F*#M-FREE ASSEMBLIES

Carri Beer, AIA
Brennan + Company Architects

Michael Hindle CPHC, CPHB
Passive to Positive Consulting

WHY FOAM FREE?

HOLISTIC,
LOW-IMPACT DESIGN

WHY FOAM FREE?

HOLISTIC,
LOW-IMPACT DESIGN

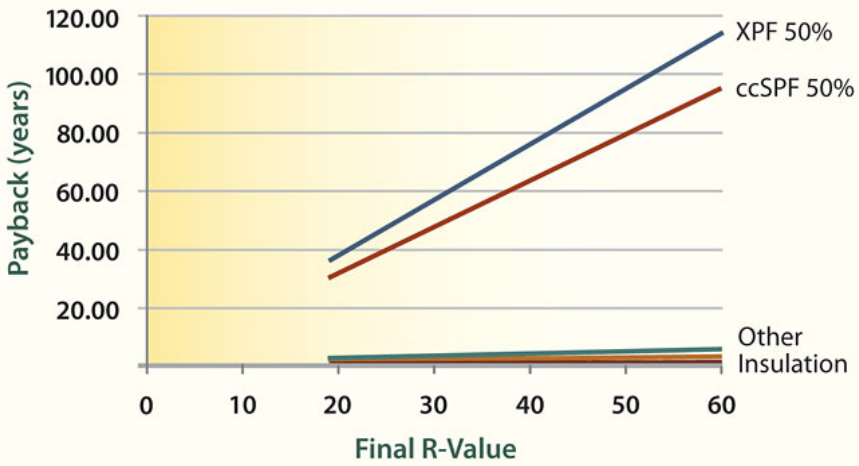
living in america

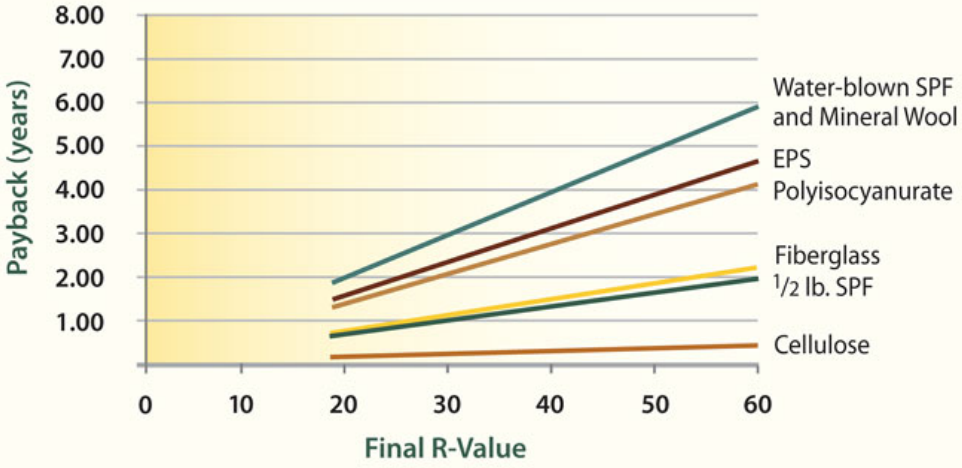
2 million plastic beverage bottles every 5 minutes

