



6 Lessons for High Performance Subcontracting

NAPHC, San Francisco, CA
September 13, 2014
Skander Spies, Energetechs



Skander Spies

Engineering

Mountains

Hands On

Committed



Energetechs Construction

Framing

Insulation

Windows

HVAC

Audits/Consulting



energetechs



Goals

“Blow Away” Clients
(expectations)

Mistakes

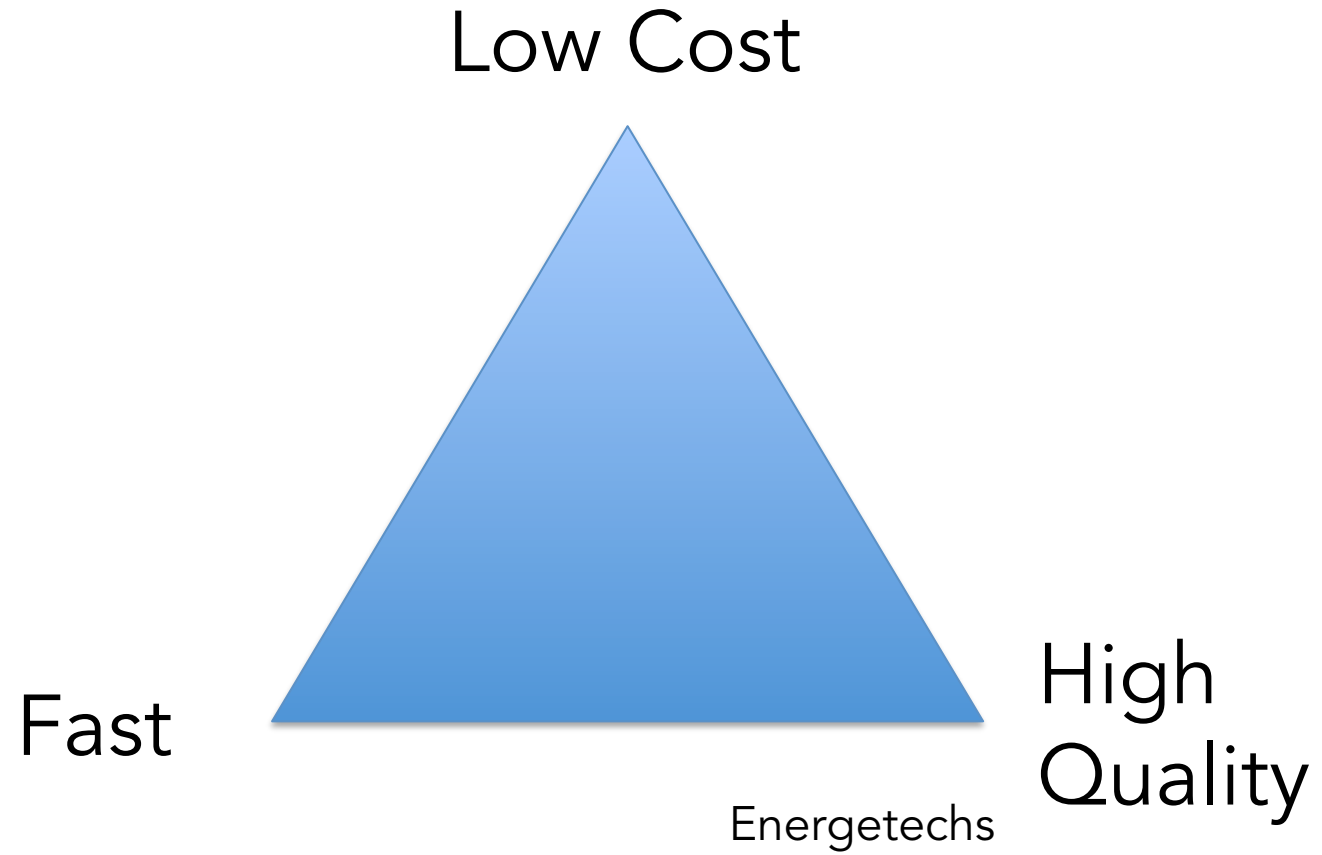
Realism

Cost Effective



© Natural Dwellings

Pick Two



Why Thermal Holes Important?

ENERGY | Energy Efficiency & Renewable Energy

$$\begin{aligned}\text{Avg. } U &= \frac{(U_1 \times A_1) + (U_2 \times A_2) + \dots}{\text{Total Area (A)}} = \frac{(.026 \times 990) + (1 \times 10)}{1,000} \\ &= \frac{35.74}{1,000} = .036 = \mathbf{R27.8 = 27\% \text{ less than R-38}}\end{aligned}$$



