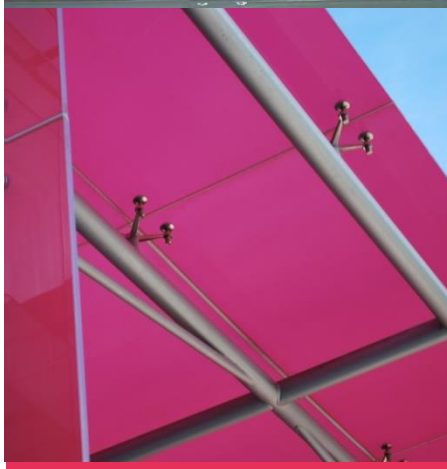








Elizabeth Street, Cheetham Hill

Manchester

Verification & Drainage Maintenance Strategy

Curtins Ref: 080139-CUR-XX-XX-RP-C-92010

Curtins Project No: 080139

Revision: V01

Issue Date: 26 April 2024

Client Name: Triton Construction

Site Address: Elizabeth Street, Cheetham Hill, Manchester

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Control Sheet

Rev	Description	Issued by	Checked	Date
V01	Verification and Maintenance for Planning Condition.	CG	CG	26/04/2024

This report has been prepared for the sole benefit, use, and information for the client. The liability of Curtins with respect to the information contained in the report will not extend to any third party.

Author	*Signature*	*Date*
Charlie Smith MEng (Hons) GMICE Civil Engineer		26 April 2024

Reviewed	*Signature*	*Date*
Chloé Grimsley BSc (Hons) Principal Engineer		26 April 2024

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Appendix A

080139-CUR-XX-XX-DR-C-92500 Drainage Layout

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080139-CUR-XX-XX-DR-C-92530 Drainage Notes

Appendix B

United Utilities Approval – Reference 4698941

Appendix C

Hauraton Channel Manufacturers Information

SDS Attenuation Tank Manufacturers Information

Hydro-International Hydro-Brake Manufacturers Information

SPEL Puraceptor Petrol Interceptor Information

1.0 Introduction

1.1 Project Background

1.1.1 Curtins have been appointed by Triton Construction to provide a Verification and Drainage Maintenance Strategy for the proposed below ground drainage design for the site at Elizabeth Street, Cheetham Hill, Manchester. The British National Grid co-ordinates for the site is approximately Easting 384186, Northing 400163.

1.2 Scope of the Verification and Maintenance Strategy

1.2.1 This report demonstrates the below ground drainage which has been installed for the development site and provides product information to inform future maintenance requirements.

1.2.2 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.

1.2.3 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 Drainage Strategy

2.1 General

2.1.1 The drainage network on site is a private drainage network.

2.1.2 The drainage network is a separate foul and surface water system within the development, with a single combined outfall into the existing combined public sewer network in Elizabeth Street.

2.2 Foul Drainage

2.2.1 The current peak foul flow rate has been estimated at **4.7 l/s** based on the Discharge Units.

2.2.2 The Final Construction Drainage Drawings are enclosed in *Appendix A.*

2.3 Surface Water Drainage

2.3.1 Any new development site drainage should be designed in accordance with current best practice to provide adequate capacity not to flood for the critical 1 in 30-year storm event and flood water generated for up to the critical 1 in 100-year plus climate change storm event shall be constrained within the areas on site so not to cause damage to buildings, essential services or adjoining developments and services.

2.3.2 Based on the nature of the development, a lifespan in excess of up to 60 years is anticipated. Therefore, the potential climate change allowance for 2070-2115 ranges between 20% for the central allowance and 40% for the upper end allowance. As such, an allowance of 40% for climate change on peak rainfall intensity has been included in the design.

2.3.3 Assessment was completed at preliminary design stage to confirm the most viable method of discharge was connection to the combined public sewer at a restricted rate.

2.3.4 The on-site surface water network is based on a pipe system serving the building and the external private areas with a flow restriction. The surface water drainage system connects to the combined outfall connection into Elizabeth Street.

2.3.5 The surface water drainage has been restricted to a maximum of 11 l/s and attenuation is provided within oversized pipes and attenuation tanks. The restriction is achieved by a hydro-brake flow control located in manhole S25.

2.3.6 The proposed network on site requires attenuation to provide capacity to accommodate the volumes generated during the 1 in 100 year +40% design event whilst maintaining the maximum flow restriction.

2.3.7 There are two below ground cellular attenuation tanks located below the car park. Attenuation Tank 1 provides approximately 445m^3 and Attenuation Tank 2 provides approximately 500m^3.

2.3.8 There are small areas of rain gardens which are local to the footpaths and will provide some source control retention locally.

2.3.9 A petrol interceptor has been installed prior to outfall to manage any pollution discharging to the public sewer system.

2.3.10 The Final Construction Drainage Drawings are enclosed in *Appendix A.*

2.4 Approvals

2.4.1 The connection to the public sewer in Elizabeth Street has been approved under a Section 106 Agreement referenced 4698941. The correspondence is enclosed in *Appendix B.*

3.0 Verification

3.1 Introduction

3.1.1 The Verification section has been developed with reference to the drainage design details and philosophy provided in section 2 of this report. Manchester City Council requirements are to verify the installation of the Drainage and SuDS to confirm by Photographic record that this has been installed.

3.1.2 The following elements have been recorded to date:

- Attenuation Tanks (2 No.)
- Catchpit Chambers
- Rain Gardens
- Petrol Interceptor
- Flow Control Chamber

3.1.3 A CCTV Survey has also been provided along with As built record information.

3.2 Photographic Information

Attenuation Tanks

3.2.1 The attenuation tanks are SDS Geolight Geocellular Units. Manufacturers information is enclosed in *Appendix C*.

3.2.2 Tank Installation was completed in September 2023, photographs are shown in Figures 1 – 2.

Figure 1 – Attenuation Tank 1 Installation











Figure 2 – Attenuation Tank 2 Installation











Catchpit Chambers

Installation was completed in October 2023; photographs are shown in Figure 3.

Figure 3 – Catchpit Installation











Rain Garden

3.2.3 Rain Installation was completed in February 2024, photographs are shown in Figure 4.

Figure 4 – Rain Garden Installation



Petrol Interceptor

3.2.4 Petrol Interceptor Installation was completed in September 2023, photographs are shown in Figure 5.

Figure 5 – Petrol Interceptor Installation



Flow Control Chamber

3.2.5 Hydro-brake Flow Control Installation was completed in April 2024, photographs are shown in Figure 6.

Figure 6 – Hydro-brake Flow Control Installation





3.3 CCTV Survey and As Built information

3.3.1 As Built Information has been provided and reflected on eth Final Construction drawings enclosed in Appendix A.

3.3.2 A CCTV Survey was completed on the installed drainage network in April 2024.

3.3.3 The survey confirms at this time, the drainage network was in general good condition. There were minor defects recorded on three lines (Drain runs S17-S16, SVP-F2 and SVP-F3) these have been recommended to be repaired prior to handover and a final CCTV Survey completed.

4.0 Maintenance Recommendations

4.1 General Maintenance

4.1.1 The maintenance strategy should be adopted to ensure the drainage network is cleaned regularly and the routine maintenance and cleansing regime should be documented.

4.1.2 A copy of the final construction drainage layout should be provided in the final Operations and Maintenance Manual along with this report.

4.1.3 Reference should be made to the following drawings:

- 080139-CUR-XX-XX-DR-C-92500 Drainage Layout
- 080139-CUR-XX-XX-DR-C-92510 MH Schedule
- 080139-CUR-XX-XX-DR-C-92520 Drainage Details Sheet 1
- 080139-CUR-XX-XX-DR-C-92521 Drainage Details Sheet 2
- 080139-CUR-XX-XX-DR-C-92522 Drainage Details Sheet 3
- 080139-CUR-XX-XX-DR-C-92523 Drainage Details Sheet 4
- 080139-CUR-XX-XX-DR-C-92530 Drainage Notes

4.1.4 The maintenance scheduling should begin from the completion date.

4.1.5 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.

4.1.6 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.

4.1.7 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.

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

4.1.9 Sediment/Material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols where applicable.

4.2 Responsibilities

4.2.1 Maintenance of the private drainage network within the development Ownership Boundary will be the responsibility of the Private Management Company which will be funded via a service charge agreement to the unit occupiers.

4.2.2 Maintenance of the drainage network outside of the development Ownership Boundary will be the responsibility of Manchester City Council and United Utilities.

4.3 Components

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

- Inspection, Manhole and Catchpit Chambers
- Pipes
- Drainage Channels and Gullies
- Cellular Storage/Attenuation
- Flow Control - Hydrobrake
- Rain Gardens
- Petrol Interceptor

4.4 Inspection, Manhole and Catchpit Chambers

4.4.1 The locations of the chambers are indicated on Curtins drainage drawing 080139-CUR-XX-XX-DR-C-92500

4.4.2 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.

4.4.3 The appropriate barriers and signage should be installed during any opening of manholes to warn site users/pedestrians.

4.4.4 When accessing chambers, the latest Health and Safety legislation should be adhered to.

4.4.5 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.

4.4.6 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.

4.5 Pipes

4.5.1 The locations of the pipes are indicated on Curtins drainage drawing 080139-CUR-XX-XX-DR-C-92500.

4.5.2 Pipes are proprietary products, and the materials can vary across the site and as such where used the manufacture's recommendations should be followed. Regardless of the product used the pipes are fully compliant with the Curtins drainage specification.

4.5.3 Pipes are intended to be the main conveyance across the development and where oversized they form the attenuation volume required by the limitation of the discharge rate. They are intended to be dry except for during rainfall events. These have been designed to be self-cleansing where possible for smaller diameter pipes, and for larger diameters the risk is reduced due to the overall pipe size.

4.5.4 Access for maintenance is provided through access chambers and manholes.

4.5.5 Regular inspection and maintenance is important to identify areas which may have been obstructed/clogged and may not be drainage correctly thus exposing the development to a greater level of flood risk.

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.

4.6 Drainage Channels and Gullies

4.6.1 The locations of the drainage channels and gullies are indicated on Curtins drainage drawing 080139-CUR-XX-XX-DR-C-92500.

4.6.2 Channels and gullies should be inspected and cleaned in accordance with the manufacturer's details.

4.6.3 Channel Units are Hauraton Recyfix hicap units.

4.6.4 Channels and gullies installed have removable covers to allow cleaning and clearing of debris and silt.

4.6.5 Channel 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.

4.6.6 The appropriate barriers and signage should be installed during any opening of gullies/channel outlet boxes to warn site users/pedestrians.

4.6.7 Locking bolts should be replaced and sufficiently tightened, taking care that the bolt heads do not stand above the top surface of the cover or grate. If covers are allowed to move within their frame, this may cause damage to the frame or seating.

4.6.8 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 such as the car park drainage.

4.6.9 Manufacturers information is enclosed in *Appendix C*.

4.7 Cellular Storage

4.7.1 The location of the attenuation tank are indicated on Curtin's drainage drawing 080139-CUR-XX-XX-DR-C-92500.

4.7.2 The attenuation tanks are geocellular units and are intended for storage of surface water run-off from the site up to and including the 1 in 100 year plus 40% climate change event to reduce the rate of run-off into the downstream network and to minimise flood risk.

4.7.3 The geocellular units are proprietary products and therefore manufacturer's recommendations should also be taken into consideration.

4.7.4 The tanks are SDS Geocellular Units.

4.7.5 Access for maintenance has been provided by catchpit manhole chambers upstream and downstream of the tank. Vents are also provided to the upstream manholes.

4.7.6 Manufacturers information is enclosed in *Appendix C*.

Maintenance Schedule	**Required Action**	**Frequency**
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required)	Inspect inlets, outlets and overflows for blockages, and clear if required. If faults persist jetting and CCTV survey may be required.	Monthly and after large storms.
	Check penstocks and other mechanical devices (if present).	Half yearly.
Regular maintenance\inspection	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly

	Debris removal from catchment surface (where may cause risks to performance)	Monthly
	Where rainfall infiltrates into blocks from above, check surface of filter for blockage by silt, algae or other matter. Remove and replace surface infiltration medium as necessary.	Monthly (and after large storms)
	Remove sediment from pre-treatment structures	Annually (or as required after heavy rainfall events)
Remedial actions	Repair/rehabilitation of inlets, outlet, overflows and vents.	As required.

4.8 Flow Control Units - Hydrobrake

4.8.1 The location of the Flow Control Chamber (MH S25) is indicated on Curtin's drainage drawings 080139-CUR-XX-XX-DR-C-92500

4.8.2 The flow control units are intended for flood control and flow restriction.

4.8.3 The flow control is a Hydro-brake Optimum unit and is a proprietary product; therefore, manufacturer's recommendations should also be taken into consideration.

4.8.4 Access for maintenance has been provided by locating within a manhole chamber.

4.8.5 Manufacturers information is enclosed in *Appendix C*.

Maintenance Schedule	**Required Action**	**Frequency**
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Inspect inlets for blockages, and clear if required. If faults persist jetting and CCTV survey may be required.	Monthly and after large storms.

Regular maintenance\ inspection	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly.
	Debris removal from catchment surface (where may cause risks to performance).	Monthly
	Remove sediment from pre-treatment structures and flow control chambers.	Annually (or as required after heavy rainfall events)
Remedial Actions	Repair/rehabilitation of inlets.	As required.

4.9 Rain Gardens

4.9.1 The locations of the rain gardens are indicated on Curtin's drainage drawing 080139-CUR-XX-XX-DR-C-92500.

4.9.2 The rain gardens are intended to be water quality and attenuation storage features. These features are intended to be dry except during rainfall events.

4.9.3 The surface has been designed as landscaping with a voided stone drainage layer below with perforated pipes, which rain can flow through the upper construction layers into the voided stone and into the perforated pipe.

4.9.4 Regular inspection and maintenance is important for the effective operation of the rain garden.

Maintenance Schedule	**Required Action**	**Frequency**
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial Inspection including incoming channel outlet boxes. 4.9.2	Half yearly and after large storms.

4.9.1		
Regular maintenance\ inspection 4.9.3	Litter and debris removal	Monthly or as required
4.9.4	Remove sediment from pre-treatment structures.	Monthly or as required
4.9.5 Remedial Action	Replace geotextiles and clean and replace filter media, if clogging occurs. Terram 1000 typical design life is 25 years.	As required.
	Excavate trench walls to expose clean soils if infiltration performance reduces to unacceptable levels.	As required.

4.10 Petrol Interceptor

4.10.1 The location of the Petrol Interceptor is indicated on Curtin's drainage 080139-CUR-XX-XX-DR-C-92500.

4.10.2 The petrol interceptor units are intended for oil pollution control.

4.10.3 The Petrol Interceptor is specified as a SPEL PURACEPTOR P015/1C/ESR Class 1 with venting and alarm and are proprietary products; therefore, manufacturer's recommendations should also be taken into consideration.

4.10.4 Manufacturers information is enclosed in *Appendix C*.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Inspect inlets for blockages, and clear if required. If faults persist jetting and CCTV survey may be required.	Monthly and after large storms.
Regular maintenance\ inspection	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly.
	Debris removal from catchment surface (where may cause risks to performance).	Monthly
	Remove sediment from pre-treatment structures and flow control chambers.	Annually (or as required after heavy rainfall events)
Remedial Actions	Repair/rehabilitation of inlets.	As required.

Appendix A

080139-CUR-XX-XX-DR-C-92500 Drainage Layout

080139-CUR-XX-XX-DR-C-92510 MH Schedule

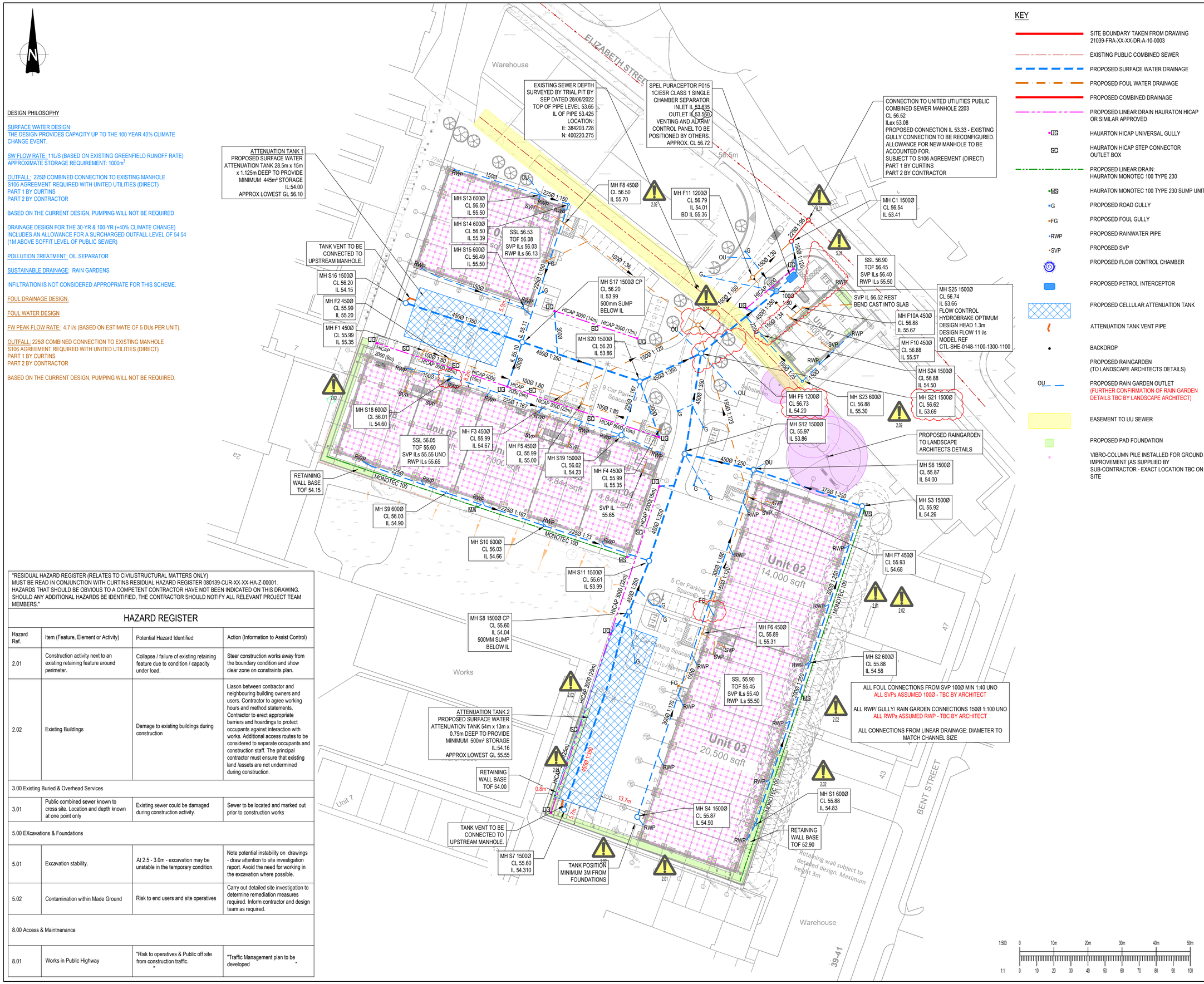
080139-CUR-XX-XX-DR-C-92520 Drainage Details Sheet 1

080139-CUR-XX-XX-DR-C-92521 Drainage Details Sheet 2

080139-CUR-XX-XX-DR-C-92522 Drainage Details Sheet 3

080139-CUR-XX-XX-DR-C-92523 Drainage Details Sheet 4

080139-CUR-XX-XX-DR-C-92530 Drainage Notes



KEY

- SITE BOUNDARY TAKEN FROM DRAWING 21039-FRA-XX-XX-DR-A-10-0003
- EXISTING PUBLIC COMBINED SEWER
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED FOUL WATER DRAINAGE
- PROPOSED COMBINED DRAINAGE
- PROPOSED LINEAR DRAIN HAURATON HICAP OR SIMILAR APPROVED
- UG — HAURATON HICAP UNIVERSAL GULLY
- SO — HAURATON HICAP STEP CONNECTOR OUTLET BOX
- PROPOSED LINEAR DRAIN: HAURATON MONOTEC 100 TYPE 230
- MS — HAURATON MONOTEC 100 TYPE 230 SUMP UNIT
- G — PROPOSED ROAD GULLY
- FG — PROPOSED FOUL GULLY
- RWP — PROPOSED RAINWATER PIPE
- SVP — PROPOSED SVP
- PROPOSED FLOW CONTROL CHAMBER
- PROPOSED PETROL INTERCEPTOR
- PROPOSED CELLULAR ATTENUATION TANK
- ATTENUATION TANK VENT PIPE
- BACKDROP
- PROPOSED RAINGARDEN (TO LANDSCAPE ARCHITECTS DETAILS)
- OU — PROPOSED RAIN GARDEN OUTLET (FURTHER CONFIRMATION OF RAIN GARDEN DETAILS TBC BY LANDSCAPE ARCHITECT)
- EASEMENT TO UU SEWER
- PROPOSED PAD FOUNDATION
- VIBRO-COLUMN PILE INSTALLED FOR GROUND IMPROVEMENT (AS SUPPLIED BY SUB-CONTRACTOR - EXACT LOCATION TBC ON SITE

1:500 0 10m 20m 30m 40m 50m

1:1 0 10 20 30 40 50 60 70 80 90 100

DESIGN PHILOSOPHY

SURFACE WATER DESIGN
THE DESIGN PROVIDES CAPACITY UP TO THE 100 YEAR 40% CLIMATE CHANGE EVENT.

SW FLOW RATE: 11L/S (BASED ON EXISTING GREENFIELD RUNOFF RATE)
APPROXIMATE STORAGE REQUIREMENT: 1000m³

OUTFALL: 225Ø COMBINED CONNECTION TO EXISTING MANHOLE S106 AGREEMENT REQUIRED WITH UNITED UTILITIES (DIRECT)
PART 1 BY CURTINS
PART 2 BY CONTRACTOR

BASED ON THE CURRENT DESIGN, PUMPING WILL NOT BE REQUIRED

DRAINAGE DESIGN FOR THE 30-YR & 100-YR (+40% CLIMATE CHANGE) INCLUDES AN ALLOWANCE FOR A SURCHARGED OUTFALL LEVEL OF 54.54 (1M ABOVE SOFFIT LEVEL OF PUBLIC SEWER)

POLLUTION TREATMENT: OIL SEPARATOR

SUSTAINABLE DRAINAGE: RAIN GARDENS

INFILTRATION IS NOT CONSIDERED APPROPRIATE FOR THIS SCHEME.

FOUL DRAINAGE DESIGN.

FOUL WATER DESIGN

FW PEAK FLOW RATE: 4.7 l/s (BASED ON ESTIMATE OF 5 DUs PER UNIT).

OUTFALL: 225Ø COMBINED CONNECTION TO EXISTING MANHOLE S106 AGREEMENT REQUIRED WITH UNITED UTILITIES (DIRECT)
PART 1 BY CURTINS
PART 2 BY CONTRACTOR

BASED ON THE CURRENT DESIGN, PUMPING WILL NOT BE REQUIRED.

*RESIDUAL HAZARD REGISTER (RELATES TO CIVIL/STRUCTURAL MATTERS ONLY)
MUST BE READ IN CONJUNCTION WITH CURTINS RESIDUAL HAZARD REGISTER 080139-CUR-XX-XX-HA-Z-00001.
HAZARDS THAT SHOULD BE OBVIOUS TO A COMPETENT CONTRACTOR HAVE NOT BEEN INDICATED ON THIS DRAWING. SHOULD ANY ADDITIONAL HAZARDS BE IDENTIFIED, THE CONTRACTOR SHOULD NOTIFY ALL RELEVANT PROJECT TEAM MEMBERS.*

HAZARD REGISTER

Hazard Ref.	Item (Feature, Element or Activity)	Potential Hazard Identified	Action (Information to Assist Control)
2.01	Construction activity next to an existing retaining feature around perimeter.	Collapse / failure of existing retaining feature due to condition / capacity under load.	Steer construction works away from the boundary condition and show clear zone on constraints plan.
2.02	Existing Buildings	Damage to existing buildings during construction	Liason between contractor and neighbouring building owners and users. Contractor to agree working hours and method statements. Contractor to erect appropriate barriers and hoardings to protect occupants against interaction with works. Additional access routes to be considered to separate occupants and construction staff. The principal contractor must ensure that existing land /assets are not undermined during construction.
3.00 Existing Buried & Overhead Services			
3.01	Public combined sewer known to cross site. Location and depth known at one point only	Existing sewer could be damaged during construction activity.	Sewer to be located and marked out prior to construction works
5.00 EXcavations & Foundations			
5.01	Excavation stability.	At 2.5 - 3.0m - excavation may be unstable in the temporary condition.	Note potential instability on drawings - draw attention to site investigation report. Avoid the need for working in the excavation where possible.
5.02	Contamination within Made Ground	Risk to end users and site operatives	Carry out detailed site investigation to determine remediation measures required. Inform contractor and design team as required.
8.00 Access & Maintnenance			
8.01	Works in Public Highway	"Risk to operatives & Public off site from construction traffic. "	"Traffic Management plan to be developed "

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DESIGN BASED ON TOPOGRAPHICAL SURVEY AND CCTV SURVEY INFORMATION AVAILABLE AT THE TIME OF DESIGN.
3. 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.
4. ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.

FOR FULL DRAINAGE NOTES REFER TO DRAWING CUR-XX-XX-DR-C-92530

DRAWING REFERENCES

THE DESIGN OF THIS SCHEME HAS BEEN DESIGNED IN ACCORDANCE WITH THE BELOW DRAWINGS AND INFORMATION.

SURVEYS
- 'TOPOGRAPHICAL SURVEY REF: TOPOGRAPHICAL SURVEY 'S22909-T_Rev –'. DATED APRIL 2021.
- CCTV SURVEY REF 000847 BY LAYER SURVEYS DATED MARCH 2022
- TRIAL PIT ON PUBLIC SEWER BY SEP 28/06/2022

ARCHITECT'S PLANS
- 21039-FRA-XX-XX-DR-A-90-0011 REV C3 ALL UNITS - SITE SETTING OUT PLAN
- 21039-FRA-XX-XX-DR-A-90-0013- REV C1 ALL UNITS - SITE DRAINAGE SETTING OUT

LANDSCAPE ARCHITECT'S PLANS
- 4018 101 REV B LANDSCAPE LAYOUT (FOR REFERENCE ONLY)

FOUNDATION PLANS
- 080139-CUR-01-FN-DR-S-16001 REV C01 UNIT 01 FOUNDATION GA
- 080139-CUR-02-FN-DR-S-16001 REV C02 UNIT 02 FOUNDATION GA
- 080139-CUR-04-FN-DR-S-16001 REV C02 UNIT 04 FOUNDATION GA
- 080139-CUR-09-FN-DR-S-16001 REV C02 UNIT 09 FOUNDATION GA
- 080139-CUR-ZZ-ZZ-DR-S-17001 REV C03 GA TO EXTERNAL RETAINING WALLS

VIBRO-COLUMN GROUND IMPROVEMENT
- TCV-22310-2-3 REV A STONE COLUMN LAYOUT PLOT 2-3
- TCV-22310-4-8 REV - STONE COLUMN LAYOUT PLOT 4-8
- TCV-22310-9 REV - STONE COLUMN LAYOUT PLOT 9

ATTENUATION TANK INFO
- AS-BUILT SETTING OUT RECEIVED 06.09.23

RAIN GARDENS ALLOW FOR BACKFALL ON FOOTWAYS - FINAL DETAILS TO BE REVIEWED AND CONFIRMED WITH TRITON.

CONSTRUCTION RECORD - FINAL CONSTRUCTION

THE INFORMATION IS BASED ON CONFIRMATION FROM THE CONTRACTOR OF THE INSTALLED WORKS. THERE MAY BE VARIATIONS ON SITE WHICH ARE NOT REFLECTED ON THIS DRAWING AND HAS NOT BEEN VERIFIED BY CURTINS.

