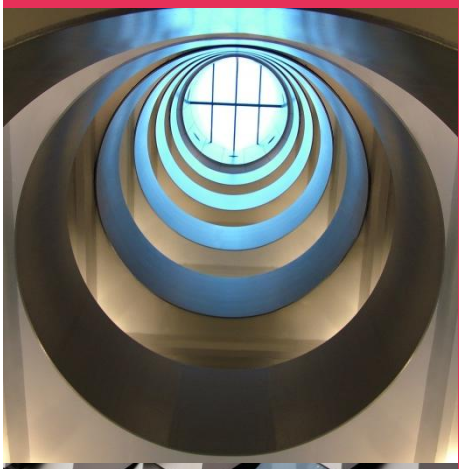
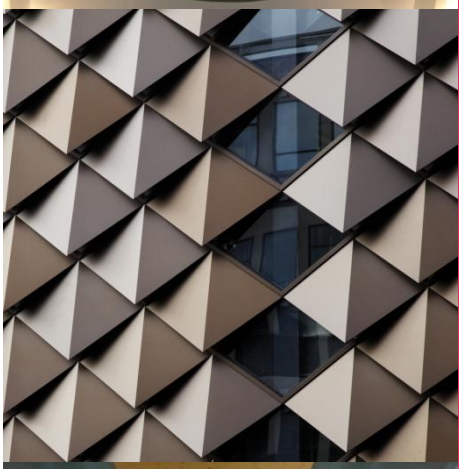
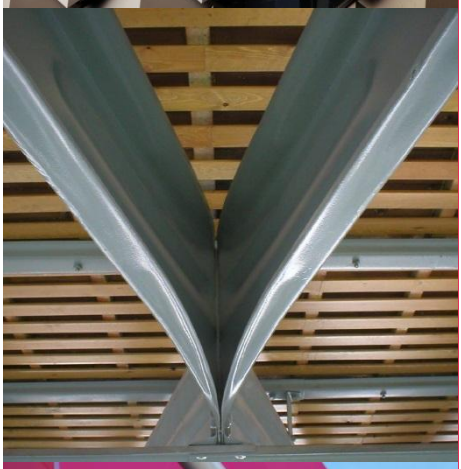
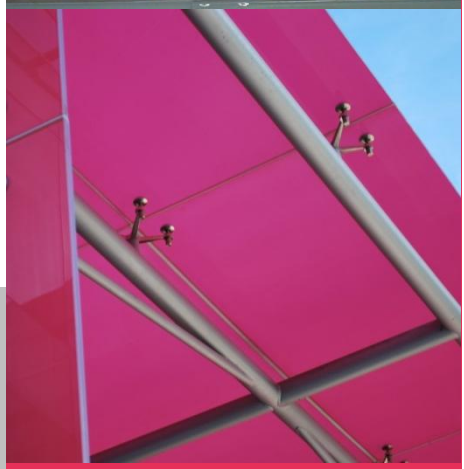








Hammerstone Road Depot, Manchester

Drainage Maintenance Plan

Curtins Ref: HRD-CUR-00-XX-RE-S-92001

Revision: P05

Issue Date: 09 September 2026

Client Name: Morgan Sindall

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Rev	Description	Issued by	Checked	Date
V01	First Issue-Draft	TH	AL	09/09/2021
V02	Updated Petrol Interceptor Details	TH	AL	20/09/2021
P03	Updated with Latest Drawings	JC	ATL	05/03/2025
P04	Updated with Final Construction Drawings	ATL	MW	05/02/2026
P05	Maintenance Company Added	ATL	ATL	09/09/26

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Author	***Signature***	***Date***
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Appendix A

Ground Floor Drainage Layout

Lower Ground Drainage Layout

Appendix B

Fuel & Oil Separators Details

Appendix C

Attenuation Tank Details

Rainwater Harvesting Tanks Details

1.0 Maintenance

1.1 Private Drainage

1.1.1 This section 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. 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.

1.1.2 The recommended operations and frequencies are typical only and should be more frequent initially to ensure that there are no unforeseen issues with the operation and then adjusted to suit the site requirements.

1.2 Components

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

- Inspection, Manhole and Catchpit Chambers
- Pipes
- Drainage Channels and Gullies
- Attenuation Tank
- Rainwater Harvesting Tank
- Flow Control Unit
- Petrol Interceptor

1.2.2 A suitable maintenance strategy should be adopted to ensure the drainage network is cleaned regularly and the routine maintenance and cleansing regime should be documented.

1.2.3 The drainage network will be the responsibility of **Equans** on behalf, of Manchester City Council.

1.2.4 A copy of the final construction drainage layout should be provided in the final Operations and Maintenance Manual.

1.2.5 The surface water network has been designed to accommodate the 1 in 100-year storm rainfall event plus an allowance for climate change particular to the requirements of the site. It may be that the exceedance flows above the 1 in 30-year storm rainfall event are stored within the site partially above ground, on non-habitable external landscaping, parking, or other space. As the flows are generally being attenuated on site and within SuDs features there will be a period of time after storm events where the network is still partially or fully surcharged and is draining down. Where this surcharging is still present after 48hrs appropriate action should be taken as noted below.

1.2.6 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.

1.2.7 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.

1.2.8 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.

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

1.2.10 The locations of the drainage is indicated on Curtins drawings enclosed in Appendix A.

1.3 Inspection, Manhole and Catchpit Chambers

1.3.1 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.

1.3.2 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 Maintenance Manager prior to any access.

1.4 Pipes

1.4.1 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 will be fully compliant with the Curtins drainage specification.

1.4.2 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-cleaning where possible for smaller diameter pipes, and for larger diameters the risk is reduced due to the overall pipe size.

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

1.4.4 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
Regular maintenance\ inspection	Inspect for evidence of poor operation via water level in chambers. If required, take remedial action.	3-monthly, 48 hours after large storms.
	Check and remove large vegetation growth near pipe runs.	Monthly or as required
Remedial Action	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.

1.5 Drainage Channels and Gullies

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

1.5.2 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.

1.5.3 Sediment\material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas such as the car park channels.

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial Inspection including channel outlet boxes.	Half yearly and after large storms.
Regular maintenance\ inspection	Litter and debris removal	Monthly or as required.
	Check and remove large vegetation growth near channel runs.	Monthly or as required
	Inspect for evidence of poor operation and/or weed growth. If required, take remedial action. Inspect silt accumulation rates and establish appropriate brushing frequencies. Silt can also be caused by adjacent landscaping areas which should	3-monthly, 48 hours after large storms.

Maintenance Schedule	Required Action	Frequency
	be reprofiled to provide a flat area or berm adjacent to the paving.	
Remedial Action	Inspect access/outlet boxes and rod through poorly performing channels and outlets as initial remediation.	As required.

1.6 Attenuation Tanks

1.6.1 The attenuation tanks are currently specified as 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.

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

1.6.3 Access for maintenance has been provided by an access shaft located on the tank and from the manhole chambers downstream of the tank.

1.6.4 Geocellular units are proprietary products and therefore manufacturer's recommendations should also be taken into consideration. Additionally different manufacturers may have different connection types and arrangements which will need to be taken into consideration.

1.6.5 Regular inspection and maintenance is important for the effective operation of attenuation tanks as designed. As the feature is buried, a regular inspection regime is very important to ensure the correction functionality of the surface water drainage network.

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.

Maintenance Schedule	Required Action	Frequency
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.	Annually (or as required after heavy rainfall events)
Remedial Actions	Repair/rehabilitation of inlets, outlets and overflows.	As required.

1.7 Rainwater Harvesting Tank

1.7.1 The rainwater harvesting tanks are currently specified as geocellular units and are intended for storage of surface water run-off from the site to be reused as a water supply for the washdown areas. There is an outlet with a valve that allows the tank to overflow into the downstream network

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

1.7.3 Access for maintenance has been provided by an access shaft located on the tank and from the manhole chambers downstream of the tank.

1.7.4 Geocellular units are proprietary products and therefore manufacturer's recommendations should also be taken into consideration. Additionally different manufacturers may have different connection types and arrangements which will need to be taken into consideration.

1.7.5 Regular inspection and maintenance is important for the effective operation of rainwater harvesting tank and valve as designed. As the feature is buried, a regular inspection regime is very important to ensure the correction functionality of the surface water drainage network.

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.
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.	Annually (or as required after heavy rainfall events)
Remedial Actions	Repair/rehabilitation of inlets, outlets and overflows.	As required.

1.8 Flow Control Units

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

1.8.2 The flow controls are specified as Hydro-brake or similar approved and are proprietary products; therefore, manufacturer's recommendations should also be taken into consideration.

1.8.3 Access for maintenance has been provided by locating within manhole chambers.

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.

1.9 Petrol Interceptor, washdown separator

1.9.1 The manufacturer's recommendations should be taken into consideration for the petrol interceptor's, washdowns separators. The SPEL, Klargester products maintenance regime have been included in Appendix B.

1.10 Rainwater Harvesting Tank

1.10.1 To aid future maintenance, the manufacturer's product details have been attached in Appendix C.

Appendix A

Ground Floor Drainage Layout

Lower Ground 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.

RESIDUAL HAZARD REGISTER
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 REF No.	ITEM (FEATURE, ELEMENT OR ACTIVITY)	RESIDUAL HAZARD
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5.05	DEEP EXCAVATIONS	DEEP EXCAVATION MORE THEN 3M NEAR EXISTING CULVERT/ NEAR EXISTING FOUNDATION WALL/ ATTENUATION TANK

DESIGN PHILOSOPHY SURFACE WATER

EXISTING BUILDING
SIPHON ROOF SYSTEM WITH RAINWATER HARVESTING TANK AND FLOW RESTRICTION BY STORMSAVER
FLOW LIMITED TO 18.1L/S 1 IN 30 YEAR STORM EVENT FOR ALL STORM EVENTS
TABLE 3 EXISTING AND PROPOSED CALCULATIONS

GROUND FLOOR YARD/CAR PARK
TO DISCHARGE TO WATERCOURSE,RESTRICTED RATE
COMBINATION OF BROWNFIELD RUNOFF (50% REDUCTION) & GREENFIELD RUNOFF.

SURCHARGE LEVEL FOR 1 IN 100+40 CC ON CULVERTED WATERCOURSE: 61.85 (1m ABOVE SOFFIT LEVEL)

LOWER GROUND CAR PARK
REUSING EXISTING CONNECTION TO COMBINED SEWER
GREATER REDUCTION THAN 50%, 7L/S FOR ALL STORM EVENTS

SURCHARGE LEVEL FOR 1 IN 100+40 CC ON PUBLIC SEWER: 59.14 (AS AGREED WITH UU)

WASHDOWN AREA
TO DISCHARGE TO FOUL WATER SEWER FLOW LIMITED TO 5L/S AS REQUESTED BY UU

FOUL WATER
4.9L/S

DRAWING BASED ON:
TOPOGRAPHICAL SURVEY BY SEP S15724-T

GPR SURVEY BY SEP S17480-U DEC 2018 JUNE 2018

CCTV SURVEYS BY SEP/ NRC:
- DEC 2018
- AUG 2020
- MAY, AUG 2021
- JAN 2022
- SEP, NOV 2023

UU RECORDS UUPS-ORD-76950

PROPOSED SITE PLAN
HRD-FRA-00-XX-DR-A-90-0200 REV C12 SITE PLAN
HRD-FRA-00-XX-DR-A-90-0207 REV C09 EXTERNAL WORKS SETTING OUT SHEET 1
HRD-FRA-00-XX-DR-A-90-0208 REV C11 EXTERNAL WORKS SETTING OUT SHEET 2

EXTERNAL SERVICES
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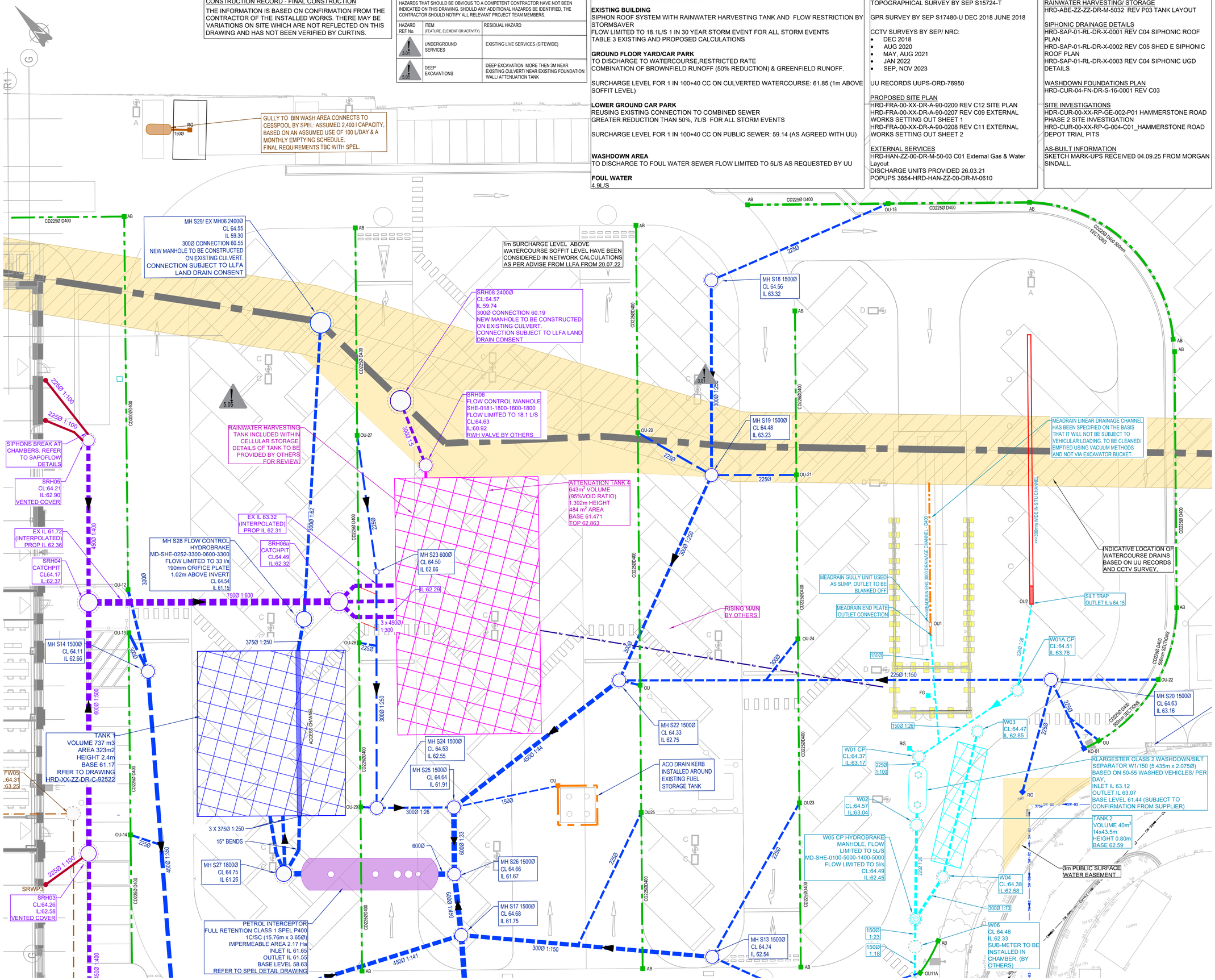
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HRD-SAP-01-RL-DR-X-0002 REV C05 SHED E SIPHONIC ROOF PLAN
HRD-SAP-01-RL-DR-X-0003 REV C04 SIPHONIC UGD DETAILS

WASHDOWN FOUNDATIONS PLAN
HRD-CUR-00-XX-DR-S-16-0001 REV C03

SITE INVESTIGATIONS
HDR-CUR-00-XX-RP-GE-002-P01 HAMMERSTONE ROAD PHASE 2 SITE INVESTIGATION
HRD-CUR-00-XX-RP-G-004-C01_HAMMERSTONE ROAD DEPOT TRIAL PITS

AS-BUILT INFORMATION
SKETCH MARK-UPS RECEIVED 04.09.25 FROM MORGAN SINDALL.



