

CASE STUDY:

# GATEWAY to the McDOWELL SONORAN PRESERVE

Scottsdale, AZ



In 1990, Scottsdale citizens (through the non-profit McDowell Sonoran Land Trust - today called the McDowell Sonoran Conservancy) initiated the preservation of Scottsdale's McDowell Mountains and Sonoran Desert. The vision is to preserve approximately 36,400 acres, equivalent to 1/3 of Scottsdale's total land area. Protected land in this geographic area is called the McDowell Sonoran Preserve. The Preserve will consist of mountains, Sonoran Desert, and natural corridors linking to natural open space in adjacent communities and to the Tonto National Forest and the Maricopa County Regional Park. The objective is to create a large sustainable natural desert habitat for wildlife and desert flora, available for appropriate passive recreation public use.

The objective is that land in the McDowell Sonoran Preserve be preserved in as natural a state as possible as this generation's legacy to those that follow while providing appropriate passive recreational use opportunities so all can enjoy and experience the splendor of the mountains and Sonoran Desert. The importance of saving these lands is underscored by Arizona Game and Fish, which considers the McDowell Mountains the most significant wildlife habitat in the valley outside the Tonto National Forest.

## KEY PARAMETERS:

**LOCATION:** McDowell Sonoran Preserve in Scottsdale, AZ

**GROSS AREA:** Site (383 acres) Building (8,800 s.f.)

**BUDGET:** \$5,600,000

**COMPLETED:** May 2009

**ANNUAL PURCHASED ENERGY USED (based on simulation):** -1.2kBtu/ft<sup>2</sup>, 65.3% reduction from base case

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

**PROGRAM:** Public Trailhead, Interpretive Center w/ staff & volunteer offices



From the Gateway hikers, mountain bikers, and equestrians can access a network of over 45 miles of trails within the McDowell Sonoran Preserve. The Gateway is the location individuals regardless of their physical condition or hiking capability can go to explore and experience the magic of the Sonoran Desert.

This project is awaiting final LEED certification and is targeting a LEED Platinum certification.



**TEAM:**

- owner: City of Scottsdale
- architect: Weddle Gilmore black rock studio
- landscape: JJR-Floor
- civil: Kland Engineering
- structural: Bakkum Noelke Engineering
- mechanical/plumbing: Associated Mechanical
- electrical: Woodward Engineering
- LEED/specification consultant: GreN A/E
- energy consultant: Quest Energy Group

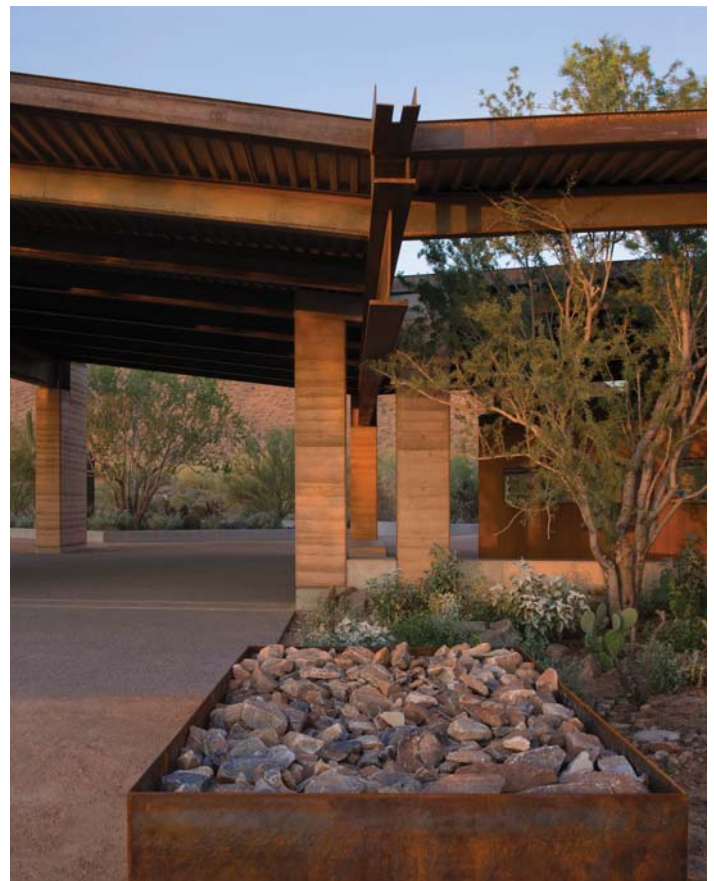
**CONSTRUCTION TEAM:**

- gen. contractor -site: Valley Rain Construction
- gen. contractor -building: The Construction Zone



**At the Building:**

- Energy Performance – Window placement, building materials, and efficient systems allow this building to perform 65% better than ASHRE 90.1-2004 baseline models.
- Rainwater Harvesting – Water collection provides approximately 50,000 gallons of water annually stored in a 20,000 gallon underground cistern. Rainwater will be used to provide 100% of the landscape irrigation water.
- Water Efficiency - Dual flush toilets, waterless urinals and efficient faucets will save approximately 250,000 gallons of water annually compared to traditional systems
- Optimum rainwater harvesting occurs by collecting approximately 50,000 gallons of rainwater annually that lands on the roof and is stored in an underground cistern, providing 100% of the water needed for landscape irrigation.
- Rammed Earth - Rammed Earth Walls were constructed with 95% site salvaged soil and 5% portland cement.
- The roof of the Gateway is covered in native desert rock cobble allowing it to disappear into the desert when viewed from the mountain trails to the east.
- Recycled/Regional Materials - The building contains more than 30% recycled materials and 47% regionally produced materials.





