

THE BEST INSULATION INSTALLATION - ACHIEVING GRADE I

ICAA CONFERENCE

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www.southface.org



LEARNING OBJECTIVES

- Comprehend the Building Thermal Envelope
- Understand energy code air barrier & insulation requirements
- Learn the details of properly installed insulation – Grade I



SCOPE OF RESIDENTIAL ENERGY CODE

- Focus is on building envelope
 - Ceilings, walls, windows, floors, foundations
 - Sets insulation levels, window U-factors and SHGC
 - Infiltration control
 - Caulk and seal to prevent air leaks
 - Verify tight envelope with blower door or visual inspection
- Ducts
 - No building cavities as ducts
 - Seal and insulate
 - Verify tight with duct pressurization test
- Lighting equipment
 - high-efficacy lamp required
- No appliance requirements
- Alternatives to prescriptive compliance



RESIDENTIAL BUILDINGS

- New construction
- 1 and 2 family (R3)
- Multi-family, 3 stories and less (R2 and R4) – IECC
- Additions, Alterations, Repairs



CONDITIONED SPACE. For energy purposes, space within a building that is provided with heating and/or cooling *equipment* or systems capable of maintaining, through design or heat loss/gain, 50°F (10°C) during the heating season and 85°F (29°C) during the cooling season, or communicates directly with a *conditioned space*. For mechanical purposes, an area, room or space being heated or cooled by any *equipment* or *appliance*.

Exempt Buildings

- No conditioning
- Historical



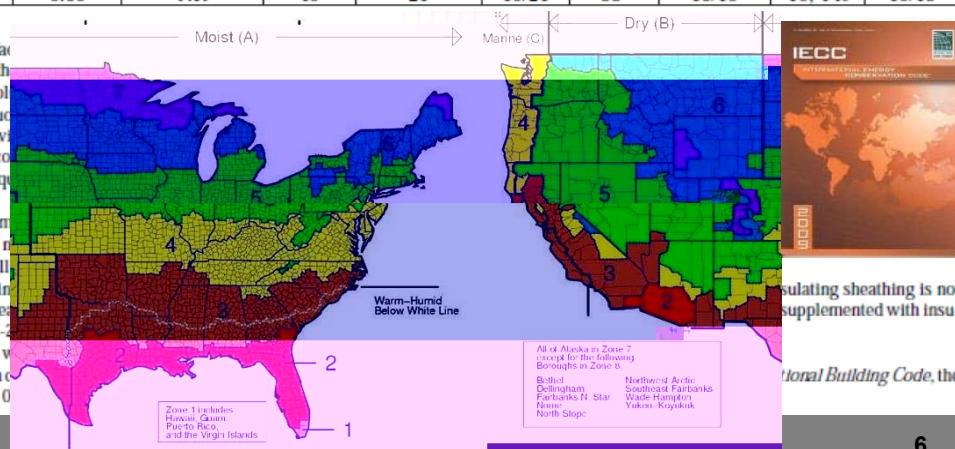
2009 IECC- Section 402.1



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 ⁱ	FLOOR R-VALUE	BASEMENT ^c WALL R-VALUE	SLAB ^d R-VALUE & DEPTH	CRAWL SPACE ^e WALL R-VALUE
1	1.2	0.75	0.30	30	13	3/4	13	0	0	0
2	0.65 ^j	0.75	0.30	30	13	4/6	13	0	0	0
3	0.50 ^j	0.65	0.30	30	13	5/8	19	5/13 ^f	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13+5 ^h	13/17	30 ^g	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13+5 ^h	15/19	30 ^g	15/19	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	38 ^g	15/19	10, 4 ft	10/13

For SI: 1 foot = 304.8 mm.

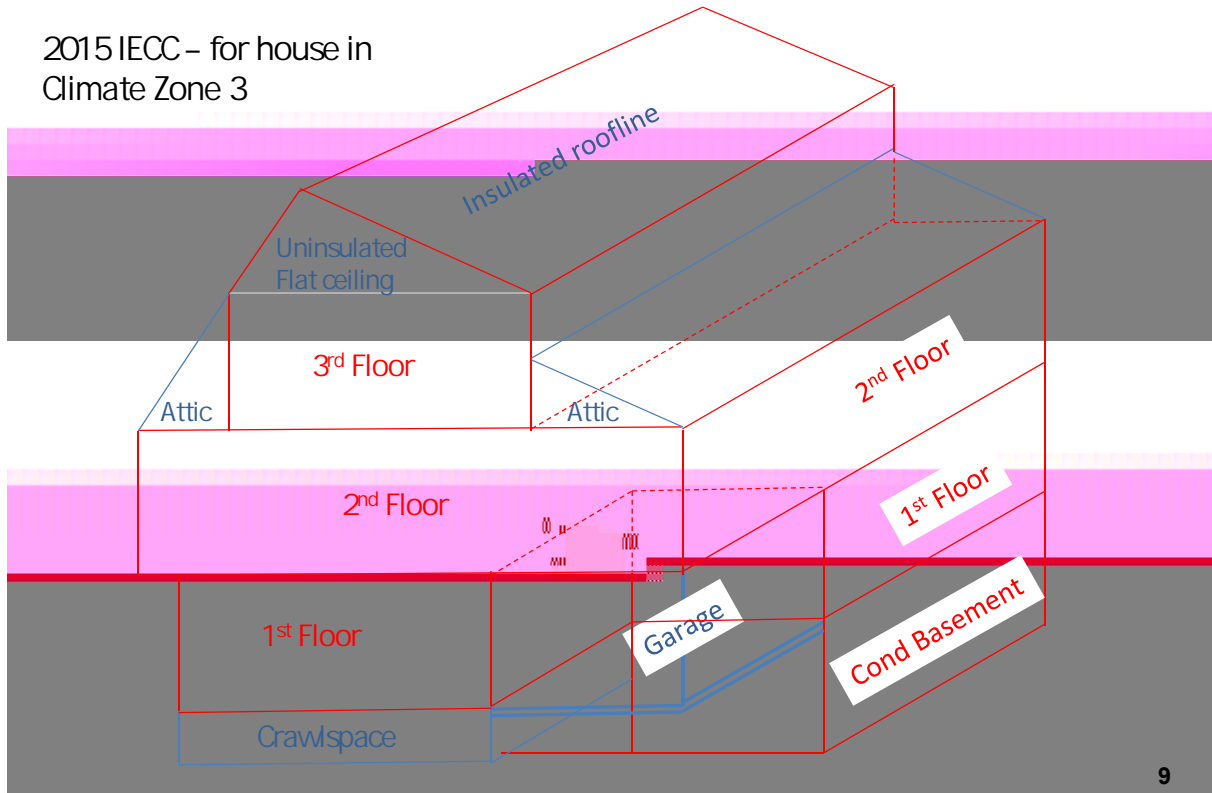
- R-values are minimums. U-factors more shall be marked with the letter R.
- The fenestration U-factor color coding shall be marked with the letter U.
- "15/19" means R-15 continuous insulation shall be permitted to be met with 19 inches of structural sheathing. "10/13" means R-10 continuous insulation shall be permitted to be met with 13 inches of structural sheathing.
- R-5 shall be added to the required R-value through 3 for heated slabs.
- There are no SHGC requirements for skylights.
- Basement wall insulation is required where structural sheathing is not supplemented with insulation.
- Or insulation sufficient to fill the cavity.
- "13+5" means R-13 cavity insulation plus 5 inches of structural sheathing of at least R-8.
- The second R-value applies to the exterior wall.
- For impact rated fenestration, the maximum U-factor shall be 0.45.



insulating sheathing is not supplemented with Insu-

International Building Code, the

2015 IECC – for house in
Climate Zone 3



RESIDENTIAL ENERGY CODE FIELD STUDY – GEORGIA RESULTS

8 Key Items :

- High-efficiency lighting
- Envelope tightness (ACH50)
- Duct leakage
- Exterior wall insulation
- Ceiling insulation
- Foundation insulation (floor / basement wall / slab)
- Window U-factor
- Window SHGC



