GEO-ENVIRONMENTAL CONSULTANTS

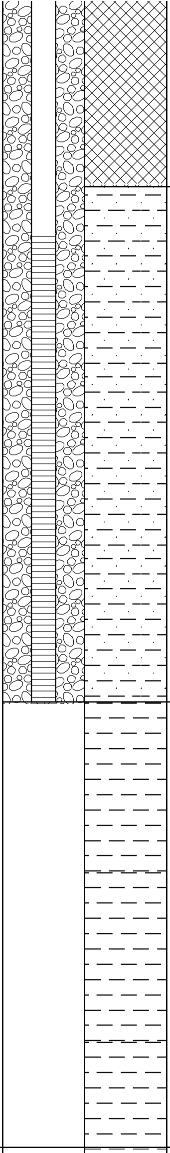
PROJECT NUMBER 23048
PROJECT NAME Welshpool
CLIENT KIM Property Investment Limited

DATE 29th March 2023
DRILLING METHOD Window Sample Borehole
BOREHOLE NO WS6
SHEET 6/6

COMPLETION
CASING uPVC
SCREEN uPVC Factory Slotted

COMMENTS Borehole dry. 1 Liner. 0.50 m pipe and 1m slotted.

Depth (m)	Depth (m)	Samples/ Test	Field Records	Water	Well Instal.	Graphic Log	Material Description	Elevation (m)
0.2	0.1	D=0.1 m					Grass onto brown / black slightly silty sandy clays with occasional ash and clinker fragments, rare broken brick, rare fine to coarse gravel and rare rootlets and rare pottery	0.2
0.4							Very stiff brown silty sandy clay	0.4
0.6 0.8	0.5 - 1.0	D = 0.5 - 1. 0 m						0.6 0.8
1 1.2 1.4	1.0 - 1.45	SPT (C) N= 20	3,3/4,5,5,6					1 1.2 1.4
1.6 1.8							Hard brown weathered siltstone	1.6 1.8
2	2.0	D= 2.0 m						2
2.2 2.4	2.0 - 2.45	50 for no movement	4,8/12,18,50/30 refusal					2.2 2.4
2.6 2.8							Termination Depth at: 2.45 m	2.6 2.8



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APPENDIX B

TRL Probe Results and CBR Conversion

GEO-ENVIRONMENTAL CONSULTING ENGINEERS

Dynamic Cone Penetrator (DCP) to CBR Relationship

Project Name	Welshpool	Location Reference:	WS1
Project Number	23048	Test Level:	Surface
Test Date	03/04/2023	Weather:	/

Calculation of Calafornia Bearing Ratio (CBR) values as per Interim Advice Note 73/06 Revision 1 (2009) "Design Guidance for Road Pavement Foundations (Draft HD25)" published by the Highways Agency.

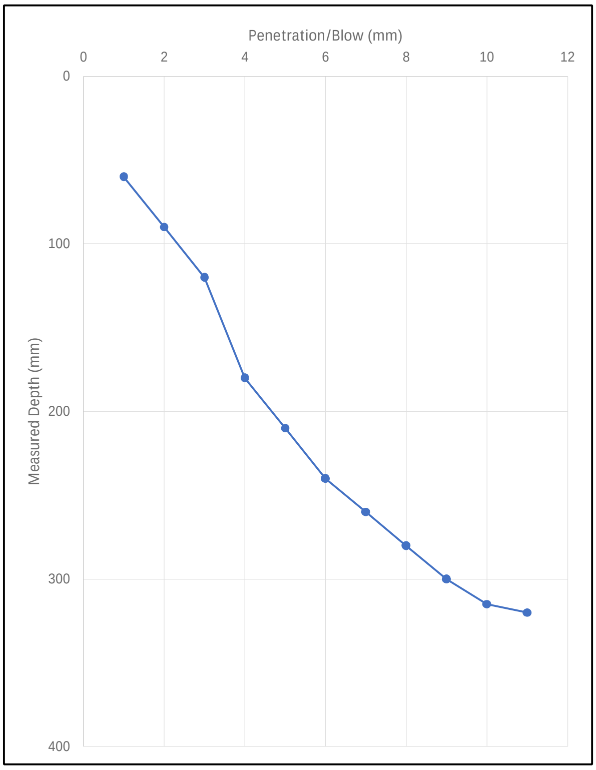
Using:

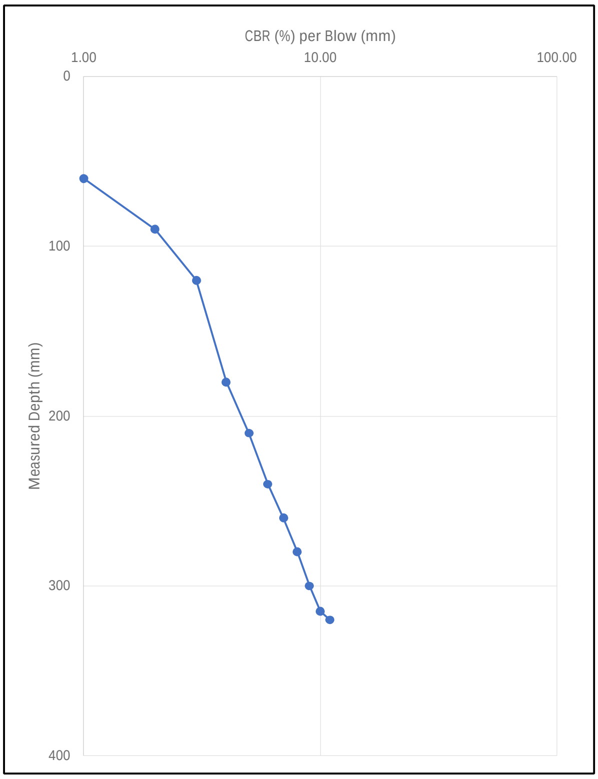
$$\log 10(CBR) = 2.48 - 1.057 \cdot \log 10(mm\ per\ blow)$$

Material at Surface	Grass
Test Start Depth (mm)	30
Access to Test Depth (mm)	Started at Surface

Measured Depth (mm)	Blows	Penetration (mm)	Penetration/blow	CBR per blow (%)
30		30	0	
60	1	30	30	8.29
90	1	30	30	8.29
120	1	30	30	8.29
180	2	60	30	8.29
210	2	30	15	17.25
240	2	30	15	17.25
260	2	20	10	26.49
280	2	20	10	26.49
300	5	20	4	69.76
315	5	15	3	94.55
320	5	5	1	302.00
320		Refusal		

Average CBR	53.36





GEO-ENVIRONMENTAL CONSULTING ENGINEERS

Dynamic Cone Penetrator (DCP) to CBR Relationship

Project Name	Welshpool	Location Reference:	WS2
Project Number	23048	Test Level:	Surface
Test Date	03/04/2023	Weather:	/

Calculation of Calafornia Bearing Ratio (CBR) values as per Interim Advice Note 73/06 Revision 1 (2009) "Design Guidance for Road Pavement Foundations (Draft HD25)" published by the Highways Agency.

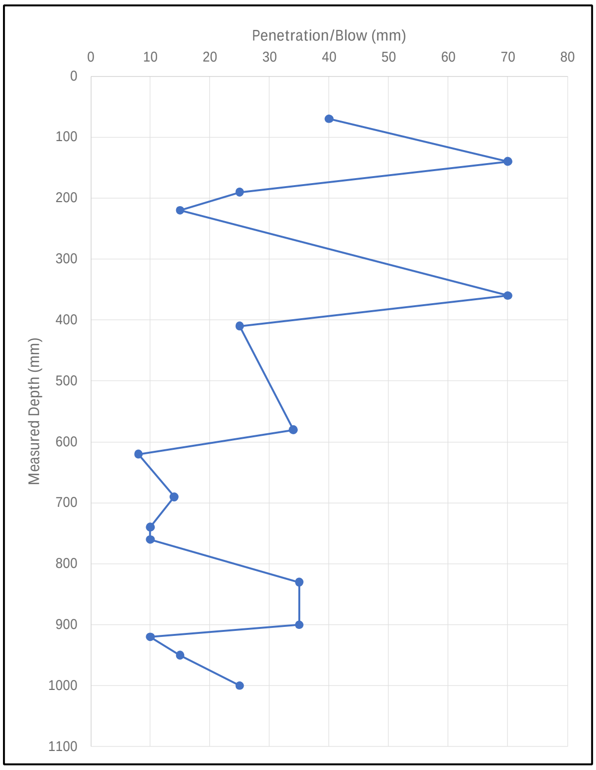
Using:

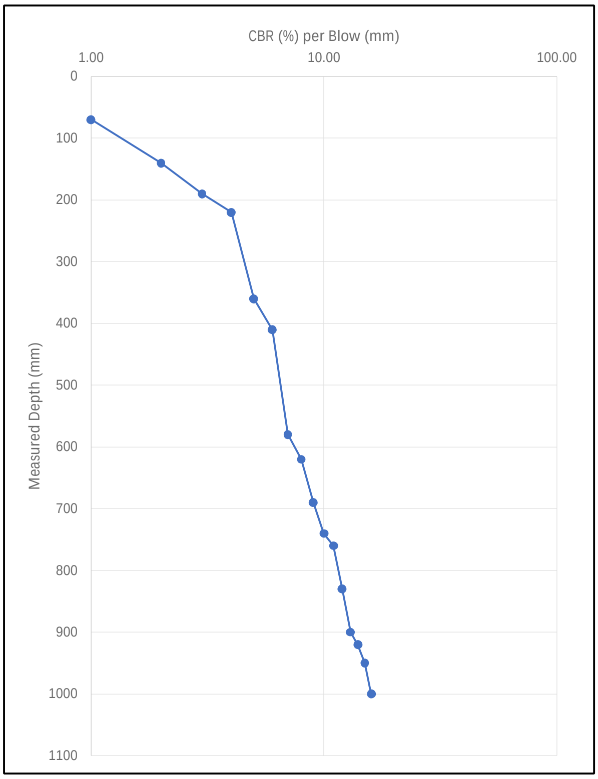
$$\log 10(CBR) = 2.48 - 1.057 \cdot \log 10(mm\ per\ blow)$$

Material at Surface	Grass
Test Start Depth (mm)	30
Access to Test Depth (mm)	Started at Surface

Measured Depth (mm)	Blows	Penetration (mm)	Penetration/blow	CBR per blow (%)
30		30	0	
70	1	40	40	6.12
140	1	70	70	3.39
190	2	50	25	10.05
220	2	30	15	17.25
360	2	140	70	3.39
410	2	50	25	10.05
580	5	170	34	7.26
620	5	40	8	33.53
690	5	70	14	18.56
740	5	50	10	26.49
760	2	20	10	26.49
830	2	70	35	7.05
900	2	70	35	7.05
920	2	20	10	26.49
950	2	30	15	17.25
1000	2	50	25	10.05

Average CBR	14.40





Dynamic Cone Penetrator (DCP) to CBR Relationship

Project Name	Welshpool	Location Reference:	WS3
Project Number	23048	Test Level:	Surface
Test Date	03/04/2023	Weather:	/

Calculation of Calafornia Bearing Ratio (CBR) values as per Interim Advice Note 73/06 Revision 1 (2009) "Design Guidance for Road Pavement Foundations (Draft HD25)" published by the Highways Agency.

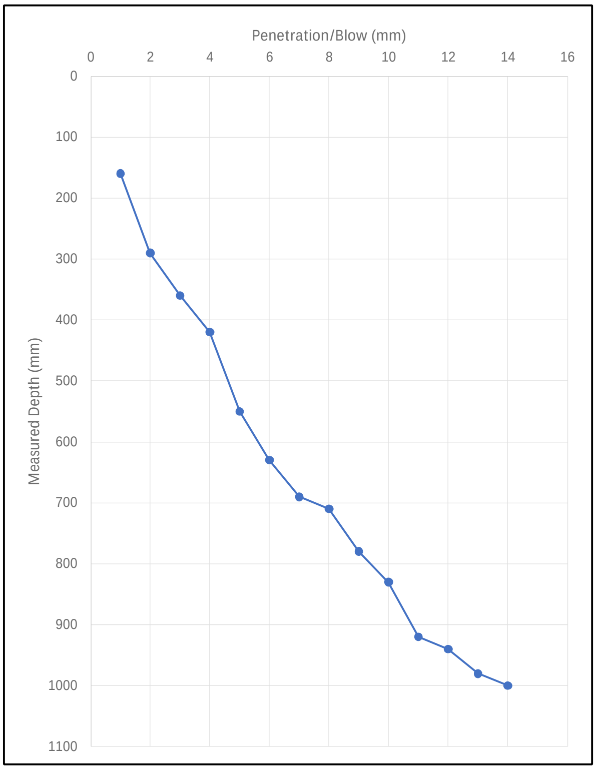
Using:

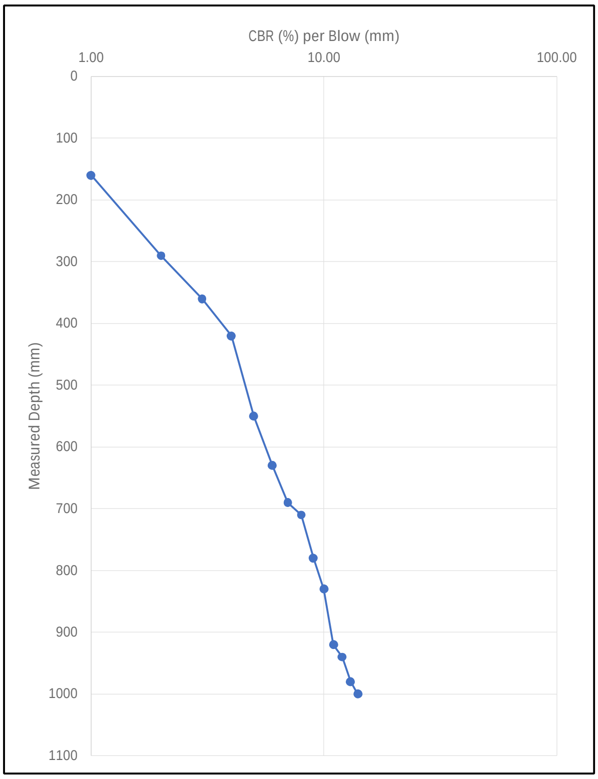
$$\log 10(CBR) = 2.48 - 1.057 \cdot \log 10(mm\ per\ blow)$$

Material at Surface	Grass
Test Start Depth (mm)	30
Access to Test Depth (mm)	Started at Surface

Measured Depth (mm)	Blows	Penetration (mm)	Penetration/blow	CBR per blow (%)
30		30	0	
160	1	130	130	1.76
290	1	130	130	1.76
360	1	70	70	3.39
420	2	60	30	8.29
550	2	130	65	3.66
630	5	80	16	16.12
690	2	60	30	8.29
710	2	20	10	26.49
780	2	70	35	7.05
830	2	50	25	10.05
920	2	90	45	5.40
940	2	20	10	26.49
980	2	40	20	12.73
1000	2	20	10	26.49

Average CBR	11.28





GEO-ENVIRONMENTAL CONSULTING ENGINEERS

Dynamic Cone Penetrator (DCP) to CBR Relationship

Project Name	Welshpool	Location Reference:	WS4
Project Number	23048	Test Level:	Surface
Test Date	03/04/2023	Weather:	/

Calculation of Calafornia Bearing Ratio (CBR) values as per Interim Advice Note 73/06 Revision 1 (2009) "Design Guidance for Road Pavement Foundations (Draft HD25)" published by the Highways Agency.

