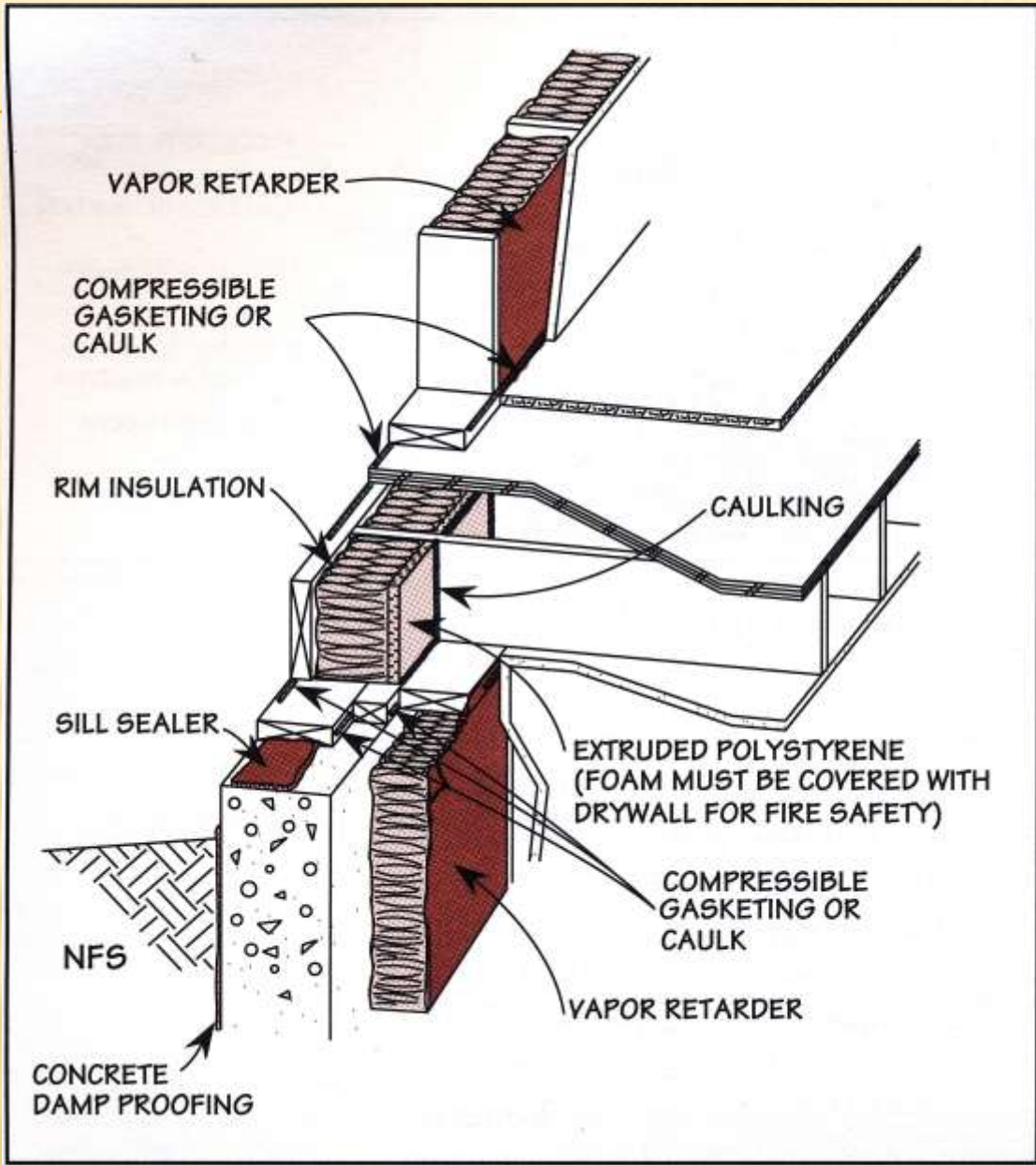
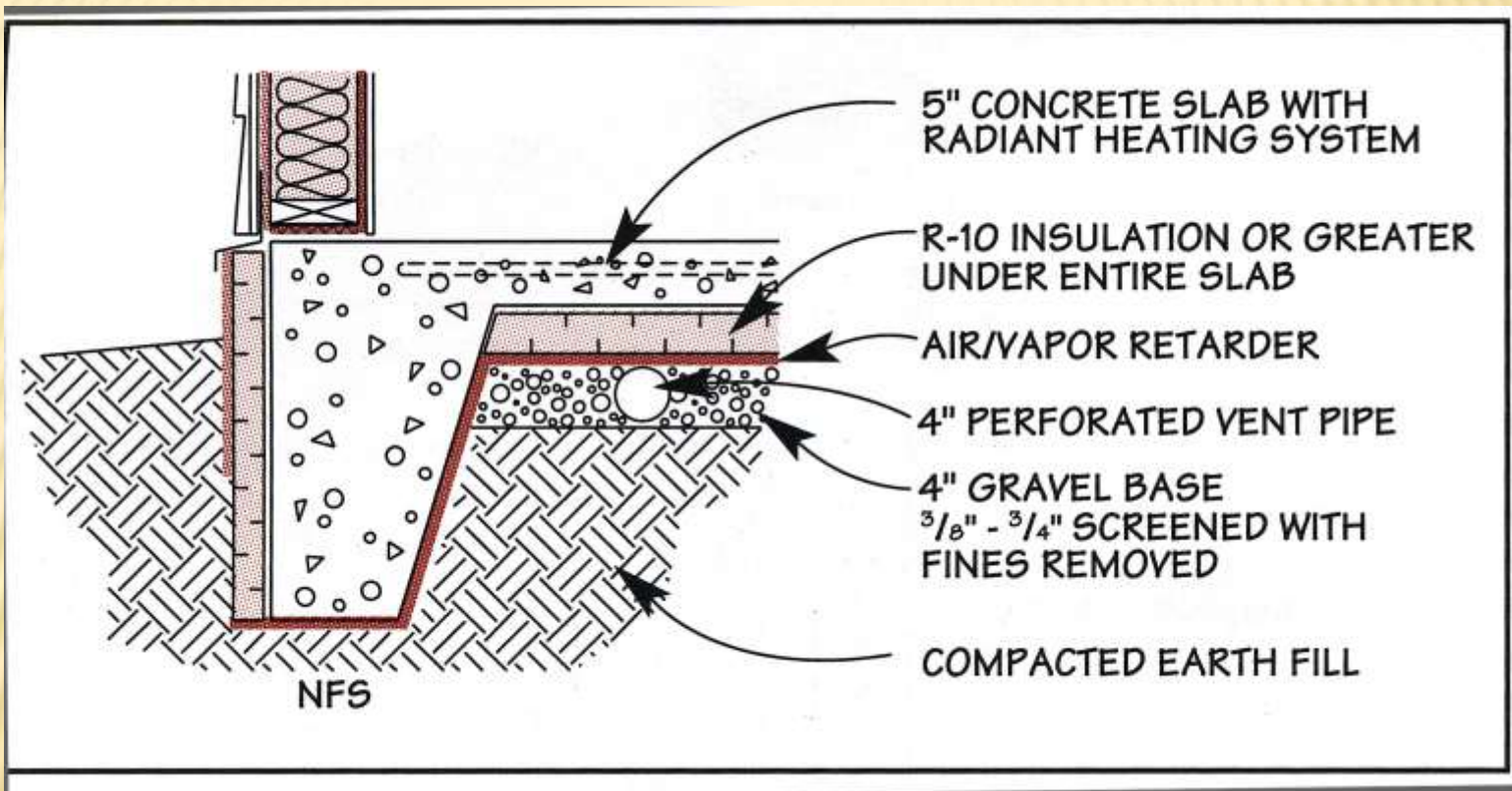