63 observations of each key item minimum

ENVELOPE TIGHTNESS (ACH50)

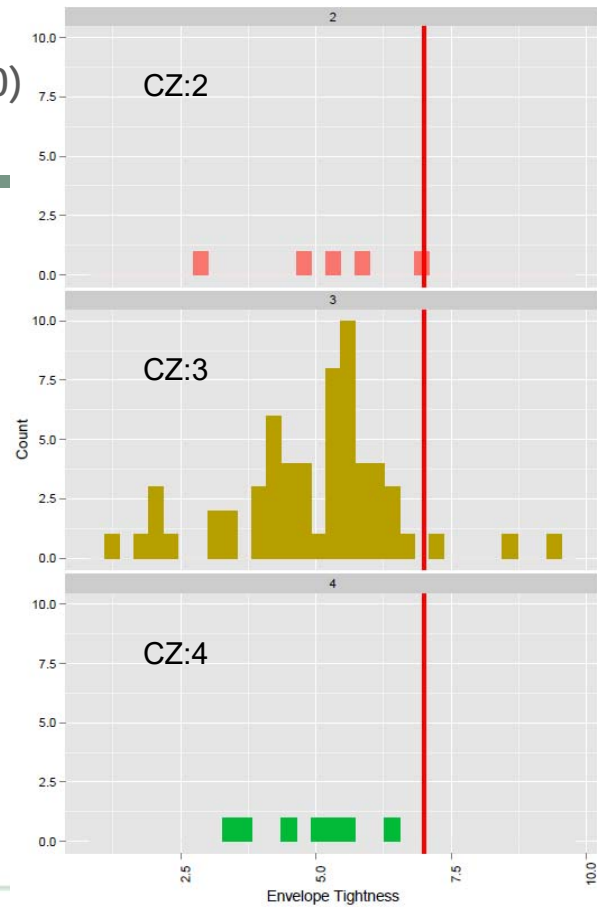
NO. OF OBSERVATIONS: 73

Vertical **red** line indicates the 2009 IECC prescriptive code requirement of 7 ACH50 (max.)

Only 4 results worse than code of 73 tests conducted

The average ACH50 for all homes tested was 4.9

Lower is Better!



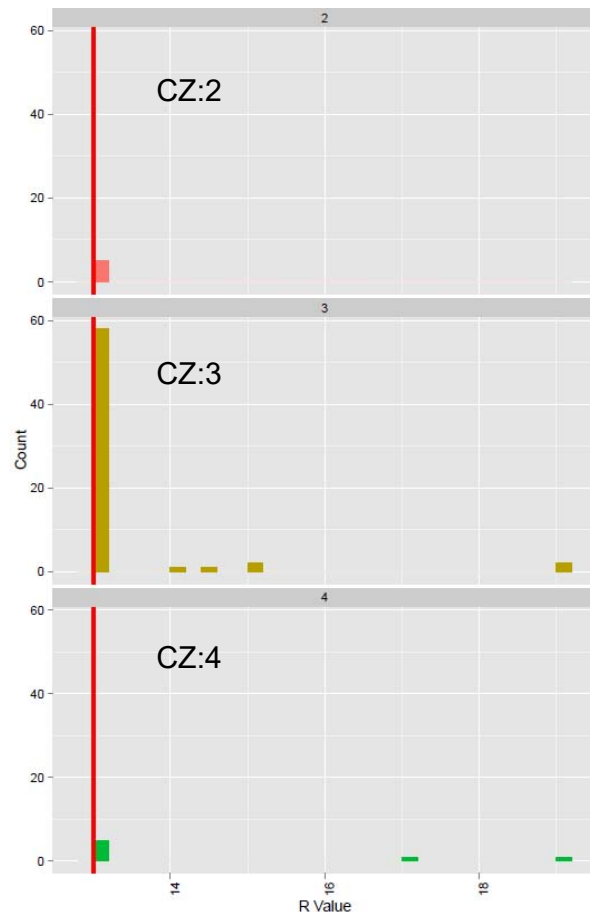
FRAME WALL R-VALUE (CAVITY)

NO. OF OBSERVATIONS: 76

Vertical **red** line indicates the 2009 IECC prescriptive code requirement of R-13 for all CZ's

Quality of installation (Grade) was generally **poor**

Higher is Better!



CEILING R-VALUE

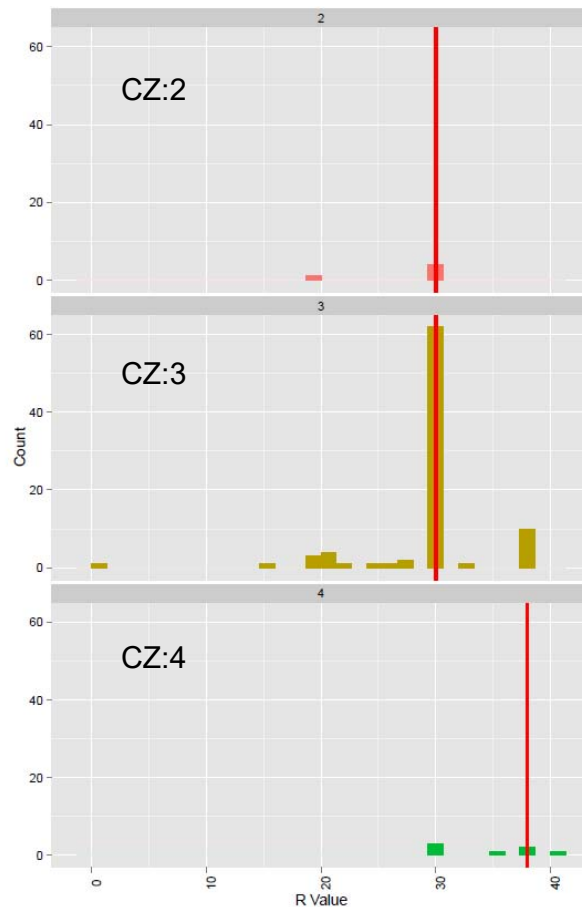
NO. OF OBSERVATIONS: 99

Vertical **red** line indicates the 2009 IECC prescriptive code requirement of R-30 in CZ's 2 & 3 and R-38 in CZ 4

GA Code allows ceiling insulation to be traded down to as low as R-19

Quality of installation (Grade) was generally **average to poor**

Higher is Better!



Section 402.2: Insulation Requirements



- Details for insulating various aspects of the building envelope
 - Ceilings with Attic – 402.2.1
 - Ceilings w/out Attic – 402.2.2
 - Access hatches and doors – 402.2.3
 - Mass Walls – 402.2.4
 - Steel Framing – 402.2.5
 - Floors – 402.2.6
 - Basement Walls – 402.2.7
 - Slab-on-grade – 402.2.8
 - Crawlspace Walls – 402.2.9
 - Masonry Veneer – 402.2.10
 - Sunrooms – 402.2.11

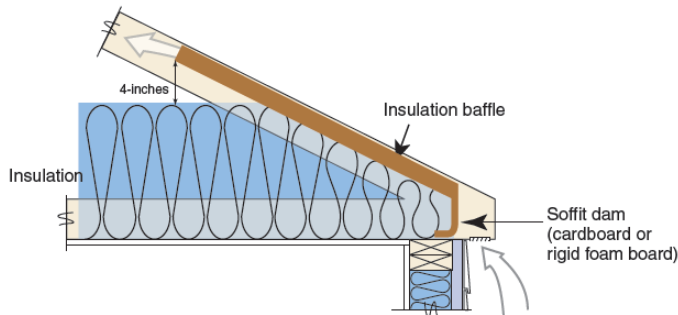
402.2.1 - Ceilings with Attics

- GA: R-19 acceptable under HVAC attic platforms (32 s.f./platform + 32" walkway)
- Rulers required every 300 s.f.