Construction by People

Good People = Good
Quality, NOT Perfect

Well Trained

Fit

Dedicated



Agenda

Mechanical Noise

MiniSplits

Framing for Insulation

Envelope Transitions

Cellulose

Vaulted Ceilings

Discussion



Mechanical Noise

Location

Frequency

Isolation

Equip Type

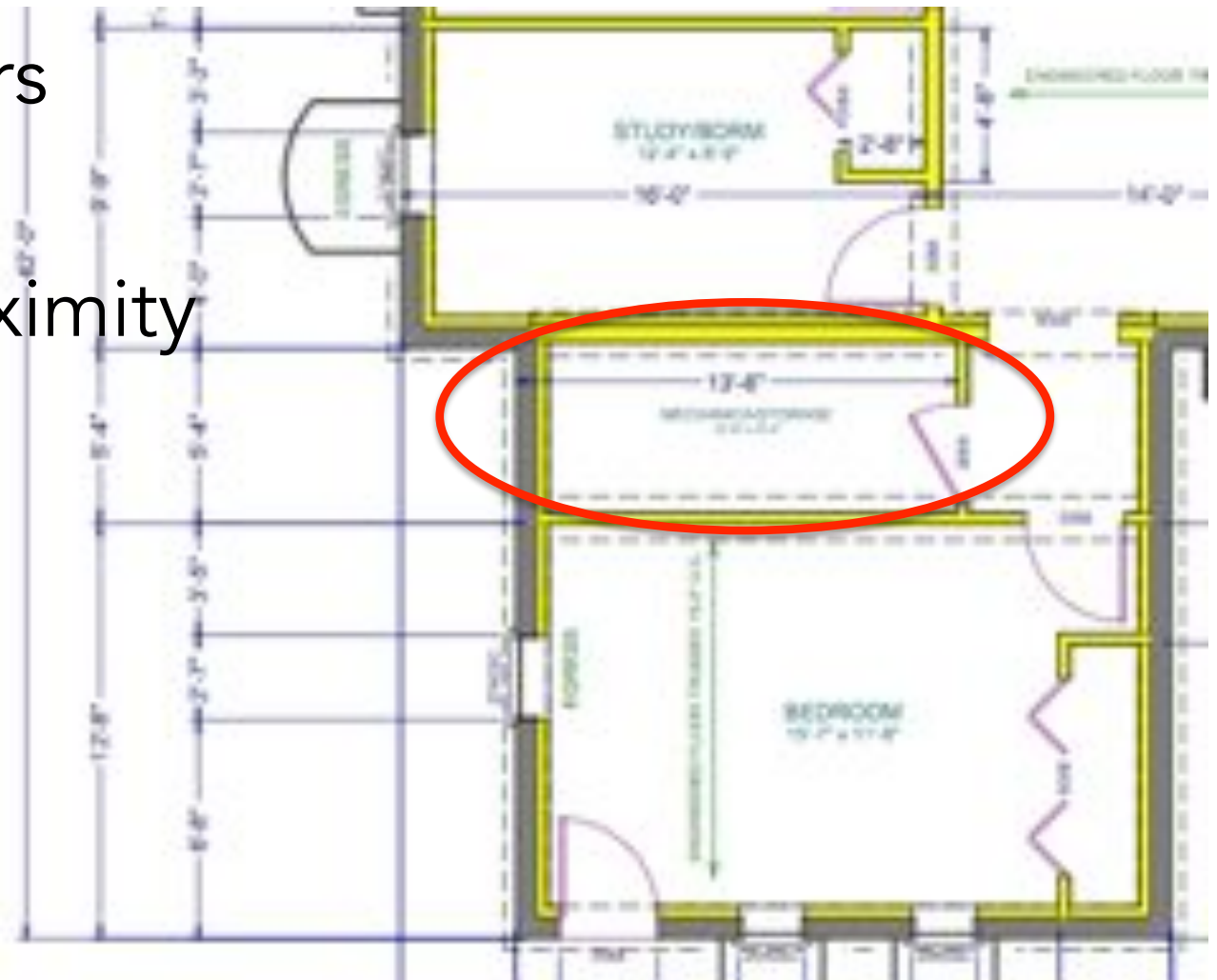


Mechanical Noise: Location

Concrete floors

Bedroom/proximity

Stairs/Chases



Mechanical Noise: Duct Noise

Straight round

	Acoustics		Dimension				
Model	125	250	500	1000	2000	4000	8000
LD 4	8	14	26	34	41	45	25
LD 5	6	12	22	28	37	38	22
LD 6	5	10	18	23	33	30	19
LD 8	4	9	17	22	29	25	18
LD 10	6	11	21	27	39	25	19
LD 12	5	9	18	23	32	20	18
LD 16	5	8	11	23	19	17	15

ACCA!

