State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATERSHED PROTECTION AND RESTORATION
BUREAU OF NJPDES STORMWATER PERMITTING & WATER QUALITY MANAGEMENT
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https://dep.nj.gov/stormwater/

PHILIP D. MURPHY
Governor

TAHESHA L. WAY
Lt. Governor

SHAWN M. LATOURETTE
Commissioner

June 20, 2024

Jeremy Fink, P.E.
Principal Product Development Engineer
Hydro International (Stormwater)
94 Hutchins Drive
Portland, ME 04102

Re: MTD Lab Certification
Hydro DryScreen Next-Generation Baffle Box
Online Installation

TSS Removal Rate 50%

Dear Mr. Fink:

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). Upstream Technologies, Inc. has requested a Laboratory Certification for the Hydro DryScreen Next-Generation Baffle Box (Hydro DryScreen).

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, 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 June 2024) for this device is published online at http://www.njcat.org/verification-process/technology-verification-database.html.

The NJDEP certifies the use of the Hydro DryScreen by Hydro International 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 Hydro DryScreen 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 Hydro DryScreen 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 Hydro DryScreen. A copy of the maintenance plan is attached to this certification. However, it is recommended to review the maintenance website at https://www.hydro-int.com/sites/default/files/hds_om_manual_a1604.pdf for any changes to the maintenance requirements.

6. Sizing Requirements:

   The example below demonstrates the sizing procedure for the Hydro DryScreen:

   Example: A 0.25-acre impervious site with a slope of 5% is to be treated to 50% TSS removal using a Hydro DryScreen. The hydraulically most distant point to the inlet of the Hydro DryScreen 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 Hydro DryScreen Model 4-ft x 8-ft with an MTFR of 0.89 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.

Table 1: Hydro DryScreen Models and Associated MTFRs

Hydro DryScreen Model	Maximum Treatment Flow Rate (cfs)	Surface Area (sq. ft.)	Hydraulic Loading Rate (gpm/sq. ft.)
3-ft x 6-ft	0.50	18	12.5
4-ft x 8-ft	0.89	32	12.5
6-ft x 12-ft	2.01	72	12.5
8-ft x 14-ft	3.12	112	12.5
10-ft x 18-ft	5.01	180	12.5
12-ft x 22-ft	7.35	264	12.5

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.

