



Flood Risk Assessment

Rivershill Yard, Worcester Park

NSS (Worcester Park) LLP

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Basis of Report

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1.0 Introduction

SLR Consulting Limited (SLR) has been appointed on behalf of NSS (Worcester Park) LLP to prepare a Flood Assessment for land off Old Maldon Lane in the London Borough of Kingston upon Thames. The purpose of this assessment is to provide advice on issues associated with flood risk as part of a retrospective planning application for the development of a Christmas tree storage and distribution depot including a single storey office, shipping containers and new vehicle access at Rivershill Yard, KT4 7QS.

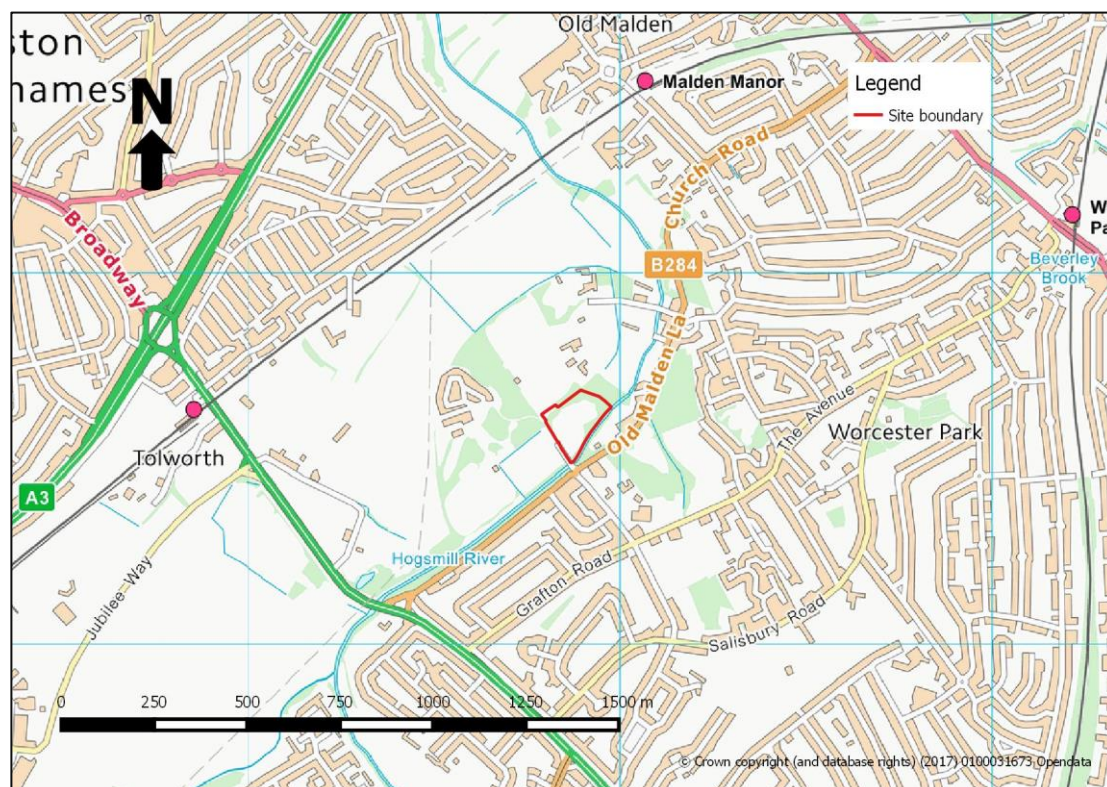
This assessment has been prepared by SLR, under the direction of a Technical Director of Hydrology at SLR who specialises in flood risk and associated planning matters. Reporting has been completed in accordance with guidance presented within the National Planning Policy Framework¹ (NPPF) and its associated Planning Practice Guidance² (PPG), taking due account of current best practice documents relating to assessment of flood risk published by the British Standards Institution BS8533³.

1.1 Site Location

The Site is situated in the Worcester Park area to the south of Kingston on Thames, London at National Grid reference (NGR) TQ 20880 65600. The Site postcode is KT4 7QS.

