OBSERVATIONS ON MANUFACTURED FRAMING

North American Passive House Conference
September 2018
Typical Light Frame Construction

- Standard for residential construction as we know it
- Layers with framing continuous through insulation
- Continuous sheathing - surface for cladding and in-plane stiffness
- Impermeable air membrane - tight system
- R-20/ U-0.05
What to Replace Typical Framing with, in order to Meet High-Performance and/or Passive House Construction Metrics?
RECENT EXAMPLES

- “Klingenberg Wall”
- “Bensonwood Wall”
- “Eco-cor Wall”
- “Membrane Wall”
Freeman, Maine

1,700 SF / 1,244 TFA

7,500 Heating Degree Days
First Floor Plan
Second Floor Plan
Cross Section
“Klingenbeberg Wall”

R total = 48.7
U value = .02
Typical Wall Section @ Slab (North Wall Shown)

- Standing seam metal roof to match existing
- 2 layers 1x strapping
- 2 1/2" EPS rigid insulation, tape all joints
- Typar building wrap over 3/4" OSB by advantech
- 11 7/8" TGI roof rafters, 24" o.c., blocked out cut ends with plywood.
- 11 7/8" sprayed cellulose insulation
- Galvanized steel drip edge, counter flashing and siding cap
- 2 1/4" x 9 1/2" Timberstrand LSL wall top plates (stagger butt joint)
- Stained red-cedar T&G siding, horizontally oriented
- 1x strapping at 2'-0" centers
- 2 1/2" rigid EPS insulation, tape all joints
- Galvanized steel drip edge, counter flashing and siding cap
- 2 1/2" EPS rigid insulation, tape all joints
- Typar building wrap over 1/2" structural MDF sheathing
- 9 1/2" spray-in cellulose insulation
- 1/2" OSB by advantech, air barrier (tape & spackle OSB joints, typical)
- 1x3 painted w/d. base
- 3/4" tongue and groove OSB by advantech
- 11 7/8" TGI floor joists, 24" o.c.
- 1/2" OSB by advantech, air barrier (tape & spackle OSB joints, typical)
- 1/2" gypsum wall board
- 2 1/2" gypsum wall board
- 3" rock wool insulation for sound attenuation
- Second flr. elev. 11'-4"
Saugerties, New York

1,506 SF/ 852 TFA

6,438 Heating Degree Days
First Floor Plan
“Bensonwood Wall”

- **R total = 46**
- **U value = 0.0215**

**Details:**
- Finish Siding
- Vertical Cor-a-Vent batten with insect netting
- 1/2” Zip Panel by Huber, continuous tape for air barrier and weather membrane
- 9 1/2” cellulose insulation
- 1 1/2” mineral wool insulation
- Metal flashing with air gap for drainage and air
- Structural Zola 7.5 mm window insulation system, thimble joint
- EPS rigid insulation in wood I-joist cavity
- 1/2” Blue Board
- 1/2” OSB with continuous air barrier
- Corvent with air space between siding and sill
- Corvent with air barrier
- Floor slab U-value = .665

**Additional Details:**
- Wood sill trim with over sloped blocking
- Weather Resitive Barrier under wood sill, attach Siga tape or equivalent to routed cavity face
- Corvent with air space between siding and sill
- EPS rigid insulation in wood I-joist cavity
- 1/2” OSB with continuous air barrier

**Contact Information:**
- Briggs Knowles
- A+D
- 44 East Street
- Providence, RI 02906
- bkad@me.com

**Project:**
- BUENO/LEE RESIDENCE
- 81 Ledgesite Road, Saugerties, New York
- 09/18/2014
Bensonwood – High Performance Buildings
Bensonwood – High Performance Buildings
Bensonwood – High Performance Buildings
Nashua, New Hampshire

3,252 SF/ 1,650 TFA

5,200 Heating Degree Days
Second Floor Plan
“Ecocor” Wall

R total = 48.7
U value = 0.02
Ecocor - 3D Building Information Model
NEXT GENERATION (?)
Environmental Bubble – Rayner Banham (1965)
Mike Davis – Polyvalent Wall (1981)

1. Silica weather skin and deposition substrate;
2. Sensor and control logic layer, external;
3. Photoelectric grid;
4. Thermal sheet radiator/selective absorber;
5. Electro-reflective deposition;
6. Micro-pore gas flow layers;
7. Electro-reflective deposition;
8. Sensor and control logic layer, internal; and
9. Silica deposition substrate and inner skin.
Techstyle Haus

978 SF/ 825 TFA

4,575 Heating Degree Days
Floor Plan
Cross Section
“Membrane” Wall

R total = 55
U value = 0.018
“Membrane” Wall
THANK YOU