

STORMWATER MANAGEMENT FACILITIES OPERATIONS & MAINTENANCE MANUAL

for

Proposed Retail Store

Prepared for

Block 157 | Lot 5
457 Mount Pleasant Avenue
Township of West Orange
Essex County, New Jersey

Prepared by



N.J. Certificate of Authorization 24GA28161700

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2. "Maintenance Log" – a summary table for recording of all maintenance work at the site.
3. "Inspection Log" – a summary table for recording the results of all inspections of the basins.

1.0 PROJECT DETAILS

1.1 Introduction and Description of Facilities:

The project site has frontage in the South along Mount Pleasant Avenue, in the West along Pleasant Valley Way, and in the North along Mount Pleasant Place. The project is situated within the Township of West Orange, Essex County, New Jersey. The subject site is more specifically defined as Block 157, Lot 5. Under existing conditions, the site is approximately 161,597 SF (3.71 AC) and consists of a Green House, a One-Story Masonry Retail Building, a One-Story Brick Retail Building, a parking lot with 165 parking stalls, and landscaping areas. Under proposed conditions, the existing Green House will be demolished, the One-Story Masonry Retail Building footprint will remain the same with a new proposed Retail Store in the western portion of the building, and the One-Story Brick Retail Building will remain. The proposed parking lot design will be reconfigured. The landscaping areas will be enhanced and include 10 proposed replacement trees to account for the 5 trees to be removed during demolition.

The various design parameters established by the Township of West Orange, specifically the Stormwater Ordinance 2918-25, will require the construction of a pervious pavement system. The pervious pavement system will collect runoff from the proposed site development. The pervious pavement system is proposed to enhance discharge water quality for the existing site. Note that the subject site is within Metropolitan Planning Area (PA-1), is previously developed, and is a known contaminated site, and therefore, the subject site is exempt from the NJDEP recharge requirements. Under post-development conditions, the stormwater management facilities will include a pervious pavement system and associated outlet structure, inspection ports, cleanouts, and piping.

This manual consists of three parts. The first part includes the introduction, project description and a list of project contacts. The second part provides the operation and maintenance instructions for the facilities and equipment. The third part (Appendix) provides information regarding the inspection and maintenance activities.

1.2 Project Contacts:

Municipal Engineer:

Address: 25 Lakeside Avenue, West Orange, NJ 07052

Tel: (973) 325-4160

Attn: Zayibeth Carballo

Department of Public Works & Engineering

Address: 25 Lakeside Avenue, West Orange, NJ 07052

Tel: (973) 325-4067

Attn: Louis Reynolds, Director/Superintendent of Public Works

Site Design Engineer:

Bohler

Address: 30 Independence Blvd., Suite 200, Warren, NJ 07059

Tel: (908) 668-8300

Attn: Tung-To Lam, P.E.

Party Responsible for Maintaining Stormwater Management Facility:

Property Owner

2.0 INSPECTION AND MAINTENANCE:

2.1 Routine Inspection and Maintenance of the Stormwater Management Facilities:

The pervious pavement system has been designed to control degradation of water quality. Without proper routine inspection and maintenance, the system may lose some or all of its capability to function to its full capacity. Lack of adequate maintenance of this system could lead to system failures.

Regularly scheduled maintenance inspections of the stormwater facilities should be performed at least four (4) times each year. The primary purpose of these inspections is to ascertain the operational condition and safety of the facilities, particularly the condition of outlet structure, sedimentation and other safety-related aspects. Inspections will also provide information on the effectiveness of regularly scheduled Preventative and Aesthetic Maintenance Procedures, and will help to identify where changes in the extent and scheduling of the procedures are warranted. Finally, the facility inspections should also be used to determine the need for and timing of Corrective Maintenance procedures.

Routine maintenance of these facilities should be separated into two (2) basic types: Functional Maintenance and Aesthetic Maintenance. Functional Maintenance is further broken down into two (2) categories: Preventative and Corrective. Aesthetic Maintenance, which is necessary to maintain the visual appeal and aesthetic quality of these facilities, should be incorporated on the same schedule as the Preventative Maintenance efforts. Listed below are the Preventative, Corrective and Aesthetic Maintenance Procedures to be performed on a routine basis:

2.1.1 Preventative Maintenance Procedures:

The purpose of Preventative Maintenance is to maximize the effectiveness of the stormwater management aspects of the pervious pavement system so that it can remain operational and safe and to minimize the need for potential emergency or extensive corrective maintenance. These procedures are as follows:

a) *Weed Growth:*

Weeds associated with pervious pavement systems typically fall into three (3) categories: submergent, floating and emergent. All three (3) are typically found, to some extent, in a stormwater management system. However, excessive growth of any of these weeds can lead to problems.