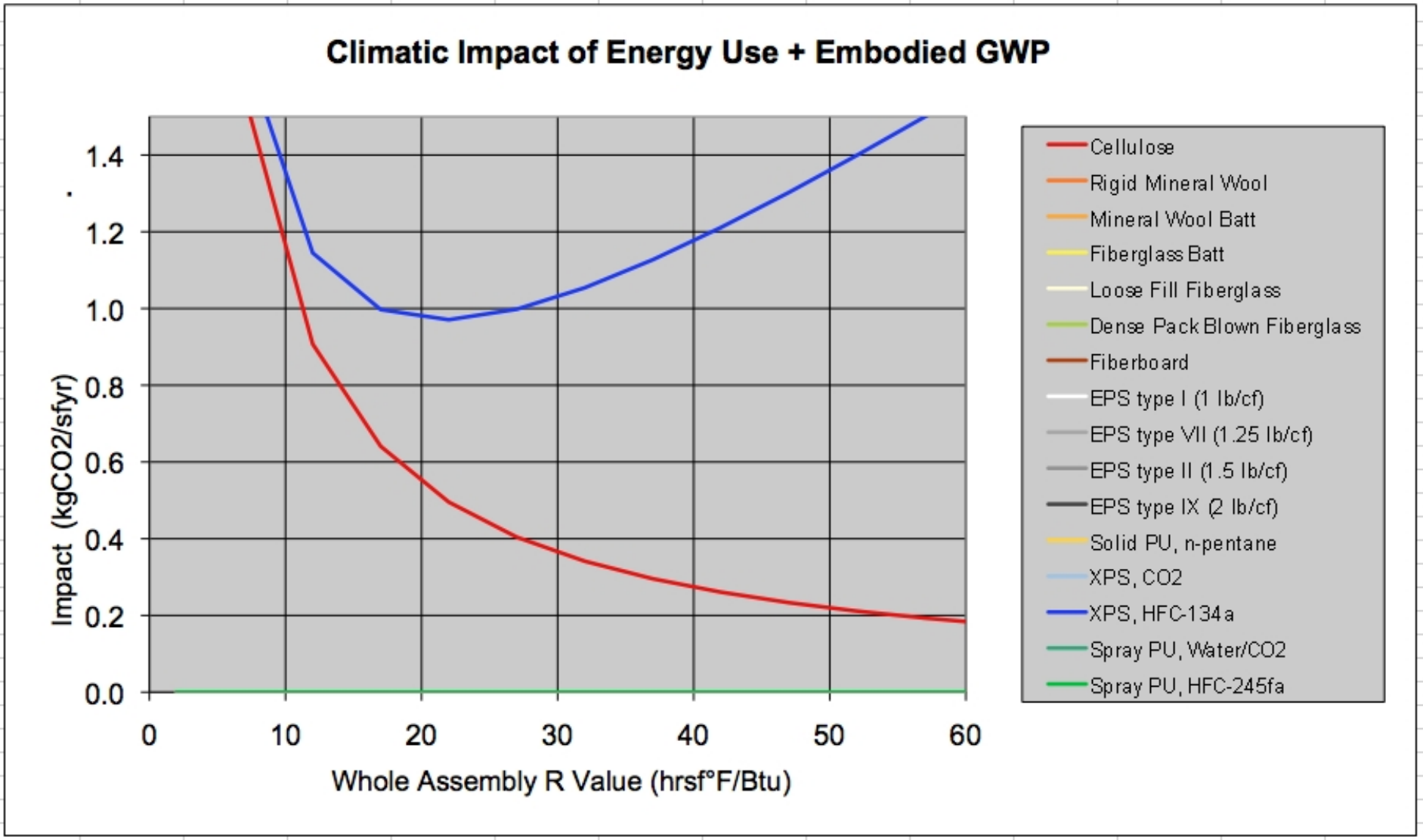
How many carcinogens are released by these bottles and plastic bags?
How many endocrine enhancing chemicals are released?
How much oil did it take to manufacture them?
WHAT ABOUT YOUR INSULATION?


500 YEARS

MATERIALS LIFE-CYCLE IMPACT






Climatic Impact of Energy Use + Embodied GWP
Impact (kgCO2/sfyr)
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
10
20
30
40
50
60
Whole Assembly R Value (hrsf°F/Btu)
Cellulose
Rigid Mineral Wool
Mineral Wool Batt
Fiberglass Batt
Loose Fill Fiberglass
Dense Pack Blown Fiberglass
Fiberboard
EPS type I (1 lb/cf)
EPS type VII (1.25 lb/cf)
EPS type II (1.5 lb/cf)
EPS type IX (2 lb/cf)
Solid PU, n-pentane
XPS, CO2
XPS, HFC-134a
Spray PU, Water/CO2
Spray PU, HFC-245fa

REMEMBER RACHEL CARSON?

MATERIALS' LIFE-CYCLE IMPACT MATTERS

American babies are born with the highest blood levels of flame retardants in the world. *(EBN June 2004).*

. . . when the flame retardant hits wastewater streams . . . it loses bromine atoms, increasing its bioaccumulation potential and potential subsequent health hazards. *(EBN vol. 20 #12).*

"PBDEs disrupt thyroid and estrogen hormones, which can cause . . . permanent changes to the brain and to reproductive systems (including reduced sperm count in males and changes to ovarian cell structure in females). . .