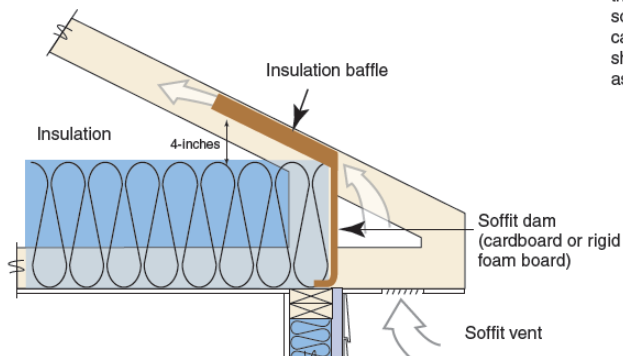


402.2.1.1 GA: Wind wash baffle

Standard Truss with tapered insulation depth



Energy Truss with full height insulation (recommended)

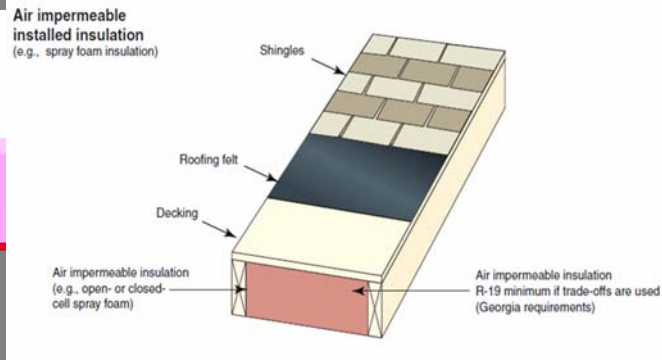


Note: Wind wash baffle and air-permeable insulation dam. For air permeable insulation in vented attics, baffles shall be installed adjacent to soffit and eave vents. A minimum of a 1-inch of space shall be provided between the insulation and the roof sheathing and at the location of the vent. The baffle shall extend over the top of the insulation inward until it is at least 4 inches vertically above the top of the insulation. Any solid material such as cardboard or thin insulating sheathing shall be permissible as the baffle.



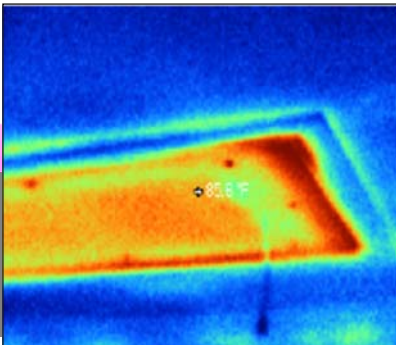
402.2.2 - Ceilings without Attics

- R-30 for 20% (up to 500 s.f.) acceptable for CZ4
- Vaulted ceilings and foam sprayed rooflines will need to perform an R-value trade-off (REScheck)
- GA specific: Can trade down to R-19 if only spray foam insulation is used (air impermeable insulation)



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402.2.3 - Attic Access



- Weather-strip and insulate access doors (GA clarification)
 - Vertical doors: R-5
 - Pull-down stairs: R-5
 - Hatches/scuttle hole covers: R-19



- If 990 s.f. = R-30, and 10 s.f. = R-1, Effective R-value = R-23!



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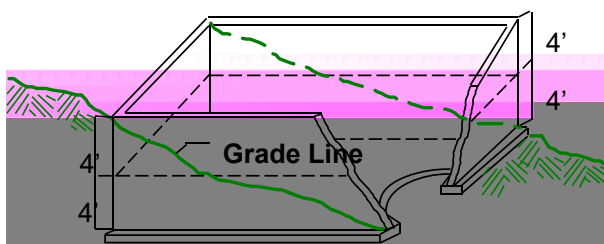
402.2.6 – Floors

- Floors – insulation must maintain **continuous permanent contact** against subfloor



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402.2.7 Basement Walls



- Basement Wall – Average gross wall must be > 50% below grade and enclose conditioned space
- CZ4: R-10 continuous or R-13 cavity
- CZ3: R-5 continuous or R-13 cavity
- CZ2: No insulation required



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402.2.7 Basement Walls

Insulation strategies:

Cellulose batt



Fiberglass batt w/ vinyl backing

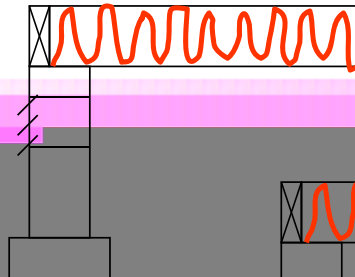


Rigid foam board

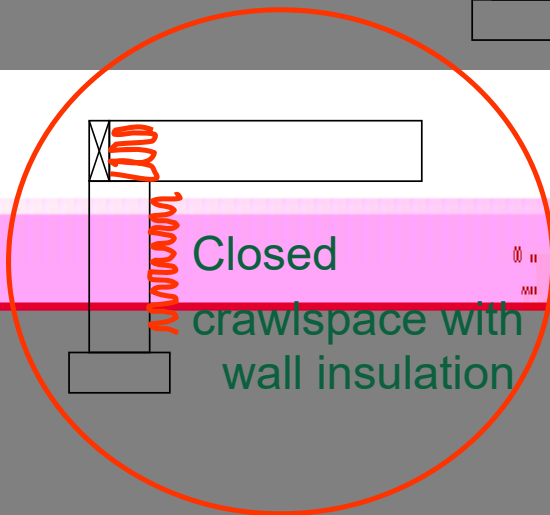
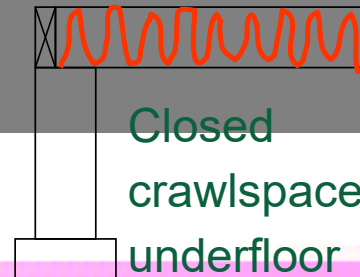


402.2.9 Crawlspace Walls - 3 Options

Standard vented crawlspace - underfloor insulation



Closed crawlspace underfloor insulation



Closed crawlspace with wall insulation

Note: all crawlspaces must meet vapor retarder requirements, as per IRC

Closed Crawlspace

- Seal ground with plastic (6" up walls, 6" overlaps)
- Insulate interior of walls to satisfy code (R-10 in CZ4, R-5 in CZ3, R-0 in CZ2)
- Eliminate all vents and leaks (access doors)
- Satisfy IRC exception to vent requirement (2006 IRC section R408.3)

Venting Exceptions:

- Continuous exhaust (radon)
- Direct condition crawlspace (supply)
- Direct condition (dehumidifier)



Critical Details:

- No drainage problems
- Use a sealed combustion / direct vent furnace or install a Heat Pump
- Pest Control and Code Official awareness

402.2.9 – Crawlspace Walls

402.2.9 Crawl space walls. As an alternative to insulating floors over crawl spaces, crawl space walls shall be permitted to be insulated when the crawl space is not vented to the outside. Crawl space wall insulation shall be permanently fastened to the wall and extend downward from the floor to within 9 inches (229 mm) of the finished interior grade adjacent to the foundation wall. A 3-inch (76 mm) inspection/view strip immediately below the floor joists shall be provided to permit inspections for termites. Exposed earth in unvented crawl space foundations shall be covered with a continuous Class 1 vapor retarder in accordance with the *International Building Code*. All joints of the vapor retarder shall overlap by 6 inches (152 mm) and be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (228 mm) up the stem wall and shall be attached and sealed to the stem wall.
(Effective January 1, 2011)



