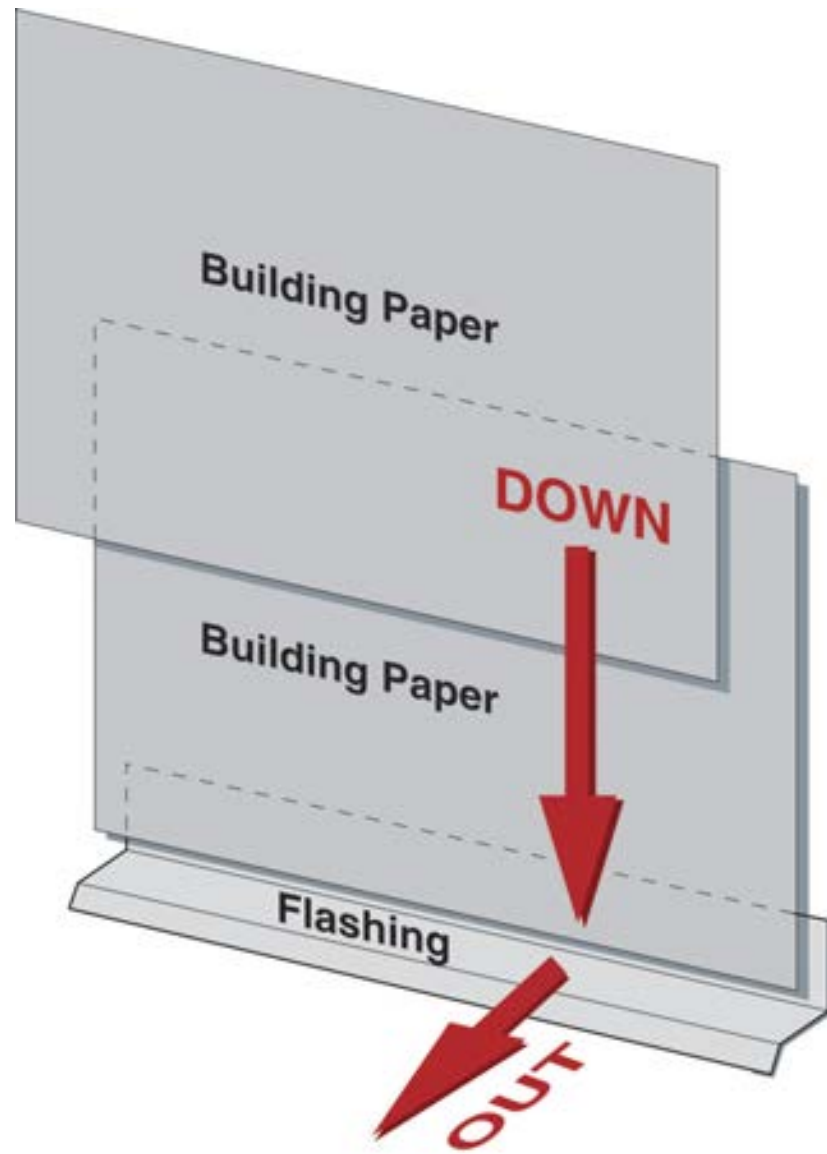
Rain Screen

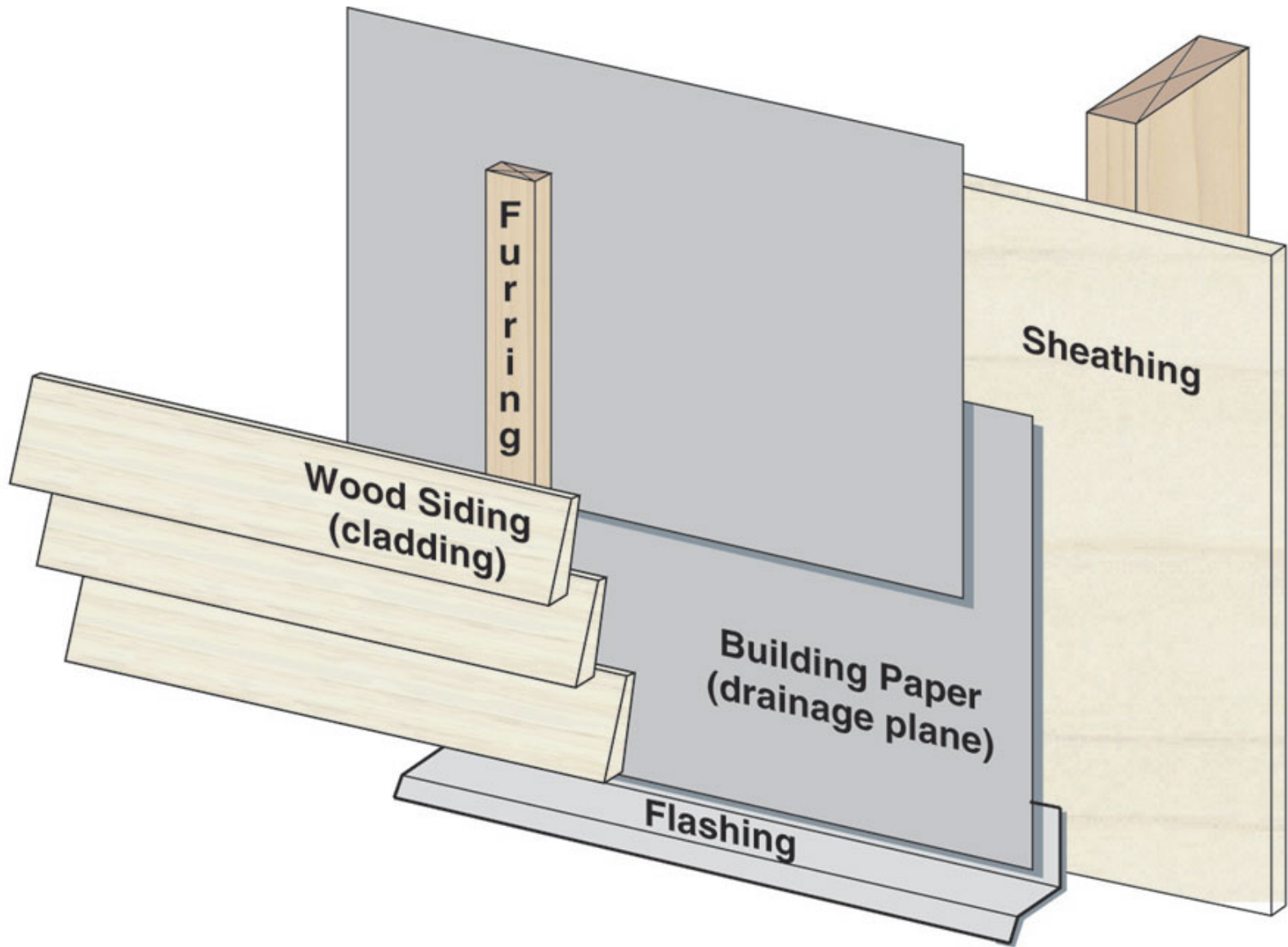


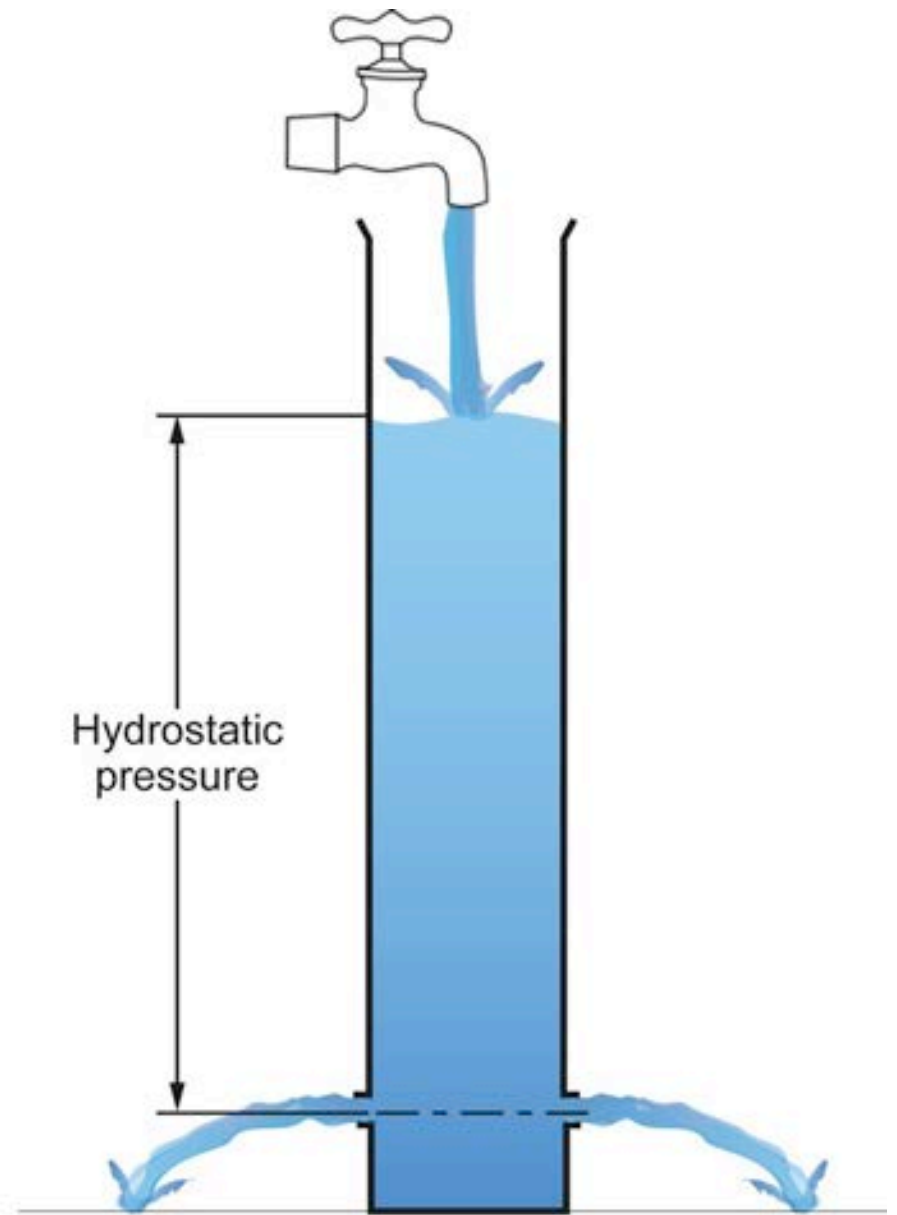
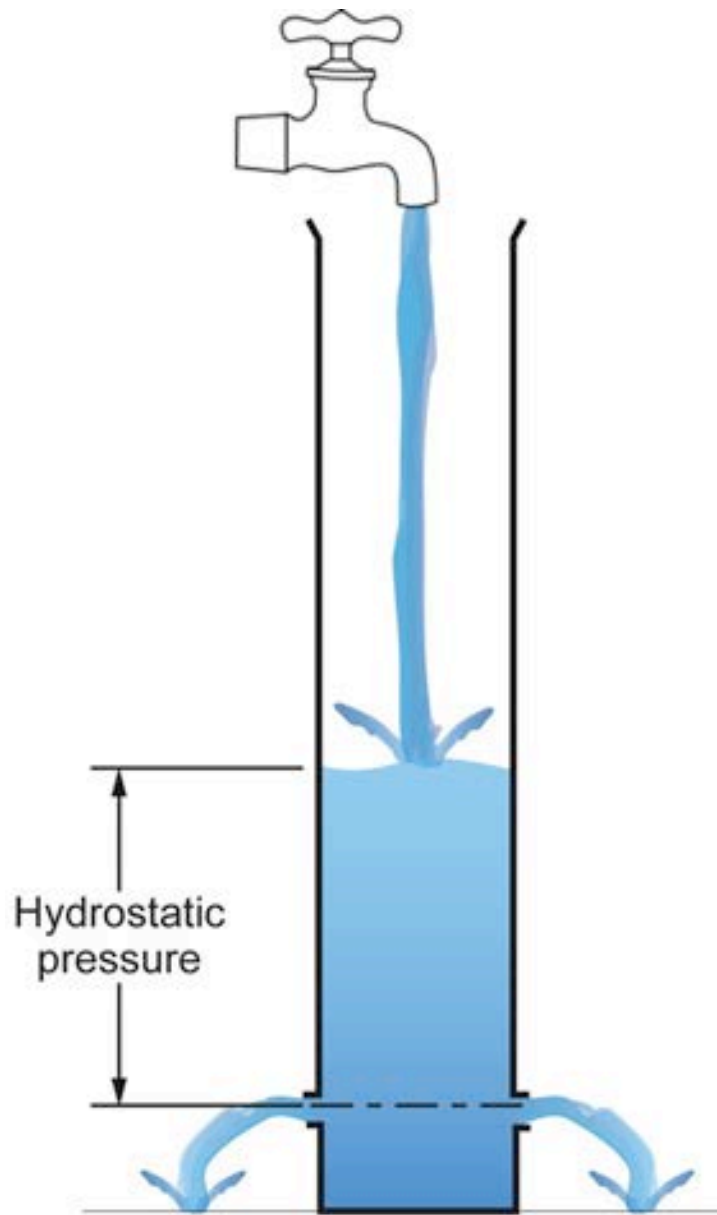
Beer Screen?



