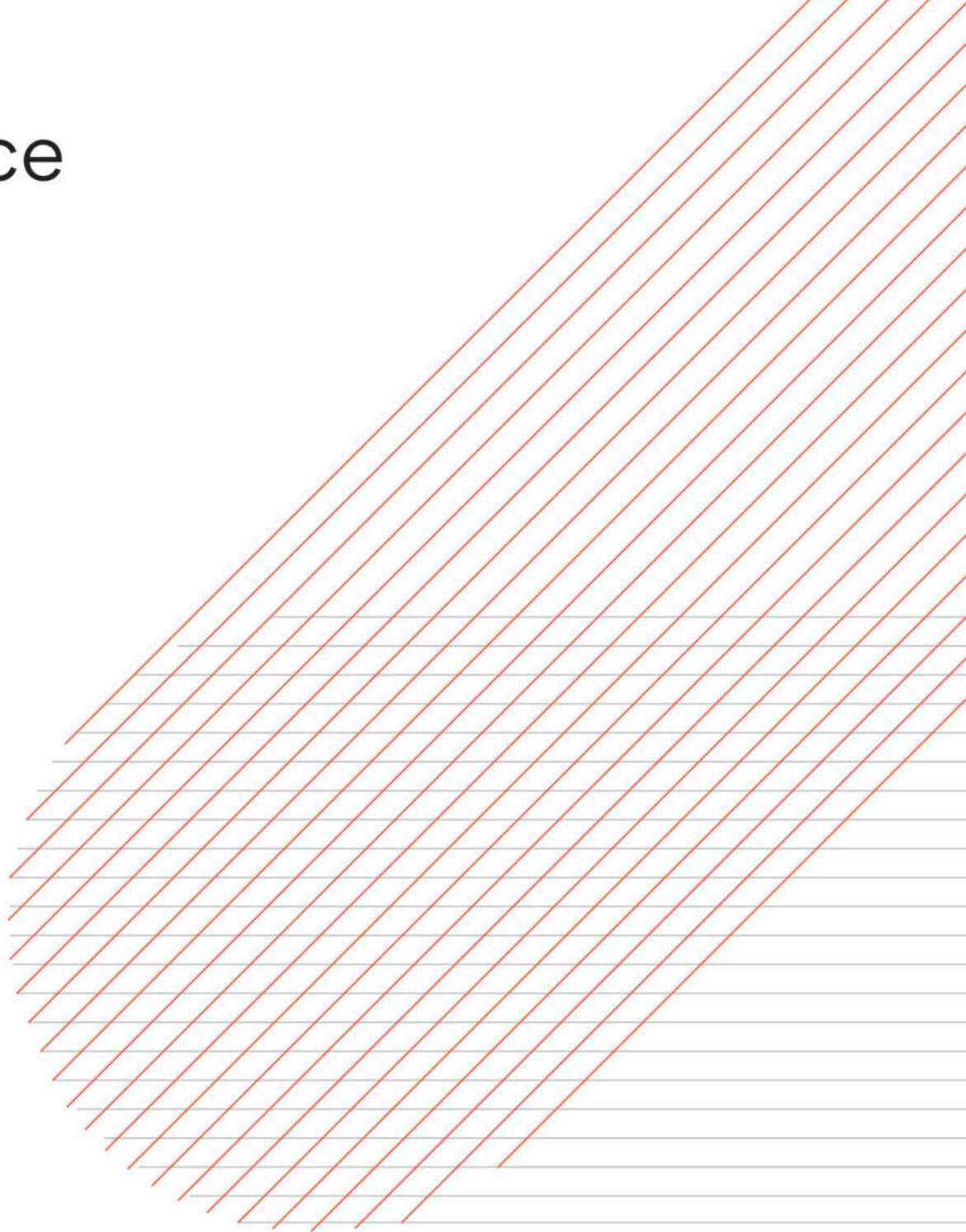




Welcome Break, Hinckley

Drainage Maintenance Plan

HINCK-DCE-XX-XX-RP-C-0001

Welcome Break, Hinckley Drainage Maintenance Plan

DATE: September 2025
REPORT REF: HINCK-DCE-00-XX-RP-C-0001
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1	P01	For Approval	26/09/2025
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Appendix A – Drainage Strategy

Appendix B – Stormceptor Information

Appendix C – Purceptor Information

Appendix D – Forecourt Separator Information

Appendix E – AquaSwirl Data Sheet

1. Introduction

- 1.1.1. Dice Consulting Engineers Ltd. (Dice) have been commissioned by Welcome Break to produce a Drainage Strategy and Drainage Maintenance Plan in support of a planning application for a proposed Service Station in Hinckley.
- 1.1.2. This report has been prepared for the sole benefit, use, and information of the client and future maintenance provider. This manual has been produced to establish the maintenance requirements of the drainage systems on-site. The proposed drainage networks can be found in Appendix A.
- 1.1.3. The contents of this report are based on current best practices, CIRIA report C753 The SuDS Manual, and any specific proprietary third-party product guidelines.

1.2. Scope

- 1.2.1. This manual is intended to give an overview of the operation and maintenance for the range of drainage features included with the Proposed Drainage and in relation to typical/standard details only. Where proprietary products are specified the manufacturer's instructions and recommendations should be followed in the first instance, unless specifically noted otherwise due to project constraints.
- 1.2.2. The recommended operations and maintenance intervals are indicative only and should initially be undertaken on a more frequent basis to ensure that there are no unforeseen issues with the construction and early operation.
- 1.2.3. The Maintenance responsibility for the private drainage systems is expected to revert to a private management company at the end of the contractor's defects liability period.
- 1.2.4. This manual has been produced to set maintenance requirements for the private drainage systems on-site.

1.3. Proposed Surface Water Drainage Design Parameters

- 1.3.1. The surface water networks have been designed to accommodate the 1 in 100-year storm rainfall event plus a 40% allowance for climate change. As the flows are generally being attenuated downstream, there will be a period after storm events where the networks are still

partially or fully surcharged and are discharging runoff. Should any surcharging still be present 48 hours after the end of the storm, appropriate action should be taken as noted in Section 2.

2. Maintenance

2.1. Pipes and Manholes

- 2.1.1. Pipes are the main conveyance for surface water across the development and have been designed to reach self-cleansing velocities.
- 2.1.2. Regular inspection and maintenance is important to identify areas which may have been obstructed/clogged and may not be drained effectively; thus exposing the development to a greater flood risk level.
- 2.1.3. A recommended sediment/material removal schedule is detailed in the table below.

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 in the form of a post construction CCTV survey.	N/A
	Inspect for evidence of poor operation via water level in chambers. If required take remedial action.	Every 3 months, 48 hours after large storms.
Occasional maintenance	Check and remove large vegetation growth near pipe runs.	Every 6 months
Remedial actions	Rod through poorly performing runs as initial remediation.	As required.
	If poor performance persists, jet and CCTV survey poorly performing runs.	As required.
	Seek advice for the remediation techniques suitable for the type of issue and its location.	As required If above does not improve performance.

2.2. Channel, Slot and Kerb Drains

- 2.2.1. Access for maintenance has been provided through access chambers and rodding points. Additionally, channel drains have removable covers for ease of maintenance.
- 2.2.2. A visual inspection of the units is recommended on a regular basis with sediment\material removal being undertaken when required.

2.3. Proprietary Treatment Systems

- 2.3.1. Maintenance should be carried out as per the specifications of the third-party product installed. Regular inspection should be carried out as per the specification, or where not specified on an annual basis. Information about the proposed SPEL Stormceptor can be found in Appendix B. Information about the SPEL Purceptor can be found in Appendix C. Information about the forecourt separators can be found in Appendix D. The Aqua Swirl data sheet can be found in Appendix E.

2.4. Flow Control Chamber

- 2.4.1. Flow control chambers are proprietary products and the manufacturer's recommendations should be followed.
- 2.4.2. Regular inspection and maintenance are important to identify areas which may have been obstructed/clogged and may not be drain efficiently, thus exposing the development to a greater level of flood risk.

2.4.3. A recommended schedule is detailed in the table below.

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 using a post-construction CCTV survey.	N/A
	Inspect for evidence of poor operation via water level in chambers. If required, take remedial action.	3-monthly, 48 hours after large storms.
Occasional maintenance	Check and remove large vegetation growth near pipe runs.	6 monthly.

2.5. Attenuation Tanks (Geo-Cellular)

2.5.1. Cellular Storage tanks are proprietary products and the manufacturer's recommendations should be followed. Access to the tank for maintenance has been provided through downstream manholes.

