

Joseph Lstiburek, Ph.D., P.Eng, ASHRAE Fellow

Building Science

Adventures In Building Science

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Stucco Failures

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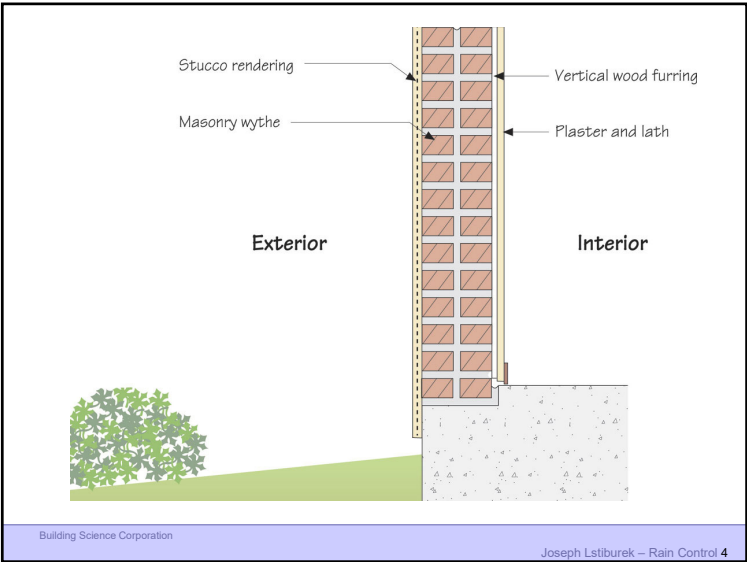
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Stucco Evolved As A Barrier System

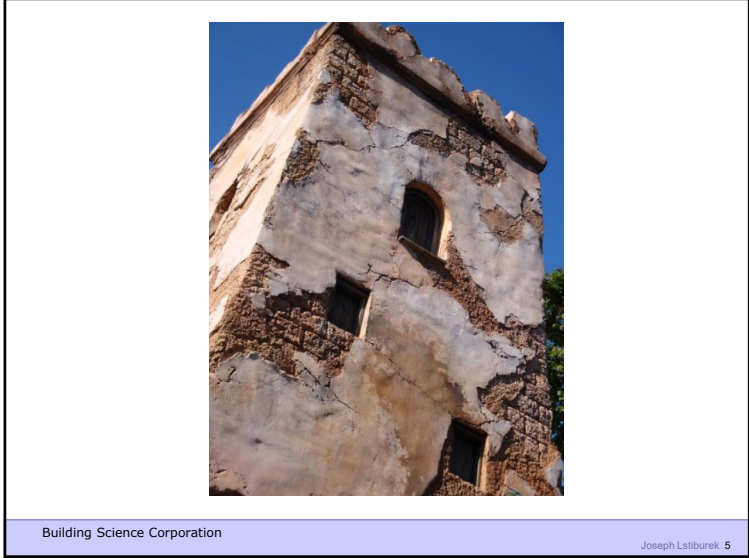
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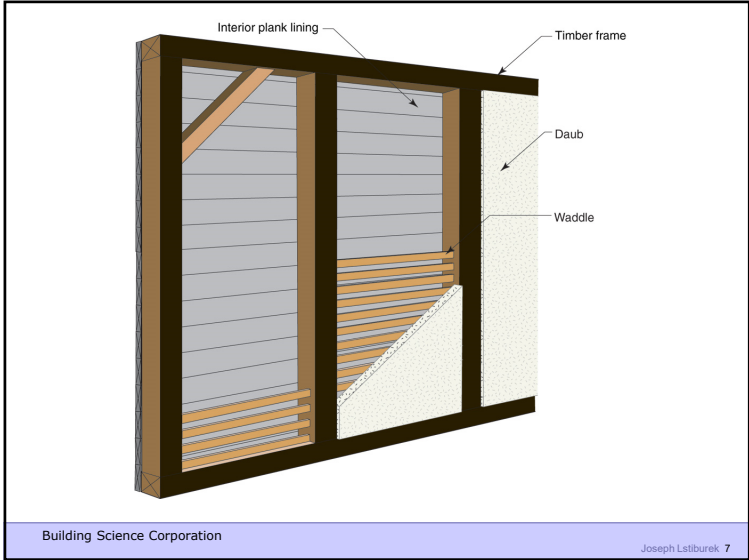
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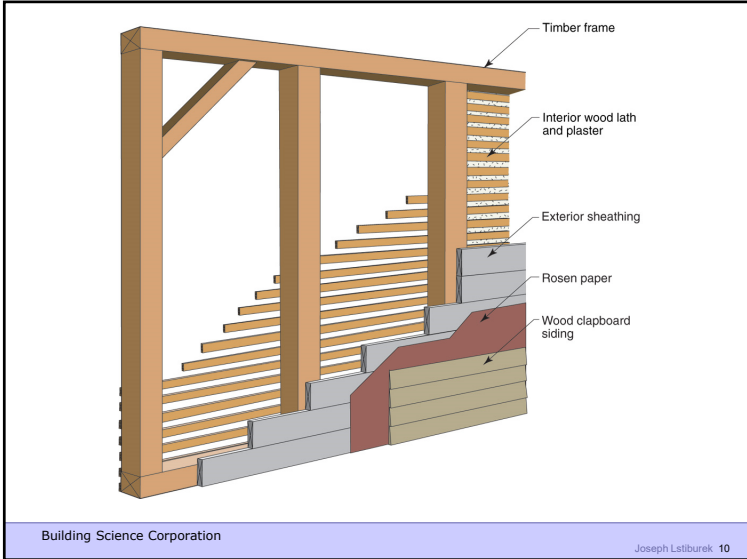
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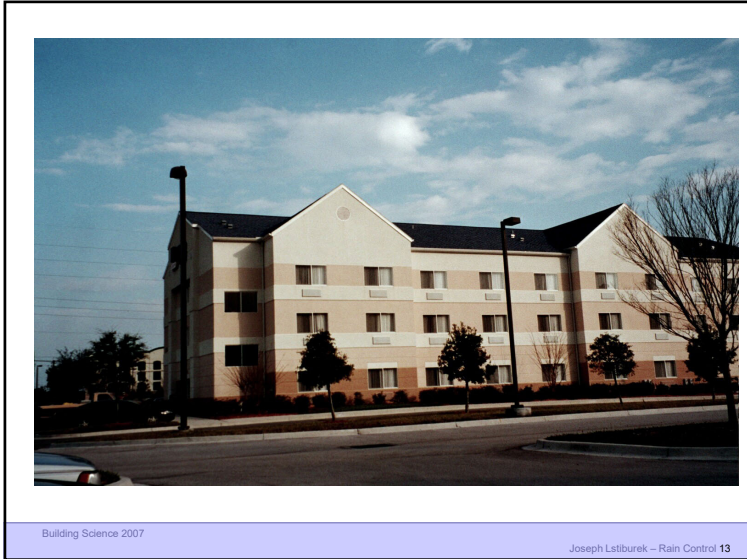
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Exterior Insulation Finish Systems
EIFS

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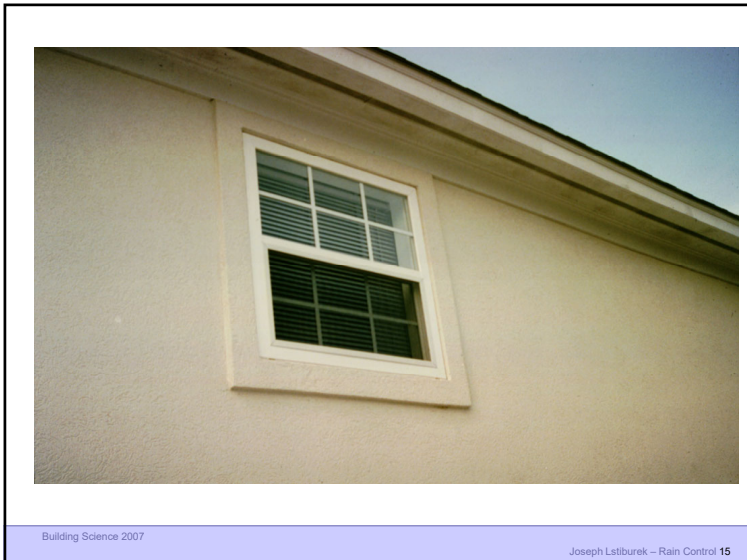
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Exterior Insulation Finish Systems
EIFS
Barrier System
Face-Sealed Not Water Managed

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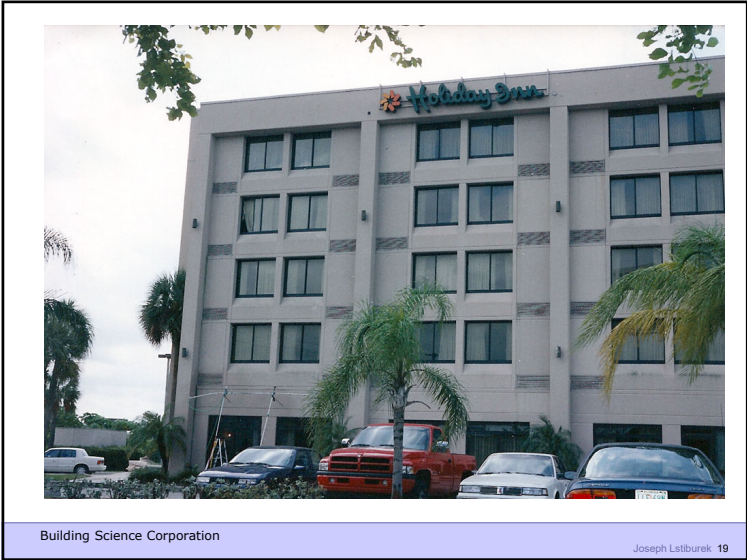
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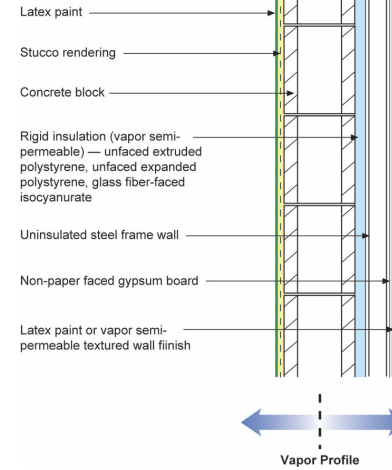
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Can Barrier or Face Seal Work?

