



Capstone Design Project Abstract

Project Title: Valdosta Flooding Assessment

Partner/ Client: Housing Resource Solutions Inc.

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The City of Valdosta, Georgia, faces chronic flooding challenges due to its unique location between multiple river basins, small topographic variations, and assorted soil types that allow little infiltration. During the catastrophic rainfall event from Hurricane Helene in late 2024, many areas of Valdosta experienced severe flooding. The Chadwyck neighborhood, located in the northeast corner of the city, sustained extensive flooding, leaving residents isolated in their homes with no way out. This community has continued to experience more frequent and severe flooding since this great storm, and homeowners are struggling to maintain their homes' structural integrity and obtain proper insurance and governmental support.

Housing Resource Solutions Inc., alongside the City of Valdosta, is seeking a feasible solution to improve the safety and quality of life of the residents in the Chadwyck neighborhood and those in the surrounding areas. The solutions must comply with all local and state regulations and focus on green infrastructure. The City of Valdosta emphasized that the proposed solution should not involve changing or relocating any existing stormwater pipes.

The root cause of the frequent flooding experienced by the Chadwyck neighborhood was determined to be a clogging of the local stormwater pipe system. The neighborhood is located downstream of a large watershed that relies on large-diameter pipes with limited velocity control to convey stormwater runoff. During average to large rain events, the volume and speed of water moving through the system exceeds the capacity of the culvert at the neighborhood entrance, resulting in localized flooding.

Design solutions include excavating a dry detention basin upstream of the community to convert it into a retention pond. This will increase the volume of the existing basin, thus increasing storage capacity. Modifications to the current outlet structure of the basin will also be implemented to aid in controlling the velocity of water moving downstream. Housing Resource Solutions Inc. and the City of Valdosta expressed a desire for added community value, so in addition to the pond retrofit, a walking trail along the pond's perimeter will be installed. Benches, picnic tables, light posts, and other park-like features will be included to enhance the area. To prevent sedimentation into the new retention pond, a grass channel will be installed in the upstream area. This channel will be lined with rocks and stones to dissipate the velocity of water entering the retention pond and will be accentuated with vegetation to create an aesthetically pleasing space. Together, these solutions aim to not only mitigate the recurring flooding that has long impacted the Chadwyck neighborhood but also to transform an undeveloped area into an inviting green space that enhances the overall quality of life for the residents of the surrounding neighborhoods.



Figure 1: Current inlet conditions after a rainfall event

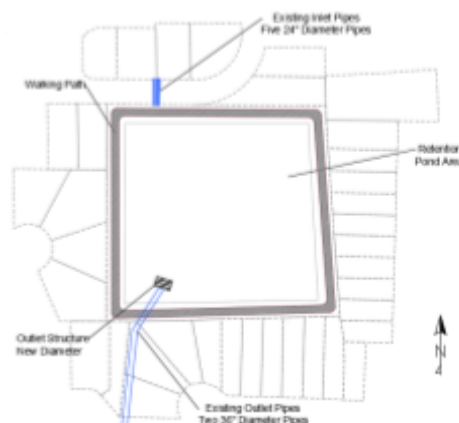


Figure 2: Proposed Pond Conditions

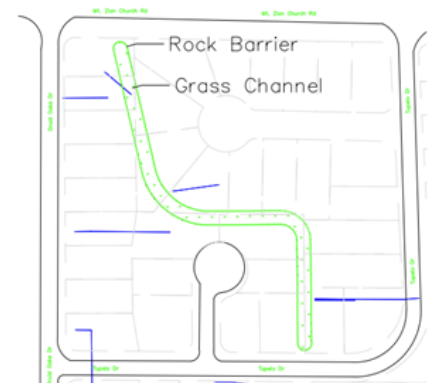


Figure 3: Proposed Grass Channel Conditions



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