

APPENDIX F

Spel Products,
Petrol Interceptor Literature

52Xn8
February 2010

The safest answer for pollution control and the environment

SPEL

Quality, high performance light liquid separators





SPFL Stormceptor
by-pass separator
SPFL
Shrewsbury 01743-445200



Protect the environment the
most reliable and efficient way

Specify SPEL Separators



Inside front cover:
SPEL Stormceptor series
600 class 2 by-pass
separator for a catchment
area of 30 hectares.
NSB 500.

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

A substantial amount of oil pollution is collected on sites such as garage forecourts, large car parks and fuel storage depots and this must be intercepted to avoid the risk of prosecution.

The Environment Agency has published Pollution Prevention Guidelines "Use and Design of Oil Separators in Surface Water Drainage Systems: PPG3". These set out the standards with which separators must comply and assist in deciding on the need for a separator at a site and the size and type that is appropriate.

These Pollution Prevention Guidelines PPG3 require separators to be tested in accordance with the standard test procedure based upon the European Standard BS EN 858-1:2002.

SPEL Separators are compliant to the European Standard BS EN 858-1, the Environment Agency's Pollution Prevention Guidelines PPG3 and the Construction Products Regulations.



Tests being carried out at HR Wallingford, for obtaining 'Light Liquid Separator Test Performance' certificates.



SPEL fuel/oil separators – for high performance and low maintenance over a long life span

SPEL Products is a Quality Assured Company under BS EN ISO 9001:2008 – with our own modern manufacturing plant the highest standard of product quality and control are ensured.

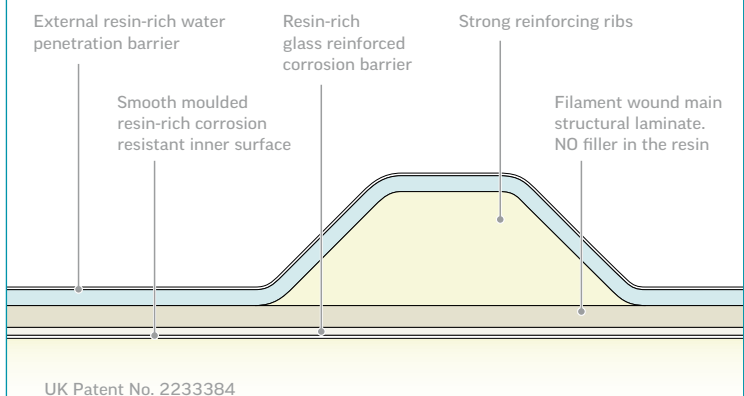
SPEL Separators are filament wound by an advanced, patented, chop hoop filament winding process. This process produces not only circumferential strength as found in helical wound tanks, but also high longitudinal strength. The interlaminar shear strength permits tanks to be cut for manholes and pipework without undue loss in strength.

The manufacturing process is carefully monitored with a digital read out system. Chopping glass, winding glass, the resin-rich inner layer and main laminate resins are kept within specification parameters and the requirements of BS4994 and BS EN 976, thus minimising human error.

Quality control procedures require each tank to be carefully inspected and tested. Ultrasonic thickness readings, Barcol hardness readings and material content weights are checked and recorded against the tank's unique serial number.

Laminate construction

- Tank shell designed in accordance with BS4994/BS EN 976.
- Filament wound shells are lightweight, but have great strength and durability and carry a 25 year warranty.
- Life expectancy in excess of 50 years.
- Smooth, high gloss, corrosion resistant, resin-rich internal surface.
- External 'flow coat' water penetration barrier.



Left: Bristol International Airport SPEL Puraceptor Class 1 full retention separator NS 942 and 'automatic' Econoskim system.

SPEL Separator range overview and how to select.

Quality products from a quality assured company

SPEL Stormceptor® class 1 by-pass separators

Typical sites

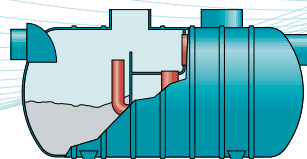
Infrequent light contamination – potential for small spills only eg. car parks.

Note: class 2 available if connection to foul sewer.

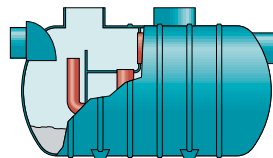
General description

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

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

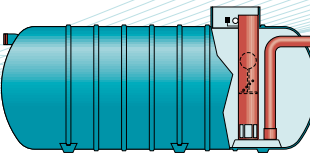


SC – with silt capacity.



Without silt capacity.

SPEL full retention class 2 separators



Typical sites

Where risk of regular contamination of surface water run off and connection is to foul sewer eg. vehicle maintenance area, goods vehicle parking/vehicle wash area.

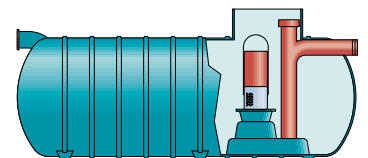
General description

Full retention separators treat the full flow generated by a rainfall intensity of 65mm/hour. They are fitted with an automatic closure device ACD.

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

Typical sites single chamber

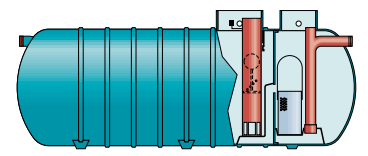
- Medium to high risk oil/fuel storage and handling areas.
- Filling stations (SPEL Puraceptor forecourt separator FP1CSC).
- Commercial vehicle/plant maintenance yards and heavily contaminated industrial areas.



Single chamber models.

Typical sites two chamber

- High risk oil/fuel storage and handling areas.
- Filling stations (SPEL Puraceptor forecourt separator FP2CSC).
- Heavily contaminated industrial areas, commercial vehicle/plant maintenance yards, power/sub stations, fire training grounds and railway light maintenance and fuelling depots.



Two chamber models.

General description

SPEL Puraceptor full retention separators treat the full flow generated by a rainfall intensity of 65mm/hour. They have been designed and tested to meet the stringent European Standard BS EN 858-1 for installations for separation of light liquids where the maximum hydrocarbon concentration in the outlet does not exceed 5mg/l.

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.

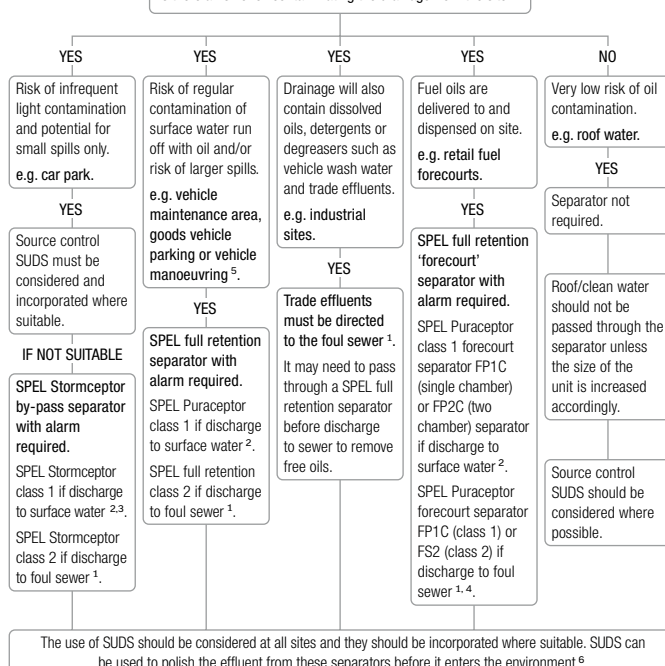
How to select and specify to the Environment Agency's Pollution Prevention Guidelines PPG3

Notes to accompany the flowchart

1. You must seek prior permission from your local sewer provider before you decide which separator to install and before you make any discharge.
2. You must seek prior permission from the Environment Agency before you decide which separator to install.

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

Is there a risk of oil contaminating the drainage from the site ?

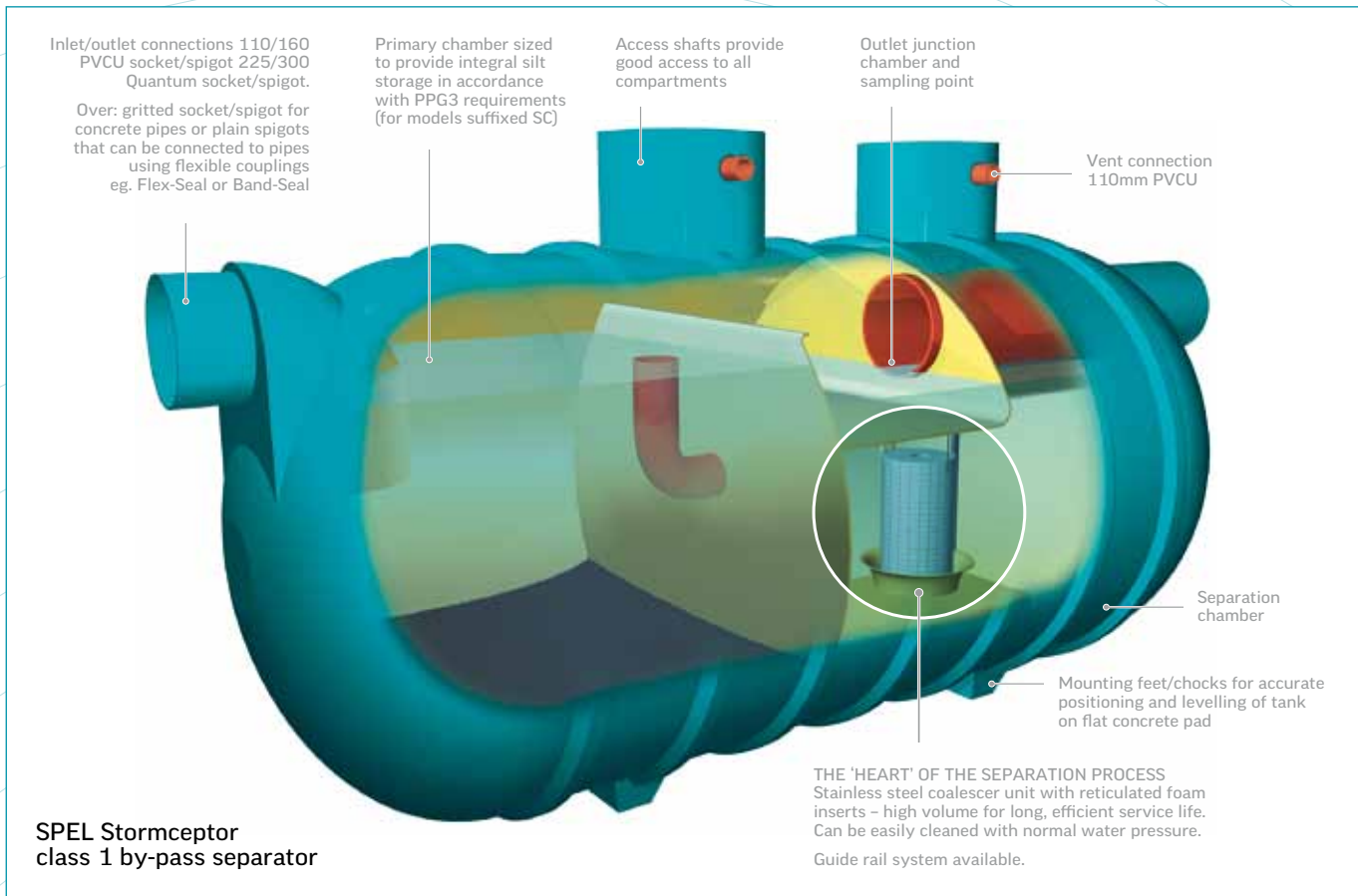


Features

- Good access to all parts for desludging.
- Dip pipe inlet for minimum turbulence and to prevent inflammable vapours passing upstream in drainage system.
- Automatic closure device (ACD) closes the separator off automatically once the maximum storage capacity of light liquid pollutants is reached, e.g. major fuel spillage, so preventing them passing into the drain.
- Designed for high performance and low maintenance over a long life span.