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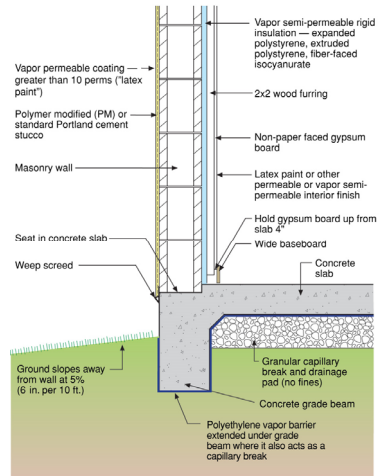
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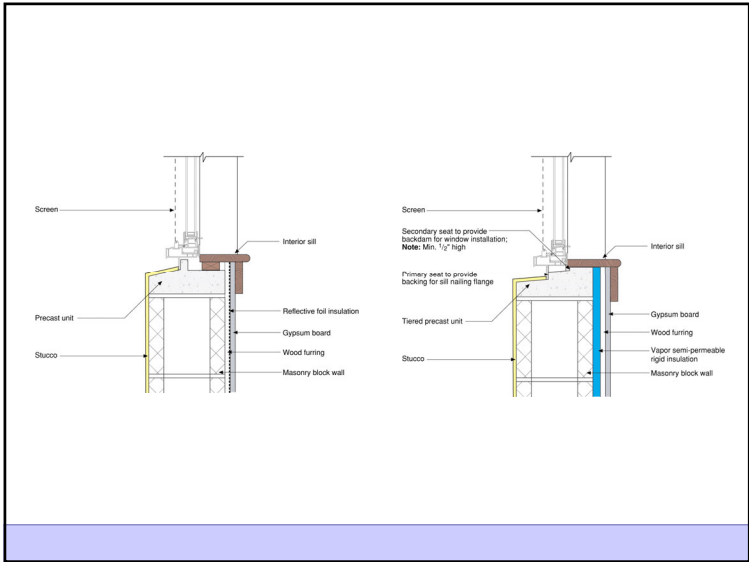
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Reminder...
Don't Do Stupid Things

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What Is Going On With Stucco?

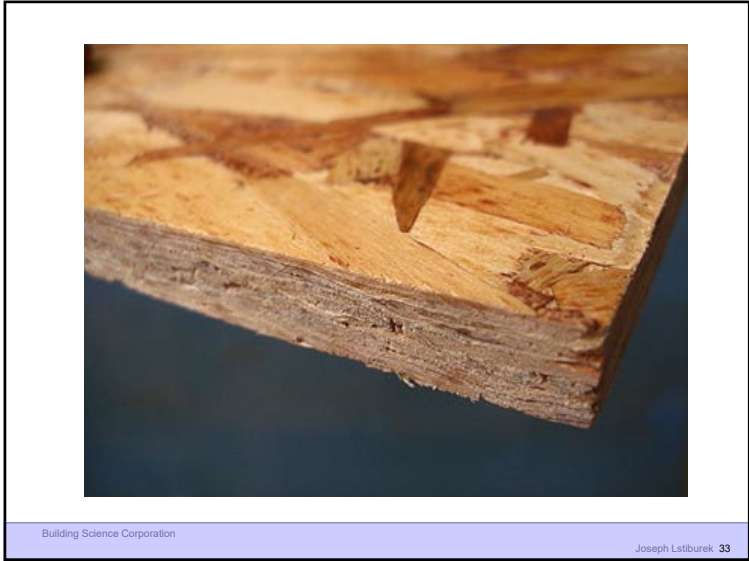
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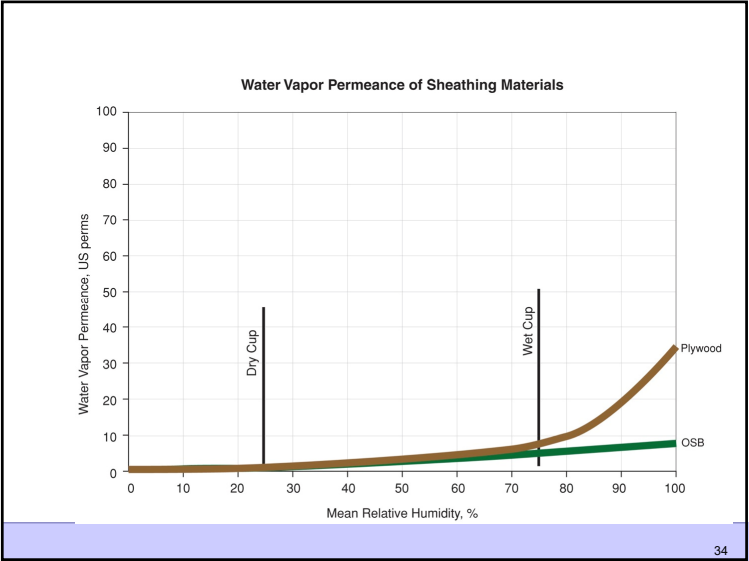
Materials
Inward Drive
Energy

