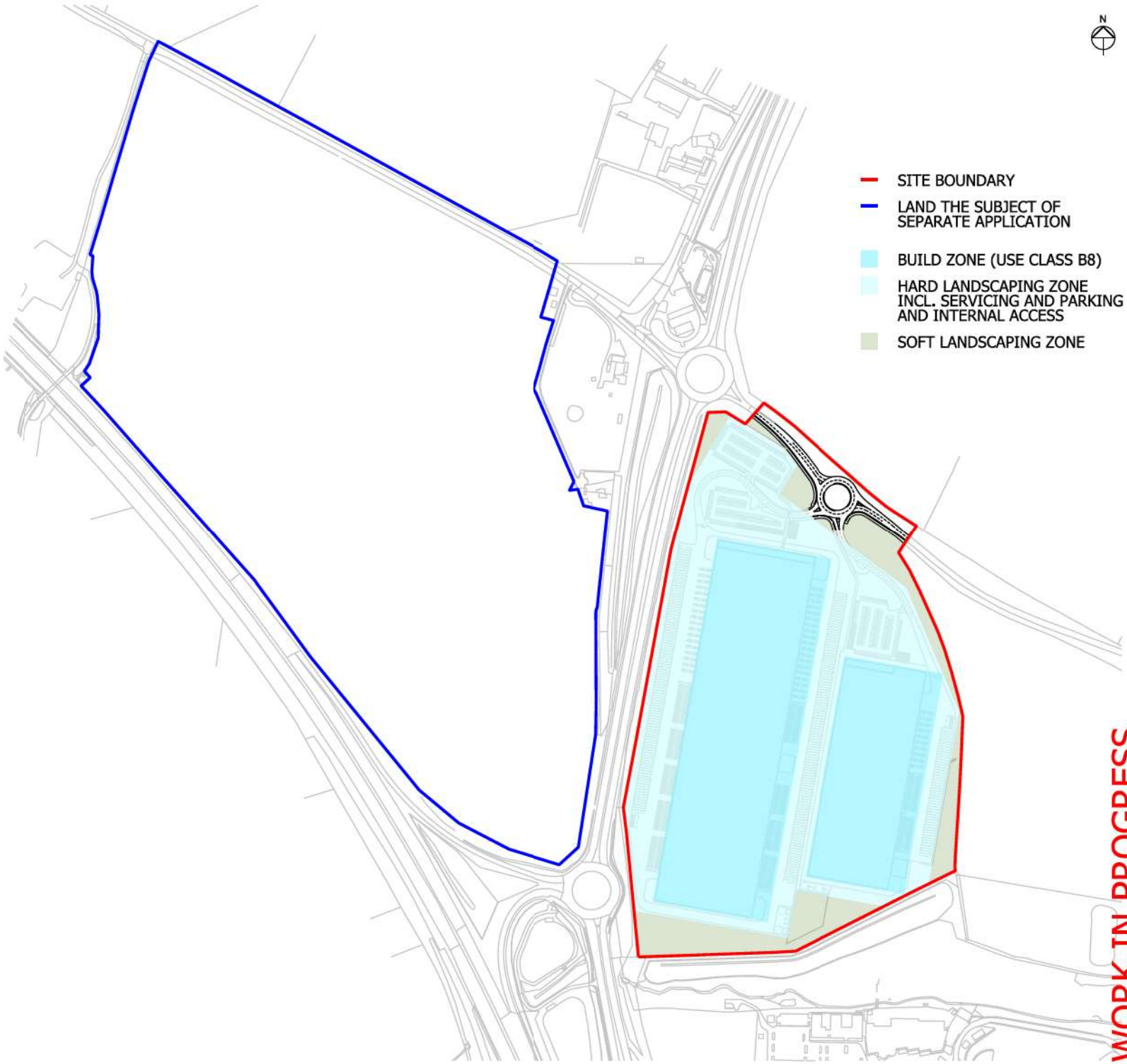

NOTES

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Subject to Statutory Approvals.

Subject to survey.

Subject to design development.

Where applicable this drawing is to be read in conjunction with other consultants drawings and with the specification.

All dimensions to be checked on site prior to commencement of work.

Subject to Rights of Light Approval.

Subject to fire engineering

Rev	Description	Chk	Date
C	Updated to reflect planning con comments / Site Layout updated	AS	18/08/2021
B	Site layout updated	AS	02/08/2021
A	Site layout updated	AS	26/07/2021

WORK IN PROGRESS

Peer House
8-14 Verulam Street
London WC1X 8LZ

tel +44(0)20 7400 2120

enquiries@cornisharchitects.com
www.cornisharchitects.com

RIBA Chartered Practice

cornisharchitects

Project Title.
JUNCTION 10 M40

Drawing Title.
PARAMETER PLAN 06
LAND USE

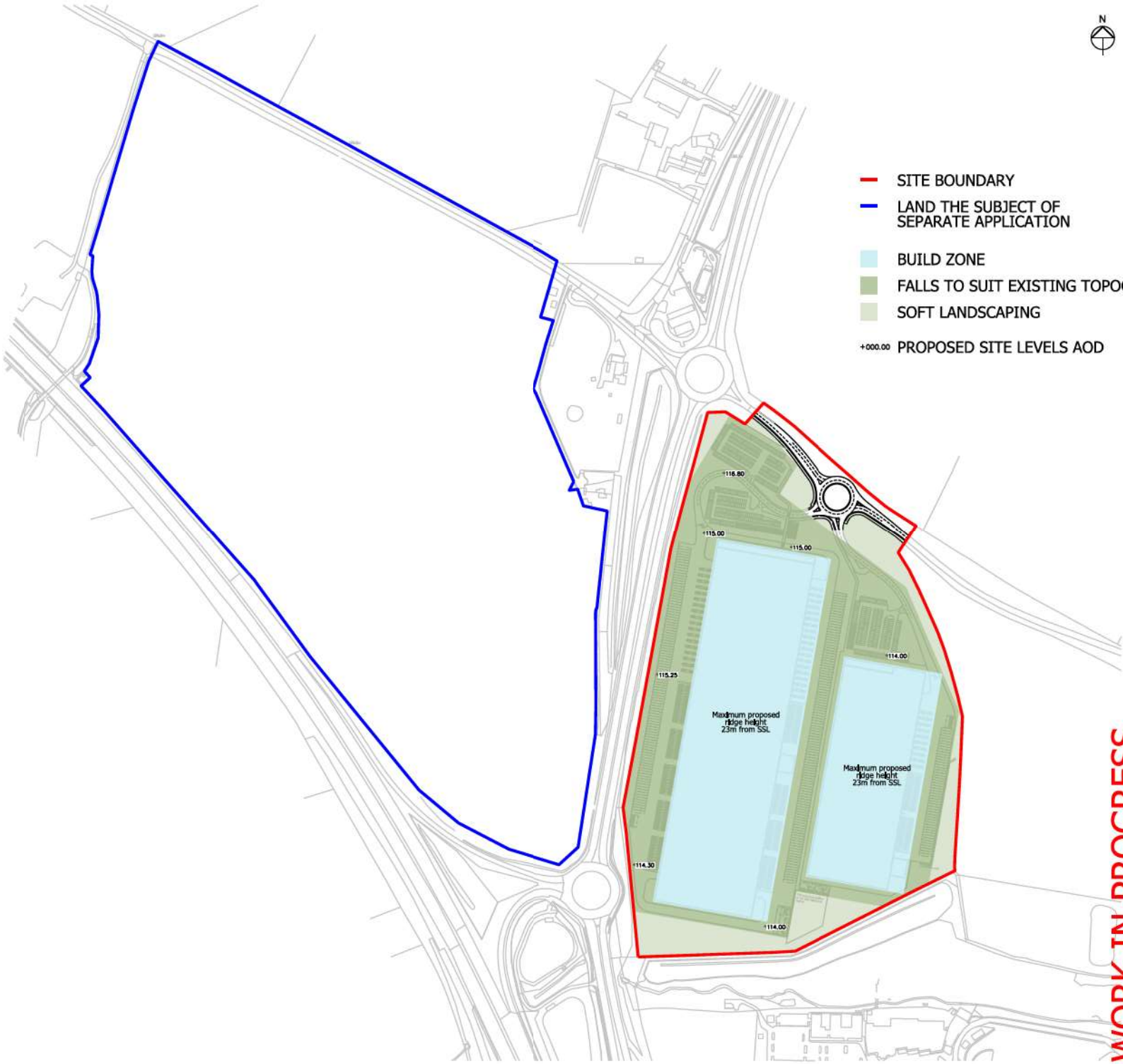
Drawing Status.
PRELIMINARY

Scale. 0 20 metres 200

Drawn By.	Scale.	Date.	Chk'd By.
A S	1:2500 @ A1	29/06/2021	S M

ALBION LAND

Drawing No. 20005 - SK - 023 Rev. C



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Subject to Rights of Light Approval.

Subject to fire engineering

Rev	Description	Chk	Date
C	Updated to reflect planning con comments / Site Layout updated	AS	18/08/2021
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Peer House
8-14 Verulam Street
London WC1X 8LZ

tel +44(0)20 7400 2120

enquiries@cornisharchitects.com
www.cornisharchitects.com

cornisharchitects

RIBA Chartered Practice

WORK IN PROGRESS

Project Title.
JUNCTION 10 M40

Drawing Title.
PARAMETER PLAN 07
BUILDING HEIGHTS

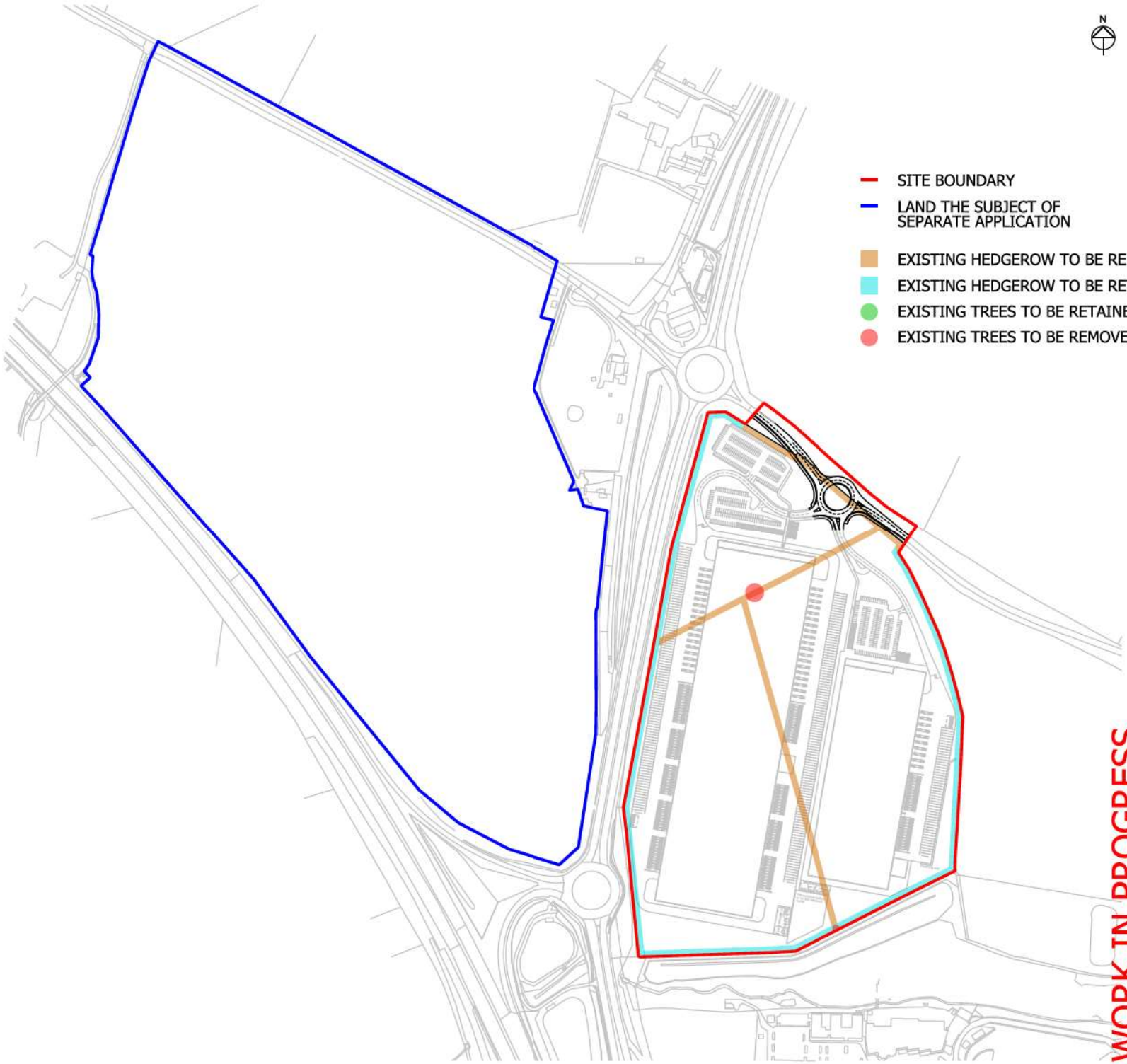
Drawing Status.
PRELIMINARY

Scale.
0 20 metres 200

Drawn By.	Scale.	Date.	Chk'd By.
A S	1:2500 @ A1	29/06/2021	S M

ALBION LAND

Drawing No. 20005 - SK - 024 Rev. C



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Subject to Statutory Approvals.

