

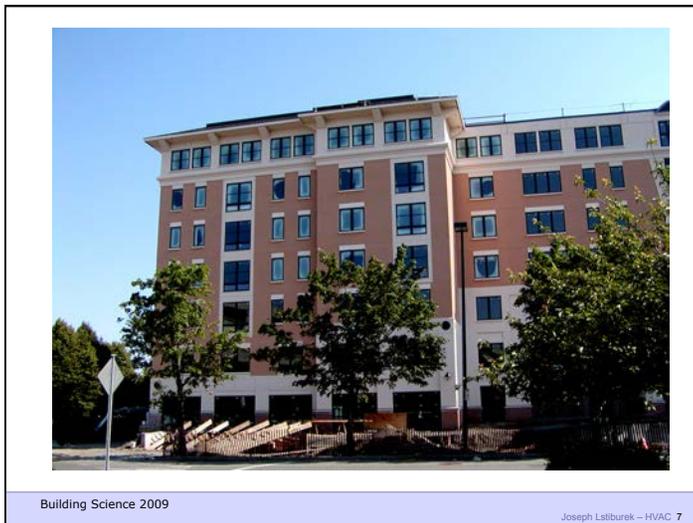
Joseph Lstiburek, Ph.D., P.Eng, ASHRAE Fellow

Building Science

Adventures In Building Science

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What is a Building?

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A Building is an Environmental Separator

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- Control heat flow
- Control airflow
- Control water vapor flow
- Control rain
- Control ground water
- Control light and solar radiation
- Control noise and vibrations
- Control contaminants, environmental hazards and odors
- Control insects, rodents and vermin
- Control fire
- Provide strength and rigidity
- Be durable
- Be aesthetically pleasing
- Be economical

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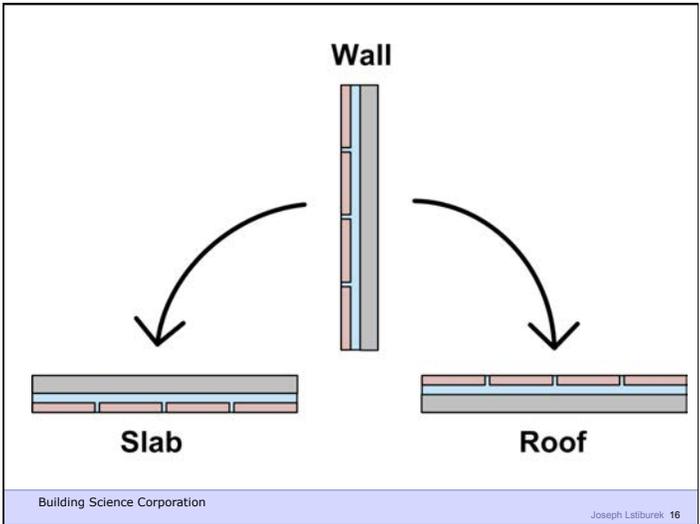
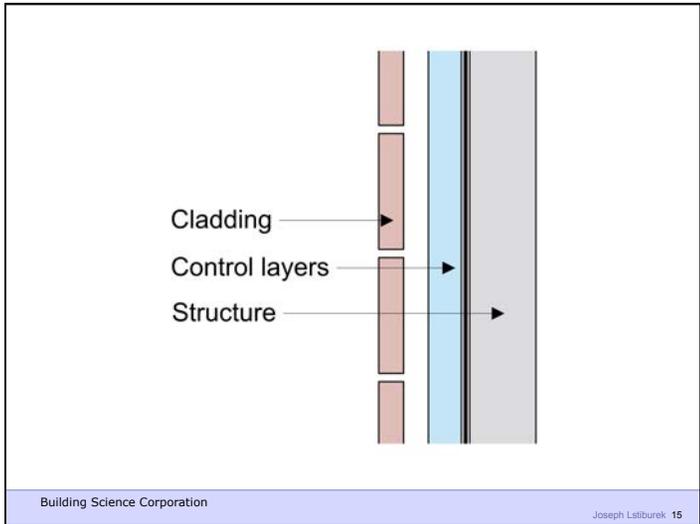
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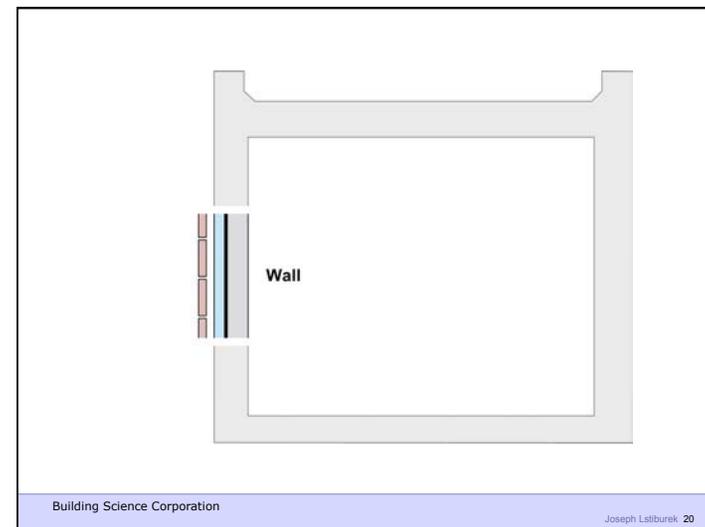
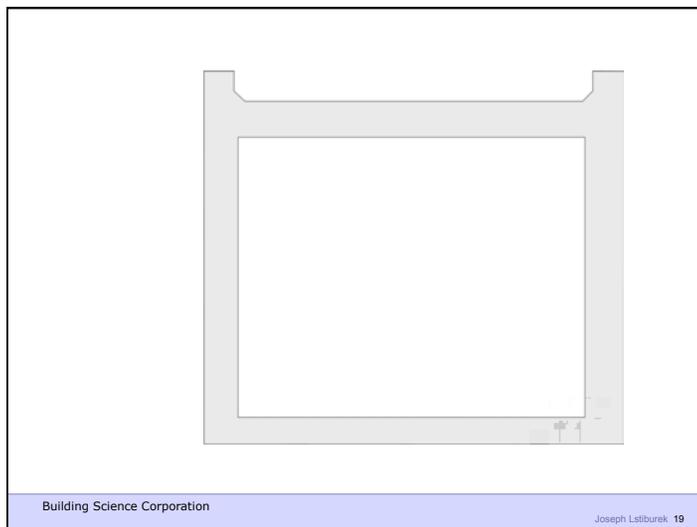
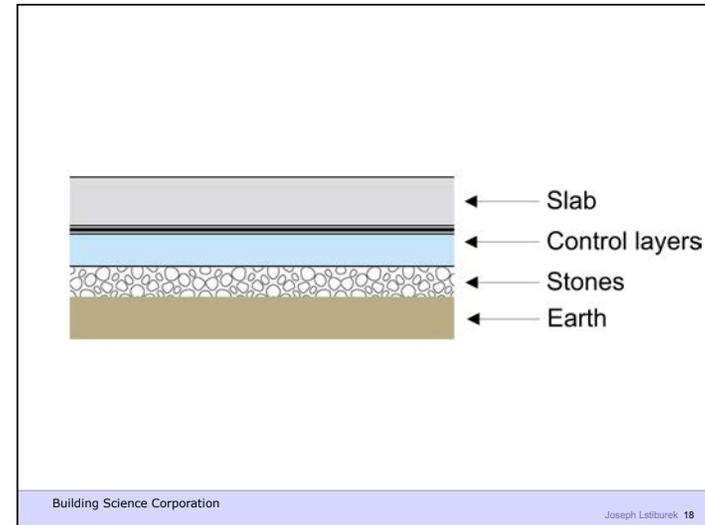
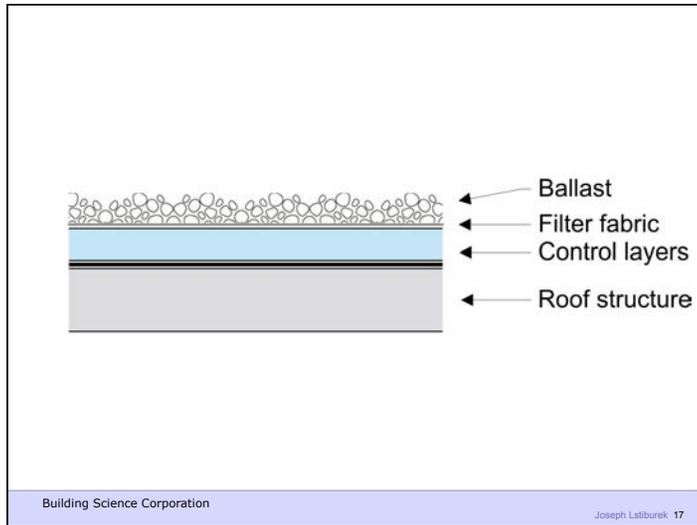
Heat Flow Is From Warm To Cold
Moisture Flow Is From Warm To Cold
Moisture Flow Is From More To Less
Air Flow Is From A Higher Pressure to a Lower Pressure
Gravity Acts Down

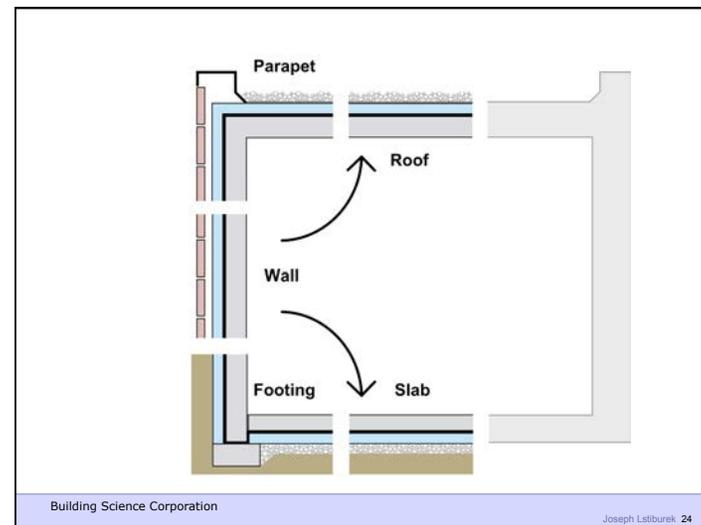
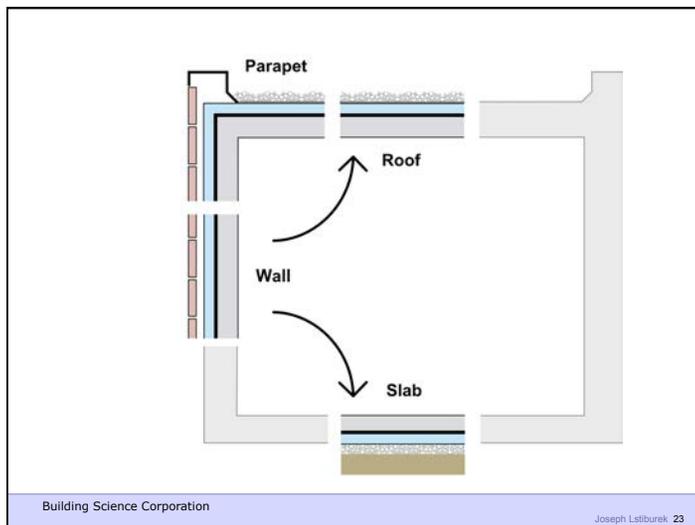
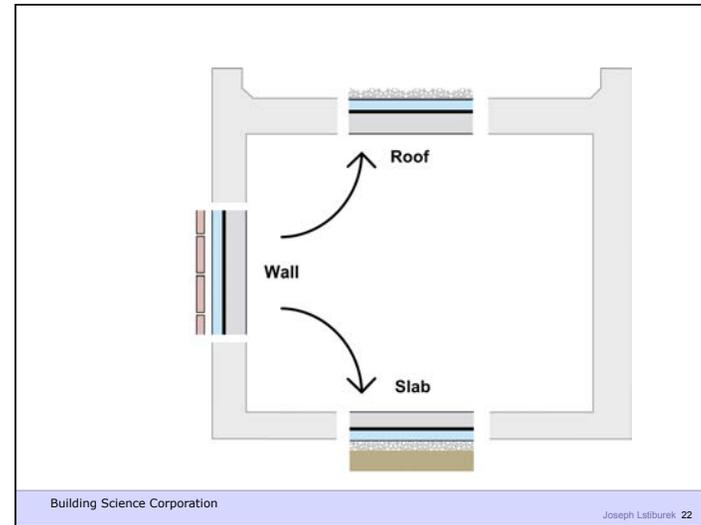
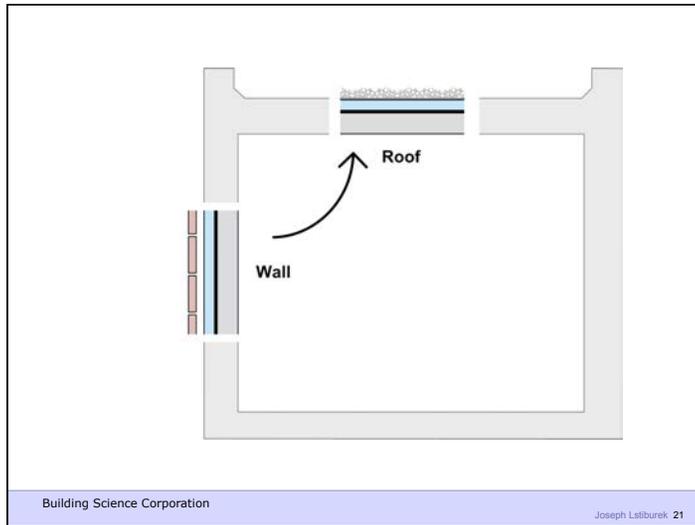
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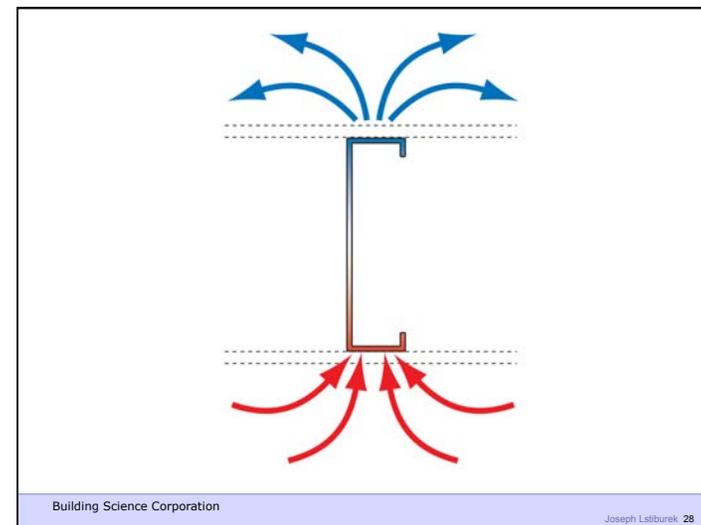
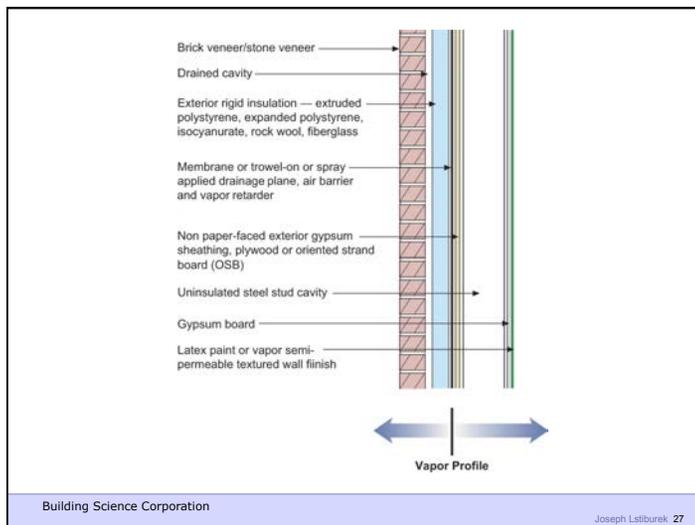
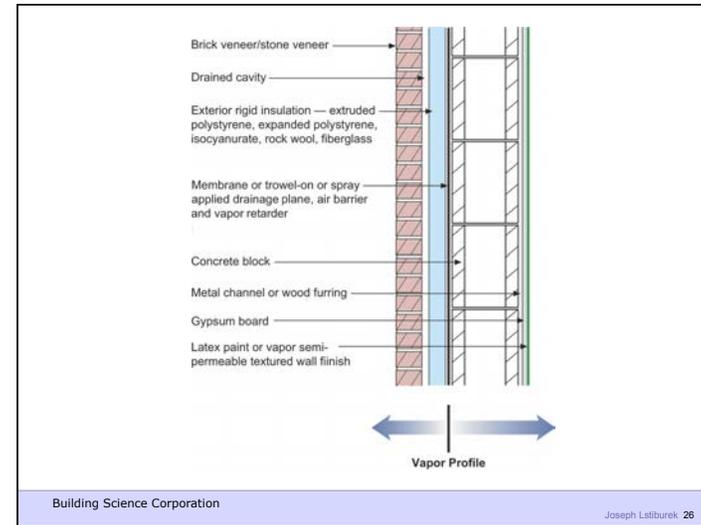
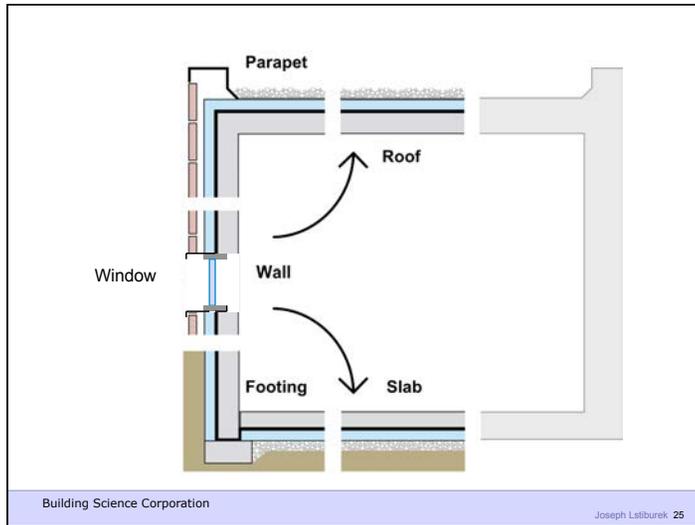
Water Control Layer
Air Control Layer
Vapor Control Layer
Thermal Control Layer

