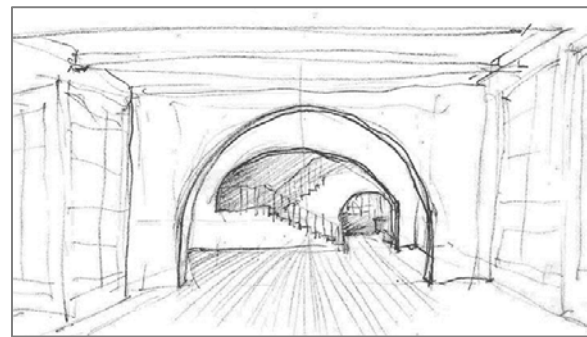
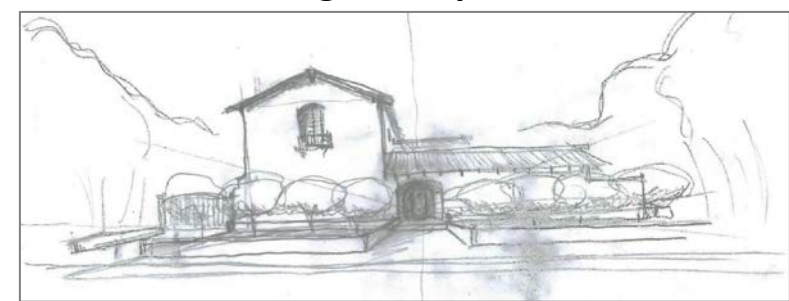


634 Lowell Timeline

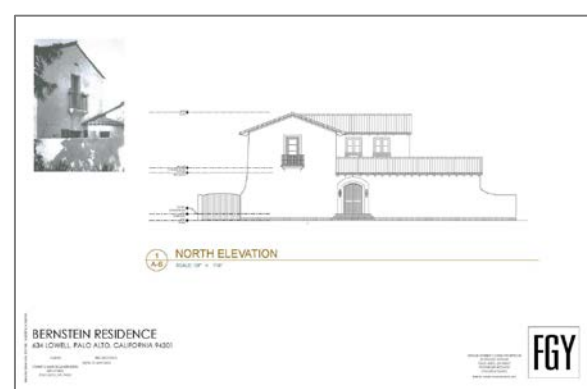
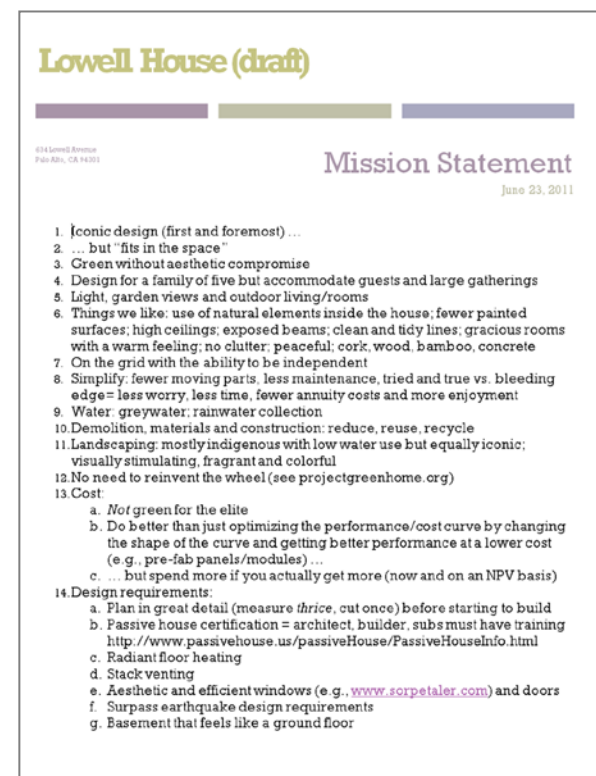
Living / Dining Room Sketch



Massing Concept Sketch



June 11 2011
Mission Statement



Schematic Design Set



IR (Planning) Set
Approved Aug 1, 2012



Permit Set
Approved Sep 27, 2012
SIPs Approved Nov 29 2012

Existing property deconstructed. Appliances, windows, doors, furnishings and fixtures, lumber and other items donated to charity. Concrete and other items that can't be re-used are recycled. Structural framing from original house stacked and stored for us in new house.



