

Low Impact Development Practice: *Cisterns*

Regional Example



Installation of the two underground cisterns for stormwater storage



City staff reusing stormwater to wash City vehicles

Location

St. Albans City Garage, St. Albans, Vermont

Applicable Land Use

Commercial, Residential, Civic, Public

Problem

The City was utilizing its potable water supply for washing vehicles, instead of gray water and the resulting washwater was draining into the nearby storm drain that leads to Stevens Brook. In addition, stormwater runoff from buildings was channeled away from the site and into a storm drain leading to Lake Champlain.

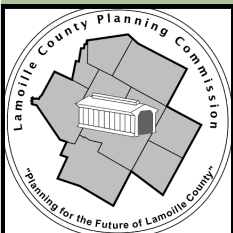
Description

The Northwest Regional Planning Commission, in collaboration with the City of St. Albans and UVM Extension, installed two cisterns at the St. Albans City public works garage. Ranging in size from 500 to 7,000 gallons, a cistern is a container used to capture stormwater for re-use and/or allow for a slow release to recharge groundwater. Cisterns differ from other capture practices, such as rain barrels, in that they capture higher volumes of water, are generally buried under ground due to their size, and are equipped with electric pumps so water can be used.

Gutters were installed on the roof of the public works garage to channel stormwater. Collected gutter water is stored in underground 430-gallon cisterns. The City uses the cistern water to wash Public Work's vehicles. When rain exceeds the capacity of the cisterns, it flows into two nearby 250 sq ft bioretention areas. Water from the washed vehicles drains into the sewer system, which is pre-treated by the local wastewater plant to remove the sediment, winter salt, oil and phosphorus from the soap as well as to reduce the volume of water draining to the stream.

Benefits

The use of cisterns reduces the demand on the public water system and the associated costs for those services. Additionally, the capture of rooftop rain water reduces the volume of runoff entering nearby streams during storm events, and therefore reduces the potential for downstream flooding and erosion, as well as sharp thermal spikes that can be harmful to aquatic habitats.

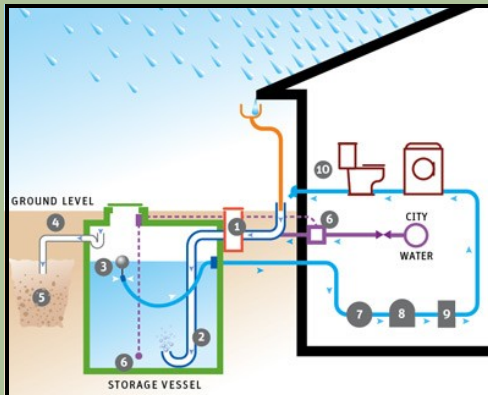


Lamoille County Planning Commission
PO Box 1637 · Morrisville, VT 05661
www.lpcvt.org · (802) 888-4548



Low Impact Development Practice: *Cisterns*

Additional Examples



Cistern diagram

Source: www.watershedactivities.com/projects/spring/rainbarl.html



Aboveground cistern

Source: <http://www.rwh.in/>

Maintenance

Low if used as a supplemental source for gray water or irrigation. Maintenance should include checking that the overflow is draining in a non-erosive manner and annual inspections of the cistern(s) and gutters to ensure system is not leaking, is free of obstructions.

Project Specifics

Timeline: Installed April 2008 (installation of cistern system took 2 days)

Total Project Value: Cistern system \$3,150

Funding: This project was funded through federal grants (EPA's Section 319 Nonpoint Source Program through VT DEC and an EPA grant to the Northwest Regional Planning Commission).

Water Quality Best Management Practices

<i>Structural:</i>	<i>Used:</i>	<i>Non-Structural:</i>	<i>Used:</i>
Bioretention or Rain Garden	X	Conservation Design	
Infiltration Basin		Cluster Development	
Infiltration Trench or Gallery		Open Space Preservation	
Dry Well		Preserve Natural Areas	
Constructed Wetland		Shared Driveway	
Vegetated Swales		Minimize Pavement Widths	
Tree Boxes/Planters		Minimize Setbacks & Frontage	
Rain Barrels/Cisterns	X	Disconnect Impervious Surfaces	
Porous Pavement		Soil Restoration	
Green Roof		Riparian Buffer/Filter Strip	

Resources

- Vermont DEC Small Sites Guide for Stormwater Management - http://www.anr.state.vt.us/dec/waterq/stormwater/htm/sw_LID.htm
- Vermont DEC for questions regarding the proper way to manage vehicle washwater – <http://www.anr.state.vt.us/dec/ww/wwmd.cfm>

This resource is part of an effort to increase awareness of Low Impact Development. It was funded by the Vermont Department of Environmental Conservation using funds from the American Recovery and Reinvestment Act of 2009, the Vermont Agency of Commerce and Community Development, and the member municipalities of the Lamoille County Planning Commission.