Subject to survey.

Subject to design development.

Where applicable this drawing is to be read in conjunction with other consultants drawings and with the specification.

All dimensions to be checked on site prior to commencement of work.

Subject to Rights of Light Approval.

Subject to fire engineering

Rev	Description	Chk	Date
C	Updated to reflect planning con comments / Site Layout updated	AS	18/08/2021
B	Site layout updated	AS	02/08/2021
A	Site layout updated	AS	27/07/2021

WORK IN PROGRESS

Peer House
8-14 Verulam Street
London WC1X 8LZ

tel +44(0)20 7400 2120

enquiries@cornisharchitects.com
www.cornisharchitects.com

RIBA Chartered Practice

cornisharchitects

Project Title.
JUNCTION 10 M40

Drawing Title.
PARAMETER PLAN 08
VEGETATION RETENTION
& REMOVAL

Drawing Status.
PRELIMINARY

Scale.
0 20 metres 200

Drawn By.	Scale.	Date.	Chk'd By.
C S	1:2500 @ A1	05/07/2021	S M

ALBION LAND

Drawing No. 20005 - SK - 025 Rev. C

APPENDIX D

Soakaway Test Results

By Applied Geology (June 2021)

IN SITU SOAKAWAY TEST RESULT

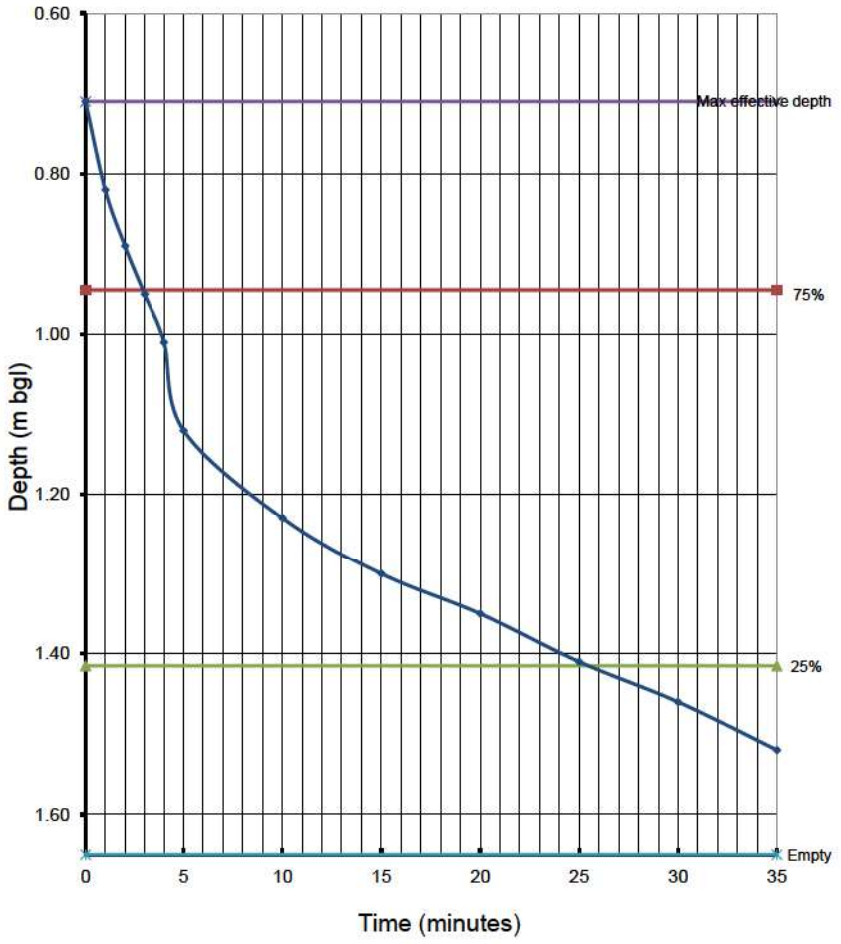
Trial Pit No.	TP38A

Filling	1 of 1

Date	02/06/2021
Operator	MM
Test Strata	White Limestone Formation
Stability of pit	Stable
Backfill used	None

Trial Pit Length (m)	2.50
Trial Pit Width (m)	0.60
Trial Pit Depth (m)	1.65
Amount of Backfill placed (m)	0
Assumed Backfill Void Ratio	N/A

Time (Minutes)	Water level (m.bgl)
0	0.71
1	0.82
2	0.89
3	0.95
4	1.01
5	1.12
10	1.23
15	1.30
20	1.35
25	1.41
30	1.46
35	1.52



Initial Water Level (m)	0.71	Total internal surface area of pit (m^2)	11.73
Final Water Level (m)	1.52	Internal surface area of trial pit within effective depth range (m^2)	4.41
Change in Water Level (m)	0.81	Volume outflowing between 75% and 25% effective depth (m^3)	0.71
Effective Depth at 25% (tp25) (m)	1.42	Time at 25% (tp25) (minutes)	25.5
Effective Depth at 75% (tp75) (m)	0.95	Time at 75% (tp75) (minutes)	3

Soil Infiltration Rate (m/s)	1.18E-04

Notes: 1. Undertaken in general accordance with BRE DG 365 method
2. Based on extrapolated data NO

Client:	Albion Land Ltd
Project:	Land adjacent to Junction 10, M40, Ardley
Project No.	AG3268-21

APPLiED GEOLOGY

IN SITU SOAKAWAY TEST RESULT

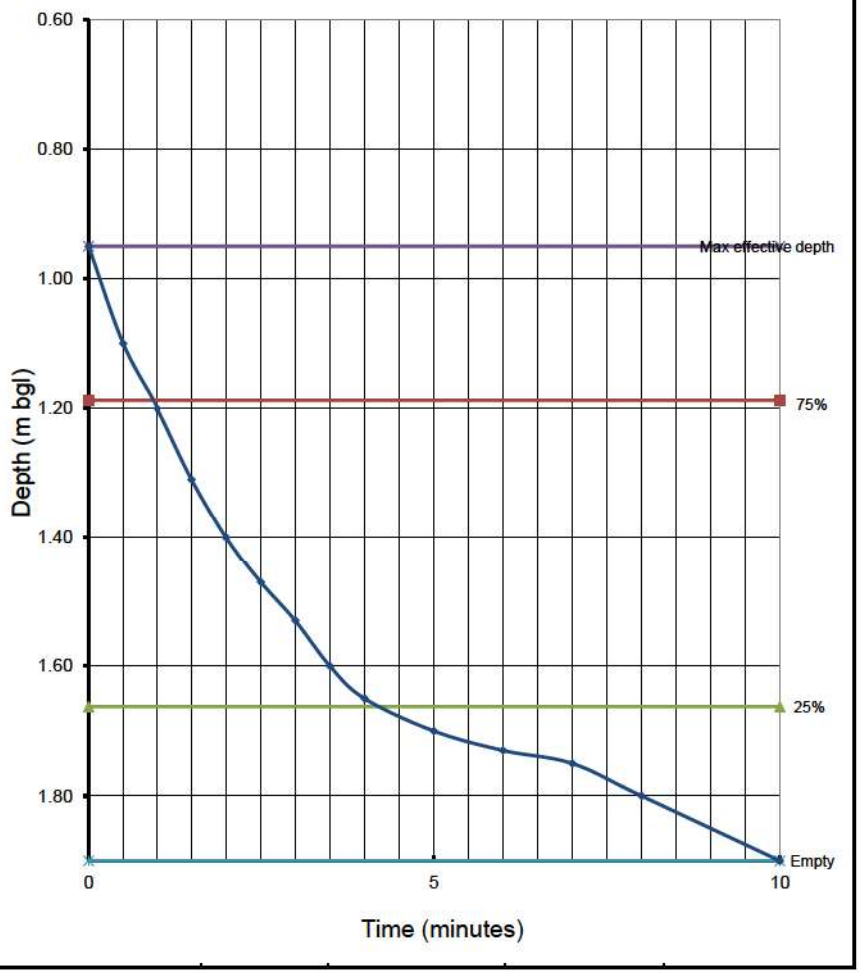
Trial Pit No.	TP72A

Filling	1 of 1

Date	02/06/2021
Operator	KM
Test Strata	White Limestone Formation
Stability of pit	Stable
Backfill used	None

Trial Pit Length (m)	2.05
Trial Pit Width (m)	0.60
Trial Pit Depth (m)	1.90
Amount of Backfill placed (m)	0
Assumed Backfill Void Ratio	N/A

Time (Minutes)	Water level (m.bgl)
0	0.95
0.5	1.10
1	1.20
1.5	1.31
2	1.40
2.5	1.47
3	1.53
3.5	1.60
4	1.65
5	1.70
6	1.73
7	1.75
8	1.80
10	1.90



Initial Water Level (m)	0.95	Total internal surface area of pit (m^2)	11.30
Final Water Level (m)	1.90	Internal surface area of trial pit within effective depth range (m^2)	3.75
Change in Water Level (m)	0.95	Volume outflowing between 75% and 25% effective depth (m^3)	0.58
Effective Depth at 25% (tp25) (m)	1.66	Time at 25% (tp25) (minutes)	4.3
Effective Depth at 75% (tp75) (m)	1.19	Time at 75% (tp75) (minutes)	0.95

Soil Infiltration Rate (m/s)	7.76E-04

Notes: 1. Undertaken in general accordance with BRE DG 365 method
2. Based on extrapolated data NO

Client:	Albion Land Ltd
Project:	Land adjacent to Junction 10, M40, Ardley
Project No.	AG3268-21

APPLiED GEOLOGY

IN SITU SOAKAWAY TEST RESULT

Trial Pit No.	TP88A

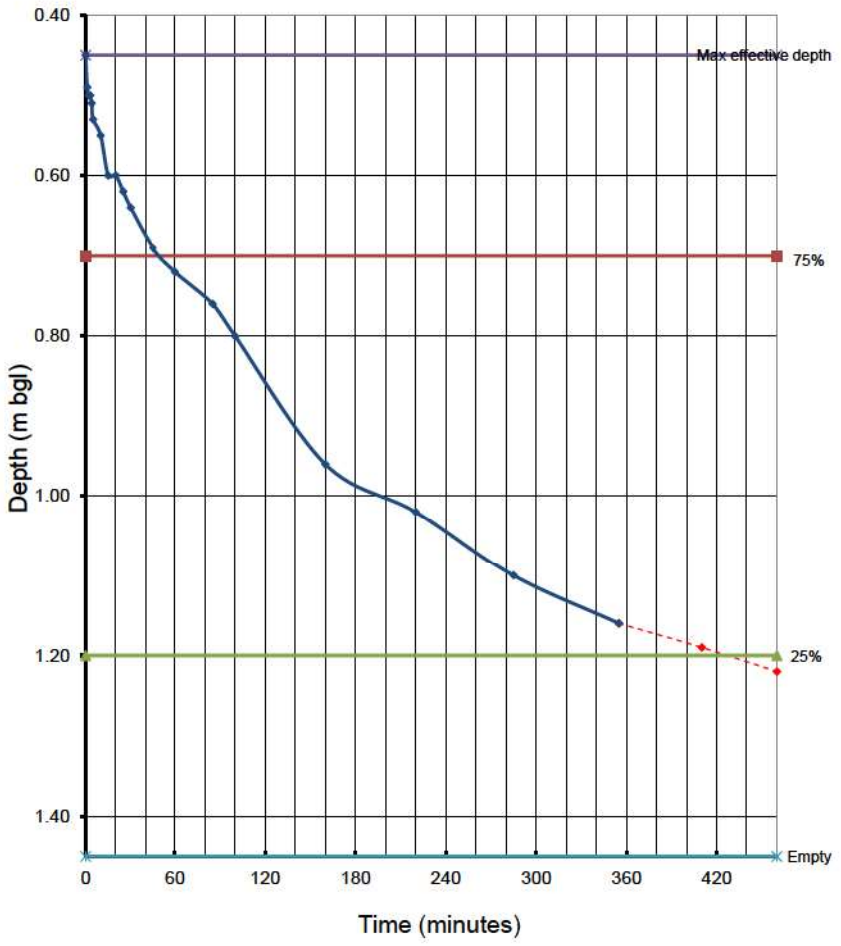
Filling	1 of 1

Date	02/06/2021
Operator	MM
Test Strata	White Limestone Formation
Stability of pit	Stable
Backfill used	None

Trial Pit Length (m)	2.15
Trial Pit Width (m)	0.60
Trial Pit Depth (m)	1.45
Amount of Backfill placed (m)	0
Assumed Backfill Void Ratio	N/A

Time (Minutes)	Water level (m.bgl)
0	0.45
1	0.49
2	0.50
3	0.50
4	0.51
5	0.53
10	0.55
15	0.60
20	0.60
25	0.62
30	0.64
45	0.69
60	0.72
85	0.76
100	0.80
160	0.96
220	1.02
285	1.10
355	1.16

Notes: Groundwater seepage at 1.40m bgl.