The pervious pavement system should be evaluated regularly to determine whether excessive invasive plant growth is evident. If it occurs, this situation can be corrected by appropriate application of fertilizers and weed killers. Weeds which have become a problem can be cleared through manual removal by professional pond maintenance technicians, in the case of the small wet pond.

b) *Maintenance of Adjacent Areas:*

Grass areas, trees, and shrubs adjacent to the pervious pavement system and conveyance swales require periodic routine maintenance to include fertilizing, de-thatching and soil conditioning in order to maintain healthy growth and to provide bank stabilization. The application of fertilizers should follow manufacturer's instructions to reduce run-off of these compounds into the pervious pavement system. Additionally, provisions should be made to re-seed and re-establish grass cover in areas damaged by sediment accumulation, stormwater flow, or other causes. These tasks should be performed, or at least evaluated, on a quarterly basis. Lawn areas should be mowed at least once a month during the growing season. Vegetated areas must be inspected at least annually for erosion and scour as well as unwanted growth, which should be removed with minimum disruption to the remaining vegetation.

Note: All use of fertilizers, mechanical treatments, pesticides and other means to ensure optimum vegetation health must not compromise the intended purpose of the stormwater management facility. All vegetation deficiencies should be addressed without the use of fertilizers and pesticides whenever possible and if necessary, the minimum amount practical.

c) *Removal and Disposal of Trash/Debris and Sediment:*

All stormwater management components expected to receive and/or trap debris and sediment must be inspected for clogging and excessive debris and sediment accumulation at least four times annually as well as after every storm exceeding one inch of rainfall in 24 hours. Such components should include pervious pavement system bottom and inspection ports.

Removal of trash and debris will prevent possible damage to vegetated areas and minimize potential mosquito breeding habitats. Debris and trash must be properly hauled off the site and transferred to an approved disposal site.

Accumulated sediment should be removed before it threatens the storage volume of the pervious pavement system. Before de-sedimentation activities are performed, consideration should be given to evacuating all standing water from the pervious pavement system. Disposal of discharged water and sediment must comply with all local, county, state and federal regulations. Only suitable disposal sites should be utilized. If stable soil conditions exist around the pervious pavement system, sediment deposition should not be an excessive maintenance issue.

Should a recurrent stabilization situation develop, the inspector should identify the upstream sources of sediment and recommend required stabilization measures.

d) *Elimination of Potential Mosquito Breeding Habitats:*

The most effective mosquito control program is one that eliminates potential breeding habitats. Almost any stagnant pool of water can be attractive to mosquitoes, and may become the source of a large mosquito population. A maintenance program dedicated to eliminating potential breeding areas is preferable to chemical means of controlling mosquitoes. The most important maintenance functions, is removal of all obstructions to natural flow patterns before stagnant water conditions can develop.

e) *Specific Maintenance of Pervious Pavement System Pipes & Chambers:*

The pervious pavement system pipes and chambers are to be evaluated for excessive deposition of sediment and debris in pipe and chamber inverts. The ground and paved parking lots above and adjacent to the pervious pavement system shall be evaluated for excessive settlement.

f) *Parking lot maintenance:*

This management measure involves employing pavement cleaning practices, such as parking lot sweeping on a regular basis, to minimize pollutant export to the stormwater conveyance system / pervious pavement system and eventually the receiving waters. These cleaning practices are designed to remove sediment, debris, and other pollutants from access drive and parking lot surfaces that are a potential source of pollution impacting urban waterways. Mechanical machines that use vacuum assisted dry sweeping to remove particulate matter shall be utilized as these have the ability to remove finer sediment particles. Parking lots and access drives shall be swept / vacuumed at least semi-annually or more often as conditions warrant. The disposal of the swept material must be properly hauled off the site and transferred to an approved disposal site. Other parking lot maintenance features include the use of on-site trash receptacle. These receptacles should be located in strategic areas where the majority of the pedestrian traffic occurs. These receptacles should be emptied weekly. The disposal of the solid waste must be properly hauled off the site and transferred to an approved disposal site.

