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Top 10 Things You Need To Know.... Energy Code & **What's Coming Next**

Southern Tier Leadership Conference

Codes Track

4-5-2023

NYS-DOS #T02-07-2836



Where I Come From...

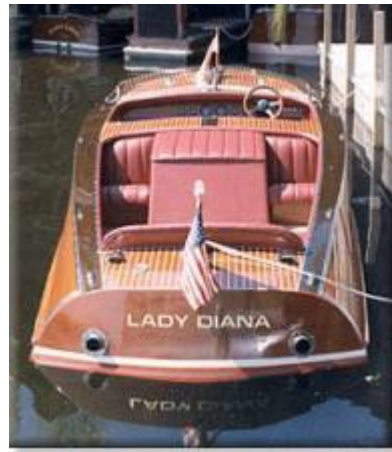


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 Energy Solutions



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Using less. Doing more.

USGBC – IAQ Cmte.
ICC – SEHPCAC
ASHRAE 189
IGCC
ASHRAE – 62.2



**NEW
ENERGY
STORE**



And My Latest Achievement...



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And My Latest Achievement...



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But First - Thank You For Your Service...



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Before We Start...

Is the Energy Code a Life Health Safety Code?

Yes...

No...

Maybe

...



Anybody Identify This Horrific Fire?



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Anybody Identify This Horrific Fire?



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...An Improperly Detailed Energy Code Requirement!!!



Do We Think This Will Result in Structural & Durability Problems?!



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Do We Think This Will Result in Structural & Durability Problems?!



...Unenforced/Badly Detailed Energy Code Requirements!!!



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Water Damage Assessment





Do We Think This Might Result in Structural Failure Too, As Well As Mold/Rot?!



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Do We Think This Might Result in Structural Failure?!



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Continuous ridge cap shingles with front edge facing west or towards the River

Ice/water shield installed continuously from drip edge to roof ridge with overlap over ridge from side to side

50 year/Lifetime shingles installed with overlap from side to side at ridge

plywood 5/8" to 3/4" continuous from Drip edge to Top of Ridge

Ridge Board 4" x 10" original to building

Caulk (silicone) installed between drywall and ridge beam continuously.

Spray foam continuous from Top plate of wall to above ridge board - Spray foam install directly to roof plywood

Mix of original 2x10 Rough Saw rafters and new 2x10's

1/2" Drywall Paper taped with 3 coats compound 1/2" Foil faced insulation with foil on both sides

Get 0. cir. j? ec \V 11 \e6- c.n a. / s; CW)

ND ve11 1110 11"10 / N'. 4



Do We Think This Might Result in Structural Failure?!



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Do We Think This Might Result in Structural Failure?!



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...Unenforced/ Badly Detailed Energy Code Requirements!!!



And This?!



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And This?!



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**...Unenforced/ Badly Detailed Energy Code Requirements!!!
– Second Highest Insurance Claim in NY**



And This?!



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And This?!



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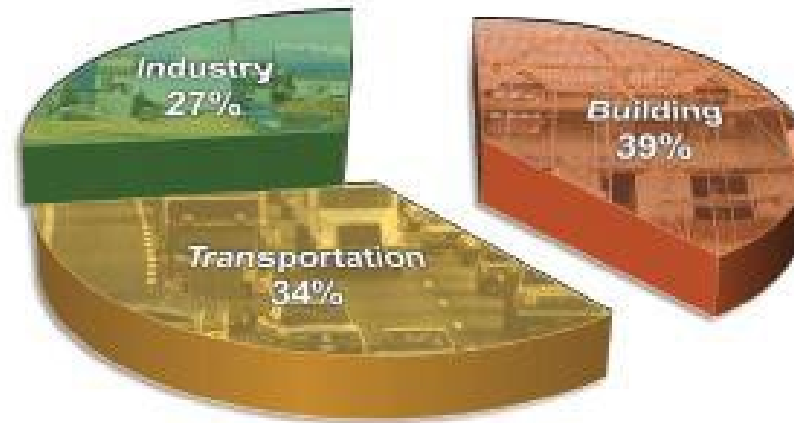


**...Unenforced/ Badly Detailed Energy Code Requirements!!!
– MAJOR Cause of CO Poisoning/Death!**



Building Energy Use

- U.S. buildings use 40% of total
- Consume 70% of electricity
- Responsible for 8% of global CO2
- Decades long building life-cycle
- Energy codes curb growing impact of building energy use



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Energy Code Facts



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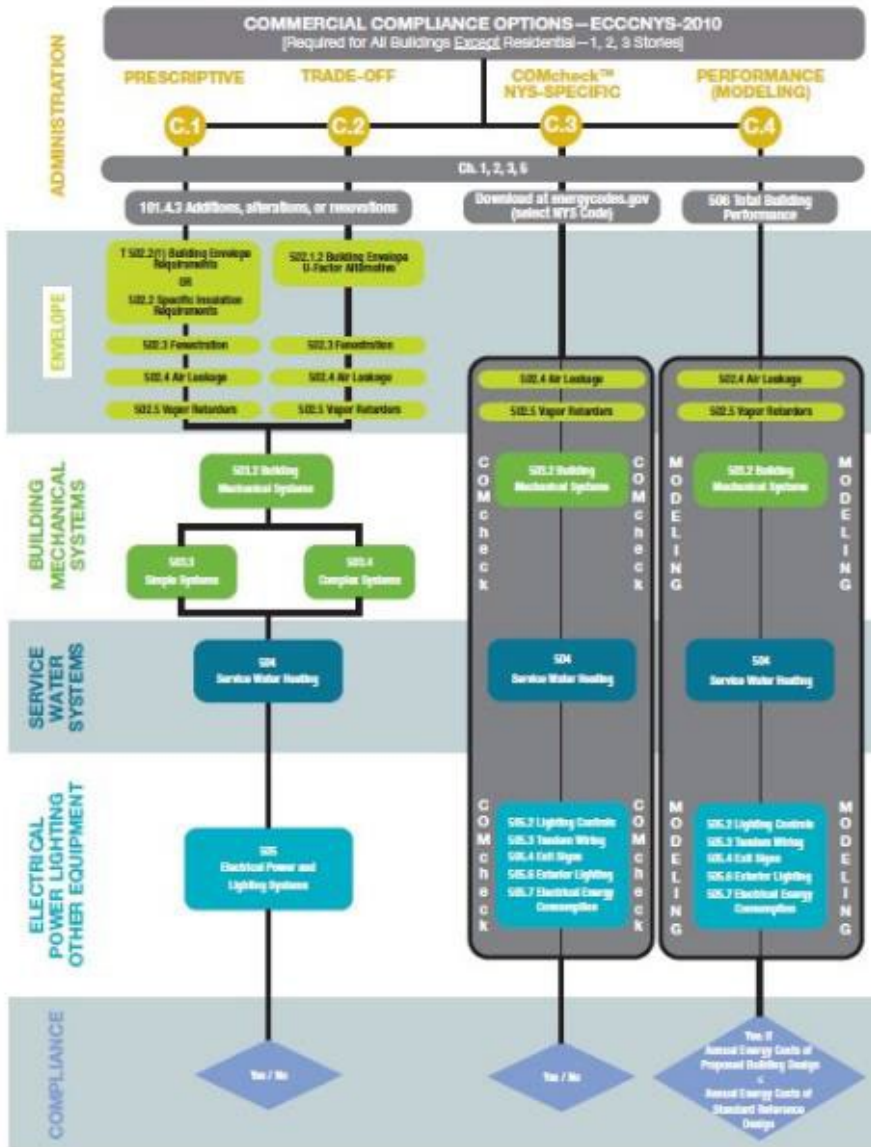
- Minimum requirements
-WORST BY LAW
- Applies to all buildings
- Revised every 3 years
- Adopted by States
- Affect design,
equipment and
materials

Energy Code Development



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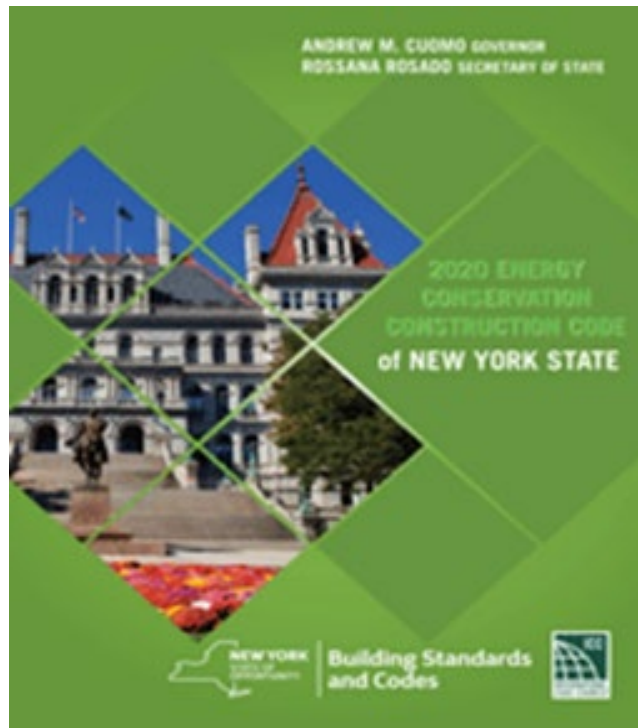
- IECC and ASHRAE 90.1
- Open Process
- Enforceable Language
- Various Compliance Paths
- NY Now Adopts Base Versions



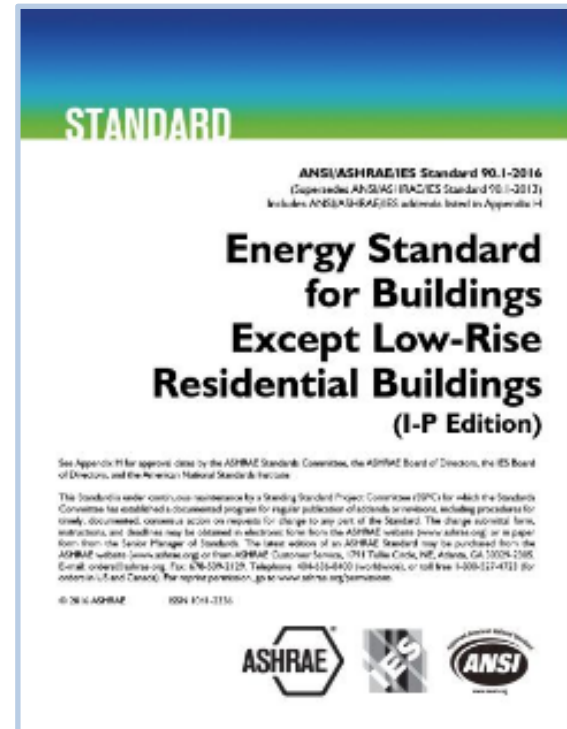
What the Energy Code Covers



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ECCCNYS-2020

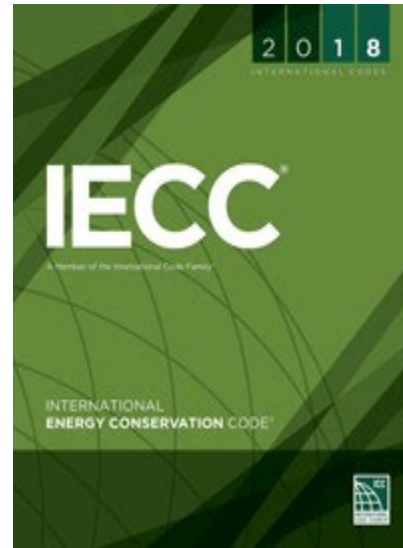


ASHRAE 90.1-2016

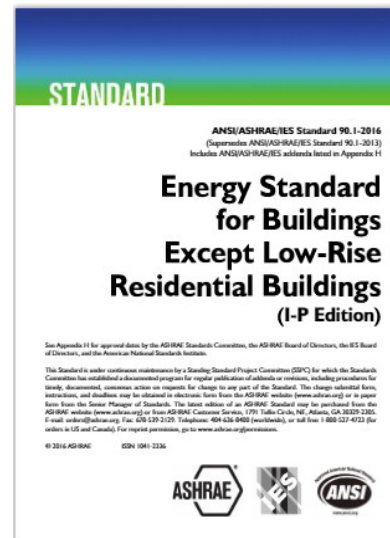
- Building Envelope
- HVAC
- Lighting
- Service Water Heating

What the Energy Code Covers... Up Next Round

- Building Envelope
- HVAC
- Lighting
- Service Water Heating
- More Electric-ready
- Solar, PV, EV-ready
- Envelope and Ventilation Cx



2024 IECC



ASHRAE 90.1-2022



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Why is Energy Important?