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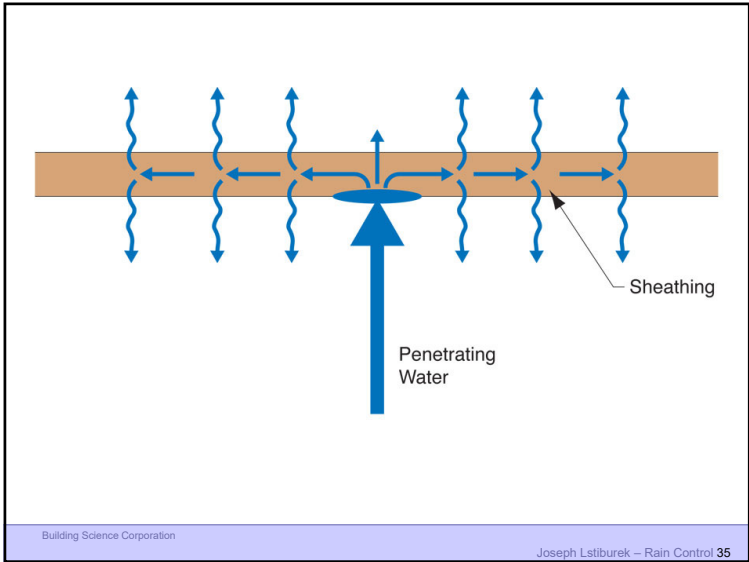
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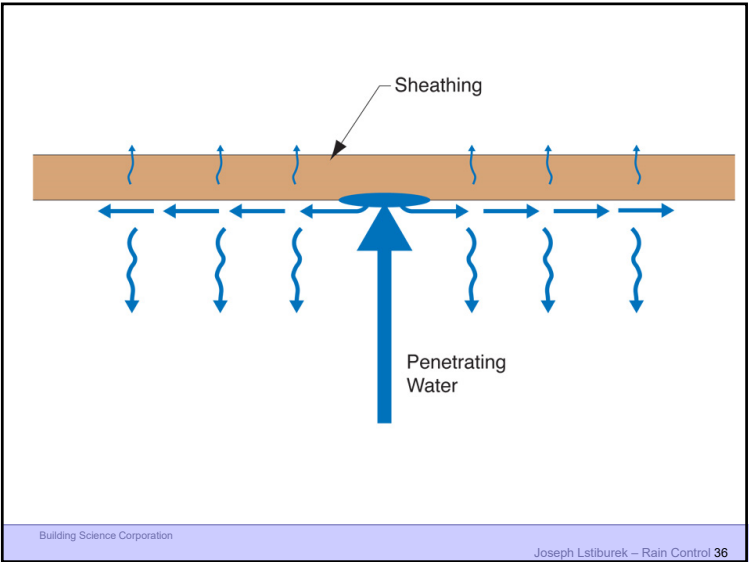
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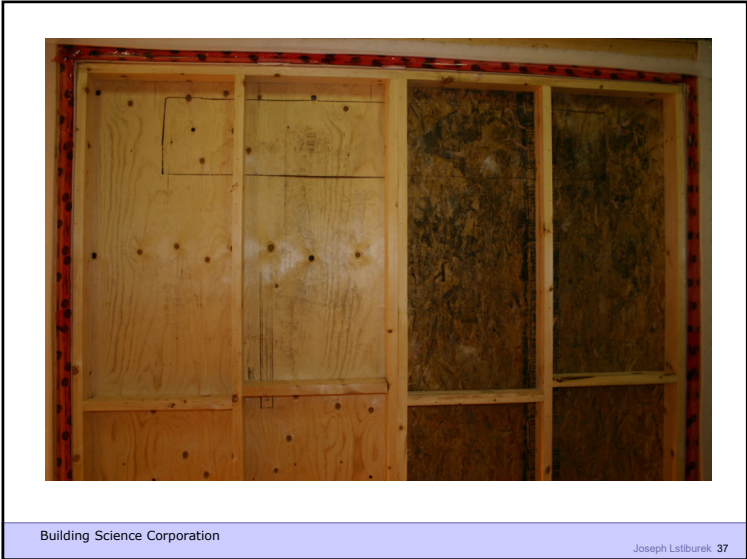
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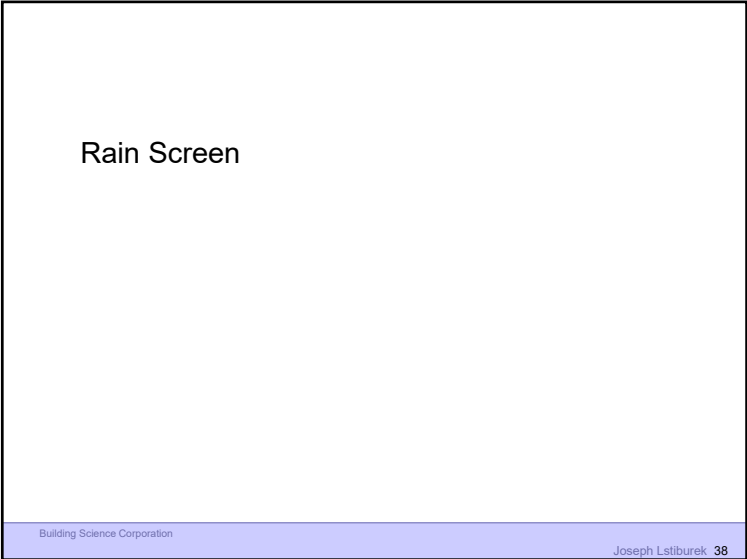
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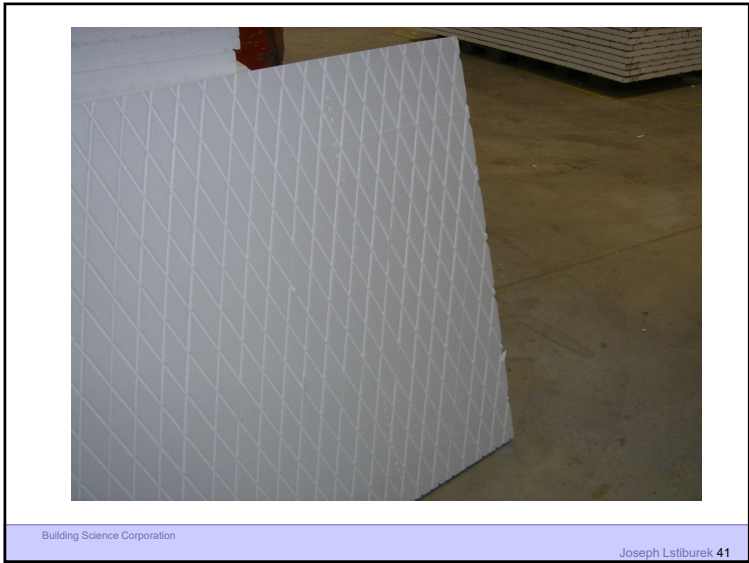
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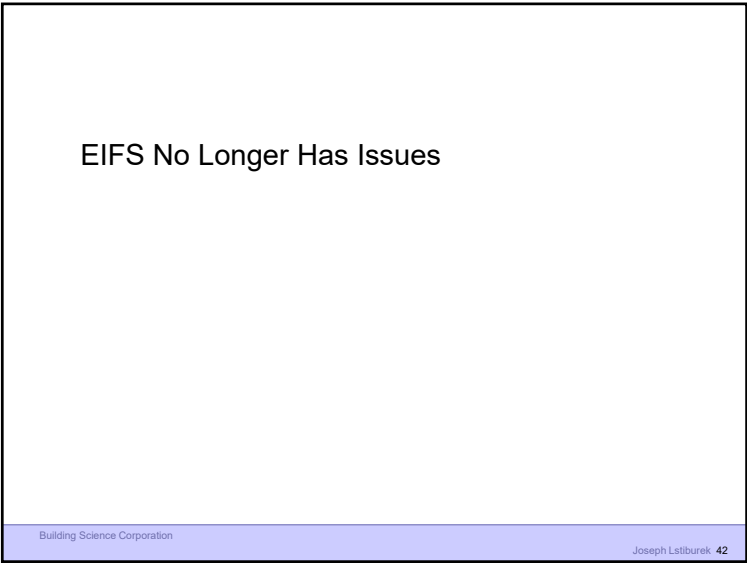
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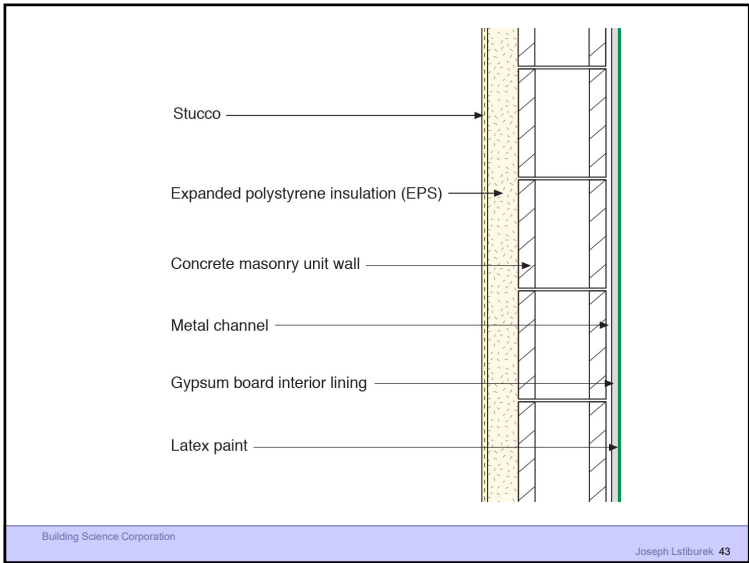
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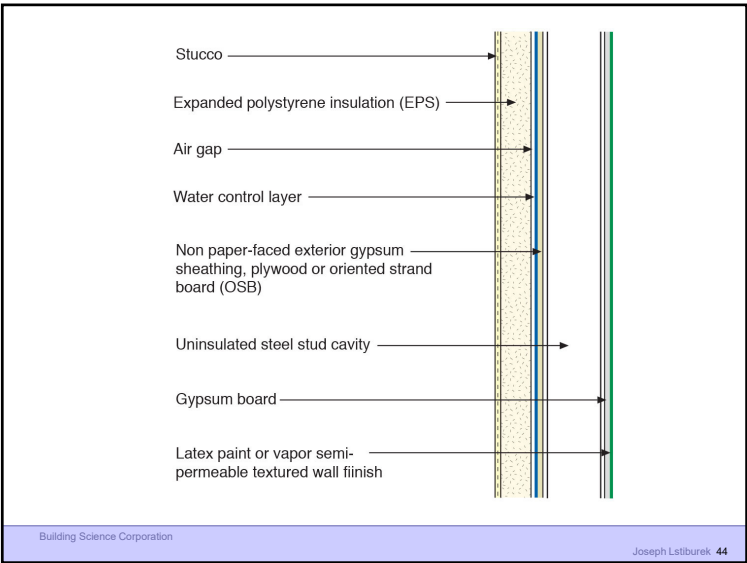
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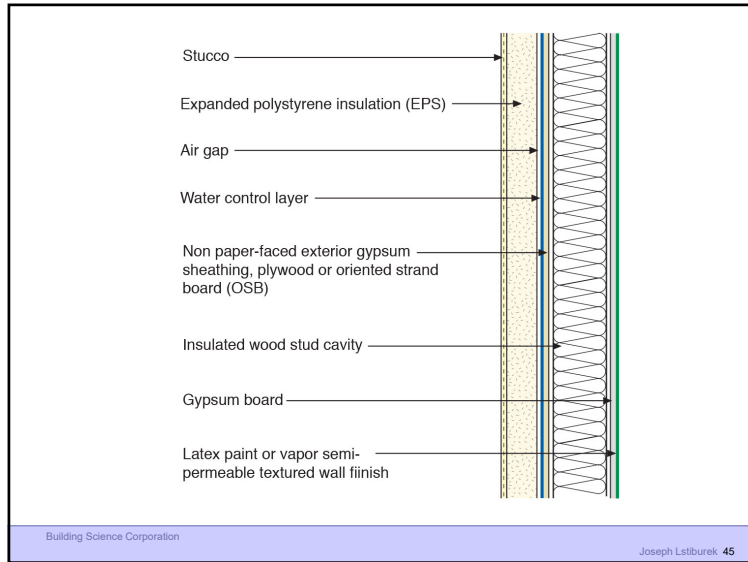
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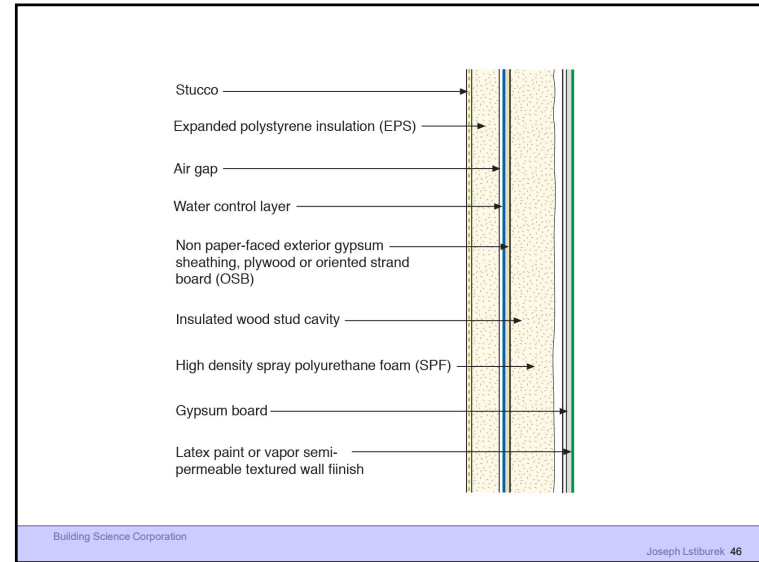
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Back To Stucco....

