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

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

Rudolf Clausius

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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

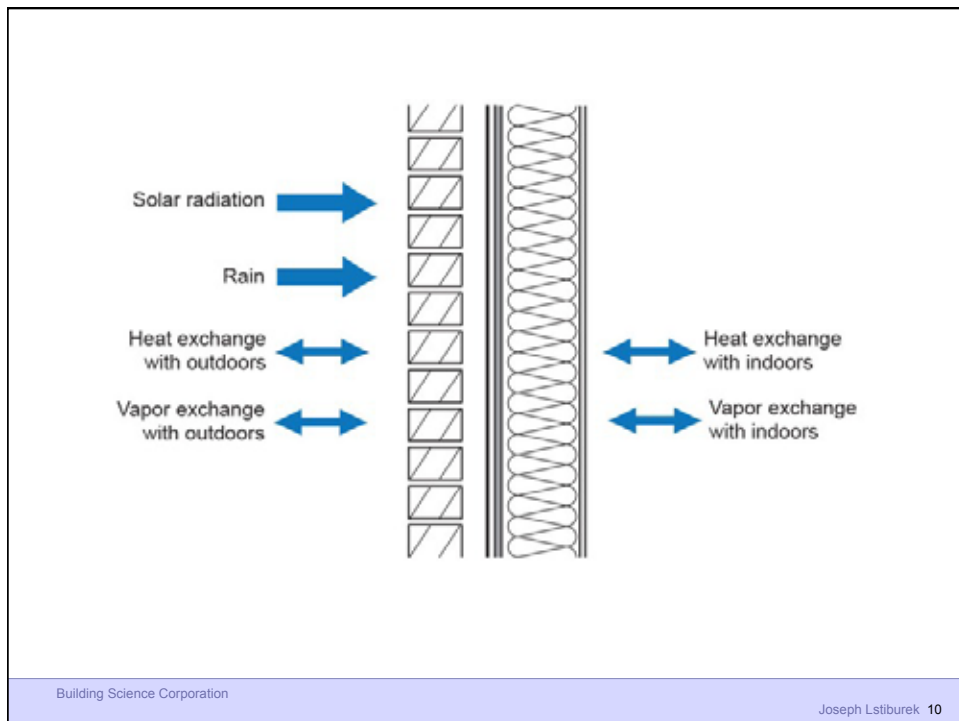
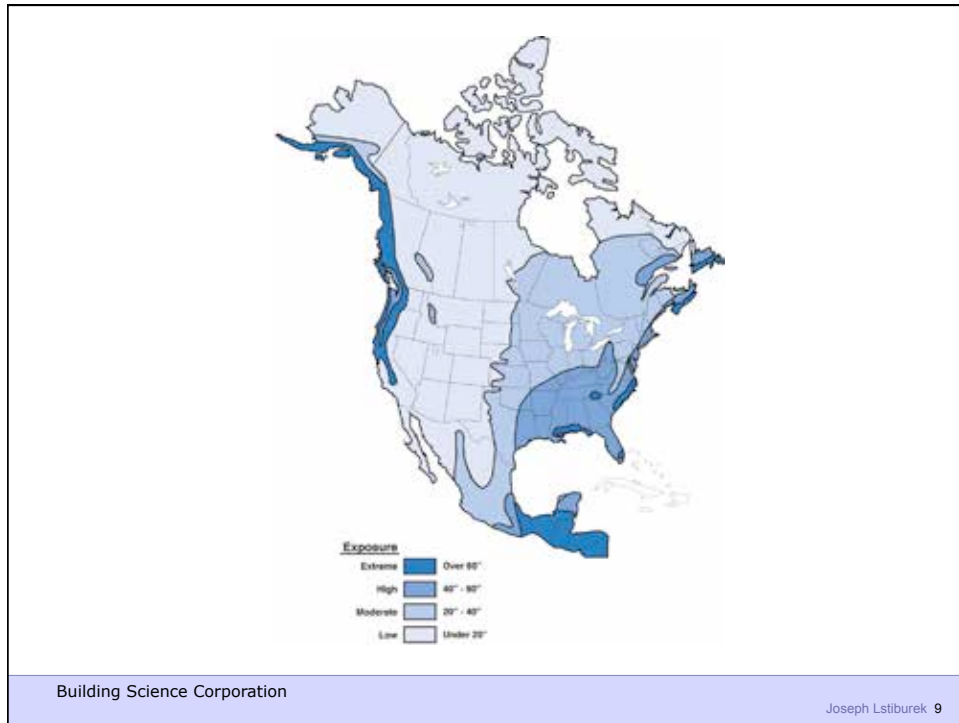
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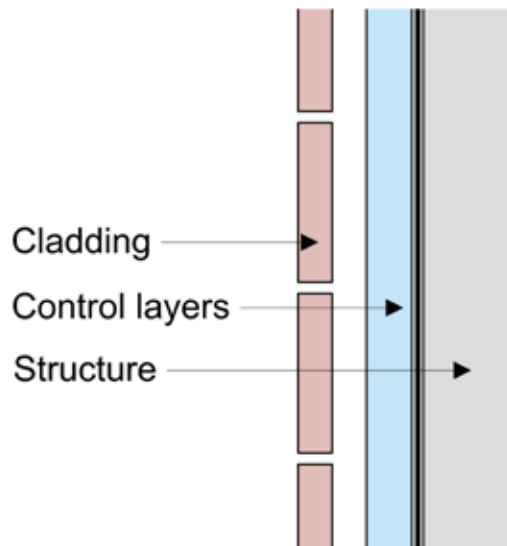