2.5.2. A recommended sediment/material removal schedule is detailed in the table below:

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required)	Inspect inlets and outlets for blockages, and clear if required. If faults persist jetting and CCTV survey may be required.	Monthly and after large storms.
	Check hydro-brakes and other mechanical devices (if present).	Half yearly.
	Inspect ventilation cowl (if present)	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 every six monthly
	Remove debris from catchment areas (where they may cause risks to performance)	Monthly
	Where rainfall infiltrates into blocks from above, check surface of filter for blockage by silt, algae, or other matter. Remove and replace surface infiltration medium as necessary.	Monthly (and after large storms)
	Remove sediment from pre-treatment structures (e.g. catchpits)	Annually (or as required after heavy rainfall events)
Remedial actions	Repair and/or rehabilitate inlets, outlets and vents.	As required.

2.6. Operation and maintenance requirements for pervious pavements

2.6.1. A recommended maintenance schedule is detailed in the table below:

Maintenance Schedule	Required action	Frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site specific observations of clogging or manufacturers recommendations. Pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment.
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As Required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying.	As required $\pm$ once per year on less frequently used pavements.
Remedial actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks	As Required

	considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging.
Monitoring	Initial Inspection	Monthly for three months after installation.
	Inspect for evidence of poor operation and/or weed growth - if required, take remedial action	Three-monthly, 48 h after large storms in first six months.
	Inspect silt accumulation rates and establish appropriate brushing frequencies.	Annually
	Monitor inspection chambers	Annually

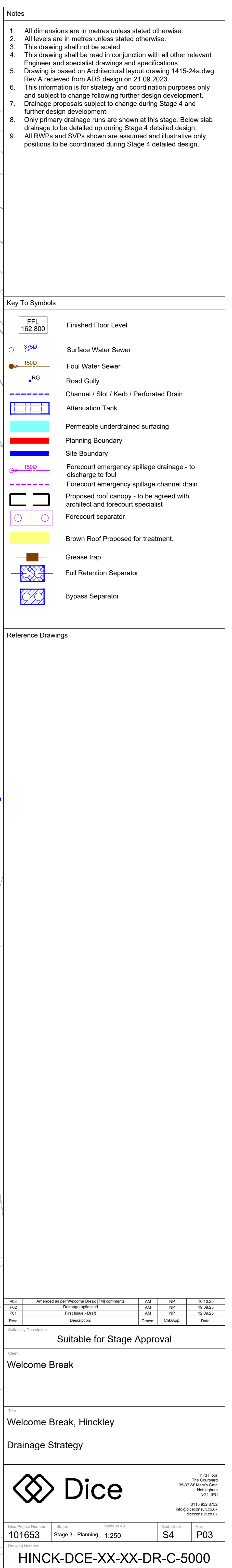
2.7. Gullies

- 2.7.1. Access for maintenance has been provided through access chambers and rodding points. Additionally, gullies have removable covers and sump units with integral buckets for ease of maintenance

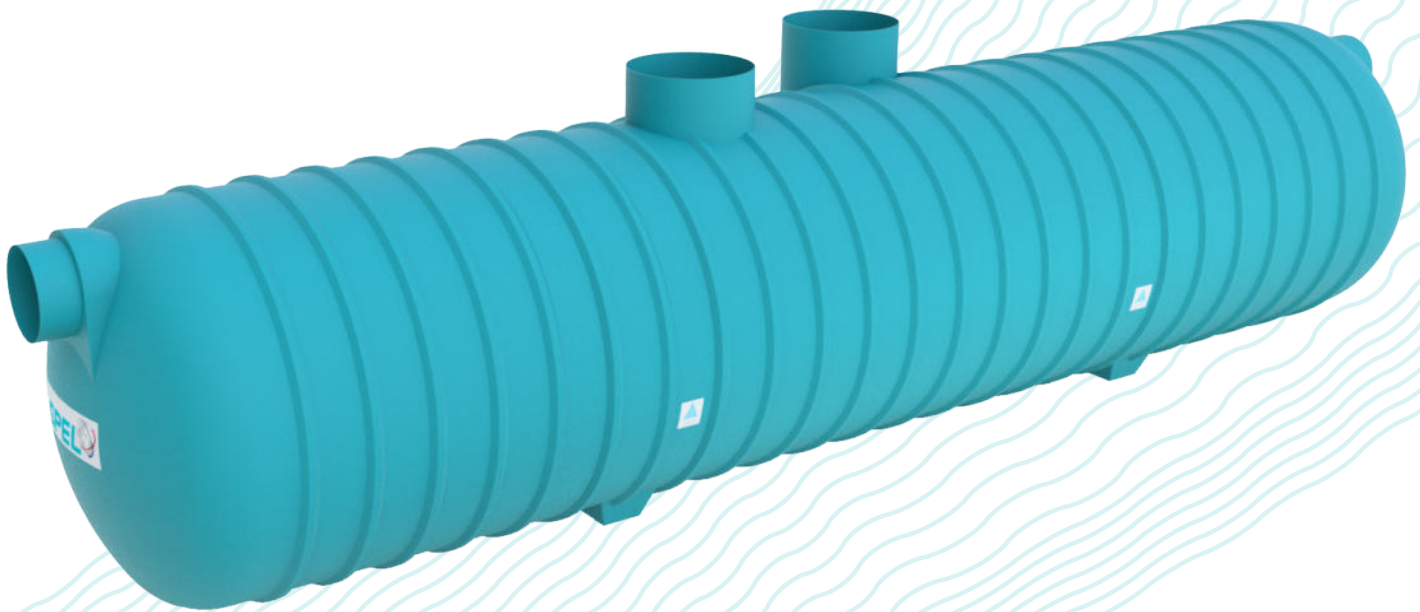
2.8. Brown Roofs

- 2.8.1. Should be maintained in accordance with the landscape architect or specialist designer's maintenance specification.

Appendix A



Appendix B



SPEL Stormceptor

ESR (Enhanced Silt Retention)

SuDS Compliant ESR Range

spelproducts.co.uk

SPEL Stormceptor ESR Range

By-Pass System

The **total** treatment solution for SuDS

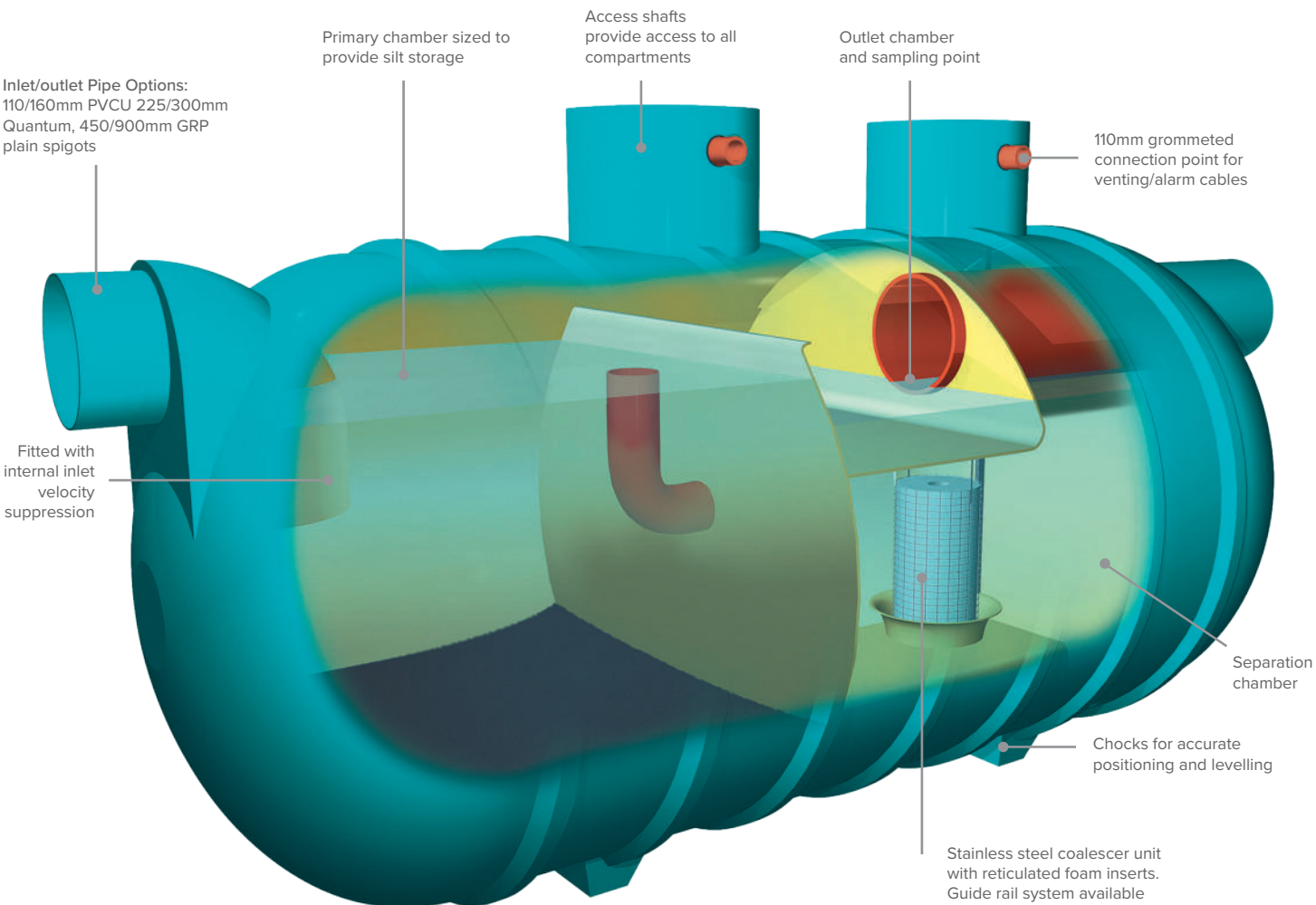
The new SPEL ESR System is fully certified to meet the CIRIA SuDS Mitigation Index. It has been tested by WRc (for TSS and Metals) to the British Water Code of Practice for Manufactured Treatment Devices. This unit is also compliant to the British and European Standard BS EN 858.

