



LB/9762

25th July 2024

Manchester City Council
P O Box 532,
Town Hall
M60 2LA

9762 – Former Mather & Platt Foundry, Grimshaw Lane, Manchester, M40 2BA

Planning Application Reference: 129444/FO/2021

Dear Sir/ Madame,

Please find a response to planning condition 13 below.

Planning Condition 13:

“13) Prior to the first occupation of the development, details of the implementation, maintenance and management of the sustainable drainage scheme shall be submitted for approval in writing by the City Council, as Local Planning Authority. For the avoidance of doubt this shall include:

- Verification reporting providing photographic evidence of construction;*
- Management and maintenance plan for the lifetime of the development which shall include the arrangements adoption by any public body or statutory undertaker, or any other arrangements to secure the operation of the sustainable drainage scheme throughout its lifetime.*
- Timescale for implementation*

The implementation of the management and maintenance plan shall be implemented in accordance with the timescales agreed and retained for as long as the development remains in use.

Reason - To manage flooding and pollution and to ensure that a managing body is in place for the sustainable drainage system and there is funding and maintenance mechanism for the lifetime of the development pursuant to policies SP1, EN14 and DM1 of the Manchester Core Strategy (2012).”

PTA response:

We can confirm that the proposed Sustainable Drainage System for the development Phase 1 has been constructed generally in accordance with the agreed scheme and a Below Ground Maintenance Plan is attached to be implemented in order to keep the system performing as designed.

I trust the following information is sufficient to clear the planning condition 13 but if additional information is required, please do not hesitate in contacting me.

LB/9762/25.07.2024

Supporting Documents:

- PTA Record drawings.
 - 9762-PTA-XX-XX-DR-C-8100_Proposed Sitewide Drainage Layout_ Rev C04
 - 9762-PTA-XX-XX-DR-C-8101_Proposed Drainage Sheet 1 of 7_ Rev C08
 - 9762-PTA-XX-XX-DR-C-8102_Proposed Drainage Sheet 2 of 7_ Rev C07
 - 9762-PTA-XX-XX-DR-C-8103_Proposed Drainage Sheet 3 of 7_ Rev C07
 - 9762-PTA-XX-XX-DR-C-8131_Proposed Drainage Details Sheet 1 of 3_ Rev C02
 - 9762-PTA-XX-XX-DR-C-8132_Proposed Drainage Details Sheet 2 of 3_ Rev C02
 - 9762-PTA-XX-XX-DR-C-8151_Phase 1 Surface Water Manhole Schedule_ Rev C07
 - 9762-PTA-XX-XX-DR-C-8151_Phase 1 Foul Water Manhole Schedule_ Rev C06
- 9762-PTA-XX-XX-SP-C-9078_Below Ground Drainage Maintenance Plan Rev C01.
- CCTV Drainage Survey Report by Lanes Group plc ref. LSO0381562 1 dated 19/07/2024.
- Site photographic evidence during the construction of surface water drainage elements.

Regards,

Luís Brito
Senior Civil Engineer

Record Drawings



- PRIVATE DRAINAGE NOTES**
1. All private drainage works to comply with the typical drainage construction details and to be in accordance with Part H of the current Building Regulations & BS EN 752.
 2. All private drainage pipework to be either:-
uPVC to BS EN 1401,
Vitrified Clayware to BS EN 295,
Concrete to BS 5911 OR,
Twin Walled Plastic to BS EN 13476,
 3. All new adoptable drainage and laterals to the public sewer are to be constructed in accordance with the DCG 2022 by Water UK.
 4. All underslab drainage shall be laid at gradients of 1:40 min for foul pipework and 1:80 min for surface water UNO.
 5. All rest bends at upstream end of underslab drainage to be 450mm below SSL UNO.
 6. RWP lateral connections are to be sized to suit RWP size as designed by specialist. Gully laterals to be sized to suit gully outlets. All other pipes 100mm diameter UNO.
 7. All underslab drainage shall be installed in straight runs and be clear of foundations UNO, with long radius bends kept to a minimum and used where unavoidable. Long radius bends along length of runs shall be a maximum of 30 degrees.
 8. Where sewers cross and there is less than 200mm clearance, both runs are to be encased in concrete for a minimum of 1m in all directions.
 9. All RWP, SVP, plant gully and all other foul drainage positions are to be set out by the Architect.
 10. Where RWPs and foul pipes are connected direct to drain, rodding access plates are to be provided above ground (by others).
 11. At least one soil pipe at the head of each foul run shall be vented to the atmosphere.
 12. Contractor to ensure that manhole covers are orientated to suit pavement finishes and set flush with surrounding levels.
 13. Contractor to ensure that any part of the existing drainage system to be retained as part of the new scheme shall be cleaned and inspected by CCTV survey. Any structural defects shall be repaired or replaced as may be required using appropriate and approved methods. Where existing manholes are to be retained the cover and frames shall be checked to ensure they are in suitable condition for re-use and if required cover levels adjusted to suit proposed finished ground levels.
 14. Refer to PTA Drainage Maintenance Schedule for maintenance of the drainage system during and for the end user post construction.

Notes:

1. Do not scale from this drawing.
2. In case of any discrepancies in drawings, details or bills, refer to engineers for clarification: unilateral decisions by the Contractor will not be accepted.
3. This drawing is to be read in conjunction with all related Architects, Consultants & Sub-Contractors drawings and specifications.
4. The Contractor is advised that all design drawings and information are to be read concurrently and any discrepancies or omissions reported directly to PTA's Civil Engineering Department.

Key:

-  Site Boundary
-  Attenuation Tank
-  Proposed Foul Water Drainage
-  Proposed Surface Water Drainage
-  Existing Combined Sewers
-  Existing Combined Sewers to be abandoned/removed
-  Drainage Channel
-  Drainage Channel Chamber
-  Proposed Gully
- TG  Trapped Gully
-  Perforated Pipe
-  Proposed Permeable Car Park

Phase 2

© Powell Tolner & Associates Ltd.
The contents of this drawing may not be reproduced in whole or in part without the prior written permission of Powell Tolner & Associates.

FOR CONSTRUCTION

C04	Record Issue.	LB	25.07.24	SLV
C03	SW & FW Adjustments; notes Added.	LB	29.09.23	SLV
C02	SW Drainage Adjustments.	LB	07.08.23	SLV
C01	Construction Issue.	LB	26.07.23	SLV
P11	Phasing Boundary Revised; Stone House Entrance Added.	LB	27.06.23	
P10	Phasing Hatch Added; Attenuation Tanks Updated.	LB	03.02.23	
P09	Indicative Attenuation Tank Connections Added.	LB	07.06.22	
P08	Minor Adjustments.	LB	19.05.22	
P07	Redesigned SW Network.	LB	12.04.22	
P06	Site Layout Updated; SW Network Adjusted; Pond Added.	LB	13.08.21	
P05	Site Layout Updated; SW Network Redesigned.	LB	07.06.21	
P04	Site Layout Updated.	LB	19.03.21	
P03	Site Layout Updated.	LB	12.02.21	
P02	Tank 1 Label Amended.	LB	03.11.20	
REV	DESCRIPTION	BY	DATE	CHK'D

PROJECT TITLE

Grimshaw Lane, Manchester

DRAWING TITLE

Proposed Sitewide Drainage Layout

DATE	October 2020	CHECKED DO	CHECKED ENG	PTA PROJ No
DRAWN	LB			9762
SCALE	1:1000			
ORIG SIZE	A1			
		LB	SLW	REVISION
				C04

DRAWING No 9762-PTA-XX-XX-DR-C- 8100

Consulting Civil & Structural Engineers

 **pta**

29 Red Lion Street
Chesham
Bucks.
HP5 1EJ
Tel. 01494 772721

THIS IS A 'RECORD DRAWING'. IT IS THE ISSUE OF A CONSTRUCTION DRAWING, WHICH INCLUDES THE INFORMATION THAT THE CONTRACTOR HAS SUPPLIED FORMALLY TO PTA TO SHOW THE CONTRACTOR'S "AS-BUILT" INFORMATION. THIS INFORMATION HAS NOT BEEN VERIFIED BY PTA. PTA HAVE RELIED UPON THE CONTRACTORS OBLIGATION TO CONSTRUCT GENERALLY IN ACCORDANCE WITH PTA'S DESIGN.

Notes:

- Do not scale from this drawing.
- In case of any discrepancies in drawings, details or bills, refer to engineers for clarification: unilateral decisions by the Contractor will not be accepted.
- This drawing is to be read in conjunction with all related Architects, Consultants & Sub-Contractors drawings and specifications.
- The Contractor is advised that all design drawings and information are to be read concurrently and any discrepancies or omissions reported directly to PTA's Civil Engineering Department.
- Contractor to allow for RWP, drainage channels, gullies and attenuation tank connections.

Key:

- Site Boundary
- Attenuation Tank
- Proposed Foul Water Drainage
- Proposed Surface Water Drainage
- Existing Combined Sewers
- Existing Combined Sewers to be abandoned/removed
- Drainage Channel
- Drainage Channel Chamber
- Proposed Gully
- Trapped Gully
- Perforated Pipe
- Proposed Permeable Car Park
- Phase 2
- Tree Protection Construction Exclusion Zone
- Root Protection Barrier, refer to PTA drawing 9762-8310

© Powell Tolner & Associates Ltd.

The contents of this drawing may not be reproduced in whole or in part without the prior written permission of Powell Tolner & Associates.

DRAWING STATUS

FOR CONSTRUCTION

C08	Record Issue.	LB	25.07.24	SLW
C07	RWP Locations Adjusted.	LB	16.11.23	SLW
C06	RWP Locations Added And Adjusted; Cover Levels Updated.	LB	31.10.23	SLW
C05	Drainage Channel Moved & RWPs Locations Adjusted.	LB	05.10.23	SLW
C04	FW Route & RWPs Locations Adjusted.	LB	29.09.23	SLW
C03	Minor Adjustments To Foul Water Drain Points.	LB	22.09.23	LB
C02	SW Drainage Layout & RWP Locations Adjusted.	LB	07.08.23	SLW
C01	Construction Issue.	LB	26.07.23	SLW
P09	Phasing Boundary Revised; Stone House Entrance Added & Manhole References Updated.	LB	27.06.23	
P08	Phasing Hatch Added; Attenuation Tanks Updated.	LB	03.02.23	
P07	Indicative Attenuation Tank Connections Added.	LB	07.06.22	

PROJECT TITLE
Grimshaw Lane, Manchester

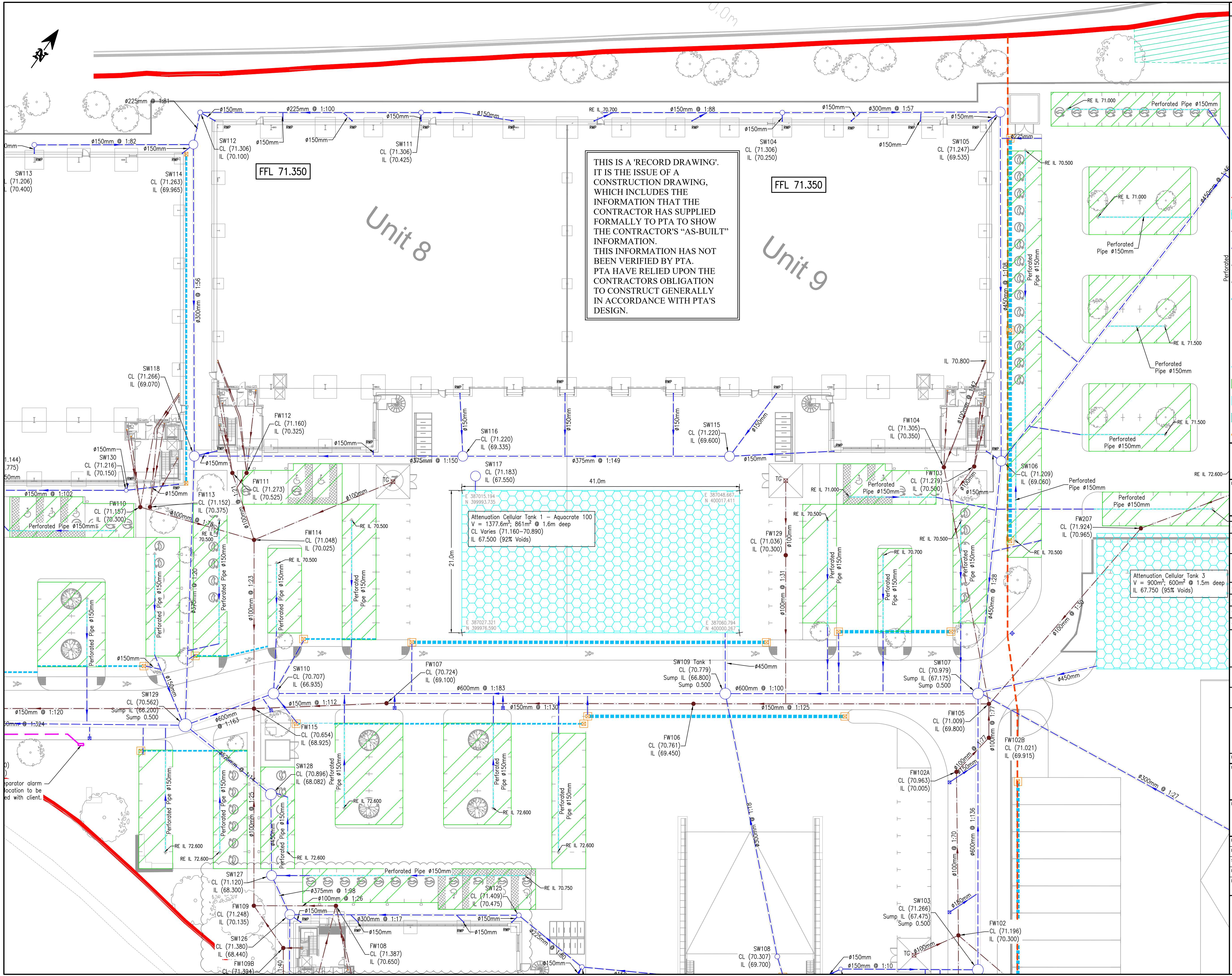
Proposed Drainage Sheet 1 of 7

DATE	March 2021	CHECKED DO	CHECKED ENG	PTA PROJ No
DRAWN	LB			9762
SCALE	1:250		LB	SLW
DRG SIZE	A1			REVISION C08
DRAWING No	9762-PTA-XX-XX-DR-C- 8101			

Consulting Civil & Structural Engineers



www.ptaconsult.co.uk



THIS IS A 'RECORD DRAWING'. IT IS THE ISSUE OF A CONSTRUCTION DRAWING, WHICH INCLUDES THE INFORMATION THAT THE CONTRACTOR HAS SUPPLIED FORMALLY TO PTA TO SHOW THE CONTRACTOR'S "AS-BUILT" INFORMATION. THIS INFORMATION HAS NOT BEEN VERIFIED BY PTA. PTA HAVE RELIED UPON THE CONTRACTORS OBLIGATION TO CONSTRUCT GENERALLY IN ACCORDANCE WITH PTA'S DESIGN.