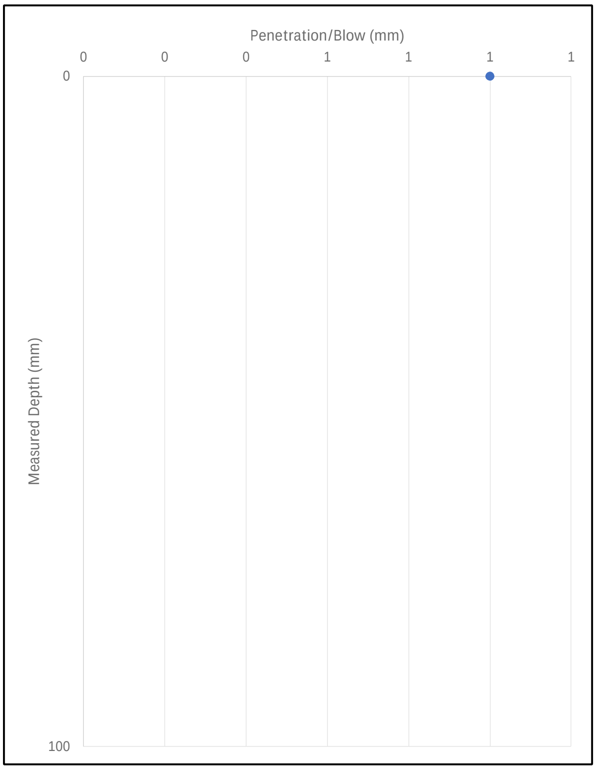
Using:

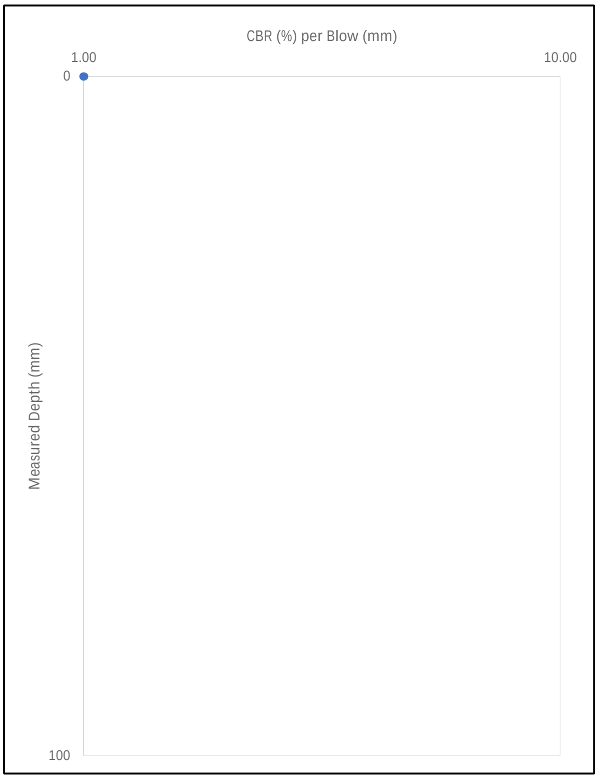
$$\log 10(CBR) = 2.48 - 1.057 \cdot \log 10(mm\ per\ blow)$$

Material at Surface	Grass
Test Start Depth (mm)	30
Access to Test Depth (mm)	Started at Surface

Measured Depth (mm)	Blows	Penetration (mm)	Penetration/blow	CBR per blow (%)
NO	DATA	SERVICES	IN	LOCATION

Average CBR	#DIV/0!





GEO-ENVIRONMENTAL CONSULTING ENGINEERS

Dynamic Cone Penetrator (DCP) to CBR Relationship

Project Name	Welshpool	Location Reference:	WS5
Project Number	23048	Test Level:	Surface
Test Date	03/04/2023	Weather:	/

Calculation of Calafornia Bearing Ratio (CBR) values as per Interim Advice Note 73/06 Revision 1 (2009) "Design Guidance for Road Pavement Foundations (Draft HD25)" published by the Highways Agency.

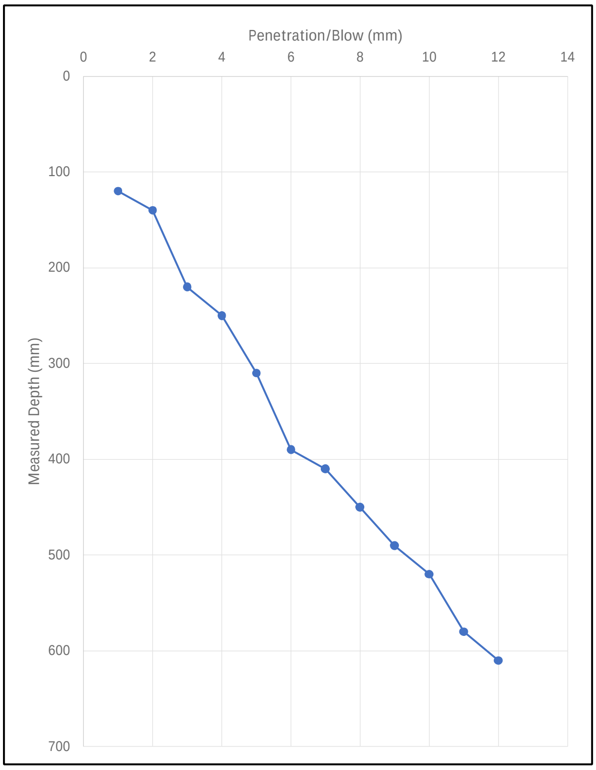
Using:

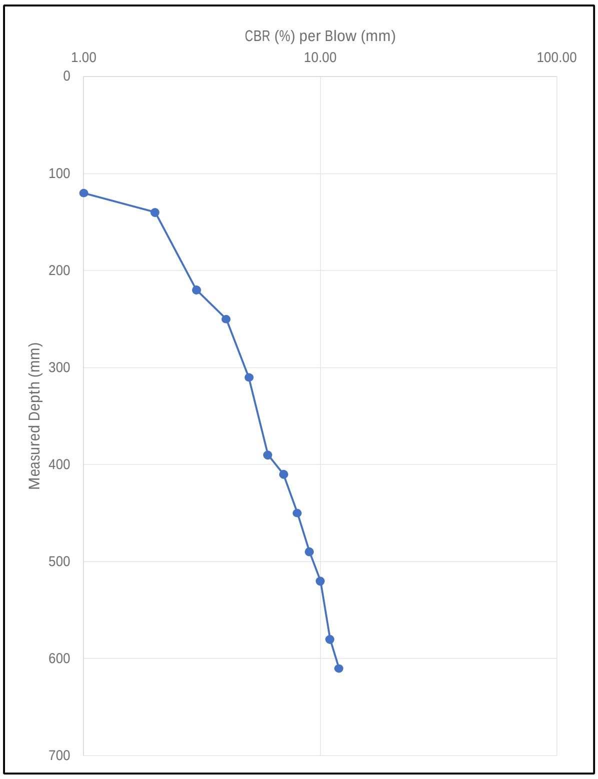
$$\log 10(CBR) = 2.48 - 1.057 \cdot \log 10(mm\ per\ blow)$$

Material at Surface	Grass
Test Start Depth (mm)	30
Access to Test Depth (mm)	Started at Surface

Measured Depth (mm)	Blows	Penetration (mm)	Penetration/blow	CBR per blow (%)
30		30	0	
120	1	90	90	2.60
140	1	20	20	12.73
220	2	80	40	6.12
250	5	30	6	45.45
310	5	60	12	21.84
390	5	80	16	16.12
410	5	20	4	69.76
450	5	40	8	33.53
490	5	40	8	33.53
520	5	30	6	45.45
580	5	60	12	21.84
610	5	30	6	45.45
610		0		
610		Refusal		

Average CBR	29.53





GEO-ENVIRONMENTAL CONSULTING ENGINEERS

Dynamic Cone Penetrator (DCP) to CBR Relationship			
Project Name	Welshpool	Location Reference:	WS6
Project Number	23048	Test Level:	Surface
Test Date	03/04/2023	Weather:	/

Calculation of Calafornia Bearing Ratio (CBR) values as per Interim Advice Note 73/06 Revision 1 (2009) "Design Guidance for Road Pavement Foundations (Draft HD25)" published by the Highways Agency.

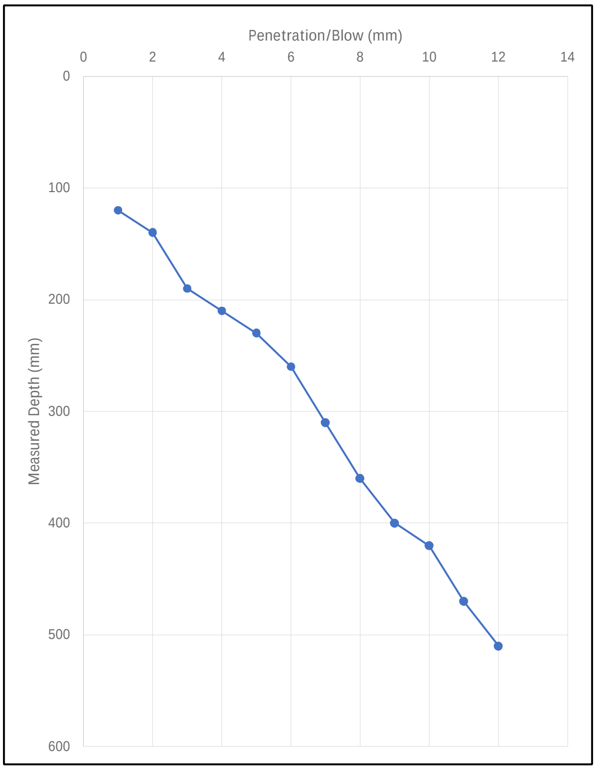
Using:

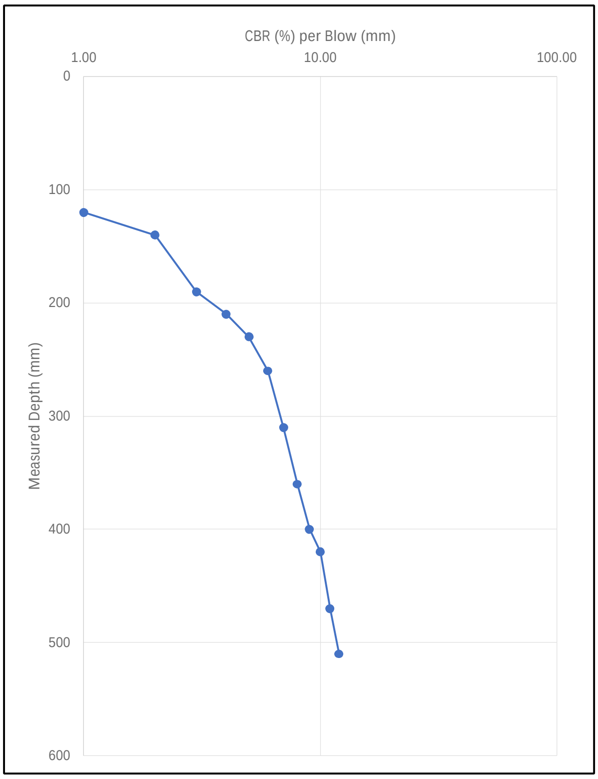
$$\log 10(CBR) = 2.48 - 1.057 \cdot \log 10(mm\ per\ blow)$$

Material at Surface	Grass
Test Start Depth (mm)	30
Access to Test Depth (mm)	Started at Surface

Measured Depth (mm)	Blows	Penetration (mm)	Penetration/blow	CBR per blow (%)
30		30	0	
120	1	90	90	2.60
140	1	20	20	12.73
190	1	50	50	4.83
210	2	20	10	26.49
230	2	20	10	26.49
260	2	30	15	17.25
310	5	50	10	26.49
360	5	50	10	26.49
400	5	40	8	33.53
420	5	20	4	69.76
470	5	50	10	26.49
510	5	40	8	33.53
510		0		
		Refusal		

Average CBR	25.55





APPENDIX C

Chemical Test Results

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 23/03176
Issue Number: 1 **Date:** 12 April, 2023

Client: BEK Enviro Ltd
Suite One
No 3 Mitton Road Business Park
Mitton Road
Whalley
Lancashire
BB7 9YE

Project Manager: Mick Buckley
Project Name: Rhallt Lane, Welshpool
Project Ref: Not specified
Order No: 7762-23048-J
Date Samples Received: 31/03/23
Date Instructions Received: 03/04/23
Date Analysis Completed: 12/04/23

Approved by:

[redacted]

