Operation and Maintenance Manual

For:

ALL SEASONS SPORTS ACADEMY

Borough of South Plainfield
Middlesex County, New Jersey

Prepared By:

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SHT/rw
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menlo engineering associates

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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

The location of the stormwater management facility this manual is intended for a mixed used building, located on Lot 3 in Block 476, situated in the Borough of South Plainfield, Middlesex County, New Jersey. The purpose of these facilities is to provide for the collection and conveyance of stormwater runoff to accommodate the following conditions:

- Provide a means of stormwater collection and conveyance.
- Facilitate water quality (to help eliminate contaminants and particulate matter from stormwater runoff).

A stormwater management facility is also commonly referred to as a Best Management Practice (or BMP). The four (4) BMP's for this project are as follows:

- Field Drain Piping – Stormwater management basin constructed on-site for the purpose of attenuating stormwater and providing water quality through infiltration. The basin is designed with an emergency spillway that discharges towards the existing brook in the event of large storm events.
- Stormwater Collection System – Collection of pipes and drainage structures including manholes and inlets that shall collect stormwater runoff.
- Lawn and Landscaped Area – Areas containing stable vegetation, lawn area or landscaping material.
- Vegetative Filters and Swales – Vegetated areas conveying stormwater runoff which provide groundwater recharge and remove pollutants.

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 Lots 7.01 & 18 of Block 178, situated in the Township of Hillsborough, 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:	***FEBRUARY 14, 2020***	DATE:	
COMPANY:	***ALL SEASONS SPORTS ACADEMY***	COMPANY:	
CONTACT:	***C/O PHIL RICHARDS***	CONTACT:	
PHONE:	***(973) 539-1451***	PHONE:	
ADDRESS:	***DPE 2700 SOUTH PLAINFIELD ASSOC., LLC C/O PHIL RICHARDS 20 COMMUNITY PLACE, SUITE 300 MORRISTOWN, NJ 07960***	ADDRESS:	

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.

Stormwater Management Maintenance

On site Stormwater Management Maintenance will be performed by an agent assigned by:

DPE 2700 SOUTH PLAINFIELD ASSOC., LLC
c/o PHIL RICHARDS
20 COMMUNITY PLACE, SUITE 300
MORRISTOWN, NJ 07960
Phone: (973) 539-1451

MAINTENANCE RESPONSIBILITIES:

1. The above referenced party shall maintain a detailed log of all preventative and corrective maintenance for the stormwater management measures shown on the plans, including a record of all inspections and copies of all maintenance related work orders.
2. The person responsible for maintenance identified above shall evaluate the effectiveness of the maintenance plan at least once a year and adjust the plan as needed.
3. The person responsible for maintenance identified above shall retain and make available upon request by any public entity with administrative, health, environmental or safety authority over the site, the maintenance plan and the documentation required above.
4. Following is a list of specific areas requiring maintenance. For detailed information and schedules, refer to the specific subsection for each item.

    a. Field Drain Piping
    b. Stormwater Collection System Maintenance
    c. Lawn & Landscaped Area Maintenance
    d. Vegetative Filters and Swale Maintenance

Field Drain Piping:

DESCRIPTION

Effective performance of the field drain piping requires effective maintenance. Maintenance involves routine periodic inspection of the piping, the removal of accumulated sediment and debris, and the correction of any structural or erosion problems.

Schedule I – Once annually

1) ***Maintenance: General***
   a) The owner or his agent shall inspect all cleanouts on the 12" dia. perforated pipe 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) Pipe Cleanouts: Inspect for and clear any debris from the cleanout ports. This is to prevent clogging of the piping and subsequent backup of stormwater runoff.
   b) All obstructions shall be removed immediately and any damage repaired.
   c) Any problems or defects shall be reported to the Owner.

3) ***Maintenance: Schedule IA (once every two years)***
   a) Pipe Cleaning: Various types of equipment are commercially available for maintenance of subsurface infiltration piping.

Vacuum Pump

This device is normally used to remove sediment from sumps and pipes. The equipment for this system is generally mounted on a vehicle. It requires a 200 to 300 gallon holding tank and a vacuum pump that has a 10-inch (254 mm) diameter flexible hose with a serrated metal end for breaking up caked sediment. This system can remove stones, leaves, litter, and sediment deposits. Normal working depth is 0 to 20 feet.

Water Jet Spray

This equipment is generally mounted on a vehicle equipped with a high pressure pump and a 200 to 300 gallon water supply. A 3-inch (76 mm) flexible hose line with a metal nozzle directs jets of water to loosen debris in pipes or trenches.

Fire Hose Flushing

This equipment consists of various fittings that can be placed on the end of a fire hose such as rotating nozzles, rotating cutter, etc. When this equipment is dragged through a pipe, it can be effective in removing light material from walls.