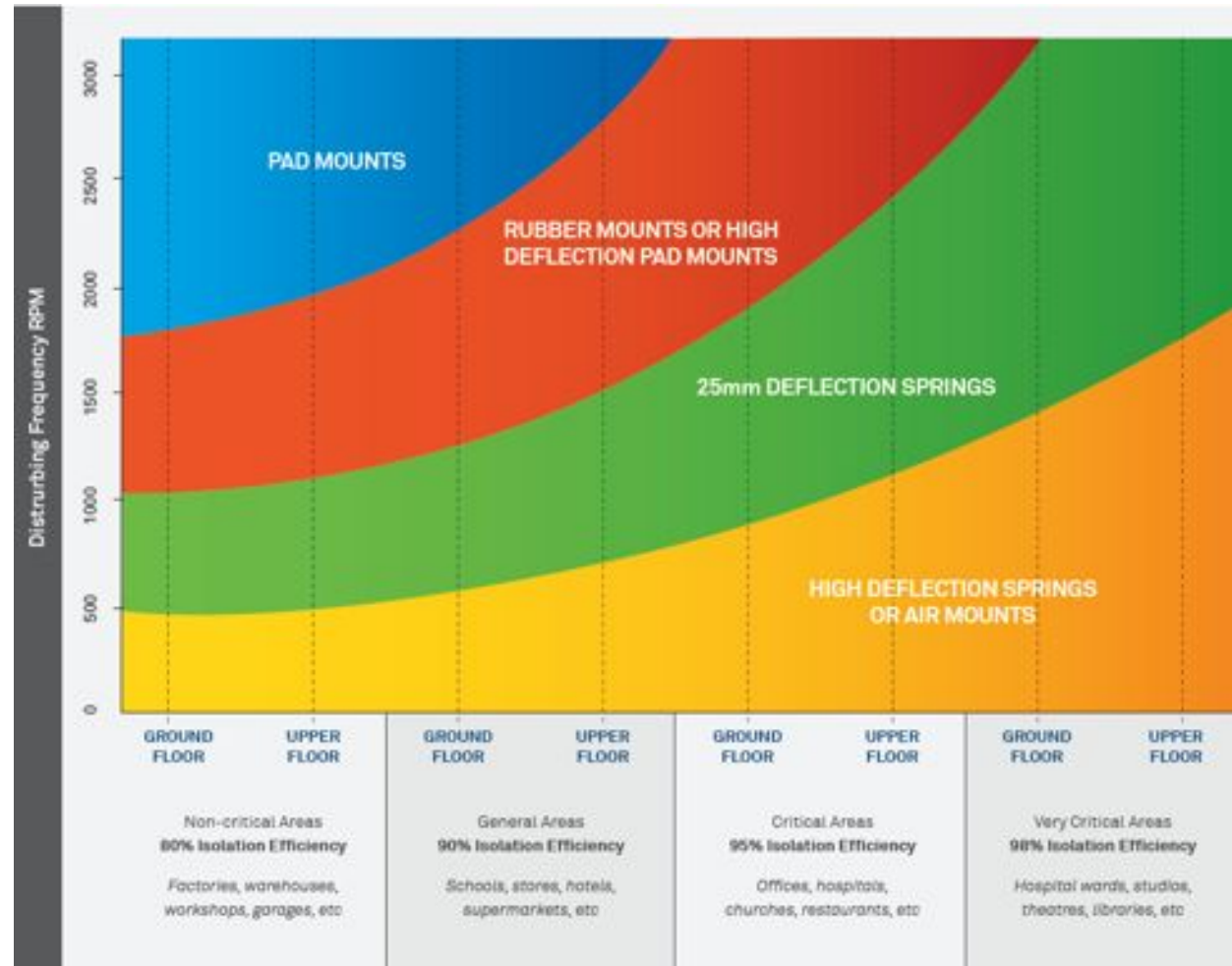
Grille noise

Silencers



Mechanical Noise: Frequency

Low Freq.



Mechanical
Noise

Low Freq...

Walls...

Overhangs...



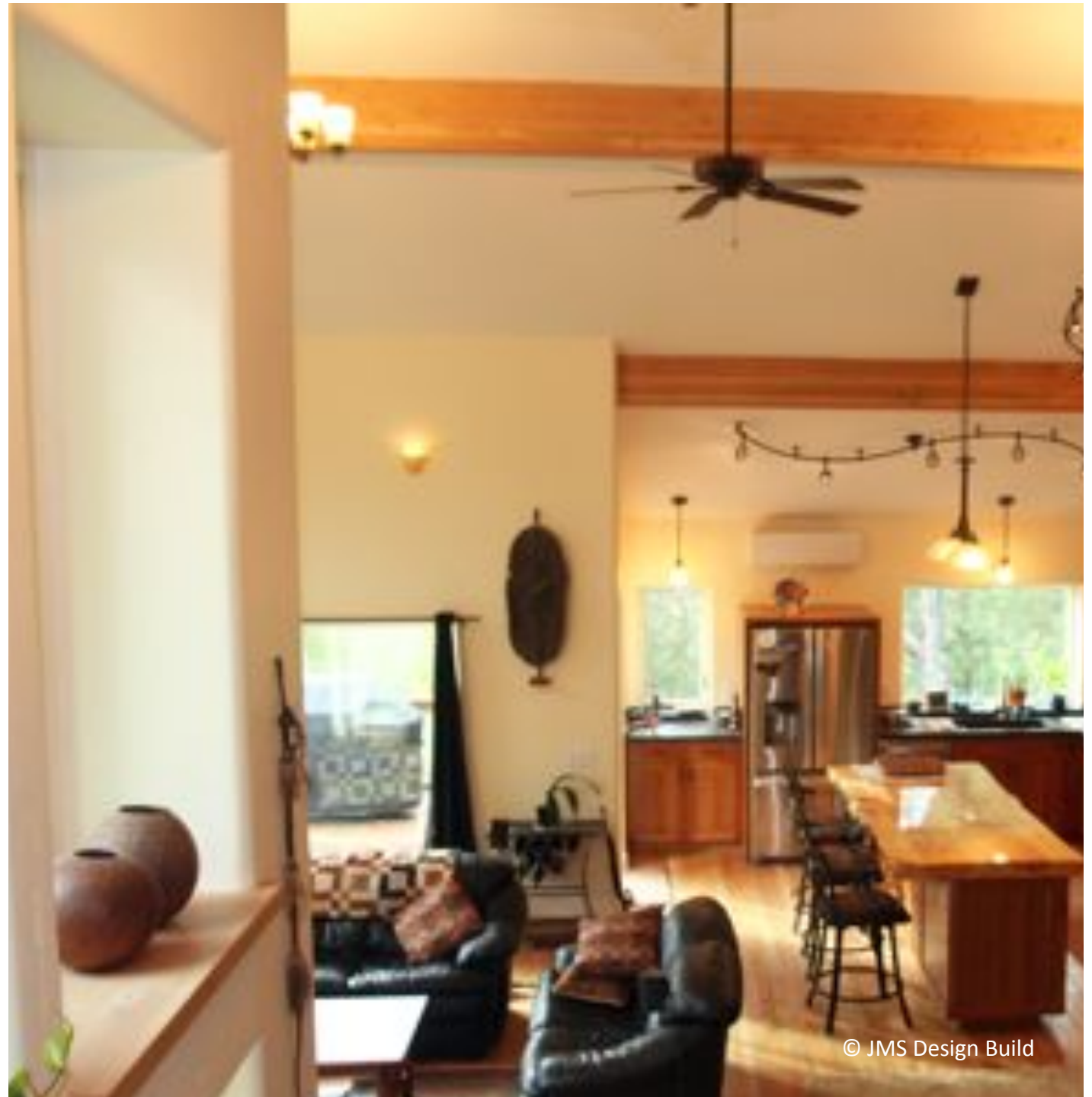
MiniSplit HVAC

“Feel”

