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
- We planned the project BEFORE we started

Excavation

Foundation

Tremco and sill seal

Standard framing

Zip sheathing with, yes, more tremco

Attention to detail

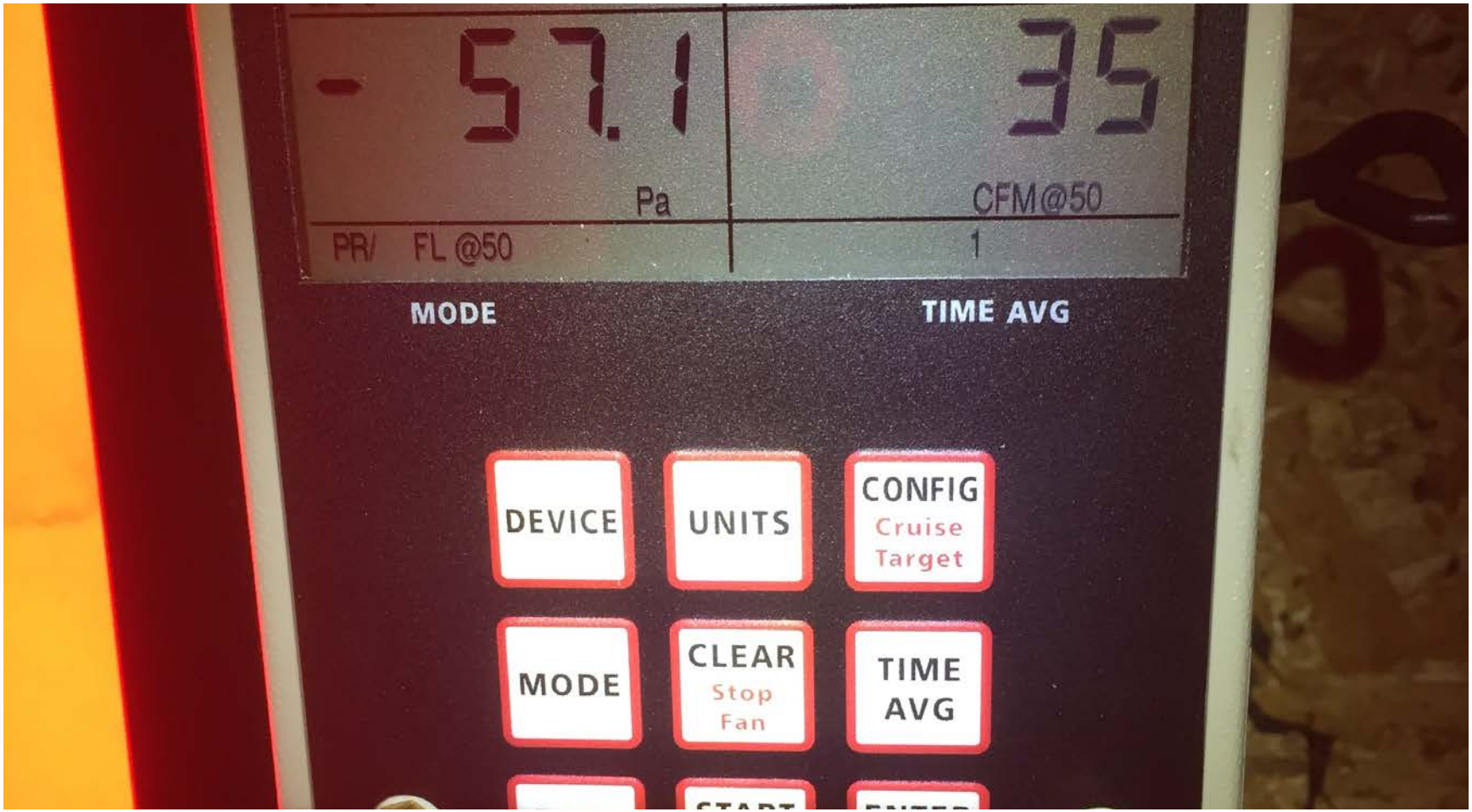
Critical top plate detail

Top plate completed, ready for trusses

Airtight drywall in 20 degree weather

The obligatory green box, juiced up with orange trim

Success!!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MODE
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INTELLO
AIR SYSTEM
FLASHING TAPE