The high performance separators for maximum long term efficiency

The cost effective solution to light liquid separation, NSB 3-1000



When you look into SPEL tanks you can see the difference

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

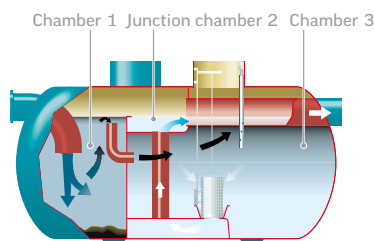
Features

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

Performance

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

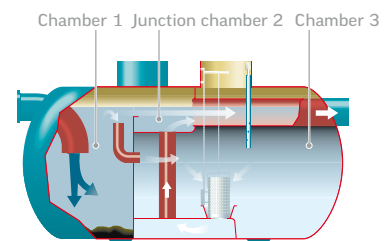
How does the SPEL Stormceptor class 1 by-pass separator operate?



Flow according to nominal size (NSB)

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

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

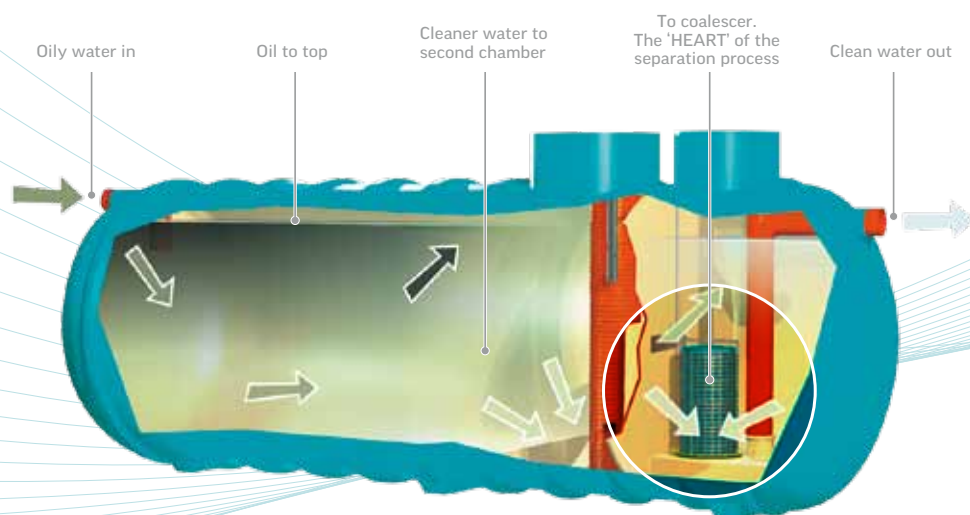


Storm flows above NSB

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

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

SPEL Puraceptor® class 1 full retention separators – single and two chamber versions, NS 4-1000



SPEL Puraceptor class 1 two chamber separators

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

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

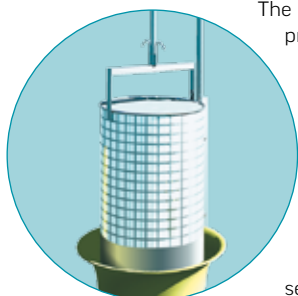
Introduction and operation

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

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

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

Why all SPEL class 1 separators perform best – even on heavily polluted sites



The 'HEART' of the separation process is the robust and highly efficient coalescer unit or units. 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.

Performance

SPEL Puraceptors have been tested in accordance with the European Standard BS EN 858-1 and the results were substantially within the maximum hydrocarbon concentration in the outlet of 5mg/l. The average for all units tested was 1.22mg/l.

SPEL Puraceptor class 1 single chamber separators

Typical applications are:

- Medium to high risk oil/fuel storage and handling areas.
- Filling stations, (SPEL Puraceptor forecourt separator FP1CSC).
- Commercial vehicle/plant maintenance yards and heavily contaminated industrial areas.

Features

- Robust stainless steel coalescer unit with long life, high volume foam insert and lifting handle.
- Stainless steel, plastic or copper ball automatic closure device (ACD)
- Good access to all parts for desludging
- Sampling point incorporated into outlet
- One access shaft for desludging and servicing of ACD and coalescer unit
- Sized for working capacity PLUS fuel/oil and silt containment, ensuring optimum performance between maintenance periods
- Designed for a long life span of high performance with low maintenance.



Typical applications are:

- High risk oil/fuel storage and handling areas.
- Filling stations, (SPEL Puraceptor forecourt separator FP2CSC).
- Heavily contaminated industrial areas, commercial vehicle/plant maintenance yards, power/sub stations, fire training grounds and railway light maintenance and fuelling depots.

Features

- Robust stainless steel coalescer unit with long life, high volume foam insert and lifting handle.
- Coalescer unit/s in second chamber – protected from bulk of oil and silt
- Stainless steel, plastic or copper ball automatic closure device (ACD)
- Good access to all parts for desludging
- Sampling point incorporated into outlet
- Two access shafts for generous access for desludging and servicing of the ACD and coalescer unit/s.
- 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.

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

SPEL coalescer unit

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

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

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

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

Optional extras

SPEL coalescer unit guide rail system

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

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

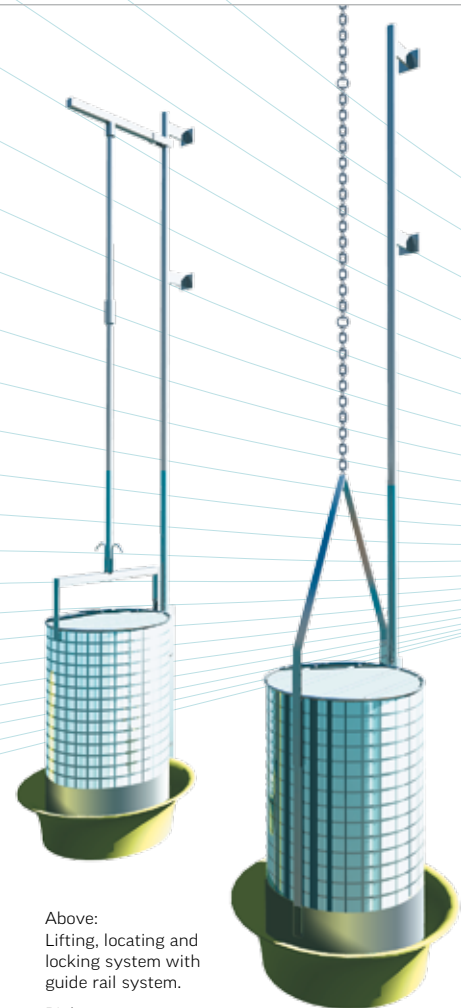
Lifting chains are available for the larger coalescer units and where extension shafts are fitted.

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

SPEL coalescer unit lifting, locating and locking system

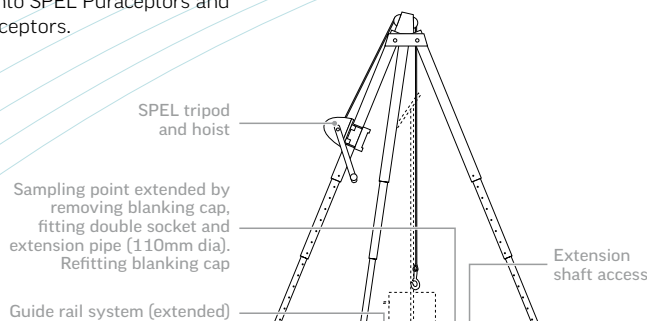
The SPEL lifting, locating and locking system is manufactured in stainless steel and replaces the standard coalescer unit handle.

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



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

Right:
The SPEL coalescer unit with lifting chain.



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.

Specifications. Site preliminaries

SPEL Separators are moulded with general purpose polyester resins. However, applications where hydrocarbons have a specifically corrosive nature, eg. toluene, chemical resistant internal linings are available.

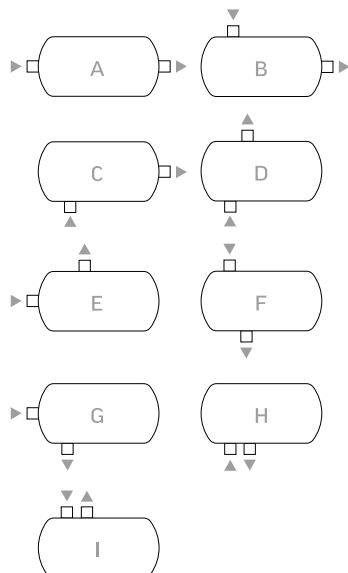
Burial depth and water table level

These factors influence the tanks grade of shell. For most applications the Standard is adequate.

Burial depth charts are available for all specifications; Standard, Heavy, Extra Heavy or Special. For guidance, see tables on right.

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.

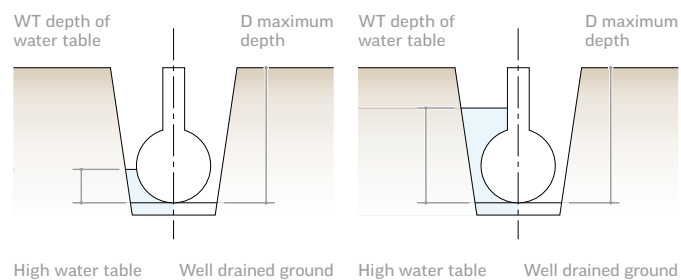


Standard tanks

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



Installation

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

Site access and conditions

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

Off-loading/handling

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

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

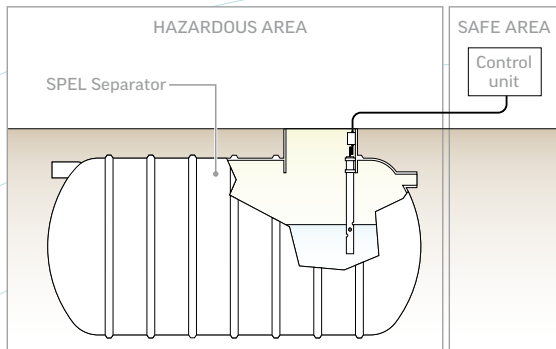
Health and safety

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

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



SPEL automatic alarm/monitoring systems



SPEL solar alarm units

This solar powered SPEL automatic alarm/monitoring system is available where mains power is unavailable.

This unit operates in low-power mode except every 30 minutes, for 15 seconds, checks the oil level in the separator. When the maximum oil storage level is reached it sends an alarm message as a text message (SMS) to the end user's mobile phone or SCADA system.

SPEL model SP1000 Oil

The SPEL automatic alarm/monitoring system provides 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. This is a requirement of the Environment Agency's Pollution Prevention Guidelines PPG3.

The system comprises a 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. It is a 'fail-safe' system providing complete assurance that it is operative. If a fault occurs it will be signalled immediately.

SPEL model SP2000 Oil/Hi

This model includes a high level alarm. When an abnormally high operating level is reached this is an indication that the coalescer unit/s require servicing.

SPEL model SP2000 Oil/Silt

This model provides, in addition to the standard oil alarm, an alarm to indicate the maximum silt capacity in the silt chamber has been reached and should be removed.

Note: If required all three alarms (Oil, Silt and Hi) can be provided.

Remote telemetry

All alarms have relay to connect to remote telemetry.



- Self-monitoring 'fail-safe' electronic system.
- Floatless oil sensor with no moving parts for highest reliability.
- Electronic sensor check for open or short circuit.
- Intrinsically safe certified sensor system.



Right: Solar unit
Top: Floatless oil sensor
Above: Oil separator alarm

SPEL vehicle wash silt trap SPEL Econoskim® System Above ground installations

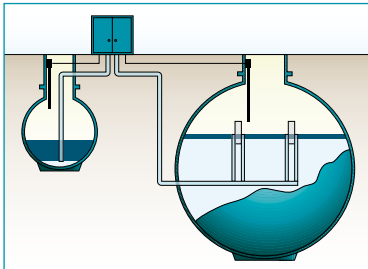


SPEL vehicle wash silt traps model ST800/5 tonne and ST800/12 tonne

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

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

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



The SPEL Econoskim® light liquid skimming and separate containment system

Reduces emptying costs by up to 90%

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

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

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

UK Patent No.2355211.