SPEL's ESR range is a total treatment system removing Hydrocarbons, Total Suspended Solids (TSS) and Metals (particulate). It's a highly efficient, single unit, water quality SuDS component.

SPEL ESR Stormceptor Certified Mitigation Index

TSS	0.8
Metals	0.6
Hydrocarbons	0.9*

**H R Wallingford test results to BS EN 858*



SPEL Stormceptor ESR Range

By-Pass System



Surface Water Treatment Device Performance Declaration

Testing carried out according to British Water Code of Practice

Product Details	Description
Manufacturer	SPEL Products
Treatment Device Name/Model	Stormceptor Type 210 C1/SC
General description	Class 1 By-pass Separator with Silt Capacity
Envisaged application	Treatment of Surface Water Run-off
Pollutant(s) captured	Suspended Solids

Test	Value	Unit
Treatment device capacity	3200	litres
Sediment Storage capacity	1000	litres
Treatment Flow rate	10	l/s
Connected Area	1,333	m²
Pollution retention flow rate	10	l/s

Parameter	Value	Unit
Maximum capacity flow rate	100	l/s
Device head loss (at treatment flowrate)	0.15	m
Device head loss (at maximum capacity treatment flowrate)	-	m
TSS capture and retention efficiency (Milisil W4 test sediment)	82	%
Zinc capture efficiency (if tested)	Not tested for dissolved metals	%
Zinc retention efficiency (if tested)	Not tested for dissolved metals	%
Copper capture efficiency (if tested)	Not tested for dissolved metals	%
Copper retention efficiency (if tested)	Not tested for dissolved metals	%
Dissolved Metals reduction	0.0	%
Particulate metals reduction*	61.5*	%
Total Metals reduction*	61.5*	%
Total Metals Mitigation Index	0.615*	-

* Extrapolated value in accordance with British Water How to Guide: Applying the CIRIA The SuDS Manual (C753) Simple Index Approach to Proprietary / Manufactured Stormwater Treatment Devices. Version 7, Section 4.3, (2021 - under pre-publication review).

Research and Development

Research and development is at the heart of what we do at SPEL, our passion as Zero Pollution Ambassadors is to be at the cutting edge of clean surface water technology.

Months of rigorous testing has resulted in the new SPEL Stormceptor ESR Range.

Certificates of compliance from WRC and HR Wallingford for the SPEL Stormceptor ESR Range

CERTIFICATE

LIGHT LIQUID SEPARATOR TEST PERFORMANCE CERTIFICATE
Compliance with Clause 8.3.3 of BS EN 858

Separator make and model number: SPEL STORMCEPTOR 330C1/SC NSB30
As detailed in SPEL Drawing SSP 9076

The separator tested complied with the drawing provided by the manufacturer and no additional features were noticed

Test date: 12 October 2006

Designated/nominal flow rate, Qw (litres/second): 30 litres/s
Net capacity of separator (excluding any allowance for silt storage), V_k (litres): 5050 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): 0.15 litres/s

Temperature of oil (°C): 16.2
Temperature of water (°C): 15.6
Temperature of air (°C): 16.8

Analysis of samples by IR spectroscopy carried out by: Intertek Caleb Brett Testing Services*
Date of results: 16 October 2006

Sample	Oil concentration (mg/l)**	Name	Date
1	0.1		
2	0.5		
3	<0.1		
4	0.6		
5	0.2		
Resulting average: 0.3mg/l			

* NAMAS accredited laboratory
** Value of baseline concentration deducted

Handwritten signature: 17/10/06
For and on behalf of HR Wallingford Ltd.



SPEL's Head of Technical Development alongside the WRC testing officer.

Quality Assured Company

BS EN ISO 9001

Design & Manufacture



Protecting our environment for over 45 years

The SuDS Manual is leading good practise in drainage design, SPEL are endorsing this with the release of the new SPEL Stormceptor ESR range.

Total Suspended Solids (TSS)	Metals	Hydrocarbons
0.8	0.6	0.9*

*H R Wallingford test results to BS EN 858

Added to these class-leading Mitigation Indices, the ESR range benefits from:

- British/European Standard BS EN 858-1 2002 certification.
- The SPEL 25 year shell Warranty.
- 50 year+ life expectancy.
- ISO9001 quality assurance.
- ISO14001 committed to environmental improvement

26.2 Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads and trunk roads/motorways ¹	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways ¹	High	0.8 ²	0.8 ²	0.9 ²

26.3 Indicative SuDS mitigation indices for discharges to surface waters

Type of SuDS component	Mitigation Indices		
	TSS	Metals	Hydrocarbons
Filter strip	0.4	0.4	0.5
Filter drain	0.4 ²	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond ⁴	0.7 ³	0.7	0.5
Wetland	0.8 ³	0.8	0.8
Proprietary treatment systems ^{5,6}	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

Tables from The SuDS Manual (C753), p568-569

For reference notes, please see the full manual: https://www.ciria.org/Memberships/The_SuDs_Manual_C753_Chapters.aspx

SPEL Stormceptor ESR Range By-Pass System

ESR Specification Chart

Model	Series	Treated Flow Rate - l/s	Maximum Flow	Catchment area (m²)*	Oil storage (litres)	Silt capacity (litres)	Overall length* (mm) L	Overall diameter (mm)	Inlet Invert (mm) A	Base to Inlet (mm) B	Base to outlet (mm) C	Max in/ out pipe diameter** (mm)	Number of access shafts (dia. mm)			
													600	750	900	1200
ESR10/C1	200	10	100	1,333	150	1,000	2,920	1,225	560	1,350	1,300	300	-	1	-	-
ESR15/C1	200	15	150	2,000	225	1,500	4,237	1,225	560	1,350	1,300	300	-	1	-	-
ESR20/C1	300	20	200	2,665	300	2,000	3,200	1,875	700	1,450	1,350	450	2	-	-	-
ESR25/C1	300	25	250	3,333	375	2,500	3,540	1,875	700	1,450	1,350	450	2	-	-	-
ESR30/C1	300	30	300	4,000	450	3,000	4,420	1,875	700	1,450	1,350	450	-	1	1	-
ESR40/C1	300	40	400	5,333	600	4,000	5,760	1,875	740	1,410	1,310	450	1	1	-	-
ESR45/C1	300	45	450	6,000	675	4,500	6,570	1,875	740	1,410	1,310	450	1	1	-	-
ESR50/C1	300	50	500	6,665	750	5,000	7,060	1,875	740	1,410	1,310	450	1	1	-	-
ESR60/C1	400	60	600	8,000	900	6,000	4,400	2,700	950	2,100	2,000	600	1	-	1	-
ESR70/C1	400	70	700	9,333	1,050	7,000	5,250	2,700	950	2,100	2,000	600	1	-	1	-
ESR80/C1	400	80	800	10,665	1,200	8,000	6,170	2,700	950	2,100	2,000	600	1	-	1	-
ESR100/C1	400	100	1000	13,333	1,500	10,000	7,400	2,700	1,100	1,950	1,850	750	1	-	1	-
ESR125/C1	400	125	1250	16,665	1,875	12,500	9,050	2,700	1,100	1,950	1,850	750	1	-	1	-
ESR150/C1	400	150	1500	20,000	2,250	15,000	9,950	2,700	1,100	1,950	1,850	750	-	-	2	-
ESR160/C1	400	160	1600	21,333	2,400	16,000	11,830	2,700	1,250	1,800	1,700	750	1	1	1	-
ESR180/C1	500	180	1800	24,000	2,700	18,000	7,470	3,650	1,185	2,690	2,550	900	-	-	-	-
ESR200/C1	500	200	2000	26,665	3,000	20,000	8,530	3,650	1,185	2,690	2,355	1,200	-	-	-	-
ESR250/C1	500	250	2500	33,333	3,750	25,000	10,040	3,650	1,185	2,690	2,355	1,200	-	-	-	-
ESR300/C1	600	300	3000	40,000	4,500	30,000	10,310	4,150	1,325	2,850	2,675	1,200	-	-	-	-
ESR350/C1	600	350	3500	46,665	5,250	35,000	11,470	4,150	1,325	2,850	2,675	1,200	-	-	-	-
ESR400/C1	600	400	4000	53,333	6,000	40,000	12,690	4,150	1,325	2,850	2,675	1,200	-	-	-	-
ESR500/C1	600	500	5000	66,665	7,500	50,000	15,870	4,150	1,325	2,850	2,675	1,200	-	-	-	-
ESR600/C1	600	600	6000	80,000	9,000	60,000	18,260	4,150	1,325	2,850	2,675	1,200	-	-	-	-
ESR700/C1	600	700	7000	93,333	10,500	70,000	22,250	4,150	2,850	2,850	2,675	1,200	-	-	-	-

