West Dearborn St. LID Pilot Project, Sarasota, FL

Downstream Defender® provides final level of treatment prior to outfall in aquatic preserve

Project Profile

Objective

Retrofit the commercial district of Englewood, FL with a Low Impact Development scheme to reduce stormwater runoff volumes, treat stormwater pollution and beautify the neighborhood.

Solution

A treatment train approach was applied to reduce the volume of stormwater runoff. Two Downstream Defender® separators were used to treat any runoff discharged into the Lemon Bay Aquatic Preserve.

Product Profile

- Low headloss accomodates flat areas such as coastal Florida where little hydraulic drop is available in the drainage profile
- Treats a wide range of flow rates
- High pollutant capture efficiency results in a smaller footprint device than other "equivalent" hydrodynamic separators
- Retains previously captured pollutants in its sump under high flow conditions that cause scour in washout in other devices

Find more about the Downstream Defender® at **www.hydro-int.com**

SARASOTA COUNTY, FL – For several years, the Sarasota Board of County Commissioners had been planning stormwater improvements for the Dearborn Street neighborhood of Englewood, Florida. The West Dearborn neighborhood has struggled economically, which some attribute to the lack of centralized stormwater infrastructure serving the area. Sarasota County's stormwater management regulations would require any newly developed or redeveloped lots on Dearborn Street to include expensive stormwater management systems on the site, designed and installed at the developer's cost.

The first goal of the stormwater infrastructure upgrade was to improve and protect the integrity of the water quality of local Lemon Bay Aquatic Preserve by eliminating the discharge of untreated stormwater from the entire Dearborn Street district. The second was to build a sustainable stormwater management infrastructure that would eliminate the need for local businesses and prospective commercial developers to bear the expense of implementing their own stormwater treatment systems. Doing so could have a significant impact on the local economy, lowering the cost of new commercial construction and spurring the redevelopment of the downtown and its surroundings.

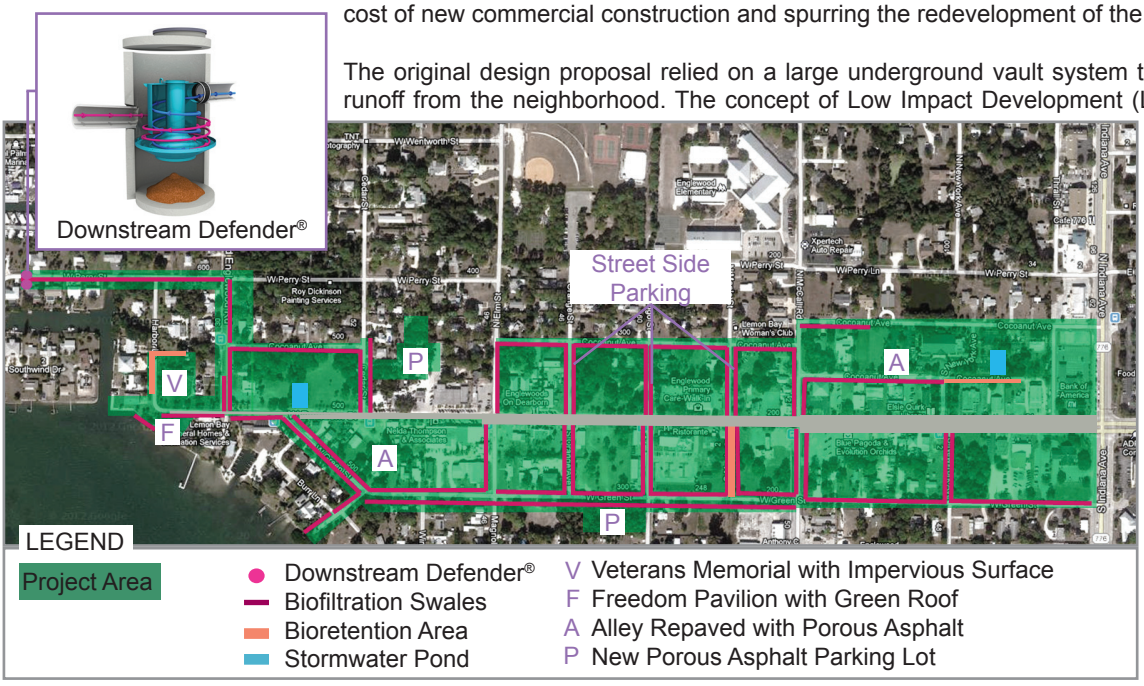

Fig.1 The W. Dearborn St. LID Pilot Project used a variety of LID techniques to reduce and treat stormwater runoff.

The original design proposal relied on a large underground vault system to capture and detain stormwater runoff from the neighborhood. The concept of Low Impact Development (LID) was pitched to the Board of County Commissioners as an alternative that would meet the stormwater management requirements plus provide the additional benefits of neighborhood beautification, parking and traffic flow improvements and increased pedestrian safety. The Board brought DMK Associates, Florida Waterscapes LLC and Axis Engineering on board to further develop the concept and the West Dearborn Street Low Impact Design Pilot Project was born.

"The property owners in this area can develop their property without having any type of

stormwater requirements," said County Engineer Mary Ann Lind.

The design team's strategy was to "surround and capture" the stormwater runoff with LID practices wherever possible. The team recognized the importance of using a treatment train approach for an optimal level of pollutant reduction when runoff could not be eliminated and had to be discharged into Lemon Bay. The team also prioritized preservation of assets, re-use of materials and minimizing impervious areas in the design.

