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Building Science

Adventures In Building Science

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Build Tight - Ventilate Right

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Build Tight - Ventilate Right

How Tight?

What's Right?

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Air Barrier Metrics

Material	0.02 l/(s-m ²) @ 75 Pa
Assembly	0.20 l/(s-m ²) @ 75 Pa
Enclosure	2.00 l/(s-m ²) @ 75 Pa
	0.35 cfm/ft ² @ 50 Pa
	0.25 cfm/ft ² @ 50 Pa
	0.15 cfm/ft ² @ 50 Pa

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Getting rid of big holes	3 ach@50
Getting rid of smaller holes	1.5 ach@50
Getting German	0.6 ach@50

Best

As Tight as Possible - with -
Balanced Ventilation
Energy Recovery
Distribution and Mixing
Source Control - Spot exhaust ventilation
Filtration
Material selection

Worst

Leaky - with – Nothing

Spot Ventilation in Bathroom/Kitchen

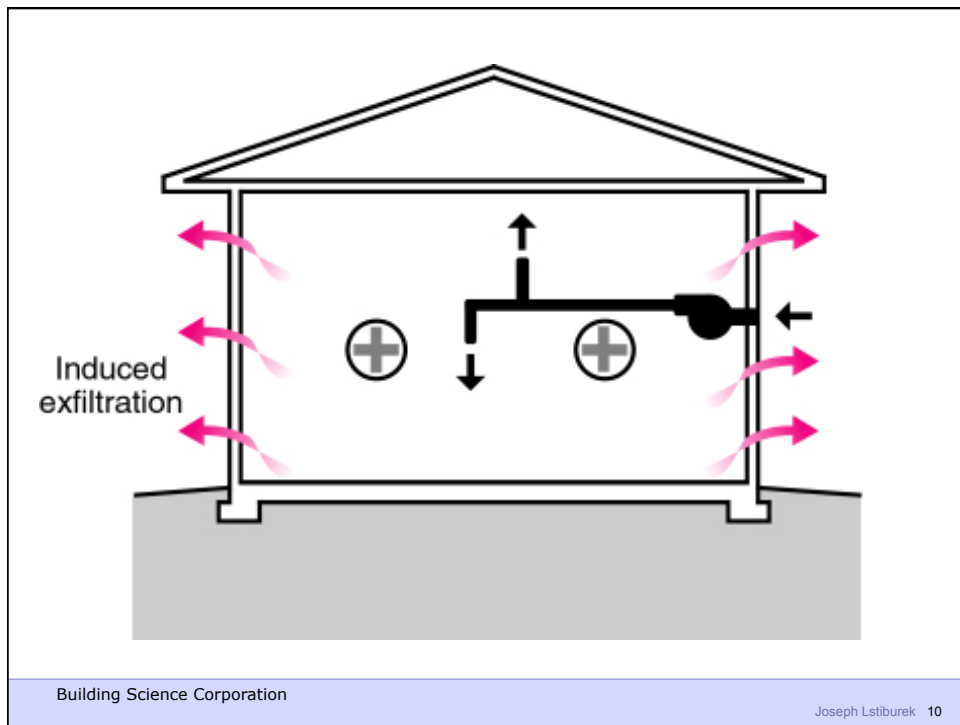
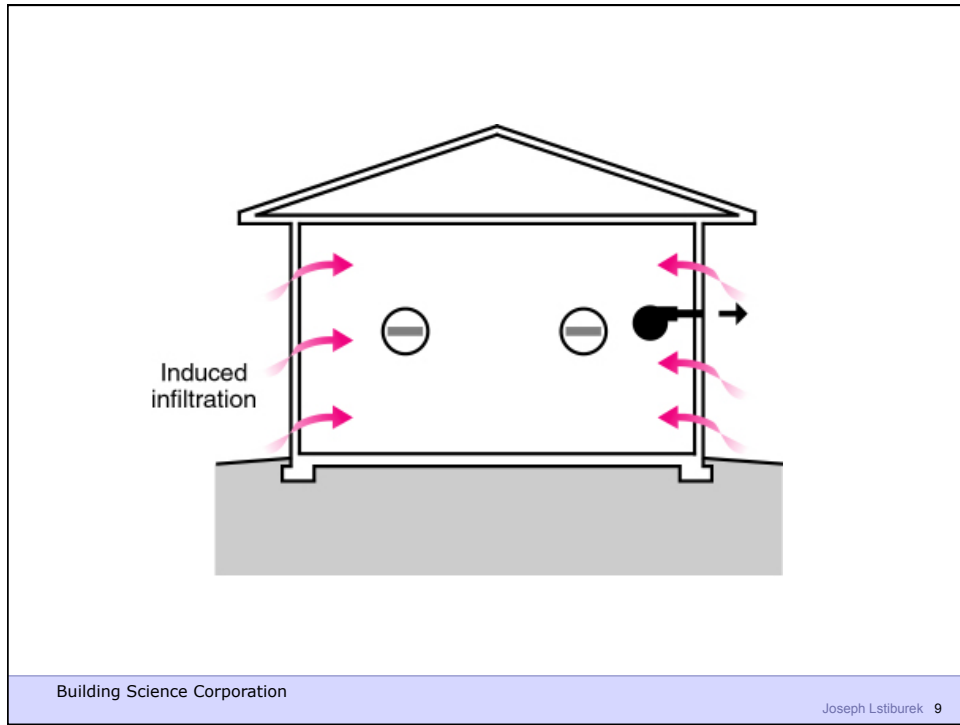
Exhaust Ventilation – with – No Distribution
and No Mixing

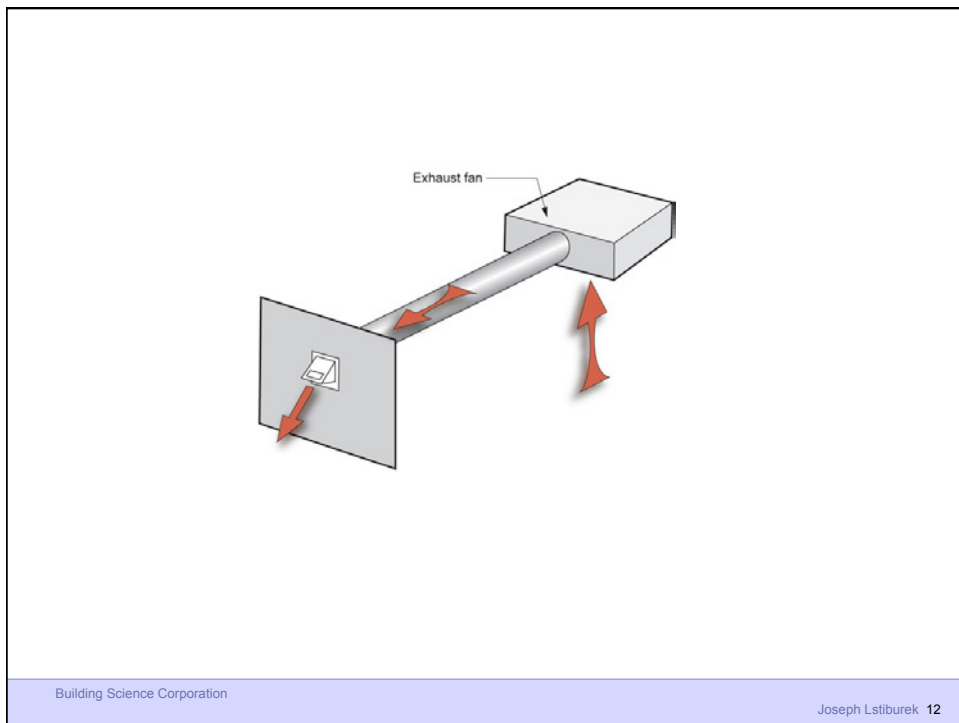
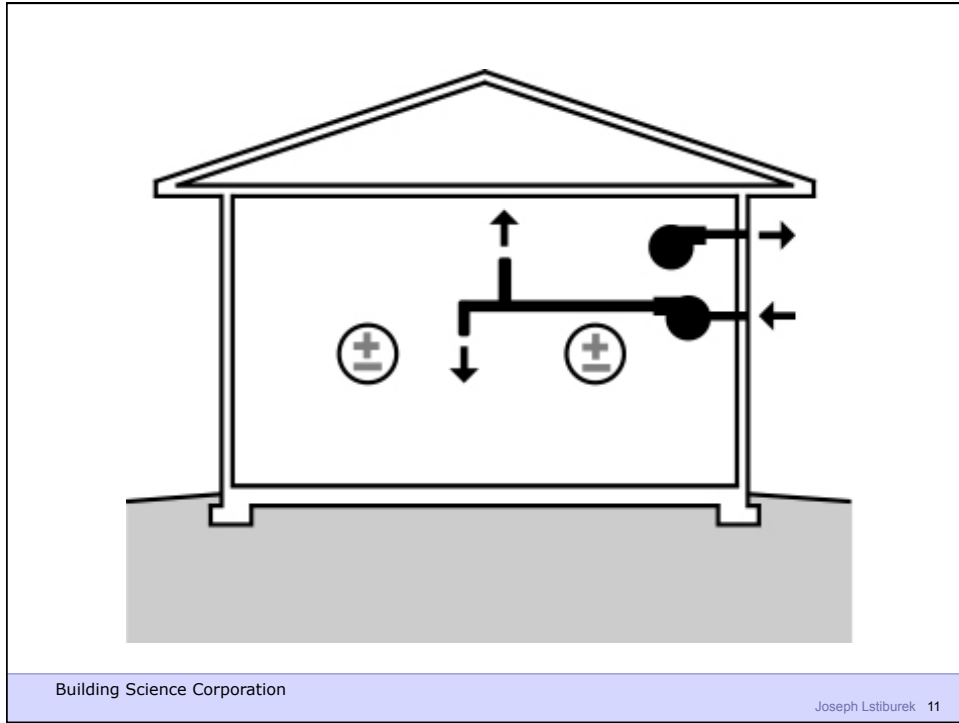
Three Types of Controlled Ventilation Systems