PBDE levels for . . . about 15 million people are nearing concentrations that have been found to cause serious health effects in animal studies. "The current margin of safety is low."

toxicologist Thomas P. McDonald, (EBN vol. 13 #6)

And Styrenes ? . . .

REMEMBER RACHEL CARSON?

MATERIALS' LIFE-CYCLE IMPACT MATTERS

Styrenes are highly fat soluble materials and neurotoxins that accumulate in lipid-rich tissues of the brain and nervous system, causing acute and chronic functional impairment . . .

a known carcinogen . . .

http://www.earthresource.org/campaigns/capp/capp-styrofoam.html

EPA National Human Adipose Tissue Survey 1982 – documented styrenes present in 100% of human tissue samples

EPA National Human Adipose Tissue Survey 1982

1988 study by the Foundation for Advancements in Science and Education found styrene contamination in 100% of samples from 8 – 350ng/g (1/3 levels determined to cause neurotoxic symptoms)

Foundation for Advancements in Science and Education

REMEMBER RACHEL CARSON?

MATERIALS' LIFE-CYCLE IMPACT MATTERS

Among the chemicals used in spray polyurethane foam (SPF) insulation, "Isocyanates, such as MDI (methylene diphenyl diisocyanate), are highly reactive chemicals that can cause skin, eye, and lung irritation, asthma, and chemical sensitization when absorbed through the skin or inhaled."
Building Green, EPA Takes Action on Spray-Foam Health Risks, May 3rd, 2011

Polyurethane foam has been known to cause chemical sensitivity in extremely small exposures after initial work related exposures.

