



**BIODESIGN INSTITUTE AT ASU
BUILDING B
TEMPE, AZ**

43% potable water use reduction

58% energy cost savings

82% site area restored using native planting

LEED Facts

**BIODESIGN INSTITUTE AT ASU-B
Tempe, AZ**

LEED for New Construction v2
Certification Awarded July 2007

PLATINUM 52*

Sustainable Sites 12/14

Water Efficiency 4/5

Energy & Atmosphere 15/17

Materials & Resources 5/13

Indoor Environmental
Quality 11/15

Innovations & Design 5/5

*Out of a possible 69 points

The Biodesign Institute at Arizona State University

Building B

PROJECT BACKGROUND

The Biodesign Institute is a state-of-the-art research facility that houses the vanguard of contemporary science, bridging disciplines in private industry, government and academia. The Biodesign Institute was envisioned not only as a high level research facility, but also as a world-class demonstration of ecological laboratory design. Interdisciplinary research is at the heart of the Institute's strategy and also serves as the inspiration for the building design to enhance the value, mission and culture of the Institute.

SUSTAINABLE STRATEGIES

- **SS:** Formerly a parking lot, 82.5% of the project site was restored using native planting – a native Sonoran garden now serves as the Eastern gateway to ASU's campus. Previously, storm water ran off into adjacent streets. This has been corrected routing rainwater into a bioswale in the garden, where it percolates back into the ground.
- **WE:** Plants on the project site are irrigated only via recycled, captured HVAC condensate. Water from cooling units is diverted into an underground 5,000 gallon storage tank sufficient to irrigate the native and drought tolerant plants. The use of this clean and viable water for irrigation not only prevents potable water for this use, but also prevents it from entering the sanitary sewer system.
- **EA:** High performance building envelope strategies, exterior glass shading, interior occupancy sensors and a 167kW PV array are a few of the strategies utilized to achieve this credit. Another major contributor to this credit was the ability to utilize ASU's new Combined Heat and Power facility that provides an extremely efficient source of energy.
- **MR:** Our team established a plan to use materials manufactured and extracted within 500 miles of the project site whenever possible.
- **EQ:** Low emitting materials were used throughout. Over 90% of occupied spaces have sightlines the outdoors. This is accomplished through the atrium space and use of glass in the lab and office areas allowing occupants a connection to the sun's movement and views to the landscaped garden.
- **ID:** Exemplary performance was accomplished by restoring the natural habitat of the site by 82.5% exceeding the threshold of 75%. This was achieved through the creation of a landscaped campus Gateway on the Institute's site. By providing this large landscaped gateway, the open space threshold was exceeded as well.

MEASUREABLE RESULTS

- 261,000 gallons saved annually through the use of high efficiency irrigation, native desert landscape and collection of condensate water from the air conditioning system into a 5,000 gallon cistern for landscape irrigation use. Water use has been reduced by 43.4% (predicted)
- 58.4% annual energy cost savings (predicted)
- 82.5% of the site area has been restored using native planting

SUSTAINABLE DESIGN CHALLENGES

One of the biggest challenges from the outset of the project was that of building orientation. Ideally, the major façades would be facing North/South, but due to the master planning of the entire Institute and the continuous nature of the lab spaces, these façades of the first two phases face East/West. The West side of the building is mainly service/support area and can be mostly opaque. The East side of the building, however, contains all the office spaces and looks out on the gateway desert garden. Knowing that there must be a careful balance struck between the benefits of daylighting compared to the mechanical load due to solar gain, the team looked at multiple options of shading from exterior to interior. Shading studies of multiple configurations were tested at specific times of the day throughout the year using computer visualization software. The design of the East Façade was handled using interior motorized shading louvers in order to allow the transparency desired, connecting the building occupants to the garden and to the community. The placement of these louvers was tested through physical mock-ups as well as CFD models to insure the occupant comfort of the individuals in these offices. On the West, interior roller shades were added in addition to fixed exterior louvers.



Photo by Mark Boisclair courtesy Gould Evans



Photo by Mark Boisclair courtesy Gould Evans

PROJECT TEAM

Owner: Arizona State University
Architect: Gould Evans + Lord, Aeck & Sargent
www.gouldevans.com, www.lordaecksargent.com
Interior design: Gould Evans www.gouldevans.com
Civil Engineer: Evans, Kuhn & Associates www.evanskuhn.com
Structural Engineer: Paragon Structural Design www.paragonstr.com
MEP: Newcomb & Boyd www.newcomb-boyd.com
Landscape Architect: Ten Eyck Landscape Architects
www.teneyckla.com
Contractor: Sundt / DPR, a joint venture www.sundt.com
www.dprinc.com
Lighting: Horten Lees Brogden www.hiblighting.com
Commissioning Agent: Bryan Brauer, PE. and Working Buildings

Project Size: 174,000 sq. ft
Project Cost: \$78.5 million



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