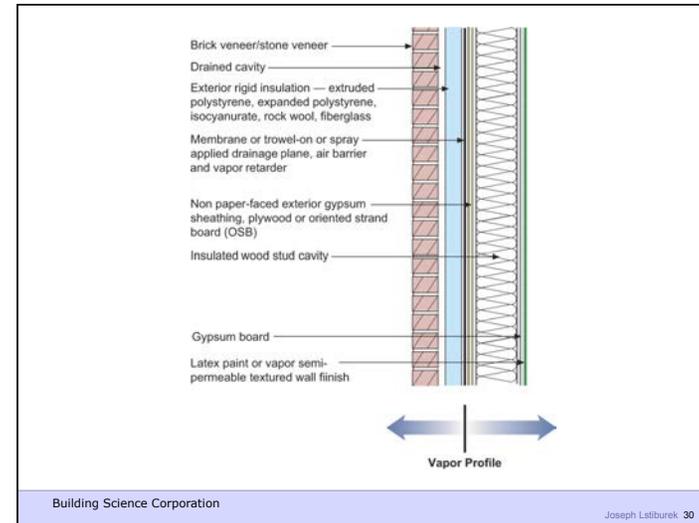
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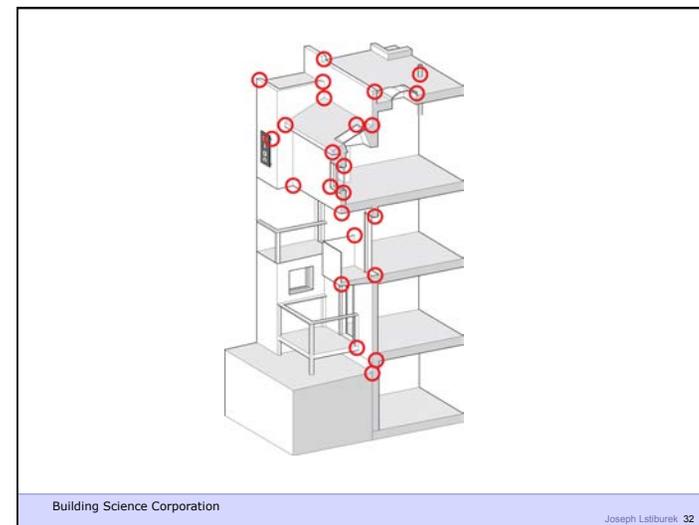


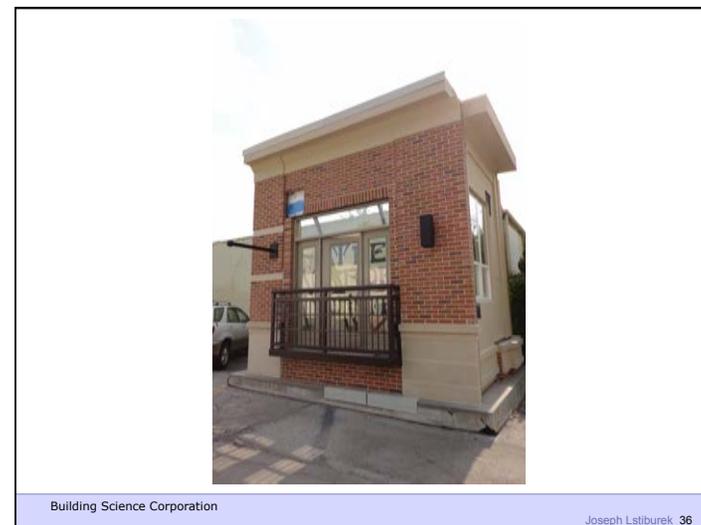


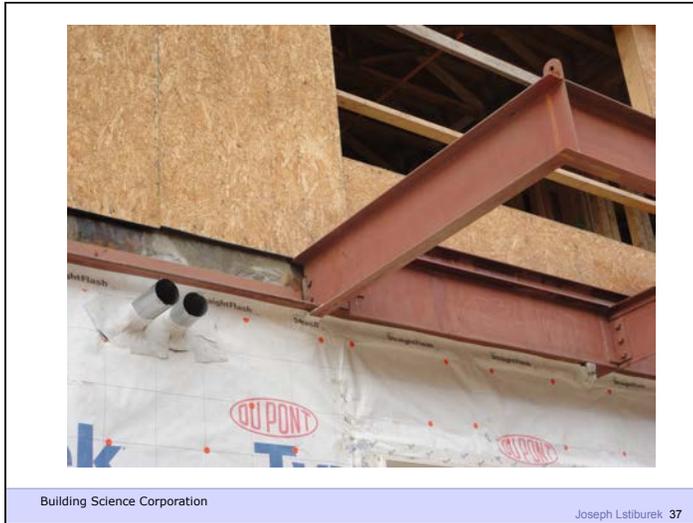
Commercial Enclosure: Simple Layers

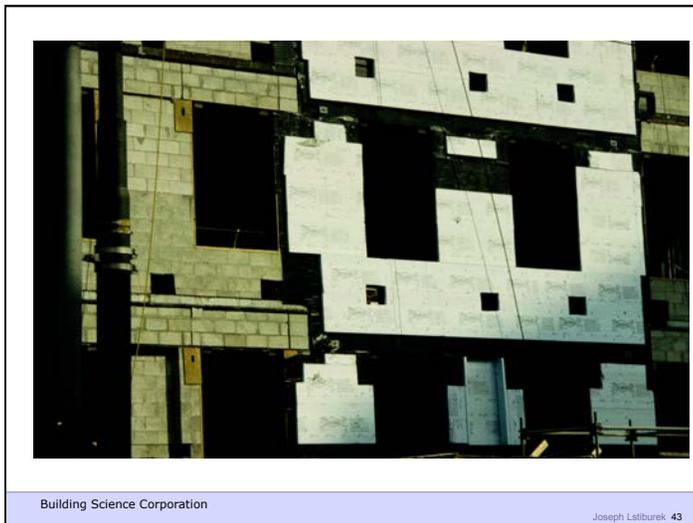
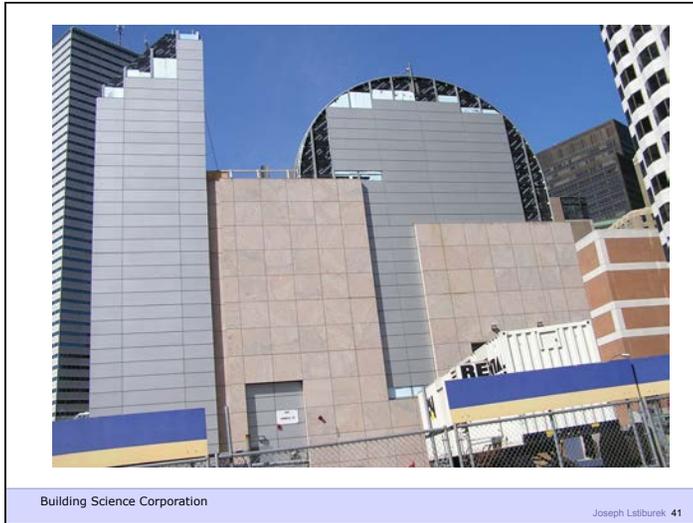
- Structure
- Rain/Air/Vapor
- Insulation
- Finish

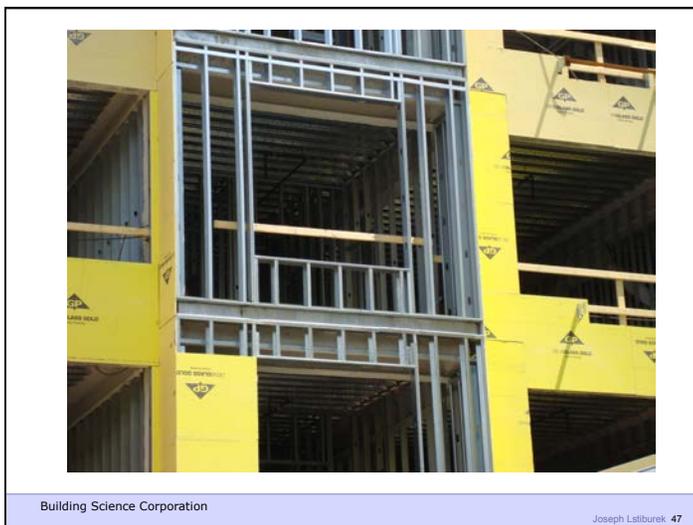
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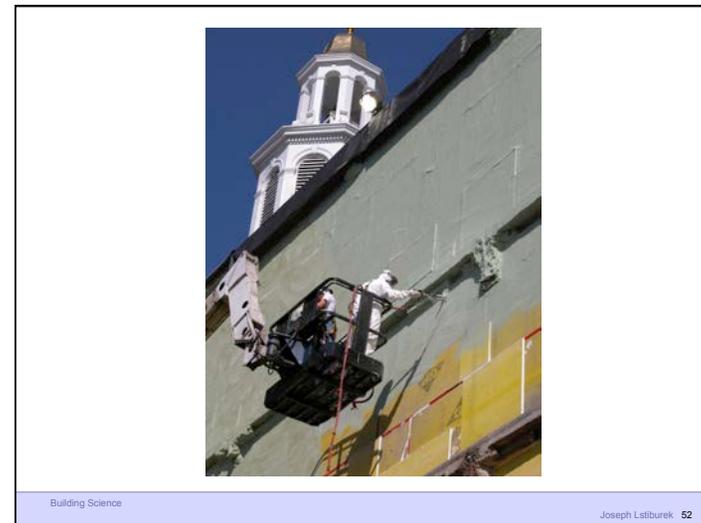
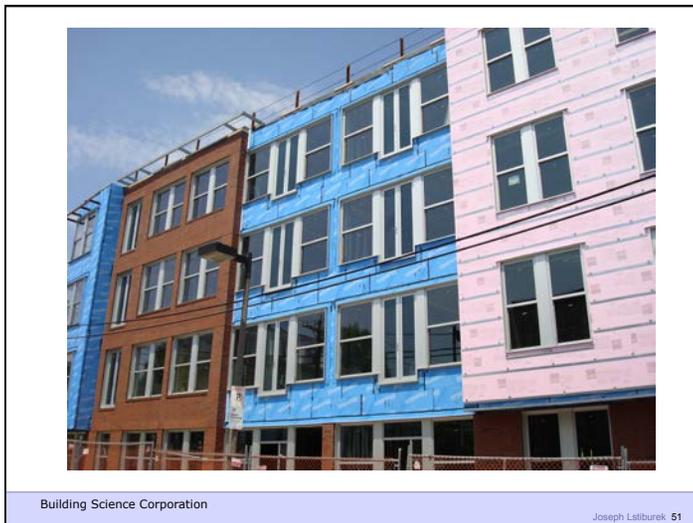
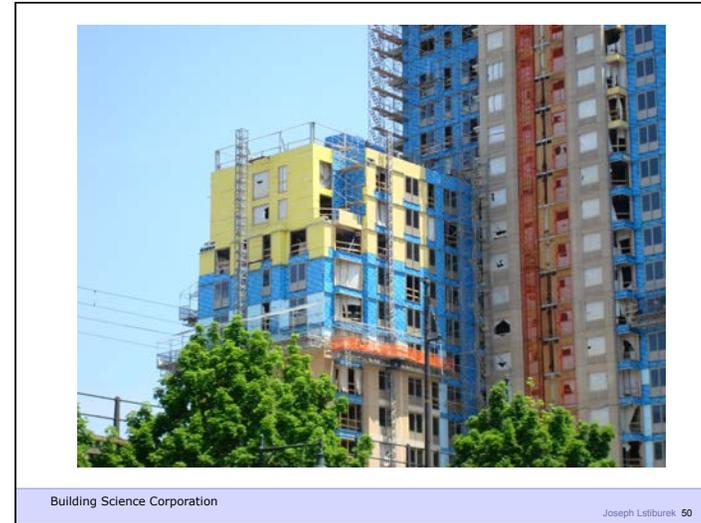




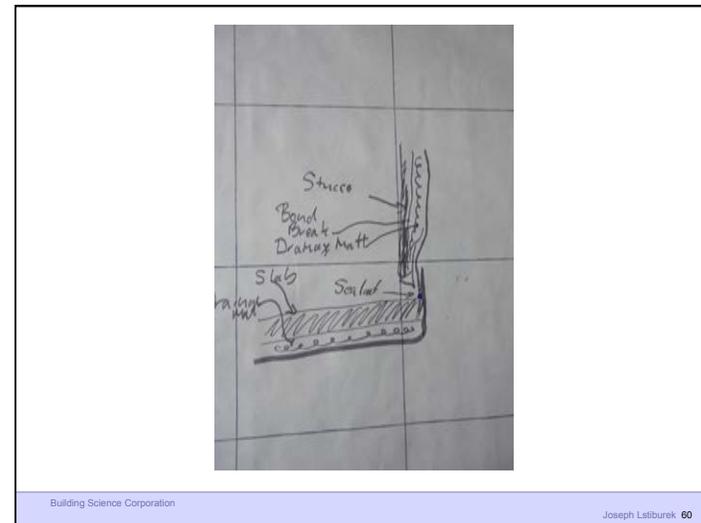
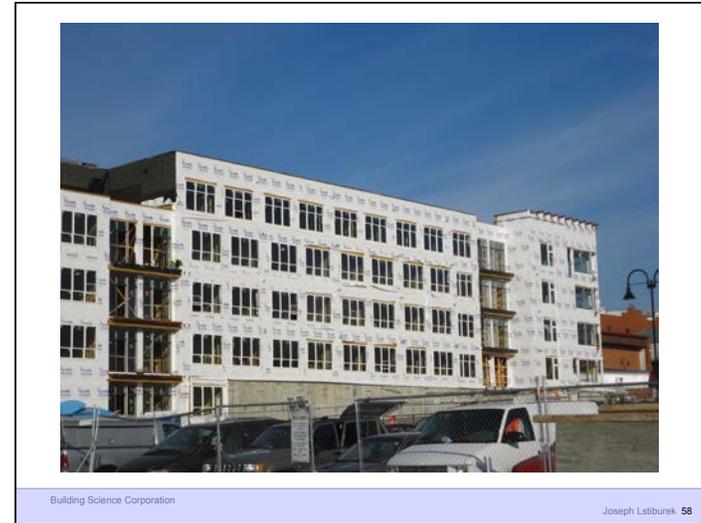