SPEL Separators for above ground installations

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



Information available from:
Special Products Division

SPEL installations



International airports and airfields



Power stations and electricity sub-stations



Export – Vasilikos Power Station, Cyprus



Supermarket car parks, lorry parks,
fuel depots



Railway fuelling and maintenance depots.
Channel Tunnel



Thames Barrier, London



Typical industrial application.
JCB's headquarters, Rocester, Staffordshire

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

25 year warranty against internal corrosion or structural failure.

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

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

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

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

Quality Assured Company
BS EN ISO 9001:2008.
Certificate No: FM 35174

UVDB/Achilles accredited –
Supplier No. 88611

SPEL

Quality that protects
the environment

SPEL Products, Lancaster Road
Shrewsbury, Shropshire
SY1 3NQ, England.

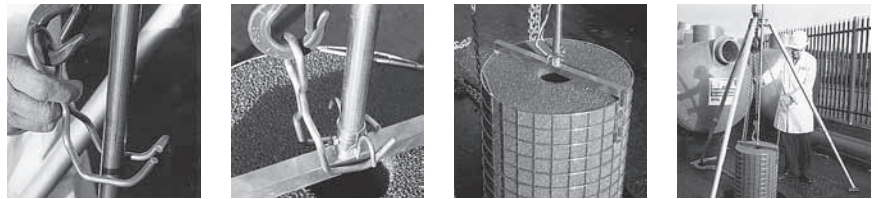
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Reference: CO&M Sept. 2010

SPEL separator commissioning, operation and maintenance



SPEL Stormceptor® class 1 and 2
by-pass separators.

SPEL full retention class 2 separators.

SPEL Puraceptor® class 1 full
retention separators (single and two
chamber models).

SPEL automatic alarm/monitoring system.

SPEL

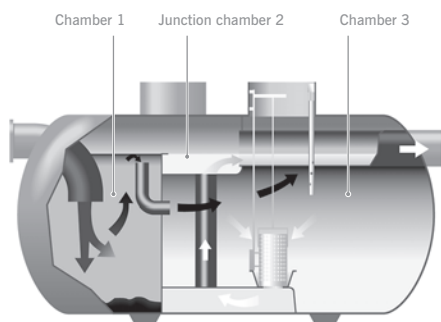
2 SPEL Stormceptor® by-pass separators

Maintenance

The SPEL Stormceptor® by-pass separator is a well proven high quality factory made unit, designed and tested in accordance with the European Standard BS EN 858-1 and meets the requirements of the Environment Agency's Pollution Prevention Guidelines PPG3 and the Construction Products Regulations.

SPEL Stormceptors are designed for long term performance and with SPEL high volume coalescer units, low maintenance.

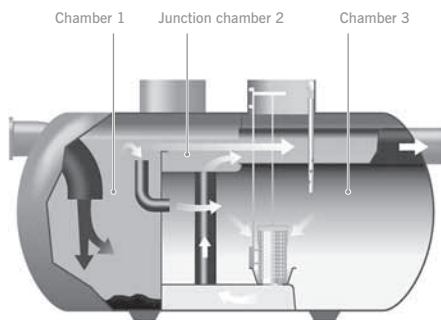
SPEL Stormceptor by-pass separators are manufactured in class 1 and class 2 models and with or without silt capacity in accordance with BS EN 858-1. The range of models is listed in section 6 of the SPEL data manual or on the SPEL Stormceptor selection chart – available on request.



Flow according to nominal size (NSB)

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

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



Storm flows above NSB

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

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

Maintenance requirements

The SPEL automatic alarm/monitoring system will automatically warn you when the SPEL Stormceptor requires emptying of light liquids, however, silt will accumulate and require removing at intervals depending on the site conditions.

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

Where a SPEL automatic alarm/monitoring system is not fitted, the SPEL Stormceptor should be checked at 3, 6, 12 monthly intervals, depending upon site conditions, to determine the depth of retained pollutants. When the depth of light liquids retained has reached the predetermined design level in accordance with the European Standard BS EN 858-1, or if excessive silt has accumulated, it should be emptied.

When emptying ensure both chambers (primary – chamber 1 and separation – chamber 3) are emptied equally to prevent unequal pressure on the internal partition.

Chamber 1

The inlet connects directly into chamber 1 – the primary chamber where silt etc. is deposited and light liquids are skimmed off to be transferred to the main separation chamber, chamber 3.

Maintenance requires the removal of accumulated silt etc., checking the skim pipe is not blocked and removing floating debris.

Chamber 2

This is the junction chamber where the clean water passing out of the main separation chamber and the storm flow over the weir from the primary chamber meet and pass to the outlet. This chamber is an approved sampling point if samples are required for analysis. As it is mainly clean water passing through the chamber, maintenance is confined to checking the weir plate is free of debris.

Chamber 3

The main separation chamber is where the light liquids are retained and in the case of class 1 Stormceptors, where the coalescer units are incorporated.

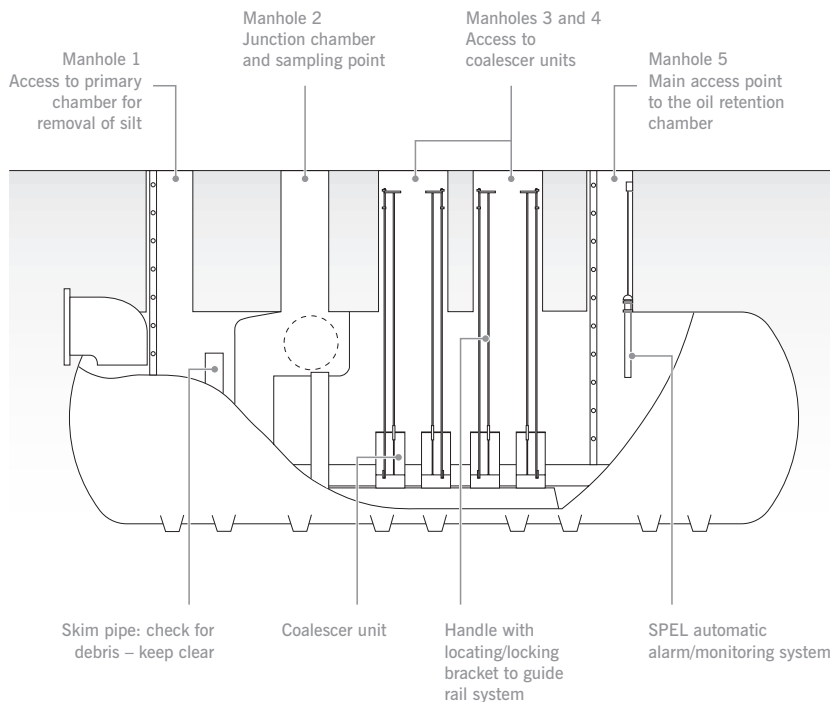
If coalescer units are incorporated, these should be removed and cleaned in accordance with the requirements set out on page 5.

Retained light liquids should be removed from the top and any sediment from the bottom. Small Stormceptor by-pass separators generally need to be completely emptied.

SPEL automatic alarm/monitoring system

If a SPEL automatic alarm/monitoring system is fitted this will automatically signal when the Stormceptor requires light liquids to be removed. If this system is fitted see pages 11 and 12.

When emptying take care not to damage or shift the probe protection tube situated in the access shaft of chamber 3.



SPEL Stormceptor class 1 by-pass separators 400, 500 & 600 series

A wide range of SPEL Stormceptor class 1 by-pass separators is available incorporating coalescer unit/s for the larger catchment areas.

When emptying ensure both chambers (primary – chamber 1 and separation – chamber 3) are emptied equally to prevent unequal pressure on the internal partition.

Manhole access 1

This is the access to the primary chamber for removal of silt, the inspection of the skim pipe and clearing of any floating debris.

Manhole access 2

These provide access to the junction chamber which is suitable as a sampling point for the final discharge.

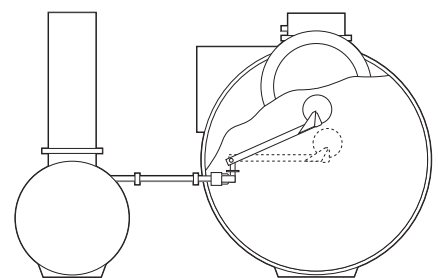
Manhole access 3 & 4 (larger models)

These provide access for the inspection, removal and reinsertion of the coalescer units.

Manhole access 5

Where manhole access is required for maintenance personnel to enter the separator, a minimum 750mm dia. manhole access shaft is provided and where required, a GRP ladder and stainless steel fittings.

The SPEL automatic alarm/monitoring system probe is generally situated at the base of this access shaft. If system fitted see pages 11 and 12.



SPEL Econoskim light liquid skimming/separate containment system

For optimum performance and efficient low cost maintenance for the larger SPEL separators serving large and/or heavily polluted catchment areas. If a SPEL Econoskim system is fitted refer to the SPEL data manual, section 11.

Maintenance

SPEL full retention class 2 separators

These are generally single chamber units with a single, or in the case of large separators two access shafts, to enable periodic removal of pollutants and silt. An automatic closure device (ACD) is fitted and should be checked that it is operating correctly. See ACD on page 6.

SPEL Puraceptor class 1 separators

The SPEL Puraceptor class 1 separator is available in single chamber or two chamber models.

Single chamber models (Figure 1)

These incorporate a coalescer unit and an automatic closure device type 'R'. For maintenance see page 6.

Two chamber models (Figure 2)

The maintenance procedure for the SPEL Puraceptor class 1 two chamber models is detailed on page 5.

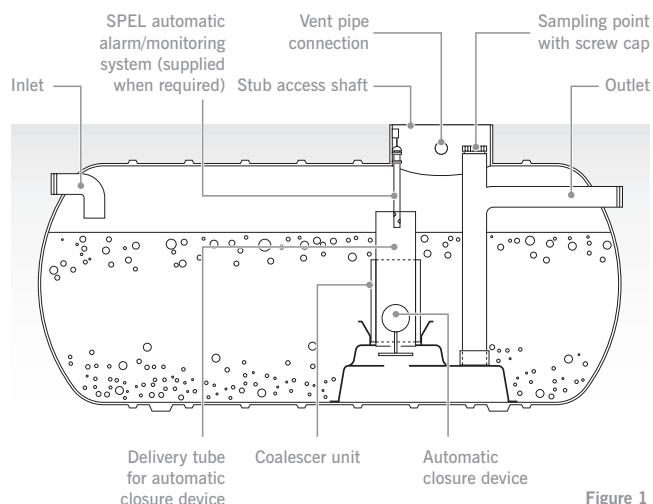


Figure 1

Maintenance requirements

The SPEL automatic alarm/monitoring system will automatically warn you when the SPEL separator requires emptying of light liquids. See pages 11 and 12. However, silt will accumulate and require removing at intervals depending on the site conditions.

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

Where a SPEL automatic alarm/monitoring system is not fitted, the SPEL separator should be checked at 3, 6, 12 monthly intervals, depending upon site conditions, to determine the depth of retained pollutants. When the depth of light liquids retained has reached the predetermined design level in accordance with the European Standard BS EN 858-1, or if excessive silt has accumulated, it should be emptied in accordance with the following procedures.