2.1.2 Corrective Maintenance Procedures:

a) Removal of Debris and Sediment:

Sediment, debris and trash which threaten the discharge capacity of the pervious pavement system should be removed immediately and properly disposed of. As noted previously, it is recommended that all water be evacuated from the pervious pavement system before any significant amount of sediment, settled debris or trash is removed from the system.

b) Structural Repairs:

Structural damage to outlet and inlet structures and roadways as a result of vandalism, flood events, settlement or other causes must be repaired promptly. The urgency of the repairs will depend upon the nature of the damage and its effects on the safety and operation of the facility. The analysis of structural damage if it occurs and the design and performance of structural repairs should only be undertaken by a Professional Engineer.

c) Weed Harvesting:

It may be necessary to remove congested weeds from the pervious pavement system. Companies specializing in manual removal of weeds should be contacted to perform these operations. Note that such work does not usually, but may in some cases require the approval of various regulatory agencies.

d) Extermination of Mosquitoes:

If neglected, pervious pavement system can become a potential mosquito breeding area. The extermination of mosquitoes will usually require the services of the County Mosquito Commission. If mosquito control in the facility becomes necessary, the preventative maintenance program should be re-evaluated, and more emphasis should be placed on control of mosquito breeding habitats.

e) Snow and Ice Removal:

Accumulations of snow and ice can threaten the functioning of the inlets and outlets. Provision of the equipment, material and personnel to monitor and remove snow and ice from critical areas will assure the function of the facility during the winter months.

2.1.3 Aesthetic Maintenance Procedures:

a) *Graffiti Removal:*

The timely removal of graffiti will restore the aesthetic quality of the pervious pavement system. Removal can be accomplished by paint or other cover, or removal with scrapers, solvents or cleansers. Timely removal is important to discourage further graffiti and other acts of vandalism.

b) *Grass Trimming/Landscape Maintenance:*

The lawn areas around the pervious pavement system shall be mowed on a regular basis as necessary to maintain the lawn at a height of 2 to 3-inches. These areas shall also be fertilized twice a year, once in the spring and once in the fall. Fertilizer for lawn areas shall be 10-20-10 applied at a rate of 11 lbs. per 1,000 sf. or as determined by a soil test. Any bare, dead or damaged lawn areas shall be re-seeded in accordance with the original procedures as outlined in the Soil Erosion and Sediment Control Plans using the same mix and seeding rates. Stabilization of bare or damaged areas shall be done in a timely fashion so as to avoid exposing the soil to erosion.

If season prevents the re-establishment of turf cover, exposed areas should be stabilized with straw or salt hay mulch as described in the Soil Erosion and Sediment Control Plans until permanent seeding can be done. Seeding can be done between March 15th and June 15th and between September 15th and December 1st, only if adequate water is provided.

The shrubs around the pervious pavement system should also be maintained in order to promote a neat appearance and healthy, vigorous growth. All shrubs should be allowed to grow together in masses as shown on the plans and not pruned into individual plants. The planting beds should be mulched with hardwood mulch every two (2) years in order to provide a suitable growing medium for the shrubbery and to retain moisture around the root zones.

Pruning of shrubs should also be done on a regular basis to maintain the shape and appearance of the shrub masses. The height of the shrubs may vary according to the plants natural growth habits, but should not exceed 6-feet. Pruning should be done as necessary throughout the year to remove dead branches and to control new growth. Any pruning, other than the removal of dead branches, should be done in either late winter/early spring or after the shrub has flowered in the spring.

In the event that a shrub should experience more than 2/3 die back, it should be replaced in kind as soon as possible in either the spring or fall planting season. The replacement shrub should be the same species as the original and installed at the size and condition as specified on the original landscape plans. If, for any reason, a substitution of species or size must be made, it shall be subject to the approval of the project Landscape Architect.

The trees surrounding the pervious pavement system area shall be maintained regularly to ensure good health and exhibit an attractive appearance. Their maintenance should include fertilization twice annually, with one application in the spring and another in early fall. The trees shall be pruned in the late winter or early spring. However, dead branches should be removed as soon as they are noticed. Care should be taken to avoid cutting off the central leader of a tree if one is present.

