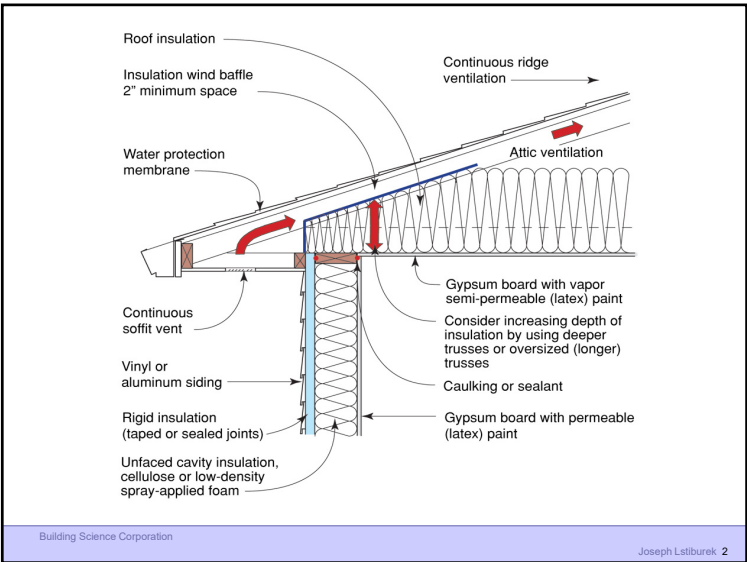


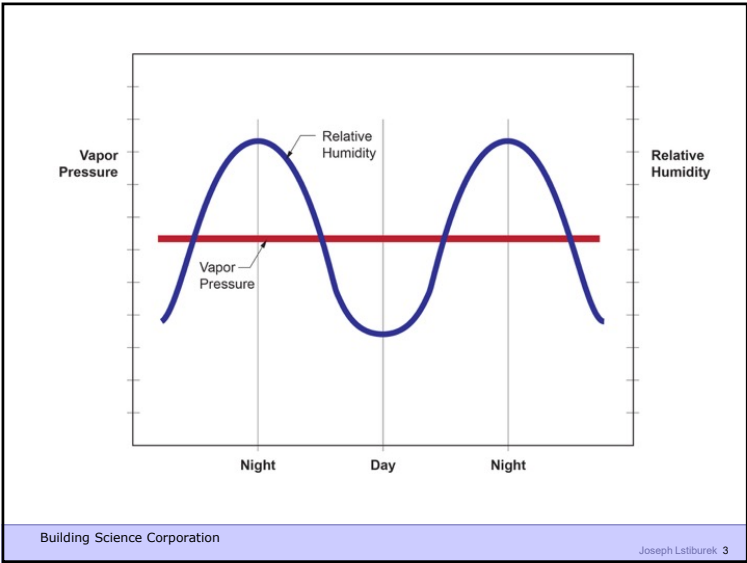
Ventilation In Attics

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1



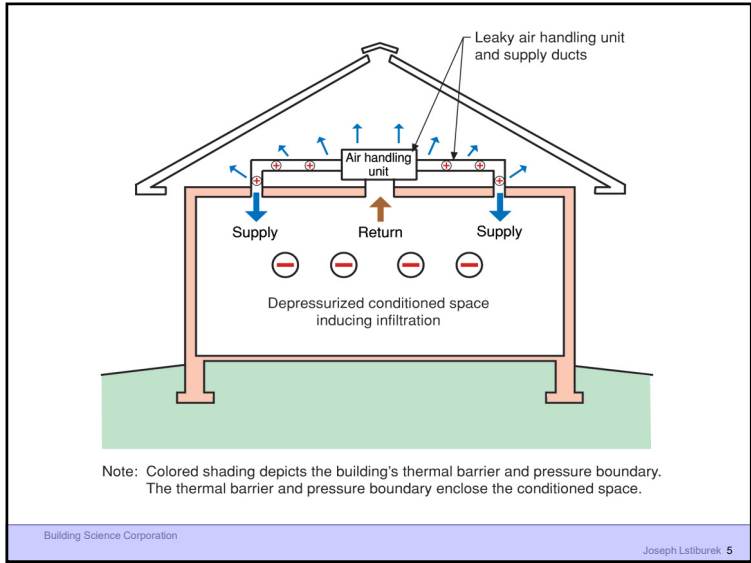
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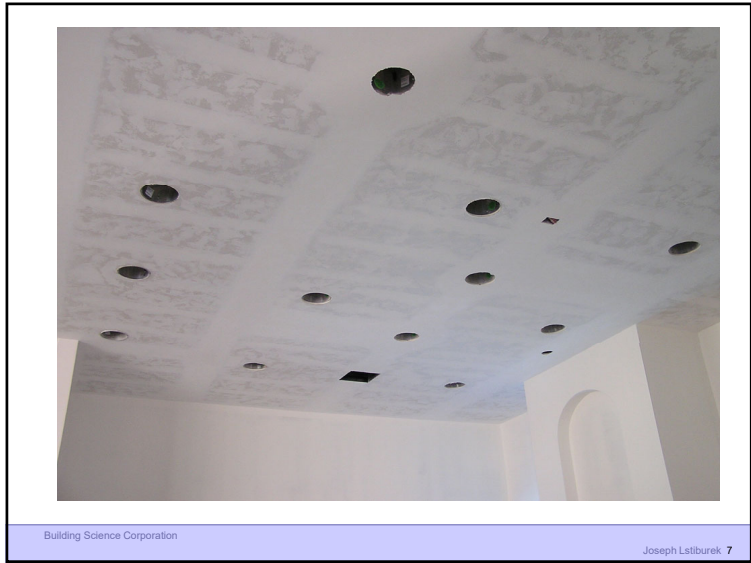
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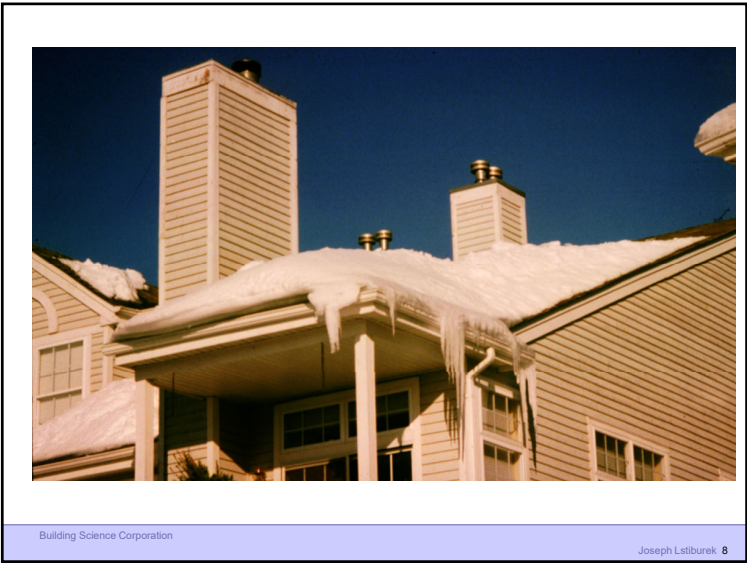
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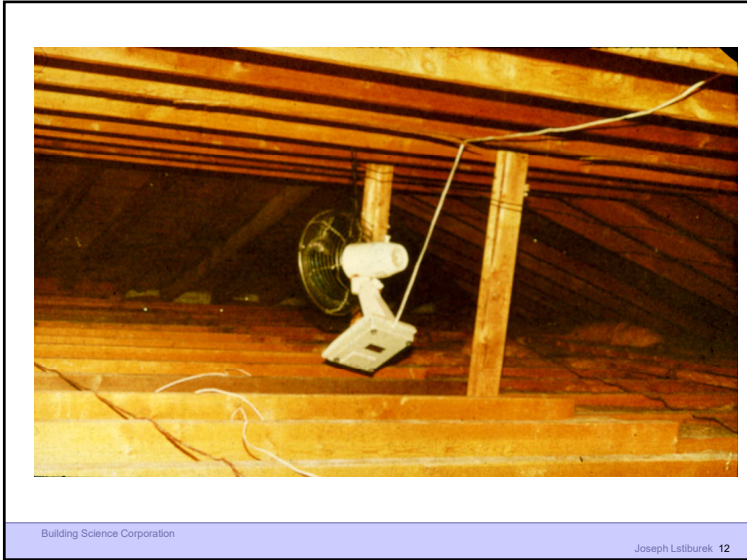
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10