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Lime vs Portland Cement
Polymer Modification

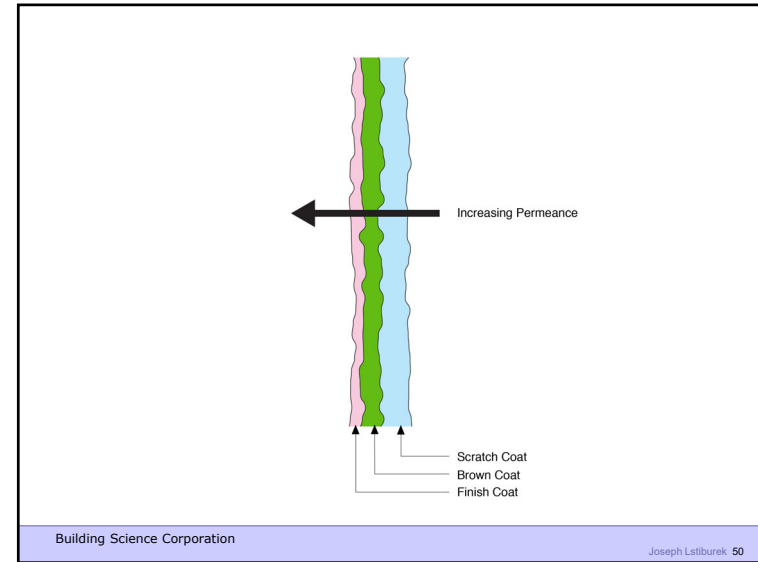
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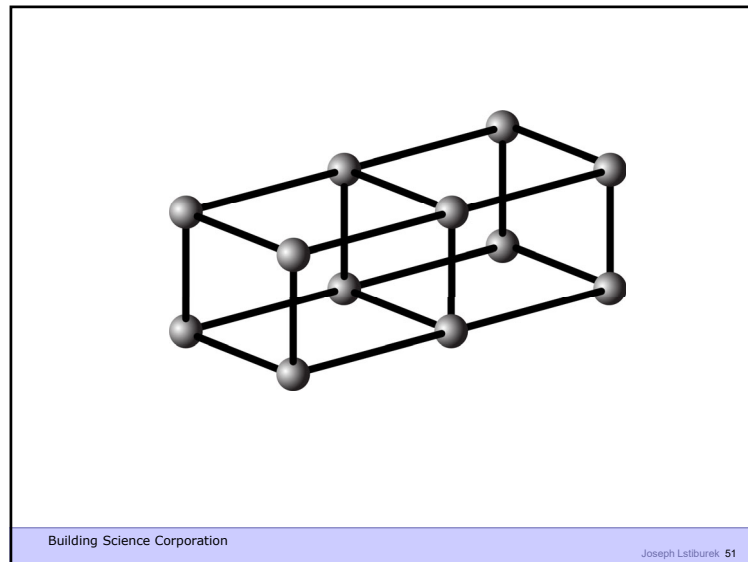
Traditional Lime Stucco	Greater than 20 perms
Lime/Portland Cement Stucco	5 to 10 perms
Portland Cement Stucco	1 to 5 perms
Polymer Modification	Less than 1

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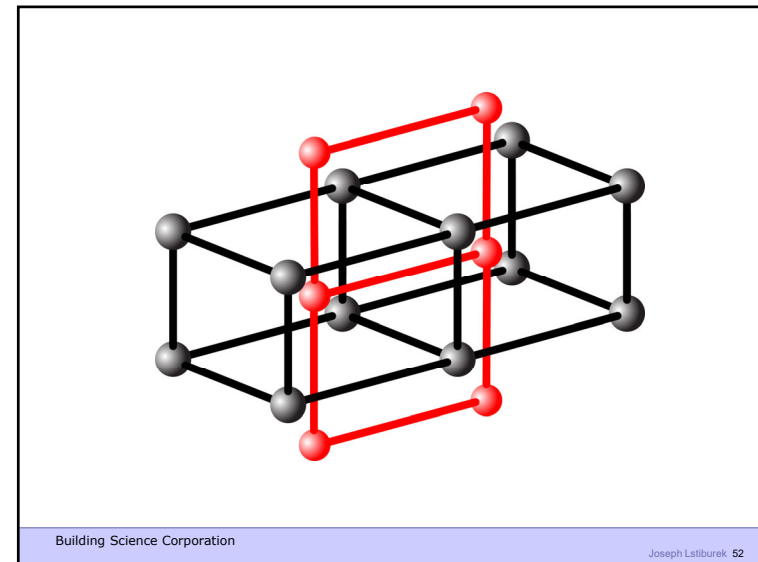
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Ancient Modification Additives
Cow Dung
Egg Whites
Pig Blood

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There's more.....

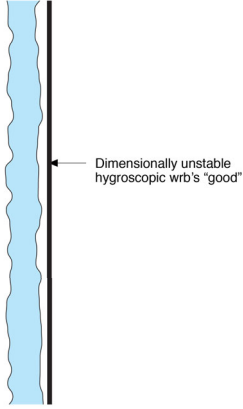
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Non Traditional Building Wraps

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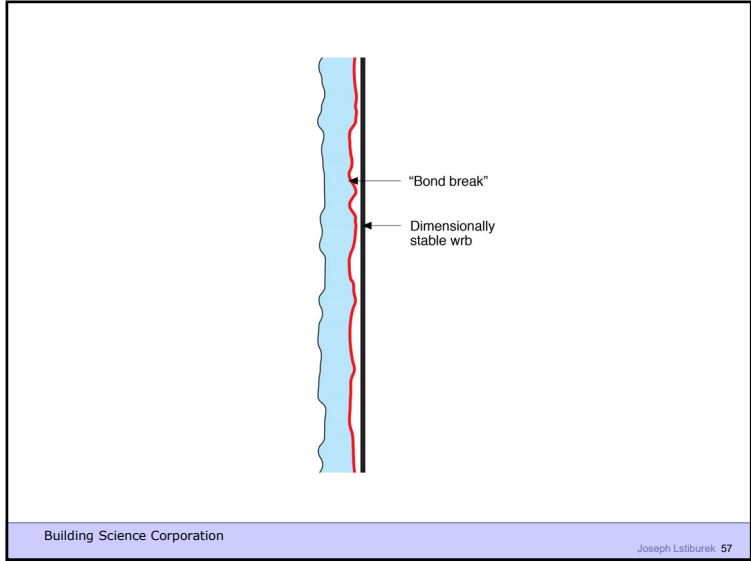
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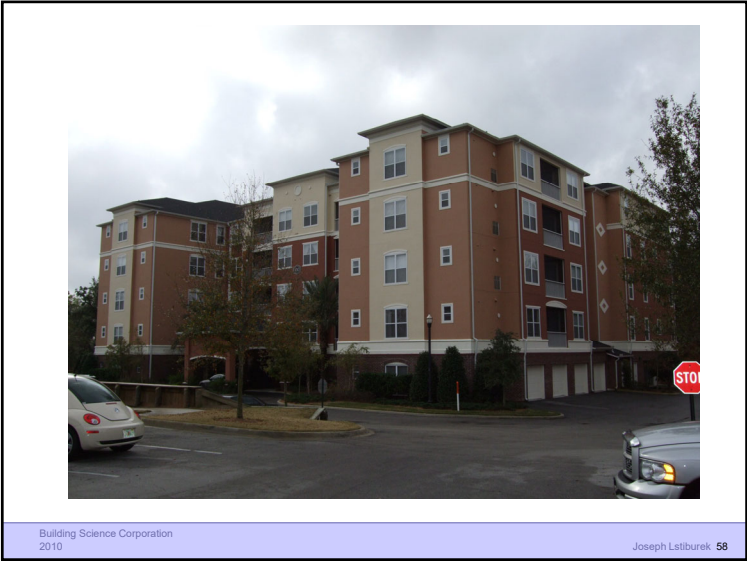
Dimensionally unstable
hygroscopic wrb's "good"