*These catchment areas are based on the SuDS Manual requirement for By-Pass devices to treat the 1 in 1 year storm event (27mm).

**This dimension is for A-C inlet/outlet options, larger pipe sizes are available for D-I inlet/outlet options.

200 Series ESR – Inside diameter 1200mm, outside diameter 1225mm.

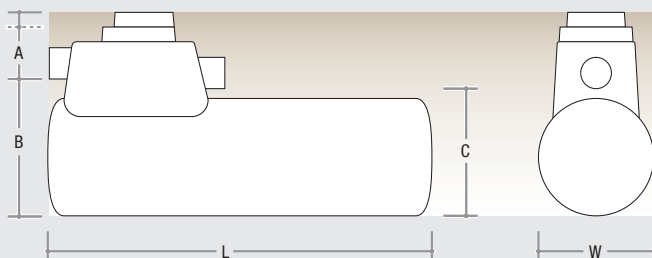
300 series ESR – Inside diameter 1800mm, outside diameter 1875mm.

400 series ESR – Inside diameter 2600mm, outside diameter 2700mm.

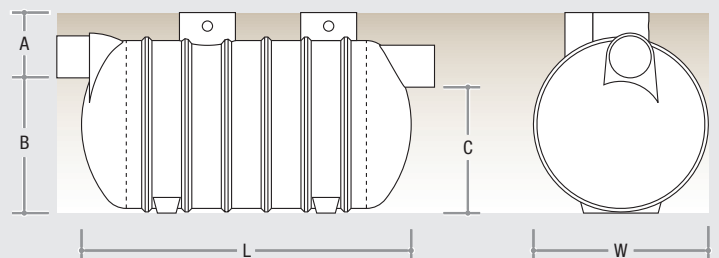
500 series ESR – Inside diameter 3500mm, outside diameter 3650mm.

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

200 series



300/400/500 & 600 series



Optional extras

SPEL coalescer unit guide rail systems

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

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

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

Extension guide rails can be incorporated into SPEL extension shafts to suit.

SPEL coalescer unit lifting, locating and locking system

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

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

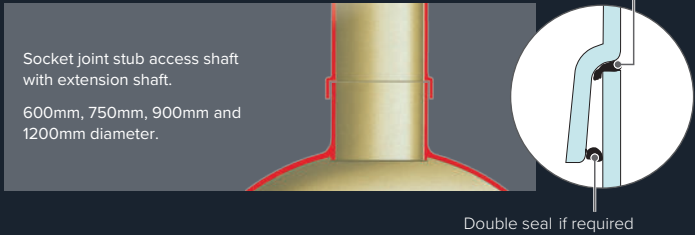


Above left: Lifting, locating and locking system with guide rail system.

Above right: The SPEL coalescer unit with lifting chain.

SPEL extension access shafts

Extension access shafts are available for deep invert applications.



Tank shell specifications

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

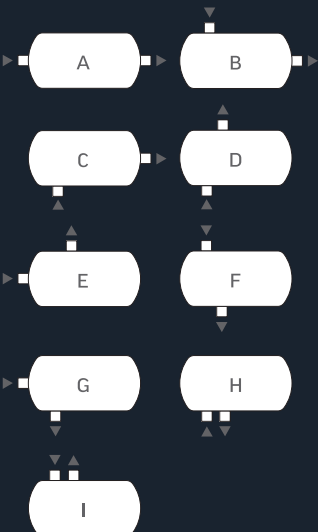
Standard tanks			Heavy tanks		
Series	WT (m)	D (m)	Series	WT (m)	D (m)
100/200	1.0	4.0	100/200	2.0	6.0
300	0.9	4.0	300	2.8	5.6
400	1.3	5.0	400	3.5	6.0
500	1.9	5.7	500	4.5	7.25
600	2.4	6.2	600	4.7	7.3

WT depth of water table	D maximum depth	WT depth of water table	D maximum depth
High water table	Well drained ground	High water table	Well drained ground

Based on installation in concrete with concrete surround
For pea gravel surround, see SPEL Data Manual p13.5

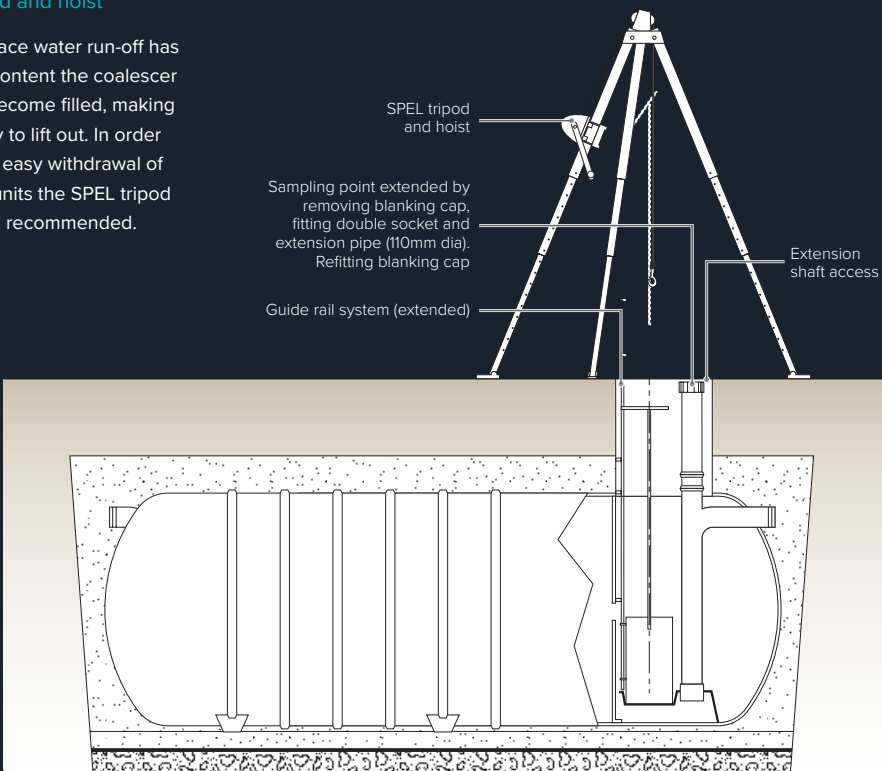
SPEL ESR Range – Inlet/outlet orientation

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



SPEL tripod and hoist

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



SPEL

Quality that protects the environment the **safest way**



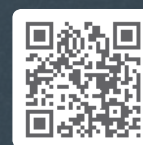
The SPEL underground tanks have been designed with reference to BS EN 13121

SPEL Tank shells carry a 25 year Warranty and have a life expectancy of over 50 years

Rigorous quality control procedures at all stages of manufacture for each serial numbered tank, ISO 9001.

SPEL is an environmentally accredited company to ISO 14001.

