



Cistern Tanks for Stormwater Management April 2024



Highland Tank supplied three 30,000 gallon cistern tanks and the rainwater harvesting system show above as part of a stormwater management plan.

www.highlandtank.com

HIGHLAND TANK PRODUCTS USED IN STORMWATER MANAGEMENT PROJECT

The Environmental Protection Agency (EPA) Phase 1 storm regulations require all states, counties, cities, etc., to develop solutions to control pollutants from runoff from commercial and industrial facilities to municipal separate storm sewer system (MS4).

This is also covered under the National Pollutant Discharge Elimination System (NPDES). Storm water regulations have become a standard part of building design to mitigate pollution from developed sites as well as provide a means of water conservation and sustainability.

The introduction of “Green Technology” embraces the use of BMP’s in mitigating the negative impacts associated with urbanization. This innovative approach has introduced dynamic storm water management tools that mimic the natural hydrology of a site without the dependence on structural practices.

Tools such as riparian buffers, green roofs, bio filtration swales, retention/detention systems and rainwater harvesting address multiple objectives like water and energy conservation.

This Highland Tank project profile, in brief, illustrates the tools used on this to reduce runoff and improve water quality by introducing “Stormwater Management as Rainwater Harvesting. Highland Tank provides solutions with technology that capture, pretreat, store and reuse storm water to maintain or restore natural site hydrology.

In its simplest form, the concept of the Highland Tank Storm Water Management System can be broken down into three areas of impact:

Quality Control (Pollution) - Pretreatment Systems

Quantity Control (Overflow) - Storage Systems

Stream Channel Protection (Erosion) - Rainwater Reuse

In 2020, Highland Tank started design work with engineer firms on a parking garage project in the Michigan Central District.

While the main purpose of the structure is to provide parking for the surrounding area, it also features a pedestrian-friendly streetscape, platforms for art presentation and other public amenities.



Highland Tank built three 30,000 gallon water storage tanks which became a canvas for Artist, Senghor Reid, to bring them to life. The tanks are installed at the Bagley Mobility Hub and are part of an art program for the Hub.

The initial design consisted of a Highland Tank pretreatment stormwater device, storm water storage system, treatment skid with integral pressurization system. The intended water reuse was to be for irrigation of gardens and all green areas in and around the Hub.

The design intention was to integrate the Highland Tank Stormwater Solution as part of the building's sustainability and highlight the district's commitment to this end.

The Highland Tank Stormwater System for Bagley Mobility Hub includes:

HTSCU 2 Pretreatment System

- The Solids Control Unit (SCU) is situated on the upper mid-level parking deck and intercepts all the stormwater from the open deck area of the structure. The unit has a 12" inlet, 16" overflow/bypass, internal diffusion baffle, grit chamber with primary/secondary media packs. The media packs were sized based on maximum flow for a particle size reduction of > 50 microns.

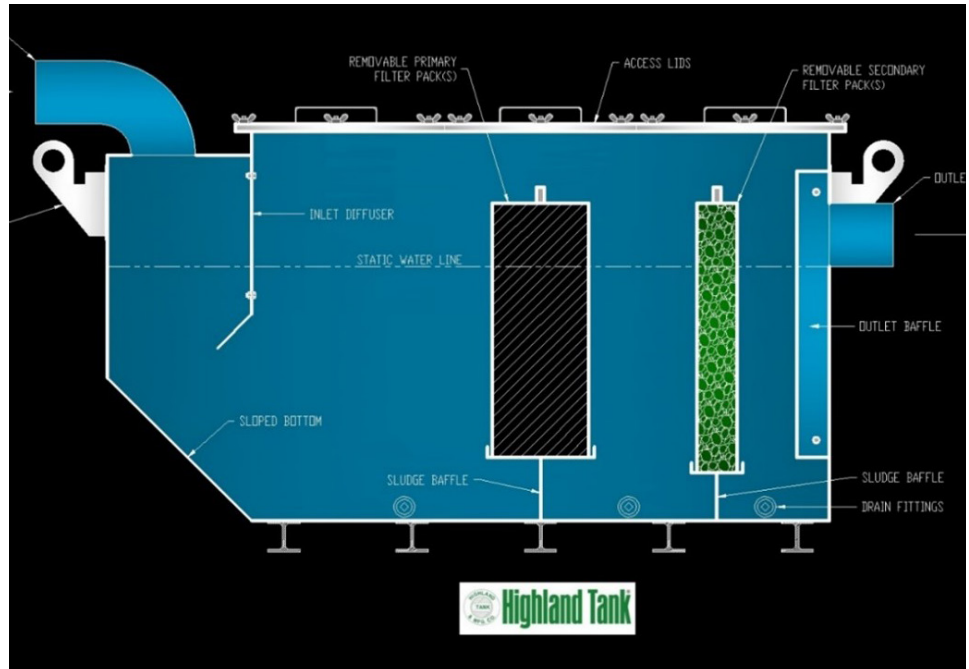


Figure 1 - Highland Tank Solids Control Unit

Benefits of a professionally designed pretreatment system are:

- *100% treatment, with no bypass function, during all types of rainfall events
- *Treatment technology provides downstream protection and reduces maintenance costs
- *Designed to remove a broad range of particles and organics
- *Designed to remove a specific size particle when using both primary and secondary media
- *Minimal elevation between inlet and outlet minimizing head loss to near 0 psi
- *Above/Below grade and/or integral to storm water retention/detention systems (see Figure 1).

HTSWC30 - The Highland Tank Stormwater cisterns are protected steel vertical vessels providing 90,000 gallons of onsite storage to protect against a hydraulic overload of the storm/ sewer infrastructure. These 3-30K SWC vessels play a critical role in maintaining the hydrology of the sewer system while reducing the potential for flooding and worse sanitary sewer overflows (SSO's).

The tanks not only provide stormwater protection but also were designed as an integral part of the building structure. Manifolds tie the 3 tanks together with a 30' VEGA site glass with built in radar continuous level sensor. The level sensor was strategically placed so that visitors could see how much water was available in the storage system.

The internal and external coating systems comply with both AWWA and NSF codes and standards. Before the startup of the tank system the owner commissioned an artist to use the tanks as a canvas to create a living work of art.

The installation features textured depictions of major bodies of water in Michigan – including the Great Lakes and Detroit River – on each of the water cisterns along what will become Southwest Greenway.

One of the most dynamic storm water management tools Highland Tank added to this project scope was a Rainwater Harvesting System.

Harvesting is a holistic 2 prong approach to quantity and quality control. In operation, the storm water is diverted from the sewer system using the SCU and the HTSWC that cleans the storm water onsite. The Rainwater recycling system (also known as rainwater harvesting systems) reduces the demand on the city's water supply, as runoff is captured, stored, and re-purposed to irrigate planted areas, gardens, and green roof.

Highland Tank's HighDRO®-Pure System is designed to collect, store, process and treat rainwater from a storm event for future reuse. It helps reduce storm water runoff and provides an alternative to using municipal water supplies.

The Bagley Hub Stormwater project is a notable example of innovative building design and sustainability. With the "GREEN" movement, the use of SCU technology and rainwater harvesting has become more widespread to reduce the environmental impact of development and population growth, especially in municipalities with finite water resources.

LEED architects, engineers and builders have long recognized Highland's protected steel water tanks for their strength, durability, and functionality.

With the addition of our new HighDRO®-Pure systems, we are continuing our commitment to protect the environment and conserve our precious natural resources to benefit our world today and tomorrow.



Call 814-893-5701 today or visit us at www.highlandtank.com for more information.

Contact: Michael Gauthier
Email: mgauthier@highlandtank.com