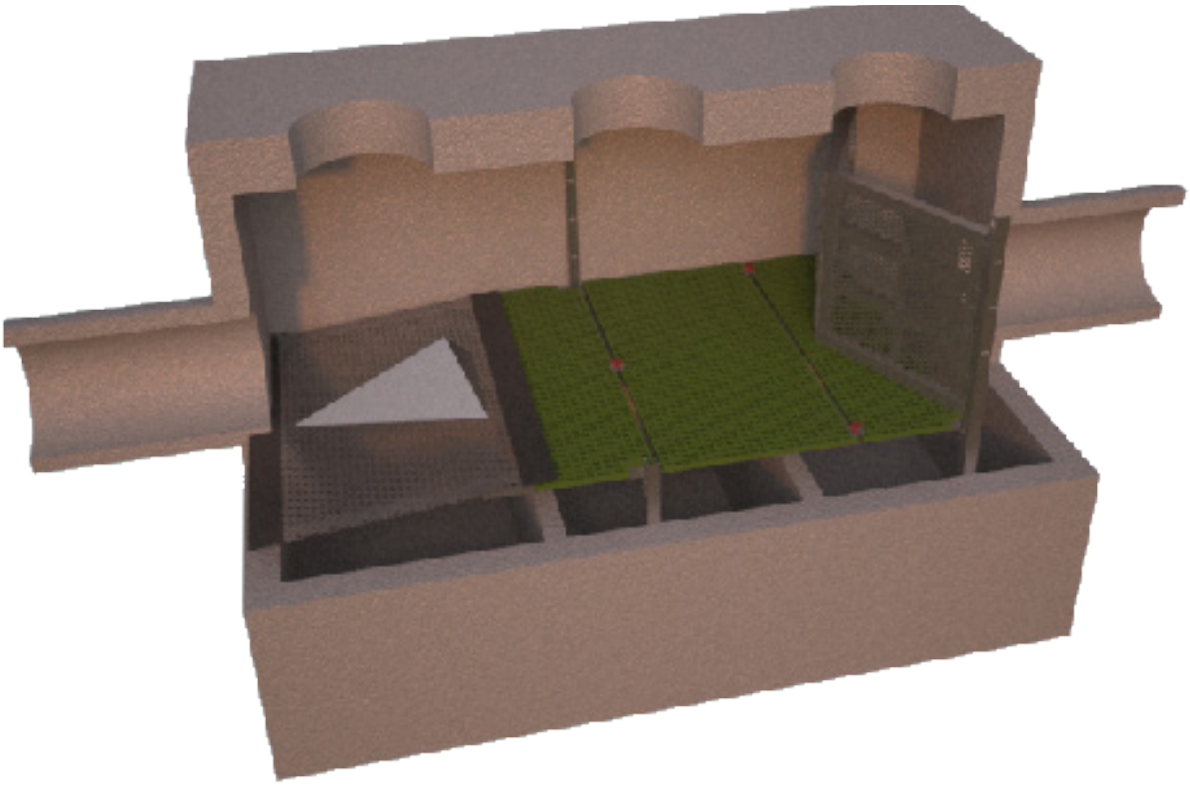
Sincerely,

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

Hydro International



Operation and Maintenance Manual

Hydro DryScreen™

Next Generation Baffle Box

Stormwater Solutions

Turning Water Around ...®

Table of Contents

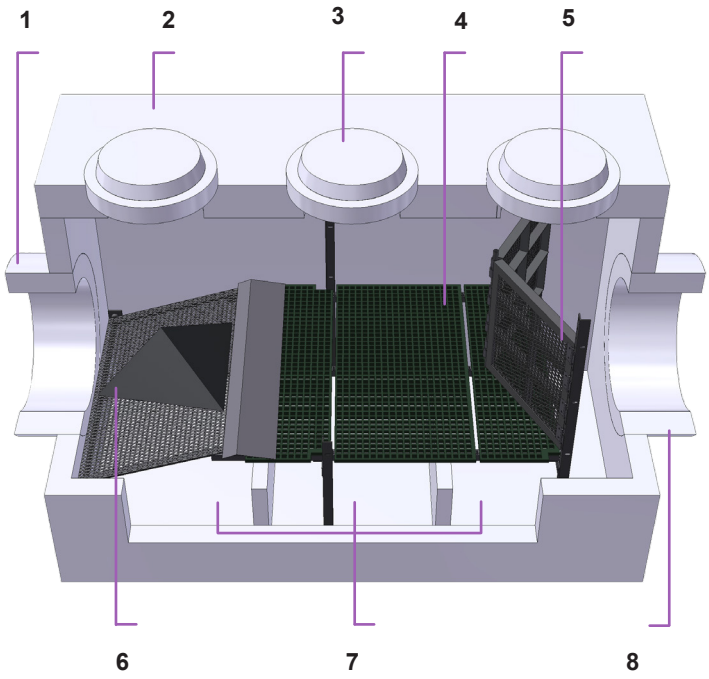
Hydro International (Stormwater), 94 Hutchins Drive, Portland ME 04102
Tel: (207) 756-6200 Fax: (207) 756-6212 Web: www.hydro-int.com

Hydro DryScreen™ by Hydro International

The Hydro DryScreen is a gravity separation system that couples pretreated screening with enhanced Baffle Box sedimentation. There are six standard precast model sizes ranging from the smallest 3-ft. × 6-ft. footprint to the largest having a footprint of 12-ft. by 22-ft. Each model has both a screening and sediment storage capacity that must be periodically inspected and cleaned to ensure proper operation and efficient separation. Figure 1 shows the key components of each Hydro DryScreen and its operation is briefly described to aid in understanding the maintenance procedures

COMPONENTS

1. Inlet Pipe
2. Precast Vault
3. Access Lids
4. Adjustable Height Dry Screen
5. Vertical Screened Weir
6. Flow Spreader
7. Sediment Storage Sump
8. Outlet Pipe



OPERATION

Baffle box sedimentation is a relatively simple pollutant removal process based on the principle of slowing the velocity of flow through a pipe in order to allow solids to settle out of the flow stream.

