

Manchester Goods Yard

Drainage Maintenance Strategy

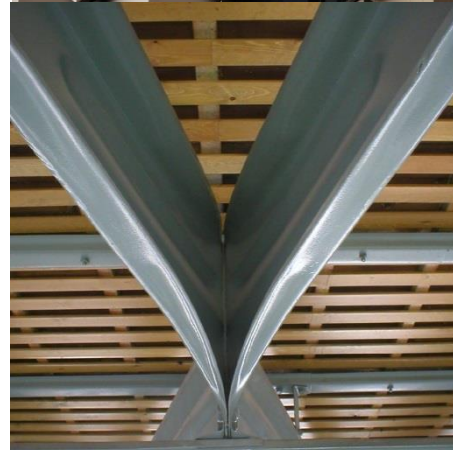
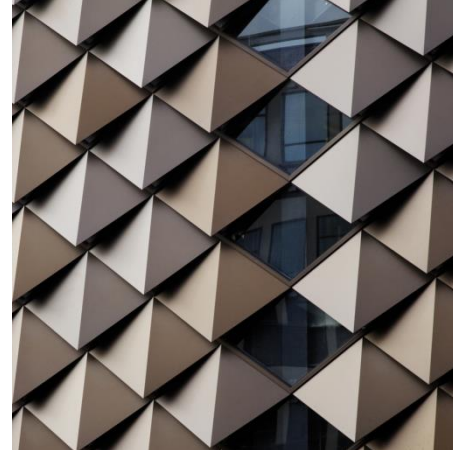
Curtins Ref: SJQ-600-CUR-00-XX-RP-C-92001

Revision: P01

Issue Date: 12 October 2021

Client Name: Allied London

Site Address: Manchester Goods Yard, St Johns Quarter, Manchester



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Control Sheet

Rev	Description	Issued by	Checked	Date
P01	First Issue	AH	CD	12/10/2021

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Author	Signature	Date
Adam Hogan MEng (Hons) GMICE Project Engineer		12 October 2021

Reviewed	Signature	Date
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Gatic - Slot drain Maintenance Guide

Naylor – Smart Filter Chamber

1.0 Introduction

1.1 Project Background

- 1.1.1 Curtins have been appointed by Allied London to provide a Drainage Maintenance Strategy for the proposed below ground drainage design for the St Johns Quarter's Manchester Good Yards (MGY), east of Water Street, Manchester. The British National Grid co-ordinates for the site is approximately Easting 383106, Northing 398032.
- 1.1.2 The report is based on currently available information and best practice guidance.
- 1.1.3 Proposals contained or forming part of this report represent the design intent and may be subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design and are deemed a material deviation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.
- 1.1.4 The surface water network has been designed to accommodate the 1 in 100-year storm rainfall event plus 30% for climate change. There may be a period of time after storm events where the network is still partially or fully surcharged and is draining down. Where this surcharging is still present after 48hrs appropriate action should be taken.

1.2 Scope of the Maintenance Strategy

- 1.2.1 This manual is intended to give an overview of the operation and maintenance for the drainage features included with the drainage strategy and in relation to typical details only. Where proprietary products are specified the manufacturer's instructions and recommendations should be followed in priority to this document unless specifically noted otherwise due to project constraints.
- 1.2.2 The recommended operations and frequencies are typical only and should be more frequent initially to ensure that there are no unforeseen issues with the operation and then adjusted to suit the site requirements.

2.0 Maintenance Recommendations

2.1 Components

2.1.1 The following components have been included within the drainage design for the proposed development:

- Inspection, Manhole and Catchpit Chambers
- Pipes
- Gullies / Sump, Outlet and Access Units
- Linear Drainage (Gatic Slot Drains)
- Smart Filter Chamber (Naylor)

2.2 General Maintenance

2.2.1 It is assumed that the maintenance of the drainage network within the ownership boundary will be the responsibility of the landowner.

2.2.2 It is assumed that the maintenance of the drainage network outside of the Ownership Boundary will be the responsibility of Manchester City Council and United Utilities.

2.2.3 A copy of the final construction drainage layout should be provided in the final Operations and Maintenance Manual. Reference should be made to the proposed drainage layout: Curtins drawing SJQ-600-CUR-06-XX-DR-C-92500.

2.2.4 The current completion date for the development is unknown. The maintenance scheduling should begin from the completion date.

2.2.5 It is recommended that the drainage system is inspected as a minimum twice a year, with the system also being inspected after any major storm event.

2.2.6 Significant sediment deposition is likely in areas used for storage, so a post clean-up operation may be required including the removal of litter, vegetation, sewerage debris and larger objects.

2.2.7 Long-term management practices include monthly sweeping of external paved areas. The sweeping program will remove sand and contaminants directly from paved surfaces before they become mobilised during storm events and transported to the drainage system.

2.2.8 During the winter months, drainage features such as gullies and channels should be cleared of ice, snow, debris or litter.

2.3 Inspection, Manhole and Catchpit Chambers

- 2.3.1 The locations of the chambers are indicated on Curtins drainage drawing SJQ-600-CUR-06-XX-DR-C-92500.
- 2.3.2 Access points have been located at the head of each run, at a change in direction and at a change of pipe size in accordance with Building Regulations Part H.
- 2.3.3 The appropriate barriers and signage should be installed during any opening of manholes to warn pedestrians.
- 2.3.4 Existing manholes are subject to existing access procedures. Typically chambers with a minimum working space of 900mm can be accessed by personnel; however, a winch must be used. Where 1050mm of working space is provided, manholes should be accessed using steps and where 1200mm working space is provided; manholes should be accessed using ladders, this is in accordance with Building Regulations Part H.
- 2.3.5 When accessing chambers, the latest Health and Safety legislation should be adhered to.
- 2.3.6 The appropriate health and safety equipment must be used when accessing manholes. Confined space certificates must be held by any personnel entering a manhole and the appropriate permits should be obtained from the Facilities Maintenance Manager prior to any access.
- 2.3.7 Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required)	Initial inspection should be provided as post construction CCTV survey.	N/A
	Inspect for evidence of poor operation via water level in chambers. If required take remedial action.	3-monthly, 48 hours after large storms.
Occasional maintenance	Check and remove large vegetation growth near pipe runs.	6 monthly
Remedial actions	Rod through poorly performing runs as initial remediation.	As required.
	If continued poor performance jet and CCTV survey poorly performing runs.	As required.

	Seek advice as to remediation techniques suitable for the type of performance issue and location.	As required If above does not improve performance.
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2.4 Pipes

- 2.4.1 The locations of the pipes are indicated on Curtins drainage drawing SJQ-600-CUR-06-XX-DR-C-92500. Pipes can be cleaned using drain cleaning rods or drain cleaning jets, accessed from inspection chambers and manholes.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required)	Initial inspection should be provided as post construction CCTV survey.	N/A
	Inspect for evidence of poor operation via water level in chambers. If required take remedial action.	3-monthly, 48 hours after large storms.
Occasional maintenance	Check and remove large vegetation growth near pipe runs.	6 monthly
Remedial actions	Rod through poorly performing runs as initial remediation.	As required.
	If continued poor performance jet and CCTV survey poorly performing runs.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue and location.	As required If above does not improve performance.

2.5 Gullies / Sump, Outlet and Access Units

- 2.5.1 The locations of the gullies or sump outlet units are indicated on Curtins drainage drawing SJQ-600-CUR-06-XX-DR-C-92500.

- 2.5.2 Gullies and sump outlet units installed have removable covers to allow cleaning and clearing of debris and silt. The appropriate barriers and signage should be installed during any opening of gullies to warn pedestrians.
- 2.5.3 Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas.

