MACTRAP
CLEANER WATER

STORMWATER SENTRY

Oil & Grit Interception with Stormwater Diversion

INSTALLATION AND OPERATION MANUAL

Mactrap manufactures the Stormwater Sentry diversion system for washdown areas exposed to rainwater. The system consists of a logically controlled wastewater pump which automatically diverts wash water and 'first flush' rainwater to wastewater, whilst allowing unpolluted rainwater to flow to stormwater.

NEW ZEALAND MADE ®

www.mactrap.co.nz 0800 MACTRAP info@mactrap.co.nz

TABLE OF CONTENTS

FUNCTIONAL DESCRIPTION

Stormwater Sentry is designed for the treatment of wastewater from washdown areas exposed to rainwater. The system consists of a logically controlled wastewater pump which automatically diverts wash water and 'first flush' rainwater to wastewater, whilst allowing unpolluted rainwater to flow to stormwater.

The system consists of:

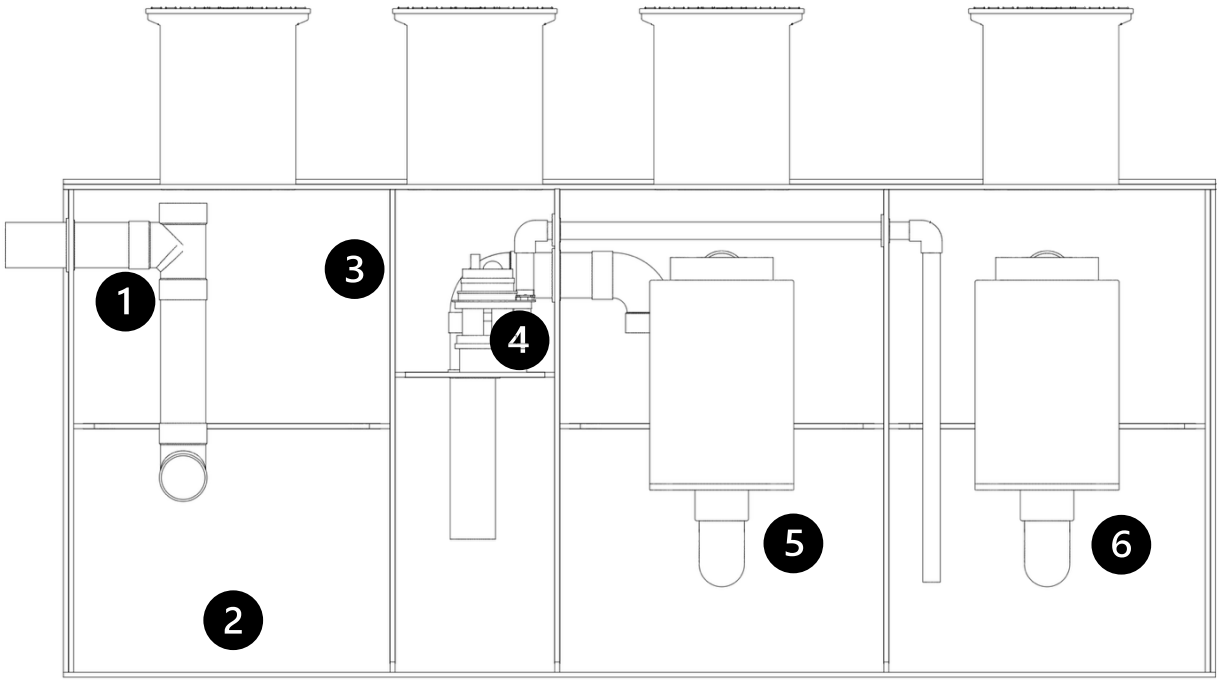
1. Diversion Separator
2. Controller

Optionally, the diversion separator can be fitted with automatic spill shutoff and/or coalescence filters. Mactrap highly recommends spill shutoff and coalescence filters where stormwater discharges to ecologically sensitive areas.

