

SURFACE WATER STRATEGY REPORT

**MFG NEWTON HEATH
ST MARYS ROAD
MANCHESTER
M40 3AR**

MARKS HEELEY LTD

NOVEMBER 2022

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MARKS HEELEY

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1.0 INTRODUCTION

1.1 Marks Heeley UK have been instructed by MFG Ltd to prepare a drainage strategy in respect of surface water drainage for the proposed electrical charging and jet bays at the petrol filling station known as MFG Newton Heath.

1.2 This report incorporates the following:

- Details of the strategy for the disposal of surface water on the site.
- An appropriate run-off rate and storage provision has been chosen.
- Demonstrate how surface water generated during events up to the 1 in 100 year event plus an allowance for climate change are managed.
- Details of the maintenance of SuDS features to demonstrate that all components will remain fully operational throughout the lifetime of the development.
- Construction details of SuDS features.

1.3 This report has been prepared to respond to the following planning conditions.

Prior to the commencement of development, details of a sustainable surface water drainage scheme and a foul water drainage schemes the Local Planning Authority. The drainage schemes must include:

- i. An investigation of the hierarchy of drainage options in the National Planning Practice Guidance (or any subsequent amendment thereof). This investigation shall include evidence of an assessment of ground conditions and the potential for infiltration of surface water in accordance with BRE365;
- ii. A restricted rate of discharge of surface water agreed with the local planning authority (if it is agreed that infiltration is discounted by the investigations);
- iii. Levels of the proposed drainage systems including proposed ground and finished floor levels in AOD;
- iv. Incorporate mitigation measures to manage the risk of sewer surcharge where applicable; and
- v. Foul and surface water shall drain on separate systems.

The approved schemes shall also be in accordance with the Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) or any subsequent replacement national standards. Prior to occupation of the proposed development, the drainage schemes shall be completed in accordance with the approved details and retained thereafter for the lifetime of the development.

2.0 EXISTING SITE

- 2.1 The existing site is located adjacent St Marys Road. The site is currently a petrol filling station, comprising of forecourt, jet bay and shop. It is proposed to construct 3no. jet wash bays South of the shop and electrical charge bays to the North.
- 2.2 The site falls from the South to North (parallel to St Marys Road) with a level change of 1M.

3.0 SITE GEOLOGY

- 3.1 From drift maps, bedrock geology consists of Collyhurst Sandstone formation- Sandstone, as Figure. 1.

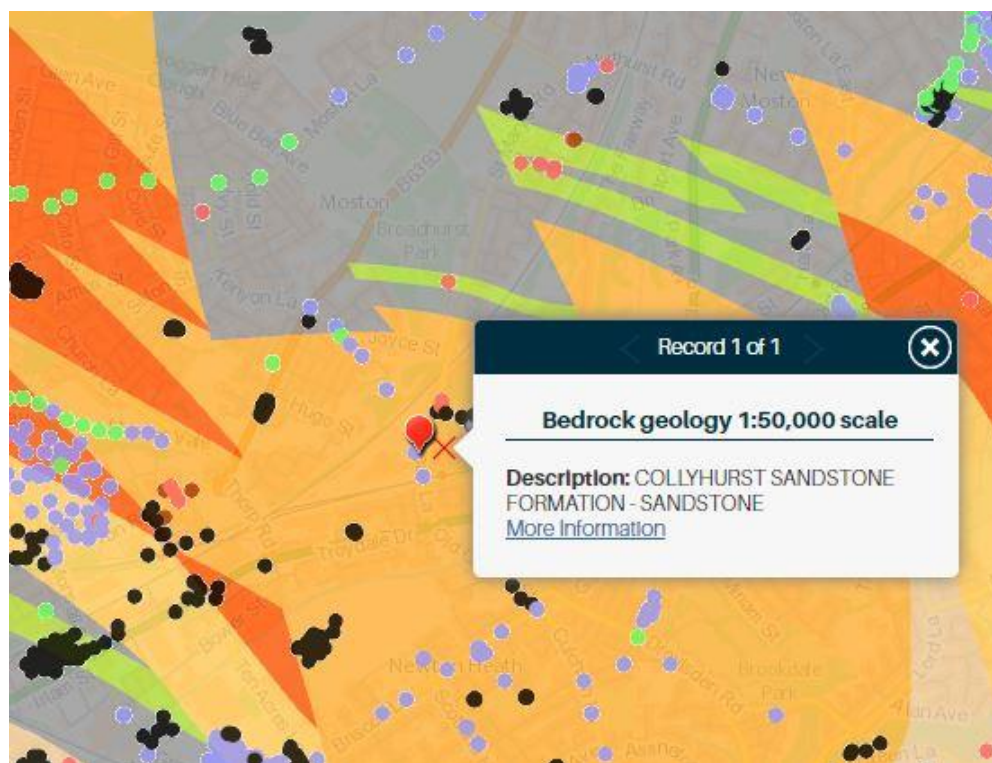


Figure. 1

- 3.2 Local boreholes within the area identify sandy clay to a depth of 5.2M over fine/medium sand, see Figure. 2.

Figure. 2

3.4 See Figure. 3 for an extract of United Utilities Asset Map showing the existing 750 dia. Combined public sewer.

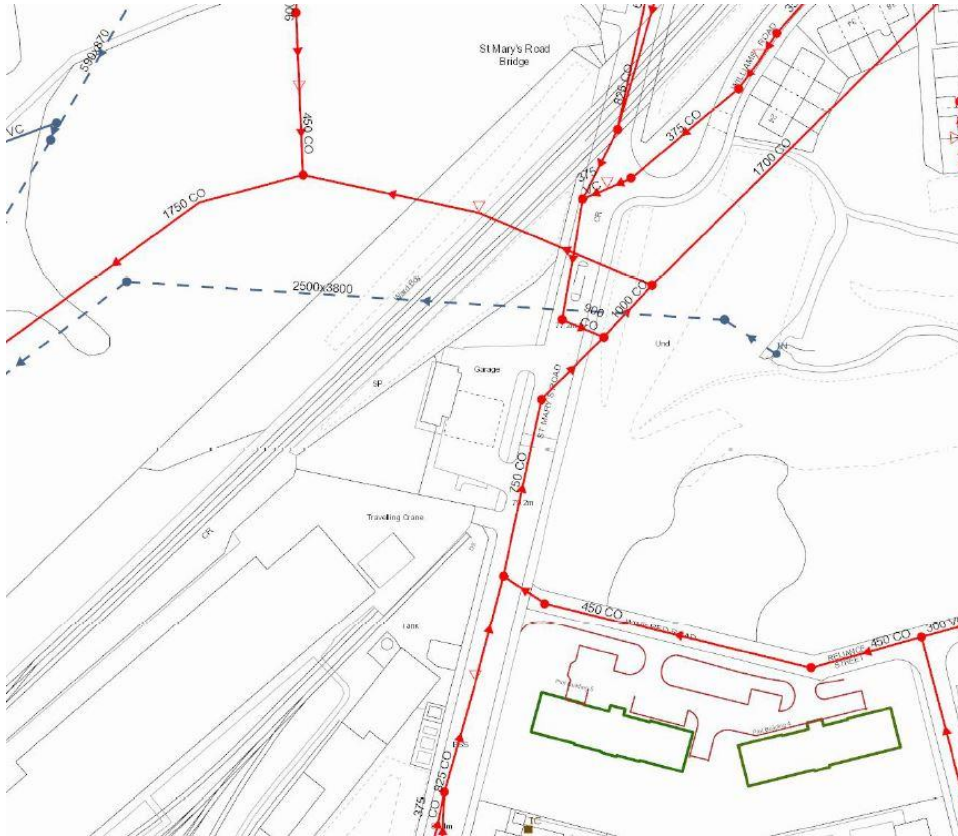


Figure. 3

4.0 PROPOSED DEVELOPMENT

- 4.1 The proposal is to construct EV charging bays, associated canopies and 3no. jet wash bays.
- 4.2 The Extent of existing hardstanding to the overall site is 892m² (0.089 Ha). Refer to Appendix 'A'.
- 4.3 The existing GPS drainage survey and existing drainage strategy can be found within Appendix 'B'.
- 4.4 The proposals extend this impermeable area to a total of 1104m² (0.11 Ha), an increase of 212m². Refer to Appendix 'C'.
- 4.5 Due to levels, the new treated and attenuated drainage catchment area will include 265m² (0.0265 Ha). Refer to Appendix 'D'.
- 4.6 New surface water drainage will be required to service this increased impermeable area created on site. The purpose of this document is to discuss these proposals.

5.0 PROPOSED SURFACE WATER DRAINAGE STRATEGY

- 5.1 Surface water run-off created by the proposals will need to be disposed of in the most appropriate way. This is to ensure the proposed development does not create additional run-off that could affect surrounding sites or put additional load on the existing sewer system which could cause surcharging in peak storm events.
- 5.2 Following the SuDS hierarchy, we have determined the most suitable method of providing surface water drainage to the proposed development.
- 5.3 Due to the bedrock geology, it is not feasible to infiltrate on site and as such this should be avoided. As there are no existing water courses in the vicinity, the surface water should be discharged to the surface water network
- 5.4 The PFS Design-Life is based on 50 years. As such climate change allowance is based on “Total Potential Change Anticipated for the 2050’s” (2040 to 2069) from table 2 within the government guidance of flood risk assessments. This demonstrates that a 10% climate change is required. This proposed scheme however provides a betterment to the requirement as it allows for 40% climate change.
- 5.5 As such, the drainage proposals have been based on provision of attenuation designed for a 1 in 100 year return period plus 40% additional allowance for climate change in accordance with Environment Agency guidelines. These will discharge to the existing surface water connection.
- 5.6 It is proposed that the storm water from the EV canopy and hard-standings will discharge through either gullies or drainage channel, on to an offline attenuation tank, hydro-brake at 1L/S and SDS Aquaswirl, before connecting back onto the existing on site SW network site where it will pass through the existing petrol interceptor and onto the public SW drain. We await a response from United Utilities regarding the additional surface area being served.
- 5.7 It is proposed that the jetwash bays are connected to the foul water network, via a wash separator. Again United Utilities have been notified, we await their response.
- 5.8 Incorporating the attenuation and restricted outflow to 1l/s across the 265m² area, the wider site does not increase in discharge rate. This is demonstrated on the catchment Appendix ‘D’.
- 5.9 Hydraulic Modelling calculations for the attenuation is included within Appendix ‘E’.
- 5.10 Proposed drainage drawings are included within Appendix ‘F’.

6.0 STORM WATER DRAINAGE COMPONENTS

- 6.1 Hydraulic Modelling calculations included in Appendix 'E' show the required attenuation size, based on a 1:100 year event +40% climate change.
- 6.2 It is proposed to install Hydro Stormbloccs (or SDS Geolight), wrapped in an impermeable membrane and surrounded in a single sized stone.
- 6.3 Construction details of the SuDS features are included in Appendix 'F'.
- 6.4 Discharge to the existing surface water network will be provided using a hydro-brake at 1L/S.