2.6 Linear Slot Drainage

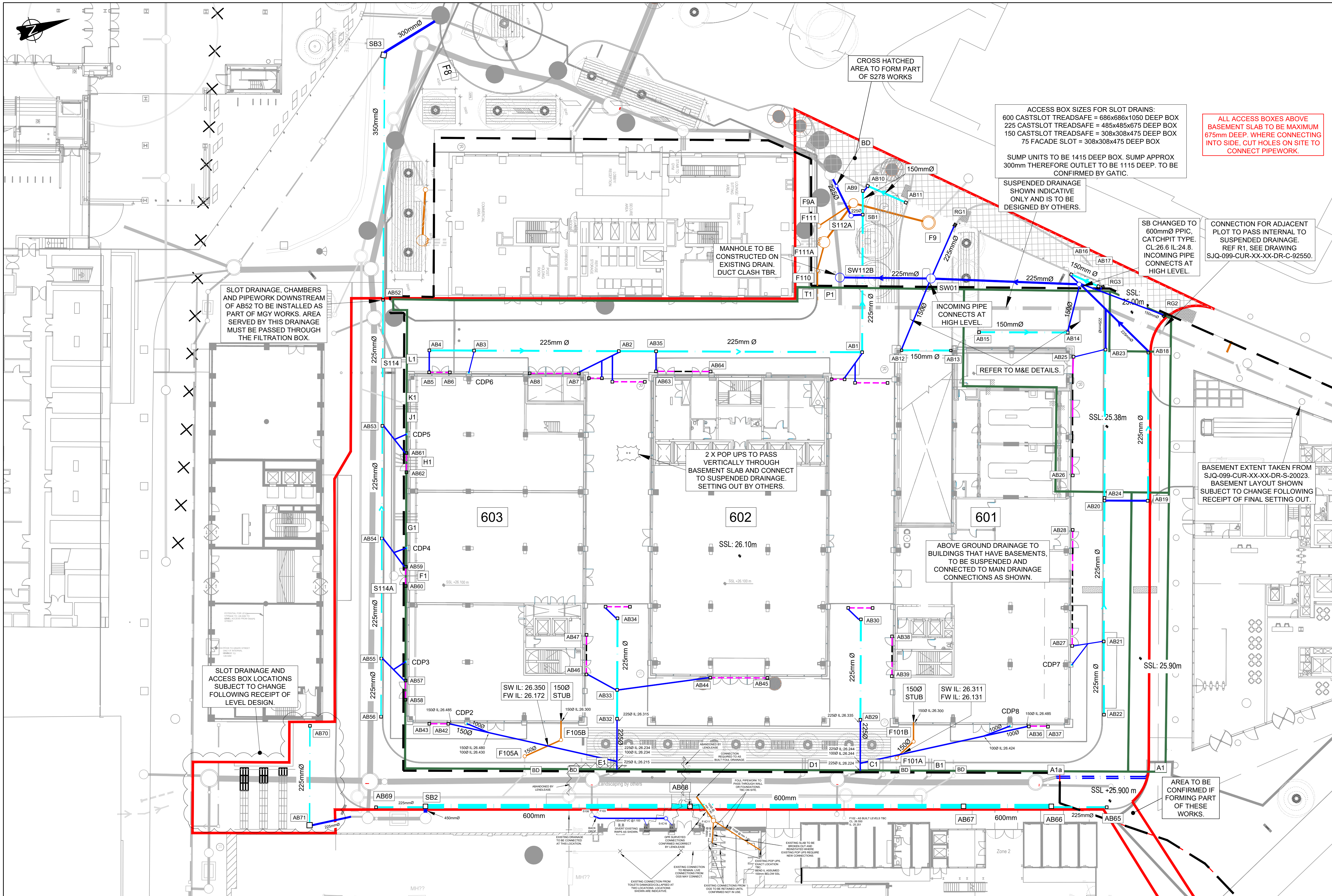
- 2.6.1 Linear channel drainage systems should be inspected and cleaned in accordance with the manufacturer's maintenance guide (see *Appendix B*).
- 2.6.2 Outlet units can be cleaned through the use of a high-pressure hose; this can be fed into the channel system through access units strategically placed along the channel run. The throat section of channel units should be kept clear at all times to ensure uninterrupted flow of surface water into the drainage channel and any debris within the throat should be removed.
- 2.6.3 See Appendix B for details of manufacturers maintenance guide.

2.7 Naylor Smart Filter Chamber

- 2.7.1 The location of the smart filters are indicated on Curtins drawing SJQ-600-CUR-06-XX-DR-C-92500.
- 2.7.2 The smart filters should be inspected and cleaned in accordance with the manufacturer's details included in Appendix B.
- 2.7.3 The maintenance guide highlights the proactive checks should be carried out every 6 months.

Appendix A

Proposed Drainage Drawings: SJQ-600-CUR-06-XX-DR-C-92500.



GENERAL NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

KEY:

PROPOSED SURFACE WATER MASTERPLAN DRAINAGE.

PROPOSED FOUL WATER MASTERPLAN DRAINAGE.

PROPOSED SURFACE WATER DRAINAGE.

PROPOSED FOUL WATER DRAINAGE.

PROPOSED GATIC LINEAR FACADE DRAINAGE (75mm).

PROPOSED BELOW GROUND LINK

PROPOSED LINEAR DRAINAGE: GATIC CASTSLOT TREADSAFE.

PROPOSED ACCESS BOX.

PROPOSED OUTLET BOX.

PROPOSED SILT BOX.

PROPOSED ROAD GULLY.

CANOPY ROOF DRAINAGE POINT WITH 100mm CONNECTION.

PROPOSED PLOT DRAINAGE BY OTHERS.

SUSPENDED DRAINAGE SHOWN INDICATIVE. TO BE DESIGNED BY OTHERS.

MGY WORKS BOUNDARY

BASEMENT FOOTPRINT

MGY BASEMENT STRUCTURAL SLAB. SEE LAYOUT FOR LEVEL CHANGES.

DRAINAGE DRAWING CO-ORDINATED WITH:

EXTERIOR ARCHITECTURE LANDSCAPE PROPOSALS SJQ-600-EXA-XX-L00-DR-L-000109.

CANOPY DRAINAGE TAKEN FROM SJQ-600-CTA-XX-L00-DR-A-20056, 20057 & 20058.

POP UPS - CHAPMAN TAYLOR DRAWING SJQ-600-CTA-XX-L00-DR-A-16910_C02

FOR MASTERPLAN DRAINAGE REFER TO DRAWINGS: SJQ-099-CUR-XX-XX-DR-C-92550 DRAINAGE LAYOUT SJQ-099-CUR-XX-XX-DR-C-92560 DRAINAGE DETAILS 1 SJQ-099-CUR-XX-XX-DR-C-92561 DRAINAGE DETAILS 2 SJQ-099-CUR-XX-XX-DR-C-92562 DRAINAGE DETAILS 3 SJQ-099-CUR-XX-XX-DR-C-92563 MANHOLE SCHEDULE

DRAWING TO BE READ IN CONJUNCTION WITH NOTES DRAWING SJQ-600-CUR-06-XX-DR-C-92551.

CONTRACTOR TO CONFIRM WHAT DRAINAGE WORKS HAVE BEEN INSTALLED BY THE PREVIOUS CONTRACTOR.

Rev	Description	Date	By	Chkd
C02	2 x POP UPS ADDED TO MEZZ INFILL AREA.	12.10.21	CD	CD
C01	TOILET DRAINAGE UPDATE. MEZZ INFILL THRESHOLD DRAINAGE ADDED.	10.09.21	CD	CD
P02	UPDATED TO INCLUDE OGS TOILETS AND RWPS	17.08.21	CD	CD
P01	STAGE 5 ISSUE	13.08.21	CS	CD

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Status:

CONSTRUCTION

Project:

St Johns

Manch

**MANCHESTER GOODS YARD
PROPOSED DRAINAGE LAYOUT**

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	11.08.21	CS	CD	CD

Scale: 1:250

Project No: Originator: Zone: Level: Type: Discipline: Category / Number: Rev:

SJQ- 600 - CUR - 06 - XX - DR - C - 92550 - C02

PROPOSED MANHOLE SCHEDULE - REFER TO SEA 700 EDITION									
REF	IL (mAOd)	USE	U/S DIA (mm)	D/S DIA (mm)	D/S CHAMBER	IL (mAOd)	NORTHING	Easting	Comments
S1	24.750	SURFACE	2 X 150	2 X 150	S1	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
A1a	24.750	SURFACE	2 X 150	2 X 150	S1	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
B1	24.750	SURFACE	2 X 150	2 X 150	S102	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
C1	24.750	SURFACE	150	150	S103	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
D1	24.750	SURFACE	2 X 150	225	S105	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
E1	24.750	SURFACE	2 X 150	225	S107	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
F1	24.750	SURFACE	150	150	S114A	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
G1	24.750	SURFACE	3 X 150	300	300 DIA PIPE	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
H1	24.750	SURFACE	4 X 150	300	300 DIA PIPE	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
J1	24.750	SURFACE	2 X 150	300	300 DIA PIPE	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
K1	25.005	FOUL	150	150	F107	25.005	25.005	25.005	SEE SJQ-099-CUR-06-XX-DR-C-92551
L1	24.750	SURFACE	2 X 150	300	S114	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
P1	24.750	FOUL	150	150	F110	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
T1	24.750	FOUL	150	150	F110	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551

REFER TO THE ABOVE LAYOUT FOR REFERENCE LOCATIONS

PROPOSED MANHOLE SCHEDULE - REFER TO SEA 700 EDITION									
REF	IL (mAOd)	USE	U/S DIA (mm)	D/S DIA (mm)	D/S CHAMBER	IL (mAOd)	NORTHING	Easting	Comments
S1	24.750	SURFACE	2 X 150	2 X 150	S1	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
A1a	24.750	SURFACE	2 X 150	2 X 150	S1	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
B1	24.750	SURFACE	2 X 150	2 X 150	S102	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
C1	24.750	SURFACE	150	150	S103	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
D1	24.750	SURFACE	2 X 150	225	S105	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
E1	24.750	SURFACE	2 X 150	225	S107	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
F1	24.750	SURFACE	150	150	S114A	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
G1	24.750	SURFACE	3 X 150	300	300 DIA PIPE	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
H1	24.750	SURFACE	4 X 150	300	300 DIA PIPE	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
J1	24.750	SURFACE	2 X 150	300	300 DIA PIPE	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
K1	25.005	FOUL	150	150	F107	25.005	25.005	25.005	SEE SJQ-099-CUR-06-XX-DR-C-92551
L1	24.750	SURFACE	2 X 150	300	S114	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
P1	24.750	FOUL	150	150	F110	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551
T1	24.750	FOUL	150	150	F110	24.750	24.750	24.750	SEE SJQ-099-CUR-06-XX-DR-C-92551

REFER TO THE ABOVE LAYOUT FOR REFERENCE LOCATIONS

ALL SUSPENDED DRAINAGE TO BE DESIGNED BY OTHERS. ALLOWANCE TO BE MADE FOR CONNECTING PROPOSED UNDERGROUND DRAINAGE WHERE SHOWN.