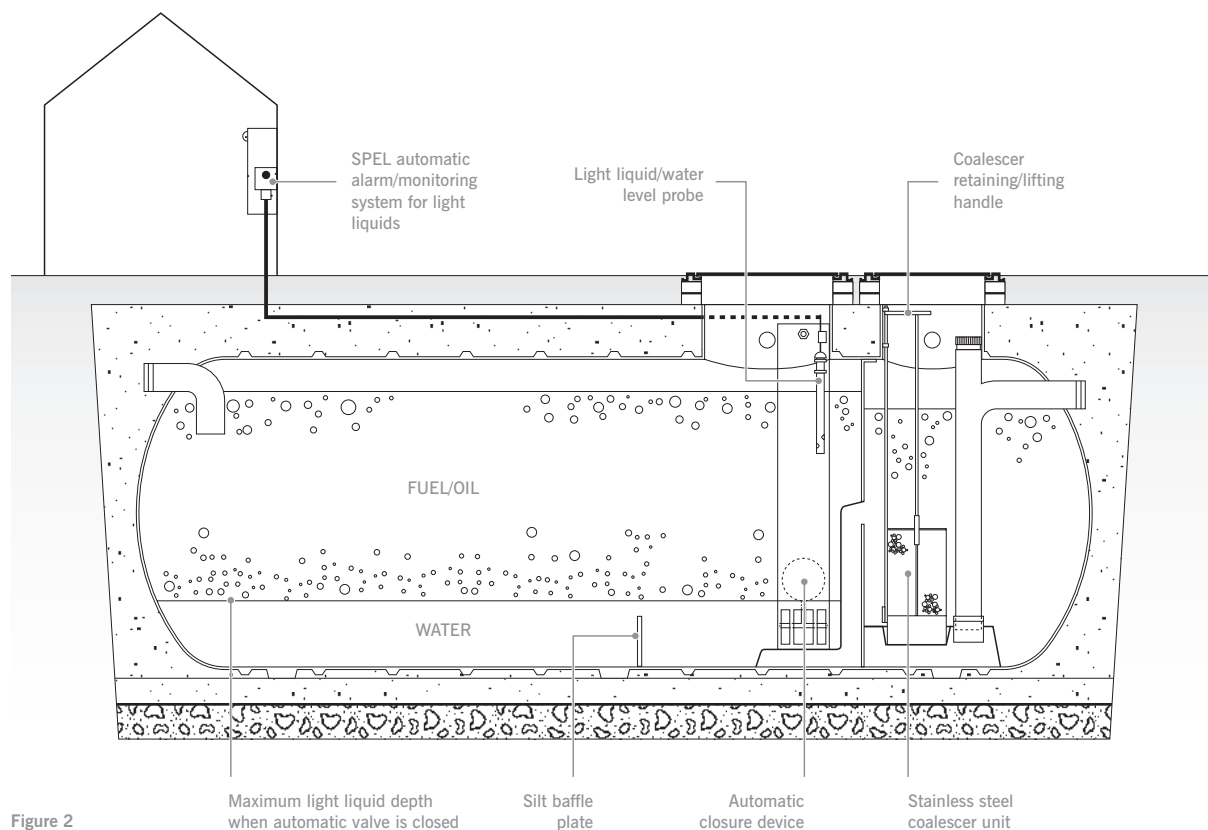


Figure 2

Maintenance procedure

The SPEL automatic alarm/monitoring system will automatically warn you when the Puraceptor requires emptying. See pages 11 and 12. Where a SPEL automatic alarm/monitoring system is not fitted, SPEL Puraceptors should be checked at three-, six- or twelve-monthly intervals depending on site conditions, to determine the depth of retained pollutants and silt in both chambers and the correct operating of the ACD (automatic closure device). When the depth of the oil/fuel retained has reached the pre-determined design level, in accordance with BS EN 858-1, it should be emptied.

Important Note: When emptying, ensure both chambers are emptied equally starting with the oil retention chamber and then the coalescer chamber and back again until empty.

Step 1: Sucking out oil/fuel and silt

Suck off the retained oil from both chambers of the Puraceptor and then the silt deposited on the bottom, leaving sufficient water to ensure the ACD remains floating.

Step 2: Coalescer unit

Use the lifting handle or unclip the retaining clip for the wire rope and lift the coalescer unit out of the tank and place ahead of the Puraceptor.

Step 3: Cleaning foam insert

Remove foam insert and wash with normal water pressure ensuring the dirty water runs into the Puraceptor.

Step 4: Sucking out complete contents (if necessary)

If the quantity of pollutants exceeds recommended levels, the complete contents of the Puraceptor may need to be removed. After sucking out completely, remove the ACD in the ACD retaining tube by first removing the retaining cap (this is to safeguard against the removal of the float by unauthorised persons). Then, by means of a pole with a hook, lift out the ACD using the lifting eye on the float. Check the seating at the base of the retaining tube is free of debris/silt that could prevent the ACD closing off in an emergency.

Step 5: Re-insert coalescer unit and ACD

Re-insert the foam insert into the stainless steel coalescer unit and re-insert the coalescer unit into the Puraceptor. Re-clip the wire rope or location pin as provided with the SPEL lifting/locating/locking system (see page 8).

Partially fill the Puraceptor with clean water to ensure the ACD when re-inserted remains floating. Check the ACD is not damaged and the closure plate is clean. Re-insert the ACD.

Finally check the ACD is floating and the retaining cap has been replaced to safeguard against its removal by unauthorised persons, unless depth of tank precludes doing so from ground level.

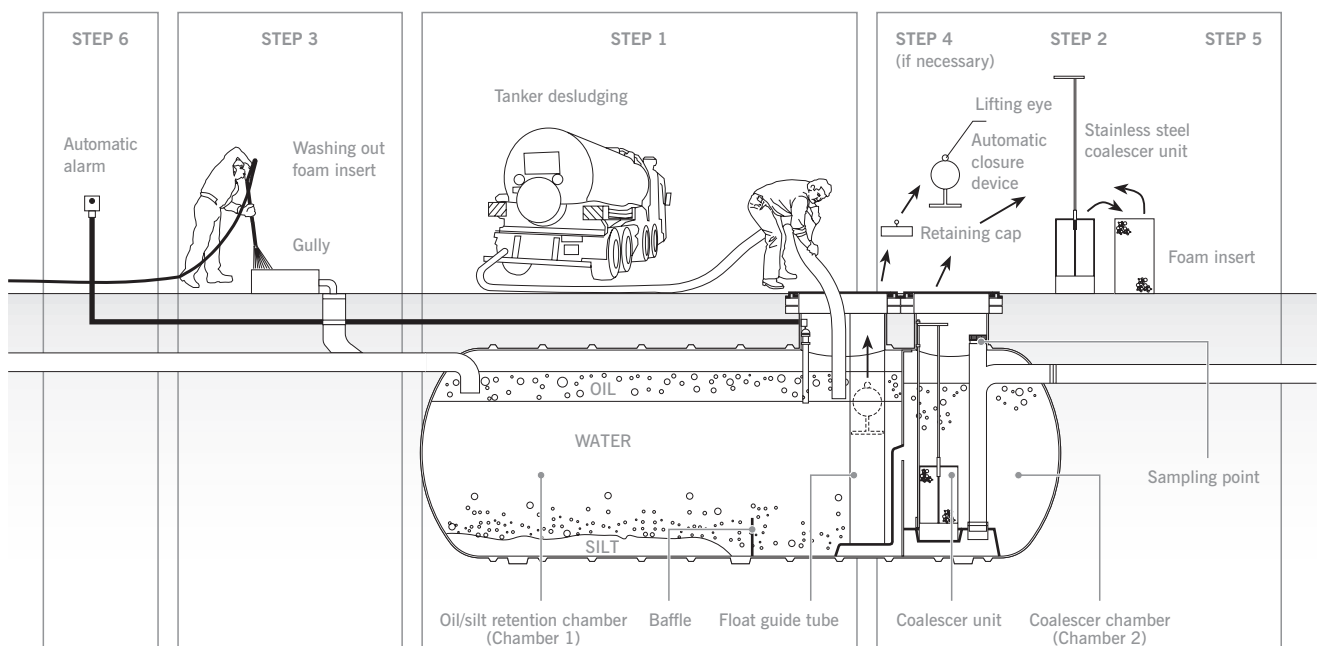
ACD closes off in emergency due to oil spill

If the ACD closes off, the oil/fuel spill needs to be removed by a suction tanker. With a single chamber model, the complete contents will need to be removed in order to release the ACD. With the two chamber models, insert the suction hose into the first chamber (oil/silt retention chamber) and then the head in the second chamber will normally provide a back pressure and automatically release the ACD.

Precaution: never try to pull the ACD off its seating by force.

Step 6: SPEL automatic alarm /monitoring system

The SPEL automatic alarm/monitoring system probe should be lifted out of the probe protection tube, wiped clean and re-inserted. The system should now be reset according to instructions. See page 11 and 12.



SPEL Puraceptor separator – two chamber model

The purpose of the automatic closure device (ACD) is to close the separator off automatically when the maximum storage capacity of light liquid is attained.

The ACD is to ensure that in the event of a major spillage, pollutants do not pass into the drainage system; it should not be regarded as a substitute for an automatic alarm/monitoring system.

Prior to installation

Prior to installation the ACD retaining tube should be covered with polythene to prevent ingress of concrete etc., which would fall onto the ACD and upset its calibration.

Operation and maintenance

If the tank should fill with light liquid the ACD, which is calibrated for a specific gravity of 0.85, will automatically fall and close off the SPEL Puraceptor.

Normally routine maintenance would include removing light liquid intercepted within the Puraceptor. If a SPEL automatic alarm/monitoring system is incorporated, it will automatically indicate when the Puraceptor should be emptied. Only in an emergency will the Puraceptor fill to its maximum and operate the ACD.

In such an event the Puraceptor should be completely sucked out and the ACD lifted out (see Maintenance Procedure – page 5).

SPEL Puraceptor class 1 separators two chamber models and full retention class 2 separators

Commissioning

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, ensuring it floats correctly with the float just visible above the water level.
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.

SPEL Puraceptor class 1 separators single chamber models

Models P004/1C to P050/1CSC

Commissioning

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

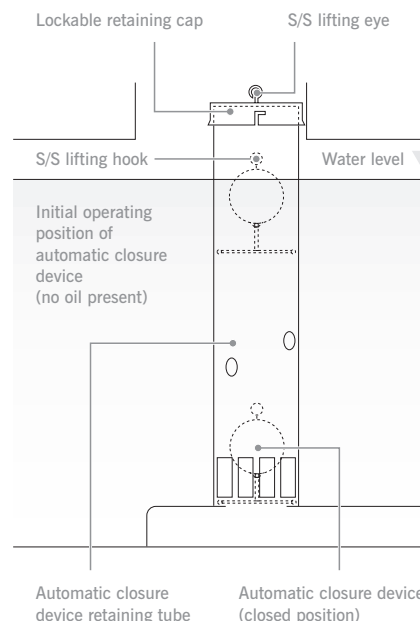
Where the ACD is already positioned in the unit, proceed as follows:

1. Before putting any water in the tank, lift rope attached to ACD up to the next knot and hang it from the rope hook. 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 and the rope hook must be unbolted. Do not leave the rope hook attached to the shaft. Ensure the ACD automatically remains in the 'operating position'.
3. Tape up or fill the hole(s) in the shaft where the rope hook was attached to prevent any backfill seeping into the shaft.

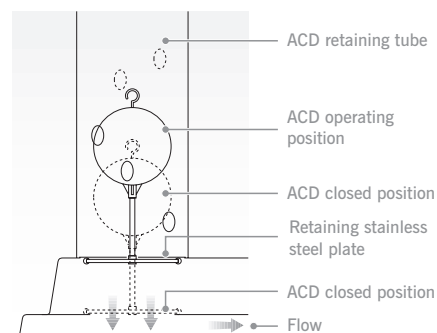
Maintenance

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.

Automatic closure device Type F (Floating)
SPEL Puraceptor class 1 separators (two chamber)
& full retention class 2 separators



Automatic closure device Type R (Retained)
SPEL Puraceptor class 1 separator (single chamber)



The SPEL Puraceptor class 1 separator and SPEL Stormceptor class 1 by-pass separators incorporate coalescer units. The coalescer units provide a coalescence process for the separation of smaller globules of light liquid pollutants before final discharge to the surface water drain.

Prior to Installation

1. Remove any strapping/ropes which have been used to hold the coalescer units from shifting in transit.
2. The access shaft(s) above the coalescer units should be covered with polythene to prevent ingress of concrete, dust, debris etc. which could clog the foam inserts.
3. On completion of the installation, check that the coalescer unit is inserted securely into the base socket.

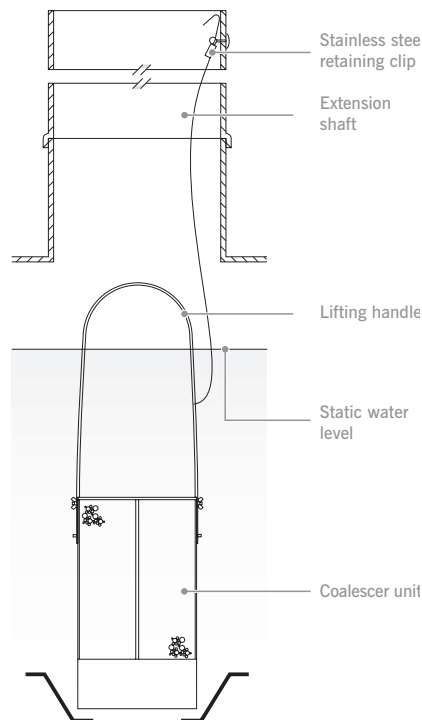


Figure 1

Stainless steel wire rope lifting device to facilitate lifting coalescer unit for maintenance. For 200/300 series separators with deep inverts.