Rev:	Description:	Date:	By:	Chkd:
C05	FINAL CONSTRUCTION	11/03/24	JC	CG
C04	UPDATED TO SUIT LATEST GROUND LEVELS	20/10/23	JC	CS
C03	FOUL POP-UP ADDED TO UNIT 1. OUTFALL ARRANGEMENT AMENDED	04/10/23	ATL	CG
C02	ATTENUATION TANKS AMENDED, LINEAR DRAINAGE AMENDED	08.09.23	ATL	CG
C01	CONSTRUCTION ISSUE	04/08/22	ATL	CG
P04	TENDER ISSUE	14/10/22	ATL	CG
P03	STAGE 3 UPDATE	23/06/22	LK	CG
P02	STAGE 3 ISSUE	15/06/22	LK	CG
P01	DRAFT ISSUE FOR COMMENT	13/05/22	CS	CG

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Status: SUITABLE FOR STAGE APPROVAL — S4

Project: ELIZABETH STREET, CHEETHAM HILL

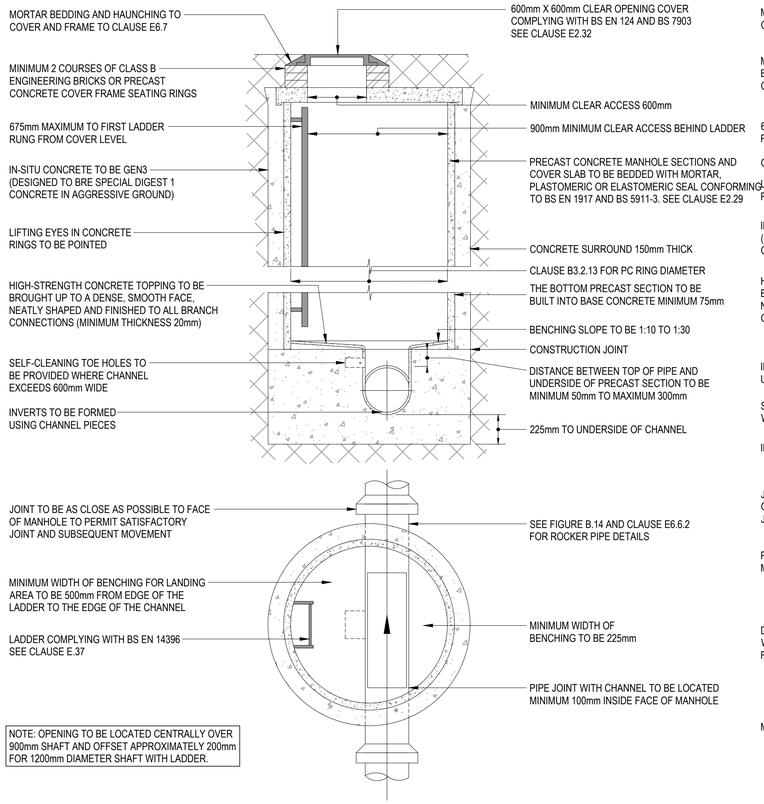
Drg Title: PROPOSED DRAINAGE LAYOUT

Drawn By	Designed By	Checked By
LK	LK	CG
	Date: 12/05/22	Scales @ A1: 1:500

Project No - Originator - Function - Spatial - Form - Discipline - Number: 080139 - CUR - XX - XX - D - C - 92500

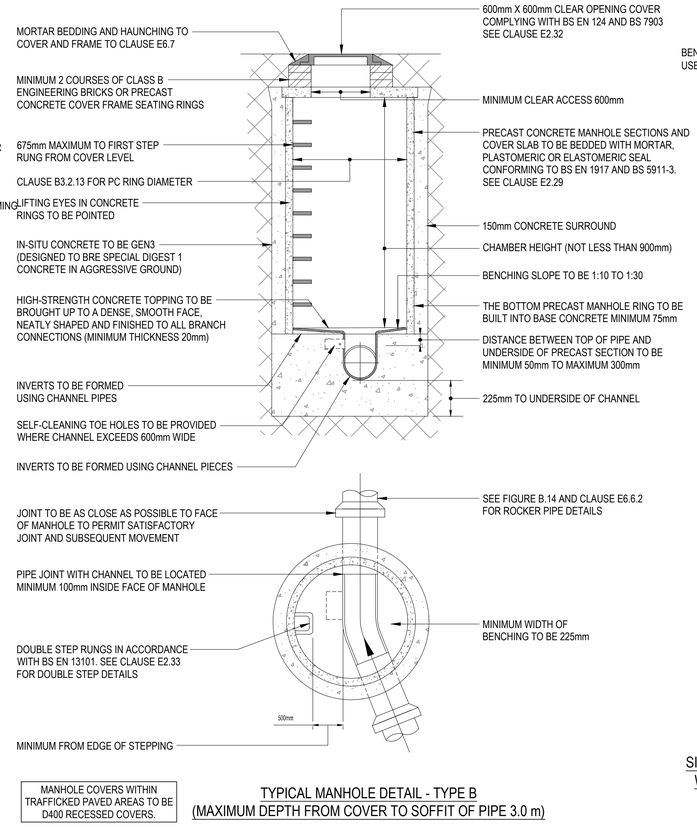
Revision: C05

\\ma-fs-1\Projects\080001 - 081000\080139 - Elizabeth Street, Cheetham Hill\04-Production\4A-Models-Drawings\92500



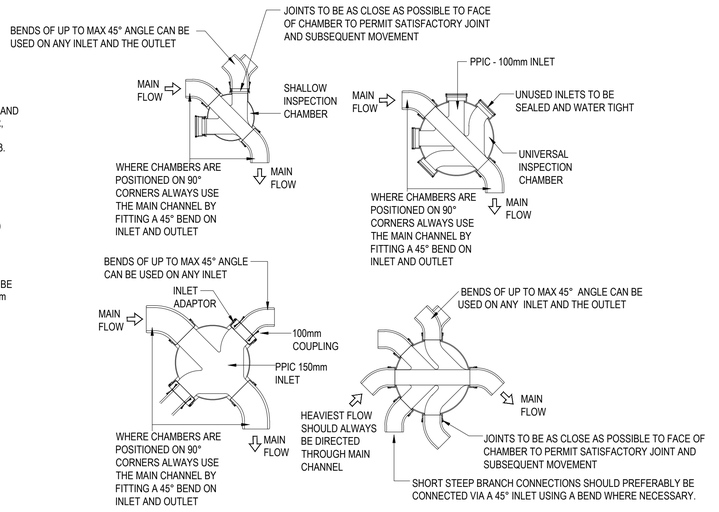
NOTE: OPENING TO BE LOCATED CENTRALLY OVER 900mm SHAFT AND OFFSET APPROXIMATELY 200mm FOR 1200mm DIAMETER SHAFT WITH LADDER.

TYPICAL MANHOLE DETAIL - TYPE A1/2
(DEPTH FROM COVER TO SOFFIT OF PIPE 3m TO 6m)

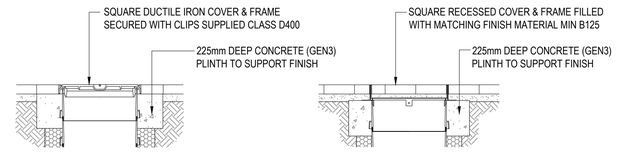


MANHOLE COVERS WITHIN TRAFFICKED PAVED AREAS TO BE D400 RECESSED COVERS.

TYPICAL MANHOLE DETAIL - TYPE B
(MAXIMUM DEPTH FROM COVER TO SOFFIT OF PIPE 3.0 m)



INSPECTION CHAMBER BASE DETAILS



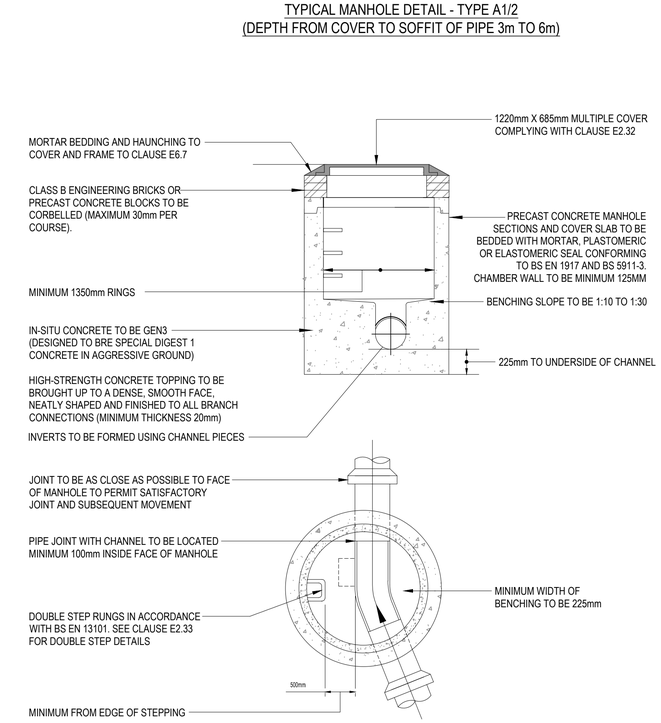
SITED IN HARD LANDSCAPED AREAS WITH STANDARD SQUARE COVER

SITED IN HARD LANDSCAPED AREAS WITH RECESSED COVER

TYPICAL INSPECTION CHAMBER COVER DETAILS

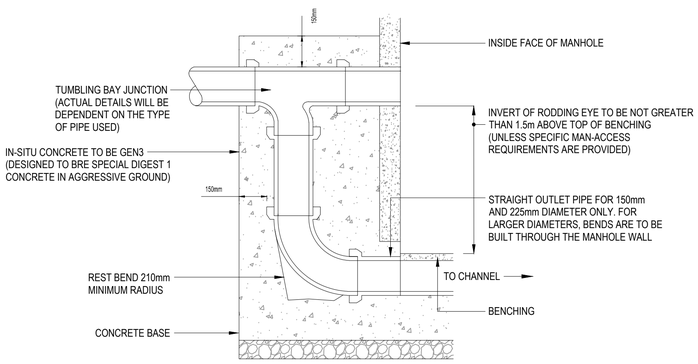
GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. 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.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
4. REFER TO DRAWING 080139-CUR-XX-XX-DR-C-92530_GENERAL DRAINAGE NOTES.

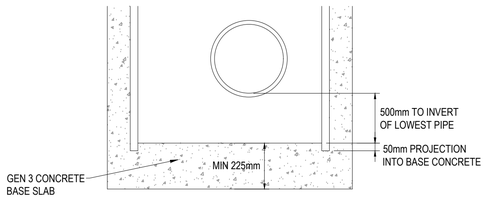


MANHOLE COVERS WITHIN TRAFFICKED PAVED AREAS TO BE D400 RECESSED COVERS.

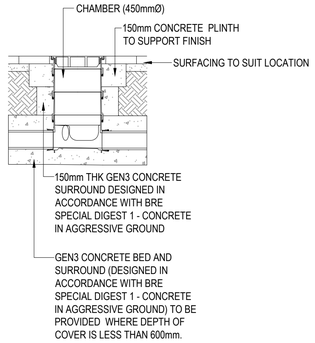
TYPICAL MANHOLE DETAIL - TYPE C
(DEPTH FROM COVER TO SOFFIT OF PIPE <1.5 m)



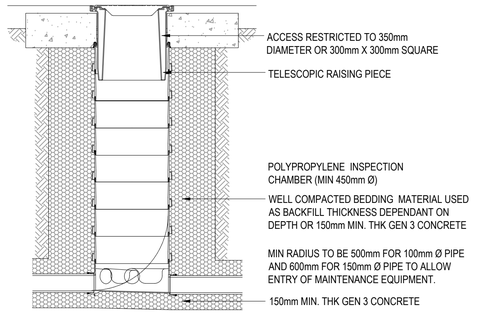
EXTERNAL VERTICAL BACKDROP



CATCH PIT DETAIL



SHALLOW INSPECTION CHAMBER
MAX DEPTH 0.6m



DEEP INSPECTION CHAMBER
DEPTHS BETWEEN 1.2m AND 3.0m

CONSTRUCTION RECORD - FINAL CONSTRUCTION

THE INFORMATION IS BASED ON CONFIRMATION FROM THE CONTRACTOR OF THE INSTALLED WORKS. THERE MAY BE VARIATIONS ON SITE WHICH ARE NOT REFLECTED ON THIS DRAWING AND HAS NOT BEEN VERIFIED BY CURTINS.

Rev:	Description:	Date:	By:	Chkd:
C02	FINAL CONSTRUCTION	11/03/24	JC	CG
C01	CONSTRUCTION ISSUE	04/08/23	ATL	CG
P02	TENDER ISSUE	14/10/22	ATL	CG
P01	STAGE 3 ISSUE	15/06/22	LK	CG

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Status: SUITABLE FOR STAGE APPROVAL — S4

Project: ELIZABETH STREET, CHEETHAM HILL

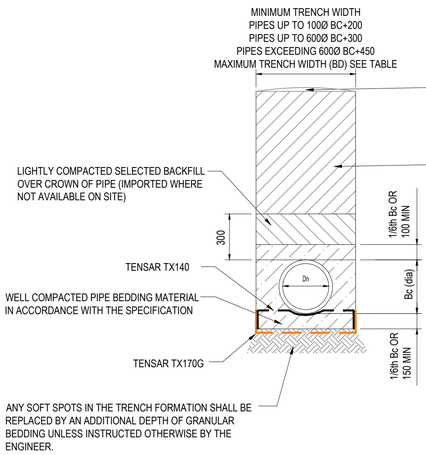
Drg Title: TYPICAL DRAINAGE DETAILS SHEET 1

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	27/05/22	LK	CG	CG
Scale: 1:20				

Project No: | Originator: | Volume: | Level: | Type: | Role: | Category / Number: | Rev:

080139 - CUR - XX - XX - DR - C - 92520 - C02

\\ma-fs-1\Projects\080001 - 081000\080139 - Elizabeth Street, Cheetham Hill\Cad-Production\4A-Models+Drawings\C\C4\20\20)



CLASS S - 360° GRANULAR SURROUND PIPE BEDDING DETAIL

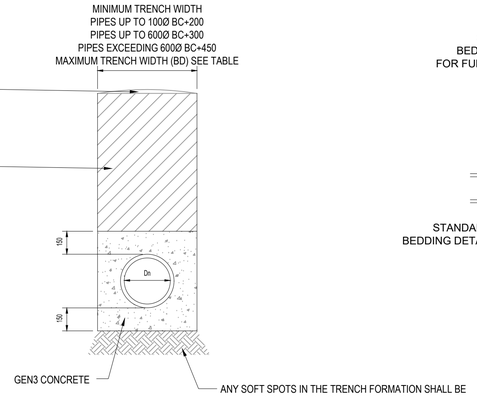
SOFT LANDSCAPE AREAS
IN SOFT LANDSCAPING AREAS TRENCH FILL ABOVE PIPES IS TO BE MOUNDED TO A MAXIMUM DEPTH OF 50MM TO ALLOW FOR FUTURE SETTLEMENT.

HARDSTANDING AREAS
SHW TYPE 1 GRANULAR MATERIAL
SOFT LANDSCAPE AREAS
SELECTED BACKFILL MATERIAL UP TO UNDERSIDE OF TOP-SOIL

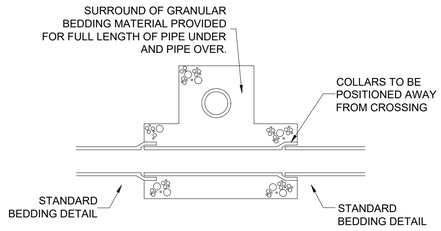
THE FLEXIBLE JOINTS IN THE PIPES SHALL BE MAINTAINED AT THE END OF EACH PIPE WITH COMPRESSIBLE SHEET CUT ACCURATELY TO FIT THE PIPE PROFILE TO BREAK THE CONCRETE SURROUND

Dn	Bd
150	0.6
225	0.7
300	0.85
375	1.05
450	1.15
525	1.25
600	1.35
675	1.45
750	1.50

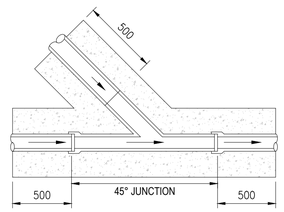
MAXIMUM TRENCH WIDTH



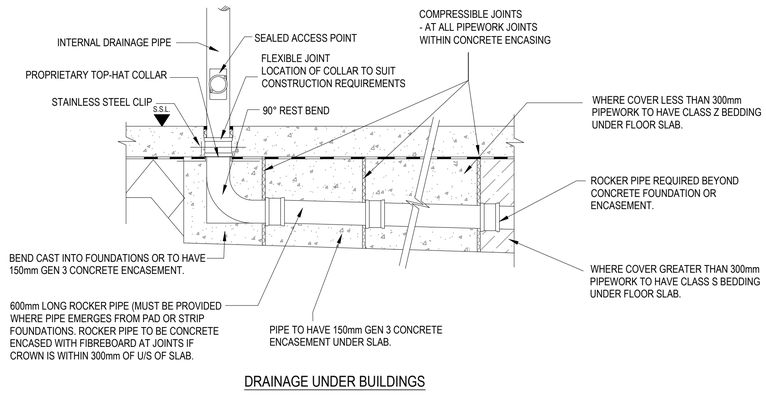
CLASS Z - CONCRETE BED AND SURROUND PIPE BEDDING DETAIL
(COVER < 900mm IN VEHICULAR LOADING AND OPEN FIELD.
COVER <600mm ELSEWHERE EXCEPT UNDER BUILDINGS.)



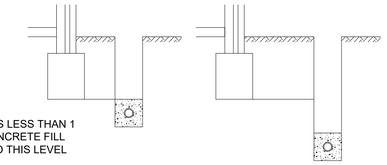
PIPE CROSSINGS DETAIL
(SCALE 1:20)



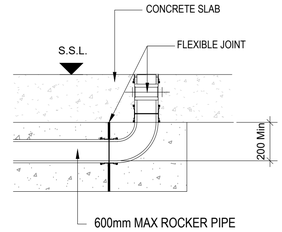
TYPICAL SADDLE CONNECTION



DRAINAGE UNDER BUILDINGS



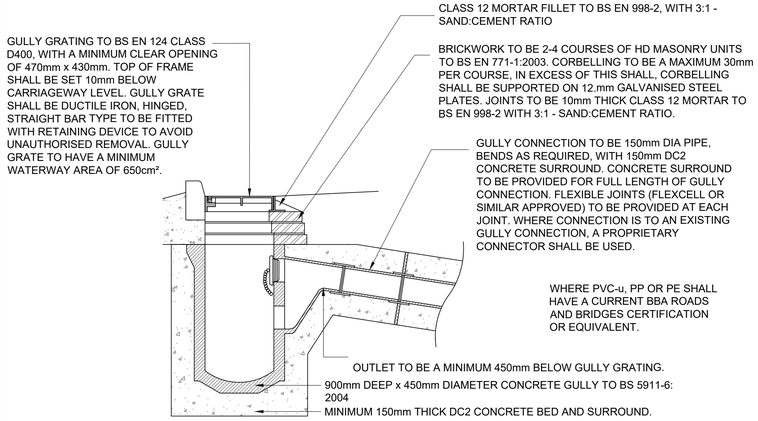
TYPICAL DETAILS WHERE DRAINAGE TRENCH IS DEEPER THAN FOUNDATIONS
(SCALE 1:20)



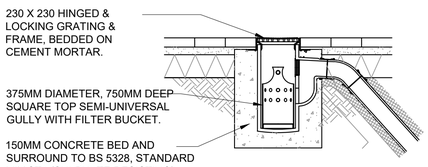
TYPICAL SECTION THROUGH SLAB
(100mmØ downpipe)

GATIC LINEAR DRAINAGE DETAILS REMOVED.

REFER TO DRAWING CUR-XX-XX-DR-C-9252E FOR LINEAR DRAINAGE CHANNEL DETAILS

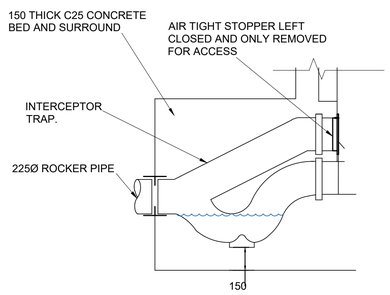


TYPICAL TRAPPED AND RODDABLE ROAD GULLY DETAIL (G)

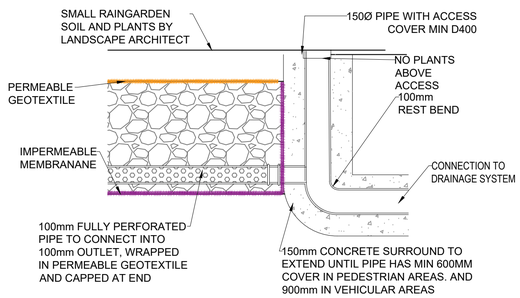


NOTE:
THE DEPTH OF THE GULLY CAN BE INCREASED BY UP TO 300MM BY FITTING A 225MM COUPLING AND A 300 MM HIGH RAISING PIECE BETWEEN THE FRAME AND THE GULLY BODY.

TYPICAL TRAPPED AND RODDABLE YARD GULLY DETAIL (FG)



P- TRAP (ODOUR CONTROL)



RAIN GARDEN OUTLET

GENERAL NOTES:

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4. REFER TO DRAWING 080139-CUR-XX-XX-DR-C-92530_GENERAL DRAINAGE NOTES.

CONSTRUCTION RECORD - FINAL CONSTRUCTION
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Rev:	Description:	Date:	By:	Chkd:
C03	FINAL CONSTRUCTION	11/03/24	JC	CG
C02	GATIC DETAIL REMOVED	07/09/23	ATL	CG
C01	CONSTRUCTION ISSUE	04/08/23	ATL	CG
P02	TENDER ISSUE	14/10/22	ATL	CG
P01	STAGE 3 ISSUE	15/06/22	LK	CG

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Status: SUITABLE FOR STAGE APPROVAL — S4

Project: ELIZABETH STREET, CHEETHAM HILL

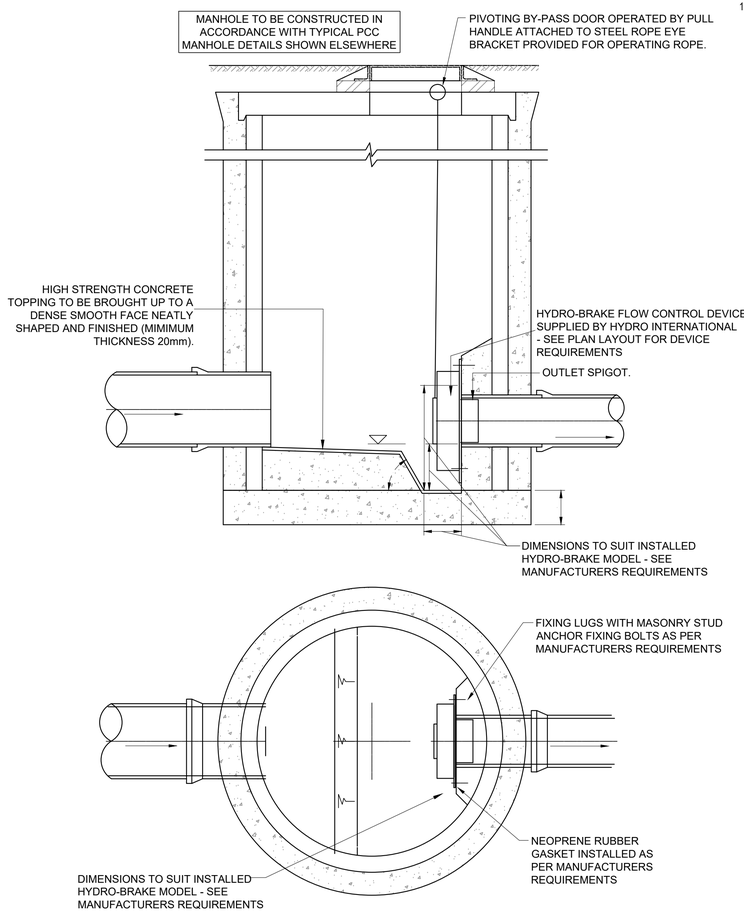
Drg Title: TYPICAL DRAINAGE DETAILS SHEET 2

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	27/05/22	LK	CG	CG
Scale: 1:20				

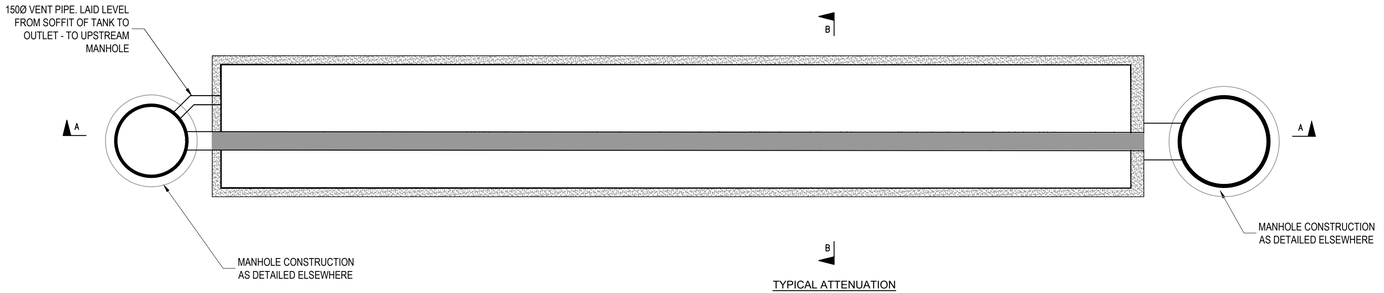
Project No: | Originator: | Volume: | Level: | Type: | Role: | Category / Number: | Rev:

080139 - CUR - XX - XX - DR - C - 92521 - C03

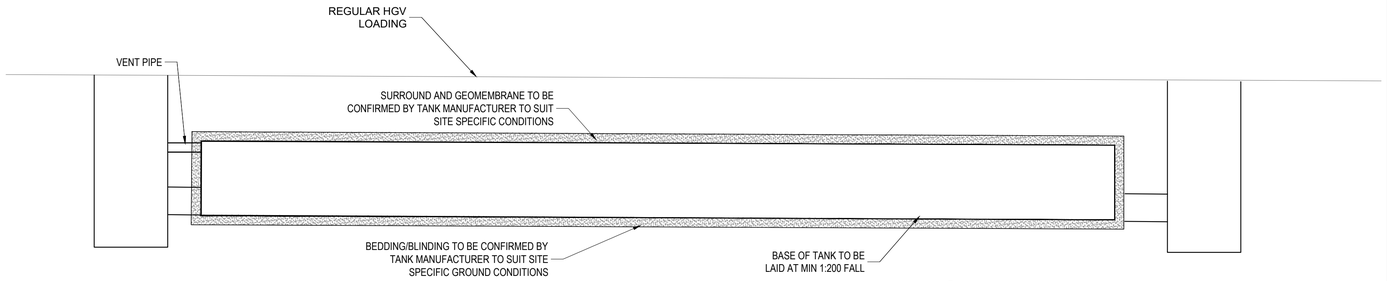
\\ms-fs-1\Projects\080001 - 081000\080139 - Elizabeth Street, Cheetham Hill\04-Production\4A-Models-Drawings\CCAD\92\



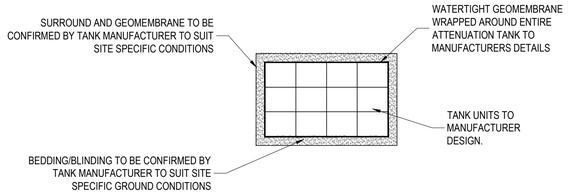
TYPICAL HYDROBRAKE MANHOLE DETAIL



TYPICAL ATTENUATION TANK PLAN



LONG SECTION A-A



CURRENT DESIGN ASSUMPTIONS

DESIGN BASED ON SDS GEOCELLULAR TANK

TANK 1 (1.125m DEEP)
- APPROX. BURIAL DEPTH OF 2.02 - 2.50m.
- APPROX. COVER DEPTH OF 0.89 - 1.37m.

TANK 2 (0.75m DEEP)
- APPROX. BURIAL DEPTH OF 1.43 - 1.71m.
- APPROX. COVER DEPTH OF 0.68 - 0.96m

THE TANKS ARE LOCATED AN AREAS SUBJECT TO REGULAR HGV LOADING. DETAILED STRUCTURAL CALCULATIONS REQUIRED BY MANUFACTURER TO PROVE TANK HAS SUFFICIENT STRENGTH.

FLOATATION CALCULATIONS WILL ALSO BE REQUIRED BY TEH MANUFACTURER.

THE MANUFACTURER WILL NEED TO CONFIRM THAT THE TANK HAS SUFFICIENT STRENGTH FOR THIS LOCATION IN ACCORDANCE WITH CIRIA C680.

FOR SIZES OF TANKS & INLET LEVELS/ LOCATIONS REFER TO DRAWING 080139-CUR-XX-XX-DR-C-92500

TANKS ARE ONLINE - ACCESS REQUIREMENTS FOR INSPECTION/ MAINTENANCE TBC BY MANUFACTURER.

IMPERMEABLE MEMBRANE, BED AND SURROUND TO BE CONFIRMED BY THE MANUFACTURER TO SUIT SITE SPECIFIC GROUND CONDITIONS.

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEER,S ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
4. REFER TO DRAINAGE LAYOUT 080139-CUR-XX-XX-DR-C-92500 FOR THE LOCATION OF THE ATTENUATION TANK AND FLOW CONTROL MANHOLE.
5. ATTENUATION TANK TO BE INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.
6. WHERE AN ALTERNATIVE ATTENUATION TANK DEVICE IS PREFERRED, IT WILL BE SUBJECT TO REDESIGN TO CONFIRM WHETHER THE SYSTEM HAS CAPACITY.
7. THE DESIGN OF THE TANK SHOULD BE PROVIDED BY THE MANUFACTURER OR SUPPLIER TO ENSURE THE TANK IS SUFFICIENT FOR THE SITE SPECIFIC CRITERIA.
8. THE TANK DESIGN SHOULD INCORPORATE:
   - CRATES SUBJECT TO REGULAR HEAVY VEHICLE LOADING,
   - SUITABLE MAINTENANCE ACCESS; AND
   - VENTING TO PREVENT TRAPPED AIR POCKETS.
9. THE STRENGTH OF THE TANK SHOULD COMPLY WITH CIRIA C680 STRUCTURAL DESIGN OF MODULAR GEOCELLULAR DRAINAGE TANKS.
10. ACCESS FOR MAINTENANCE SHOULD BE IN ACCORDANCE WITH CIRIA GUIDANCE.
11. VENTING TO THE TANK SHOULD BE CONFIRMED BY THE TANK MANUFACTURER. VENTING CURRENTLY PROPOSE TO BE ROUTED BACK TO THE NEAREST MANHOLE ABOVE THE DESIGN WATER LEVEL.
12. CONSTRUCTION AND INSTALLATION OF THE TANK SHOULD BE STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION REQUIREMENTS.
13. THE CURRENT DESIGN OF THE TANK IS BASED ON USE OF SDS MODULES. HOWEVER, WHERE AN ALTERNATIVE SYSTEM IS PROPOSED, THE DIMENSIONS OF THE UNITS WILL NEED TO BE CHECKED WITHIN THE DESIGN AND MAY RESULT IN A REDESIGN.
14. THE CONTRACTOR SHALL PROHIBIT THE MOVEMENT OF CONSTRUCTION PLANT ACROSS THE STORAGE TANK AND WHERE NECESSARY PROVIDE ADDITIONAL SUPPORT AND PROTECTION TO THE STRUCTURE. PARTICULARLY POST CONSTRUCTION. TEMPORARY FENCING CAN BE USED TO PROHIBIT TRADE STOCKS, PILLING MATERIALS, HEAVY PLANTS ETC.
15. FLOW CONTROL TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS, INSTRUCTIONS AND RECOMMENDATIONS.
16. WHERE ALTERNATIVE FLOW CONTROL DEVICE IS PREFERRED, IT WILL BE SUBJECT TO REDESIGN TO CONFIRM WHETHER THE SYSTEM HAS CAPACITY.
17. SURFACE WATER DRAINAGE CONNECTION SUBJECT TO S106 AGREEMENT WITH UNITED UTILITIES.
18. FOR FULL DRAINAGE NOTES REFER TO 080139-CUR-XX-XX-DR-C-92530.

