

# OPERATIONS AND MAINTENANCE MANUAL

FOR

**35 Commerce Avenue**

**Building Addition**

**Albany, New York**

**December 2020**

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## **1.0 Introduction**

The following manual describes the inspection, maintenance, and operational tasks that are required for each stormwater management practice (SMP) at 35 Commerce Avenue, Albany, New York, herein referred to as “the project site”. The procedures described in this manual are designed to maintain each of the post-construction SMP’s operational functionality. Proper inspection and maintenance are required to ensure facilities continue to operate at their design capacities and efficiencies.

## **2.0 Maintenance Responsibility**

The stormwater management system for the project site consists of the following SMPs:

- Stormwater Planters
- Catch Basins
- Closed Drainage Systems

The above listed practices require routine inspection and maintenance. It will be the responsibility of the current property owner to provide maintenance of all SMPs.

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## **3.0 Background**

The proposed development at the project site utilizes several permanent stormwater facilities. Approved design drawings detail elements of each system. These drawings should be kept on-site in a maintenance office or at the offices of the current property owner. In addition, a Stormwater Pollution Prevention Plan (SWPPP) has been completed for the development and should be stored in a similar location. These separately bound documents are referenced by this manual. The stormwater analysis was essential in the determination of the various stormwater system components and their design. The details of each SMP are included in the approved design drawings and the stormwater system analysis is presented in the SWPPP.

## **4.0 Description of the Water Quality Treatment and SMPs**

The location and details of the green infrastructure practices, detention structures, and closed drainage system are presented in the project documents. These include the engineering drawings and the SWPPP. However, these documents do not present the operational and maintenance requirements of the stormwater treatment facilities. The objective of these facilities is to achieve the water quantity and water

quality requirements in accordance with the NYSDEC Phase II SPDES. In summary, the facility functions to:

1. Detain and control the release of stormwater runoff in order that the volume of post development runoff is equal to or less than that occurring during pre-development conditions;
2. Detain runoff from the 90% rainfall event in order for water borne sediments and other pollutants to have the opportunity to settle, and filter prior to surface discharge to receiving waters.

There are two distinct discharge points to which stormwater runoff is directed, a City of Albany owned closed drainage system along Commerce Avenue and a private closed drainage system in the northern parking area.

The roof of the building addition (2020) is directed to two (2) downspouts. These downspouts are located on the eastern side of the building at the corners. Each downspout drains to a Stormwater Planter. These Stormwater Planters are Stormwater Management Practices (SMPs) which must be maintained to ensure proper operation and treatment of stormwater flows. Each planter is equipped with an underdrain that ties the planter into one of the aforementioned discharge points. Refer to as-built plans in Appendix B for exact locations.

It is important that periodic inspection of these components, along with required maintenance, be performed in a timely manner to assure the intended and proper function.

## **5.0 Maintenance Requirements**

The requirements for the proper operation and maintenance of the SMPs are:

1. Trash and debris shall be removed from the stormwater planters, catch basins, outlet control structures, culvert pipes, and grassed swales (ditches) as necessary.
2. Sediment shall be removed from catch basin sumps when it accumulates to a depth of more than six inches. All masonry adjustments at structure frames shall be inspected and repaired as required.
3. Sediment shall be removed from all grassed swales when it is visibly being collected at the surface. Topsoil and re-seed where required.
4. Trash and debris shall be removed from the outlet control structure debris screens as required.

5. Sediment shall be removed from the closed drainage system as required. Storm pipe end sections shall be inspected for erosion around the end section, proper connection to the pipe and proper slope.
6. Pipe inlets and outlets shall be inspected for erosion and accumulation of sediment. Remove sediment and replace stone fill as required.
7. Remove any wild saplings growing within twenty-five feet (25') of all stormwater detention facilities (including stormwater planters).
8. Bare spots in lawn areas and grassed swales shall be seeded and mulched.
9. When the exfiltration capacity of the stormwater planters diminishes substantially, such as when the water ponds on the surface for more than forty-eight (48) hours, the top few inches of discolored material shall be removed and shall be replaced with fresh material. The removed sediments shall be disposed of in an acceptable manner such as a landfill.
10. Each spring, clean the catch basins, pipes, and landscaped areas of fallen leaves, trash and dead plants. Replace plants and mulch as needed.
11. Each spring clean debris from the stormwater planters. Remove trash and re-plant as needed.

### **5.1 Mowing**

The stormwater planters do not require mowing. The plant species within these areas must be specifically selected for that environment. If it is deemed maintenance is required consult with a Registered Landscape Architect. The dry detention basin requires mowing periodically, at least every two months or if the grass gets to be five inches (5") in height. Grass clippings should be disposed of properly.

### **5.2 Debris and Litter Control**

Removal of debris and litter should be performed as required. Particular attention should be given to removal of debris and trash in detention facilities and around all grates and outlet control structures to prevent clogging.

