

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

# Building Science

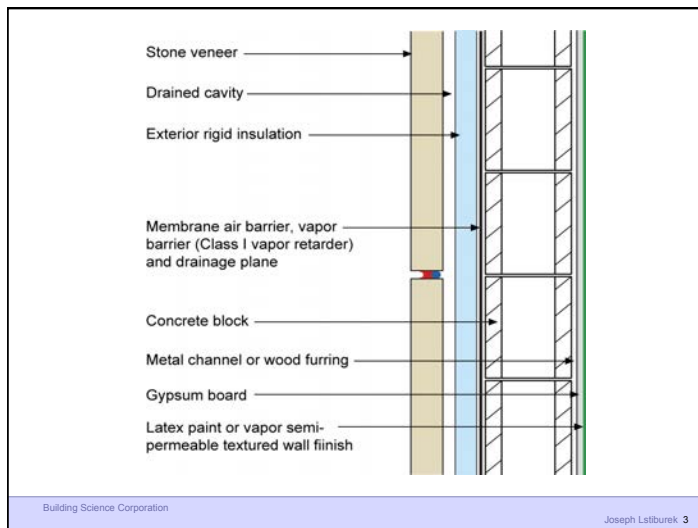
## Air Control Pressures

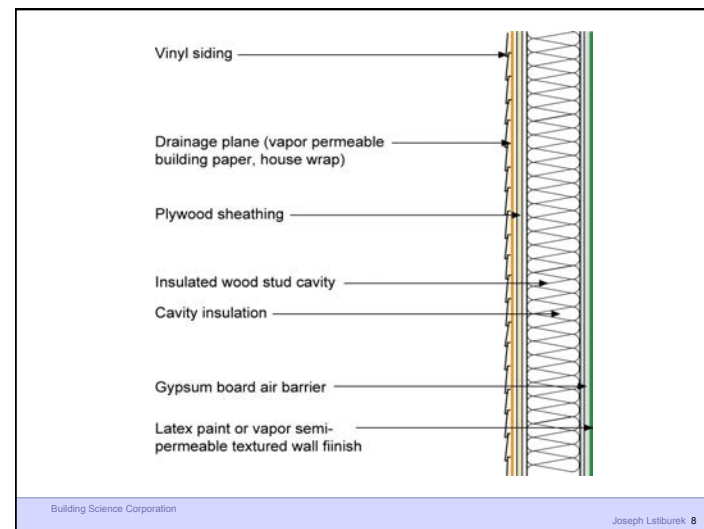
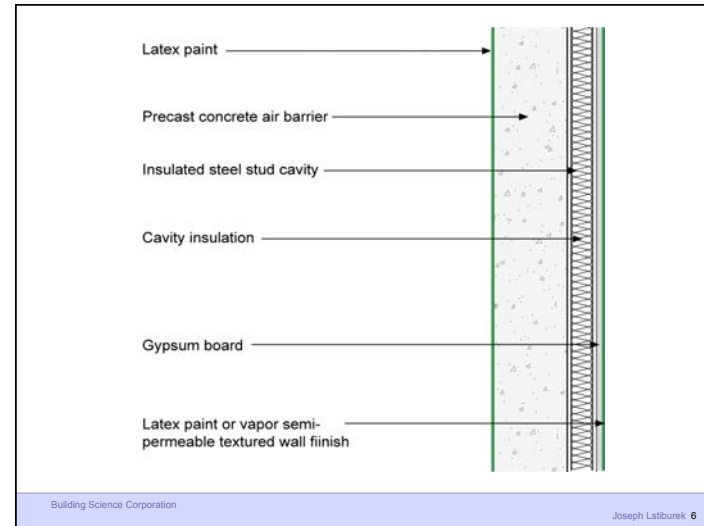
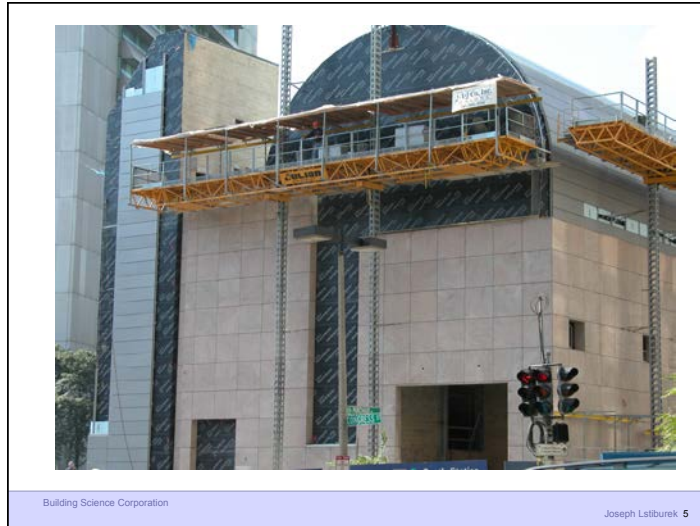
presented by [www.buildingscience.com](http://www.buildingscience.com)

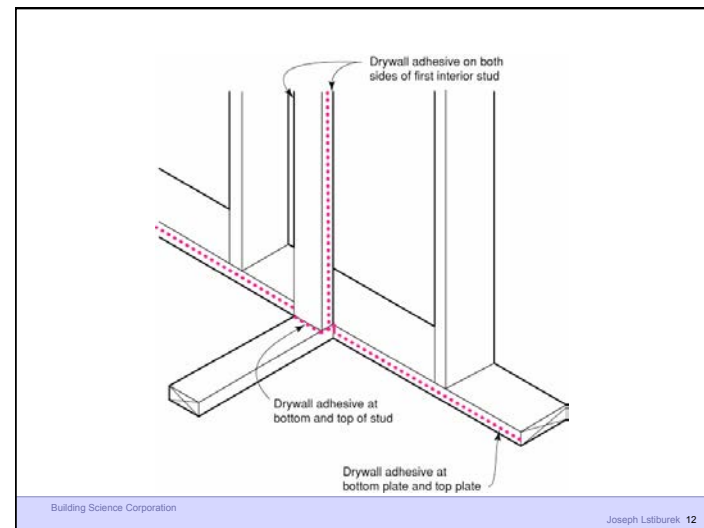
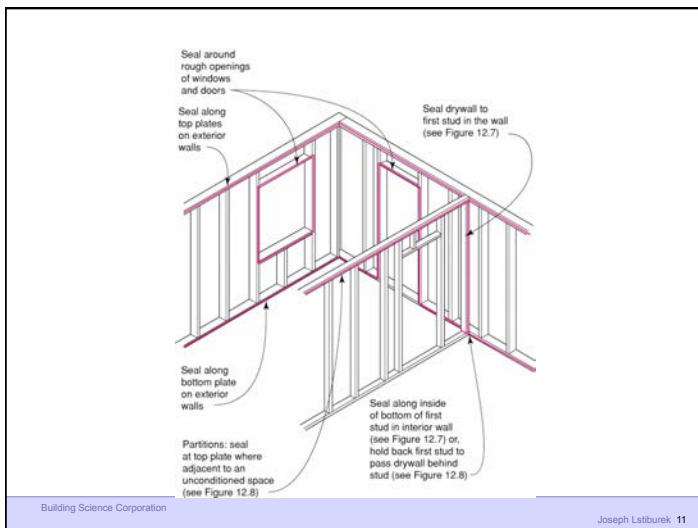
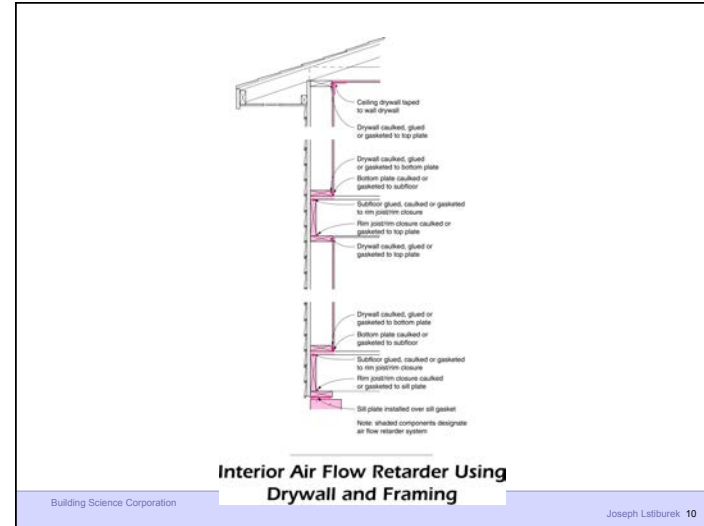
### Air Barrier Metrics

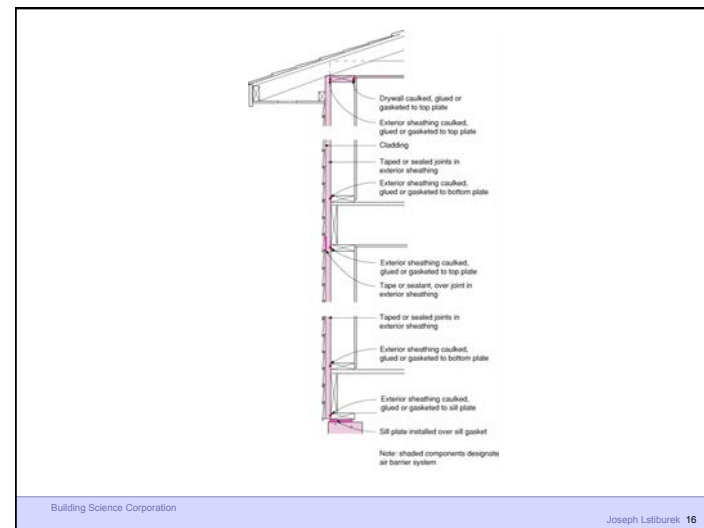
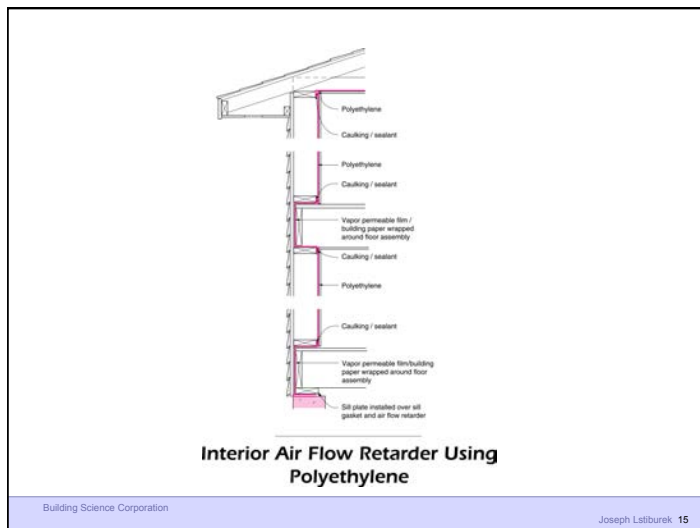
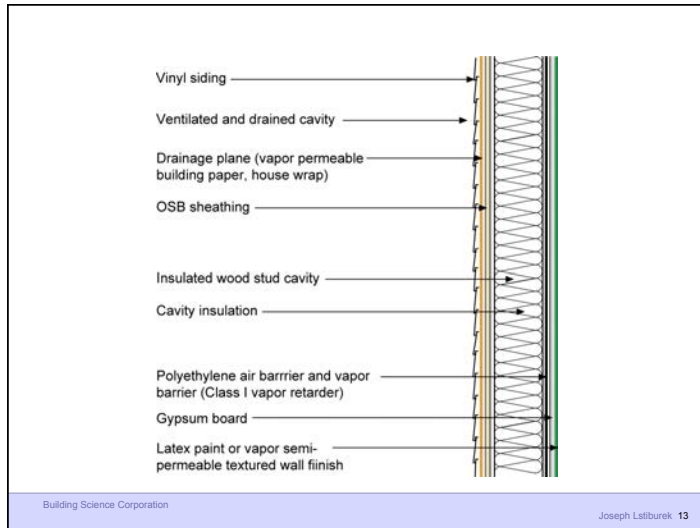
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Assembly	0.20 l/(s-m <sup>2</sup> )@75 Pa
Enclosure	2.00 l/(s-m <sup>2</sup> )@75 Pa