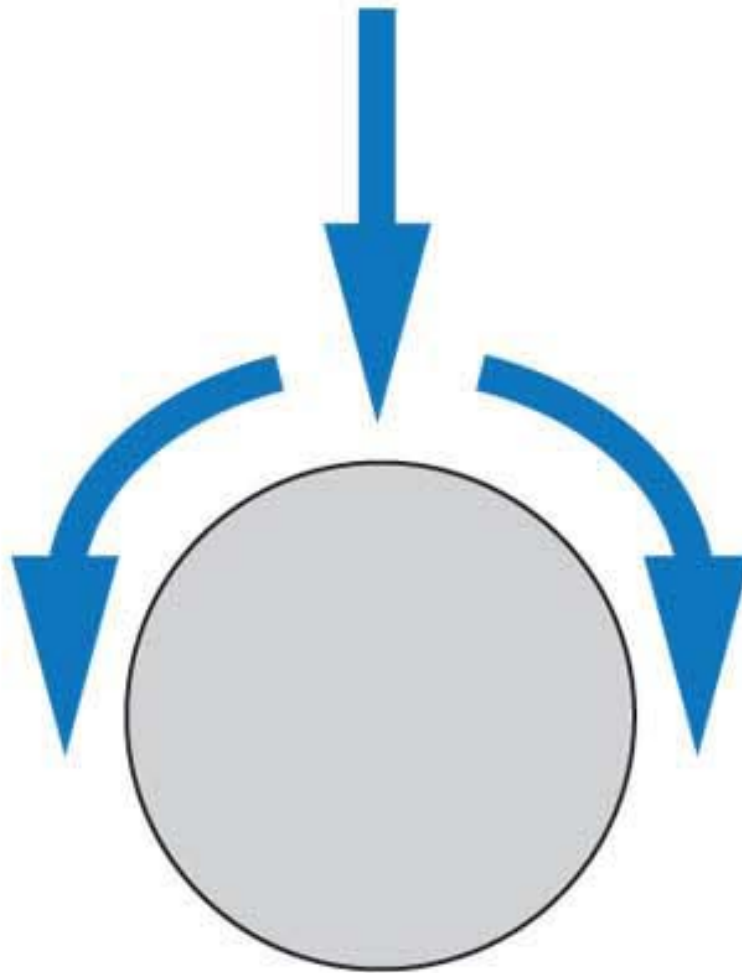


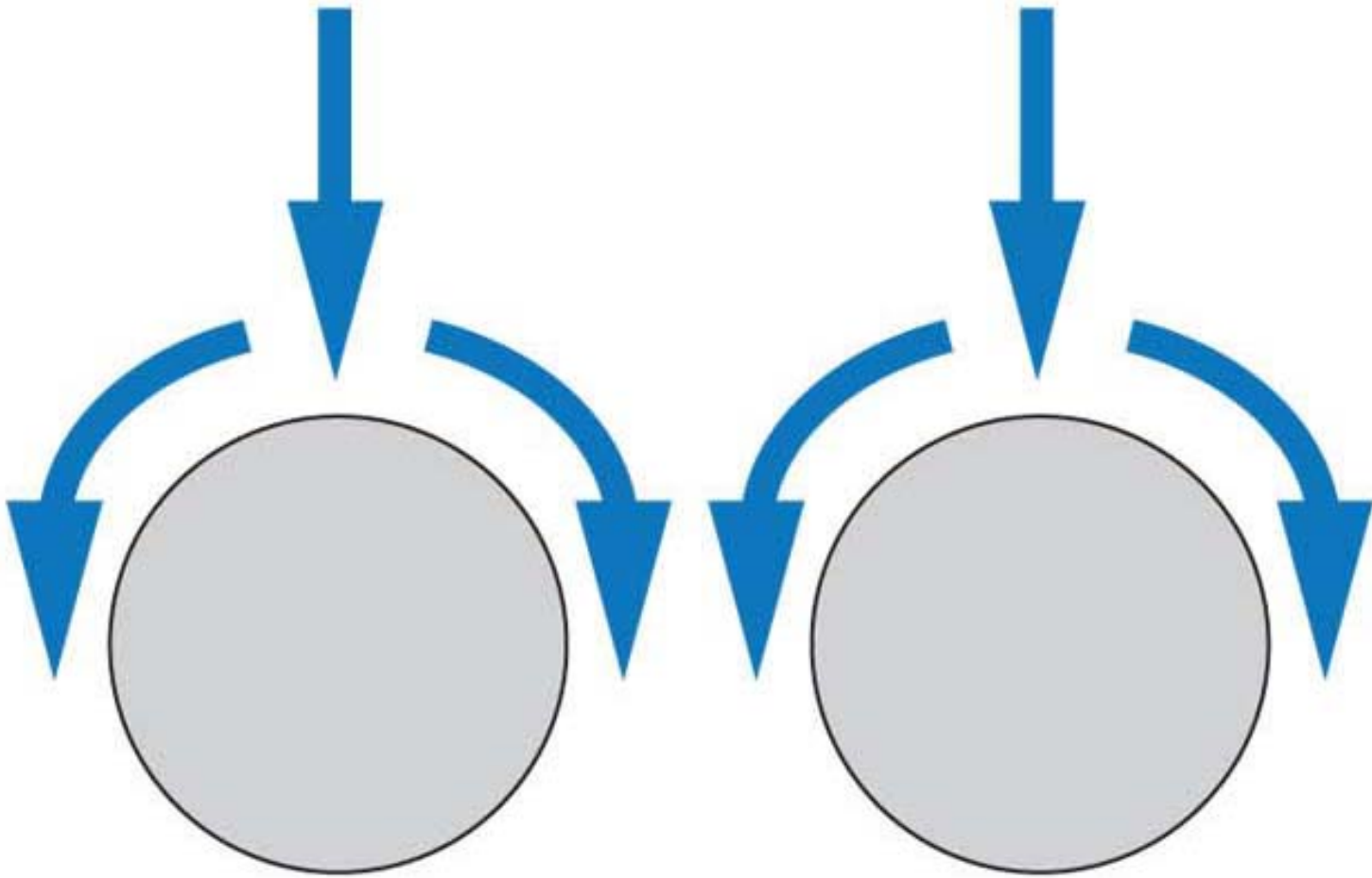


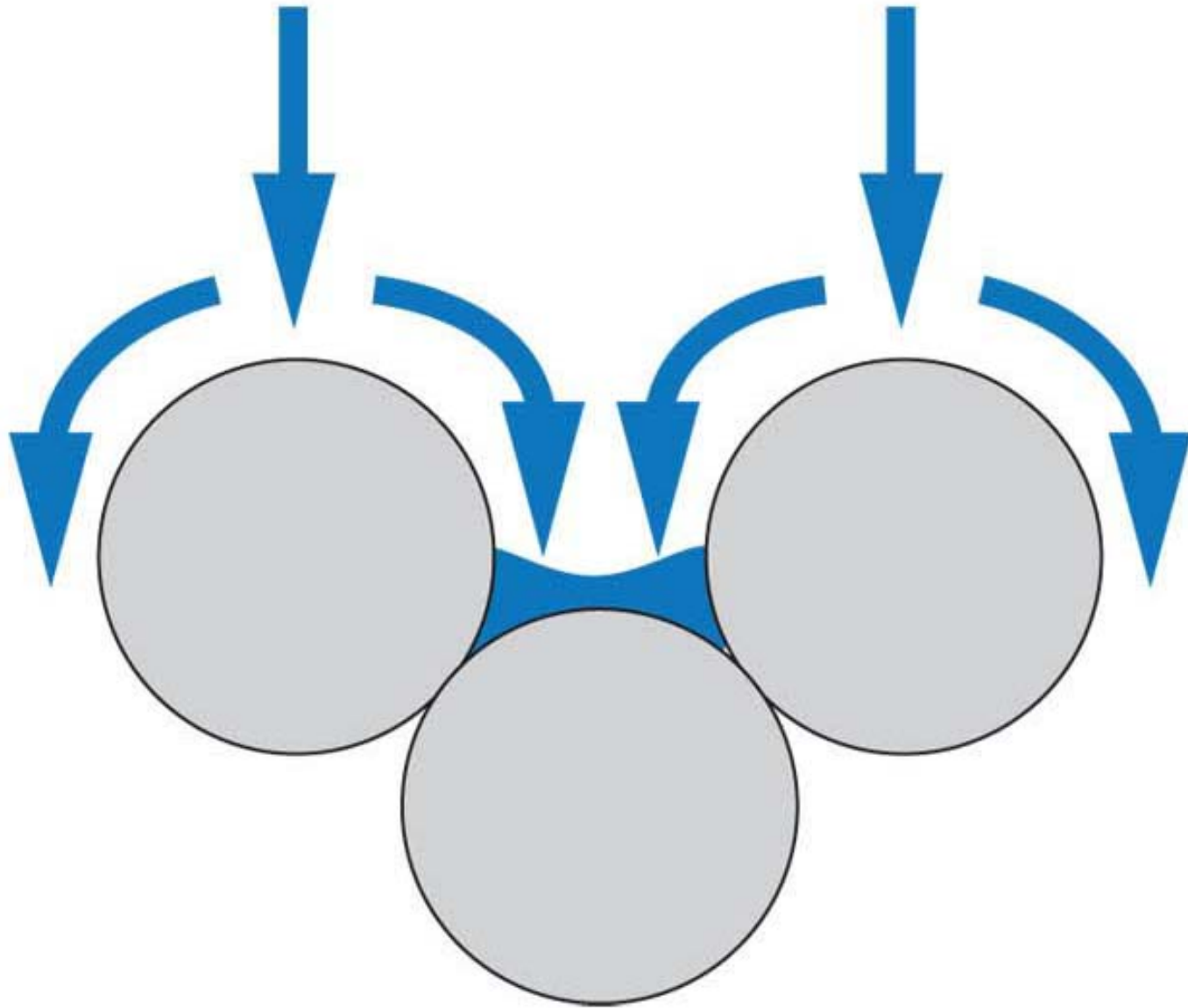


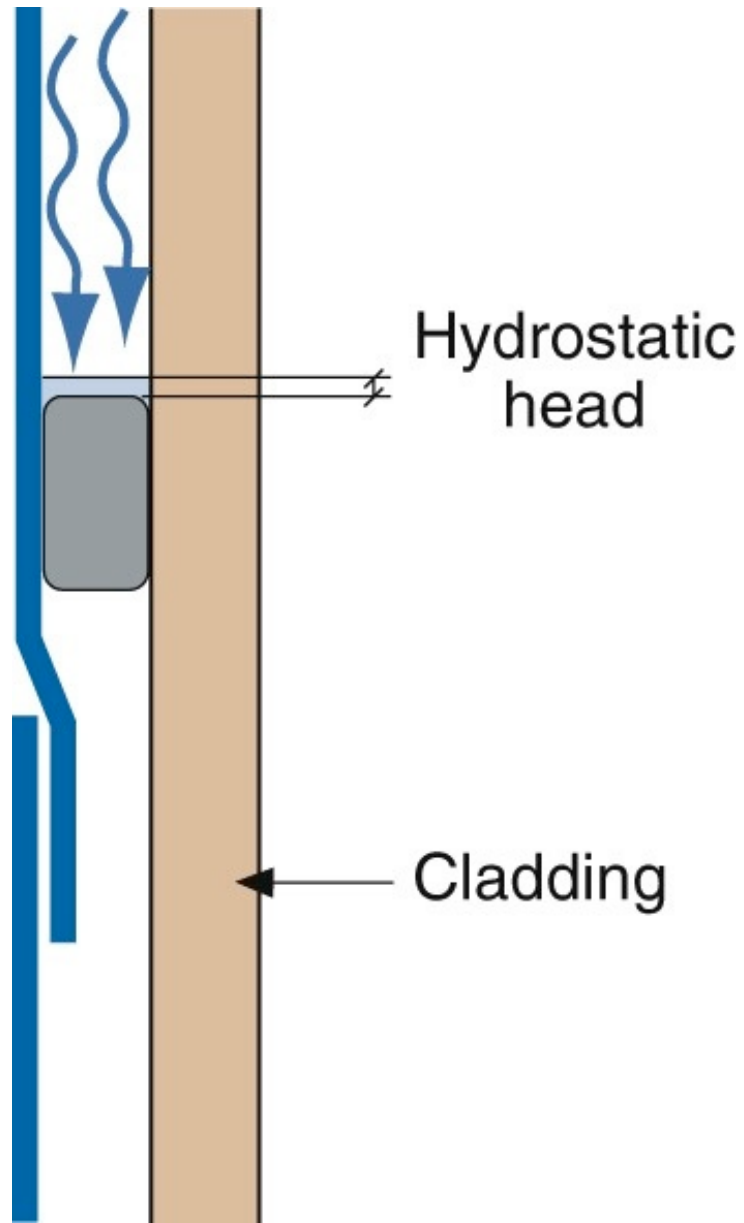


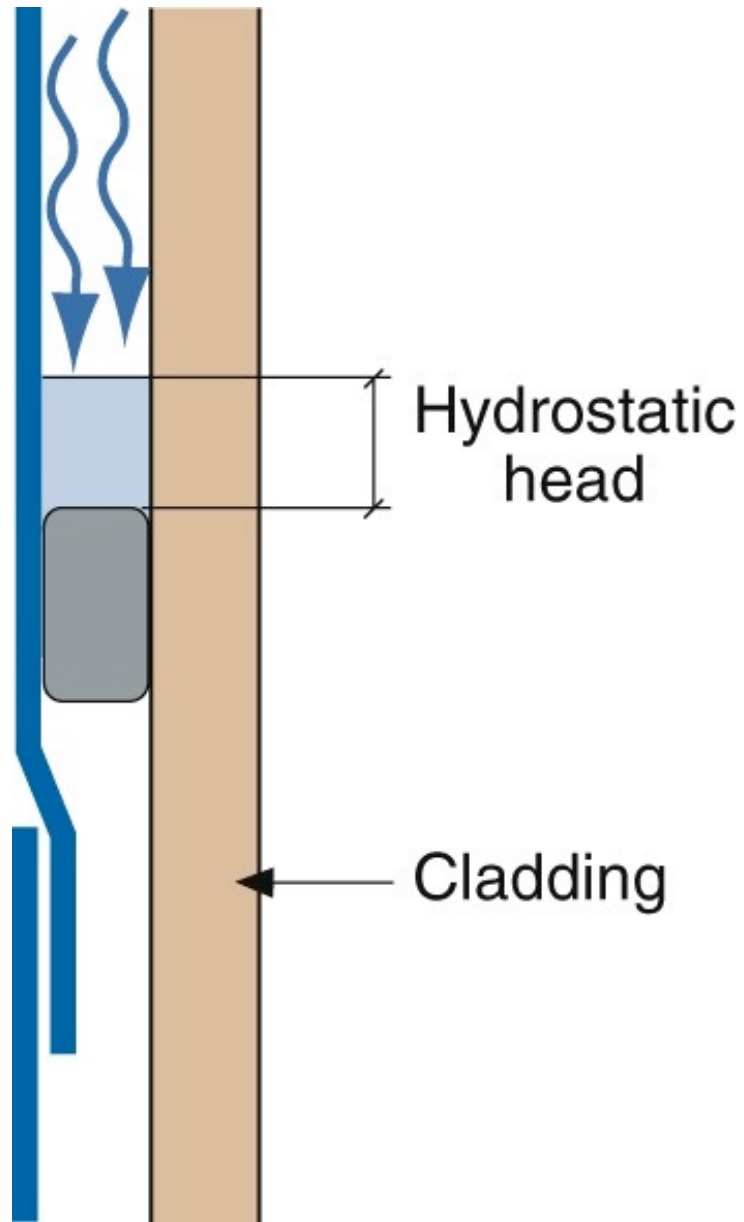


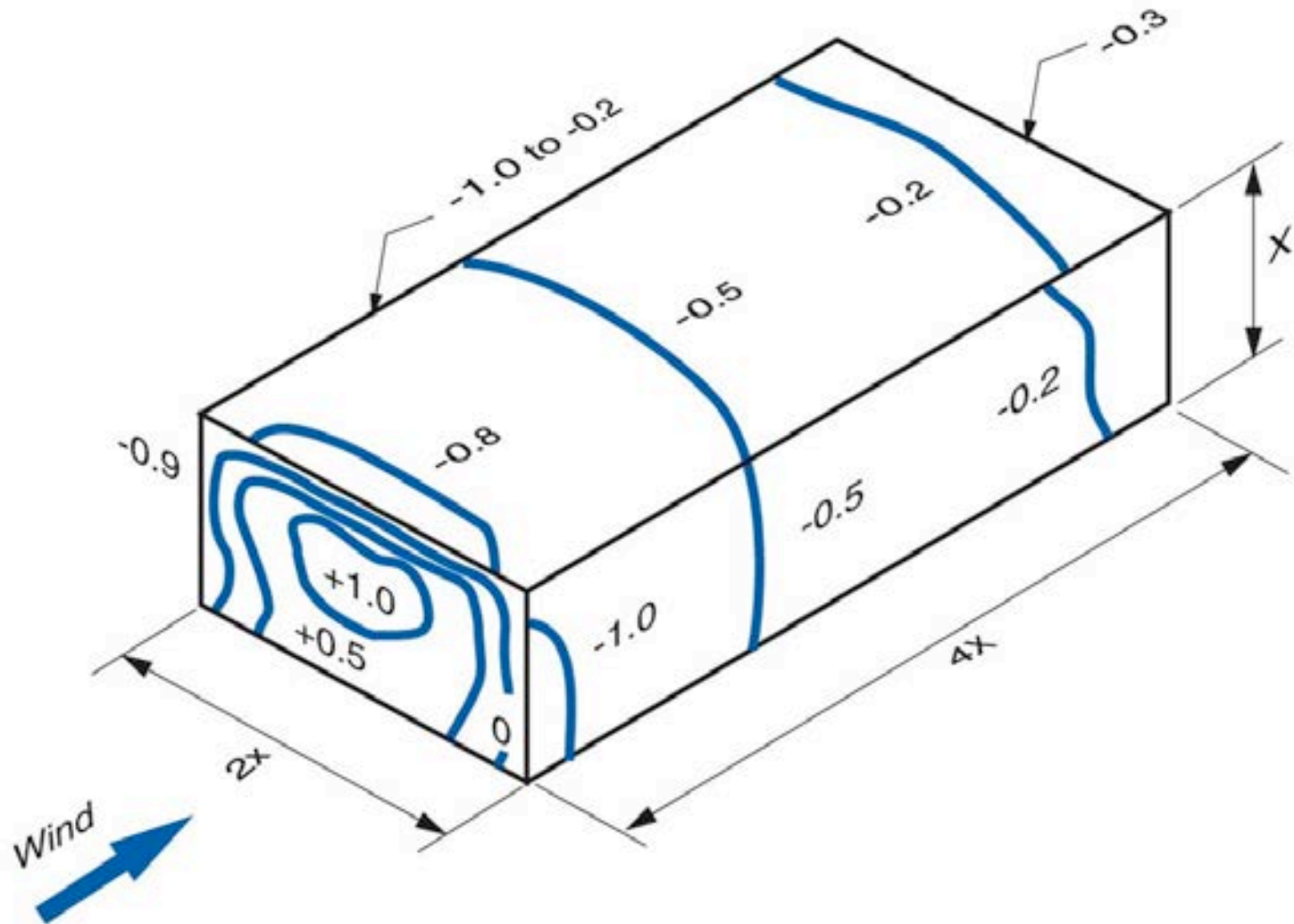