### **5.3 Structural Repairs and Replacement**

The outlet control structure, inlet/outlet devices, and frames and grates will deteriorate with time and may require repair or replacement. Typical concrete structures and galvanized metal should have a life cycle of 25-30 years or longer. All structural features shall be inspected one year after installation, and once every two years thereafter, by a Professional Engineer licensed to practice in the State of New York.

#### **5.4 Erosion Control**

Sources of soil erosion within the drainage areas tributary to the basins will require stabilization with the use of vegetative practices or other accepted erosion control practices. Immediate attention will have to be given to correcting problems such as soil settlement or erosion that may occur on the basin embankment, basin side slopes and emergency spillway. Also, attention shall be given to repositioning protective stone fill outlet devices that become dislodged or shifted due to stormwater runoff flows.

Appendix A of this manual contains a sample "General Maintenance Card" provided by the Albany County Stormwater Coalition and a sample "Maintenance Inspection Checklist" which assists to identify elements to be inspected and the recording of observed conditions.

Reference: Text used in understanding the goals and practices for responsible erosion control include the New York State Department of Environmental Conservation publication entitled "Reducing the Impacts of Stormwater Runoff from New Development".

Appendix A  
**Maintenance Cards and Inspection Checklist**

## Stormwater Planter Operation and Maintenance Plan

**Stormwater Planters** are infiltration and filtration stormwater facilities that can provide flood control, flow control and stormwater quality benefits. Stormwater Planters are walled vegetated surface reservoirs used to collect and treat stormwater runoff from impervious surfaces by allowing pollutants to settle and filter out as the water percolates through the vegetation and soil mediums before infiltrating into the ground below or being piped to its downstream destination.

Stormwater Planters can be used to help fulfill a site's required landscaping area requirement and should be integrated into the overall site design. Numerous design variations of shape and planting scheme can be used to fit the character.

All facility components and vegetation shall be inspected for proper operations and structural stability. These inspections shall occur, at a minimum, quarterly for the first 2 years from the date of installation, 2 times per year thereafter, and within 48 hours after each major storm event.

**Training and/or Written Guidance** information for operating and maintaining Stormwater Planters shall be provided to all property owners and tenants. A copy of the O & M Plan shall be provided to all property owners and tenants.

**Inspection Logs** shall be kept by the facility owner demonstrating the following items have been inspected and are being maintained properly:

- **Access** to Stormwater Planters shall be safe and efficient. Obstacles preventing maintenance personnel and/or equipment access to the components of the facility shall be removed.
- **Debris and Litter** shall be removed to prevent channelization, clogging, and interference with plant growth. Fallen leaves and debris from deciduous plant foliage shall be raked and removed.
- **Erosion Damage** shall be identified and controlled when native soil is exposed or erosion channels are forming.
- **Filter Media** consisting of sand and/or topsoil shall be tested to ensure stormwater percolates through the planter. Remove and replace sand and/or topsoil to correct percolation deficiencies.
- **Infiltrating Stormwater Planters** shall be excavated and cleaned, and gravel or soil shall be replaced to correct low infiltration rates. Water should drain through the planter within 3-4 hours after a storm event.
- **Inlets** shall be cleared when conveyance capacity is plugged to ensure unrestricted stormwater flow to the rain garden.
- **Mulch** shall be replenished as needed to ensure healthy plant growth.
- **Nuisance and Prohibited Vegetation** from the NYS Department of Environmental Conservation invasive species list shall be removed when

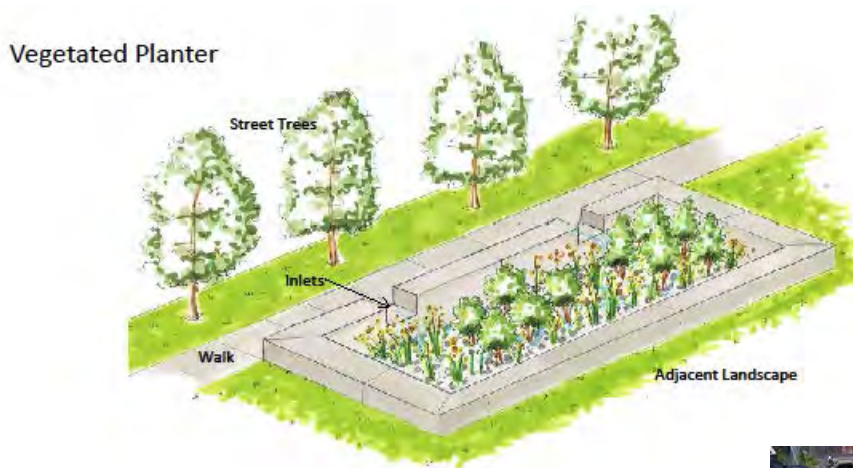


discovered. Invasive vegetation contributing up to 25% of vegetation of all species shall be removed and replaced.