LEGEND

SITE BOUNDARY BASED ON HRD-FRA-00-XX-DR-A-90-0200

EXISTING SERVICES BASED ON CCTV SURVEY AUG 2020
- EXISTING SURFACE WATER PIPE
- EXISTING COMBINED WATER PIPE
- EXISTING UNSURVEYED BUILDING DRAINAGE (ASSUMED ROUTE SHOWN)

UNITED UTILITIES RECORDS UUPS-ORD-76950
ALL UU ASSETS ARE SHOWN INDICATIVELY
- UU FOUL WATER SEWER
- UU SURFACE WATER SEWER
- UU COMBINED WATER SEWER
- WATERCOURSE
- 8M EASEMENT BASED ON SEWER FOR ADOPTION 6TH EDITION

PROPOSED DRAINAGE
- PROPOSED FOUL WATER DRAIN
- PROPOSED RISING MAIN FROM RH TANK
- PROPOSED SURFACE WATER DRAIN
- PROPOSED SURFACE WATER FOR WASHDOWN
- PROPOSED SURFACE WATER FROM SIPHON BY SAPOFLOW
- PROPOSED SURFACE WATER GRAVITY DRAINAGE FROM SIPHON
- PROPOSED SURFACE WATER BY STORMSAVER
- LINEAR DRAINAGE CHANNEL GATIC CASTSLOT TREADSAFE D400
- LINEAR DRAINAGE CHANNEL MEADRAIN ENS 3000 D400

DP FOUL WATER DOWN PIPE
FG FLOOR GULLY
SRWP SIPHON RAIN WATER PIPE
AB ACCESS BOX
OU OUTLET BOX
CP CATCHPIT
FLOW CONTROL CHAMBER
PROPOSED ATTENUATION TANK
PETROL INTERCEPTOR OR SIMILAR
PROPOSED SERVICES
EXISTING BUILDING FOOTPRINT

Rev:	Description:	Date:	By:	Chkd:
CR2	UPDATED FOR PLANNING CONDITION DISCHARGE	09.09.26	ATL	ATL
CR	FINAL CONSTRUCTION ISSUE	09.10.25	JC	ATL
C09	UPDATED IN LINE WITH DISCUSSIONS/ AS CONSTRUCTED TANK INFO	03.03.25	JC	ATL
C08	WASHDOWN DRAINAGE AMENDED	10.02.25	JC	ATL
C07	LINEAR DRAINAGE CHANNEL AMENDED	22.10.24	JC	ATL
C06	UPDATED IN LINE WITH DISCUSSIONS	21.10.24	JC	ATL
C05	STAGE 5 ISSUE	23.09.24	JC	ATL
P08	UPDATED IN LINE WITH COMMENTS	13.02.24	ATL	MW
P07	UPDATED FOR NEW TENDER	02.02.24	ATL	MW
C04	CAR PARK DRAINAGE REMOVED	20.04.23	ATL	MW
C03	DRAINAGE FLOWS, COVER LEVELS AND, WASHDOWN OUTFALL ARRANGEMENT AMENDED	25.11.22	ATL	MW

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Birmingham • Bristol • Cambridge • Cardiff • Douglas • Dublin • Edinburgh • Glasgow • Kendal • Leeds • Liverpool • London • Manchester • Nottingham

Status: FINAL CONSTRUCTION

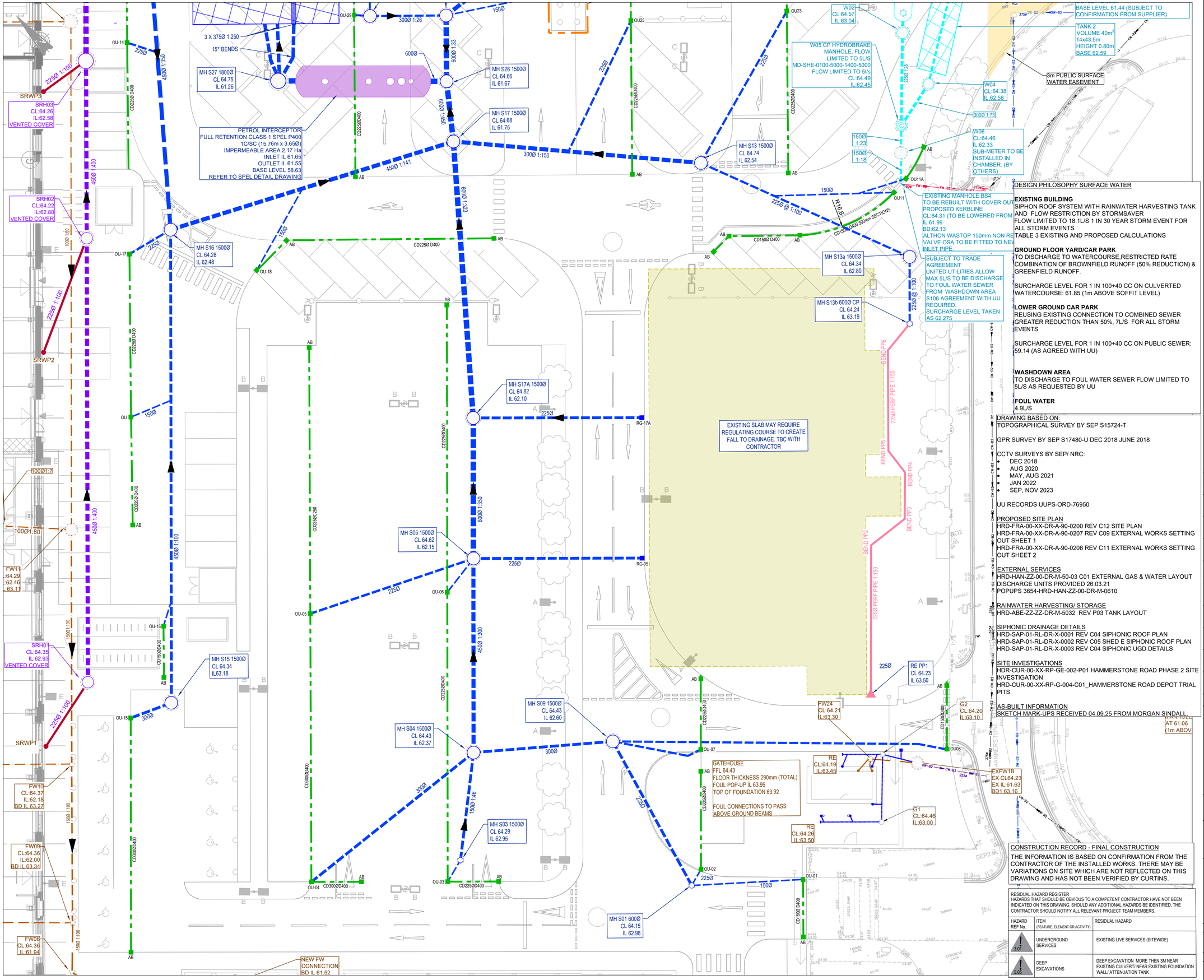
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Drg Title: PROPOSED DRAINAGE 1:200 LAYOUT SHEET 1

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	Scale: 1:200				

Project Code:	Originator:	Zone:	Level:	Type:	Discipline:	Category / Number:	Rev:
HRD	- CUR -	XX -	00 -	DR -	C -	92-504	-CR2

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LEGEND

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Rev:	Description:	Date:	By:	Chkd:
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C05	UPDATED IN LINE WITH DISCUSSIONS/ AS CONSTRUCTED TANK INFO	03.03.25	JC	ATL
C04	WASHDOWN DRAINAGE AMENDED	10.02.25	JC	ATL
C03	LINEAR DRAINAGE CHANNEL AMENDED	22.10.24	JC	ATL
C02	UPDATED IN LINE WITH DISCUSSIONS	21.10.24	ATL	ATL
C01	STAGE 5 ISSUE	23.09.24	JC	ATL
P03	UPDATED IN LINE WITH UPDATED SITE LAYOUT	03.04.24	KS	ATL
P02	UPDATED IN LINE WITH COMMENTS	13.02.24	ATL	MW
P01	ISSUED FOR NEW TENDER	29.01.24	ATL	MW

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Status: CONSTRUCTION RECORD

Project: HAMMERSTONE ROAD

Drg Title: PROPOSED DRAINAGE 1:200 LAYOUT SHEET 2

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
068065	A1	29.01.24	ATL	ATL	MW
	Scale: 1:200				

Project Code: Originator: Zone: Level: Type: Discipline: Category / Number: Rev:

HRD - CUR - XX - 00 - DR - C - 92-508 -CR2

\\ma-fs-1\Projects\068001 - 069000\068065 - Hammerstone Road Depot\CMS 4 Production\4B Models & Drawings_Civil-C\CAD\92\

TABLE 1: PROPOSED CATCHMENTS MAXIMUM FLOW RATES

CATCHMENT REF	AREA (Ha)	CALCULATION METHOD	FLOW RATE - 1:1 YEAR STORM EVENT	FLOW RATE - 1:30 YEAR STORM EVENT	FLOW RATE - 1:100 YEAR + 40% CC STORM EVENT
CATCHMENT PC (LOWER GROUND CP)	0.332	50% BROWNFIELD OF THE EXISTING 1-YEAR STORM EVENT AREA EC (25%)	7.0	7.0	7.0
REFER TO DRAWINGS HRD-CUR-XX-00-DR-C-92-621 & 622 FOR DETAILS OF EXISTING AND PROPOSED CATCHMENTS					

INFORMATION PROVIDED BY THE CCTV SURVEY DID NOT PROVIDE CONFIRMATION WHERE SOUTH WATERCOURSE IS LOCATED

FOR EXISTING DRAINAGE REFER TO DRAWING NUMBER: HRD-CUR-XX-00-DR-C-92-510

PROPOSED SERVICES SHOULD BE LOCATED OUTSIDE PROPOSED DRAINAGE

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.

LEGEND

SITE BOUNDARY

PROPOSED DRAINAGE
- PROPOSED SURFACE WATER DRAIN
- PRIVATE SURFACE WATER DIVERSION
- Ø225 GATIC CHANNEL C250 (UNLESS NOTED D400)
- CP CATCHPIT
- HB HYDROBRAKE
- BD BACKDROP
- AB ACCESS BOX
- OU OUTLET BOX

UNITED UTILITIES RECORDS UUPS-ORD-76950 ALL UU ASSETS ARE SHOWN INDICATIVELY
- CW UU FOUL WATER SEWER
- SW UU SURFACE WATER
- SEWER WATERCOURSE
- SW-B2 PRIVATE SURFACE WATER
- FW-B2 PRIVATE FOUL
- CW-B2 PRIVATE COMBINED
- 8M EASEMENT BASED ON SEWER FOR ADOPTION 6TH EDITION
- OIL INTERCEPTOR
- ATTENUATION TANK
- SW PROPOSED SERVICES

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. ALL EXISTING SEWERS, CONNECTIONS, PIPE SIZES AND INVERT LEVELS TO BE CONFIRMED BY CONTRACTOR PRIOR TO COMMENCEMENT OF WORKS TO ENSURE CONNECTIVITY. ANY VARIANCE FROM THE INFORMATION SHOWN SHOULD BE REPORTED TO THE ENGINEER FOR REVIEW.
3. DO NOT SCALE THIS DRAWING. ALL DETAILS AND DIMENSIONS ARE TO BE CHECKED BY THE CONTRACTOR. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER.
4. ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.
5. WHERE EXISTING DRAINAGE IS BEING USED, ALLOWANCES SHOULD BE MADE TO REMEDIATE THIS DRAINAGE IN LINE WITH AVAILABLE CCTV SURVEY INFORMATION. IF NO SURVEY IS AVAILABLE, IT IS ADVISED TO OBTAIN ONE PRIOR TO COMMENCEMENT OF WORKS.
6. ALL EXISTING SERVICES TO BE LOCATED PRIOR TO COMMENCEMENT OF ANY DRAINAGE WORKS, AND WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORK.
7. ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS. THESE ARE TO BE CONFIRMED ONCE A DETAILED CAPACITY CHECK HAS BEEN UNDERTAKEN AT A LATER DESIGN STAGE.
8. OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.
9. FOR FULL DRAINAGE NOTES REFER TO HRD-CUR-XX-ZZ-DR-C-92-502

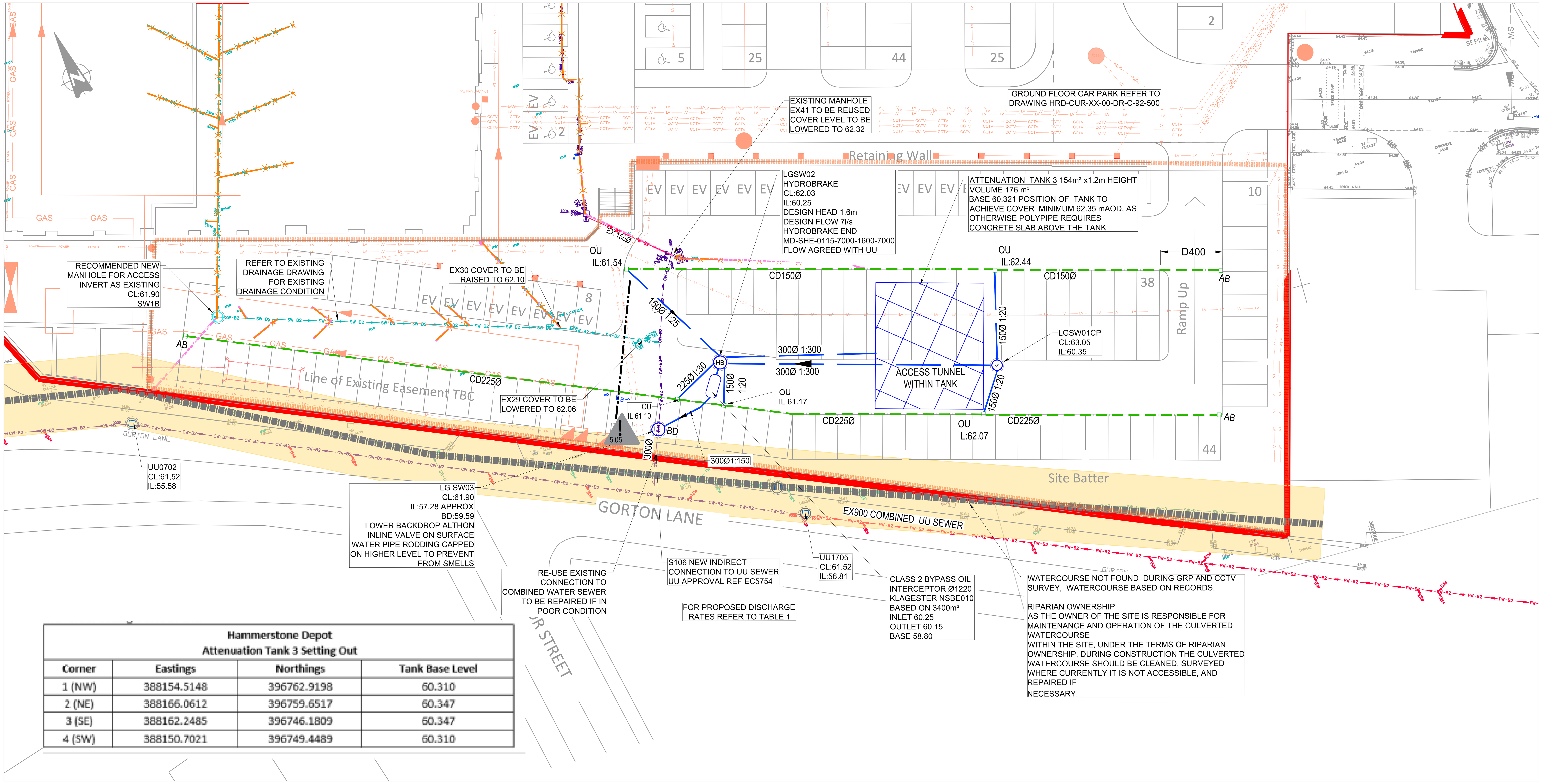
DRAWING BASED ON:
TOPOGRAPHICAL SURVEY BY SEP S15724-T
GPR SURVEY BY SEP S17480-U DEC 2018 JUNE 2018
CCTV SURVEY BY SEP DRAINAGE SURVEYS LTD DEC 2018 AND AUG 2020
UU RECORDS UUPS-ORD-76950