Briefing on Sprat Polyurethane Foam: EPA/OSHA

MATERIALS LIFE-CYCLE IMPACT

WE HAVE ALTERNATIVES –
we just have to choose them + design + build accordingly


mineral wool


dense pack cellulose


mineral wool


dense pack fiberglass


FoamGlas

THE PASSIVE BIRDHOUSE

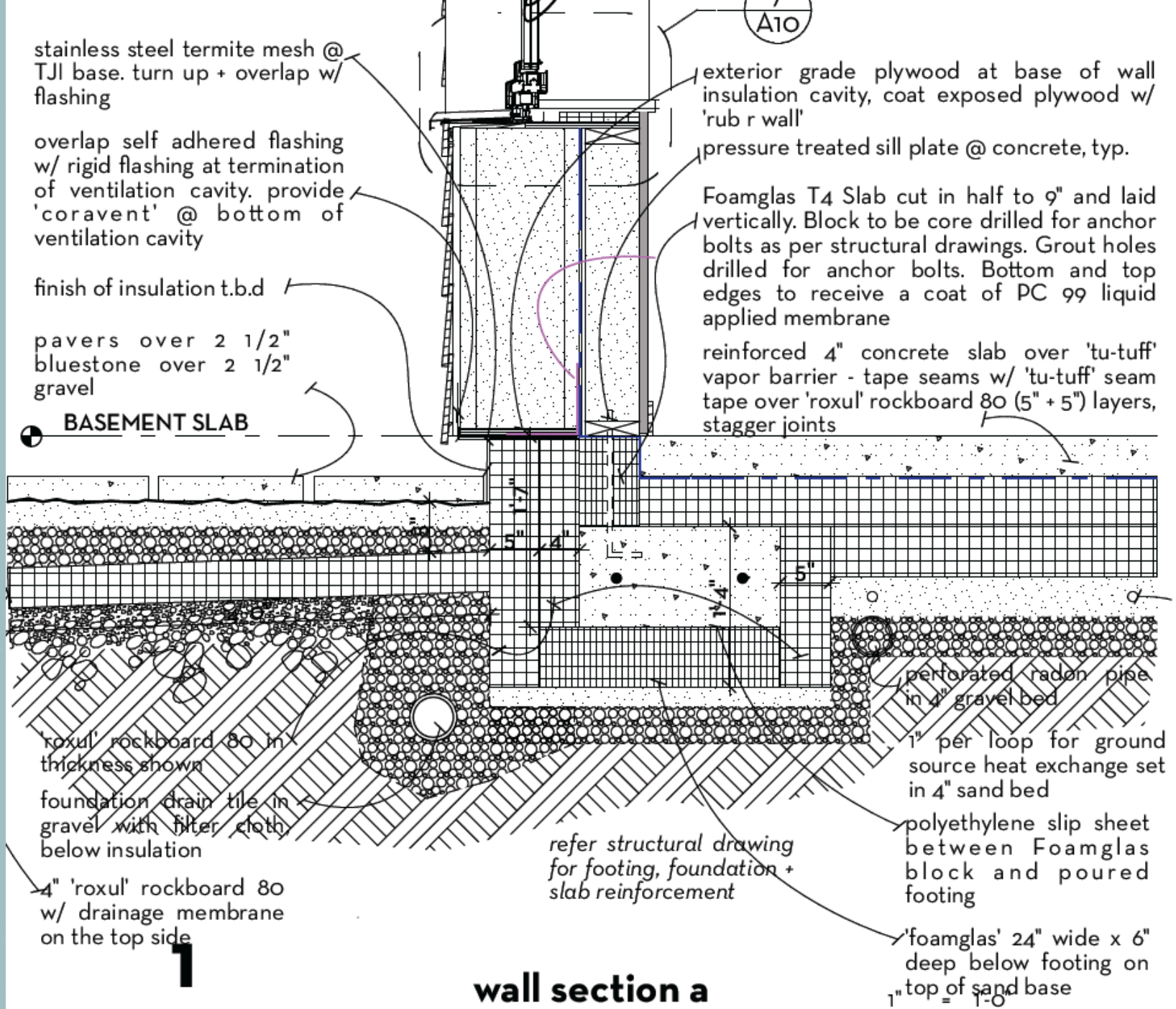
PASSIVE HOUSE, NET-ZERO, FOAM FREE

Architect: Carri Beer, AIA LEED AP
Brennan+Company Architects

PH Consultant: Michael Hindle, CPHC
Passive to Positive

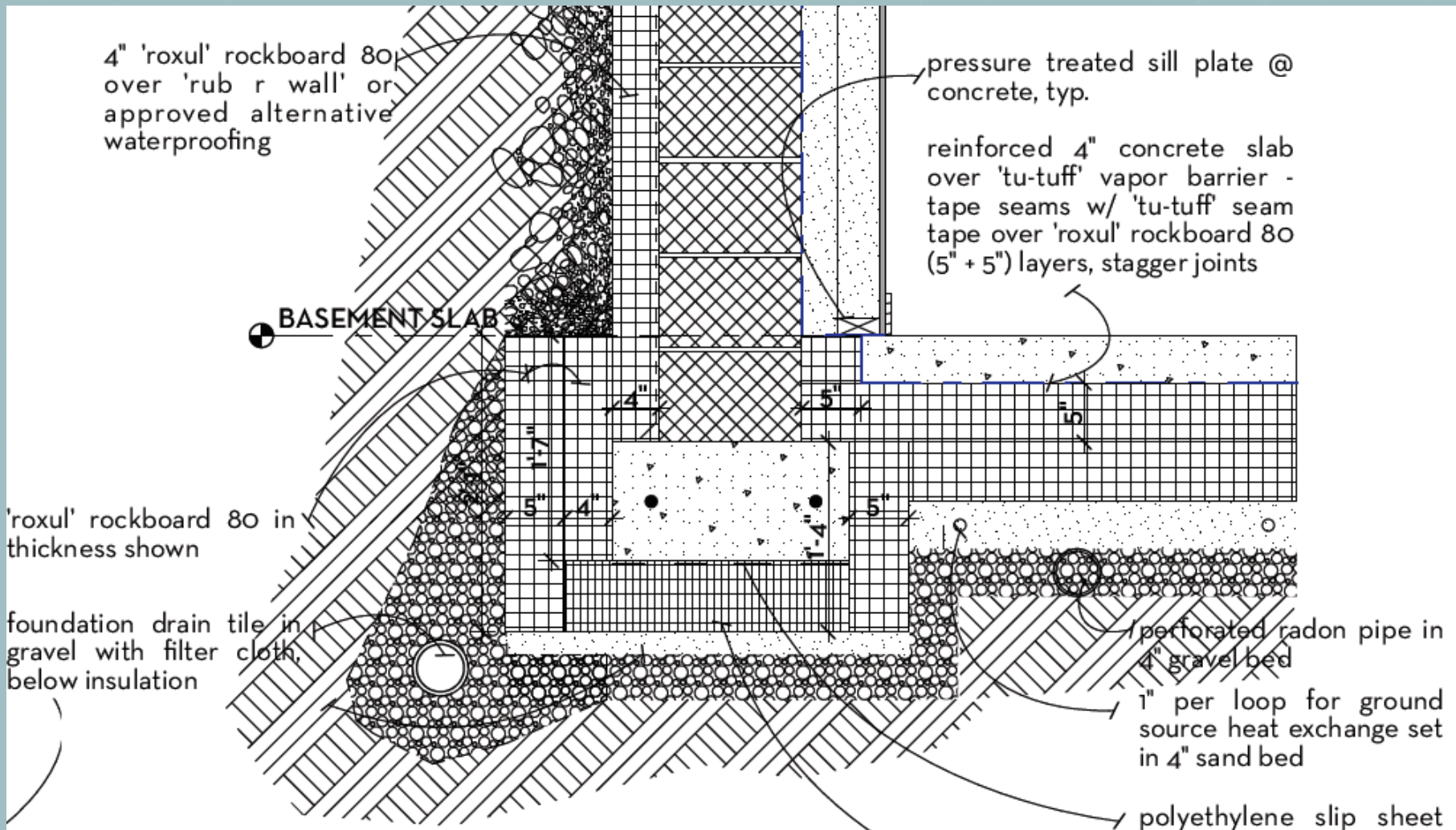
Builder: Gosnell Builders Inc.

