

BYWAY 30 APPLICATION

FLOOD RISK ASSESSMENT AND DRAINAGE STRATEGY

NICHOLAS KING HOMES PLC & LIGHTWOOD STRATEGIC LTD

01 JULY 2024



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1.0 Introduction

Context

- 1.1. This Flood Risk Assessment (FRA) has been prepared by Abley Letchford Partnership Ltd (ALP), on behalf of Nicholas King Homes PLC and Lightwood Strategic Ltd to support an Outline planning application relating to the proposed Byway 30 crossing arrangement relating to a proposed link road connecting the eastern and western parcels of the South Wokingham Master Planning Area extension that crosses the byway which is open to all traffic.

Development Proposals

- 1.2. This FRA relates to a proposed Byway crossing arrangement relating to a proposed Link Road connecting the Eastern and Western parcels of the SDL Extension that crosses the Byway Open to all traffic (WOKW30).

Requirement for a Flood Risk Assessment

- 1.3. The requirement for a FRA is set out in Section 14 of the revised National Planning Policy Framework (NPPF) as revised in December 2023.
- 1.4. The footnote accompanying Paragraph 172 states:

‘A site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use..’
- 1.5. The site is a greenfield site that comprises established hedges and tree lined boundaries. The area of the site is approximately 0.2 hectares. As the site area extends greater than 1 hectare, a site-specific flood risk assessment is required. To comply with the requirements of the NPPF, matters related to flood risk and drainage are addressed within this report.

Report Aim and Formation

- 1.6. The principal aims of this report are to demonstrate that the proposed development complies with national and local planning policy in respect to flood risk and to demonstrate that a suitable drainage strategy can be provided as part of development.
- 1.7. This report will also summarise the impacts the development could have on flood risk to the surrounding area and outlines the mitigation strategies that will be implemented to minimise this risk.

Report Structure

- 1.8. This report addresses the requirements of revised NPPF and considers the following aspects:



- Section 2: Policy and Sources of Information – a review of policy relevant to the assessment and sources of information used to inform the assessment.
- Section 3: Site Setting – a description of the site location, topography, geology and hydrology.
- Section 4: Overview of Flood Risk – a review of data for flooding from all sources to determine the baseline flood risk to the site and an assessment of the impacts of the development on flood risk.
- Section 5: Sequential Test and Exception Test – a description of the proposed development and a classification of the vulnerability in the context of the Sequential Test and Exception Test.
- Section 6: Flood Risk Mitigation – the mitigation measures implemented to manage the potential flood risk to the development.
- Sections 7 and 8: Drainage Strategy – a summary of appropriate strategies to manage the surface water and foul water from the site in the post development scenario.
- Section 9: Conclusion – a summary of the development proposals in the context of site vulnerability and the requirements of the NPPF.

2.0 Policy and Sources of Information

Introduction

- 2.1. This chapter provides a review of policy relevant to the assessment and the available information on all sources of flood risk.

National Planning Policy

- 2.2. National Planning Policy in relation to Flood Risk is set out in Section 14 of the National Planning Policy Framework (NPPF) and Planning Practice Guidance (PPG) ID: 7 for Flood Risk and Coastal Change. Flood Risk is discussed in Paragraphs 165-175 of the NPPF.
- 2.3. Paragraphs 165-168 discuss the sequential approach. Paragraph 166 refers to a Strategic Flood Risk Assessment (SFRA) that would form the basis of applying the Sequential Test for local authorities to allocate development, whilst Paragraphs 168-169 relates to the Exception Test.
- 2.4. Paragraph 173 discusses the determination of planning applications stating:

‘When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood risk assessment. Development should only be allowed in areas at risk of flooding where, in light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

- a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;*
- b) the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;*
- c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;*
- d) any residual risk can be safely managed; and*
- e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.’*

Environment Agency

- 2.5. The Flood and Water Management Act (2010) provides the Environment Agency (EA) a strategic overview role for all forms of flooding and coastal erosion. They also have direct responsibility for the prevention, mitigation and remediation of flood damage for main rivers and coastal areas. The EA is a statutory consultee in relation to flood risk and planning dependent upon criteria.
- 2.6. The EA Standing Advice has been consulted and reviewed within this FRA.
- 2.7. The EA Flood Map for Planning, EA Long Term Flood Risk Mapping and the Catchment Data Explorer websites have been interrogated in respect to flood risk extents and sources.

Local Authorities

- 2.8. The site lies within the administrative area of Wokingham Borough Council (WBC). WBC is the Local Planning Authority (LPA) and the Lead Local Flood Authority (LLFA).
- 2.9. Planning guidance published by WBC regarding the flood risk was referred to in order to assess the methodology best suited to suit the local area. The following key documents were reviewed:
- WBC Core Strategy policy CP1 'Sustainable development' and CP3 'General Principles for Development' (adapted January 2010);
 - WBC Local Flood Risk Management Strategy (dated April 2015);
 - WBC Preliminary Flood Risk Assessment (PRFA) (dated June 2011) and PFRA addendum (dated 2017);
 - WBC Level 1 Strategic Flood Risk Assessment (SFRA) (dated May 2023 and published in May 2024); and
 - WBC Level 2 SFRA (dated August 2023 and published in May 2024).
- 2.10. WBC became the LLFA under the Flood and Water Management Act 2010. WBC provide guidance to assess, manage and inform flood risk.
- 2.11. WBC has permissive rights over any Ordinary Watercourses including land drainage ditches. If any work is required within the watercourse (improvements or crossings) then approval from the LLFA is required under the Flood and Water Management Act 1991.

Local Water Authority

- 2.12. South East Water (SEW) is responsible for the supply of clean water. Thames Water (TW) is responsible for the disposal of wastewater.
- 2.13. Information with regards to sewer and water main flooding is contained within the WBC Level 1 and Level 2 SFRA and has been reviewed as part of this FRA. All water companies have a statutory obligation to maintain a register of properties and areas which are at risk of flooding from the public sewerage system and is shown on the DG5 Flood Register.

Other Sources of Information

- 2.14. A desktop study of the site was carried out using the following websites to ascertain local features, hydrology and soil characteristics:
- DEFRA's Magic Map portal,
 - British Geological Survey (BGS) 'Geology of Britain' online viewer, and
 - Cranfield University 'Soilscapes' portal.
- 2.15. Site walkovers conducted during October 2020 allowed observation of existing topography, watercourses, and nearby drainage outfalls.

3.0 Site Setting

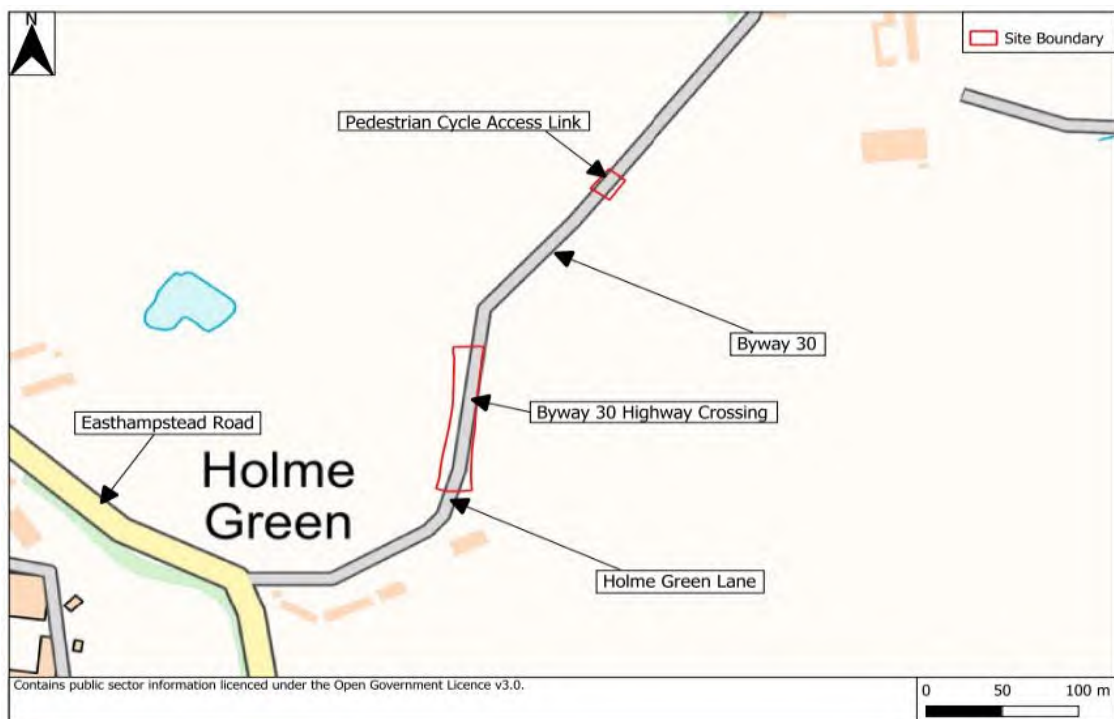
Introduction

- 3.1. This chapter provides a description of the site location, its topography, hydrological context, geology and hydrogeology.

Site Location

- 3.2. The site is located approximately 3km to the east of Wokingham. The nearest postcode is RG40 3BP. The site centre grid reference is: 483071E, 167402N. The site location is shown in Figure 1.