PROPOSED SITE PLAN GA
HRD-FRA-00-XX-SK-A-90-9006 REV C02

SIPHONIC DRAINAGE
STORMSAVER 05.07.22
SAPOFLOW SIPHON SYSTEM 29.06.22

Lower Ground Surface Water

MH REF	CL (mAOD)	IL (mAOD)	DEPTH TO SOFFIT (m)	DS PIPE DIA (mm)	MH DIA (mm)	MH TYPE	CATCHPIT	COVER SIZE (mm)	COVER CLASS	COVER TYPE	RECESSED	RESTRICTED ACCESS	BACK DROP	Back drop IL (mAOD)	COMMENTS	EASTING	NORTHING
Lower Ground Surface Water																	
LGSW01	63.05	60.35	2.55	150	1200	TYPE B	Y	600X600	D400	SINGLE SEALED	N	N	N	N/A	CATCHPIT MIN SUMP DEPTH 300mm	388165.024	396750.481
LGSW02	62.03	60.25	1.48	300	1500	HYDROBRAKE CHAMBER	N	1200X675	D400			N	N	N/A	FLOW CONTROL CHAMBER REFER TO HYDROBRAKE DETAILS FOR SUMP DEPTH	388135.490	396758.968
LGSW03	61.90	57.28	4.32	300	1500	TYPE A2	N	600X600	C250			N	Y	59.59		388126.901	396753.635
SW1B	61.90	60.30	1.38*	225	1500*	TYPE C*	N	1200X675*	D400			N	N		MANHOLE TO BE CONSTRUCTED ON EXISTING DRAIN. *INVERT LEVEL INTERPOLATED FROM CCTV SURVEY - TBC ON SITE	388083.112	396778.715
EX29	62.06	EXISTING MANHOLE COVER ADJUSTED TO SUIT PROPOSED LEVELS						600X600	C250			N	N	N/A		388127.742	396763.677
EX30	62.10							600X600	C250			N	N	N/A		388119.157	396767.106
EX41	62.32							600X600	C250			N	N	N/A		388133.251	396771.833



Hammerstone Depot
Attenuation Tank 3 Setting Out

Corner	Eastings	Northings	Tank Base Level
1 (NW)	388154.5148	396762.9198	60.310
2 (NE)	388166.0612	396759.6517	60.347
3 (SE)	388162.2485	396746.1809	60.347
4 (SW)	388150.7021	396749.4489	60.310

Rev:	Description:	Date:	By:	Chkd:
CR	CONSTRUCTION RECORD ISSUE	28.05.24	ATL	ATL
C06	LG SW03 AMENDED IN LINE WITH ON SITE INFORMATION	14.07.23	ATL	ATL
C05	LG SW03 MOVED FOLLOWING ADDITIONAL SURVEY	3.07.23	MW	MW
C04	ATTENUATION TANK AMENDED TO SUIT REVISED REQUIREMENTS	27.06.23	ATL	MW
C03	TANK RELOCATED TO ACHIEVE COVER RECOMMENDED BY POLYPIPE	24.10.22	MW	MW
C02	OIL INTERCEPTOR BASED ADDED	19.08.22	MW	MW
C01	CONSTRUCTION ISSUE	22.07.22	ATL	MW
P08	DRAINAGE NOTE ADDED	25.04.22	ATL	MW
P07	MAIN BUILDING DRAINAGE AMENDED	25.03.22	ATL	MW
P06	STAGE 4 UPDATED	05/08/21	MW	MW
P05	ISSUED FOR STAGE 4	09/04/21	MW	MW
P04	UPDATED TO COMMENTS FOR COSTING	23/03/21	MW	MW
P03	ISSUED FO STAGE 3- UPDATED SITE PLAN	02/12/20	MW	MW
P02	ISSUED FOR STAGE 3	18/11/20	MW	MW
P01	ISSUED FOR STAGE 3	29.01.19	MW	CG

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Status: STAGE 5

Project: HAMMERSTONE ROAD

Drg Title: PROPOSED LOWER FLOOR DRAINAGE

Project No:	Size:	Date:	Drawn By:	Designed By:	Checked By:
068065	A1, Scale: 1:250	29.01.19	MW	MW	CG

Project Code: Originator: Zone: Level: Type: Discipline: Category / Number: Rev:
HRD - CUR - XX - 00 - DR - C - 92-501 - CR

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Appendix B

Fuel & Oil Separators Klagester

SPEL Washdown separator

015319
NSBE010-NSBE125 Class 1 Bypass Separator Installation & Maintenance Guidelines

Kingspan Environmental Service Contact Numbers:

GB: 0844 846 0500

NI: 028 3025 4077

IRL: 048 3025 4077

Enclosed Documents

DS1155	**NSBE010-NSBE030 Class 1 Bypass Separators**
DS1254	**NSBE036 Class 1 Bypass Separator**
DS1224	**NSBE040 & NSBE050 Class 1 Bypass Separators**
DS1225	**NSBE075-NSBE125 Class 1 Bypass Separators**

Issue	Description	Date
05	CC1405 – Coalescer Chains were Pipes	Feb 2018

HEALTH & SAFETY

These warnings are provided in the interest of safety. You must read them carefully before installing or using the equipment.

It is important that this document is retained with the equipment for future reference. Should the equipment be transferred to a new owner, always ensure that all relevant documents are supplied in order that the new owner can be acquainted with the functioning of the equipment and the relevant warnings.

Installation should only be carried out by a suitably experienced contractor, following these guidelines.

We recommend the use of a dust mask and gloves when cutting GRP components.

Electrical work should be carried out by a qualified electrician.

Contaminated surface water can contain substances harmful to human health. Any person carrying out maintenance on the equipment should wear suitable protective clothing, including gloves. Good hygiene practice should also be observed.

Access covers should be selected with reference to the location of the unit and traffic loads to be accommodated. These are not (normally) part of the Separator supply.

When covers are removed precautions must be taken against personnel falling into the unit.

Should you wish to inspect the operation of the equipment, please observe all necessary precautions, including those listed below, which apply to maintenance procedures.

Ensure that you are familiar with the safe working areas and accesses. Ensure that the working area is adequately lit.

Take care to maintain correct posture, particularly when lifting. Use appropriate lifting equipment when necessary. Keep proper footing and balance at all times. Avoid any sharp edges.

OIL ALARM SYSTEMS

PPG3 requires that the oil level alarm be fitted, tested and commissioned by a competent Installer. This is to ensure that the excessive oil probe is calibrated correctly, raising an alarm when 90% of the recommended maximum oil storage volume is reached. Should the oil level alarm fail to provide an early warning, excessive oil could pass through the separator, thus polluting the environment. This could result in substantial cleanup costs and legal action being taken under the water resources act 1991.

MAINTENANCE

The correct ongoing maintenance is essential for the proper operation of the equipment. Operators who rely on oil level alarms to prompt them to service separators between maintenance intervals run the risk of polluting should the alarms not work, hence the ongoing functional assessment of the oil alarm systems is fundamental if pollution incidents are to be avoided.

The removal of sediment and retained oil/grease should be carried out by a contractor holding the relevant permits to transport and dispose of such waste. The contractor must refer to the guidelines in this document.

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CE

Kingspan Environmental
College Road North
Aston Clinton
Aylesbury
Buckinghamshire
HP22 5EW
United Kingdom

13

En 858 : Separator systems for light liquids

GRP Glass Reinforced Plastic Tank

Bypass Separators NSB003 - NSB150

Class 1

Watertightness	Passed
Structural Testing	Passed
Hydraulic Efficiency	Passed

1 Introduction

1.1.1 These Guidelines represent Best Practice for the installation of the above Separator Units. Many years of specialist experience has led to the successful installation of thousands of separator units. It must be noted, however, that these Guidelines are necessarily of a general nature. It is the responsibility of others to verify that they are appropriate for the specific ground conditions and in-service loads of each installation. Similarly, any information or advice given by our employees or agents regarding the design of an installation must be verified by a qualified specialist (e.g. Civil engineering consultant).

1.1.2 For guidance of Separator selection and application, please refer to the most recent issue of Environment Agency Guidelines pollution prevention guidelines No. 3 (PPG3).and BS En 858

1.2 Handling & Storage

1.2.1 Care must be taken to ensure that units are not damaged during delivery and handling on site. Please take care and place unit so that it cannot fall and become damaged

1.2.2 The design requirements of these products will frequently mean that the centre of gravity of the unit is “offset”. Care must therefore be taken to ensure that the unit is stable when lifting. Rainwater may also collect inside units, particularly if they have been stored on site prior to installation, adding weight and increasing instability. Check units before lifting and pump out any excess water.

1.2.3 When lifting units, use webbing slings of a suitable specification. Do not use chains.

1.2.4 A suitable spreader bar should be used to ensure that units are stable and that loads are evenly distributed during lifting. When lifting separators, a spreader bar should be used where the slings would otherwise be at an angle > 30 degrees to the vertical.

1.2.5 Lifting equipment should be selected by taking into account the unit weight, length and the distance of lift required on site.

1.2.6 We accept no responsibility for the selection of lifting equipment.

1.2.7 Whenever units are stored or moved on site, ensure that the storage location is free of rock, debris and any sharp objects, which may damage the unit. The units must be placed on ground, which is flat, and level and the unit orientated onto its side with even support. Do not roll separators.

1.3 Site Planning

The following points should be considered before installation of the equipment:

1.3.1 The discharge must have the consent of the relevant Environmental Regulator.

1.3.2 The installation should have Planning and Building Control approval.

1.3.3 Consider installing flow cut-off valves to isolate the separator in an emergency or during site cleaning operations. See Environment Agency Guidelines PPG3.

1.3.4 We will fit a tube to receive the alarm probe. This tube provides protection and ensures that the probe is positioned at the correct level to sense the oil build up. The tube design and probe level setting assumes the use of our standard oil alarm system and may not be suitable for other alarm supplier’s equipment. The probe tube may be fitted either within the neck or within the body of the unit. It should be extended to ground level when fitted in the body of the tank and you should make provision to extend the tube to the required height before backfilling. Consult the alarm supplier’s instructions for their detailed fitting installation instructions.

1.3.5 Consider venting of the unit. Comply with local regulations. In the UK, comply with the following regulations. For Petrol Stations: Health and Safety Guidance Note 41 (HS(G)41). For other applications: BS8301: 1985 (obsolescent) BS EN 752 Building Drainage. Adequate ventilation should be provided to the separator. The ventilation pipe should be as short as is practicable and be terminated not less than 2.5m above paving nor less than 1m above the head of an openable window or other opening into a building within a horizontal distance of 3m. Each neck should be vented independently, we advise against joining these below ground prior to their rising as vent stacks.

1.3.6 Consider installation of a sampling point downstream of the separator. There is no suitable facility to effectively sample the wastewater from inside the unit.

1.3.7 Uncontaminated run off such as roof water should be excluded from separators. (EA Guidelines PPG3.)

1.3.8 Ground conditions and water table level should be assessed. If the water table will be above the base of the units at any time of the year, adequate concrete backfill must be provided to avoid flotation. In poorly draining ground, consideration should also be given to the likelihood of flotation due to surface water collecting in the backfill, and an appropriate installation method devised to avoid this.

1.3.9 If the discharge is to a soakaway, a porosity test should be carried out as part of the assessment of suitability for sub-soil drainage.

1.3.10 The separator must be installed at a level, which will allow connection to the incoming drain and a free discharge at the system outlet. The water table must be below the discharge outlet.

1.3.11 Do not install the unit deeper than necessary, ensure that you purchase extension shaft kits. The minimum invert depth of the unit is shown on the customer drawing.

1.3.12 Adequate access must be provided for routine maintenance. Vehicles should not be permitted within a distance equal to the depth of the unit, unless suitable structural protection is provided to the installation.

1.3.13 There must be at least 1 metre of clear, level ground all around the access covers to allow for routine maintenance.

1.3.14 It is essential that a mains water supply is accessible for routine cleansing and refilling after removal of waste material and liquid.

1.3.15 Provide electrical supply for alarm system.

1.3.16 Installation should only be carried out by suitably qualified and experienced contractors in accordance with current Health and Safety Regulations. Electrical work should be carried out by a qualified electrician, working to the latest edition of IEE wiring regulations.

1.3.17 This unit is designed to operate with gravity in and out flows. The unit is not designed to operate with a pumped influent.

2 Installation

2.1 Installation – General

2.1.1 When units are installed in unstable ground conditions where movement of the surrounding material and/or unit may occur, the connecting pipework should be designed to minimise the risk of damage from differential movement of the unit(s) and/or surrounding material.

2.1.2 For separators with burial depths greater than 1000mm from cover level to the top of the unit, specific site conditions should be taken into consideration and the backfill designed to bear any loads which may be applied during and after installation to prevent the tank being subjected to these loads.

2.1.3 The excavation must be deep enough to provide bedding and cover depth as determined by the type of surface pavement and loading. Asphalt and concrete pads should extend a minimum of 300mm horizontally beyond the unit in all directions.

2.1.4 In situations where the excavation will not maintain a vertical wall, it will be necessary to shore up the sidewalks of the excavation with suitable trench sheets and bracing systems to maintain a vertical wall from the bottom to the top of the excavation. DO NOT completely remove the shoring system until the backfilling is complete, but before the concrete fully hardens.

2.1.5 In areas where the water table is above the bottom of the excavation and/or the excavation is liable to flood, the excavation should be dewatered using suitable pumping equipment and this should continue until the installation is complete.