FOAM FREE ENCLOSURE #1



1 wall section a

1" = 1'-0"



2 **wall section b**

1" = 1'-0"

FOAMGLAS BELOW FOOTING

FOAMGLAS BELOW FOOTING

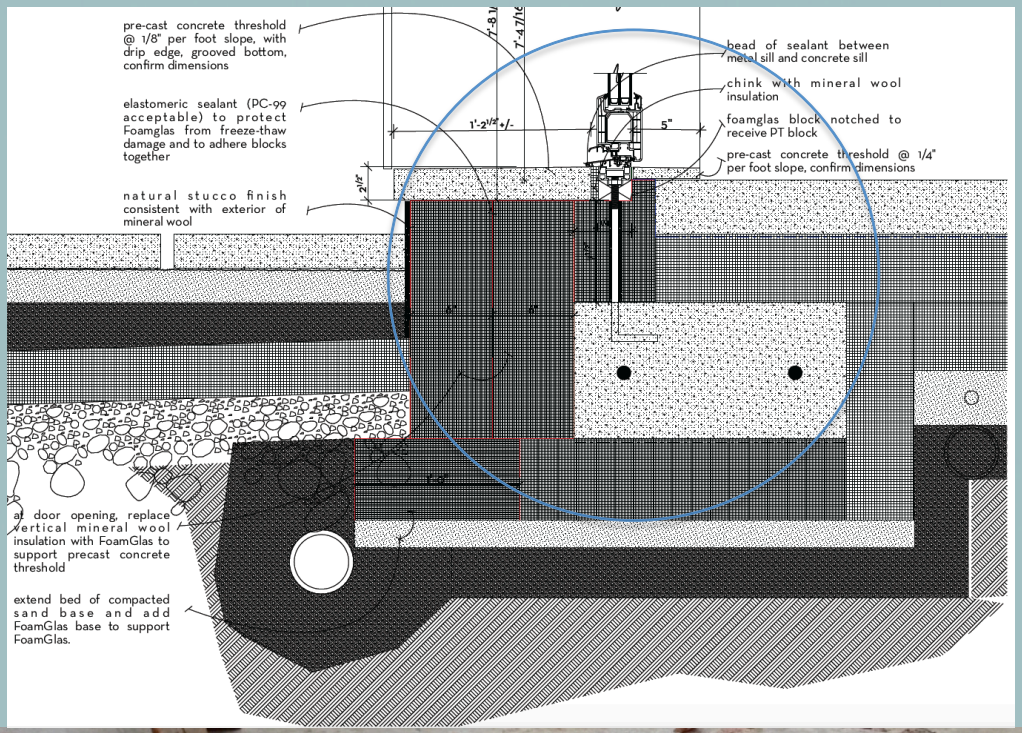

POURED FOOTINGS OVER
FOAMGLAS


FOAMGLAS PERIMETER BLOCK
+ MINERAL WOOL BELOW SLAB

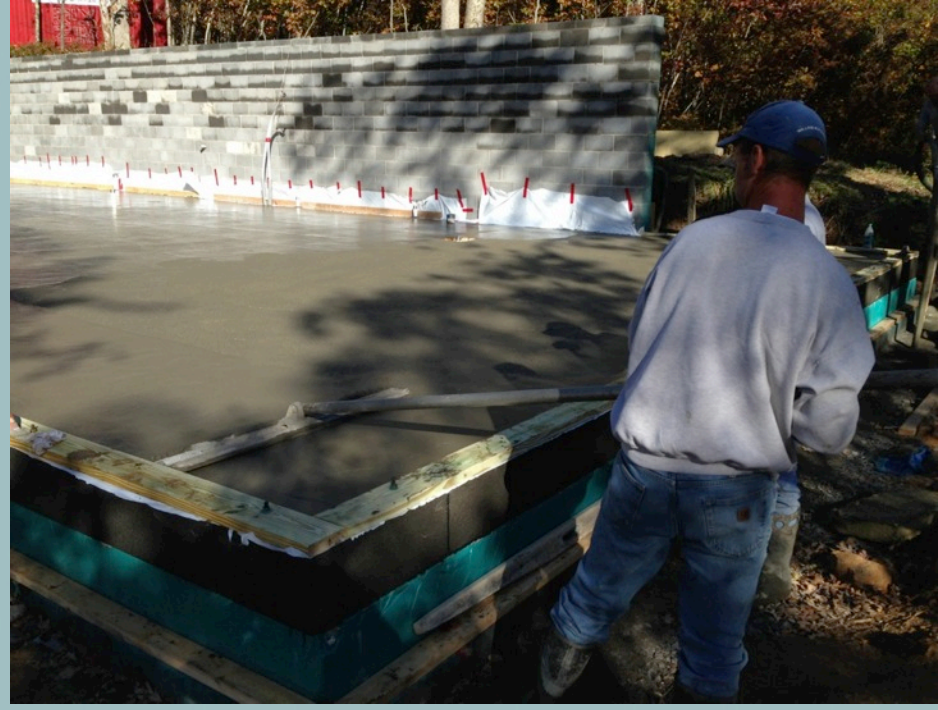
MINERAL WOOL BELOW SLAB

EXTERIOR MINERAL WOOL AT FOUNDATION

MINERAL WOOL FROST SKIRT



FOAMGLAS THRESHOLD



POURING CONCRETE ON MINERAL WOOL

FOAM-FREE CONTINUITY OF AIR-TIGHT LAYER


THERMAL BREAK BETWEEN
CONDITIONED +
UNCONDITIONED FOUNDATION

FOAM-*FREE* WINDOW DETAIL

AIR-TIGHT TAPE INSIDE, FREE DRAINING, BACK-DAMMED SILL TO THE EXTERIOR

SUPER-INSULATED AND….

COMPLETELY FOAM-FREE!

