

North Manchester General Hospital, MSCP & Enabling Works

Drainage Maintenance Strategy

Curtins Ref: 075805-CUR-00-XX-RE-C-002

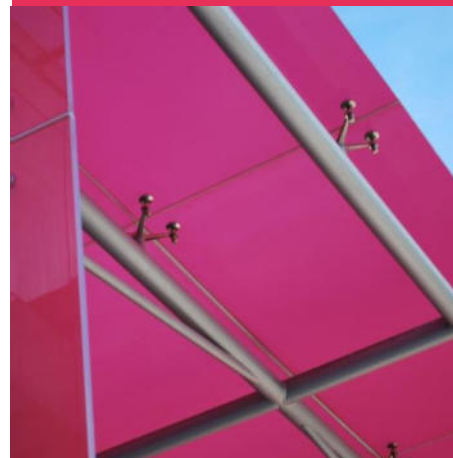
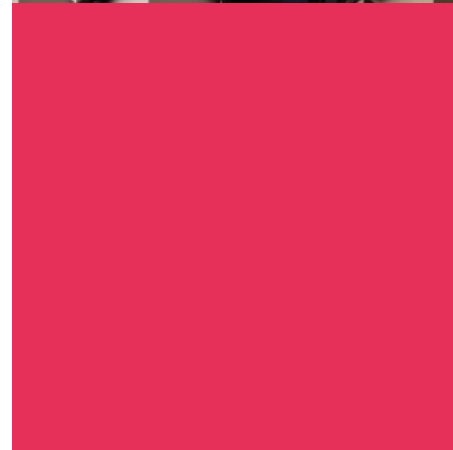
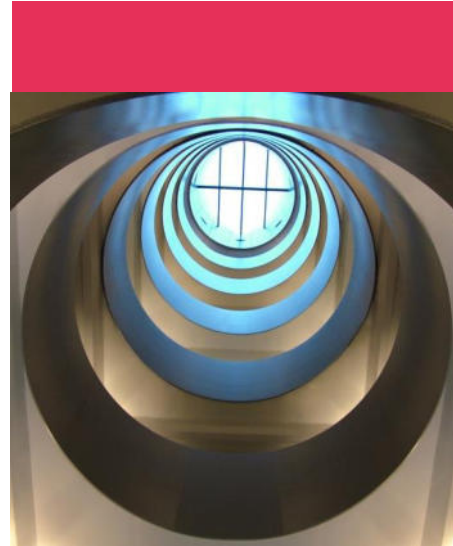
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Site Address: North Manchester General Hospital.



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Control Sheet

Rev	Description	Issued by	Checked	Date
P01	First issue	ATL	MW	17/02/2022

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1.0 Introduction

1.1 Project Background

- 1.1.1 Curtins was appointed by NHS Manchester University NHS Foundation Trust to provide a Drainage Maintenance Strategy for the proposed multi-storey car park and enabling works within the North Manchester General Hospital site in Crumpsall, Manchester.
- 1.1.2 This report is intended to give an overview of the operation and maintenance for the drainage features included with the drainage strategy and in relation to typical details. Where proprietary products are specified, the manufacturer's instructions and recommendations should be followed in priority to this document unless specifically noted otherwise due to project constraints.
- 1.1.3 The recommended operations and frequencies are typical only and should be more frequent initially to ensure that there are no unforeseen issues with the operation and then adjusted to suit the site requirements.

2.0 Oil/ Fuel Spill Strategy

2.1 Background

- 2.1.1 The proposed surface water drainage design incorporates a Petrol Interceptor (PI) in order to remove Hydrocarbons from the surface water run-off.
- 2.1.2 The surface water drainage is proposed to connect to the masterplan drainage, which has an ultimate outfall downstream to a watercourse. Therefore, a Full Retention Interceptor is required, with a design flow of 5 l/s, based on the allowable discharge from the site into the masterplan drainage.
- 2.1.3 The PI is designed to serve run-off from areas that are open to rainfall. In this case, this would be the car park roof, and external hardstanding areas. Any oil/ fuel from these areas would be heavily diluted by rainfall.

2.2 Internal Drainage

- 2.2.1 The internal floors of the car park do not receive any direct rainfall, other than some incidental blown rain that may enter through any open sections of cladding.
- 2.2.2 As any oil/ fuel that drips onto these areas are not washed away by rainfall, the oil/ fuel will not be diluted to the same degree. This would mean that it is more likely that the oil/ fuel residue would be left within the surface water drainage system, including the attenuation tank and flow control manhole, due to the lower overall flows.
- 2.2.3 If a detergent or cleaning agent is used to clean the internal levels, it would cause pollution of the watercourse as the cleaning products will not be removed by oil interceptor. The detergent breaks up the oil/ fuel, which means it mixes with the water, and passes through the PI without being removed. This would then pass directly to the watercourse. Therefore, it is recommended that the internal gullies on all levels, excluding the roof, are connected to the foul drainage system.
- 2.2.4 The foul drainage connects to the masterplan foul drainage network, which in turn connects to the public United Utilities Sewer network. The minor oil/ fuel is dealt with by UU's treatment works.

2.3 Larger Oil/ Fuel Spills

2.3.1 If a larger oil/ fuel spillage occurs, then steps should be taken to prevent this from entering the drainage network (whether foul or surface water).

2.3.2 Spill kits should include the following as a minimum requirement:

- Means of preventing the oil/ flow from flowing towards the gullies
- Means of absorbing the oil (absorbent material and/ or pads)
- Secure bags for disposal.