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Energy Prices Continue to Increase, Fluctuate

- Oil Prices WILL continue their slow rise back up
- Customers Expect a High Degree of Comfort and Low Energy Costs
- Customers Expect a Healthy Living Environment
- As a Code Officials/ Community, You Want Fewer Callbacks in the Buildings/Homes Built
- Better Buildings for our Communities!!



**Satisfied
Customers**



Benefits to YOUR Community?



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- More Efficient, Affordable Housing and Buildings
- Better, More Comfortable Homes and Buildings
- Higher Durability, Fewer Callbacks
- Reduce Ice Damming, Water, Moisture Damage
- Energy Dollars Saved In Community, Stays In Community
- Communities with Better Codes Have Lower Insurance Premiums
 - ISO BCEGS Process
- Fastest, Least Expensive Way to Meet Community Sustainability Goals
- Energy Prices Continue to Increase, Fluctuate



Benefits to YOUR Local Businesses

NEW OPPORTUNITIES!

- ▶ Duct and Envelope Testing (DET) - BP Contractors
- ▶ Performance Compliance Modeling - Res (ERI)
- ▶ Commissioning - Com HVAC
- ▶ Raters-for Codes Third Party - ERI/HERS-As-Codes
- ▶ Educate Your Clients/Customers

**JOBs, Electrical, HVAC, Construction -
currently EE produces 10X the Jobs Fossil
Fuel does!**



However... Codes Including Energy NOT Well Supported



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- Compliance Is Low statewide
- Code Officials Overworked, Under-Resourced
- 10 Codes to Enforce
- Low Investment in Training
- Often Asked to “Back Off...”
- Get Them Some Help...and Support!!
- NYSERDA Energy Code Support Project
- USGBC Upstate/UG contractor for Designers
- NYS-DOS Codes Division



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Check Your Knowledge... #1

True or False

The Energy Code can address and mitigate numerous life/health safety issues, if enforced and complied with Properly

???



Check Your Knowledge... #1



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True or False

Enforcing of and compliance with the Air Sealing and Insulation requirements of the NY Energy Code can reduce or eliminate Ice Damming.

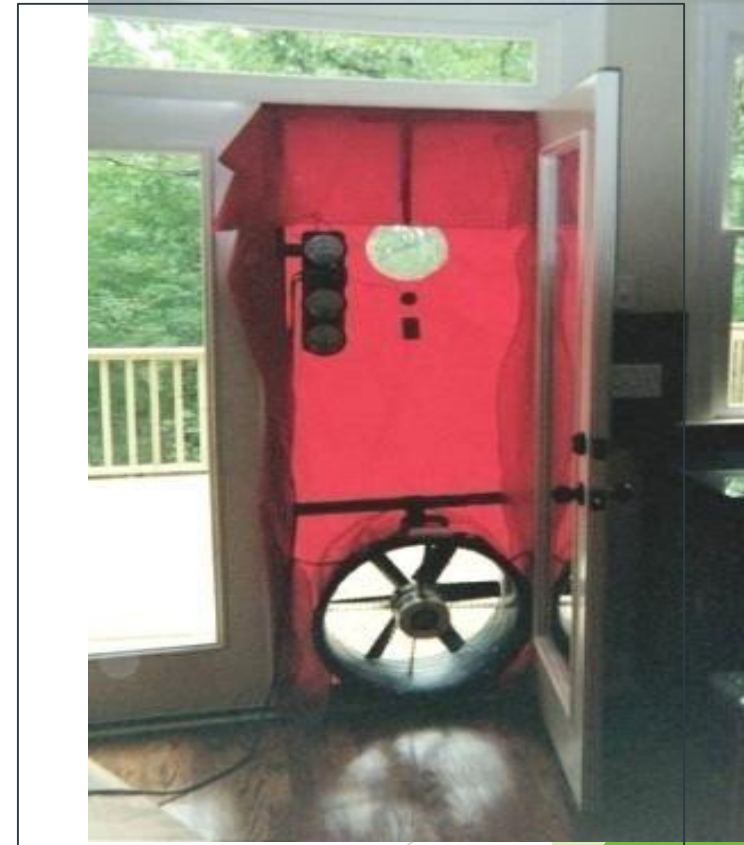
Answer - TRUE

#1 - All New Homes Must Be Air Leakage Tested



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- ▶ Section 402.4
- ▶ Performance testing of house leakage
 - ▶ Blower door result must be less than 3 ACH50
 - ▶ For Multifamily - .3CFM50/ft² of Envelope
 - ▶ MF > 7 Dwelling units - SAMPLE unit may be tested (see ground rules)
- ▶ Additions, Substantial Renovations NOT included in that requirement
- ▶ Tenant Separation Walls MUST BE Insulated to R-10 and Air Sealed



Requirements hold same for 2024 in NY

1 - Mandatory Testing

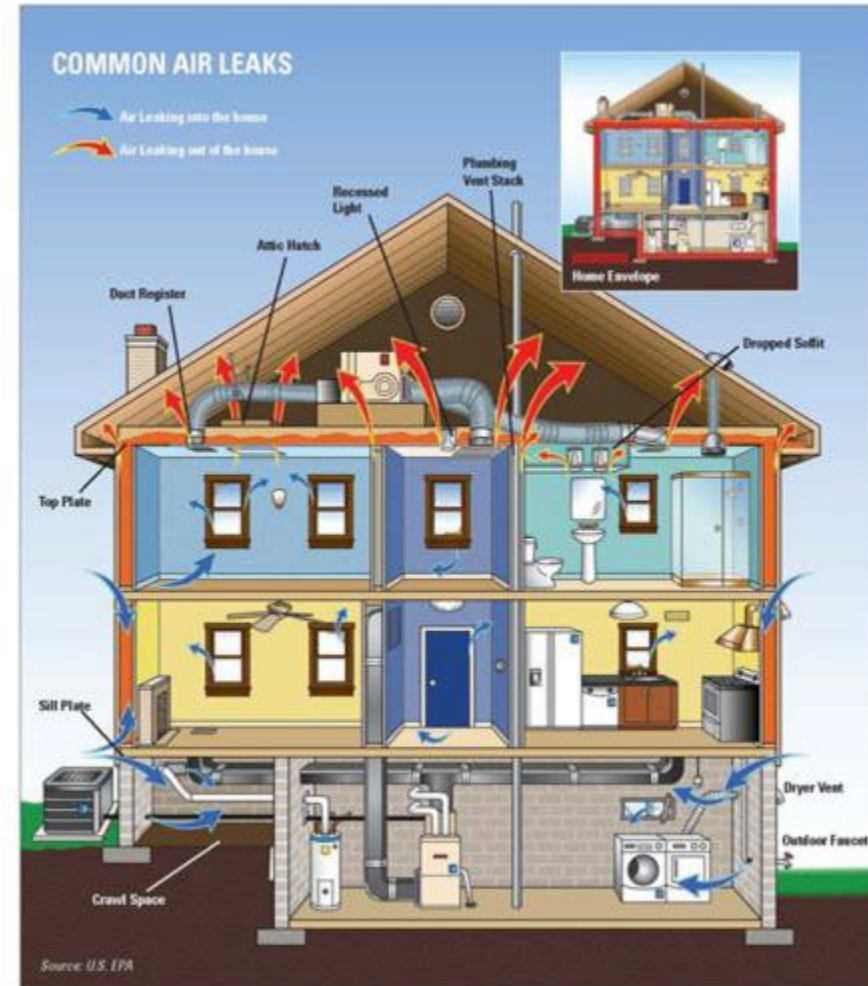


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Air Leakage **MUCH** More
Important now

- ▶ Seal all joints, penetrations and other such openings in the building envelope
- ▶ **MUST TEST ALL HOMES!!**
- ▶ **Whole-House Mechanical Ventilation Required**
- ▶ **ASSURE Makeup Air Provided!**

