DRAINAGE MAINTENANCE PLAN

McDonald's Dearne Valley Plot 7 (NB8415)

Prepared for: McDonald's Restaurants
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Document History

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Appendix D: Grease Trap

Appendix E: Maintenance Schedule

1.0 Introduction

1.1 This Sustainable Drainage Maintenance Plan has been prepared by Glanville Consultants Ltd on behalf of McDonald's Restaurants Limited.

2.0 Drainage Maintenance Responsibility & Training

2.1 The McDonald's site and all of its drainage is privately owned and maintained by McDonald's. It is the store manager's responsibility to ensure that the drainage system is regularly inspected and maintained, in accordance with this plan. Figure 1 shows the layout of the drainage system including the location of each of the items requiring maintenance, listed in this plan and a summary of the maintenance requirements.

2.2 The majority of tasks can be completed by McDonald's staff trained for each specific task. Training should include manual handling, for lifting manhole covers. Manholes & chambers can be dangerous due to trapped harmful gases and should not be entered unless staff are confined space trained and issued with appropriate equipment. Entering confined spaces should not normally be required and should be controlled by a permit to enter system administered by the store manager. It may be appropriate to rely on non-store based, specialist staff, on the rare occasions when confined space entry is required.

3.0 Drainage Inspection and Maintenance Requirements and Frequency

Catchpit Manholes and Gullies (Figure 1 - Ref A & C)

3.1 Catchpit manholes and gullies are designed to trap silt, leaves and other debris before it reaches more sensitive parts of the drainage system where it could reduce drainage efficiency. Catchpit manholes are located prior to the cellular storage tank and adjacent to surface drainage channels. Gullies are located throughout the car park and drive through lane, adjacent to kerb-lines.

3.2 Catchpit manholes and gullies need to be inspected on a monthly basis except during the autumn leaf fall when they may require inspections to be increased to fortnightly.

3.3 Equipment required for inspection includes, moveable barriers and cones to guard openings, manhole keys, gloves and a torch. A minimum of two people are required.

3.4 Catchpit manholes and gullies need to be emptied once the sump becomes half full. Emptying should be performed using a gulley emptying vacuum truck or similar device which does not require man entry.

Foul Water Manholes and Inspection Chambers (Figure 1 - Ref B)

3.5 Foul water manholes and inspection chambers need to be inspected on a monthly basis or immediately if foul odours are present or there is a suspected blockage.

3.6 Equipment required for inspection includes moveable barriers and cones to guard openings, manhole keys, gloves and a torch. A minimum of two people are required.

3.7 If manholes show any signs of blockage, specialist contractors should be called for clearance work, without delay.

Drainage Channel Outlets (Figure 1 - Ref D)

3.8 Drainage channel outlets need to be inspected on a monthly basis except during the autumn when leaf fall, may require inspections to be increased to fortnightly.

3.9 Equipment required for inspection includes moveable barriers and cones to guard openings, lifting tools, gloves and a torch. A minimum of two people are required.

3.10 Silt, leaves and debris should be cleared from the channel outlets during each inspection.

Surface Water Treatment (Figure 1- Ref E)

3.11 Catchpit manholes and gullies are located upstream of the treatment units to prolong their life and effectiveness. The treatment chambers should be inspected on a 3 monthly basis or immediately after a known pollution spillage within the car park.

3.12 Equipment required for inspection includes, moveable barriers and cones to guard openings, manhole keys, gloves, wire ties and cutters and a torch. A minimum of two people are required.

3.13 Inspection and maintenance of the Downstream Defender will be in accordance with manufacturer's guidelines and is to be by the manufacturer or their preferred service provider.

3.14 Sand trench treatment has no inspection but replace every 10 years.

3.15 Staff should have appropriate training for these inspections as they involve specialist products. It is recommended that initial training is provided by manufacturers of this equipment.

Surface Water Flow Control Chamber (Figure 1 - Ref F)

3.16 The flow control unit requires inspections once per month.

3.17 Any blockage should be cleared from the outlets during each inspection. If this requires man entry, ensure to use confined space trained staff. See also the manufacturer's guidelines in Appendix B.

Cellular Attenuation Tank (Figure 1 - G)

3.18 The cellular crates are protected by the upstream catchpit manholes. The catchpit manhole adjacent to the crates will allow limited inspection of the cellular crates. The attenuation tank should be examined when the catchpits

are inspected, on a monthly basis. The system should also be inspected after every major storm. If there is any evidence of silt within the crate system, jetting can be performed and any silt should be washed from the tank into the catchpit manhole, where it can be emptied.

3.19 Jetting requires specialist equipment and should be carried out by specialist contractors to ensure that damage to the crate storage is avoided. Provided the catchpit manholes are emptied appropriately, crate storage jetting should never be required. See also the manufacturer's guidelines in Appendix C.

Grease Trap (Figure 1 - H)

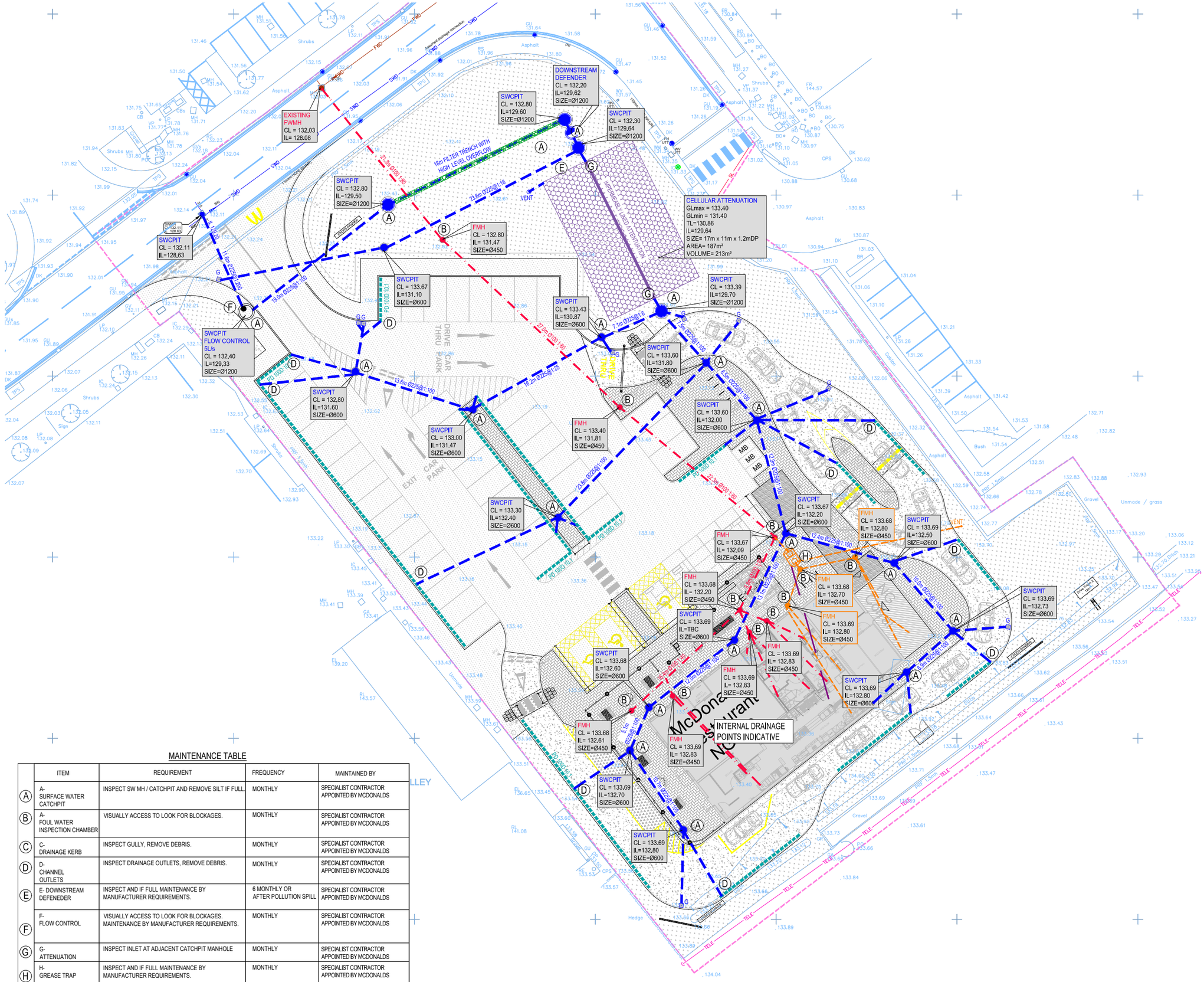
3.20 The Grease Trap should be inspected on a monthly basis, by lifting the inspection cover. Any signs of a malfunction or blockage should be reported immediately to the external specialist maintenance company.

3.21 The Grease Trap has an alarm hard wired into the Store Manager's office with a visual and audible warning system. If the alarm is triggered the external specialist maintenance company should be called out immediately. See also the manufacturer's guidelines in Appendix D.

4.0 Drainage Inspection and Maintenance Records

4.1 Appendix E includes the annual drainage record log sheet. Copies should be taken of the log sheet for use for each year's records. Each inspection should be recorded on the log sheet for that year by the store manager. The log sheet shall be kept with this maintenance plan in the store manager's office for inspection.

Figure



MAINTENANCE TABLE

	ITEM	REQUIREMENT	FREQUENCY	MAINTAINED BY
(A)	A- SURFACE WATER CATCHPIT	INSPECT SW MH / CATCHPIT AND REMOVE SILT IF FULL.	MONTHLY	SPECIALIST CONTRACTOR APPOINTED BY MCDONALDS
(B)	A- FOUL WATER INSPECTION CHAMBER	VISUALLY ACCESS TO LOOK FOR BLOCKAGES.	MONTHLY	SPECIALIST CONTRACTOR APPOINTED BY MCDONALDS
(C)	C- DRAINAGE KERB	INSPECT GULLY, REMOVE DEBRIS.	MONTHLY	SPECIALIST CONTRACTOR APPOINTED BY MCDONALDS
(D)	D- CHANNEL OUTLETS	INSPECT DRAINAGE OUTLETS, REMOVE DEBRIS.	MONTHLY	SPECIALIST CONTRACTOR APPOINTED BY MCDONALDS
(E)	E- DOWNSTREAM DEFENEDER	INSPECT AND IF FULL MAINTENANCE BY MANUFACTURER REQUIREMENTS.	6 MONTHLY OR AFTER POLLUTION SPILL	SPECIALIST CONTRACTOR APPOINTED BY MCDONALDS
(F)	F- FLOW CONTROL	VISUALLY ACCESS TO LOOK FOR BLOCKAGES. MAINTENANCE BY MANUFACTURER REQUIREMENTS.	MONTHLY	SPECIALIST CONTRACTOR APPOINTED BY MCDONALDS
(G)	G- ATTENUATION	INSPECT INLET AT ADJACENT CATCHPIT MANHOLE	MONTHLY	SPECIALIST CONTRACTOR APPOINTED BY MCDONALDS
(H)	H- GREASE TRAP	INSPECT AND IF FULL MAINTENANCE BY MANUFACTURER REQUIREMENTS.	MONTHLY	SPECIALIST CONTRACTOR APPOINTED BY MCDONALDS

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS, DOCUMENTS AND SPECIFICATIONS. ANY DISCREPANCIES BETWEEN INFORMATION SHOWN ON THIS AND ANY OTHER DRAWING SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.
2. DO NOT SCALE FROM THIS DRAWING. WORK TO FIGURED DIMENSIONS ONLY.
3. THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION PURPOSES UNLESS SPECIFICALLY STATED AS 'FOR CONSTRUCTION' IN THE DRAWING STATUS.
4. ALL DRAWING INFORMATION MUST BE READ FROM HARD COPY / PDF FILES ONLY, MARKED CHECKED. BEFORE PROCEEDING PLEASE ENSURE THE ISSUE STATUS IS APPROPRIATE FOR THE INTENDED USE. ALL INFORMATION EXTRACTED DIRECTLY FROM DRAWING FILES (E.G. DWG'S) IS DONE SO ENTIRELY AT THE USERS RISK.

KEY

- SITE BOUNDARY
- EXISTING SURVEY
- PROPOSED SITE LAYOUT
- SW CL = XX.XXX IL = XX.XXX — DRAINAGE LABEL CPIT=CATCHPIT
- G — PROPOSED GULLEY WITH 150Ø PIPE
- 9.3m–100ø — PROPOSED SURFACE WATER DRAINAGE PIPEWORK SHOWING LENGTH, PIPE DIAMETER AND GRADE
- PROPOSED BUILDING SURFACE WATER CATCHPIT CHAMBER 600mm SUMP
- RWP — PROPOSED RAINWATER DOWN PIPE INVERT 500mm BELOW PROPOSED EXTERNAL LEVEL (ALL OUTLETS 100Ø & TO HAVE RODDING ACCESS UNLESS OTHERWISE INDICATED)
- ACO MONO DRAIN PD100D 0,0 DRAINAGE CHANNEL (BLACK)
- PROPOSED FOUL WATER DRAINAGE PIPEWORK SHOWING LENGTH, PIPE DIAMETER AND GRADE
- PROPOSED BUILDING FOUL WATER DRAINAGE INSPECTION CHAMBER
- ALARMED 2000l SPEL GREASE TRAP WITH HARD WIRE TO MANAGERS OFFICE
- 110Ø DUCTS FOR GREASE TRAP/ CABLES TO INCOMING ELECTRICS CUPBOARD
- PERMAFLEECE SURROUND TO HEAVY DUTY CELLULAR SOAKAWAY STORAGE POLYSTORM - R WITH POLYSTORM ACCESS
- DOWNSTREAM DEFENDER
- CONTROL CHAMBER - FLOW CONTROL XXl/s LIMITING FLOW
- SAND FILTER TRENCH WITH HIGH LEVEL OVERFLOW

FIGURE 1

Rev.	Description	Date	Chkd
P1	PRELIMINARY ISSUE	11/09/20 FC	HBG

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Client :

Project : McDONALD'S RESTAURANT DEARNE VALLEY (NBXXXX)

Title : DRAINAGE MAINTENANCE PLAN

Project Engineer :	HBG	Scale :	1:200 @ A1
Project Director :	HBG	Date :	SEPT' 2020
Status :	PRELIMINARY		

Drawing No. 4200204-SK08 Rev P1

Appendices

Appendix A:

Surface Water Treatment Manufactures Guidelines

Downstream Defender®

High-Level Treatment in a Small Footprint

Product Profile

The Downstream Defender® is an advanced vortex separator used to treat stormwater runoff in pretreatment or stand-alone applications. Its unique flow-modifying internal components distinguish the Downstream Defender® from conventional and simple swirl separators that typically bypass untreated peak flows to prevent washout of captured pollutants. Its wide treatment flow range, low headloss, small footprint and low-profile make it a compact and economical solution for capturing nonpoint source pollution.