2.3.3 The waste created by the spill kit is classed as hazardous waste, and should be treated as such

3.0 General Maintenance

3.1 Components

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

- Pipes
- Gullies
- Attenuation Tank
- Flow Control Unit
- Petrol Interceptor

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

3.1.3 Maintenance of the private drainage network will be the responsibility of an on-site facilities management team.

3.1.4 It is recommended that the drainage system is inspected as a minimum twice a year, with the system also being inspected after any major storm event.

3.1.5 Significant sediment deposition is likely in areas used for storage, so a post clean-up operation may be required including the removal of litter, vegetation, sewerage debris and larger objects.

3.1.6 Long-term management practices include monthly sweeping of external paved areas. The sweeping program will remove sand and contaminants directly from paved surfaces before they become mobilised during storm events and transported to the drainage system.

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

3.1.8 Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas such as the filter drains and the upstream/downstream chambers.

3.1.9 The location of the components noted within this report are shown on drawing number 20200-CUR-MSCP-EX-DR-D-7511 (Proposed Drainage Layout), which is available in *Appendix A*.

3.2 Inspection, Manhole and Catchpit Chambers

3.2.1 Access points have been located at the head of each run, at a change in direction and at a change of pipe size in accordance with Building Regulations Part H.

- 3.2.2 The appropriate health and safety equipment must be used when accessing manholes. Confined space certificates must be held by any personnel entering a manhole and the appropriate permits should be obtained from the Maintenance Manager prior to any access.

3.3 Pipes

- 3.3.1 Pipes are proprietary products and the materials can vary across the site and as such where used the manufacture's recommendations should be followed. Regardless of the product used the pipes will be fully compliant with the Curtins drainage specification.
- 3.3.2 Pipes are intended to be the main conveyance across the development and where oversized they form the attenuation volume required by the limitation of the discharge rate. They are intended to be dry except for during rainfall events. These have been designed to be self-cleaning where possible for smaller diameter pipes, and for larger diameters the risk is reduced due to the overall pipe size.
- 3.3.3 Access for maintenance is provided through access chambers and manholes.

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

Maintenance Schedule	Required Action	Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Initial Inspection should be provided as post construction CCTV survey.	N/A
Regular maintenance\ inspection	Inspect for evidence of poor operation via water level in chambers. If required, take remedial action.	3-monthly, 48 hours after large storms.
	Check and remove large vegetation growth near pipe runs.	Monthly or as required
Remedial Action	Rod through poorly performing runs as initial remediation.	As required.
	If continued poor performance jet and CCTV survey poorly performing runs.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue and location.	As required If above does not improve performance.

3.4 Gullies

- 3.4.1 Channels and gullies should be inspected and cleaned in accordance with the manufacturer's details. Channel units can be cleaned through the use of a high-pressure hose; this can be fed into the channel system through access units strategically placed along the channel run. The throat section of channel units should be kept clear at all times to ensure uninterrupted flow of surface water into the drainage channel and any debris within the throat should be removed.
- 3.4.2 Locking bolts should be replaced and sufficiently tightened, taking care that the bolt heads do not stand above the top surface of the cover or grate. If covers are allowed to move within their frame, this may cause damage to the frame or seating.
- 3.4.3 Sediment\material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas such as the car park channels.

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

	landscaping areas which should be reprofiled to provide a flat area or berm adjacent to the paving.	
Remedial Action	Inspect sumps and outlet pipes and rod through poorly performing channels and outlets as initial remediation.	As required.
	Inspect for evidence of poor operation and/or weed growth. If required, take remedial action. Inspect silt accumulation rates and establish appropriate brushing frequencies. Silt can also be caused by adjacent landscaping areas which should be reprofiled to provide a flat area or berm adjacent to the paving.	3-monthly, 48 hours after large storms.
Regular maintenance\ inspection	Brushing and Vacuuming	Three times/year at end of winter, mid-summer, after autumn leaf fall, or as required based on site specific observations of clogging or manufacturers' recommendations.
Occasional maintenance	Stabilise and mow contributing and adjacent areas.	As required and as per landscape architect's specification.
	Removal of weeds	As required.
Remedial Action	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 considered detrimental to the structural performance or a hazard to users.	As required.
	Rehabilitation of surface and upper sub-structure. This could include replacement of the jointing and bedding material. The upper geotextiles layer may also need replacing if clogged and Terram 1000 has a life span of 25 years.	As required (if infiltration performance is reduced as a result of significant clogging).

3.5 Attenuation Tanks

- 3.5.1 The attenuation tanks are currently specified as geocellular units, which are wrapped in a geotextile blanket.
- 3.5.2 The geocellular units and geotextile are proprietary products and therefore manufacturer's recommendations should also be taken into consideration.
- 3.5.3 Access for maintenance should be provided by an access shaft located on the tank and from the manhole chambers downstream of the tank.
- 3.5.4 Regular inspection and maintenance is important for the effective operation of attenuation tanks as designed. As the feature is buried, a regular inspection regime is very important to ensure the correction functionality of the surface water drainage network.

