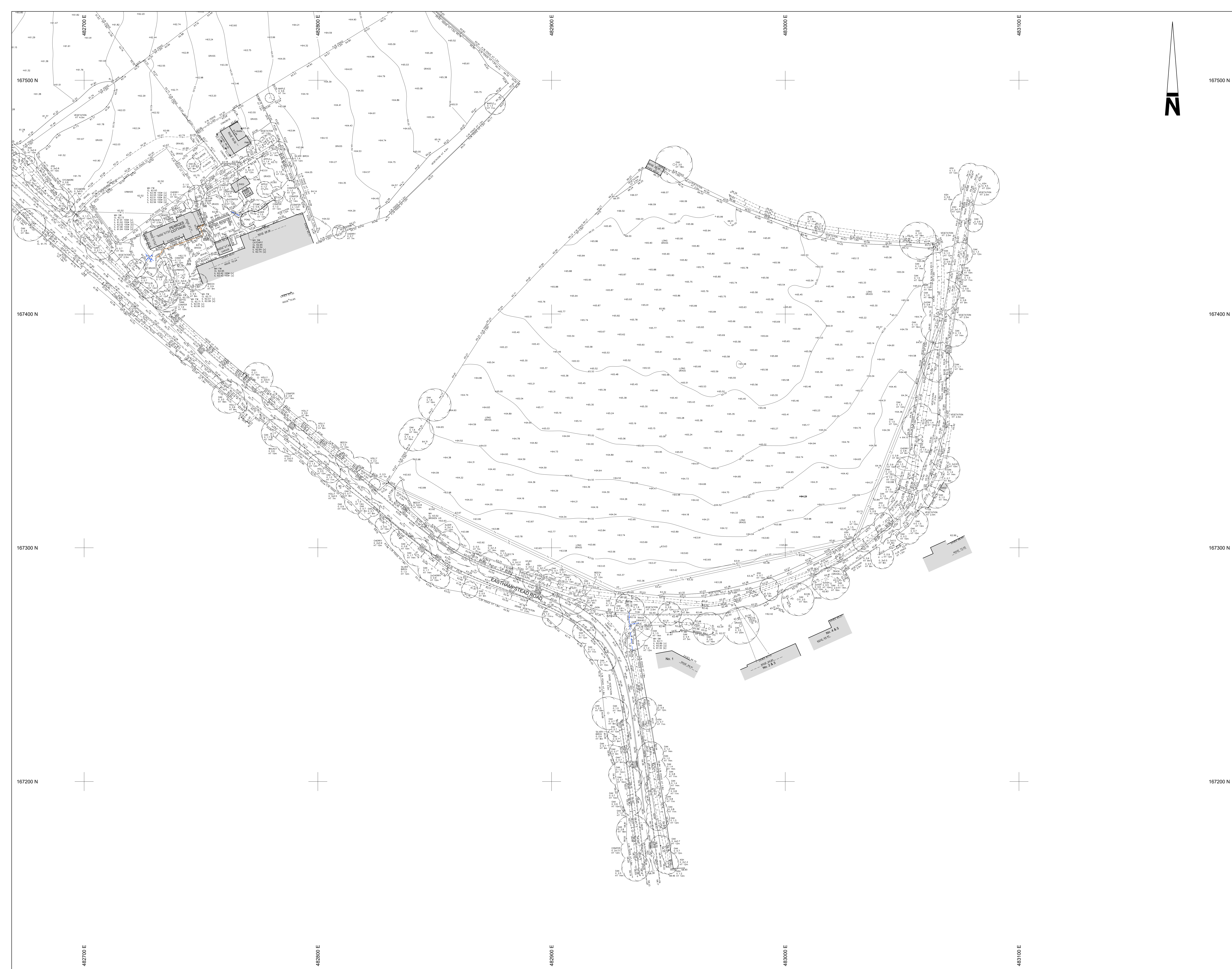
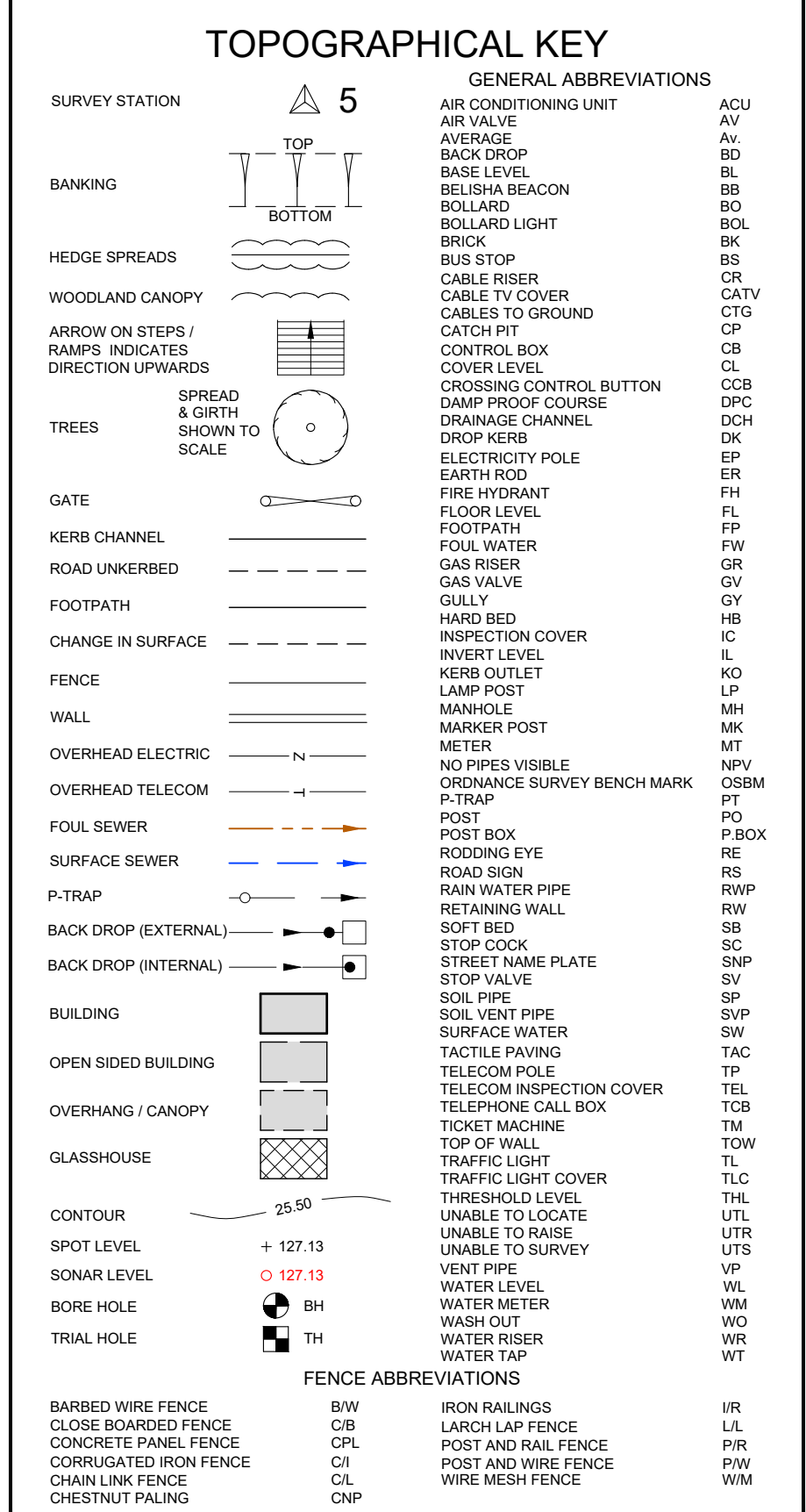


