Rhode Island’s first passive house

Demetrick Housewrights – Builder

Steven Baczek – Architect
Project goals

• Simple construction details
• Builder friendly – materials and methods
• $282,000 construction budget — This number was dictated by the bank loan/appraisal
• 1800 sq. ft, 3 BR, 2.5 baths
• PHIUS certification
WTF!

- Yeah, that’s $156/sq. ft.
- And yes, we did it, well almost did it
How did we get there?

• Simple construction details
• Local, cost-effective materials from lumberyard
• Builder friendly construction details
• Builder, architect and owner committed to the plan
Excavation
Foundation
Tremco and sill seal
Standard framing
Zip sheathing with, yes, more tremco
Attention to detail
Critical top plate detail
Top plate completed, ready for trusses
The battle raged
The obligatory green box, juiced up with orange trim
Airtight drywall in 20 degree weather
Success!!
Sub Slab foam – 6”=R-26 - and vapor barrier
Finished concrete floor is installed
Now we make holes
And fix them
The Devil is in the details
Tape holds the window in and water out
Schuco UPVC windows, R 7.7, U.13
Now we frame walls
Insulation

R – 56 walls –
  4” closed cell foam
  8” dense pack fiberglass

R – 92 roof
  28” loose fill cellulose
Trim and Siding

- 1x6 #2 pine siding
- Boral flatstock trim
- James Hardie board and batten detail
- Open rainscreen installation
Painted furring strips provide drainage space

#30 felt hides green Zip and integrated flashings
Form and Function
Mechanicals
Zehnder comfoaire 350 ERV
GE Geospring HPHW heater
Daiken Quaternity minisplit on 1st floor
Standard energy star appliances
Final project numbers

Annual Heating demand 4.17 kbtu/sq ft/yr

Annual cooling demand 1.42 kbtu/sq ft/yr

Specific primary energy demand 31.5 kbtu/sq ft/yr

Heating load – 4.26 btu/sq ft/hr

Cooling load – 4.11 btu/sq ft/hr

0.16 ACH50
Final Project Costs

Original budget - $282,690
Final Construction costs - $300,420.25
$/Sq. Footage - $163 (american style)
Builder net profit - %10

Cost overruns due to:
• Builder: +/- $4000
• Weather: +/- $4000
• Owner changes: +/- $10,000

Passive House fees – approx. $8,000 additional
• CPHC
• PHIUS+ rater
• PHIUS application and certification fees

Architectural fees – a steak dinner
The last frontier

• What to do about the humidity?

1st floor, kitchen

2nd floor hallway
In summary, what defined this Project?

**Simple redundencies**

- Sheathing Serves as air barrier, secondary WRB, structural sheathing and nailbase for rainscreen/siding
- Air barrier – Zip Sheathing, tape and Tremco, drywall Ceiling, simple shape, no origami!
- WRB – taped zip, #30 felt for shadow and to integrate flashings
- Double stud walls – carpenter friendly
- Minimized difficulty for subcontractors with simple construction details – business as usual
- Wicked awesome builder/Wicked awesome builder
Lessons Learned

WARNING

TO AVOID INJURY
DON'T TELL ME HOW TO DO MY JOB
The Slabless Slab