CONSTRUCTION RECORD - FINAL CONSTRUCTION

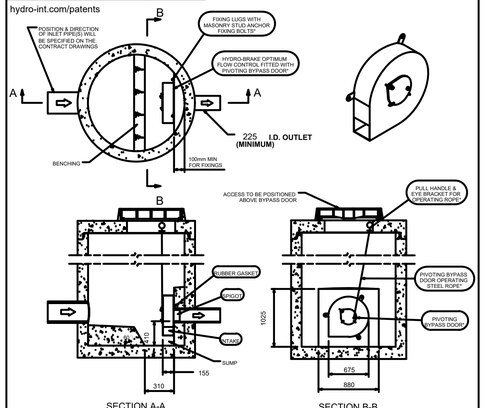
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Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.300	11.000
Flush-Flo™	0.386	10.998
Kick-Flo	0.836	8.932
Mean Flow		9.537

Hydro-Brake Optimum Flow Control including:
- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet
- Indicative Weight: 30 kg

hydro-int.com/patents



IMPORTANT:
- LIMIT OF HYDRO INTERNATIONAL SUPPLY
- THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
- FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
- ALL CIVIL AND INSTALLATION WORK BY OTHERS
- * WHERE SUPPLIED
- HYDRO-BRAKE FLOW CONTROL & HYDRO-BRAKE OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE: The head/flow characteristics of this SHE-0148-1100-1300-1100 Hydro-Brake Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve. **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**

DATE	03/08/2023 22:30
SITE	Elizabeth Street
DESIGNER	Chloe Grimsley
REF	080139

SHE-0148-1100-1300-1100
Hydro-Brake Optimum

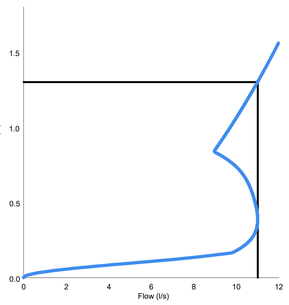
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chloe.grimsley@curtins.com

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.300	11.000
Flush-Flo	0.386	10.998
Kick-Flo®	0.836	8.932
Mean Flow		9.537

hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.045	1.297
0.090	4.469
0.134	7.977
0.179	10.001
0.224	10.469
0.269	10.757
0.314	10.918
0.359	10.988
0.403	10.994
0.448	10.956
0.493	10.890
0.538	10.801
0.583	10.691
0.628	10.553
0.672	10.371
0.717	10.125
0.762	9.787
0.807	9.329
0.852	9.010
0.897	9.229
0.941	9.443
0.986	9.651
1.031	9.854
1.076	10.053
1.121	10.248
1.166	10.439
1.210	10.626
1.255	10.809
1.300	10.989

DESIGN ADVICE: The head/flow characteristics of this SHE-0148-1100-1300-1100 Hydro-Brake Optimum® Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve. The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

DATE	03/08/2023 22:30
Site	Elizabeth Street
DESIGNER	Chloe Grimsley
Ref	080139

SHE-0148-1100-1300-1100
Hydro-Brake Optimum®

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Rev:	Description:	Date:	By:	Chkd:
C03	FINAL CONSTRUCTION	11/03/24	JC	CG
C02	NOTES AMENDED	07/09/23	ATL	CG
C01	CONSTRUCTION ISSUE	04/08/23	ATL	CG
P02	TENDER ISSUE	14/10/22	ATL	CG
P01	STAGE 3 ISSUE	15/06/22	LK	CG

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Status: SUITABLE FOR STAGE APPROVAL — S4

Project: ELIZABETH STREET, CHEETHAM HILL

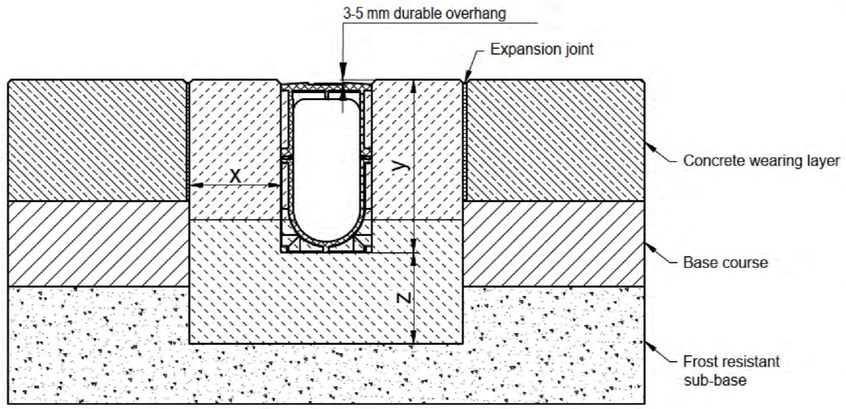
Drg Title: TYPICAL DRAINAGE DETAILS SHEET 3

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	27/05/22	LK	CG	CG
Scale: 1:20				

Project No:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
080139	- CUR -	XX -	XX -	DR -	C -	92522 -	C03

\\ms-fs-1\Projects\080001 - 081000\080139 - Elizabeth Street, Cheetham Hill\Q4-Production\4A-Models-Drawings\CCAD\92(

Installation example
concrete class C 250 - D 400



* y = Channel height plus camber

Category according to EN 1433 / DIN 19580		A 15	B 125	C 250	D 400**	E 600	F 900
Foundation: width x / height y / thickness z (in cm)				10 / * / 15	15 / * / 15		
The named concrete quality is a minimum quality							
EN 206-1 / DIN 1045-2	quality of concrete stretcher			C30/37 XF4, XM1	C30/37 XF4, XM1		
	with danger of frost on the lateral support			C25/30 XF3	C25/30 XF3		

Applying to following systems:

RECYFIX MONOTEC 100, 200

The installation examples / advise constantly are adapted to the technical conditions.
With new editions older expenditures lose their validity.
Before planning or installation please verify the current version at www.hauraton.com
In building construction is a sealing layer below the channels necessary.

** Not for use in continuously frequented areas of carriageways or motorways

Date: 05.11.2019

Our general installation instructions apply.

Format DIN A4

scale 1:6

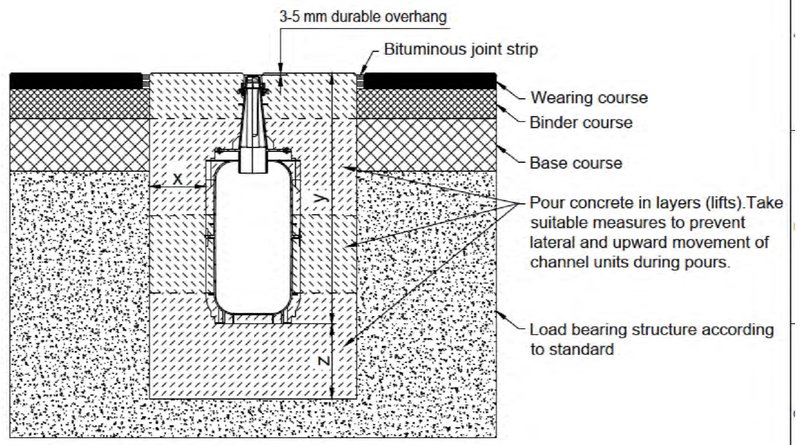
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RF-Mono-Rinne 100 H280 Einbaubeispiel Klasse D 400 in Beton

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TYPICAL HAURATON MONOTEC CONSTRUCTION DETAIL
AS PROVIDED BY HAURATON

Installation Example
in asphalted areas Class A
15 - F 900



* y = Channel height plus camber

Category according to EN 1433 / DIN 19580		A 15	B 125	C 250	D 400**	E 600**	F 900**
Foundation: width x / height y / thickness z (in cm)		10 / * / 10	10 / * / 10	15 / * / 15	15 / * / 15	15 / * / 20	15 / * / 20
EN 206-1 / DIN 1045-2	quality of concrete stretcher	C30/37 XF4,XM1	C30/37 XF4,XM1	C30/37 XF4,XM1	C30/37 XF4,XM1	C30/37 XF4,XM1	C30/37 XF4,XM1
The named concrete quality is a minimum quality	without danger of frost on the lateral support	C25/30 X0	C25/30 X0	C25/30 X0	C25/30 X0	C25/30 X0	C25/30 X0
	with danger of frost on the lateral support	C25/30 XF3	C25/30 XF3	C25/30 XF3	C25/30 XF3	C25/30 XF3	C25/30 XF3

Applying to following systems:

RECYFIX HICAP F 1200, 2200, 3200, 5200

The installation examples / advise constantly are adapted to the technical conditions. With new editions older expenditures lose their validity. Before planning or installation please verify the current version at www.hauraton.com In building construction is a sealing layer below the channels necessary.

The installation example represents a proven recommendation from HAURATON. The final responsibility for the execution lies with the planner in charge. Specific conditions of the project must be taken into account.

** Installation situations of drainage systems with high dynamic loads (e.g. airports, motorways and manoeuvring areas of buses, lorries and forklifts, etc.) are not sufficiently considered in DIN EN 1433. Please contact us for such applications to work out project-specific solutions.

Date: 14.11.2022

Our general installation instructions apply.

Format DIN A4

scale 1:10

0000097861_BRITISH.dwg 6 EBBw

RF-HICAP-F-5200 Einbaubeispiel Klasse E 600 in Asphalt

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TYPICAL HAURATON RECYFIX HICAP F CONSTRUCTION DETAIL
AS PROVIDED BY HAURATON

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. 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.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
4. REFER TO DRAWING 080139-CUR-XX-XX-DR-C-92530_GENERAL DRAINAGE NOTES.
5. DRAINAGE CHANNEL HAUNCH JOINTING TO ALIGN WITH CONCRETE SLAB JOINTING LAYOUT, BUT TO COMPLY WITH HAURATON MINIMUM JOINT SPACING REQUIRMENTS. REFER TO DRAWING 080139-CUR-XX-XX-D-C-94702 FOR JOINTING LAYOUT.

CONSTRUCTION RECORD - FINAL CONSTRUCTION

THE INFORMATION IS BASED ON CONFIRMATION FROM THE CONTRACTOR OF THE INSTALLED WORKS. THERE MAY BE VARIATIONS ON SITE WHICH ARE NOT REFLECTED ON THIS DRAWING AND HAS NOT BEEN VERIFIED BY CURTINS.

Rev:	Description:	Date:	By:	Chkd:
C03	FINAL CONSTRUCTION	11/03/24	JC	CG
C02	JOINTING NOTE ADDED	09/10/23	ATL	CG
C01	CONSTRUCTION ISSUE	07/09/23	ATL	CG

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Status: SUITABLE FOR STAGE APPROVAL — S4

Project: ELIZABETH STREET, CHEETHAM HILL

Drg Title: TYPICAL DRAINAGE DETAILS SHEET 4

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	07/09/23	ATL	CG	CG
Scale: NTS				

Project No:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
080139	CUR	XX	XX	DR	C	92523	C03

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Manhole schedule

Surface Water Manholes

MH REF	CL (mAOD)	IL (mAOD)	DEPTH TO SOFFIT (m)	DS PIPE DIA (mm)	MH DIA (mm)	MH TYPE	CATCHPIT	CATCHPIT Depth (mm)	COVER SIZE (mm)	COVER CLASS	COVER TYPE	RECESSED	RESTRICTED ACCESS	BACK DROP	Back drop IL (m)	COMMENTS	EASTING	NORTHING
S1	55.880	54.830	0.75	300	600	PPIC	N	N/A	600X600	D400	SINGLE SEALED	N	N	N	N/A		**384220.965**	400062.603
S2	55.880	54.580	1.00	300	600	PPIC	N	N/A	600X600	D400	SINGLE SEALED	N	Y	N	N/A	RESTRICTED ACCESS 350mm DIA MAX;	384236.864	400110.008
S3	55.920	54.261	1.28	375	1500	TYPE C	N	N/A	1200X675	B125	SINGLE SEALED	N	N	N	N/A		384252.244	400155.882
S4	55.870	54.900	0.67	300	1500	TYPE C	N	N/A	1200X675	D400	SINGLE SEALED	N	N	N	N/A		384186.319	400064.772
S5	OMITTED																	
S6	55.870	54.002	1.42	450	1500	TYPE C	N	N/A	1200X675	D400	SINGLE SEALED	N	N	N	N/A		384220.436	400166.545
S7	55.600	54.310	0.84	450	1500	TYPE C	N	N/A	1200X675	D400	SINGLE SEALED	N	N	N	N/A		384165.457	400066.617
S8	55.600	54.148	1.00	450	1500	TYPE C	Y	500	1200X675	D400	SINGLE SEALED	N	N	N	N/A	CP DEPTH: 500mm	384177.825	400103.871
S9	56.030	54.900	0.91	225	600	PPIC	N	N/A	600X600	D400	SINGLE SEALED	N	N	N	N/A		384130.333	400159.789
S10	56.030	54.658	1.15	225	600	PPIC	N	N/A	600X600	D400	SINGLE SEALED	N	N	N	N/A		384159.093	400150.149
S11	55.610	53.990	1.17	450	1500	TYPE C	N	N/A	1200X675	D400	SINGLE SEALED	N	N	N	N/A		384189.774	400139.866
S12	55.970	53.846	1.67	450	1500	TYPE B	N	N/A	600X600	D400	SINGLE SEALED	N	N	N	N/A		384200.186	400171.23
S13	56.500	55.500	0.78	225	600	PPIC	N	N/A	600X600	D400	SINGLE SEALED	N	N	N	N/A		384157.776	400247.123
S14	56.500	55.391	0.88	225	600	PPIC	N	N/A	600X600	D400	SINGLE SEALED	N	N	N	N/A		384166.138	400244.437
S15	56.490	55.500	0.77	225	600	PPIC	N	N/A	600X600	D400	SINGLE SEALED	N	N	N	N/A		384152.686	400214.112
S16	56.200	54.150	1.60	450	1500	TYPE B	N	N/A	600X600	D400	SINGLE SEALED	N	N	N	N/A		384114.652	400216.731
S17	56.200	53.986	1.76	450	1500	TYPE B	Y	500	600X600	D400	SINGLE SEALED	N	N	N	N/A	CP DEPTH: 500mm	384152.590	400204.015
S18	56.010	54.600	1.19	225	600	PPIC	N	N/A	600X600	D400	SINGLE SEALED	N	Y	N	N/A	RESTRICTED ACCESS 350mm DIA MAX;	384130.509	400193.971
S19	56.020	54.227	1.57	225	1500	TYPE B	N	N/A	600X600	D400	SINGLE SEALED	N	N	N	N/A		384181.694	400176.726
S20	56.200	53.860	1.89	450	1500	TYPE B	N	N/A	600X600	D400	SINGLE SEALED	N	N	N	N/A		384187	400192.475
S21	56.620	53.690	2.48	450	1500	TYPE B	N	N/A	600X600	B125	SINGLE SEALED	N	N	N	N/A		384205.0427	400200.7134
S22	OMITTED																	
S23	56.880	55.300	1.43	150	600	PPIC	N	N/A	600X600	D400	SINGLE SEALED	N	Y	N	N/A	RESTRICTED ACCESS 350mm DIA MAX;	384234.697	400192.502
S24	56.880	54.499	2.16	225	1500	TYPE B	N	N/A	600X600	D400	SINGLE SEALED	N	N	N	N/A		384222.871	400205.88
S25	56.740	53.665	2.85	225	1500	TYPE B	Y	*TBC	1200X675	D400	SINGLE SEALED	N	N	N	N/A	HYDROBRAKE MANHOLE 1500mm *SUMP DEPTH TBC BY HYDROBRAKE SUPPLIER	384227.071	400218.929
S26	OMITTED																	

Foul Water Manholes

MH REF	CL (mAOD)	IL (mAOD)	DEPTH TO SOFFIT (m)	DS PIPE DIA (mm)	MH DIA (mm)	MH TYPE	CATCHPIT	CATCHPIT Depth (mm)	COVER SIZE (mm)	COVER CLASS	COVER TYPE	RECESSED	RESTRICTED ACCESS	BACK DROP	Back drop IL (m)	COMMENTS	EASTING	NORTHING
F1	55.990	55.350	0.54	100	450	PPIC	N	N/A	450X450	D400	SINGLE SEALED	N	N	N	N/A		384123.742	400201.527
F2	55.990	55.202	0.69	100	450	PPIC	N	N/A	450X450	D400	SINGLE SEALED	N	N	N	N/A		384131.175	400199.023
F3	55.990	54.672	1.17	150	450	PPIC	N	N/A	450X450	D400	SINGLE SEALED	N	Y	N	N/A		384163.811	400188.027
F4	55.990	55.350	0.54	100	450	PPIC	N	N/A	450X450	D400	SINGLE SEALED	N	N	N	N/A		384192.892	400178.275
F5	55.990	55.001	0.89	100	450	PPIC	N	N/A	450X450	D400	SINGLE SEALED	N	N	N	N/A		384170.189	400185.879
F6	55.890	55.310	0.48	100	450	PPIC	N	N/A	450X450	D400	SINGLE SEALED	N	N	N	N/A		384205.366	400118.504
F7	55.930	54.680	1.10	150	450	PPIC	N	N/A	450X450	D400	SINGLE SEALED	N	Y	N	N/A	RESTRICTED ACCESS 350mm DIA MAX;	384218.829	400158.67
F8	56.500	55.700	0.70	100	450	PPIC	N	N/A	450X450	D400	SINGLE SEALED	N	N	N	N/A		384164.903	400238.854
F9	56.730	54.198	2.38	150	1200	TYPE B	N	N/A	600X600	D400	SINGLE SEALED	N	N	N	N/A		384204.132	400209.0271
F10	56.880	55.570	1.21	100	450	PPIC	N	N/A	450X450	D400	SINGLE SEALED	N	N	N	N/A		384231.299	400210.963
F10A	56.880	55.670	1.11	100	450	PPIC	N	N/A	450X450	D400	SINGLE SEALED	N	N	N	N/A		384234.900	400214.146
F11	56.790	54.010	2.63	150	1200	TYPE B	N	N/A	600X600	D400	SINGLE SEALED	N	N	Y	55.360	BD IL: 55.36m	384220.112	400223.008

Combined Water Manholes

MH REF	CL (mAOD)	IL (mAOD)	DEPTH TO SOFFIT (m)	DS PIPE DIA (mm)	MH DIA (mm)	MH TYPE	CATCHPIT	CATCHPIT Depth (mm)	COVER SIZE (mm)	COVER CLASS	COVER TYPE	RECESSED	RESTRICTED ACCESS	BACK DROP	Back drop IL (m)	COMMENTS	EASTING	NORTHING
C1	56.540	53.410	2.91	225	1500	TYPE B	N	N/A	600X600	D400	SINGLE SEALED	N	N	N	N/A		384231.515	400233.598

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. ALL ADOPTABLE DRAINAGE WORKS INCLUDING WORKS TO EXISTING PUBLIC SEWERS TO BE UNDERTAKEN IN ACCORDANCE WITH "SEWERS FOR ADOPTION 7th EDITION" AND "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION" AND CONSTRUCTED TO THE RELEVANT STATUTORY UNDERTAKERS DETAILS.
3. ALL PRIVATE DRAINAGE WORKS TO BE IN ACCORDANCE WITH CURTINS DRAINAGE SPECIFICATION, "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION", BS EN 752 2017 'DRAIN AND SEWER SYSTEMS OUTSIDE BUILDINGS' AND THE BUILDING REGULATIONS APPROVED 'DOCUMENT H'.
4. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
5. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
6. THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION MAY NEED TO BE INCREASED TO ACCOMMODATE THE CONNECTIONS AND BENDS.
7. COVER LEVELS BASED ON TENDER DESIGN LEVELS REDUCED BY 0.1m READ IN CONJUNCTION WITH TRITON LEVELS SKETCH.
8. COVER LEVELS, GULLY POSITIONS, AND BUILDING LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT/LANDSCAPE ARCHITECT. CONTRACTOR TO ALLOW FOR ADJUSTMENT TO SUIT AGREED POSITIONS AND FINISHED LEVELS, AND CONFIRM ALL COVER LEVELS ON SITE.
9. ALL MANHOLE COVERS IN BLOCK/SLAB AND EXTERNAL PAVING AREAS MAY REQUIRE RECESSED COVERS OF THE APPROPRIATE GRADE TO ACCEPT THE LANDSCAPE ARCHITECT'S PAVING PROPOSAL UNLESS CONFIRMED OTHERWISE.
10. THE LANDSCAPE ARCHITECT MAY REQUIRE THE ORIENTATION OF CHAMBER COVERS TO BE CO-ORDINATED WITH THE PAVING PATTERN. THIS WILL BE SUBJECT TO REVIEW WITH THE MANHOLE INTERNAL BENCHING ARRANGEMENT, LANDING AND STEP LOCATION AND IF REQUIRED, SHOULD BE ADVISED TO US AS SOON AS POSSIBLE.
11. ALL MANHOLE, GULLY AND CHANNEL (ACCESS/OUTLET) COVERS (IRONWORK) SHOULD BE THE FOLLOWING SPECIFICATION:
    - B125 LOAD CLASS IN PEDESTRIAN AREAS
    - D400 LOAD CLASS IN VEHICULAR AREAS.

    ANY AMBIGUITIES ON DRAWINGS/ACCESS AND MAINTENANCE STRATEGY SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY.
12. ALL SURFACE CHANNEL ACCESS BOXES/OUTLET BOXES IN BLOCK/SLAB AND EXTERNAL PAVING AREAS MAY REQUIRE RECESSED COVERS OF THE APPROPRIATE GRADE TO ACCEPT THE LANDSCAPE ARCHITECT'S PAVING PROPOSAL. TBC BY LANDSCAPE ARCHITECT AND SUBJECT TO AVAILABILITY FROM MANUFACTURER.
13. ALL SURFACE CHANNELS TO BE OF THE TREADSAFE TYPE, UNLESS OTHERWISE SPECIFIED.
14. ALL PROPRIETARY PRODUCTS TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS, INSTRUCTIONS AND RECOMMENDATIONS.

CONSTRUCTION RECORD - FINAL CONSTRUCTION

THE INFORMATION IS BASED ON CONFIRMATION FROM THE CONTRACTOR OF THE INSTALLED WORKS. THERE MAY BE VARIATIONS ON SITE WHICH ARE NOT REFLECTED ON THIS DRAWING AND HAS NOT BEEN VERIFIED BY CURTINS.

Rev:	Description:	Date:	By:	Chkd:
C04	FINAL CONSTRUCTION	11/03/24	JC	CG
C03	COVER LEVELS AMENDED	24/10/23	JC	ATL
C02	DRAINAGE UPDATED	09/10/23	ATL	CG
C01	CONSTRUCTION ISSUE	04/08/23	ATL	CG
P03	TENDER ISSUE	14/10/22	ATL	CG
P02	STAGE 3 UPDATE	23/06/22	LK	CG
P01	STAGE 3 ISSUE	15/06/22	LK	CG

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Status: CONSTRUCTION

Project: ELIZABETH STREET, CHEETHAM HILL

Drg Title: MANHOLE SCHEDULES SHEET 1

Size:	Date:	Drawn By:	Designed By:	Checked By:
A1	27/05/22	LK	CG	CG
Scale: 1:20				

Project No:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
080139	- CUR -	XX -	XX -	D	- C	- 92510	- C04

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GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.

2. ALL ADOPTABLE DRAINAGE WORKS INCLUDING WORKS TO EXISTING PUBLIC SEWERS TO BE UNDERTAKEN IN ACCORDANCE WITH "DESIGN AND CONSTRUCTION GUIDANCE FOR FOUL AND SURFACE WATER SEWERS OFFERED FOR ADOPTION - LATEST EDITION" AND "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION" AND CONSTRUCTED TO THE RELEVANT STATUTORY UNDERTAKERS DETAILS.

3. ALL PRIVATE DRAINAGE WORKS TO BE IN ACCORDANCE WITH CURTINS DRAINAGE SPECIFICATION, "CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION", BS EN 752 2017 'DRAIN AND SEWER SYSTEMS OUTSIDE BUILDINGS' AND THE BUILDING REGULATIONS APPROVED 'DOCUMENT H'.

4. 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.

5. DESIGN BASED ON TOPOGRAPHICAL SURVEY, CCTV SURVEY AND PUBLIC SEWER TRIAL DIG INFORMATION AVAILABLE AT THE TIME OF THE DESIGN.

6. OUTFALL CONNECTION SUBJECT TO AGREEMENT WITH UNITED UTILITIES.

7. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.

8. COVER LEVELS, GULLY POSITIONS, AND BUILDINGS LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT. CONTRACTOR TO ALLOW FOR ADJUSTMENT TO SUIT AGREED POSITIONS AND FINISHED LEVELS, AND CONFIRM ALL COVER LEVELS ON SITE.

9. ALL INTERNAL DRAINAGE CONNECTIONS ARE PROVIDED TO THE PENETRATION POSITIONS SHOWN ON ARCHITECT AND M&E DRAWINGS. REFER TO DIMENSIONED LOCATIONS AND DIAMETERS ON ARCHITECT'S GROUND FLOOR SETTING-OUT PLANS.

10. ALL UNDERGROUND FOUL DRAINAGE SHOULD BE SUITABLY VENTED AT OR NEAR TO THE HEAD OF RUNS.

11. ALL ACCESS FITTINGS, STACKS, RWP'S AND GULLIES TO BE RODDABLE. ALL TO HAVE LOW LEVEL RODDING ACCESS PLATES UNLESS AN ALTERNATIVE MEANS OF ACCESS IS AGREED. ACCESS POINT TO BE ABOVE ANY GROUND FLOOR CONNECTED APPLIANCE SPILL LEVEL.

12. LARGE ACCESS FITTING REQUIRED ABOVE GROUND WHERE GREATER THAN 12M UP TO 22M TO A JUNCTION. SMALL ACCESS FITTING REQUIRED UP TO 12M TO A JUNCTION.

13. ALL GULLY AND CHANNEL DRAIN OUTLETS AND TERMINATION POINTS TO BE TRAPPED AND RODDABLE. INTERNAL GULLIES AND CHANNEL DRAINS TO BE SPECIFIED BY OTHERS.

14. WHERE NO WC'S ARE CONNECTED UPSTREAM, UNDERSLAB FW DRAINAGE TO BE LAID AT 1:40 MIN. AFTER THE CONNECTION OF AT LEAST 1NO WC, A MIN. FALL OF 1:80 APPLIES.

15. ALL CONNECTIONS FROM POP-UPS TO BE LAID AT A CONSTANT GRADIENT TO JUNCTION/ INSPECTION CHAMBER/ MANHOLE UNLESS NOTED OTHERWISE. ANY ISSUES RELATING TO CLASHES WITH FOUNDATIONS ARE TO BE FORWARDED TO THE ENGINEER, ALLOWING SUFFICIENT TIME FOR AN ALTERNATIVE SOLUTION TO BE PROPOSED.

16. INVERT LEVELS AT MANHOLES/ INSPECTION CHAMBERS TO BE USED TO SET OUT PIPEWORK. PIPE GRADIENTS ARE SHOWN INDICATIVELY ONLY.

17. ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS.

18. ALL SEWERS, UNLESS AGREED OTHERWISE STATED, SHALL BE:
- 100mm to 300mm DIA TO BE VITRIFIED CLAY.
- 375mm DIA AND GREATER TO BE CLASS 120 CONCRETE PIPES.

19. AS AN ALTERNATIVE THE CONTRACTOR MAY USE AN APPROVED UNPLASTICISED POLYVINYL CHLORIDE (PVCU) WITH APPROVAL FROM THE ENGINEER.

20. SEWER PIPES TO BE LAID IN MAXIMUM 3 METRE LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER LENGTHS.

21. THE FIRST PIPE OUT OF MANHOLES TO BE AS SHORT AS PRACTICABLE SO AS TO PROVIDE A FLEXIBLE JOINT AS CLOSE AS POSSIBLE TO THE OUTSIDE FACE OF THE CONCRETE SURROUND AND CONNECTED TO A LENGTH OF ROCKER PIPE.

22. ALL NEW CONNECTIONS INTO EXISTING MANHOLES (OR INTO EXISTING SEWERS) TO BE 'SOFFITS LEVEL' UNLESS OTHERWISE NOTED.

23. ALL ADOPTABLE DRAINAGE PIPES WILL REQUIRE A MINIMUM OF 1200mm COVER, IN ACCORDANCE WITH SEWERAGE UNDERTAKERS REQUIREMENTS. WHERE THIS IS NOT ACHIEVED, IT WILL BE NECESSARY TO AGREE THE BED AND SURROUND DETAIL.

24. ALL PRIVATE DRAINAGE PIPES WITH A COVER OF LESS THAN 600mm IN NON-TRAFFICKED AREAS AND LESS THAN 1200mm IN TRAFFICKED AREAS TO BE BEDDED AND SURROUNDED IN CONCRETE (CLASS Z). COMPRESSIBLE MATERIAL SHALL BE PROVIDED AT EVERY PIPE JOINT. WHERE COVER EXCEEDS THIS DEPTH, PIPES ARE TYPICALLY BEDDED AND SURROUNDED IN CLASS S. REFER TO PIPE EMBEDMENT DETAILS DRAWING FOR SPECIFIC TYPES.

25. WHERE DRAINAGE PIPES ARE LESS THAN 300mm BELOW THE UNDERSIDE OF THE GROUND FLOOR SLAB, CONCRETE ENCASEMENT IS REQUIRED (CLASS Z). COMPRESSIBLE JOINTS ARE TO BE PROVIDED AT EVERY PIPE JOINT WITHIN THE CONCRETE.

26. WHERE PIPES ARE MORE THAN 300mm BELOW THE UNDERSIDE OF THE SLAB, CLASS S BEDDING IS ACCEPTABLE.

27. SULPHATE RESISTANT CEMENT (C20-DC2) AND PRECAST CONCRETE PRODUCTS MUST BE USED OR A LABORATORY REPORT PROVIDED TO PROVE THAT SUCH PRECAUTIONS ARE NOT REQUIRED.

28. WHERE FOUL SEWERS RUN ABOVE SURFACE SEWERS, CONCRETE PROTECTION MAY BE REQUIRED AT CROSSOVERS TO PREVENT ANY POTENTIAL CONTAMINATION.

