



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

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DIVISION OF WATERSHED PROTECTION AND RESTORATION
BUREAU OF NJPDES STORMWATER PERMITTING

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October 24, 2025

Joe Costa
Senior Scientist & Quality Manager
Oldcastle Infrastructure
7000 Central Park, Suite 800
Atlanta, GA 30328

Re: MTD Lab Certification
BioPod HF System
Offline Installation

TSS Removal Rate 80%

Dear Mr. Costa:

The Stormwater Management rules under N.J.A.C. 7:8-5.2(f) and 5.2(j) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). Oldcastle Infrastructure has requested a Laboratory Certification for the BioPod HF System (BioPod HF).

The project falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advanced Technology" dated August 4, 2021. The applicable protocol is the "New Jersey Laboratory Testing Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device" dated January 14, 2022, updated April 25, 2023.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix (dated September 2025) for this device is published online at <http://www.njcat.org/verification-process/technology-verification-database.html>.

The NJDEP certifies the use of the BioPod HF by Oldcastle Infrastructure at a TSS removal rate of 80% when designed, operated and maintained in accordance with the information provided in the Verification Appendix and the following conditions:

1. The maximum treatment flow rate (MTRF) for the manufactured treatment device (MTD) is calculated using the New Jersey Water Quality Design Storm (1.25 inches in 2 hrs) in N.J.A.C. 7:8-5.5.

2. The BioPod HF stormwater treatment device shall be installed using the same configuration reviewed by NJCAT and shall be sized in accordance with the criteria specified in item 6 below.
3. This BioPod HF stormwater treatment device cannot be used in series with another MTD or a media filter (such as a sand filter) to achieve an enhanced removal rate for total suspended solids (TSS) removal under N.J.A.C. 7:8-5.5.
4. Additional design criteria for MTDs can be found in Chapter 9.5 of the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual which can be found on-line at <https://dep.nj.gov/stormwater/>.
5. The maintenance plan for a site using this device shall incorporate, at a minimum, the maintenance requirements for the BioPod HF. A copy of the maintenance plan is attached to this certification. However, it is recommended to review the maintenance website at: https://oldcastleinfrastructure.com/wp-content/uploads/2025/05/6-A-045_BioPod-High-Flow-Operations-and-Maintenance-Manual_WEB.pdf for any changes to the maintenance requirements.
6. For an MTD to be considered “green infrastructure” in accordance with the March 2, 2020 amendments to the Stormwater Management rules at N.J.A.C. 7:8, the MTD must meet the GI definition noted at amended N.J.A.C. 7:8-1.2. Specifically, the MTD shall (1) infiltrate into the subsoil; and/or (2) treat stormwater runoff through filtration by vegetation or soil. Any configuration that uses a bio-filtration media and can be configured "above ground" and incorporate a tree box, planter box, or shrubs, etc., would meet the GI definition. Any MTD with bio-filtration media that would be placed "below ground" as a vault without any vegetation can be considered GI (for NJ purposes) only if the device infiltrates the entire Water Quality Design Storm into the subsoil. Further, the below ground device (vault) would need to meet the NJDEP Stormwater BMP Manual conditions of having the soil below the MTD meet the minimum tested infiltration rate of one inch per hour, have at least two feet of separation from the seasonal high water table, and infiltrate into the subsoil.
7. Sizing Requirements:

The example below demonstrates the sizing procedure for the BioPod HF:

Example: A 0.25-acre impervious site with a slope of 5% is to be treated to 80% TSS removal using a BioPod HF. The hydraulically most distant point to the inlet of the BioPod HF is 110 feet. The site is located in an area for which the projected 2-year storm rainfall depth was calculated to be 3.84 inches.

The selection of the appropriate model of a BioPod HF is based upon both the maximum inflow drainage area and the MTFR. It is necessary to calculate the required model using both methods and to use the largest model determined by the two methods.

Inflow Drainage Area Evaluation:

The drainage area to the BioPod HF in this example is 0.25 acres. Based upon the information in Table 1 below, one 2 X 4 BioPod HF Planter, or one 4 X 4 BioPod HF with External Bypass, or one 4 X 6 BioPod HF with Integral Bypass Tray would be able to treat the runoff without exceeding the maximum allowable drainage area.

Maximum Treatment Flow Rate (MTFR) Evaluation:

The site runoff (Q) was based on the following:

CN = 98 (Curve Number for impervious)

Dimensionless Unit Hydrograph (DUH) = SCS Standard DUH (peak rate factor of 484)

Time of concentration = 0.8 minutes

Q = 0.77 cfs

Given the site runoff is 0.77 cfs and based on Table 1 below, one 7 X 15 BioPod HF Planter, or one 7 X 15 BioPod HF with External Bypass, or one 8 X 16 BioPod HF with Integral Bypass Tray, with an MTFR of 0.993, 0.908 and 1.181 cfs, respectively, would be required to remove 80% of the TSS from the impervious area without exceeding the MTFR.

