


# MAINTENANCE PLAN

Storm Sewers and Systems Maintenance Plan for Whitebox Student Campus at Groody Road, Newcastle, Castletroy, Limerick

**January 2025**

GARLAND
Concepts Realised

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| Description of Change | Originator | Rev | Approval | Date |
|---|---|---|---|---|
| Initial Release | PC | 1st | BL | 30/09/24 |
| Updated Project Details | PC | A | BL | 23/01/25 |
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## 1. INTRODUCTION

This maintenance plan has been prepared by GARLAND to help, both public and private operators, meet the requirements for proper maintenance and operation of the various storm sewer systems components. Proper maintenance will help to assure that:

- Storm sewer facilities operate as they were designed;
- Storm sewer systems are cleaned of the pollutants that they trap, such as sediment and oils, so that the systems are not overwhelmed and in so doing become sources of pollutants;
- Pollutant sources are removed, or minimized, prior to entering the storm sewer system.

This document discusses the various storm sewer system components and the general maintenance activities required for each component. Together with preventing a site from flooding, properly maintained storm sewers can help reduce surface water and groundwater pollution.

## 2. GULLIES

Gullies trap sediment and some oils that are washed off the road surface during a storm event. This sediment and the oils, if not removed from the gullies and inlets have the potential to pollute water bodies. The gullies need to be inspected and cleaned, at a minimum annually and more often if necessary; to remove accumulated sediment, oils, and rubbish.

*Inspection*

Inspect gullies at least once per year, more often if necessary. Periodically inspect the catch basin or curb inlets and surrounding areas for pollutants, such as leaks from vehicles, minor spills, and oil dumping. Also remove the source of any pollutant and ensure that grass clippings and leaf debris is not being blown into the streets.

*Cleaning*

Clean gullies when they become one third full in order to maintain sediment-trapping capacity. Gully and manhole cleaning should be performed in a manner that keeps the removed sediment and contaminated water from being discharged back into the storm sewer. Clean putrid materials from the gullies when discovered or reported. Keep the inlet grates cleared of debris and litter.

*Safety*

Work inside underground structures (e.g. manholes) requires special confined space equipment and procedures.

*Materials Handling*

Disposal of waste from maintenance of drainage facilities shall be conducted in accordance with good practise and Local Authority regulations. Removed sediment must

be disposed of as solid waste. Contaminated water should be disposed of in a sanitary sewer after oils are removed using oil absorbent materials or other mechanical means. Used oil absorbents should be recycled or disposed according to the manufacturer's instructions and in accordance with EPA and Local Authority requirements.

*Repairs*

Repair any damages that prevent the gully from functioning as designed.

## 3. MANHOLES

Manholes are large cylindrical vaults usually set at storm sewer pipe connections. Unless maintenance staff have undertaken approved training and have been provided with appropriate equipment, they should never enter a manhole as there is the possibility of the presence of poisonous gas and or injury.

*Inspection*

Inspect the manhole once per year. Check frame and lid for cracks and wear, such as rocking lids or lids move by traffic. Periodically inspect the manhole and surrounding areas for pollutants such as leaks from dumpsters, minor spills, and oil dumping. Take action to have the pollutant source removed.

*Cleaning*

Clean manholes when there is a blockage of the stormwater channel. Cleaning should be performed in a way that ensures the removed sediment and water is not discharged back into the storm sewer.

*Safety*

Never enter a confined space without having undertaken an approved training course and without the proper equipment. Work inside underground structures requires the use of special confined space equipment and the implantation of accepted procedures.

*Materials Handling*

Disposal of waste from the maintenance of drainage facilities shall be conducted in accordance with local regulations. Removed sediment must be disposed of as solid waste. Contaminated water should be disposed of in a sanitary sewer after oils are removed using oil absorbent materials or other mechanical means. Used oil absorbents should be recycled or disposed according to the manufacturer's instructions and in accordance with EPA and Local Authority requirements.

*Repairs*

Repair any defects that prevent the manhole from functioning as designed. Repair all security and access features. Repair any broken parts or lids from wear and tear of traffic.