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



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

#ZeroPollutionAmbassadors

SPEL 10/21

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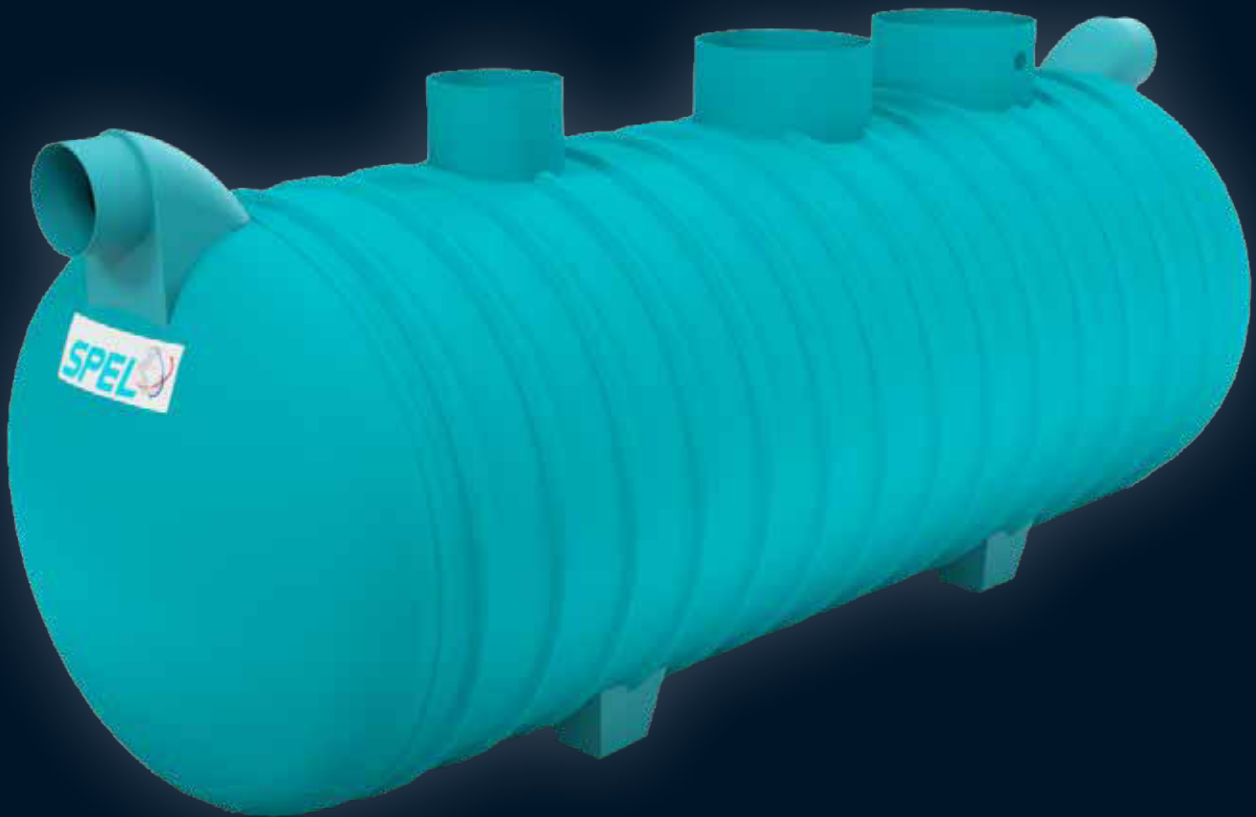
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Appendix C



The **safest answer** for **pollution control** and our **environment**

Quality solutions protecting our global environment



SPEL Puraceptor

ESR (Enhanced Silt Retention)

Total Treatment SuDS Compliant ESR Range

SPEL Puraceptor ESR Range

Full Flow Treatment System

The **total** treatment solution for SuDS

The new SPEL Puraceptor ESR System is designed to treat the full flow from the catchment area and includes the important Automatic Closure Device (ACD). This device will close off the outlet of the separator when captured oil exceeds the maximum oil storage volume.

Fully certified to meet the CIRIA SuDS Mitigation Index, this system has been tested by WRc (for TSS and Metals) to the British Water Code of Practice for Manufactured Treatment Devices*, and by HR Wallingford to the British and European Standard BS EN 858.

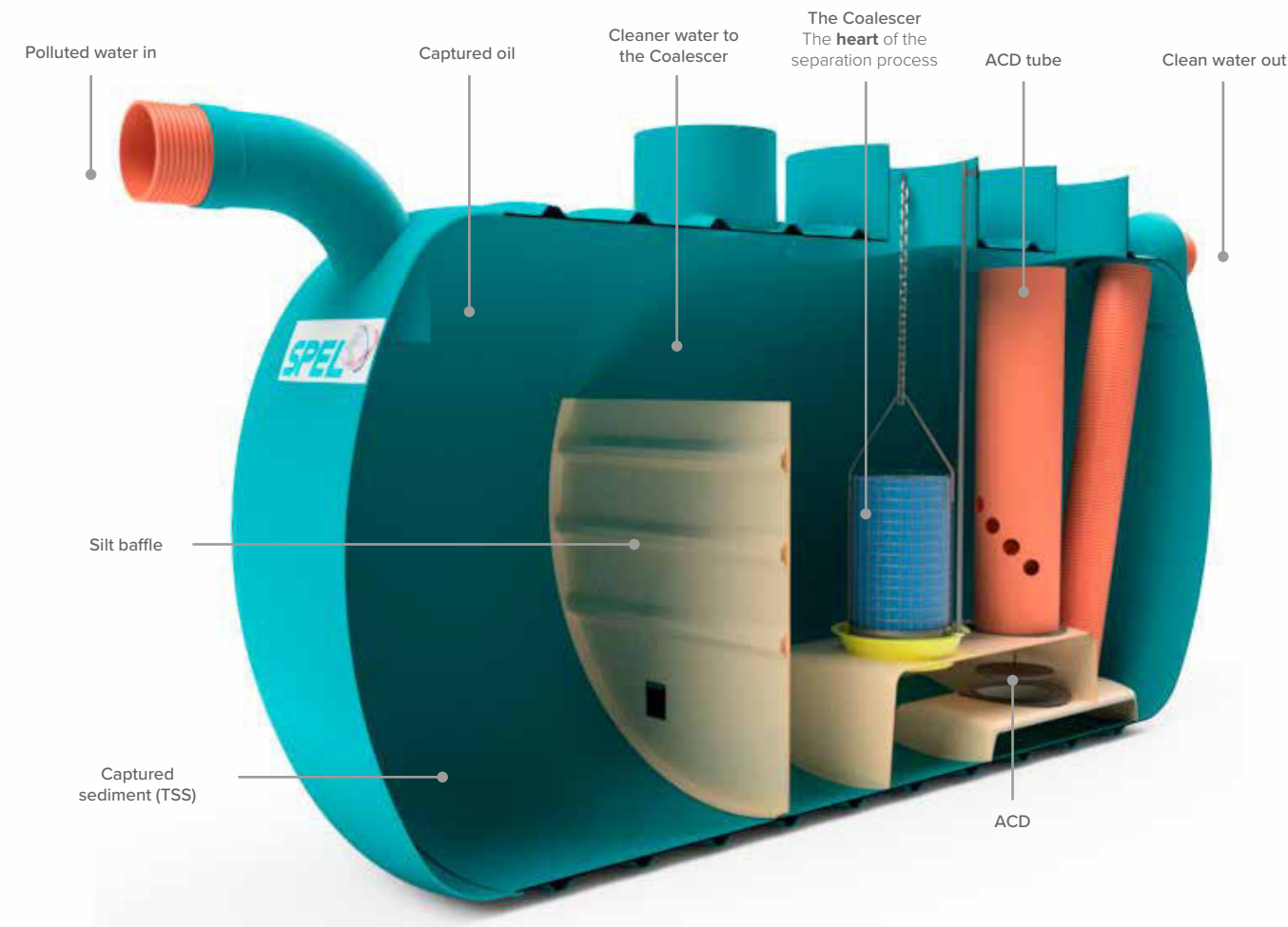
SPEL's ESR range is a total treatment system removing Hydrocarbons, Total Suspended Solids (TSS) and Metals (particulate) from stormwater. It's a highly efficient, single unit, SuDS water quality device.