Where wire ropes are fitted in place of the lifting, locating and locking system

Fig 1. The stainless steel wire rope lifting devices will be situated on top of the coalescer units and will have to be taken up out of the access shaft(s) above. A small slit in the polythene will allow you to pass the handles out.

Installation

During installation, it is important that the foam inserts are not clogged with dust, debris or drops of wet concrete. To safeguard against this, we recommend covering the access shaft with a sheet of polythene, if not already covered.

Commissioning

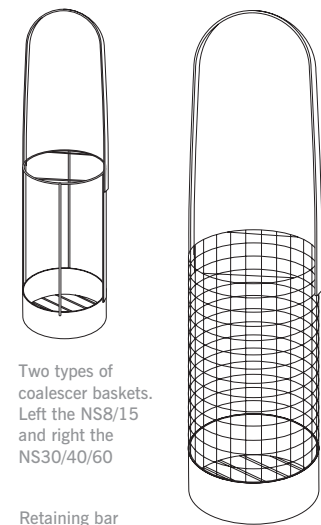
On completion of installation, check the foam insert is fitted inside the stainless steel coalescer unit (Fig 2) and the coalescer unit is inserted securely into the base socket.

Maintenance

1. Lift handle and coalescer unit out of the tank and place ahead of the Puraceptor.
2. Remove foam insert and wash with normal water pressure ensuring the dirty water runs into the Puraceptor.
3. Re-insert the foam insert into the stainless steel coalescer unit (Fig 2) and re-insert the coalescer unit into the Puraceptor.

Lifting chains

On heavily polluted sites silt and contaminants may build up in the coalescer unit foam inserts and add significantly to its weight. It is recommended that in this situation the larger coalescer units, NS40 and NS60, are fitted with SPEL lifting chain sets (Fig 3) to suit the tank invert depth at ground level for safe lifting with the SPEL tripod and hoist (see page 9).



Two types of coalescer baskets. Left the NS8/15 and right the NS30/40/60

Retaining bar



Figure 2

Ensure the foam insert is fitted inside the stainless steel coalescer unit and secured under the retaining bar.

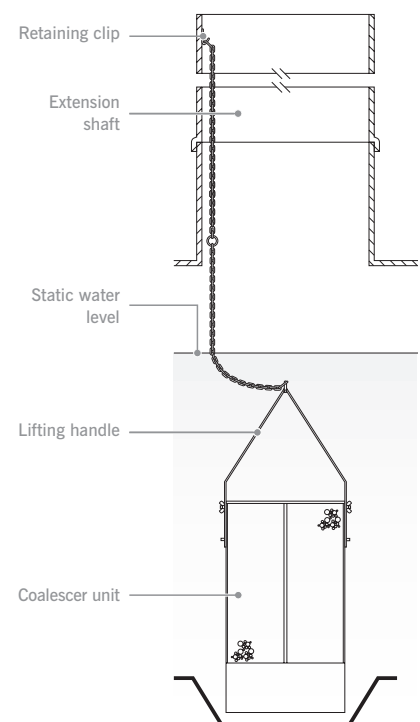
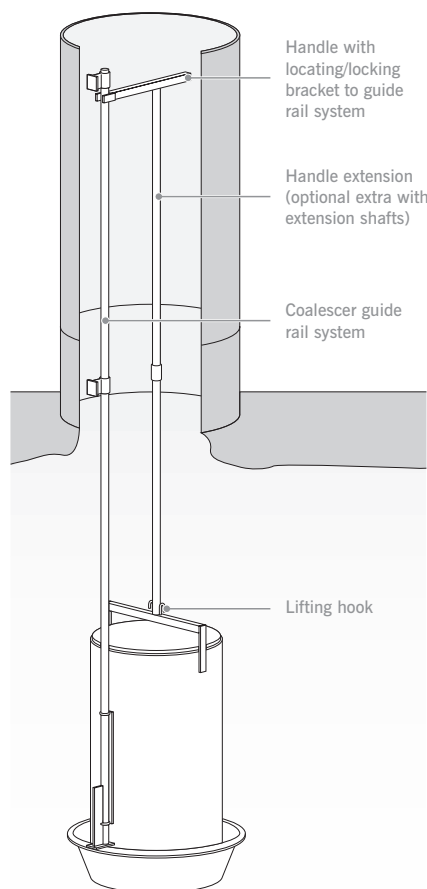


Figure 3

Coalescer unit with lifting chains.



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

SPEL coalescer unit guide rail system

This facilitates easy insertion and removal of coalescer units. 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 finally 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 lifting/locating/locking system for positive location and security locking

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 could prevent the coalescer unit from re-seating correctly after servicing.

The coalescer unit lifting/locating/locking system ensures 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 i.e. 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 inverters and provide easy access for lifting manually or with the SPEL tripod and hoist utilising the lifting hook.





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 & hoist is recommended.

A stainless steel lifting hook is included for automatically engaging the coalescer unit, even under water. This enables coalescer units to be lifted out safely from ground level.

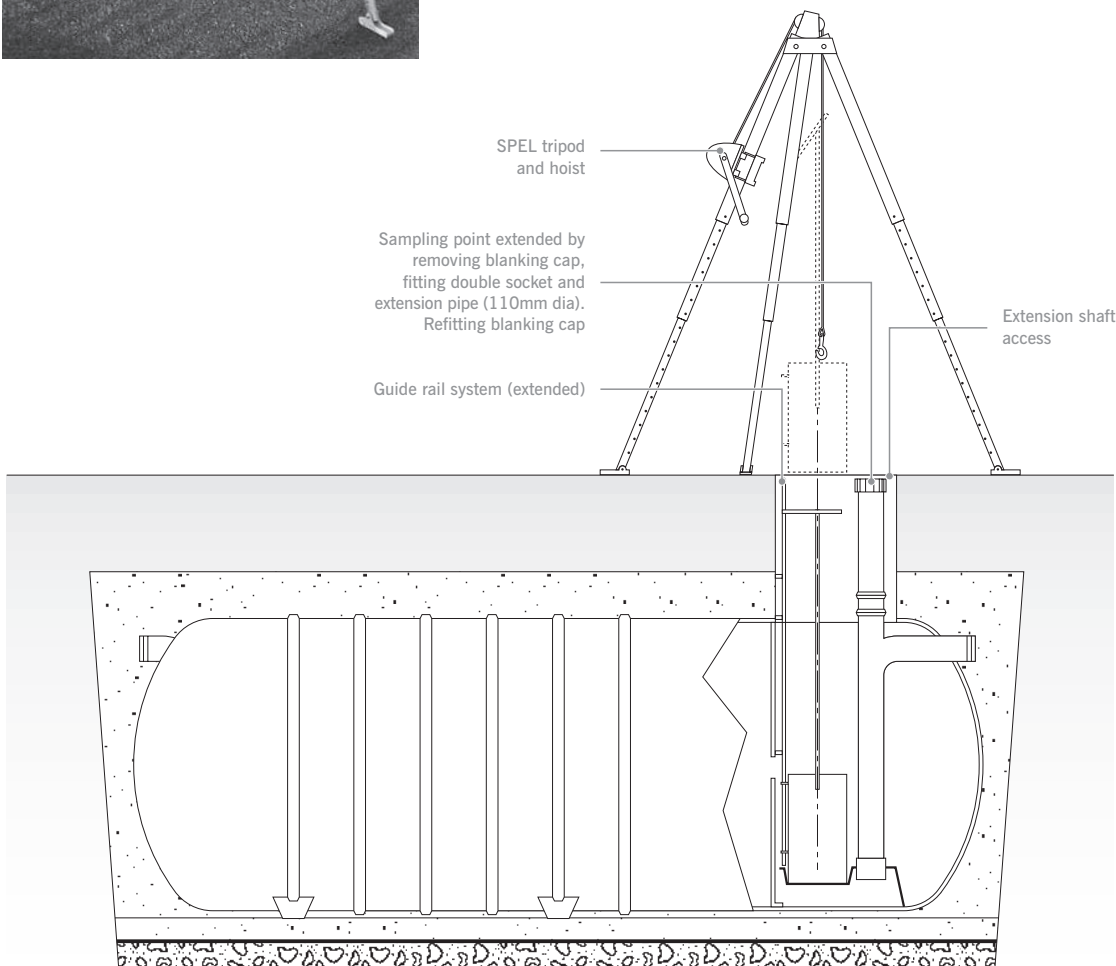
Note: The SPEL tripod and hoist can be used for servicing pumps incorporated in SPEL package pumping stations.

Health & safety

The HSE state that all equipment used for the health and safety of people at work should be periodically examined and tested in line with the manufacturer's recommendations. Safe working load is 200kg.

Service & maintenance

For service and maintenance contact SPEL on +44 (0)1743 445200.



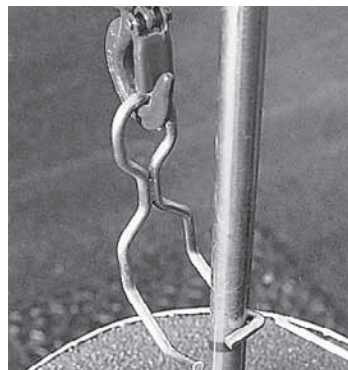
10 SPEL tripod and hoist

For maintenance of coalescer units

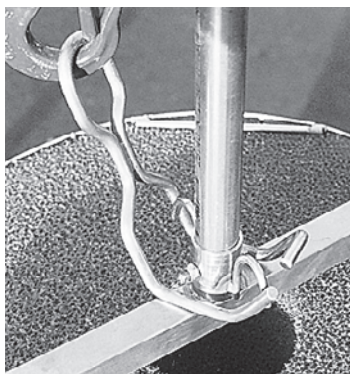
SPEL tripod and hoist used in conjunction with the SPEL coalescer unit lifting/locating/locking system



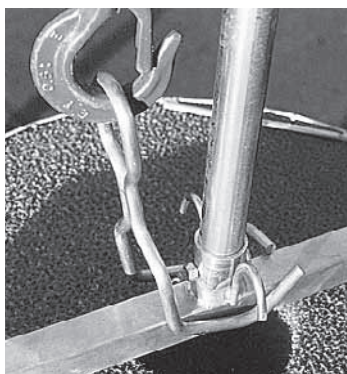
Step 1&2 – Snap the 'lifting hook' onto the SPEL lifting/locating/locking system handle shaft.



Step 3 – Lower the 'lifting hook' down the shaft to the bottom bracket.



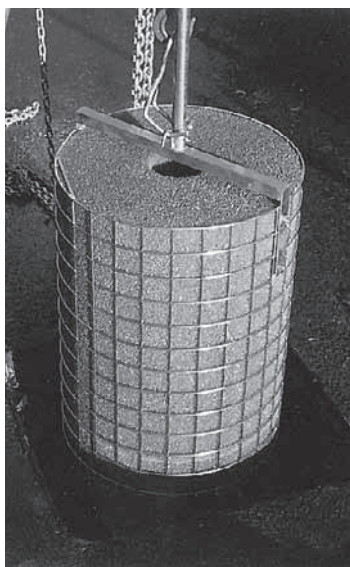
Step 4 – Swivel the hoist chain until the 'lifting hook' is at 90° to the bottom bracket, allowing it to pass the lifting hooks welded each side of the bottom bracket.



Step 5 – Once passed the lifting hooks, swivel the 'lifting hook' through 90° to allow it to saddle the bottom bracket and position itself under the lifting hooks.



Step 6 – Raise the lifting chain to engage the 'lifting hook' with the lifting hooks on the bottom bracket.



Step 7 – Raise the coalescer unit.



