State of New Jersey

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Governor

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Lt. Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
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CATHERINE R. McCABE
Commissioner

Jay Holtz, P.E.
Director of Regulatory Management
Oldcastle Infrastructure
7000 Central Parkway, Suite 800
Atlanta, GA 30328

August 6, 2020

Re: MTD Laboratory Certification – Revised Certification
Biopod™ Biofilter with StormMix Media
On-line Installation

TSS Removal Rate 80%

Dear Mr. Holtz:

This revised certification letter supersedes the Department's prior certification dated December 21, 2018. This revision was completed as a result of a change to the company name (formerly Oldcastle Precast), and the development of an updated maintenance manual. Paragraph 6. below has also been added to address green infrastructure. No other modifications were made to this certification.

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7(c) allow the use of 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™ Biofilter with StormMix Media.

This project falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advanced Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device" dated January 25, 2013.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the afore mentioned 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 (with the November 2018 Addendum added to the report dated May 2018) for this device is published online at http://www.njcat.org/uploads/newDocs/BioPodBiofilterReportFinal.pdf.

The NJDEP certifies the use of the Biopod™ Biofilter with StormMix Media 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 subject to the following conditions:

1. The maximum treatment flow rate (MTFR) 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. The MTFR is based on 1.8 gpm/ft^2 (0.004 cfs/ft^2) of effective filtration treatment area.

2. The Biopod™ Biofilter with StormMix Media shall be installed using the same configuration as the unit verified by NJCAT, and sized in accordance with the criteria specified in item 6 below.

3. This 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 9.6 of the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual which can be found on-line at www.njstormwater.org.

5. The maintenance plan for a site using this device shall incorporate, at a minimum, the maintenance requirements for the Biopod™ Biofilter with StormMix Media, which is attached to this document. However, it is recommended to review the maintenance website at https://oldcastleinfrastructure.com/wp-content/uploads/2018/10/BioPod_InspMaint_Jan-2019_v1.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. The Biopod™ BioFilter can be configured in two different manners, either as an open top planter box for shrubs, other smaller plants, or as a grated tree box; or it can be configured as an underground treatment vault fed by a subsurface inlet pipe. With the planter box, this MTD can also be configured with an open bottom configuration to promote infiltration and groundwater recharge. 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 stormwater into the subsoil. Further, an open bottom configuration or below ground device (vault) would need to comply the NJDEP Stormwater BMP Manual conditions of having the most hydraulically restrictive soil layer 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 measured from the lowest point of the system, and infiltrate into the subsoil.

7. Sizing Requirements:

The example below demonstrates the sizing procedure for a Biopod™ Biofilter with StormMix Media.

Example: A 0.25-acre impervious site is to be treated to 80% TSS removal using Biopod™ Biofilter with StormMix Media. The impervious site runoff (Q) based on the New Jersey Water Quality Design Storm was determined to be 0.79 cfs or 354.58 gpm.

The selection of configuration for use in the Biopod™ Biofilter with StormMix Media is based upon both the MTFR and the maximum inflow drainage area. It is necessary to select the configuration using both methods and to rely on the method that results in the larger configuration determined by the two methods.

Inflow Drainage Area Evaluation:

The drainage area to the Biopod™ Biofilter with StormMix Media in this example is 0.25 acres. Based upon the information in Table A-1 below, any of the certified models of Biopod™ Biofilter with StormMix Media can be used to treat the impervious area without exceeding the maximum drainage area.

Maximum Treatment Flow Rate (MTFR) Evaluation:

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

time of concentration = 10 minutes
i = 3.2 in/hr (page 5-8, Fig. 5-3 of the NJ Stormwater BMP Manual)
c = 0.99 (runoff coefficient for impervious)
Q = ciA = 0.99x3.2x0.25 = 0.79 cfs

Based on a flow rate of 0.79 cfs and the information in Table A-1 below, multiple units will be required to use Biopod™ Biofilter with StormMix to treat the impervious area without exceeding the MTFR. Any combination would be acceptable as long as the flowrate to each unit does not exceed its MTFR, the total MTFR for all of the units equals or exceeds 0.79 cfs, and the entire 0.25 acre is treated by one of the units. Two examples are shown below:

Example 1: 9 units of the 4’ x 6’ model without internal by-pass.