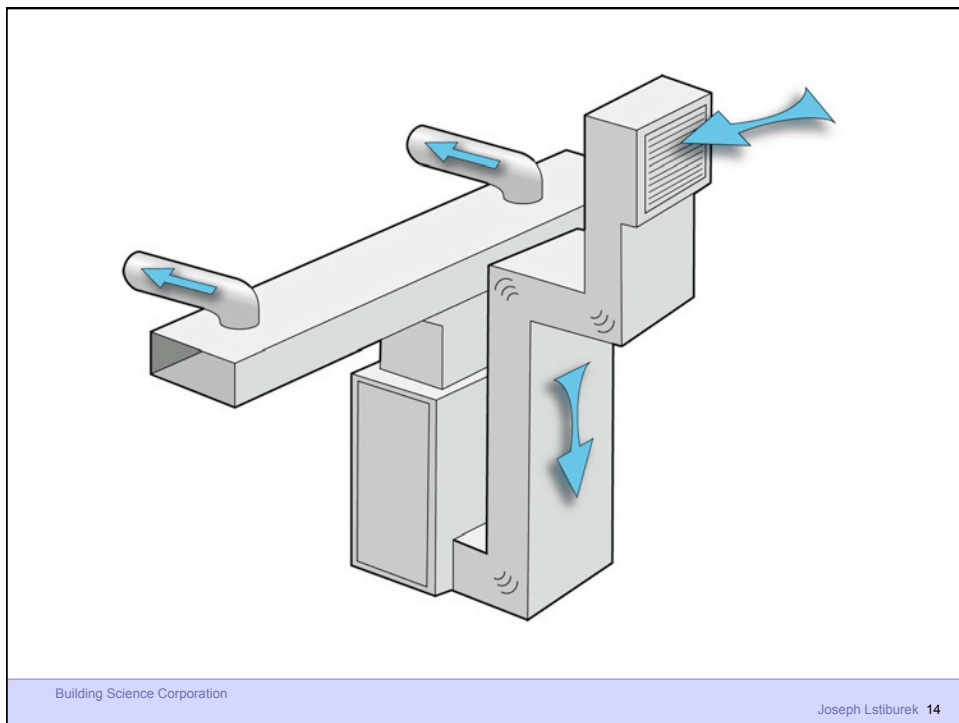
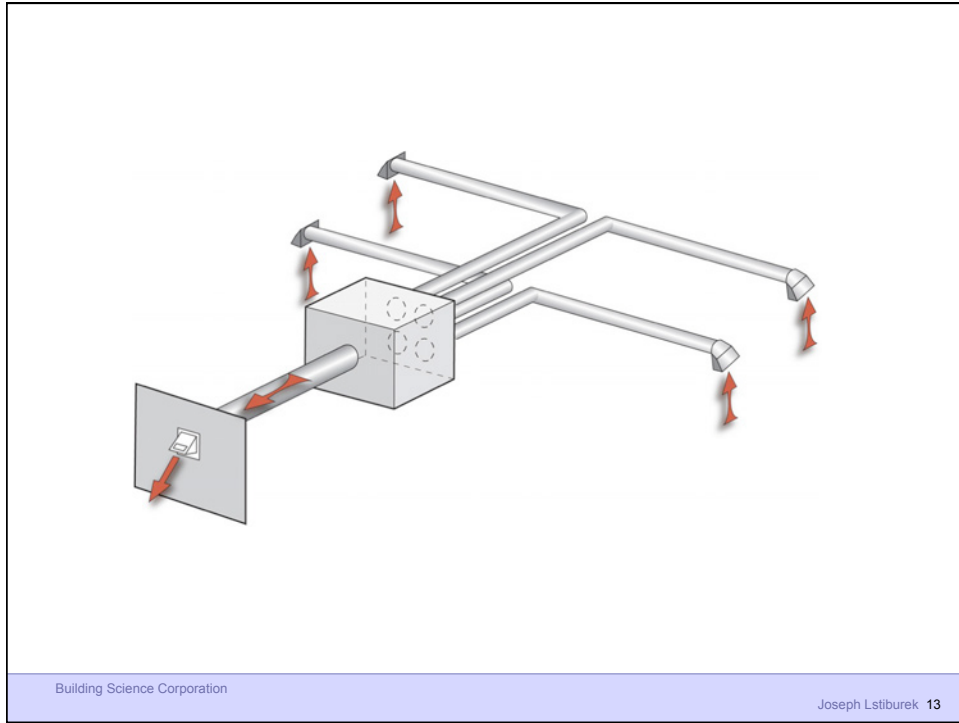
Exhaust Ventilation

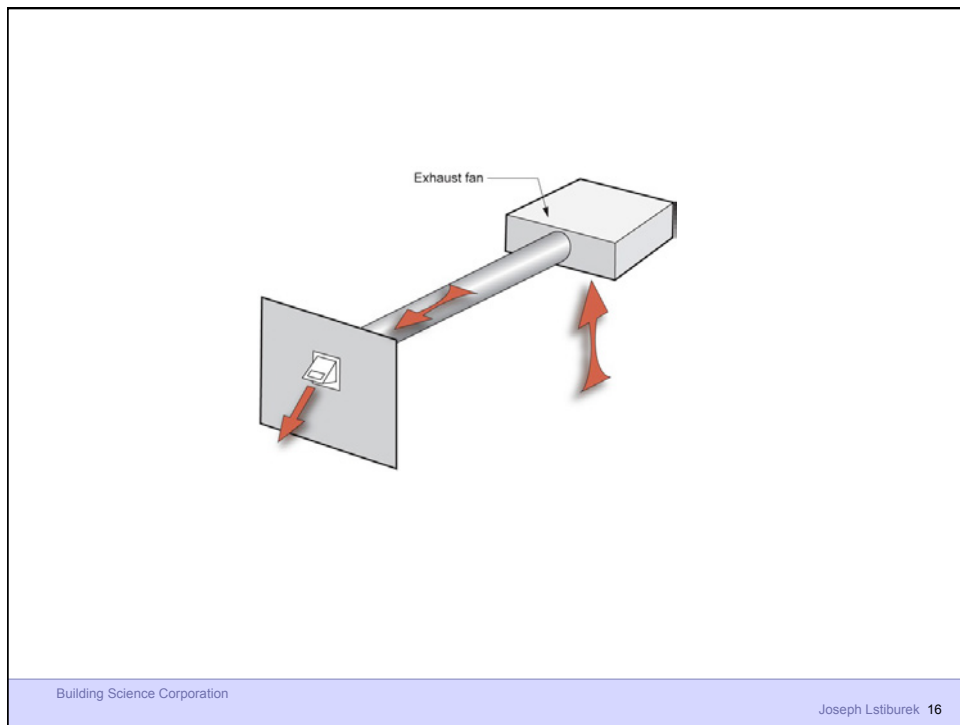
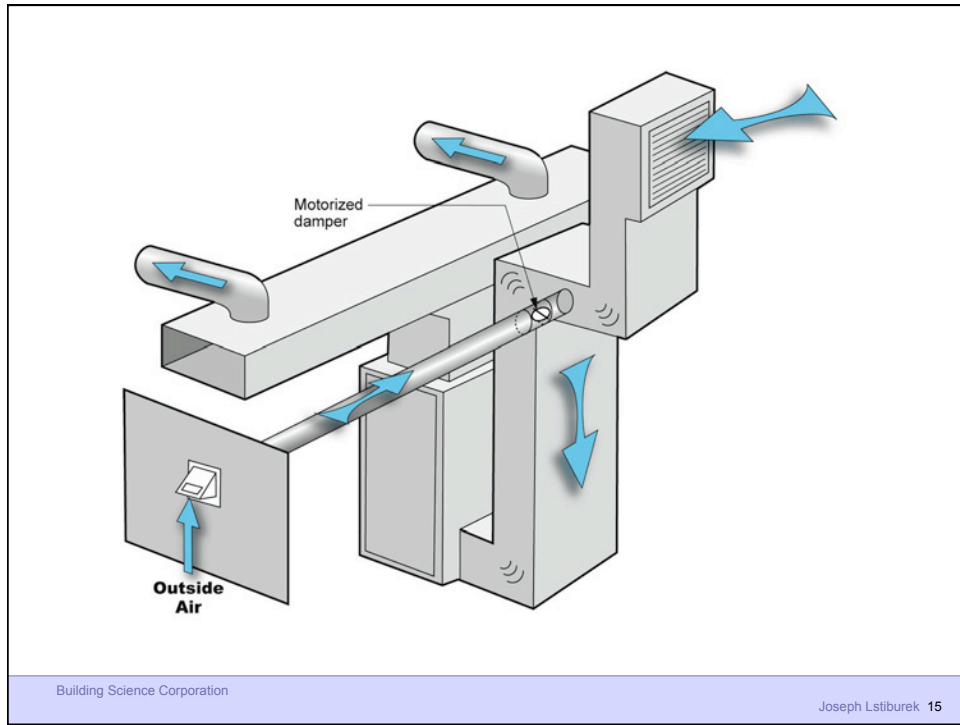
Supply Ventilation