2.1.6 During installation care must be taken to ensure that the body of the unit is uniformly supported so that point loads through the unit are avoided.

2.1.7 The concrete Specification is not a site specific installation design.

GENERAL CONCRETE SPECIFICATION IN ACCORDANCE WITH BS EN 206-1 (BS 8500-1)		
TYPE OF MIX		(DC) DESIGN
PERMITTED TYPE OF CEMENT		BS 12 (OPC): BS 12 (RHPC): BS 4027 (SRPC)
PERMITTED TYPE OF AGGREGATE (coarse & fine)		BS 882
NOMINAL MAXIMUM SIZE OF AGGREGATE		20 mm
GRADES:	C25 /30 C25 /30 C16 /20	REINFORCED & ABOVE GROUND WITH HOLDING DOWN BOLTS REINFORCED (EG. FOR HIGH WATER TABLE) UNREINFORCED (NORMAL CONDITIONS)
MINIMUM CEMENT CONTENT	C30 C20	270 - 280 Kg/M^3 220 - 230 Kg/M^3
SLUMP CLASS		S1 (25mm)
RATE OF SAMPLING		READY MIX CONCRETE SHOULD BE SUPPLIED COMPLETE WITH APPROPRIATE DELIVERY TICKET IN ACCORDANCE WITH BS EN 12350-1
NOTE: STANDARD MIXES SHOULD NOT BE USED WHERE SULPHATES OR OTHER AGGRESSIVE CHEMICALS EXIST IN GROUND WATER		

2.2 Separator Installation

2.2.1 Excavate a hole of sufficient length and width to accommodate the tank and a minimum 225mm concrete surround and to a depth, which allows for the burial depth of the unit plus concrete base slab and haunch.

2.2.2 Construct a suitable concrete base slab appropriate to site conditions. Ensure that the slab is flat and level.

2.2.3 When the concrete base slab has set enough to support the installed load, add a concrete haunch so as to provide even support under the unit and then lower the unit onto the haunch using suitable webbing slings and lifting equipment.

2.2.4 **Pour no more than 300-mm depth of clean water into the unit, avoiding shock loads. For units with more than one chamber, add water to each chamber simultaneously. DO NOT OVERFILL; the unit is not designed to hold water whilst unsupported.**

2.2.5 **Place concrete backfill to approximately 300mm depth under and to the sides of the tank ensuring good compaction to remove voids. DO NOT use vibrating pokers. Continue adding concrete backfill, simultaneously keeping the internal water level no more than 200 mm above the backfill level at all times, until the backfill is just below the underside of the outlet drain, giving sufficient room to connect the inlet and outlet pipework.**

2.2.6 Connect inlet and outlet drains and vent pipes when safe access to the backfill can be gained.

2.3 Pipework Connections

2.3.1 In all cases, ensure that the outlet pipework level is maintained for correct operation. (Unless specified on the order, the fall across the unit will be as per the customer drawings).

2.3.2 Small units are generally fitted with **PVCu spigots** to both the outlet and the inlet.

2.3.3 Connect using the same size PVCu socket or a suitable reducer.

2.3.4 Larger units are generally fitted with **Our GRP** manufactured sockets.

2.3.5 The connecting pipework should be pushed into the socket. Ensure that the seal is secure and watertight before backfilling the pipe.

2.3.6 Alternatively, proprietary **flex seal couplings** can be obtained to fit over the outside of the site pipework and the outside of the GRP socket. When using this connection method, please be aware that the outside GRP laminate is not perfectly regular and that you may need to use a sealant on the outside diameter of the GRP. Take care not to over tighten the coupling when connecting to the GRP and ensure that the seal is secure before backfilling the pipe. Drawing 403144 provides the ID of our Bypass GRP sockets. The OD is variable, as the wall thickness can be up to 15-20 mm. If purchasing a flexseal coupling for use with clay /concrete, we suggest that a size 110 mm larger than the ID is selected.

2.4 Oil Level Alarm Neck Fitting

2.4.1 We will fit a tube to receive the oil alarm probe. This provides protection and ensures that the probe is positioned at the correct level to sense oil build up.

2.4.2 See alarm supplier information and ensure that the probe is placed within the tube and can be accessed from ground level.

2.4.3 Continue backfilling with concrete over the tank body to the required level. Build up a shell of concrete, minimum 225mm thick, around the access shaft(s). Temporarily strut the access shaft to avoid distortion.

2.4.4 Where we supply an extension shaft to meet a deeper invert requirement, a coalescer extension chain will be required. When fitting, ensure that the chain is fitted to just below the surface so that the coalescer can easily be removed. Remove the coalescer from the unit before adding the extension chain. When refitting, ensure that the coalescer is correctly inserted and fully pushed into the base fitting. This is important and you must ensure that the coalescer is correctly located before putting the unit in to operation.

2.4.5 It is advisable to seal the joints on the extension shafts (particularly on sites with high ground water) with proprietary sealant or by GRP lamination. Temporarily strut the extension neck(s) to avoid distortion during back filling. Where more than one neck section is required to suit a deep invert, consider back-filling section by section. If the extension neck is too long, it can be trimmed using a fine-toothed saw. The original fixing hole bolting the coalescer to the neck should be sealed.

2.4.6 Ensure that the vent socket if cut out, is replaced elsewhere. The maximum recommended inlet invert is 2000mm (using 500mm long extension sections). If you are installing a unit deeper than this then you must make your own arrangements for removing and replacing the coalescer. Consideration must be given to the depth of lift involved.

2.4.7 Continue back-filling, ensuring minimum 225mm concrete thickness around the access shaft/ extension neck and alarm access tube (as applicable).

2.4.8 Mains powered Alarm Systems. See alarm suppliers installation instructions. Lay 82mm diameter PVCu underground ducting between the alarm panel location and the alarm probe position. The ducting should be 500mm below ground level and fitted with a drawstring for later cable insertion. Any changes of direction should be by long radius bend. If necessary, drill a suitable hole in the access shaft adjacent to the alarm probe terminal box, to accept the ducting and seal.

2.4.9 In traffic areas a suitable top slab must be constructed. The top slab should bear on a suitable foundation to prevent superimposed loads being transmitted to the unit and access shafts. Loads applied to covers and frames must bear on the top slab, not the access shaft.

2.4.10 The unit should be filled with clean water up to the invert level of the outlet pipe. Ensure the unit identification is placed/ marked inside the neck for future information. The unit is now ready for use.

2.5 Alarm Installation

2.5.1 Install the alarm probe and control panel, as per the Suppliers Alarm Installation Guidelines. Ensure that the probe is positioned correctly for the required storage of oil. The table below indicates the maximum volume of oil to be stored and the depth of floating oil expected in the separation chamber.

Unit	Required Minimum Oil Storage volumes in litres	Max. (100%)Depth of floating oil (Static)
NSBE010	150 litres	320mm
NSBE015	225 litres	335mm
NSBE020	300 litres	335mm
NSBE025	375 litres	385mm
NSBE030	450 litres	385mm
NSBE040	600 litres	420mm
NSBE050	750 litres	430mm
NSBE075	1125 litres	430mm
NSBE100	1500 litres	435mm
NSBE125	1875 litres	435mm

3 Operation

3.1.1 The unit is sized on treating a defined area and rainfall (5 mm/hour) EN.858 Part 1 and using the factor provided in the Environment agency guidelines PPG3. (0.0018 = 6.5mm/hr) The unit will treat the entire flow i.e. NSBE015 will treat a flow of 15 litres per second. If the flow is greater than this then the excess flow will bypass the main treatment chamber. A NSBE015 unit will work in bypass mode over 15 and up to 150 litres per second. Flows in excess of this will back up on to the site. During a storm, the rain falls and flushes any surface debris, silt or oil into the tank. This first flush, up to the maximum rated flow is fully treated. As the severity of the storm increases, so does the rate of flow increase. The liquid entering the separator after the first flush tends to be cleaner and so, in lower risk applications, is allowed to bypass the oil separation chamber for directly discharge.

3.1.2 The bypass unit has three chambers. The entire flow up to the units listed flow rating is fully treated and passes through all chambers. (E.g. NSBE015 treats 15 litres per second.)

3.1.3 Flows in excess of this rating will bypass the separation chamber and the liquid passes untreated to the outlet chamber.

3.1.4 The first chamber will accumulate silt and grit. The maximum volume that can be retained is the rating x 100 e.g. a NSBE015 is capable of holding 1500 litres of silt.

3.1.5 The second / separating chamber is sized to separate oil at the rated flow rate and to accumulate the required oil storage volume. A NSBE015 maximum oil storage volume is 225 litres. An oil probe should be positioned to detect the accumulation of oil when there is no or low flow conditions. The probe should be positioned so that the alarm operates at 90% of the rated oil storage volume.

3.1.6 In bypass flow conditions, the flow moves directly from the inlet to the outlet chamber avoiding the separating chamber.

3.1.7 Separators are purchased as Class 1 units. Class 1 Bypass Separators are fitted with a removable coalescer which also includes media to further improve the discharge quality. The coalescer media requires maintenance.

3.1.8 Bypass Class 1 Separators are not effective for the removal of soluble or emulsified pollutants such as oil/detergent mixes found in vehicle wash effluents. With permission such discharges should be drained to the foul sewer. Consult our technical department for Separation equipment to meet these applications.

4 Maintenance

4.1 Waste Removal and Servicing

4.1.1 Separated light liquid **must** be removed from separator when the oil capacity has been reached.

4.1.2 An oil level alarm system is available for purchase which gives warning when the separated light liquid/water interface level reaches 90% of the maximum recommended oil storage volume.

4.1.3 Separators should be inspected at least every six months or more frequently if experience dictates. A log should be maintained detailing the depth of oil found, any oil volume removed and any silt removal or cleaning carried out. A specimen maintenance log is included in the appendices.

4.1.4 Every site is different, in respect to the amount and type of silt generated by the drain design and installation. Frequently, the construction programme itself generates large and perhaps unusual quantities of silt and grit. We do recommend that following the initial installation, an inspection of the separator contents be made to check that building rubble has not entered the unit. Further inspections at 3 and 6 months should be made so as to be able to assess the volumes of silt and oil accumulated. The inspection and emptying programme can then be defined following the first 6 months site experience. We recommend leaving a maximum interval between inspections of 6 months.

4.1.5 Alarm probes should be removed and cleaned with water whenever waste material is removed from the separator. Please note the alarm may alert until the liquid level is replaced.

4.1.6 **Separator waste is a "special waste" under the terms of The Waste Management Code of Practice. The Code imposes a duty of care on the waste producer to ensure that the Cleansing contractor is registered with the Environment Agency and that the final disposal of the waste is to a licensed facility.**

4.1.7 You should consider the purchase of a maintenance service, which includes bi-annual inspections, removal of oil and silt, cleaning of the alarm probe and cleaning or replacement of the coalescer (where appropriate).

4.2 Waste Removal Procedure – Oil & Silt

4.2.1 **Oil can only be effectively removed when there is no flow entering the unit. Isolate the unit and prevent flow from entering. Always remove the oil before attempting to remove the coalescer. If this is not done, when the coalescer is withdrawn the oil can coat the media surface and when replaced the oil may be forced through the media, contaminating the effluent.**

4.2.2 Remove the access cover and lower the desludging hose in to the separation chamber. Draw off the surface oil.

4.2.3 If removing the silt, lower the desludge hose to the base of the tank and empty the contents of the chamber. Ensure that you access and clean both the inlet and the separation compartments.

4.2.4 Remove the alarm probe, if fitted, clean with water and replace.

4.2.5 Consider the period of time that the coalescer has been installed and consider removing and inspecting (cleaning or replacing) the coalescer media. If removed, ensure that it is correctly replaced into position. Replace the access covers. It is best to lower the water level to aid re-fitting.

4.2.6 Re-fill the separator with clean water up to the outlet level.

4.2.7 If an alarm is fitted, it will display an alarm condition until the separator is re-filled. Check alarm operation when unit full.

4.3 Checking the Coalescer Assembly

4.3.1 Coalescers, where fitted, may be cleaned periodically to maintain efficiency. Coalescers should be checked following a major incident and replaced if necessary. Please contact us if you wish to purchase the coalescer media.

4.3.2 Identify the type and size of separator (shown on labels inside the access neck).

4.3.3 Assemblies weighing less than 25 Kg may be removed by hand. Heavier assemblies should be lifted by mechanical means. Any lifting device employed must be capable of lifting:

4.3.3.a In excess of the maximum assembly weight.

4.3.3.b The assembly completely out of the access shaft.

4.3.3.c Giving a smooth and controlled lift.

4.3.3.d Swinging the assembly to one side clear of the access shaft.

Unit	Dry Weight (Kg)	Wet Weight (Kg)	Silted Weight (Kg)	Number Within unit	Replacement Media Part No.
NSBE010	5.7 kg	≈50 kg	≈60 kg	1	402862
NSBE015	6.2 kg	≈55 kg	≈65 kg	1	402864
NSBE020	6.2 kg	≈55 kg	≈65 kg	1	402864
NSBE025	12.0 kg	≈65 kg	≈75 kg	1	402866
NSBE030	12.0 kg	≈65 kg	≈75 kg	1	402866
NSBE040	21.0 kg	≈100 kg	≈200 kg	1	402885
NSBE050	21.0 kg	≈100 kg	≈200 kg	1	402885
NSBE075	21.0 kg	≈100 kg	≈200 kg	2	402885
NSBE100	21.0 kg	≈100 kg	≈200 kg	2	402885
NSBE125	21.0 kg	≈100 kg	≈200 kg	3	402885

4.3.4 Ensure that the area around the access shaft is clear and that there is space to place the assembly once removed. If space is not available it will be necessary to support the assembly over the access shaft. e.g. by scaffold poles and platform.

4.3.5 Only remove the access cover when necessary to remove the assembly. Do not leave the access shaft uncovered and unattended.

4.4 Removing the coalescer assembly.

4.4.1 Undo and remove the bracket which secures the coalescer to the access shaft.

4.4.2 Lift the assembly with a smooth and steady motion. Coalescers will become lighter as water drains from the exposed media. Allow the water to drain completely. Assemblies blocked with fine silt may be very heavy.

4.4.3 Fully extract the assembly and set it down adjacent to the access shaft.

4.5 Cleaning the coalescer assembly/ Media Replacement.

4.5.1 Hose down the assembly using clean water at normal pressure. If the media is heavily contaminated with oil and silt, it may not be possible to clean it effectively by hosing. Do not allow untreated cleaning water to pass out of the unit. Continue hosing until the water runs clear.

4.5.2 To replace the media, undo the banding. Slide media off the core tube and slide new media on. Ensure all the apertures on the core tube are covered by the media. Re-secure or replace banding. Consider replacing media and banding every two years.

4.6 Replacing the coalescer assembly.

4.6.1 Position it over the access shaft.

4.6.2 Lower the assembly steadily into the access shaft ensuring that the end locates within the sump at the bottom of the tank.

4.6.3 Replace the access cover.

5 Emergencies

5.1.1 At sites where there is a high risk of spillage, spill kits containing drain seals, absorbent materials, disposal containers and other appropriate equipment should be held. In the event of a spillage on site, the material should be contained, (if a spill kit is not available, sand or soil may be used) and the Environment Agency notified immediately using the appropriate emergency hotline number listed in the Agency Guideline PPG3. Year 2011 **- 0800 80 70 60**

6 Warranty

The company will replace or, at its option, properly repair without charge any goods which are found to be defective and which cause failure in normal circumstances of use **within a period of twelve months from the date of delivery.**

This warranty is conditional upon:

(a) the Buyer notifying the Company of any claim within Seven days of the failure becoming discernible.

