

OPERATION AND MAINTENANCE PLAN

Permanent Stormwater Treatment Controls for the YMCA of Martha's Vineyard Oak Bluffs, MA

October 2007

Stormwater treatment controls for this project consist of bioretention areas, bioretention swales, "Downstream Defender" stormwater treatment units, and a pair of underground infiltration/detention galleries. All catch basins have extra-deep sumps (4 ft). Reference is made to the proposed grading and drainage plans for the stormwater system configuration.

Operation and maintenance procedures for each of these control elements are outlined below:

Catch Basins

Sumps are designed to trap leaves, sticks, debris, stones, and coarse sediment. The accumulated mass must be periodically removed, and disposed of in a landfill as a solid waste.

Catch basins should be inspected bi-monthly to note accumulation, and before depth reaches 2 ½ ft, the mass should be vacuumed out with a special vacuum truck designed for the purpose.

The Town of Oak Bluffs, and other Vineyard communities, contracts with various vacuum truck vendors on the mainland to visit the island periodically to maintain catch basins on municipal streets and roads. The YMCA will do likewise, and coordinate visits with Oak Bluffs Highway Dept.

Bioretention Areas and Swales

Annually, remove accumulated material in the sediment forebays with rakes and shovels.

Basins, swales, sediment forebays, berms, and adjacent areas should be periodically weeded during the growing season to remove unwanted plant materials.

Berms and adjacent areas should be mowed regularly to a reasonable height.

Mulch will decompose slowly and blend with the soil medium over time. Replace mulch once a year to maintain a depth of 2 ½-in to 3-in. If necessary, remove old mulch before annual replenishment to keep depth within this range. Deep layers of mulch will reduce oxygen and carbon dioxide cycling.

Leave grasses and perennial seed heads standing through the winter. Plants should not be cut back until spring when new growth starts. Plants should be pruned and dead-headed during the growing season to promote new growth and more flowering. Diseased and damaged plant parts should be promptly pruned. Remove pest-infested plants promptly, especially prior to winter to deny pests a winter refuge.

Periodically remove trash and debris, both for appearance and to prevent blockage of flow and infiltration. Pet waste should not be left to decay because of the danger of disease-causing organisms.

“Downstream Defender” Stormwater Treatment Units

Downstream Defender is a proprietary product of Hydro International of Portland, ME. These cylindrical precast concrete units trap floating oil and grease via a baffle arrangement, and settle non-floating solids via a vortex flow pattern. They are available in four diameters: 4-ft, 6-ft, 8-ft, and 10-ft. Both units at the YMCA are 6-ft diameter.

There are two access ports located at the top of the units appearing as manhole covers on grade. The floatables access port is above the outer annular space between the dip plate and the manhole wall, where floatables are retained. The sediment removal access port is located directly over the hollow center shaft which leads to the sediment storage area below the vortex chamber. Both floatables and sediment should be removed via vacuum truck, floatables first.

The frequency of the vacuum procedure is best determined in the field after installation. During the first year, the units should be inspected bi-monthly to determine the rate of accumulation of sediment and floatables. A probe can be used to determine the level of solids in the bottom sediment storage area. This information can then be used to determine a maintenance schedule. The contents should be removed when sediment depth has reached 20 inches, or floatables depth 18 inches, whichever occurs first.

Although water is removed along with the pollutants during the cleaning process, the units are typically not completely dewatered. A 6-ft Downstream Defender will have about 1200 gallons of water removed in the process. Disposal should be a landfill or other appropriate disposal site which meets federal and state standards.

One of the purposes of these units is to keep sediment from fouling the underground infiltration/detention galleries to assure unobstructed infiltration of treated stormwater into the ground. If maintenance of the Downstream Defenders is lax, it could result in poor operation of the galleries, or even failure.

Underground Infiltration/Detention Galleries

Each gallery consists of multiple rows of 36-in diameter perforated polyethylene pipe, placed in a bed of crushed stone wrapped in geotextile fabric. In each rain event, stormwater which has passed through bioretention areas and a stormwater treatment unit enters the galleries. In heavy rain events the inflow will exceed the rate of infiltration, and the level will rise before ultimately

draining into the ground. The volume of the galleries is sufficient to hold the 50-year storm event. An overflow basin at each gallery will operate in greater events to protect the storm drains from back-flooding.

There are 24-in access risers with manhole covers at the four corners of each gallery, with 6-in ports at each end of each interior row. Every six months, the access risers and ports should be probed to see if there is accumulation occurring. If so, more frequent cleaning of the stormwater treatment units is called for.

Small amounts of sediment can be flushed towards the risers with power wash wands and removed via vacuum truck thru the risers.