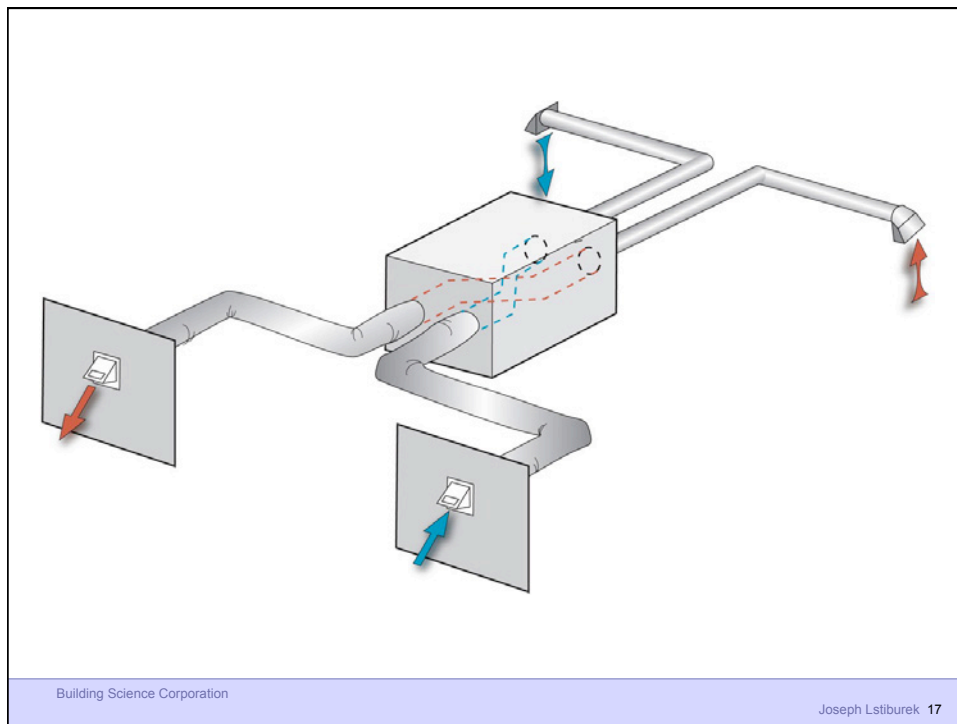
Balanced Ventilation











Ventilation Rates Are Based on Odor Control

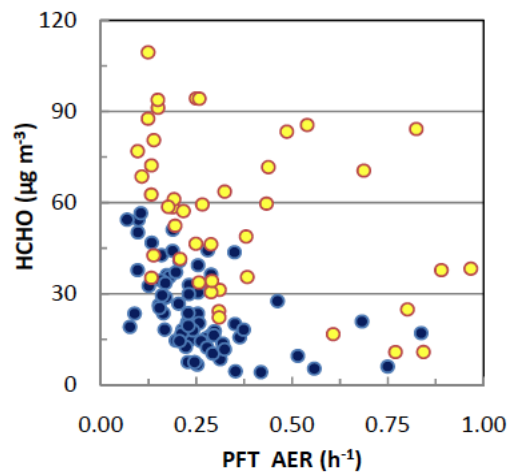
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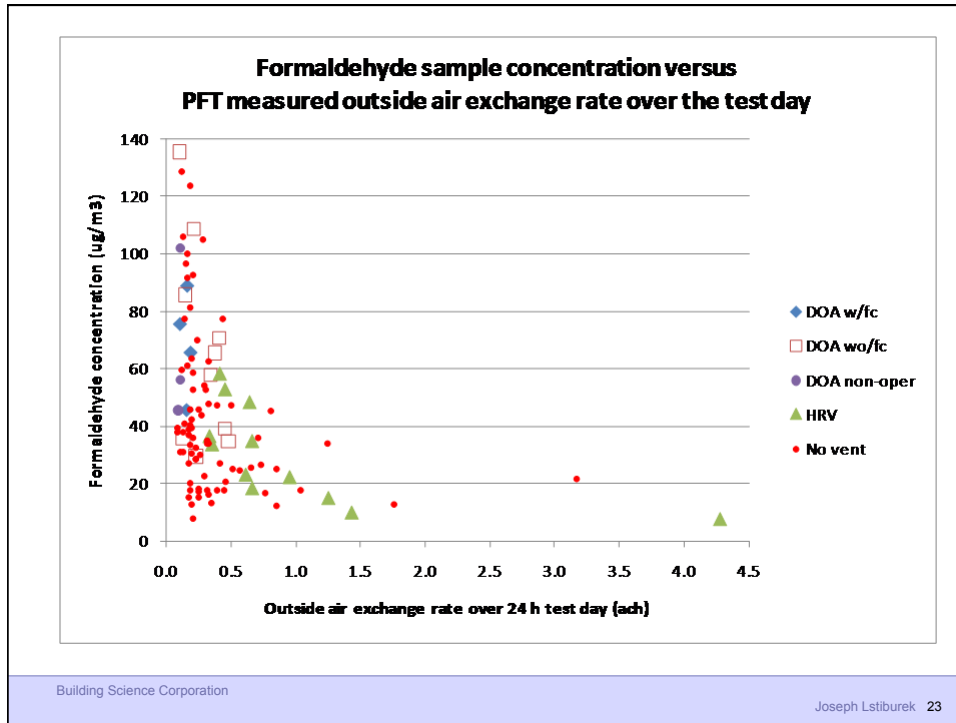
Ventilation Rates Are Based on Odor Control
Health Science Basis for Ventilation Rates is
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Almost Nothing Cited Applies to Housing

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 The Applicable Studies Focus on Dampness



Aubin, D., Won, D.Y., Schleibinger, H., 2010



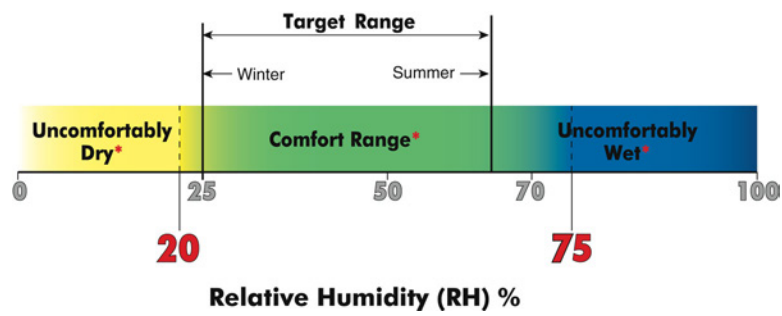
Dilution Is Not The Solution To Indoor Pollution

Source Control

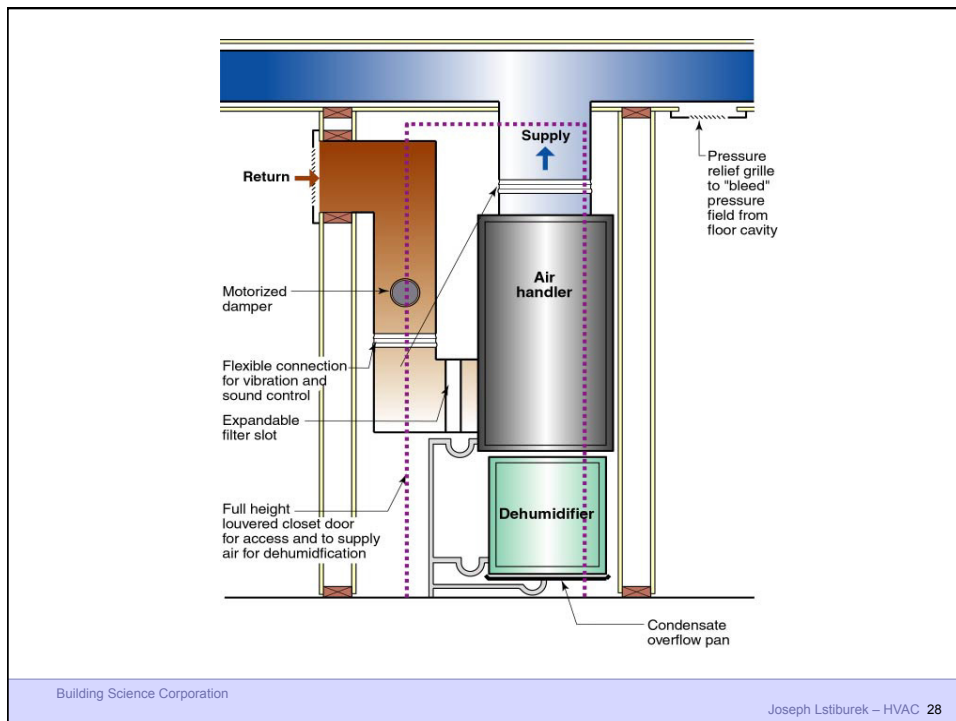
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Dilution For People Source Control For The Building

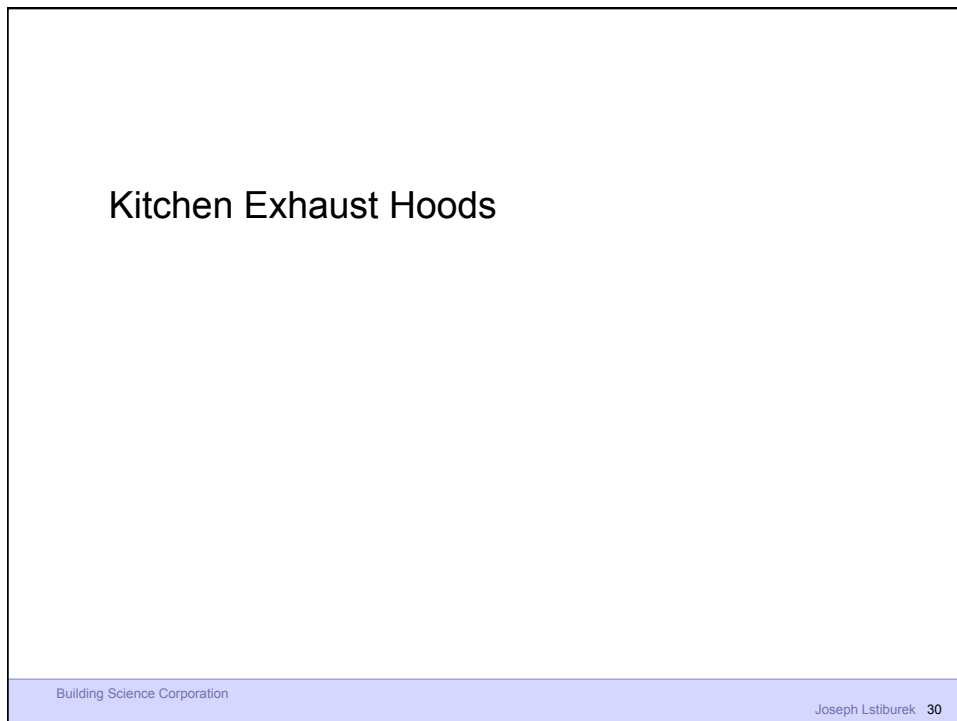


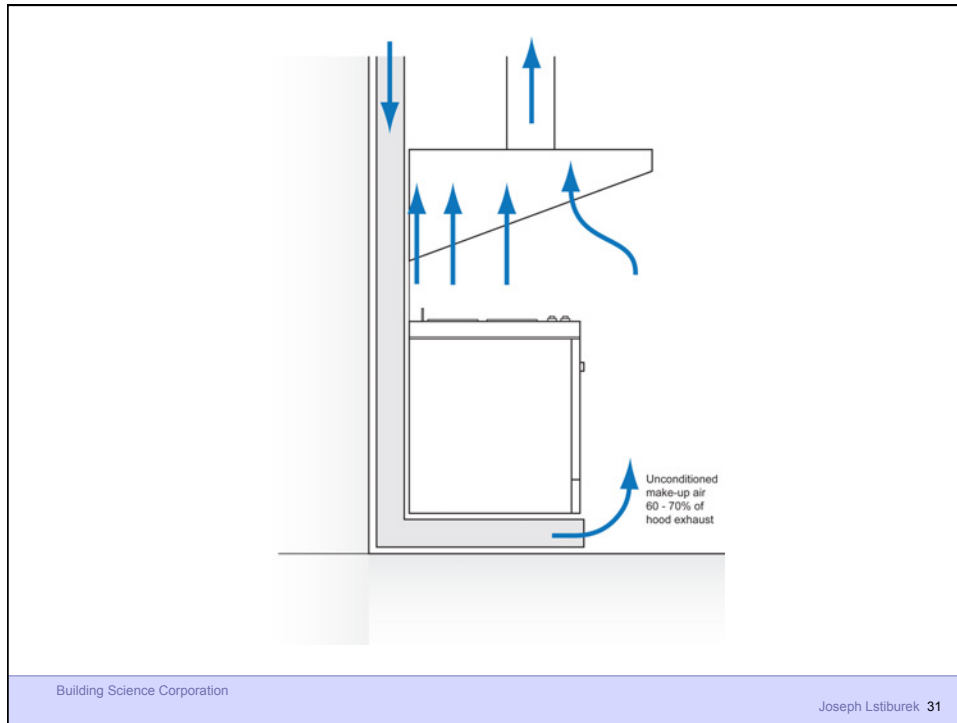
Recommended Range of Relative Humidity
 Above 25 percent during winter
 Below 70 percent during summer