29. ALL CONNECTIONS PASSING THROUGH BASES OR EDGE BEAMS TO BE IN SEALED SLEEVES. ALTERNATIVELY CONNECTIONS MAY BE CAST-IN WITH FLEXIBLE JOINTS NOT GREATER THAN 150MM FROM FACE OF CONCRETE.

30. THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION MAY NEED TO BE INCREASED TO ACCOMMODATE THE CONNECTIONS AND BENDS.

31. ALL MANHOLE COVERS IN BLOCK/SLAB AND EXTERNAL PAVING AREAS TO HAVE RECESSED COVERS OF THE APPROPRIATE GRADE TO ACCEPT ARCHITECT'S PAVING PROPOSAL UNLESS CONFIRMED OTHERWISE.

32. ALL INTERNAL COVERS TO HAVE MECHANICALLY JOINTED CORNERS AND DOUBLE SEALED WITH RECESSED TRAY TO ALLOW FOR FINISHES.

33. UNLESS NOTED OTHERWISE IN THE MANHOLE SCHEDULE, ALL MANHOLE, GULLY AND CHANNEL COVERS (IRONWORK) SHOULD BE THE FOLLOWING SPECIFICATION:
- B125 LOAD CLASS IN PEDESTRIAN AREAS
- D400 LOAD CLASS IN VEHICULAR AREAS.

34. ALL PROPRIETARY PRODUCTS TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS, INSTRUCTIONS AND RECOMMENDATIONS.

35. DRAINAGE CHANNEL HAUNCH JOINTING TO ALIGN WITH CONCRETE SLAB JOINTING LAYOUT, BUT TO COMPLY WITH HAURATON MINIMUM JOINT SPACING REQUIRMENTS. REFER TO DRAWING 080139-CUR-XX-XX-D-C-94702 FOR JOINTING LAYOUT.

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.

2. 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.

3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

4. REFER TO DRAWING 080139-CUR-XX-XX-DR-C-92500 FOR DRAINAGE LAYOUT.

CONSTRUCTION RECORD - FINAL CONSTRUCTION

THE INFORMATION IS BASED ON CONFIRMATION FROM THE CONTRACTOR OF THE INSTALLED WORKS. THERE MAY BE VARIATIONS ON SITE WHICH ARE NOT REFLECTED ON THIS DRAWING AND HAS NOT BEEN VERIFIED BY CURTINS.

Rev:	Description:	Date:	By:	Chkd:
C03	FINAL CONSTRUCTION	11/03/24	JC	CG
C02	LINEAR DRAINAGE JOINTING NOTE ADDED	04/10/23	ATL	CG
C01	CONSTRUCTION ISSUE	04/08/23	ATL	CG
P02	TENDER ISSUE	14/10/22	ATL	CG
P01	STAGE 3 ISSUE	15/06/22	LK	CG

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Civils & Structures • Transport Planning • Environmental • Infrastructure • Geotechnical • Conservation & Heritage • Principal Designer
Birmingham • Bristol • Cambridge • Cardiff • Douglas • Dublin • Edinburgh • Glasgow • Kendal • Leeds • Liverpool • London • Manchester • Nottingham

Status: SUITABLE FOR STAGE APPROVAL — S4

Project: ELIZABETH STREET, CHEETHAM HILL

Drg Title: GENERAL DRAINAGE NOTES

Drawn By	Designed By	Checked By
LK	LK	CG
	Date: 13/06/22	Scales @ A1: N.T.S.

Project No - Originator - Function - Spatial - Form - Discipline - Number: 080139 - CUR - XX - XX - DR - C - 92530

Revision: C03

\\rma-fs-1\Projects\080001 - 081000\080139 - Elizabeth Street, Cheetham Hill\04-Production\4A-Models-Drawings-Calcs\2D\

Appendix B

United Utilities Approval – Reference 4698941

United Utilities Inspection Notice

This form is to confirm a new connection has been made to an existing public sewer under Section 106 of the Water Industry Act 1991

Water for the North West

Site details: Details of the site or premise that have been connected to the public sewer	
United Utilities notification reference (EC/NC/SC/WC)	4698941
Site address	Elizabeth Street Cheetham Hill Manchester M8 8JJ
Development type	New property

Contractor Details			
Contractor name / Company Name	Yorkshire Civil Engineering Ltd		
Contractor Email Addess	matty@ycelltd.co.uk		
Works Supervisor	Gary Turner		
Confirm sewer 'log on' & 'log off' procedure followed	Yes ☑	No ☐	

Principal Contractor Details (if applicable)	
Company name (if applicable)	Triton Construction Ltd
Name of Contact for Project	Simon De Wet
Email Address	s.dewet@tritonconstruction.co.uk
Number of site inspections conducted by United Utilities	1

Connection details			
Sewer connection type	Foul		
Foul sewer pipesize diameter	150mm		
Connecting into:	225mm	Existing Sewer Type	Combined
Connecting to asset:	exisiting manhole 2203		
Connection Location	Elizabeth Street Cheetham Hill Manchester M8 8JJ		

Outcome	
Connection status	Satisfactory

Comments
I can confirm that the Foul Sewer connection is SATISFACTORY - 150mm Foul Sewer connecting into the 225mm Combined connected via exisiting manhole 2203 in Elizabeth Street Cheetham Hill Manchester M8 8JJ

Approved: I confirm the sewer connection detailed above has been satifactorily completed and inspected

Developer Services Inspector	Marcus Jones
Date of Inspection	21/11/2023

Appendix C

Hauraton Channel Manufacturers Information

SDS Attenuation Tank Manufacturers Information

Hydro-International Hydro-Brake Manufacturers Information

SPEL Puraceptor Petrol Interceptor Information

DesignSoftware

Project Details

Project Name	Elizabeth Street	Country, Location	Manchester
Reference (Project, Dwg.)		Date	24/08
Company	Triton	Designer	Phil Rosney
Telephone		Email	

HAURATON Details

Contact	Phil Rosney	Design Reference	
Telephone	07946271444	Email	Phil.rosney@hauraton.com

Project Summary

Channel Runs	10	Total Outflow	229.6 l/s
Point Inflows	0	Controlled Outflow	

HAURATON Systems

Channel Type	Channel Run Reference
RECYFIX®MONOTEC	Run 1a, Run 1b, Run 3a, Run 3b
RECYFIX®HICAP®	Run 2a, Run 2b, Run 4a, Run 4b, Run 5, Run 6

Additional Notes

Select grating/cover types and system part numbers from HAURATON's product information.

Product information regarding channel systems is available on HAURATON's website and within the DesignSoftware 'Library' and 'Help' section.

Refer to the Hydraulic Analysis, Materials List and Information datasheets for further details relating to this project design.

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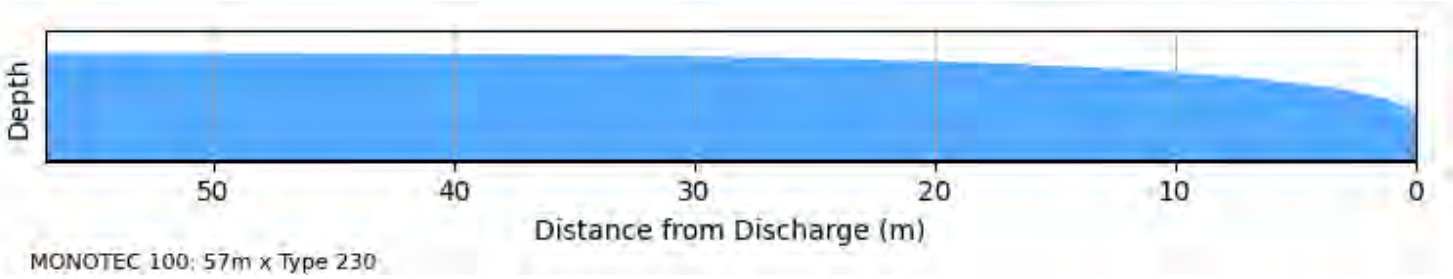
Hydraulic Analysis

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IT'S RUNNING WELL

Project Details

Project Name	Elizabeth Street	Country, Location	Manchester
Reference (Project, Dwg.)		Date	24/08
Company	Triton	Designer	Phil Rosney
Telephone		Email	

Hydraulic Profile



Design & Rainfall Data

Channel Run Ref.	Run 1a	Channel Location	
Channel Length (m)	57	Area Drained(m^2)	130
Surface Type	Asphalt	Run-Off Coefficient	0.9
Longitudinal Slope (%)	0	Pipe Connection	Free Discharge
Loading EN 1433:2002	A15 - D400	Climate Change (%)	
Rainfall	133 mm/h		

Hydraulic Results

Total Outflow (end: l/s)	4.3	*Used Volume (%)	71%
Velocity (end: m/s)	0.7		

Channel Configuration & Dimensions

HAURATON System	Type	Length (m)	Internal Width (mm)	Height (mm)	Invert Depth (mm)
RECYFIX®MONOTEC 100	230	57.0	110	230	213
Total Run Length:		57			

Note 1: Information relating to the headings/data included on this page can be found in the 'Help' file and within the 'Information' datasheet ('Documents' Tab on the Tab Selector Bar)

Note 2: *Used Volume (%) relates to the largest channel unit in the run

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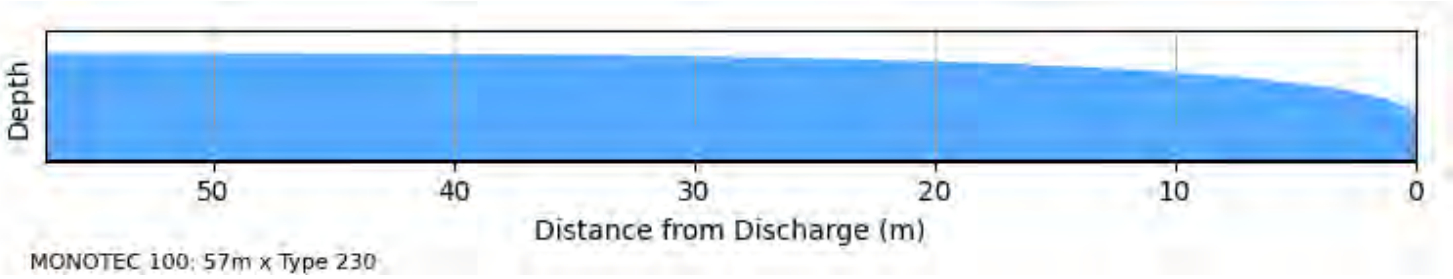
Hydraulic Analysis

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Project Details

Project Name	Elizabeth Street	Country, Location	Manchester
Reference (Project, Dwg.)		Date	24/08
Company	Triton	Designer	Phil Rosney
Telephone		Email	

Hydraulic Profile



Design & Rainfall Data

Channel Run Ref.	Run 1b	Channel Location	
Channel Length (m)	57	Area Drained(m^2)	130
Surface Type	Asphalt	Run-Off Coefficient	0.9
Longitudinal Slope (%)	0	Pipe Connection	Free Discharge
Loading EN 1433:2002	A15 - D400	Climate Change (%)	
Rainfall	133 mm/h		

Hydraulic Results

Total Outflow (end: l/s)	4.3	*Used Volume (%)	71%
Velocity (end: m/s)	0.7		

Channel Configuration & Dimensions

HAURATON System	Type	Length (m)	Internal Width (mm)	Height (mm)	Invert Depth (mm)
RECYFIX®MONOTEC 100	230	57.0	110	230	213
Total Run Length:		57			

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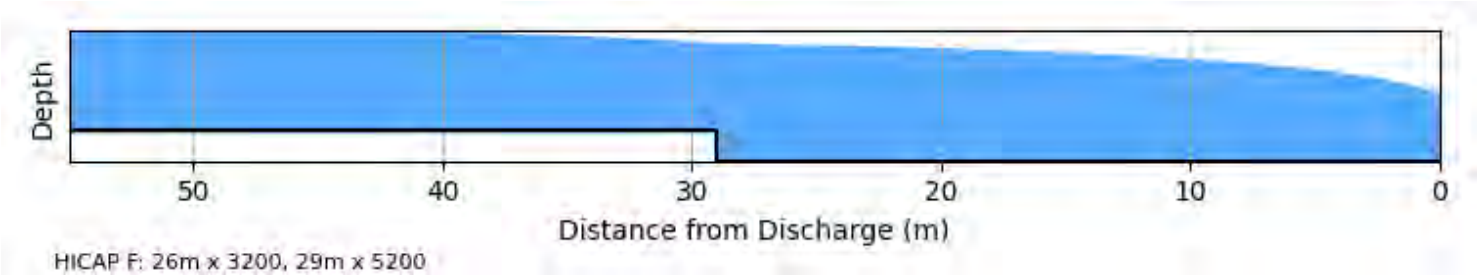
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Project Details

Project Name	Elizabeth Street	Country, Location	Manchester
Reference (Project, Dwg.)		Date	24/08
Company	Triton	Designer	Phil Rosney
Telephone		Email	

Hydraulic Profile



Design & Rainfall Data

Channel Run Ref.	Run 2a	Channel Location	
Channel Length (m)	55	Area Drained(m^2)	1485
Surface Type	Asphalt	Run-Off Coefficient	0.9
Longitudinal Slope (%)	0	Pipe Connection	Free Discharge
Grating Type	Slot 14mm	Slot Opening (mm or mm^2)	14mm
Loading EN 1433:2002	E600 - F900	Climate Change (%)	
Rainfall	133 mm/h		

Hydraulic Results

Total Outflow (end: l/s)	49.3	*Used Volume (%)	69%
Velocity (end: m/s)	1.3	Minimum Freeboard	0.37mm

Channel Configuration & Dimensions

HAURATON System	Part No.	Length (m)	Internal Width (mm)	Height (mm)	Invert Depth (mm)
HICAP F 3200	13225	26	150	580	550
HICAP F 5200	13425	29	200	665	636
Total Run Length:		55			

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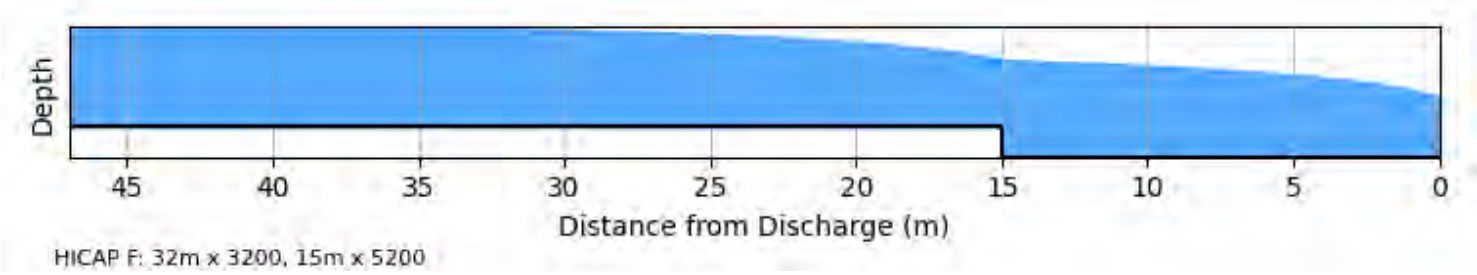
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Hydraulic Analysis

Project Details

Project Name	Elizabeth Street	Country, Location	Manchester
Reference (Project, Dwg.)		Date	24/08
Company	Triton	Designer	Phil Rosney
Telephone		Email	

Hydraulic Profile



Design & Rainfall Data

Channel Run Ref.	Run 2b	Channel Location	
Channel Length (m)	47	Area Drained(m^2)	1270
Surface Type	Asphalt	Run-Off Coefficient	0.9
Longitudinal Slope (%)	0	Pipe Connection	Free Discharge
Grating Type	Slot 14mm	Slot Opening (mm or mm^2)	14mm
Loading EN 1433:2002	E600 - F900	Climate Change (%)	
Rainfall	133 mm/h		

Hydraulic Results

Total Outflow (end: l/s)	42.2	*Used Volume (%)	48%
Velocity (end: m/s)	1.3	Minimum Freeboard	0.39mm

Channel Configuration & Dimensions

HAURATON System	Part No.	Length (m)	Internal Width (mm)	Height (mm)	Invert Depth (mm)
HICAP F 3200	13225	32	150	580	550
HICAP F 5200	13425	15	200	665	636
Total Run Length:		47			

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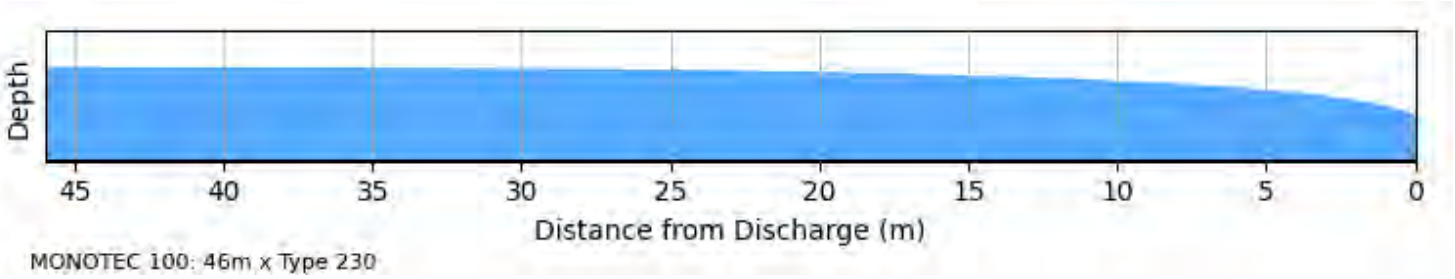
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Hydraulic Analysis

Project Details

Project Name	Elizabeth Street	Country, Location	Manchester
Reference (Project, Dwg.)		Date	24/08
Company	Triton	Designer	Phil Rosney
Telephone		Email	

Hydraulic Profile



Design & Rainfall Data

Channel Run Ref.	Run 3a	Channel Location	
Channel Length (m)	46	Area Drained(m^2)	110
Surface Type	Asphalt	Run-Off Coefficient	0.9
Longitudinal Slope (%)	0	Pipe Connection	Free Discharge
Loading EN 1433:2002	A15 - D400	Climate Change (%)	
Rainfall	133 mm/h		

Hydraulic Results

Total Outflow (end: l/s)	3.7	*Used Volume (%)	55%
Velocity (end: m/s)	0.7		

Channel Configuration & Dimensions

HAURATON System	Type	Length (m)	Internal Width (mm)	Height (mm)	Invert Depth (mm)
RECYFIX®MONOTEC 100	230	46.0	110	230	213
Total Run Length:		46			

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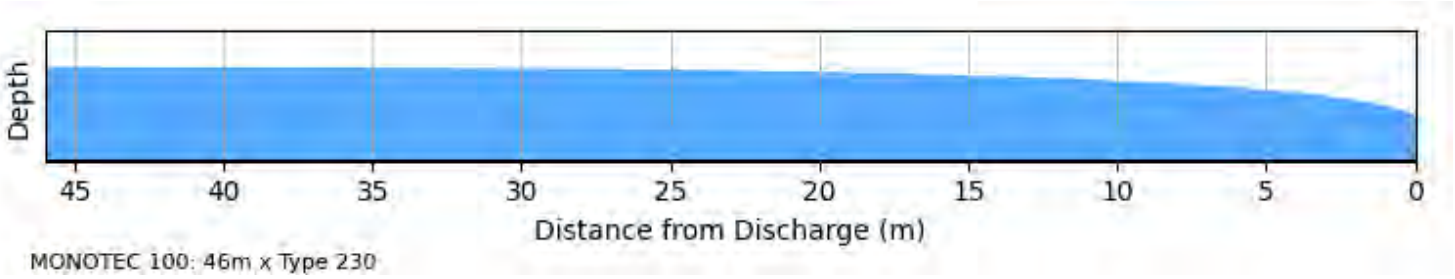
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Project Details

Project Name	Elizabeth Street	Country, Location	Manchester
Reference (Project, Dwg.)		Date	24/08
Company	Triton	Designer	Phil Rosney
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Hydraulic Profile



Design & Rainfall Data

Channel Run Ref.	Run 3b	Channel Location	
Channel Length (m)	46	Area Drained(m^2)	110
Surface Type	Asphalt	Run-Off Coefficient	0.9
Longitudinal Slope (%)	0	Pipe Connection	Free Discharge
Loading EN 1433:2002	A15 - D400	Climate Change (%)	
Rainfall	133 mm/h		

Hydraulic Results

Total Outflow (end: l/s)	3.7	*Used Volume (%)	55%
Velocity (end: m/s)	0.7		

Channel Configuration & Dimensions

HAURATON System	Type	Length (m)	Internal Width (mm)	Height (mm)	Invert Depth (mm)
RECYFIX®MONOTEC 100	230	46.0	110	230	213
Total Run Length:		46			

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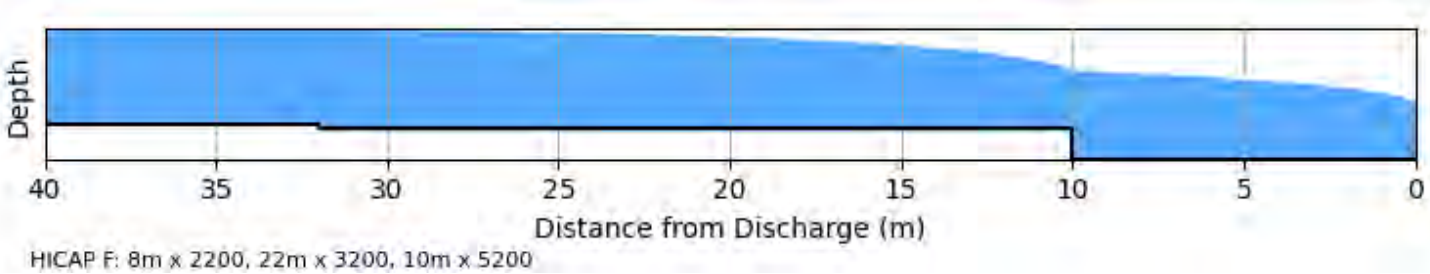
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Project Details

Project Name	Elizabeth Street	Country, Location	Manchester
Reference (Project, Dwg.)		Date	24/08
Company	Triton	Designer	Phil Rosney
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Hydraulic Profile



Design & Rainfall Data

Channel Run Ref.	Run 4a	Channel Location	
Channel Length (m)	40	Area Drained(m^2)	1200
Surface Type	Asphalt	Run-Off Coefficient	0.9
Longitudinal Slope (%)	0	Pipe Connection	Free Discharge
Grating Type	Slot 14mm	Slot Opening (mm or mm^2)	14mm
Loading EN 1433:2002	E600 - F900	Climate Change (%)	
Rainfall	133 mm/h		

Hydraulic Results

Total Outflow (end: l/s)	39.8	*Used Volume (%)	41%
Velocity (end: m/s)	1.3	Minimum Freeboard	0.97mm

Channel Configuration & Dimensions

HAURATON System	Part No.	Length (m)	Internal Width (mm)	Height (mm)	Invert Depth (mm)
HICAP F 2200	13028	8	100	565	535
HICAP F 3200	13225	22	150	580	550
HICAP F 5200	13425	10	200	665	636
Total Run Length:		40			

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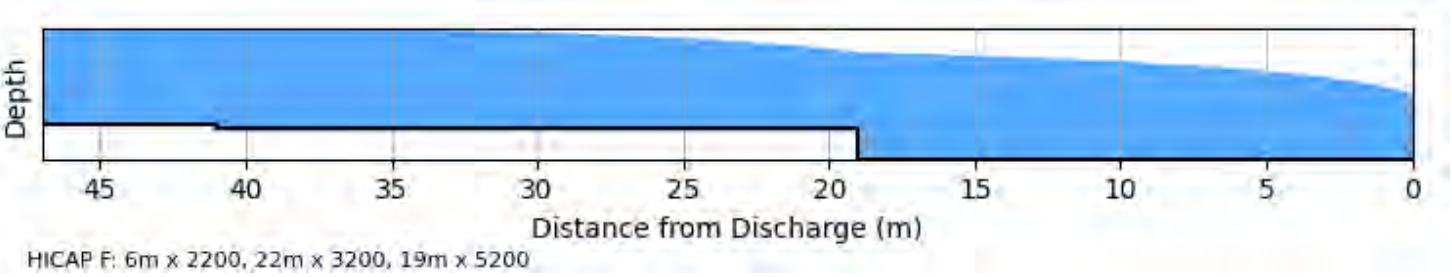
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Project Details

Project Name	Elizabeth Street	Country, Location	Manchester
Reference (Project, Dwg.)		Date	24/08
Company	Triton	Designer	Phil Rosney
Telephone		Email	

Hydraulic Profile



Design & Rainfall Data

Channel Run Ref.	Run 4b	Channel Location	
Channel Length (m)	47	Area Drained(m^2)	1400
Surface Type	Asphalt	Run-Off Coefficient	0.9
Longitudinal Slope (%)	0	Pipe Connection	Free Discharge
Grating Type	Slot 14mm	Slot Opening (mm or mm^2)	14mm
Loading EN 1433:2002	E600 - F900	Climate Change (%)	
Rainfall	133 mm/h		

Hydraulic Results

Total Outflow (end: l/s)	46.5	*Used Volume (%)	57%
Velocity (end: m/s)	1.3	Minimum Freeboard	0.08mm

Channel Configuration & Dimensions

HAURATON System	Part No.	Length (m)	Internal Width (mm)	Height (mm)	Invert Depth (mm)
HICAP F 2200	13028	6	100	565	535
HICAP F 3200	13225	22	150	580	550
HICAP F 5200	13425	19	200	665	636
Total Run Length:		47			

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Note 2: *Used Volume (%) relates to the largest channel unit in the run

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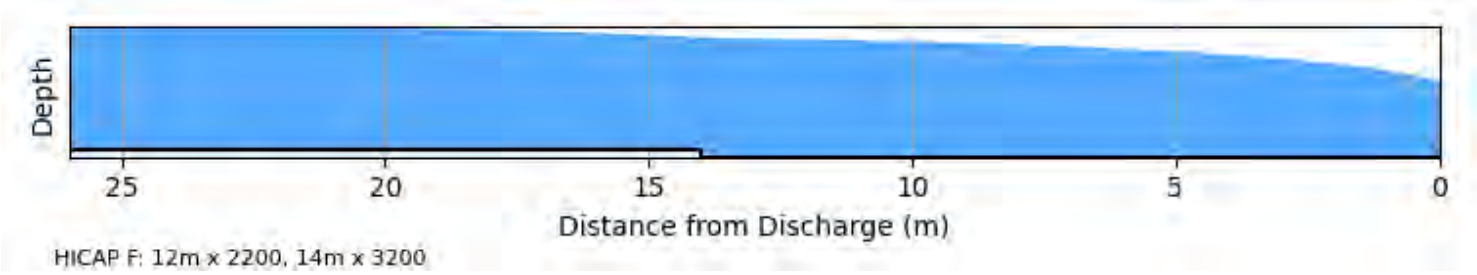
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Hydraulic Analysis

Project Details

Project Name	Elizabeth Street	Country, Location	Manchester
Reference (Project, Dwg.)		Date	24/08
Company	Triton	Designer	Phil Rosney
Telephone		Email	

Hydraulic Profile



Design & Rainfall Data

Channel Run Ref.	Run 5	Channel Location	
Channel Length (m)	26	Area Drained(m^2)	870
Surface Type	Asphalt	Run-Off Coefficient	0.9
Longitudinal Slope (%)	0	Pipe Connection	Free Discharge
Grating Type	Slot 14mm	Slot Opening (mm or mm^2)	14mm
Loading EN 1433:2002	E600 - F900	Climate Change (%)	
Rainfall	133 mm/h		

Hydraulic Results

Total Outflow (end: l/s)	28.9	*Used Volume (%)	72%
Velocity (end: m/s)	1.2	Minimum Freeboard	2.52mm

Channel Configuration & Dimensions

HAURATON System	Part No.	Length (m)	Internal Width (mm)	Height (mm)	Invert Depth (mm)
HICAP F 2200	13028	12	100	565	535
HICAP F 3200	13225	14	150	580	550
Total Run Length:		26			

Note 1: Information relating to the headings/data included on this page can be found in the 'Help' file and within the 'Information' datasheet ('Documents' Tab on the Tab Selector Bar)

Note 2: *Used Volume (%) relates to the largest channel unit in the run

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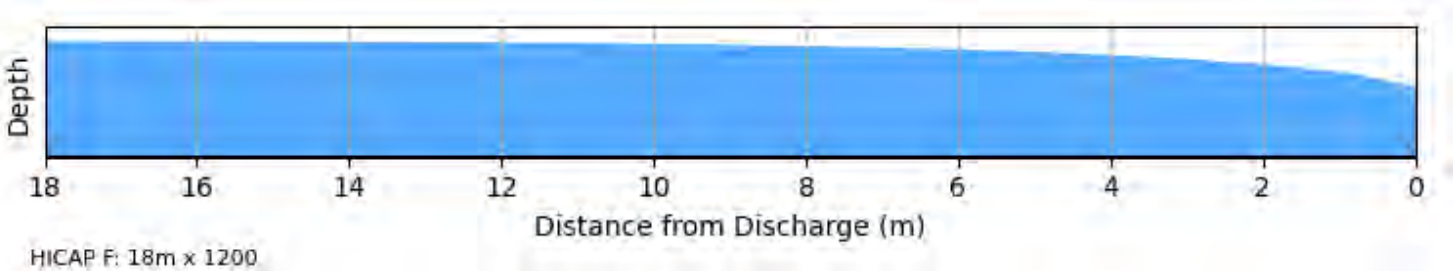
DesignSoftware

Hydraulic Analysis

Project Details

Project Name	Elizabeth Street	Country, Location	Manchester
Reference (Project, Dwg.)		Date	24/08
Company	Triton	Designer	Phil Rosney
Telephone		Email	

Hydraulic Profile



Design & Rainfall Data

Channel Run Ref.	Run 6	Channel Location	
Channel Length (m)	18	Area Drained(m^2)	210
Surface Type	Asphalt	Run-Off Coefficient	0.9
Longitudinal Slope (%)	0	Pipe Connection	Free Discharge
Grating Type	Slot 14mm	Slot Opening (mm or mm^2)	14mm
Loading EN 1433:2002	E600 - F900	Climate Change (%)	
Rainfall	133 mm/h		

Hydraulic Results

Total Outflow (end: l/s)	7.0	*Used Volume (%)	82%
Velocity (end: m/s)	0.9	Minimum Freeboard	20.44mm

Channel Configuration & Dimensions

HAURATON System	Part No.	Length (m)	Internal Width (mm)	Height (mm)	Invert Depth (mm)
HICAP F 1200	13023	18	100	465	434
Total Run Length:		18			

Note 1: Information relating to the headings/data included on this page can be found in the 'Help' file and within the 'Information' datasheet ('Documents' Tab on the Tab Selector Bar)

Note 2: *Used Volume (%) relates to the largest channel unit in the run

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DesignSoftware

Information

Design Formula

The design formula used for this hydraulic analysis is the Modified Manning-Strickler method.