INTELLO®
Makita

The battle raged


INTELLO

Sub Slab foam – 6”=R-26 - and vapor barrier

Finished concrete floor is installed

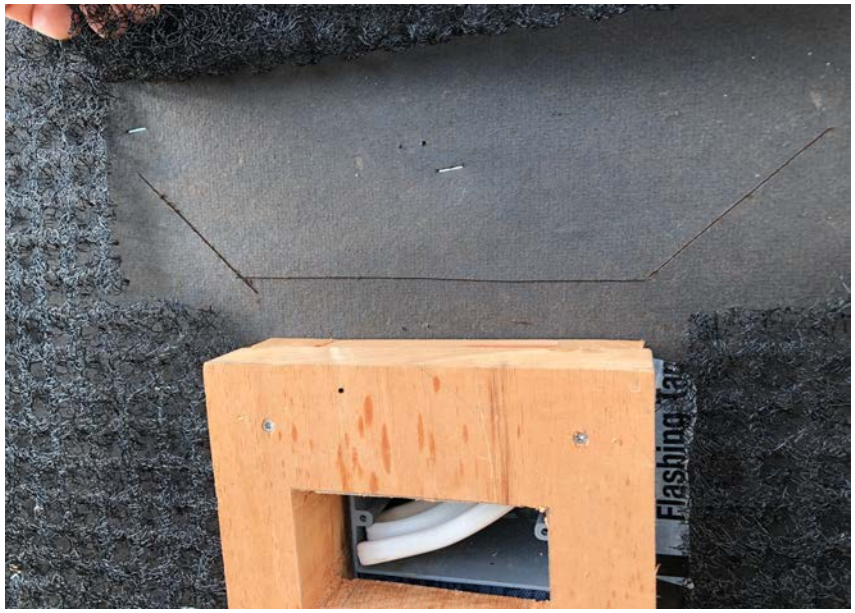
Now we make holes

And fix them

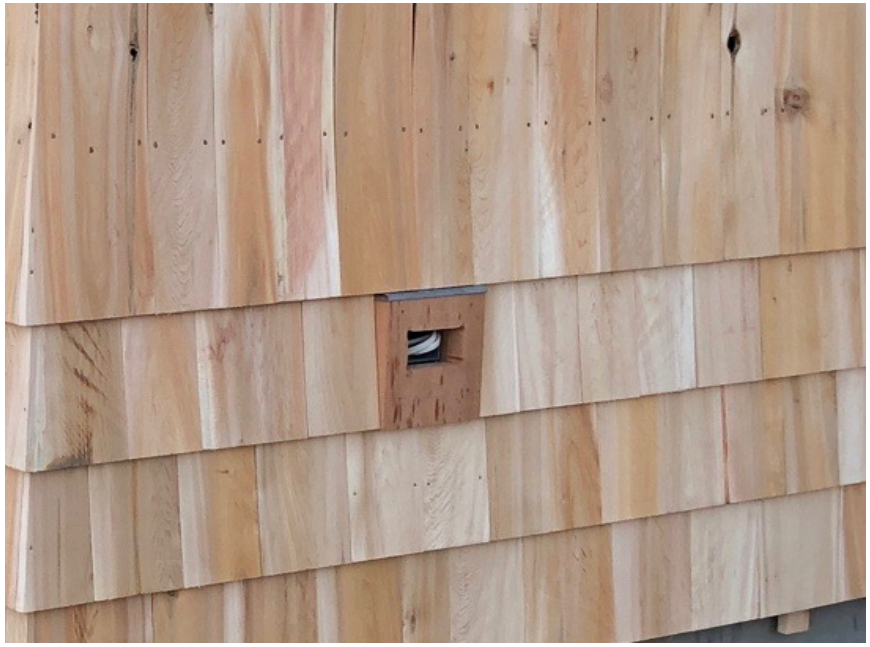

TESCON PRO


7/16" ROOF AND WALL SH


3M
All Weather
Flashing Tape 8067




3M
All Weather
Flashing Tape 8067



The Devil is in the details


3M
All Weather
Flashing Tape 8067

Installing exterior faucets in thick walls

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

Plain old 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

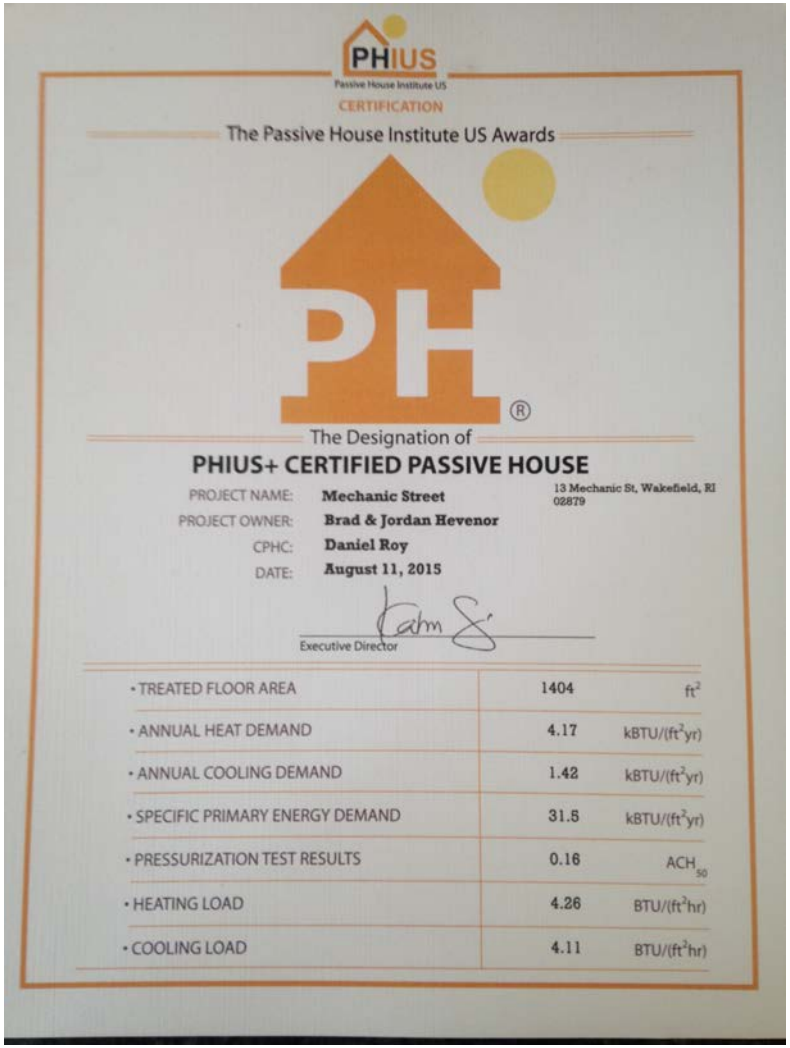
Annual cooling demand 1.42 kbtu/sq ft/yr

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



PHIUS
Passive House Institute US
CERTIFICATION
The Passive House Institute US Awards

The Designation of
PHIUS+ CERTIFIED PASSIVE HOUSE

PROJECT NAME: **Mechanic Street** 13 Mechanic St, Wakefield, RI 02879
PROJECT OWNER: **Brad & Jordan Hevenor**
CPHC: **Daniel Roy**
DATE: **August 11, 2015**

Executive Director

• TREATED FLOOR AREA	1404	ft^2
• ANNUAL HEAT DEMAND	4.17	$kBTU/(ft^2yr)$
• ANNUAL COOLING DEMAND	1.42	$kBTU/(ft^2yr)$
• SPECIFIC PRIMARY ENERGY DEMAND	31.5	$kBTU/(ft^2yr)$
• PRESSURIZATION TEST RESULTS	0.16	ACH_{50}
• HEATING LOAD	4.26	$BTU/(ft^2hr)$
• COOLING LOAD	4.11	$BTU/(ft^2hr)$