Notes:

- Do not scale from this drawing.
- In case of any discrepancies in drawings, details or bills, refer to engineers for clarification; unilateral decisions by the Contractor will not be accepted.
- This drawing is to be read in conjunction with all related Architects, Consultants & Sub-Contractors drawings and specifications.
- The Contractor is advised that all design drawings and information are to be read concurrently and any discrepancies or omissions reported directly to PTA's Civil Engineering Department.
- Refer to BEA drawings for details on Tree Root Protection Areas.

Key:

- Site Boundary
- Attenuation Tank
- Proposed Foul Water Drainage
- Proposed Surface Water Drainage
- Existing Combined Sewers
- Existing Combined Sewers to be abandoned/removed
- Drainage Channel
- Drainage Channel Chamber
- Proposed Gully
- Trapped Gully
- Perforated Pipe
- Proposed Permeable Car Park
- Phase 2
- Tree Protection
- Construction Exclusion Zone
- Root Protection Barrier, refer to PTA drawing 9762-8310

© Powell Tolner & Associates Ltd.

The contents of this drawing may not be reproduced in whole or in part without the prior written permission of Powell Tolner & Associates.

FOR CONSTRUCTION

REV	DESCRIPTION	BY	DATE	CHK'D
C07	Record Issue.	LB	25.07.24	SLW
C06	RWP Locations Adjusted & FW Network Moved.	LB	16.11.23	SLW
C05	RWP Locations Added And Adjusted; Cover Levels Updated.	LB	31.10.23	SLW
C04	SW Route Adjusted.	LB	29.09.23	SLW
C03	Attenuation Tank 1 Updated.	LB	22.09.23	LB
C02	RWP Connections Added.	LB	07.08.23	SLW
C01	Construction Issue.	LB	26.07.23	SLW
P09	Phasing Boundary Revised; Stone House Entrance Added & Manhole References Updated.	LB	27.06.23	
P08	Phasing Hatch Added; Attenuation Tanks Updated.	LB	03.02.23	
P07	Indicative Attenuation Tank Connections Added.	LB	07.06.22	
P06	Drainage Channel Laterals & Permeable Paving Drainage Added; Manhole Cover Levels Updated; Attenuation Tank 1 Revised.	LB	19.05.22	

PROJECT TITLE

Grimshaw Lane, Manchester

DRAWING TITLE

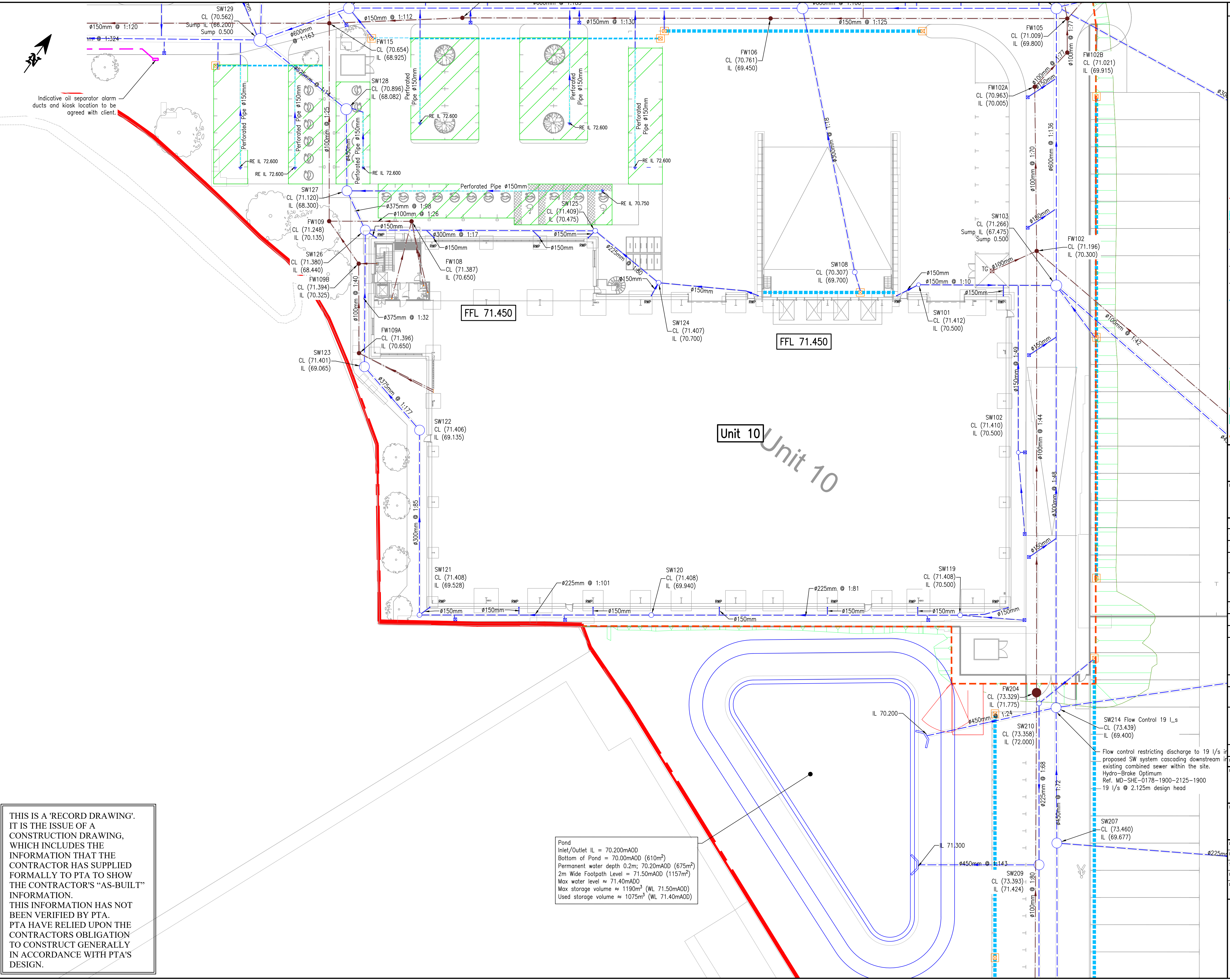
Proposed Drainage Sheet 2 of 7

DATE	MARCH 2021	CHECKED DO	CHECKED ENG	PTA PROJ No
DRAWN	LB		SLW	9762
SCALE	1:250	LB		REVISION
DRG SIZE	A1			C07
DRAWING No	9762-PTA-XX-XX-DR-C- 8102			

Consulting Civil & Structural Engineers

29 Red Lion Street
Chesham
Bucks.
HP5 1EJ
Tel. 01494 772721

www.placonsult.co.uk



THIS IS A 'RECORD DRAWING'. IT IS THE ISSUE OF A CONSTRUCTION DRAWING, WHICH INCLUDES THE INFORMATION THAT THE CONTRACTOR HAS SUPPLIED FORMALLY TO PTA TO SHOW THE CONTRACTOR'S "AS-BUILT" INFORMATION. THIS INFORMATION HAS NOT BEEN VERIFIED BY PTA. PTA HAVE RELIED UPON THE CONTRACTORS OBLIGATION TO CONSTRUCT GENERALLY IN ACCORDANCE WITH PTA'S DESIGN.

Pond
Inlet/Outlet IL = 70.200m AOD
Bottom of Pond = 70.00m AOD (610m²)
Permanent water depth 0.2m; 70.20m AOD (675m²)
2m Wide Footpath Level = 71.50m AOD (1157m²)
Max water level ≈ 71.40m AOD
Max storage volume ≈ 1190m³ (WL 71.50m AOD)
Used storage volume ≈ 1075m³ (WL 71.40m AOD)

Notes:

- Do not scale from this drawing.
- In case of any discrepancies in drawings, details or bills, refer to engineers for clarification; unilateral decisions by the Contractor will not be accepted.
- This drawing is to be read in conjunction with all related Architects, Consultants & Sub-Contractors drawings and specifications.
- The Contractor is advised that all design drawings and information are to be read concurrently and any discrepancies or omissions reported directly to PTA's Civil Engineering Department.
- Refer to BEA drawings for details on Tree Root Protection Areas.

Key:

- Site Boundary
- Attenuation Tank
- Proposed Foul Water Drainage
- Proposed Surface Water Drainage
- Existing Combined Sewers
- Existing Combined Sewers to be abandoned/removed
- Drainage Channel
- Drainage Channel Chamber
- Proposed Gully
- Trapped Gully
- Perforated Pipe
- Proposed Permeable Car Park
- Phase 2
- Tree Protection Construction Exclusion Zone
- Root Protection Barrier, refer to PTA drawing 9762-8310

© Powell Tolner & Associates Ltd.
The contents of this drawing may not be reproduced in whole or in part without the prior written permission of Powell Tolner & Associates.

DRAWING STATUS

FOR CONSTRUCTION				
REV	DESCRIPTION	BY	DATE	CHK'D
C07	Record Issue.	LB	25.07.24	SLW
C06	FW Network Adjusted.	LB	07.06.24	SLW
C05	RWP Locations Adjusted & FW Network Moved.	LB	16.11.23	SLW
C04	RWP Locations Added And Adjusted; Cover Levels Updated.	LB	31.10.23	SLW
C03	SW Route Adjusted.	LB	29.09.23	SLW
C02	Gullies Position Adjusted.	LB	07.08.23	SLW
C01	Construction Issue.	LB	26.07.23	SLW
P09	Phasing Boundary Revised; Stone House Entrance Added & Manhole References Updated.	LB	27.06.23	
P08	Phasing Hatch Added.	LB	03.02.23	
P07	Indicative Attenuation Tank Connections Added.	LB	07.06.22	
P06	Drainage Channel Laterals & Permeable Paving Drainage Added; Manhole Cover Levels Updated.	LB	19.05.22	
P05	Redesigned SW Network.	LB	12.04.22	

PROJECT TITLE

Grimshaw Lane, Manchester

DRAWING TITLE

Proposed Drainage Sheet 3 of 7

DATE	March 2021	CHECKED DO	CHECKED ENG	PTA PROJ No
DRAWN	LB			9762
SCALE	1:250		LB	SLW
DRG SIZE	A1			REVISION
				C07

DRAWING No

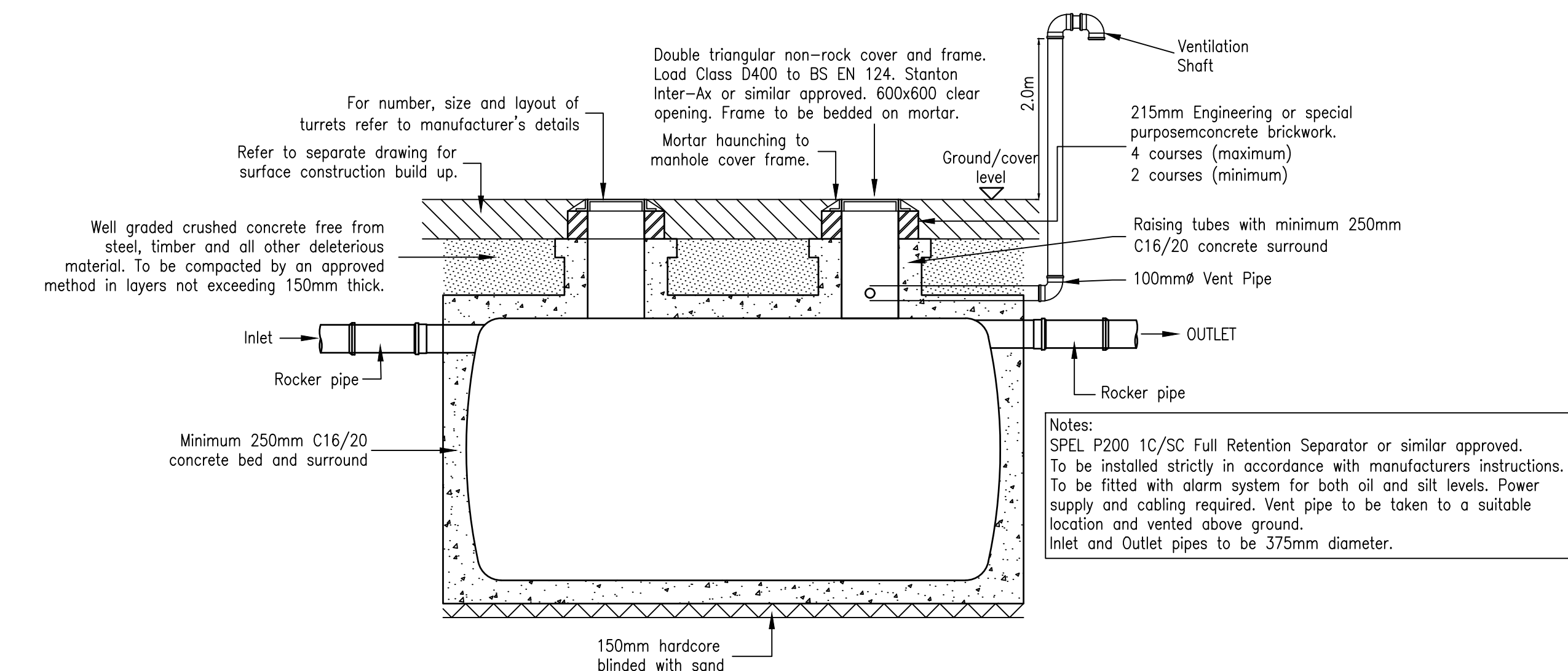
9762-PTA-XX-XX-DR-C- 8103

Consulting Civil & Structural Engineers

pta

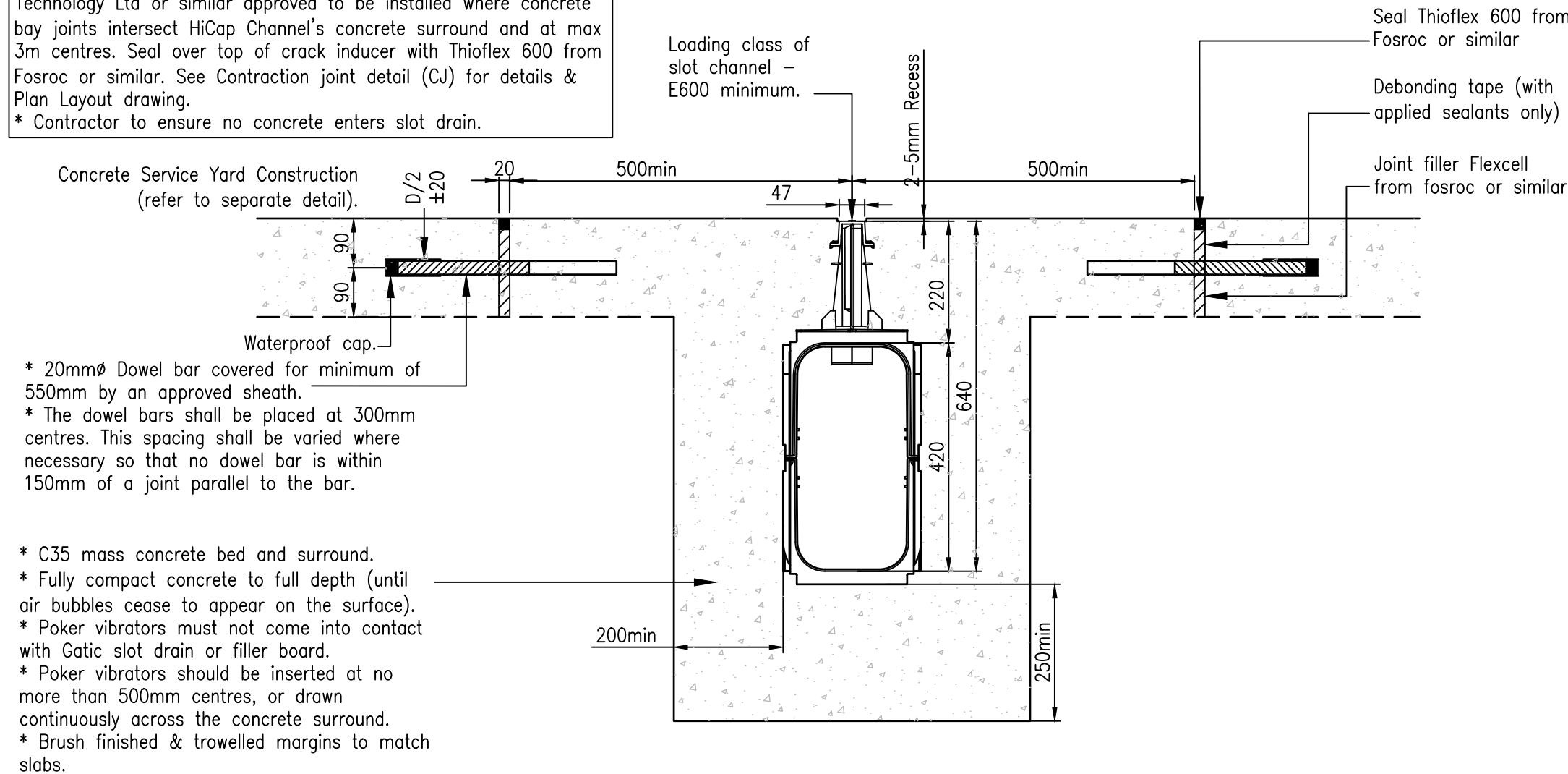
29 Red Lion Street
Chesham
Bucks.
HP5 1EJ
Tel. 01494 772721