9 units x 0.096 cfs (MTFR)=0.864 cfs

Since this exceeds 0.79 cfs, this configuration is acceptable as long as the flow to each individual unit does not exceed the MTFR of 0.096 cfs, and the entire 0.25 acre area is treated by one of the 9 units.

Example 2: 7 units of the 4’ x 8’ model without internal by-pass.

7 units x 0.128 cfs (MTFR)=0.896 cfs

Since this exceeds 0.79 cfs, this configuration is acceptable as long as the flow to each individual unit does not exceed the MTFR of 0.128 cfs, and the entire 0.25 acre area is treated by one of the 7 units.

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

The sizing table corresponding to the available system models are noted below:

Table A-1 BioPod™ Biofilter Model Sizes and New Jersey Treatment Capacities

Configuration	Dimensions (ft)	Effective Filtration Treatment Area (ft^2)	Maximum Treatment Flow Rate (cfs)	Drainage Area (Acres)
BioPod	4 x 4	16	0.064	0.31
	4 x 6	24	0.096	0.47
	4 x 8	32	0.128	0.63
	4 x 12	48	0.192	0.94
	6 x 6	36	0.144	0.70
	6 x 8	48	0.192	0.94
	6 x 12	72	0.288	1.41
	8 x 16	128	0.512	2.50
BioPod with Internal Bypass	4 x 6	20.86	0.083	0.41
	4 x 8	28.86	0.115	0.56
	4 x 12	44.86	0.179	0.88
	6 x 6	32.86	0.131	0.64
	6 x 8	44.86	0.179	0.88
	6 x 10	56.86	0.227	1.11
	6 x 12	68.86	0.275	1.35
	8 x 16	124.86	0.499	2.44

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 of the items identified in Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of 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 Jim Murphy of my office at (609) 633-7021.

Sincerely,

Gabriel Mahon, Chief
Bureau of Nonpoint Pollution Control

Attachment: Maintenance Plan

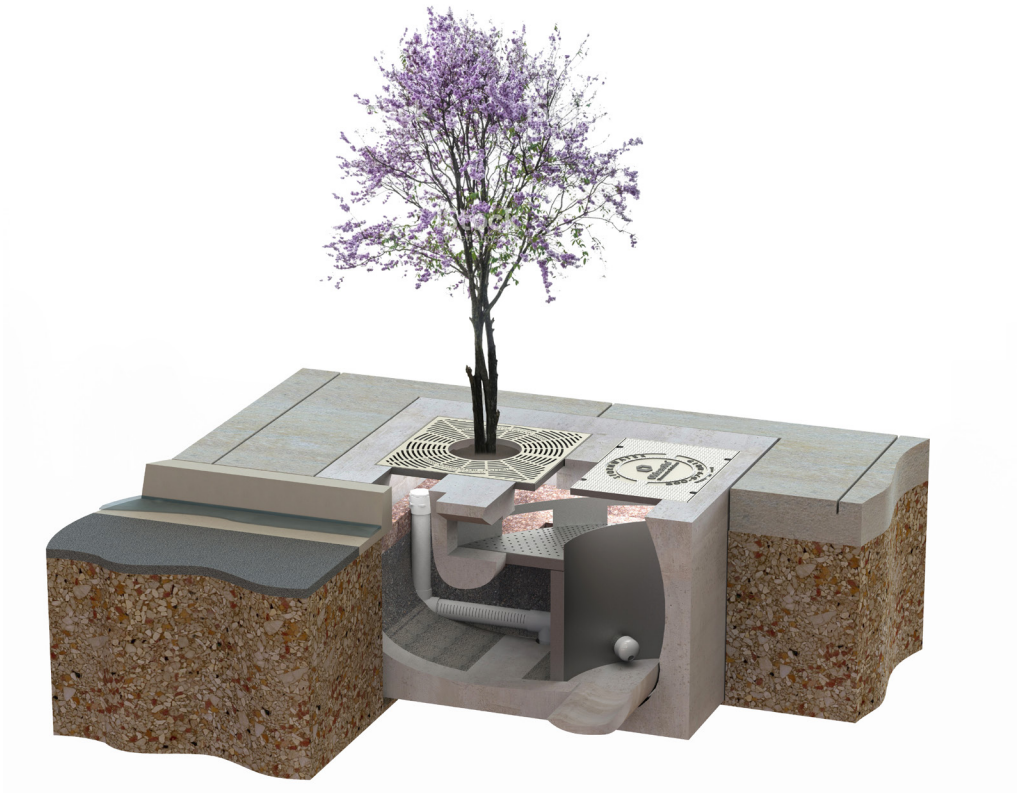
cc: Chron File
Richard Magee, NJCAT
Vince Mazzei, NJDEP - DLUR
Jim Murphy, NJDEP - BNPC
Brian Salvo NJDEP - BNPC

