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**USGBC-AZ Chapter/LEED**

<http://www.usgbc.org/Chapters/arizona/>

**EPA**

documenting environmental features into new buildings:

<http://www.epa.gov/opptintr/epp/pdfs/grnbldg.pdf>

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# The Arizona Department of Environmental Quality Building

PHOENIX, ARIZONA

LEED Silver Certified by the U.S. Green Building Council



## HIGHLIGHTING HIGH PERFORMANCE

The Arizona Department of Environmental Quality’s six story 300,000 square-foot building was designed specifically to be high performance and environmentally sensitive. In melding new construction design and practices with the old, the designers worked to blend the building into the historical settings of the 1893 Evans house and the 1908 Carnegie Library.

The building is green, due in part to its 25-year Privatized Lease-To-Own financing agreement, which made it possible to include energy features in the building based on life cycle costs instead of traditional “first costs” methodology. The design results are energy usage at \$1.17 per square foot vs. a \$1.51 low-end industry average, conservatively saving \$137,103 in energy costs over 18 months. Opus West, the construction and property manager, estimates it cost approximately 1percent more to build to Leadership in Energy and Environmental Design™ (LEED) Certified Silver level than without any green building requirements. This makes the payback period just four years, through energy savings alone.

## ENERGY AND INDOOR AIR QUALITY

**Landscape and Exterior Designed to Reduce Heat Islands:** The white reflective roof complies with federal Energy Star standards, reflecting the sun to reduce the heat island effect, which typically raises urban temperatures 10 degrees or more compared to outlying areas. Since heat is reflected from the roof rather than absorbed, it takes less energy to cool the building.

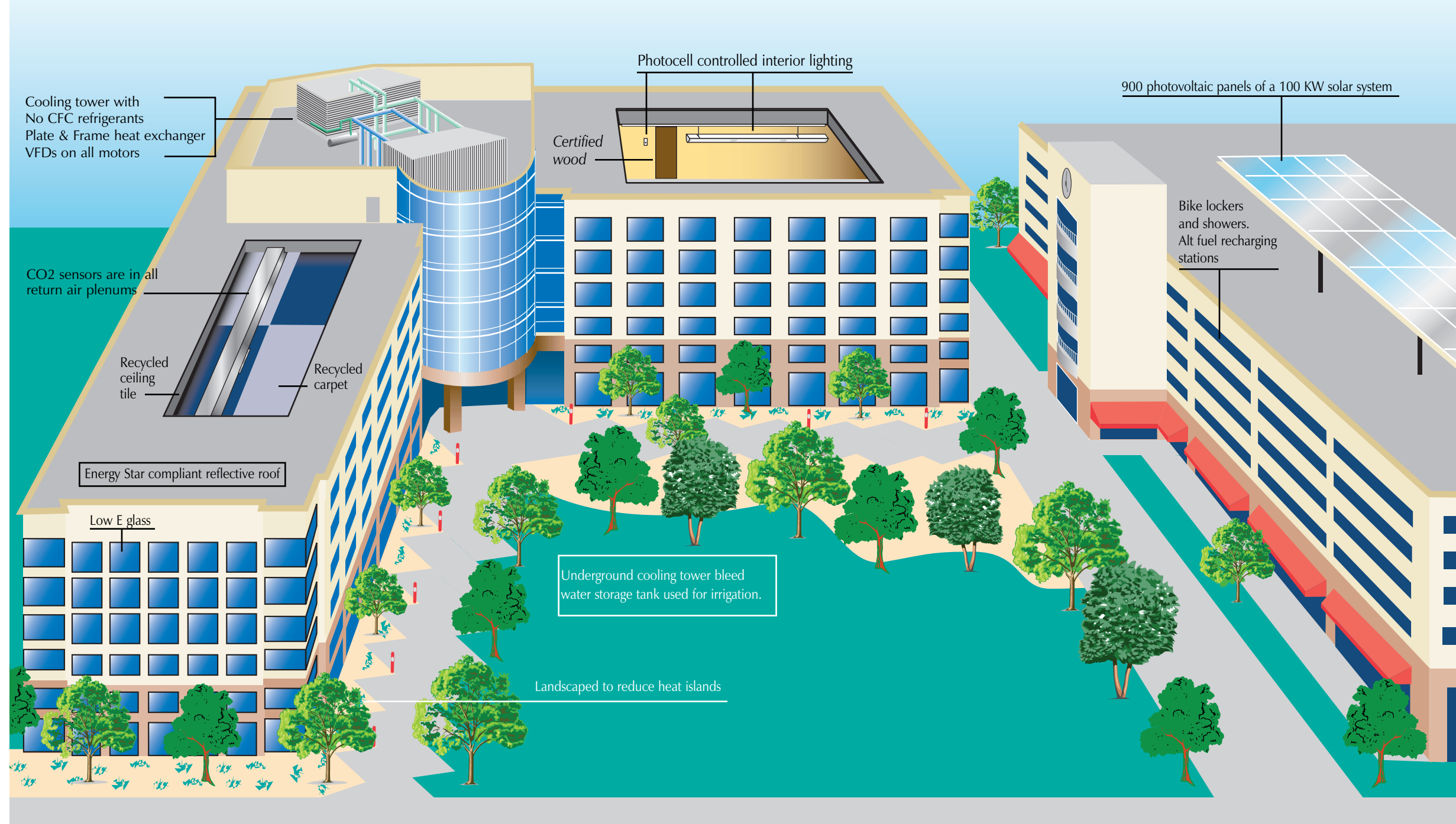
**Minimum Energy Performance:** Every motor in the building uses variable frequency drives, which means they run only at the needed capacity instead of at full power all the time. The electrical system uses EnergyStar-rated transformers and the cooling system does not use CFCs. A plate-and-frame heat exchanger transfers heat through thin stainless-steel plates from the cooling water tower on one side to a warm closed loop on the other. The building also uses “low-E” glass, which reflects heat and therefore reduces demand on the cooling system.

