Project Fact Sheet:
Los Angeles Pierce College (LAPC) Northeast Campus Stormwater Capture & Use and Biofiltration Project

Project Description

The LAPC Northeast Stormwater Capture & Use and Biofiltration Project will consist of two underground cisterns or tanks for the capture of stormwater and an underground irrigation system for the distribution and use of the captured stormwater. The underground cisterns or tanks will be placed under a portion of the LAPC soccer field and underneath a grassed area to the east of the LAPC baseball field. These systems will also include hydrodynamic separators as pre-treatment systems, an underground irrigation system to be placed under the LAPC ball fields, pumps for pumping water into the underground irrigation system, and filtrations systems such as sand filters or mechanical filters to remove solids prior to pumping into the underground irrigation system. Additionally, the project proposes to incorporate vegetated biofiltration areas in the campus football stadium parking lot (Parking Lot 5) located primarily in the pavement area in the center of existing parking stall rows, and along the eastern portion of the parking lot perimeter. These vegetated areas will be sized to accept sheet flow runoff from the parking lot asphalt surface.

Multiple Project Benefits

This project will effectively capture runoff from approximately 80% of the LAPC campus impervious area and demonstrates a significant reduction in runoff to the local storm drain network while also providing a non-potable water supply and therefore reducing the potable water demand for irrigation associated with the campus ball fields.

Project Phasing

In 2019, a thorough utility survey was conducted for the entire LAPC campus. The resulting information shows that the Northeast portion of the campus can be effectively subdivided into two drainage areas, Northeast-North (Phase 1) and Northeast-South (Phase 2). LACCD is planning the implementation of the Northeast-North, Phase 1, of the project which drains a slightly larger area of the northeast campus and is associated with underground storage of stormwater under a portion of the LAPC soccer field. The Northeast-South stormwater project, Phase 2, includes the Northeast-South drainage area and incorporates underground storage below the grassy field beyond the outfield fence of the LAPC baseball field. In addition to the stormwater capture and use system, the project also includes a biofiltration element for capture of stormwater from LAPC Parking Lot 5, providing the additional benefits of a nature-based solution. Phase 2 will be implemented if Safe Clean Water Program funds are awarded.

Project Sizing

The stormwater sizing criteria for the LAPC Northeast Stormwater Capture & Use and Biofiltration Project is identified in Small MS4 Permit (SWRCB Order No.2013-001-DWQ), as this is the criteria that LACCD and LAPC will be subject to when LACCD is designated under the Small MS4 Permit. The State Water Board has identified its intention to designate community colleges with adoption of the next Small MS4 Permit. The volumetric criteria based on the 85th percentile 24-hour storm event, identified in Section F.5.g.2.b. of the Small MS4 Permit, was utilized in sizing the systems (results shown in Table 1 below).

Drainage Area	BMP Type	Drainage Area (sf)		Precip	Design Volume	Area (sf)		BMP
		Imp (sf)	Perv (sf)	Depth (in)	(cf)	Min Required	Available	Depth (ft)
Northeast-North (LAPC 3A)	Capture & Use	2,194,481	944,118	1	172,454	43,113	106,800	4.0
Northeast-South (LAPC 3B)	Capture & Use	1,758,418	1,414,255	1	143,667	35,917	206,744	4.0
Stadium Parking	Biofiltration	150,543	16,727	1	11,430	7,620	7,693	1.0

Design Criteria

The structural stormwater measures or BMPs for the Capture & Use components of the project will consist of 1) two underground cisterns or tanks for the capture of stormwater in the soccer pit; 2) three pretreatment hydrodynamic separators (e.g. CDS unit) just upstream of the underground cisterns or tanks, 3) pumps for pumping the captured stormwater, 4) filtration systems to remove solids to prevent clogging in the irrigation system, and 5) an underground irrigation system located in the LAPC athletic fields for the use of the captured stormwater.

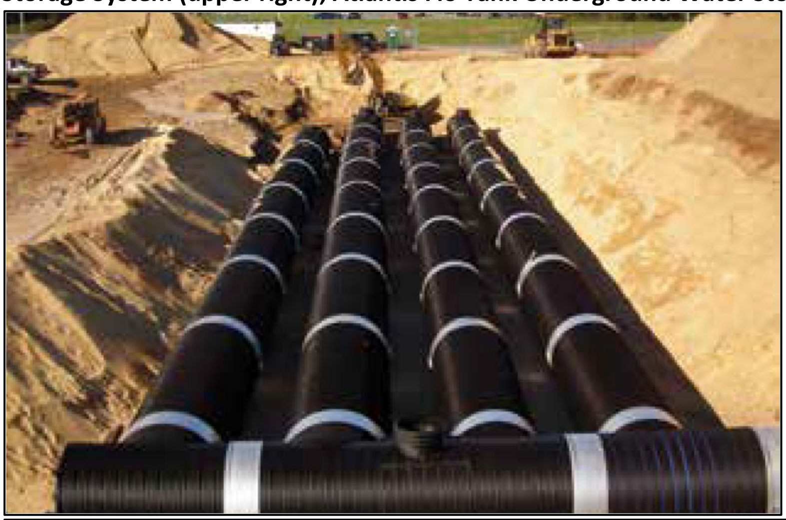
Acceptable underground water storage tanks include the following systems, also identified in Figure 1 below:

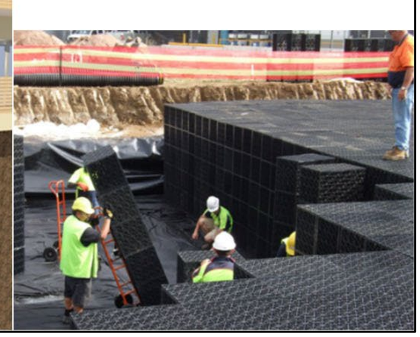
a. The Contech DuroMaxx system is an underground water storage tank system. DuroMaxx steel-reinforced polyethylene (SRPE) pipe combines steel and polyethylene (PE) to make a strong and durable pipe for stormwater detention and infiltration applications. DuroMaxx provides the lightweight, durability of traditional HDPE with the added structural strength of steel, making it the suitable option for deep burial and corrosive soil applications.

b. The StormTrap™ SingleTrap® Concrete Underground Storage System is a concrete underground water storage system. It capitalizes on design flexibilities to meet requirements without disturbing existing utilities or changing project configurations to meet stormwater needs. SingleTrap can be employed with a variety of stormwater applications that best fit the project's water quality and total water storage requirements without compromising its structural integrity.

c. The Atlantis Flo Tank Underground Water Storage Tank is designed to store water in a modular type system. The Atlantis Flo-Tank® is a structural lightweight modular tank system used to construct underground water storage for various applications. The modular nature of the system allows for the easy construction of tanks of any volume and can be designed to accommodate specific site conditions.

Figure 1 – Contech DuroMaxx Underground Water Storage Tank (upper left); StormTrap™ SingleTrap® Concrete Underground Storage System (upper right); Atlantis Flo Tank Underground Water Storage Tank (bottom).





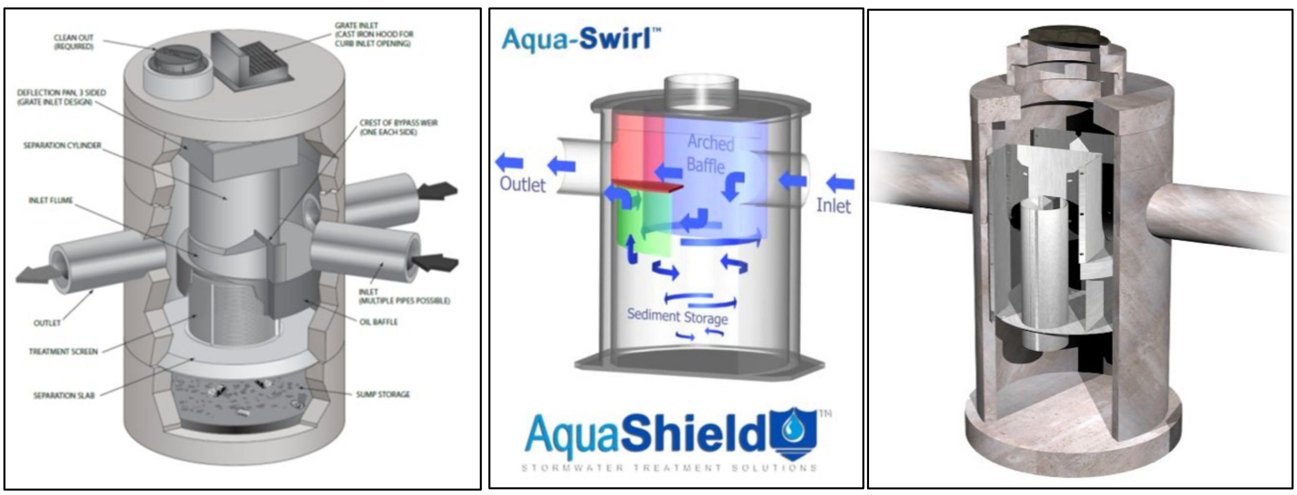
The following are acceptable hydrodynamic separator systems, also identified in Figure 2 below:

a. The Contech Continuous Deflective Separator (CDS) system is deployed for the stormwater quality control of trash, debris, sediment, and hydrocarbon removal and can be used as a pretreatment device. The CDS is a swirl concentrator hybrid technology that uses continuous deflective separation – a combination of swirl concentration and indirect screening to screen, separate and trap debris, sediment, and hydrocarbons from stormwater runoff.

b. The Aqua-Swirl™ Stormwater Treatment System is a custom engineered, post-construction flow-through water quality device designed to remove coarse sediment, debris and free-floating oil by utilizing hydrodynamic separation technology. Aqua-Swirl™ technology is a modular high flow rate treatment system that has no moving parts and operates under gravity flow conditions within a single swirl chamber.

c. The Old Castle Dual Vortex Separator uses an integral "flow through" high-flow bypass, an effective system for the removal and retention of sediment, debris and pollutants from stormwater runoff. Captured debris and floatables are retained even during high flows. At peak flows, excess flows breach the control weir and exit the system without impacting treatment or re-entraining captured pollutants.

