

Operation and Maintenance Manual

Hydro DryScreen™

Next Generation Baffle Box

Stormwater Solutions
Turning Water Around ...®

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Hydro DryScreen™ by Hydro International

The Hydro DryScreen is a gravity separation system that couples pretreated screening with enhanced Baffle Box sedimentation. There are five standard precast model sizes ranging from the smallest 4-ft. × 8-ft. footprint to the largest having a footprint of 12-ft. by 20-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

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).

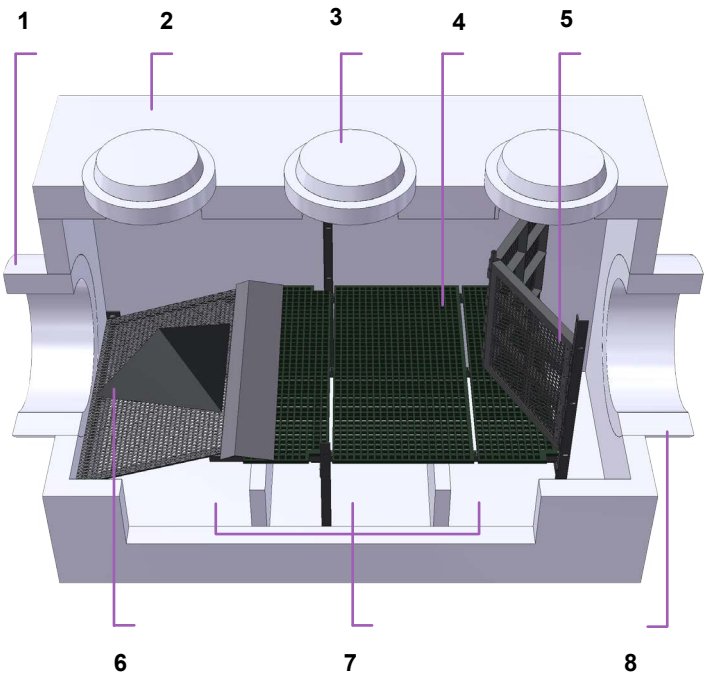
As the flow encounters the first baffle wall, the velocity slows again allowing particles to settle. Other solids in the flow stream strike the baffle wall and settle to the sump where their further movement is impeded by the presence of the baffle. Flow continues through the next two baffle chambers,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



not 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. The sump depth on standard models is 3-ft which is the maximum sediment storage depth.

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. A commercially or municipally owned sump-vac is used to remove screenings and any pollutants that have settled into the wet sump. Three access ports are located in the top of the precast vault. Each system will have different heights above the horizontal screen but it is intended for walking on. Once access is gained, the vertical screened weir and sections of the horizontal screen can be opened. Once opened, vactor hose access into each sump chamber is possible. The sump liquid and particulate matter is easily removed to proper disposal.

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. Maintenance events will require entry into the underground vault or confined space entry. Components have been designed to open for access to the sump chambers and do not require removal. 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 every three to 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 every three to 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)	(yd³)	(m³)	(ft)	(m)	(yd³)	(m³)
4 x 8	1.2 x 2.4	2.5	0.76	2.5	1.7	3.0	0.91	3.6	2.8
6 x 12	1.8 x 3.7	3.5	1.07	8.0	5.0	3.0	0.91	8.0	6.1
8 x 14	2.4 x 4.3	4.0	1.22	14.2	9.1	3.3	1.01	13.8	10.6
10 x 16	3.0 x 4.9	4.5	1.37	22.9	14.7	3.8	1.16	22.7	17.3
12 x 20	3.7 x 6.1	5.0	1.52	38.9	26.8	4.0	1.22	35.6	27.1

- 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. Using a sediment probe such as a Sludge Judge®, measure the depth of sediment that has collected in the sump of the vessel.
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 75% of maximum clean-out depths stated in Table 1, sediment removal is required.

