

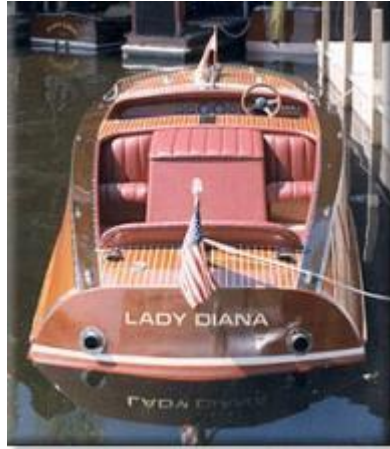


The Code, New and Green Technologies

**Monroe County Fire Marshalls and
Inspectors Conference
W. Webster, NY
T02-07-2841
August 2021**

Where I Come From...





Using less. Doing more.

USGBC – IAQ Cmte.
ICC – SEHPCAC
ASHRAE 189
IGCC



**NEW
ENERGY
STORE**

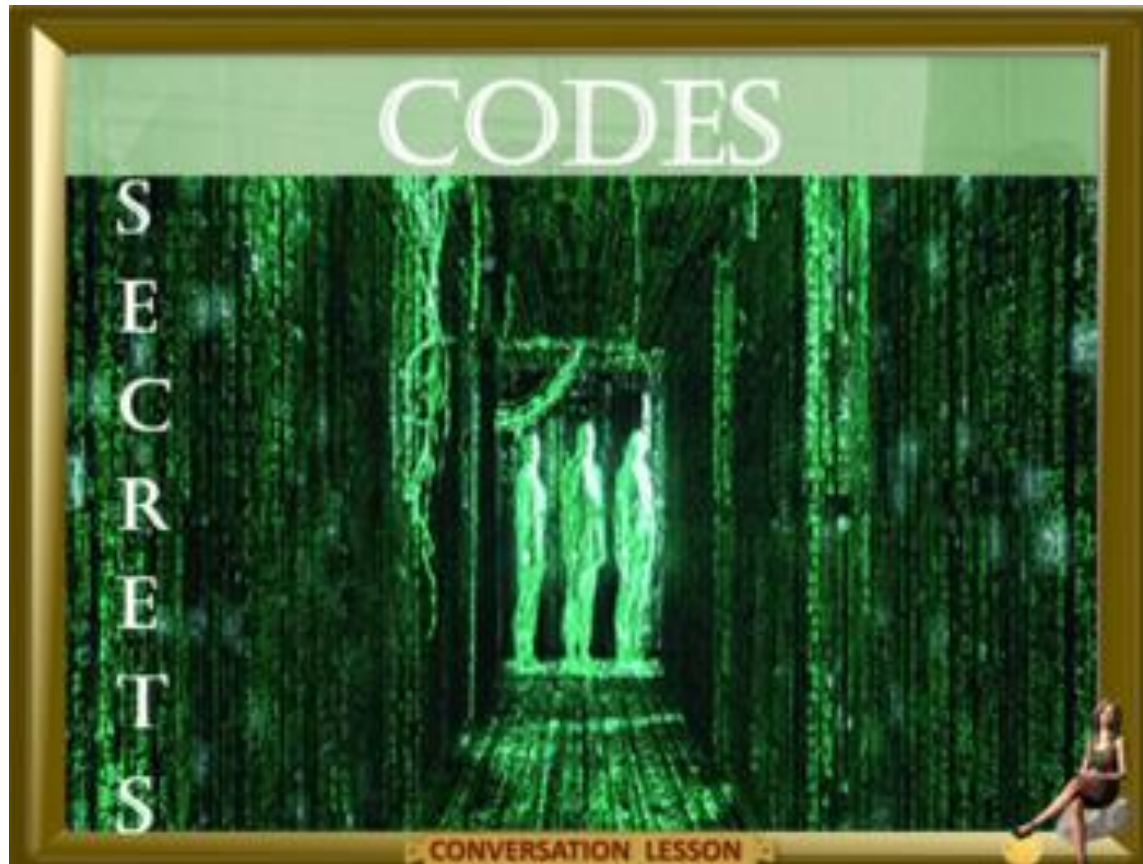
Most Importantly - Thank You All for Your Service!



Uh OH! DeWein's Gonna Try To
Turn Us Into A Bunch of Greenies!



Guess What?!
You Already Are!
CODES Are The ORIGINAL Green!



But Before We Start...

**Is the Energy Code a Life Health
Safety Code?**

Yes...

No...

Maybe

...

Anybody Identify This Horrific Fire?



Anybody Identify This Horrific Fire



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

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



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



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



Water Damage Assessment

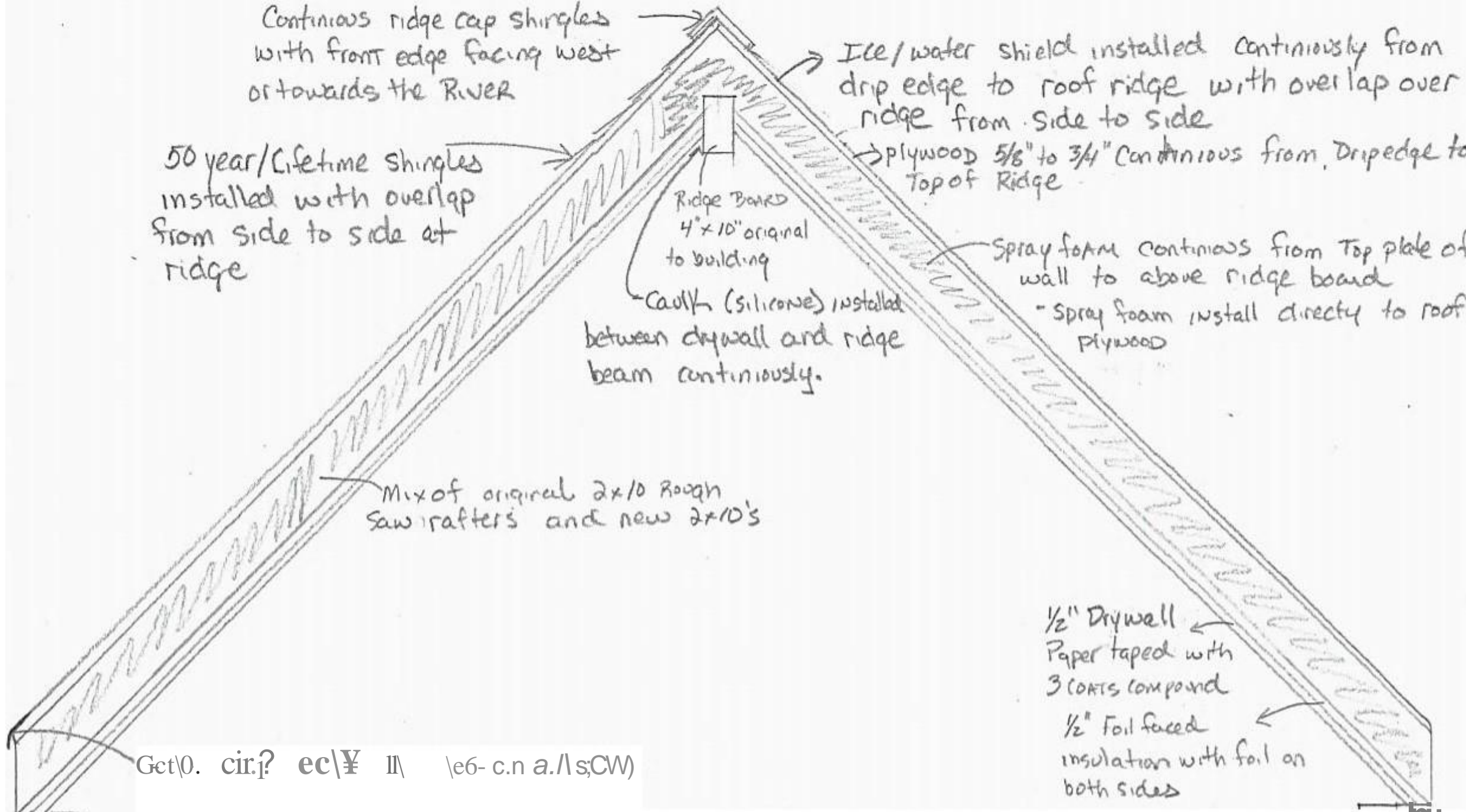


**Do We Think This Might Result in Structural Failure Too,
As Well As Mold/Rot?!**



Do We Think This Might Result in Structural Failure?!





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

ND ve11 1110 ll"lo /N'. 4

And This?!



And This?!

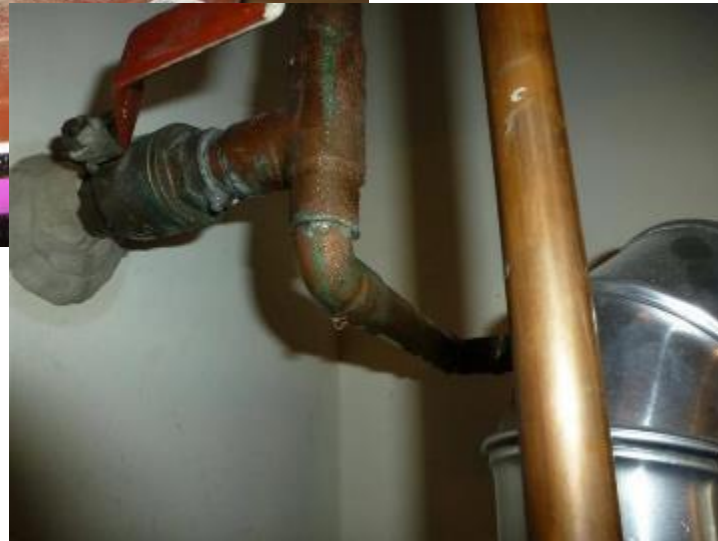


**...Unenforced/ Badly Detailed Energy Code Requirements!!!
– Second Highest Insurance Claim in NY**

And This?!



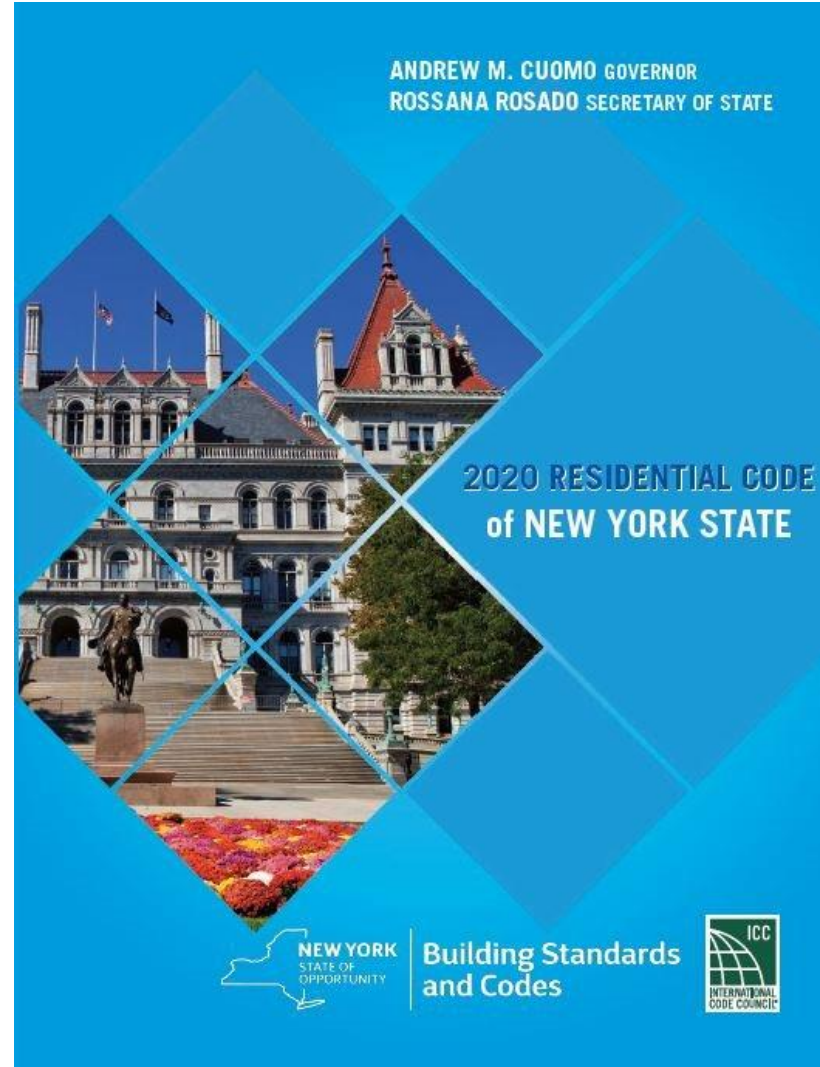
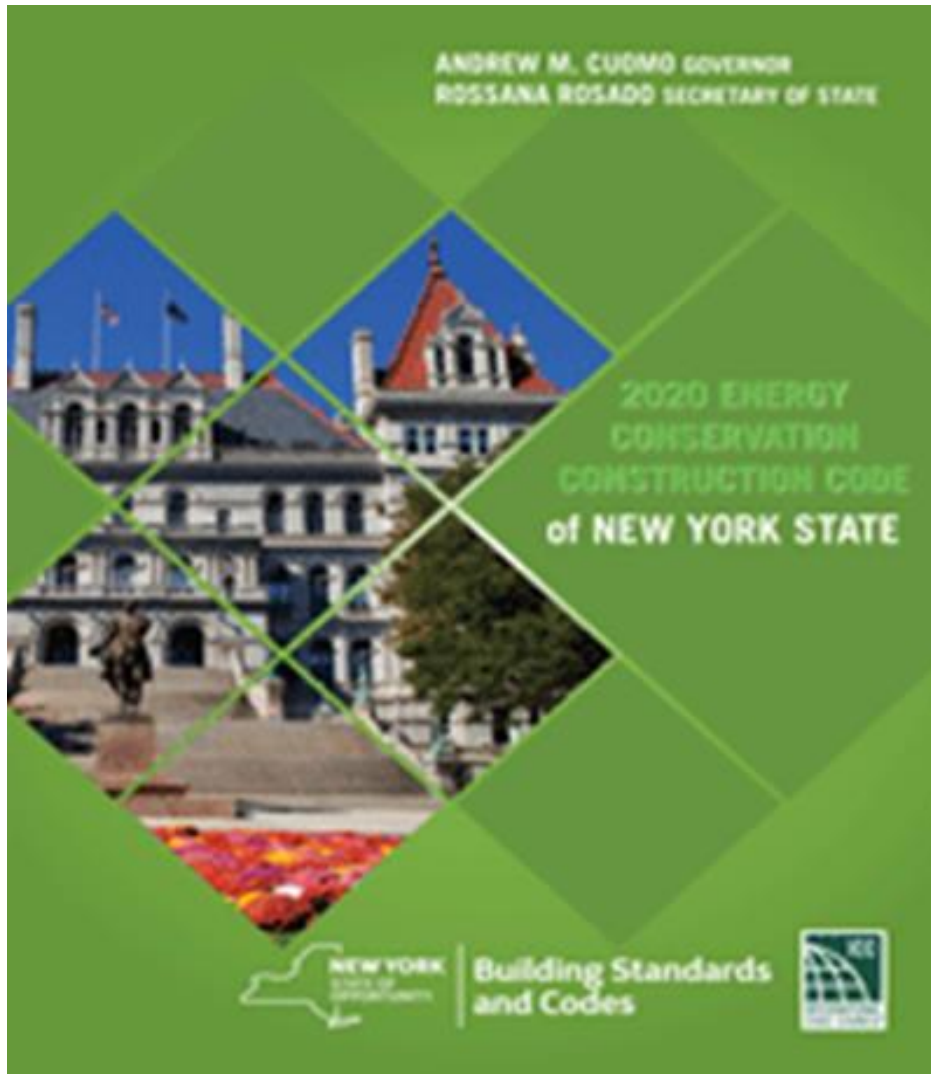
And This?!



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

New York State Codes

Currently – Based on 2018 I-Codes with NY Enhancements



Code Barriers & Mistakes - Real or Perceived?

- The Energy Code Requires a Poly Vapor Barrier
- My Code Official won't let me do advanced framing
- I can't build an unvented crawlspace in my town
- Are there ANY ventilation requirements in the Code?
- My HVAC Sub won't seal his ducts; isn't that a code requirement?
- I can't get my Builder to detail a proper Drainage Plane, plus he leaves it off the gable end!!
- Do I hafta vent a cathedral ceiling if it's filled with Polyurethane foam?

Meanwhile...



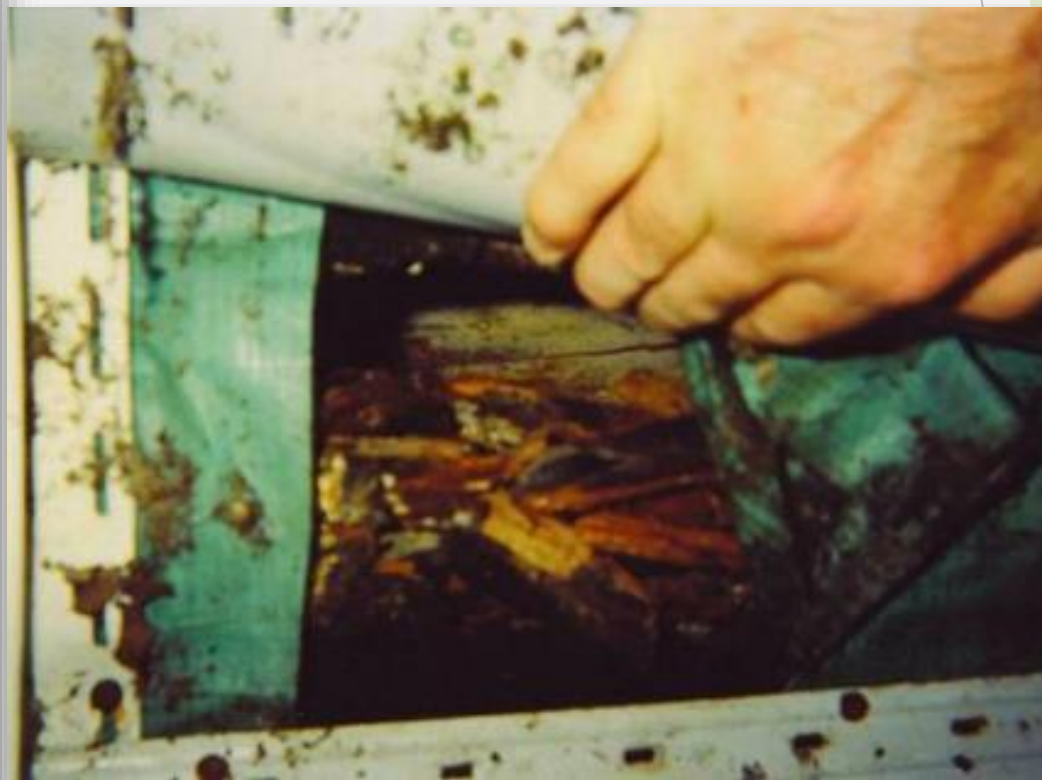
Improper Substitution



Mold and Moisture Damage



Mold and Moisture Damage



Meanwhile... Building Performance Programs Expand

Nationally:

US-DOE Building America – Building America Partners

Energy & Environmental Building Association

US-EPA Energy Star Homes

HUD – PATH

Building Performance Institute

Environments for Living

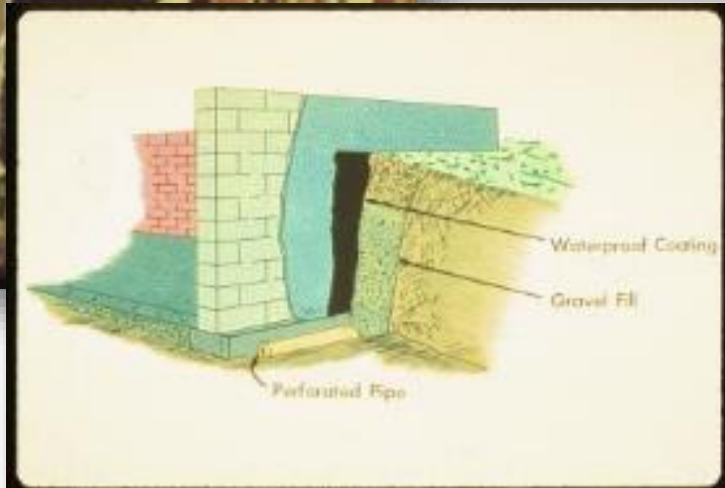
At the State Level:

Home Performance with Energy Star

State Energy Star Labeled Homes

...and so do the findings from the field

Some of the Requirements, “Barriers”



Vapor Retarders

Residential Code - Chapter 3

Residential Code - Section R702.7 “Moisture Vapor Retarder”

Removed from Energy

Intent of Code - Slow Water Vapor Migration by Diffusion
Type I a BAD idea wherever A/C used, especially Central

Vapor Retarders

Now in RCNYS - Chapter 7

ECCCNYS-2020 - Chapter 402.1.1, Referencing RCNYS-2020 R702.7 Vapor retarder required on winter warm side... I, II, or III

- Poly Probably a BAD Idea

| ZONE | CLASS III VAPOR RETARDERS PERMITTED FOR: |
|------|--|
| 5 | Vented cladding over OSB Vented cladding over Plywood Vented cladding over Fiberboard Vented cladding over Gypsum Insulated sheathing with R -value > 5 over 2 x 4 wall Insulated sheathing with R -value > 7.5 over 2 x 6 wall |
| 6 | Vented cladding over Fiberboard Vented cladding over Gypsum Insulated sheathing with R -value > 7.5 over 2 x 4 wall Insulated sheathing with R -value > 11.25 over 2 x 6 wall |

Exempt in Zone 4, MANY Improvements

Vapor Retarders

Example:
Poly Vapor Retarder
BE CAREFUL!!



- ▶ Example:
Kraft-Faced Vapor Retarder

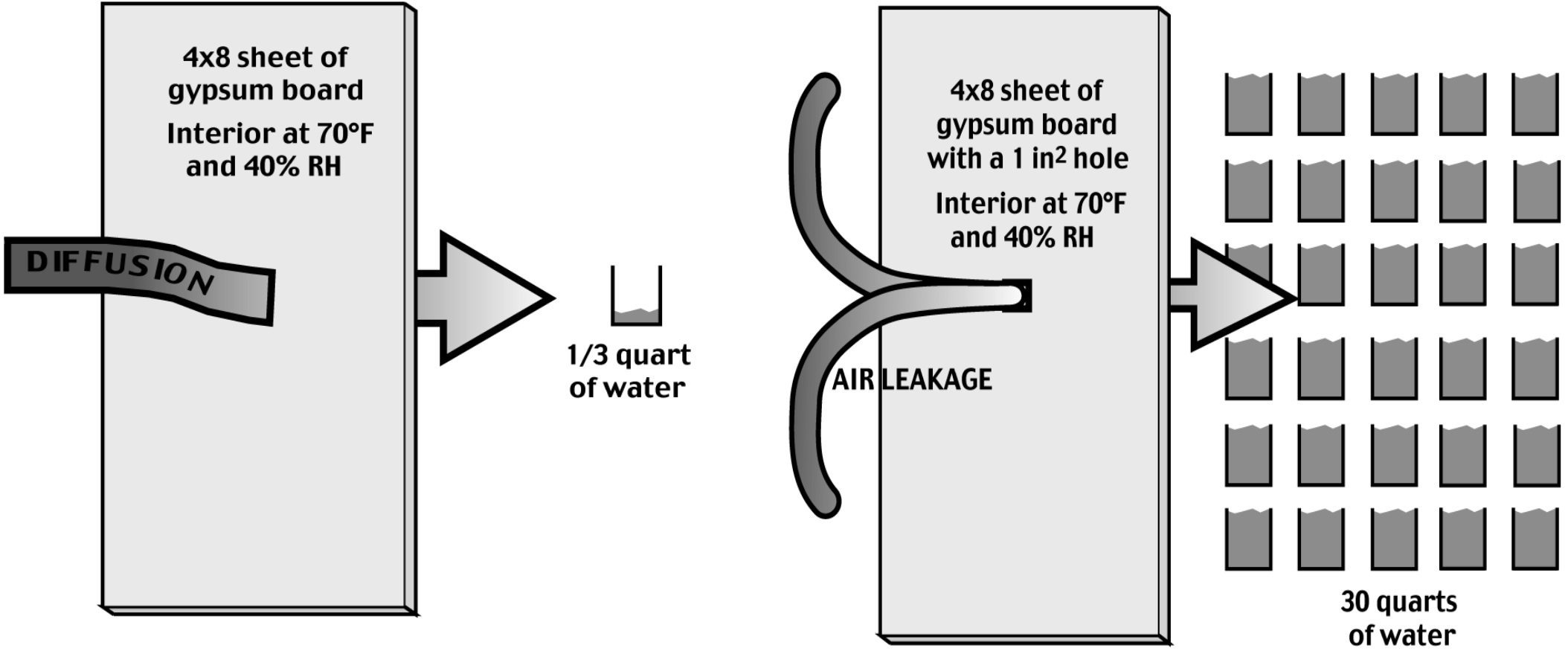
So, Why Is This and fixing The Codes a GREEN BUILDING Issue?



