Paths to Zero Carbon Multifamily Design

Solar response

“PassiveHaus Lite”

Modular & resilient design
Edwin M. Lee Apartments
“Solar response” approach to low carbon

Swords to Plowshares & Chinatown Community Development Center
Nibbi Brothers Construction

EUI: 18.2 kbtu/sf/yr (modeled)
GreenPoints Rated Platinum
Edwin M. Lee Apartments
Edwin M. Lee Apartments

*ALL VETERANS*

LUNCH TODAY: BEEF CHILI

This Morning, 10:30

"CALM = MINDFUL"

5 SENSES FOR MINDFULNESS"
Edwin M. Lee Apartments

Unit massing & daylighting studies, LMSa

Lessons learned:
• Non-profit clients accustomed to mixed-fuel systems
• Not all MEP designers ready to propose all-electric in 2015-16
• Architects were not ready to advocate for untested* (*low-income housing in the Bay Area) technology

• Fire Dept fickle on PV array overhang guidance, costing the project ~8% of total generation
• Subs not accustomed to insulating hot water pipes beyond the mains
• “Future” flat-roof PV was covered by contingencies at end of the project

• Post-occupancy evaluation (including energy use & survey) to be completed in Fall 2021
88 Broadway & 735 Davis
“Passive House Lite” approach to low carbon

BRIDGE & John Stewart Company
Cahill Construction

EUI: 20.4 & 24.4 kbtu/sf/yr (modeled)
GreenPoints Rated Platinum & Gold target
88 Broadway & 735 Davis

125 UNITS OF FAMILY AFFORDABLE HOUSING
53 UNITS OF SENIOR AFFORDABLE HOUSING
88 Broadway & 735 Davis

FRAME AND INFILL

FRAME AND INFILL

FRAME AND INFILL

BEARING WALL

BROADWAY

FRONT STREET AA

VALLEJO

Neighborhood context
88 Broadway & 735 Davis
100% DD detail

100% CD detail
88 Broadway & 735 Davis

Energy recovery ventilators at each unit route horizontally through facade

S&P TR90
Energy recovery ventilators at each unit route horizontally through facade
88 Broadway & 735 Davis

Solar thermal water heating panels offset natural gas demand, achieving 50% Solar Fraction

Butterfly habitat at roof deck
Lessons learned:

- ERV: integrated-exterior-wall options still need to be field-tested
- Balancing system is key for functional ventilation
- ERV is one-speed, continuous ventilation; a switched system might have benefits
- VE surprises: a double wall was more economical than exterior rigid insulation in 2018’s market
- Post-occupancy evaluation (including energy use & survey) to be completed in Fall 2022
88 Broadway & 735 Davis
“Modular & resilient” approach to low carbon

Community Housing Partnership + BRIDGE
Cahill Construction & Factory OS

EUI: 26.3 kbtu/sf/yr (modeled)
GreenPoints Rated Platinum target
Mission Bay sidewalk subsidence

Images: SF Gate
Mission Bay South Block 9

Current sidewalk elevation

Future projected sidewalk elevation

Etc...

Bay fill subsidence: Resilience and accessibility detail at stepped entrance
Mission Bay South Block 9

Under Exploration:
Solar-tied backup power systems for community room receptacle loads + lighting, & limited elevator power

Community room rendering
Hope Center + Berkeley Way

“Embodied carbon pilot project” approach

Bay Area Low-Carbon Concrete Codes Pilot Project:
Endeavor to meet cement reduction and GWP reduction criteria from Bay Area Concrete Code proposed language

BRIDGE + Berkeley Food and Housing Project
Nibbi Brothers Construction

EUI: 21 kbtu/sf/yr (modeled)
GreenPoints Rated Platinum target
Hope Center + Berkeley Way

Bay Area Low-Carbon Concrete Codes Pilot Project:
Endeavor to meet cement reduction and GWP reduction criteria from Bay Area Concrete Code proposed language
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