www.placonsult.co.uk



Typical Full Retention Separator Detail
1:50

- * HiCap Channel should be installed strictly in accordance with Manufacturers instructions.
- * Ensure a fall in concrete surround so that the top of throat is 2-5mm below concrete slab level.
- * 2 Part crack inducer/joint former by SCP Concrete Sealing Technology Ltd or similar approved to be installed where concrete bay joints intersect HiCap Channel's concrete surround and at max 3m centres. Seal over top of crack inducer with Thioflex 600 from Fosroc or similar. See Contraction joint detail (CJ) for details & Plan Layout drawing.
- * Contractor to ensure no concrete enters slot drain.

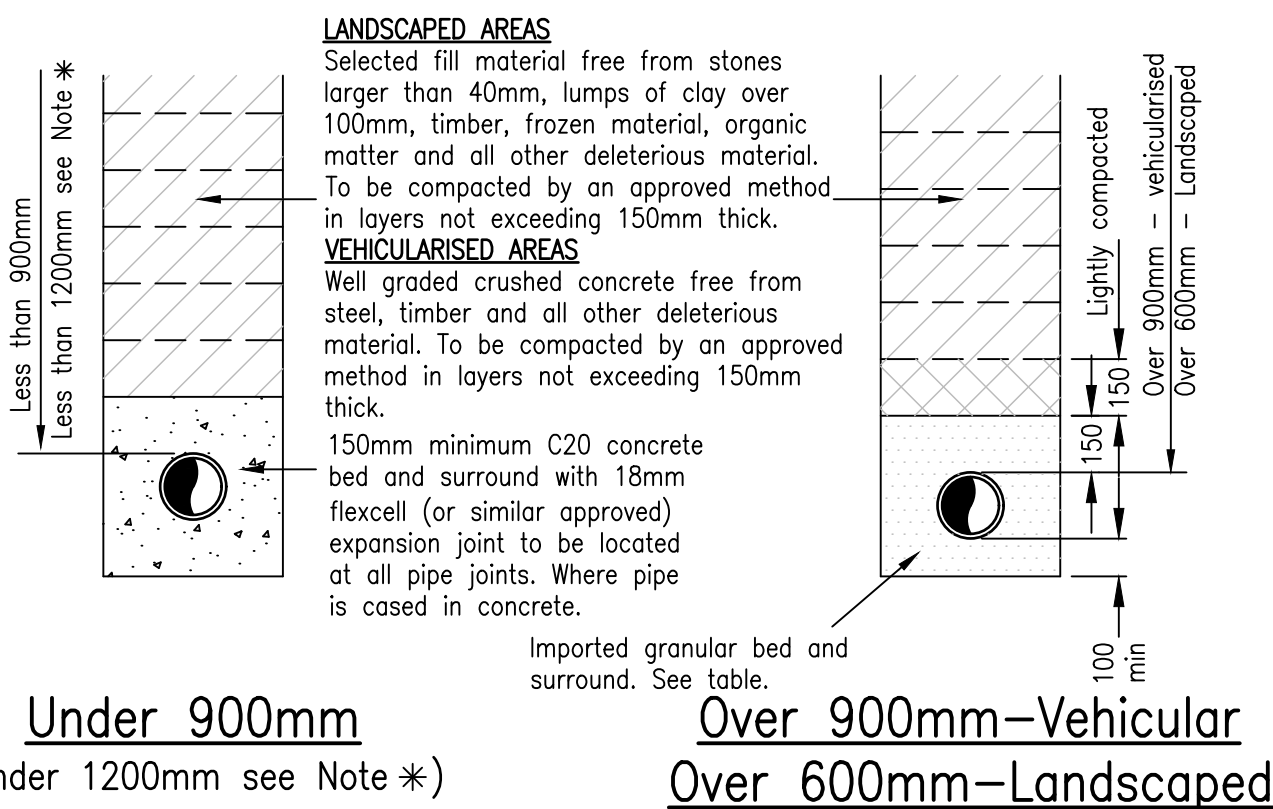


Hauraton Recyfix HiCap Channel Detail

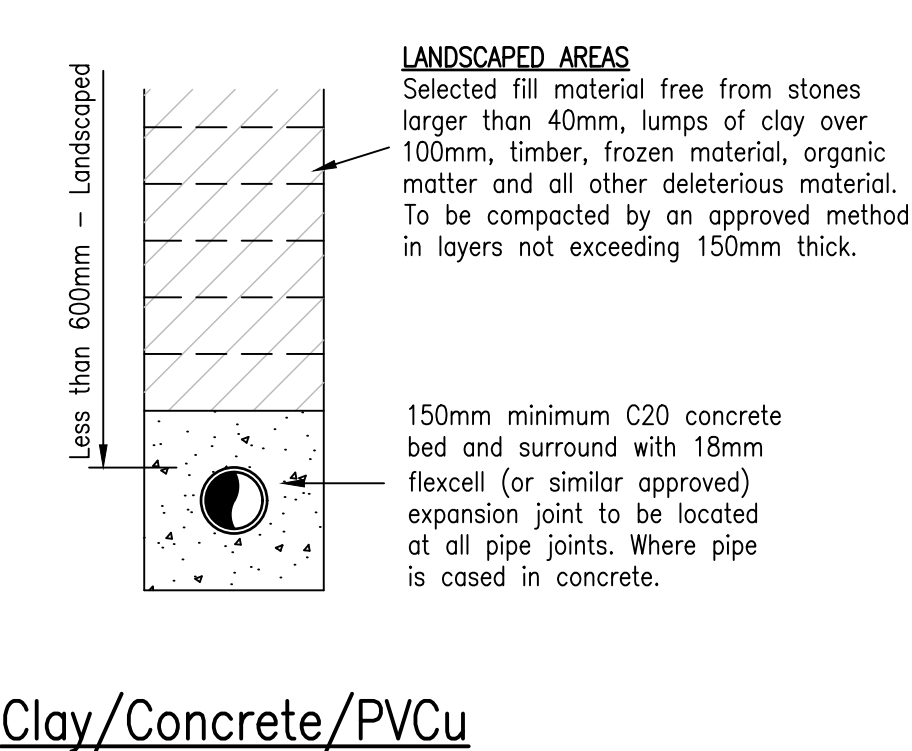
(1:10)

NOTE: *
Where PVCu pipes larger than 300mm diameter are used in vehicularized areas, the concrete protection detail shall be installed up to 1200mm cover.

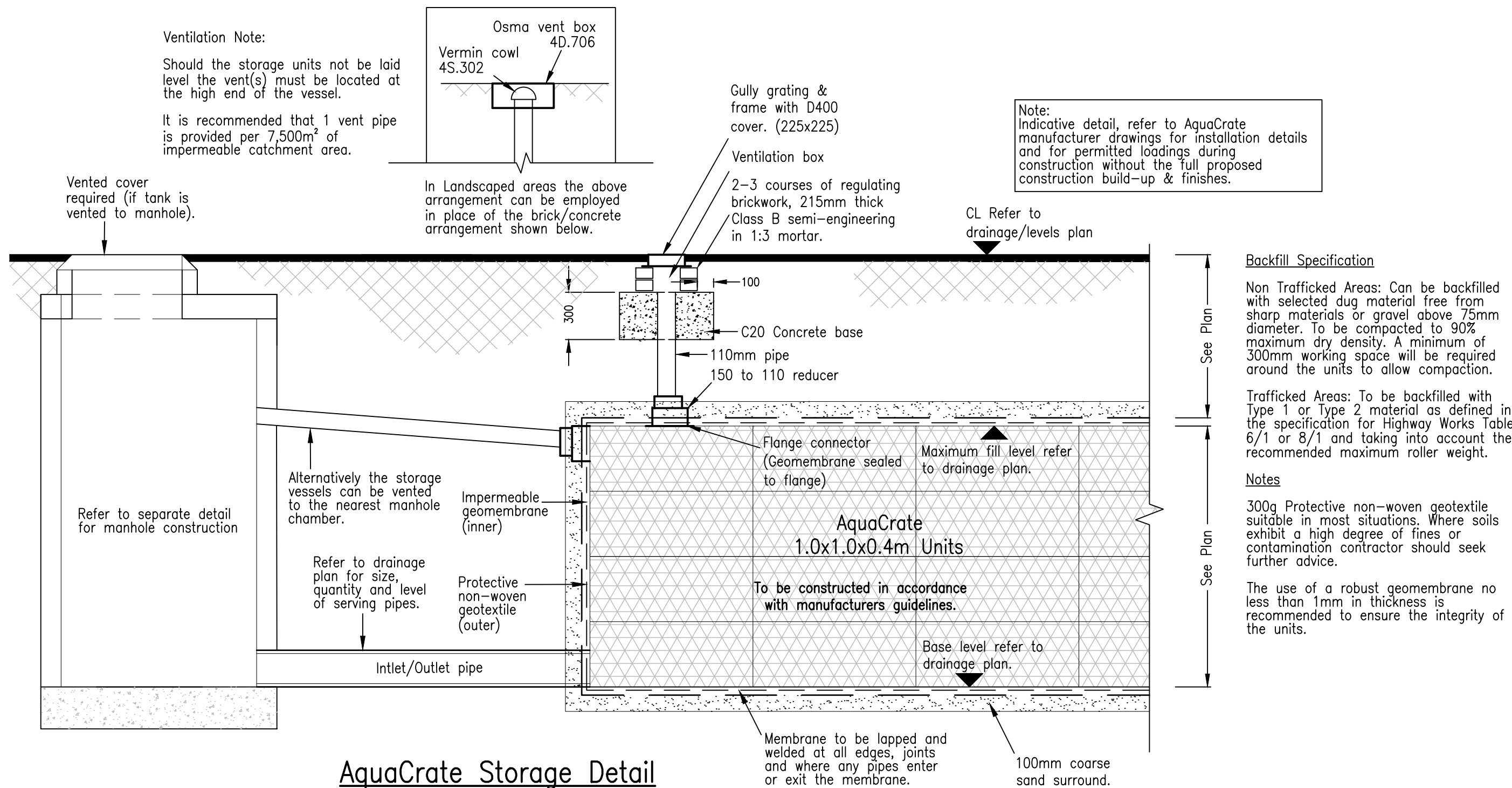
NOTE:
Concrete protection detailed to be installed where pipes are near foundations (see separate detail) and as above in accordance with Part H of Building Regs., clause 2.45



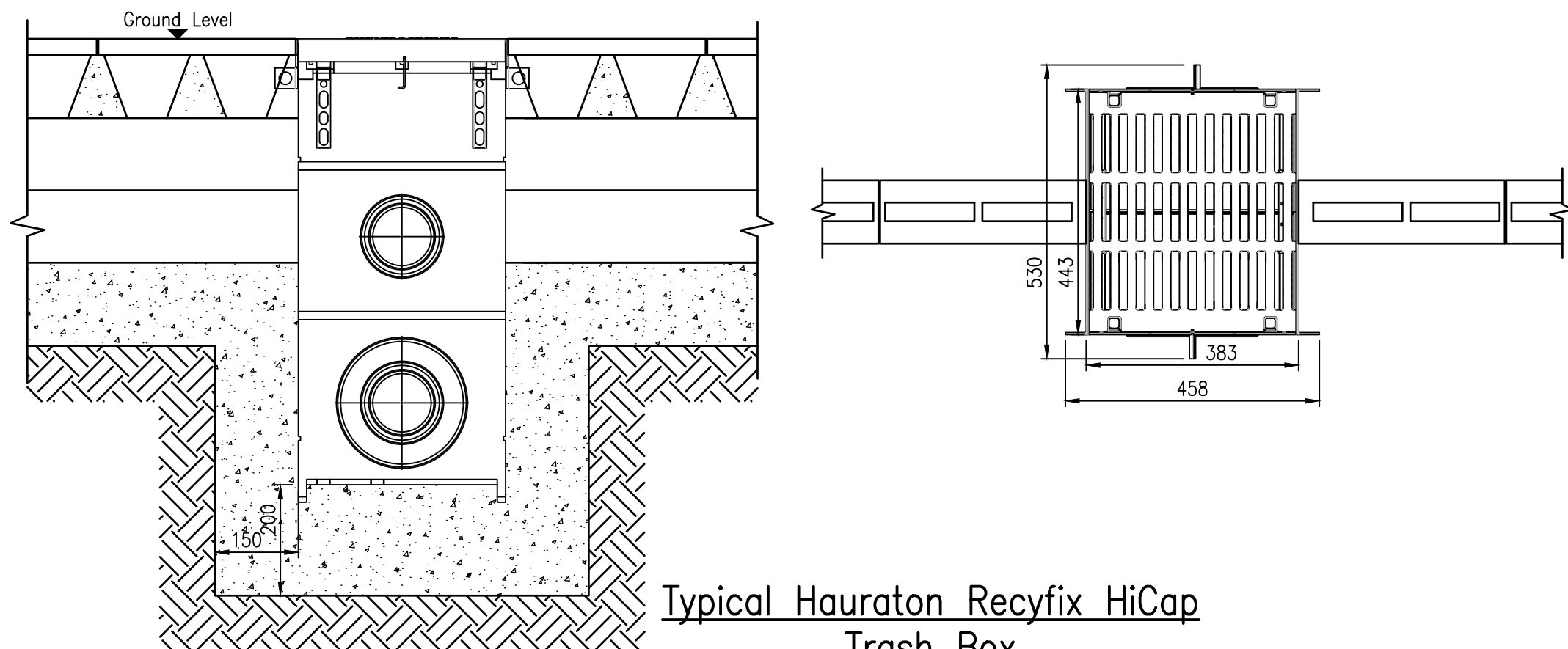
Pipe Bedding Details
Concrete, Clay & PVCu Pipes
1:20