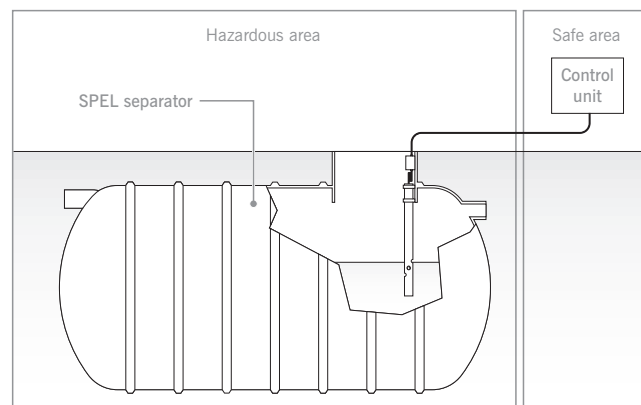
Step 8 – As the coalescer unit rises, steer the lifting handle past the tripod head and hoist to allow continued lifting of the coalescer unit.



Step 9 – Once the coalescer unit is above ground level, swing it to one side of the manhole for maintenance.

The SPEL automatic alarm/monitoring system provides 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. This is a requirement of the Environment Agency's Pollution Prevention Guidelines PPG3.

The system comprises a 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.



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.

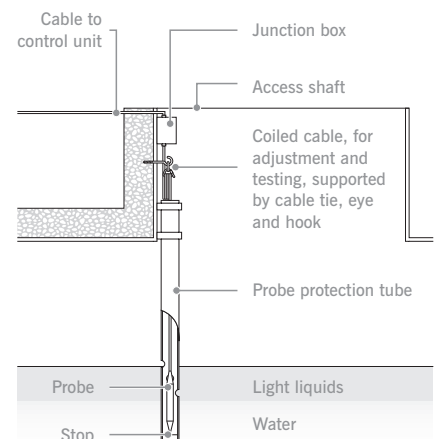
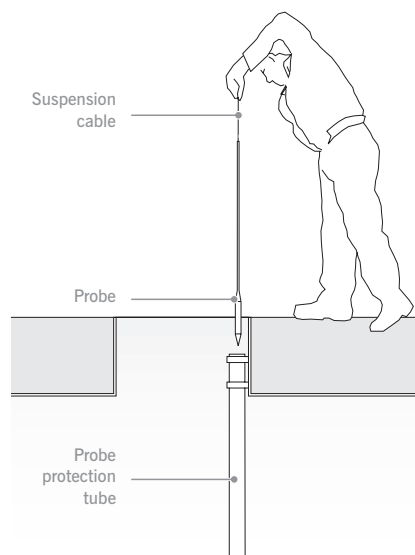
Installation

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 by 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.

Maintenance

When the separator is maintained, lift the probe out of the probe protection tube, check it operates the alarm (see under Tests page 12) and at the same time wipe oil and contaminants from the probe to prevent a fake alarm after re-inserting.



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.

Control unit (electrical connections)**1. Mains voltage connection:**

The control unit should be connected to a suitable 220/240V AC supply and fused at 3 amps. 110V AC version available.

Note: This appliance must be earthed.

2. Control unit/probe junction box connection

Wiring from the control unit to the probe junction box in the separator chamber requires a 3-core screened, 0.75mm core section cable.

Maximum cable length: 300 metres.

3. Probe connection

A 5 metre 3-core probe cable is normally fitted to the junction box and the probe.

After all connections have been made, the cables must be secured by tightening each entry gland.

Probe

The probe is installed freely suspended in the SPEL separator within the probe protection tube. The 3-core cable is connected into the junction box mounted in the access shaft above the probe protection tube. Extra cable is provided to enable raising the junction box where extension shafts are incorporated.

Important note: In all cases good, standard electrical practice should be followed, and the installation must conform to the appropriate local code of practice – BS 5345 in the UK. In essence, the installation must be such that the intrinsic safety is not compromised by:

- Exposure to risk of mechanical damage
- Unauthorised modification or interference
- Exposure to moisture, dust and foreign bodies
- Excessive heat
- Invasion of intrinsically safe circuit by other electrical equipment or circuitry

Certificate of conformity

The alarm device has been approved to be used in explosion-hazardous areas. The control unit and probe are approved according to ATEX Directive 94/9/EC. These approvals mean that the probes can be installed in Zone 0, which is continuously explosion-hazardous.

The control unit must be located in the safe area, but it can be connected to the probe without any barrier.

Tests**Physical function test**

The function can be tested by lifting the probe within the probe protection tube. In approximately 5 seconds, the alarm is given by a red light and audible signal. Both relays release. Push the RESET button – the buzzer goes off and relay K1 picks up.

When the probe is placed in water again, relay K2 picks up and the red light goes off.

Cable break and short circuit test

Also the function can be tested in case of cable fault or short circuit. First cause short circuit in probe cable terminals 1 and 2. Then the yellow light for short circuit is lit. Both the relays pick up and the buzzer goes on. Remove the short circuit and reset the buzzer.

Simulated function test

The function of probe, cable and electronics can be tested. Push the TEST button for 2 to 5 seconds. Both relays pick up, and the red light is lit. When the TEST button is released, the red light goes off and relay K2 returns to its normal position. The buzzer and relay K1 must be reset.

Installation

Important note: It is important that installation is carried out by a competent technician familiar with this type of equipment or contact our Special Products Division for installation, commissioning and maintenance service.

Silt level alarm

It is recommended that separators also be fitted with silt level alarms to prevent the build-up of excessive levels of silt. These can be provided separately or as a combination with the oil level alarm. Contact our technical department for details.

Solar powered alarm

The SPEL automatic alarm/monitoring system – solar powered version, is available where mains power is unavailable. See 10.3 of our SPEL data manual of contact our technical department for details.

APPENDIX G

SDS Limited,
Geolight Attenuation Tank Literature

Sustainable Drainage Systems Ltd

GEOlight™

Stormwater Management



GEOlight™
is an ultra
lightweight
honeycombed
modular structure
made from recycled PVC.

The ready to install units are
preformed to provide an underground
stormwater storage facility, for the application
of stormwater attenuation or infiltration.

The high void rate (95%), high compressive strength (to
1000KN/m²) and low resistance to water flow makes GEOlight™
an ideal material for cost efficient and maintainable underground
water storage during storm conditions.

Stormwater Management

The Environment Agency is keen to promote the wider use of sustainable drainage systems, which reduce the impact of surface-water run-off. There are two main ways of storing surface water for stormwater management:

- Stormwater attenuation tanks
- Soakaway infiltration systems

Stormwater attenuation systems

This consists of underground water storage facilities that hold excess water during periods of peak rainfall.

GEOlight™ – an efficient and economic solution for stormwater management.

The stored water is gradually released in a controlled manner into the surface-water drainage system or directly into watercourses, reducing the risk of upstream and downstream flooding.

Soakaway infiltration systems

Soakaways are designed to store surface-water run-off until it can be gradually absorbed by the surrounding ground.

GEOlight™ Attenuation

GEOlight™

GEOlight™ has been specifically designed to form underground water storage reservoirs in stormwater management schemes. Its honeycombed structure gives it certain unique characteristics that make it ideal for this purpose:

- The high void rate (95%) of GEOlight™ means that the maximum volume of water is stored in the minimum volume.
- High compressive strength. GEOlight™ is available in two strengths as standard: 200 and 400kN/m². Note: Higher compressive strengths available from 600 to 1000 kN/m². The graph on the right shows the results of a compression test, where samples of GEOlight™ 400 were compressed at 1mm per minute. The deformation at 400kN/m² is about 1.6%.

The GEOlight™ Stormwater Attenuation System consists of two manholes (inspection chambers) connected by a length of perforated distribution pipe which feeds the stormwater storage reservoirs on either side formed from GEOlight™.

The distribution pipe is normally from 225mm up to 500mm diameter, generally covered in a trench filled with draining material such as 15/25 clean graded stone, free from fines.

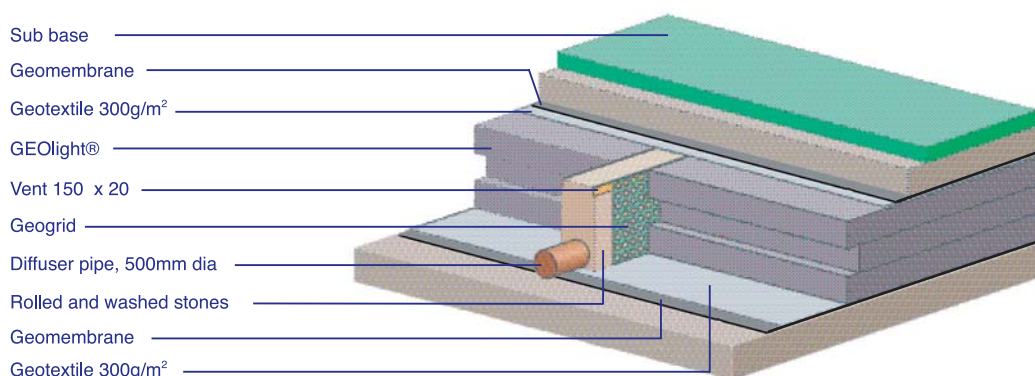
Results of Compression Test on GEOlight 400



The reservoirs and distribution pipe are wrapped in a waterproof membrane, such as butyl, to prevent seepage of water into the surrounding ground. The top of each GEOlight reservoir has a vent which is connected back to the upstream manhole.

A geotextile or 10mm mesh geogrid is laid between the distribution pipe and GEOlight™ to prevent the GEOlight™ units being clogged by the draining materials.

Sectional View of GEOlight™ reservoir



How does it work?

1. In normal conditions, water enters a back drop manhole. This is the upstream manhole and any silt or sediment will collect in the bottom of the chamber. The water then flows along the distribution pipe into the downstream manhole. The upstream pipework is sized to cope with normal flow conditions. The distribution pipe and attenuation tank are sized to cope with storm conditions. The outflow pipe is sized to cope with the permissible discharge.

2. In storm conditions the flow restrictor (vortex flow control or orifice plate) in the downstream manhole limits the amount of water flowing out of the manhole. This causes the water level in the distribution pipe to rise and water to spill into the GEOlight™ reservoirs on either side. As the water level rises in the reservoirs, air is forced out of the high level vents into the upstream manhole.

3. Once the storm has passed, the water level in the GEOlight reservoirs gradually falls as water passes through the flow restrictor in the downstream manhole. The vents now allow air to return into the GEOlight™ reservoirs. Gradually the reservoirs empty. The flow restrictor prevents excess surges of flood water to pass downstream and uses the storage reservoirs to store the water for the period of the storm.

Calculating the storage capacity

The storage capacity of the GEOlight™ reservoirs is determined by the maximum outflow permitted, (set by the water company or Environment Agency), the impermeable area of the site and the rainfall return period – normally 1 in 30 years, but again can be dictated by the water company.

A full design service, including calculations, can be supplied via a third party consultant. Please contact SDS for details.

Other uses

The water storage ability of GEOlight™ lends itself to a number of other uses:

- Water recycling combines with irrigation systems – this is increasingly popular:
- GEOlight™ is used to retain stormwater which is then pumped as required to a network of standpipes for irrigation.
- Drainage channels – the natural permeability of GEOlight™ lends itself for use as an underground drainage channel that collects and drains away groundwater.

- Pollution control – improved water run-off quality. When used in combination with oil / petrol separators, GEOlight™ can replenish groundwater without the risk of contamination from oil, chemicals or suspended solids.
- To form lightweight embankments – GEOlight™ can be used to quickly form the base of embankments that only weigh a fraction of earth embankments. Slope stabilisation.

