

# Operation & Maintenance Manual

for:

## Oscar & Ella Wilf Campus for Senior Living- Single-Family & Solar Field Development

Block(s): 386.07

Lot(s): 54.05

Township of Franklin

Somerset County, New Jersey

### Prepared By:

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## Purpose

The intent of this manual is to provide a strategic plan for the party(s) responsible for the operation and maintenance of the stormwater management facility(s) located on the site in question. The plan must be complied with to insure the proper function and prolonged life span of the facility(s).

For regular maintenance, the plan describes a list of procedures to be completed and carried out under a specific schedule and contingency procedures during unusual or infrequent conditions that may arise. In addition to maintenance, a detailed inspection log of tasks/conditions/findings of the stormwater management facilities will be recorded in this manual upon every inspection performed.

THIS MANUAL IS BASED ON THE REQUIREMENTS SET FORTH BY THE *NEW JERSEY STORMWATER BEST MANAGEMENT PRACTICES MANUAL, APRIL 2004.*

## Description

This manual is intended to describe the maintenance of the stormwater management facilities for a development called Oscar & Ella Wilf Campus for Senior Living- Single-Family & Solar Field Development, located on Lot 54.05 in Block 386.07, situated in the Township of Franklin, Somerset County, New Jersey. The purpose of these facilities is to provide some degree of the following conditions:

- Provide a temporary means of storage for stormwater.
- Facilitate water quality (to help eliminate contaminants and particulate matter from stormwater runoff).
- Recharge the groundwater supply.

A stormwater management facility is also commonly referred to as a Best Management Practice (or BMP). The six (6) BMP's for this project are as follows:

- Lawn and Landscaped Area– any area containing stable vegetation, lawn area or landscaping.
- Pervious Pavement- areas of pavement used to address water quality impacts located on the solar portion of the development.
- Small-Scale Bioretention Basins w/ Underdrain (2)- with the purpose of attenuating stormwater runoff and providing water quality. They are located east of the solar array and outlets to a ditch towards Seeley's Brook.
- Small-Scale Infiltration Basin (1)- with the purpose of attenuating stormwater runoff, providing water quality and recharge. The basin is located northwest of the residential development and outlets to a tributary to Seeley's Brook.
- Stormwater Collection System– a collection of pipes and drainage structures including manholes and inlets that collect stormwater runoff.

## RESPONSIBILITY

All BMP operation tasks, maintenance and inspection log entries, as defined within this manual, will be performed by the maintenance staff employed or retained by owner of Lot 54.05 in Block 386.07, situated in the Township of Franklin, Somerset County, New Jersey *or a third party designated by said owner and/or operator*. The latest dated party listed below will be considered the party responsible.

DATE:	<u>MARCH 25, 2022</u>	DATE:	_____
COMPANY:	<u>THE FOUNDATION OF THE WILF CAMPUS</u>	COMPANY:	_____
CONTACT:	_____	CONTACT:	_____
PHONE:	<u>(732) 735-5002</u>	PHONE:	_____
ADDRESS:	<u>350 DEMOTT LANE</u>	ADDRESS:	_____
	<u>SOMERSET, NJ 08873</u>		_____

Additional Information (if applicable): \_\_\_\_\_  
\_\_\_\_\_

DATE:	_____	DATE:	_____
COMPANY:	_____	COMPANY:	_____
CONTACT:	_____	CONTACT:	_____
PHONE:	_____	PHONE:	_____
ADDRESS:	_____	ADDRESS:	_____
	_____		_____

- Any amendment or alteration to this manual (i.e.: change in ownership, the inclusion of third party maintenance agreements, a modification or addition to maintenance procedures) must be entered in this manual or attached as a rider to this manual, and complete copies submitted to all parties involved and, must be in compliance with the most current guidelines set forth by the New Jersey Department of Environmental Protection Stormwater Management Rules.
- This manual as outlined, or any amendment or alteration to this manual is to be recorded in the deed of record for the property. The deed shall state that any future sale of the property carries with it the responsibility of the new owner to comply with the conditions of this Operation and Maintenance Manual.
- In addition, this manual as outlined, or any amendment or alteration to this manual, must be made available upon request to the local mosquito control or extermination committee and any public entity with administrative, health, environmental, or safety authority over the site.
- The person or party responsible (as named above) for maintenance must maintain a detail log of all preventive and corrective maintenance for the structural stormwater management measures as described in this manual, including inspections and copies of all maintenance related work orders.
- The person or party responsible (as named above) for maintenance shall evaluate the effectiveness of the Operation and Maintenance Plan at least once per year and adjust the plan and the deed as needed.