Oldcastle Infrastructure™
A CRH COMPANY

BIOPOD™ SYSTEM

WITH STORMMIX™ MEDIA

Inspection and Maintenance Guide



Water

BioPod™ Biofilter with StormMix™ Biofiltration Media

Description

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

Function

The BioPod system uses engineered, high-flow rate filter media to remove stormwater pollutants, allowing for a smaller footprint than conventional bioretention systems. Contained within a compact precast concrete vault, the BioPod system consists of a biofiltration chamber and an optional integrated high-flow bypass with a contoured inlet rack to minimize scour. The biofiltration chamber is filled with horizontal layers of aggregate (which may or may not include an underdrain), biofiltration media and mulch. Stormwater 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.

Configuration

The BioPod system can be configured with either an internal or external bypass. The internal bypass allows both water quality and bypass flows to enter the treatment vault. The water quality flows are directed to the biofiltration chamber while the excess flows are diverted over the bypass weir without entering the biofiltration chamber. Both the treatment and bypass flows are combined in the outlet area prior to discharge from the structure. BioPod units without an internal bypass are designed such that only treatment flows enter the treatment structure. When the system has exceeded its treatment capacity, ponding will force bypass flows to continue down the gutter to the nearest standard catch basin or other external bypass structure.

The BioPod system can be configured as a tree box filter with tree and grated inlet, as a planter box filter with shrubs, grasses and an open top, or as an underground filter with access risers, doors and a subsurface inlet pipe. The optional internal bypass may be incorporated with any of these configurations. In addition, an open bottom configuration may be used to promote infiltration and groundwater recharge. The configuration and size of the BioPod system is designed to meet the requirements of a specific project.

Inspection & Maintenance Overview

State and local regulations require all stormwater 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.

Some configurations of the BioPod 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.

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 inspections:

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

Inspection Procedures

BioPod 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 6) to determine whether maintenance is required:

- If the BioPod unit is equipped with an internal bypass, inspect the contoured inlet rack 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 Stormwater at (800) 579-8819 to determine appropriate corrective action.
- Note whether the curb inlet, inlet pipe, or – if the unit is equipped with an internal bypass – the inlet rack 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 rack. 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. 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.

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.