Figure 1 – Site Location

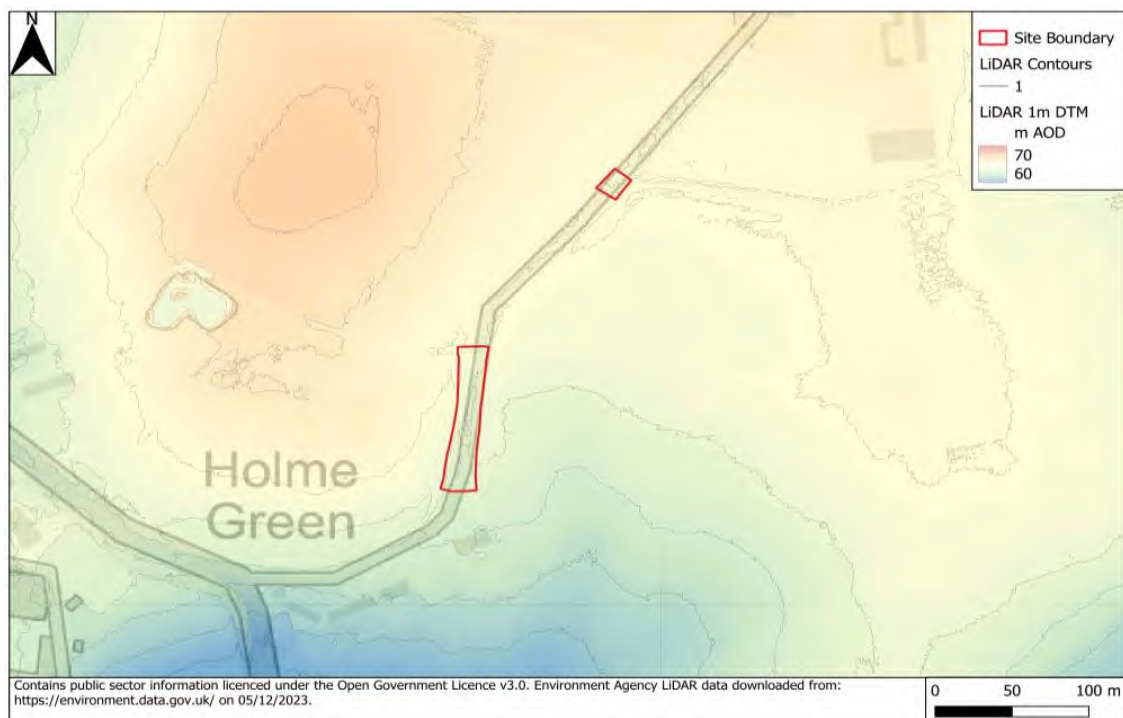


- 3.3. The Nicholas King Homes (NKH) Site is located to the west. The Lightwood Strategic (Lightwood) Site is located to the east. Agricultural fields are located to the north. The village of Holme Green is located to the south.
- 3.4. The site covers an area of approximately of 0.2ha.
- 3.5. The site consists predominantly of Holme Green Lane/ Byway 30. There is a drainage ditch to the east and west of the track. There are trees and hedges either side of the Holme Green Lane/ Byway 30.

Topography

- 3.6. Ground levels across the site are shown by LiDAR data in Figure 2.

Figure 2 – Site Topography



- 3.7. The LiDAR indicates that the ground levels across the site slope downwards from north to south. The elevations across the byway part of the Site are between 63.1m AOD and 65.0m AOD.
- 3.8. The pedestrian/ cycleway has ground levels between 64.5m AOD and 65.5m AOD.
- 3.9. A topographical survey of the Site has been carried out by MK Surveys dated July 2021. A copy of the topographical survey is included in Appendix 1. The detailed survey generally agrees with the LiDAR elevations across the Site. The topographical survey includes the drainage ditches to the east and west of Holme Green Lane/ Byway 30. It shows that the ditches are approximately 0.5m to 1m in deep and between 3m and 4m wide at top of bank.

Watercourses and Ditches

- 3.10. A review of the Ordnance Survey (OS) mapping did not identify any major watercourses with the Site. A review of the topographical survey identified a drainage ditch to both the west and east of Holme Green Lane/ Byway 30 which runs alongside the byway in a north and south direction. The location for the proposed pedestrian/cycleway is not shown on the topographical survey due to the limited coverage. It has been assumed that the drainage ditch continues along Holme Green Lane/ Byway 30. The drainage ditches flow in a southerly direction towards the drainage ditch to the north of Easthampstead Road.
- 3.11. The nearest watercourse is an Ordinary Watercourse which is a tributary of the Emm Brook. It is located approximately 260m to the south of the Site. Emm Brook is the nearest Main River. It is located approximately 540m to the southwest of the Site and flows in a north-easterly direction towards Wokingham.

Surface and Foul Water Sewers

- 3.12. Sewer Asset Records obtained from Thames Water do not indicate the presence of any surface or foul water sewers within the Site. The nearest public asset is a foul sewer located adjacent to the Easthampstead Sewage Treatment Works on Old Wokingham Road to the south-east of the site.
- 3.13. The risk of flooding from sewers is therefore considered to be low.
- 3.14. A copy of Thames Waters Asset Record is included within Appendix 1.

Geology and Hydrogeology

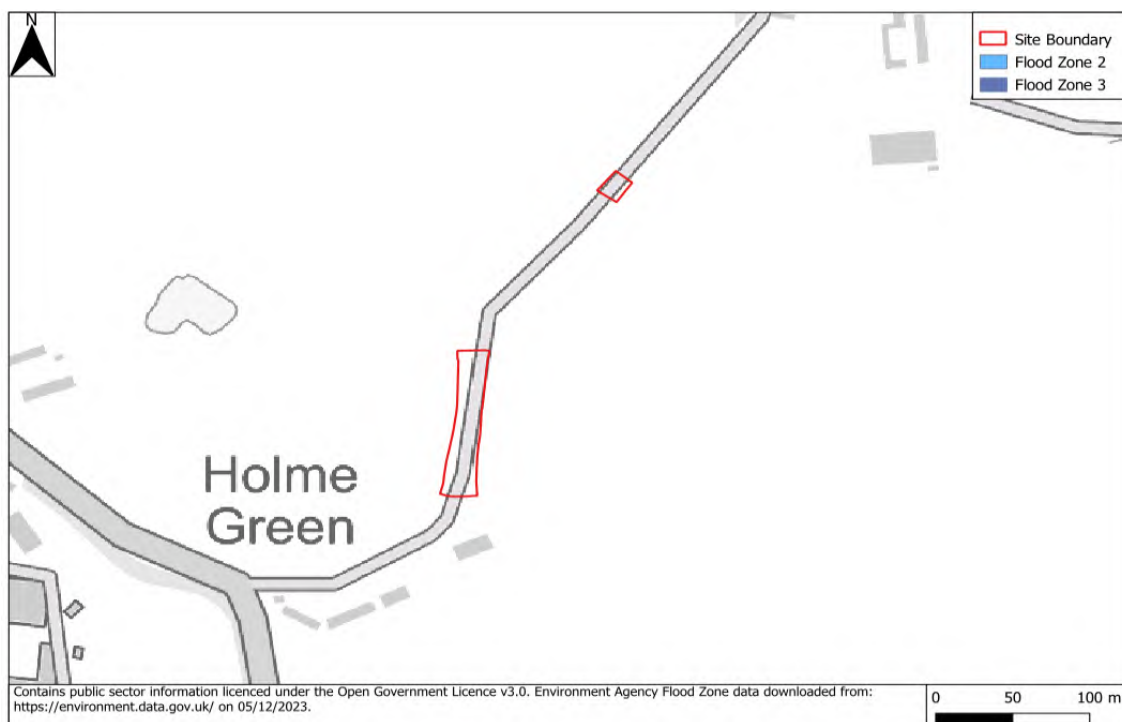
- 3.15. British Geological Survey (BGS) 'Geology of Britain' online viewer indicates that the geology underlying the site is London Clay Formation – Clay, silt and sand. There are superficial deposits to the north of the site of River Terrace Deposits 6 – Sand and gravel.
- 3.16. The Cranfield University 'Soilscapes' online viewer indicates the site overlies slowly permeable seasonally wet slightly acidic but base rich loamy and clayey soils.
- 3.17. The DEFRA Magic Map online viewer indicates that the site lies outside of any Groundwater Source Protection Zone (SPZ), or Principal Aquifer designation. The mapping indicates that the site is located within a Secondary A aquifer.
- 3.18. Minor secondary aquifers are associated with the underlying bedrock and superficial drift layers. These rocks can provide modest amounts of water, but the nature of the rock or the aquifer's structure limits their use. They support water supplies at local rather than strategic scale.

4.0 Overview of Flood Risk

EA Flood Map for Planning

- 4.1. The EA Flood Map for Planning provides an initial indication of the extent of flood zones. This is refined by site-specific modelled flood levels and topographic survey. In the NPPF, Flood zones are defined as follows:
- Flood Zone 1 'Low Probability' – Land less than 1 in 1000 (0.1%) annual probability of river or sea flooding.
 - Flood Zone 2 'Medium Probability' – Land between 1 in 100 (1%) and 1 in 1000 (0.1%) annual probability of river flooding, or between 1 in 200 (0.5%) and 1 in 1000 (0.1%) annual probability of sea flooding.
 - Flood Zone 3 'High Probability' – Land at 1 in 100 (1%) or greater annual probability of river flooding, or 1 in 200 (0.5%) or greater annual probability of sea flooding.
- 4.2. Figure 3 shows the EA flood zone mapping. It confirms that the entire Site is located within Flood Zone 1 'Low Probability' of fluvial flooding.