A Site location plan is provided as **Figure 1-1**.

Figure 1-1: Site Location Plan



1 National Planning Policy Framework: Communities and Local Government (Updated July 2021)

2 Planning Practice Guidance: Communities and Local Government (Updated June 2021)

3 BS8533:2017, Assessing and managing flood risk in development: Code of Practice (2nd Edition, December 2017)

The Site is located in an area under the jurisdiction of Royal Borough of Kingston upon Thames who act as both planning authority and the Lead Local Flood Authority (LLFA).

2.0 Baseline Site Appraisal

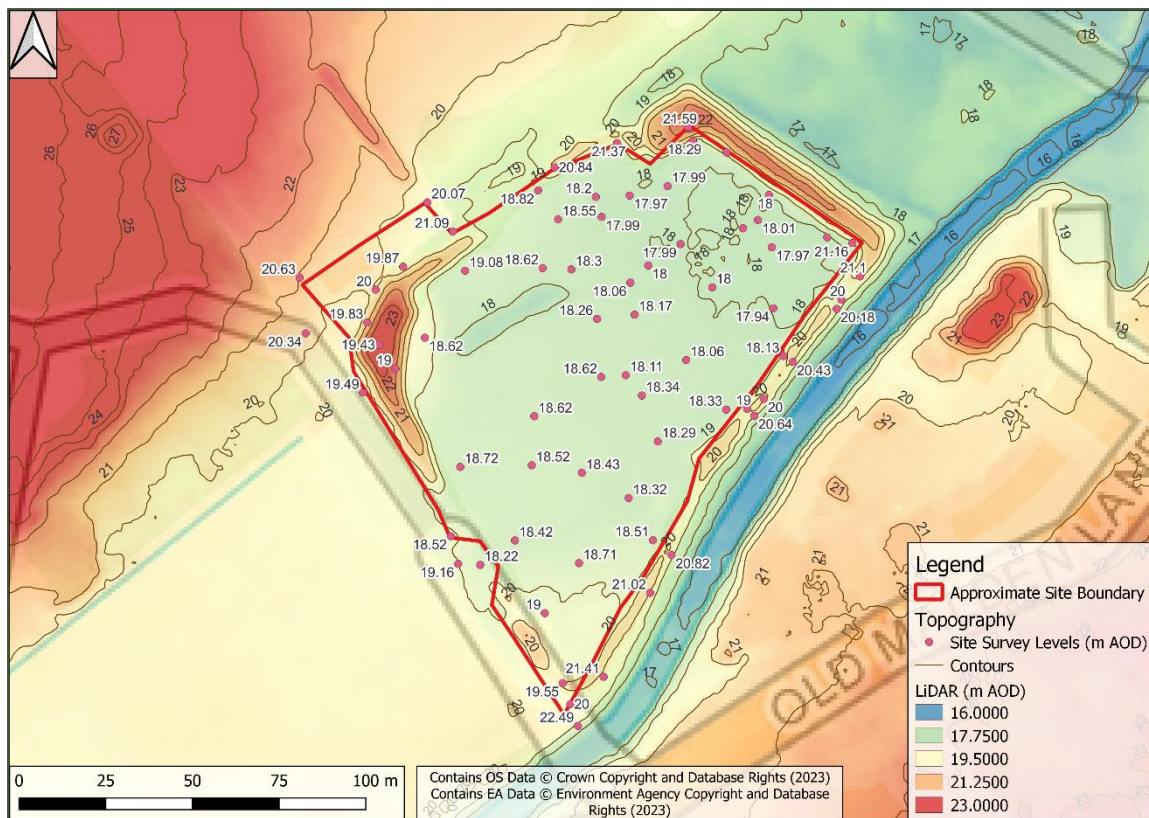
2.1 Existing Site Features

The Site is accessed via a small lane off Old Malden Road. The lane forms the Site’s south-western boundary and on the opposite side of this is a football pitch. The land to the north and east is mostly undeveloped and is associated with residential properties (i.e., extended gardens) or playing fields. The south-eastern Site boundary is formed by a watercourse called the Hogsmill River.