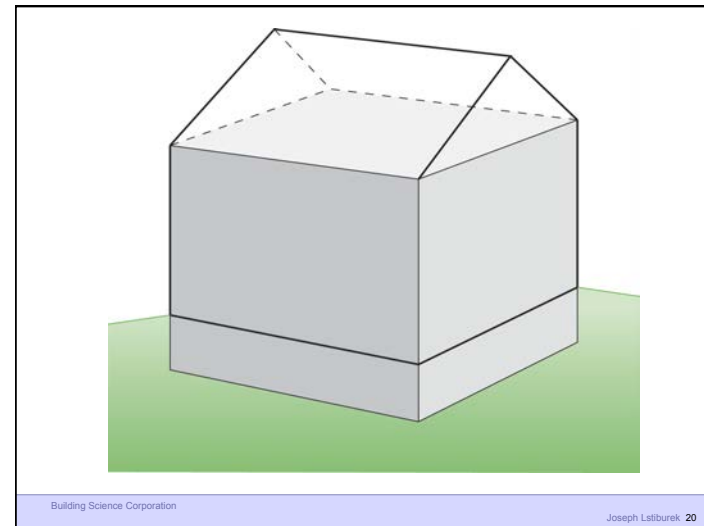
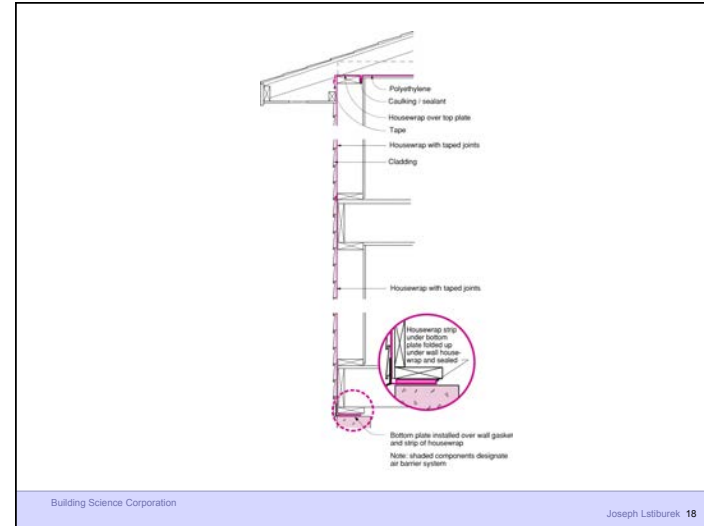
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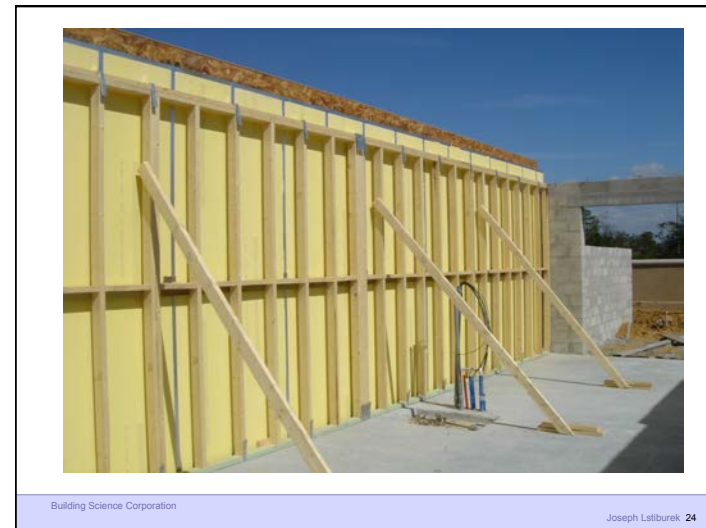
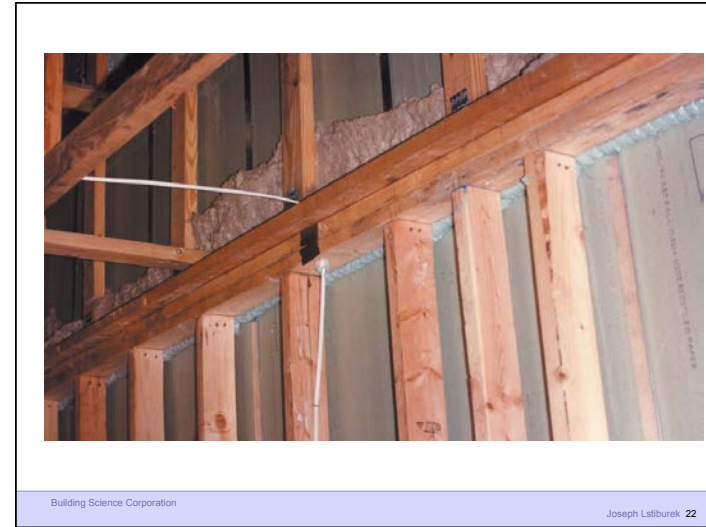
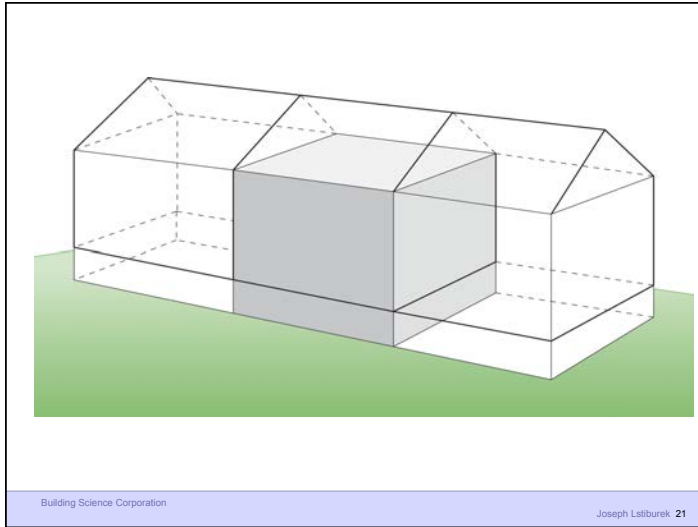


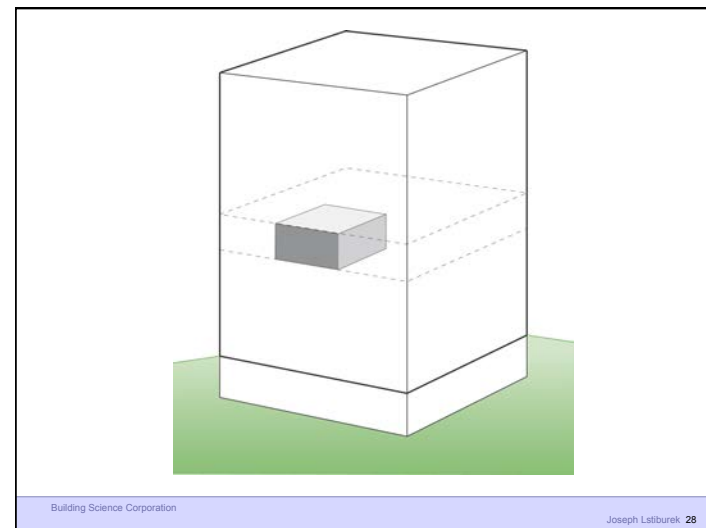
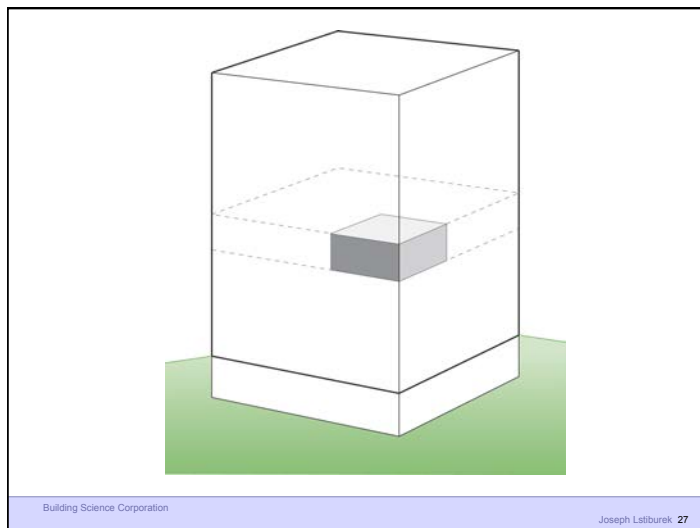
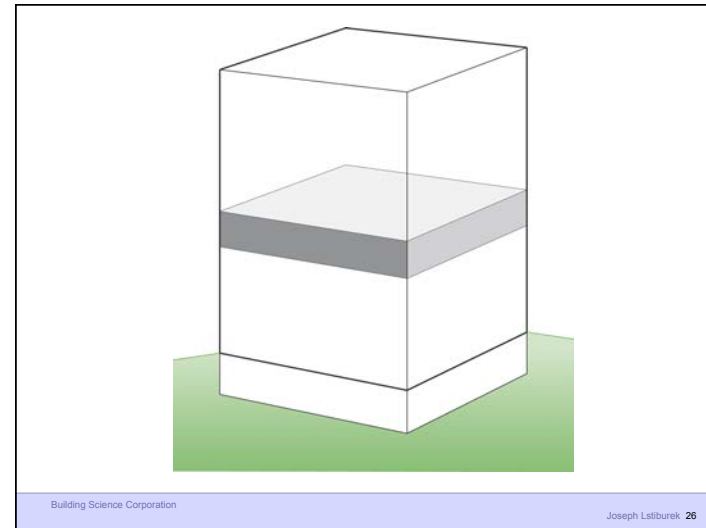
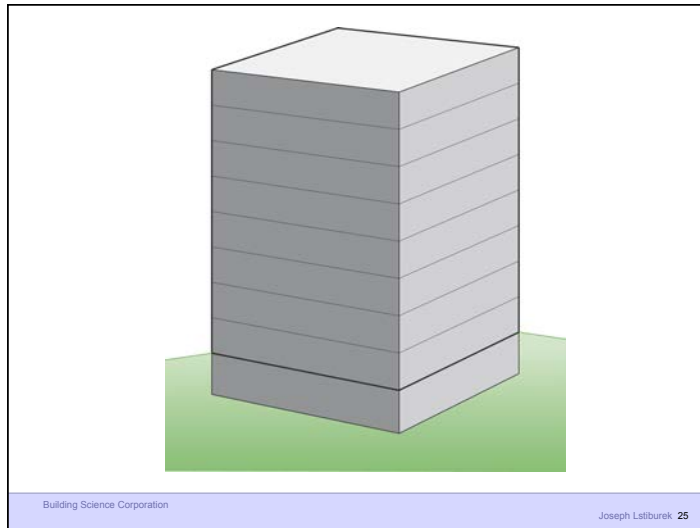








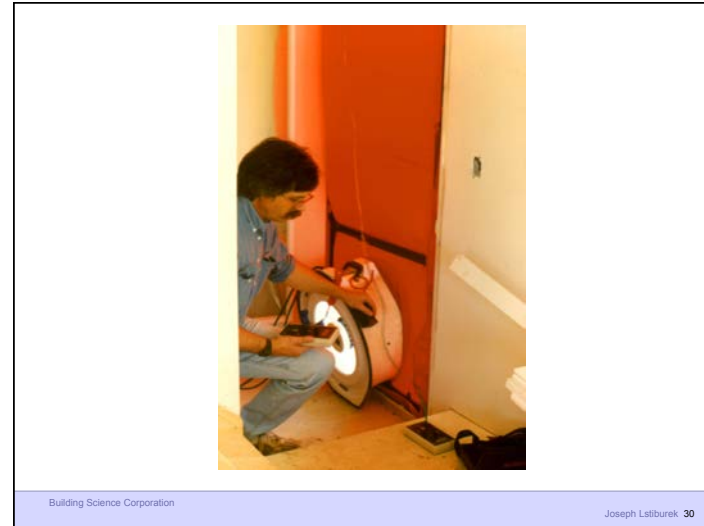






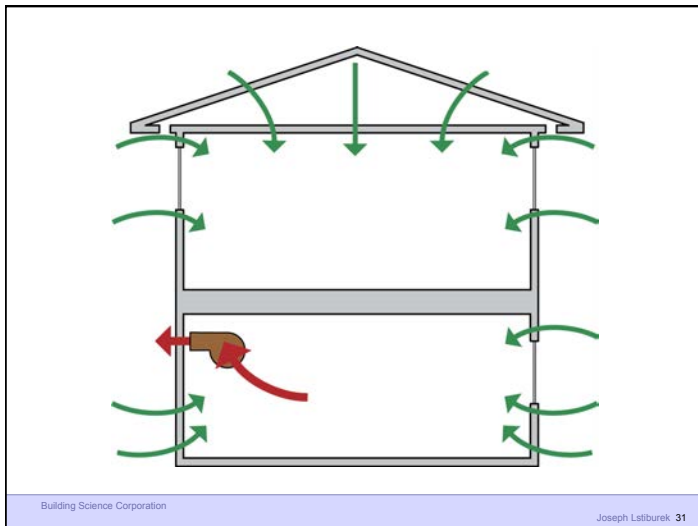
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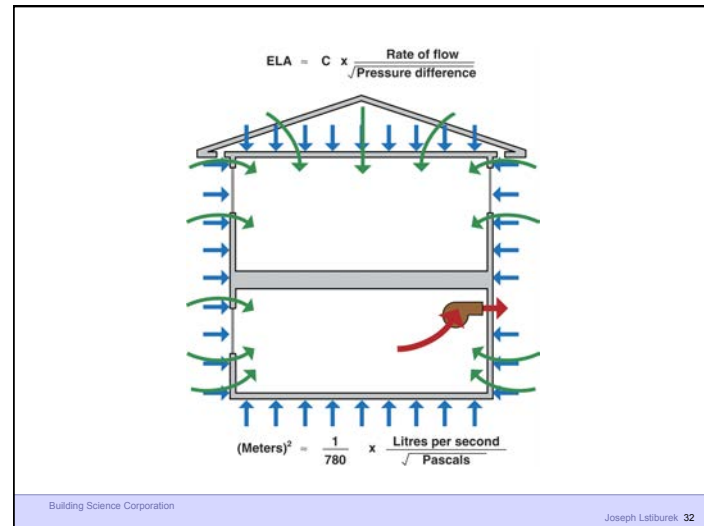
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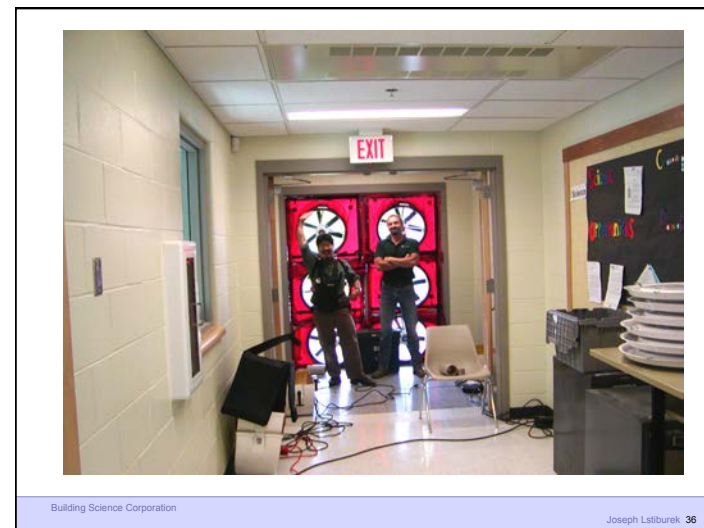
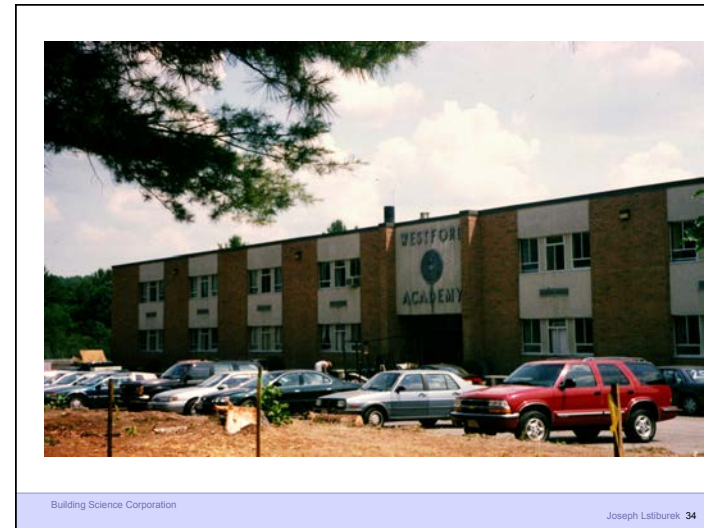
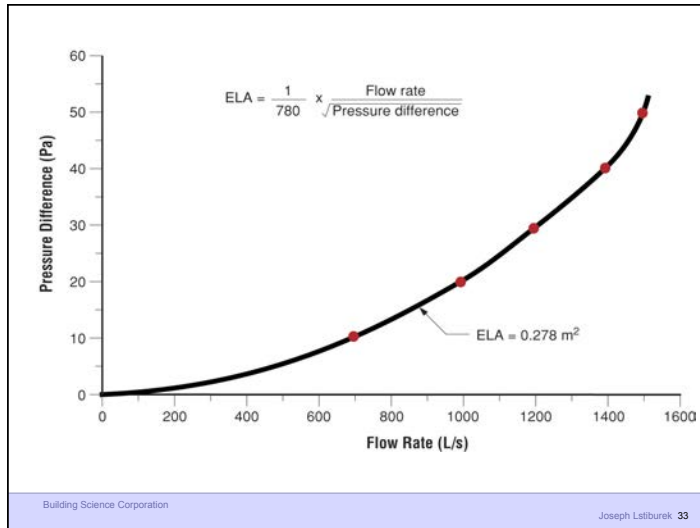
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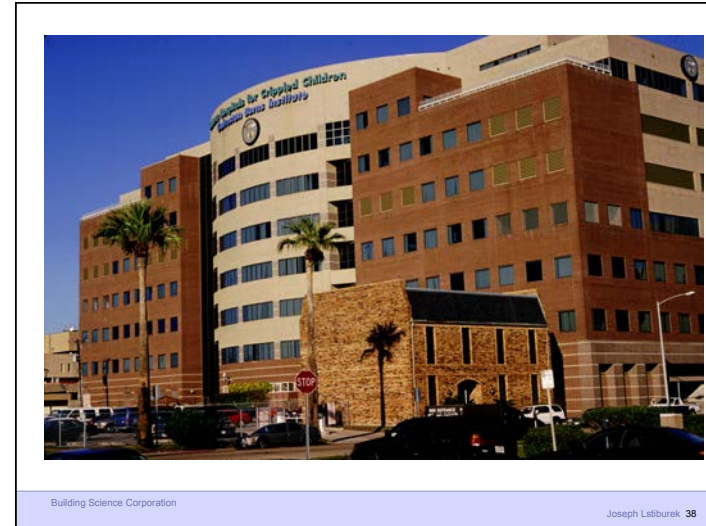


