

PLAN GRID NORTH

File Name: S15946-2D.dwg

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100.0	LEVEL

NOTES

1. All levels are in O.S. Newlyn Datum. Established using network RTK.

2. Survey plotted on a plan grid, oriented to National Grid.

3. All dimensions are in metres unless otherwise stated.

4. All dimensions are to the centre of the feature unless otherwise stated.

5. All dimensions are to the top of the feature unless otherwise stated.

6. All dimensions are to the bottom of the feature unless otherwise stated.

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96. All dimensions are to the bottom of the feature unless otherwise stated.

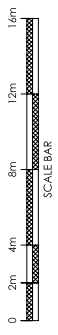
97. All dimensions are to the side of the feature unless otherwise stated.

98. All dimensions are to the front of the feature unless otherwise stated.

99. All dimensions are to the back of the feature unless otherwise stated.

100. All dimensions are to the top of the feature unless otherwise stated.

SURVEY STATION	
Name	Height
AL1	344440.312
AL2	344440.312
AL3	344440.312
AL4	344440.312
AL5	344440.312
AL6	344440.312
AL7	344440.312
AL8	344440.312
AL9	344440.312
AL10	344440.312
AL11	344440.312
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AL100	344440.312



SCALE BAR

REV DATE DESCRIPTION



Client
Hale
198a Providence Square
Jacobus Street
London
SE1 2DZ

Project Title
Topographical Survey of Land at:
Acornfield Road
Liverpool
L33

Surveyed	Drawn	Checked
D. Wright	D. Wright	R. Crichtley
Scale	Date	Drawing Ref.
1:200	Apr 18	S15946-1
No.	Size	Rev
08	A1	—

398520N

344000E

343900E

343800E

398420N

Appendix B – Proposed Site Layout

Disclaimer:
Subject to survey.

Notes:

KEY

- Image Business Park
Site Boundary Line
(13.885m² / 3.43acres / 1.39ha)

AREA SCHEDULE(GIA)

UNIT 2 (GIA)
Warehouse (incl. office Undercroft)
Office (FF Only)
Car parking spaces
(Incl 5 disabled bays)

60,000ft²
55,800ft²
4,200ft²
86

EXTERNAL MATERIALS:

- In-situ concrete
Concrete block paving
Permeable paving
In-situ concrete path
Soft landscaping
(See landscaping proposal by BEA)
Existing Fence Line
Proposed Fence Line
2.1m Black paladin fence

- Refuse
Electrical Substation
Disabled Parking Bays
Cycle Parking
Motorcycle Parking
EV Charging Points
Water Meter

- (R)
(SS)
(1)
(2)
(3)
(4)
(5)

D	Amendment	21.10.21	HT	HA
C	Fence line amended to lie into east	14.09.21	HT	HA
B	Car Parking amended	03.09.21	HT	HA
A	Substation Included	24.05.21	HT	HA
-	First issue	20.05.21	HT	HA

Rev: Notes: Date: Iss: Dwn: Iss:



Client:



hale

ARCHITECTURE | DESIGN MANAGEMENT
22c Leathermarket Street, London, SE1 3HP

Project:

Imagination 02
Image Business Park, Knowsley

Drawing Title:

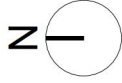
Site 2
Proposed Site Plan

Project No:
21065

Scale @ A1/A3:
1:500 / 1:1000

Drawing No:
21065 - PL1002

Revision:
D



Appendix C – Public Sewer Asset Plan

Appendix D – Exceedance Flow Path Plan

- Notes:**
1. Do not scale from this drawing.
 2. In case of any discrepancies in drawings, details or bills, refer to engineers for clarification: unilateral decisions by the Contractor will not be accepted.
 3. This drawing is to be read in conjunction with all related Architects, Consultants & Sub-Contractors drawings and specifications.
 4. The Contractor is advised that all design drawings and information are to be read concurrently and any discrepancies or omissions reported directly to PTA's Civil Engineering Department.
 5. Proposed site layout based on Hile Drawing PL1002B.
 6. Channel drains to collect overland flow and discharge into below ground drainage.

Key:

- Overland Exceedance Flood Flow Path
- Existing Levels
- Proposed Levels
- Channel Drains

× 42.942

× 42.676

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COMMENT/COSTING/APPROVAL
NOT FOR CONSTRUCTION

P02	Updated FFL	GW/19.11.21	SLW		
P01	First Issue	GW/25.06.21	AH		
REV	DESCRIPTION	BY	DATE	DATE	DATE

PROJECT TITLE	KNOWSLEY PHASE 2
SITE	KNOWSLEY PHASE 2

Exceedance Flood Route

DATE	June 2021	THIS DRAWING IS ISSUED ONLY FOR THE PURPOSES DESCRIBED IN THE DRAWING STATUS BOX.	9865
DRAWN	GW		REASON
SCALE	1:250		
DWG SIZE	A1		P02
DRAWING NO	9865-PTA-ZZ-XX-DR-C-8150		

Consulting Civil & Structural Engineers

pta

29 Red Lion Street
Chesham
Bucks
HP8 4JL
Tel: 01494 772721

www.ptaconsult.co.uk



Appendix E – Existing Runoff Calculations

Pre-development 1-year Peak Rainfall

From Wallingford Procedure, Volume 3 - Maps

CC Allowance = %

Rainfall Depths (M5 - 60minutes)

M5-60 =

Rainfall Ratio (r)

r =

Design Storm Return Period

P =

Time of concentration

T_c =

Therefore, Z_1 = 0.645

Therefore M5-15 = 12.6 mm

Therefore, Z_2 = 0.615

Therefore M1-15 = 7.8 mm

Therefore, average point intensity = 31.1 mm/hr

Site Area = m²

C_v =

$$Q_p = 3.61 \times C_v \times i \times A$$

Therefore, Q_p = 3.61 x 0.75 x 31.1094336 x 4800

= 40.43 litres/sec

Volume during storm = 37 m³

Pre-development 1-year Peak Rainfall

From Wallingford Procedure, Volume 3 - Maps

CC Allowance = %

Rainfall Depths (M5 - 60minutes)

M5-60 =

Rainfall Ratio (r)

r =

Design Storm Return Period

P =

Time of concentration

T_c =

Therefore, Z_1 = 0.645

Therefore M5-15 = 12.6 mm

Therefore, Z_2 = 1.509

Therefore M30-15 = 19.1 mm

Therefore, average point intensity = 76.3 mm/hr

Site Area = m²

C_v =

$$Q_p = 3.61 \times C_v \times i \times A$$

Therefore, $Q_p = 3.61 \times 0.75 \times 76.3104831999999 \times 4800$

= 99.17 litres/sec

Volume during storm = 92 m³

Pre-development 1-year Peak Rainfall

From Wallingford Procedure, Volume 3 - Maps

CC Allowance = %

Rainfall Depths (M5 - 60minutes)

M5-60 =

Rainfall Ratio (r)

r =

Design Storm Return Period

P =

Time of concentration

T_c =

Therefore, Z_1 = 0.645

Therefore M5-15 = 12.6 mm

Therefore, Z_2 = 1.952

Therefore M100-15 = 24.7 mm

Therefore, average point intensity = 98.7 mm/hr

Site Area = m²

C_v =

$$Q_p = 3.61 \times C_v \times i \times A$$

Therefore, $Q_p = 3.61 \times 0.75 \times 98.6885088000001 \times 4800$

= 128.26 litres/sec

Volume during storm = 118 m³

Pre-development 1-year Peak Rainfall

From Wallingford Procedure, Volume 3 - Maps

CC Allowance = %

Rainfall Depths (M5 - 60minutes)

