Presentation summary

- Project goals
- Design evolution / Non-PHPP analysis
- Detailed design description
- Sensitive PHPP items
- Net zero energy goal
- Lessons learned
Owner’s project goals

- Passive House certification
- Net zero energy
- Urban density
- Location
- Site
- The building
Project overview

- Location
- Site
- The building
Project overview

- Location
- Site
- The building
Design evolution

- System choices / roadmapping phase
- “Background checks”
- VE “round 1”
- PHPP QC review “round 1”
Insulation levels

Choice of heating and ventilation system

Choice of DHW system

Renewable energy systems
AEROMATIC™ SERIES LOW-PROFILE COMMERCIAL

LW1500i
Energy Recovery Ventilator

Standard Features
Mayekawa Eco Cute has been improved.

The world's biggest heating capacity
with the industry's highest COP (4.2)

Hot water supply at 90°C all year around
Holding temperature at 65°C

Efficiently supplying a large amount of
high temperature water covering a wide array of users.

Applications:
- For large volume supply
- Hospitals, Golf courses, Hotels etc.
- For high temperature large volume supply
- Central schemes, Food processing plants etc.
Insulation levels

Choice of heating and ventilation system

Choice of DHW system

Renewable energy systems
Design evolution

- System choices / roadmapping phase
- “Background checks”
- VE “round 1”
- PHPP QC review “round 1”
- Overheating risk
- Moisture
Typical Loft

Night flush roofing: 2'6" x 2'6" min openings
8' apart
- Overheating risk
- Moisture
Design evolution

- System choices / roadmapping phase
- “Background checks”
- VE “round 1”
- PHPP QC review “round 1”
• Current (and final?) design

- Walls
- Roof
- Floors
- Windows
- Doors
- Thermal bridges
TYP. EXT. CORK WALL
3" CORK
PROSOCO
SHEATHING PER STRUCTURAL
2X6 FRAMING
BLOWN IN CELLULOSE
2X4 FRAMING
VAPOR BARRIER
5/8" GWB

R=42
R=10.8
R=.62
R=32
R=56

TYP. EXT. METAL WALL
METAL PANEL
2X6 FURRING
3" ROCK WOOL
PROSOCO
SHEATHING PER STRUCTURAL
2X6 FRAMING
BLOWN IN CELLULOSE
2X4 FRAMING
VAPOR BARRIER
5/8" GWB

R=42
R=10.8
R=.62
R=32
R=56
• Current (and final?) design
- Walls
- Roof
- Floors
- Windows
- Doors
- Thermal bridges
ONE HOUR ROOF PER SBC TABLE 721.1 (3) 26-1.1
METAL ROOF
CLASS A ROOF MEMBRANE
TJI CEILING FRAMING PER STRUC.
ROOF SHEATHING PER STRUCT.
R-53 INSULATION
(2) LAYERS \(\frac{1}{2}\)" TYPE "X" GWB
• Current (and final?) design

- Walls
- Roof
- Floors
- Windows
- Doors
- Thermal bridges
- Walls
- Roof
- Floors
- Windows
- Doors
- Thermal bridges
• Current (and final?) design
- Walls
- Roof
- Floors
- Windows
- Doors
- Thermal bridges
• Current (and final?) design
  - Light fixtures and lamp technology
  - Heating
  - Cooling
  - Ventilation
  - Domestic Hot Water / Solar Hot Water
  - Plug loads (Energy Star equipment)
• Current (and final?) design
  - Light fixtures and lamp technology
  - Heating
  - Cooling
  - Ventilation
  - Domestic Hot Water / Solar Hot Water
  - Plug loads (Energy Star equipment)
100% Factory Fire Tested
Efficiency: Up to 99.8% (based on incoming water)
Maximum Outlet Temperature: 200°F
Thermal Shock Proof Heat Exchanger
10 Year Limited Heat Exchanger Warranty
18 Month Parts Warranty
Modulating Stainless Steel Burner
5:1 Turndown Ratio
Self Diagnostic microprocessor controls
Blocked flue/blocked condensate pressure switch
Common venting on multiple units
• Current (and final?) design
  - Light fixtures and lamp technology
  - Heating
  - Cooling
  - Ventilation
  - Domestic Hot Water / Solar Hot Water
  - Plug loads (Energy Star equipment)
Annual energy use breakdown

- DHW, gas: 41%
- Space heating: 16%
- Appliances/lights, elec. & gas: 37%
- HVAC aux: 6%

Expected average energy expenses per loft: $7.50/month
• Net-zero energy aspects

- Net zero energy total: 53 kW PV system needed.
- Net zero electricity-only: 37 kW needed
• “Sensitive PHPP items”
  - Ventilation rates
  - Domestic Hot Water
  - Night-flush cooling / window shading
- Lessons learned

-WANTED! PH-experienced team members
-Domestic Hot Water
-Early QC of PHPP
-“Integrated design” (PH analyst, arch designer, GC)
The project team

-Josh Fletcher, owner, Fletchco LLC

-Joshua Brevoort and Eric Baldwin, project architects, ZeroPlus and Baldwin West Design

-Peter Reppe, CPHC, mechanical/plumbing engineer, moisture analysis, and Shantu Shah / Jim Krumstick, electrical engineer, SOLARC Engineering

-Joe Giampietro, CPHC, PH certification manager, architectural consultant, NK Architects

-Yuval Sofer, general contractor, YSBuilt