Initial Water Level (m)	0.45	Total internal surface area of pit (m^2)	9.27
Final Water Level (m)	1.22	Internal surface area of trial pit within effective depth range (m^2)	4.04
Change in Water Level (m)	0.77	Volume outflowing between 75% and 25% effective depth (m^3)	0.65
Effective Depth at 25% (tp25) (m)	1.20	Time at 25% (tp25) (minutes)*	430
Effective Depth at 75% (tp75) (m)	0.70	Time at 75% (tp75) (minutes)	50

Soil Infiltration Rate (m/s)	7.00E-06 *

Notes: 1. Undertaken in general accordance with BRE DG 365 method
2. Based on extrapolated data Yes*

Client:	Albion Land Ltd
Project:	Land adjacent to Junction 10, M40, Ardley
Project No.	AG3268-21

APPLiED GEOLOGY

IN SITU SOAKAWAY TEST RESULT

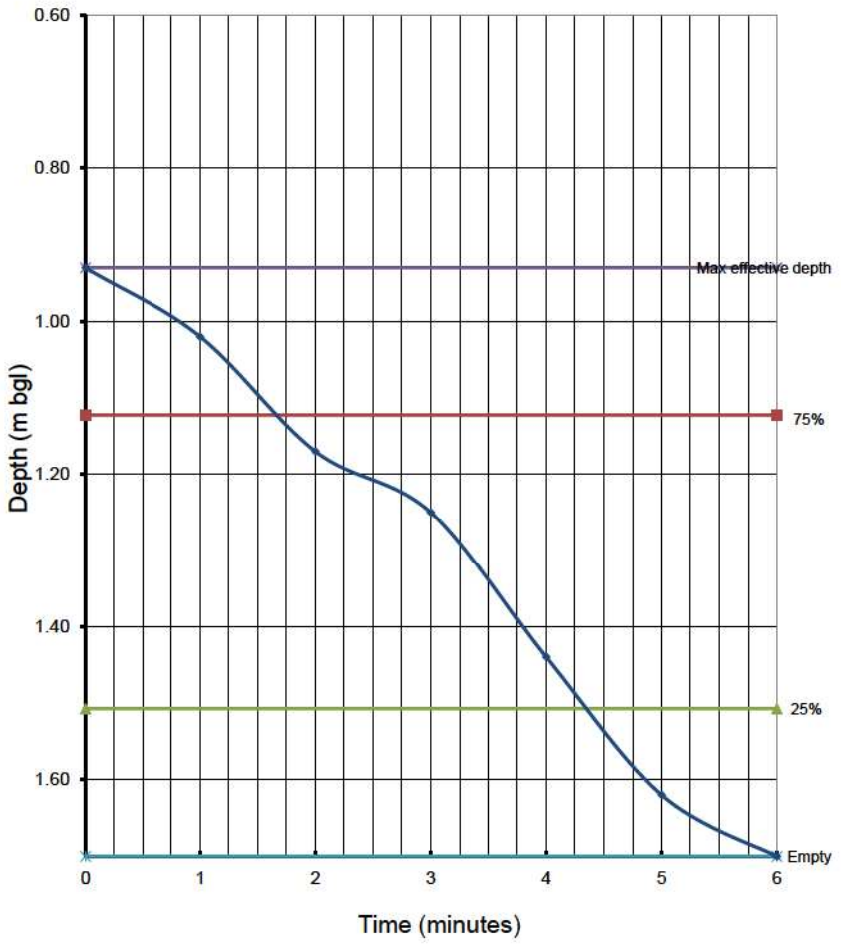
Trial Pit No.	TP121A

Filling	1 of 1

Date	02/06/2021
Operator	MM
Test Strata	White Limestone Formation
Stability of pit	Stable
Backfill used	None

Trial Pit Length (m)	2.65
Trial Pit Width (m)	0.85
Trial Pit Depth (m)	1.70
Amount of Backfill placed (m)	0
Assumed Backfill Void Ratio	N/A

Time (Minutes)	Water level (m.bgl)
0	0.93
1	1.02
2	1.17
3	1.25
4	1.44
5	1.62
6	1.70



Initial Water Level (m)	0.93	Total internal surface area of pit (m^2)	14.15
Final Water Level (m)	1.70	Internal surface area of trial pit within effective depth range (m^2)	4.95
Change in Water Level (m)	0.77	Volume outflowing between 75% and 25% effective depth (m^3)	0.87
Effective Depth at 25% (tp25) (m)	1.51	Time at 25% (tp25) (minutes)	4.3
Effective Depth at 75% (tp75) (m)	1.12	Time at 75% (tp75) (minutes)	1.7

Soil Infiltration Rate (m/s)	1.12E-03

Notes: 1. Undertaken in general accordance with BRE DG 365 method
2. Based on extrapolated data NO

Client:	Albion Land Ltd
Project:	Land adjacent to Junction 10, M40, Ardley
Project No.	AG3268-21

APPLiED GEOLOGY

IN SITU SOAKAWAY TEST RESULT

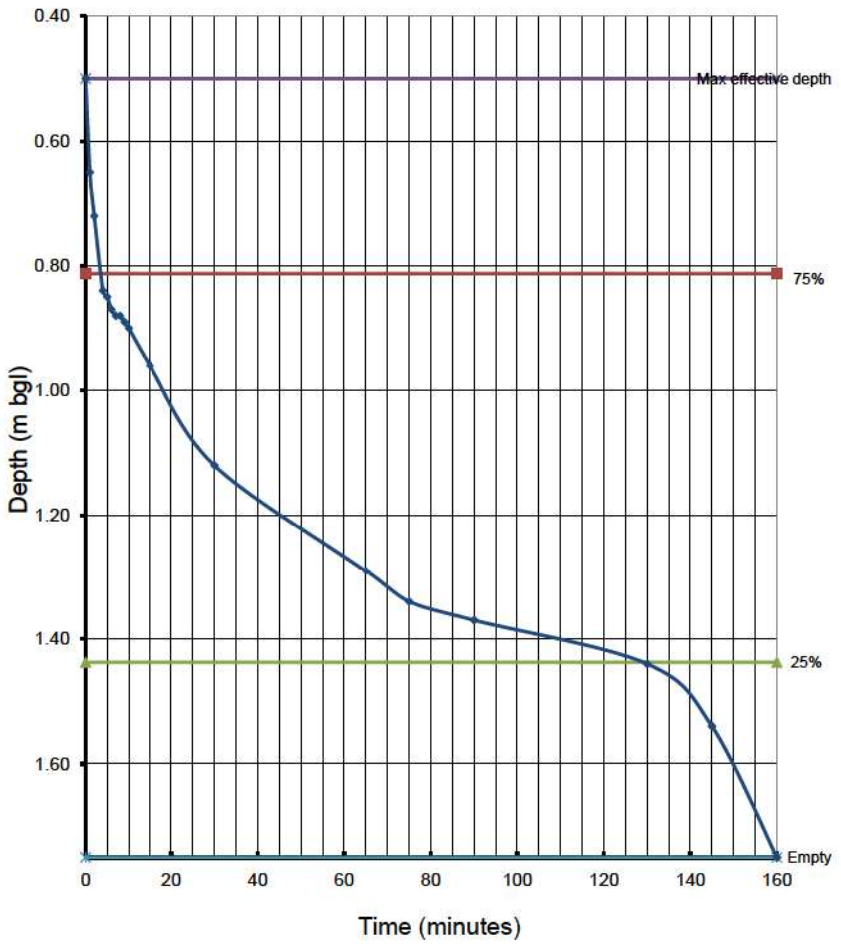
Trial Pit No.	TP136

Filling	1 of 1

Date	02/06/2021
Operator	MM
Test Strata	White Limestone Formation
Stability of pit	Stable
Backfill used	None

Trial Pit Length (m)	2.50
Trial Pit Width (m)	0.75
Trial Pit Depth (m)	1.75
Amount of Backfill placed (m)	0
Assumed Backfill Void Ratio	N/A

Time (Minutes)	Water level (m.bgl)
0	0.50
1	0.65
2	0.72
4	0.84
5	0.85
6	0.87
7	0.88
8	0.88
9	0.89
10	0.90
15	0.96
30	1.12
65	1.29
75	1.34
90	1.37
130	1.44
145	1.54
160	1.75



Initial Water Level (m)	0.50	Total internal surface area of pit (m^2)	13.25
Final Water Level (m)	1.75	Internal surface area of trial pit within effective depth range (m^2)	5.94
Change in Water Level (m)	1.25	Volume outflowing between 75% and 25% effective depth (m^3)	1.17
Effective Depth at 25% (tp25) (m)	1.44	Time at 25% (tp25) (minutes)	130
Effective Depth at 75% (tp75) (m)	0.81	Time at 75% (tp75) (minutes)	3.3

Soil Infiltration Rate (m/s)	2.60E-05

Notes: 1. Undertaken in general accordance with BRE DG 365 method
2. Based on extrapolated data NO

Client:	Albion Land Ltd
Project:	Land adjacent to Junction 10, M40, Ardley
Project No.	AG3268-21

APPLiED GEOLOGY

APPENDIX E

Drainage Asset Location Searches

By Thames Water / Anglian Water
(August 2021)

Asset location search

Property Searches

Applied Geology Ltd
Unit 23 Stareton,Unit 23

KENILWORTH
CV8 2LY

Search address supplied Land Adjacent Junc 10 M40
Ardley
Bicester

Your reference AG3268-21

Our reference ALS/ALS Standard/2021_4407675

Search date 21 April 2021

Knowledge of features below the surface is essential for every development

The benefits of this knowledge not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility of any development.

Did you know that Thames Water Property Searches can also provide a variety of utility searches including a more comprehensive view of utility providers' assets (across up to 35-45 different providers), as well as more focused searches relating to specific major utility companies such as National Grid (gas and electric).

Contact us to find out more.

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0800 009 4540

Asset location search

Property Searches

Search address supplied: Land Adjacent Junc 10 M40, Ardley, Bicester,

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This searchprovides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0800 009 4540, or use the address below:

Thames Water Utilities Ltd
Property Searches
PO Box 3189
Slough
SL1 4WW

Email: searches@thameswater.co.uk
Web: www.thameswater-propertysearches.co.uk

Asset location search

Property Searches

Waste Water Services

Please provide a copy extract from the public sewer map.

Following examination of our statutory maps, Thames Water has been unable to find any record of public sewerage within this area. However, there may be other sewerage pipework within the area that is not owned by the company. You may be able to obtain records of such pipework from the building control department of your local authority, from property deeds or from neighbouring landowners.

The following quartiles have not been printed as they are out of Thames' sewer catchment area. For details of the assets requested please contact the water company indicated below:

SP5428NW	Anglian
SP5528NW	Anglian
SP5529SW	Anglian
SP5428NE	Anglian
SP5528SW	Anglian
SP5428SE	Anglian
SP5429NW	Anglian
SP5429SW	Anglian
SP5429SE	Anglian

Following examination of our statutory maps, Thames Water has been unable to find any record of public sewerage within this area. However, there may be other sewerage pipework within the area that is not owned by the company. You may be able to obtain records of such pipework from the building control department of your local authority, from property deeds or from neighbouring landowners.

