Section 1-1

STRONGER QUINLAN

D6

Connecting the Strong Complex and the Quinlan Natural Area Through Green Infrastructure

A Large Rainwater Cisterns

Three 10,000 gallon rainwater harvesting cisterns capture the runoff from the Strong Complex rooftops. A stormwater analysis revealed that the three buildings in the Strong Complex - Boyd, Van Zile, and Putnam - contribute 30,000 gallons of runoff during a 1.1" water quality storm event. Currently, the downspouts lead directly to Campus Creek, exacerbating the problems of flooding and erosion. This design solves part of that problem by capturing the stormwater at the source, storing it, and then releasing it slowly for irrigation of the lawn areas and bioretention cell (G).

C Table Cisterns

Six "Table Cisterns" adorn the small corner plazas along the main path in the center of the Strong Complex courtyard. Each of the Table Cisterns functions as a rain barrel, and utilizes a funnel-shaped shade structure to draw rainwater into a central basin. Each individual unit has the capacity to hold 45 gallons of water, about the size of a small bath. If full, the overflow is directed into a runnel which is connected to the bioretention cell.

D Gabion Seat Walls

Concentric rings of seat walls constructed in the form of gabions allow visitors to look out towards the Quinlan Natural Area and contemplate nature. Additionally, the space doubles as a study area and performance venue for residents of the Strong Complex and greater community.

F Permeable Plaza

A circular permeable paving plaza is situated at a central node of activity. It serves as a nexus between the converging pathways of the Strong Complex, and a heavily trafficked route called Petticoat Lane. The permeable paving replaces an existing asphalt roadway, thus promoting infiltration and storage.

G Bioretention Cell

The primary green infrastructure component of the proposed design is a bioretention cell, which is nested within a detention basin. Stormwater from the Strong Complex throughout the watershed is collected and stored in the bioretention cell, where natural hydrologic mechanisms promote infiltration and groundwater recharge.

J Preserved Woodland

A mature riparian woodland contributes to the picturesque quality of the Quinlan Natural Area. The quiet, shaded reprieve is traversed by hundreds of students and faculty each day. *Stronger Quinlan* strives to maintain this inherent character of the site, while honoring it's unique history.

K Campus Creek

Campus Creek is a degraded ecosystem, which is evidenced by the stream bank scour, the lack of biodiversity, and the frequent flash flooding events. The design helps alleviate these issues by capturing stormwater runoff at the source and reducing the volumetric load of water entering the creek.

Project Statement

Stronger Quinlan is a green infrastructure and campus beautification project which aims to promote sustainable stormwater management and resiliency in the Midwestern United States. The campus community will benefit from these six green infrastructure techniques:

1. Downspout Disconnection
2. Rainwater Harvesting Cisterns
3. Permeable Paving
4. Bioretention Cell & Detention Basin
5. Urban Tree Canopy
6. Native Vegetation & Restoration

Objectives

#1 Help restore natural hydrologic regime and mitigate the recurrent flash flooding of Campus Creek .

#2 Increase the capacity of the site to be resilient and adaptive to climate change, campus development, and community use.