7.0 MAINTENANCE REQUIREMENTS

- 7.1 The MFG Site and all of its drainage is privately owned and maintained by MFG. It is the store managers responsibly to ensure that the drainage system is regularly inspected and maintained, in accordance with this plan. Appendix 'F' shows the layout of the drainage system including the location of each of the items requiring maintenance, listed in this plan and a summary of the maintenance requirements.
- 7.2 The majority of tasks can be completed by MFG's staff trained for each specific task. Training should include manual handling, for lifting manhole covers. Manholes & chambers can be dangerous due to trapped harmful gases and should not be entered unless staff are confined space trained and issued with appropriate equipment. Entering confined spaces should not normally be required and should be controlled by a permit to enter system administered by the store manager. It may be appropriate to rely on non-store based, specialist staff, on the rare occasions when confined space entry is required.
- 7.3 Maintenance of SuDS fits within an overall asset management process:
 - Mapping of SuDS assets
 - Inspection / monitoring
 - Routine light (regular) maintenance
 - Routine heavy (infrequent) maintenance
 - Remedial maintenance

There should also be regular reviews of maintenance regimes to ensure that they are being effective and the performance of the systems are being maintained. Such regular reviews may also allow maintenance to be reduced.

- 7.4 Most Manufactures provide guidance on the maintenance requirements for Engineered solutions. These include the following for this site; Premier Tech Aqua Forecourt separators, Hydro Stormbloc, Hydro-Brake, SDS Aqua-Swir. Refer to Appendix 'G' for the specific maintenance guides.

Catchpit Manholes and Gullies

- 7.5 Catchpit manholes and gullies need to be inspected on a monthly basis except during the autumn leaf fall when they may require inspections to be increased to fortnightly.
- 7.6 Equipment required for inspection includes, moveable barriers and cones to guard openings, manhole keys, gloves and a torch. A minimum of two people are required.
- 7.7 Catchpit manholes and gullies need to be emptied once the sump becomes half full. Emptying should be performed using a gulley emptying vacuum truck or similar device which does not require man entry.

Foul Water Manholes and Inspection Chambers

- 7.8 Foul water manholes and inspection chambers need to be inspected on a monthly basis or immediately if foul odours are present or there is a suspected blockage.
- 7.9 Equipment required for inspection includes moveable barriers and cones to guard openings, manhole keys, gloves and a torch. A minimum of two people are required.
- 7.10 If manholes show any signs of blockage, specialist contractors should be called for clearance work, without delay.

Drainage Channel Outlets

- 7.11 Drainage channel outlets need to be inspected on a monthly basis except during the autumn when leaf fall, may require inspections to be increased to fortnightly.
- 7.12 Equipment required for inspection includes moveable barriers and cones to guard openings, lifting tools, gloves and a torch. A minimum of two people are required.
- 7.13 Silt, leaves and debris should be cleared from the channel outlets during each inspection.

7.14 Surface Water Treatment

- 7.15 The Aqua-Swirl maintenance regime will be carried out in accordance with Appendix 'G'.
- 7.16 Inspection and maintenance of the attenuation crates is to be carried out in accordance with the manufacturer's recommendations, see Appendix 'G'.
- 7.17 Maintenance will also be required for the pump. This maintenance will include a service every 6 months to check for blockages as well as checking the impeller and control floats/ ultrasonic head. This should be agreed by the pump provider.

Drainage Inspection and Maintenance Records

- 7.18 Appendix 'H' includes the annual drainage record log sheet. Copies should be taken of the log sheet for use for each year's records. Each inspection should be recorded on the log sheet for that year by the store manager. The log sheet shall be kept with this maintenance plan in the store manager's office for inspection.

8.0 MAINTENANCE RESPONSIBILITY

- 8.1 The responsibility for the enacting of this SuDS Maintenance Plan is entrusted to the owner of the property. The developer will provide this SuDS Maintenance Plan in addition to an Operation and Maintenance Manual to the onsite PFS management.
- 8.2 The Operation and Maintenance Manual shall be passed on to subsequent future owners of the PFS. This will include engineering drawings that detail the design and installation of the SuDS components so that persons undertaking any maintenance works will have a point of reference for the required specification of each of these. Where applicable, the engineering drawings shall make reference to this SuDS Maintenance Plan
- 8.3 Following construction but prior to practical completion, the responsibility for maintenance shall lie with the developer.

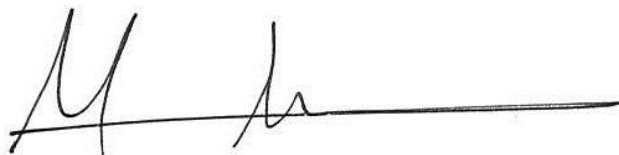
9.0 TIMESCALE FOR IMPLEMENTATION

- 9.1 The duties of maintenance will come into effect prior to occupation of the PFS, following practical completion and handover
- 9.2 Installation to be inspected immediately following the first storm event, whenever this should occur post installation.
- 9.3 Maintenance to be no less frequent than at monthly intervals for the first three months and thereafter:
 - A. Inspection / Monitoring Monthly
 - B. Regular Maintenance 2 Monthly Intervals
 - C. Infrequent Maintenance 6 Monthly Intervals

10.0 CONCLUSION

- 10.1 The drainage scheme has been based upon disposal of surface water runoff via the existing surface water connections on site, ensuring that no increase of flood risk will result from the proposed redevelopment.
- 10.2 The proposed attenuation storage is to accommodate run-off from a 1:100-year rainfall event plus a 40% additional allowance for climate change, in accordance with Environment Agency guidelines.
- 10.3 The proposed drainage network incorporates storm water pollution prevention measures such as, SDS Aqua-Swirl, and a Class 1 petrol interceptor.
- 10.4 Therefore, we consider the proposals acceptable from a surface water flooding and SuDS point of view.

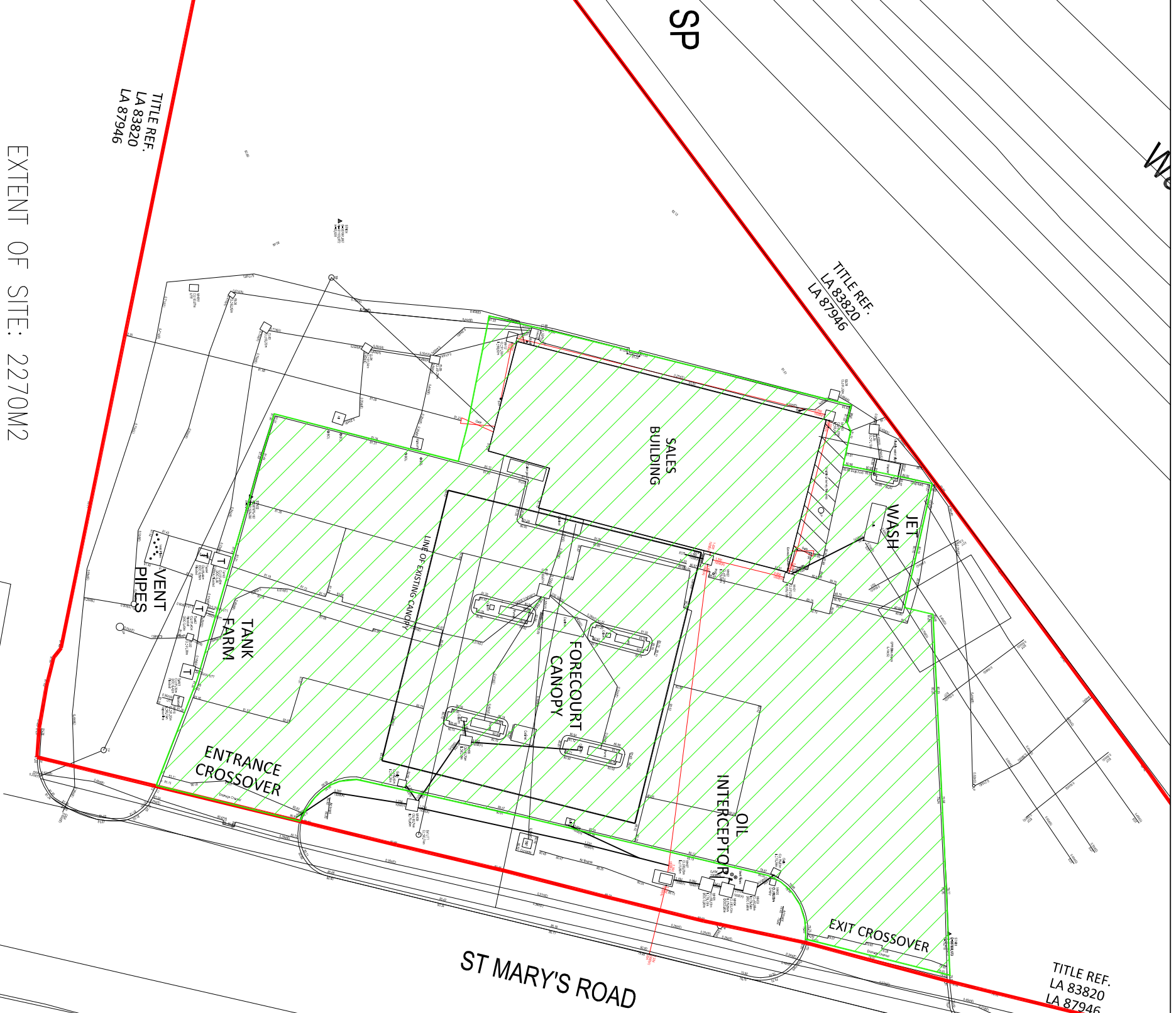
Author:

A handwritten signature in black ink, consisting of a stylized 'M' followed by a horizontal line and a small flourish.

Mark Newman
BSc (hons) (Eng.)

APPENDIX A

EXISTING HARD STANDING



TITLE REF.
LA 83820
LA 87946

TITLE REF.
LA 83820
~~LA 87946~~

ST MARY'S ROAD

TITLE REF.
LA 83820
LA 87946

Setting out dimensions, walls and levels to architects' drawings

- [illegible]

PRELIMINARY

[illegible]

©

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MBH

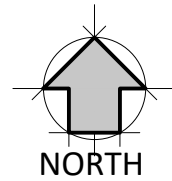
Project
MFG NEWTON HEATH
ST MARYS ROAD
MANCHESTER, M40 3AR

EXISTING SITE

Sheet Size	Original Scale	Designed/Drawn	Checked	Authorised
A1	As Shown	Date 00/00/00	Date 00/00/00	Date 00/00/00
Status	Drawing Number	Rev		
P	H16361-01	-		

APPENDIX B

EXISTING GPS DRAINAGE SURVEY & EXISTING DRAINAGE PHILOSOPHY



STANDARD DISCLAIMERS

- This drawing is based on all the available as built information for the site and the standard details available. Installation may be compromised by unforeseen elements encountered on site during installation of works.
- Contractors must follow good practice in locating and excavating around existing services and follow all necessary H&S procedures.
- Contractors must follow the routes and works shown on the attached plans unless discussed and agreed with the Project Manager & Architect.
- As constructed details must be returned to the Architect for production of as built layouts.