Physics - Second Law of Thermo- Dynamics States:

- Air Moves From *High* to *Low* Pressure.
- Heat Moves From *Warm* to *Cold*.
- Moisture Moves From *Warm* to *Cold* AND From *Wet* toward *Dry*.
- DeWein's Corollary - Stuff Rolls Down Hill!

Water Vapor Diffusion



Vapor Retarders

Best Practice

- Match the Wall Materials to Climatic and other Design conditions
- Do we want a Poly Vapor Retarder where we are both heating and cooling the house?
- Do we need a Vapor Retarder in Walls that are blown with Foam?
- What do we do for Wet Spray Cellulose in Walls WRT Vapor Retarder?
- Alternate (“Smart”) Vapor Retarders?

Representative Vapor Permeability Info

| Material | Dry Cup | Wet Cup | Comments |
|----------------------------------|---------|---------|---------------------------|
| Plywood | .75 | 3.5 | Semi-permeable |
| OSB | .75 | 2 | Semi- |
| Fiberboard (AI) | 14.5 | 15 | Permeable |
| Thermo Ply | 0.5 | 0.6 | impermeable |
| XPS | 1 | 1 | Semi (but with skin, im-) |
| EPS | 5 | 5 | Semi- |
| 6-mil poly | .06 | .06 | Impermeable |
| Kraft paper | 1 | >>1? | Semi- (variable) |
| MemBrain™ | 1 | 10+ | Variable, by design |
| Tyvek® | 14 | ? | permeable |
| Latex paint (primer + 1 coat) | 3.6 | 6 | Semi- |

Smart Vapor Retarders



Vaulted Ceilings and Venting (or not)

Energy - Chapter 4

Residential - Chapter 8

Energy Code - Chapter 4, Insulation Requirements ONLY

Residential Code - Chapter 806 “Ventilation Required”

- Ventilation Required in enclosed attics and rafter spaces
- Protected against rain, snow, and critters
- Minimum area 1/150 of roof area OR 1/300 if 80% is high
- Clearance at eaves, **BLOCK INSULATION ENDS**
- ALTERNATE is a Vapor Barrier of 1 Perm or less, Redux to 1/300 allowed
- RCNYS & ECCCNY NOW allows for unvented roof assemblies with new rules 2015 & 2020 ECCCNY, RCNYS
- NOTE INTENT OF Code - Water Vapor/Moisture control!
- Letter from NY-DOS

Vaulted Ceilings and Venting (or not)

Best Practice

Problem - If proper Air Barrier requirements are met, probably don't need a Vapor Barrier, HOWEVER; Code Still Requires it

Answer – Get an ES or other report that indicates the system meets code intent w/o ventilation!

Example – Letter from NY-DOS RE: Foam in Vaulted Ceiling

OK, so what do we think/do about Vapor Retarder and Wet-Spray Cellulose? Or Dense-Pack?

Vaulted Ceilings and Venting (or not)

Best Practice

What ASHRAE Says:

Vapor, Not Heat!

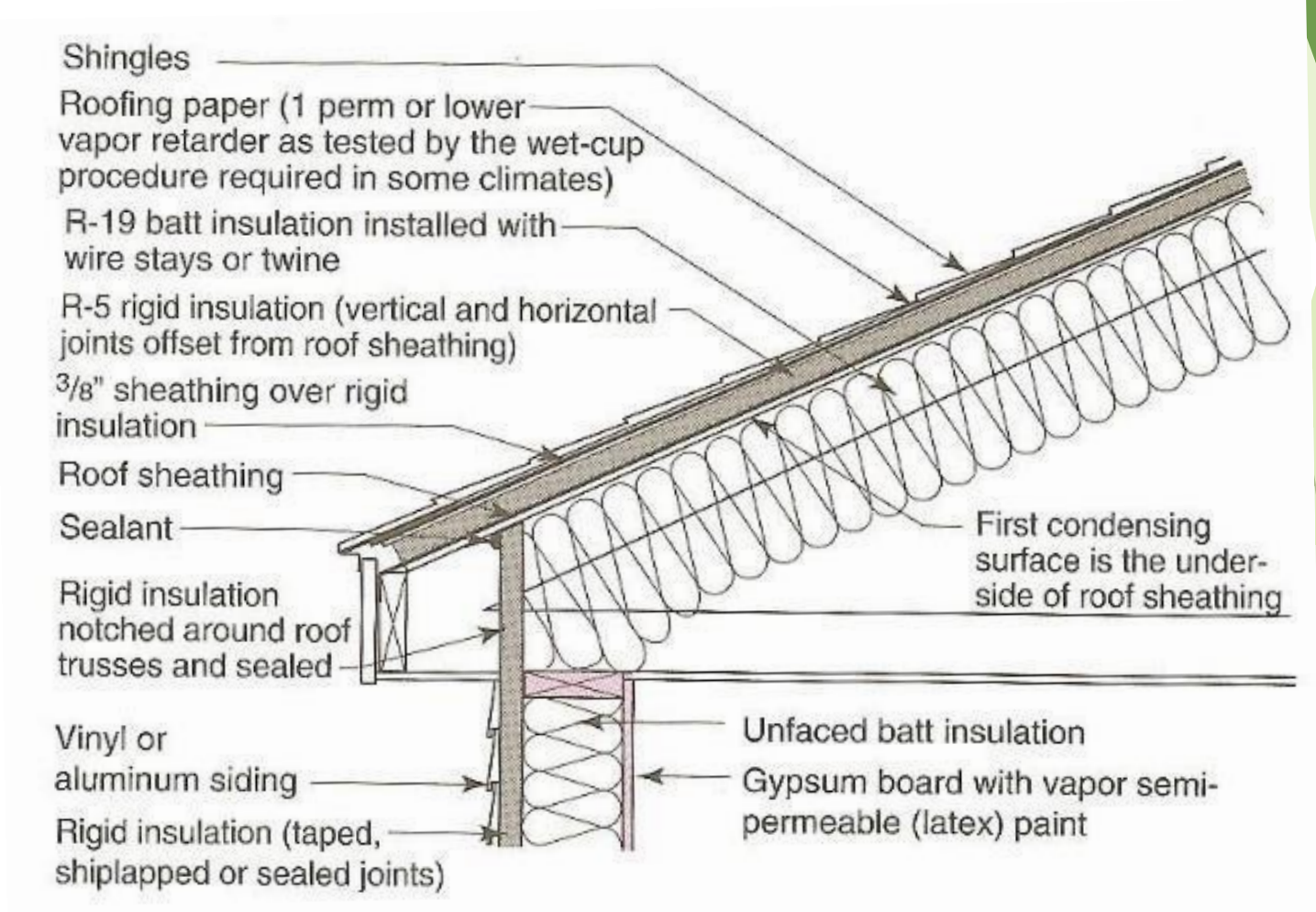
Although there clearly are potential benefits from attic vents in heating climates, there are also disadvantages: Vents can be prone to snow and rain entry that can wet the insulation, and cold air blowing through eave vents can degrade the thermal performance of attic insulation.... In heating climates, attic ventilation usually provides a measure of protection from excessive moisture accumulation in the roof sheathing, but if indoor humidity is high and humid indoor air leaks into the attic, the use of attic vents does not guarantee that attic moisture problems will not develop. Therefore, moisture control in attics in heating climates depends primarily on maintaining low indoor humidity levels during cold weather and on ensuring sufficient airtightness and vapor resistance (i.e. a vapor retarder) in the ceiling.

--12017 ASHRAE Handbook, Fundamentals, 23.6

Vaulted Ceilings and Venting (or not)

Best Practice

What Joe and the Field Guide Say:



Vaulted Ceilings and Venting (or not)

Best Practice

What Joe and the Field Guide Say:

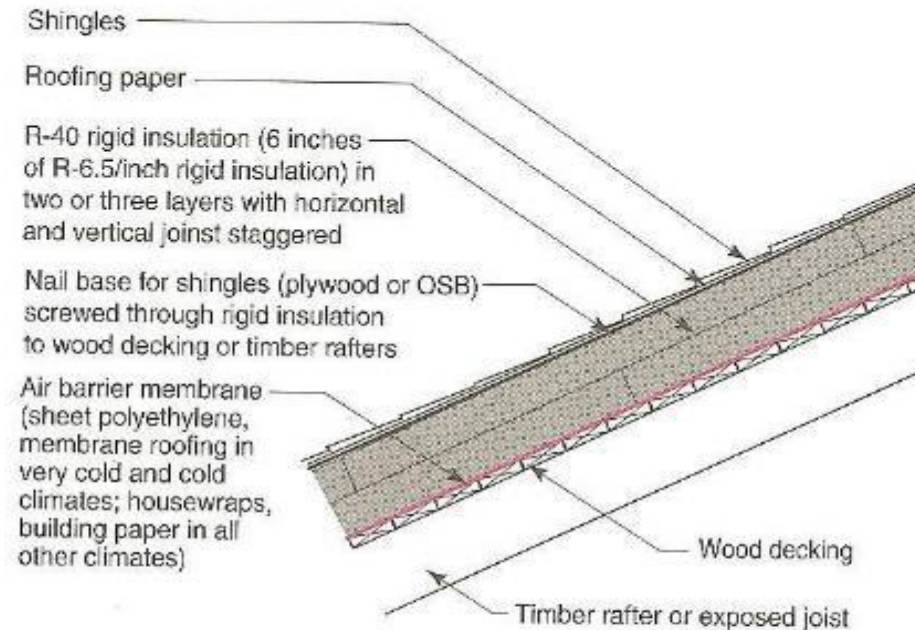


Figure 6.7

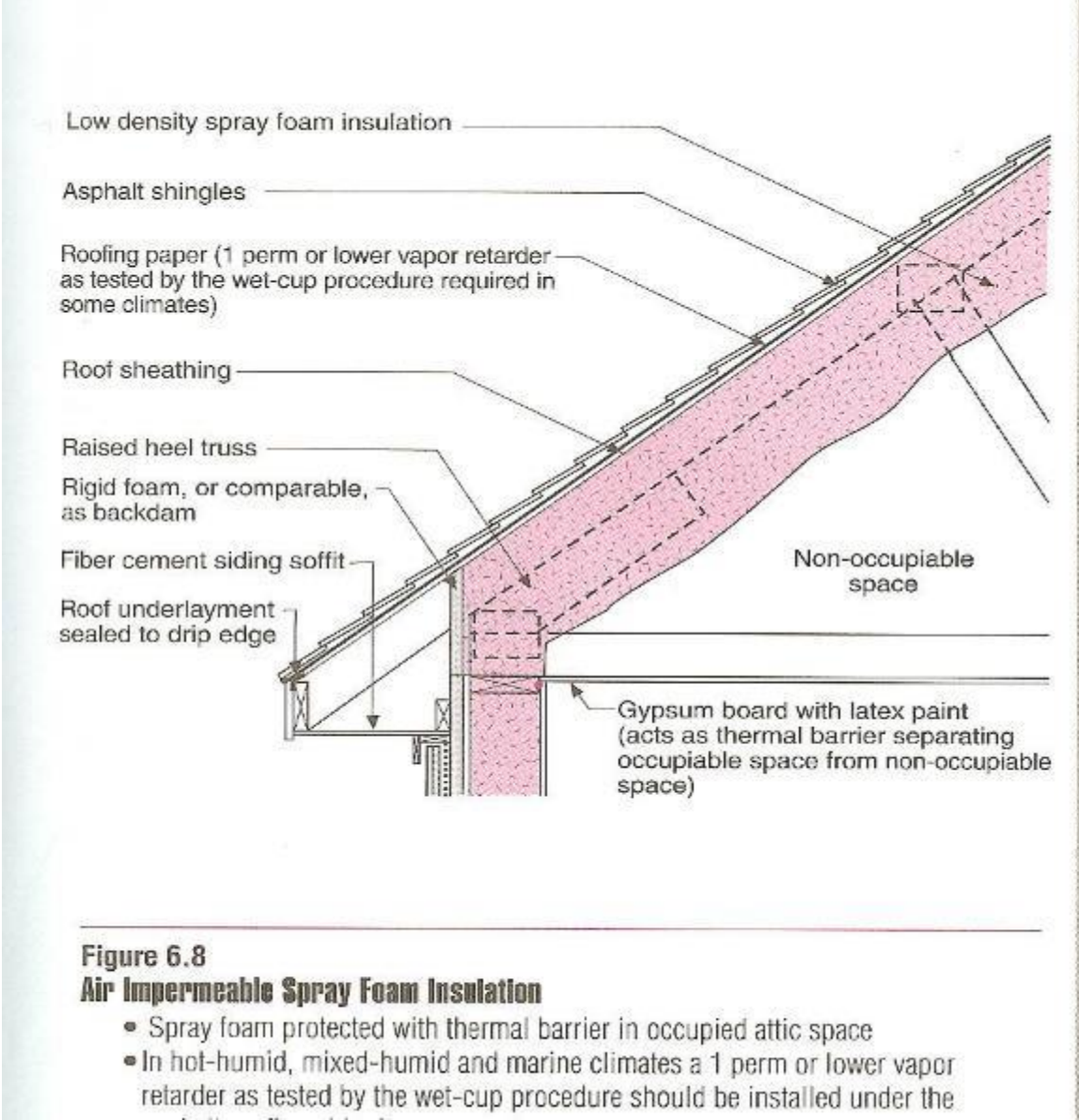
Compact Unvented Roof Assembly

- R-value increased to R-50 in very cold climate zones to control ice-damming
- Optimum roof assembly design to enclose pool areas and spas

Vaulted Ceilings and Venting (or not)

Best Practice

What Joe and the Field Guide Say:



Vaulted Ceilings and Venting (or not)

Best Practice

What Joe and the Field Guide Say:

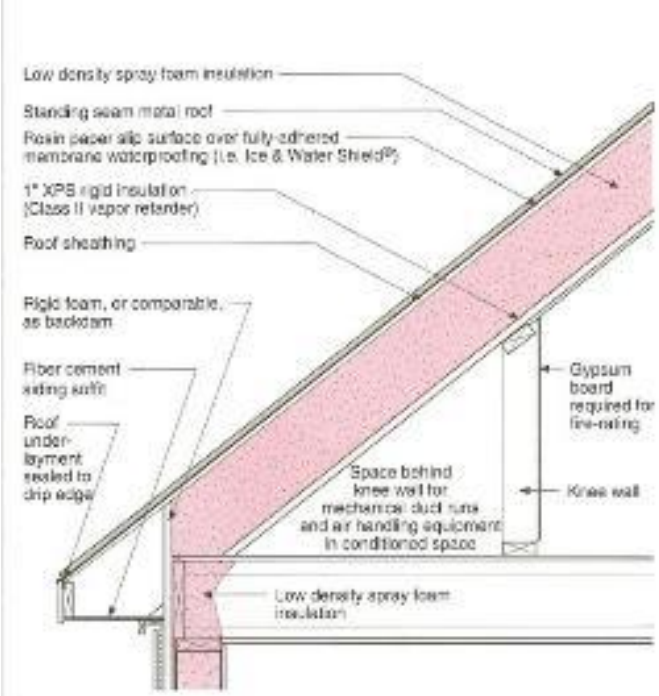


Figure 6.9
Air Impermeable Spray Foam Insulation

- Spray foam protected with thermal barrier in occupied attic space
- Interior vapor retarder (Class I) required with low density spray foam in Climate Zones 6 and 7

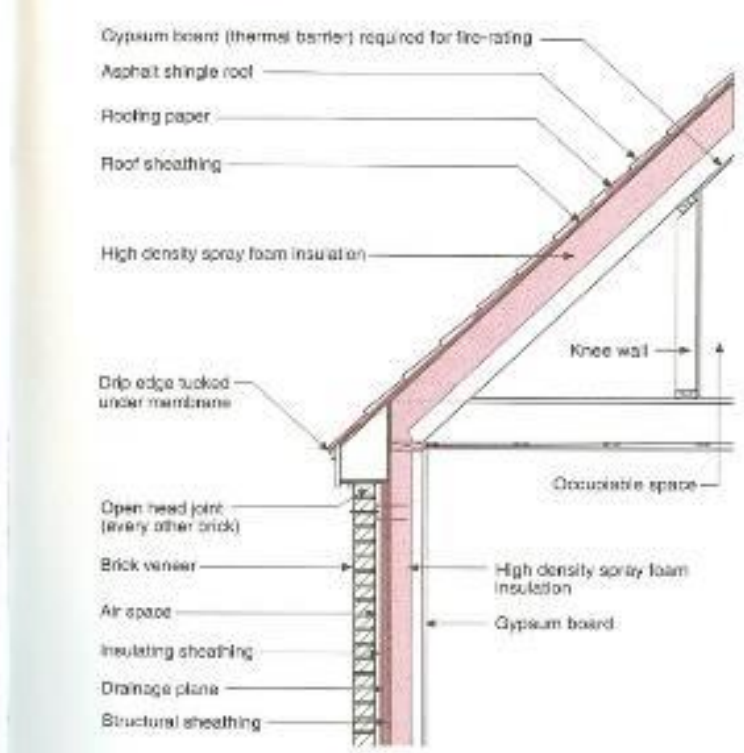


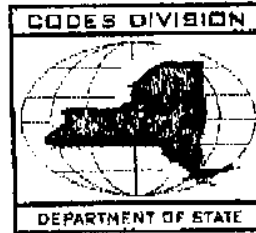
Figure 6.10
Air Impermeable Spray Foam Insulation

- Spray foam protected with thermal barrier in occupied attic space
- High density foam insulation partially fills roof rafter cavity and wall cavity
- No interior vapor retarder required in any climate zone with high density spray foam insulation

Vaulted Ceilings and Venting (or not)

Best Practice

What the NYS
Department of State
Says:



NEW YORK STATE DEPARTMENT OF STATE

Division of Code Enforcement and Administration
41 State Street Albany, New York 12231
Phone no. (518) 474-4073 [Fax] (518) 486-4487

Facsimile Transmission Sheet

DATE: September 1, 2005
TO: ~~Dave Abrey~~ Mike Dewine
FAX: 664-5672
FROM: Cheryl A. Fischer, P.E.
Assistant Director for Code Interpretation
NOTE: Cathedral Ceiling

This is in response to your question whether the application of spray in foam in the rafter space of a cathedral ceiling, even a flat ceiling, requires ventilation of the space in accordance with *Residential Code of New York State (RCNYS)* section R806.1. NO. Any such impervious material which completely fills the rafter space is permitted without ventilating the roof.

A Water Management Problem?



Water Management (Drainage Plane)

Energy Code - N/A Vapor retarder ONLY

Residential Code - Chapter 7

Energy code - Only deals with Vapor Retarder requirement - does it need more? YES!

RCNYS-2020 Sections 703.4 and R703.8.5 - WRT Exterior Coverings & How They Are Detailed w/ flashing

703.1 – Intent to prevent moisture from getting into wall

703-2 – Weather –resistant sheathing paper or material tested to ASTM D 226 (Housewraps, other building papers)

ONLY required under Brick and Stone veneer

This will be changing in future, in '06 to include Hard Board lap and panel siding, soon for all sidings.

703.7.5 and .8 - Flashing required, vague around siding other than Stone or Brick

Required around openings, doors, windows, fairly vague

Water Management (Drainage Plane)

Energy Code - N/A Vapor retarder ONLY

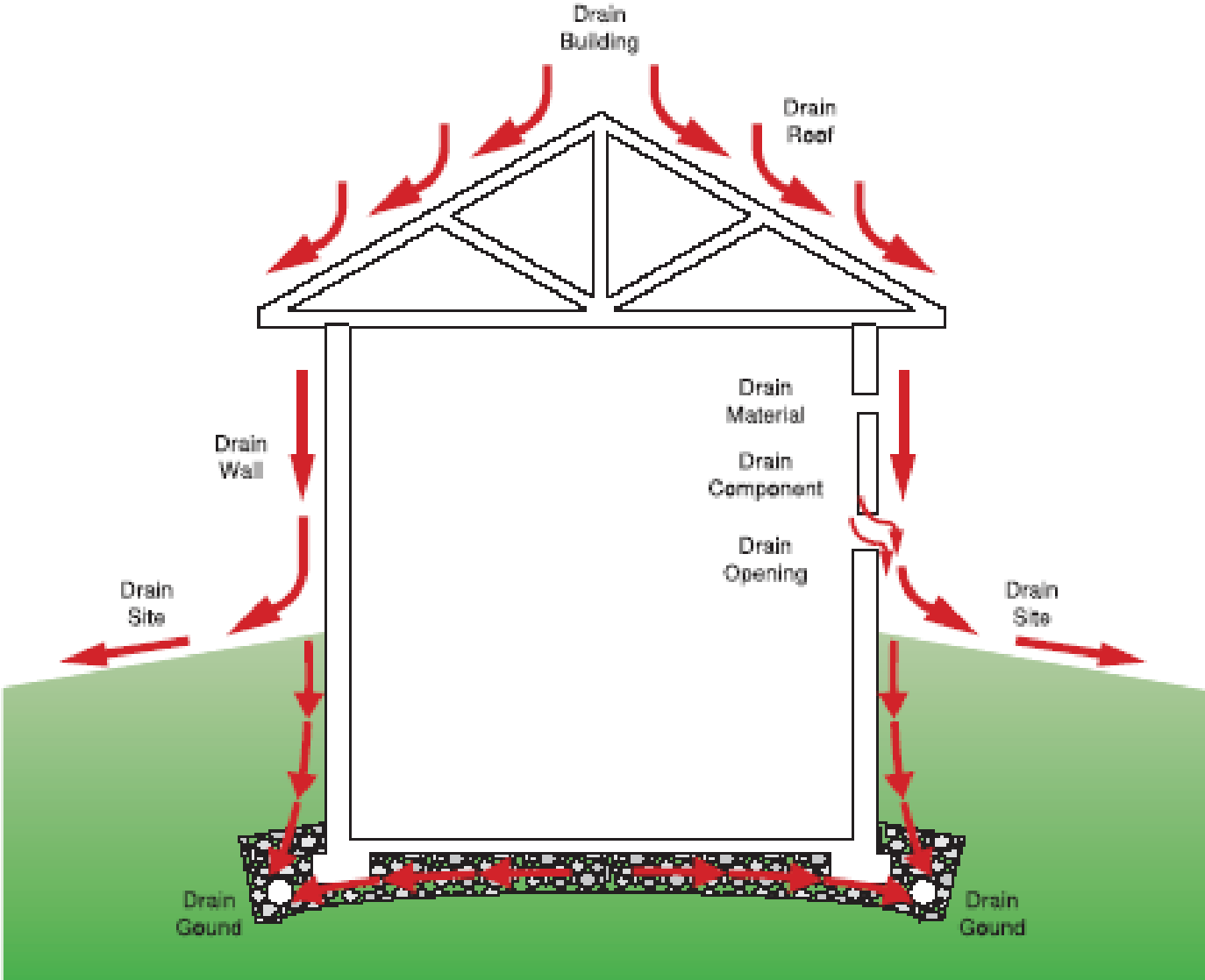
Residential Code - Chapter 7 703.3.(1)

Changing to include most ALL Siding, check the RCNYS-2020!

