

SUBJECT
Ford Car Park Extension, Halewood - Condition 10

TO
Sophie Cotton

DATE
15 May 2024

OUR REF
10603362-ARC-XX-ZZ-RP-CE-0011

DEPARTMENT
Enabling Infrastructure

PROJECT NUMBER
10603362

COPIES TO
David Atkinson

FROM

Introduction

Planning consent (23/02377/FUL) for a car park extension at Ford Halewood, has been granted:

Proposed car park (to the east of existing car park) to provide additional vehicle and cycle parking spaces and associated works. Getrag Ford Speke Boulevard Halewood Knowsley L24 9LE

This note sets out the details for the surface water drainage associated with the proposed car park extension in line with the requirements of Condition 10 of the planning consent.

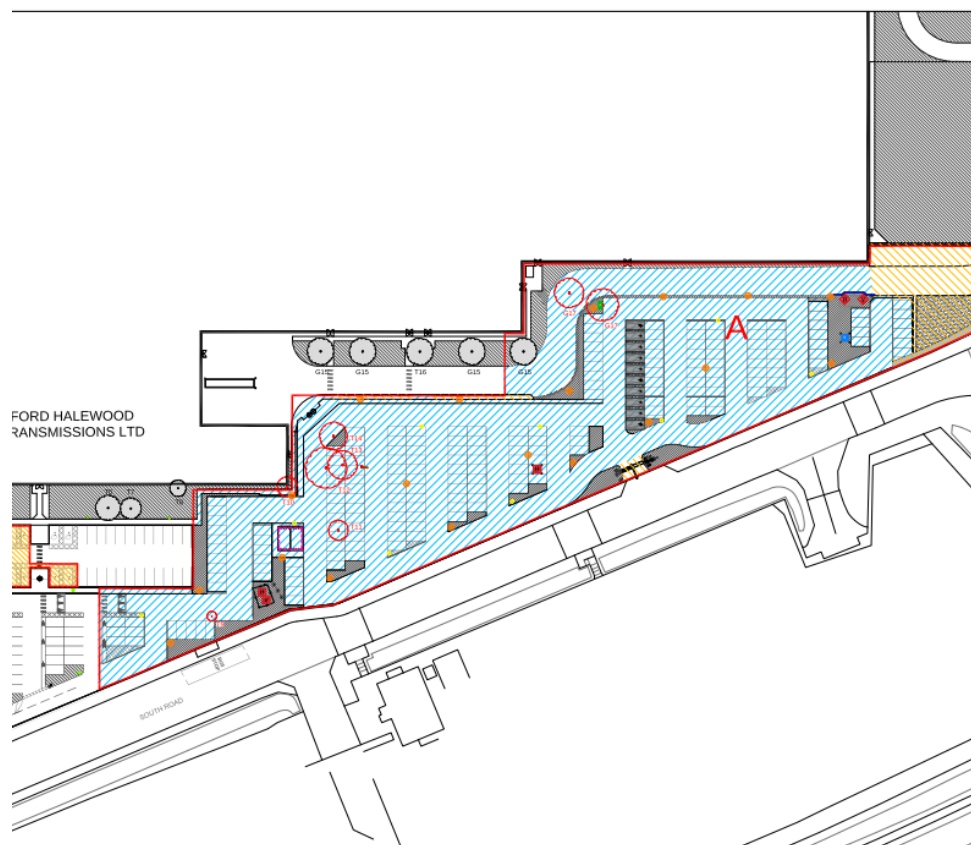


Figure 1: Consented Car Park General Arrangement

Arcadis Consulting (UK) Limited, 16th Floor, 103 Colmore Row, Birmingham, B3 3AG, United Kingdom, T +44 (0)121 503 2700 [arcadis.com](https://www.arcadis.com)

Arcadis Consulting (UK) Limited is a private limited company registered in England under registered number 02212959. Registered office at: 80 Fenchurch Street, London EC3M 4BY, UK. Part of the Arcadis Group of Companies along with other entities in the UK. Regulated by RICS.

Condition 10: Detailed Drainage Strategy

Development shall not commence until a detailed SUDS based drainage scheme based on the principles of The SUDS Manual (C753) and the criteria as set out within Knowsley Strategic Flood Risk Assessment (SFRA, Levels 2), has been submitted and approved in writing by the Local Planning Authority (LPA). The applicant should provide suitable drainage drawings, summary calculations and results of all investigations detailing the surface water drainage works as set below. The maximum rate of discharge, off-site, shall not exceed 4.5l/s regardless of the surface water discharge destination (i.e. infiltration or discharge to surface water drainage systems). The works shall be implemented in accordance with the approved scheme before the development is brought into use.