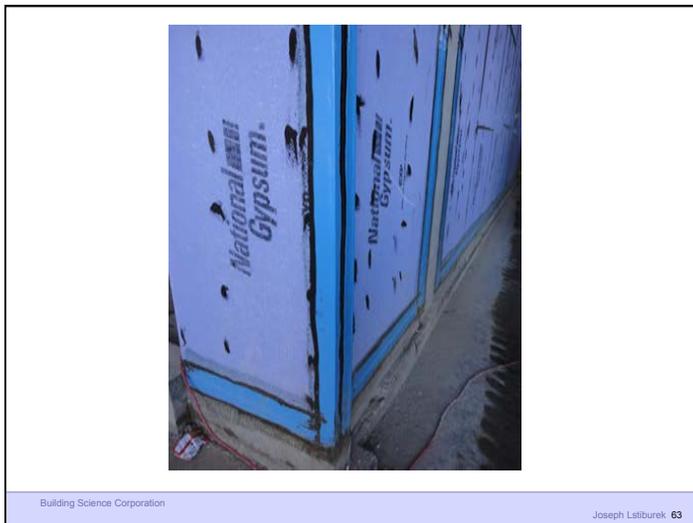


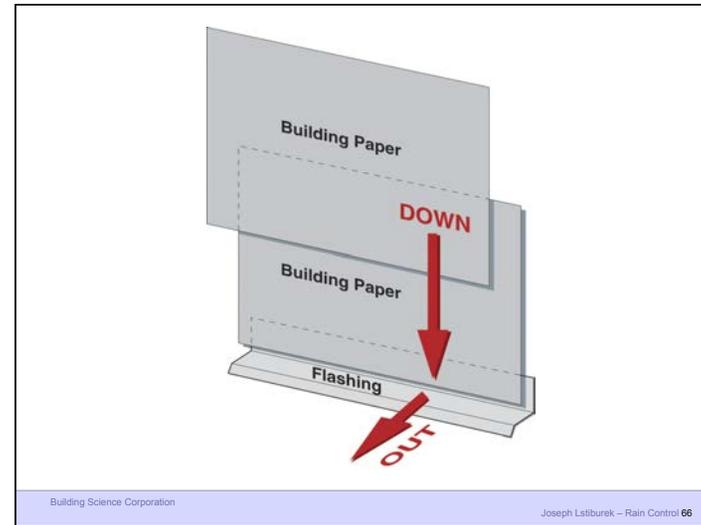
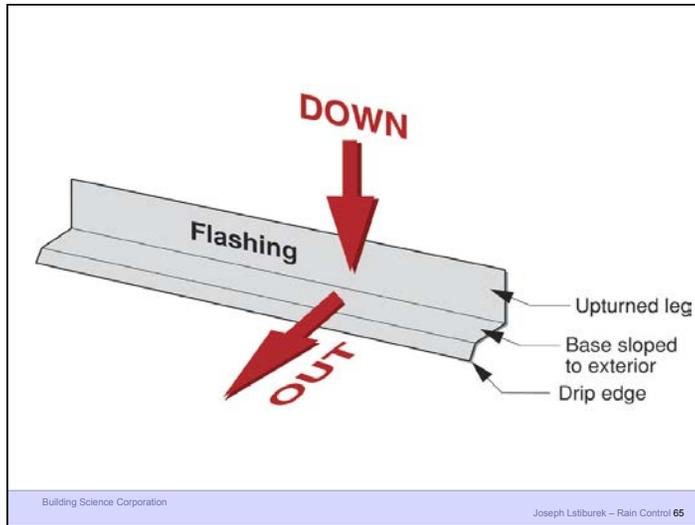


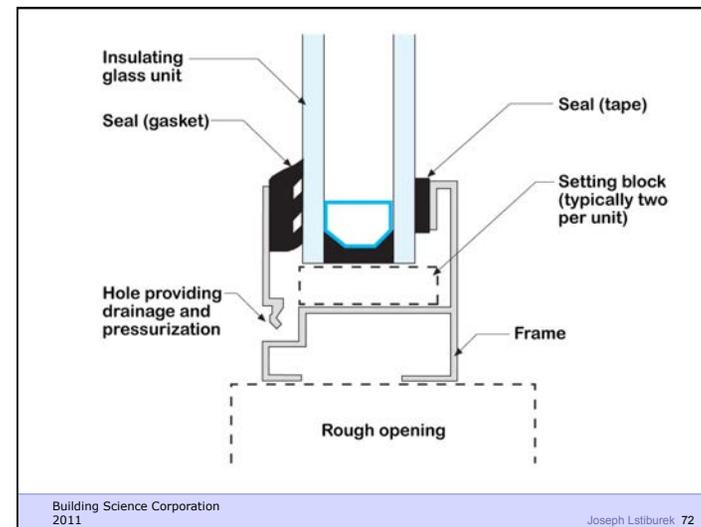
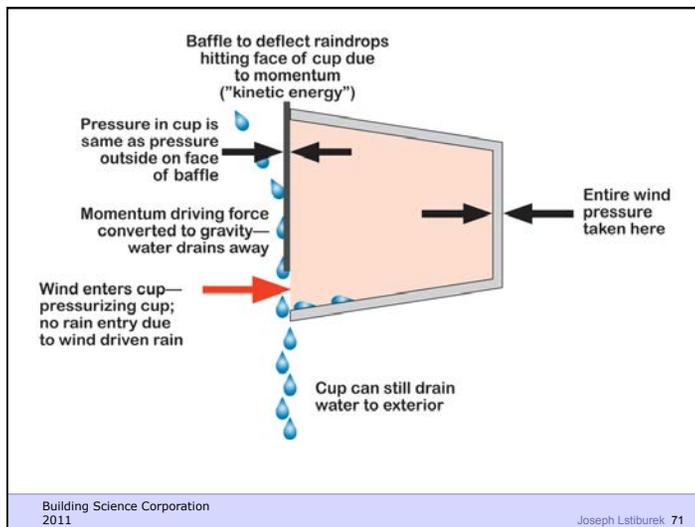
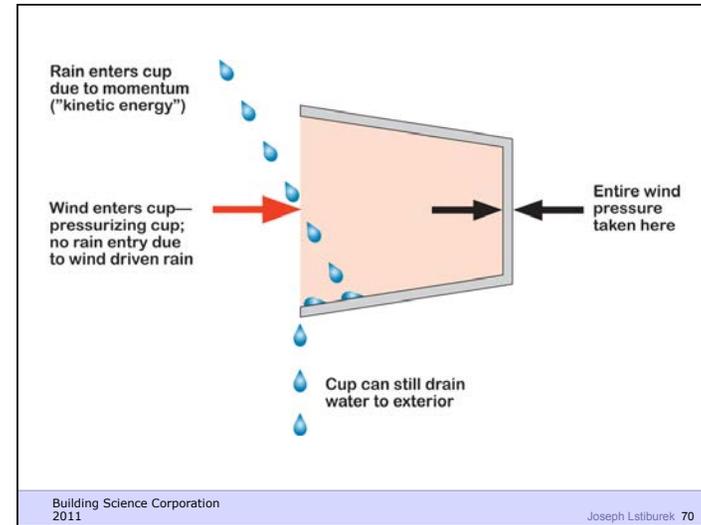
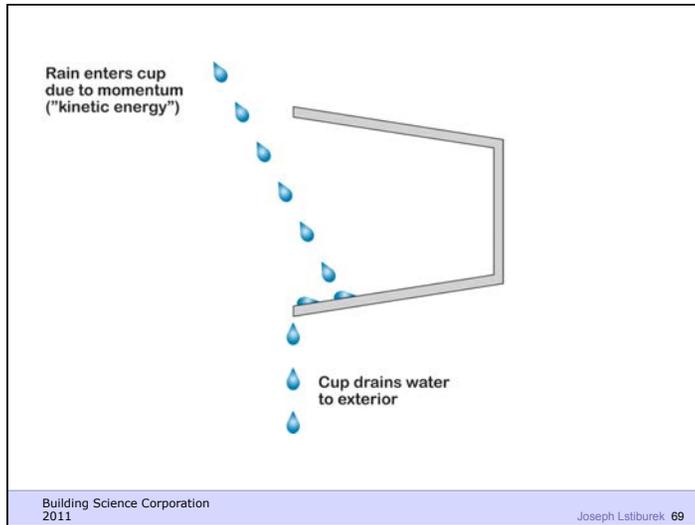


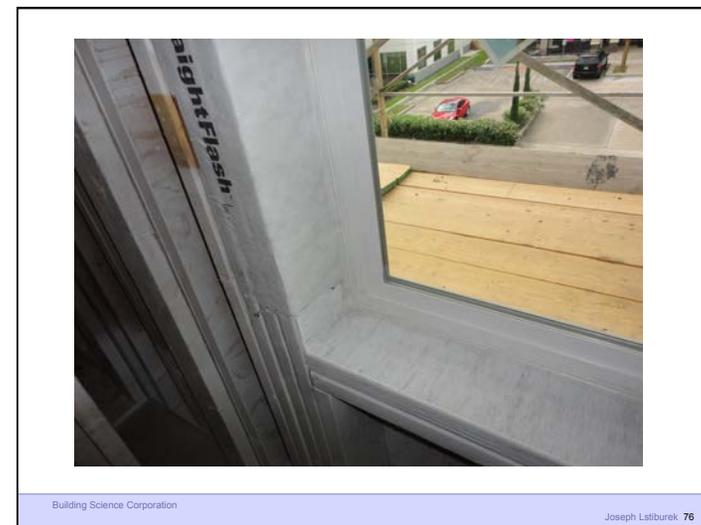
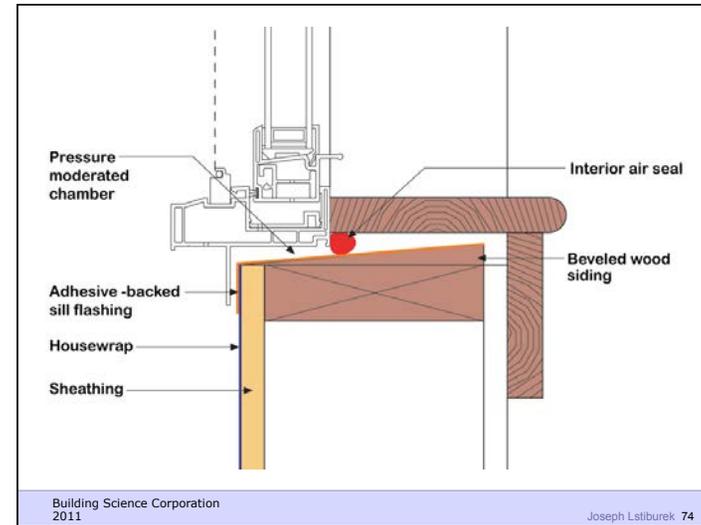
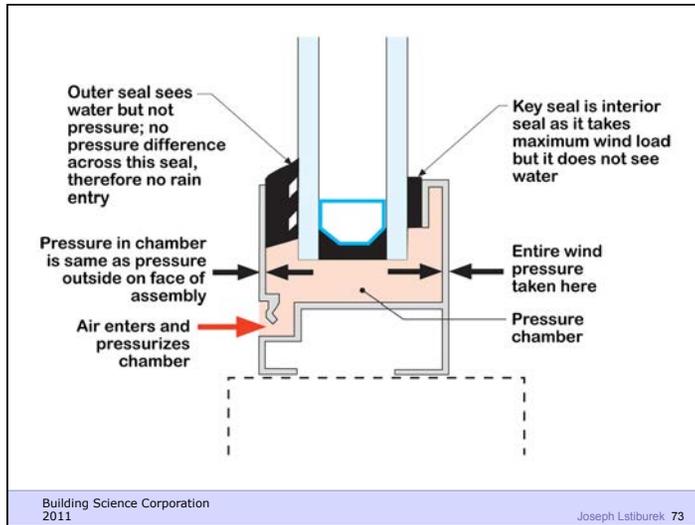




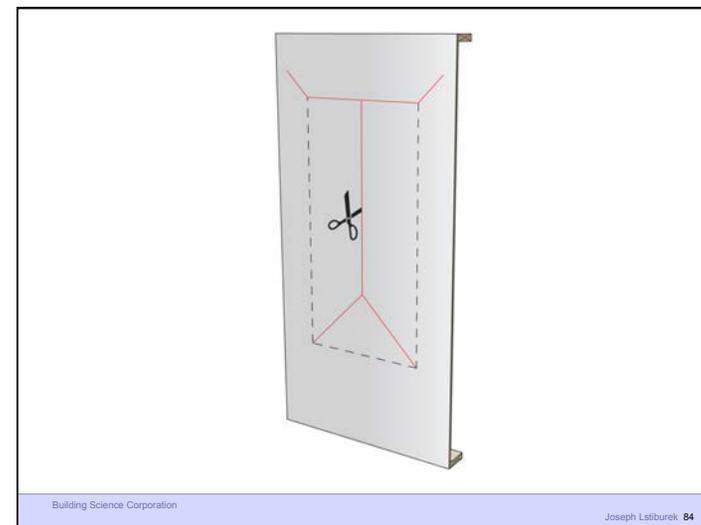
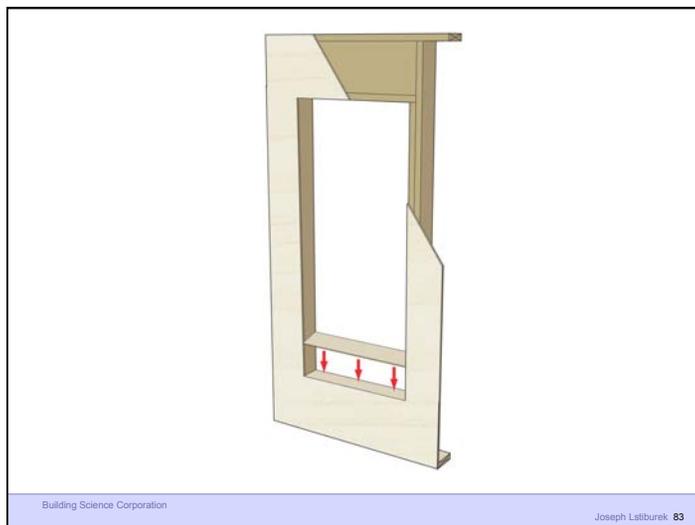
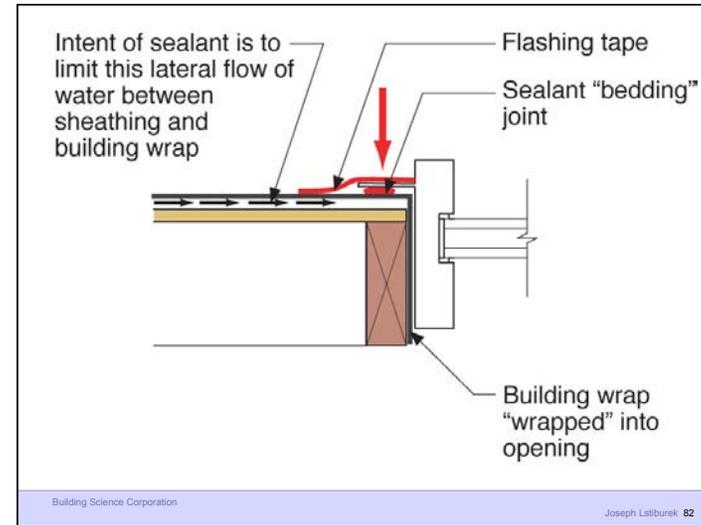