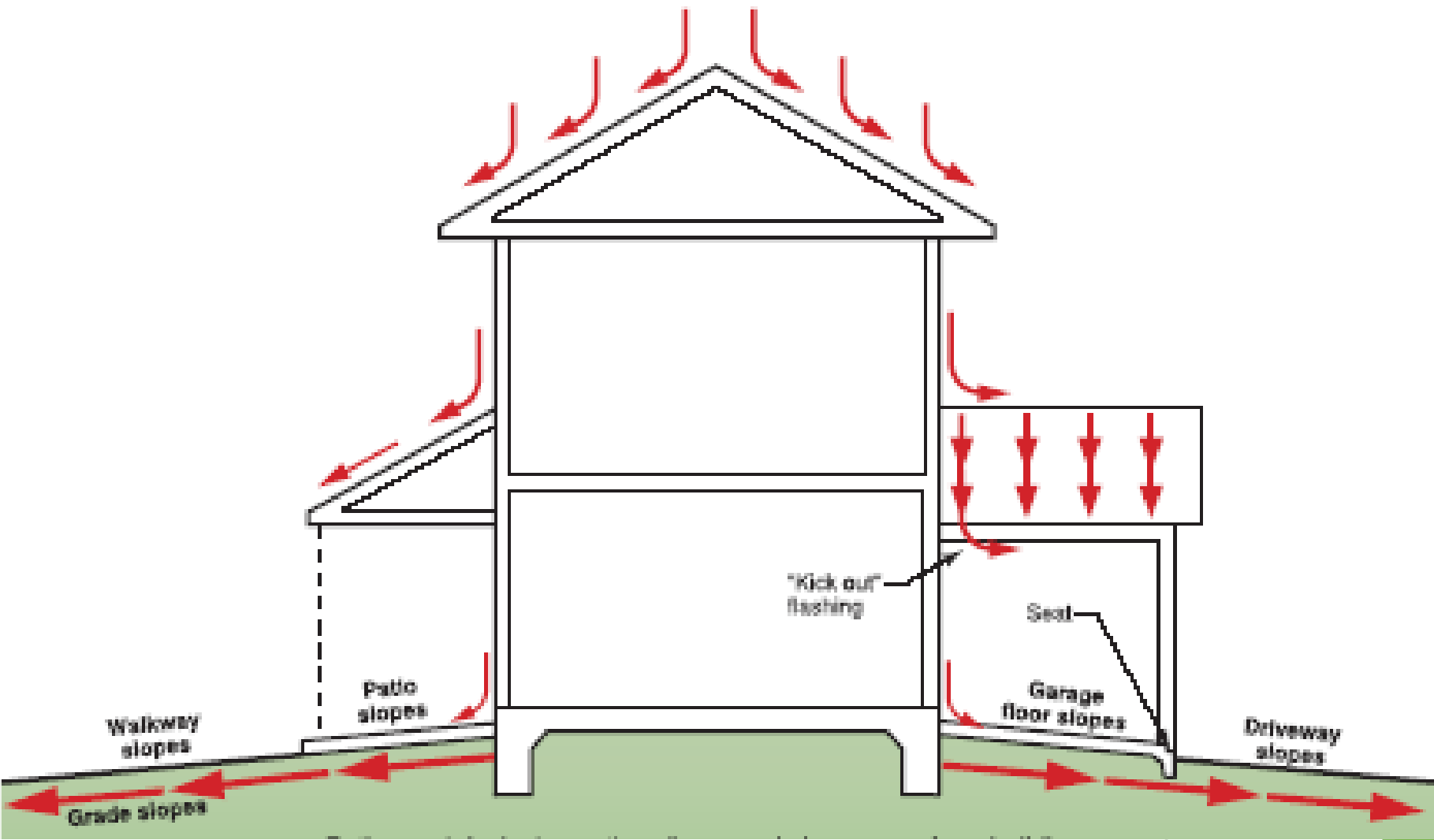
TABLE R703.3(1)
SIDING MINIMUM ATTACHMENT AND MINIMUM THICKNESS

| SIDING MATERIAL | NOMINAL THICKNESS (inches) | JOINT TREATMENT | TYPE OF SUPPORTS FOR THE SIDING MATERIAL AND FASTENERS | | | | | | |
|---|--------------------------------------|--------------------|---|--|--|--|--|---|---|
| | | | Wood or wood structural panel sheathing into stud | Fiberboard sheathing into stud | Gypsum sheathing into stud | Foam plastic sheathing into stud ^d | Direct to studs | Number or spacing of fasteners | |
| Anchored veneer: brick, concrete, masonry or stone (see Section R703.8) | 2 | Section R703.8 | Section R703.8 | | | | | | |
| Adhered veneer: concrete, stone or masonry (see Section R703.12) | — | Section R703.12 | Section R703.12 | | | | | | |
| Fiber cement siding | Panel siding (see Section R703.10.1) | 5/16 | Section R703.10.1 | 6d common (2" x 0.113") | 6d common (2" x 0.113") | 6d common (2" x 0.113") | 6d common (2" x 0.113") | 4d common (1 1/2" x 0.099") | 6" panel edges 12" inter. sup. |
| | Lap siding (see Section R703.10.2) | 5/16 | Section R703.10.2 | 6d common (2" x 0.113") | 6d common (2" x 0.113") | 6d common (2" x 0.113") | 6d common (2" x 0.113") | 6d common (2" x 0.113") or 11 gage roofing nail | Note f |
| Hardboard panel siding (see Section R703.5) | 7/16 | — | 0.120" nail (shank) with 0.225" head | 0.120" nail (shank) with 0.225" head | 0.120" nail (shank) with 0.225" head | 0.120" nail (shank) with 0.225" head | 0.120" nail (shank) with 0.225" head | 0.120" nail (shank) with 0.225" head | 6" panel edges 12" inter. sup.d |
| Hardboard lap siding (see Section R703.5) | 7/16 | Note e | 0.099" nail (shank) with 0.240" head | 0.099" nail (shank) with 0.240" head | 0.099" nail (shank) with 0.240" head | 0.099" nail (shank) with 0.240" head | 0.099" nail (shank) with 0.240" head | 0.099" nail (shank) with 0.240" head | Same as stud spacing 2 per bearing |
| Horizontal aluminum ^g | Without insulation | 0.019 ^b | Lap | Siding nail 1 1/2" x 0.120" | Siding nail 2" x 0.120" | Siding nail 2" x 0.120" | Siding nail ^h 1 1/2" x 0.120" | Not allowed | Same as stud spacing |
| | | 0.024 | Lap | Siding nail 1 1/2" x 0.120" | Siding nail 2" x 0.120" | Siding nail 2" x 0.120" | Siding nail ^h 1 1/2" x 0.120" | Not allowed | |
| | With insulation | 0.019 | Lap | Siding nail 1 1/2" x 0.120" | Siding nail 2 1/2" x 0.120" | Siding nail 2 1/2" x 0.120" | Siding nail ^h 1 1/2" x 0.120" | Siding nail 1 1/2" x 0.120" | |
| Insulated vinyl siding ^l | 0.035 (vinyl siding layer only) | Lap | 0.120 nail (shank) with a 0.313 head or 16-gage crown ^{k, l} | 0.120 nail (shank) with a 0.313 head or 16-gage crown ^l | 0.120 nail (shank) with a 0.313 head or 16-gage crown ^l | 0.120 nail (shank) with a 0.313 head or 16-gage crown ^l | 0.120 nail (shank) with a 0.313 head Section R703.11.2 | Not allowed | 16 inches on center or specified by manufacturer instructions, test report or other sections of this code |
| Particleboard panels | 3/8 | — | — | 6d box nail (2" x 0.099") | 6d box nail (2" x 0.099") | 6d box nail (2" x 0.099") | 6d box nail (2" x 0.099") | 6d box nail (2" x 0.099") | 6" panel edges 12" inter. sup. |
| | | 1/2 | — | 6d box nail (2" x 0.099") | 6d box nail (2" x 0.099") | 6d box nail (2" x 0.099") | 6d box nail (2" x 0.099") | 6d box nail (2" x 0.099") | |
| | | 5/8 | — | 6d box nail (2" x 0.099") | 8d box nail (2 1/2" x 0.113") | 8d box nail (2 1/2" x 0.113") | 6d box nail (2" x 0.099") | 6d box nail (2" x 0.099") | |
| Polypropylene siding ^h | Not applicable | Lap | Section 703.14.1 | Section 703.14.1 | Section 703.14.1 | Section 703.14.1 | Section 703.14.1 | Not allowed | As specified by the manufacturer instructions, test report or other sections of this code |
| Steel ^c | 29 ga. | Lap | Siding nail (1 3/4" x 0.113") Staple-1 3/4 | Siding nail (2 3/4" x 0.113") Staple-2 1/2 | Siding nail (2 1/2" x 0.113") Staple-2 1/4 | Siding nail (1 3/4" x 0.113") Staple-1 3/4 | Siding nail (1 3/4" x 0.113") Staple-1 3/4 | Not allowed | Same as stud spacing |
| | | | | 0.120" nail(shank) with a 0.313" | 0.120" nail(shank) with a 0.313" | 0.120" nail(shank) with a 0.313" | 0.120" nail(shank) with | | |

Everything Has to Work



Everything...



Water Management Fundamentals

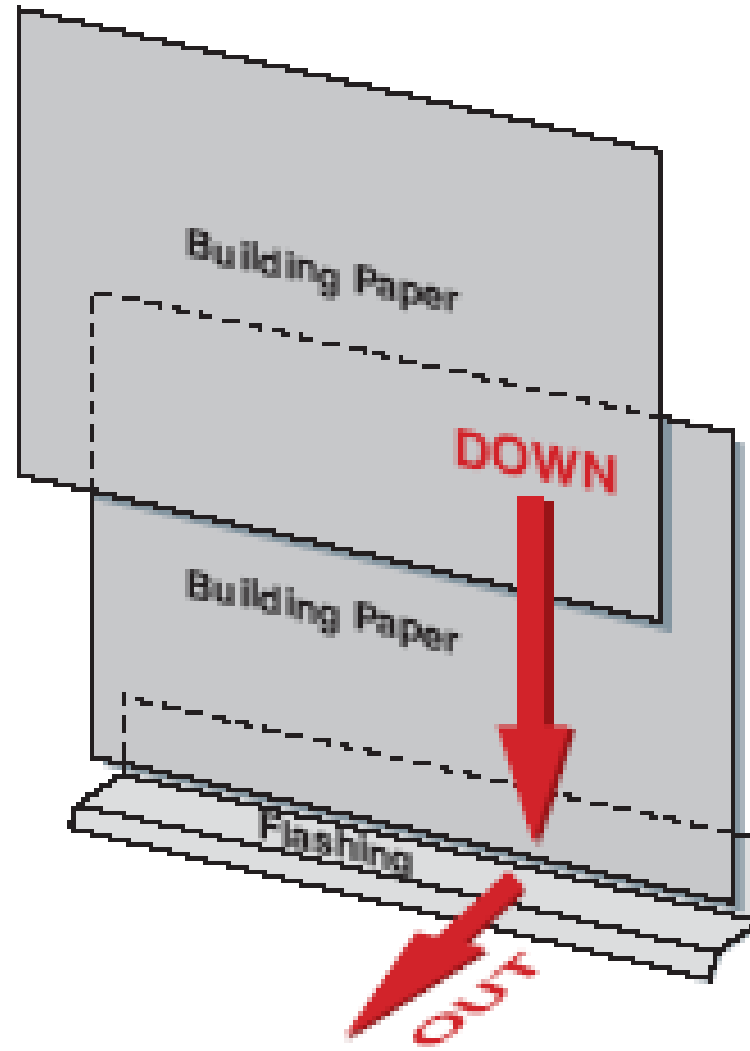
Builders are used to applying basic water management principles daily

Shingles

Building paper

Where do we mess up?

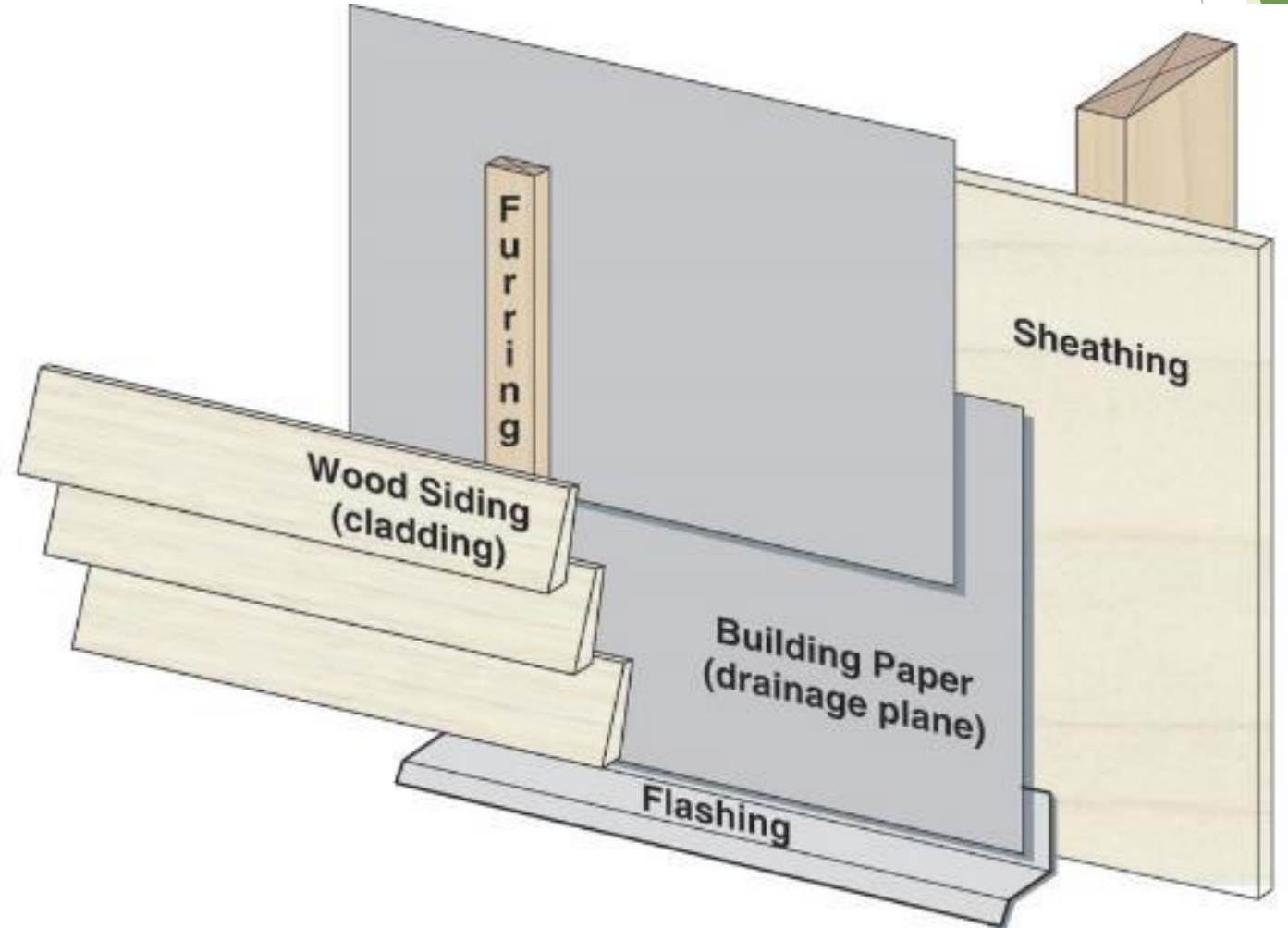
Almost always at the joints and connections where different things come together



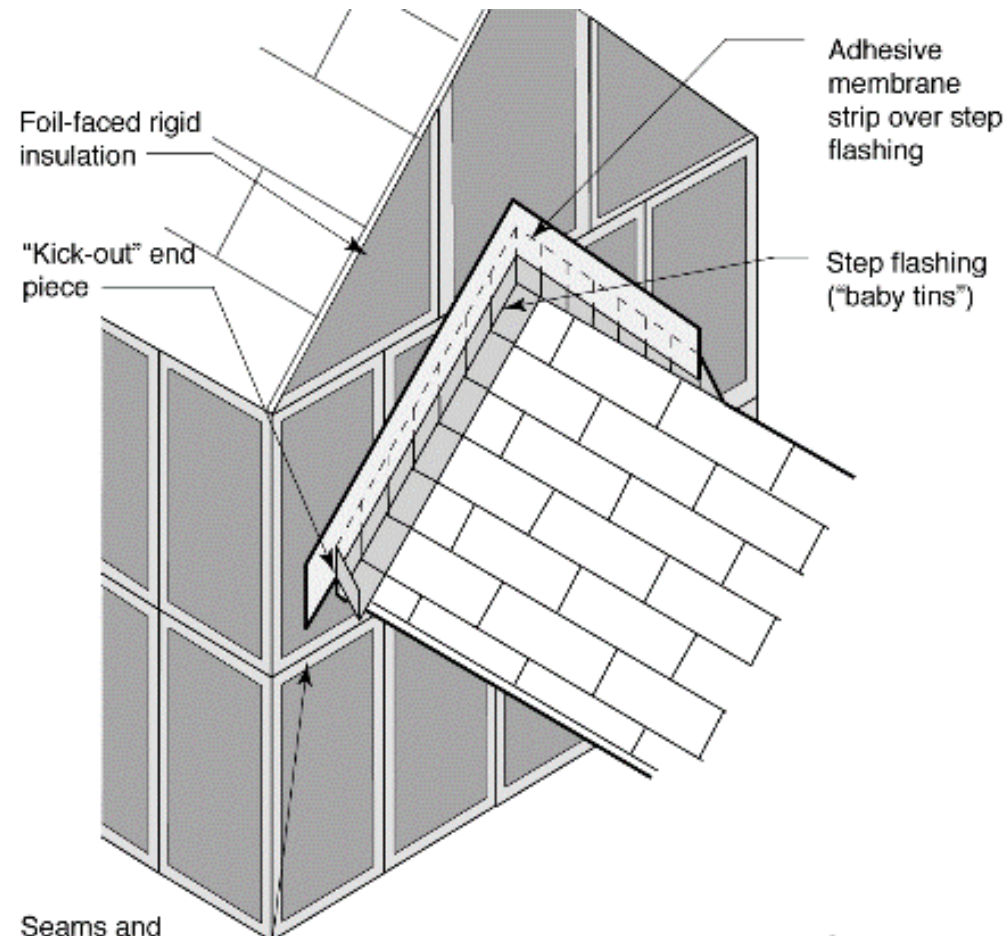
Water Management Simplicity

Let's look at the
basic components
of wall water
management.

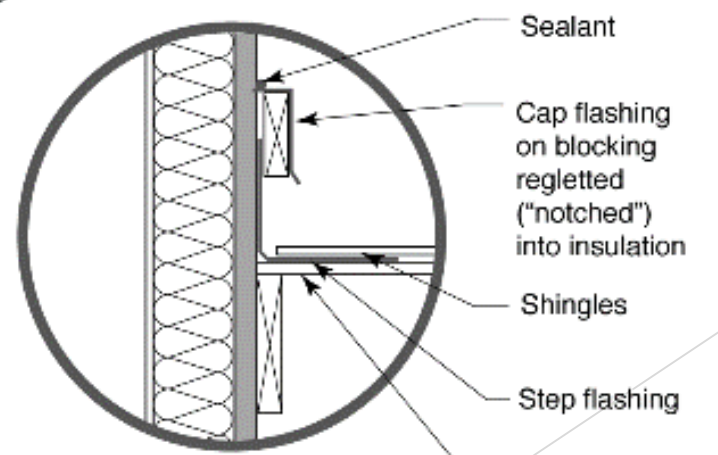
One Solution...







Seams and corners taped to provide drainage plane continuity



Alternate Flashing Detail

40+ HOUSEWRAPS!

BBA Non-Wovens: Reemay Inc.

Typar Housewrap

Pactiv

GreenGuard® Classic Wrap

GreenGuard® Value Wrap

GreenGuard® Ultra

GreenGuard® Raindrop

Top Choice

Owens Corning

PinkWrap®

PinkWrap® Plus

Celotex Corp.

Tuffwrap®

Tuff Weather Wrap

Fabrene Inc./Dow/Canadian

Air-Guard®

Abitibi-Price/Sto-Cote Products

Pro-Wrap & Air Seal® Housewraps

Firstline Corporation

Firstwrap® Air Barrier

Firstwrap® Housewrap

Firstwrap® Weather Barrier

Perma Wrap

Global Guard

John Manville, et al

Valeron® Film

DuPont

Tyvek® HomeWrap®

Tyvek® StuccoWrap®

Tyvek® DrainWrap®

Tyvek® CommercialWrap®

Ludlow Coated Products

Rwrap®

Barricade®

Energy-Wrap Housewrap

Air Stop

Air Stop II

Weather Trek

CS Fabric/Protecto Wrap Co.

PrimeWrap®

Hi-Q Wrap

Energy Housewrap

Dri-Shield Housewrap

Marvel Guard

Ply Dry

Protecto-Wrap

Dow

Weathermate®

Weathermate® Plus

Many Manufacturers

#15 Felt

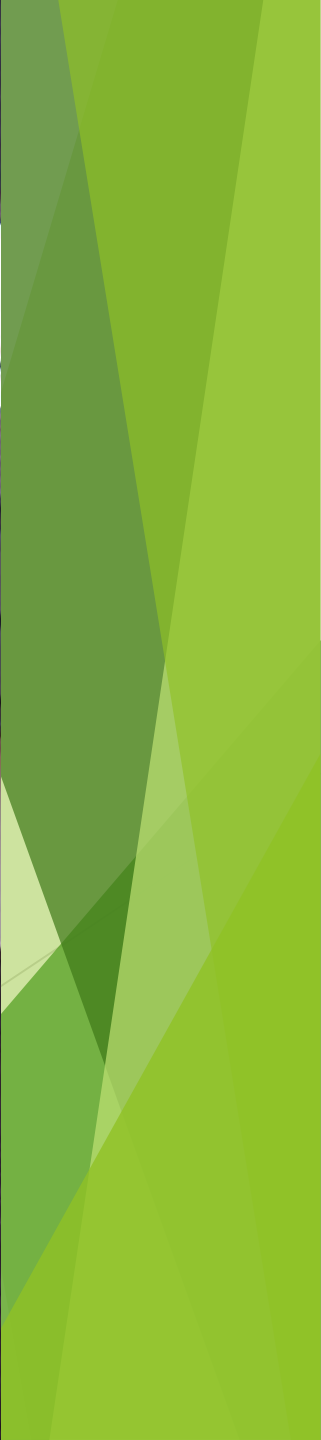


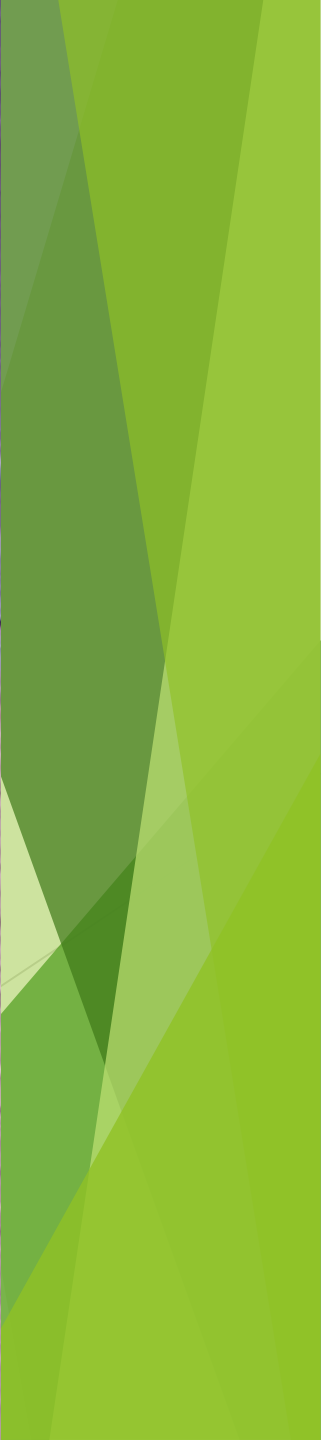
Window Leaks

JUMP!!













