Building Science
Adventures In Building Science

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Water Control Layer
Air Control Layer
Vapor Control Layer
Thermal Control Layer

Cladding
Control layers
Structure

Wall

Slab

Roof
Configurations of the Perfect Wall
Beer Screen?

Drain the Rain on the Plane
If You Want to Save Cash…Flash
Commercial Enclosure: Simple Layers

- Structure
- Rain/Air/Vapor
- Insulation
- Finish
Intent of sealant is to limit this lateral flow of water between sheathing and building wrap.
Open Joints vs Closed Joints

Limits of Pressure Equalization
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
Capillarity
Stucco Evolved As A Barrier System

Exterior Insulation Finish Systems (EIFS)

Stucco Failures
Exterior Insulation Finish Systems
EIFS
Barrier System
Face-Sealed Not Water Managed
Can Barrier or Face Seal Work?
Reminder...
Don't Do Stupid Things
What Is Going On With Stucco?

Materials
Inward Drive
Energy

Water Vapor Permeance of Sheathing Materials

- Dry Cup
- Wet Cup
- Plywood
- OSB

Mean Relative Humidity, %

Water Vapor Permeance, US perms
Rain Screen
EIFS No Longer Has Issues
Back To Stucco….
Side Trip To My Backyard….
“Lumpy Stucco”…. Should Have Been The Big Warning….
Side Trip To Vancouver….
Back To America….Pennslyvania…. And Then Pretty Much Anywhere It Rains…
Back To Lumpy Stucco….
Easy Solution....
Recommendations….
Provide a 3/8 inch air space behind all stucco in regions where it rains more than 20 inches per year
Provide a 3/8 inch air space behind all stucco over three stories
Don’t install interior vapor barriers
Air space can be reduced to 1/16 inch where inward vapor drive is limited

Recommendations….
Barrier works in Florida over block
Barrier does not work in Florida over OSB
Don’t install interior vapor barriers in Florida
Don’t drain a drained system into a barrier system