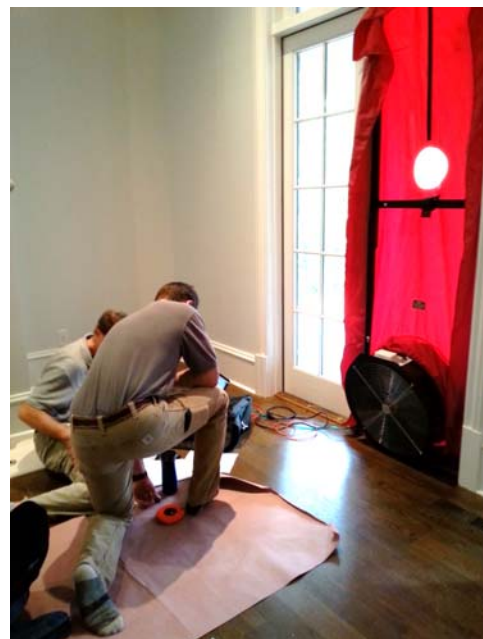
- Insulate band joist area
- 3-inch view strip (removable)
- Crawl space wall insulation to extend within 9 inches of finished interior grade
- Complete plastic sealed to walls at least 6 inches up the stem wall



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BLOWER DOOR ENVELOPE TESTING

- Required by 2011 GA Energy Code (< 7 ACH50)
- Quantifies the Amount of Leakage Across the Home's Thermal Boundary
- Administered by a Certified Professional
- Reported to Builder and Code Official



HOW TO FAIL A BLOWER DOOR TEST



Leave Big Holes
In Your Walls

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HOW TO FAIL A BLOWER DOOR TEST



Don't Install Blocking
(Just Cover Over With Insulation)

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HOW TO FAIL A BLOWER DOOR TEST



Don't Air Seal
Blocking
(Just Cover Over
With Insulation)

HOW TO FAIL A BLOWER DOOR TEST



Don't Complete Kneewalls
(Just Cover Over
With Insulation)

HOW TO FAIL A BLOWER DOOR TEST



Don't Complete
Kneewalls
(Just Cover Over
With Insulation)

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HOW TO FAIL A BLOWER DOOR TEST



Don't Cap Chases

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CORRECT PRACTICES



Penetrations in
Top Plate Sealed

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CORRECT PRACTICES



Chase capped
and sealed
around duct

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CORRECT PRACTICES



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CORRECT PRACTICES

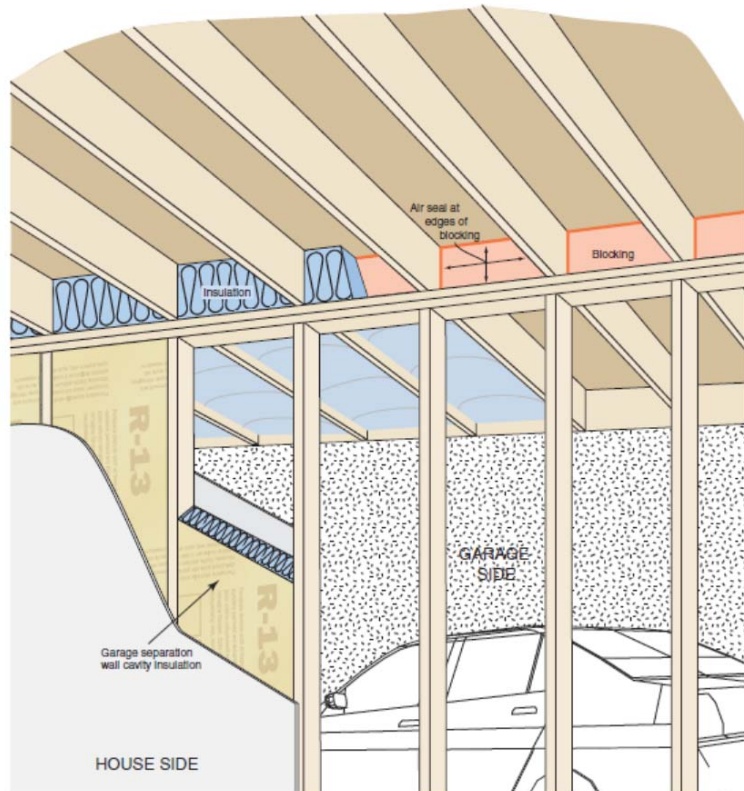
Garage blocking and sealing key points

Blocking, air sealing and insulation required above garage separation wall



Garage on Other Side of Wall

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CORRECT PRACTICES



Install Kneewall blocking

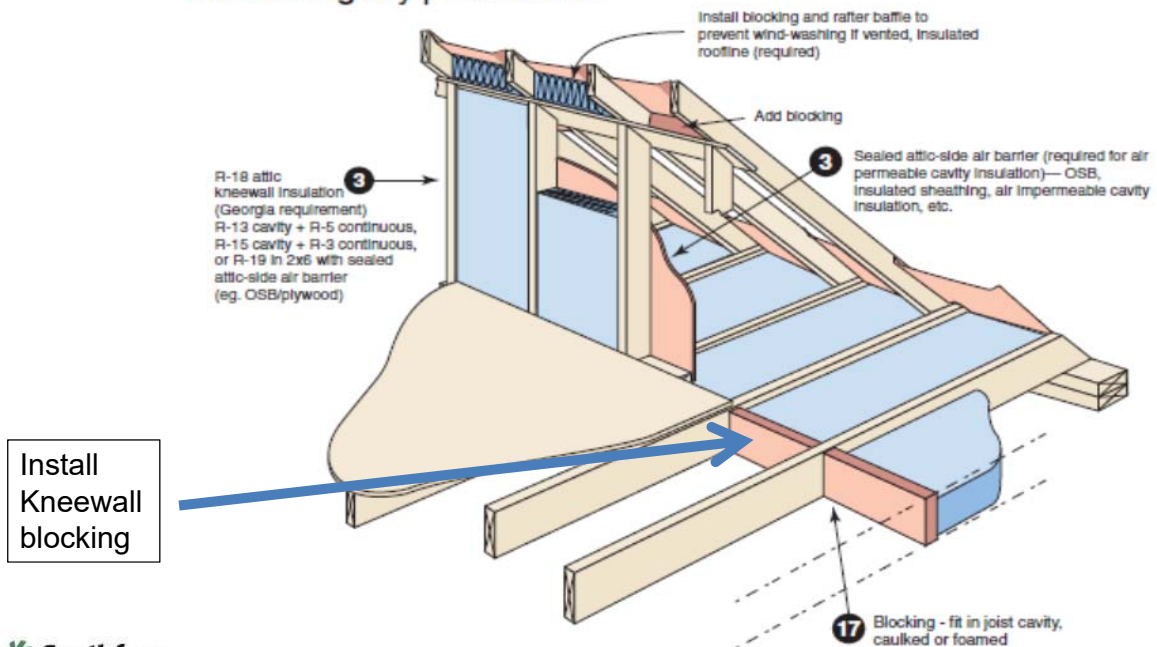


Not This!?!



CORRECT PRACTICES - KNEEWALLS

Air sealing key points *continued*



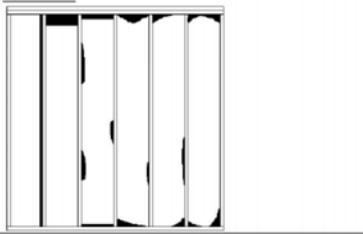
INSTALLING INSULATION



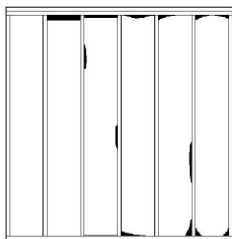
INSULATION INSTALLATION: GRADE I, II, OR III

Unless verified, assume Grade III (worst) – see Appendix A-11-16

installation shall be *at least* this good to be labeled as "Grade III".

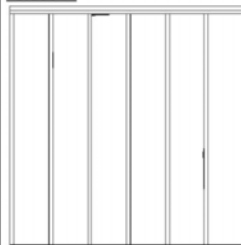


"Grade II":



No more than 2% of surface area of insulation missing is acceptable for "Grade II"

"Grade I":

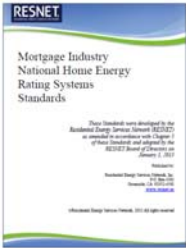


Occasional very small gaps are acceptable for "Grade I".