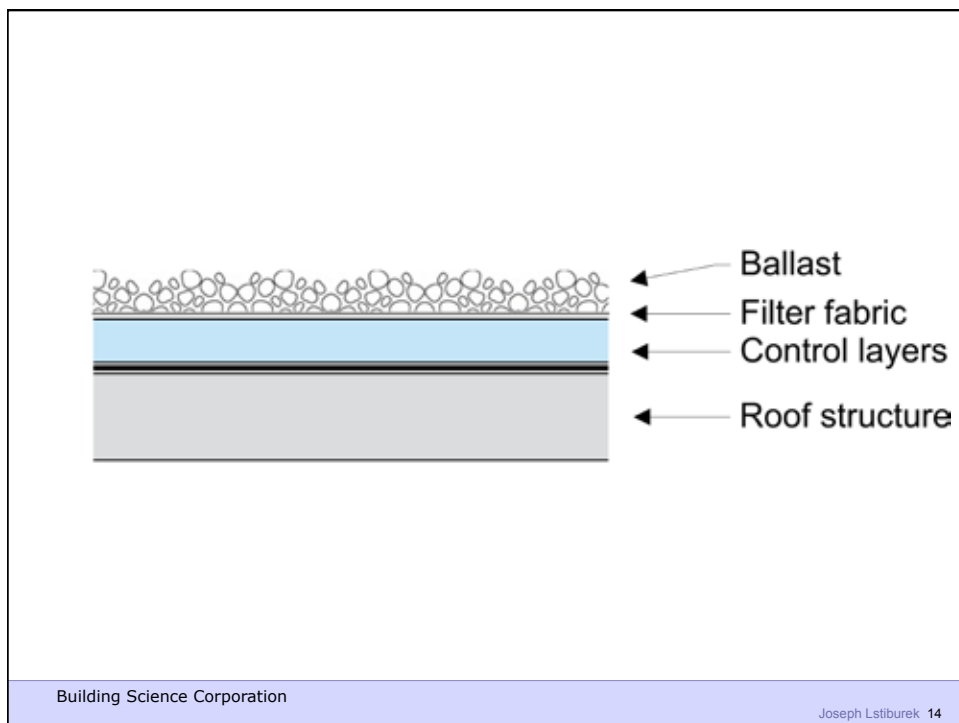
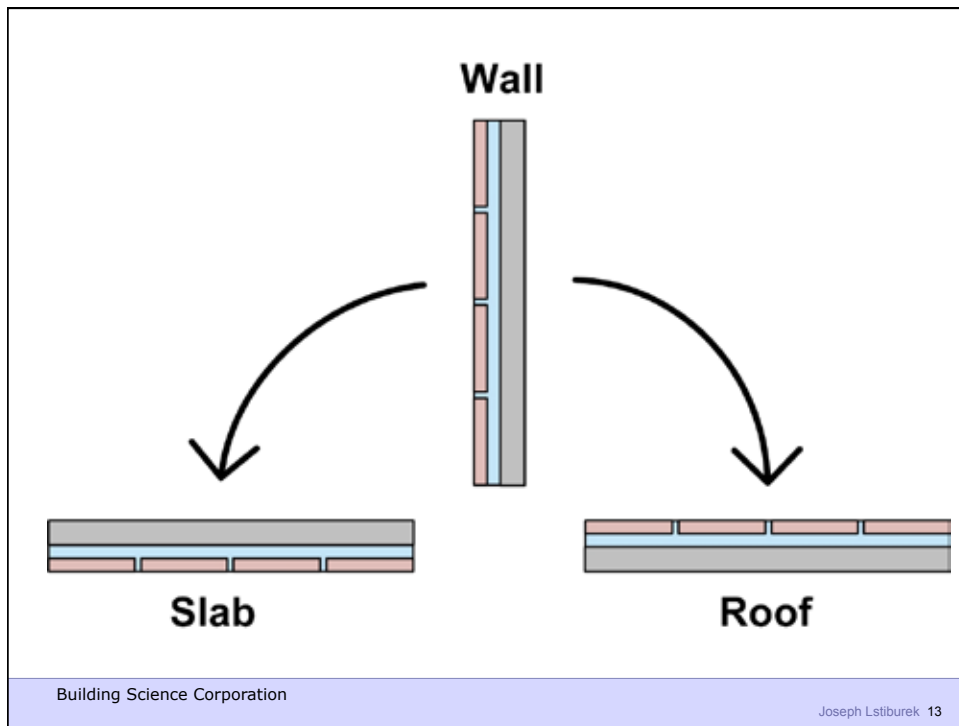
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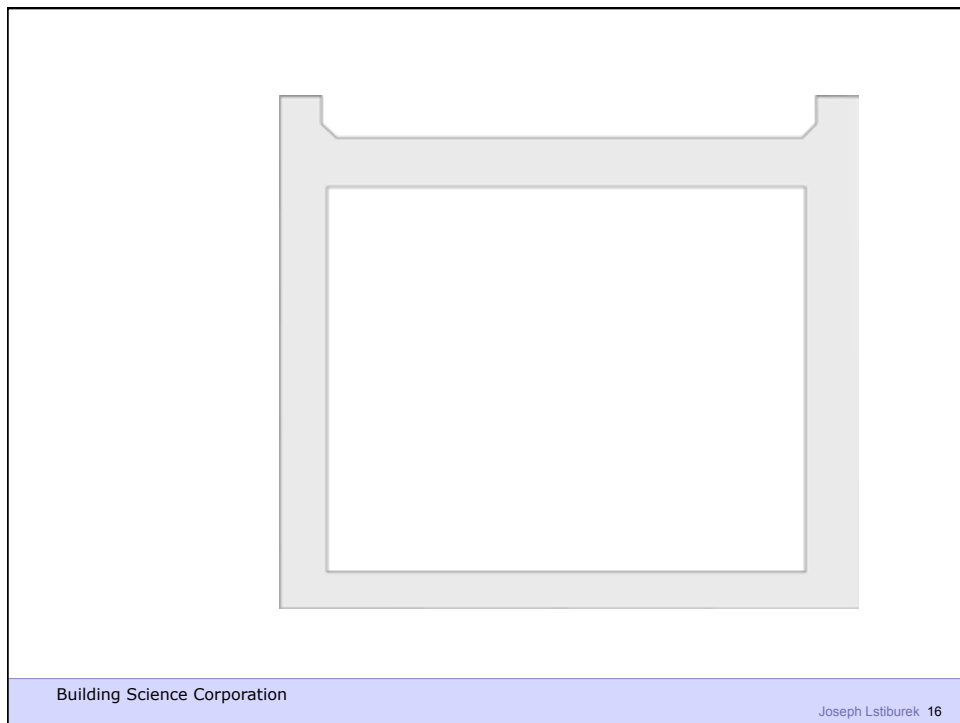
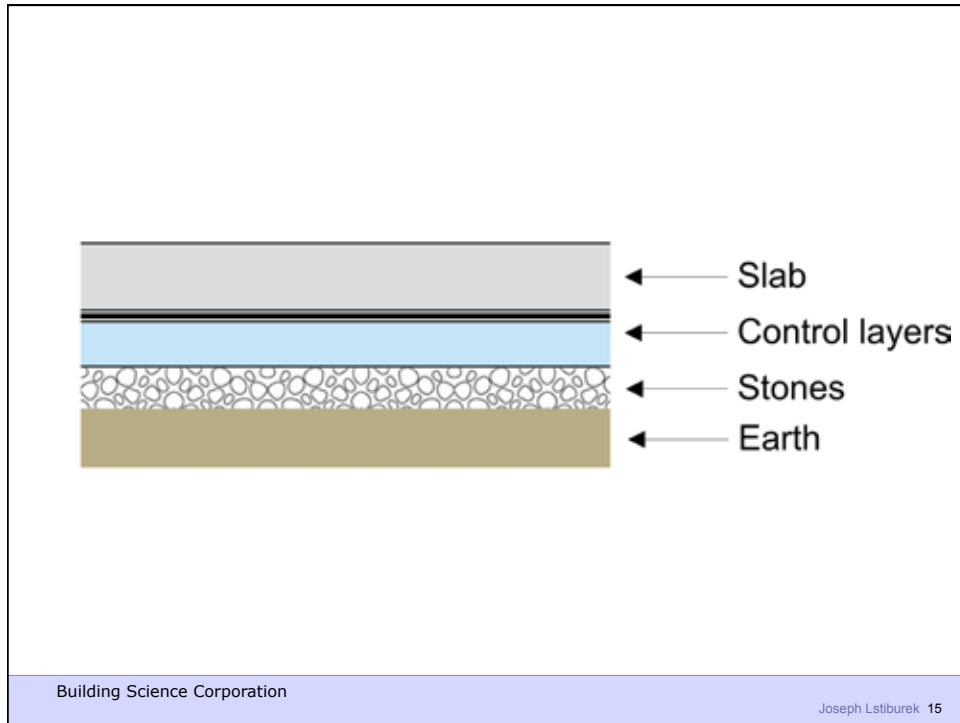
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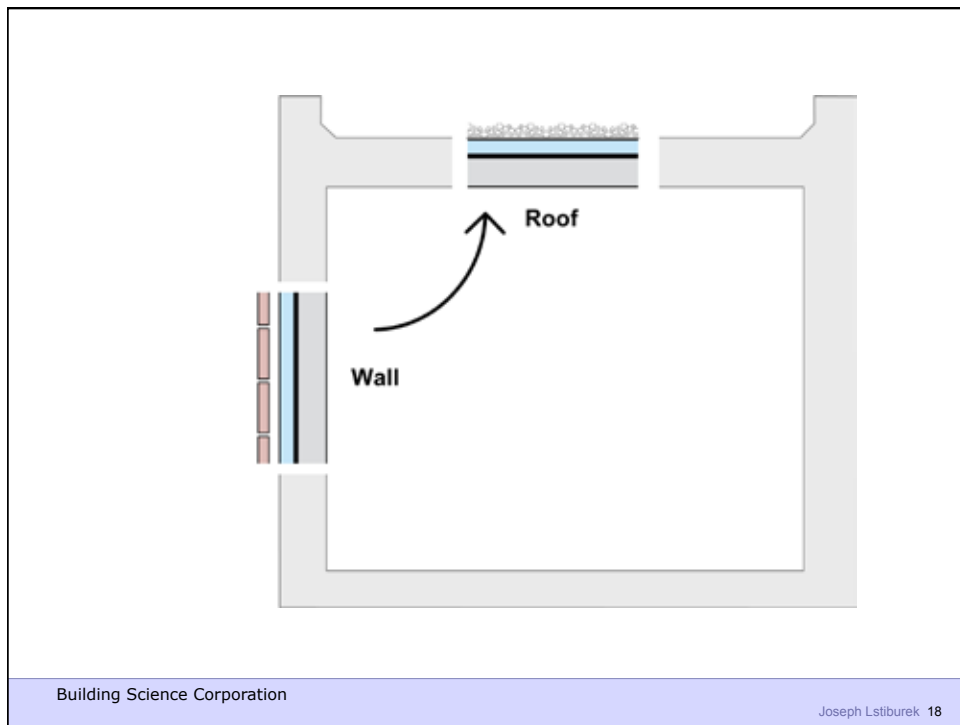
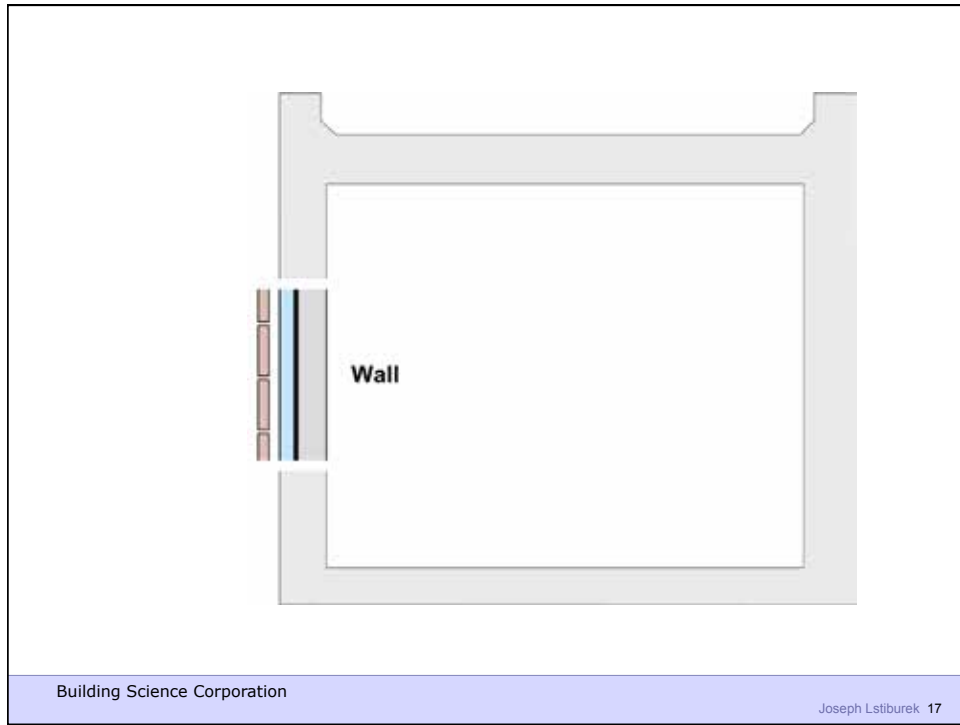
Water Control Layer  
Air Control Layer  
Vapor Control Layer  
Thermal Control Layer