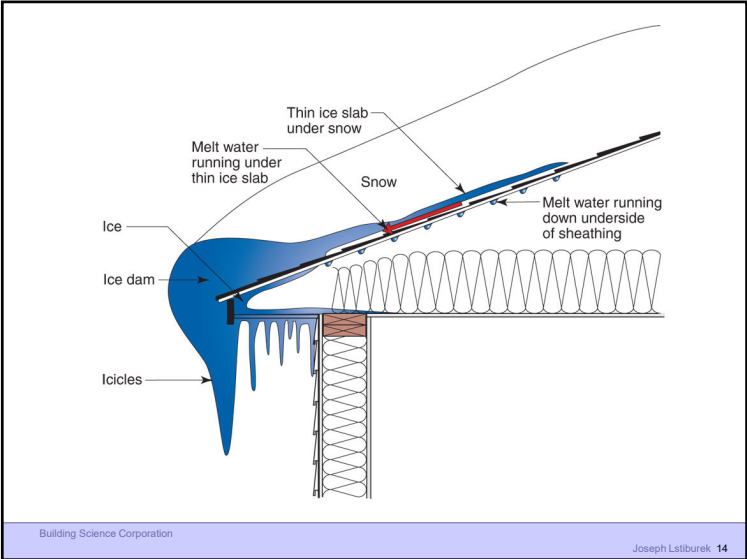
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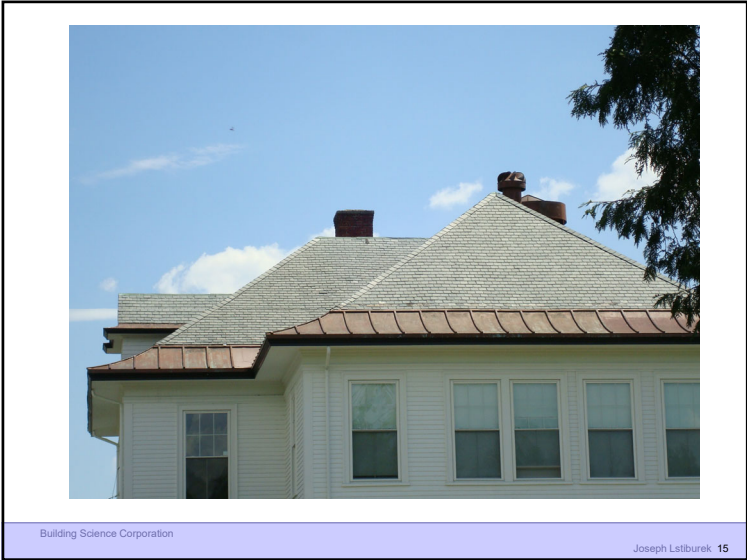
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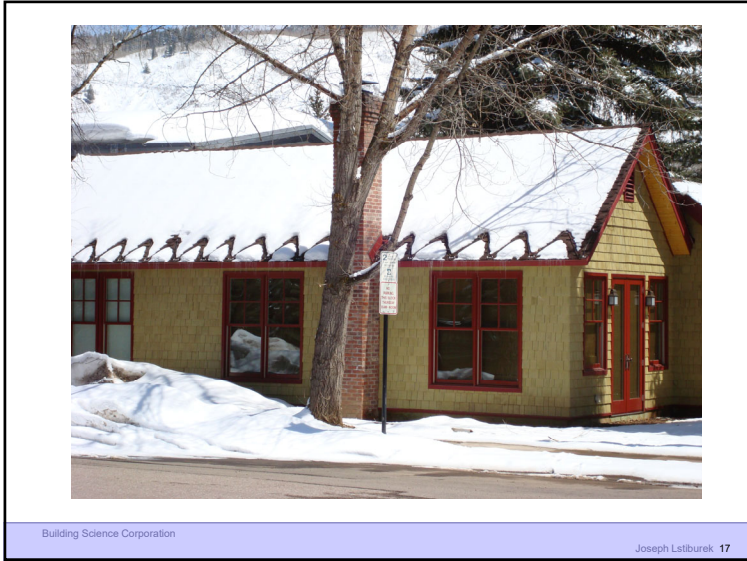
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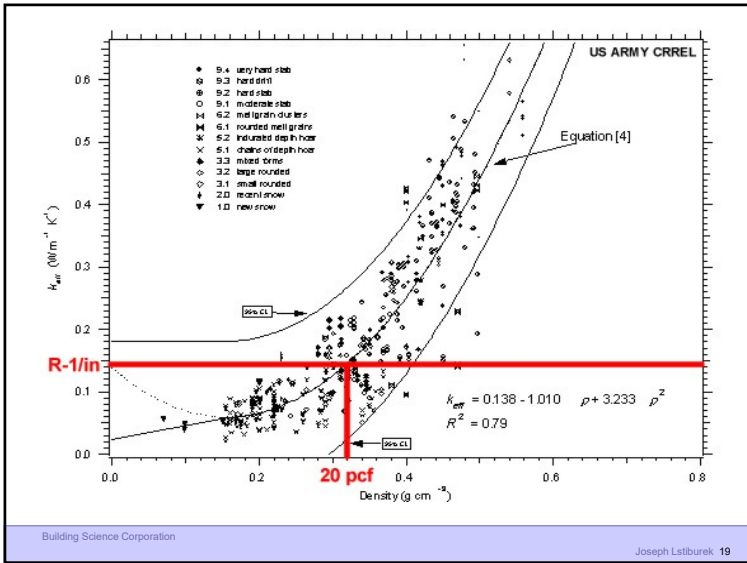
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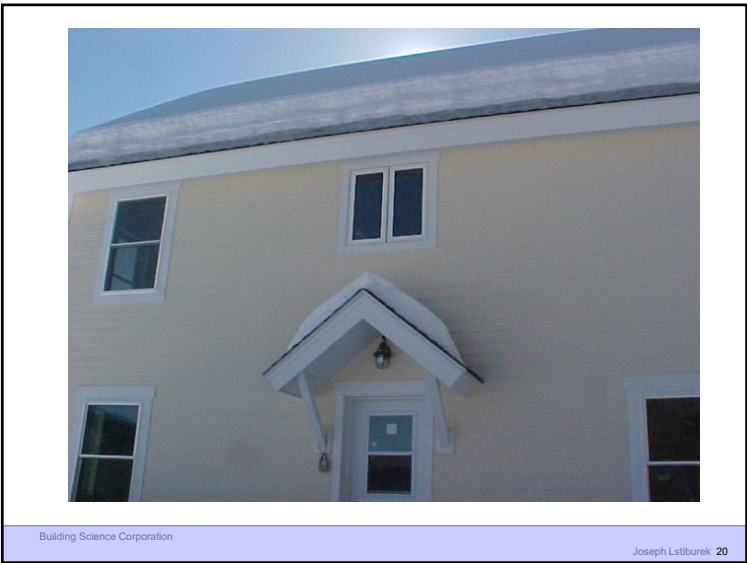
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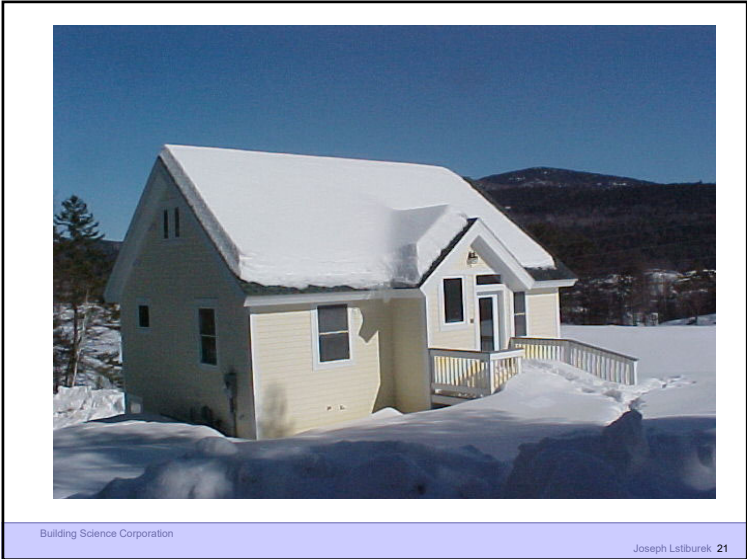
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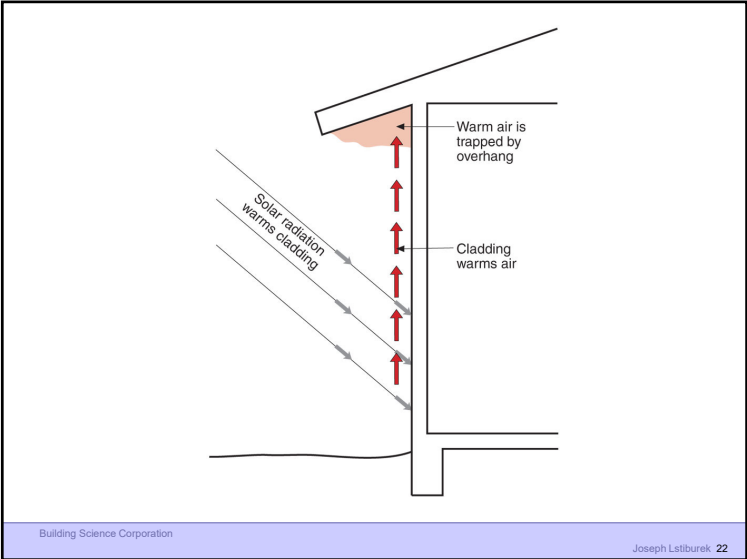
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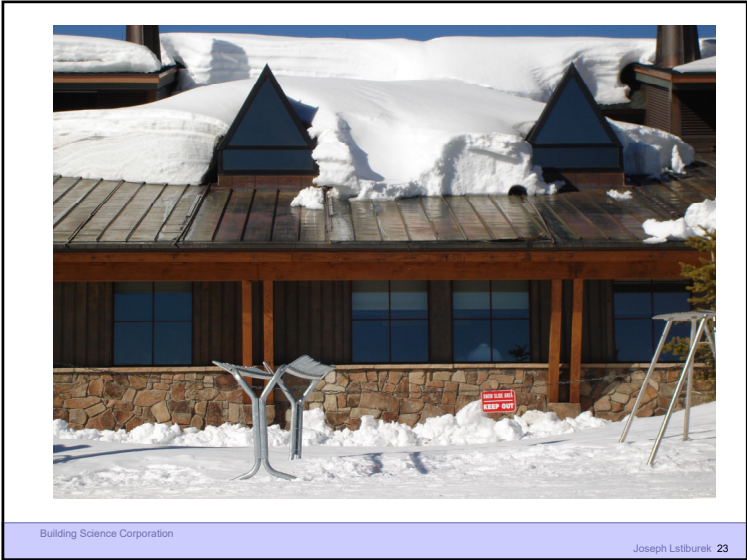
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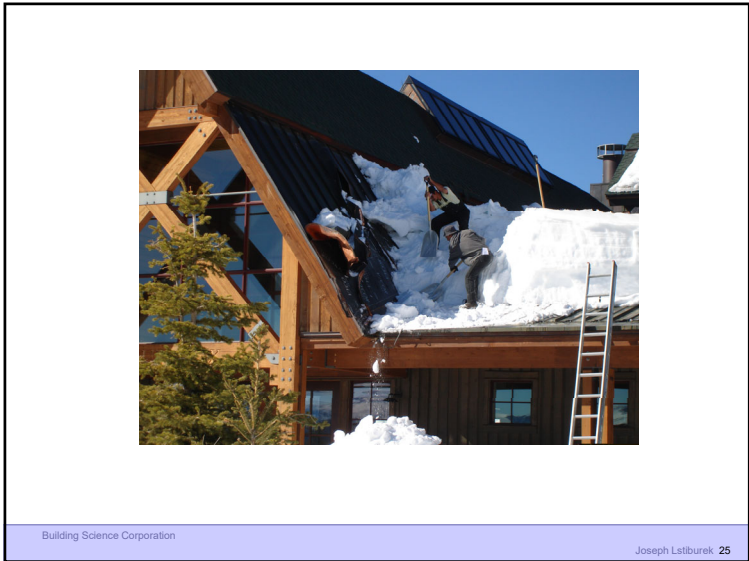
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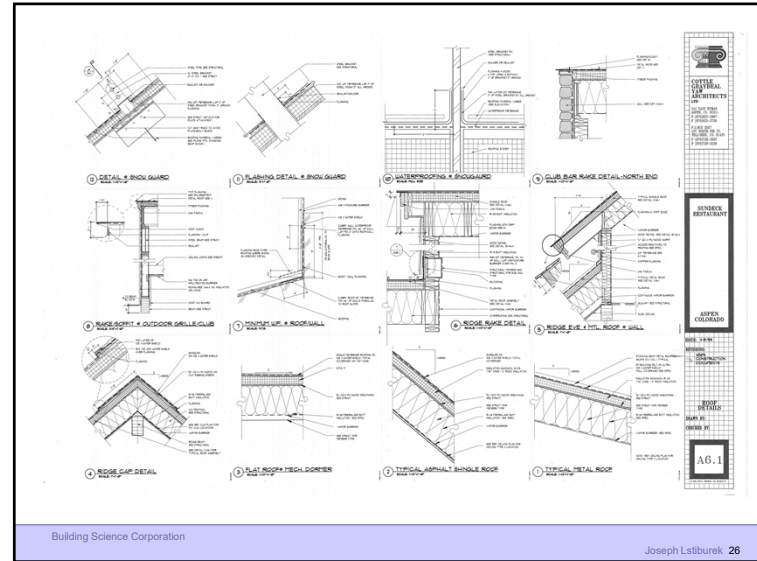
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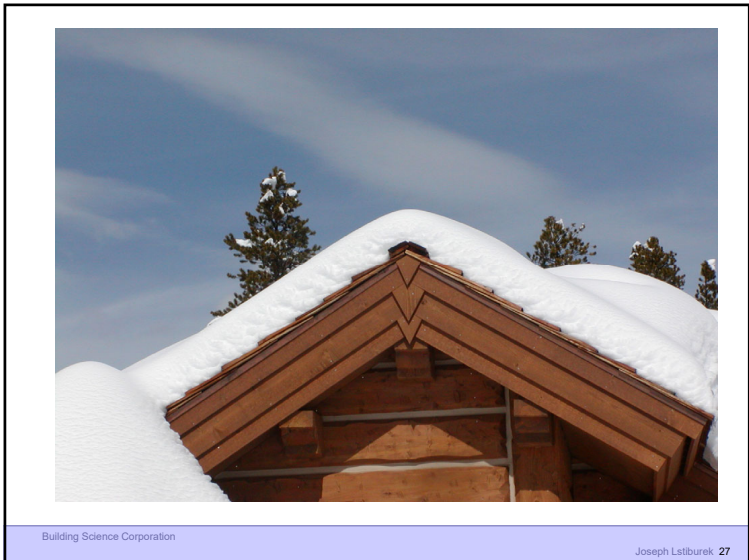
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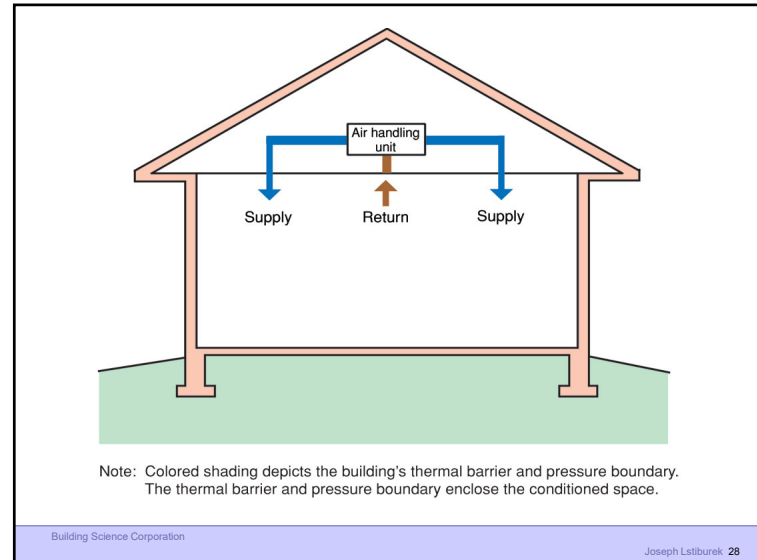
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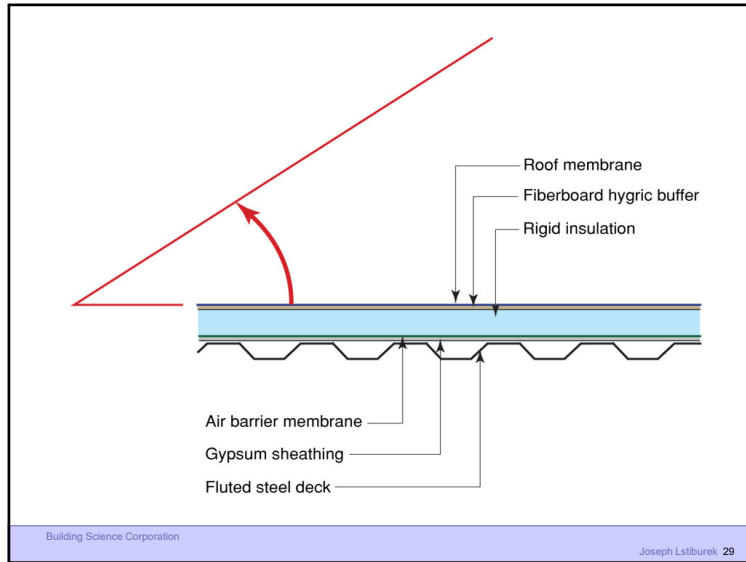
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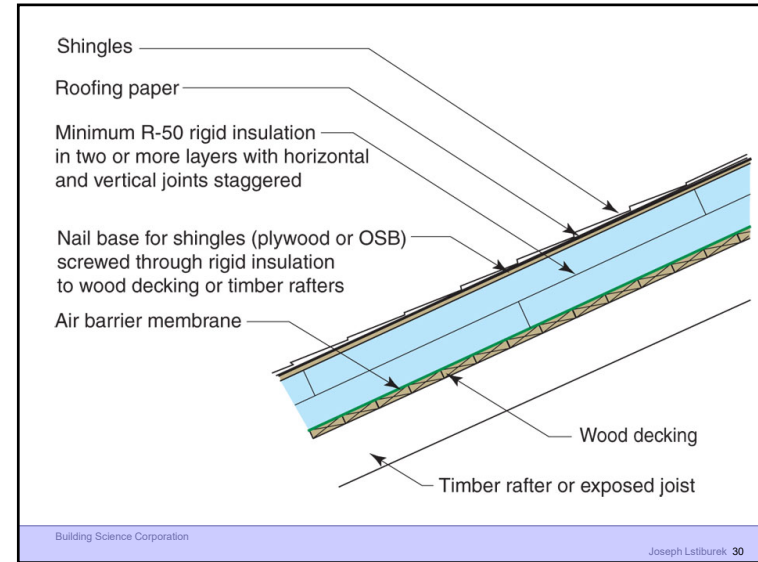
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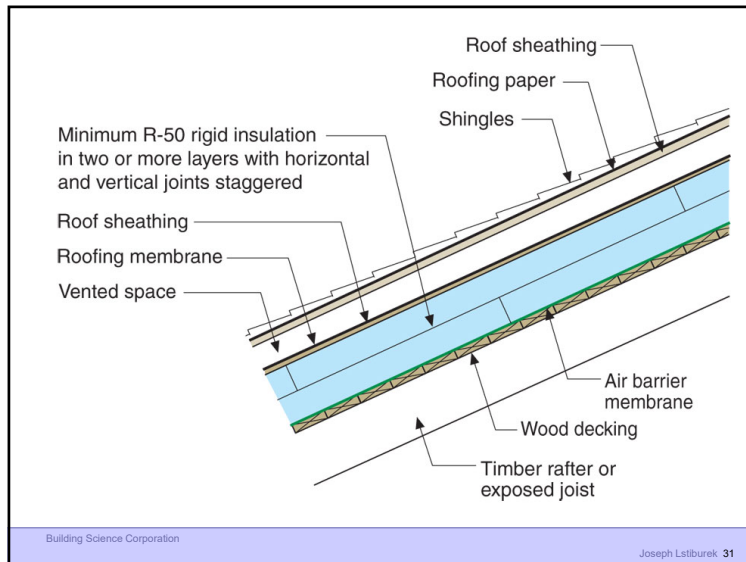
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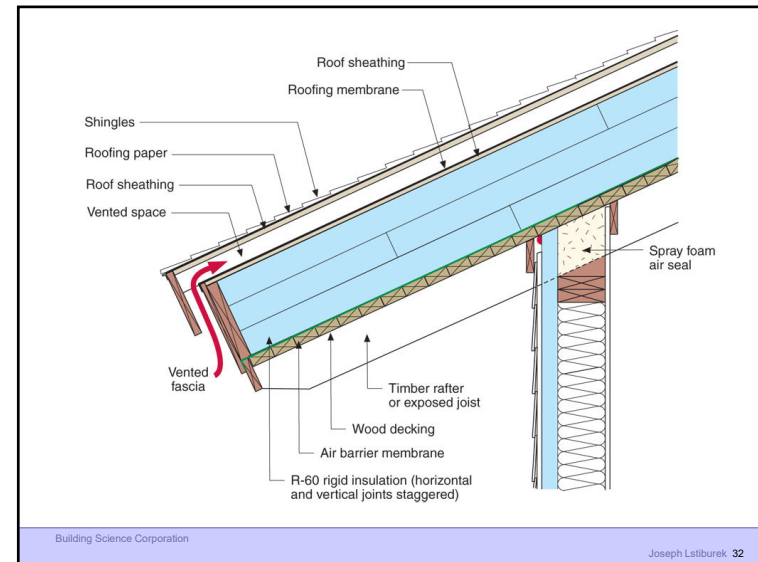
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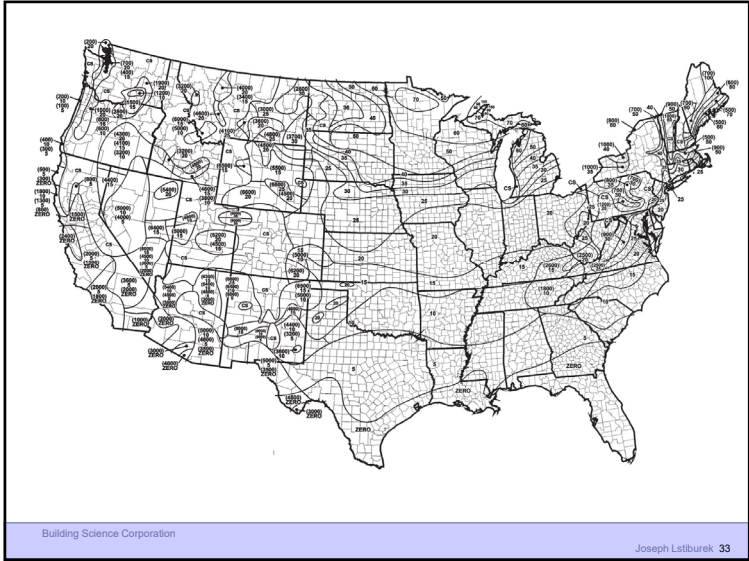
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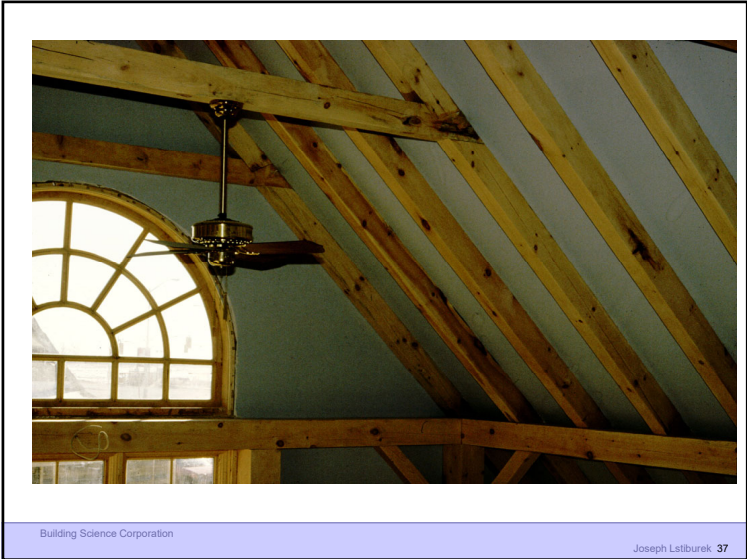
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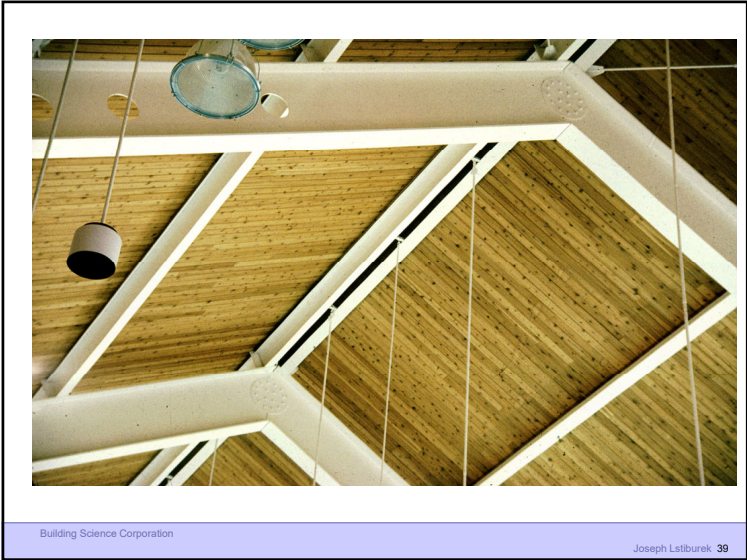
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38