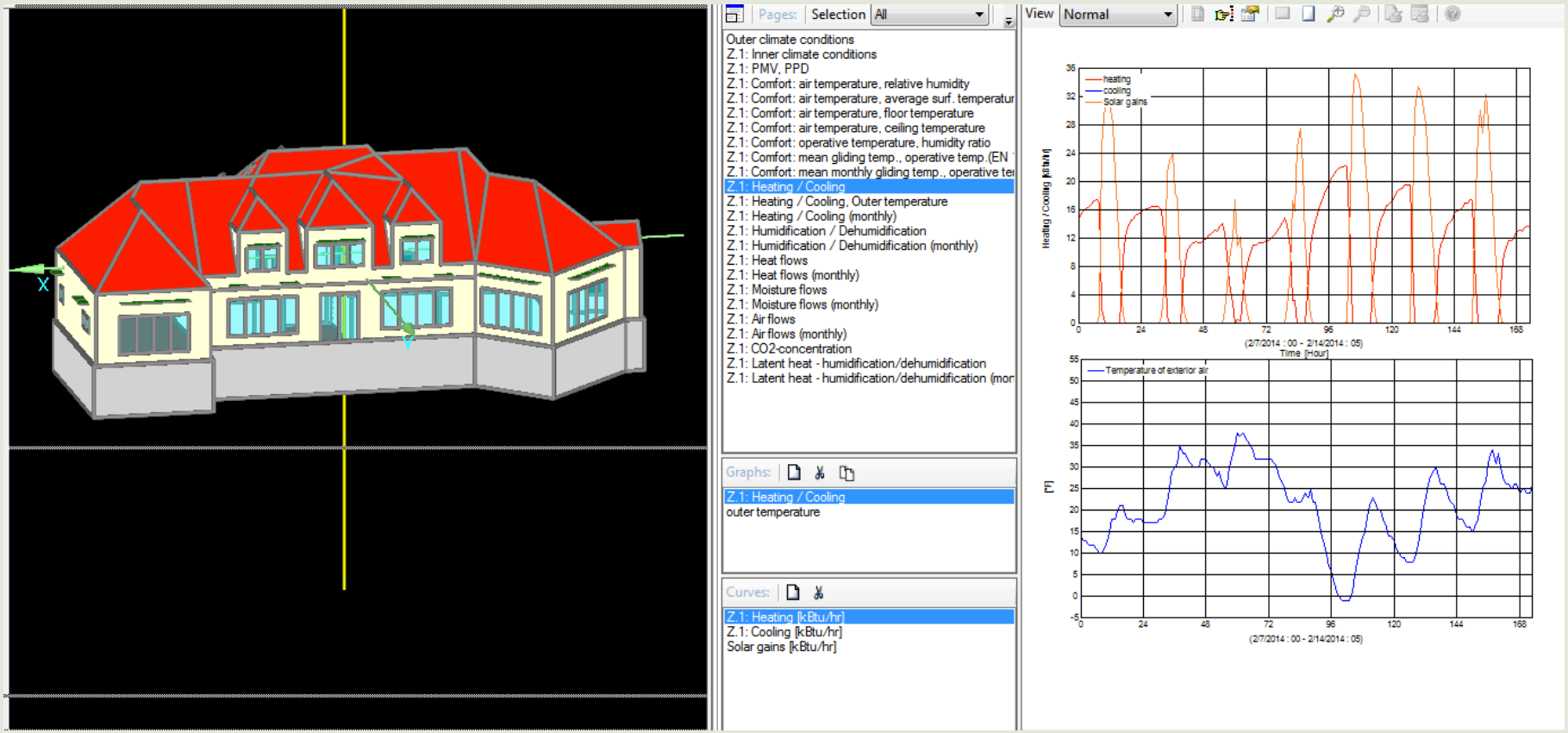
NON-FOAM DETAIL WAS $6,524 MORE THAN EPS FOAM

WHICH FOR THIS PROJECT WAS AN INCREASE OF 0.006%

(LABOR WAS A WASH BECAUSE THE MATERIALS WERE SO EASY AND ENJOYABLE TO USE.)

