State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

DIVISION OF WATERSHED PROTECTION AND RESTORATION
BUREAU OF NJPDES STORMWATER PERMITTING & WATER QUALITY MANAGEMENT
P.O. Box 420 Mail Code 501-02A
Trenton, New Jersey 08625-0420
609-633-7021 / Fax: 609-777-0432
https://dep.nj.gov/stormwater/

SHAWN M. LATOURETTE
Commissioner

September 1, 2023

Jim Merchlewitz
Business Development Manager
Xerxes
7901 Xerxes Avenue South, Suite 201
Minneapolis, MN 55431

Re: MTD Lab Certification
HydroChain™ Prime Separator (HCPS)
Online Installation

TSS Removal Rate 50%

Dear Mr. Merchlewitz:

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). Xerxes has requested a Laboratory Certification for the HydroChain™ Prime Separator (HCPS).

The project falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advance Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Laboratory Testing Protocol to Assess Total Suspended Solids Removal by a Hydrodynamic Sedimentation Manufactured Treatment Device" dated January 1, 2021.

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 August 2023) for this device is published online at http://www.njcat.org/verification-process/technology-verification-database.html.

The NJDEP certifies the use of the HCPS by Xerxes at a TSS removal rate of 50% 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 (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.

2. The HCPS 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 HCPS 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 11.3 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 HydroChain Prime Separator. A copy of the maintenance plan is attached to this certification. However, it is recommended to review the maintenance website at https://cdn.shawcor.com/shawcor/files/b8/b8d1c49f-5417-492a-b5ef-cbf32427726c.pdf for any changes to the maintenance requirements.

6. Sizing Requirements:

   The example below demonstrates the sizing procedure for the HydroChain Prime Separator:

   Example: A 0.25-acre impervious site with a slope of 5% is to be treated to 50% TSS removal using a HydroChain Prime Separator (HCPS). The hydraulically most distant point to the inlet of the HCPS 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.

   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, the HydroChain Prime Separator Model HCPS-4 with an MTFR of 1.07 cfs would be the smallest model approved that could be used for this site that could remove 50% of the TSS from the impervious area without exceeding the MTFR.

   The sizing table corresponding to the available system models is noted below. Additional specifications regarding each model can be found in the Verification Appendix under Table A-1.

Table 1: HCPS Models and Associated MTFRs

HCPS Model	Diameter (ft)	Maximum Treatment Flow Rate[1] (cfs)	Effective Treatment Area (sq. ft.)	Hydraulic Loading Rate (gpm/sq. ft.)
HCPS-3	3	0.60	7.07	38.2
HCPS-4	4	1.07	12.57	38.2
HCPS-5	5	1.67	19.63	38.2
HCPS-6	6	2.41	28.27	38.2
HCPS-8	8	4.28	50.27	38.2
HCPS-10	10	6.69	78.54	38.2

[1] Maximum Treatment Flow Rate (MTFR) is based on a verified loading rate of 38.2 gpm/ft^2.

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,

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

Attachment: Maintenance Plan

c: Richard Magee, NJCAT

XERXES®

HydroChain™ Prime Separator Manual

For Installation, Operation & Maintenance in Concrete Manholes

TABLE OF CONTENTS

HOW THE PRIME SEPARATOR WORKS

IMAGE 1

1. Stormwater flows through the inlet pipe into the center of the separator and a deflector plate creates a radial flow pattern.
2. Solids sink to the bottom of the manhole and floatables remain on the surface of the water.
3. Solids collect in the manhole, which is separated hydraulically from the treatment funnel by flow breakers/panels and a grate. Suspended and settled solids are periodically cleaned out when needed.
4. Cleaned water flows evenly upward, along the outer walls of the prime separator.
5. Cleaned water flows over a serrated weir into a channel.
6. The cleaned water flows out of the separator through the outlet pipe.

NOTE TO CONTRACTING INSTALLER:

Before beginning the installation, read through this entire document. Keep this document at the work site to refer to safety procedures as needed. It is the contractor's responsibility to ensure that all the correct piping components required by product and site drawings have been ordered and are at the site before installation begins.

SECTION 1: INTRODUCTION

1. These instructions relate to installing, operating and maintaining the Prime Separator.
2. Compliance with this manual is necessary for the proper handling, installation, maintenance, inspection and operation of these products.
3. It is the responsibility of the project owner and the installing contractor performing the installation to understand and follow all requirements contained in this document (the edition in effect at the time of installation), and to comply with all federal, state or provincial, and local safety regulations that apply.