(b) the Company being allowed a reasonable opportunity to inspect the goods so as to confirm that they are defective.

(c) the goods not having been modified, mishandled or misused and being used strictly in accordance with any relevant instructions issued by the Company.

The Company's liability under this Clause is limited to the repair or replacement of the defective goods, and does not cover costs of transport, installation or associated site costs, if applicable.

The Company's liability to replace or repair the goods is in lieu of and excludes all other warranties and conditions, and in particular (but without limitation) the Company shall have no liability of any kind for consequential loss or damage.

For any further advice, please us.

A warranty form is included in this package, to register your unit for warranty. Please complete ALL sections of the form, and return it at your earliest convenience.

SEPARATOR MAINTENANCE LOG

Site address/location .....

.....

Separator location .....

.....

Type of separator .....

Nominal Flow .....

Total capacity .....

Inspection/ Maintenance Date	Comments	Waste Volumes Removed (if appropriate)

012582
Washdown & Silt Separator
Installation & Operation Guidelines

Kingspan Environmental

Kingspan Environmental Service Contact Numbers:

GB: 0844 846 0500

NI: 028 3025 4077

IRL: 048 3025 4077

HEALTH & SAFETY

These warnings are provided in the interest of safety. You must read them carefully before installing or using the equipment.

It is important that this document is retained with the equipment for future reference. Should the equipment be transferred to a new owner, always ensure that all relevant documents are supplied in order that the new owner can be acquainted with the functioning of the equipment and the relevant warnings.

Installation should only be carried out by a suitably experienced contractor, following these guidelines.

We recommend the use of a dust mask and gloves when cutting GRP components.

Electrical work should be carried out by a qualified electrician.

Contaminated surface water can contain substances harmful to human health. Any person carrying out maintenance on the equipment should wear suitable protective clothing, including gloves. Good hygiene practice should also be observed.

Access covers should be selected with reference to the location of the unit and traffic loads to be accommodated. These are not (normally) part of the Separator supply.

When covers are removed precautions must be taken against personnel falling into the unit.

Should you wish to inspect the operation of the equipment, please observe all necessary precautions, including those listed below, which apply to maintenance procedures.

Ensure that you are familiar with the safe working areas and accesses. Ensure that the working area is adequately lit.

Take care to maintain correct posture, particularly when lifting. Use appropriate lifting equipment when necessary. Keep proper footing and balance at all times. Avoid any sharp edges.

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1.0 Introduction

These Guidelines represent Best Practice for the installation of the above Kingspan Separator Units. Many years of specialist experience has led to the successful installation of thousands of separator units. It must be noted, however, that these Guidelines are necessarily of a general nature. It is the responsibility of others to verify that they are appropriate for the specific ground conditions and in-service loads of each installation. Similarly, any information or advice given by employees or agents of Kingspan regarding the design of an installation must be verified by a qualified specialist (e.g. Civil engineering consultant).

2.0 Handling & Storage

2.1. Care must be taken to ensure that units are not damaged during delivery and handling on site. Please take care and place unit so that it cannot fall and become damaged

2.2. The design requirements of Kingspan products will frequently mean that the centre of gravity of the unit is “offset”. Care must therefore be taken to ensure that the unit is stable when lifting. Rainwater may also collect inside units, particularly if they have been stored on site prior to installation, adding weight and increasing instability. Check units before lifting and pump out any excess water.

2.3. When lifting units, use webbing slings of a suitable specification. Do not use chains.

2.4. A suitable spreader bar should be used to ensure that units are stable and that loads are evenly distributed during lifting. When lifting separators, a spreader bar should be used where the slings would otherwise be at an angle > 30 degrees to the vertical.

2.5. Lifting equipment should be selected by taking into account the unit weight, length and the distance of lift required on site.

2.6. Kingspan Environmental accepts no responsibility for the selection of lifting equipment.

2.7. Whenever Kingspan units are stored or moved on site, ensure that the storage location is free of rock, debris and any sharp objects which may damage the unit. The units must be placed on ground which is flat and level and the unit orientated onto its side with even support. Do not roll separators.

3.0 Site Planning

The following points should be considered before installation of the equipment:

3.1. The discharge must have the consent of the relevant Environmental Regulator.

3.2. The installation should have Planning and Building Control approval.

3.3. Consider installing flow cut-off valves to isolate the separator in an emergency or during site cleaning operations. See Environment Agency Guidelines PPG3.

3.4. Consider installation of a sampling point downstream of the separator. There is no suitable facility to effectively sample the waste water from inside the unit..

3.5. Uncontaminated run off such as roof water should be excluded from separators. (EA Guidelines PPG3.)

3.6. Ground conditions and water table level should be assessed. If the water table will be above the base of the units at any time of the year, adequate concrete backfill must be provided to avoid flotation. In poorly draining ground, consideration should also be given to the likelihood of flotation due to surface water collecting in the backfill, and an appropriate installation method devised to avoid this.

3.7. The separator must be installed at a level which will allow connection to the incoming drain and a free discharge at the system outlet. The water table must be below the discharge outlet.

3.8. Do not install the unit deeper than necessary, ensure that you purchase extension shafts. The minimum invert depth of the unit is shown on the customer drawing.

3.9. Adequate access must be provided for routine maintenance. Vehicles should not be permitted within a distance equal to the depth of the unit, unless suitable structural protection is provided to the installation.

3.10. There must be at least 1 metre of clear, level ground all around the access covers to allow for routine maintenance.

3.11. It is essential that a mains water supply is accessible for routine cleansing and refilling after removal of waste material and liquid.

4.0 Installation – General

4.1. When units are installed in unstable ground conditions where movement of the surrounding material and/or unit may occur, the connecting pipework should be designed to minimise the risk of damage from differential movement of the unit(s) and/or surrounding material.

4.2. For separators with burial depths greater than 1000mm from cover level to the top of the unit, specific site conditions should be taken into consideration and the backfill designed to bear any loads which may be applied during and after installation to prevent the tank being subjected to these loads.

4.3. The excavation must be deep enough to provide bedding and cover depth as determined by the type of surface pavement and loading. Asphalt and concrete pads should extend a minimum of 300mm horizontally beyond the unit in all directions.

4.4. In situations where the excavation will not maintain a vertical wall, it will be necessary to shore up the side walls of the excavation with suitable trench sheets and bracing systems to maintain a vertical wall from the bottom to the top of the excavation. DO NOT completely remove the shoring system until the backfilling is complete, but before the concrete fully hardens.

4.5. In areas where the water table is above the bottom of the excavation and/or the excavation is liable to flood, the excavation should be dewatered using suitable pumping equipment and this should continue until the installation is complete.

4.6. During installation care must be taken to ensure that the body of the unit is uniformly supported so that point loads through the unit are avoided.

4.7. Concrete Specification is a *general* specification. It is not a site-specific installation design.

GENERAL CONCRETE SPECIFICATION IN ACCORDANCE WITH BS EN 206-1 (BS 8500-1)		
TYPE OF MIX		(DC) DESIGN
PERMITTED TYPE OF CEMENT		BS 12 (OPC): BS 12 (RHPC): BS 4027 (SRPC)
PERMITTED TYPE OF AGGREGATE (coarse & fine)		BS 882
NOMINAL MAXIMUM SIZE OF AGGREGATE		20 mm
GRADES:	C25 /30 C25 /30 C16 /20	REINFORCED & ABOVE GROUND WITH HOLDING DOWN BOLTS REINFORCED (EG. FOR HIGH WATER TABLE) UNREINFORCED (NORMAL CONDITIONS)
MINIMUM CEMENT CONTENT	C30 C20	270 - 280 Kg/M^3 220 - 230 Kg/M^3
SLUMP CLASS		S1 (25mm)
RATE OF SAMPLING		READY MIX CONCRETE SHOULD BE SUPPLIED COMPLETE WITH APPROPRIATE DELIVERY TICKET IN ACCORDANCE WITH BS EN 12350-1
NOTE: STANDARD MIXES SHOULD NOT BE USED WHERE SULPHATES OR OTHER AGGRESSIVE CHEMICALS EXIST IN GROUND WATER		

5.0 Separator Installation

5.1. Excavate a hole of sufficient length and width to accommodate the tank and a minimum 225mm concrete surround and to a depth which allows for the burial depth of the unit plus concrete base slab and haunch.

5.2. Construct a suitable concrete base slab appropriate to site conditions. Ensure that the slab is flat and level.

5.3. When the concrete base slab has set enough to support the installed load, add a concrete haunch so as to provide even support under the unit, then lower the unit onto the haunch using suitable webbing slings and lifting equipment.

5.4. Pour no more than 300 mm depth of clean water into the unit, avoiding shock loads. For units with more than one chamber, add water to each chamber simultaneously. DO NOT OVERFILL, the unit is not designed to hold water whilst unsupported.

5.5. Place concrete backfill to approximately 250mm depth under and to the sides of the tank ensuring good compaction to remove voids. DO NOT use vibrating pokers. Continue adding concrete backfill, simultaneously keeping the internal water level no more than 200 mm above the backfill level at all times, until the backfill is just below the underside of the outlet drain, giving sufficient room to connect the inlet and outlet pipework.

5.6. Connect inlet and outlet drains and vent pipes when safe access to the backfill can be gained.
PIPEWORK CONNECTIONS
In all cases, ensure that the outlet pipework level is maintained for correct operation. (Unless specified on the order, the fall across the unit will be as per the customer drawings).
Small units are generally fitted with **PVCu spigots** to both the outlet and the inlet.
Connect using the same size PVCu socket or a suitable reducer.
Larger units are generally fitted with **Kingspan GRP** manufactured sockets.
The connecting pipework should be pushed into the socket and a joint made to fill in the gap using rope/hemp with a cement mortar or bonding mix. Ensure that the seal is secure and watertight before backfilling the pipe.

Alternatively, proprietary **flex seal couplings** can be obtained to fit over the outside of the site pipework and the outside of the GRP socket. When using this connection method, please be aware that the outside GRP laminate is not perfectly regular and that you may need to use a sealant on the outside diameter of the GRP. Take care not to over tighten the coupling when connecting to the GRP and ensure that the seal is secure before backfilling the pipe. A drawing can be provided to show the ID of our GRP sockets. The OD is variable, as the wall thickness can be up to 15-20 mm. If purchasing a flexseal coupling for use with clay /concrete, we suggest that a size 110 mm larger than the ID is selected.

5.7. Continue backfilling with concrete over the tank body to the required level. Build up a shell of concrete, minimum 225mm thick, around the access shaft(s). Temporarily strut the access shaft to avoid distortion.

5.8. It is advisable to seal the joints on the extension shafts (particularly on sites with high ground water) with proprietary sealant or by GRP lamination. Temporarily strut the extension neck(s) to avoid distortion during back filling. Where more than one neck section is required to suit a deep invert, consider back-filling section by section. If the extension neck is too long, it can be trimmed using a fine-toothed saw.

5.9. Ensure that the vent socket if cut out, is replaced elsewhere. The maximum recommended inlet invert is 2000mm (using 500mm long extension sections).

5.10. Continue back-filling, ensuring minimum 225mm concrete thickness around the access shaft/ extension neck and alarm access tube (as applicable).

5.11. In traffic areas a suitable top slab must be constructed. The top slab should bear on a suitable foundation to prevent superimposed loads being transmitted to the unit and access shafts. Loads applied to covers and frames must bear on the top slab, not the access shaft.

5.12. The unit should be filled with clean water up to the invert level of the outlet pipe. Ensure the unit identification is placed/ marked inside the neck for future information. The unit is now ready for use.

Unit	Total Capacity (Litres)	Max. Recommended Silt Volume
W1/012	1200	600
W1/020	2000	1000
W1/030	3000	1500
W1/040	4000	2000
W1/060	6000	3000
W1/080	8000	4000
W1/100	10000	5000
W1/120	12000	6000
W1/150	15000	7500
W1/190	19000	9500

The units above all include a single chamber, (W1) but on request, we may be able to provide with 2 or 3 chambers. If you require larger units, these are also available. Please contact us to discuss your specific application

Invert depths (E) can be supplied in additional increments of 500mm from the minimum stated above. Please indicate the inlet drain invert required when specifying units. Maximum 2.0 m.

6.0 Operation

As contaminated water passes through the separation chamber, it is retained long enough to allow settleable solids to sink to the bottom of the unit. Our design uses a maximum of 6 minutes retention time, at the flow rate given. The separator water is able to discharge safely without the risk of pollution to the municipal plant.

The nature of the silt varies depending on either the ground or surface receiving the flow. These aspects should be considered when selecting the size of the unit in relation to the flow being treated. .

7.0 Maintenance

Waste Removal and Servicing

7.1 Separators should be inspected at least every six months or more frequently if experience dictates. A log should be maintained detailing any silt removal or cleaning carried out. A specimen maintenance log is included in the appendices.

7.2 Every site is different, in respect to the amount and type of silt generated by the drain design and installation. Frequently, the construction programme itself generates large and perhaps unusual quantities of silt and grit. We do recommend that following the initial installation, an inspection of the separator contents be made to check that building rubble has not entered the unit. Further inspections at 3 and 6 months should be made so as to be able to assess the volumes of silt accumulated. The inspection and emptying programme can then be defined following the first 6 months site experience. We recommend leaving a maximum interval between inspections of 6 months.

Waste Removal Procedure –Silt

7.3 Remove the access cover and lower the desludging hose in to the separation chamber.

7.4 Lower the desludging hose to the base of the tank and withdraw any grit or sludge that may be present. Do not remove more water than is necessary. Ensure that you access and clean both compartments.

8.0 Emergencies

At sites where there is a high risk of spillage, spill kits containing drain seals, absorbent materials, disposal containers and other appropriate equipment should be held. In the event of a spillage on site, the material should be contained, (if a spill kit is not available, sand or soil may be used) and the Environment Agency notified immediately using the appropriate emergency hotline number listed in the Agency Guideline PPG3. Year 2012 **- 0800 80 70 60**

9.0 Warranty

Taken from 'Kingspan's Terms & Conditions of Sale'
The company will replace or, at its option, properly repair without charge any goods which are found to be defective and which cause failure in normal circumstances of use within a period of twelve months from the date of delivery.

This warranty is conditional upon:
(a) the Buyer notifying the Company of any claim within Seven days of the failure becoming discernible.
(b) the Company being allowed a reasonable opportunity to inspect the goods so as to confirm that they are defective.
(c) the goods not having been modified, mishandled or misused and being used strictly in accordance with any relevant instructions issued by the Company.

The Company's liability under this Clause is limited to the repair or replacement of the defective goods, and does not cover costs of transport, installation or associated site costs, if applicable.

The Company's liability to replace or repair the goods is in lieu of and excludes all other warranties and conditions, and in particular (but without limitation) the Company shall have no liability of any kind for consequential loss or damage.

For any further advice, please contact us.

Our service provider: Kingspan Environmental Services: 0844 846 0500

SEPARATOR MAINTENANCE LOG

Site address/location .....

.....

Separator location .....

.....

Type of separator .....

Nominal Flow .....

