www.coraiht.com

Technical Note
Project: Lidl Food Store 263 Wilmslow Road Manchester M14 5LN, Discharge of Condition 27 (Drainage) attached to Planning Permission 142775/FO/2025
Application Reference: OTH-2026-000152
Date: 27th June 2026

1.1.1 Following receipt of comments from the LLFA, the following technical note and supporting information has been provided in order to satisfy the remaining points raised.

- *Progression through the drainage hierarchy must be evidence based and supported by site investigation including assessments of ground conditions and infiltration testing in accordance with BRE365. Proposals of attenuation should achieve half drain time within 24 hours.*

  Paragraphs 2.4.5 and 2.4.6 of the Flood Risk Assessment 3rd issue previously provided clarity on the ground conditions to be experienced onsite. The ground comprises of stiff clays which would not have presented any infiltration potential with hydrocarbon odours noted in a number of window sample holes.

  Given the content of the existing ground investigation, the requirement for infiltration testing could have been deemed irresponsible with the potential to mobilise hydrocarbons, however, to resolve the concern site specific infiltration testing has subsequently been concluded with the results confirming our initial statement that infiltration is not feasible at the site.

  Infiltration results are shown in **Appendix A**.

- *For surface water connections, evidence of agreement in principle from the relevant authority/service provider is required to ensure there is adequate spare capacity in the existing system taking future development requirements into account. An email of acceptance of proposed new connection will suffice.*

  The previous site use which is noted as being 100% impermeable had previously discharged at an unrestricted rate to the offsite public network. The brownfield flow has been estimated within paragraph 5.4.2 of the flood risk assessment 3rd issue as 72.4l/s with the post development flow being restricted to no more than 5 l/s, presenting a reduction in flow of 93%, which will significantly reduce the pressure on the downstream network over the current arrangement.

  We can no longer obtain connection agreements with United Utilities without discharge of planning condition first.

- *Details of the flow control manhole details (inverts, levels etc) on the drainage layout.*

  Manhole location, reference, cover and invert levels are shown on drawing reference 16-3046-200 Sheet 1 of 3 with a specific detail provided by Hydro International shown n drawing reference Sheet 2 of 3.

Cora IHT Ltd. Adamson House, Towers Business Park, Wilmslow Road, Manchester, M20 2YY
Email: toan.chau@coraiht.com
Registered in England No 10321930

- *The foul and surface water systems are proposed to discharge to the same existing manhole (EXMH04). Please confirm on the drainage layout what measures will be in place to prevent foul water from surcharging into the surface water system.*

  A non-return valve is to be fitted to the surface water pipe

- *Hydraulic calculations of the proposed drainage system, including all design parameters. Results must demonstrate no surcharge for the 1 in 2, no flooding in the 1 in 30 and no flooding of buildings for the 1 in 100 + 45% Climate Change.*

  Causeway Flow Calculations are shown in **Appendix B**

- *Where flows less than 5 l/s are proposed, a blockage risk assessment must be undertaken.*

  The maximum discharge rate from the site for the 1 in 100-year storm plus 45% allowance for climate change is stated as 5l/s as stated in Paragraph 5.4.2, 5.4.4, 7.1.8 and 8.1.6 of the FRA 3rd Issue.

- *A plan indicating easement SuDS features (including attenuation tanks) should be appropriately positioned, including a 2.5m easement from the existing highway and a 5m easement from any dwellings.*

  The proposed rain garden is a non-infiltrating bioretention system incorporating an underdrain. No infiltration to the surrounding ground will occur, and runoff will be conveyed to the drainage network. Consequently, the feature does not present the same foundation risks as an infiltration device, and the proposed stand-off distance is considered appropriate, subject to maintenance access and exceedance routing.

- *The layout and calculations must be jointly updated to account for any edits required. When preparing a resubmission, the applicant must ensure that the drainage layout and hydraulic calculations correspond.*

  Both the drainage calculations and drawings are consistent updated drainage drawings are shown in **Appendix C**.

Cora IHT Ltd. Adamson House, Towers Business Park, Wilmslow Road, Manchester, M20 2YY
Email: toan.chau@coraiht.com
Registered in England No 10321930

APPENDIX A

Cora IHT Ltd. Adamson House, Towers Business Park, Wilmslow Road, Manchester, M20 2YY
Email: toan.chau@coraiht.com
Registered in England No 10321930

Obsidian Geo-Consulting Ltd
Unit C4
Castle Vale Enterprise Park
Park Lane
Birmingham
B35 6LJ

T: 0121 747 2288
M: 0771 552 7530
W: www.obsidian-geoconsulting.co.uk

12th March 2026

BM/24-1965-P/L002

Lidl Great Britain Ltd
Eastgate Way
Manor Park
Runcorn
WA7 1NT

For the attention of Robert Lawton

Dear Robert,

RE: Soakaway Testing, Proposed Lidl Site, 261, Wilmslow Road, Manchester

Further to your instruction please find enclosed the results of soakaway testing undertaken in accordance with BRE Digest 365 at the proposed Lidl site at 261, Wilmslow Road, Manchester.

1.0 Introduction

It is understood that Lidl proposes to develop the site with the construction of a new store building in the southern area of the site, with car parking in the western and northern areas of the site and access from Wilmslow Road to the west. The site had consisted of a large, derelict, centrally positioned building, prior to its demolition, which was formerly a bus garage with external reinforced hardstanding areas. The proposed site layout is shown on appended HTC Architects Proposed Setting Out Site Plan Ref. 2594/F413 dated April 2024.

The site has previously been the subject of an intrusive ground investigation as detailed within the Obsidian Geo-Environmental Investigation Report 24-1965-P-R1.

Lidl have been requested by the Local Authority drainage officer to confirm the suitability of soakaway drainage in the proposed car parking areas to the west and north of the proposed store footprint. Obsidian were instructed to undertake three soakaway tests. The soakaway tests have been undertaken in accordance with BRE Digest 365.

2.0 Site Works

The soakaway test pit construction, the soakaway testing and backfilling works were undertaken between the 5th and 6th March 2026.

Prior to locating and excavating the soakaway test locations, service plans provided by the client were reviewed and each location was positioned to avoid any potential buried services. In addition, each location was scanned by Obsidian using a Cable Avoidance Tool (CAT) and Signal Generator (Genny). All exploratory holes were positioned to avoid these services.

All soakaway locations were excavated within areas shown to be free of services, however during the excavation of SA01, an uncharted clay pipe was encountered. The clay pipe in SA01 was encountered at a depth of 0.65m below ground level (bgl), with a base depth 0.80m bgl, cutting across the south-western corner of the trial pit. The soakaway was still undertaken in this pit but had an initial start depth of 0.88m bgl to avoid any interaction with the clay pipe.

Photographs are presented as Appendix A.

2.1 Soakaway Test Pit Construction

The soakaway test pits were positioned within the target areas specified by Lidl taking account of the buried services and obstructions detailed in Section 2.0. The locations of the soakaway test pits are shown on the appended Obsidian Exploratory Hole Location Plan Ref: 24-1965-P/02/B.

The surface concrete was broken out at each location using the excavator¯s breaker attachment. Once sufficient surfacing was broken out, soakaway test pits were excavated to depths of between 1.35m and 1.50m bgl, using a toothed bucket. Upon completion, the sides of each pit were stable. A marker line and test point was created along the top of the test pits (SA01 and SA03) to allow the water level to be continually recorded throughout the testing period. Following the completion of the soakaways the pit walls remained stable without any loss to their integrity. The test pits were backfilled with arisings following the completion of the tests and left raised at surface to allow for any future settlement.

Exploratory hole logs are presented in Appendix B.

2.2 Strata Encountered

SA01
Concrete Made Ground with 12 mm steel reinforcement and a membrane at its base was recorded from ground level to 0.20m bgl. This was underlain by Made Ground comprising dark brown and black, very sandy gravel of fine to coarse, subangular limestone with occasional brick fragments to a depth of 0.45m bgl. Beneath this, stiff, orangish brown, locally grey, silty clay was encountered to a depth of 0.80m bgl. A clay pipe was observed cutting through the south-western corner of the pit, with the base of the pipe recorded at 0.80m bgl. The clay was underlain by very stiff, dark brown and grey, silty clay which extended to the base of the pit at 1.50m bgl.

SA02
Concrete Made Ground with no steel reinforcement was recorded from ground level to 0.05m bgl. This was underlain by concrete Made Ground with 12 mm steel reinforcement extending to a depth of 0.30m bgl. Beneath this, Made Ground comprising dark brown clay with a faint hydrocarbon odour was encountered to 0.45m bgl. Underlying this, stiff, orangish brown, locally grey, silty clay was recorded to a depth of 0.85m bgl. The clay was underlain by very stiff, dark brown and grey, silty clay which extended to the base of the pit at 1.35m bgl.

SA03
Concrete Made Ground with basal 10mm steel reinforcement was recorded from ground level to 0.08m bgl. This was underlain by Made Ground comprising concrete cobbles to a depth of 0.20m bgl. Beneath this, Made Ground consisting of dark brown and black, very sandy gravel of fine to coarse, subangular limestone with occasional brick fragments was encountered to 0.50m bgl. Underlying this, stiff, orangish brown, locally grey, silty clay was recorded to a depth of 0.90m bgl. The clay was underlain by very stiff, dark brown and grey, silty clay which extended to the base of the pit at 1.45m bgl.

3.0 Soakaway Tests and Results

In accordance with the requirements of BRE Digest 365, three repeat tests should be completed in full within a 24-hour period, with the water level passing through the 75% and 25% effective depth level in each test. Each pit was rapidly filled using a towed bulk water tank. The water levels were recorded at appropriate time intervals using a Geosense dip meter with shrouded tip. None of the test locations achieved three repeat tests within a 24-hour period and the water levels in the first test at each location were shown to not change at all during 5th March. Following significant heavy rainfall overnight, with water levels within the pits after the allowed 24-hour period had in fact increased, likely due to pipe ingress in SA01 and surface water ingress in SA02 and SA03. The most significant increase in levels occurred in SA02, where levels changed from 0.88m bgl to 0.45m bgl.

The results of the soakaway tests are presented within Appendix C, and the infiltration rates are summarised in Table 3.1 below:

Table 3.1: Summary of Soakaway Test Results

Soakaway Test Pit	Calculated Infiltration Rates		
	Test 1	Test 2	Test 3
SA01	FAIL	-	-
SA02	FAIL	-	-
SA03	FAIL	-	-

In each test location, the first attempted test resulted in the water level not falling. The results indicate that soakaways constructed within the recorded natural clay on site would not represent a viable drainage option for the site.

We trust that the above is acceptable; however, if you should have any queries, please do not hesitate to contact the undersigned.