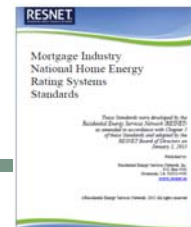


INSULATION INSTALLATION: RESNET APPENDIX A

- Voids / Gaps
- Compression / Incomplete fill

Building Element: Walls (continued)		
Rated Feature	Task	On-Site Inspection Protocol
 <p>Insulation Installation</p>	Determine cavity insulation installation characteristics	<p>When it is possible to inspect insulation as installed (i.e., new construction), inspectors shall rate the installation as "Grade I, II, or III" according to the following guidelines, regardless of insulation material or installation process. Note that all insulation installation techniques require proper care to ensure they are completed correctly; if they are not, thermal performance can suffer dramatically. These guidelines apply to cavity fill insulation, continuous rigid insulation, and any other field-installed insulation products.</p> <p>1. "Grade I" shall be used to describe insulation that is generally installed according to manufacturers instructions and/or industry standards. A "Grade I" installation requires that the insulation material uniformly fills each cavity side-to-side and top-to-bottom, without substantial gaps or voids around obstructions (such as blocking or bridging), and is split, installed, and/or fitted tightly around wiring and other services in the cavity. To inspect, probe in, around, or through the insulation and/or vapor retarder in several places to see whether these requirements are met. Replace or repair the vapor retarder and insulation as necessary. During inspection (typically before drywall is installed), if the exterior sheathing is visible from the building interior through gaps in the cavity insulation material, it is not considered a "Grade I" installation.</p> <p>To attain a rating of "Grade I", wall insulation shall be enclosed on all six sides, and shall be in substantial contact with the sheathing material on at least one side (interior or exterior) of the cavity. Exception: the interior sheathing/enclosure material is optional in climate zones 1-3, provided insulation is adequately supported and meets all other requirements.</p> <p>For rim or band joist insulation, use the inspection guidelines under "Walls—Insulation value" to assess "Grade I", "Grade II", or "Grade III" installation. Exception: the interior sheathing/enclosure material is optional in all climate zones, provided insulation is adequately supported and meets all other requirements.</p>

INSULATION INSTALLATION: GRADE I



For exterior applications of rigid insulation, insulation shall be in firm contact with the structural sheathing materials, and tightly fitted at joints to be considered a "Grade I" installation.

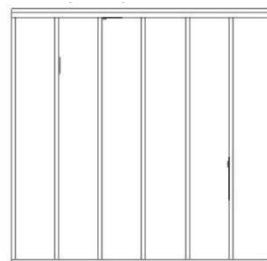
For faced batt insulation, Grade I can be designated for side-stapled tabs, provided the tabs are stapled neatly (no buckling), and provided the batt is only compressed at the edges of each cavity, to the depth of the tab itself, and provided it meets the other requirements of Grade I.

For sprayed or blown-in products, density shall be sufficient that the fill material springs back when compressed slightly with a hand or finger, and provided it meets the other requirements of Grade

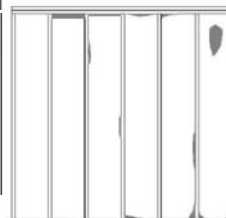
Interpretation:

The following illustrations represent the boundary conditions between Grade I and Grade II, that is, the installation shall be at least this good to be labeled as "Grade I":

The following standards may be applied as a reference: NAIMA, Recommendations for Installation in Residential and Other Light-Frame Construction—Fiber Glass Home Insulation (PUB # BI402), Recommendations for Installation in Residential and Other Light-Frame Construction—Fiber Glass Loose Fill Insulation (PUB # BI403), CIMA, Technical Bulletin #2 -- Standard Practice for Installing Cellulose Building Insulation, Technical Bulletin #3-- Standard Practice for Installation of Sprayed Cellulosic Wall Cavity Insulation. For other products and materials, manufacturer's installation instructions will apply.

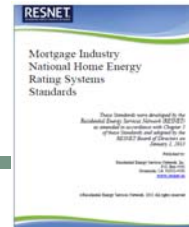


Occasional very small gaps are acceptable for "Grade I".



Compression or incomplete fill amounting to 2% or less, if the empty spaces are less than 30% of the intended fill thickness, are acceptable for "Grade I".

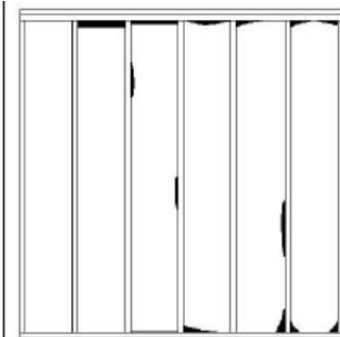
INSULATION INSTALLATION: GRADE II



2. "Grade II" shall be used to describe an installation with moderate to frequent installation defects: gaps around wiring, electrical outlets, plumbing and other intrusions; rounded edges or "shoulders"; or incomplete fill amounting to less than 10% of the area with 70% or more of the intended thickness (i.e., 30% compressed); or gaps and spaces running clear through the insulation amounting to no more than 2% of the total surface area covered by the insulation. To attain a rating of "Grade II", wall insulation shall be enclosed on all six sides, and shall be in substantial contact with the sheathing material on at least one side (interior or exterior) of the cavity.

Interpretation:

The following illustrations represent the boundary conditions between Grade II and Grade III, that is, the installation shall be at least this good to be labeled as "Grade II":



No more than 2% of surface area of insulation missing is acceptable for "Grade II"

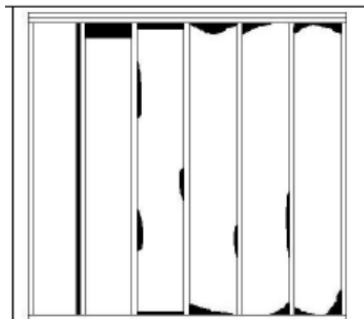
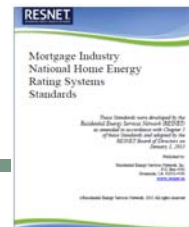


No more than 10% of surface area of insulation compressed or incomplete fill, by up to 30% (70% or more of intended thickness) is acceptable for "Grade II".



Source: www.resnet.us 47

INSULATION INSTALLATION: GRADE III



3. "Grade III" shall be used to describe an installation with substantial gaps and voids, with missing insulation amounting to greater than 2% of the area, but less than 5% of the surface area is intended to occupy. More than 5% missing insulation shall be measured and modeled as separate, uninsulated surfaces according to 3.B.5.p. This designation shall include wall insulation that is not in substantial contact with the sheathing on at least one side of the cavity, or wall insulation in a wall that is open (unsheathed) on one side and exposed to the exterior, ambient conditions or a vented attic or crawlspace. The presence of an air-impermeable barrier such as housewrap will be considered to enclose the building cavities.