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

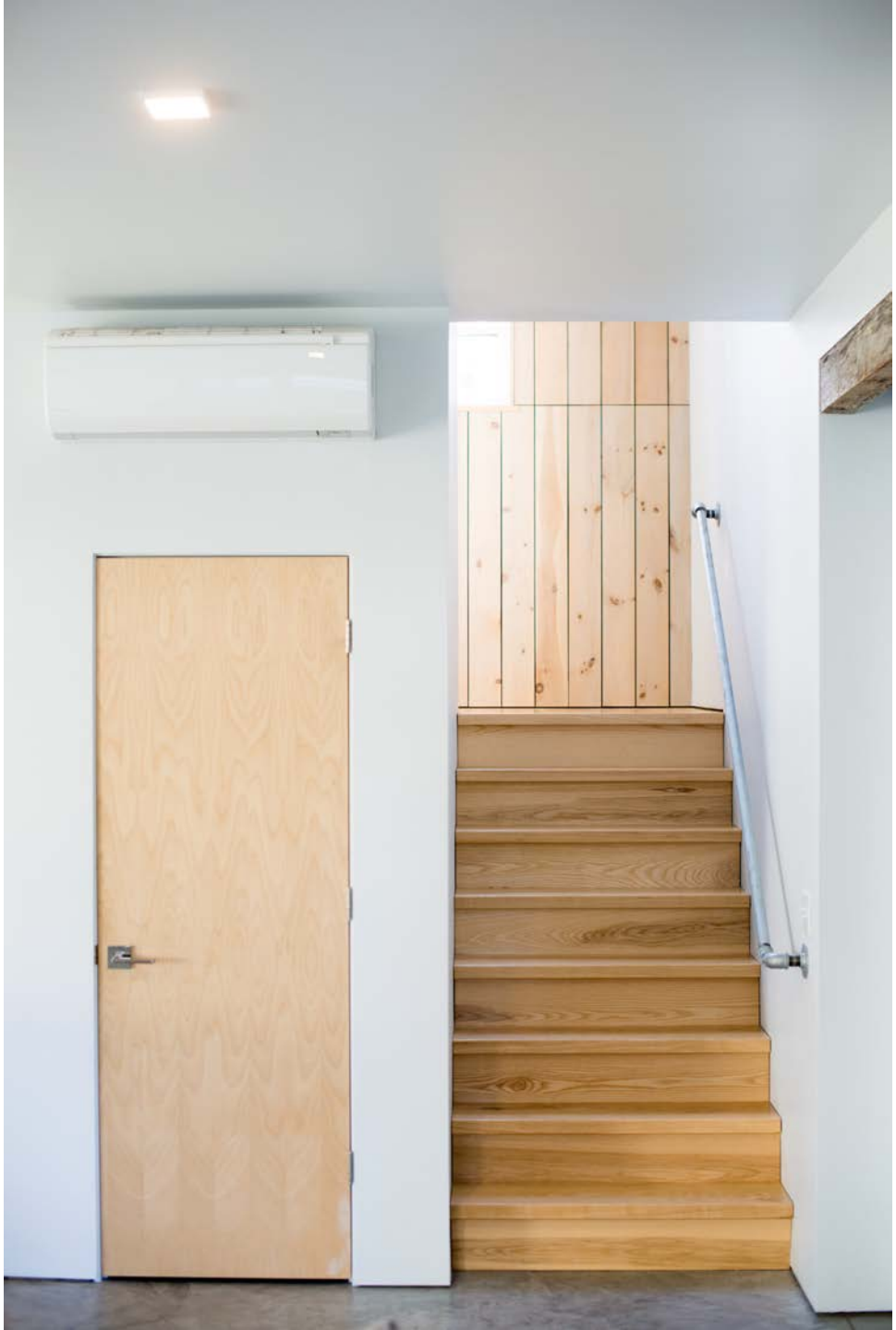
- What to do about the humidity?

1st floor, kitchen

2nd floor hallway


NEW YORK


Magnificent
Outstanding
Magic
TRUMP IS THE ANSWER



In summary, what defined this Project?