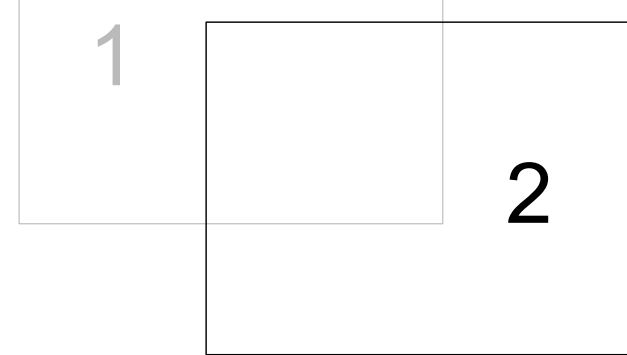


- Notes:**
1. GRID AND LEVELS BASED ON ORDNANCE DATUM, DERIVED FROM THE NATIONAL GRASS NETWORK. LOCAL SCALE FACTOR 0.999898 APPLIED.
 2. DRAINAGE INFORMATION HAS BEEN DETERMINED WITHOUT MAN ENTRY INTO CHAMBERS AND WHILST EVERY EFFORT HAS BEEN MADE TO CORRECTLY IDENTIFY THIS INFORMATION, IT SHOULD ALWAYS BE CHECKED IN AREAS THAT ARE CRITICAL TO THE FUTURE PROPOSAL.
 3. ALL SEWERS ARE PRESUMED TO BE STRAIGHT BETWEEN CHAMBERS, WITH ROUTES/CONNECTIVITY OBTAINED USING ACOUSTIC METHODS ONLY. THESE ARE TO BE CONSIDERED PRESUMED AND SHOULD BE INVESTIGATED FURTHER IN CRITICAL AREAS.
 4. TREE AND HEDGE SPECIES HAVE BEEN IDENTIFIED AS ACCURATELY AS POSSIBLE BUT SHOULD BE CROSS CHECKED IN CRITICAL AREAS.

Station	Description	Easting	Northing	Level
S6	ROAD NAIL	482750.516	167447.470	63.016
S9	ROAD NAIL	482744.956	167423.024	62.816
S9A	ROAD NAIL	482752.305	167432.907	63.046
S10	ROAD NAIL	482736.968	167399.211	62.263
S19	ROAD NAIL	482927.174	167271.067	62.231
S25	ROAD NAIL	482511.951	167601.989	58.903

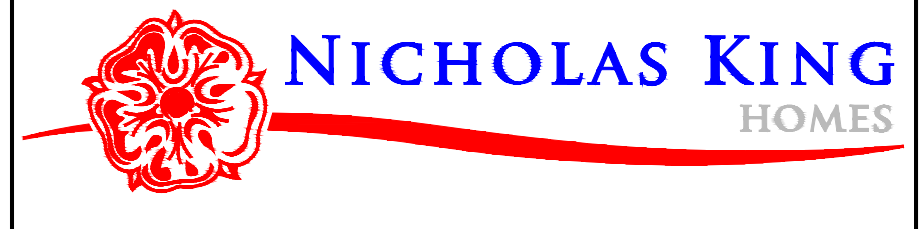


Sheet Layout: (Not to Scale)



Topographical Survey

Client:



Easthampstead Road
Wokingham
Berkshire
RG40 3BN

Scale: 1:500	Sheet Size: A0	Sheet Number: 2	Date: July 2021		
Project Number: 30092		Rev: -	Surveyed by: DD	Checked by: AJ	Approved by: RPE

mk surveys

www.mksurveys.com www.survey4bim.co.uk

Head Office: Milton Keynes t: 01908 565561 e: mail@mksurveys.co.uk

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

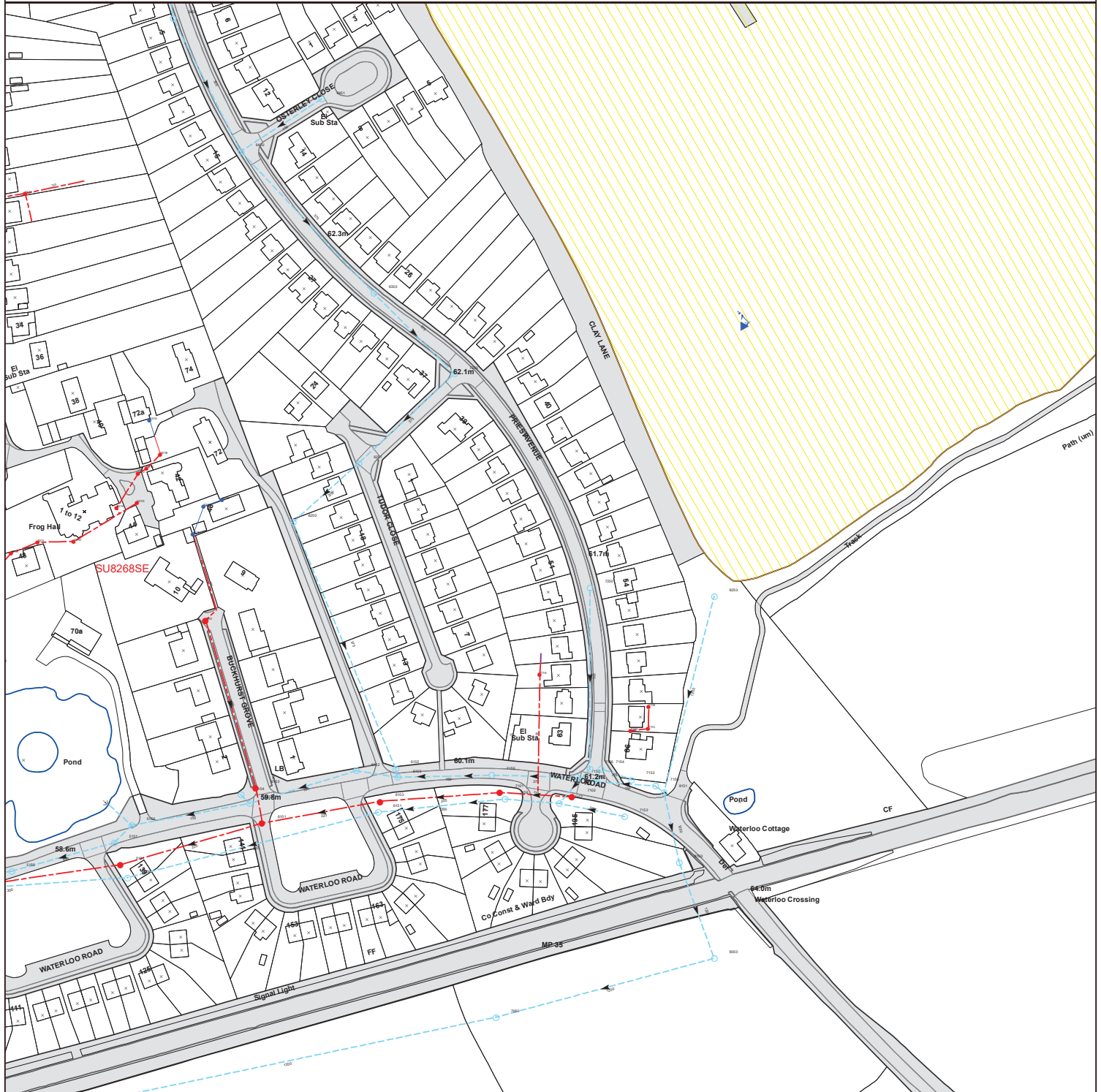
Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

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



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: 1:1790
Width: 500m
Printed By: SAsirvat
Print Date: 09/10/2018
Map Centre: 482750,168250
Grid Reference: SU8268SE