Anglian Water
Anglian House
Ambury Road
Huntingdon
Cambridgeshire
PE29 3NZ

Tel: 01480 323 000
Fax: 01480 323 115

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water

Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

The following quartiles have been printed as they fall within Thames' water area:

SP5428NE
SP5528SW
SP5428SE
SP5429SE

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies.

For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.

The following quartiles have not been printed as they contain no assets:

SP5428NW
SP5528NW
SP5529SW
SP5429NW
SP5429SW

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Payment for this Search

A charge will be added to your suppliers account.

Asset location search

Property Searches

Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Clean Water queries

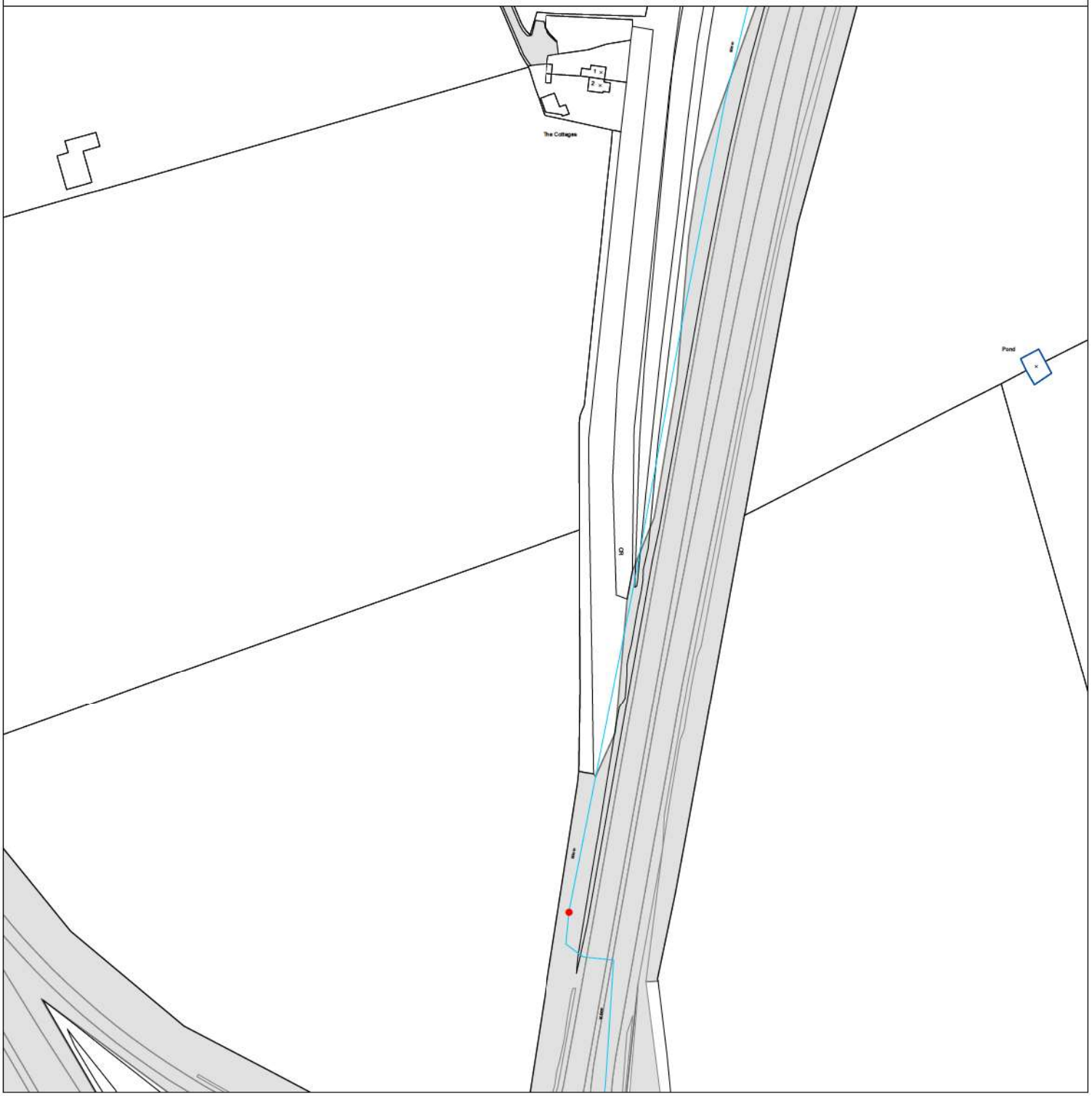
Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Based on the Ordnance Survey Map with the sanction of the Controller of H.M Stationary Office License Number 10019345

ALS/ALS Standard/2021_4407675



0 10 20 40 60 80
Meters

Scale:	1:1792
Width:	500m
Printed By:	G1KANAGA
Print Date:	21/04/2021
Map Centre:	454750,228750
Grid Reference:	SP5428NE

Comments:

Based on the Ordnance Survey Map with the sanction of the Controller of H.M Stationary Office License Number 10019345

ALS/ALS Standard/2021_4407675

0 10 20 40 60 80 Meters

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified before any works are undertaken. Crown copyright Reserved

Scale:	1:1792
Width:	500m
Printed By:	G1KANAGA
Print Date:	21/04/2021
Map Centre:	455250,228250
Grid Reference:	SP5528SW

Comments:

Based on the Ordnance Survey Map with the sanction of the Controller of H.M Stationary Office License Number 10019345

ALS/ALS Standard/2021_4407675

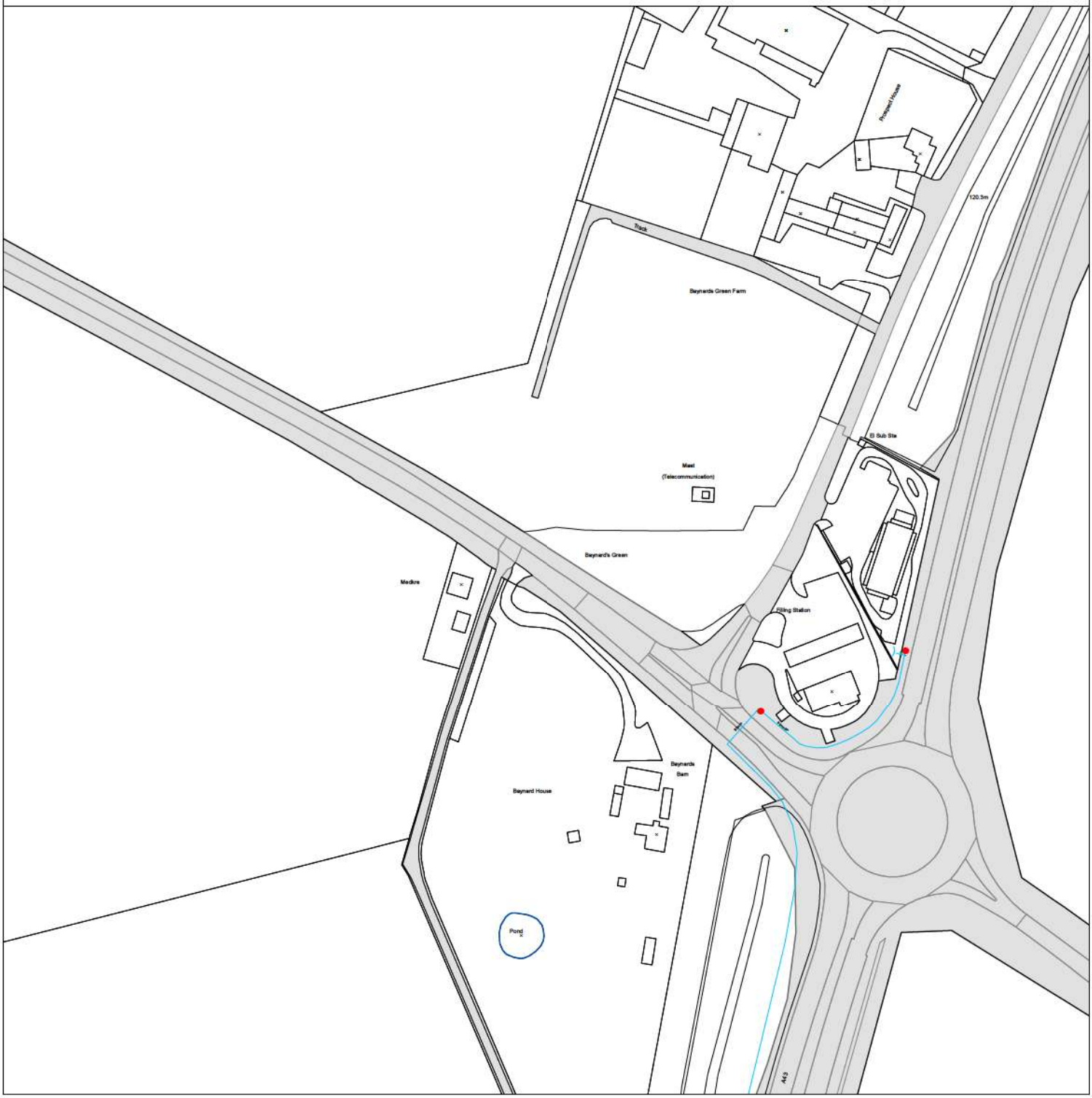
0 10 20 40 60 80 Meters

Scale:	1:1792
Width:	500m
Printed By:	G1KANAGA
Print Date:	21/04/2021
Map Centre:	454750,228250
Grid Reference:	SP5428SE

Comments:

Based on the Ordnance Survey Map with the sanction of the Controller of H.M Stationary Office License Number 10019345

ALS/ALS Standard/2021_4407675



0 10 20 40 60 80
Meters

Scale:	1:1792
Width:	500m
Printed By:	G1KANAGA
Print Date:	21/04/2021
Map Centre:	454750,229250
Grid Reference:	SP5429SE

Comments:

Based on the Ordnance Survey Map with the sanction of the Controller of H.M Stationary Office License Number 10019345

ALS/ALS Standard/2021_4407675

0 45 90 180 270 360
Meters

Scale:	1:7161
Width:	2000m
Printed By:	Rveldhur
Print Date:	21/04/2021
Map Centre:	454661,228936
Grid Reference:	SP5428NE

Comments:

ALS Water Map Key

Water Pipes (Operated & Maintained by Thames Water)

4"

Distribution Main: The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.

16"

Trunk Main: A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.

3" SUPPLY

Supply Main: A supply main indicates that the water main is used as a supply for a single property or group of properties.

3" FIRE

Fire Main: Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.

3" METERED

Metered Pipe: A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.

Transmission Tunnel: A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.

Proposed Main: A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

Valves

- General Purpose Valve
- Air Valve
- Pressure Control Valve
- Customer Valve

Hydrants

- Single Hydrant

Meters

- Meter

End Items

Symbol indicating what happens at the end of a water main.

- Blank Flange
- Capped End
- Emptying Pit
- Undefined End
- Manifold
- Customer Supply
- Fire Supply

Operational Sites

- Booster Station
- Other
- Other (Proposed)
- Pumping Station
- Service Reservoir
- Shaft Inspection
- Treatment Works
- Unknown
- Water Tower

Other Symbols

- Data Logger

Other Water Pipes (Not Operated or Maintained by Thames Water)

Other Water Company Main: Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.

