Stormwater Quality Unit Description

The Prinsco Stormwater Quality Unit (SWQU) is designated to work in a wide range of operating conditions for stormwater applications. This system is built off engineering principles specially designed to remove debris collected in runoff including trash, sediment, oils, and other suspended solids.

Inspection and Maintenance Overview

Maintaining a clean and obstruction free SWQU is essential to ensuring the system performs as designed. Excess debris build up can decrease the design storage volume and may reduce the efficiency of the system. It is crucial to ensure that the pre-treatment device(s) are maintained regularly. If the system is expected to experience an excess of trash, oils, or sediment, increase the frequency of both inspection and maintenance procedures directed below.

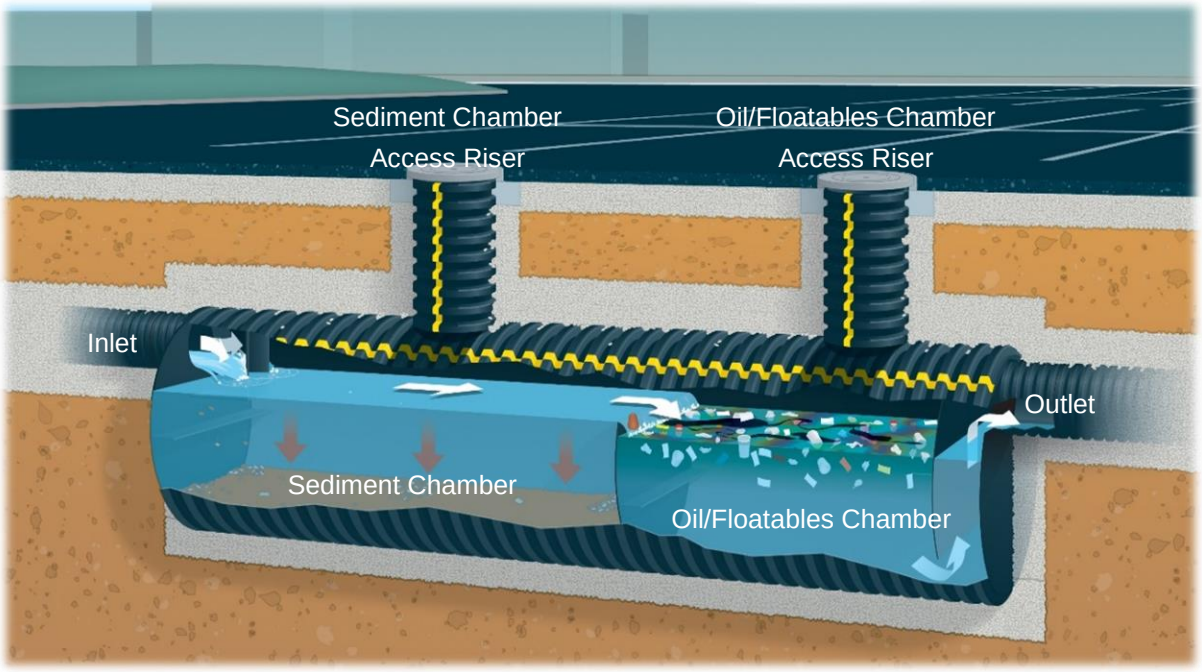

Figure 1: SWQU Components

Access Risers

The Prinsco SWQU typically has two, 24'' diameter vertical risers which are centered over the sediment and oil/floatables chambers and provide access to the individual sections. Extreme care should be taken to keep the risers covered to avoid any unintended access during installations, inspection, and maintenance. SWQU access risers have restricted spaces and are not meant for continuous occupancy; therefore, should follow appropriate guidelines according to OSHA confined space directions.

Initial System Inspection

An initial inspection of the pretreatment device should be performed before the system is put into operation. It is best to create an Inspection and Maintenance Log Sheet at this time. An example of an Inspection and Maintenance Log Sheet can be found at the end of this technical note. Included with the log sheet should be a layout of the system and/or pre-treatment devices with the invert elevations at the inspection ports prior to sediment accumulation. Initial measurements can be taken with a stadia rod or

other measurement techniques. These measurements will allow for future sediment height measurements to be taken from outside of the system, eliminating the need for a manned entrance.