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

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

3.6 Flow Control Units

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

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

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

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

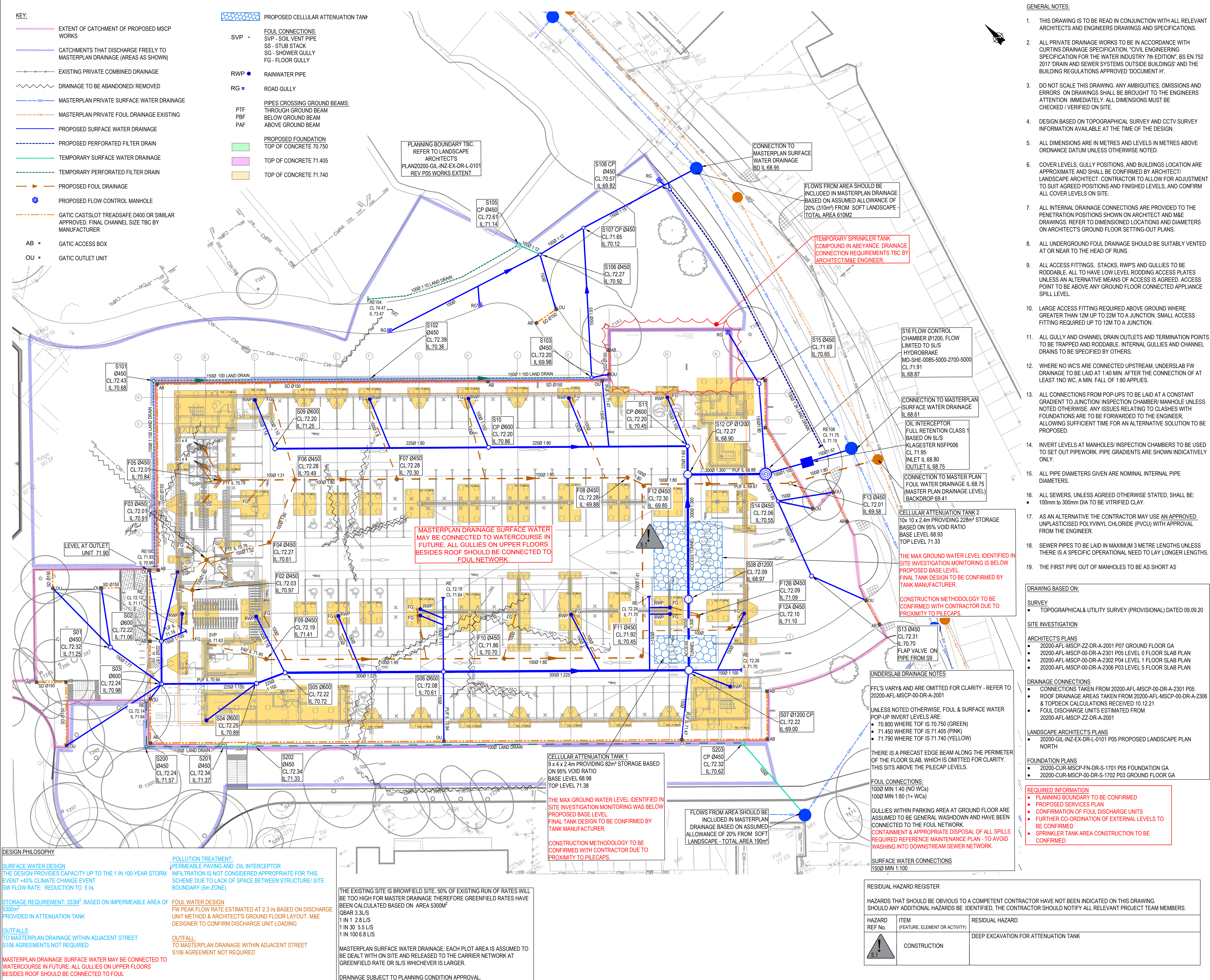
	Debris removal from catchment surface (where may cause risks to performance).	Monthly
	Remove sediment from pre-treatment structures and flow control chambers.	Annually (or as required after heavy rainfall events)
Remedial Actions	Repair/rehabilitation of inlets.	As required.

3.7 Petrol Interceptor

- 3.7.1 The manufacturer's recommendations should be taken into consideration for the petrol interceptor's, washdowns separators. The Klagester products maintenance regime is available in *Appendix B*.

