2017

Solar Synapsis: Engineering Advisory Committee Presentation

University of Nevada, Las Vegas. Solar Decathlon Team.

Follow this and additional works at: https://digitalscholarship.unlv.edu/sd_2017_marketing

Part of the Environmental Design Commons, and the Sustainability Commons

Repository Citation

This Presentation is brought to you for free and open access by the Solar Decathlon 2017: Sinatra Living at Digital Scholarship@UNLV. It has been accepted for inclusion in Sinatra Living: Marketing and Promotion by an authorized administrator of Digital Scholarship@UNLV. For more information, please contact digitalscholarship@unlv.edu.
Where to begin

What is the Solar Decathlon?

The U.S. Department of Energy Solar Decathlon is an international competition that challenges 16 collegiate teams to design, build, and operate the most attractive, effective, and energy-efficient solar-powered house.

Project Details

- Integral Engineering Components
- HVAC Redundancy
- Photo-voltaic Redundancy
- Water heating Redundancy
- Energy Modeling
- Life Safety
- Transport
- Architecture
Where to begin

What is the Solar Decathlon?

It is called a *decathlon* because there are 10 categories upon which the house must perform to.

*Waiting for the SD Rules to see what the contest will be and what can be used in the home, i.e. grid connected battery storage, transportation – electric car with charging station, cost, etc.*
Quick Facts:
- 2013: 2nd Place Internationally
- 1st Place Market Appeal
- 2nd Place Communications
- 3rd Place Architecture
Quick Facts:
- Currently resides at the Springs Preserve
Who is involved?

Solar Decathlon is an interdisciplinary effort

Three areas of expertise are joining to design a smart-home for active aging....
We plan to take 1st Place...

We believe the project will succeed with engineering at the forefront of our design and a bold target market.

Solar Synapsis is a home designed for net positive energy production, synchronizing design strategies to delay the onset and progression of neurodegenerative disorders, and delivering sustainable living.
To accelerate the delivery of a design-build project, the team must maximize collaboration and minimize coordination time. Key decision-makers across design and construction teams need to be involved in key project design decisions from the beginning of the design development and construction document phases.
How does it all come together?

To accelerate the delivery of a design-build project, the team must maximize collaboration and minimize coordination time. Key decision-makers across design and construction teams need to be involved in key project design decisions from the beginning of the design development and construction document phases.
Project Process

Iteration #1
2013 Module Chassis

- Custom Made
- High Cost, Heavy Steel
- Irregular shape
2017 Chassis Option

- Pre-manufactured mobile home chassis
- Low Cost
- 1 week production, 1 week shipment
- Appeals to homebuilders
Project Process

Redundancy
Project Process

Redundancy

Subcontest 10-1: Energy Production

Energy (net kWh)

Time

Project Process

Integrated Mechanical Unit
### Budget

**$972,000**

$392,000 for Construction  
$580,000 for Transport / University expenses

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site works</td>
<td>$50,000</td>
</tr>
<tr>
<td>Masonry</td>
<td>$1,000</td>
</tr>
<tr>
<td>Metal</td>
<td>$6,000</td>
</tr>
<tr>
<td>Millwork / Casework</td>
<td>$10,000</td>
</tr>
<tr>
<td>Roofing / Waterproofing</td>
<td>$50,000</td>
</tr>
<tr>
<td>Doors &amp; Windows</td>
<td>$25,000</td>
</tr>
<tr>
<td>Finishes</td>
<td>$100,000</td>
</tr>
<tr>
<td>Special Construction</td>
<td>$20,000</td>
</tr>
<tr>
<td>HVAC, Plumbing, Mechanical</td>
<td>$60,000</td>
</tr>
<tr>
<td>Healthcare related equipment</td>
<td>$40,000</td>
</tr>
<tr>
<td>Electrical</td>
<td>$30,000</td>
</tr>
</tbody>
</table>

**Building Subtotal**  
$392,000

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Conditions</td>
<td>$20,000</td>
</tr>
<tr>
<td>Travel Cost</td>
<td>$100,000</td>
</tr>
<tr>
<td>Mobilization</td>
<td>$100,000</td>
</tr>
<tr>
<td>Contractor Contingency</td>
<td>$20,000</td>
</tr>
<tr>
<td>Faculty Support / Grad Student</td>
<td>$200,000</td>
</tr>
</tbody>
</table>

**Total**  
$440,000

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deconstruction</td>
<td>$60,000</td>
</tr>
<tr>
<td>Haul Back to Vegas</td>
<td>$80,000</td>
</tr>
</tbody>
</table>

**Total**  
$140,000

**Total**  
$972,000
Q&A