But First - Gimme A Break!



Water Management (Drainage Plane)

Energy Code - N/A Vapor Retarder ONLY

Residential - Chapter 7

Exterior Conditions

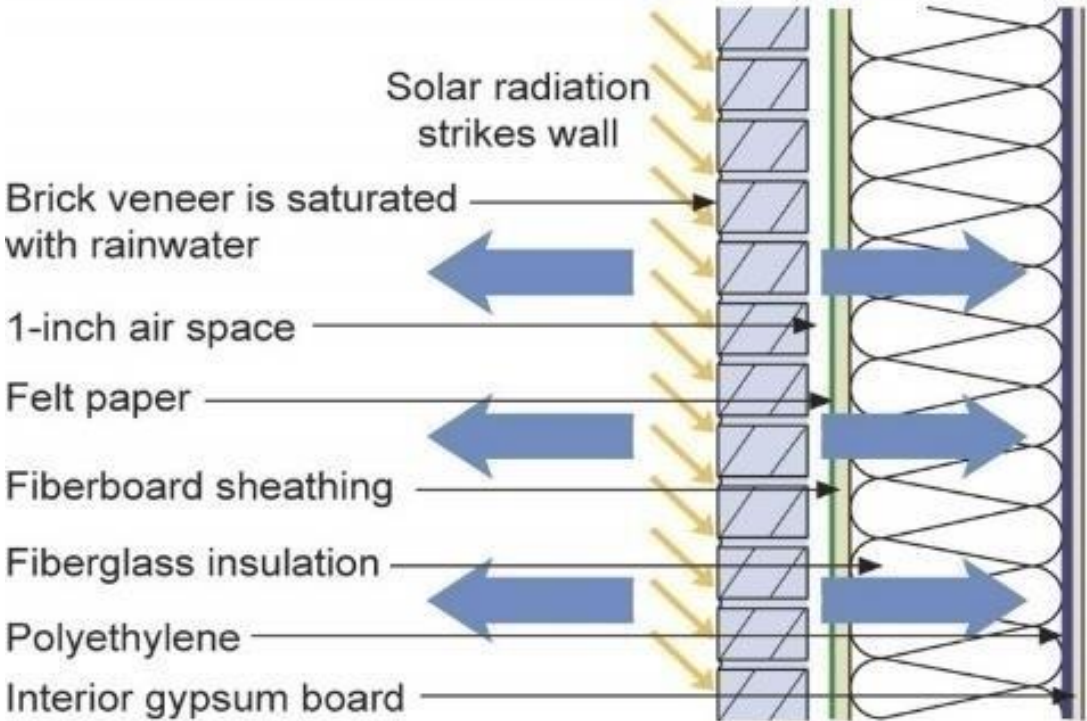
Temperature: 80°F
Relative humidity: 75%
Vapor pressure: 2.49 kPa

Conditions within Cavity:

Temperature: 120°F
Relative humidity: 100%
Vapor pressure: 11.74 kPa

Interior Conditions

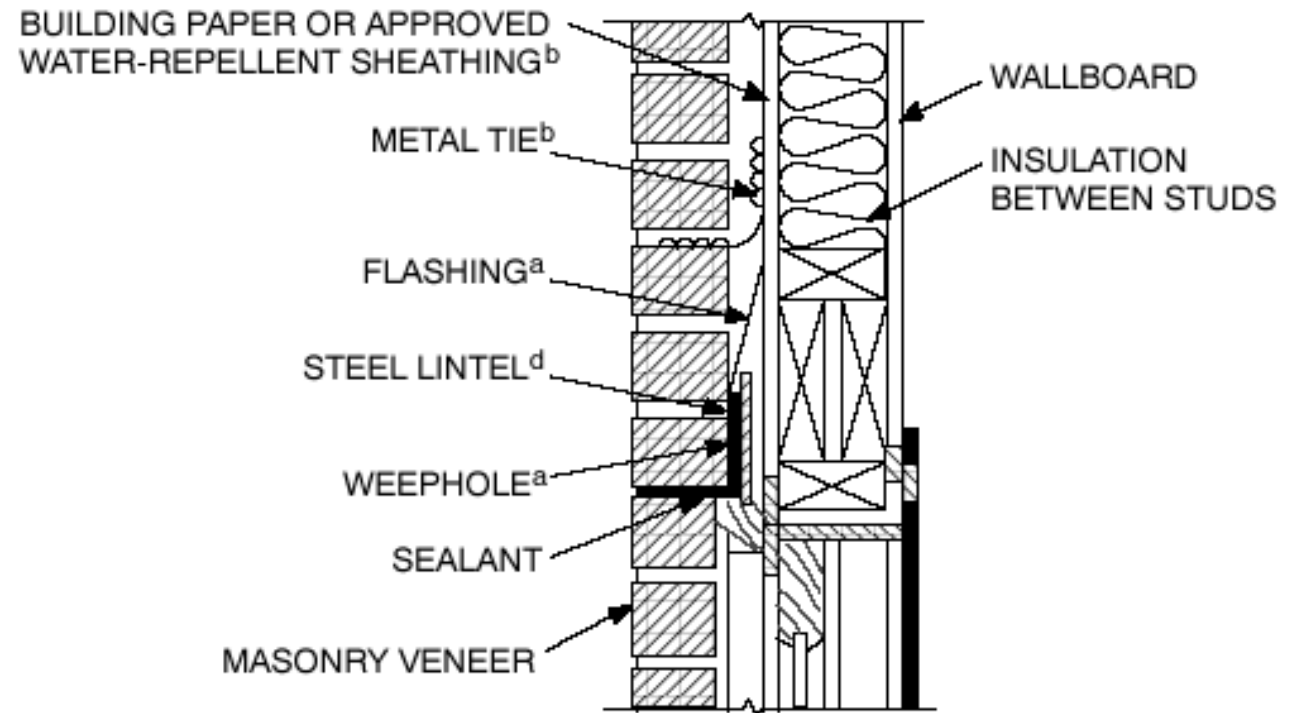
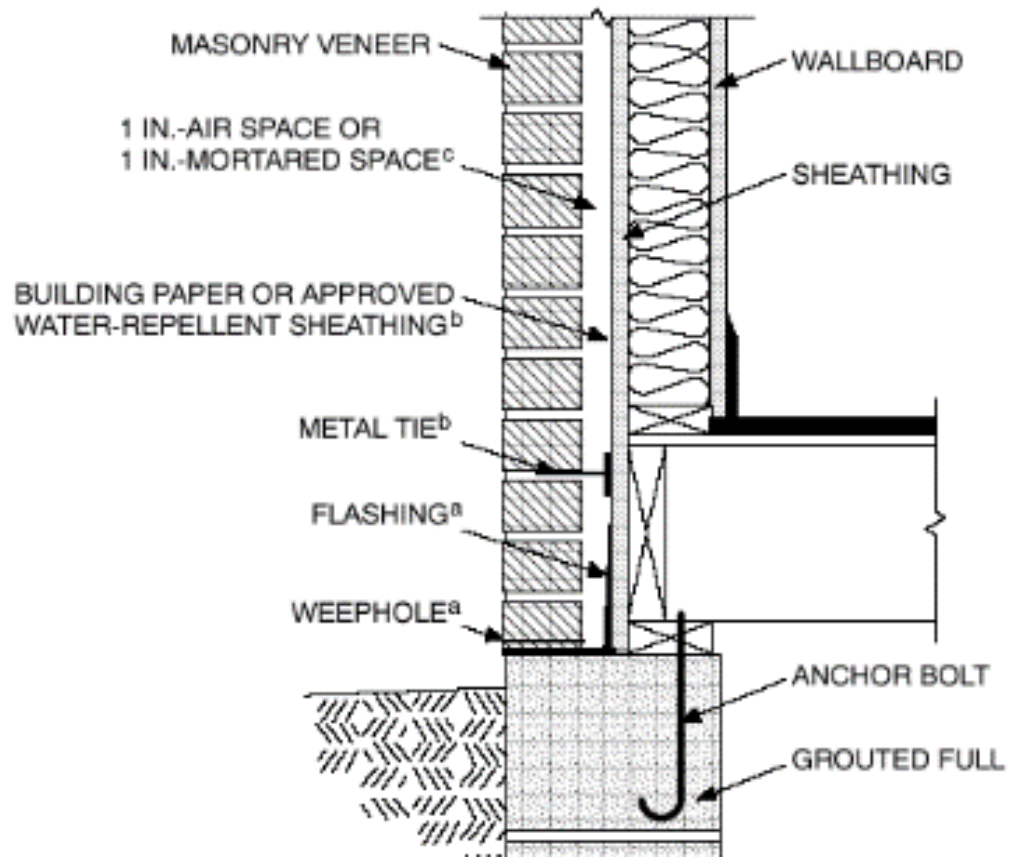
Temperature: 75°F
Relative humidity: 60%
Vapor pressure: 1.82 kPa



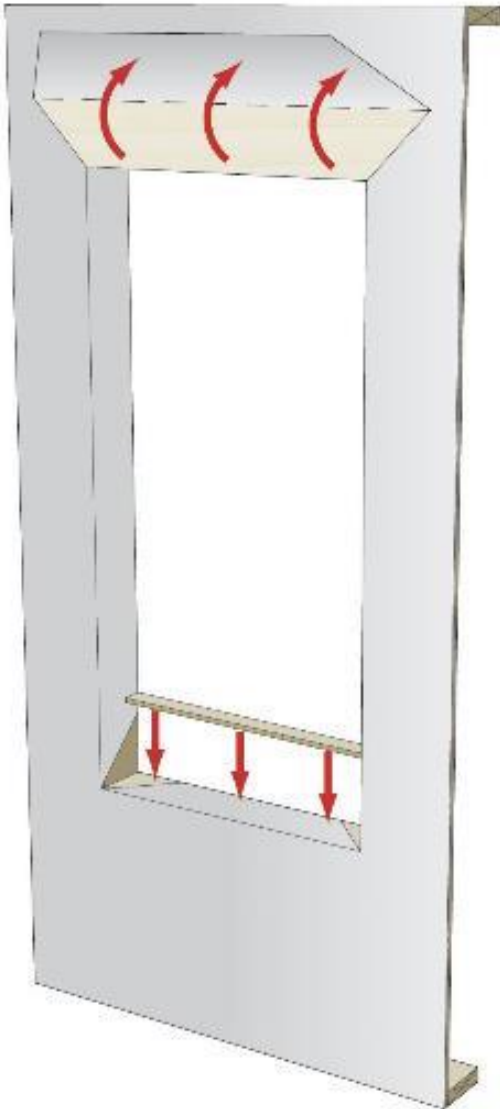
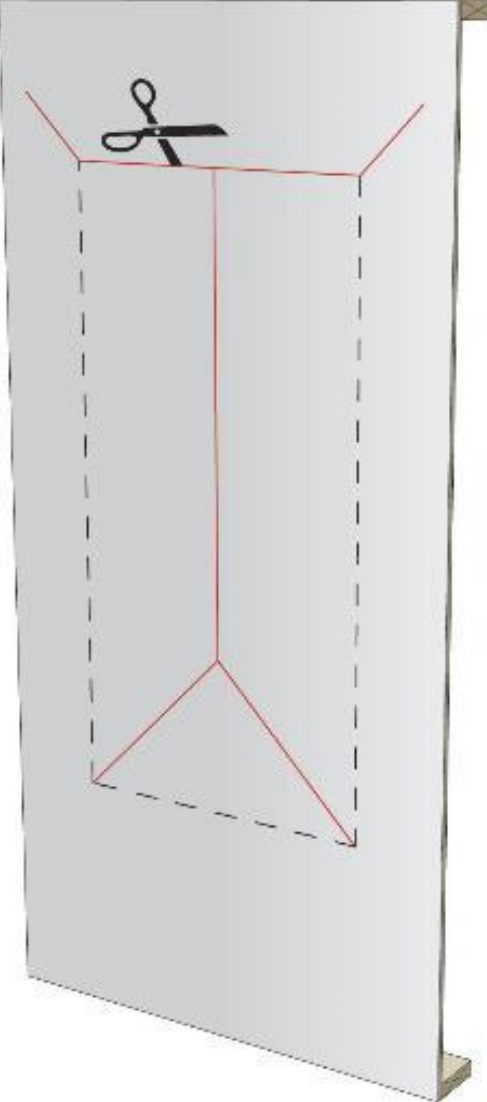
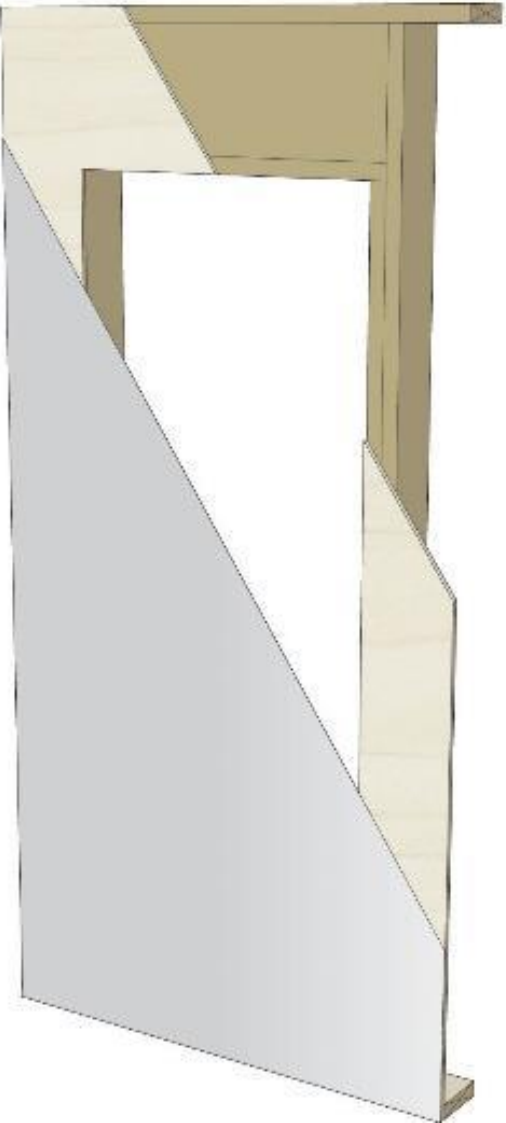
Vapor is driven both inward and outward by a high vapor pressure differential between the brick and the interior and the brick and the exterior.

Water Management (Drainage Plane)

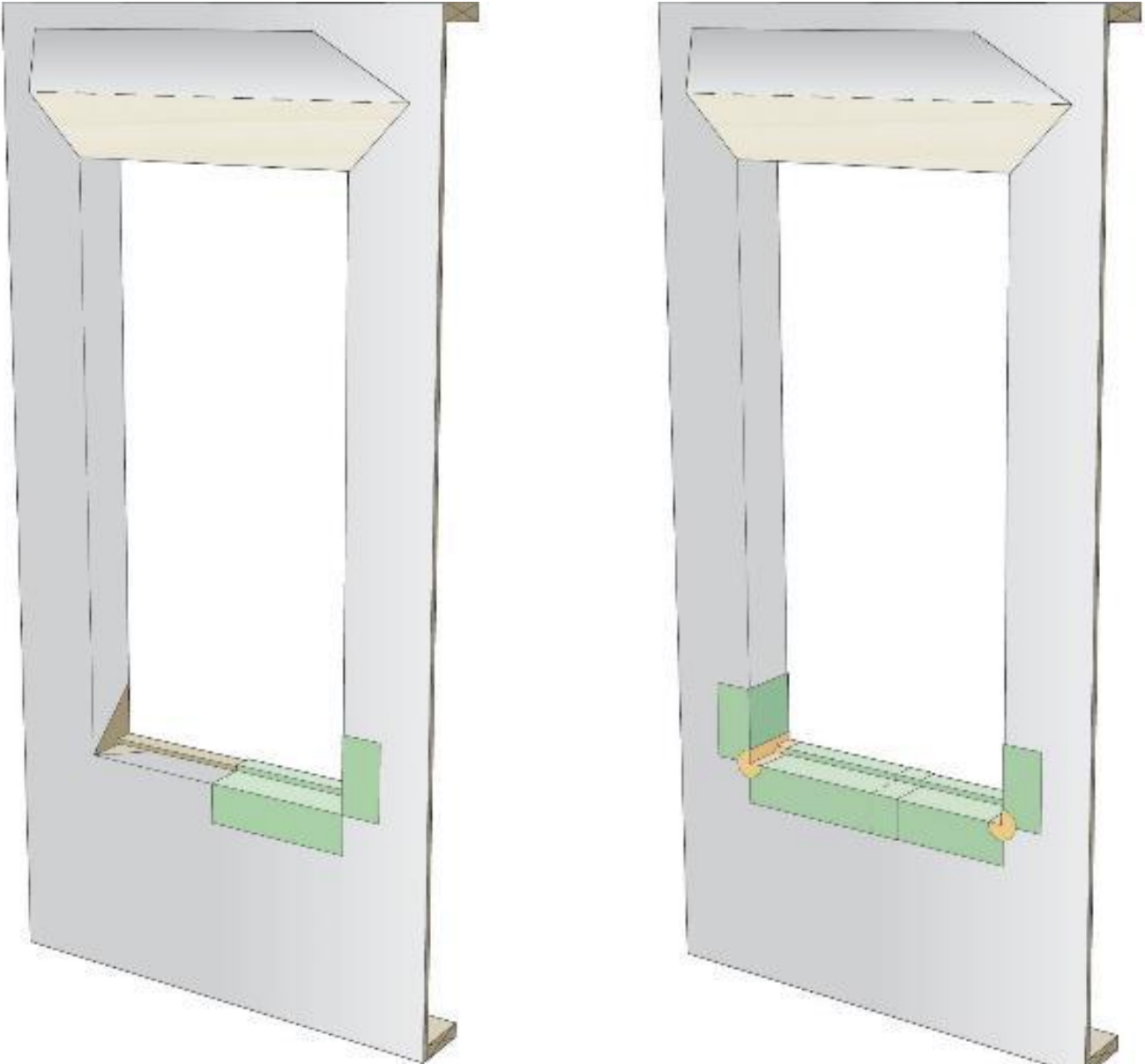
Energy Code - N/A Vapor Retarder ONLY
Residential - Chapter 7



Deal With Window and Door Penetrations!



Preparing for the Window...

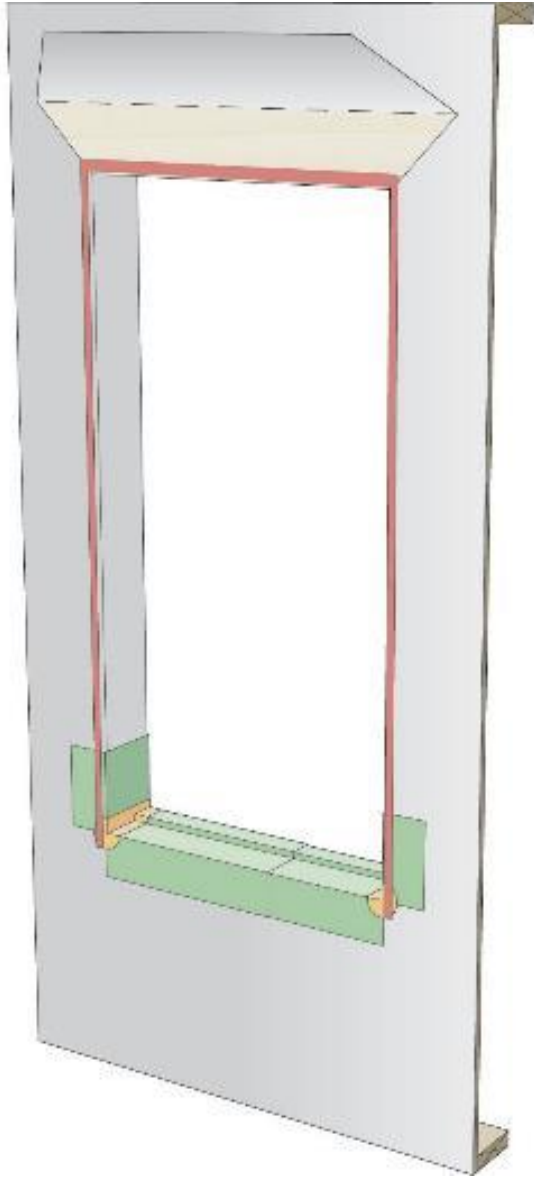


Sill Flashing

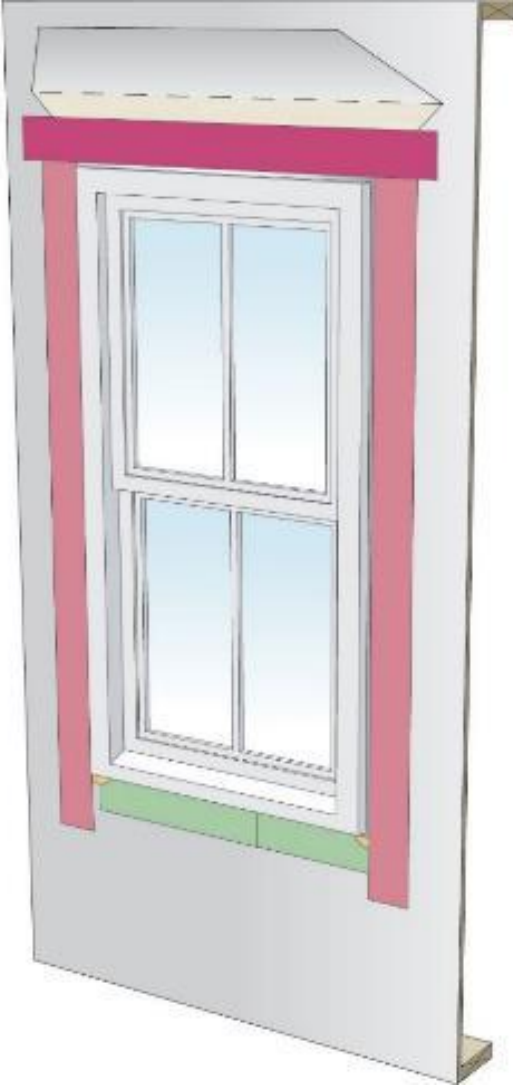
Can use continuous or multi-piece flashing approach
Key is integration into whole wall system



