OCEAN PROTECT

OceanGuard

Technical Design Guide

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Introduction

The OceanGuard technology is a gully pit basket designed to fit within new and existing stormwater pits targeting pollution in stormwater runoff. The system is offered with a choice of filtration bag liners, designed to remove gross pollutants, total suspended solids and attached pollutants. It can be adopter as a stand-alone technology or as part of a treatment train with our StormFilter or Jellyfish filtration products.

The filtration bag, filtration cage and flow diverter work together to maximise the flow treated, pollutant capture, hydraulic efficiency and ultimately retaining captured pollutants dry. OceanGuard pit inserts are highly effective, easy to install and simple to maintain.

Operational Overview

The OceanGuard is installed into field or kerb inlet gully pits. The flow diverter at top of the unit has a rigid recycled plastic HDPE skirt that is installed against the walls directing all incoming stormwater flows into the filtration bag.

The stormwater is then filtered via direct screening through the filtration bag liner ensuring that any debris larger than the openings in the filtration bag are captured and retained.

During large storm events the water elevation in the filtration bag can rise and peak flows are internally bypassed through slots created in the flow diverter which has no moving parts that may prematurely fail.

At the end of the storm event debris and stormwater rest at the base of the filtration bag where the stored material will start to dry until the next storm event.

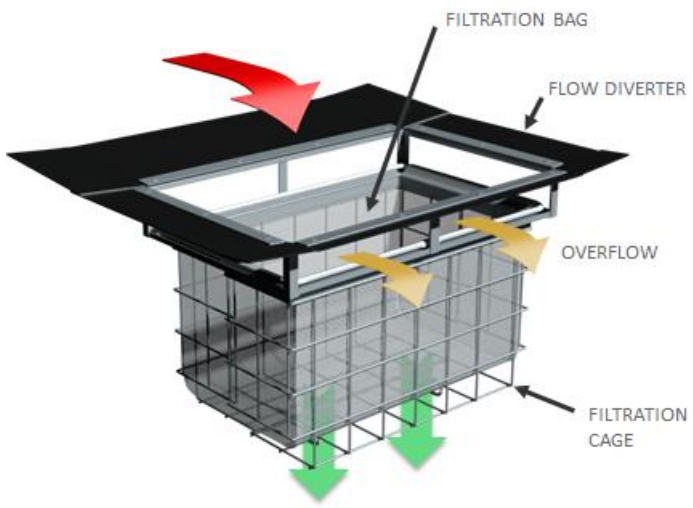

Figure 1: OceanGuard components

Features

The OceanGuard technology has the following features:

- Flow Diverter
  Directs flow into the unit for filtration of stormwater flows and includes an in-built rigid bypass to divert stormwater overflows in high-intensity and peak storm flows.
- Filtration Bag
  Removable coarse (gross pollutant removal) and fine grade (200micron) filtration bags.
- Filtration Cage
  The supporting cage that allows for the use of larger filtration bags.

The OceanGuard can also be fitted with an oil/hydrocarbon adsorbent material (optional) to capture and retain oil and grease. The adsorbent material is contained in socks that are designed to ensure maximum contact with stormwater as it enters the gully pit.

The OceanGuard is designed to be easily retrofitted into new and existing stormwater pits, requiring no construction or land take. The OceanGuard is often the most practical solution and reduces the pollutant load and maintenance burden on downstream infrastructure.

Configurations

The OceanGuard can fit a range of pits typically found in Australia including, kerb entry, rear entry with grated drain entry as well as field gully pits. There are multiple sizes to suit pits ranging in plan dimensions of *450 x 450mm – 1200 x 1200mm*. Additional custom sizes are available to suit circular and non-standard pits.

The standard OceanGuard configuration treats surface flow only, see figure 2. In some instances, it may be necessary to treat pipe flow, see figure 3. Remember to limit the upstream catchment to the basket to no more than 1000m^2 (or DN300mm pipe) otherwise the peak flows may cause structural damage to the OceanGuard. Furthermore, to assist design checks by a suitable qualified engineer need to be undertaken to ensure the upstream catchment is not excessively large. Please note that the OceanGuard technology is not a replacement for an in-line gross pollutant trap.

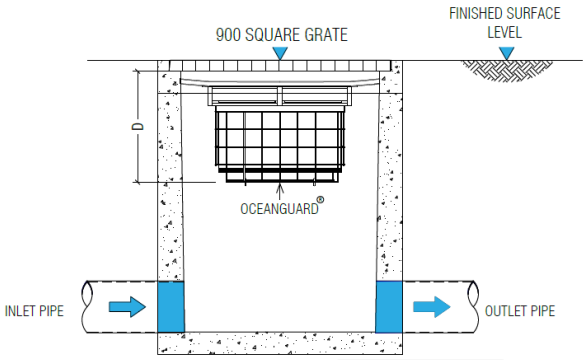

Figure 2: Standard configuration – surface flow

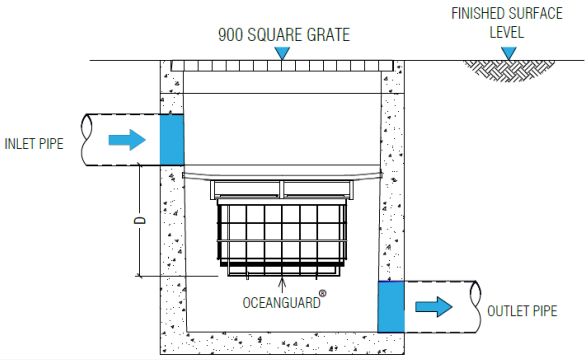

Figure 3: Example configuration – pipe flow

Another typical configuration required, is where the runoff collected by grated strip or trench drains needs to be treated, see figure 4.