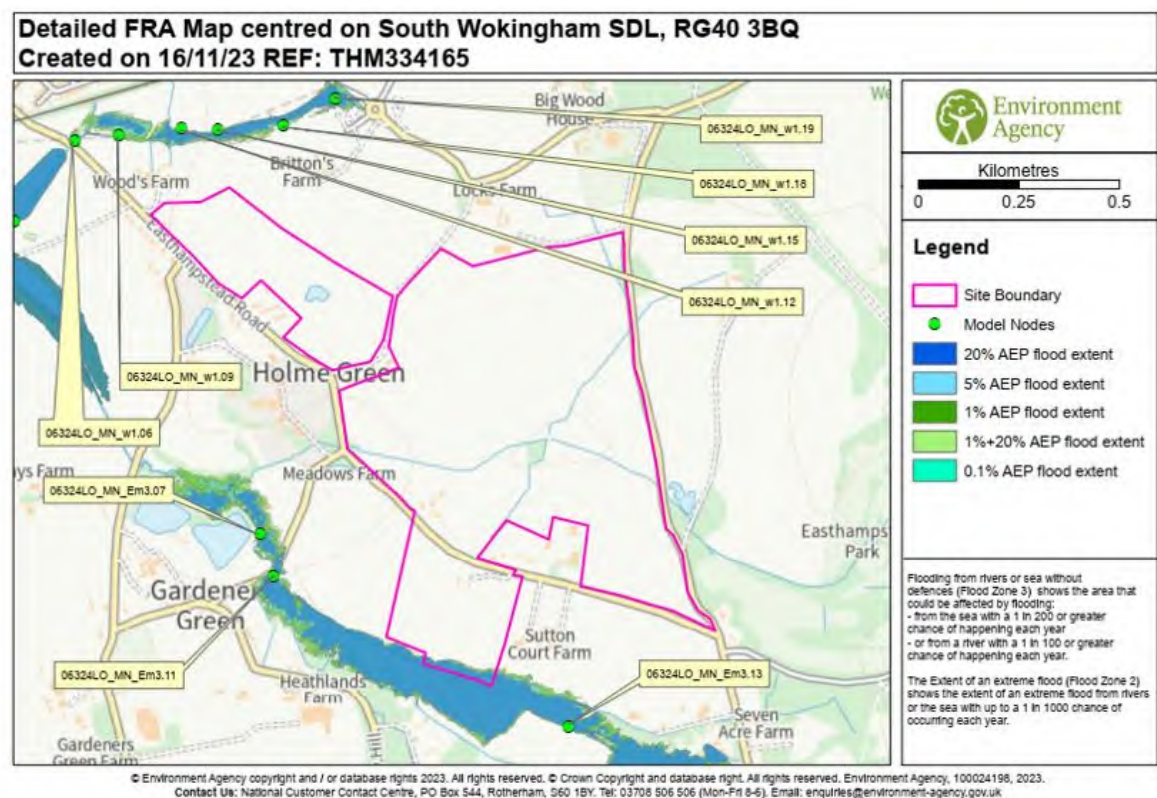
Figure 3 – EA Flood Map for Planning



Flood Risk from Fluvial Sources

- 4.3. The site is shown to be within Flood Zone 1 of the EA Flood Map for Planning. This indicates that the site is not affected by fluvial flooding in the 1 in 1000 annual probability scenario. These maps are based on strategic modelling and do not take into consideration site specific information.
- 4.4. The EA has provided modelled flood levels and extents for the Site as part of their Product 4 'Detailed Flood Risk Assessment Map' dataset (EA reference: THM334165). The modelled data is from the EA River Loddon (Lower) model, dated 2009.
- 4.5. Figure 4 shows an extract from the EA Product 4 dataset.

Figure 4 - EA Product 4 Extract – Detailed FRA Map

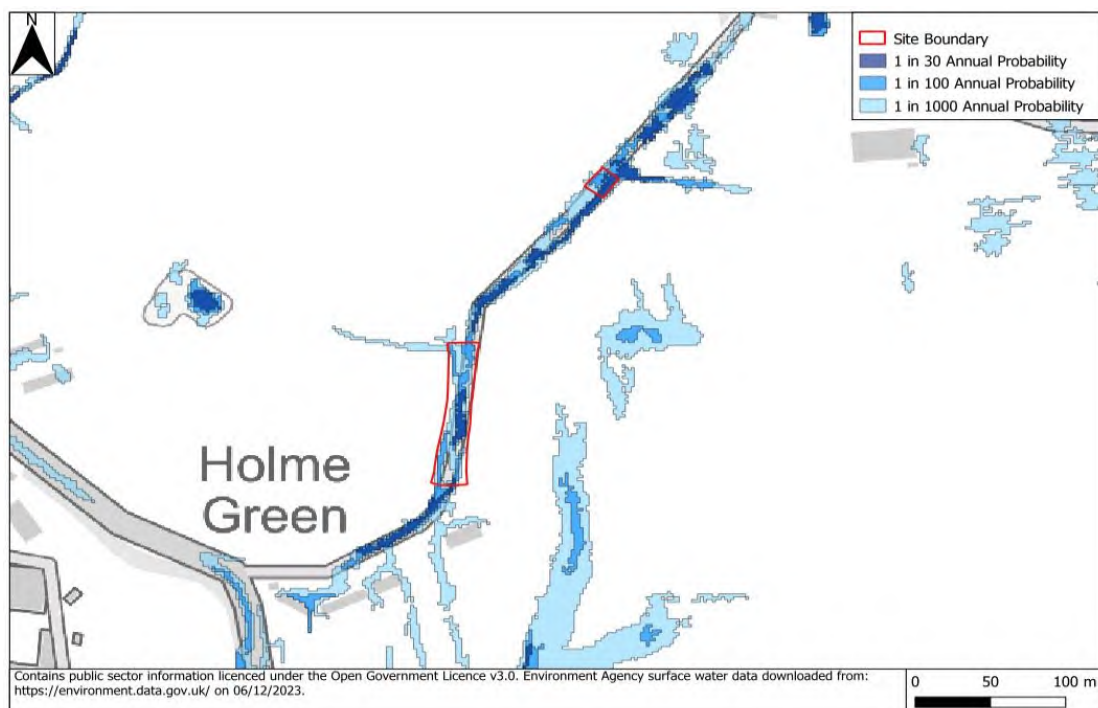


- 4.6. The mapping in Figure 4 confirms that the Site is located within Flood Zone 1.
- 4.7. The wider Site is allocated within the WBC local Plan, and is referred to as the South Wokingham Master Planning Area extension within the Level 2 WBC SFRA Appendix A.
- 4.8. The fluvial flood risk was assessed within the WBC Level 2 SFRA. The WBC Level 2 SFRA shows additional flooding to the north and north-west of the Site, that is not included within the EA Flood Map for Planning, nor Product 4 dataset. The additional flooding does not affect the Site for the byway application. The WBC Level 2 SFRA mapping confirms that the Site is located with Flood Zone 1.
- 4.9. The WBC Level 2 SFRA states 'in the absence of detailed hydraulic modelling, Flood Zones 2 and 3a have been taken from the Environment Agency's Flood Map for Planning.' As such the EA mapping has been taken as the best available data.

Flood Risk from Surface Water

- 4.10. The EA's Risk of Flooding from Surface Water mapping indicates areas that could be susceptible to surface water flooding during extreme rainfall events. The EA surface water mapping defines rainfall events based on the following:
- 1 in 30 (3.3%) annual probability 'High Risk'
 - 1 in 100 (1%) annual probability 'Medium Risk'
 - 1 in 1000 (0.1%) annual probability 'Low Risk'
 - Lower than 1 in 1000 (0.1%) annual probability 'Very Low Risk'.
- 4.11. The NPPF PPG – 'Flood Risk and Coastal Change' includes the 1 in 100 annual probability of surface water flood (including climate change) within the definition of the design flood event to be used to inform a FRA.
- 4.12. Figure 5 shows the flood risk from surface water. The EA Flood Risk from Surface Water mapping indicates that the site is at a 'Low' (0.1% annual probability) 'Medium' (1%) annual probability and 'High' (3.3%) annual probability for surface water flooding.

Figure 5 – EA Flood Risk from Surface Water



- 4.13. The EA surface water mapping is based on a national scale surface water ground surface model. The model does not consider any site-specific local information or below ground drainage infrastructure. The mapping therefore provides a guide to vulnerable areas based on the topography of the area and not a detailed assessment of surface water flooding for a specific site.



- 4.14. Figure 5 shows that the Site has areas of 'Low', 'Medium' and 'High' risk of surface water flooding along Holme Green Lane/ Byway 30. The Site has drainage ditches running either side of Holme Green Lane/ Byway 30. From a review of surveyed levels within the byway and the ditches, it appears that surface water will run off Holme Green Lane/ Byway 30 and flow into these drainage ditches.

