

# GreenSource

THE MAGAZINE OF SUSTAINABLE DESIGN

## LEARNING FROM NATURE

LOGGING'S  
PAST TURNS  
GREEN

BIOPHILIA  
AND YOU

VAN JONES  
ON GREEN  
COLLAR  
JOBS



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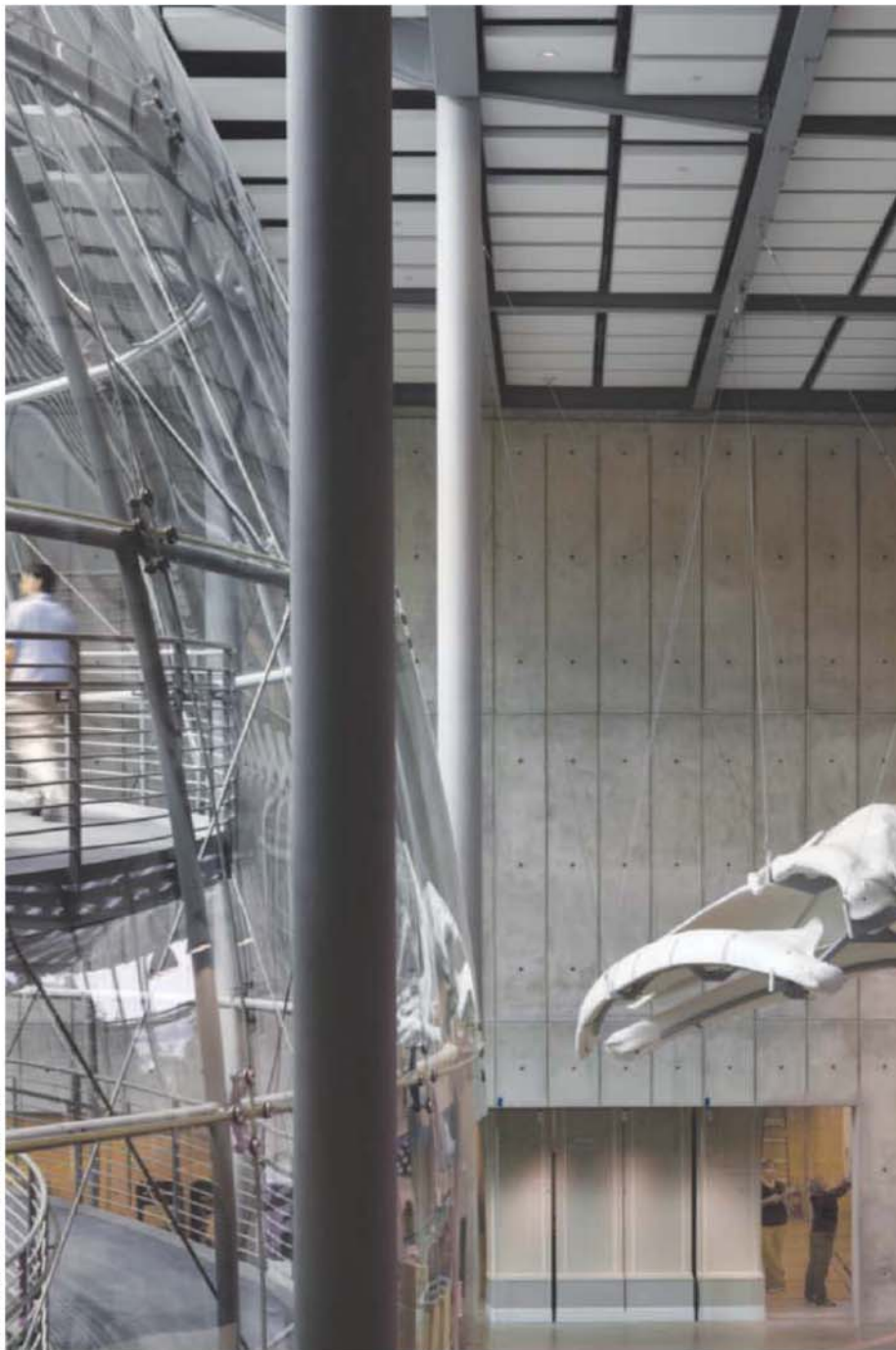
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MARCH/APRIL 2009