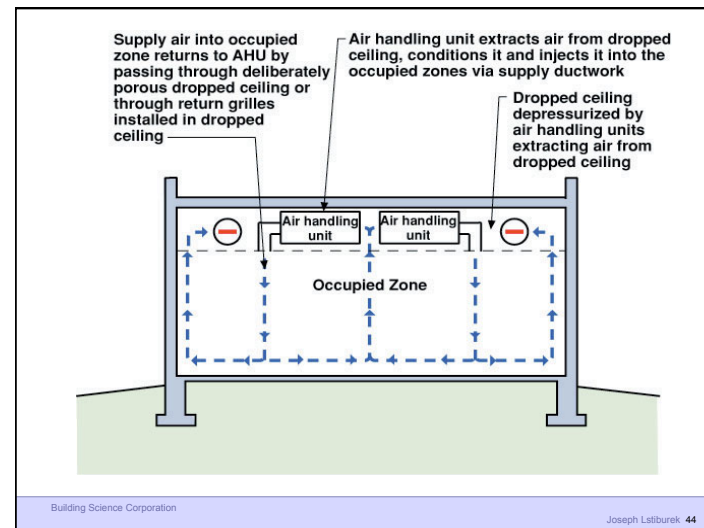
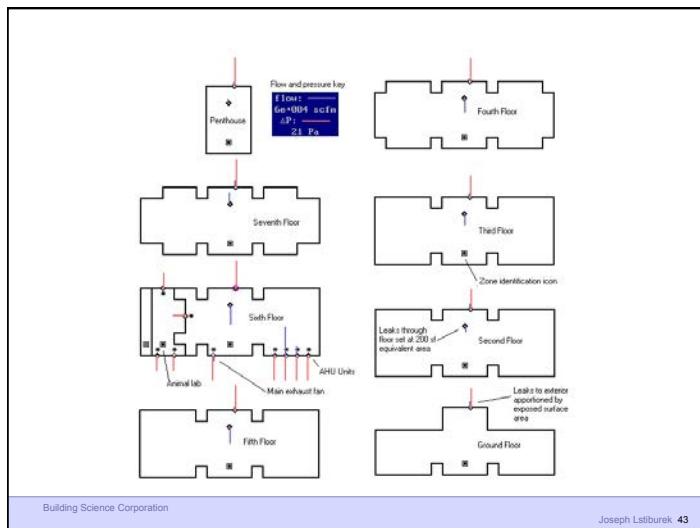
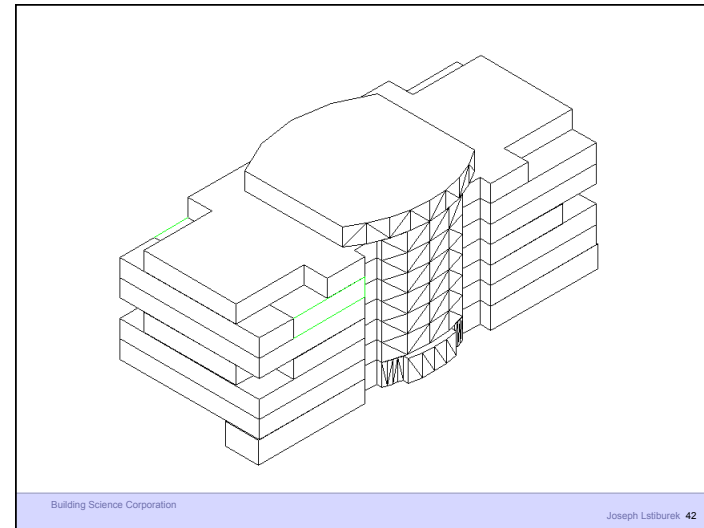
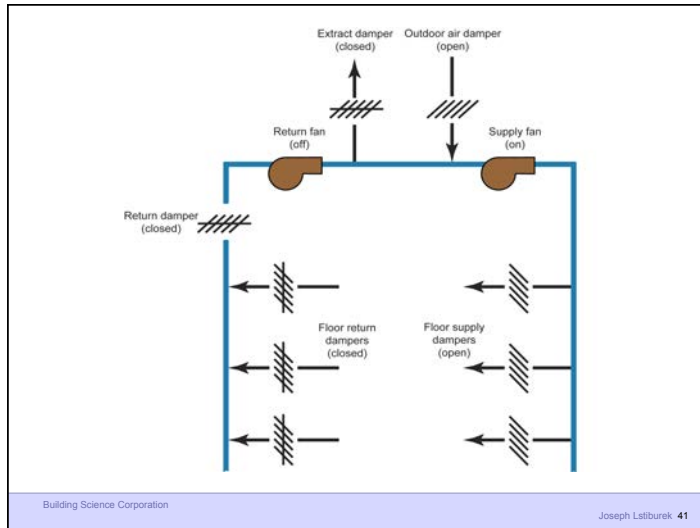
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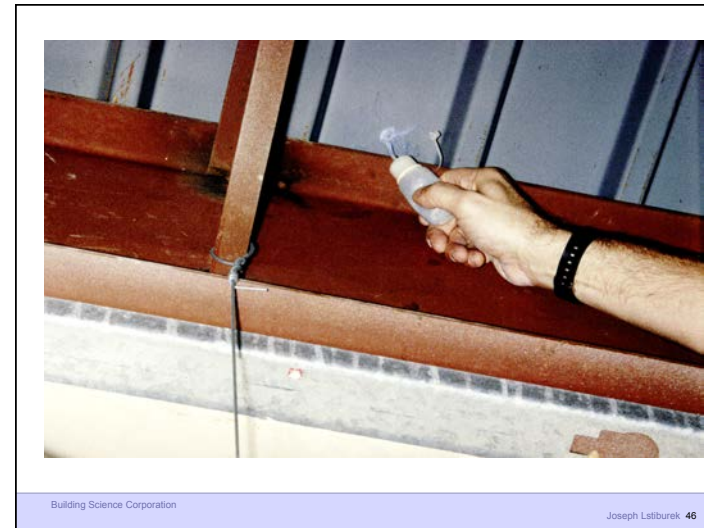
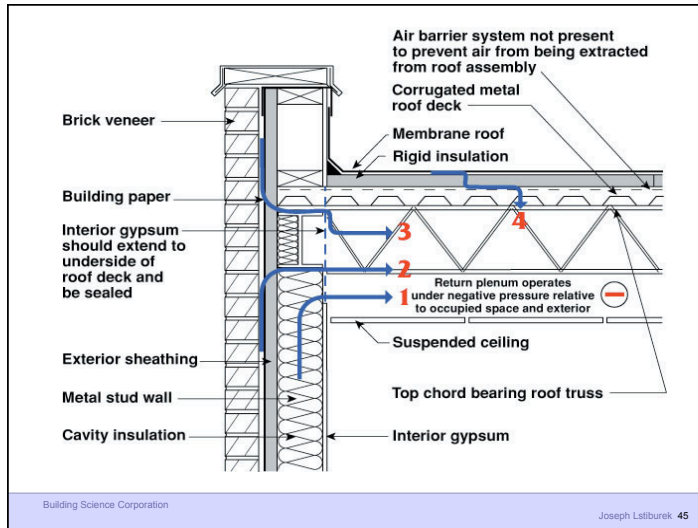


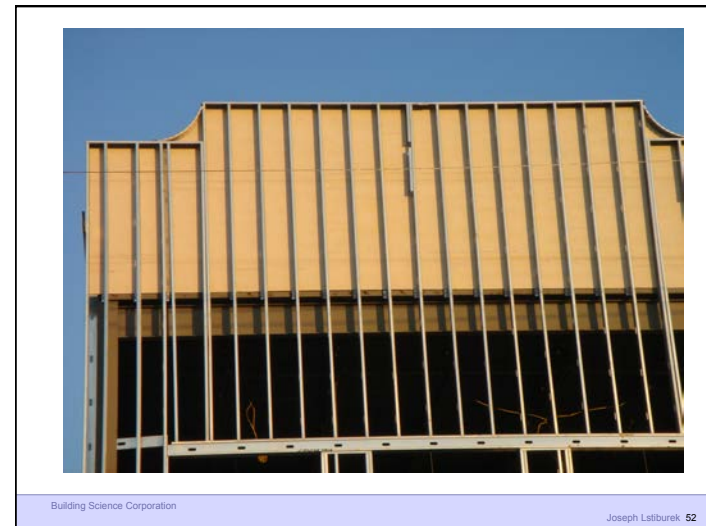
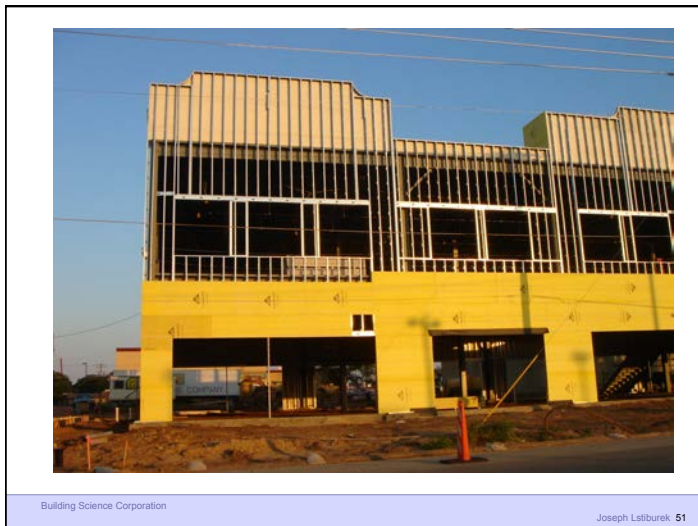
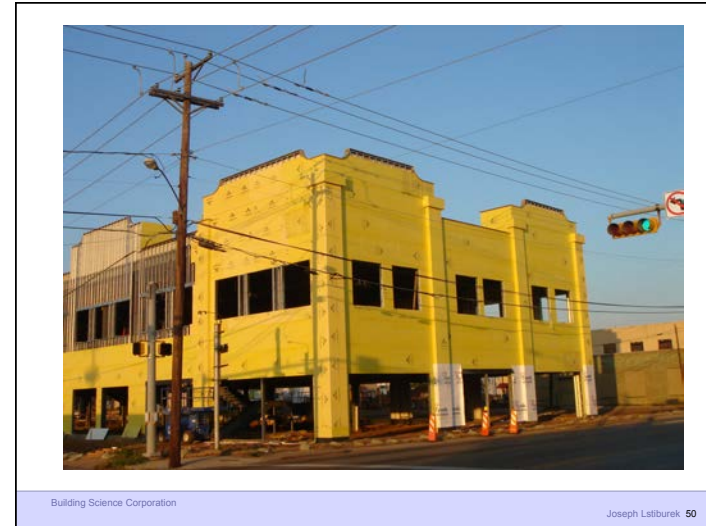




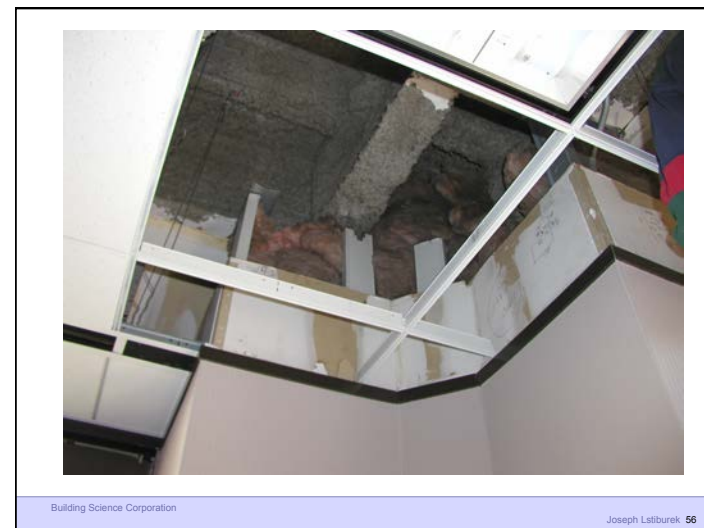
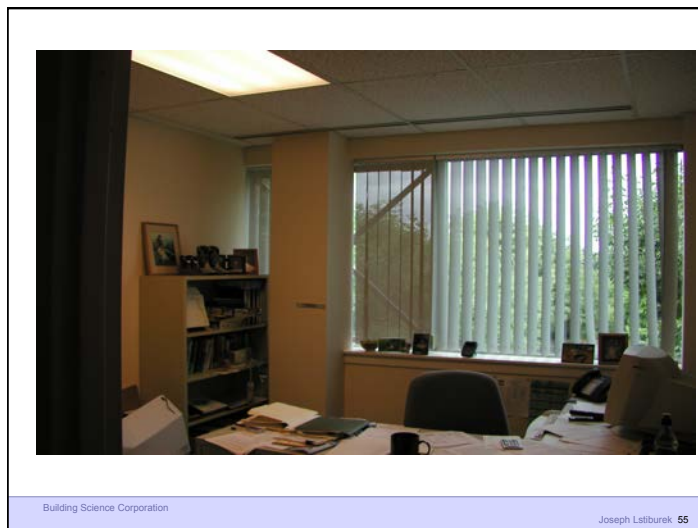
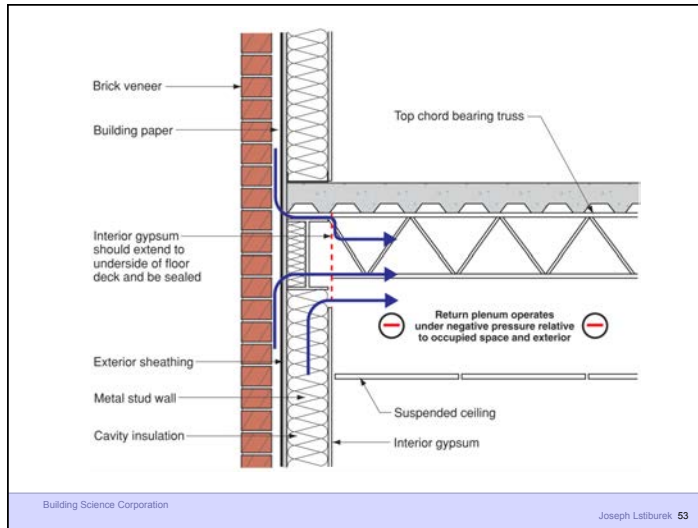