M5-60 =

Rainfall Ratio (r)

r =

Design Storm Return Period

P =

Time of concentration

T_c =

Therefore, Z_1 = 0.645

Therefore M5-15 = 12.6 mm

Therefore, Z_2 = 1.952

Therefore M100-15 = 34.5 mm

Therefore, average point intensity = 138.2 mm/hr

Site Area = m²

C_v =

$$Q_p = 3.61 \times C_v \times i \times A$$

Therefore, Q_p = 3.61 x 0.75 x 138.16391232 x 4800

= 179.56 litres/sec

Volume during storm = 166 m³

Appendix F – MicroDrainage Output Files

PTA

29 Red Lion Street
Chesham Bucks
HP5 1EJ

Overview

Date 14/12/2021 15:50
File SW01.MDX

Designed by GeorgeW
Checked by

XP Solutions

Network 2020.1

Page 1



STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	19.800	Add Flow / Climate Change (%)	0
Ratio R	0.381	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	25.166	0.150	167.8	0.023	5.00	0.0	0.600	o	225	Pipe/Conduit	
S2.000	6.040	0.060	100.7	0.067	5.00	0.0	0.600	o	225	Pipe/Conduit	
S2.001	45.487	1.165	39.0	0.050	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.001	19.152	0.125	153.2	0.071	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.002	16.150	0.100	161.5	0.076	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.000	20.849	0.125	166.8	0.100	5.00	0.0	0.600	o	300	Pipe/Conduit	
S3.001	6.792	0.050	135.8	0.100	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.42	41.650	0.023	0.0	0.0	0.0	1.01	40.0	3.1
S2.000	50.00	5.08	42.800	0.067	0.0	0.0	0.0	1.30	51.8	9.1
S2.001	50.00	5.38	42.740	0.117	0.0	0.0	0.0	2.52	178.4	15.8
S1.001	50.00	5.67	41.425	0.211	0.0	0.0	0.0	1.27	89.6	28.6
S1.002	50.00	5.89	41.300	0.286	0.0	0.0	0.0	1.23	87.3	38.8
S3.000	50.00	5.29	41.350	0.100	0.0	0.0	0.0	1.21	85.9	13.5
S3.001	50.00	5.37	41.225	0.200	0.0	0.0	0.0	1.35	95.2	27.1

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PTA		Page 2
29 Red Lion Street Chesham Bucks HP5 1EJ	Network Results Overview	
Date 14/12/2021 15:50 File SW01.MDX	Designed by GeorgeW Checked by	
XP Solutions	Network 2020.1	

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.003	5.152	0.100	51.5	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S4.000	21.558	0.150	143.7	0.034	5.00	0.0	0.600	o	150	Pipe/Conduit	
S5.000	33.501	0.225	148.9	0.034	5.00	0.0	0.600	o	150	Pipe/Conduit	
S4.001	17.316	0.100	173.2	0.040	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.004	6.677	0.150	44.5	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.005	16.073	0.450	35.7	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S6.000	21.280	0.125	170.2	0.157	5.00	0.0	0.600	o	300	Pipe/Conduit	
S6.001	8.208	0.050	164.2	0.004	0.00	0.0	0.600	o	300	Pipe/Conduit	
S6.002	4.791	0.025	191.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S7.000	5.405	0.100	54.1	0.250	5.00	0.0	0.600	o	300	Pipe/Conduit	
S6.003	31.523	0.200	157.6	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S6.004	10.736	0.075	143.1	0.083	0.00	0.0	0.600	o	375	Pipe/Conduit	
S6.005	10.643	1.700	6.3	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S8.000	19.436	2.125	9.1	0.143	5.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.003	50.00	5.92	41.100	0.486	0.0	0.0	0.0	2.53	279.4	65.9
S4.000	50.00	5.43	41.550	0.034	0.0	0.0	0.0	0.84	14.8	4.5
S5.000	50.00	5.68	41.550	0.034	0.0	0.0	0.0	0.82	14.5	4.5
S4.001	50.00	5.97	41.250	0.107	0.0	0.0	0.0	0.99	39.4	14.5
S1.004	50.00	6.01	41.000	0.593	0.0	0.0	0.0	2.72	300.7	80.4
S1.005	50.00	6.10	40.850	0.593	0.0	0.0	0.0	3.04	335.8	80.4
S6.000	50.00	5.30	42.650	0.157	0.0	0.0	0.0	1.20	85.0	21.3
S6.001	50.00	5.41	42.525	0.161	0.0	0.0	0.0	1.22	86.5	21.8
S6.002	50.00	5.48	42.475	0.161	0.0	0.0	0.0	1.13	80.0	21.8
S7.000	50.00	5.04	42.550	0.250	0.0	0.0	0.0	2.14	151.5	33.9
S6.003	50.00	5.84	42.375	0.411	0.0	0.0	0.0	1.44	159.1	55.7
S6.004	50.00	5.96	42.175	0.494	0.0	0.0	0.0	1.51	167.0	66.9
S6.005	50.00	5.98	42.100	0.494	0.0	0.0	0.0	7.28	804.1	66.9
S8.000	50.00	5.06	42.600	0.143	0.0	0.0	0.0	5.23	369.6	19.4

29 Red Lion Street
Chesham Bucks
HP5 1EJ

Storage Structure

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Date 14/12/2021 15:50
File SW01.MDX
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Designed by Georgew
Checked by



XP Solutions

Network 2020.1

Storage Structures for Storm

Cellular Storage Manhole: S5, DS/PN: S1.006

Invert Level (m)	40.400	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	425.0	0.0	1.501	0.0	0.0
1.500	425.0	0.0			

