

First LEED Certified House in the Valley Nearing Completion

The odd “Smurf Blue” colored house that some of you may have noticed on the slope under Flat Top is now turning a sage green as siding covers the insulation board. This is the Valley’s first LEED (Leadership in Energy and Environment Design) house nearing completion.

The house designed by Bertoldi Architects is being built by Big Canyon Homes for Richard and Miranda Menzies, who have recently moved to the Valley from Germany. The Menzies have long been interested in sustainability having witnessed first hand the investments in alternative energy in Europe supported by higher fuel costs and government subsidies. They felt that if they were to build a new house, they wanted to make it as sustainable as practical.

According to the US Department of Energy the residential sector consumes 22% of the nations energy output and 7% of the water, contributing 25% of the US carbon emissions. These facts prompted the US Green Building Council to develop the LEED program to reduce the environmental footprint of residential houses. The program promotes a whole building approach to sustainability by recognizing performance in eight areas. Metrics in these areas measure and drive sustainable building practices. The idea is to promote a team effort between the homeowner, the architect, the builder, and the LEED representatives.

For the Menzies residence, a full day of meetings was held, with the team and all the builder’s key subcontractors, before any ground was broken or construction drawings released. This meeting drove key decisions on the construction of the house, such as the type of floor joists, the location of the mechanical room, the layout of the plumbing etc well before the design was finalized.

The decision was made that the most cost effective approach was to insulate the house and to carefully seal the shell to prevent heat loss through drafts. This then influenced the design of the rafters and so on. Compromises were made between optimizing the orientation of the house and the location of windows for maximum energy efficiency while still taking full advantage of the spectacular views offered by the lot. A geothermal heating and cooling system, which extracts heat from the ground in the winter and returns it in the summer was selected as the most cost effective, sustainable method for heating and cooling the house. Solar panels were added on the roof and on a pole to cover the power needed for the geothermal and the rest of the house electric appliances. The solar panels are tied into the electric power grid so that when the sun shines power is provided to the grid and the house electric meter runs “backward”. Conversely, in the evening when the appliances are being used power is drawn from the grid and the meter runs forwards. The geothermal unit also provides much of the energy for the domestic hot water. Overall it is estimated that the house should only use ~30% of the energy of a comparably sized house built to current day building standards. With the addition of the solar panels the energy bills for the house should be very small.

In the interior some renewable resources such as bamboo floors are incorporated and the amount of volatile organic compounds from paints and adhesives are being held to a minimum. Externally, shade from the summer sun is being provided on the south/west facing windows by a trellis and architectural roof features. A rainwater and snow collection system will be installed, which should provide adequate water to irrigate all the planned plantings once they are established.