Inspection Frequency

Inspection frequency will vary based on the system design and requirements. A SWQU inspection schedule should be developed for each individual system, with the industry standard being a minimum of four times per year and after all major storm events. After the inspection schedule is established for the SWQU, it should be tracked on the Inspection and Maintenance Log Sheet. During each check, visually inspect the structure in its entirety to ensure no damage has occurred to the system or its components.

Due to construction activities, more frequent inspections should be performed during the first year of operation. Construction sediment and debris loading can be minimized if the Stormwater Pollution Prevention Plan (SWPPP) for the construction site is followed. After the first year of operation, the rate at which the pretreatment system collects soil/pollutants will be heavily dependent on the site activities. During winter months, in geographical areas where sand is applied to road surface, systems may see increased sediment loading. Other increased loading areas are present with vehicle or equipment wash-down areas.

Inspection Procedures

The following steps address the recommended procedure for inspecting SWQU's:

1) Uncover the Bypass Structure, located near the SWQU. Within the Bypass Structure, inspect the diversion structure for damage and sediment buildup. Record observations. Close the structure lid when finished.
2) Locate both the Sediment Chamber Access Riser and Oil/Floatables Chamber Access Riser on the SWQU. Risers are located near the Bypass Structure in the direction of water flow.
3) Remove the lid off the Sediment Chamber Access Riser. In the chamber, inspect and measure the sediment buildup from baseline measurements with a stadia rod or other measurement techniques. Record these values in addition to any visual observations. Close the structure lid when finished.
4) After removing the lid off the Oil/Floatables Chamber Access Riser, measure and inspect the oil depth with either a calibrated dipstick, tape measure, or other measurement techniques. Record these values in addition to any visual observations. Close the structure lid when finished.

Maintenance and Cleaning Frequency

Cleaning frequency will vary for each pre-treatment device based on the system design. It is at the sole discretion of the inspector to determine if or when the device will require cleaning. The following are recommendations of when the device should be cleaned:

- If the system is experiencing an unusual amount of silt and soil build up
- If the SWQU reaches a sediment height between 10 and 20 percent of the pipe diameter

Figure 2: Vacuum Truck with Hose

If the system reaches a sediment height greater than 20 percent of the pipe diameter, the system should be cleaned at the soonest opportunity.

System Cleaning

Before cleaning the system, some additional aspects should be considered. The system should have no flow of water and cleaning should be scheduled on a day with dry weather. Before cleaning, all outlet stubs should be blocked off. If this is not done, sediment loading could back up or plug downstream pipelines, adding to cleaning expenses. This is also done to prevent any of the debris or pollutants from washing into downstream waterways. When beginning the cleaning process, all upstream pipelines or pre-treatment units should be cleaned first.

Common Cleaning Procedures

The following steps address the recommended procedure for cleaning SWQUs:

1) Locate the Bypass Structure, remove the lid, and insert vacuum hose into the riser to pump out debris.
2) Locate the Sediment Chamber Access Riser. Insert vacuum hose into the riser and pump out the chamber. If necessary, rinse the system and vacuum out remaining water. After cleaning, inspect the inlet pipe and weir plate for damage or blockage.
3) Locate the Oil/Floatables Chamber Access Riser. Floating trash and debris can be netted out of the chamber if desired. Insert vacuum hose into the riser and pump out the chamber. If necessary, rinse the system and vacuum out remaining water. After cleaning, inspect the outlet pipe and weir plate for damage or blockage.
4) Makes notes on the Inspection and Maintenance Log Sheet. A sample of this log sheet can be found on the last pages of this document. Refill SWQU, up to the sediment weir plate, with water.
5) Close the structure lids when finished.

Material Disposal

After maintenance and cleaning, dispose of sediment, floatables, oil, and water, as directed, in accordance with local regulations. Water and sediment from cleanout procedures should not be dumped into a sanitary sewer. In some locations, proper disposal of sediments from the SWQU can be compared to the disposal of sediments from manholes or catch basins.