Pipe Bedding Details
Under 600mm Landscaped
1:20

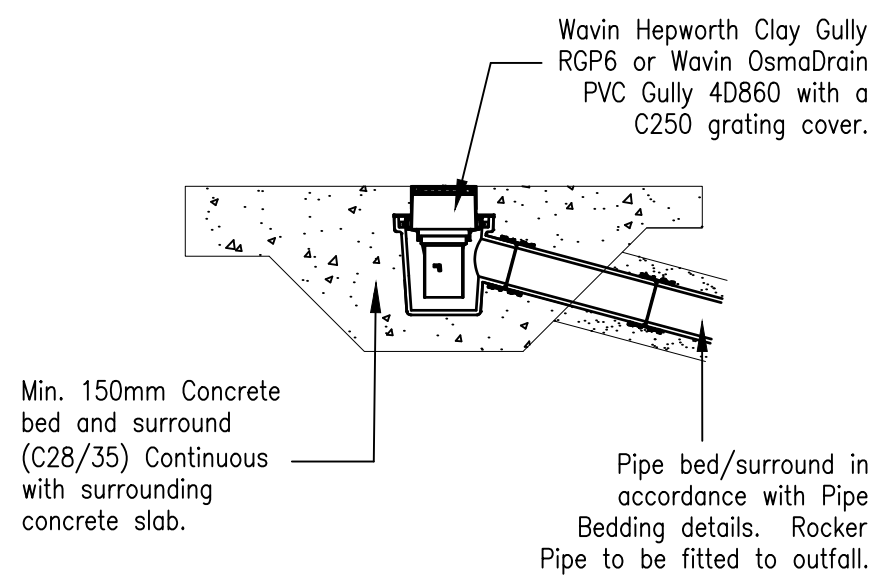


AquaCrate Storage Detail
1:25

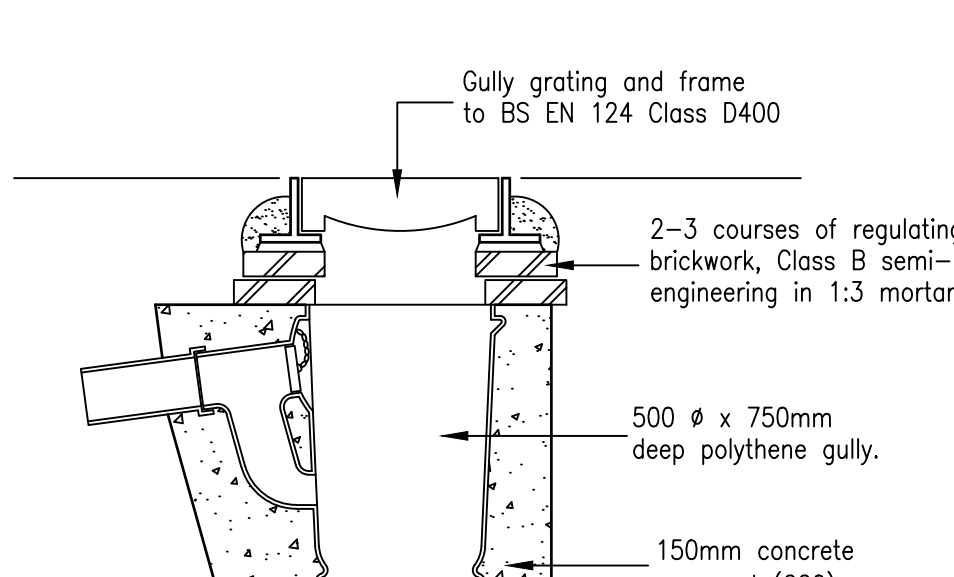


Typical Hauraton Recyfix HiCap
Trash Box
(Not to scale)

Granular materials for Pipe Bedding
TO BE EITHER
Nominal single size aggregate complying with BS EN 12620 as follows:
DN 100 10mm size
DN 150 10mm or 14mm size
DN 200 to DN300 10mm, 14mm or 20mm size
DN 375 to 525 14mm or 20mm size
DN 600 and above 14mm or 20mm or 40mm size
OR
Graded aggregate complying with table 4 of BS 882:1992 as follows:
DN 100 14mm to 5mm
DN 150 to DN 525 20mm to 5mm or 14mm to 5mm
DN 600 and above 40mm to 5mm or 20mm to 5mm or 14mm to 5mm



External Trapped Yard Gully
1:20



Gully Detail
1:20

Notes:

1. Do not scale from this drawing.
2. In case of any discrepancies in drawings, details or bills, refer to engineers for clarification; unilateral decisions by the Contractor will not be accepted.
3. This drawing is to be read in conjunction with all related Architects, Consultants & Sub-Contractors drawings and specifications.
4. The Contractor is advised that all design drawings and information are to be read concurrently and any discrepancies or omissions reported directly to PTA's Civil Engineering Department.

THIS IS A 'RECORD DRAWING'. IT IS THE ISSUE OF A CONSTRUCTION DRAWING, WHICH INCLUDES THE INFORMATION THAT THE CONTRACTOR HAS SUPPLIED FORMALLY TO PTA TO SHOW THE CONTRACTOR'S "AS-BUILT" INFORMATION. THIS INFORMATION HAS NOT BEEN VERIFIED BY PTA. PTA HAVE RELIED UPON THE CONTRACTORS OBLIGATION TO CONSTRUCT GENERALLY IN ACCORDANCE WITH PTA'S DESIGN.

© Powell Tolner & Associates Ltd.

The contents of this drawing may not be reproduced in whole or in part without the prior written permission of Powell Tolner & Associates.

DRAWING STATUS

FOR CONSTRUCTION

C02	Record Issue.	LB	25.07.24	SLW
C01	Construction Issue.	LB	26.07.23	SLW
P02	Oil Separator Detail Changed.	LB	07.06.21	
P01	First Issue.	LB	19.03.21	
REV	DESCRIPTION	BY	DATE	CHK'D

PROJECT TITLE
Grimshaw Lane, Manchester

Proposed Drainage Details Sheet 2 of 2

DATE	March 2021	CHECKED DO	CHECKED ENG	PTA PROJ No
DRAWN	LB			9762
SCALE	As Noted	LB	SLW	REVISION
DRG SIZE	A1			C02

9762-PTA-XX-XX-DR-C- 8132

Consulting Civil & Structural Engineers
pta
29 Red Lion Street
Chesham
Bucks.
HP5 1EJ
Tel. 01494 772721

www.ptaconsult.co.uk

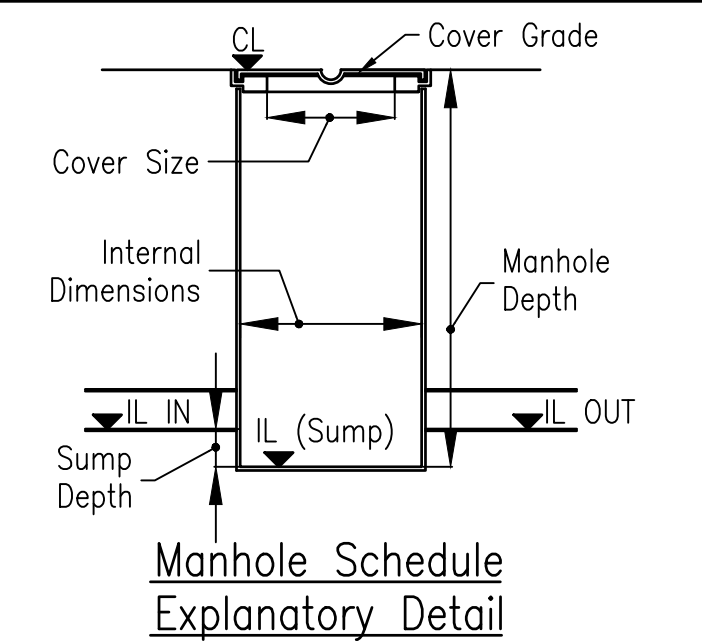
PHASE 1 SURFACE WATER MANHOLE SCHEDULE									
MANHOLE NAME	COVER LEVEL [m AOD]	CHAMBER INVERT LEVEL [m AOD]	SUMP DEPTH [m]	INVERT LEVELS [m AOD]	COORDINATES [m]	CLEAR OPENING & COVER TYPE [mm]	COVER GRADE	INTERNAL DIMENSIONS [mm] & MANHOLE TYPE	
SW101	71.412	70.500 (0.912 DEPTH)	0.000	70.775 (150# IN) 70.500 (150# OUT)	E: 387101.691 N: 399968.403	600x600	D400	450# PIC	
SW102	71.410	70.500 (0.910 DEPTH)	0.000	70.525 (100# IN) 70.525 (100# IN) 70.500 (150# OUT)	E: 387127.909 N: 399956.751	600x600	D400	450# PIC	
SW103	71.266	67.475 (3.791 DEPTH)	0.500	68.275 (300# IN) 68.425 (150# IN) 68.200 (375# IN) 67.975 (600# OUT)	E: 387118.287 N: 399980.013	600x600	D400	1500# PC Ring	
SW104	71.306	70.250 (1.056 DEPTH)	0.000	70.400 (150# IN) 70.400 (150# IN) 70.250 (300# OUT)	E: 387021.582 N: 400066.590	600x600	C250	600# PIC	
SW105	71.247	69.535 (1.712 DEPTH)	0.000	69.685 (300# IN) 69.835 (150# IN) 69.535 (450# OUT)	E: 387047.807 N: 400085.267	600x600	C250	1350# PC Ring	
SW106	71.209	69.060 (2.149 DEPTH)	0.000	69.060 (450# IN) 69.360 (150# IN) 69.060 (450# OUT)	E: 387077.692 N: 400043.302	600x600	C250	1350# PC Ring	
SW107	70.979	67.175 (3.804 DEPTH)	0.500	67.675 (600# IN) 67.825 (450# IN) 67.675 (600# OUT)	E: 387094.750 N: 400013.289	600x600	D400	1500# PC Ring Catchpit	
SW108	70.307	69.700 (0.607 DEPTH)	0.000	69.775 (225# IN) 69.700 (300# OUT)	E: 387092.972 N: 399964.487	600x600	D400	600# PIC	
SW109 Tank 1	70.779	66.800 (3.979 DEPTH)	0.500	67.300 (600# IN) 67.525 (300# IN) 67.450 (450# IN) 67.300 (600# OUT)	E: 387064.279 N: 399991.730	600x600	D400	1500# PC Ring	
SW110	70.707	66.935 (3.772 DEPTH)	0.000	66.935 (600# IN) 67.310 (225# IN) 67.310 (225# IN) 67.385 (150# IN) 66.935 (600# OUT)	E: 387009.822 N: 399953.199	600x600	D400	1500# PC Ring	
SW111	71.306	70.425 (0.881 DEPTH)	0.000	70.500 (150# IN) 70.500 (150# IN) 70.425 (225# OUT)	E: 386978.050 N: 400035.782	600x600	C250	600# PIC	
SW112	71.306	70.100 (1.206 DEPTH)	0.000	70.100 (225# IN) 70.175 (150# IN) 70.100 (225# OUT)	E: 386951.404 N: 400016.937	600x600	D400	600# PIC	
SW113	71.206	70.400 (0.806 DEPTH)	0.000	70.400 (150# IN) 70.400 (150# OUT)	E: 386934.186 N: 399998.875	600x600	C250	600# PC Ring	
SW114	71.263	69.965 (1.298 DEPTH)	0.000	70.040 (225# IN) 70.115 (150# IN) 70.115 (150# IN) 69.965 (300# OUT)	E: 386953.330 N: 400012.493	600x600	C250	1200# PC Ring	
SW115	71.220	69.600 (1.620 DEPTH)	0.000	69.825 (150# IN) 69.825 (150# IN) 69.600 (375# OUT)	E: 387044.545 N: 400020.690	600x600	D400	1350# PC Ring	
SW116	71.220	69.335 (1.885 DEPTH)	0.000	69.335 (375# IN) 69.560 (150# IN) 69.335 (375# OUT)	E: 387012.391 N: 399997.938	600x600	D400	1350# PC Ring	
SW117	71.183	67.550 (3.633 DEPTH)	0.000	67.550 (300# OUT)	E: 387015.612 N: 399996.622	600x600	D400	1350# PC Ring	
SW118	71.266	69.070 (2.196 DEPTH)	0.000	69.145 (300# IN) 69.070 (375# IN) 69.295 (150# IN) 69.070 (375# OUT)	E: 386980.017 N: 399975.033	600x600	C250	1350# PC Ring	
SW119	71.408	70.500 (0.908 DEPTH)	0.000	70.575 (150# IN) 70.625 (100# IN) 70.500 (225# OUT)	E: 387134.759 N: 399932.274	600x600	C250	600# PIC	
SW120	71.408	69.940 (1.468 DEPTH)	0.000	69.940 (225# IN) 69.940 (225# OUT)	E: 387097.682 N: 399906.049	600x600	C250	600# PIC	
SW121	71.408	69.528 (1.880 DEPTH)	0.000	69.603 (225# IN) 70.061 (150# IN) 69.528 (300# OUT)	E: 387069.851 N: 399886.363	600x600	C250	600# PIC	
SW122	71.406	69.135 (2.271 DEPTH)	0.000	69.210 (300# IN) 69.135 (375# OUT)	E: 387054.155 N: 399908.554	600x600	C250	1350# PC Ring	
SW123	71.401	69.065 (2.336 DEPTH)	0.000	69.065 (375# IN) 69.065 (375# OUT)	E: 387042.149 N: 399911.478	600x600	C250	1350# PC Ring	
SW124	71.407	70.700 (0.707 DEPTH)	0.000	70.775 (150# IN) 70.775 (150# IN) 70.700 (225# OUT)	E: 387070.314 N: 399946.547	600x600	D400	600# PIC	
SW125	71.409	70.475 (0.934 DEPTH)	0.000	70.550 (225# IN) 70.625 (150# IN) 70.475 (300# OUT)	E: 387058.303 N: 399947.399	600x600	D400	600# PIC	
SW126	71.380	68.440 (2.940 DEPTH)	0.000	68.440 (375# IN) 68.515 (300# IN) 68.665 (150# IN) 68.440 (375# OUT)	E: 387030.640 N: 399927.944	600x600	C250	1350# PC Ring	
SW127	71.120	68.300 (2.820 DEPTH)	0.000	68.375 (375# IN) 68.600 (150# IN) 68.300 (450# OUT)	E: 387025.112 N: 399931.095	600x600	C250	1350# PC Ring	
SW128	70.896	68.082 (2.814 DEPTH)	0.000	68.177 (450# IN) 68.082 (525# OUT)	E: 387018.090 N: 399940.831	600x600	D400	1500# PC Ring	
SW129	70.562	66.200 (4.362 DEPTH)	0.500	66.850 (600# IN) 67.075 (375# IN) 66.925 (525# IN) 66.700 (750# OUT)	E: 387001.887 N: 399941.835	600x600	D400	1800# PC Ring Catchpit	
SW130	71.216	70.150 (1.066 DEPTH)	0.000	70.150 (150# IN) 70.150 (150# IN) 70.150 (150# OUT)	E: 386974.719 N: 399965.090	450x450	C250	450# PIC	