2.2 Topography

Topographic data from on and around the Site, gathered using Light Detection and Ranging (LiDAR) aerial photogrammetric techniques, has been downloaded from the Environment Agency (EA) open data Website⁴ (Figure 2-1) and provides information on the topography of the land on and surrounding the Site.

Figure 2-1: EA LiDAR of the area surrounding the Site



A detailed Site survey was undertaken July 2023 and is included in Appendix A. The general topography from the LiDAR data and the topographic survey correlates well. However, the LiDAR data depicts a raised island towards the north west of the Site that is absent from the topographic survey. As the LiDAR has been generated from data collected in 2022, it predates the existing development, and the more recent Site-specific topographic survey is therefore primarily used in this assessment. However, the LiDAR data helps confirm ground levels on the Site prior to development activities and away from the Site.

⁴ Environment Agency open data website, Available at: <http://environment.data.gov.uk>

Based on the topographic data, it is known that ground levels on the Site generally range between 17.6m above Ordnance Datum (AOD) and 21.4m AOD. The highest area is to the west with the lowest ground to the east.

Both the LiDAR and Site-specific topographic survey indicate bunds along the southern and eastern boundaries that reaches 22.5m AOD at the south west corner. The crest of the bund is typically at around 21.0 m AOD but drops to a low point of 20.0m in one place.

The bank of Hogsmill River adjacent to the Site lies at approximately 17.3 m AOD at the south west corner and falls to approximately 15.8m AOD at the south east corner.

The lowest level around the perimeter of the Site is along the access track at the entrance gate to the Site at approximately 18.22m AOD. Land levels further to the west along the land and the football pitches is however higher with a minimum elevation of around 19.6m AOD

More generally, the land levels locally form a valley along the Hogsmill River, and levels slope down to towards the river and along the valley from the southwest to the northeast. The Site is located on the northern bank of the river with higher ground situated to the north (i.e., further up the flank of the valley) and to the west (i.e., upstream along the base of the valley). The land to the west including both the adjacent road and the football pitch appear to have been historically raised by around 1.5m.

2.3 Geological and Hydrogeological Features

2.3.1 Geology

The National Soils Resources Institute, Soilscales website⁵ describes the soils in the higher western part of the Site as '*Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils.*' The soils across the rest of the Site are described as '*Loamy soils with naturally high groundwater.*'

British Geological Survey (BGS) mapping⁶ indicates that Site is underlain by bedrock geology of London Clay. There are superficial deposits of Kempton Park Gravels overlying the bedrock geology with Alluvium deposits overlying this close to the river.

2.3.2 Hydrogeology

The London Clay has a low permeability and has been designated as an unproductive stratum by the EA⁷. The overlying drift deposits (alluvium and gravels) have been designated by the EA as a Secondary A Aquifer. This relates to permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

EA mapping also shows that the Site is not located within a groundwater Source Protection Zone (SPZ).

2.4 Hydrology and Drainage

As already noted, the Hogsmill River forms the south-eastern Site boundary and is draining an upstream catchment area estimated⁸ to be around 56km².

5 Soilscales online soil map, Cranfield Soil and Agrifood Institute, <http://www.landis.org.uk/soilscales/>

6 British Geological Survey online viewer, <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

7 DEFRA, Magic Map, Available at: [Magic Map Application \(defra.gov.uk\)](http://magicmap.defra.gov.uk/)

8 Flood Estimation Handbook (2016) Centre for Ecology and Hydrology (CEH), available at: <https://fehweb.ceh.ac.uk>

This upstream catchment is heavily urbanised and includes the majority of Epsom, Ewell, Worcester Park and a large part of Banstead. The southern upstream parts of the catchment are all underlain by permeable chalk geology while the lower reaches closer to the Site are underlain by low permeability clays.

Along the reach past the Site the river is around 7m wide and is flowing from the southwest to the northeast. Immediately upstream (southwest) of the Site the river passes beneath the lane that provides access onto the Site. As already noted, the lane and the ground to the west have been raised and this raised ground would form a barrier to flood flows along the floodplain upstream of the Site.