CONTIGUOUS WALL LOCATION SHOWN INDICATIVE ONLY AND IS TO BE CONFIRMED BY OTHERS.

THRESHOLD DRAINAGE HAS BEEN SHOWN AS REQUESTED HOWEVER, LEVELS FALL AWAY FROM BUILDINGS.

DRAINAGE RUNS SHOWN GREY ARE TO BE INSTALLED AS PART OF A SEPARATE CONTRACT. ONLY DRAINAGE SHOWN IN COLOUR IS TO FORM PART OF MGY SCHEME.

M&E ENGINEER TO CONFIRM THAT SUSPENDED DRAINAGE CAN BE DRAINED VIA THE CONNECTIONS PROVIDED.

LINEAR DRAINAGE CHANNELS SHOWN AND ASSOCIATED OUTLET/ACCESS BOXES ARE TO SIT ABOVE STRUCTURAL SLAB WITHIN EXTERNAL FINISHES.

NO EXTERNAL AREAS ARE TO DRAIN DIRECTLY ON TO THE ADOPTED HIGHWAY. INTERCEPTING DRAINAGE WILL BE REQUIRED TO PREVENT THIS.

EXTERNAL LEVELS TO FALL AWAY FROM BUILDINGS.

LINEAR DRAINAGE POSITIONS SHOWN INDICATIVE AND ARE SUBJECT TO APPROVED FINAL LEVELS.

ALL BUILDING LEVELS AND ACCESS TO BASEMENT CAR PARK TO ACHIEVE MINIMUM LEVELS OF 26.9m AOD IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE FLOOD RISK ASSESSMENT.

DETAILS OF FACADE SLOT DRAIN ACCESS BOXES ARE TO BE CONFIRMED AND COORDINATED WITH BUILDING WALLS/FOUNDATIONS.

ALL DRAINAGE WITHIN TRAFFICKED AREAS TO HAVE A LOADING CLASS OF D400 OR GREATER.

BUILDING LAYOUTS, EXTERNAL LAYOUT ARE SUBJECT TO CHANGE AS THE SCHEME PROGRESSES.

RECESSES MAY BE REQUIRED WITHIN THE SLAB TO ALLOW FOR DRAINAGE CONNECTIONS. REFER TO STRUCTURAL SLAB DRAWINGS FOR DETAILS.

ADDITIONAL DRAINAGE RUNS, LINEAR DRAINS, GULLIES ETC MAY BE REQUIRED FOLLOWING APPROVAL OF FINAL EXTERNAL LEVEL DESIGN.

WHERE SHALLOW CONNECTIONS TO EXTERNAL MASTER DRAINAGE ARE REQUIRED, DRAINAGE IS TO BE LOCATED WITHIN CONSTRUCTION MAKE UP ABOVE SLAB OR WITHIN STRUCTURAL SLAB AS DETAILED BY STRUCTURAL ENGINEER.

GATIC FACADE DRAIN TO BE 75mm Ø UNO. ALL SLOT DRAIN SIZING SHOWN ON LAYOUT.

GATIC FACADE OUTLETS TO BE 100mmØ UNO. CANOPY DRAIN OUTLETS TO BE 100mmØ UNO.

CANOPY DRAIN TO BEND 300mm BELOW GROUND AT 26.6m OAD.

Unfiled/Project/06/1800 - 06/17/2026/1804 - Manchester Goods Yard/04/Production/MA Models Drawings/CAD/02 - Drainage/MGY NEW

Appendix B

Gatic Slot drain Maintenance Guide

Naylor Smart Filter Chamber

Gatic Slotdrain

Cleaning and Maintenance – Rev0

If linear drains only had clear rainwater running through them, there would be no need to maintain them. Unfortunately, they don't. Detritus suspended in the water and rubbish will gradually enter a linear drain and settle, making it less efficient and eventually blocking it altogether.

To prevent this, Gatic advises a regular maintenance program tailored to the environment into which the system is installed. This will keep the system running as efficiently as possible.

Unlike grated linear drainage systems, Slotted systems are by their very nature more difficult to access and clean. However, as long as access points are detailed at regular intervals, the system can be effectively cleaned by high pressure water jetting (figure 1).



Figure 1

Gatic advises that for 100-350mm Wide Channels mid-run access units should be placed every 30-50m. For 400-600mm Wide Channels mid-run access units should be placed every 75-100m. For short channel runs of 10m long or less, channel end-caps may be sufficient at the start of the channel run as cleaning can be carried out from the catch pit end.



Figure 2

To remove dirt and debris build up, the water pressure for cleaning linear drains is usually between 1000 and 3000 psi or around 200 bar. Gatic advises using a rear facing spinning jet as shown in figure 2 combined with surface jetting as shown in figure 3.



Figure 3

June 2019

Oliver Timmins

From: Matthew Ellison <Matthew.Ellison@naylor.co.uk>
Sent: 28 October 2019 16:39
To: Oliver Timmins
Subject: FW: Smart Filter - Maintenance Guide
Attachments: Naylor Smart Sponge Brochure.pdf

Good Afternoon Oliver.

Many thanks for your enquiry. Please see image below that should give you the information you require. I have also attached a copy of the smart sponge brochure for your reference purposes.

Smart Paks - Smart Filters®

It is intended that proactive checks are completed on a six monthly basis, any remedial work will be managed reactively.

1. Open the top of the Smart Filter® & using the plastic ties lift out the wire cage containing the Smart Paks, snip the plastic ties & remove the individual Smart Pak, shake off excess water & weigh the Smart Pak and record this on the maintenance schedule.
2. If the recorded weight is greater than twice the dry weight, replace the Smart Paks accordingly with new ones. If less than twice the weight, a changeover date can be calculated based on the relative weights.
3. Relace the Smart Paks back in the wire cages, renewing any plastic ties to hold the cages closed and slide the cage back into

Size	Dry Weight		Spent Weight		Size	Dry Weight		Spent Weight	
SMPK1212-2.5	1.95kg		4.6kg		SMPK1515-2.5	2.9kg		7.2kg	
SMPK1212-3	2.22kg		5.5kg		SMPK 1515-3	3.5kg		8.7kg	

Smart Pak weights before and after application (assumes a non confined unit).

Kindest Regards

From: Oliver Timmins [<mailto:Oliver.Timmins@curtins.com>]
Sent: 28 October 2019 14:55
To: Environmental <Environmental@naylor.co.uk>
Subject: Smart Filter - Maintenance Guide

To who it may concern,

We have specified one of your products for one of our sites we are helping develop.

The product is the 'Smart Filter'.

We are having to write a maintenance strategy as part of our works.

I was wondering if you are able to supply me with any maintenance information/documents regarding the product. Including how often it should be inspected and cleaned etc.