Flood Risk from Groundwater

- 4.15. Groundwater flooding has the potential to occur after prolonged periods of unusually high rainfall. During such periods, more water than usual infiltrates through the ground, raising the water table above its normal depth below the surface. Where the water table is at a shallow depth in any case, the water table can reach the surface. This can cause groundwater to merge with rainfall and cause localised flooding.
- 4.16. The WBC Level 1 SFRA includes mapping of the areas susceptible to groundwater flooding. The groundwater mapping for the Site is included within Appendix A, Page D3. The Site is location in a 1km² grid square of which between 25% and 50% of the area is susceptible to groundwater flooding.
- 4.17. The WBC Level 1 SFRA includes mapping of the areas of groundwater emergence flooding which shows the depth below the ground surface. The mapping for the Site included within Appendix A, Page D3. The mapping does not indicate any potential groundwater emergence data for the site.
- 4.18. In assessing the site allocation, the WBC Level 2 SFRA suggests that an appropriate assessment of the groundwater regime may be required. If necessary, this can be completed at detailed design.

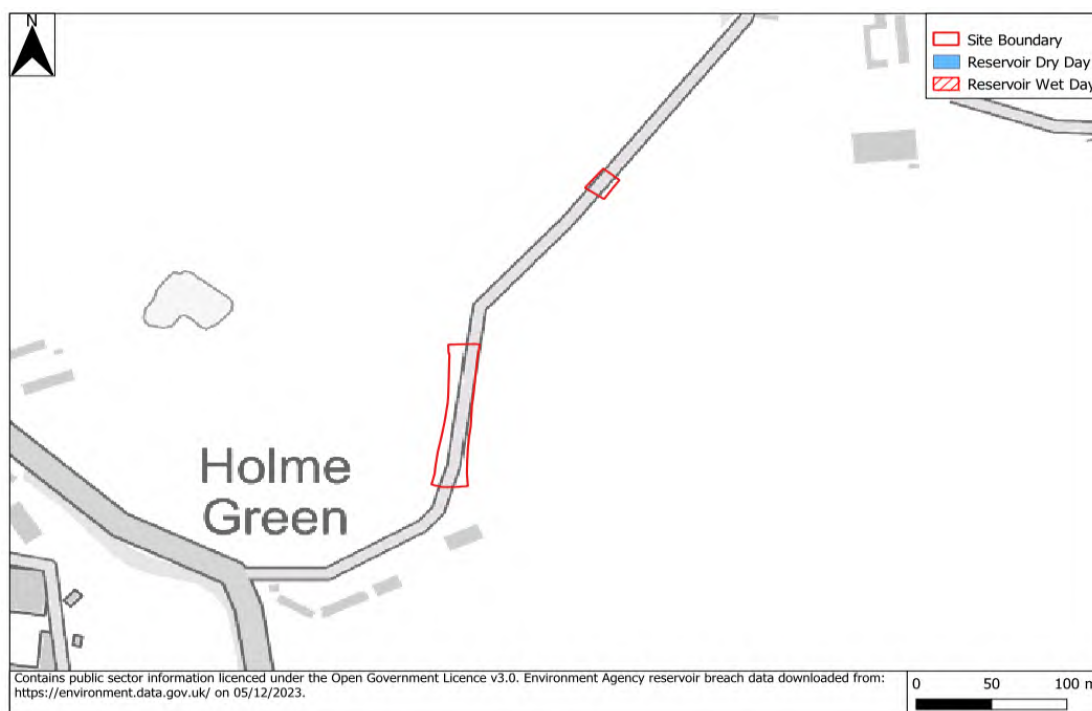
Flood Risk from Sewers

- 4.19. When exceeded, surcharged sewer networks can lead to flooding from backed up manholes and gully connections.
- 4.20. The Thames Water Asset Location Plans (reference 2018_3887954) show that there are no sewers within the Site boundary. A copy of the Thames Water Asset Location Plans is provided in Appendix 1.
- 4.21. The WBC Level 2 SFRA states that the Site *'is in a postcode area (RG40 3) with no recorded historic sewer flooding incidents, according to available incident records from Thames Water (from January 2000 up to 1 May 2022)'*.

Flood Risk from Reservoirs

- 4.22. Figure 6 shows the flood risk from reservoirs.

Figure 6 – EA Flood Risk from Reservoirs



- 4.23. The mapping indicates that the Site is not at risk of flooding in the event of a reservoir breach. The Site is therefore at low risk of flooding from reservoirs.

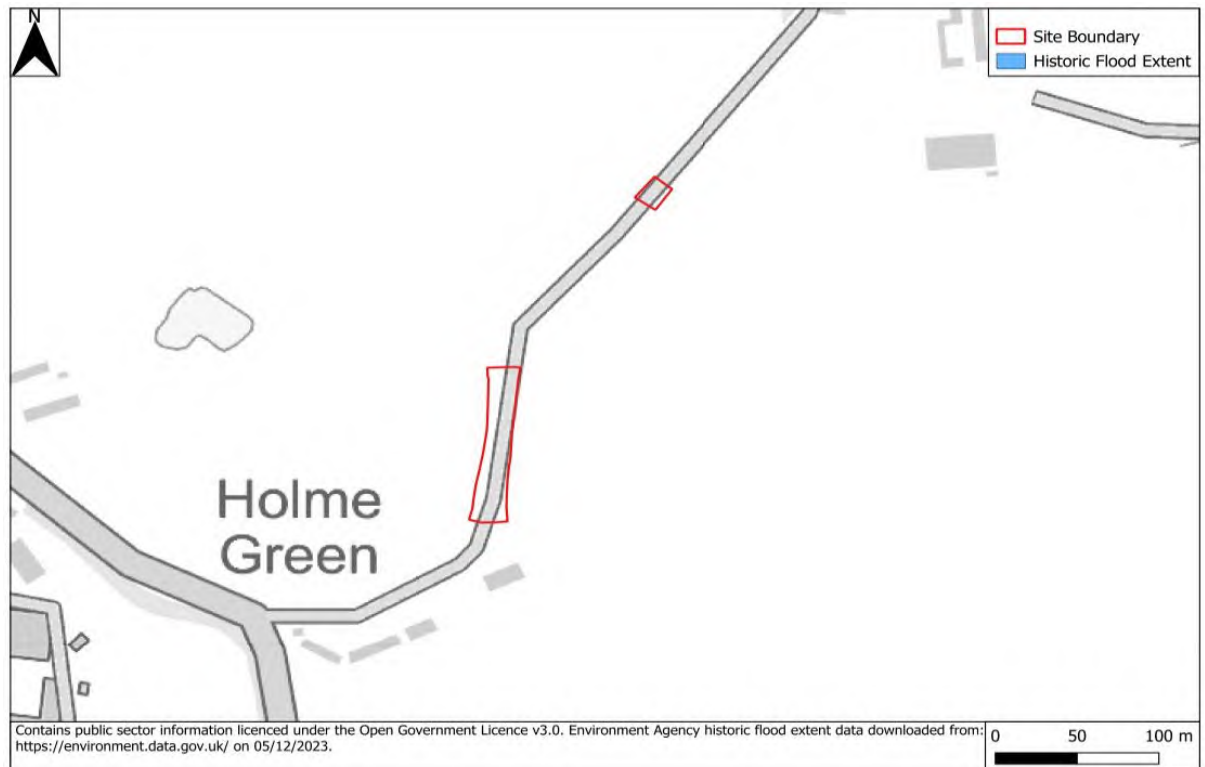
Flood Risk from Other Sources

- 4.24. The EA flood risk maps, WBC PFRA and WBC Level 1 and Level 2 SFRA indicate that the site is not at risk of flooding from canals or other artificial sources.

Historic Flooding

- 4.25. Figure 7 shows the EA Historic Flood Map. The EA Historic Flood Map shows the maximum extent of recorded flood events.

Figure 7 - Historic Flood Extent



4.26. The Site is not shown to have been impacted by a historic flood event.

Flood Risk Summary

4.27. A summary of flooding from all sources is provided in Table 1.

Table 1 – Summary of Flood Risk

Source of Flooding	High	Medium	Low	Comments
Tidal			✓	The site is inland and not influenced by tidal levels.
Fluvial			✓	The entire Site is located within Flood Zone 1 according to all available data including the EA Flood Zone mapping, Product 4 data and the WBC Level 1 and Level 2 SFRA.
Pluvial		✓		The EA Risk of Flooding from Surface Water mapping indicates that the Site is at a 'Low' 'Medium' and 'High' risk of flooding from surface water. It is likely that surface water flow from Holme Green Lane/ Byway 30 would flow into the drainage ditches running alongside the byway.
Groundwater			✓	The risk of groundwater flooding is considered to be low.
Sewers			✓	The Thames Water sewer maps indicate that there are no sewers within the Site boundary and no available data suggests there is a potential for sewer flooding.
Reservoirs, canals and other artificial sources			✓	EA and WBC SFRA Level 1 mapping do not indicate the site to be at risk of flooding from other sources.

- 4.28. The Site is deemed to be at low risk of flooding once an appropriate strategy for managing the surface water runoff within the byway and its ditches is implemented.



5.0 Sequential Test and Exception Test

NPPF Sequential Test

- 5.1. NPPF states that Local Planning Authorities allocating land for development should apply the Sequential Test to demonstrate that there are no reasonably available sites in areas with a lower probability of flooding that would be appropriate to the type of development or land use proposed.
- 5.2. However paragraph 174 of NPPF also states that applications for some minor development and changes of use should not be subject to the sequential or exception tests but should still meet the requirements for site-specific flood risk assessments.
- 5.3. Given the nature of the proposed works paragraph 174 is deemed to be applicable and the Sequential Test and the Exception Test are not required.