If a tree is severely damaged or experiences more than 2/3 die back, it should be replaced in either the spring or fall planting season, whichever comes first. The only exception to this is if the replacement tree has a fall transplanting hazard. Replacement trees should be planted at the same size and condition as specified on the landscape plans. Any tree or shrub maintenance, tree pruning or plant material substitution of species or size shall be subject to the approval of the project Landscape Architect.

c) *Control of Weeds:*

Although a regular grass maintenance program will minimize weed intrusion, some weeds will appear. Periodic weeding, either chemically or mechanically, will help to maintain a healthy turf, and keep grassed areas looking attractive. Application of chemicals should be minimized and monitored closely so as not to affect the ecosystems within the pervious pavement system. Excessive growth of weeds within the system can be controlled mechanically as discussed in the previous section.

The recording of all maintenance work and inspections provide valuable data on the facility's condition. Review of this information will also help to establish more efficient and beneficial maintenance procedures and practices. As the owner is ultimately responsible for site maintenance, all recorded information should be directed to the owner of the pervious pavement system for review and subsequent follow-up on recommendations. Data obtained from informal inspections should be retained; however, under current regulations, this data does not have to be submitted to NJDEP.

2.1.4 Summary of Maintenance Procedures:

Preventative Maintenance

- a) Weed Growth
- b) Maintenance of Adjacent Areas
- c) Removal and Disposal of Trash/Debris and Sediment
- d) Elimination of Potential Mosquito Breeding Habitats
- e) Specific Maintenance of Underground Detention Basin Pipes & Chambers
- f) Parking Lot Maintenance

Corrective Maintenance

- a) Removal of Debris and Sediment
- b) Structural Repairs
- c) Weed Harvesting
- d) Extermination of Mosquitoes
- e) Snow and Ice Removal

Aesthetic Maintenance

- a) Graffiti Removal
- b) Grass Trimming/Landscape Maintenance
- c) Control of Weeds

2.1.5 Maintenance Equipment and Materials

Note: Only light equipment is allowed to be used within open basins to prevent compaction.

Grass Maintenance Equipment

- a) Riding Mowers
- b) Hand Mowers
- c) Gas Powered Trimmers
- d) Gas Powered Edgers
- e) Seed Spreaders
- f) Fertilizer Spreaders
- g) De-Thatching Equipment
- h) Pesticide and Herbicide Application Equipment
- i) Grass Clipping and Leaf Collection Equipment

Vegetative Maintenance Equipment

- a) Saws
- b) Pruning Shears
- c) Hedge Trimmers
- d) Aquatic Weed Harvester (owned/operated by subcontractor)

Transportation Equipment

Debris, Trash and Sediment Removal Equipment

- a) Loader (not to be used in the bottom of basins)
- b) Backhoe (not to be used in the bottom of the basins)
- c) Grader (not to be used in the bottom of the basins)
- d) Dredging Equipment (not to be used in the bottom of the basins)
- e) Portable Pump for Dewatering
- f) Jet Vac Equipment for removal of sediment in underground pipe & chamber basins

Miscellaneous Equipment

- a) Shovels
- b) Wheel Barrows
- c) Gloves
- d) Hand Pushed Tilling Machine
- e) Brooms

Standard Mechanics Tools

Tools for Maintenance of Equipment

Materials

- a) Topsoil
- b) Fill
- c) Seed
- d) Soil Amenities (Fertilizer, Lime, etc.)
- e) Chemicals (Pesticides, Herbicides, etc.)
- f) Mulch
- g) Paint Removers
- h) Spare Parts for Equipment

Parking Maintenance Equipment

- a) Sweeping/Vacuuming Equipment
- b) Trash Receptacles
- c) Snow Plowing Equipment
- d) Snow Shovels

2.1.6 Checklists and Logs

Appendix of this report contains sample checklists and logs regarding various aspects of the basin maintenance and inspection. A brief description of the use of each form is listed below:

1. "Maintenance Work Order and Checklist" – a comprehensive form outlining both required and completed maintenance work.
2. "Maintenance Log" – a summary table for recording of all maintenance work at the site.
3. "Inspection Log" – a summary table for recording the results of all inspections of the basins.