As stormwater enters the Hydro DryScreen chamber, the flow is diffused and slowed by the Flow Spreader. Gross solids are conveyed around the spreader and captured on the horizontal screen (Fig.1).

As the flow encounters the first baffle wall, the velocity slows again allowing particles to settle. Other solids in the flow stream strike the baffle wall and settle to the sump where their futher movement is impeded by the presence of the baffle. Flow continues through the next two baffle chambers, where smaller particles settle.

POLLUTANT CAPTURE AND RETENTION

The internal components of the Hydro DryScreen have been designed to capture and retain floating pollutants, like trash and organic matter as well as particulate matter that will settle.

A horizontal screen is positioned above the system's sump which allows them to dry out and makes it easier to view during inspections and remove when it's time to clean out. At design flow rates, the vertical screened weir traps and prevents floating pollutants on the horizontal adjustable dry screen from being carried downstream. The storage capacity of each DryScreen model is determined by the height of the vertical screen.

Pollutants that settle during separation and fall into the sump are trapped between two baffle walls. Most of the pollutants that cannot be screened will settle into the first chamber and the adjacent two chambers will capture what does not have time to settle in the first chamber.

WET SUMP

The sump of the Hydro DryScreen retains a standing water level between storm events. The water in the sump prevents stored sediment from solidifying in the base of the unit. (The clean-out procedure becomes more difficult and labor intensive if the system allows fine sediment to dry-out and consolidate. Dried sediment must be manually removed by maintenance crews. This is a labor intensive operation in a hazardous environment.)

BLOCKAGE PROTECTION

Hydraulic testing of the Hydro DryScreen has shown that there is no hydraulic impact even with 75% of the total open area of the screen blinded. While this is an important hydraulic consideration it is still recommended to remove pollutants as they accumulate to prevent them from being lost during the larger less frequent storm events.

MAINTENANCE OVERVIEW

The Hydro DryScreen protects the environment by removing a wide range of pollutants from stormwater runoff. Periodic removal of these captured pollutants is essential to the continuous, long-term operation of the device. The Hydro DryScreen will capture and retain pollutants that float and settle until the storage volumes are full to capacity. When these capacities are reached, the system will no longer perform as intended which may violate the regulations requiring its use. Maximum pollutant storage capacities are provided in Table 1.

The Hydro DryScreen provides surface access for easy and safe inspection, monitoring and clean-out procedures. Three access ports are located in the top of the precast vault. The system can include optional surface access hatches in the horizontal screen intended to opened from the surface using a pole. If the system includes these hatches, there is no need for entry into the vault during maintenance. Without these hatches however, entry is required and proper confined space entry procedures must be followed. If the system must be entered, each unit will have different working clearances above the horizontal screen but the surface is intended for walking on. Once access is gained, the vertical screened weir and sections of the horizontal screen can be opened manually and vactor hose access into each sump chamber is possible. A commercially or municipally owned sump-vac is used to remove screenings and any pollutants that have settled into the wet sump.

Ideally, the Hydro DryScreen is regularly inspected to determine the frequency of a maintenance event and what is required. Maintenance events may only need to address screenings, or only sediment or both. In the case of inspection and floatables removal, a vactor truck may not be required. However, a vactor truck is required if the maintenance event is to include removal of the sump liquid and pollutants.

Determining Your Maintenance Schedule

The frequency of cleanout is determined in the field after installation. During the first year of operation, the unit should be inspected at least every six months to determine the rate of sediment and screenings accumulation. A simple probe such as a Sludge Judge® can be used to determine the level of accumulated solids stored in the sump. This information can be recorded in the maintenance log (attached) to establish a routine maintenance schedule.

Inspection Procedures

Inspection is a simple process that may not have to involve entry into the vault. Maintenance crews should be familiar with the internal components prior to inspection.

Scheduling

- It is important to inspect your Hydro DryScreen at least every six months during the first year of operation to determine your site-specific rate of pollutant accumulation.
- Typically, inspection may be conducted during any season of the year if the winter months do not prevent access to the surface openings.
- Sediment removal is not required unless sediment depths exceed the maximum clean-out depths stated in Table 1.