Private Main: Indiates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

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Ways to pay your bill

Credit Card	**BACS Payment**	**Telephone Banking**	**Cheque**
Call **0800 009 4540** quoting your invoice number starting CBA or ADS / OSS	Account number **90478703** Sort code **60-00-01** A remittance advice must be sent to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.** or email **ps.billing@thameswater.co.uk**	By calling your bank and quoting: Account number **90478703** Sort code **60-00-01** and your invoice number	Made payable to '**Thames Water Utilities Ltd**' Write your Thames Water account number on the back. Send to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW** or by DX to **151280 Slough 13**

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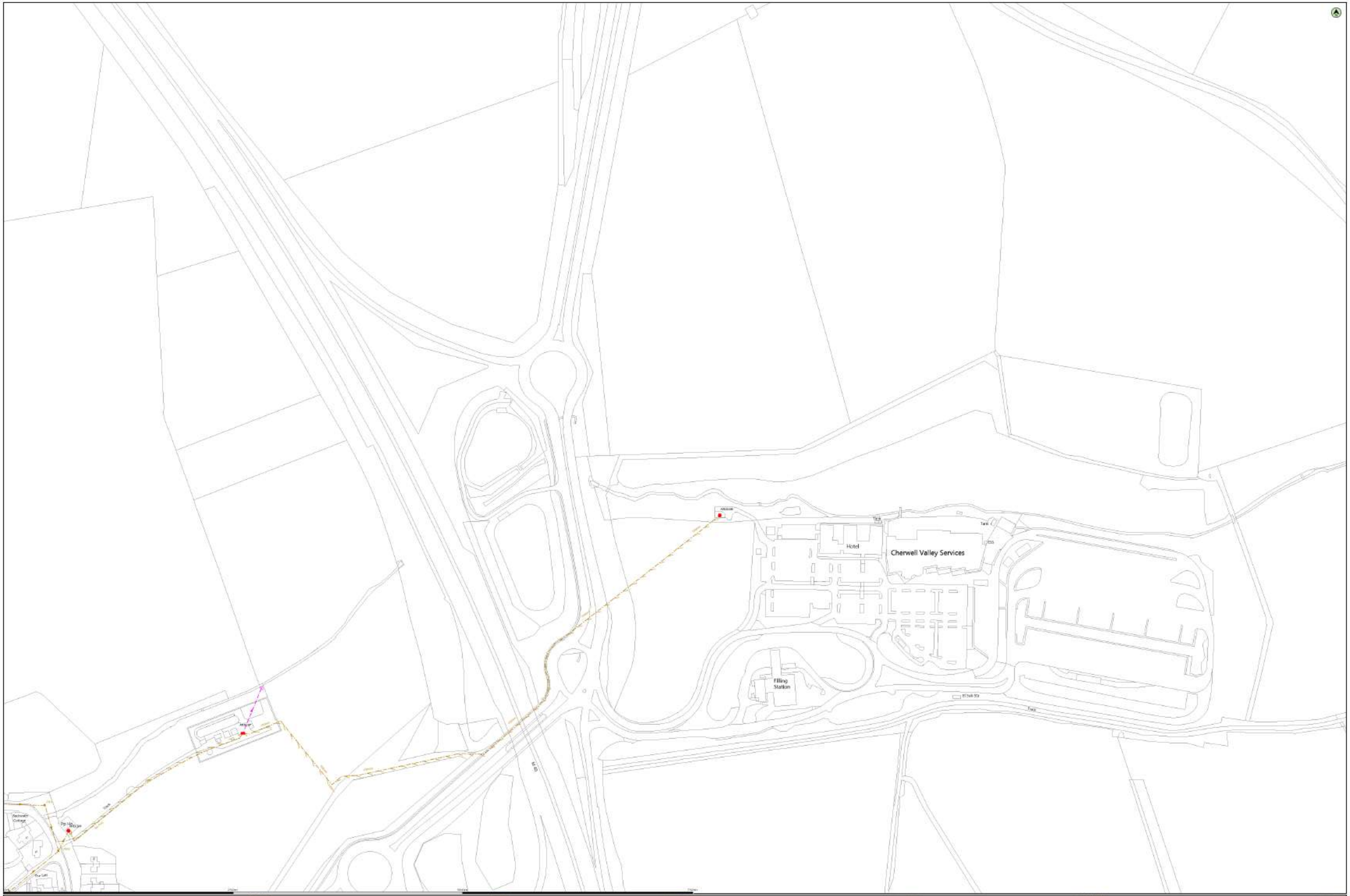


Foul Sewer		Outfall*		Sewage Treatment Works	
Surface Sewer		Inlet*		Public Pumping Station	
Combined Sewer		Manhole*		Decommissioned Pumping Station	
Final Effluent					
Rising Main*					
Private Sewer*					
Decommissioned Sewer*					

Site: Cherwell Valley

love every drop
anglianwater

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert
1801	454169	227879	F	111.77	110.03	1.74
2801	454207	227873	F	110.75	108.99	1.76
2802	454222	227923	F	111.23	108.71	2.52

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert

Scale 1:1250

Foul Sewer		Outfall*		Sewage Treatment Works	
Surface Sewer		Inlet*		Public Pumping Station	
Combined Sewer		Manhole*		Decommissioned Pumping Station	
Final Effluent					
Rising Main*					
Private Sewer*					
Decommissioned Sewer*					

*(Colour denotes effluent type)

love every drop
anglianwater

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Easting	Northing	Liquid Type	Cover Level	Invert Level	Depth to Invert

APPENDIX F

Flood Map for Planning

By Environment Agency (August 2021)

Flood map for planning

Your reference	Location (easting/northing)	Created
S1299	**454663/228949**	**13 Aug 2021 9:15**

Your selected location is in flood zone 1, an area with a low probability of flooding.

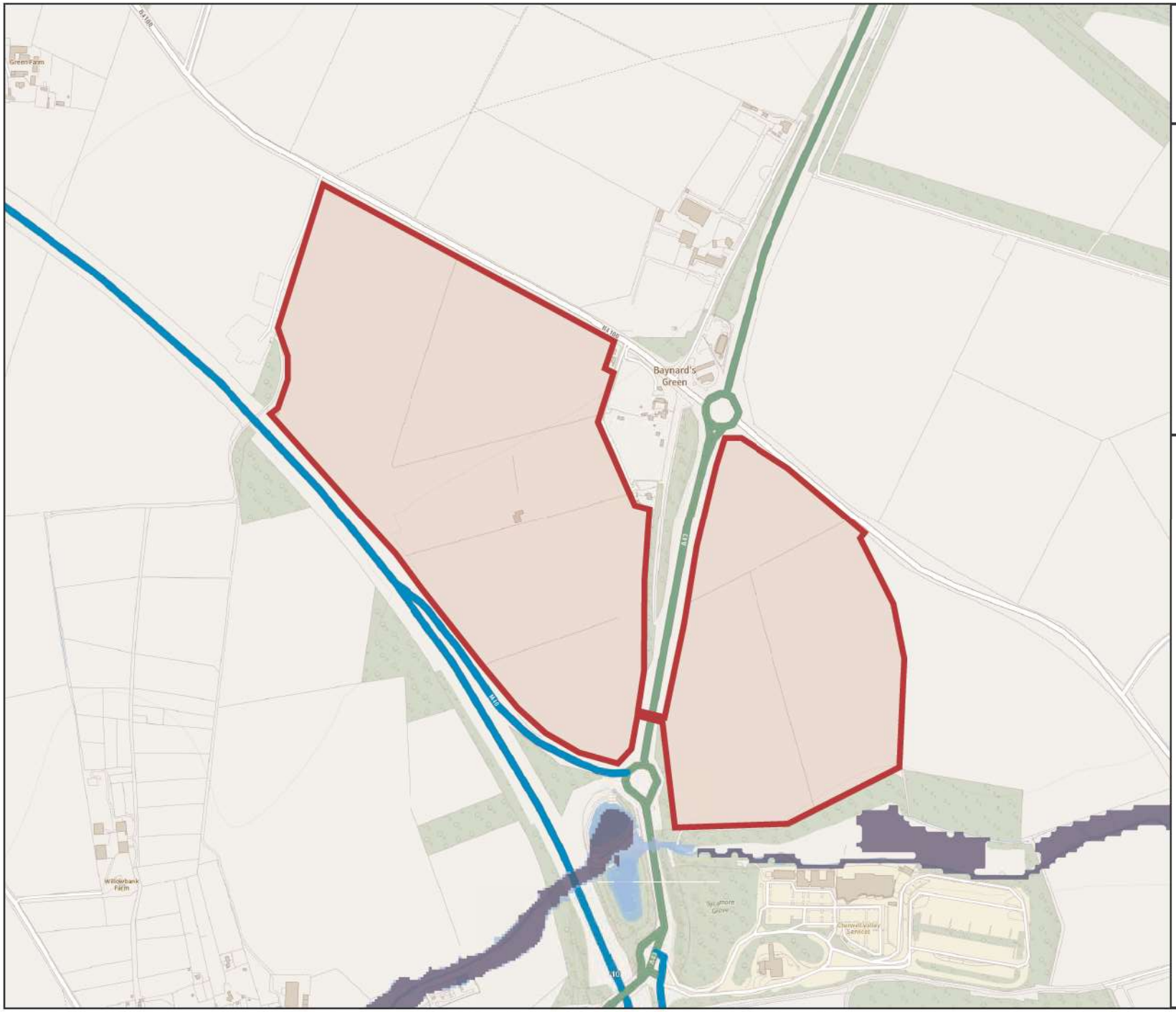
This means:

- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.



Environment Agency

Flood map for planning

Your reference
S1299

Location (easting/northing)
454663/228949

Scale
1:10000

Created
13 Aug 2021 9:15

- Selected area
- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Flood storage area

0 100 200 300m

APPENDIX G

Concept Drainage & External Works

By Bailey Johnson Hayes (August 2021)

Concept Site Levels & Drainage (1:2500 @A1)

50m 0 50m 100m 150m 200m 250m

1:2500 @ A1

A1

PRELIMINARY

Rev	Date	Revision Description
C	15.08.21	Minor Revs
B	09.08.21	Swales updated to allow for trees
A	29.07.21	Site Layout updated

Revision Schedule

Project Title: Junction 10 - M40

Client: ALBION LAND

Drawing Title: CONCEPT SITE LEVELS & DRAINAGE

BAILEY JOHNSON HAYES
Consulting Engineers
ST.ALBANS: Suite 4, Phoenix House, 63 Campfield Rd, ST.ALBANS, Herts AL1 5FL
MANCHESTER: Grange House, John Dalton Street, MANCHESTER, M2 6FW

Scale	1:2500 @A1
Date	07.07.21
Drawn	JNG

Drawing Number: S1299-Ext-05 C

Concept External Works (1:2500 @A1)

50m 0 50m 100m 150m 200m 250m

1:2500 @ A1

A1

PRELIMINARY

Rev	Date	Revision Description
A	18.08.21	General updates

Revision Schedule

Project Title: Junction 10 - M40

Client: ALBION LAND

Drawing Title: CONCEPT EXTERNAL WORKS

BAILEY JOHNSON HAYES
Consulting Engineers
ST.ALBANS: Suite 4, Phoenix House, 63 Campfield Rd, ST.ALBANS, Herts AL1 5FL
MANCHESTER: Grange House, John Dalton Street, MANCHESTER, M2 6FW

Scale	1:2500 @A1
Date	16.08.21
Drawn	DJC

Drawing Number: S1299-Ext-06A

APPENDIX H

Greenfield Runoff Estimates

By Bailey Johnson Hayes (August 2021)

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	James Griffiths
Site name:	Unit 1 (Sub-Catchment)
Site location:	Land at Junction 10, M40

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	51.95468° N
Longitude:	1.20717° W
Reference:	276498316
Date:	Aug 17 2021 11:44

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 23.95

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	1	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.1	0.3

Hydrological characteristics

	Default	Edited
SAAR (mm):	663	663
Hydrological region:	6	6
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	3.78	40.96
1 in 1 year (l/s):	3.21	34.82
1 in 30 years (l/s):	8.68	94.21
1 in 100 year (l/s):	12.04	130.66
1 in 200 years (l/s):	14.12	153.19

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	James Griffiths
Site name:	Units 2&3 (Sub-Catchment)
Site location:	Land at Junction 10, M40

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	51.95931° N
Longitude:	1.21121° W
Reference:	3550932296
Date:	Aug 17 2021 11:46

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 19.5

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	1	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.1	0.3

Hydrological characteristics

	Default	Edited
SAAR (mm):	665	665
Hydrological region:	6	6
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	3.09	33.47
1 in 1 year (l/s):	2.62	28.45
1 in 30 years (l/s):	7.1	76.98
1 in 100 year (l/s):	9.84	106.76
1 in 200 years (l/s):	11.54	125.17

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	James Griffiths
Site name:	Units 4&5 (Sub-Catchment)
Site location:	Land at Junction 10, M40

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	51.95342° N
Longitude:	1.20105° W
Reference:	1323855975
Date:	Aug 17 2021 11:50

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 23.18

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	1	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.1	0.3

Hydrological characteristics

	Default	Edited
SAAR (mm):	662	662
Hydrological region:	6	6
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