Components

1. Inlet to Precast Vortex Chamber
2. Cylindrical Baffle
3. Center Shaft
4. Outlet Pipe
5. Sediment Storage Sump
6. Access Lid

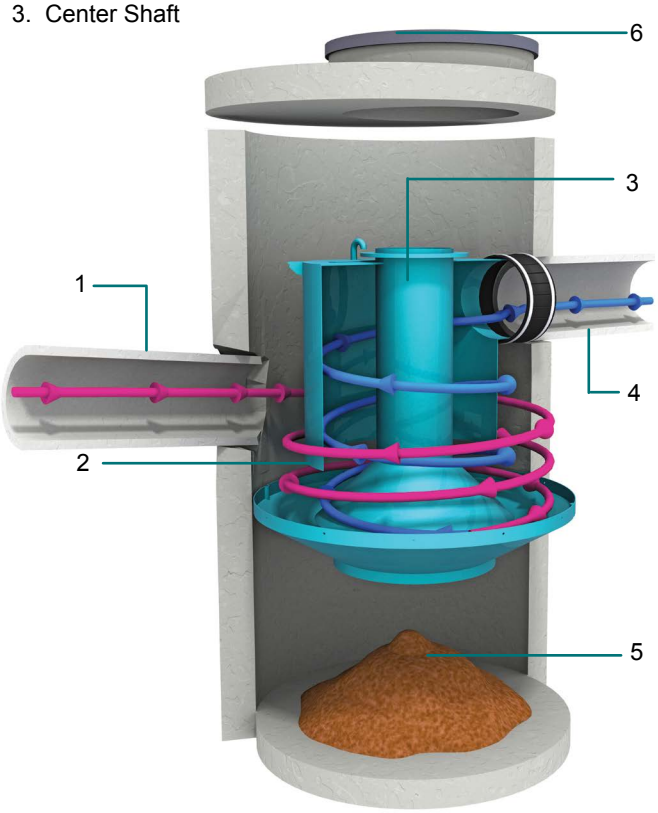


Fig.1 The Downstream Defender® has internal components designed to maximize pollutant capture and minimize pollutant washout.

Applications

- Removal of total suspended solids (TSS), floatable trash and petroleum products from stormwater runoff
- New construction or redevelopment of commercial and residential sites
- Pollutant hotspots such as maintenance yards, parking lots, gas stations, streets, highways, airports and transportation hubs
- Site constrained LID or green infrastructure based developments
- LEED® development projects

Advantages

- Special internal components maximize pollutant capture and minimize footprint, headloss and washout
- Captures and retains a wide range of TSS particles
- High peak treatment flow rates
- Treats the entire storm with no washout or untreated bypass flows
- Low maintenance requirements - no dredging required, and no screens or media to block
- Variable inlet/outlet angles for ease of site layout

How it Works

Advanced hydrodynamic vortex separation is a complex hydraulic process that augments gravity separation with low-energy rotary forces. The flow modifying internal components used in the Downstream Defender® harness the energy from vortex flow and maximize the time for separation to occur while deflecting high scour velocities (**Fig.1**).

Polluted stormwater is introduced tangentially into the side of the precast vortex chamber to establish rotational flow. A cylindrical baffle with an inner center shaft creates an outer (magenta arrow) and inner (blue arrow) spiraling column of flow and ensures maximum residence time for pollutant travel between the inlet and outlet.

Oil, trash and other floating pollutants are captured and stored on the surface of the outer spiraling column. Low energy vortex motion directs sediment into the protected sump region. Only after following a long three-dimensional flow path is the treated stormwater discharged from the outlet pipe. Maintenance ports at ground level provide access for easy inspection and clean-out.

Downstream Defender®

Drainage Profile

The Downstream Defender® is designed with a submerged tangential inlet to minimize turbulence within the device. Turbulence increases system headlosses and reduces performance by keeping pollutant particles in suspension.

The inlet elevation of the Downstream Defender® is located one inlet pipe diameter lower than the elevation of the outlet invert (**Fig.2**). This arrangement ensures that influent flows are introduced to the treatment chamber quiescently below the water surface elevation, minimizing turbulence.

The unique flow-modifying internal components also minimize hydraulic losses. There are no internal weirs or orifices; large clear openings ensure low headloss at peak flow rates with little risk of blockages that cause upstream flooding.

Inspection and Maintenance

Nobody maintains our systems better than we do. To ensure optimal, ongoing device performance, be sure to recommend Hydro International as a preferred service and maintenance provider to your clients.



Call **1 (800) 848-2706** to schedule an inspection and cleanout or learn more at **hydro-int.com/service**

Sizing & Design

The Downstream Defender® can be used to meet a wide range of stormwater treatment objectives. It is available in 5 precast models that fit easily into the drainage network (**Table 1)**. Selection and layout of the appropriate Downstream Defender® model depends on site hydraulics, site constraints and local regulations. Both online (**Fig.3a)** and offline (**Fig.3b**) configurations are common.

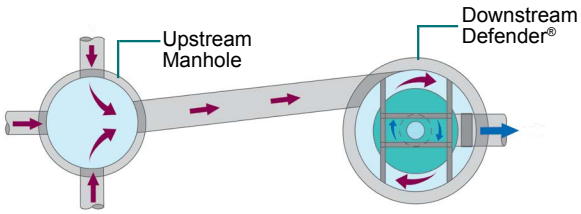


Fig.3a The Downstream Defender® in an online configuration.

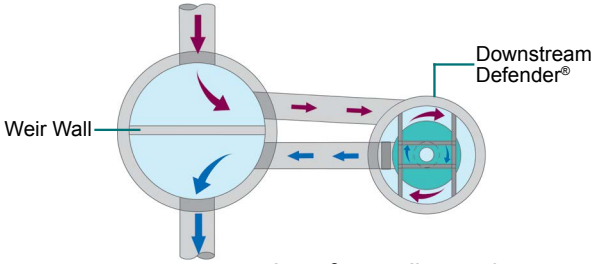


Fig.3b The Downstream Defender® in an offline configuration.

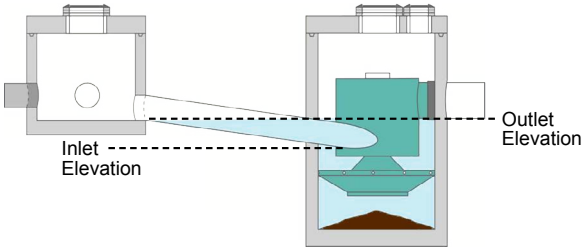


Fig.2 The Downstream Defender® has a submerged inlet that reduces headloss and improves efficiency of pollutant capture.



Free *Stormwater Sizing Tool*

This simple online tool will recommend the best separator, model size and online/offline arrangement based on site-specific data entered by the user.

Go to hydro-int.com/sizing to access the tool.

Table 1. Downstream Defender® Design Chart.

Model Number and Diameter		Peak Treatment Flow Rate		Maximum Pipe Diameter		Oil Storage Capacity		Sediment Storage Capacity		Minimum Distance from Outlet Invert to Top of Rim		Standard Height from Outlet Invert to Sump Floor	
(ft)	(m)	(cfs)	(L/s)	(in)	(mm)	(gal)	(L)	(yd^3)	(m^3)	(ft)	(m)	(ft)	(m)
4	1.2	3.0	85	12	300	70	265	0.70	0.53	2.8	0.85	4.1	1.25
6	1.8	8.0	227	18	450	216	818	2.10	1.61	3.2	0.98	5.9	1.80
8	2.4	15.0	425	24	600	540	2,044	4.65	3.56	4.2	1.28	7.7	2.35
10	3.0	25.0	708	30	750	1,050	3,975	8.70	6.65	5.0	1.52	9.4	2.85
12*	3.7	38.0	1,076	36	900	1,770	6,700	14.70	11.24	5.6	1.71	11.2	3.41

*Not available in all areas. Contact Hydro International for details.

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Email: stormwaterinquiry@hydro-int.com Web: www.hydro-int.com

Appendix B:

Surface Water Flow Control Chamber Manufactures Guidelines

ACO Water Management:
Civils + Infrastructure

Uniclass JR12/JR23 L731	
CI/SfB (52.7)	







Surface Water Flow Control Systems

ACO Q-Brake Vortex and ACO Q-Plate

Introduction to the ACO Group

Throughout the world ACO branded drainage and surface water management systems are recognised for their innovative design, high quality manufacture, environmental excellence and industry leading performance.

Today the ACO Group has a research and production base that reaches across four continents. This unmatched resource pioneers the development of solutions that are tailored to individual applications, meeting the need for high performance, sustainable products that deliver optimum value throughout their operational life.



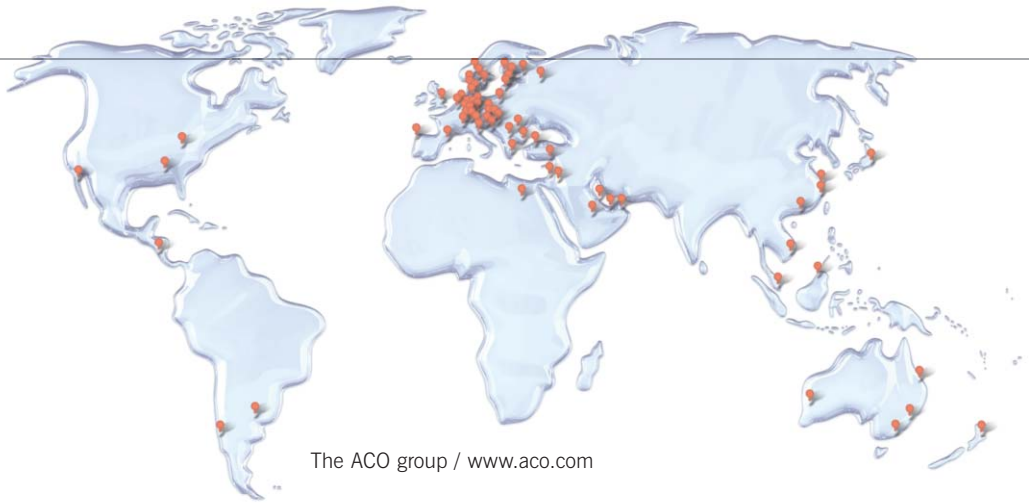
ACO Technologies plc

ACO operates as ACO Technologies plc in the United Kingdom. Founded over 25 years ago, the company has grown quickly on a reputation for design innovation and customer service.

There are 2 core divisions, ACO Water Management and ACO Building Drainage, that serve every sector of the construction industry, providing solutions for applications as diverse as rail, highways, airports, landscaping, retail, distribution centres and environmentally sensitive projects.



To help architects, designers and contractors meet the legal requirements that now tightly control the way surface water is managed, ACO has created its unique 'Surface Water Management Cycle' – Collect, Clean, Hold, Release – the four core processes now required for the complete and sustainable management of surface water drainage.



The ACO group / www.aco.com

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ACO Q-Brake Vortex specification and design process	10
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Introduction to ACO's Surface Water Flow Control Systems

ACO's range of flow control systems are designed to regulate storm water flow before it discharges into the watercourse or sewer networks. ACO Q-Brake Vortex flow controls and ACO Q-Plate orifice plates are capable of regulating any flow for surface water applications and can be used in conjunction with retention and attenuation systems, such as ACO StormBrixx, as an integrated sustainable urban drainage (SuDS) scheme.

What is ACO Q-Brake Vortex?

ACO Q-Brake Vortex is a horizontal vortex flow control designed to regulate storm water flows from 1-100 litres per second. Manufactured from grade 304 stainless steel, each ACO Q-Brake Vortex is individually configured to suit specific performance criteria.

The design of a vortex flow control is based on the fluid mechanics principle of the forced vortex, which permits flow regulation without any moving parts.

ACO Q-Brake Vortex utilises the upstream head and discharge to generate a 'vortex' within the structure of the unit. The water is then released at a pre-determined controlled rate preventing downstream flooding.

Unlike more conventional methods, ACO Q-Brake Vortex is less prone to blockage, and permits higher flow at a lower head of water, as a vortex control allows an outlet 4-6 times larger in cross sectional area to be used.

ACO Q-Brake Vortex can form part of the design of any integrated drainage scheme for a wide range of infrastructure, industrial and other SuDS applications.

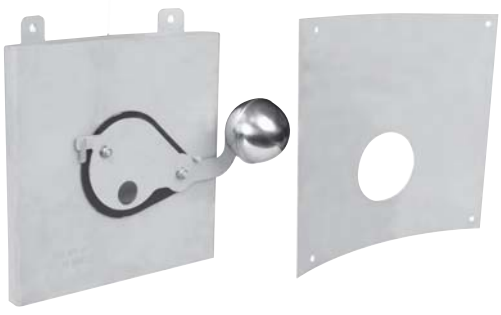


What is ACO Q-Plate?