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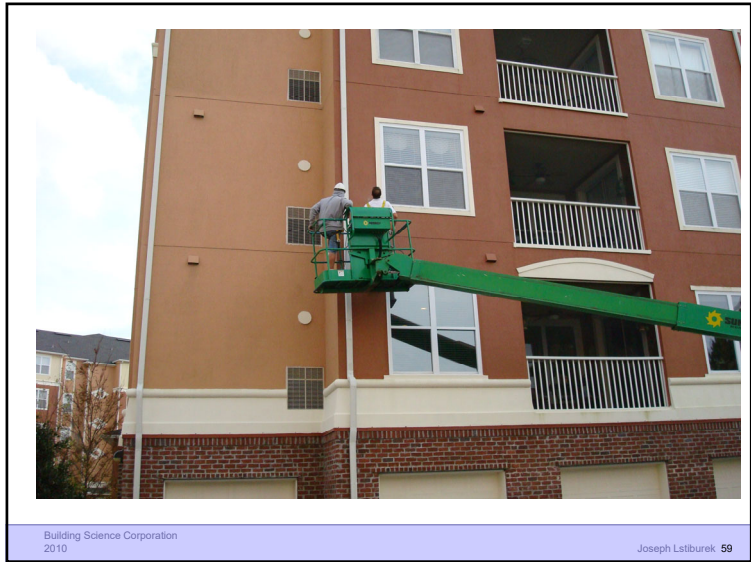
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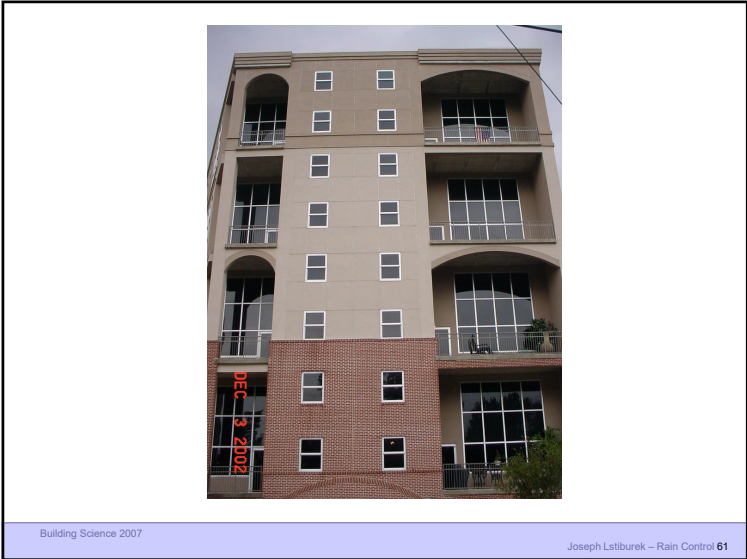
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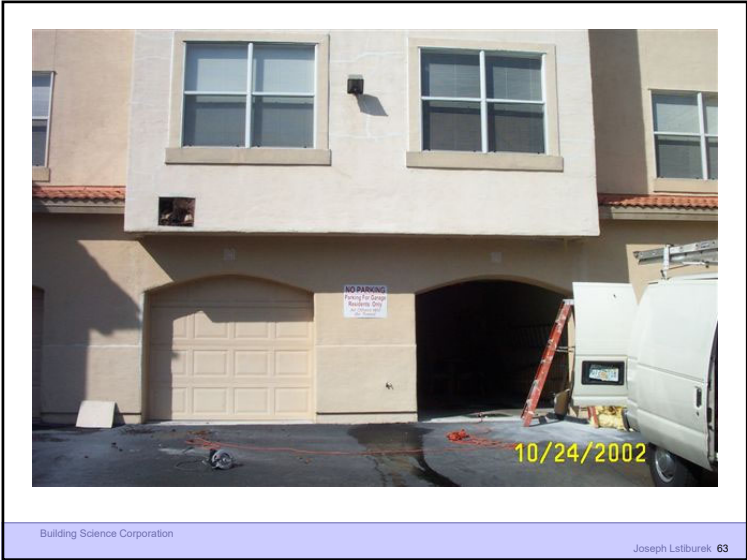
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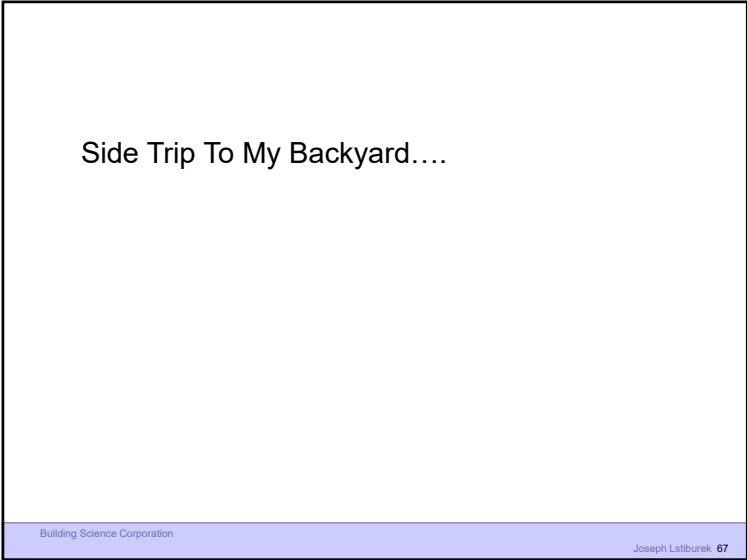
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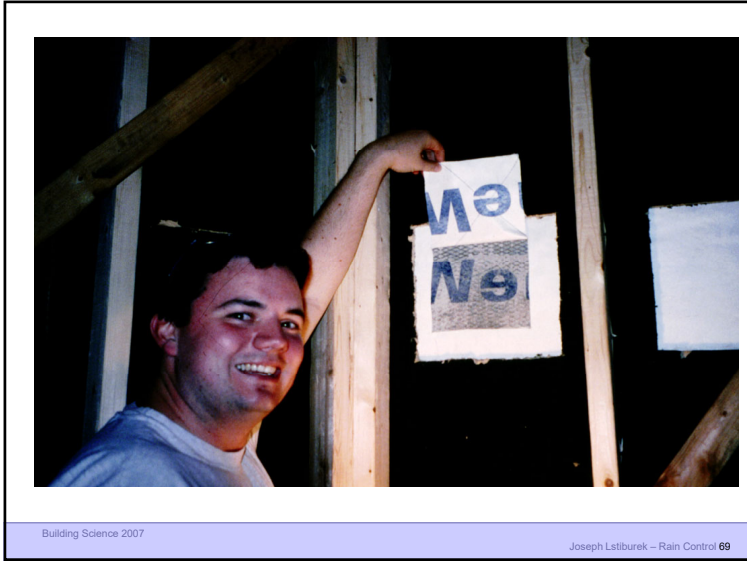
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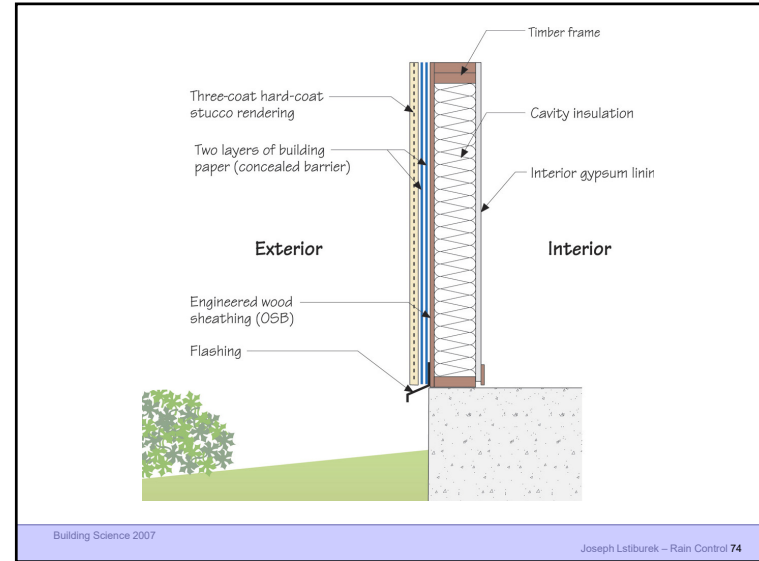
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“Lumpy Stucco”....
Should Have Been The Big Warning....