Operation

The principle of operation is as follows:

1. Water enters the separator from the wash pad and into the sediment chamber.
2. Grit and other heavier than water sediment settles to the bottom of the sediment chamber.
3. Any light oil contaminants rise to the surface and are carried with the inflow to the pump chamber.
4. If the power washer is active the transfer pump activates and diverts the inflow to the wastewater chamber.
5. If the power washer is inactive then the inflow continues to the stormwater chamber from midwater pickup. Residual light oils are trapped in the pump chamber until the next pump activation.
6. If the power washer is inactive but the pump has not operated for 20 hours, then the first of the inflow (first flush) is transferred to the wastewater chamber.



Sediment Chamber	Pump Chamber	Stormwater Chamber	Wastewater Chamber

Both the stormwater and the wastewater chambers are light oil traps. They can be fitted with automatic spill shutoff and coalescence filters to further protect the outflow from light oil contaminants.
The wastewater chamber will trap light oils until it is cleaned out on its regular maintenance cycle. The stormwater chamber will further trap any residual light oils that may reach the chamber and should be cleaned on the same maintenance cycle as the wastewater chamber.

A stormwater diversion separator without coalescence filters will nominally separate light oil droplets of 60 microns or larger. Emulsified light oils of less than 60 microns will not separate without coalescence filters.

CONTROLLER

The controller manages the operation of the diversion pump. It is essential that the controller also controls the power washer so that the diversion function activates as designed.
There are three methods for managing the power washer:

1. Directly connect the power washer to the "Power Washer Output" connections within the controller. If the power washer is not electrically powered or the power washer exceeds the power rating (single phase 10 amps) of the controller, then:
2. Utilise the "Power Washer Output" connections (230 V) to control a solenoid valve on the power washer water supply, or
3. Utilise the "Power Washer Output" connections (230 V) to control a sufficiently rated relay/contactor to supply the power washer.

If the connected power washer fails, then the system can operate with an independent power washer if the "Power Washer Enabled" function is manually activated on the controller.

Do not use for normal operation[1].

Controller Operation

1. Activate the controller by turning the "Power On/Off" switch to the right. The indicator will illuminate. The controller should always remain on except for system service. The power switch enables the control circuitry. It does not isolate the pump and power washer supplies.

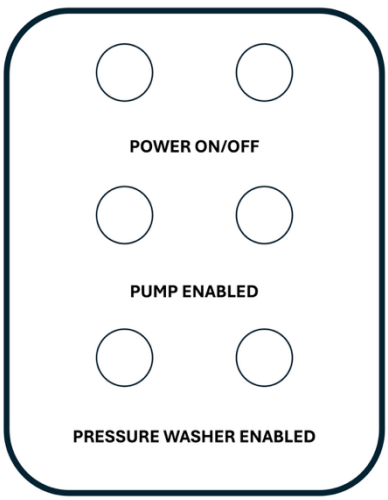
   Do not use the power on/off function as an electrical isolator.

2. The pump is enabled by default and should always remain on except for system service. Press the "Pump Enabled" button to enable or disable control of the pump.

   Do not use the pump enable function as an electrical isolator.

3. The power washer is enabled by pressing the "Pump Enabled" button to enable or disable control of the power washer.

   Do not use the power washer enable function as an electrical isolator.

