



Project Summary

Dallas Zoo Stormwater Runoff Improvement Project

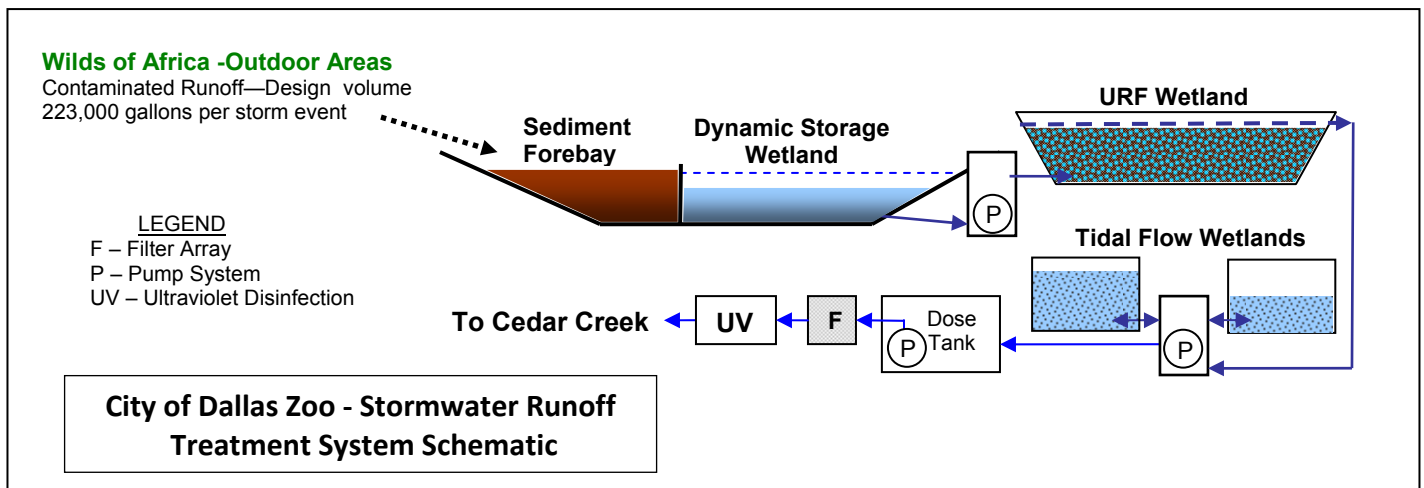
Outdoor animal exhibits at the Dallas Zoo (Dallas, TX) generate contaminated stormwater runoff that flows into Cedar Creek, impairing water quality. Aqua Nova Engineering, PLC in collaboration with EcoSolutions, LLC designed a unique wetland system to treat the contaminated runoff. Projected construction start in Spring 2015.

The first half-inch of rainfall from design storm events contains nearly all of the contamination and is diverted to the new treatment system by the control structures. Effluent from the treatment system will meet Type I

reclaimed water standards and can be used for irrigation or discharged to Cedar Creek over a period of three days.

Area available for the system was limited and had many constraints. Therefore a creative solution was required. As shown in the Treatment System Schematic, runoff enters the Sedimentation Forebay then flows into the Dynamic Storage Wetland (DSW) and is pumped slowly through the remaining treatment components.

Temporary storage of the captured runoff in the DSW allows subsequent components to be much smaller and significantly more energy efficient.



The main components along with area and function are listed below.

- Sedimentation Forebay (1,500 ft²): is full of water and allows heavier particles to settle out.
- Dynamic Storage Wetland (5,000 ft²): fills during storm events for flow equalization and further sediment removal.
- URF Wetland (1,500 ft²): Upflow Rock Filter wetland with coarse rock removes fine sediment, such as silt and some organic contaminants (BOD).
- Fill and Drain Wetlands (a) (2,200 ft²): two wetland cells alternately fill-and-drain removing remaining BOD, ammonia and suspended solids.
- Filtration and disinfection: simple cartridge filters remove turbidity to allow effective UV disinfection to Type I reclaimed standards.

The Dynamic Storage Wetland has terraced sidewalls, varied depths and permanent water pools to provide habitat for beneficial plants and organisms. This also serves as a reservoir for recycling water through the other wetlands during periods of no rain.

The Sediment Forebay and URF Wetland include special aeration and pumping systems to simplify sediment removal. System operation is mostly automated through a programmable logic controller with a touch-screen, graphical user interface. An internet connection provides remote monitoring, control and alarm notifications.

(a) Wetland cells alternately fill and drain with vertical flow through the treatment medium. Water level remains below top of medium. Wetlands are planted with appropriate vegetation.



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