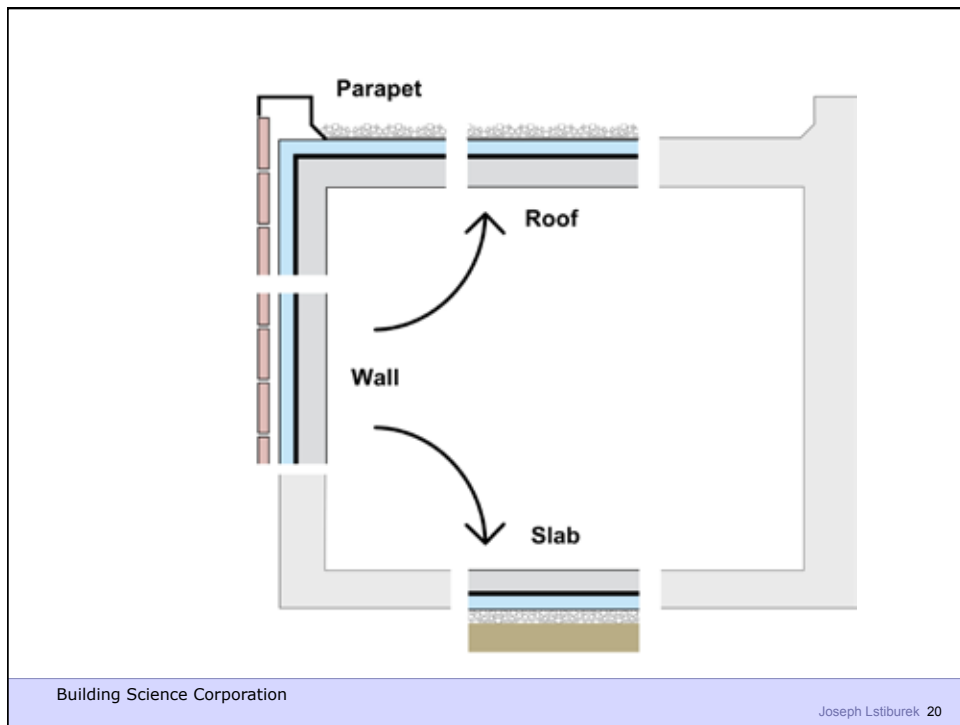
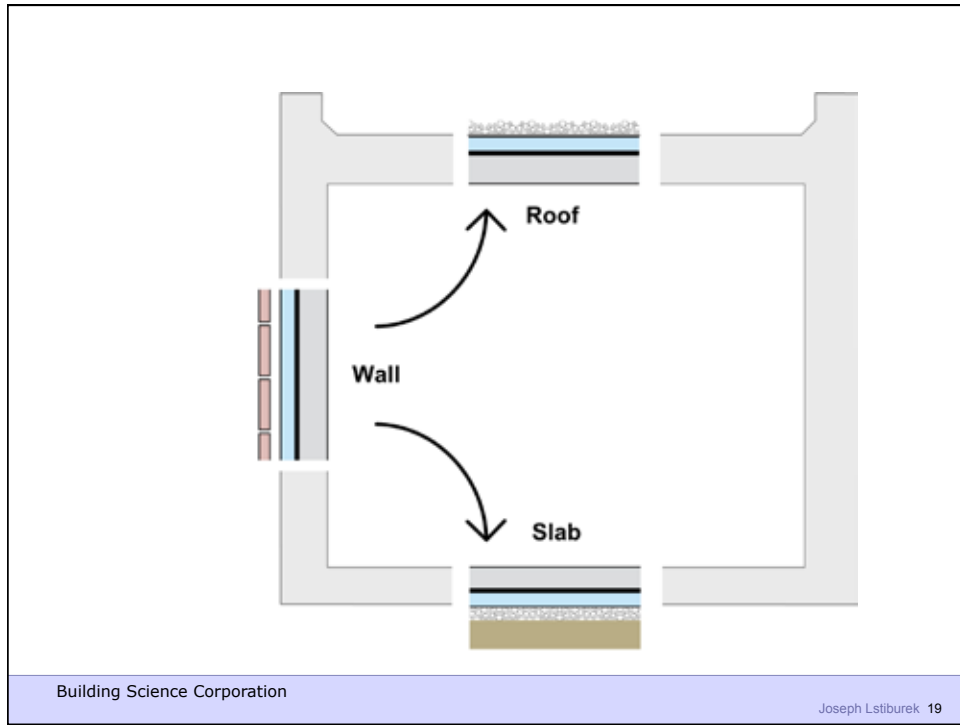


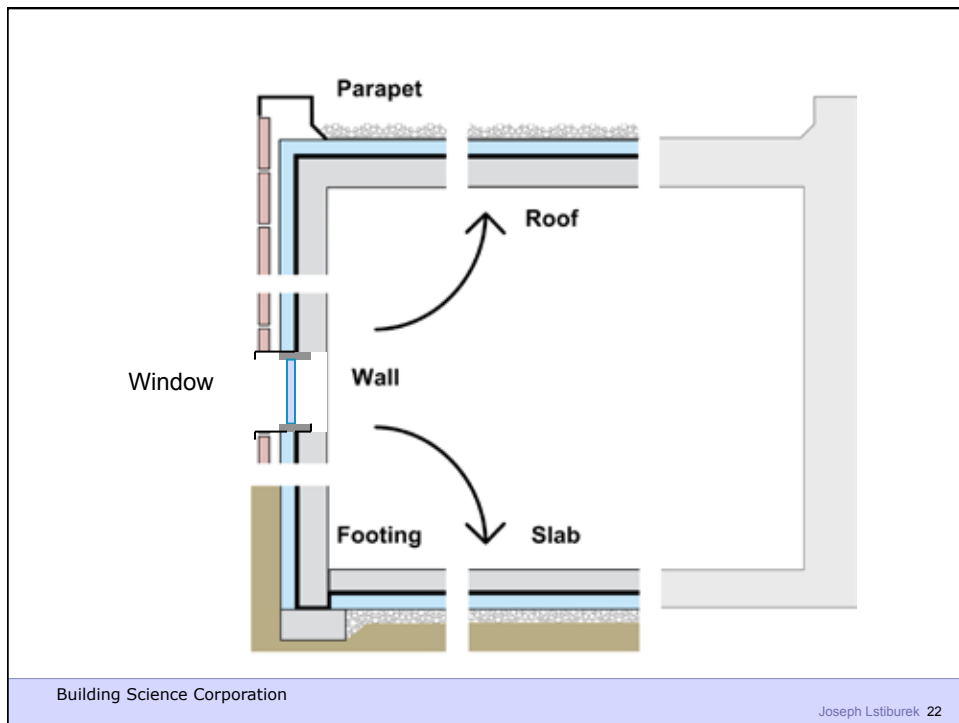
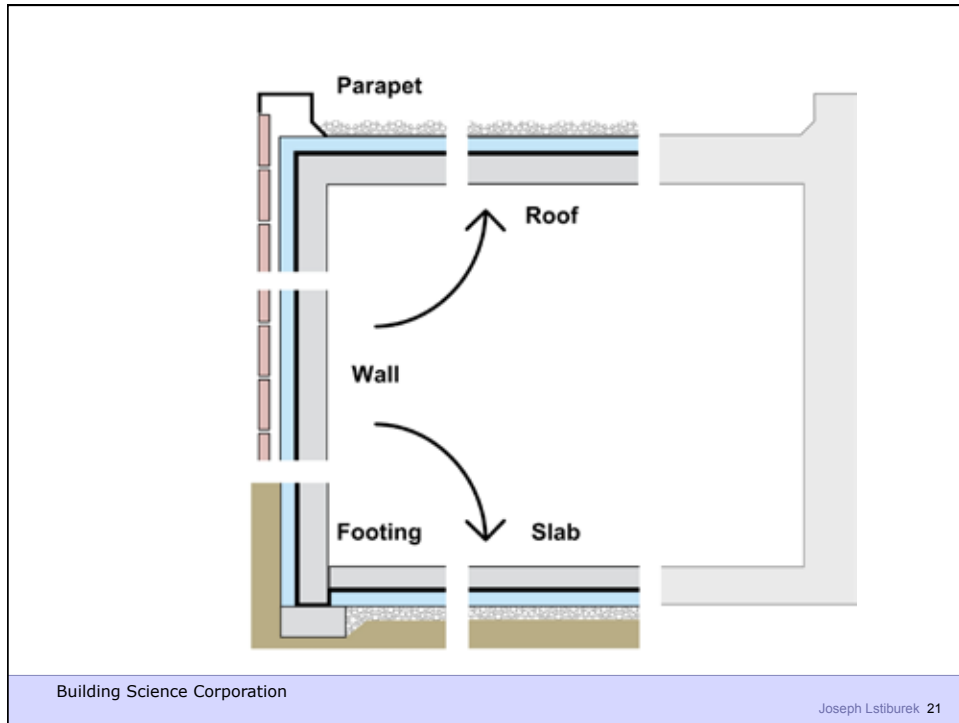


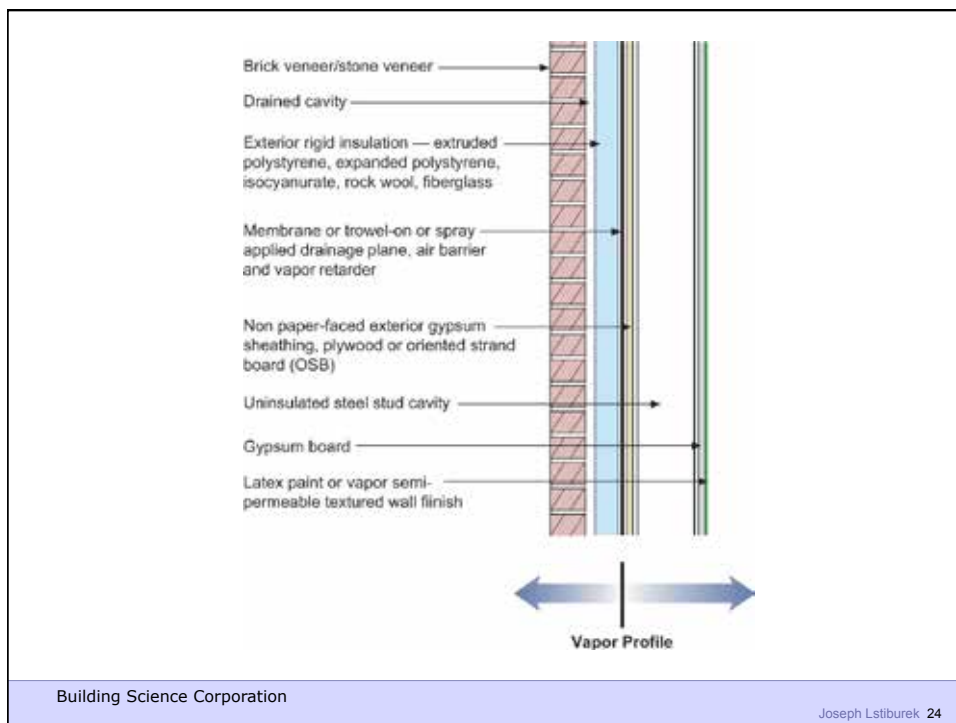
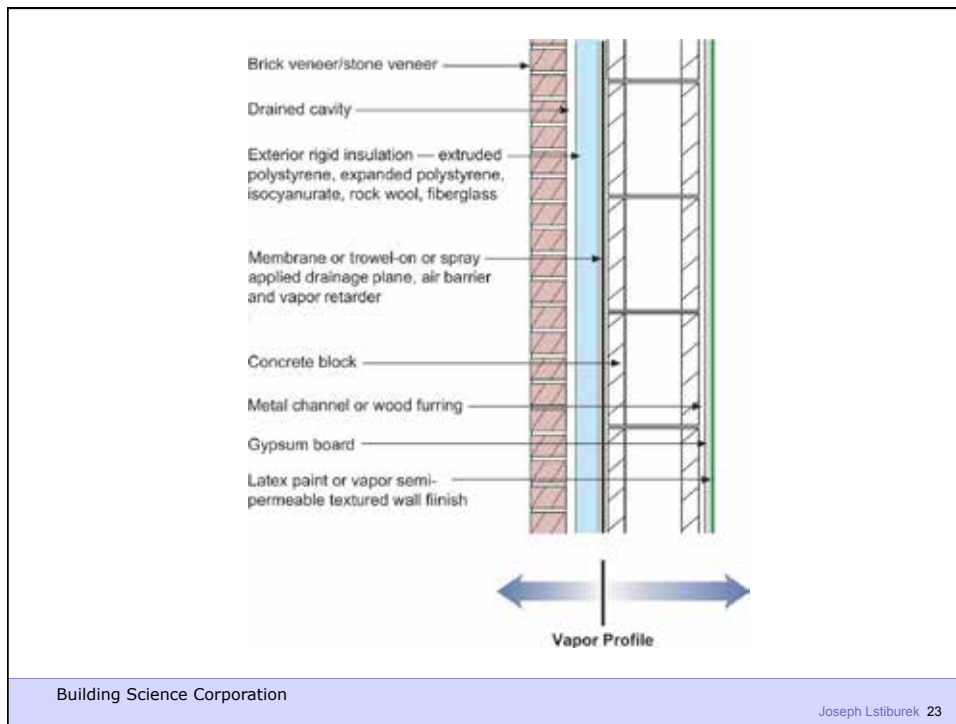