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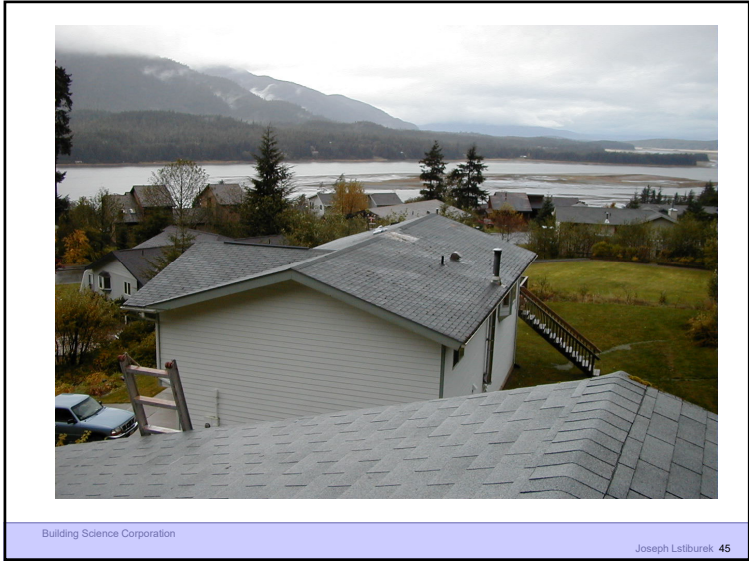
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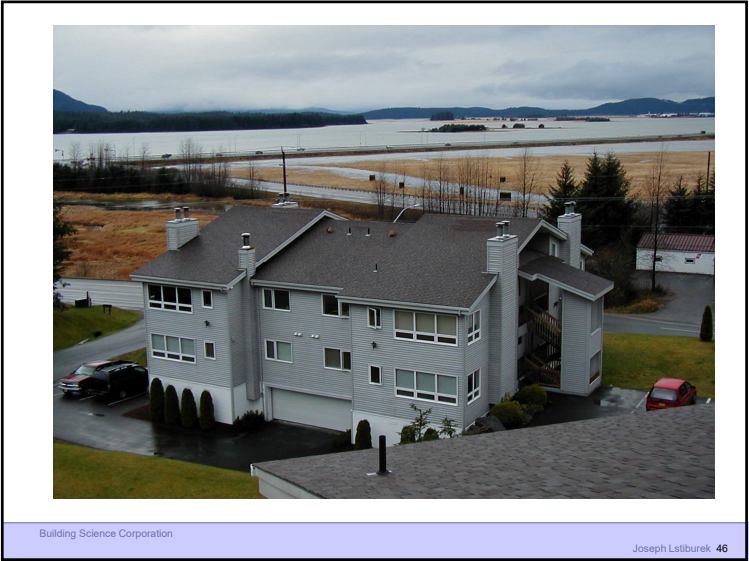
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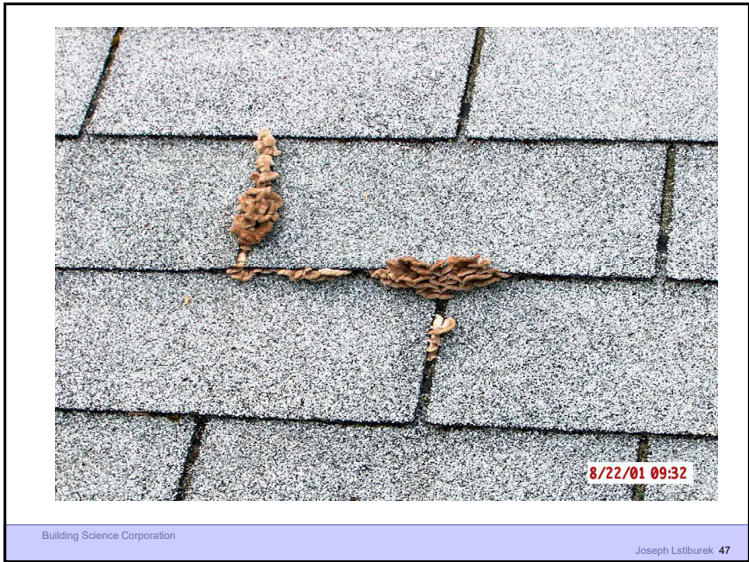
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46



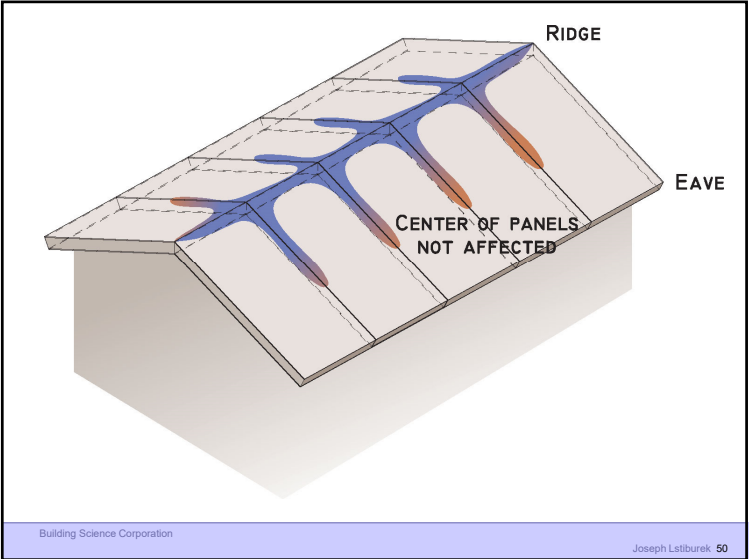
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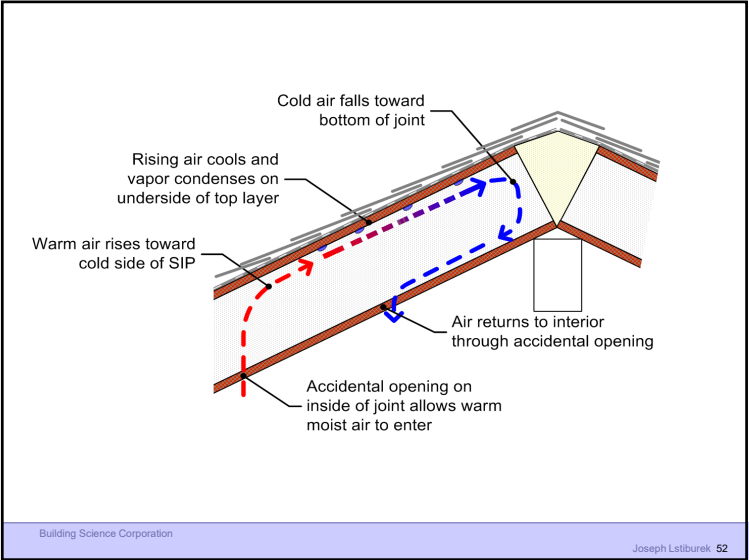
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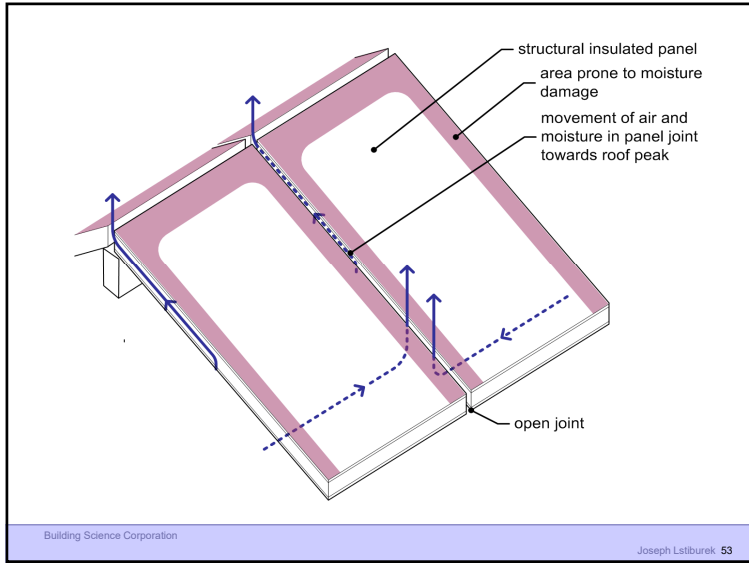
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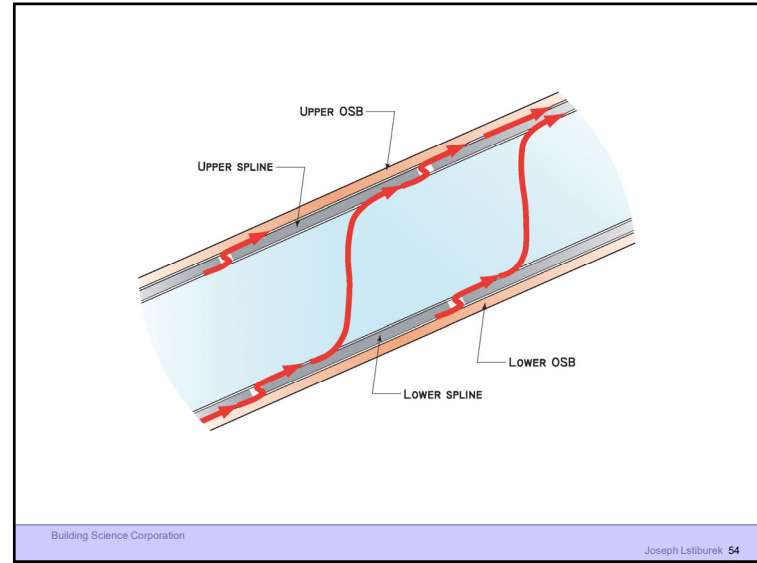
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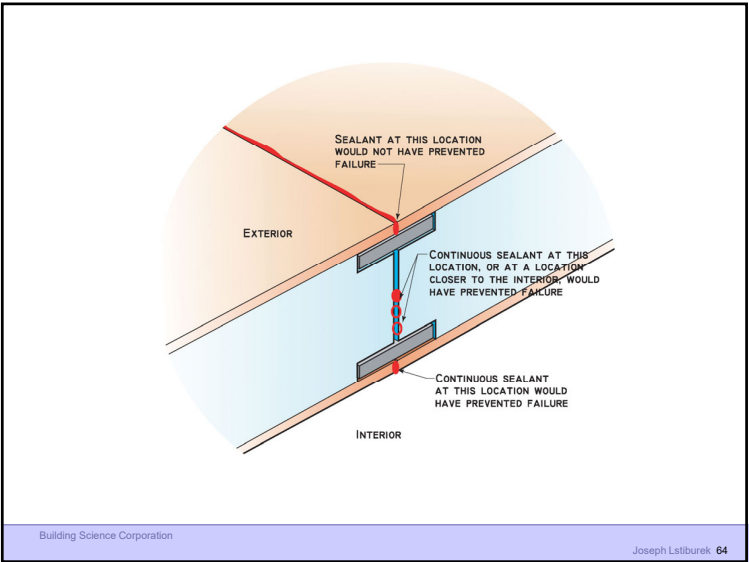
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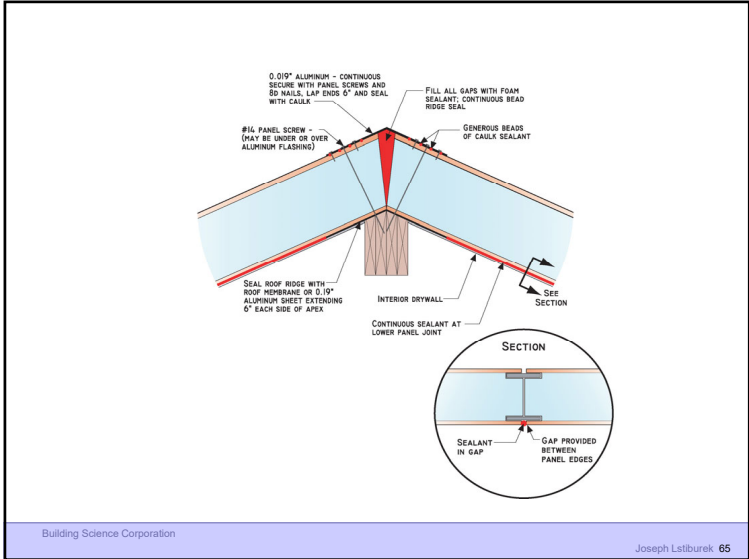
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64