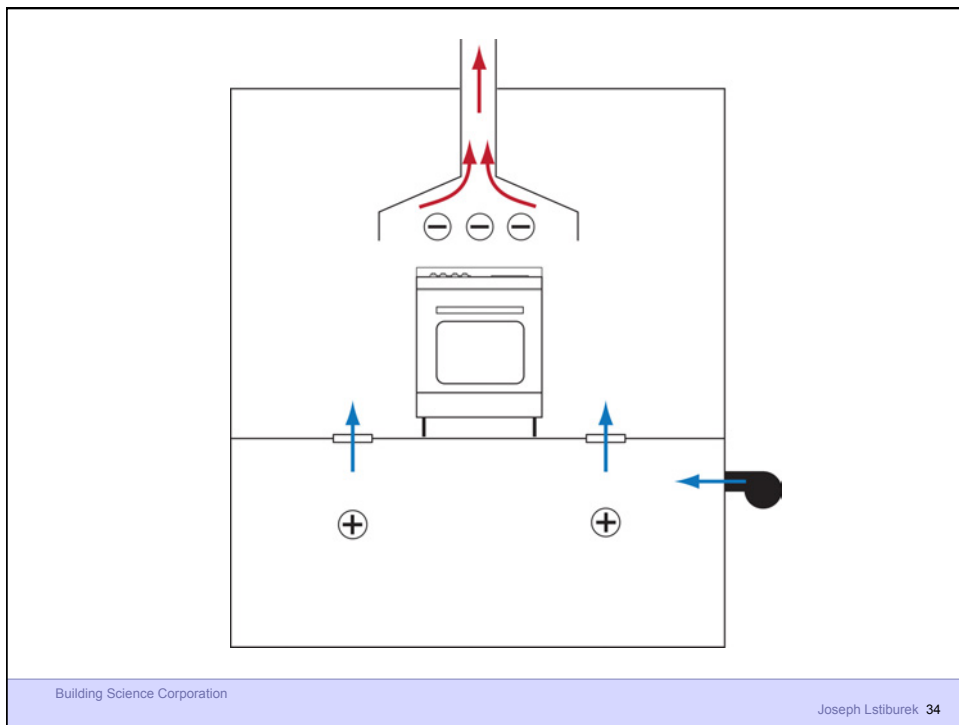
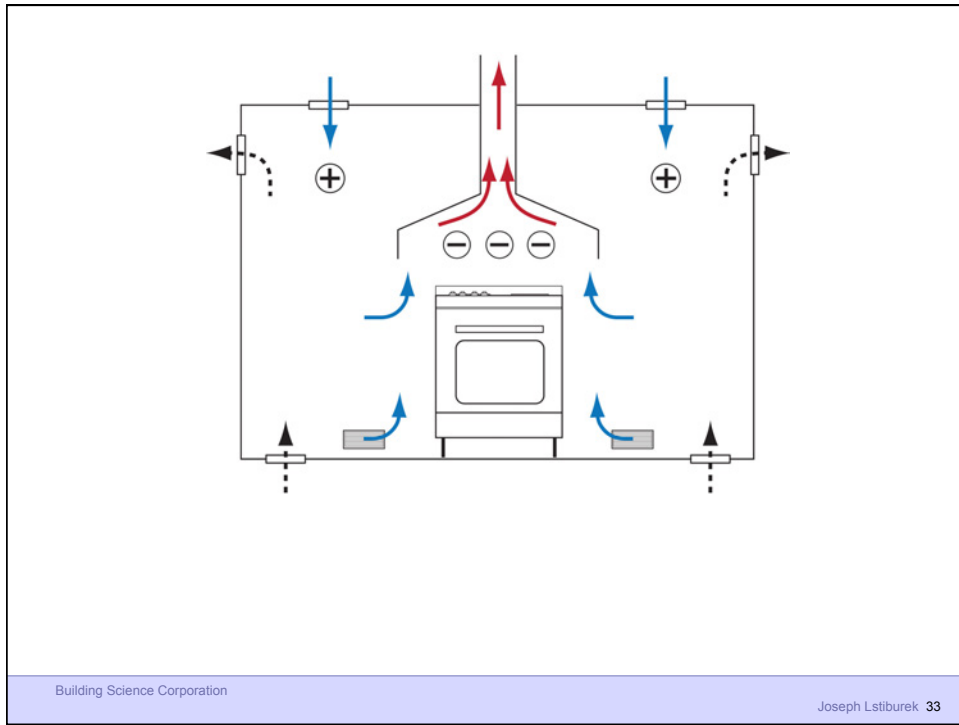


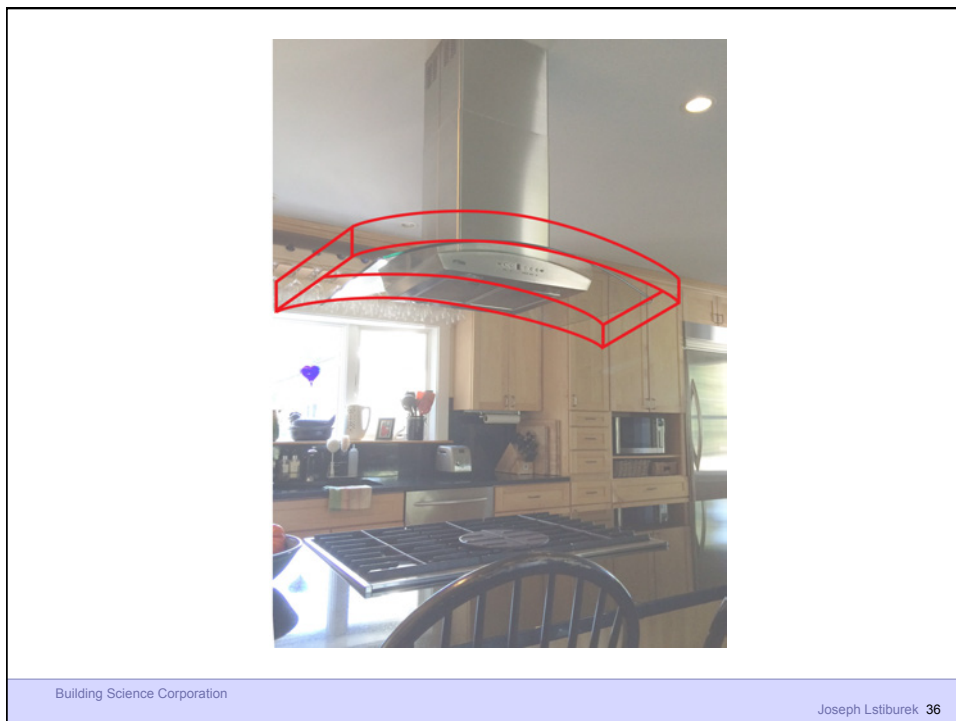


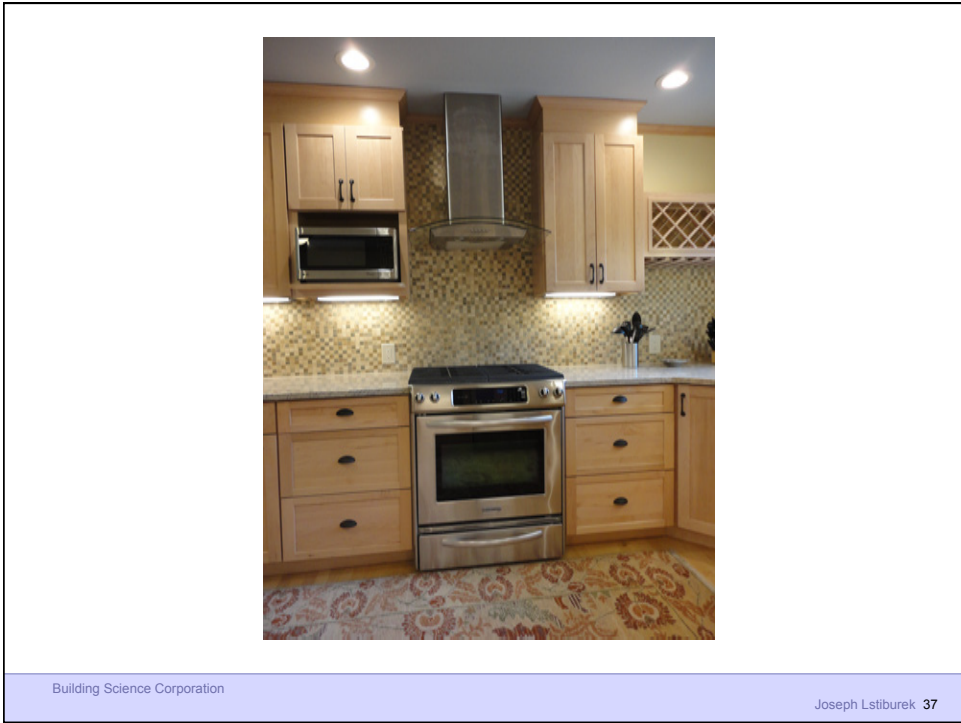
Kitchen Exhaust Hoods













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Clothes Dryers

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Fireplaces

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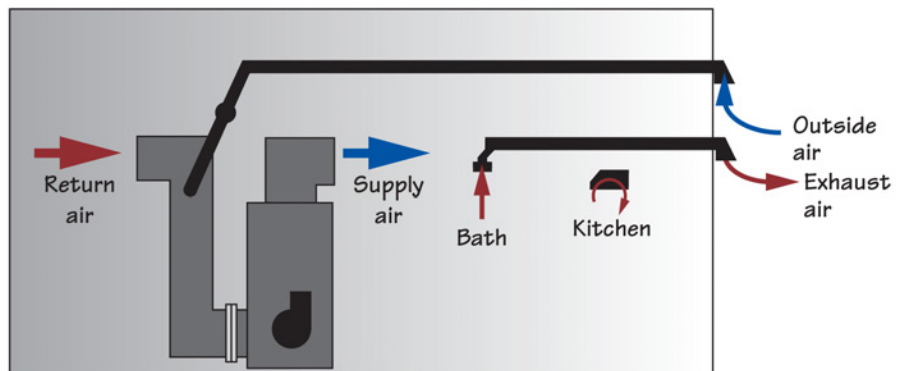