Figure 2 – Examples of hydrodynamic separators: Contech CDS hydrodynamic separator unit (left); Aqua-Swirl hydrodynamic separator (middle); Old Castle Dual Vortex hydrodynamic separator (right).



Additionally, the Capture & Use project will require underground irrigation and filtration systems. For underground irrigation, acceptable technologies include the Hunter Industries Eco-Mat which is designed to suit a variety of hard-to-irrigate areas. The Eco-Mat uses a specifically engineered combination of inline emitter tubing and fleece, which evenly disperses water from under the surface. Another acceptable system, the Netafim Subsurface Drip System is one of the only products proven to work in turf with their Techline® CV and Techline® DL Dripline.

The purposes of the filtration systems for the Northeast Stormwater Capture & Use Project is to ensure that the underground irrigation system does not get clogged with solids from stormwater as well as meet any regulatory requirements. During project design, coordination with the manufacturer of the selected underground irrigation system will ensure proper identification of the required filtration for the respective system. For subsurface irrigation, which is proposed for the Northeast Stormwater Capture & Use Project, California Maximum Contamination Levels and the California Toxics Rule Standards are identified as required standards by the Los Angeles County Department of Public Health (LACDPH). Coordination must also occur with the LACDPH to identify if these standards apply to this project and then integrate a filtration system that meets these standards or standards identified by LACDPH for use prior to discharge into the subsurface irrigation system. Sand filter vaults are a commonly used filtration system for such applications. A sand filter is a device that uses sand or gravel to filter out, or strain, particles and particle-bound constituents found in stormwater. The primary treatment process is filtration. Common constituents that are removed include total suspended solids (TSS), total phosphorus, total and dissolved metals, microbiological constituents, and litter.

Additionally, the project will, incorporate biofiltration planters in LAPC Parking Lot 5. Bioretention/biofiltration systems are depressed areas that accept stormwater discharges and include an aggregate layer with an underdrain, an engineered bioretention soil media, a mulch layer, bioretention plants, and an overflow drain for larger storm events. Bioretention/biofiltration areas can accept sheet flows or concentrated flows and are volume-based systems. The cross section in Figure 3 identifies a typical parking lot bioretention planter box developed by CASQA/LIDI that will be used for the design. More information about the CASQA/LIDI bioretention designs are available at californialid.org.

Figure 3 – Bioretention with Underdrain – CASQA/LIDI

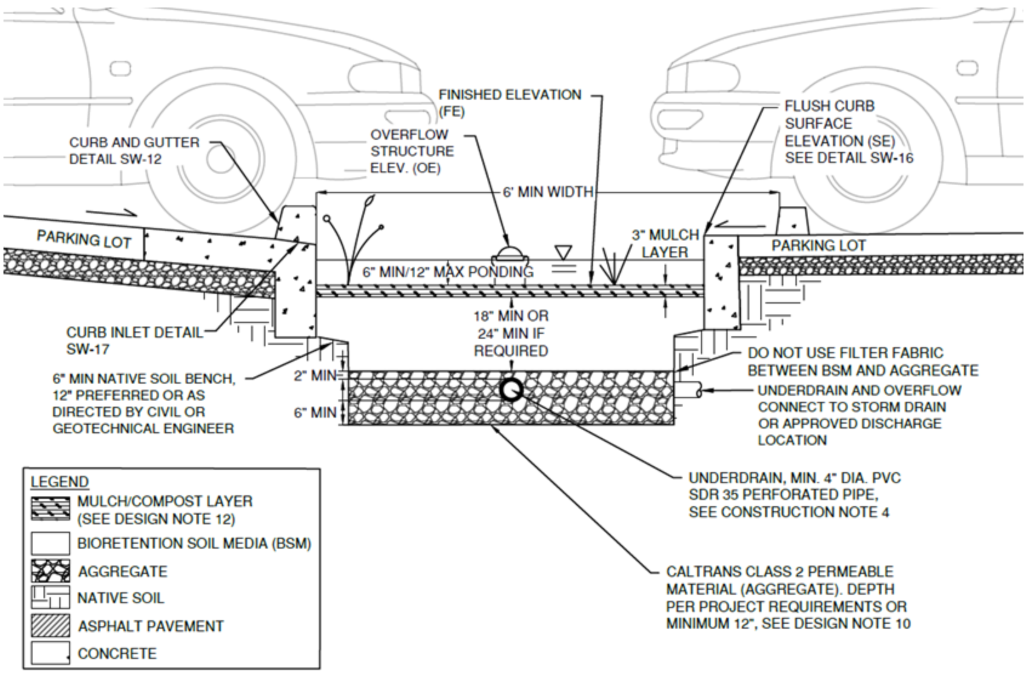


Figure 4 – LAPC Lot 5 Biofiltration Planter Rendering.