Total capacity .....

Inspection/ Maintenance Date	Comments	Waste Volumes Removed (if appropriate)

SECTION

3

SPEL Fuel/Oil Separators - Overview

For the removal of hydrocarbons, silt and soluble metals as sediment bound

Introduction, Testing & Compliance with BS EN 858-1:2002 & Performance	**3.1 - 3.2**
Where are Separators Needed?	**3.3**
How to Select & Specify	**3.4**
SPEL Puraceptor® Class 1 Full Retention Separators – Single & Two Chamber	**3.5**
SPEL Stormceptor® Class 1 By-Pass Separators	**3.6**
SPEL Coalescer Guide Rail Systems	**3.7**
How to Specify - *Type, Sizing, Model, Connections (size and orientation) and Tank Specification re. Tank Invert Depth and Water Table and Options for Alarm and SPEL Econoskim® System*	**3.8**
SPEL Automatic Alarm/Monitoring Systems	**3.9 - 3.19**
Automatic Closure Device	**3.20**
Maintenance	**3.21 - 3.24**


INDIAN AIR FORCE




39 38 37 36 35 34 33 32 31 30 29 28 27 26 25



It is a known fact the planet's atmosphere and climate have been changing for decades, and hydrocarbons are one of the main culprits. Spillages of oil and fuel from industrial sites, filling stations and the emissions from automotive leaks can have a cumulative effect that can damage the environment in devastating ways.

Highway surface runoff discharges contain pollutants that have accumulated on the carriageway, particularly following periods of dry weather.

These pollutants can then be transported via the surface water drainage system to discharge to ground or receiving watercourses.

Previous studies have demonstrated that highway runoff affects the quality of waters and sediments. Increased concentrations of metals, hydrocarbons and anions are associated with changes in the structure and functioning of biological communities.

Spills and leaks from fuel handling facilities using containers, tanks, drums, intermediate bulk containers (IBCs) and mobile containers called 'bowsers', can course serious pollution incidents.

The common saying is 'prevention is better than cure'. To fit a SPEL Separator to capture fuel, oil and silt prior to SuDS attenuation schemes is far better than hoping for the best and then have to instigate remedial work. All have a responsibility to cater for any possible pollution incidents.

- General Guidance by the Environment Agency regarding fuel/oil separators
- They are typically needed for any site with a risk of oil contamination, such as:
- Car parks larger than 800m2 in area or for 50 or more car parking spaces
- Smaller car parks discharging to a sensitive environment, such as a marsh that has been designated as a nature reserve
- Vehicle maintenance areas
- Roads
- Refuelling facilities

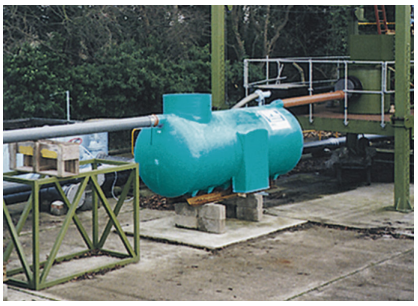
The type and class of separator needed will depend on the activity and where the discharge is directed to.

Fuel/oil separators do not work if there is detergent in the water, e.g. from car washing (see Section 6).

Testing and independent accreditation

The highly successful and well known SPEL fuel/oil/silt Separators are the result of extensive testing by H R Wallingford, the hydraulics research testing station, for hydrocarbon removal performance against the stringent European Standard BS EN 858 -1:2002. The tests required the hydrocarbons introduced into the separator at 5ml/litre to be reduced to a maximum of 5mg/litre in the outlet.

H R Wallingford started the testing in 1999.The SPEL Stormceptor® by-pass class 1 by-pass separator was the first to be accredited under the standard in the UK.



Hydrocarbon removal performance

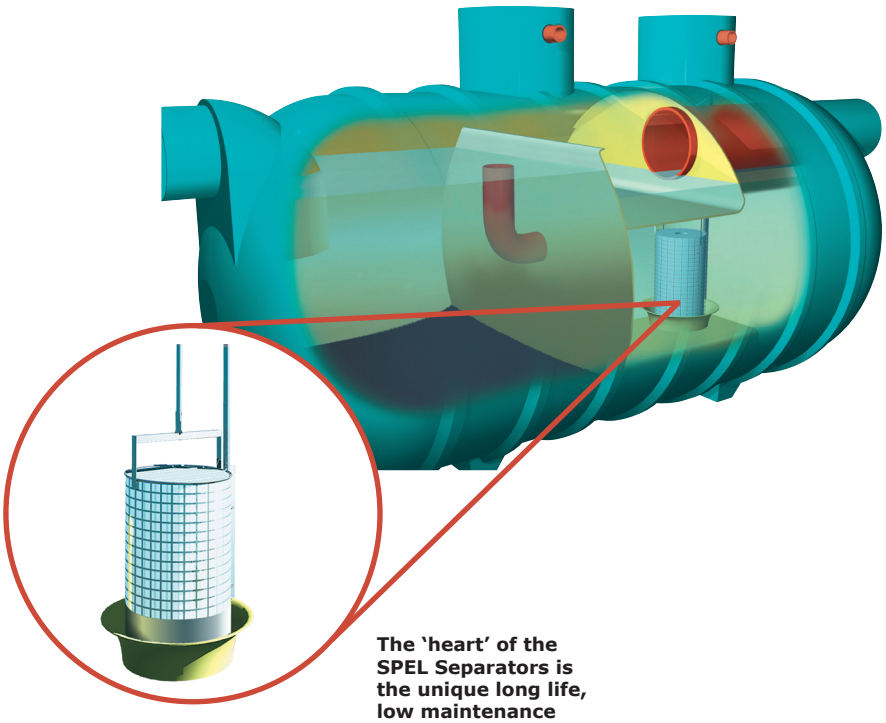
All models performed well within the European Standard with an average of 0.64mg/l.

Since then the SPEL Stormceptor® Class 1 by-pass and the Puraceptor® Class 1 full retention Separators have advanced in performance and construction as a result of technological advances in design and manufacture.

The 'heart' of the SPEL Separators is the unique long life, low maintenance coalescer unit/s which 'polishes' the final effluent AFTER 90% hydrocarbon and silt have been separated out.

Coalescer units comprise a stainless steel holder with a robust and efficient high volume reticulated foam insert. The coalescing process brings the smaller globules of oil into larger and buoyant forms to separate by gravity. The high volume foam safeguards against blockages due to silt and ensures a long life between servicing.

The coalescer inserts are easy to clean with normal pressure water and rarely require replacing.



The 'heart' of the SPEL Separators is the unique long life, low maintenance coalescer unit/s

3.2 Introduction

25 Year Warranty (life expectancy of over 50 years)

Manufacture

The full range of models is manufactured in glass reinforced plastics using the latest computerised equipment to ensure consistent quality. The shells are chop-hoop filament wound (see Section 2), the end domes using a specialised computer controlled machine and the components sprayed up by an eight axial robotic machine.

Quality control procedures ensure each serial numbered tank is tested and inspected to the strict quality parameters required.









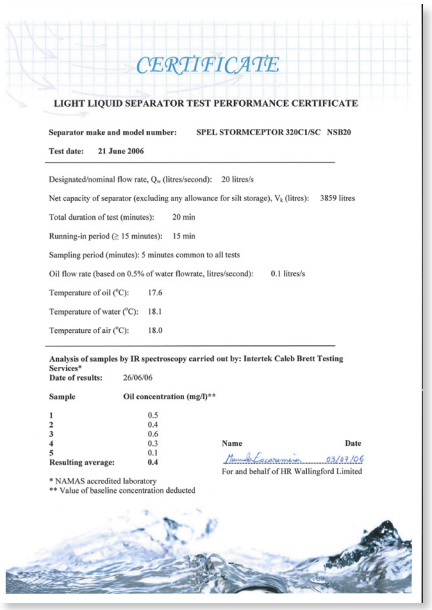


The design and construction

The SPEL Separators are designed to meet the requirements of underground tanks with a generous safety factor and meet the external load requirements depending on the burial depth and water table level as detailed in Section 3 with tables for each tank series. The quality shells have a chemical resistant inner lining suitable for aviation fuels with a smooth moulded finish to ensure easy desludging and cleaning.

Tests 'in the field' in other countries

SPEL being used globally has allowed us to obtain 'in the field' performance data in other countries for total suspended solids (TSS) with 75% removal and the reduction in soluble metals e.g. zinc, lead, copper, nickel, cadmium, arsenic and mercury.



CERTIFICATE

LIGHT LIQUID SEPARATOR TEST PERFORMANCE CERTIFICATE

Separator make and model number: SPEL STORMCEPTOR 320C1/SC NSB20

Test date: 21 June 2006

Designated/nominal flow rate, Q_n (litres/second): 20 litres/s

Net capacity of separator (excluding any allowance for silt storage), V_k (litres): 3859 litres

Total duration of test (minutes): 20 min

Running-in period (≥ 15 minutes): 15 min

Sampling period (minutes): 5 minutes common to all tests

Oil flow rate (based on 0.5% of water flowrate, litres/second): 0.1 litres/s

Temperature of oil (°C): 17.6

Temperature of water (°C): 18.1

Temperature of air (°C): 18.0

Analysis of samples by IR spectroscopy carried out by: Intertek Caleb Brett Testing Services*

Date of results: 26/06/06

Sample	Oil concentration (mg/l)**
1	0.5
2	0.4
3	0.6
4	0.3
5	0.1
Resulting average:	**0.4**

Name Date

03/07/06

For and behalf of HR Wallingford Limited

* NAMAS accredited laboratory

** Value of baseline concentration deducted

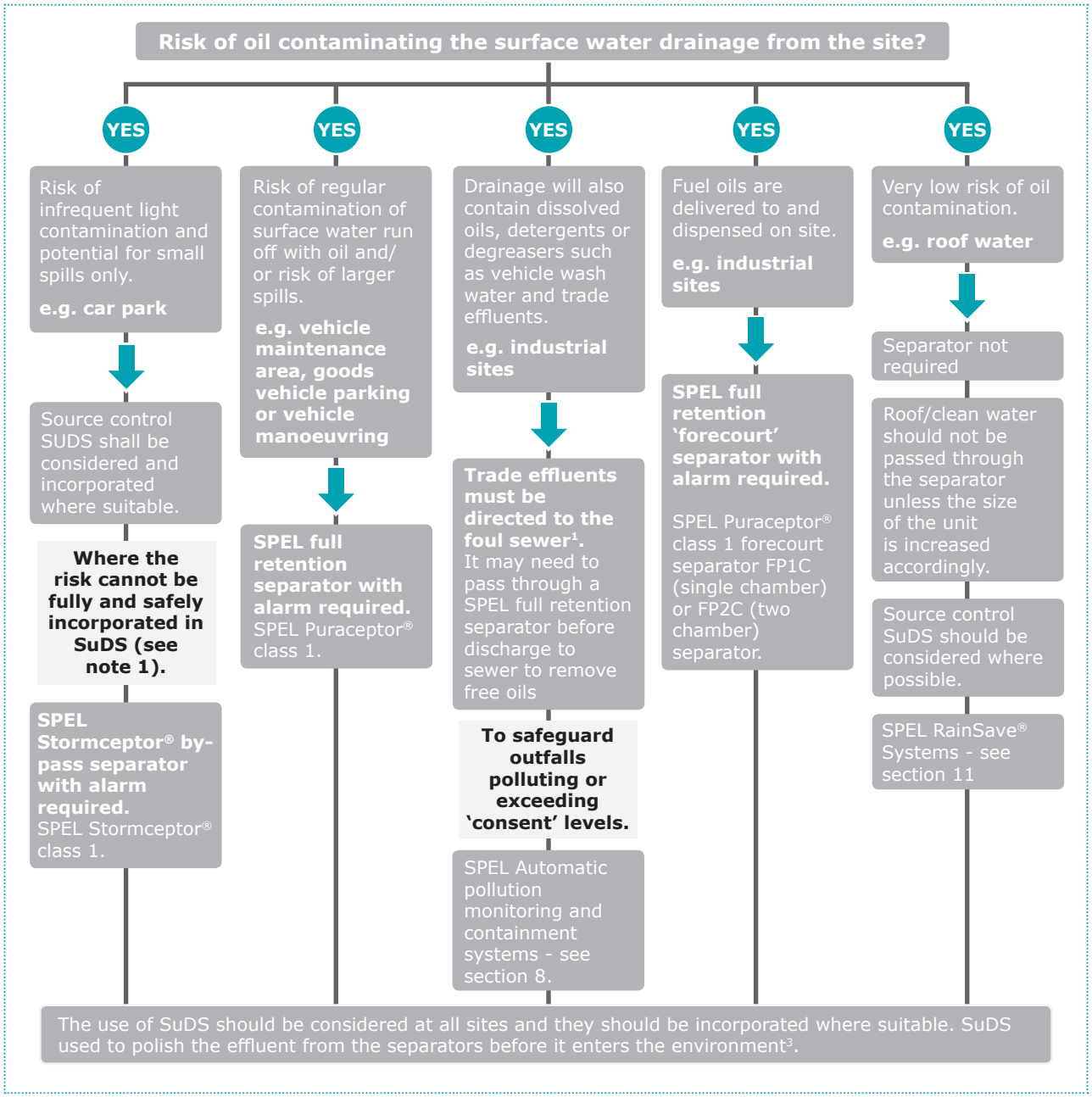
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Where are separators needed?

Surface water can be contaminated by oil and other contaminants depending on the site use. Sites with this risk need to have measures in place to prevent polluting the environment. These sites include:-

- Car parks typically larger than 800m2 or for 50 or more car parking spaces
- Smaller car parks discharging to a sensitive environment
- Areas where goods vehicles are parked or manoeuvred
- Vehicle maintenance areas
- Roads
- Industrial sites where fuel and oil are stored or handled
- Refuelling facilities
- Any other site with a risk of contamination

3.4 How to Select and Specify Separator Type & Class



Selecting the appropriate type of SPEL Separator

This flow chart is to aid selection of the most suitable and appropriate type of SPEL Separator for use in surface water drainage systems that discharge to rivers and soakaways. However, the appropriate provision on any site will require detailed consideration of the local circumstance and risk factors including:

- The discharge point of your proposed separator.
- The environmental sensitivity of your location.
- Activities on your site.

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] 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.

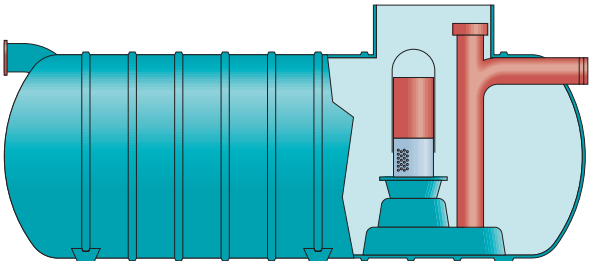
[3] A separator may be one of the devices used in the SuDS scheme.

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SPEL Puraceptor® separators have been designed and tested to meet the stringent European Standard BS EN 858-1 for installations for separator of light liquids where the maximum hydrocarbon concentration in the outlet does not exceed 5mg/l. Suitable for discharging into a surface water drain. For further details see section 5.

