

# Pete V. Domenici US Courthouse Sustainable Landscape Retrofit



## Landscape Performance Benefits

- Reduces potable water use for irrigation by 86%, when compared to an established baseline through the use of a low-water plant palette, efficient drip irrigation, and rainwater harvesting via 16,000 gallons of underground storage cisterns.
- Reduces the volume of stormwater runoff by 90% when compared to existing conditions. A combination of rain gardens, bioswales, rock gardens, and filtering devices treat stormwater for pollutants of concern for 95% of the site area.
- Reduces energy consumption on-site by 30% by utilizing energy efficient fixtures when compared to the lowest cost alternative fixture.
- Diverted 480 tons of demolition and construction waste from the landfill by repurposing materials on site and recycling unused materials. This saved \$9,949 in landfill fees.
- Reduces net energy use for outdoor lighting by 99% by generating 27.5 kWh of on-site solar power. This saves approximately \$3,749.09 in energy costs each year.

### Overview

The Pete V. Domenici U.S. Courthouse Sustainable Landscape Retrofit in Albuquerque, New Mexico reconnects an existing site with its historical and geographic context through an evocative and sustainable design. Located in the downtown district, the intent of the design was to convert a water intensive turf landscape into a landscape that provides a dignified setting for court operations while enhancing environmental efficiency. Design strategies include rainwater harvesting, stormwater management, energy-efficient lighting, on-site solar panels, native and drought-tolerant plants, and extensive use of repurposed materials. The renovated landscape is a model for the Government Services Administration (GSA) demonstrating how a municipal site can more efficiently use public and natural resources.

### Sustainable Features

- Over 21,000sf of existing concrete paving was harvested from site and reused to create a series of site walls and benches. The walls were constructed from concrete blocks created by saw cutting existing concrete into modular units.
- The hardscape materials palette includes 23,240sq ft (31.9%) of materials with an SRI value greater than 29 and at maturity trees provides shade for 31,033sq ft (42.6%) of hardscape surfaces.
- Power for the landscape is provided by a 27.5 kWh solar panel array installed on the lower levels of the courthouse roof.
- The stormwater management strategy includes three major stormwater features on site: a system of trench drains that release to rock lined bioswales in the parking lot, trench drains that direct water from the entry plaza to rock garden designed for stormwater detention, and the series of terraced gardens that slowly direct water through south edge of the site.
- Irrigation water is supplemented by rainwater collected from the one-acre roof and stored in 2 underground rainwater cisterns. When combined the cisterns have a total capacity of 16,000 gallons. The cisterns are tied into the drip irrigation system and utilized to water the

### Designer

Rios Clementi Hale Studios

### Land Use

Retrofit  
Institutional

### Project Type

Civic/Government facility  
Courtyard/Plaza

### Location

333 Lomas Boulevard  
Northwest  
Albuquerque, New Mexico  
87102

### Size

4.6 Acres

### Budget

\$2.8 Million

### Completion Date

May 2013

drought-tolerant landscape.

- Over 40% of the materials utilized for the project were sourced from within 500 miles of the site.
- Salvaged 25% of building materials and plants for reuse in the landscape renovation, preventing the addition of materials to the landfill.
- A variety of topdress materials are used to create a dynamic pattern in the landscape while providing a mulch to retain moisture in the soil. The selected materials included 2 types of inorganic rock mulch and pecan shell mulch sourced from farms located in New Mexico.
- An existing stone art piece installed by the Art in Architecture Program and created by artist Doug Hyde was relocated, with the permission of the artist, and designed to fit within the renovated landscape design.
- The plant palette is made up of 58% native plants. The 18 native species include Sunset Hyssop, Mescal Agave, Mormon Tea, Apache Plume, Modesto Ash, Red Yucca, Pineleaf Penstemon, and Soapstone Yucca.
- Eighty-seven established Honey Locust and Sycamore trees were preserved in their existing locations. The design team worked with an arborist to provide monitoring and recommendations, such as limiting soil compaction, for preserving tree health throughout construction.
- Provides a prevailing wage per Davis-Bacon Act for 100% of the 45 construction workers and a living wage per Living Wage Calculator for 58% of workers.
- Three percent of parking is reserved as preferred parking for Green Score Rated reduced emissions vehicles, encouraging low emission and high-fuel efficiency vehicles for commuting.

### Challenge

When considering stormwater management strategies for the landscape retrofit the design team had to work within several unique constraints. The project was initiated over concerns that the existing water intensive landscape was beginning to cause water related damage to the parking structure located underneath the landscape. A primary goal of the landscape retrofit was to design a landscape that would reduce the possibility of water damage in the future. Additionally, the design team had to work within New Mexico state regulations controlling the distribution of water. In New Mexico distribution and access to water are managed to ensure the downstream release of all surface and groundwater. Both of these constraints led the design team to rule out stormwater strategies that relied on retaining and infiltrating water on-site.