Appendix A

Proposed Drainage Layout



GENERAL NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- ALL PRIVATE DRAINAGE WORKS TO BE IN ACCORDANCE WITH CURTINS DRAINAGE SPECIFICATION, 'CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION', BS EN 752 2017 'DRAIN AND SEWER SYSTEMS OUTSIDE BUILDINGS' AND THE BUILDING REGULATIONS APPROVED 'DOCUMENT H'.
- DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
- DESIGN BASED ON TOPOGRAPHICAL SURVEY AND CCTV SURVEY INFORMATION AVAILABLE AT THE TIME OF THE DESIGN.
- ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.
- COVER LEVELS, GULLY POSITIONS, AND BUILDINGS LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT/ LANDSCAPE ARCHITECT. CONTRACTOR TO ALLOW FOR ADJUSTMENT TO SUIT AGREED POSITIONS AND FINISHED LEVELS, AND CONFIRM ALL COVER LEVELS ON SITE.
- ALL INTERNAL DRAINAGE CONNECTIONS ARE PROVIDED TO THE PENETRATION POSITIONS SHOWN ON ARCHITECT AND M&E DRAWINGS. REFER TO DIMENSIONED LOCATIONS AND DIAMETERS ON ARCHITECT'S GROUND FLOOR SETTING-OUT PLANS.
- ALL UNDERGROUND FOUL DRAINAGE SHOULD BE SUITABLY VENTED AT OR NEAR TO THE HEAD OF RUNS.
- ALL ACCESS FITTINGS, STACKS, RWP'S AND GULLIES TO BE RODDABLE. ALL TO HAVE LOW LEVEL RODDING ACCESS PLATES UNLESS AN ALTERNATIVE MEANS OF ACCESS IS AGREED. ACCESS POINT TO BE ABOVE ANY GROUND FLOOR CONNECTED APPLIANCE SPILL LEVEL.
- LARGE ACCESS FITTING REQUIRED ABOVE GROUND WHERE GREATER THAN 12M UP TO 22M TO A JUNCTION. SMALL ACCESS FITTING REQUIRED UP TO 12M TO A JUNCTION.
- ALL GULLY AND CHANNEL DRAIN OUTLETS AND TERMINATION POINTS TO BE TRAPPED AND RODDABLE. INTERNAL GULLIES AND CHANNEL DRAINS TO BE SPECIFIED BY OTHERS.
- WHERE NO WCs ARE CONNECTED UPSTREAM, UNDERSLAB FW DRAINAGE TO BE LAID AT 1:40 MIN. AFTER THE CONNECTION OF AT LEAST 1NO WC, A MIN. FALL OF 1:80 APPLIES.
- ALL CONNECTIONS FROM POP-UPS TO BE LAID AT A CONSTANT GRADIENT TO JUNCTION/ INSPECTION CHAMBER/ MANHOLE UNLESS NOTED OTHERWISE. ANY ISSUES RELATING TO CLASHES WITH FOUNDATIONS ARE TO BE FORWARDED TO THE ENGINEER, ALLOWING SUFFICIENT TIME FOR AN ALTERNATIVE SOLUTION TO BE PROPOSED.
- INVERT LEVELS AT MANHOLES/ INSPECTION CHAMBERS TO BE USED TO SET OUT PIPEWORK. PIPE GRADIENTS ARE SHOWN INDICATIVELY ONLY.
- ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS.
- ALL SEWERS, UNLESS AGREED OTHERWISE STATED, SHALL BE:
 - 100mm to 300mm DIA TO BE VITRIFIED CLAY.
- AS AN ALTERNATIVE THE CONTRACTOR MAY USE AN APPROVED UNPLASTICISED POLYVINYL CHLORIDE (PVCU) WITH APPROVAL FROM THE ENGINEER.
- SEWER PIPES TO BE LAID IN MAXIMUM 3 METRE LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER LENGTHS.
- THE FIRST PIPE OUT OF MANHOLES TO BE AS SHORT AS

DRAWING BASED ON:

SURVEY

- TOPOGRAPHICAL & UTILITY SURVEY (PROVISIONAL) DATED 09.09.20

SITE INVESTIGATION

ARCHITECT'S PLANS

- 20200-AFL-MSCP-ZZ-DR-A-2001 P07 GROUND FLOOR GA
- 20200-AFL-MSCP-00-DR-A-2301 P05 LEVEL 0 FLOOR SLAB PLAN
- 20200-AFL-MSCP-00-DR-A-2302 P04 LEVEL 1 FLOOR SLAB PLAN
- 20200-AFL-MSCP-00-DR-A-2306 P03 LEVEL 5 FLOOR SLAB PLAN

DRAINAGE CONNECTIONS

- CONNECTIONS TAKEN FROM 20200-AFL-MSCP-00-DR-A-2301 P05
- ROOF DRAINAGE AREAS TAKEN FROM 20200-AFL-MSCP-00-DR-A-2306 & TOPDECK CALCULATIONS RECEIVED 10.12.21
- FOUL DISCHARGE UNITS ESTIMATED FROM 20200-AFL-MSCP-ZZ-DR-A-2001

LANDSCAPE ARCHITECT'S PLANS

- 20200-GIL-INZ-EX-DR-L-0101 P05 PROPOSED LANDSCAPE PLAN NORTH

FOUNDATION PLANS

- 20200-CUR-MSCP-FN-DR-S-1701 P05 FOUNDATION GA
- 20200-CUR-MSCP-00-DR-S-1702 P03 GROUND FLOOR GA

REQUIRED INFORMATION

- PLANNING BOUNDARY TO BE CONFIRMED
- PROPOSED SERVICES PLAN
- CONFIRMATION OF FOUL DISCHARGE UNITS
- FURTHER CO-ORDINATION OF EXTERNAL LEVELS TO BE CONFIRMED
- SPRINKLER TANK AREA CONSTRUCTION TO BE CONFIRMED

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

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

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

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

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

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

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

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

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

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

30. UNLESS NOTED OTHERWISE IN THE MANHOLE SCHEDULE, ALL MANHOLE, GULLY AND CHANNEL COVERS (IRONWORK) SHOULD BE THE FOLLOWING SPECIFICATION:

- B125 LOAD CLASS IN PEDESTRIAN AREAS
- D400 LOAD CLASS IN VEHICULAR AREAS.

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

32. FOUL GULLIES WITHIN GROUND FLOOR PARKING AREAS ARE FOR GENERAL WASHDOWN ONLY. THE PROCEDURE FOR CONTAMINATION & DISPOSAL OF LARGER SPILLS TO BE CONFIRMED AND INCLUDED IN MAINTENANCE PLAN

REV.	DESCRIPTION	DATE	DRW.	CHK.
P11	UPDATED IN LINE WITH MCC COMMENTS	16.02.22	ATL	MW
P10	STAGE 4 UPDATE	31.01.22	ATL	MW
P09	STAGE 4 UPDATE	24.01.22	ATL	MW
P08	STAGE 4 UPDATE	17.12.21	ATL	CG
P07	DRAFT STAGE 4 ISSUE	10.09.21	MW	MW
P06	DRAFT STAGE 4 ISSUE	21.07.21	MW	MW
P05	DRAFT STAGE 4 ISSUE	28.06.21	MW	DS

PROJECT

NMGH MSCP

TITLE

Proposed Drainage Layout

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PURPOSE OF ISSUE

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MW

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DS

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28/06/2021

SCALE (@A1)

1:200

PROJECT NUMBER

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REV.