SWQU Inspection & Maintenance Log Sheet (Example)					
Type of System:	60" Diameter, 40' long with 2-24" Diameter Risers			**Location**:	Minneapolis, MN
System Notes/Comments:	Contact owner when sediment level reaches 8" (200 mm) or outlet stub is restricted. Scheduled cleaning should be done through SB's JET/VAC				
Initial Inspection (Example)	Sediment Chamber		Oil/Floatables Chamber		**Date:** 3/10/13 **Inspector Name:** Inspector 1 **Post Inspection Notes/Comments:**
	Point 1	Point 2	Point 1	Point 2	
Invert Depth	84" (2100 mm)	84" (2100 mm)	86" (2150 mm)	87" (2175 mm)	
Debris Depth	----	----	----	----	
Inspection and Maintenance (Example)	Sediment Chamber		Oil/Floatables Chamber		**Date:** 3/10/13 **Inspector Name:** Inspector 2 **Maintenance Name:** SB's JET/VAC
	Point 1	Point 2	Point 1	Point 2	**Post Maintenance Notes/Comments:**
Invert Depth	81" (2025 mm)	81" (2025 mm)	81" (2025 mm)	82" (2050 mm)	Excess amounts of sediment, upon further inspection pre-treatment unit reached max
Debris Depth	3" (75 mm)	3" (75 mm)	5" (125 mm)	5" (125 mm)	

SWQU Inspection & Maintenance Log Sheet

Type of System:					**Location**:
System Notes/Comments:					
Initial Inspection	Sediment Chamber		Oil/Floatables Chamber		**Date:**
					Inspector Name:
					Post Inspection Notes/Comments:
	Point 1	Point 2	Point 1	Point 2	
Invert Depth					
Debris Depth	----	----	----	----	
Inspection and Maintenance	Sediment Chamber		Oil/Floatables Chamber		**Date:**
					Inspector Name:
					Maintenance Name:
	Point 1	Point 2	Point 1	Point 2	**Post Maintenance Notes/Comments:**
Invert Depth					
Debris Depth					
Inspection and Maintenance	Sediment Chamber		Oil/Floatables Chamber		**Date:**
					Inspector Name:
					Maintenance Name:
	Point 1	Point 2	Point 1	Point 2	**Post Maintenance Notes/Comments:**
Invert Depth					
Debris Depth					
Inspection and Maintenance	Sediment Chamber		Oil/Floatables Chamber		**Date:**
					Inspector Name:
					Maintenance Name:
	Point 1	Point 2	Point 1	Point 2	**Post Maintenance Notes/Comments:**
Invert Depth					
Debris Depth					
Inspection and Maintenance	Sediment Chamber		Oil/Floatables Chamber		**Date:**
					Inspector Name:
					Maintenance Name:
	Point 1	Point 2	Point 1	Point 2	**Post Maintenance Notes/Comments:**
Invert Depth					
Debris Depth					
Inspection and Maintenance	Sediment Chamber		Oil/Floatables Chamber		**Date:**
					Inspector Name:
					Maintenance Name:
	Point 1	Point 2	Point 1	Point 2	**Post Maintenance Notes/Comments:**
Invert Depth					
Debris Depth					

SWQU Inspection & Maintenance Log Sheet

Type of System:					**Location**:
System Notes/Comments:					
Inspection and Maintenance	Sediment Chamber		Oil/Floatables Chamber		**Date:**
					Inspector Name:
					Post Inspection Notes/Comments:
	Point 1	Point 2	Point 1	Point 2	
Invert Depth					
Debris Depth	----	----	----	----	
Inspection and Maintenance	Sediment Chamber		Oil/Floatables Chamber		**Date:**
					Inspector Name:
					Maintenance Name:
	Point 1	Point 2	Point 1	Point 2	**Post Maintenance Notes/Comments:**
Invert Depth					
Debris Depth					
Inspection and Maintenance	Sediment Chamber		Oil/Floatables Chamber		**Date:**
					Inspector Name:
					Maintenance Name:
	Point 1	Point 2	Point 1	Point 2	**Post Maintenance Notes/Comments:**
Invert Depth					
Debris Depth					
Inspection and Maintenance	Sediment Chamber		Oil/Floatables Chamber		**Date:**
					Inspector Name:
					Maintenance Name:
	Point 1	Point 2	Point 1	Point 2	**Post Maintenance Notes/Comments:**
Invert Depth					
Debris Depth					
Inspection and Maintenance	Sediment Chamber		Oil/Floatables Chamber		**Date:**
					Inspector Name:
					Maintenance Name:
	Point 1	Point 2	Point 1	Point 2	**Post Maintenance Notes/Comments:**
Invert Depth					
Debris Depth					
Inspection and Maintenance	Sediment Chamber		Oil/Floatables Chamber		**Date:**
					Inspector Name:
					Maintenance Name:
	Point 1	Point 2	Point 1	Point 2	**Post Maintenance Notes/Comments:**
Invert Depth					
Debris Depth					