More information regarding this formula and approach can be found in the 'Help' section of the DesignSoftware and on request from HAURATON.

Notes - Hydraulic Analysis Datasheet

Should you require additional assistance in using HAURATON DesignSoftware, please speak with our technical department; contact details below.

Longitudinal Slope - Ground slope along which the channel is laid; not the slope of the catchment area draining towards the channel run. For channels laid along level ground, insert 0%.

Loading (EN1433:2002) - HAURATON systems have been tested for loading and watertightness in accordance with the European Standard EN 1433:2002 'Drainage Channels for Vehicular and Pedestrian Areas'. Refer to HAURATON for further information.

Area Drained - This software assumes a uniform drainage catchment area.

Pipe Connection - This software provides channel sizing and hydraulic calculations on a 'free outflow' basis. The project designer has the responsibility to select the correct pipe connection accessory and pipe diameter to ensure water flow from the channel system is not restricted.

Minimum Freeboard - Minimum distance between the water level (within the channel body) and the channel top.

Used Volume - This data (%) relates to the used volume within the largest channel in the run.

Design Service

HAURATON can provide a comprehensive design service, which is free of charge.

Our approach to project design is to achieve the most cost-effective channel configuration and design solution for the client.

Information is provided on request and includes the following:

- ✔ Hydraulic calculations (datasheets) for each channel run
- ✔ Channel configuration drawings
- ✔ Materials list (parts schedule)
- ✔ Product dimension drawings
- ✔ System installation drawings
- ✔ System installation guide
- ✔ Technical datasheets (product and material)
- ✔ Other product and technical information

Refer to HAURATON should you require a detailed design proposal. We're happy to help.

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DesignSoftware

Information

System Information

HAURATON drainage systems should be installed in accordance with manufacturer's recommendations. Refer to HAURATON for guidance and information regarding installation.

Trench Excavation & Concrete Volume (m^3)

Information regarding total material volume (m^3) to be excavated and total concrete volume (m^3) required for specific channel run installations can be provided by HAURATON on request.

Grating Intake Capacity

Refer to HAURATON product information and our technical department for details regarding intake capacity through system gratings.

Channel Over-Topping & Surface Water Storage

For projects where channel over-topping or water storage on the pavement surface may be considered in order to achieve a more cost-effective drainage design, please contact HAURATON for specific technical support

Catchment Area Design (Area Drained)

HAURATON DesignSoftware assumes a uniform drainage catchment area in relation to the channel run being designed.

The DesignSoftware data provided also assumes that catchment area sizes, and the spacing between multiple channel runs, have been designed within acceptable limits in relation to the channels being modelled.

As the topography and characteristics of a catchment area will be specific to each project, it is the responsibility of the project engineer to determine the catchment area size for each channel run, and the maximum spacing between multiple channel runs within a given area, based on their knowledge, experience and appropriate data related to the project under design.

General Information

DesignSoftware Version: HDSV2.0

HAURATON DesignSoftware and information generated is intended for hydraulic design and specification of HAURATON surface drainage systems only. Use of this software for hydraulic design/specification of third-party drainage systems is not recommended.

The project design team has the responsibility to check and approve hydraulic designs created within HAURATON DesignSoftware and to ensure the channel size and type selected is suitable and adequate for their project requirements. HAURATON cannot be held liable for designs undertaken by users of HAURATON DesignSoftware.

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FASERFIX®, RECYFIX® and RECYFIX®HICAP®F Slot Channel is a registered trade mark of HAURATON GmbH & Co. Kg (Germany).

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Water Infrastructure Systems

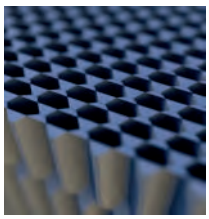
SDS GEOlight®

Stormwater Management System

Product Profile

SDS GEOlight® is an ultra lightweight honeycombed modular structure made from recycled PVC. The ready to install units are preformed to provide an underground stormwater storage facility, for the application of stormwater attenuation or infiltration.

The high void rate (>95%), high compressive strength (to 1000KN/m^2) and low resistance to water flow makes SDS GEOlight® an ideal material for cost efficient and maintainable underground water storage during storm conditions.





SDS GEOlight® Benefits

- High compressive strength – can be located under all roads, car parks and amenity area surfaces.
- Reduced excavation costs – the very high void rate (95%) minimises the required volume of earthworks.
- Speed of installation – 1000m^3 reservoir, completed in one week.
- Light and easy to handle.
- Excellent hydraulic characteristics.
- The honeycomb structure is highly permeable, offering low resistance to water flow.
- SDS GEOlight®'s unique lateral and vertical filling arrangement requires a minimum amount of pipework and stone.
- Depth of tank invert reduced by using patented lateral supply.
- Simplified distribution pipe network, easy maintenance – dispensing with costly and complicated pipework configurations.
- Modular format offers design flexibility to overcome topographical contraints and architectural requirements.
- Greatly reduces the risk of flooding when used as stormwater storage.
- Can also be used for water recycling and combining with irrigation systems.
- Can virtually eliminate pollution when used in combination with specialist separation and filtration technology such as SDS Aqua-Swirl™ and SDS Aqua-Filter™.
- Design service available, including calculations.

APPLICATIONS



RETAIL



INFRASTRUCTURE



INDUSTRIAL



RESIDENTIAL



COMMERCIAL



PUBLIC SECTOR

SDS Ltd, Clearwater House, Castlemills, Biddisham, Somerset, BS26 2RE

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E: info@sdslimited.com





SDS GEOlight® 400	SDS GEOlight® 600	SDS GEOlight® 800
APPLICATIONS		
Stormwater Management		
Attenuation / Infiltration		
Bacterial filter-bed for biological treatment		
Hydrocarbon Separation		
Filtration and Separation Units		
SPECIFICATIONS		
Material	Recycled Rigid PVC	
Colour	Dark grey to black	
Standard length of a block	2000 mm	2000 mm	2000 mm
Standard width of a block	500 mm	500 mm	500 mm
Standard height of a block*	750 mm	750 mm	750 mm
	*Other block sizes available on request		
Void Ratio	> 95%	> 95%	> 95%
Compressive Strength	420 kN/m²	610 kN/m²	800 kN/m²
ADVANTAGES		
Highly cost effective		
Reduced excavation costs		
High void capacity		
Good UV resistance		
Good hydrocarbon resistance		



GEO DS/1021

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SDS Structural Design Calculations

Elizabeth Street, Cheetham Hill

E/1445/22

23/08/23

Version 2

1 Introduction

This is a report showing the structural analysis of a geocellular modular drainage tank for the new proposed Elizabeth Street, Cheetham Hill.

ATT Tank 1 1.125m deep 481m^3 tank is to be installed.

ATT Tank 2 0.750m deep 528m^3 tank is to be installed.

Tank loading is calculated using DIN 1072 loading classification 60/30.

Assumptions:

- Pressure from point load of tyre disperses at an angle of 26°.
- Shear angle of resistance taken as 38°.
- Soil/ fill density of 19kNm^3.
- Maximum and minimum cover depths;

ATT Tank 1 of 1.365m and 0.885m respectively.

ATT Tank 2 of 0.960m and 0.680m respectively.

2 Design information

Calculations are based on the following design information:

Site Levels and tank dimensions	*E144522_01 - ATT1 - Elizabeth Street, Cheetham Hill* *E144522_02 - ATT2 - Elizabeth Street, Cheetham Hill*
Loading	*CIRIA C680 – Table 4.2 Characteristic loads for different land use 2008*
Factors	*CIRIA C680 – Table 4.5 Partial load factors (based on EN 1997-1:2004) 2008*

3 Design equations

3.1 Vertical pressure equations:

Vertical loading takes account of permanent loading from cover backfill *c* according to (3.1), variable load from vehicles etc (surcharge) *q* and accidental loading from HGVs (point) *w*. Pressure from HGV assumes a 26° distribution, from point of application. Load due to depth of cover over tank is given by equation (3.1)

$$c = \gamma.z \tag{3.1}$$

where γ is soil density and z the cover depth. Therefore design vertical pressure given by:

$$\sigma_{v,d} = c.\lambda + q.\lambda + w.\lambda \tag{3.2}$$

where λ are appropriate the load factors.

3.2 Lateral pressure equations:

Lateral pressures calculated using the coefficient of lateral earth pressure and vertical pressure resulting from permanent backfill and variable surcharge. Maximum pressure taken at 200mm above the base of tank.

$$\sigma_{h,d} = \{K_a(q + \gamma h)\} \times \lambda \tag{3.3}$$

where K_a is the coefficient of lateral earth pressure given by equation (3.4), h is the reference depth at which the lateral pressure is ascertained. Again λ is the factor of safety.

$$K_a = \frac{1 - \sin\phi}{1 + \sin\phi} \tag{3.4}$$

where ϕ is the angle of shear resistance.

4 Design calculation spreadsheets

ATT Tank 1

Proposal number:	E/1445/22
Date:	23/08/2023

Job Name:	Elizabeth Street, Cheethar
Author:	JC

Site Elevations (m)		
Ground Level AOD	Max	56.490
	Min	56.010
Tank Level	Top	55.125
	Bottom	54.000
Cover Depth, z	Max, z_{max}	1.365
	Min, z_{min}	0.885

Soil/Fill Characteristics	
γ (kNm^{-3})	19.00
ϕ (°)	38.00

VERTICAL

Area Due To Spread Of Point Load, A (m^2)		
Spread angle (degrees)		26.00
A (z_{max})		2.96
A (z_{min})		1.56

Load Area (m.m)	
0.20	0.60

Loading Case (Din 1072)		60/30.
Surcharge, q	10.00	kNm^{-2}
Cover Fill, c Max/Min [γ.z]	25.94	kNm^{-2}
	16.82	kNm^{-2}
Point, w	100.00	kN

Factors, λ	
Surcharge	1.50
Cover	1.35
Point	1.50

Factored Vertical Loading, (kNm^{-2})	
Surcharge [q_d=q.λ]	15.00
Cover [c_d=c.λ]	35.01
	22.70
Point [w_d=(w/A).λ]	50.71
	96.41

Design Vertical Loading, $\sigma_{v,d}$		
$\sigma_{v,d,}(z_{max})$	100.72	kNm^{-2}
$\sigma_{v,d,}(z_{min})$	134.11	

LATERAL

Reference Depth	
h (m)	2.29

ϕ (rad)	0.66
k_a [1-sinϕ/ 1+sinϕ]	0.24

Loading Case (Din 1072)		60/30.
Surcharge, q	10.00	kNm^{-2}
Cover, c [γ.h]	43.51	kNm^{-2}

Factors, λ	
Lateral	1.35
Variable	1.50

Factored Lateral Loading, (kNm^{-2})	
Surcharge [q_d=k_a.q.λ]	3.57
Cover Fill [c_d=k_a.c.λ]	13.97

Design Lateral Loading, $\sigma_{l,d}$		
$\sigma_{l,d,}(z_{max})$	17.54	kNm^{-2}

ATT Tank 2

Proposal number:	E/1445/22
Date:	23/08/2023

Job Name:	Elizabeth Street, Cheethar
Author:	JC

Site Elevations (m)		
Ground Level AOD	Max	55.870
	Min	55.590
Tank Level	Top	54.910
	Bottom	54.160
Cover Depth, z	Max, z_{max}	0.960
	Min, z_{min}	0.680

Soil/Fill Characteristics	
γ (kNm^{-3})	19.00
ϕ (°)	38.00

VERTICAL

Area Due To Spread Of Point Load, A (m^2)		
Spread angle (degrees)		26.00
A (z_{max})		1.75
A (z_{min})		1.09

Load Area (m.m)	
0.20	0.60

Loading Case (Din 1072)		60/30.
Surcharge, q	10.00	kNm^{-2}
Cover Fill, c Max/Min [γ.z]	18.24	kNm^{-2}
	12.92	kNm^{-2}
Point, w	100.00	kN

Factors, λ	
Surcharge	1.50
Cover	1.35
Point	1.50

Factored Vertical Loading, (kNm^{-2})	
Surcharge [q_d=q.λ]	15.00
Cover [c_d=c.λ]	24.62
	17.44
Point [w_d=(w/A).λ]	85.91
	137.53

Design Vertical Loading, $\sigma_{v,d}$		
$\sigma_{v,d,}(z_{max})$	125.53	kNm^{-2}
$\sigma_{v,d,}(z_{min})$	169.98	

LATERAL

Reference Depth	
h (m)	1.51

ϕ (rad)	0.66
k_a [1-sinϕ/ 1+sinϕ]	0.24

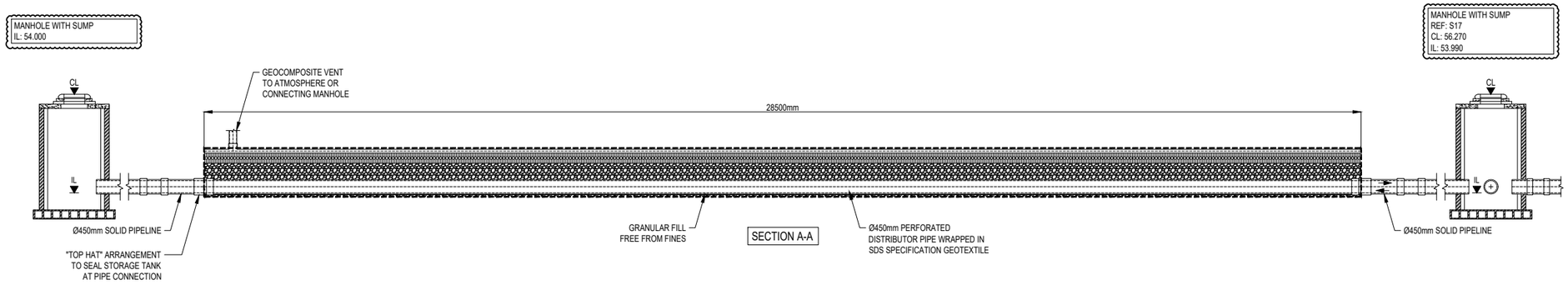
Loading Case (Din 1072)		60/30.
Surcharge, q	10.00	kNm^{-2}
Cover, c [γ.h]	28.69	kNm^{-2}

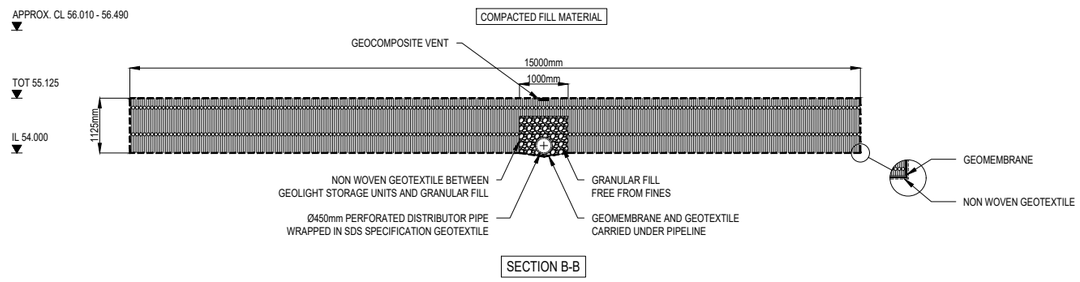
Factors, λ	
Lateral	1.35
Variable	1.50

Factored Lateral Loading, (kNm^{-2})	
Surcharge [q_d=k_a.q.λ]	3.57
Cover Fill [c_d=k_a.c.λ]	9.21

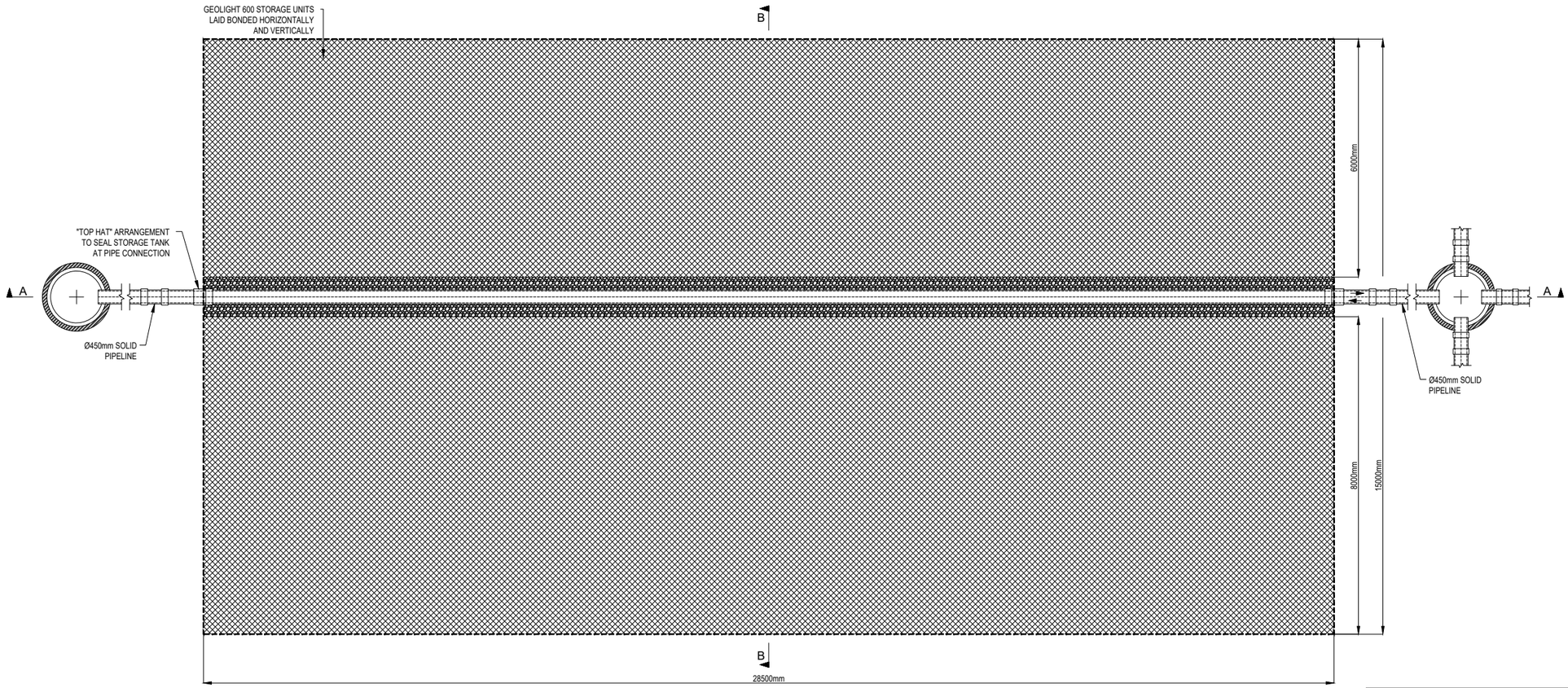
Design Lateral Loading, $\sigma_{l,d}$		
$\sigma_{l,d,}(z_{max})$	12.78	kNm^{-2}

CONSTRUCTION





SECTION B-B



REFERENCE DRAWINGS:

Drawing Number	Revision	Drawing Title	Date
080139-CUR-XX-XX-D-C-92500	C01	PROPOSED DRAINAGE LAYOUT	-

Notes:

This Drawing is to be read in conjunction with all relevant Architect's Engineer's and specialists' drawings and specifications.

Do not scale from this drawing in either paper or digital form. Use written dimensions only.

SDS to leave solid stub only, exiting tank for connection by others.

All external Manholes, Access Points, Junctions & Pipe are shown for guidance only and not part of the SDS program unless otherwise agreed.

Rev	Comments	Date	DRW	CHK
-	ISSUED FOR CONSTRUCTION	22.08.23	CG	SP
B	MANHOLE UPDATE ISSUED FOR APPROVAL	22.08.23	CG	SP
A	REDESIGN AS PER LATEST DWG ISSUED FOR APPROVAL	17.08.23	CG	RJ
-	ISSUED FOR APPROVAL	10.07.23	CG	SP

Water Infrastructure Systems

Clearwater House
Castlemills
Biddisham
Somerset
BS26 2RE
+44 (0)1934 751303

sdslimited.com

Project: ELIZABETH STREET
CHEETHAM HILL

Client: TRITON CONSTRUCTION

Title: ATTENUATION TANK 1 DETAIL

Scale: NTS | Date: 10.07.23

Drawing No: E144522_01 | Rev: B

Delivery Note

Delivery Note No. **SH-028476**
Delivery Note Date **15/02/24**

Invoice To:

James Burrell Ltd Gateshead
Deptford Road, Gateshead
Tyne & Wear
Gateshead
NE8 2BR
United Kingdom

Deliver To:

Simon 07572 433173
Triton Construction Ltd
Elizabeth Street
Cheetham Hill
Manchester
M8 8JJ
United Kingdom

Account No CUS-000322
Order No. SOR-027303
Customer Ref. OP 153465
Hydro Ref. 22_21_6233 Elizabeth Street Cheetham Hill

Item No.	Description	Qty	Unit of Measure
PQT1410.SHE	Manhole ref: S25 Hydro-Brake®Optimum Type HBO-SHE Product Code: SHE-0148-1100-1300-1100 Design Objective: Minimise upstream storage Design Flow = 11l/s; Design Head = 1.3m BBA Approved (08/4596 Product Sheet 1) WRc Approved (PT/329/0412) 3 mm thick Stainless Steel Grade 304L Designed to suit a minimum 225 mm outlet pipe and a minimum 1200 mm chamber Complete with: CurvedMountingPlate; Fixed Inlet an d Pivoting Bypass Door To Suit 225mm outlet pipe Hydro-Brake to be supplied with 3.5m Stainless Ste el bypass rope	1	Each

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.300	11.000
Flush-Flo™	0.386	10.998
Kick-Flo®	0.836	8.932
Mean Flow		9.537

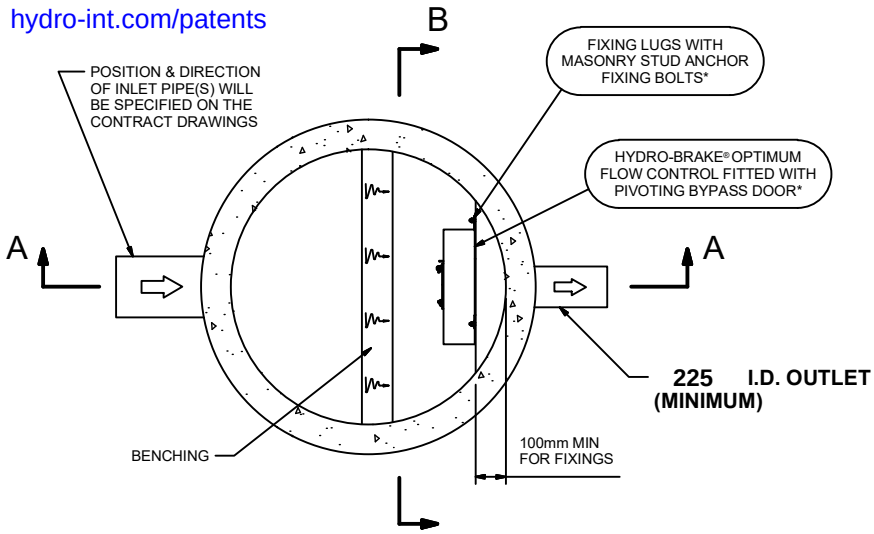
Hydro-Brake® Optimum Flow Control including:

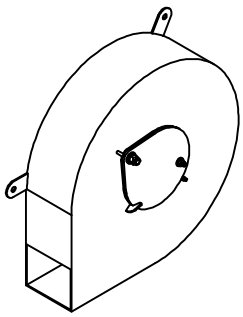
- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet
- Indicative Weight: 30 kg

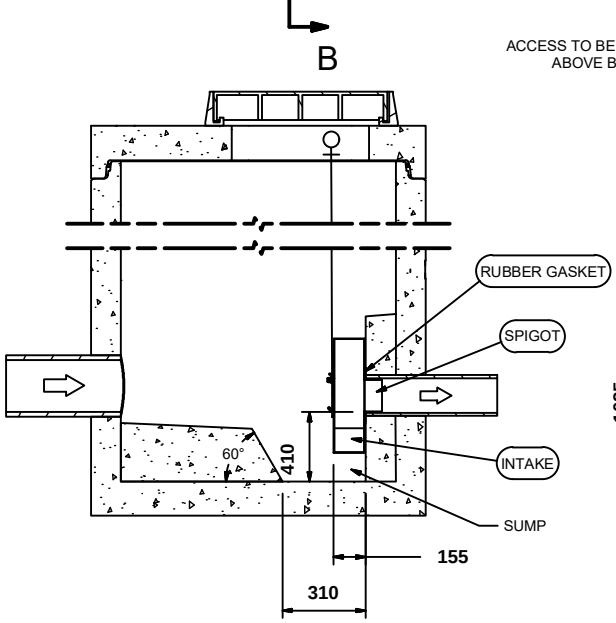
BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE 08/4596

wrc approved PT/503/0422

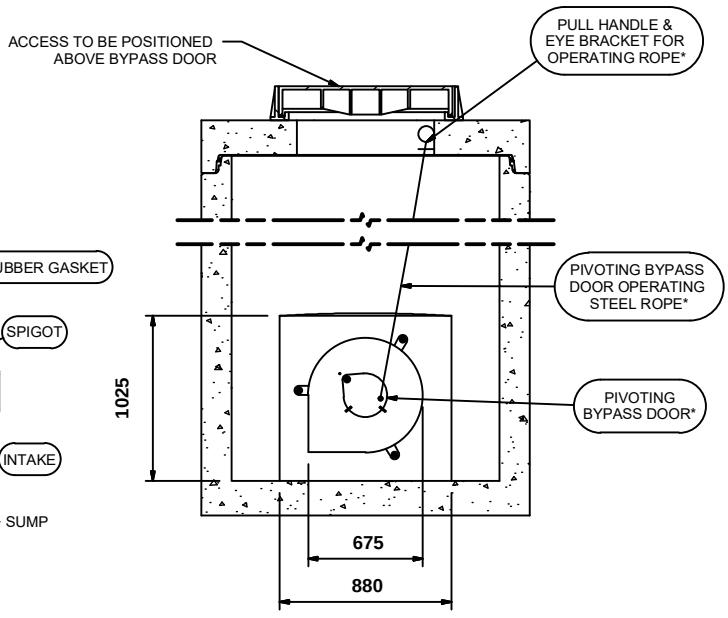
hydro-int.com/patents







SECTION A-A



SECTION B-B

IMPORTANT: (oval) LIMIT OF HYDRO INTERNATIONAL SUPPLY
THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS
* WHERE SUPPLIED
HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE

The head/flow characteristics of this SHE-0148-1100-1300-1100 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro International®

DATE	03/08/2023 22:30
SITE	Elizabeth Street
DESIGNER	Chloe Grimsley
REF	080139

SHE-0148-1100-1300-1100
Hydro-Brake® Optimum

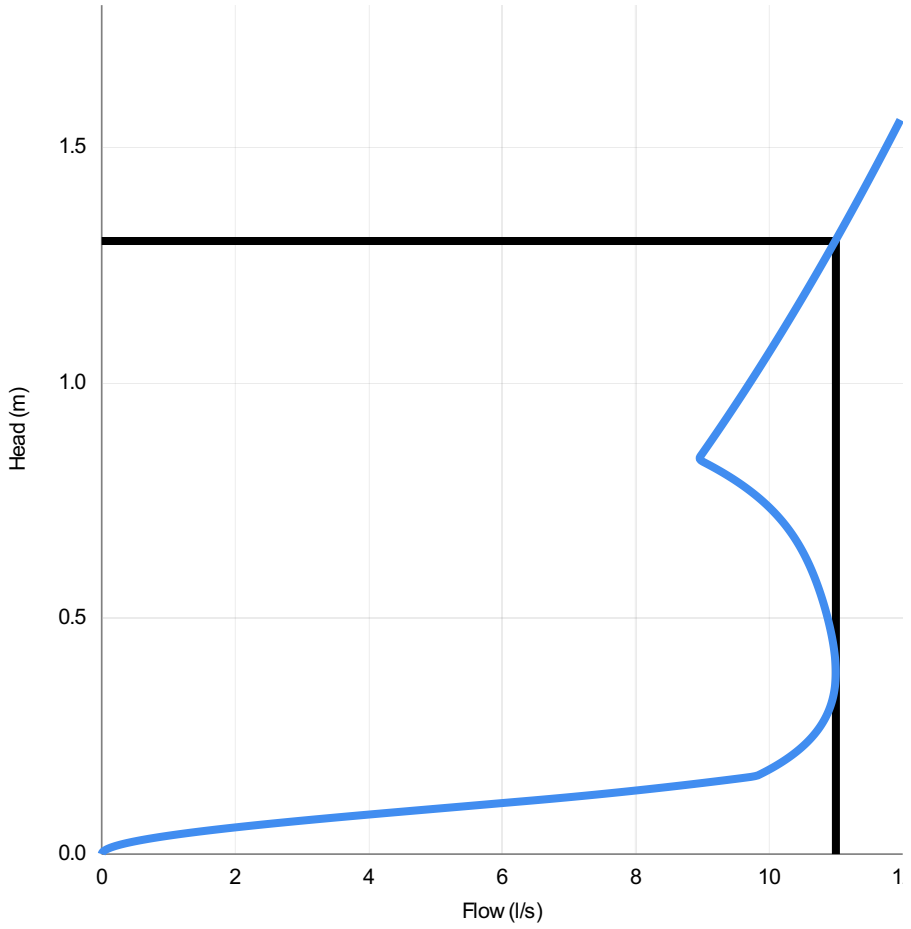
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chloe.grimsley@curtins.com