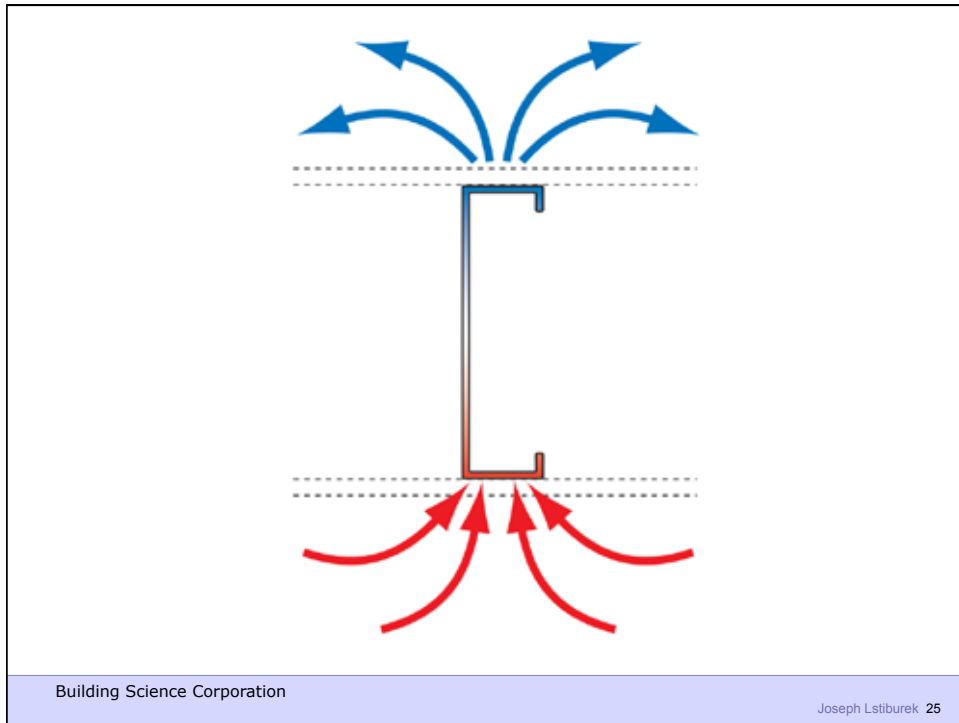


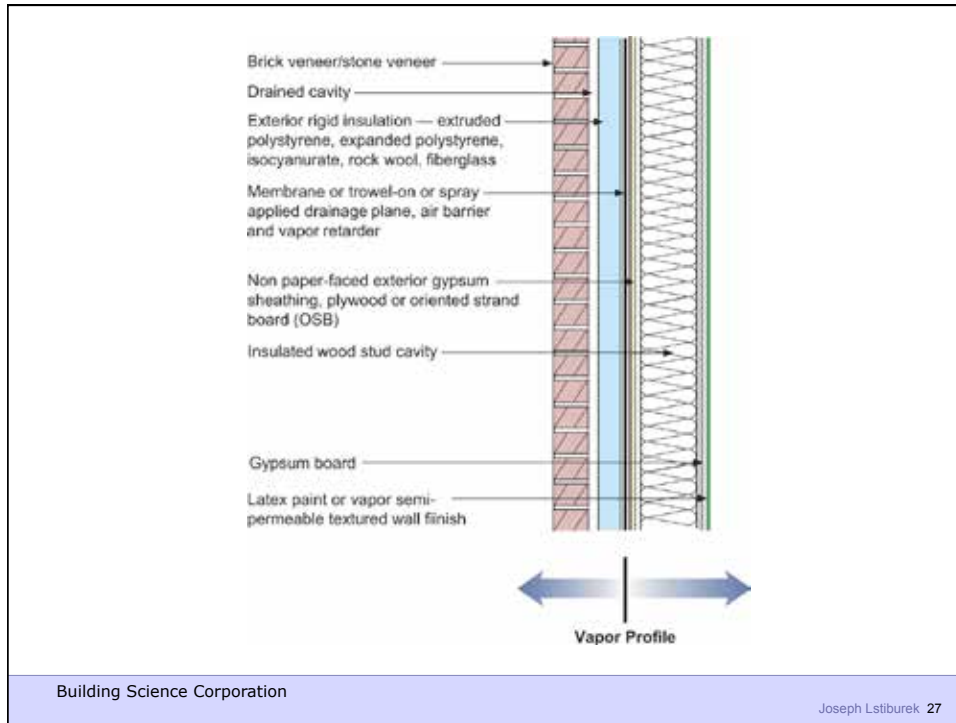








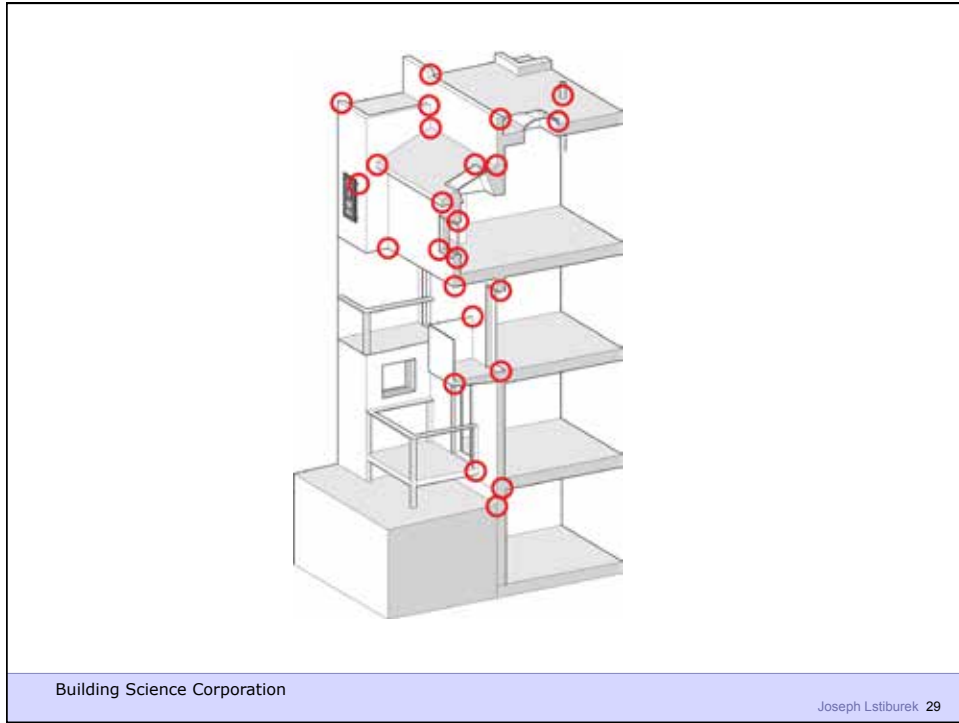




## Commercial Enclosure: Simple Layers



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





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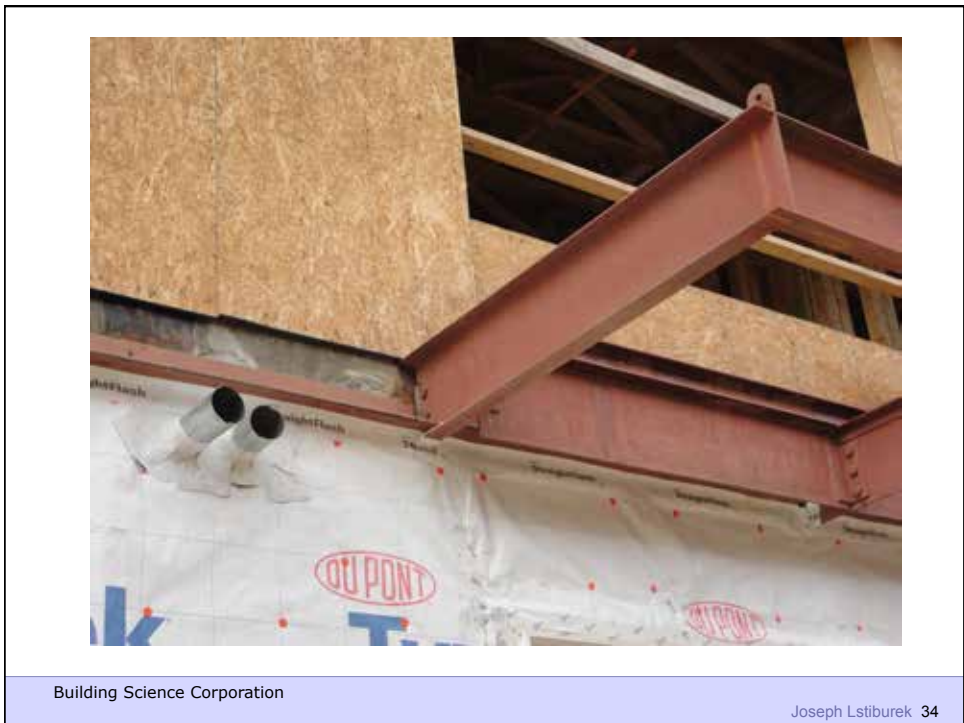
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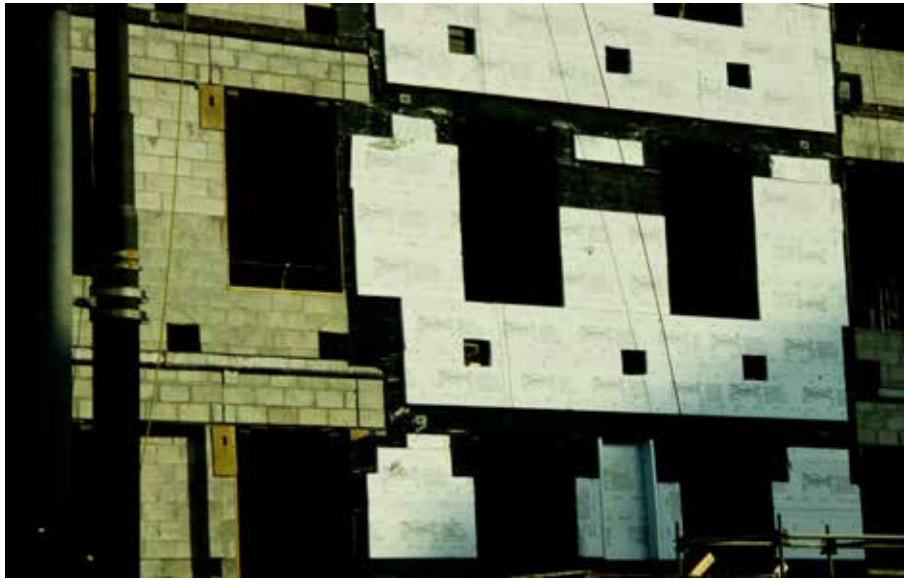
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Joseph Lstiburek 41