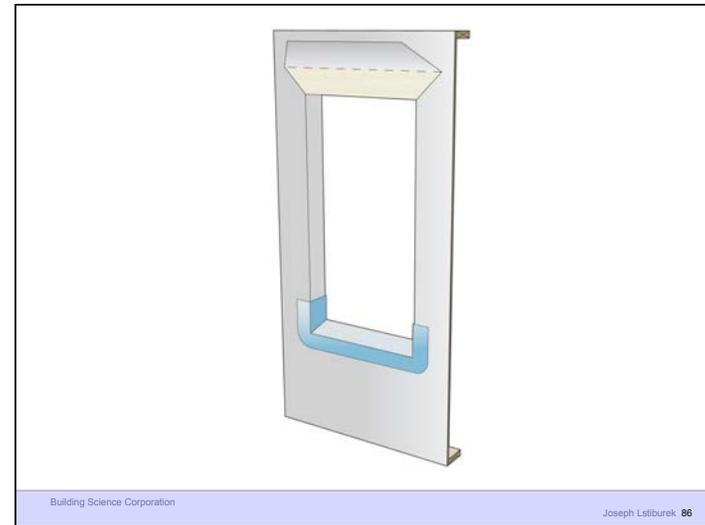
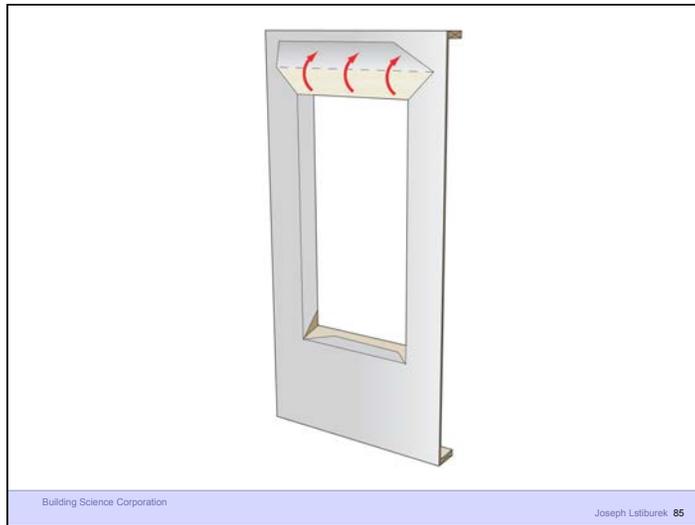




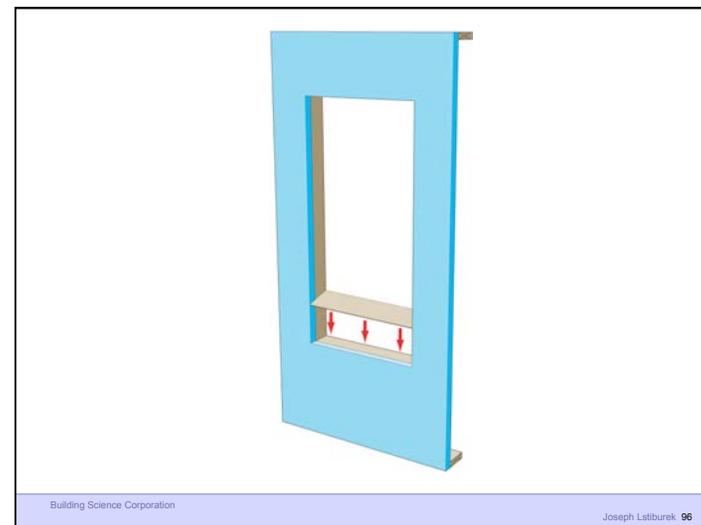
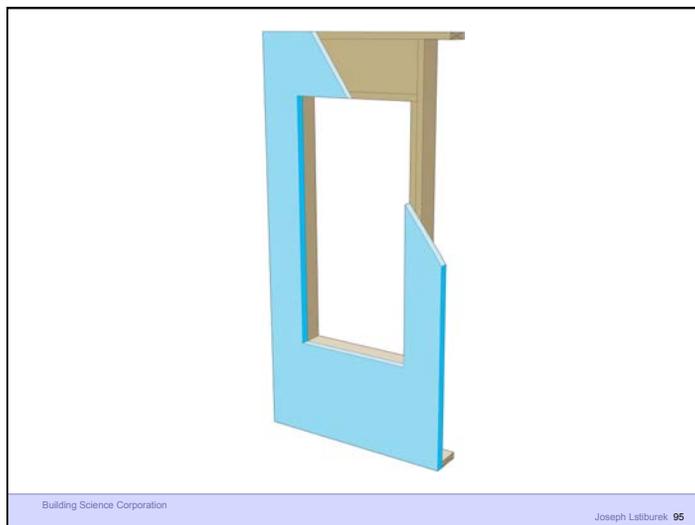


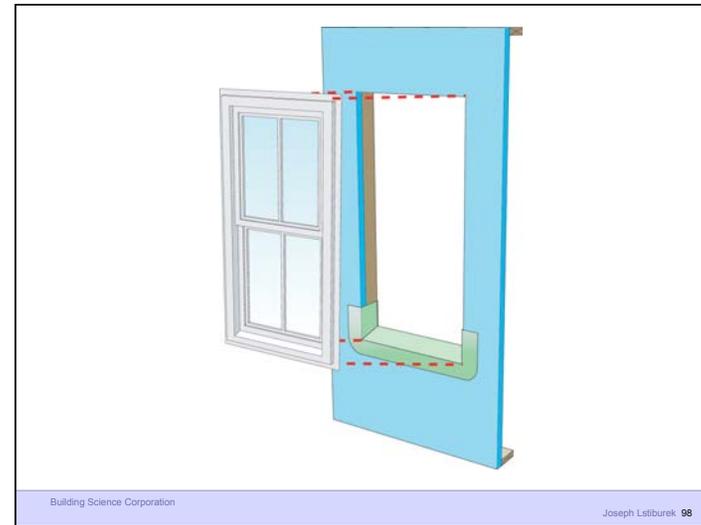
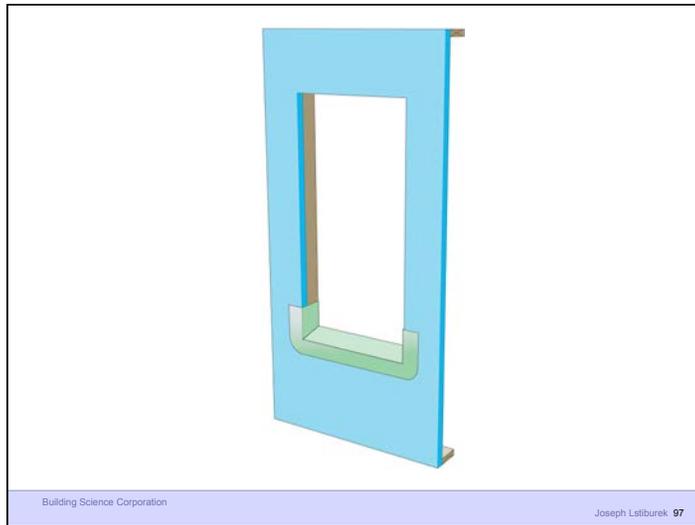


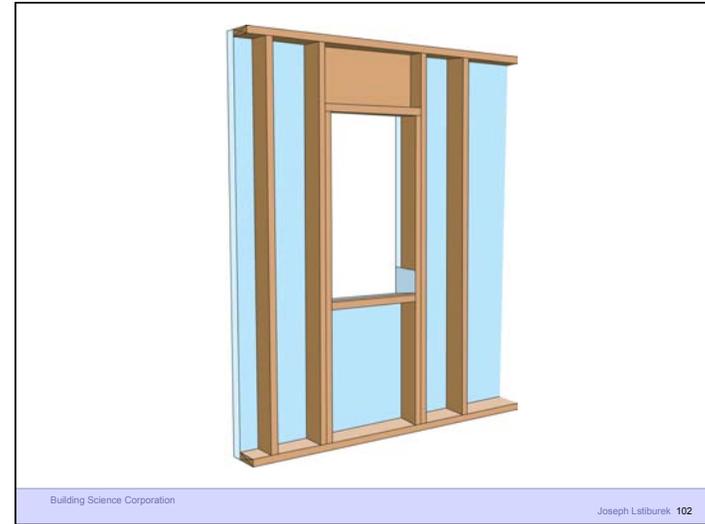
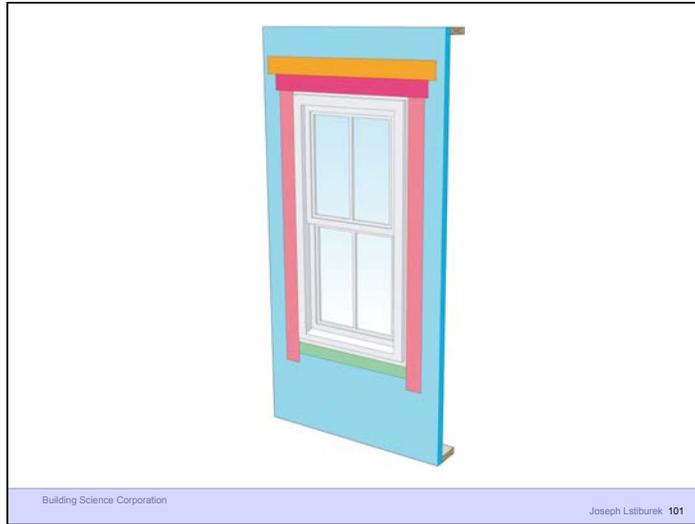


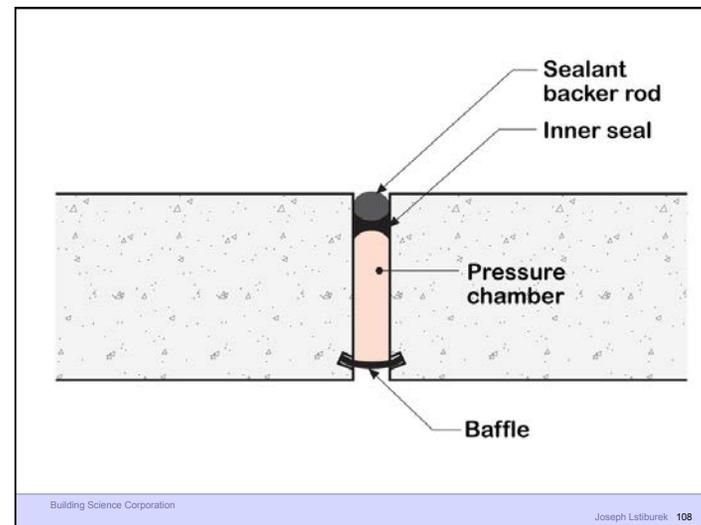
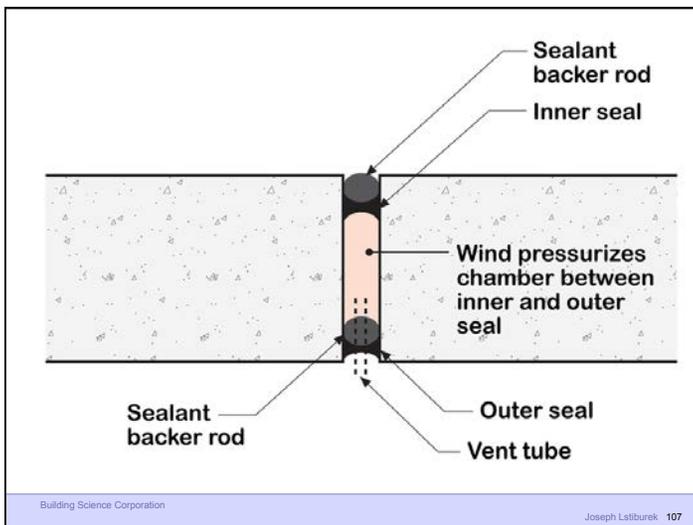
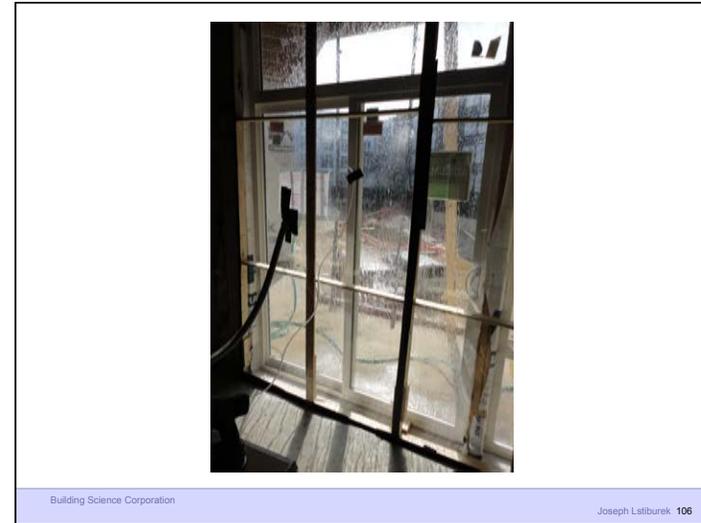


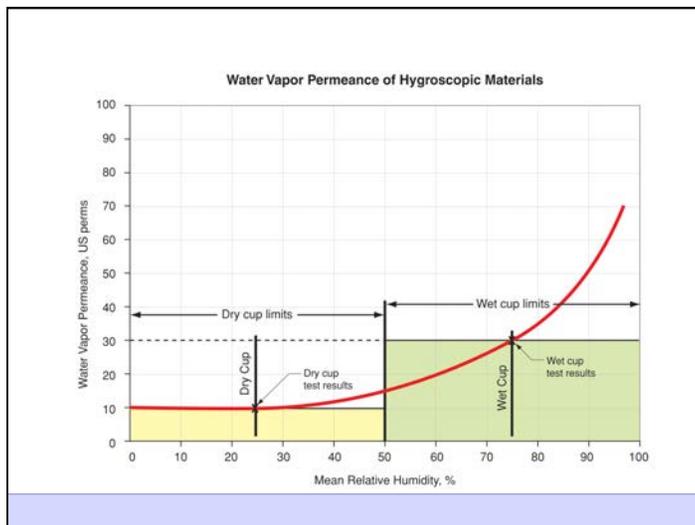
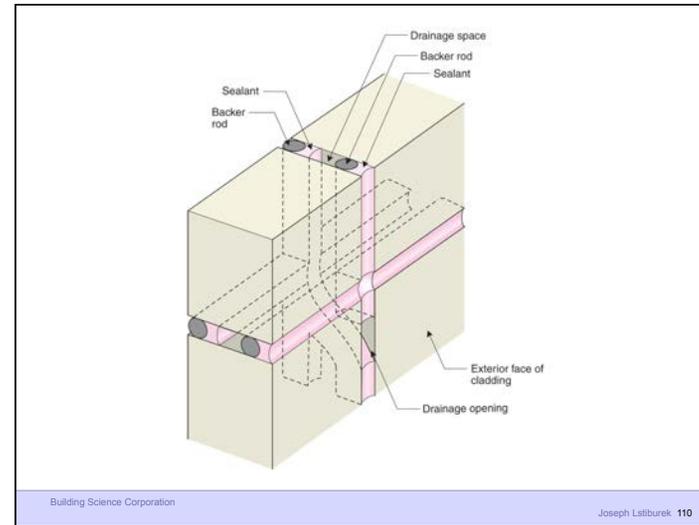
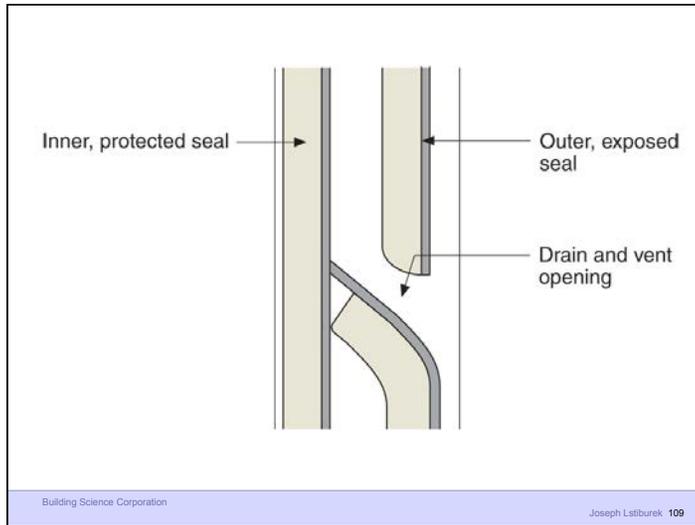