PHASE 1 SURFACE WATER MANHOLE SCHEDULE									
MANHOLE NAME	COVER LEVEL [m AOD]	CHAMBER INVERT LEVEL [m AOD]	SUMP DEPTH [m]	INVERT LEVELS [m AOD]	COORDINATES [m]	CLEAR OPENING & COVER TYPE [mm]	COVER GRADE	INTERNAL DIMENSIONS [mm] & MANHOLE TYPE	
SW131	71.144	69.775 (1.369 DEPTH)	0.000	69.925 (150# IN) 69.925 (150# IN) 69.925 (150# IN) 69.775 (300# OUT)	E: 386956.042 N: 399951.879	600x600	C250	600# PIC	
SW132	70.579	68.850 (1.729 DEPTH)	0.000	68.925 (300# IN) 69.000 (225# IN) 68.850 (375# OUT)	E: 386960.019 N: 399924.441	600x600	D400	1350# PC Ring	
SW133	70.471	66.550 (3.921 DEPTH)	0.000	66.550 (750# IN) 66.925 (375# IN) 67.150 (150# IN) 66.550 (750# OUT)	E: 386961.952 N: 399914.127	600x600	D400	1800# PC Ring	
SW134	70.102	69.350 (0.752 DEPTH)	0.000	69.425 (150# IN) 69.350 (225# OUT)	E: 386932.029 N: 399942.235	600x600	D400	600# PIC	
SW135	71.206	70.200 (1.006 DEPTH)	0.000	70.200 (150# IN) 70.200 (150# IN) 70.200 (150# OUT)	E: 386902.782 N: 399976.647	450x450	C250	450# PIC	
SW136	71.196	69.855 (1.341 DEPTH)	0.000	69.930 (150# IN) 69.930 (150# IN) 69.980 (100# IN) 69.855 (225# OUT)	E: 386883.739 N: 399963.178	600x600	C250	600# PIC	
SW137	71.174	69.355 (1.819 DEPTH)	0.000	69.430 (225# IN) 69.505 (150# IN) 69.555 (100# IN) 69.355 (300# OUT)	E: 386908.777 N: 399927.820	600x600	D400	600# PIC	
SW138 Flow Control 80 L_s	70.071	65.485 (4.586 DEPTH)	1.000	66.485 (750# IN) 66.935 (300# IN) 67.085 (150# IN) 66.485 (600# OUT)	E: 386942.478 N: 399900.393	750x750	D400	2100# PC Ring Flow Control Chamber	
SW139	69.467	68.500 (0.967 DEPTH)	0.000	68.500 (150# IN) 68.550 (100# IN) 68.500 (150# OUT)	E: 386885.829 N: 399956.726	450x450	C250	450# PIC	
SW140	69.473	68.185 (1.288 DEPTH)	0.000	68.260 (150# IN) 68.185 (225# OUT)	E: 386897.893 N: 399939.664	600x600	C250	600# PIC	
SW141	69.450	67.850 (1.600 DEPTH)	0.000	67.850 (225# IN) 67.925 (150# IN) 67.975 (100# IN) 67.850 (225# OUT)	E: 386923.540 N: 399902.985	600x600	C250	600# PIC	
SW142	69.456	68.750 (0.706 DEPTH)	0.000	68.750 (150# IN) 68.750 (150# OUT)	E: 386824.853 N: 399882.635	450x450	C250	450# PIC	
SW143	69.456	68.280 (1.176 DEPTH)	0.000	68.355 (150# IN) 68.355 (150# IN) 68.280 (225# OUT)	E: 386809.980 N: 399903.656	600x600	C250	600# PIC	
SW144	69.434	67.930 (1.504 DEPTH)	0.000	68.005 (225# IN) 67.930 (300# OUT)	E: 386840.199 N: 399925.031	600x600	C250	600# PIC	
SW145	69.456	68.750 (0.706 DEPTH)	0.000	68.750 (150# IN) 68.750 (150# OUT)	E: 386840.479 N: 399873.292	450x450	C250	450# PIC	
SW146	69.456	68.485 (0.971 DEPTH)	0.000	68.560 (150# IN) 68.560 (150# IN) 68.485 (225# OUT)	E: 386849.427 N: 399860.644	600x600	C250	600# PIC	
SW147	69.465	67.750 (1.715 DEPTH)	0.000	67.825 (225# IN) 67.750 (300# OUT)	E: 386873.637 N: 399877.768	600x600	C250	600# PIC	
SW148	69.383	67.485 (1.898 DEPTH)	0.000	67.560 (300# IN) 67.560 (300# IN) 67.485 (375# OUT)	E: 386857.412 N: 399900.707	600x600	D400	1350# PC Ring	
SW149	69.449	68.750 (0.699 DEPTH)	0.000	68.750 (150# IN) 68.750 (150# IN) 68.750 (150# OUT)	E: 386865.611 N: 399933.426	450x450	D400	450# PIC	
SW150 Tank 2	69.376	66.600 (2.776 DEPTH)	0.500	67.100 (375# IN) 67.250 (225# IN) 67.100 (375# IN) 67.100 (375# OUT)	E: 386874.460 N: 399912.765	600x600	D400	1350# PC Ring	
SW151	69.376	67.250 (2.126 DEPTH)	0.000	67.250 (375# OUT)	E: 386858.053 N: 399935.960	600x600	D400	1200# PC Ring	
SW152	69.450	67.060 (2.390 DEPTH)	0.000	67.060 (375# IN) 67.285 (150# IN) 67.135 (300# OUT)	E: 386878.302 N: 399915.483	600x600	D400	1350# PC Ring	
SW153 Flow Control 5 L_s	69.347	66.435 (2.912 DEPTH)	0.000	66.510 (225# IN) 66.435 (300# IN) 66.585 (150# IN) 66.585 (150# IN) 66.585 (150# IN) 66.435 (300# OUT)	E: 386899.453 N: 399885.580	750x750	D400	1200# PC Ring Flow Control Chamber	
SW154	68.074	65.350 (2.724 DEPTH)	0.000	65.350 (600# IN) 65.725 (300# IN) 65.350 (675# OUT)	E: 386906.272 N: 399874.270	600x600	D400	1500# PC Ring	
SW155	66.853	65.500 (1.353 DEPTH)	0.000	65.650 (150# IN) 65.650 (225# IN) 65.652 (150# IN) 65.500 (300# OUT)	E: 386859.229 N: 399850.593	600x600	D400	1200# PC Ring	
SW156	66.759	65.500 (1.259 DEPTH)	0.000	65.650 (150# IN) 65.650 (150# IN) 65.650 (225# IN) 65.500 (375# OUT)	E: 386871.034 N: 399838.172	600x600	D400	1350# PC Ring	
SW157 Flow Control 95 L_s	66.943	63.750 (3.193 DEPTH)	1.000	64.750 (675# IN) 65.050 (300# IN) 65.425 (375# IN) 64.750 (375# OUT)	E: 386870.040 N: 399849.396	750x750	D400	2100# PC Ring Flow Control Chamber	
SW158	66.634	64.550 (2.084 DEPTH)	0.000	64.550 (375# IN) 64.550 (300# IN) 64.550 (375# OUT)	E: 386855.151 N: 399838.865	600x600	D400	1500# PC Ring	
SW159	66.543	64.290 (2.253 DEPTH)	0.000	64.290 (375# IN)	E: 386850.597 N: 399837.664	600x600	D400	1500# PC Ring	

Notes:

- Do not scale from this drawing.
- In case of any discrepancies in drawings, details or bills, refer to engineers for clarification: unilateral decisions by the Contractor will not be accepted.
- This drawing is to be read in conjunction with all related Architects, Consultants & Sub-Contractors drawings and specifications.
- The Contractor is advised that all design drawings and information are to be read concurrently and any discrepancies or omissions reported directly to PTA's Civil Engineering Department.

THIS IS A 'RECORD DRAWING'. IT IS THE ISSUE OF A CONSTRUCTION DRAWING, WHICH INCLUDES THE INFORMATION THAT THE CONTRACTOR HAS SUPPLIED FORMALLY TO PTA TO SHOW THE CONTRACTOR'S "AS-BUILT" INFORMATION. THIS INFORMATION HAS NOT BEEN VERIFIED BY PTA. PTA HAVE RELIED UPON THE CONTRACTORS OBLIGATION TO CONSTRUCT GENERALLY IN ACCORDANCE WITH PTA'S DESIGN.



© Powell Tolner & Associates Ltd.
The contents of this drawing may not be reproduced in whole or in part without the prior written permission of Powell Tolner & Associates.

DRAWING STATUS

FOR CONSTRUCTION

C07	Record Issue.	LB	25.07.24	SLW
C06	MH SW104, SW111, SW124 & SW135 Moved Back; Minor Cover Levels Adjustments.	LB	16.11.23	SLW
C05	MH SW104, SW111, SW124 & SW135 Moved; Minor Cover Levels Adjustments.	LB	31.10.23	SLW
C04	Cover Levels Adjustments.	LB	05.10.23	SLW
C03	Surface Water Network Adjustments.	LB	29.09.23	LB
C02	Construction Issue.	LB	07.08.23	SLW
C01	Construction Issue.	LB	26.07.23	SLW
P08	Schedule Updated To Phase Only.	LB	27.06.23	
P07	Minor Adjustments.	LB	03.02.23	
P06	SW Pipe Connections Added.	LB	07.06.22	
P05	SW Cover Levels Updated.	LB	19.05.22	
P04	SW Network Updated.	LB	12.04.22	
P03	SW Network Updated.	LB	08.06.21	
P02	SW Network Updated.	LB	06.04.21	

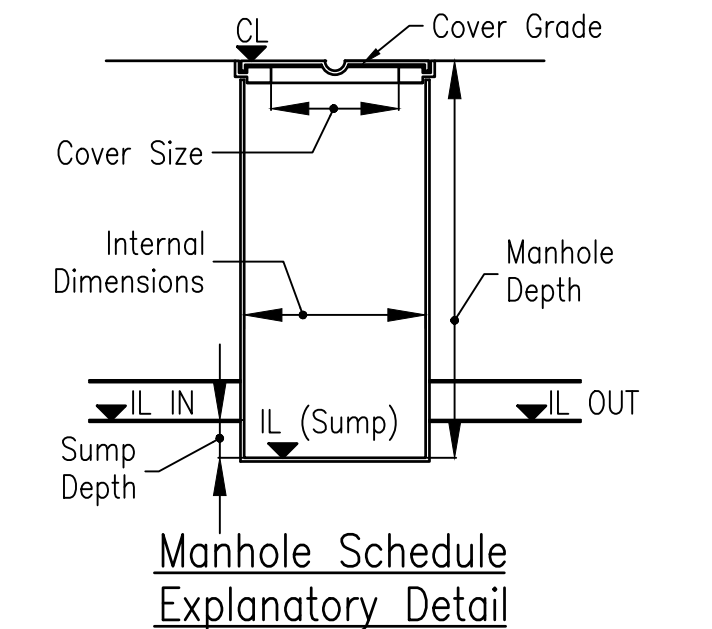
PHASE 1 FOUL WATER MANHOLE SCHEDULE								
MANHOLE NAME	COVER LEVEL [m AOD]	CHAMBER INVERT LEVEL [m AOD]	SUMP DEPTH [m]	INVERT LEVELS [m AOD]	COORDINATES [m]	CLEAR OPENING & COVER TYPE [mm]	COVER GRADE	INTERNAL DIMENSIONS [mm] & MANHOLE TYPE
FW102	71.196	70.300 (0.896 DEPTH)	0.000	70.300 (100ø IN) 70.300 (100ø IN) 70.350 (100ø IN) 70.350 (100ø OUT)	E: 387113.004 N: 399982.496	450x450	D400	450ø PIC
FW102A	70.963	70.005 (0.958 DEPTH)	0.000	70.005 (100ø IN) 70.005 (100ø OUT)	E: 387098.813 N: 400002.035	450x450	D400	450ø PIC
FW102B	71.021	69.915 (1.106 DEPTH)	0.000	69.915 (100ø IN) 69.915 (100ø OUT)	E: 387099.811 N: 400008.907	450x450	D400	450ø PIC
FW103	71.279	70.500 (0.779 DEPTH)	0.000	70.550 (100ø IN) 70.500 (100ø IN) 70.550 (100ø IN) 70.500 (100ø OUT)	E: 387074.903 N: 400040.347	450x450	C250	450ø PIC
FW104	71.305	70.350 (0.955 DEPTH)	0.000	70.400 (100ø IN) 70.350 (100ø IN) 70.400 (100ø IN) 70.350 (100ø OUT)	E: 387071.309 N: 400037.667	450x450	C250	450ø PIC
FW105	71.009	69.800 (1.209 DEPTH)	0.000	69.850 (100ø IN) 70.550 (100ø IN) 69.800 (150ø OUT)	E: 387096.924 N: 400012.989	450x450 Restricted to 350ø	D400	450ø PIC
FW106	70.761	69.450 (1.311 DEPTH)	0.000	69.450 (150ø IN) 69.450 (150ø OUT)	E: 387061.311 N: 399987.792	450x450 Restricted to 350ø	D400	450ø PIC
FW107	70.724	69.100 (1.624 DEPTH)	0.000	69.100 (150ø IN) 69.100 (150ø OUT)	E: 387024.266 N: 399961.661	450x450 Restricted to 350ø	D400	450ø PIC
FW108	71.387	70.650 (0.737 DEPTH)	0.000	70.700 (100ø IN) 70.700 (100ø IN) 70.650 (100ø IN) 70.650 (100ø OUT)	E: 387035.452 N: 399932.930	450x450 Recessed	C250	450ø PIC
FW109	71.248	70.135 (1.113 DEPTH)	0.000	70.185 (100ø IN) 70.135 (100ø IN) 70.135 (100ø OUT)	E: 387025.554 N: 399925.947	450x450	C250	450ø PIC
FW109A	71.396	70.650 (0.746 DEPTH)	0.000	70.700 (100ø IN) 70.650 (100ø IN) 70.650 (100ø OUT)	E: 387040.346 N: 399912.650	450x450	C250	450ø PIC
FW109B	71.394	70.325 (1.069 DEPTH)	0.000	70.375 (100ø IN) 70.325 (100ø IN) 70.325 (100ø OUT)	E: 387032.708 N: 399923.356	450x450	C250	450ø PIC
FW110	71.157	70.300 (0.857 DEPTH)	0.000	70.350 (100ø IN) 70.300 (100ø IN) 70.350 (100ø IN) 70.300 (100ø OUT)	E: 386977.852 N: 399964.282	450x450 Recessed	C250	450ø PIC
FW111	71.273	70.525 (0.748 DEPTH)	0.000	70.575 (100ø IN) 70.525 (100ø IN) 70.575 (100ø IN) 70.525 (100ø OUT)	E: 386986.040 N: 399976.256	450x450	C250	450ø PIC
FW112	71.160	70.325 (0.835 DEPTH)	0.000	70.375 (100ø IN) 70.325 (100ø IN) 70.375 (100ø IN) 70.325 (100ø OUT)	E: 386987.751 N: 399977.464	450x450	C250	450ø PIC
FW113	71.152	70.375 (0.777 DEPTH)	0.000	70.425 (100ø IN) 70.375 (100ø IN) 70.425 (100ø IN) 70.375 (100ø OUT)	E: 386979.019 N: 399965.119	450x450	C250	450ø PIC
FW114	71.048	70.025 (1.023 DEPTH)	0.000	70.075 (100ø IN) 70.025 (100ø IN) 70.075 (100ø IN) 70.025 (100ø OUT)	E: 386994.367 N: 399970.041	450x450	D400	450ø PIC
FW115	70.654	68.925 (1.729 DEPTH)	0.000	68.925 (150ø IN) 68.925 (100ø IN) 68.975 (100ø IN) 68.925 (150ø OUT)	E: 387008.751 N: 399949.706	450x450 Restricted to 350ø	D400	450ø PIC
FW116	70.490	68.550 (1.940 DEPTH)	0.000	68.550 (150ø IN) 68.550 (150ø OUT)	E: 386972.016 N: 399923.714	450x450 Restricted to 350ø	D400	450ø PIC
FW116A	69.765	68.190 (1.575 DEPTH)	0.000	68.190 (150ø IN) 68.240 (100ø IN) 68.190 (150ø OUT)	E: 386935.559 N: 399897.348	450x450 Restricted to 350ø	D400	450ø PIC