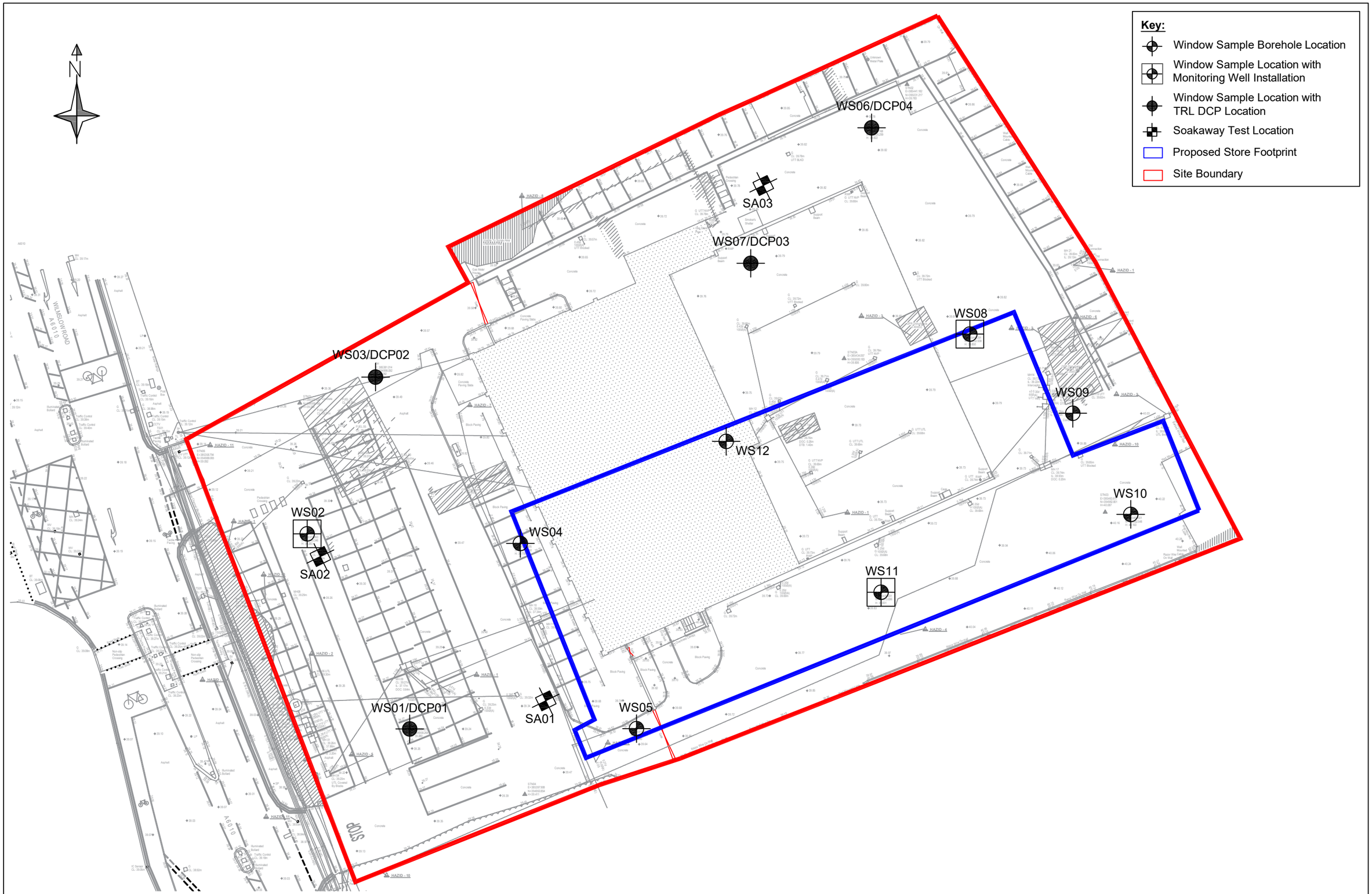
Yours sincerely
For and on behalf of Obsidian Geo-Consulting Ltd



Ben Murphy
Principal Geo-Environmental Engineer
ben.murphy@obsidian-geoconsulting.co.uk

Enc.
Drawings
Appendix A K Photographs
Appendix B K Exploratory Hole Records
Appendix C K Soakaway Test Results

Drawings



OBSIDIAN GEO–CONSULTING

PROJECT: Proposed Lidl Store, 261 Wilmslow Road, Manchester	**PROJECT NO:** 24-1965-P	**DRAWING NO:** 02
	REVISION: B	**SCALE:** NTS
TITLE: Exploratory Hole Location Plan	**DRAWN BY:** BM	**DATE:** 11/03/2026
	APPROVED BY: SMD	**DATE:** 11/03/2026

DICKENSON ROAD

39.6m

9.3m

Telephone Exchange

The Exchange

FB

PH

Wilmslow Rd

LB

Ward Bdy

Platt La

CR

MARCUS GROVE

HIGHWAYS BASED ON SCP DRAWING: SCP_240296

Site Area:
6,585m²
1.627 Acres

89 CAR PARK SPACES
INC 6 ACCESSIBLE, 9 P&C, 2 EVC

SALES AREA
1270m²

Unknown building, possible sub-station, confirmation of removal needed.

PROPOSED GA SECTION
1:200

SCHEDULE OF AREAS (TYPE 1300) REFERENCE ONLY

SALES =	1334 m²
WAREHOUSE=	410 m²
ANCILLARY=	218 m²
GIA =	1962 m²
GEA (EX. CANOPY) =	2045 m²
GEA (INC. CANOPY) =	2215 m²

ADAPTED STORE SCHEDULE OF AREAS

SALES =	1270 m²
WAREHOUSE=	385 m²
ANCILLARY (GF)=	190 m²
ANCILLARY (FF)=	108 m²
GIA (Ground Floor Only) =	1845 m²
GEA (EX. CANOPY) =	1921 m²
GEA (INC. CANOPY) =	2074 m²

THIS DRAWING IS COPYRIGHT, AND REMAINS THE PROPERTY OF HTC ARCHITECTS. IT MUST NOT BE REPRODUCED, USED, DISCLOSED OR TRANSMITTED TO THIRD PARTIES IN ANY FORM, IN WHOLE OR IN PART, WITHOUT PRIOR WRITTEN PERMISSION.

DO NOT SCALE!
ALL DIMENSIONS SHOULD BE CHECKED ON SITE BEFORE WORK COMMENCES

Rev. | Date | Description | Drawn

client
Lidl GB Ltd

project
Wilmslow Rd, Rusholme

drawing title
Proposed Setting Out Site Plan- Option 10 2x5m parking

date April 2024
status Feasibility
scale 1:500 @ A3
drawn KA checked MH
job no. 2594 dwg no. F413 rev.

htcarchitects
York Place Studio
8 Britannia Street
Leeds
LS1 2DZ
T:(0113) 244 3457
W: www.htcarchitects.co.uk
E: info@htcarchitects.co.uk

Appendix A
Photographs




Photographs 1 & 2 – Clay pipe encountered in SA01 and arisings from pit.




Photographs 3 & 4 – Completed excavation of SA01 and infilled with water.




Photographs 5 & 6 – SA01 backfilled upon completion of soakaway testing.



Photograph 7 – SA02 surfacing broken out.




Photographs 8 & 9 – SA02 arisings.




Photographs 10 & 11 – SA02 filled and water levels increased significantly after 24 hours.




Photographs 12 & 13 – SA02 backfilled upon completion of soakaway testing.




Photographs 14 & 15 – SA03 broken out and excavated.





Photographs 16 & 17 – SA03 backfilled upon completion of soakaway testing.



Photograph 18 – Barriers reinstated and gate locked upon completion of works.

Appendix B
Exploratory Hole Records

Trial Pit Log

Project Name: 261 Wilmslow Road, Manchester	Client: Lidl Great Britain Ltd	Date: 05/03/2026 - 06/03/2026
Location:	Contractor: Obsidian Geo-Consulting Ltd	
Project No. : 24-1965-P	Crew Name: P&J Hemmings Ltd	Equipment: Tracked Excavator

Location Number	Location Type	Level	Logged By	Scale	Page Number
SA01	TP		BM	1:15	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								MADE GROUND: Concrete with 12mm steel reinforcement. Membrane at base.
					0.20			MADE GROUND: Dark brown and black, very sandy gravel of fine to coarse, subangular limestone and occasional brick.
					0.45			Stiff, orangish brown, locally grey, silty CLAY. Clay pipe encountered cutting through south-western corner of pit. Base of pipe at 0.80m bgl.
					0.80			Very stiff, dark brown and grey, silty CLAY.
					1.50			End of Borehole at 1.500m

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks

1. Soakaway test pit location scanned with CAT and Genny. 2. Pit advanced to 1.50m bgl. 3. No groundwater encountered. 4. Pit walls stable. 5. Soakaway testing undertaken, see separate sheet. 6. Pit backfilled with arisings upon completion.

Trial Pit Log

Project Name: 261 Wilmslow Road, Manchester	Client: Lidl Great Britain Ltd	Date: 05/03/2026 - 06/03/2026
Location:	Contractor: Obsidian Geo-Consulting Ltd	
Project No. : 24-1965-P	Crew Name: P&J Hemmings Ltd	Equipment: Tracked Excavator

Location Number	Location Type	Level	Logged By	Scale	Page Number
SA02	TP		BM	1:15	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.05			MADE GROUND: Concrete with no steel reinforcement.
								MADE GROUND: Concrete with 12mm steel reinforcement.
					0.30			MADE GROUND: Dark brown clay with feint hydrocarbon odour.
					0.45			Stiff, orangish brown, locally grey, silty CLAY.
					0.85			Very stiff, dark brown and grey, silty CLAY.
					1.35			End of Borehole at 1.350m

1

2

3

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks

1. Soakaway test pit location scanned with CAT and Genny. 2. Pit advanced to 1.35m bgl. 3. No groundwater encountered. 4. Pit walls stable. 5. Soakaway testing undertaken, see separate sheet. 6. Pit backfilled with arisings upon completion.

Trial Pit Log

Project Name: 261 Wilmslow Road, Manchester	Client: Lidl Great Britain Ltd	Date: 05/03/2026 - 06/03/2026
Location:	Contractor: Obsidian Geo-Consulting Ltd	
Project No. : 24-1965-P	Crew Name: P&J Hemmings Ltd	Equipment: Tracked Excavator

Location Number	Location Type	Level	Logged By	Scale	Page Number
SA03	TP		BM	1:15	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.08			MADE GROUND: Concrete with basal 10mm steel reinforcement.
								MADE GROUND: Concrete cobbles.
					0.20			MADE GROUND: Dark brown and black, very sandy gravel of fine to coarse, subangular limestone and occasional brick.
					0.50			Stiff, orangish brown, locally grey, silty CLAY.
					0.90			Very stiff, dark brown and grey, silty CLAY.
					1.45			End of Borehole at 1.450m

1

2

3

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks

1. Soakaway test pit location scanned with CAT and Genny. 2. Pit advanced to 1.45m bgl. 3. No groundwater encountered. 4. Pit walls stable. 5. Soakaway testing undertaken, see separate sheet. 6. Pit backfilled with arisings upon completion.