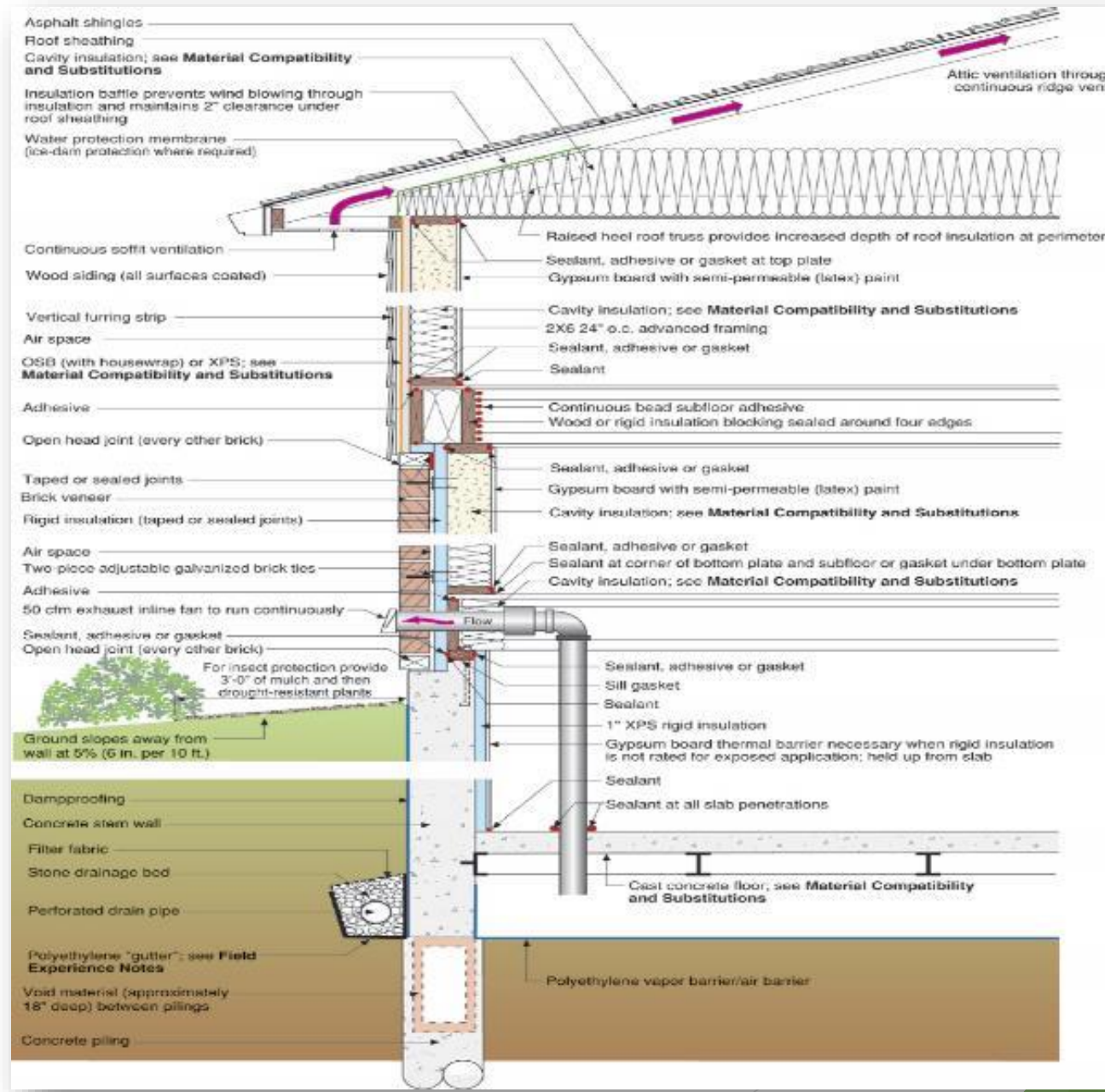
Integrate Windows



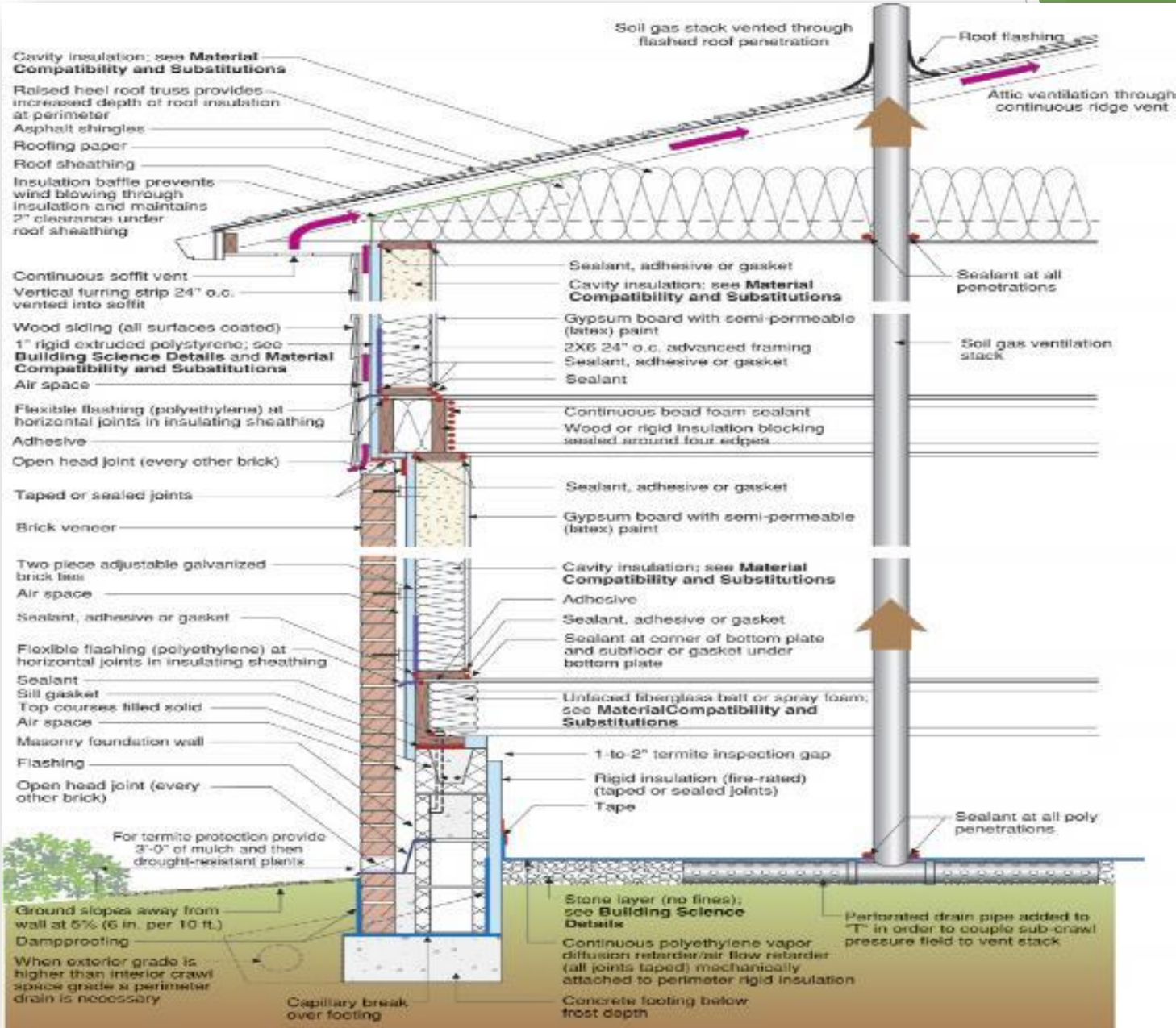
Continuous Drainage Plane



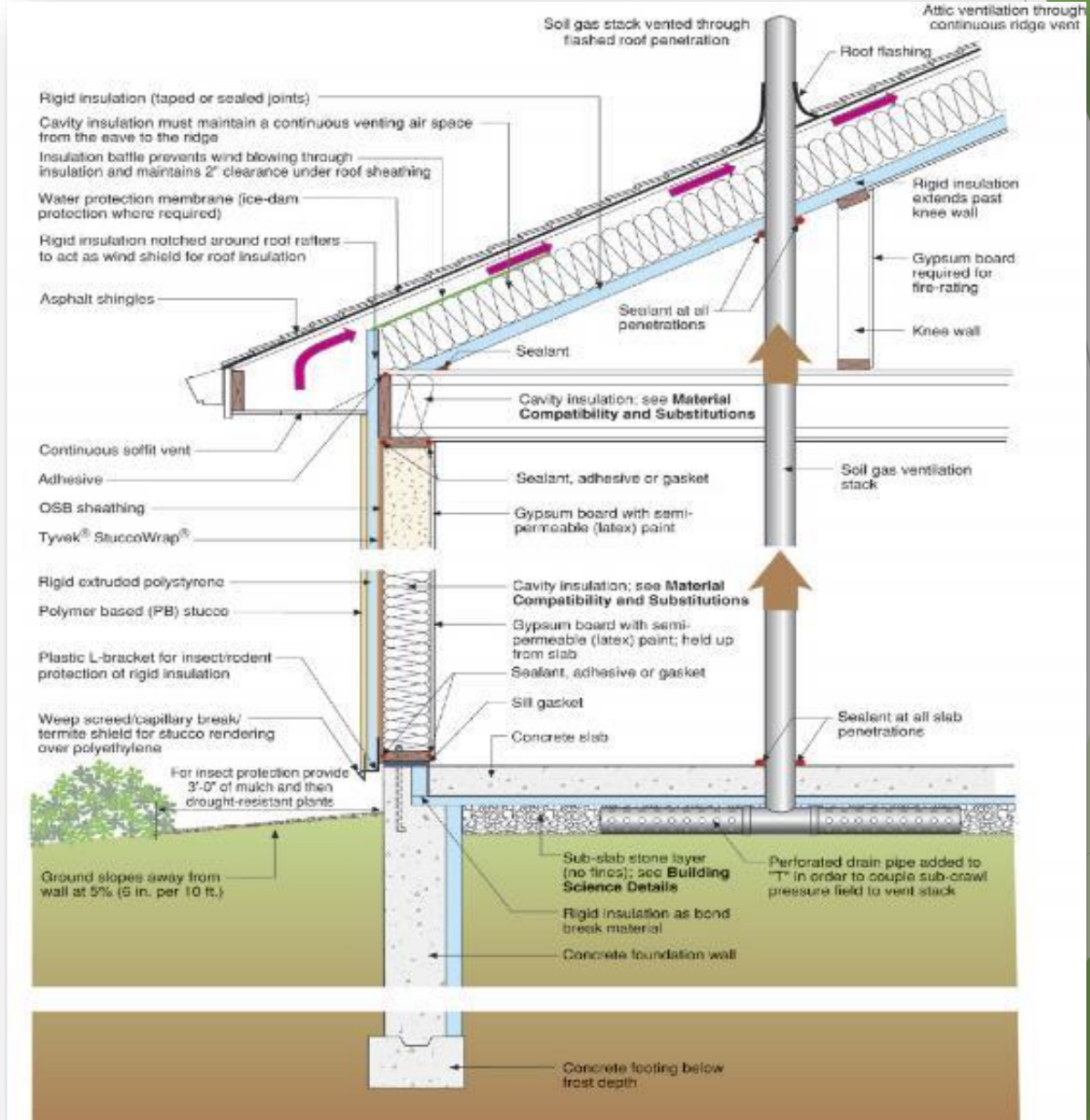
The "Denver"



The "Chicago"



The “Minneapolis”



Advanced Framing (OVE)

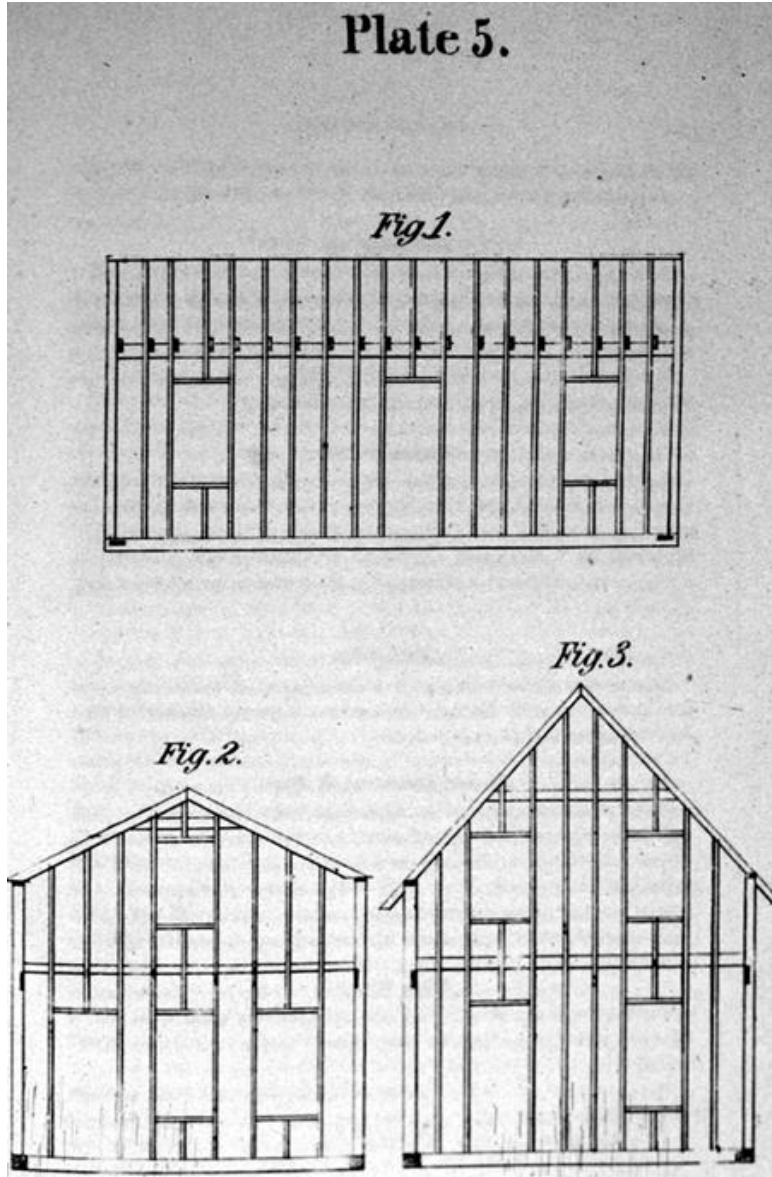
Energy - N/A

Residential - Chapter 6

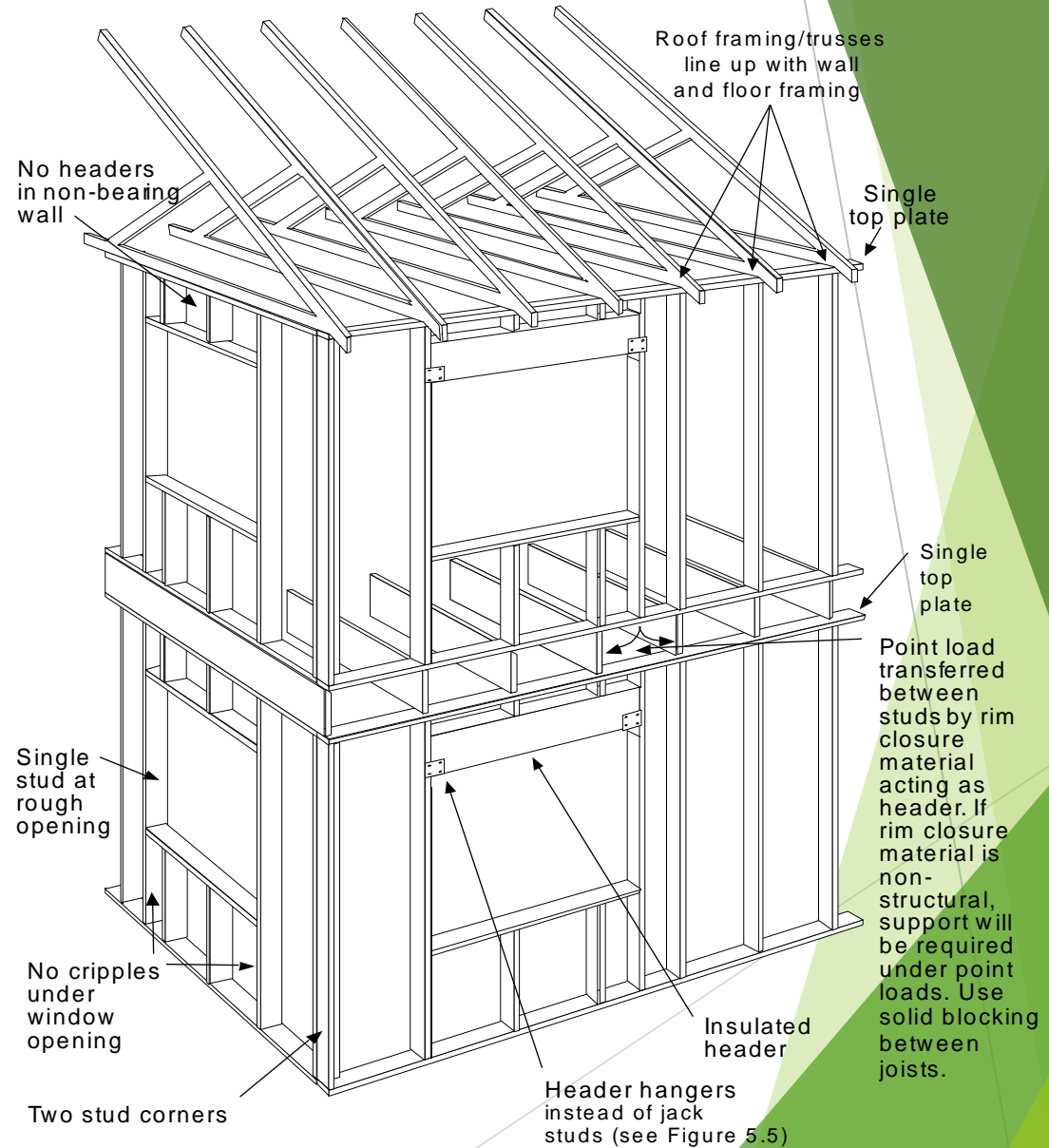
- Residential Code - Chapter 601 “Wall Construction”, 602 “Wall Covering”, Table 502.5 (1) “Girder/Header Spans”
- 602.3.2 allows single Top Plate if steel plate is used at joints, or lintels adequately also tied with steel bridges or ties
- 602.3.3 Allows bearing stud wall to be 24” on center if loads above bear within 5” of studs below (stack framing)
- 602.5 Allows Interior Non-load bearing walls to be 2x3
- 602.7.2 - Allows Non-Load bearing headers in non load bearing walls
- 602.10.3 - Allows Braced Wall construction with either let-in wood bracing OR steel strapping as alternate, or Structural Panel sheathing at corners
- Table 502.5 (1) - Allows Header Hangers
Sounds Like a Perceived, not Real Barrier!

Using Lumber Efficiently

Carpentry Made Easy, William Bell, 1858



EEBA Builder's Guide, Lstiburek, 2001





This wall has been prepared for the next phase of insulation and drywall



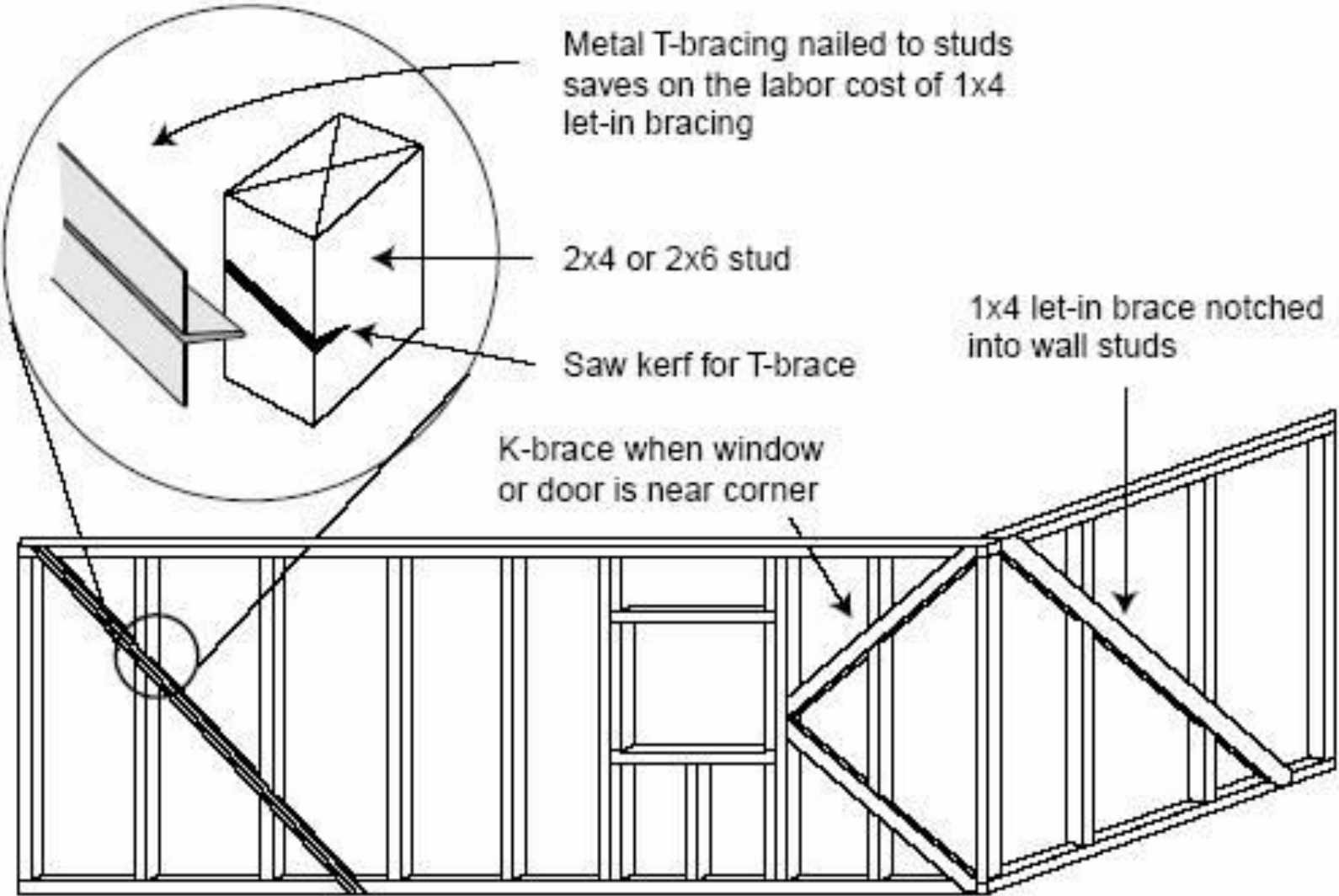
Advanced Framing (OVE)

Best Practice - Using Lumber More Efficiently

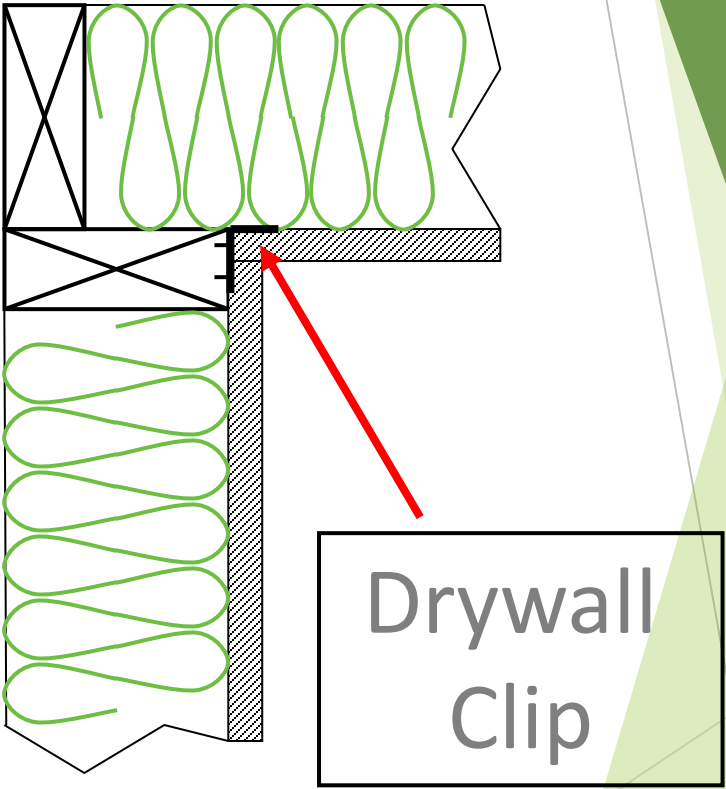
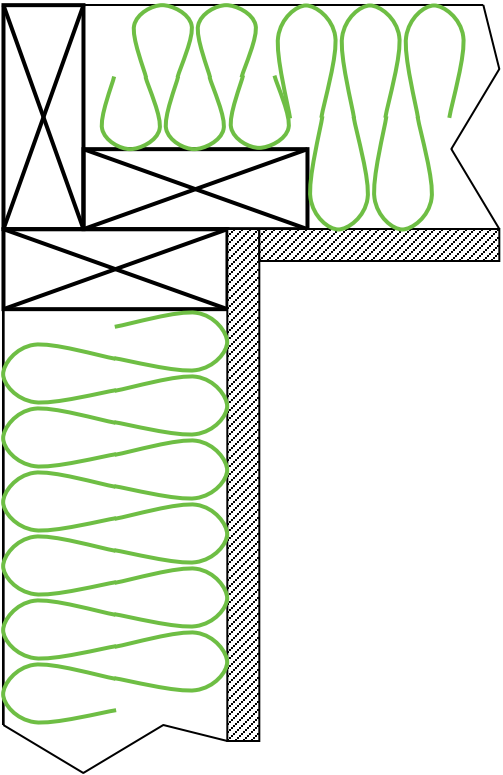
Is This Getting It Done?