## **LAWN AND LANDSCAPED AREA MAINTENANCE:**

### **Description**

Maintenance involves routine periodic inspection of the vegetation, fertilization, and the correction of erosion problems.

### **Schedule III – annually or as noted**

Shrubs & Trees:	Between March 1 and April 15
Mowing:	As specified per BMP
Fertilize:	Fall - Between September 1 and October 15
Liming:	Between September 1 and October 15
Soil Testing:	Between September 1 and October 15
Pest & Disease Control:	As required
Overseeding:	Between September 1 and October 15 (As required)
Aeration:	Between September 1 and October 15 (As required)

### **1) Maintenance: General**

- a) The Contractor shall inspect all areas to verify that all work is being performed properly and as scheduled, locate potential problems, and correct unacceptable conditions. A brief verbal report is to be submitted to the Owner. Problems requiring immediate attention shall be reported to the Owner.

### **2) Shrubs & Trees:**

- a) These plants shall be maintained in a natural setting. No shearing is allowed, shrubs and trees will be hand-pruned to remove dead or diseased branches. Dead plant material shall be replaced in kind unless cultural requirements necessitate change. When planting within compacted slopes, excavate larger holes and backfill with a suitable planting medium.  
(Cost: \$100/ 1,000 SF)

### **3) Mowing:**

- a) All clippings are to be raked, bagged and disposed off-site to prevent clogging of the outlet structure.  
(Cost: \$250/ acre)

### **4) Fertilize:**

- a) Fall: Fertilizer analyses and rates are to be based on soil test results. Standard fertilizer blends rather than custom blends are assumed.  
(Cost: \$20/ 1,000 SF)

### **5) Liming:**

- a) One application in the fall as required by a soil test. Minimum requirements - Lime with pulverized dolomite limestone at a rate of 100 lbs./1,000 s.f.  
(Cost: \$10/ 1,000 SF)

**6) Soil Testing:**

- a) The Contractor shall take soil samples from grassed areas for the following analysis: ph, available Mg, P, K, C, recommended nitrogen application. Copies of the analyses for each area are to be furnished to the Owner. Samples shall be taken before liming and fertilization as noted on the schedule.

**7) Turf disease and pest control:**

- a) As required. Submit to the Owner the following information before spraying:
- i) -Targeted pests or diseases.
  - ii) -Materials and methods used.
- (Cost: \$20/ 1,000 SF)

**8) Overseeding:**

- a) Overseeding is scheduled, as required per field inspection; or a minimum of once every four (4) years. A variseeder or equal equipment should be used to overseed designated lawn areas. Seed type and rate per the following schedule.  
(Cost: \$200/ 1,000 SF)
- b) Seed type and rates for grass basin bottoms:  
Lofts Reclaim Conservation Mix-Damp Formula  
(At a rate of 5 lbs./1,000 s.f.)
- 45% Tall Fescue
  - 10% Perennial Ryegrass
  - 25% Poa Trivalis
  - 10% Salty Alkaligrass
  - 5% Redtop
  - 5% Reed Canary Grass
- c) Seed type and rates for lawn areas, grass basin side slopes and berm:  
SCS Seed Mix 16
- (3.5 lbs./1,000 s.f) Tall Fescue
  - (0.4 lbs./1,000 s.f) Kentucky Bluegrass (blend)
  - (0.4 lbs./1,000 s.f) Perennial Ryegrass (blend)
- d) Seed type and rates for low maintenance areas:  
Lofts Reclaim Native Grass Mixture  
(At a rate of 60lbs/acre)
- 30% Little Bluestem
  - 20% Indiangrass
  - 20% Azure Blue Fescue
  - 15% Side Oats Grama
  - 10% Big Bluestem
  - 5% Switchgrass

**9) Aeration:**

- a) A coring with 3" minimum hollow tines should be used to aerate lawn areas, followed by a steel drag mat to disperse cores. Coring should be timed for adequate soil moisture to insure proper

penetration and plug removal. Coring should be done in conjunction with fertilization and/or liming and overseeding in the fall, once a year.  
(Cost: \$10/ 1,000 SF)

## **PERVIOUS PAVEMENT SYSTEM:**

### ***DESCRIPTION***

Maintenance involves general maintenance, storage bed drain time inspection, and cold weather maintenance.