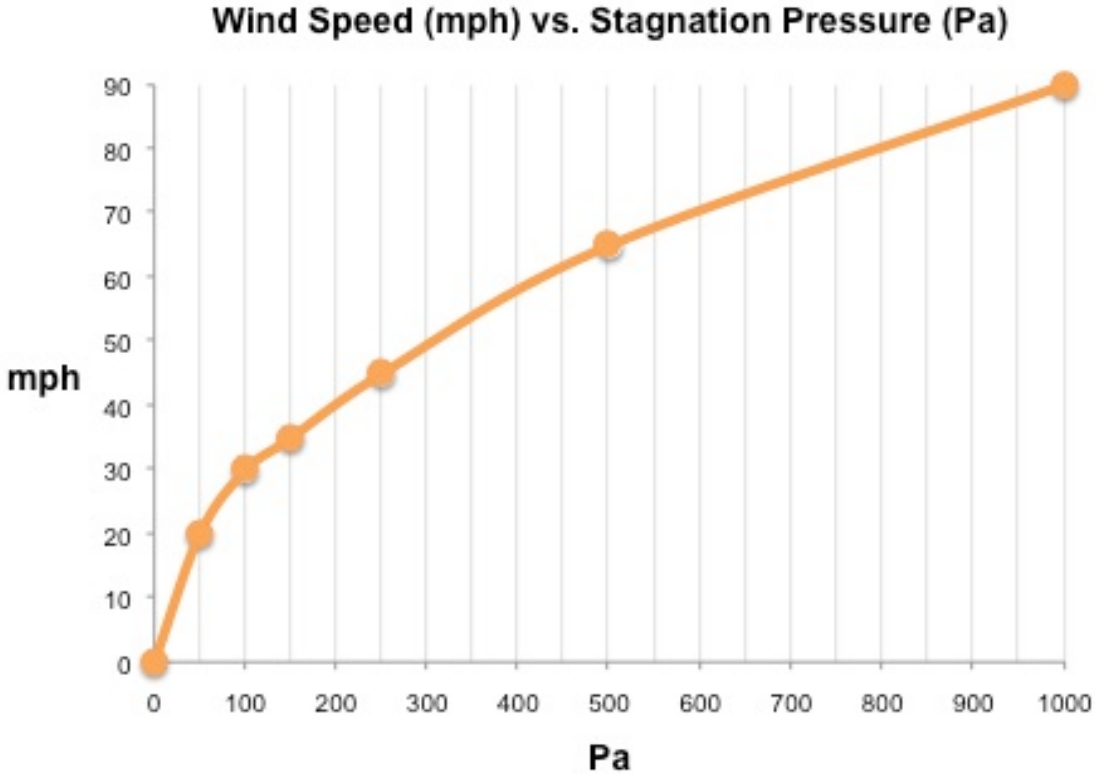








Pascals	mph
50	Pa = 20 mph
100	Pa = 30 mph
150	Pa = 35 mph
250	Pa = 45 mph
500	Pa = 65 mph
1,000	Pa = 90 mph







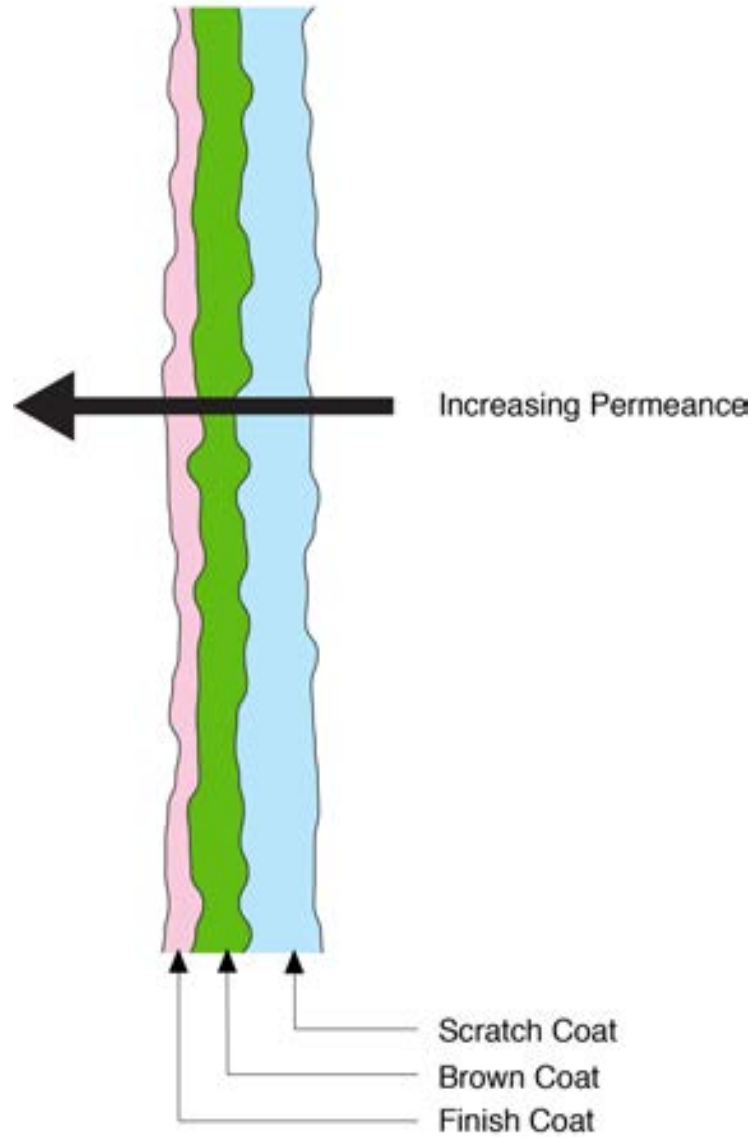




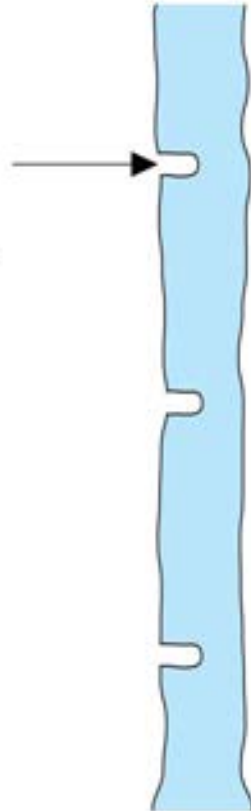
Back To Stucco....