Scheme Based on Technics Underground Services Survey dated 11-02-2022

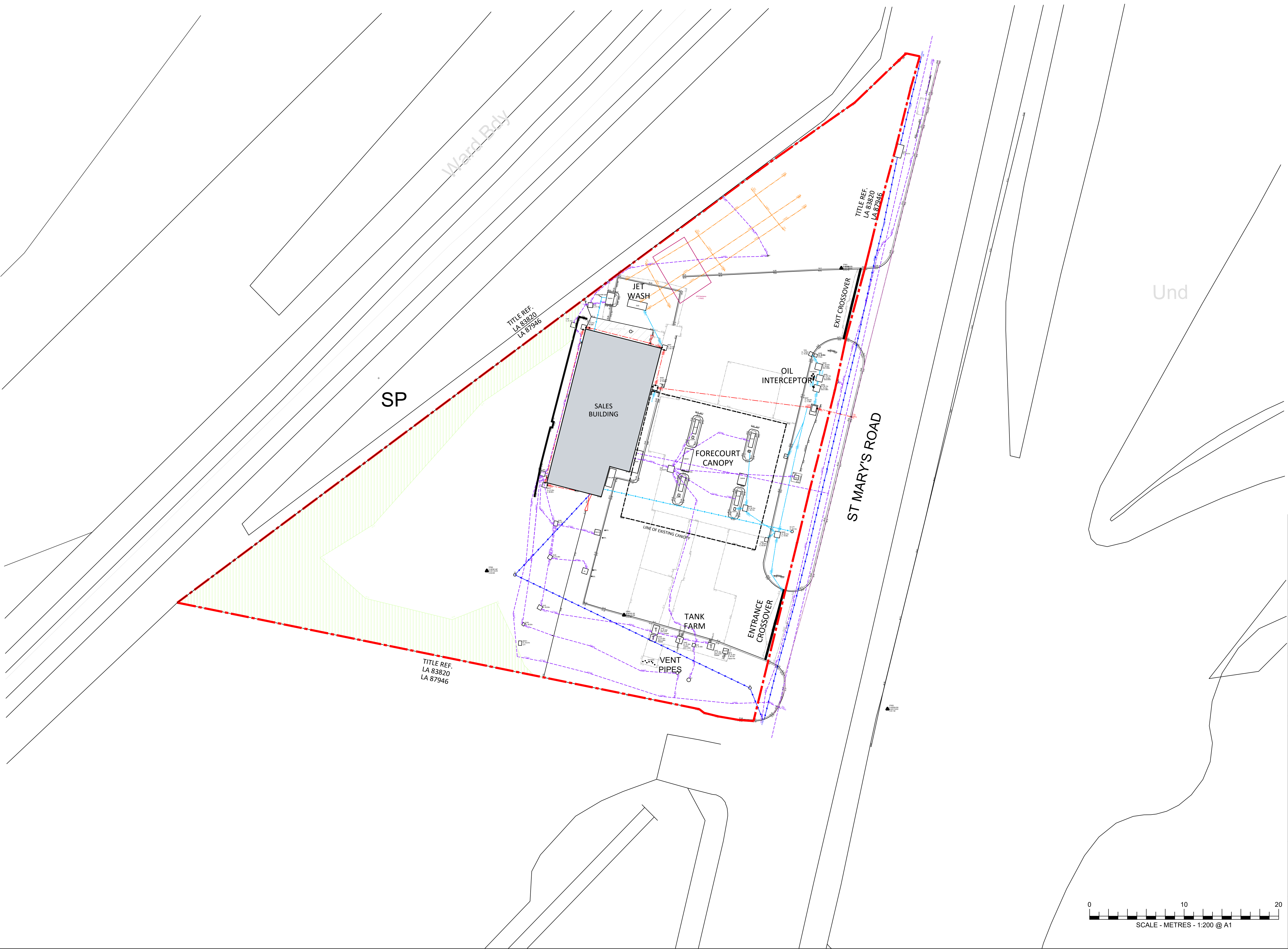
DRAWING NOTES

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This drawing has been produced for the project listed below, is submitted in support of this application application to the Local Planning Authority and is not intended for use by any other person or for any other purpose.

Every effort has been made to ensure the accuracy of these drawings, however MBH Design Studio Ltd. accept no responsibility for any discrepancies arising from the reuse of survey information and preliminary drawings commissioned by the Applicant from others.

- LEGEND**
- Existing Power Duct
 - Existing Data Duct
 - Existing Water Line
 - Unkown GRP
 - Existing BT Line
 - Existing Vent Line
 - Existing Surface water Drain
 - Existing Brown water Drain
 - Existing Combined water Drain
 - Existing Foul water Drain
 - Existing Fuel Lines
 - Existing Levels
 - Extents of Existing Tanks



REV	DATE	DESCRIPTION	DRAWN/CHECKED
REVISION NOTES			
TENDER			
mbh MBH Design Studio Ltd. Rosemount House, Rosemount Avenue, West Byfleet, Surrey, KT14 6LB www.mbhstd.com t: 01932 352 727 f: 01932 351 545 CLIENT mfg motor fuel group			
PROJECT FS080 NEWTON HEATH SERVICE STATION ST. MARY ROAD, NEWTON HEATH, MANCHESTER, M40 3AR			
DRAWING TITLE EXISTING SITE PLAN			
DRAWN BY TN	DATE 03.11.2022	SCALE 1:200	PAPER SIZE A1
CHECKED BY RRB	DRAWING NUMBER 13664-080-01	REV.	

APPENDIX C

HARD STANDING

Setting out dimensions,
walls and levels to
architects' drawings

EXTENT OF SITE: 2270M²
EXTENT OF PROPOSED HARD STANDING
DRAINING TO PUBLIC SEWER (SHOWN HATCHED) 1704M²
212M² INCREASE IN HARD STANDING

Ward Bdy

SP

ST MARY'S ROAD

SALES
BUILDING

FORECOURT
CANOPY

ENTRANCE
CROSSOVER

EXIT CROSSOVER

SUBSTATION
ENCLOSURE

MBH

MFG NEWTON HEATH
ST MARYS ROAD
MANCHESTER, M40 3AR

PROPOSED SITE

PRELIMINARY

MARKS
HIBBLEY

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PROPOSED SITE

Sheet Size	Original Scale	Designed/Drawn	Checked	Authorised
A1	As Shown	Date 00/00/00	Date 00/00/00	Date 00/00/00

Status	Drawing Number	Rev
P	H16361-02	-

- GENERAL NOTES:
1. This drawing is for general construction with all relevant drawings and specifications.
 2. The drawing shall not be used for any other purpose without the written permission of the Engineer.
 3. This drawing shall not be used for any other purpose without the written permission of the Engineer.
 4. Dimensions and locations shall be based on the site. Any discrepancies between this drawing and site conditions shall be brought to the attention of the Engineer for resolution prior to placing orders or
 5. All work shall comply with the Building Regulations and the requirements of the Local Authority.
 6. Current Codes of practice are British Standards.
 7. For materials of steel see BS 5950: Part 1.
 8. For design to be based upon the construction. Loading is assumed to be 10kN/m² S.N. in
 9. assumed to be based upon the construction. Loading is assumed to be 10kN/m² S.N. in
 10. assumed to be based upon the construction. Loading is assumed to be 10kN/m² S.N. in
 11. assumed to be based upon the construction. Loading is assumed to be 10kN/m² S.N. in
 12. assumed to be based upon the construction. Loading is assumed to be 10kN/m² S.N. in

APPENDIX D

PROPOSED CATCHMENT AREA

APPENDIX E

HYDRAULIC MODELLING



CLASS 1 PETROL INTERCEPTOR
Disconnect, decommission and remove the
existing Interceptor, replacing with new
Corder Class 1, 10,000L nom. capacity,
fitted with hydrocarbon alarm wired back
to shop, Blue Fibreite cover. Interceptor to
be bedded and surrounded in concrete.
225mm dia inlet + 225mm dia outlet

EXISTING CHANNEL
RE-CONNECTED VIA
NEW INTERCEPTOR,
ATTENUATION AND
AQUASWIRL

ATTENUATION
CRATES FULLY WRAPPED
IN IMPERMEABLE MEMBRANE
WELDED JOINTS
220x55x10m dp
(110m3) HGV loading
CRATES TO BE SUITABLE FOR HGV LOADING

EXISTING
INTERCEPTOR TO BE
MADE REDUNDANT

NH SW2
SOS AQUASWIRL
AS-2

Project:	Date: 06/12/2022		
	Designed by: J. Kusz	Checked by:	Approved By:
Report Details: Type: Junctions Phase: Phase	Company Address:		



Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)
Manhole	Manhole	586.789	-8.256	80.45	1.00
Manhole (1)	Manhole	602.401	-12.217	79.83	0.44
Manhole (2)	Manhole	601.391	-4.605	80.00	0.85
Manhole (3)	Manhole	599.644	-10.897	80.00	1.00
Manhole (4)	Manhole	598.44	-16.295	80.30	1.90
Manhole (5)	Manhole	599.916	-17.033	80.30	1.95
Manhole (6)	Manhole	602.673	-18.082	80.23	2.33

Name	Invert Level (m)	Chamber Shape	Diameter (m)	Manhole Locked
Manhole	79.45	Circular	0.90	☒
Manhole (1)	79.39	Circular	1.20	☐
Manhole (2)	79.15	Circular	0.90	☒
Manhole (3)	79.00	Circular	0.90	☒
Manhole (4)	78.40	Circular	1.20	☐
Manhole (5)	78.35	Circular	0.90	☒
Manhole (6)	77.90	Circular	1.20	☒

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
Manhole	Inlet	Catchment Area	(None)	No Restriction
Manhole (1)	Inlet	Catchment Area (2)	(None)	No Restriction
Manhole (2)	Inlet	Pipe (1)	(None)	No Restriction
	Inlet (1)	Catchment Area (1)	(None)	No Restriction
	Inlet (2)	Catchment Area (3)	(None)	No Restriction
Manhole (3)	Inlet	Pipe	(None)	No Restriction
	Inlet (1)	Pipe (2)	(None)	No Restriction
Manhole (4)	Inlet	Pipe (4)	(None)	No Restriction
Manhole (5)	Inlet	Pipe (5)	(None)	No Restriction
Manhole (6)	Inlet	Pipe (6)	(None)	No Restriction

Project:	Date: 06/12/2022		
	Designed by: J. Kusz	Checked by:	Approved By:
Report Details: Type: Junctions Phase: Phase	Company Address:		



Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
Manhole	Outlet	Pipe	Free Discharge
Manhole (1)	Outlet	Pipe (1)	Free Discharge
Manhole (2)	Outlet	Pipe (2)	Free Discharge
Manhole (3)	Outlet	Pipe (3)	Free Discharge
Manhole (4)	Outlet	Pipe (5)	Hydro-Brake®
	Invert Level (m)	78.40	
	Design Depth (m)	1.00	
	Design Flow (L/s)	1.0	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☐	
	Unit Reference	CHE-0045-1000-1000-1000	
Manhole (5)	Outlet	Pipe (6)	Free Discharge

Project:	Date: 06/12/2022		
	Designed by: J. Kusz	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Phase: Phase	Company Address:		



Tank

Type : Tank

Dimensions

Exceedence Level (m)	80.30
Depth (m)	1.80
Base Level (m)	78.50
Freeboard (mm)	0
Initial Depth (m)	0.00
Porosity (%)	99
Average Slope (1:x)	0.00
Total Volume (m³)	7.195

Depth (m)	Area (m²)	Volume (m³)
0.00	11.91	0.000
0.50	11.91	5.895

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (3)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (4)
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	3.04

Project:	Date: 06/12/2022		
	Designed by: J. Kusz	Checked by:	Approved By:
Report Details: Type: Connections Phase: Phase	Company Address:		



Name	From	To	Length (m)	Connection Type	Slope (1:x)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)
Pipe	Manhole	Manhole (3)	13.12	Pipe	29.164		0.6	100
Pipe (1)	Manhole (1)	Manhole (2)	7.68	Pipe	31.995		0.6	100
Pipe (2)	Manhole (2)	Manhole (3)	6.53	Pipe	43.533		0.6	100
Pipe (3)	Manhole (3)	Tank	2.52	Pipe	5.030		0.6	100
Pipe (4)	Tank	Manhole (4)	2.21	Pipe	22.141		0.6	100
Pipe (5)	Manhole (4)	Manhole (5)	1.65	Pipe	33.001		0.6	100
Pipe (6)	Manhole (5)	Manhole (6)	2.95	Pipe	6.556		0.6	100