#### **1. General Maintenance**

- a) Failure to correctly maintain a pervious paving system will shorten its lifespan or result in system failure; therefore, the maintenance plan must ensure proper training of personnel and include the special equipment necessary in accordance with the industry's or manufacturer's requirements.
- b) The surface course must be inspected after every storm exceeding 1 inch of rainfall. If mud or sediment is tracked onto the surface course, it must be removed as soon as possible. Removal should take place when all runoff has drained from the surface course.
- c) The surface course must be inspected, at least once annually, for cracking, subsidence, spalling, erosion, deterioration and unwanted vegetation. Remedial measures must be taken as soon as possible. Herbicides must not be applied.
- d) The surface course of a pervious paving system must be vacuum swept, not power swept, at least four times per year. Vacuum sweeping must be followed by either air blowing or high-pressure power washing performed in accordance with the specifications recommended for the particular type of system. All dislodged material must be promptly removed.
  - The first annual maintenance must be performed in the spring.
  - Maintenance must additionally be performed in the autumn, after the fallen leaves are collected and removed.
- e) Each spring, after the last snow or ice event, the infiltration rate of the surface course must be tested in accordance with the methods of either ASTM C1701 or C1781, as corresponds to the post-construction test performed for the system. At least 3 locations must be tested. One of the locations must be in an area where sediment is most likely to be deposited, such as, but not limited to, a parking lot entrance. The other test locations must be evenly spaced across the system surface. The locations and results obtained must be recorded in the maintenance plan for future reference and compared to the as-built testing results as a metric for determining if a system requires corrective action.
- f) Corrective action must be immediately taken to restore the infiltration capacity of the pervious paving system under the following scenarios:
  - Standing water is observed on the surface course; or
  - The testing methods above show an infiltration rate of 20 inches per hour or less for a system designed for quantity control or 6.4 or less for a system designed for water quality control only.
- g) Disposal of debris, trash, sediment and other waste material must be done at suitable disposal/recycling sites and in compliance with all applicable local, state and federal waste regulations.
- h) Under no circumstances may any sealants or coatings be applied to pervious paving systems, except for those approved by the manufacturer to improve surface course resistance to de-icing chemicals or refresh traffic striping.



- i) Over the lifetime of the surface course, no more than 10% of its surface area may be patched with impervious material such as bituminous asphalt or concrete. All patching must be recorded in the maintenance manual for future reference to prevent exceedance of this maximum.

**2. Storage Bed Drain Time**

If the system fails to drain the maximum design storm volume within 72 hours, corrective action must be taken.

**3. Cold Weather Maintenance**

- a) Care must be taken when removing snow from the surface course; pervious paving surface courses may be damaged by snowplows or loader buckets set too low to the ground or not equipped with a rubber blade guard. Sand, grit or cinders may not be used on surface courses for snow/ice control.
- b) De-icing chemicals may not be used on pervious concrete less than one year old.
- c) De-icers containing magnesium chloride, calcium magnesium acetate or potassium acetate may never be used on pervious concrete.

## **SMALL-SCALE BIORETENTION BASIN MAINTENANCE:**

### ***DESCRIPTION***

Effective Bioretention system performance requires regular and effective maintenance. Maintenance involves routine periodic inspection of the system and vegetation, the removal of accumulated sediment and debris, and the correction of any structural or erosion problems.

Schedule I - four times annually and after every storm exceeding 1 inch of rainfall

Schedule IA - once a month during the growing season

Schedule II - bi-annually, during the growing season and the non-growing season

Schedule III - annually

### **1) Maintenance: General**

The Contractor shall inspect all areas to verify that all work is being performed properly and as scheduled, locate potential problems, and correct unacceptable conditions. A brief verbal report is to be submitted to the Owner. Problems requiring immediate attention shall be reported to the Owner.

### **2) Maintenance: Schedule I**

- a) System Outlet: Inspect for and clear debris from the trashrack/grate and exit ports of the basin outlet structures. This is to prevent clogging of the outlets and subsequent backup of detained water.
- b) Inspect for and clear excessive debris from the basin bottom, pipe inlets and aprons.
- c) Inspect for any erosion of banks or other hazards. Any erosion shall be immediately repaired and stabilized accordingly. Maintain seeded areas until they are established.
- d) Inspect receiving waters for damage, obstructions, and unsightly debris. All obstructions shall be removed immediately, and any damage repaired.
- e) Any problems or defects shall be reported to the Owner.

