35+ years
13,000+ homes
400+ awards
multifamily experts
Coliseum Place Affordable Family Housing, Oakland, CA

Zero Net Energy Goal
Energy Loads for Coliseum Place

- In-unit electricity: 50%
- Central Hot Water: 20%
- Common: 20%
- Laundry: 10%
- Plug Loads: 25%
- Lighting: 25%
- Cooling: 25%
- Heating: 25%

Bar graphs and charts show the distribution and percentages of energy loads for different categories.
Decentralized Hot Water

Non-Recirculating Hot Water
“Mini-Plants”
Decentralized Hot Water

- All-Electric, Central Hot Water
- Distributed Hot Water
- PV Scenarios

PV Scenarios:
- PV, 100% ZNE (108% Roof area, on elevated canopy)
- PV, 68% offset (Elevated canopy as designed)
- PV, 38% offset (Max. roof-mounted)

Load Types:
- Plug Loads
- Lighting
- Cooling
- Heating
- Hot Water
- Laundry
- Common
Operational Carbon vs Embodied

175 tons
All-electric, distributed hot water

295 tons
Mixed-fuel Baseline

GWP (tons CO2e)

2020 2025 2030 2035
Operational Carbon vs Embodied

70% cement replacement in foundations
Operational Carbon vs Embodied

Carbon penalty for non-FSC lumber

120 tons
DBA Portfolio Evaluation & Reporting

AIA 2030 Commitment

Predicted Use
- Conventional (w PV)
- Conventional (no PV)
- All-electric (w PV)
- All-electric (no PV)

Size of Bubble = # of units

MR Market Rate
H Hotel
Others Affordable

~2015
~2023

Predicted EUI (Net)
Actual Use

Edwina Benner
Buildings and Climate Change

1) Resources (energy, water, waste)
2) Renewable energy
3) Emissions reduction
4) Ecological impacts
Housing and Climate Change

1) Resources (energy, water, waste)
2) Renewable energy
3) Emissions reduction
4) Ecological impacts
5) Density & displacement
6) Resident access to transit and micro-mobility
7) Social resilience
8) Economic participation & stability
9) Health, wellbeing & autonomy
10) Equal and fair access to innovation & adaptation
Fighting Environmental & Social Vulnerability
Access to Nature, Community, City

1:3 parking, 100% EV-primed

1:1 bike parking
+ chargers for scooters, wheelchairs
+ storage for family bike accessories

BART (1 block)

...next time...

1:3 parking, 100% EV-primed
Access to Innovation

U.S. Household Income Distribution and EV ownership

<table>
<thead>
<tr>
<th>Income Bracket</th>
<th>All Households</th>
<th>Households Owning Battery Electric or Plug-in Hybrid Electric Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 25k</td>
<td>16%</td>
<td>3%</td>
</tr>
<tr>
<td>25k to 50k</td>
<td>19%</td>
<td>25%</td>
</tr>
<tr>
<td>50k to 75k</td>
<td>14%</td>
<td>25%</td>
</tr>
<tr>
<td>75k to 100k</td>
<td>14%</td>
<td>25%</td>
</tr>
<tr>
<td>100k to 150k</td>
<td>19%</td>
<td>42%</td>
</tr>
<tr>
<td>More than 150k</td>
<td>14%</td>
<td>42%</td>
</tr>
</tbody>
</table>
Access to a Healthy Indoor Environment

The Six Classes Approach to Reducing Chemical Harm
Healthier Products, Healthier People

1. Highly Fluorinated
2. Antimicrobials
3. Flame Retardants
4. Bisphenols + Phthalates
5. Some Solvents
6. Certain Metals
### Related Product News

**A Cheat Sheet for Decoding Vinyl Product Literature**
Healthy Building Network recently demystified our approach to product research for the Community of Practice team in Seattle. In preparation for the call, we reviewed product literature for a vinyl sheet floor that had been specified for their demonstration project, and matched that against...