Name	Upstream Cover Level (m)	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Flow Restriction (L/s)
Pipe	80.45	79.45	80.00	79.00	
Pipe (1)	79.83	79.39	80.00	79.15	
Pipe (2)	80.00	79.15	80.00	79.00	
Pipe (3)	80.00	79.00	80.30	78.50	
Pipe (4)	80.30	78.50	80.30	78.40	
Pipe (5)	80.30	78.40	80.30	78.35	1.10
Pipe (6)	80.30	78.35	80.23	77.90	

Project:	Date: 06/12/2022		
	Designed by: J. Kusz	Checked by:	Approved By:
Report Details: Type: Area Summary Phase: Phase	Company Address:		



Inflow Label	Connected To	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	Manhole	Time of Concentration	0.005	100	0	100	0.005
Catchment Area (1)	Manhole (2)	Time of Concentration	0.015	100	0	100	0.015
Catchment Area (2)	Manhole (1)	Time of Concentration	0.006	100	0	100	0.006
Catchment Area (3)	Manhole (2)	Time of Concentration	0.003	100	0	100	0.003
TOTAL			0.029				0.029

Project:	Date: 06/12/2022		
	Designed by: J. Kusz	Checked by:	Approved By:
Report Details: Type: Network Design Criteria Phase: Phase		Company Address:	



Flow Options

Peak Flow Calculation	(UK) Modified Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

FSR

Type: FSR

Return Period (years)	2.0
Region	England and Wales
M5-60 (mm)	18.0
Ratio R	0.358

Pipe Options

Lock Slope Options	None
Design Level	Level Inverts
Min. Cover Depth (m)	1.20
Min. Slope (1:x)	500.00
Max. Slope (1:x)	40.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	☐
Reduce Channel Depths	☐

Pipe Size Library

Default

Add. Increment (mm)	75
---------------------	----

Diameter (mm)	Min. Slope (1:x)	Max. Slope (1:x)
100	0.00	0.00
150	0.00	0.00

Project:	Date: 06/12/2022		
	Designed by: J. Kusz	Checked by:	Approved By:
Report Details: Type: Network Design Criteria Phase: Phase		Company Address:	



Manhole Options

Apply Offset	☐
Synchronise Manhole Invert Levels	☒

Manhole Size Library

Default

Diameter / Width

Connection (mm)	Diameter / Length (m)	Width (m)
0	1.20	0.00
375	1.35	0.00
500	1.50	0.00
750	1.80	0.00

Additional Sizing

Connection (mm)	900
Diameter / Length (m)	0.90
Width (m)	0.00

Depth

Depth (m)	Diameter / Length (m)	Width (m)
0.00	1.05	0.00
1.50	1.20	0.00

Access

Depth (m)	Ladder Protrusion (mm)
0.00	130
3.00	230

Benching Requirements

Landing Width (mm)	500
Benching Width (mm)	225

Project:	Date: 06/12/2022			
	Designed by: J. Kusz	Checked by:	Approved By:	
Report Details: Type: Outfall Details Phase: Phase	Company Address:			

Outfalls

Outfall	Outfall Type	Fixed Surcharged Level (m)	Level Curve
Manhole (6)	Free Discharge		

Project:	Date: 06/12/2022		
	Designed by: J. Kusz	Checked by:	Approved By:
Report Details: Type: Junctions Phase: Phase (1)	Company Address:		



Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)
Manhole	Manhole	586.789	-8.256	80.45	1.00
Manhole (1)	Manhole	602.401	-12.217	79.83	0.44
Manhole (2)	Manhole	601.391	-4.605	80.00	0.85
Manhole (3)	Manhole	599.644	-10.897	80.00	1.00
Manhole (4)	Manhole	598.44	-16.295	80.30	1.90
Manhole (5)	Manhole	599.916	-17.033	80.30	1.95
Manhole (6)	Manhole	602.673	-18.082	80.23	2.33

Name	Invert Level (m)	Chamber Shape	Diameter (m)	Manhole Locked
Manhole	79.45	Circular	0.90	☒
Manhole (1)	79.39	Circular	1.20	☐
Manhole (2)	79.15	Circular	0.90	☒
Manhole (3)	79.00	Circular	0.90	☒
Manhole (4)	78.40	Circular	1.20	☐
Manhole (5)	78.35	Circular	0.90	☒
Manhole (6)	77.90	Circular	1.20	☒

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
Manhole	Inlet	Catchment Area	(None)	No Restriction
Manhole (1)	Inlet	Catchment Area (2)	(None)	No Restriction
Manhole (2)	Inlet	Pipe (1)	(None)	No Restriction
	Inlet (1)	Catchment Area (1)	(None)	No Restriction
	Inlet (2)	Catchment Area (3)	(None)	No Restriction
Manhole (3)	Inlet	Pipe	(None)	No Restriction
	Inlet (1)	Pipe (2)	(None)	No Restriction
Manhole (4)	Inlet	Pipe (4)	(None)	No Restriction
Manhole (5)	Inlet	Pipe (5)	(None)	No Restriction
Manhole (6)	Inlet	Pipe (6)	(None)	No Restriction

Project:	Date: 06/12/2022		
	Designed by: J. Kusz	Checked by:	Approved By:
Report Details: Type: Junctions Phase: Phase (1)	Company Address:		



Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
Manhole	Outlet	Pipe	Free Discharge
Manhole (1)	Outlet	Pipe (1)	Free Discharge
Manhole (2)	Outlet	Pipe (2)	Free Discharge
Manhole (3)	Outlet	Pipe (3)	Free Discharge
Manhole (4)	Outlet	Pipe (5)	Hydro-Brake®
	Invert Level (m)	78.40	
	Design Depth (m)	1.00	
	Design Flow (L/s)	1.0	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☐	
	Unit Reference	CHE-0045-1000-1000-1000	
Manhole (5)	Outlet	Pipe (6)	Free Discharge

Project:	Date: 06/12/2022		
	Designed by: J. Kusz	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Phase: Phase (1)	Company Address:		



Tank

Type : Tank

Dimensions

Exceedence Level (m)	80.30
Depth (m)	1.80
Base Level (m)	78.50
Freeboard (mm)	0
Initial Depth (m)	0.00
Porosity (%)	99
Average Slope (1:x)	0.00
Total Volume (m³)	7.195

Depth (m)	Area (m²)	Volume (m³)
0.00	11.91	0.000
0.50	11.91	5.895

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (3)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (4)
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	3.04

Project:	Date: 06/12/2022		
	Designed by: J. Kusz	Checked by:	Approved By:
Report Details: Type: Connections Phase: Phase (1)	Company Address:		



Name	From	To	Length (m)	Connection Type	Slope (1:x)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)
Pipe	Manhole	Manhole (3)	13.12	Pipe	29.164		0.6	100
Pipe (1)	Manhole (1)	Manhole (2)	7.68	Pipe	31.995		0.6	100
Pipe (2)	Manhole (2)	Manhole (3)	6.53	Pipe	43.533		0.6	100
Pipe (3)	Manhole (3)	Tank	2.52	Pipe	5.030		0.6	100
Pipe (4)	Tank	Manhole (4)	2.21	Pipe	22.141		0.6	100
Pipe (5)	Manhole (4)	Manhole (5)	1.65	Pipe	33.001		0.6	100
Pipe (6)	Manhole (5)	Manhole (6)	2.95	Pipe	6.556		0.6	100

Name	Upstream Cover Level (m)	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Flow Restriction (L/s)
Pipe	80.45	79.45	80.00	79.00	
Pipe (1)	79.83	79.39	80.00	79.15	
Pipe (2)	80.00	79.15	80.00	79.00	
Pipe (3)	80.00	79.00	80.30	78.50	
Pipe (4)	80.30	78.50	80.30	78.40	
Pipe (5)	80.30	78.40	80.30	78.35	1.10
Pipe (6)	80.30	78.35	80.23	77.90	

Project:	Date: 06/12/2022		
	Designed by: J. Kusz	Checked by:	Approved By:
Report Details: Type: Area Summary Phase: Phase (1)		Company Address:	



Inflow Label	Connected To	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	Manhole	Time of Concentration	0.005	100	0	100	0.005
Catchment Area (1)	Manhole (2)	Time of Concentration	0.015	100	0	100	0.015
Catchment Area (2)	Manhole (1)	Time of Concentration	0.006	100	0	100	0.006
Catchment Area (3)	Manhole (2)	Time of Concentration	0.003	100	0	100	0.003
TOTAL			0.029				0.029

Project:	Date: 06/12/2022		
	Designed by: J. Kusz	Checked by:	Approved By:
Report Details: Type: Network Design Criteria Phase: Phase (1)		Company Address:	



Flow Options

Peak Flow Calculation	(UK) Modified Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

FSR

Type: FSR

Return Period (years)	2.0
Region	England and Wales
M5-60 (mm)	18.0
Ratio R	0.358

Pipe Options

Lock Slope Options	None
Design Level	Level Inverts
Min. Cover Depth (m)	1.20
Min. Slope (1:x)	500.00
Max. Slope (1:x)	40.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	☐
Reduce Channel Depths	☐

Pipe Size Library

Default

Add. Increment (mm)	75
---------------------	----

Diameter (mm)	Min. Slope (1:x)	Max. Slope (1:x)
100	0.00	0.00
150	0.00	0.00

Project:	Date: 06/12/2022		
	Designed by: J. Kusz	Checked by:	Approved By:
Report Details: Type: Network Design Criteria Phase: Phase (1)		Company Address:	



Manhole Options

Apply Offset	☐
Synchronise Manhole Invert Levels	☒

Manhole Size Library

Default

Diameter / Width

Connection (mm)	Diameter / Length (m)	Width (m)
0	1.20	0.00
375	1.35	0.00
500	1.50	0.00
750	1.80	0.00

Additional Sizing

Connection (mm)	900
Diameter / Length (m)	0.90
Width (m)	0.00

Depth

Depth (m)	Diameter / Length (m)	Width (m)
0.00	1.05	0.00
1.50	1.20	0.00

Access

Depth (m)	Ladder Protrusion (mm)
0.00	130
3.00	230

Benching Requirements

Landing Width (mm)	500
Benching Width (mm)	225

Project:	Date: 06/12/2022			
	Designed by: J. Kusz	Checked by:	Approved By:	
Report Details: Type: Outfall Details Phase: Phase (1)	Company Address:			

Outfalls

Outfall	Outfall Type	Fixed Surcharged Level (m)	Level Curve
Manhole (6)	Free Discharge		

Project:	Date: 06/12/2022			
	Designed by: J. Kusz	Checked by:	Approved By:	
Report Title: Analysis Criteria	Company Address:			

Runoff Type	Dynamic
Output Interval (mins)	1
Time Step	Default
Urban Creep (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

1:100 PLUS CLIMATE

Type: FSR

Region	England and Wales
M5-60 (mm)	18.0
Ratio R	0.360
Summer	☒
Winter	☒

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	40

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

1:30

Type: FSR

Region	England and Wales
M5-60 (mm)	18.0
Ratio R	0.359
Summer	☒
Winter	☒

Return Period

Return Period (years)	Increase Rainfall (%)
30.0	0

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project:	Date: 06/12/2022			
	Designed by: J. Kusz	Checked by:	Approved By:	
Report Title: Analysis Criteria	Company Address:			

