IBEW-NECA Zero Net Energy Center

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Alameda County Electrical JATC, Training Director
Electrical Training for Sustainable Careers
14600 Catalina Street,
San Leandro, CA
Mission

Provide IBEW/NECA with best-trained, highest-skilled, most productive and professional workforce in the electrical construction industry

& Vision

- Create the optimal learning environment
- Showcase the electrical systems IBEW-NECA train on and install
- Zero Net Energy
Surveying Assets & Resources

Existing Structure
IBEW-NECA Zero Net Energy Center
Integrated Construction Team

- **Owner:** Alameda County Joint Apprentice Training Center
  San Leandro, CA

- **Architect:** FCGA Architecture
  Danville, CA

- **Energy:** Environmental Building Strategies
  San Francisco, CA

- **Contractor:** NOVO Construction
  San Francisco, CA

- **Renewables:** Red Top Electric Co., Inc.
  Livermore, CA
Design, Cost & Synergy Iterating

EBS High Performance Building Delivery Process

<table>
<thead>
<tr>
<th>Discovery</th>
<th>Design &amp; Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment</td>
<td>Construction Documents</td>
</tr>
<tr>
<td>Water</td>
<td>Bidding &amp; Construction</td>
</tr>
<tr>
<td>Energy</td>
<td></td>
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<tr>
<td>Materials</td>
<td></td>
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<tr>
<td>Budget</td>
<td></td>
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</tbody>
</table>

Investigation | Modeling | Conceptual Design | Schematic Design | Design Development |

- Environment
- Water
- Energy
- Materials
- Budget
Natural passive ventilation
Night pre-cooling
Thermal mass energy storage
Dimmable day-lighting
Ultra high Efficiency lighting controls
Operable windows & skylights

Variable refrigerant flow mechanical systems
Integrated building automation systems
Roof solar
Photovoltaic tracking tree array
Solar tubes
Wind Turbines
Roof Monitors

- Natural Light
- Ventilation
- Thermal Heating
- Solar Armature
Natural Heating / Thermal Swapping

- Solar Thermal Panel
- Sunlight
- Thermal Mass Wall
- Warm Room (Needs Cooling)
- Cool Room (Needs Heating)
- Heat Exchanger
- Water Tank
- Condensing Unit
- Smart Manifold
- HVAC (Heating, Ventilation, Air Conditioning)
- Sample Fall Day

Section through Student Break Room
Learning Environment

- Natural light
- Fresh air
- Climate Control
- Acoustics
## PG&E Energy True Up History

<table>
<thead>
<tr>
<th>Billing Month</th>
<th>Bill to Date</th>
<th>Energy (kWh)</th>
<th>Energy Charges/Credits</th>
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</thead>
<tbody>
<tr>
<td>October - 2013</td>
<td>10/08/13</td>
<td>-11,447</td>
<td>-$2,452.29</td>
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<td>November - 2013</td>
<td>11/06/13</td>
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<td>December - 2013</td>
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<td>$523</td>
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<td>January - 2014</td>
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<td>February - 2014</td>
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<td>March - 2014</td>
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<td>May - 2014</td>
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**TOTALS:**

-69,071       $15,265.96