**2024 - Verification Testing
for Ventilation - like Duct
test**





Why - Better Durability



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Why - Fewer Callbacks



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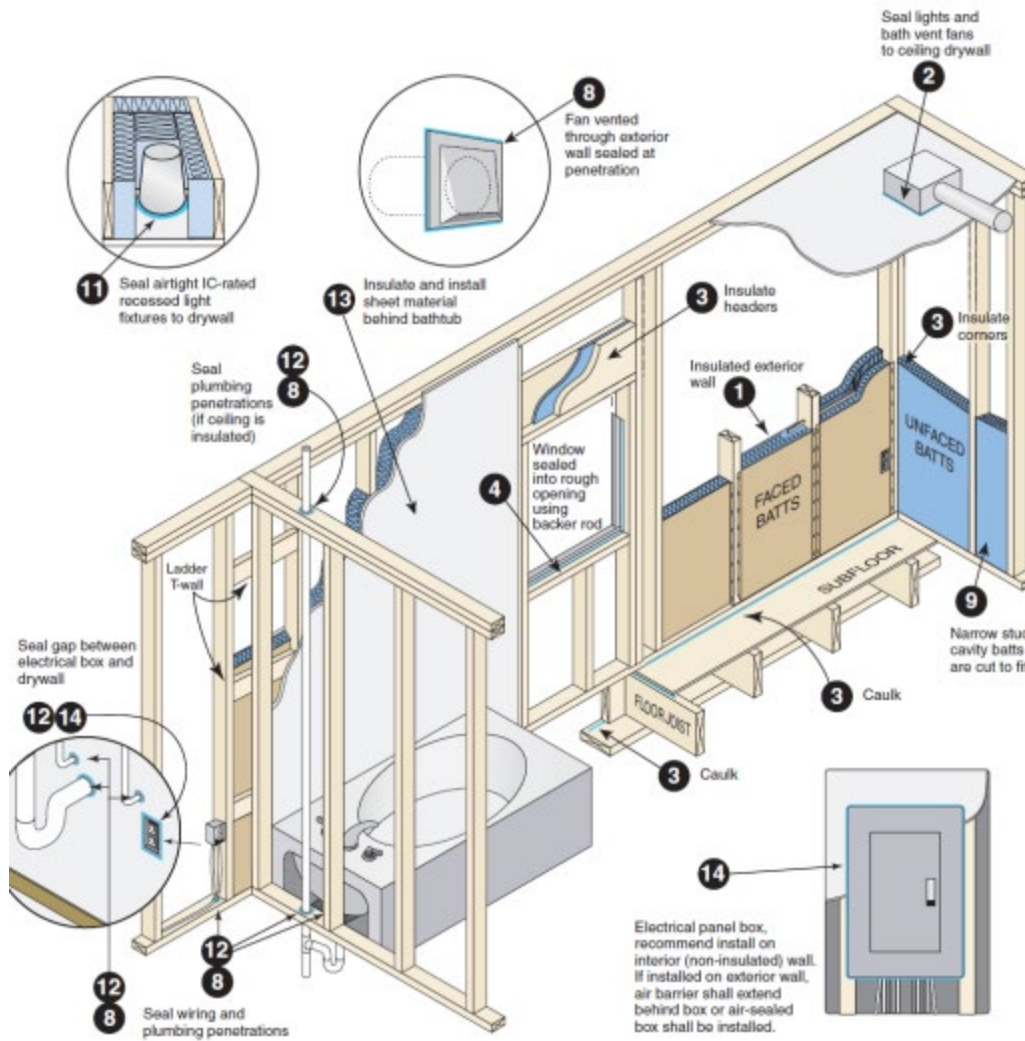




Air-Sealing Techniques



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#2 - Visual Inspection **Too!!! BUT No Time...**

Table 402.4.1.1



TABLE R402.4.1.1
AIR BARRIER AND INSULATION INSTALLATION^a

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
General requirements	<p>A continuous <i>air barrier</i> shall be installed in the building envelope.</p> <p>The exterior thermal envelope contains a continuous <i>air barrier</i>.</p> <p>Breaks or joints in the air barrier shall be sealed.</p>	<p>Air-permeable insulation shall not be used as a sealing material.</p>
Ceiling/attic	<p>The <i>air barrier</i> in any dropped ceiling or soffit shall be aligned with the insulation and any gaps in the <i>air barrier</i> shall be sealed.</p> <p>Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.</p>	<p>The insulation in any dropped ceiling/soffit shall be aligned with the <i>air barrier</i>.</p>
Walls	<p>The junction of the foundation and sill plate shall be sealed.</p> <p>The junction of the top plate and the top of <i>exterior walls</i> shall be sealed.</p> <p>Knee walls shall be sealed.</p>	<p>Cavities within corners and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance, <i>R-value</i>, of not less than R-3 per inch.</p> <p>Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the <i>air barrier</i>.</p>



Visual Inspection Checklist - Builder Punchlist?



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Residential Air Leakage and Insulation Installation Checklist

ECCCNYS-2020
Table 402.4.1.1

Date: _____ Name of Evaluator(s): _____

Building Name & Address: _____ Conditioned Floor Area: _____ ft²

Building Contact: Name: _____ Phone: _____ Email: _____

Compliance Approach: Prescriptive (402.1.2 or 402.1.3) UA Trade-off (402.1.4) Building Performance (405) REScheck ERI Method (R406)

State: _____ Jurisdiction: _____

Building Type: 1- and 2-Family, Detached: Single Family Modular Townhouse

Multifamily: Apartment Condominium

Project Type: New Construction Addition to existing building Existing building renovation

COMPONENT	CRITERIA ^a	PLAN REVIEW			SITE INSPECTION		
		Y	N	N/A	Y	N	N/A
1. Air barrier and thermal barrier	A continuous air barrier shall be installed in the building envelope.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Exterior thermal envelope contains a continuous air barrier.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Breaks or joints in the air barrier shall be sealed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Air-permeable insulation shall not be used as a sealing material.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Ceiling/attic	The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier sealed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Access openings, drop down stair or knee wall doors to unconditioned attic spaces shall be sealed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Walls	Corners and headers shall be insulated and the junction of the foundation and sill plate shall be sealed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	The junction of the top plate and top of exterior walls shall be sealed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Knee walls shall be sealed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Windows, skylights and doors	The space between window/door jambs and framing, and skylights and framing, shall be sealed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Rim joists	Rim joists shall be insulated and include the air barrier.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Floors	Insulation shall be installed to maintain permanent contact with underside of						



Check Your Knowledge... #3



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True or False

In addition to requiring the Blower Door test on all new homes, the Energy Code also requires that the CEO conduct a Visual Inspection to Table 4.2.4.1.1, “Air Leakage and insulation Inspection...”



Check Your Knowledge... #3



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True or False

In addition to requiring the Blower Door test on all new homes, the Energy Code also requires that the CEO conduct a Visual Inspection to Table 4.2.4.1.1, “Air Leakage and insulation Inspection...”

Answer - TRUE



#3 - Duct System Sealing & Testing



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Misunderstood
Code
Requirement





403.3.3 Duct Tightness Testing Mandatory - IF ducts Outside Envelope

EITHER at Rough-in OR Final (Post Construction)
MUST Include Air Handler Tested to ASHRAE 193 Mfr designated on label)

Duct Tightness Thresholds (Prescriptive):

When testing at rough-in stage with no air handler installed

Maximum 3 cfm per 100 s.f. - Total Leakage

Testing at rough-in stage w/ air handler

Maximum 4 cfm per 100 s.f. - Total Leakage
(RIT Rough-In Total Leakage)

When testing at final (Post Construction)

Maximum 4 cfm per 100 s.f. - "Total Leakage"
(PCT Post-Construction Total Leakage)



402.4.1.1

**ECCCNYS-2020:
Blower Door and Duct Leakage test results must be displayed on Certificate!**



But First - Gimme A Break!



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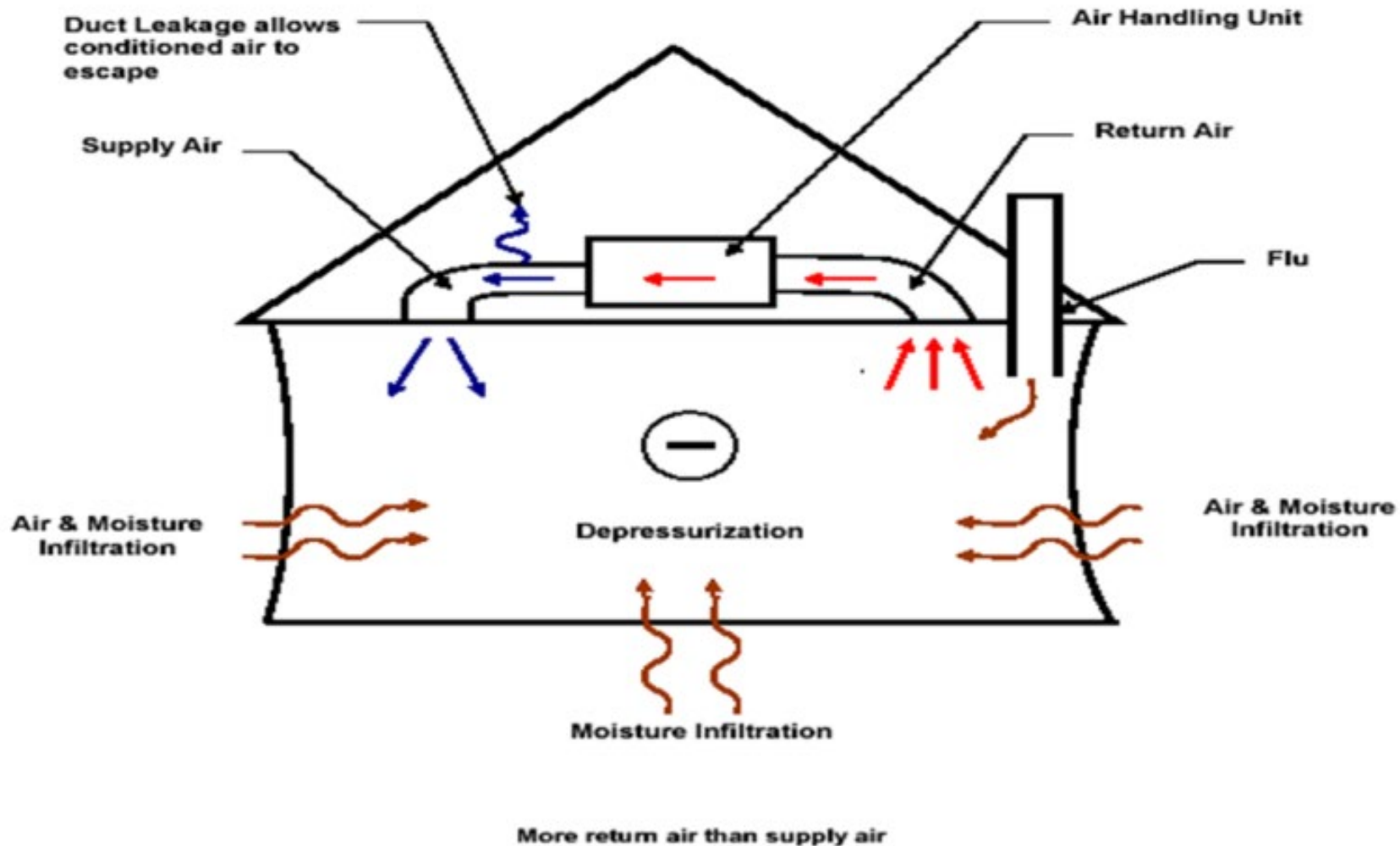