FSR

Type: FSR

Region	England and Wales
M5-60 (mm)	18.0
Ratio R	0.358
Summer	☒
Winter	☒

Return Period

Return Period (years)	Increase Rainfall (%)
2.0	0

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project:	Date: 06/12/2022		
	Designed by: J. Kusz	Checked by:	Approved By:
Report Details: Type: Junctions Summary Phase: Phase	Company Address:		



Critical Storm

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
Manhole	FSR: 100 years: Increase Rainfall (%) +40: 120 mins: Winter	80.45	79.45	79.71	0.26	1.0	0.164	0.000	1.0	2.804	Surcharged
Manhole (1)	FSR: 100 years: Increase Rainfall (%) +40: 120 mins: Winter	79.83	79.39	79.71	0.32	1.2	0.361	0.000	1.2	3.400	Flood Risk
Manhole (2)	FSR: 100 years: Increase Rainfall (%) +40: 120 mins: Winter	80.00	79.15	79.71	0.56	4.4	0.356	0.000	4.4	12.674	Flood Risk
Manhole (3)	FSR: 100 years: Increase Rainfall (%) +40: 120 mins: Winter	80.00	79.00	79.71	0.71	5.4	0.450	0.000	5.4	15.474	Flood Risk
Manhole (4)	FSR: 100 years: Increase Rainfall (%) +40: 120 mins: Winter	80.30	78.40	79.71	1.31	2.4	1.476	0.000	1.1	11.403	Surcharged
Manhole (5)	FSR: 100 years: Increase Rainfall (%) +40: 60 mins: Winter	80.30	78.35	78.36	0.01	1.1	0.009	0.000	1.1	5.902	OK
Manhole (6)	FSR: 100 years: Increase Rainfall (%) +40: 15 mins: Summer	80.23	77.90	78.00	0.10	0.7	0.000	0.000	0.7	0.968	OK

Project:	Date: 06/12/2022		
	Designed by: J. Kusz	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Phase: Phase	Company Address:		



Critical Storm

Stormwater Control	Storm Event	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	FSR: 100 years: Increase Rainfall (%): +40: 120 mins: Winter	79.71	1.21	5.4	6.599	0.000	0.000	2.4	11.881	8	OK

Project:	Date: 06/12/2022		
	Designed by: J. Kusz	Checked by:	Approved By:
Report Details: Type: Connections Summary Phase: Phase	Company Address:		



Critical Storm

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe	FSR: 100 years: Increase Rainfall (%): +40: 15 mins: Winter	Pipe	Manhole	Manhole (3)	80.5	79.48	0.04	1.318	0.9	0.25	2.8	OK
Pipe (1)	FSR: 100 years: Increase Rainfall (%): +40: 15 mins: Winter	Pipe	Manhole (1)	Manhole (2)	79.8	79.46	0.10	1.598	0.5	0.31	3.4	OK
Pipe (2)	FSR: 100 years: Increase Rainfall (%): +40: 15 mins: Winter	Pipe	Manhole (2)	Manhole (3)	80.0	79.44	0.10	5.966	1.6	1.25	11.5	Surcharged
Pipe (3)	FSR: 100 years: Increase Rainfall (%): +40: 15 mins: Winter	Pipe	Manhole (3)	Tank	80.0	79.05	0.10	7.277	2.8	0.52	14.2	OK
Pipe (4)	FSR: 100 years: Increase Rainfall (%): +40: 30 mins: Winter	Pipe	Tank	Manhole (4)	80.3	79.44	0.10	3.558	0.8	0.25	3.3	Surcharged
Pipe (5)	FSR: 100 years: Increase Rainfall (%): +40: 60 mins: Winter	Pipe	Manhole (4)	Manhole (5)	80.3	79.64	0.02	5.915	1.1	0.1	1.1	Surcharged
Pipe (6)	FSR: 100 years: Increase Rainfall (%): +40: 60 mins: Winter	Pipe	Manhole (5)	Manhole (6)	80.3	78.36	0.06	5.902	0.2	0.05	1.1	OK

Project:	Date: 06/12/2022		
	Designed by: J. Kusz	Checked by:	Approved By:
Report Details: Type: Junctions Summary Phase: Phase (1)	Company Address:		



Critical Storm

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
Manhole	FSR: 100 years: Increase Rainfall (%) +40: 120 mins: Winter	80.45	79.45	79.71	0.26	1.0	0.164	0.000	1.0	2.804	Surcharged
Manhole (1)	FSR: 100 years: Increase Rainfall (%) +40: 120 mins: Winter	79.83	79.39	79.71	0.32	1.2	0.361	0.000	1.2	3.400	Flood Risk
Manhole (2)	FSR: 100 years: Increase Rainfall (%) +40: 120 mins: Winter	80.00	79.15	79.71	0.56	4.4	0.356	0.000	4.4	12.674	Flood Risk
Manhole (3)	FSR: 100 years: Increase Rainfall (%) +40: 120 mins: Winter	80.00	79.00	79.71	0.71	5.4	0.450	0.000	5.4	15.474	Flood Risk
Manhole (4)	FSR: 100 years: Increase Rainfall (%) +40: 120 mins: Winter	80.30	78.40	79.71	1.31	2.4	1.476	0.000	1.1	11.403	Surcharged
Manhole (5)	FSR: 100 years: Increase Rainfall (%) +40: 60 mins: Winter	80.30	78.35	78.36	0.01	1.1	0.009	0.000	1.1	5.902	OK
Manhole (6)	FSR: 100 years: Increase Rainfall (%) +40: 15 mins: Summer	80.23	77.90	78.00	0.10	0.7	0.000	0.000	0.7	0.968	OK

Project:	Date: 06/12/2022		
	Designed by: J. Kusz	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Phase: Phase (1)		Company Address:	



Critical Storm

Stormwater Control	Storm Event	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	FSR: 100 years: Increase Rainfall (%): +40: 120 mins: Winter	79.71	1.21	5.4	6.599	0.000	0.000	2.4	11.881	8	OK

Project:	Date: 06/12/2022		
	Designed by: J. Kusz	Checked by:	Approved By:
Report Details: Type: Connections Summary Phase: Phase (1)	Company Address:		

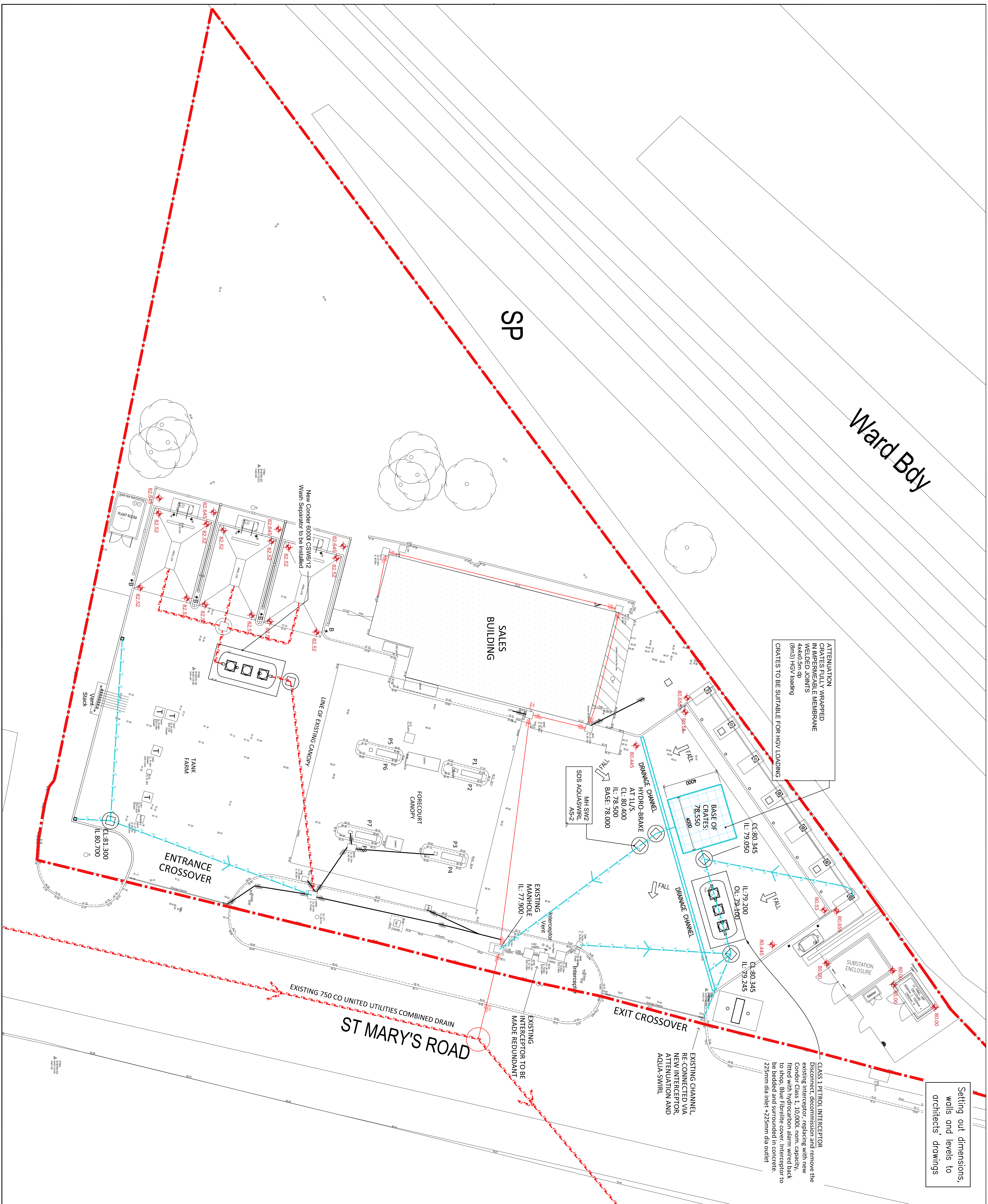


Critical Storm

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe	FSR: 100 years: Increase Rainfall (%): +40: 15 mins: Winter	Pipe	Manhole	Manhole (3)	80.5	79.48	0.04	1.318	0.9	0.25	2.8	OK
Pipe (1)	FSR: 100 years: Increase Rainfall (%): +40: 15 mins: Winter	Pipe	Manhole (1)	Manhole (2)	79.8	79.46	0.10	1.598	0.5	0.31	3.4	OK
Pipe (2)	FSR: 100 years: Increase Rainfall (%): +40: 15 mins: Winter	Pipe	Manhole (2)	Manhole (3)	80.0	79.44	0.10	5.966	1.6	1.25	11.5	Surcharged
Pipe (3)	FSR: 100 years: Increase Rainfall (%): +40: 15 mins: Winter	Pipe	Manhole (3)	Tank	80.0	79.05	0.10	7.277	2.8	0.52	14.2	OK
Pipe (4)	FSR: 100 years: Increase Rainfall (%): +40: 30 mins: Winter	Pipe	Tank	Manhole (4)	80.3	79.44	0.10	3.558	0.8	0.25	3.3	Surcharged
Pipe (5)	FSR: 100 years: Increase Rainfall (%): +40: 60 mins: Winter	Pipe	Manhole (4)	Manhole (5)	80.3	79.64	0.02	5.915	1.1	0.1	1.1	Surcharged
Pipe (6)	FSR: 100 years: Increase Rainfall (%): +40: 60 mins: Winter	Pipe	Manhole (5)	Manhole (6)	80.3	78.36	0.06	5.902	0.2	0.05	1.1	OK

APPENDIX F

PROPOSED DRAINAGE PLAN



Setting out dimensions, walls and levels to architects' drawings

ATTENUATION
CRATES FULLY WRAPPED
IN IMPERMEABLE MEMBRANE
WELDED JOINTS
4x4x0.5m dp
(8m³) HGV loading

CLASS 1 PETROL INTERCEPTOR
Disconnect, decommission and remove the existing Interceptor, replacing with new Condor Class 1, 10,000l nom. capacity, fitted with hydrocarbon alarm wired back to shop. Blue fireline cover. Interceptor to be bedded and surrounded in concrete. / 225mm dia inlet +225mm dia outlet

GENERAL NOTES:

1. The drawing is complete.
2. The drawing is in conformance with all relevant drawings and specifications.
3. The drawing is clear and legible.
4. The drawing is free from errors and omissions.
5. The drawing is free from ambiguities and contradictions.
6. The drawing is free from unnecessary details and information.
7. The drawing is free from irrelevant information.
8. The drawing is free from superfluous information.
9. The drawing is free from redundant information.
10. The drawing is free from conflicting information.
11. The drawing is free from inconsistent information.
12. The drawing is free from contradictory information.
13. The drawing is free from conflicting interests.
14. The drawing is free from conflicting objectives.
15. The drawing is free from conflicting values.