There are no formal drainage networks on the Site. Runoff from the hard surfaces drains overland to the east. Onward flow of this water is prevented by the raised embankments and water then readily infiltrates to the ground, presumably into areas where the River Terrace Gravel are exposed or close to the survey. No issues with standing water or water logging in this eastern part of the Site are reported.

3.0 Planning Policy and Guidance

3.1 Proposal Summary

This report has been prepared in support of a retrospective planning application for development at Rivershill Yard for the erection of a single storey office, shipping containers for storage and a new vehicle access in connection with the use of the Site as a Christmas tree storage and distribution depot.

Within PPG² buildings used for shops, car parks, sewage treatment works and properties that do not need to remain operational during flooding are all classified as 'less vulnerable' development types.

In line with PPG and best practice guidance (BS8533) and in the absence of more specific information, a 75-year lifetime is assumed for a non-residential development.

3.2 Planning Context

3.2.1 National Planning Policy

This FRA report has been completed in accordance with the guidance presented in the NPPF¹ and with reference to PPG². The NPPF states that Local Plans should be supported by a Strategic Flood Risk Assessment (SFRA) and develop policies to manage flood risk from all sources taking account of advice from the Environment Agency. It is crucial that Local Planning Authorities consider the risks posed by flooding within their boundary when determining planning applications.

3.2.2 Local Planning Policy

The Site is situated in an area under the jurisdiction of the Royal Borough of Kingston upon Thames. Development locally is guided by their core strategy⁹ within which the key policy of relevance to this assessment is Policy DM 4.

“Policy DM 4: Water Management and Flood Risk

The Council will:

- a. require development to be designed to take account of the impacts of climate change including: water conservation, the need for summer cooling and increase flood risk from fluvial and surface water flooding*
- b. consider development proposals in accordance with national guidance (currently PPS25), the Borough SFRA and related studies including the surface water management plans. The Kingston Town Centre Area Action Plan (K+20) Policy K24 Flood Risk Management will be taken into consideration in the assessment of development proposals within Kingston Town Centre.*
- c. require a Flood Risk Assessment for major development proposals within Flood Zone 1 of one hectare or more and all new development in Flood Zones 2 and 3. It should address all sources of flooding, the future impact of climate change and take into account the findings of the SFRA, national guidance (currently PPS25) and good practice guidance.*

⁹ Core Strategy, Local Development Framework, Royal Borough of Kingston upon Thames, Adopted April 2012

d. *require development proposals to include Sustainable Urban Drainage Systems (SUDs) to manage and reduce surface water run-off unless it can be demonstrated that such measures are not feasible. SUDs techniques include:*

- *rainwater recycling;*
- *soak-aways;*
- *porous surfacing and*
- *features to retain water on Site (ponds and green spaces).*

Development proposals will need to be in line with the Mayor of London's drainage hierarchy. They should also demonstrate that there is adequate public sewerage capacity to serve their development and deal with surface water run-off.

e. *require development proposals to demonstrate that there is no adverse impact on the quantity or quality of water resources and, where possible, they should seek to improve water quality*

f. *encourage efficient water use and for water conservation measures to be included in development proposals”*