Danielle Brierley
Deputy Client Services Supervisor

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

UKAS TESTING 1247

Lab Sample ID	23/03176/1	23/03176/2	23/03176/3	23/03176/4	23/03176/5			Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS1	WS2	WS3	WS5	WS6					
Depth to Top	0.15	0.1	0.2	0.15	0.1					
Depth To Bottom										
Date Sampled	29-Mar-23	29-Mar-23	29-Mar-23	29-Mar-23	29-Mar-23					
Sample Type	Soil	Soil	Soil	Soil	Soil					
Sample Matrix Code	4AE	4AE	4AE	4AE	4AE					
% Stones >10mm$_{A}$	<0.1	<0.1	7.1	1.8	3.4			% w/w	0.1	A-T-044
Asbestos in soil$_{D}^{\#}$	NAD	NAD	NAD	NAD	NAD					A-T-045
Asbestos Matrix (visual)$_{D}$	-	-	-	-	-					A-T-045
Asbestos Matrix (microscope)$_{D}$	-	-	-	-	-					A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_{D}$	N/A	N/A	N/A	N/A	N/A					A-T-045
pH$_{D}^{M\#}$	8.17	8.24	7.86	7.88	7.77			pH	0.01	A-T-031s
Sulphate (water sol 2:1)$_{D}^{M\#}$	<0.01	<0.01	<0.01	<0.01	<0.01			g/l	0.01	A-T-026s
Sulphate (acid soluble)$_{D}^{M\#}$	1300	1200	740	1300	740			mg/kg	200	A-T-028s
Cyanide (total)$_{A}^{M\#}$	<1	<1	<1	<1	<1			mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC$_{A}$	<0.2	<0.2	<0.2	<0.2	<0.2			mg/kg	0.2	A-T-050s
Organic Matter$_{D}^{M\#}$	7.8	8.0	8.5	15.9	9.6			% w/w	0.1	A-T-032s
Arsenic$_{D}^{M\#}$	9	9	8	21	9			mg/kg	1	A-T-024s
Boron (water soluble)$_{D}^{M\#}$	<1.0	<1.0	<1.0	1.5	<1.0			mg/kg	1	A-T-027s
Cadmium$_{D}^{M\#}$	1.3	1.2	1.6	1.8	1.7			mg/kg	0.5	A-T-024s
Copper$_{D}^{M\#}$	44	43	45	44	46			mg/kg	1	A-T-024s
Chromium$_{D}^{M\#}$	26	27	26	27	26			mg/kg	1	A-T-024s
Chromium (hexavalent)$_{D}$	<1	<1	<1	<1	<1			mg/kg	1	A-T-040s
Lead$_{D}^{M\#}$	198	128	163	167	174			mg/kg	1	A-T-024s
Mercury$_{D}$	1.73	2.49	1.29	0.80	1.43			mg/kg	0.17	A-T-024s
Nickel$_{D}^{M\#}$	33	34	37	30	39			mg/kg	1	A-T-024s
Selenium$_{D}^{M\#}$	<1	<1	<1	<1	<1			mg/kg	1	A-T-024s
Zinc$_{D}^{M\#}$	257	206	343	267	327			mg/kg	5	A-T-024s

Envirolab Job Number: **23/03176**

Client Project Name: **Rhallt Lane, Welshpool**

Client Project Ref: **Not specified**

Lab Sample ID	23/03176/1	23/03176/2	23/03176/3	23/03176/4	23/03176/5			**Units**	**Limit of Detection**	**Method ref**
Client Sample No										
Client Sample ID	WS1	WS2	WS3	WS5	WS6					
Depth to Top	0.15	0.1	0.2	0.15	0.1					
Depth To Bottom										
Date Sampled	29-Mar-23	29-Mar-23	29-Mar-23	29-Mar-23	29-Mar-23					
Sample Type	Soil	Soil	Soil	Soil	Soil					
Sample Matrix Code	4AE	4AE	4AE	4AE	4AE					
PAH-16MS										
Acenaphthene$_{A}^{M\#}$	<0.01	0.03	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-019s
Acenaphthylene$_{A}^{M\#}$	<0.01	0.03	<0.01	<0.01	0.01			mg/kg	0.01	A-T-019s
Anthracene$_{A}^{M\#}$	0.03	0.10	<0.02	<0.02	0.03			mg/kg	0.02	A-T-019s
Benzo(a)anthracene$_{A}^{M\#}$	0.14	0.89	0.11	0.06	0.11			mg/kg	0.04	A-T-019s
Benzo(a)pyrene$_{A}^{M\#}$	0.14	1.20	0.13	0.05	0.13			mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene$_{A}^{M\#}$	0.18	1.32	0.18	0.08	0.16			mg/kg	0.05	A-T-019s
Benzo(ghi)perylene$_{A}^{M\#}$	0.08	0.76	0.07	<0.05	0.08			mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene$_{A}^{M\#}$	<0.07	0.44	0.08	<0.07	<0.07			mg/kg	0.07	A-T-019s
Chrysene$_{A}^{M\#}$	0.19	1.01	0.14	0.09	0.16			mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene$_{A}^{M\#}$	<0.04	0.14	<0.04	<0.04	<0.04			mg/kg	0.04	A-T-019s
Fluoranthene$_{A}^{M\#}$	0.27	1.42	0.21	0.13	0.24			mg/kg	0.08	A-T-019s
Fluorene$_{A}^{M\#}$	<0.01	0.03	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene$_{A}^{M\#}$	0.09	0.84	0.10	<0.03	0.09			mg/kg	0.03	A-T-019s
Naphthalene $_{A}^{M\#}$	<0.03	0.04	<0.03	<0.03	<0.03			mg/kg	0.03	A-T-019s
Phenanthrene$_{A}^{M\#}$	0.17	0.42	0.17	0.13	0.16			mg/kg	0.03	A-T-019s
Pyrene$_{A}^{M\#}$	0.23	1.42	0.17	0.10	0.19			mg/kg	0.07	A-T-019s
Total PAH-16MS$_{A}^{M\#}$	1.52	10.1	1.36	0.64	1.36			mg/kg	0.01	A-T-019s

Lab Sample ID	23/03176/1	23/03176/2	23/03176/3	23/03176/4	23/03176/5			**Units**	**Limit of Detection**	**Method ref**
Client Sample No										
Client Sample ID	WS1	WS2	WS3	WS5	WS6					
Depth to Top	0.15	0.1	0.2	0.15	0.1					
Depth To Bottom										
Date Sampled	29-Mar-23	29-Mar-23	29-Mar-23	29-Mar-23	29-Mar-23					
Sample Type	Soil	Soil	Soil	Soil	Soil					
Sample Matrix Code	4AE	4AE	4AE	4AE	4AE					
TPH CWG with Clean Up										
Ali >C5-C6$_{A}^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
Ali >C6-C8$_{A}^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
Ali >C8-C10$_{A}$	<1	1	<1	<1	<1			mg/kg	1	A-T-055s
Ali >C10-C12$_{A}^{M\#}$	<1	1	<1	<1	<1			mg/kg	1	A-T-055s
Ali >C12-C16$_{A}^{M\#}$	1	3	<1	<1	<1			mg/kg	1	A-T-055s
Ali >C16-C21$_{A}^{M\#}$	1	4	<1	<1	<1			mg/kg	1	A-T-055s
Ali >C21-C35$_{A}^{M\#}$	9	42	6	5	8			mg/kg	1	A-T-055s
Total Aliphatics$_{A}$	12	51	6	5	8			mg/kg	1	Calc-As Recd
Aro >C5-C7$_{A}^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
Aro >C7-C8$_{A}^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
Aro >C8-C10$_{A}$	<1	1	<1	<1	<1			mg/kg	1	A-T-055s
Aro >C10-C12$_{A}$	1	3	<1	1	<1			mg/kg	1	A-T-055s
Aro >C12-C16$_{A}$	6	12	2	5	4			mg/kg	1	A-T-055s
Aro >C16-C21$_{A}^{M\#}$	10	29	4	14	8			mg/kg	1	A-T-055s
Aro >C21-C35$_{A}^{M\#}$	27	116	10	23	20			mg/kg	1	A-T-055s
Total Aromatics$_{A}$	45	161	15	44	32			mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35)$_{A}$	57	211	21	49	39			mg/kg	1	Calc-As Recd
BTEX - Benzene$_{A}^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
BTEX - Toluene$_{A}^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene$_{A}^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
BTEX - m & p Xylene$_{A}^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
BTEX - o Xylene$_{A}^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
MTBE$_{A}^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.
The results reported herein relate only to the material supplied to the laboratory.
The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside the scope of our accreditation.
If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.
A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis.
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample, 9 = INCINERATOR ASH.
Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,
E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.
US indicates Unsuitable Sample for analysis.
NDP indicates No Determination Possible.
NAD indicates No Asbestos Detected.
N/A indicates Not Applicable.
Superscript # indicates method accredited to ISO 17025.
Superscript "M" indicates method accredited to MCERTS.
Subscript "A" indicates analysis performed on the sample as received.
Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve
Subscript "^" indicates analysis has dependant options against results. Testing dependant on results appear in the comments area of your sample receipt.
EPH CWG results have humics mathematically subtracted through instrument calculation
TPH results "with Cleanup" indicates results cleaned up with Silica during extraction

EPH CWG GCxGC ID from TPH CWG

Where we have identified humic substances in any ID's from TPH CWG with Clean Up please note that the concentration of these humic substances is not included in the quantified results and are included in the ID for information.

Please contact us if you need any further information.

v2

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	BEK Enviro Ltd, Suite One , No 3 Mitton Road Business Park , Mitton Road , Whalley , Lancashire , BB7 9YE	**Project No:**	23/03176
		Date Received:	03/04/2023 (am)
Project:	Rhallt Lane, Welshpool	**Cool Box Temperatures (°C):**	4.3
Clients Project No:			

NO DEVIATIONS IDENTIFIED with respect to sampling dates or containers received.

Note: If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3 (for water samples 5 ± 3°C), ISO 18400-105:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	23/03176/1	23/03176/2	23/03176/3	23/03176/4	23/03176/5
Client Sample No					
Client Sample ID/Depth	WS1 0.15m	WS2 0.1m	WS3 0.2m	WS5 0.15m	WS6 0.1m
Date Sampled	29/03/23	29/03/23	29/03/23	29/03/23	29/03/23
A-T-019s	10/04/2023	10/04/2023	10/04/2023	10/04/2023	10/04/2023
A-T-022s	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023
A-T-024s	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023
A-T-026s	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023
A-T-027s	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023
A-T-028s	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023
A-T-031s	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023
A-T-032s	11/04/2023	11/04/2023	12/04/2023	12/04/2023	12/04/2023
A-T-040s	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023
A-T-042sTCN	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
A-T-044	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023
A-T-045	04/04/2023	04/04/2023	04/04/2023	04/04/2023	04/04/2023
A-T-050s	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
A-T-055s	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
Calc-As Recd	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

APPENDIX D

Geotechnical Test Results

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client	BEK Enviro Ltd
Address	Suite One No. 3 Mitton Road Business Park Mitton Road Whalley Lancashire BB7 9YE
Contract	Rhallt Lane, Welshpool
Job Number	MRN 4627/21
Date of Issue	20 April 2023
Page	1 of 4

Approved Signatories

S J Hutchings, O P Davies

Notes

1. All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.
2. Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.
3. Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.
4. Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.
5. The results included within the report are representative of the samples submitted for analysis.
6. This certificate should not be reproduced, except in full, without the express permission of the laboratory.

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A1:2021 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A1:2021 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014

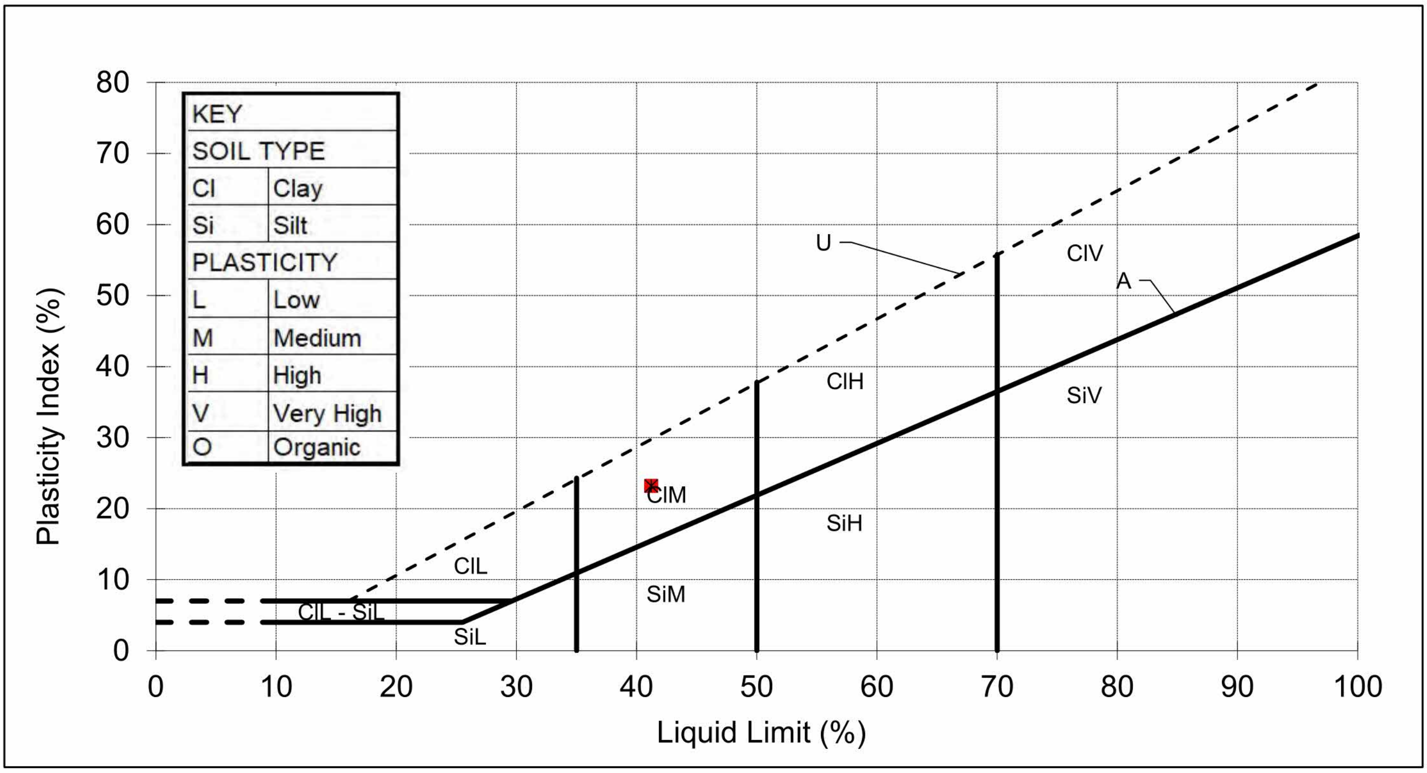
CLIENT	BEK Enviro Ltd
SITE	Rhallt, Welshpool
JOB NUMBER	MRN 4627/21

SAMPLE LABEL	WS1 (1.0-1.5m)	DATE SAMPLED	29-Mar-23
SAMPLE No.	123156	DATE RECEIVED	04-Apr-23
DATE TESTED	06-Apr-23	SAMPLED BY	Client

MATERIAL	Stiff brown slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Moisture Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	21.8	42.3	0.976	
Determination 2 (avg)	21.4	42.1		

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
22.5	41	18	23	92



REMARKS

SIGNED [redacted]

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 20-Apr-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A1:2021 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A1:2021 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014