SIPs are insulating rigid insulation laminated to high-performance engineered wood sheathing. SIPs have significant advantages over a conventionally built "stick frame" homes, including strength, higher dimensional tolerances, higher insulation values, less air leakage, faster construction time, less material waste, and the wood is from partially recycled material. R-control provided the SIPs, and worked with Jim Crowley at Crowley Builders, Inc.



The windows are high performance European style (tilt and turn) windows with pull down shades and screens built into the frame and pre-wired for alarms.



SIGA products were used seal windows and doors, seams between SIPs and as a membrane on the façade. Fortifiber's Jumbotex provides protection from rain while allowing the building to breathe. Roxul AFB and Thermafiber insulation for fire, sound and heat insulation between floors and where there were thermal bridges through the external walls.

The 1920s hand made cap and pan roof tiles were reclaimed from a school in Monterey, CA and had been sitting in a field less than 30 miles away in Half Moon Bay.

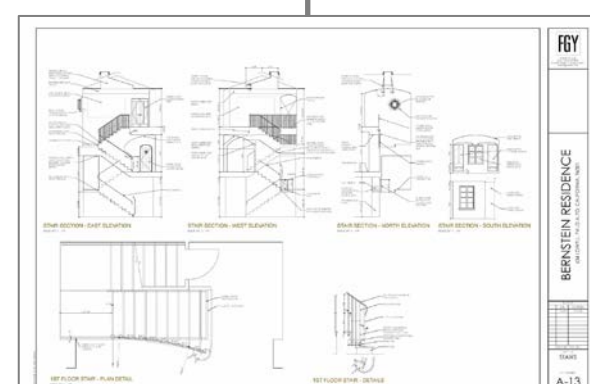


NZE

Net Zero Energy



Construction Starts



Interior Design Set



The wood forms were re-used by the contractor on other basement projects. The board formed concrete wall wood was cleaned, planed and used to create the wood walls in the basement. The concrete uses 30% flyash content.



Floor joists complete; Backfill complete; Ground floor SIPs are being erected.



Power-Pipe® captures drain water heat, then "recycles" the heat to raise the temperature of incoming cold water. A 60-inch Power-Pipe System can raise the cold water temperature from 10°C (50°F) to as much as 24°C (75°F), under equal flow conditions.



Because Passive Houses are very air tight, a HRV (heat recovery ventilator) is used to bring fresh conditioned air into the house. 3" flexible hoses are used to distribute air with less energy loss, no noise, and space than metal ducts.



Blower door test passed! A score of .54 ACH 50 was achieved. What does this score mean? .54 of the volume of air in the house changes every hour at 50 pascals of air pressure. The Passive House requirement is <= .60 ACH 50.



The last step in achieving a net zero energy house is placing enough PV on the roof to meet the plug loads. The goal is to minimize the PV requirement by designing the house well and minimizing plug loads through the use of efficient appliances and systems. In 2014, we produced 23 MWh, close to our projected production of 23.4 MWh. This provided enough energy to power the house (which is 100% electric) and one electric vehicle with enough left over to possibly charge a second EV. We also analyzed our energy use by circuit (HVAC, stove, refrigerator, lights, etc.) and found that our predictive modeling was very accurate relative to actual consumption.



Messana Radiant Cooling provided the Ray Magic radiant panels that were used through out the house to heat and cool the house faster than radiant flooring. The panels are similar to dry wall but they contain piping through which hot and cold water passes. These panels are placed in the ceiling and or the walls. Sandium Heating and Air Conditioning installed the panels.