In order to discharge this condition, the surface water drainage strategy, detailed design drawings, calculations and supporting information shall be expected to consider the following elements:

- A. Any drainage strategy proposal should clearly demonstrate how the movement down the hierarchy has been considered and that the selection of the most appropriate set of SuDS techniques has taken into account the site geological and topographical characteristics. To assess the feasibility of infiltration techniques as part of the proposed drainage strategy, evidence must be provided to show that a suitable number of soakaway tests have been completed across the whole site within different geology and to a suitable depth (i.e. a similar depth to the proposed infiltration devices). The tests should be completed according to the BRE 365 method and their results should be submitted with the full application.*
- B. Drainage Plan showing drainage layout, manholes including cover and invert levels, proposed levels, pipe sizes and gradients, all on -line controls, on and off line storage structures and outfall details.*
- C. Design details of the online control device (e.g. orifice), attenuation storage, and intercepting drains proposed at the north boundary of the site will be required.*
- D. Plan showing overland exceedance routes in the storm event in excess of the 1 in 100 + 40% CC storm event. A 1 in 200 years plus 40% event would normally be recommended as the Exceedance event and expected that where manholes are surcharged to be identified, and volume and maximum depth of flood water and where the flood water pools or flows to be determined.*

To discharge the above condition the following information has been prepared.

SuDS Drainage Hierarchy

The British Geological Survey (BGS) maps were show that the site us underlain by clay with a bedrock geology comprised of Kinnerton sandstone formations. BGS Boreholes nearby confirm this.

Soil layer	Depth
Brown CLAY with pebbles	0 - 36m
Red SANSTONE	36m+

Table 1: BGS Borehole Data

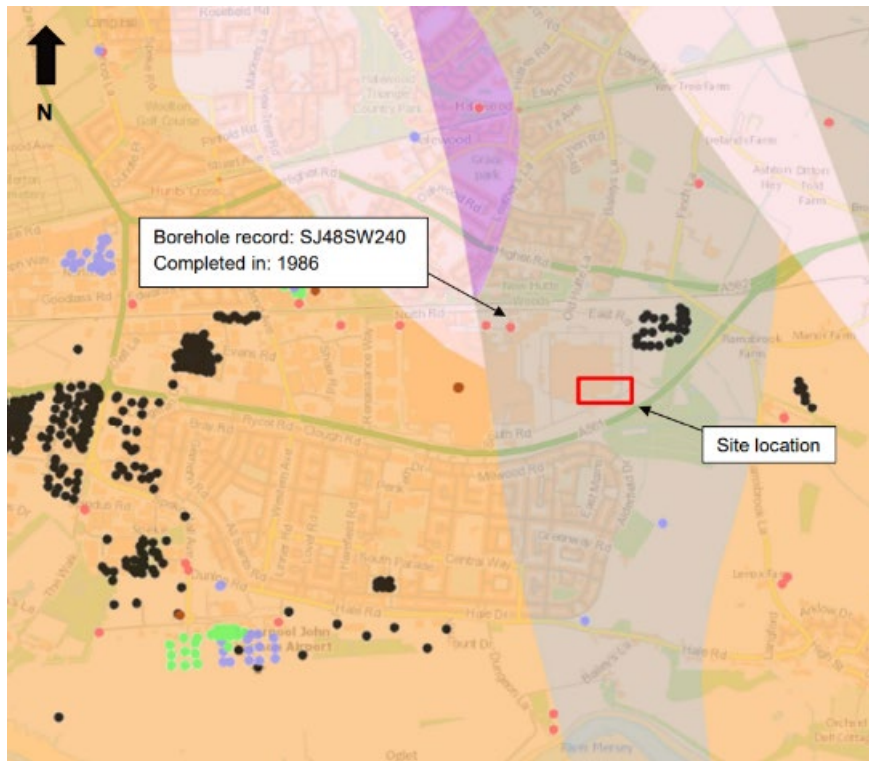


Figure 2: BGS Borehole Location Plan

In accordance with the discharge hierarchy as set out within the CIRIA SuDS Manual (C753) and Building Regulations Part H, surface water runoff should discharge to the following in order of priority:

1. into the ground (infiltration);
2. to a surface water body (watercourse);
3. to a surface water sewer, highway drain, or another drainage system;
4. to a combined sewer.