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66



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68



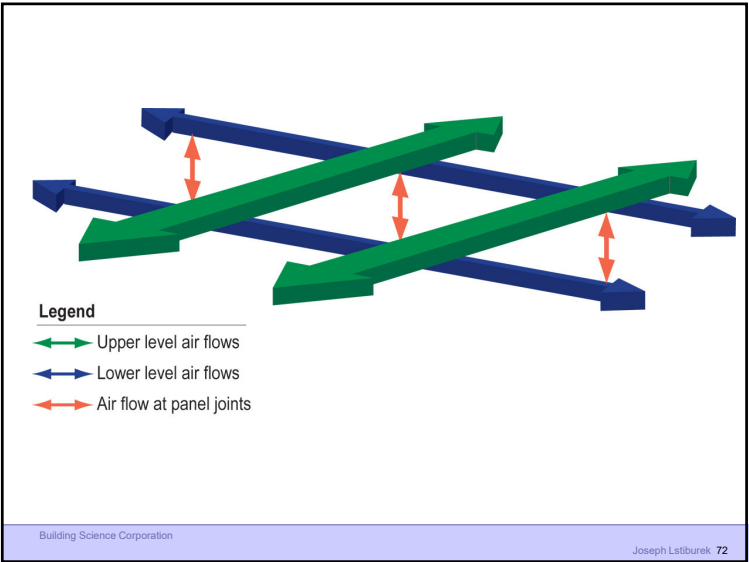
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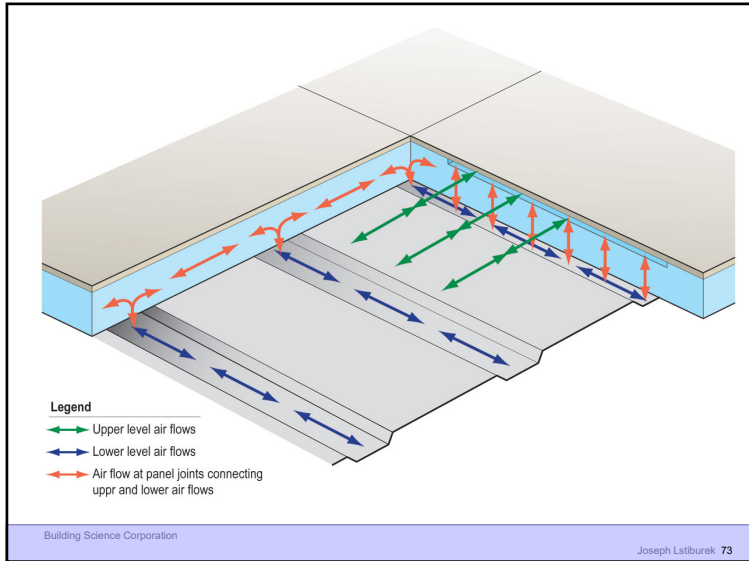
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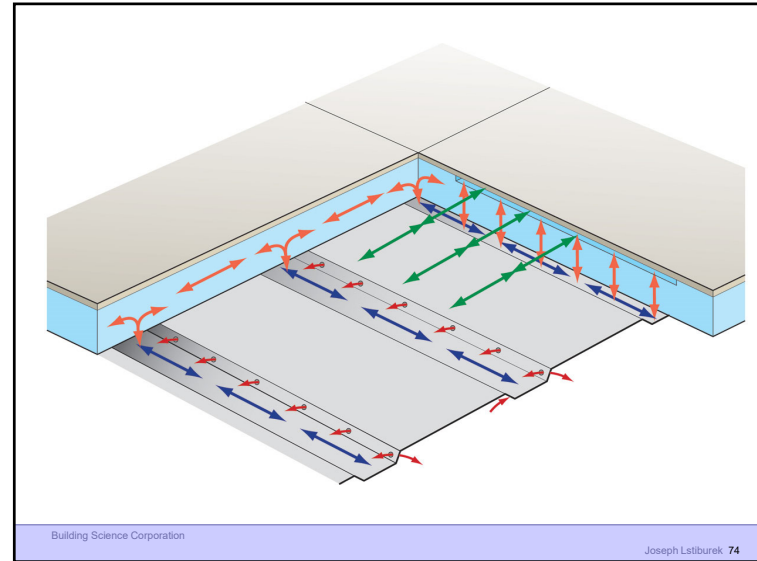
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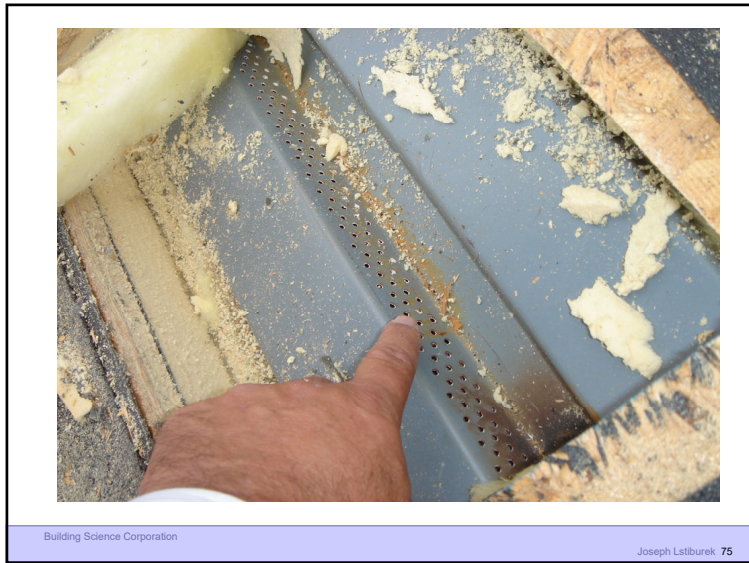
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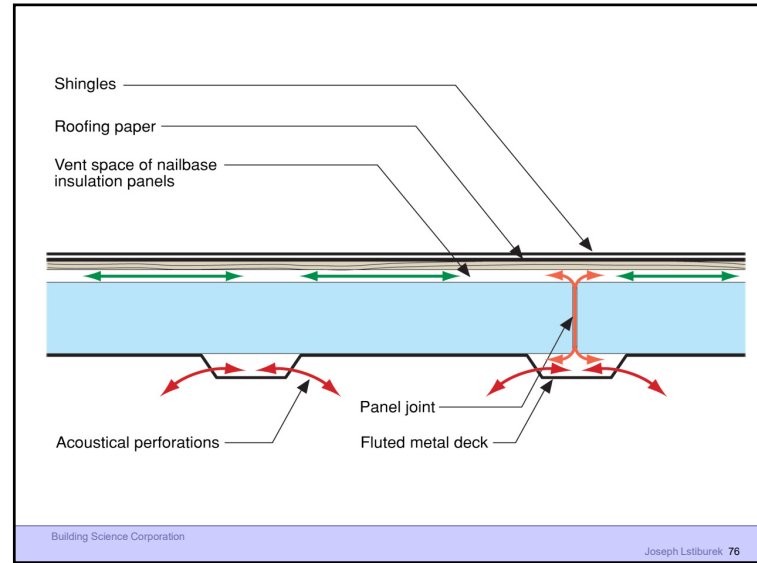
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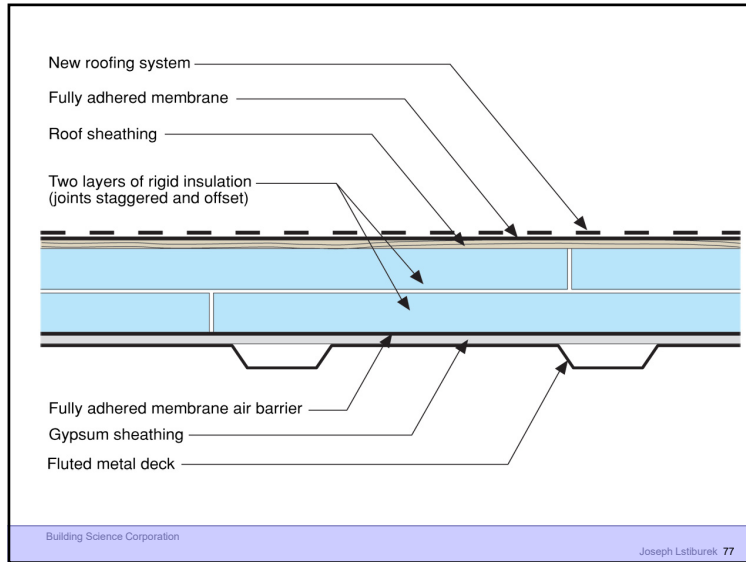
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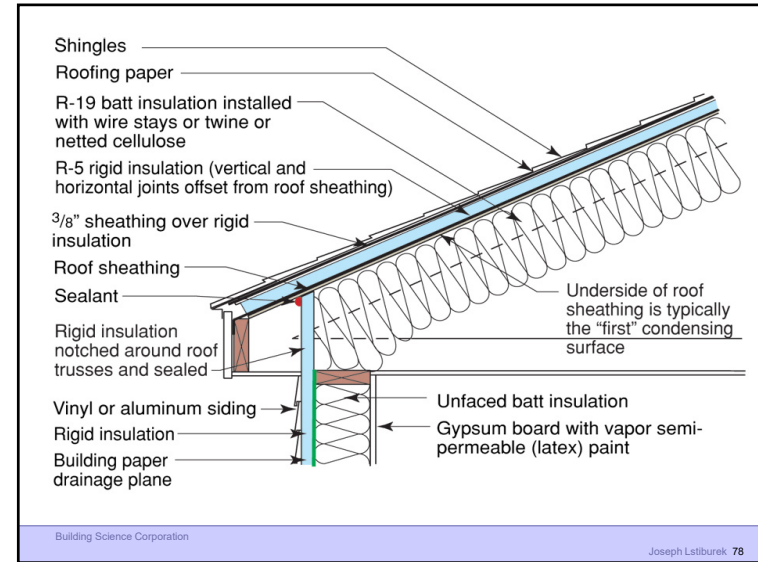
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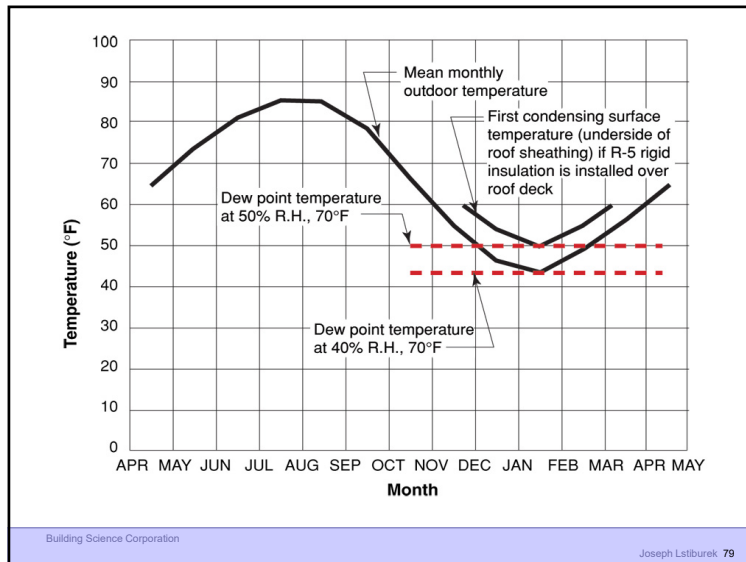
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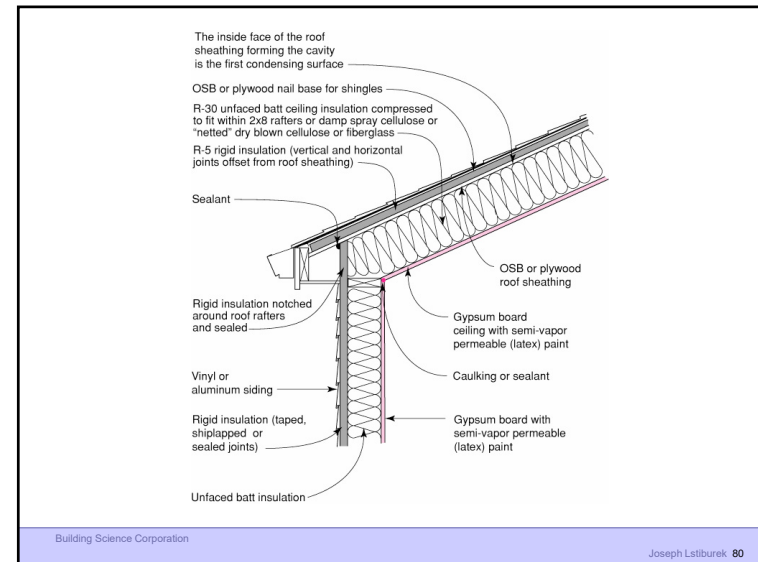
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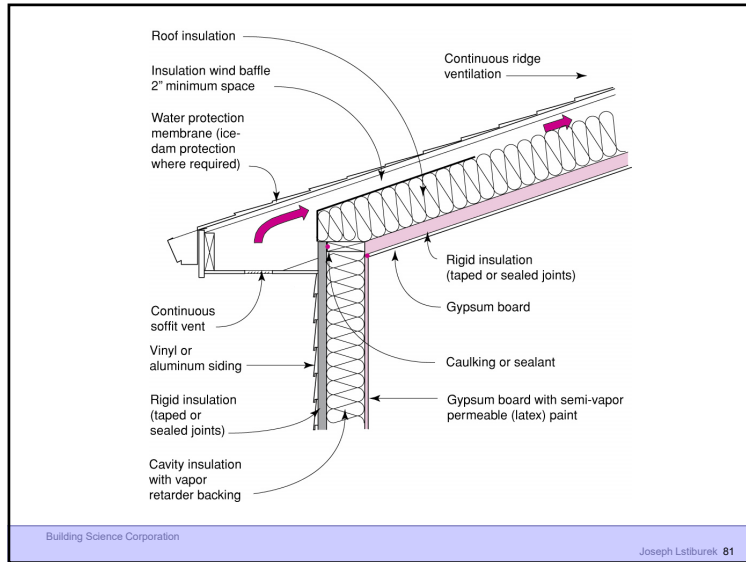
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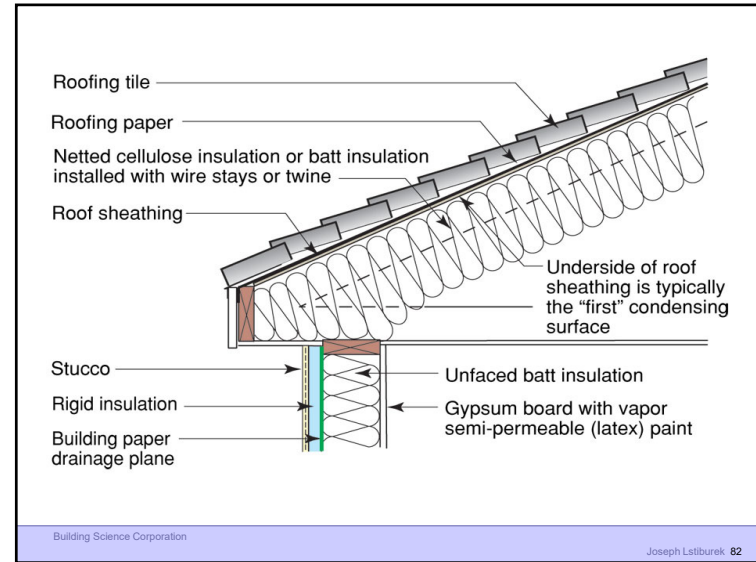
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81



82



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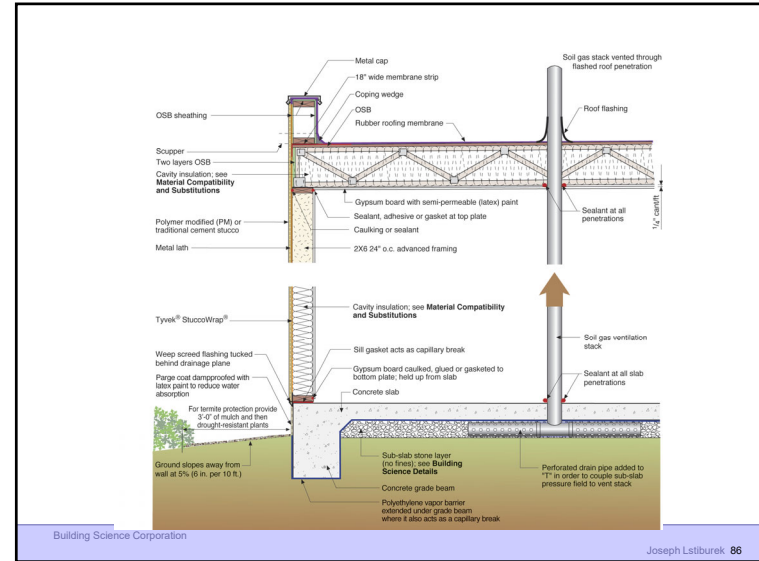
84



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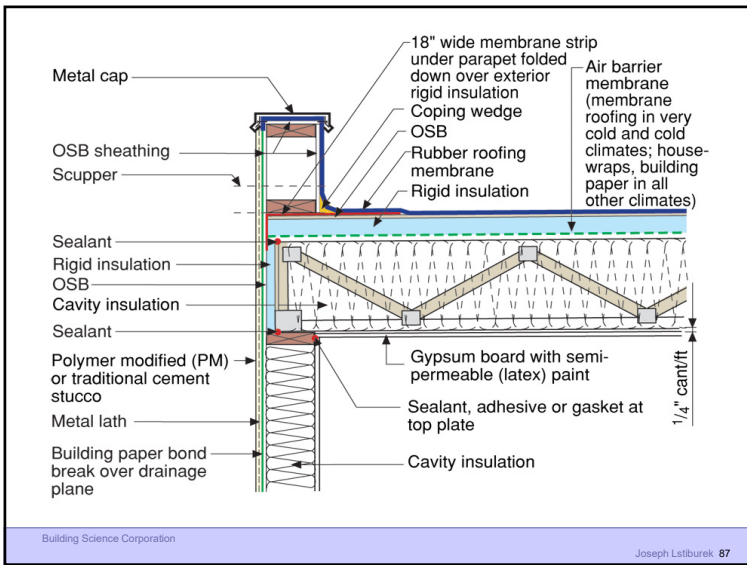
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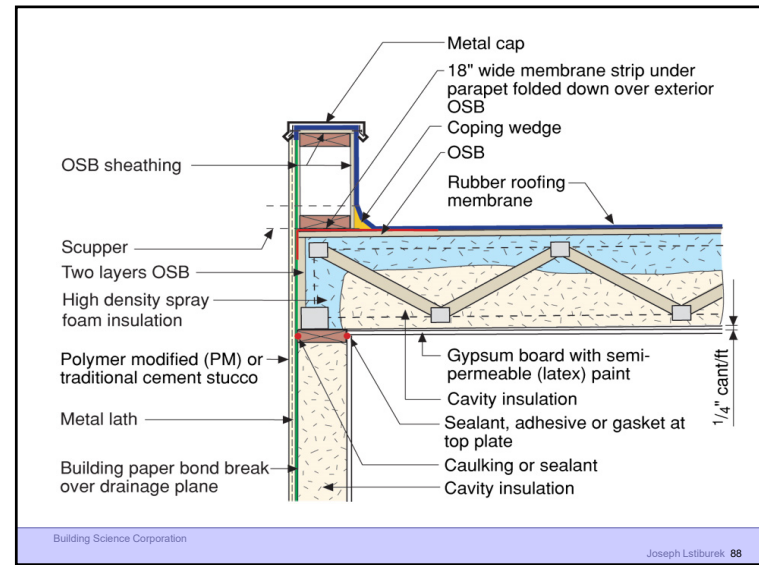
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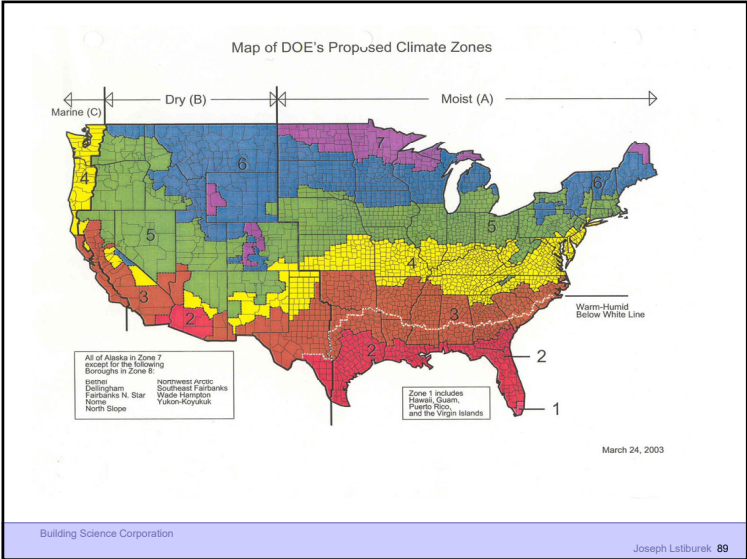
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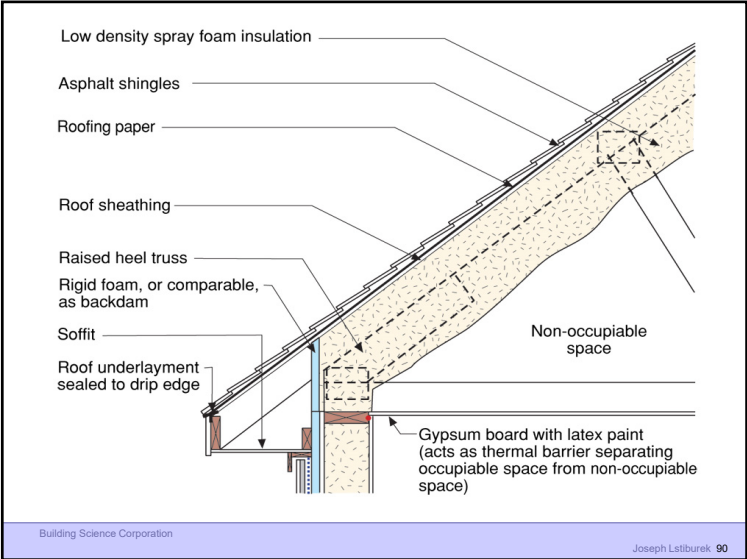
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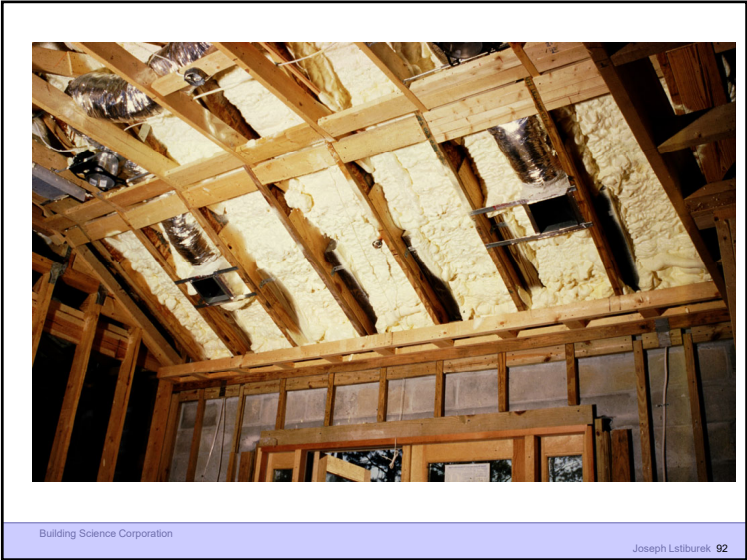
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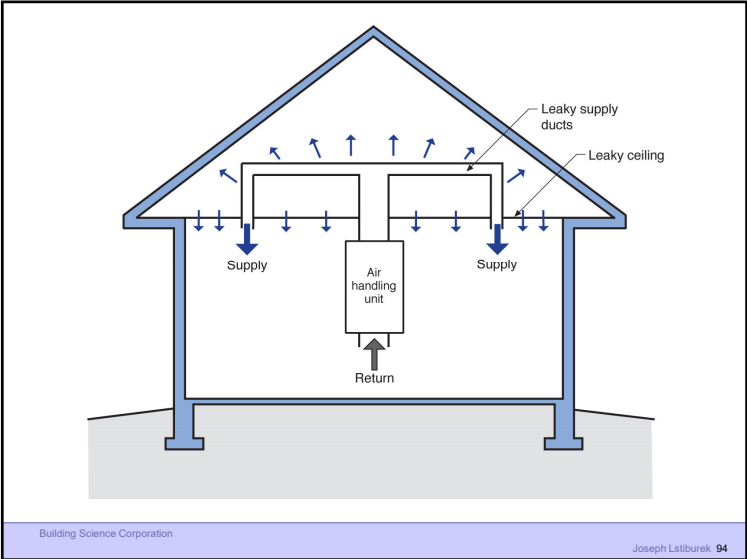
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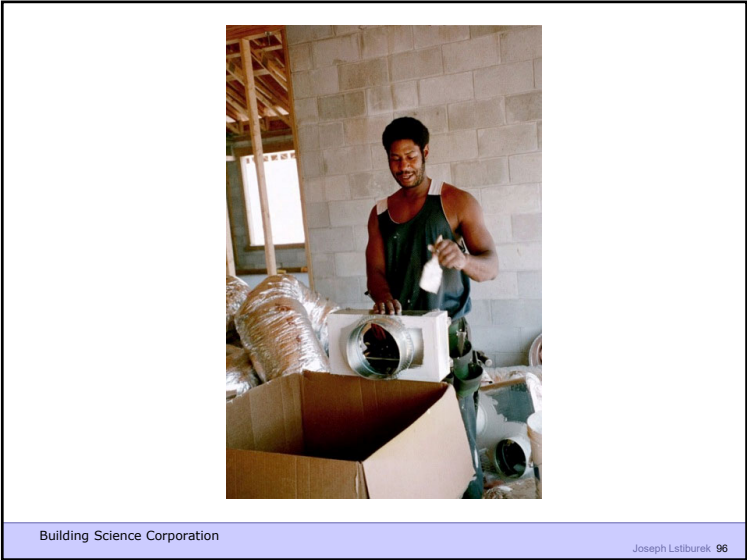
93