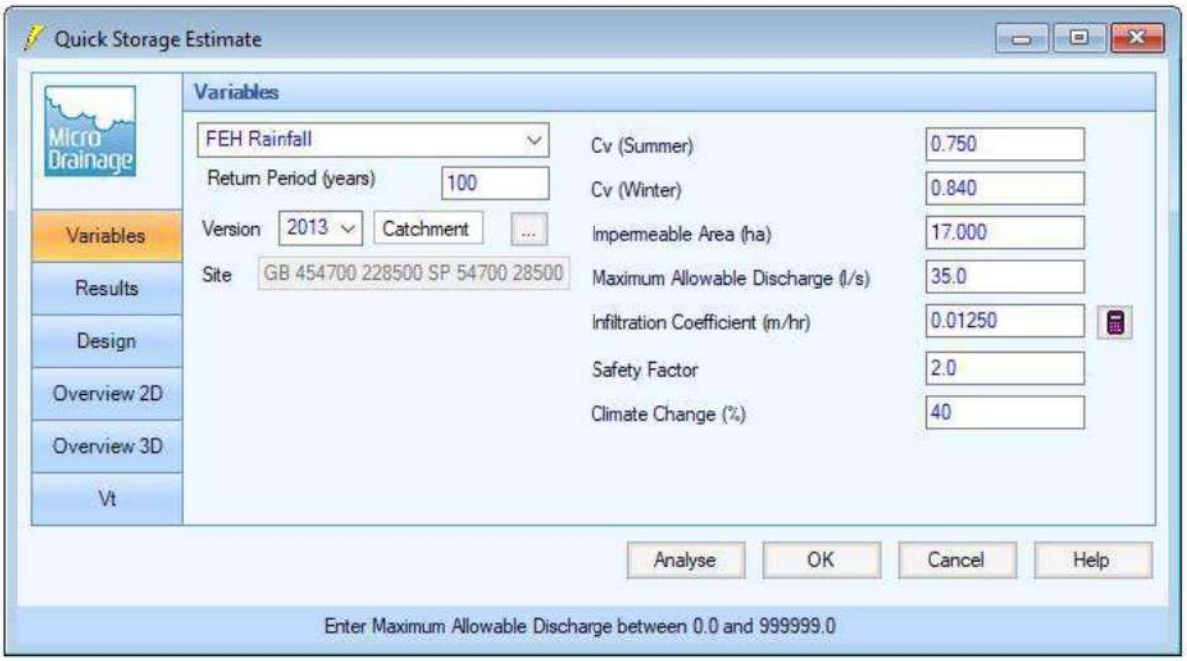
	Default	Edited
Q_{BAR} (l/s):	3.65	39.57
1 in 1 year (l/s):	3.1	33.64
1 in 30 years (l/s):	8.39	91.02
1 in 100 year (l/s):	11.64	126.24
1 in 200 years (l/s):	13.64	148.01

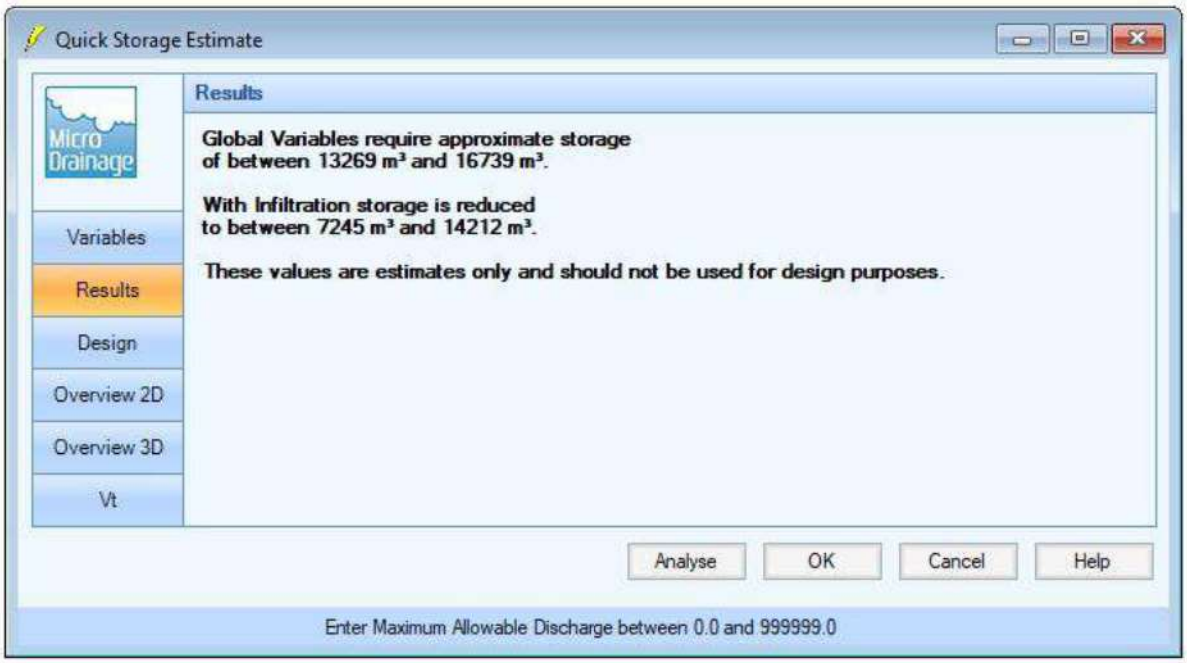
APPENDIX J

Quick Storage Estimates

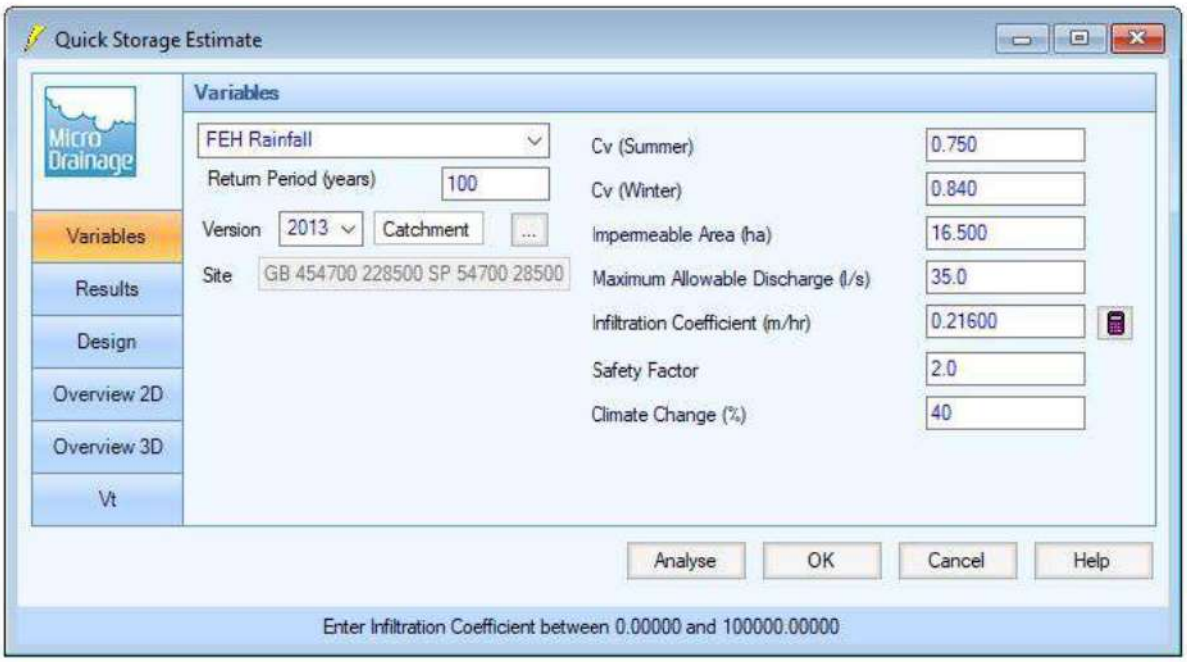
By Bailey Johnson Hayes (August 2021)

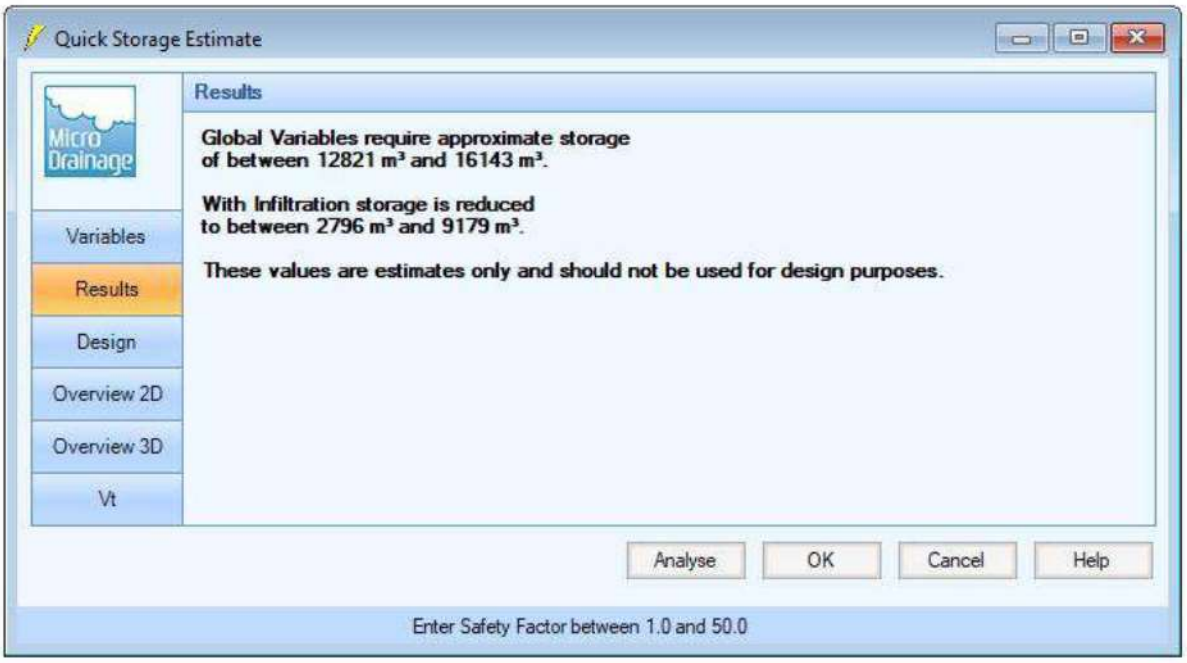
Unit 1 Sub-Catchment – Quick Storage Estimates
100-year + 40% Initial Calculations