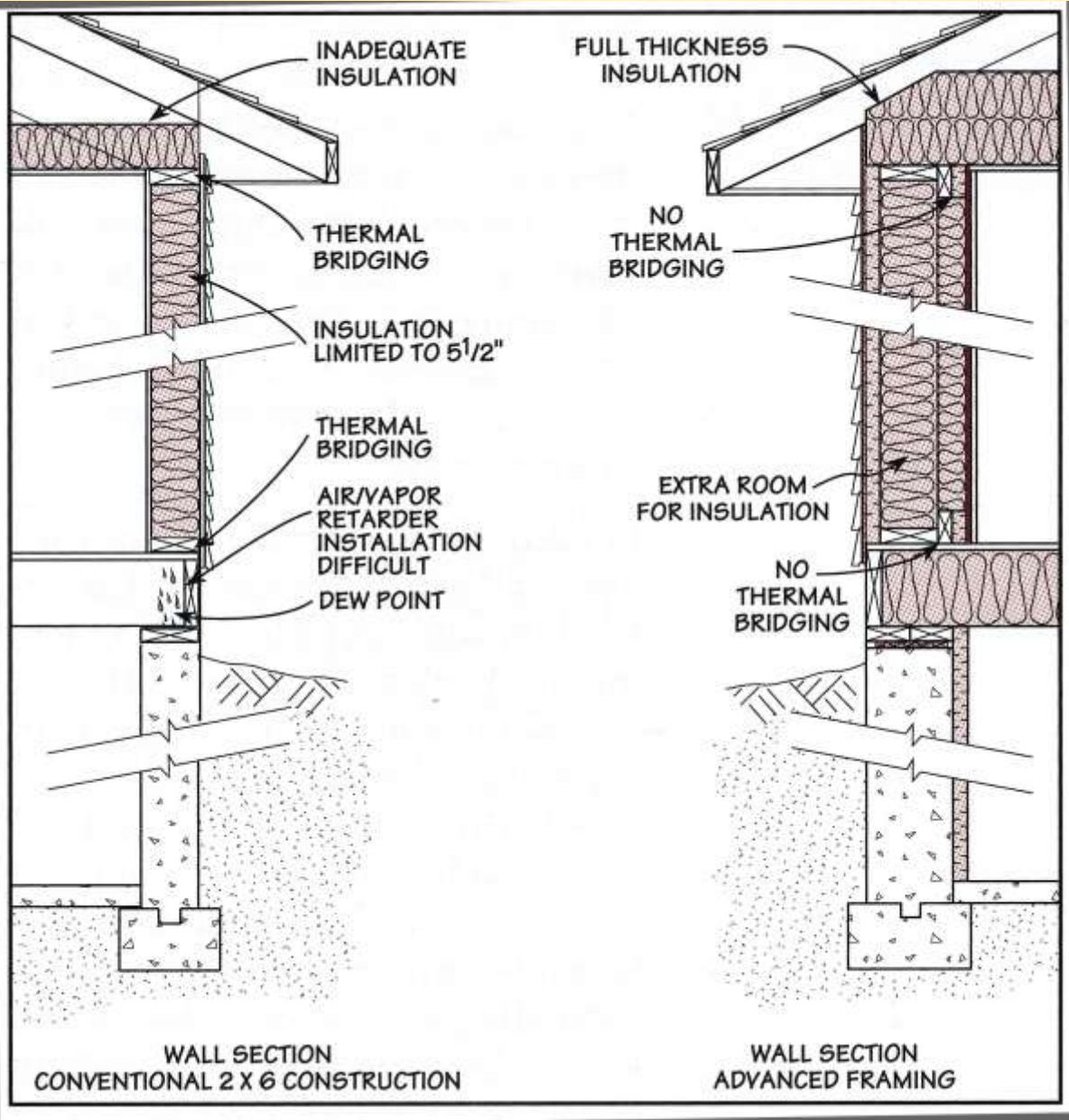
Richard DeBusman  
Sierra Foothills, California  
May, 2011