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95



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Conditioned Attics Not Unvented Attics
Need Supply Air

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Conditioned Attics Not Unvented Attics
Need Supply Air
50 cfm/1000 ft² of Attic

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Hygric Buoyancy

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Components in Dry Air	Volume Ratio compared to Dry Air	Molecular Mass - <i>M</i> (kg/kmol)	Molecular Mass in Air
Oxygen	0.2095	32.00	6.704
Nitrogen	0.7809	28.02	21.88
Carbon Dioxide	0.0003	44.01	0.013
Hydrogen	0.000005	2.02	0
Argon	0.00933	39.94	0.373
Neon	0.000018	20.18	0
Helium	0.000005	4.00	0
Krypton	0.000001	83.8	0
Xenon	0.09 10 ⁻⁶	131.29	0
Total Molecular Mass of Air			28.97

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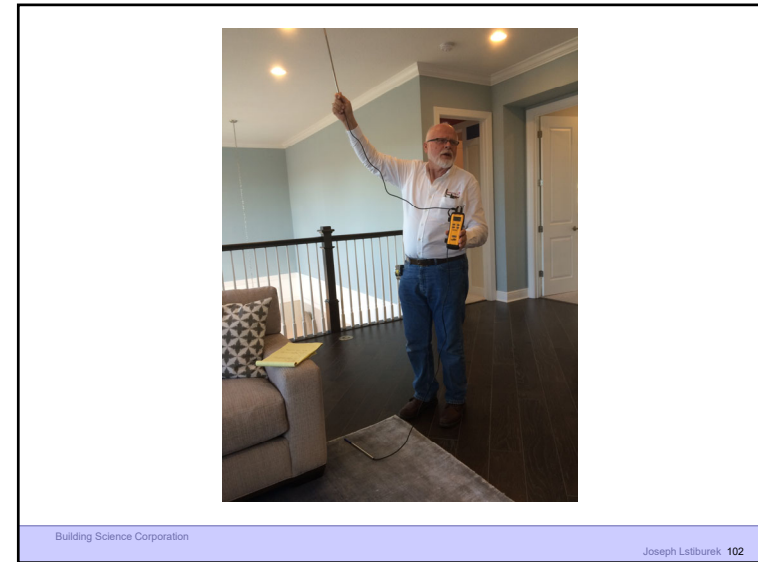
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Components in Dry Air	Volume Ratio compared to Dry Air	Molecular Mass - <i>M</i> (kg/kmol)	Molecular Mass in Air
Oxygen	0.2095	32.00	6.704
Nitrogen	0.7809	28.02	21.88
Carbon Dioxide	0.0003	44.01	0.013
Hydrogen	0.0000005	2.02	0
Argon	0.00933	39.94	0.373
Neon	0.000018	20.18	0
Helium	0.000005	4.00	0
Krypton	0.000001	83.8	0
Xenon	0.09 10 ⁻⁶	131.29	0
Total Molecular Mass of Air			28.97

Note Water Vapor (H₂O) is 18
Dry Air is 29

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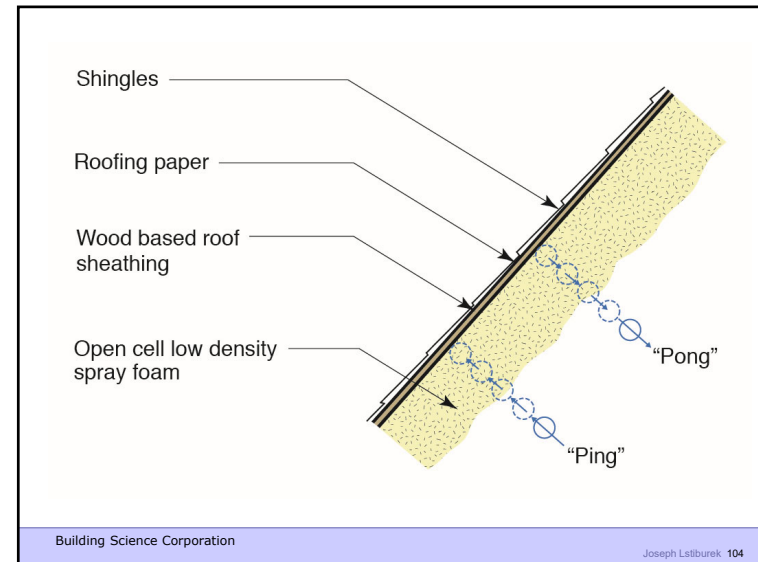
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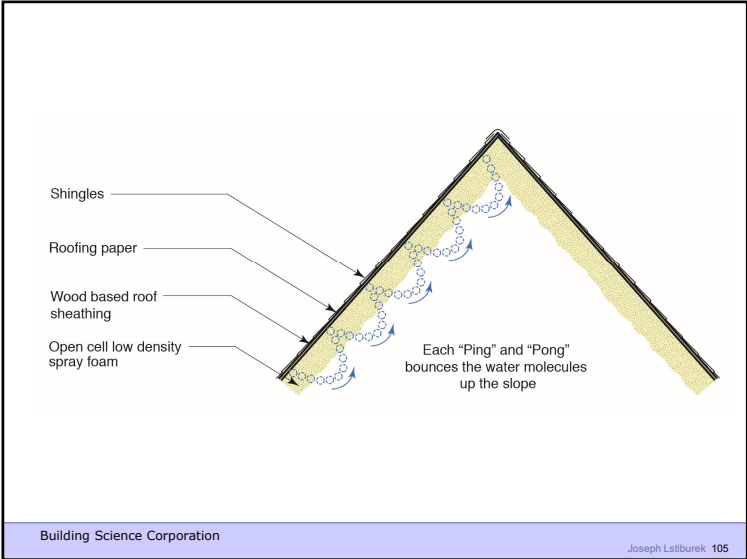
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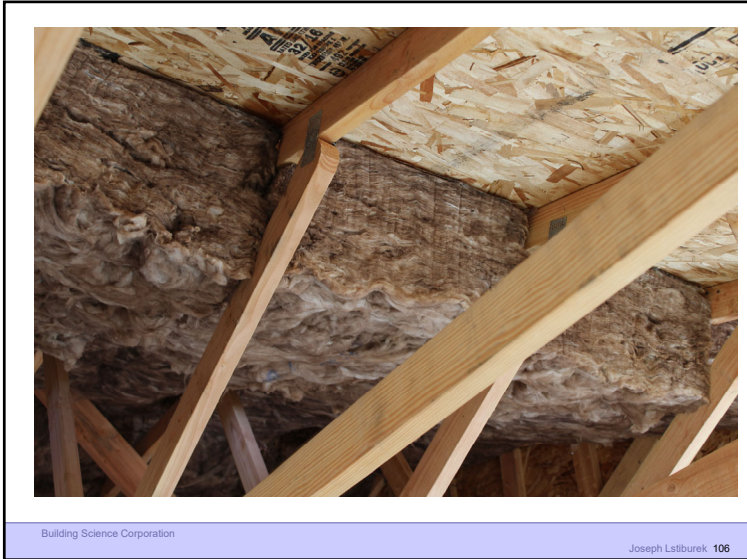
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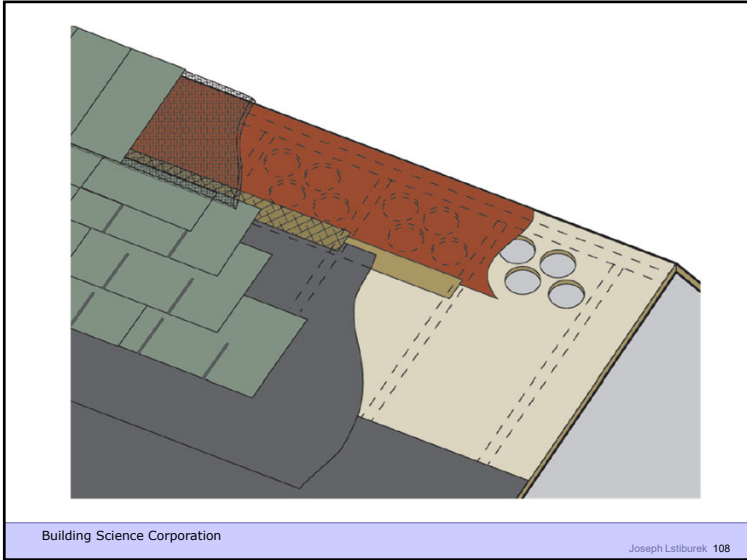
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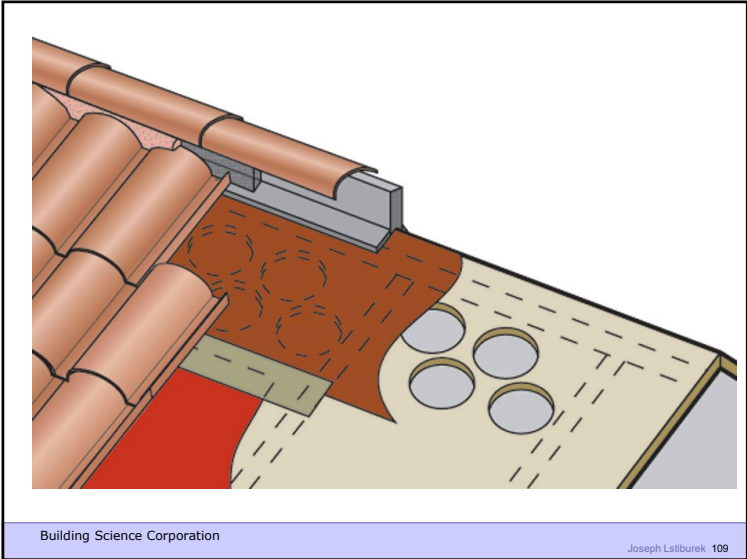
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107



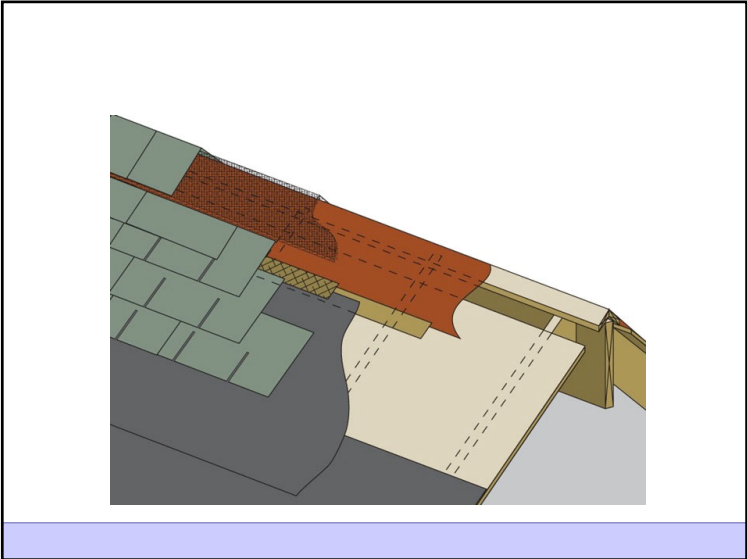
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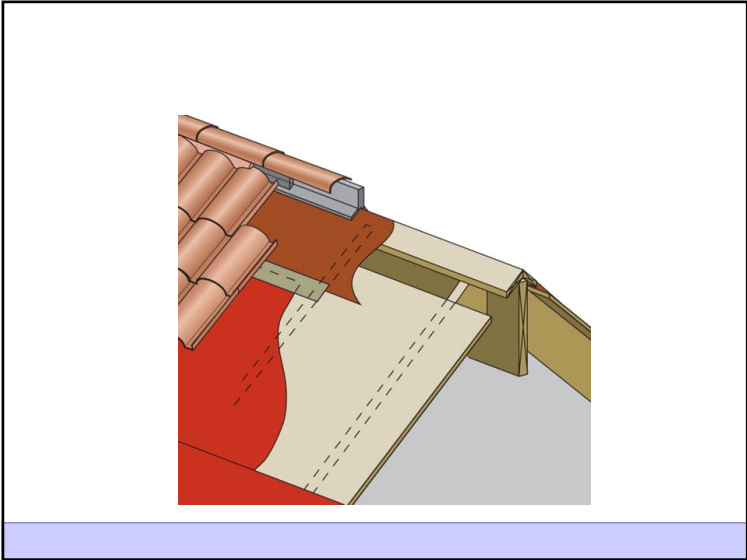
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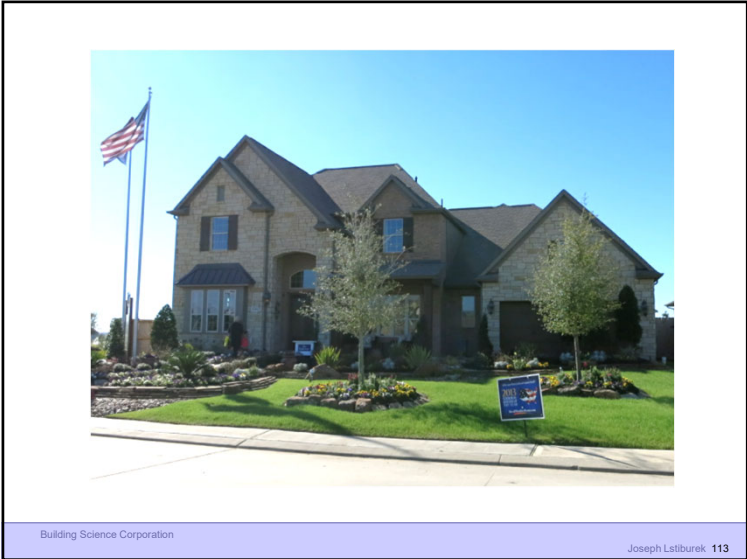
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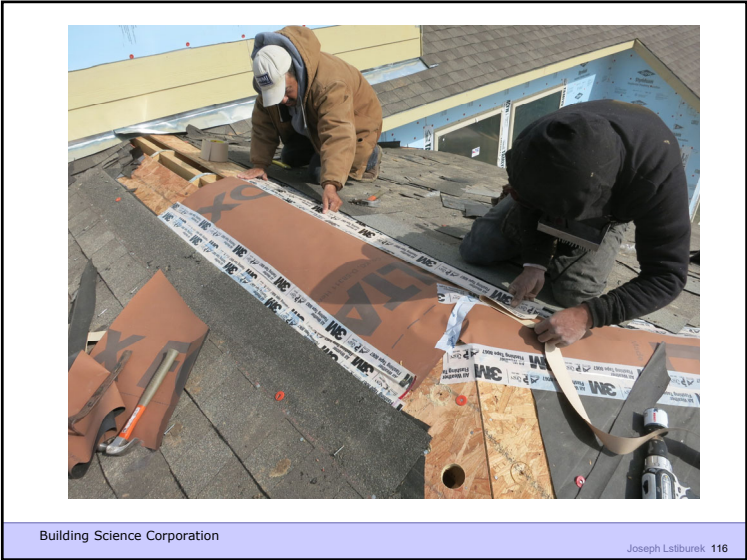
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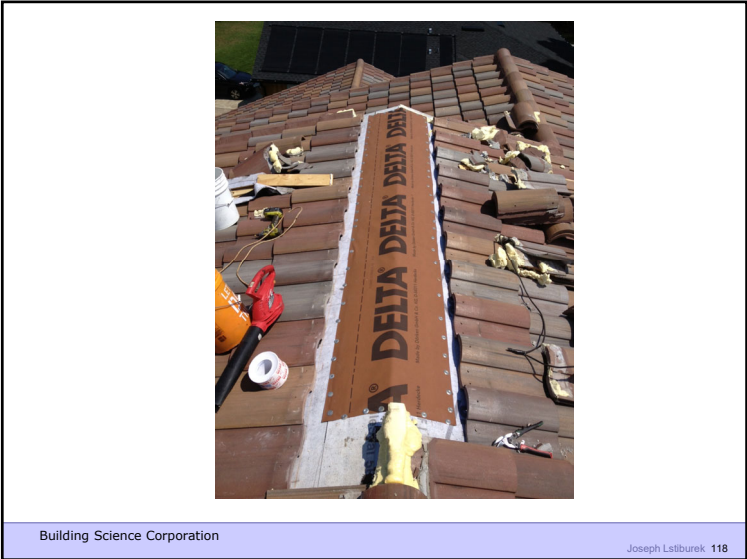
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Code Change

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R806.5 Unvented attic and unvented attic enclosed rafter assemblies.

