Passive House "Placetailor Style"

“Passive House for You and Me!”

Declan Keefe
CPHC, LEED AP, CSL
Strategic Director
Placetailor is an architecture, construction and development company committed to building high performance, energy efficient contemporary buildings.
Passive House Projects Placetailor Style

We designed, built, and developed the first Passive House in Boston!

Powahouse

Client: Placetailor
3 units in Roxbury, MA
Designer/Builder/Developer
Built 2012
Costs: $230/ft excluding PV
Net Positive
Passive House
Passive House Projects Placetailor Style

We consulted and managed one of the first Net Positive Developments in the City of Boston!

Client: Urbanica
4 units in Roxbury, MA
Consulting & Construction Management
Built: 2014
Net Positive
LEED Platinum
Passive House
Passive House Projects Placetailor Style

Energy Efficient Homes on a Super Steep “Unbuildable” Site...

Cliff House

Client: CCG LLC
5 units in Roxbury, MA
Designer/Builder/Developer
Under Construction, 2018
Net Zero Ready
Energy Modeled to meet Passive House
I like you guys! Let’s design/build a **6-unit Workforce Housing** project in Dorchester.

Sure, what if it’s a **Passive House** project?
Test whatever you want! As long as you can build it for $200/SF.

We got this!
Urban infill in Dorchester, and near the T, I like it!

What can we test?
Let’s start with a simple box!
...Design it to a 4’x8’ module.
...Modest, **efficient, compact units.** Let’s align all the plumbing!
NORWELL STREET FACADE

4X8 EXTIRA PANEL TYP.
PAINT ALL SIDES
COLOR: BEN MOORE 2153-70
ALL BUTT JOINTS T-CHANEL REGLET
HARDIE LAP
3" HORIZONTAL "V" GROOVE
COLOR: BEN MOORE 2152-30
BORAL TRIM
5/4X8 / WRAP
PAINT ALL SIDES
COLOR: BEN MOORE 2057-30
DRIP EDGE 8" GALV ALUM
4X4 BLACK LOCUST TO EXTIRA PANEL
PAINT ALL SIDES
COLOR: BEN MOORE 2153-70

6' - 6 3/4"
5/4X8 BORAL
SEE A.402 FOR SECTION
3X3 BLACK LOCUST
EXTIRA PANEL W/ 1/2" "V" NOTCH" GROOVE
4" O.C.
COORDINATE TRIM
DIMS. W/ WINDOW
SHOP DRAWINGS

1/4" = 1'-0"
1 FRONT ELEVATION
1/4" = 1'-0"
2 REAR ELEVATION
3 SIDING AXON

...Simple materials & symmetry!
% Additional Cost per “Additional Cost Assembly”

- Insulation: 22.3%
- Air Sealing: 11.8%
- Foundation: 26.8%
- Insulation: 4.3%
- Foundation Air Barrier: 7.2%
- Windows: 20%
- Doors: 7.5%

Exterior Wall Framing
Frame one wall...then another...**easy!**
## Additional Cost*

<table>
<thead>
<tr>
<th>Assembly</th>
<th>Square foot Costs</th>
<th>High Performance</th>
<th>Code built</th>
<th>High Performance - Code Built</th>
<th>% cost increase</th>
<th>% of total cost increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exterior Wall Framing</td>
<td>$2.63</td>
<td>$30,481</td>
<td>$15,241</td>
<td>$15,241</td>
<td>-50%</td>
<td>15.4%</td>
</tr>
<tr>
<td>Bat/Blow-in Insulation</td>
<td>$2.19</td>
<td>$25,382</td>
<td>$12,691</td>
<td>$12,691</td>
<td>-50%</td>
<td>12.8%</td>
</tr>
<tr>
<td>Exterior Windows</td>
<td>$1.95</td>
<td>$45,351</td>
<td>$34,013</td>
<td>$11,338</td>
<td>-25%</td>
<td>11.4%</td>
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<tr>
<td>Airsealing/Air Barrier</td>
<td>$1.16</td>
<td>$11,191</td>
<td>$4,476</td>
<td>$6,715</td>
<td>-60%</td>
<td>6.8%</td>
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<tr>
<td>Exterior Doors</td>
<td>$0.73</td>
<td>$8,507</td>
<td>$4,254</td>
<td>$4,254</td>
<td>-50%</td>
<td>4.3%</td>
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<tr>
<td>Foundation Air Barrier</td>
<td>$0.71</td>
<td>$4,112</td>
<td>$0</td>
<td>$4,112</td>
<td>-100%</td>
<td>4.2%</td>
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<tr>
<td>Foundation Insulation</td>
<td>$0.42</td>
<td>$4,095</td>
<td>$1,638</td>
<td>$2,457</td>
<td>-60%</td>
<td>2.5%</td>
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<tr>
<td>Floor Structure framing</td>
<td>$0.00</td>
<td>$35,068</td>
<td>$35,068</td>
<td>$0</td>
<td>0%</td>
<td>0.0%</td>
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<tr>
<td>HVAC</td>
<td>$0.00</td>
<td>$65,717</td>
<td>$65,717</td>
<td>$0</td>
<td>0%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
**Additional Cost**
(To go from code minimum building to same exact building but Passive House)

- Exterior Wall Framing
- Bat/Blow-in Insulation
- Exterior Windows
- Airsealing/Air Barrier
- Exterior Doors
- Foundation Air Barrier
- Foundation Insulation
- Floor Structure framing
- HVAC

Total: $56,806  5%  $10/SF
<table>
<thead>
<tr>
<th></th>
<th>Passive House</th>
<th>Code Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Energy Cost/ Year/ Building</strong></td>
<td>$3,523</td>
<td>$10,068</td>
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<tr>
<td><strong>Energy Cost/ Unit/ Month</strong></td>
<td>$49</td>
<td>$139</td>
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<td><strong>kWh/ Year</strong></td>
<td>21,556</td>
<td>61,018</td>
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</tbody>
</table>

**Annual Savings:** $6,544.20

**Simple Pay Back:** 8.6 years

**Return on Investment:** 100% in 30 Year Term

Pay Additional $56,806 up front to make $56,778 in Savings in 30 years

*all costs estimated from EPA data and energy modeling.*
A Passive House sheathingless wall assembly, but do we hit $200/SF?

Even better:
• $191/SF!
• 65% energy savings
• under market rent
• & breaking ground today!
Norwell Workforce Housing

Client: T.Lee
6 units in Dorchester, MA
Designer/Builder
Under Construction: 2018
Costs: $191/ft excluding PV
Net Positive
Passive House Modeled

Total: $1,109,581
Passive House

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