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A P P E N D I X

MAINTENANCE WORK ORDER
&
CHECKLIST FOR STORMWATER
MANAGEMENT FACILITIES

**MAINTENANCE WORK ORDER AND CHECKLIST
FOR STORMWATER MANAGEMENT FACILITIES**

NAME OF FACILITY _____
 LOCATION _____ DATE _____
 CREW _____ WORK STARTED _____
 EQUIPMENT _____ WORK COMPLETED _____
 WEATHER _____ TOTAL MANPOWER OF WORK _____

A. PREVENTATIVE MAINTENANCE

WORK ITEMS	ITEMS REQUIRED	ITEMS DONE	COMMENTS AND SPECIAL INSTRUCTIONS
1. GRASS CUTTING			
A. BOTTOMS			
B. EMBANKMENTS AND SIDE SLOPES			
C. PERIMETER AREAS			
D. ACCESS AREAS AND ROADS			
E. OTHERS			
2. GRASS MAINTENANCE			
A. FERTILIZING			
B. RE-SEEDING			
C. DE-THATCHING			
D. PEST CONTROL			
E. OTHERS			
3. VEGETATIVE COVER			
A. FERTILIZING			
B. PRUNING			
C. PEST CONTROL			
D. OTHERS			
4. TRASH AND DEBRIS REMOVAL			
A. BOTTOMS			
B. EMBANKMENTS AND SIDE SLOPES			
C. PERIMETER AREAS			
D. ACCESS AREAS AND ROADS			
E. INLETS			
F. OUTLETS AND TRASH RACKS			
G. OTHERS			
5. SEDIMENT REMOVAL			
A. INLETS			
B. OUTLETS AND TRASH RACKS			
C. BOTTOM			
D. OTHERS			
6. ELIMINATION OF POTENTIAL MOSQUITO BREEDING HABITATS			
7. UNDERGROUND BASIN MAINTENANCE			
A. BOTTOMS			
B. OUTLETS AND TRASH RACKS			
C. ACCESS HATCHES			
D. OTHERS			
8. INFILTRATION BASIN - TILING BOTTOM SAND LAYER			
9. OTHER PREVENTIVE MAINTENANCE			
A. PARKING LOT SWEEPING			
B. EMPTYING TRASH RECEPTACLES			

**MAINTENANCE WORK ORDER AND CHECKLIST
FOR STORMWATER MANAGEMENT FACILITIES**

NAME OF FACILITY _____
 LOCATION _____ DATE _____
 CREW _____ WORK STARTED _____
 EQUIPMENT _____ WORK COMPLETED _____
 WEATHER _____ TOTAL MANPOWER OF WORK _____

B. CORRECTIVE MAINTENANCE

WORK ITEMS	ITEMS REQUIRED	ITEMS DONE	COMMENTS AND SPECIAL INSTRUCTIONS
1. REMOVAL OF DEBRIS AND SEDIMENT			
2. STRUCTURAL REPAIRS			
3. EMBANKMENTS AND SIDE SLOPES			
4. DEWATERING			
5. BASIN MAINTENANCE			
6. CONTROL OF MOSQUITOES			
7. EROSION REPAIR			
8. FENCE REPAIR			
9. SNOW AND ICE REMOVAL			
10. OTHER			

C. AESTHETIC MAINTENANCE

WORK ITEMS	ITEMS REQUIRED (X)	ITEMS DONE (X)	LOCATION AND COMMENTS
1. GRAFFITI REMOVAL			
2. GRASS TRIMMING			
3. WEEDING			
4. OTHERS			

REMARKS (REFER TO ITEM NO. IF APPLICABLE)

WORK ORDER PREPARED BY: _____

MAINTENANCE LOG FOR
STORMWATER MANAGEMENT
FACILITIES

**MAINTENANCE LOG
FOR STORMWATER MANAGEMENT FACILITIES**

NAME OF FACILITY _____		DATE _____
LOCATION _____	WORK STARTED _____	
CREW _____	WORK COMPLETED _____	
EQUIPMENT _____	TOTAL MANPOWER OF WORK _____	
WEATHER _____		