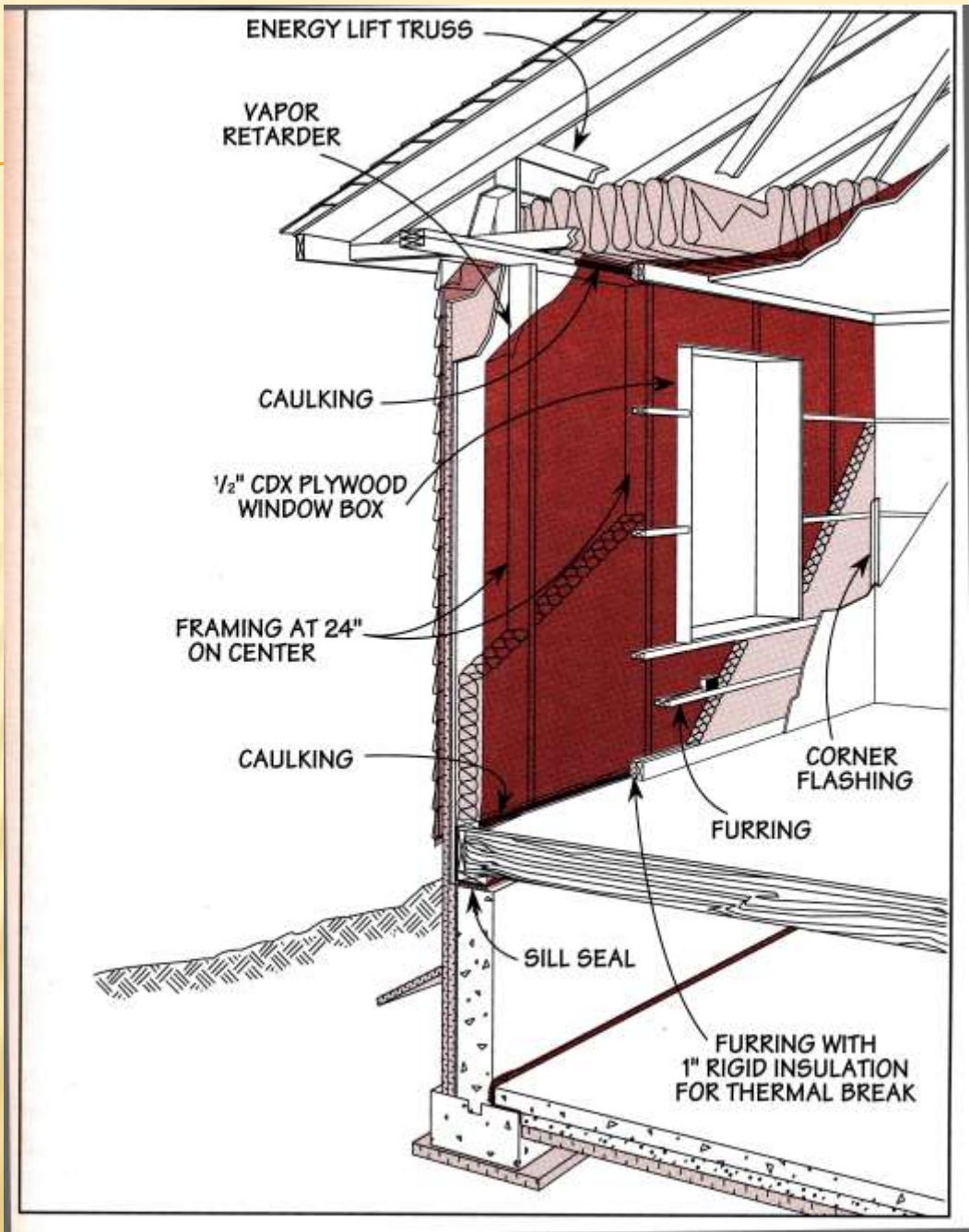
# **DESIGN CONSIDERATIONS FOR THE MOST EFFICIENT THERMAL SHELL TODAY**

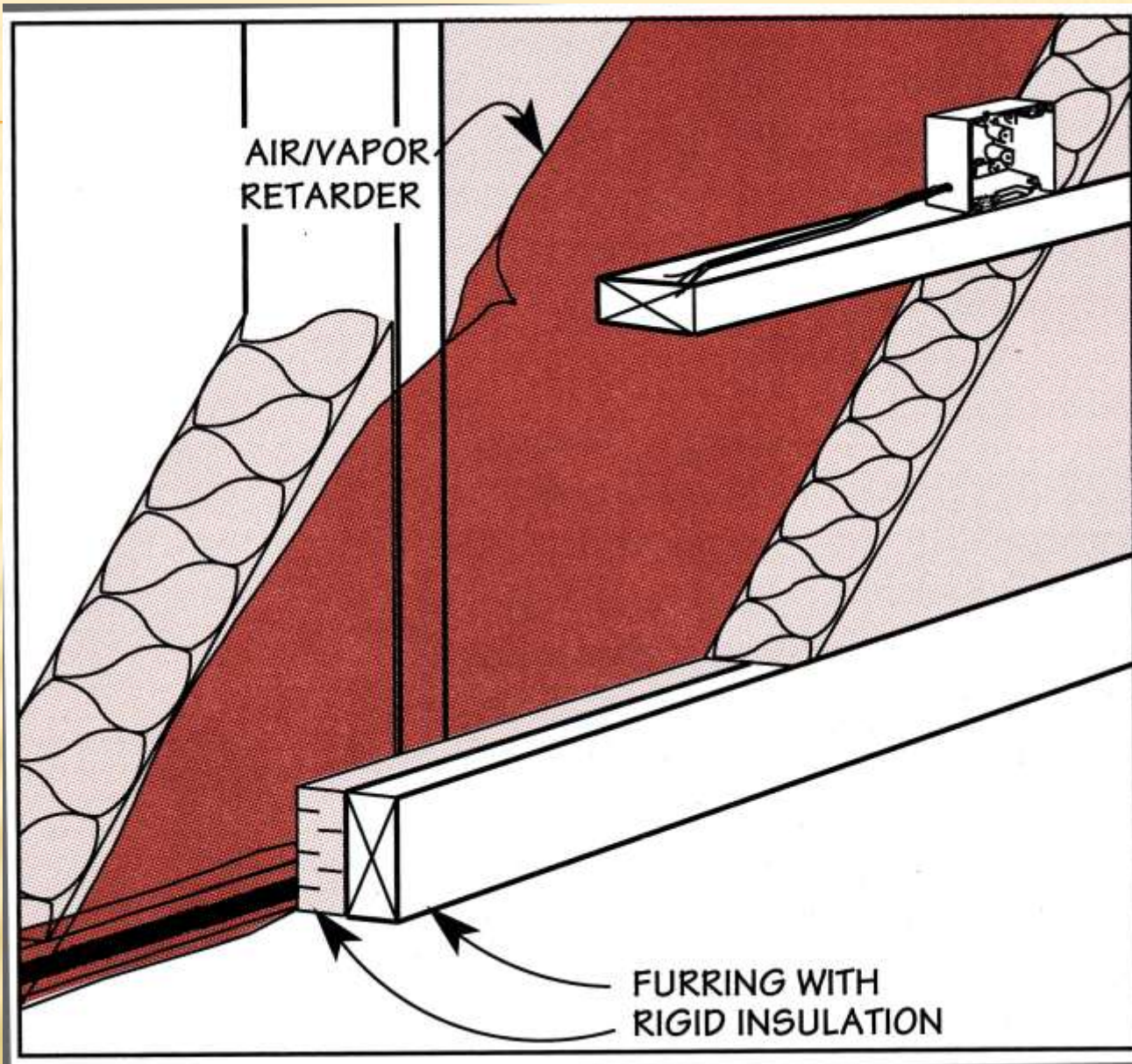
# **TRIED AND TRUE TECHNIQUES FOR