The MTFR evaluation results will be used since that method results in the highest minimum configuration determined by the two methods.

The sizing table corresponding to the available system model is noted below. Additional specifications regarding the BioPod HF can be found in the Verification Appendix.

Table 1: BioPod HF Model and Associated MTRs

Configuration	Dimensions	Maximum Treatment Flow Rate (cfs)	Effective Filter Treatment Area (sf)	Maximum Inflow Drainage Area (acres)
BioPod HF Planter	2 X 4	0.076	8	0.30
	4 X 4	0.151	16	0.60
	4 X 6	0.227	24	0.90
	4 X 8	0.303	32	1.20
	4 X 12	0.454	48	1.81
	5 X 10	0.473	50	1.88
	6 X 8	0.454	48	1.81
	6 X 12	0.681	72	2.71
	7 X 15	0.993	105	3.95
	8 X 12	0.908	96	3.61
BioPod HF with External Bypass	2 X 4	0.038	4	0.15
	4 X 4	0.076	8	0.30
	4 X 6	0.151	16	0.60
	4 X 8	0.227	24	0.90
	4 X 12	0.378	40	1.50
	5 X 10	0.378	40	1.50
	6 X 8	0.341	36	1.35
	6 X 12	0.568	60	2.26
	7 X 15	0.927	98	3.69
	8 X 12	0.757	80	3.01
BioPod HF with Integral Bypass Tray	4 X 4	0.197	20.86	0.78
	4 X 8	0.273	28.86	1.09
	4 X 12	0.424	44.86	1.69
	6 X 6	0.311	32.86	1.24
	6 X 8	0.424	44.86	1.69
	6 X 10	0.538	56.86	2.14
	6 X 12	0.651	68.86	2.59
	8 X 16	1.181	124.86	4.70

Be advised a detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management Rules, N.J.A.C. 7:8. The plan must include all the items identified in the Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks, indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance and Retrofit of Stormwater Management Measures.

If you have any questions regarding the above information, please contact Lisa Schaefer of my office at lisa.schaefer@dep.nj.gov.

Sincerely,

A handwritten signature in blue ink that reads "Gabriel Mahon". The signature is written in a cursive style with a large initial 'G'.

Gabriel Mahon, Chief
Bureau of NJPDES Stormwater Permitting
Division of Watershed Protection and Restoration
New Jersey Department of Environmental Protection

Attachment: Maintenance Plan

c: Richard Magee, NJCAT

BioPod™ HF

High Flow System with StormMix™ Media

Inspection and Maintenance Manual



BioPod™ High Flow (HF) Biofilter with StormMix™ Biofiltration Media

Description

The BioPod™ HF Biofilter System (BioPod HF) is a storm water biofiltration treatment system used to remove pollutants from storm water runoff. Impervious surfaces and other urban and suburban landscapes generate a variety of pollutants that can enter storm water and contaminate downstream receiving waters unless treatment is provided. The BioPod HF system uses proprietary StormMix™ biofiltration media to capture and retain pollutants including total suspended solids (TSS), metals, nutrients, gross solids, trash and debris.

Function

The BioPod HF system uses engineered, high-flow rate filter media to remove storm water pollutants, allowing for a smaller footprint than conventional bioretention systems. Contained within a compact precast concrete vault, the BioPod HF system consists of a biofiltration chamber and an optional integrated high-flow bypass. The biofiltration chamber is filled with horizontal layers of aggregate, biofiltration media and mulch. Storm water passes vertically down through the mulch and biofiltration media for treatment. The mulch provides pretreatment by retaining most of the solids or sediment. The biofiltration media provides further treatment by retaining finer sediment and dissolved pollutants. The aggregate allows the media bed to drain evenly for discharge through an underdrain pipe or by infiltration.

Inspection & Maintenance Overview

State and local regulations require all storm water management systems to be inspected on a regular basis and maintained as necessary to ensure performance and protect downstream receiving waters. Without maintenance, excessive pollutant buildup can limit system performance by reducing the operating capacity of the system and increasing the potential for scouring of pollutants during periods of high flow.

The BioPod HF may require periodic irrigation to establish and maintain vegetation. Vegetation will typically become established about two years after planting. Irrigation requirements are ultimately dependent on climate, rainfall and the type of vegetation selected.

Inspection & Maintenance Frequency

Periodic inspection is essential for consistent system performance and is easily completed. Inspection is typically conducted a minimum of twice per year, but since pollutant transport and deposition varies from site to site, a site-specific maintenance frequency should be established during the first two or three years of operation.