- vapor diffusion port
- port area 1:600 of the ceiling area
- vapor permeance greater than 20 perms
- roof slope greater than 3:12
- insulation under the roof deck or at the ceiling
- air supply 50 cfm/1000 ft² ceiling area when insulation installed directly under the roof deck
- Climate Zones 1, 2 and 3

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Vapor Diffusion Port: A passageway for conveying water vapor from an unvented attic to the atmosphere.

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Sweating Ducts

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Sweating Ducts
 Light Colored Roofs
 Cool Roofs
 Radiant Barriers
 ACCA Manual J, S and D
 ASHRAE 62.2

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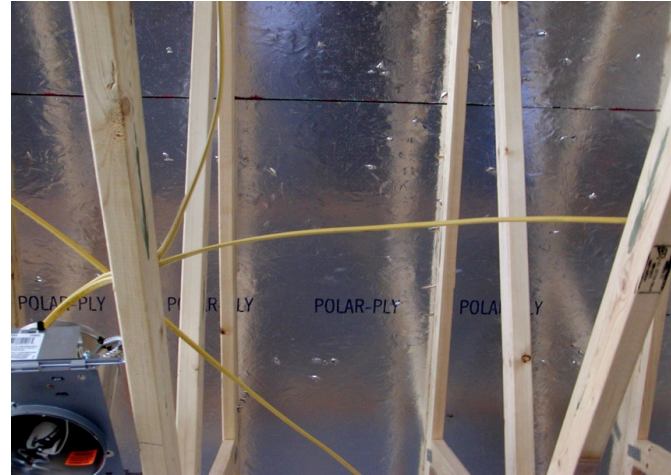
124

Ductwork Attic Dehumidification System

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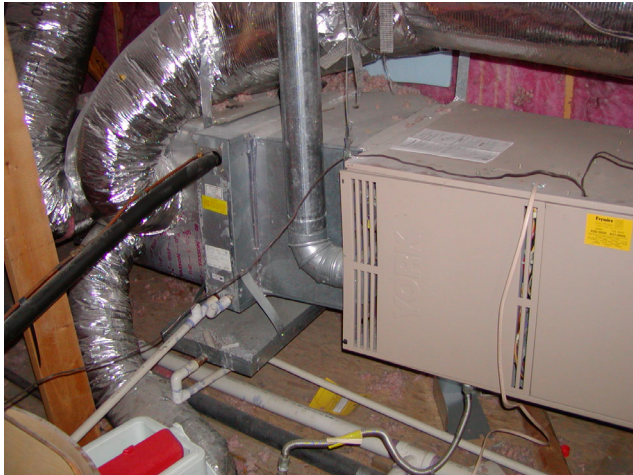
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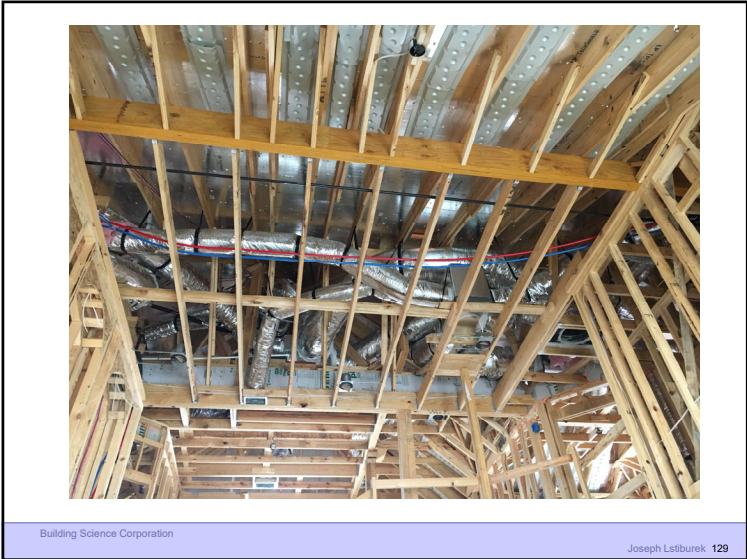
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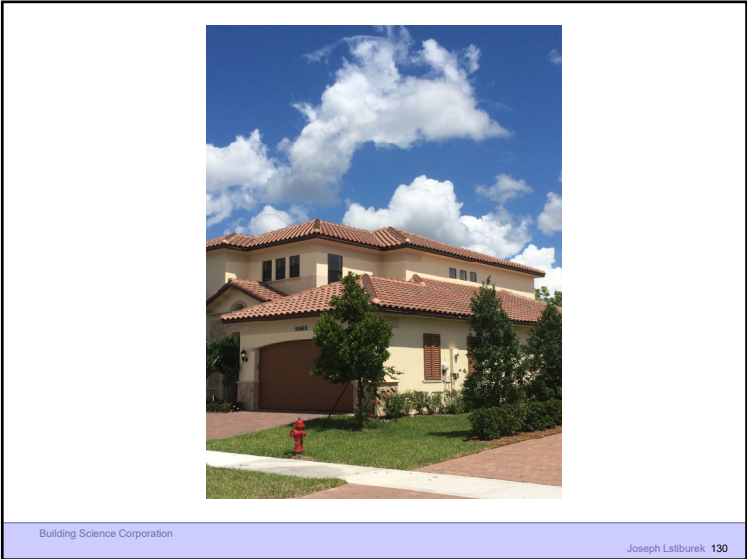
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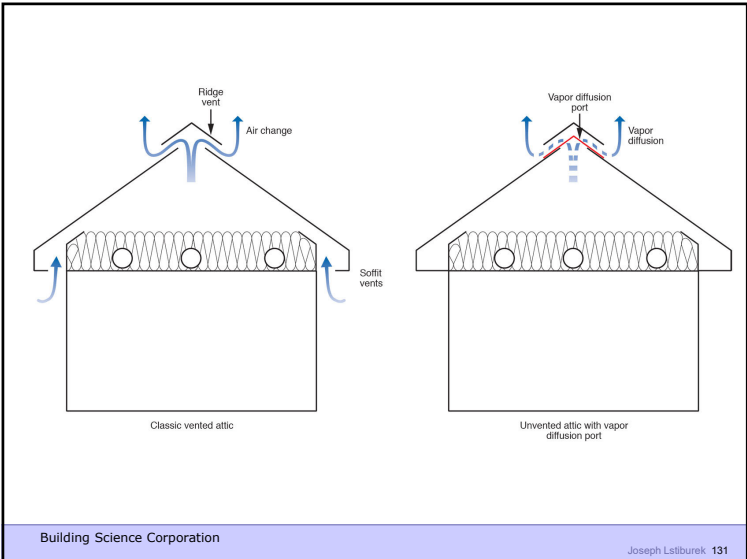
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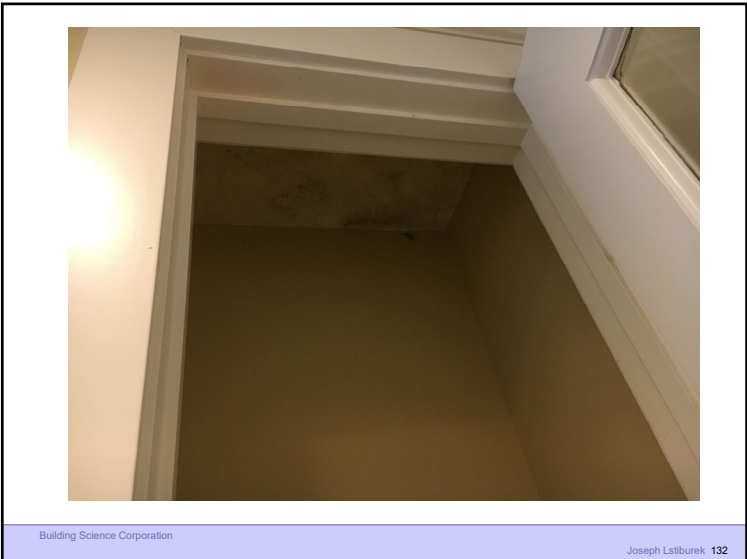
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Joseph Lstiburek 131

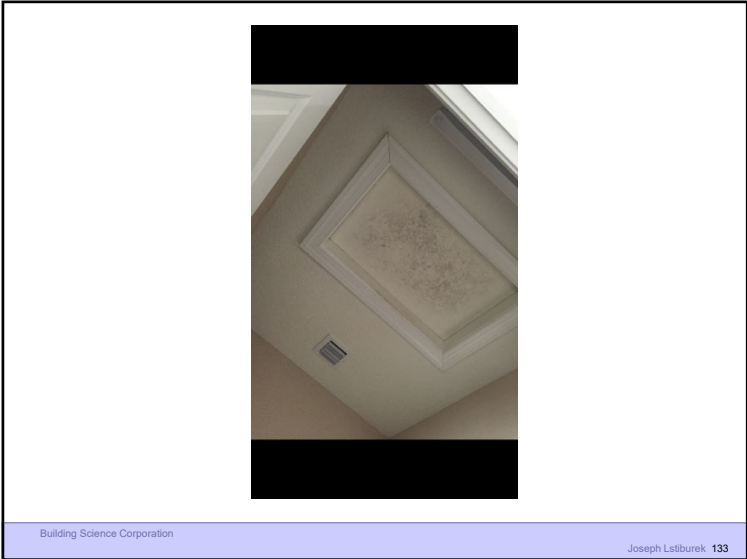
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Joseph Lstiburek 133

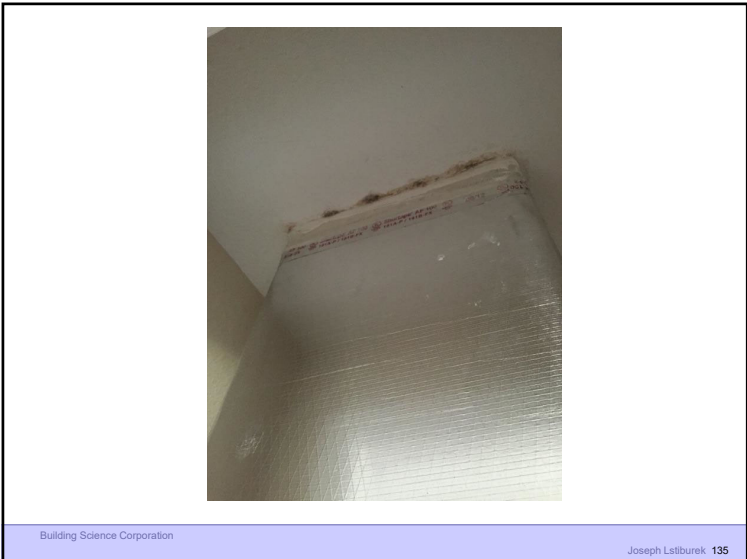
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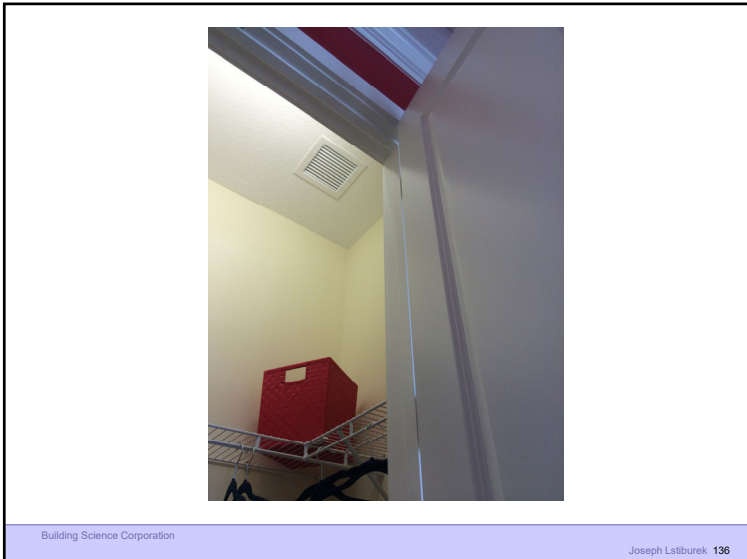
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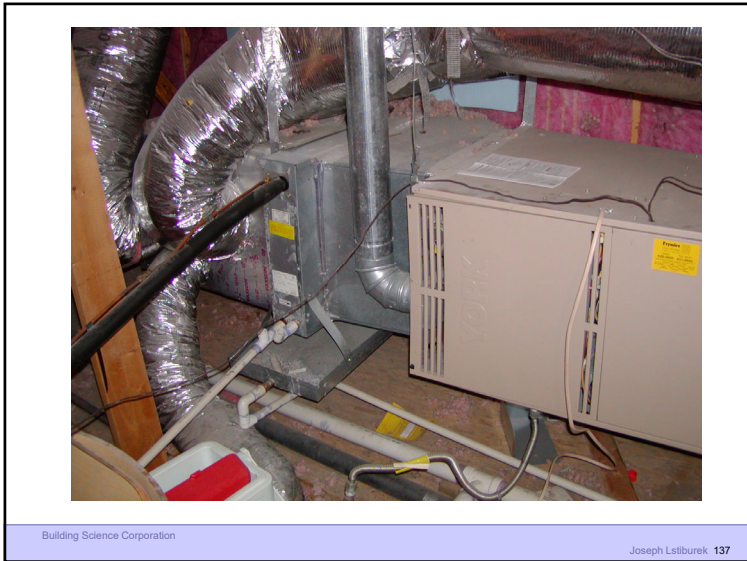
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Crawl spaces must be completely connected to either the outside or the inside

Vented crawl spaces work

Unvented conditioned crawl spaces work

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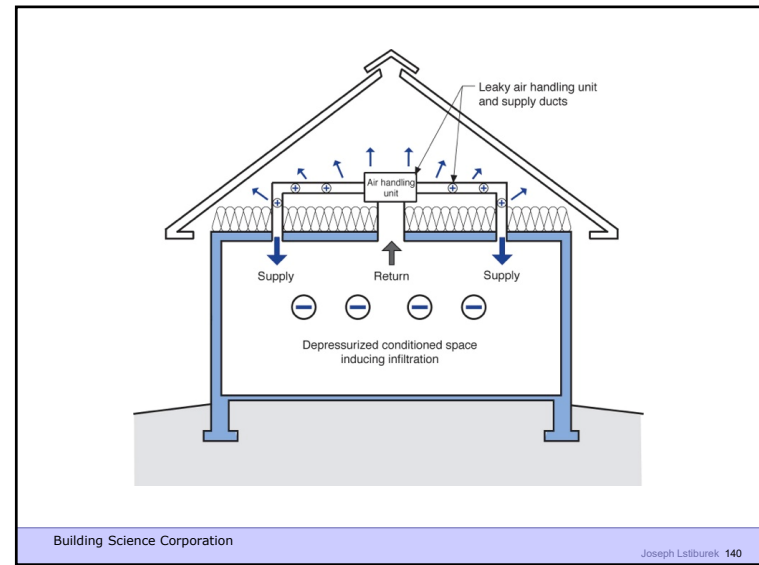
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Don't Do Stupid Things

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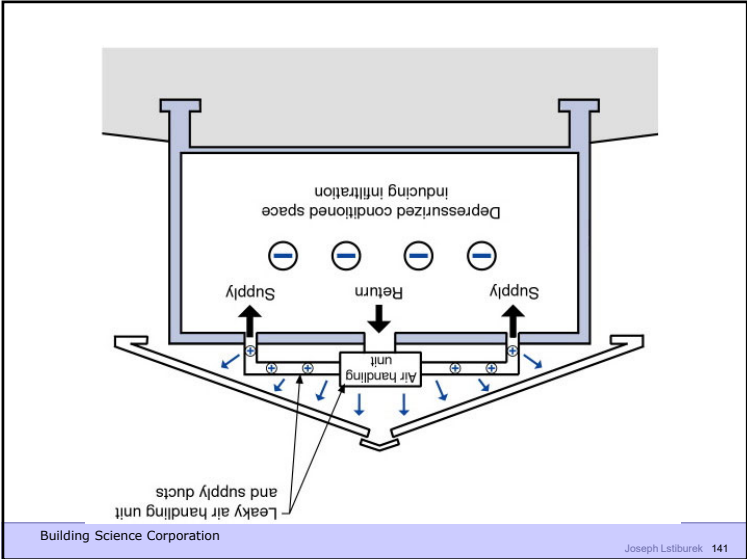
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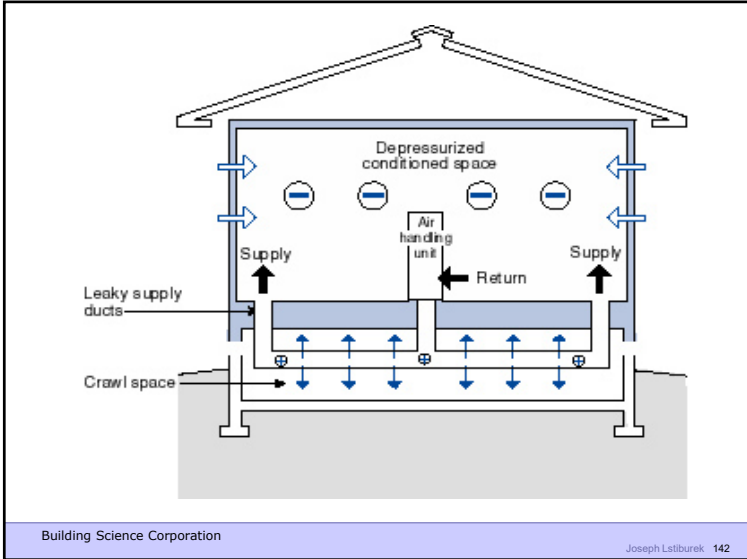
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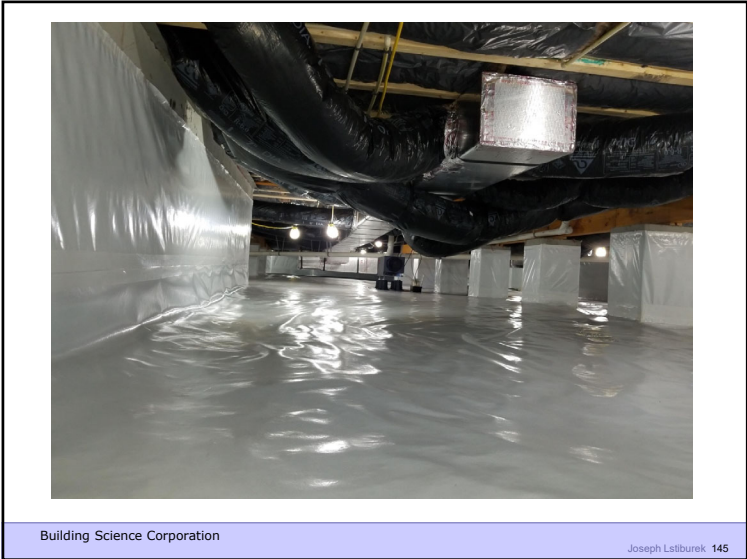
Smart Thing