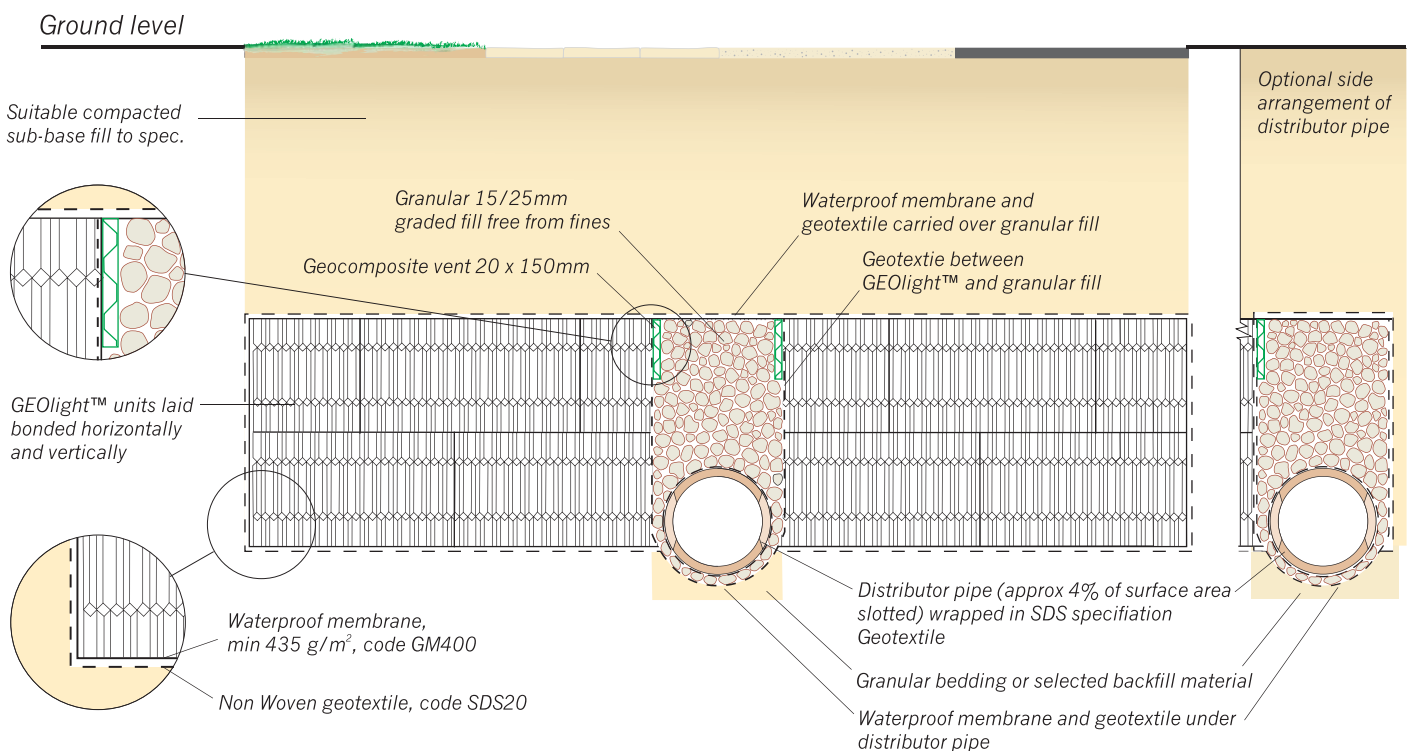
Stormwater Attenuation – Design details

The details on these two pages illustrate the construction of a typical GEOlight™ Stormwater Attenuation System. The length and height of the GEOlight™ reservoirs is determined by the quantity water to be stored.

The layout of each scheme is specifically designed to suit the characteristics and limitation of the site. Typically the distributor pipe would be arranged in the centre of the reservoir, but can alternatively be placed at the side where topographical constraints dictate.

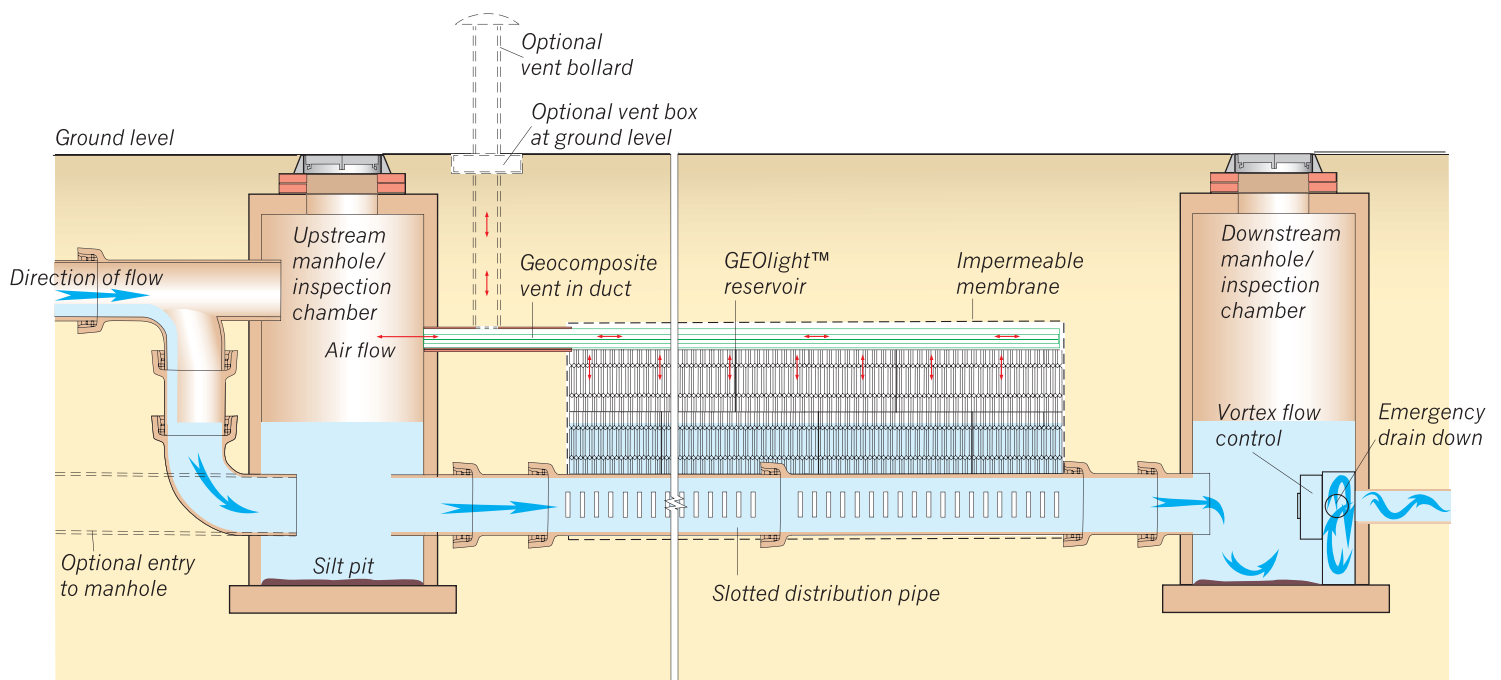
The high performance waterproof membrane should be sealed continuously to encapsulate the GEOlight™ reservoirs, distributor pipe and granular fill. It is protected by a heavyweight needle punched, non woven geotextile. To help with maintenance a high flow geotextile is placed between the granular fill and GEOlight™ attenuation units to prevent silt and particles being washed into the reservoir. GEOlight™ can be used under a range of surfaces e.g. grass, porous paving, standard paving block, tarmac and concrete.

Cross Section

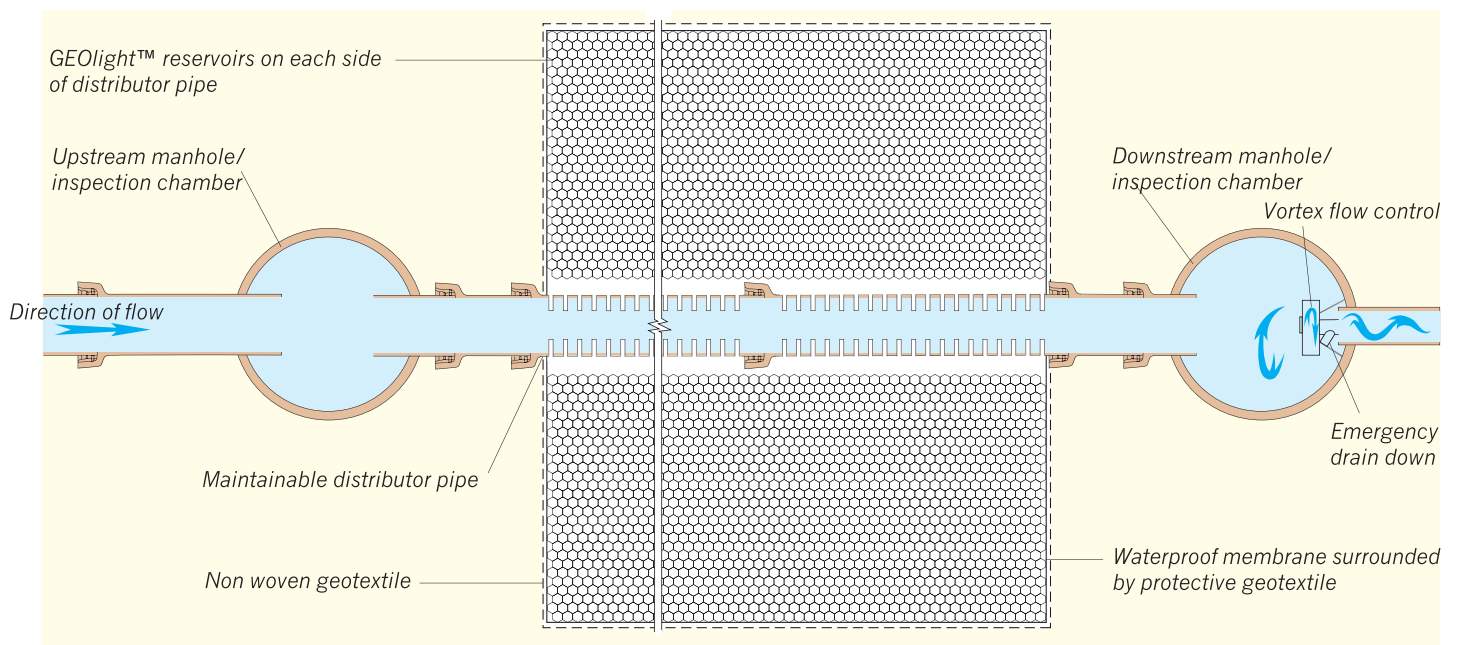


Stormwater Attenuation – Design details

Long Section



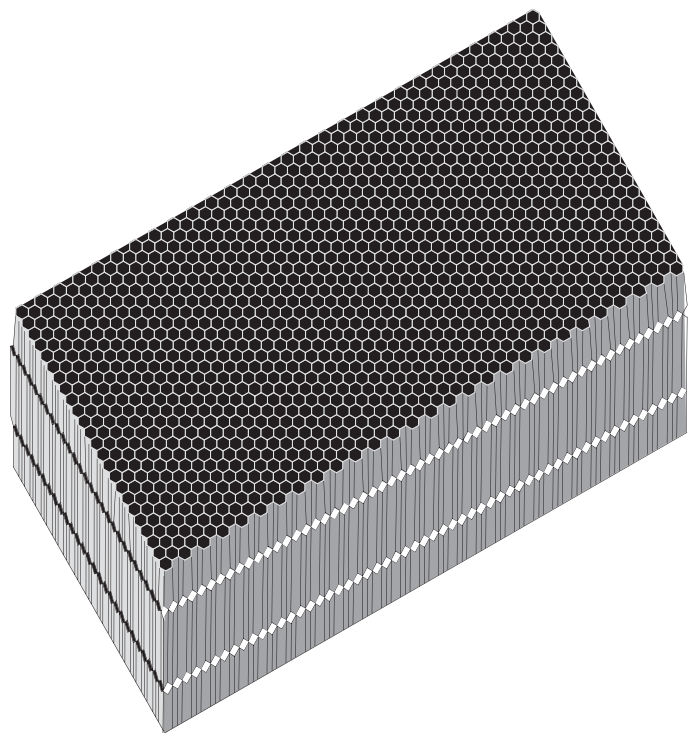
Plan



Benefits

- High compressive strength – can be located under all roads, car parks and amenity area surfaces.
- Reduced excavation costs – the very high void rate (95%) minimises the required volume of earthworks.
- Speed of installation – 1000m³ reservoir, completed in one week.
- Light and easy to handle.
- Excellent hydraulic characteristics. The honeycomb structure is highly permeable, offering low resistance to water flow.
- GEOlight's unique lateral and vertical filling arrangement requires a minimum amount of pipework and stone.
- Depth of tank invert reduced by using patented lateral supply.
- Simplified distribution pipe network, easy maintenance – dispensing with costly and complicated pipework configurations.
- Modular format offers design flexibility to overcome topographical constraints and architectural requirements.
- Greatly reduces the risk of flooding when used as stormwater storage.
- Can also be used for water recycling and combining with irrigation systems.
- Can virtually eliminate pollution when used in combination with specialist petrol / oil separators.
- Design service available, including calculations.