Kind Regards,
Oliver Timmins

Oliver Timmins
Graduate Engineer
T. 0161 236 2394
oliver.timmins@curtins.com



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Plat
Unit

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Registered Number: 2908579 VAT Number: 183 8089 30

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Naylor - Human Capital Awards Winner - Growing Business

Naylor - Investors in People

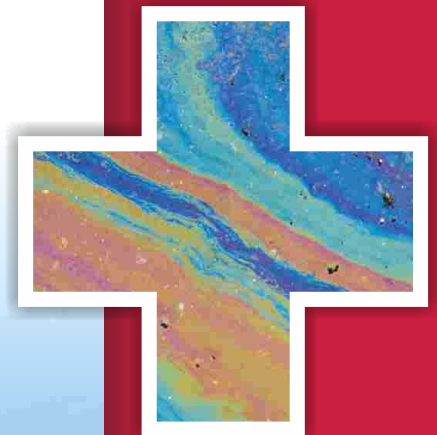


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ENVIRONMENTAL

**SMART⁺
sponge[®]**

**Oil Filtration & Pathogen
Reduction Products**

**Solutions
for Water
Framework
Directive
Compliance**



**The smarter
solution to deal
with hydrocarbon
pollution and
comply with the
Water Framework
Directive**

- Treats stormwater & urban run-off
- Removes hydrocarbons
- Destroys bacteria
- Filters heavy metals
- Allows solid waste recycling
- Complies with the Water Framework Directive
- Complies with Bathing Water Directive

email: environmental@naylor.co.uk web: www.naylor.co.uk



Winners -
Growing Business



The MANUFACTURING
EXCELLENCE Awards
Winner - Best SME



Tel 01226 794135

Fax 01226 791531

Used Oil Facts

- It is estimated that a quarter of a billion gallons of used oil is generated each year in the UK from industry and motor vehicles
- The fate of much of this used oil is unknown but a large proportion is presumably disposed of improperly
- 1 in 5 households carry out a do-it-yourself oil change
- The oil from a single oil change (1 gallon) can contaminate 1 million gallons of drinking water - a year's supply of water for 50 people
- Oil contributes to 20% of all UK water pollution incidents
- Used oil is a useful substance that, when recovered, can be used as a fuel and saves resources

Used Oils Impact on the Environment

- 10 litres of oil from one car can pollute a lake the size of two football pitches
- Used motor oil contains toxic substances such as toluene, lead, cadmium and benzene
- Oil films prevent replenishment of dissolved oxygen, impair photosynthesis and block sunlight
- Sump oil accounts for 40% of oil pollution of the nation's harbours and waterways
- Concentrations of 50 to 100 parts per million of used oil can foul sewage treatment plants
- Oil dumped on land reduces soil productivity
- Many industrialised countries, worldwide, recover a greater portion of their used oil as fuel and lubricants than the United Kingdom

A large, vibrant background image showing a close-up of oil pollution. It features swirling patterns of blue, green, yellow, and orange, with dark, irregular shapes representing oil droplets and debris. A small, rusted metal object is visible on the right side.

*It is estimated that a
**quarter
of a billion
gallons**
of used oil is generated each
year in the UK from industry
and motor vehicles*

THE **SMARTER** SOLUTION TO: Treat surface water pollution

"A revolutionary new product that is taking the global surface water market by storm"

Smart Sponge®

- Treats stormwater & urban run-off
- Removes hydrocarbons
- Destroys bacteria
- Filters heavy metals & sediment

Smart Sponge® was developed for the oil industry, the Smart Sponge® is based on patented polymer technologies and is the only non-toxic, fully recyclable filtration system that destroys bacteria and absorbs hydrocarbons on contact. Contaminated stormwater run-off, known as 'non-point source pollution', is a major source of contamination for lakes, streams, rivers, estuaries, coastal waters and even groundwater and forms part of the focus for the Water Framework Directive and Bathing Water Directive.

Smart Sponge® is a proprietary combination of synthetic polymers with a unique molecular structure that is chemically selective to hydrocarbons. Smart Sponge® fully encapsulates recovered oil, preventing absorbed oil from leaching and is also capable of removing low levels of oil from water, thereby successfully removing sheen. The spent product is able to be used within a Waste for Energy process as it produces between 10,000 - 18,000 BTU per pound, thereby creating a closed-loop solution with no resultant waste product.

THE **SMARTER** SOLUTION TO: Spill kits

The **Smart Sponge**® technology, **Smart Sponge**® is **NOT** a spill kit

"Smart Sponge® has the capacity to absorb up to five times its own weight (depending on the type of oil contaminant) and remove up to 95% of the hydrocarbons present in stormwater run-off."

Absorbent **VS** Adsorbent

The **Smart Sponge**® proprietary blend of polymers is oleophilic – an absorbent, which means that hydrocarbons are bonded within its chemical matrix. Therefore, absorption is permanent and saturated product cannot be washed off, squeezed out, or leached from the material during subsequent rain events.

Once absorbed, those pollutants are transformed into a stable solid for easy recycling, providing a closed-loop solution to water pollution. Traditional adsorbents lack this absorbent characteristic. Instead they feature an adsorbent capability that merely attracts hydrocarbons to their surface, but cannot prevent them from leaching back into the environment.

Smart Sponge® Key Features:

- Chemically selective to hydrocarbons
- Removes surface sheen
- Transforms pollutants into a stable solid
- Non-leaching
- Fully recyclable



Smart Sponge® - a proprietary polymer technology unique in its ability to effectively remove, absorb and retain hydrocarbons from flowing or static water. **Smart Sponge**® technology maximises the effectiveness of its oil-absorbing polymers by forming them into an extremely porous structure that allows effective, long-lasting absorption, without clogging or channelling, which is common among any other filtration media in a powder, particulate or fibre form.

Oil contributes to 20% of all UK water pollution incidents.



The **Smart Sponge**® polymers are also hydrophobic and oleophilic - allowing water to pass through while hydrocarbons are absorbed. The structure is so effective, that even as it swells with contaminants, high flow rates and filtering capabilities are still maintained. Field and laboratory tests have confirmed the **Smart Sponge**® capacity to absorb 2-4 times its own weight or more (depending on the type of oil contaminant) and remove up to 95% of the hydrocarbons present in stormwater run-off.

THE **SMARTER** SOLUTION TO: Support infrastructure

Wiltshire Council Gully Trials Case Study

"Wiltshire Council is always seeking ways of improving its service to the community while at the same time remaining as kind to the environment as possible. So when Wiltshire Council was introduced to the Smart Sponge® technology (SST) with its synthetic polymers used for removing hydrocarbons and oil derivatives from surface water, we decided to trial the product.

The various tests demonstrated just how the technology built into the Smart Sponge® system offered an easy solution to the problem many local authorities face when dealing with gullywaste and the ever-increasing costs associated with its disposal. Currently Wiltshire Council disposes of gully waste by way of landfill, which has environmental and cost implications.

Wiltshire Council undertook its own year long trials that clearly show that financial savings can be made by reducing the volume of contaminated waste as the Smart Sponge® transforms captured pollutants into a solid waste for recycling as a Waste to Fuel energy or as landfill waste. In addition this also had a significant reduction in environmental impact!



Water quality samples and weight of SS were taken every three months from each test gully over a 12 month period. Eight road gullies and one interceptor had PAH values averaging 8500ppm. **The PAH levels have decreased over this 12 month period to under 1ppm.** To date, the trial has clearly proven that SS reduces the level of PAH in contaminated surface water run-off, far exceeding EU legislations criteria. In the future, Wiltshire Council is aiming to recycle the spent SS as a waste to fuel energy, which burns at 10 - 18,000 BTU per pound. In the immediate future we are installing Smart Sponge technology in all of the depots we use to tip out gully waste.



Brian Lanham Weather and Drainage Manager

"Working alongside the Smart Sponge® team whilst investigating this product has made the decision making so much easier, and I believe we have chosen the right product for the right job."

Sarah Peterson Technical Assistant

"Smart Sponge® has shown excellent results throughout our entire trial. I have been impressed with every aspect of Smart Sponge®, especially the ease of using and maintaining the product. I am very much looking forward to the next developments involving the use of Smart Sponge® within Wiltshire."

West Lothian River Protection Trials Case Study

In February 2012, West Lothian Council decided to trial the Smart Sponge® Ultra Urban Filters at the downpipes for the A899 Road Bridge a four-lane carriageway over 700 metres long which drains runoff directly into the River Almond through four 225mm diameter pipes to see how much hydrocarbon pollution could be prevented from entering the river.

They decided to trial the Naylor Smart Sponge® Ultra Urban Filters (UUF) positioned at the base of the down pipes from the bridge - this is one of several Smart Sponge® bridge solutions that is available and was chosen to allow ground level easy access for monitoring and changeover purposes.

Four UUF units were installed in February 2012 and monitored by SAC Consulting Limited under an Environmental Monitoring Contract with West Lothian Council as part of their remit to monitor various water courses. The four units were removed in October 2013 and found to have absorbed over 48 litres of hydrocarbons from the run off into the river as well as high levels of silt & sedimentation changing the liquid contaminant into a solid waste.

The project has successfully demonstrated the ability of Smart Sponge® to absorb hydrocarbons from the runoff from the bridge and of the three treatment options available from Smart Sponge® the Ultra Urban Filter provides the greatest absorption rates whilst also intercepting detritus from the bridge deck.



Graeme Hedger Officer with West Lothian Council

"The pilot scheme has tested Smart Sponge® products in a variety of challenging locations. Evidence from the monitored trial suggests that the products are effective at intercepting and locking up hydrocarbons in runoff preventing pollution from reaching receiving watercourses helping the council meet its obligations under the European Water Framework Directive. The use of Smart Sponge® products is to be continued beyond duration of the pilot scheme in a number of the locations included in the pilot scheme."