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Joseph Lstiburek 42



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Joseph Lstiburek 43



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Joseph Lstiburek 45



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Joseph Lstiburek 46



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Joseph Lstiburek 47



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Joseph Lstiburek 48





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Joseph Lstiburek 49



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Joseph Lstiburek 50



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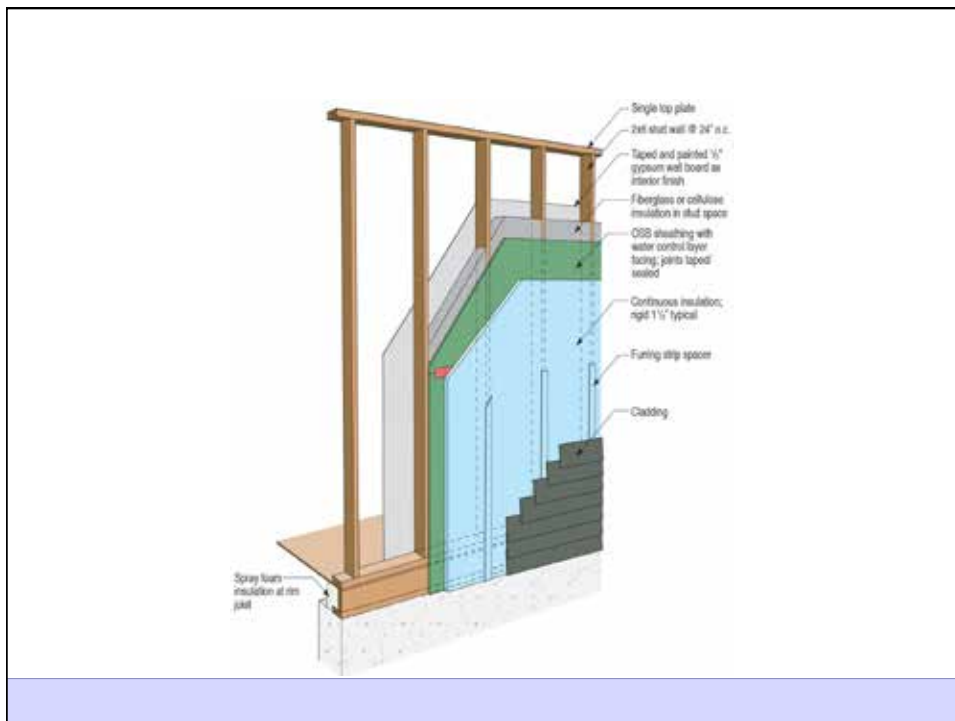
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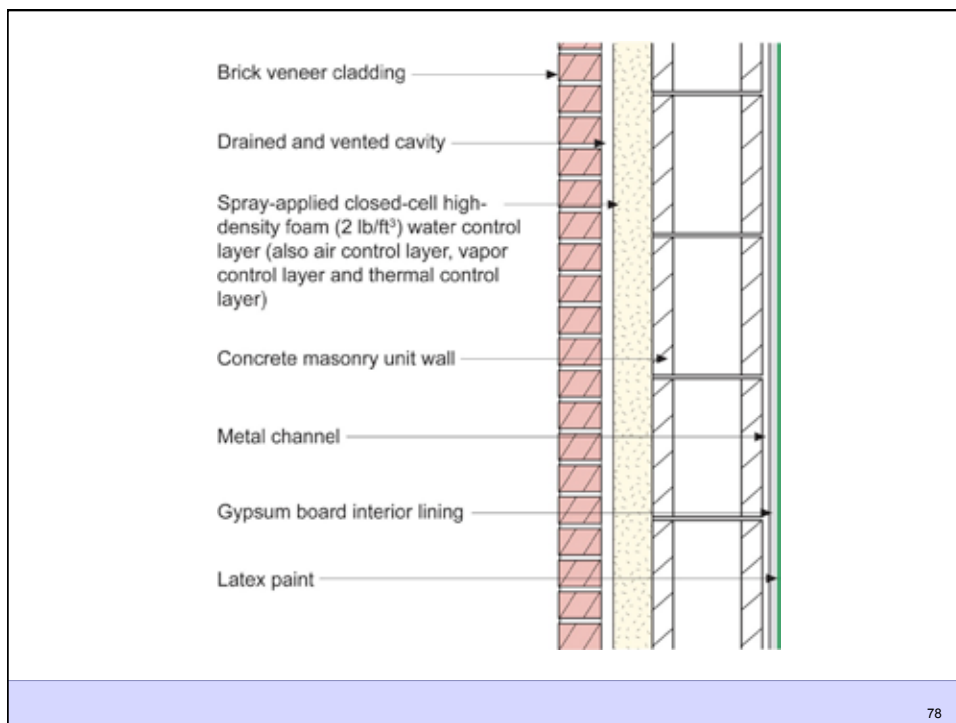
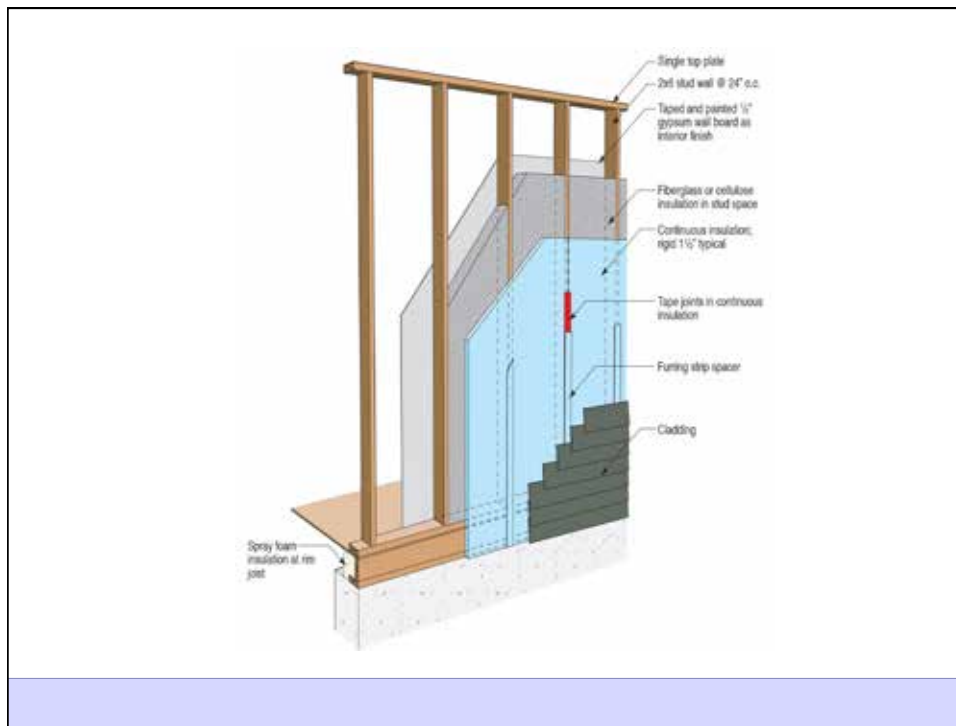
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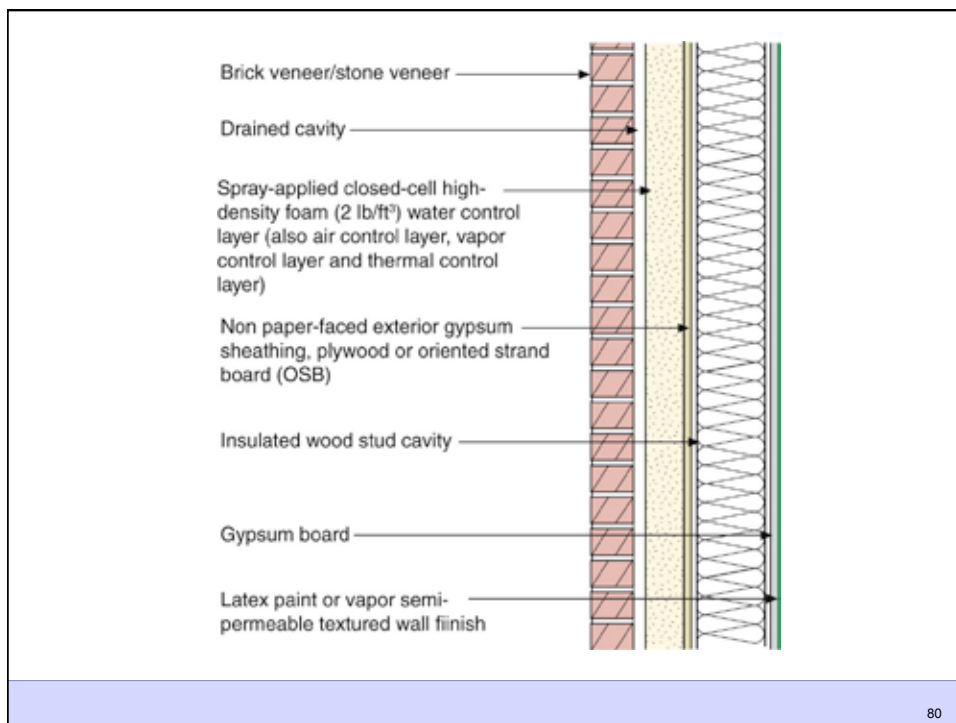
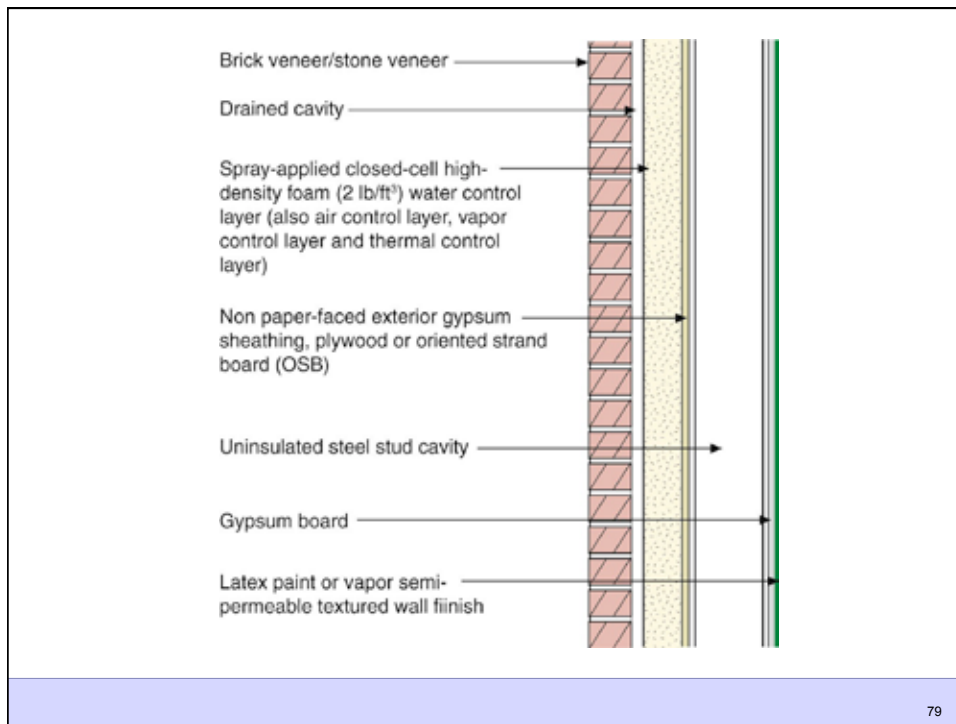