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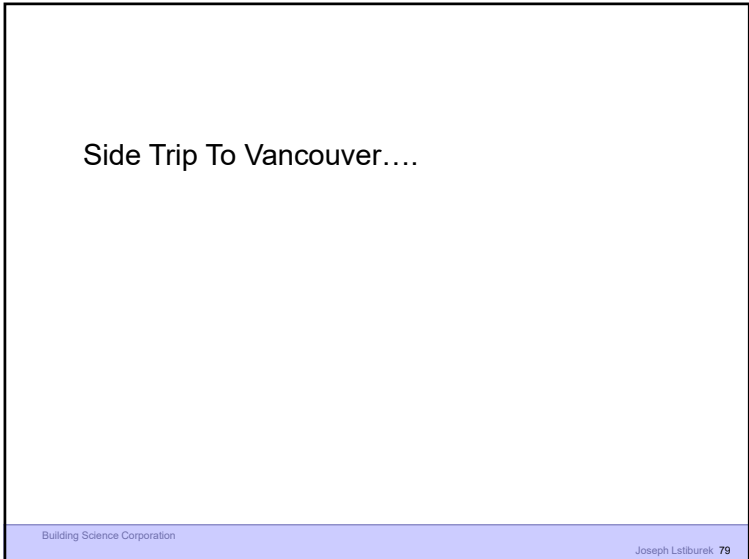
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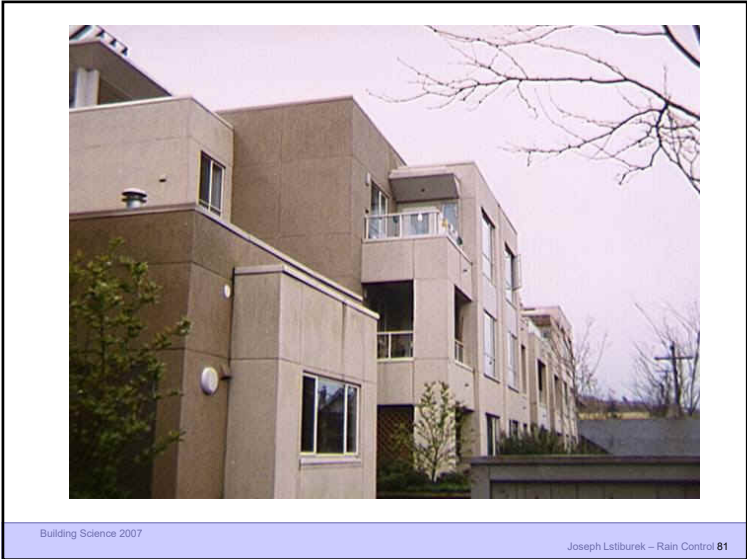
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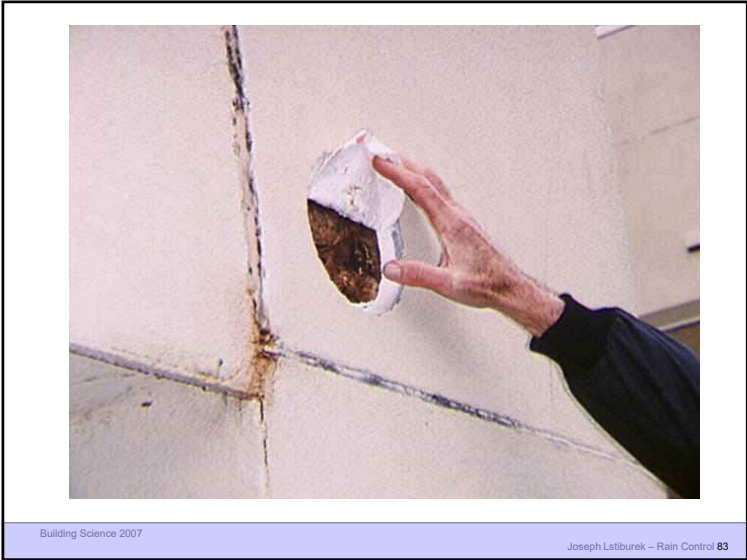
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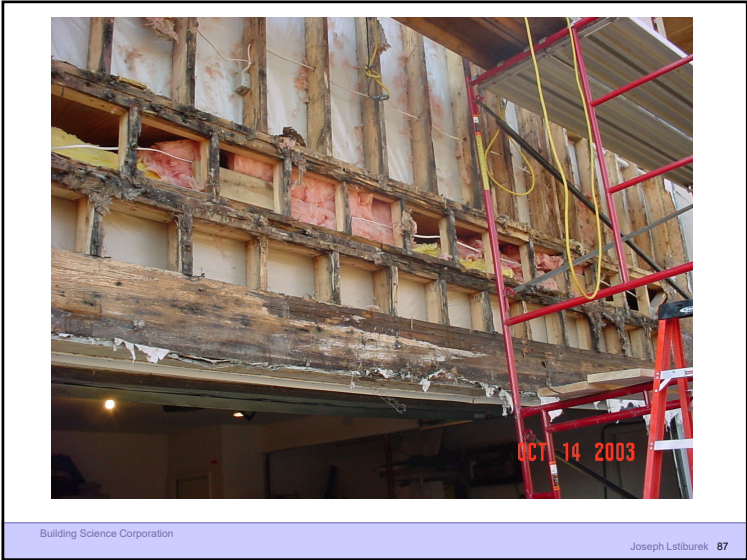
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What Happened In Vancouver?
OSB Instead of Plywood
Non Traditional Building Wraps
Interior Vapor Barriers
Increased Thermal Resistance
Portland Cement Instead of Lime

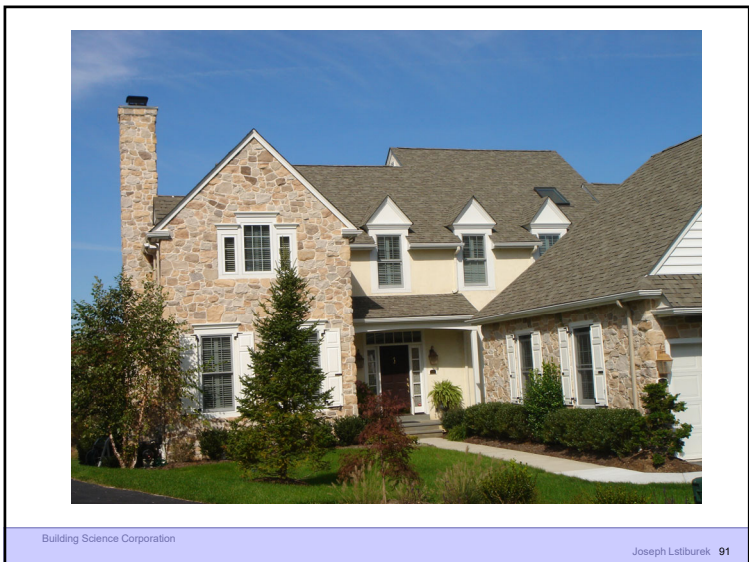
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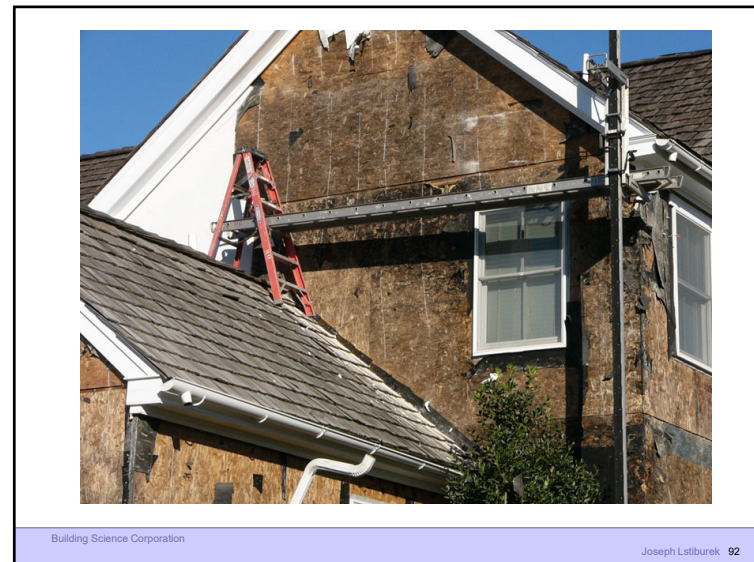
Back To America....Pennsylvania....
And Then Pretty Much Anywhere It Rains...