**McGraw Hill  
CONSTRUCTION**

# GreenSource

MARCH/APRIL 2009  
THE MAGAZINE OF SUSTAINABLE DESIGN

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**THE AIA/CONTINUING EDUCATION OPPORTUNITY**  
"COURTING NATURE IN DESIGN," P. 102.

## KEY PARAMETERS

**LOCATION:** Scottsdale, Arizona (northern Sonoran Desert)

**GROSS SQUARE FOOTAGE:** 3,950 ft<sup>2</sup> (367 m<sup>2</sup>)

**COST:** \$3.3 million

**COMPLETED:** July 2006

**ANNUAL PURCHASED ENERGY USE (BASED ON SIMULATION):** 0, 100% reduction from base case

**ANNUAL CARBON FOOTPRINT (PREDICTED):** 0

**PROGRAM:** Public trailhead facility

## TEAM

**OWNER:** City of Scottsdale

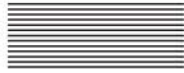
**ARCHITECT:** Weddle Gilmore architects

**LANDSCAPE:** Floor & Associates

**ENGINEERS:** DMJM Harris (civil); Bakkum Noelke (structural); Kunka Engineering (MEP)

**ENVIRONMENTAL CONSULTANT:** GREN A/E Consultants, American Solar Electric (solar)

**GENERAL CONTRACTOR:** Valley Rain



## CASE STUDY

# LOST DOG WASH TRAILHEAD SCOTTSDALE, ARIZONA

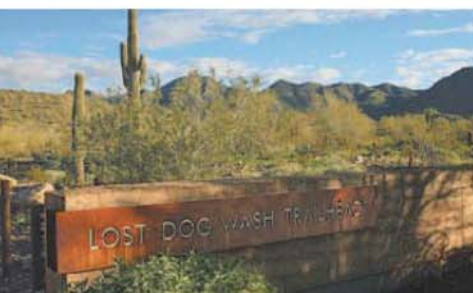
DAVID R. MACAULAY

THE RICH AND VARIED DESERT LANDSCAPE of the McDowell-Sonoran Preserve links vital open space, wildlife corridors, and adjacent communities in central Arizona. Lost Dog Wash Trailhead, the southern gateway to the preserve, is at once a visitors' center, an outdoor education facility, and access point for countless miles of hiking, biking, and horseback riding trails. The site and structures here also serve as a demonstration of sustainable design: of solar power, recycled structural steel, local materials, rainwater and graywater harvesting, and a restored landscape.

Located at the heart of this seven-acre site, the Trailhead Gateway Structure totals 4,000 square feet and includes public restrooms, composting operations, and maintenance facilities, as well as covered seating and a sunrise viewing area. Nearby lies the Desert Amphitheater and the Equestrian Staging Area, while separate parking areas serve hiking and horseback riding trails. The design of the site and outlying structures accommodate guest lectures and field-based classrooms, along with providing opportunities for bird watching, picnicking, and guided interpretive hikes so participants can learn about local history.

Lost Dog Wash Trailhead represents the third of nine planned "visitor access areas" that will eventually ring the edge of the preserve. Established by the city in 1995, the McDowell-Sonoran Preserve covers 57 square miles of mountains, heavily vegetated alluvial washes, and large tracts of undisturbed Sonoran Desert in northeastern Scottsdale. The preserve has already become a national model for protecting large natural open spaces within urban environments.