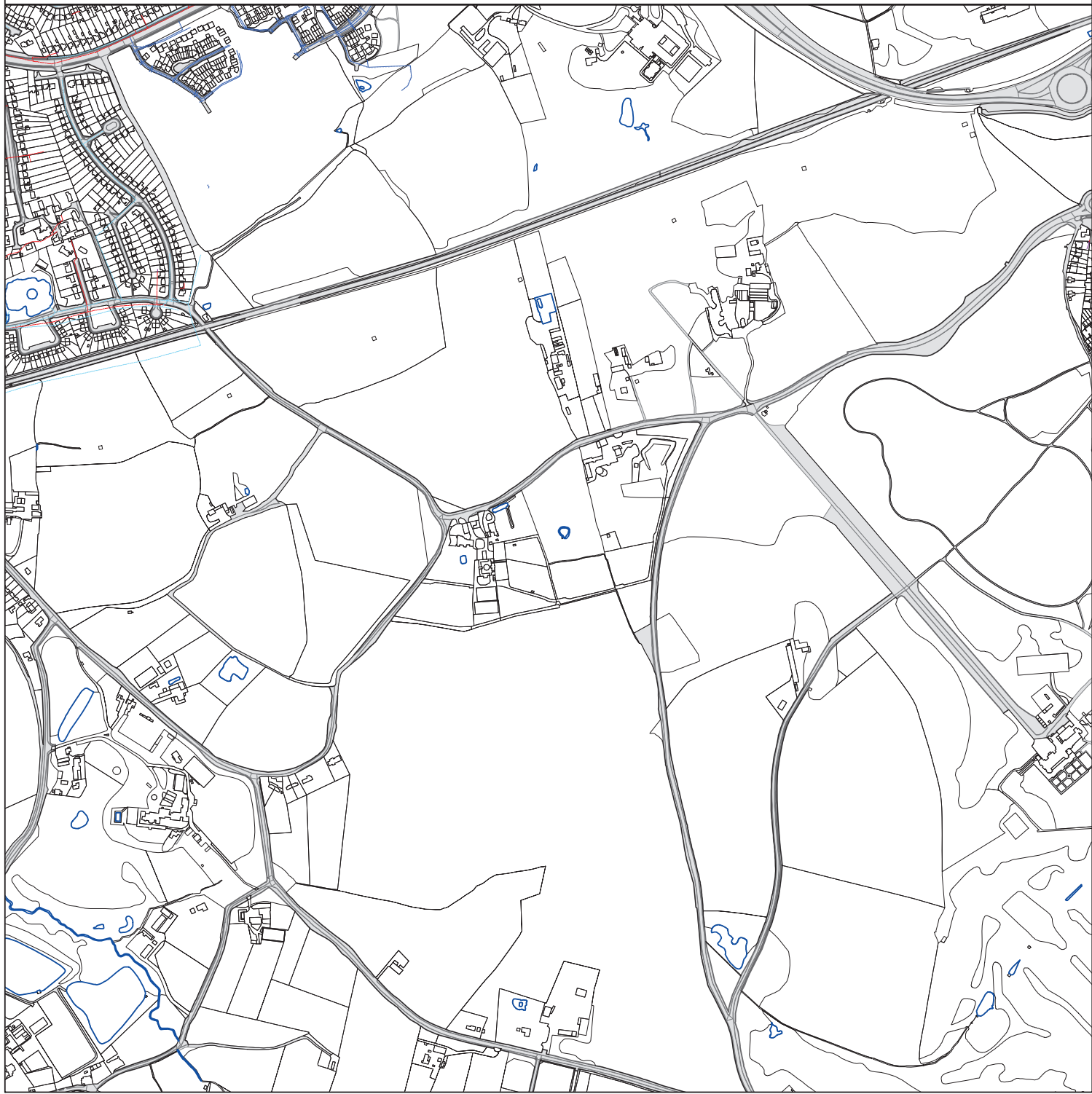
Comments:

ALS/ALS Standard/2018_3887954

NB: Level quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates no Survey information is available.

REFERENCE	COVER LEVEL	INVERT LEVEL
711A		
5450	62.13	60.58
7050	61.15	57.55
6250		
6151	60.28	58.3
6154	59.72	58.72
6251	61.6	59.95
7153	61.64	60.35
8150	62.17	59.12
5152	59.72	57.23
7155	60.99	57.97
6102	59.7	58.4
8050	61.5	58.62
7156	61.2	59.9
7151	61.17	58.77
5101	59.42	57.57
8151	62.05	59.45
6451	62.83	61.34
6155	60.05	59.14
521C		
521K		
521G		
6152	60	58.35
521B		
7157	61.13	58.93
521D		
521F		
711B		
541A		

REFERENCE	COVER LEVEL	INVERT LEVEL
7158	60.72	58.77
7159	60.43	57.69
7101	60.71	58.71
6350	62.38	60.25
6103	60.31	58.31
6450	62.11	60.43
7152	61.62	60.32
7350	62.13	60.07
5050	59.15	57.29
7102	61.15	58.9
6153	59.67	57.92
6101	59.8	58.03
8250		
7250	61.46	60.39
7154	61.22	60.02
7150	62.17	59.4
5151	58.92	56.4
5150	58.25	55.86
6150	60.02	57.2
521J		
521I		
521H		
521A		
531A		
5201	60.15	58.99
521E		
711D		
711C		



0 45 90 180 270 360
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: 1:7161
Width: 2000m
Printed By: SAsirvat
Print Date: 09/10/2018
Map Centre: 483465,167688
Grid Reference: SU8367NW

Comments:



Public Sewer Types (Operated & Maintained by Thames Water)

	Foul: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
	Surface Water: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
	Combined: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
	Trunk Surface Water
	Trunk Foul
	Storm Relief
	Trunk Combined
	Bio-solids (Sludge)
	Vent Pipe
	Proposed Thames Surface Water Sewer
	Proposed Thames Water Foul Sewer
	Foul Rising Main
	Surface Water Rising Main
	Combined Rising Main
	Proposed Thames Water Rising Main
	Vacuum

Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plans are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
- 4) Most private pipes are not shown on our plans. as in the past, this information has not been recorded.
- 5) 'na' or '0' on a manhole level indicates that data is unavailable.

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

	Air Valve
	Dam Chase
	Fitting
	Meter
	Vent Column

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

	Control Valve
	Drop Pipe
	Ancillary
	Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

	Outfall
	Undefined End
	Inlet

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.

Other Symbols

Symbols used on maps which do not fall under other general categories

	Public/Private Pumping Station
	Change of characteristic indicator (C.O.C.I.)
	Invert Level
	Summit

Areas
Lines denoting areas of underground surveys, etc.

	Agreement
	Operational Site
	Chamber
	Tunnel
	Conduit Bridge

Other Sewer Types (Not Operated or Maintained by Thames Water)

	Foul Sewer
	Combined Sewer
	Culverted Watercourse
	Surface Water Sewer
	Gully
	Proposed
	Abandoned Sewer

Terms and Conditions

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

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
4. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
5. In case of dispute TWUL's terms and conditions shall apply.
6. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
8. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800

If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to her at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

Ways to pay your bill

Credit Card	BACS Payment	Telephone Banking	Cheque
Call 0845 070 9148 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

Thames Water Utilities Ltd Registered in England & Wales No. 2366661 Registered Office Clearwater Court, Vastern Rd, Reading, Berks, RG1 8DB.



Search Code

IMPORTANT CONSUMER PROTECTION INFORMATION

This search has been produced by Thames Water Property Searches, Clearwater Court, Vastern Road, Reading RG1 8DB, which is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered search firms maintain compliance with the Code.

The Search Code:

- provides protection for homebuyers, sellers, estate agents, conveyancers and mortgage lenders who rely on the information included in property search reports undertaken by subscribers on residential and commercial property within the United Kingdom
- sets out minimum standards which firms compiling and selling search reports have to meet
- promotes the best practise and quality standards within the industry for the benefit of consumers and property professionals
- enables consumers and property professionals to have confidence in firms which subscribe to the code, their products and services.

By giving you this information, the search firm is confirming that they keep to the principles of the Code. This provides important protection for you.

