

OPERATION AND MAINTENANCE MANUAL **STORMWATER MANAGEMENT FACILITIES**

for a

**PRELIMINARY & FINAL MAJOR SITE PLAN FOR PROPOSED SELF-STORAGE
FACILITY**

of

**BLOCK 1709; LOT 1
2419 HIGHWAY 33**

in

**THE TOWNSHIP OF NEPTUNE
MONMOUTH COUNTY, NJ**

has been prepared for

**PSI ATLANTIC NEPTUNE NJ, LLC
530 OAK COURT DRIVE, SUITE 185**

MEMPHIS, TN 38117

by

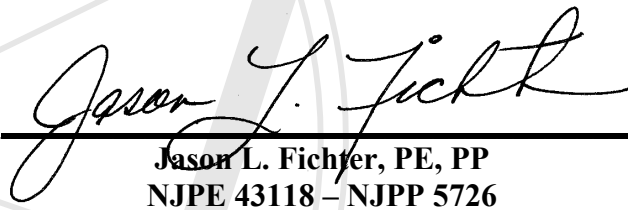
InSite Engineering, LLC

**1955 Route 34, Suite 1A
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CERTIFICATE OF AUTHORIZATION 24GA28083200

on

February 7, 2020


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I. INTRODUCTION

This document has been prepared to provide direction in the maintenance of the stormwater management facilities located at 2419 Route 33, on Lot 1, within Block 1709, in the Township of Neptune, Monmouth County, New Jersey. This manual addresses the maintenance issues for the specific components of the above ground infiltration/detention system and stormwater conveyance systems. This manual also addresses the functional maintenance category, as represented by the preventative maintenance component and the corrective maintenance component, as well as the aesthetic category of the stormwater management systems.

The primary emphasis of this maintenance program is on Preventative rather than Corrective Maintenance. Aesthetic maintenance will also play a key role on this maintenance program. When performed regularly, Aesthetic maintenance will help reduce the required amount of both Preventative and Corrective maintenance. It will maintain the visual appeal of a Stormwater Management Facility and allow it to reflect positively on the maintenance staff, owner, and community.

Both the Township and NJDEP require the following procedures be followed as per NJAC 7:8-5.8:

- a. Copies of the maintenance plan must be provided to the owner and operator of the stormwater management measure. Copies must also be submitted to all reviewing agencies as part of each agency's approval process and in some instances recorded with the County Clerk.
- b. The title and date of the maintenance plan and the name, address, and telephone number of the person with stormwater management maintenance responsibility as specified in the plan must be recorded on the deed of the property on which the measure is located. Any change in this information due, for example, to a change in property ownership, must also be recorded on the deed.

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- c. The person with maintenance responsibility must evaluate the maintenance plan for effectiveness at least annually and revise as necessary.
- d. A detailed, written log of all preventative and corrective maintenance performed at the stormwater management measure must be kept, including a record of all inspections and copies of maintenance-related work orders.
- e. The person with maintenance responsibility must retain and, upon request, make available the maintenance plan and associated logs and other records for review by a public entity with administrative, health, environmental, or safety authority over the site.

II. PROJECT DESCRIPTION

The subject site is specifically identified as Lot 1, within Block 1709, in the Township of Neptune, Monmouth County, New Jersey. The subject property encompasses approximately 3.75 acres which includes a single-family home, storage buildings, multiple greenhouses, and a cell tower with a maintenance building. The project site is located at the intersection of Route 18 and Route 33, in between the entrance ramp from Route 33 Westbound to Route 18 Southbound. The site has frontages on the ramp to Route 18 Southbound on the south, west, and north sides, and Route 18 on the east. The area consists of highways and commercial uses.

The property is zoned within the C-5 Route 33 Commercial Zone in the Hospital Support Overlay. The applicant, PSI Atlantic Neptune NJ, LLC is proposing to develop the subject property with a self-storage facility. The total area of the building is 38,700 square feet. Additional improvements include parking areas, lighting and landscaping measures, stormwater management facilities, and other associated site amenities.

The proposed project includes stormwater management facilities to attenuate the increase in runoff generated by the proposed impervious parking and building surfaces. More specifically, one (1)

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surface infiltration/detention basin located on the north-east side of the property, adjacent to the wetlands. The surface infiltration basin will be utilized to meet required flow rate reductions, groundwater recharge and water quality

III. RESPONSIBILITY FOR OPERATION AND MAINTENANCE

This manual is prepared by InSite Engineering, LLC to provide a mechanism by which remedial repairs and routine maintenance items can be performed to avoid long term degradation of the stormwater management facilities.

