Introduction
The Camden Yards Sports Complex has recently finished a renovation of the Pedestrian Spine project, the walkway that connects Oriole Park at Camden Yards to M&T Bank Stadium, home of the Baltimore Ravens. According to Rachelina Bonacci, the public information officer for the Maryland Stadium Authority (via SouthBMore.com), “The 975 ft. Pedestrian Spine is being renovated to include enhanced security features, new hardscaping, a new impervious surface, new landscaping, and stormwater improvements.”

Every weekend fans will be looking for a classic game day experience from convenient stadium access to tailgating party atmospheres, and a lot goes into retrofitting the existing parking lot to integrate stormwater management needs. A seemingly simple project can have demanding benchmarks to meet while still accommodating huge crowds and a developer’s land-use and long-term maintenance requirements.

Situation
While expanding the walkway and retrofitting the existing parking lot to meet stormwater requirements, Carroll Engineering, Inc., the engineer of record, was mindful to accommodate growing stadium traffic, as the outcome rests on the project’s ability to maximize space while safely and conveniently welcoming thousands of vehicles and pedestrians.

First, a stormwater system introduced into the site plan would have to meet local Environmental Site Design (ESD) requirements, but the conventional wisdom is that treatment systems designed to address vast areas of impervious land and heavy pollutant concentrations, would themselves, have to take up a large footprint.
Challenge
“This project presented a set of obstacles, between meeting the ESD redevelopment requirements, and managing the stormwater in a way that did not disrupt game day activity. This design allowed the stormwater to be adequately managed without sacrificing any space along the new walkway, or any parking spaces within the existing parking lot”, states Brad Eldred, regional stormwater manager for Bio Clean Environmental. The challenges for the Pedestrian Spine redevelopment didn’t stop there. Any incorporated system had to be versatile enough to tie into existing drainage infrastructure, meet Maryland ESD requirements, and have long-term ease-of-maintenance cost benefits.

Solution
The Modular Wetlands System Linear (Modular Wetlands) is one of the only biofiltration systems that can be installed underground without plants. On this project, as a redevelopment application, the Modular Wetlands was approved to be used entirely underground. The Modular Wetlands has a traffic-rated structure and hatch, making it completely safe for visitors to tailgate over, and it meets pollutant removal benchmarks without surface plants.

The Modular Wetlands is approved by the Maryland Department of the Environment and the Maryland State Highway Administration, and the five units employed in the new design gave the redevelopment team multiple short and long-term benefits. The Modular Wetlands pretreatment chamber and unique horizontal flow require minimal maintenance, provide ongoing cost-savings, and proven superior performance for years to come.

REFERENCES
1. SouthBMore.com Website
   https://www.southbmore.com/2019/03/08/ravens-walk-undergoing-a-5-1-million-renovation-at-the-camden-yards-sports-complex
WA TAPE GULD Approval Without Plants

- With or without plants (open planter or sealed), the system maintains superior performance in any design configuration.

Can Accept Existing Pipe Below Surface

- Piping into the system opens up numerous configuration and design options, like downstream of detention usage or diverting for retrofits.

Works Months Without Requiring Maintenance

- The easily accessible pretreatment chamber traps and isolates trash, sediments, and hydrocarbons. A unique feature, proven to keep maintenance frequencies & costs at industry-leading lows.

Can Accommodate High Flow Internal Bypass

- The Side-By-Side Orientation option allows abnormal high flows to bypass from pretreatment directly to the discharge chamber.

Design Flexibility & Safety

- Space-saving design provides low excavation and installation costs, plus there is no dangerous depressed planter or standing water.

The Modular Wetlands® System Linear

(Modular Wetlands)