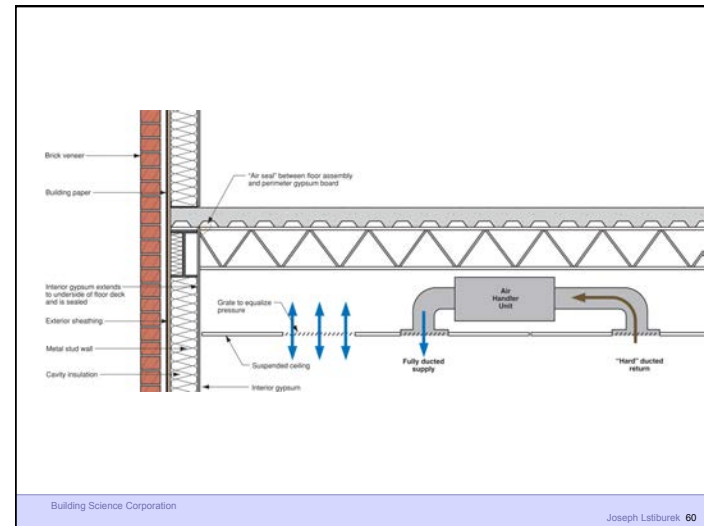


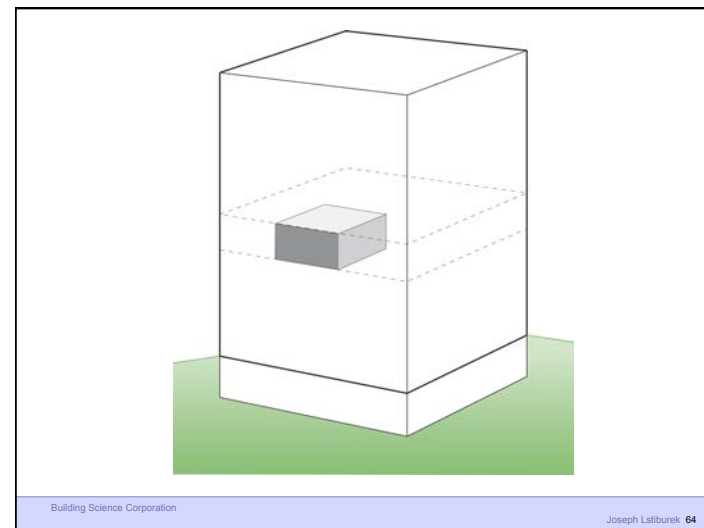
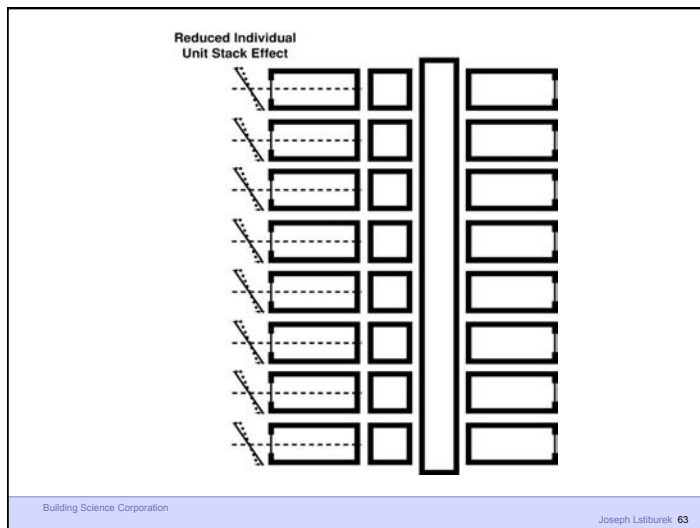
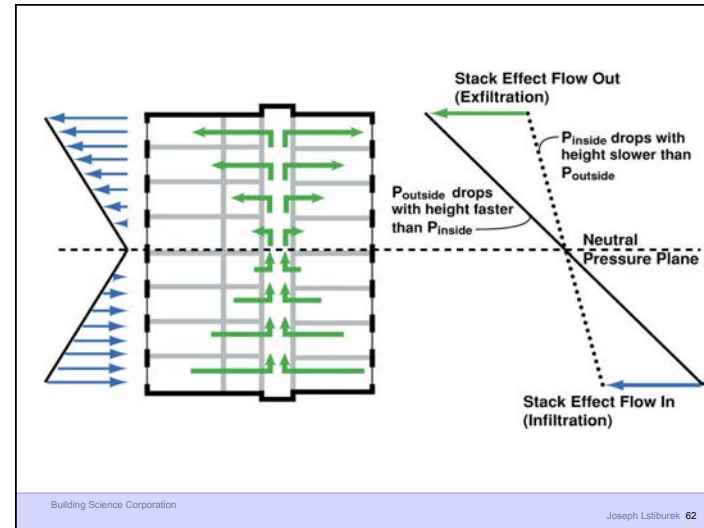
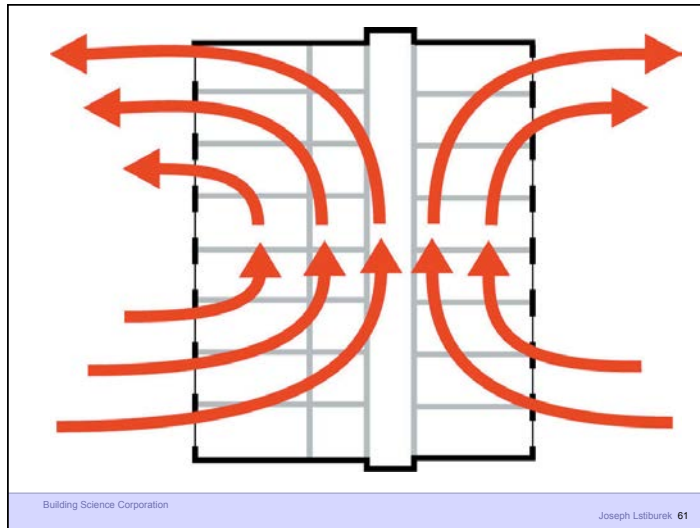


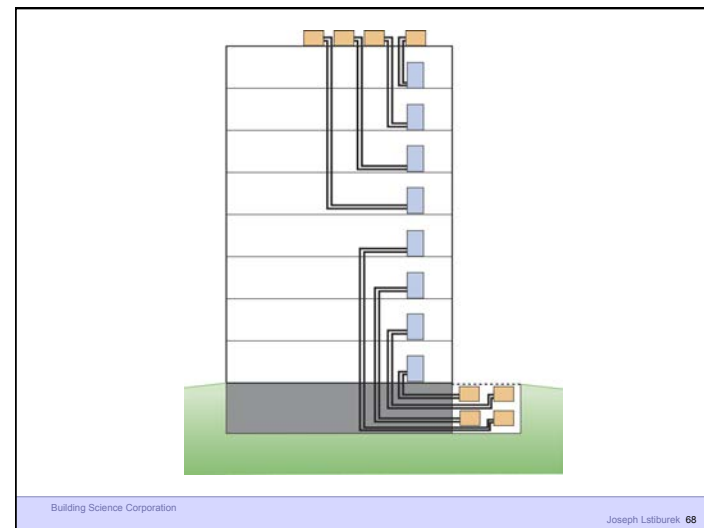
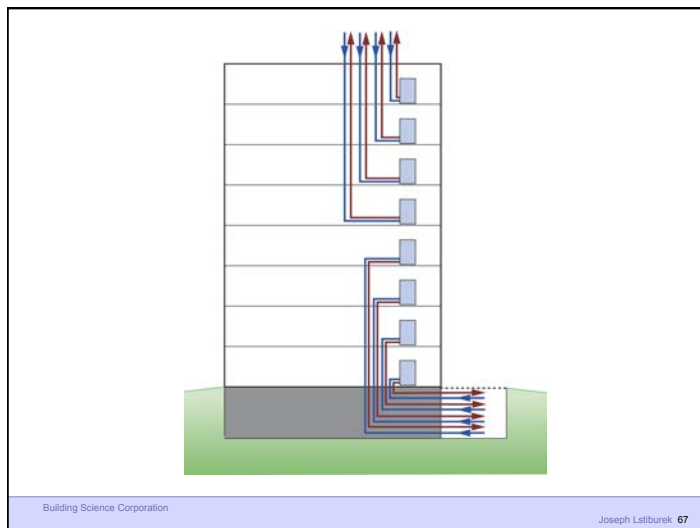
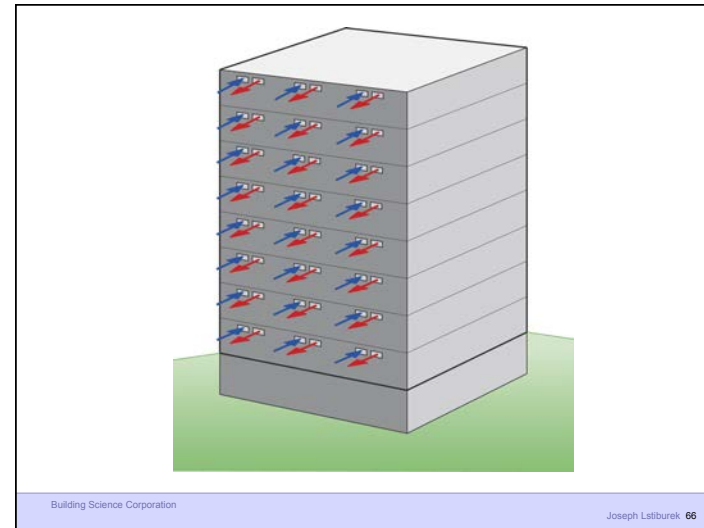
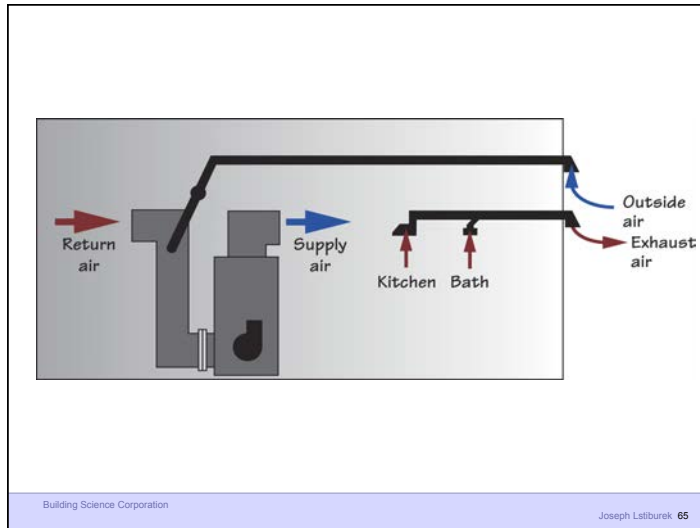


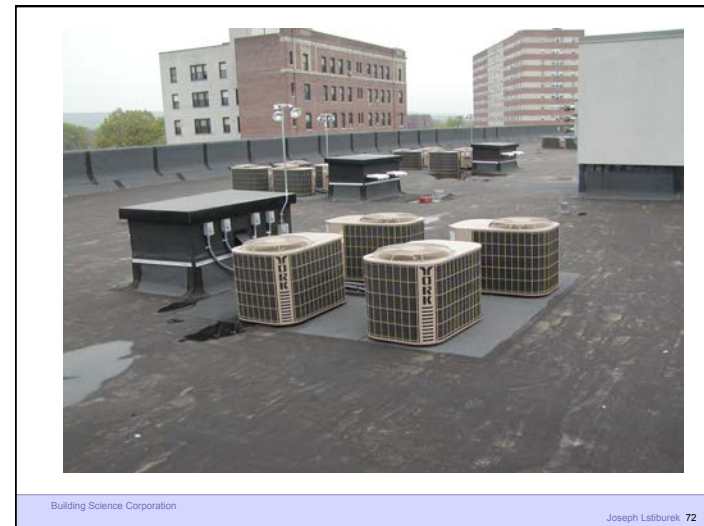
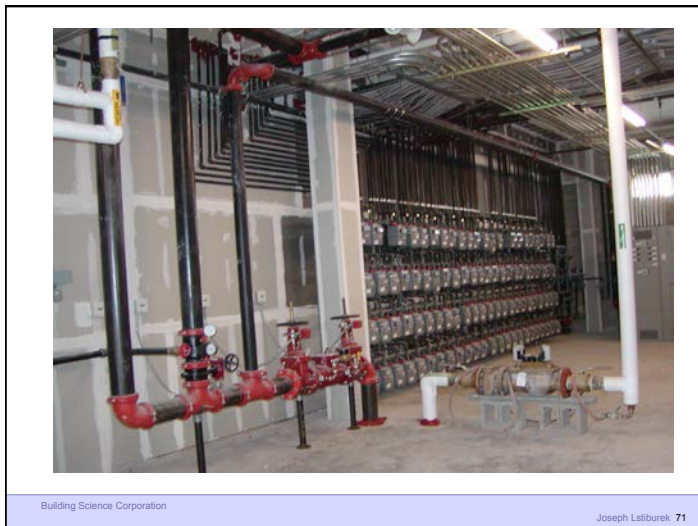
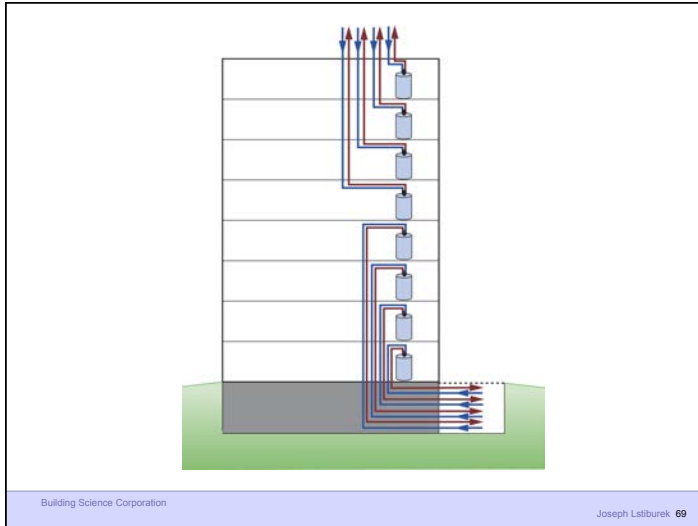