The parties responsible for the shared maintenance repair, and guarantee of the stormwater management facilities onsite will be as follows:

PSI Atlantic Neptune, LLC
530 Oak Court Drive, Suite 185
Memphis, TN 38117
Contact Phone Number: 901-290-0184

The drainage plan and any future revisions shall be recorded upon the deed of record for the property. The responsible parties, as indicated above, are to contract directly with outside contractors for the maintenance and repair of the stormwater management facilities.

This includes maintenance of onsite landscape areas and required snow removal operations. Periodic maintenance of the stormwater management facilities is to be contracted with and performed by a qualified contractor.

Should ownership of the property change, permanent arrangements shall be made requiring that the operation and maintenance of all facilities shall pass to any successive owner.

IV. GENERAL MAINTENANCE INFORMATION

This document has been prepared to provide direction in the maintenance of the Stormwater Management Facilities located at 2419 Route 33 within Lot 1 of Block 1709, situated in the Township of Neptune, Monmouth County, New Jersey. A well-organized maintenance manual will protect the Stormwater Management Facility against deterioration while prolonging the life of the facility as well. The manual establishes a basic maintenance program based primarily on systematic inspections of the facility by a representative of the property owner.

A regular inspection means the visual inspection of the facilities at scheduled periods to check for any signs of deterioration in the materials or functioning of the constructed systems. The designated inspector shall perform informal inspections, also identified herein as maintenance inspections. Informal inspection means the visual inspection of the onsite facilities by the inspector to detect any deterioration of the facilities.

During each inspection, a checklist of items shall be used. The completed checklist shall be signed by the inspector and appropriately filed by the owner.

This manual is intended as a guide outlining the proper procedure for conducting routine maintenance for the Stormwater Management Facilities. A copy of this manual shall be provided to the appointed individual or company who will perform the onsite inspections. Should the individual/company responsible for the inspections change, a copy of this manual shall be given to the new inspector to maintain consistency of the inspection reports. A continuous record of the operations and maintenance of the facilities must be maintained. The designated inspectors list lists the official and various contractors responsible for inspections. This section shall be updated periodically pending any changes to the list.

This section of the manual has been prepared to provide the Inspector with a simple and systematic method for inspecting, operating and maintaining the stormwater management system. For the most part, the maintenance for the facilities involves observation rather than evaluation. The following sections provide a step-by-step procedure to assist the inspector in performing all duties

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in a rational and orderly manner. The inspector must become familiar with the background information in this manual.

Finally, prior to conducting an inspection or performing routine maintenance, the inspector must review the Maintenance Tools and Equipment List, and the Inspection and Inspection Checklist located within this manual. Each time an inspection reveals the need for maintenance, the inspector shall notify the owner, who may hire a contractor to perform the work (under the direction of a New Jersey Licensed Professional Engineer as needed). Each time maintenance is performed on the stormwater management facilities, the inspector must record the incident and place a copy of the maintenance checklist on file. Inspections shall be performed a minimum of once every year and after each major storm event of 1 inch of rain or more. Routine maintenance shall be performed after each inspection and each major storm event as required.

This manual addresses the need to properly plan for the maintenance of the Stormwater Management Facilities by addressing the maintenance issues for varying components of the proposed infiltration basin as they relate to preventative maintenance, corrective maintenance, and aesthetic maintenance. Additionally, specific maintenance criteria, as provided by the Stormwater Management Facilities manufacturers, is also included in this manual. This manual also addresses the costs associated with the maintenance requirements for the facilities.

Presented below are descriptions, as provided by the manufacturers, of maintenance procedures that are applicable to the proposed Stormwater Management Facilities. The primary emphasis of this maintenance program is on Preventative rather than Corrective Maintenance. The goal of this maintenance program is to provide a sufficient amount of Preventative Maintenance to minimize (or entirely eliminate) any Corrective Maintenance procedures.

Aesthetic maintenance will also play a key role on this maintenance program. As described below, Aesthetic maintenance procedures can be easily incorporated into a Preventative Maintenance schedule. When performed regularly, Aesthetic maintenance will help reduce the required amount of both Preventative and Corrective maintenance. It will maintain the visual appeal of a

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Stormwater Management Facility and allow it to reflect positively on the maintenance staff, owner, and community.