PTA		Page 6							
29 Red Lion Street Chesham Bucks HP5 1EJ	Storm Summary								
Date 14/12/2021 15:50 File SW01.MDX	Designed by Georgew Checked by								
XP Solutions	Network 2020.1								
Summary of Critical Results by Maximum Level (Rank 1) for Storm Simulation Criteria Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000 Hot Start Level (mm) 0 Inlet Coefficient 0.800 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000 Foul Sewage per hectare (l/s) 0.000 Number of Input Hydrographs 0 Number of Storage Structures 1 Number of Online Controls 1 Number of Time/Area Diagrams 0 Number of Offline Controls 0 Number of Real Time Controls 0 Synthetic Rainfall Details Rainfall Model FSR Ratio R 0.381 Region England and Wales Cv (Summer) 0.750 M5-60 (mm) 19.800 Cv (Winter) 0.840 Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF Analysis Timestep Fine Inertia Status OFF DTS Status ON Profile(s) Summer and Winter Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440 Return Period(s) (years) 1, 30, 100 Climate Change (%) 0, 0, 40 WARNING: Half Drain Time has not been calculated as the structure is too full.									
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	15 Winter	100	+40%	100/15 Summer				42.822
S2.000	S2	15 Winter	100	+40%	100/15 Summer				43.038
S2.001	S3	15 Winter	100	+40%					42.952
S1.001	S2	15 Winter	100	+40%	30/15 Summer				42.797
S1.002	S3	15 Winter	100	+40%	30/15 Summer				42.578
S3.000	S19	15 Winter	100	+40%	100/15 Summer				42.444
S3.001	S20	15 Winter	100	+40%	30/15 Summer				42.383
S1.003	S4	15 Winter	100	+40%	30/15 Summer				42.214
S4.000	S5	15 Winter	100	+40%	100/15 Summer				42.227
S5.000	S6	15 Winter	100	+40%	100/15 Summer				42.316
S4.001	S5	15 Winter	100	+40%	30/15 Summer				42.034
S1.004	S5	240 Winter	100	+40%	30/15 Summer				41.877
S1.005	S6	240 Winter	100	+40%	100/15 Summer				41.874
S6.000	S10	15 Winter	100	+40%	100/15 Summer				43.702
S6.001	S11	15 Winter	100	+40%	100/15 Summer				43.547
S6.002	S12	15 Winter	100	+40%	30/15 Winter				43.438
S7.000	S17	15 Winter	100	+40%	30/15 Winter				43.625
S6.003	S17	15 Winter	100	+40%	30/15 Winter				43.334
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PTA		Page 7
29 Red Lion Street Chesham Bucks HP5 1EJ	Storm Summary	
Date 14/12/2021 15:50 File SW01.MDX	Designed by Georgew Checked by	
XP Solutions	Network 2020.1	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.947	0.000	0.39			14.5	FLOOD RISK	
S2.000	S2	0.013	0.000	1.17			40.2	SURCHARGED	
S2.001	S3	-0.088	0.000	0.43			71.2	OK	
S1.001	S2	1.072	0.000	1.34			104.3	FLOOD RISK	
S1.002	S3	0.978	0.000	1.87			138.3	SURCHARGED	
S3.000	S19	0.794	0.000	0.69			52.1	FLOOD RISK	
S3.001	S20	0.858	0.000	1.67			102.2	SURCHARGED	
S1.003	S4	0.739	0.000	1.91			236.9	SURCHARGED	
S4.000	S5	0.527	0.000	1.14			15.9	SURCHARGED	
S5.000	S6	0.616	0.000	1.12			15.7	FLOOD RISK	
S4.001	S5	0.559	0.000	1.37			48.3	SURCHARGED	
S1.004	S5	0.502	0.000	0.45			69.0	SURCHARGED	
S1.005	S6	0.649	0.000	0.26			67.9	SURCHARGED	
S6.000	S10	0.752	0.000	1.08			80.4	FLOOD RISK	
S6.001	S11	0.722	0.000	1.35			82.5	SURCHARGED	
S6.002	S12	0.663	0.000	1.59			83.3	SURCHARGED	
S7.000	S17	0.775	0.000	1.70			134.4	FLOOD RISK	
S6.003	S17	0.584	0.000	1.51			213.2	SURCHARGED	

PTA		Page 8
29 Red Lion Street Chesham Bucks HP5 1EJ		Storm Summary
Date 14/12/2021 15:50 File SW01.MDX		Designed by Georgew Checked by
XP Solutions		Network 2020.1



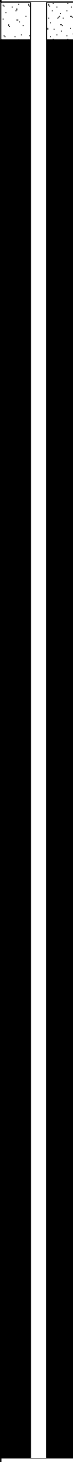
Summary of Critical Results by Maximum Level (Rank 1) for Storm

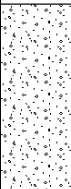
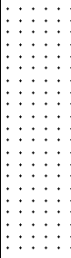
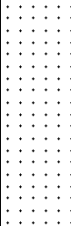
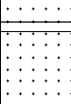
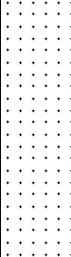
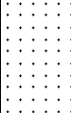
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S6.004	S13	15 Winter	100	+40%	30/15 Summer				42.881
S6.005	S14	15 Winter	100	+40%					42.286
S8.000	S15	15 Winter	100	+40%					42.706
S6.006	S15	240 Winter	100	+40%	30/15 Summer				41.876
S1.006	S5	240 Winter	100	+40%	30/15 Summer				41.869
S1.007	S5	15 Winter	30	+0%					40.036

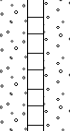
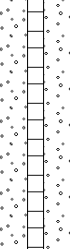
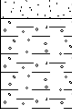
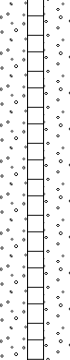
PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S6.004	S13	0.331	0.000	2.32			248.7	SURCHARGED	
S6.005	S14	-0.189	0.000	0.49			249.3	OK	
S8.000	S15	-0.194	0.000	0.27			86.4	OK	
S6.006	S15	1.026	0.000	0.81			74.5	SURCHARGED	
S1.006	S5	1.094	0.000	0.07			19.8	SURCHARGED	
S1.007	S5	-0.264	0.000	0.19			19.9	OK	

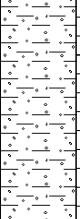
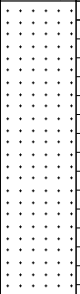
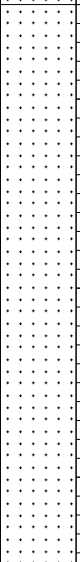
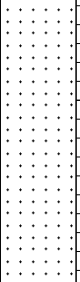
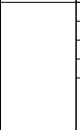
Appendix G – Proposed Drainage Strategy

Appendix H – Borehole Logs

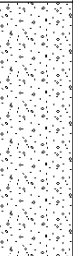
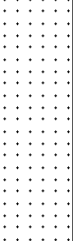
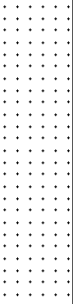
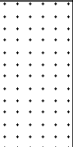
 Environment - Health & Safety - Sustainability Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com						Project No: 19-0654.02		Hole ID: BH1		Page: 1 of 2						
						Project: Image Business Park, Knowsley (Plot B)										
Rotary Core Borehole Log						Date: 25/06/2019		Client: Knowsley (Image Business Park) Ltd								
Description of Strata	Legend	Strata Depth (m)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Core Recovery			Sample Details		Test Details		Backfill		
							Run (m)	TCR% SCR% RQD%	Min. Fl Av. Fl Max. Fl	Depth (m)	Type Ref	Depth (m)	Results			
Grass over MADE GROUND: Dark brown slightly gravelly sand with abundant roots. Gravel is fine to medium angular brick and quartzite. (TOPSOIL) MADE GROUND: Medium dense light brown slightly silty gravelly sand with occasional pockets of soft sandy clay. Gravel is fine to coarse angular to subrounded brick, concrete, slag, plastic, quartzite. Rare cobbles of concrete and metal pole. <i>Becoming slightly clayey below 1.20 m bgl.</i> Medium dense light brown locally black slightly gravelly medium to coarse SAND. Gravel is fine to medium quartzite. (SHIRDLEY HILL SAND FORMATION) Stiff reddish brown slightly gravelly sandy CLAY. Gravel is fine to medium subrounded quartzite. (GLACIAL TILL) Medium dense light brown locally black slightly gravelly medium to coarse SAND. Gravel is fine to medium subrounded quartzite. (GLACIAL TILL) <i>Poor recovery between 3.00 m and 4.00 m bgl.</i>		0.20	(0.20)	44.81						0.40	ES 1	0.40	PID=0.2ppmv			
		1.40	(1.20)	43.61									1.20	SPT(S) N=12 (1,3/4,4,2,2)		
													1.60	PID=0.0ppmv		
													2.00	SPT(S) N=17 (4,2/3,4,5,5)		
		2.20	(0.80)	42.81									2.40	PID=0.1ppmv		
													3.00	SPT(S) N=12 (3,2/3,3,3,3)		
													4.00	SPT(S) N=10 (1,1/2,2,3,3)		
		4.00		41.01									4.40	PID=0.2ppmv		
													5.00	SPT(S) N=29 (3,6/7,7,8,7)		
													6.00	SPT(S) N=39 (5,6/7,9,11,12)		
													6.00	PID=0.1ppmv		
													7.50	SPT(S) N=50 (12,5/50 for 230mm)		
Remarks: 1. Hand dug service avoidance pit to 1.20 m bgl. 2. Borehole advanced to 5.00 m bgl using dynamic sampling techniques with rotary openhole follow on to 9.00 m bgl and rotary coring to 15.00 m bgl. 2. Borehole terminated at 15.00 m bgl. 3. Groundwater encountered at 8.70 m bgl. 4. Borehole installed with gas and groundwater standpipe as indicated above.						Water Level Observations					Flush					
						Date	Time	Strike	Duration	Standing	Depth (m)	Return				
						26/06/2019		8.70 m	20 min	8.50 m	9.00 - 10.50	90				
Coordinates: E344018.10 N398882.02		Elevation (mAOD): 45.01		Drilled By: Delta Drilling		Plant Used: Comacchio GEO 300		Logged: BHO	Checked: MY	Approved:	Scale (m): 1:40					