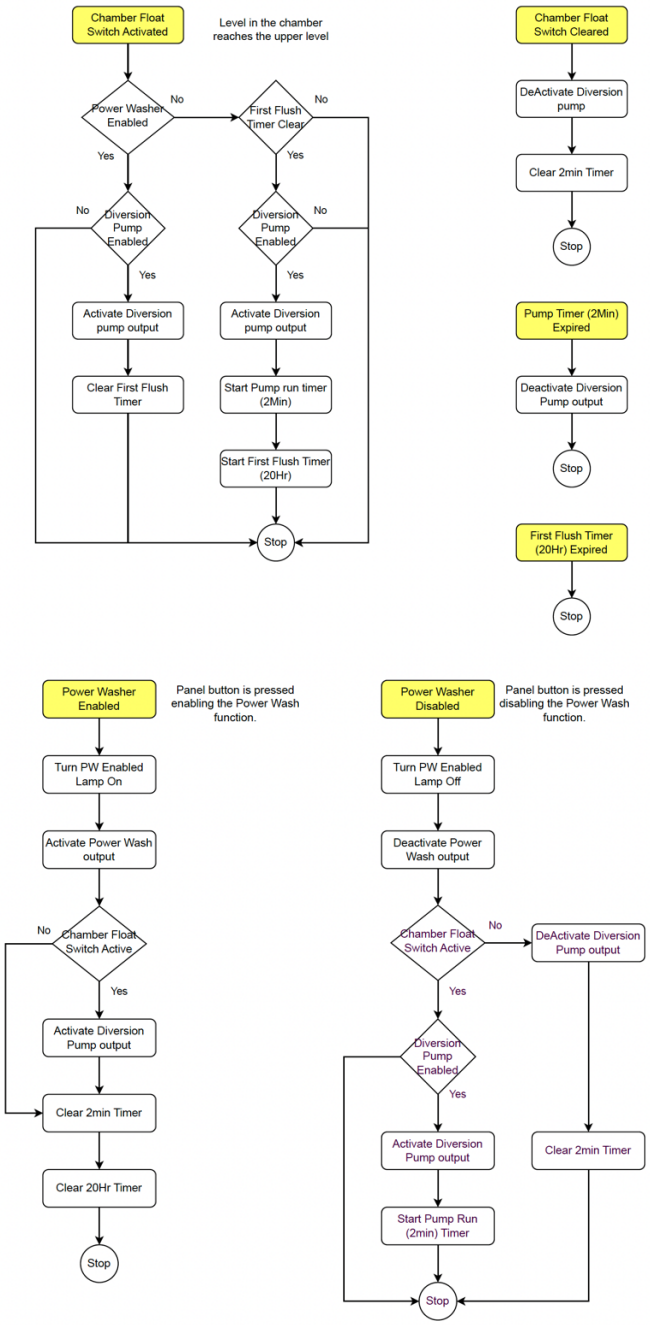


1. Only use this method as a short-term remedial facility. If the power washer is active and generating wastewater without the "Power Washer Enabled" function activated, then light oil contaminants may flow to stormwater.