THE **SMARTER** SOLUTION TO: Remove pathogens from stormwater

"The presence of bacteria in stormwater is a serious problem and poses significant health risks that increasingly result in the contamination of water bodies."

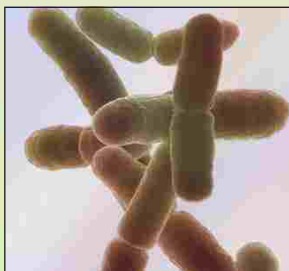
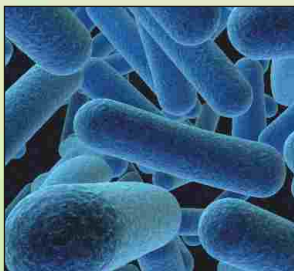
Roger Goulding - National Advisor, EA.

"We've looked at the capability of Smart Sponge® Plus to remove bacteria from urban streams and drainage affecting bathing waters. Following dramatic successes in the laboratory, field trials have shown potential for it to work....."

Smart Sponge® **PLUS**

Apart from the standard Smart Sponge® there is also Smart Sponge® **PLUS** which has all the features of being able to remove hydrocarbons as well as being the only non-toxic, fully recyclable filtration system that destroys bacteria at street level.

The presence of bacteria in stormwater is a serious problem and poses significant health risks that increasingly result in the contamination of water bodies. The greatest opportunity to reduce this bacterial count is during rain events through the control and treatment of stormwater run-off. This can be achieved by the Smart Filter® system fitted with Smart Sponge® **PLUS** which can also be adapted and used as part of a full treatment system for Combined Sewer Overflows (CSO's)



Smart Sponge® Plus's

ability to remove E.coli, Enterococci, Salmonella and many more pathogens from moving water makes it the ideal solution.

THE SMARTER SOLUTION TO:

Remove pathogens from stormwater

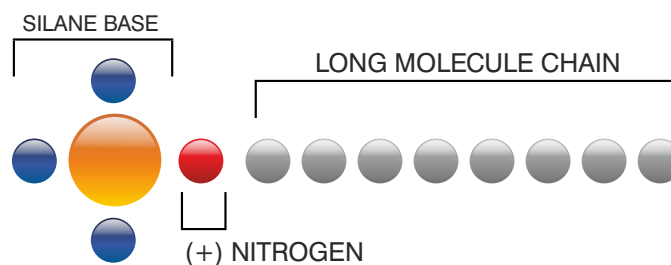
Smart Sponge® PLUS technology

Smart Sponge® PLUS for Hydrocarbons Plus Bacteria

- Smart Sponge® PLUS dramatically reduces coliform bacteria found in stormwater, industrial wastewater and municipal wastewater
- Smart Sponge® PLUS can be engineered using controlled test parameters (such as modifying flow rates and coliform bacteria concentration) to meet your performance requirements
- Smart Sponge® PLUS is designed to assist water systems to meet Total Maximum Daily Load Limits (TMDLs) for coliform bacteria
- When properly installed and maintained Smart Sponge® PLUS provides a significant reduction in coliform bacteria

Smart Sponge® PLUS – has all the features of standard Smart Sponge® as well as the dual action capability of destroying disease-causing micro-organisms from surface water such as:

- Aspergillus Niger • Trichophyton Mentagrophytes • Penicillium Pinophilum
- Chaetomium Globosum • Trichoderma Virens • Aureobasidium Pullulans
- Escherichia Coli • Salmonella • Streptococcus • Enterococci



Environment Agency laboratory tests confirmed a 99.9% removal of E. Coli and 99.5% reduction for Enterococci with a Smart Sponge® Plus treatment train, clearly demonstrating its effectiveness in achieving Log 1 and Log 2 reduction levels.

Roger Goulding - National Advisor, EA

"We've looked at the capability of Smart Sponge® Plus to remove bacteria from urban streams and drainage affecting bathing waters. Following dramatic successes in the laboratory, field trials have shown potential for it to work, if silt and sediment can be successfully removed before the treatment train."

Anti-microbial agent

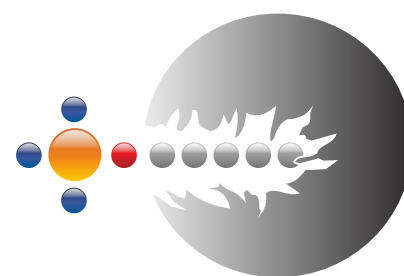
In the Smart Sponge® PLUS, the anti-microbial agent is chemically and permanently bound to the polymer surface and serves to control fungi, static odour and mildew.

The anti-microbial mechanism is based on the agent's electromagnetic interaction with the micro-organism cell membrane, causing the micro-organism disruption but no chemical or physical change in the agent.

Anti-microbial activity does not reduce the agent capability or cause its depletion and, therefore, maintains long-term effectiveness. Test results demonstrated the maximum bacterial removal rates of Smart Sponge® PLUS in both dry and wet weather sampling for fecal coliform ranged from 89.4 to 99.6 percent; and for Enterococcus, 96.2 to 99.9 percent.

Contaminants	Concentration Range	P.S.D d50	Performance	Filter bed depth
Oil & Grease	> 100ppm	-	>95%	> 100mm
	< 100ppm	-	>75%	> 100mm
Bacteria				
E.coli	1x10 ³ CFU*/100ml	-	>90%	>1.5m
Fecal Coliform	1x10 ³ CFU*/100ml	-	>90%	>0.9m
Enterococcus	1x10 ⁴ CFU*/100ml	-	>90%	>0.9m
Total Coliforms	1x10 ⁴ CFU*/100ml	-	>90%	>1.5m
TSS	100-300ppm	>15μ	>80%	>1.5m
TSS	>100ppm	>100μ	>80%	>0.6m
T. Phosphorous		>15μ	>40%	>1.5m

* Colony Forming Units



Physical inactivation of Bacteria - Rupture of the Cell Wall

THE SMARTER SOLUTION TO:

Remove hydrocarbons from carriageway run-off

"In tests, Wiltshire County Council reduced hydrocarbon concentrations in their road gullies from 8,000ppm to 1ppm"

Smart Gully® Range

The clever push fit design incorporates a finned rubber gasket ensuring a snug fit replacing the rodding bung ensuring no loss of hydraulic capacity or engineering design. Smart Gully® incorporates the unique Smart Sponge® technology that removes hydrocarbons from stormwater.

The Smart Gullies® have a Smart Gully Adaptor® already fitted and are supplied complete with a purpose designed Smart Pak® already installed and are available for both plastic and concrete gullies.

Range table (Complete Smart Gully® units)

Prod No.	Description	Dims (mm)
SGCO2	Concrete Smart Gully®	375 ID 900 deep
SGCO3	Concrete Smart Gully®	450 ID 750 deep
SGCO4	Concrete Smart Gully®	450 ID 900 deep
SGCO5	Concrete Smart Gully®	450 ID 1050 deep
SGP67004	Plastic Smart Gully®	450 ID 900 deep x 160 outlet
SGP67005	Plastic Smart Gully®	450 ID 750 deep x 160 outlet
SGP67003	Plastic Smart Gully®	450 ID 900 deep x 178 outlet
SGP67009	Plastic Smart Gully®	450 ID 750 deep x 178 outlet
SGP67002	Plastic Smart Gully®	375 ID 750 deep x 178 outlet
SGV07536	Vitrified Clay Smart Gully®	300 ID 610 deep x 100 outlet
SGV07537	Vitrified Clay Smart Gully®	300 ID 610 deep x 150 outlet
SGV07545	Vitrified Clay Smart Gully®	375 ID 760 deep x 150 outlet
SGV07556	Vitrified Clay Smart Gully®	450 ID 915 deep x 150 outlet

* all Smart Gullies® c/w 1 x Adaptor.

The special Smart Gully Adaptors® (SGA) are also available for retrofitting in existing gullies:



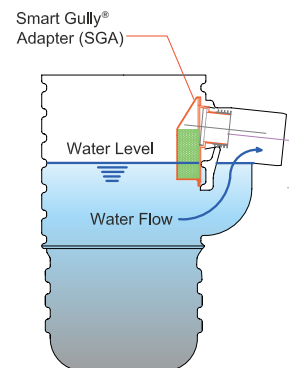
SGA - Backplate



SGA - Frontplate

Range table (Smart Gully Adaptor® units & spares)

Prod No.	Description	Dims (mm)
SGA01 - 12	Smart Gully Adaptor® (body only)	H260 x W160 x D75 Not including spigot
SGA02 - 12	Smart Gully Adaptor® c/w Smart Pak & seal	H260 x W160 x D75 Not including spigot
SGS01	Smart Seal for SGA (spare)	100 x 110 dia
SMPK66-2.5	Smart Sponge® Smart Pak refill	150 x 150 x 62.5



Naylor Smart Gully® Showing SGA inserted into rodding eye, resulting in no reduction in flow.

