

PROJECT FAST FACTS



WHY

Maximize Useable Land
in an Urban Area for
Buildings and Parking



WHEN

Construction was
completed in June 2017



WHAT

PIPE-R™ Reservoir System
with a storage volume of
10,000 cubic feet



WHERE

Greenville,
North Carolina

THETA CHI FRATERNITY HOUSE

Case Study



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Rethinking Water Management Systems



Theta Chi Fraternity House-Greenville, North Carolina – Using a PIPE-R™ Reservoir System to Increase Usable Land and Manage Stormwater Runoff



Introduction

Theta Chi built a new facility in Greenville, North Carolina adjacent to East Carolina University. The project included a building for student housing, one for social activities and an oversized parking lot to accommodate resident and visitor parking. The property was not large enough to accommodate a traditional stormwater pond along with the buildings, amenities and parking required. Theta Chi was looking for a cost-effective way to meet the City's stormwater requirements while maximizing their useable land. Stroud Engineering contacted HydroVault Systems (HVS), a stormwater company based in Asheville, North Carolina, about an underground water storage system called the **PIPE-R™ Reservoir System**.

PIPE-R™ is an underground retention system that replaces traditional above ground retention systems. Since **PIPE-R™** is a modular system, it has 95% void space allowing it to fit into areas where other systems will not. The patented system requires approximately 60% less stone than other systems. The stone savings results in lower costs and faster installation. The **PIPE-R™ Reservoir System** may be installed under anything non-structural such as parking lots, drive throughs, landscaped areas, and playing fields.

Project Description

To maximize land use, Theta Chi installed a **PIPE-R™ Reservoir System** under a landscaped area located at the back of the property. The **PIPE-R™** system provided a storage volume of approximately 10,000 cubic feet. Stormwater runoff enters the **PIPE-R™** system through a series of inlet structures located throughout the property and downspouts from the building directly connected to the system. Stroud Engineering worked with the engineers from **Environmental Conservation Solutions, LLC (ECS)** to design a comprehensive system which allowed for the use of existing stormwater infrastructure on the property. ECS is the patent holder of the **PIPE-R™ Reservoir System** with engineers on staff to support client engineers during the design process. A Suntree Technologies' Grate Inlet Skimmer Basket (GISB) was used as pre-treatment to the **PIPE-R™** system to remove sediments, trash, organic debris, and floatables from the stormwater entering the **PIPE-R™** system.



Construction

Construction started in the spring of 2017. After excavation was complete, the system took only two days to install. Installation included placing the **PIPE-R™** cubes in the excavated area, wrapping the **PIPE-R™** cubes with a non-woven geotextile fabric, installing a series of eight-inch pipes to connect the **PIPE-R™** chambers, and covering the system in preparation for landscaping. The installing contractor used four laborers and two backhoes for construction.

Project Challenges

The project site had two major challenges: **space limitations and space capacity**.

First, the available space for an underground system was extremely limited. The engineer could not install the system under the parking lot and roadway because the utilities and stormwater conveyance were already there. A small landscaped area was available for the system and the engineer needed a system that could fit into the footprint. The engineer chose the **PIPE-R™ Reservoir System** due to the flexible installation options, as the height of the system can vary from 8.625 to 86 inches tall. The engineer designed a **PIPE-R™** system that was 69 inches tall.

The second major challenge was installing the system in such a small space. The design required an excavation of approximately fifteen feet deep. This prevented the contractor from using traditional construction equipment in the excavated hole and a ladder was required for labor access. The **PIPE-R™** System's modular design allowed the installing contractor to lower each cube into place with a backhoe using straps connected to each cube.

The largest **PIPE-R™** cube only weighed three hundred and fifty pounds. Competitive systems would have taken significantly longer to install given the small space and lack of access with standard construction equipment.

Project Results

The flexible design options and ease of installation of the **PIPE-R™ Reservoir System** made this project possible. Theta Chi opened the facility in the Fall of 2018. The residents and visitors to the facility use the landscaped area to enjoy outdoor activities.