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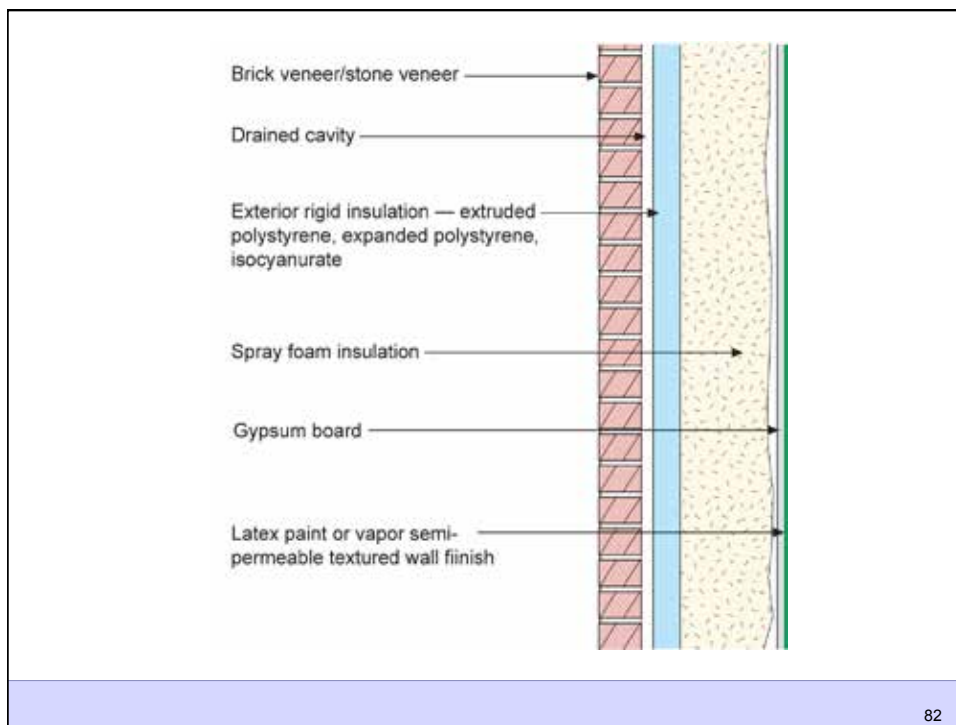
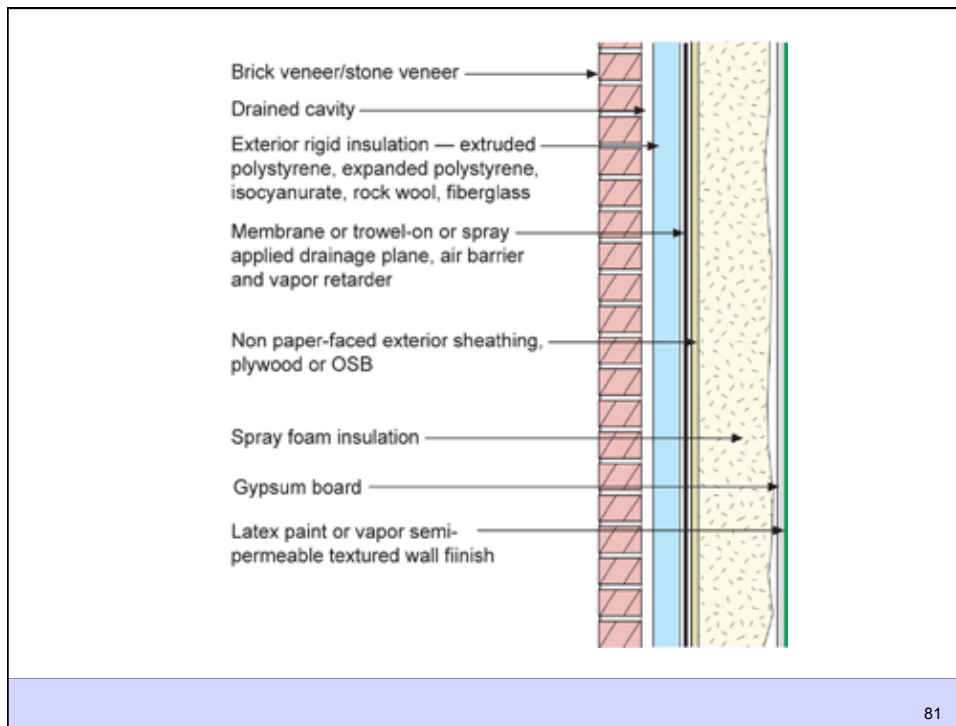
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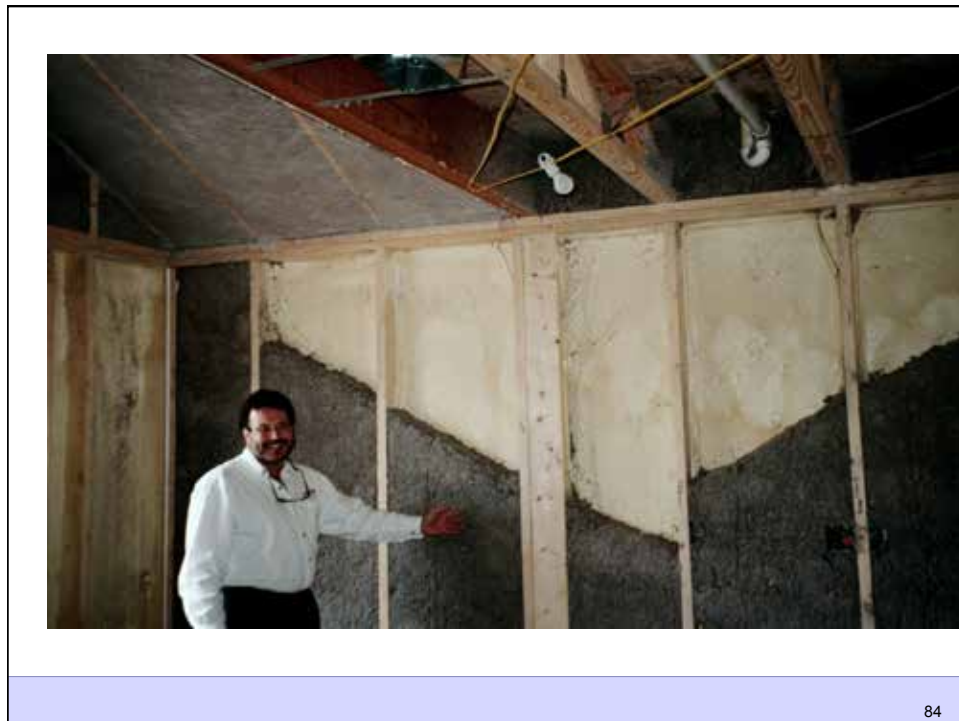
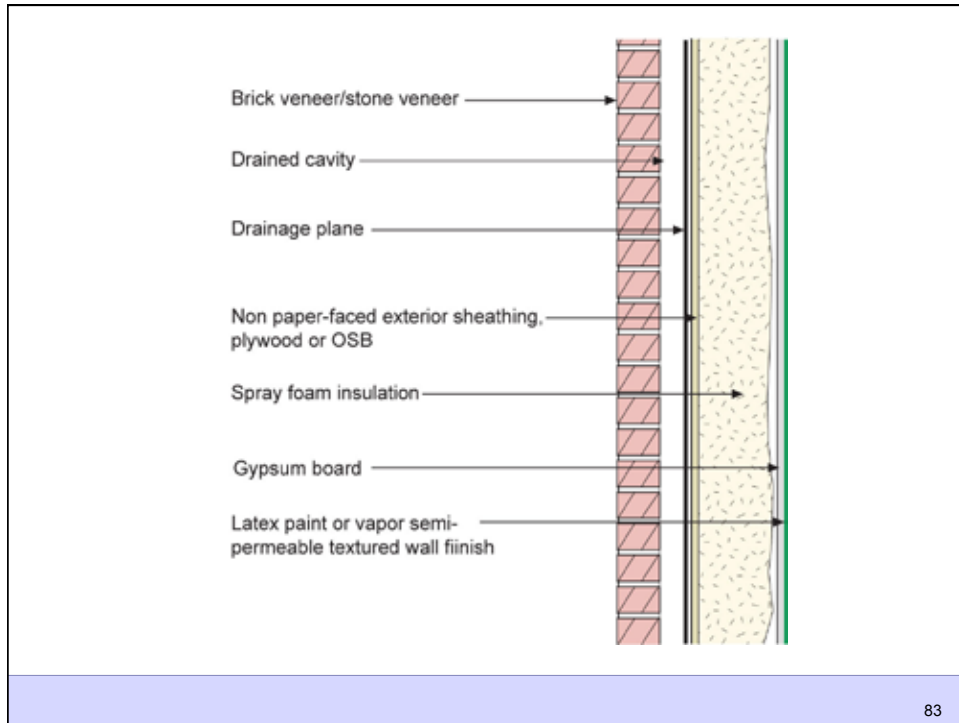