Smart Sponge® technology is based on its proprietary blend of synthetic polymers aimed at removal of hydrocarbons and oil derivatives from surface water.

This unique process creates a very porous structure with hydrophobic and oleophilic characteristics capable of selectively removing hydrocarbons while allowing high flow through rates for water.

As hydrocarbons are absorbed into its structure, the Smart Sponge® swells and maintains porosity and filtering capabilities.



The Smart Sponge® unique molecular structure is based on innovative polymer technologies that are chemically selective to hydrocarbons.

The SGA's have a purpose designed Smart Pak® fitted to absorb the hydrocarbons - it is specially designed to last 12 months in a worst case scenario and maintenance is simplicity itself and takes just a few seconds.

The Smart Sponge® technology transforms the pollutants into a stable solid waste for easy recycling.

Smart Sponge® waste to energy finalises the closed-loop solution with the spent Smart Sponge® creating 10,000-18,000 BTU per pound with no resulting waste product.

Smart Sponge® can also be used as an anti-microbial technology capable of destroying disease causing micro-organisms from surface water such as E.coli, Streptococcus and Enterococci to name but a few.

THE **SMARTER** SOLUTION TO:

Remove hydrocarbons from oil water interceptors

In recent tests carried out on a 'typical' MOD facility, it was shown that a 64% saving in maintenance costs could be achieved together with a 99% saving in the volume of environmental waste

Passive Skimmer / Interceptor Enhancer Range

The Smart Sponge® Passive Skimmers are installed within existing interceptors/separators (OWI's) to dramatically increase the effectiveness of the OWI (from typically 45% removal to 95% removal) whilst at the same time reducing annual maintenance costs by up to 64%.

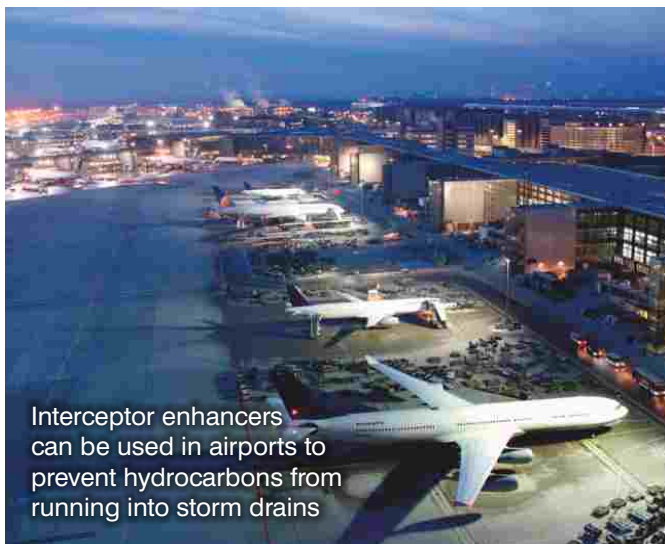
The regulations controlling the maintenance of interceptors/separators (OWI's) advise six monthly inspections and emptying and recharging with clean water when required. A new method of reducing both maintenance costs and environmental waste when servicing OWI's by the use of the Smart Sponge® Interceptor Enhancers has shown dramatic results.

The Smart Sponge® absorbs the hydrocarbon contamination and locks it into the molecular structure of the polymer, transferring the hydrocarbons into a solid waste suitable for either controlled disposal or for use as an alternative fuel. This unique ability means that instead of disposing of tonnes of contaminated liquid waste it is now possible to reduce this dramatically to a few kilos of solid waste, thus achieving dramatic savings in both cost and environmental benefits.

Range table (Interceptor Enhancers/Passive Skimmers)

Prod No.	Description	Dims (mm)
PS1313-40	Small Passive Skimmer	330 X 330
PS1818-20	Medium Passive Skimmer	457 X 457
PS2727-10	Large Passive Skimmer	686 X 686

Pack sizes: Small - 40pk, Medium - 20pk, Large - 10pk



Traditionally, maintenance of an OWI would consist of a tanker with a 2 man gang extracting the whole volume of the OWI (in the case of even a medium sized OWI this could amount to 110,000 litres or 110 tonnes) which would take many trips plus the disposal costs of the contaminated waste. The tanker would then have to re-charge the OWI to bring it back to operating condition.

Taking the same OWI as an example and now using a Smart Sponge® Passive Skimmer as a solution, this would transform the 116 tonnes of liquid waste into just 145 kg of solid waste and the maintenance procedure becomes just a 2 man job with a van. The cost and environmental benefits of this new system are obvious, particularly when many such OWI's can be serviced in a typical day.

In recent tests carried out on a 'typical' MOD facility, it was shown that a 64% saving in maintenance costs could be achieved together with a 99% saving in the volume of environmental waste – and even this 1% of remaining waste can be used as an alternative fuel as part of the Waste for Energy initiative creating a truly closed-loop system of maintenance where everyone benefits.

Deployment Guidance (Oil Water Interceptors)

		No of PS to absorb hydrocarbon		
NSB*	Area Drained	PS1313	PS1818	PS2727
1.5S	833	10	6	3
3.0S	1,666	19	11	5
4.5S	2,499	28	16	8
6.0S	3,332	38	22	10
10S	5,553	NA	36	17
12S	6,670	NA	43	20
15S	8,330	NA	NA	25
20S	11,106	NA	NA	34
25S	13,883	NA	NA	42

* Nominal Size Bypass

The Smart Sponge® Family

Smart Filter®, Smart Brake® & Smart Stop® Range

The Smart Filter®:

Specifically designed for end of pipe applications and installations through which contaminated or polluted water flows. The unique design allows the Smart Filter® to either sit inside or outside the pipe connection and will absorb hydrocarbons that pass through the system during normal conditions. The Smart Filter® is available in 2 different standard sizes and will accommodate standard pipe sizes.

Flow rates are catered for through the design of the Smart Filter®, sized to take the first flush effect plus a safety factor of 2x with any excess passing through the bypass facility.



Smart Filter®



Orifice Plate

The Smart Brake®:

Is a collaboration of design from the Smart Filter® and houses the Smart Paks within a more confined area which allows normal flow through the system. The Smart Brake's® unique design works during an event and slows the flow rate whilst absorbing any hydrocarbons present, allowing the final outfall flow to disperse reducing flooding, resulting in the contaminated flow from travelling further along a water course. The Smart Brake® will also absorb any hydrocarbons present within a normal flow, effectively acting as a Smart Filter®.



Unit showing overflow connection

The Smart Stop®:

Uses the basic principles of the Smart Filter® but houses the Smart Paks within a more confined area which allows normal flow through the system. The Smart Stop's® unique design works during an event where more hydrocarbons are present within the resulting flow and the volume of hydrocarbons are quickly absorbed within the Smart Paks which swell into the defined cage and seal the outfall pipe providing the contaminated flow from travelling further along a water course. The contaminated water is then stopped at source enabling the hydrocarbon clean up to be targeted in one area reducing the impact to the environment. The Smart Brake® will also absorb any hydrocarbons present within a normal flow, effectively acting as a Smart Filter®.

N.B. A suitable silt trap device is recommended prior to the Smart Filter® chamber to prolong the life of the Smart Sponge®. If this is impractical a silt sump is recommended within the Smart Filter® chamber.

Smart Filter® Standard Range

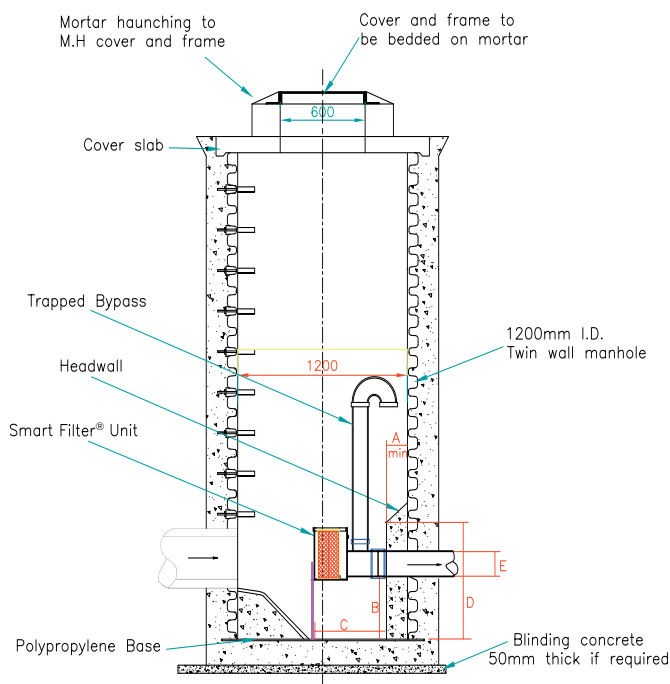
Prod No.	Description	Dims (mm)	Qty
SF01-30302	Smart Filter® c/w 2 No. 305 x 305 Std Smart Paks. 150 dia outlet for flow up to 14 l/s	360 x 330 x 330	1
SF02-38382	Smart Filter® c/w 2 No. 380 x 380 Std Smart Paks. 150 dia outlet for flow up to 22 l/s	400 x 400 x 400	1
SF01-30302P	Smart Filter® c/w 2 No. 305 x 305 Plus Smart Paks. 150 dia outlet for flow up to 14 l/s	360 x 330 x 330	1
SF02-38382P	Smart Filter® c/w 2 No. 380 x 380 Plus Smart Paks. 150 dia outlet for flow up to 22 l/s	400 x 400 x 400	1