SPEL ESR Puraceptor Certified Mitigation Index

TSS	0.8
Metals	0.6
Hydrocarbons	0.99*

**H R Wallingford test results to BS EN 858: tested to it's maximum designed flow rate*

SPEL ESR Puraceptor



SPEL Puraceptor ESR Range

Full Flow Treatment System



Surface Water Treatment Device Performance Declaration

Testing carried out according to British Water Code of Practice*

Product Details	Description
Manufacturer	SPEL Products
Treatment Device Name/Model	Puracaptor Type ESR P010/1C
General description	Full Retention Class 1 Separator with Silt Capacity
Envisaged application	Treatment of Surface Water Run-off
Pollutant(s) captured	Total Suspended Solids

Parameter	Value	Unit
Treatment device capacity	3200	litres
Sediment Storage capacity	1000	litres
Treatment Flow rate	10	l/s
Connected Area	1,333	m ²
Pollution retention flow rate	10	l/s

Parameter	Value	Unit
Maximum capacity flow rate	10*	l/s
Device head loss (at treatment flowrate)	0.286	m
Device head loss (at maximum capacity treatment flowrate)	0.286*	m
TSS capture and retention efficiency (Milisil W4 test sediment)	80	%
Zinc capture efficiency (if tested)	Not tested for dissolved metals	%
Zinc retention efficiency (if tested)	Not tested for dissolved metals	%
Copper capture efficiency (if tested)	Not tested for dissolved metals	%
Copper retention efficiency (if tested)	Not tested for dissolved metals	%
Dissolved Metals reduction	0.0	%
Particulate metals reduction*	60.3*	%
Total Metals reduction*	60.3*	%

- + Maximum test flow for a Full Retention device equates to the device maximum design flow

* Extrapolated value in accordance with British Water How to Guide: Applying the CIRIA The SuDS Manual (C753) Simple Index Approach to Proprietary / Manufactured Stormwater Treatment Devices. Version 7, Section 4.3. (2021 - under pre-publication review).

Research and Development

Research and development is at the heart of what we do at SPEL, our passion as Zero Pollution Ambassadors is to be at the cutting edge of clean surface water technology.

Months of rigorous testing has resulted in the new SPEL ESR Treatment System, available in both by-pass or full flow.

Certificates of compliance from WRc and HR Wallingford for the SPEL Puraceptor ESR Range



SPEL's Head of Technical Development alongside the WRc testing officer.

Protecting our environment for over 45 years

The SuDS Manual is leading good practise in drainage design, SPEL are endorsing this with the new SPEL Purceptor ESR range

Total Suspended Solids (TSS)	Metals	Hydrocarbons
0.8	0.6	0.99*

*H R Wallingford test results to BS EN 858

Added to these class-leading Mitigation Indices, the ESR range benefits from:

- British/European Standard BS EN 858-1 2002 certification.
- The SPEL 25 year shell Warranty.
- 50 year+ life expectancy.
- ISO9001 quality assurance.
- ISO14001 committed to environmental improvement
- Generously sized for high performance and low maintenance over a long life span.

26.2 Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads and trunk roads/motorways ¹	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways ¹	High	0.8 ²	0.8 ²	0.9 ²

26.3 Indicative SuDS mitigation indices for discharges to surface waters

Type of SuDS component	Mitigation Indices		
	TSS	Metals	Hydrocarbons
Filter strip	0.4	0.4	0.5
Filter drain	0.4 ²	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond ⁴	0.7 ³	0.7	0.5
Wetland	0.8 ³	0.8	0.8
Proprietary treatment systems ^{5,6}	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

Tables from The SuDS Manual (C753), p568-569

For reference notes, please see the full manual: https://www.ciria.org/Memberships/The_SuDs_Manual_C753_Chapters.aspx

SPEL Puraceptor ESR Range Full Flow System

Specification Chart

Full flow devices must be sized on modelled flow rate



IMPORTANT: It is essential to cross-check the catchment-based flow rate from the chart below with the modelled flow rate to ensure the separator is correctly sized to treat the peak flow without causing restriction or overstressing the system.

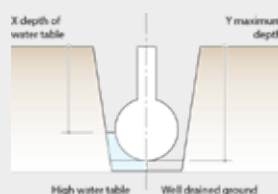
Model	Series	Max. Flow	Catchment Area	Overall length (mm)	Oil storage (L)	Silt capacity (L)	Overall diameter (mm)	Inlet Invert (mm)	Base to inlet (mm)	Base to outlet (mm)	Max in/out pipe diameter (mm)	Number of access shafts (dia. mm)			
		(l/s)	Based on 65mm/hr					A	B	C		600	750	900	1200
P004 1C/ESR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

Tank shell specifications

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

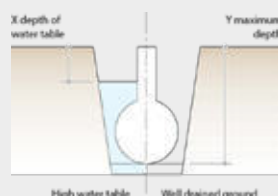
Standard tanks

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



Heavy tanks

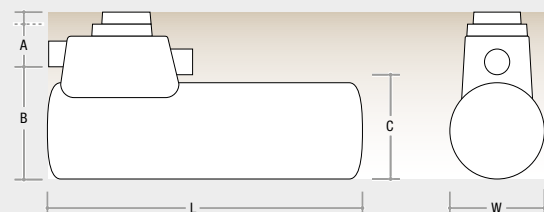
Series	WT (m)	D (m)
100/200	2.0	6.0
300	2.8	5.6
400	3.5	6.0
500	4.5	7.25
600	4.7	7.3



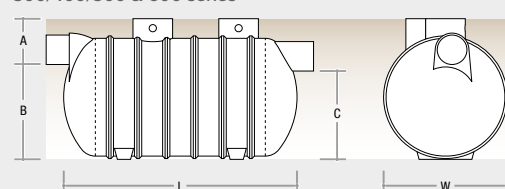
Based on installation in concrete with concrete surround.
For pea gravel surround, see SPEL Data Manual p13.5

200 Series ESR – Inside diameter 1200mm, outside diameter 1225mm.
300 series ESR – Inside diameter 1800mm, outside diameter 1875mm.
400 series ESR – Inside diameter 2600mm, outside diameter 2700mm.
500 series ESR – Inside diameter 3500mm, outside diameter 3650mm.
600 series ESR – Inside diameter 4000mm, outside diameter 4150mm.

200 series



300/400/500 & 600 series



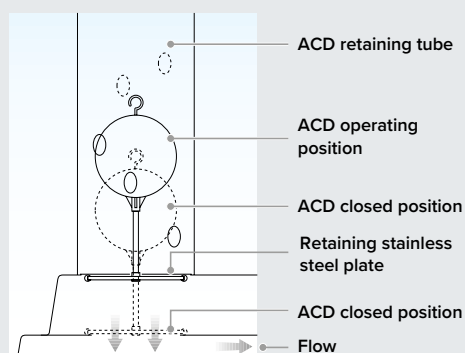
Commissioning, Installation and Maintenance

Automatic Closure Device: Protection in an event of a major spillage

The purpose of the automatic closure device (ACD) is to close the separator off automatically when the maximum oil storage capacity is attained. The ACD ensures that in the event of a major spillage, pollutants do not enter the drainage system, however the ACD should not be regarded as a substitute for an automatic alarm/monitoring system.

Automatic Closure Device

Dependent upon site conditions it is advisable to remove the ACD periodically taking care not to raise it too quickly and damage the plastic/copper float. Clean from debris/silt to prevent premature closing. Check the seating in the base unit is free of debris/silt that could prevent proper closing in an emergency.



SPEL Puraceptor® Class 1 Separators Single Chamber Models Models P004/1C/ESR to P050/1C/ESR

After the tank has been installed, leave the water in.

1. Remove the ACD from the packing box, taking care not to cause damage.
2. Remove the retaining cap from the top of the retaining tube in the separator.
3. Insert the ACD into the retaining tube using the lifting eye provided. Allow it to sink to the bottom. The stainless steel retaining plate should seat on the base flange and the ACD attain its operating position as shown in the open position.
4. Replace the retaining cap. This is to safeguard against the removal of the float by unauthorised persons or rising above the tube under abnormal conditions.

Note: If the tank's invert depth exceeds 1m it is advisable to remove the retaining cap prior to installation and only replace after inserting the ACD, if it is possible to do so from ground level.

Larger Models

Where the ACD is already positioned in the unit, proceed as follows:

1. Before putting any water in the tank, lift rope attached to ACD up to the next knot and hang it from the slot and shaft. This is now in the 'operating position'.
2. As soon as the water level in the tank is above the ACD, the rope must be removed altogether. Ensure the ACD automatically remains in the 'operating position'.

Installation

SPEL Separators can be installed with a concrete or pea gravel surround, dependent upon ground conditions and water table level. Detailed installation instructions are provided with each unit, see Installation TSII or SPEL Data Manual Section 13.

Site access and conditions

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

Off-loading/handling

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

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

Health and safety

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

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

Maintenance Requirements

We recommend the SPEL Separator is checked at 3, 6 or 12 monthly intervals to determine the depth of silt in the primary chamber.

The SPEL automatic alarm/monitoring system will automatically warn you when the SPEL Separator requires emptying of light liquids. See ref. 3.10 – 3.19. However, silt will accumulate and require removing at intervals depending on the site conditions.

SPELGuard Commissioning & Maintenance



SPELGuard contracts available.

For more information contact us:

info@spelproducts.co.uk | 01743 445 200

Optional extras

SPEL coalescer unit guide rail systems

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

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

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

Extension guide rails can be incorporated into SPEL extension shafts to suit.