3.3 Flood Risk and Planning

3.3.1 Flood Zone Classification

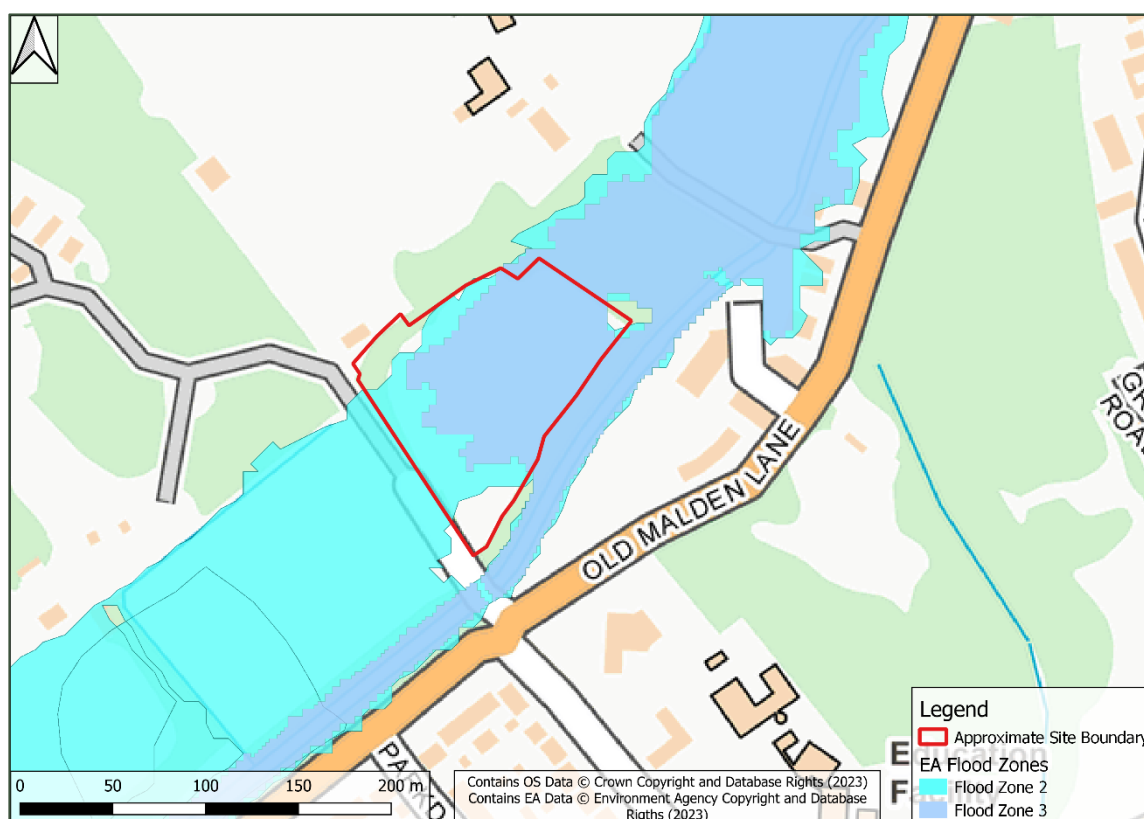
The definition of EA Flood Zones is provided in PPG *Table 1: Flood Zones*:

- *Zone 1 - Low Probability* (Flood Zone 1) is defined as land which could be at risk of flooding from fluvial or tidal flood events with less than 0.1% annual probability of occurrence (1:1,000 year) i.e. considered to be at 'low probability' of flooding.
- *Zone 2 - Medium Probability* (Flood Zone 2) is defined as land which could be at risk of flooding with an annual probability of occurrence between 1% (1:100 year) and 0.1% (1:1,000 year) from fluvial sources and between 0.5% (1:200 year) and 0.1% (1:1,000 year) from tidal sources i.e., considered to be at 'medium probability' of flooding.
- *Zone 3a - High Probability* (Flood Zone 3a) is defined as land which could be at risk of flooding with an annual probability of occurrence greater than 1% (1:100 year) from fluvial sources and greater than 0.5% (1:200 year) from tidal sources i.e., considered to be at 'high probability' of flooding.
- *Zone 3b - the Functional Floodplain* (Flood Zone 3b) is defined as land where water has to flow or be stored in times of flood. Local Planning Authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain in agreement with the EA. In the absence of definitive information, it is often defined as land that would flood with an annual probability of occurrence of 5% (1:20 year) or greater.

In assessing the boundary between Flood Zones 1, 2 and 3, the protection afforded by flood defence structures, and other local circumstances, is not taken into account by the EA. Based upon the EA Flood Map for Planning¹⁰ (**Figure 3-1**) the Site lies across Flood Zone 1, 2 and 3.