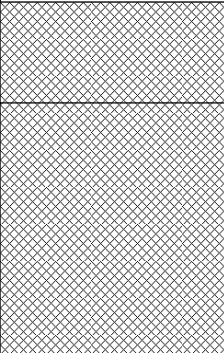
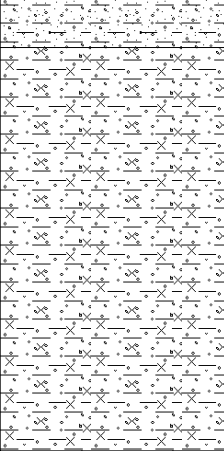
 Environment - Health & Safety - Sustainability Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com						Project No: 19-0654.02		Hole ID: BH1		Page: 2 of 2				
						Project: Image Business Park, Knowsley (Plot B)								
Rotary Core Borehole Log						Date: 25/06/2019		Client: Knowsley (Image Business Park) Ltd						
Description of Strata	Legend	Strata Depth (m)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Core Recovery			Sample Details		Test Details		Backfill
							Run (m)	TCR% SCR% RQD%	Min. FI Av. FI Max. FI	Depth (m)	Type Ref	Depth (m)	Results	
Reddish brown slightly clayey SAND (Drillers Description) (WEATHERED CHESTER SANDSTONE FORMATION)		8.70		36.31		8.50 8.70								
Strong red SANDSTONE. (Drillers Description) (CHESTER SANDSTONE FORMATION)		9.00	(0.30)	36.01								9.00	SPT(S) 50 (25 for 75mm/50 for 70mm)	
Weak to medium strong dark reddish brown medium grained thinly laminated SANDSTONE. (CHESTER SANDSTONE FORMATION)			(1.60)				1.5	68 58 44		9.70 - 10.00	C 5			
Bands of coarse sandstone gravel between 10.50 m and 10.60 m bgl		10.60		34.41								10.50	SPT(S) 50 (25 for 30mm/50 for 30mm)	
Weak to medium strong dark reddish brown medium to coarse grained thinly laminated SANDSTONE with occasional greenish grey fine to medium grained sandstone bands. (CHESTER SANDSTONE FORMATION)			(1.40)				1.5	100 30 10						
		12.00		33.01						11.80 - 12.00	C 6			
Weak light greenish grey fine to medium grained SANDSTONE. (CHESTER SANDSTONE FORMATION)		12.05		32.96								12.00	SPT(S) 50 (25 for 25mm/50 for 30mm)	
Medium strong dark reddish brown medium to coarse grained thinly laminated SANDSTONE with occasional bands of weak greenish grey fine to medium grained sandstone. (CHESTER SANDSTONE FORMATION)			(1.75)				1.5	84 62 47		12.55 - 12.70	C 7			
		13.80		31.21								13.50	SPT(S) 50 (25 for 30mm/50 for 40mm)	
Medium strong greenish grey fine to medium grained thinly laminated SANDSTONE. (CHESTER SANDSTONE FORMATION)		13.95		31.06										
Strong dark reddish brown medium to coarse grained thinly laminated SANDSTONE. (CHESTER SANDSTONE FORMATION)			(1.05)				1.5	60 49 68		14.40 - 14.50	C 8			
Poor recovery between 14.50 m and 15.00 m bgl. Borehole complete at 15.00 m bgl.		15.00		30.01								15.00	SPT(S) 50 (5,10/50 for 45mm)	
Remarks: 1. Hand dug service avoidance pit to 1.20 m bgl. 2. Borehole advanced to 5.00 m bgl using dynamic sampling techniques with rotary openhole follow on to 9.00 m bgl and rotary coring to 15.00 m bgl. 2. Borehole terminated at 15.00 m bgl. 3. Groundwater encountered at 8.70 m bgl. 4. Borehole installed with gas and groundwater standpipe as indicated above.							Water Level Observations					Flush		
							Date	Time	Strike	Duration	Standing	Depth (m)	Return	
							26/06/2019		8.70 m	20 min	8.50 m	9.00 - 10.50	90	
Coordinates: E344018.10 N398882.02		Elevation (mAOD): 45.01		Drilled By: Delta Drilling		Plant Used: Comacchio GEO 300		Logged: BHO	Checked: MY	Approved:	Scale (m): 1:40			

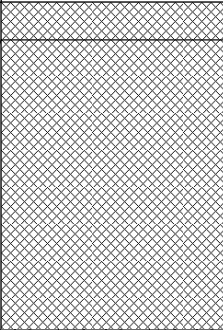
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							Project: Image Business Park, Knowsley (Plot B)							
Rotary Core Borehole Log							Date: 25/06/2019			Client: Knowsley (Image Business Park) Ltd				
Description of Strata	Legend	Strata Depth (m)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Core Recovery			Sample Details		Test Details		Backfill
							Run (m)	TCR% SCR% RQD%	Min. Fl Av. Fl Max. Fl	Depth (m)	Type Ref	Depth (m)	Results	
Grass over MADE GROUND: Dark brown slightly gravelly sand with frequent roots. Gravel is fine to medium brick and quartzite. (TOPSOIL)		0.20	(0.20)	44.56						0.30	ES 1	0.30	PID=0.1ppmv	
MADE GROUND: Dark brown, locally yellowish brown, slightly clayey slightly gravelly sand with rare cobble of concrete. Gravel is fine to coarse brick, concrete, wood, glass, slag and quartzite.			(1.30)									1.20	SPT(S) N=7 (1,1/1,2,2,2)	
		1.50		43.26										
Firm to stiff reddish brown sandy CLAY with occasional coarse gravel of quartzite. (GLACIAL TILL)		1.70	(0.20)	43.06						1.60	D 2	1.60	PID=0.0ppmv	
Soft reddish brown sandy CLAY with occasional coarse gravel of quartzite. (GLACIAL TILL)			(1.30)									2.00	SPT(S) N=4 (1,1/1,1,1,1)	
		3.00		41.76										
Firm reddish brown sandy CLAY with occasional coarse gravel of quartzite. (GLACIAL TILL)			(1.70)							3.10	D 3	3.00 3.10	SPT(S) N=13 (2,2/2,3,3,5) PID=0.0ppmv	
												4.00	SPT(S) N=18 (2,2/3,6,4,5)	
		4.70		40.06										
Dense dark brown medium to coarse SAND with occasional coarse gravel of quartzite. (GLACIAL TILL)		5.00	(0.30)	39.76						4.80	D 4	4.80	PID=0.0ppmv	
Firm to stiff brown slightly gravelly CLAY. (Drillers Description) (GLACIAL TILL)			(3.90)									5.00	SPT(S) N=41 (6,10/10,11,10,10)	
												6.00	SPT(S) N=47 (5,6/10,11,12,14)	
												7.50	SPT(S) N=50 (5,6/50 for 280mm)	
Remarks: 1. Hand dug service avoidance pit to 1.20 m bgl. 2. Borehole advanced to 5.00 m bgl using dynamic sampling techniques with rotary openhole follow on to 9.00 m bgl and rotary coring to 15.00 m bgl. 2. Borehole terminated at 15.00 m bgl. 3. Groundwater encountered at 8.50 m bgl. 4. Borehole installed with gas and groundwater standpipe as indicated above.							Water Level Observations					Flush		
							Date	Time	Strike	Duration	Standing	Depth (m)	Return	
							27/06/2019		8.50 m			13.50 - 15.00	90	
Coordinates: E343949.70 N398853.17		Elevation (mAOD): 44.76		Drilled By: Delta Drilling		Plant Used: Comacchio GEO 300			Logged: BHO	Checked: MY	Approved:	Scale (m): 1:40		