Bracing and Insulation



Three and Two Stud Corners



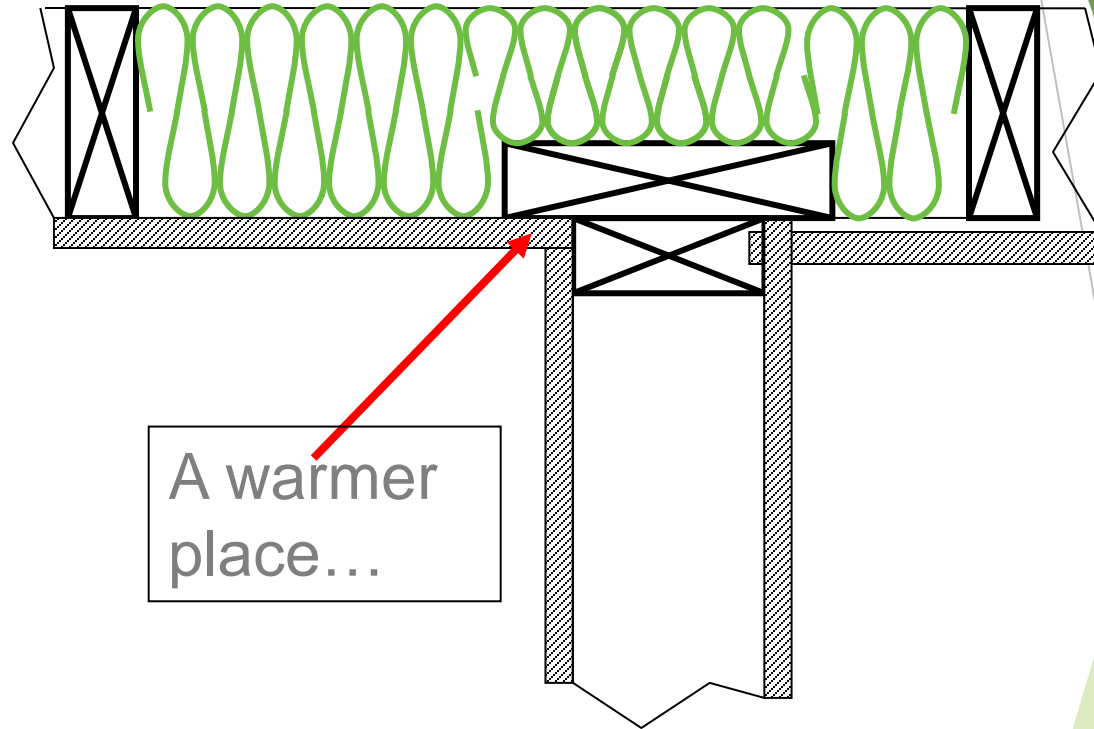
Corner Framing Example



Drywall Backing at Partitions

Backing made of:

- Larger 2x
- Plywood
- Horizontal ladder blocking
- Or drywall clips



Ladder Framing



DETAILS – OVE FRAMING

- minimized cripples
- open web floor truss
- insulating sheathing
- modular dimensions

- 24-inch OC 2X6 in-line
- 2-stud corners
- load-tuned headers
- single top plate



Advanced Framing: Small



1,200 sq. ft. single story

Advanced Framing: Large



8,000 sq. ft. 2-story w/walkout

Whole House Material Savings

| 2x4 16 | 2x6 16 | 2x6 24 | 2x6 Adv.Fr |
|--|---|---|--|
| 276 Studs 940 Bd Ft \$504 | 276 Studs 1475 Bd Ft \$798 | 243 Studs 1289 Bd Ft \$696 | 168 Studs 905 Bd Ft \$471 |
| OSB R-9 \$1138 | OSB R-13 \$1432 | OSB R-14 \$1350 | OSB R-15 \$1122 |
| 1" XPS R-12 \$1094 | 1" XPS R-18 \$1388 | 1" XPS R-18 \$1346 | 1" XPS R-20 \$1157 |

Note: These values do not include any labor savings. Material usage only!



- ▶ Keep the dough rolling

Crawlspaces: To Vent or NOT to Vent

Energy Code - Chapter 4

Residential - Chapter 4

Energy Code - Section 402.2.11 Crawlspace Walls

Allows insulation of Crawlspace sidewalls where crawlspace is NOT ventilated to the outside

Residential Code - 408.1 Under Floor Space

Requires Mechanical Ventilation to inside space of
1 CFM per 50 ft²

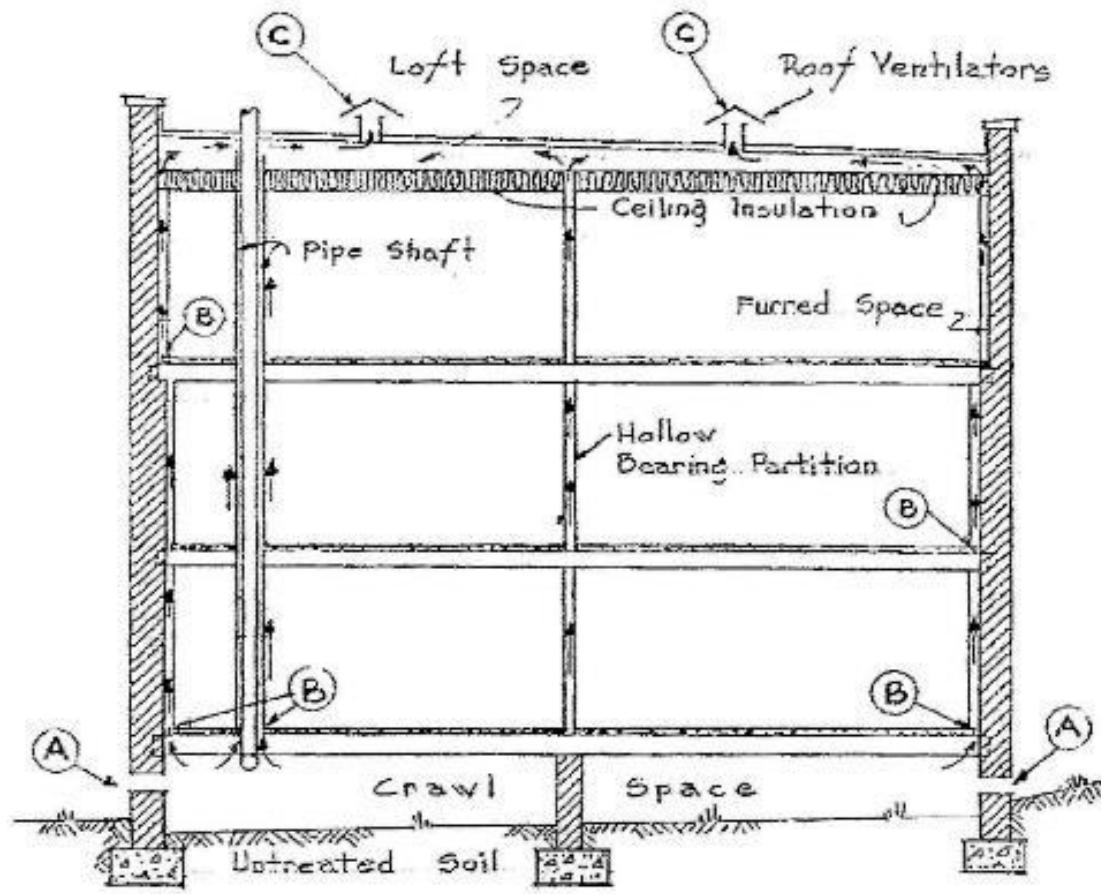
Requires Vapor retarder on ground

Another PERCEIVED Code Barrier, but very real if CEO doesn't like or understand it

Crawlspaces and Basements

- **Dr. Bill Rose, University of Illinois Small Buildings Research Council**
- **Exposed soil is a Major source of Moisture in the home.**
- **100 Lbs. (12.2 gals.) of water per 1,000 SF of dry exposed soil per day!**
- **Whole Family = 8 gals./day**
- **Each 1,000 SF of soil equals 150% increase in moisture contribution!**

Crawlspaces: To Vent or NOT to Vent Best Practice



- Ⓐ = Inadequate wall ventilation:
- Ⓑ = Openings in floor $\frac{1}{8}'' \pm$, continuous
- Ⓒ = Roof ventilation misplaced unless vents are also in side walls above top ceiling floor.
- → Arrows indicate path of warm humid air

Is This a Good Idea?



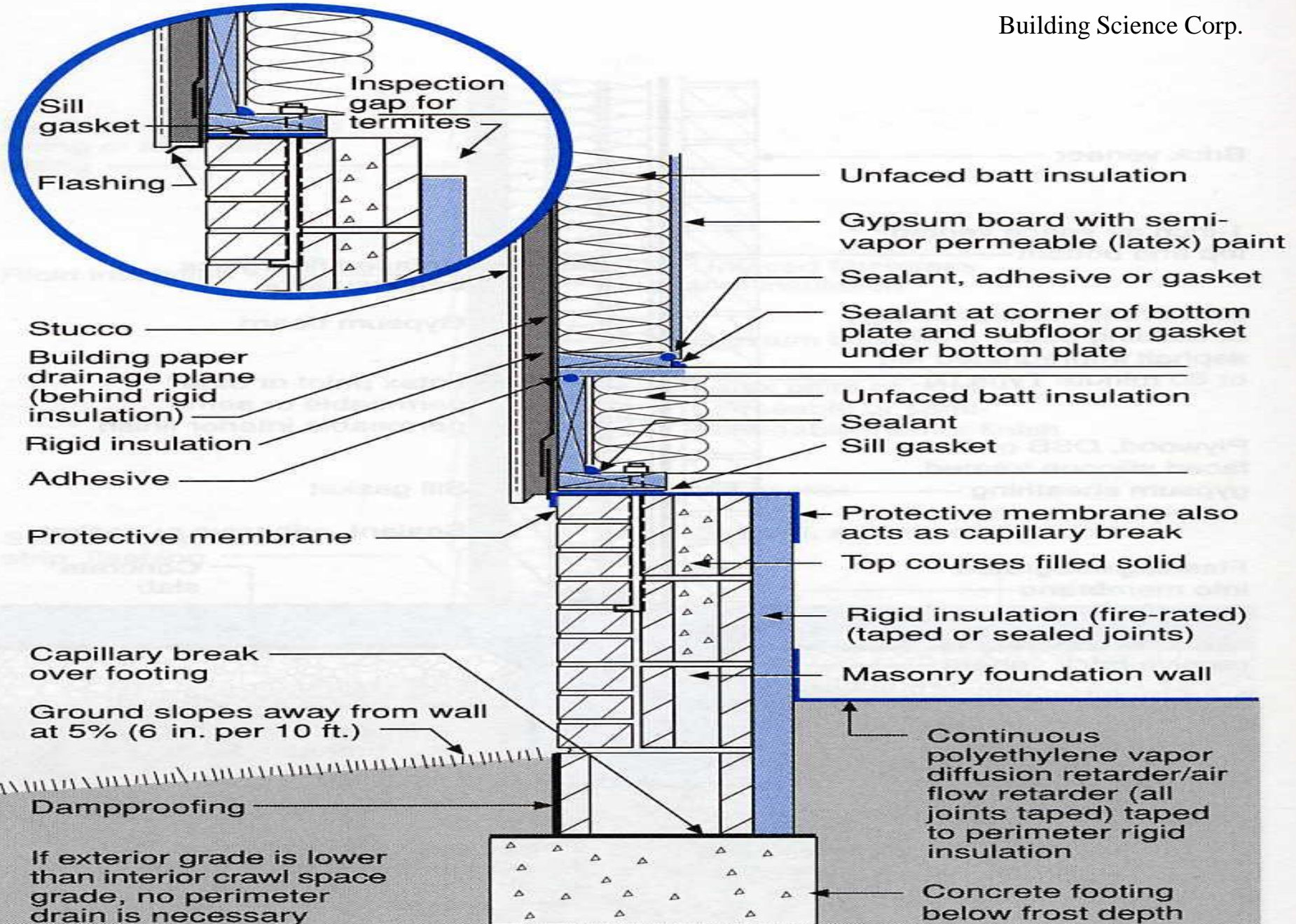
Are vents helping?



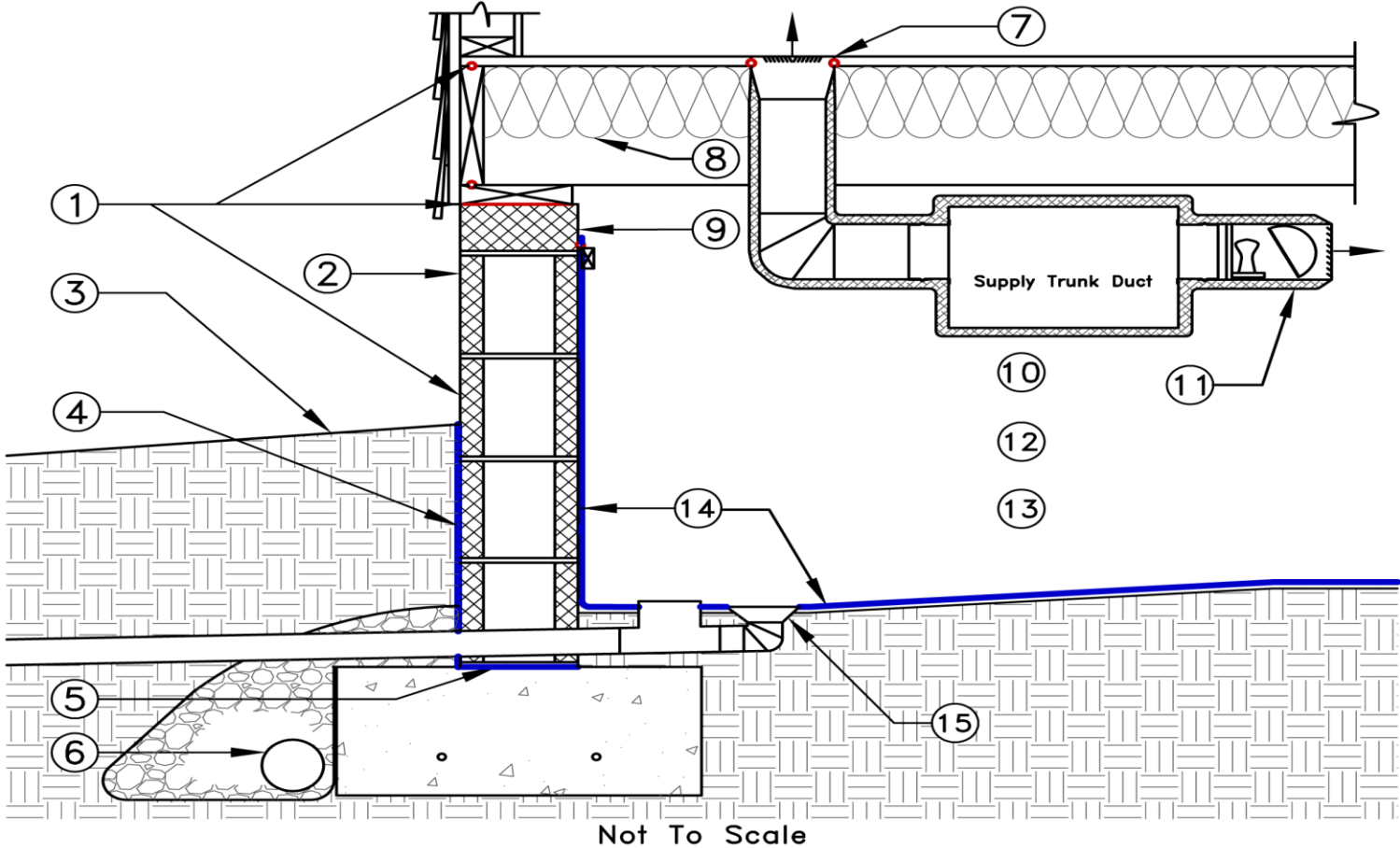
Vented Crawlspaces

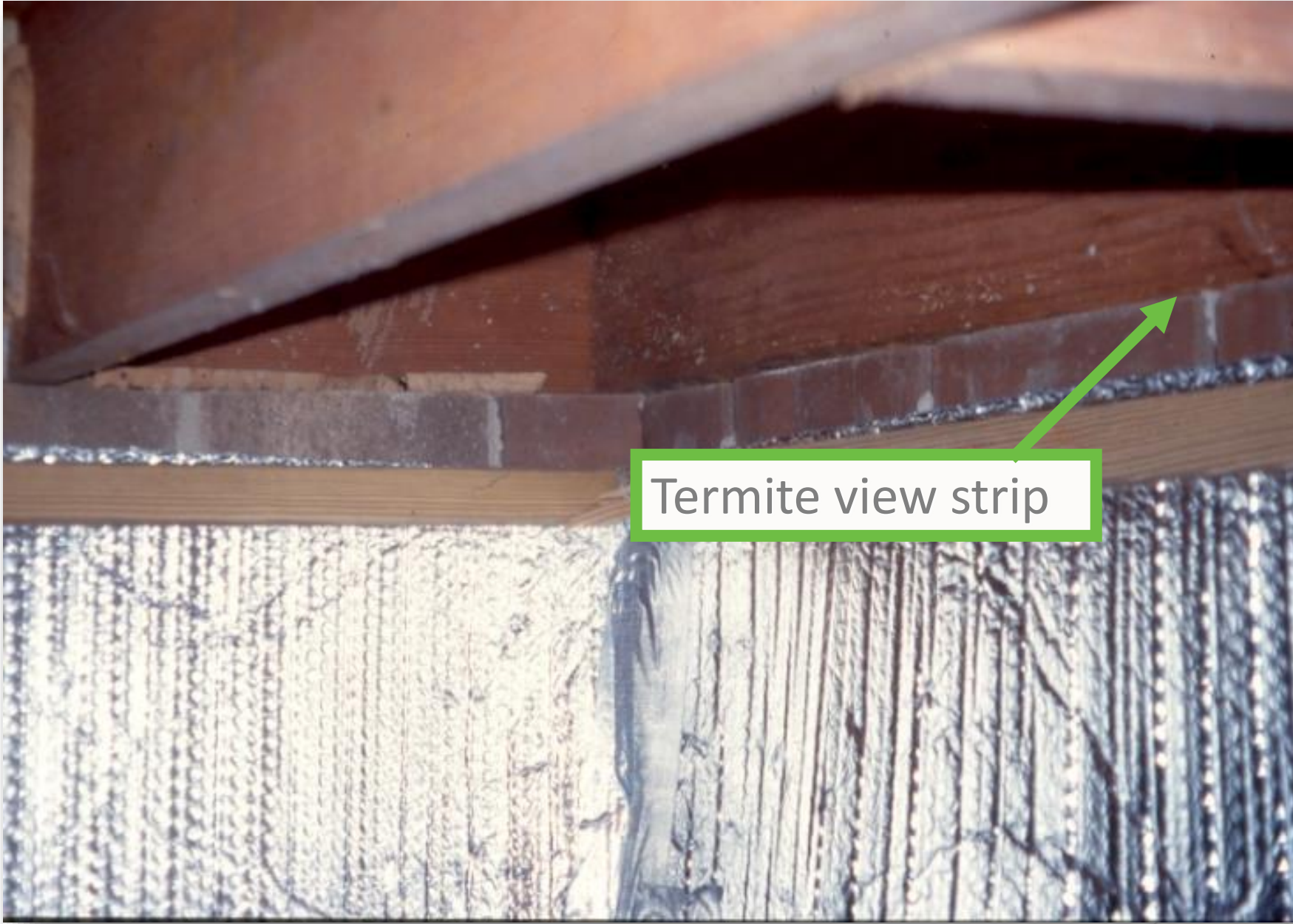


Alternative Detail



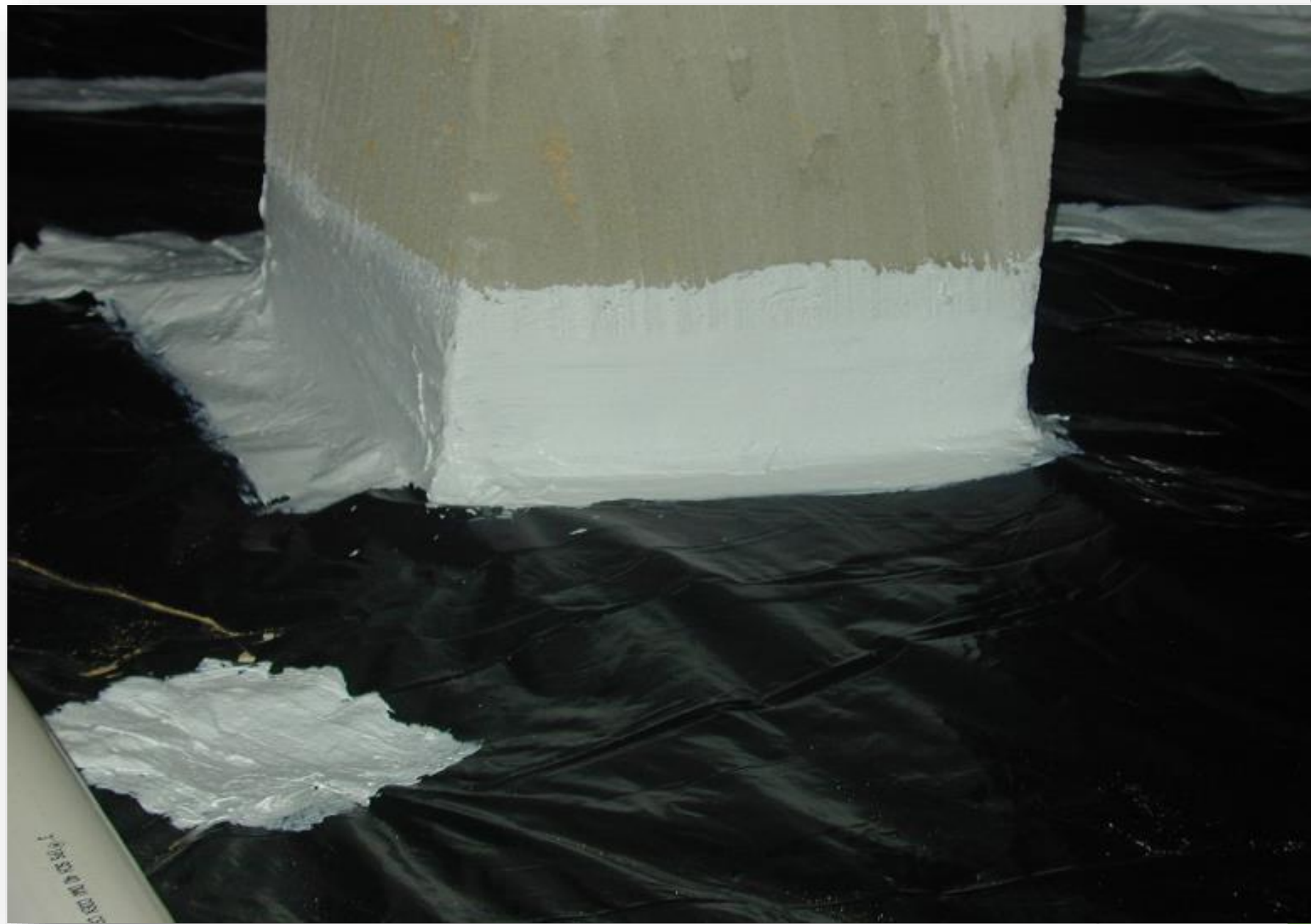
Crawlspaces: To Vent or NOT to Vent Best Practice





Termite view strip

Photo by the Healthy Building Company



1 234 567 890 123 456



Termite view strip



Unvented Crawlspace: Fire Code Issues

- National Evaluation Service - ER-699 allows use of (DOW) foam board insulation uncovered if;
- Entrance for utilities only
- No interconnection to other spaces
- Air not circulated to other spaces
- Foam plastic < 1" or 2" (density driven)
- Meets venting (or no venting in this case, IRC)
- In combustible construction (most all Residential) only

Air Sealing

Energy Code - Chapter 4

Residential Code - Essentially Mirrored

Energy Code - 402.4.1 “Air sealing and Insulation”

Requires Window and Door tested leakage Minimums (NFRC Label)

Caulking and Sealants Somewhat ambiguous; “Exterior Joints, seams, or penetrations in building envelope...” (...tubs, showers, penetrations...”