6.0 Flood Mitigation Strategy

Sequential Approach

- 6.1. The NPPF encourages a 'sequential approach' in master planning for new development: locating the more vulnerable uses of the development in the areas of lowest flood risk from all sources.
- 6.2. For this site the sequential approach is not applicable, given the nature of the proposed works.

Floodplain Storage

- 6.3. The Site is located outside of the fluvial flood extent.
- 6.4. The byway crossing and pedestrian/cycleway crossing will be designed so that there is no detrimental impact on floodplain storage. At detailed design a further analysis of the flow in the ditches and their capacity will be undertaken and this will inform the design of the crossing, the culverts and any associated ditch channel works. It is unlikely that floodplain storage will be affected as the issue is more of conveyance of surface water flow at this location.

Residual Risk

- 6.5. The NPPF PPG – 'Flood Risk and Coastal Change' defined residual risk as coming from 'flood risk management infrastructure' and the 'residual risk' to a development once any site-specific flood mitigation measures are taken into account'.
- 6.6. Residual risk to the Site includes a breach in the raised flood defences, the failure of a reservoir and a flood event greater than the designed standards.
- 6.7. The EA AIMS dataset, which contains information of flood defences, indicates that the Site does not benefit from raised flood defences. The EA mapping for reservoir breaches indicates that the Site is not located within an area at risk of flooding in the event of a reservoir. The Site is located outside of the 1 in 1000 annual probability flood extent.
- 6.8. The residual risk to the Site is therefore low.

WBC Requirements

6.9. The WBC Level 2 SFRA has considered this Site (South Wokingham Master Planning Area extension) and sets out key criteria to be addressed as part of any development of the Site. These are summarised in Table 2.

6.10. **Table 2 – WBC Level 2 SFRA Key Message for The South Wokingham Master Planning Area Extension.**

WBC Level 2 SFRA Guidance	Summary of Mitigation Measures
The developer will need to show, through an FRA, that future users of the development will not be placed in danger from flood hazards throughout its lifetime. It is for the applicant to show that the development meets the objectives of the NPPF's policy on flood risk. For example, how the operation of any mitigation measures can be safeguarded and maintained effectively through the lifetime of the development, (Para 048 Flood Risk and Coastal Change PPG).	This FRA has been completed and presents a development strategy in accordance with WBC guidelines following data sourced from the WBC PFRA, WBC Level 1 and Level 2 SFRA, alongside using the EA Flood Risk Maps. The Site is entirely located within Flood Zone 1. There will be no development within the fluvial flood extent. The Site has a 'Low', 'Medium' and 'High' risk of surface water flooding. The crossings of the drainage ditches will be designed to ensure that the flow routes are maintained through appropriately sized culverts.
The risk from surface water flow routes should be quantified as part of a site-specific FRA, including a drainage strategy, so runoff magnitudes from the development are not increased by development across any ephemeral surface water flow routes. A drainage strategy should help inform site layout and design to ensure runoff rates areas close as possible to pre-development greenfield rates.	There is a surface water flow route along Holme Green Lane/ Byway 30. It is likely that the surface water flow will flow into the drainage ditches to the east and west of Holme Green Lane/ Byway 30. The crossings of the drainage ditches will be designed to ensure that the flow routes are maintained through appropriately sized culverts.
Arrangements for safe access and egress will need to be provided for the 1% AEP fluvial and rainfall events with an appropriate allowance for climate change, considering depth, velocity, and hazard. Design and access arrangements will need to incorporate measures, so development and occupants are safe.	The Site is located entirely within Flood Zone 1. The proposals are for a byway crossing and a pedestrian/cycleway crossing. No residential development is proposed therefore safe access is not required.
Provisions for safe access and egress should not impact on surface water flow routes or contribute to loss of floodplain storage. Consideration should be given to the siting of access points with respect to areas of surface water flood risk.	The proposals are for a byway crossing and a pedestrian/cycleway crossing. No residential development is proposed therefore safe access is not required.
Flood resilience and resistance measures should be implemented where appropriate during the construction phase, e.g. raising of floor levels and use of boundary walls. These measures should be assessed to make sure that flooding is not increased elsewhere.	The Site is located outside of the fluvial flood event. The culverts will be appropriately sized to accommodate any extra flow from raising the ground levels which will be designed at detail design.



7.0 Surface Water Drainage

Introduction

7.1. This chapter covers surface water drainage.

Overall Strategy

- 7.2. For the byway crossing arrangement there will be a minimal change to the impermeable area. The new road which connects the western development to the eastern development will have associated highways drainage that will collect any surface water run off from the Site. Levels across the carriageway and may be raised in some locations as part of the proposed works. As such the natural flow regime may be affected. The highway drainage strategy for the roads within the NKH and Lightwood sites will account for this.
- 7.3. The pedestrian/cycle access will have a negligible change in impermeable area given Holme Green Lane/ Byway 30 is currently not permeable. Therefore, there is no requirement to address the surface water drainage for this section of the Site.

8.0 Conclusion

Flood Risk

- 8.1. The EA Flood Risk mapping was reviewed alongside the Wokingham Borough Council (WBC) Preliminary Flood Risk Assessment (PFRA) and WBC Level 1 and Level 2 Strategic Flood Risk Assessment (SFRA).
- 8.2. This Flood Risk Assessment (FRA) concludes that:
- The entire site is located within Flood Zone 1 'Low Probability' (land at less than 1 in 1000 (0.1%) annual probability of river or sea flooding').
 - The Site is located in an area with a 'Low' (land between 1 in 100 and 1 in 1000 annual probability), 'Medium' (land between 1 in 30 and 1 in 100 annual probability) and 'High' (land greater than 1 in 30 annual probability) risk of flooding from surface water. The EA surface water mapping is based off a coarse dataset that doesn't account for site specific features. The drainage ditches that run along either side of Holme Green Lane/ Byway 30 are unlikely to be picked up within the mapping. Surface water flow going along Holme Green Lane/ Byway 30 would likely be picked up in these drainage ditches.
 - The risk of groundwater flooding is considered to be low.
 - The WBC Level 1 SFRA mapping indicates the potential susceptibility to groundwater flooding and also the expected depth to groundwater. In assessing the site allocation, the Level 2 SFRA suggests that an appropriate assessment of the groundwater regime may be required. If necessary this can be completed at detailed design.
 - There are no sewers within the Site boundary therefore the risk of flooding from sewers is considered to be at a low.
 - The site is not at risk of flooding in the event of a reservoir breach.
- 8.3. In summary the Site is at a low risk of flooding from all sources.

Sequential Test and Exception Test

- 8.4. In accordance with NPPF, the Sequential Test and Exception Test are not applicable to the proposed works.

Mitigation Strategy

- 8.5. In the design of the byway crossing the culverts will be sized appropriately to ensure the conveyance of the surface water flow route within the drainage ditches adjacent to Holme Green Lane/ Byway 30.

Summary

- 8.6. This FRA demonstrates that the proposed development complies with national and local planning policy with respect to flood risk and drainage. The risk of flooding is adequately managed, and, with the implementation of a suitable surface water drainage strategy, the offsite flood risk is not increased.