V. DESIGNATED INSPECTORS LIST

This section must be updated periodically to reflect the name(s) and telephone number(s) of the Inspectors and Contractors who are appointed to perform the inspections and maintenance of the Stormwater Management Facilities:

<u>Inspectors Name/Company</u>	<u>Address</u>	<u>Telephone Number</u>
--------------------------------	----------------	-------------------------

1.

2.

3.

Designated Contractor

1.

2.

3.

<u>Professional Engineer</u>	<u>Address</u>	<u>Telephone Number</u>
------------------------------	----------------	-------------------------

1.

2.

3.

Officers

1.

2.

3.

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VI. INSPECTION AND INSPECTION CHECKLIST

The proposed Stormwater Management Facilities shall be inspected on a regular basis during informal maintenance procedures and after major rainfall events of 1" or more. Additional regularly scheduled inspections shall also occur by qualified personnel. The inspections shall include, but are not limited to, the following:

Informal Inspection:

- a. Inspect inlet structures for debris and trash along pavement areas.
- b. Inspect pavement for signs of settling (depressions) and ponding.
- c. Inspect inlets and manholes for damage to curb pieces, grates, and covers.
- d. Inspect outlet control structures for debris, trash, external damage to structure, and graffiti.
- e. Inspect system bottoms for standing water within 72 hours after storm event.

Regularly Scheduled Inspections

- a. All informal inspection items
- b. Inspect inlet and manhole interiors for sediment, debris, garbage, and structural damage.
- c. Inspect pipes for clogging by sediments, garbage, and debris
- d. Inspect outlet control structures interior for sediment, debris, garbage and structural damage.

The inspection checklist and log should be copied and completed for required items every time an inspection is performed. In general, informal inspections should be performed every 2-4 weeks between March and November. After each inspection, maintenance operations shall be directed as necessary.

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VII. FUNCTIONAL MAINTENANCE

A. Introduction

Functional Maintenance is the maintenance required to keep a Stormwater Management Facility functional or operational at all times. Functional Maintenance includes both preventative (routine) maintenance and corrective (emergency) maintenance.

1. Preventative Maintenance

Preventative Maintenance includes functional maintenance procedures that are required to maintain a Stormwater Management Facility's intended operation and safe condition by preventing the occurrence of problems and malfunctions. Preventative maintenance will be performed in accordance with the direction presented in this manual. Typical routine procedures include grass cutting and fertilizing, silt and debris removal, and upkeep of moving parts. Since it is performed on a regular basis, preventative maintenance is simpler to schedule and budget for and, ultimately, is easier and less expensive to perform than corrective maintenance.

2. Corrective Maintenance

Corrective maintenance includes the functional maintenance procedures that are required to correct a problem or malfunction at a Stormwater Management Facility and to restore the facility's intended operation and safe condition. Based upon the severity of the problem, corrective maintenance must be performed on an as-needed or emergency basis. By its nature, corrective maintenance is much more difficult to schedule and budget for and, ultimately, is generally more difficult and expensive to perform than preventative maintenance.

3. Aesthetic Maintenance

Aesthetic maintenance is the maintenance required to enhance or maintain the visual appeal of a facility. The stormwater facilities have been designed to be an integral component of the development. As such, these facilities should not have an impact on the aesthetic quality of the development as a whole.

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4. Procedures

- a. Copies of the maintenance plan must be provided to the owner and operator of the stormwater management measure. Copies must also be submitted to all reviewing agencies as part of each agency's approval process and in some instances recorded with the County Clerk.
- b. The title and date of the maintenance plan and the name, address, and telephone number of the person with stormwater management maintenance responsibility as specified in the plan must be recorded on the deed of the property on which the measure is located. Any change in this information due, for example, to a change in property ownership, must also be recorded on the deed.
- c. The person with maintenance responsibility must evaluate the maintenance plan for effectiveness at least annually and revise as necessary.
- d. A detailed, written log of all preventative and corrective maintenance performed at the stormwater management measure must be kept, including a record of all inspections and copies of maintenance-related work orders.
- e. The person with maintenance responsibility must retain and, upon request, make available the maintenance plan and associated logs and other records for review by a public entity with administrative, health, environmental, or safety authority over the site.