P11

Appendix B

Klargester Petrol Interceptor Maintenance Information.

001374

**NSFP003 – NSFP006 Class 1 Full Retention Separator
Installation & Operation Guidelines**



Kingspan Environmental Service Contact Numbers:

GB: 0844 846 0500

NI: 028 3025 4077

IRL: 048 3025 4077

Enclosed Documents

DS0992P	NSFP003 – NSFP006 Class 1 Full Retention Separator
DS1014P	NSFP003 - NSFP006 Installation Drawing
NSFPEXTzz	NSFP Neck Extension Assembly

Issue	Description	Date
05	CC1405 – Coalescer Extension Chains were Pipes	February 2018

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Appendices

Separator Maintenance Log

1 Introduction

- 1.1.1 These Guidelines represent Best Practice for the installation of the above Separator Units. Many years of specialist experience has led to the successful installation of thousands of separator units. It must be noted, however, that these Guidelines are necessarily of a general nature. It is the responsibility of others to verify that they are appropriate for the specific ground conditions and in-service loads of each installation. Similarly, any information or advice given by our employees or agents regarding the design of an installation must be verified by a qualified specialist (e.g. Civil engineering consultant).
- 1.1.2 For guidance of Separator selection and application, please refer to the most recent issue of Environment Agency Guidelines pollution prevention guidelines No. 3 (PPG3).and BS EN 858. Our units have been independently tested by BSI and are certified as meeting the standards.

1.2 Handling & Storage

- 1.2.1 Care must be taken to ensure that units are not damaged during delivery and handling on site. Please take care and place unit so that it cannot fall and become damaged
- 1.2.2 The design requirements of these products will frequently mean that the centre of gravity of the unit is "offset". Care must therefore be taken to ensure that the unit is stable when lifting. Rainwater may also collect inside units, particularly if they have been stored on site prior to installation, adding weight and increasing instability. Check units before lifting and pump out any excess water.
- 1.2.3 When lifting units, use webbing slings of a suitable specification. Do not use chains.
- 1.2.4 A suitable spreader bar should be used to ensure that units are stable and that loads are evenly distributed during lifting. When lifting separators, a spreader bar should be used where the slings would otherwise be at an angle > 30 degrees to the vertical.
- 1.2.5 Lifting equipment should be selected by taking into account the unit weight, length and the distance of lift required on site.
- 1.2.6 We accept no responsibility for the selection of lifting equipment.
- 1.2.7 Whenever units are stored or moved on site, ensure that the storage location is free of rock, debris and any sharp objects, which may damage the unit. The units must be placed on ground, which is flat, and level and the unit orientated onto its side with even support. Do not roll separators.

1.3 Site Planning

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

- 1.3.1 The discharge must have the consent of the relevant Environmental Regulator.
- 1.3.2 The installation should have Planning and Building Control approval.
- 1.3.3 Consider installing flow cut-off valves to isolate the separator in an emergency or during site cleaning operations. See Environment Agency Guidelines PPG3.
- 1.3.4 We will fit a tube to receive the alarm probe. This tube provides protection and ensures that the probe is positioned at the correct level to sense the oil build up. The tube design and probe level setting assumes the use of our standard oil alarm system and may not be suitable for other alarm supplier's equipment. The probe tube is fitted within the neck of the unit. It should be extended to ground level when extension necks are required. Consult the alarm supplier's instructions for they're detailed fitting installation instructions.
- 1.3.5 Consider venting of the unit. Comply with local regulations. In the UK, comply with the following regulations. For Petrol Stations: Health and Safety Guidance Note 41 (HS(G)41). For other applications: BS8301: 1985 (obsolescent) BS EN 752 Building Drainage. Adequate ventilation should be provided to the separator. The ventilation pipe should be as short as is practicable and be terminated not less than 2.5m above paving nor less than 1m above the head of an openable window or other opening into a building within a horizontal distance of 3m. Each neck should be vented independently, we advise against joining these below ground prior to their rising as vent stacks.
- 1.3.6 Consider installation of a sampling point downstream of the separator. There is no suitable facility to effectively sample the wastewater from inside the unit.

- 1.3.7 Uncontaminated run off such as roof water should be excluded from separators. (EA Guidelines PPG3.)
- 1.3.8 Ground conditions and water table level should be assessed. If the water table will be above the base of the units at any time of the year, adequate concrete backfill must be provided to avoid flotation. In poorly draining ground, consideration should also be given to the likelihood of flotation due to surface water collecting in the backfill, and an appropriate installation method devised to avoid this.
- 1.3.9 If the discharge is to a soakaway, a porosity test should be carried out as part of the assessment of suitability for sub-soil drainage.
- 1.3.10 The separator must be installed at a level, which will allow connection to the incoming drain and a free discharge at the system outlet. The water table must be below the discharge outlet.
- 1.3.11 Do not install the unit deeper than necessary, ensure that you purchase extension shaft kits. The minimum invert depth of the unit is shown on the customer drawing.
- 1.3.12 Adequate access must be provided for routine maintenance. Vehicles should not be permitted within a distance equal to the depth of the unit, unless suitable structural protection is provided to the installation.
- 1.3.13 There must be at least 1 metre of clear, level ground all around the access covers to allow for routine maintenance.
- 1.3.14 It is essential that a mains water supply is accessible for routine cleansing and refilling after removal of waste material and liquid.
- 1.3.15 Provide electrical supply for alarm system. (If required)
- 1.3.16 Installation should only be carried out by suitably qualified and experienced contractors in accordance with current Health and Safety Regulations. Electrical work should be carried out by a qualified electrician, working to the latest edition of IEE wiring regulations.
- 1.3.17 This unit is designed to operate with gravity in and out flows. The unit is not designed to operate with a pumped influent.