### **3) Maintenance: Schedule IA (monthly during growing season)**

Vegetated Areas: Mowing and/or trimming of vegetation must be performed on a regular schedule based on specific site conditions. Grass should be mowed at least once a month during the growing season.

- Bi-weekly inspections are required when establishing/restoring vegetation.
- A minimum of one inspection during the growing season and one inspection during the nongrowing season is required ensure the health, density and diversity of the vegetation.
- Mowing/trimming of vegetation must be performed on a regular schedule based on specific site conditions; perimeter grass should be mowed at least once during growing season.

### **4) Maintenance: Schedule II (bi-annually)**

- a) The planting soil bed at the bottom of the system should be inspected at least twice annually. The permeability of the soil bed material should be retested as field conditions warrant.
- b) Once established, inspections of vegetation health, density, and diversity should be performed during both the growing and non-growing season at least twice annually.
- c) The vegetative cover should be maintained at 85 percent. If vegetation has greater than 50 percent damage, the area should be reestablished in accordance with the original specifications

(see seeding specification) and the inspection requirements presented above. All use of fertilizers, mechanical treatments, pesticides and other means to assure optimum vegetation health must not compromise the intended purpose of the vegetative filter. All vegetation deficiencies should be addressed without the use of fertilizers and pesticides whenever possible.

**5) Maintenance: Schedule III (annually)**

- a) Vegetated areas must be inspected annually for erosion and scour. Vegetated areas must be inspected for unwanted growth, which must be removed with minimum disruption to the planting soil bed and remaining vegetation.
- b) When establishing or restoring vegetation, biweekly inspections of vegetation health must be performed during the first growing season or until the vegetation is established.

**6) Basin Performance Criteria**

If significant increases or decreases in the normal drain time are observed, or if the 72 hour maximum drain time is exceeded, the basin's outlet, underdrain system, filter medium and both groundwater and tailwater levels must be evaluated and appropriate measures taken to comply with the maximum drain time requirements and maintain the proper functioning of the basin.

**7) Prevention of Water Pollution**

The contractor's activities shall be performed by methods that will prevent entrance or accidental spillage of solid matter, contaminants, debris or other pollutants and wastes into the downstream conveyance system. Such pollutants and wastes include, but are not restricted to, refuse, garbage, cement, collected silt and sediment, etc. Disposal of debris and trash should be done only at suitable disposal / recycling sites and must comply with all applicable local, state, and federal waste regulations.

## **SMALL-SCALE INFILTRATION BASIN MAINTENANCE:**

### ***DESCRIPTION***

Effective infiltration basin performance requires regular and effective maintenance. Maintenance involves routine periodic inspection of the basin and vegetation, the removal of accumulated sediment and debris, and the correction of any structural or erosion problems.

Schedule I - four times annually and after every storm exceeding 1 inch of rainfall

Schedule IA - once a month during the growing season

Schedule II - bi-annually, during the growing season and the non-growing season

Schedule III - annually

### ***8) Maintenance: General***

- a) The Contractor shall inspect all areas to verify that all work is being performed properly and as scheduled, locate potential problems, and correct unacceptable conditions. A brief verbal report is to be submitted to the Owner. Problems requiring immediate attention shall be reported to the Owner.

(Cost: \$300/visit x 4 = \$1,200)

### ***9) Maintenance: Schedule I***

- a) Basin Outlet Works: Inspect for and clear debris from the trashrack and exit ports of the basin outlet structures. This is to prevent clogging of the outlets and subsequent backup of detained water.
- b) Inspect receiving waters for damage, obstructions and unsightly debris. All obstructions shall be removed immediately and any damage repaired.
- c) Inspect for and clear excessive debris from the basin bottom, pipe inlets and aprons.
- d) Inspect for any erosion of banks or other hazards. Any erosion shall be immediately repaired and stabilized accordingly. Maintain seeded areas until they are established.
- e) Any problems or defects shall be reported to the Owner.

