NEW YORK RESILIENT HOUSE
Resilient House creates a dwelling that is sustainable in the broadest sense. Socially, it is low cost. Culturally, it accommodates a contemporary lifestyle and aesthetic. Ecologically, it uses minimal resources to build and to operate. It accomplishes this through simple, sensitive, and creative design.

Design
Simplicity is key to cost-effective, flexible housing. The layout of Resilient House orients living spaces towards the sun, and minimizes interior partitions – reducing cost and creating a dramatic beauty the occupants will be proud to call home. The building shape is contemporary, but classic, creating an aesthetic that is sensitive in a broad range of contexts.

Sustainability
The pier foundation of Resilient House reduces site impact and ensures durability due to its elevation above the flood plain. Its structurally insulated panel (SIP) structure allows for a very tightly sealed and highly insulated building envelope with minimal thermal bridging. SIPs are pre-fabricated, ensuring minimal material waste and a rapid on-site construction timeline. Interior spaces and apertures are oriented towards the south, allowing solar heating during cold months, while precise overhang depths provide shading during the warm season.

Resilience
Building above the floodplain with a flood-resistant foundation ensures natural phenomenon will not affect the structure. Specifying long-lifespan materials like metal siding and roofs drastically reduces maintenance and replacement costs over the building’s lifespan. Refer to the budget proposal for cost analysis of building durably. By considering the lifespan of the building, we hope to set a precedent for marginal increases in capital investment resulting in reduced operating costs in low-budget housing.
Outdoor living space in the South side yard ensures adequate set-back from solar obstructions. It also activates the community by pulling life into the semi-private side yards. Covered, outdoor spaces also create buffer zones before entering or exiting the home.

The interior layout is organized around a light and exposure hierarchy. Private spaces (bedrooms & washrooms) are to the North where sun and openness are not required. Circulation occurs beneath the clerestory windows along the central spine of the building. It is open to all living spaces, which are naturally heated or ventilated depending on the season. Finally, an outdoor living space is bathed in sunlight for comfortable use no matter the season or time of day.
The classic, pentagonal house silhouette is the basis of this design. Its perimeter is extruded at both ends to cover from precipitation and create a contemporary aesthetic. The roofline is broken by a line of clerestory windows, allowing natural heating and ventilation to influence the form in a way that breathes life and meaning into the shape.
### Estimate Summary

**Project Entry Number:** 26848  
**Project City:** New York  
**Project Square Footage:** 1250

<table>
<thead>
<tr>
<th>Quantity (Concrete)</th>
<th>Unit</th>
<th>Item Description</th>
<th>Unit Price</th>
<th>Material Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>150 R3</td>
<td>Piers</td>
<td>$4.18</td>
<td>$616.00</td>
<td></td>
</tr>
<tr>
<td>135 R3</td>
<td>concrete beams</td>
<td>$4.18</td>
<td>$546.30</td>
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</tbody>
</table>

**Framing**

- 2215 soft wall  
  - Framed, 2"b  
  - $2.80  
  - $6,202.00
- 1250 soft floor  
  - Framed, 2"f  
  - $2.90  
  - $3,629.00
- 1950 soft ceiling  
  - Framed, 2"f  
  - $2.90  
  - $5,655.00
- 490 soft porch  
  - Framed, 2"f  
  - $2.60  
  - $1,274.00

**Plumbing (Mechanical - 15000)**

- 1250 soft floor  
  - Plumbing  
  - $1.95  
  - $2,437.50
- 2 toilets  
  - $99.00  
  - $198.00
- 3 Sinks  
  - $110.00  
  - $330.00
- 2 Showers  
  - $183.00  
  - $366.00

**HVAC & GAS**

- 3 count  
  - w/c & kitchen exhaust fans  
  - $90.00  
  - $270.00
- 0 Rough in  
  - $0.00
- 0 Trim out  
  - $0.00
- 1 3 Ton unit Multi zone Mini Split heat pump  
  - $3,968.95  
  - $3,968.95