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.300	11.000
Flush-Flo	0.386	10.998
Kick-Flo®	0.836	8.932
Mean Flow		9.537

hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.045	1.297
0.090	4.469
0.134	7.977
0.179	10.001
0.224	10.469
0.269	10.757
0.314	10.918
0.359	10.988
0.403	10.994
0.448	10.956
0.493	10.890
0.538	10.801
0.583	10.691
0.628	10.553
0.672	10.371
0.717	10.125
0.762	9.787
0.807	9.329
0.852	9.010
0.897	9.229
0.941	9.443
0.986	9.651
1.031	9.854
1.076	10.053
1.121	10.248
1.166	10.439
1.210	10.626
1.255	10.809
1.300	10.989

DESIGN ADVICE

The head/flow characteristics of this SHE-0148-1100-1300-1100 Hydro-Brake Optimum® Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

! **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**

DATE	03/08/2023 22:30
Site	Elizabeth Street
DESIGNER	Chloe Grimsley
Ref	080139

SHE-0148-1100-1300-1100

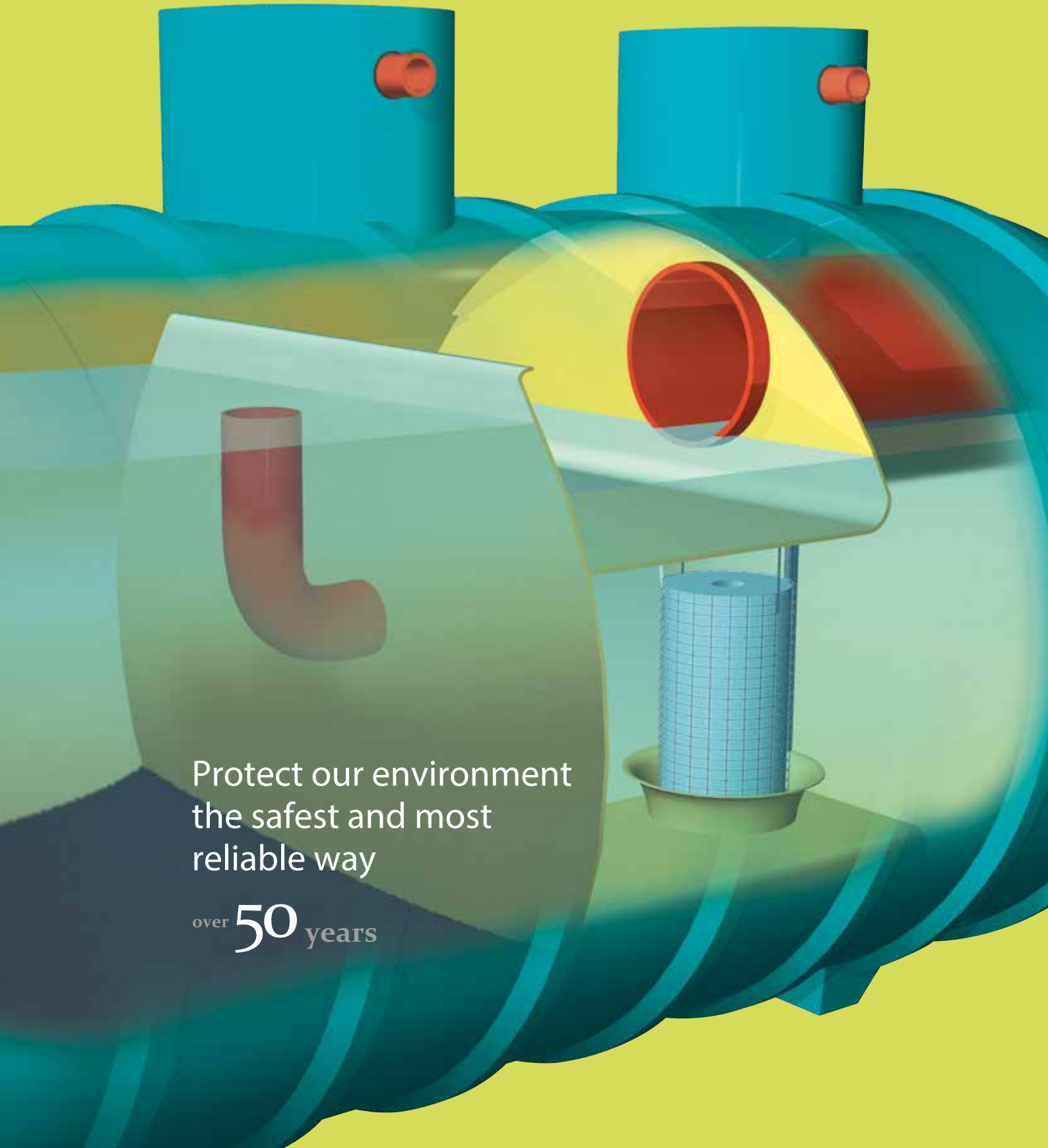
Hydro-Brake Optimum®

© 2018 Hydro International, Rivermead Court, Kenn Business Park, Windmill Road, Kenn, Clevedon, BS21 6FT. Tel 01275 878371 Fax 01275 874979 Web www.hydro-int.com Email designtools@hydro-int.com

SPEL

Fuel/oil Separators

Quality, high performance light liquid separators



Protect our environment
the safest and most
reliable way

over 50 years

Quality Assured Company BS EN ISO 9001:2008 Design & Manufacture





Protects our environment reliably and efficiently



Leaks and spillages of oil and fuel are washed down drains every time it rains and, unless intercepted, find their way into water courses, polluting reservoirs and rivers. This can have a disastrous effect on plants and wildlife

The extensive range of SPEL Separators are for incorporating into surface water drainage systems to separate out the hydrocarbons as required by the Environment Agency's Pollution Prevention Guidelines PPG 3.

Performance

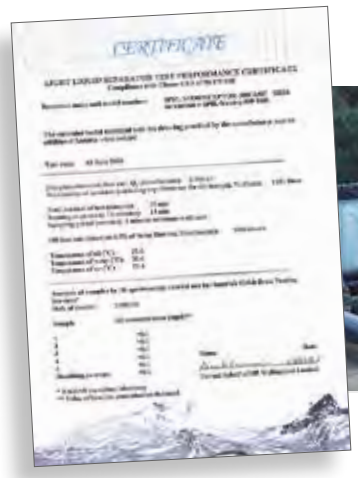
The performance of fuel/oil separators is critical and must pass the standard test procedure as laid down in the European Standard BS EN 858-1 2002.

SPEL Separators have been tested at the Hydraulics Research Station – H R Wallingford, to this stringent test procedure with exceptional results. The average result was 0.67mg/l in the effluent discharge, well within the required 5mg/l.

Design & Manufacturing

SPEL Separators are designed and manufactured in reinforced plastic (GRP) to a very high specification utilising the latest 'state of the art' filament winding operation, computer controlled end dome and robotic spray up machines that ensure consistency of quality and production efficiency.

- Tank shells are designed and manufactured in accordance with BS 4994
- Carry a 25 year shell Warranty
- Life expectancy in excess of 50 years
- Internal corrosion barrier and external 'flow coat' water penetration barrier
- Rigid quality assurance procedures – independently audited


CERTIFICATE



Tests being carried out at HR Wallingford, for obtaining 'Light Liquid Separator Test Performance' certificates. The average hydrocarbon concentration measured for all SPEL Separators tested was 0.67mg/l and well within the required 5mg/l.

To view an enlarged certificate visit our website www.spelproducts.co.uk

SPEL coalescer unit; the 'HEART' of the separation process

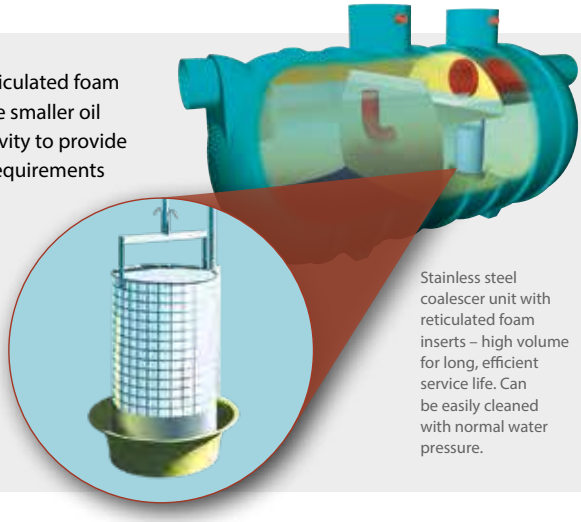
SPEL coalescer unit

The unit comprises a stainless steel holder with lifting handle and a foam insert. It is the essential part of the Class 1 separators.

The highly efficient large volume reticulated foam insert facilitates the coalescing of the smaller oil globules and their separation by gravity to provide a discharge quality well within the requirements of the European standard.

The high volume of the inserts safeguard against blockages due to silt and ensures a long life between servicing.

The inserts are easily cleaned using normal pressure water and rarely require replacement.



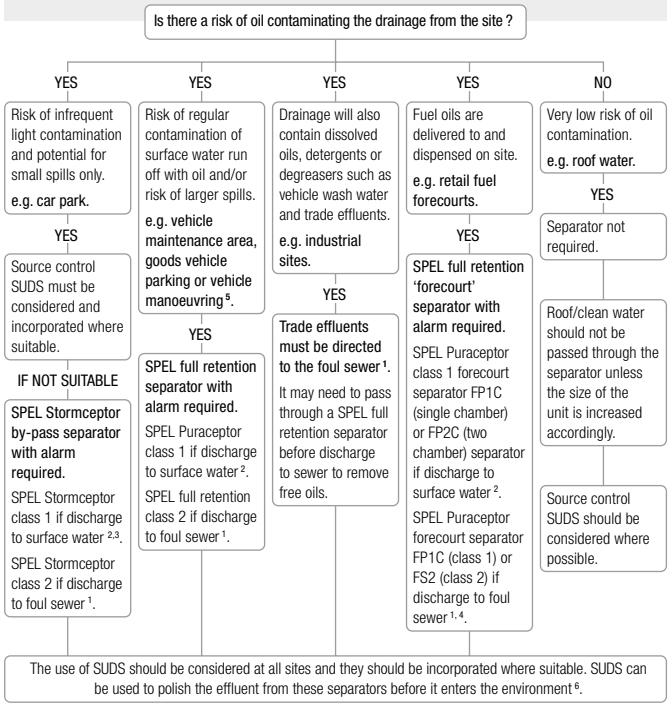
Stainless steel coalescer unit with reticulated foam inserts – high volume for long, efficient service life. Can be easily cleaned with normal water pressure.

SPEL Separator range overview and how to select

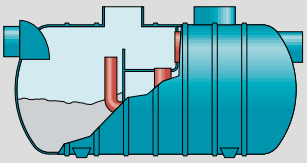
How to select and specify to the Environment Agency's Pollution Prevention Guidelines PPG3

Notes to accompany the flowchart:

1. You must seek prior permission from your local sewer provider before you decide which separator to install and before you make any discharge.
2. You must seek prior permission from the Environment Agency before you decide which separator to install.
3. In this case, if it is considered that there is a low risk of pollution a source control SUDS scheme may be appropriate.
4. In certain circumstances, the sewer provider may require a class 1 separator for discharges to sewer to prevent explosive atmospheres from being generated.
5. Drainage from higher risk areas such as vehicle maintenance yards and goods vehicle parking areas should be connected to foul sewer in preference to surface water.
6. In certain circumstances, a separator may be one of the devices used in the SUDS scheme. Ask the Environment Agency for advice.



SPEL Stormceptor® class 1 by-pass separators



SC – with silt capacity.

Typical sites

Infrequent light contamination – potential for small spills only eg. car parks.

Note: class 2 available if connection to foul sewer.

General description

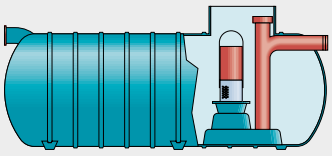
SPEL Stormceptors are the most widely used separators where it is acceptable to treat the 'first flush' ie. flows according to the nominal size (NSB) generated by rainfall rates of up to 6.5mm/hour. This covers most rainfall events in the UK. Any excess rainfall is by-passed without treatment.

Features

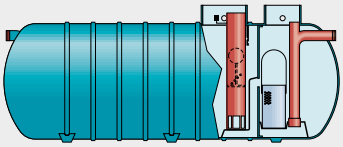
- Long life efficient coalescer units.
- Good access to all parts for desludging.
- Nine different inlet/outlet orientations to suit site drainage lay-out.

The SPEL Stormceptor was the first Environment Agency listed class 1 by-pass separator to BS EN 858-1:2002 (2001)

SPEL Puraceptor® class 1 full retention separators – single and two chamber models



Single chamber models – for full range see page 7



Two chamber models – for full range see page 8

Typical sites single chamber

Fuel storage and handling areas, filling stations, commercial vehicle/plant and contaminated industrial areas.

General description

The SPEL Puraceptor models are designed for high performance and long service life between maintenance periods.

The Puraceptor is available in two versions, single or two chamber, dependent upon the site application and requirements.

An automatic closure device (ACD) is fitted to close off the separator when the contained oil exceeds the maximum oil storage volume.

Features

- Good access to all parts for desludging.
- One access shaft for desludging and servicing of ACD and coalescer unit.
- Sized for working capacity PLUS fuel/oil and silt containment, ensuring optimum performance between maintenance periods.

Typical sites two chamber

High risk fuel storage areas, filling stations, railway fuelling and maintenance depots, fire training grounds etc.

Additional features

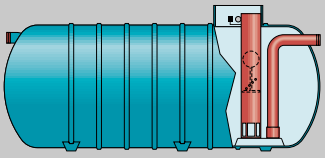
This is the model to cope with heavy levels of pollutants and silt.

The coalescer unit is mounted in the second chamber, providing a coalescence process for the separation of smaller globules of light liquid pollutants before final discharge to the surface water drain.

Being incorporated in the second chamber prevents blockage of the coalescer insert in the event of heavy spillages or heavy silt content in surface water. It can be simply lifted out for cleaning during routine maintenance.

The second access shaft provides easier access for desludging and maintenance of the coalescer.

SPEL full retention class 2 separators



Typical sites

Where risk of regular contamination of surface water run-off with discharge to foul sewer.

SPEL Stormceptor by-pass separators

When you look into SPEL tanks you can see the difference

The SPEL Stormceptor was the first Environment Agency's listed class 1 by-pass separator to BS EN 858-1:2002 (2001).

SPEL Stormceptor by-pass separators are being used effectively throughout the UK and abroad, since 1985. All sizes and types of development have been catered for, including industrial development sites, hypermarkets and airports. Areas of up to 55 hectares can be covered with a single unit.

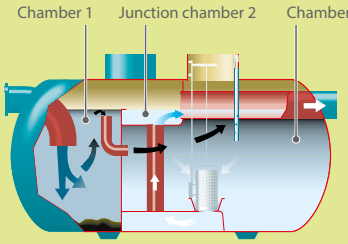
Features

- Long life efficient coalescer units.
- Good access to all parts for desludging.
- Nine different inlet/outlet orientations to suit site drainage layout.

Performance

The Stormceptor tests at the hydraulics research establishment, HR Wallingford, achieved an average of 0.67mg/l, well within the 5mg/l required by the European Standard BS EN 858-1.

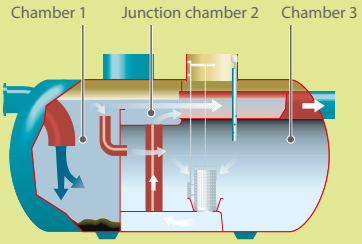
How does the SPEL Stormceptor class 1 by-pass separator operate?



Flow according to nominal size (NSB)

The polluted surface water first enters the primary chamber where silt settles out and is retained. The fuel, oil and other pollutants lighter than water, rise to the surface and are efficiently skimmed off and transferred to the separation chamber.

All flows within the nominal size pass through the separation chamber, where the quiescent conditions allow the pollutants to separate out efficiently. Water from the cleanest zone in the separation chamber flows through a coalescer unit, to remove smaller globules of oil, up to the junction chamber and thence to the outlet.



Storm flows above NSB

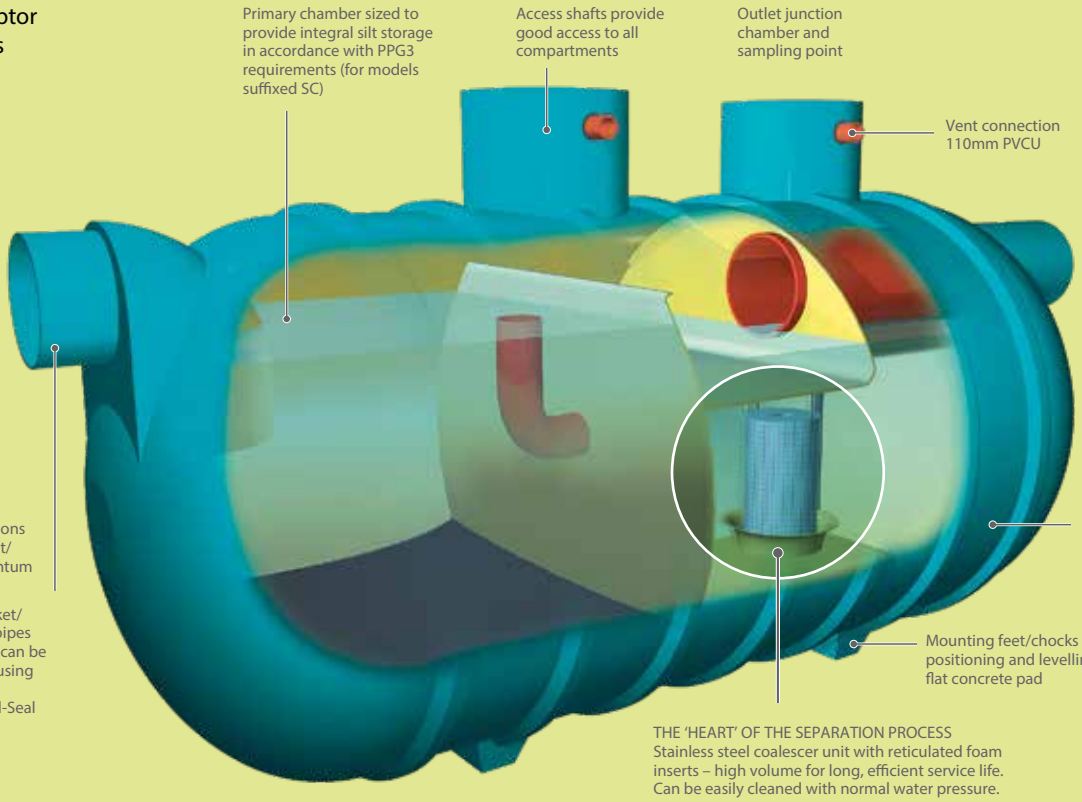
During a storm the level in the primary chamber rises and the stormwater passes over the weir into the junction chamber and to the outlet.

The design keeps the turbulence within the separation chamber to a minimum which avoids disturbing the contaminants retained.

Wide and comprehensive range from NSB 3 – 1000



SPEL Stormceptor class 1 by-pass separator



SPEL Stormceptor class 1 by-pass separators

Compliant to the European Standard BS EN 858-1:2002, the Environment Agency's Pollution Prevention Guidelines PPG3 and the Construction Products Regulations

Model	Nominal size (NSB) Flow (l/s)	Peak flow (l/s)	Catchment drainage area (m²) / Hectares	Oil storage litres NSBx15	Silt** storage litres NSBx100	*Overall length (mm) L	*Overall diameter (mm) W	Inlet Invert (mm) A	Base to Inlet (mm) B	Base to outlet (mm) C	Max in/out pipe diameter (mm) for orientation type A-C	type D-I	Number of access shafts (dia. mm) 450	600	750	900
103 C1/SC	3	30	1,667	45	300	1,550	1,300	500	1,015	965	160	160	2	-	-	-
204 C1/SC	4	40	2,222	60	400	1,860	1,225	550	1,350	1,300	300	300	-	1	1	-
206 C1/SC	6	60	3,333	90	600	2,120	1,225	550*	1,350	1,300	300	300	-	1	1	-
208 C1/SC	8	80	4,444	120	800	2,270	1,225	550*	1,350	1,300	300	300	-	1	1	-
210 C1/SC	10	100	5,556	150	1,000	2,920	1,225	550*	1,350	1,300	300	300	-	1	1	-
212 C1/SC	12	120	6,667	180	1,200	3,570	1,225	550*	1,350	1,300	300	300	-	1	1	-
215 C1/SC	15	150	8,333	225	1,500	4,237	1,225	550*	1,350	1,300	400	400	-	1	1	-
320 C1/SC	20	200	11,111	300	2,000	3,200	1,875	700	1,450	1,350	450	600	-	2	-	-
325 C1/SC	25	250	13,889	375	2,500	3,540	1,875	700	1,450	1,350	450	600	-	2	-	-
330 C1/SC	30	300	16,667	450	3,000	4,420	1,875	700	1,450	1,350	450	600	-	-	1	1
340 C1/SC	40	400	22,222	600	4,000	5,760	1,875	740	1,410	1,310	450	600	-	1	1	-
345 C1/SC	45	450	25,000	675	4,500	6,570	1,875	740	1,410	1,310	450	600	-	1	1	-
350 C1/SC	50	500	27,778	750	5,000	7,060	1,875	740	1,410	1,310	450	600	-	1	1	-
460 C1/SC	60	600	33,333	900	6,000	4,400	2,700	950	2,100	2,000	600	750	-	1	-	1
470 C1/SC	70	700	38,889	1,050	7,000	5,250	2,700	950	2,100	2,000	600	750	-	1	-	1
480 C1/SC	80	800	44,444	1,200	8,000	6,170	2,700	950	2,100	2,000	600	750	-	1	-	1
4100 C1/SC	100	1,000	55,556	1,500	10,000	7,400	2,700	1,100	1,950	1,850	750	900	-	1	-	1
4125 C1/SC	125	1,250	69,444	1,875	12,500	9,050	2,700	1,100	1,950	1,850	750	900	-	1	-	1
4150 C1/SC	150	1,500	83,333	2,250	15,000	9,950	2,700	1,100	1,950	1,850	750	900	-	-	-	2
4160 C1/SC	160	1,600	88,889	2,400	16,000	11,830	2,700	1,250	1,800	1,700	750	900	-	1	1	1
5180 C1/SC	180	1,800	10	2,700	18,000	7,470	3,650	1,185	2,690	2,475	900	900				
5200 C1/SC	200	2,000	11.1	3,000	20,000	8,530	3,650	1,185	2,690	2,280	1,200	1,200				
5250 C1/SC	250	2,500	13.9	3,750	25,000	10,040	3,650	1,185	2,690	2,280	1,200	1,200				
6300 C1/SC	300	3,000	16.7	4,500	30,000	10,310	4,150	1,325	2,850	2,600	1,200	1,200				
6350 C1/SC	350	3,500	19.4	5,250	35,000	11,470	4,150	1,325	2,850	2,600	1,200	1,200				
6400 C1/SC	400	4,000	22.2	6,000	40,000	12,690	4,150	1,325	2,850	2,600	1,200	1,200				
6500 C1/SC	500	5,000	27.8	7,500	50,000	15,870	4,150	1,325	2,850	2,600	1,200	1,200				
6600 C1/SC	600	6,000	33.3	9,000	60,000	18,260	4,150	1,325	2,850	2,600	1,200	1,200				
6700 C1/SC	700	7,000	38.9	10,500	70,000	22,250	4,150	1,325	2,850	2,600	1,200	1,200				
6500/C1	500	5,000	27.8	7,500	Nil	11,910	4,150	1,325	2,850	2,600	1,200	1,200				
6600/C1	600	6,000	33.3	9,000	Nil	13,510	4,150	1,325	2,850	2,600	1,200	1,200				
6700/C1	700	7,000	38.9	10,500	Nil	16,650	4,150	1,325	2,850	2,600	1,200	1,200				
6750/C1	750	7,500	41.7	11,250	Nil	18,260	4,150	1,325	2,850	2,600	1,200	1,200				
6800/C1	800	8,000	44.4	12,000	Nil	19,890	4,150	1,325	2,850	2,600	1,200	1,200				

*Tank shell – fittings extra. **Where silt capacity required it is available on the models indicated SC.

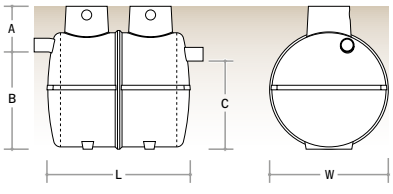
200 Series Stormceptors have a dual size access shaft. For units that will collect silt we recommend using the 750mm diameter access which provides enough room for the silt removal hose to be lowered into the tank during maintenance. The value of 'A' here is for the 750mm access – the 600mm access has an 'A' value of 700mm.

400 series – models without silt capacity are available if required – details on application.

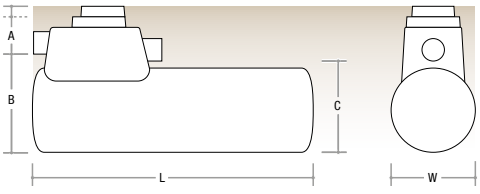
500 series – Inside diameter 3500mm, outside diameter 3650mm.

600 series – Inside diameter 4000mm, outside diameter 4150mm.

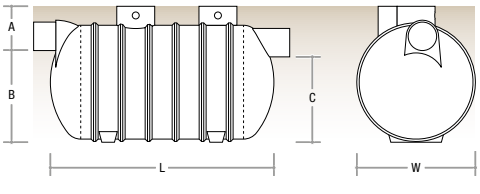
100 series



200 series



300/400/500 & 600 series



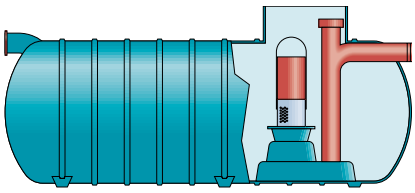
SPEL Puraceptor class 1 full retention separators – Single chamber models

Compliant to the European Standard BS EN 858-1:2002, the Environment Agency's Pollution Prevention Guidelines PPG3 and the Construction Products Regulations

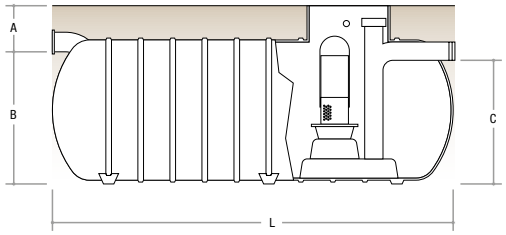
Model	Nominal size (NS) Series	Flow (l/s)	Catchment area (m^2)	Oil storage (litres)	Silt capacity (litres)	Overall length* (mm) L	Overall diameter (mm)	Inlet Invert (mm) A	Base to inlet (mm) B	Base to outlet (mm) C	Max in/ out pipe diameter (mm)	Number of access shafts (dia. mm) 600	750	900	1200
P004 1C/SC	200	4	222	40	400	1,720	1,225	630	1,110	1,050	160	-	1	-	-
P006 1C/SC	200	6	333	60	600	2,310	1,225	630	1,110	1,050	160	-	1	-	-
P010 1C/SC	200	10	556	100	1,000	3,410	1,225	630	1,110	1,050	160	-	1	-	-
P015 1C/SC	300	15	833	150	1,500	3,200	1,875	350	1,800	1,740	225	-	1	-	-
P020 1C/SC	300	20	1,111	200	2,000	3,540	1,875	350	1,800	1,740	225	1	1	-	-
FP 1C/SC	300	20	1,111	200	2,000	4,290	1,875	350	1,800	1,740	225		1	-	-
P030 1C/SC	300	30	1,667	300	3,000	4,420	1,875	390	1,760	1,700	300	1	-	1	-
P040 1C/SC	300	40	2,222	400	4,000	5,760	1,875	390	1,760	1,700	300	1	-	1	-
P050 1C/SC	300	50	2,778	500	5,000	7,060	1,875	390	1,760	1,700	300	1	-	1	-
P065 1C/SC	400	65	3,611	650	6,500	4,810	2,700	425	2,625	2,525	300	1	-	2	-
P080 1C/SC	400	80	4,444	800	8,000	5,700	2,700	425	2,625	2,525	300	1	-	2	-
P100 1C/SC	400	100	5,555	1,000	10,000	7,400	2,700	475	2,575	2,475	450	1	-	2	-
P125 1C/SC	400	125	6,944	1,250	12,500	8,580	2,700	475	2,575	2,475	450	-	1	2	-
P150 1C/SC	400	150	8,333	1,500	15,000	10,180	2,700	475	2,575	2,475	450	-	1	2	-
P165 1C/SC	400	165	9,166	1,650	16,500	11,200	2,700	500	2,550	2,450	450	2	1	1	-
P200 1C/SC	400	200	11,110	2,000	20,000	13,710	2,700	660	2,390	2,290	600	2	1	1	-
P250/1CSC	400	250	13,888	2,500	25,000	16,750	2,700	660	2,390	2,290	600	2	1	2	-
P280 1C/SC	400	280	15,555	2,800	28,000	18,800	2,700	660	2,390	2,290	600	1	2	2	-
P300 1C/SC	500	300	16,665	3,000	30,000	12,410	3,650	805	3,070	2,970	750	1	2	2	-
P400 1C/SC	500	400	22,220	4,000	40,000	15,760	3,650	805	3,070	2,970	750	2	2	2	-
P500 1C/SC	500	500	27,775	5,000	50,000	20,530	3,650	955	2,920	2,820	900	2	2	1	1
P500 1C/SC	600	500	27,775	5,000	50,000	16,040	4,150	925	3,250	3,150	900	2	2	1	1
P600 1C/SC	600	600	33,330	6,000	60,000	19,080	4,150	925	3,250	3,150	900	2	2	-	2
P700 1C/SC	600	700	38,888	7,000	70,000	21,460	4,150	925	3,250	3,150	900	3	2	3	-
P800 1C/SC	600	800	44,440	8,000	80,000	23,020	4,150	925	3,250	3,150	900	3	2	2	1
P900 1C/SC	600	900	49,846	9,000	90,000	24,658	4,150	925	3,250	3,150	900	3	2	-	3

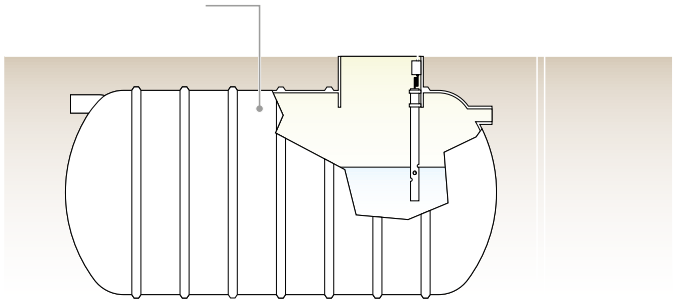
Model FP1C is a special forecourt unit with 7600 litre spillage holding capacity.