Sewer Jet Flusher

Sewer jet flushers are usually truck-mounted and consist of a large water tank of at least 1000 gallons, a triple action water pump capable of producing 1000 psi or more pressure, a gasoline motor to run the pump, a hose reel large enough for 500 feet (153 m) of 1-inch (25 mm) inside diameter high pressure hose, and a hydraulic pump to operate the hose reel. In order to clean pipes properly, a minimum nozzle pressure of 600 psi is required. All material is flushed ahead of the nozzle by spray action. This extremely mobile machine can be used for cleaning pipes with sand and gravel infiltration, and for general cleaning.

Stormwater Collection System Maintenance

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.

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

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.

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.

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.

4) **Prevention of Water Pollution**
   b) The contractor's activities shall be performed by methods that will prevent entrance or accidental spillage of solid matter, contaminates, 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.

5) **Estimated Maintenance Costs**
   a) A "Vactor" truck is recommended for cleanout of inlets. This cleaning can be easily accomplished in three (3) hours of less for most commercial installations of the size of the subject site. Standard vactoring operations should be employed in the cleanout of the stormwater collection inlets. Disposal of material from the unit should be in accordance with the local municipality's requirements. The clean-out cost is based on a typical four (4) hour minimum retail clean-out charge at $125 per hour, resulting in a minimum cost of $500+/- regardless if one or all inlets cleaned.

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) 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.

3) **Mowing:**
   a) All clippings are to be raked, bagged and disposed off-site to prevent clogging of the outlet structure.

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.

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.

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.

8) **Overseeding: (general turf and landscape areas)**
   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.

   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 berms:
      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.

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CDS® Inspection and Maintenance Guide – New Jersey

CDS TECHNOLOGIES

Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point allows both sump cleanout and access outside the screen.

The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine weather the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump. Refer to Table 1 for depth from water surface to top of sediment pile for each model size indicating that maintenance is required.

Cleaning

Cleaning of a CDS systems should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes.

CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile[1]		Sediment Storage Capacity	
	ft	m	ft	m	yd^3	m^3
CDS-3	3	0.9	3.0	0.9	0.5	0.4
CDS-4	4	1.2	3.0	0.9	0.9	0.7
CDS-5	5	1.5	3.25	1.0	1.5	1.1
CDS-6	6	1.8	4.0	1.2	2.1	1.6
CDS-7	7	2.1	4.75	1.4	2.9	2.2
CDS-8	8	2.4	5.5	1.7	3.7	2.8
CDS-10	10	3.0	7.0	2.1	5.8	4.4
CDS-12	12	3.4	8.5	2.6	8.4	6.4

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities

[1] Distances from water surface to top of sediment pile are based on 75% of sump capacity being occupied.

Support

- Drawings and specifications are available at www.contechstormwater.com.
- Site-specific design support is available from our engineers.

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The product(s) described may be protected by one or more of the following US patents: 5,322,629; 5,624,576; 5,707,527; 5,759,415; 5,788,848; 5,985,157; 6,027,639; 6,350,374; 6,406,218; 6,641,720; 6,511,595; 6,649,048; 6,991,114; 6,998,038; 7,186,058; 7,296,692; 7,297,266; 7,517,450 related foreign patents or other patents pending.

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CDS Inspection & Maintenance Log

CDS Model: _____ Location: _____

Date	Water depth to sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than the values listed in table 1 the system should be cleaned out. **Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.**

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

Maintenance Log

Detail logs of all preventative and corrective maintenance performed at the stormwater management measures, including all maintenance-related work orders must be recorded in this log. Document all maintenance performed and keep receipts.

Date of Inspection or Maintenance	Name of Inspector or Worker and Company	Description of Maintenance or Inspection Task

Inspection Log Entry **Date:** **Performed By:**

Extended Detention Basin

Checklist	Physical Condition* 1	2	3	4	Required Cleaning (y/n)	Description of Maintenance or Damage Report
Outlet Structure						
Scouring at Outfall						
Pests or Diseases						
General Landscape Condition						

Stormwater Treatment Device

Checklist	Physical Condition* 1	2	3	4	Required Cleaning (y/n)	Description of Maintenance or Damage Report
Structure Integrity						
Accumulated Sediment						
Floatables						

Stormwater Collection System

Checklist	Physical Condition* 1	2	3	4	Required Cleaning (y/n)	Description of Maintenance or Damage Report
Frame and Casting						
Access Steps						
Interior Masonry						
Accumulated Sediment						
Scouring at Outfall						

Lawn and Landscaped Area Maintenance

Checklist	Physical Condition* 1	2	3	4	Required Cleaning (y/n)	Description of Maintenance or Damage Report
General turf condition						
General Landscape Condition						
Pests or Diseases						

Additional Notes: _____

_____

_____

* Denotes a rating table to describe the condition of item (1 being in excellent condition and 4 being in need of immediate repair).