The 'heart' of SPEL Separators is the unique long life, low maintenance coalesce unit which 'polishes' the final effluent AFTER 90% hydrocarbons of SPEL

SINGLE CHAMBER MODELS



Typical sites

- Medium to high risk oil/fuel storage and handling areas.
- Filling stations (SPEL Puraceptor® forecourt separator FP1C).
- Commercial vehicle/plant maintenance yards and heavily contaminated industrial areas.

Features

Good access to all parts for desludging.

Sampling point incorporated into outlet.

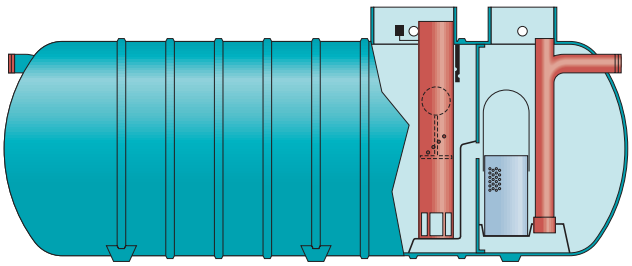
Stainless steel/plastic or copper ball automatic closure device. (ACD).

Robust stainless steel coalescer unit with long life foam insertion and lifting handle. These strong stainless steel units incorporate robust high volume reticulated foam inserts. The inserts efficiently coalesce the finer globules of hydrocarbons for gravity separation and due to their large volume, last for long periods before requiring cleaning.

Cleaning is then a simple operation using normal pressure water. The inserts can be reused again and again, rarely requiring replacement.

One access shaft for desludging tank and servicing of ACD and coalescer unit.

TWO CHAMBER MODELS



Typical sites

High risk oil/fuel storage and handling areas, filling stations (SPEL Puraceptor® forecourt separator FP2C), heavily contaminated industrial areas, commercial vehicle/plant maintenance yards, power stations and sub-stations.

Two chamber models provide protection to the coalescer foam inserts from silt and heavy fuel/oil contamination resulting in less frequent maintenance and easier cleaning of the coalescer foam inserts.

Features

Good access to all parts for desludging.

Coalescer unit/s incorporated into second chamber.

Stainless steel, plastic or copper ball automatic closure device (ACD).

Two access shafts for generous access to the desludging tank and servicing of the ACD and coalescer units.

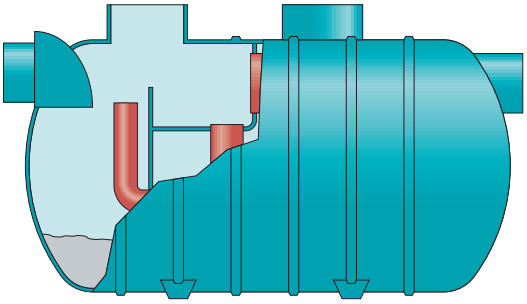
Sampling point incorporated into outlet.

Robust stainless steel coalescer unit with long life, high volume foam insert and lifting handle. These strong stainless steel units incorporate robust high volume reticulated foam inserts. The inserts efficiently coalesce the finer globules of hydrocarbons for gravity separation and due to their large volume, last for long periods before requiring cleaning. Cleaning is then a simple operation using normal pressure water. The inserts can be reused again and again, rarely requiring replacement.

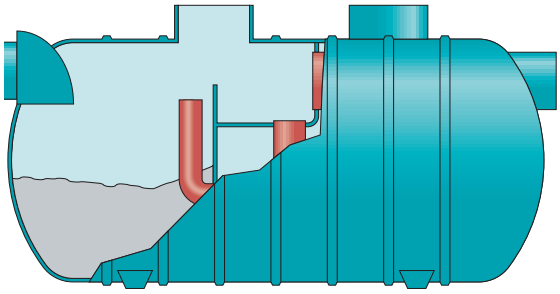
- Sized for working capacity PLUS fuel/oil and silt containment, ensuring optimum performance between maintenance periods.
- Designed for a long life span of high performance with low maintenance.

3.6 SPEL Separators Stormceptor® By-Pass Seperator

By-Pass Separator with Minimum Silt Capacity



By-Pass Separator with Silt Capacity BS EN 858



SPEL Stormceptors® are the most widely used separators where it is acceptable to treat the first flush and normal flows up to 6.5mm/hr rainfall. This covers approximately 99% of all rainfall events in the UK. Any excess rainfall is by-passed without treatment.

Class 1 separators, which are designed to achieve a concentration of less than 5mg/l of oil under standard test conditions, should be used when the separator is required to remove very small oil droplets, such as those arising from car park run-off.

These are used when it is considered an acceptable risk not to provide full treatment for high flows, for example, where the risk of a large spillage and heavy rainfall occurring at the same time is small. They are especially suitable for situations where the main requirement is to trap spillages.

The SPEL Stormceptor® is the first by-pass separator certified to BS EN 858-1.
For further details see section 4.

Typical sites and range

200/300 series the popular range of Stormceptors® for small to medium parking areas associated with smaller supermarkets and industrial estates.

400 series large capacity Stormceptors® for supermarkets, hypermarkets and large vehicle parking areas, industrial complexes, docks, airport aprons etc.

500/600 series the largest Stormceptor® range, for catchment areas from eight hectares upward to in excess of 30 hectares. Details are supplied against specific schemes.

Features

- Good access to all parts for desludging.
- Large and fully accessible primary chamber for silt capacity and its removal.
- Outlet junction chamber-approved sampling point.
- Dip pipe inlet for minimum turbulence and to prevent inflammable vapours passing upstream in drainage system.
- Most models can provide a choice of nine different inlet/outlet orientations to suit site drainage lay-out (check before specifying). See section 4.
- Coalescer unit/s incorporated within the main separation chamber provide an efficient coalescing separation process to reduce the hydrocarbon content in the outlet to 5mg/litre or less. These strong stainless steel units incorporate robust high volume reticulated foam inserts. Cleaning is then a simple operation using normal pressure water. The inserts can be reused again and rarely require replacement.
- Handle and/or lifting retaining cables with security fixing provided with each coalescer unit (see optional extra systems). See 3.4.
- Designed for high performance and low maintenance over a long life span.

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SPEL coalescer unit guide rails

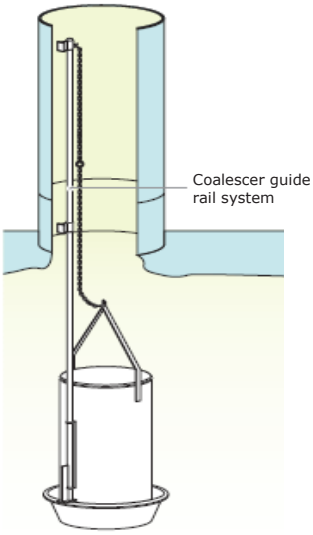
Normal servicing of the smaller SPEL Separators frequently requires emptying the unit completely providing access for the coalescer units to be taken out, cleaned and returned and guided accurately to their seating positions. However larger SPEL Separators may only require the hydrocarbon pollutants and silt to be removed.

In order to limit the servicing to sucking off the fuel/oil from the top and the silt from the bottom guide rails are required to ensure coalescer units are replaced into their correct positions.

The system is robust, manufactured throughout in stainless steel and the action positive, leaving no doubt the coalescer unit is located properly.

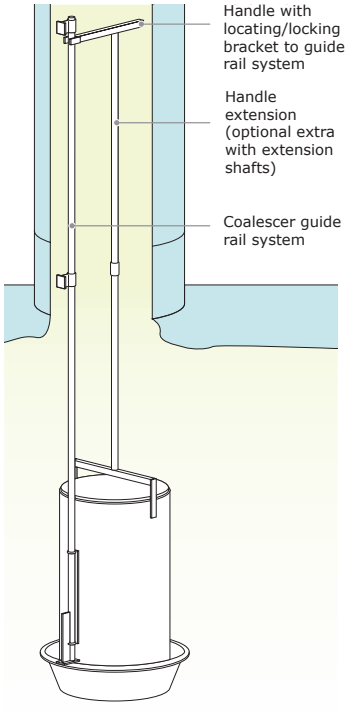
Brackets fixed to the top and bottom of the coalescer unit simply engage the stainless steel guide rail fixed to the top of the stub access shaft. The coalescer is then lowered in the normal way, being guided at the correct angle into the conical base unit which locates the coalescer unit into its final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

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



SPEL coalescer unit guide rail system

SPEL coalescer unit lifting/locating/locking system for positive location and security locking



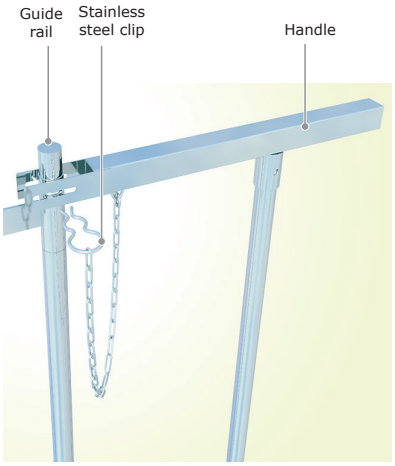
SPEL coalescer unit guide rail system/lifting, locating and locking system

SPEL coalescer units lowered into the separator with the SPEL guide rail system are easily guided into the base unit's conical moulding to automatically seat correctly.

However, when the separator is full of water, debris or sludge accumulated over a period, this could prevent the coalescer unit from re-seating correctly after servicing.

The coalescer unit lifting/locating/locking system provides assurance the coalescer unit is seated correctly and can be locked into position to prevent tampering.

The system is particularly suitable in SPEL Separator + Econoskim® systems where the total contents of the separator are not emptied on servicing.



The system comprises a robust stainless steel lifting and lowering handle that locates on the guide rail system. When the coalescer unit is correctly located in the conical seating in the separator, the handle will align with guide rail top bracket ie. the handles slotted holes with the top bracket clip locking groove, see diagram.

When aligned the stainless steel clip can be located through the slots and lock into position on the top bracket.

The stainless steel lifting handle can be extended to suit deep tank inverts and provide easy access for lifting manually or with the SPEL tripod and hoist.

3.8 How to Specify SPEL Separators

Type and model

Follow these steps to specify your requirements

Determine the type of separator – full retention or by-pass – see chart 3.4.

Specify whether silt capacity is required integrally or separately upstream of the separator.

Against the catchment area within which your requirements fall, the SPEL Separator nominal size can be ascertained or

To meet projected 'climate change' requirements – e.g. return storm frequency and percentage for climate change.

Optional extras available:

SPEL automatic alarm/monitoring system (section 3).

Extension shafts (see 2.13).

SPEL coalescer unit guide rail system (see 3.7).

SPEL mechanical anchoring system (see 13.11 – 13.12).

SPEL Econoskim® light liquid skimming and separate containment system (section 7).

SPEL automatic alarm/monitoring system (section 3).

Tank specification

SPEL Separators are available in four specifications to suit invert depths and ground water conditions. Standard, Heavy, Extra Heavy and Special, see tables alongside.

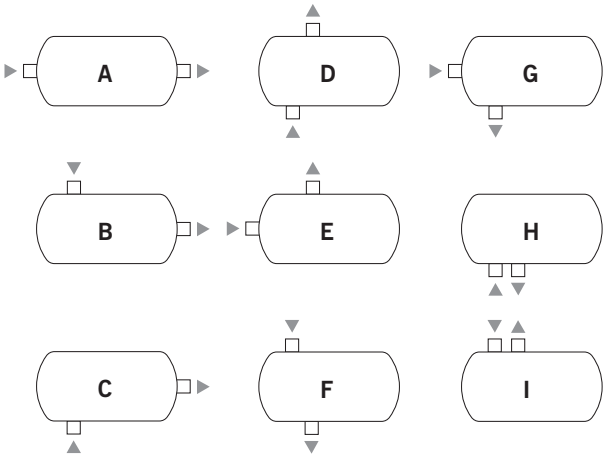
Concrete surround

Connections

110,160,225 mm diameter mm PVCu/Quantum
Inlets are socket and outlets are spigots.

300 mm diameter and larger
Inlet and outlets are spigots and can be connected to the site pipework using Flex-Seal, Band-Seal or similar flexible couplings.

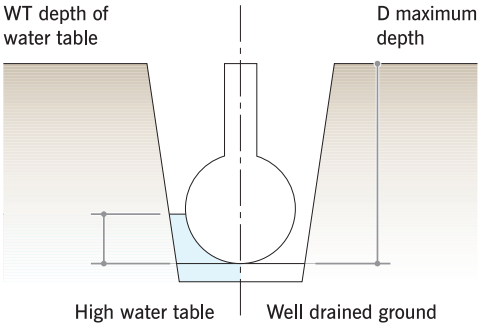
Inlet/outlet pipe connection orientation A-I
(see options below).

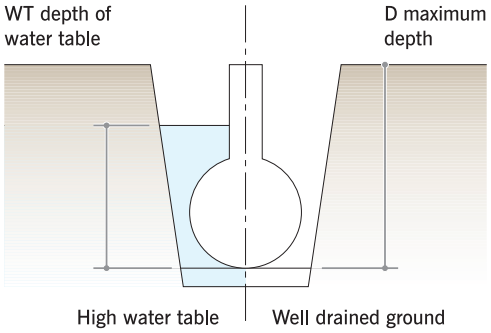


For extra heavy and special specification range and pea gravel surround refer to section 13 or contact technical sales.

Standard tanks		
Series	**WT(m)**	**D(m)**
100/200/300	1.0	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





For detailed tables – see section 13.4 & 13.5

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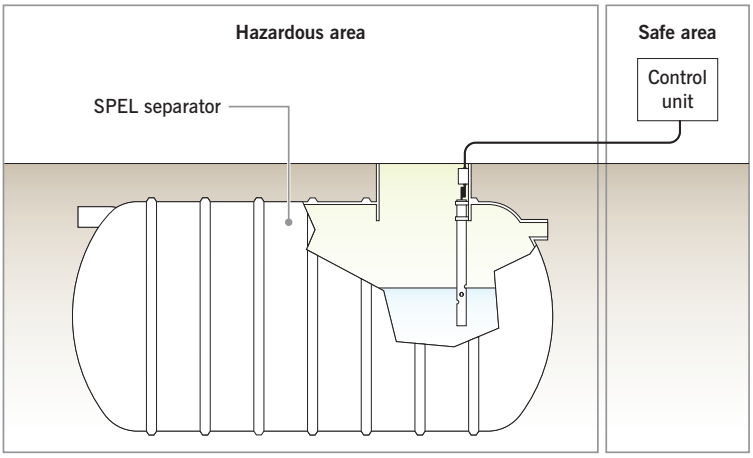
Installation, operation and maintenance instructions

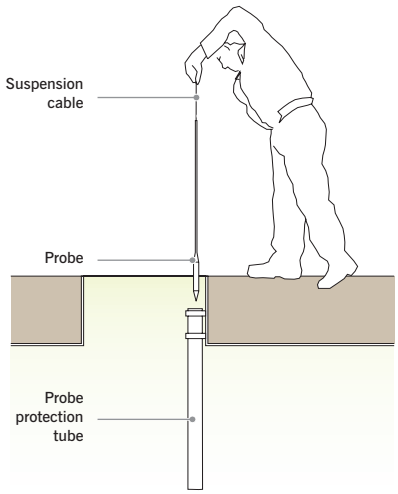
SPEL Automatic Alarm/Monitoring Systems – Overview

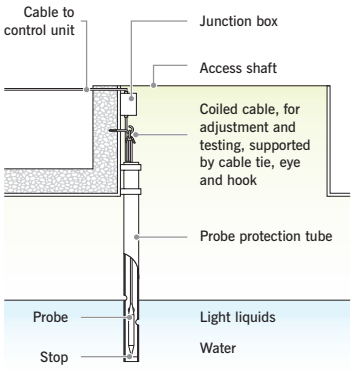
The SPEL automatic alarm/monitoring systems provide visual and audible warning when the level of the oil in the SPEL Separator reaches 90% of the storage volume under static liquid level conditions.