*Overall length subject to inlet/outlet size and orientation.



Single chamber models.





Alarm options:

1. SPEL Automatic oil alarm/monitoring system Model ALARM-DY Type 14400. No volt free terminals. Not BMS compatible. Flashing beacon optional extra.
2. SPEL Automatic oil alarm/monitoring system, Model OMS-1. Volt free connection and BMS compatible. Flashing beacon optional extra.
3. SPEL Automatic oil alarm/monitoring system, Model ALARM-1000. Two volt free connections, 300m range and BMS compatible. Flashing beacon optional extra, solar power and multi probe options available.

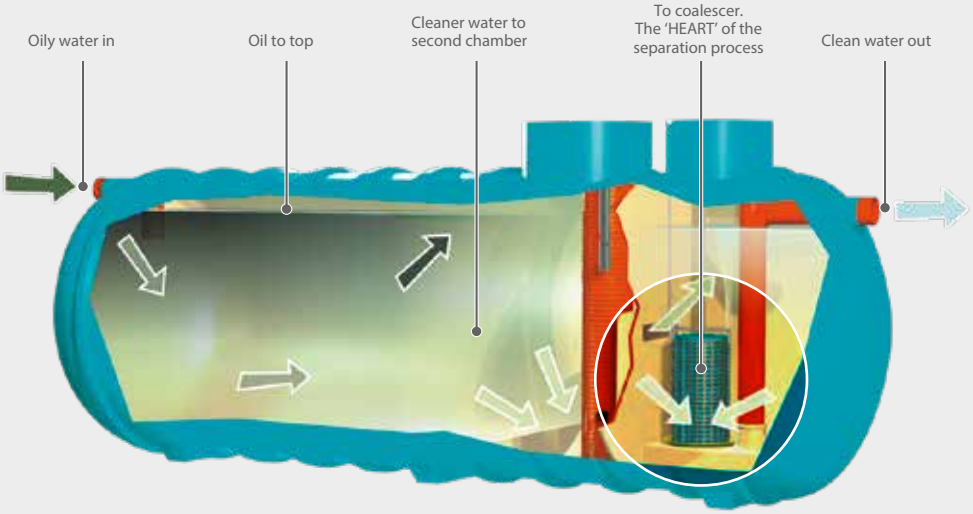
All alarms are IP65 rated but for added protection we recommend to position within a cabinet.

SPEL Puraceptor class 1 full retention separators – Two chamber models

Compliant to the European Standard BS EN 858-1:2002, the Environment Agency's Pollution Prevention Guidelines PPG3 and the Construction Products Regulations

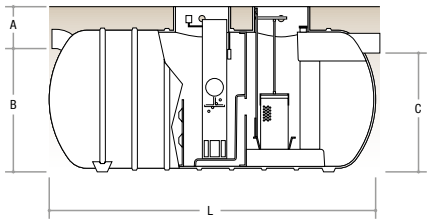


Typical sites include high risk oil/fuel storage and handling areas, filling stations, heavily contaminated industrial areas, commercial vehicle/plant maintenance yards, rail maintenance and fuelling depots, fire training grounds and sub-stations.



Model	Series	Nominal size (NS)	Catchment area (m^2)	Oil storage (litres)	Silt capacity (litres)	Overall length** (mm) L	Overall diameter (mm)	Inlet Invert (mm) A	Base to Inlet (mm) B	Base to outlet (mm) C	Max in/ out pipe diameter (mm)	Number of access shafts (dia. mm) 450	600	750	900	1200
P006/2CSC	200	6	333	60	600	3,050	1225	340	1,200	1,140	160	–	–	2	–	–
P010/2CSC	200	10	556	100	1,000	3,820	1225	340	1,200	1,140	160	–	–	2	–	–
P015/2CSC	300	15	833	150	1,500	4,020	1875	350	1,800	1,740	225	–	–	2	–	–
P020/2CSC	300	20	1111	200	2,000	4,020	1875	350	1,800	1,740	225	–	–	2	–	–
P025/2CSC	300	25	1389	250	2,500	4,290	1875	350	1,800	1,740	225	–	–	2	–	–
P030/2CSC	300	30	1667	300	3,000	4,420	1875	390	1,760	1,700	300	–	1*	2	–	–
FP2CSC	300	20	1111	200	2,000	5,500	1875	350	1,800	1,740	225	–	–	2	–	–
P035/2CSC	300	35	1944	350	3,500	5,070	1875	390	1,760	1,700	300	–	1*	2	–	–
P040/2CSC	300	40	2222	400	4,000	5,760	1875	390	1,760	1,700	300	–	1*	2	–	–
P050/2CSC	300	50	2778	500	5,000	7,060	1875	390	1,760	1,700	300	–	1*	2	–	–
P065/2CSC	300	65	3611	650	6,500	9,180	1875	390	1,760	1,700	300	1	–	2	–	–
P065/2CSC	400	65	3611	650	6,500	5,470	2700	425	2,625	2,525	300	1	–	1	1	–
FP15/2CSC	400	15	833	150	1,500	7,400	2700	425	2,625	2,525	300	–	1	2	–	–
P080/2CSC	400	80	4444	800	8,000	5,700	2700	425	2,625	2,525	300	–	–	1	1	–
P100/2CSC	400	100	5555	1000	10,000	7,400	2700	475	2,575	2,475	450	–	–	1	1	–
P125/2CSC	400	125	6944	1250	12,500	8,580	2700	475	2,575	2,475	450	–	–	2	1	–
P150/2CSC	400	150	8333	1500	15,000	10,180	2700	500	2,550	2,450	450	–	–	2	1	–
P200/2CSC	400	200	11110	2000	20,000	13,710	2700	660	2,390	2,290	600	–	1	2	1	–
P300/2CSC	500	300	16665	3000	30,000	12,530	3650	675	3,200	3,100	600	–	1	2	–	1
P350/2CSC	500	350	19443	3500	35,000	13,950	3650	675	3,200	3,100	600	–	2	2	2	–
P400/2CSC	500	400	22220	4000	40,000	15,980	3650	675	3,200	3,100	600	–	2	2	2	–

* SPEL Forecourt Separator Model FP2C has 7,600 litre spill capacity
** Larger models available in 500/600 series. Designed to suit specific requirements



Optional extras

SPEL coalescer unit guide rail systems

To facilitate easy insertion of coalescer units, the SPEL guide rail system manufactured in stainless steel can be incorporated into SPEL Puraceptors and class 1 Stormceptors.

Brackets fixed to the top and bottom of the coalescer unit simply engage the stainless steel guide rail fixed to the top of the stub access shaft. The coalescer unit is then lowered in the normal way, being guided at the correct angle into the conical base.

Lifting chains are available for the larger coalescer units and where extension shafts are fitted.

Extension guide rails can be incorporated into SPEL extension shafts to suit (preferably when ordered with the separator).



Above left:
Lifting, locating and locking system with guide rail system.

Above right:
The SPEL coalescer unit with lifting chain.

SPEL coalescer unit lifting, locating and locking system

The SPEL lifting, locating and locking system is manufactured in stainless steel and replaces the standard coalescer unit handle.

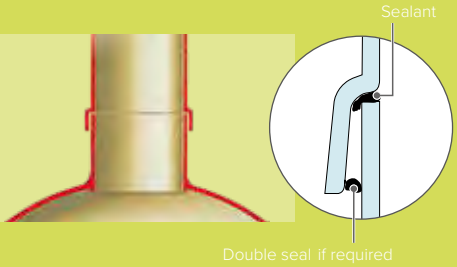
The locating/locking handle ensures the coalescer unit is seated and locked in its correct position after maintenance.

SPEL extension access shafts

Extension access shafts are available for separators with deep inverts.

Socket joint stub access shaft with extension shaft.

600mm, 750mm, 900mm and 1200mm diameter.



Tank shell specifications

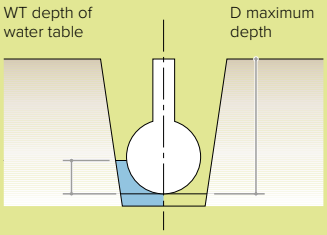
The 'standard' specification is normally adequate for most installations but heavier specifications are available depending upon the burial depth and water table level, in winter. The concern is when a separator is emptied completely and remains empty for a period of time.

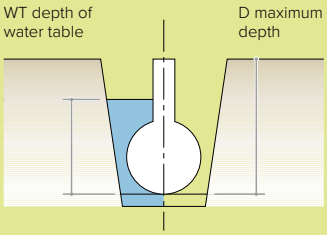
Standard tanks

Series	WT (m)	D (m)
100/200	1.0	4.0
300	0.9	4.0
400	1.3	5.0
500	1.9	5.7
600	2.4	6.2

Heavy tanks

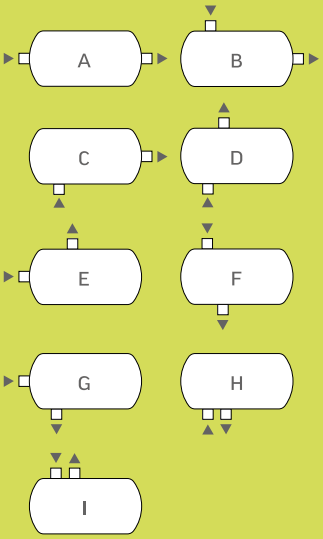
Series	WT (m)	D (m)
100/200	2.0	6.0
300	2.8	5.6
400	3.5	6.0
500	4.5	7.25
600	4.7	7.3





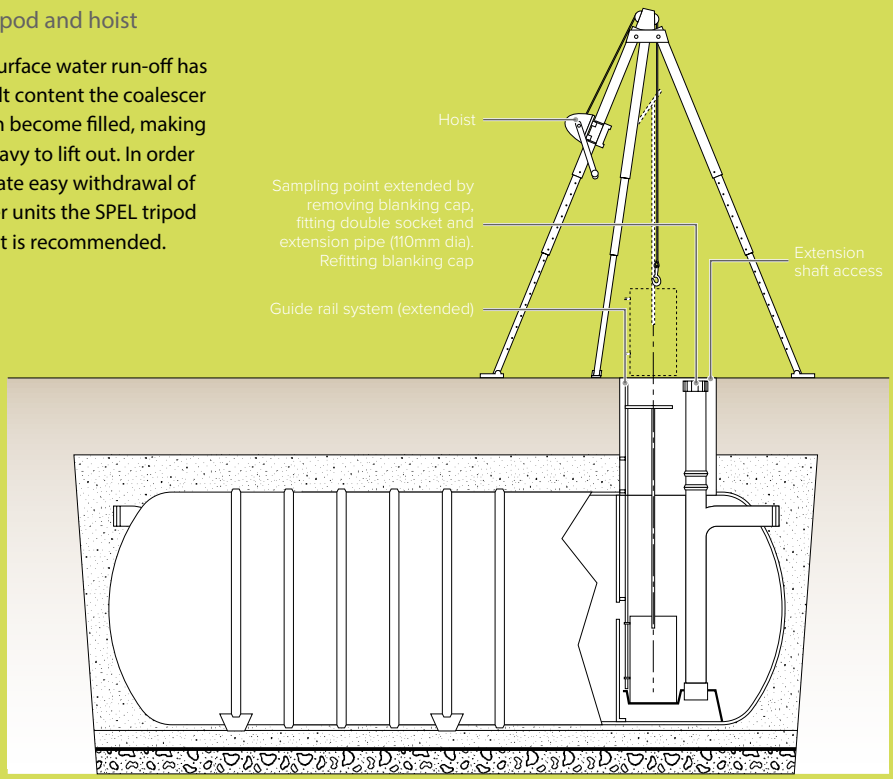
SPEL Separators – Inlet/outlet orientation

Dependent upon model and diameter of connections, these nine different orientations are available. However on the larger models it is important to check with our technical department.

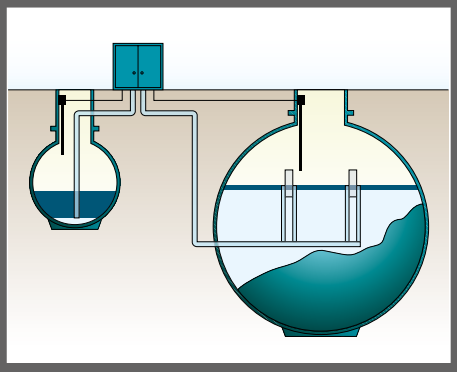


SPEL tripod and hoist

Where surface water run-off has a high silt content the coalescer units can become filled, making them heavy to lift out. In order to facilitate easy withdrawal of coalescer units the SPEL tripod and hoist is recommended.



The SPEL Econoskim® light liquid skimming and separate containment system





The SPEL Econoskim® light liquid skimming and separate containment system...

reduces emptying costs by up to 90%... savings can be higher than £10,000 per annum.

SPEL Puraceptor separators are being specified for large railway depots, industrial and commercial sites, with the SPEL Econoskim light liquid skimming and separate containment system. This maintains the units in peak performance and dramatically reduces maintenance costs.

Emptying is confined to removing the sludge accumulated in the relatively small primary chamber and the light liquid pollutants from the containment tank. This involves far less volume than would be the case with a conventional system and therefore less costly. In some situations the light liquids have a recovery value.

The Econoskim system is available in manual or fully automatic form.

UK Patent No.2355211.

SPEL Separators for above ground installations

SPEL Separators are also designed and manufactured for above ground installations. The separators can incorporate secondary containment (bunded), galvanised access platform and servicing equipment.



Information available from:
Special Products Division

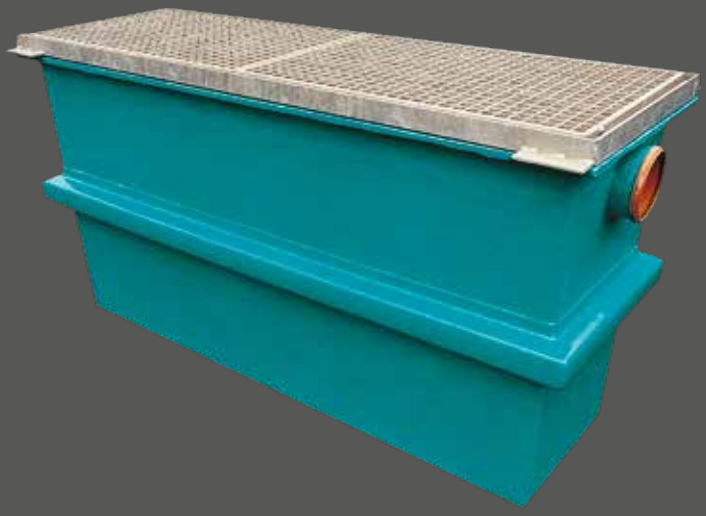
SPEL vehicle wash silt traps

SPEL vehicle wash silt traps model ST800/5 tonne and ST800/12 tonne

Whichever type of vehicle washing installation, the SPEL vehicle wash silt trap is essential to solve this problem. Dirty water flows directly into the vehicle wash silt trap where the sludge and grit settle out prior to the water passing through the high level outlet to the drainage system.

Moulded in glass reinforced plastic (GRP) it is easy to handle, robust and corrosion proof. The heavy duty, hot dipped galvanised gratings comply with slow moving wheel load bearing requirements of FACTA Class B gratings available in 5 or 12 tonnes.

For ease of access and to empty the vehicle wash silt trap the grating is hinged and held open with an integral stay. Sludge can then be removed manually or by tanker.



Installation of SPEL Separators

Installation

SPEL Separators can be installed with a concrete or pea gravel surround, dependent upon ground conditions and water table level. Detailed installation instructions are provided with each unit 'SPEL Tankstor and separator installation instructions'.

Site access and conditions

It is the responsibility of the contractor to ensure suitable access to good hard ground that is safe and suitable for off-loading.

Off-loading/handling

The contractor is responsible for off-loading. The tank must be handled with care to prevent accidental damage from impact or contact with sharp objects.

Tanks should be lifted using slings, not chains or wire ropes. Do not drag tanks along the ground for any distance and avoid jarring or bumps. Do not lift with water in the tank.

Health and safety

Installation should be carried out by a competent contractor in accordance with Health & Safety at Work legislation and good building practice.

A warning notice should be visible at the top of each access shaft – 'danger, harmful fumes' and 'respirators must be worn in this tank'. Before entering persons must be qualified in accordance with 'confined space' requirements.





Export



SPEL are exporting globally from the Americas to Africa, Middle East, Far East, Australia, the Atlantic and Pacific Islands –over 35 countries.

SPEL Environmental of Sydney cover Australia and New Zealand and other countries are covered by SPEL Products and their agents.

SPEL Environmental Australia T. +61 2 8705 0255
www.spel.com.au



Abu Dhabi, UAE



Vasilikos Power Station, Cyprus



Wideawake Airfield, Ascension Islands



Khalifa Port, UAE

SPEL

Quality that protects the environment the safest way



RAF Brize Norton



Asda, Rochdale



Gwynt-Y-Mor Windfarm, St Asaph, North Wales



Design life of over 50 years in accordance with BS EN 976.

25 year warranty against internal corrosion or structural failure.

Tanks are constructed in first quality materials to BS 3532, BS 3691/BS 2782 or equivalent.

Engineered to the highest standards BS 4994/BS EN 976.

Rigorous quality control procedures at all stages of manufacture for each serial numbered tank.

Quick and simple installation procedures. Detailed instructions with each tank.

Certificate No: FM 35174 UVDB/Achilles accredited – Supplier No. 88611.

Scan code with a QR reader to launch our website: www.spelproducts.co.uk

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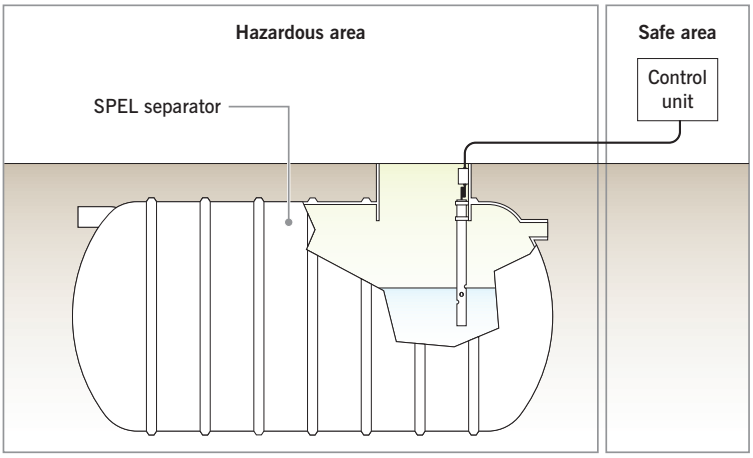
Installation, operation and maintenance instructions

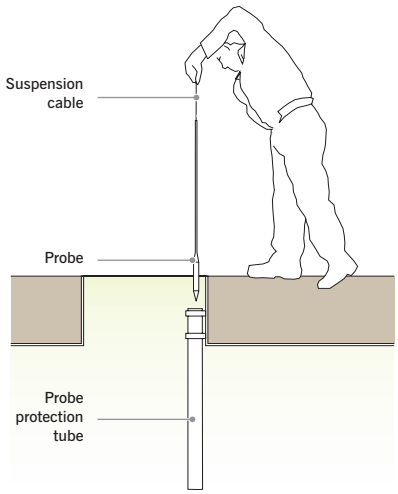
SPEL Automatic Alarm / Monitoring Systems – Overview

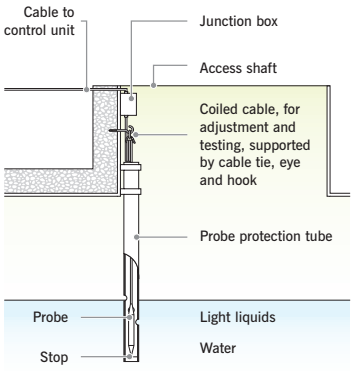
The SPEL automatic alarm/monitoring systems provide visual and audible warning when the level of the oil in the SPEL Separator reaches 90% of the storage volume under static liquid level conditions.

The systems comprise a conductive 'fail safe' probe mounted in the main separation chamber which senses when the designed volume of light liquids has accumulated and sends a signal to the electronic control unit activating a red 'empty now' warning light and an audible alarm.

Cabinets







Maintenance

When the separator is maintained, lift the probe out of the probe protection tube, check it operates the alarm (see under Ref. 3.18) and at the same time wipe oil and contaminants from the probe to prevent a fake alarm after re-inserting.

It is a legal requirement in the UK to kit and oil alarm/monitor construction. Product regulation trading standards. It is less expensive to fix appropriate tube during construction.

Operation

The probe is freely suspended in the probe protection tube in the separator at the correct level. When the oil-layer or depth of hydrocarbons reaches the predetermined level, the top of the probe will be immersed in the oil, breaking the circuit and activating the alarm. It is a 'fail-safe' system providing complete assurance that it is operative. If a fault occurs it will be signalled immediately.

Installation

Control unit (general positioning)

The control unit has been designed to be located indoors and outdoors, within a non-hazardous area. It should be wall mounted and positioned such that the LED display and push switches on the front panel can be readily seen and accessed. The unit can be secured to the wall using the four mounting holes provided. Included within the control is an intrinsically safe circuit (approved according to ATEX Directive 94/9/EC), to which the probe unit is connected.

Inserting probe on site

All that is required on site is to undertake the electrical installation in accordance with the instructions provided. Fix the plated hook provided in the position indicated and lower the probe into the probe protection tube until it locates onto the stop at the base. Coil excess cable and secure with the nylon cable-tie provided. The cable-tie eyelet is then hooked onto the hook to maintain the probe in the vertical position just touching the stop.

The probe protection tube is factory fitted and positioned to ensure the probe activates the alarm when the light liquids retained reach 90% of the storage volume the SPEL Separator is designed for.

3.10 SPEL Automatic Oil Alarm/Monitoring System Model ALARM-DY14400

Ideal for new build sites or where mains supply is readily available, making installation efficient and cost effective. The unit has an audible alarm and mute button. there is provision for a remote low power beacon.

Alarm warnings allow you time to take corrective action ensuring the safe and economic operation of separators preventing oil passing through the separator and polluting watercourses which may result in expensive fines and clean up costs.

Benefits

The alarm system and sensors guarantee an increased level of safety and requires simple installation for bespoke monitoring of oil and petrol separators.

Warn of excessive oil level

Tells you when a separator needs emptying

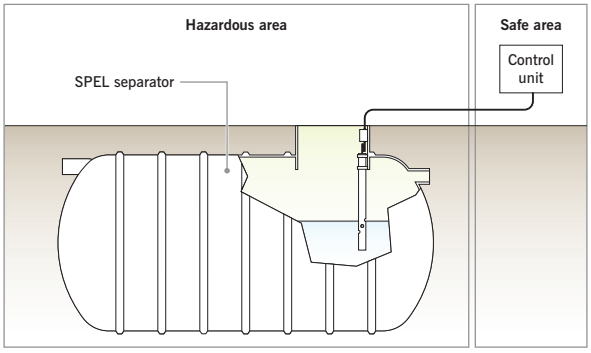
Reduces waste management costs

Designed to comply with EN858-1 and 2

Can be fitted to interceptors from all manufacturers

Reduces interceptor servicing costs

Ensures safe and economic operation of interceptors



Specifications

- Mains powered: 230VAC
- IP65 ABS Enclosure: 180 x 130 x 60mm
- Output: Remote Beacon Only (11volt. 100m Amax
- Alarm: Audible (local)
- Probe Range: 200 metres max. (dependent on cable style)
- ATEX approved: Baseefa 13ATEX0172
- Specific Marking of Explosion Protection: Ex II (1) G [Ex ia Ga] IIB (-20°C ≤ Ta ≤ 50°C)
- ATEX Directive Marking: Ex II (1) G
- Notified Body: Baseefa 1180 Buxton UK

Compatible probe types:

- High Oil



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Oil separator alarm device

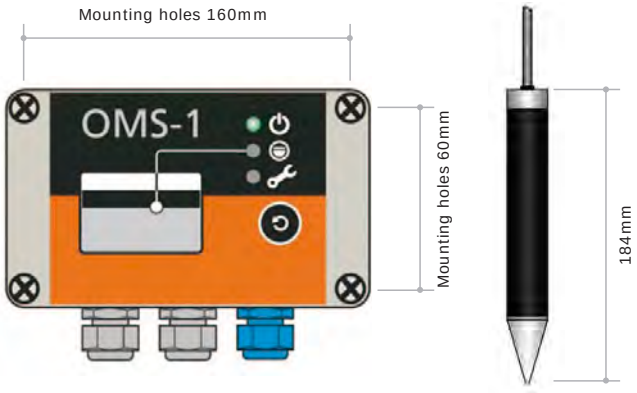
The SPEL OMS-1 alarm device is specially designed for oil separators. It indicates when it is time to empty the oil separator and thus prevents harmful hydrocarbon emissions to the sewer system.

SPEL OMS-1 control unit and SPEL OMS sensor



Accessories: Cable joint

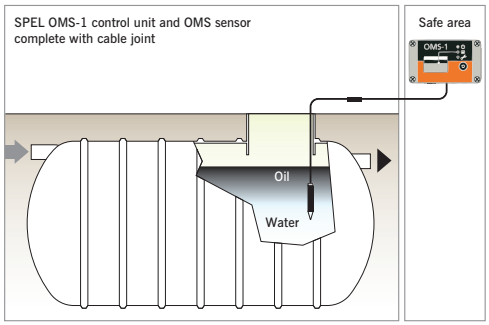
Control unit	SPEL OMS-1
Dimensions:	175 mm x 75 mm x 35 mm (L x H x D)
Material:	Polycarbonate
Enclosure:	IP65
Operation temperature:	-30 °C...+50 °C
Supply voltage:	230 VAC ± 10 %, 50/60 Hz The device is not equipped with a mains switch.
Power consumption:	1 VA
Sensors:	OMS sensor
Relay outputs:	Potential-free relay output 250 V, 5 A, 100 VA Operational delay 10 sec. Relay de-energize at trigger point
Electrical safety:	IEC/EN 61010-1, Class II ⧈, CAT II
Insulation level sensor / mains supply voltage:	375 V (IEC/EN 60079-11)
EMC:	EC/EN 61000-6-3 (Emission) IEC/EN 61000-6-1 (Immunity)
Ex-classification: **Special conditions** **ATEX** **IECEx**	Ⓔx II (1) G [Ex ia] IIB (Ta = -30 °C...+50 °C) VTT 12 ATEX 003X IECEx VTT 12.0001X
Electrical parameters:	U_o = 6,6 V I_o = 20,2 mA P_o = 33,3 mW
Manufacturing year: Please see the serial number on the type plate	xxx x xxxxx xx YY x Where YY = manufacturing year (e.g. 12 – 2012)



Mounting holes diameter ø 4.5mm Enclosure depth 35mm

Sensor	SPEL OMS
Principle of operation:	Measurement of conductivity
Material:	PVC, AISI 316
Enclosure:	IP68
Temperature:	Operation: 0 °C...+60 °C Safety: -30 °C...+60 °C
Cable:	Oil-proof cable 2 x 0,75 mm², standard length 5 m. Other lengths optional. The max. length of the fixed cable is 15 m. Can be extended up to 100 m.
EMC:	IEC/EN 61000-6-3 (Emission) IEC/EN 61000-6-1 (Immunity)
Ex-classification:	Ⓔx II 1 G Ex ia IIA T6 Ga According to IEC/EN 60079-11 simple apparatus.
Manufacturing year: Please see the serial number on the type plate	x xxx x xxxxx xx YY x Where YY = manufacturing year (e.g. 12 – 2012)

Application



3.12 IdOil® Sensors

idOil sensors are an integral part of the idOil oil separator alarm system and they are to be used with the idOil control units. All idOil sensors are digital and polarity free.

	idOil-LIQ	idOil-OIL	idOil-SLU
Measurement principle	Vibration	Conductive	Ultrasonic
Mounting	Suspension		
Wetted parts	PVC, aluminium, PA, CR, Viton	PVC, AISI 316, PA, CR, NBR	PP, AISI 316, PA, CR, Silicon
Weight incl. 5m cable	240g	395g	530g
IP classification	IP68		
Ambient temperature	-30°c...+60°C		-25°c...+60°C
Supply voltage	12 V DC		
Fixed cable	Length 5m, 2 x 0.75 mm² PUR unshielded		
EMC	IEC/EN 61000-6-2 Emission IEC/EM 61000-6-3 Immunity		
ATEX	VTT 17 ATEX 005X	VTT 17 ATEX 004X	VTT 17 ATEX 006X
IECEx	IECEx VTT 17.0003X	IECEx VTT 17.0002X	IECEx VTT 17.0004X
Ex-classification	Ex II 1 G Ex ia IIb T5 Ga	Ex II 1 G Ex ia IIA T5 Ga	Ex II 1 G Ex ia IIB T5 Ga
Exi Interface Values	U_i=16 V, I_i=80 mA, P_i=400 mW	U_i=16V, I_i=80 mA, P_i=400 mW	U_i=16V, I_i=80 mA, P_i=400mW
Max values in IIB	C_i ≤ 5.2 nF, L_i ≤ 1,6 mH	C_i ≤ 5.2 nF, L_i ≤ 1.6 mH	C_i ≤ 4.0 nF, L_i ≤ 1.6 mH



idOil-LiQ high liquid level sensor

Indicates when the liquid level in the oil separator rises excessively e.g. in an outlet blockage situation.



idOil-OIL oil sensor

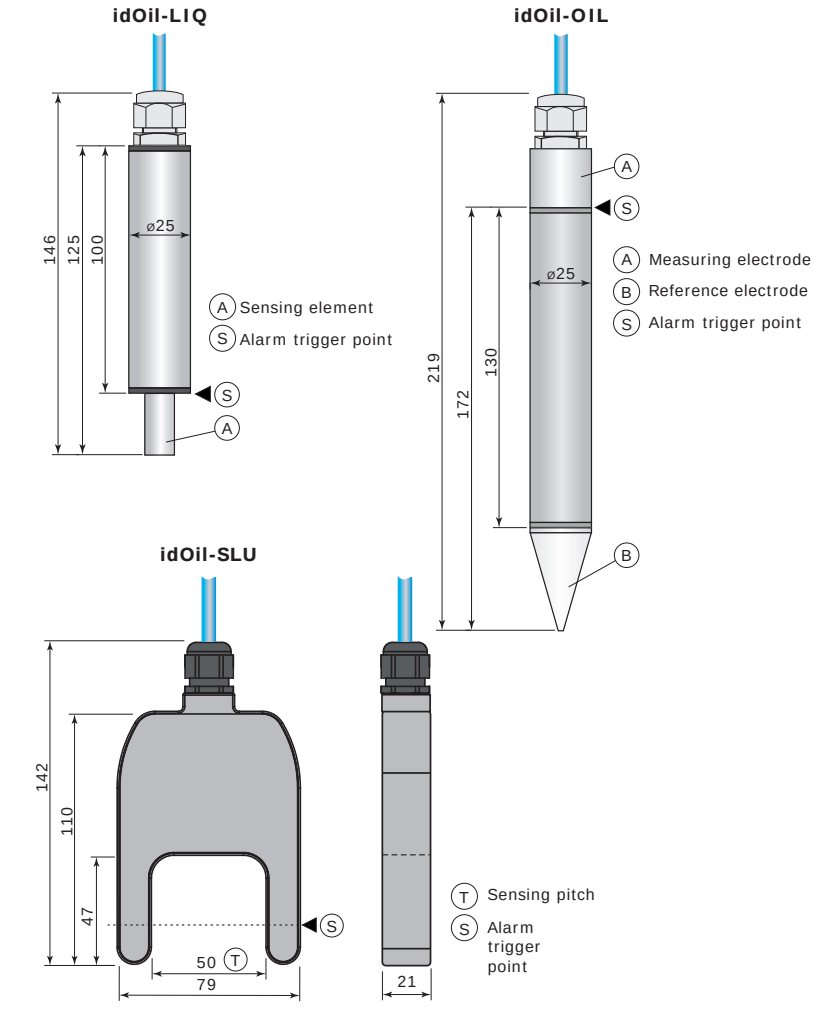
Detects oil and indicates when the separator's oil storage is full.



idOil-SLU sludge sensor

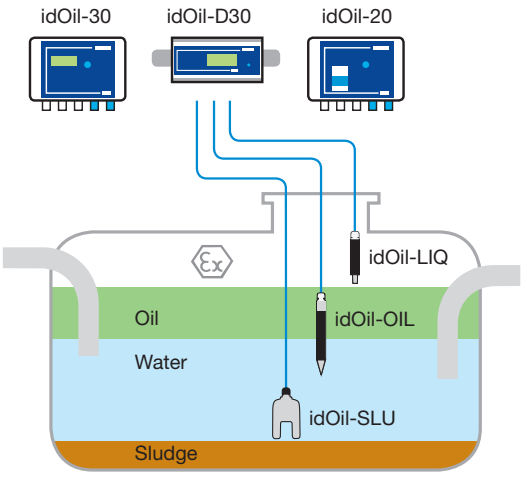
Monitors the sludge layer in the oil separator and indicates when the sludge layer has reached its maximum level.