Simple redundencies

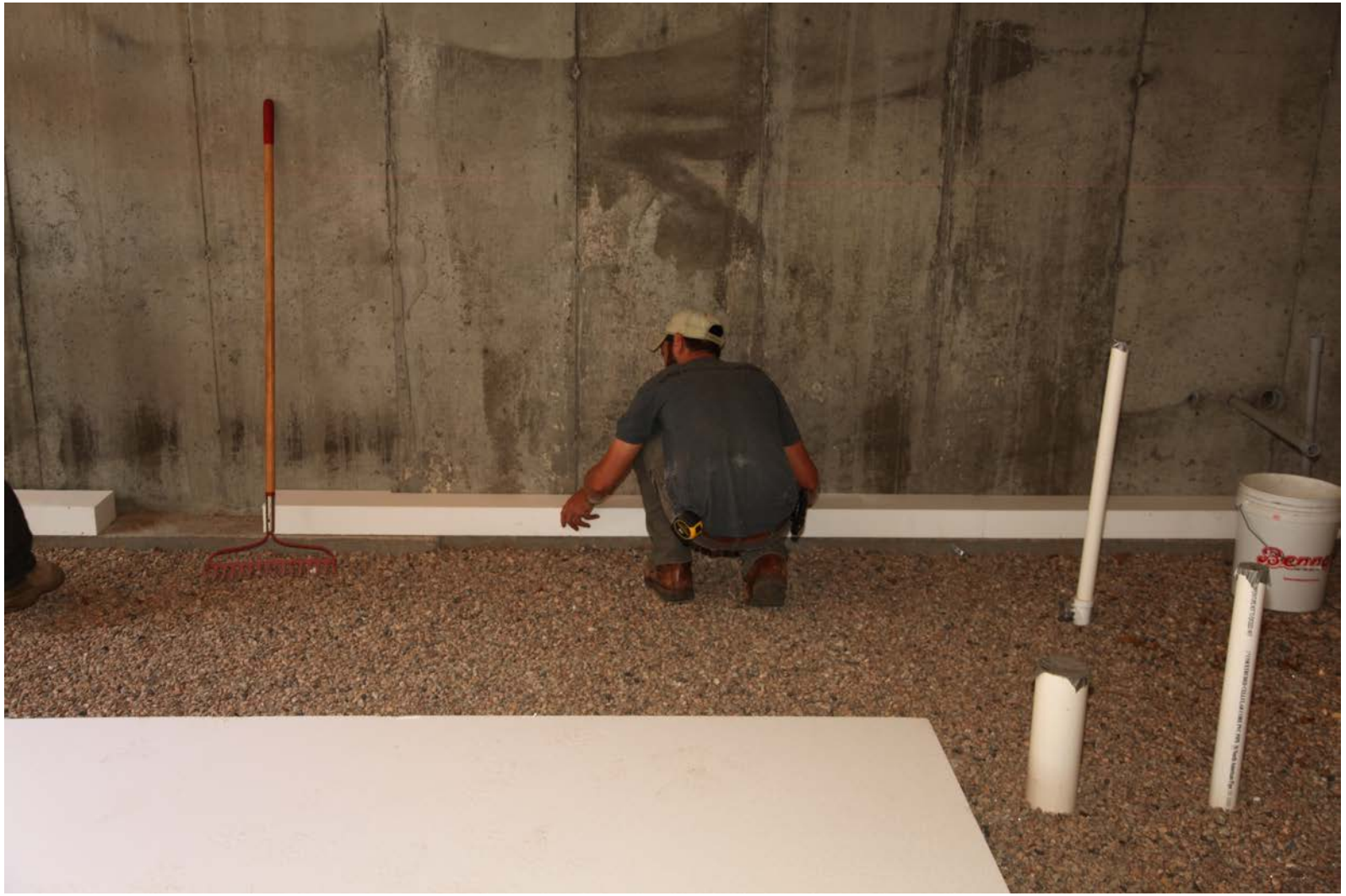
- Sheathing Serves as air barrier, secondary WRB, structural sheathing and nailbase for rainscreen/siding
- Air barrier – Zip Sheathing, tape and Tremco, drywall Ceiling, simple shape, no origami!
- WRB – taped zip, #30 felt for shadow and to integrate flashings
- Double stud walls – carpenter friendly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

Lessons Learned (from this project and others):

- Planning these details into the project BEFORE construction starts is imperative
- It's hard to find a good HVAC contractor, so just stick with minisplits
- Air sealing is easy if it's done right the first time
- Be careful of overheating
- Don't reinvent the wheel
- Keep it simple!
- This really works!
- Anybody can do this!
- What are you waiting for?!?

Lessons Learned

The Slabless Slab




All Weather
Flashing Tape 8067
3M


AdvanTech
3M


AdvanTech
FLOORING
LIFETIME
ESR-1785
SPACE PANELS 1/8 INCH
U.S. Patent Nos.
7150128, 7882661


AdvanTech
LIFETIME


LIFETIME
LIFETIME