Timing

Volume

Service



© JMS Design Build

MiniSplit HVAC

Volume

Timing



© JMS Design Build



MiniSplit HVAC

Service



Performance Framing

Order of
Operations

Think
Insulation

Less Wood



Operations

Avoid
unfillable
gaps



Reduce Framing

Stay on top
of your
framers

Reduce wood

Faster!



Framing to Insulate

Limit horizontals

Align studs

Limit "micro cavities"



Framing to Insulate



Envelope Transitions

Air

Water

Thermal

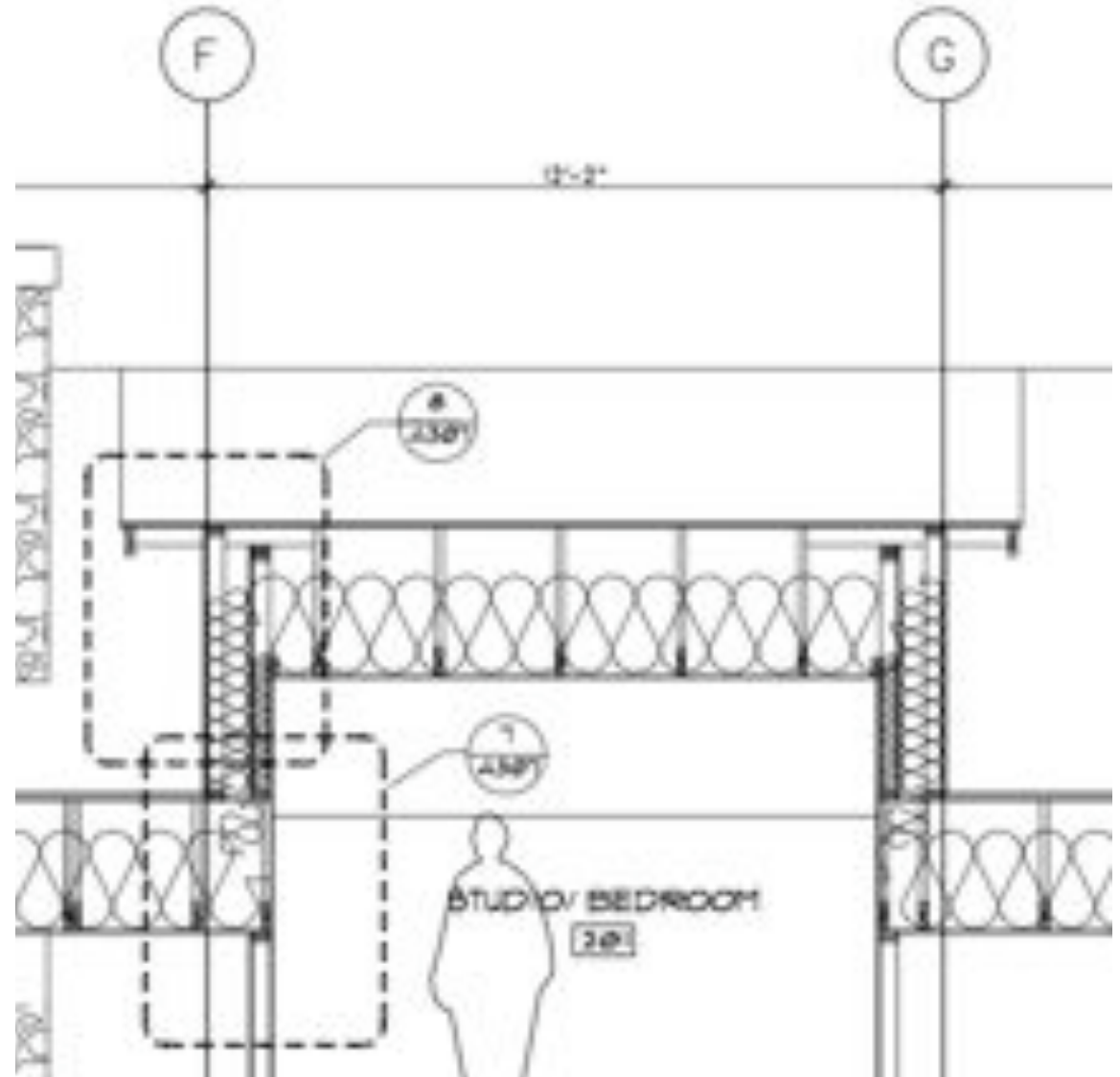


Envelope Transitions

Air

Water

Thermal



Envelope Transitions



Envelope Transitions

Air

Water

Thermal



Envelope Transitions

Who is
responsible?