B. Above Ground Infiltration/Detention Basin

One (1) above ground infiltration/detention basin will be utilized at the project site for stormwater flow rate reductions and the 100-year storm event. The basins will consist of a 6" sand bottom, a berm around the basin to impound detained runoff and an access roadway for maintenance on top of the berm with an access into the interior of the basin. Each of these components needs to be inspected on a regular schedule to determine if any

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maintenance or repairs are required. The following sections outline maintenance and inspection procedures for the basins.

1. Preventative Maintenance Procedures

Preventive maintenance shall be performed on a regular basis to ensure that the basins operate properly and remain aesthetically pleasing. Preventive maintenance shall include but not be limited to the following:

a. Grass Mowing

Grass mowing shall be performed at least once every month during the growing season to prevent the basins from becoming unkempt and overgrown. All grass clippings are to be removed from the basin areas and disposed of properly. Additional vegetative trimming shall be performed to remove any undesirable growth on the embankments. Grass and other ground covers are permitted to grow on the berm surfaces. Trees and shrubs are not permitted as their root clusters may degrade the stability of the structures.

b. Removal and Disposal of Trash and Debris

After any significant rainfall event, and at least every three (3) months, trash and other debris shall be removed from the basins and berms, outlet structure trash racks and other associated areas. Trash should always be disposed of in conformance with current township, county and state standards. Failure to properly clean the trash racks could cause the outlet structures to become clogged and cause the basins to overtop its spillways.

c. Sediment Removal and Disposal

Accumulated sediment should be removed from the basins' fore bay to prevent reduced pond storage, stagnant water and the clogging of outlet structures and soil pores. Sediment volume should be monitored on a bi-yearly basis. Sediment removal and disposal should be completed in accordance with all township, county

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and state regulations. Sediment removal and disposal should be performed on an as-needed basis after every severe storm event. Removal activities should not be undertaken until the basin is thoroughly dry.

d. Grass Maintenance

If required, grass shall be re-seeded and/or fertilized as necessary to ensure a healthy grass cover on all surfaces. Fertilizers should not be over-used to prevent introducing them into the groundwater. A firm and complete grass cover and shallow root mat are essential to prevent erosion and structural degradation. Grass maintenance and inspections shall occur along with grass cutting operations, as necessary.

e. Vegetative Cover and Pest Control

Trees and shrubs are not permitted on the constructed berm surfaces. Pests, especially burrowing animals, shall be controlled and must not be allowed to live on or in the basin berms. All vegetated areas should be inspected biweekly during the 1st growing season and then every 6 months after that for unwanted growth, which should be removed with minimum disruption to the remaining vegetation and basin subsoil.

f. Mosquito Habitats

Any and all shallow stagnant pools of water must be removed by regrading or draining to prevent mosquito breeding habitats. Any and all regrading is subject to approval of a professional engineer licensed in the State of New Jersey appointed by the owner/operator and is subject to all applicable requirements and permits required by the Township and other agencies.

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g. Structural Inspection

All structural components must be inspected for cracking, subsidence, erosion and deterioration at least annually. Structural damage to outlet and inlet structures, trash racks, low-flow channels, flood events or other causes must be repaired promptly. The analysis of the structural damage and the design and performance of the structural repairs should only be performed by a licensed professional engineer.

2. Corrective Maintenance Procedures

Any and all corrective maintenance, which may be required should be performed as soon as possible after the situation that requires attention is reported. Corrective maintenance includes damage caused by vandalism, removal of trash, debris and sediment build-up, and vegetation and pest control. All of these items may threaten the proper operation of the facility.

3. Maintenance Inspection

A routine maintenance inspection should be performed at least once every three months to ensure proper basin and outlet operation, and corrective maintenance applied as necessary. In addition, a maintenance inspection should be performed both whenever a severe storm warning is issued and after a severe storm event has passed.

4. Inspection and Maintenance of Records

Included in Appendix A of this document are checklists and logs, which should be utilized for all maintenance and inspections. The responsible party shall maintain a detailed log of all preventive and corrective maintenance for the structural stormwater management measures, including a record of all inspections and copies of all maintenance-related work orders. The reports should remain on file with the party responsible for maintenance (see Section III below) and be used to evaluate the

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effectiveness of past maintenance and inspections so that future improvements on the schedules can be made.