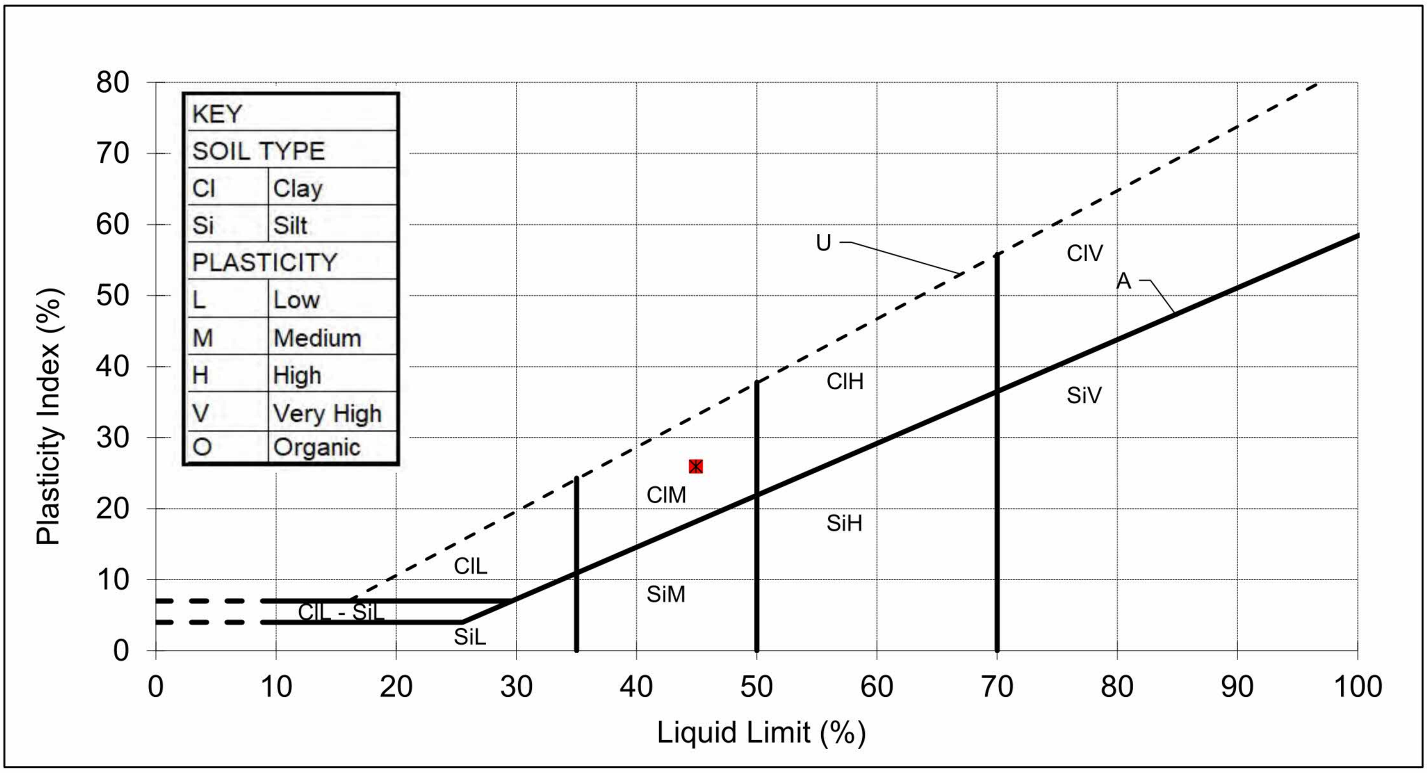
CLIENT	BEK Enviro Ltd
SITE	Rhallt, Welshpool
JOB NUMBER	MRN 4627/21

SAMPLE LABEL	WS3 (1.0-1.5m)	DATE SAMPLED	29-Mar-23
SAMPLE No.	123157	DATE RECEIVED	04-Apr-23
DATE TESTED	06-Apr-23	SAMPLED BY	Client

MATERIAL	Firm brown slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Moisture Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	19.5	44.4	1.012	
Determination 2 (avg)	19.3	44.4		

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
29.3	45	19	26	87



REMARKS

SIGNED [redacted]

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 20-Apr-23

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A1:2021 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A1:2021 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014

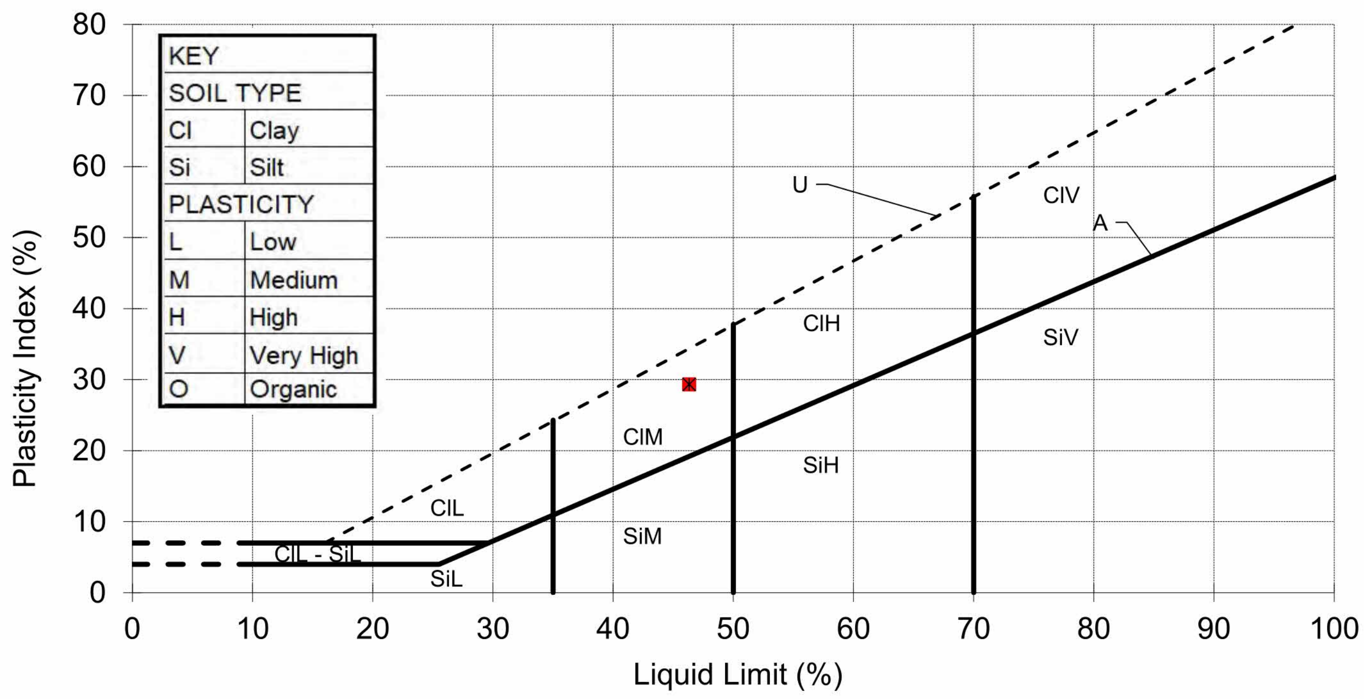
CLIENT	BEK Enviro Ltd
SITE	Rhallt, Welshpool
JOB NUMBER	MRN 4627/21

SAMPLE LABEL	WS6 (0.5-1.0m)	DATE SAMPLED	29-Mar-23
SAMPLE No.	123158	DATE RECEIVED	04-Apr-23
DATE TESTED	06-Apr-23	SAMPLED BY	Client

MATERIAL	Stiff brown slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Moisture Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	18.4	45.0	1.029	
Determination 2 (avg)	18.4	45.0		

Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
22.6	46	17	29	94



REMARKS

SIGNED [redacted]

NAME O.P. Davies BA (Hons)
(Laboratory Manager)

DATE 20-Apr-23

APPENDIX E

Falling Head Test Results

GEO-ENVIRONMENTAL CONSULTING ENGINEERS

Falling Head Permeability Test in a Standpipe

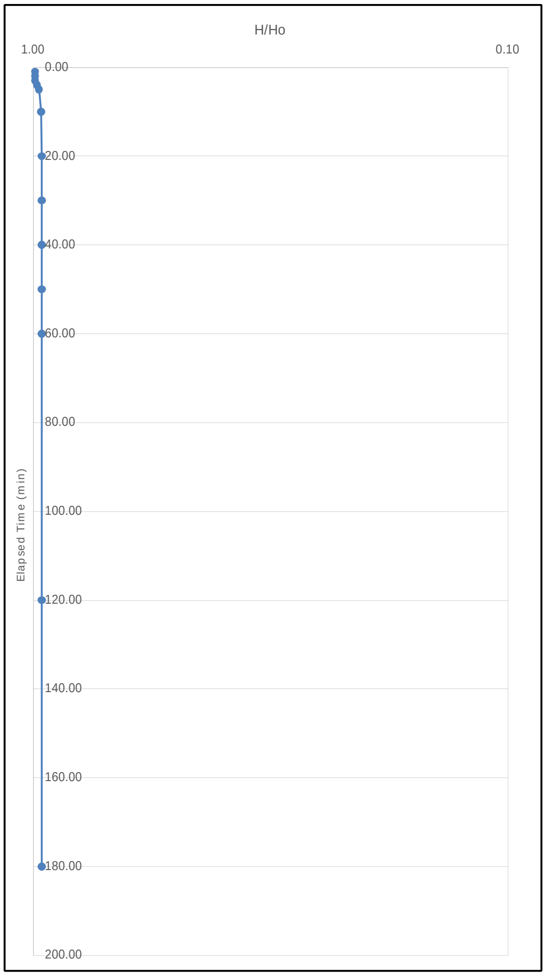
Project Name	Welshpool
Project Number	23048
Test Date	03/04/2023
Borehole ID	WS6

FIELD MEASUREMENTS

Elapsed Time, t (m)	Depth at Time, t (m)	H (m)	H/Ho
1.00	0.31	2.14	1.00
2.00	0.32	2.13	0.99
3.00	0.32	2.13	0.99
4.00	0.32	2.13	0.99
5.00	0.34	2.11	0.98
10.00	0.36	2.09	0.97
20.00	0.38	2.07	0.96
30.00	0.39	2.06	0.96
40.00	0.39	2.06	0.96
50.00	0.39	2.06	0.96
60.00	0.39	2.06	0.96
120.00	0.39	2.06	0.96
180.00	0.39	2.06	0.96
240.00	0.39	2.06	0.96

BOREHOLE INFORMATION

Depth to base of casing:	0.50	m
Depth to base of borehole before test:	1.50	m
Depth to base of borehole after test:	1.50	m
Test Section:	1.00	m
Depth to standing water:	2.45	m
Depth to induced water:	0.30	m
Diameter of Borehole (D):	0.10	m
Diameter of Piezo/Standpipe (d):	0.035	m
Test Length (L):	1.16	m
Diameter of test length (D):	0.100	m
Differential head at start of test (Ho):	2.15	m
Differential Head at end of test (Hf):	2.06	m
Time elapsed at end of test (tf):	14400	sec



PERMEABILITY CALCULATION

H/Ho > 0.37, thus permeability is calculated as a constant head test

Therefore

Permeability, K = Q / HxF

where

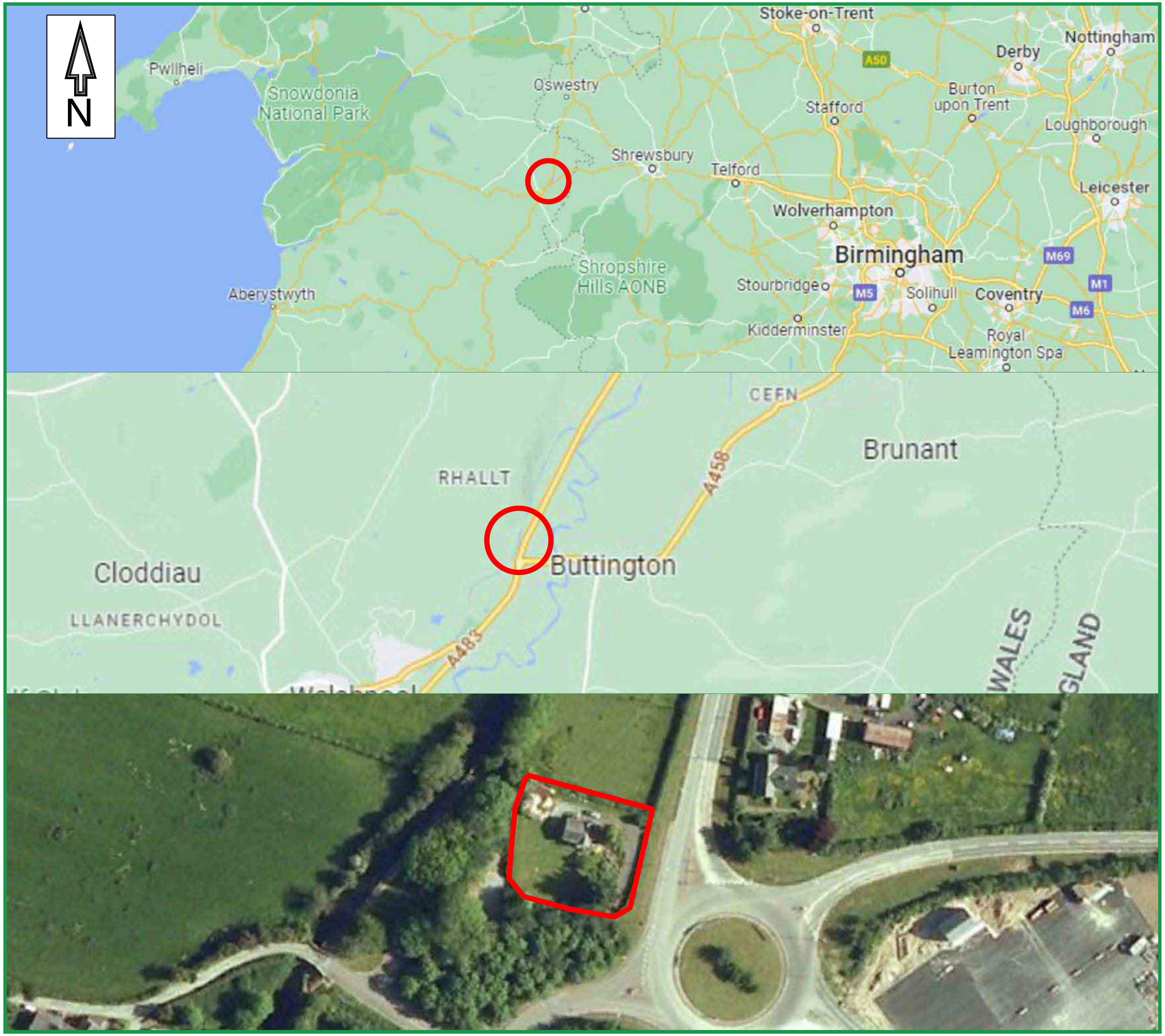
FLOW RATE (Q)	4.91E-08	m3/secs
AVERAGE HEAD (Hc)	2.11	m
SHAPE FACTOR (F)		

PERMEABILITY	8.90E-09	m/sec

Comments:

APPENDIX F

Drawings



LEGEND

🟥 SITE LOCATION

REV	DESCRIPTION	DATE	BY

GEO-ENVIRONMENTAL CONSULTING ENGINEERS

Suite One, No 3 Mitton Road Business Park, Mitton Road,
Whalley, Lancashire BB7 9YE
Tel: 01254 377622 Mob: 07906753583
Email: mbuckley@bekenviro.co.uk
Web: www.bekenviro.co.uk