Cellulose Installation

Dense vs Wet

Finishing

Install Realism



Cellulose Settles

Dense-pack
settles

Smart blocking

Better planning
with framers



Cellulose Settles

Wet-spray settles

Smart blocking

Know when to use
which



Cellulose Installation

Touch up w foam

Netting

Trimming



Cellulose Limits



Cellulose Limits



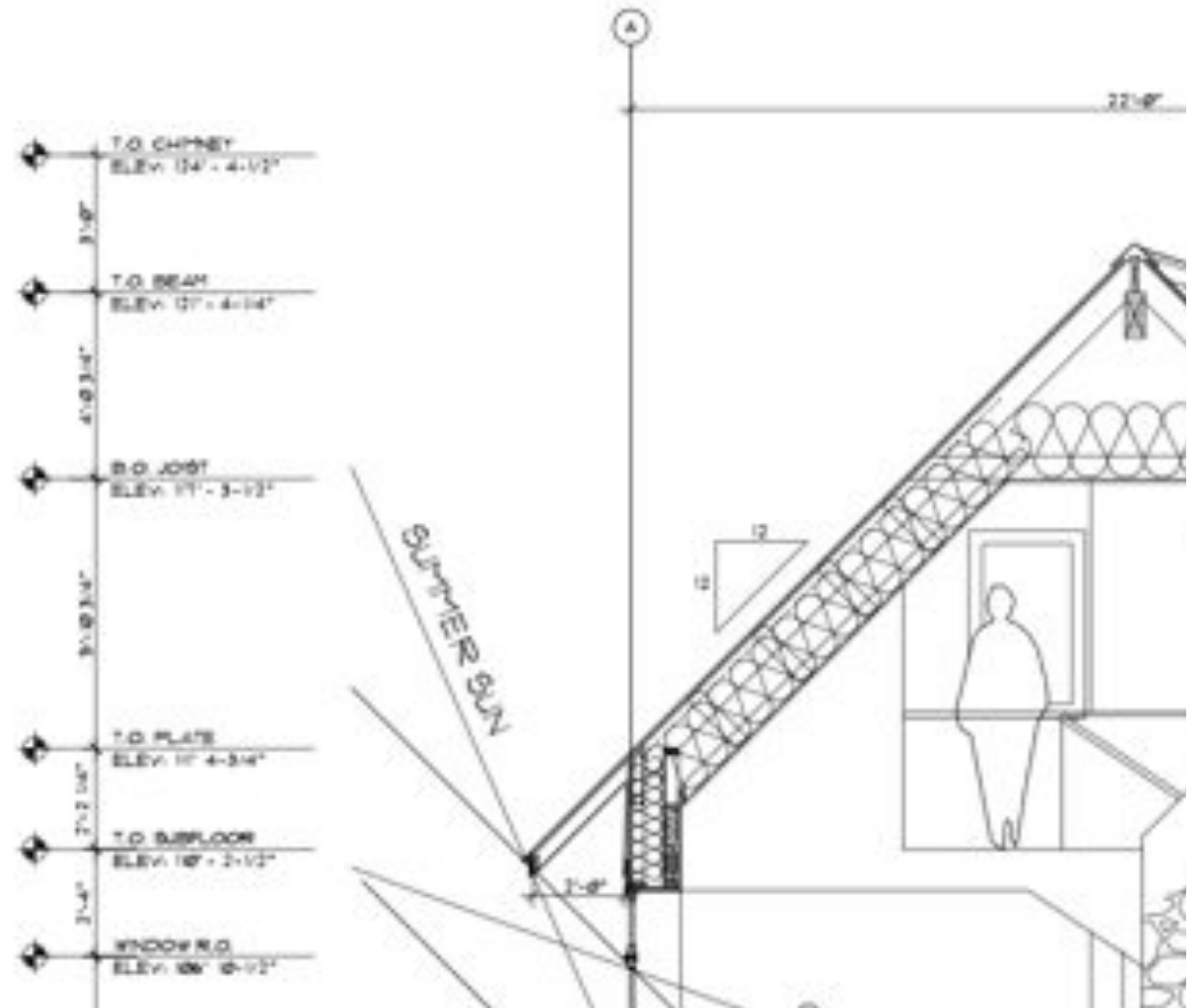
Vaulted Ceilings: Issues

Venting

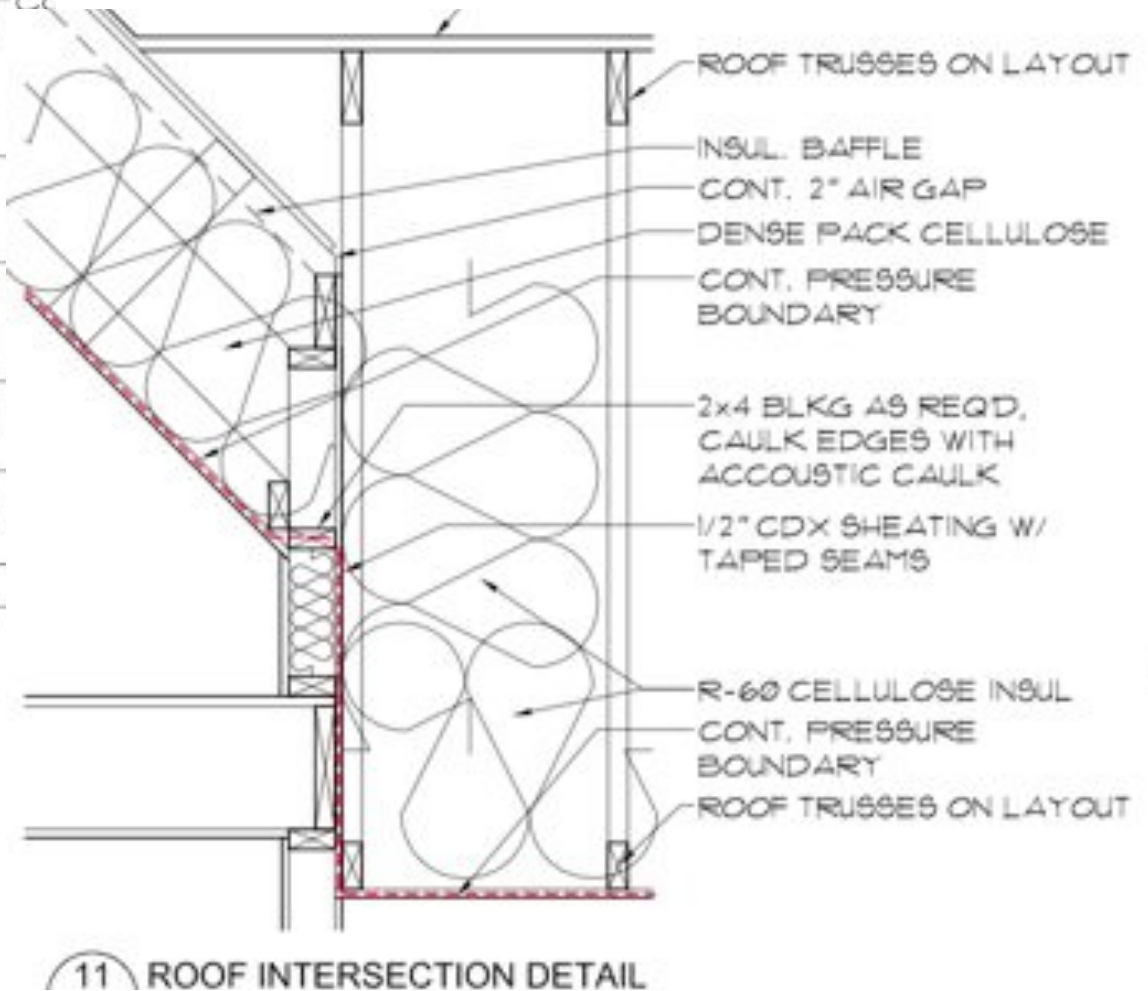
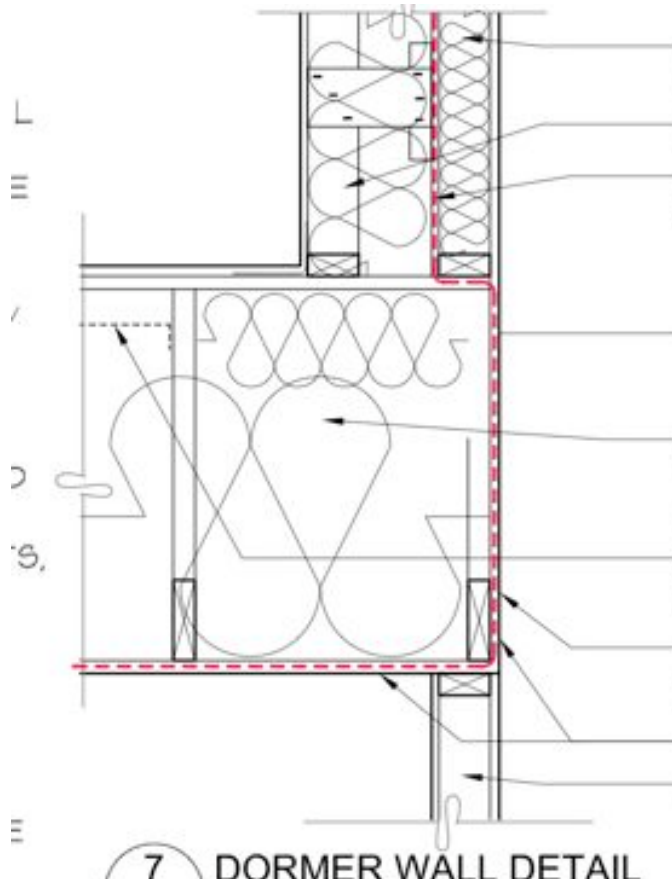
High R Value