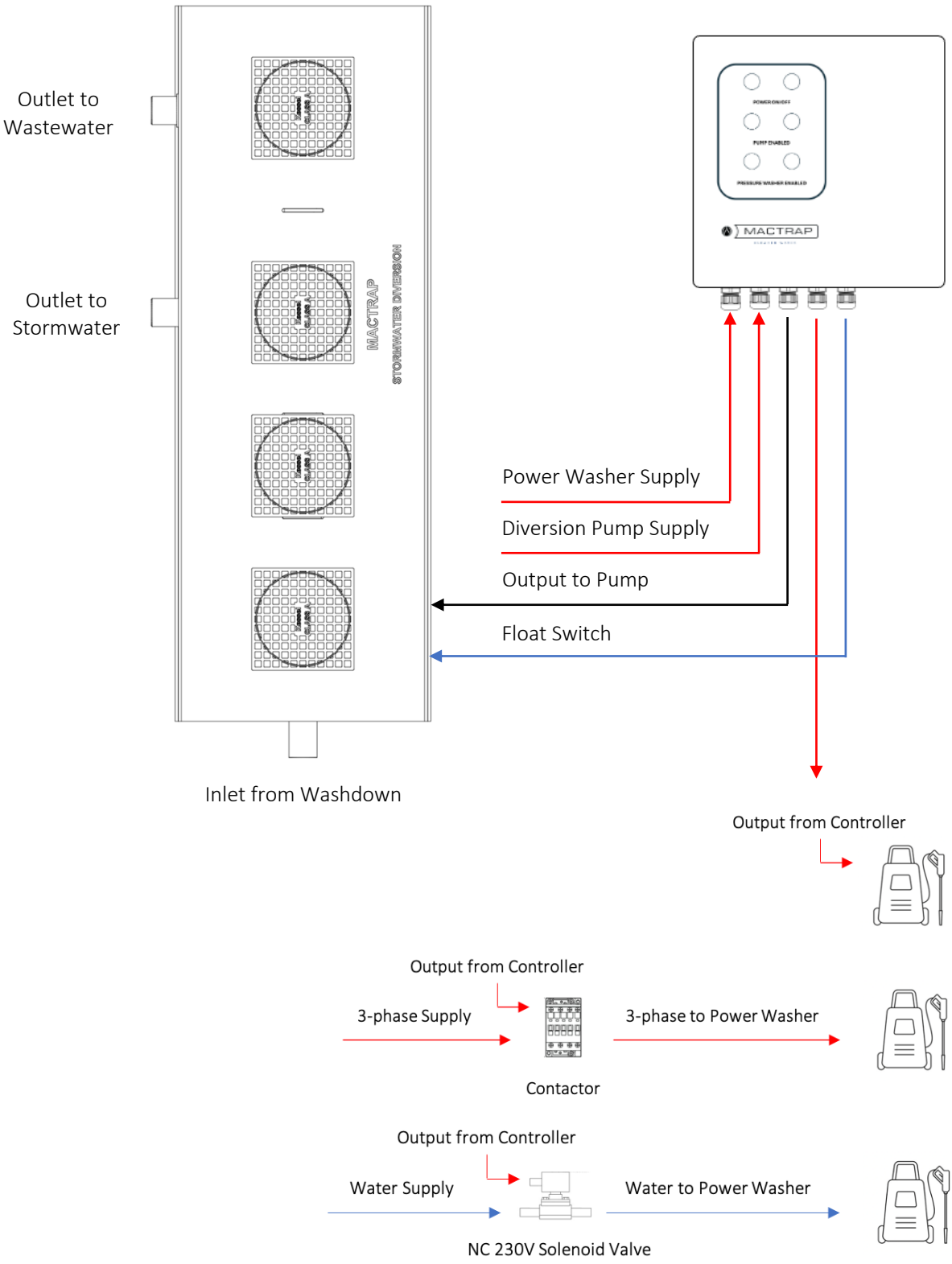
CONTROL LOGIC

PLC Inputs	
1	Pump Enabled/Disable Switch
2	Power wash Enable/Disable Switch
3	Chamber Float Switch

PLC Outputs	
1	Pump Enabled Lamp
2	Power Washer Enabled Lamp
3	Pump
4	Power Washer



CONNECTIONS

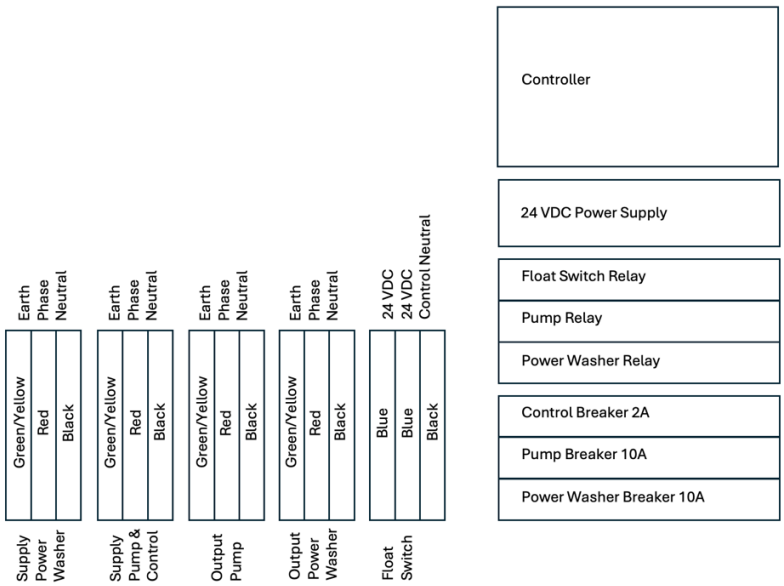


CONTROLLER INSTALLATION

Install the controller with visual access to the power washer. The controller is fitted with cable glands, but these can be replaced with conduit connectors as appropriate.