Appendix C
Soakaway Test Results

Soakaway Test Results

In accordance with BRE Digest 365:2016 - Soakaway Design

OBSIDIAN GEO-CONSULTING

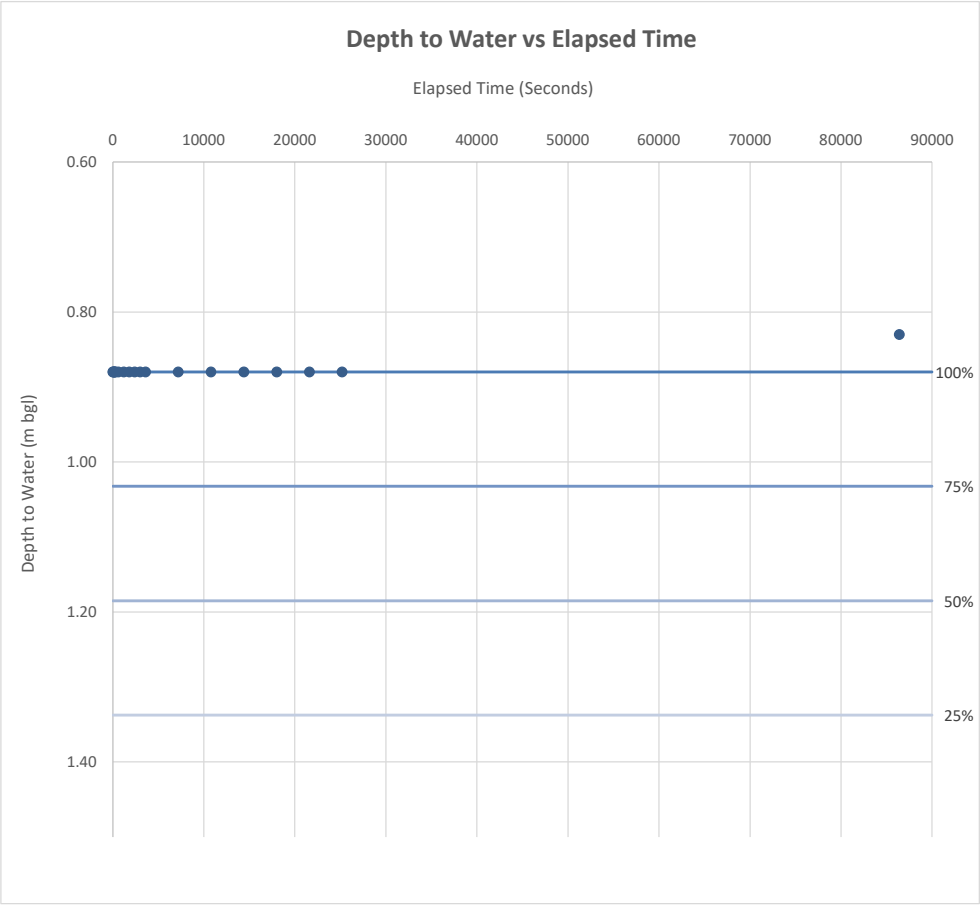
Project Name:	Lidl, 261 Wilmslow Road, Manchester
Project Number:	24-1965-P
Client:	Lidl Great Britain Limited

Test Location:	SA01	**Depth to top of test zone (m):**	0.88
Test Number:	1	**Depth to base of test zone (m):**	1.49
Test Date:	05/06/2026	**Length of pit (m):**	2.00
Logged By:	BM	**Width of pit (m):**	0.65
Groundwater:	Dry	**Voids Ratio (%):**	100

	From - to (m bgl)		**Description**
Ground Conditions	0.00	0.20	MADE GROUND: Concrete with 12mm steel reinforcement. Membrane at base.
	0.20	0.45	MADE GROUND: Dark brown and black, very sandy gravel of fine to coarse, subangular limesto
	0.45	0.80	Stiff, orangish brown, locally grey, silty CLAY. Clay pipe encountered cutting through south-weste
	0.80	1.50	Very stiff, dark brown and grey, silty CLAY.

Water Level During Test

Time (secs)	Depth bgl (m)
0	0.88
60	0.88
120	0.88
180	0.88
240	0.88
300	0.88
600	0.88
1200	0.88
1800	0.88
2400	0.88
3000	0.88
3600	0.88
7200	0.88
10800	0.88
14400	0.88
18000	0.88
21600	0.88
25200	0.88
86400	0.83



Soil Infilration Rate

$$f = \frac{V_p}{\alpha_p \times t_p}$$

f = soil infiltration rate
Vp = volume of water from 75% to 25% effective depth
ap = Internal surface area at 50% effective depth
tp = time for the water level to fall from 75% to 25% effective depth

time at 75% effective depth (secs)	NA
time at 25% effective depth (secs)	NA

Calculated Soil Infiltration Rate (m/sec)	**NA**

Soakaway Test Results

In accordance with BRE Digest 365:2016 - Soakaway Design

OBSIDIAN GEO-CONSULTING

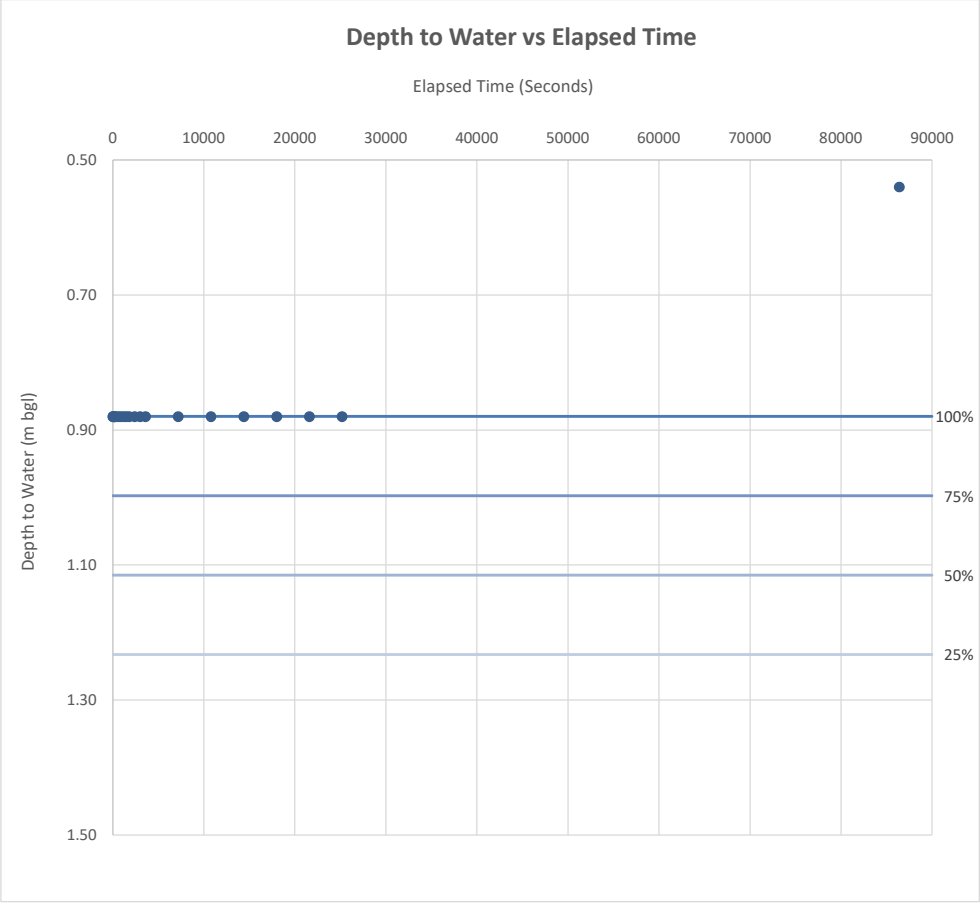
Project Name:	Lidl, 261 Wilmslow Road, Manchester
Project Number:	24-1965-P
Client:	Lidl Great Britain Limited

Test Location:	SA02	**Depth to top of test zone (m):**	0.88
Test Number:	1	**Depth to base of test zone (m):**	1.35
Test Date:	05/06/2026	**Length of pit (m):**	2.10
Logged By:	BM	**Width of pit (m):**	0.65
Groundwater:	Dry	**Voids Ratio (%):**	100

	From - to (m bgl)		Description
Ground Conditions	0.00	0.05	MADE GROUND: Concrete with no steel reinforcement.
	0.05	0.30	MADE GROUND: Concrete with 12mm steel reinforcement.
	0.30	0.45	MADE GROUND: Dark brown CLAY with feint hydrocarbon odour.
	0.45	0.85	Stiff, orangish brown, locally grey, silty CLAY.
	0.85	1.35	Very stiff, dark brown and grey, silty CLAY.

Water Level During Test

Time (secs)	Depth bgl (m)
0	0.88
60	0.88
120	0.88
180	0.88
240	0.88
300	0.88
600	0.88
900	0.88
1200	0.88
1500	0.88
1800	0.88
2400	0.88
3000	0.88
3600	0.88
7200	0.88
10800	0.88
14400	0.88
18000	0.88
21600	0.88
25200	0.88
86400	0.54