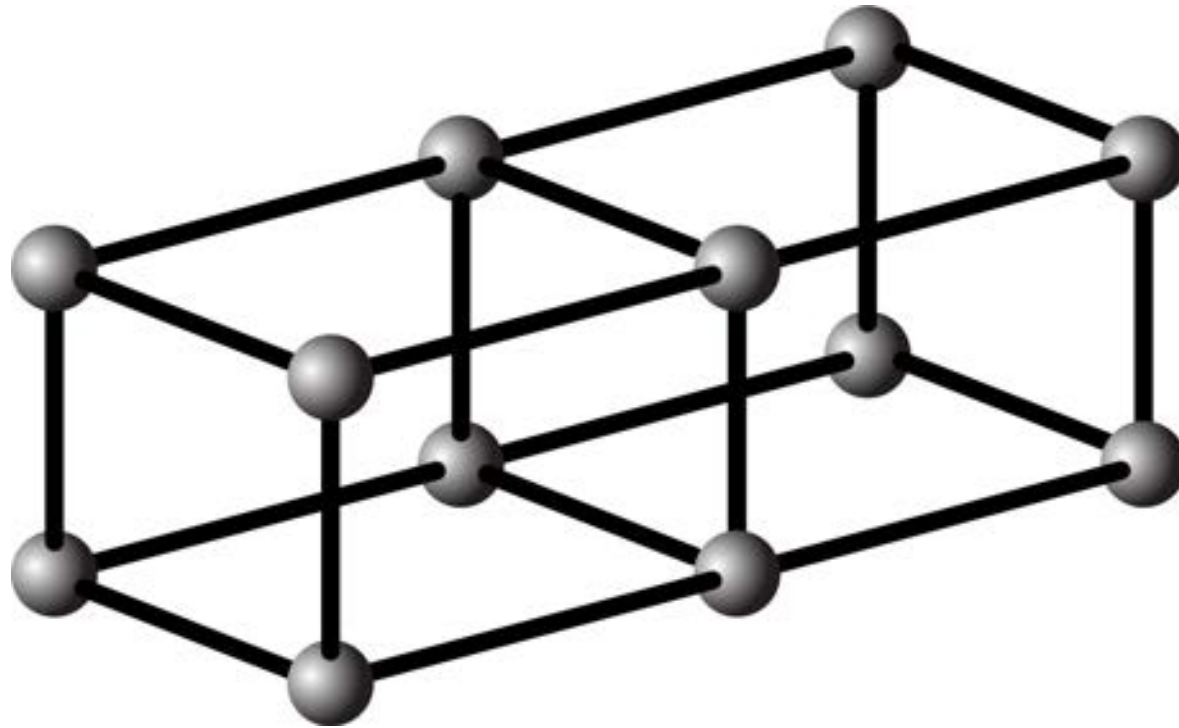
Lime vs Portland Cement Polymer Modification

Traditional Lime Stucco	Greater than 20 perms
Lime/Portland Cement Stucco	5 to 10 perms
Portland Cement Stucco	1 to 5 perms
Polymer Modification	Less than 1



Horizontal "scoring"
provides mechanical
bond and "shelf"
for water during "wet"
curing





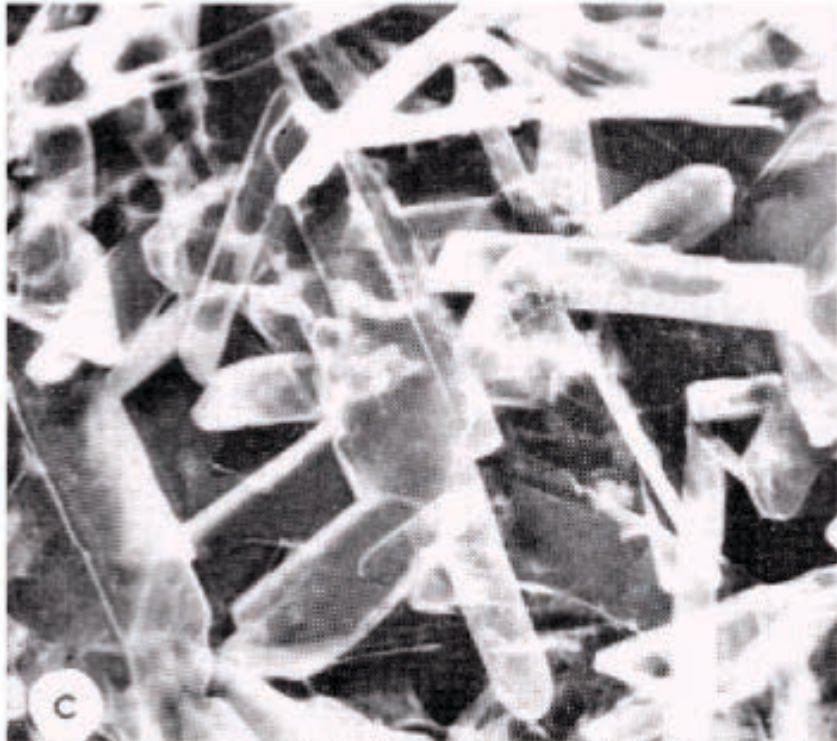


Figure 1c. Gypsum, hydrated from plaster of paris and water, porosity 30 per cent.

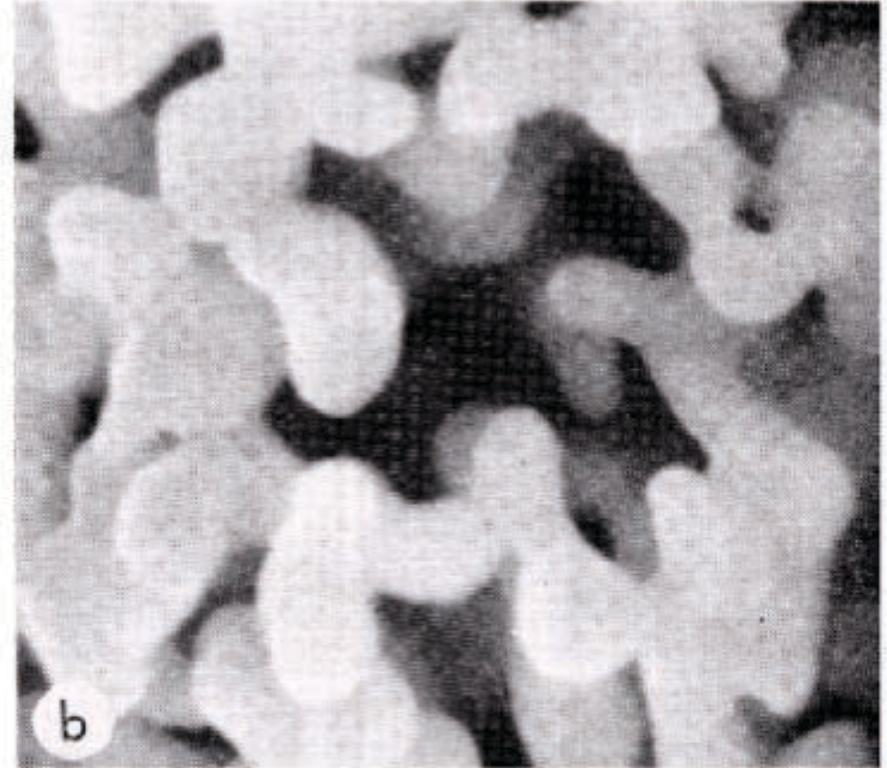
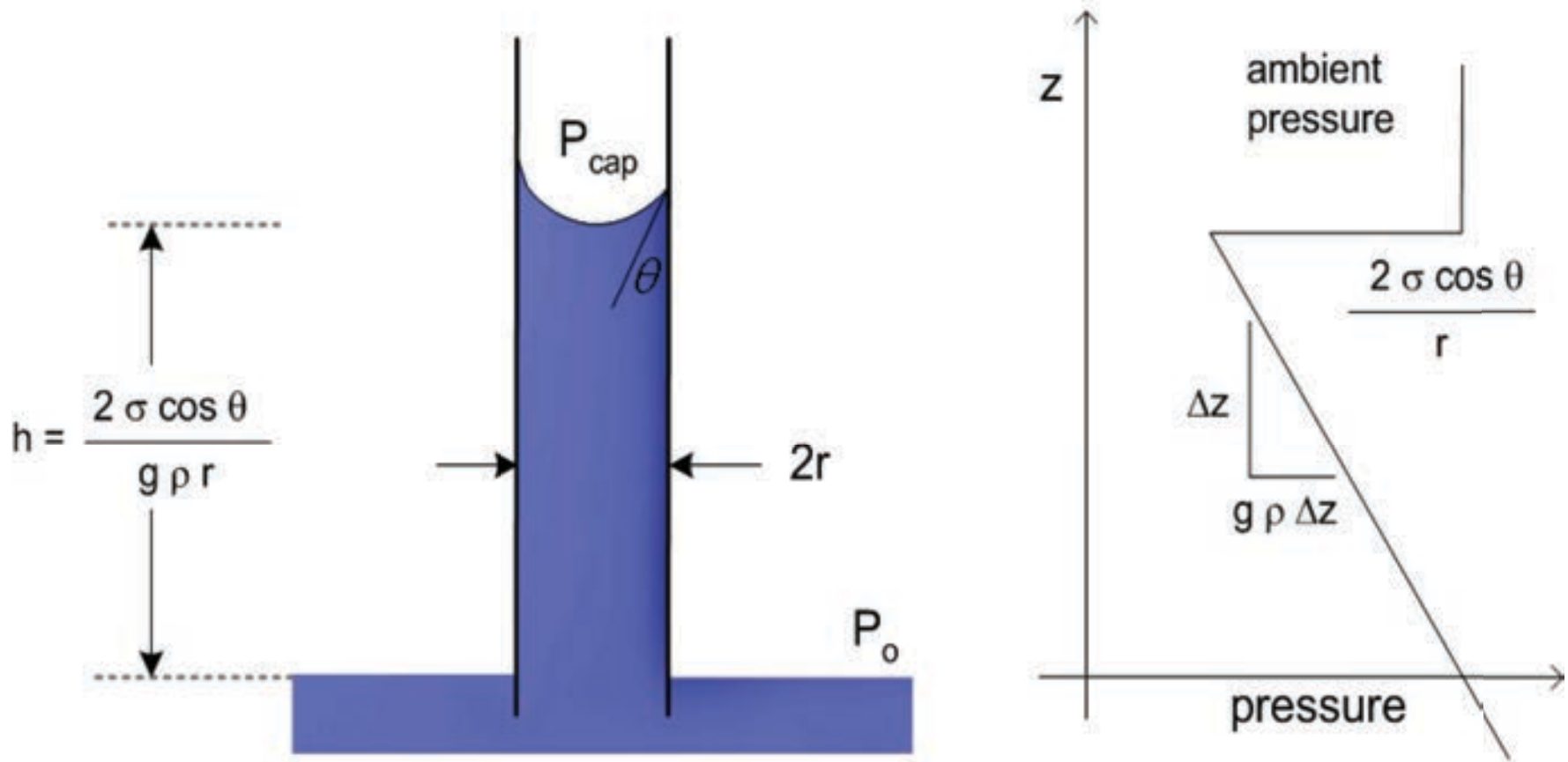
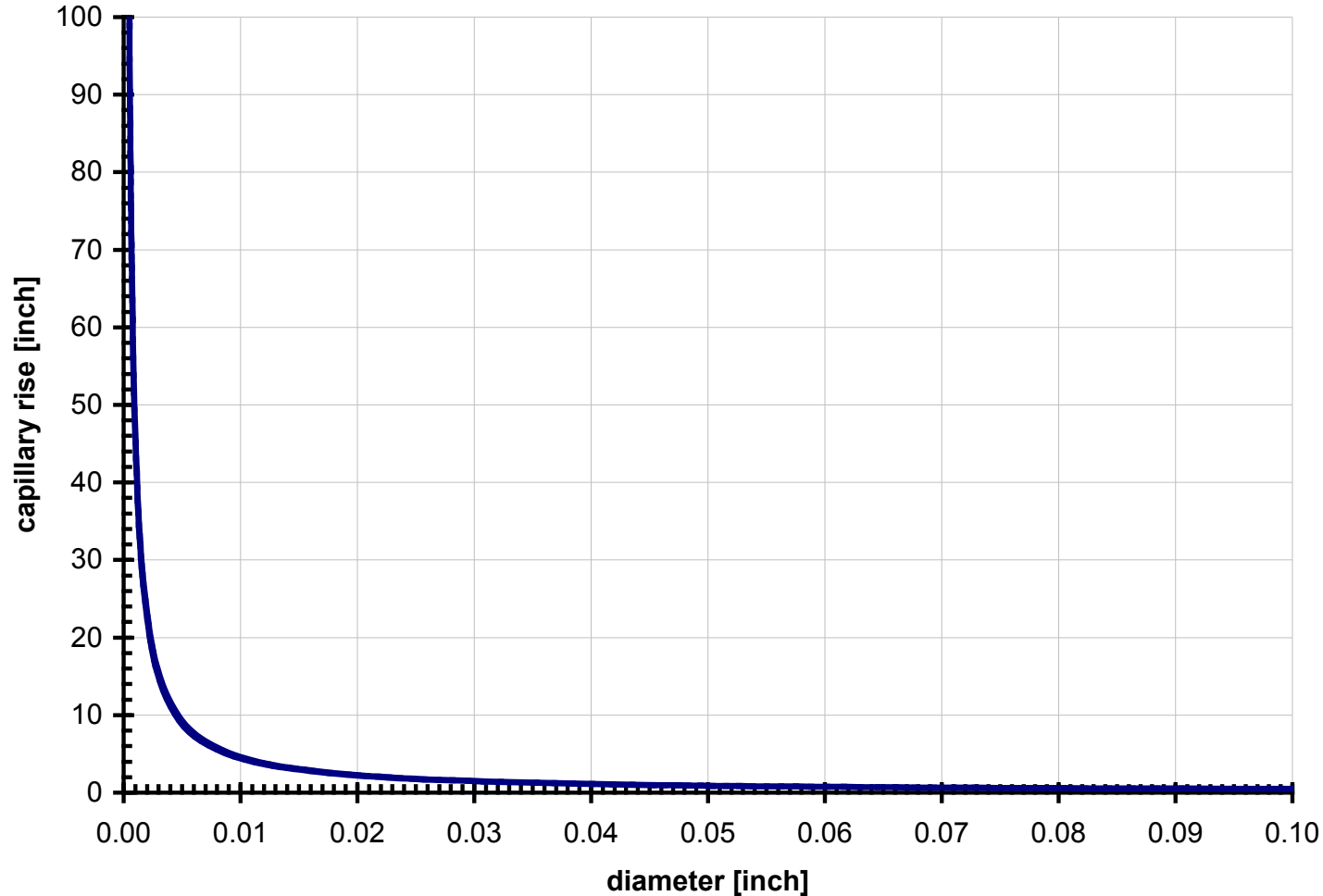