The Code's core principles

Firms which subscribe to the Search Code will:

- display the Search Code logo prominently on their search reports
- act with integrity and carry out work with due skill, care and diligence
- at all times maintain adequate and appropriate insurance to protect consumers
- conduct business in an honest, fair and professional manner
- handle complaints speedily and fairly
- ensure that products and services comply with industry registration rules and standards and relevant laws
- monitor their compliance with the Code

Complaints

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award compensation of up to £5,000 to you if he finds that you have suffered actual loss as a result of your search provider failing to keep to the Code.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs Contact Details

The Property Ombudsman scheme
Milford House
43-55 Milford Street
Salisbury
Wiltshire SP1 2BP
Tel: 01722 333306
Fax: 01722 332296
Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk

PLEASE ASK YOUR SEARCH PROVIDER IF YOU WOULD LIKE A COPY OF THE SEARCH CODE



Appendix 2 - EA Product 4 Data

EA Product 4 Data

Appendix 3 - LLFA Developer Checklist

Product 4 (Detailed Flood Risk) for South Wokingham SDL, RG40 3BQ

Our Ref: THM334165

Product 4 is designed for developers where Flood Risk Standing Advice FRA (Flood Risk Assessment) Guidance Note 3 Applies. This is:

- i) "all applications in Flood Zone 3, other than non-domestic extensions less than 250 sq metres; and all domestic extensions", and
- ii) "all applications with a site area greater than 1 ha" in Flood Zone 2.

Product 4 includes the following information:

Ordnance Survey 1:25k colour raster base mapping;
Flood Zone 2 and Flood Zone 3;
Relevant model node locations and unique identifiers (for cross referencing to the water levels, depths and flows table);
Model extents showing *defended* scenarios;
FRA site boundary (where a suitable GIS layer is supplied);
Flood defence locations (where available/relevant) and unique identifiers; (supplied separately)
Flood Map flood storage areas (where available/relevant);
Historic flood events outlines (where available/relevant, not the Historic Flood Map) and unique identifiers;

Statutory (Sealed) Main River (where available within map extents);

A table showing:

- i) Model node X/Y coordinate locations, unique identifiers, and levels and flows for *defended* scenarios.
- ii) Flood defence locations unique identifiers and attributes; (supplied separately)
- iii) Historic flood events outlines unique identifiers and attributes; and
- iv) Local flood history data (where available/relevant).

Please note:

If you will be carrying out computer modelling as part of your Flood Risk Assessment, please request our guidance which sets out the requirements and best practice for computer river modelling.

This information is based on that currently available as of the date of this letter. You may feel it is appropriate to contact our office at regular intervals, to check whether any amendments/ improvements have been made. Should you re-contact us after a period of time, please quote the above reference in order to help us deal with your query.

This information is provided subject to the enclosed notice which you should read.

This letter is not a Flood Risk Assessment. The information supplied can be used to form part of your Flood Risk Assessment. Further advice and guidance regarding Flood Risk Assessments can be found on our website at:

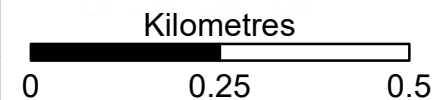
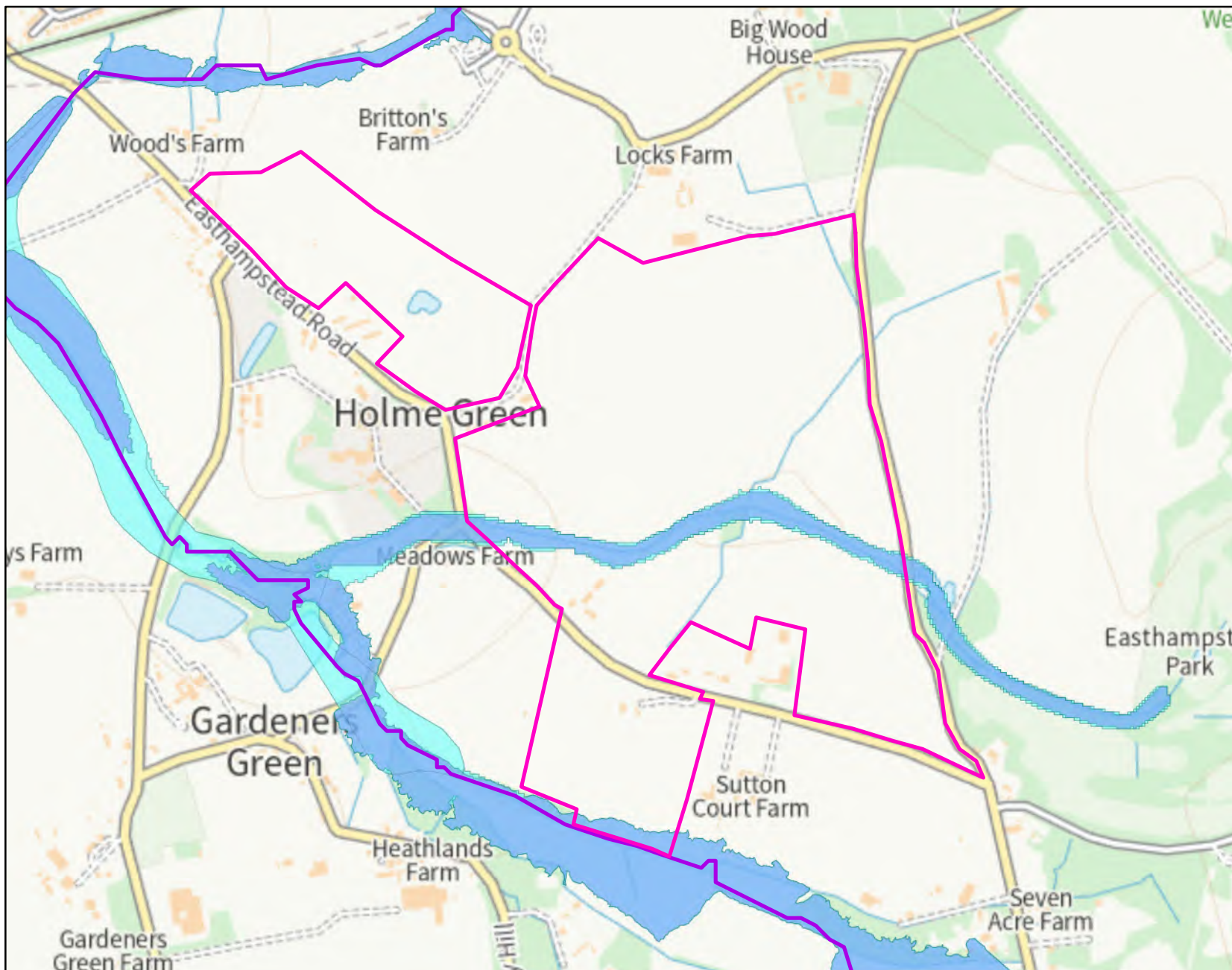
<https://www.gov.uk/guidance/flood-risk-assessment-local-planning-authorities>

If you would like advice from us regarding your development proposals you can complete our pre application enquiry form which can be found at:

<https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion>

Flood Map for Planning centred on South Wokingham SDL, RG40 3BQ

Created on 16/11/23 REF: THM334165



Legend

- Site Boundary
- Main River
- Flood Map - Flood defences
- Flood Map - Flood Storage Areas
- Flooding from rivers or sea (FZ3)
- Extent of extreme flood (FZ2)

Flooding from rivers or sea without defences (Flood Zone 3) shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

The Extent of an extreme flood (Flood Zone 2) shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

Defence information

Defence Location: No defences and NOT on Main River

Description: This location is not on Main River and we do not hold defence information for this area. There may be an ordinary watercourse nearby which could affect the site. Please contact your local authority for further details.

Model information

THM334165

Model: Loddon (Lower) 2009

Description: The information provided is taken from the Lower Loddon Detailed Flood Risk Mapping study which was completed in January 2009. This model is a 1D-2D model using ESTRY-TUFLOW. The model was originally built in 2007 but the hydrology was updated and model rerun in 2009. The model was re-run for more return periods on the main Loddon than on some of the tributaries.