Soil Infilration Rate

$$f = \frac{V_p}{\alpha_p \times t_p}$$

f = soil infiltration rate
Vp = volume of water from 75% to 25% effective depth
ap = Internal surface area at 50% effective depth
tp = time for the water level to fall from 75% to 25% effective depth

time at 75% effective depth (secs)	NA
time at 25% effective depth (secs)	NA

Calculated Soil Infiltration Rate (m/sec)	**NA**

Soakaway Test Results

In accordance with BRE Digest 365:2016 - Soakaway Design

OBSIDIAN GEO-CONSULTING

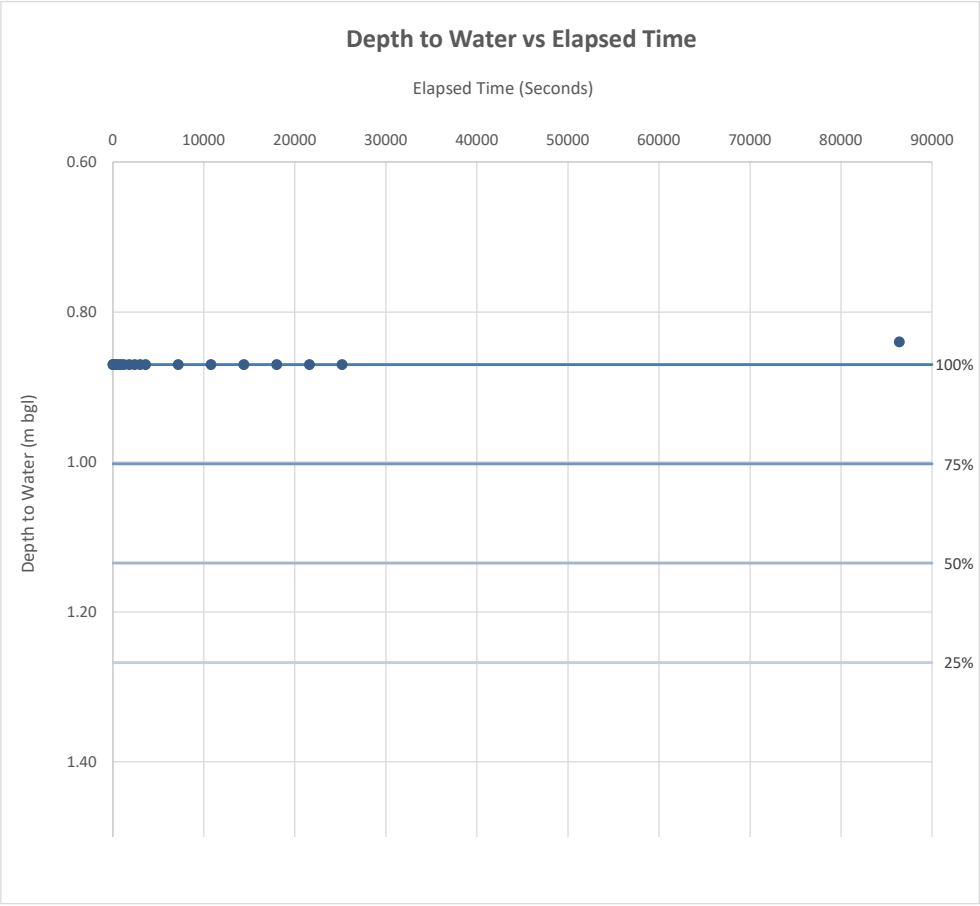
Project Name:	Lidl, 261 Wilmslow Road, Manchester
Project Number:	24-1965-P
Client:	Lidl Great Britain Limited

Test Location:	SA03	**Depth to top of test zone (m):**	0.87
Test Number:	1	**Depth to base of test zone (m):**	1.40
Test Date:	05/06/2026	**Length of pit (m):**	2.05
Logged By:	BM	**Width of pit (m):**	0.65
Groundwater:	Dry	**Voids Ratio (%):**	100

	From - to (m bgl)		**Description**
Ground Conditions	0.00	0.08	MADE GROUND: Concrete with basal 10mm steel reinforcement.
	0.08	0.20	MADE GROUND: Concrete cobbles.
	0.20	0.50	MADE GROUND: Dark brown and black, very sandy gravel.
	0.50	0.90	Stiff, orangish brown, locally grey, silty CLAY.
	0.90	1.45	Very stiff, dark brown and grey, silty CLAY.

Water Level During Test

Time (secs)	Depth bgl (m)
0	0.87
60	0.87
120	0.87
180	0.87
240	0.87
300	0.87
600	0.87
900	0.87
1200	0.87
1800	0.87
2400	0.87
3000	0.87
3600	0.87
7200	0.87
10800	0.87
14400	0.87
18000	0.87
21600	0.87
25200	0.87
86400	0.84



Soil Infilration Rate

$$f = \frac{V_p}{\alpha_p \times t_p}$$

f = soil infiltration rate
Vp = volume of water from 75% to 25% effective depth
ap = Internal surface area at 50% effective depth
tp = time for the water level to fall from 75% to 25% effective depth

time at 75% effective depth (secs)	NA
time at 25% effective depth (secs)	NA

Calculated Soil Infiltration Rate (m/sec)	**NA**



www.obsidian-geoconsulting.co.uk

APPENDIX B

Cora IHT Ltd. Adamson House, Towers Business Park, Wilmslow Road, Manchester, M20 2YY
Email: toan.chau@coraiht.com
Registered in England No 10321930

Results for 2 year Critical Storm Duration. Lowest mass balance: 98.46%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SMH1	10	37.882	0.038	3.6	0.0536	0.0000	OK
15 minute winter	SMH2	10	37.752	0.065	10.7	0.1057	0.0000	OK
15 minute winter	SMH3	11	37.563	0.095	20.5	0.1681	0.0000	OK
240 minute winter	SMH4 HYDRO	188	37.515	0.339	6.5	0.7028	0.0000	OK
240 minute winter	SMH5	188	37.175	0.036	3.8	0.0409	0.0000	OK
240 minute winter	EX MH04	188	36.986	0.036	3.8	0.0000	0.0000	OK
15 minute winter	SPPIC1	11	38.565	0.090	6.9	0.1192	0.0000	OK
15 minute winter	SPPIC2	11	38.295	0.060	10.2	0.0498	0.0000	OK
15 minute winter	SMH6	11	38.245	0.072	7.0	0.1196	0.0000	OK
15 minute winter	SMH7	11	38.139	0.094	22.3	0.1608	0.0000	OK
15 minute winter	SMH8	11	37.931	0.107	25.7	0.1531	0.0000	OK
15 minute winter	SMH9	11	37.783	0.121	30.6	0.1868	0.0000	OK
15 minute winter	SMH10	11	37.582	0.156	43.1	0.1762	0.0000	OK
240 minute winter	CELL STORE	188	37.515	0.339	10.3	45.2154	0.0000	OK
15 minute winter	SPPIC3	10	38.245	0.073	6.7	0.0939	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SMH1	1.000	SMH2	3.5	0.443	0.035	0.1534	
15 minute winter	SMH2	1.001	SMH3	10.5	0.701	0.103	0.3969	
15 minute winter	SMH3	1.002	SMH4 HYDRO	20.2	1.096	0.199	0.3126	
240 minute winter	SMH4 HYDRO	Hydro-Brake®	SMH5	3.8				
240 minute winter	SMH5	1.004	EX MH04	3.8	0.652	0.013	0.1328	82.6
15 minute winter	SPPIC1	2.000	SPPIC2	6.3	0.649	0.624	0.4824	
15 minute winter	SPPIC2	2.001	SMH7	10.2	0.852	0.152	0.1383	
15 minute winter	SMH6	3.002	SMH7	6.8	0.509	0.228	0.5150	
15 minute winter	SMH7	2.002	SMH8	22.3	1.301	0.332	0.2272	
15 minute winter	SMH8	2.003	SMH9	25.7	1.277	0.382	0.1953	
15 minute winter	SMH9	2.004	SMH10	30.5	1.193	0.504	0.4446	
15 minute winter	SMH10	2.005	CELL STORE	42.8	1.556	0.707	0.3559	
240 minute winter	CELL STORE	2.006	SMH4 HYDRO	3.0	-0.148	0.019	1.7034	
15 minute winter	SPPIC3	4.000	SPPIC4	6.6	0.676	0.220	0.2560	

Flow+ v11.1 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 2 year Critical Storm Duration. Lowest mass balance: 98.46%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SPPIC4	10	38.143	0.059	13.0	0.0688	0.0000	OK
240 minute winter	SPPIC5	188	37.515	0.339	2.3	4.9631	0.0000	OK
240 minute winter	SPPIC6	188	37.515	0.220	0.6	0.0623	0.0000	OK
15 minute winter	SPPIC7	10	38.547	0.027	1.2	0.0111	0.0000	OK
15 minute winter	SPPIC8	11	38.368	0.038	2.3	0.0153	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SPPIC4	4.001	SMH10	12.7	0.740	0.152	0.4793	
240 minute winter	SPPIC5	5.001	SMH4 HYDRO	-2.3	-0.316	-0.015	0.1857	
240 minute winter	SPPIC6	5.000	SPPIC5	-0.6	-0.024	-0.003	3.6784	
15 minute winter	SPPIC7	3.000	SPPIC8	1.1	0.415	0.071	0.0643	
15 minute winter	SPPIC8	3.001	SMH6	2.3	0.388	0.141	0.1119	

Flow+ v11.1 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 98.46%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	SMH1	352	38.508	0.664	1.8	0.9327	0.0000	SURCHARGED
360 minute winter	SMH2	352	38.508	0.821	5.3	1.3446	0.0000	SURCHARGED
360 minute winter	SMH3	352	38.508	1.040	9.4	1.8406	0.0000	SURCHARGED
360 minute winter	SMH4 HYDRO	352	38.508	1.332	10.4	2.7596	0.0000	SURCHARGED
360 minute winter	SMH5	352	37.175	0.036	3.9	0.0412	0.0000	OK
360 minute winter	EX MH04	352	36.986	0.036	3.9	0.0000	0.0000	OK
15 minute winter	SPPIC1	14	38.977	0.502	24.6	3.3968	0.0000	SURCHARGED
15 minute winter	SPPIC2	13	38.851	0.616	29.0	2.4544	0.0000	SURCHARGED
15 minute winter	SMH6	11	38.902	0.729	22.2	1.2047	0.0000	SURCHARGED
15 minute winter	SMH7	12	38.833	0.788	55.5	1.3427	0.0000	SURCHARGED
15 minute winter	SMH8	12	38.716	0.892	53.2	1.2816	0.0000	SURCHARGED
15 minute winter	SMH9	12	38.574	0.912	68.9	1.4122	0.0000	SURCHARGED
360 minute winter	SMH10	352	38.508	1.082	21.3	1.2240	0.0000	SURCHARGED
360 minute winter	CELL STORE	352	38.508	1.332	24.5	177.5187	0.0000	SURCHARGED
360 minute winter	SPPIC3	352	38.508	0.336	3.3	0.4313	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	SMH1	1.000	SMH2	1.8	0.345	0.018	1.3268	
360 minute winter	SMH2	1.001	SMH3	4.9	0.535	0.048	1.8512	
360 minute winter	SMH3	1.002	SMH4 HYDRO	8.2	0.677	0.081	1.1959	
360 minute winter	SMH4 HYDRO	Hydro-Brake®	SMH5	3.9				
360 minute winter	SMH5	1.004	EX MH04	3.9	0.655	0.013	0.1343	119.7
15 minute winter	SPPIC1	2.000	SPPIC2	18.1	1.041	1.782	0.8693	
15 minute winter	SPPIC2	2.001	SMH7	30.8	0.955	0.458	0.4537	
15 minute winter	SMH6	3.002	SMH7	20.9	0.597	0.701	1.5284	
15 minute winter	SMH7	2.002	SMH8	48.3	1.360	0.719	0.5270	
15 minute winter	SMH8	2.003	SMH9	53.6	1.347	0.797	0.3866	
15 minute winter	SMH9	2.004	SMH10	67.5	1.697	1.116	0.6934	
360 minute winter	SMH10	2.005	CELL STORE	20.9	0.879	0.345	0.5154	
360 minute winter	CELL STORE	2.006	SMH4 HYDRO	-3.9	-0.197	-0.025	2.1052	
360 minute winter	SPPIC3	4.000	SPPIC4	3.3	0.553	0.111	1.0457	