PRELIMINARY

[illegible]

THE STAGES
CANNON MULL LANE
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CONSULTING STRUCTURAL AND CIVIL ENGINEERS

MBH

Project
MFG NEWTON HEATH
ST MARYS ROAD
MANCHESTER, M40 3AR

PROPOSED DRAINAGE

Sheet Size	Original Scale	Designed/Drawn	Checked	Authorised
A1	As Shown	Date 00/00/00	Date 00/00/00	Date 00/00/00
Status	Drawing Number	Rev		
P	H16361-04	A		

APPENDIX G

SuDs FEATURES MAINTENANCE DETAILS

SDS Aqua-Swirl™

Hydrodynamic Vortex Separator

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

SYMBiotic™

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

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



SDS Aqua-Swirl™ is sized according to water quality treatment flow rates which are based on the initial movement of pollutants into the storm drainage system. This flow rate typically represents approximately 90% to 95% of the total pollutants in the runoff volume.

The treatment flow rate of the SDS Aqua-Swirl™ system is engineered to meet or exceed the local water quality treatment criteria and form an intrinsic part of the SuDS solution train.

Features	Benefits
Available with performance monitoring via SDS SYMBiotIC™.	Provides bespoke suite of operating data, such as silt levels and pollutants, viewable via a secure web portal dashboard with live notifications via email and text.
BBA HAPAS certified.	Approved for installation under roads and pavements; adoptable by the Highways Agency.
Manufactured from HDPE high strength plastic Weholite.	Offers a durable, light weight and low cost alternative to concrete. Easy and quick to install resulting in substantial cost savings.
Specialised sealed baffle.	Delivers the most effective performance of any vortex separator.
Internal bypass with pollution retention.	Able to treat localised rain and larger storm events while retaining captured pollutants.
NJDEP verified performance.	Verification accepted by UK Government environmental regulators (as cited in the CIRIA C753 SuDS Manual).
Single swirl chamber.	Simplifies inspection and maintenance facilities with no special equipment required.
Compact dimensions.	Reduces ground excavation and product installation costs.
Small footprint design.	Can be retro-fitted with minimal disruption to existing infrastructure utilities or surface features, extending the ability to meet new regulations.
Certified installation lifting supports.	Easy installation without the need for large, expensive cranes.
Suitable for use during site construction programme.	Can be put into operation prior to completion of the site build, with the inclusion of a planned maintenance schedule.
Available in 9 different standard sizes and also bespoke.	Provides greater design flexibility and assists the removal of sediments at a greater rate than comparable systems.

SPECIFICATIONS

SDS Aqua-Swirl™ Model No.	Maximum ID pipe connection (mm) BYP ¹	Chamber Internal Diameter (mm)	Water Quality Treatment Flow Rate NJDEP (L/s) Fine	Water Quality Treatment Flow Rate (L/s) OK110 Coarse	Oil/debris storage capacity litres	Sediment storage capacity m ³	Aqua-Swirl™ Weight kg
AS-2	375	750	16	30	136	0.3	300
AS-3	500	1050	31	53	416	0.6	700
AS-4	600	1200	40	77	644	0.8	1000
AS-5	750	1500	63	120	1382	1.3	1100
AS-6	900	1800	91	173	1439	1.8	1400
AS-7	1050	2100	123	235	1987	2.5	1700
AS-8	1200	2400	161	307	2612	3.3	2200
AS-9	1350	2800	220	418	3596	4.4	2600
AS-10	1500	3000	252	480	4164	5.1	3100

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

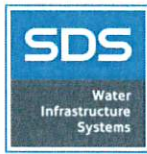
Notes:

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

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

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

A-S DS/0819



Installation & Maintenance

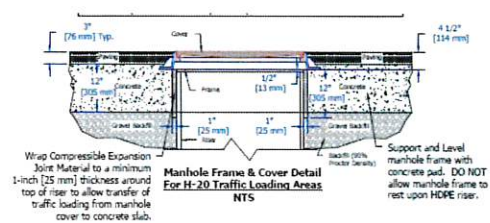
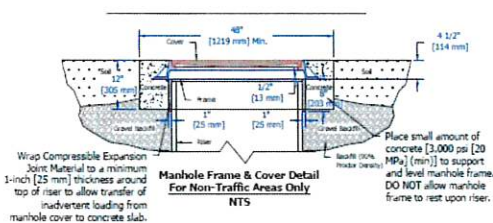
SDS Aqua Swirl™ Hydrodynamic Separator

Aqua-Swirl™ systems are fabricated from high performance HDPE materials; they are durable lightweight and can be installed without use of heavy lifting equipment.

Lifting support cables are provided to allow easy off loading and installation, resulting in significantly reduced installation costs.

Installation:

- 1) Excavation to required size and depth allowing for 600mm around each side of the unit
- 2) Prepare the bed with 20-40mm clean stone to a depth of 300mm
- 3) Compacted in 150mm layers to ASTM D 2321 to a proctor density of 95%
- 4) Install the unit and backfill with 20-40mm clean stone in 150mm layers to ASTM D 2321 sufficient backfill should be placed over components prior to using heavy compaction or construction equipment to prevent damage.
- 5) Connect to drainage network pipework with rubber couplings like Fernco, Flex Seal or Band Seal.
- 6) The Aqua Swirl has an octagonal base plate extending 150mm from the outside diameter to provide mitigation against buoyancy, concrete can be poured directly onto the base plate if required to provide additional resistive force.
- 7) The riser pipe is supplied to the required length and can be cut to size on site to the required depth.
- 8) Recommended man hole cover Clark drain CD751H KMD frame and cover or equal
- 9) Where traffic loading is required a reinforced concrete pad must be placed over the entire Aqua swirl as per design calculated by engineer.
- 10) If traffic loading is not required, it's recommended that bollards are placed around access risers in non-traffic areas to prevent inadvertent loadings by maintenance vehicles.



System Operation:

The Aqua-Swirl[®] is most commonly installed in an "off-line" configuration. Or, depending on local regulations, an "in-line" (on-line) conveyance flow diversion (CFD) system can be used. The CFD model allows simple installation by connecting directly to the existing storm conveyance pipe thereby providing full treatment of the "first flush," while the peak design storm is diverted and channelled through the main conveyance pipe

The patented Aqua-Swirl[®] Stormwater Treatment System provides a highly effective means for the removal of sediment, floating debris, and free oil. Swirl technology, or vortex separation, is a proven form of treatment utilized in the Stormwater industry to accelerate gravitational separation.

The treatment operation begins when Stormwater enters the Aqua-Swirl[®] through a tangential inlet pipe that produces a circular (or vortex) flow pattern that causes contaminants to settle to the base of the unit. Since Stormwater flow is intermittent by nature, the Aqua-Swirl[®] retains water between storm events providing both dynamic and quiescent settling of solids. The dynamic settling occurs during each storm event while the quiescent settling takes place between successive storms.

A combination of gravitational and hydrodynamic drag forces encourages the solids to drop out of the flow and migrate to the center of the chamber where velocities are the lowest.

The treated flow then exits the Aqua-Swirl[®] behind the arched outer baffle. The top of the baffle is sealed across the treatment channel, thereby eliminating floatable pollutants from escaping the system. A vent pipe is extended up the riser to expose the backside of the baffle to atmospheric conditions, preventing a siphon from forming at the bottom of the baffle.

Maintenance:

Long term performance of the Aqua Swirl or any other device depends on inspection and maintenance program.

Recommended schedule in line with Ciria C753 guidance

On hand over – 3 months -6 months -12 months and then annually or as deemed necessary from details obtain from previous inspections.

Each sites sediment loadings will be different and at its highest just after the build phase, hence why a more frequent visit are required at the start of the programme.

The Aqua-Swirl[®] has been designed to minimize and simplify the inspection and maintenance process. The single chamber system can be inspected and maintained entirely from the surface thereby eliminating the need for confined space entry. Furthermore, the entire structure (specifically, the floor) is accessible for visual inspection from the surface. There are no areas of the structure that are blocked from visual inspection or periodic cleaning. Inspection of any free- floating oil and floatable debris can be directly observed and maintained through the manhole access provided directly over the swirl chamber.

Inspection:

To inspect the Aqua-Swirl[®], remove the manhole cover. We also provide a permanent metal information plate affixed inside the access riser which provides our contact information, the Aqua-Swirl[®] model size, and serial number.

The only tools needed to inspect the Aqua-Swirl[®] system are a flashlight and a measuring device such as a stadia rod or pole. Given the easy and direct accessibility provided, floating oil and debris can be observed directly from the surface. Sediment depths can easily be determined by lowering a measuring device to the top of the sediment pile and to the surface of the water. When the sediment pile is within 42 to 48 inches of the water surface (or sediment pile thickness is 18 to 24 inches as measured from the base), the system should be maintained. The maximum Sediment storage capacity of the Aqua-Swirl[®] is reached when the sediment pile is within 30 inches of the water surface (or sediment accumulation is 36 inches thick as measured from the base).

It should be noted that in order to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile. Keep in mind that the finer sediment at the top of the pile may offer less resistance to the measuring device than the larger particles which typically occur deeper within the sediment pile.

The Aqua-Swirl[®] design allows for the sediment to accumulate in a semi-conical fashion as illustrated above. That is, the depth to sediment as measured below the water surface may be less in the center of the swirl chamber; and likewise, may be greater at the edges of the swirl chamber.

Removal:

Cleaning the Aqua-Swirl[®] is simple and quick. Free-floating oil and floatable debris can be observed and removed directly through the 30-inch service access riser provided. A vacuum truck is typically used to remove the accumulated sediment and debris. An advantage of the

Aqua-Swirl[®] design is that the entire sediment storage area can be reached with a vacuum hose from the surface (reaching all the sides). Since there are no multiple or limited (hidden or "blind") chambers in the Aqua-Swirl[®], there are no restrictions to impede on-site maintenance tasks.