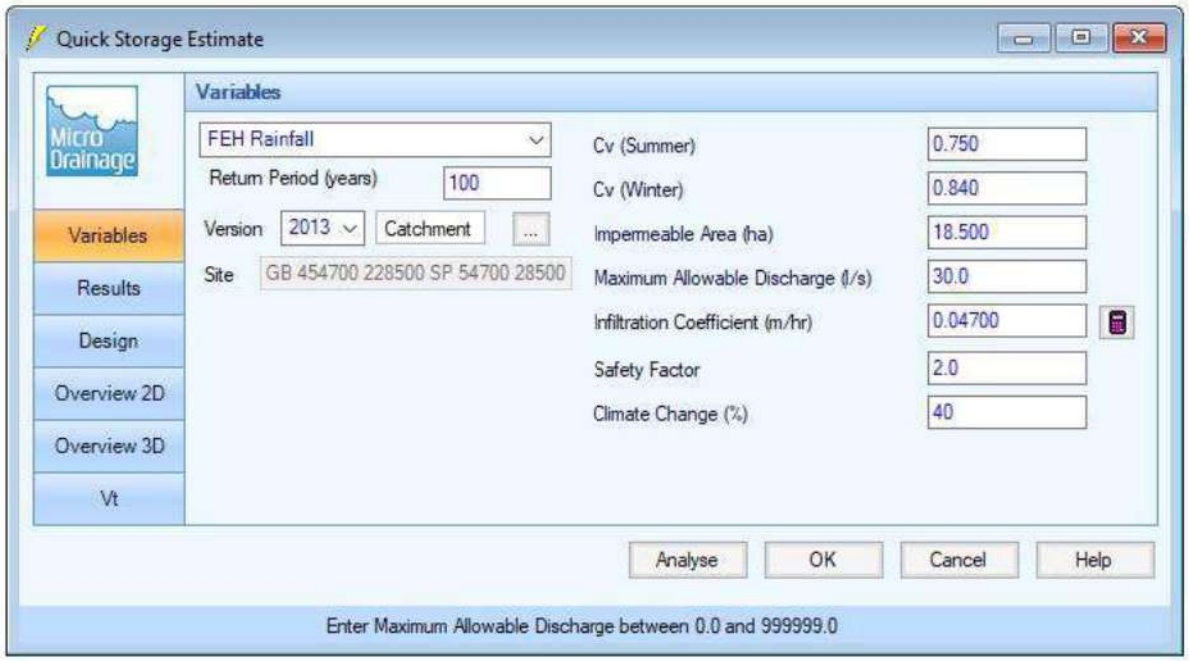


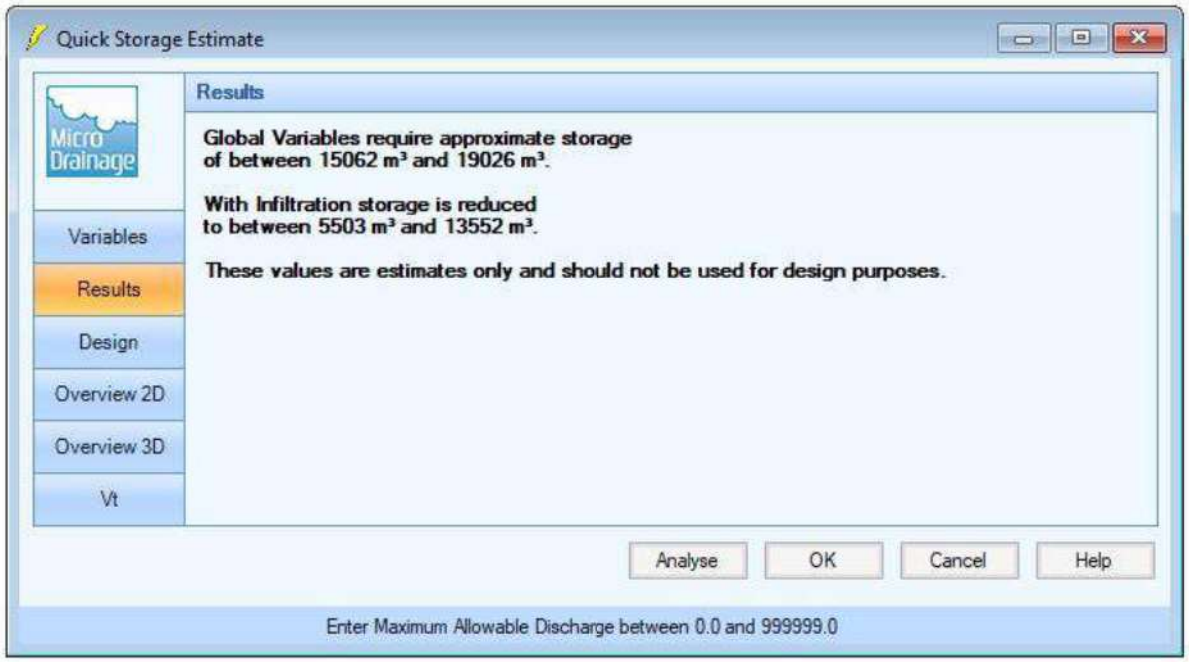
Units 2 & 3 Sub-Catchment – Quick Storage Estimates
100-year + 40% Initial Calculations





Units 4 & 5 Sub-Catchment – Quick Storage Estimates
100-year + 40% Initial Calculations





Appendix 15.2

PHASE II GROUND INVESTIGATION REPORT

APPLiED GEOLOGY

REPORT ON PRELIMINARY PHASE II GROUND INVESTIGATION AT LAND ADJACENT TO JUNCTION 10 M40, ARDLEY

REPORT STATUS SHEET

Client:	Albion Land Ltd
Report Title:	Report on Preliminary Phase II Ground Investigation at Land adjacent to Junction 10, M40, Ardley
Report Number:	AG3268-21-AM64
Report Status:	Validated Issue 2
Date:	August 2021

		Date	Signed for and on behalf of Applied Geology Limited
Report Author	K McGeoch BSc (Hons) MSc Project Geologist	26/08/2021	[redacted]
Checked	A P Smith BSc (Hons) PGDip FGS Principal Engineering Geologist	26/08/2021	
Authorised	G P Wiggin BSc (Hons) MSc FGS Associate Director	26/08/2021	

CONTENTS

APPENDICES

EXECUTIVE SUMMARY

Investigation Objective	A preliminary Phase II Ground Investigation to provide information for planning and preliminary support for development design for large commercial warehouses and associated infrastructure.
Site Description	The site is located at Junction 10 of the M40, approximately 1km north of Ardley village. It comprises two separate sites of irregular shape, west and east of the A43 dual carriageway. Both sites comprise essentially cropped agricultural fields. The western site is 43.9Ha in area and is bound to the southwest by the M40, to the east by the A43, to the north by the B4100 and fields to the west. The eastern site is 24.2Ha in area, bound to the west by the A43 dual carriageway, to the north by the B4100, to the east by fields and to the south by fields and Cherwell Valley service station beyond. The entire general area is noted to generally slope towards the southeast.
Site History	From the earliest map edition to the present day, the site has generally comprised several open fields. The earliest maps (1880-1881) show a pond in the east and buildings in the centre west with the two sites split by a road (later becoming the A43) present at this time. The buildings in the west were demolished by 2002 and another building shown to have replaced them. The area surrounding the sites has predominantly remained open fields, with notable exceptions including two quarries (1880 - 1900, which by 1980 were longer mapped), the M40 and associated junction 10 adjacent to the sites (1992-1994), a garage (110m to the north which by 2010-2014 had been replaced by a petrol station) and a sewage works (450m southwest in 1980).
Anticipated Geology	Anticipated geology from BGS and historical information is suggested to comprise agricultural Topsoil underlain directly by the Jurassic White Limestone Formation. Superficial deposits of Alluvium are indicted along Padbury Brook located 35m south and southeast of the eastern site. Head deposits are also indicated, potentially extending from the M40 junction into the western site. Made Ground is not generally anticipated, however, there is a potential for limited and localised occurrence in two areas; a former temporary service station and former buildings in the west.
Other Pertinent Desk Study Data	The nearest surface watercourse is the Padbury Brook located approximately 35m south of the sites flowing to the east. The alluvium is classified as a Secondary A Aquifer and the Head Deposits as a Secondary (undifferentiated) Aquifer. The White Limestone Formation is classified as a Principal Aquifer. Three groundwater abstractions are located within 500m of the centre of the site, the nearest being 146m northeast for household (potable) and general farming use. Neither of the two sites is not located within a groundwater Source Protection Zone. There are no recorded historic or current landfill sites within 250m of the sites. There are two operational petrol stations within 250m of the sites namely Baynards Green Service Station operated by ESSO 110m north of the site and Cherwell Valley Service Area operated by Moto Hospitality 170m to the south.
Scope of Investigation	57 trial pits plus 1 soakaway test on the Eastern site and 99 trial pits plus 4 soakaway test on the western site undertaken based on an 70m grid.
Ground Conditions	An initial layer of agricultural Topsoil and localised Topsoil/Made Ground (two locations only) was proven to depths of between 0.15m to 0.45m bgl, overlying localised subsoil to depths of between 0.30m and 0.70m bgl. Localised Made Ground and Possible Made Ground was also encountered in three locations proven to depths of between 0.60m and 2.10m bgl. In turn these materials overlay strata of the White Limestone Formation comprising an initial highly variable weathered horizon, grading to competent rock strength material with depth. The weathered horizon was found to extend to variable depths (between 0.70m and 2.49m bgl), generally noted to be thinner (<1m bgl) in the southwest of the western site and western margins of the eastern site and thickest (>2m bgl) in the central/northern parts of the western site. The underlying competent rock strength material was proven to depths of between 0.80m and 2.90m bgl, with all trial pits terminating within this material.
Geo-environmental Assessment	Contamination related risks appear to be negligible and it is considered unlikely that further detailed assessment or remedial actions will be required for the proposed development.
Geotechnical Overview	Earthwork's testing indicates that the natural materials won on site will be suitable for re-engineering (as Class 2A/B, Class 2C or Class 1C earthworks materials) in order to construct the required development plateaus. Some materials are likely to be wetter than the acceptable moisture content range requiring moisture modification on site before compaction. A detailed Earthworks Specification will be needed including methods, controls, and verification testing with target end performance criteria. The in situ White Limestone Formation appears suitable to support conventional strip/trench fill or pad foundations, with foundation placed in either the weathered or intact competent rock strength zones, dependant on structural loads, settlement tolerances, and the final extent of the cut/fill earthworks exercise. Following earthworks and suitable re-engineering of site won materials, ground bearing floor slabs are considered suitable placed on a suitable granular mattress. Owing to the likely variations in engineered fill thicknesses, analysis of potential differential settlements will be required as part of detailed design. No special concrete design measures are required for buried concrete. The site is considered to be suitable for the use of soakaway drainage, however, the highly variable infiltration rates calculated from the soakaway testing undertaken across the site and the localised shallow groundwater suggest a hybrid drainage strategy (soakaways, attenuation, swales) may need to be considered. Supplementary investigations to provide information for full detailed design are advised comprising rotary cored boreholes, additional testing to assess settlements and facilitate a detailed Earthworks Specification and investigation of two localised Made Ground/Possible Made Ground areas identified.

1.0 INTRODUCTION

1.1 Objectives and Scope of Investigation

Land adjacent to Junction 10 of the M40 motorway, near Ardley is being considered for development by Albion Land Ltd. The land is split into two separate sites, located to the west and east of the A43.The proposals for both the western and eastern sites comprise the construction of Storage or Distribution (with ancillary office) buildings, together with new entrances from the B4100, associated access roads, service yards, HGV and car parking and hard and soft landscaping

A Phase I Geotechnical and Geoenvironmental Desk Study has previously been produced by Applied Geology for both the western and eastern sites on behalf of the Albion Land Ltd in May 2015 (Report Ref. AG2255-15-V99). A brief summary of the key findings of this report is presented in Section 3.

Applied Geology was further appointed by Albion Land Ltd to undertake a Preliminary Phase II intrusive ground investigation in order to provide information for planning and preliminary support for development design. This comprises the following:

- An assessment of the potential for hazardous substances or conditions to exist at the site that might warrant mitigation or remediation appropriate to the intended end use proposed by the Client.
- An assessment of geological conditions and geotechnical parameters to support safe and economic engineering design.

The terms of reference/brief for the works were mutually developed between Bailey Johnson Hayes (Engineer to the Client) and Applied Geology and are outlined in our proposal and estimate reference AG21-7630let001 dated 13th April 2021. During development of the brief for the works, the Engineer specifically requested that the investigation was undertaken on a 70m grid basis across the site area.

The scope of works undertaken by Applied Geology comprised:

- A site inspection and walkover survey
- Ground investigation comprising trial pitting and sampling, and a programme of laboratory testing.
- Assessment and reporting of the results of the works.

Underground service plans for the site were obtained by Applied Geology on 20th April 2021. A topographic survey drawing was not available at the time of the fieldwork or writing this of this report, however, an Ordnance Survey 'Mastermap' drawing was provided by the Engineer for use as a base plan for drawings.

1.2 Report Layout

This report presents a brief description of the site and the factual results of the intrusive investigations carried out. An interpretation of the ground conditions and a discussion/assessment of the findings is presented in the later report text sections. The report should be read in conjunction with the general procedures detailed in

Appendix F and the 'General Notes' given at the end of the main text, which provide details of investigation techniques, assessment methodology and standards, health & safety and limitations and exceptions of the report. Drawings and factual data including exploratory hole records and laboratory testing results records are presented in the other Appendices.

2.0 SITE DESCRIPTION AND PROPOSALS

2.1 Site Description

The subject land is located adjacent to the north of Junction 10 of the M40, approximately 1km north of the centre of the village of Ardley. The Ordnance Survey grid reference for the centre of the site is 454583 229025 as shown on Site Location Plan in Appendix B.

The subject land is split into two separate sites by the A43 dual carriageway which lies in a shallow cutting. The western site is bound to the southwest by the M40, to the east by the A43, to the north by the B4100 and fields to the west. The eastern site is bound to the west by the A43 dual carriageway, to the north by the B4100, to the east by fields and to the south by fields and Cherwell Valley service station beyond. A couple of houses and associated gardens are present in the north western corner of the western site. The whole area is noted to generally slope towards the southeast. An Exploratory Hole Location Plan, showing the main site features, Drawing No. AG3268-21-02 Rev 2, is presented in Appendix B.

A site inspection/walkover was previously undertaken by Applied Geology (AG) on 19th May 2015 and is described in the Phase I Desk Study Report.