The project team considered site-sensitive placement of all trailhead facilities within this native landscape as its biggest challenge. "We wanted the structures, even the 300 parking spaces, to look like they belonged, nestled into a complete, natural environment as if grown out of that spot," says Phil Weddle, AIA, the lead architect and a principal at WeddleGilmore architects of Tempe, Arizona. The resulting design retains the drainage and vegetation patterns of the site's native arroyos, swales, and hills to minimize grading disturbances and maximize the amount of



BILL TIMMERMAN

# Passage into the Desert

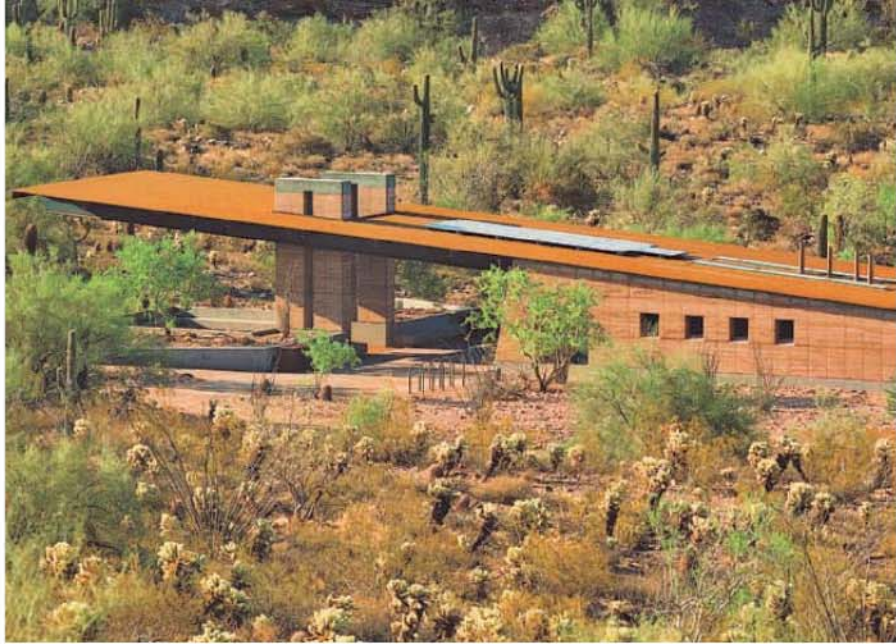
THIS SUSTAINABLE VISITORS' CENTER CELEBRATES A NEW ENTRANCE TO THE NATION'S LARGEST URBAN NATURE PRESERVE

Overlooking the McDowell Mountains in Scottsdale, Lost Dog Wash offers a new model for site-sensitive desert development.

native growth preserved. “At Lost Dog Wash, we looked for opportunities in the design to create emotional bonds for people,” says Weddle, “to encourage natural experiences—whether watching an equinox sunrise or sitting in an amphitheater next to a rare crested saguaro cactus.”

WeddleGilmore teamed with landscape architects Floor & Associates (now JJR|Floor) of Phoenix to design the site, considered the most extensive preserve access area developed to date. Floor’s Chris Brown, ASLA, sees this project as crucial to the ongoing evolution of sustainable design within a desert environment. The City of Scottsdale commissioned his firm to establish the design and construction guidelines and recommend sites for all nine trailheads. “We focused on using the existing site as a touchstone for every design decision, from initial concepts through to the project’s final construction phase,” says Brown, the project’s lead landscape architect. “It was important for us to understand what’s actually here—not just as a Sonoran Desert site, but specific to this seven acres of the McDowell-Sonoran Preserve.” Initially, Brown and his team conducted surveys to study all plant densities and plant communities. This location, classified as an upland Sonoran Desert biome, features a rich palette of desert flora: saguaro, ocotillo, barrel cactus, and large stands of jumping cholla (Teddy Bear cholla).

As a result, the trailhead’s program elements—the main building, outlying structures, and parking lots—were carefully sited between existing desert washes to minimize environmental and visual impacts and to integrate built structures into the existing landscape. Project teams left significant natural areas with smaller wash corridors undisturbed and protected throughout construction to allow drainage, while preserving large swaths of desert vegetation, including native trees and cacti stands. Where some disturbance was necessary, landscape designers removed the site’s “desert pavement” (four inches of native top dress) and spread it back later by hand. They also salvaged a number of affected trees, cacti, shrubs, and natural artifacts, using the original site data to re-vegetate the immediate area and replicate pre-construction conditions. In all, developers catalogued and reintroduced more than 1,000 specimen plants to the site as part of the planting design.