River Channel Model: ESTRY 1D model of Lower Loddon, Old Loddon, St. Patricks Stream, River Thames (from Sonning to Marsh Lock), Twyford Brook, Billingbear Brook and Emm Brook (from Toutley Bridge to Loddon), Barkham Brook, Ashridge Stream, Waterloo Road Stream and Upper Emm Brook (from Nine Mile Ride to Toutley Bridge)

Model design runs (Main River Loddon):

1 in 5 / 20% Annual Exceedance Probability (AEP); 1 in 20 / 5% AEP; 1 in 50 / 2% AEP; 1 in 100 / 1% AEP; 1 in 1000 / 0.1% AEP; and 1 in 100+20% / 1% AEP plus 20% increase in flows

Mapped outputs (main River Loddon):

1 in 5 / 20% AEP; 1 in 20 / 5% AEP; 1 in 50 / 2% AEP; 1 in 100 / 1% AEP, 1 in 100+20% / 1% AEP plus 20% increase in flows, and 1 in 1000 / 0.1% AEP

Model design runs (tributaries – Emm Brook (Wokingham), Emm Brook (Upstream), Ashridge Stream, Waterloo Road Stream, Barkham Brook):

1 in 5 / 20% Annual Exceedance Probability (AEP); 1 in 20 / 5% AEP; 1 in 100 / 1% AEP; and 1 in 100+20% / 1% AEP plus 20% increase in flows

Mapped outputs (tributaries):

1 in 5 / 20% AEP; 1 in 20 / 5% AEP, 1 in 100 / 1% AEP and 1 in 100+20% / 1% AEP plus 20% increase in flows

Model accuracy:

Levels $\pm$ 250mm

Modelled in-channel flood flows and levels

THM334165

The modelled flood levels and flows for the closest most appropriate model node points for your site that are within the river channel are provided below:

				Flood Levels (mAOD)											
Node label	Model	Easting	Northing	20% AEP	5% AEP	3.3% AEP	1% AEP	1% AEP (+10% increase in flows)	1% AEP (+15% increase in flows)	1% AEP (+20% increase in flows)	1% AEP (+25% increase in flows)	1% AEP (+35% increase in flows)	1% AEP (+70% increase in flows)	0.1% AEP	
06324LO MN w1.19	Loddon (Lower) 2009	482934	167954	61.34	61.69		61.73			61.77					
06324LO MN w1.18	Loddon (Lower) 2009	482804	167888	60.32	61.43		61.48			61.51					
06324LO MN w1.15	Loddon (Lower) 2009	482642	167877	58.76	60.39		60.44			60.48					
06324LO MN w1.12	Loddon (Lower) 2009	482551	167881	57.62	58.82		58.87			58.92					
06324LO MN w1.09	Loddon (Lower) 2009	482395	167863	55.57	56.56		56.64			56.69					
06324LO MN w1.06	Loddon (Lower) 2009	482286	167849	54.46	54.54		54.61			54.68					
06324LO MN Em3.07	Loddon (Lower) 2009	482747	166865	55.78	55.88		56.01			56.08					
06324LO MN Em3.11	Loddon (Lower) 2009	482781	166761	56.62	56.71		56.80			56.85					
06324LO MN Em3.13	Loddon (Lower) 2009	483514	166383	61.79	61.90		62.05			62.07					

				Flood Flows (m3/s)											
Node label	Model	Easting	Northing	20% AEP	5% AEP	3.3% AEP	1% AEP	1% AEP (+10% increase in flows)	1% AEP (+15% increase in flows)	1% AEP (+20% increase in flows)	1% AEP (+25% increase in flows)	1% AEP (+35% increase in flows)	1% AEP (+70% increase in flows)	0.1% AEP	
06324LO MN w1.19	Loddon (Lower) 2009	482934	167954												
06324LO MN w1.18	Loddon (Lower) 2009	482804	167888												
06324LO MN w1.15	Loddon (Lower) 2009	482642	167877												
06324LO MN w1.12	Loddon (Lower) 2009	482551	167881												
06324LO MN w1.09	Loddon (Lower) 2009	482395	167863												
06324LO MN w1.06	Loddon (Lower) 2009	482286	167849												
06324LO MN Em3.07	Loddon (Lower) 2009	482747	166865												
06324LO MN Em3.11	Loddon (Lower) 2009	482781	166761												
06324LO MN Em3.13	Loddon (Lower) 2009	483514	166383												

Note:
Due to changes in guidance on the allowances for climate change, the percentage increase in river flows above should no longer to be used for development design purposes. The data included in this Product can be used for interpolation of levels as part of an intermediate level assessment.

For further advice on the new allowances please visit <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

Modelled floodplain flood levels

THM334165

The modelled flood levels for the closest most appropriate model grid cells for your site are provided below:

				flood levels (mAOD)										
2D grid cell reference	Model	Easting	Northing	20% AEP	5% AEP	3.3 AEP	1% AEP	1% AEP (+10% increase in flows)	1% AEP (+15% increase in flows)	1% AEP (+20% increase in flows)	1% AEP (+25% increase in flows)	1% AEP (+35% increase in flows)	1% AEP (+70% increase in flows)	0.1% AEP
No modelled floodplain level data available														

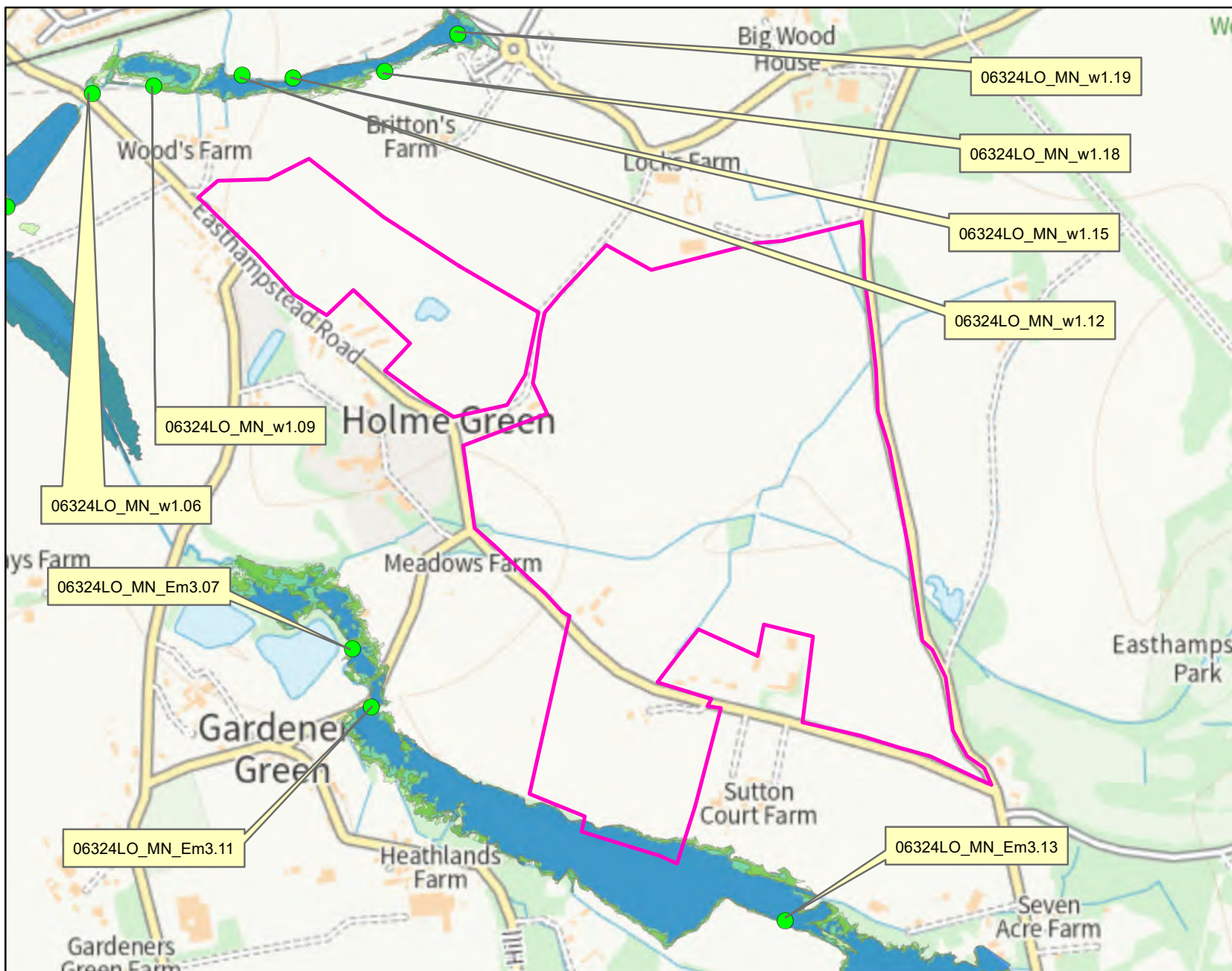
This flood model has represented the floodplain as a grid.
The flood water levels have been calculated for each grid cell.