NOTE: The presence of our representative does not relieve the installer of having sole responsibility for proper installation.

4. No instructions or procedures presented in this manual should be interpreted so as to put at risk any person's health or safety, or to harm any property or the environment.
5. Work must be performed according to standard industry practices applicable to this installation and product operation.
6. Work must comply with all relevant codes, regulations and standards of appropriate governmental agencies, such as:
   - construction, health, safety and environmental codes
   - industry standard practices
   - confined space entry
7. Governmental agency codes, regulations and standards always take precedence over our requirements.
8. Any variation to, or deviation from, these instructions must be approved in writing from us prior to installation.
9. Failure to comply with this document will void our obligations under the applicable limited warranty.
10. If project requirements exceed any of our requirements, the project engineer must consult with our engineers by contacting us at stormwater.eng@shawcor.com for approval.
11. For any questions on the interpretation of these instructions or for any other technical inquiries, contact us at stormwater.eng@shawcor.com.

SECTION 2: PRODUCT DELIVERY AND INSPECTION

12. Check the delivery against the project order. If any components are missing, contact your sales representative.
13. A Prime Separator will be shipped with the following **(See IMAGE 1):**
    - Wood bracing inside separator to be used to lift and place the separator
    - 2 transition plates, and bolts for piping connections
    - 2 anchor plates, and nuts and bolts to attach the separator to the manhole

NOTE: The contractor is to supply a total of 4 anchors (to connect the 2 anchor plates to the manhole) and a minimum of 2 couplers (to connect the transition plate to the storm sewer). It is the contractor's responsibility to check product drawings for site piping and transition plate specifications to ensure that the correct couplers are ordered.

14. Visually inspect the Prime Separator and transition plates – both the interior and exterior – to make sure that no shipping or handling damage has occurred. Look particularly for visible damage, cracks or deep scrapes.

NOTE: Do not attempt any repairs. If damage is detected, contact your sales representative.

SECTION 3: HANDLING AND LIFTING THE PRIME SEPARATOR

NOTE: Protect the Prime Separator from dirt and debris during handling and installation.

15. Before unloading the Prime Separator when it is delivered, select a smooth, solid, level area on which to place it, and clear that area of all large rocks, trash and debris.

NOTICE
The installer must take care so that the Prime Separator is not rolled, dropped or damaged during loading, unloading, handling and installing as this could result in damage to the product.

16. Use the wood bracing inside the separator to lift and set it. **See IMAGE 2.**

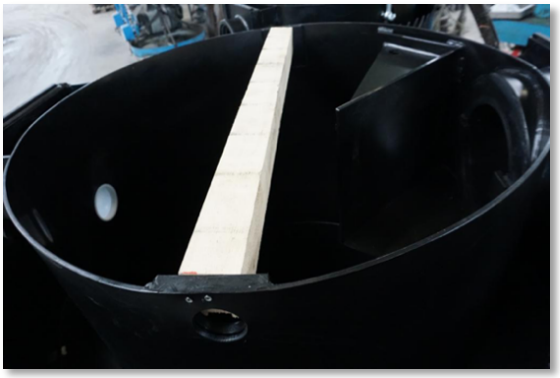


IMAGE 2

⚠ CAUTION
While moving or lifting the Prime Separator, do not position any part of your body underneath it. Failure to follow this caution could result in minor or moderate injury.

SECTION 4: PREPARING THE EXCAVATION AND MANHOLE

⚠ WARNING
Working in and around excavations is dangerous. Prior to beginning work, follow all OSHA and Canadian regulations related to excavations. Collapse of excavation walls could result in death or serious injury.

17. Locate the excavation location according to the project's site plan.
18. Prepare the excavation according to the site requirements and standard industry practices.
19. Make sure excavation walls are supported according to applicable industry and regulatory requirements.
20. Install the concrete manhole according to its manufacturer's instructions.
21. Before installing the manhole, make sure piping openings correspond to product drawings.

SECTION 5: INSTALLING THE PRIME SEPARATOR

22. Before setting the Prime Separator into the excavation, bolt the transition plates to the inlet and outlet openings. **See IMAGE 3.**

IMAGE 3

23. Use the wood brace to set the Prime Separator in the manhole to ensure proper alignment of piping, transition plates and anchor plates.
24. Position and adjust the separator to make sure it is centered and plumb. If needed, use the adjustable bolts on the bottom of the separator to ensure that the separator is plumb and at the correct height. **See IMAGE 4.**

NOTE: Using spacers to attain correct positioning is not allowed.

