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Advancing Infrastructure

CASE STUDY

Quattrone Develops Cost-efficient Stormwater Network Solution for New Housing Complex in Florida

Using OpenFlows™ StormCAD® Saves USD 10,000 and Avoids a Potential Six-month Construction Delay

DEVELOPING A SUPERIOR RENTAL COMPLEX

Coastland Residential is developing Mallory Townhomes as an affordable rental housing complex in the city of Fort Myers. These homes are designed to provide modern, superior communal living for local families. Offering a Key West coastal vibe, the development is a gated, villa-style community with 21 two-story buildings, featuring 126 two-bedroom and 38 three-bedroom units, as well as amenities, including gym facilities, a pool, children's play area, and a dog park. "Mallory Townhomes will provide local residents [with] a superior rental product to the typical garden-style apartments in the area," said Anthony Seijas, founder and principal of Coastland Residential.

About a year into construction, the underground contractor identified a conflict with the final stormwater outfall structure while connecting a reinforced concrete pipe (RCP) from one of the originally designed stormwater structures with the existing master stormwater network. Providing civil engineering, water management, and site planning services, Quattrone & Associates were brought on site to evaluate and discuss potential remedies to keep construction on schedule.

ADDRESSING NETWORK ISSUES MID-CONSTRUCTION

The original design plan called for connecting a 42-inch stormwater RCP into one of the existing stormwater structures. However, the riser was not wide enough to connect with the RCP. The existing structure was also much lower than anticipated—located approximately 10 feet below the water table. The city of Fort Myers requested that the proposed RCP be lowered to connect to the base of the existing structure instead, where it was wide enough to make the connection. This proposal required a scuba team and would have been cost prohibitive, as well as would have delayed construction.

However, Joshua Eisenoff, the project's new civil engineer at Quattrone, was not advised of these issues and the city's proposed solution until midway through construction when he was brought on site to meet with the construction team. "After initial conversations, [we discussed] the option of rerouting the entire stormwater system to have two, instead of three, outfall locations," said Eisenoff. Yet the contractor had already purchased all the RCP for the original design. Therefore, Quattrone wanted to reuse all the RCP that the contractor originally purchased so they did not have to purchase an entire new supply.

Eisenoff sought to re-network the entire system with the same size and length of the already-purchased pipe to avoid modifying the existing master stormwater system, which would take months to verify using a scuba team. "I believe the constraints of wanting to use the same RCP pipe as originally designed with a new layout was a unique challenge. When starting a project from scratch, you have less constraints than modifying a project that is halfway through construction," said Eisenoff.

OPENFLOWS STORMCAD FACILITATES OPTIMAL DESIGN SOLUTION

Upon learning about OpenFlows StormCAD from a co-worker, Eisenoff thought that it might be a useful application to quickly input the current stormwater scenario and modify the design to reroute the network. "After hearing about the OpenFlows StormCAD software, I thought I would give it a try and model the site's stormwater layout," said Eisenoff.

PROJECT SUMMARY

ORGANIZATION

Quattrone & Associates, Inc.

SOLUTION

Water and Wastewater

LOCATION

Fort Myers, Florida, United States

PROJECT OBJECTIVES

- To determine a cost-efficient design solution for stormwater network issues identified midway through construction.
- To reuse all existing pipe materials and avoid construction delays.

PROJECT PLAYBOOK

OpenFlows StormCAD

FAST FACTS

- Midway through construction of Mallory Apartments, developers identified a conflict with the originally designed stormwater structure.
- The initial proposed remedy would have delayed construction and cost tens of thousands of dollars.
- Quattrone proposed using OpenFlows StormCAD to model and analyze the site's stormwater layout to resolve the issue more efficiently.

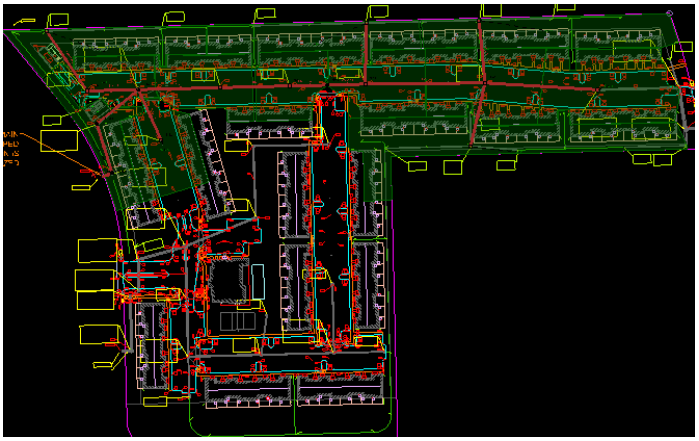
ROI

- Bentley's application saved the owner and contractor USD 10,000 and avoided a six-month potential construction delay.

"Bentley's OpenFlows StormCAD allowed me to quickly and efficiently design a new stormwater network for a project with multiple unique challenges in a timely manner, while accommodating difficult project constraints."

– Joshua Eisenoff, Civil Engineer, Quattrone & Associates, Inc.

A first-time user, Eisenoff found Bentley's hydraulic modeling and analysis application easy to use. The ease of dropping catch basins, maintenance holes, and outflow structures proved quick and accurate. The software's flexibility allowed the team to consider and incorporate local storm events to run the model specifically for this project site while generating detailed reports. "The software let me choose and identify the size and lengths of RCP to match the size and length of material that was already purchased on site," said Eisenoff. Working in Bentley's digital environment provided a visual and analytical model to help redesign the stormwater layout, determining an optimal design solution to reroute all the existing piping while also re-networking the entire system amid construction.



Midway through construction of Mallory Apartments, developers identified a conflict with the originally designed stormwater structure.

ADVANCED HYDRAULIC MODELING DRIVES SAVINGS

By performing advanced hydraulic modeling and analysis with OpenFlows StormCAD, Quattrone could evaluate and visualize their design solution, reusing all the existing RCP materials to keep construction moving forward. "The design incorporated reusing RCP so it would not go to waste. This process lowered lead times of new construction material and costs greatly," said Eisenoff.

The original proposed remedy of modifying the existing master stormwater structure would have cost tens of thousands of dollars and resulted in a six-month or more construction postponement. Using OpenFlows StormCAD, Quattrone could cost effectively redesign the stormwater network within one day to keep the project on schedule. "Thankfully, Bentley's OpenFlows StormCAD software allowed us to redesign the stormwater network efficiently to save time and over USD 10,000 for the contractor and owner," said Eisenoff.