An updated site inspection/walkover was undertaken by Applied Geology on 21st April 2021 as part of this current phase of works. Access to the western site was gained via double metal farm gates off the B4100 in the north eastern field corner and access to the eastern site was gained through a gap in the boundary hedge off the B4100 roughly centre of the northern boundary. The two sites are discussed further below:

Western Site

At the time of the site walkover survey, the two most northerly fields in the western site were noted to be cropped, with the remaining four fields having been recently seeded and crops just starting to sprout. A disused stone barn was present in the middle of the western site, part of which was noted to have a possible asbestos cement sheet roof. During the previous AG walkover of May 2015 this barn was noted to be used for the storage of hay bales. An electric substation and phone mast were present just beyond the boundary at the west corner of the site. The north western, north eastern, eastern and southern boundaries of the western site were formed by mature and semi-mature trees, with internal hedgerows separating the western site into six separate fields.

Entrance to northeast corner of the western site, looking southeast.

View across cropped fields in the western site. M40 in the far right of the photo.

View of recently seeded and sprouted fields in the western site.

View across recently seeded field with stone barn in distance.

Eastern Site

At the time of the site walkover survey, the eastern site was split into three separate fields separated by mature hedgerows, with the two southernmost fields having been cropped and the northernmost field having been recently seeded with the crops just starting to sprout. A drainage ditch was noted to run along the north boundary which was filled with nettles and weeds. A wooden fence and footpath ran along the southern margin, just outside of the site boundary, and semi mature and mature trees lined the western boundary of the eastern site. Hedgerows lined the north and eastern boundaries.

View across site from entrance off the B4100.

Cropped field in the eastern site.

2.2 Site Proposals

At the time of writing this report, outline planning permission was being sought for each site for the erection of Class B8 buildings and Class Eq(i) ancillary office floorspace along with new site accesses from the B4100, internal access roads, parking and servicing, hard and soft landscaping and other associated infrastructure.

Detailed finished level and loading information is not yet available, although it is understood that warehouse floor slab loadings are likely to in the order of 75 kN/m^2.

The proposals, which may be subject to change, are shown on a preliminary 'Masterplan', Dwg No. 20005-SK-002 by Cornish Architects dated 12th February 2020. Preliminary level information is presented on a Concept Site Levels drawing, Dwg No. S1299-Ext-05 B by Bailey Johnson Hayes, dated 9th August 2021. Copies of these drawings are presented in Appendix B.

3.0 DESK STUDY SUMMARY

A Phase 1 Geotechnical and Geoenvironmental Desk Study was carried out for the site by Applied Geology (ref. AG2255-15-V99), dated May 2015. For full details of the geoenvironmental setting of the site, reference should be made to the desk study report (Appendix A). A summary of the key findings is provided below:

- The earliest maps (1880-1881) show the sites comprising of several fields to the southeast, south and west of Baynards Green with a possible pond in the eastern site and buildings in the centre of the western site. The two sites are separated by a road at this time, which later becomes the A43. The buildings in the western site were demolished by 2002 and another building is shown to have replaced them. A pump was marked adjacent to the buildings in the western site in 1900 but by 1980 it is no longer marked. A quarry is present 280m to the south of the sites in 1880 and another quarry is labelled 350m to the south by 1900. By 1980, both quarries are no longer marked. The M40 and junction 10 had been constructed by 1992-1994. Other services in the general vicinity included a garage 110m to the north and sewage works 450m to the southwest in 1980. By 2010-2014 the garage had been demolished and replaced by a petrol station.

- Anecdotal information provided by the current landowners suggests that a temporary service station was present approximately 25 years ago in the southeastern area of the western site adjacent to the A43.

- The anticipated ground conditions comprise Topsoil underlain by the Jurassic White Limestone Formation. Superficial deposits of Alluvium have been identified along Padbury Brook 35m south and southeast of the eastern site and Head deposits were also identified extending from Junction 10 onto the western site. Made Ground is not indicated on either site, however, based on the anecdotal evidence, it is anticipated that Made Ground may be present in the area where the temporary service station once stood in the southeast of the western site. Made Ground is also anticipated where the buildings are located in the centre of the western site.

- The sites do not lie within a radon affected area with <1% of homes above the Action Level, therefore no radon protective measures are necessary.

- The sites are not indicated to be within an area of coal mining. The closest recorded ground workings are a former limestone quarry around 450m east. Historical maps are noted to show evidence of old pits and quarries in the general vicinity and, although none are indicated to have been present on the sites themselves, this cannot be fully discounted. The sites are not indicated to be located in an area of recorded natural cavity formation.

- The nearest surface watercourse is the Padbury Brook located approximately 35m south and flowing to the east. There are no surface water abstractions within 2km of the sites but there are 21 No. licensed discharge consents within 500m of the sites. The closest is 29m south relating to emergency discharges from Cherwell Valley Services into the Padbury Brook.

- According to the Environment Agency the alluvium is classified as a Secondary A Aquifer and the Head Deposits as a Secondary (undifferentiated) Aquifer. The White Limestone Formation is classified as a Principal Aquifer.

- There are three groundwater abstractions within 500m of the sites with the nearest being 146m northeast for household (potable) and general farming use. The sites are not located within a groundwater Source Protection Zone.

- There are no recorded historic or current landfill sites within 250m of the sites.

- There are two operational petrol stations within 250m of the sites namely Baynards Green Service Station operated by ESSO 110m north and Cherwell Valley Service Area operated by Moto Hospitality 170m south. There are no other recorded industrial land uses within 250m of the sites.

- There are three recorded pollution incidents within 250m of the sites for oils and fuels in 2002 and 2003. They were classified as having a minor impact on water and minor or no impact to land.

- There are two Sites of Special Scientific Interest (SSSI) within 2km of the sites, namely Ardley Cutting and Quarry 1.25km southwest and Ardley Trackways 1.7km south. There are also a number of ancient and semi-natural woodlands and ancient replanted woodlands within 2km.

A Conceptual Site Model (CSM) was not derived for the site as part of the previous the desk study report, as the report was produced primarily for due diligence purposes. A CSM has therefore been derived for the site, from the previous desk study information as part of this report and this is presented below:

Source	Pathway	Receptor	Risk*
Potential contaminants within Made Ground, if present locally, associated with previous site uses.	Dermal contact, ingestion and inhalation of dust	End users	Neg - Low
	Migration and leaching	Secondary A Aquifer, Secondary (undifferentiated) Aquifer and Principal Aquifer Watercourse - Padbury Brook	Neg - Low
Localised hotspots associated with Made Ground if present, asbestos cement building materials, leakages from farm plant, etc.	Dermal contact, ingestion and inhalation of dust	End users	Low
	Migration and leaching	Secondary A Aquifer, Secondary (undifferentiated) Aquifer and Principal Aquifer Watercourse - Padbury Brook	Low
Pesticides	Dermal contact, ingestion and inhalation of dust	End users	Low
	Migration and leaching	Secondary A Aquifer, Secondary (undifferentiated) Aquifer and Principal Aquifer Watercourse - Padbury Brook	Low
Naturally heavy metal contamination in Topsoil	Dermal contact, ingestion and inhalation of dust	End users	Neg - Low
Ground gas from onsite Made Ground, if present at significant thicknesses, or off-site sources.	Inhalation	End users	Neg
Potential hydrocarbon contamination from off site petrol stations.	Migration and Leaching.	Secondary A Aquifer, Secondary (undifferentiated) Aquifer and Principal Aquifer Watercourse - Padbury Brook	Low
Elevated sulphates in Made Ground or natural soils	Direct contact	Buried concrete	Low

*** Definition of Risk Categories**

Negligible - Contaminants that might have unacceptable impact on key receptors, are unlikely to be present, or, no pathway is envisaged.

Low Risk: Contaminants may be present but are unlikely to be at levels to have unacceptable impact on key receptors, or pathways are likely to be minimal.

Medium Risk: Contaminants are probably present and might have an unacceptable impact on key receptors. Pathways may also be present therefore remedial measures may be necessary to reduce the risks.

High Risk – Contaminants probably or certainly present and pathways are probably also present. Therefore, contaminants are likely to have an unacceptable impact on key receptors and remedial measures are likely to be necessary to reduce the risks to acceptable levels.

4.0 GROUND INVESTIGATION WORKS

4.1 Fieldwork

The following scope of fieldwork was undertaken:

- 156 No Machine Excavated Trial Pits (ref. TP1 to TP152, TP38A, TP72A, TP88A and TP121A) to depths of between 0.50m and 2.90m below ground level (bgl);
- 5 No Soakaway infiltration tests in trial pits (Ref. TP38A, TP72A, TP88A, TP121A and TP136).

The trial pit records are included in Appendix C with the in-situ test results included in Appendix D.

Soakaway infiltration testing was undertaken in TP38A, TP72A, TP88A, TP121A and TP136 in general accordance with BRE DG 365 Methodology but with each pit only filled once. The tests were carried out in the excavated trial pits of measured dimensions, with each pit filled with clean water and the water levels observed over a period of at least 6 hours per test. Upon completion of the tests any remaining water was bailed out using the excavator bucket and the trial pit backfilled with arisings.

Coverage of the trial pits was based on a 70m grid which was specified by the Engineer. The final locations of the exploratory holes were selected by Applied Geology and set out on site by specialist surveyors Midland Survey Ltd. The locations were also cleared for the presence of underground services prior to excavation by a specialist utility clearance contractor (Midland Survey Ltd).

The locations of the trial pit soakaway tests were discussed and agreed with the Engineer prior to excavation and testing. The soakaway trial pits were specifically targeted to the approximate location of the proposed car parking and balancing ponds as reflected on the preliminary layout proposals.

All exploratory hole locations were levelled to Ordnance Datum and surveyed to National Grid. The locations of the exploratory holes are presented on the Exploratory Hole Location Plan, Dwg. No. AG3268-21-02 Rev 2, included in Appendix B and the co-ordinates and levels are included on the relevant exploratory hole records in Appendix C.

4.2 Laboratory Testing

Geotechnical laboratory testing on selected samples was scheduled by Applied Geology and comprised the following:

- 137 No Natural Moisture Content tests;
- 20 No Atterberg Limit tests;
- 20 No Particle Size Distribution tests;
- 7 No Particle Density tests;
- 10 No Moisture Content/ Dry Density Relationship (2.5kg, 4.5kg & Vibrating hammer) tests;
- 22 No CBR tests;

- 34 No BRE SD1 (12 with pyrite) suite tests.

No obvious sources of contamination were identified by the desk study, walkover and site observations during the fieldwork, with the exception of potential for hydrocarbons associated with the use of farm machinery onsite and pesticides. Therefore, samples were analysed for a general suite of contaminants. 35 No. samples submitted for testing were analysed for the following suite of contaminants:

- Selected metals suite [arsenic, boron, beryllium, cadmium, chromium (total,), copper, mercury, nickel, lead, zinc, selenium, vanadium];
- Speciated (16 US EPA) Polycyclic Aromatic Hydrocarbons (PAH);
- pH;
- Soluble sulphate;
- Organic matter;
- Total Petroleum Hydrocarbon Criteria Working Group (TPH CWG) including BTEX & MTBE;
- Asbestos (screen).

Additionally, nine of the samples tested for the above suite of contaminants and one additional sample were also tested for trivalent and hexavalent chromium and speciated phenols. The one additional sample was also tested for Total Petroleum Hydrocarbon Criteria Working Group (TPH CWG) including BTEX & MTBE.

Owing to the risk of pesticides resulting from the agricultural use of the site, ten of the samples were also analysed for a suite of common pesticides.

At the request of the Engineer, 6 No. samples were submitted for Inert Waste Acceptance Criteria (WAC) testing.

Nine of the soil samples tested for the above suite, were also submitted for leachate testing and were analysed for the following suite of contaminants:

- Selected metals suite [arsenic, boron, beryllium, cadmium, chromium (total), copper, mercury, nickel, lead, zinc, selenium, vanadium];
- Speciated (16 US EPA) Polycyclic Aromatic Hydrocarbons (PAH);
- Phenols (total);
- pH;
- Sulphate.

All laboratory test results are included in Appendix E.

5.0 GROUND CONDITIONS

5.1 Strata Summary

An initial layer of Topsoil was generally encountered across the entire site with localised areas of underlying subsoil, all underlain in turn by the White Limestone Formation, which was found to be weathered in the upper horizons of the stratum. Limited Made Ground and Possible Made Ground was encountered in a couple of localised locations. Full details of the strata encountered are given on the trial pit records presented in Appendix C. A generalised ground profile is presented below to summarise the information.