ACO Q-Plate orifice plates are designed for use where an ACO Q-Brake vortex is not the most effective solution.

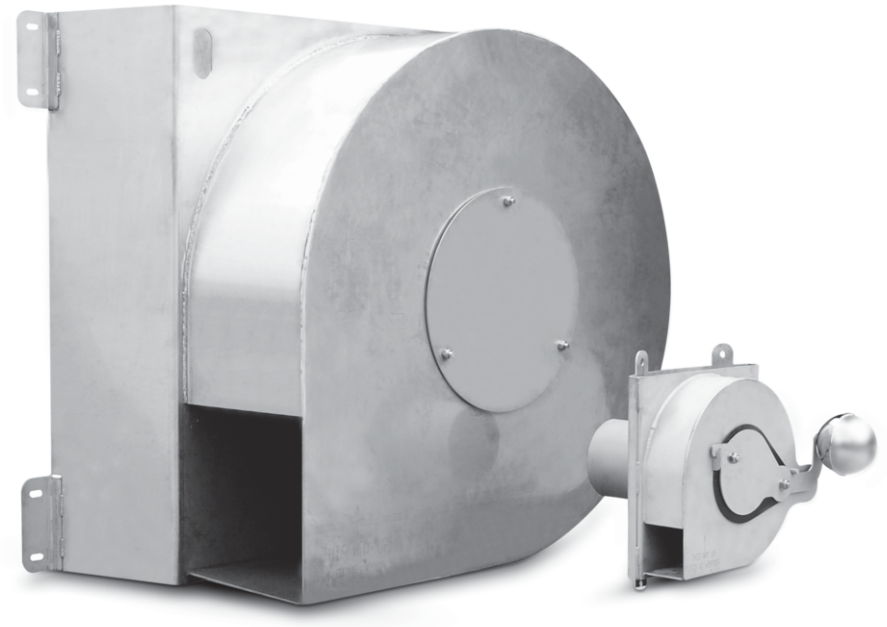
To suit application requirements, the range is available with or without remote bypass and drain down and is designed to match a variety on manhole configurations.

Information regarding the specification of ACO Q –Plates can be found on page 14.



ACO Q-Plates with and without draindown

Why choose ACO Q-Brake Vortex?



- **Planning and connection**

  ACO Q-Brake Vortex addresses the planning and connection requirements set out in the Floods and Water Management Act. Where a discharge restriction is in place, ACO Q-Brake Vortex regulates the surface water flow to the specified rate.

- **Tailored performance**

  Each ACO Q-Brake Vortex is tailored to the specific performance requirements of the application providing optimum efficiency within the system.

- **Optimum hydraulic efficiency**

  The mechanism employed within ACO Q-Brake Vortex provides superior hydraulic performance in comparison to traditional flow control systems.

- **Water Authority Approval**

  ACO Q-Brake Vortex has been approved for use by a number of water authorities including Severn Trent, Anglian and Scottish Water.

- **Proven performance**

  ACO Q-Brake Vortex is UK manufactured and has been independently laboratory tested to verified discharge rates.

- **Simplified access and maintenance**

  ACO Q-Brake Vortex has large clear openings making it less prone to blockage. The absence of any loose parts also reduces maintenance requirements.

  The patented bypass door and emergency drain down facility allows ACO Q-Brake Vortex to be remotely accessed from the surface to allow the upstream system to be independently drained, completely bypassing the inlet. Building Regulations 2000 Section H discourages direct man access to sewer manholes.

- **Reduces total installed cost**

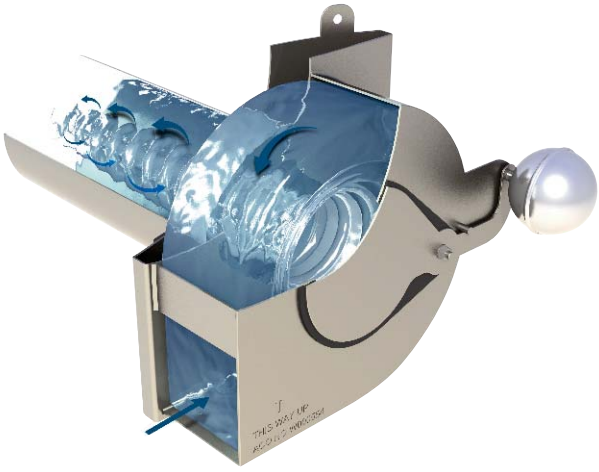
  ACO Q-Brake Vortex allows more flow at lower heads, reducing the need for on-site storage volume requirements lowering installation costs.

- **Ease of installation**

  Each ACO Q-Brake Vortex unit is custom built to suit the profile of the chamber. Radius fixing options remove the need for additional benching - simplifying installation and reducing cost.

- **WinDes**

  ACO Q-Brake Vortex can be sized and modelled on the latest version of the design software and can be incorporated into the overall hydraulic drainage design.



Benefits of using a surface water flow control system

Storage and the controlled release of clean water into the natural environment is an important aspect of managing surface water in the SuDS approach. The Floods and Water Management Act now gives overall responsibility to the local regulatory body to impose, where appropriate, the discharge rate of a surface water flow control system.

ACO's range of flow control systems can be used in conjunction with ACO's award-winning attenuation and infiltration system, ACO StormBrixx, to provide a fully integrated storm water control system meeting the requirements of the regulations.

This diagram simulates how the ACO StormBrixx system is used to provide storm water attenuation, whilst the ACO Q-Brake Vortex is used to regulate the rate of discharge from the development into the watercourse or sewer network.

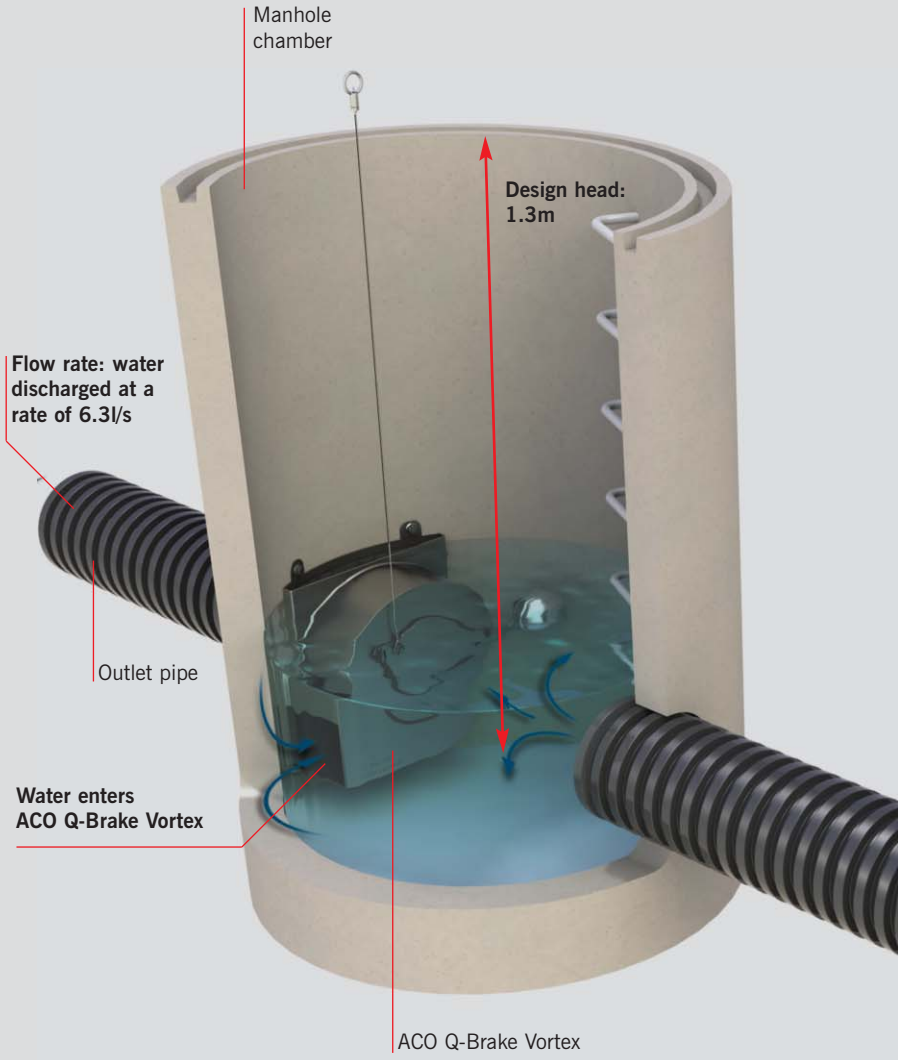
Compared to the use of traditional flow control systems, the combination of ACO StormBrixx and ACO Q-Brake Vortex can reduce the need for additional upstream storage lowering overall installation and maintenance costs.

This benefit is best demonstrated in the example opposite. The conclusion of the example means that upstream storage can be reduced by 11m^3 compared to using a traditional flow control system.

For more information on ACO's award winning attenuation and infiltration system, ACO StormBrixx, please go to www.stormbrixx.co.uk.

Example:

There is a project in Bedford, England with a catchment area of 13,000m^2. The project has design criteria of a 1 in 30 year storm and the runoff from the site must not exceed 6.3l/s at a design head of 1.3m.

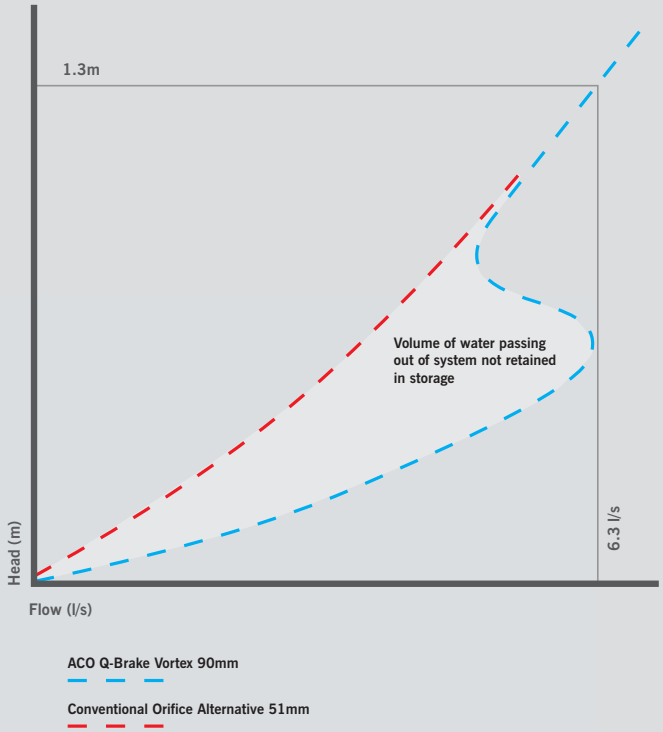


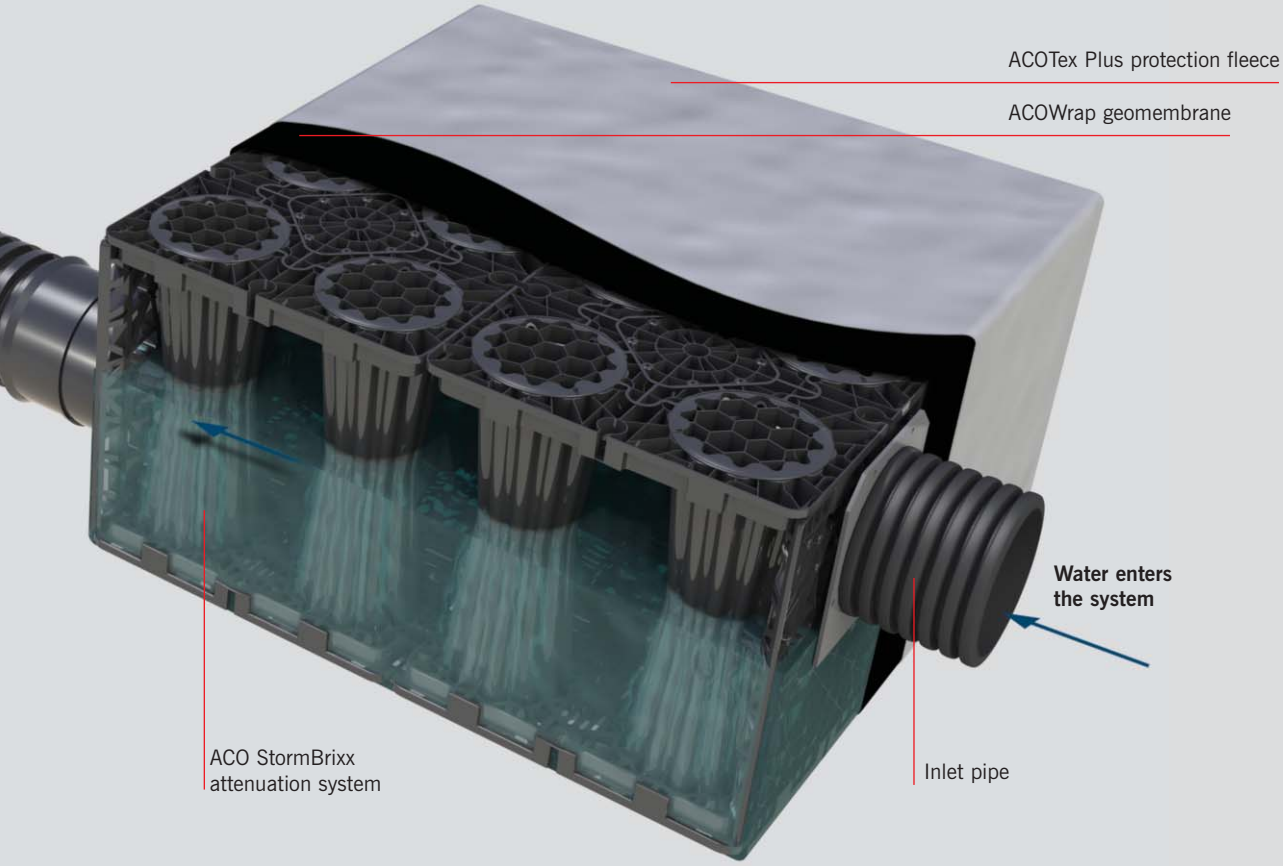
Results:

Using MicroDrainage® software, ACO has compared the upstream storage requirements using ACO Q-Brake Vortex and a traditional orifice plate. The results are summarised below:

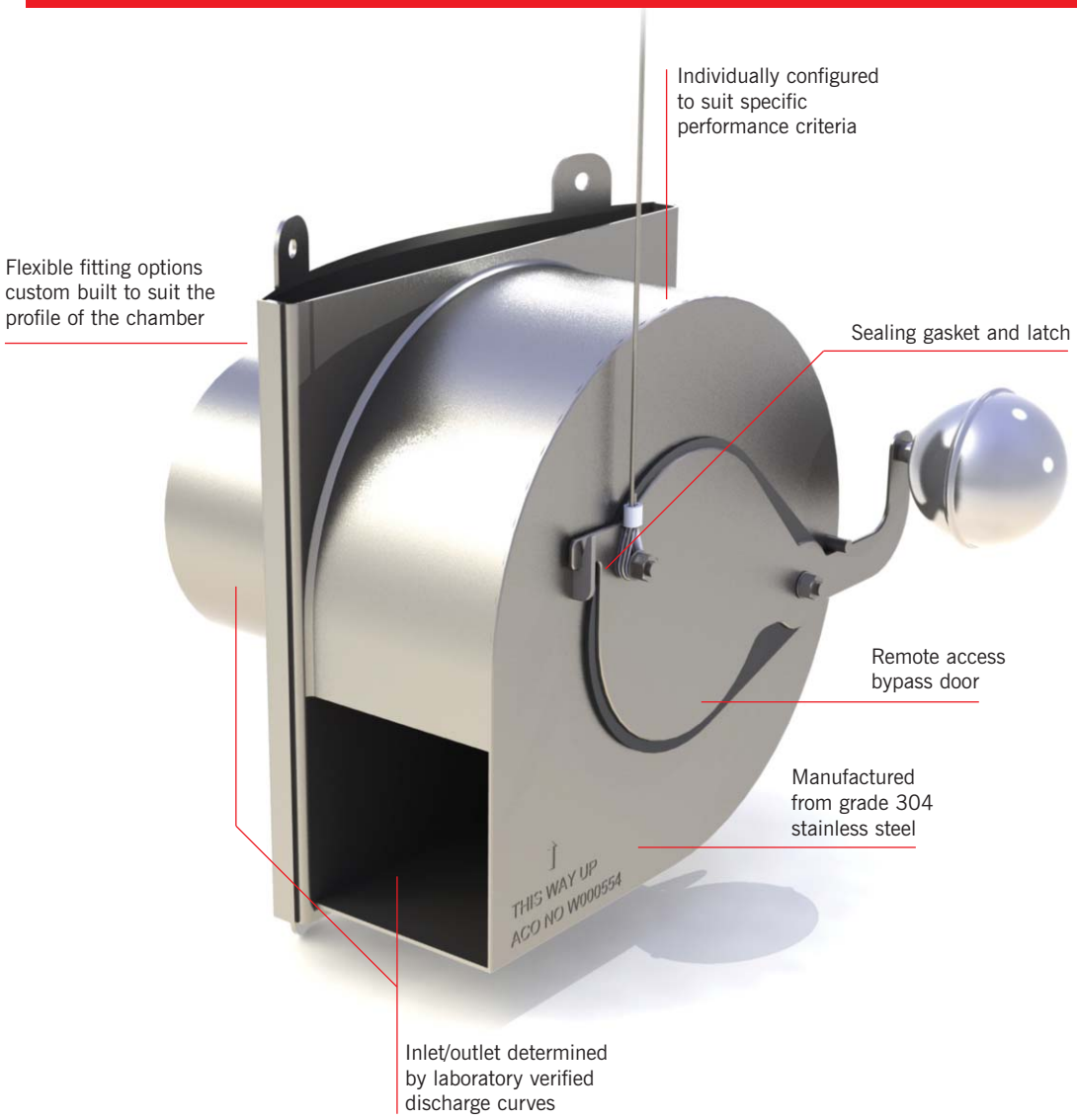
- ACO Q-Brake Vortex required Ø90mm. Upstream attenuation required 402m³.
- Orifice plate size required Ø 51mm. Upstream attenuation required 413m³. ACO Q-Brake Vortex reduces upstream attenuation by 11m³ whilst having an orifice over three times the area of the traditional orifice plate and making ACO Q-Brake Vortex more efficient and far less prone to blockage.

Discharge characteristics



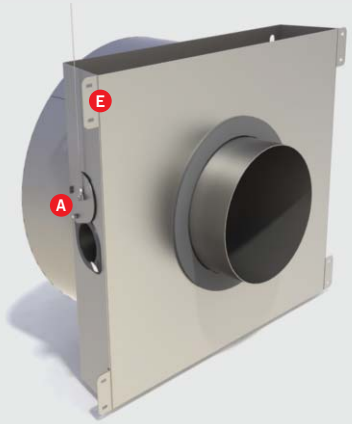


ACO Q-BRAKE FLOW CONTROL FEATURES OVERVIEW



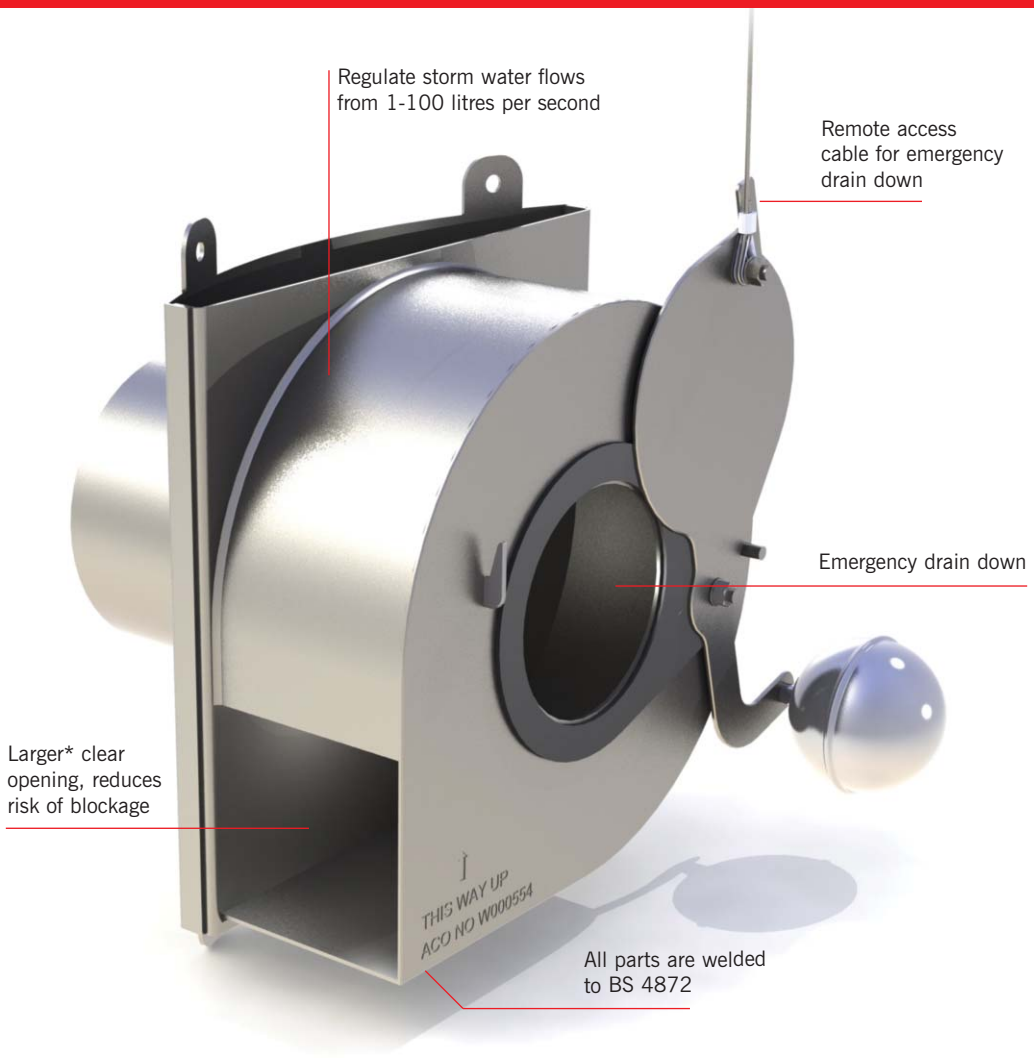
Additional and varying features for ACO Q-Brake Vortex >40l/s

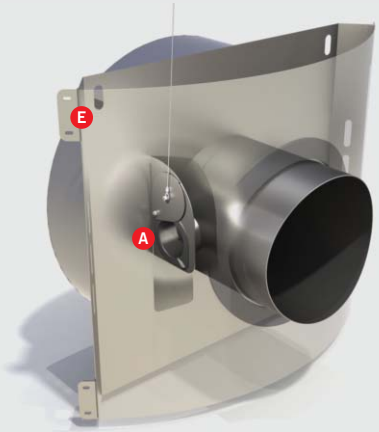
- **A** Remote access bypass door and emergency draindown. Located in a different position to ACO Q-Brake Vortex units <40l/s
- **B** Removable maintenance cover
- **C** Side vents to aid draindown on units with radius fixing
- **D** Lifting eyes
- **E** Fixing locators



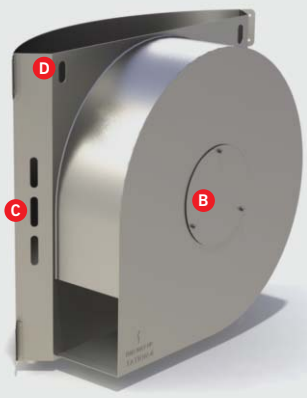
Square manhole fixing (rear)

***Larger than traditional orifice plates**





Radius manhole fixing (rear)



Radius manhole fixing (front)

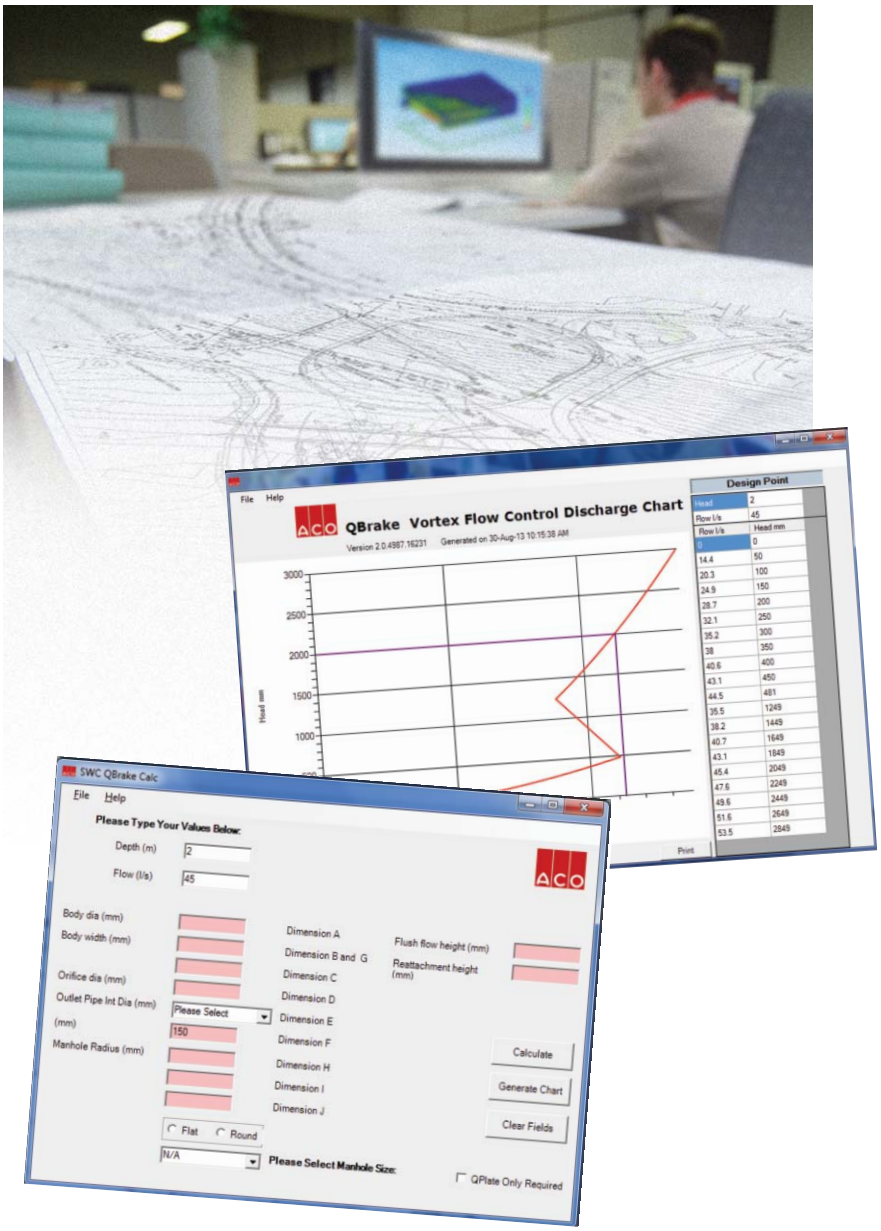
ACO Q-Brake Vortex specification and design process

Manufactured from grade 304 stainless steel, each ACO Q-Brake Vortex is individually configured to suit specific performance criteria. Our engineers will use industry standard drainage software and hydraulic design calculations to ensure the system is correctly sized for any project requirement.