## 4. OIL/WATER SEPARATORS

An oil/water separator is an underground vault that treats stormwater by mechanically separating oil from water. The oil rises to the surface and floats on the water and sediment settles to the bottom. These separators can have special maintenance problems and should be serviced by specialist contractors. The main issues are working in confined spaces and properly handling any sludge and oil cleaned from the separators. Manufacturer's recommendations for maintenance should be followed at a minimum.

*Inspection*

The separators are installed with an alarm system and sim card that sends a text message to a designated phone number to warn of high oil levels. The stormwater discharges from the separator should be checked periodically. It should be clear and not have a thick visible oil sheen. Annually check for cracks large enough to let soil enter the vault, broken or defective plates and baffles, and crushed or damaged pipes. Periodically inspect the surrounding areas for pollutants, such as leaks from dumpsters, minor spills, and oil dumping. Take action to ensure that the pollutant source is removed.

*Cleaning*

Remove rubbish from the vault, inlet, and piping. Remove oil when it reaches 25mm in thickness. Remove sediment when it accumulates to a depth of 150mm.

*Safety*

Work inside underground structures requires special confined space equipment and procedures.

*Materials Handling*

Disposal of waste from maintenance of drainage facilities shall be conducted in accordance with local regulations. Removed sediment must be disposed of as solid waste. Contaminated water should be disposed of in a sanitary sewer after oils are removed using oil absorbent materials or other mechanical means. Used oil absorbents should be recycled or disposed according to the manufacturer's instructions and in accordance with EPA and Local Authority requirements.

Repairs

Repair any damages that prevent the oil/water separator from functioning as designed. Repair any cracked or defective plates or baffles. Cracks are repaired so that no cracks greater than 6mm are present. Repair any leaks that allow water levels to drop and cause oil to be washed from the unit. Repair all security and access features so they are fully functional. This includes locking lids, covers, and ladder rungs.

## 5. FLOW CONTROL STRUCTURES

Flow control structures direct or restrict flow in or out of a facility. Outflow controls on detention facilities are a common example where flow control structures slowly release stormwater at a specific rate. If these flow controls are damaged, plugged, bypassed, or not working properly, the facility could overtop or be releasing water at too high a rate.

*Inspection*

Inspect at least once per year for all features listed under Cleaning and Repairs, or when a facility does not drain properly or other problems occur.

*Cleaning*

Remove sediment within 450mm of the bottom of an orifice plate. Remove rubbish and debris that may block the orifice plate. Remove any rubbish or debris that may block an overflow pipe.

*Safety*

Work inside underground structures requires special confined space equipment and procedures.

*Materials Handling*

Disposal of waste from maintenance of drainage facilities shall be conducted in accordance with local regulations. Removed sediment must be disposed of as solid waste. Contaminated water should be disposed of in a sanitary sewer after oils are removed using oil absorbent materials or other mechanical means. Used oil absorbents should be recycled or disposed according to the manufacturer's instructions and in accordance with EPA and Local Authority requirements.

*Repairs*

Repair or replace to original design specification any outlet orifice that is enlarged, bypassed, or damaged. Make certain that overflow outlets are not blocked. Structures should be securely in place and aligned within 10 percent of the vertical. Repair outlet pipe structures that have leaking connections or holes not specified by the design. Repair or replace a non-functional or damaged cleanout gate. Repair or replace damaged orifice plates to original design specification.

## 6. STORM SEWERS/DRAIN PIPE

Storm sewer pipes convey stormwater. Storm pipes are constructed of many different types of materials and are sometimes perforated to allow groundwater to be collected by the storm system. Storm pipes are cleaned to remove sediment or blockages when problems are identified. Storm pipes must be clear of obstructions and breaks to prevent localized flooding.

*Inspection*

Pipes are difficult to inspect requiring special equipment and training. Usually, if a problem occurs the owner needs to call a sewer or plumbing contractor to inspect, repair, or clean pipelines.

*Cleaning*

Clean pipes when sediment depth is greater than 20 percent of pipe diameter. When cleaning a pipe, minimize sediment and debris discharges from pipes to the storm sewer. Install downstream debris traps (where applicable) before cleaning and then remove

material. Generally, use mechanical methods to remove root obstructions from inside storm sewer pipes. Do not put root-dissolving chemicals in storm sewer pipes. If there is a problem, remove the vegetation over the line.

*Safety*

Work inside underground structures requires special confined space equipment and procedures.

*Materials Handling*

Sediment and debris from pipes should be disposed as solid waste. Remove any stones first.

