

## The LEED Scorecard/ Pepperwood Preserve News (Spring 2010)

The Dwight Center for Research and Education at Pepperwood, scheduled for occupancy this spring, is expected to achieve LEED Gold level certification by the U.S. Green Building Council. The facility earned the Green Project of the Year Award (2009) by the North Bay Business Journal, and will serve to further the conservation education mission of Pepperwood Preserve.

LEED, Leadership in Energy and Environmental design, is an internationally recognized green building certification program, developed by the U.S. Green Building Council, launched in 1998. The program was designed to combine technology, planning, and building strategies to improve performance measures in water and energy efficiency, carbon emission reduction, improved indoor environmental quality, and conscious stewardship of our finite natural resources.

### *Site Selection and Solar Orientation*

Throughout time, passive solar structures have evolved by optimizing landscape features and utilizing solar gain and heat loss for maximum comfort, connecting the building with the uniqueness of place and climate. The Dwight Center is situated on a southern facing hillside at the 'military crest' located below the ridgeline to maximize views and sunlight while protecting the building from strong winds. External wall screening and broad roof overhangs add to the passive performance of the building by capturing direct morning and winter sunlight and redirecting afternoon and summer sunshine. Even the photo-voltaic (PV) roof, high above the central courtyard, acts as a parasol to shade and cool the courtyard and mezzanine below while providing additional shading for the building.

### *Water Efficiency*

Highly efficient plumbing fixtures have been chosen for the water closets, urinals, and faucets and showerhead. Groundwater and rainwater collected will be captured into cisterns and gravity fed to low-flow toilets and landscape irrigation. Storm water runoff passes through a series of grassy bio-swales that filter out oils, solids, and biomass, before it is distributed back into the native vegetation

### *Energy and Atmosphere*

A large PV system supplies all the electricity required to run the facility, and can feed into and draw from the PG&E grid as needed. Working in tandem with the rooftop photovoltaic system is a highly efficient two-stage indirect/direct evaporative cooling system that cools the air by water saturation that is reclaimed by a condenser. The system utilizes 100% fresh air intake, conditioning the interior air with less particulate and microbial matter, more ionized air particles and fewer volatile organic compounds that are typically found inside buildings. Each room is equipped with its own thermostat and carbon dioxide monitor to provide optimal health, comfort and temperature control.

Windows and skylights provide substantial day-lighting, reducing the need for additional illumination. Lighting sensors in the building respond to outside light, increasing and decreasing light fixture lumens, minimizing energy consumption while providing uniform light distribution. Occupancy sensors automatically shut off non-emergency interior lights when visitors are no longer present. Exterior lighting is provided only as needed for user safety and comfort to reduce light noise to neighboring communities.

*Material Selection and Resources*

The Dwight Center is designed as a classic direct (solar) gain, distributed mass, passive building. Thick concrete walls create high thermal mass that stabilizes diurnal (day/night) heat exchange and slows interior temperature swings. This reduces the impacts associated with mechanical heating and cooling.

Over twenty percent of the construction materials used to build the facility contain recycled content, and most of the structure is recyclable. For instance, fly ash, a waste product of the steel industry, is used as an admixture for the concrete walls and foundations, providing added tensile strength and durability to the concrete while reducing needless landfill waste. Reclaimed redwood boards from the Preserve have been refashioned as doors for the new facility. Tectum, made from salvaged wood products, Wheatboard, made from recycled wheat chaff, and Homasote, made from reclaimed fiber material provide acoustic damping.

Finish materials include cork panels and plyboo, which are made from rapidly renewable harvests. FSC certified sustainable wood furniture has been selected for the classrooms, administration, conference and staff room. All of the finish materials have been specifically selected for their high environmental quality, low volatile organic content, and reduction of harmful off-gassing potential. The paint, coatings, adhesives, and bindings used in the facility are free of formaldehydes.

In accordance with LEED and the Pepperwood, careful measures have been taken during construction to minimize site impact and wildlife disruption. The LEED program is the first of its kind in the U.S. and outlines specific guidelines, combining metrics with strategic environmental development. With reference to LEED, architect Ned Forrest predicts, "Some day there won't be a certification process, this will simply become standard practice for building design."

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