- **Outlets** shall be cleared when 50% of the conveyance capacity is plugged.
- **Piping** shall be cleared of sediment and debris to maintain conveyance capacity.
- **Planter Walls** shall be examined for deficiencies, such as rot, cracks, and failure, and repaired as needed. Holes that are not consistent with the design and allow water to flow directly through the planter to the ground shall be plugged.
- **Sedimentation** build-up near or exceeding 2" in depth shall be hand-removed with minimum damage to vegetation using proper erosion control measures. Sediment shall be removed if it is more than 4 inches thick or so thick as to damage or kill vegetation.
- **Vegetation** shall be healthy and dense enough to provide filtering while protecting underlying soils from erosion. Dead vegetation shall be removed to maintain less than 10% of area coverage or when vegetative filter function is impaired. Vegetation shall be replaced immediately to control erosion where soils are exposed and within 3 months to maintain cover density.

**Spill Prevention Measures** shall be exercised on site when handling substances that contaminate stormwater. Releases of pollutants shall be corrected as soon as identified.

**Non-Chemical Pest Control** measures shall be taken to prevent development of insects, mosquitoes, and rodents.



# Stormwater Maintenance Inspection Checklist

## Stormwater Planters

**Project:** \_\_\_\_\_

**Location:** \_\_\_\_\_

**Site Status:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Time:** \_\_\_\_\_

**Inspector:** \_\_\_\_\_

<u>Maintenance Item</u>	<u>Satisfactory/ Unsatisfactory</u>	<u>Comments</u>
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Stormwater Planters # \_\_\_\_\_

1) Containment (Biannual, After Major Storms):

- i) Cracking, bulging, or sliding of walls \_\_\_\_\_
- ii) Seeps/leaks on downstream face \_\_\_\_\_
- iii) Slope protection or riprap failure \_\_\_\_\_
- iv) Spillway clear of obstructions and debris \_\_\_\_\_
- v) Other (specify) \_\_\_\_\_

2) Planter (Monthly, After Major Storms):

- i) Accumulated debris \_\_\_\_\_
- ii) Erosion, rills, etc. \_\_\_\_\_
- iii) Condition of plantings \_\_\_\_\_

3) Outlet Control Structure (Biannual):

- i) Inlet protection device \_\_\_\_\_
- ii) Excessive sediment accumulation \_\_\_\_\_
- iii) Concrete/masonry condition of structure
  - (a) Cracks or displacement \_\_\_\_\_
  - (b) Minor spalling (<1") \_\_\_\_\_
  - (c) Major spalling (rebars exposed) \_\_\_\_\_
  - (d) Joint failures \_\_\_\_\_
  - (e) Water tightness \_\_\_\_\_
- iv) Outlet pipe condition \_\_\_\_\_
- v) Underdrain functioning \_\_\_\_\_

<b>Maintenance Item</b>	<b>Satisfactory/ Unsatisfactory</b>	<b>Comments</b>
4) Other (As Required):		
i) Complaints from residents	_____	
ii) Aesthetics	_____	
iii) Lawn restoration required	_____	
iv) Odor	_____	
v) Any public hazards (specify)	_____	
vi) Other (specify)	_____	

Comments:

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Actions to Take:

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# Stormwater Maintenance Inspection Checklist

## Closed Drainage System

**Project:** \_\_\_\_\_

**Location:** \_\_\_\_\_

**Site Status:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Time:** \_\_\_\_\_

**Inspector:** \_\_\_\_\_

<u>Maintenance Item</u>	<u>Satisfactory/ Unsatisfactory</u>	<u>Comments</u>
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Drainage Structures # \_\_\_\_\_

Inlet & Outlet Pipes

Material Type: HDPE \_\_\_\_\_

PVC \_\_\_\_\_

CMP \_\_\_\_\_

1. Drainage Structures Condition (Annual) \_\_\_\_\_

a) Ground surface conditions around structure \_\_\_\_\_

b) Frame & Grate condition \_\_\_\_\_

c) Grade rings/bricks condition \_\_\_\_\_

d) Spalling mortar/infiltration \_\_\_\_\_

e) Steps condition \_\_\_\_\_

f) Cracks or displacement \_\_\_\_\_

g) Minor spalling (<1") \_\_\_\_\_

h) Major spalling (reinforcement exposed) \_\_\_\_\_

i) Joint failures \_\_\_\_\_

j) Water tightness \_\_\_\_\_

k) Other \_\_\_\_\_

2. Sediment Accumulation (Spring & Fall) \_\_\_\_\_

3. Pipes obstructed (Annual, As Required) \_\_\_\_\_

a) Debris removal necessary \_\_\_\_\_

b) Other \_\_\_\_\_

<b>Maintenance Item</b>	<b>Satisfactory/ Unsatisfactory</b>	<b>Comments</b>
4. Outlet/inlet pipe conditions (Annual)		
5. Other (As Required)		
a) Complaints from residents		
b) Aesthetics		
c) Lawn restoration required		
d) Odor		
e) Any public hazards (specify)		
f) Other (specify)		

Comments:

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Actions to Take:

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Appendix B  
**As-Built Site Drawings**