PHASE 1 FOUL WATER MANHOLE SCHEDULE								
MANHOLE NAME	COVER LEVEL [m AOD]	CHAMBER INVERT LEVEL [m AOD]	SUMP DEPTH [m]	INVERT LEVELS [m AOD]	COORDINATES [m]	CLEAR OPENING & COVER TYPE [mm]	COVER GRADE	INTERNAL DIMENSIONS [mm] & MANHOLE TYPE
FW116B	67.845	66.800 (1.045 DEPTH)	0.000	66.800 (150ø IN) 66.850 (150ø IN) 66.800 (150ø OUT)	E: 386898.815 N: 399871.351	450x450	D400	450ø PIC
FW116C	67.624	64.500 (3.124 DEPTH)	0.000	66.000 (150ø IN) 64.500 (150ø IN)	E: 386886.282 N: 399865.849	600x600	D400	1350ø PC Ring
FW117	69.463	68.775 (0.688 DEPTH)	0.000	68.825 (100ø IN) 68.825 (100ø IN) 68.775 (100ø IN) 68.775 (100ø OUT)	E: 386842.861 N: 399919.019	450x450 Recessed	C250	450ø PIC
FW118	69.463	68.750 (0.713 DEPTH)	0.000	68.750 (100ø IN) 68.800 (100ø IN) 68.800 (100ø IN) 68.750 (100ø OUT)	E: 386843.438 N: 399918.202	450x450 Recessed	C250	450ø PIC
FW119	69.474	68.200 (1.274 DEPTH)	0.000	68.200 (100ø IN) 68.250 (100ø IN) 68.250 (100ø IN) 68.200 (100ø OUT)	E: 386868.352 N: 399882.990	450x450 Recessed Restricted to 350ø	C250	450ø PIC
FW120	69.474	68.175 (1.299 DEPTH)	0.000	68.175 (100ø IN) 68.225 (100ø IN) 68.225 (100ø IN) 68.175 (100ø OUT)	E: 386868.929 N: 399882.175	450x450 Recessed Restricted to 350ø	C250	450ø PIC
FW121	69.466	68.750 (0.716 DEPTH)	0.000	68.800 (100ø IN) 68.800 (100ø IN) 68.750 (100ø OUT)	E: 386861.104 N: 399941.520	450x450 Recessed	C250	450ø PIC
FW122	69.466	68.630 (0.836 DEPTH)	0.000	68.630 (100ø IN) 68.680 (100ø IN) 68.680 (100ø IN) 68.630 (100ø OUT)	E: 386863.870 N: 399937.611	450x450 Recessed	C250	450ø PIC
FW123	69.477	68.750 (0.727 DEPTH)	0.000	68.800 (100ø IN) 68.800 (100ø IN) 68.750 (100ø IN) 68.800 (100ø IN) 68.750 (100ø OUT)	E: 386877.068 N: 399920.154	450x450 Recessed	C250	450ø PIC
FW124	69.466	68.245 (1.221 DEPTH)	0.000	68.245 (100ø IN) 68.295 (100ø IN) 68.295 (100ø IN) 68.245 (100ø OUT)	E: 386881.580 N: 399912.572	450x450 Recessed Restricted to 350ø	C250	450ø PIC
FW125	69.466	68.220 (1.246 DEPTH)	0.000	68.220 (100ø IN) 68.270 (100ø IN) 68.270 (100ø IN) 68.220 (100ø OUT)	E: 386882.159 N: 399911.754	450x450 Recessed Restricted to 350ø	C250	450ø PIC
FW126	69.451	67.760 (1.691 DEPTH)	0.000	67.810 (100ø IN) 67.810 (100ø IN) 67.810 (100ø IN) 67.810 (100ø IN) 67.760 (150ø OUT)	E: 386896.300 N: 399891.761	450x450 Recessed Restricted to 350ø	C250	450ø PIC
FW127	69.444	68.820 (0.624 DEPTH)	0.000	68.870 (100ø IN) 68.870 (100ø IN) 68.820 (100ø OUT)	E: 386905.064 N: 399888.832	450x450	C250	450ø PIC
FW128	70.951	70.300 (0.651 DEPTH)	0.000	70.300 (100ø IN) 70.300 (100ø OUT)	E: 386918.311 N: 399917.051	450x450	D400	450ø PIC
FW129	71.036	70.300 (0.736 DEPTH)	0.000	70.300 (100ø IN) 70.300 (100ø OUT)	E: 387059.756 N: 400013.569	450x450	D400	450ø PIC

Notes:

- Do not scale from this drawing.
- In case of any discrepancies in drawings, details or bills, refer to engineers for clarification: unilateral decisions by the Contractor will not be accepted.
- This drawing is to be read in conjunction with all related Architects, Consultants & Sub-Contractors drawings and specifications.
- The Contractor is advised that all design drawings and information are to be read concurrently and any discrepancies or omissions reported directly to PTA's Civil Engineering Department.

THIS IS A 'RECORD DRAWING'. IT IS THE ISSUE OF A CONSTRUCTION DRAWING, WHICH INCLUDES THE INFORMATION THAT THE CONTRACTOR HAS SUPPLIED FORMALLY TO PTA TO SHOW THE CONTRACTOR'S "AS-BUILT" INFORMATION. THIS INFORMATION HAS NOT BEEN VERIFIED BY PTA. PTA HAVE RELIED UPON THE CONTRACTORS OBLIGATION TO CONSTRUCT GENERALLY IN ACCORDANCE WITH PTA'S DESIGN.



© Powell Tolner & Associates Ltd.
The contents of this drawing may not be reproduced in whole or in part without the prior written permission of Powell Tolner & Associates.

DRAWING STATUS
FOR CONSTRUCTION

C06	Record Issue.	LB	25.07.24	SLW
C05	FW Manholes Adjusted; FW102A & FW02B Added, FW101 Removed.	LB	07.06.24	SLW
C04	FW Manholes Adjusted; FW109A & FW09B Added.	LB	16.11.23	SLW
C03	Minor Cover Levels Adjustments.	LB	31.10.23	SLW
C02	Foul Water Network Adjustments; FW116A, FW116B & FW166C Added.	LB	29.09.23	LB
C01	Construction Issue.	LB	26.07.23	SLW
P02	Schedule Updated To Phase 1 Only.	LB	27.06.23	
P01	First Issue.	LB	19.03.21	

PROJECT TITLE				
Grimshaw Lane, Manchester				
DRAWING TITLE				
Phase 1 Foul Water Manhole Schedule				
DATE	March 2021	CHECKED DO	CHECKED ENG	PTA PROJ No
DRAWN	LB	LB	SLW	9762
SCALE	N/A			REVISION
DRG SIZE	A1			C06
DRAWING No				
9762-PTA-XX-XX-DR-C- 8161				

Below Ground Drainage Maintenance Plan



Powell Tolner & Associates Ltd

BELOW GROUND DRAINAGE MAINTENANCE PLAN

Project: Lowry Park, Grimshaw Lane, Manchester

PTA Project Ref: 9762

Document Ref: 9762-PTA-XX-XX-SP-C-9078

Status: For Record

Revision: C01

Date: July 2024

Client: A&H Construction & Developments plc



Issued by

PTA
29 Red Lion Street
Chesham
Buckinghamshire
United Kingdom
HP5 1EJ
Tel: + 44 1494 772721
central@ptaconsult.co.uk

	Name	Position	Signature	Date
Prepared by:	Luís Brito	Senior Civil Engineer	LB	06.10.2023
Reviewed by:	Alex Herman	Director	AH	06.07.2020
For and on behalf of Powell Tolner & Associates Limited				

Revision	Date	Description	Prepared	Reviewed
P01	06.10.23	Issued for Information	LB	AH
C01	24.07.24	Issued for Record.	LB	SLW

©This report is the copyright of PTA.

Any unauthorised reproduction or usage by any person other than the addressee is strictly prohibited.

TABLE OF CONTENTS

1	Introduction.....	1
2	Manholes, Inspection Chambers, Pipe Work, Drainage Channels & Gullies.....	2
3	Vortex Flow Control (<i>Hydro-brake</i>)	3
4	Attenuation Tanks (<i>AquaCrate</i>).....	4
5	Porous Paved Area	5
6	Proprietary Surface Water Treatment Devices (<i>Full Retention Oil Separator</i>)	6
7	Attenuation Pond	7
8	Construction Stage	8
	Appendix A – <i>Hydro-brake Vortex Flow Control Unit</i> Maintenance and Safety Data Sheet	9
	Appendix B – <i>SPEL Full Retention Separator</i> Commissioning, operation and maintenance.....	10

1 Introduction

Project Name: Lowry Park

Project Location: Grimshaw Lane, Manchester

PTA Job Number: 9762

This document has been prepared to provide a maintenance methodology to the surface water drainage elements proposed for this development. If any discrepancies from manufactures guidance is encountered, the proprietary system guidance should be adopted.

The drainage networks are comprised of gullies, drainage channels, vortex flow controls, cellular attenuation tanks, proprietary treatment systems & ponds together with connecting pipe network, manholes & inspection chambers. Refer to drawing 9762-PTA-XX-XX-DR-8100 – 8103 & 8111-8114 for the proposed drainage layouts.

Any man-entry into the system and silt removal should be by trained personnel with adequate personal protective equipment. Approved safety procedures must be followed in accordance with the Health and Safety Act.

This drainage systems maintenance will be the responsibility of the project developer or by an appointed maintenance company and as such an appropriated maintenance regime should be implemented (as below).

2 Manholes, Inspection Chambers, Pipe Work, Drainage Channels & Gullies

The surface water drainage system should be inspected and maintained periodically, primarily to check for silt sedimentation within the system or ingress of any detritus or debris which would decrease system performance. Table 1 sets out the recommended maintenance actions and frequency.

Maintenance schedule	Required action	Typical frequency
Regular Maintenance	Remove manhole and chamber covers to sewers and flow control on network– inspect to ensure water is flowing freely and that the water flow route is unobstructed. Remove debris and silt as required. Traps of the internal gullies within the carpark/ bin store/ cycle store area(s) to be topped up with mineral oil.	Half Yearly Undertake one of these inspections after leaf fall in autumn
Occasional Maintenance	None required	
Remedial Actions	Re-line or replace pipework if unable to clear blockages by jetting.	As required
Monitoring	Inspect chambers for build-up of silt and debris	Half yearly

Table 1 – Operation & maintenance requirements for pipe network, manholes & inspection chambers, drainage channels & gullies - Based on CIRIA SuDS Manual 2015

3 Vortex Flow Control (*Hydro-brake*)

Vortex flow controls typically rely on their geometry to create a vortex within the device to restrict the flow rate to a specified design point.

These systems have a larger cross-sectional area than that of a comparable orifice that is sized for the same design point, reducing the risk of blockage.

The products specified to be installed are Hydro-Brake Optimum MD-SHE-0178-1900-2125-1900, MD-SHE-0321-8000-3750-8000 & MD-SHE-0374-9500-1985-9500.

Table 2 sets out the recommended maintenance actions and frequency, refer appendix A for manufacture guidance notes.

Maintenance schedule	Required action	Typical frequency
Regular Maintenance	Inspect and identify if it is not operating correctly. If required, take remedial action.	Initially monthly for 3 months, then half yearly.
Remedial Actions	Repair/rehabilitate flow control.	As required.
Monitoring	Inspect chambers for build-up of silt and debris	Half yearly

Table 2 – Operation & maintenance requirements for vortex flow controls

4 Attenuation Tanks (*AquaCrate*)

Geocellular attenuation tanks are proposed, they are modular storage systems made with plastic units. These units can be assembled to achieve the required volume and usually on multiple layers. Generally, the units have 95% voids content and are used to create an efficient below ground structure to temporarily store surface water.

The products specified to be installed are AquaCrate 100 & 414 by Pennine Manufacturing Ltd.

Table 3 sets out the recommended maintenance actions and frequency.

Maintenance schedule	Required action	Typical frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then annually.
	Remove debris from the catchment surface (where it may cause risks to performance).	Monthly.
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockages by sediment, algae or other matter; remove and replace surface infiltration medium as required.	Annually.
	Remove sediments from pre-treatment structures and/or internal forebays.	Annually, or as required.
Remedial Actions	Repair/rehabilitate inlets, outlets, overflows and vents.	As required.
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed.	Annually
	Survey inside of tank for sediment build-up and remove if necessary.	Every 5 years or as required.

**Table 3 – Operation & maintenance requirements for attenuation storage tanks –
Based on CIRIA SuDS Manual 2015**

5 Porous Paved Area

The following Table 5 sets out the recommended maintenance actions and frequency for porous paved area. These areas should not be used as storage areas for topsoil, sand, etc without the use of a protective layer. The neglect of these areas is likely to reduce the efficiency of the means of drainage.

Maintenance schedule	Required action	Typical frequency
Regular Maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surfaces from adjacent impermeable areas as this are is most likely to collect the most sediment.
Occasional Maintenance	Stabilise and mow contributing and adjacent areas.	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements.
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the surface.	As required
	Remedial works to any depressions, rutting and cracked considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping.	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Inspect for evidence of poor operation and/or weed growth -if required, take remedial action	Three-monthly, 48 hours after large storms in the first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies.	Annually
	Monitor inspection chambers	Annually

Table 5 – Operation & maintenance requirements for Porous Paved Area - Based on CIRIA SuDS Manual 2015

6 Proprietary Surface Water Treatment Devices (*Full Retention Oil Separator*)

These are manufactured products to provide a treatment to the surface water by removing specific pollutants. The products specified to be installed: Full retention oil separator P200 1CSC by SPEL.