Recommended Equipment

- Safety Equipment and Personal Protective Equipment
- (traffic cones, work gloves, etc.)
- Crow bar or other tool to remove grate or lid
- Pole with skimmer or net
- Sediment probe (such as a Sludge Judge®)
- Trash bag for removed floatables
- Maintenance Log

Inspection Procedures

1. Set up any necessary safety equipment around the access port or grate of the Hydro DryScreen as stipulated by

Table 1. Hydro DryScreen™ Storage Capacities

Standardized Hydro DryScreen™ Models		Standard Screen Height		Screen Storage Capacity		Standard Sump Depth		Sediment Storage Capacity	
(ft)	(m)	(ft)	(m)	(yd^3)	(m^3)	(ft)	(m)	(yd)	(m)
3 x 6	1.8 x 0.9	2	0.6	0.9	0.7	1.7	0.5	0.6	0.5
4 x 8	2.4 x 1.2	2.5	0.8	2.5	1.7	2.1	0.6	1.1	0.8
6 x 12	3.7 x 1.8	3.5	1.1	8	5	2.6	0.8	2.5	1.9
8 x 14	4.3 x 2.4	4	1.2	14.2	9.1	3.2	1.0	4.0	3.0
10 x 18	5.5 x 3.0	4.5	1.4	22.9	14.7	3.9	1.2	6.4	4.9
12 x 22	6.7 x 3.7	5	1.5	38.9	26.8	4.6	1.4	9.5	7.2

local ordinances. Safety equipment should notify passing pedestrian and road traffic that work is being done.
2. Remove the lids to the manhole.
3. Without entering the vessel, look down into the chamber to inspect the inside. Make note of screenings and volumes with concern for them to exceed the weir height.
4. Without entering the vessel, use the pole with the skimmer net to remove and screenings and loose debris from horizontal screen.
5. If the DryScreen has been outfitted with optional surface access hatches in the screen, open the hatches from the surface with the pole and measure the depth of the sediment that has collected in the sump of the vessel using a sediment probe such as a Sludge Judge®. The sediment sump closest to the inlet pipe will typically accumulate the most sediment and the depth in this area should be used to assess if maintenance is required.
6. On the attached Maintenance Log, record the date, unit location, estimated volume of screenings and gross debris removed, and the depth of sediment measured. Also note any apparent irregularities such as damaged components or blockages.
7. Securely replace the access covers.
8. Take down safety equipment.
9. Notify Hydro International of any irregularities noted during inspection.

Screenings & Sediment Cleanout

The access openings or ports located at the top of the precast vault provide unobstructed access for a vactor hose and skimmer pole to be lowered onto the horizontal screens and sump. Screenings may also be removed by hand or by vacuuming and can typically be scheduled with sediment removal. A commercially or municipally owned sump-vac is used to remove captured screenings and sediment.

Scheduling

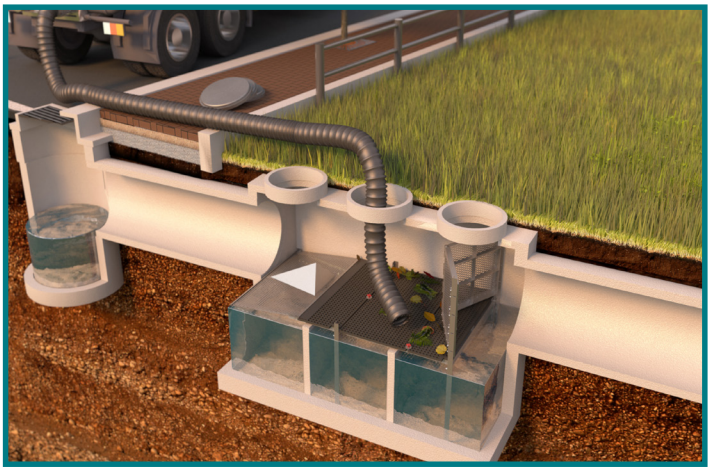
- Floatables and sump cleanout are typically conducted once a year during any season but weather and cold temperatures should be considered.
- If sediment depths are greater than 50% of maximum clean-out depths stated in Table 1, sediment removal is required.