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Approaches

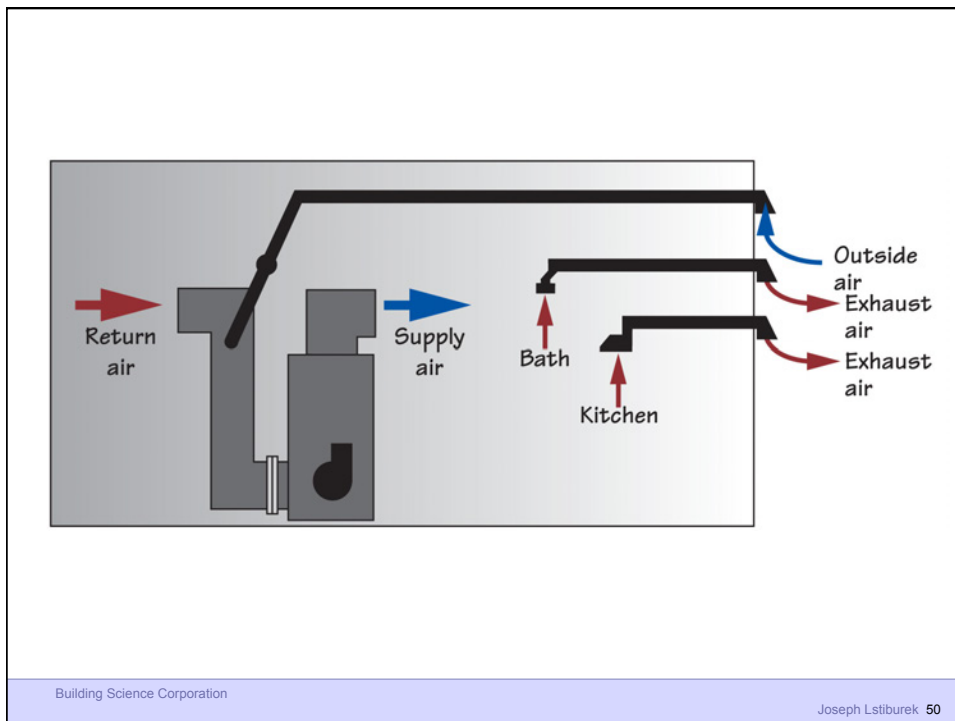
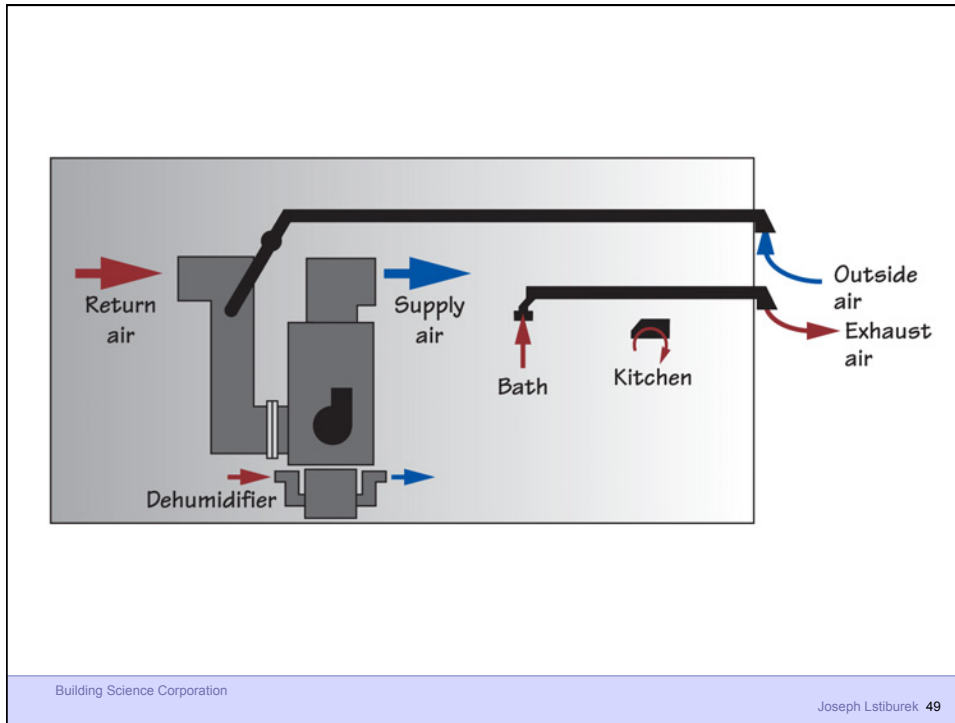
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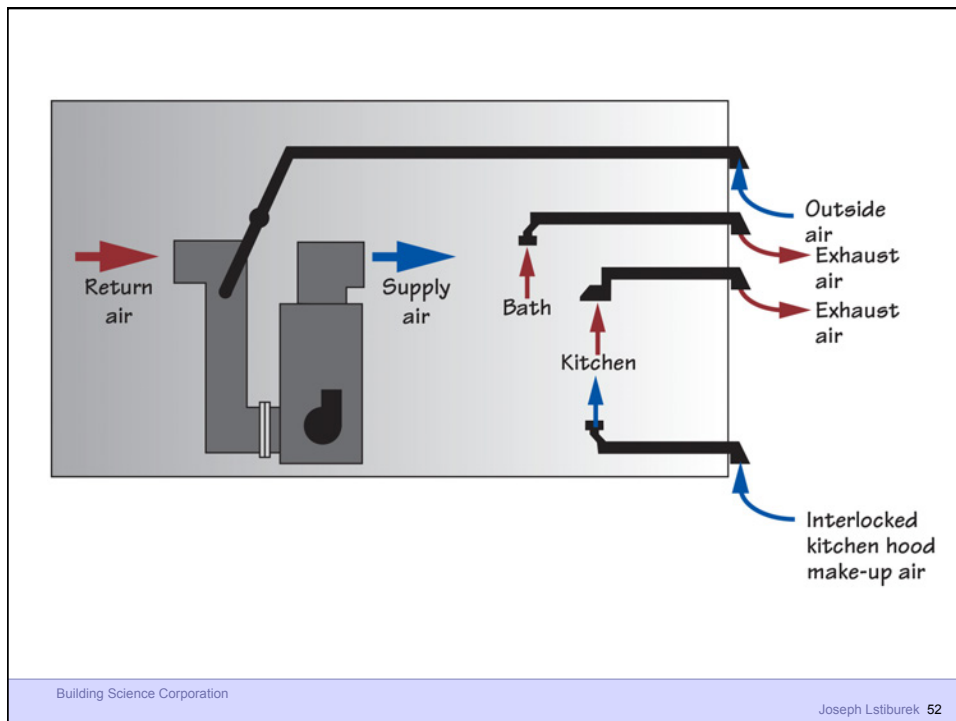
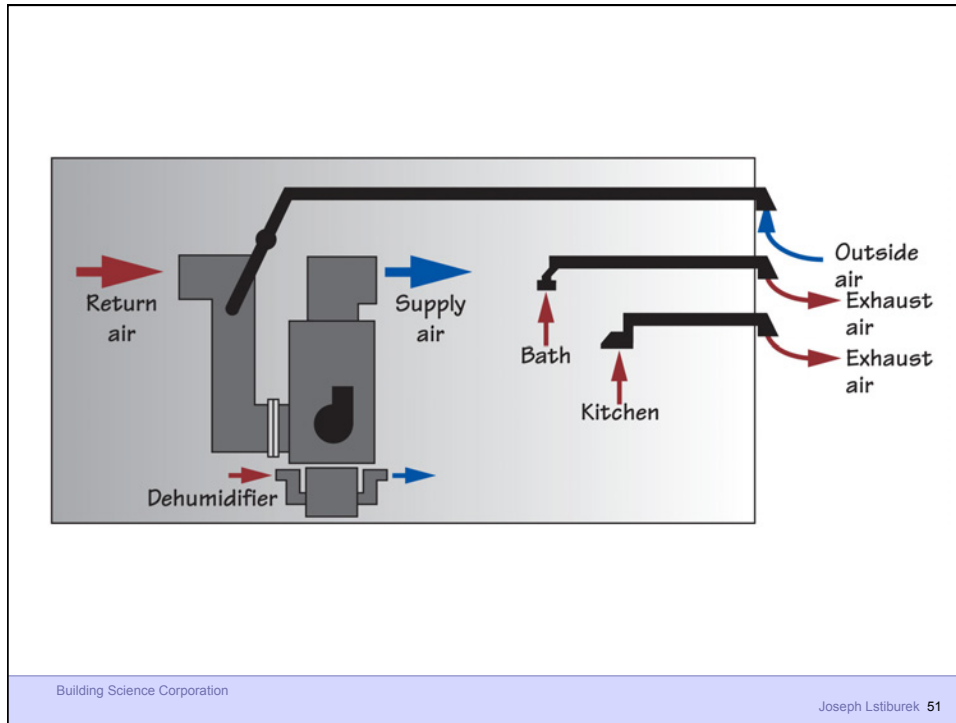
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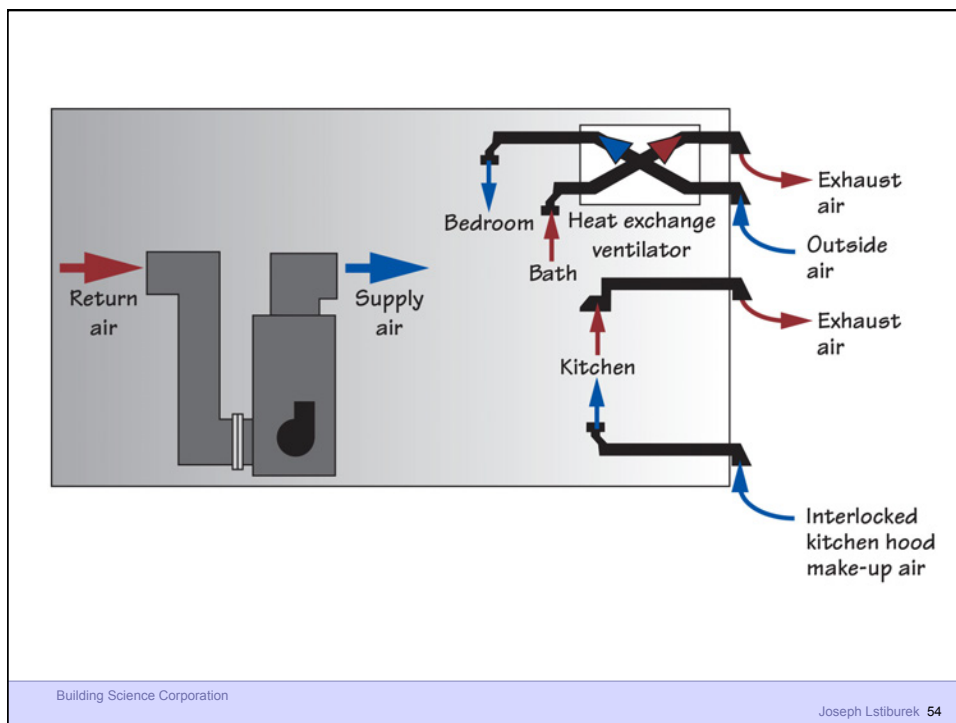
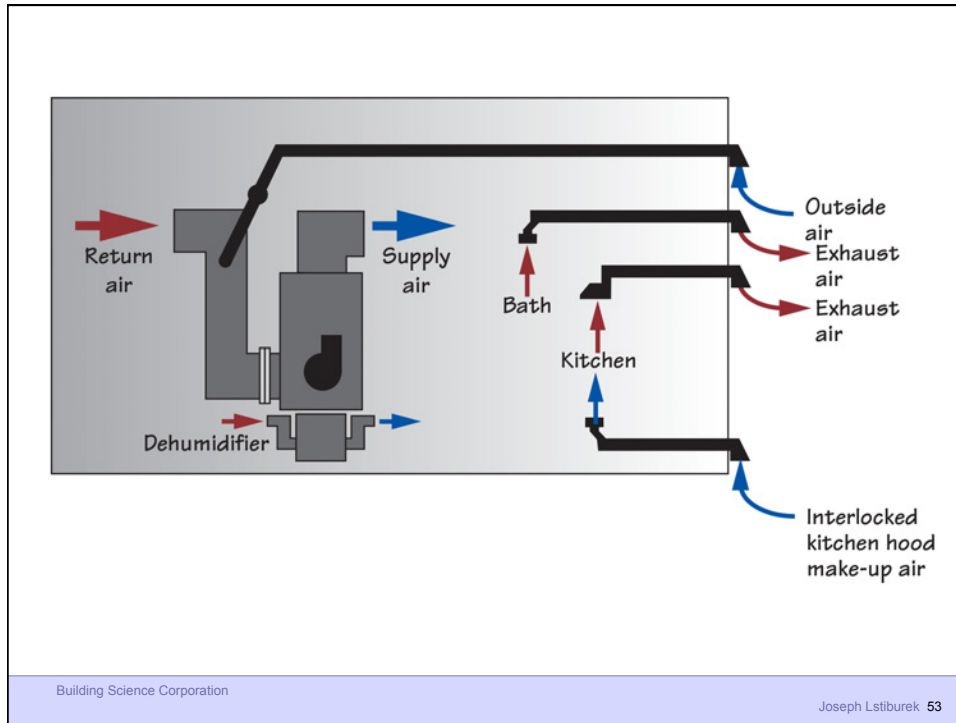


