Program:
Home and professional studio
Option for air b-n-b rental
Living space on upper level to improve lake views
Desire for cathedral ceiling space
**ENVELOPE SYSTEMS:**

**Foundation:**
- Concrete footing/frost wall with 2” XPS
- 8” EPS under 4” concrete slab
- 5” polyiso at slab edge

**Wall:**
- Double stud wall with airtight drywall
- Dense pack cellulose outer
- Mineral wool in inner stud bay
- Rigid insulation spray foam rim joists
- Zip sheathing, taped
- Corrugated metal siding

**Roof:**
- Scissors trusses, various plate heights
- Intello vapor/air control layer
- Loose blown cellulose

**Stick framed screen porch**
HERS: 44
(Home Energy Rating System)

Square Feet: 1790 sf w/studio
Volume: 15,987 cu. ft.
Blower Door: 155 cfm50, .58 ACH50

Predicted energy use:
  45.4 MMBtu, 21.9 MMbtu heating
  $2172

Actual Energy Use:
  Electric: 9580 kwh/yr, $1683
  Propane: 200 gal., $650
  51 MMBtu, 28.5 kbtu/sf/yr, 18.4 kbtu/sf/yr
  electric only

Moisture monitoring- 5 locations, recorded
very stable at 8-16% moisture
LAKE DUNMORE

FOUNDATION, FRAMING AND WINTER CONDITIONS
LAKE DUNMORE
INNER STUD WALL WITH MECHANICAL CHASE
HVAC:

- 3 pair Lunos E2 HRV (60 cfm max.)
- Bath fans
- 3 heat pump heads
- Master bathroom electric towel warmer,
- Gas fireplace
- Heat pump hot water heater
## Wall Assembly Comparison

<table>
<thead>
<tr>
<th></th>
<th>Arctic Wall R-48</th>
<th>Double stud wall R-43</th>
<th>Double stud with service cavity R-44</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2x4 and I-joist wall</strong></td>
<td>$315.20</td>
<td>$315.20</td>
<td>$409.76</td>
</tr>
<tr>
<td>Plates</td>
<td>$1,255.50</td>
<td>$1,255.50</td>
<td>$1,632.15</td>
</tr>
<tr>
<td>Studs</td>
<td>$419.00</td>
<td>$419.00</td>
<td>$419.00</td>
</tr>
<tr>
<td>Headers</td>
<td>$449.65</td>
<td>$250.00</td>
<td>$250.00</td>
</tr>
<tr>
<td>Window and door bucks</td>
<td>$540.00</td>
<td>$540.00</td>
<td>$540.00</td>
</tr>
<tr>
<td>Sheathing</td>
<td>$1,012.00</td>
<td>$1,012.00</td>
<td>$1,012.00</td>
</tr>
<tr>
<td>Strapping</td>
<td>$5,320.00</td>
<td>$6,720.00</td>
<td>$4,760.00</td>
</tr>
<tr>
<td>Cellulose Walls 1520 c.f.</td>
<td>$2,373.00</td>
<td>$2,373.00</td>
<td>$2,373.00</td>
</tr>
<tr>
<td>Roxul 2x4 cavity</td>
<td>$4,200.00</td>
<td>$4,200.00</td>
<td>$4,200.00</td>
</tr>
<tr>
<td>All Air sealing</td>
<td>$2,024.00</td>
<td>$2,024.00</td>
<td>$2,024.00</td>
</tr>
<tr>
<td>Insulation at window jamb</td>
<td>$450.00</td>
<td>$450.00</td>
<td>$450.00</td>
</tr>
<tr>
<td>WRB</td>
<td>$800.00</td>
<td>$800.00</td>
<td>$800.00</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>$19,158.35</td>
<td>$17,553.61</td>
<td>$17,966.61</td>
</tr>
</tbody>
</table>

### 1920 sf wall area

Double wall labor is more than Arctic wall for the following:

- Air sealing: $480.00
- Framing: $1,600.00

Subtract from Arctic Wall total: $2,080.00

### Assumptions:

Cellulose is $3.50 c.f. for wall dense pack
CLOSING THOUGHTS:

• HIGH PERFORMANCE BUILDINGS MAKE BEAUTIFUL HOMES! THEY DO TAKE MORE PLANNING.

• ONE PERSON SHOULD TAKE RESPONSIBILITY FOR AIR SEALING!

• YES, DO TRY THESE IDEAS IN YOUR OWN PROJECTS!

• WE SHAPE OUR BUILDINGS, THEREAFTER THEY SHAPE US.- WINSTON CHURCHILL

• USE HIGH PERFORMANCE CONSTRUCTION- YOUR CLIENTS WILL BE WARM AND HAPPY CUSTOMERS!
THANK YOU!  QUESTIONS?

IN THE WOODS-
ALEX CARVER
NORTHERN TIMBERS
CONSTRUCTION

RIVER VIEW-
TOM LEBOEUF
NORTHEAST CRAFTSMEN GROUP AND H.J. LEBOEUF INC.

LAKE DUNMORE-
JARED MOATS
STRUCTURAL ENERGY CORPORATION

JEAN TERWILLIGER, ARCHITECT
VERMONT INTEGRATED ARCHITECTURE, P.C., MIDDLEBURY, VT

THREE HIGH-PERFORMANCE HOMES, THREE APPROACHES