IMAGE 4

25. Determine and mark the proper position for the anchor plates. **See IMAGE 5.**

IMAGE 5

26. Remove the separator from the manhole.
27. Install the anchor plates. **See IMAGE 6.**

IMAGE 6

28. Place the separator back in the manhole, following above handling and setting instructions.
29. Connect each inlet and outlet piping to the corresponding transition plate with a coupler.

SECTION 6: INSPECTION, MAINTENANCE AND CLEANING

NOTE: Proper and optimum operation of the Prime Separator requires following these recommended inspection, maintenance and cleaning guidelines.

30. The site owner is responsible for creating, recording and retaining inspection and maintenance records in accordance with their own site requirements and applicable regulations. The log at the end of this manual is provided only as an example.
31. After installation, we recommend that the Prime Separator be inspected a minimum of every 6 months, and after major rainfalls or storm events.
32. Inspection may then be increased or decreased based on observation. The owner is responsible for determining the inspection schedule.
33. We recommend that the site owner establish an inspection schedule based on the following factors:
    - Manhole or vault size
    - Site and environmental conditions
    - Drainage area
    - Annual rainfall
    - Volume of stormwater runoff
    - Volume of sediment, dirt, debris and trash entering the system
    - Volume and type of pollutants collected
34. Typically, the manhole must be emptied of sediment every 6 to 36 months.
35. Maintenance frequency is determined by the same factors stated above for determining inspection frequency. The owner is responsible for determining the maintenance schedule.
36. We recommend cleaning the separator using a pump-out vehicle equipped with suction and flushing capabilities, or a submersible sediment (sludge) pump with hoses.
37. Follow these steps to clean the Prime Separator:

- Remove the floatables and oils from the water surface. **See IMAGE 7.**
- Suction out the water until it is level with the top of the grate.
- Remove any existing debris from the grate.
- Lift and secure the hinged grate.
- Suction out the sediment and solids from each section of the manhole. **See IMAGE 8.**
- Rinse the manhole and separator with water.

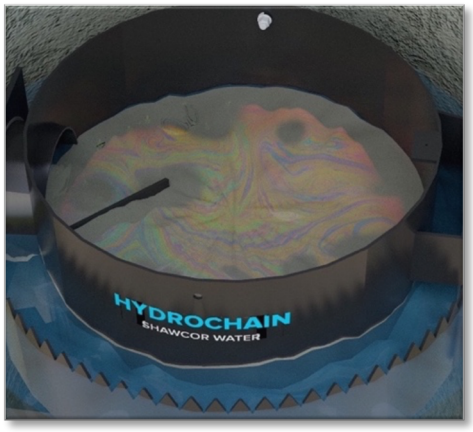


IMAGE 7

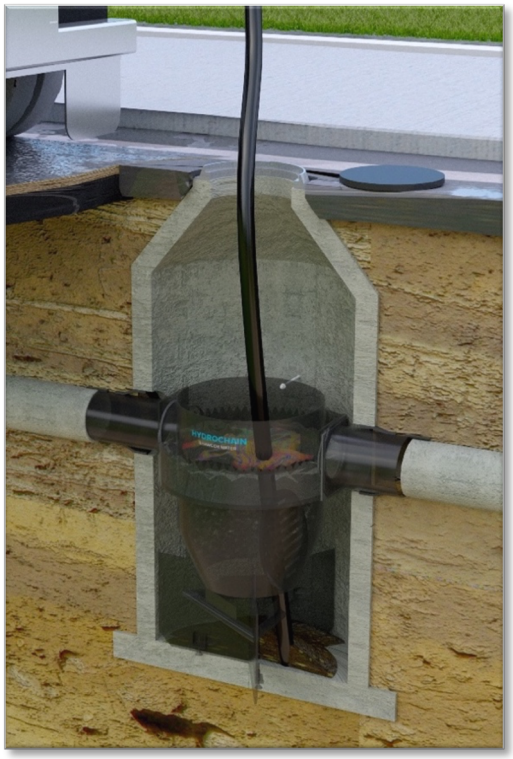


IMAGE 8

38. Close and lock the grate and manhole cover.
39. Dispose of all removed water and waste material in accordance with applicable regulations.
40. Log details of maintenance performed in the inspection, maintenance and cleaning records provided by the site owner.