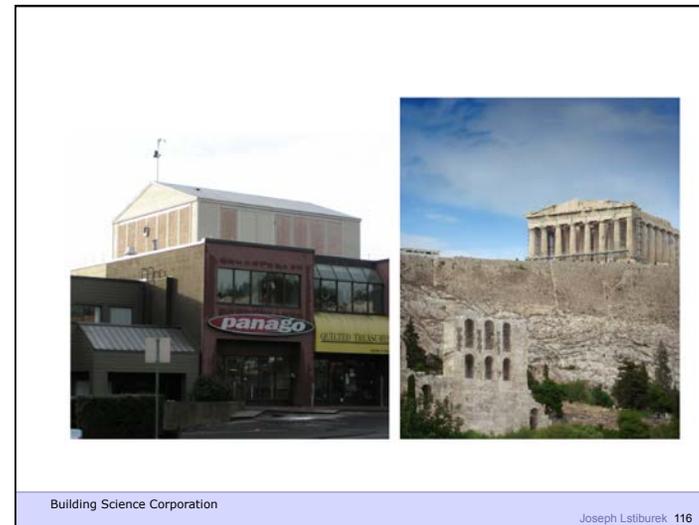
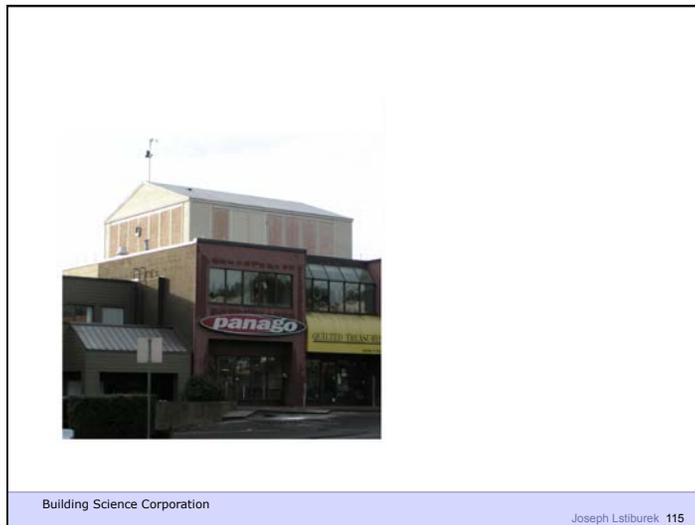
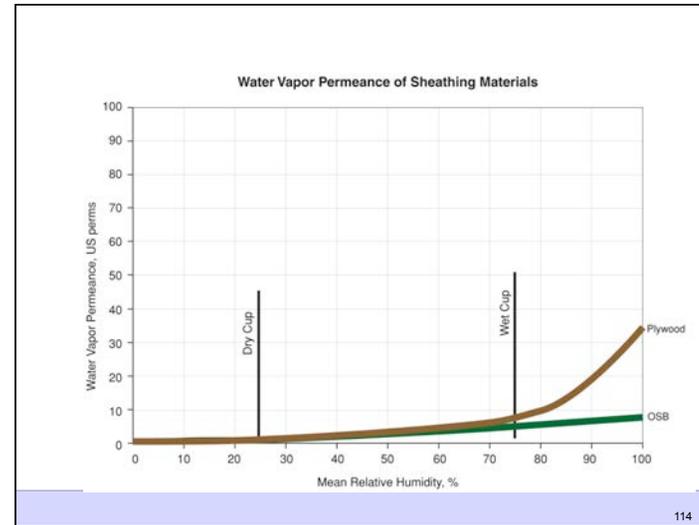
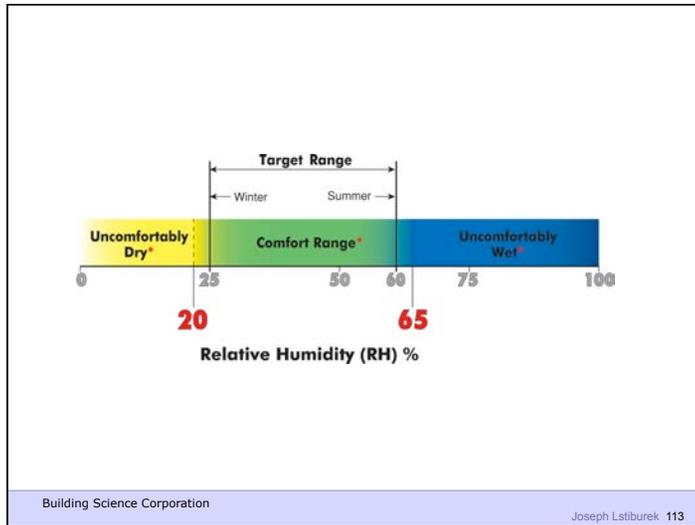


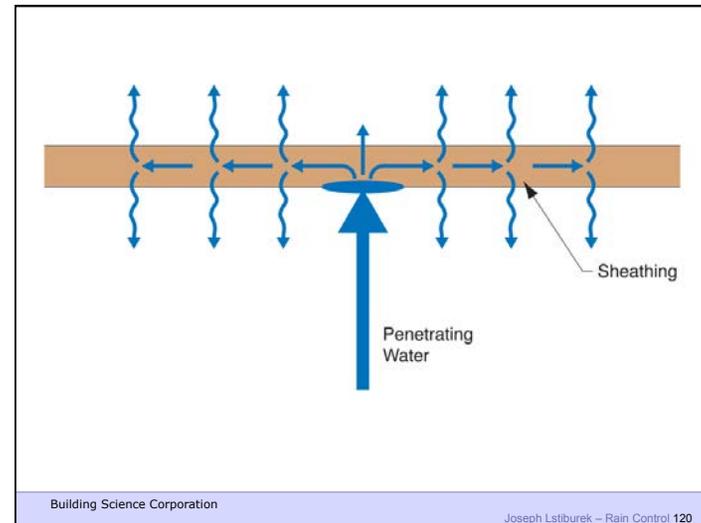
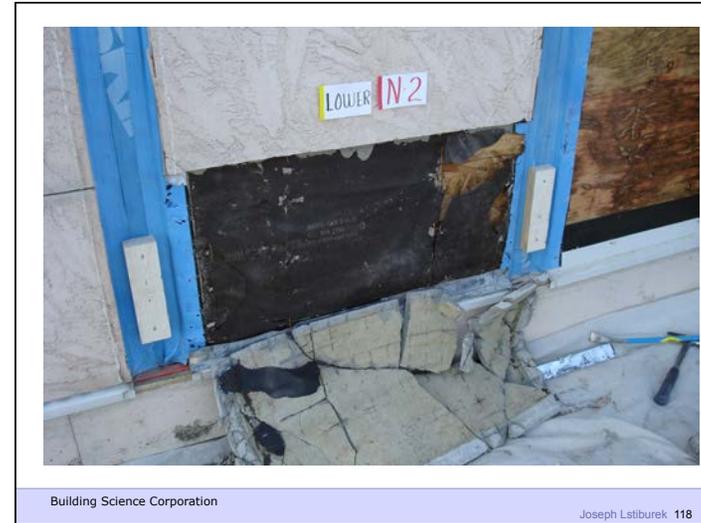


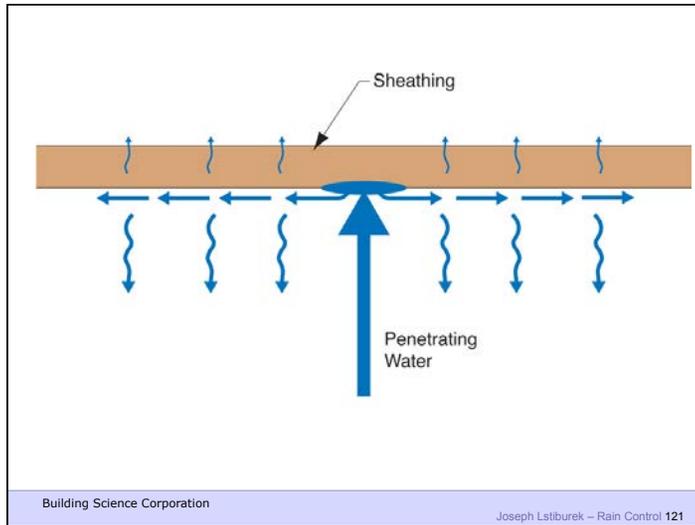






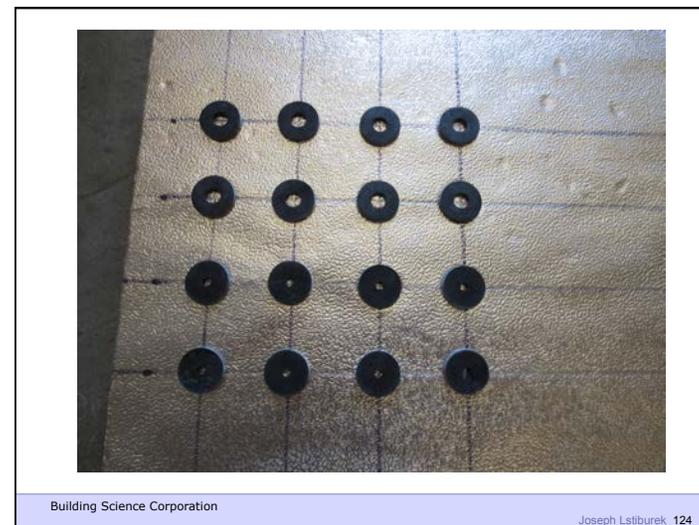






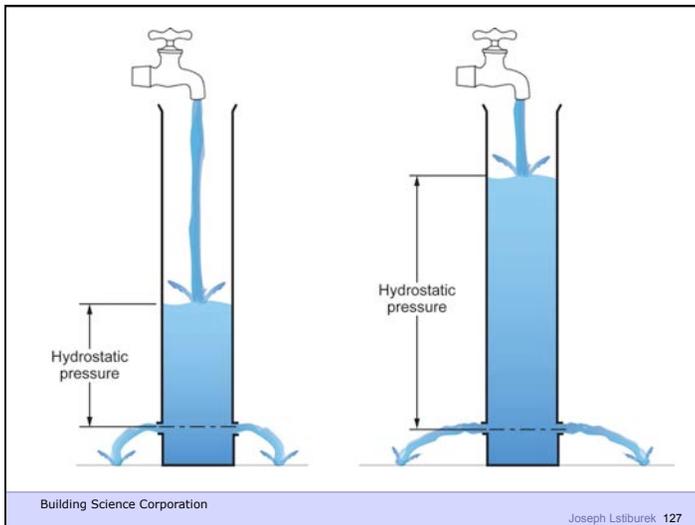
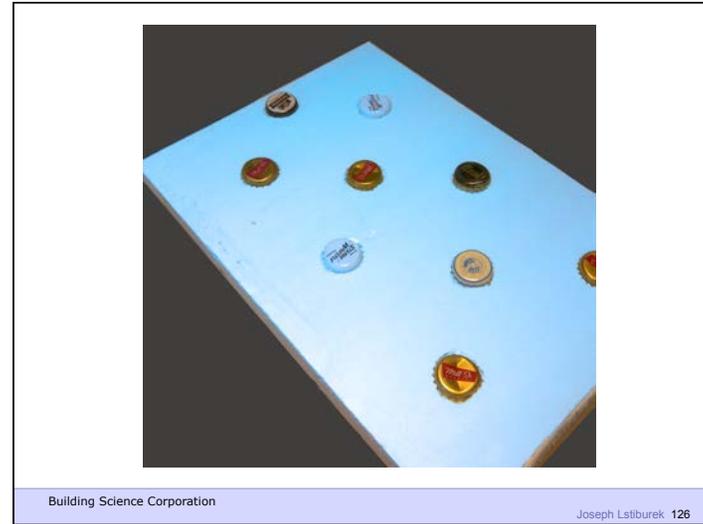
Rain Screen

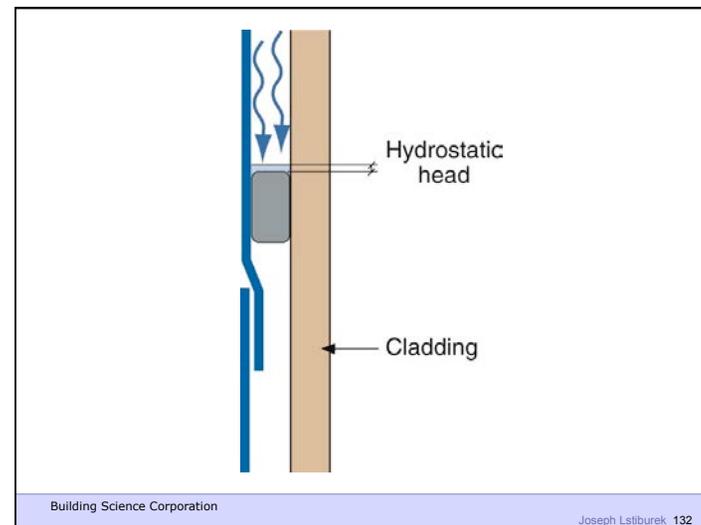
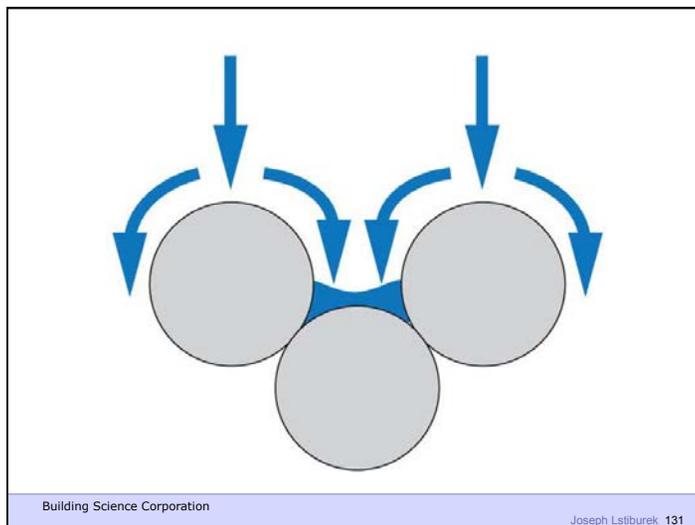
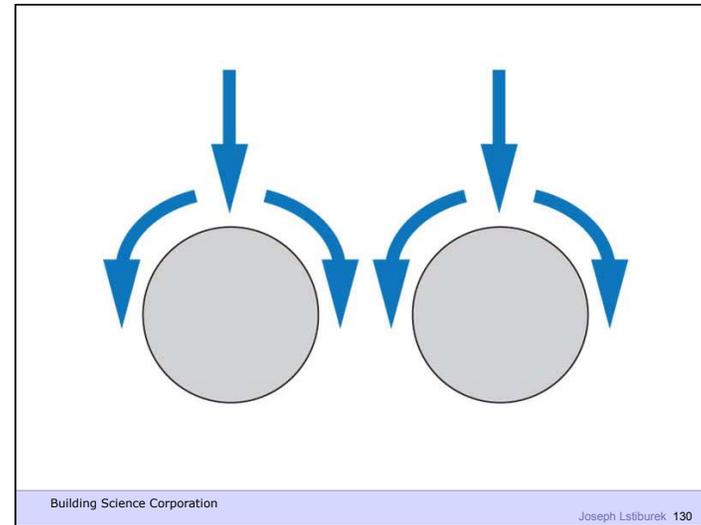
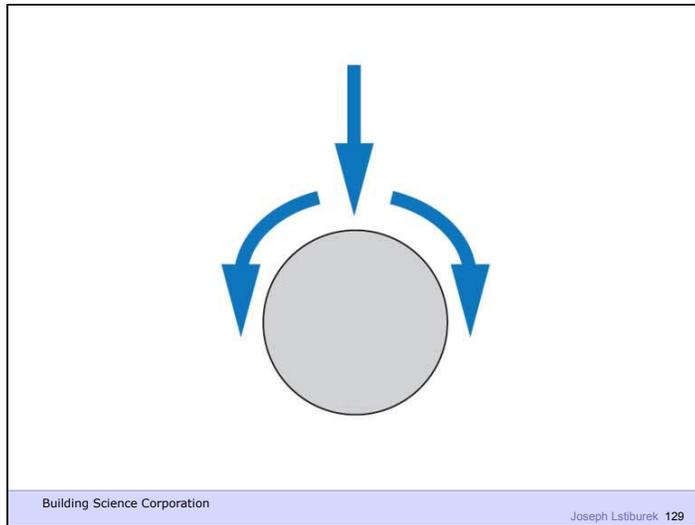
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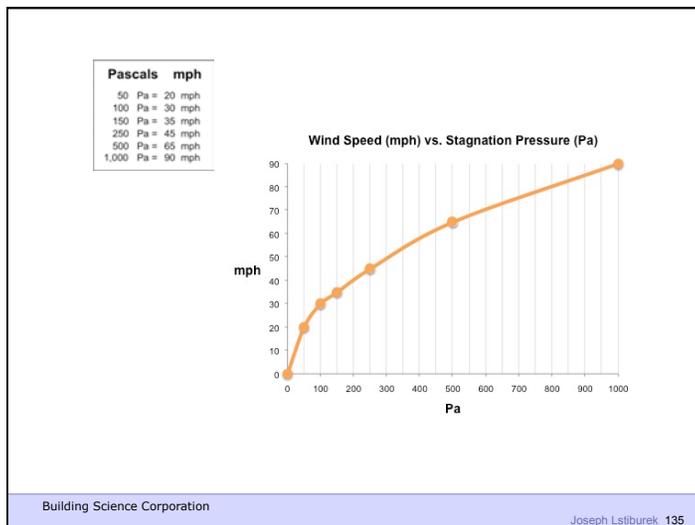
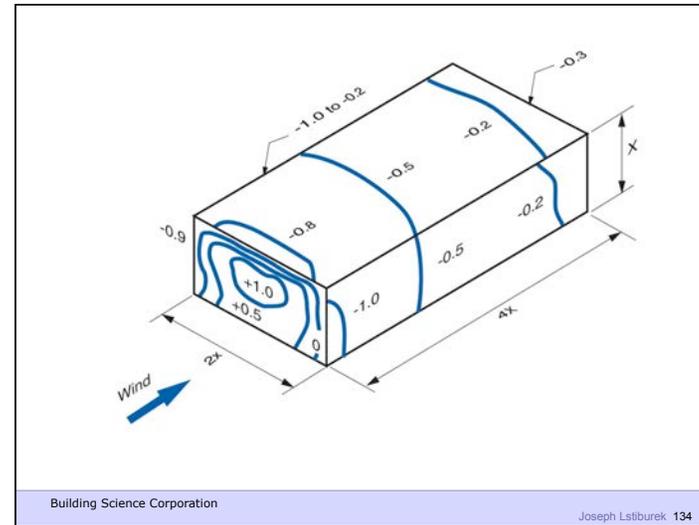
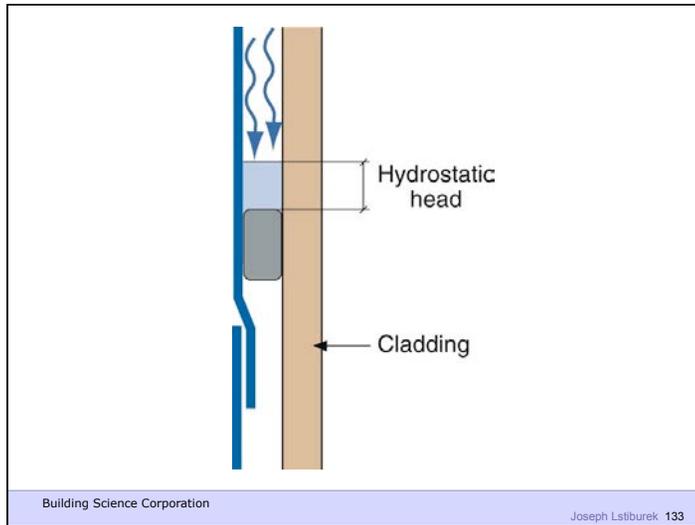