Based on the subsurface classification of the site (Clay) infiltration has not been considered achievable, as shown by the existing onsite positive drainage for the adjacent developed areas. The site is also located within a Source Protection Zone catchment. Due to the nature of the development (a carpark, with higher levels of contamination), infiltration was not deemed an appropriate discharge method.

There are also no watercourses within the site boundary or in close proximity to the site to connect into and therefore connection into the existing surface water sewers located within the site is proposed.

Surface Water Drainage Details

The attached drainage plan, undertaken by McDermotts, shows the drainage layout, manholes including cover and invert levels, proposed levels, pipe sizes and gradients, Hydrobrake control details and details of the cellular storage volumes and outfall details.

Surface Water discharge from the new car park will be limited to the agreed 4.5l/s, through a hydrobrake connection into the existing adjacent sewer. Storage has been provided within cellular storage crates. Product details are also attached..

Gullies and drainage channels are positioned at low points to capture runoff from the new hardstanding,

including along the northern boundary of the site.

Overland flow routing

Overland exceedance routes in the storm event in excess of the 1 in 100 + 40% CC storm event are shown below.

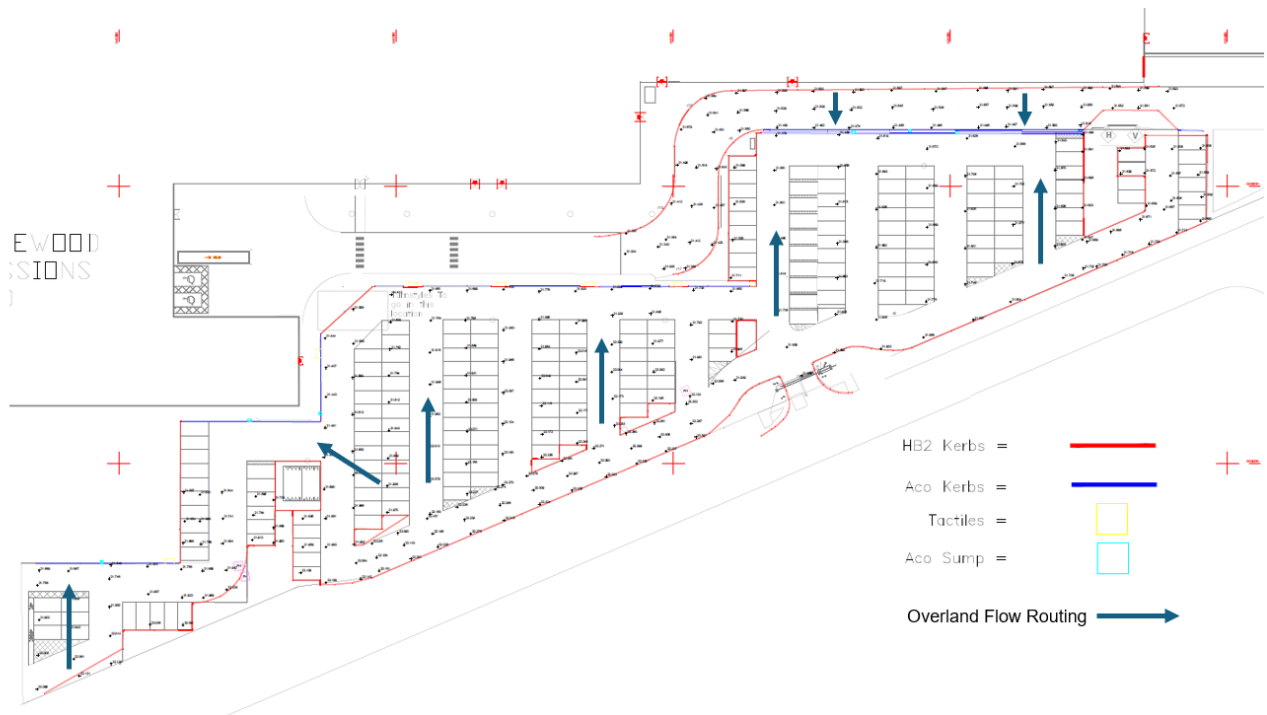


Figure 3: Overland Flow Routing

Enc. C576-400 As Built Survey (McDermotts)

C576-100 Drainage As Built (McDermotts)