Note:
Due to changes in guidance on the allowances for climate change, the percentage increase in river flows above should no longer to be used for development design purposes. The data included in this Product can be used for interpolation of levels as part of an intermediate level assessment.

For further advice on the new allowances please visit
<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

Detailed FRA Map centred on South Wokingham SDL, RG40 3BQ

Created on 16/11/23 REF: THM334165



Legend

- Site Boundary
- Model Nodes
- 20% AEP flood extent
- 5% AEP flood extent
- 1% AEP flood extent
- 1%+20% AEP flood extent
- 0.1% AEP flood extent

Flooding from rivers or sea without defences (Flood Zone 3) shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

The Extent of an extreme flood (Flood Zone 2) shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

Historic flood data

THM334165

Our records show that the area of your site has been affected by flooding.
Information on the floods that have affected your site is provided in the table below:

Flood Event Code	Flood Event Name	Start Date	End Date	Source of Flooding	Cause of Flooding
No historic flood data available					

Please note the Environment Agency maps flooding to land not individual properties. Floodplain extents are an indication of the geographical extent of a historic flood. They do not provide information regarding levels of individual properties, nor do they imply that a property has flooded internally.

Start and End Dates shown above may represent a wider range where the exact dates are not available.



Appendix 3 - Wokingham Borough Council Developer Checklist

WBC Developer Checklist

Planning Application Drainage Checklists

Major Development Outline Applications

Outline planning applications for Major Developments must include the following information and details on the proposed drainage strategy and system(s).

Ref.	Documentation required	Requirement met/included
	The applicant shall submit a description of the proposed drainage system(s) with an explanation of key operating principles and design decisions including but not necessarily limited to: ■ Identification of the destination of discharge (in accordance with Building Regulation Part H hierarchy) with appropriate justification for the selection; ■ Identification of proposed points of connection(s) to water bodies, sewers, public surface water sewers or highway drains etc.; ■ Evidence of agreement in principal from key third parties whose systems the proposed drainage system will need to connect / impact (Environment Agency, Lead Local Flood Authority, Thames Water or adjacent landowner); ■ Identification of the SuDS techniques that will be applied at the site with appropriate justification for the selection; ■ A description of how water will be collected and dealt with across the site by the proposed SuDS techniques including what volumes are to be stored where; ■ A description of the water quality treatment measures applied to surface water as it drains the site; ■ Where necessary a description of how the proposed system(s) will deal with surface water overland flow flooding originating from off-site areas; ■ Where necessary, an explanation of why it is not reasonably practicable to achieve any of the non-statutory technical standards for sustainable drainage systems (March 2015); ■ Where proposing discharge to ground; evidence to support proposed infiltration rates used in initial calculations. This should include nearby borehole logs, geological mapping and if available any geotechnical investigations, infiltration tests and records of groundwater monitoring. Consideration shall also be given to the implications of any local Source Protection Zones; ■ Where necessary, identification of any mechanical or electrical features necessary for the effective operation of the drainage strategy; and; ■ Proposals for the adoption and maintenance of the entire drainage system(s), including a schedule, with written agreement in principal from the adopting/maintaining body.	✓ ✓ Discussions on going ✓ ✓ ✓ ✓ N/A N/A N/A
	Plans & Drawings Required	

	The applicant shall submit plans defining the proposed drainage system including but not necessarily limited to: ■ Topographic survey of the site including local surface water drainage features; ■ Position of the site relative to surrounding flood sources, including where necessary identification of surface water/groundwater flows entering the development from adjacent land; ■ Where necessary definition of sub-catchments within the site; ■ A conceptual plan of the proposed drainage system(s) identifying the proposed point(s) of outfall, position of SuDS techniques / drainage features, the attenuation features, conveyance routes (including exceedance routes) comprising the drainage system(s); and ■ A thematic plan of the existing and proposed developments identifying land uses / coverings significant in informing discharge rates.	✓ ✓ ✓ ✓ ✓
	Calculations Required	
	Overview design calculations and design parameters to demonstrate conformity with the design criteria for the site. These should include: ■ Demonstration through calculation of the existing and proposed (unmitigated) development discharge rates for the 1, 30 and 100 year (including allowance for the effects of climate change) design storm events; ■ Demonstration through calculation(s) of the volumes of surface water storage required to attenuate site discharges to pre-development / agreed discharge rates; ■ Demonstration through calculation(s) that the proposed drainage system(s) will not result in flooding off site under the 100 year return period design storm including allowance for climate change; and ■ Demonstration through calculation(s) that provision is made to meet long term storage volumes required for the site, unless discharge rates have been restricted to QBar for all storm events up to and including the 1 in 100 year including allowance for climate change	✓ ✓ ✓ ✓

Additional requirements for a large site or multi-plot development (including Strategic Development Locations).

Ref.	Detail required	Requirement met/included
	■ Plans demonstrating the phasing of drainage infrastructure (in keeping with wider development phasing proposals, demonstrating how flood risks and drainage will be managed throughout and on completion of the development.	