CLIENT.
KIM PROPERTY INVESTMENT LTD

JOB TITLE.
LAND TO NORTH OF RHALLT
LANE, WELSHPOOL

DRAWING TITLE.
SITE LOCATION PLAN

SCALE @ A3.	DRAWN BY.	APPROVED BY.	DATE.
NTS	D.E.	M.B.	29/03/23

DRAWING No.	REV.
23048-1	-

LEGEND

🟥 SITE FOOTPRINT

REV	DESCRIPTION	DATE	BY

GEO-ENVIRONMENTAL CONSULTING ENGINEERS
Suite One, No 3 Mitton Road Business Park, Mitton Road,
Whalley, Lancashire BB7 9YE
Tel: 01254 377622 Mob: 07906753583
Email: mbuckley@bekenviro.co.uk
Web: www.bekenviro.co.uk

CLIENT.
KIM PROPERTY INVESTMENT LTD

JOB TITLE.
LAND TO NORTH OF RHALLT
LANE, WELSHPOOL

DRAWING TITLE.
SITE LAYOUT

SCALE @ A3.	DRAWN BY.	APPROVED BY.	DATE.
NTS	D.E.	M.B.	29/03/23

DRAWING No.	REV.
23048-2	-

1. DO NOT SCALE FROM THIS DRAWING. USE FIGURED DIMENSIONS ONLY.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS STATED OTHERWISE.
3. THE CONTRACTOR IS TO CHECK DRAWINGS AND TO VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING ANY WORK OR MAKING ANY SHOP DRAWINGS. ANY DISCREPANCIES ARE TO BE NOTIFIED TO REV-A ASSOCIATES IMMEDIATELY.
4. THIS DRAWING IS THE PROPERTY OF REV-A ASSOCIATES. COPYRIGHT IS RESERVED BY THEM AND THE DRAWING IS ISSUED ON THE CONDITION THAT IT IS NOT COPIED, REPRODUCED, RETAINED OR DISCLOSED TO ANY UNAUTHORISED PERSON, EITHER WHOLLY OR IN PART, WITHOUT THE CONSENT IN WRITING OF REV-A ASSOCIATES.
5. ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT BUILDING REGULATIONS AND ALL ASSOCIATED BRITISH STANDARDS.

For landscaping details please refer to landscape plan

🟥 Site Boundary
Site Area - 1.028 Ha / 10,0283m^2
╌ Pedestrian routes

Rev	Date	By	Checked
P02.9	20/07/2022	AC	AA
Updates to layout			
P02.8	24/06/2022	AC	AA
Updates to layout			
P02.7	13/04/2022	AC	AA
Updates to layout			
P02.5	13/04/2022	AC	AA
Changes to ev parking			
P02.4	22/02/2022	AC	AA
Changes to access road			
P02.3	17/02/2022	AC	AA
Changes to access road			
P02.2	12/10/2021	AC	AA
Changes to ev parking and landscape buffer for hotel			
P02.1	12/10/2021	AC	AA
Changes to visitor parking and landscape buffer for hotel			

REV-A ASSOCIATES

www.rev-a.co.uk info@rev-a.co.uk

Client
Stephen James Property Ltd

Project Title
Moors Farm, Mixed Use Redevelopment

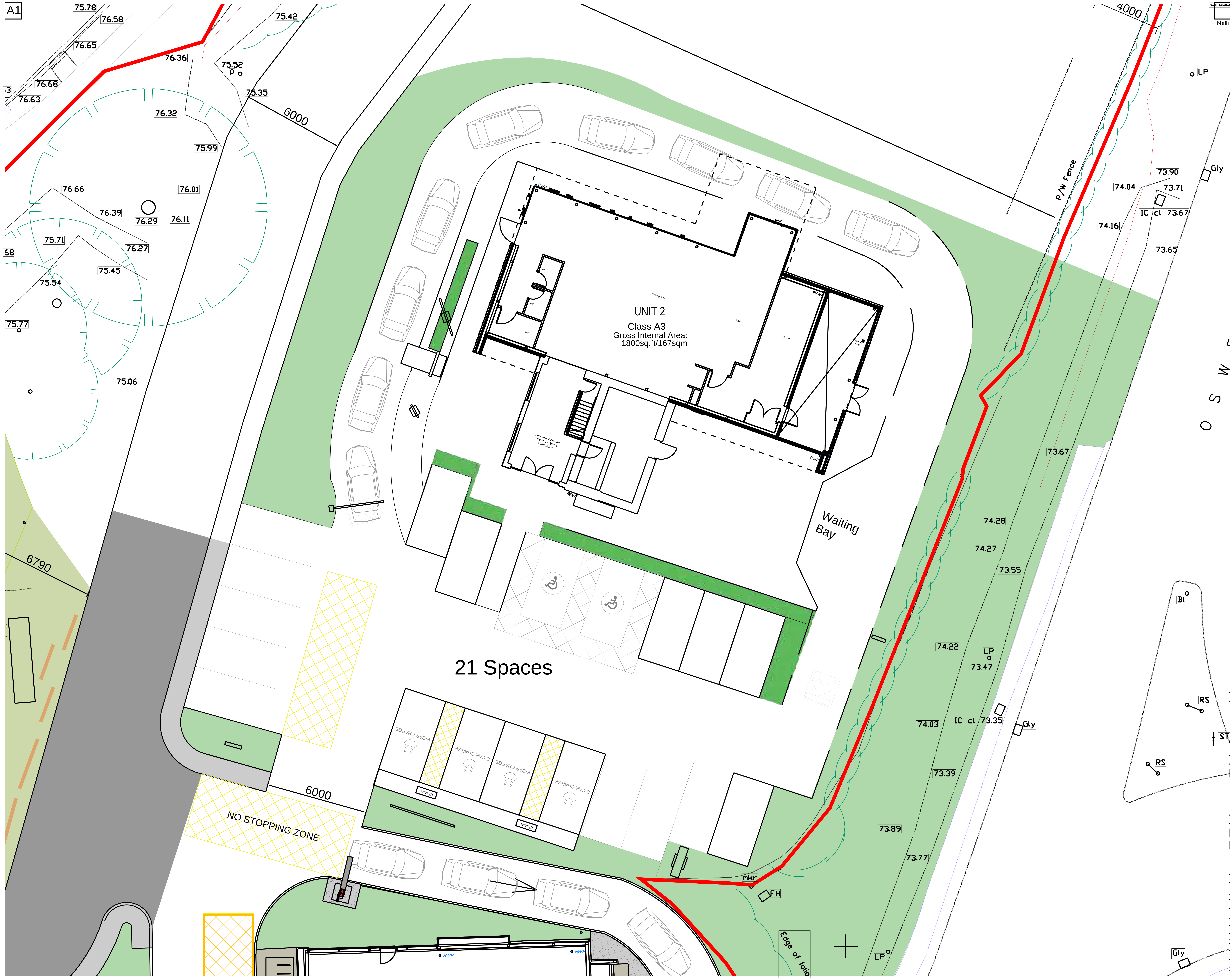
Date	Drawn By:	Checked By:
27/11/2020	AC	AA
Suitability	Scale	Revision
S0	1:500	P02.9

Drawing Name
Proposed Site Plan

Drawing Number
SHR17065-REVA-DR-A-002

PLANNING ISSUE

Appendix 4–Masterplan



1. DO NOT SCALE FROM THIS DRAWING. USE FIGURED DIMENSIONS ONLY.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS STATED OTHERWISE.
3. THE CONTRACTOR IS TO CHECK DRAWINGS AND TO VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING ANY WORK OR MAKING ANY SHOP DRAWINGS. ANY DISCREPANCIES ARE TO BE NOTIFIED TO REV-A ASSOCIATES IMMEDIATELY.
4. THIS DRAWING IS THE PROPERTY OF REV-A ASSOCIATES. COPYRIGHT IS RESERVED BY THEM AND THE DRAWING IS ISSUED ON THE CONDITION THAT IT IS NOT COPIED, REPRODUCED, RETAINED OR DISCLOSED TO ANY UNAUTHORISED PERSON, EITHER WHOLLY OR IN PART, WITHOUT THE CONSENT IN WRITING OF REV-A ASSOCIATES.
5. ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT BUILDING REGULATIONS AND ALL ASSOCIATED BRITISH STANDARDS.

Rev	Date	By	Checked

REV-A ASSOCIATES
www.rev-a.co.uk info@rev-a.co.uk

Client
KIM Property Investments Limited

Project Title
Moors Farm, Mixed Use Redevlopment

Date	Drawn By:	Checked By:
12/07/2023	AC	AA

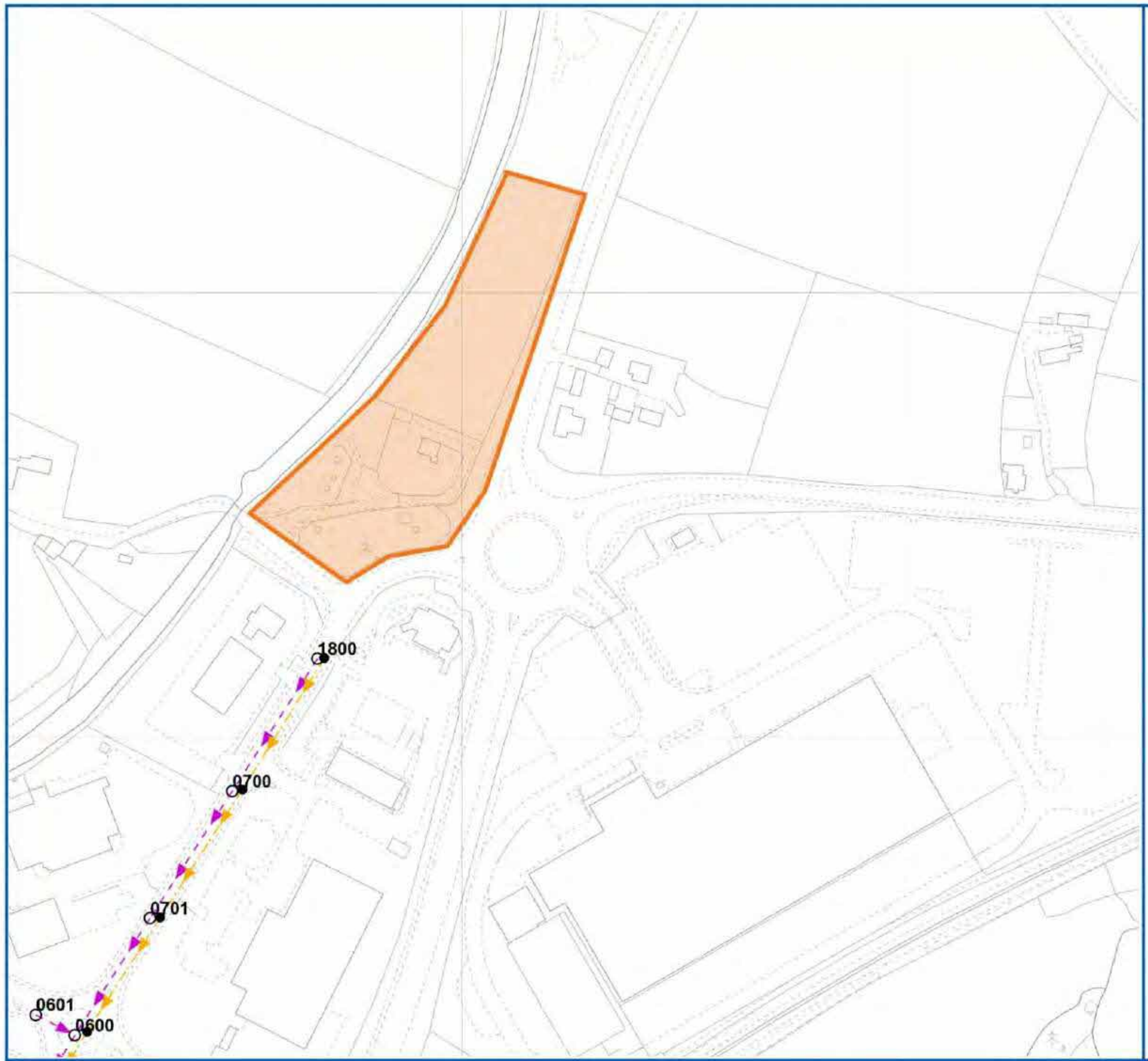
Suitability	Scale	Revision
S2	1:100	P01

Drawing Name
Starbucks Site Plan

Drawing Number
17065-REVA-00-00-DR-A-006

TENDER ISSUE

Appendix 5 –Sewer Records



Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
<UNK>	<UNK>	<UNK>	<UNK>	F	<UNK>	<UNK>	<UNK>	<UNK>	<UNK>	24/05/2012 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	<UNK>	<UNK>	<UNK>	<UNK>	<UNK>	24/05/2012 00:00:00
SJ24080600	<UNK>	<UNK>	<UNK>	S	U	U	<UNK>	<UNK>	0	16/10/2008 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	<UNK>	<UNK>	<UNK>	<UNK>	<UNK>	24/05/2012 00:00:00
SJ24080701	<UNK>	<UNK>	<UNK>	S	U	U	<UNK>	<UNK>	0	16/10/2008 00:00:00
SJ24080601	<UNK>	<UNK>	<UNK>	S	U	U	<UNK>	<UNK>	0	16/10/2008 00:00:00
SJ24081800	<UNK>	<UNK>	<UNK>	S	U	U	<UNK>	<UNK>	0	16/10/2008 00:00:00
SJ24080700	<UNK>	<UNK>	<UNK>	S	U	U	<UNK>	<UNK>	0	16/10/2008 00:00:00

LEGEND

Operational Site

Waste Water Pump
- Transferred Asset
- S24
- S104
- S102
- Null Private
- Null
- None
- Highway Drain
- Adopted Sewer

Storage
- DS Disposal Site
- Off-Line Waste Water Storage
- On-Line Waste Water Storage
- Wet Well

Waste Water Process Structure
- STP Sewage Treatment Point
- STS Sewage Treatment Structure
- SLTP Sludge Treatment Point
- SLTS Sludge Treatment Structure

Manhole
- ● Foul Bifurcation Manhole
- ● Combined Bifurcation Manhole
- ○ Surface Water Bifurcation Manhole
- Dual Manhole
- ● Foul Single Manhole
- ● Combined Single Manhole
- ○ Surface Water Single Manhole
- Twin Manhole
- ● Foul Adopted Manhole
- ● Combined Adopted Manhole
- ○ Surface Adopted Manhole
- ● Transferred Manhole
- ● Unsurveyed Manhole