Recommended Equipment

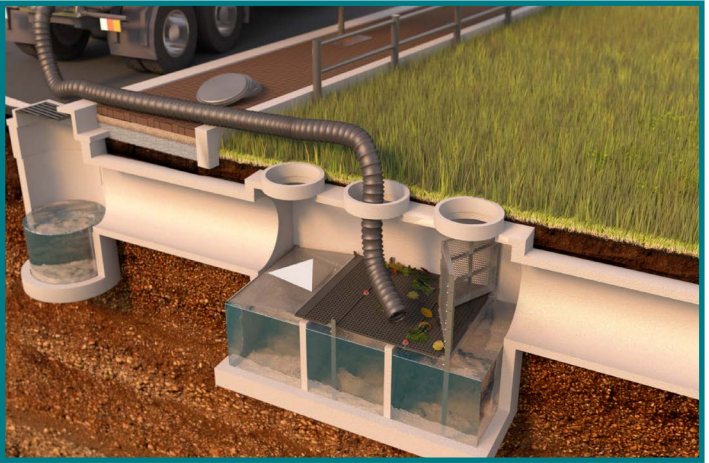
- Safety Equipment (traffic cones, etc.)
- Crow bar or other tool to remove grate or lid
- Pole with skimmer or net (if only floatables are being removed)
- Sediment probe (such as a Sludge Judge®)
- Vactor truck (6-inch/150mm diameter flexible hose recommended)
- Hydro DryScreen Maintenance Log

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.

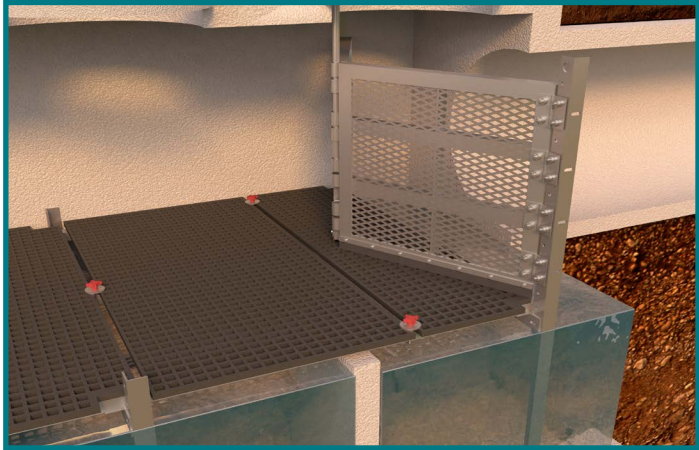
2. Remove access lids and visually inspect the inside of the vault. Document observations and take pictures. Estimate and record the screenings and sediment depths. Update the maintenance log.

3. Using a vactor removal system, vacuum pollutants trapped on the screen above the horizontal baffle walls and behind the vertical weir.

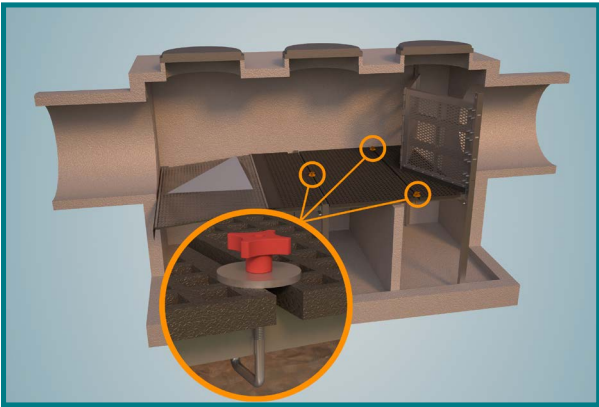


4. Using confined space entry procedures, enter the Hydro DryScreen.

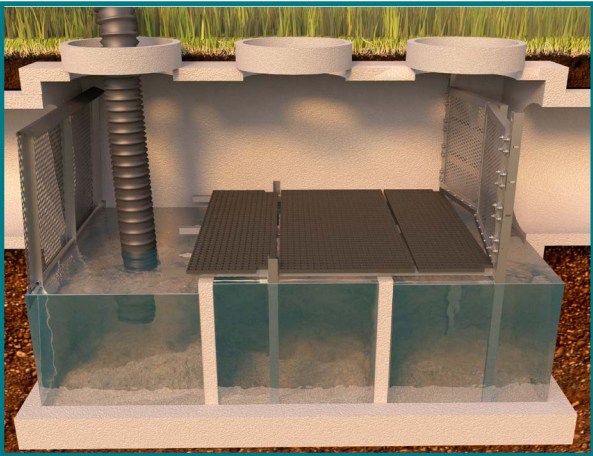
5. Remove the hinge pine from the weir wall. Push weirwall



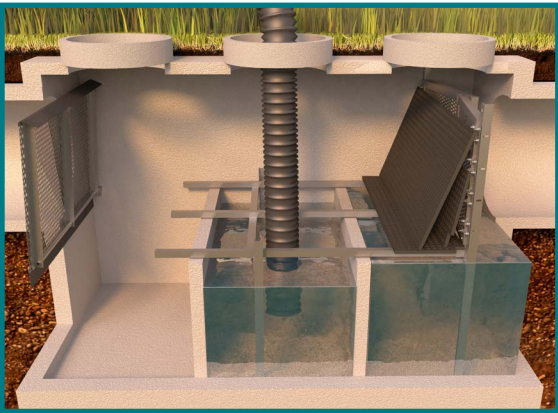
6. Remove the red hold down clamps.