2 Installation

2.1 Installation - General

- 2.1.1 When units are installed in unstable ground conditions where movement of the surrounding material and/or unit may occur, the connecting pipework should be designed to minimise the risk of damage from differential movement of the unit(s) and/or surrounding material.
- 2.1.2 For separators with burial depths greater than 1000mm from cover level to the top of the unit, specific site conditions should be taken into consideration and the backfill designed to bear any loads which may be applied during and after installation to prevent the tank being subjected to these loads.
- 2.1.3 The excavation must be deep enough to provide bedding and cover depth as determined by the type of surface pavement and loading. Asphalt and concrete pads should extend a minimum of 300mm horizontally beyond the unit in all directions.
- 2.1.4 In situations where the excavation will not maintain a vertical wall, it will be necessary to shore up the sidewalls of the excavation with suitable trench sheets and bracing systems to maintain a vertical wall from the bottom to the top of the excavation. DO NOT completely remove the shoring system until the backfilling is complete, but before the concrete fully hardens.
- 2.1.5 In areas where the water table is above the bottom of the excavation and/or the excavation is liable to flood, the excavation should be dewatered using suitable pumping equipment and this should continue until the installation is complete.
- 2.1.6 During installation care must be taken to ensure that the body of the unit is uniformly supported so that point loads through the unit are avoided.
- 2.1.7 The Concrete Specification is not a site specific installation design.

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

- 2.1.8 Pea Shingle - 6 mm to 10 mm rounded pea shingle, offering low point loading characteristics is considered to be the most suitable material for back filling in dry ground installation. (PEASHINGLE ONLY TO BE USED IN DRY SITE CONDITIONS).

2.2 Separator Installation

2.2.1 DRY GROUND CONDITIONS

- 2.2.2 Excavate the site, allowing for a minimum clearance on all sides and base of the unit of 200mm and level the base.
- 2.2.3 Ensure that the hole is kept dry. Should any rain or surface water collect in the hole, this should be pumped out.
- 2.2.4 A base of at least 200mm of lean mix concrete should be provided.
- 2.2.5 Lower the tank in the hole using a rope sling through the lifting points provided on the tank. Under no circumstances should the sling be attached to the inlet pipe or the outlet pipe.
- 2.2.6 Position the inlet pipe in line with the incoming drain. Note that the inlet and the outlet pipes are clearly embossed on the tank. The unique profile of the base will help to level the tank, but make sure the tank is in the truly upright position in order to maintain the 100mm fall between the inlet and outlet pipes.
- 2.2.7 After any concrete in the base has taken up it's initial set (usually after one day), ballast the tank by putting approximately 0.5m depth of water into it.
- 2.2.8 Backfill the space around the tank with pea gravel or similar material (PEASHINGLE ONLY TO BE USED IN DRY SITE CONDITIONS). The backfill should be free from organic material, large stones, brick or sharp objects. Backfilling should be carried out in layers, making sure that voids are not left under and around the sides of the tank and that there are no localized stress concentrations. Its is most important that the installer progressively fills the tank with water to the level above the backfill in order to stabilize pressures on the tank.
- 2.2.9 Remove any temporary covers and connect up the tank inlet and outlet pipes to your own pipework.
- 2.2.10 Backfilling can now proceed up to ground level in 300mm stages ensuring tank is ballasted in all chambers as you go.

- 2.2.11 A galvanized lockable manhole cover (600x600mm) and frame is to be fitted to suit specific site loadings, THE TANK MUST NOT BE LOAD BEARING. The top of the manhole should not be set below the local ground level. If necessary a further neck extension should be added to the tank to bring the cover up to ground level (see section 6).
- 2.2.12 Venting can be provided through the cover or a Tee piece arrangement on the outlet/inlet.
- 2.2.13 **WET GROUND CONDITIONS**
- 2.2.14 Excavate a hole to appropriate depth allowing at least 300mm for lean mix concrete and hard-core base. Allow for tank width plus at least 400mm with additional allowance for any necessary shuttering.
- 2.2.15 De-water the excavation using suitable pumping equipment. Ensure that the pump discharge does not saturate the ground in the immediate vicinity. In wet ground conditions the installer should ensure that the base is adequate to support the weight of the tank and its contents. If the base of the excavation is unstable, i.e. running sand or similar, excavate an additional 250-300mm below concrete levels and fill up with compacted hard-core. Place a sheet of polythene over the hard-core and up the sides of the excavation before putting in the concrete cradle.
- 2.2.16 Lay a bed of concrete (minimum 150mm thick) on top of the polythene at the base of the excavation. De-watering is to continue until you are satisfied that the concrete has cured.
- 2.2.17 Lower the tank onto the concrete bed, ensuring that the inlet and outlet are in the correct position. Ensure the tank is upright and then ballast it with water to a maximum of 500mm deep.
- 2.2.18 Haunch up the concrete bed at least 450mm all round the base, ensuring that all voids in the concrete are eliminated and at least 150mm of concrete is left below the tank base.
- 2.2.19 Backfill to the invert depth with concrete. Ensure that the water level inside the tank is maintained no more than 250-300mm above concrete backfill level. It is most important that the installer progressively fills the tank with water to a level above the backfill in order to stabilise pressure on the tank.
- 2.2.20 Backfill evenly all round the tank, consolidating in layers. The backfilling should start before the base has hardened and be a single continuous operation so that the tank has a full concrete jacket without joins.
- 2.2.21 DO NOT use vibrating pokers to consolidate concrete. DO NOT discharge concrete directly on to the tank. Ensure that the concrete is not too wet and that is tamped in around the tank.
- 2.2.22 Align and connect pipework.
- 2.2.23 Build up a shell of concrete around the neck of the tank to 150-200mm thickness before completing the backfill with a suitable material. Care must be taken to avoid distortion of the neck whilst concreting this area.
- 2.2.24 Fit cover and frame. Apply surface finish e.g. turf
- 2.2.25 Do not empty tank until the concrete backfill has cured. Tanks may be left filled with water.