Recommended Equipment

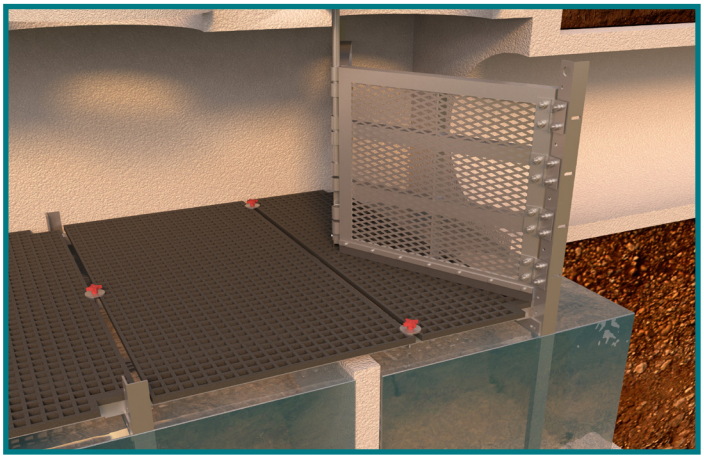
- Safety Equipment (traffic cones, etc.)
- Crow bar or other tool to remove grate or lid
- Pole with skimmer or net (if only floatables are being removed)
- Sediment probe (such as a Sludge Judge®)
- Vactor truck (6-inch/150mm diameter flexible hose recommended)
- Hydro DryScreen Maintenance Log

Floatables and Sediment Clean out Procedures

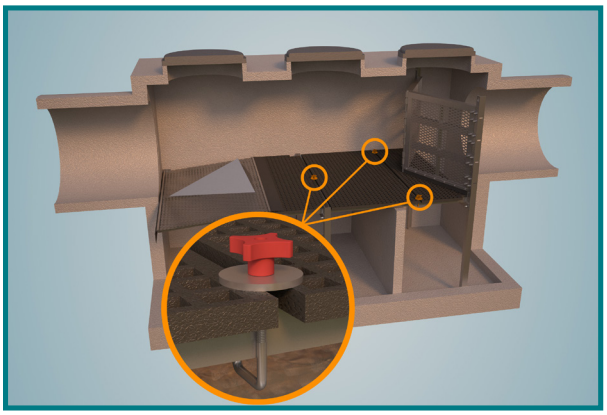
1. Set up any necessary safety equipment around the access ports as stipulated by local ordinances. Safety equipment should notify passing pedestrian and road traffic that work is being done.
2. Remove access lids and visually inspect the inside of the vault. Document observations and take pictures. Estimate and record the screenings and sediment depths in the maintenance log.
3. Using a vactor removal system, vacuum pollutants trapped on the screen above the horizontal baffle walls and behind the vertical weir.



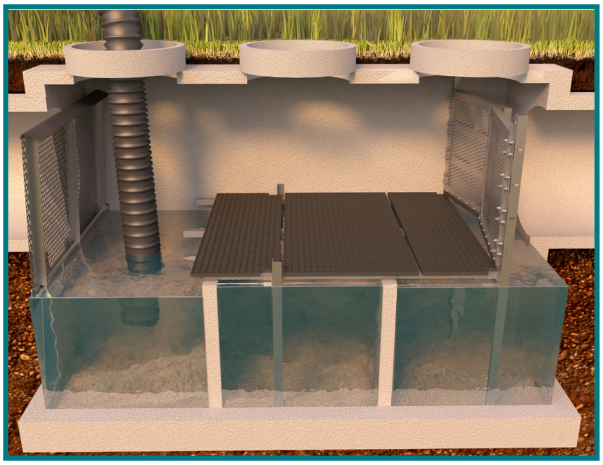
4. If provided, access the sump through the surface access hatches. Otherwise enter the system and follow Steps 5-10.
5. Remove the hinge pin from weir wall. Push Vertical Screened Weir towards the outlet pipe allowing rear panel to be removed.