Flow+ v11.1 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 98.46%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	SPPIC4	352	38.508	0.424	6.4	0.4942	0.0000	SURCHARGED
360 minute winter	SPPIC5	352	38.508	1.332	4.5	19.4893	0.0000	SURCHARGED
360 minute winter	SPPIC6	352	38.508	1.213	1.5	0.3432	0.0000	SURCHARGED
15 minute winter	SPPIC7	12	38.953	0.433	9.8	0.1771	0.0000	SURCHARGED
15 minute winter	SPPIC8	12	38.942	0.612	7.8	0.2473	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	SPPIC4	4.001	SMH10	6.4	0.569	0.076	1.0150	
360 minute winter	SPPIC5	5.001	SMH4 HYDRO	-4.5	-0.362	-0.028	0.2296	
360 minute winter	SPPIC6	5.000	SPPIC5	-1.5	-0.012	-0.008	5.6785	
15 minute winter	SPPIC7	3.000	SPPIC8	5.9	0.577	0.363	0.4024	
15 minute winter	SPPIC8	3.001	SMH6	9.6	0.546	0.593	0.3311	

Flow+ v11.1 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 98.46%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	SMH1	352	39.023	1.179	2.3	1.6564	0.0000	SURCHARGED
360 minute winter	SMH2	352	39.023	1.336	6.4	2.1883	0.0000	SURCHARGED
360 minute winter	SMH3	352	39.023	1.555	12.4	2.7523	0.0000	SURCHARGED
360 minute winter	SMH4 HYDRO	352	39.023	1.847	14.9	3.8269	0.0000	SURCHARGED
360 minute winter	SMH5	352	37.178	0.039	4.5	0.0443	0.0000	OK
360 minute winter	EX MH04	352	36.989	0.039	4.5	0.0000	0.0000	OK
15 minute winter	SPPIC1	16	39.046	0.571	32.2	6.9689	0.0000	SURCHARGED
360 minute winter	SPPIC2	352	39.024	0.789	7.2	11.2950	0.0000	SURCHARGED
360 minute winter	SMH6	352	39.024	0.851	4.7	2.8009	0.0000	SURCHARGED
360 minute winter	SMH7	352	39.024	0.979	15.4	4.3358	0.0000	SURCHARGED
360 minute winter	SMH8	352	39.024	1.200	16.9	1.7245	0.0000	SURCHARGED
360 minute winter	SMH9	352	39.024	1.362	19.5	2.1082	0.0000	SURCHARGED
360 minute winter	SMH10	352	39.024	1.598	27.3	1.8069	0.0000	SURCHARGED
360 minute winter	CELL STORE	352	39.023	1.847	32.6	200.0892	0.0000	SURCHARGED
360 minute winter	SPPIC3	352	39.024	0.852	5.7	11.3712	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	SMH1	1.000	SMH2	2.0	0.360	0.020	1.3268	
360 minute winter	SMH2	1.001	SMH3	6.0	0.535	0.059	1.8512	
360 minute winter	SMH3	1.002	SMH4 HYDRO	11.9	0.665	0.118	1.1959	
360 minute winter	SMH4 HYDRO	Hydro-Brake®	SMH5	4.5				
360 minute winter	SMH5	1.004	EX MH04	4.5	0.687	0.015	0.1489	136.3
15 minute winter	SPPIC1	2.000	SPPIC2	18.8	1.079	1.853	0.8693	
360 minute winter	SPPIC2	2.001	SMH7	7.2	0.815	0.106	0.4537	
360 minute winter	SMH6	3.002	SMH7	4.6	0.468	0.156	1.5284	
360 minute winter	SMH7	2.002	SMH8	14.7	1.215	0.219	0.5270	
360 minute winter	SMH8	2.003	SMH9	16.3	1.151	0.243	0.3866	
360 minute winter	SMH9	2.004	SMH10	19.1	1.004	0.316	0.6934	
360 minute winter	SMH10	2.005	CELL STORE	26.7	0.913	0.441	0.5154	
360 minute winter	CELL STORE	2.006	SMH4 HYDRO	-7.5	-0.209	-0.047	2.1052	
360 minute winter	SPPIC3	4.000	SPPIC4	4.3	0.593	0.145	1.0457	

Flow+ v11.1 Copyright © 1988-2026 Causeway Technologies Ltd

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 98.46%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	SPPIC4	352	39.024	0.940	9.1	11.3726	0.0000	FLOOD RISK
360 minute winter	SPPIC5	352	39.023	1.847	4.2	27.0264	0.0000	SURCHARGED
360 minute winter	SPPIC6	352	39.023	1.728	1.5	0.4890	0.0000	SURCHARGED
15 minute winter	SPPIC7	11	39.091	0.571	11.2	0.2336	0.0000	SURCHARGED
15 minute winter	SPPIC8	11	39.069	0.739	11.3	0.2986	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	SPPIC4	4.001	SMH10	8.2	0.573	0.098	1.0150	
360 minute winter	SPPIC5	5.001	SMH4 HYDRO	-4.2	-0.412	-0.027	0.2296	
360 minute winter	SPPIC6	5.000	SPPIC5	-1.5	-0.011	-0.008	5.6785	
15 minute winter	SPPIC7	3.000	SPPIC8	7.0	0.596	0.433	0.4024	
15 minute winter	SPPIC8	3.001	SMH6	10.6	0.602	0.655	0.3311	

Flow+ v11.1 Copyright © 1988-2026 Causeway Technologies Ltd

Node SMH4 HYDRO Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	37.176	Product Number	CTL-SHE-0089-5000-2294-5000
Design Depth (m)	2.294	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Node SPPIC1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Width (m)	5.000	Depth (m)	
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	38.875	Length (m)	28.750	Inf Depth (m)	
Safety Factor	2.0	Time to half empty (mins)	0	Slope (1:X)	300.0		

Node SPPIC2 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Width (m)	5.000	Depth (m)	
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	38.765	Length (m)	28.750	Inf Depth (m)	
Safety Factor	2.0	Time to half empty (mins)	80	Slope (1:X)	300.0		

Node SMH6 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Width (m)	5.000	Depth (m)	
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	38.951	Length (m)	19.250	Inf Depth (m)	
Safety Factor	2.0	Time to half empty (mins)	0	Slope (1:X)	300.0		

Node SMH7 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Width (m)	5.000	Depth (m)	
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	38.913	Length (m)	19.250	Inf Depth (m)	
Safety Factor	2.0	Time to half empty (mins)	0	Slope (1:X)	300.0		

Node CELL STORE Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	37.176
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Flow+ v11.1 Copyright © 1988-2026 Causeway Technologies Ltd

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	140.0	0.0	1.000	140.0	0.0	1.500	140.0	0.0	1.501	0.0	0.0

Node SPPIC5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	37.176
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	41.0	0.0	2.564	41.0	0.0

Node SPPIC3 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Width (m)	5.000	Depth (m)	
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	38.572	Length (m)	13.700	Inf Depth (m)	
Safety Factor	2.0	Time to half empty (mins)	176	Slope (1:X)	300.0		

Node SPPIC4 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.35	Width (m)	5.000	Depth (m)	
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	38.572	Length (m)	13.700	Inf Depth (m)	
Safety Factor	2.0	Time to half empty (mins)	176	Slope (1:X)	300.0		

Flow+ v11.1 Copyright © 1988-2026 Causeway Technologies Ltd

APPENDIX C

Cora IHT Ltd. Adamson House, Towers Business Park, Wilmslow Road, Manchester, M20 2YY
Email: toan.chau@coraiht.com
Registered in England No 10321930

ALL COVER LEVELS INTERPOLATED FROM HTC ARCHITECTS DRAWING REFERENCE 2594 P406E

SMH6
CL 39.551
IL 38.173

SPPIC2
CL 39.365
IL 38.235

3.000 - 225mmØ PIPE
54.00m LONG @ 1 IN 120

SMH7
CL 39.513
IL 38.045

SPPIC7
CL 39.809
IL 38.329

3.000 - 150mmØ PIPE 54.00m LONG @ 1 IN 120

FPPIC1
CL 39.815
IL 38.627

2.002 - 150mmØ PIPE 22.859m LONG @ 1 IN 120

SPPIC8
CL 39.815
IL 38.235

FMH1
CL 39.815
IL 38.041

SMH9
CL39.532
IL 37.587

SMH8
CL 39.590
IL 37.749

FMH2
CL 39.815
IL 37.790

FPPIC2
CL 39.815
IL 38.101

150mmØ PIPE 10.546m LONG @ 1 IN 80

2.002 - 225mmØ PIPE 7.456m LONG @ 1 IN 120

SMH10
CL 39.678
IL 37.351

150mmØ PIPE 16.829m LONG @ 1 IN 80

CELLULAR STORAGE
140m² X 1.5m DEEP
14 x 10 x 1.5m = 210m³
CL 39.706
TOP OF CRATES 38.176
IL 37.176

NSBP006
BYPASS
SEPARATOR
1700x1350

FPPIC3
CL 39.815
IL 37.580

1.000 - 300mmØ PIPE 18.842m LONG @ 1 IN 120

1.001 - 300mmØ PIPE 26.288m LONG @ 1 IN 120

SMH1
CL 39.815
IL 37.844

SMH2
CL 39.815
IL 37.687

1.002 - 300mmØ PIPE 15.983m LONG @ 1 IN 120

SPPIC6
CL39.815
IL 37.295

SMH3
CL 39.815
IL 37.468

SPPIC5
CL39.470
IL 37.176

SMH4
HYDRO
CL 39.470
IL 37.176

SMH5
CL 39.453
IL 37.139

1.004 - 450mmØ PIPE 22.645m LONG @ 1 IN 120

SPPIC3
CL39.172
IL 38.172

SPPIC4
CL 39.172
IL 38.084

EX MH04
CL 39.20
IL 36.95
NON RETURN VALVE TO BE FITTED TO SURFACE WATER OUTFALL
DOWN STREAM PIPE TO BE FULLY CLEANED OF ALL OBSTRUCTIONS PRIOR TO FORMING NEW CONNECTION

