State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
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Lt. Governor
DIVISION OF WATERSHED PROTECTION AND RESTORATION
BUREAU OF NJPDES STORMWATER PERMITTING & WATER QUALITY MANAGEMENT
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SHAWN M. LATOURETTE
Commissioner

February 11, 2022

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

Re: MTD Lab Certification
HydroChain™ Vortex Filter (HCVF)
Online Installation

TSS Removal Rate 80%

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). Shawcor has requested a Laboratory Certification for the HydroChain™ Vortex Filter (HCVF).

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 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 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 February 2022) for this device is published online at http://www.njcat.org/verification-process/technology-verification-database.html.

The NJDEP certifies the use of the HCVF by Shawcor 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 (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 calculated based on a verified loading rate of 8.24 gpm/ft^2 of effective filtration treatment area.

2. The HCVF shall be installed using the same configuration reviewed 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 11.3 of the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual, which can be found online at www.njstormwater.org.

5. The maintenance plan for a site using this device shall incorporate, at a minimum, the maintenance requirements for the HCVF. 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/hg/medialibraries/shawcor/corporate/pdfs/cps/hydrochain-vortex-filter-manual-02-22.pdf for any changes to the maintenance requirements.

6. Sizing Requirement:

   The example below demonstrates the sizing procedure for the HCVF:

   Example: A 0.25-acre impervious site is to be treated to 80% TSS removal using an HCVF. 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 the appropriate model of an HCVF 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 HCVF in this example is 0.25 acres. Based upon the information in Table 1 below, one HCVF-5 model with 6 HCFC-5 filter cartridges would be the smallest model able to treat the runoff without exceeding the maximum allowable drainage area of the model selected.

   Maximum Treatment Flow Rate (MTFR) Evaluation:

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

   time of concentration = 10 minutes
   i = 3.2 in/hr (page 21, Fig. 5-10 of Chapter 5 of the NJ Stormwater BMP Manual)
   c = 0.99 (runoff coefficient for impervious)
   Q = ciA = 0.99 x 3.2 x 0.25 = 0.79 cfs (354.58 gpm)
   (Note: 1 cfs = 448.83 gpm)

Given the site runoff is 0.79 cfs and based on Table 1 below, one HCVF-9 model with 18 HCFC-5 filter cartridges could be used to treat the impervious area without exceeding the MTFR of the individual model.

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 models is noted below. Additional specifications regarding each model can be found in the NJCAT Verification Report in the Verification Appendix under Tables A-1 and A-2.

Table 1. HydroChain™ Vortex Filter Model MTFRs and Maximum Allowable Drainage Area.

HCVF Model	Manhole Diameter (ft)	Filter Cartridges Model	No. of Cartridges	MTFR (cfs)	Maximum Allowable Drainage Area (acres)
HCVF-4	4	HCFC-4	4	0.119	0.20
HCVF-5	5	HCFC-5	6	0.268	0.44
HCVF-6	6	HCFC-5	7	0.313	0.51
HCVF-7	7	HCFC-5	8	0.358	0.59
HCVF-8	8	HCFC-5	12	0.537	0.88
HCVF-9	9	HCFC-5	18	0.805	1.32
HCVF-10	10	HCFC-5	20	0.895	1.47
HCVF-12	12	HCFC-5	32	1.43	2.35

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 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

cc: Richard Magee, NJCAT