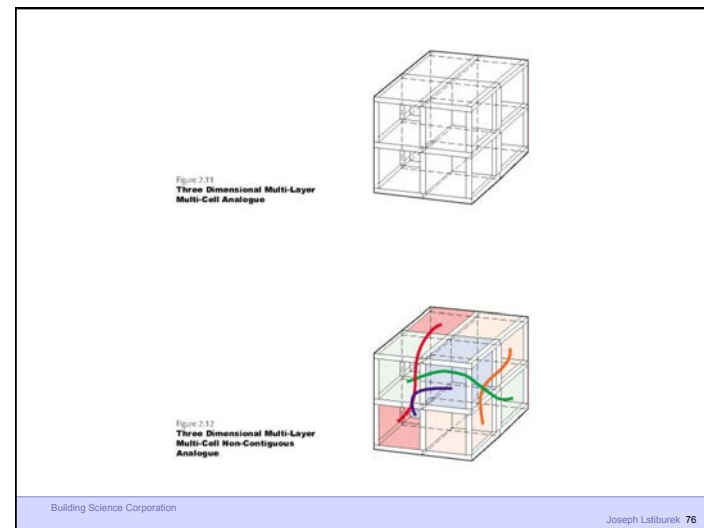
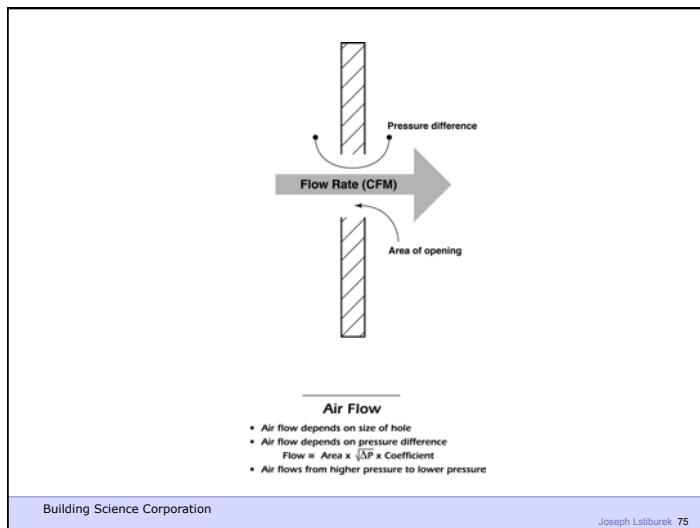


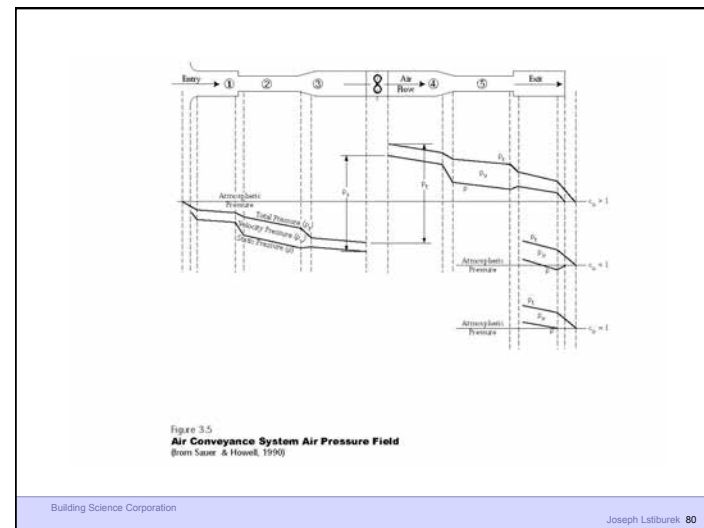
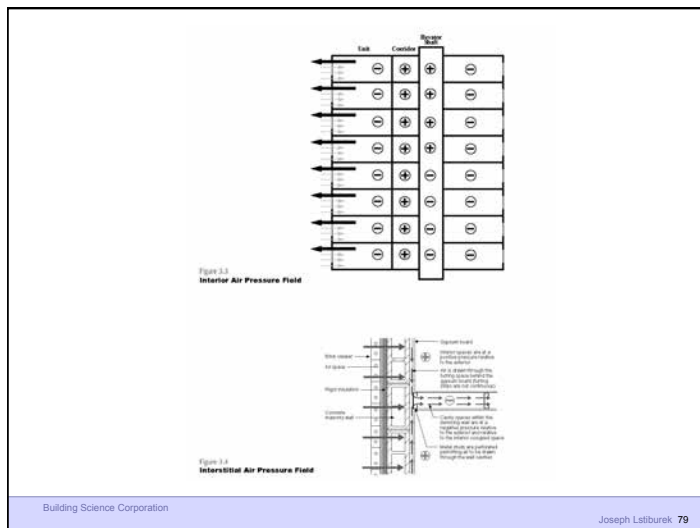
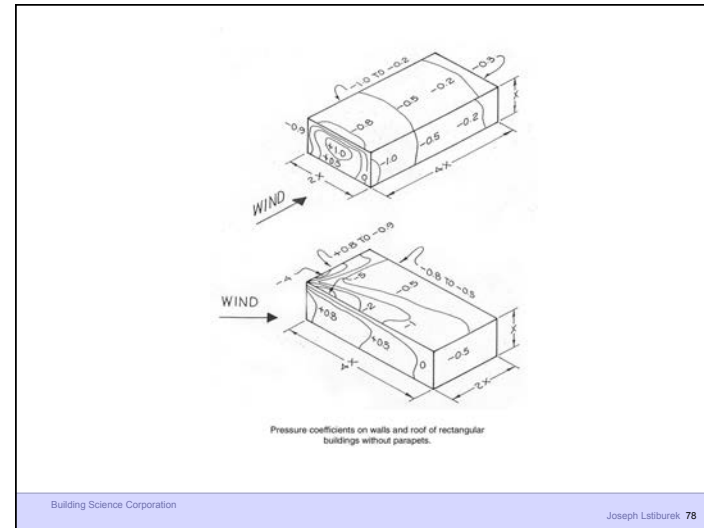
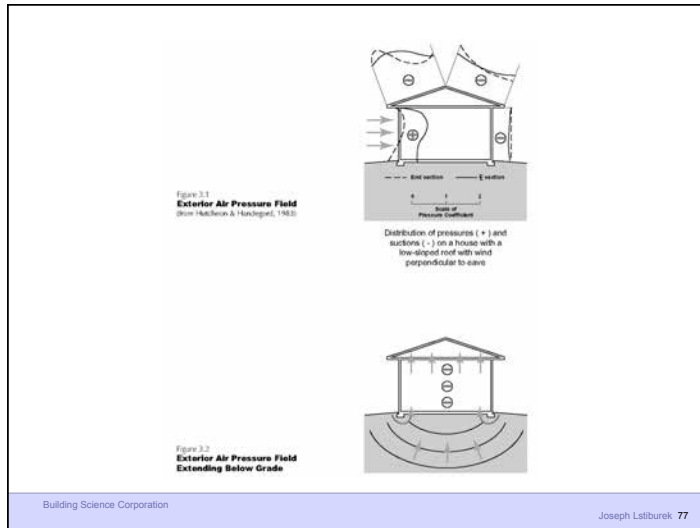


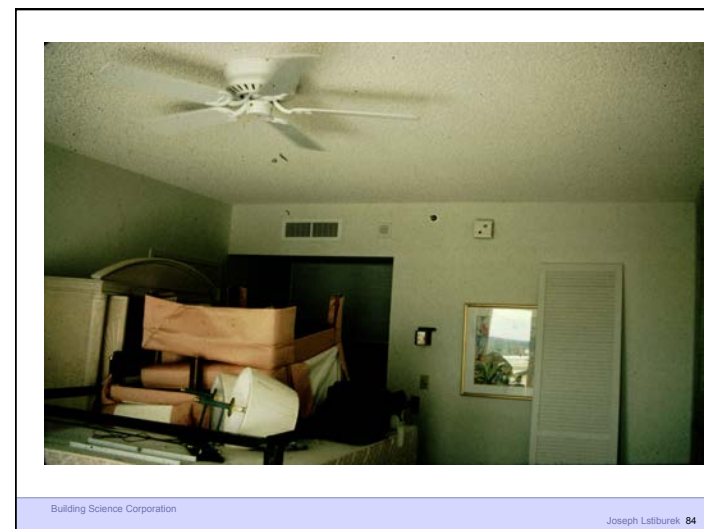
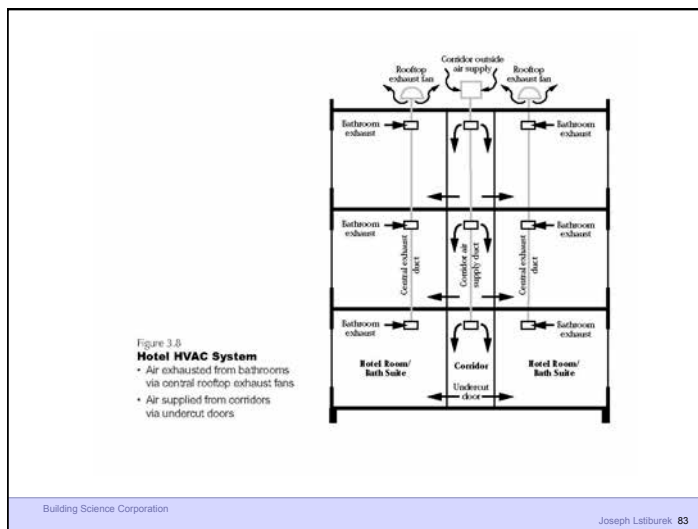


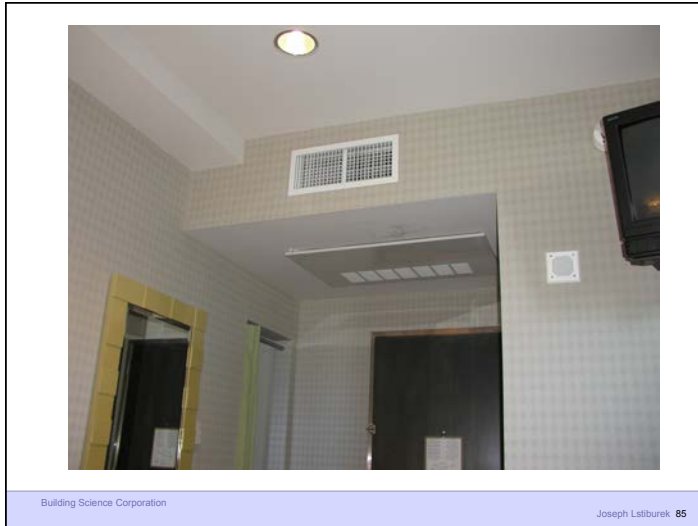






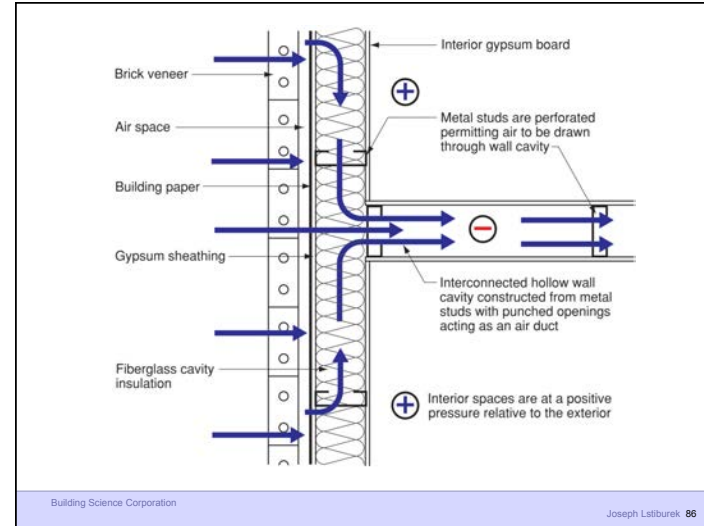






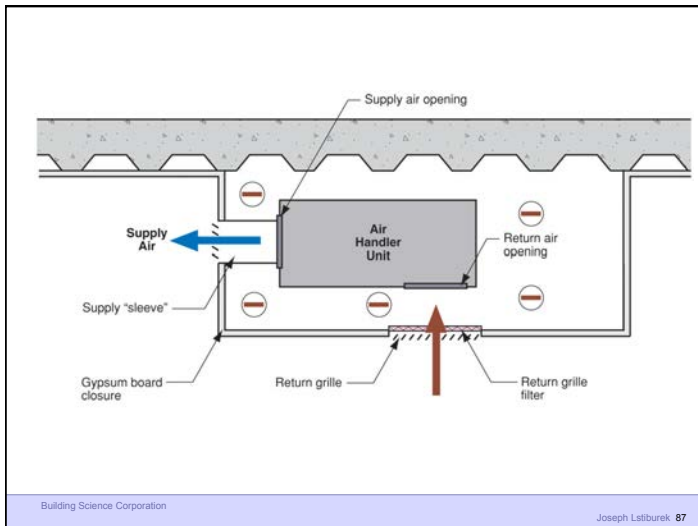
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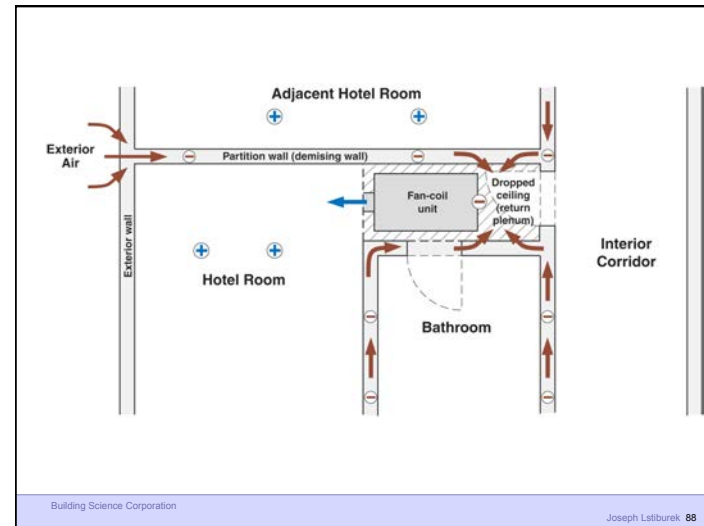
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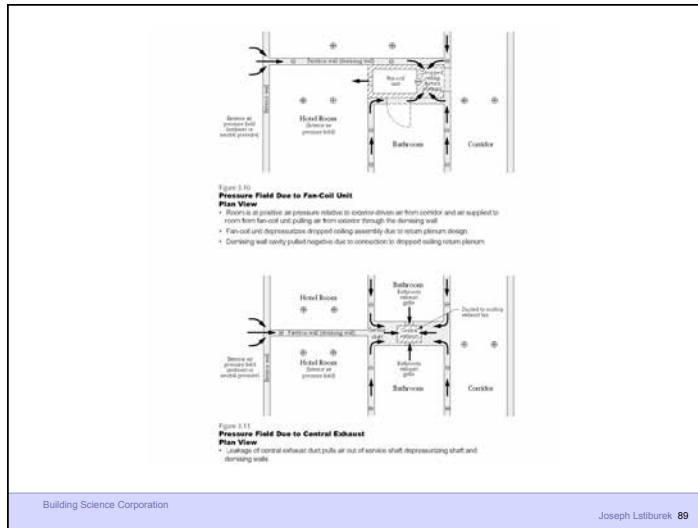
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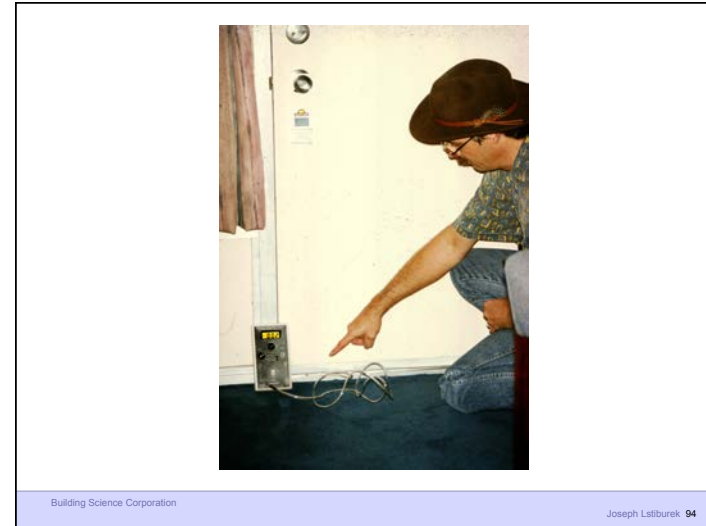
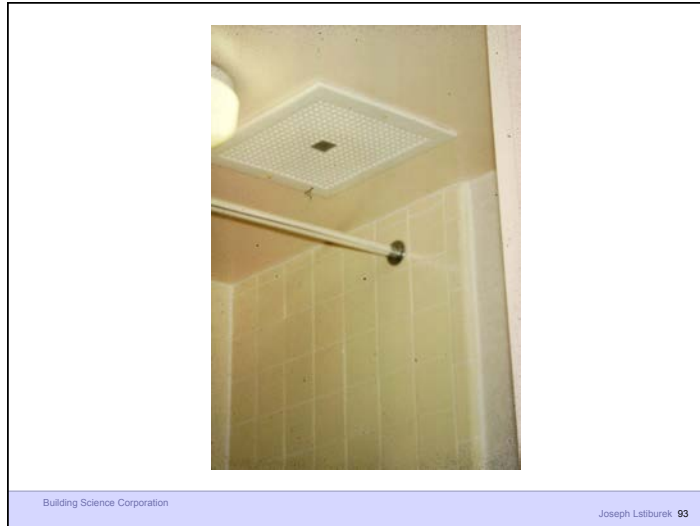