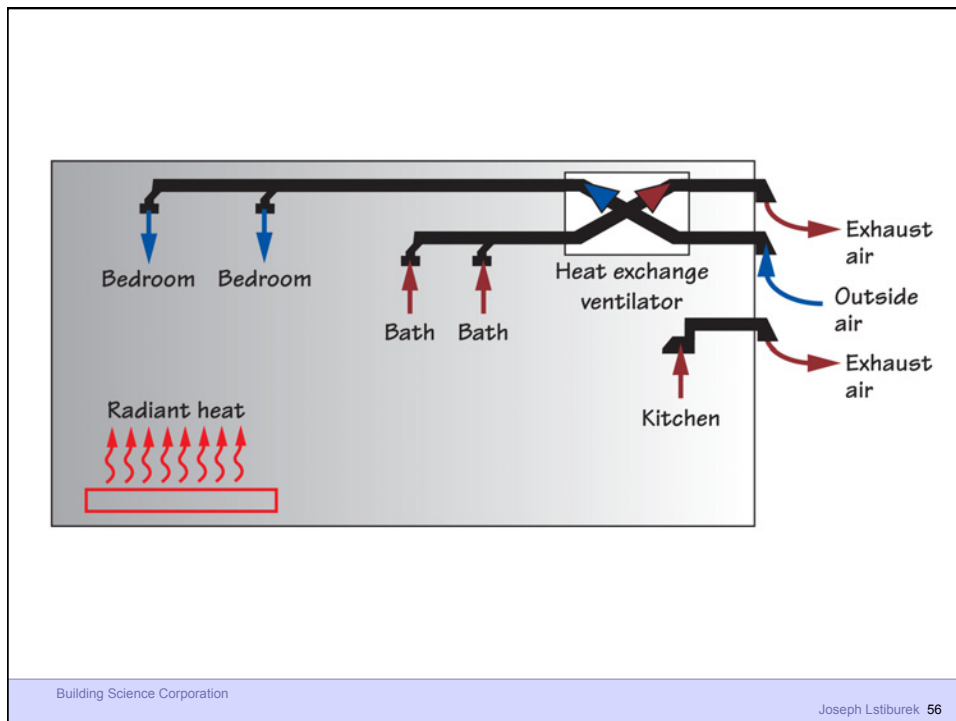
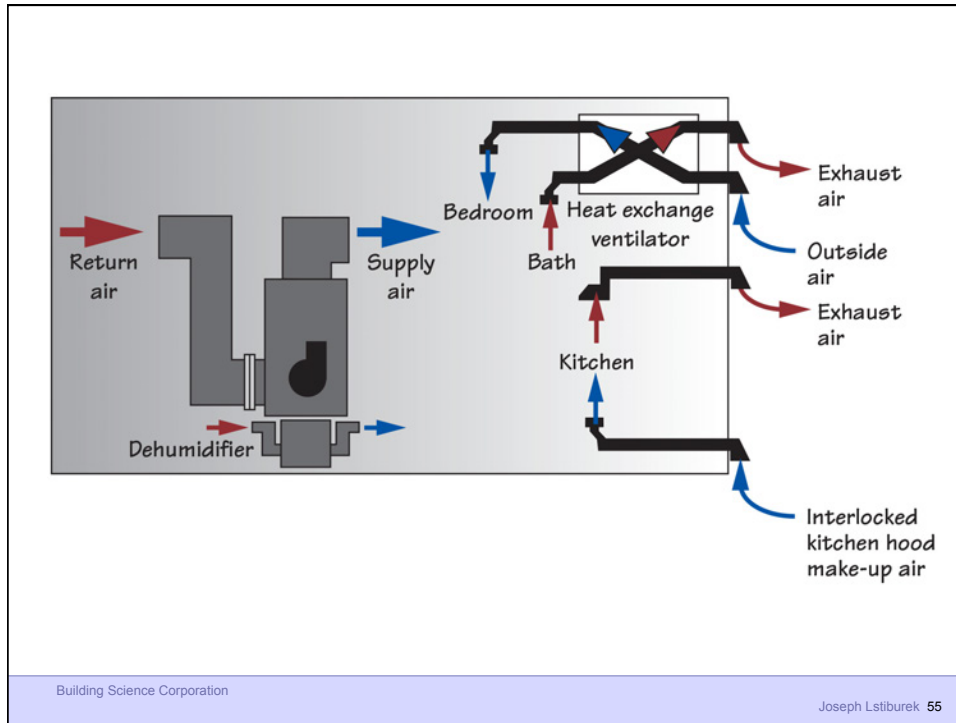
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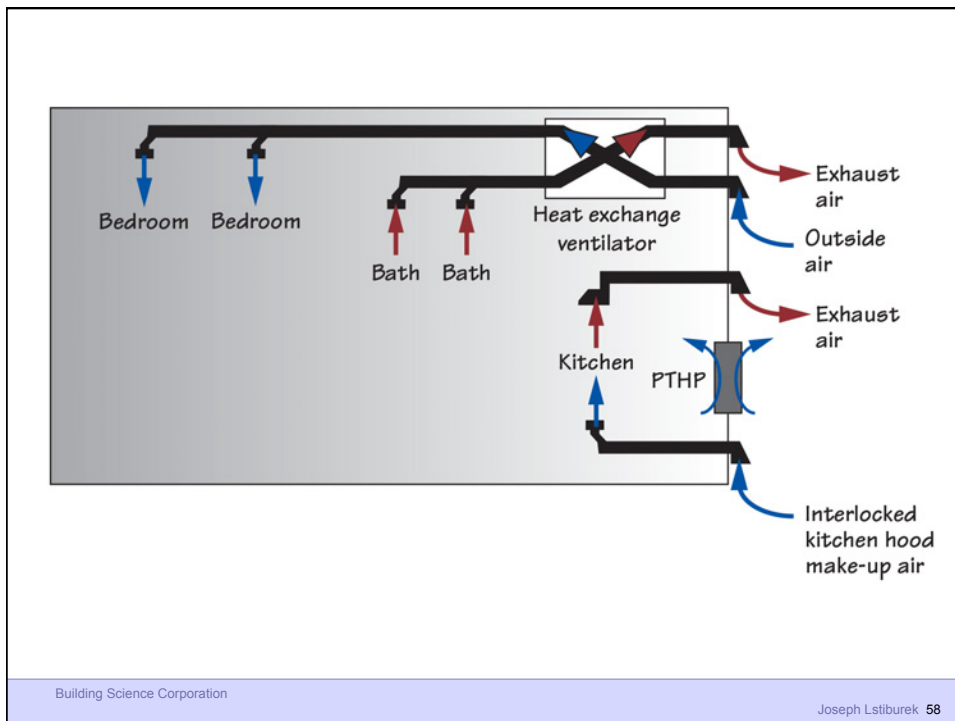
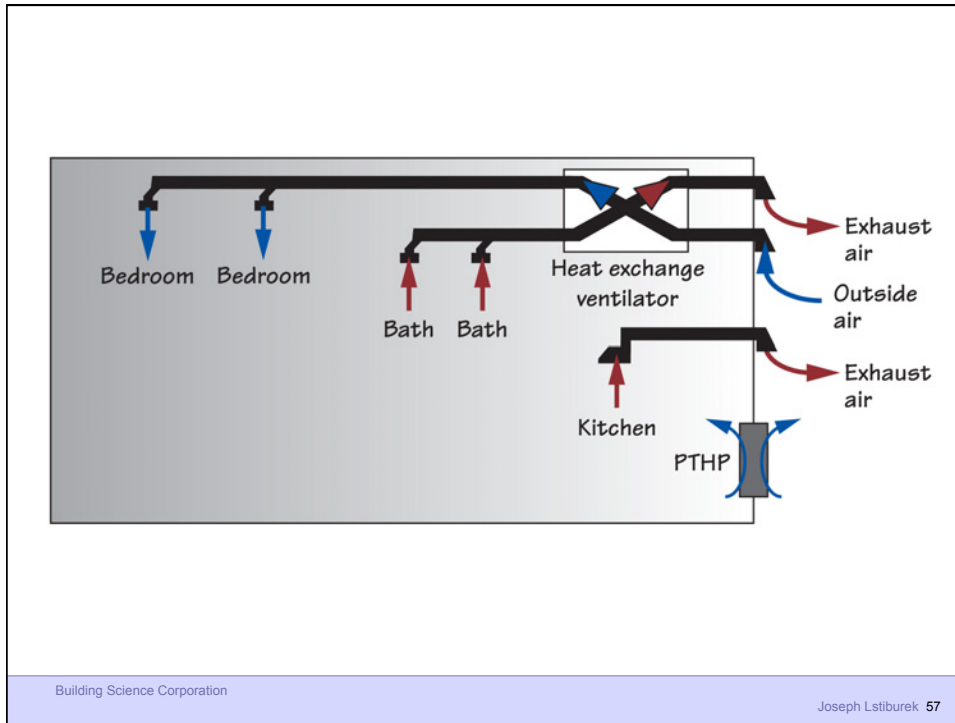
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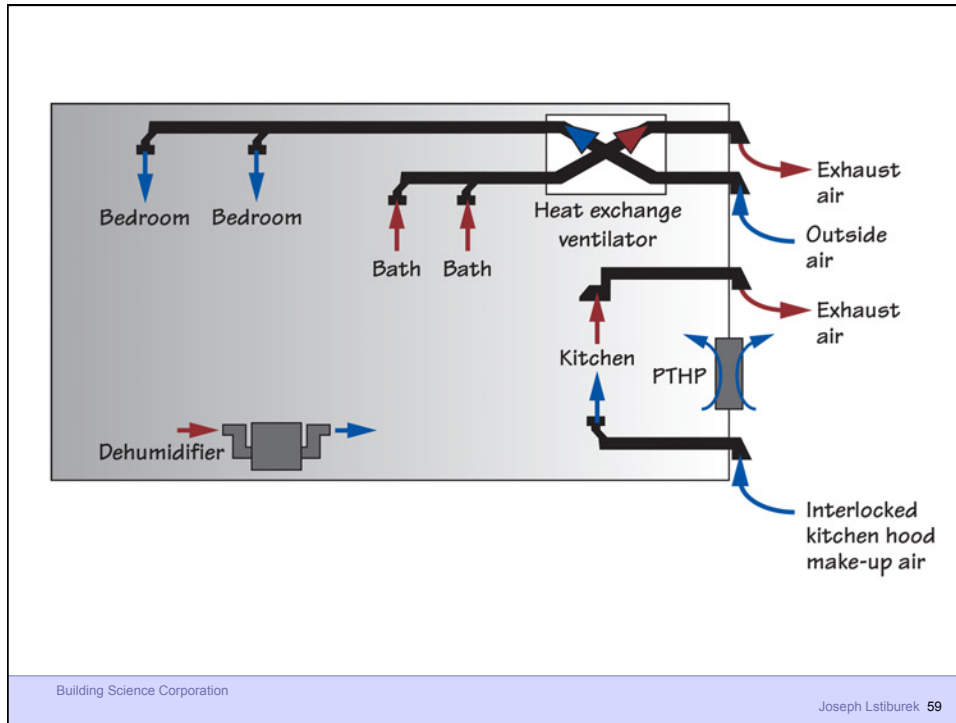