Air Sealing

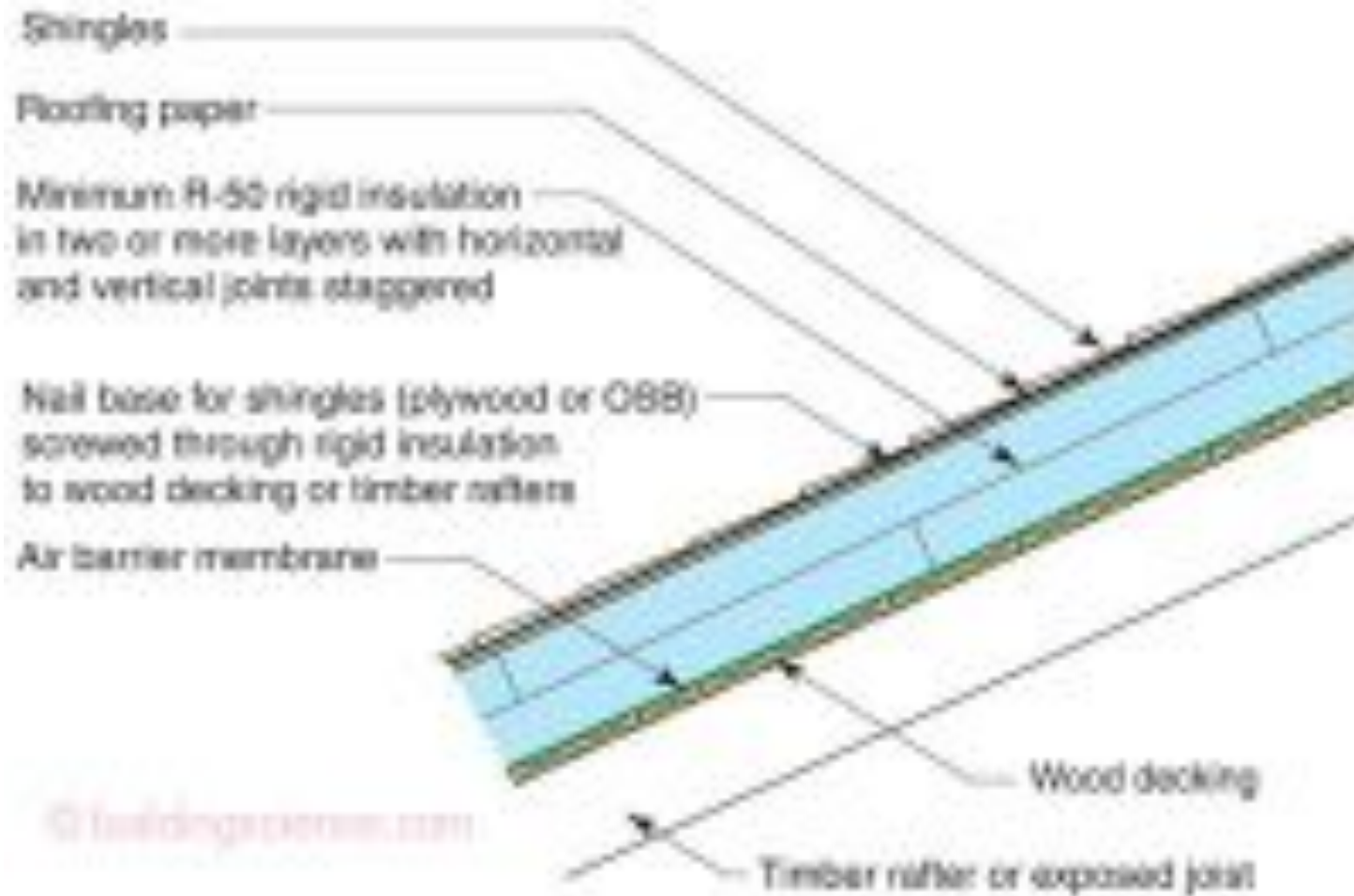
Expensive



Vaulted Ceilings: Issues



Vaulted Ceilings: Solutions





Vaulted Ceilings: Solutions

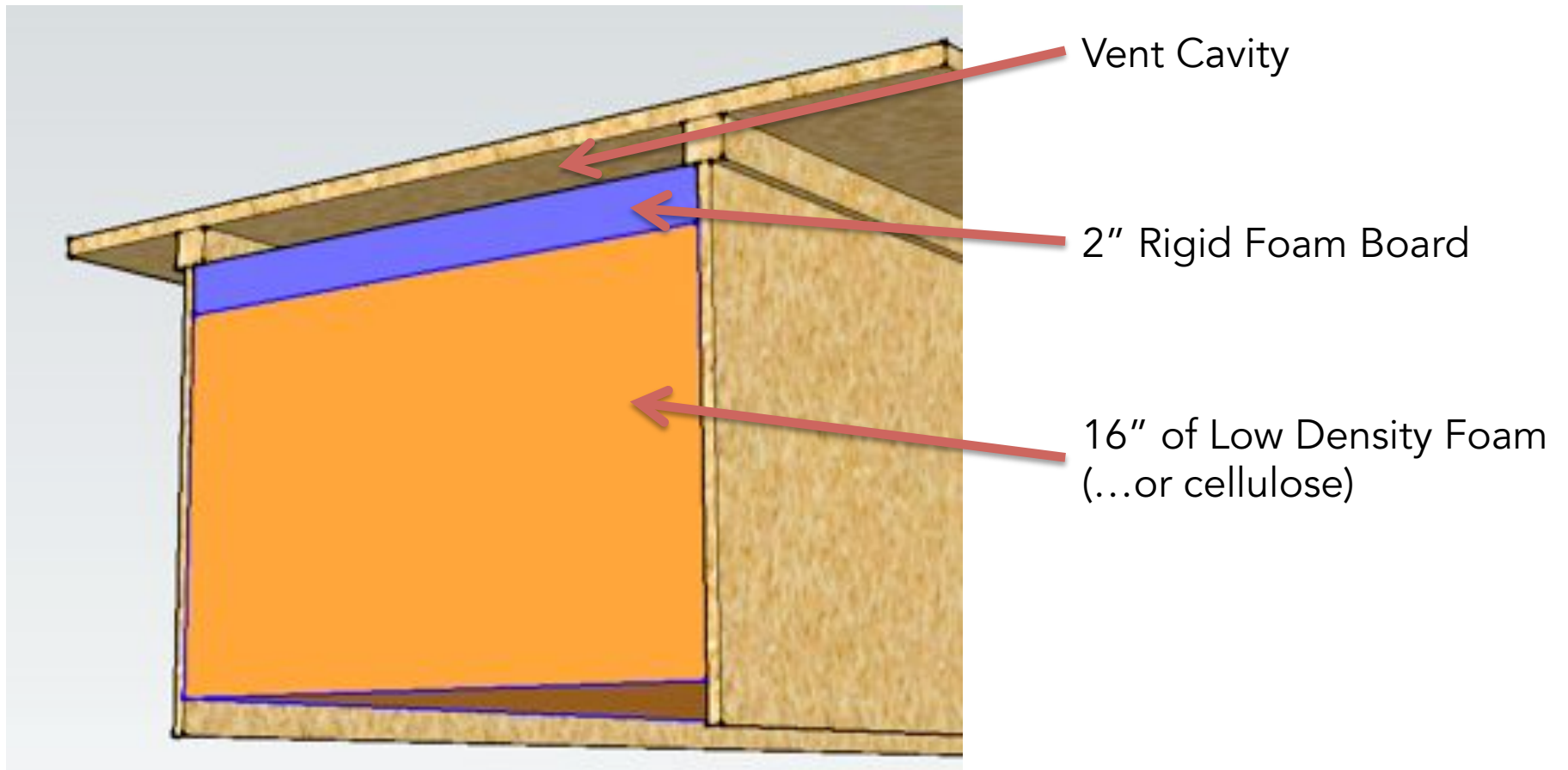
Cellulose < 3:12 w/ attic

No overhead cellulose application

Preserve venting



Vaulted Ceilings: Solution



Similarities

Fewer vaulted ceilings

Less volume