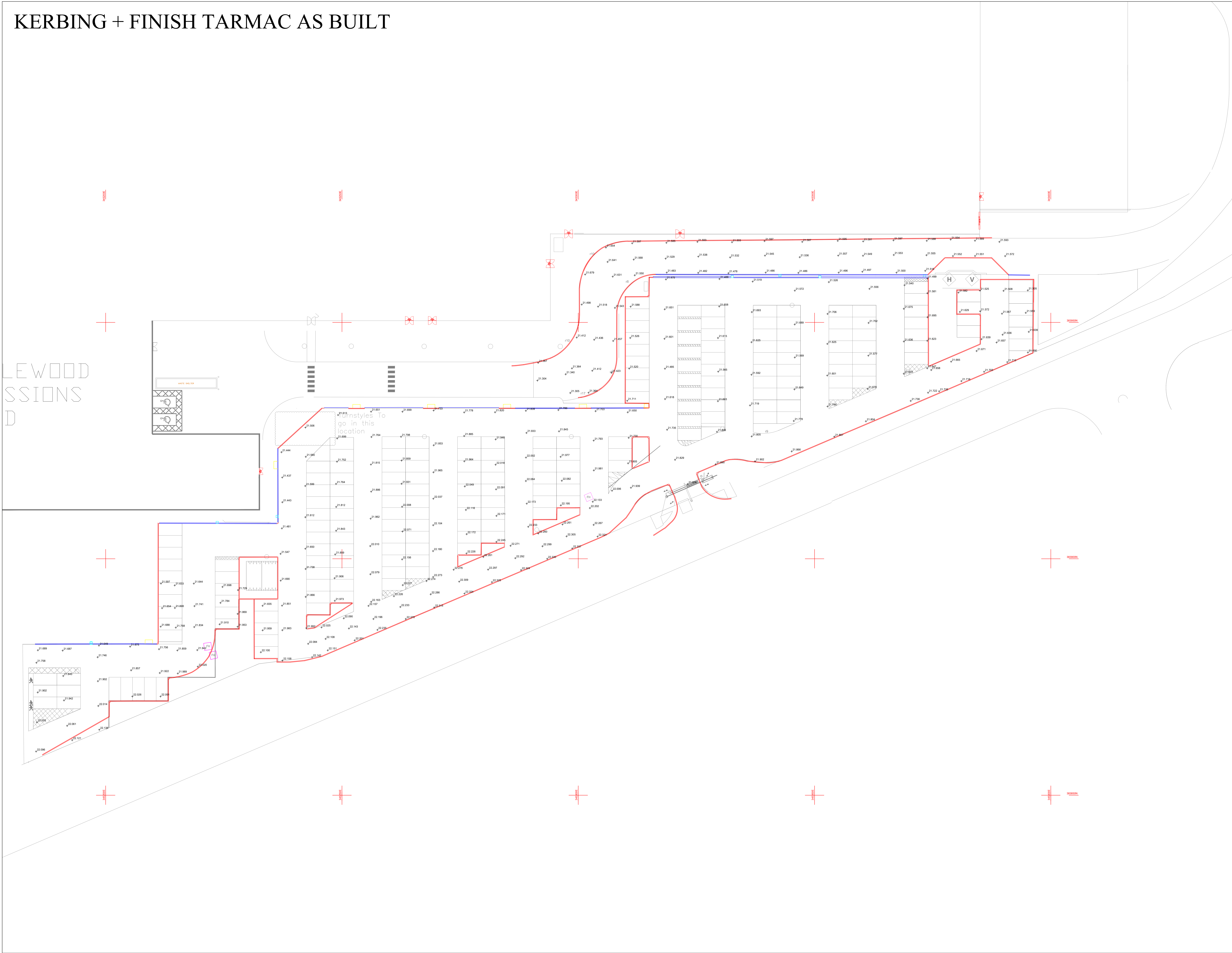
Aco StormBrixx Data Sheet

Aco Q-Brake Datasheet

Dover D400 Gully Gratings Datasheet

Klargester Datasheet

KERBING + FINISH TARMAC AS BUILT



- HB2 Kerbs =
- Aco Kerbs =
- Tactiles =
- Aco Sump =



ACO StormBrixx SD, HD900 and HD

DATA SHEET

The ACO StormBrixx is a unique and patented plastic geocellular stormwater management system.

Its versatile design allows the system to be used in applications across all construction environments as a standalone solution or as part of an integrated Sustainable Drainage System (SuDS).