In order to complete this process and deliver the product options available, please provide the ACO engineers with the following information:

- The proposed design flow – maximum allowable discharge
- The proposed design head – invert of outlet pipe to top water level
- The proposed outlet pipe diameter
- The proposed type and size of outlet manhole

Before production can commerce, ALL of the above information must be verified on ACO's Contract Review Document issued at the time of order placement.



Finished product

From this information ACO will size and design the ACO Q-Brake Vortex to meet the design criteria and to suit the proposed surface water application.

ACO will supply:

- Head discharge table & graph
- ACO Q-Brake Vortex installation details
- Information for manhole sizing

ACO Water Management Design Services Team

ACO has embraced the concept of 'value engineering' – a totally new approach to on-site construction that saves both time and money. ACO will review any design to minimise the total scheme and life cost of a proposal.

By utilising ACO's portfolio of products, it is often possible to remove the need for conventional underground drainage.

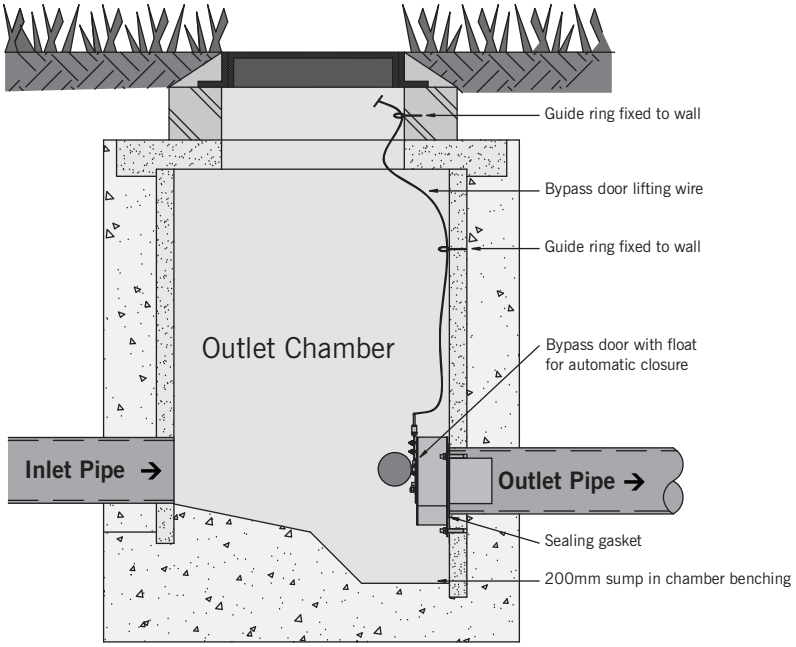
ACO Water Management Design Services Team

Tel: 01462 816666
Email: technical@aco.co.uk

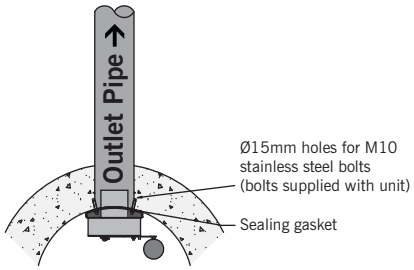
Micro Drainage Modelling
ACO Q-Brake Vortex can be sized and modelled on the latest version of Micro Drainage.

Micro Drainage
an XP Solutions company

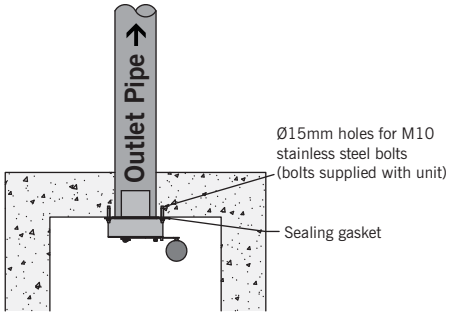
Installation detail



Fixing installation detail for round manhole chambers



Fixing installation detail for flat sided manhole chambers



Guide to installing ACO Q-Brake Vortex flow control regulator

Step 1:

Construct the chamber that is to house the ACO Q-Brake Vortex flow control. Note that if the chamber has a curved wall (e.g. a concrete ring manhole), the diameter of the chamber should be specified on the order and Contract Review Document for the ACO Q-Brake Vortex flow control unit.

Step 2:

The base of the chamber must be at a level 200mm below the bottom of the ACO Q-Brake Vortex flow control. When the chamber base is benched, there must be a 200mm deep sump below the bottom of the unit as shown on the sketch.

Step 3:

Offer the ACO Q-Brake Vortex flow control unit up to the outlet pipe using the lifting eyes where appropriate. Ensure the unit is upright (arrow pointing vertically up). Mark the position of the fixing holes on the chamber wall. Remove the unit and drill fixing holes to suit the M10 bolts supplied with the unit. (Note bolts are Rawlbolt R-XPT-S stainless steel M10 bolts requiring a hole 15mm diameter).

Step 4:

Place bolts into the drilled holes. Locate the ACO Q-Brake Vortex flow control onto the bolts (again check it is upright). Ensure that the gasket is flat against the wall. Fit the nuts and tighten them to pull the unit against the gasket and seal it against the wall.

Step 5:

Fix the two wire guide rings (supplied) to the chamber wall, one approx mid height and one just under the access cover. Thread the bypass door lifting wire through the rings. Adjust the length of the wire by fixing the handle in the correct position and cut to length if necessary.

An electronic version of the ACO Q-Brake Vortex installation detail is available to download from the ACO website.
Visit www.aco.co.uk.

Operation and maintenance recommendations

Commissioning the product

Before the product is commissioned, the chamber containing the ACO Q-Brake Vortex should be inspected in line with normal practice. Any debris or silt should be removed. Any visible fixing bolts should be checked.

If an internal blockage is suspected, the control can be inspected internally and cleaned out by opening the inspection bypass door on the upstream end. The bypass door must be returned to the closed position before the control becomes operational or bolted shut.

Frequency of inspection / maintenance

Inspections should be carried out at frequent and regular intervals (approximately every 3-6 months). The frequency will depend upon the location and the environment, and should be based on local knowledge. Action is only required in the event of a blockage or suspected blockage.

Maintenance plan

ACO Q-Brake Vortex flow controls require no routine maintenance although inspections should be carried out at regular intervals (See frequency of inspection / maintenance section).

Manual handling

ACO Q-Brake Vortex flow controls should be handled in accordance with current legislation and regulations:

- The Health and Safety at Work Act 1974
- The Management of Health and Safety at Work Regulations 1999
- The Manual Handling Operations Regulations 1992

Service life

ACO Q-Brake Vortex flow controls have no moving parts to wear or fail. Manufactured from grade 304 stainless steel plate they will resist scour, degradation and chemical attack. The unit is designed to easily outlast the drainage system in which it is installed.

COSHH

ACO Q-Brake Vortex flow controls are manufactured from grade 304 stainless steel. This material is not regarded as hazardous to health and demonstrates no chemical hazard when used for the stated applications.

MODEL SPECIFICATION CLAUSE

The vortex flow control device shall be supplied by ACO Technologies plc; all materials and components within the scope of this system shall be obtained from this manufacturer.

All units shall be manufactured from grade 304 stainless steel incorporating rear mounted remote access bypass and emergency drain down door complete with stainless steel cable and fixings.

ACO Q-Brake Vortex is a vortex flow control device designed to suit a design head of #mm and design flow of # litres per second.

Insert information as appropriate

NBS Specification

ACO Q-Brake Vortex should be specified in section R12. Assistance in completing this clause can be found in the ACO Water Management entry in NBS Plus, or please contact the ACO Water Management Design Services Team.

Note: A specification in NBS format is available to download from www.thenbs.com or www.aco.co.uk

RECYCLED CONTENT

ACO Technologies aims to incorporate as much recycled material or waste material as is practicable in its manufactured products.

Typically steel products contain between 25% and 33% recycled content by weight. Therefore the total recycled content of the ACO Brake Vortex will contain be at minimum approximately 25% by weight recycled material.

ACO Q-Brake Vortex is intended for a long life with low maintenance, to reduce the need to recycle, but when eventually the product is no longer needed, much of its content can be readily recycled with a very low risk of pollution to the environment.



Product Testing

Through ACO's continual product development and refinement programme has led to an enhanced range of ACO Q-Brake Vortex flow controls. The range has been independently tested and complex software written to ensure that the best possible characteristics and curves are achieved to help reduce upstream storage requirements and installation costs.

What is ACO Q-Plate?

ACO Q-Plate orifice plates are designed for use where an ACO Q-Brake vortex is not the most effective solution. To suit application requirements, the range is available with or without remote bypass and drain down and is designed to match a variety of manhole configurations. A neoprene sealing gasket and fixing holes are featured on each unit.



ACO Q-Plate with remote draindown and bypass recommended for all orifice apertures less than 100mm



ACO Q-Plate

ACO Q-Plate Bypass features

- Manufactured from 304 stainless steel
- Orifice aperture up to 150mm
- Sealing pipe gasket
- Emergency drain-down and access cable
- Bypass door (with improved seal) and latch
- Flat or curved radius to suit manhole diameter
- Manhole fixings

ACO Q-Plate features

- Manufactured from 304 stainless steel
- Four fixing positions
- Pipe sealing gasket
- Manhole fixings
- Flat or curved radius to suit manhole diameter

ACO Q-Plate Specification and design process

To suit project requirements, two options of ACO Q-plate are available:

ACO Q-Plate Bypass
< 100mm orifice with remote drain-down and bypass (also available up to 150mm)

ACO Q-Plate
>100mm orifice without remote drain-down and bypass

In order to complete this process and deliver the product options available, please provide the ACO engineers with the following information:

- The proposed design flow – maximum allowable discharge
- The proposed design head – invert of outlet pipe to top water level
- The proposed outlet pipe diameter
- The proposed type and size of outlet manhole

Before production can commerce, ALL of the above information must be verified on ACO's Contract Review Document issued at the time of order placement.

Finished product

From this information ACO will size and design the ACO Q-Plate to meet the design criteria and to suit the prosed surface water application.

ACO will supply:

- Head discharge table & graph
- ACO Q-Plate installation details
- Information for manhole sizing

Guide to installing an ACO Q-Plate

Step 1:

Construct the chamber that is to house the ACO Q-Plate orifice control. Note that if the chamber has a curved wall (e.g. a concrete ring manhole), the diameter of the chamber should be specified on the order and Contract Review Document for the ACO Q-Plate Orifice control unit.

Step 2:

There should be a small sump under the outlet to ensure the orifice control does not easily block, ideally there should be upstream sediment and debris traps. When the chamber base is benched, there should be a minimum 200mm deep sump below the bottom of the unit as shown on the sketch.

Step 3:

Offer the ACO Q-Plate orifice control unit up to the outlet pipe. Ensure the unit is upright (arrow pointing vertically up) and that the orifice is correctly positioned at the invert of the outlet pipe.

Check there is a good seal between the orifice plate and the outlet pipe. Mark the position of the fixing holes on the chamber wall. Remove the unit and drill fixing holes to suit the bolts supplied with the unit.

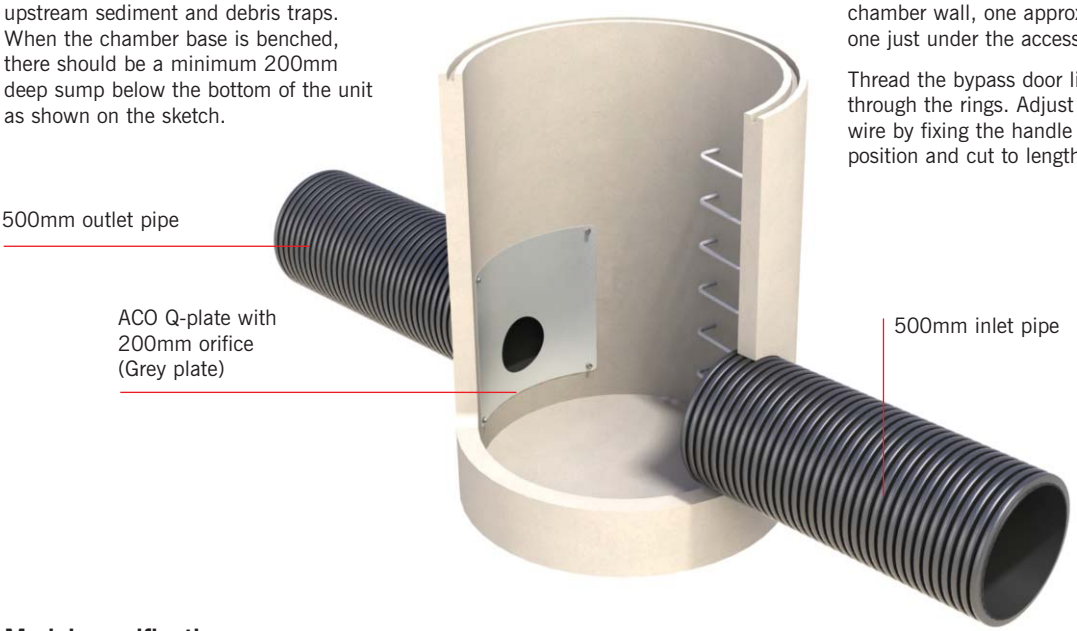
Step 4:

Place bolts into the drilled holes. Locate the ACO Q-Plate orifice control onto the bolts (again check it is correctly aligned). Ensure that the gasket is flat against the wall. Fit the nuts and tighten them to pull the unit against the gasket and seal it against the wall.