VIII. MAINTENANCE SCHEDULE

All maintenance shall be completed according to the following schedule. The inspection reports shall be summarized and signed by the inspector. These reports shall include a summary of the performance, condition of the entire stormwater system and recommendations for the repairs and/or replacement of facilities. If any deficiencies are observed in the stormwater management facility, the inspector shall notify the owner that corrective action should be implemented as soon as possible. The inspection reports shall be kept on file by the owners and shall be available for review by governing agencies as required.

Maintenance items required shall be completed as soon as possible after the item is identified for repair. Items under preventative maintenance shall be performed during routine maintenance of the site to ensure that the onsite systems are free of sediments, debris and garbage so that they continue to function in the appropriate manner.

The stormwater management systems shall have informal (preventative maintenance) inspections performed during regularly scheduled landscaping maintenance periods and after significant storm events of 1 inch of rain or more. These inspections shall occur between the months of March and November. A regular inspection for the stormwater facilities shall be performed once every year and shall be performed between the months of March and May or between September and November. The enclosed forms shall be used to assist in the inspection procedure. All maintenance repairs must be completed as outlined in this manual and records of it shall be kept as part of the annual inspection and maintenance report.

IX. MAINTENANCE TOOLS AND EQUIPMENT

The following is a list of required inspection equipment for routine maintenance procedures and inspections.

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1. A clipboard, a pencil and the inspection checklist – the inspection checklist is included in the Appendix.
2. A standard 6-foot collapsible ruler.
3. A camera – photographs or observed portions of the facilities will provide a measure of performance when comparing past and present maintenance practices or conditions.
4. A flashlight – a flashlight can be used to observe the inside of the inlets onsite.

The following is a list of tools and machinery that are typically required to maintain a Stormwater Management Facility.

1. Transportation Equipment
 - a. Trucks for transportation of materials
 - b. Trucks for transportation of equipment
 - c. Vehicles for transportation of personnel
2. Debris, Trash and Sediment Removal Equipment
 - a. Vacuum truck
 - b. Water Jetting units
3. Miscellaneous Equipment
 - a. Shovels
 - b. Rakes
 - c. Picks
 - d. Wheel Barrows
 - e. Painting Equipment
 - f. Gloves
 - g. Standard Mechanics Tools
 - h. Tools for maintenance of equipment
 - i. Safety equipment
 - j. Tools for concrete work (mixers, forms, etc.)

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4. Materials
 - a. Paint
 - b. Paint removers
 - c. Spare parts for equipment
 - d. Concrete

X. MAINTENANCE COSTS

In order to properly implement a stormwater management facilities maintenance plan, the costs associated with the maintenance procedures must be budgeted into the overall design of the system. Please refer to the Probable Costs Data Sheet included within this manual for general costs associated with the necessary equipment needed to maintain the system properly.

XI. REFERENCES

“Maintenance Guidance.” NJDEP New Jersey Department of Environmental Protection, 7 Jan. 2016, www.njstormwater.org/maintenance_guidance.htm.

New Jersey Department of Environmental Protection. April 2004 revised through November 2018. *New Jersey Stormwater Best Management Practices Manual, as amended*.

Stormwater Management Facilities Maintenance Manual. New Jersey Department of Environmental Protection. Trenton, New Jersey

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APPENDIX I

SAMPLE MAINTENANCE WORK ORDER AND CHECKLIST

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**Maintenance Work Order and Checklist
for
Stormwater Facilities
Located at
2419 Route 33; Block 1709, Lot 1**

Preventative Maintenance

Work Item	Items Required	Items Done	Comments and Special Instructions
Trash and Debris Removal			
Bottoms			
Perimeter Areas			
Access Areas and Roads			
Outlet Structure and Trash Racks			
Inlets			
Discharge Pipe			
Other			
Sediment Removal			
Inlets			
Discharge Pipe			
Other			
Mechanical Components			
Locks			
Access Hatches			
Other Preventative Maintenance			

Corrective Maintenance

Work Item	Items Required	Items Done	Location, Comments, and Special Instructions
Removal of Debris & Sediment			
Structural Repairs			
Dewatering			
Erosion Repair			
Snow & Ice Removal			
Other			

Additional Maintenance Remarks and Notes:

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APPENDIX II

SAMPLE MAINTENANCE LOG

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**Maintenance Log
for
Stormwater Facilities
Located at
2419 Route 33; Block 1709, Lot 1**