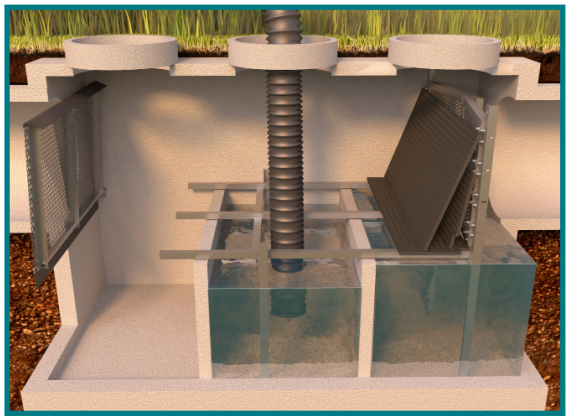
6. Remove the red hold down clamps from the horizontal screen if provided. This will allow the screens to be removed for sump access.



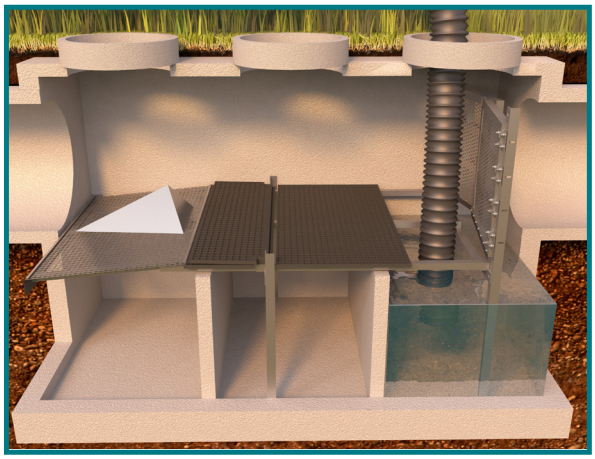
7. Vacuum sediment and liquid from the first section of the sump. Return the inlet screen back into position, resting on the central screen.



8. Vacuum sediment and liquid from the second section, replace the screen and re-attach the hold-downs.



9. Vacuum sediment and liquid from the third section, under the closed weir walls. Move the doors of the weir wall back into position and replace the hinge pin.



10. Pull all sections back as you found them and reapply the red hold down clamps.

11. Take pictures of cleaned system, exit the Hydro DryScreen and replace the access.

Activity	Frequency
Inspection	- At least every six months during first year of installation - Every six months after the first year of installation
Screenings Removal	- Once per year, with sediment removal - Following a spill in the drainage area
Sediment Removal	- Once per year or as needed - Following a spill in the drainage area

Hydro DryScreen® Installation Log

HYDRO INTERNATIONAL REFERENCE NUMBER:	
SITE NAME:	
SITE LOCATION:	
OWNER:	CONTRACTOR:
CONTACT NAME:	CONTACT NAME:
COMPANY NAME:	COMPANY NAME:
ADDRESS:	ADDRESS:
TELEPHONE:	TELEPHONE:
FAX:	FAX:

INSTALLATION DATE: / /

MODEL (CIRCLE ONE):

3-FT X 6 FT (0.9M X 1.8M) 4-FT X 8-FT (1.2m X 2.4m) 6-FT X 12-FT (1.8m X 3.6m) 8-FT X 14-FT (2.4m X 4.3m) 10-FT X 18-FT (3.0m X 5.5m) 12-FT X 22-FT (3.7m X 6.7m)

Hydro International (Stormwater), 94 Hutchins Drive, Portland ME 04102
Tel: (207) 756-6200 Fax: (207) 756-6212 Web: www.hydro-int.com

Hydro DryScreen® Maintenance Log

Site Name: _____ Owner Change since last inspection? Y N

Location: _____

Owner Name: _____

Address: _____ Phone Number: _____

Site Status: _____

Date: _____ Time: _____ Site conditions*: _____

**(Stable, Under Construction, Needing Maintenance, etc.)*

Date	Initials	Depth of Floatables and Oils Removed	Sediment Depth Measured Prior to Removal	Site Activity and Comments

*Note: Sediment removal is not required unless sediment depths exceed 50% of maximum clean-out depths stated in Table 1.