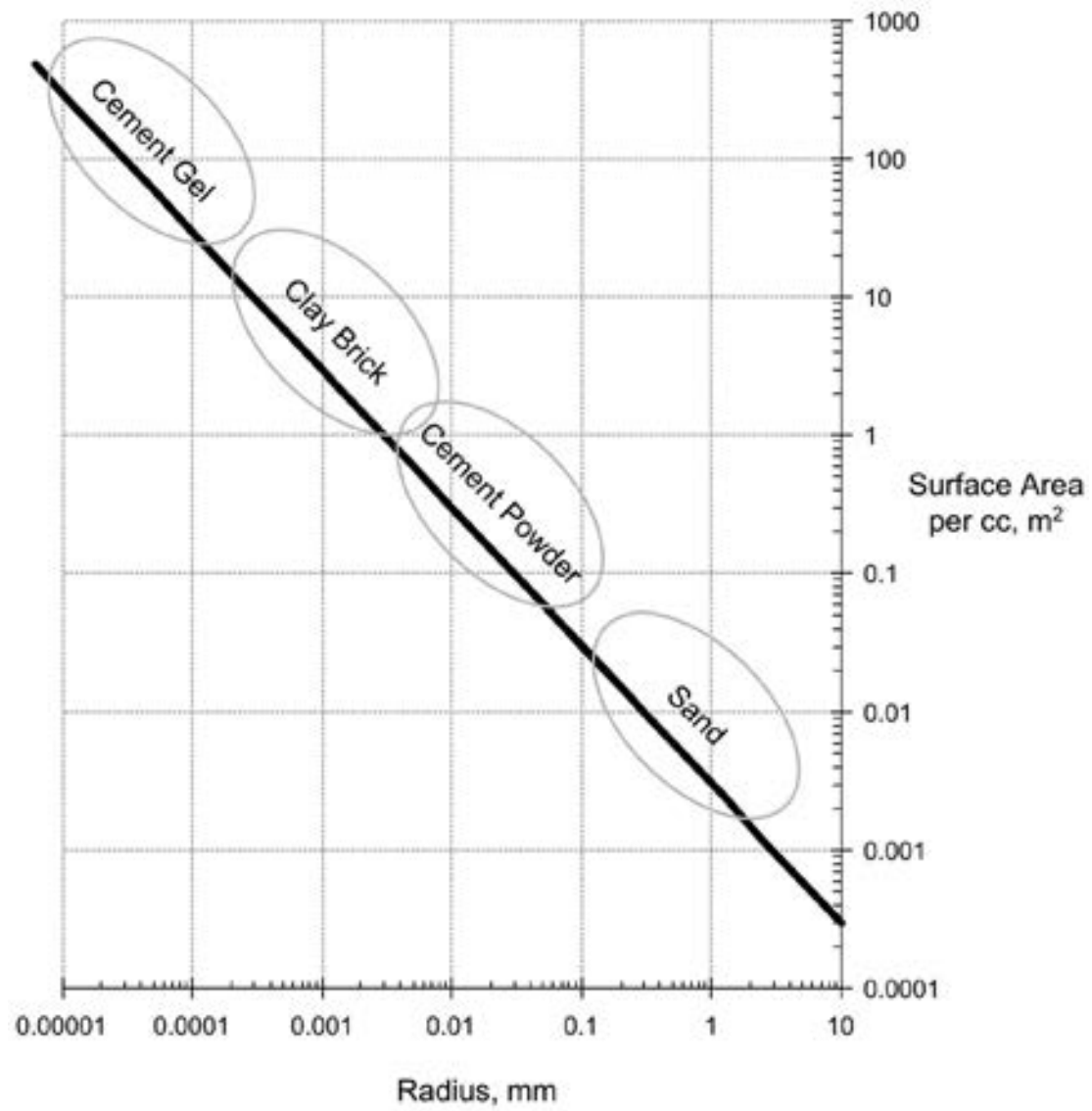
Figure 1b. Brick, sintered clay, porosity 40 per cent.