Date:

--	--	--	--	--

Preventative Maintenance

(place check in box of completed items for each date)

Trash and Debris Removal

System Bottoms					
Perimeter Areas					
Access Areas and Roads					
Outlet Structure and Trash Racks					
Inlets					
Discharge Pipe					

Sediment Removal

Outlet Structure					
Discharge Pipe					
Trash Rack					
System Bottom					
Other					

Mechanical Components

Locks					
Access Hatches					

**Other Preventative
Maintenance**

--	--	--	--	--	--

Corrective Maintenance

(place check in box of completed items for each date)

Removal of Debris & Sediment					
Structural Repairs					
Dewatering					
Erosion Repair					
Snow & Ice Removal					

Aesthetic Maintenance

(place check in box of completed items for each date)

Graffiti Removal					
Vandalism Repair					
Stolen Part Replacement					
Other					

Additional Maintenance Remarks and Notes:

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APPENDIX III

SAMPLE INSPECTION CHECKLIST

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**Inspection Checklist
for
Stormwater Facilities
Located at
2419 Route 33; Block 1709, Lot 1**

Facility Item	O.K.	Routine	Urgent	Comments
Bottoms(Detention and Infiltration				
Standing Water				
Settlement				
Trash and Debris				
Sediment				
Aesthetics				
Other				
Inlet Structure				
Condition of Structure				
Erosion				
Trash and Debris				
Sediment				
Aesthetics				
Other				
Outlet Structure				
Condition of Structure				
Erosion				
Trash and Debris				
Sediment				
Mechanical Components				
Aesthetics				
Other				
Other				
Miscellaneous				
Effectiveness of Existing Maintenance Program				

OK-The item checked is in good condition, and the maintenance program is adequate.

Routine-The item checked requires attention, but does not present an immediate threat to the facility function or other facility components.

Urgent-The item checked requires immediate attention to keep the facility operational or to prevent damage to other facility components.

Comments-Provide explanation and details if columns 2 or 3 are checked

Additional Maintenance Remarks and Notes:

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APPENDIX IV

SAMPLE INSPECTION LOG

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**Inspection Log
for
Stormwater Facilities
Located at
2419 Route 33; Block 1709, Lot 1**

(place check in box of completed items for each date)

Date:

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**Bottoms(Detention and
Infiltration**

Standing Water						
Settlement						
Trash and Debris						
Sediment						
Aesthetics						
Other						

Inlet Structure

Condition of Structure						
Erosion						
Trash and Debris						
Sediment						
Aesthetics						
Other						

Outlet Structure

Condition of Structure						
Erosion						
Trash and Debris						
Sediment						
Mechanical Components						
Aesthetics						
Other						

Miscellaneous

Effectiveness of Existing Maintenance Program						

Additional Maintenance Remarks and Notes:

APPENDIX V

OPINION OF PROBABLE COSTS

InSite Engineering, LLC

1955 Route 34, Suite 1A • Wall, NJ 07719
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**ENGINEERS OPINION OF PROBABLE COSTS
FOR MAINTENANCE OF STORMWATER MANAGEMENT FACILITIES
PREPARED FOR
PSI ATLANTIC NEPTUNE NJ, LLC - 2419 HIGHWAY 33, NEPTUNE**

ESTIMATED ANNUAL COST OF STORMWATER SYSTEMS MAINTENANCE								
FREQUENCY	DESCRIPTION	CREW	COST PER HOUR PER CREW	EQUIPMENT	COST PER HOUR	EST. HOURS	COST	COST PER YEAR
Monthly	Litter pickup and grounds repair at / around inlets to systems, remove sediment/debris from	1 Maint. Person	\$15.00	Hand tools	\$30.00	3.0	\$135.00	\$1,620.00
Quarterly	Clean outlet control structures, system bottoms, inlets and manholes, repair any damage	2 Laborers	\$50.00	Water jet and vacuum trucks, pick-up truck and hand tools	\$200.00	6.0	\$1,800.00	\$7,200.00
TOTAL PER YEAR:								\$8,820.00
Notes: 1. This engineer's estimate has been prepared based upon review of plans entitled "Preliminary & Final Major Site Plan" as prepared this office, dated 02/07/2020.								

APPENDIX VI

DRAINAGE AND DETAILS PLAN

InSite Engineering, LLC

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