Maintenance Indicators

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 curb inlet or inlet rack is obstructed.
- Standing water is observed in the biofiltration chamber more than 24 hours after a rainfall event (use discretion if the BioPod is located downstream of a storage system that attenuates flow).
- Trash and debris in the inlet rack 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

The following equipment is helpful when conducting BioPod maintenance:

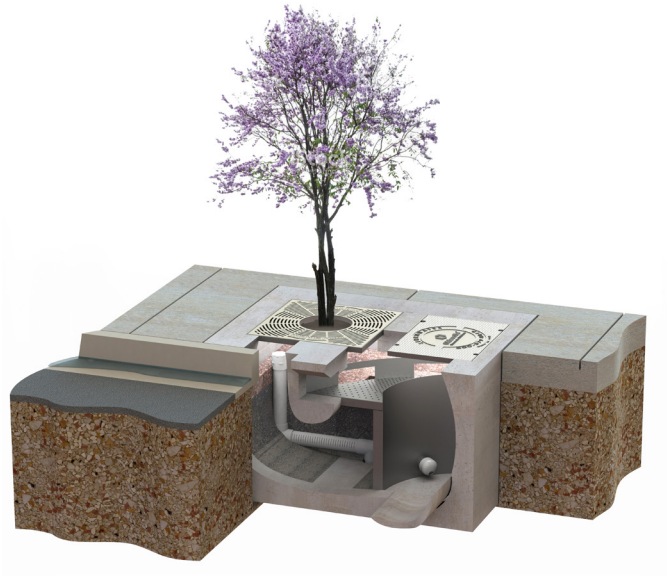
- Suitable clothing (appropriate footwear, gloves, hardhat, safety glasses, etc.)
- Traffic control equipment (cones, barricades, signage, flagging, etc.)
- Manhole hook or pry bar
- Flashlight
- Tape measure
- Rake, hoe, shovel and broom
- Bucket
- Pruners
- Vacuum truck (optional)

Maintenance Procedures

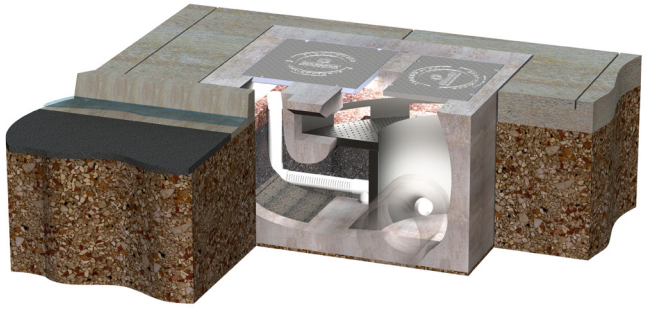
Maintenance should be conducted during dry weather when no flows are entering the system. All maintenance may be conducted without entering the BioPod structure. Once safety measures such as traffic control are deployed, the access covers may be removed and the following activities may be conducted to complete maintenance:

- Remove all trash and debris from the curb inlet and inlet rack 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 to leave the site clean.
- All material removed from the BioPod 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.

Natural, shredded hardwood mulch should be used in the BioPod. 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 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.

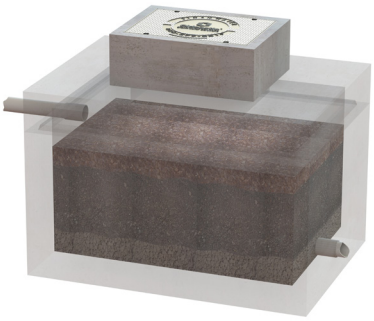


BioPod Tree Module



BioPod Media Module

BioPod Planter Module



BioPod Media Vault

BioPod Inspection & Maintenance Log

BioPod Model_____ **Inspection Date**_____

Location_____

Condition of Internal Components Notes:

☐ Good ☐ Damaged ☐ Missing

Curb Inlet or Inlet Rack Blocked Notes:

☐ Yes ☐ No

Standing Water in Biofiltration Chamber Notes:

☐ Yes ☐ No

Trash and Debris in Inlet Rack 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**

BIOPOD™ SYSTEM

WITH STORMMIX™ MEDIA

OUR MARKETS

BUILDING STRUCTURES

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WATER

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