Calculating capillary rise

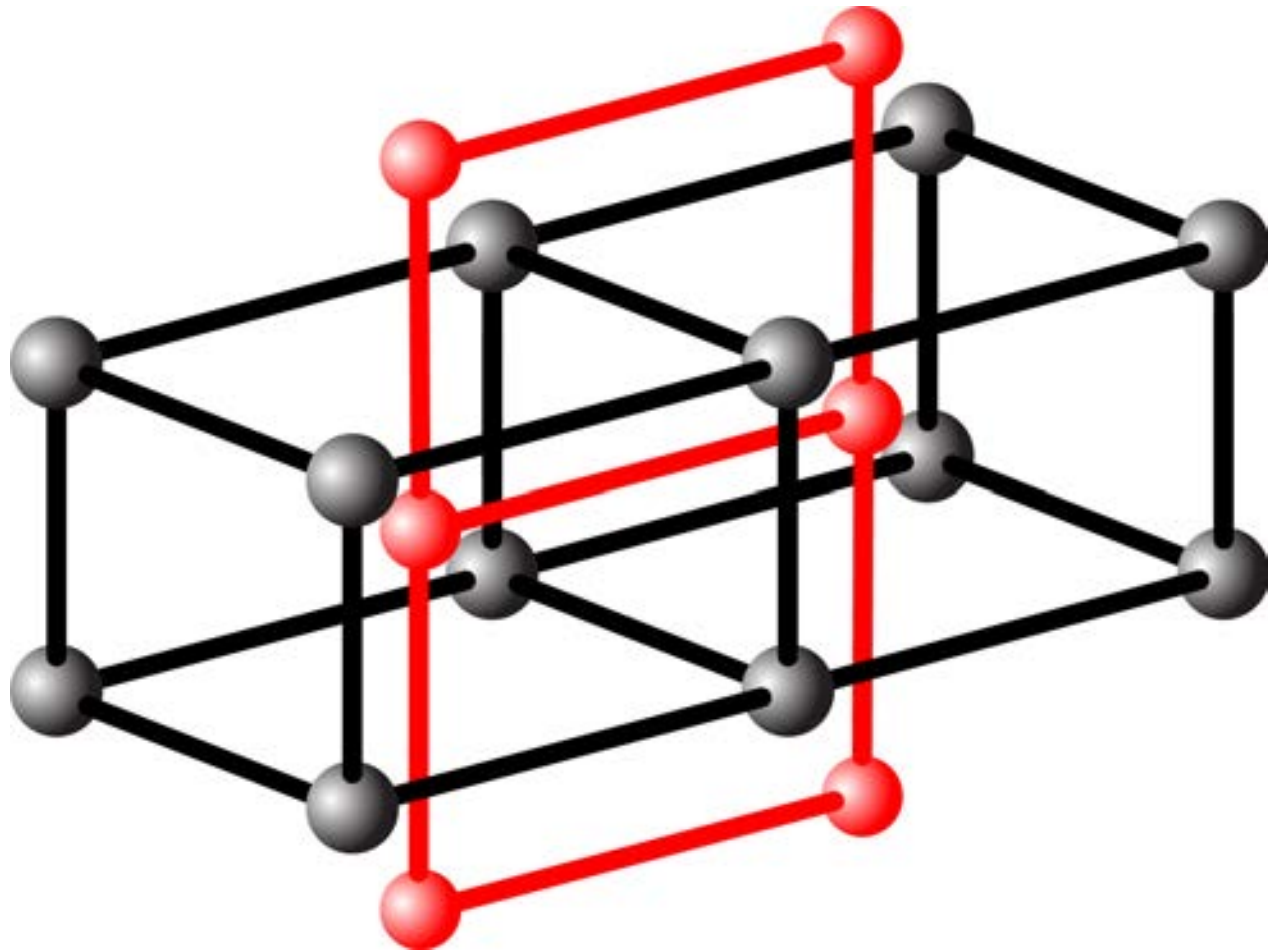


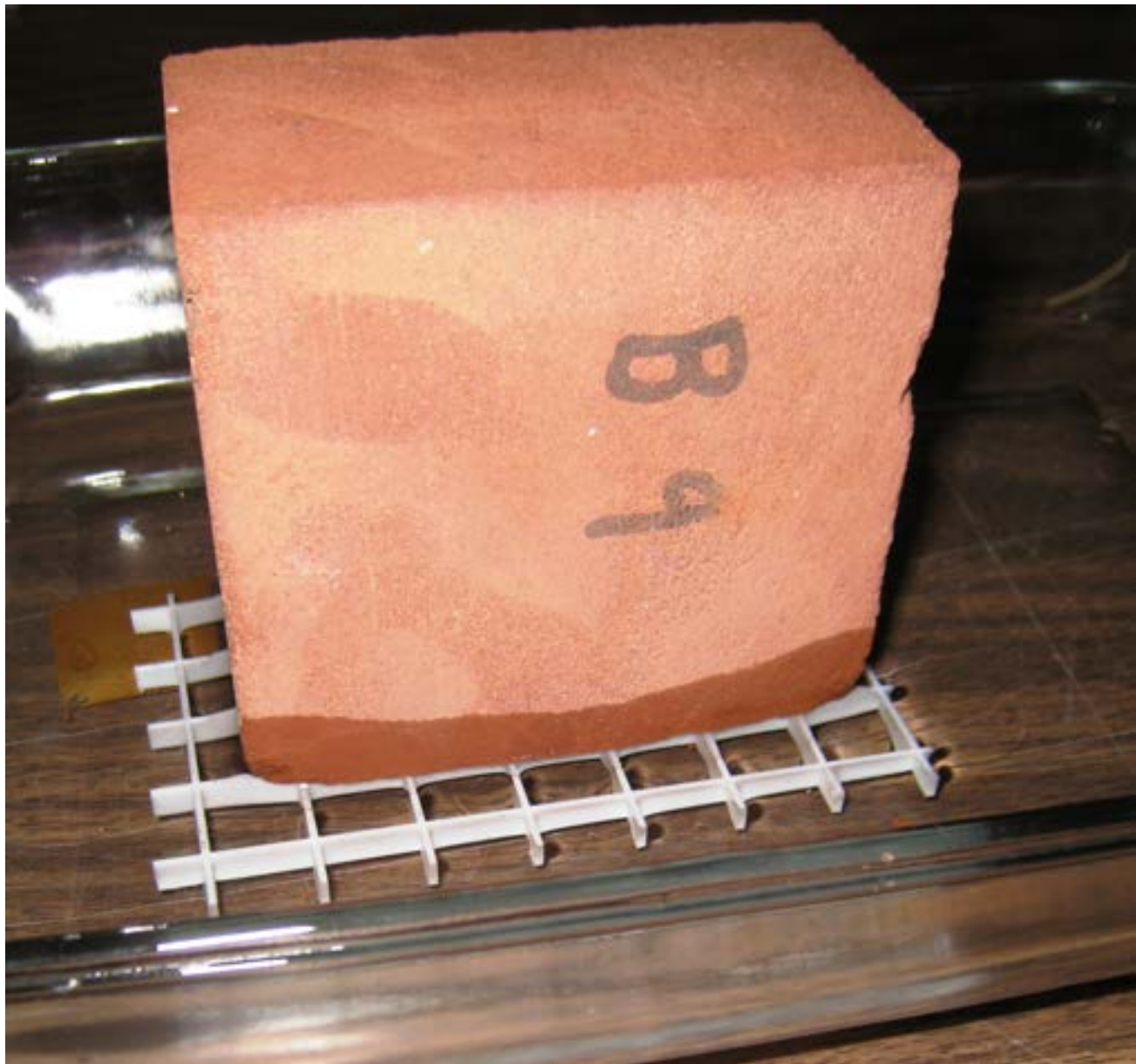
Capillary rise versus diameter





Surface area vs. particle size
From Straube & Burnett, 2005





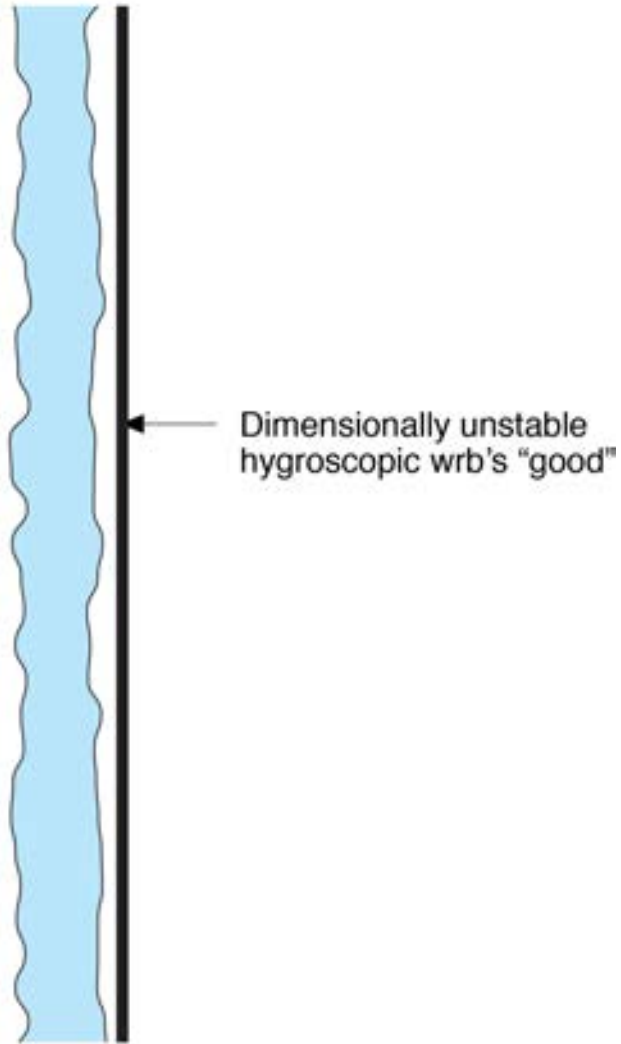
Ancient Modification Additives

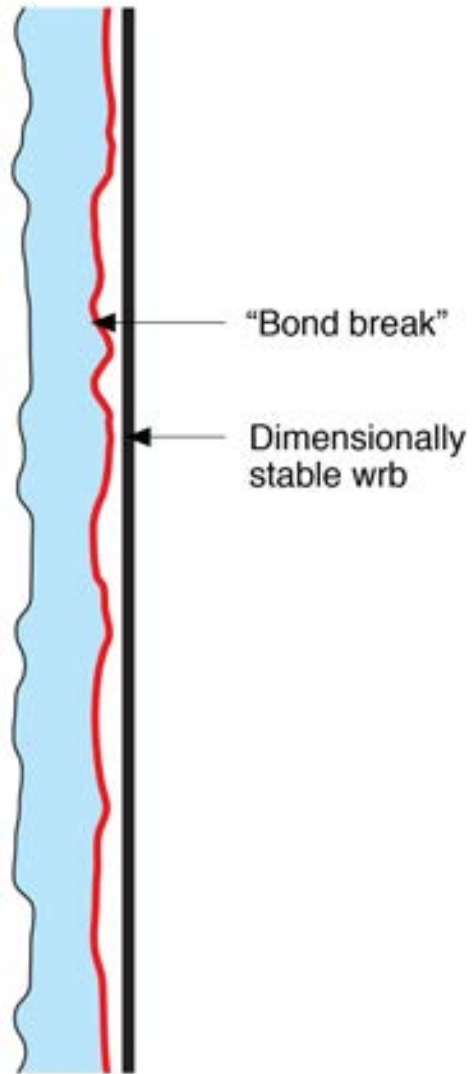
Cow Dung

Egg Whites

Pig Blood

Non Traditional Building Wraps























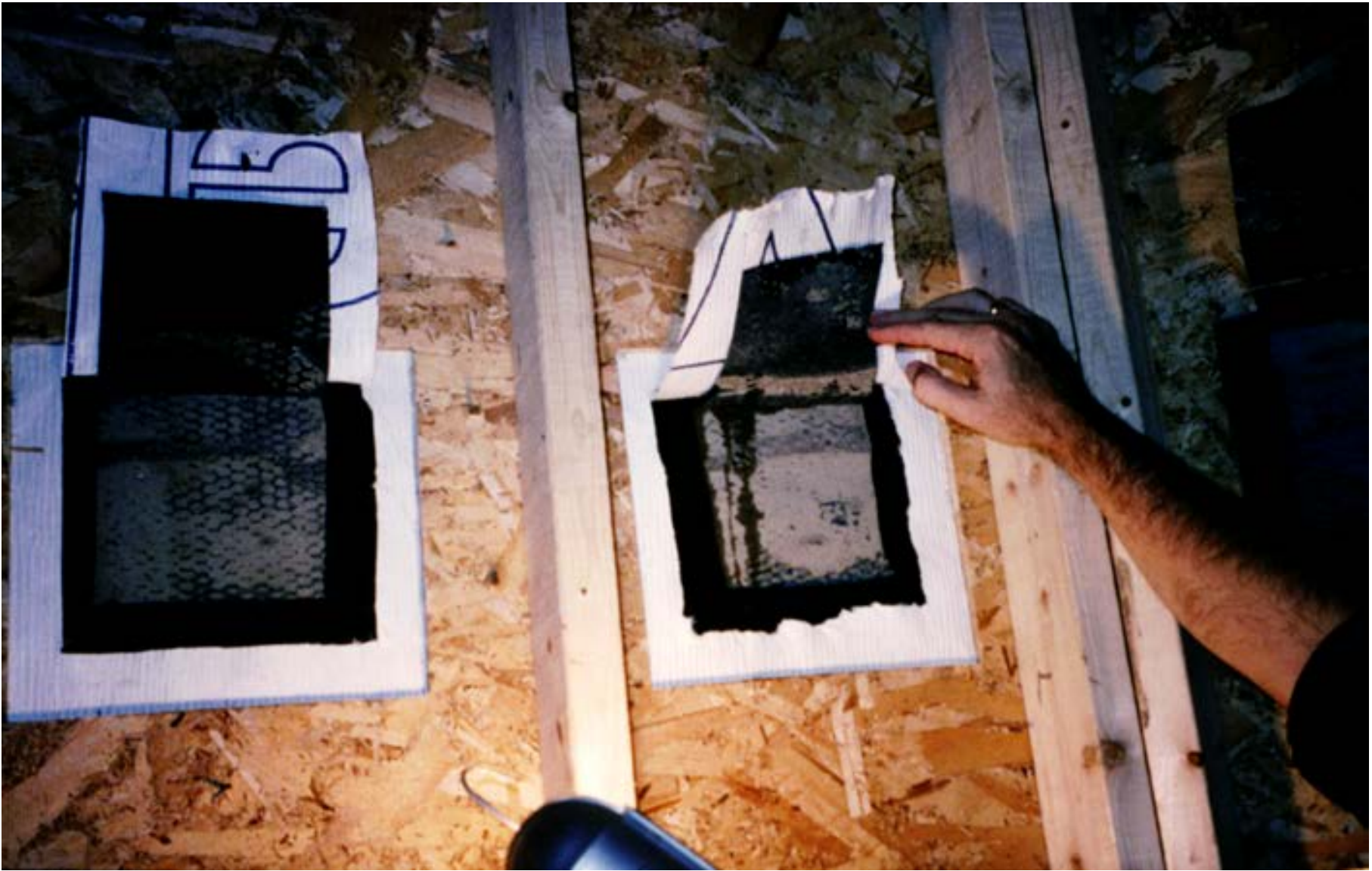


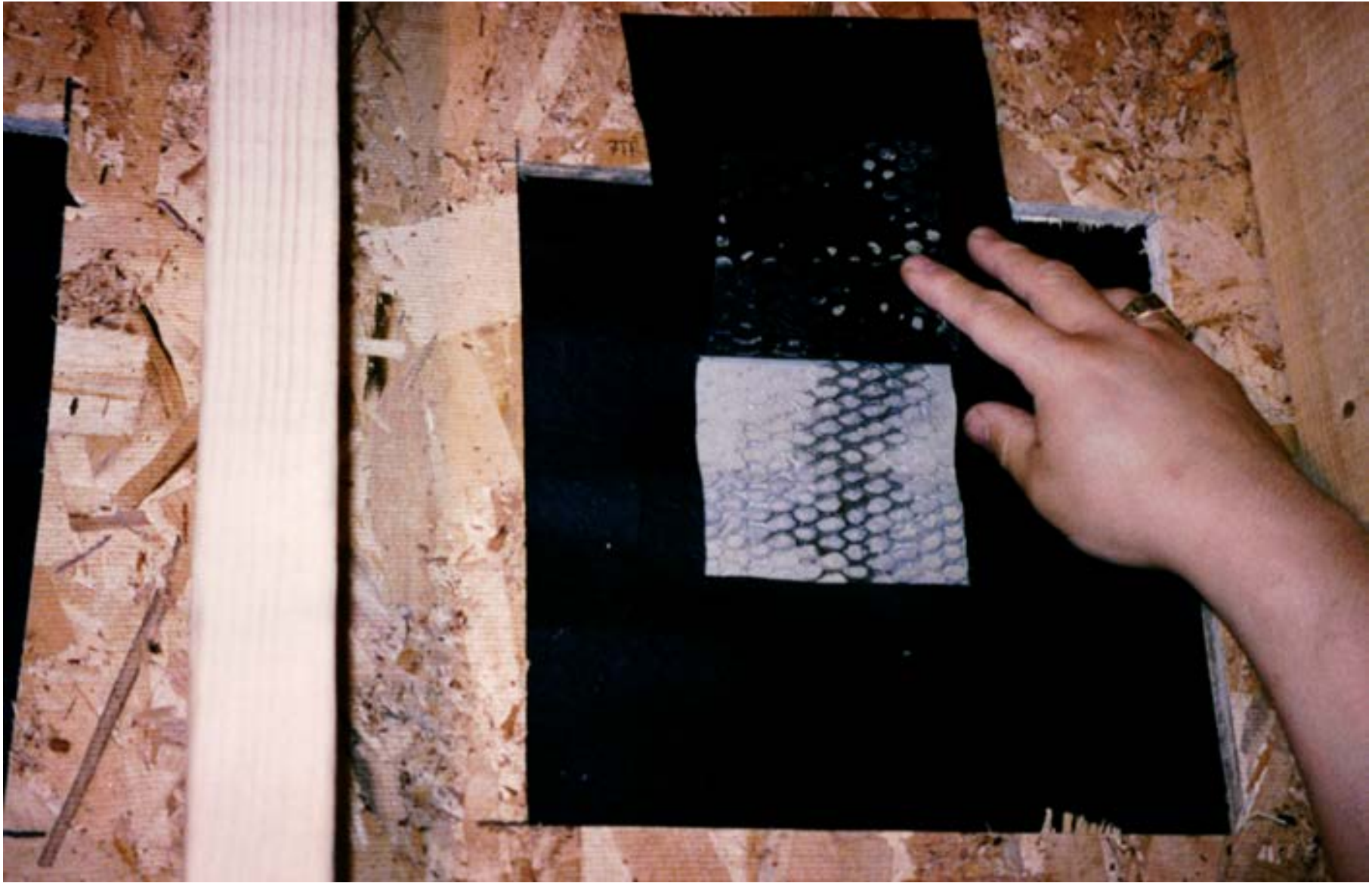
Side Trip To My Backyard....