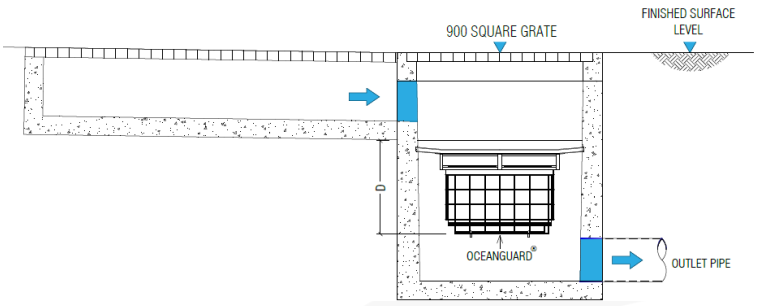

Figure 4: Example configuration – Grated strip/trench drain

Performance

Typically, laboratory testing provides a means to generate hydraulic and basic performance data, but it should also be complemented with long-term field data. Gully pit baskets that operate under unrestricted flows require both a combination lab and field studies to accurately understand performance.

Ocean Protect has and is undertaking field testing locally in Australia and copies of the supporting articles are available upon request from Ocean Protect.

Gully pit baskets and associated technology have been available in Australia and overseas for more than 20 years. The OceanGuard technology has design elements and removal performance that are the same as some off-patent technologies, such as the previous generation EnviroPod previously sold by Stormwater360 Australia (Now Ocean Protect) under licence.

The OceanGuard meets all previous performance data and current approvals across Australia in terms of pollutant removal, flow rate and head loss. Please contact your Ocean Protect representative for more information.

Please contact your Ocean Protect representative to obtain the StormFilter approval status in your area.

Maintenance

Maintenance of the OceanGuard is simple effective and seldom requires confined space entry or specialised equipment, often being completed by hand without the need of vacuum equipment. Simply remove the OceanGuard from the pit with the tags provided and invert the bag into a waste bin. Inspect the liner and brush by hand or spray with a pressure washer if required to rejuvenate the filtration bag. Record the information and replace the filtration bag.

Inspection & Cleaning

The Ocean Guard® system should be inspected at regular intervals from 1-2 months during the first year of installation to ensure optimum performance. The frequency at which the OceanGuard will need to be maintained will depend on site activities, land uses, catchment area and this size of OceanGuard installed, 1-6 times annually (3-4 typ.).

For further information please refer to the OceanGuard Operations and Maintenance Manual.

Design Basics

The design requirements of any OceanGuard system is detailed in 3 typical steps.

1. Hydraulic Design & Configuration
2. Water Quality Design
3. Mass Load Design

1. Hydraulic Design & Configuration

All OceanGuard inserts must be designed to ensure that the hydraulic requirements of the system are met without adversely impacting the upstream hydraulics (limiting the likelihood of localised flooding).

2. Water Quality Design

Ocean Protect recommends and uses the widely endorsed Model for Urban Stormwater Improvement Conceptualisation (MUSIC), which makes it easy to correctly sizing an appropriate StormFilter system for your site.

A complimentary design service which includes MUSIC modelling is provided by the Ocean Protect engineering team. Simply email your project details to design@oceanprotect.com.au or alternatively you can always call one of our engineers for a discussion or to arrange a meeting in your office. The team will provide you with an efficient design containing details of the devices required to meet your water quality objectives together with budget estimates, product drawings and the MUSIC (.sqz) file.

Alternatively, you can download the MUSIC treatment nodes for the Ocean Protect products from our website (www.oceanprotect.com.au).

When designing/modelling an OceanGuard system for water quality purposes in MUSIC, a single GPT node is utilised. The GPT node is utilised with relevant removal efficiencies inserted. These parameters can vary based on the jurisdiction (authority) of your project, relevant details can be obtained from Ocean Protect. When modelling, the high-flow bypass is modified in node by adding the total number of Ocean Guards installed and multiplying this number by 20L/s, eg 10 x Ocean Guards = $0.2m^3/s$.

All details such as drawings, specifications and maintenance manuals can also be downloaded for integration into your project's documentation. Additionally the Ocean Protect team is available to review your model and provide additional assistance and guidance on the configuration of the OceanGuard system(s) for your project.

3. Mass Load Design

Always be mindful of the magnitude of upstream catchment areas pay particular attention to perceived dirty or high loading sites. The Ocean Protect team can provide assistance and details on this process.