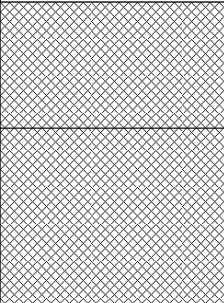
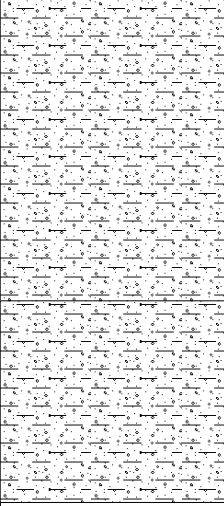
 Environment - Health & Safety - Sustainability Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com						Project No: 19-0654.02		Hole ID: BH2		Page: 2 of 2				
Rotary Core Borehole Log						Project: Image Business Park, Knowsley (Plot B)								
						Date: 25/06/2019		Client: Knowsley (Image Business Park) Ltd						
Description of Strata	Legend	Strata Depth (m)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Core Recovery			Sample Details		Test Details		Backfill
							Run (m)	TCR% SCR% RQD%	Min. Fl Av. Fl Max. Fl	Depth (m)	Type Ref	Depth (m)	Results	
Firm to stiff brown slightly gravelly CLAY. (Drillers Description) (GLACIAL TILL)		8.90		35.86		8.50								
Weak reddish brown medium to coarse grained thinly laminated SANDSTONE. (CHESTER SANDSTONE FORMATION) <i>Band of weak reddish brown medium to coarse grained sandstone gravel between 9.00 m and 9.20 m bgl.</i>		10.50	(1.60)	34.26			1.5	46 33 28		9.30 - 9.50	C 5	9.00	SPT(S) 50 (25 for 130mm/50 for 150mm)	
Weak reddish brown medium to coarse grained thinly laminated SANDSTONE with bands of weak greenish grey fine to medium grained laminated sandstone. (CHESTER SANDSTONE FORMATION) <i>Band of weak reddish brown medium to coarse grained sandstone gravel between 10.50 m and 10.70 m bgl.</i>							1.5	33 4 0				10.50	SPT(S) 50 (25 for 20mm/50 for 25mm)	
<i>Band of weak reddish brown medium to coarse grained sandstone gravel between 13.50 m and 13.70 m bgl.</i>			(4.50)				1.5	43 16 0				12.00	SPT(S) 50 (25 for -29mm/50 for 50mm)	
							1.5	97 60 20		14.00 - 14.20	C 6	13.50	SPT(S) N=50 (25 for 15mm/50 for 25mm)	
Borehole complete at 15.00 m bgl.		15.00		29.76								15.00	SPT(S) 50 (25 for 20mm/50 for 35mm)	
Remarks: 1. Hand dug service avoidance pit to 1.20 m bgl. 2. Borehole advanced to 5.00 m bgl using dynamic sampling techniques with rotary openhole follow on to 9.00 m bgl and rotary coring to 15.00 m bgl. 2. Borehole terminated at 15.00 m bgl. 3. Groundwater encountered at 8.50 m bgl. 4. Borehole installed with gas and groundwater standpipe as indicated above.							Water Level Observations					Flush		
							Date	Time	Strike	Duration	Standing	Depth (m)	Return	
							27/06/2019		8.50 m			13.50 - 15.00	90	
Coordinates: E343949.70 N398853.17		Elevation (mAOD): 44.76		Drilled By: Delta Drilling		Plant Used: Comacchio GEO 300		Logged: BHO	Checked: MY	Approved:	Scale (m): 1:40			

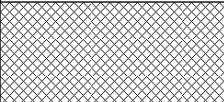
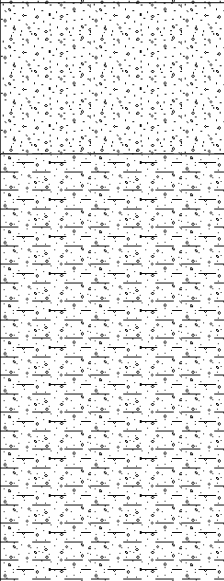
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Rotary Core Borehole Log						Date: 26/06/2019		Client: Knowsley (Image Business Park) Ltd						
						Project: Image Business Park, Knowsley (Plot B)								
Description of Strata	Legend	Strata Depth (m)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Core Recovery			Sample Details		Test Details		Backfill
							Run (m)	TCR% SCR% RQD%	Min. FI Av. FI Max. FI	Depth (m)	Type Ref	Depth (m)	Results	
Grass over MADE GROUND: Dark brown slightly gravelly sand with frequent roots. Gravel is fine to medium brick and quartzite.			(1.40)							0.40	ES 1	0.40	PID=0.2ppmv	
MADE GROUND: Medium dense dark brown slightly clayey gravelly sand with rare cobble of brick. Rare glass and timber.		1.40		43.38										
											2.00	SPT(S) N=13 (2,2/3,3,4,3)		
										2.50	D 2	2.50	PID=0.0ppmv	
										3.00	SPT(S) N=12 (1,2/2,2,4,4)			
MADE GROUND: Brown sandy gravel with brick. (Drillers Description)			(3.60)									4.00	SPT(S) N=19 (2,2/5,5,4,5)	
		5.00		39.78							5.00	SPT(S) N=37 (5,6/6,10,11,10)		
MADE GROUND: Brown sandy gravel with brick. (Drillers Description)		6.00	(1.00)											
Reddish brown slightly gravelly clayey fine SAND. (Drillers Description) (WEATHERED CHESTER SANDSTONE FORMATION)				38.78						6.00	D 3	6.00	SPT(S) N=50 (8,10/50 for 275mm) PID=0.0ppmv	
		7.10		37.68										
Reddish brown slightly gravelly medium SAND. (Drillers Description) (WEATHERED CHESTER SANDSTONE FORMATION)												7.50	SPT(S) N=50 (10,13/50 for 170mm)	
Remarks: 1. Hand dug service avoidance pit to 1.20 m bgl. 2. Borehole advanced to 6.00 m bgl using dynamic sampling techniques with rotary openhole follow on to 10.50 m bgl and rotary coring to 15.00 m bgl. 2. Borehole terminated at 15.00 m bgl. 3. Groundwater encountered at 7.80 m bgl. 4. Borehole installed with gas and groundwater standpipe as indicated above.							Water Level Observations					Flush		
							Date	Time	Strike	Duration	Standing	Depth (m)	Return	
							28/06/2019		7.80 m			7.50 - 9.00	90	
Coordinates: E343921.87 N398909.25		Elevation (mAOD): 44.78		Drilled By: Delta Drilling		Plant Used: Comacchio GEO 300		Logged: BHO	Checked: MY	Approved:	Scale (m): 1:40			