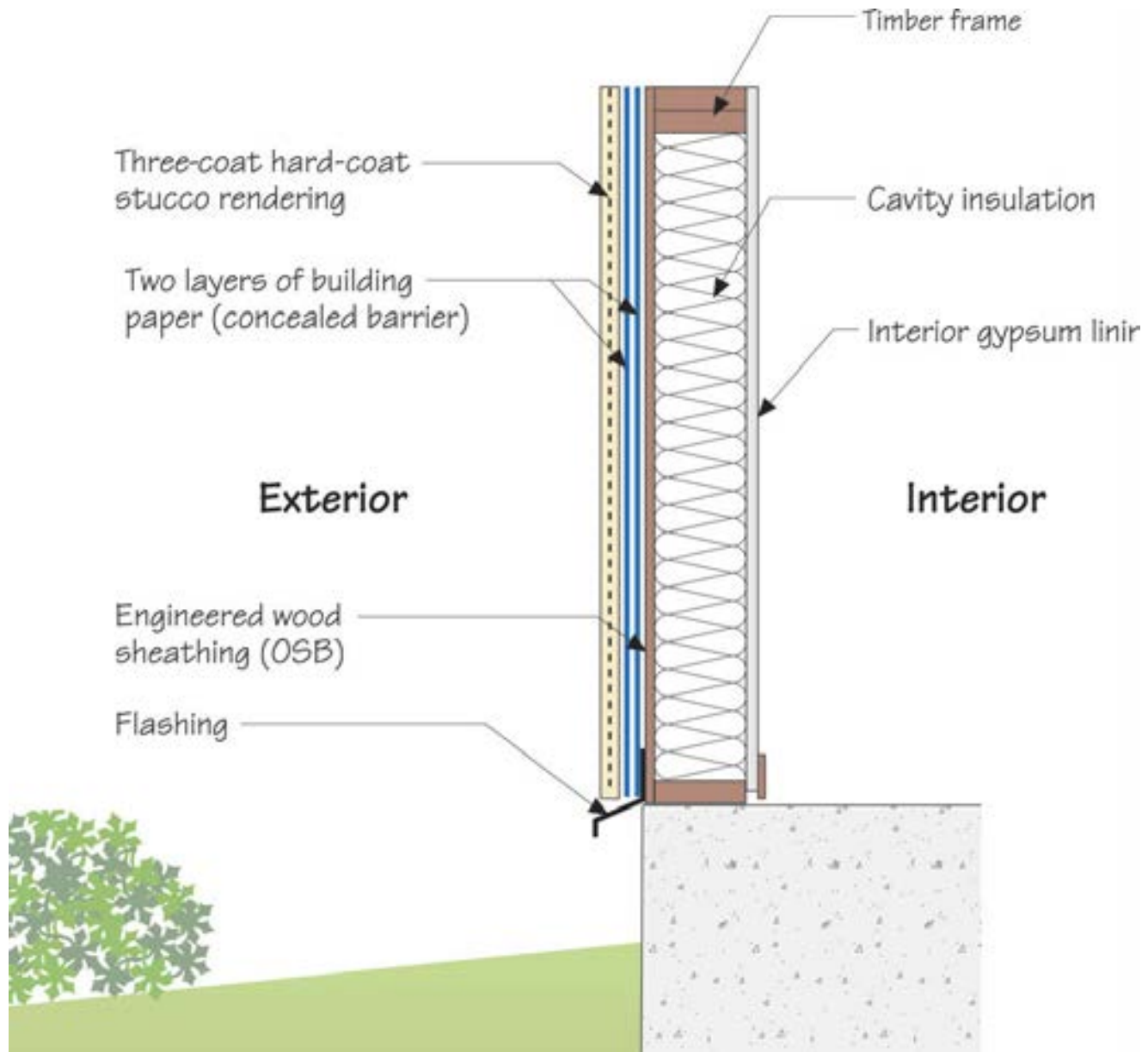












“Lumpy Stucco”

Should Have Been The Big US Warning







Back To America....Pennslyvania....
And Then Pretty Much Anywhere It Rains...





















Back To Lumpy Stucco....

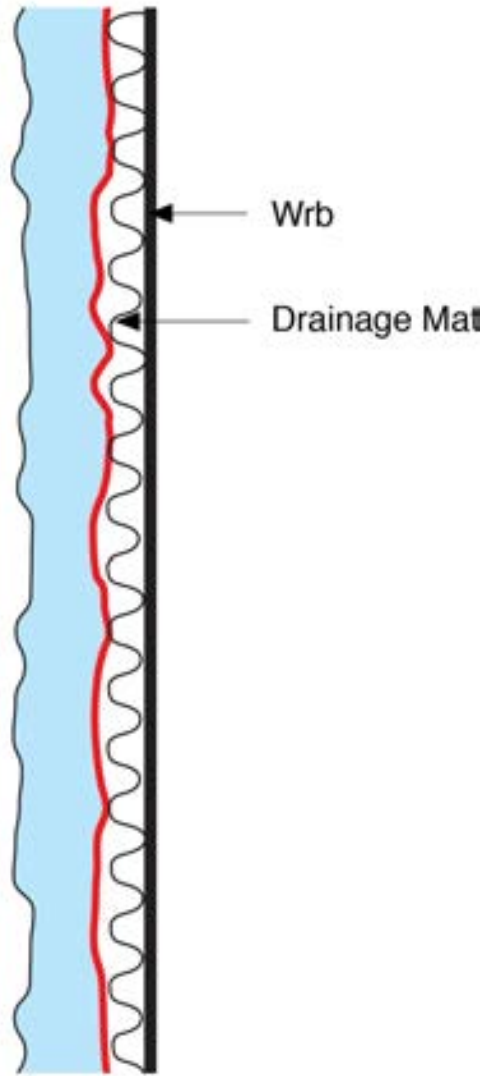








Easy Solution....