The range consists of StormBrixx SD (standard duty) and StormBrixx HD (heavy duty) stormwater management systems. StormBrixx SD is manufactured from recyclable polypropylene and has a design life of 50 years, whilst StormBrixx HD is manufactured from recycled polypropylene and has a design life of 60 years.

Benefits

- Fully certified performance - DiBt, MFP, compliance with BS EN 17152-1
- Brick bonding and cross bonding for optimum stability
- Remote and man access for ease of maintenance
- High void ratio which minimises excavation volume (97% for SD and HD900, 95% for HD)
- Reduced CO₂ emissions



ACO StormBrixx SD, HD900 and HD

Simplified handling and logistics

- Compact delivery method with stackable nested design allowing up to four times fewer deliveries
- Unique stackable design that simplifies on site storage and handling during installation
- Time savings: movement on site and installation

The ACO StormBrixx Range



Complies with BS EN 17152-1

NEW — ACO StormBrixx HD900

Void ratio:	97%
Short term vertical compressive strength:	605kN/m ²
Short term lateral compressive strength:	120kN/m ²
Accessibility:	Remote access
One layer height:	920mm

Product Code	Description	Length [mm]	Width [mm]	Height [mm]	Weight [kg/m ²]
--------------	-------------	-------------	------------	-------------	-----------------------------

Components overview - dimensions and weights

314054	Half Body	1208	604	460/496	12.3
314091	Side Panel	907	592	104	3.13
314092	Top Cover	550	550	45	0.76
314094	Half Layer Cover Plate	1200	600	94	3.66
314098	Half Layer Side Panel	450	592	104	1.5



ACO StormBrixx HD

Void ratio:	95%
Short term vertical compressive strength:	455kN/m ²
Short term lateral compressive strength:	95kN/m ²
Accessibility:	Man access & remote access
One layer height:	612mm

Product Code	Description	Length [mm]	Width [mm]	Height [mm]	Weight [kg/m ²]
--------------	-------------	-------------	------------	-------------	-----------------------------

Components overview - dimensions and weights

314061	Half Body GF	1205	602	306/343	10
314021	Side Panel	580	580	35	1.6
314022	Top Cover	550	550	43	0.8



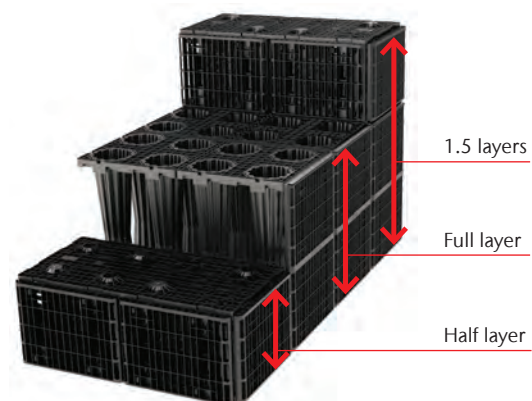
ACO StormBrixx SD

Void ratio:	97%
Short term vertical compressive strength:	350kN/m ²
Short term lateral compressive strength:	70kN/m ²
Accessibility:	Remote access
One layer height:	914mm

Product Code	Description	Length [mm]	Width [mm]	Height [mm]	Weight [kg/m ²]
--------------	-------------	-------------	------------	-------------	-----------------------------

Components overview - dimensions and weights

314090	Half Body	1200	600	494	9.41
314091	Side Panel	907	592	104	3.13
314092	Top Cover	550	550	45	0.76
314094	Half Layer Cover Plate	1200	600	94	3.66
314098	Half Layer Side Panel	450	592	104	1.5



The ACO StormBrixx SD and HD900 half layer is suitable for where installation depth is restricted.

ACO Water Management Contacts:

Sales: uk-swc@aco.co.uk
 Technical: technical@aco.co.uk
 Tel: 01462 816666

www.aco.co.uk

ACO. we care for water

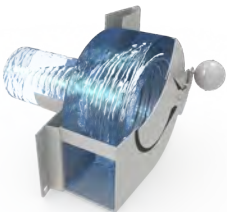


ACO Q-Brake Flow Control System

PRODUCT DATASHEET

- ▶ Custom built to suit the site requirements
- ▶ Available from 2-100 l/s and up to 3m design head
- ▶ Manufactured from grade 304 stainless steel
- ▶ All parts welded to BS 4872
- ▶ Available with curved or flat back
- ▶ Attenuation volume required reduced
- ▶ Larger* clear opening, reduces risk of blockage