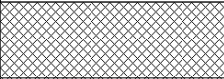
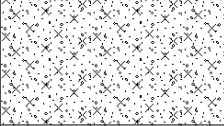
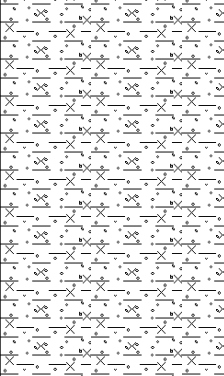
 Environment - Health & Safety - Sustainability Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com						Project No: 19-0654.02		Hole ID: BH3		Page: 2 of 2				
						Project: Image Business Park, Knowsley (Plot B)								
Rotary Core Borehole Log						Date: 26/06/2019			Client: Knowsley (Image Business Park) Ltd					
Description of Strata	Legend	Strata Depth (m)	Strata Thickness (m)	Reduced Level (mAOD)	Casing Diameter (mm)	Water	Core Recovery			Sample Details		Test Details		Backfill
							Run (m)	TCR% SCR% RQD%	Min. Fl Av. Fl Max. Fl	Depth (m)	Type Ref	Depth (m)	Results	
Reddish brown slightly gravelly medium SAND. (Drillers Description) (WEATHERED CHESTER SANDSTONE FORMATION)			(2.10)			7.80								
Poor recovery between 9.05 m and 10.50 m bgl due to obstruction.		9.20		35.58								9.00	SPT(S) N=50 (25 for 85mm/50 for 75mm)	
Reddish brown SANDSTONE. (Drillers Description) (CHESTER SANDSTONE FORMATION)			(1.30)				1.5	3 3 0						
		10.50		34.28										
Medium strong dark reddish brown medium to coarse grained thinly laminated SANDSTONE. (CHESTER SANDSTONE FORMATION)			(2.00)				1.5	76 58 46		11.10 - 11.35	C 4	10.50	SPT(S) N=50 (25 for 60mm/50 for 40mm)	
		12.50		32.28										
Medium strong to strong reddish brown medium to coarse grained thinly laminated SANDSTONE. (CHESTER SANDSTONE FORMATION)			(1.70)				1.5	92 70 38		12.50 - 12.60 12.70 - 12.95	C 5 6 C	12.00	SPT(S) N=50 (25 for 30mm/50 for 40mm)	
		14.20		30.58										
Medium strong reddish brown medium to coarse grained thinly laminated SANDSTONE. (CHESTER SANDSTONE FORMATION)			(0.80)				1.5	100 86 83		13.60 - 13.85 14.40 - 14.50	C 7 C 8	13.50	SPT(S) N=50 (25 for 30mm/50 for 45mm)	
		15.00		29.78										
Borehole complete at 15.00 m bgl.												15.00	SPT(S) N=50 (25 for 25mm/50 for 30mm)	
Remarks: 1. Hand dug service avoidance pit to 1.20 m bgl. 2. Borehole advanced to 6.00 m bgl using dynamic sampling techniques with rotary openhole follow on to 10.50 m bgl and rotary coring to 15.00 m bgl. 2. Borehole terminated at 15.00 m bgl. 3. Groundwater encountered at 7.80 m bgl. 4. Borehole installed with gas and groundwater standpipe as indicated above.							Water Level Observations					Flush		
							Date	Time	Strike	Duration	Standing	Depth (m)	Return	
							28/06/2019		7.80 m			7.50 - 9.00	90	
Coordinates: E343921.87 N398909.25		Elevation (mAOD): 44.78		Drilled By: Delta Drilling		Plant Used: Comacchio GEO 300		Logged: BHO	Checked: MY	Approved:	Scale (m): 1:40			

 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com		Project No: 19-0654.01		Hole ID: TP2		Page: 1 of 1		
		Project: Image Business Park, Knowsley (Plot B)						
Trial Pit Log		Date: 25/06/2019		Client: Knowsley (Image Business Park) Ltd				
Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details		Test Details	
					Depth (m)	Type Ref	Depth (m)	Results
Grass over MADE GROUND: Blackish brown slightly gravelly silty sand with frequent roots. Gravel is fine to coarse angular to subrounded brick, quartzite and sandstone. (TOPSOIL)		0.40	44.32		0.50 0.70 - 0.90	ES 1 B 2	0.50	PID=0.00ppmv
MADE GROUND: Reddish brown slightly silty gravelly sand with occasional pockets of firm yellowish brown sandy clay and occasional cobbles of brick and concrete. Gravel is fine to coarse angular to subrounded brick, concrete, glass, plastic, clinker, quartzite and sandstone. Rare metal pole and timber.		1.40	43.32					
Firm light grey mottled orangish brown slightly gravelly sandy CLAY. Gravel is fine to medium subrounded quartzite. (GLACIAL TILL)		1.60	43.12					
Firm reddish brown mottled orangish brown slightly gravelly slightly sandy CLAY with rare pocket of yellowish brown fine grained sand. Gravel is fine to medium subangular to rounded quartzite and sandstone. (GLACIAL TILL)		3.20	41.52		3.10	D 4	3.10	PID=0.00ppmv
Trial pit complete at 3.20 m bgl.								
Dimensions and Orientation: Length = 3.10 m Width = 0.85 m 		Orientation: Inclination:		Remarks: 1. Trial pit terminated at 3.20 m. 2. Groundwater was not encountered during excavation. 3. Trial pit sides stable. 4. Trial pit backfilled with arisings upon completion.				
Coordinates: E343959.68 N398901.15		Elevation (mAOD): 44.72		Excavated By: Boundary Plant Hire		Plant Used: 13T Tracked Excavator		Logged: BHO Checked: MY Approved: Scale: 1:30

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		Project: Image Business Park, Knowsley (Plot B)						
Trial Pit Log		Date: 26/06/2019		Client: Knowsley (Image Business Park) Ltd				
Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details		Test Details	
					Depth (m)	Type Ref	Depth (m)	Results
Grass over MADE GROUND: Blackish brown slightly gravelly silty sand with frequent roots. Gravel is fine to coarse angular to subrounded brick, quartzite and sandstone. (TOPSOIL)		0.15	44.87		0.50	ES 1	0.50	PID=0.20ppmv
MADE GROUND: Dark brown slightly clayey gravelly sand with occasional cobbles of brick and concrete and occasional pockets of yellowish brown medium to coarse sand. Gravel is fine to coarse angular to subrounded brick, concrete, glass, sandstone and quartzite.		1.30	43.72					
Orangish brown slightly gravelly medium to coarse SAND. Gravel is fine to coarse subrounded to rounded quartzite. (SHIRDLEY HILL SAND FORMATION)		1.70	43.32					
Soft light grey mottled orangish brown slightly gravelly sandy CLAY. Gravel is fine to coarse subrounded to rounded quartzite. (GLACIAL TILL)		2.50	42.52					
Firm reddish brown slightly gravelly sandy CLAY. Gravel is fine to coarse subrounded to rounded quartzite. (GLACIAL TILL)		3.30	41.72					
Trial pit complete at 3.30 m bgl.								
Dimensions and Orientation: Length = 3.20 m Width = 0.90 m 				Orientation: Inclination:		Remarks: 1. Trial pit terminated at 3.30 m. 2. Slight groundwater seepage was encountered at 2.20 m bgl during excavation. 3. Trial pit sides stable. 4. Trial pit backfilled with arisings upon completion.		
Coordinates: E344010.48 N398834.15		Elevation (mAOD): 45.02		Excavated By: Boundary Plant Hire		Plant Used: 13T Tracked Excavator		Logged: BHO Checked: MY Approved: Scale: 1:30

