Westmoreland Conservation District

Stormwater Program

St. James Evangelical Lutheran Church Parking Lot Rain Gardens

Design features: Rain gardens

Date of installation: Fall 2015

Location: St. James Evangelical Lutheran Church, Ligonier, Westmoreland County, PA

Client: St. James Evangelical Lutheran Church

Installation cost: $72,000 from St. James Evangelical Lutheran Church and Richard King Mellon Foundation

Partners: Westmoreland Conservation District, St. James Evangelical Lutheran Church, Ligonier Construction Company

Project contact: Kathryn Hamilton PLA, kathyh@wcdpa.com

Two rain gardens at the low end of the parking lot capture much of the surface runoff through curb cuts before it runs out to the nearby street. Small ornamental trees accent the meadow cover to provide shade.

Project Description

This project is a renovation of an existing asphalt parking lot, which had no stormwater management on-site and allowed runoff to drain directly to the street inlets and to nearby Mill Creek. Renovations included removing pavement from two parking spaces and from around the existing storage building and installing three rain gardens to capture and control the roof runoff from the storage building and a portion of the surface runoff from the parking lot.

The rain garden locations were excavated to a three to four foot depth and backfilled with layers of straw (for separation), clean angular stone, more straw, engineered soil mix of topsoil, sand, and compost, and then stabilized with vegetation.

The surface of the gardens are concave to provide ponding volume for stormwater runoff. Soil and stone drainage layers provide storage and water quality benefits for the volume.

The vegetation chosen was a meadow mix that could be mowed and small ornamental native trees to provide shade.

Benefits/Performance Measures

Impervious area managed: 18,000 square feet or about 0.40 of an acre comprised of an asphalt parking lot and a storage building.

Stormwater reduction performance analysis: Runoff from a two inch storm event on the parking area (which accommodates up to 38 cars) is managed by more than 1,200 sf of rain garden infiltration beds, which can capture and store more than 1,000 cubic feet of runoff.

Community and economic benefits that have resulted from the project: The surface of the rain gardens provides catchment for stormwater runoff and pollutants, provides cooling for heated runoff, and provides volume reduction and water quality improvements to the stormwater runoff that reaches Mill Creek in the Loyalhanna Creek Watershed.

Related information: The project costs listed above include demolition, installation of concrete curbing, an underdrain system, rain garden soil mix, vegetation, and a surface course of asphalt over the entire lot.

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Recommended Maintenance

Maintenance of any kind of stormwater infiltration system is necessary in order to keep the system working properly. The surface storage volume and the overflow and underdrain system should be maintained as designed to ensure continued function of the system. Curb cuts and outlet risers should be kept clear of debris, and vegetation should be maintained and replaced as necessary to keep a dense stand of healthy vegetation.

Westmoreland Conservation District website - Publications
Stormwater BMP Maintenance Guides
http://wcdpa.com/wp-content/uploads/Stormwater-Maintenance-Guides.pdf

Additional Information

Straw is used to separate soil layers from stone layers from the engineered (top-soil-sand-compost) soil mix layers. A pipe riser with a basket grate connected to an underdrain provides a safe overflow outlet for larger storms.

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Additional Information

Freshly seeded and mulched, the rain gardens include rock aprons at the curb cuts to slow and spread out the runoff into the rain garden.

A rain garden, connected by pipe beneath the access path to the storage building, controls a portion of the parking lot as well as the storage building roof runoff. A dense meadow mix covers the surface of the garden.