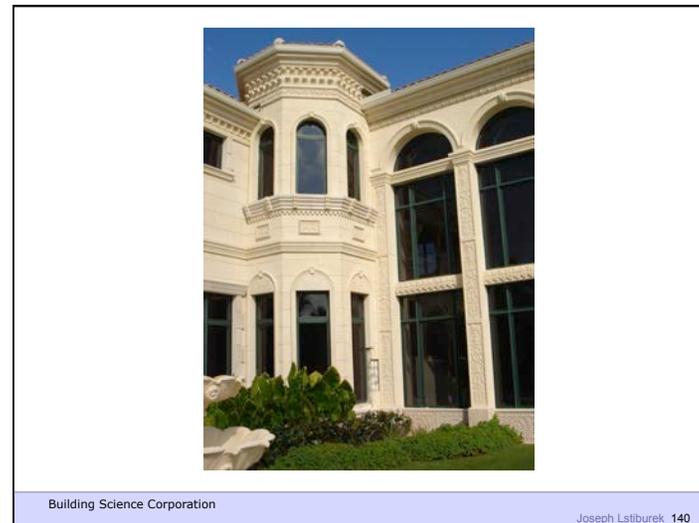
Beer Screen?

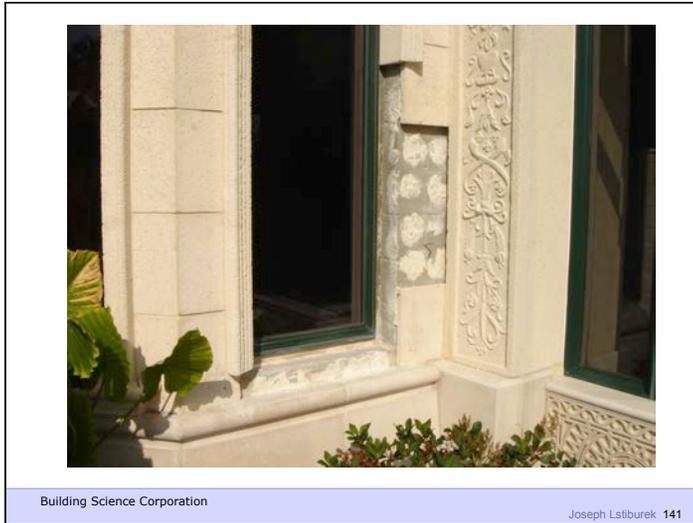
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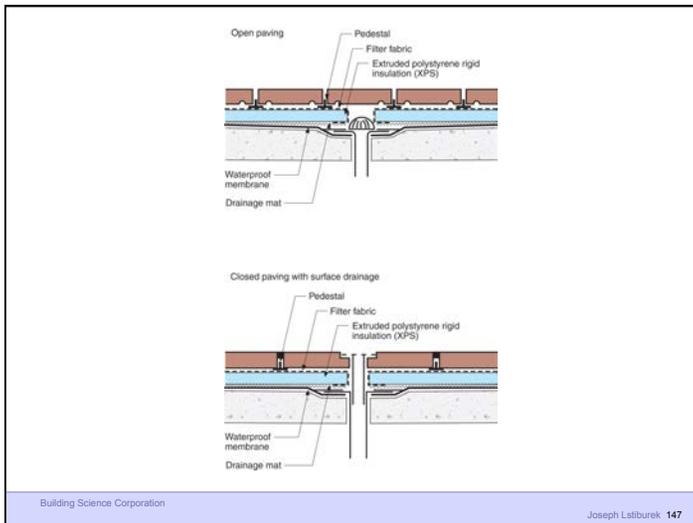
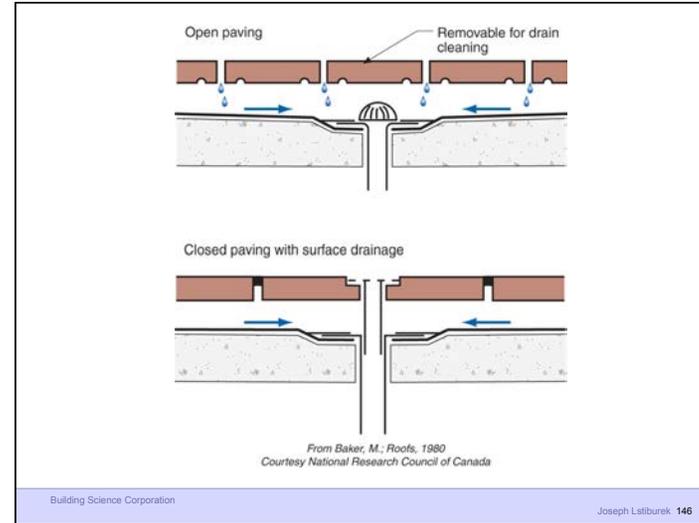
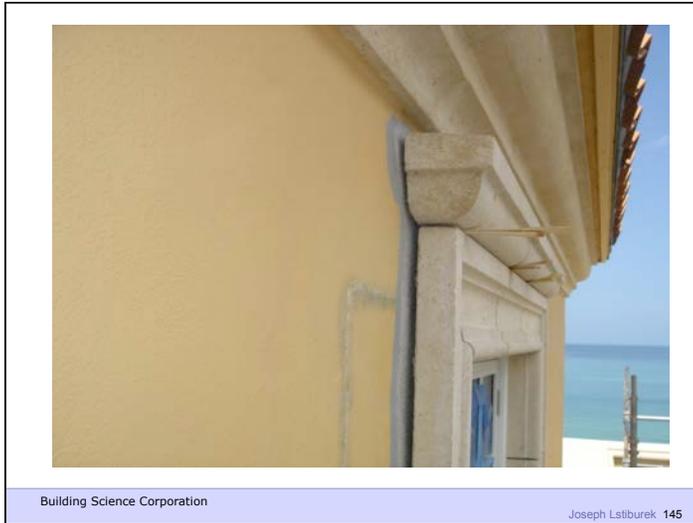


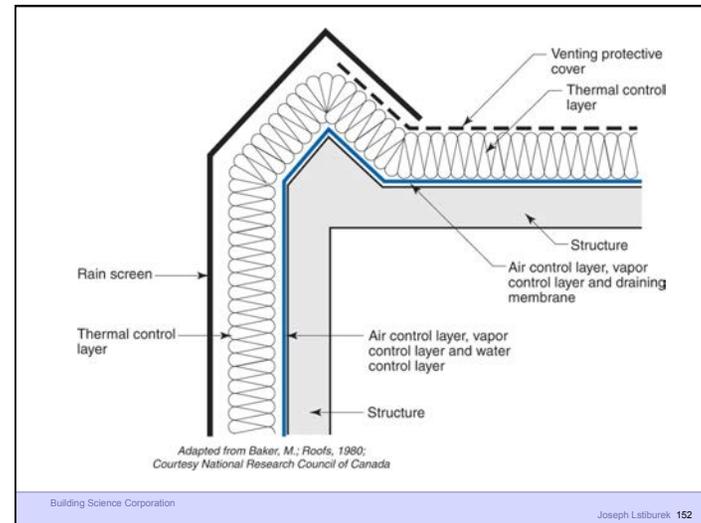
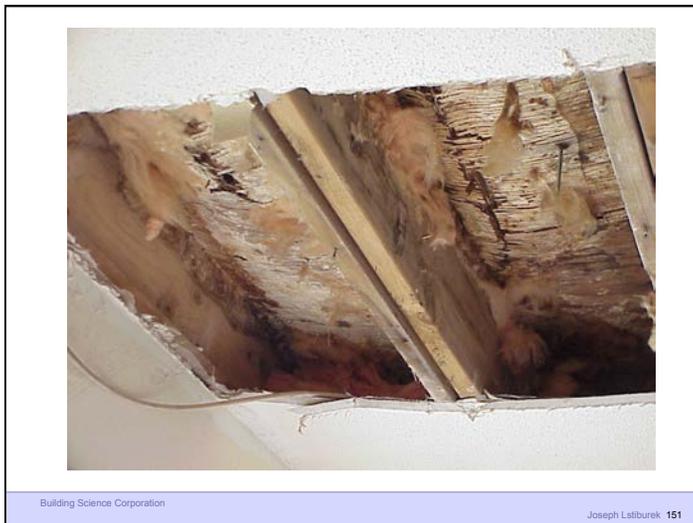
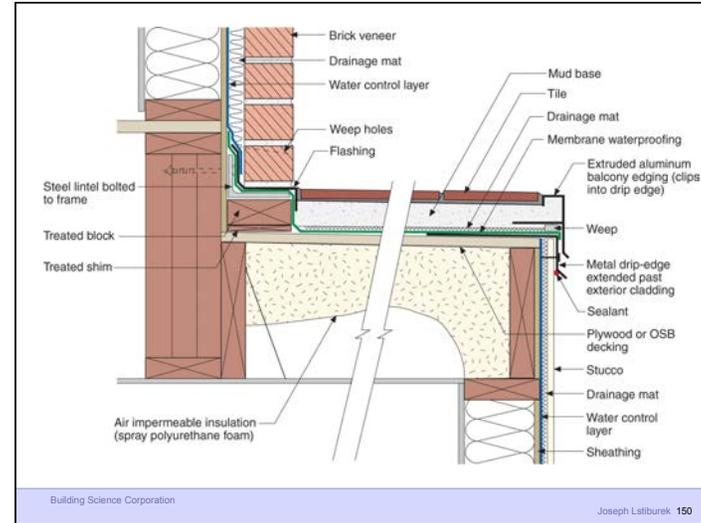


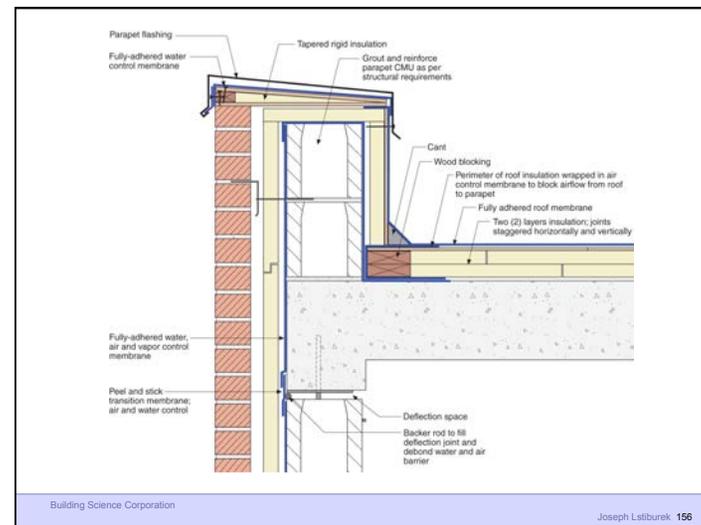
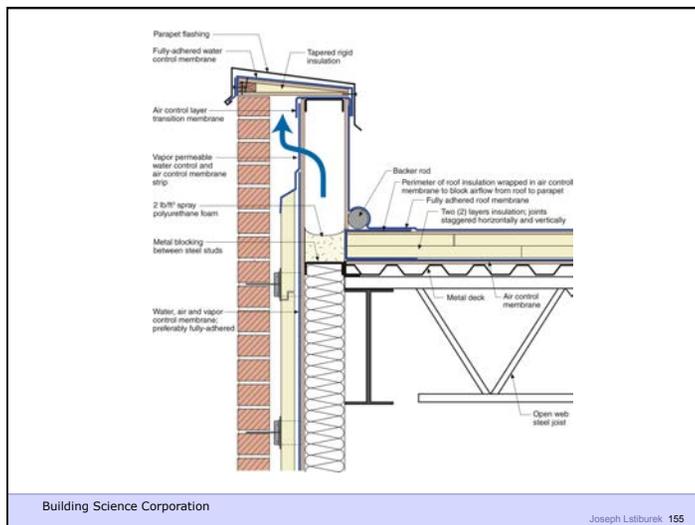
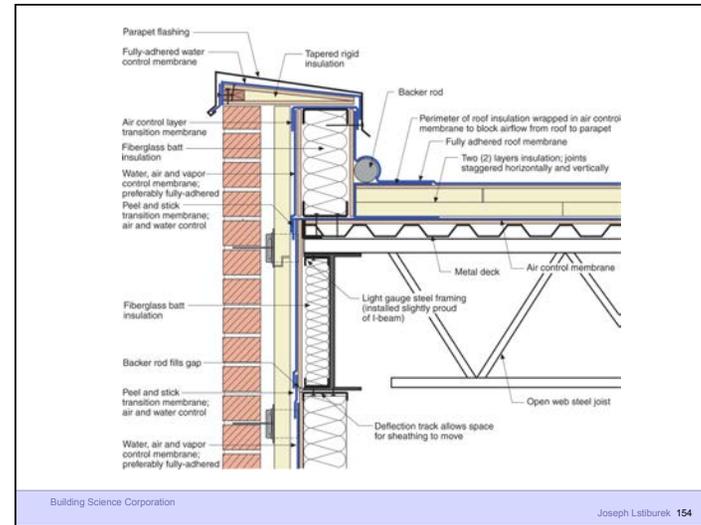
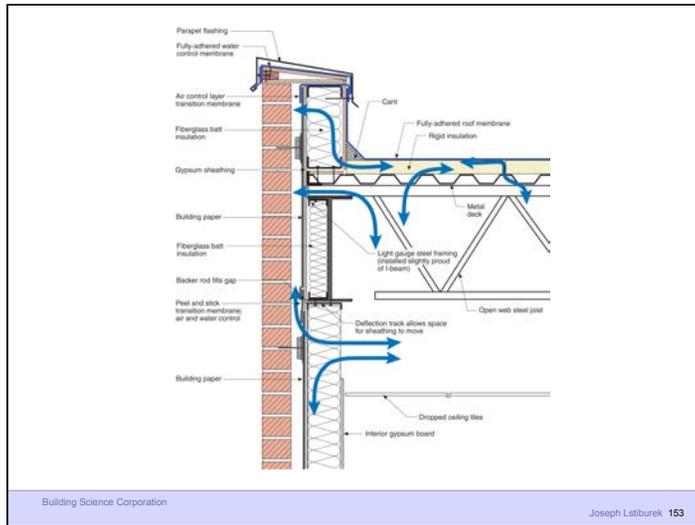