INSULATING THE THERMAL SHELL**





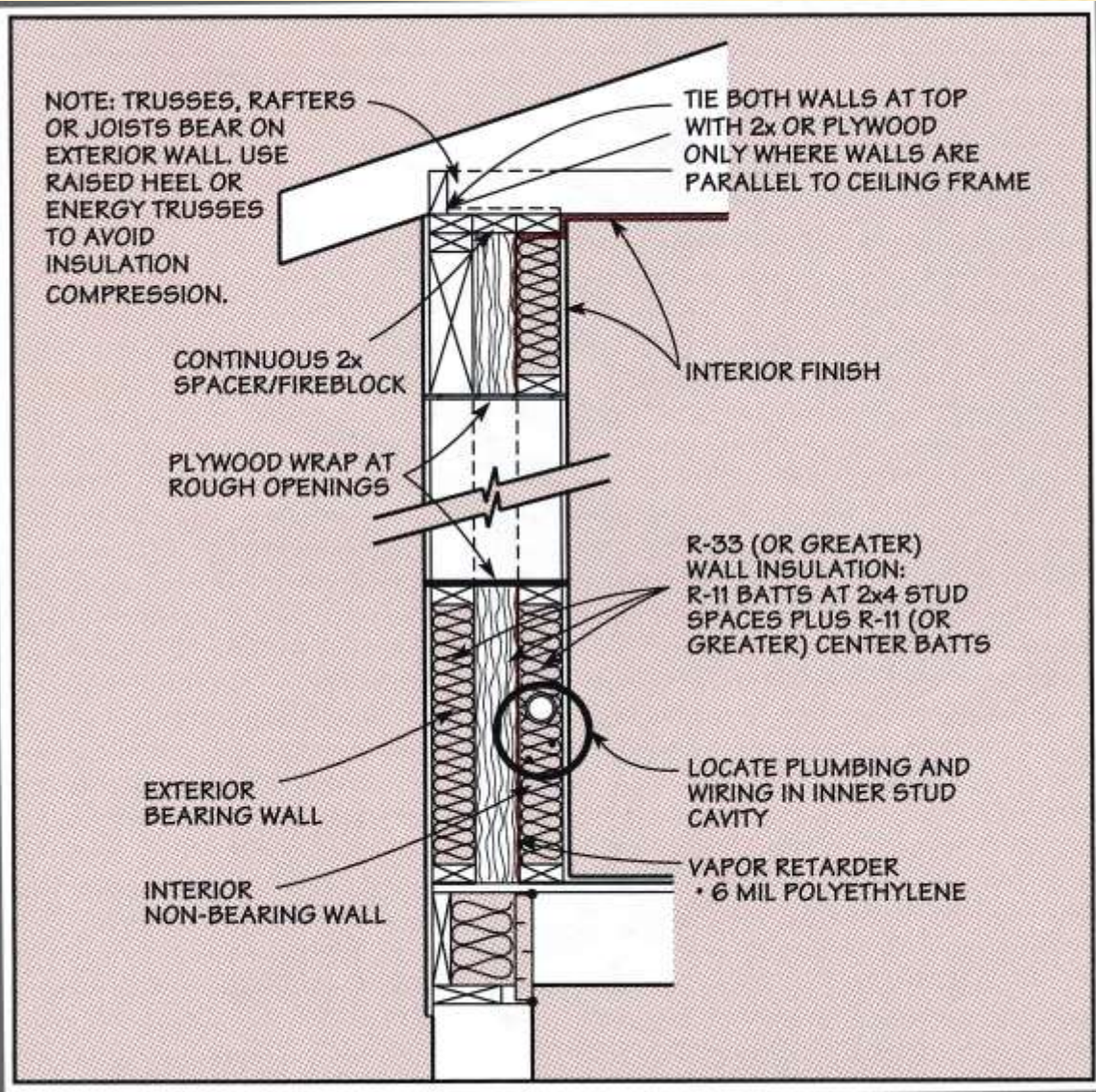




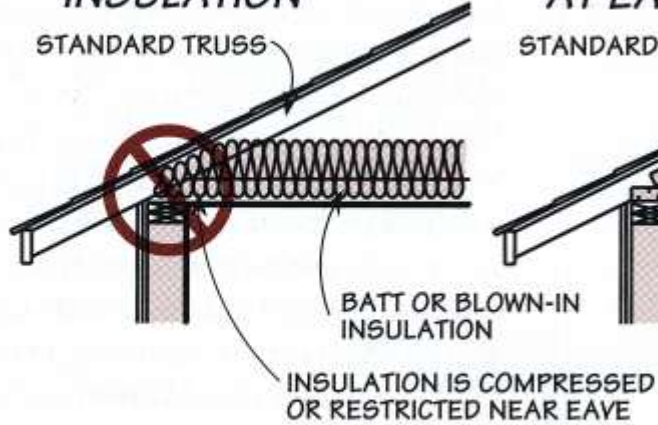


AIR/VAPOR  
RETARDER

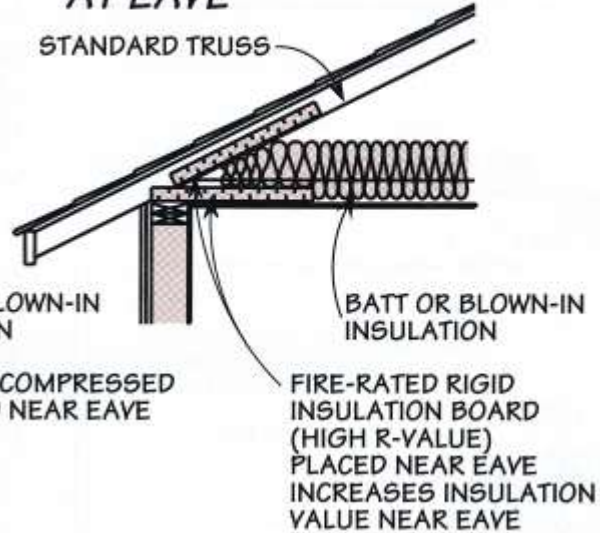
