MAHOPAC CENTRAL SCHOOL DISTRICT MAHOPAC, NY

MS4PY6 SWMP: TRAINING WORKSHOP FOR O & M STAFF

DECEMBER 2015

PART 1: STORMWATER POLLUTION PREVENTION

PART 2: TRAINING PROGRAM QUIZ

FOR MORE INFORMATION CONTACT
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WORKSHOP PART ONE: STORMWATER POLLUTION PREVENTION

1. CONVENTIONAL STORMWATER MANAGEMENT PRACTICES

In the past, conventional wisdom for stormwater management was that stormwater was a problem to solve rather than a valuable resource to conserve. Conventional stormwatwer engineering methods involved the:

Onsite Collection of Stormwater: stormwater was collected through a series of catch basins and inlets at the site.

Piped Offsite Discharge: the collected stormwater was discharged offsite**,** away from developed areas through a network of underground storm sewer pipes.

2. IMPACTS OF INCREASING DEVELOPMENT

Increasing development, resulting in increasing impervious surfaces, accelerates the rate and volume of stormwater runoff. As trees are replaced by impervious surfaces, the natural stormwater management and treatment functions are lost, resulting in increased runoff, flooding, erosion and pollution. Impervious surfaces reduce natural absorption, soil filtration and infiltration and groundwater recharge. Site grading and drainage devices, such as storm sewers and concrete-lined channels, eliminate natural depressions and convey stormwater at a much faster rate. The impacts of increasing development result in:

Basement and Street flooding: impervious surfaces increase the frequency and severity of basement and street flooding.

Increased Pollution: Pollutants carried by the runoff from construction activities may contain sediment, heavy metals and petroleum-based hydrocarbons. Excessive application of fertilizers to our lawns and gardens often cause unwanted algae growth and depletion of oxygen in rivers and lakes. The excessive application of salt often adds significant amounts of chlorides to our water supplies. Sewage overflows from poorly maintained septic fields can cause the contamination of surface and groundwater resources, resulting in beach closings and elevated pathogen levels in our precious drinking water supplies.

3. THE INNOVATIVE ALTERNATIVES TO STORMWATER MANAGEMENT

The following innovative stormwater management practices, mimic nature and are effective in reducing the runoff quantity as well as improving the quality of the discharged water:

1. Green Roofs: are layers of living vegetation installed on top of buildings and garages. They help manage stormwater by filtering rainwater through the soil and the root uptake zone. The water that leaves the roof is reduced in quantity and the filtration though the root zone removes pollutants present in the rainwater. Green roofs insulate the building, reducing cooling and heating costs. In addition, green roofs extend the life of roofs approximately two to three times its normal life.

2. Downspouts, Rain Barrels and Cisterns: traditionally downspouts collect rainwater and discharge the rainwater directly into storm sewer systems. Alternative stormwater management encourages the careful disconnection of the downspouts so that the roof runoff can flow directly into vegetated areas. The rainwater can be allowed to flow across the lawn or is routed via a surface swale into a rain garden or onsite detention or retention facility. The runoff can also be temporarily stored in a rain barrel or a cistern, and utilized as needed to irrigate lawns and landscaped areas in between storm events.

3. Permeable Paving: permeable paving may include porous concrete, stone or perforated plastic or other materials which promote the absorption of rain and snowmelt. Permeable paving is suitable for parking lots, driveways, access lanes, emergency and fire lanes. Some can support grass or other suitable vegetation, providing a green appearance. For permeable paving to be effective, it must be installed over sandy or permeable soils. The alternative, if permeable soils are not present, is to install a

porous underdrain system that can re-direct the collected stormwater to a nearby waterway.

4. Bioretention Systems: are shallow landscaped depressions utilized to promote absorption and infiltration of stormwater runoff. Runoff from parking lots and other paved areas is re-directed to the bioretention system, ponds on the surface and gradually infiltrates into the soil bed. Stormwater pollutants are removed by adsorption, filtration and bacterial decomposition. Treated water is infiltrated into the surrounding soil or is collected by an underdrain system and discharged directly to a stormwater system or nearby receiving waters.

5. Filter Strips: are densely vegetated areas that accept sheet flow runoff from adjacent paved and impervious surfaces. They slow down runoff, filter sediment and other pollutants and enhance infiltration of surface runoff. Filtered water is discharged into surrounding soils, swales, stormwater systems or nearby surface waters.

6. Rain Gardens: are similar to the larger-scale bioretention system. Typical locations of rain gardens are residential yards and community common areas. Rain gardens, which consist of shallow depressions, receive water from nearby roofed areas and parking lots. Rain gardens, typically planted with native wetland and prairie vegetation, improve water quality by filtering pollutants in the plant bed, through plant absorption and soil bacterial decomposition. Treated water is infiltrated into the surrounding soil or is collected by an underdrain system and discharged directly to a stormwater system or nearby receiving waters.

7. Vegetated Bioswales: are filter strips along a ditch or drainage channel planted with native vegetation. Swales have gently sloping sides and convey stormwater down a gently sloping gradient. Swales can be augmented with check dams and other techniques to slow down the velocity of the discharged runoff. Vegetated swales handle concentrated flows during severe storm events and are used to direct water to a destination such as wetlands, stormwater systems or nearby surface waters.

8. Wetlands and Naturalized Detention Areas: Conventional detention /retention basins store stormwater onsite and release the runoff gradually to a downstream drainage or water body. Naturalized detention areas mimic a natural lake or wetland by utilizing native plants along the perimeter of the water body. The wetland flat slopes at the perimeter of the water body and utilize a combination of vegetated and open water areas in the in the wetland basin. The design usually incorporates shallow zones of emergent vegetation at the edge of the wetland basin.

WORKSHOP PART TWO: TRAINING PROGRAM QUIZ

1. The **Conventional Stormwater Management Practices** have focused end-of-pipe systems Select your choice below.
    - True
    - False
2. **Conventional Stormwater Management Practices** discharge collected runoff to a nearby ditch or an offsite municipal conveyance system. Select your choice below.
    - True
    - False

3. The Effects of Increasing Development include: 1) Basement and Street Flooding 2) Increased Stormwater Pollution Select your choice below.

- True
- False

4. Innovative Alternatives to Stormwater Management include: 1) Green Roofs 2) Downspouts, Rain Barrels and Cisterns 3) Permeable Paving 4) Bioretention Systems 5) Filter Strips 6) Rain Gardens 7) Vegetated Bioswales 8) Wetlands and Naturalized Detention Areas and 9) Natural Landscaping. Select your choice below.

- True
- False