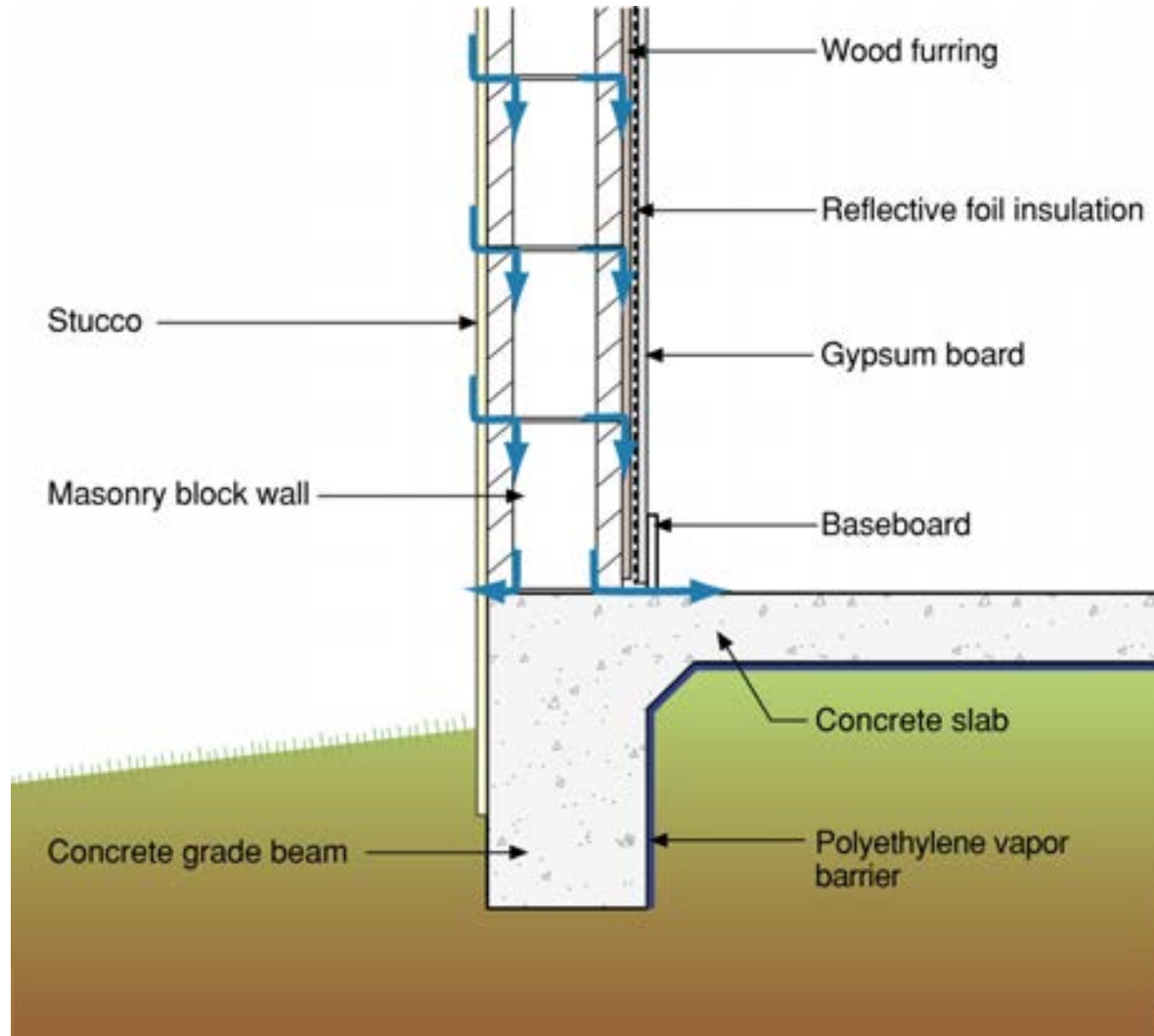


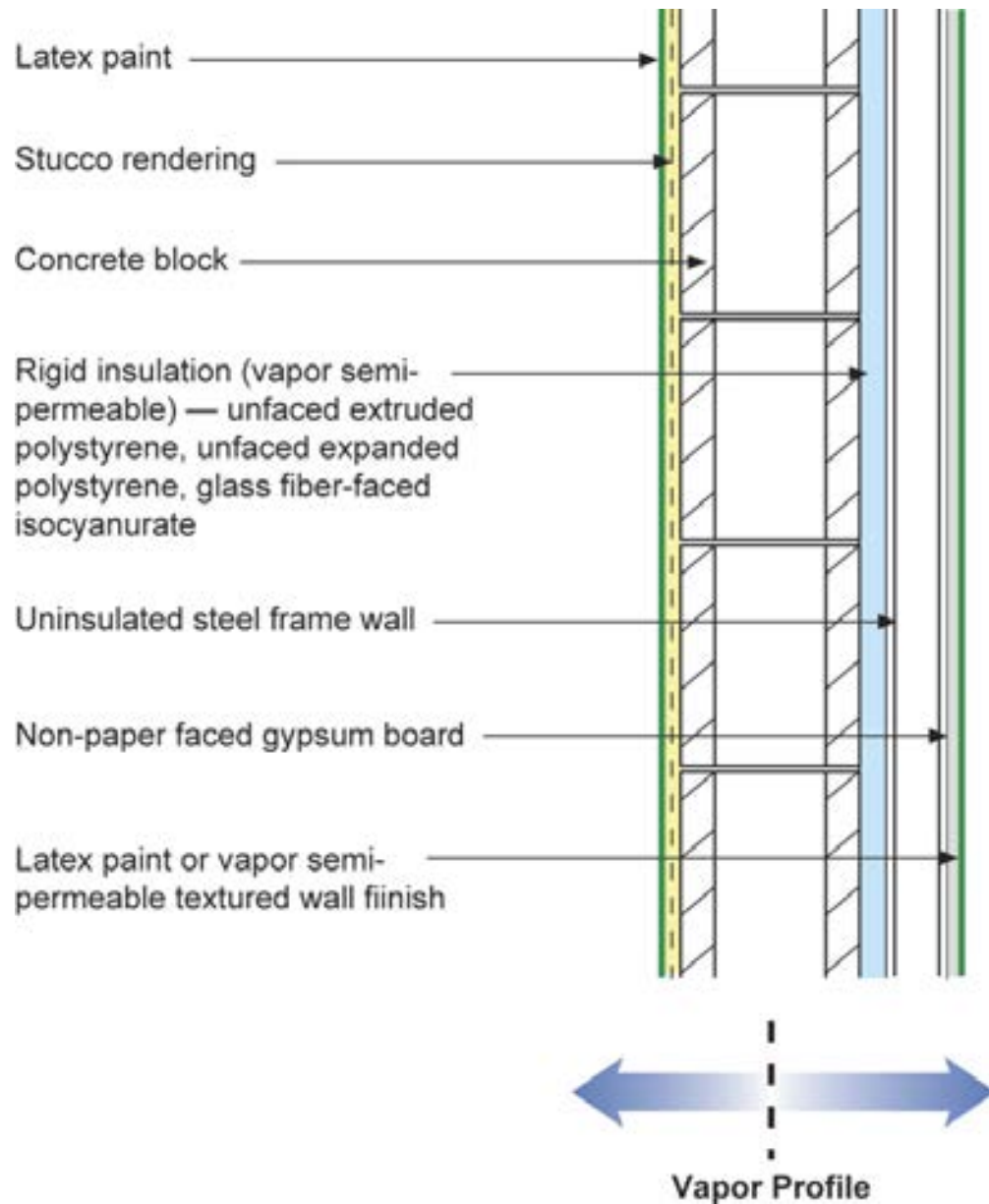


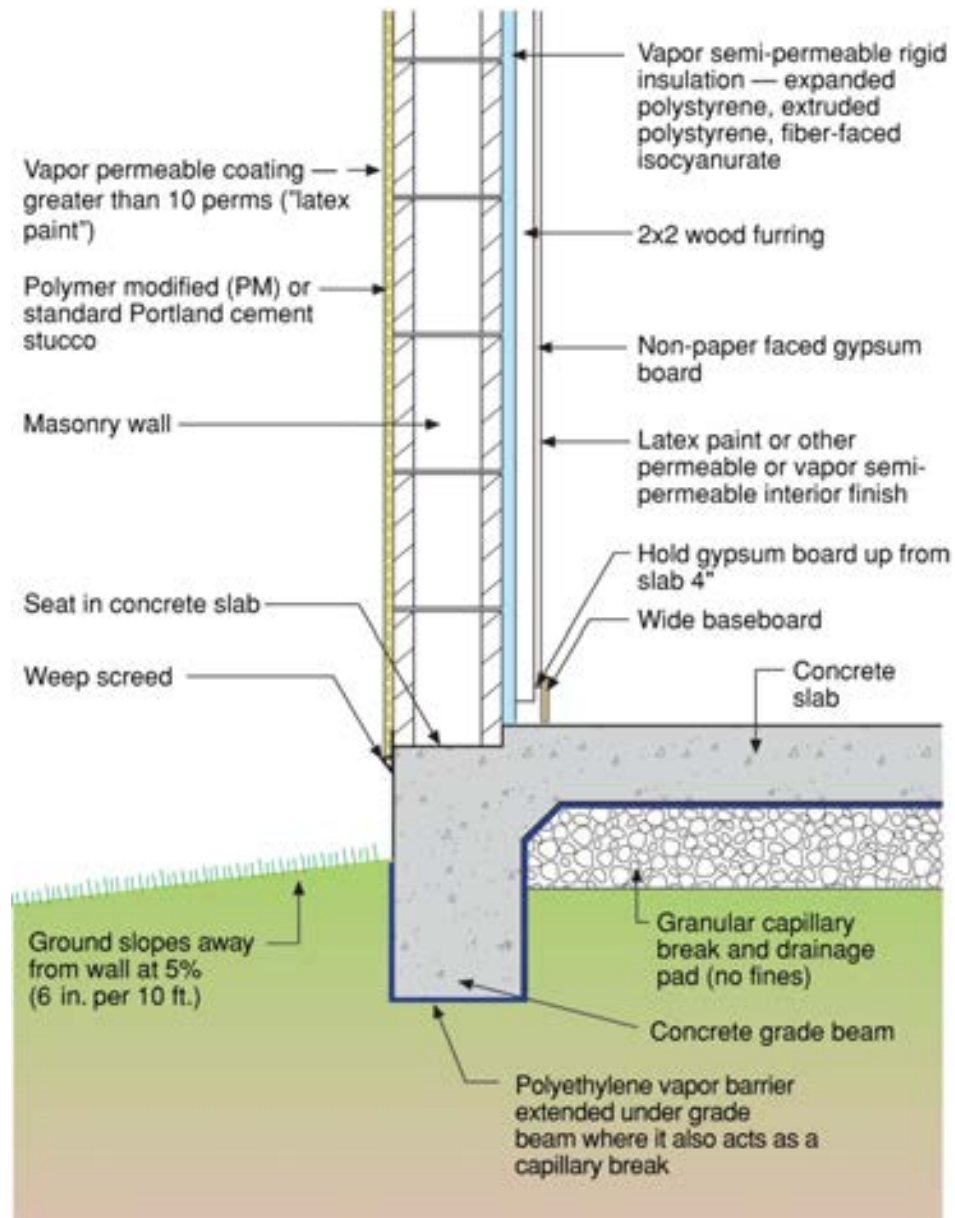


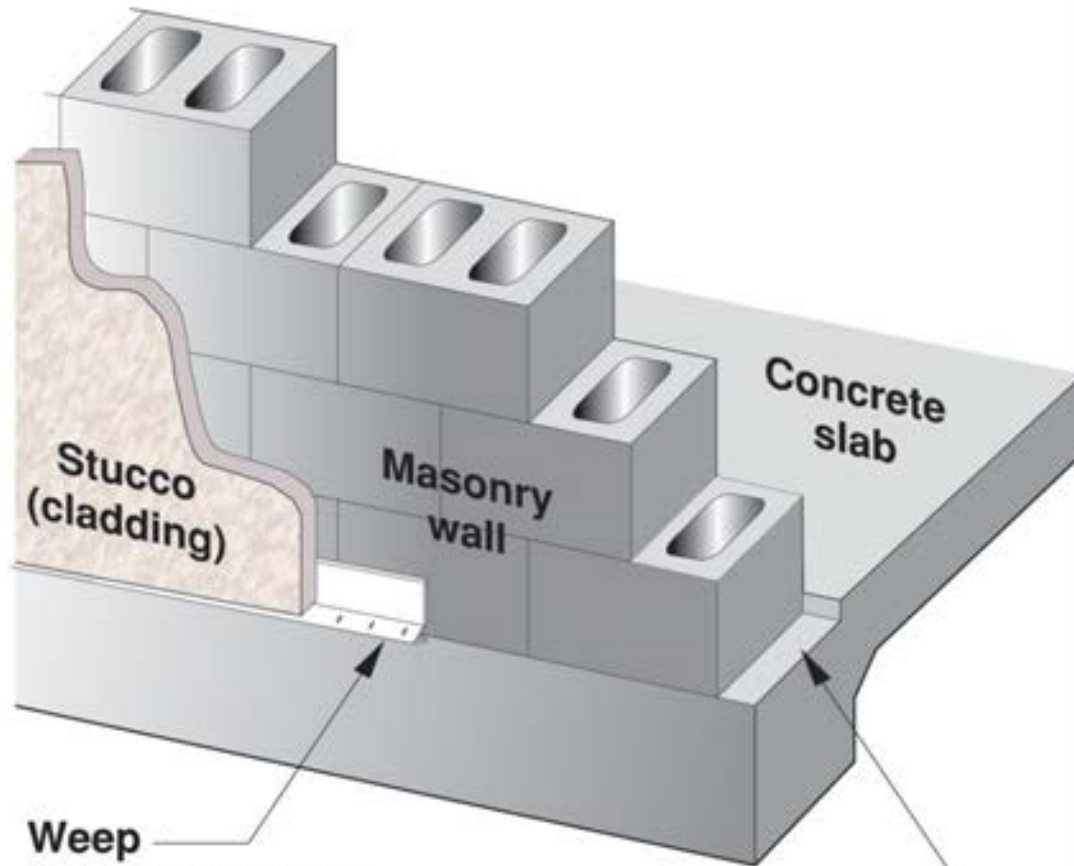


Rainwater Entry Mass Assembly









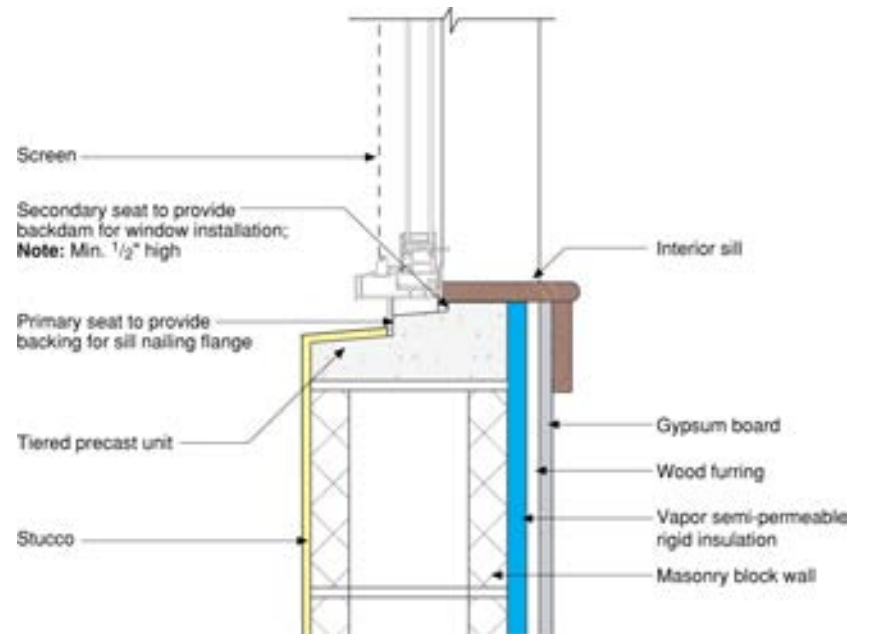
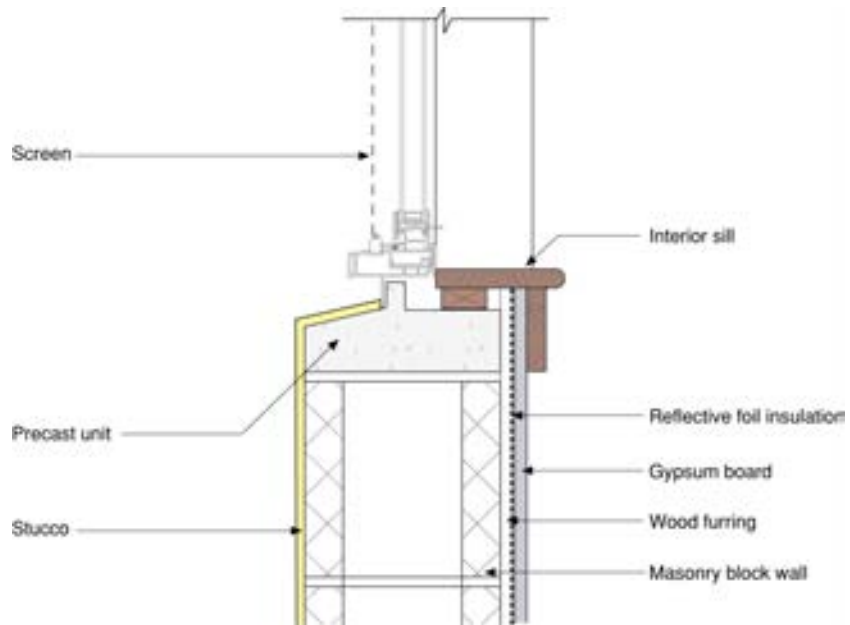
**Weep
Screed Flashing**
(provides drainage at
stucco - masonry connection)

"Seat" in slab acting
as a flashing for masonry -
slab connection









Reminder...

Don't Do Stupid Things























Vapor semi-permeable rigid insulation —
extruded polystyrene

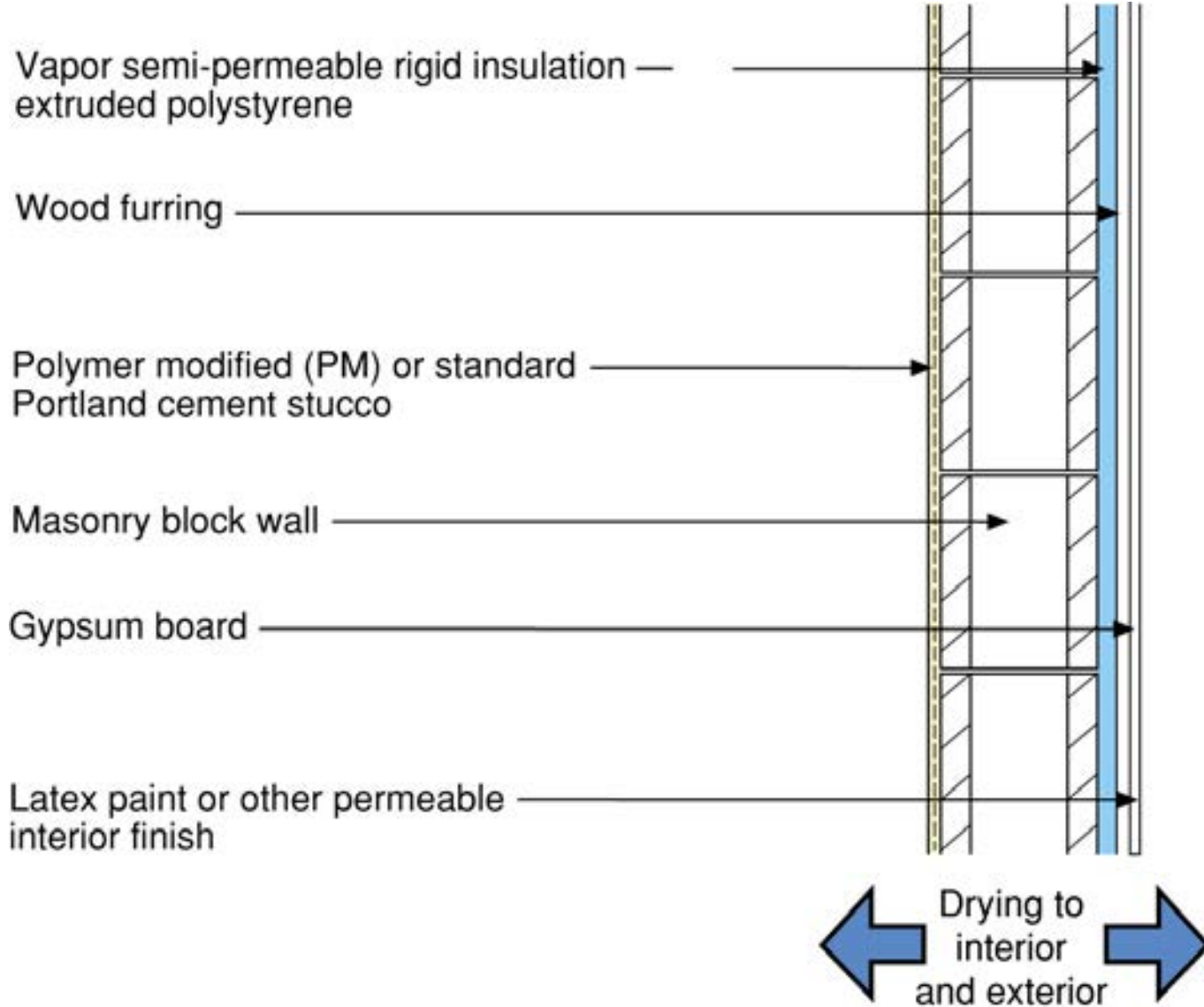
Wood furring

Polymer modified (PM) or standard
Portland cement stucco

Masonry block wall

Gypsum board

Latex paint or other permeable
interior finish



The diagram shows a vertical cross-section of a wall assembly. From left to right, the layers are: a thin interior finish (indicated by a dashed line), a thick masonry block wall, a layer of polymer modified or standard Portland cement stucco, a layer of wood furring, a layer of vapor semi-permeable rigid insulation (extruded polystyrene), another layer of wood furring, a layer of gypsum board, and a thin exterior finish. Arrows from the labels on the left point to these layers. At the bottom, two blue arrows point outwards, one to the left and one to the right, with the text 'Drying to interior and exterior' between them.

Drying to
interior
and exterior









