



Green Infrastructure & Stormwater Management CASE STUDY

NEEM Rain Water Harvesting and Sustainable Orchard Management

Location: Shiprock, NM

Client: Dine College

Design Firm(s): NEEM

Landscape architect/Project contact: Jeff Ensminger

Email: pblackwater@dinecollege.edu

ASLA Chapter: None

Project Specifications

Project Description: Rain water harvesting based on Anasazi/Puebloan/Navajo traditional methods of capture utilizing an existing area with a 2 degree slope. The water harvested is conveyed to containment where it is distributed in dripline irrigation based on evapotranspiration rates as needed for a Research Orchard on 7 acres. The capture area is 160 ft X 60 ft. A disrupted "siphon" (canal) and one well is back up supply. The orchard is 2 acres and the system was designed to work in coordination with the four state program WINTREE which monitors and gathers information daily on weather, soil, rainfall, fruit phenology, Chill units so the amount of water required and when it is needed is available.

Project Type:

Institutional/education

A retrofit of an existing property

Design features: Bioretention facility, rain garden, and cistern. This was a unique - stand alone - rural application intended to promote rain harvesting in the rural sector who remove most of the water from the aquifer and contribute in inputs to its demise at the same time. The effort was to provide the majority of water required for the project area with expansion capability making the property more self sufficient.

This project was designed to meet the following specific requirements or mandates:

Local ordinance

Impervious area managed: 5,000 sq/ft to 1 acre

Amount of existing green space/open space conserved or preserved for managing stormwater on site: 1 acre to 5 acres

The regulatory environment and regulator was supportive of the project.

Did the client request that other factors be considered, such as energy savings, usable green space, or property value enhancements? No.

Cost & Jobs Analysis

Estimated Cost of Stormwater Project: \$10,000-\$50,000 (Public funding: Federal)

Related Information: Materials supply was 75% of cost, much labor and grading was provided within the tribal community in the bottom up approach to involving the community on the Dine project.

Was a green vs. grey cost analysis performed? No

Cost impact of conserving green/open space for stormwater management over traditional site design/site development approaches (grey infrastructure)? Significantly reduced costs (10% or greater savings).

Number of jobs created: Not available

Job hours devoted to project:

Planning and Design: 1 month

Construction: 3 months

Annual Maintenance: performed

Performance Measures

Community & economic benefits that have resulted from the project: This project demonstrates the viability in an arid climate of something they have done for 2,000 years but became dependant on the European Canal system and had abandoned. The project should promote Federal backed water farming and recharge. When presented to Tribal leaders it was presented as cultural and as a necessity in such a climate where aquifers are first to show signs of decline and compromise.

Project Recognition

Additional Information

Links to images: www.neemtree.org