Sales area 1258m²

Plant Deck above

Night cage

Delivery area

Chiller

Staff cycle hoops

Trolley Bays

DRS

Bakery

Utility

Yellow lining to diagram 1018.1

White lining to diagram 1004

White lining to diagram 1057

Red thermoplastic non-slip surfacing

Crossing studs to diagram 1057

Proposed kerbing to tie into existing

Proposed white lining

Proposed kerbing to tie into existing

KEY

- PROPOSED SURFACE WATER SEWER
- PROPOSED RISING MAIN
- PROPOSED 150mmØ FOUL WATER SEWER
- PROPOSED PERFORATED PIPE WRAPPED IN PERMEABLE MEMBRANE
- EXISTING FOUL WATER SEWER
- EXISTING SURFACE WATER SEWER
- PROPOSED CELLULAR STORAGE
- PROPOSED BYPASS SEPARATOR BY KLARGESTER OR SIMILAR APPROVED
- PROPOSED RAIN GARDEN AREA
- PROPOSED AREAS OF PERMEABLE SURFACING WITH 600mm GRANULAR STORAGE LAYER
- NEW FOUL WATER INSPECTION CHAMBER 450mm DIAMETER
- NEW FOUL WATER MANHOLE 1200mm DIAMETER
- RE PROPOSED RODDING EYE
- NEW SURFACE WATER INSPECTION CHAMBER 600mm DIAMETER
- NEW SURFACE WATER MANHOLE 1200mm DIAMETER
- G NEW SURFACE WATER GULLY
- P PUMPING STATION WITH DUTY / STANDBY PUMPS AND HIGH LEVEL ALARM
- H NEW SURFACE WATER HYDROBRAKE OPTIMUM 1500mm DIAMETER TO RESTRICT THE FLOW TO NO MORE THAN 5 L/S
- CONNECTIONS FROM PREVIOUS SITE USE PREVIOUSLY COMMUNICATED WITH OFFSITE NETWORK VIA CHAMBERS HIGHLIGHTED,
- 7,500 LITRE RAINTECH GRP ONE PIECE UNDERGROUND RAINWATER STORAGE TANK
- 1:67 PROPOSED FLOW ARROWS GENERATED FORM HTC ARCHITECTS SPOT LEVELS ON DRAWING REFERENCE 2594-P406E
- 39.14 TIE IN LEVELS AT BACK OF ADOPTED HIGHWAY

Rev	Date	Revision Details	By	Chkd	Appd
P7	APR 26	LEVELS AT ADOPTED HIGHWAY ADDED	GRE		
P6	APR 26	AMENDMENTS FOLLOWING COMMENTS	GRE		
P5	APR 26	PERMEABLE SURFACING ADDED	GRE		
P4	JAN 26	SITE LAYOUT UPDATED	GRE		
P3	FEB 25	SITE LAYOUT UPDATED	GRE		
P2	OCT 24	RAIN GARDEN REPOSITIONED + SITE LAYOUT UPDATED	GRE		
P1	SEP 24	FIRST ISSUE	GRE		

Cora iHt

Client: LIDL GREAT BRITAIN Ltd

Project: RUSHOLME

Title: PROPOSED DRAINAGE ARRANGEMENT SHEET 1 of 3

Drawing No.: 16-3046-200

Revision: P7

Scale: 1:200 @ A1

Date: SEPTEMBER 2024

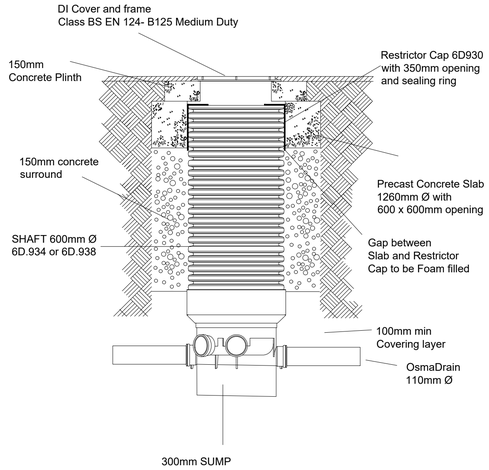
Drawn: GRE

Chk:

App:

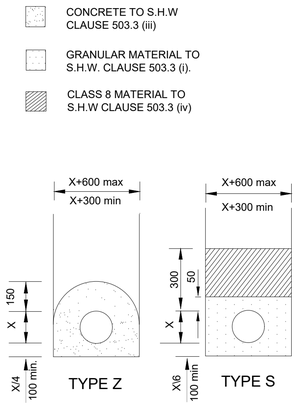
Common name	Scientific name	Habit	Sunlight and Aspect	Origin
Guelder rose	Viburnum opulus	Perennial shrub	Any	Native. Flowers attract insects and berries are eaten by birds.
Dogwood	Cornus sanguinea	Perennial shrub	Any	Native. Leaves are larval food for vase bearer moth and berries eaten by birds. Often planted for attractive winter stems.
Culvers root	Veronicastrum virginicum	Herbaceous perennial	Full sun or partial shade	Non-native. Tall with long terminal blue flower spikes. On the RHS 'plants for pollinators' list.
Aster	Aster spp.	Herbaceous perennial	Full sun or partial shade	Non-native. Often late flowering. Clump forming. Several species on the RHS 'plants for pollinators' list.
Black eyed susan	Rudbeckia birta	Herbaceous annual or biennial	Full sun or partial shade	Non-native. Spectacular yellow and black flowers. On RHS 'plants for pollinators' list.
Stinking hellebore	Helleborus foetidus	Herbaceous perennial	Full sun or partial shade	Native. Winter flowers.
Montbretia	Crocosmia spp.	Deciduous rhizomatous perennial	Partial shade	Naturalised. Red flowers. Thrives in most conditions.
Bugle	Ajuga reptans	Rhizomatous perennial	Partial shade	Native. Low growing and will form a mat.
Columbine	Aquilegia spp.	Herbaceous perennial	Full sun or partial shade	Non-native. Clump forming with tall flower spikes. On RHS 'plants for pollinators' list.
Inula	Inula hookeri	Herbaceous perennial	Partial shade	Tall clump forming with yellow flowers. On RHS 'plants for pollinators' list.
Hemp agrimony	Eupatorium cannabinum	Herbaceous perennial	Full sun or partial shade	Native. Sub-shrubs with pink flowers.
Bellflower	Campanula glomerata	Herbaceous perennial	Full sun or partial shade	Native. Clumps bearing violet-blue bell shaped flowers.
Sneezeweed	Helenium sp.	Herbaceous perennial	Full sun	Non-native. Clump forming with red flowers. On RHS 'plants for pollinators' list.
Lesser periwinkle	Vinca minor	Perennial sub-shrub	Any	Non-native. Ground cover with blue flowers.
Elephants ear	Bergenia sp.	Rhizomatous perennial	Full sun or partial shade	Non-native. Large leaves and pink flowers.
Plantain lilies	Hosta spp.	Herbaceous perennial	Part shade	Non-native. Attractive light coloured flowers.
Yellow flag	Iris pseudocorus	Rhizomatous perennial	Full sun or partial shade	Native. Likely to prefer wetter areas near inlet.
Siberian flag	Iris sibirica	Rhizomatous perennial	Full sun or partial shade	Non-native. Blue flowers. Prefers moist but well drained soil.
Garlic and onions	Allium spp.	Bulbous perennials	Full sun	Non-native. On RHS 'plants for pollinators' list.
Soft rush	Juncus effusus	Evergreen perennial	Full sun or partial shade	Native. Form tussocks – likely to prefer wetter areas.
Pendulous sedge	Carex pendula	Rhizomatous perennial	Full sun or partial shade	Native. Nodding flower spikes. Likely to prefer wetter areas near inlet.
Zebra grass	Miscanthis sinensis	Perennial, deciduous grass	Full sun	Non-native. Tussock forming ornamental grass with silky flowers.
Switch grass	Panicum virgatum	Deciduous perennial grass	Full sun	Non-native. Tussock forming ornamental grass.
Royal fern	Osmunda regalis	Deciduous fern	Any	Native. Large clump-forming plants.
Male fern	Dryopteris felix-mas	Deciduous or evergreen fern	Partial shade or full shade	Native. Large shuttlecock-like form.
Broad buckler fern	Dryopteris dilatata	Deciduous or evergreen fern	Partial shade or full shade	Native. Large shuttlecock-like form.