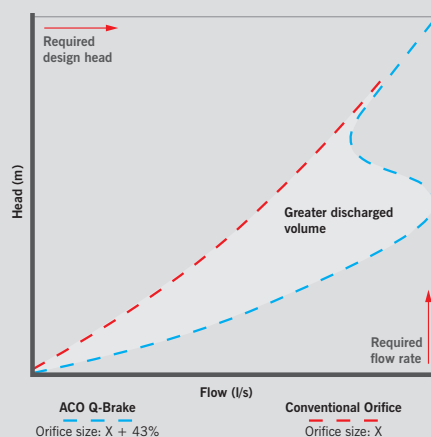
*Larger than traditional orifice plates



ACO Q-Brake

Discharge characteristics

ACO Q-Brake is a horizontal vortex flow control designed to prevent downstream flooding by controlling the release of storm water before it discharges into the water environment.



Designed to regulate storm water flows from 2 -100 litres per second, ACO Q-Brake is tailored to the specific performance requirements of the application providing optimum efficiency within the drainage system.

ACO Q-Plates can be used for larger sizes. Both this and ACO Q-Brake can be supplied with a durable plastic chamber, ACO Q-Chamber.

- ▶ ACO Q-Brake is available as a model in both microdrainage & causeway flow hydraulic design software
- ▶ ACO Q-Brake has many water authority approvals



ACO Q-Chamber

ACO Q-Chamber is a new durable bespoke prefabricated chamber designed to house ACO Q-Brake, as well as ACO Q-Plate. It combines easy-handling and simple installation with a fully-welded plastic, durable construction.

