The Biodesign Institute at Arizona State University Building B

Achieving USGBC LEED Platinum

The Biodesign Institute represents the largest investment in biotech research infrastructure in Arizona.

Its research integrates biology, medicine, engineering, nanotechnology and advanced computing in new ways to inspire new solutions to disease, injury, sustainability and security.
Environmentally friendly features incorporated into the design of Biodesign B range in scale from site and urban planning to interior finishes. The facility entry is near the new light-rail station set to open in 2008. Overall, the project exceeded LEED criteria for use of recycled materials, at 15 percent, including aluminum ceiling panels, recycled-content carpet and rubber stair-well flooring. A construction waste management plan reduced landfill construction waste by more than 60 percent. Other green elements include:

- Fly ash – a waste by-product of coal burning power plants – was used to offset the energy demands of a typical concrete structure.

- A reflective roof membrane and high-albedo paving materials mitigate the Phoenix area’s urban heat island effect.

- A 5,000-gallon irrigation water cistern collects air conditioning condensate, which eliminates the use of potable water in landscape irrigation. Rainwater from the roof and paving are routed, via pipes, directly to the drought-resistant, native desert landscaping.

- Low-flow lavatories, kitchen sinks, showers and waterless urinals use 30 percent less water than conventional fixtures.

- An exterior shading system on the south and west facades controls unwanted heat from the desert sun.

- The top portion of the interior shade louver system is automatically controlled to maximize daylight penetration by reflecting diffuse light onto the ceilings.

- Office occupancy sensors automatically control artificial lighting, reducing lighting energy demand and associated cooling loads. These strategies reduce energy use by 29 percent.

- Terrazzo floors were made with locally available materials, including area river rock. This pays tribute to the Salt River that flowed through the site long ago.

- Ozone-friendly refrigerants were used to help mitigate ozone depletion.

- An innovative, variable-volume exhaust system was designed in place of a conventional, constant-volume system, reducing energy demand associated with meeting laboratory ventilation requirements in the desert.

- A two-week flush-out was performed to improve indoor environmental air quality before occupying the building.

In addition to adhering to LEED standards, Biodesign B was designed to foster cross-disciplinary interaction. Its height was limited to four levels to encourage using stairs, rather than elevators. Glass-walled laboratories and office space offer transparent views of each other and the atrium that separates them. This design encourages researchers to cross public spaces, which provides ample opportunities for impromptu meetings in the spacious hallways and stairwells.

“What we created was the idea of a large connecting space – or, as we call it, a three-dimensional collaborative space. So all the floors are associated with an atrium that goes north and south – and then in the future, east and west – so that everyone is connected in a bigger sense within the buildings.”

Larry Lord, Science Principal, Lord Aeck & Sargent, Architectural Firm