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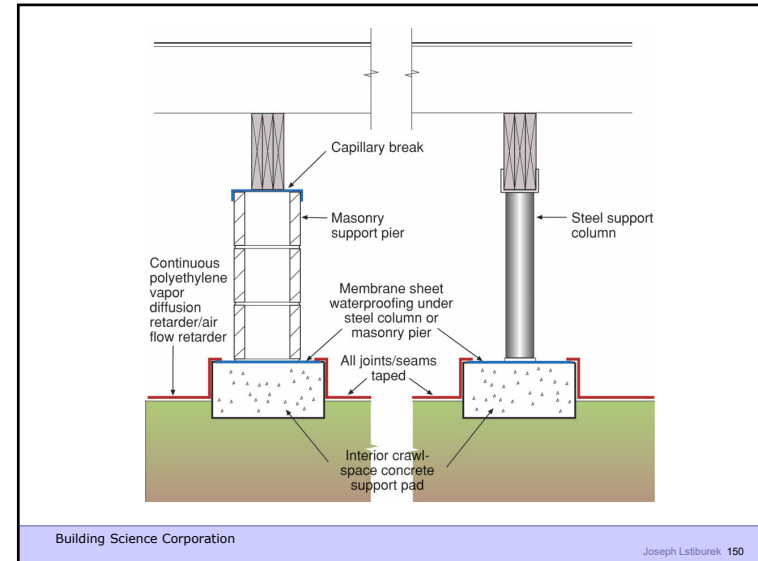
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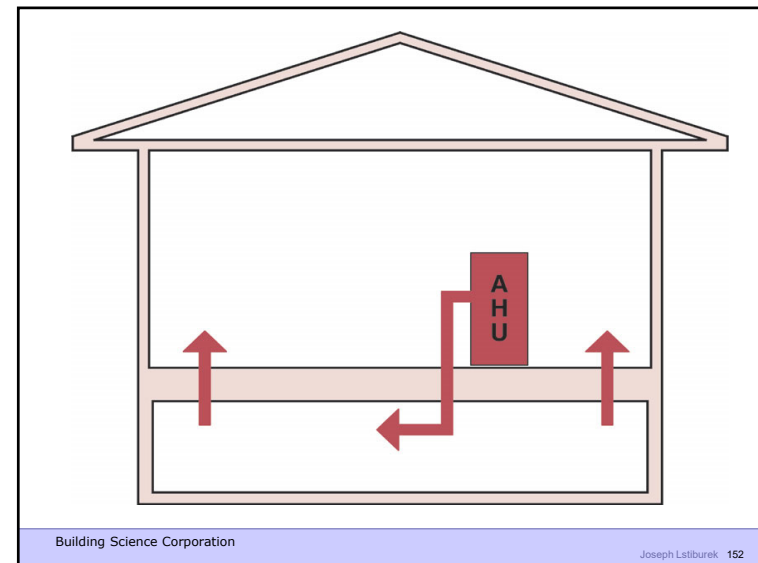
Conditioned Crawlspaces Not Unvented Crawlspaces
 Need Supply Air
 50 cfm/1000 ft² of Crawlspace Area

Or
 Dehumidification

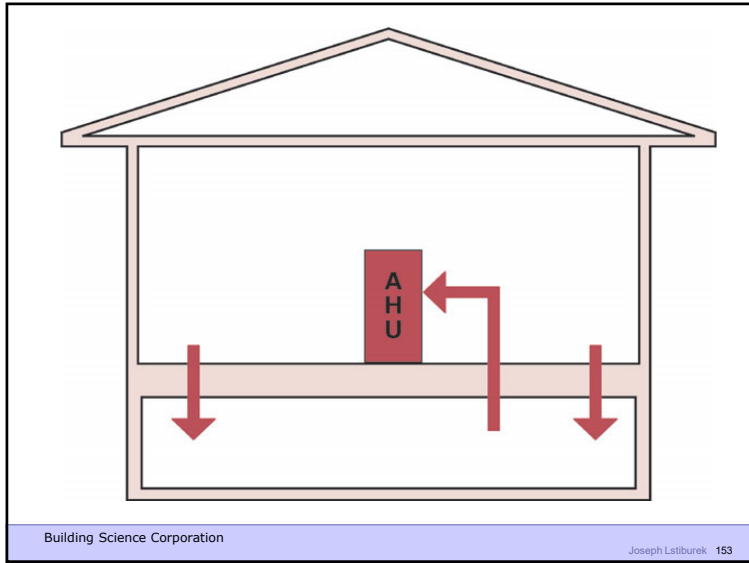
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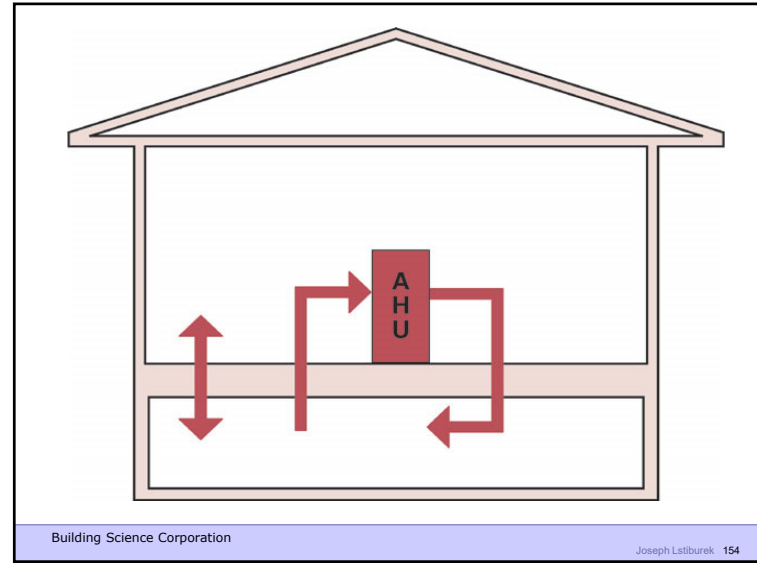
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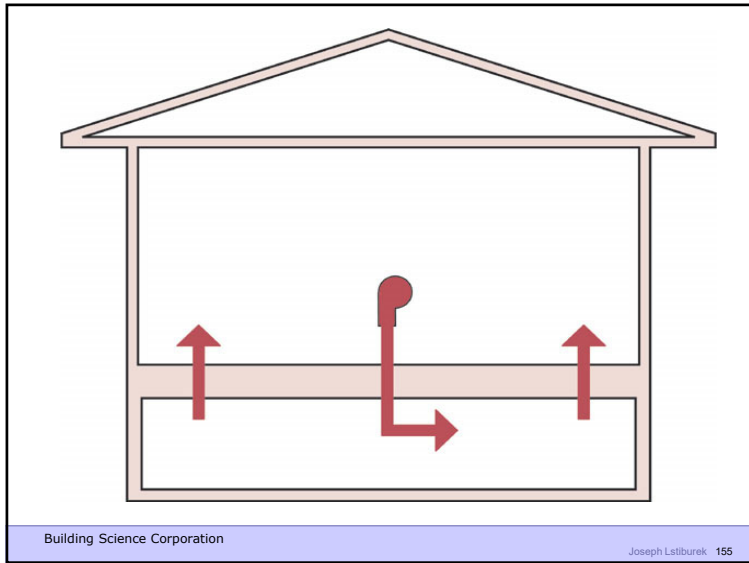
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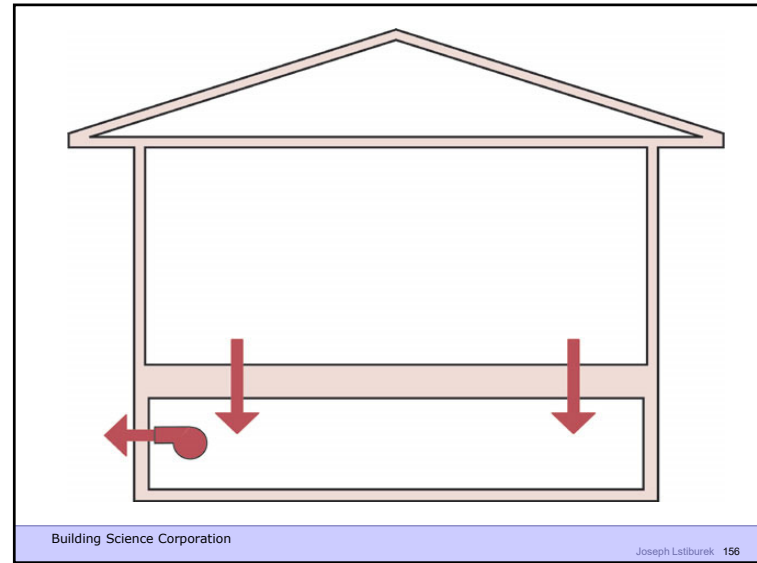
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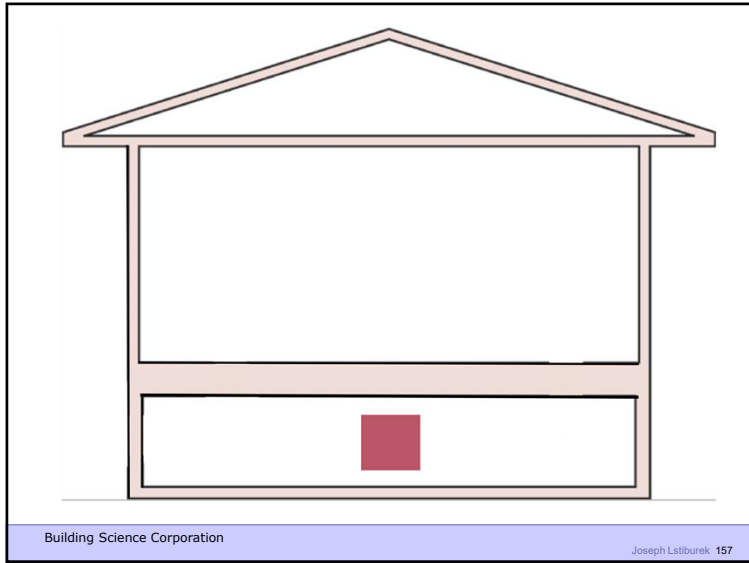
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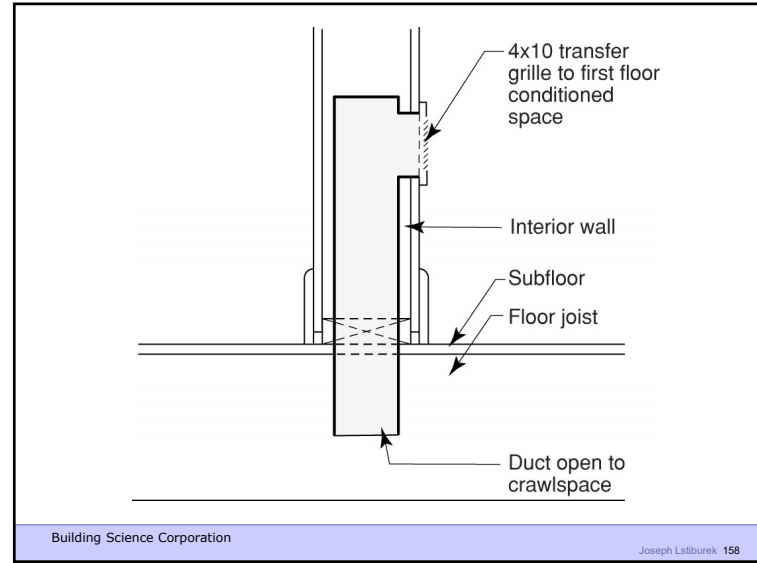
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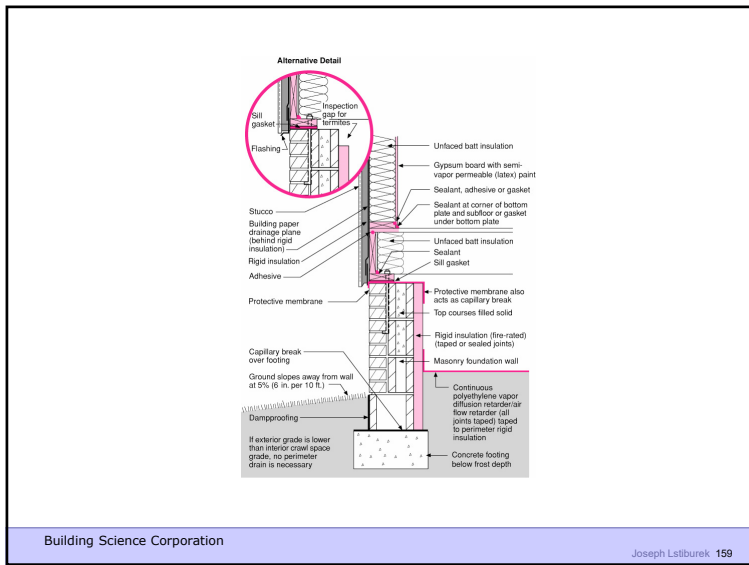
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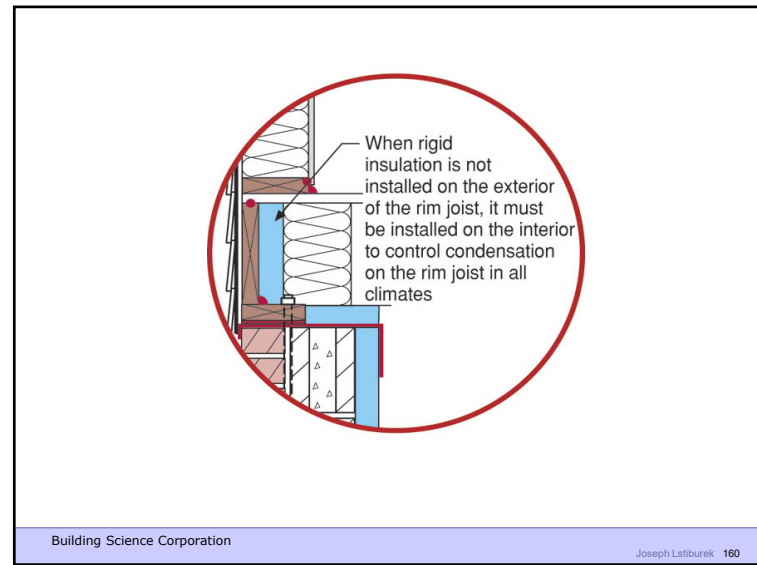
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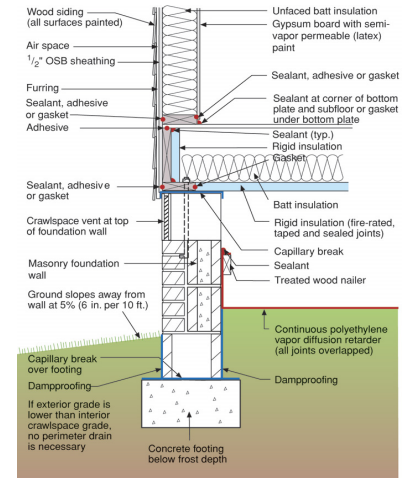
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Smart Thing