Appendix 4 - Drainage Strategy

Drainage Strategy Plan

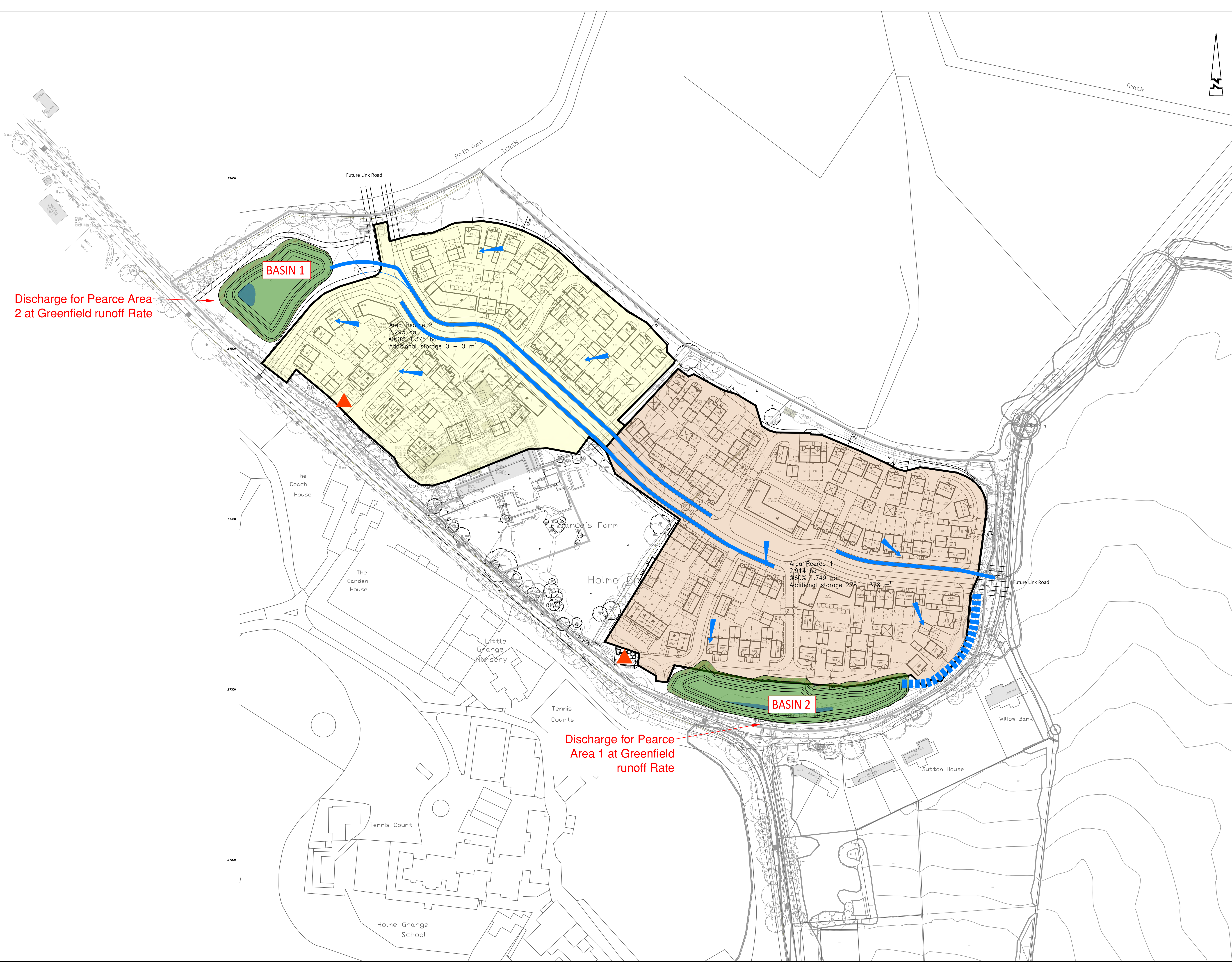
Greenfield Runoff Rates

Long Term Storage Calculations

Per Hectare Storage Calculations

Storage Calculator

Thames Water Sewer Capacity Letter



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NOTES:

1. Do not scale.
2. Refer to all other Project Drawings and supporting notes.
3. All levels are in meters above Ordinance Datum.
4. Surface Water Strategy is indicative and based on masterplanning information at the time of production.
5. All Surface Water Calculations were Undertaken Using Causeway Flow Drainage Software and are subject to detailed design.
6. All Outfalls have been visually determined during site walkover and are assumed viable to be utilized as surface water outfalls.

Return Period	Flow (l/s/ha)
1 in 2	3.37
1 in 10	3.29
1 in 30	8.91
1 in 100	12.56

Longterm Storage	Rate	Volume
Basin 1	216 l/s/ha	42.4 m ³ /ha
Basin 2	216 l/s/ha	42.4 m ³ /ha

Basin	Calculated storage required (m ³)	Estimated storage required (m ³)
Basin 1	1000 m ³	1000 m ³
Basin 2	1000 m ³	1000 m ³

- Key:
- Application Boundary
 - Flood Zone 2
 - Flood Zone 3
 - Proposed Drainage
 - Basin
 - Flow Arrow
 - Basin 1 Catchment
 - Basin 2 Catchment
 - Potential Foul Pump Station Location

P2	07/24	DISCHARGE POINTS ADDED	LC	JS
P1	12/23	FIRST ISSUE	LC	JS
Rev	Date	Description	Drawn	Checked

ABLE LETCHFORD PARTNERSHIP
Consulting Engineers

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Hungerford, Berkshire RG17 0YT
www.alpce.co.uk Tel: 01488 684390

Client:

NICHOLAS KING HOMES

Project:

PRIORS FARM,
SOUTH WOKINGHAM SDL

Title:

PEARCE FARM DRAINAGE
CATCHMENT STRATEGY

Status:

FOR INFORMATION

Scale	Date	Drawn	Checked
1:1000 @ A1	DEC 2023	LC	JS
Drawing No	Revision		
A218-026	P2		

Calculated by:Jonathan Shuttleworth

Site name:Priors Farm

Site location:Wokingham

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:51.39600° N

Longitude:0.80342° W

Reference:721263223

Date:Oct 02 2023 12:25

Runoff estimation approach

FEH Statistical

Site characteristics

Total site area (ha):1

Methodology

Q_{MED} estimation method:Calculate from BFI and SAAR

BFI and SPR method:Specify BFI manually

HOST class:N/A

BFI / BFIHOST:0.389

Q_{MED} (l/s):

Q_{BAR} / Q_{MED} factor:1.14

Hydrological characteristics

	Default	Edited
SAAR (mm):	667	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 $SPR/SPRHOST \leq 0.3$?

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

Q_{BAR} (l/s):		3.87
1 in 1 year (l/s):		3.29
1 in 30 years (l/s):		8.91
1 in 100 year (l/s):		12.36
1 in 200 years (l/s):		14.49

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

Long Term Storage (LTS) Volume Calculation



Project No.	A218
Project Title	Priors Farm, Wokingham
Client	Lightwood Strategic

Calcs by	JS
Checked	SL
Date	11/12/2023
Revision	A

LTS calculation method based on equation 24.10 from CIRIA C753 - The SuDS Manual

Where;	Vol_{xs}	Extra runoff volume from a development site compared to the greenfield equivalent during the 100 yr 6		
	RD	Rainfall Depth	74.67 mm	(for 100 year 6 hour storm)
	A	Site Area	1.67 ha	(Exc. Large undeveloped areas)
		Impermeable Catchment	1 ha	
	PIMP	Percentage Impermeable	60 %	
	α	Proportion Impermeable to Network	1	
	Cv	Impermeable Runoff Coefficient	0.84	(0.84 Modified Rational Method)
		Permeable Catchment	0.67 ha	
		Permeable Catchment to Network	0.00	
	β	Proportion Perm to Network	0.00	
	SPR	Soil Proportion Runoff	0.47	(Based on data provided by HR Wallingford)

$$Vol_{xs} = \frac{RD}{100} \times A \times \left(\frac{PIMP}{100} \right) \times \left(\frac{\alpha}{1} \times \frac{Cv}{0.84} \right) + \left(1 - \frac{PIMP}{100} \right) \times \left(\frac{\beta}{1} \times \frac{SPR}{0.47} \right) - \frac{SPR}{0.47}$$

Volume_{xs} = 42.40 m³/ha

Design Settings

Rainfall Methodology	FEH-22	Maximum Time of Concentration (mins)	30.00	Preferred Cover Depth (m)	1.200
Return Period (years)	2	Maximum Rainfall (mm/hr)	550.0	Include Intermediate Ground	✓
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00	Enforce best practice design rules	✓
CV	1.000	Connection Type	Level Soffits		
Time of Entry (mins)	8.00	Minimum Backdrop Height (m)	0.200		

Nodes

Name	Area (ha)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
Per Ha LTS	1.000	100.000	1200	-60.353	378.274	1.500
Per Ha Storage QBar	1.000	100.000	1200	46.023	381.354	1.500

Simulation Settings

Rainfall Methodology	FEH-22	Skip Steady State	x	2 year (l/s)	3.3	100 year 360 minute (m ³)	328
Summer CV	1.000	Drain Down Time (mins)	240	30 year (l/s)	8.9		
Winter CV	1.000	Additional Storage (m ³ /ha)	0.0	100 year (l/s)	12.4		
Analysis Speed	Detailed	Check Discharge Rate(s)	✓	Check Discharge Volume	✓		

Storm Durations

60	180	360	600	960	2160	4320	7200	10080
120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	40	0	0	100	40	0	0
30	40	0	0				

Pre-development Discharge Rate

Site Makeup	Greenfield	Region	6	QMed	3.4
Greenfield Method	FEH	QBar/QMed conversion factor	1.136	QBar	3.9
Positively Drained Area (ha)	1.000	Growth Factor 2 year	0.88	Q 2 year (l/s)	3.4
SAAR (mm)	662	Growth Factor 30 year	2.30	Q 30 year (l/s)	8.9
Host	1	Growth Factor 100 year	3.19	Q 100 year (l/s)	12.4
BFIHost	0.389	Betterment (%)	0		

Pre-development Discharge Volume

Site Makeup	Greenfield	SPR	0.47	Storm Duration (mins)	360
Greenfield Method	FSR/FEH	CWI	99.556	Betterment (%)	0
Positively Drained Area (ha)	1.000	Return Period (years)	100	PR	0.457
Soil Index	1	Climate Change (%)	0	Runoff Volume (m³)	328

Node Per Ha Storage QBar Offline Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Loop to Node		Sump Available	✓
Invert Level (m)	98.500	Product Number	CTL-SHE-0094-3900-1000-3900
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	3.9	Min Node Diameter (mm)	1200