Gravity Sewer Pipe
- Foul Gravity Sewer
- Combined Gravity Sewer
- Surface Water Gravity Sewer
- S104 Surface Water Gravity Sewer
- S104 Combined Gravity Sewer
- S104 Foul Gravity Sewer
- Private Surface Water Gravity Sewer
- Private Combined Gravity Sewer
- Private Foul Gravity Sewer
- Surface Water Unsurveyed Pipe
- Combined Unsurveyed Pipe
- Foul Unsurveyed Pipe
- Transferred Surface Water Sewer
- Transferred Combined Sewer
- Transferred Foul Sewer
- Disposal Pipe
- Overflow Pipe
- Culverted Water Course
- Waste Internal Site Pipe
- Sewer Service Connection
- Gravity Sewer Others

Pressure Sewer Pipe
- Surface Water Pressure Sewer
- Combined Pressure Sewer
- Foul Pressure Sewer
- S104 Surface Water Pressure Sewer
- S104 Combined Pressure Sewer
- S104 Foul Pressure Sewer
- Private Surface Water Pressure Sewer
- Private Combined Pressure Sewer
- Private Foul Pressure Sewer
- Surface Water Vacuum Sewer
- Foul Vacuum Sewer
- Combined Vacuum Sewer
- S104 Surface Water Vacuum Sewer
- S104 Combined Vacuum Sewer
- S104 Foul Vacuum Sewer
- Private Surface Water Vacuum Sewer
- Private Combined Vacuum Sewer
- Private Foul Vacuum Sewer
- Surface Water Siphon
- Combined Siphon
- Foul Siphon
- Private Surface Water Siphon
- Private Combined Siphon
- Private Foul Siphon
- S104 Surface Water Siphon
- S104 Combined Siphon
- S104 Foul Siphon
- Surface Water Unsurveyed Pipe
- Combined Unsurveyed Pipe
- Foul Unsurveyed Pipe
- Disposal Pipe

Service Pipe
- Surface Water Lateral Drain
- Combined Lateral Drain
- Foul Lateral Drain
- S104 Surface Water Lateral Drain
- S104 Combined Lateral Drain
- S104 Foul Lateral Drain
- Private Surface Water Lateral Drain
- Private Combined Lateral Drain
- Private Foul Lateral Drain
- Transferred Surface Water Lateral Dra
- Transferred Combined Lateral Drain
- Transferred Foul Lateral Drain

Ancillary
- Balancing Lagoon
- Grease Trap
- Interceptor
- Screen

Chamber
- Flushing Chamber
- Scaleaway
- Overflow

Fitting
- ■ Blind Shaft
- ☒ Facility Connector
- Head Node
- ☐ Lamphole
- ◆ Sewerage Air Valve
- Sewerage Chemical Injection Point
- Sewerage Hatch Box
- ● Sewerage Pressure Washout
- Vent Column
- Waste Water Outfall

Control Valve
- Hydrobrake
- Penstock
- Sewerage Isolation Valve
- Sewerage Non Return Valve

Print200mLine

MATERIALS

-	- NONE
AC	- ASBESTOS CEME
BR	- BRICK
CC	- CONCRETE BOX CULVERT
CI	- CAST IRON
CO	- CONCRETE
CSB	CONCRETE SEGMENTS (BOLTED)
CSU	- CONCRETE SEGMENTS (UNBOLTED)
DI	- DUCTILE IRON
GRP	- GLASS REINFORCED PLASTIC
MAC	- MASONRY IN REGULAR COURSES
MAR	- MASONRY RANDOMLY COURSED
PE	- POLYETHLENE
PF	- PITCH
PP	- POLYPROPYLENE
PSC	- PLASTIC STEEL COMPOSITE
PVC	- POLYVINYL CHLORIDE
RPM	- REINFORCED PLASTIC MATRIX
SI	- SPUN (GREY) IRON
ST	- STEEL
U	- UNKNOWN
VC	- VITRIFIED CLAY
XXX	- OTHER

CATEGORIES

W	- WEIR
C	- CASCADE
DB	- DAMBOARD
SE	- SIDE ENTRY
FV	- FLAP VALVE
BD	- BACK DROP
S	- SIPHON
D	- HIGHWAY DRAIN
S104	- SECTION 104

SHAPE

C	- CIRCULAR
E	- EGG SHAPED
0	- OTHER
R	- RECTANGLE
S	- SQUARE
T	- TRAPEZOIDAL
U	- UNKNOWN

PURPOSE

C	- COMBINED
E	- FINAL EFFLUENT
F	- FOUL
L	- SLUDGE
S	- SURFACE WATER

HAFREN DYFRDWY severn dee

Hafren Dyfrdwy
Asset Data Management
Packsaddle/Wrexham Road
Wrexham
LL14 4EH
Telephone: 0345 601 6616

SEWER RECORD (Tabular)

O/S Map Scale: 1:2,500

Date of Issue: 26-07-23

This map is centred upon:

X: 324250.30 **Y:** 308891.59

Disclaimer Statement:

1 Do not scale off this Map.

2 This plan and any information supplied with it is furnished as a general guide, is only valid at the date of issue and no warranty as to its correctness is given or implied. In particular this plan and any information shown on it must not be relied upon in the event of any development or works (including but not limited to excavations) in the vicinity of SEVERN TRENT WATER assets or for the purposes of determining the suitability of a point of connection to the sewerage or distribution systems.

3 On 1 October 2011 most private sewers and private lateral drains in Severn Trent Water's sewerage area, which were connected to a public sewer as at 1 July 2011, transferred to the ownership of Severn Trent Water and became public sewers and public lateral drains. A further transfer takes place on 1 October 2012. Private pumping stations, which form part of these sewers or lateral drains, will transfer to ownership of Severn Trent Water on or before 1 October 2016. Severn Trent Water does not possess complete records of these assets. These assets may not be displayed on the map.

5 Ordnance Survey licence number: **100031673**

6 Document users other than SEVERN TRENT WATER business users are advised that this document is provided for reference purpose only and is subject to copyright, therefore, no further copies should be made from it.

RHAGOROL O'R TAP
WONDERFUL ON TAP

HAFREN
DYFRDWY
severn dee

26th July 2023

Hafren Dyfrdwy
Oxley Moor Rd
Wolverhampton
WV9 5HN

www.hdcymru.co.uk

networksolutions@hdcymru.co.uk

Our Ref: 1089291

David Gridley
SBK
45 Frederick Street
Birmingham
B1 3HN

Proposed Redevelopment at: Lime Kiln Cottage Buttington Cross Welshpool

Dear Sir

I refer to your 'Development Enquiry Request' in respect of the above site Please find enclosed the sewer records that are included in the fee together with the Supplementary Guidance Notes which refer to surface water disposal from development sites.

Public Sewers in Site – Required Protection

Due to a change in legislation on 1 October 2011, there may be former private sewers on the site which have transferred to the responsibility of Hafren Dyfrdwy which are not shown on the statutory sewer records, but are located in your client's land. These sewers would also have protective strips that we will not allow to be built over. If such sewers are identified to be present on the site, please contact us for further guidance.

Foul Water Drainage

The nearest foul water sewer is in the highway Rhallt Ln to the south will be suitable. The foul water 150mm should be able to receive the approx. flows of 0.88l/s @2 x dwf. A gravity foul connection should be able to be accommodated from your proposed site into these sewers. Please be advised that a new / indirect connection to this sewer would be allowed subject to a formal S.106 sewer connection approval (see later)

Surface Water Drainage

Under the terms of Section H of the Building Regulations 2010, the disposal of surface water by means of soak ways should be

considered as the primary method. If soakaways are proven not possible and then connection to the canal, with the relative authority approval at 5l/s Greenfield run off should also be investigated. If these options are proven not possible then 2l/s into the private surface water sewer should be acceptable, But approval must be confirmed with the sewer owner. .

If following testing, it is demonstrated that soakaways would not be possible on the site; satisfactory evidence will need to be submitted. The evidence should be either percolation test results or a statement from the SI consultant (extract or a supplementary letter). This would satisfy SGN1 (enclosed),in accordance with Powys Council SUDS Policy as the Lead Local Flood Authority (LLFA) for the area and statutory consultee in the planning process. Please see the guidance notes attached for further information.

New Connections

For any new connections (including the re-use of existing connections) to the public sewerage system, the developer will need to submit Section 106 application forms. Our New Connections department are responsible for handling all such enquiries and applications. To contact them for an application form and associated guidance notes please call 0800 7076600.

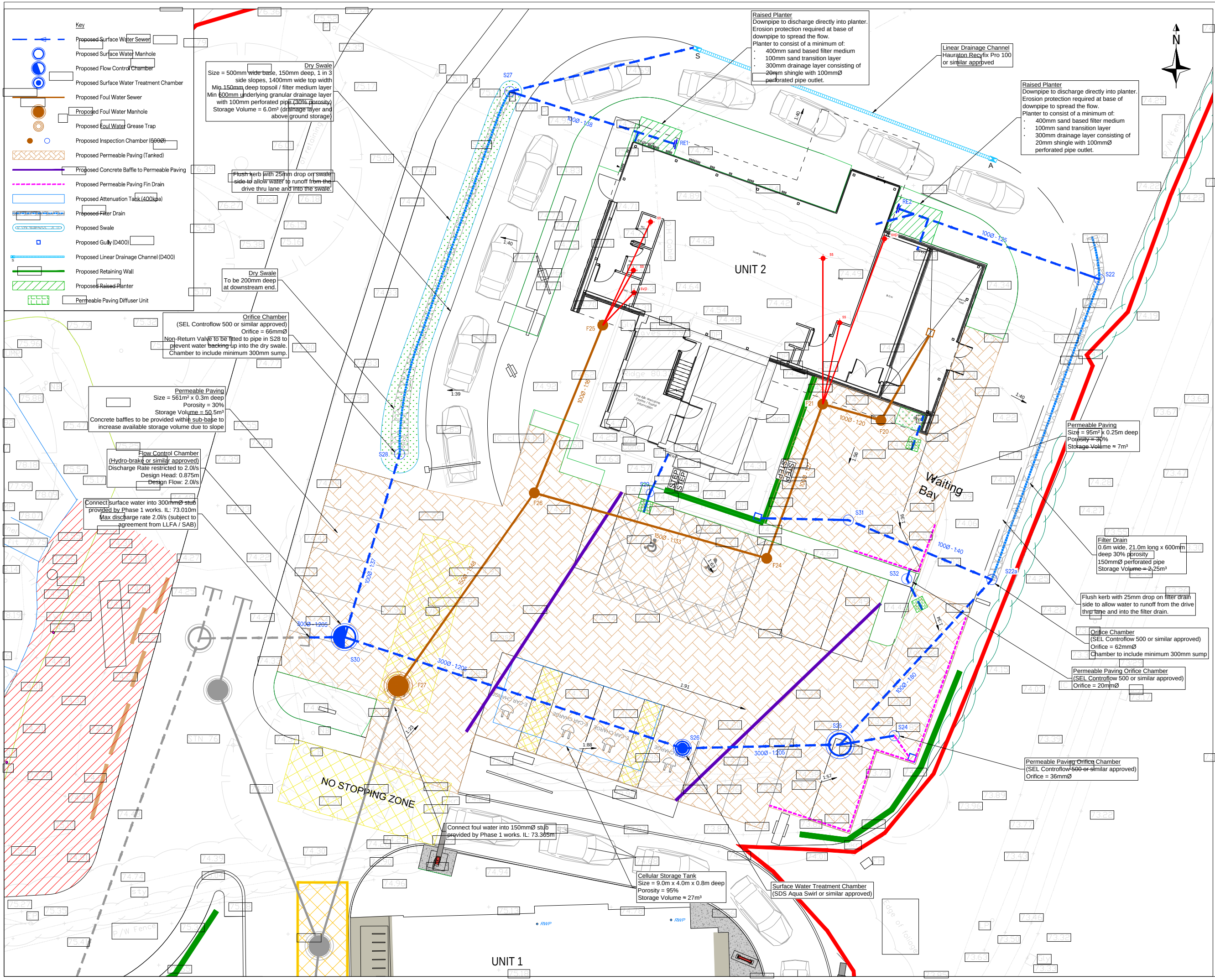
Please quote 1089291 in any future correspondence (including e-mails) with HD Limited. Please note that 'Development Enquiry' responses are only valid for 6 months from the date of this letter.

Yours sincerely

[redacted]

Michael Taylor
Network Solutions

Appendix 6 –Proposed Drainage Layout



Key

— ◁ —	Proposed Surface Water Sewer
○	Proposed Surface Water Manhole
◑	Proposed Flow Control Chamber
◉	Proposed Surface Water Treatment Chamber
—	Proposed Foul Water Sewer
●	Proposed Foul Water Manhole
◎	Proposed Foul Water Grease Trap
● ○	Proposed Inspection Chamber (600Ø)
▨	Proposed Permeable Paving (Tanked)
—	Proposed Concrete Baffle to Permeable Paving
- - -	Proposed Permeable Paving Fin Drain
▭	Proposed Attenuation Tank (400kpa)
▨	Proposed Filter Drain
▭	Proposed Swale
□	Proposed Gully (D400)
▨ S	Proposed Linear Drainage Channel (D400)
—	Proposed Retaining Wall
▨	Proposed Raised Planter
▦	Permeable Paving Diffuser Unit

Dry Swale
Size = 500mm wide base, 150mm deep, 1 in 3 side slopes, 1400mm wide top width
Min 150mm deep topsoil / filter medium layer
Min 600mm underlying granular drainage layer with 100mm perforated pipe (30% porosity)
Storage Volume = 6.0m³ (drainage layer and above ground storage)

Flush kerb with 25mm drop on swale side to allow water to runoff from the drive thru lane and into the swale.

Dry Swale
To be 200mm deep at downstream end.

Orifice Chamber
(SEL Controflow 500 or similar approved)
Orifice = 66mmØ
Non-Return Valve to be fitted to pipe in S28 to prevent water backing up into the dry swale.
Chamber to include minimum 300mm sump.

Permeable Paving
Size = 561m² x 0.3m deep
Porosity = 30%
Storage Volume = 50.5m³
Concrete baffles to be provided within sub-base to increase available storage volume due to slope

Flow Control Chamber
(Hydro-brake or similar approved)
Discharge Rate restricted to 2.0l/s
Design Head: 0.875m
Design Flow: 2.0l/s

Connect surface water into 300mmØ stub provided by Phase 1 works. IL: 73.010m
Max discharge rate 2.0l/s (subject to agreement from LLFA / SAB)

Raised Planter
Downpipe to discharge directly into planter.
Erosion protection required at base of downpipe to spread the flow.
Planter to consist of a minimum of:
- 400mm sand based filter medium
- 100mm sand transition layer
- 300mm drainage layer consisting of 20mm shingle with 100mmØ perforated pipe outlet.