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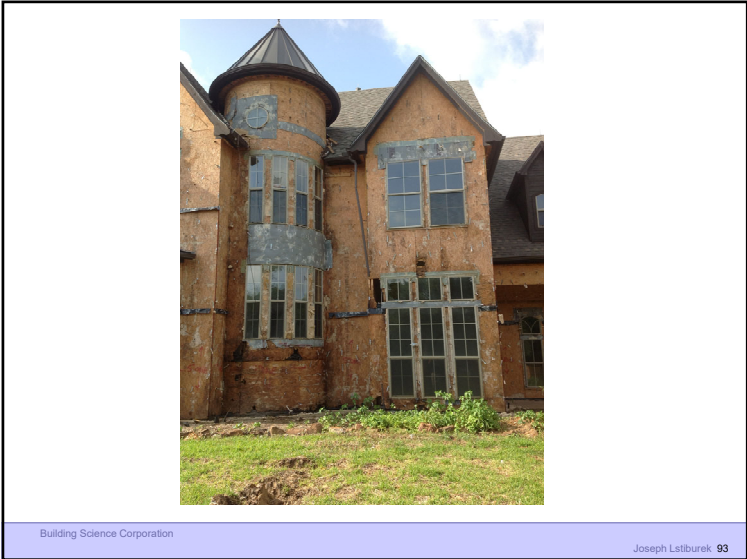
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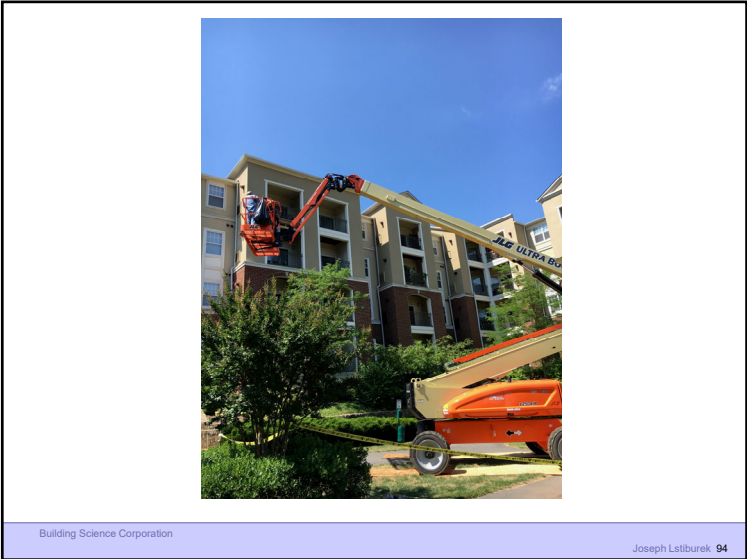
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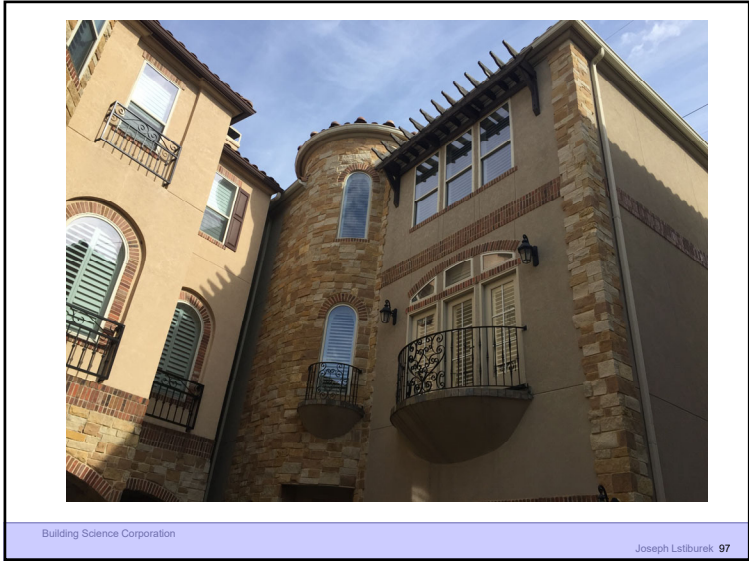
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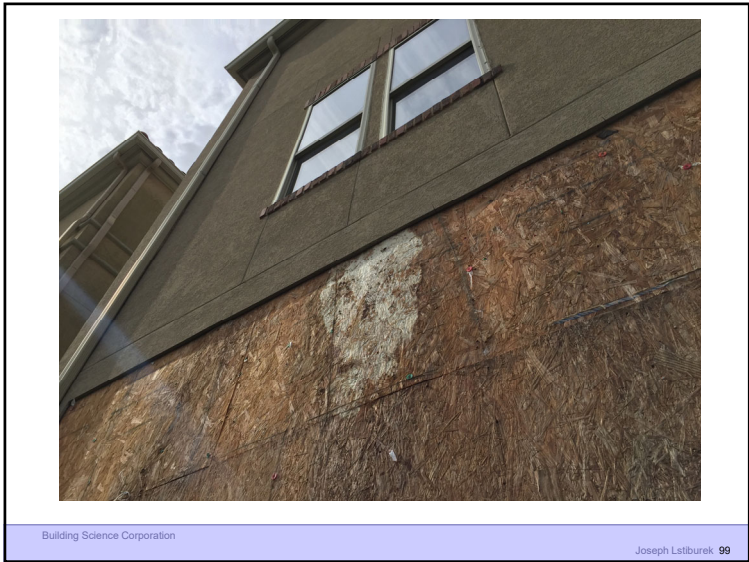
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Back To Lumpy Stucco....

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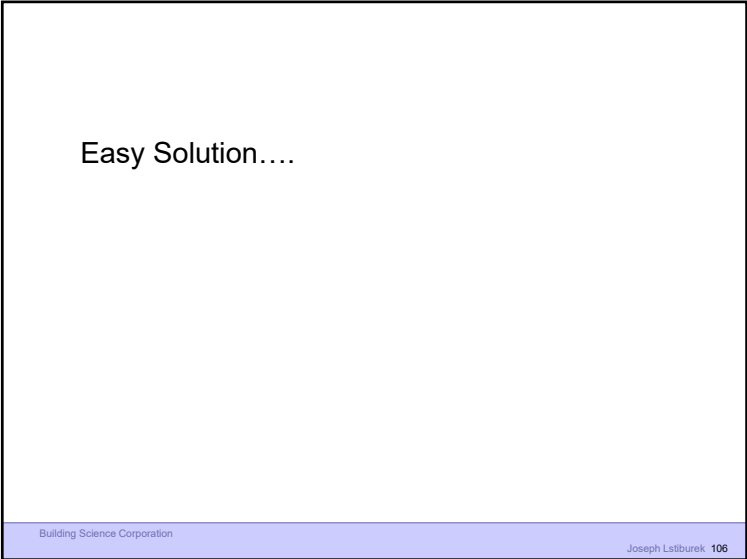
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Recommendations....

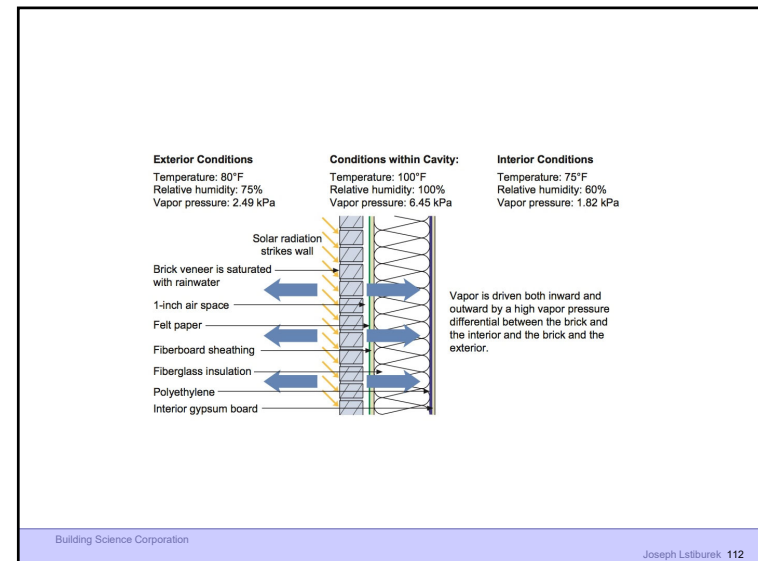
- Provide a 3/8 inch air space behind all stucco in regions where it rains more than 20 inches per year
- Provide a 3/8 inch air space behind all stucco over three stories
- Don't install interior vapor barriers
- Air space can be reduced to 1/16 inch where inward vapor drive is limited

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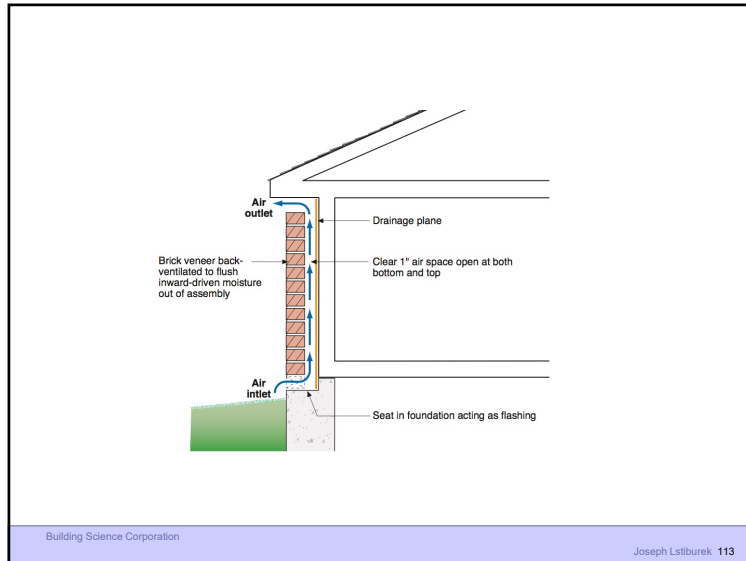
Recommendations....