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		Project: Image Business Park, Knowsley (Plot B)						
Trial Pit Log				Date: 25/06/2019		Client: Knowsley (Image Business Park) Ltd		
Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details		Test Details	
					Depth (m)	Type Ref	Depth (m)	Results
Grass over MADE GROUND: Blackish brown slightly gravelly silty sand with frequent roots. Gravel is fine to coarse angular to subrounded brick, quartzite and sandstone. (TOPSOIL)		0.50	44.23		1.00 - 1.10	B 1	1.00	PID=0.00ppmv
MADE GROUND: Dark brown slightly silty gravelly sand with occasional cobbles of brick and concrete. Gravel is fine to coarse angular to subrounded brick, concrete, ceramics, wood, sandstone and quartzite.		1.20	43.53					
Orangish brown slightly gravelly medium to coarse SAND. Gravel is fine to coarse subrounded to rounded quartzite. (SHIRDLEY HILL SAND FORMATION)		1.50	43.23					
Firm, locally stiff, grey slightly gravelly sandy CLAY. Gravel is fine to medium rounded quartzite. (GLACIAL TILL)		2.70	42.03		1.60	D 2	1.60	PID=0.00ppmv
Firm light grey mottled reddish brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse subrounded to rounded quartzite. (GLACIAL TILL)		3.50	41.23					
Trial pit complete at 3.50 m bgl.								
Dimensions and Orientation: Length = 3.90 m Width = 0.85 m 				Orientation: Inclination:		Remarks: 1. Trial pit terminated at 3.50 m. 2. Groundwater was not encountered during excavation. 3. Trial pit sides stable. 4. Trial pit backfilled with arisings upon completion.		
Coordinates: E343988.81 N398808.07		Elevation (mAOD): 44.73		Excavated By: Boundary Plant Hire		Plant Used: 13T Tracked Excavator		Logged: BHO Checked: MY Approved: Scale: 1:30

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		Project: Image Business Park, Knowsley (Plot B)						
Trial Pit Log		Date: 25/06/2019		Client: Knowsley (Image Business Park) Ltd				
Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details		Test Details	
					Depth (m)	Type Ref	Depth (m)	Results
Grass over MADE GROUND: Blackish brown slightly gravelly silty sand with frequent roots. Gravel is fine to coarse angular to subrounded brick, quartzite and sandstone. Rare glass. (TOPSOIL)		0.40	44.26		0.60	ES 1	0.60	PID=0.10ppmv
MADE GROUND: Dark brown slightly silty gravelly sand with occasional cobbles of brick and concrete. Gravel is fine to coarse angular to rounded brick, concrete, slag, sandstone and quartzite.		0.90	43.76					
Greenish grey and orangish brown gravelly SAND. Gravel is fine to coarse subrounded to rounded quartzite. (SHIRDLEY HILL SAND FORMATION)		1.20	43.46					
Light grey locally orangish brown gravelly SAND. Gravel is fine to coarse subrounded to rounded quartzite. (SHIRDLEY HILL SAND FORMATION)	1.80	42.86						
Stiff, locally firm, reddish brown mottled greyish brown slightly sandy slightly gravelly CLAY. (GLACIAL TILL)		2.50						
Trial pit complete at 3.50 m bgl.		3.50	41.16					
Dimensions and Orientation: Length = 3.90 m Width = 0.90 m 		Orientation: Inclination:		Remarks: 1. Trial pit terminated at 3.50 m. 2. Groundwater was not encountered during excavation. 3. Instability in upper 1.00 m of Made Ground. 4. Trial pit backfilled with arisings upon completion.				
Coordinates: E343949.17 N398839.03		Elevation (mAOD): 44.66		Excavated By: Boundary Plant Hire		Plant Used: 13T Tracked Excavator		Logged: BHO Checked: MY Approved: Scale: 1:30

 Head Office 3 Henley Way, Doddington Road Lincoln, LN6 3QR Tel: +44 (0) 1522 882555 Email: info@deltasimons.com		Project No: 19-0654.01		Hole ID: TP6		Page: 1 of 1						
		Project: Image Business Park, Knowsley (Plot B)										
Trial Pit Log		Date: 26/06/2019		Client: Knowsley (Image Business Park) Ltd								
Description of Strata	Legend	Strata Depth (m)	Reduced Level (mAOD)	Water Strike (m)	Sample Details		Test Details					
					Depth (m)	Type Ref	Depth (m)	Results				
Grass over MADE GROUND: Blackish brown slightly gravelly silty sand with frequent roots. Gravel is fine to coarse angular to subrounded brick, quartzite and sandstone. Rare glass. (TOPSOIL)		0.30	44.55		0.60	ES 1	0.60	PID=0.10ppmv				
MADE GROUND: Dark brown slightly silty gravelly sand with occasional lenses of yellowish brown fine to medium sand and occasional pockets of soft dark brown sandy clay. Gravel is fine to coarse angular to subrounded brick, concrete, slag, coal, clinker, quartzite and sandstone. Rare timber and boulder of concrete.												
		1.30	43.55									
Orangish brown slightly silty slightly gravelly SAND. Gravel is fine to coarse subrounded to rounded quartzite. (SHIRDLEY HILL SAND FORMATION)		1.80	43.05						1.50	D 2	1.50	PID=0.00ppmv
		2.00	42.85									
Greenish grey and orangish brown gravelly clayey SAND with occasional pockets of soft reddish brown clay. Gravel is fine to coarse subrounded to rounded quartzite and sandstone. (SHIRDLEY HILL SAND FORMATION) Soft, locally very soft, greenish grey mottled reddish brown slightly gravelly sandy CLAY with occasional pockets of greenish grey fine to medium sand. Gravel is fine to coarse subrounded to rounded quartzite. (Wet) (GLACIAL TILL)		3.50	41.35	3.40	D 3	3.40	PID=0.00ppmv					
Trial pit complete at 3.50 m bgl.												
Dimensions and Orientation: Length = 3.50 m Width = 0.60 m 				Orientation: Inclination:		Remarks: 1. Trial pit terminated at 3.50 m. 2. Slight groundwater seepage was encountered at 1.90 m bgl during excavation. 3. Trial pit sides stable. 4. Trial pit backfilled with arisings upon completion.						
Coordinates: E343886.60 N398837.44		Elevation (mAOD): 44.85		Excavated By: Boundary Plant Hire		Plant Used: 13T Tracked Excavator		Logged: BHO Checked: MY Approved: Scale: 1:30				

Appendix I – SuDS Proforma

PRO-FORMA 1: Sustainable Drainage System: Planning Permission

This pro-forma is a requirement of the Planning Validation Checklist. You **must complete all white boxes in full** and submit this pro-forma along with your supporting evidence to the Local Planning Authority for any application which seeks planning permission for major development (as defined in section 2 of [Statutory Instrument 2015 No. 595](#)).

This pro-forma supports developers and regulators in **summarising and confirming** how surface water from a development will be managed sustainably under current and future conditions. It should be completed in conjunction with the Council's 'Completing your Pro Forma' document and your sustainable drainage system should be designed in accordance with [CIRIA The SuDS Manual C753](#).