“shall allow for differential expansion...”

“...Covered with Vapor-permeable house-wrap...”

NEWER AIR LEAKAGE CHECKLIST!!

NOTHING about interior spaces, focuses on ENVELOPE

Residential Code - Mirrors Energy

Fire Retardency –

R602 GENERALLY requires fire retardency if through a fire rated separation, not elsewhere

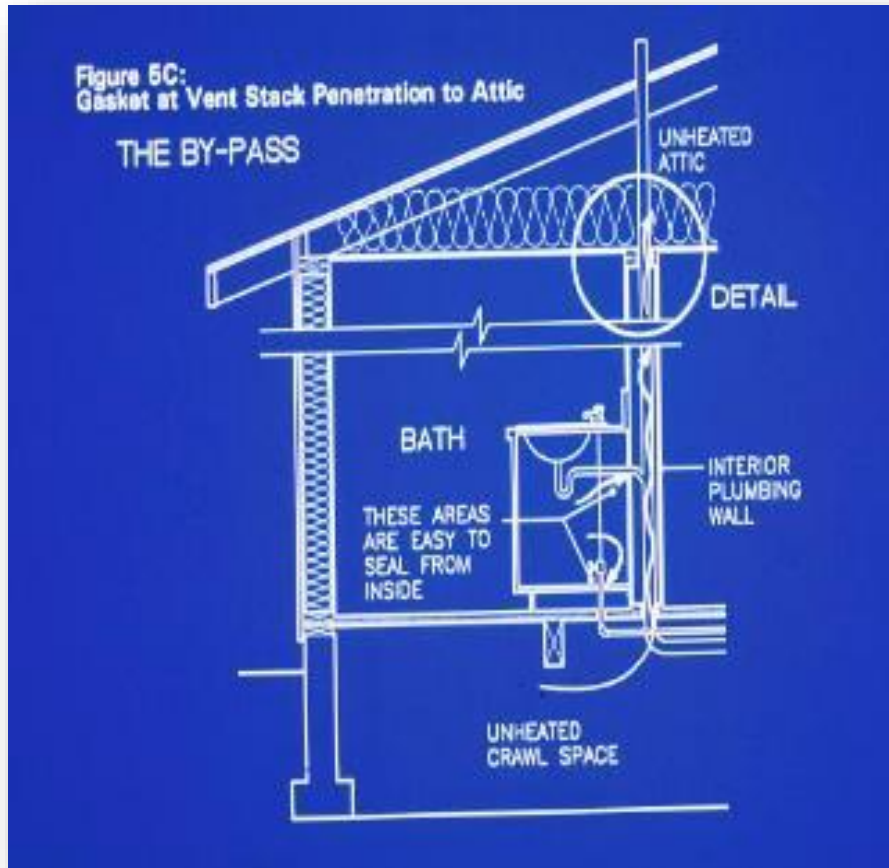
*R302.11, duct penetration of garage/house walls is the only such penetration

Let’s ask the Code Pros...

Who Needs Air Sealing?



Teach The Subs...



**to seal the penetrations
they make!!**

Air Sealing Best Practice

Behind tubs



Plumbing & Electrical...



Roof/Wall Intersections



Chimney Shafts and Penetrations



Cantilevers, Bay Windows, Etc.



Projections



Blower Door Testing

Basic air tightness diagnostics

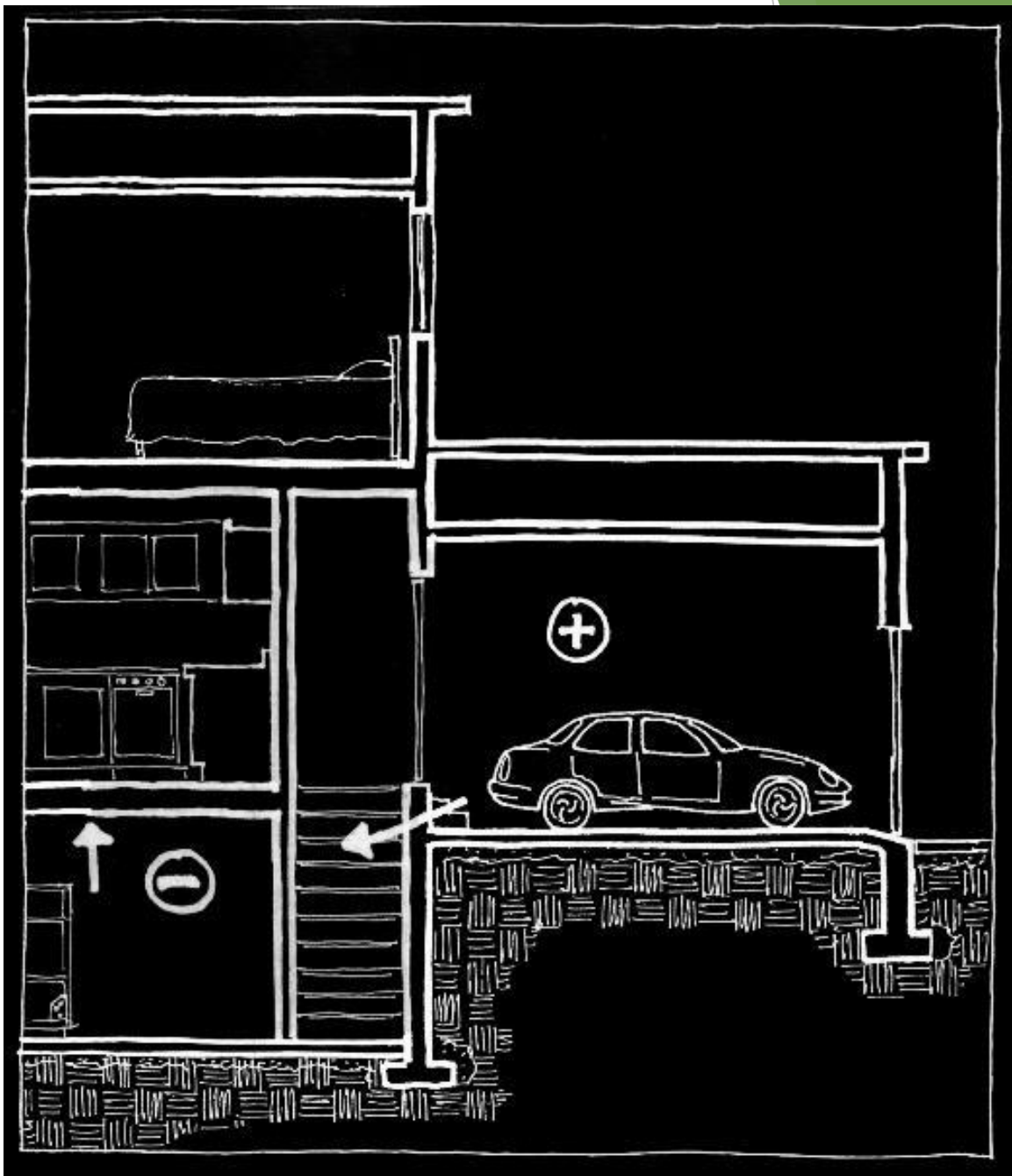


One Approach...

“Own your own holes”



Attached or “built over” garages may shelter the conditioned space thermally, but not in terms of air quality-- air sealing here is critical.



Duct Sealing - What the Code Says:

Energy - Chapter 403

Residential- Chapter 16

Energy Code - Chapter 403.3.2, “Sealing...”

“All joints. transverse seams...”

Sealed with Tapes and Mastics listed in accordance with
UL181A or B

Unlisted Tapes Not Permitted

Residential Code - Chapter 16 “Duct Systems”

Essentially Mirrors Energy – more detail prov



DUCTS – THE NEXT BIG HOLE

Builders don't think about them!

Builder savings?

Yes! Reduce callbacks with:

Improved duct performance

Better duct insulation

Joint sealing

More Detail also in RCNYS-2020 M1504



How Big is the Duct?

▶ Well, it depends...



Multiple Duct Types

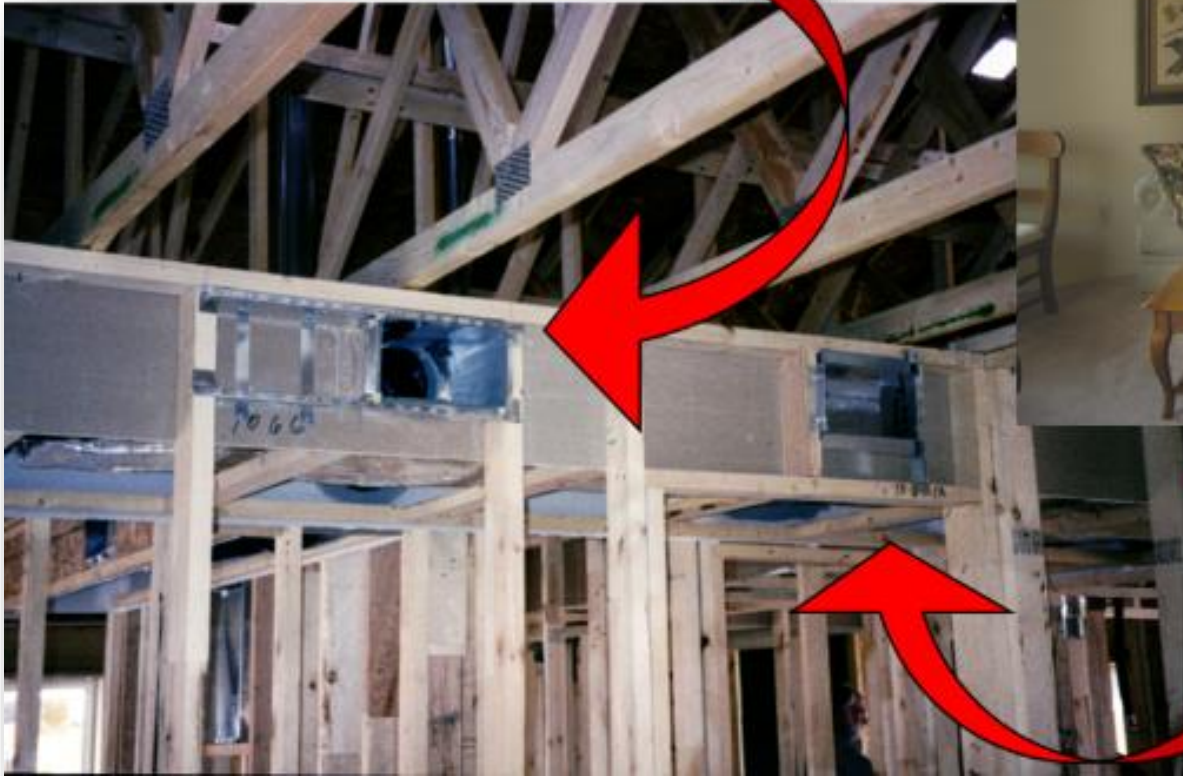


Seal Your Ducts!



Ducts Inside Conditioned Space

Supply in dropped soffit



Note plant shelf/dropped soffit and open plan

Transfer grille

Big Duct Holes and the Code



What's Missing?



Duct Sealing (or Lack Thereof)



But First...



Fresh Air Ventilation



NY Residential Code Ventilation Requirements – RCNYS-2020

- **Primarily in RCNYS-2020, some and ECCCCNYS – 2020**
- **Energy Code requires efficient, quiet fans capable of 100% run time**
- **Res Code – covered in Sec 1504 Mech. Ventilation**
- **Energy Code – fan efficacy covered in Sec R403.6**
- **Does NOT reference ASHRAE 62.2, BUT**
- **Based on 62.2, various versions**

NYS Residential Code Ventilation Requirements...

ECCCNYS–2020 requires Sec R403.6 & Table)

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

RCNYS-2020 – Sec. 1505.4 & 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...

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...”

NYS Residential Code Ventilation Requirements...

CAN be exhaust-only, supply-only, or balanced

Exhaust Only

- Can use a bath or other fan as part of the system
- Must have an accessible override to go to full on (during times of high moisture) or off
- Can be run intermittently per Residential code criteria
- Automatic Control
 - Timer, Programmable, Humidistat

Supply Only

- Ditto above except supply to some general area of house (not bath)
- Usually supplied to basement near HVAC/DHW appliances

NYS Residential Code Ventilation Requirements...

Sec. R303.4 and R1505.4 Mechanical ventilation.

Where the air infiltration rate of a dwelling unit is 5 air changes per hour or less... (testing required by ECCCNY to 3 ACH50) the dwelling unit shall be provided with *whole-house mechanical ventilation in accordance with Section M1505.4*

NYS Residential Code Ventilation Requirements...

Balanced

- Can use a bath or other fan as part of the system
- Must have an accessible override to go to full on (during times of high moisture) or off
- Can be run intermittently per Residential code criteria
- Automatic Control
 - Timer, Programmable, Humidistat
- MAKEUP Air of the same flow as the exhaust, controlled automatically with the exhaust

AND...

- *Can be connected to the return on an air system for distribution*
- *Many E-Star Homes have used passive makeup air systems with barometric dampers*

NYS Residential Code Ventilation Requirements...

Technical Bulletin - Handout



Building Standards and Codes

Division of Building Standards
and Codes

One Commerce Plaza
99 Washington Avenue, Suite 1160
Albany, NY 12231-0001
(518) 474-4073
Fax: (518) 486-4487
www.dos.ny.gov

TB-1003-RCNYS

TECHNICAL BULLETIN

Code Effective Date: October 3, 2016

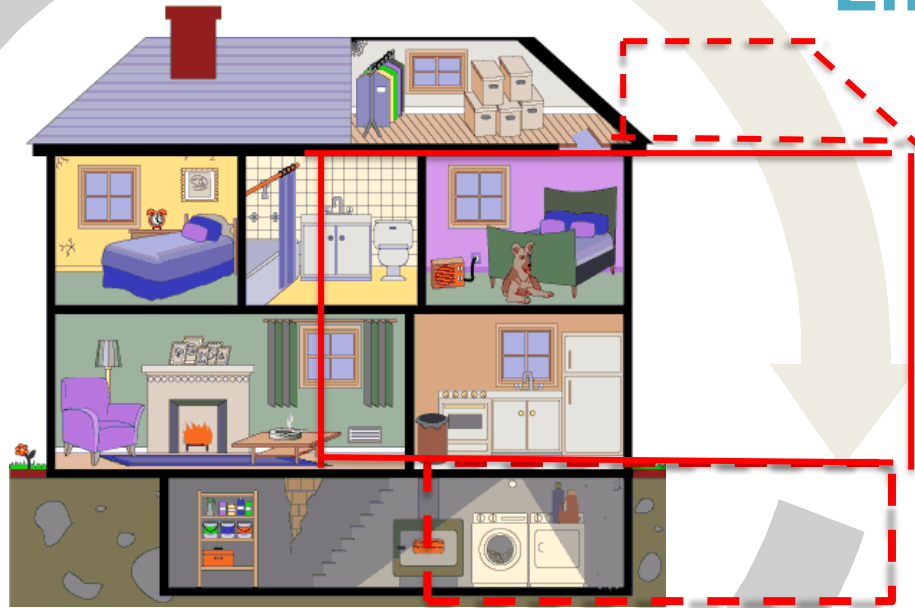
Source Document: 19NYCRR 1240 - Energy Code of New York State-2016 (ECNYS)
19NYCRR 1220 - Residential Code of New York State-2016 (RCNYS)

Topic Section(s) R403.6 (ECNYS), (1103.6-RCNYS)-Mechanical Ventilation
(Mandatory)
Section M1507 - Whole House Mechanical Ventilation (RCNYS)

Why Ventilate – House as a System

Envelope

Environment



Mechanical

Occupants

Home Building Changes

Envelope

- Bigger houses
- Smaller lots
- More and larger windows
- Tighter envelopes
- More insulation
- More complex roofs

Mechanicals

- High Efficiency HVAC
- More air-conditioning
- More plumbing
- More exhaust fans
- More fuel choices
- More appliances and lighting



Multifamily ventilation tends to be more complex

- IAQ Issues - Air Infiltration:
 - Neighboring Units
 - Garage
 - Hallway/Common - Odors
- IAQ Issues - Off Gassing:
 - Cabinets
 - Carpets
 - CO/Combustion
 - Furniture
- IAQ Issues - Moisture & Mold:
 - Leaks
 - Humidity

Multifamily



Multifamily Ventilation

Multifamily ventilation is more important than ever

- Both Low rise and High rise:
 - Property owners are retaining ownership longer than ever.
 - Less desirable land available
 - Gut and rehab, very active
- IAQ Issues & Concerns:
 - Building health concerns
 - Isolating units from Common Building
 - Extensive Air Sealing during rehab
 - Meeting Fire and ventilation codes
- IAQ Issues - Water:
 - Managing moisture, Mold & Mildew
 - Building longevity



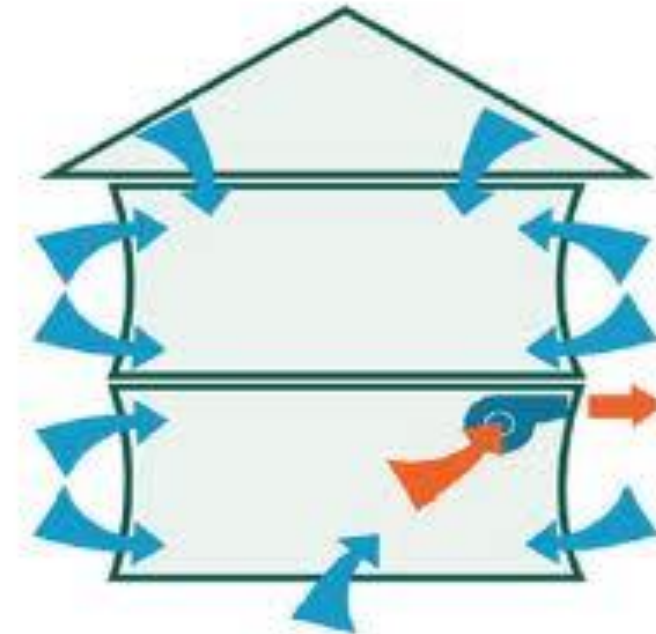
ASHRAE 62.2 – Whole Building EXHAUST

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

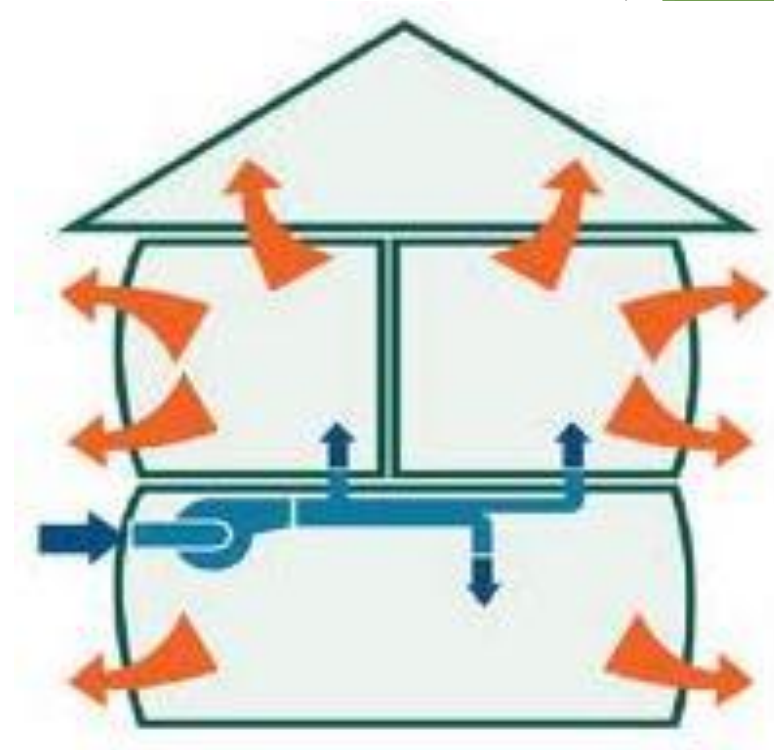
ASHRAE 62.2 - Whole Building SUPPLY

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 BALANCED

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

Advanced, Green & Beyond Code Programs

The right side of the slide features a decorative graphic composed of several overlapping, semi-transparent green triangles and polygons. The colors range from a light, pale green to a dark, forest green. The shapes are arranged in a way that creates a sense of depth and movement, with some shapes appearing to be in front of others. The overall effect is a modern, abstract design that complements the title.

ENERGY STAR® Homes

**A voluntary government backed
program that helps individuals and
businesses protect the environment
through energy efficiency**



A Joint Program



ENERGY STAR[®]

Is a joint program of the



U.S. Environmental Protection Agency

and the

U.S. Department of Energy

*helping us all save money and protect the environment
through energy efficient products and practices*

ENERGY STAR® Labeled Homes - TOWARD NET ZERO!

