

Thesis Project Portfolio

Piedmont Virginia Community College Site Design

(Technical Report)

**Green Roofs: Understanding the Advancements of Green Technology Through the Human
and Environment Relationship**

(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science

University of Virginia • Charlottesville, Virginia

In Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

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Spring, 2022

Department of Civil Engineering

Table of Contents

Sociotechnical Synthesis

Piedmont Virginia Community College Site Design

Green Roofs: Understanding the Advancements of Green Technology Through the Human and Environment Relationship

Thesis Prospectus

Sociotechnical Synthesis

Engineering is often seen as just manipulating equations and reviewing numbers. While this is an important aspect of engineering, it does not encompass all the complexities that must be addressed during designing. Engineers must be careful of how their work impacts society and the environment, and use their knowledge to create solutions. Engineers have the ability to make an impact on communicates and make a difference in the world with their mindful and creative decisions in design.

The STS and technical reports are interconnected through the impacts of infrastructure on the designated sites. The technical report, although there is limited research, was constructed with the mindset of the changes in the social structure that the physical project could impact. For my technical project, I am working with a team that includes three other civil engineering undergraduate students and we are working towards creating a site plan for Piedmont Virginia Community College (PVCC) located in Albemarle County, Virginia. This site plan is being developed for a new 20,000 sqft. building and a parking lot with 100 spaces to be included on the campus at PVCC. The site plan deliverable is a plan set submittal with grading plans, stormwater management plans, erosion and sediment control plans, a utility connection plan, and a traffic control plan for the desired site. Although all these pieces are strictly engineering, the outcome of the new building on the school campus was to change the interaction between the students, faculty and prospective students and create a more cohesive network of buildings.

The STS paper focuses on the relationship between humans, the environment, and the technology that exists between the two. The paper revolves around green roofs, which is a specific green infrastructure, and their improvements and changes throughout history as society changes. Modernization of green roofs allowed for specific scientific data to be implemented in a

manner where the environment was used within technology to increase its effectiveness.

Although technology has created a lot of damage, there may be new solutions to improving the environmental conditions around the world through new creations. Beyond technology, the complexities of regulations and political barriers are touched on as it can alter the direct relationship between humans and the environment.

Working on these two papers together has helped remind me of the importance and impact that civil engineering infrastructure can have on the community and the environment. Civil engineering is more than just calculations, there is a whole world being changed by the lines I draw on paper. I am interested in using this information going forward to improve the way I operate as a civil engineer to maximize my own impacts on nature and the community through my work.