(Cost: \$560/visit x 8 = \$5,120)

### ***10) Maintenance: Schedule IA (monthly during growing season)***

- a) Vegetated Areas : Mowing and/or trimming of vegetation must be performed on a regular schedule based on specific site conditions. Grass should be mowed at least once a month during the growing season.

(Cost: \$550/visit x 8 = \$4,400)

### ***11) Maintenance: Schedule II (bi-annually)***

- a) The planting soil bed at the bottom of the system should be inspected at least twice annually. The permeability of the soil bed material should be retested as field conditions warrant.
- b) Once established, inspections of vegetation health, density, and diversity should be performed during both the growing and non-growing season at least twice annually.
- c) The vegetative cover should be maintained at 85 percent. If vegetation has greater than 50 percent damage, the area should be reestablished in accordance with the original specifications (see seeding specification) and the inspection requirements presented above. All use of

fertilizers, mechanical treatments, pesticides and other means to assure optimum vegetation health must not compromise the intended purpose of the vegetative filter. All vegetation deficiencies should be addressed without the use of fertilizers and pesticides whenever possible.  
(Cost: \$135/visit x 2 = \$270)

**12) Maintenance: Schedule III (annually)**

- a) Vegetated areas must be inspected annually for erosion and scour. Vegetated areas must be inspected for unwanted growth, which must be removed with minimum disruption to the planting soil bed and remaining vegetation.
- b) When establishing or restoring vegetation, biweekly inspections of vegetation health must be performed during the first growing season or until the vegetation is established.\

(Cost \$240/visit x 16 = \$3,840)

(Cost for a & b: included in costs for Schedule I and IA above.)

**13) Basin Performance Criteria**

- a) If significant increases or decreases in the normal drain time are observed, or if the 72 hour maximum drain time is exceeded, the basin's outlet structure, sand bottom, underdrain system, and both groundwater and tailwater levels must be evaluated and appropriate measures taken to comply with the maximum drain time requirements and maintain the proper functioning of the basin.

(Cost: \$300 for report)

**14) Prevention of Water Pollution**

- a) The contractor's activities shall be performed by methods that will prevent entrance or accidental spillage of solid matter, contaminants, debris or other pollutants and wastes into the downstream conveyance system. Such pollutants and wastes include, but are not restricted to, refuse, garbage, cement, collected silt and sediment, etc. Disposal of debris and trash should be done only at suitable disposal / recycling sites and must comply with all applicable local, state, and federal waste regulations.

## **STORMWATER COLLECTION SYSTEM MAINTENANCE:**

Schedule I - four times annually and after every storm exceeding 1 inch of rainfall

Schedule III - annually

### **Description**

Stormwater collection system maintenance involves routine periodic inspection of the storm collection system, the removal of accumulated sediment and debris, and the correction of any structural problems.

#### **1) Inspection : General**

- a) The Contractor shall inspect all areas to verify that all work is being performed properly and as scheduled, locate potential problems, and correct unacceptable conditions. A brief verbal report is to be submitted to the Owner. Problems requiring immediate attention shall be reported to the Owner.

(Cost: \$300/visit x 4 = \$1,200)

#### **2) Inspection : Schedule I**

- a) Inlets, conduit, outfalls and other conveyance elements: Inspect for and clear debris from the gratings, inlets and pipes. This is to prevent clogging of the inlets and subsequent backup of stormwater runoff. Any problems or defects shall be reported to the Owner.

(Cost: \$1,500/visit x 4 (excludes visit for 1"+ rainfall events) = \$6,000)

#### **3) Inspection : Schedule III (annually)**

- a) Visual inspection of all components of the onsite stormwater collection system. Inspect for and remove silt and sediment, litter and other debris from all inlets, gratings and drainage pipes. All inlets and manhole are to be vacuumed. (Frequency of vacuuming may be adjusted if maintenance records indicate that sediment and debris accumulation is insignificant.) In the event that the accumulated material exceeds 10% of the pipe diameter, it must be flushed / vacuumed out of the system.

(Cost: \$2,500)

#### **4) Prevention of Water Pollution**

- a) The contractor's activities shall be performed by methods that will prevent entrance or accidental spillage of solid matter, contaminants, debris or other pollutants and wastes into the downstream conveyance system. Such pollutants and wastes include, but are not restricted to, refuse, garbage, cement, collected silt and sediment, etc. Disposal of debris and trash should be done only at suitable disposal / recycling sites and must comply with all applicable local, state, and federal waste regulations.