Duct Leakage: Building Pressure Issues



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Supply Side Leakage



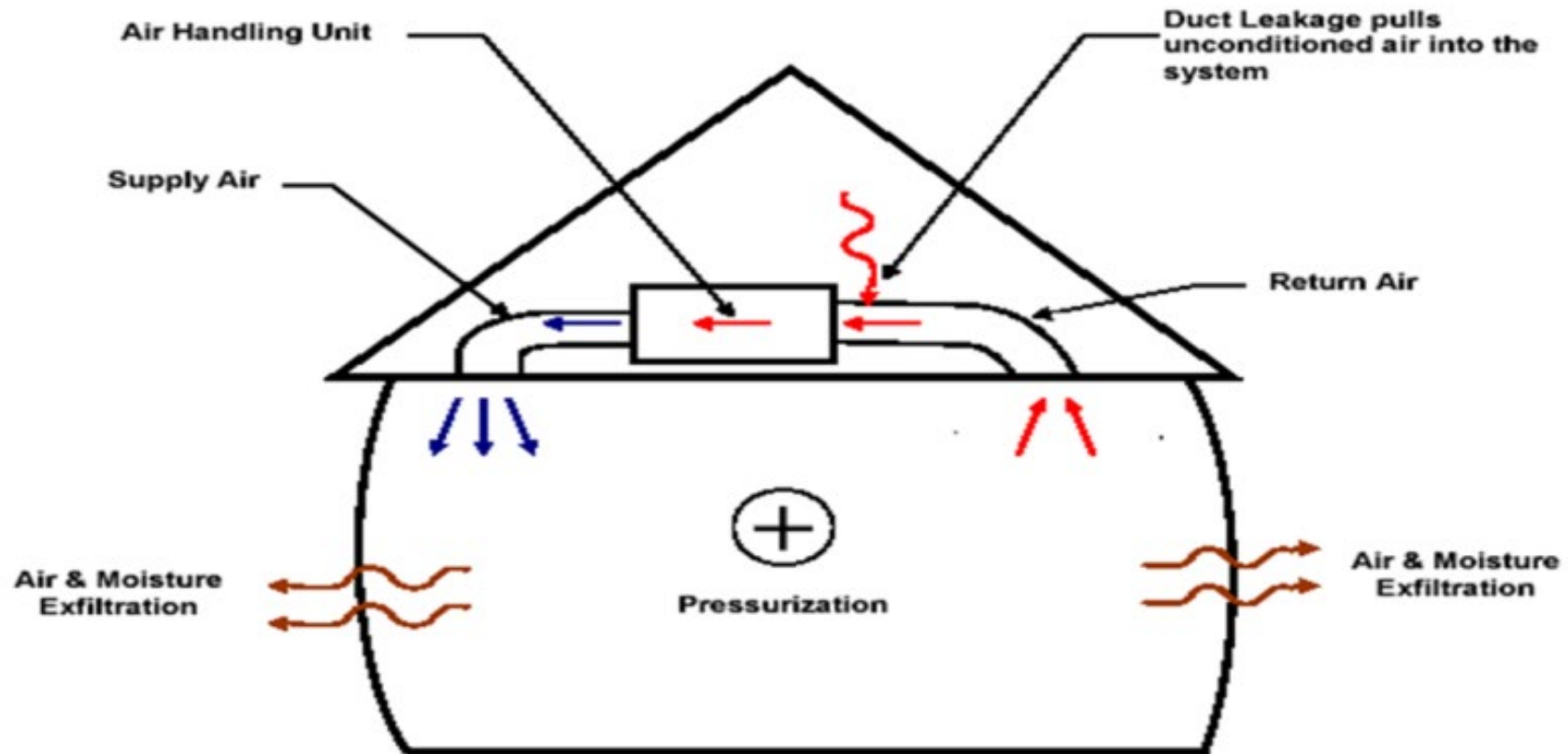


Duct Leakage & Building Pressures



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Return Side Leakage



More supply air than return air

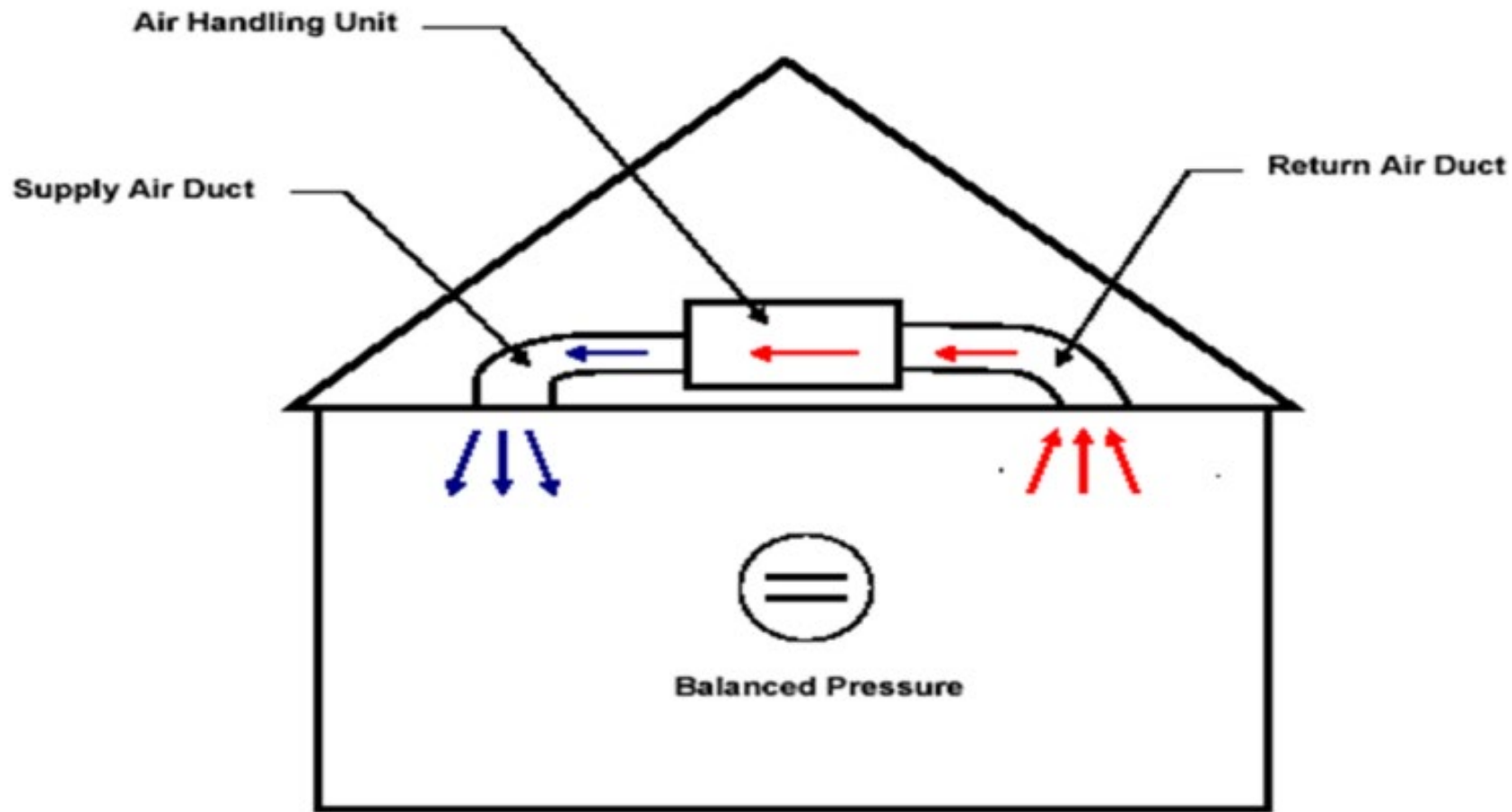


Duct Leakage & Building Pressures



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Balanced System





Example - Backdrafting

Excessive Negative Pressures in area of DHW, Furnace, Fireplace may cause those appliances to backdraft - potential CO poisoning!!



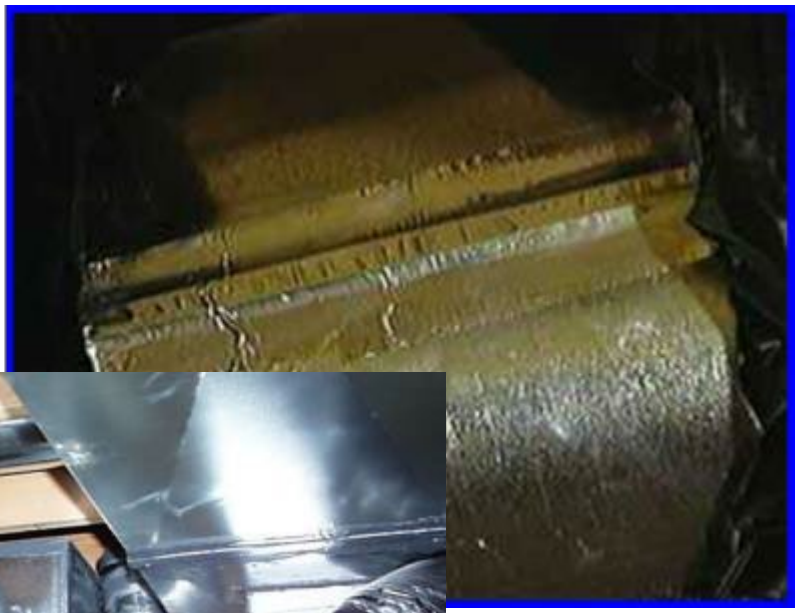
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The Good...



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The Bad... & UGLY



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MANY

What is

Heat Loss/Gain?

The diagram shows a person sitting at a desk, pointing towards a window. A yellow sun is visible through the window. Two red arrows originate from the sun: one points left towards the person, and the other points down towards the desk. This illustrates heat gain from the sun entering the room.



Check Your Knowledge... #3



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Duct Sealing: (pick all that apply)

- Can prevent backdrafting of gas appliances
- Is a requirement of the RCNYS as well as The NY Energy Code
- Is only required in renovation projects
- Isn't a necessary requirement



Check Your Knowledge... #3



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Duct Sealing: (pick all that apply)

- **Can prevent backdrafting of gas appliances**
- **Is a requirement of the RCNYS as well as The NY Energy Code**
- Is only required in renovation projects
- Isn't a necessary requirement



Duct Sealing



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Remember
This...??



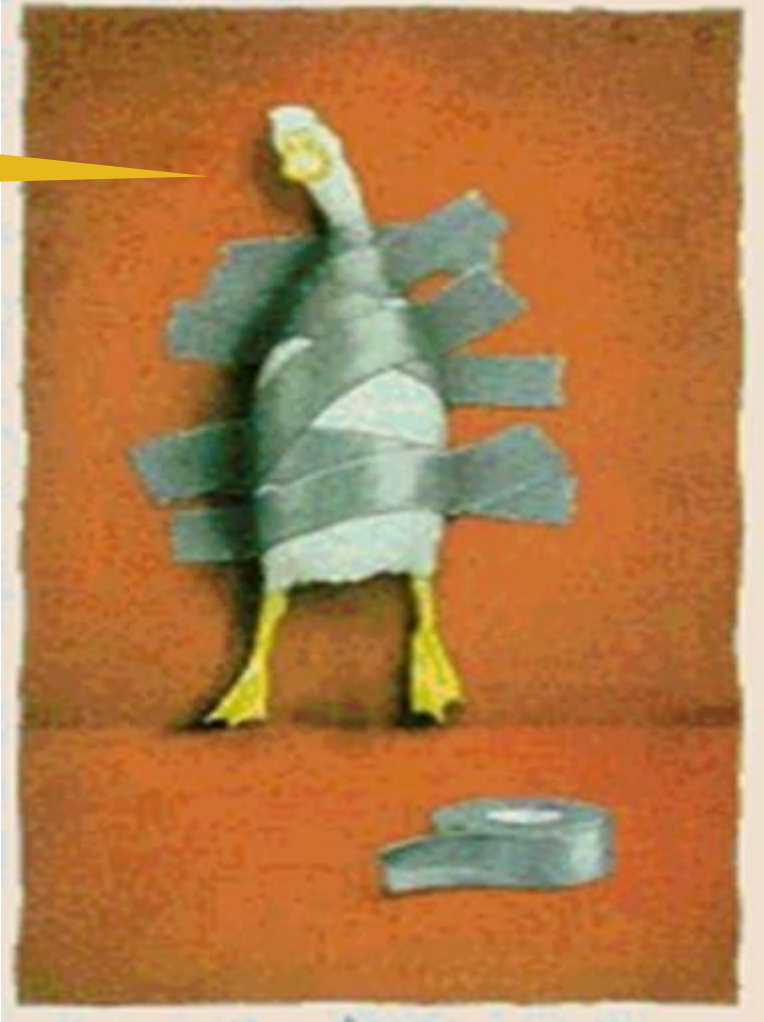


Testing Duct Leaks - Tapes



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Don't use
regular duck
tape!