Appendices

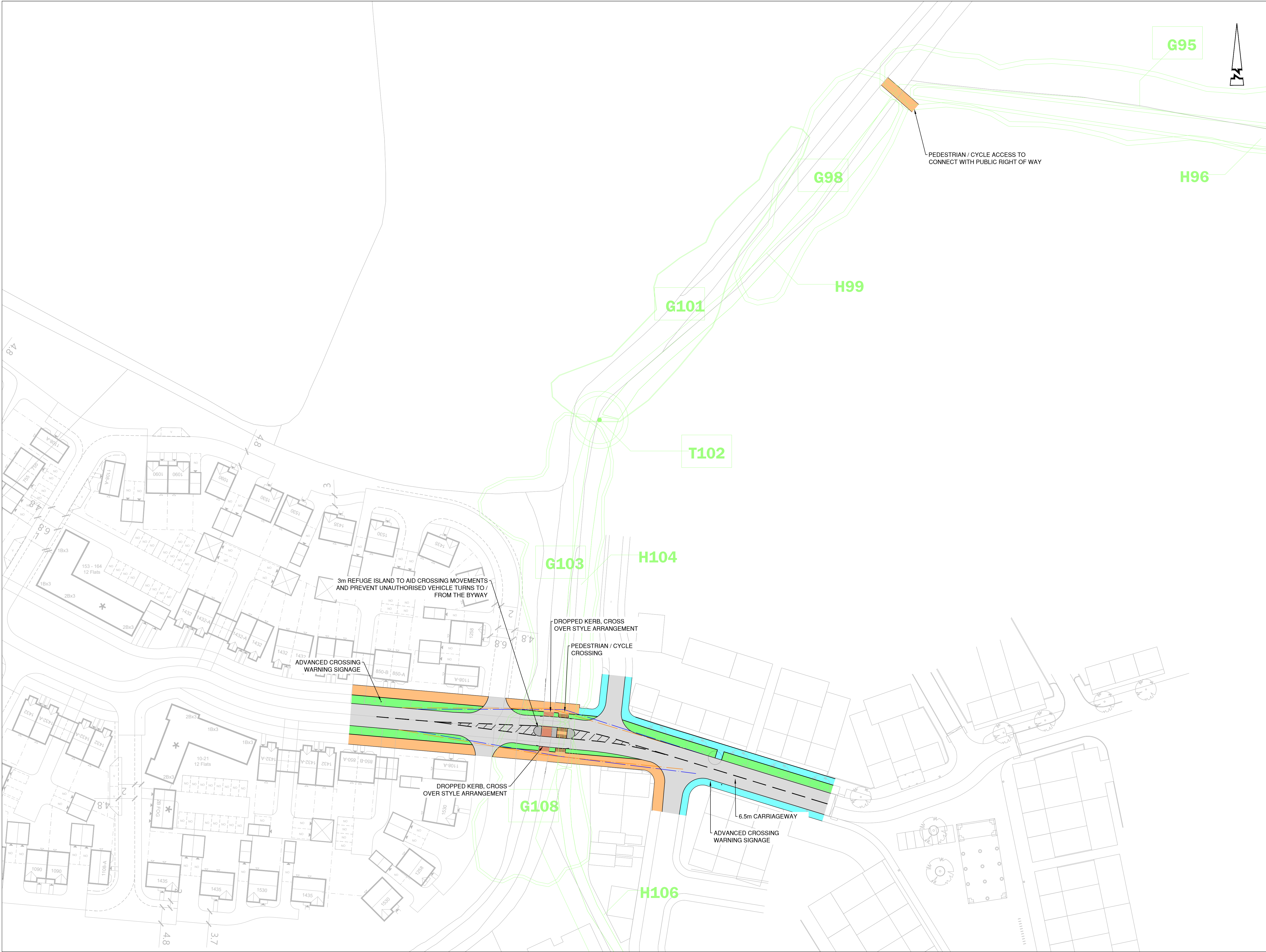


Appendix 1 - Plans

Site Construction Drawings

Topographic Survey

Thames Water Asset Plan



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KEY

- CARRIAGEWAY
- FOOTWAY / CYCLEWAY
- FOOTWAY
- VERGE
- BYWAY
- 2.4m X 43m VISIBILITY SPLAY

P3	01.24	CARRIAGEWAY REALIGNED	TDM	NB
P2	01.24	LIGHTWOOD DETAIL ADDED	TDM	NB
P1	01.24	FIRST ISSUE	TDM	NB
Rev	Date	Description	Drawn	Checked

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Client
**NICHOLAS KING
LIGHTWOOD STRATEGIC**

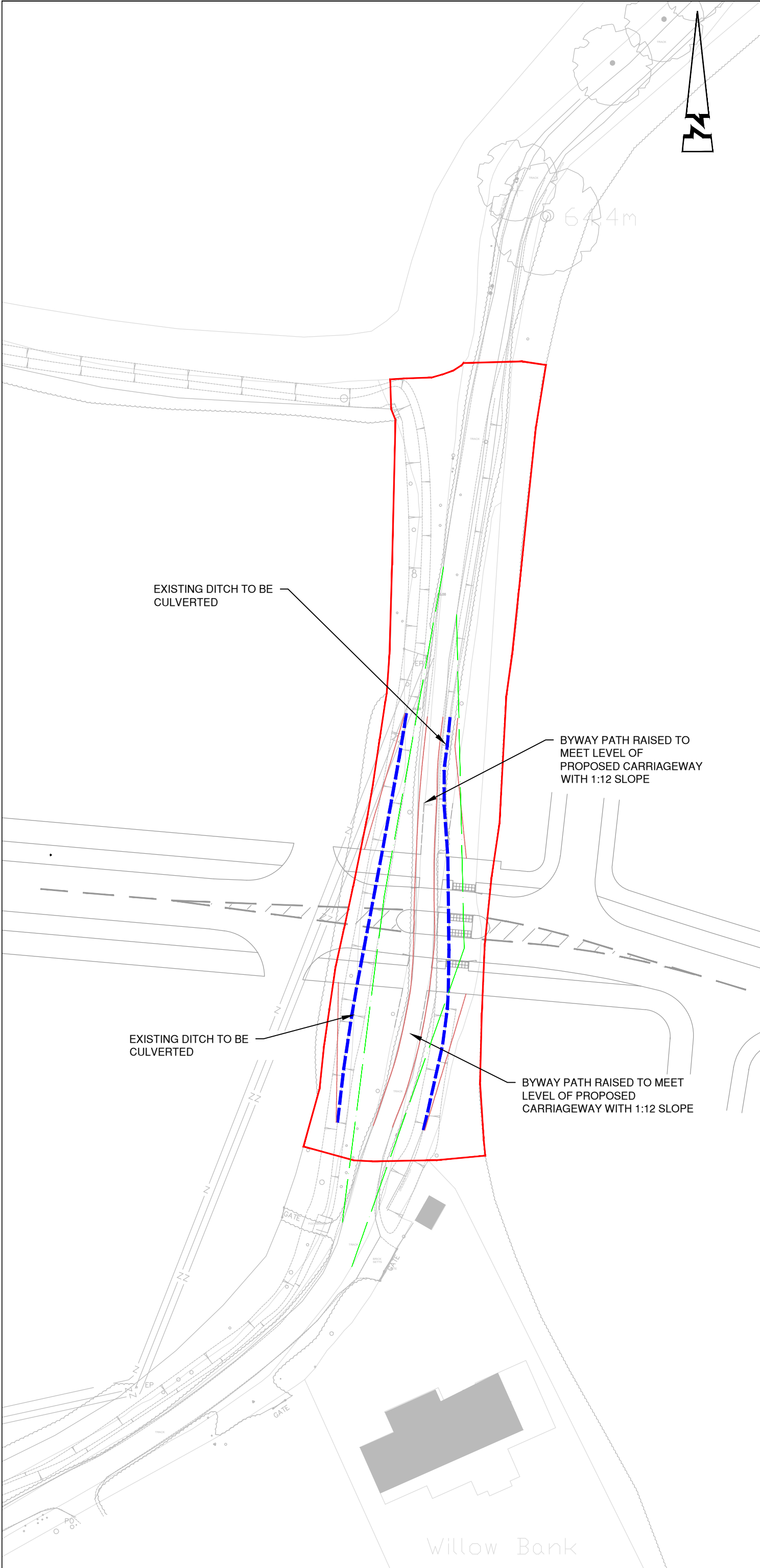
Project
**SOUTH WOKINGHAM
SDL EXTENSION**

Title
**PROPOSED BYWAY
CROSSING ARRANGEMENT**

Status
PRELIMINARY

Scale	Date	Drawn	Checked
1:500 @ A1	JAN 2024	TDM	NB

Drawing No	Revision
A218-029	P3



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KEY

- APPLICATION BOUNDARY
- CULVERT
- POTENTIAL EARTHWORKS
- 2.4m X 43m VISIBILITY SPLAY

P1	02.24	FIRST ISSUE	TDM	NB
Rev	Date	Description	Drawn	Checked



3 Tealgate, Charnham Park
Hungerford, Berkshire RG17 0YT
www.alpce.co.uk Tel: 01488 684390

Client
**NICHOLAS KING
LIGHTWOOD STRATEGIC**

Project
**SOUTH WOKINGHAM SDL
EXTENSION**

Title
**POTENTIAL WORKS ALONG
BYWAY CROSSING**

Status
PRELIMINARY

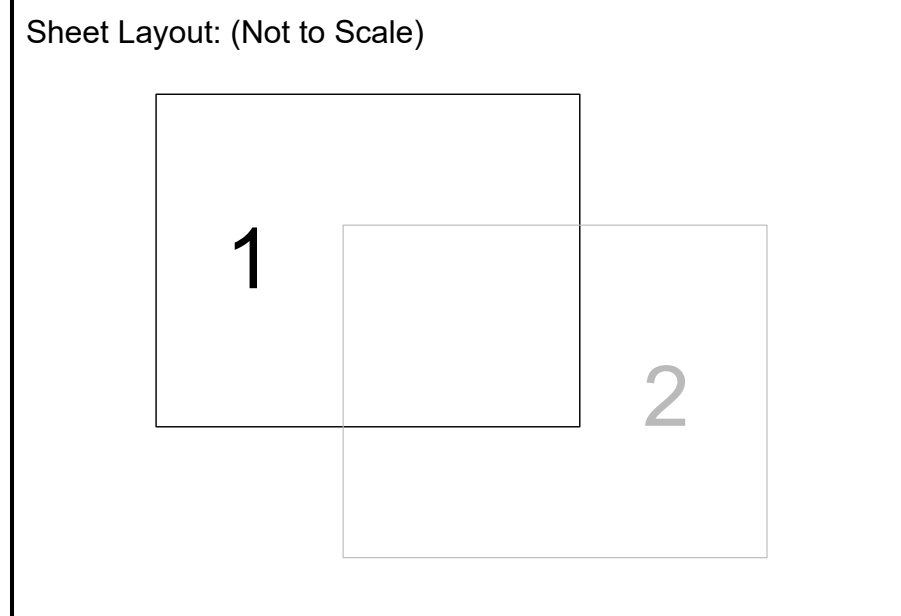
Scale 1:500 @ A3	Date FEB 2024	Drawn TDM	Checked NB
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Drawing No A218-037	Revision P1
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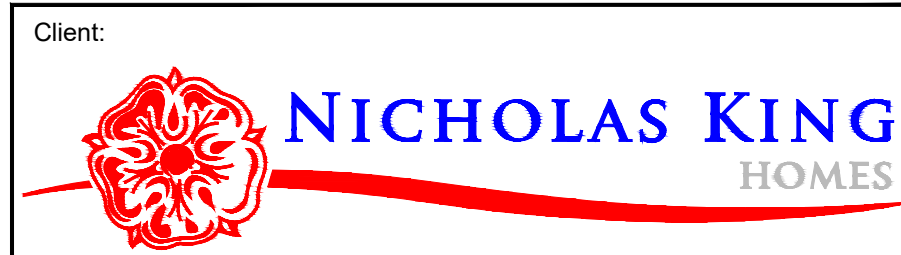
- Notes:
1. GRID AND LEVELS BASED ON ORDNANCE DATUM, DERIVED FROM THE NATIONAL OSNS NETWORK. LOCAL SCALE FACTOR 0.99996 APPLIED.
 2. DRAINAGE INFORMATION HAS BEEN DETERMINED WITHOUT MAN ENTRY INTO CHAMBERS AND WHILST EVERY EFFORT HAS BEEN MADE TO CORRECTLY IDENTIFY THIS INFORMATION, IT SHOULD ALWAYS 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 ASSUMED 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.