¹⁰ Flood Map for Planning Service : Website: <https://flood-map-for-planning.service.gov.uk/>

Figure 3-1: Extracts from the EA Flood Map for Planning



The Flood map for Plan does not delineate between Flood Zone 3a and 3b and it is the responsibility of local planning authority to define this delineation based on local circumstances. The Strategic Flood Risk Assessment¹¹ (SFRA) defines Flood Zone 3b as follows:

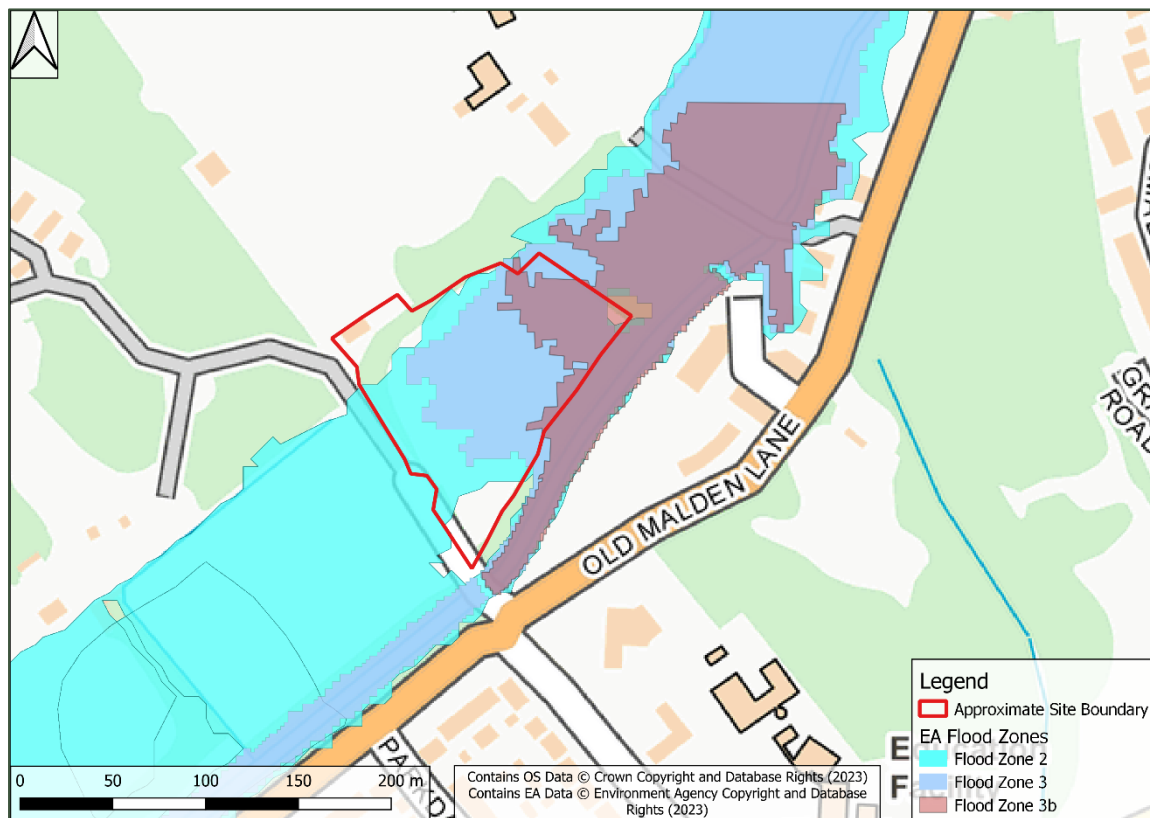
“Land within EA modelled fluvial flood risk extents predicted for up to and including 1 in 20-year return period events, allowing for the impact of flood defences. It also includes land featured as part of the EA’s Flood Storage Areas dataset’.

Mapping contained in the SFRA shows that the eastern part of the Site is designated as an area of functional floodplain (Flood Zone 3b).

This understanding is based on modelling data provided by EA to inform the SFRA. An extract of that mapping showing the indicative extent of Flood Zone 3b is provided in **Figure 3-2**.