Smart Brake® Range

Prod No.	Description	Dims (mm)	Qty
SB01-30302	Smart Brake® c/w 2 No. 305 x 305 Std Smart Paks. Specify orifice size for desired flow	360 x 330 x 330	1
SB02-38382	Smart Brake® c/w 2 No. 380 x 380 Std Smart Paks. Specify orifice size for desired flow	400 x 400 x 400	1

Smart Stop® Range

Prod No.	Description	Dims (mm)	Qty
SS01-30302	Smart Stop® c/w 2 No. 305 x 305 Std Smart Paks. 150 dia outlet for flow up to 14 l/s	360 x 330 x 330	1
SS02-38382	Smart Stop® c/w 2 No. 380 x 380 Std Smart Paks. 150 dia outlet for flow up to 22 l/s	400 x 400 x 400	1



Typical Installation showing overflow connection and silt trap.

The Smart Sponge® Family

Smart Filter® Chamber Range

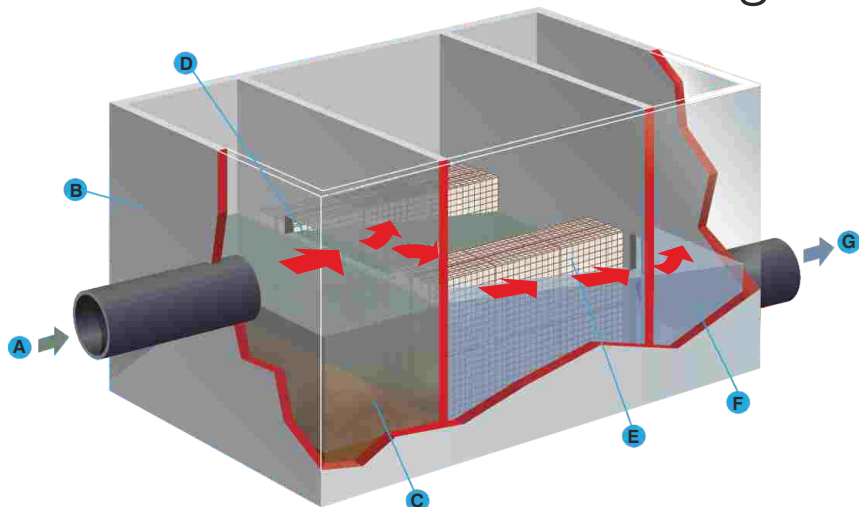


Diagram Key

- A. Inflow
- B. Lightweight composite chamber with vehicle loading capability
- C. Chamber with weir to trap sediment
- D. Flow passes through Smart Paks and through side orifices
- E. Smart Paks to absorb hydrocarbons
- F. Collection chamber with outlet to sewer
- G. Outflow

Note: Arrows show direction of water flow

Smart Filters® for Highways, Large Catchment Areas etc:

Specifically designed for extreme storm events and larger flow situations, the basic principles of the smaller Smart Filters® can be adapted to virtually any flow and also adapted to site restrictions.

The Smart Filters® come in several standard modular chamber sizes but can also be manufactured bespoke to suit specific site conditions. Contaminated wastewater enters the system into a settlement chamber and passes through an orifice into a distribution chamber and then is passed through the Smart Sponge® units (Paks) which removes up to 95% of all hydrocarbons. The cleaned water then passes through purpose designed side orifices to exit the treatment chamber via the outlet pipe.



Smaller Smart Filter® being lowered into position

Smart Filter's® Advantages:

- Treats 100% of the storm flow
- Removes 95% of hydrocarbons
- Removes heavy metals & silts
- Can cope with extreme conditions
- Shallow excavations
- Low head drop
- Modular design
- Virtually any flow catered for
- Waste product 100% recyclable
- Easy maintenance procedure

Prod No.	Description	Dimensions WxLxH	Treated Flow (l/s)	Max Flow (l/s)	380 x 380 Smart Paks	Pak Height (no.)	Aux Silt Capacity	Max Oil Capacity	Head Drop across unit
SF03.1A	Smart Filter® 44 l/s Flow, c/w 200mm dia pipes	0.8 x 1.2 x 1.2	10.9	44	4	1	190 litres	48 litres	380mm
SF03.1B	Smart Filter® 88 l/s Flow, c/w 300mm dia pipes	0.8 x 1.2 x 1.2	21.7	88	8	1	75 litres	96 litres	380mm
SF03.2A	Smart Filter® 130 l/s Flow, c/w 300mm dia pipes	1.2 x 1.8 x 2.0	32.6	130	12	1	210 litres	144 litres	380mm
SF03.2B	Smart Filter® 265 l/s Flow, c/w 300mm dia pipes	1.2 x 1.8 x 2.0	70.4	265	24	2	420 litres	288 litres	760mm
SF03.2C	Smart Filter® 350 l/s Flow, c/w 300mm dia pipes	1.2 x 1.8 x 2.0	94	350	32	2	75 litres	384 litres	760mm
SF03.3A	Smart Filter® 400 l/s Flow, c/w 300mm dia pipes	1.2 x 1.8 x 2.0	117	425	40	2	275 litres	480 litres	760mm

N.B. A suitable hydrodynamic separator (HDS) should be utilised prior to the Smart Filter® to remove the majority of silt from entering the filter. An auxiliary silt storage, is provided as a fail safe on all units. Treated Flow calculations are calculated according to first flush effect for typical storms.

The Smart Sponge® Family

Ultra-Urban® Filter Range

The Ultra-Urban® Filter with Smart Sponge® is an innovative low-cost BMP that helps meet anti-pollution requirements with effective filtration, efficient application and moderate maintenance. The Ultra-Urban® Filter absorbs oil and grease and captures trash and sediment from stormwater run-off before it enters the storm drain system. The Ultra-Urban® Filter is ideal for commercial, industrial and construction applications. The filter is available in two standard designs; one designed to clip onto the side of a catch basin in a row according to the flow (CO) and the other which is a single unit designed for typical drop-in catch basins and gullies (DI).

The Ultra-Urban® Filter, made of a high strength corrugated recycled content plastic, is designed for use in surface water drains that experience oil and grease pollution accompanied by sediment and debris. Rubbish and sediment accumulate in the upper basket chamber while oil and grease are absorbed in the filtration media.

Code	Max Flow (l/s)	Area Drained (m ²)	Oil Capacity (litres)	Silt Capacity (cm ³)	Typical Life (Years)	Media Life (Years)	Head Drop (mm)
DI1414N	17.7	1,275	21	425	2.3	1-3	790
DI1414H	12.0	860	13	230	2.1	1-3	560
DI1616N	22.7	1,635	25	510	2.1	1-3	790
DI1616H	17.0	1,225	19	285	2.1	1-3	560
DI2020N	31.5	2,260	31	850	1.9	1-3	790
DI2020H	23.3	1,675	24	480	1.9	1-3	560

N.B. The above drained areas and Min Life calculations are based on a typical 50mm rainfall with an anticipated worse case hydrocarbon contamination level of 30mg/100ml (a more typical level would be 10mg for normal use).



Sectional view of UUF showing Smart Sponge®

Performance

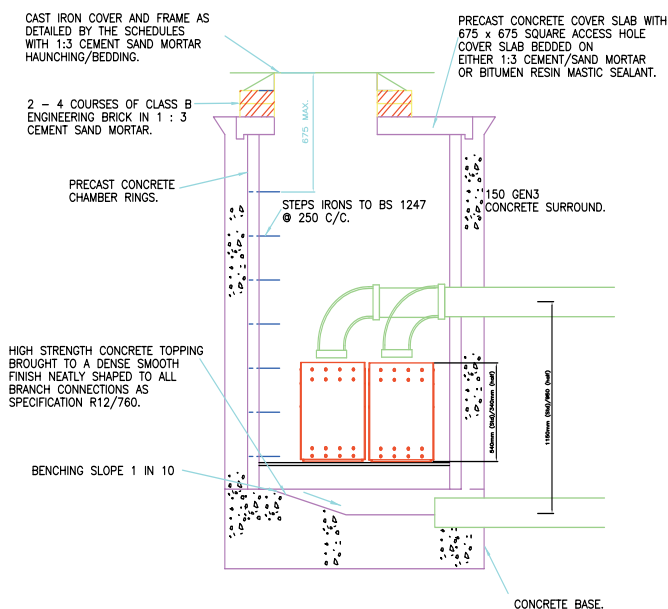
Field and laboratory tests have confirmed the capability of the Smart Sponge® to absorb, depending on the type of oil contaminant, up to 2-3 times its own weight and remove 70% to 95% of the hydrocarbons present in stormwater run-off, typically in the range of 5 to 30 mg/litre (ppm). The captured oil is permanently bound within the Smart Sponge®, eliminating leaching and allowing for easy disposal of the filtration media. Flow rates through the DI1616H filters exceed 17 l/s.