*Repairs*

Repair or replace pipes when a dent or break affects more than 20 percent of the pipe diameter. Repair or replace pipes damaged by rust or deterioration.

## 7. UNDERGROUND DETENTION SYSTEMS

Some detention systems consist of underground tanks or vaults that are usually placed under road or green areas. They hold and slowly release stormwater runoff from roofs and roads. Manufactures recommendations should be followed as a minimum.

*Inspection*

Inspect annually to prevent the accumulation of silt in the system which, if allowed to develop, would reduce effectiveness. The detention system should also be inspected after every major storm event. Periodically inspect the manhole and surrounding areas for pollutants such as leaks from vehicles, minor spills, and oil dumping. Take action to have the pollutant source removed.

*Cleaning*

Remove rubbish from the inlet and piping. Clean air vents that have one-half of their area plugged. Remove sediment when it accumulates to 1/10th the depth of a rectangular vault or 1/10th the diameter of a round tank or pipe.

*Materials Handling*

Disposal of waste from maintenance of drainage facilities shall be conducted in accordance with local regulations. Removed sediment must be disposed of as solid waste. Contaminated water should be disposed of in a sanitary sewer after oils are removed using oil absorbent materials or other mechanical means. Used oil absorbents should be recycled or disposed of according to the manufacturer's instructions and in accordance with EPA and Local Authority requirements.

*Repairs*

Any part of a tank or pipe that is bent out of shape more than 10 percent of its design shape must be replaced or repaired. Repair any joints that are cracked and which allow soil into the facility. Repair all security and access features so they are fully functional.

## 8. PERMEABLE PAVING

Permeable paving allows stormwater to soak through to the underlying stone reservoir, where it can filter down into the soil below. An overflow pipe may be used within the stone reservoir when soils are too compacted or do not infiltrate well. The main focus with permeable paving should be to keep the surface as clean as possible in order to maintain Hydraulic Conductivity. The use of grit or salt/grit blends for winter maintenance should be prevented. Permeable paving surfaces will generally require less applied salt than conventional dense surfaces as the water from melting ice and snow will drain away. Signs should be erected to identify the surface type and to prevent the application of sand or grit.

*Inspection*

Inspect at least annually to prevent the accumulation of silt and debris in the surface which, if allowed to develop, would reduce effectiveness. Inspect permeable pavement after storms to ensure proper drainage; water should not pond for more than 36 hours. Inspect structural integrity of the permeable pavement; repair or replace areas as needed. Inspect overflow outfall drain and repair or replace as needed. Inspect to ensure the surface has not been subject of a liquid spillage such as petrol, oil, etc which may have damaged same. The Hydraulic Conductivity of the surface should be assessed at least every two years to assess the effectiveness of maintenance.

*Cleaning*

Surface should be vacuum swept at least 2-3 times per year. This should be programmed to ensure that leaf fall is cleared during the autumn. It may also be necessary to locally clean areas were leaves accumulate around kerbs etc. on a more frequent basis, particularly in autumn. Cleaning – brush and hose down with water if required. High pressure washers can damage the surface and are not recommended. Other than mild, well diluted detergent, cleaning agents of any kind are not recommended. Should it be required, any proposed moss or weed treatment should be checked to ensure that is suitable for use on asphalt surfaces.

*Materials Handling*

Disposal of waste from maintenance of drainage facilities shall be conducted in accordance with local regulations. Removed sediment must be disposed of as solid waste. Contaminated water should be disposed of in a sanitary sewer after oils are removed using oil absorbent materials or other mechanical means. Used oil absorbents should be recycled or disposed of according to the manufacturer's instructions and in accordance with EPA and Local Authority requirements.

*Repairs*

If there is damage to the permeable paving the paving blocks should be replaced.

## 9. BIORETENTION SYSTEMS

Bioretention systems collect stormwater runoff from small carpark areas, roads and roofs. Runoff filters through the vegetation and surrounding soil mix, trapping sediment and pollutants before flowing to a piped stormwater system.

*Inspection*

Inspect quarterly to assess the plants for disease infection, poor growth, invasive species, etc. and replace as necessary. Watering may be required in dry periods, especially during plant establishment. The bioretention system should also be inspected after every major storm event to ensure the outlet is not blocked and clear of debris.