FURRING WITH  
RIGID INSULATION



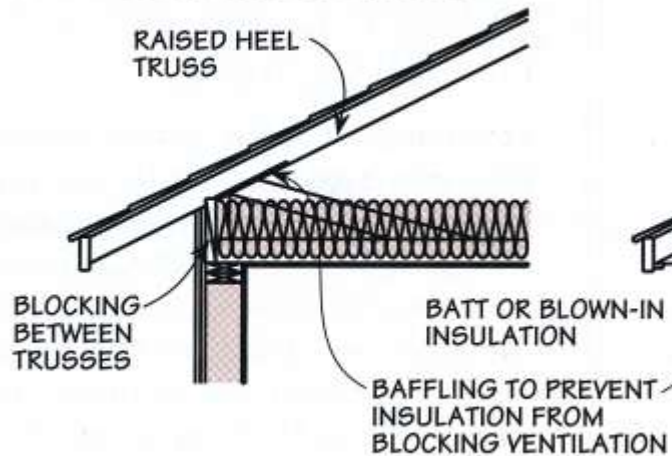
### COMPRESSED INSULATION



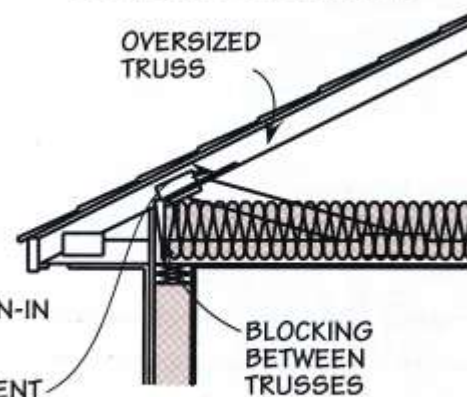
### INCREASED INSULATION AT EAVE