SPEL coalescer unit lifting, locating and locking system

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

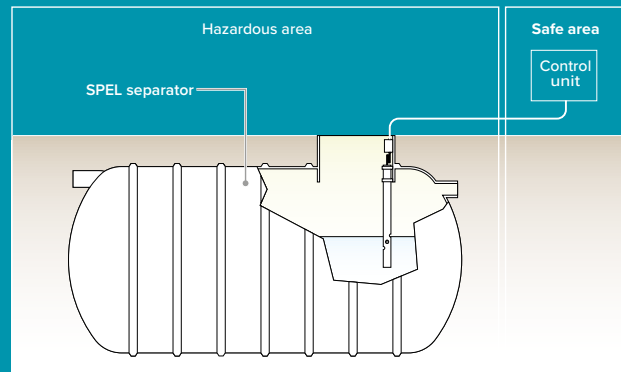
The locating/locking handle ensures the coalescer unit is seated and locked in its correct position after maintenance.



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

Above right:
The SPEL coalescer unit with lifting chain.

SPEL Automatic Alarm/Monitoring Systems



SPEL offer a range of alarms, for full details refer to the *SPEL Data Manual Section 3*. Kiosks with beacons and provision for BMS and remote information via browser user interface.

SPEL Model Alarm-DY14400

Oil alarm only – not BMS compatible

SPEL Model IdOil-20

Oil, silt and/or high level alarm with volt free terminal for beacon and BMS capability

SPEL Model IdOil-30

For oil, silt and/or high level as required. This alarm provides a range of options for BMS and remote information to on or off-site monitoring facilities.

SPEL Model IdOil Solar Oil Separator Alarm

for remote off-grid areas.

SPEL extension access shafts

Extension access shafts are available for deep invert applications.



Socket joint stub access shaft with extension shaft.

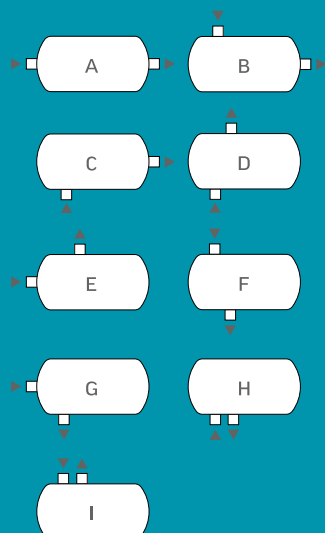
600mm, 750mm, 900mm and 1200mm diameter.

See tripod drawing below for other extension adjustments

Double seal if required

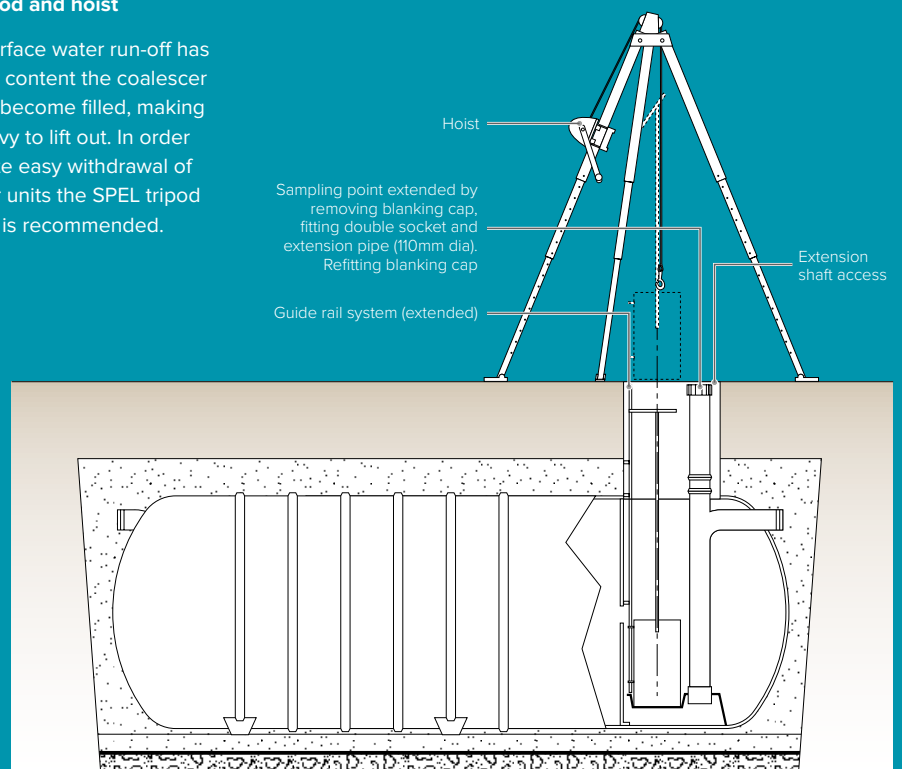
SPEL ESR Range – Inlet/outlet orientation

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



SPEL tripod and hoist

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



Puraceptor ESR

Enhanced Silt Retention

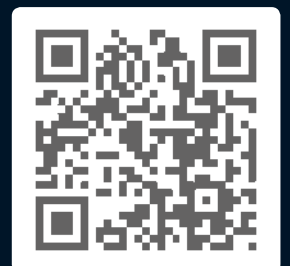
SPEL's ESR range is a total treatment system removing Hydrocarbons, Total Suspended Solids (TSS) and Metals (particulate) from stormwater. It's a highly efficient, single unit, SuDS water quality device.



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spelproducts.co.uk

08/22

Appendix D

SPEL Forecourt Separators

Designed for Spill Control

Overview

SPEL Forecourt Separators treat 100% of the flow and have been designed and tested to meet the stringent British/European Standard BS EN 858-1.

Forecourt separators are sized to ensure the maximum spill risk can be controlled within the separator. Normal road tankers have compartments no larger than 7,600 litres which is the designed spill capacity for a forecourt separator.

All SPEL Forecourt Separators are fitted with a special automatic closure device (ACD) which shuts the separator down when the contained oil exceeds the maximum oil spill capacity.

Larger Forecourt type models are available for larger spill risk areas such as airport fuelling zones.

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

Product Range

Series 300

(1.2m inside diameter):
NS 20
Catchment area: 1111m²

Series 400, 500 & 600

2.6m, 3.5m, 4m inside diameter
are available for larger NS
and spill capacities to suit site
requirements.

**Contact the technical team for
more information:**
(01743) 445 200
sales@spelproducts.co.uk



Applications

Petrol station forecourts

Refuelling facilities

Fuel storage sites

Shell Design

Designed with reference to BS EN 13121.
All tank shells carry the SPEL 25 Year
Warranty and life expectancy in excess
of 50 years.

Shell Specifications

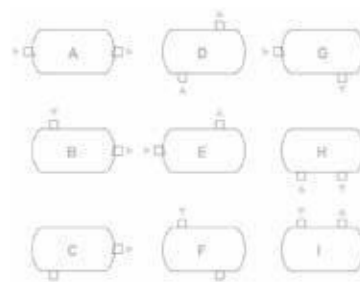
Different tank shell specifications are available
dependent upon tank invert levels, ground
conditions and ground water levels

Inlet/Outlet Connections

160/225/300mm diameter PVCU socket/
spigot.

450, 600, 750, 900 and 1200mm diameter
GRP spigot available. For connecting to site
pipework via Flex-Seal/Band-Seal or similar
flexible couplings.

The nine inlet/outlet options below are
available to assist with design and installation.



*This graphic shows indicative locations
only. For accurate location, please
contact our technical team.*

SPEL Forecourt Separators

Product Table

Model	Series	Nominal Size (NS)	Catchment area (m ²)	Oil storage (litres)	Silt capacity (litres)	Overall length* (mm)	Overall diameter (mm)	Inlet Invert (mm)	Base to inlet (mm)	Base to outlet (mm)	Optimum in/out pipe diameter* (mm)	Number of access shafts (dia. mm)		
		Flow (l/s)				L		A	B	C		750	900	1200
FP 1C/SC Class 1 Forecourt Separator Single Chamber with Silt Capture	300	20	1,111	200	2,000	4,290	1,875	350	1,800	1,740	225	1	-	-
FP 2C/SC Class 1 Forecourt Separator Two Chamber with Silt Capture	300	20	1,111	200	2,000	5,500	1,875	350	1,800	1,740	225	2	-	-
FS2 SC Class 2 Forecourt Separator Single Chamber with Silt Capture	300	20	1,111	200	2,000	4,290	1,875	350	1,800	1,740	225	-	-	1

Larger spill capacity models available upon request

*SPEL Separators are designed for a maximum flow (NS/NSB) but can be fitted with larger than the recommended maximum connection size IN/OUT or with the addition of adapters providing the maximum flow (NS/NSB) cannot be exceeded or any increase in the operating level in the SPEL Separator to cause the captured pollutants to escape into the vent connections or through access shaft connections. Any overriding of the above criteria could jeopardise performance to the European Standard BS EN 858-1.