ENERGY STAR® Labeled Homes

Increased Features & Benefits

Homebuyer

Builder

Environment

Program Incentives

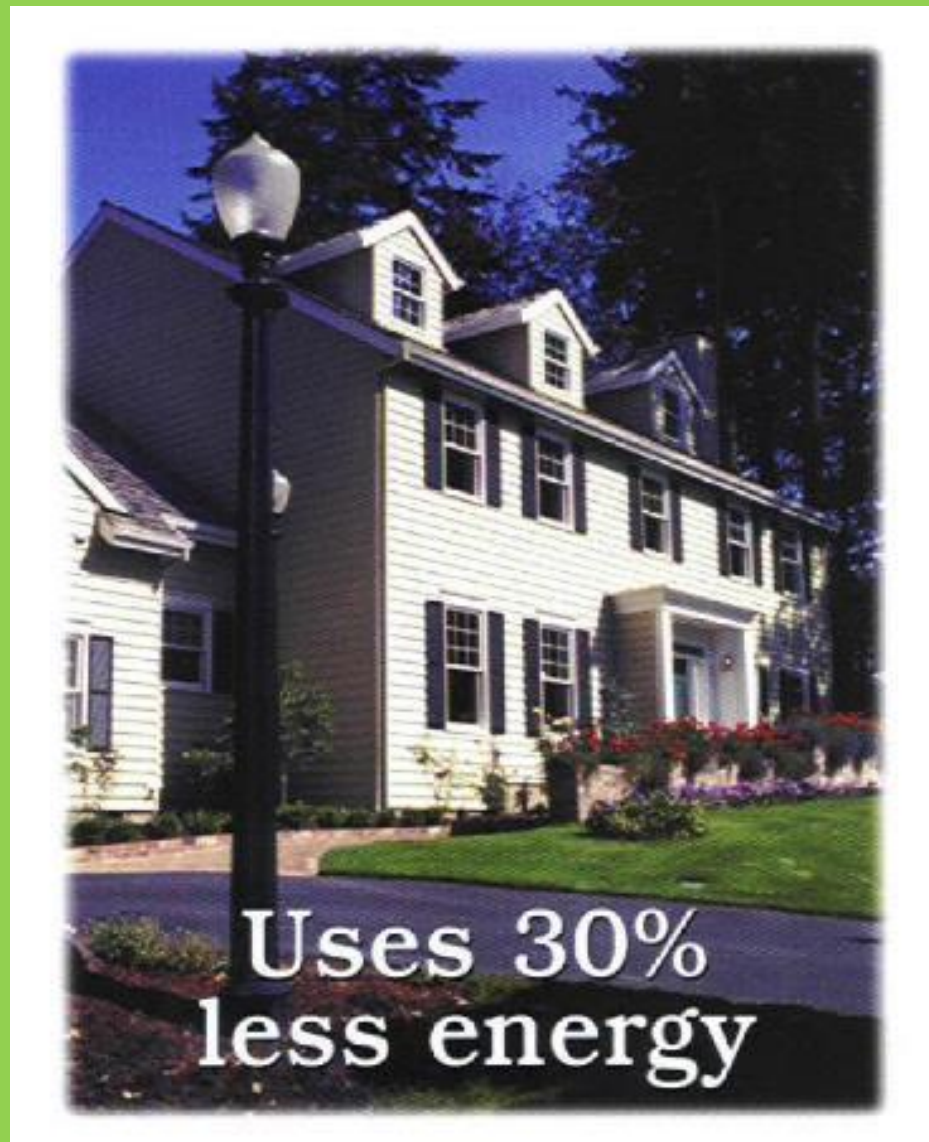
Builder

Co-Op Advertising

Program Participation

Building

Marketing





ENERGY EFFICIENCY

Energy efficiency is the quickest, cleanest and cheapest way to extend our nation's energy supplies

Energy Conservation

Orientation

- Southern exposure

 - Helps heat your home in the winter

 - Protects against heat gain in the summer

- Paying attention to the details

 - Keeps the home from overheating in the summer

Windows

- Large window areas

 - Increase construction costs

 - Drive up energy costs

- Energy Efficient Windows

 - Low-e coatings

 - Insulating spacers

 - Low-conductivity framing materials

Energy Conservation

Air infiltration

Seal the thermal envelope

Junctures

Penetrations

Gaps or holes

Electrical outlets

Through-wall pipes

Around windows

At wall corners

At bottom and top plates

Insulation

Climate-based recommendations from DOE

Installed per Manufacturers recommendations

Energy Conservation

Mechanical systems

- High efficiency equipment
- Properly sized using industry standard manuals
- Centrally located HVAC equipment

Improved duct layout design

- Run in conditioned spaces
- Properly sized
- Sealed with mastic
- Return air runs hard-ducted, not run in wall cavities.

Energy Conservation

Water heating equipment

- High efficiency

- Centrally located

- Tankless water heaters

 - Supply more hot water

 - Lower energy costs

Energy efficient lighting and appliances

- 500 kWh annual savings

Energy Conservation

Indoor Air Quality

Mechanical ventilation

Provides fresh air

Dilutes indoor pollutants

VOCs

Cooking odors

Unwanted moisture

Sealing all walls common to the garage helps keep dangerous exhaust gases from entering the home.

ENERGY STAR® Labeled Homes

Extra benefits mean more value!

Consumers can expect more value from their home purchase including:

- Lower Energy Bills
- Increased Comfort
- Improved Indoor Air Quality
- More Durable, Quality Construction
- Higher Resale Value
- Easier on the Environment

Lower energy bills

Approximately 30% more energy efficient than a standard built home

Tested & certified energy efficient home

Savings could fund anything from college tuition to vacations

Savings could help to pay off mortgage early

Increased Comfort

Walls are warmer in winter & cooler in summer

No cold spots

No drafty windows

More even distribution of heating & cooling

No annoying drafts or airborne dust

More consistent temperature

Tighter, quieter home



Improved Indoor Air Quality

Health & Safety

Ventilation provides fresh, clean air.
Reduced indoor pollutants
Fewer holes where pollen, dust,
pollution, and insects can enter your
home
Healthier living environment



More Durable Quality Construction

Greater attention paid to construction details

High-efficiency equipment is quieter and lasts longer

Fewer moisture problems resulting in longer-lasting building materials

Fewer call-backs



HIGHER RESALE VALUE



- ▶ More durable materials
- ▶ Reduction of moist air
- ▶ Attention to construction quality
- ▶ Fewer problems and fewer call-backs
- ▶ Higher resale price than average homes



Increased Home Value

A study by The Appraisal Journal found that the selling price of homes increased by \$20.73 for every \$1 decrease in energy bills.

If your energy bills average \$1,500/yr. and you saved \$400/yr., your home value would increase by \$8,300.

Environmental Benefits

Preserve precious natural resources

Reduce Air Pollution

By 2012, the U.S. EPA estimates ENERGY STAR®-built homes will reduce pollution by the equivalent of 3,000,000 cars

Builder Benefits

Higher Home Value

- Lower Energy Costs
- Increased Comfort
- Improved Air Quality

Less Callbacks

- Greater Durability

Environmental Responsibility

- Healthier Living Environment
- Reduced air pollution

Cash Incentives



Energy Conservation

Other Considerations

- Water-saving products

 - Low-flow showerheads

 - Low-flow faucets

 - Low-flow toilets

 - Water wise landscaping practices

- Roofing, siding, decking products that have a long service life require less maintenance over time

LEED FOR HOMES UPDATE



The Home Building Industry's View

- ▶ Green home building is at a tipping point among the builder population
- ▶ As of 2006, 50% of builders “are focusing their attention on green building issues”
- ▶ It's the right thing to do





Public Perception?

Reality



Applicable Building Types

Single Family



Market Rate &
Affordable

Multi-Family



Up to 3
Stories

Gut Rehab



Strip to Studs
on One Side

Checklist

Simple

- ❖ 1 page (both sides)
- ❖ 100 points
- ❖ Entry level = 30 pts.

| LEED for HOMES | | Project Checklist | | Maximum Points ² | |
|----------------|------|--|----------|-----------------------------|----------------|
| | | Builder Name: | | | Dry Normal Wet |
| | | Address (Street/City/State): | | | |
| Yes ? No | 1 | Location and Linkages | OR | 10 | |
| HOLD | 1 | LEED-ND Neighborhood | LL2-5 | 10 | |
| | 2 | Site Selection | LL1 | 2 | |
| | 3.1 | Infrastructure | LL1 | 1 | |
| | 3.2 | Site within 1/2 Mile of Existing Water, Sewer, and Roads Select an Infill Site | LL1 | 1 | |
| | 4.1 | Community Resources | LL1 | 1 | |
| | 4.2 | Within 1/4 Mile of Extensive Community Resources / Public Transportation | LL1 | 2 | |
| | 4.3 | AND/OR Within 1/2 Mile of Green Spaces | LL1 | 1 | |
| | 5.1 | Compact Development | LL1 | 1 | |
| | 5.2 | Average Housing Density >= 7 Units / Acre | LL1 | 2 | |
| | 5.3 | OR Average Housing Density >= 20 Units / Acre | LL1 | 3 | |
| | | Sub-Total | | | |
| Yes ? No | | Sustainable Sites | OR | 14 | |
| | 1.1 | Site Stewardship | Required | | |
| | 1.2 | Minimize Disturbed Area of Site (If Site > 1/3 Acre) Erosion Controls (During Construction) | Required | | |
| | 2.1 | Landscaping | Required | | |
| | 2.2 | Basic Landscaping Design | | 1 | |
| | 2.3 | Apply 3 to 4 Inches of Mulch Around Plants Limit Turf | | 5 | 3 1 |
| | 2.4 | Minimize Landscape Water Demand | | 3 | 2 1 |
| | 3 | Shading of Hardscapes | | 1 | |
| | 4.1 | Surface Water Management | Required | | |
| | 4.2 | Locate and Plant Trees to Shade Hardscapes | | 1 | |
| | 4.3 | Install Permeable Material for at Least 65% of Lot (If Lot >= 1/4 acre) Use Permeable Paving Materials Design and Install Permanent Erosion Controls | | 1 | 3 5 |
| | 4.3 | OR | | 1 | 2 3 |
| | | Non-Toxic Pest Control | | 2 | |
| | | Select Insect and Pest Control Alternatives from List | | 2 | |
| | | Sub-Total | | | |
| Yes ? No | | Water Efficiency | OR | 12 | |
| | 1.1 | Water Reuse | Required | | |
| | 1.2 | Rainwater Harvesting System Grey Water Re-Use System | | 1 | |
| | 2.1 | Irrigation System | Required | | |
| | 2.2 | Main Shutoff Valve, Sub-Meter, and Third-Party Inspection | | 5 | 3 1 |
| | 2.3 | Select High Efficiency Measures from List Rain Sensing Controls | | 1 | |
| | 3.1 | Indoor Water Use | Required | | |
| | 3.2 | High Efficiency Fixtures (Toilets, Showers, and Faucets) OR Very High Efficiency Fixtures (Toilets, Showers, and Faucets) | | 3 | |
| | | Sub-Total | | | |
| Yes ? No | | Indoor Environmental Quality | OR | 14 | |
| | 1 | ENERGY STAR with IAP | IE2-10 | 10 | |
| | 2.1 | Meets ENERGY STAR w/ Indoor Air Package (IAP) | Required | | |
| | 2.2 | Space Heating and DHW Equip w/ Closed/Power-Exhaust; & CO Monitor Fireplaces w/ Outside Air Supply and Closed Combustion | IE1 | 1 | |
| | 3 | Humidity Control | IE1 | 1 | |
| | 4.1 | Analyze Moisture Loads AND Install Central System (where Needed) | Required | | |
| | 4.2 | Outdoor Air Ventilation | IE1 | 2 | |
| | 4.3 | Meets ASHRAE Std 62.2 Dedicated Outdoor Air System (w/ Heat Recovery) Third-Party Testing of Outdoor Air Flow Rate into Home | IE1 | 1 | |
| | 5.1 | Local Exhaust | IE1 | 1 | |
| | 5.2 | Meets ASHRAE Std 62.2 Timer / Automatic Controls for Bathroom Exhaust Fans | IE1 | 1 | |
| | 5.3 | Third-Party Testing of Exhaust Air Flow Rate Out of Home | IE1 | 1 | |
| | 6.1 | Supply Air Distribution | IE1 | 2 | |
| | 6.2 | Meets ACCA Manual D Third-Party Testing of Supply Air Flow into Each Room in Home | Required | | |
| | 7.1 | Supply Air Filtering | IE1 | 1 | |
| | 7.2 | >= 8 MERV Filters, w/ Adequate System Air Flow | Required | | |
| | 7.3 | >= 10 MERV Filters, w/ Adequate System Air Flow OR >= 12 MERV Filters, w/ Adequate System Air Flow | IE1 | 2 | |
| | 8.1 | Contaminant Control | IE1 | 1 | |
| | 8.2 | Seal-Off Ducts During Construction Permanent Walk-Off Mats OR Central Vacuum | Required | | |
| | 8.3 | Third-Party Testing of Particulates and VOCs before Occupancy | IE1 | 1 | |
| | 9.1 | Radon Protection | IE1 | 1 | |
| | 9.2 | Install Radon Mitigation System if Home is Located in EPA Region 1 Install Ground Contaminant Mitigation System (Outside of EPA Region 1) | Required | | |
| | 10.1 | Vehicle Emissions Protection | IE1 | 1 | |
| | 10.2 | No Air Handling Equipment OR Return Ducts in Garage | Required | | |
| | 10.3 | Tightly Seal Shared Surfaces between Garage and Home Exhaust Fan in Garage OR No Garage in Contact with Home | IE1 | 1 | |
| | | Sub-Total | | | |

| Materials and Resources | | OR | | 24 | |
|-------------------------|------|---|----------|----|-----|
| Yes ? No | 1 | Home Size | Required | | |
| | 2.1 | Home that is Smaller than National Average | | 10 | |
| | 2.2 | Material Efficient Framing | Required | | |
| | 2.3 | No Extra Uses of Lumber for Aesthetic Purposes Advanced Framing Techniques | IE1 | 2 | |
| | 3 | Local Sources | Required | | |
| | 4.1 | Materials Extracted / Manufactured / Produced within 500 Miles | Required | | |
| | 4.2 | Durability Plan | Required | | |
| | 4.3 | Detailed Durability Plan: (Pre-Construction) Third-Party Verification of Implementation of Durability Plan | IE1 | 3 | 5 |
| | 5.1 | Environmentally Preferable Products | Required | | |
| | 5.2 | Tropical Hardwoods, if used, must be FSC Select Environmentally Preferable Products from List | Required | | |
| | 6.1 | Waste Management | Required | | |
| | 6.2 | Max of 2.5 Lbs Per Square Foot of Construction Waste Sent to Landfill 0.5 Pts for Each Additional 0.5 Lbs Per Square Foot Reduction | Required | | |
| | | Sub-Total | | | |
| Yes ? No | | Energy and Atmosphere | OR | 23 | |
| | 1.1 | ENERGY STAR Home | Required | | |
| | 1.2 | Meets ENERGY STAR for Homes with Third-Party Testing Exceeds ENERGY STAR for Homes, 2 Pts Per HERS Point > HERS 86 | EA2-7 | 16 | |
| | 2.1 | Insulation | Required | | |
| | 2.2 | Third-Party Inspection of Insulation Installation, At Least HERS Grade II | EA1 | 1 | |
| | 2.3 | OR Third-Party Inspection of Insulation Installation, At Least HERS Grade I Above Code Insulation; At Least 5% > Local Code Per REScheck | EA1 | 1 | |
| | 3.1 | Air Infiltration | Required | | |
| | 3.2 | Third-Party Envelope Air Leakage Tested <= 0.35 ACH | EA1 | 1 | |
| | 3.3 | OR Third-Party Envelope Air Leakage Tested <= 0.15 ACH | EA1 | 2 | |
| | 4.1 | Windows | Required | | |
| | 4.2 | Windows Meet ENERGY STAR for Windows (See Table) | EA1 | 1 | |
| | 4.3 | OR Windows Exceed ENERGY STAR for Windows by >= 10% (See Table) OR Windows Exceed ENERGY STAR for Windows by >= 20% (See Table) | EA1 | 2 | |
| | 5.1 | Duct Tightness | Required | | |
| | 5.2 | Third-Party Duct Leakage Tested <= 5.0 CFM25 / 100 SF to Outside | EA1 | 1 | |
| | 5.3 | OR Third-Party Duct Leakage Tested <= 3.0 CFM25 / 100 SF to Outside OR Third-Party Duct Leakage Tested <= 1.0 CFM25 / 100 SF to Outside | EA1 | 2 | |
| | 6.1 | Space Heating and Cooling | Required | | |
| | 6.2 | Meets ENERGY STAR for HVAC w/ Manual J & refrigerant charge test | EA1 | 1 | |
| | 6.3 | Exceeds ENERGY STAR for HVAC by >= 10%, w/ Manual J OR Exceeds ENERGY STAR for HVAC by >= 20%, w/ Manual J | EA1 | 3 | |
| | 7.1 | Water Heating | Required | | |
| | 7.2 | Improved Hot Water Distribution System Improved Water Heating Equipment | EA1 | 3 | |
| | 8.1 | Lighting | Required | | |
| | 8.2 | Energy Efficient Fixtures and Controls OR ENERGY STAR Advanced Lighting Package | EA1 | 3 | |
| | 9.1 | Appliances | Required | | |
| | 9.2 | Select Appliances from List Very Efficient Clothes Washer (MEF > 1.8, AND WF < 5.5) | EA1 | 2 | |
| | 10 | Renewable Energy | Required | | |
| | 10.1 | Renewable Electric Generation System (1 Point / 10% Annual Load Reduction) | EA1 | 1 | |
| | 11 | Refrigerant Management | Required | | |
| | 11.1 | Minimize Ozone Depletion and Global Warming Contributions | EA1 | 1 | |
| | | Sub-Total | | | |
| Yes ? No | | Homeowner Awareness | OR | 1 | |
| | 1.1 | Homeowner Education | Required | | |
| | 1.2 | Basic Owner's Manual and Walkthrough of LEED Home Comprehensive Owner's Manual and Multiple Walkthroughs / Trainings | EA1 | 1 | |
| | | Sub-Total | | | |
| Yes ? No | | Innovation and Design Process | OR | 4 | |
| | 1.1 | Innovative Design | Required | | |
| | 1.2 | Provide Description and Justification for Specific Measure | EA1 | 1 | |
| | 1.3 | OR Provide Description and Justification for Specific Measure | EA1 | 1 | |
| | 1.4 | Provide Description and Justification for Specific Measure | EA1 | 1 | |
| | | Sub-Total | | | |
| | | Project Totals ¹ (pre-certification estimates) | | | 108 |

Notes: 1. Certified 30-49 points Silver 50-69 points Gold 70-89 points Platinum 90-108 points
2. *Points* are shown for 3 precipitation zones: Dry (< 20 inches / year); Normal (20-40 inches / year); and Wet (> 40 inches / year)

I hereby attest that I have verified all of the indicated credits above as installed in the home identified above.

Rater's Name _____ Company _____
Signature _____ Date _____

I hereby attest that I have reviewed the verification information, and certify that this home meets the requirements of LEED for Homes

Provider's Name _____ Company _____
Signature _____ Date _____

Rating System

Rating System
For Pilot Demonstration of
LEED® for Homes Program

US Green Building Council

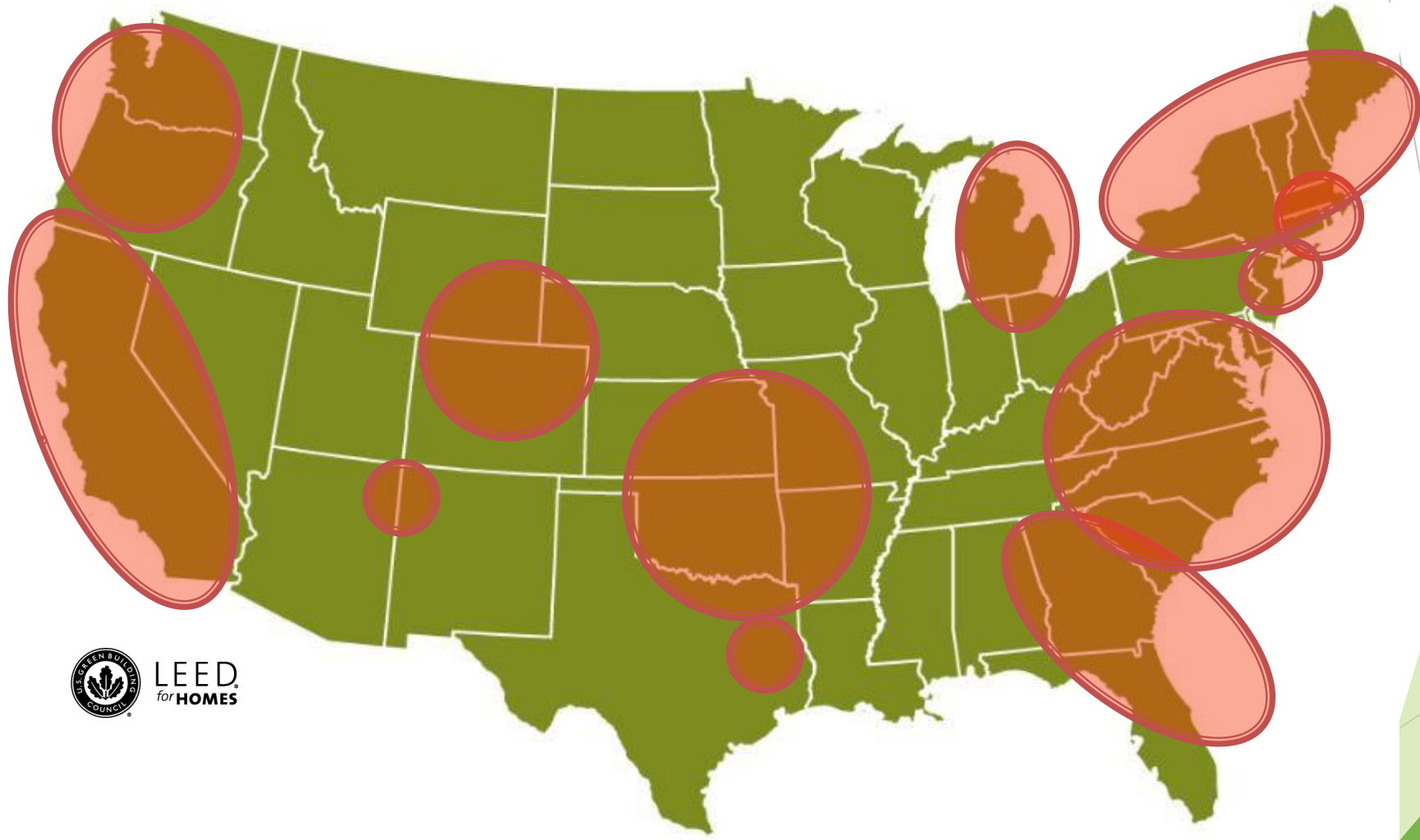
August 5, 2005

www.usgbc.org/leed/homes



LEED®
for **HOMES**

Pilot Markets



Who is Working with LEED for Homes?

National Programs

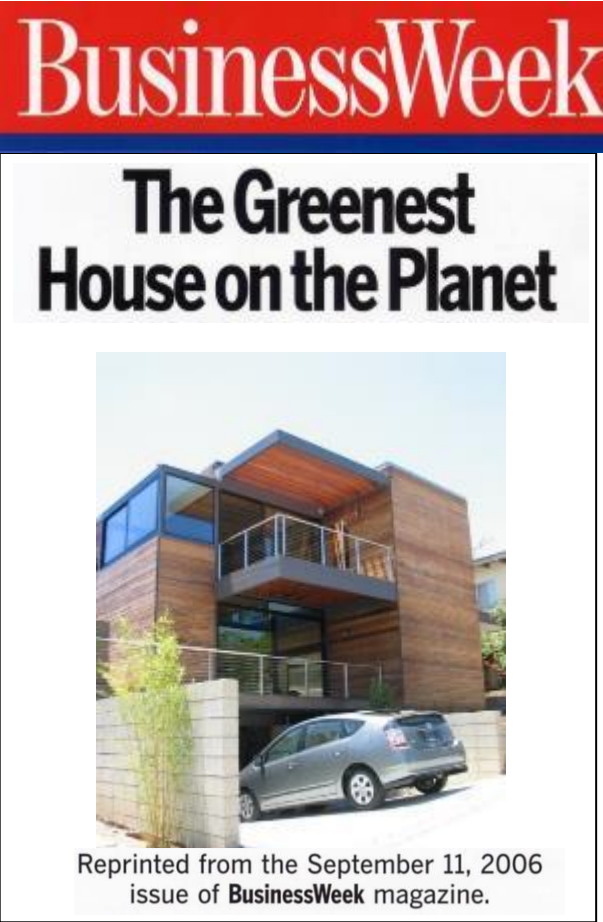


ENVIRONMENTS FOR **Living**

Local and Regional Programs



What is the Media saying about LEED for Homes?



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What the Focus Is On



Code Intent

Energy - Chapter 103

Residential- Chapter 104

Energy and Residential Codes

“Alternate Materials...”

“The Provisions of this code are not intended to prevent the use of any materials, method of construction...”

Manufacturers - Do some testing!
Go for ES evaluation!

Code Intent...

Energy - Chapter 103

Residential- Chapter 104

In NY - Energy and Residential Codes

“Alternate Materials...”

“The Provisions of this code are not intended to prevent the use of any materials, method of construction...

Approved by the State Fire Prevention and Building Code Council as meeting the intent of this code.”

Promote product testing/verification!

Go for ES evaluation!

Work with CEO's NY-DOS and Code Council on approval!

Thank You!



Mike DeWein
North Branch Services

- Energy Code Consulting & Municipal Services
- Plan Review Services
- Air Barrier Inspections
- Large Building Blower Door Testing

dewein53@gmail.com

518-369-7545