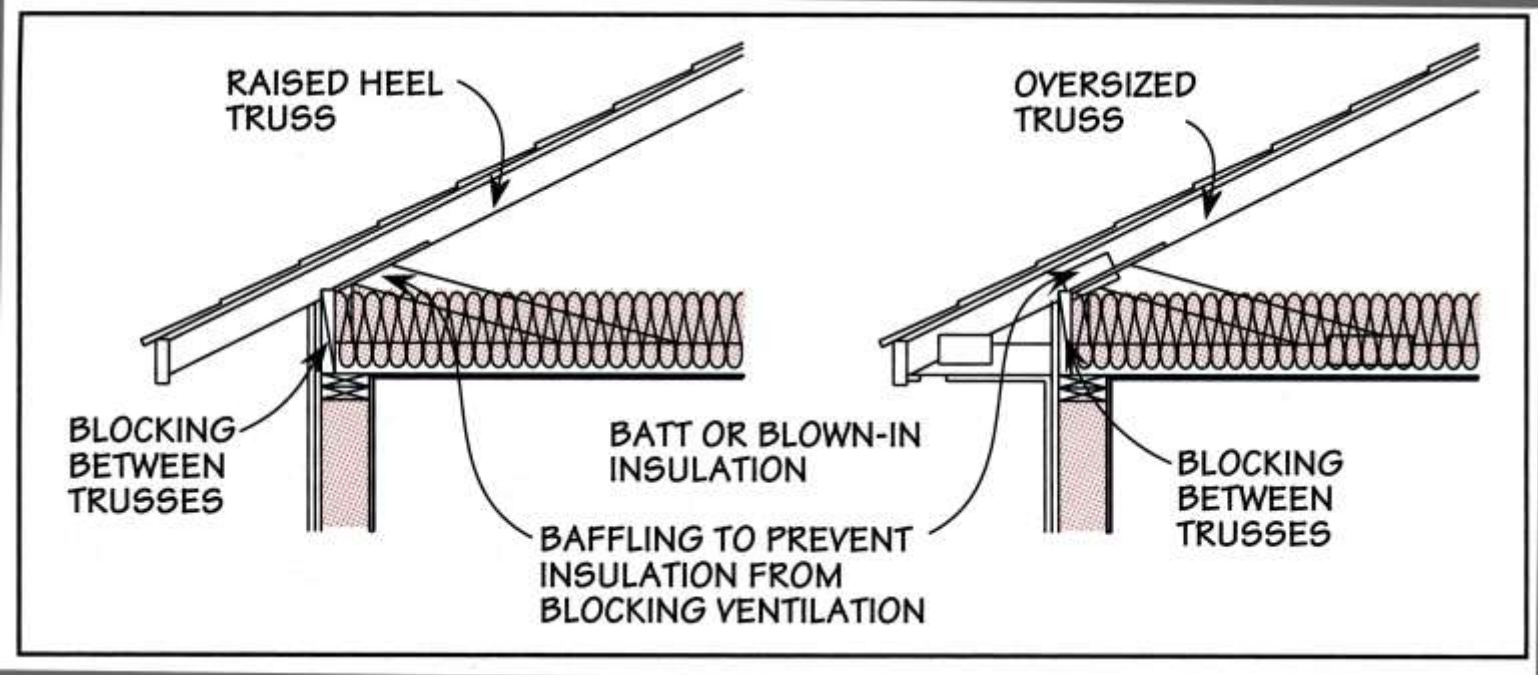


### FULL INSULATION

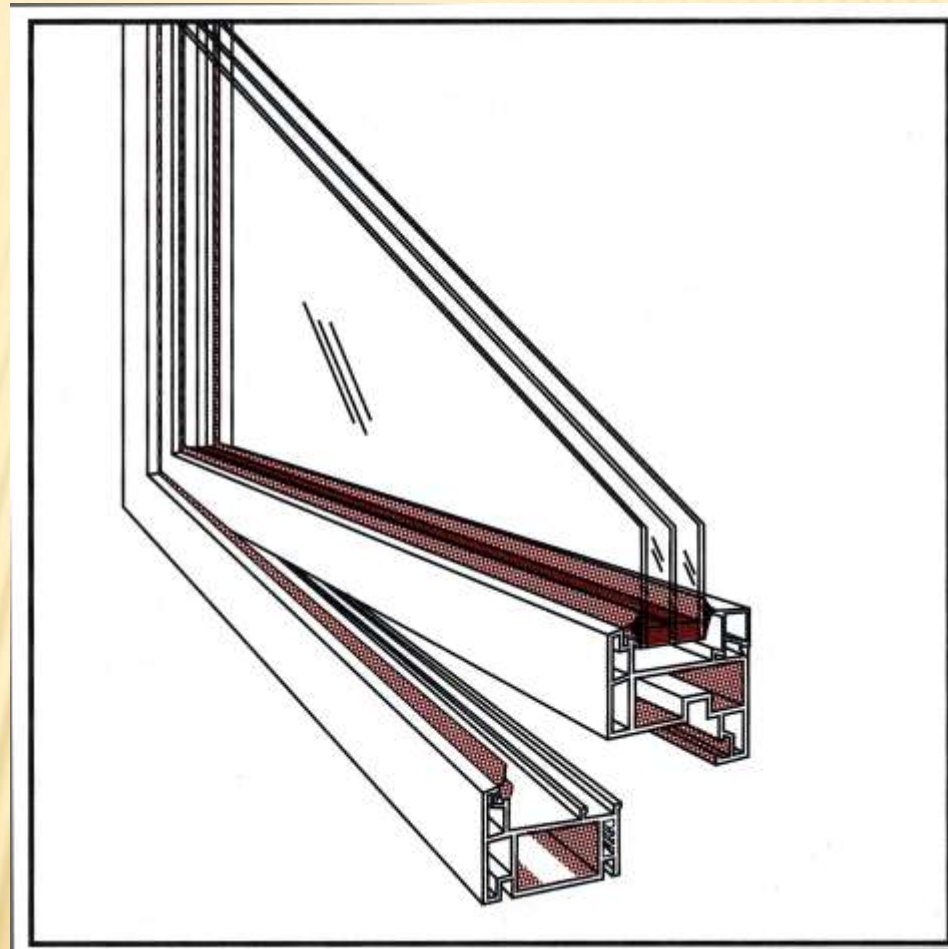


### FULL INSULATION





# HIGH R-VALUE WINDOWS



# U-VALUES & R-VALUES

× U-Value:

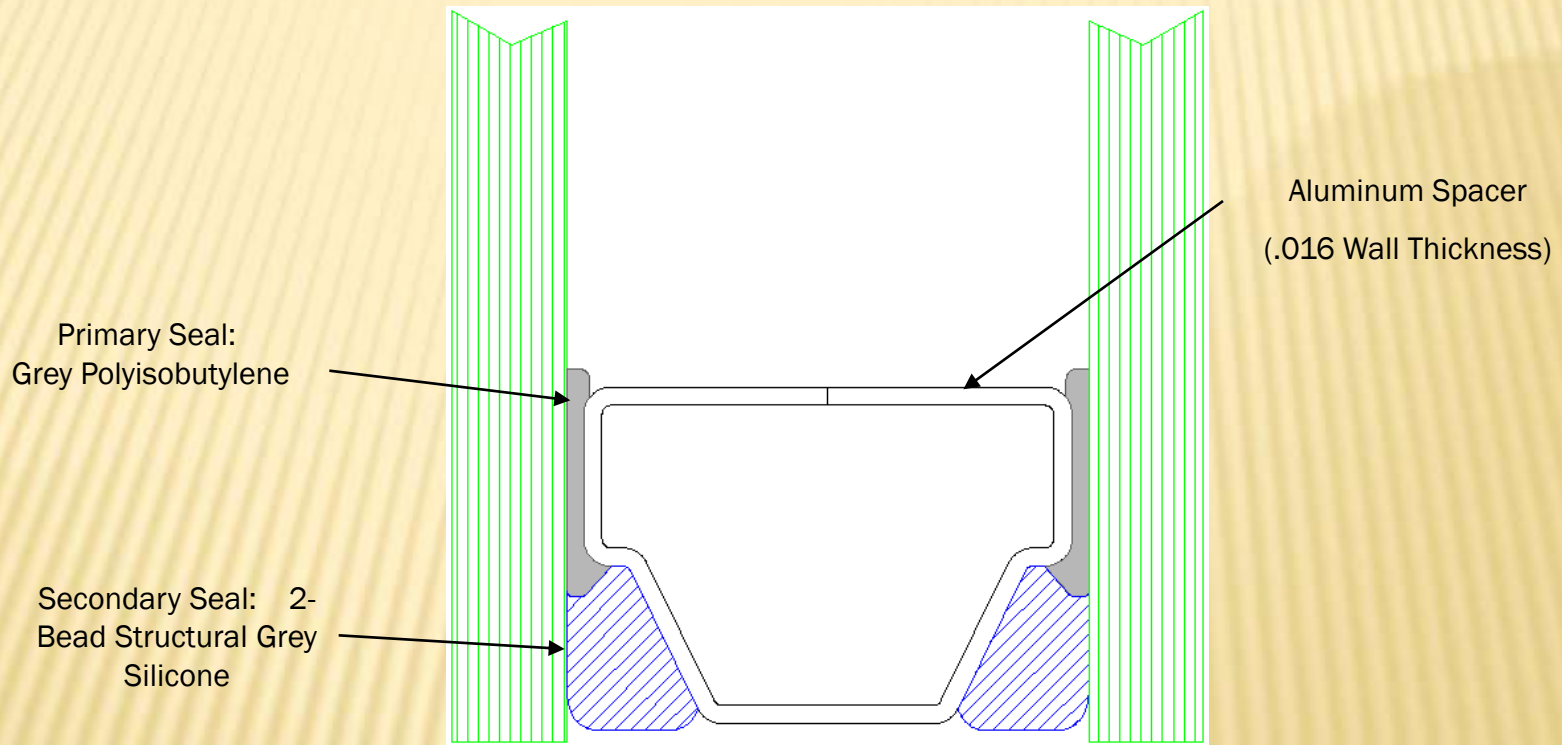
The Rate of Heat Transfer from The Warm Side to the Cold Side Expressed as BTU's per Hour per ft<sup>2</sup> per °F Temperature Difference (BTU/Hr/Ft<sup>2</sup> / °F)

× R-Value:

The Resistance to Heat Transfer, Calculated as 1/U

<u>Glass Type:</u>	<u>U-Value:</u>	<u>R-Value:</u>
Single glazed	1.00	1
2-Pane IG	.50	2
2-Pane LoE	.25	4
3-Pane LoE	.13	7.7

# Cardinal® IG Aluminum Space Dual Seal System (Polyisobutylene/Silicone)



Cardinal® IG  
Unit Cross Section Detail

IG

\* Duxton Window & Door  
Cardinal Glass Industries

# GREAT LAND WINDOW FEATURES

Without question, Great Land Window's fiberglass windows and doors are the most suitable products for Alaskan climates:

- The expansion/contraction problems that plague vinyl are virtually nonexistent with fiberglass (vinyl expands&contracts at over 8 times the rate of fiberglass).
- Fiberglass is extremely strong - over 8 times stronger than vinyl.
- Fiberglass' great strength and thermal stability result in less routine adjusting.
- Fiberglass frames can be insulated as they require no internal reinforcement.
- A fiberglass frame will produce a window or door with the greatest R-Value.
- Fiberglass is the most environmentally friendly window frame material.
- Fiberglass windows can be easily painted to match existing or custom décor.
- All of our glazing can be installed from the warm interior of the building.
- Great Land Window can provide many window and door configurations.