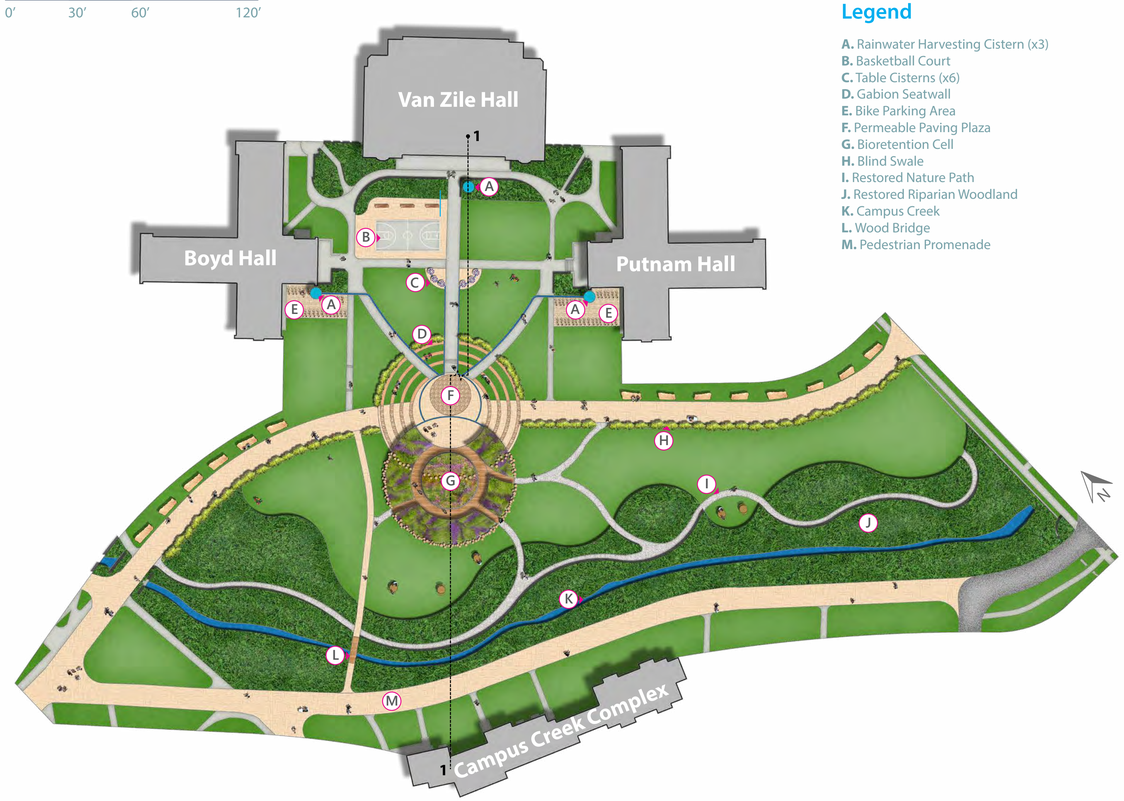
#3 Enhance the ecosystem services of the site by incorporating native plant communities and minimizing areas of irrigated turfgrass.

#4 Engage the campus community in a meaningful way through education, research, and an eco-revelatory design approach.

Site Plan

Scale

0' 30' 60' 120'



Legend

A. Rainwater Harvesting Cistern (x3)
B. Basketball Court
C. Table Cisterns (x6)
D. Gabion Seatwall
E. Bike Parking Area
F. Permeable Paving Plaza
G. Bioretention Cell
H. Blind Swale
I. Restored Nature Path
J. Restored Riparian Woodland
K. Campus Creek
L. Wood Bridge
M. Pedestrian Promenade

Post-Design Analysis

Stormwater Usage

The rainwater harvesting cisterns contribute to an annual reduction of potable water use for irrigation of up to 597,990 gallons per year. Additionally, with all of the green infrastructure interventions, there is a 46 percent reduction of runoff volume in a 1.1 inch water quality storm event. That equates to cost savings for the university, and promotes a more sustainably-minded campus community.

Shrub and Lawn Areas

Together, the lawn, shrub, swale, and detention basin areas comprise the permeable surfaces of the project site, at 217,500 square feet (60%). A restored riparian woodland surrounds the Campus Creek corridor (dark green) and promotes slow infiltration of stormwater. The turfgrass lawn maximizes site use and ease of maintenance, and will be irrigated as needed utilizing water stored in the cisterns.

Permeable Paving

Over 50,000 square feet (14%) of permeable paving (orange) is added to the site in the proposed design. As the university phases out vehicular access into the heart of campus, asphalt roadways will be replaced by new pedestrian corridors, allowing for the implementation of new materials. The proposed design offers a 16 percent increase in permeable surface area through the removal and replacement of impermeable surfaces.

Proposed Design

The *Stronger Quinlan* project addresses the current problems of both flooding and site underutilization by activating the site through socially engaging green infrastructure elements. The 580 residents of the Strong Complex will have a reinvigorated central courtyard, and users of the Quinlan Natural area are afforded a new opportunity to appreciate the beauty of the restored riparian ecosystem.