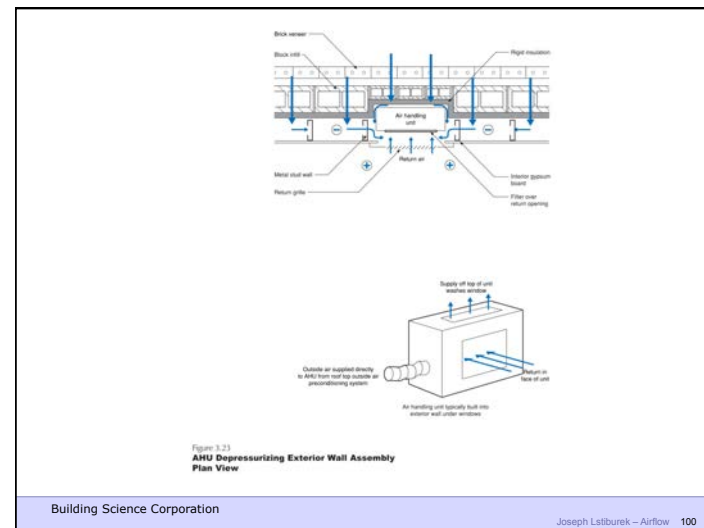
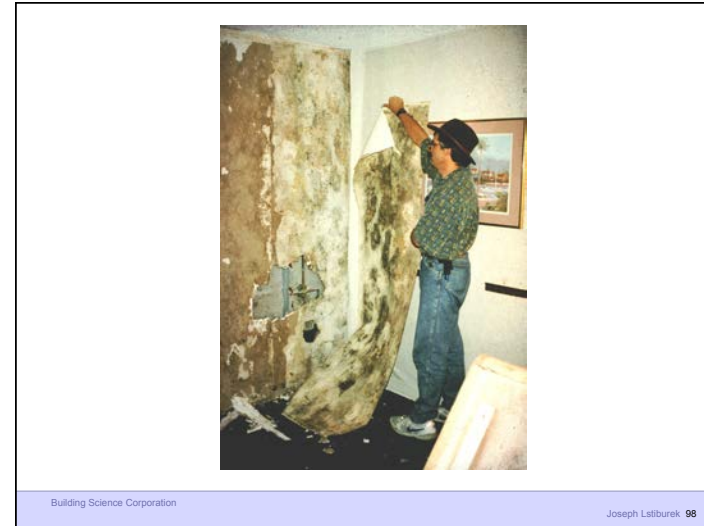
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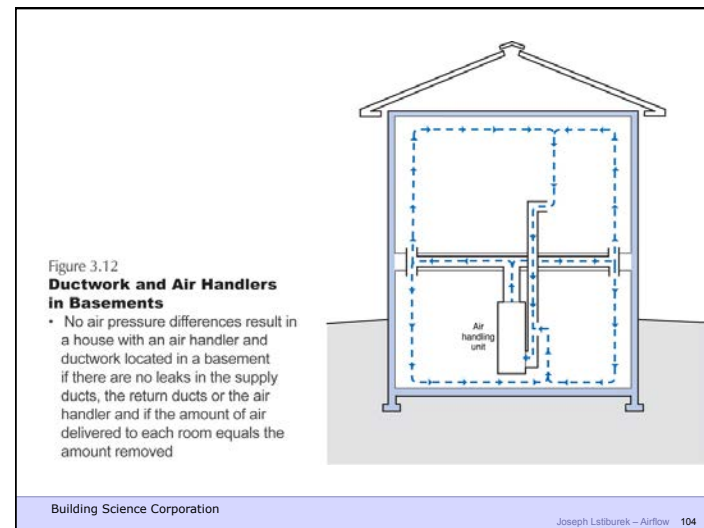
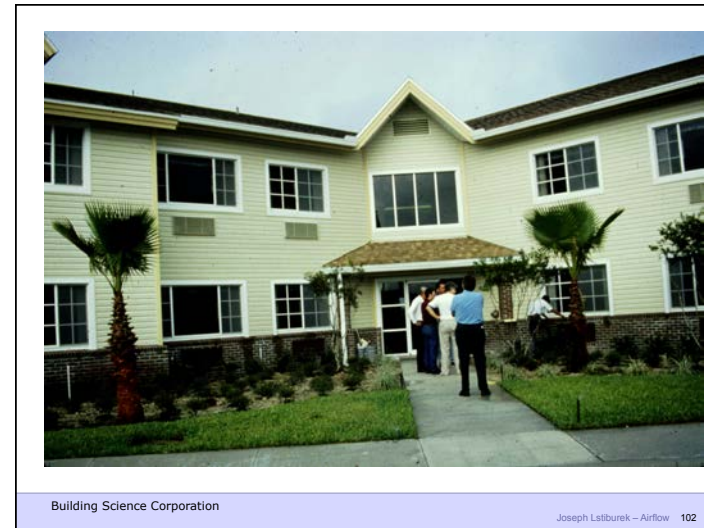
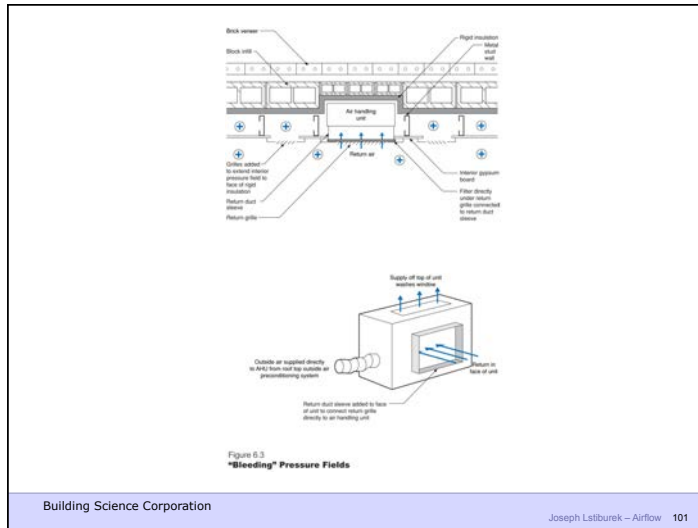
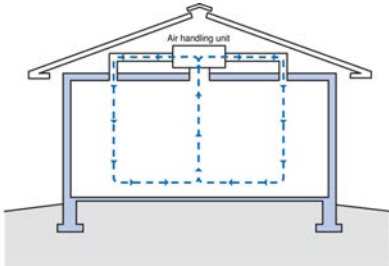


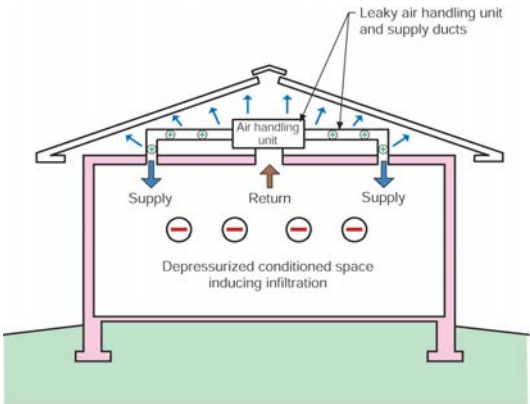
Figure 3.13  
**Ductwork and Air Handlers in Vented Attics**

- No air pressure differences result in a house with an air handler and ductwork located in a vented attic if there are no leaks in the supply ducts, the return ducts or the air handler and if the amount of air delivered to each room equals the amount removed



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Leaky air handling unit and supply ducts

Supply Return Supply

Depressurized conditioned space inducing infiltration

Note: Colored shading depicts the building's thermal barrier and pressure boundary. The thermal barrier and pressure boundary enclose the conditioned space.

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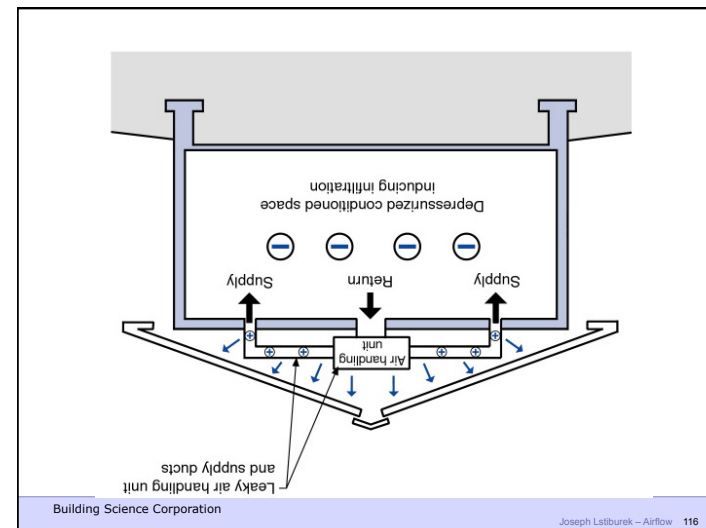
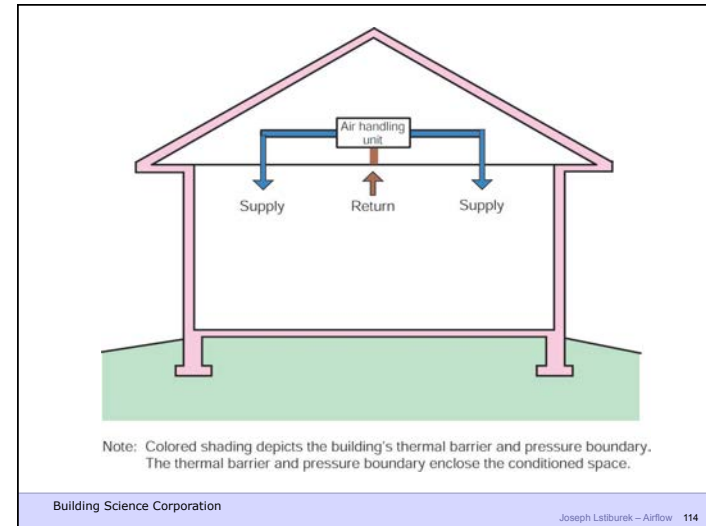
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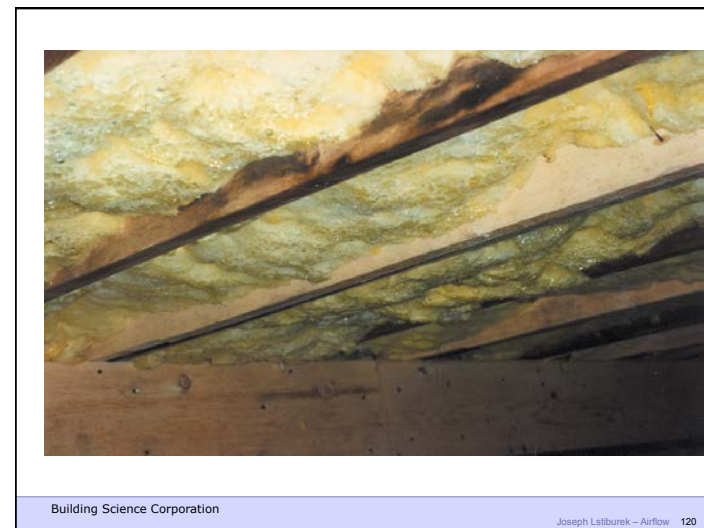
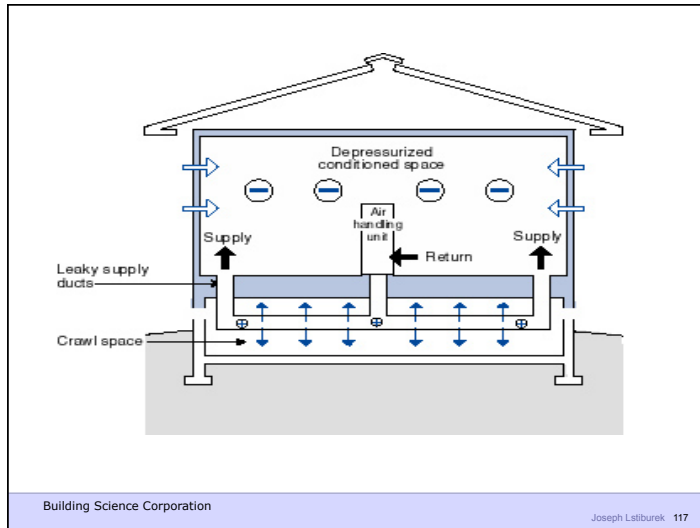