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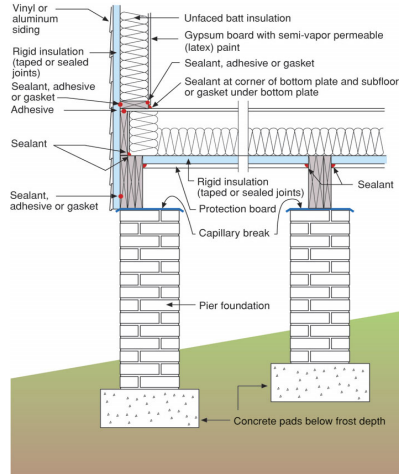
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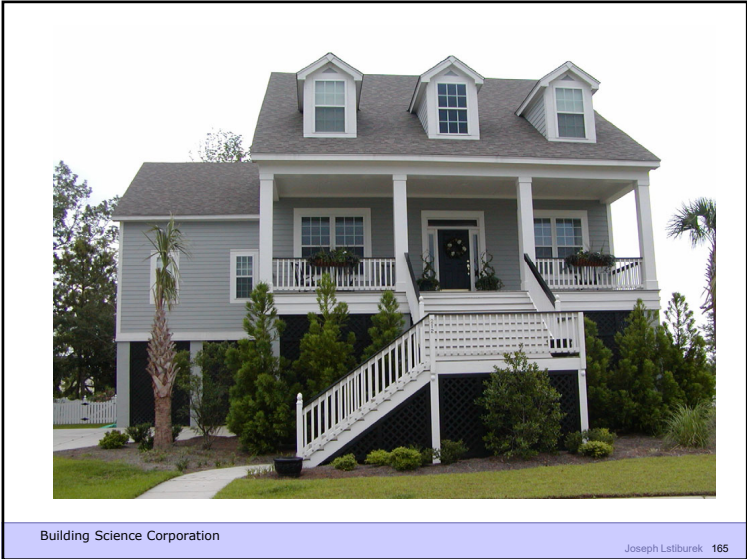
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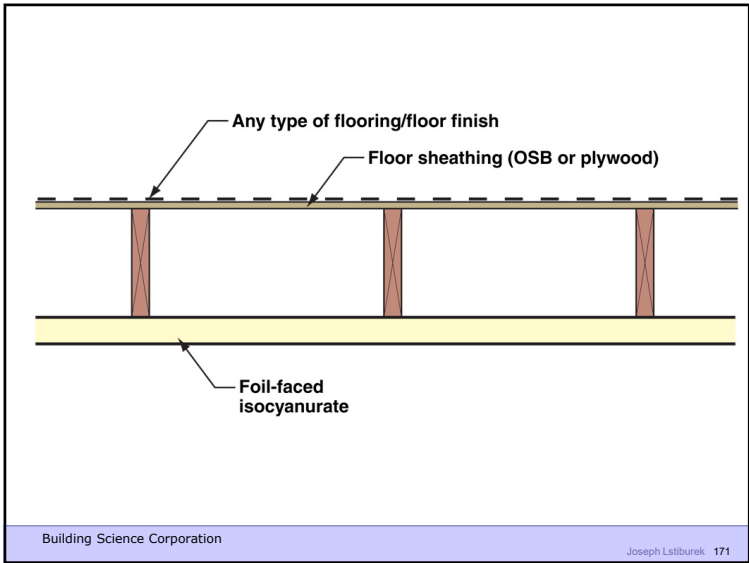
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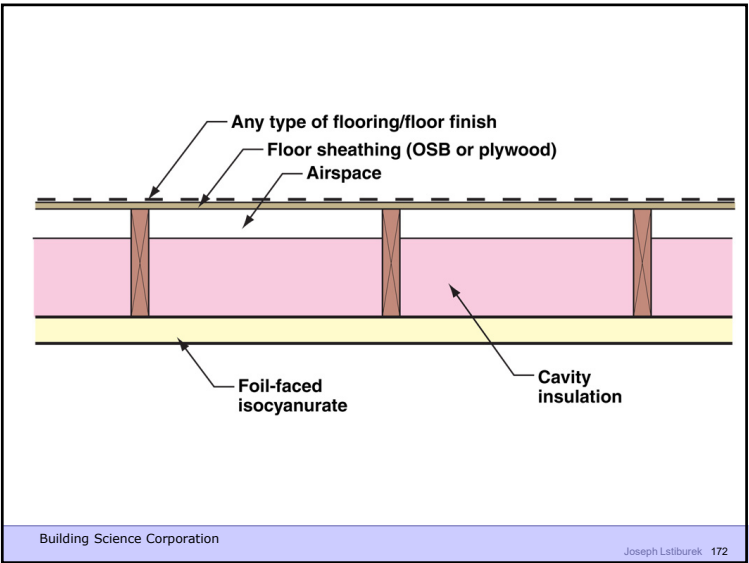
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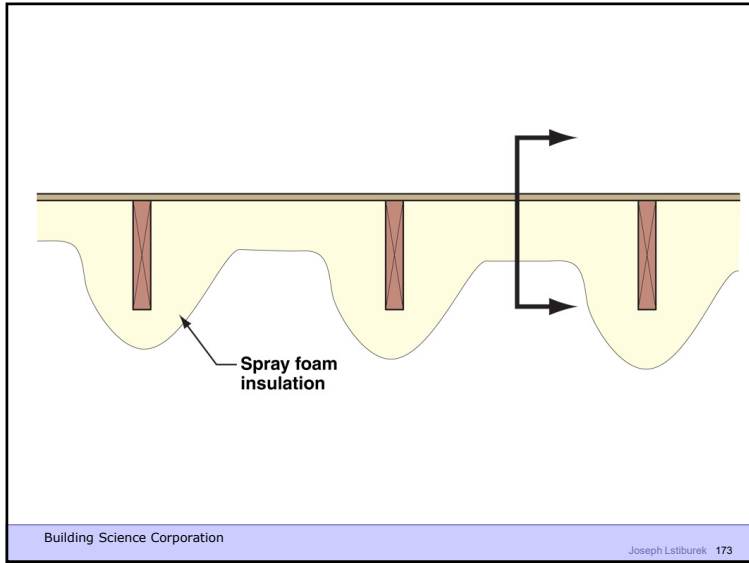
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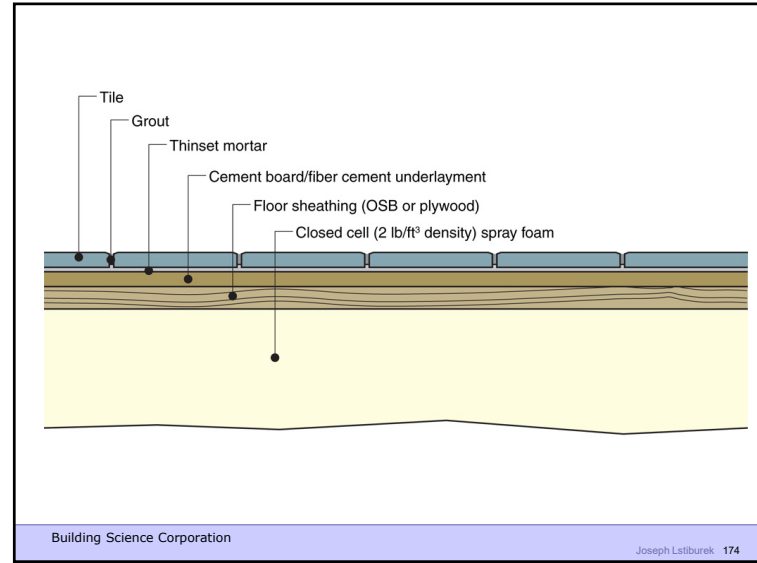
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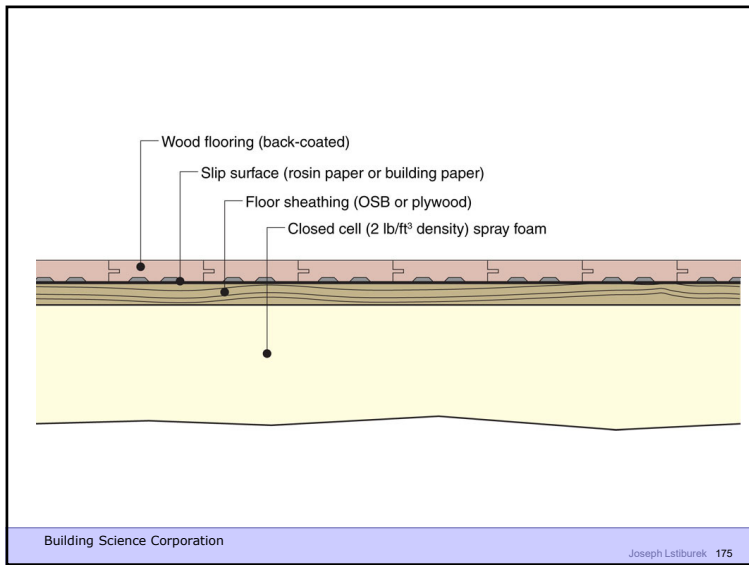
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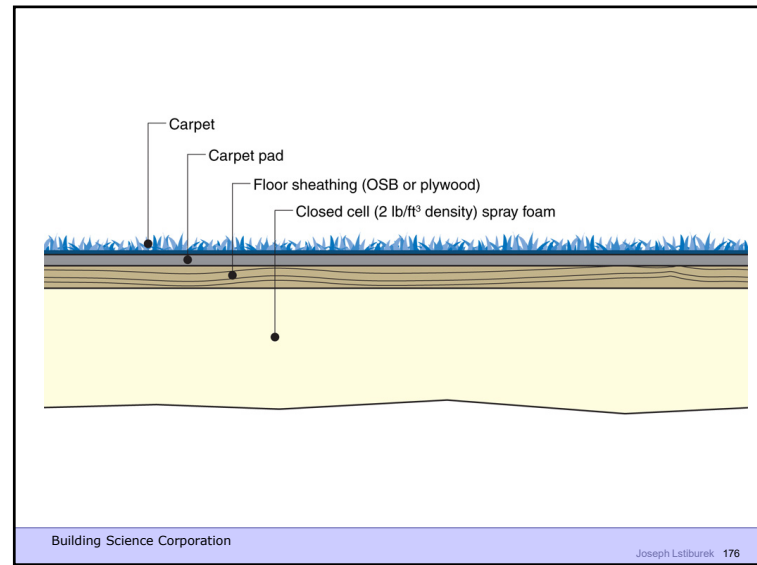
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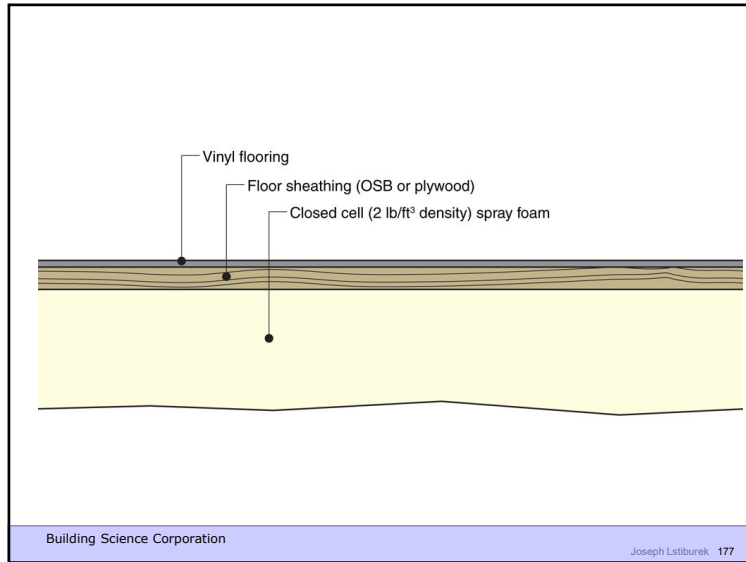
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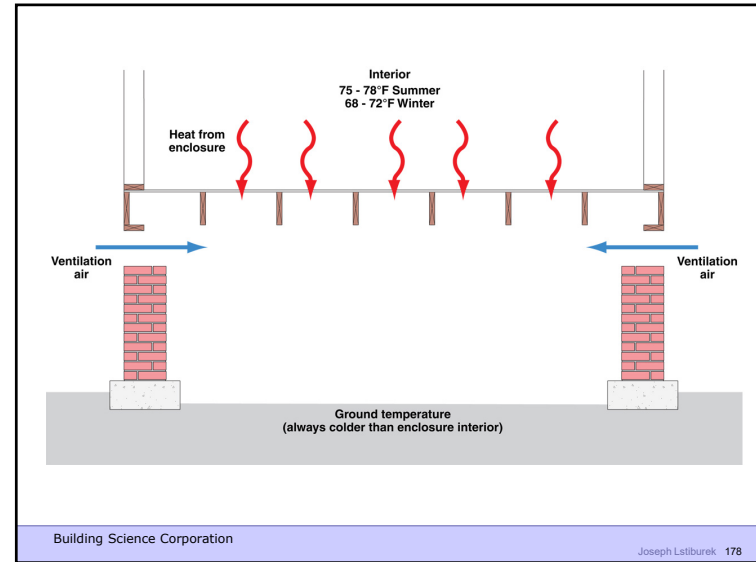
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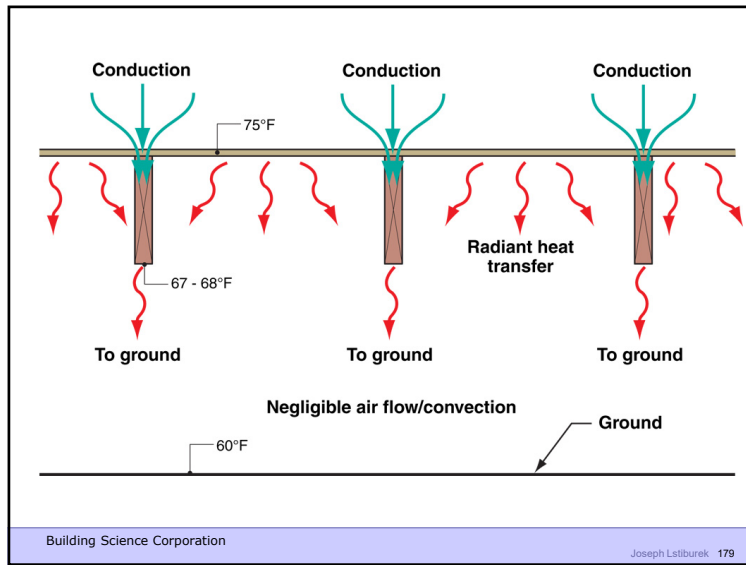
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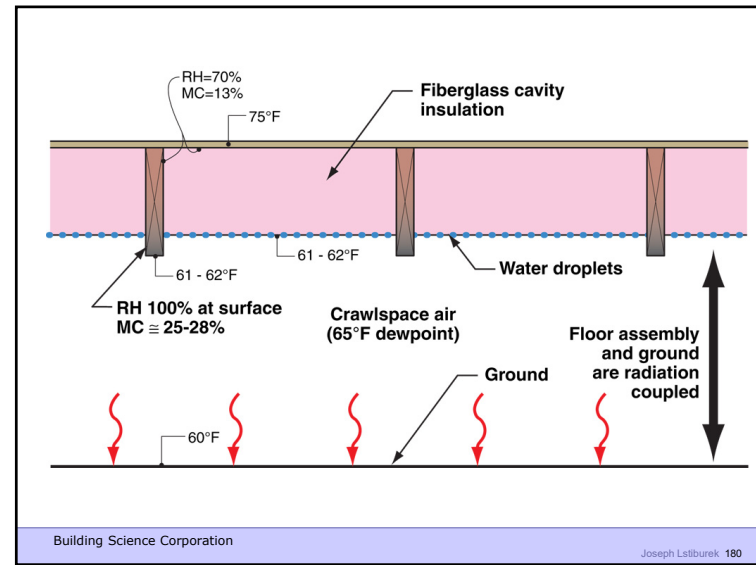
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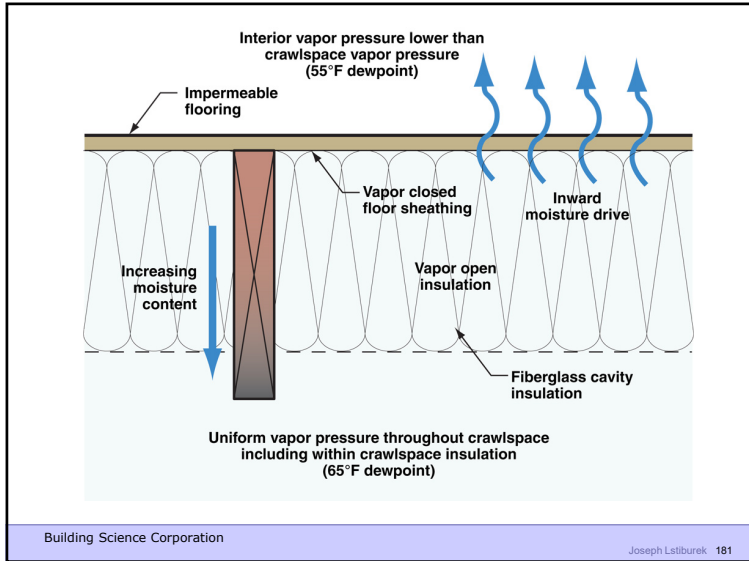
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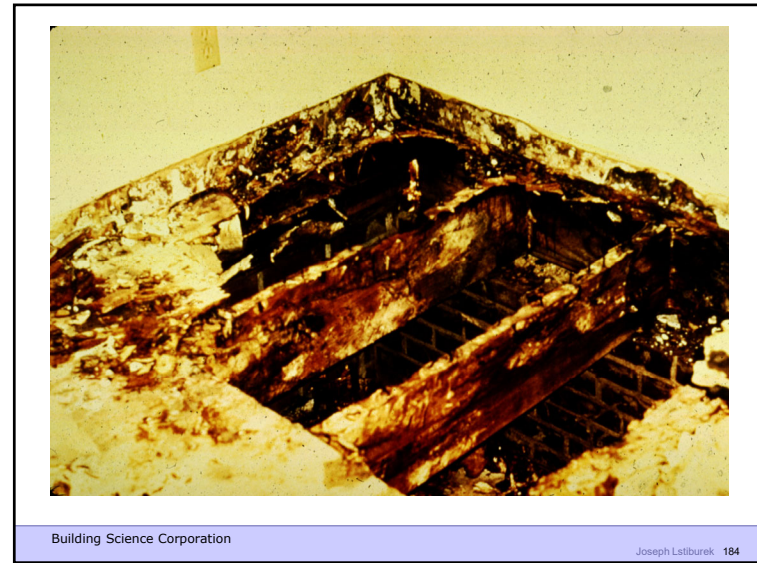
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