*Cleaning*

Remove rubbish, leaves and debris at top of bioretention system. Check inlet and outlet pipes are not blocked and clear of rubbish, leaves and debris.

*Materials Handling*

Disposal of waste from maintenance of drainage facilities shall be conducted in accordance with local regulations. Removed sediment must be disposed of as solid waste. Contaminated water should be disposed of in a sanitary sewer after oils are removed using oil absorbent materials or other mechanical means. Used oil absorbents should be recycled or disposed of according to the manufacturer's instructions and in accordance with EPA and Local Authority requirements.

*Repairs*

Check bioretention system is draining adequately by filling with water and monitoring over 24 hours. If not draining, attempt clearing outlet pipe using low (not high) pressure water blaster hose. If the system is still not draining, it may need the soil and underdrain system replaced. Repair minor accumulation of silt by raking away surface mulch and infill any holes or scour in the filter medium if required.

## 10. WETLAND

Wetlands are landscaped depressions with a permanent pool of water that provide both attenuation and treatment of surface water runoff. Dense stands of vegetation facilitate the adhesion of contaminants to vegetation, aerobic decomposition of pollutants and can also help stabilise settled sediment and prevent resuspension. Attenuation storage is provided above the permanent pool and wetland areas. Surface water from regular rainfall events is routed through the wetland and when the flows rise, because the outlet is restricted, the wetland fills and provides storage of runoff and flow attenuation.

*Inspection*

Inspect annually to prevent the accumulation of silt in the system which, if allowed to develop, would reduce effectiveness. The wetland should also be inspected after every major storm event. Periodically inspect the inlet and outlet manholes and surrounding areas for pollutants such as leaks from vehicles, minor spills, and oil dumping. Take action to have the pollutant source removed.

*Cleaning*

Remove rubbish from the wetland, inlet and outlet headwalls and piping. Remove sediment when it accumulates in the wetland. Cut grass of wetland that can be regarded as meadow grass unless additional management is required for landscape/amenity/recreational or aesthetic reasons.

*Materials Handling*

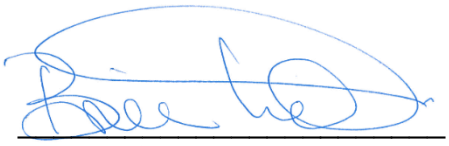
Disposal of waste from maintenance of drainage facilities shall be conducted in accordance with local regulations. Removed sediment must be disposed of as solid waste. Contaminated water should be disposed of in a sanitary sewer after oils are removed using oil absorbent materials or other mechanical means. Used oil absorbents should be recycled or disposed of according to the manufacturer's instructions and in accordance with EPA and Local Authority requirements.

*Repairs*

Repair erosion or other damage by reseeding or re-turfing the wetland. Relevel uneven surfaces and reinstate design levels. Realign rip-rap and repair/rehabilitate the inlets and outlets.

## 11. SUMMARY MAINTENANCE SCHEDULE

| Component | Inspection | Cleaning |
|---|---|---|
| Gully | Min once per year | When one third full |
| Manhole | Annually | When blockage occurs |
| Oil/Water Separator | Annually/Alarm System | Remove oil when it reaches 25mm thickness or on reception of text message form alarm system. Remove sediment when it accumulates to 150mm in depth |
| Flow Control Structure | Min once per year | Remove sediment within 450mm of the bottom of an orifice |
| Storm Sewers | Annually | Clean pipes when sediment depth is greater than 20 percent of pipe diameter |
| Underground Detention System | Annually and after major storm events | Clean air vents that have one-half of their area plugged. Remove sediment when it accumulates to 1/10th the depth of a rectangular vault or 1/10th the diameter of a round tank or pipe. |
| Permeable Paving | 2-3 Times Year | Vacuum sweep the pavement to remove sediment and prevent clogs. Brush and hose down with water if required |
| Bioretention Systems | Quarterly | Remove rubbish leaves and debris at top of tree pit. Check outlet pipe is not blocked and clear of rubbish, leaves and debris. |
| Wetland | Annually and after major storm events | Remove rubbish from wetland, inlet and outlet headwalls and piping. Remove sediment when it accumulates. Cut grass monthly or as required. |

**Signed:** 

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**Date:** 23 January 2025

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