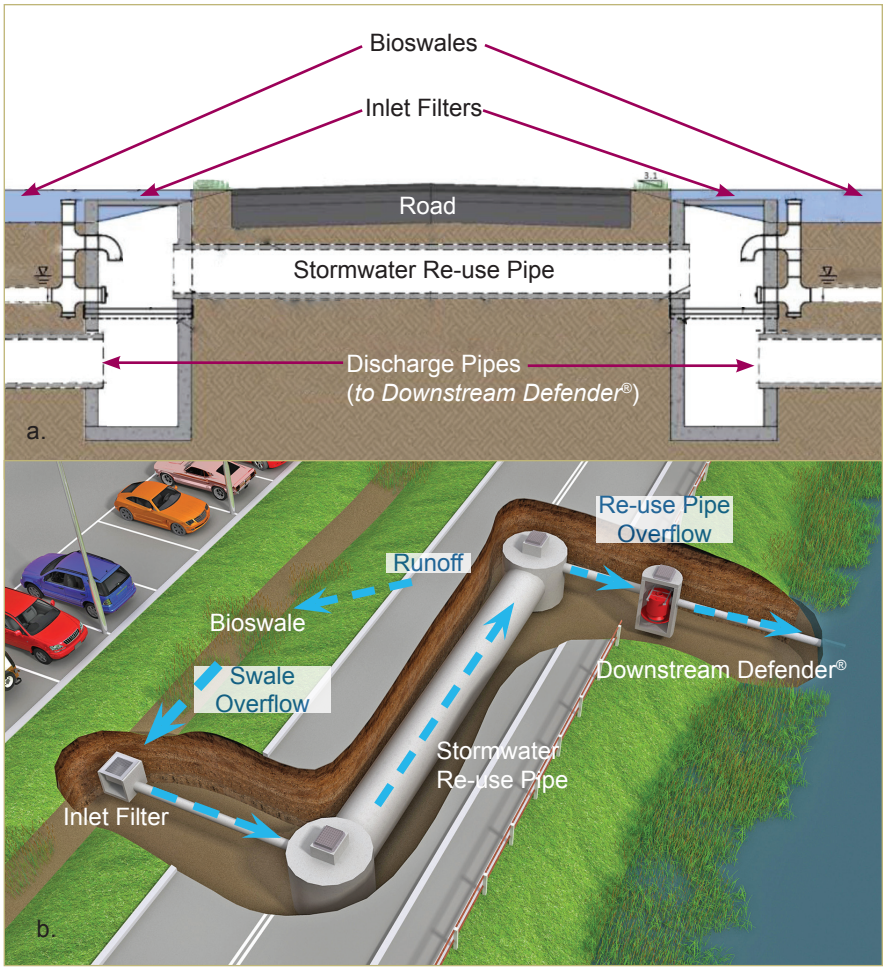

Fig.2 a) The treatment train system conveys runoff to bioswales for treatment. Excess flow bypasses the bioswale media and enters the drainage system through an inlet filter. Stormwater is stored in the re-use pipe. Excess runoff is conveyed to discharge pipes. b) Discharge is treated by a Downstream Defender® prior to entry into Lemon Bay.

Although a wide variety of stormwater BMPs were used in the scheme, roadside biofiltration swales were the most extensively used BMP. The swales were also the first step in the large treatment train network that spanned the site from State Road 776 (Indiana Avenue) on the east to the 700 block of West Perry Street on the west (Fig.1, previous page).

The treatment train system is designed to convey road and roof runoff to nearby bioswales where engineered soil media provides a high level of treatment. Water then flows out of the underdrain to a re-use/discharge pipe. During more intense storm events, excess runoff flows directly into the re-use/discharge pipe via a filtered inlet. Stormwater in the re-use/discharge pipe network is available to property owners for irrigation. When the flow in the re-use/discharge pipe exceeds its storage capacity, the excess flow is conveyed to an 8-ft Downstream Defender® advanced vortex separator installed on West Perry Street for final treatment prior to being discharged into Lemon Bay (Fig.2).

A 6-ft Downstream Defender® installed nearby will treat the runoff from Englewood Road, a more heavily trafficked arterial, which thus carries with it a higher concentration of pollutants. The installation of this Downstream Defender® unit will be critical as the water that flows from Englewood Road has never before had a stormwater treatment solution in place.

The Downstream Defender® by Hydro International is an advanced vortex separator designed to remove hydrocarbons, Total Suspended Solids and their associated pollutants such as metals from stormwater runoff. The Downstream Defender® is a low headloss separator, making it a good fit for flat areas such as coastal Florida that do not have much hydraulic drop available in the drainage profile.

The Downstream Defender® has also been shown to retain previously captured pollutants in its sump under high flow conditions that cause scour in washout in other devices. "When the hydrodynamic separator is the last line of defense before an aquatic preserve, the last thing you want is a device that is prone to washout," says Will Hall of Hydro International, who managed the project for Hydro International. "The stakeholders in this project can have confidence that the Downstream Defender® is truly protecting Lemon Bay."

Once fully implemented, the city will select a third party to conduct water tests before and after heavy rains to determine the impact on water quality in the bay. In order to ensure the units perform at maximum efficiency, Sarasota County will be maintaining the units on a monthly basis.

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