In the event of a spillage, the separator should be emptied. Emptying should be undertaken by a registered waste removal company, experienced in separator emptying.

Every five years, the separator should be emptied and given a general inspection to test its integrity and performance, after which the separator must be refilled with clean water.

A detailed log should be kept up when the separator has been inspected, maintained, emptied and serviced, along with records of any specific events relating to the system such as cleaning, spillages.

Failure to carry out the maintenance may result in pollution of the environment.

Table 6 sets out the recommended maintenance actions and frequency, refer appendix B for manufacture guidance notes.

Maintenance schedule	Required action	Typical frequency
Regular Maintenance	Remove litter and debris and inspect for sediment, oil and grease accumulation.	Monthly for 3 months, then annually.
	Change the filter media.	As recommended by manufacturer.
	Remove sediment, oil grease and floatables.	As necessary – indicated by system inspections or immediately following significant spill.
Remedial Actions	Replace malfunctioning parts or structures.	As required.
Monitoring	Inspect for evidence of poor operation.	Biannually
	Inspect filter media and establish appropriate replacement frequencies.	Biannually
	Inspect sediment accumulation rates and establish removal frequencies.	Monthly during first half year of operation, then every six months.

Table 6 – Operation & maintenance requirements for proprietary surface water treatment systems - Based on CIRIA SuDS Manual 2015

7 Attenuation Pond

The following Table 7 sets out the recommended maintenance actions and frequency for attenuation pond.

Maintenance schedule	Required action	Typical frequency
Regular Maintenance	Litter and debris removal.	Monthly
	Amenity grass 35-50mm for access, paths and visual requirements.	As required
	Grass cut to pond edges, access and overflows 75-100mm and not to exceed 150mm.	Monthly or as required.
	Wetland, meadow or rough grass cut at 50mm and remove to wildlife or compost piles.	Annually, or as required.
	Cut pond vegetation if required and no more than 30% 100mm above pond base and remove to wildlife or compost piles	Annually, or as required.
	Inspect and clear inlets, outlets and control structures	Monthly
	Remove sediment from the base of the structures	Annually
Remedial Actions	Repair or replace inlets, outlets or control structures to design detail.	As required.
Monitoring	inlets, outlets pipes and control structures	Annually
	For sediment at the base of the structures	Monthly or as required.

**Table 7 – Operation & maintenance requirements for attenuation pond
(Based on CIRIA SuDS Manual 2015)**

8 Construction Stage

All recently installed drainage is to be checked at least once weekly via walkover survey during the full period of construction. All excess silts and debris to be removed and disposed of appropriately. Temporary covers to be installed in order to avoid any site debris entering the newly installed chambers, linear channel drains & pipework. Excavated materials should be placed in such a manner that any instability will not result in them directly entering the drainage network.

Appendix A – *Hydro-brake Vortex Flow Control Unit*
Maintenance and Safety Data Sheet

Hydro-Brake® Flow Control

Maintenance and Safety Data Sheet

Maintenance

Normally little maintenance is required as there are no moving parts within the Hydro-Brake® Flow Control. Experience has shown that if blockages occur they do so at the intake, and the cause on such occasions has been due to a lack of attention to engineering details such as approach velocities being too low, inadequate benching or the use of units below the minimum recommended size. Hydro-Brake® Flow Controls are fitted with a pivoting by-pass door, which allows the manhole chamber to be drained down should blockages occur. The smaller type conical units, below the minimum recommended size, are also supplied with rodding facilities or vortex suppressor pipes as standard.

Following installation of the Hydro-Brake® Flow Control it is vitally important that any extraneous material i.e. building materials are removed from the unit and the chamber. After the system is made live, and assuming that the chamber design is satisfactory, it is recommended that each unit be inspected monthly for three months and thereafter at six monthly intervals with hose down if required. If problems are experienced please do not hesitate to contact the company so that an investigation may be made.

Hydro-Brake® Flow Controls are typically manufactured from grade 304 Stainless Steel which has an estimated life span in excess of the design life of drainage systems.

Manual Handling

The handling of Hydro-Brake® Flow Controls should be in accordance with current legislation and regulations:

- The Health and Safety at Work Act 1972.
- The Management of Health and Safety at Work Regulations 1992.
- The manual Handling Operations Regulations 1992.

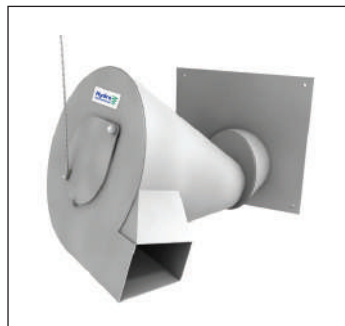
All published and printed by the Health and Safety Executive

COSHH

Hydro-Brake® Flow Controls are manufactured from Stainless Steel, which is not regarded as hazardous to health and exhibits no chemical hazard when used under normal circumstances for the stated applications.



Hydro-Brake® Flow Control "S" Range



Hydro-Brake® Flow Control "C" Range

www.hrdtec.com

HRD Technologies Ltd. Tootenhill House, Rathcoole, Co.Dublin

Tel: +353 1 4013964 Fax: +353 1 4013978

Email: enquiries@hrdtec.com Web: www.hrdtec.com

HRD Technologies Ltd is a subsidiary of Hydro International Plc

Hydro-Brake® - Maintenance & Safety Data Sheet B0613

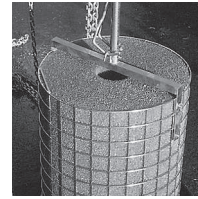
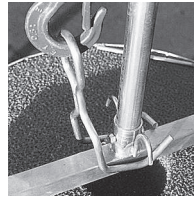
Stormwater Solutions

Turning Water Around...®

Appendix B – SPEL Full Retention Separator
Commissioning, operation and maintenance

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

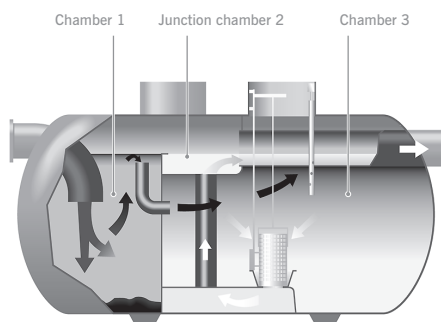
2 SPEL Stormceptor® by-pass separators

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.

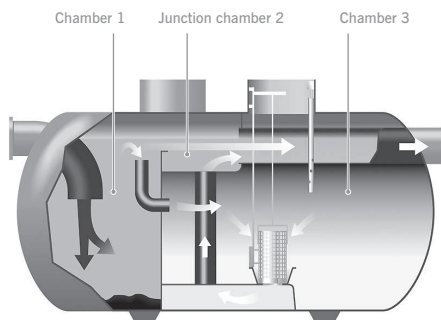
SPEL Stormceptor by-pass separators are manufactured in class 1 and class 2 models and with or without silt capacity in accordance with BS EN 858-1. The range of models is listed in section 6 of the SPEL data manual or on the SPEL Stormceptor selection chart – available on request.



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.

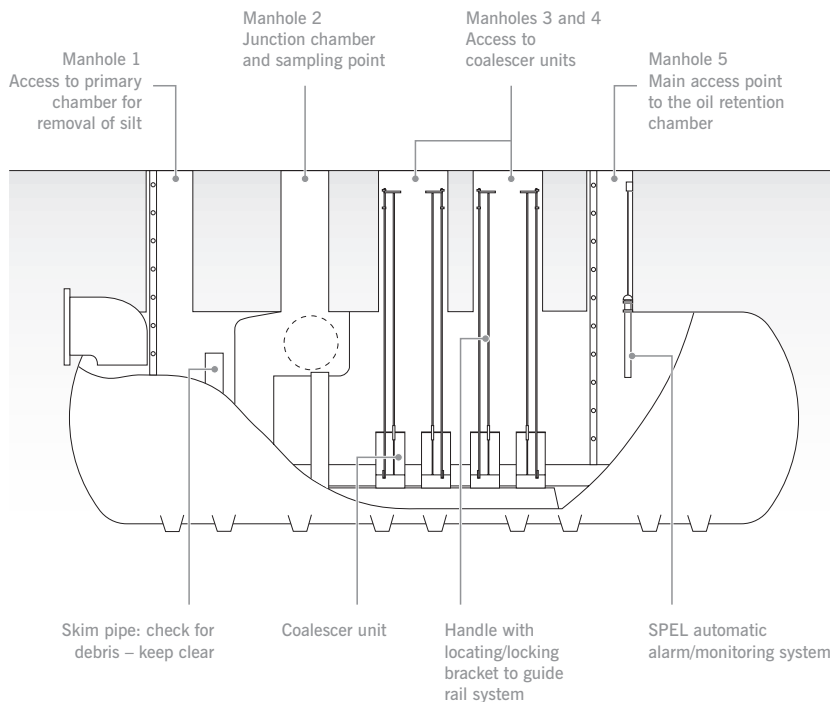
If coalescer units are incorporated, these should be removed and cleaned in accordance with the requirements set out on page 5.

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.

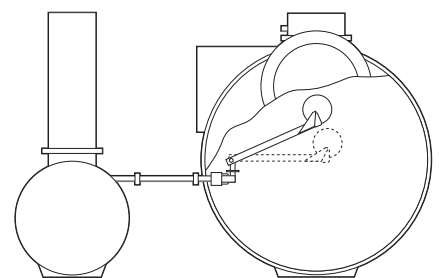
Manhole access 3 & 4 (larger models)

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.

4 SPEL full retention class 2 and Puraceptor® class 1 separators

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 2.

Two chamber models (Figure 2)

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

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.

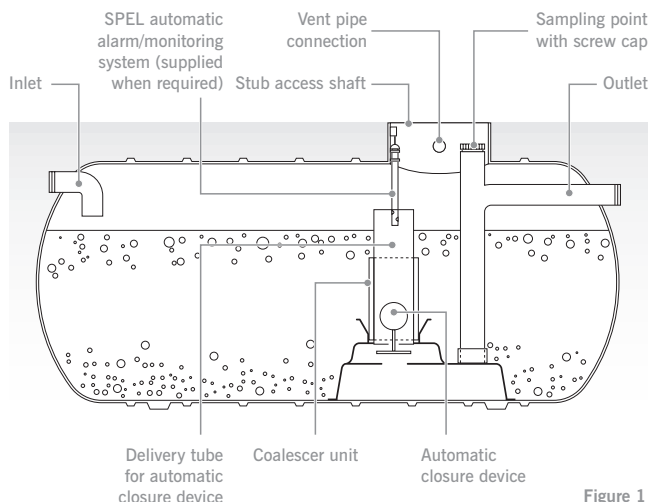


Figure 1

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.

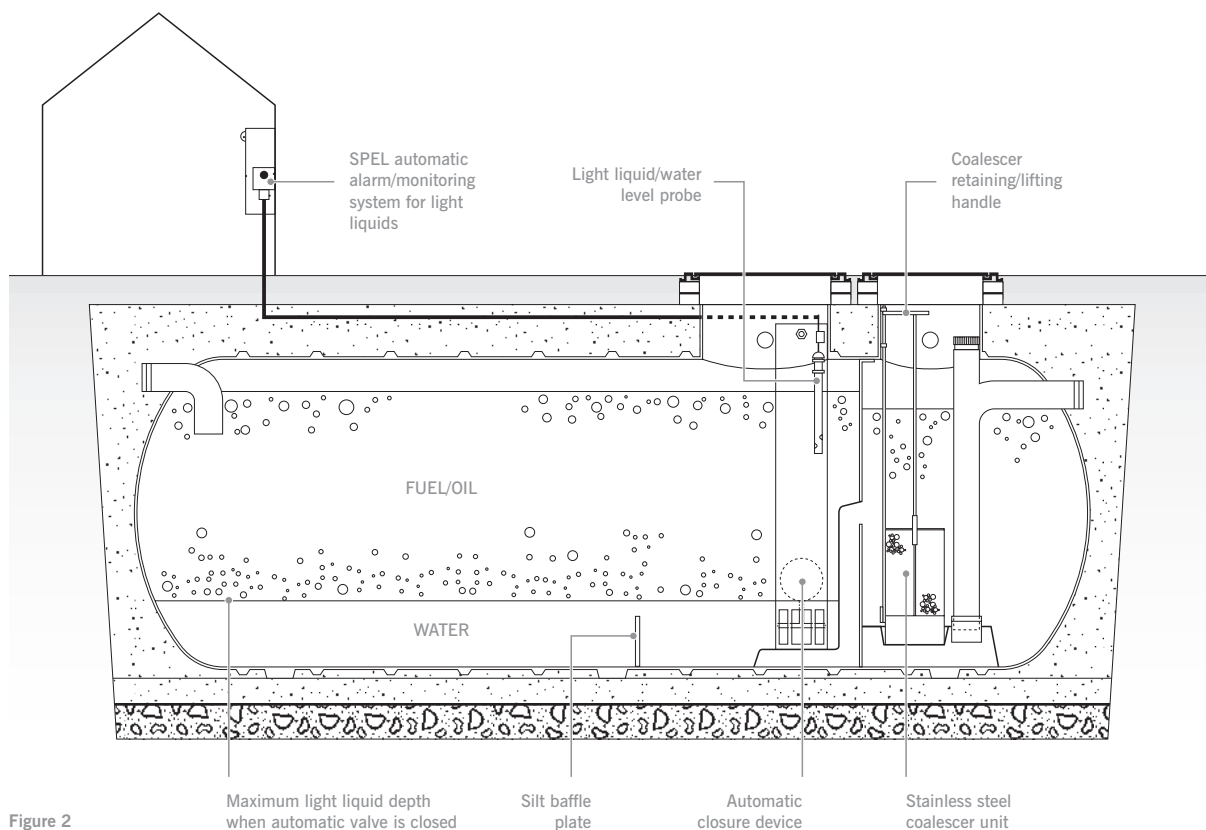


Figure 2

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.