The pro-forma follows Policy CS24 of [Knowsley MBC's Local Plan](#), [National Planning Policy Framework](#), [House of Commons Written Statement \(HWSW 161\) on SuDS](#), [Planning Practice Guidance](#) and [Defra's Non-Statutory Technical Standards for Sustainable Drainage Systems](#). It is supported by the [Defra/EA Guidance on Rainfall Runoff Management](#) and can be completed using freely available tools such as [Tools for Sustainable Drainage Systems](#) or approved Industry Standard surface water management design software. The Council's [Sustainable Drainage & Surface Water Management Technical Guidance document](#) also provides further information.

Section 1: Development Details				
Development Name		Image Business Park, Knowsley Site 2		
Development Address (including postcode)		L33 7UF	Planning Application Reference (if available)	-
Development Grid Reference	Northings	398907	Expected lifetime of development (years)	100
	Eastings	343786	Have you submitted a Flood Risk Assessment?	Yes ☐ No ☒
Total Development Site Area (Ha)		1.3880	Type of Planning Application (✓)	Outline ☐
Site area served by proposed drainage system (excluding open space) (Ha)*		1.24		Full ☒
Is your surface water drainage system designed to a (tick all that apply):				Hybrid ☐
Greenfield Standard - Site is undeveloped and a new drainage system will be installed; OR - Site is already developed and a new surface water drainage system will be installed to serve the new development.		☐		Reserved Matters ☐
Previously Developed Standard Site is already developed and the <u>entirety</u> of the existing surface water drainage system will be used to serve the new development.		☒		

PRO-FORMA 1: Sustainable Drainage System: Planning Permission

Section 2: Impermeable Area and Existing Drainage For outline or reserved matters applications, go to Section 3

	Existing (E)	Proposed (P)	Difference (P – E)	Evidence Checklist	
Impermeable Area (Ha)	.048	.11359	0.6559	☒	Plans showing development layout of site with existing and proposed impermeable areas.
State Drainage Method	-	Hydrobrake, permeable paving and storage tanks	N/A	☒	Plans showing current and proposed locations of sustainable drainage system.
Are there existing sewers, watercourses, water bodies, highway drains, soakaways or filter drains on the site?			Yes ☐ No ☒	☒	Plans showing existing layout to include: • Watercourses, open or culverted • Water bodies – ponds, swales etc. • Sewers, including manholes • Highway drains, include manholes • Soakaways, filter drains

Section 3: Surface Water Discharge Hierarchy – Planning Practice Guidance

Surface Water Discharge Method	Proposed?	If YES - Evidence Checklist		If NO - Evidence Checklist	
1. Infiltration to ground	Yes ☐ No ☒	☐	Completed Infiltration Checklist from CIRIA The SuDS Manual C753 Appendix B <i>An editable version of this form is available on SusDrain website.</i>	☒	Geotechnical Survey, including Soil Permeability Testing stating Percolation Coefficient, in accordance with BRE 365 AND Statement providing justification in your Sustainable Drainage Strategy
2. Discharge to watercourse or surface water body (Main River or Ordinary)	Yes ☐ No ☒	☐	Watercourse and/or Water Body Survey Report	☐	Plan showing nearby watercourses and water bodies AND Statement providing justification in your Sustainable Drainage Strategy
3. Discharge to surface water sewer	Yes ☒ No ☐	☐	Water and Sewerage Company written agreement for the Right to Connect.	☒	Plan showing nearby sewers AND Statement providing justification in your Sustainable Drainage Strategy
4. Discharge to combined sewer	Yes ☐ No ☒				

PRO-FORMA 1: Sustainable Drainage System: Planning Permission

Section 4: Calculate Peak Discharge Rates – Technical Standards S2 and S3 (unless S1 applies)

Rainfall Event	Existing Rate (l/s)	Greenfield Rate (l/s)	Proposed Rate (l/s) <i>Brownfield sites must reduce discharge rates by 50%</i>	Evidence Checklist	
Qbar		-		☒	MicroDrainage (or equivalent) calculations
1:1 Year Event	40.43	-	20		
1:30 Year Event	99.17	-	20		
1:100 Year Event	179.56	-	20		

Section 5: Calculate Discharge Volume – Technical Standards S4 and S6 (unless S1 applies)

Rainfall Event	Existing Volume (m ³)	Greenfield Volume (m ³)	Proposed Volume (m ³)	Evidence Checklist	
1:100 Year 6 Hour Event				☐	MicroDrainage (or equivalent) calculations

Section 6: Infiltration

Site Information	✓	Evidence Checklist	
Do your sustainable drainage proposals include any infiltration?	Yes ☐ No ☒ <i>If NO, please move on to Section 7</i>	☒	Proposed sustainable drainage plans
You should submit an alternative 'Plan B' sustainable drainage design utilising an alternative discharge method if site specific ground conditions are unknown at this stage. This will become the default design in the event infiltration proposals are not feasible upon site specific ground investigation. Have you submitted an alternative 'Plan B' sustainable drainage design?	Yes ☐ No ☒	☒	'Plan B' conceptual sustainable drainage plans and statement of approach

PRO-FORMA 1: Sustainable Drainage System: Planning Permission

Section 7: Storage – Technical Standards S7, S8 and S9

Storage Details	Details	Evidence Checklist	
State climate change allowance used (%)	40%	☒	State / use in MicroDrainage
State storage volume provided (m ³) (excluding non-void spaces) <i>Must include an allowance for climate change and urban creep.</i>	640m3 (tank and paving)	☒	Drainage plans showing location of attenuation and all flow control devices and any supporting calculations
Summarise how storage will be provided for 1:30 year event on site. <i>Storage must be designed to ensure that at no flooding occurs onsite in a 1 in 30 year event except in designed areas and no flooding occurs offsite in a 1 in 100 year (+ climate change allowance) event.</i>	Storage tank and permeable paving will hold the 1:30 storm storage.	☒	Plans showing size and location of storage and supporting calculations
Summarise how storage will be provided for 1:100 year (+ climate change) 6 hour event on site. <i>Where storage above the 1:30 year rainfall event is provided in designated areas designed to accommodate excess surface water volumes, plans showing storage locations and surface water depths and supported by MicroDrainage (or equivalent) calculations.</i>	Storage tank and permeable paving will hold the 1:30 storm storage.	☒	Plans showing size and location of storage and supporting calculations

Section 8: Operation and Maintenance – Technical Standard S12 and HCWS161

Consideration	Select <u>ALL</u> that apply (✓)		Evidence Checklist
State how <u>ALL</u> components of the sustainable drainage system will be maintained for the design life of the development.	Sustainable drainage features are at property level	☒	☒ Statement provided within your Sustainable Drainage Strategy
	Sustainable drainage system to be adopted by Water and Sewerage Company through a Section 104 agreement (Water Industry Act 1991)	☒	
	Applicant to secure maintenance of sustainable drainage features by entering into a Section 106 agreement (Town and Country Planning Act 1990)	☐	

PRO-FORMA 1: Sustainable Drainage System: Planning Permission

Declaration and Submission

This pro-forma has been completed using evidence from information which has been submitted with my planning application.

The information submitted in the Sustainable Drainage Strategy and site-specific Flood Risk Assessment (FRA), where submitted, is proportionate to the site conditions, flood risks and magnitude of development and I agree that this information can be used as evidence to this sustainable drainage approach.

Submitter Details

Form <u>completed</u> by	George Westgarth	Email Address	George.westgarth@ptaconsult.co.uk
		Daytime Telephone	01494 772 721
Form <u>signed off</u> by	George Westgarth	Accreditation(s) and/or Qualification(s) of Signatory	-
Date (dd/mm/yyyy)	14.12.2021	Company	PTA

Client Details

Name	-	Company	-
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