A. PREVENTATIVE MAINTENANCE

WORK ITEMS	ITEMS REQUIRED	DATE REQUIRED	ITEMS DONE	DATE DONE	COMMENTS AND SPECIAL INSTRUCTIONS
1. GRASS CUTTING					
A. BOTTOMS					
B. EMBANKMENTS AND SIDE SLOPES					
C. PERIMETER AREAS					
D. ACCESS AREAS AND ROADS					
E. OTHERS					
2. GRASS MAINTENANCE					
A. FERTILIZING					
B. RE-SEEDING					
C. DE-THATCHING					
D. PEST CONTROL					
E. OTHERS					
3. VEGETATIVE COVER					
A. FERTILIZING					
B. PRUNING					
C. PEST CONTROL					
D. OTHERS					
4. TRASH AND DEBRIS REMOVAL					
A. BOTTOMS					
B. EMBANKMENTS AND SIDE SLOPES					
C. PERIMETER AREAS					
D. ACCESS AREAS AND ROADS					
E. INLETS					
F. OUTLETS AND TRASH RACKS					
G. OTHERS					
5. SEDIMENT REMOVAL					
A. INLETS					
B. OUTLETS AND TRASH RACKS					
C. BOTTOM					
D. OTHERS					
6. ELIMINATION OF POTENTIAL MOSQUITO BREEDING HABITATS					
7. UNDERGROUND BASIN MAINTENANCE					
A. BOTTOMS					
B. OUTLETS AND TRASH RACKS					
C. ACCESS HATCHES					
D. OTHERS					
8. OTHER PREVENTIVE MAINTENANCE					
A. PARKING LOT SWEEPING					
B. EMPTYING TRASH RECEPTACLES					

**MAINTENANCE LOG
FOR STORMWATER MANAGEMENT FACILITIES**

NAME OF FACILITY _____
 LOCATION _____ DATE _____
 CREW _____ WORK STARTED _____
 EQUIPMENT _____ WORK COMPLETED _____
 WEATHER _____ TOTAL MANPOWER OF WORK _____

B. CORRECTIVE MAINTENANCE

WORK ITEMS	ITEMS REQUIRED	DATE REQUIRED	ITEMS DONE	DATE DONE	COMMENTS AND SPECIAL INSTRUCTIONS
1. REMOVAL OF DEBRIS AND SEDIMENT					
2. STRUCTURAL REPAIRS					
3. EMBANKMENTS AND SIDE SLOPES					
4. DEWATERING					
5. BASIN MAINTENANCE					
6. CONTROL OF MOSQUITOES					
7. EROSION REPAIR					
8. FENCE REPAIR					
9. SNOW AND ICE REMOVAL					
10. SAND LAYER REPLACEMENT					
11. OTHER					

C. AESTHETIC MAINTENANCE

WORK ITEMS	ITEMS REQUIRED	DATE REQUIRED	ITEMS DONE	DATE DONE	COMMENTS AND SPECIAL INSTRUCTIONS
1. GRAFFITI REMOVAL					
2. GRASS TRIMMING					
3. WEEDING					
4. OTHERS					

REMARKS (REFER TO ITEM NO. IF APPLICABLE)

WORK PERFORMED BY: _____

INSPECTION LOG FOR
STORMWATER MANAGEMENT
FACILITIES

**INSPECTION LOG
FOR STORMWATER MANAGEMENT FACILITIES**

NAME OF FACILITY _____

LOCATION _____

DATE _____

WEATHER _____

A. PREVENTIVE MAINTENANCE

FACILITY ITEM	ITEMS REQUIRED	ITEMS DONE	COMMENTS AND SPECIAL INSTRUCTION
1. GRASS CUTTING			
A. BOTTOMS			
B. EMBANKMENTS AND SIDE SLOPES			
C. PERIMETER AREAS			
D. ACCESS AREAS AND ROADS			
E. OTHERS			
2. GRASS MAINTENANCE			
A. FERTILIZING			
B. RE-SEEDING			
C. DE-THATCHING			
D. PEST CONTROL			
E. OTHERS			
3. VEGETATIVE COVER			
A. FERTILIZING			
B. PRUNING			
C. PEST CONTROL			
D. OTHERS			
4. TRASH AND DEBRIS REMOVAL			
A. BOTTOMS			
B. EMBANKMENTS AND SIDE SLOPES			
C. PERIMETER AREAS			
D. ACCESS AREAS AND ROADS			
E. INLETS			
F. OUTLETS AND TRASH RACKS			
G. OTHERS			
5. SEDIMENT REMOVAL			
A. INLETS			
B. OUTLETS AND TRASH RACKS			
C. BOTTOM			
D. VORTECHNIC UNITS			
E. OTHERS			
6. ELIMINATION OF POTENTIAL MOSQUITO			
7. OTHER PREVENTIVE MAINTENANCE			
A. PARKING LOT SWEEPING			
B. EMPTYING TRASH RECEPTACLES			