Linear Drainage Channel
Hauraton Recyfix Pro 100 or similar approved

Raised Planter
Downpipe to discharge directly into planter.
Erosion protection required at base of downpipe to spread the flow.
Planter to consist of a minimum of:
- 400mm sand based filter medium
- 100mm sand transition layer
- 300mm drainage layer consisting of 20mm shingle with 100mmØ perforated pipe outlet.

Permeable Paving
Size = 95m² x 0.25m deep
Porosity = 30%
Storage Volume ≈ 7m³

Filter Drain
0.6m wide, 21.0m long x 600mm deep 30% porosity
150mmØ perforated pipe
Storage Volume = 2.25m³

Flush kerb with 25mm drop on filter drain side to allow water to runoff from the drive thru lane and into the filter drain.

Orifice Chamber
(SEL Controflow 500 or similar approved)
Orifice = 62mmØ
Chamber to include minimum 300mm sump

Permeable Paving Orifice Chamber
(SEL Controflow 500 or similar approved)
Orifice = 20mmØ

Permeable Paving Orifice Chamber
(SEL Controflow 500 or similar approved)
Orifice = 36mmØ

Connect foul water into 150mmØ stub provided by Phase 1 works. IL: 73.365m

Cellular Storage Tank
Size = 9.0m x 4.0m x 0.8m deep
Porosity = 95%
Storage Volume ≈ 27m³

Surface Water Treatment Chamber
(SDS Aqua Swirl or similar approved)

NOTES

1. This drawing is to be read in conjunction with all relevant Architects, Engineers and other specialist details and specifications.
2. Drawing issued for preliminary discussions only, further to approval from Client. Following receipt of further information and comments the scheme may be revised.
3. Drawing based upon REV-A Architects layout drawing: 17065-REVA-00-00-DR-A-002 rev C01.
4. Topographical Survey data drawing is from Battlefield Land Surveys Ltd dated May 2023. The survey information used in the preparation of this drawing is not warranted. The contractor shall check all dimensions and levels on site.
5. The location and level of all existing services are to be identified prior to construction and the engineer advised of any clashes.
6. All external drainage works shall be constructed in accordance with the Civil Engineering Specification for the Water Industry Edition 7, together with the relevant Sewerage Undertaker's requirements.
7. S106 approval required prior to any connection works to public sewer.
8. Drainage design subject to SAB approval.
9. Prior to commencing work on the drainage, all existing drains, sewers manholes and outfalls to remain shall be located, identified and a CCTV condition survey carried out. Where necessary, protection to the existing drainage infrastructure shall be provided.
10. Refer to standard details drawings for further specification details.
11. All pipework with less than 1.2m cover in road and car park areas, or less than 0.9m cover in drive thru lanes and public open space, to have concrete surround or similar protection. The contractor is to protect all buried pipes and tree roots from damage caused by loads imposed by construction plant.
12. All concrete to drainage, manholes bases, surrounds etc to be in accordance with the BRE Special Digest 1. Refer to site investigation report for sulphate class.
13. All pipes shall be clay to BS EN 295, concrete to BS 5911 or plastic to BS EN 13476 and 1401, unless otherwise stated on the drawings.
14. All abandoned sewers are to be removed and trench suitably reinstated.
15. All manhole and drainage channel covers shall comply with BS EN 124. Manhole covers within external block paved areas & internal to buildings shall be recessed.
16. Ventilation shall be provided at the head of foul drainage runs. Access for rodding shall be provided to all soil and rainwater down pipes above finished floor level.
17. All pipes within the building footprint are to be 100mmØ and laid at a gradient of 1 in 40 unless stated otherwise on this drawing.
18. The proposed drainage network is designed to accommodate up to and including the 1 in 100 year + 40% allowance for climate change event.
19. Phase 1b (Starbucks Site) - The discharge rate of 2.0l/s is based upon the lowest practicable discharge rate achievable without the system becoming susceptible to regular blockage.
20. Soakaways are not feasible as confirmed by the site investigation report by BEK dated April 2023.
21. Additional drainage may cross the site and due to change in legislation in October 2011, these former private sewers may now be the responsibility of the Sewerage Undertaker, but not be shown on their records.
22. All pumps and separators to be alarmed and vented.
21. RWP and SVP locations provided by Architect.

T04	Updated to minor site layout changes	17.11.23	DG	AH
T03	Updated to minor site layout changes	26.09.23	DG	AH
T02	Updated to minor site layout changes	08.09.23	DG	AH
T01	Updated to include SVP and RWP locations	20.07.23	DG	AH
P01	First Issue	25.05.23	DG	AH
Rev.	**Amendments**	**Date**	**By**	**Chkd.**

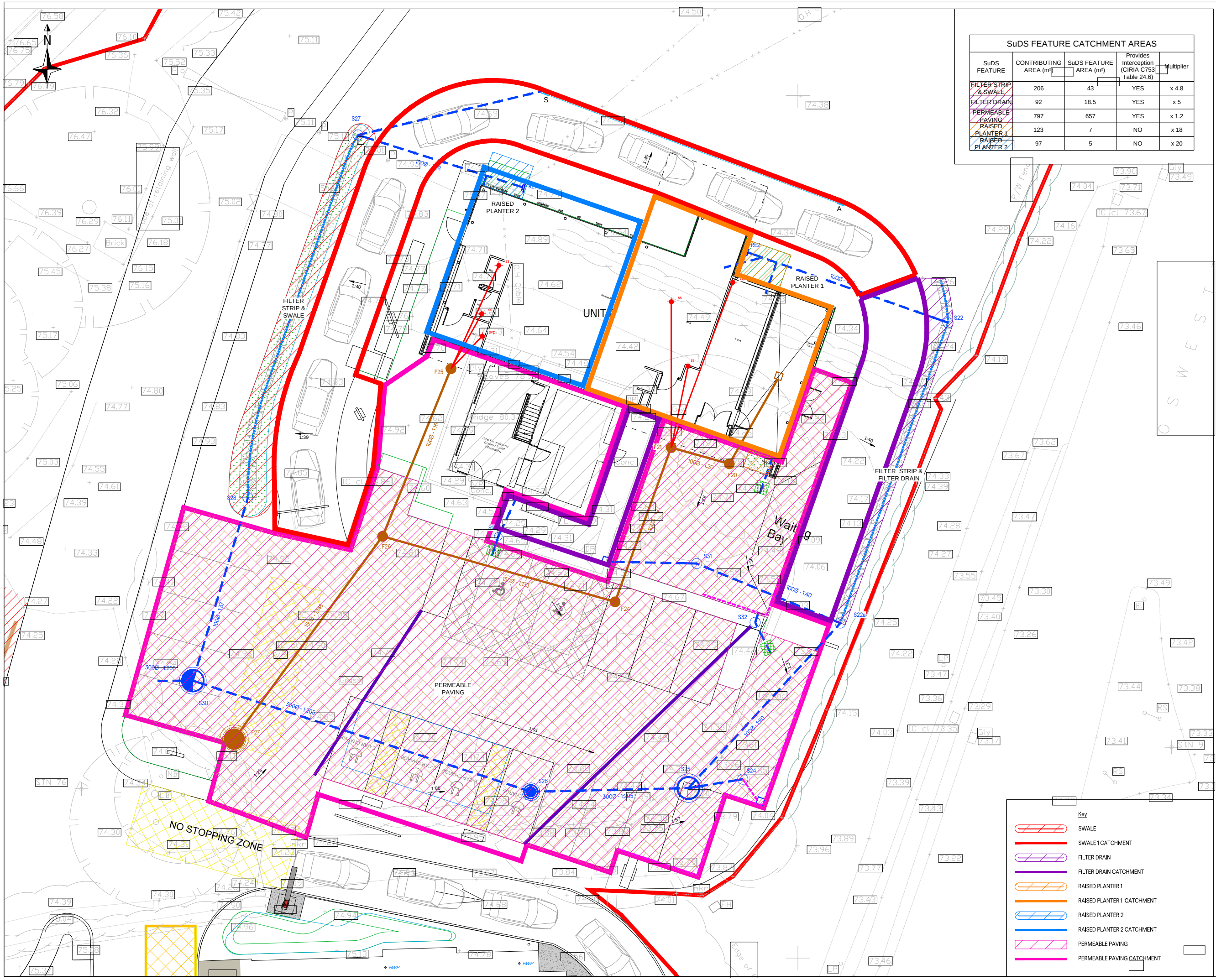
SBK
Civil & Structural Consultants
45 Frederick Street, Birmingham, B1 3HN
Email: officeadmin@sbkconsult.com

Drawing Status
TENDER

Lime Kiln Cottage,
Welshpool

Drainage Plan
Starbucks Wide

Drawing Number SBK-23-118-DR-C-532
Revision T04
Drawn by DG **Checked by** AH
Date 12.05.2023 **Scale** 1:100 @ A1



SuDS FEATURE CATCHMENT AREAS

SuDS FEATURE	CONTRIBUTING AREA (m²)	SuDS FEATURE AREA (m²)	Provides Interception (CIRIA C753 Table 24.6)	Multiplier
FILTER STRIP & SWALE	206	43	YES	x 4.8
FILTER DRAIN	92	18.5	YES	x 5
PERMEABLE PAVING	797	657	YES	x 1.2
RAISED PLANTER 1	123	7	NO	x 18
RAISED PLANTER 2	97	5	NO	x 20

NOTES

1. This drawing is to be read in conjunction with all relevant Architects, Engineers and other specialist details and specifications.
2. Drawing issued for preliminary discussions only, further to approval from Client. Following receipt of further information and comments the scheme may be revised.
3. Drawing based upon REV-A Architects layout drawing: 17065-REVA-00-00-DR-A-002 rev C01.
4. Topographical Survey data drawing is from Battlefield Land Surveys Ltd dated May 2023. The survey information used in the preparation of this drawing is not warranted. The contractor shall check all dimensions and levels on site.
5. The location and level of all existing services are to be identified prior to construction and the engineer advised of any clashes.
6. All external drainage works shall be constructed in accordance with the Civil Engineering Specification for the Water Industry Edition 7, together with the relevant Sewerage Undertaker's requirements.
7. S106 approval required prior to any connection works to public sewer.
8. Drainage design subject to SAB approval.
9. Refer to drawing SBK-23-118-DR-C-532 for full drainage design layout.

Key

▨	SWALE
━	SWALE 1 CATCHMENT
▨	FILTER DRAIN
━	FILTER DRAIN CATCHMENT
▨	RAISED PLANTER 1
━	RAISED PLANTER 1 CATCHMENT
▨	RAISED PLANTER 2
━	RAISED PLANTER 2 CATCHMENT
▨	PERMEABLE PAVING
━	PERMEABLE PAVING CATCHMENT

Rev.	Amendments	Date	By	Chkd.
P01	First Issue	17.11.23	DG	AH

SBK

Civil & Structural Consultants
45 Frederick Street, Birmingham, B1 3HN
Email: officeadmin@sbkconsult.com

Drawing Status
PRELIMINARY

Lime Kiln Cottage,
Welshpool

Drainage SuDS Catchment Plan
Starbucks Site

Drawing Number
SBK-23-118-SK-C-004
Revision
P01

Drawn by DG
Checked by AH
Date 23.10.2023
Scale 1:150 @ A1

Appendix 7 –Hydraulic Calculations

Appendix 8 –Land Registry Document

HM Land Registry Cofrestrfa Tir EM

Official copy of register of title
Copi swyddogol o gofrestr teitl

Title number / Rhif teitl CYM677940

Edition date / Dyddiad yr argraffiad 19.02.2020

- This official copy shows the entries on the register of title on 16 MAR 2020 at 13:02:53.
- This date must be quoted as the "search from date" in any official search application based on this copy.
- The date at the beginning of an entry is the date on which the entry was made in the register.
- Issued on 16 Mar 2020.
- Under s.67 of the Land Registration Act 2002, this copy is admissible in evidence to the same extent as the original.
- This title is dealt with by HM Land Registry, Wales Office.
- Mae'r copi swyddogol hwn yn dangos y cofnodion yn y gofrestr teitl ar 16 MAWRTH 2020 am 13:02:53.
- Rhaid dyfynnu'r dyddiad hwn fel y "dyddiad y chwilir ohono" mewn unrhyw gais am chwiliad swyddogol sy'n seiliedig ar y copi hwn.
- Y dyddiad ar ddechrau cofnod yw'r dyddiad y gwnaethpwyd y cofnod yn y gofrestr.
- Cyhoeddwyd ar 16 Mawrth 2020.
- Dan adran 67 Deddf Cofrestru Tir 2002, mae'r copi hwn yn dderbyniol fel tystiolaeth i'r un graddau â'r gwreiddiol.
- Gweinyddir y teitl hwn gan Gofrestrfa Tir EM Swyddfa Cymru.

A: Property Register / Cofrestr Eiddo

This register describes the land and estate comprised in the title.

Mae'r gofrestr hon yn disgrifio'r tir a'r ystad a gynhwysir yn y teitl.

POWYS

1 (04.10.1989) The Freehold land shown edged with red on the plan of the above title filed at the Registry and being Land lying to the south of Lime Kiln Cottage, Oswestry Road, Welshpool (SY21 9JP).

2 (04.10.1989) The land has the benefit of the following rights granted by the Deed of Mutual Easement dated 31 July 1989 referred to in the Charges Register:-

"1. To lay pipes or drains under and through the green land to the Brook

2. To discharge surface water and treated sewerage effluent through such pipes or drains into the Brook

3. To connect up to and use without charge any service or communication conducting media laid or installed in under or over the green land by the Grantee".

NOTE 1: The Brook referred to is Gungrog Brook

A: Property Register continued / Parhad o'r gofrestr eiddo

NOTE 2: The green land referred to lies to the south of the land in this title.

3 (11.04.1994) The land has the benefit of the rights granted by but is subject to the rights reserved by a Deed dated 22 March 1994 made between (1) Peter James Herbert (2) Frank Galliers Limited and (3) Lloyds Bank PLC.

NOTE: Original filed under WA506284.

B: Proprietorship Register / Cofrestr Perchnogaeth

This register specifies the class of title and identifies the owner. It contains any entries that affect the right of disposal.

Mae'r gofrestr hon yn nodi'r math o deitl ac yn enwi'r perchennog. Mae'n cynnwys unrhyw gofnodion sy'n effeithio ar yr hawl i waredu.

Title absolute/Teitl llwyr

1 (15.04.2016) PROPRIETOR: MICHAEL SLACK and HENIA SLACK of The Moors, Oswestry Road, Welshpool SY21 9JR.

2 (15.04.2016) The price stated to have been paid on 28 May 2015 was £15,000.

3 (15.04.2016) RESTRICTION: No disposition by a sole proprietor of the registered estate (except a trust corporation) under which capital money arises is to be registered unless authorised by an order of the court.