2.3 Pipework Connections

- 2.3.1 In all cases, ensure that the outlet pipework level is maintained for correct operation. (Unless specified on the order, the fall across the unit will be as per the customer drawings).
- 2.3.2 These units are fitted with **PVCu spigots** to both the outlet and the inlet.
- 2.3.3 Connect using the same size PVCu socket or a suitable reducer.
- 2.3.4 Ensure that the connecting pipework seal is secure and watertight before backfilling the pipe.
- 2.3.5 Alternatively, proprietary **flex seal couplings** can be obtained to fit over the outside of the site pipework. When using this connection method, ensure that the seal is secure before backfilling the pipe. If purchasing a flexseal coupling for use with clay /concrete, we suggest that a size 110 mm larger than the ID is selected.

2.4 Oil Level Alarm & Neck Fitting

- 2.4.1 We will fit a tube to receive the oil alarm probe. This provides protection and ensures that the probe is positioned at the correct level to sense oil build up.
- 2.4.2 See alarm supplier information and ensure that the probe is placed within the tube and can be accessed from ground level.
- 2.4.3 Continue backfilling with concrete/pea shingle (dry site) over the tank body to the required level. Build up a shell of concrete, minimum 225mm thick, around the access shaft(s). When using pea shingle continue to back fill up to required level. Temporarily strut the access shaft to avoid distortion.
- 2.4.4 Where we supply an extension shaft to meet a deeper invert requirement, a coalescer extension chain will be required. When fitting, ensure that the chain is secured to just below the surface so that the coalescer can easily be removed. Remove the coalescer from the unit before adding the extension chain. When refitting, ensure that the coalescer core tube is correctly seated onto the base fitting. This is important and you must ensure that the coalescer is correctly located before putting the unit in to operation.
- 2.4.5 It is advisable to seal the joints on the extension shafts (particularly on sites with high ground water) with proprietary sealant. Temporarily strut the extension neck(s) to avoid distortion during back filling. Where more than one neck section is required to suit a deep invert, consider back-filling section by section. The original fixing hole bolting the coalescer to the neck should be sealed. If extending the neck, remember to add a suitable length of cord to enable the float valve to be lifted when the unit is emptied. If the valve is not raised during filling then the float valve may self seat.
- 2.4.6 The maximum recommended inlet invert is 2000mm (using 500mm long extension sections). If you are installing a unit deeper than this then you must make your own arrangements for removing and replacing the coalescer. Consideration must be given to the depth of lift involved.
- 2.4.7 Continue back-filling, ensuring minimum 225mm concrete thickness around the access shaft/ extension neck. When using pea shingle back fill as required.
- 2.4.8 Mains powered Alarm Systems. See alarm suppliers installation instructions. Lay 82mm diameter PVCu underground ducting between the alarm panel location and the alarm probe position. The ducting should be 500mm below ground level and fitted with a drawstring for later cable insertion. Any changes of direction should be by long radius bend. If necessary, drill a suitable hole in the access shaft adjacent to the alarm probe terminal box, to accept the ducting and seal.
- 2.4.9 In traffic areas a suitable top slab must be constructed. The top slab should bear on a suitable foundation to prevent superimposed loads being transmitted to the unit and access shafts. Loads applied to covers and frames must bear on the top slab, not the access shaft.
- 2.4.10 The unit should be filled with clean water up to the invert level of the outlet pipe. Ensure the unit identification is placed/ marked inside the neck for future information. The unit is now ready for use.

2.5 Alarm Installation

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

Unit	Recommended Maximum Oil Storage volumes in litres	Actual Oil Storage volume in litres	Max. (100%)Depth of floating oil (Static)
NSFP003	30 litres	107	210mm
NSFP006	60 litres	107	210mm

3 Operation

- 3.1.1 The unit is sized on treating a defined area and rainfall (65 mm/hour) EN.858 Part 1 and using the factor provided in the Environment agency guidelines PPG3. (0.018 = 65mm/hr) The entire flow up to the units listed flow rating is fully treated.
- 3.1.2 An oil probe should be positioned to detect the accumulation of oil when there is no or low flow conditions. The probe should be positioned so that the alarm operates at 90% of the rated oil storage volume. **When the alarm operates, the oil should be removed. Accumulated silt should also be removed.**
- 3.1.3 Units include a core tube with replaceable media. Separated liquid enters the core tube after passing through the media, to the outlet. The coalescer media requires maintenance and replacement at intervals. (See Section 4).
- 3.1.4 Units are provided with a closure device, incorporating a float. As the level of oil builds up and forms a floating layer, so the float/closure device moves downward to prevent oily water being passed through the unit. The unit **MUST** be emptied after the closure device has operated. The coalescer media should be inspected and changed if fouled.
- 3.1.5 These separators are not effective for the removal of soluble or emulsified pollutants such as oil/detergent mixes found in vehicle wash effluents. With permission such discharges should be drained to the foul sewer. Consult our Technical Sales Department for suitable alternative equipment.