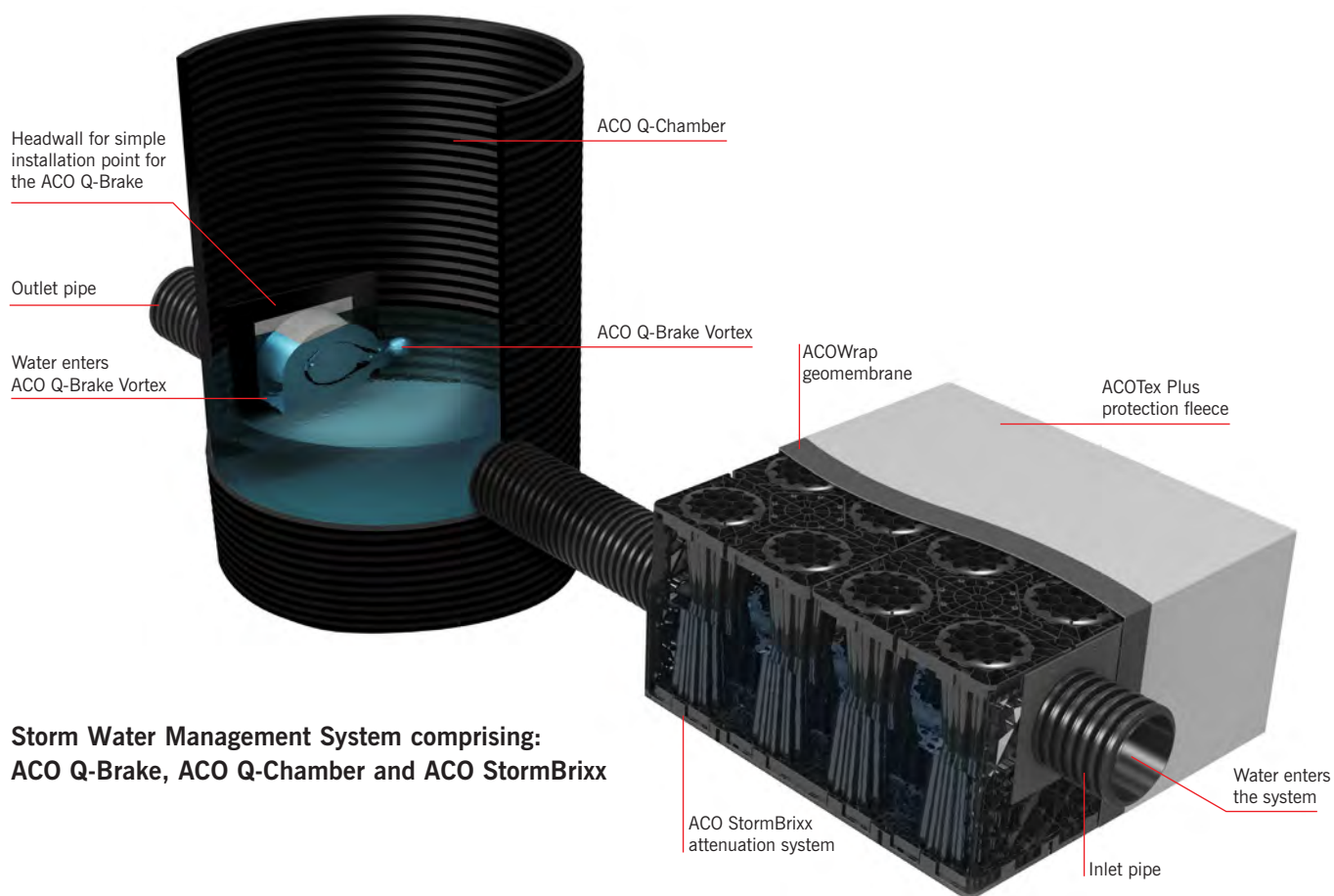
Key benefits

- ▶ Easy transportation and installation
 - ▶ Minimise working time in a confined space
 - ▶ All plastic interfaces fully welded, watertight and spark tested
 - ▶ Available in a structured wall HDPE plastic chamber with a solid HDPE baseplate
 - ▶ Bespoke fabrication of chambers with inlets and outlets in twin-wall pipe for simple connection
 - ▶ Chambers available in*:
Diameters 600mm – 2500mm
Height 1000mm – 3500mm
- *other dimensions available on special request

Parameters to quote:

ACO Q-Brake: Design head (m) & Flow rate (l/s)

ACO Q-Chamber: Depth to invert / Diameter of the chamber / Number of pipe connections / Diameters of pipe connections



**Storm Water Management System comprising:
ACO Q-Brake, ACO Q-Chamber and ACO StormBrixx**

ACO Q-Brake and ACO Q-Chamber are manufactured to order, each specifically optimised for the design parameters of the project. For our dedicated stormwater management team, please contact: uk-sw@aco.co.uk Tel: **01462 816666**

ACO Technologies plc

ACO Business Park, Hitchin Road, Shefford, Bedfordshire SG17 5TE
Tel: 01462 816666 Fax: 01462 815895
e-mail: technologies@aco.co.uk website: www.aco.co.uk



For more information on orifice plates and geocellular tanks visit www.aco.co.uk





FEATURES

Traffic flow hinged

Unique spring locked design

BS EN124-2 Class D400

Ductile Iron for strength and durability.

Black coated finish.

Waterway - 900cm²

Bespoke Options

- Anti Skid coating (60+ PSRV)
- Reversible hinge direction (non-traffic flow)

PRODUCT CODE	CLEAR OPENING (MM)	OVER BASE (MM)	DEPTH (MM)
CGD22TF	430 x 370	590 x 465	100
CGD30	430 x 370	590 x 465	150

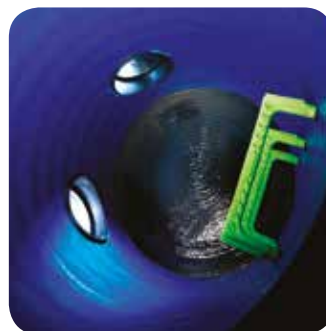
BSEN124-2 Gully gratings & frames: D400 - Group 4

D400 gully gratings and frames are designed for use in the kerb side of carriageways and estate roads including pedestrian streets. These Gratings are HA104/09 approved

All D400 gully gratings and frames are certified to the requirements of BSEN124-2



RIDGISTORMSeparate Catchpits are designed to separate silt and other particles from stormwater, helping to protect the downstream drainage system and local environment. They can be integrated into our range of pipe systems, such as Ridgidrain and Ridgistorm-XL to offer a fully integrated drainage system.



Applications

RIDGISTORMSeparate Catchpits are pre-fabricated for use in a range of stormwater systems requiring silt and debris separation and retention.

Key Features and Benefits

- Provides easy access for silt collection
- Network Rail Parts and Drawing System (PADs) approved for use in CESS Areas
- Separates silt and debris from the downstream drainage system
- Eliminates wastage associated with in-situ construction
- Multiple inlet and outlet options, supplied with integral sockets as standard allowing quick and seamless connection to pipeline
- Depths can be tailored to suit project requirements
- Optional step rungs to BS EN 13101 and ladders to BS EN 14396
- Integral lifting points available on request to improve Health and Safety of handling and installation
- Stub connections and rocker pipes are available

Other fabrications in our RIDGISTORMSeparate range:

- Silt Traps
- Filter Chambers

Performance

RIDGISTORMSeparate Catchpits are fabricated from Ridgistorm-XL pipework, which is manufactured to meet the material requirements of BS EN 13476:2007 (Part 1-3).