Inspection Equipment

The following equipment is helpful when conducting BioPod HF inspections:

- Recording device (pen and paper form, voice recorder, iPad, etc.)
- Suitable clothing (appropriate footwear, gloves, hardhat, safety glasses, etc.)
- PPE as required for entry
- Traffic control equipment (cones, barricades, signage, flagging, etc.)
- Manhole hook or pry bar
- Flashlight
- Tape measure
- Socket

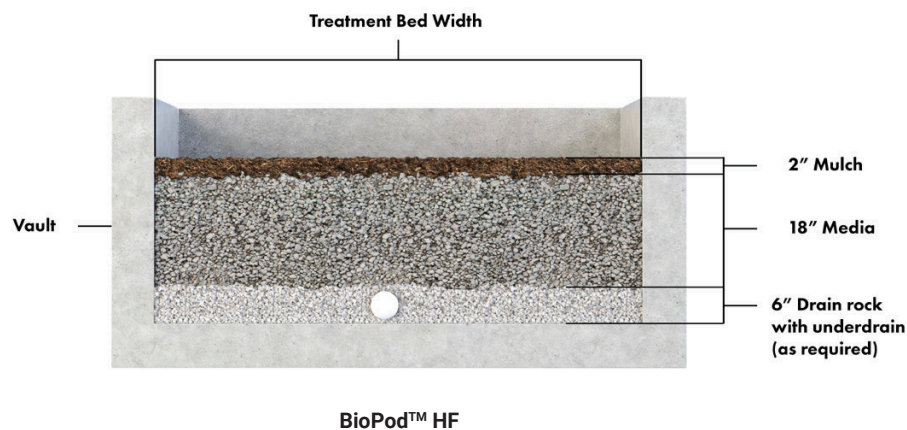
Inspection Procedures

BioPod HF inspections are visual and are conducted without entering the unit. To complete an inspection, safety measures including traffic control should be deployed before the access covers or tree grates are removed. Once the covers have been removed, the following items should be checked and recorded (see form provided on page 8) to determine whether maintenance is required:

- If the BioPod HF unit is equipped with an internal bypass, inspect the inlet chamber and outlet chamber and note whether there are any broken or missing parts. In the unlikely event that internal parts are broken or missing, contact Oldcastle Storm water at (800) 579-8819 to determine appropriate corrective action.
- Note whether the curb inlet or inlet pipe is blocked or obstructed.
- If the unit is equipped with an internal bypass, observe, quantify and record the accumulation of trash and debris in the inlet chamber. The significance of accumulated trash and debris is a matter of judgment. Often, much of the trash and debris may be removed manually at the time of inspection if a separate maintenance visit is not yet warranted.
- If it has not rained within the past 24 hours, note whether standing water is observed in the biofiltration chamber.
- Finally, observe, quantify and record presence of invasive vegetation and the amount of trash and debris and sediment load in the biofiltration chamber. Erosion of the mulch and biofiltration media bed should also be recorded. Often, much of the invasive vegetation and trash and debris may be removed manually at the time of inspection if a separate maintenance visit is not yet warranted. Sediment load may be rated light, medium or heavy depending on the conditions. Loading characteristics may be determined as follows:
 - **Light sediment load** – sediment is difficult to distinguish among the mulch fibers at the top of the mulch layer; the mulch appears almost new.
 - **Medium sediment load** – sediment accumulation is apparent and may be concentrated in some areas; probing the mulch layer reveals lighter sediment loads under the top 1" of mulch.
 - **Heavy sediment load** – sediment is readily apparent across the entire top of the mulch layer; individual mulch fibers are difficult to distinguish; probing the mulch layer reveals heavy sediment load under the top 1" of mulch.

Maintenance Indicators

Mulch acts as a prefilter to protect the StormMix™ media from sediment loading and subsequent loss of hydraulic capacity. As runoff carries sediment into the BioPod HF, the sediment will accumulate on top of the mulch layer and then, over time, begin to work its way down through the mulch and eventually into the media bed. Mulch replacement should be performed when the mulch layer is full of sediment but the StormMix media is still relatively clean. Maintenance personnel should observe sediment accumulation on the surface of the mulch layer and then dig down into the mulch and potentially into the media bed to the point where the mulch or media appears relatively clean. The sediment penetration depth can be used to rate the sediment load and determine maintenance requirements as follows:



Sediment Conditions	Inspection Rating	Maintenance Requirements
Little visible sediment	Light sediment load	None
Sediment on mulch surface only	Light sediment load	None
Sediment throughout mulch layer	Medium sediment load	Minor maintenance
Sediment less than 3" into media layer	Medium sediment load	Minor maintenance
Sediment less more 3" into media layer	Heavy sediment load	Full maintenance
Standing water on top of media layer	Heavy sediment load	Full maintenance

The following photographs help illustrate these conditions.