Connections

1. Provide a 230V 10-amp supply to the Power Washer Supply.
2. Provide a 230V 10-amp supply to the Diversion Pump Supply.
3. Connect the blue float switch cable to the Float Switch connectors.
4. Connect the black diversion pump cable to the Output Pump connectors.
5. Connect the power washer cable to the Output Power Washer connector.



Commissioning checks

The controller is pre-tested and should operate without adjustment. Confirm operation as follows:

1. Ensure the internal circuit breakers are closed.
2. Power on the controller.
3. The Diversion Pump function is auto enabled. Press to enable if off.
4. Enable the Power Washer function.
5. Fill the Diversion Separator until the upper level activates. The diversion pump should pump the contents of the pump chamber to the wastewater chamber.
6. Disable the Power Washer function.
7. Fill the Diversion Separator until the upper level activates.
8. The PLC controller will indicate the 20-hour duration is in progress.
9. Fill the Diversion Separator until the upper level activates. The diversion pump should not activate while the 20-hour duration is active.
10. Enable the Power Washer function.
11. The 20-hour duration should reset, and the diversion pump should pump the contents of the pump chamber to the wastewater chamber.

SEPARATOR INSTALLATION

Location

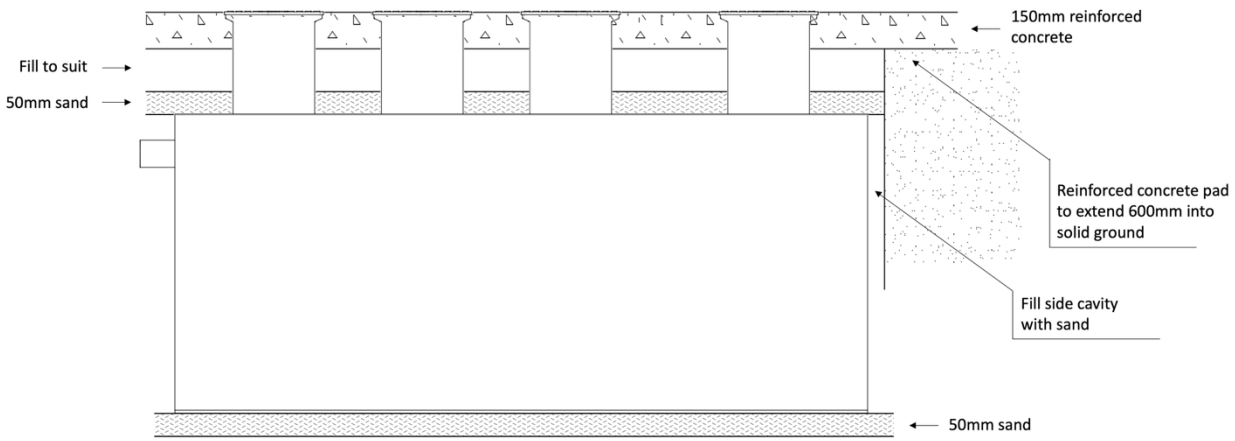
1. Install the stormwater diversion separator in a location that is accessible by vacuum tanker so that it can be regularly serviced.
2. Excavate the hole as close as possible to the size of the separator.
3. Ensure the base is flat and firm with even compaction and at least 25mm of sand for levelling.
4. Half fill with water then back fill with sand and lightly compact to the water level, fill the remainder of the separator with water and complete back filling.