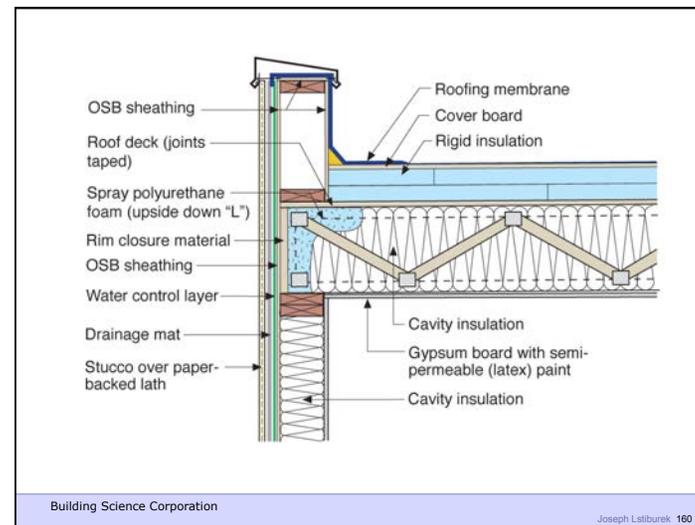
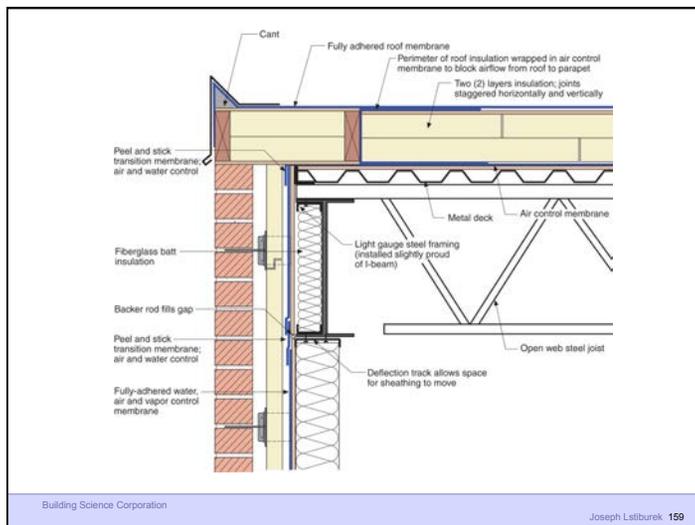
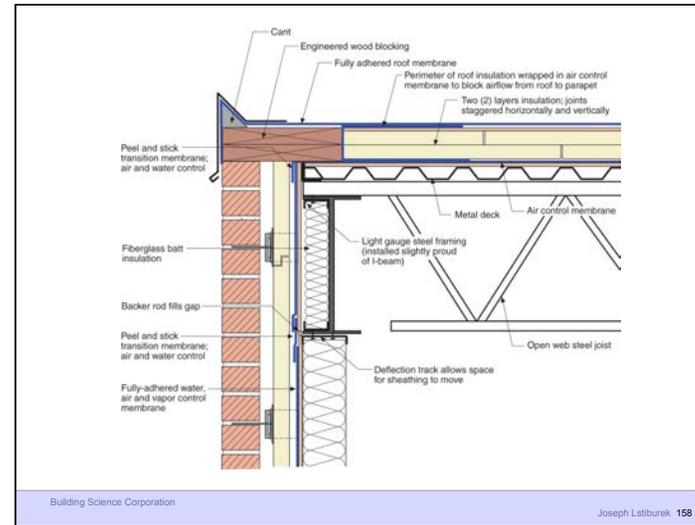
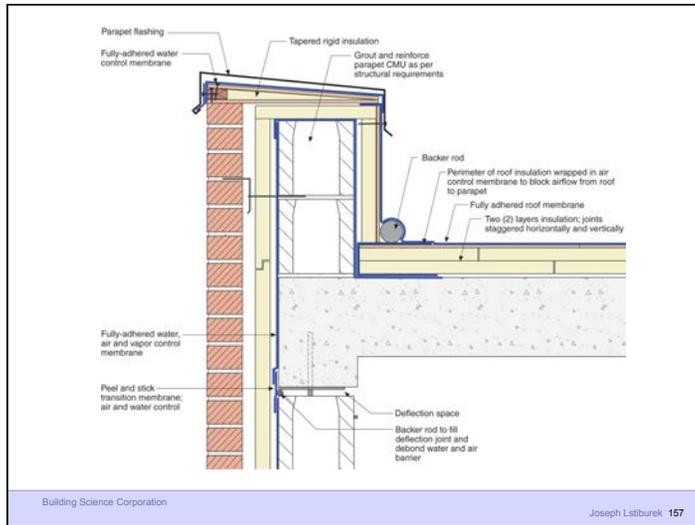


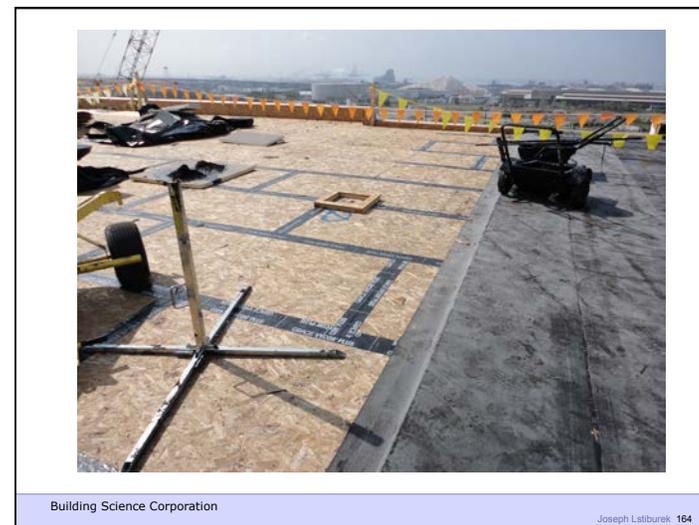
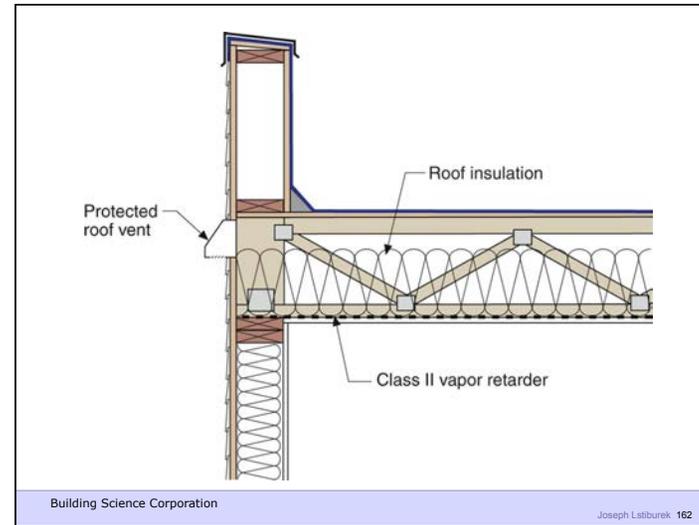
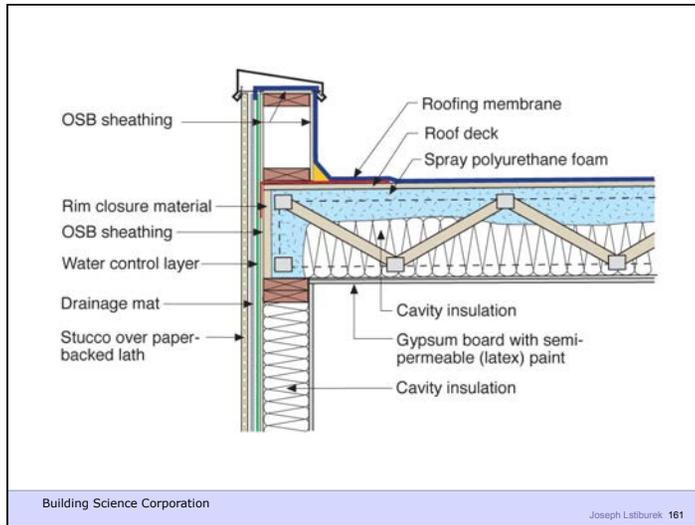


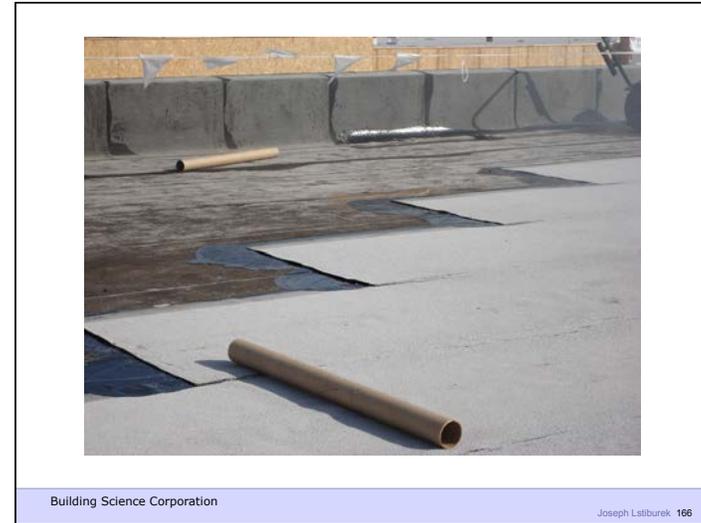
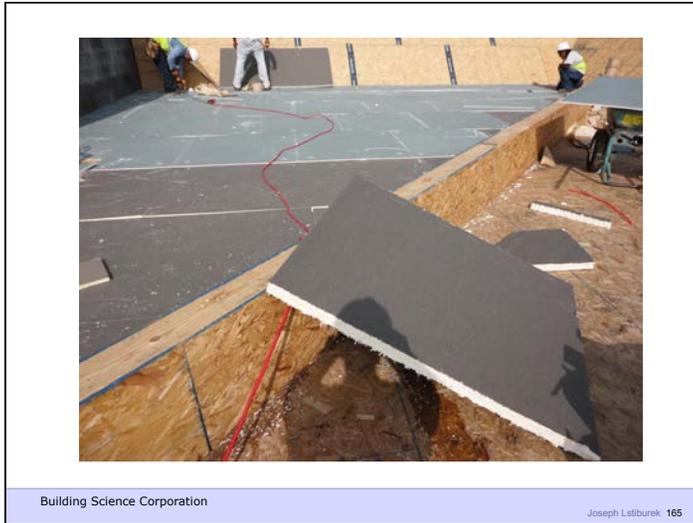


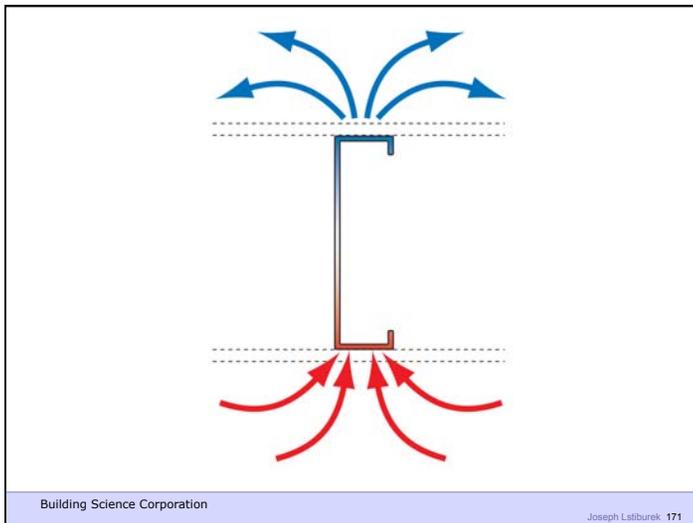
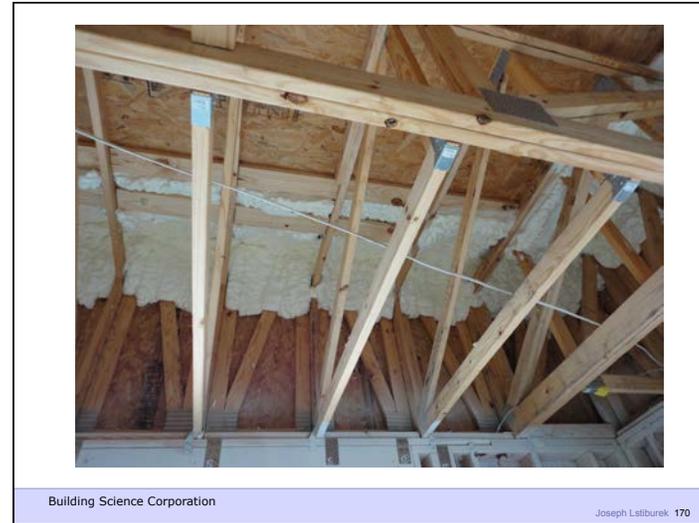
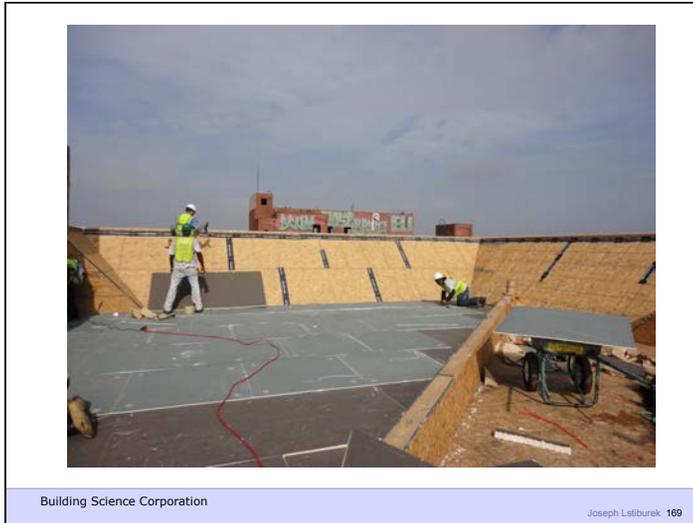