Dimensions (mm)



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Application



Cable connectors

Cable connectors are used for cable extension between the sensors and the control unit. They are oil resistant, IP68 and suitable for ATEX Zone 0. Simple apparatus according to IEC/EN 60079-11.



LCJ1-1
Cable connector for one sensor



LCJ1-2
Cable connector for two sensors



LCJ1-3
Cable connector for three sensors

Sensor cable extension with installation

Sensor cable extension with Labkotec cable connector

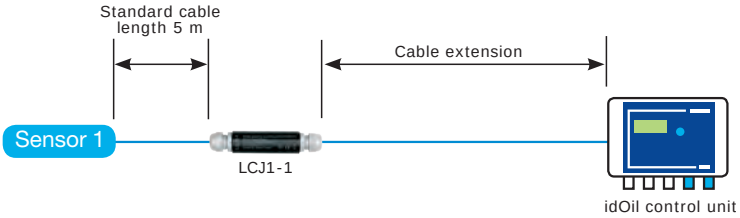
LCJ1-1 for one sensor
LCJ1-2 for two sensors
LCJ1-3 for three sensors

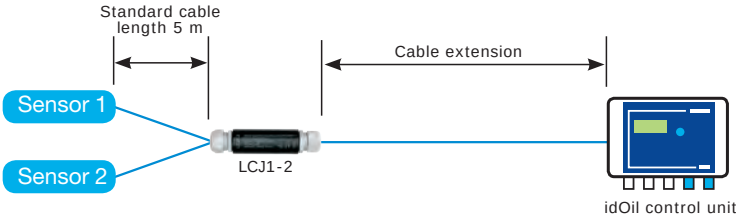
Extension cable example

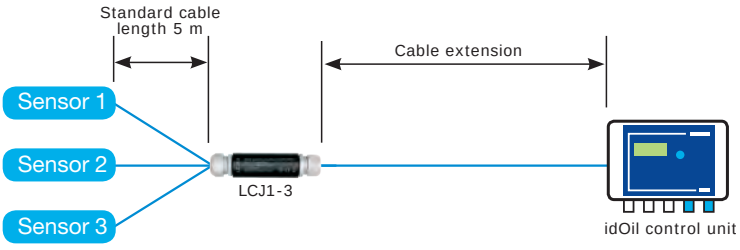
Twisted pair cable, 2 x 0.75 mm²

Extension cable diameter

LCJ1-1: Ø 4mm...9mm
LCJ1-2 and LCJ1-3: Ø 5mm...10mm
Max. extension cable resistance 68 Ohms.







3.14 IdOil®-20 Oil Separator Alarm Control Unit



Fulfils requirements of EN 858-1&2 standards

The idOil-20 is an easy to use oil separator alarm control unit that offers all necessary basic features. It can be equipped with up to three different types of idOil sensors that are identified automatically with a one-touch commissioning feature.

- High liquid level alarm, when the liquid level in the oil separator rises excessively e.g. in an outlet blockage situation.
- Oil layer thickness alarm, when the oil separator's full capacity for oil or petrol has been reached.
- Sludge layer thickness alarm, when the sludge layer in the bottom of the separator has reached its maximum level.
- Separator leakage alarm, when the liquid level drops unexpectedly.

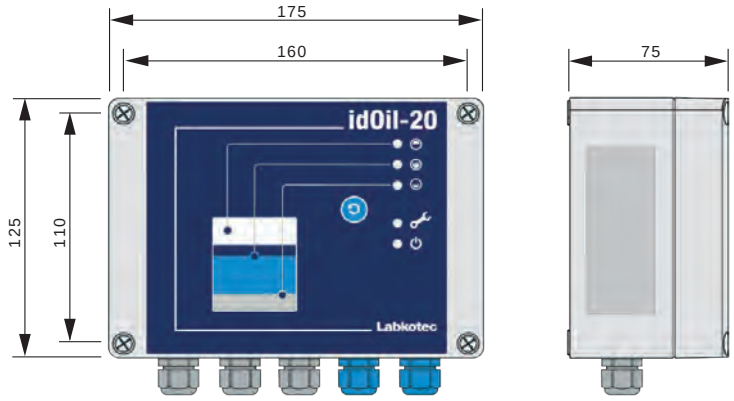
In these situations, an integrated alarm buzzer will sound, the display will show the alarm information and the relay(s) will switch.

Features

- Multi supply voltage
- Sensor combination with up to three different idOil sensors
- Polarity-free sensor connection
- Automatic sensor and sensor type detection
- Quick one-touch commissioning
- LED lights for alarms, sensor fault and power
- Buzzer for alarm indication
- Two potential free relay outputs. One for alarms and one for faults

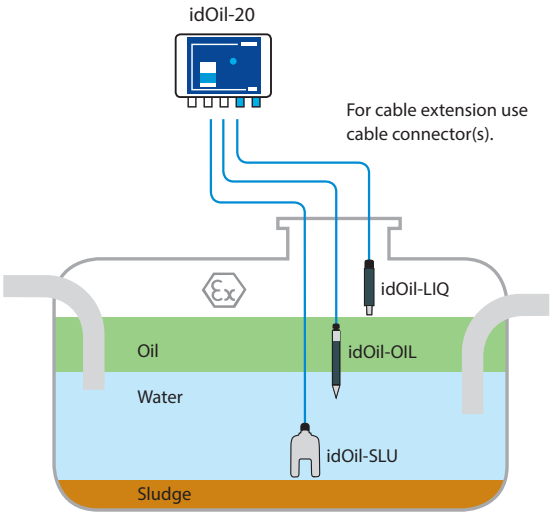
Mounting	Wall mounting
Enclosure material	Polycarbonate
Weight	750g
IP classification	IP65
LED Lights	For alarms, sensor fault and power
Ambient temperature	-30°C...+60°C
Supply voltage	100-240 V AC, 50/60 Hz
Supply power fuse	Max. 10 A
Power consumption	Max. 8 VA
Relay outputs	5 A, 250 V AC/30 V DC, 100 VA potential free changeover contracts, 2 pcs
EMC	IEC/EN 61000-6-2 IEC/EN 61000-6-3
Electrical safety	Class I, CAT II IEC/EN 61010-1, UL 61010-1 CAN/CSA-C 22.2 NO. 61010-1-12
Ex-classification	Ⓔx II (1) G [Ex ia Ga] IIB
ATEX **IECEx**	VTT 16 ATEX 018X IECEx VTT 16.0005X
Exi interface values	U_o - 14.5 v, I_o = 78 mA, P_o - 367 mW, R = 243 Ω
Max values in IIB	C_o = 4.0 µF, L_o = 16.7 mH
Compatible sensors	idOil-LIQ high liquid level sensor idOil-OIL oil sensor idOil-SLU sludge sensor
Accessories	LCJ1-1 cable connector for one sensor LCJ-1 cable connector for two sensors LCJ1-3 cable connector for three sensors LMS-SAS5 mounting set for one sensor

Dimensions (mm)



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Application



Cable connectors

Cable connectors are used for cable extension between the sensors and the control unit. They are oil resistant, IP68 and suitable for ATEX Zone 0. Simple apparatus according to IEC/EN 60079-11.



LCJ1-1
Cable connector for one sensor

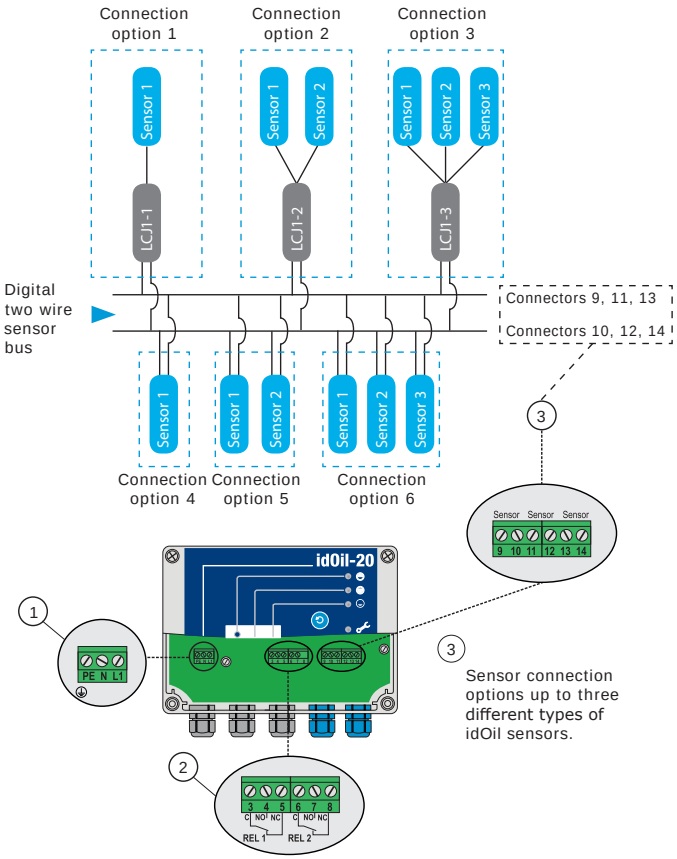


LCJ1-2
Cable connector for two sensors



LCJ1-3
Cable connector for three sensors

Installation



1 Supply voltage 100-240 V AC
PE = Ground conductor
N = Neutral conductor
L1 = Phase conductor

2 Supply voltage 100-240 V AC
Relay 1
3 = Common pole
4 = Opening pole when alarm
5 = Closing pole when alarm
Relay 2
6 = Common pole
7 = Opening pole when alarm
8 = Closing pole when alarm

3 Sensor connectors
9 = Sensor 1 connection 1
10 = Sensor 1 connection 2
11 = Sensor 2 connection 1
12 = Sensor 2 connection 2
13 = Sensor 3 connection 1
14 = Sensor 3 connection 2

3.16 IdOil®-30 Oil Separator Alarm Control Unit



Fulfils requirements of EN 858-1&2 standards

idOil-30 is a control unit for oil separator alarm systems. It can be equipped with up to three types of idOil sensors. With the idOil-30 and applicable Labkotec sensors following alarms can be monitored:

- High liquid level alarm, when the liquid level in the oil separator rises excessively e.g. in an outlet blockage situation.
- Oil layer thickness alarm, when the oil separator's full capacity for oil or petrol has been reached.
- Sludge layer thickness alarm, when the sludge layer in the bottom of the separator has reached its maximum level.
- Separator leakage alarm, when the liquid level drops unexpectedly.

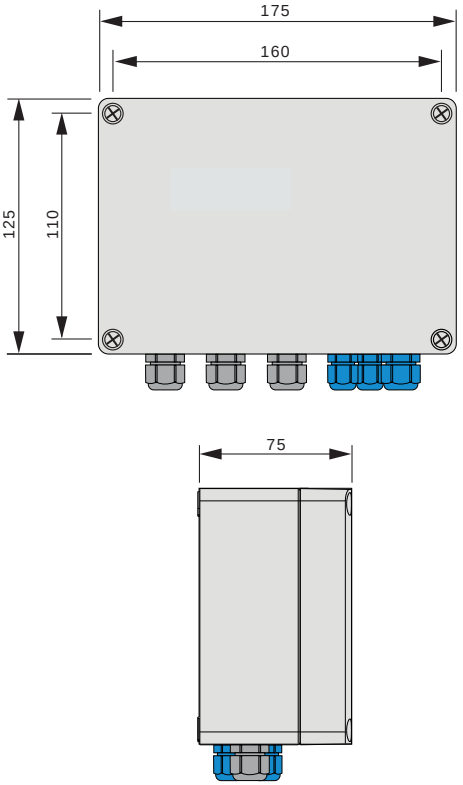
In these situations, an integrated alarm buzzer will sound, the display will show the alarm information and the relay(s) will switch. idOil-30 can be connected locally to laptop/tablet/smartphone via WLAN to access the inbuilt browser user interface for further configurations and settings.

Features

- Multi supply voltage
- Selectable sensor combination with up to three sensors
- Polarity-free sensor connection
- Automatic sensor and sensor type detection
- Quick one touch commissioning
- Display for system status and alarm information
- Two fully configurable potential free relay outputs
- Alarm log
- Service and maintenance diary
- WLAN connection locally between control unit and laptop/tablet smartphone to access the built in browser user interface for settings and configuration

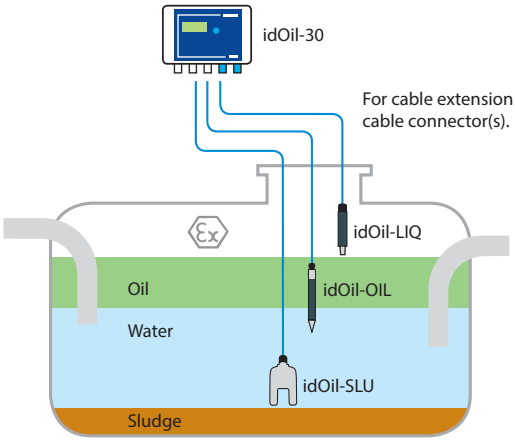
Mounting	Wall mounting
Enclosure material	Polycarbonate
Weight	780g
IP classification	IP65
Display	4 line monochrome LCD
Ambient temperature	-30°C...+60°C
Supply voltage	100-240V AC, 50/60 Hz
Supply power fuse	Max. 10 A
Power consumption	Max. 12 VA
Relay outputs	5 A, 250 V AC/30 V DC, 100 VA potential free changeover contacts, 2 pcs
EMC	IEC/EN 61000-6-2 IEC/EN 61000-6-3
Electrical safety	Class 1, CAT II IEC/EN 61010-1, UL 61010-1 CAN/CSA-C 22.2 NO. 61010-1-12
Ex-classification	Ⓔx II (1) G [Ex is Ga] IIB
ATEX **IECEx**	VTT 16 ATEX 018X IECEx VTT 16.0005X
Exi interface values	U_o = 14.5 V, I_o = 78mA, P_o = 367 mW, R = 243 Ω
Max values in IIB	C_o = 4.0 µF, L_o = 16.7 mH
Compatible sensors	idOil-LIQ high liquid level sensor idOil-OIL oil sensor idOil-SLU sludge sensor
Accessories	LCJ1-1 cable connector for one sensor LCJ1-2 cable connector for two sensors LCJ1-3 cable connector for three sensors LMS-SAS5 mounting set for one sensor

Dimensions (mm)

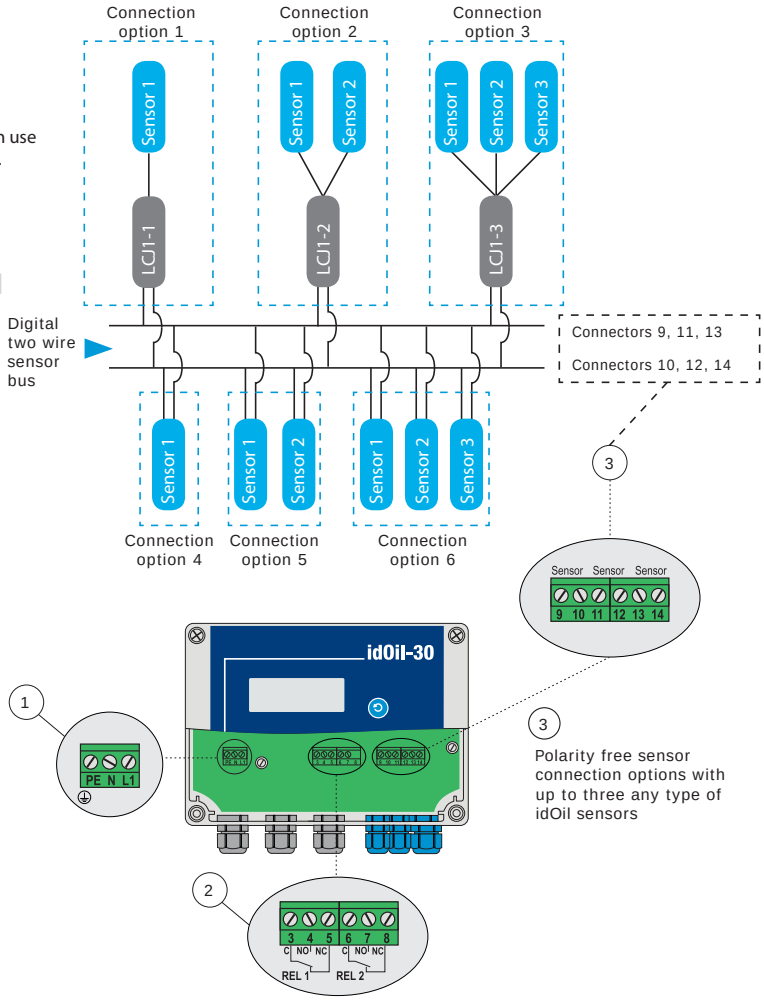


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Application



Installation



3 Polarity free sensor connection options with up to three any type of idOil sensors

Settings, configurations and information via browser user interface



- System status view with current alarms
- Date and time settings
- Language selection
- Alarms log, downloadable
- Inspection settings
- Write inspection notes
- Inspection diary, downloadable
- Customer data input for display
- Alarm settings
- Sensor identification and naming
- Relay configuration
- Software update

Cable connectors



LCJ1-1
Cable connector for one sensor



LCJ1-2
Cable connector for two sensors



LCJ1-3
Cable connector for three sensors

1 Supply voltage 100-240 V AC
PE = Ground conductor
N = Neutral conductor
L1 = Phase conductor

2 Supply voltage 100-240 V AC
Relay 1
3 = Common pole
4 = Opening pole when alarm
5 = Closing pole when alarm
Relay 2
6 = Common pole
7 = Opening pole when alarm
8 = Closing pole when alarm

3 Sensor connectors
9 = Sensor 1 connection 1
10 = Sensor 1 connection 2
11 = Sensor 2 connection 1
12 = Sensor 2 connection 2
13 = Sensor 3 connection 1
14 = Sensor 3 connection 2

3.18 IdOil®-D30 Oil Separator Alarm Control Unit



Fulfils requirements of EN 858-1&2 standards

idOil-D30 is a control unit for oil separator alarm systems. It can be equipped with up to three types of idOil sensors. With the idOil-D30 and applicable Labkotec sensors following alarms can be monitored:

- High liquid level alarm, when the liquid level in the oil separator rises excessively e.g. in an outlet blockage situation.
- Oil layer thickness alarm, when the oil separator's full capacity for oil or petrol has been reached.
- Sludge layer thickness alarm, when the sludge layer in the bottom of the separator has reached its maximum level.
- Separator leakage alarm, when the liquid level drops unexpectedly.

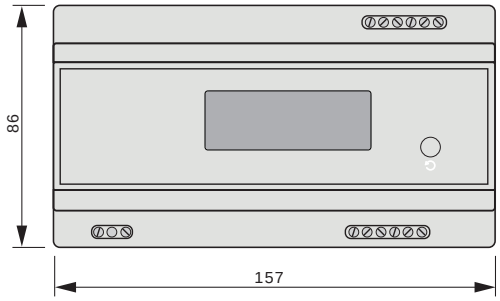
In these situations, an integrated alarm buzzer will sound, the display will show the alarm information and the relay(s) will switch. idOil-D30 can be connected locally to laptop/tablet/smartphone via WLAN to access the inbuilt browser user interface for further configurations and settings.

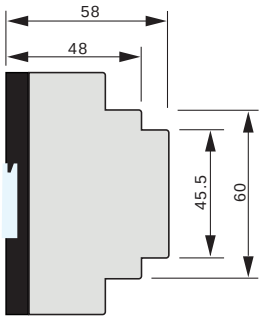
Features

- Multi supply voltage
- Selectable sensor combination with up to three sensors
- Polarity-free sensor connection
- Automatic sensor and sensor type detection
- Quick one touch commissioning
- Display for system status and alarm information
- Two fully configurable potential free relay outputs
- Alarm log
- Service and maintenance diary
- WLAN connection locally between control unit and laptop/tablet/ smartphone to access the built in browser user interface for settings and configuration

Mounting	M36 DIN rail mounting
Enclosure material	Lexan 940 (top), Noryl VO 1550 (base)
Weight	380g
IP classification	IP20
Display	4 line monochrome LCD
Ambient temperature	-30°C...+60°C
Supply voltage	100-240V AC, 50/60 Hz
Supply power fuse	Max. 10 A
Power consumption	Max. 12 VA
Relay outputs	5 A, 250 V AC/30 V DC, 100 VA potential free changeover contacts, 2 pcs
EMC	IEC/EN 61000-6-2 IEC/EN 61000-6-3
Electrical safety	Class 1, CAT II IEC/EN 61010-1, UL 61010-1 CAN/CSA-C 22.2 NO. 61010-1-12
Ex-classification	Ⓔx II (1) G [Ex is Ga] IIB
ATEX **IECEx**	VTT 16 ATEX 018X IECEx VTT 16.0005X
Exi interface values	U_o = 14.5 V, I_o = 78mA, P_o = 367 mW, R = 243 Ω
Max values in IIB	C_o = 4.0 µF, L_o = 16.7 mH
Compatible sensors	idOil-LIQ high liquid level sensor idOil-OIL oil sensor idOil-SLU sludge sensor
Accessories	LCJ1-1 cable connector for one sensor LCJ1-2 cable connector for two sensors LCJ1-3 cable connector for three sensors

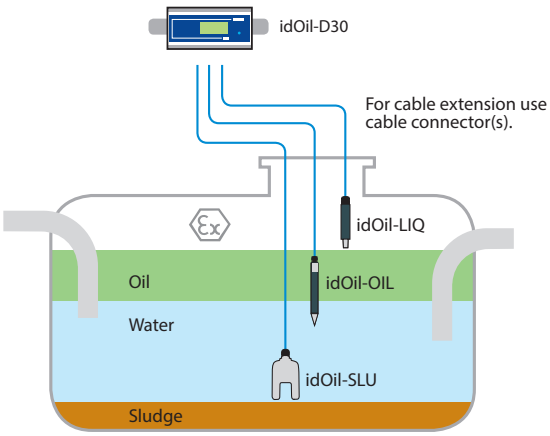
Dimensions (mm)





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Application



Settings, configurations and information via browser user interface



- System status view with current alarms
- Date and time settings
- Language selection
- Alarms log, downloadable
- Inspection settings
- Write inspection notes
- Inspection diary, downloadable
- Customer data input for display
- Alarm settings
- Sensor identification and naming
- Relay configuration

Cable connectors



LCJ1-1
Cable connector for one sensor

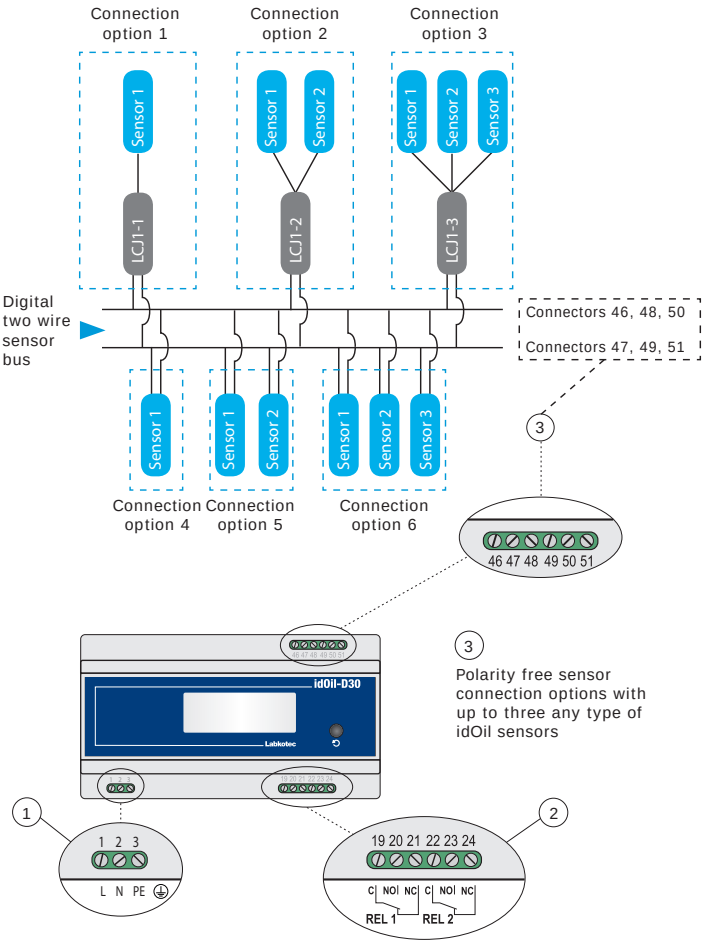


LCJ1-2
Cable connector for two sensors



LCJ1-3
Cable connector for three sensors

Installation



3 Polarity free sensor connection options with up to three any type of idOil sensors

(1) Supply voltage 100-240 V AC
1 = L, phase conductor
2 = N, neutral conductor
3 = PE, ground conductor

(2) Relay output
Relay 1
19 = Common pole
20 = Opening pole when alarm
21 = Closing pole when alarm
Relay 2
22 = Common pole
23 = Opening pole when alarm
24 = Closing pole when alarm

(3) Sensor connectors
46 = Sensor 1 connection 1
47 = Sensor 1 connection 2
48 = Sensor 2 connection 1
49 = Sensor 2 connection 2
50 = Sensor 3 connection 1
51 = Sensor 3 connection 2

3.20 IdOil® Solar Oil Separator Alarm



idOil Solar with beacon light



idOil Solar

Enclosure material	Polycarbonate
Weight	8000g
IP classification	IP43 with two ventilation devices
Ambient temperature	-30 °C...+60 °C
Supply voltage	11-17 V DC
Compatible sensors	idOil-LIQ, idOil-OIL, idOil-SLU
Relay outputs	5 A, 30 V DC, 100 VA potential free, 2 pcs
EMC	IEC/EN 61000-6-2 IEC/EN 61000-6-3
Electrical safety	Class III, IEC/EN 61010-1, UL 61010-1 CAN/CSA-C 22.2 NO. 61010-1-12
Overvoltage category	
ATEX	VTT 16 ATEX 018X
IECEx	IECEx VTT 16.0005X
Ex-classification	Ⓔx II (1) G [Ex ia Ga] IIB

idOil Solar oil separator alarm

The idOil Solar is a solar powered oil separator alarm for off-grid areas. It can be equipped with a beacon light and/or 3G modem.

In an alert situation, the beacon light will flash and/or an alarm message will be sent to the user's mobile phone. The idOil Solar control unit has the same features as the idOil-30.



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