‘Companies who pollute the environment can be hit with unlimited financial penalties from the Environment Agency from today (11 December 2023).’ [gov.uk](https://www.gov.uk/government/news/unlimited-penalties-introduced-for-those-who-pollute-environment), ‘Unlimited penalties introduced for those who pollute environment’ (11 December 2023)

Appendix E

STORMWATER TREATMENT

SDS Aqua-Swirl®

Hydrodynamic Vortex Separator

SDS Aqua-Swirl® is a custom engineered, flow-through water quality device that utilises hydrodynamic separation technology to maximise the removal of coarse sediment, debris and free-floating oil from surface water runoff.

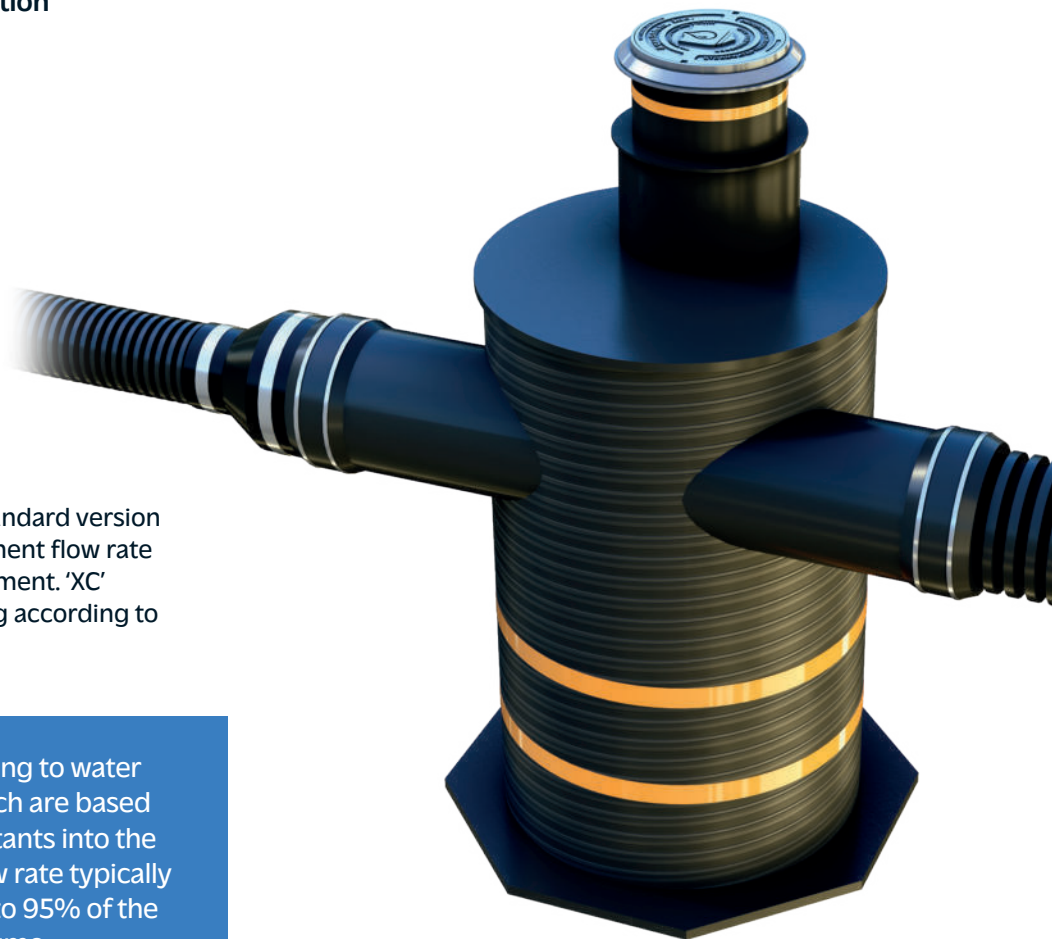
When connected to a SDS SYMBiotIC™ system, SDS Aqua-Swirl® provides real time data on a broad range of key operating factors such as pollutant loads and silt capture level.

SYMBiotIC™

- BBA HAPAS approved
- HDPE plastic modular construction
- No moving parts
- Sealed baffle
- Large debris storage chamber
- Lifting supports
- Compact dimensions
- Available in 9 different sizes
- Bespoke sizing available

SDS Aqua-Swirl® is supplied in the standard version when sizing to its water quality treatment flow rate according to OK-110 (coarse) test sediment. 'XC' versions are also available when sizing according to the NJDEP (finer) test sediment.

SDS Aqua-Swirl® is sized according to water quality treatment flow rates which are based on the initial movement of pollutants into the storm drainage system. This flow rate typically represents approximately 90% to 95% of the total pollutants in the runoff volume. The treatment flow rate of the SDS Aqua-Swirl® system is engineered to meet or exceed the local water quality treatment criteria and form an intrinsic part of the SuDS solution.



Features	Benefits
Performance monitoring available via SDS SYMBiotIC™.	Provides bespoke suite of operating data, such as silt levels and pollutants, viewable via a secure web portal dashboard with live notifications via email and text.
BBA HAPAS certified.	Approved for installation under roads and pavements; adoptable by National Highways.
NJCAT/NJDEP-verified performance for sediment removal and retention.	Verification accepted by the Environment Agency (as cited in the CIRIA C753 SuDS Manual).
'XC' models meet NJDEP testing protocol.	Ensures that particulates and adhered pollutants are not mobilised during major storm events, maximising the capture of floating debris, oil and hydrocarbons.
Manufactured from HDPE high strength plastic Weholite.	Offers a durable, light weight and low-cost alternative to concrete. Easy and quick to install resulting in substantial cost savings.
Bespoke construction.	No on-site assembly required.
Specialised sealed baffle.	Prevents captured floatables from escaping.
Internal bypass with pollution retention.	Able to treat localised rain and larger storm events while retaining captured pollutants.
Single easy-access chamber for pollutant removal and storage.	Simplifies inspection and maintenance facilities with no special equipment required.
Compact dimensions.	Reduces ground excavation and product installation costs.
Small footprint design.	Can be retro-fitted with minimal disruption to existing infrastructure utilities or surface features, extending the ability to meet new regulations.
Certified installation lifting supports.	Easy installation without the need for large, expensive cranes.
Suitable for use during site construction programme.	Can be put into operation prior to completion of the site build, with the inclusion of a planned maintenance schedule.
Available in 9 different standard sizes and also bespoke.	Provides greater design flexibility and assists the removal of sediments at a greater rate than comparable systems.

Specifications

Aqua-Swirl® Model No.	Maximum ID Pipe Connection (mm) BYP ¹	Chamber Internal Diameter (mm)	Water Quality Treatment Flow Rate OK-110 Coarse (l/s) Model AS- ²	Water Quality Treatment Flow Rate NJDEP Fine (l/s) Model XC-	Oil/ Debris Storage Capacity (litres)	Sediment Storage Capacity (m³)	Aqua-Swirl® Weight (kg)
AS-2/XC-2	375	750	30	16	136	0.3	300
AS-3/XC-3	500	1050	53	31	416	0.6	700
AS-4/XC-4	600	1200	77	40	644	0.8	1000
AS-5/XC-5	750	1500	120	63	1382	1.3	1100
AS-6/XC-6	900	1800	173	91	1439	1.8	1400
AS-7/XC-7	1050	2100	235	123	1987	2.5	1700
AS-8/XC-8	1200	2400	307	161	2612	3.3	2200
AS-9/XC-9	1350	2800	418	220	3596	4.4	2600
AS-10/XC-10	1500	3000	480	252	4164	5.1	3100

¹ BYP (Internal Bypass) provides full treatment of the first flush of water while the peak design storm is diverted and channelled through the main conveyance pipe.

² Based on the Tennessee Tech University 'Laboratory Evaluation of TSS Removal Efficiency for the Aqua-Swirl® Concentrator Stormwater Treatment System'.

Notes: **Details of pollution mitigation indices, head loss and CAD details, standard drawings and Installation Guides available upon request.**

The sediment storage capacity has been calculated in accordance with the relevant test protocol and is not a physical maximum; any additional sediment capacity required is achieved with bespoke deeper units.

For assistance in design and specific sizing using historical rainfall data, please contact SDS.

A-S DS/0125