### Solution

Instead the design team explored strategies focused on slowing and moving water through the site. For example the large terraced garden at the front of the courthouse is actually a series of micro-basins. As water moves from one to the other water is slowed and small amounts are absorbed by the landscape. In areas where it was difficult to change existing grades, such as the parking lot, the design team installed trench drains to collect and direct stormwater to nearby landscape areas. Fortunately, New Mexico state regulations only apply to stormwater that falls on the site, so it was permissible for the design team to capture stormwater that falls on the roof of the Courthouse. Two underground cisterns collect rainwater from the roof and distribute it as landscape irrigation water.

### Cost Comparison

- The design incorporates 1,796ft of recycled concrete site walls. Had the design team utilized a standard concrete site wall the cost would have been approximately \$152,552, the approximate cost of the recycled concrete walls was \$102,000. Utilizing the recycled material diverted waste from the landfill, created site walls with a premium finish, and saved approximately \$50,552.

### Lessons Learned

- One of the primary design strategies for the landscape retrofit was to utilize the site as a "quarry" harvesting existing concrete and increasing permeability by removing concrete paving. This strategy helped to divert over 21,000sq ft of concrete from the landfill. As a relatively unconventional building material the design team had to first convince the GSA that the material was the right choice and then convince the contractor that it could be built. The design solution uses existing concrete cut into modules and artfully assembled into site walls that animate the site. The demolition plan specified dimensions for the saw cut blocks that were packed and stored on site. Based upon the expected quantity of blocks the team designed a series of site walls and benches that incorporated a mixture of the different concrete colors harvested. An expected loss for damaged blocks was included in their calculations but the success rate exceeded their expectations at around 84% success. During construction the design team worked closely with the contractor to insure their comfort with the details. Their collaboration resulted in an exemplary use of recycled concrete as a building material that has influenced the local design and construction community to consider new materials.

- The existing landscape of the Courthouse featured an art piece by Doug Hyde. Installed as part of the Art in Architecture program the piece was originally associated with the malfunctioning water features. The project team had to develop a process for relocating the delicate 6,000-pound stones in order to align with the original structure and the new design. Early in the design process the artist gave approval and advice for relocating. During construction an art conservator was brought in to help with actual relocation of the piece. Each block was craned into place over their new footings. Initially the stones were placed over a block of ice that allowed each stone to be easily adjusted to its exact location. The challenge of utilizing the ice blocks was that each block melted at a different rate requiring another set of adjustments to the location once the ice had completely melted.

#### **Project Team**

Client: U.S. General Services Administration  
Landscape Architect: Rios Clementi Hale Studios  
General Contractor: AIC General Contractor, Inc.  
Landscape Contractor: The Hilltop MEP  
Engineer: NSI - Biohabitats  
Structural Engineer: KPFF  
Civil Engineer: NSI- Biohabitats  
Water System Design: NSI-Biohabitats  
Lighting: KGM  
Electrical Engineer: Syska Hennessy  
Arborist: Bryan Suhr  
Waterproofing: Simpson Gumpertz & Heger  
Irrigation Designer & Local Landscape Architect: Surroundings Photovoltaic  
Design Consultant: Positive Energy

#### **Role of the Landscape Architect**

Rios Clementi Hale Studios (RCHS) served as lead designer and landscape architect of record. As project prime RCHS led a team of engineers, designers, and client groups from initial concepts to design development, construction documentation and observation, SITES Pilot Project Certification, and on-going monitoring. RCHS continues to communicate the sustainable design systems and through outreach opportunities.

#### **Case Study Prepared By:**

Research Fellow: Chris A. Martin Ph.D., Professor and Head Mathematics and Science, School of Letters and Science, Arizona State University  
Research Assistant: Kaylee R. Colter, MS Candidate, Arizona State University  
Firm Liaisons: Samantha Harris, ASLA, LEED AP, Project Manager, RCHS; Mike Tramutola, Landscape Architect, Associate, RCHS; Brent Jacobsen, Landscape Architect, LEED Green Associate, Designer, RCHS

#### **Product List:**

Soil Amendments: Grow-Well Brands  
Concrete: Duke City Redi Mix  
Irrigation: RainBird  
Rainwater Cisterns: Xerxes  
Lighting: Beta LED, Ghidini, Nora Lighting, Beta Lighting, BK Lighting  
Photovoltaic Panels: SunPower, Sanyo

Case Study Completed: August 2014

#### **References & Resources**

Sustainable Sites Initiative Pilot Program, Certification - 2 Stars, 2013  
Associated Builders and Contractors Excellence in Construction, Special Recognition Award,  
Rios Clementi Hale Studios Project Website

**Additional Images**



**SITE PLAN**

The design draws on the chevron pattern of traditional Pueblo blanket weaving to define spaces, direct water, and mitigate grades.