**SOURCES:**

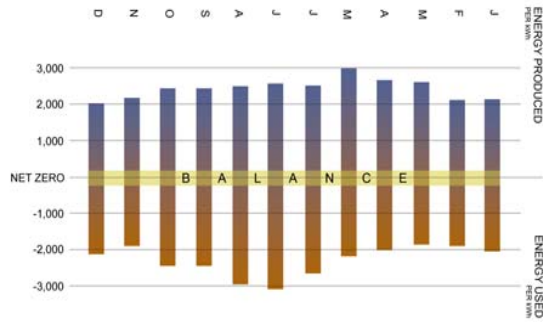
- RAMMED EARTH WALLS:** Construction Zone, Multi
- STOREFRONT:** Arcadia / Sierra Aluminum Products
- METAL PANEL SIDING:** USS-Posco Industries
- GLASS:** PPG Solarban 60
- HOLLOW METAL DOORS & FRAMES:** Ceco Door
- STEEL FRAMING:** Clarkwestern
- ARCHITECTURAL METALS:** Nucor
- CONCRETE FLOORS:** Integrally colored, ground & polished finish w/ 20% flyash, color by Davis Color
- DUAL-FLUSH TOILETS:** Caroma Walvit
- URNIALS:** Caroma cube3 ultra 0.13 gpf
- CARPET:** Shaw Contract Group
- WALL TILE (restrooms):** Interceramic - blond corten
- PHOTOVOLTAICS:** SunPower 230W panels and 7000m inverters, designed and installed by Perfect Power
- RAINWATER CISTERN STORAGE:** StormTech
- PAVING:** Soil Sement by Midwest Supply installed by Valley Rain Construction



**At the Amphitheater:**

- Protection of Habitat (Bridge) - Site construction included hand digging, moving soil by buckets, and narrowing personnel access paths. Desert surface, including plant litter was collected, stored and replaced after construction. The McDowell Sonoran Conservancy's (MSC) Field Institute, in partnership with the City of Scottsdale, conducts educational presentations at the amphitheater to instill a better understanding among participants of the Sonoran Desert and the natural and cultural history of the McDowell Mountains. The amphitheater will also serve as a field classroom with lectures and exhibits for school children.
- Temporary construction access was provided by old jeep roads & then revegetated was construction of the amphitheater was complete. The Gateway will also host a series of formalized hike experiences. The MSC runs a series of scheduled interpretative hikes led by trained hike leaders that take participants on one of the nearby trails in the Preserve to learn about and experience the wonder of the surrounding natural environment.
- Constructed in conjunction with the amphitheater is the Bajada Interpretive Trail, a ¾-mile fully accessible interpretive trail that focuses on the unique conditions of the McDowell Sonoran Preserve and the Bajada that the Gateway site occupies.





### At the Equestrian Staging / Solar:

- The Equestrian Staging Area provides equestrians access to a network of over 45 miles of trails within the McDowell Sonoran Preserve.
- Renewable energy produced by the 18 kilowatt solar system generate as much solar electricity as the Gateway consumes leading to a 'net zero' energy consumption for the Trailhead.
- Photovoltaic System produces 29,000 kWh per year or approximately 105% of the projected annual energy demand.
- Recycle bins are located throughout the site and directed to service yard where they are held for pick up.
- Waste Management - Approximately 90% of construction waste was funneled into local recycling programs.



### Throughout the Site and Parking:

- Vehicle Drive Lanes & Parking Stalls - Designed to fit between natural drainage patterns, the layout minimizes grading disturbance and retains large amounts of native vegetation.
- Volunteers working in cooperation with City Staff salvaged well over 1,500 cacti for revegetation of the Gateway site. Habitat restoration included collecting, storing and replacing the natural desert surface with plant litter that contains rich organic matter and native seeds. In all, the salvage program included over 4,200 hours of volunteer service from the McDowell Sonoran Conservancy, Corporate Volunteer programs and three Eagle Scout projects.
- Landscape – 100% of the new trees were salvaged from the construction site and an adjacent utility corridor. New cacti were salvaged and planted by volunteers.
- 100% of the landscape irrigation will provided from rainwater harvesting following a one year establishment period. Parking areas and driveways are constructed with stabilized decomposed granite paving, which acts to retain the natural desert character and minimizing drainage run off. Site lighting utilizes low level bollard lighting with full cut off to limit light pollution. Site lighting is timer controlled to shut down a couple of hours after dusk.