Interpretation:

The following illustration represents the boundary conditions between Grade III and the situation whereby one must measure the uninsulated areas; that is, the installation shall be at least this good to be labeled as "Grade III":



Source: www.resnet.us 48

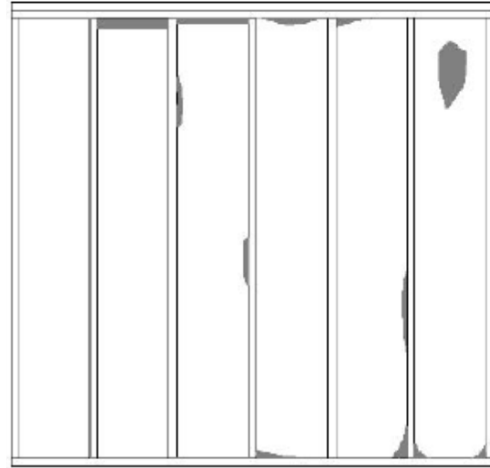
GRADE I

Appendix A-11 - A-13

- occasional very small gaps
- less than 2% compression/incomplete fill (which may not be more than 30% compressed)



Gaps

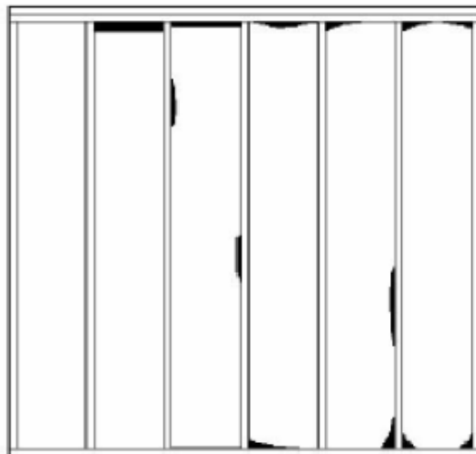


Compression

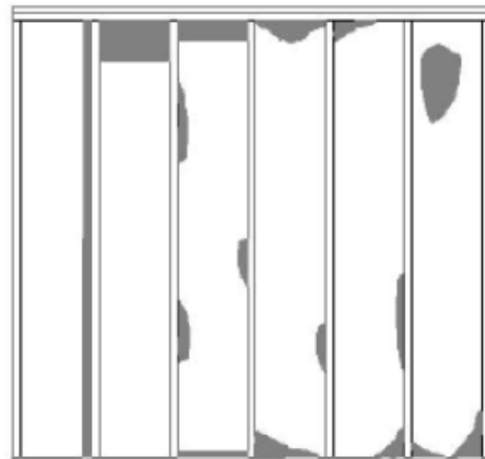
GRADE II

Appendix A-13 - A-15

- <2% gaps
- <10% compression/incomplete fill (which may not be more than 30% compressed in depth)



Gaps

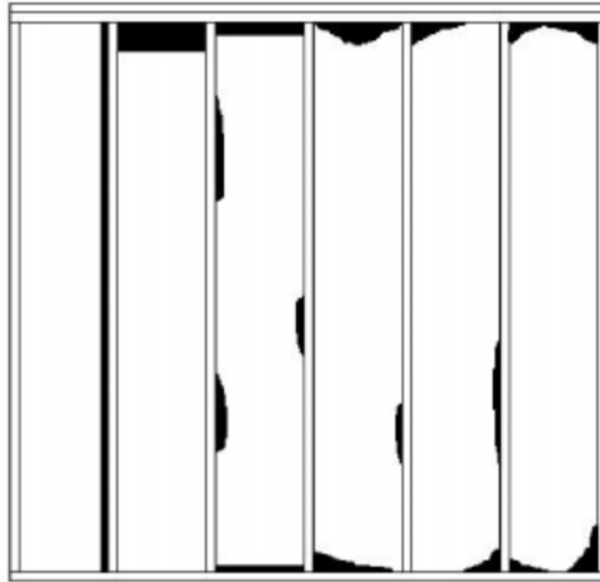


Compression

GRADE III

Appendix A-15 - A-16

- > 2% and < 5% gaps
- (greater than 5% = downgraded R-value)

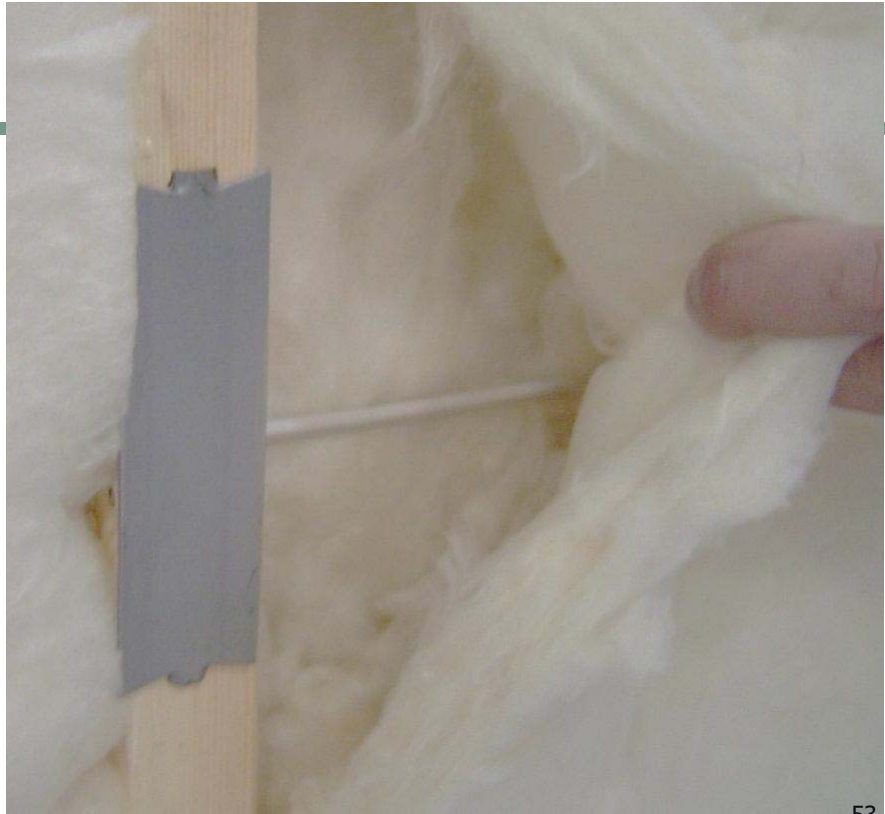


Gaps

WHAT GRADE?



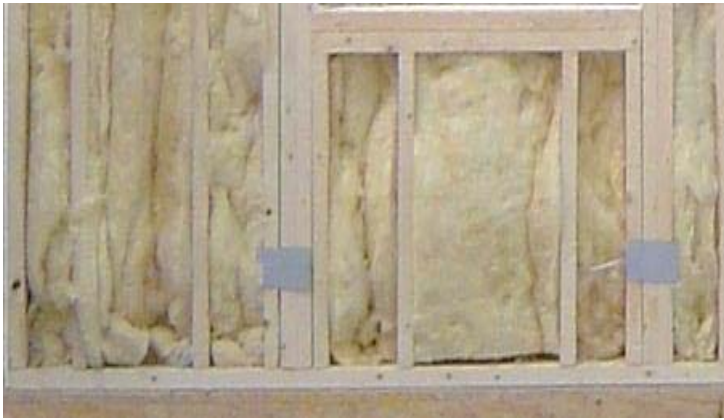
WHAT GRADE?



What Grade?



WHAT GRADE?



WHAT GRADE?



WHAT GRADE?



WHAT GRADE?

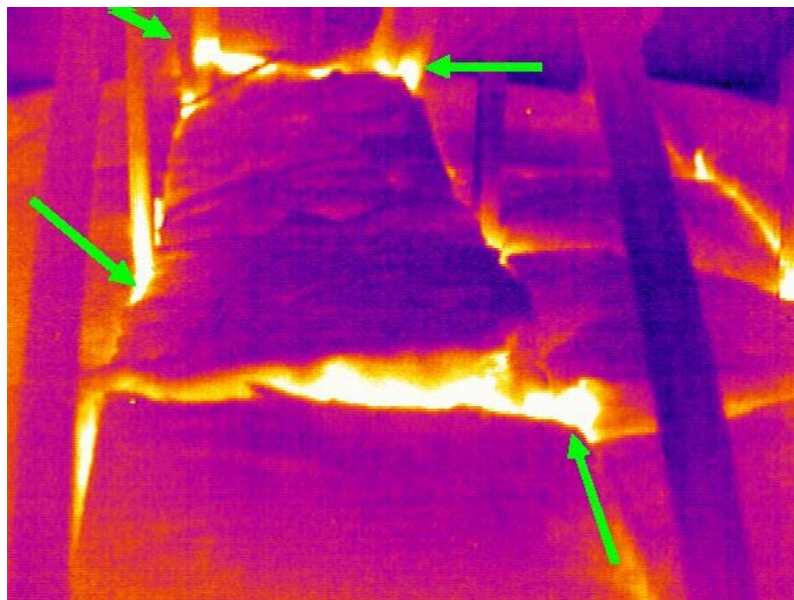


WHAT GRADE?