4 Maintenance

4.1 Waste Removal and Servicing

- 4.1.1 Separated light liquid **must** be removed from separator when the oil capacity has been reached.
- 4.1.2 An oil level alarm system is available for purchase which gives warning when the separated light liquid/water interface level reaches 90% of the maximum recommended oil storage volume.
- 4.1.3 Separators should be inspected at least every six months or more frequently if experience dictates. A log should be maintained detailing the depth of oil found, any oil volume removed and any silt removal or cleaning carried out. A specimen maintenance log is included in the appendices.
- 4.1.4 Every site is different, in respect to the amount and type of silt generated by the drain design and installation. Frequently, the construction programme itself generates large and perhaps unusual quantities of silt and grit. We do recommend that following the initial installation, an inspection of the separator contents be made to check that building rubble has not entered the unit. Further inspections at 3 and 6 months should be made so as to be able to assess the volumes of silt and oil accumulated. The inspection and emptying programme can then be defined following the first 6 months site experience. We recommend leaving a maximum interval between inspections of 6 months.

- 4.1.5 Alarm probes should be removed and cleaned with water whenever waste material is removed from the separator. Please note the alarm may alert until the liquid level is replaced. If the unit is emptied, the float/closure device should be raised, and lowered only after the unit has been refilled. (Do not lower it in an empty unit, as the closure will self seat.)
- 4.1.6 **Separator waste is a “special waste” under the terms of The Waste Management Code of Practice. The Code imposes a duty of care on the waste producer to ensure that the Cleansing contractor is registered with the Environment Agency and that the final disposal of the waste is to a licensed facility.**
- 4.1.7 You should consider the purchase of a maintenance service, which includes bi-annual inspections, removal of oil and silt, cleaning of the alarm probe and cleaning or replacement of the coalescer (where appropriate).

4.2 Waste Removal Procedure – Oil & Silt

- 4.2.1 **Oil can only be effectively removed when there is no flow entering the unit. Isolate the unit and prevent flow from entering. Always remove the oil before attempting to remove the coalescer. If this is not done, when the coalescer is withdrawn the oil can coat the media surface and when replaced the oil may be forced through the media, contaminating the effluent.**
- 4.2.2 Remove the access cover and lower the desludging hose in to the separation chamber. Draw off the surface oil.
- 4.2.3 If removing the silt, lower the desludge hose to the base of the tank and empty the contents of the chamber. Ensure that you access and clean all compartments.
- 4.2.4 Remove the alarm probe, if fitted, clean with water and replace. Ensure that it is working correctly.
- 4.2.5 Consider the period of time that the coalescer has been installed and consider removing and inspecting (cleaning or replacing) the coalescer media. If removed, ensure that it is correctly replaced and secured into position. Replace the access covers. It is best to lower the water level to aid re-fitting.
- 4.2.6 Re-fill the separator with clean water up to the outlet level.
- 4.2.7 If an alarm is fitted, it will display an alarm condition until the separator is re-filled. Check alarm operation when unit full.

4.3 Checking the Coalescer Assembly

- 4.3.1 Coalescers should be checked and cleaned regularly to maintain efficiency. Coalescers should be checked following a major incident and media replaced if necessary. It may be possible to squeeze/rinse out silt contamination from the media, but it is impossible to remove oil. Please contact us if you wish to purchase replacement coalescer media.
- 4.3.2 Identify the type and size of separator (shown on labels inside the access neck).
- 4.3.3 Assemblies weighing less than 25 Kg may be removed by hand. Heavier assemblies should be lifted by mechanical means. Any lifting device employed must be capable of lifting:
- 4.3.3.a In excess of the maximum assembly weight.
- 4.3.3.b The assembly completely out of the access shaft.
- 4.3.3.c Giving a smooth and controlled lift.
- 4.3.3.d Swinging the assembly to one side clear of the access shaft.

Unit	Dry Weight (Kg) Core tube & media	Wet Weight (Kg) Core tube & media	Silted Weight (Kg) Core tube & media	Replacement Media Part No.
NSFP003	11 kg	21 kg	≈30 kg	402672
NSFP006	11 kg	21 kg	≈30 kg	402672

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

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

4.4 Removing the coalescer assembly.

4.4.1 Undo any fixings which secure the coalescer to the access shaft (if fitted).

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

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

4.5 Cleaning the coalescer assembly/ Media Replacement.

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

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

4.6 Replacing the coalescer assembly.

4.6.1 Position coalescer assembly over the access shaft and remove any safety coverings.

4.6.2 Lower the assembly steadily into the access shaft, orientate the core tube correctly and locate over sump cone. Check that the float/closure device is free to operate.

4.6.3 Replace the access cover.

5 Connection of Extension Neck

(Option in 1800L Tanks only)

5.1.1 See the accompanying illustration.

5.1.2 Remove existing lid by unscrewing 8 screws and lifting off lid.

5.1.3 Apply mastic around flange of tank that joins to extension neck.

5.1.4 Place extension neck onto flange of the tank and screw down using 8 fixings.

5.1.5 Please refer to drawing NSFPEXTzz

5.1.6 Apply mastic to top face of extension piece that is joining to cover.

5.1.7 Place lid on top of extension neck and screw down using 8 fixings.

5.1.8 Backfill in 200mm stages with concrete (wet site) or peashingle (dry site), bracing neck during each stage until you reach the cover level.

5.1.9 For traffic area loading ensures you refer to tank installation section.

6 Emergencies

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

HEALTH & SAFETY

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

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

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

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

Electrical work should be carried out by a qualified electrician.

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

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

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

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

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

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

OIL ALARM SYSTEMS

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

MAINTENANCE

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

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

SEPARATOR MAINTENANCE LOG



Site address/location
.....
Separator location
.....
Type of separator
Nominal Flow
Total capacity

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

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