WATER COMPATIBLE PLANT SPECIES FOR BIO-RETENTION AREA



TYPICAL CATCHPIT CHAMBER DETAIL

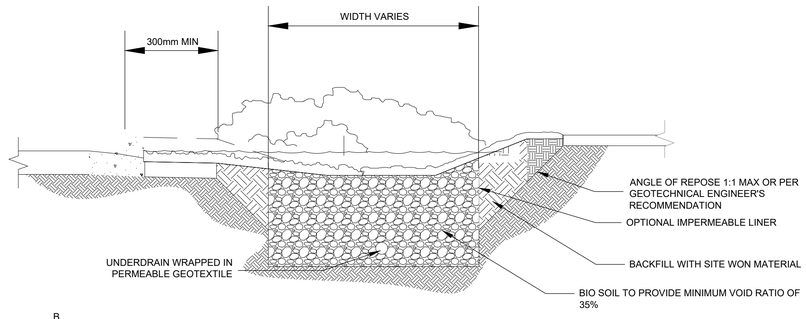
non entry



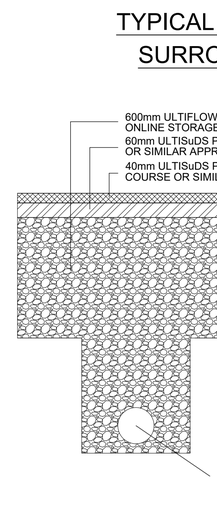
TYPICAL PIPE BED AND SURROUND DETAIL

DRAINAGE NOTES

1. ALL NON ADOPTABLE DRAINS UP TO 150 Dia. TO BE 'POLYPIPE uPVC UNDERGROUND DRAIN' MANUFACTURED IN ACCORDANCE WITH BS EN 1401-1OR EQUAL APPROVED.
2. ALL NON ADOPTABLE DRAINS WITH A PIPE Dia of 225 or 300 TO BE EITHER A PLAIN WALLED PLASTIC PIPE TO BS 1401-1 (POLYSEWER) OR A STRUCTURED WALL PLASTIC PIPE TO WIS-04-35-01 'POLYSEWER'. OR EQUAL APPROVED
3. ALL ADOPTABLE DRAINS UP TO 300 Dia. TO BE 'POLYSEWER' BY 'POLYPIPE' AND MANUFACTURED IN ACCORDANCE WITH THE WATER INDUSTRY SPECIFICATION WIS-4-35-01.
4. DRAINAGE PIPEWORK 400mm to 600mm DIA TO BE 'RIDGIDRAIN' HDPE BY POLYPIPE OR EQUAL APPROVED.
5. ALL PIPE LENGTHS NOT TO EXCEED 3m.
6. DRAINS TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
7. NEW INSPECTION CHAMBERS (IC) TO BE A MINIMUM OF 450MM DIA. EXCEPT FOR MINI ACCESS CHAMBERS WHICH MAY BE SMALLER, REFER TO M.H. SCHEDULE FOR ACTUAL SIZES.
8. ALL EXTERNAL RAINWATER PIPES (RWP) TO BE TERMINATED AT RODDABLE GULLIES. INTERNAL RWP's TO ARCHITECTS DETAILS BUT SHOULD ALLOW FOR RODDABLE ACCESS.
9. FOR ALL DRAINAGE ABOVE GROUND FLOOR SLAB INCLUDING SETTING OUT FOR PENETRATIONS THROUGH THE GROUND FLOOR SLAB REFER TO ARCHITECTS DRAWING & SPECIFICATIONS
10. ANY DRAINS PASSING THROUGH SUBSTRUCTURE WALLS TO HAVE A MINIMUM 50mm CLEAR SPACE, RC LINTEL SUPPORT ABOVE & CEMENT FIBRE COLLARS EITHER SIDE TO PREVENT VERMIN ENTRY
11. ANY DRAINS CAST IN & PASSING THROUGH CONCRETE GROUND BEAMS TO HAVE A FLEXIBLE JOINT NOT MORE THAN 150mm FROM THE FACE OF THE GROUND BEAM. (FLEXIBLE JOINT TO MANUFACTURERS DETAILS) AND A MAXIMUM 600mm LONG ROCKER PIPER EITHER SIDE
12. ANY ALTERATIONS TO DRAINAGE PROPOSED BY CONTRACTOR TO BE SUBMITTED TO ENGINEER FOR APPROVAL PRIOR TO COMMENCEMENT OF WORK ON SITE. ANY REVISIONS ARE ALSO SUBJECT TO THE APPROVAL OF THE LOCAL BUILDING INSPECTOR.
13. ALL DRAINS RUNNING UNDER BUILDINGS TO HAVE A MINIMUM FALL OF 1:40 TOWARDS THE BUILDING EXTERIOR. PIPE TO BE ENCASED IN 100MM GRANULAR FILL.
14. COVER LEVELS SHOWN ARE APPROXIMATE ONLY AND SHOULD BE ALTERED TO SUIT FINISHED SURFACE LEVELS.
15. THE BEDDING SPECIFICATION FOR ALL ADOPTABLE DRAINS WHERE COVER IS GREATER THAN 1200mm SHALL BE TYPE 'S'....WHERE COVER IS LESS THAN 1200mm TYPE 'Z' SHALL BE USED
16. THE DEVELOPER/CONTRACTOR MUST SELF VET AND CERTIFY THAT THE DESIGN CRITERIA, MATERIAL STANDARDS AND WORKMANSHIP SPECIFICATIONS FOR THE PROPOSED SEWERS ARE IN ACCORDANCE WITH THOSE SET OUT IN 'SEWERS FOR ADOPTION 7TH EDITION'
17. PROPOSED COVER AND INVERT LEVELS TO BE CONFIRMED BY THE CONTRACTOR PRIOR TO ANY WORKS COMMENCING ONSITE
18. ALL PPIC'S LOCATED WITHIN VEHICLE AREAS TO RECEIVE A MINIMUM 150mm CONCRETE BED AND SURROUND

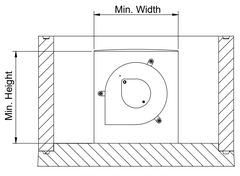


TYPICAL RAINGARDEN DETAIL

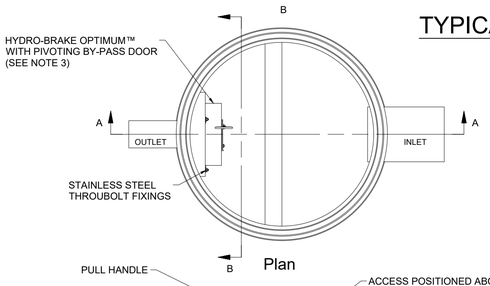


TYPICAL PERMEABLE SURFACING (PARTIAL INFILTRATION) DETAIL INCLUDING ONLINE STORAGE

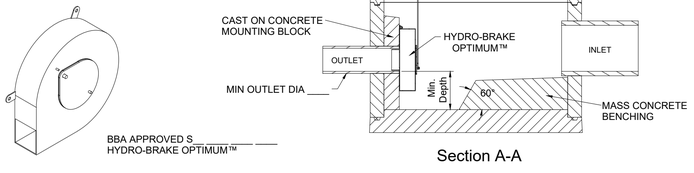
NOTE - A pre-formed Hydro-Brake® Chamber Base is available from Hydro International with Hydro-Brake Optimum™ pre-fitted



Section B-B
(View on mounting block)



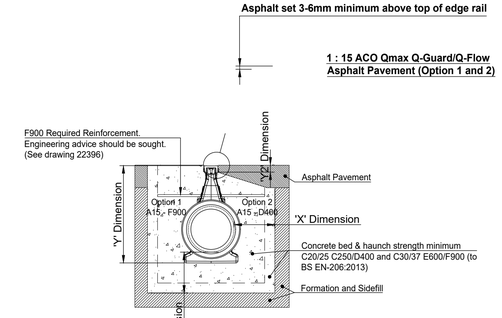
Plan



Section A-A

BBA APPROVED S
HYDRO-BRAKE OPTIMUM™

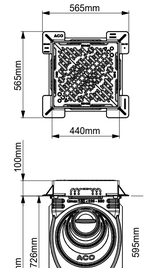
TYPICAL HYDROBRAKE OPTIMUM DETAIL



TYPICAL ACO QMAX DETAIL

Load Class		C250	D400	E600	F900
Minimum Dimensions (mm)	X	X-DIM-1	X-DIM-2	X-DIM-3	X-DIM-4
	Y	Full Channel Height (Less Y2 where applicable)			
	Z	Z-DIM-1	Z-DIM-2	Z-DIM-3	Z-DIM-4
Maximum Dimensions (mm)	Y2	Y2-DIM-1	Y2-DIM-2	Y2-DIM-3	Y2-DIM-4
	Y3	Y3-DIM-1	Y3-DIM-2	Y3-DIM-3	Y3-DIM-4
Reinforcement		R-1	R-2	R-3	R-4
Load Class Concrete		C-1	C-2	C-3	C-4

32972 - OUTLET/INLET CHAMBER WITH D400 SLOTTED COVER AND FRAME



ISOMETRIC VIEW
OUTLET/INLET CHAMBER

QMAX 150, 225 AND 350 (D400) ACCESS, OUTLET/INLET AND SILT CHAMBER DETAIL

Rev	Date	Revision Details	By	Chkd	Appd
P7	APR 26	LEVELS AT ADOPTED HIGHWAY ADDED	GRE		
P6	APR 26	AMENDMENTS FOLLOWING COMMENTS	GRE		
P5	APR 26	PERMEABLE SURFACING ADDED	GRE		
P4	JAN 26	SITE LAYOUT UPDATED	GRE		
P3	FEB 25	SITE LAYOUT UPDATED	GRE		
P2	OCT 24	RAIN GARDEN REPOSITIONED	GRE		
P1	SEP 24	FIRST ISSUE	GRE		

Client: LIDL GREAT BRITAIN Ltd

Project: RUSHOLME

Title: PROPOSED DRAINAGE ARRANGEMENT SHEET 2 of 3

Drawing No.: 16-3046-200

Revision: P7

Scale: NTS

Date: SEPTEMBER 2024

Drawn: GRE

Chk:

App:

BREAK TANK & BOOSTER SET SCHEDULE

ITEM	LOCATION	MAX. FLOW RATE (L/s)	MAX. PRESSURE (BAR)	ELECTRICAL DATA	POWER	MANUFACTURER/ MODEL
BS01	SLUICE	0.13	1.5	1 PHASE, 230V, 50Hz	0.35kW	ARROW VALVES LTD / BTMIDI-1L

1.00 BS01 SHALL BE PROVIDED WITH AN MIDIBRA WALL MOUNTING BRACKET AND A BTDT3 STAINLESS STEEL DRIP TRAY.
2.00 CONTACT: MILLIE GRADY (ARROW VALVES LTD); TEL 01442 823 123