Step 5:

If you have been supplied the Q-Plate with the drain down and bypass door fix the two wire guide rings (supplied) to the chamber wall, one approx mid height and one just under the access cover.

Thread the bypass door lifting wire through the rings. Adjust the length of the wire by fixing the handle in the correct position and cut to length if necessary.



Model specification

ACO Q-Plate orifice control *with remote drain down and bypass (delete as appropriate), ##mm orifice designed to suit a pipe outlet size of ###mm, a design head of ## mm and design flow of # litres per second.

ACO Technologies plc

- ACO Water Management
  Civils + Infrastructure
  Urban + Landscape
- ACO Building Drainage
- ACO Sport
- ACO Wildlife

ACO Water Management:
Civils + Infrastructure

A division of ACO Technologies plc
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website: www.aco.co.uk

The ACO Group: A strong family you can depend on.

ISO 9001
FM 13502

ISO 14001
EMS 538781

OHSAS 18001
OHS 524145

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ACO CARES ABOUT THE ENVIRONMENT
Printed on material approved by the Forest Stewardship Council (FSC) who provide a means of assuring that products come from responsibly managed forest.

PC21199

Appendix C:

Cellular Attenuation Tank Manufactures Guidelines

Polystorm Range

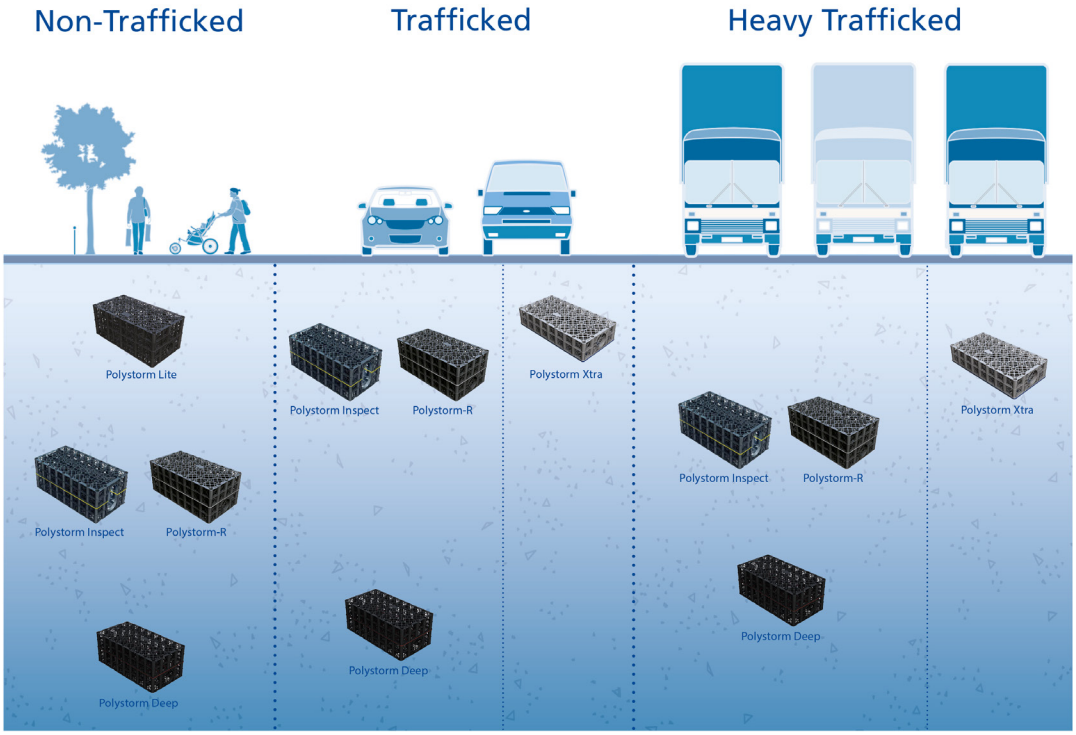
PRODUCT INFORMATION | ISSUE 7 - FEB 19

The tried and tested Polystorm range for the management of surface water is designed to provide retention, attenuation or infiltration at a variety of depths. The Polystorm range can accommodate a wide range of loadings, from pedestrianised areas to large HGV parks. The current range comprises of five modular cells and two access options for both horizontal and vertical inspection.

Key Features and Benefits:

- High void ratio providing greater water storage capacity and reduced excavation and disposal costs
- Suitable for retention, attenuation and infiltration systems
- Light weight yet robust, affording excellent Health and Safety and installation benefits
- Modular units allow flexibility of shape, making them ideal for shallow excavation systems, narrow strips or for restricted areas
- Units available from 20 tonnes per square metre vertical load bearing capacity, up to a maximum of 83 tonnes per square metre vertical load bearing capacity
- Can be utilised in non-trafficked, trafficked or heavily trafficked applications
- Unique rounded corners for ease of handling and reduces likelihood of punctures to membranes
- BBA Approved *Polystorm, Polystorm-R & Polystorm Lite (Polystorm Xtra and Polystorm Deep pending)
- Up to 60 year design life
- Polystorm modular cells are manufactured from polypropylene
- Polystorm Access is manufactured from HDPE
- 100% recyclable at the end of useful life

BBA BRITISH BOARD OF AGREMENT
CERTIFICATE No. 06/4297



- Polystorm Xtra is for use in shallow non-sub-base replacement applications
- Our Polystorm (PSM1) modular cell can also be used in place of Polystorm-R (PSM1A)

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Polypipe

Polystorm Range

PRODUCT INFORMATION | ISSUE 7 - FEB 19

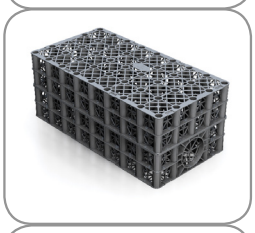
Polystorm Lite (PSM2)

Specifically designed for non-trafficked applications within landscaped areas, pedestrianised areas or public open spaces such as playgrounds. With 20 tonne per square metre vertical compressive strength, it can take the load of general maintainance vehicles such as grass cutters.



Polystorm (PSM1)

With 44 tonne per square metre vertical compressive strength, made from virgin material, Polystorm is ideally suited for trafficked and loaded areas. It is used frequently for housing delvelopments, car parks and commercial developments.



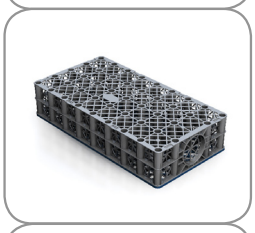
Polystorm-R (PSM1A)

Similar to the Polystorm cell, Polystorm-R is used for trafficked and loaded applications and has a vertical compressive strength of 61 tonne per square metre. Polystorm-R has the added benefit of having up to 100% recycled material content. It is ideally suited for housing, commercial and infrastructure projects.



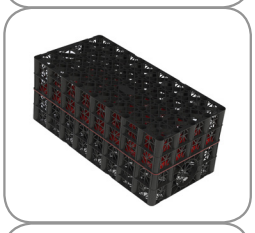
Polystorm Xtra (PSM3)

Designed for use in heavily trafficked areas for shallow, non sub-base applications where a reduced cover is required. It has an impressive vertical compressive strength of 83 tonnes per square metre.



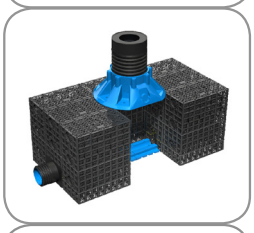
Polystorm Deep (PSM5)

Polystorm Deep has been designed for use in trafficked applications such as lorry parks and industrial access roads. It can be buried deeper than any other Polystorm cell and can be value engineered as part of a hybrid system with Polystorm, Polystorm-R and Polystorm Lite.



Polystorm Access (please see datasheet for codes)

Polystorm Access provides a 1m x 0.5m shaft within a Polystorm structure to enable surface access for remote camera inspection and maintainance activities such as flushing and rodding. The system consists of a 500mm diameter shaft which extends from surface level to the top of a Polystorm structure, at which point a turret provides an interface between the shaft and the inspection chamber within the system.



Polystorm Inspect (PSM4)

Polystorm Inspect provides a tunnel along the length of a fully installed Polystorm structure to enable access for inspection and maintainance. Polystorm Inspect can be combined with Polystorm Access for full inspection and maintainance activities such as fushing and rodding.



Geomembranes and Geotextiles

Polystorm Geotextiles are UV-stabilized, polypropylene, continuous filament needle-punched non-woven geotextiles, designed to complement the range of Polystorm modular cells. They are suitable for infiltration applications and can also be incorporated into drainage trenches.



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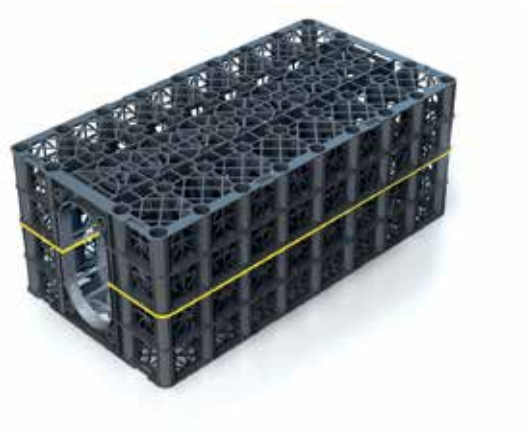
Polystorm Inspect

Data Sheet

PRODUCT INFORMATION **P1** **ISSUE 2 - JAN 2016**

Product code: PSM4

The Polystorm Inspect cell is complementary to the Polystorm range of modular cell solutions. Its primary purpose is to provide a tunnel along the length of a fully installed Polystorm structure to enable access for inspection and maintenance. Polystorm Inspect is a high strength thermoplastic cell which evenly distributes its load through the Polystorm structure.
The tunnel end is left open by default but the unit can be closed off if required by clipping into place the moulded end plate. For purposes of identification the cell features a yellow centre section and end plate.



Key Benefits

- Creates a horizontal tunnel running through the middle of the tank to provide access for inspection and maintenance, i.e. jetting and rodding
- Can be used with Polystorm Lite, Polystorm-R and Polystorm (cannot be used in the same layer as Polystorm Xtra as the Polystorm Inspect cell is deeper)
- Tunnel can be used as a flow inlet track achieving greater stormwater flow distribution within the unit
- Large access tunnel (height 320mm and width 172mm nominal) – allows maximum field of vision while maintaining the system's structural performance
- High strength to weight ratio
- Light weight cell allows easier handling and reduced Health and Safety risk
- Utilises the same Shear Connectors and Clips as the Polystorm range
- The tunnel restricts the dissipation of silt in to the overall structure making inspection and maintenance easier
- Polystorm Inspect cells with 225mm (PSM4CRD225) or 300mm (PSM4CRD300) inlets are available

Applications

Polystorm Inspect is designed to work with the rest of the Polystorm range within a layered hybrid system enabling an intelligently engineered attenuation or infiltration structure to be created. It is intended to be used from the inlet point of the Polystorm structure. If used other than along an inlet tract, the Polystorm Inspect end plate should be used to cap off the tunnel entrance. The most cost effective way to create a tank is to use a combination of Polystorm Inspect cells and other Polystorm modular cells.

UNIT TYPE	VALUE
PHYSICAL PROPERTIES	
Length	1m
Width	0.5m
Depth	0.4m
Total volume	0.2m³
Unit weight	11.6kg*
Cube storage volume	0.188m³ (188 litres)
Volumetric void ratio	94%
SHORT TERM COMPRESSIVE STRENGTH	
Vertical	Minimum 440kN/m²
Lateral	Minimum 63kN/m²
SHORT TERM DEFLECTION	
Short-term vertical deflection	Minimum 70.1kN/m²
LONG TERM DEFLECTION	
Estimated long term vertical deflection (creep)	0.6113Ln (design life in hrs)

Note: The table above is applicable to PSM4 without the end plate.
*Approximate weight
End plates to be purchased separately as required.

Please note: The use of Polystorm Inspect does not negate the requirement for a Silt Trap to be installed prior to the Polystorm structure. The use of a Silt Trap or other silt prevention device would always be recommended.

Technical Support

Detailed guidance and assistance is available.
For further information, please contact our Technical Team on **+44 (0) 1509 615100** or email **civils@polypipe.com**

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Polypipe

Polystorm Inspect

Data Sheet

RECOMMENDED MAXIMUM DEPTH OF INSTALLATION (to cell invert) [m]

TYPICAL SOIL TYPE	TYPICAL ANGLE OF SHEAR RESISTANCE	WITHOUT GROUNDWATER (below base of cells) NORMAL CASE		WITH GROUNDWATER AT 1M BELOW GROUND LEVEL AND UNITS WRAPPED IN GEOMEMBRANE	
		Pedestrian	Trafficked (cars)	Pedestrian	Trafficked (cars)
Stiff over consolidated clay e.g. London clay	24°	2.3	2.0	1.8	1.7
Normally consolidated silty sandy clay e.g. alluvium, made ground	26°	2.4	2.2	1.9	1.7
Loose sand and gravel	30°	2.8	2.6	2.0	1.8
Medium dense sand and gravel	33°	3.2	2.9	2.1	1.9
Dense sand and gravel	38°	3.9	3.6	2.2	2.1

Note:

1) Stated depths based on the calculation methodology detailed within CIRIA C680 (2008)
2) Assuming a soil density = 19 kN/m³ water density = 9.81 kN/m³
3) Assumed ultimate limit state (ULS) partial factor of safety applied to: Material = 2.75 Live load = 1.5 Dead load = 1.35

Notes:

1. Unless stated, all values are nominal and may vary within normal production tolerances.
2. Polypipe reserve the right to change product specifications without prior notice.
3. This document is uncontrolled and updates will not be issued automatically.