CONTINUOUS INSULATION & AIR BARRIER

Building Thermal Envelope
(air barrier and insulation must be in contact)



INSTALLING INSULATION



 Southface

INSTALLING INSULATION

- Voids / Gaps
- Compression / Incomplete Fill

Appendix RC
2015 IECC (2018 Georgia Energy Code)

Georgia Insulation Installation – *Passing Grade Details*

Wall and ceiling insulation that makes up portions of the building thermal envelope in Georgia residences shall be installed to Passing Grade quality.

Two criteria affect installed insulation grading: **voids/ gaps** (in which no insulation is present in a portion of the overall insulated surface) and **compression/incomplete fill** (in which the insulation does not fully fill out or extend to the desired depth).

Voids/Gaps

- Voids or gaps in the insulation are < 1% of overall component surface area (only occasional and very small gaps allowed for Passing Grade)

Compression/Incomplete Fill

- Compression/Incomplete Fill for both *air permeable insulation* (e.g., fiberglass, cellulose) and *air impermeable insulation* (e.g., spray polyurethane foam) must be less than 1 inch in depth or less than 30% of the intended depth, whichever is more stringent. The allowable area of compression/incomplete fill must be less than 2% of the overall insulated surface to achieve a Passing Grade.
- Any compression/incomplete fill with a **depth** greater than the above specifications (up to 1" or 30% of the intended depth, whichever is more stringent) shall not achieve a Passing Grade.

Additional Wall Insulation Requirements

- All vertical air permeable insulation shall be installed in substantial contact with an air barrier on all six (6) sides.
Exception: Unfinished basements, rim/band joist cavity insulation and fireplaces (insulation shall be restrained to stay in place).
For unfinished basements, air permeable insulation and associated framing in a framed cavity wall shall be installed less than ¼" from the basement wall surface.
- Attic kneewall details – Attic kneewalls shall be insulated to a total R-value of at least R-18 through any combination of cavity and continuous insulation. Air permeable insulation shall be installed with a fully sealed attic-side air barrier (e.g., OSB with seams caulked, rigid insulation with joints taped, etc.). Attic kneewalls with air impermeable insulation shall not require an additional attic-side air barrier.



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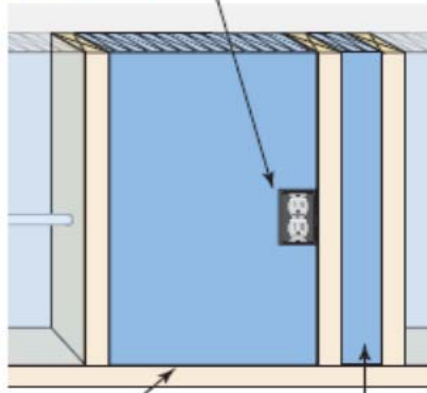
WALL INSULATION – VOIDS / GAPS

Wall Insulation key points

VOIDS / GAPS

Passing Grade 

Insulation is notched and completely surrounds electrical box



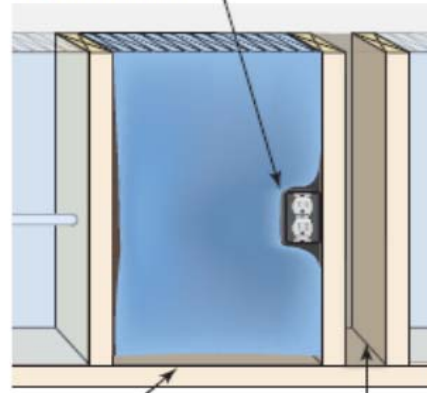
Insulation fully fills cavity at top and bottom

Narrow cavity fully insulated

Good!!!

Unacceptable Installation 

Incomplete insulation coverage around electrical box



Insulation does not extend to bottom of cavity

Narrow cavity not insulated

Bad!!!

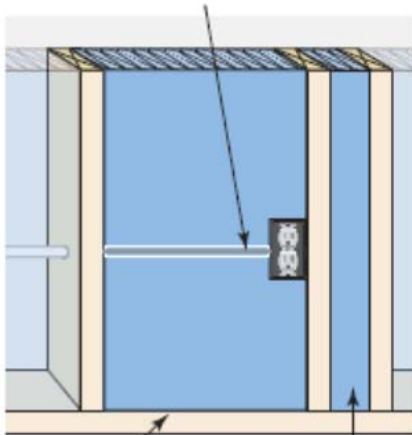
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WALL INSULATION – COMPRESSION / INCOMPLETE FILL

COMPRESSION / INCOMPLETE FILL

Passing Grade 

Insulation is slit around electrical wire



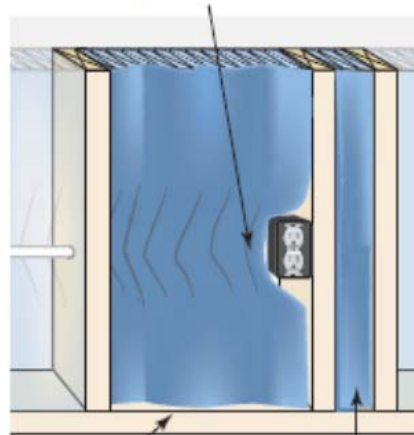
Insulation extends from front to back and fully fills entire cavity

Proper width insulation fully fills narrow cavity

Good!!!

Unacceptable Installation 

Insulation is compressed behind electrical wire



Insulation does not fully fill entire cavity

Improper width insulation is compressed into narrow cavity

Bad!!!

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PHOTOS OF INSULATION

- Please note – wall and ceiling vapor retarders are not required in Climate Zones 1-4
- Often, kraft paper-facing on batts adversely impacts installation



PHOTOS OF INSULATION



VIDEOS OF INSULATION INSTALLATION



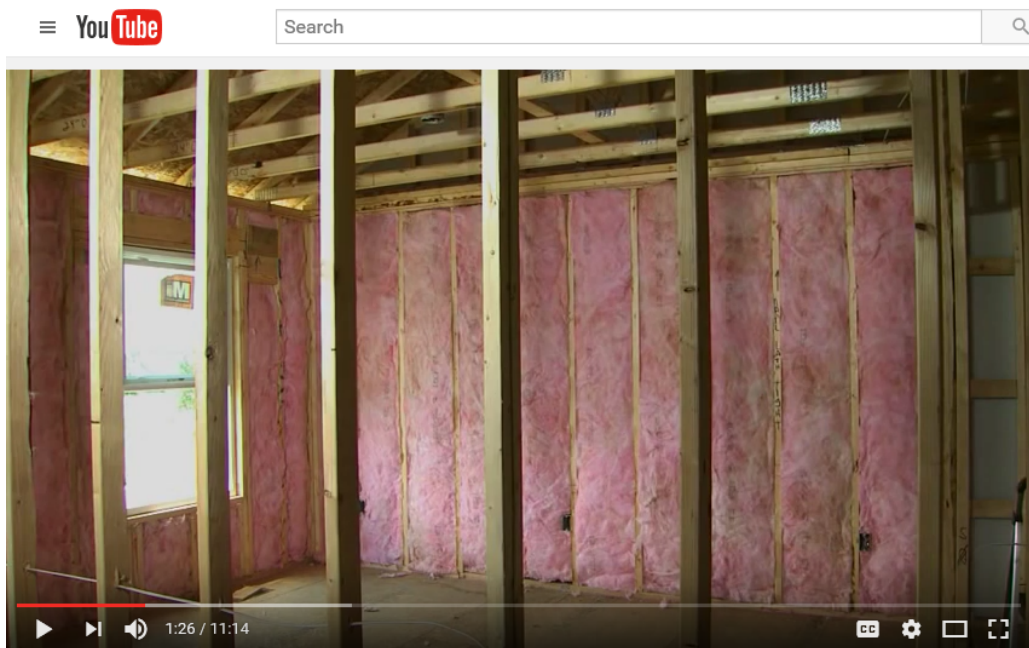
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VIDEOS OF INSULATION INSTALLATION