SAMPLE INSPECTION AND MAINTENANCE RECORD LOG

SITE DATA

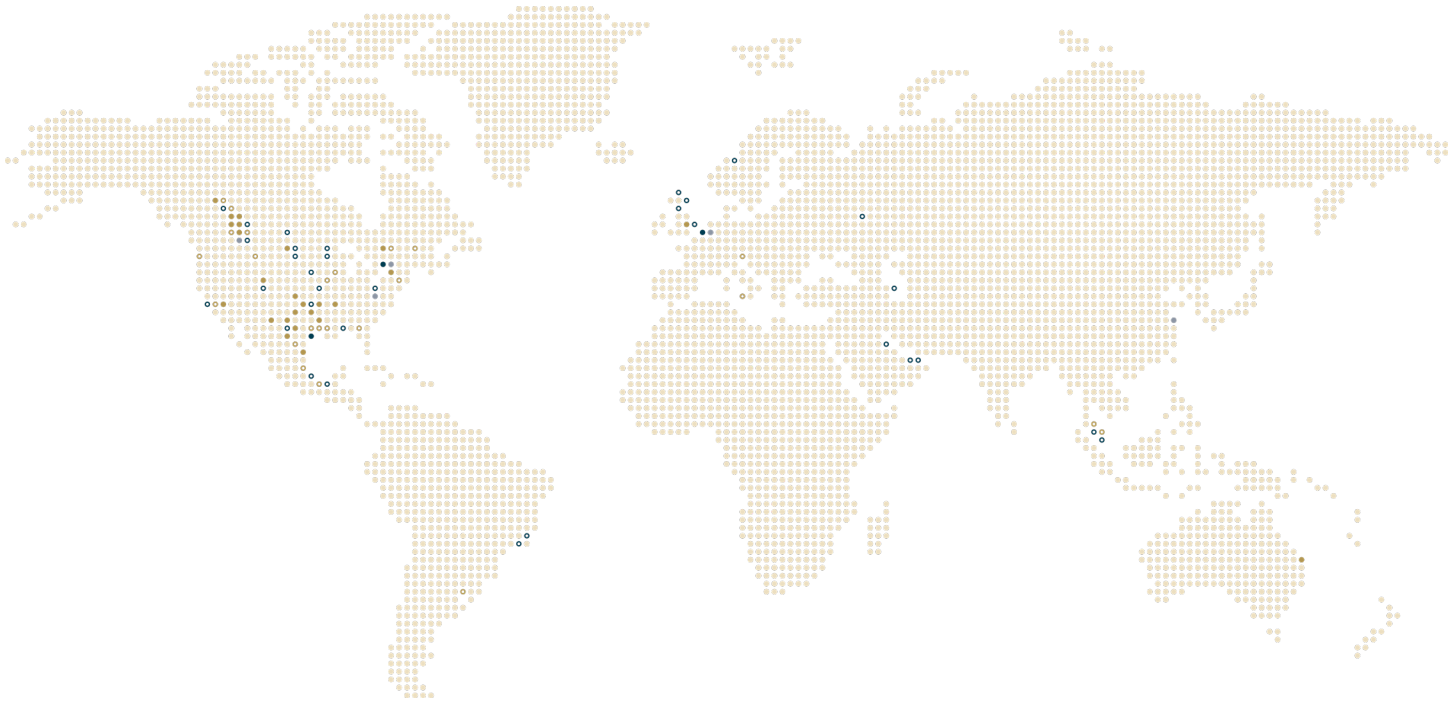
Site Owner	
Site Address	
Product Name & Number	
Order Number	
Installing Contractor	
Installation Date(s)	

INSPECTION AND MAINTENANCE LOG

Specify Inspection or Maintenance					
Date of Inspection or Maintenance					
Name of Inspector or Maintenance Contractor					
Visible Oil Yes / No					
Oil Removed Yes / No					
Floatable Debris Yes / No					
Floatables Removed Yes / No					
Sediment Record depth					
Sediment Removed Yes / No					
Visible Product Damage Yes / No					

NOTE: Consult appropriate regulatory agency for information on disposal of pumped-out water and waste material.

XERXES®



CARING FOR WATER AROUND THE WORLD

When you need to manage and treat stormwater, we have the expertise and technology to meet your requirements.

xerxes.com
watersales@shawcor.com

XHCPSM0123