Light Sediment Load

- Little visible sediment or light sediment on mulch surface only
- Mulch layer appears relatively fresh, open, and fibrous
- No maintenance required



Medium Sediment Load

- Thick sediment throughout mulch layer and up to 3" into top of media layer
- Digging down 3" to 6" below the top of the mulch reveals relatively clean media with little sediment accumulation
- Minor maintenance required



Heavy Sediment Load

- Thick sediment throughout mulch layer and more than 3" into top of the media bed
- Digging down more than 6" below the top of the mulch layer reveals heavy sediment accumulation
- Full maintenance required



Heavy Sediment Load

- Thick sediment and standing water on surface of mulch layer more than 24 hours after a storm event
- Full maintenance required



Maintenance should be scheduled if any of the following conditions are identified during inspection:

- The concrete structure is damaged or the tree grate or access cover is damaged or missing
- The inlet obstructed
- Standing water is observed in the biofiltration chamber more than 24 hours after a rainfall event (use discretion if the BioPod HF is located downstream of a storage system that attenuates flow)
- Trash and debris in the inlet chamber cannot be easily removed at the time of inspection
- Trash and debris, invasive vegetation or sediment load in the biofiltration chamber is heavy or excessive erosion has occurred

Maintenance Equipment

- Suitable clothing (appropriate footwear, gloves, hardhat, safety glasses, etc.)
- PPE as required for entry
- Traffic control equipment (cones, barricades, signage, flagging, etc.)
- Manhole hook or pry bar
- Flashlight
- Tape measure
- Rake, hoe, shovel and broom
- Bucket
- Pruners
- Vacuum truck (optional)
- Socket

Maintenance Procedures

Maintenance should be conducted during dry weather when no flows are entering the system. In most cases, maintenance may be conducted without entering. Entry may be required to maintain depending on system depth. Once safety measures such as traffic control are deployed, the access covers may be removed and the following activities may be conducted to complete maintenance:

- Remove all trash and debris from the inlet chamber manually or by using a vacuum truck as required.
- Remove all trash and debris and invasive vegetation from the biofiltration chamber manually or by using a vacuum truck as required.
- If the sediment load is medium or light but erosion of the biofiltration media bed is evident, redistribute the mulch with a rake or replace missing mulch as appropriate. If erosion persists, rocks may be placed in the eroded area to help dissipate energy and prevent recurring erosion.
- If the sediment load is heavy, remove the mulch layer using a hoe, rake, shovel and bucket, or by using a vacuum truck as required. If the sediment load is particularly heavy, inspect the surface of the biofiltration media once the mulch has been removed. If the media appears clogged with sediment, remove and replace one or two inches of biofiltration media prior to replacing the mulch* layer.
- Prune vegetation as appropriate and replace damaged or dead plants as required.
- Replace the tree grate and/or access covers and sweep the area around the BioPod HF to leave the site clean.
- All material removed from the BioPod HF during maintenance must be disposed of in accordance with local environmental regulations. In most cases, the material may be handled in the same manner as disposal of material removed from sumped catch basins or manholes.

BioPod™ HF

High Flow System with StormMix™ Media

* NoFloat cypress mulch should be used in the BioPod HF. Timely replacement of the mulch layer according to the maintenance indicators described above should protect the biofiltration media below the mulch layer from clogging due to sediment accumulation. However, whenever the mulch is replaced, the BioPod HF should be visited 24 hours after the next major storm event to ensure that there is no standing water in the biofiltration chamber. Standing water indicates that the biofiltration media below the mulch layer is clogged and must be replaced. Please contact Oldcastle Infrastructure at (800) 579-8819 to purchase the proprietary StormMix™ biofiltration media.



Biopod HF Planter

Biopod HF Tree

BioPod HF Inspection & Maintenance Log

BioPod HF Model _____ Inspection Date _____

Location _____

Condition of Internal Components NOTES:
 Good Damaged Missing

Curb Inlet Blocked NOTES:
 Yes No

Standing Water in Biofiltration Chamber NOTES:
 Yes No

Trash and Debris in Inlet Chamber NOTES:
 Yes No

Trash and Debris in Biofiltration Chamber NOTES:
 Yes No

Invasive Vegetation in Biofiltration Chamber NOTES:
 Yes No

Sediment in Biofiltration Chamber NOTES:
 Light Medium Heavy

Erosion in Biofiltration Chamber NOTES:
 Yes No

Maintenance Requirements
 YES - Schedule Maintenance NO - Schedule Re-Inspection



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