SUBSEQUENT DETAIL REVISIONS YIELDED PROJECTED 30% SAVINGS, REDUCING INCREMENTAL COST TO $3000

WAYLAND PASSIVE HOUSE



Designer: Donald Gross
Donald Gross + Associates

PH Consultant: Michael Hindle, CPHC
Passive to Positive

Builder: Auburndale Builders

FOAM FREE ENCLOSURE #2

FOAM FREE FOUNDATION

PERIMETER FOOTING INSULATION

FOAM FREE FOUNDATION

FOOTING INSULATION LAID WITH SLIP SHEET

FOOTER POST POUR

FOAM FREE FOUNDATION

PERIMETER THERMAL BREAK OF FOOTING EDGE

FOAM FREE FOUNDATION

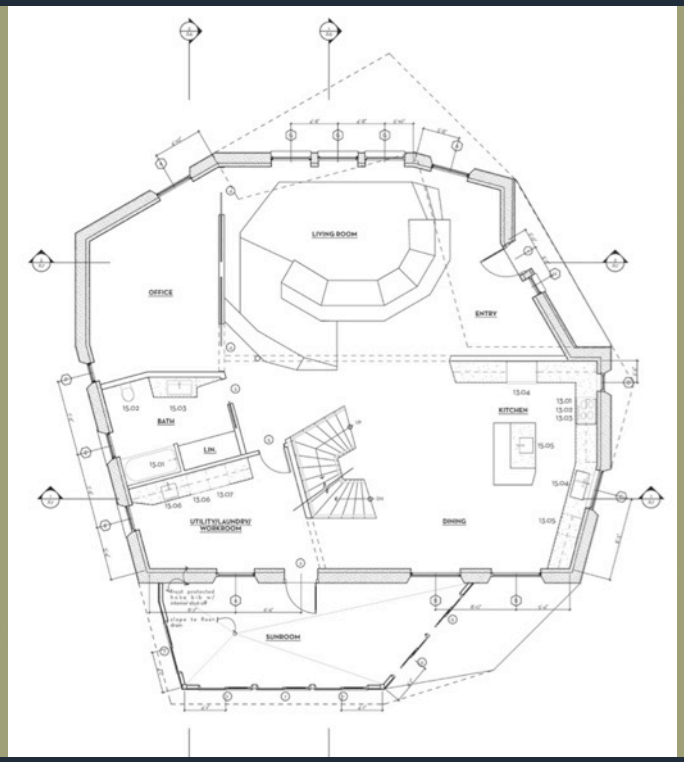
FOAMGLAS THERMAL BREAK OF CONDITIONED BASEMENT TO UNCONDITIONED GARAGE FOUNDATION

ENVELOPE DESIGN + OCCUPANT HEALTH

MANAGEMENT OF CONDENSATION PLANE TEMPERATURES – ***NO MOLD GROWTH ASSURED***


SIGA-Majpell 5
www.siga.ch
The Better Insulation
SIGA-Wigluv

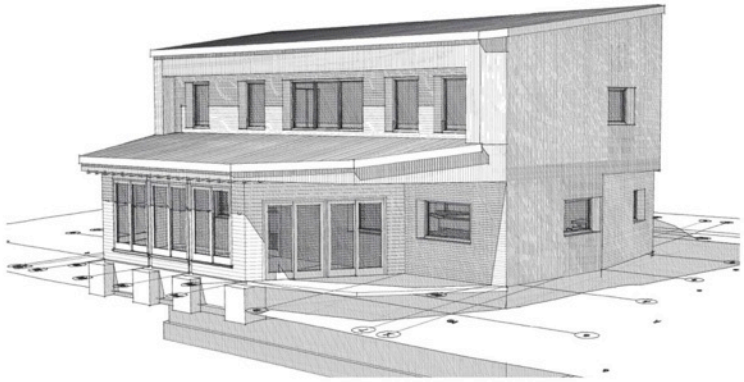
HONEYCOMB BUNKER
PASSIVE HOUSE, NET-ZERO FOAM FREE



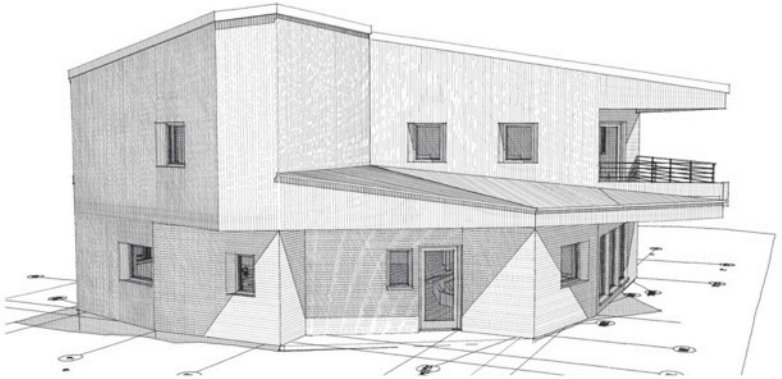
FOAM FREE ENCLOSURE #3

Designer: Daniel Gantenbein
Architect: Carri Beer, AIA LEED AP
Brennan+Company Architects

PH Consultant: Michael Hindle, CPHC
Passive to Positive



1 southeast sketch



2 northeast sketch

3 northwest sketch

4 southwest sketch

project:
GANTENBEIN RESIDENCE
218 Commissioners Pike
Woodstown, New Jersey 08098

phase	date
progress set	02.13.15

drawing:
exterior sketches

orientation:

sheet no.
A5

Perlite – lower cost alternative to mineral wool?

Every square mile of ocean hosts 46,000 pieces of floating PLASTIC!

photo by Chris Jordan: "midway: message from the gyre" series http://www.chrisjordan.com/

"Whether we and our politicians know it or not, Nature is party to all our deals and decisions, and she has more votes, a longer memory, and a sterner sense of justice than we do."

Wendell Berry

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