**INSPECTION LOG
FOR STORMWATER MANAGEMENT FACILITIES**

NAME OF FACILITY _____
 LOCATION _____
 DATE _____
 WEATHER _____

B. CORRECTIVE MAINTENANCE

FACILITY ITEM	ITEMS REQUIRED	ITEMS DONE	COMMENTS AND SPECIAL INSTRUCTION
1. REMOVAL OF DEBRIS AND SEDIMENT			
2. STRUCTURAL REPAIRS			
3. EMBANKMENTS AND SIDE SLOPES			
4. BASIN MAINTENANCE			
5. CONTROL OF MOSQUITOES			
6. EROSION REPAIR			
7. FENCE REPAIR			
8. SNOW AND ICE REMOVAL			
9. BASIN DRAIN TIME			
10. OTHER			

C. AESTHETIC MAINTENANCE

FACILITY ITEM	ITEMS REQUIRED	ITEMS DONE	COMMENTS AND SPECIAL INSTRUCTION
1. GRASS TRIMMING			
2. WEEDING			
3. OTHERS			

REMARKS (REFER TO ITEM NO. IF APPLICABLE)

(1) ITEMS CHECKED ARE IN GOOD CONDITION, AND THE MAINTENANCE PROGRAM IS ADEQUATE.
 (2) ITEMS CHECKED REQUIRE ATTENTION, BUT DOES NOT PRESENT AN IMMEDIATE THREAT TO THE FACILITY FUNCTION OR OTHER FACILITY COMPONENTS.
 (3) THE ITEMS CHECKED REQUIRES IMMEDIATE ATTENTION TO KEEP THE FACILITY OPERATIONAL OR TO PREVENT DAMAGE TO OTHER FACILITY COMPONENTS.
 (4) PROVIDE EXPLANATION AND DETAILS IF COLUMNS 2 OR 3 ARE CHECKED.
 REMARKS (REFER TO ITEM NO. IF APPLICABLE)

INSPECTOR: _____

PROBABLE ANNUAL COSTS FOR
INSPECTION AND PREVENTIVE &
CORRECTIVE MAINTENANCE FOR
STORMWATER MANAGEMENT
FACILITIES

PROBABLE ANNUAL COSTS FOR INSPECTION AND, PREVENTIVE & CORRECTIVE MAINTENANCE
--

OPERATION AND MAINTENANCE OF STORMWATER MANAGEMENT STRUCTURES

Location: Lot 5 in Block 157 in the Township of West Orange, Essex County, New Jersey

	<u>QUANTITY</u>	<u>UNIT</u>	<u>UNIT COST</u>	<u>TOTAL COST</u>
INSPECTION				
Monthly inspection for excessive grass growth	12	Visit	\$250.00	\$3,000.00
Quarterly Inspection for clogging, damage, sedimentation	4	Visit	\$250.00	\$1,000.00
Inspection for clogging, ponding, sedimentation after storm event exceeding 1"	5	Visit	\$250.00	\$1,250.00
Annual inspection for erosion, scour & damage	1	Visit	\$250.00	\$250.00
Annual time-to-drain tests, condition of outlet valves	1	Visit	\$250.00	\$250.00
	Annual Inspection costs			\$5,750.00
PREVENTIVE AND CORRECTIVE MAINTENANCE				
Mow/Trim grass	0.7	Acres	\$50.00	\$35.00
Unblock and vacuum stormwater inlets	1	No	\$20.00	\$20.00
Clean, unblock, and remove sediments from Manhole	1	Lumpsum	\$1,500.00	\$1,500.00
Clean, unblock, and flush stormwater pipes	1,037	FT	\$0.75	\$777.75

Note: Maintenance shall be carried out when and to the extent of the situation as it arises.