Notes

Hydro International (Stormwater), 94 Hutchins Drive, Portland ME 04102
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Hydro DryScreen® Inspection Log

Site Name: _____ Owner Change since last inspection? Y N

Location: _____

Owner Name: _____

Address: _____ Phone Number: _____

Site Status: _____

Date: _____ Time: _____ Site conditions*: _____

**(Stable, Under Construction, Needing Maintenance, etc.)*

Inspection Frequency Key: A=annual; M=monthly; S=after major storms

Inspection Items	Inspection Frequency	Inspected? (Yes/No)	Maintenance Needed? (Yes/No)	Comments/Description
Debris Removal				
Adjacent area free of debris?	M			
Inlets and Outlets free of debris?	M			
Chamber free of debris?	M			
Vegetation				
Surrounding area fully stabilized? (no evidence of eroding material in Hydro DryScreen®)	A			
Grass mowed?	M			
Water retention where required				
Water holding chamber(s) at normal pool?	M			
Evidence of erosion?	A			
Sediment Deposition				
Sedimentation sump not more than 50% full?	A			
Structural Components				
Any evidence of structural deterioration?	A			
Rim & cover in good condition?	A			
Spalling or cracking of structural parts?	A			
Outlet/Overflow Spillway	A			
Other				
Noticeable odors?	A			
Evidence of flow bypassing facility?	A			

Inspector Comments: _____

_____

_____

_____

Overall Condition of Hydro DryScreen: Acceptable ☐ Unacceptable ☐

***"Acceptable" would mean properly functioning; "unacceptable" would mean damaged or required further maintenance.*

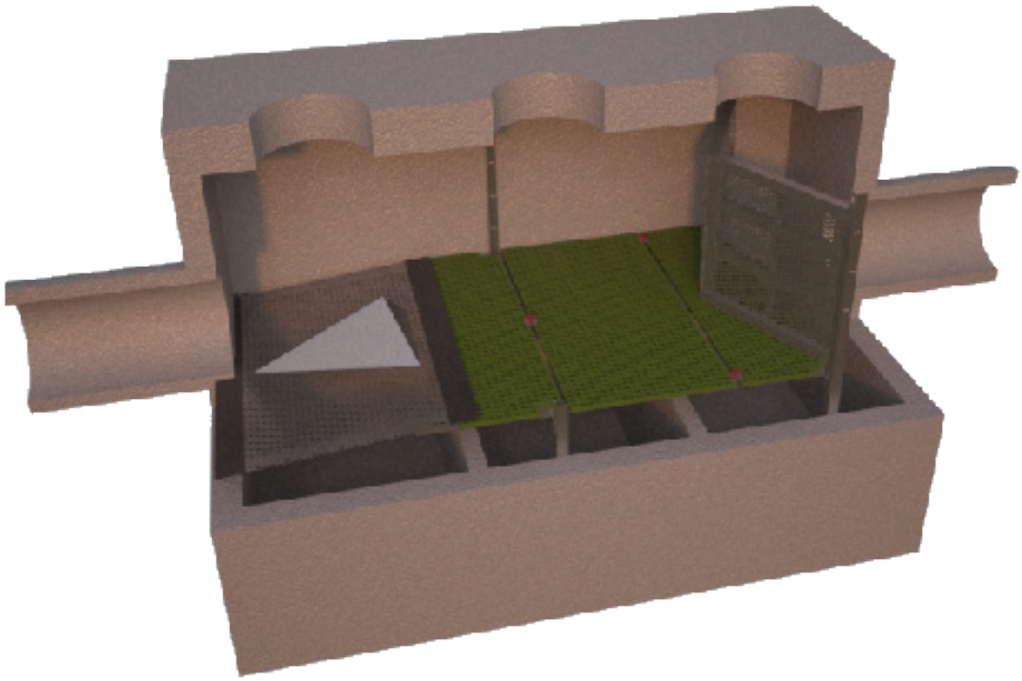
If any of the above Inspection Items are checked "Yes" for "Maintenance Needed", list Maintenance actions and their completion dates below:

Maintenance Action Needed	Due Date

The next routine inspection is schedule for approximately: (date) _____

Inspected by: (signature) _____

Inspected by: (printed) _____



Need Maintenance for your Hydro DryScreen?

Call 1 (800) 848 - 2706

Stormwater Solutions

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