**Spectrum of Flooring Options Now Includes Ceramic Tiles**
Healthy Building Network and the HomeFree team have now had a chance to talk with several communities of practice, working hard to incorporate healthy materials guidance into their varied – but all amazing – affordable housing projects. As part of these conversations, we have highlighted...

**Brief: Post-Consumer Flexible Polyurethane Foam Scrap Used In Building Products**
Carpet cushion (that soft layer installed between a sub-floor and a carpet) is made from flexible polyurethane foam (FPF). Generally, that foam is recycled scrap from the manufacture of furniture, such as couch cushions, or old carpet cushion itself. Healthy Building Network’s research into...

**How Common Product Profiles Help Inform Product Decisions**
On the Products section of HomeFree, in addition to individual products, visitors will now see Common Product Profiles (CPFs for short). These Common Product Profiles...

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linoleum</td>
<td></td>
</tr>
<tr>
<td>Pre-finished solid wood floors</td>
<td></td>
</tr>
<tr>
<td>Pre-finished engineered floors</td>
<td></td>
</tr>
<tr>
<td>Ceramic Tiles (made in the USA/Lead-free)</td>
<td></td>
</tr>
<tr>
<td>Biobased floors</td>
<td></td>
</tr>
<tr>
<td>Rubber or rubber/cork floors made without crumb rubber</td>
<td></td>
</tr>
<tr>
<td>Laminate</td>
<td></td>
</tr>
<tr>
<td>Carpets</td>
<td></td>
</tr>
<tr>
<td>Finished on-site engineered floors</td>
<td></td>
</tr>
<tr>
<td>New formulations of vinyl floors</td>
<td></td>
</tr>
<tr>
<td>Ceramic Tiles (not made in the USA/presence of Lead is unknown)</td>
<td></td>
</tr>
</tbody>
</table>
Climate Change Adaptation

Air Quality Index (PM2.5) in Oakland During the Camp Fire, 2018
Climate Change Adaptation

Heat and Income in Oakland

SURFACE TEMP.

INCOME

Cooler
Hotter

Min $20K
Median $58K
Max $208K
Climate Change Adaptation

Overheating Study, Mission District

Max Indoor Air Temperatures without West Facing Courtyard Sunshades
View from South West

Image: Bright Green Strategies
Climate Change Adaptation

Indoor temperatures by unit
Passive Performance - HVAC is off
No windows open

- With overhangs & increased air sealing
- With shade screen & increased air sealing

Temperature ranges:
- <62°F
- 62-68°F
- 68-75°F
- 75-82°F
- >82°F
Climate Change Adaptation

- Local Programs & Services
  - Air Filtration
  - Medical Refrigeration
  - Communications Center
  - On-Site Solar Power
  - Off-Grid Battery Backup
  - First Aid & Preparedness Supplies
  - Clean Water
  - Resilience Hub

Local Programs & Services
- Clean Water
- First Aid & Preparedness Supplies
- Off-Grid Battery Backup
- On-Site Solar Power
- Resilience Hub
- Local Programs & Services
- Medical Refrigeration
- Communications Center

Resilience Hub
Economic participation & stability

Broadband access, by income

Source: Pew Research Center
Economic participation & stability

Free Building Wi-fi

Self-Serve Library

Park w/ BBQ's & Community Garden

Kitchen/Cafe & Produce

San Francisco Public Library

Peaches Patties A Jamaican Kitchen
When I Said “Housing as Infrastructure”...

Planning for On-Site Greywater Treatment & Re-use

Proposal would include a 4000 gallon storage tank, and a custom treatment system for indoor use.
A 25,000 – 30,000 gallon cistern in the crawl space, would be sufficient to store available site-sourced rainwater.

This would offer an additional 24% reduction

Reaching net-zero water would require adding 3-4 times the current site in catchment area or otherwise creatively offsetting 1.2 million gallons per year.
An on-site black-water treatment system (Aquacell) could use 4-8 times the amount of energy per unit water treated compared to municipal blackwater treatment, according to a study by Hyphae Design.