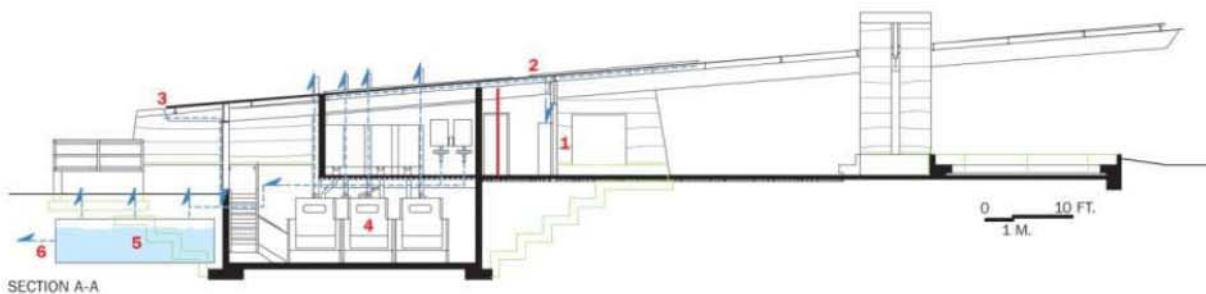


▲ Part visitor center, part desert outpost, the self-contained structure generates 100 percent of its own energy and non-potable water needs.

» Rammed-earth wall construction and unfinished steel supports ensure that the main building can withstand harsh desert conditions (summer highs of 115 degrees) year round.



◀ The Trailhead’s Desert Amphitheater, presided over by a rare crested saguaro cactus, contains ample seating for interpretive, educational, and cultural programs.



## SECTION

- 1 PV array storage system
- 2 PV solar array
- 3 Rainwater collection system
- 4 Composting system
- 5 Cistern
- 6 Drip irrigation system



Brown believes close attention to these site patterns and densities helps to “blur the edges” of natural and recreated landscapes at Lost Dog Wash. “One of our design intentions was to acknowledge this passage into the desert,” observes Weddle, “that once you’ve arrived at the trailhead structure, you feel you’re in the preserve.” The architecture of this large covered space reflects the natural materials, texture, and colors of the surrounding landscape. The rammed earth wall construction contains only soil native to the site and excavated during foundation construction. In addition, the building’s very low profile and angular forms tie into the outline of mountains in the distance. All structural steel, metal-roof panels, and wall panels feature 90 percent recycled steel with the materials left unfinished and allowed to rust and patina naturally.

## SOURCES

**RAMMED EARTH WALLS:** Rammed Earth Solar Homes

**CURTAINWALL:** Flush metal wall panels by Kovach

**CONCRETE FLOORS:** Integrally colored exposed aggregate with 20% flyash, color by Davis Colors

**HOLLOW METAL DOORS:** Curries Company

**SLOPED ROOFING:** Kovach

**FLOOR AND WALL TILE:** Dal-Tile (public restrooms)

**LIGHTING:** LED lighting by Holly Solar Products

**PHOTOVOLTAICS:** Kyocera KC125G 125-watt panels, Solar-One battery storage system, Outback Power Systems power inverter, designed and installed by American Solar Electric