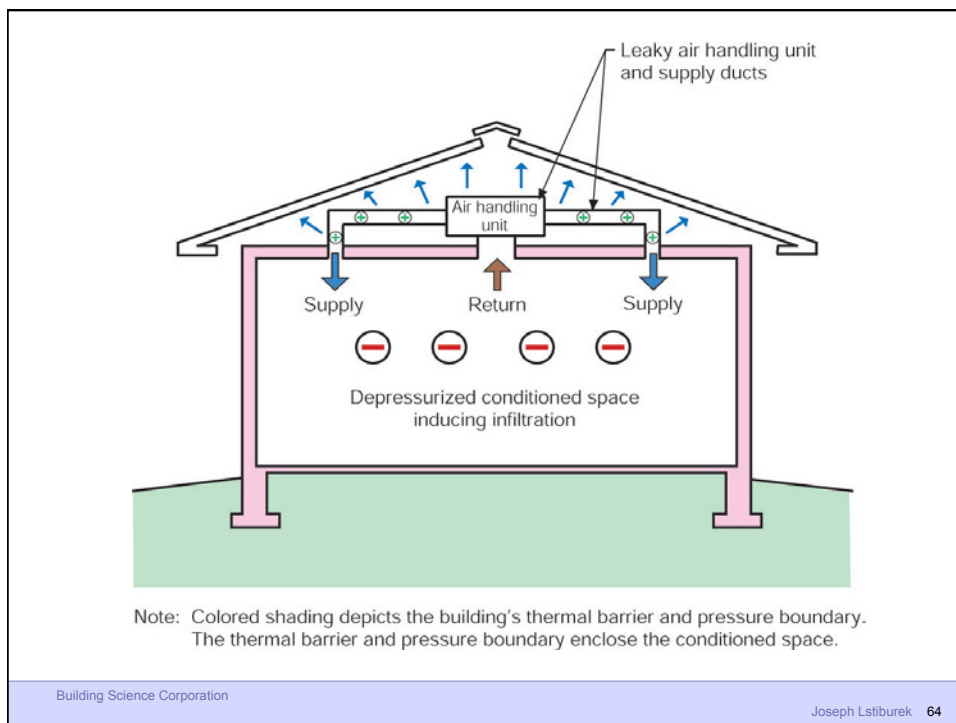
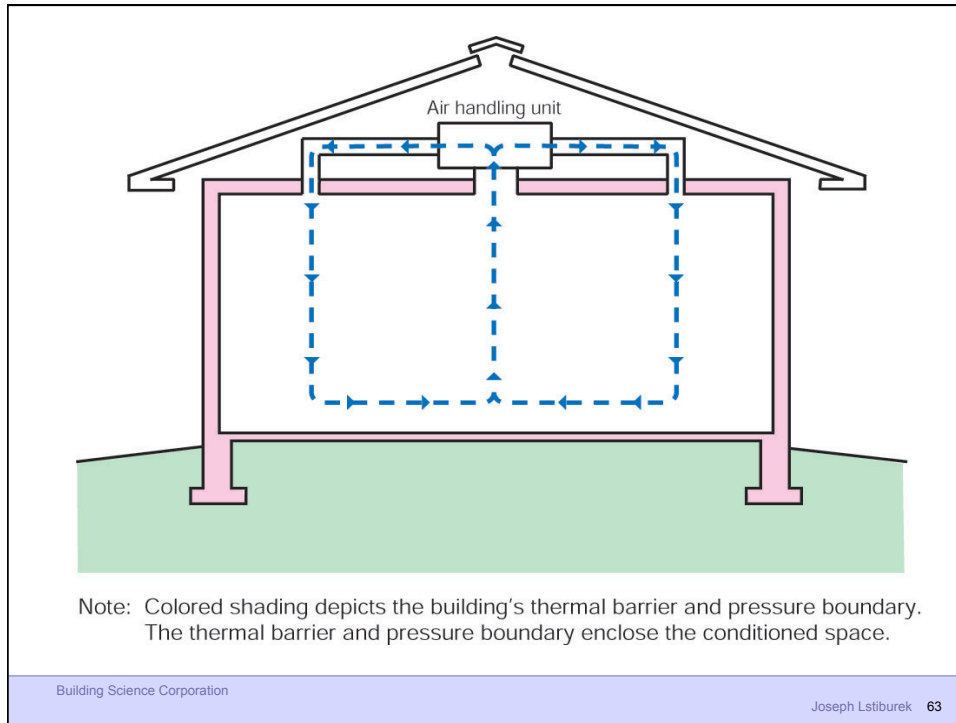


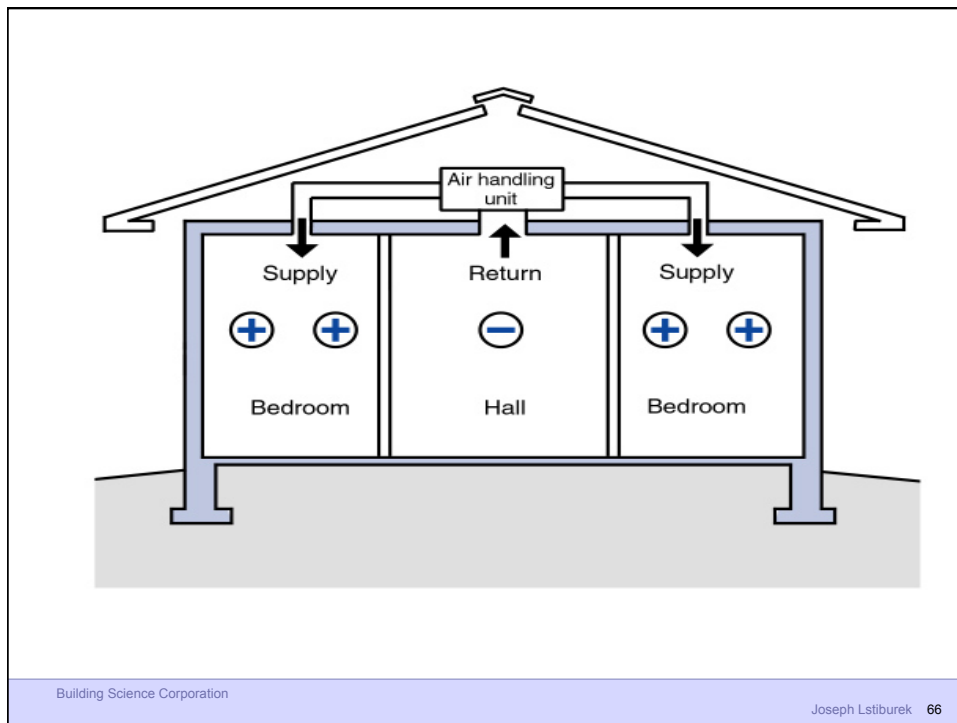
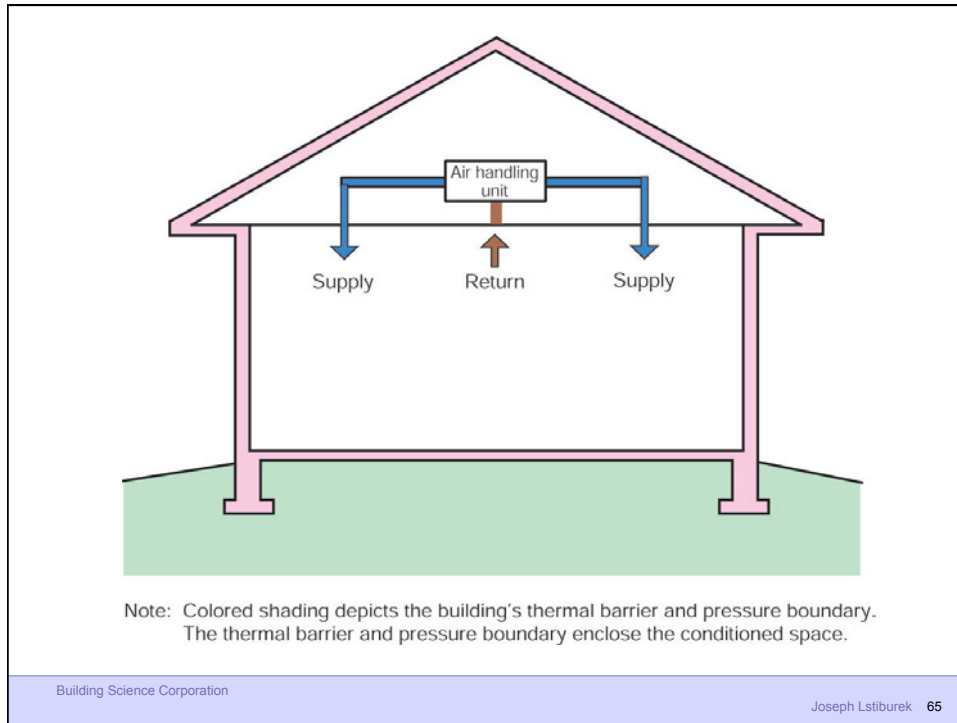