Class A (pedestrian) Load Bridge

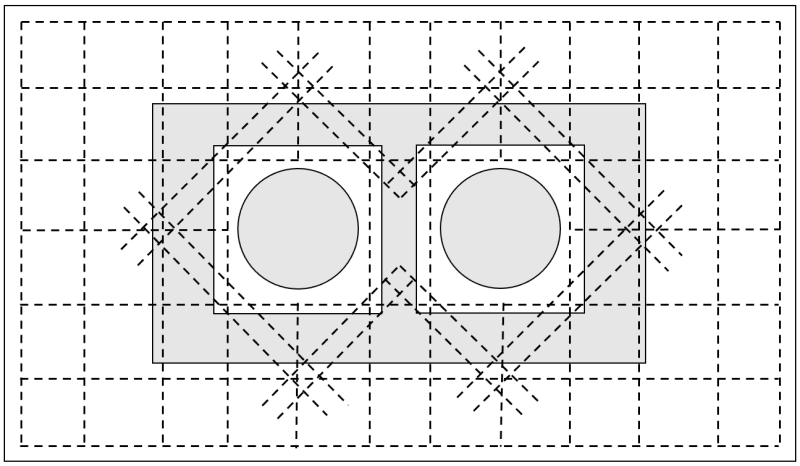
1. While normal pedestrian traffic will not harm the separator, unexpected vehicle loading, such as a service vehicle, will likely cause damage. Consider a load bridge if there is likely to be sustained pedestrian loading or possible vehicular loading.
2. The Class A risers and covers are in the form of a variable height riser that the HDPE cover fits over and is settled into a load bearing pedestrian strata.

Class D (vehicular) Load Bridge

1. The Class D risers and covers are in the form of a variable height riser that the cast iron cover fits over and is settled into a load bearing traffic strata. These are to be inserted into concrete or surrounding load bridge.
2. An engineer's detail is required to ensure the risers and cover plates are set and located on a substrate that will hold the appropriate class cover. This means a concrete surround or steel frame to engineer's requirement installed above the separator to take trafficable weight.
3. Ensure that the load bridge extends at least 600mm onto the surrounding stable ground.



4. The Class D vehicular load bridge must be constructed using reinforced concrete. An engineer's detail is required for the load bridge specification for heavy vehicles. The concrete load bridge for Class D should be a minimum of 150mm depth and reinforced with 12mm rebar as shown below:



Venting

Venting should be off the inlet drainage and should be within 1m from the separator. The separator can be vented from the top surface. If installing a vent from the top surface of the separator, then install using a bulkhead fitting or appropriate seal. Mactrap can supply venting seals as required.

Backflow prevention

If backflow prevention is required, then the backflow prevention device should be installed in the outlet drainage within five metres of the separator.

Connections

The invert level of inlet and outlets are set. Do not raise or lower the inlet or outlet. If the invert of the outlet is too high, then the inlet connection may be submerged. The invert of the outlet pipe must remain lower than the invert of the inlet pipe. The outlet pipe and drainage must never be of lesser diameter than the inlet pipe.

Electrical Conduit

Electrical cables should be installed in electrical conduit and protected as described by the appropriate authority. Allow sufficient conduit size to pull replacement cables if necessary.

OPERATION

Controller

1. Ensure that the Diversion Pump always remains enabled.
2. Ensure that the Power Washer is enabled whenever the power washer is in use.

If the Power Washer is not enabled, then light oils will not be diverted to the wastewater chamber

3. Ensure that the Power Washer is disabled when the power washer is no longer in use.

If the Power Washer is not disabled, then rainwater will be diverted to the wastewater chamber

Wastewater and Stormwater Chambers

1. The operator is responsible to ensure that the light oil level in the wastewater and stormwater chambers does not exceed 25% of the volume of the chambers. If the 25% light oil level is reached, then the chambers must be emptied and/or serviced under an appropriate maintenance contract.
2. The operator is responsible to ensure that the sediment level in the sediment chamber does not exceed 25% of the volume of the sediment chamber. If the 25% sediment level is reached, then the sediment chamber must be emptied and/or serviced under an appropriate maintenance contract.
3. A 12-month maintenance plan and schedule must be adhered to as required by the Local Authority. Regular maintenance and observation by Operator should be carried out to ensure cleaning and removal of light oils and other sediments.