**COMPOSTING SYSTEM:** Clivus Multrum M35

**FOAM-FLUSH TOILETS:** Clivus Multrum AF208

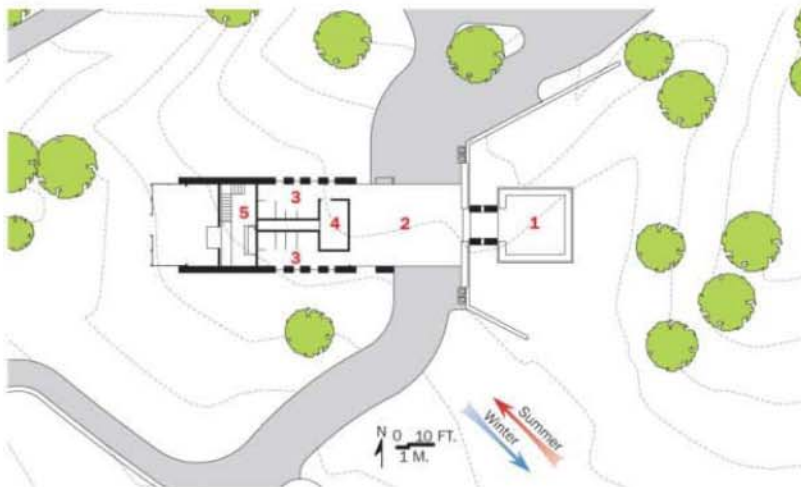
**UNDERGROUND CISTERN:** Xerxes Corporation

**PAVING:** Soil-Sement by Midwest Supply, installed by Earth Care Consultants

Sustainable-design elements within the main structure include a 3,000-watt roof integrated PV solar array, which provides 100 percent of the trailhead’s energy needs. Composting systems used in restrooms will save approximately 200,000 gallons of water annually. Graywater and rainwater harvested from the roof and stored in a 4,000-gallon underground irrigation cistern supplies 75,000 gallons of irrigation water per year. As a result, the project’s only utility connection is for potable drinking water.

Completed in July 2006, Lost Dog Wash Trailhead now sets the tone for current and future sustainable development projects at access areas surrounding the 36,400-acre McDowell-Sonoran Preserve. In a local economy driven predominantly by tourism, Scottsdale’s citizens continue to speak out in favor of open space, of preserving archeological sites, and protecting land for its intrinsic value. “When we built our amenities at Lost Dog Wash, it was only natural that we would be as green as we possibly could,” says Bob Cafarella, Preservation Director for Scottsdale’s Preservation Division. “Our citizens expect it.” <<<

David R. MacCaulay specializes in writing about green design. He has served as a magazine editor, written numerous articles on architecture and green design, co-authored *The Ecological Engineer*, and authored *Integrated Design*.

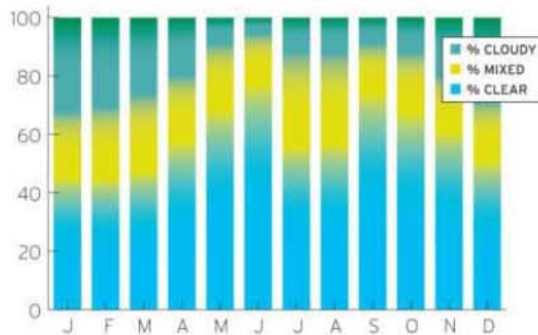


## FLOOR PLAN

- 1 Sitting room
- 2 Entry area
- 3 Restrooms
- 4 Battery storage
- 5 Compost units

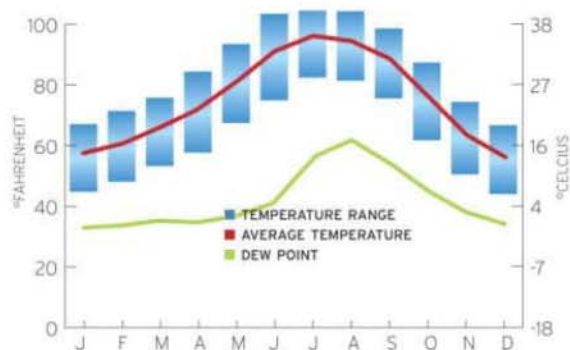
## SKY CONDITIONS

Arizona’s clear skies make photovoltaics highly effective.



## TEMPERATURES & DEW POINTS

Hot days, cool nights, and low humidity are typical desert conditions.



## PRECIPITATION

It doesn’t rain often, but when it does the rain can be intense.