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

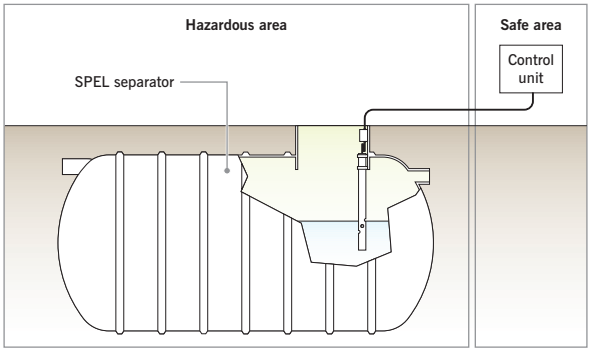
Reduces waste management costs

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

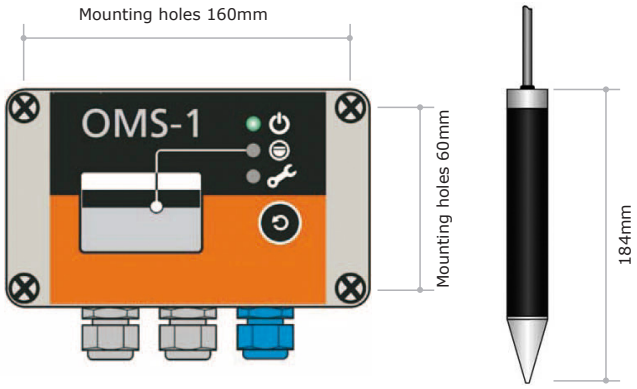
The SPEL OMS-1 alarm device is specially designed for oil separators. It indicates when it is time to empty the oil separator and thus prevents harmful hydrocarbon emissions to the sewer system.

SPEL OMS-1
control unit and
SPEL OMS sensor



Accessories: Cable joint

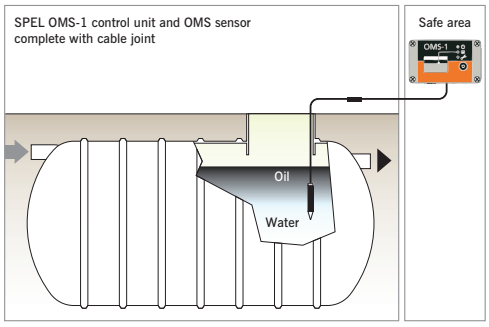
Control unit	SPEL OMS-1
Dimensions:	175 mm x 75 mm x 35 mm (L x H x D)
Material:	Polycarbonate
Enclosure:	IP65
Operation temperature:	-30 °C...+50 °C
Supply voltage:	230 VAC ± 10 %, 50/60 Hz The device is not equipped with a mains switch.
Power consumption:	1 VA
Sensors:	OMS sensor
Relay outputs:	Potential-free 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:	ⒺxII 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

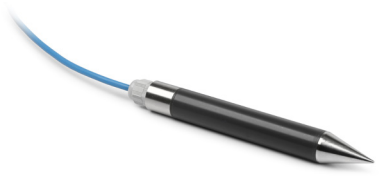
idOil sensors are an integral part of the idOil oil separator alarm system and they are to be used with the idOil control units. All idOil sensors are digital and polarity free.

	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

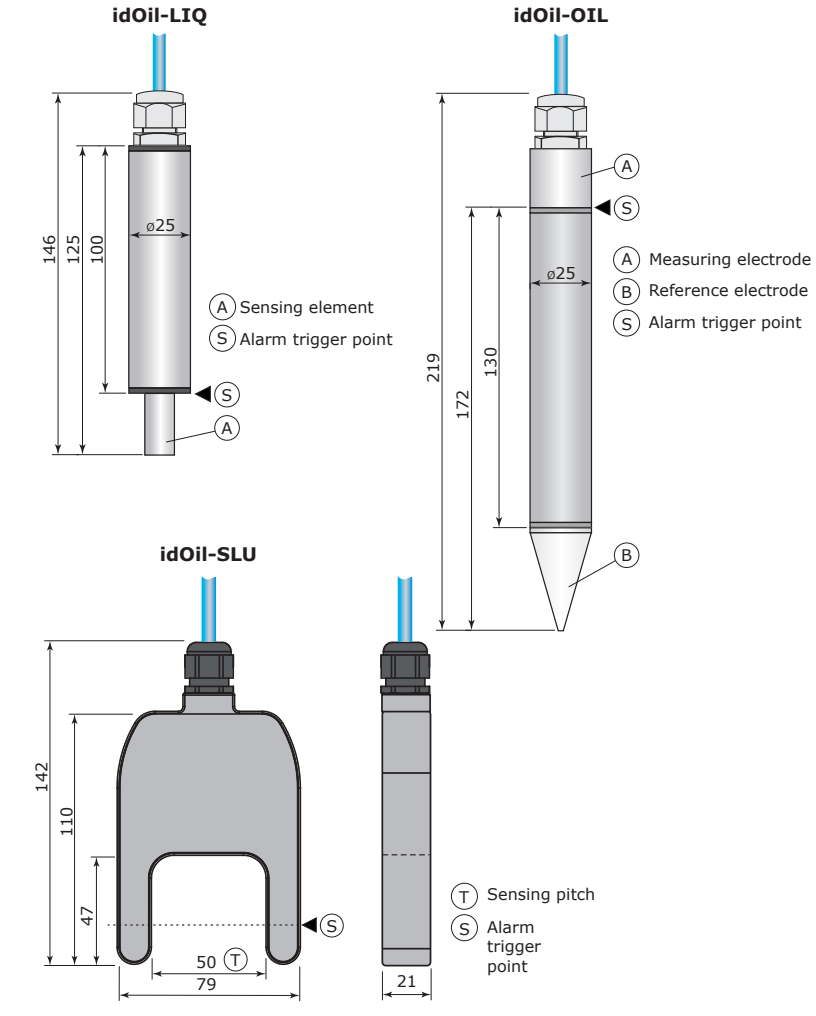
Detects oil and indicates when the separator's oil storage is full.



idOil-SLU sludge sensor

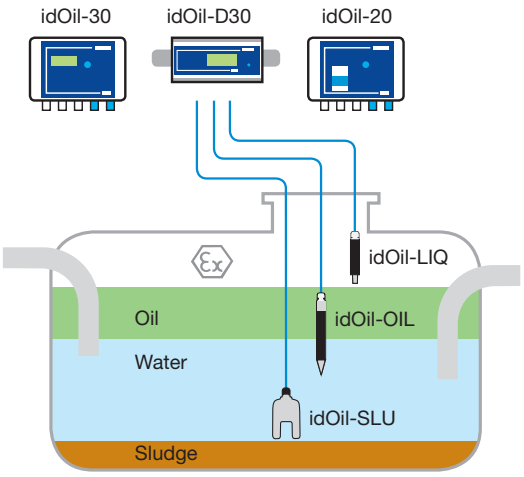
Monitors the sludge layer in the oil separator and indicates when the sludge layer has reached its maximum level.

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



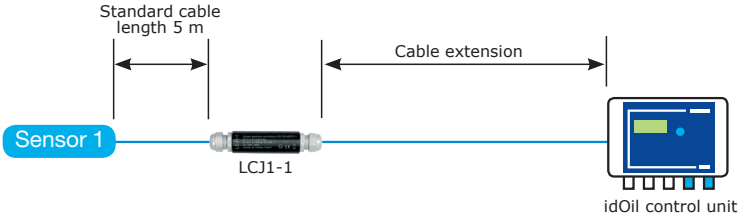
LCJ1-3
Cable connector for three sensors

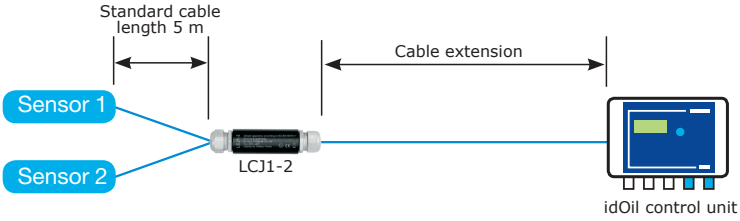
Sensor cable extension with installation

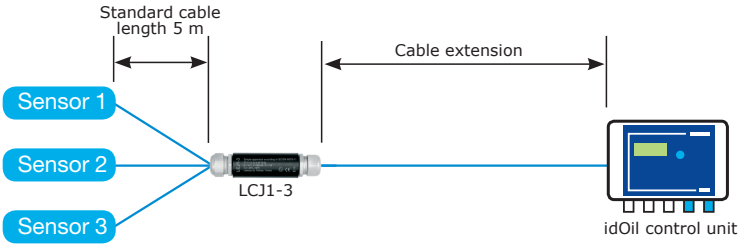
Sensor cable extension with Labkotec cable connector
LCJ1-1 for one sensor
LCJ1-2 for two sensors
LCJ1-3 for three sensors

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.

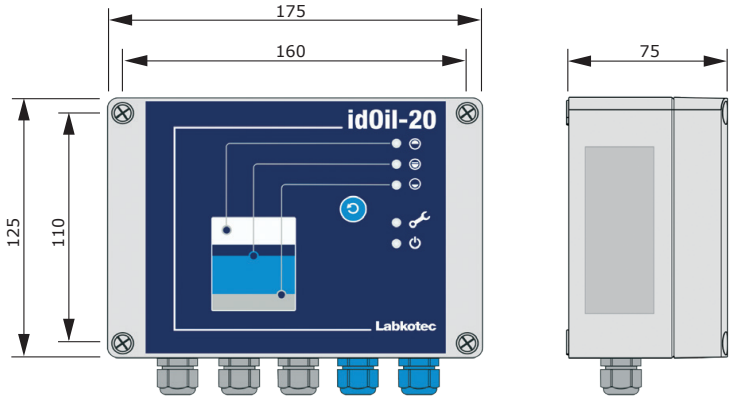
In these situations, an integrated alarm buzzer will sound, the display will show the alarm information and the relay(s) will switch.

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

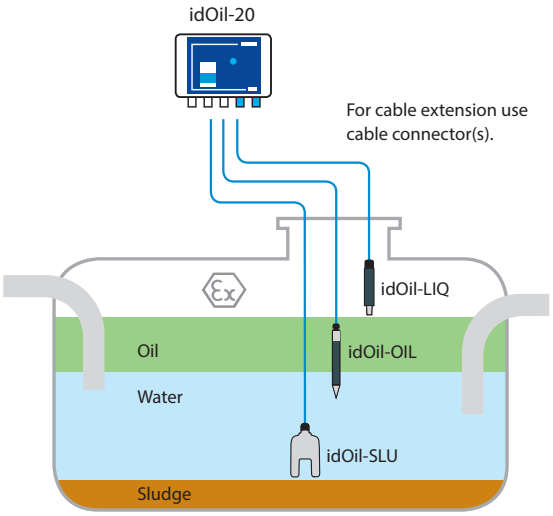
Mounting	Wall mounting
Enclosure material	Polycarbonate
Weight	750g
IP classification	IP65
LED Lights	For alarms, sensor fault and power
Ambient temperature	-30°C...+60°C
Supply voltage	100-240 V AC, 50/60 Hz
Supply power fuse	Max. 10 A
Power consumption	Max. 8 VA
Relay outputs	5 A, 250 V AC/30 V DC, 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	⟨Ex⟩ 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

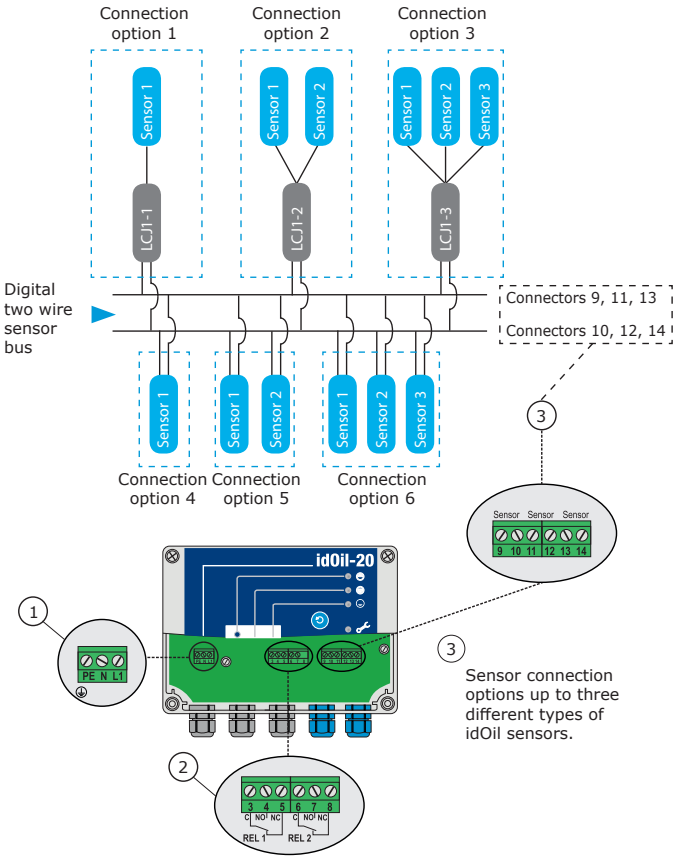


LCJ1-2
Cable connector for two sensors



LCJ1-3
Cable connector for three sensors

Installation



Sensor connection options up to three different types of idOil 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

3.16 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.

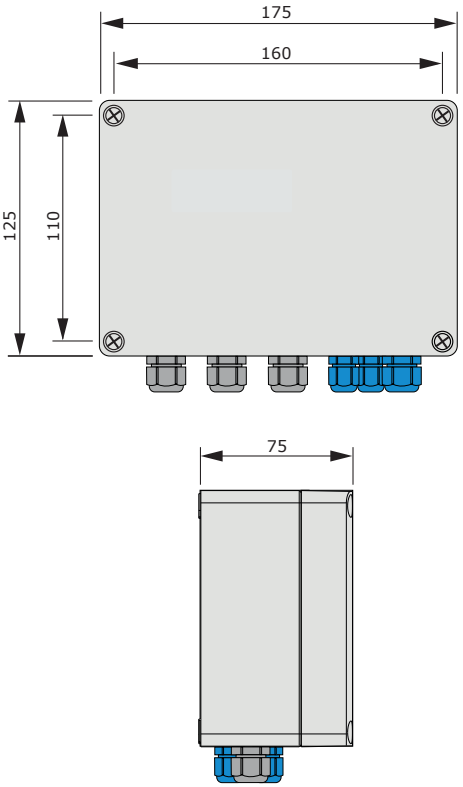
In these situations, an integrated alarm buzzer will sound, the display will show the alarm information and the relay(s) will switch. idOil-30 can be connected locally to laptop/tablet/smartphone via WLAN to access the inbuilt browser user interface for further configurations and settings.

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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