**Interior Lighting:** Indoor lighting uses energy-saving dimming fluorescent ballasts. Controlled by photocells that sense the amount of light coming through the windows, the ballasts provide no more artificial light than is needed. Occupancy sensors ensure that lights burn only when a space is occupied. Exit signs use LEDs.

**Solar Power:** Located atop the parking garage is a 900-panel, 100-kilowatt solar power system that feeds into the local power utility’s grid, thus increasing the “green power” used in the Phoenix area. The solar panels also provide shade for automobiles.

**Indoor Air Quality with Energy Savings:** Sensors monitor indoor levels of carbon dioxide, adjusting exhaust air fan speeds to control the pre-programed levels and to save energy.

**Alternative Energy and Pedal Power:** The parking garage has 15 alternative fuel recharging stations: two in the guest parking area, 13 in the employee parking area. It also has two 20 x 10-foot chained-linked fence areas with showers and lockers for bicycle riders.



## MATERIALS

**Construction Waste Management:** The builder recycled almost 2,500 tons of wood, gypsum board, steel, cardboard, concrete, masonry, and paper – 87 percent of construction debris, exceeding the goal of 75 percent. Posting bilingual signs and educating subcontractor construction crews were important steps in making the recycling effort successful.

**Recycled Content:** The building uses materials containing a high amount of recycled content, which puts less strain on our natural resources. The builder required that 25-50 percent of the building materials contain a minimum weighted average of 20 percent post-consumer recycled content or a minimum weighted average of 40 percent post-industrial recycled content. Building materials with recycled content include structural steel and glass (over 20 percent each), carpet (over 65 percent) and ceiling tile (over 85 percent).

**Local and Regional Materials:** The building also contains many regional materials, which reduced the need for transportation and its associated energy and pollution costs. The builder specified that 20-50 percent of the building materials come from within 500 miles of the project site. Regionally manufactured materials used included architectural pre-cast, rebar, cast-in-place masonry, E-crete masonry, stainless steel, structural steel, plastic laminate millwork, architectural millwork, metal framing, gypsum board, acoustical ceiling grid, interior signage, exterior signage, canopies, and parking equipment.

**Certified Wood:** At least half the wood in the building, and all the doors, are certified to Forest Stewardship Council Guidelines. That means the wood comes from forests that are sustainably managed.

**Low-Emitting Materials:** All adhesives, sealants, paints, composite wood products, and carpet systems contain low levels of volatile organic compounds or urea-formaldehyde compounds, which contribute to both indoor and outdoor air pollution.

## INNOVATION AND DESIGN PROCESS

**Alternate Fuel for Concrete Mixers:** The supplier substituted vegetable oil for diesel to fuel the concrete mixers, thus burning a much cleaner fuel and reducing pollution.

**Water Efficient Landscaping:** A unique irrigation system uses the bleed water from the cooling tower to irrigate the landscaping, reducing by 100 percent the use of potable water.

