Thesis Project Portfolio

Chesterfield Fire Station and Parks and Recreation

(Technical Report)

Designing Public Parks to Shape Communities

(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

Emma Coutts

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Department of Civil and Environmental Engineering

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Sociotechnical Synthesis

Land development and the design of public spaces impact the lives of all members of a community, whether it is through monetary contributions via taxes or use of the designs once they are built. Amenities and services that are often taken for granted, such as parks and fire stations, were all designed by someone with the intention of solving a problem for the community they are located within. This design consideration has both technical and social implications which I explore in my thesis portfolio.

For the technical portion, my group created a site design for a parcel which contains a fire station and a parks and recreation area in Chesterfield County, Virginia. This was done in collaboration with Dewberry, a construction engineering company. The result of the design process was nine plan sheets covering the site plan, demolition plan, grading, stormwater, utilities, and erosion and sediment control for the site. These plan sheets are accompanied by a technical report detailing the design choices made. The technical report also communicates the process and changes made to the design over time, the standards that are being used to guide the design, and a discussion of potential future work that could be done on the site.

The design of the site was done primarily with AutoCAD Civil3D software as well as SWMM, which was used to model the stormwater design options. Each plan sheet was created using a provided base layer of the site. First, a demolition plan and buildable area map were produced, which were used to create a site layout. The site layout is the base of each of the remaining plan sheets.

The sociotechnical portion of my thesis explores how to design a better public park. I studied the importance of parks and the distribution of access to them. Then, through an analysis

of both Google reviews for nine parks in Virginia and minutes from a Board of Supervisors meeting in Albemarle County, Virginia about the comprehensive plan for a new park, I analyzed trends in peoples' opinions of public parks both before and after they have been implemented in communities. I used reasoning attached to high and low ratings on Google reviews to understand what people think is good and bad in parks once they are already built and used by the community. The minutes from the Board of Supervisors meeting showed the opinions people had of a park before it was implemented, and documented a different set of concerns. Through this analysis, I found that the way to ensure parks will be used is to welcome the community's opinions at all stages of the design process to ensure that the design meets the needs and desires of those it is intended for.

Both the STS and technical portions of my portfolio explore different aspects of the process of designing public spaces. In combination, my technical and STS papers show the perspectives of both the engineer and the intended user of a public space. My technical report touches on the technical challenges and restrictions that engineers work within to ensure that a product is compliant with the many standards that make a design acceptable. My STS paper explores the perspectives of the users and their importance to the design process. Together, my thesis portfolio explores the many, often conflicting, pressures that are felt by an engineer during the design process. Some balance between the two conclusions must be reached to ensure that a project is completed, that it meets all the requirements of both the entity that commissioned it and the governmental bodies that regulate it, and that it meets the needs and desires of the community that it was built for.