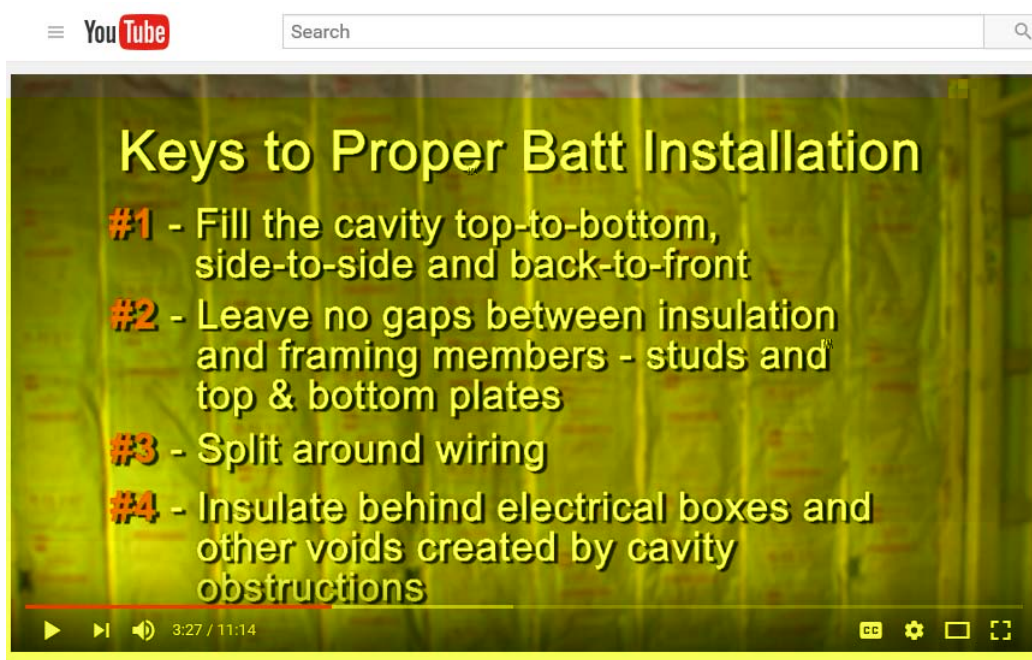
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VIDEOS OF INSULATION INSTALLATION



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VIDEOS OF INSULATION INSTALLATION



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Ugly Ceiling Insulation



FLOOR INSULATION

Underfloor insulation that makes up portions of the building thermal envelope in Georgia residences shall be installed to Passing Grade quality.

Two criteria affect installed insulation grading: **voids/gaps** (in which no insulation is present in a portion of the overall insulated surface) and **compression/incomplete fill** (in which the insulation does not fully fill out or extend to the desired depth).

Voids/Gaps

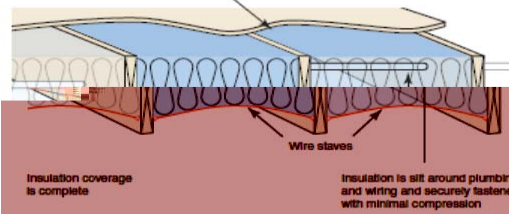
- o Voids or gaps in the insulation are minimal for Passing Grade (< 2% of overall component surface area)

Compression/Incomplete Fill

- o **Compression/Incomplete Fill** for both *air permeable insulation* (e.g., fiberglass, cellulose) and *air impermeable insulation* (e.g., spray polyurethane foam) must be less than 1 inch in depth or less than 30% of the intended depth, whichever is more stringent. The allowable area of compression/incomplete fill must be less than 10% of the overall insulated surface to achieve a Passing Grade.
- o Any compression/incomplete fill with a depth greater than the above specifications (up to 1" or 30% of the intended depth, whichever is more stringent) shall not achieve a Passing Grade.
- o Air-permeable underfloor insulation shall be permanently installed against the subfloor decking. Adequate insulation supports (e.g., wire staves) for air permeable insulation shall be installed at least every 18-24". Exception: The floor framing-cavity insulation shall be permitted to be in contact with the topside of sheathing or continuous insulation installed on the bottom side of floor framing where combined with insulation that meets or exceeds the minimum wood frame wall R-value and that extends from the bottom to the top of all perimeter floor framing members.

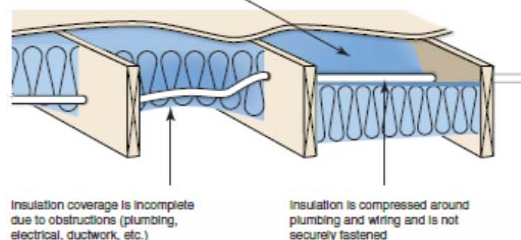
Passing Grade 

Installed insulation is in complete contact with air barrier (subfloor)



Unacceptable Installation 

Insulation is not installed in complete contact with air barrier (subfloor)

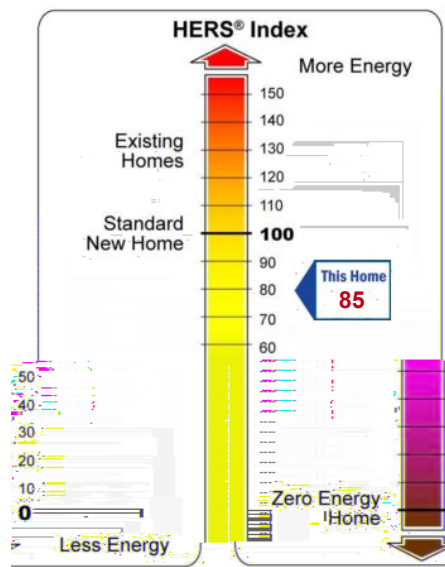


ACME BASE - 2816 S.F. HOME IN REM/RATE

- Two mechanical systems – both in the vented attic
- • 75% of 1st floor ducts inside; all others plus 2nd floor ducts in attic
- 80% furnaces, 14 SEER A/C's, no mechanical ventilation, 50 gal gas DHW
- Basic 2009 energy code compliant R-values (assume Grade III)
 - R-30 flat ceiling, R-19 vault
 - R-13 grade III + OSB walls
 - R-19 floor over garage; no slab insulation
- Typical DP low-e windows: U-0.35 SHGC-0.30; poor orientation
- Duct leakage is 12% Total; 8% To Outside
- Envelope Leakage is 7 ACH₅₀, 0.45 ELR₅₀, 3009 cfm₅₀
- Elec rate 12.5¢/kWh + \$10 base fee; Gas rate 75¢/therm + \$20 base fee



HERS RATING ACME HOUSE



- R-13 Grade III:
(U-0.097)
Htg + Clg Cost:
\$475+\$346
- R-13 Grade I:
(U-0.085)
Htg + Clg Cost:
\$448+\$340
- Saves \$33 / year



WRAP UP AND ENERGY CODE RESOURCES

Thank you!

mikeb@southface.org

Online educational resources are available by visiting:

www.southfaceonlinetraining.org

Technical assistance or training requests can be submitted to

Energy Code Hotline at: energycodes@southface.org or

404-604-3598

Additional Resources

DOE Field Study: For additional information on other DOE Field Studies and participating states, visit the Building Energy Codes website here:

<https://www.energycodes.gov/compliance/energy-code-field-studies>

Georgia Field Study: If you would like further information regarding the Georgia Energy Code Field Study, please visit our project webpage found at: www.seealliance.org