4 (15.04.2016) RESTRICTION: No disposition of the registered estate by the proprietor of the registered estate or by the proprietor of any registered charge not being a charge registered before the entry of this restriction is to be registered without a certificate signed by The Welsh Ministers of Welsh Government Crown Building, Cathays Park, Cardiff CF10 3NQ or their conveyancer that the provisions of Clause 2 of the section entitled "Positive Covenants by the Transferee" of a Transfer dated 28th May 2015 and made between The Welsh Ministers (1) and Michael Slack and Henia Slack (2) have been complied with.

5 (15.04.2016) The Transfer to the proprietor contains a covenant to observe and perform the covenants referred to in the Charges Register and of indemnity in respect thereof.

C: Charges Register / Cofrestr Arwystlon

This register contains any charges and other matters that affect the land.

Mae'r gofrestr hon yn cynnwys unrhyw arwystlon a materion eraill sy'n effeithio ar y tir.

1 (04.10.1989) The land is subject to the following rights granted by the Deed of Mutual Easement dated 31 July 1989 made between (1) William Evan Davies and William Keith Davies (Grantors) and (2) David Marshall Corfield (Grantee):-

1. To pass and repass with or without vehicles of all descriptions at all times over and across any part of the red land until such time as the Grantors shall construct a proper roadway over the red land which will enable the Grantee to obtain full and continuous unobstructed access from the green land across the red land to the public highway abutting the red land on it's North Eastern corner and to then use that roadway.

2. To connect up to and use, without charge, any service or communication conducting media laid or installed in under or over the red land by the Grantors.

C: Charges Register continued / Parhad o'r gofrestr arwystlon

3. In the event of the Grantors not developing the red land, to enter on the red land with men machinery and plant in order to connect up to or construct or lay and install either the said roadway or the said service or communication conducting media and also to inspect maintain and repair or renew any of those things".

NOTE: The red land comprises the land in this title.

2 (06.06.1995) A Transfer dated 31 March 1995 made between (1) Frank Galliers Limited (Transferor) and (2) The Development Board for Rural Wales (Transferee) contains the following covenants by the Vendor:-

"The Transferor hereby covenants with the Transferee for the benefit of the Land and every part thereof and so as to bind the Retained Land into whosesoever ownership the same may pass so far as practicable to observe and perform the restrictions and stipulations set out in the First Schedule hereto

THE FOURTH SCHEDULE

Restrictive Covenants

Not to do permit or suffer to be done on the Retained Land anything which may be or become or cause a nuisance annoyance or damage to the Transferee or to the owners or occupers of any part of the Land"

3 (19.02.2020) UNILATERAL NOTICE in respect of an option to purchase contained in an Option Agreement dated 14 February 2020 made between (1) Michael Anthony Slack and Henia Slack and (2) Kim Property Investment Limited.

NOTE: Copy filed under CYM105567.

4 (19.02.2020) BENEFICIARY: Kim Property Investments Limited (Co. Regn. No. 11428681) of Alex House, 260/8 Chapel Street, Salford, Manchester, M3 5JZ..

End of register / Diwedd y gofrestr

These are the notes referred to on the following official copy

The electronic official copy of the title plan follows this message.

Please note that this is the only official copy we will issue. We will not issue a paper official copy.

This official copy was delivered electronically and when printed will not be to scale. You can obtain a paper official copy by ordering one from HM Land Registry.

This official copy is issued on 16 March 2020 shows the state of this title plan on 16 March 2020 at 13:02:53. It is admissible in evidence to the same extent as the original (s.67 Land Registration Act 2002). This title plan shows the general position, not the exact line, of the boundaries. It may be subject to distortions in scale. Measurements scaled from this plan may not match measurements between the same points on the ground.
This title is dealt with by the HM Land Registry, Wales Office .

Dyma'r nodiadau y cyfeirir atynt ar y copi swyddogol canlynol.

Mae'r copi swyddogol electronig o'r cynllun teitl yn dilyn y neges hon.

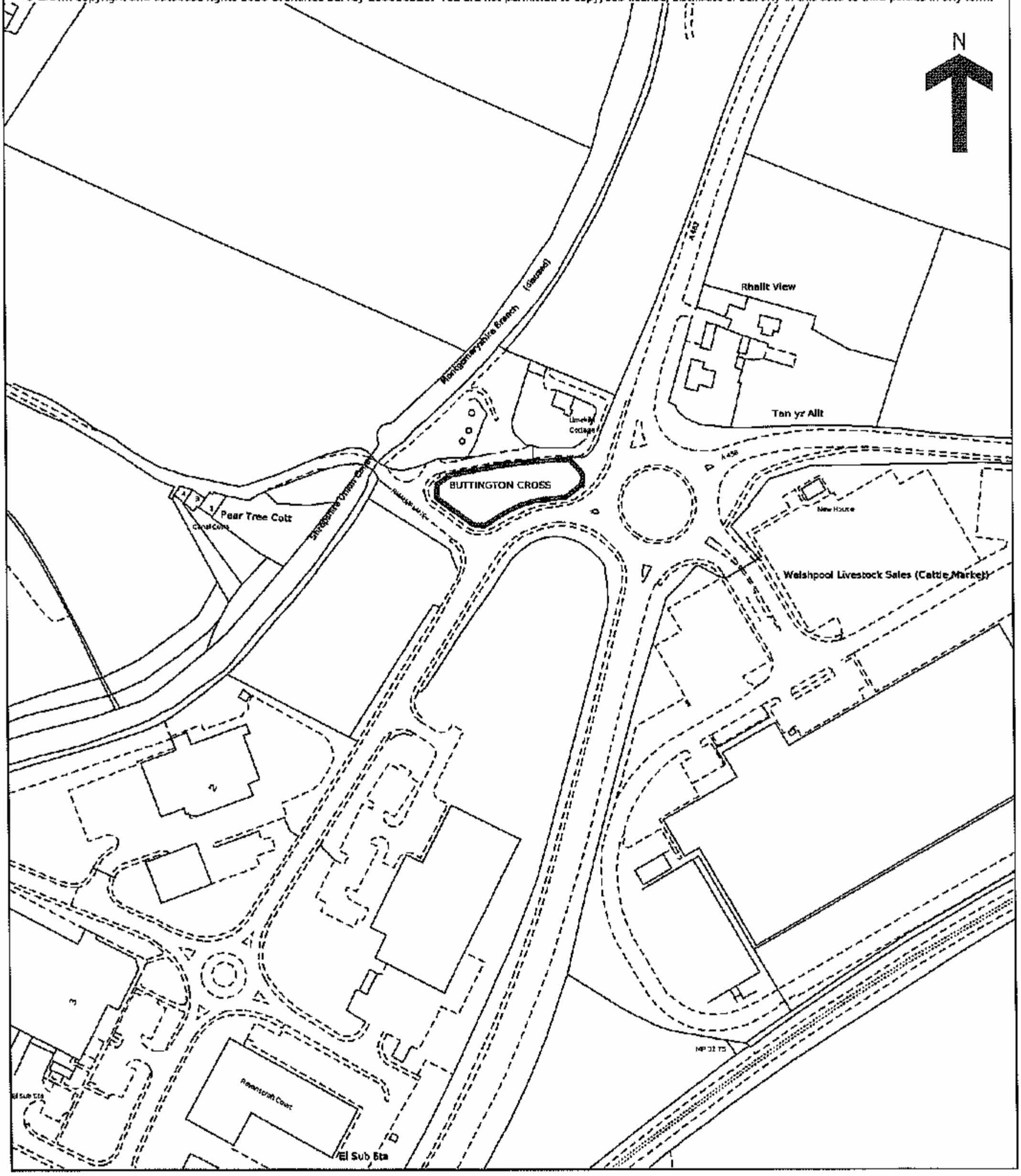
Sylwch mai hwn yw'r unig gopi swyddogol a ddarparwn. Ni fyddwn yn darparu copi swyddogol papur.

Anfonwyd y copi swyddogol hwn yn electronig a phan gaiff ei argraffu ni fydd wrth raddfa. Gallwch gael copi swyddogol papur trwy archebu un o Gofrestrfa Tir EM.

Mae'r copi swyddogol hwn a gyhoeddir ar 16 Mawrth 2020 yn dangos sefyllfa'r cynllun teitl hwn ar 16 Mawrth 2020 am 13:02:53. Mae'n dderbyniol fel tystiolaeth i'r un graddau â'r gwreiddiol (adran 67 Deddf Cofrestru Tir 2002). Mae'r cynllun teitl hwn yn dangos safle cyffredinol, nid union linell, y terfynau. Gall fod gwyriadau yn y raddfa. Mae'n bosibl na fydd mesuriadau wedi eu graddio o'r cynllun hwn yn cyfateb â mesuriadau rhwng yr un pwyntiau ar y llawr.
Gweinyddir y teitl hwn gan Gofrestrfa Tir EM Swyddfa Cymru.

HM Land Registry
Official copy of title plan

Title number **CYM677940**
Ordnance Survey map reference **SJ2408NW**
Scale **1:2500**
Administrative area **Powys**



This official copy is incomplete without the preceding notes page.

These are the notes referred to on the following official copy

The electronic official copy of the title plan follows this message.

Please note that this is the only official copy we will issue. We will not issue a paper official copy.

This official copy was delivered electronically and when printed will not be to scale. You can obtain a paper official copy by ordering one from HM Land Registry.

This official copy is issued on 09 October 2020 shows the state of this title plan on 09 October 2020 at 15:19:08. It is admissible in evidence to the same extent as the original (s.67 Land Registration Act 2002). This title plan shows the general position, not the exact line, of the boundaries. It may be subject to distortions in scale. Measurements scaled from this plan may not match measurements between the same points on the ground.
This title is dealt with by the HM Land Registry, Wales Office .

Dyma'r nodiadau y cyfeirir atynt ar y copi swyddogol canlynol.

Mae'r copi swyddogol electronig o'r cynllun teitl yn dilyn y neges hon.

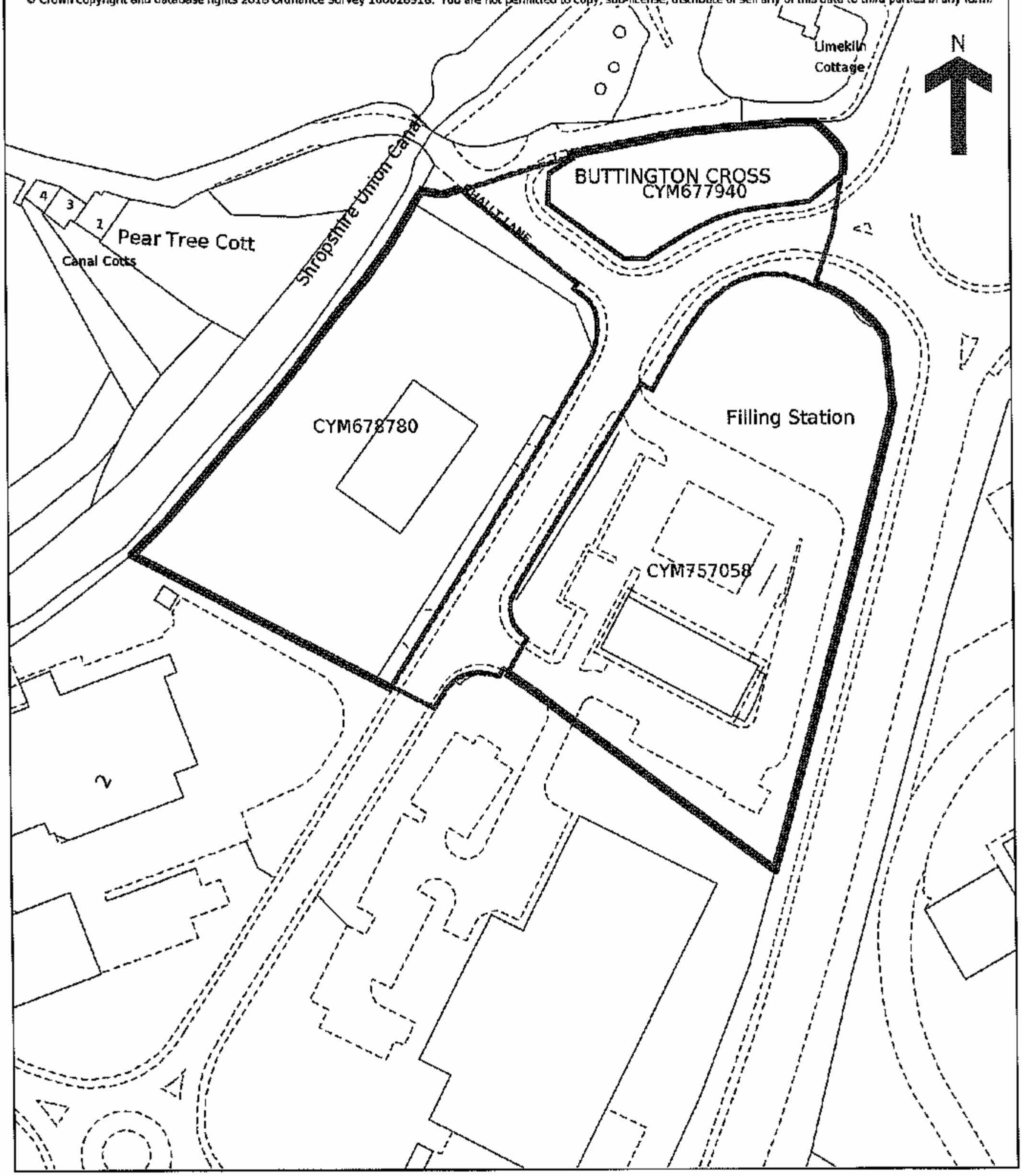
Sylwch mai hwn yw'r unig gopi swyddogol a ddarparwn. Ni fyddwn yn darparu copi swyddogol papur.

Anfonwyd y copi swyddogol hwn yn electronig a phan gaiff ei argraffu ni fydd wrth raddfa. Gallwch gael copi swyddogol papur trwy archebu un o Gofrestrfa Tir EM.

Mae'r copi swyddogol hwn a gyhoeddir ar 09 Hydref 2020 yn dangos sefyllfa'r cynllun teitl hwn ar 09 Hydref 2020 am 15:19:08. Mae'n dderbyniol fel tystiolaeth i'r un graddau â'r gwreiddiol (adran 67 Deddf Cofrestru Tir 2002). Mae'r cynllun teitl hwn yn dangos safle cyffredinol, nid union linell, y terfynau. Gall fod gwyriadau yn y raddfa. Mae'n bosibl na fydd mesuriadau wedi eu graddio o'r cynllun hwn yn cyfateb â mesuriadau rhwng yr un pwyntiau ar y llawr.
Gweinyddir y teitl hwn gan Gofrestrfa Tir EM Swyddfa Cymru.

HM Land Registry
Official copy of title plan

Title number **WA506284**
Ordnance Survey map reference **SJ2408NW**
Scale **1:1250 enlarged from 1:2500**
Administrative area **Powys**



This official copy is incomplete without the preceding notes page.