- 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

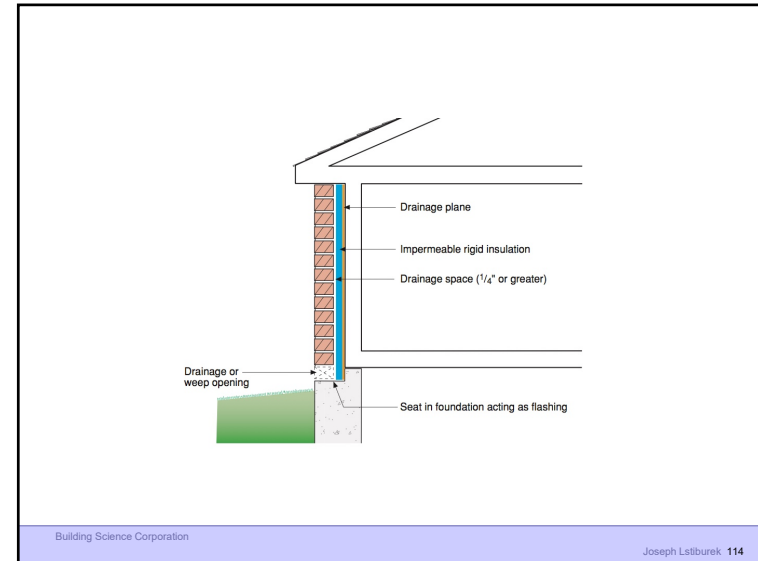
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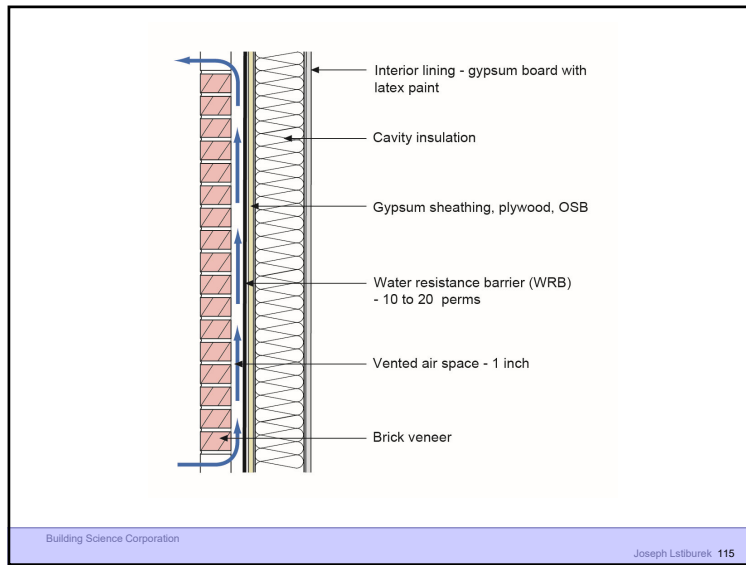
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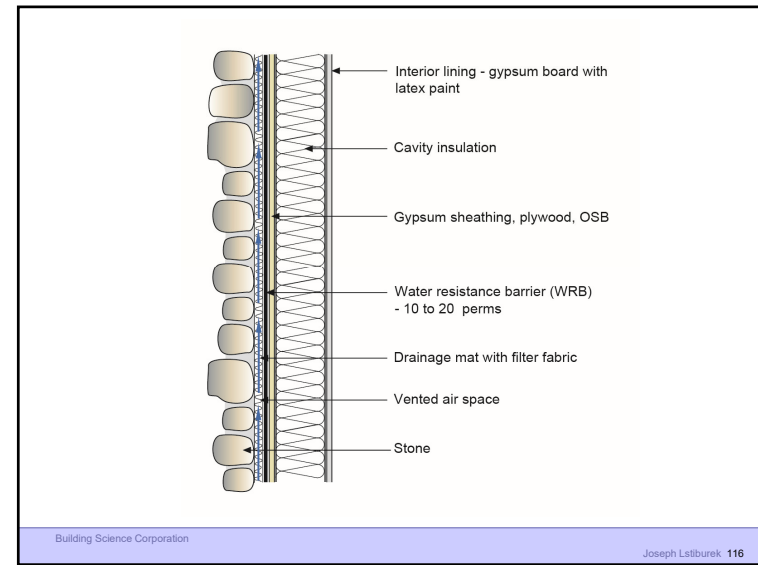
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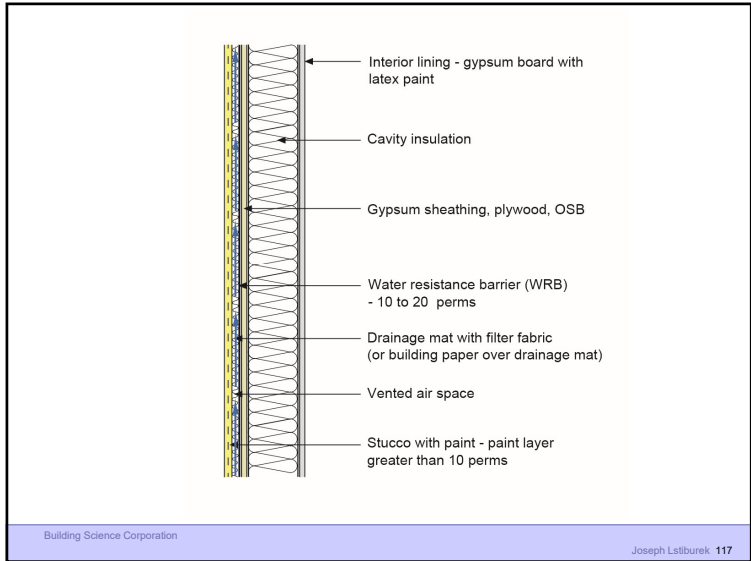
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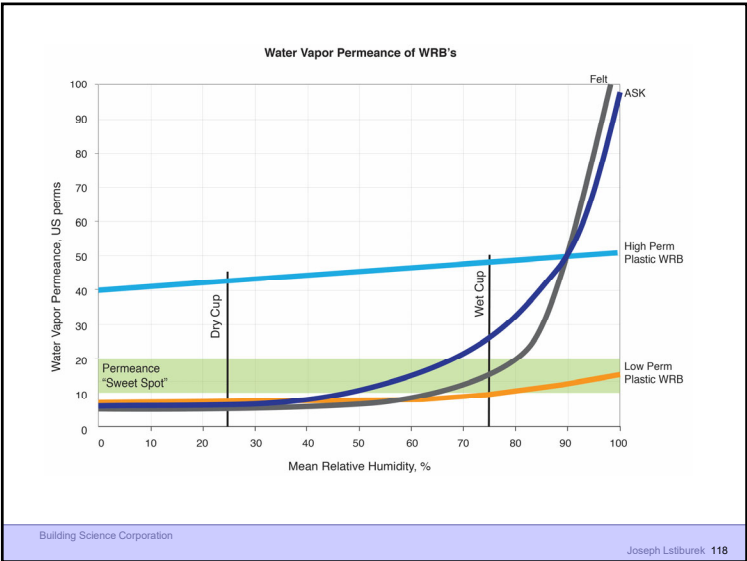
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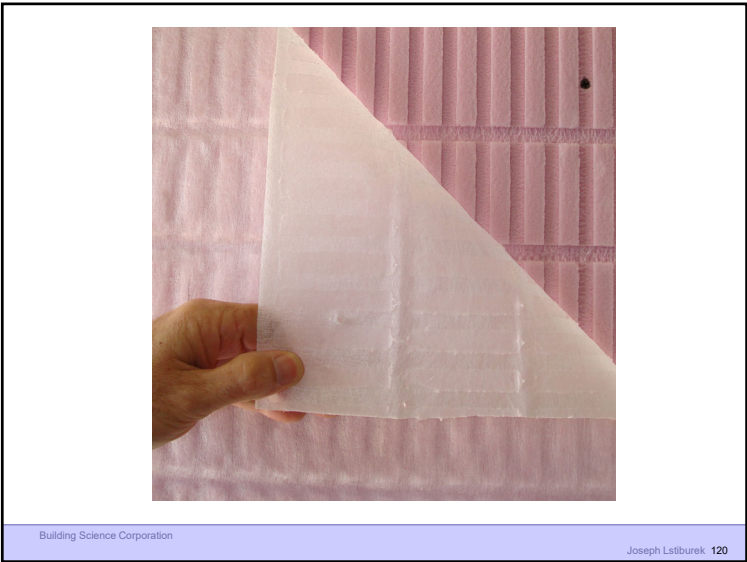
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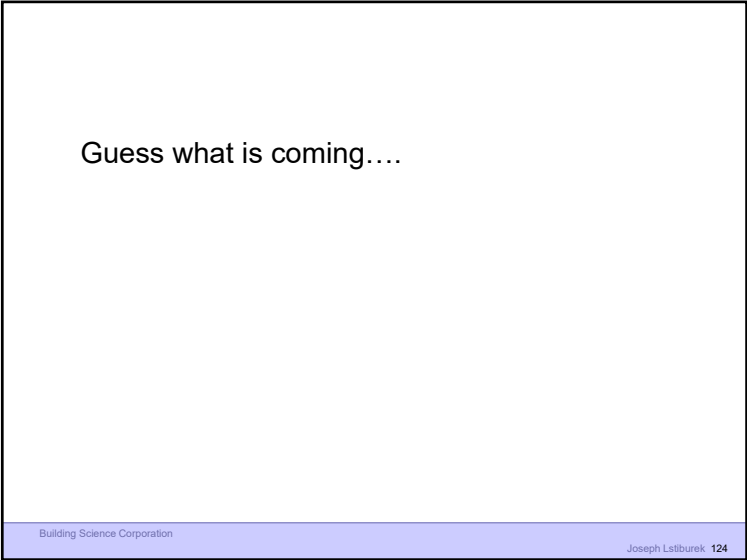
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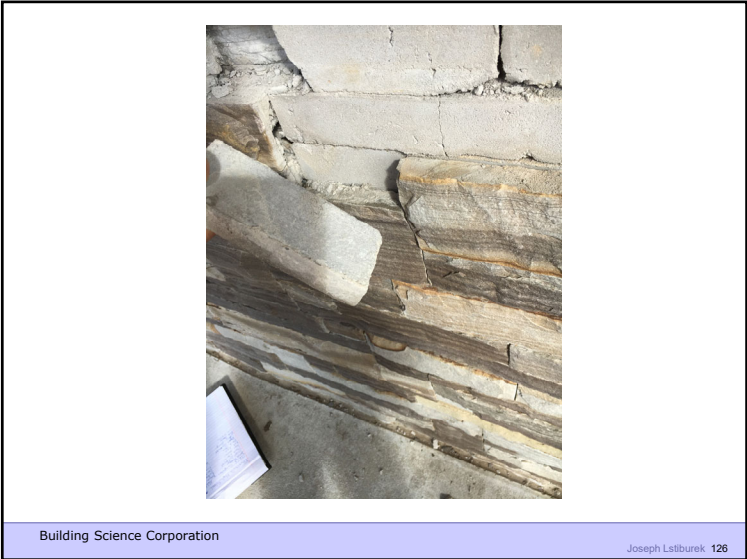
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