

Underground Detention Systems

Description

Detention tanks and vaults are underground structures used to attenuate peak storm water flows through detention or extended detention of storm water runoff. They are constructed out of concrete pipe (RCP), corrugated metal pipe (CMP), High Density Polyethylene Pipe (HDPE) or concrete vaults. The design and material selections considers the potential loading from vehicles on the vault or pipe.

When and Where to Use It

Due to the costs associated with underground detention systems for construction and maintenance, these systems are used when space is limited and there are no other practical alternatives.

In the ultra-urban environment, costs for developable land may be high enough that these systems become a feasible alternative.

Relatively expensive to construct, use concrete vaults in areas where system replacement costs are high.

Less expensive, use CMP or HDPE systems to control significant volumes of runoff in parking lots, adjacent to rights-of-way, and in medians, where they is replaced or maintained if necessary.

Design Criteria

Locate underground detention systems downstream of other structural storm water controls providing treatment of the water quality volume.

The maximum contributing drainage area to be served by a single underground detention vault or tank is 25-acres.

Size underground detention systems to mitigate flows from the 2- and 10 –year design storm event and up. Design the systems to meet detention and water quality requirements set forth in local and state regulations.

Use routing calculations to demonstrate that the storage volume is adequate.

Inspection and Maintenance

- Design the system for easy access for inspection and maintenance.
- Remove any trash/debris and sediment buildup in the underground vaults or tanks annually by pumping them out.
- Perform structural repairs to inlet and outlets as needed based on inspections.

Average Pollutant Removal Capability

<u>Total Suspended Solids:</u>	50%-85%	<u>Metals:</u>	NA
<u>Copper:</u>	35%-70%	<u>Lead:</u>	50%-90%
<u>Zinc:</u>	35%-90%	<u>Total Phosphorus:</u>	55%-70%
<u>Total Nitrogen:</u>	35%-55%	<u>Pathogens/Bacteria:</u>	10%-60%



CMP Underground Detention



HDPE Underground Detention