More coordination

More realism

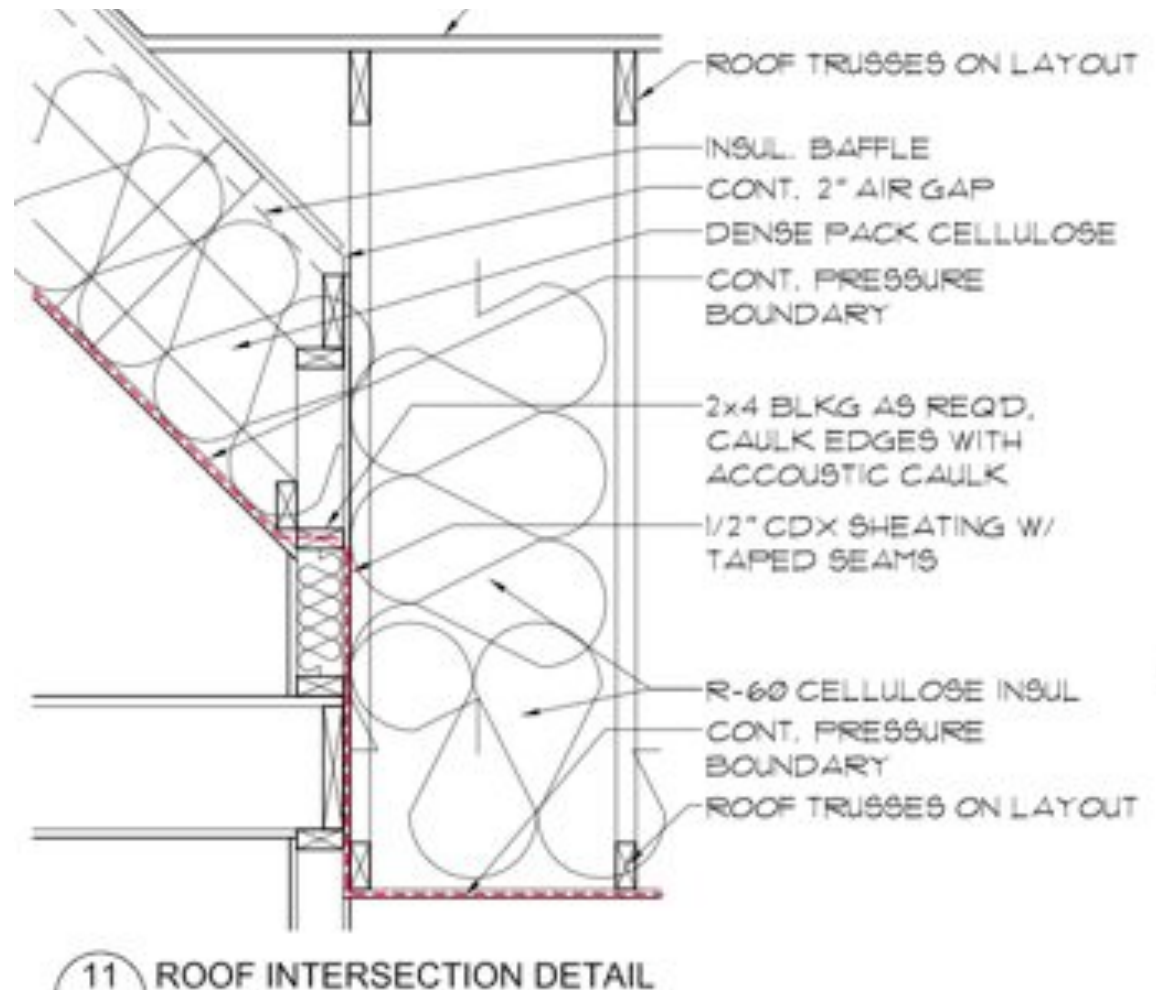


Other Notes

Climate

Morale

Subs/Goals



Thanks!

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Citations:

- <http://www.embelton.com/vibration-isolation/isolation-selection-guide/>
- <http://www.fantech.net/enus/>
- JMS Design Build
- Natural Dwellings Architecture
- Riversong Builders