**Electrical**

- 1250 soft floor area  
  - Electrical rough in  
  - $2.65  
  - $3,312.50
- 12 fixture  
  - $120.00  
  - $1,440.00

**Roofing**

- 1950 soft roof area  
  - Roofing: asphalt shingles  
  - $1.75  
  - $3,412.50

**Solar**

- *Based on a 4.5KWh system at $2.88 per watt estimate*
  - $0.00

**Exterior Doors and Windows**

- 3 7 square feet  
  - Exterior Doors and Locks  
  - $295.00  
  - $885.00
- 374 square feet  
  - double pane, wooden windows  
  - $17.50  
  - $6,649.00

**Insulation**

- 5415 soft thermal envelope  
  - Insulation  
  - $0.80  
  - $3,249.00

**Drywall**

- 3260 soft interior wall / ceiling  
  - Drywall  
  - $0.31  
  - $1,010.60

**Interior Doors**

- 4 doors  
  - Interior Doors and Trim Materials  
  - $115.00  
  - $460.00

**Interior Painting**

- 3260 soft interior wall / ceiling  
  - Interior Painting  
  - $0.08  
  - $260.80

**Cabinets and Countertops**

- 31 linear feet  
  - Cabinets  
  - $50.00  
  - $1,550.00
- 38 linear feet  
  - Countertops  
  - $10.00  
  - $380.00

**Flooring**

- 1950 soft floor area  
  - Flooring  
  - $2.65  
  - $5,312.50

**Exterior Finishes**

- 2215 soft  
  - Wooden Siding  
  - $1.80  
  - $4,097.00

**Appliances**

- 1  
  - Fridge  
  - $350.00
- 1  
  - Dishwasher  
  - $220.00
- 1  
  - Washer Dryer  
  - $400.00

**HARD COST TOTAL** $51,096.75

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### Recommended Upgrades

Using traditional construction methods and equipment, this dwelling can be built for under $50k. We encourage a series of upgrades that will improve the building’s durability and maintainability, causing a reduction in the lifecycle cost of the building.

Constructing the envelope of Structurally Insulated Panels (SIPs) increases insulation thicknesses, and reduces thermal Bridging and air leakage. Combined with a more efficient ventilation system and upgraded windows, these two changes result in a 30% reduction in energy consumption. In New York, this results in approximately $450/yr in energy savings.

Improving the durability of the cladding can save thousands of dollars over the building’s lifecycle. The lifespan of metal siding and roofing is at minimum 4 times longer than wood siding and asphalt shingles. Eliminating replacement of cladding 4 times results in $6,000 savings.

These recommended upgrades results in lifecycle cost savings, reduced maintenance, and a healthier indoor air environment.

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### Quantity | Unit | Item Description | Unit Price | Material Cost |
|------------|------|------------------|------------|---------------|

**Building Envelope**

- Subtract cost of standard framing  
  - $1,154.82
- Subtract cost of fiberglass insulation  
  - $1,249.00
- 2215 soft wall SIPS, 5.5" thick @ R22  
  - $4.30  
  - $9,524.50
- 1250 soft floor Framed, 7.5" @ R30  
  - $3.62  
  - $4,325.00
- 1950 soft ceiling SIPS, 9.5" thick @ R18  
  - $5.00  
  - $9,750.00

**HVAC & GAS**

- Subtract cost of two w/c fans  
  - $1,249.99  
  - $1,249.99

**Fueling**

- 1 125 cfm capacity Energy Recovery Ventilator  
  - $1,249.99  
  - $1,249.99

**Exterior Doors and Windows**

- Subtract cost of double pane, vinyl windows  
  - $14,960.00
- 374 square feet Alpen S55 windows  
  - $40.00  
  - $1,520.00

**Net incremental cost increase** $17,365.99

Cost

**Standard Construction On-Site Energy Conservation** $150,000

**Energy Conservation Upgrades Savings** $105,000

**Upgraded Construction On-Site Energy Conservation** $105,000