Disposal:

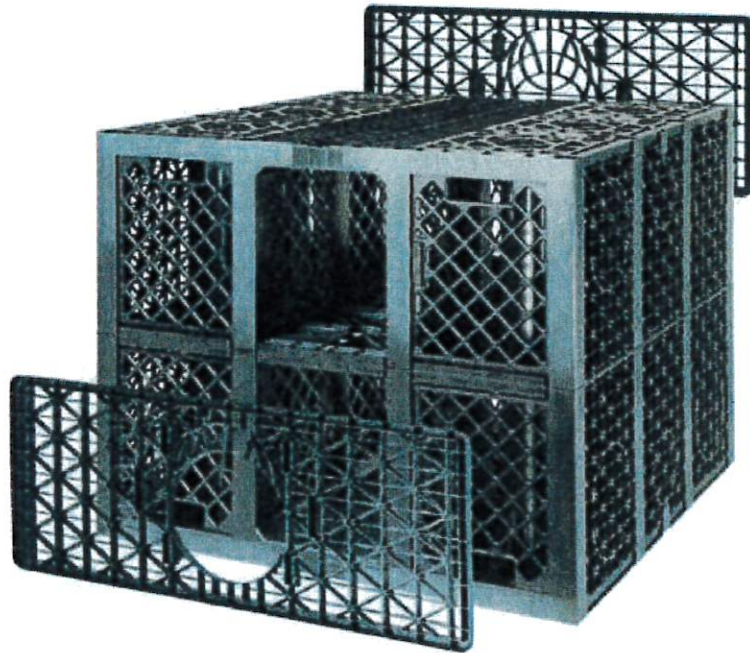
All removed products should be disposed of in line with local council requirements

sdslimited.com

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Stormbloc® User Manual



The Accessible 'Engineered' Solution to SuDS

SuDS / Source Control

Regulatory and guidance documents such as PPS 25 and Building Regulations are putting increasing demands on developers and engineers to consider sustainable drainage systems (SuDS) wherever possible and to incorporate source control approaches into surface water drainage systems.

*"Sustainable drainage systems (SuDS) are increasingly being used to mitigate the flows and pollution from runoff. The philosophy of SuDS is to replicate as closely as possible the natural drainage from a site before development and to treat runoff to remove pollutants, so reducing the impact on receiving watercourses. This requires a reduction in the rate and volume of runoff from developments, combined with treatment to remove pollutants as close to the source as possible."*¹

¹ CIRIA C609 (2004) - Sustainable Drainage Systems - Hydraulic, structural and water quality advice.



Maintenance Instructions

The patented inspection / maintenance tunnels within each Stormbloc® module allows almost the entire volume of the construct to be inspected via CCTV camera and flushed through.

A catchpit chamber immediately upstream of the system is recommended as this will reduce the amount of silt entering the installation. For larger installations it may also be advantageous to add further catchpits to the system design or an advanced vortex silt trap such as the Downstream Defender® by Hydro International. The collection sump(s) should not be allowed to overfill as this will lead to silt carry-over into the Stormbloc® modules.

As all schemes are different, the frequency at which the catchpit(s) should be emptied will need to be determined on site. For small soakaways and individual infiltration tanks it will generally only be necessary to ensure that the catchpits / silt traps are free from debris such as leaves or sediment. It is recommended that any system be inspected no less frequently than at monthly intervals for the first 3 months and thereafter at 6 monthly intervals. In addition, it is suggested that the installation is inspected immediately following the first storm event, whenever this should occur post installation.

Individual maintenance schedules should be drawn up using the information obtained from the initial inspections. It should also be noted that more regular inspections may be required should the catchpit(s) fill more frequently and/or if the initial inspections reveal that maintenance / cleaning will be required more regularly than at six month intervals.

Flushing of the system can be achieved using a jetting system with a 150 bar pump pressure (ie. approximately 80 bar at the nozzle) at a discharge flow of 300 l/min. The jet nozzle should be introduced to the system via the Stormbloc® Inspect / manhole and the integral inspection / maintenance tunnel. The silt should be flushed to the Stormbloc® Inspect or catchpit manhole and removed from there.

References

- 1 Water Research Centre (2001)
Sewers for Adoption 5th Edition.
- 2 Department for Transport, Local Government and the Regions (2001).
Planning Policy Statement (PPS), Note 25: Development and Flood Risk.
- 3 The Building Regulations 2000 (amended 2001).
Approved Document H3.
- 4 British Standards Institute (1973).
CP312: Part 1: 1973 British Standard Code of Practice for Plastics Pipework (Thermoplastics Material). General Principles and Choice of Material.
- 5 Building Research Establishment (1991).
BRE Digest 365, Soakaway Design.
- 6 Construction Industry Research and Information Association (1995).
CIRIA Report 156 Infiltration Drainage - Manual of Good Practice.
- 7 Construction Industry Research and Information Association (1997)
The SUDS Manual (C. 697).
- 8 Micro Drainage.
The Micro Drainage Suite of Programs.
Website: www.microdrainage.co.uk
- 9 Hydro International.
Stormcell® User Manual.
- 10 Hydro International.
Stormwater Package Brochure.
- 11 WTB Geotechnics
SC Membrane: Technical Data Sheet.
- 12 WTB Geotechnics
AZTEX SPR14 Geotextile Technical Data Sheet.

Hydro International PLC

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Agrément Certificate

10/4795

Product Sheet 1

HYDRO INTERNATIONAL STORMWATER MANAGEMENT SYSTEMS

STORMBLOC STORMWATER MANAGEMENT SYSTEM

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This relates to the Stormbloc Stormwater Management System, for use as sub-surface water storage or as a soakaway to manage run-off from impermeable surfaces.

AGRÉMENT CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.



KEY FACTORS ASSESSED

System design — information is provided in the Certificate to assist in the design of a stormwater management system (see section 5).

Strength — the system has adequate strength and stiffness to resist long- and short-term loads when used in accordance with this Certificate (see section 6).

Resistance to chemicals — the system will have adequate resistance to the types and levels of chemicals likely to be found in rainwater and soils normally encountered in civil engineering practice (see section 9).

Durability — the system will have a service life in excess of 50 years when installed in accordance with this Certificate (see section 11).

The BBA has awarded this Agrément Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 24 December 2010

Brian Chamberlain

Head of Approvals — Engineering

Greg Cooper

Chief Executive

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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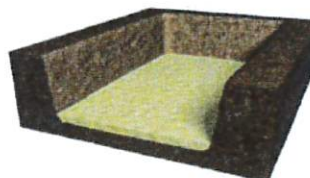
STORMBLOC® STORAGE SYSTEM – INSTALLATION GUIDELINES

Notes: Detailed design advice and installation instructions can be found in the Stormbloc® User Manual. Stormbloc® modules are delivered in stacks of 4 No 0.66m deep modules (20kg per module) or 8 No 0.35m deep modules (12kg per module). The maximum mass of any Stormbloc® Inspect component is 48kg. Modules should not be dropped or thrown and impacts should be avoided. Care should be taken when walking on the modules as these may be slippery especially when wet or frosty.

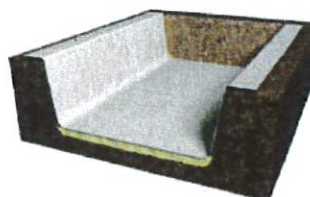
1) Excavate the area for the installation in accordance with the design. For installations greater than 3m from finished cover level to the base of the Stormbloc® tank, advice should be sought from Hydro International.



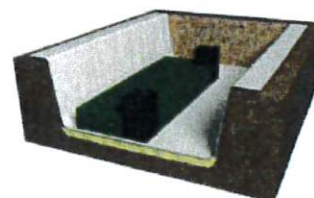
2) Form a level sand or gravel subgrade layer, min 100mm deep.



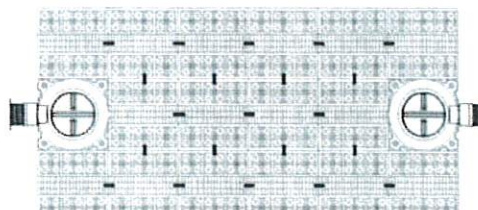
3) Line the excavation with a suitable impermeable geomembrane (min 460 g/m²). On sites where there are concerns relating to contamination, or groundwater level / protection, a fully encapsulated system, with a heat sealed membrane installed by a specialist lining contractor will often be required. Where multiple sheets are required, these should be lapped and sealed in accordance with the manufacturer's recommendations.



4) Inspect the modules for damage prior to installation. Lay the Stormbloc® modules and Stormbloc® Inspect Chambers on the geomembrane in accordance with the design. The integral inspection tunnels within the modules should generally create a continuous line along the length of the tank.

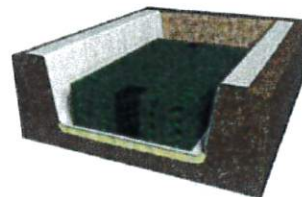


5) The modules should be connected using the supplied connecting pieces in the centre of each edge that neighbours another module. Where a single layer of 0.35m deep modules is used, the supplied connecting pieces should link the top of the structural support pillars of neighbouring modules.



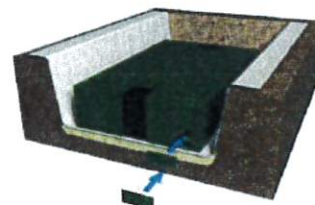
6) For multi-layer designs, the supplied multi-layer connectors should be used between layers. Modules on the second and subsequent layers can then be located using the multi-layer connectors.

Where 0.35m deep modules are used, these should form the top layer and oriented such that the text imprinted on the 0.35m deep module is at the bottom edge.



7) All tunnel ends should be fitted with the appropriate end plate as supplied. End plates can be provided blank, with holes pre-cut to ease pipe connections, or with an adapter spigot in accordance with the design.

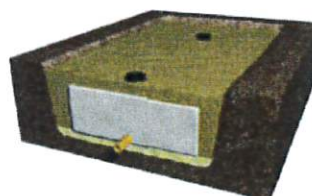
Pipe connections into the Stormbloc® Inspect modules may require a band-seal to attach onto the spigot. Please contact Hydro International for site specific details.



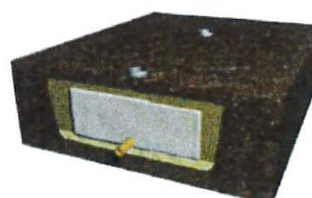
8) The sides and top of the Stormbloc® system should be completely wrapped within the geomembrane. Holes should be cut into the geomembrane to accommodate pipe connections and the extension shaft on the Stormbloc® Inspect chambers. Where multiple sheets are required, these should overlap by min 300mm. All joins, laps and pipe connections must be appropriately sealed.



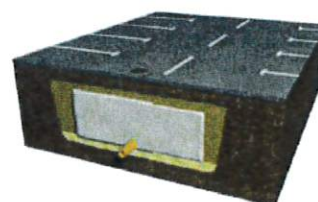
9) The sides of the excavation should be filled with a suitable granular material such as Type 1 or Type 2 sub-base or Class 6P selected granular material as defined in the Department for Transport Specification for Highway Works (SHW). This material should be compacted in 150mm layers using a laminar working device. Care should be taken to ensure that the geomembrane is not punctured or torn during installation or backfilling.



10) Backfill over the top of the modules should also be carried out using Type 1 or Type 2 sub-base in accordance with the Department for Transport Specification for Highway Works (SHW). The initial 300mm of cover should be compacted using a laminar working device. Thereafter other types of compaction plant may be used provided the mass per metre width $\leq 2300\text{kg}$.



11) Once 500mm of well compacted cover has been achieved, heavier plant may run across the system up to a maximum mass per metre width of 5000kg. The wheel load from tipper trucks and excavators should not exceed 50 kN fully loaded. Vehicles should only traverse above the Stormbloc® in straight passes. If a change in direction is required, vehicles should drive off the system, turn and drive back on in the direction required.



GEOLIGHT maintenance

Once received stormwater reaches the storage reservoir through one or more distribution pipes laid out on the side faces of the Geolight blocks.