Check Your Knowledge... #4



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What Energy Code requirement has proven to mitigate many of the CO calls that are a major health concern? Pick All That Apply...

- Insulation levels
- Manual J & S Calculations
- Duct Sealing and testing
- Foundation Insulation



Check Your Knowledge... #4



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What Energy Code requirement has proven to mitigate many of the CO calls that are a major health concern?

- Insulation levels
- Manual J & S Calculations
- ***Duct Sealing and testing***
- Foundation Insulation



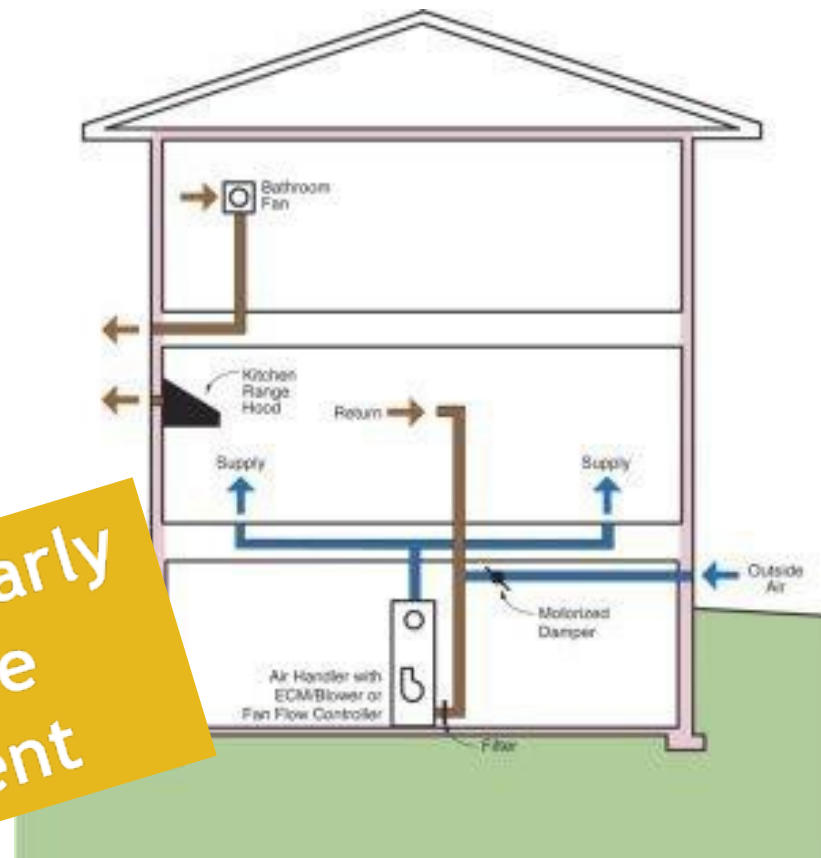
#4 - Equipment Sizing



A sizing calculation is required

- ACCA Manual J or other “approved”
- Manual S-Sizing
- Manual D Duct Design
- *Residential Code of New York (Section M1401.3)*

New, More Clearly Stated Code Requirement





New For 2020...Buried Ducts



Min. R-8 Insulated Duct
Min. R-19 buried above/below duct



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Sizing Heating Systems



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- ▶ Undersized
- ▶ Properly Sized
- ▶ Oversized

BIGGER is NOT BETTER!

#5 - Chapter 4 PRESCRIPTIVE Requirements



► IF Using Prescriptive - All Components of the Building Must Meet Strict Minimum Requirements

[NY] TABLE R402.1.2 INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT^a

CLIMATE ZONE	FENESTRATION U-FACTOR ^b	SKYLIGHT ^b U-FACTOR	GLAZED FENESTRATION SHGC ^{b, e}	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE ^f	FLOOR R-VALUE	BASEMENT ^c WALL R-VALUE	SLAB ^d R-VALUE & DEPTH	CRAWL SPACE ^c WALL R-VALUE
4	0.32	0.55	0.40	49	20 or 13+5 ^h	8/13	19	10 /13	10, 2 ft	10/13
5	0.30	0.55	NR	49	20 or 13+5 ^h	13/17	30 ^g	15/19	10, 2 ft	15/19
6 Option 1	0.30	0.55	NR	49	20+5 ^h or 13+10 ^h	15/20	30 ^g	15/19	10, 4 ft	15/19
6 Option 2	0.28	0.55	NR	60	23 cavity	19/21	30 ^g	15/19	10, 4 ft	15/19

NR = Not Required.

For SI: 1 foot = 304.8 mm.

a. R-values are minimums. U-factors and SHGC are maximums. Where insulation is installed in a cavity that is less than the label or design thickness of the insulation, the installed R-value of the insulation shall be not less than the R-value specified in the table.

b. The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.

c. "10/13" means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation on the interior of the basement wall. "15/19" means R-15 continuous insulation on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. Alternatively, compliance with "15/19" shall be R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the home.

► Rock Wool can ALSO use Option 2 Coming in '24..

4 except Marine	.30	0.55	0.40	60	20 + 5 or 13 + 10ci or 0 + 15	8/13	19	10ci or 13	10ci, 4 ft	10ci or 13
5 and Marine 4	0.30 ⁱ	0.55	0.40	60	20 + 5 or 13 + 10ci or 0 + 15	13/17	30	15ci or 19 or 13 + 5ci	10ci, 4 ft	15ci or 19 or 13 + 5ci
6	0.30 ⁱ	0.55	NR	60	20 + 5ci or 13 + 10ci or 0 + 20	15/20	30	15ci or 19 or 13 + 5ci	10ci, 4 ft	15ci or 19 or 13 + 5ci



#5 - Chapter 4 Proposed 2024 IECC

4 except Marine	5 and Marine 4	6
0.30	0.30 0.28 ^h	0.30 0.28 ^h
0.55	0.53 0.50	0.55 0.50
0.40	0.40 NR	NR
60	49	60
30 or 20&5ci or 13&10ci or 0&20ci	30 or 20&5ci or 13&10ci or 0&20ci	30 or 20&5ci or 13&10ci or 0&20ci
8/13	13/17	15/20
19 or 13+5ci or 15ci	30 or 19+7.5ci or 20ci	30 or 19+7.5ci or 20ci
10ci or 13	15ci or 19 or 13&5ci	15ci or 19 or 13&5ci
10ci, 3 4 ft	10ci, 3 4 ft	10ci, 4 ft
R10ci, 3 ft and R-5 full slab	R10ci, 3 ft and R-5 full slab	R10ci, 4 ft and R-5 full slab

#5 - OPTION for Prescriptive - And High Performance



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IF Using Prescriptive - All Components of the Building Must Meet Strict Minimum Requirements

- ▶ High Density Foam to R-23 in Cavity
- ▶ Higher Performance Windows- U-.28
- ▶ R-60 in Ceiling
- ▶ Maybe Higher Performance FG, Slag Wools PLUS Lower Thickness Exterior Insulated Sheathing?
 - ▶ Check with NYS-DOS, Local Code Official
- ▶ With the 2018 IECC Adoption
 - ▶ R-23 option in CZ 6, to enable slag wool use as higher-performance; R-60 Roof, U-.28 windows

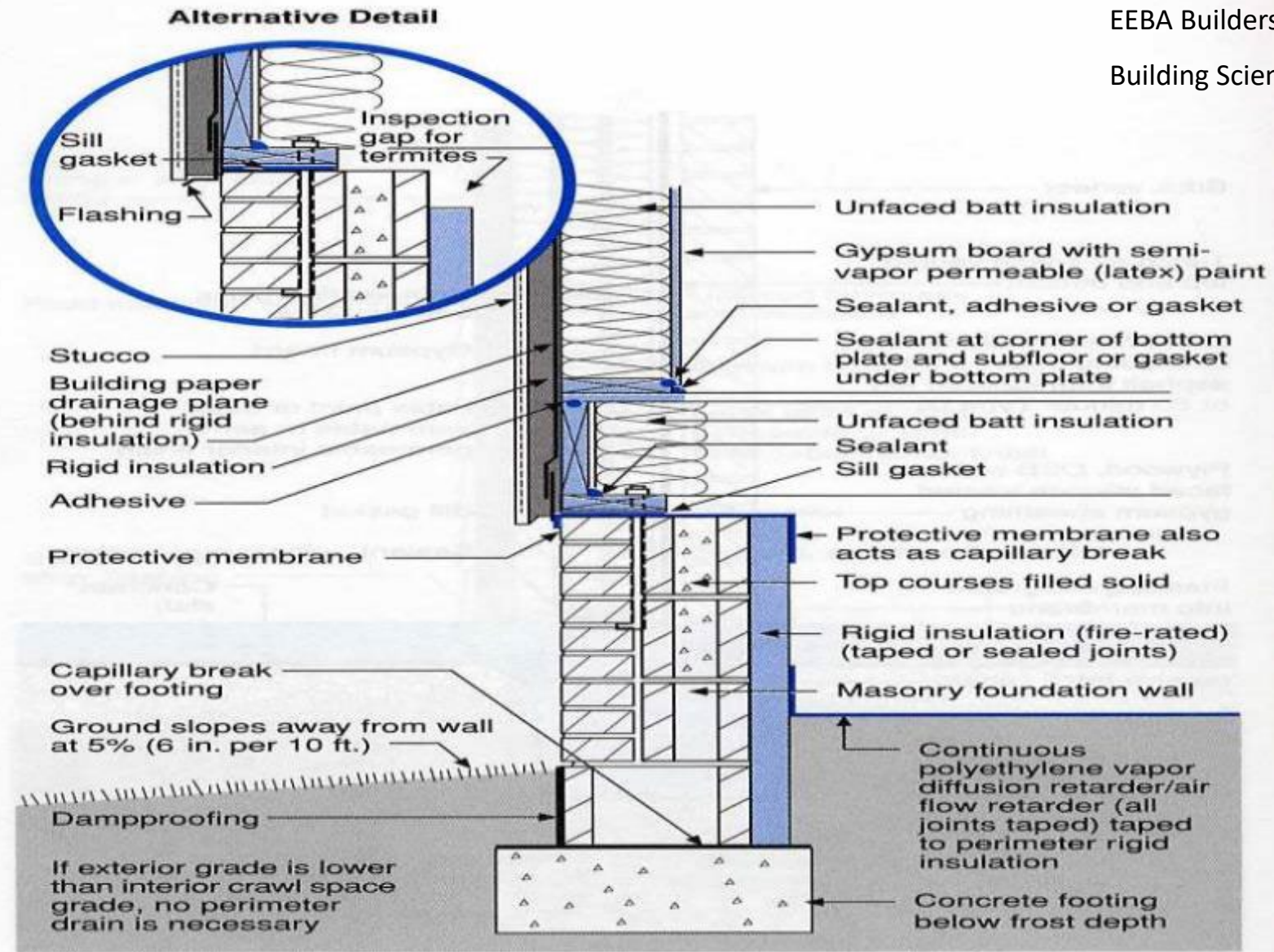
NOT Sure if this will be an out in 2024



Is This a Good Idea?