RECOMMENDED MINIMUM COVER LEVELS [m]

LIVE LOAD CONDITIONS	PEDESTRIAN	LIGHT TRAFFICKED
		Car park with vehicle mass <6000kg
Minimum cover depth required (m)	0.50	0.60

Note:

1) Stated depths based on the calculation methodology detailed within CIRIA C680 (2008)
2) Assumed serviceability limit state (SLS) partial factor of safety applied to: Material = 1.5 Live load = 1.0 Dead load = 1.0
3) Shallower minimum burial depths may be applicable subject to specific site conditions.

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Polypipe

Appendix D:

Grease Trap Manufactures Guidelines

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19.9.2014
D15622Be

GA-1

Grease Separator Alarm Device

Installation and Operating Instructions



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SYMBOLS


Warning / Attention


Device is protected by double or reinforced insulation

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1 GENERAL

GA-1 is an alarm device for monitoring the thickness of the grease layer accumulating in a grease separator.

The system consists of GA-1 control unit, GA-SG1 sensor and a cable joint.

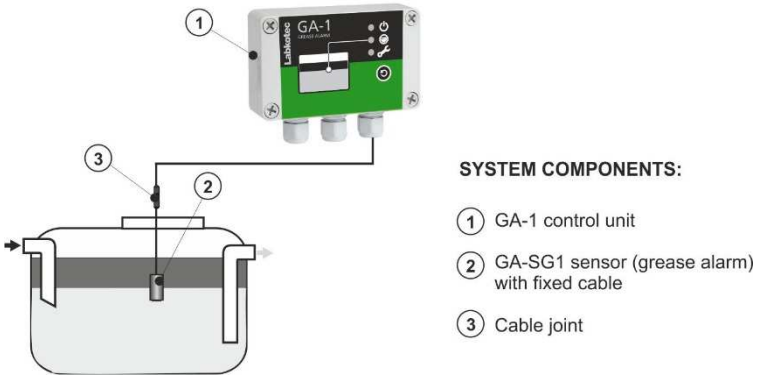


Figure 1. Grease separator supervision with GA-1 alarm device

GA-SG1 sensor is installed into the grease separator and it supervises thickness of grease layer.

The LED indicators, push button and interfaces of the GA-1 control unit are described in figure 2.

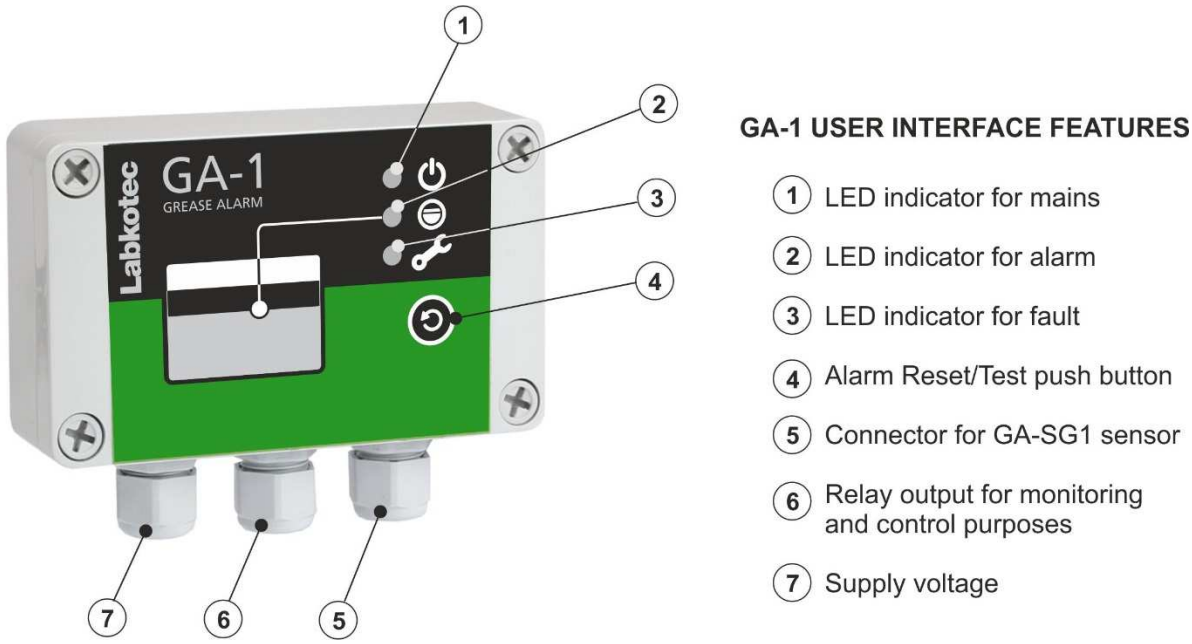


Figure 2. GA-1 control unit – features

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2 INSTALLATION

2.1 GA-1 control unit

GA-1 control unit can be wall-mounted. The mounting holes are located in the base plate of the enclosure, beneath the mounting holes of the front cover.

The cover of the enclosure must be tightened so, that the edges touch the base frame. Only then does the push button function properly and the enclosure is tight.

Before installation, please read the safety instructions in chapter 6!

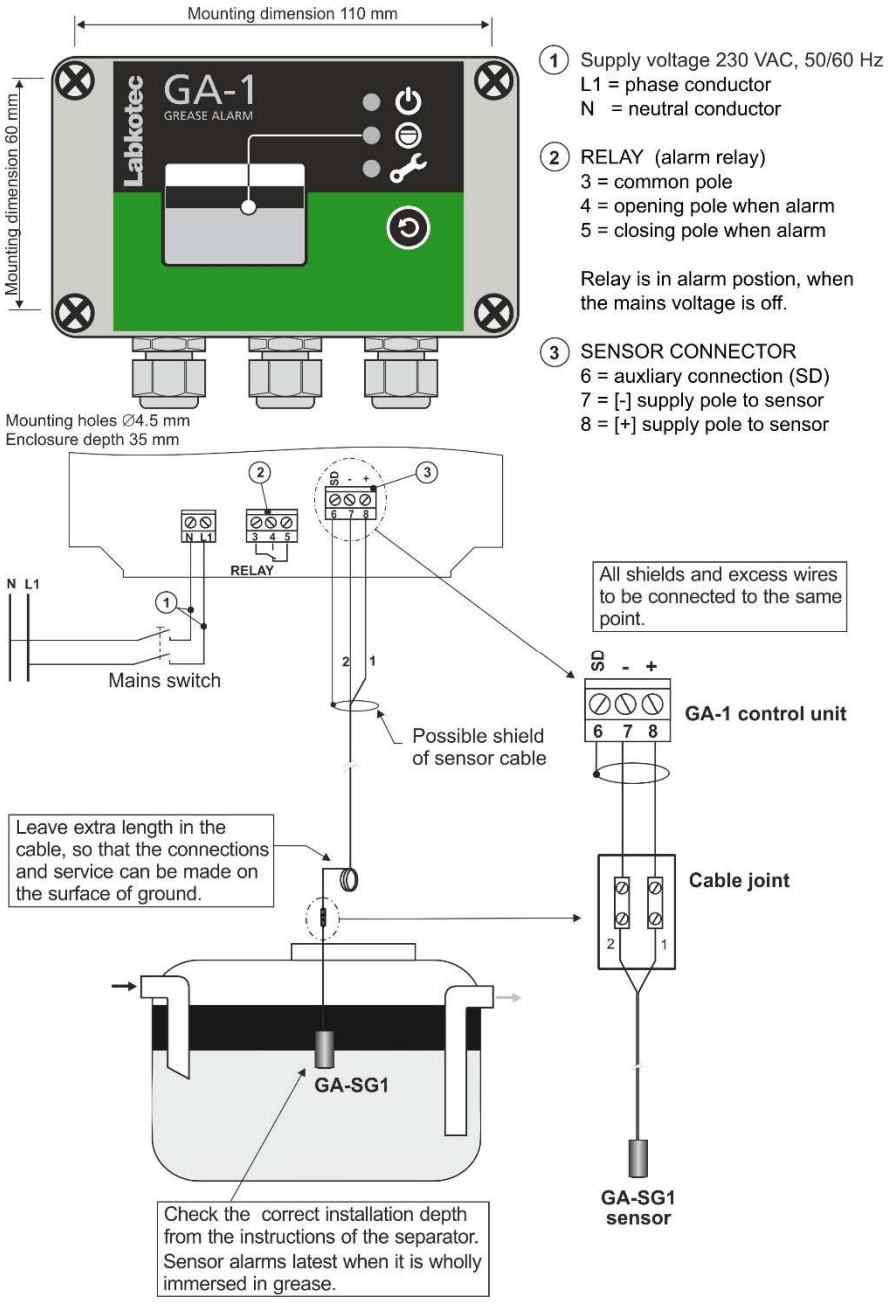


Figure 3. GA-1 alarm device installation.

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2.2 GA-SG1 sensor

GA-SG1 sensor should be installed as described in figure 3.

The sensor gives an alarm latest when it is wholly immersed in grease.

Please check the correct installation depth also from the instructions of the grease separator.

2.3 Installation Accessories

The delivery includes a cable joint (figure 4), fixing accessories (figure 5) for installation of the control unit and the sensor. In figure 6 is an installation example of cable with suspension hook.

Connections of the sensor cable inside the cable joint are explained in figure 3. If shielded cable is used cable shields and possible excess wires need to be connected to the same point in galvanic contact.

IP rating of the cable joint is IP68. Make sure, that the cable joint is closed properly.



Figure 4 Cable joint

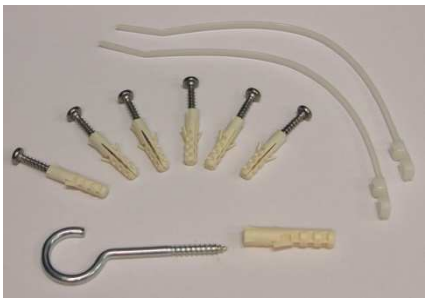


Figure 5. Fixing accessories



Figure 6. Cable installation example

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3 OPERATION

The operation of the alarm device should be checked always after the installation. Also check the operation always when emptying the separator or at least once every six months.

Functionality test

1. Immerse the sensor into water. The device should be in normal mode.
2. Lift the sensor up in air or grease. A grease alarm should be generated (see chapter 3.1 for more detailed description).
3. Clean up the sensor.
4. Immerse the sensor back into water. The alarm should go off after a delay of 10 sec.

A more detailed description of the operation is provided in chapter 3.1.
If the operation is not as described here, check connections and cabling. If necessary contact a representative of the manufacturer.

3.1 Modes of operation

Normal mode – no alarms

Sensor is totally immersed in water.

Mains LED indicator is on.
Other LED indicators are off.
Relay is energized.

Grease alarm

Sensor is immersed in grease. (the sensor gives an alarm latest when it is wholly immersed in grease).

Mains LED indicator is on.
Grease Alarm LED indicator is on.
Buzzer on after 10 sec delay.
Relay de-energize after 10 sec delay.
(Note. The same alarm takes place when GA-SG1 sensor is in the air.)

After removal of an alarm, the Grease Alarm LED indicator and buzzer will be off, and relay will be energized after 10 sec delay.

Fault alarm

Sensor cable break, short circuit or a broken sensor.

Mains LED indicator is on.
Sensor circuit Fault LED indicator is on after 10 sec delay.
Buzzer is on after 10 sec delay.
The relay de-energize after 10 sec delay.

Reset of an alarm

When pressing the Reset/Test push button.

Buzzer will go off.
Relay and LED indicator will not change their position until the alarm or fault situation is removed.
If the buzzer is not reset, it goes off automatically after three days.

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TEST FUNCTION

Test function provides an artificial alarm, which can be used to test the function of the GA-1 alarm device and the function of other equipment, which are connected to GA-1 via its relay.



Attention! Before pressing the Reset/Test button, make sure that the change of relay status does not cause hazards elsewhere!

Normal situation	*When pressing the Reset/Test push button:* *Grease Alarm and Fault LED indicators are immediately on.* *Buzzer is immediately on.* *Relay de-energize after 2 sec of continuous pressing.* *When the Reset/Test push button is released:* *LED indicators and buzzer go immediately off.* *Relay energize immediately.*
Alarm on	*When pressing the Reset/Test push button for the first time:* *Buzzer will go off.* *When pressing the Reset/Test push button after that:* *Fault LED indicator is immediately on.* *Grease Alarm LED indicator remains on.* *Buzzer remains on. If it has been reset earlier, it will return to be on.* *When the Reset/Test push button is released:* *The device returns right away to the preceding status.*
Fault alarm on	*When pressing the Reset/Test push button:* *The device does not react to the test at all.*

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4 TROUBLE-SHOOTING

Problem:	***No alarm when sensor in grease or air, or the alarm will not go off***
Possible reason:	*Sensor is dirty.*
To do:	*1. Clean-up the sensor and check the operation again.*

The following operations must be performed only by a qualified electrician!

Problem:	***MAINS LED indicator is off***
Possible reason:	*Device doesn't get supply voltage.*
To do:	*1. Check that power separation switch is not switched off.* *2. Measure the voltage between poles N and L1. It should be 230 VAC + 10 %.*

Problem:	***FAULT LED indicator is on***
Possible reason:	*Current in sensor circuit too low (cable break or out of connector) or too high (cable in short circuit). The sensor might also be broken.*
To do:	*1. Make sure, that the sensor cable has been connected correctly to the GA-1 control unit.* *2. Measure the voltage separately between the poles 7 and 8. The voltages should be between 7,0 - 8,5 V. Note! The voltage alternates between the sensor connectors in 1 second intervals.* *3. Measure sensor current when the sensor is in the air or in grease. The measured current should be 7,0 – 8,5 mA.* *4. Measure current when the sensor is in the water. Measured current should be 2,5 – 3,5 mA*

If the problem can not be solved with the above instructions, please contact Labkotec Oy's service.