These distribution pipes are covered in a trench filled with draining material requiring little compaction, like washed rolled pebbles, free from fines, and 15/25 grading.

A 10 mm mesh geogrid or GEOTextile, laid between the distribution pipe and Geolight, prevents the horizontal Geolight blocks being clogged by the draining materials.

The permeability of the supply and distribution pipe located on the periphery of the reservoir is designed to prevent any clogging of the system upstream of the stormwater drain.

This sizing is checked for each supply. It is obtained thanks to design programmes by SDS limited following testing of a size 1 reservoir in which all hydraulic configurations were studied.

These tests also made it possible to check the very good vertical and horizontal permeabilities of Geolight blocks and this general layout is usually accepted.

The choice of one of these layouts or a combination of them is according to:

- the place reserved for the reservoir
- available slopes
- hydraulic parameters (discharge)
- position of stormwater input and output systems.

The ends of feeder drains (distribution pipes) are connected to inspection chambers(manholes), acting as settling tanks and making inspection and maintenance of the whole distribution pipe possible.

For small discharges, stormwater does not penetrate Geolight blocks, but circulates either in an appropriate bypass, or in the distribution pipe drain. This is for draining the first water which will be handled downstream if required.

When the reservoir is drained, water is drained through a distribution pipe possibly the same as the one located at the input which operates in the opposite direction. Drainage discharge is controlled by the downstream system piping.

A ventilation system consisting of a drainage geocomposite is fresh air vented in the inspection pits. It is laid out in the upper part of the distribution pipes and the general space occupied by the reservoir.

We generally recommend that the stormwater tank inspection chambers are checked periodically in conjunction with general maintenance of the underground pipe network.



CONDER® TANKS
COVERED BY THIS
GUIDE:

- All CNS & Forecourt Separators
- Above and Below Ground

Environment Agency*

"Use and Design of Oil Separators in Surface Water Drainage Systems: PPG3"

**CNS & Forecourt
Separators
Commissioning &
Maintenance
Guide Rev 4**

CNS & Forecourt Separators Commissioning and Maintenance Guide

INTRODUCTION

The primary function of oil/water separators is to separate oil, petrol, diesel etc., from waste water and retain the separated liquids. These separated liquids must be removed regularly, using a licensed effluent disposal contractor (your contracted service provider), to ensure that the separator operates as efficiently as possible.

The natural oil/water separating process from gravity fed waste water depends on the storage, or 'dwell', time within the separator chamber. Guidelines have been established by the *Environment Agency** for minimum 'dwell' times, and hence, minimum working volumes for separators. These have been applied in tests carried out by Premier Tech Aqua Ltd which are based on the maximum flowrate into the separator (l/sec). As the working volume reduces by the accumulation of the separated oil, petrol, diesel etc., so the separating efficiency reduces.

Another major influencing factor on the efficiency of separator systems is sediment. Oil/water separators are usually designed as liquid/liquid separators unless the specification has determined a requirement to store a volume of sediment. This can be accommodated within a combined liquid/sediment separator where the storage volume is increased accordingly. However, if the design of the drainage system can allow the sediment to be separated and stored upstream of the oil/water separator, in catch-pits or sediment separators, the system would function more efficiently. Settled sediment must be removed regularly to ensure optimum efficiency (ref. *Environment Agency*).

REGULAR MAINTENANCE OF SEPARATOR EQUIPMENT WILL ENSURE IT OPERATES AS INTENDED WITH MINIMUM RISK OF POLLUTION TO THE ENVIRONMENT.

MAINTENANCE INSPECTIONS

Separators are used in widely varying circumstances where some will require very frequent maintenance and others will have substantially longer intervals before any maintenance (emptying) is required. However, for every separator regular maintenance inspections should be carried out to determine whether or not there is a need to remove the accumulated oil, petrol, Diesel, etc., or sediment. The owner of the Conder® separator is responsible for its operation and ensuring that the effluent quality does not breach any Discharge Consent Standards. It is advisable to set up a 'Service Agreement' with an effluent disposal contractor who can provide 'automatic' and regular maintenance and advise you if any problems with the system occur. The owner is reminded that the existence of a 'Service Agreement' does not necessarily transfer responsibility for general maintenance which must be conducted in accordance with this guide.

The *Environment Agency** has determined that separators shall be inspected at least every six months to establish whether or not emptying is necessary, and a log shall be maintained. Additional equipment for separators provided by Premier Tech Aqua such as an Alarm System which will give warning of the accumulation of oil, petrol, diesel, etc., but should not be used to replace regular inspections.

To keep your Conder® Separator in top condition, we recommend regular servicing by Premier Tech Aqua's service partners

MAINTENANCE PROCEDURES

1.0 Health and Safety

Section 6(a) of the United Kingdom Health and Safety at Work Act 1974 requires manufacturers to advise their customers on the safety and handling precautions to be observed when installing, operating, maintaining and servicing their products.

The maintenance procedures described here should be read and fully understood by the operator (competant person) before commencing work. Appropriate personal protective equipment should be used (gloves, goggles, waterproof clothing etc.,) particularly when handling filters which have been in contact with oil and oily sediment.

Before any work commences always identify the separator and its associated manhole covers or access covers and cone off or erect suitable barriers around the entire work area. Ensure that access and circulation areas are clearly designated and ensure that there is an adequate safety buffer between vehicles and any above ground tank and its associated pipework.

A MEWP or suitable scaffolding will be required to gain access the manway of above ground tanks; maintain adequate separation between MEWP and the tank shell. Scaffolding should not be permitted to come in contact with the tank shell and must not be supported off of the tank shell.

DO NOT ENTER THE TANK

2.0 Commissioning the separator following installation

- 2.1 Sediment and other construction debris can accumulate in the separator during its installation and whilst associated works are in progress. If this has occurred, isolate the separator from the drainage system remove the sediment as follows.
- 2.2 Slowly lift out the combined coalescing filter and automatic closure device assembly. This should be lifted at a rate of 20mm per second (1.2m per minute), until clear of the water, ensuring that most of the residual water is drained from the coalescing filter. This will reduce the combined overall weight of the assembly.

NOTE: This assembly could weigh up to 55kgs and should be handled by two persons unless a mechanical hoist (recommended) is being used.

- 2.3 Remove this assembly to a place of safe keeping.

CNS & Forecourt Separators Commissioning & Maintenance Guide Rev 4

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Peterlee
Co Durham
SR8 2RA

TEL: 0870 264 0004
FAX: 0870 264 0005

2.4 Fill the separator with clean water up to the outlet invert level.

2.5 Whilst ensuring that the closure is captive inside the housing tube, and the retaining cap is in place at the top of the tube, slowly lower the filter/closure assembly into the separator until it is firmly located inside the coned seating at the bottom of the tank.

NOTE: Do not lower the filter/closure assembly into the separator *before* it has been filled with water. If you do, the closure will be held in the **closed position** and the separator will not function.

3.0 Maintenance

3.1 If, following maintenance inspections, the separator is found to be storing the maximum volume of oil, petrol, diesel etc., or the maximum volume of sediment, inform your licensed effluent disposal contractor who will arrange emptying. Before making arrangements, check that you are registered with the Environment Agency, as required under Hazardous Waste Regulations, where hazardous waste producers must be registered before any waste can be removed.

The following are guidelines only for determining the maximum storage volumes of oil and sediment.

a) For CNS separators multiply the maximum flowrate for which the separator has been designed (l/sec) by 10. This will be the maximum storage volume of hydrocarbons in litres e.g. a CNS15 separator is designed for a 15 l/sec flowrate, therefore, can store 150 litres.

For forecourt separators the maximum storage volume of hydrocarbons is 7,600 litres.

b) Where no specific sediment volumes have been determined for the separator, or where no sediment has been expected to accumulate in the system, the maximum stored depth of sediment should not exceed 20% of the depth of the separator barrel e.g. a 1.8m diameter separator should not store more than 360mm depth of sediment.

3.2 Apply the Health and Safety requirements detailed in Section 1 before commencing any work.

3.3 Isolate the separator from the drainage system either by closing pre-installed valves in the upstream and downstream manholes or by securely fitting proprietary pipeline stoppers.

3.4 Slowly lift out the combined coalescing filter and automatic closure device assembly. This should be lifted at a rate of 20mm per second (1.2m per minute), until clear of the water, ensuring that most of the residual water is drained from the coalescing filter. This will also reduce the combined overall weight of the assembly.

NOTE: This assembly could weigh up to 55kgs and should be handled by two persons unless a mechanical hoist (recommended) is being used.

Sheet 3 of 4

CNS & Forecourt Separators Commissioning & Maintenance Guide Rev 4

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SR8 2RA

TEL: 0870 264 0004
FAX: 0870 264 0005

- 3.5 Remove this assembly to a place of safe keeping.
- 3.6 Using a licensed effluent disposal contractor (your contracted service provider) carry out the following:

Remove the oil, petrol, diesel etc., from the surface of the liquid, leaving as much of the cleaner water as possible in the separator. Remove the sediment from the bottom of the separator taking great care in and around the filter outlet housing on the base to ensure that it does not become damaged, again leaving as much of the cleaner water as possible in the separator.

- 3.7 Move the filter/closure assembly to a convenient position *upstream* of the separator so that any polluted water washed from the filter will be directed back to the separator.

Remove the filter from the housing tube and wash the filter using a low pressure hose. If the filter has become 'blinded' with sediment or it is too dirty to clean or has become damaged, replace it by contacting Premier Tech Aqua Tel: 0870 264 0004. Re-fit the filter to the housing tube.

- 3.8 Fill the separator with clean water up to the outlet invert level.
- 3.9 Whilst ensuring that the closure is captive inside the housing tube, and the retaining cap is in place at the top of the tube, slowly lower the filter/closure assembly into the separator until it is firmly located inside the coned seating at the bottom of the tank.
- NOTE:** Do not lower the filter/closure assembly into the separator *before* it has been filled with clean water. If you do, the closure will be held in the **closed position** and the separator will not function.
- 3.10 Check that the Alarm probe has not been damaged and that the alarm system is working.
- 3.11 Replace the manhole covers or access covers ensuring the covers are locked down where necessary and remove the cones and/or barriers from the worksite.

REMEMBER - if the alarm system activates due to the accumulation of oil, petrol, diesel etc., do not delay in contacting your licensed effluent disposal contractor.

**CNS & Forecourt
Separators
Commissioning &
Maintenance Guide
Rev 4**

 **PREMIER TECH**
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2 Whitehouse Way
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TEL: 0870 264 0004
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APPENDIX H

MAINTENANCE LOGS

Inspection Log – Year..... sheet 1 of 2

Inspection Date	A - Surface Water Catchpit Manholes	B - Foul Water Manholes	E – Surface Water Treatment	G – Hydro Attenuation	Comments
January					
February					
March					
April					
May					
June					

How to complete this Log:

- 1.0 Write date in LH column.
- 2.0 Tick which items have been inspected for that date.
- 3.0 Add to notes and maintenance completed e.g. Catch pits or Channels emptied.

Inspection Log – Year..... sheet 2 of 2

Inspection Date	A - Surface Water Catchpit Manholes	B - Foul Water Manholes	E – Surface Water Treatment	G – Hydro Attenuation	Comments
July					
August					
September					
October					
November					
December					

How to complete this Log:

- 1.0 Write date in LH column.
- 2.0 Tick which items have been inspected for that date.
- 3.0 Add to notes and maintenance completed e.g. Catch pits or Channels emptied.