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6 - REScheck™ Software Still works!



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NY Version WILL BE available, useable Self-contained

Includes all references and Mandatory,
Prescriptive requirements

NO Equipment Tradeoff, Window Area

Little Impact

USE 2018 IECC in REScheck for NYS





6 - REScheck™ & BECP Website



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Building Energy Codes Program Building Energy Codes [SEARCH](#)

[HOME](#) [EVENTS](#) [ABOUT](#)

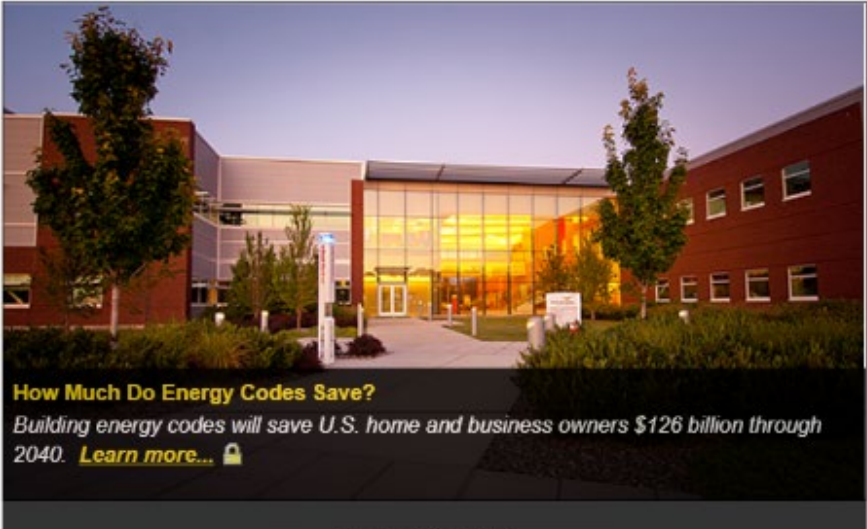
[U.S. Department of Energy](#) » [Energy Efficiency and Renewable Energy](#) » [Building Technologies Office](#) » [BECP Home](#) [Site Map](#) [Printable Version](#) [SHARE](#)

DEVELOPMENT

ADOPTION

COMPLIANCE

RESOURCE CENTER



How Much Do Energy Codes Save?
Building energy codes will save U.S. home and business owners \$126 billion through 2040. [Learn more...](#)

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REScheck Compliance Certificate

New York State Energy Conservation Construction Code

REScheck Software Version 3.5 Release 1

Data filename: D:\Program Files\Check\REScheck\ny example 1.rck

COUNTY: Albany

STATE: New York

HDD: 6894

CONSTRUCTION TYPE: Detached 1 or 2 Family

HEATING TYPE: Non-Electric

DATE: 12/20/02

COMPLIANCE: Passes

Maximum UA = 401

Your Home UA = 390

2.7% Better Than Code (UA)

Permit Number

Checked By/Date

**Compliance
Certificate**

	<u>Gross Area or Perimeter</u>	<u>Cavity R-Value</u>	<u>Cont. R-Value</u>	<u>Glazing or Door U-Factor</u>	<u>UA</u>
Ceiling 1: Flat Ceiling or Scissor Truss	1600	38.0	0.0		47
Skylight 1: Metal Frame with Thermal Break:Double Pane with Low-E	28			0.450	13



Check Your Knowledge... #5



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True or False

When reviewing REScheck™ software documentation for ECCCNY-2020 compliance, make sure the 2020 NY Energy Code is being used



Check Your Knowledge... #5



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True or False

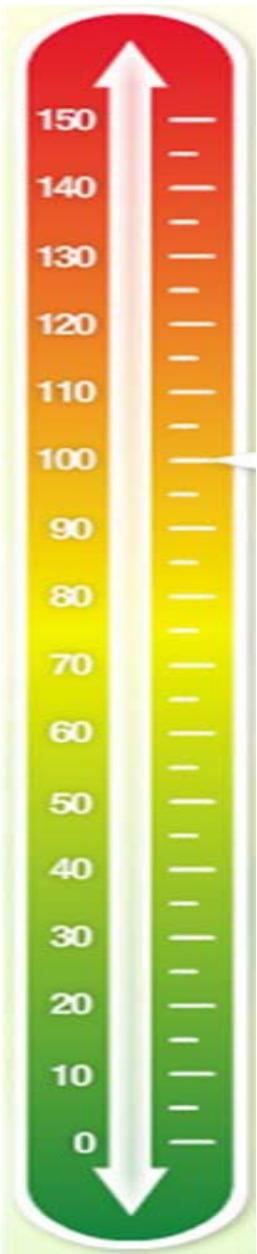
When reviewing REScheck™ software documentation for ECCCNYS-2020 compliance, make sure the 2018 IECC is being used

Answer - TRUE



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#7 - HERS-As-Codes/ERI/Performance Compliance Energy Rating Index with ECCCNY 2020 ERI Values Now LOWER



Most Flexible Performance Approach, Most Cost-Effective
 Many Homes at or near Energy Star
 MUST work with a Rater
 Get a Rater to help Demo Compliance
 Go to Energy Star for Recognition if so desired.

Climate Zone Z4	Climate Zone Z5	Climate Zone Z6
62	61	61

REM/Rate Sample Report



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2009 IECC ANNUAL ENERGY COST COMPLIANCE			
Date:	August 04, 2010	Rating No.:	
Building Name:	ACME House	Rating Org.:	Southface Energy Rated Homes
Owner's Name:	Mike Barcik	Phone No.:	
Property:	Willie E. Coyote Road	Rater's Name:	Diana Burk
Address:	Atlanta, GA 30308	Rater's No.:	
Builder's Name:		Rating Type:	Based On Plans
Weather Site:	Atlanta, GA	Rating Date:	7/16/10
File Name:	Burk_Plan2_CM_DB_CM_QAD.big		
Annual Energy Cost			
	2009 IECC	As Designed	
Heating:	530	514	
Cooling:	214	220	
Water Heating:	271	256	
Lights & Appliances:	555	555	
Photovoltaics:	-0	-0	
Service Charge:	120	120	
Total:	1689	1666 *	
Duct Insulation R-Value Check (per Section 405.2)			
Minimum Duct Insulation (Design must be higher):	6.0	8.0	
Window SHGC Check (per Section 402.5)			
Window SHGC Value (Design must be lower):	0.500	0.310	
Home Infiltration per Section 402.4.2:		PASSES	
Duct Leakage per Section 403.2.2:		PASSES	
This home MEETS the annual energy cost requirements in accordance with Section 405 of the 2009 International Energy Conservation Code based on a climate zone of 3A.			
Name:	Diana Burk	Signature:	
Organization:	Southface Energy Rated Homes	Date:	August 04, 2010
* Design energy cost is based on the following systems: ASHP: Htg: 70.1 kBtu/h, 7.7 HSPF, Ctg: 36.0 kBtu/h, 13.0 SEER. Water Heating: Conventional, Elec, 0.95 EF ASHP: Htg: 64.1 kBtu/h, 8.0 HSPF, Ctg: 30.0 kBtu/h, 13.0 SEER. Window-to-Floor Area Ratio: 0.15 Code default: Htg: 0.35 Ctg: 0.35 ACH/heat			
In accordance with IECC, building inputs, such as setpoints, infiltration rates, and window shading may have been			
REMRate - Residential Energy Analysis and Rating Software v12.83 This information does not constitute any warranty of energy cost or savings. © 1985-2010 Architectural Energy Corporation, Boulder, Colorado.			

Total annual energy costs
 Duct insulation
 Window U-factor and SHGC
 Envelope and duct testing
 Compared between Energy
 Code and actual home



#8 - 90% High-Efficiency Lighting

Bulbs, NOT Necessarily Fixtures
Can be met with CFLs or LEDs



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Lighting Changes – Coming – New Efficacy requirements and controls

- Increase efficacy value of high-efficacy lamps
 - **BETTER DEFINED**
 - 65 lumens per watt (90% of lighting)
 - 70 lumens per watt (100% of lighting)
- Interior Lighting Controls
 - Hard-wired Lighting **MUST** have Dimmer, Occupant Sensor in Bathrooms, Hallways, Exterior Lighting and Safety Lighting
- Exterior lighting in low-rise multifamily buildings must comply with IECC Section C405.4 Exterior Lighting Power Requirements (LPD, Lighting Power Densities, Watts/ft²)
- Exterior lighting controls
 - Manual On/Off switches with automatic shutoff
 - Photosensor controls
 - Timer switch
 - Automatic shutoff allowing override allows return to normal control within 24 hours





Check Your Knowledge... #7



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True Or False

Anyone can produce an Energy Rating Index report (ERI) showing compliance to the NY Energy Code.



Check Your Knowledge... #7



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True Or False

Anyone can produce an Energy Rating Index report (ERI) showing compliance to the NY Energy Code.

Answer – FALSE; ONLY a certified HERS/RESNET Rater can conduct an Emery Rating for a home



#9 - Existing Buildings Covered - Renovations, Additions, Alterations, Repairs



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**Existing Buildings
Additions
Alterations
Repairs!**

Make Sure Your Renovation Work COMPLIES!

***KEY For Residential, Commercial and Combination
Construction Types!
FEW Jurisdictions Enforce for Existing Buildings!***

#10 - Residential Ventilation - Required On All Homes



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- ▶ Whole-House Ventilation - Residential Code and Energy Code
- ▶ Exhaust-Only
- ▶ Supply Only
- ▶ Balanced
- ▶ HRV/ERV Qualifies, BUT May Not Need To Go That Far!
- ▶ NYS-DOS says Makeup Air Critical

Ventilation Testing Will Be Required Next Code!

- ▶ ***KEY For Residential - Health, Life, Safety, IAQ, Liability, Better More Comfortable Home!***



NYS Residential Code Ventilation Requirements...



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ECCCNYS-2020 requires Sec R403.6 & Table)

- Fans must be energy efficient
- Whole-house mechanical ventilation system

RCNYS-2020 - Sec. 1505 & Tables

- Whole-house mechanical ventilation system
- CAN be exhaust-only, supply-only, or balanced
- *IMPLIED that makeup air be supplied*
- Bath Fans CAN be part of the system for exhaust
- Must have automatic control with accessible shutoff
- Can be operated full time or intermittently



NYS Residential Code Ventilation Requirements...