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5 REPAIR AND SERVICE

The sensor should be cleaned and the operation should also be tested when emptying or maintaining the grease separator or at least once every six months. The easiest way to check the operation is to lift the sensor up in the air and to put it back to the separator. The operation is described in chapter 3.

For cleaning, a mild detergent (e.g. washing-up liquid) and a scrubbing brush can be used.

In case of queries, please contact Labkotec Oy's service:

service@labkotec.fi.

6 SAFETY INSTRUCTIONS



The device does not include a mains switch. A two pole mains switch (250 VAC 1 A), which isolates both lines (L1, N) must be installed in the main power supply lines in the vicinity of the unit. This switch facilitates maintenance and service operations and it has to be marked to identify the unit.



If opening of housing's cover is needed, only a qualified electrician is allowed to install or to maintain the device.



If the device is used against the manufacturer's instructions, the protection provided by the device may be damaged.



The device is not allowed to install in hazardous areas.

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7 TECHNICAL DATA

GA-1 control unit	
Dimensions	125 mm x 75 mm x 35 mm (L x H x D)
Weight	250 g Package 0,8 kg (control unit + sensor + cable joint)
Enclosure	IP 65, material polycarbonate Cable glands adjustment range is 6 – 10mm
Operation temperature	-30 ºC…+50 ºC
Supply voltage	230 VAC ± 10 %, 50/60 Hz The device is not equipped with a mains switch
Power consumption	5 VA
Sensors	GA-SG1 sensor
Relay output	Potential-free relay output 250 V, 5 A Operational delay 10 sec. Relay de-energize at trigger point.
Electrical safety	IEC/EN 61010-1, Class II ⧈, CAT II
EMC Emission Immunity	 IEC/EN 61000-6-3 IEC/EN 61000-6-1
Manufacturing year: Please see the serial number on the type plate	xxx x xxxxx xx **YY** x where YY = manufacturing year (e.g. 14 = 2014)

GA-SG1 sensor	
Principle of operation	Capacitive
Material	POM, PUR, AISI 316
Weight	350 g (sensor + fixed cable)
IP-classification	IP68
Operation temperature	0 ºC…+90 ºC
Cable	Fixed cable 2 x 0.75 mm^2. Standard length 5 m, other lengths optional. The max. length of the fixed cable is 15 m, can be extended. Maximum cable loop resistance is 75 Ω.
EMC Emission Immunity	 IEC/EN 61000-6-3 IEC/EN 61000-6-1
Manufacturing year: Please see the serial number from the bottom of sensor	GAxxxxx**YY** where YY = manufacturing year (e.g. 14 = 2014)

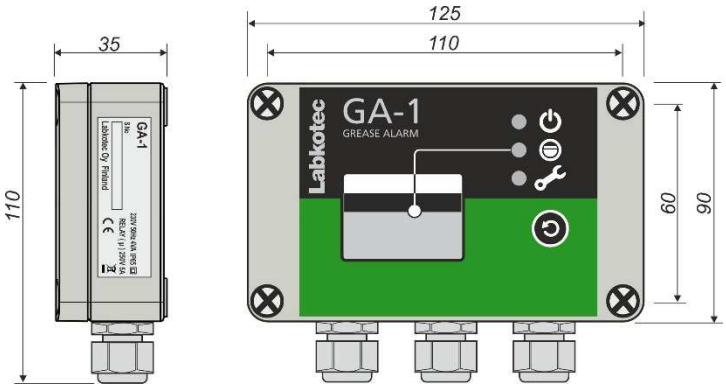


Figure 7. GA-1 control unit

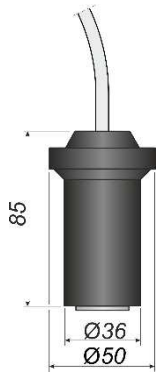
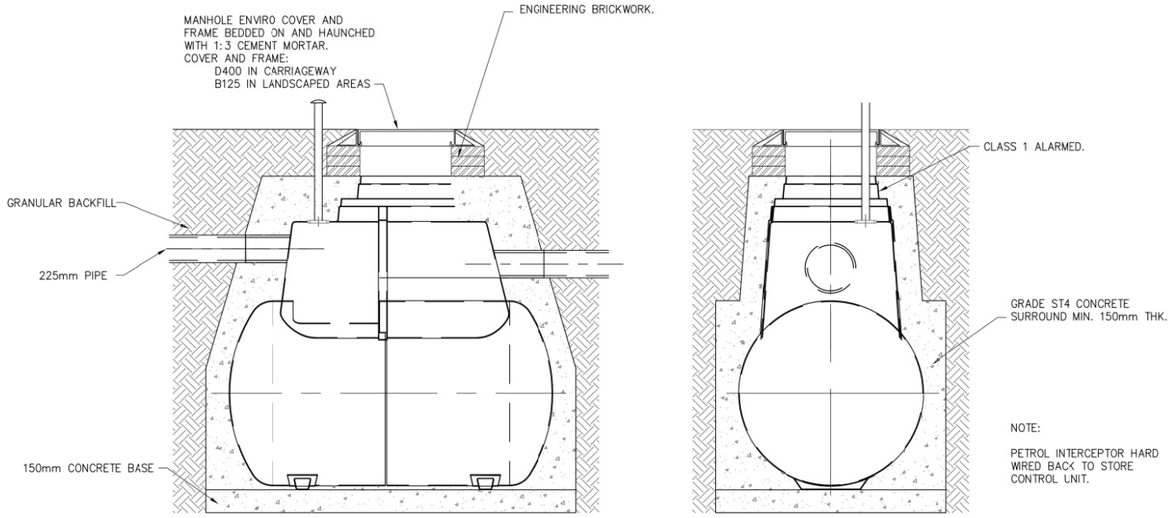


Figure 8. GA-SG1 sensor

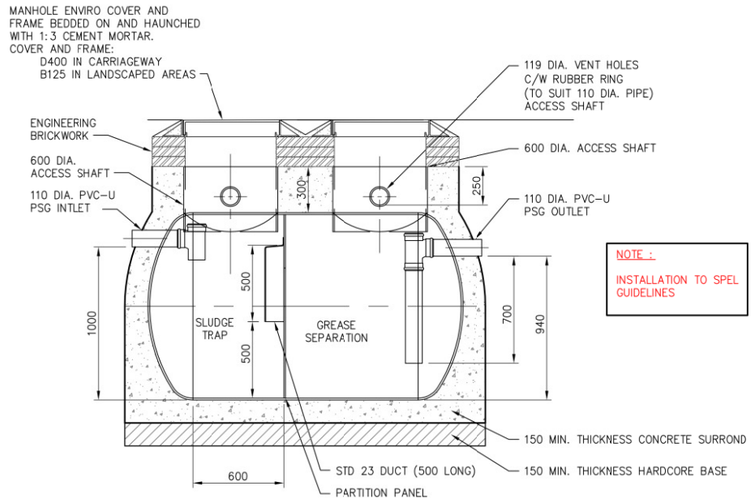
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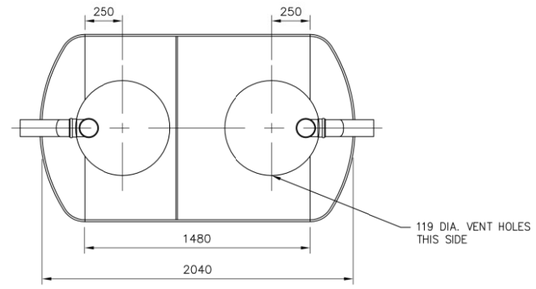


SPEL 206 C1 PETROL INTERCEPTOR (OR SIMILAR APPROVED). CONCRETE SURROUND

Scale 1:20



SECTION



PLAN

2000L SPEL GREASE INTERCEPTOR WITH TELEMETRY ALARM

SCALE 1:20

0mm 40mm 80mm

ORIGINAL
SHEET SIZE A1

This drawing should not be scaled. For construction purposes, work to figured dimensions only

McDonald's ™

FOR INFORMATION ONLY

Rev.	Description	Date	Chkd

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Client : McDonald's RESTAURANT

Project : McDONALD'S RESTAURANT

Title : PROPOSED GREASE TRAP & PETROL INTERCEPTOR

Project Engineer :	J.H.	Scale :	AS SHOWN
Project Director :	J.B.	Date :	APR' 2014
Status :	INFORMATION		

Drawing No G' TRAP & P'INTERCEPT Rev P1

Labkotec
INDUTRADE GROUP

L15624_e
F15625_e

Declaration of Conformity

This declaration certifies that the below mentioned apparatus conforms to the essential requirements of the EMC directive 2004/108/EY and Low-Voltage directive (LVD) 2006/95/EC.

Description of the apparatus:	Measuring and control unit with sensor
Type:	GA-1 Grease Alarm control unit with GA-SG1 sensor GA-2 Grease Alarm control unit with two GA-SG1 sensors
Manufacturer:	Labkotec Oy Myllyhaantie 6 FI-33960 Pirkkala FINLAND

The construction of the appliance is in accordance with the following standards:

EMC:	
EN 61000-6-1 (2007)	Electromagnetic compatibility, Generic standards – Immunity for residential, commercial and light-industrial environments.
EN 61000-6-3 (2007) +A1 (2011)	Electromagnetic compatibility, Generic standards – Emission standard for residential, commercial and light-industrial environments.
EN 61000-3-2 (2006) +A1+A2 (2009)	Electromagnetic compatibility, Product family standard: Harmonic current emissions.
EN 61000-3-3 (2008)	Electromagnetic compatibility, Product family standard: Voltage changes, fluctuations and flicker sensation.
LVD:	
EN 61010-1 (2010)	Safety requirements for electrical equipment for measurement, control and laboratory use. Part 1: General requirements.

This product is CE-marked since 2013.

Signature

The authorized signatory to this declaration, on behalf of the manufacturer, and the Responsible Person based within the EU, is identified below.

Pirkkala 20.5.2013

Ari Tolonen
CEO
Labkotec Oy

SPEL Grease/Fat Separators

Introduction

Grease separators are used to remove fat and grease from waste water. This is often essential to eliminate incidents of drain blockages caused by the waste from catering establishments. The operation of septic tanks, pumps, and sewage treatment systems will also be improved by removing the fat and grease from the effluent.

Siting and Installing the Tank

The tank should not be installed near a road or driveway, where it could be subjected to high external loads, unless the installation is designed to withstand such loadings so they are not transferred to the tank shell.

Where the tank is to emptied using a tanker, it should be sited within 30m of a vehicle access provided that the invert level of the septic tank is no more than 3m below the level of the vehicle access. This distance may need to be reduced where the depth to the invert of the tank is more than 3m. There should also be a clear route for the hose such that the tank can be emptied and cleaned without the contents being taken through a dwelling or place of work.

Adequate ventilation of the tank and the inlet pipework must be provided to prevent the accumulation of fermentation gases.

For full installation instructions concerning tank specification handling and burial please consider our supplied installation guidelines, Sec4.

Operation

Please refer to a supplied drawing. Contaminated water flows into the tank through the inlet pipe. Heavy deposits will settle on the bottom of the chamber and light contaminants will mostly float on top of the water. Cleaner water flows through to the second chamber where water is allowed to pass out of the tank taken from the cleanest part of the chamber.

Maintenance

Grease, sludge and other fatty effluents remain in the tank until removed by a specialist cleansing or waste disposal contractor. The tank must be emptied periodically of retained grease, sludge and other fatty effluents. Other than this action SPEL Grease separators are essentially maintenance free, however, it is not possible to predict site specific maintenance requirements. SPEL tank shells usually carry a 25-year warranty.

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Alarm Options
SPEL can provide a range of alarms to suit your needs.

Access
SPEL Grease separators have good access to both chambers for period emptying of retained grease, sludge and similar fatty effluents. Access is made in each case through a circular access shaft of 600mm diameter at the crown of the chamber.

Emptying Period
Periods between emptying will have to be determined depending on site conditions but normally at least twice a year.

Emptying Procedure
Typically the contents of the chambers will be sucked out by a specialist cleansing or waste disposal contractor. Both light and heavy deposits should be removed at this time. A Large hose is usually lowered down into the chamber through the access shaft. As the contents are sucked out care should be taken to ensure that both chambers contents are reduced equally. If one chamber is allowed to contain too great a quantity of fluid in comparison with the other chamber damage to the dividing baffle wall may result. Following removal the tank should be re-charged with clean water. The removed contents should be disposed of by the specialist contractor.

The contents of this document are supplied for general guidance only. SPEL Products can accept no liability for harmful incidents that arise as a result of the contents of this document. It is not possible for SPEL Products to predict site specific operational or maintenance requirements.

Appendix E:

Maintenance Schedule

Inspection Log - Year …….. sheet 1 of 2

Inspection Date	A - Surface Water Catchpit Manholes	B - Foul Water Manholes	C - Gulley	D - Channel Outlets	E – Surface Water Treatment	F – Surface Water Flow Control Chamber	G – Cellular Attenuation Tank	H - Grease Trap	Comments
'Month'									
February									
March									
April									
May									
June									

How to complete this Log:

1.0 Write date in LH column.

2.0 Tick which items have been inspected for that date.

3.0 Add to notes and maintenance completed e.g. gullies / catchpits emptied or smart sponge replaced.

Inspection Log - Year …….. sheet 2 of 2

Inspection Date	A - Surface Water Catchpit Manholes	B - Foul Water Manholes	C - Gulley	D - Channel Outlets	E – Surface Water Treatment	F – Surface Water Flow Control Chamber	G – Cellular Attenuation Tank	H - Grease Trap	Comments
July									
August									
September									
October									
November									
December									

How to complete this Log:

1.0 Write date in LH column.

2.0 Tick which items have been inspected for that date.

3.0 Add to notes and maintenance completed e.g. gullies / catchpits emptied or smart sponge replaced

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- Geomatics (Land Surveying)
- Building Surveying
- BIM