Installation

The Ultra-Urban® Filter is easily installed and installation time varies depending upon mounting devices selected. A single mounting bracket made of 16 gauge galvanised steel is required for the installation of the CO series of UUF. The Ultra-Urban® Filter should not be installed where modules obstruct the drain pipe outlet. The size of the drain should allow room for stormwater overflow. The Drain Inlet (DI) series Ultra-Urban® Filter will suspend from the drain into the catch basin through a structural plastic mount and funnel mechanism (see drawings).

Maintenance

The Ultra-Urban® Filter should be serviced as needed to remove sediment and debris, according to expected debris accumulation. The sediment and debris can be quickly vacuumed out of the modules through the opening of the drain with conventional maintenance equipment. For example, a CO installation with four to five Ultra-Urban® Filter modules can be typically serviced in 10 minutes or less. Under normal operating conditions the Ultra-Urban® Filter should be replaced every 1-3 years.



Twin Ultra Urban® Filters installed in typical chamber

Design

The Ultra-Urban® Filters can be positioned within a chamber to take run-off from any area and require a difference in invert according to the drawing above. There is a range of sizes to choose from according to the area to be drained, with additional units able to be positioned alongside one another to increase the flow capability. Units should be emptied with a standard vacuum pipe on a regular basis and changed when they weigh approximately twice the installation weight.

The Smart Sponge® Family

Line Skimmers

Line Skimmers are ideal for creating lines of hydrocarbon protection in areas such as ponds and streams as well as clarifying wells and marinas. Installation is carried out by placing the line skimmers across the water course, tied off to fixed points. The line skimmers can also be tied to one another to create longer protection booms as required. Smart Sponge® Line Skimmers are non leaching so cannot contaminate the water during replacement



Prod No.	Dry Weight		Spent Weight		Litres
LS104-10 (1.2m)	0.7kg		2.8kg		2.4Ltr
LS110-04 (3m)	1.9kg		7.6kg		9.0Ltr
LS304-04 (1.2m)	2.2kg		8.8kg		6.5Ltr
LS308-04 (2.4m)	4.4kg		17.6kg		13.0Ltr
LS408-04 (2.4m)	5.9kg		23.6kg		17.0Ltr

Line Skimmer weights before and after application

Applications

- Preserving Ecologically Sensitive Areas
- Coastal Marshlands
- Estuaries
- Grass Flats
- Fishing and Breeding Grounds
- Boat Docks and Marinas
- Marine Fueling Locations
- Clarifying Wells



Line Skimmers deployed at Linlithgow Loch

Disposal Options

As local conditions, product use and exposure can vary widely, the end user must determine the most appropriate disposal method for a spent Smart Sponge® or Smart Sponge® Plus product. However Smart Sponge® samples saturated with hydrocarbons both in the lab and in the field have been tested according to the USA EPA's Toxicity Characteristic Leaching Procedure ("TCLP"). These tests show that Smart Sponge® is a "non-leaching" (i.e., non-detect or "N.D.") product. As a result, Smart Sponge® technology can afford many cost effective and environmentally friendly disposal options. The following waste disposal and resource recovery systems are available for disposal and/or recycling of the spent Smart Sponge® products.

Waste to Energy Facilities

This is a specialised segment of the solid waste industry and within the USA this is a recognised route for used spent Smart Sponge® as an alternative fuel in the production of electricity. The spent Smart Sponge® generates between 10,000 – 18,000BTU per pound (0.45kg).

Cement Kilns

This industry has used the spent Smart Sponge® as an alternative fuel in the production process of Portland Cement. This process is considered a beneficial re-use of waste products. The BTU value of spent Smart Sponge® is consistently above the average acceptable levels set for this high temperature process.

Landfills

As mentioned above, spent Smart Sponge® products have been classified as a solid waste within the USA and have been accepted at Subtitle D Landfills. Discussions are ongoing with the Environment Agency to establish similar classification for the UK.

THE **SMARTER** SOLUTION TO: Quick Installation & Maintenance

Passive Skimmers

It is intended that proactive checks are completed on a six monthly basis, any remedial work will be managed reactively.

1. Fix a tether rope to the absorbent Passive Skimmer and record the weight in Kg
2. Fix the tether so that the Passive Skimmers can be recovered but allowing the skimmer to float freely.
3. Every 6 months withdraw the Passive Skimmer, shake off excess water and check and record weight. If weight is above trigger value replace skimmer.

Passive Skimmers are deemed spent if their weights are greater than:

Size	Dry Weight	Spent Weight
PS1313 (Small)	0.5kg 	2.0kg (approx. 2.4 litres) 
PS1818 (Medium)	0.9kg 	3.6kg (approx. 4.2 litres) 
PS2727 (Large)	1.9kg 	7.6kg (approx. 9.0 litres) 



Passive Skimmers are available in Small, Medium and Large packs
PS1313 (Small) shown

Smart Gully Adaptor®

Smart Gully Adaptor® Instructions for SGA Installation and Maintenance.



Insert the back plate into the rodding eye of the gully



Slide the front plate with Smart Pak in down onto the back plate



Back plate will lock into position on the tabs provided



Remove the front plate by sliding upward



Weigh the unit with Smart Pak in



Remove and replace spent Smart Pak



Install new Smart Pak and refit

Size	Dry Weight	Spent Weight
SMPK (150X150X62.5)	0.5kg 	1.2kg (approx. 1.4 litres) 

Smart Paks - Smart Filters®

It is intended that proactive checks are completed on a six monthly basis, any remedial work will be managed reactively.

1. Open the top of the Smart Filter® & using the plastic ties lift out the wire cage containing the Smart Paks, snip the plastic ties & remove the individual Smart Pak, shake off excess water & weigh the Smart Pak and record this on the maintenance schedule.
2. If the recorded weight is greater than twice the dry weight, replace the Smart Paks accordingly with new ones. If less than twice the weight, a changeover date can be calculated based on the relative weights.
3. Relace the Smart Paks back in the wire cages, renewing any plastic ties to hold the cages closed and slide the cage back into

Size	Dry Weight	Spent Weight	Size	Dry Weight	Spent Weight
SMPK1212-2.5	1.95kg 	4.6kg 	SMPK1515-2.5	2.9kg 	7.2kg 
SMPK1212-3	2.22kg 	5.5kg 	SMPK 1515-3	3.5kg 	8.7kg 

Smart Pak weights before and after application (assumes a non confined unit).

THE **SMARTER** SOLUTION TO: Quick Installation & Maintenance

Ultra-Urban® Filters

The Ultra-Urban® Filters can be installed as a drop in unit with a collar or as a slot in system secured to the side of the gully or inlet with brackets.

The Ultra-Urban® Filter Is Easily Installed

Installation time varies depending upon mounting devices selected. A single mounting bracket made of 16-gauge galvanised steel is required for the installation of the Curb Opening (CO) series. The Ultra-Urban® Filter should not be installed where modules obstruct the drain pipe outlet. The size of the drain should allow room for stormwater over flow. The Drain Inlet (DI) series Ultra-Urban® Filter will suspend from the drain into the catch basin through a structural plastic mount and funnel mechanism.



Low Maintenance

The Ultra-Urban® Filter should be serviced as needed to remove sediment and debris, according to expected debris accumulation. The sediment and debris can be quickly vacuumed out of the modules through the opening of the drain with conventional maintenance equipment. Under normal operating conditions the Ultra-Urban® Filter should be replaced every 1-3 years.

Prod No.	Dry Weight	Spent Weight	Litres
UUF1414N	9.1kg 	27kg 	21Ltr
UUF1414H	5.9kg 	17kg 	13Ltr
UUF1616N	10.9kg 	32kg 	25Ltr
UUF1616H	8.2kg 	24kg 	19Ltr
UUF2020N	13.6kg 	40kg 	31Ltr
UUF2020H	10kg 	30kg 	24Ltr

Solutions
for Water
Framework Directive
Compliance

Smart Sponge® & Smart Sponge® **PLUS** technology effectively and efficiently reduces the amount of coliform bacteria, debris and hydrocarbons, to keep the UK's beaches, marinas, airports regulations in compliance with Bathing Water Directive and Stormwater regulations.





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that is taking the
global surface water market
by storm**



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