Node Per Ha LTS Offline Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Loop to Node		Sump Available	✓
Invert Level (m)	98.500	Product Number	CTL-SHE-0079-2000-0125-2000
Design Depth (m)	0.125	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node Per Ha LTS Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	98.900	Product Number	CTL-SHE-0096-4200-1100-4200
Design Depth (m)	1.100	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	4.2	Min Node Diameter (mm)	1200

Node Per Ha LTS Online Weir Control

Flap Valve	x	Invert Level (m)	99.400	Design Flow (l/s)	2.9	Discharge Coefficient	0.590
Replaces Downstream Link	✓	Design Depth (m)	0.100	Width (m)	0.050		

Node Per Ha Storage QBar Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	98.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	990.0	0.0	1.500	990.0	0.0

Node Per Ha LTS Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	98.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	890.0	0.0	1.500	890.0	0.0

Results for 2 year +40% CC Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	Per Ha LTS	690	98.880	0.380	24.8	338.7560	0.0000	OK

600 minute winter	Per Ha Storage QBar	570	98.823	0.323	28.6	320.5976	0.0000	OK
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Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
720 minute winter	Per Ha LTS	Hydro-Brake®	0.0	0.0
720 minute winter	Per Ha LTS	Weir	0.0	0.0
720 minute winter	Per Ha LTS	Hydro-Brake®	3.3	136.0
600 minute winter	Per Ha Storage QBar	Hydro-Brake®	3.9	148.6

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	Per Ha LTS	464	99.286	0.786	73.6	700.7449	0.0000	OK

720 minute winter	Per Ha Storage QBar	705	99.277	0.777	51.8	770.3555	0.0000	OK
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Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
480 minute winter	Per Ha LTS	Hydro-Brake®	4.2	117.4
480 minute winter	Per Ha LTS	Weir	0.0	0.0
480 minute winter	Per Ha LTS	Hydro-Brake®	4.7	151.0
720 minute winter	Per Ha Storage QBar	Hydro-Brake®	3.9	169.4

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	Per Ha LTS	464	99.487	0.987	91.5	879.6086	0.0000	OK

720 minute winter	Per Ha Storage QBar	720	99.482	0.982	64.1	973.6196	0.0000	OK
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Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
480 minute winter	Per Ha LTS	Hydro-Brake®	4.2	118.3
480 minute winter	Per Ha LTS	Weir	2.4	20.4
480 minute winter	Per Ha LTS	Hydro-Brake®	5.2	168.6
720 minute winter	Per Ha Storage QBar	Hydro-Brake®	3.9	184.5

Pearce 1	Parcel	Total Area (ha)	Hardstanding (ha)						
	1	2.9143	1.74858						
					Flow Rates	Qbar	3.87	6.7670046 l/s	
						LTS	2	3.49716 l/s	
						1 in 2	3.4	5.945172 l/s	
						1 in 30	8.9	15.562362 l/s	
						1 in 100	12.4	21.682392 l/s	
						LTS vol	42.4	74.139792 m ³	
	Total	2.9143	1.74858						
					Downstream Storage				
					Pond 2		1070 m ³		
					Total		1070 m ³		
	Estimated Storage Required								
	Using Long Term Storage			1556.2362 m ³					
	Using Qbar			1731.0942 m ³					
	Estimated Required Additional Storage								
	Using Long Term Storage			486.2362 m ³	or	278.074895 m ³ /ha			
	Using Qbar			661.0942 m ³	or	378.074895 m ³ /ha			

Pearce 2	Parcel	Total Area (ha)	Hardstanding (ha)						
	1	2.2925	1.3755		Flow Rates	Qbar	3.87	5.323185 l/s	
						LTS	2	2.751 l/s	
						1 in 2	3.4	4.6767 l/s	
						1 in 30	8.9	12.24195 l/s	
						1 in 100	12.4	17.0562 l/s	
						LTS vol	42.4	58.3212 m ³	
	Total	2.2925	1.3755						
					Downstream Storage				
					Pond 2		1370 m ³		
					Total		1370 m ³		
	Estimated Storage Required								
	Using Long Term Storage		1224.195 m ³						
	Using Qbar		1361.745 m ³						
	Estimated Required Additional Storage								
	Using Long Term Storage		0 m ³	or		0 m ³ /ha			
	Using Qbar		0 m ³	or		0 m ³ /ha			



Jonathan Shuttleworth

Abley Letchford Partnership
3 Tealgate
Charnham Park
Hungerford
RG17 0YT



29th November 2023

Pre-planning enquiry: Capacity concerns

Site: Land to the East of Easthampton Road and West of Old Wokingham Road, Priors Farm, Wokingham, Berkshire, RG40 3BQ

Dear Jonathan

Thank you for providing the information on your proposal, the construction of 5250 general houses over a 10-year period. The preferred ultimate connection point would be to the Waste Treatment Works to the south, located at co-ordinates 484171, 166256. This would reduce pumping or eliminate the need for it entirely. A more complex alternative would be to utilise multiple pump stations to join the infrastructure located to the north passing through the railway line with the ultimate destination being the waste water treatment works located at co-ordinates 481346, 169950.

We have completed the assessment of the foul water flows based on the information submitted in your application with the purpose of assessing sewer capacity within the existing Thames Water sewer network.

Foul Water

We've assessed your **foul water** proposals and concluded from our initial review, that our sewerage network may not have sufficient capacity to meet your requirements.

In order to ensure we make the appropriate upgrades – or 'off-site reinforcement' – to serve your development, we'll need to carry out modelling work and, if required, design a solution and build the necessary improvements. This work is done at our cost. Once we've begun modelling, we may need to contact you to discuss changing the connection point for capacity reasons. Please note that we'll pay the cost of covering any extra distance if the connection needs to be made at a point further away than the nearest practicable point of at least the same diameter.

How long could modelling and reinforcement take?

Typical timescales for a development of your size are:

Modelling: 8 months

Design: 6 months

Construction: 6 months

Total: 20 months

If the time you're likely to take from planning and construction through to first occupancy is longer than this, we'll be able to carry out the necessary upgrades in time for your development. If it's shorter, please contact me on the number below to discuss the timing of our activities.

What do you need to tell us before we start modelling?

We're responsible for funding any modelling and reinforcement work. We need, though, to spend our customers' money wisely, so we'll only carry out modelling once we're confident that your development will proceed.

To have this confidence, we'll need to know that you **own the land and have either outline or full planning permission. The proposed build programme will also be useful.** Please provide this information to us as soon as you have it.

If the modelling shows we need to carry out reinforcement work, then before we start construction, we'll need you to supply us with notification that you've confirmed your F10 – Notification of construction project - submission to the Health and Safety Executive.

Surface Water

Where disposal of surface water is other than to a public sewer, the applicant shall ensure that approval for the discharge has been obtained from the appropriate authorities.

Please Note

All connection requests are subject to a full Section 106 (Water Industry Act 1991) application before the Company can confirm approval to the connection itself. Please also note that capacity in the public sewerage system cannot be reserved. Please make sure you submit your connection application giving us at least 21 days' notice of the date you wish to make your new connection/s.

The discharge of non-domestic is not permitted until a consent has been issued by Thames Water. If anything, other than domestic sewage is discharged into the public sewers without the above agreement an offence is committed, and the applicant will be liable to the penalties contained in Section 109(1) (WIA 1991).

If discharge of effluent from trade processes is sort applicants should contact Trade Effluent prior to seeking a connection approval, to discuss trade effluent consent and conditions of discharge. For Trade Effluent queries and to apply for Discharge Consents please call 0203 577 9200 or email trade.effluent@thameswater.co.uk.

The views expressed by Thames Water in this letter are in response to this pre-development enquiry at this time and do not represent our final views on any future planning applications made in relation to this site.

Regards

Steve Knight

Developer Services – Adoptions Engineer

0800 009 3921 – Help Desk

Transport
Development Planning
Sustainable
Deliver
Trusted
Enable
Site Appraisal
Hydrology
Highways
Civil Engineering
Successful
Travel Planning
Support
Drainage
Dynamic
Masterplanning
Flood Risk Assessment
Infrastructure Design

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