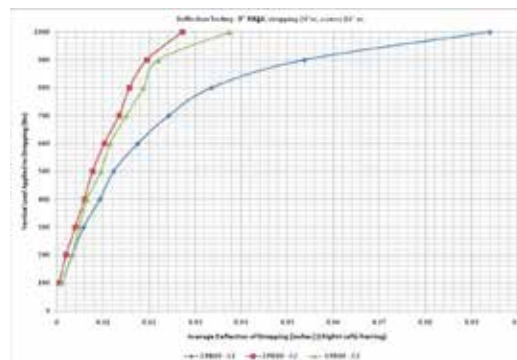






## Rockwool

1x3 furring @ 24" o.c.  
#10 screws @ 16" o.c. vertically  
Result: 20 psf cladding weight  
with < 2/100" deflection



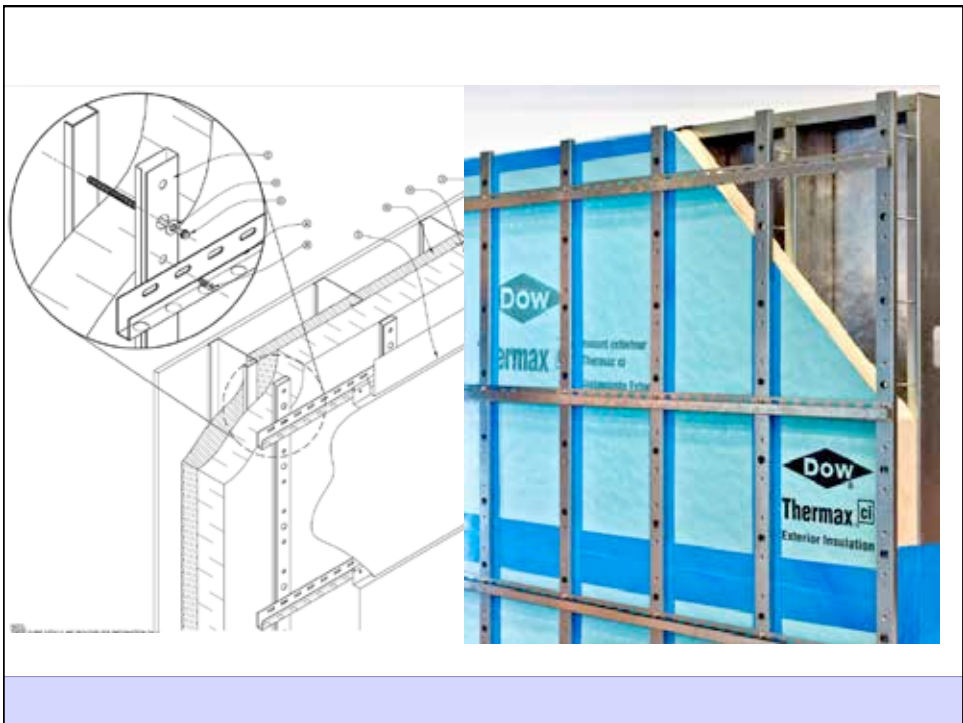
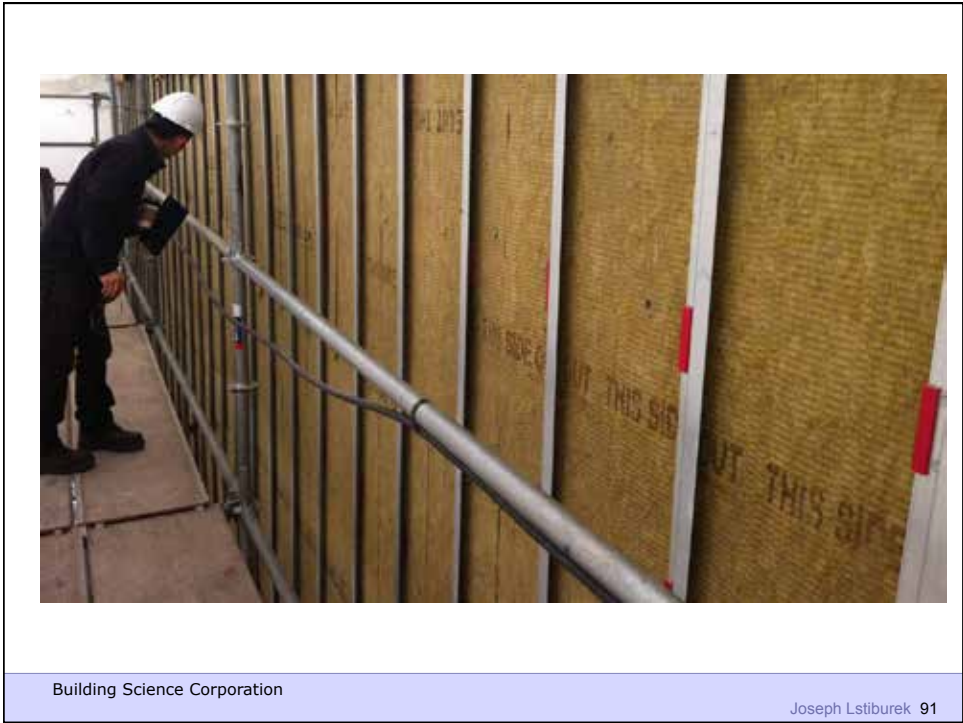


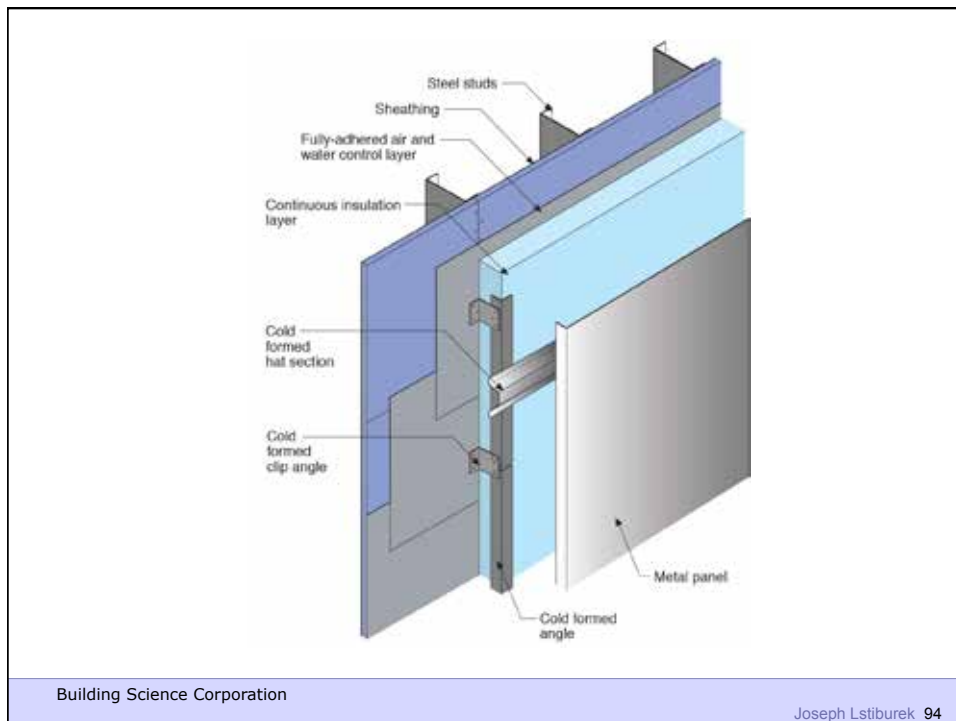
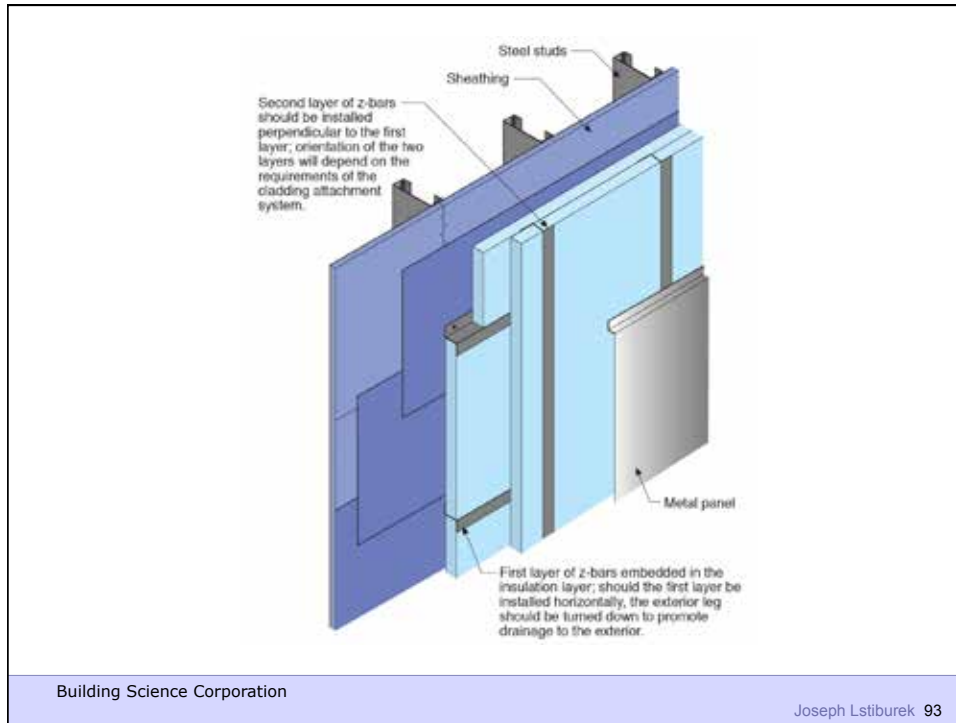
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90