WATER CONDITIONER SCHEDULE

ITEM	LOCATION	MAKE	MODEL	ELECTRICAL DATA	POWER
HY01	UTILITY ROOM	HYDROTEC	HY-MAG-DN25	1 PHASE, 230V, 50Hz	31W

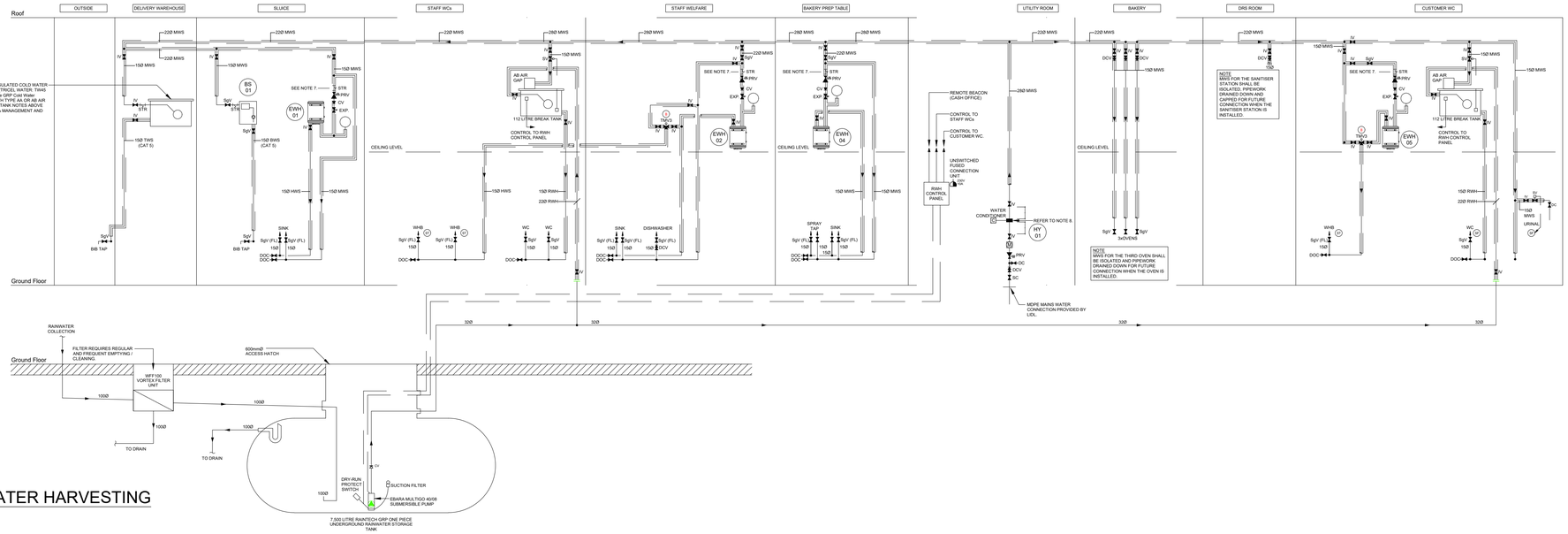
ELECTRIC WATER HEATER SCHEDULE

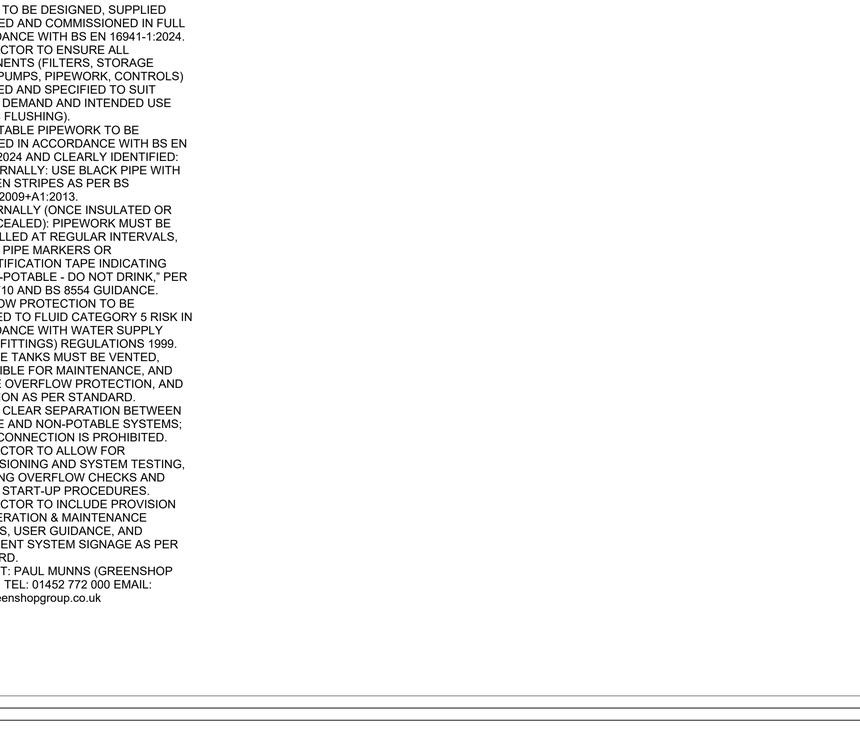
ITEM	LOCATION	ELECTRICAL DATA	RATED POWER	MANUFACTURER/ MODEL	ACCESSORIES
EWH01	SLUICE AREA	1 PHASE, 230V, IP24	3kW	HYCO - POWERFLOW SMART PF30LS	-
EWH02	STAFF WELFARE	1 PHASE, 230V, IP24D	1.2kW	HYCO - SPEEDFLOW SF15L1	SF7 KIT
EWH03	BAKERY	1 PHASE, 230V, IP24D	1.2kW	HYCO - SPEEDFLOW SF15L1	SF7 KIT
EWH04	CUSTOMER WC	1 PHASE, 230V, IP24D	1.2kW	HYCO - SPEEDFLOW SF15L1	SF7 KIT

FLOW LIMITING VALVE AND CARTRIDGE SCHEDULE

MANUFACTURER	TYPE	MODEL	LOCATION	MANUFACTURER/ MODEL	COMMENTS
ARROW VALVES LTD	VALVE	AFL15CL	ALL AREAS	-	15mm AFL VALVE COMP DZR NICKEL c/w LEVER
	CARTRIDGE	AFLC04	WHB'S	0.040	IDENTITY DISC COLOUR: PURPLE
	CARTRIDGE	AFLC07	KITCHEN SINK	0.070	IDENTITY DISC COLOUR: LIGHT GREY
	CARTRIDGE	AFLC10	REMAINING SINKS	0.100	IDENTITY DISC COLOUR: BLACK

1.00 CONTACT: MILLIE GRADY (ARROW VALVES LTD); TEL 01442 823 123





RAINWATER HARVESTING NOTES

1. SYSTEM TO BE DESIGNED, SUPPLIED INSTALLED AND COMMISSIONED IN FULL ACCORDANCE WITH BS EN 16941-1:2024.
2. CONTRACTOR TO ENSURE ALL COMPONENTS (FILTERS, STORAGE TANKS, PUMPS, PIPEWORK, CONTROLS) ARE SIZED AND SPECIFIED TO SUIT SYSTEM DEMAND AND INTENDED USE (E.G. WC FLUSHING).
3. NON-POTABLE PIPEWORK TO BE INSTALLED IN ACCORDANCE WITH BS EN 16941-1:2024 AND CLEARLY IDENTIFIED:
   - 3.1. EXTERNALLY: USE BLACK PIPE WITH GREEN STRIPES AS PER BS 8515:2009+A1:2013.
   - 3.2. INTERNALLY (ONCE INSULATED OR CONCEALED): PIPEWORK MUST BE LABELLED AT REGULAR INTERVALS, WITH PIPE MARKERS OR IDENTIFICATION TAPE INDICATING “NON-POTABLE - DO NOT DRINK,” PER BS 1710 AND BS 8554 GUIDANCE.
4. BACKFLOW PROTECTION TO BE PROVIDED TO FLUID CATEGORY 5 RISK IN ACCORDANCE WITH WATER SUPPLY (WATER FITTINGS) REGULATIONS 1999.
5. STORAGE TANKS MUST BE VENTED, ACCESSIBLE FOR MAINTENANCE, AND INCLUDE OVERFLOW PROTECTION, AND FILTRATION AS PER STANDARD.
6. ENSURE CLEAR SEPARATION BETWEEN POTABLE AND NON-POTABLE SYSTEMS; CROSS-CONNECTION IS PROHIBITED.
7. CONTRACTOR TO ALLOW FOR COMMISSIONING AND SYSTEM TESTING, INCLUDING OVERFLOW CHECKS AND SYSTEM START-UP PROCEDURES.
8. CONTRACTOR TO INCLUDE PROVISION FOR OPERATION & MAINTENANCE MANUALS, USER GUIDANCE, AND PERMANENT SYSTEM SIGNAGE AS PER STANDARD.
9. CONTACT: PAUL MUNNS (GREENSHOP GROUP). TEL: 01452 772 000 EMAIL: paul@greenshopgroup.co.uk

LEGEND

- B — TMV3 BLENDING VALVE SET AT 40-43°C c/w CHECK VALVES AND STRAINERS.
- SF — SENSOR FLUSH.
- ST — SENSOR TAP.
- M — WATER METER c/w PULSED OUTPUT WIRED BACK TO STORE BMS.
- SC - STOP COCK
- STR - STRAINER.
- SgV - SERVICE GATE VALVE.
- DOC - DRAIN OFF COCK.
- CV - CHECK VALVE.
- DCV - DOUBLE CHECK VALVE.
- IV - ISOLATING VALVE.
- SV - SOLENOID VALVE.
- DC - DC INTERRUPTER VALVE.
- HWS - HOT WATER SERVICE.
- MWS - MAINS WATER SERVICE.
- PRV - PRESSURE REDUCING VALVE
- SgV (FL) - 15mm SERVICING VALVE WITH AUTOMATIC FLOW LIMITING CARTRIDGE LIMITING FLOW TO THE FOLLOWING:
  WHB's - 0.048l/s
  SINK's (KITCHEN SINK) - 0.08l/s
  SINK's (BAKERY, CLEANERS) - 0.12l/s
  URINAL - 2l/BOWL PER HOUR
  WC's - 4l/flush
  DISHWASHER - 12l/cycle

NOTES

1. ALL PIPEWORK TO BE INSULATED. CWS TO BE ADDITIONALLY VAPOUR SEALED.
2. ALL PIPEWORK TO BE ENCLOSED SUPPLEMENTARY BONDING.
3. ALL PIPE SIZES AND EQUIPMENT ARE INDICATIVE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CALCULATING ALL FINAL PLANT SELECTIONS AND EQUIPMENT SIZES.
4. TAPS TO INCORPORATE SENSOR CONTROL AND TOILETS INFRA-RED FLUSHING CONTROL.
5. CONTRACTOR SHALL ALLOW FOR THE INSTALLATION OF WATERLESS TRAPS ON ALL PRESSURE RELIEF PIPEWORK.
6. ALL PENETRATIONS THROUGH FLOOR SLAB TO GROUND FLOOR TO BE FIRE SEALED.
7. MAINS WATER COLD FILL TO ELECTRIC WATER HEATER TO INCLUDE MANUFACTURER'S UNVENTED KIT.
8. REGIONS WHERE WATER HARDNESS IS GREATER THAN 10 DEGREE CLARK (OR 143 PPM) A PHYSICAL WATER CONDITIONER SHALL BE PROVIDED ON THE INCOMING MAIN. REFER TO PERFORMANCE SPECIFICATION FOR DETAILS.

COLD WATER STORAGE TANK NOTES

1. COLD WATER STORAGE TANKS MUST BE CONSTRUCTED FROM NON-DELETERIOUS MATERIALS WHICH MUST BE WRAS APPROVED.
2. COLD WATER STORAGE TANKS SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH THE CURRENT WATER SUPPLY (WATER FITTINGS) REGULATIONS 1999, INSTALLED IN APPROPRIATE AND SUITABLE LOCATIONS TO ALLOW EASY AND SAFE ACCESS TO FACILITATE INSPECTION AND MAINTENANCE.
3. COLD WATER STORAGE TANKS SHOULD BE PROTECTED FROM THE INGRESS OF LIGHT, INSECTS AND BIRDS.
4. COLD WATER STORAGE TANKS SHOULD BE ARRANGED SO AS TO MINIMISE THE RETENTION TIME OF STORAGE WATER AND THEREFORE INCREASE THE RATE OF STORED WATER EXCHANGE.
5. COLD WATER STORAGE TANKS SHOULD BE DESIGNED IN ORDER THAT THE STORED WATER IS MAINTAINED AT A TEMPERATURE OF <20°C.

Rev	Date	Revision Details	By	Chkd	Appd
P7	APR 26	LEVELS AT ADOPTED HIGHWAY ADDED	GRE		
P6	APR 26	AMENDMENTS FOLLOWING COMMENTS	GRE		
P5	APR 26	PERMEABLE SURFACING ADDED	GRE		
P4	JAN 26	SITE LAYOUT UPDATED	GRE		
P3	FEB 25	SITE LAYOUT UPDATED	GRE		
P2	OCT 24	RAIN GARDEN REPOSITIONED	GRE		
P1	SEP 24	FIRST ISSUE	GRE		

Cora iHt

Client: LIDL GREAT BRITAIN Ltd

Project: RUSHOLME

Title: DRAINAGE ARRANGEMENT SHEET 3 of 3

Drawing No.	Revision
16-3046-200	P7

Scale	1:250 @ A1	Date	APRIL 2026
Drawn	GRE	Chk	App