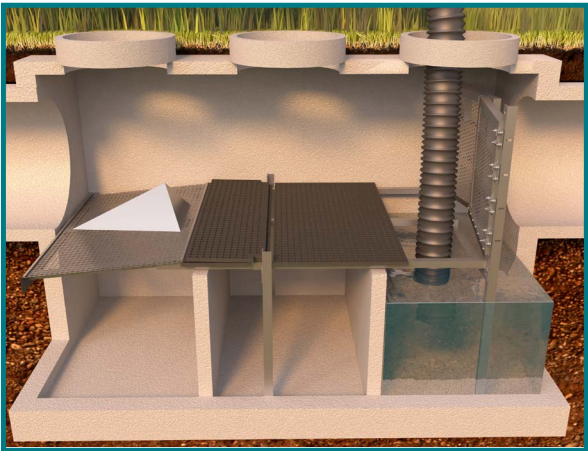
7. Vacuum sediment and liquid from the first section of the sump. Return the inlet screen back into position, resting on the central screen.



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	<ul style="list-style-type: none">- Regularly during first year of installation- Every 3-6 months after the first year of installation
Screenings Removal	<ul style="list-style-type: none">- Once per year, with sediment removal- Following a spill in the drainage area
Sediment Removal	<ul style="list-style-type: none">- 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): 4-FT X 8-FT 6-FT X 12-FT 8-FT X 14-FT 10-FT X 16-FT 12-FT X 24-FT
 (1.2m X 2.4m) (1.8m X 3.6m) (2.4m X 4.2) (3m X 4.8m) (3.7m X 7.3)



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 75% of maximum clean-out depths stated in Table 1.

Notes



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 Downstream Defender®)	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.*

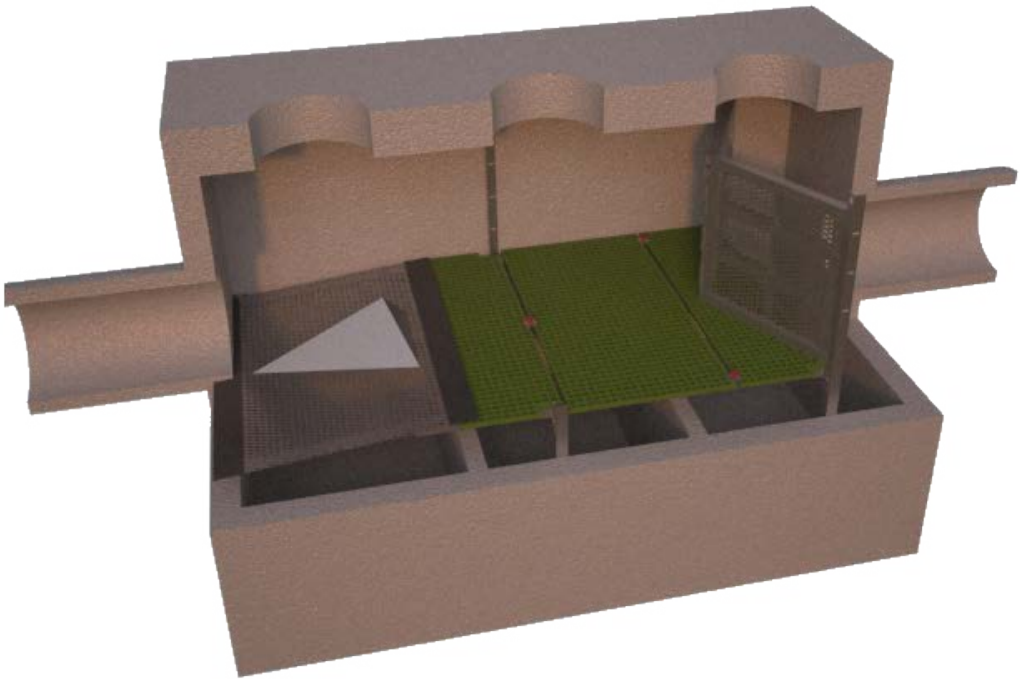
If any of the above Inspection Items are checked "Yes" for "Maintenance Needed", list Maintenance actions and their completion dates below:

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

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