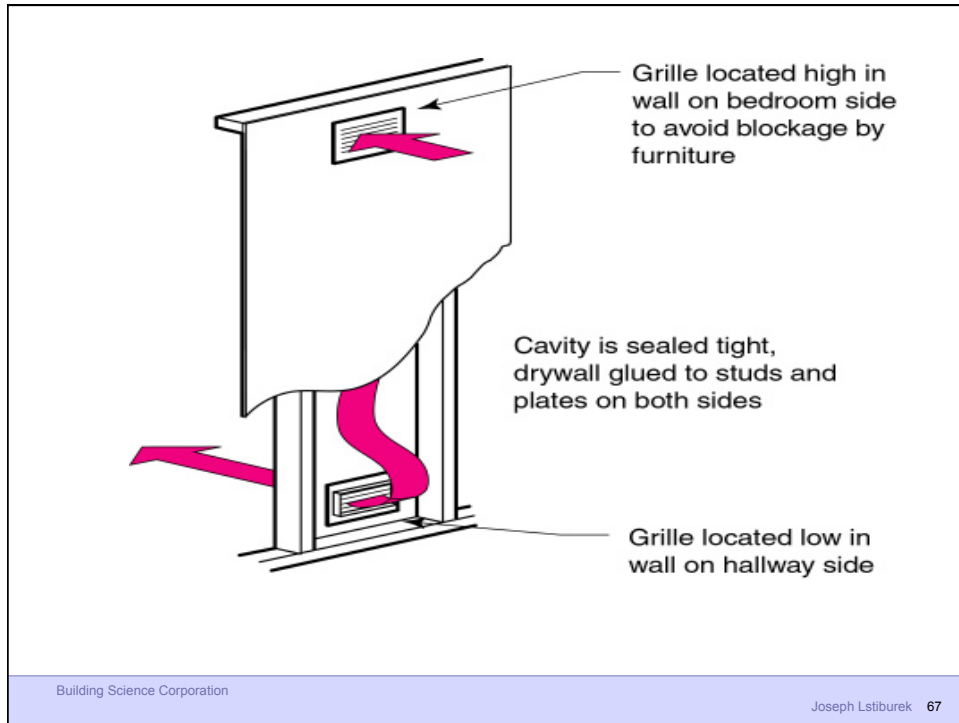


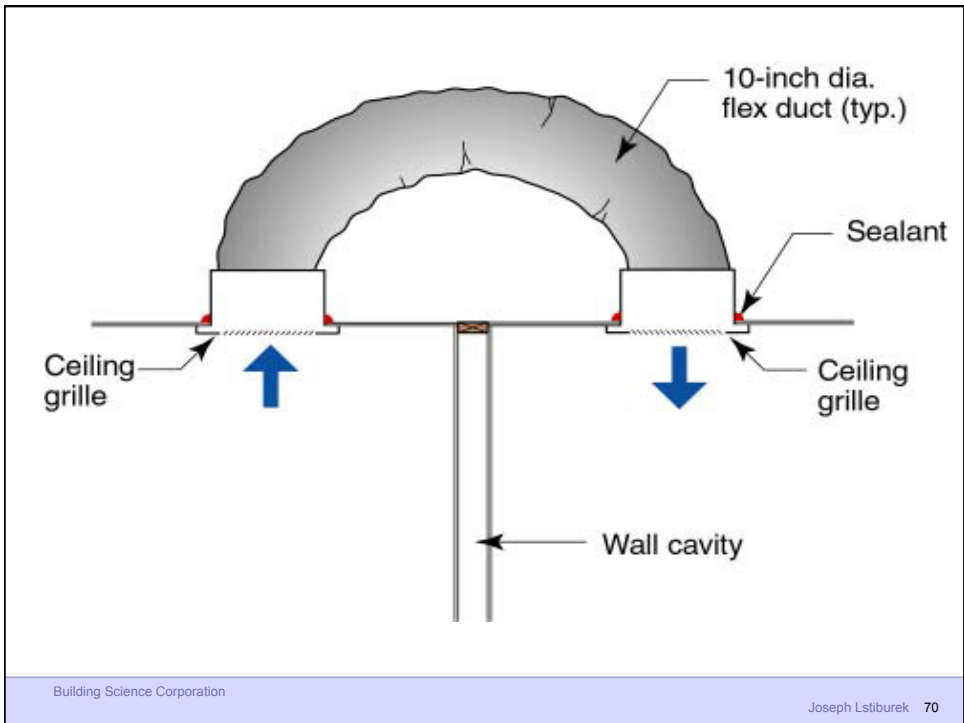
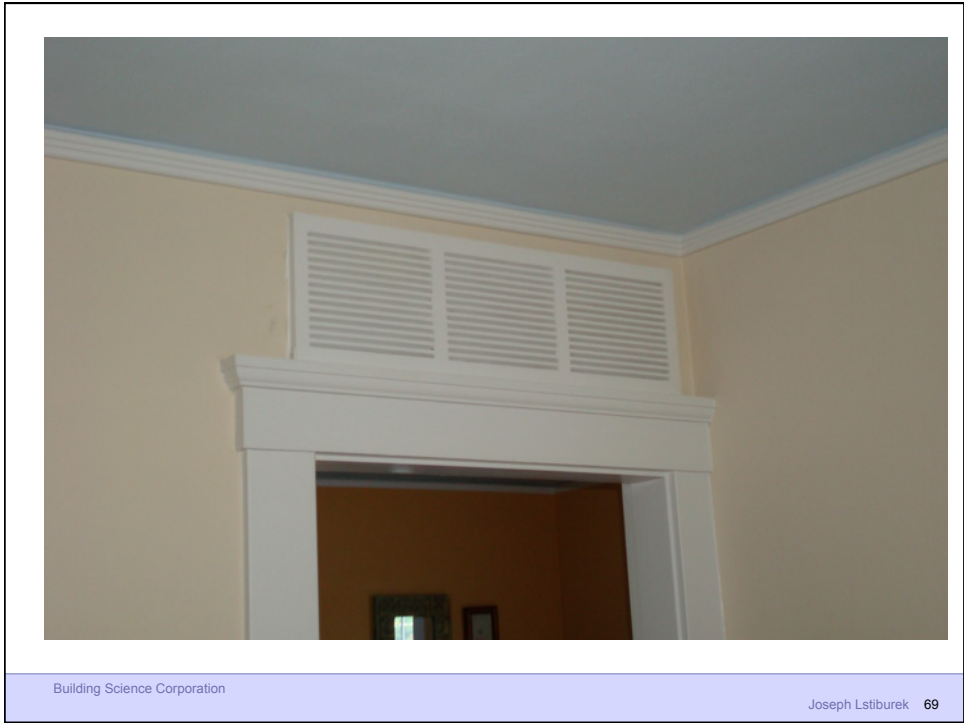
Duct Leakage Should Be Less Than 5% of
Rated Flow As Tested by Pressurization To
25 Pascals

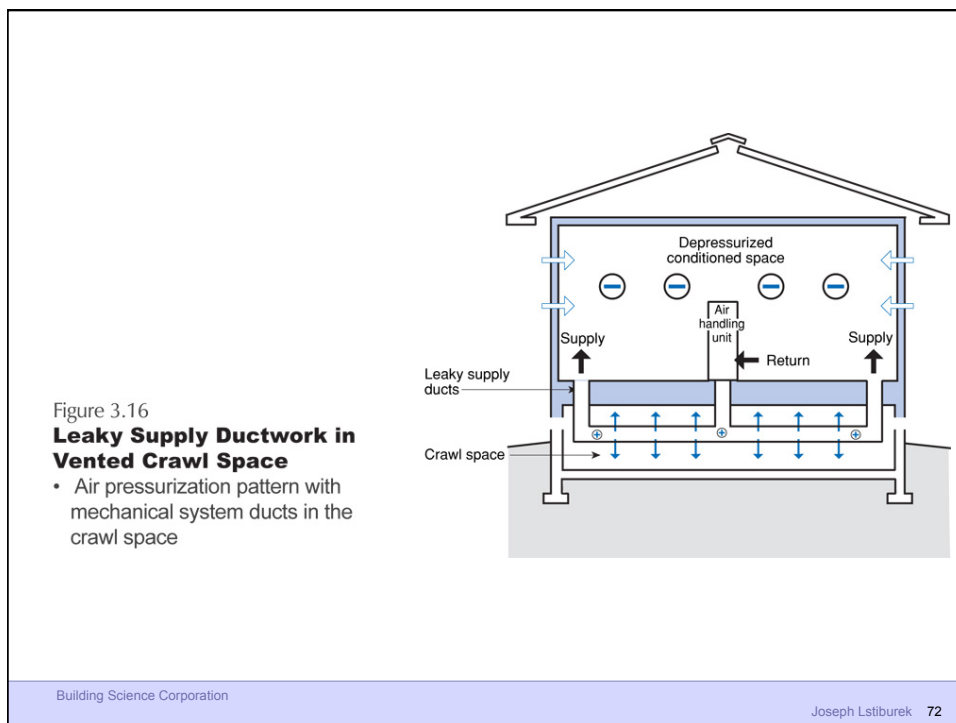
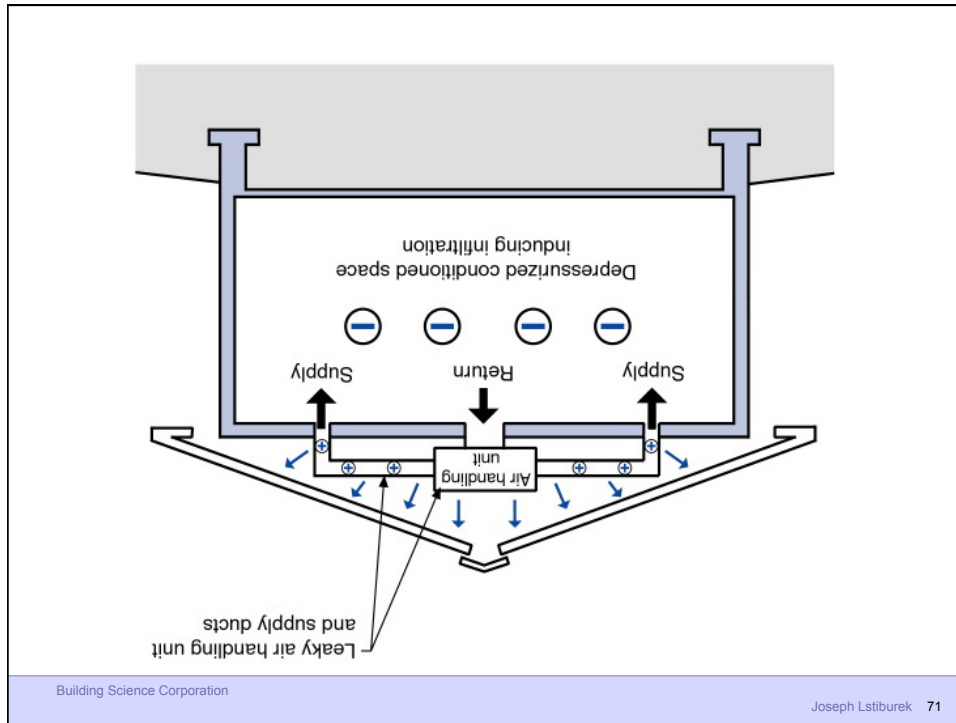


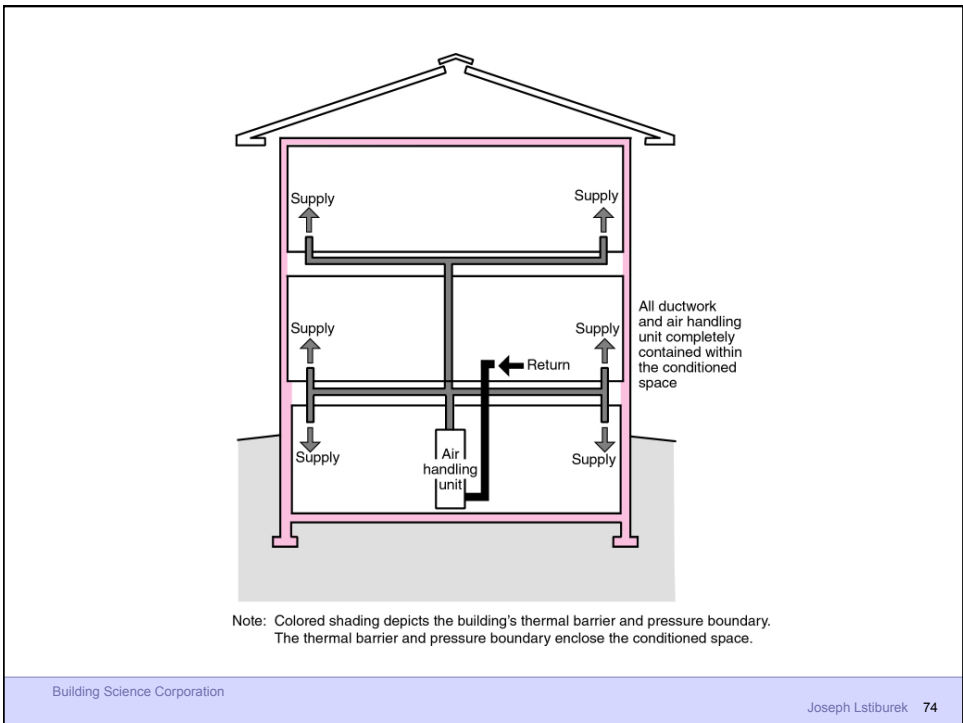














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