**Great Land Window** can provide brochures, color samples, and/or a complete Section 8 handbook with technical specs, standard colors, sizes, configurations, and other options. We can be reached at:

**Great Land Window**  
**2401 College Rd.**  
**Fairbanks, AK 99709**  
**(907) 479-8437**  
**[info@greatlandwindow.com](mailto:info@greatlandwindow.com)**  
**[www.greatlandwindow.com](http://www.greatlandwindow.com)**

Please don't hesitate to contact us if you have any questions or would like us to provide you with further details or specifications.



# THE POSSIBILITIES

- ✘ Revolutionary R-12 Vacuum Glass Turns Windows into Walls
- ✘ Guardian Industries has under development a revolutionary vacuum-glazing panel
- ✘ The glass – Guardian VIG (for vacuum-insulated glass) – 250-micron space evacuated between two layers of glass, one of which has a low-e coating.

Information here from:

<http://www.nextenergynews.com/news1/next-energy-news2.27b.html>



**For more information:**

<b>SunGuard</b> Phone: 866-GuardSG (866.482.7374) Email: <a href="mailto:SunGuard@guardian.com">SunGuard@guardian.com</a> Web: <a href="http://SunGuardGlass.com">SunGuardGlass.com</a>	<b>ClimaGuard &amp; Neutral 70</b> Phone: 800.521.9438 Email: <a href="mailto:ClimaGuardInfo@guardian.com">ClimaGuardInfo@guardian.com</a>
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**Solar Management Glass** [click here](#)

# **EFFICIENT THERMAL SHELL DESIGN: REALITIES FOR TODAY**

## **FASWALL**®

- ✘ Made from recycled wood chips, mineralized, then combined with a portland cement binder.
  - ✘ Low embodied energy and designed for eliminating job site waste.
  - ✘ All natural materials including mineral wool insulation inserts\*
  - ✘ Remarkable water vapor breath-ability **eliminates** wall moisture issues.
  - ✘ Produced in Oregon
  - ✘ Will not rot or harbor mold.
  - ✘ 4 hour fire rating!
  - ✘ Very low sound transmission
  - ✘ Price competitive with framing, SIPS, and foam ICF's.
  - ✘ Exceptional thermal performance--thermal mass is insulated into the living space.
- \*foam insulation inserts are available



## TESTING, EVALUATIONS, LISTINGS



- ✘ 4 hour fire rating. ASTM C-119, E-84-89a. No flame spread, no smoke development
- ✘ Passed 300 cycle freeze-thaw test. ASTM C-666
- ✘ No termite tunneling. University of Georgia Dept. of Entomology
- ✘ Sound Transmission testing: STC of 55. ASTM E 90-90
- ✘ ASHRAE parallel path R value analysis of R 21 with mineral wool inserts and R 25.5 with Poly-iso foam inserts (*no value added for thermal mass*)
- ✘ ICBO listing ER 5589 recently updated to ICC listing.

**WALL-FORMS ARE DRY STACKED AND INTERLOCK ON THE ENDS CREATING A STABLE WALL SECTION THAT NEEDS MINIMAL BRACING PRIOR TO INFILLING.**



Shelter  
Works Ltd

# FLEXIBLE CONDUIT CAN BE RUN IN THE WALLS DURING LAY-UP, THEN FISH WIRES AFTER POURING.



# FILLING WALLFORMS WITH A BOOM TRUCK. LINE PUMPS CAN BE USED ALSO.



**EXCELLENT ACCURATE STACKING JOB. NOTE THAT THE SEAMS LINE UP INSURING THAT THE CORES LINE UP PROPERLY. BUCKS ARE TEMPORARY AND WILL BE REMOVED.**



# INFILLING WITH A LINE PUMP (SHELTERWORKS RECOMMENDS SCAFFOLDING FOR STACKING AND FILLING)



Shelter  
Works Ltd.



**ATTRACTIVE DESIGNS THAT ARE EXCEPTIONALLY ENERGY EFFICIENT: A 32000 BTU WATER HEATER AND A WOOD STOVE HEATS THIS NORTHERN CLIMATE HOME.**



# IDEAL MATERIAL TO CRAFT COZY, COTTAGE STYLE DWELLINGS













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## Mission Statement

We are a non-profit organization whose members are designers, contractors, owner builders, and people interested in straw building.

Our mission is to '...further the practice of straw building by exchanging current information and practical experience, promoting and conducting research and testing, and making that body of knowledge available to working professionals and the public at large.'

It's important for the success of CASBA that you become involved. We see ourselves as a clearinghouse for information and a network of resources. If you'd like to offer any special skills, enthusiasms, or time please let us know about them. We'll be happy to help you get connected with other members who also want to build with bales.

[www.strawbuilding.org](http://www.strawbuilding.org)

- 
- ✘ Net Zero Housing CAN Be Achieved Through Meticulous Design, Conservation, and Advancements in Building Materials Technologies
  - ✘ You CAN Do It!

**THANK YOU**