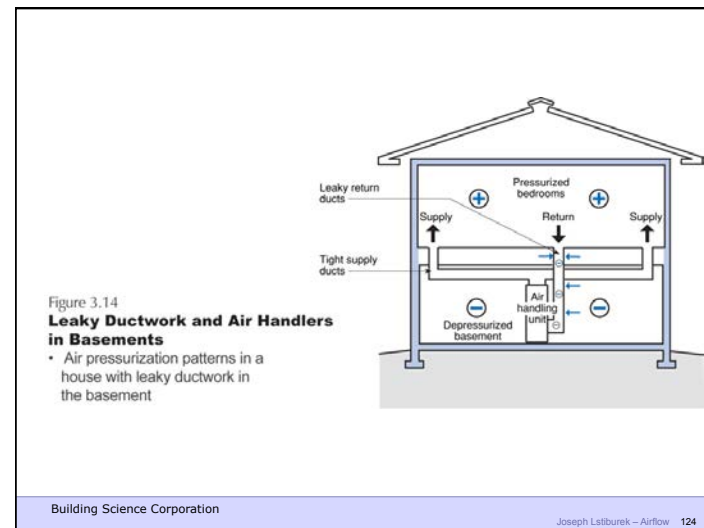
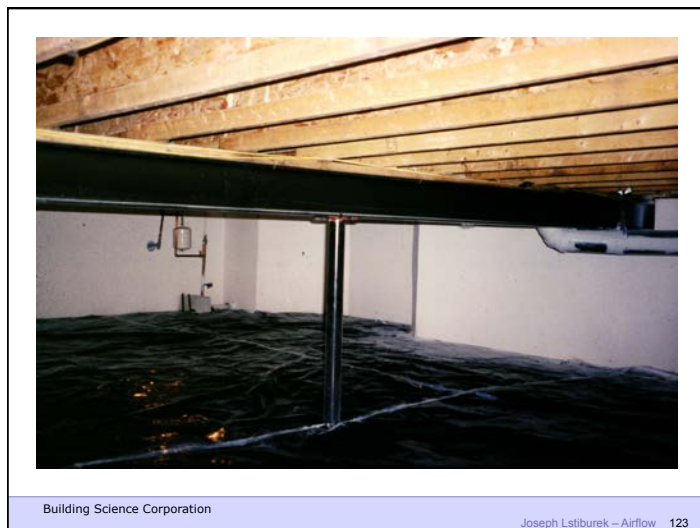
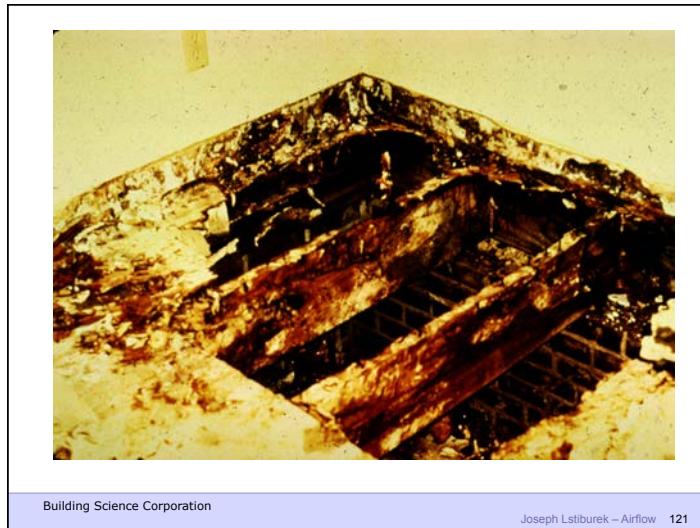




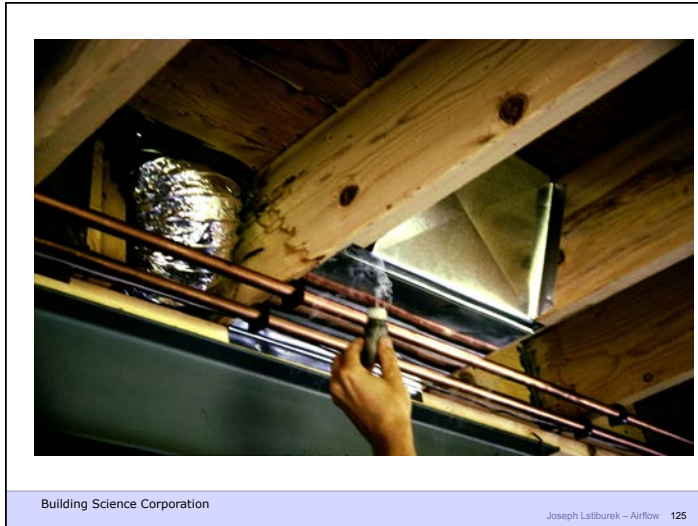
Duct Leakage Should Be Less Than 5% of Rated Flow As Tested By Pressurization To 25 Pascals

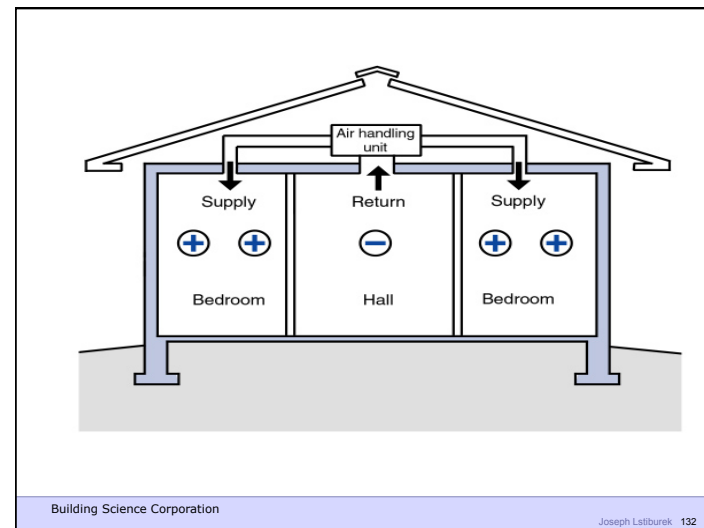
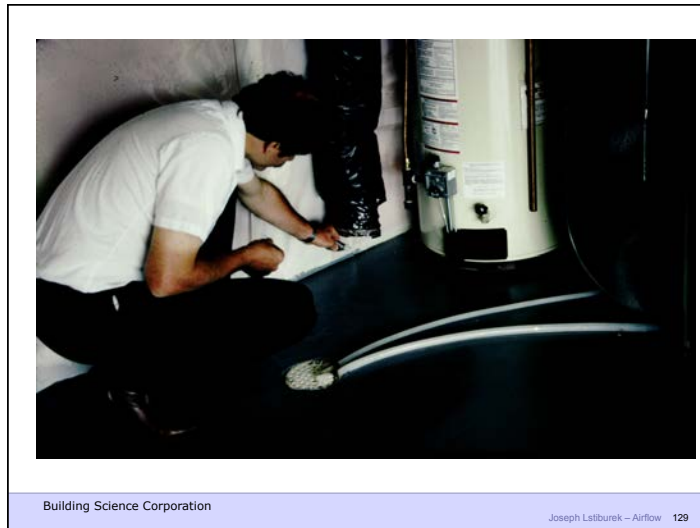




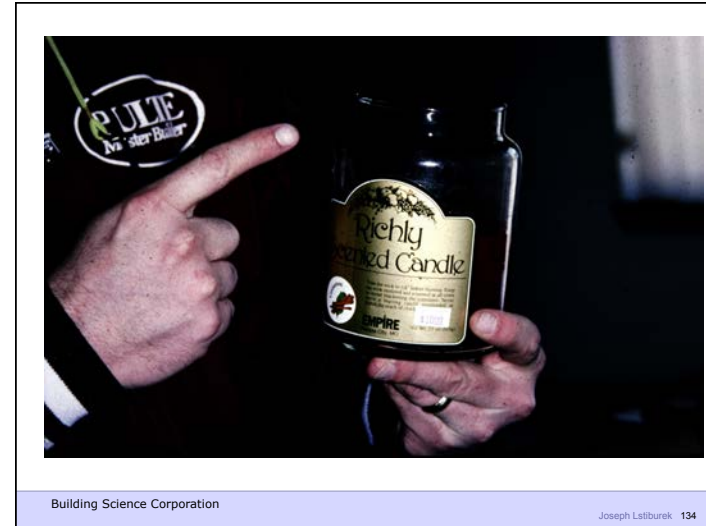
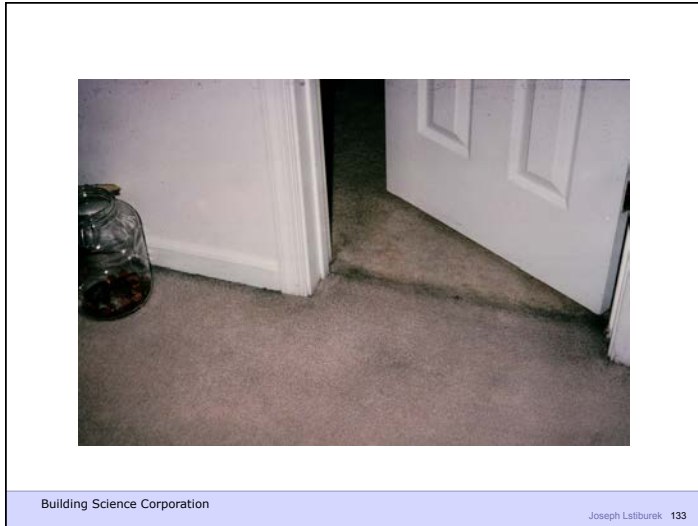


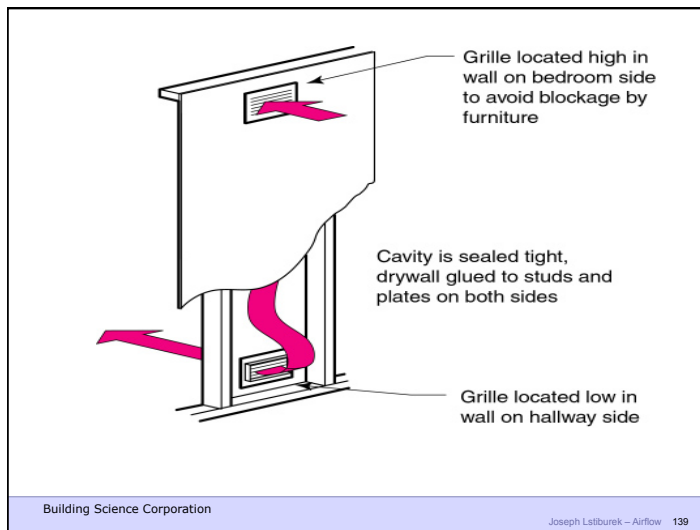


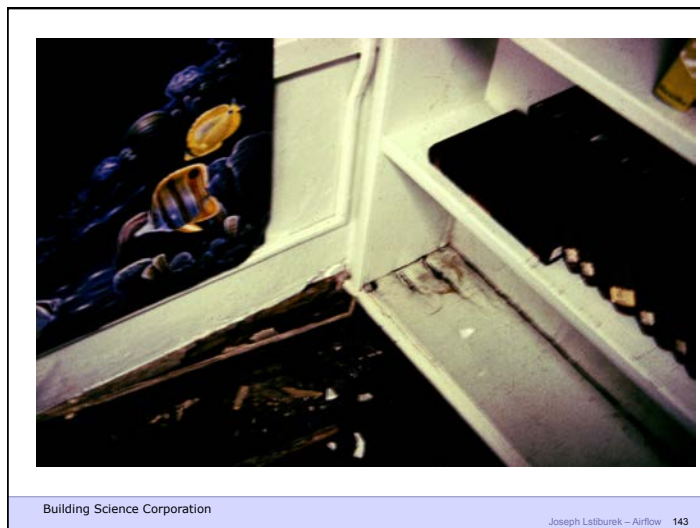
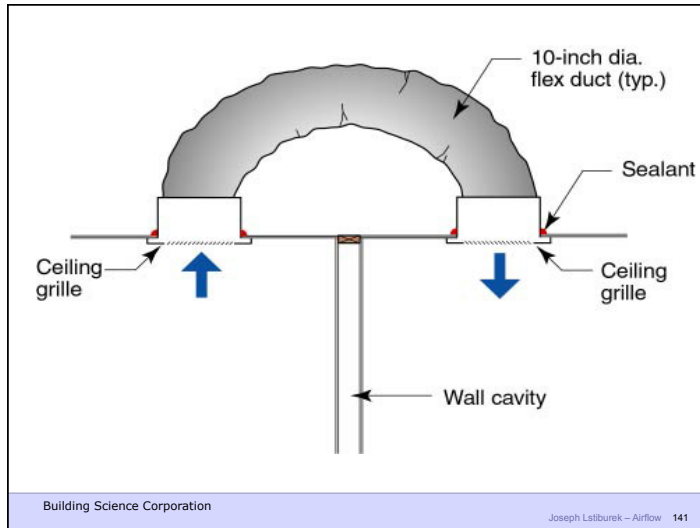














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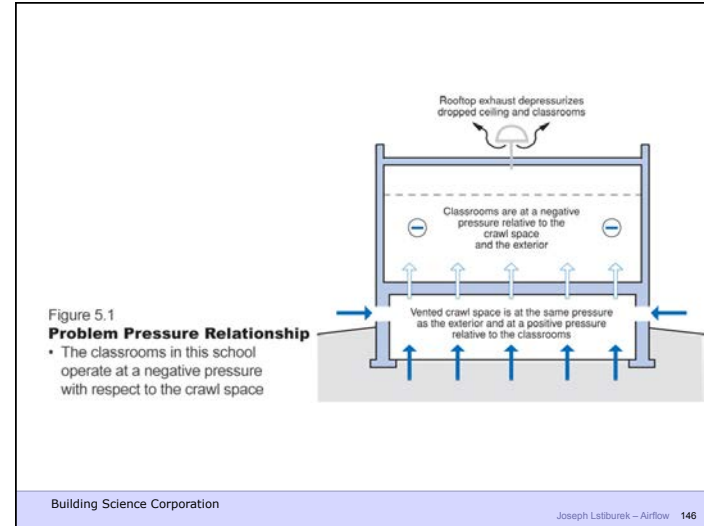


Figure 5.1  
**Problem Pressure Relationship**  
• The classrooms in this school operate at a negative pressure with respect to the crawl space

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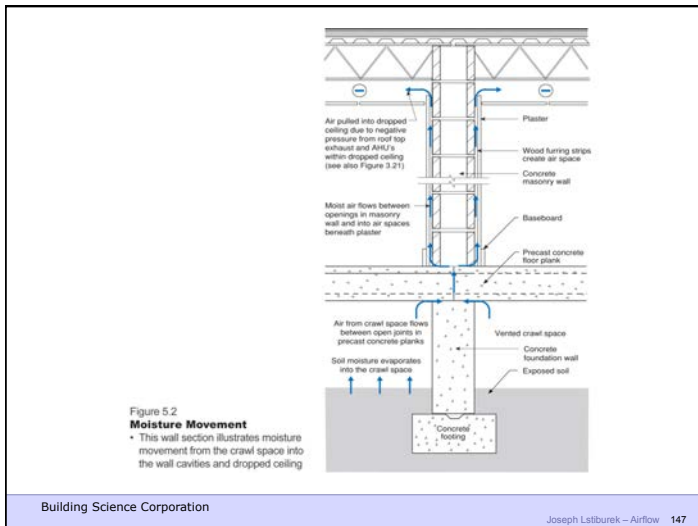