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Whole-house mechanical ventilation system

“An exhaust system, supply system, or combination thereof that is designed to mechanically exchange indoor air for **outdoor air** where operating continuously or through a programmed intermittent schedule to satisfy the whole-house ventilation rate.”

FIRST implication that makeup needed – “exchange indoor air for outdoor...”



ASHRAE 62.2 - Whole Building EXHAUST



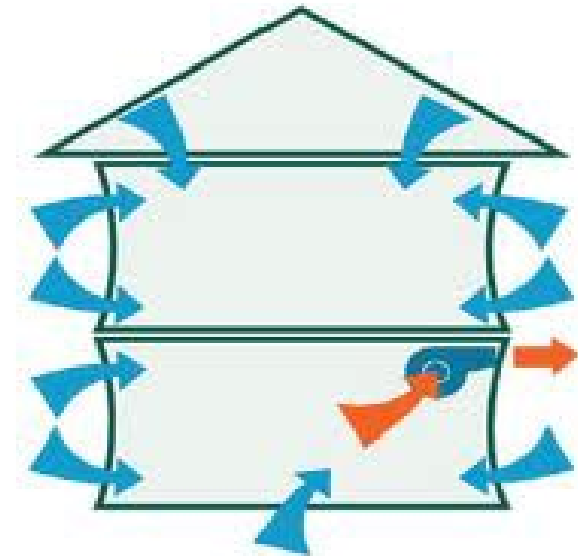
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Typical Solution

Continuous bathroom exhaust fans run at low speed or higher speed exhaust fan with intermittent control

Advantages

- Typically, the most 'cost-effective' solution
- Can be designed to handle local bathroom exhaust and whole house needs with the same equipment
- Can provide drying potential in cold climates



Effect on the House

- Negative indoor pressure draws exterior air into space by infiltration



ASHRAE 62.2 - Whole Building SUPPLY



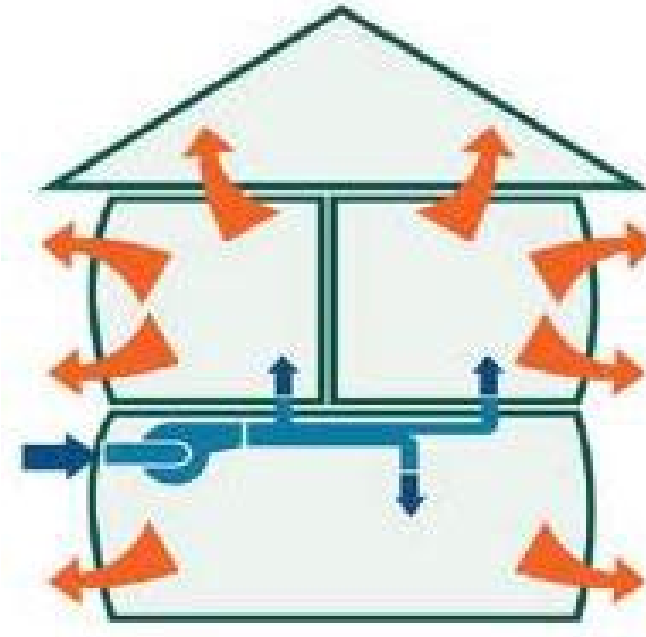
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Typical Solution

Powered Supply Fan with Motorized damper, with intermittent open/close cycle attached to HVAC Return

Advantages

- Simple- but can be involved install
- Fresh air comes from a known location; can be filtered, heated, cooled, dehumidified
- Can reduce introduction of moisture into wall cavities in hot, humid climates
- Decreases chances for combustion appliance spillage



Effect on the House

- Positive indoor pressure pushes interior air outside by exfiltration



ASHRAE 62.2 - Whole Building B

Typical Solution

HRV/ERV stand-alone unit, or attached to HVAC.

Advantages

- House stays in balance
- Opportunity for heat and moisture (energy) recovery may make up for increased cost of HRV/ERV
- Remote mounted unit is quieter
- Fresh air comes from a known location; can be filtered, heated, cooled, dehumidified
- Ideal solution for high IAQ/IEQ environments, but be conscious of costs to operate AHU fan to distribute air.



Effect on the House

- Balanced airflow between interior and exterior
- Homeowner education required to ensure they understand, operate and maintain the system



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N1103.6.2 Mechanical Testing & Verification - Coming NEXT Update - 2024 I-Codes



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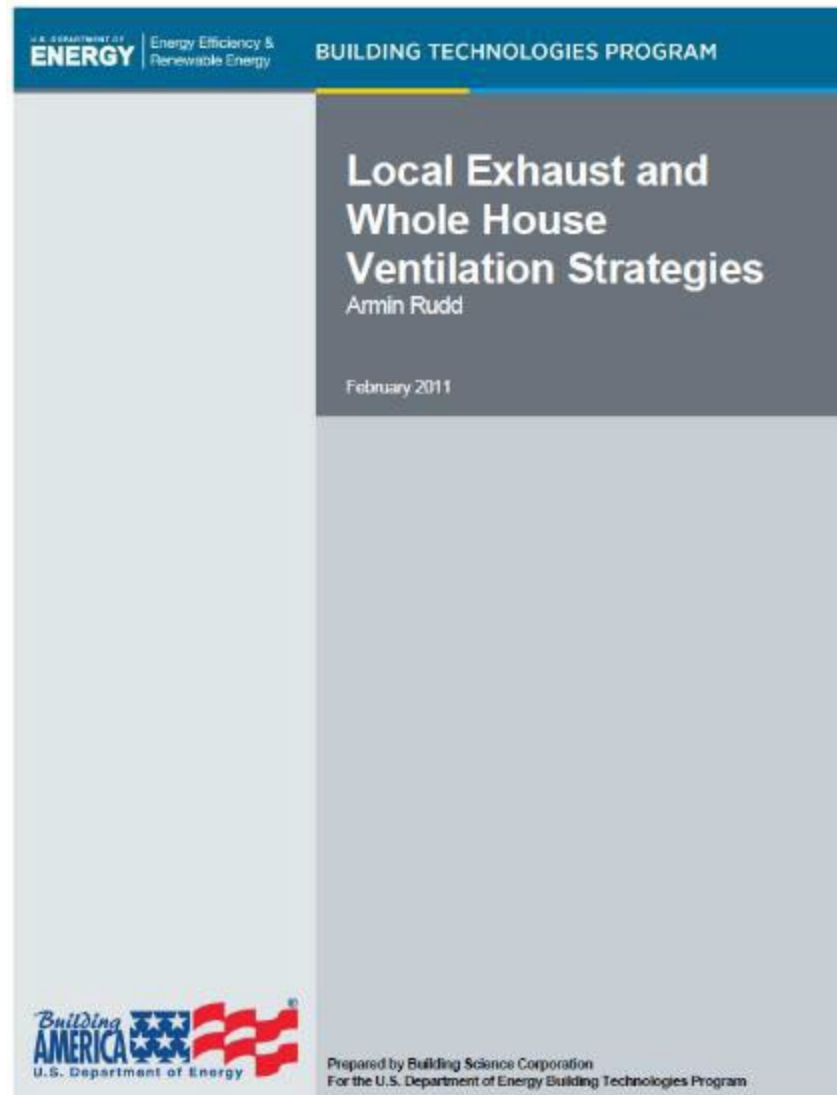
Source: https://buildingsfieldtest.nrel.gov/flow_hood



Local Exhaust and Whole House Ventilation Strategies



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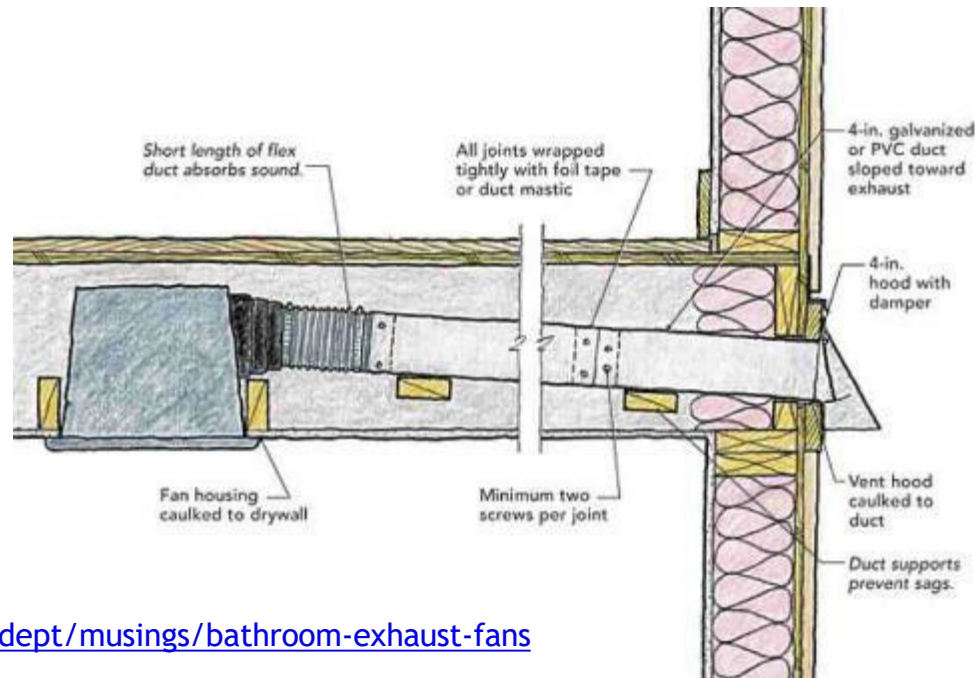
Source: <https://basc.pnnl.gov/sites/default/files/resource/A%20Rudd%20BSC%20Ventilation%20Report%202-10-2011.pdf>

Mechanical Ventilation

Exhaust-Only Ventilation

Types of exhaust ventilation systems

- Single-point
- Multi-point from bathrooms
- Multi-point from bedrooms/common areas