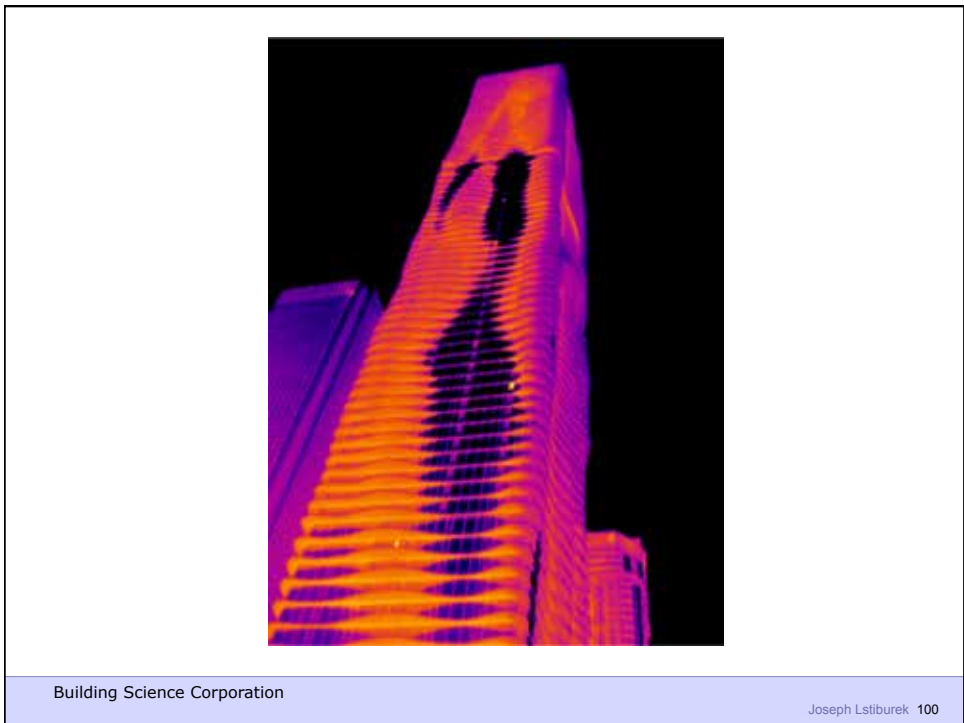














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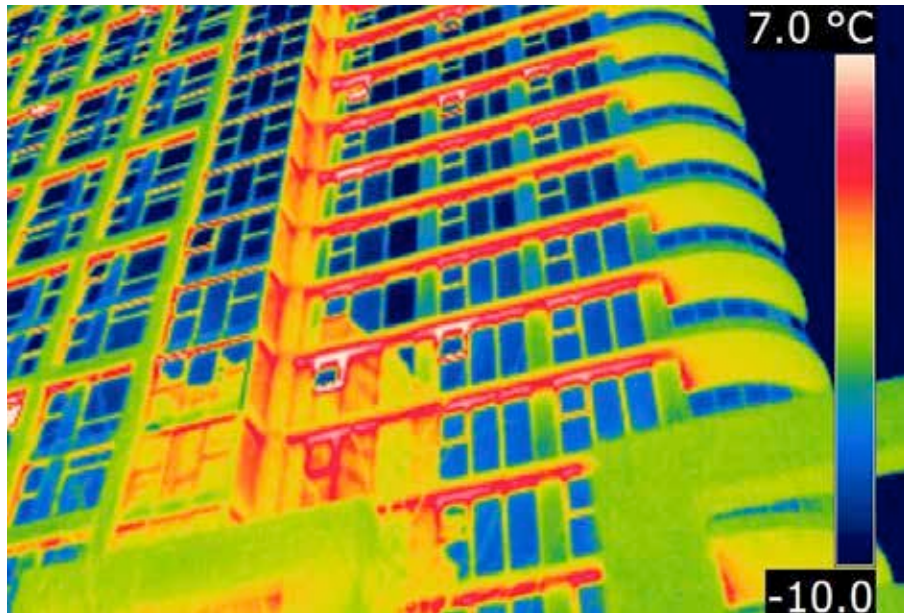
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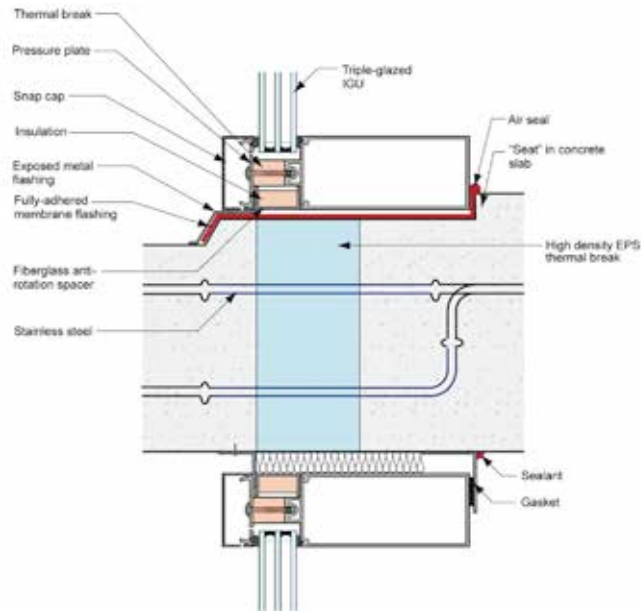
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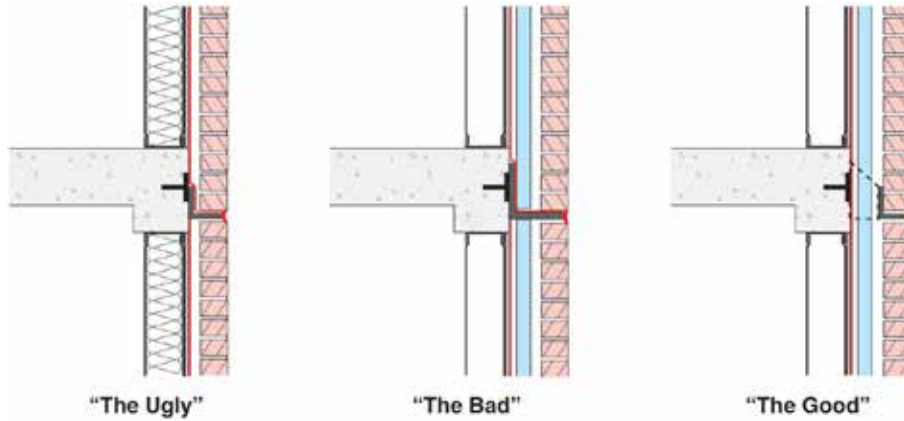
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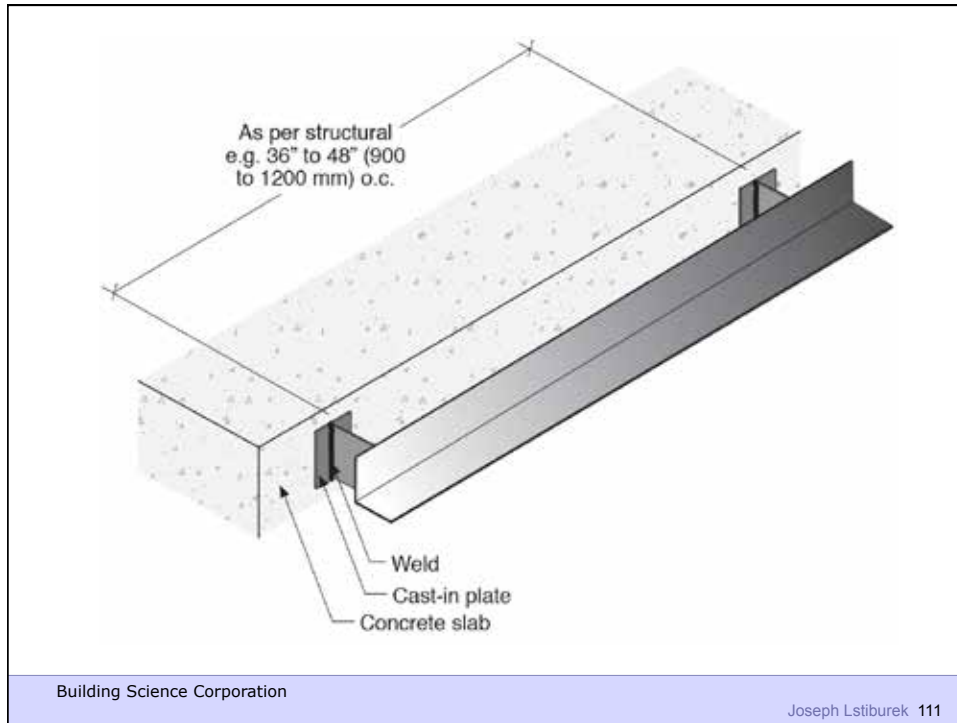
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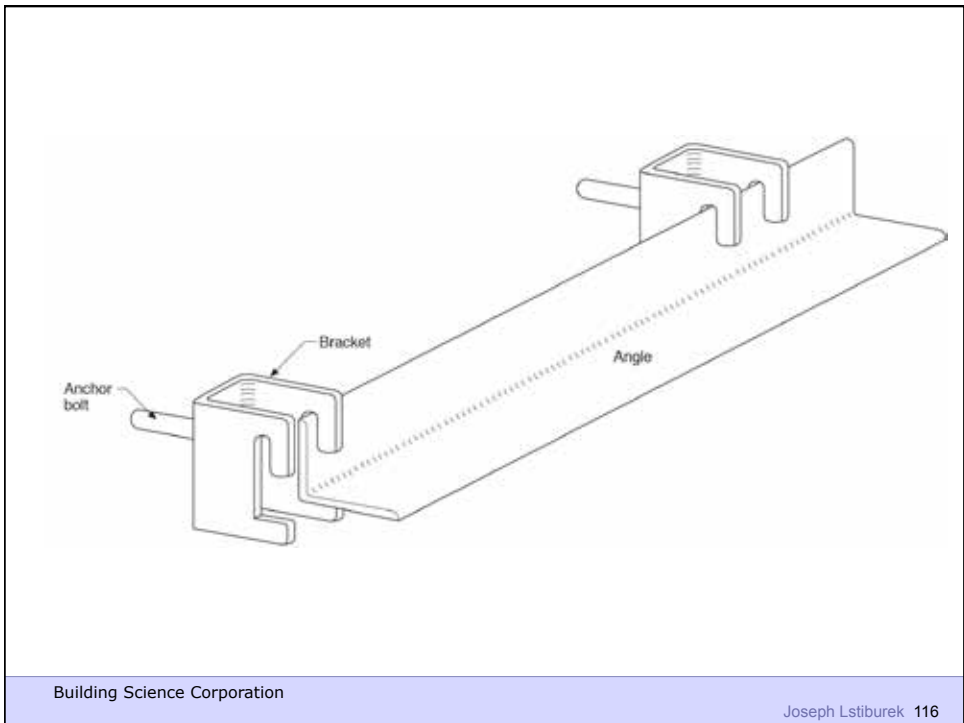
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