Figure 5.2  
**Moisture Movement**  
• This wall section illustrates moisture movement from the crawl space into the wall cavities and dropped ceiling

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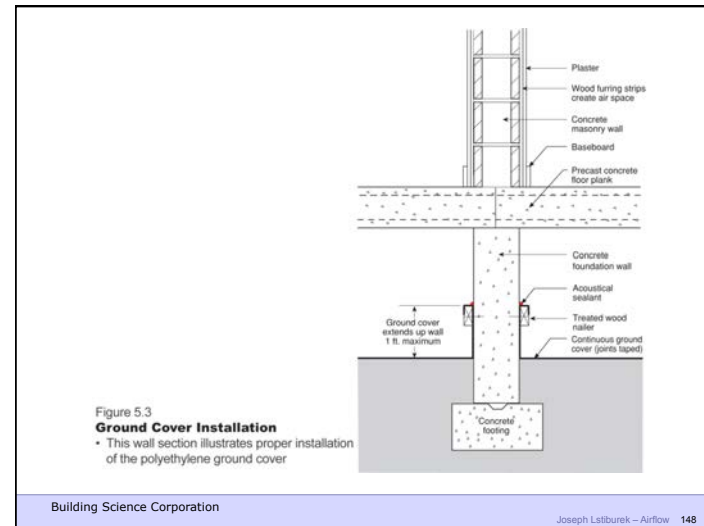
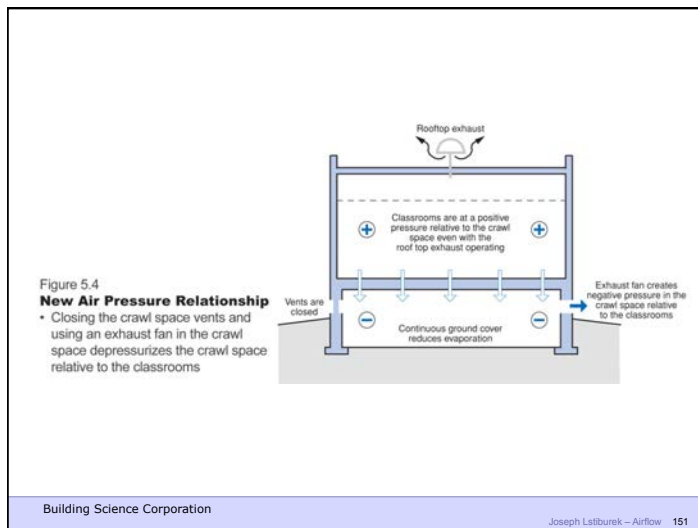
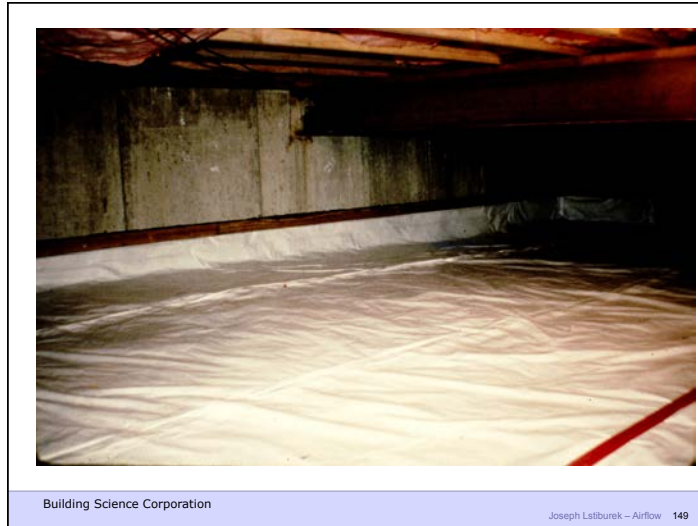


Figure 5.3  
**Ground Cover Installation**  
• This wall section illustrates proper installation of the polyethylene ground cover

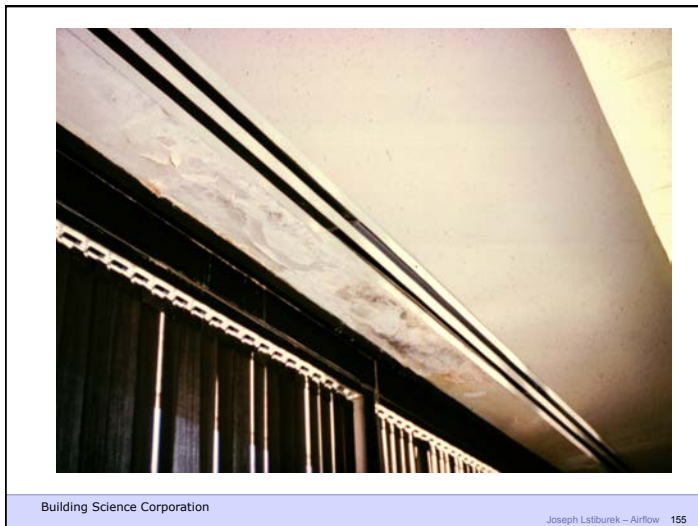
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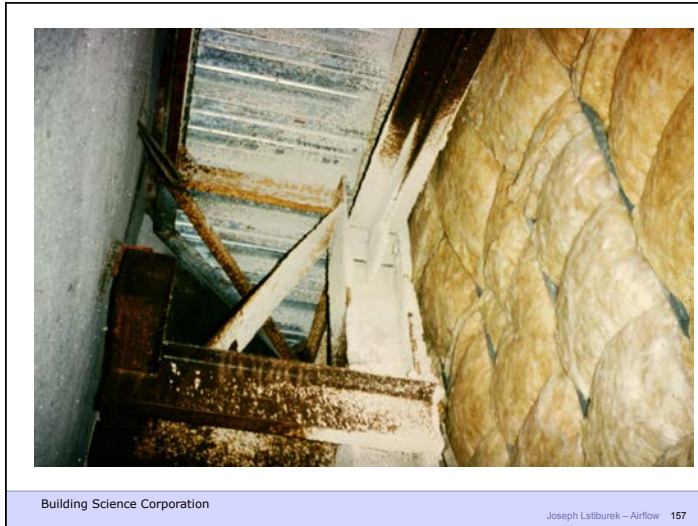
Joseph Lstiburek – Airflow 148











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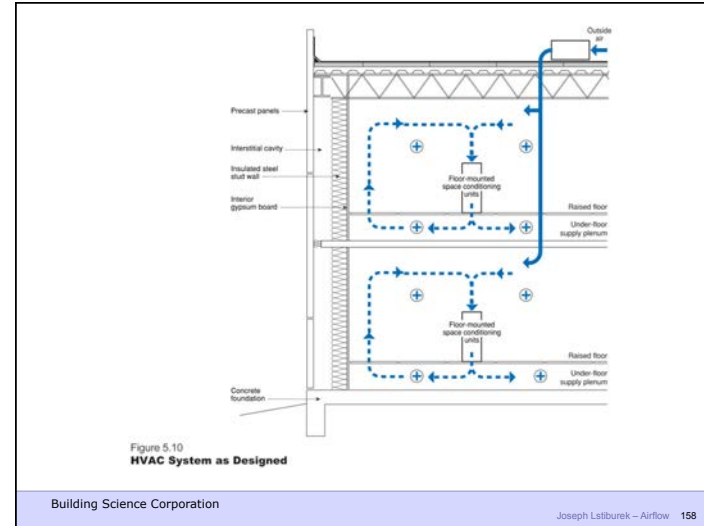


Figure 5.10  
HVAC System as Designed

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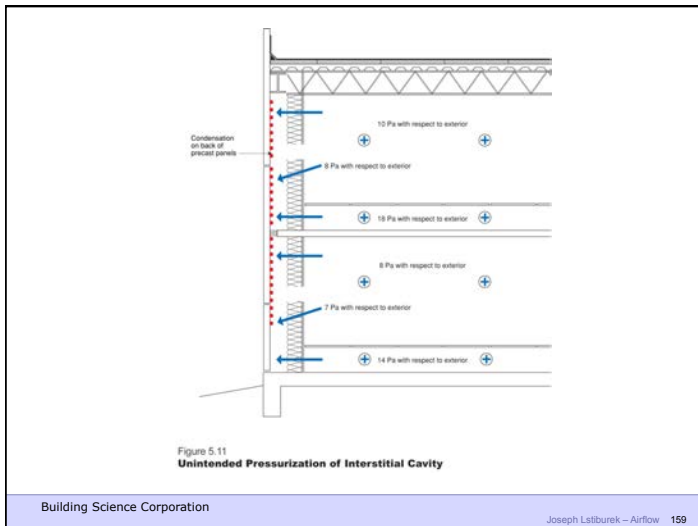


Figure 5.11  
Unintended Pressurization of Interstitial Cavity

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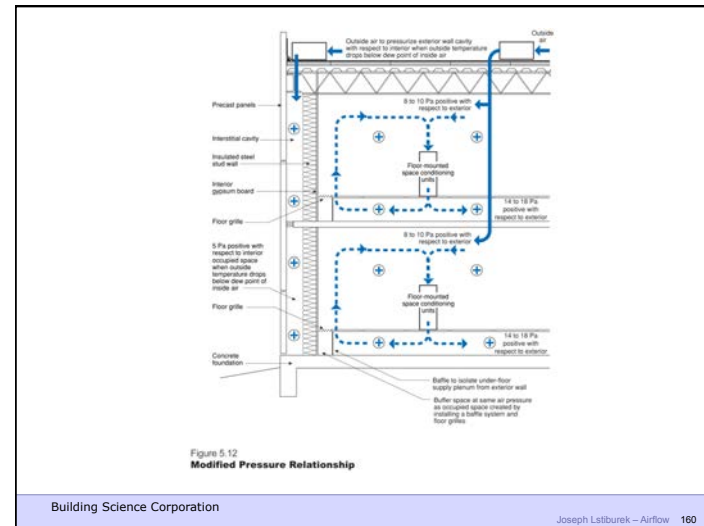


Figure 5.12  
Modified Pressure Relationship

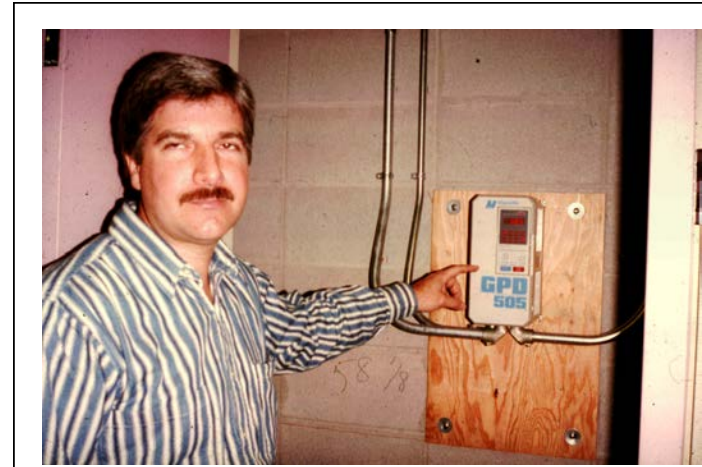
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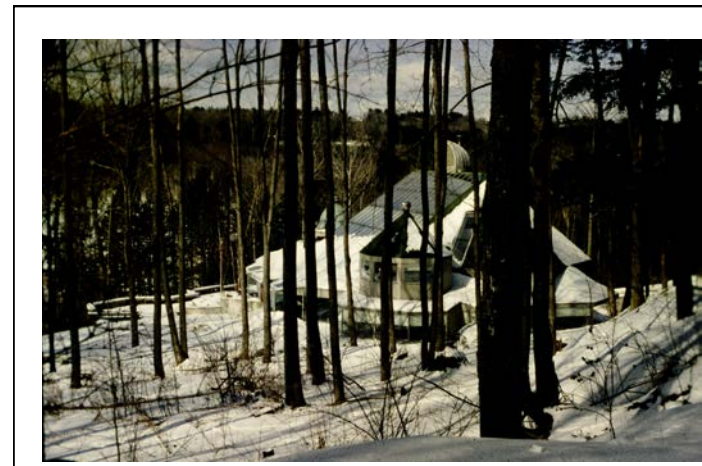
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Joseph Lstiburek – Airflow 162



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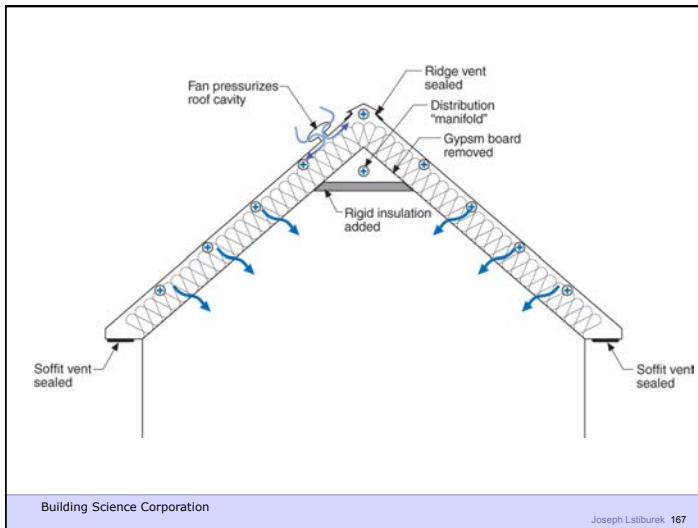
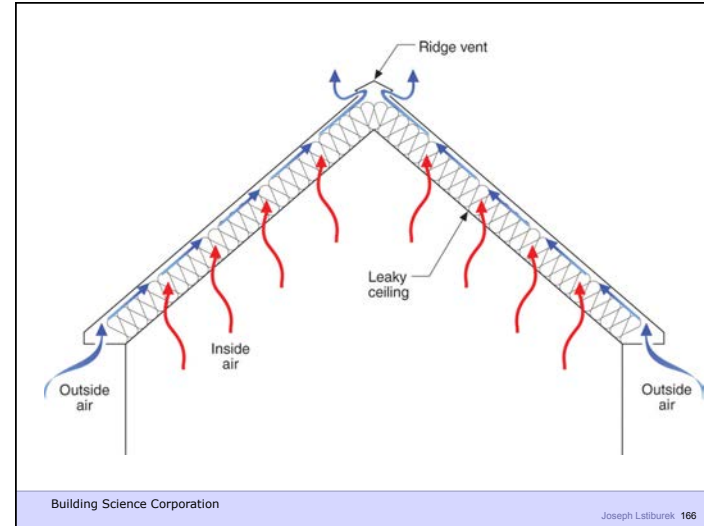
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