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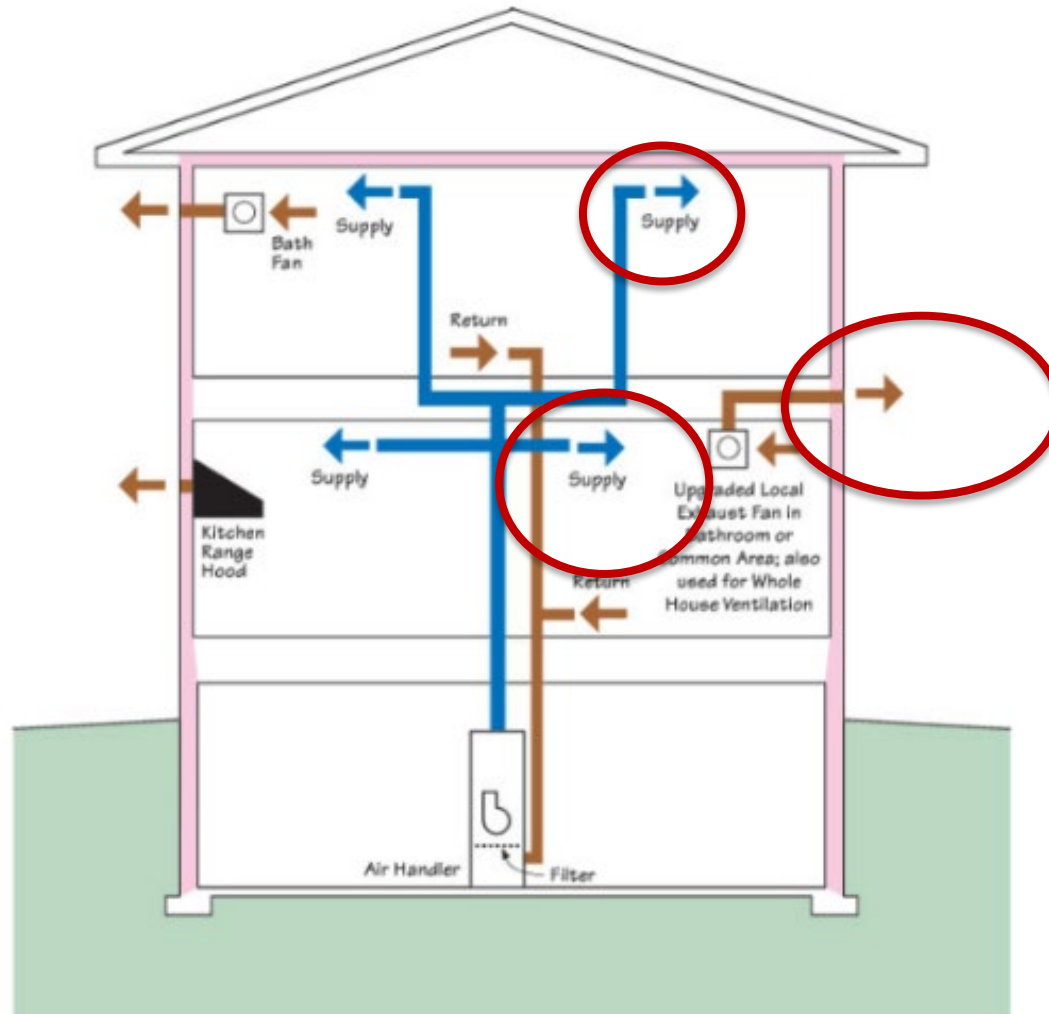


Mechanical Ventilation

Single-Point Exhaust Ventilation



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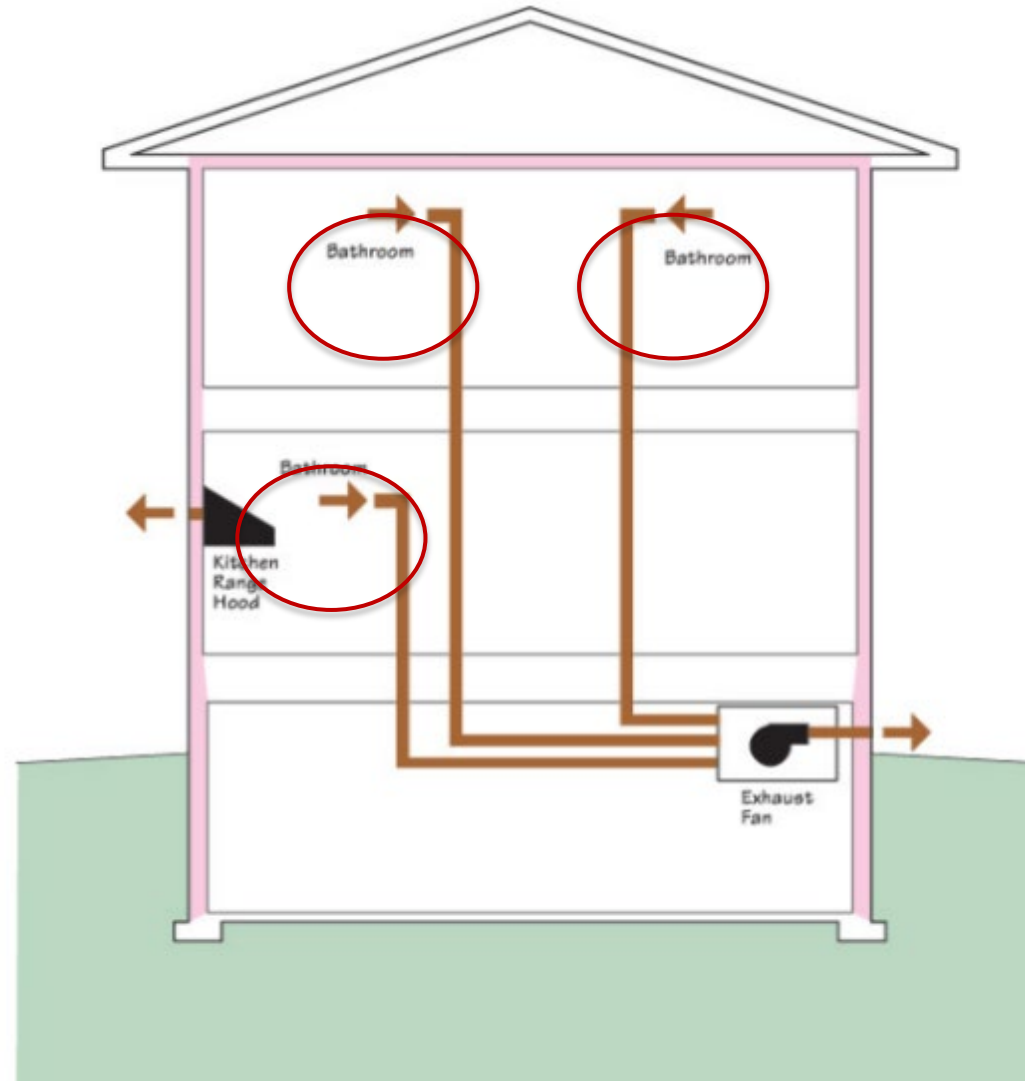


Mechanical Ventilation

Multi-point Exhaust Ventilation from bathrooms



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Source: <https://basc.pnnl.gov/sites/default/files/resource/A%20Rudd%20BSC%20Ventilation%20Report%202-10-2011.pdf>

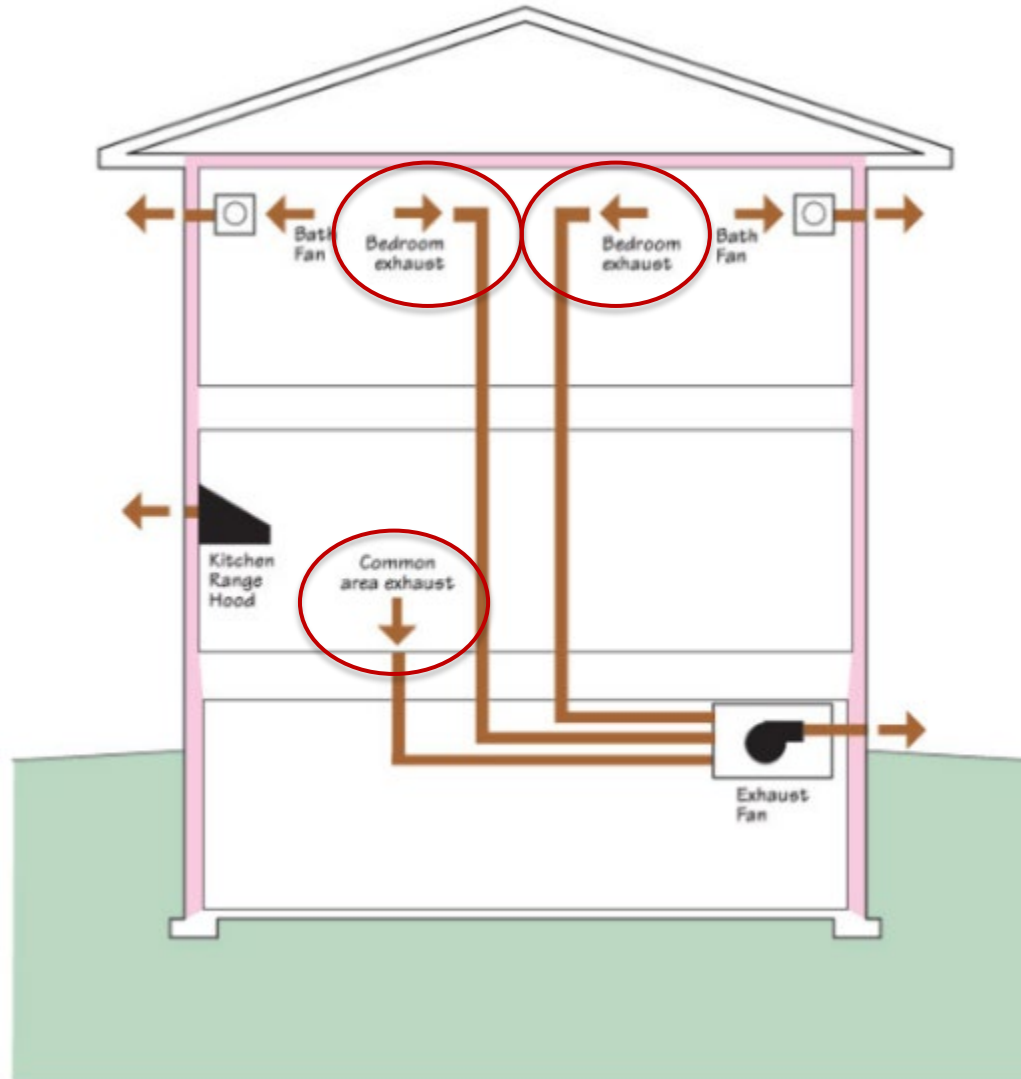


Mechanical Ventilation

Multi-point Exhaust Ventilation from bedrooms/common areas



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Source: <https://basc.pnnl.gov/sites/default/files/resource/A%20Rudd%20BSC%20Ventilation%20Report%202-10-2011.pdf>



Check Your Knowledge... #8



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Pick ALL Correct Answers:

A Whole House Ventilation system can be which of the following:

- Exhaust Only
- Makeup Air
- Supply Only
- Balanced



Check Your Knowledge... #8



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Pick ALL Correct Answers:

A Whole House Ventilation system can be which of the following:

- ***Exhaust Only***
- Makeup Air
- ***Supply Only***
- ***Balanced***

QUESTIONS?



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Technical Support



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- ▶ NYS - DOS
518.474.4073
www.dos.state.ny.us/code
- ▶ US-DOE
1-800-270-CODE
www.energycodes.gov

So...What Do We Do Next?



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- **LEAD** - Energy Code Compliance in YOUR Communities
- **SUPPORT YOUR First Responders and CODE OFFICIALS**
- **SUPPORT NFBOA, NYSBOC**
- **Remember Renovation Too**
- **Good Insulation Details!**
- **Build tight, Ventilate Right**

North Branch Services

Mike DeWein

President

518-369-7545

dewein53@gmail.com

- Training
- Air Barrier Audits
- Building Diagnostics
- Energy Plan Review: Inspection
- Thermal Imaging

**SUPPORT NYSBOC, NACEOA Fire
Officials!**



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Why I do this stuff!



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