Coordinate Table				
Station	Description	Easting	Northing	Level
S6	ROAD NAIL	482750.516	167447.470	63.016
S9	ROAD NAIL	482744.966	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

TOPOGRAPHICAL KEY	
SURVEY STATION	5
BANKING	TOP BOTTOM
HEDGE SPREADS	WOODLAND CANOPY
ARROW ON STEPS / RAMP INDICATES DIRECTION UPWARDS	ARROW ON STEPS / RAMP INDICATES DIRECTION DOWNWARDS
TREES	WALL
GATE	OVERHEAD ELECTRIC
KERB CHANNEL	ROAD UNWEAR
FOOTPATH	CHANGE IN SURFACE
FENCE	OVERHEAD TELECOM
WALL	FOUL SEWER
OVERHEAD ELECTRIC	SURFACE SEWER
P-TRAP	BACK DROP (EXTERNAL)
OPEN SIDED BUILDING	GLASSHOUSE
GLASSHOUSE	CONTOUR
SNIP LEVEL	SONAR LEVEL
BORE HOLE	TRIAL HOLE
TRIAL HOLE	
FENCE ABBREVIATIONS	
BARBED WIRE FENCE	CLOSE BOARD FENCE
CONCRETE PANEL FENCE	POST AND RAIL FENCE
CORRUGATED IRON FENCE	CHAIN LINK FENCE
WIRE MESH FENCE	CHESTNUT PALING



Topographical Survey



Easthampstead Road
Wokingham
Berkshire
RG40 3BN

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





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

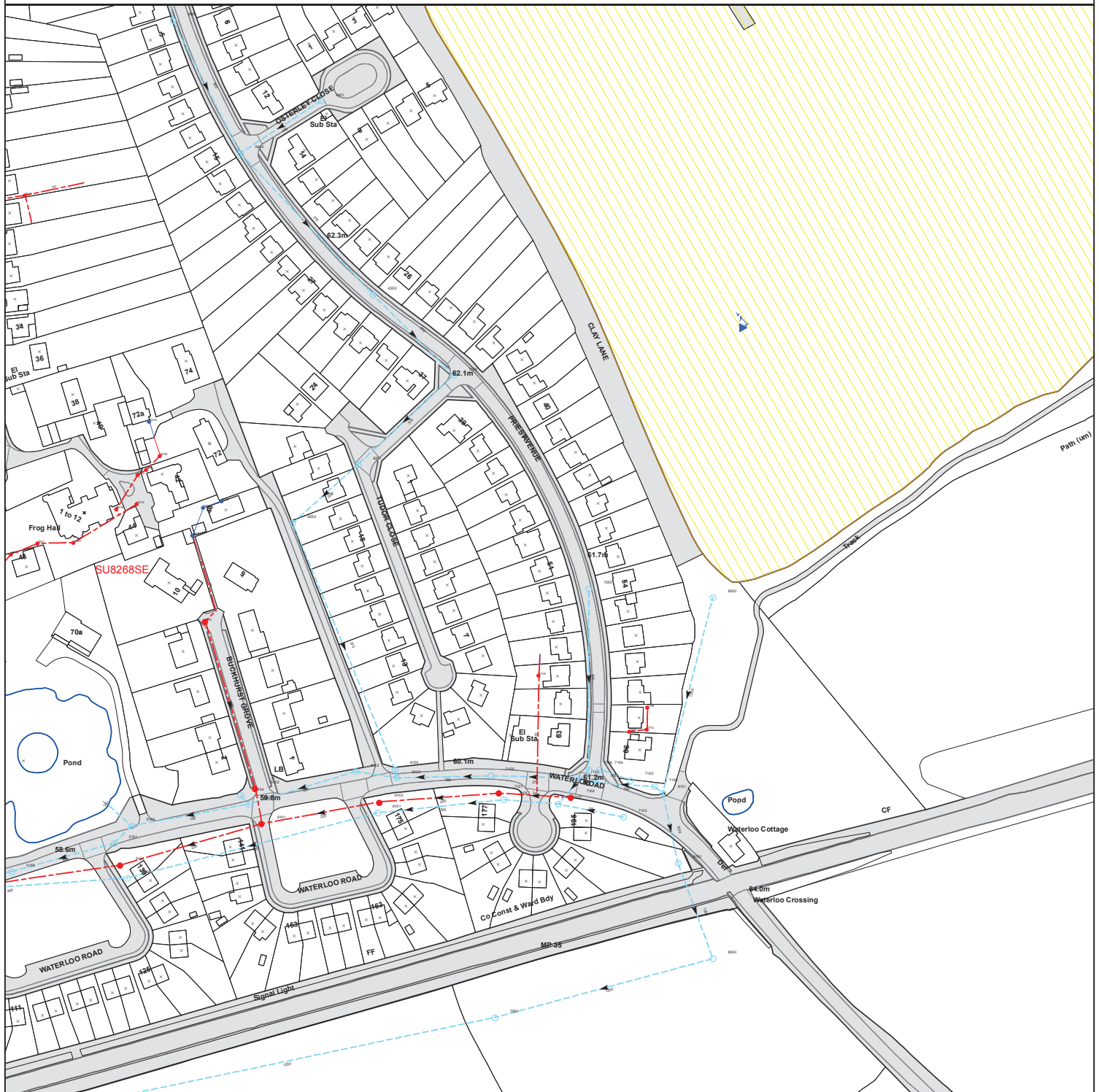
Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

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

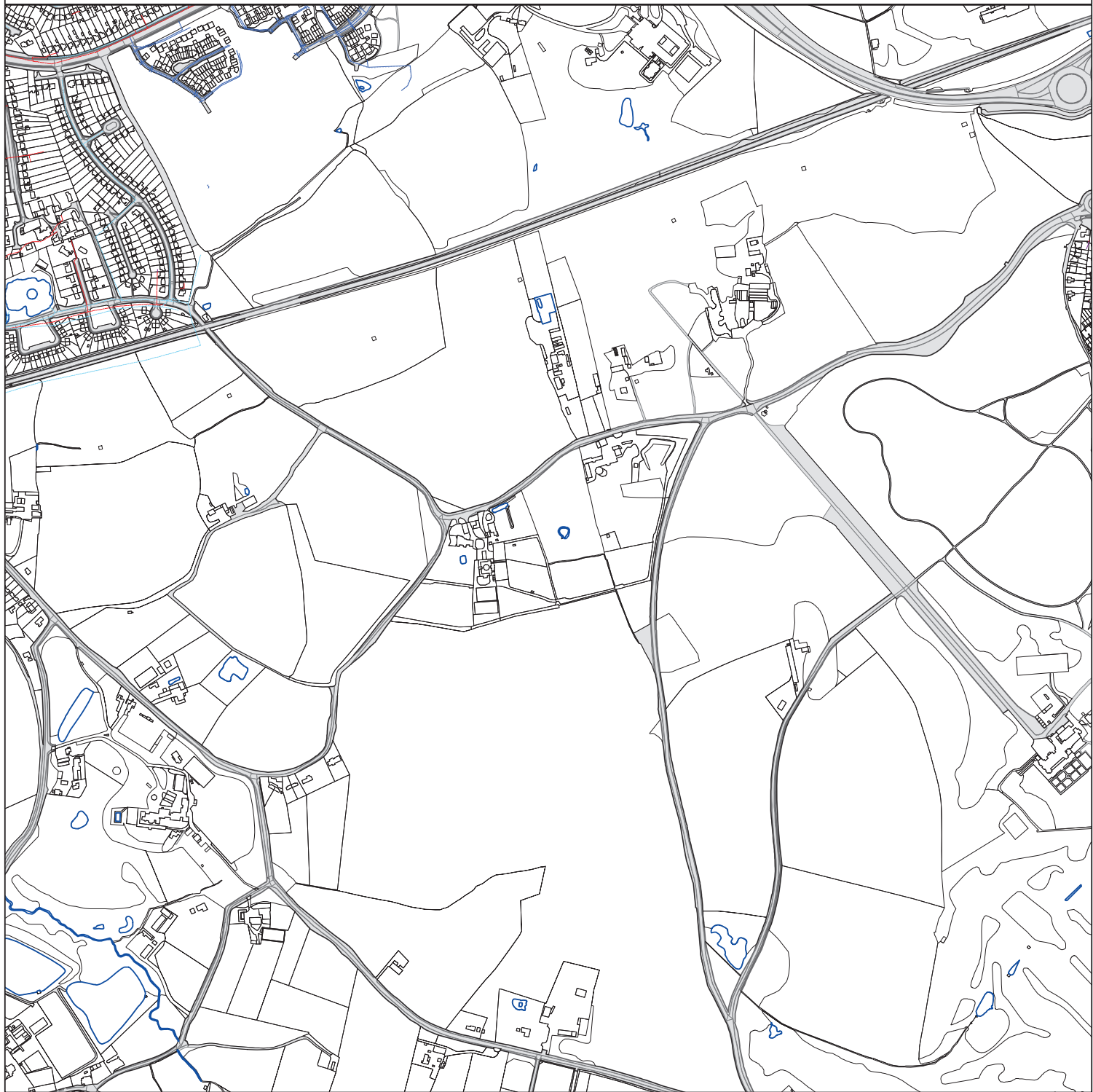
Comments:

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 Surface Water Sewer
	Gallery
	Foul Rising Main
	Surface Water Rising Main
	Sludge 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

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:

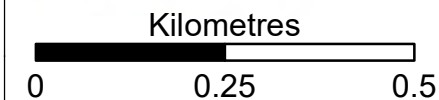
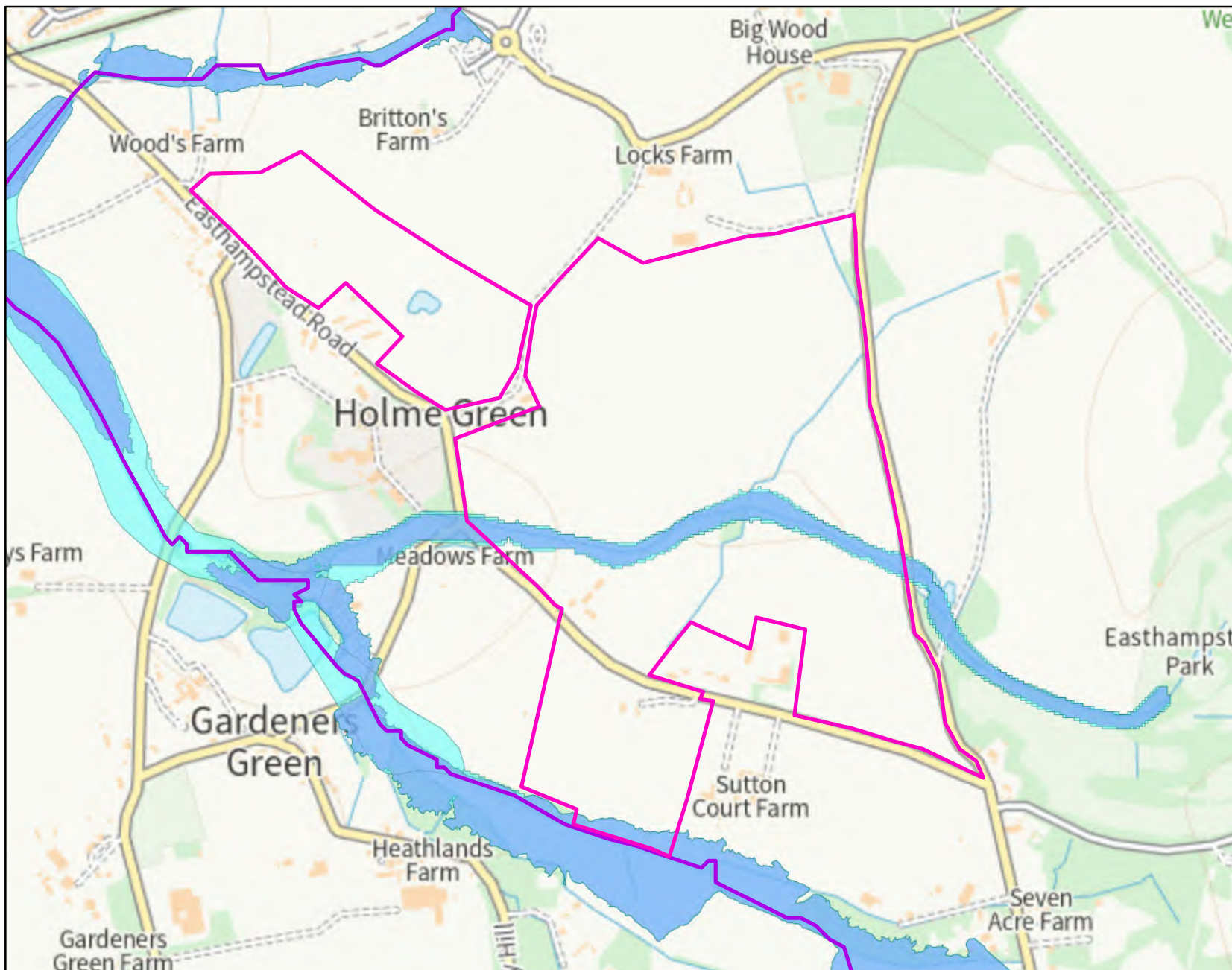
<https://www.gov.uk/guidance/flood-risk-assessment-local-planning-authorities>

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														

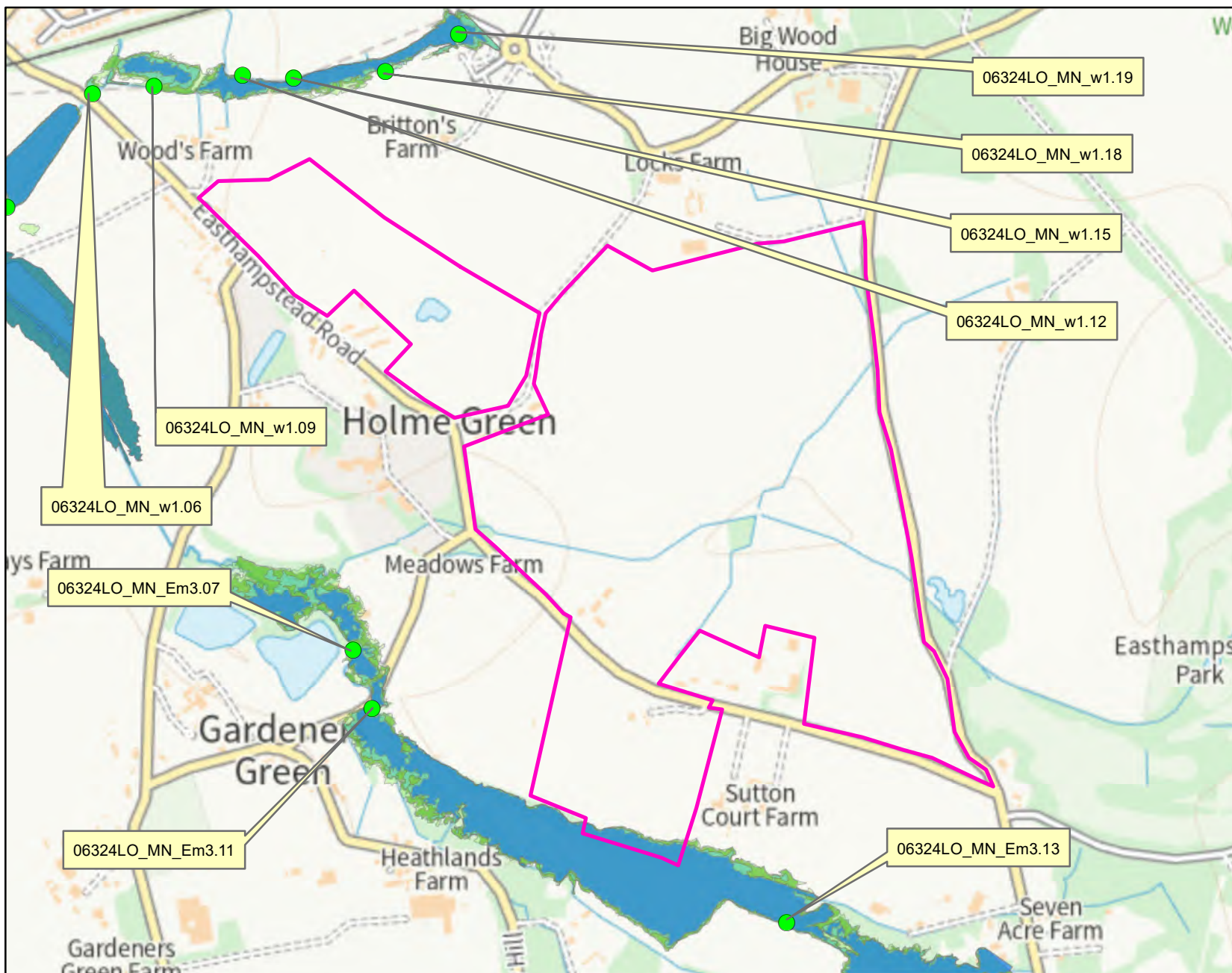
This flood model has represented the floodplain as a grid.
The flood water levels have been calculated for each grid cell.

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.

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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