RIDGISTORMSEPARATE CATCHPITS

PHYSICAL PROPERTIES

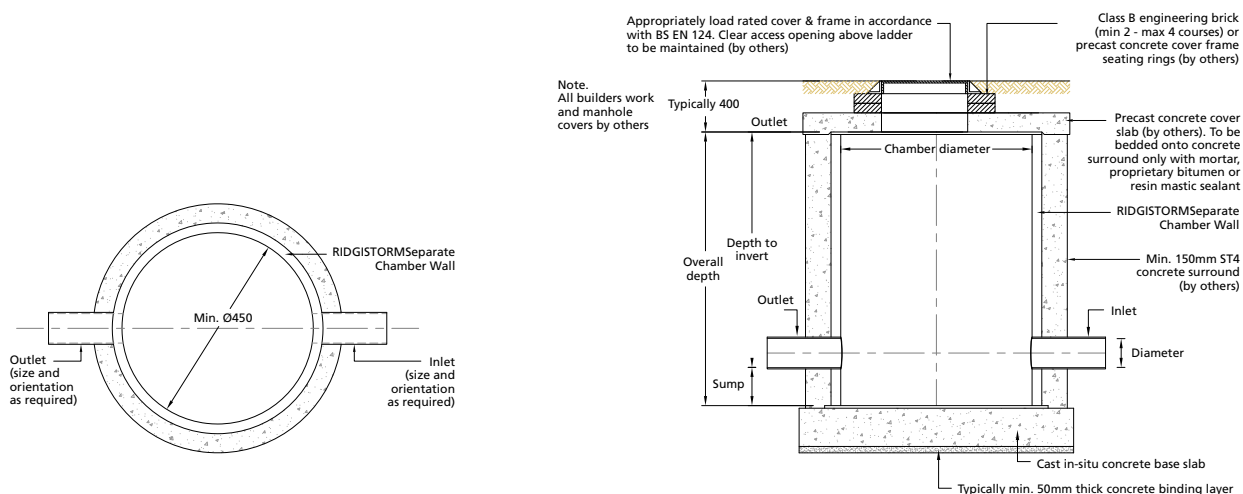
Diameter	450-3000mm
Depth	To suit requirements
Sump depth	To suit (min. 50mm)
Material	HDPE
Colour	Black with blue Interior
Chemical resistance	HDPE is naturally resistant to most chemicals associated with stormwater drainage systems
Inlets/outlets	100-3000mm

Our Ridgistorm-XL Fabrications range

All of our Ridgistorm-XL fabrications are tailor-made, fully-welded, watertight structured wall chambers to suit project-specific requirements. Health and Safety benefits become apparent during handling and installation, due to our fabrications' strong but light in weight nature. In addition, off-site construction ensures uncompromised, high quality products being delivered to site ready-to-install, reducing installation time and costs.



RIDGISTORM Separate Catchpit



For further information please contact our Technical Team on +44 (0) 1509 615100 or download our CAD Standard Details from our website www.polypipe.com/toolbox

All descriptions and illustrations in this publication are intended for guidance only and shall not constitute a 'sale by description'. All dimensions given are nominal and Polypipe may modify and change the information, products and specifications from time to time for a variety of reasons, without prior notice. The information in this publication is provided 'as is' on May 2016. Updates will not be issued automatically. This information is not intended to have any legal effect, whether by way of advice, representation or warranty (express or implied). We accept no liability whatsoever (to the extent permitted by law) if you place any reliance on this publication you must do so at your own risk. All rights reserved. Copyright in this publication belongs to Polypipe and all such copyright may not be used, sold, copied or reproduced in whole or part in any manner in any media to any person without prior consent. © Polypipe is a registered trademark of Polypipe. All Polypipe products are protected by Design Right under CDPA 1988. Copyright © 2016 Polypipe. All rights reserved.

Polypipe Civils

Charnwood Business Park, Loughborough, Leicestershire LE11 1LE
Tel: +44 (0)1509 615100 Fax: +44 (0)1509 610215 Email: civils@polypipe.com

www.polypipe.com/civils