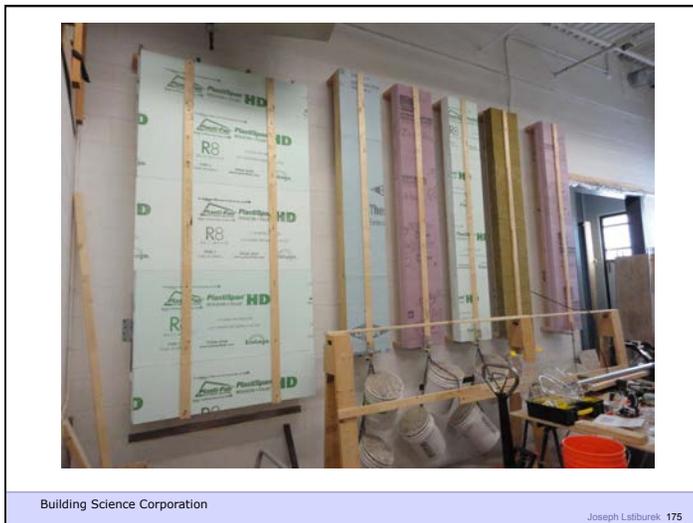


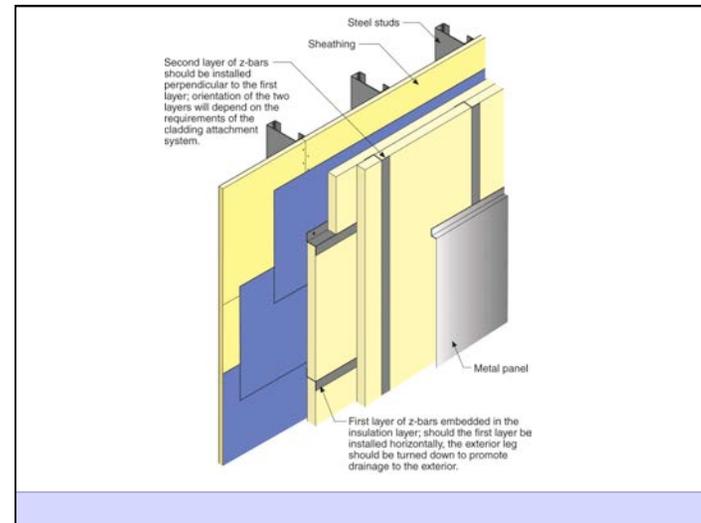
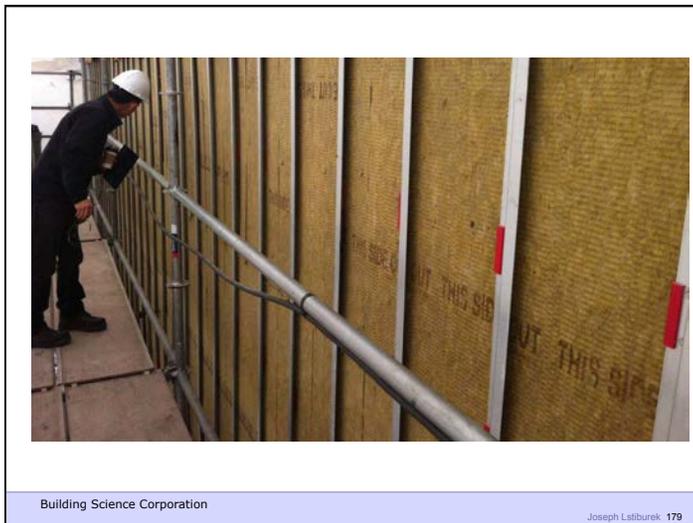
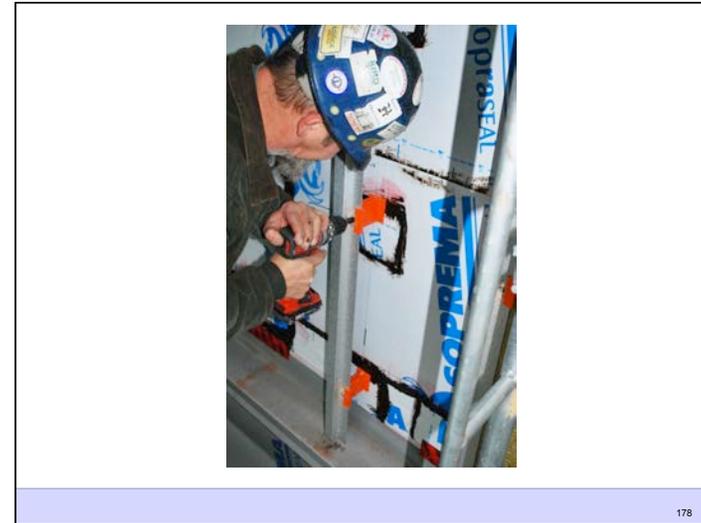
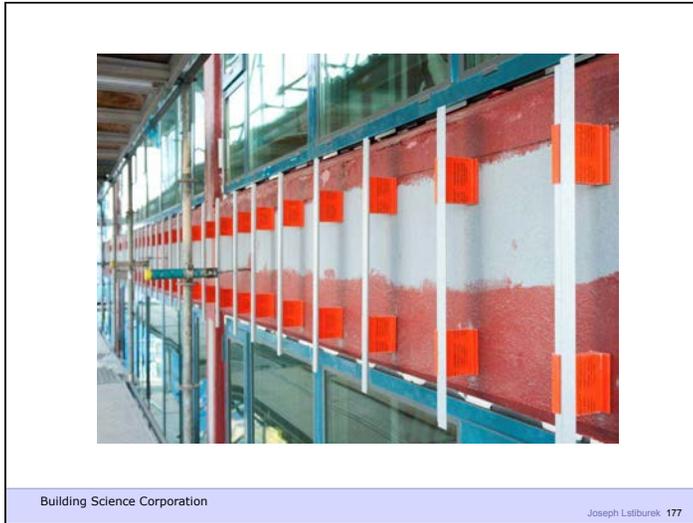


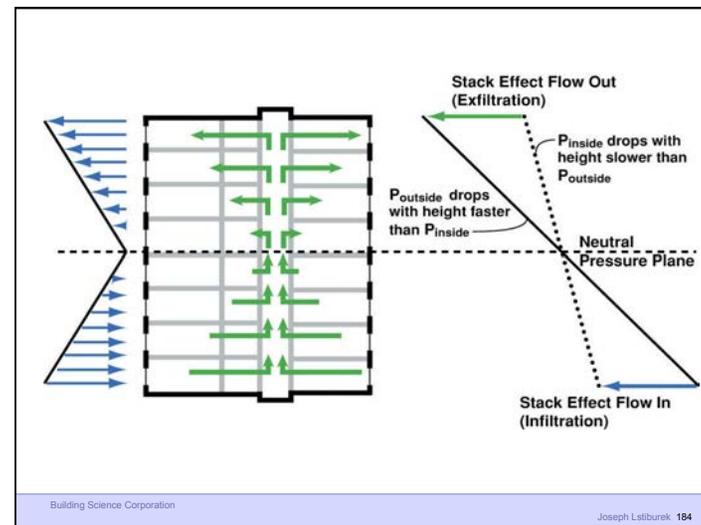
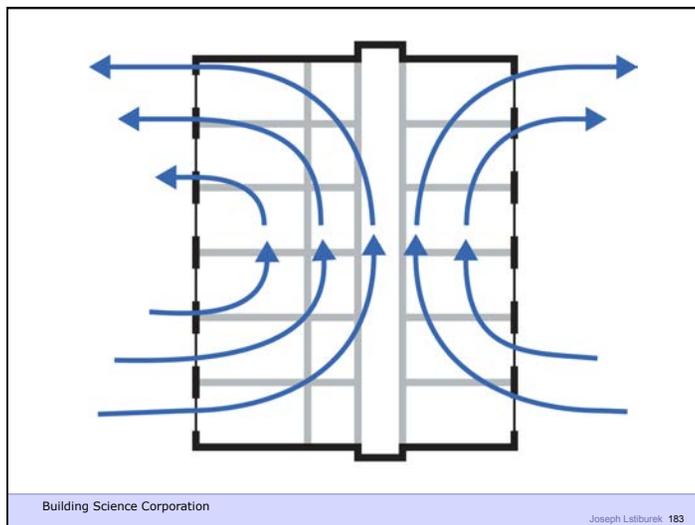
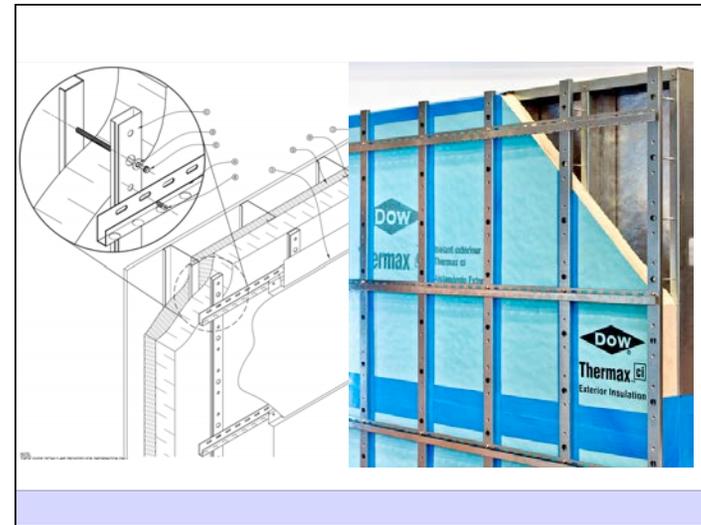
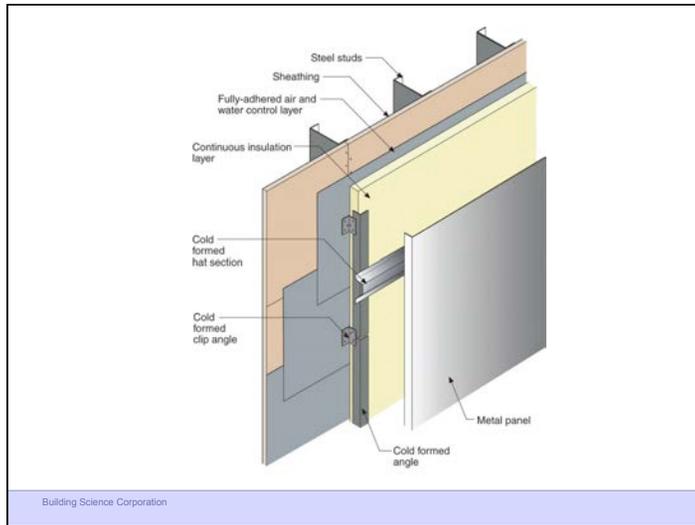


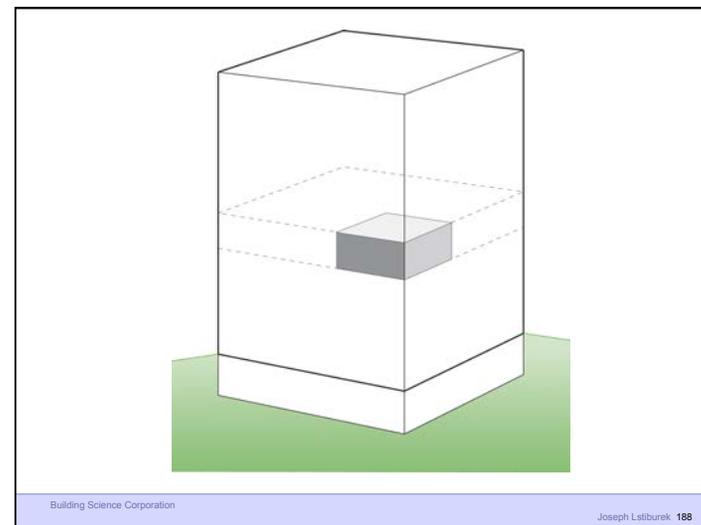
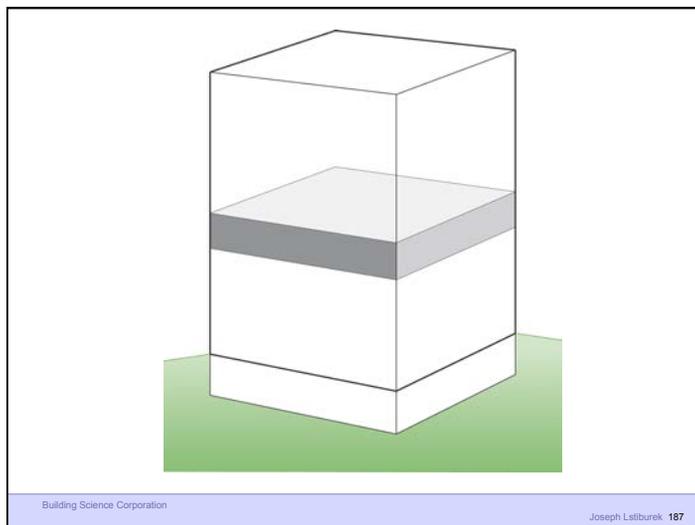
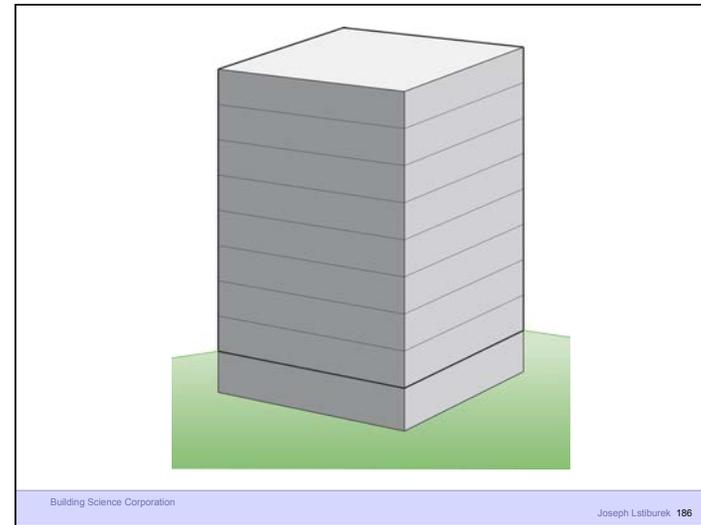
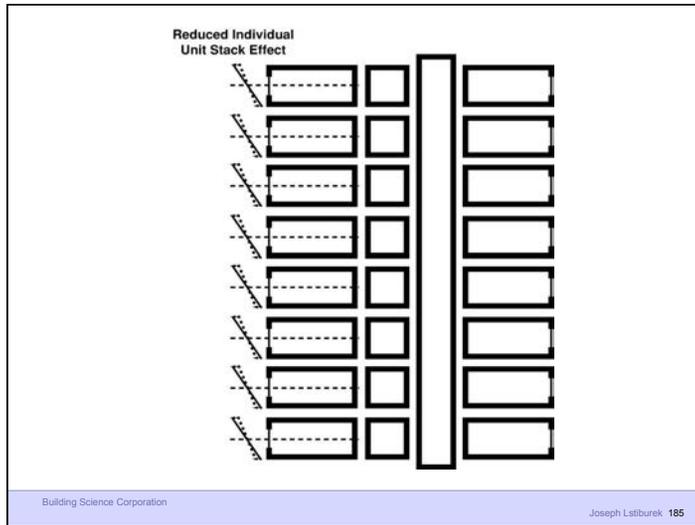


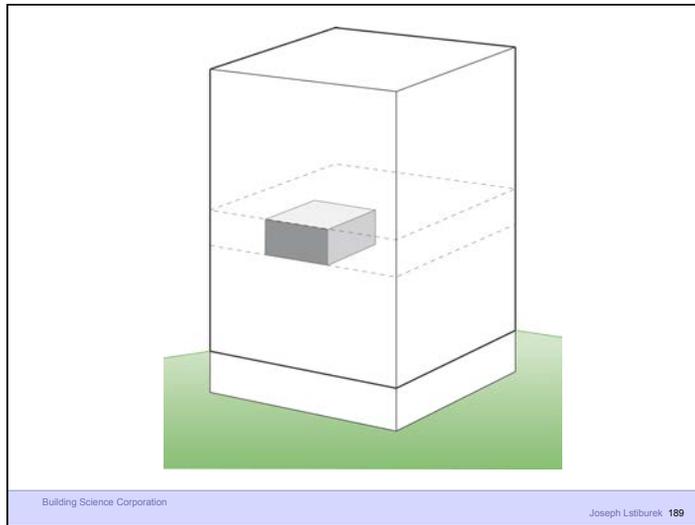












Air Barrier Metrics

Material	0.02 I/(s-m2)@75 Pa
Assembly	0.20 I/(s-m2)@75 Pa
Enclosure	2.00 I/(s-m2)@75 Pa

Building Science Corporation Joseph Lstiburek 190