Diagram showing block size 2.0m (length) x 1.0m (width) x 0.5m (height)



COSHH and Handling Information

1. Composition / Information on ingredients

Hazardous ingredients: None as finished goods or products.
Types of materials: Polyvinyl chloride (PVC)
MEK

2. Hazards Identification

Nature of Hazard: There are no health risks from the products during normal use.
The products may contain various pigment colours and stabilisers that may be toxic.
These chemicals are, however, bound within the product material and not easily extracted.

3. First-Aid Measures

Eye contact: Plastic materials may cause physical irritation in the eyes. Wash out with large amounts of water. If irritation persists, seek medical advice.
Skin contact: Not applicable.
Inhalation: Not applicable.
Ingestion: Not expected to have any toxic effects.

4. Fire-Fighting Measures

Extinguishing Media: On small fires use any hand-held extinguisher type. On large fires use water.
Fire and Explosion Hazards: Melting plastics may flow and spread in a large fire. Products of fire will be thick black toxic smoke.
Material Characteristics: PVC products will burn in the presence of a flame but are classed as self-extinguishing.
Protective Equipment: Wear self-contained breathing apparatus and protective clothing.

5. Handling and Storage

Handling: There are no hazards associated with the finished products. However, when cutting GEOlight, we recommend that the correct tools are used e.g. Handsaw or Alligator saw. When cutting dusts may be created. Avoid inhaling these dusts.
Take care of heat build-up within materials during cutting etc.
The pallets of GEOlight units should be placed on level ground and should not be stacked on site.
The maximum weight of the pallet of GEOlight units as delivered to site is 650kg (700kg on one copy), including packaging. Machines used to lift the pallet should be able to lift this weight safely.
Loose individual units should not be stored more than three units high.
GEOlight units are lightweight ranging from 23kg to 55kg and can be easily handled – one or two person lift.
Storage: GEOlight units will resist the effects of UV light for up to six months. However, prolonged

storage in direct sunlight should be avoided. GEOlight units should not be stored near to any fuel storage areas or any other solvents. GEOlight units are very robust and resistant to damage during normal handling. However, they should be secured in areas where impacts from vehicles or construction plant will be avoided.

6. Exposure Controls / Personal Protection

Respiratory Protection: Not required under normal conditions of use. Where cutting, etc., creates dusts, wear a disposable half-mask to the standard FFP2S.
Hand Protection: Wear impervious strong gloves to prevent cuts to the hands while handling, cutting etc.
Eye Protection: Wear safety glasses when cutting, etc.
Skin Protection: Wear overalls.

7. Site Hazards

Other Hazards for consideration: Working in excavations and trenches – GEOlight may be designed with a shallow invert for infiltration (soakaway) or attenuation (storage) system. This negates the need for deep excavations or trenches.
Excavation near services e.g. gas, electricity. Contaminated soil areas.
N.B. All risk assessments should be undertaken by the main contractor relating to fire, lifting the units by excavator / forklift, access to and working in excavations and trench support.

8. Stability and Reactivity

Decomposition Products: Major thermal decomposition products are oxides of carbon. Relevant differences are (in addition): PVC may produce amounts of Hydrogen Chloride.
Stability: These materials are stable at temperatures up to normal operating limits (moulding parameters)

9. Ecological information

Biodegradability: Plastic products are not readily biodegradable but are not detrimental to terrestrial wildlife.
Aquatic Toxicity: Non-toxic to marine life.

10. Disposal Considerations

Method: The preferred method is collection and re-cycling. Plastics can safely be placed with regular industrial or household wastes where re-cycling is not available.

11. Other Information

As the handling, storage, use and disposal of the product are beyond our control SDS disclaim all liability for loss, damage, injury or expense in any way connected with such activities and further make no warranties, express or implied, as to the suitability of the product for any particular use.

Contact

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GEOlight™

Stormwater Management System



Sustainable Drainage Systems Ltd

drainage | design | solutions

product profile

GEOlight™ is an ultra lightweight honeycombed modular structure made from recycled PVC.

The ready to install units are preformed to provide an underground stormwater storage facility, for the application of stormwater attenuation or infiltration.

The high void rate (>97%), high compressive strength (to 1000KN/m²) and low resistance to water flow makes GEOlight™ an ideal material for cost efficient and maintainable underground water storage during storm conditions.



applications



Car Parks and shopping centres



Airports and Seaports



Industrial Distribution Centres



Residential Homes



Park & Ride sites



Sports grounds & Golf Courses

GEOlight™ Benefits

- High compressive strength – can be located under all roads, car parks and amenity area surfaces.
- Reduced excavation costs – the very high void rate (95%) minimises the required volume of earthworks.
- Speed of installation – 1000m³ reservoir, completed in one week.
- Light and easy to handle.
- Excellent hydraulic characteristics. The honeycomb structure is highly permeable, offering low resistance to water flow.
- GEOlight's unique lateral and vertical filling arrangement requires a minimum amount of pipework and stone.
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Specification Sheet



Geolight™ 200

Cellular Block structure composed of 1m³ specification blocks manufactured from recycled PVC.

Applications:

- Stormwater Management
- Attenuation/Infiltration
- Bacterial filter-bed for biological treatment
- Hydrocarbons separation
- Filtration & Separation Units

Specifications:

Material:	Recycled Rigid PVC
Colour:	Dark grey to black
Standard length of a block:	2000mm
Standard width of a block:	1000mm
Standard height of a block:	500 mm
Other block sizes available:	On request
Weight/m ³ dry:	40 kg/m ³
Void Ratio:	> 97%
Specific surface area:	160 m ² /m ³ ± 5%
Compressive Strength:	200kN/m ²

Advantages:

- Highly cost effective
- Reduced excavation costs
- High void capacity
- Good UV resistance
- Good hydrocarbon resistance

Geolight™ 400

Cellular Block structure composed of 1m³ specification blocks manufactured from recycled PVC.

Applications:

- Stormwater Management
- Attenuation/Infiltration
- Bacterial filter-bed for biological treatment
- Hydrocarbons separation
- Filtration & Separation Units

Specifications:

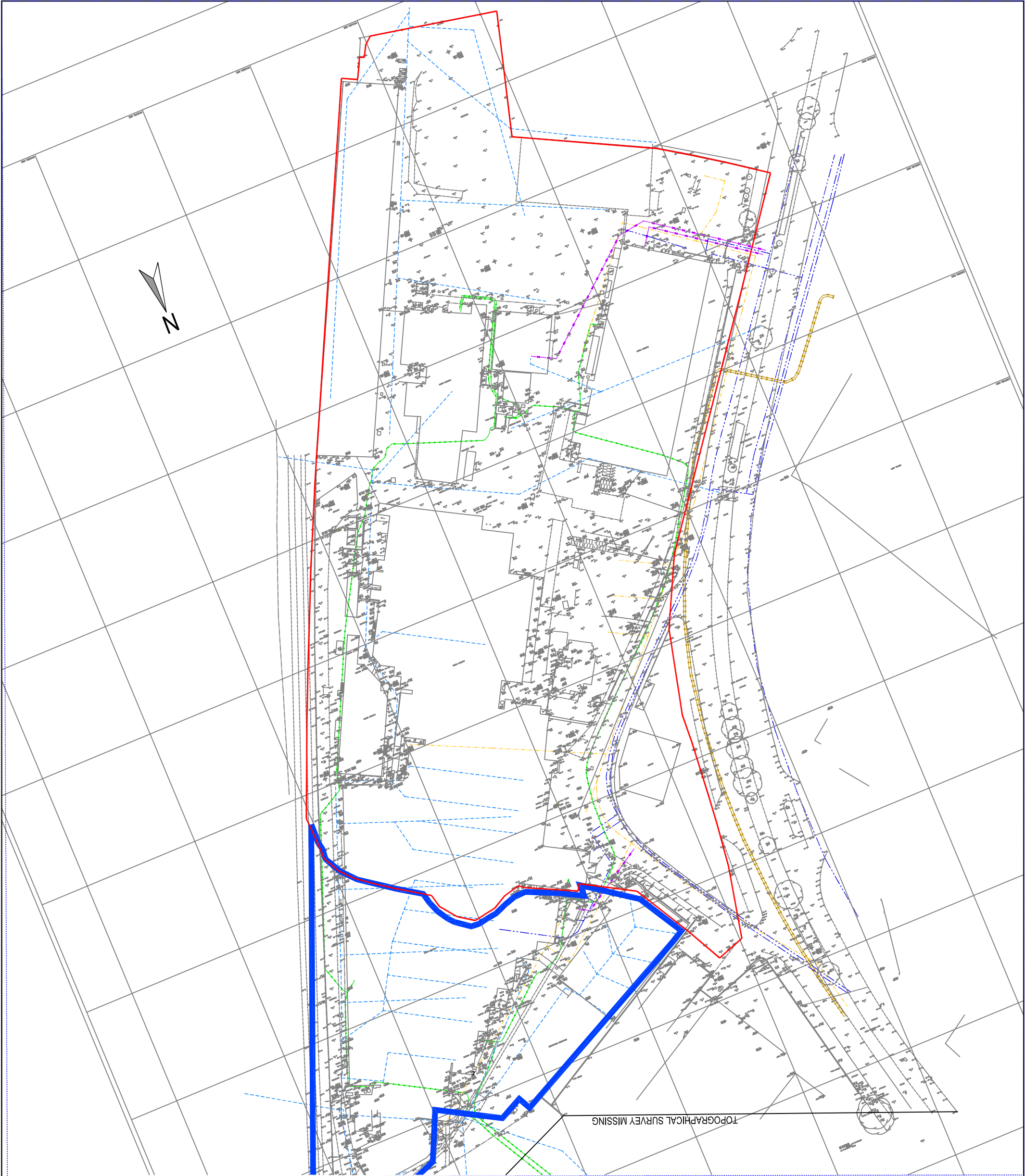
Material:	Recycled Rigid PVC
Colour:	Dark grey to black
Standard length of a block:	2000mm
Standard width of a block:	1000mm
Standard height of a block:	500 mm
Other block sizes available:	On request
Weight/m ³ dry:	55 kg/m ³
Void Ratio:	> 95%
Specific surface area:	160 m ² /m ³ ± 5%
Compressive Strength:	400kN/m ²

Advantages:

- Highly cost effective
- Reduced excavation costs
- High void capacity
- Good UV resistance
- Good hydrocarbon resistance

APPENDIX H

Existing Drainage Plan,
extracted from Appendix D of FRA



NOTES :

1. DO NOT SCALE: CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ANY OMISSIONS OR ERRORS
2. ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS NOTED OTHERWISE

LEGEND:

— SAINSBURY'S BOUNDARY
— SIME DARBY BOUNDARY

EXISTING SERVICES KEY

--- ELECTRICAL CABLES
--- WATER PIPELINE
--- FOUL WATER
--- SURFACE WATER
--- GAS PIPELINE

REPORT ISSUE

03	BOUNDARY UPDATED	NM	LF	LF	01.12.08
02	BOUNDARIES AMENDED	NM	LF	LF	26.11.08
01	REPORT ISSUE	DB	KD	-	24.10.2008
REV	DESCRIPTION	BY	CHK	APP	DATE

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Project:
RE-DEVELOPMENT OF FORMER LEC SITE,
BOGNOR REGIS

Drawing Title:

EXISTING SERVICES

Scale	Drawn	Date	Checked	Date	Approved	Date
1:1250	DB	24.10.2008	KD	24.10.2008	-	-
Project No.	Office	Type	Drawing No.	Revision		
A050949	34	01	FIG_3	03		

APPENDIX I

Proposed On-site Drainage and Level Strategy (2No. GA's)

APPENDIX J

Proposed S278 Surface Water Drainage Strategy