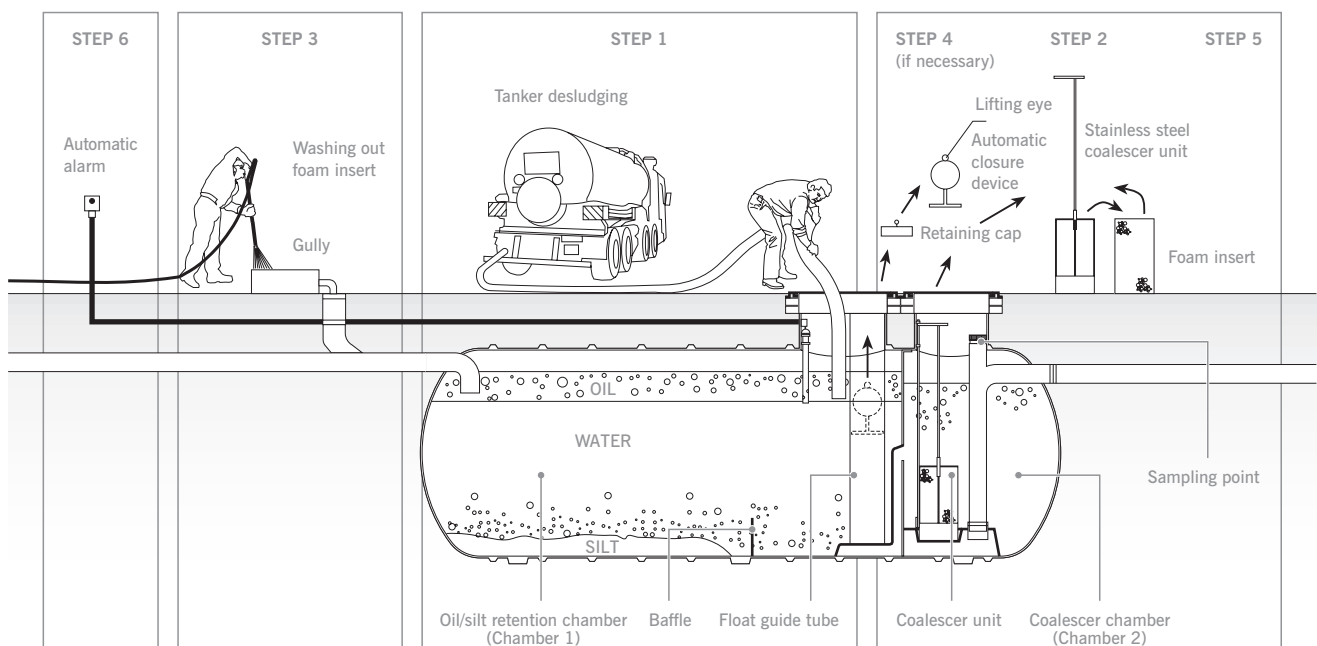
ACD closes off in emergency due to oil spill

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

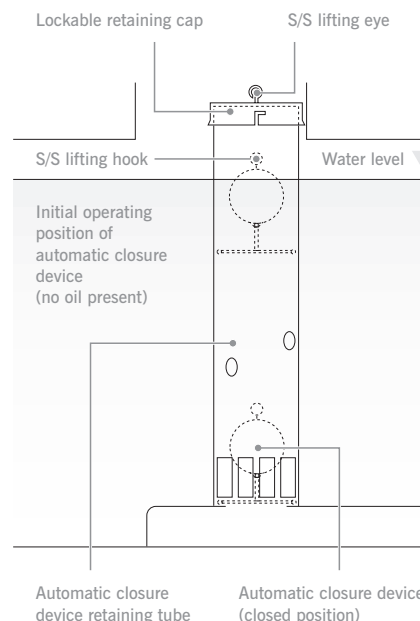
Where the ACD is already positioned in the unit, proceed as follows:

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.

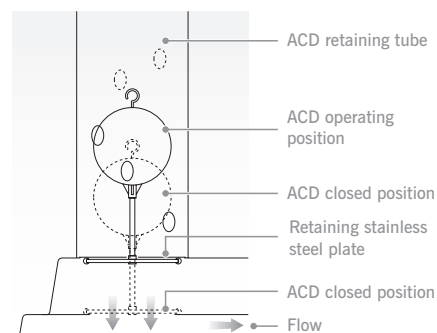
Maintenance

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.

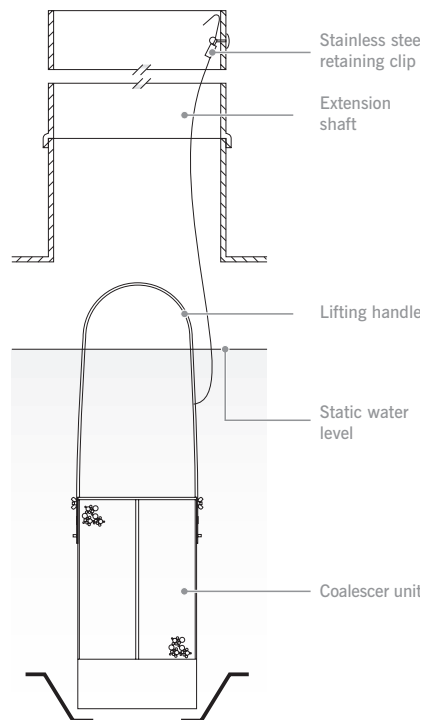


Figure 1

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

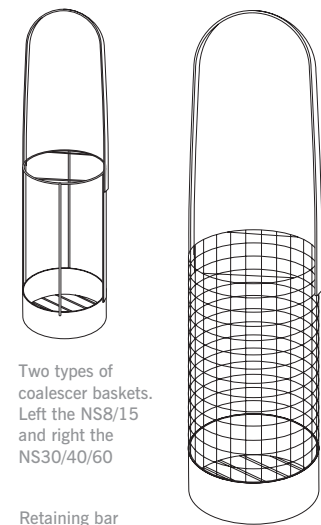
On completion of installation, check the foam insert is fitted inside the stainless steel coalescer unit (Fig 2) and the coalescer unit is inserted securely into the base socket.

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.

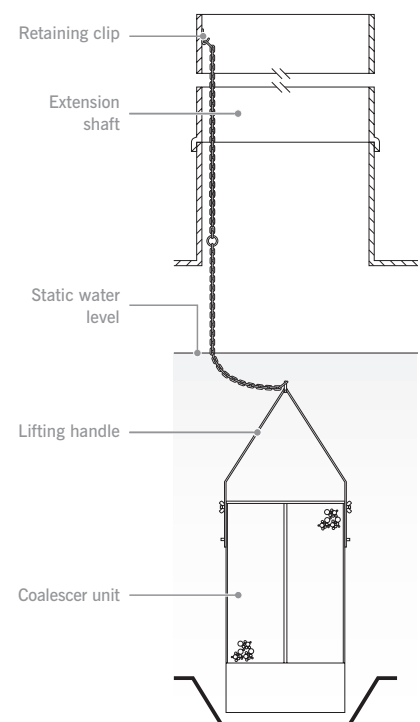
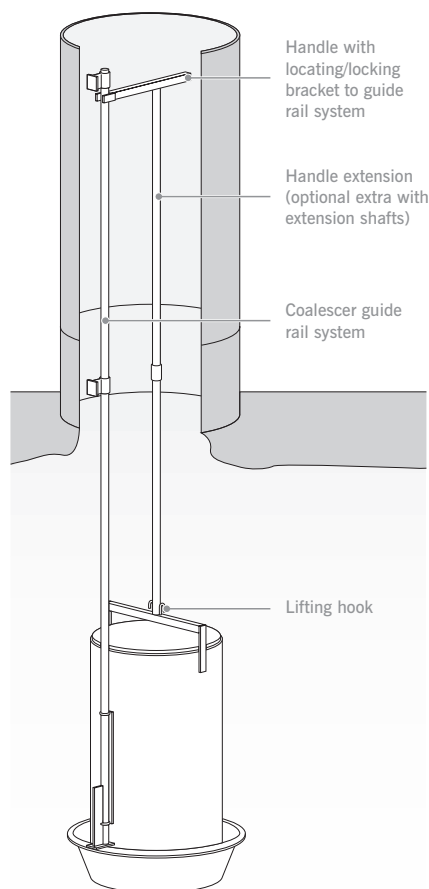


Figure 3

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.

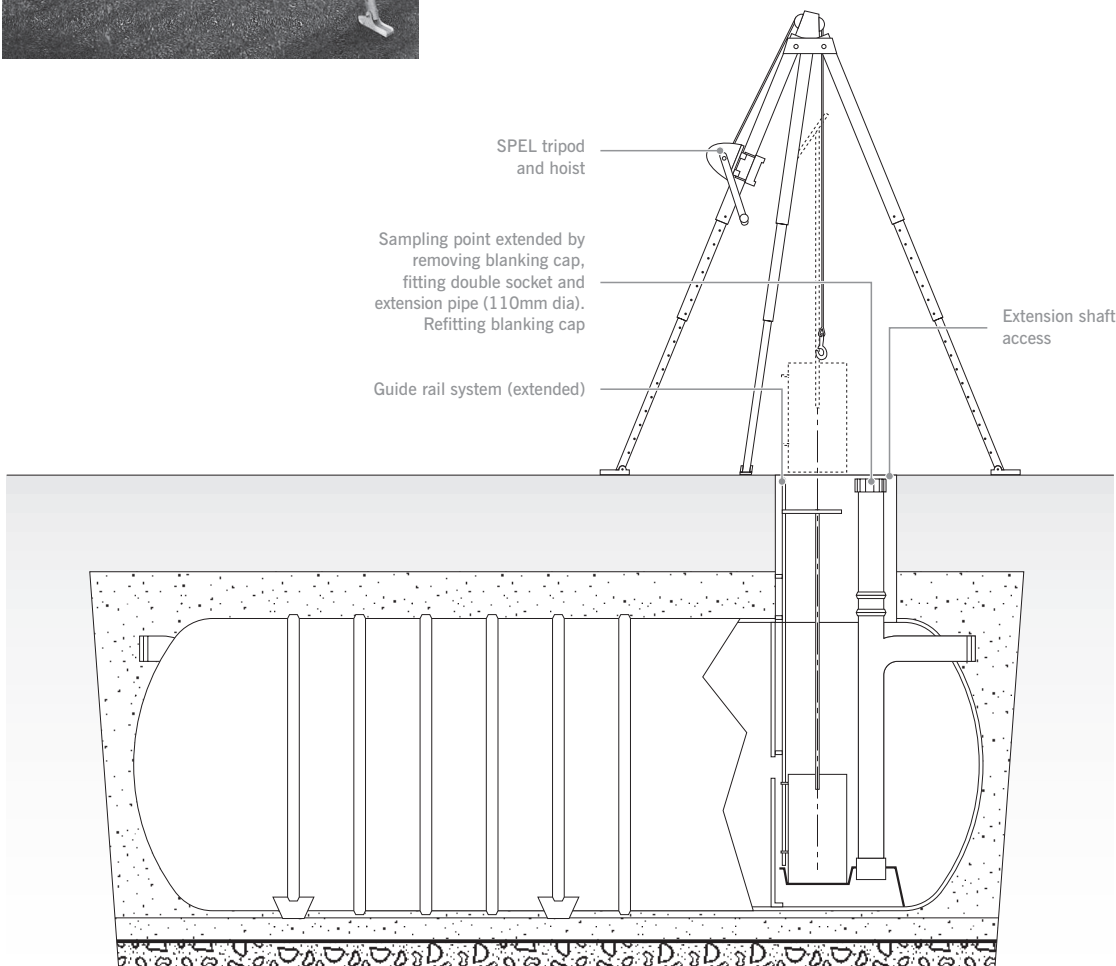
Note: The SPEL tripod and hoist can be used for servicing pumps incorporated in SPEL package pumping stations.

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.

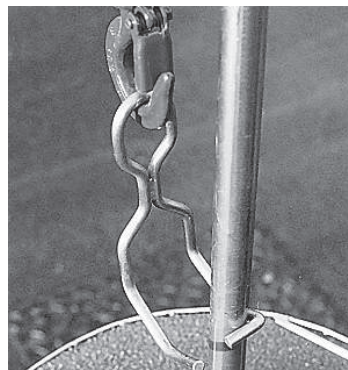


10 SPEL tripod and hoist

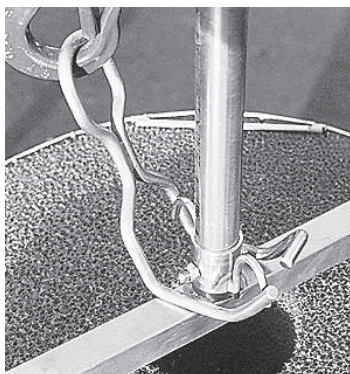
For maintenance of coalescer units

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

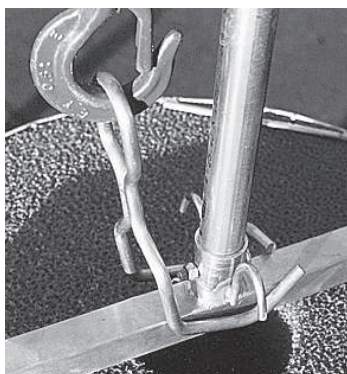
Step 1&2 – Snap the 'lifting hook' onto the SPEL lifting/locating/locking system handle shaft.



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



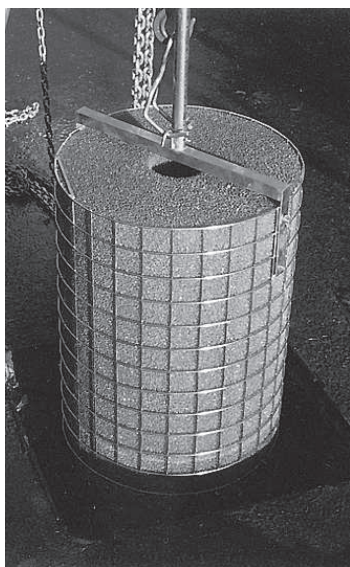
Step 4 – Swivel the hoist chain until the 'lifting hook' is at 90° to the bottom bracket, allowing it to pass the lifting hooks welded each side of the bottom bracket.



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.



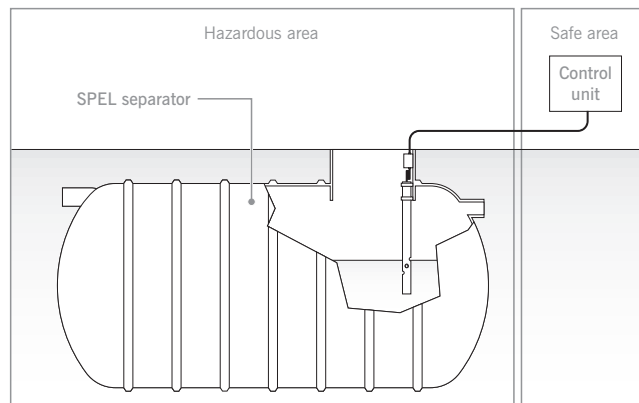
Step 8 – As the coalescer unit rises, steer the lifting handle past the tripod head and hoist to allow continued lifting of the coalescer unit.



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.

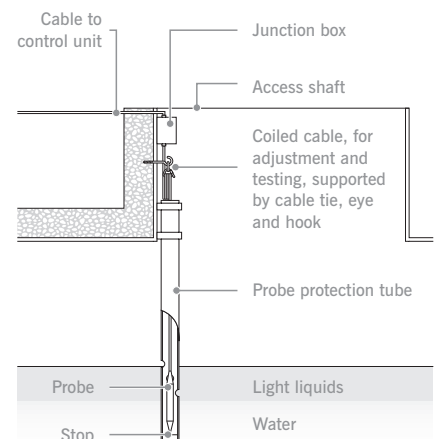
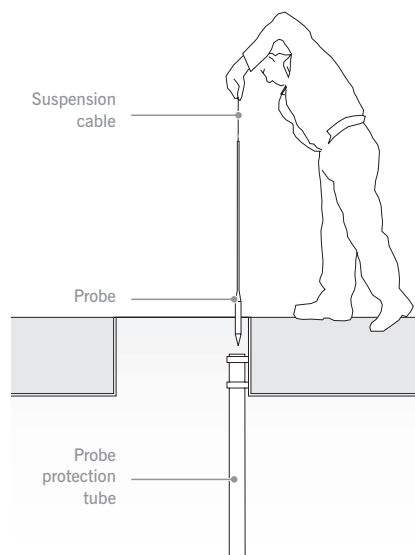
Installation

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.