¹¹ Strategic Flood Risk Assessment, Local Development Framework, Royal Borough of Kingston upon Thames, Level 1 and 2, July 2022, https://www.kingston.gov.uk/downloads/file/180/strategic_flood_risk_assessment

Figure 3-2: SFRA Flood Mapping Delineating Flood Zone 3b



Following a detailed review (see Section 5.1) this assessment concludes that no part of the Site floods regularly and, due to embankments along the Site boundary, the Site should not be considered as land or where floodwater water has to flow or be stored in times of flood. On this basis the Site should correctly be designated as falling across Flood Zone 1, 2 and 3a.

3.3.2 Flood Risk Compatibility

As discussed in Section 3.3.1 the Site lies across Flood Zones 1, 2 and 3a and, as detailed in Section 3.1, commercial development would be considered a 'less vulnerable' development type.

PPG Table 3: *Flood risk vulnerability and Flood Zone 'compatibility'* (reproduced as Table 3-1) confirms that, with respect to flood risk 'Less vulnerable' development types are potentially appropriate Flood Zone 1, 2 and 3a.

While it is not accepted that the eastern part of the Site is located in Flood Zone 3b, we would however not that no building or raised structures have been constructed in this part of the Site.

**Table 3-1
Flood Risk Vulnerability and Flood Zone ‘Compatibility’**

Flood Risk Vulnerability Classification (PPG Table 2)		Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Flood Zone (PPG Table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	Exception Test Required	✓	✓	✓
	Zone 3a	Exception Test Required	x	Exception Test Required	✓	✓
	Zone 3b (functional floodplain)	Exception Test Required	x	x	x	✓

Key: ✓ Development is appropriate x Development should not be permitted

3.3.3 Sequential Test

NPPF Paragraph 162 advises that the aim the Sequential Test is to ‘steer new development to areas with the lowest risk of flooding from any source’. Furthermore, it states:

‘Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding.’

The Site spans across Flood Zones 1, 2 and 3a. A technical assessment of fluvial flood risk to the Site is provided at Section 0 and with comparison to the Site Layout (attached at Appendix B), all buildings are sited in Flood Zone 1 and 2. This demonstrates that the sequential approach has been used to guide the placement of development on the Site.

Furthermore, as discussed within this report, the risk of flooding from other sources at the Site are considered to be low and will remain low through the projected lifetime of the development. As such it is considered that the scheme passes the Sequential Test.

3.3.4 Exception Test

With reference to PPG Table 3: Flood risk vulnerability and Flood Zone ‘compatibility’, provided that the development does not stray in Flood Zone 3b (which it doesn’t), the flood risk vulnerability for commercial development is deemed appropriate and compatible for the Flood Zone of the Site in accordance with NPPF.

In the light of this the Exception Test need not be applied.

3.4 Climate Change

In July 2021 the EA issued updated guidance on the impacts of climate change¹² on flood risk in the UK to support NPPF. This advice sets out that peak rainfall intensity, sea level, peak river flow, offshore wind speed and extreme wave heights are all expected to increase in the future as a result of climate change.

¹² Environment Agency, February 2016 (updated October 2021). Flood risk assessments: climate change allowances (Accessed August 2023 at <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>)

The guidance acknowledges that in relation to certain factors there is considerable uncertainty with respect to the absolute level of change that is likely to occur. As such, in these instances, the guidance provides estimates of possible changes that reflect a range of different emission scenarios.

PPG recommends that considerations for future climate change are included in FRA's for proposed developments. Flooding from the sea is of no concern at this Site and similarly changes in wind speed and wave action is only of direct concern in locations immediately adjacent to area of open water. As such the consideration of climate change in this assessment only covers possible changes related to peak fluvial flows and peak rainfall intensity.

3.4.1 Fluvial flows

For peak fluvial flow rates, the EA guidance notes that the effect of climate change will increase over time and acknowledges that there is uncertainty with respect to the absolute level of change that is likely to occur. As such the document provides estimates of possible changes that reflect three different emission scenarios (*Upper End*, *Higher Central* and *Central*) and three different horizons. These recommended allowances for peak fluvial flow are set out in **Table 3-2**.

Table 3-2: Peak River Flow Allowances by Management Catchment (2021)

Management Catchment	Allowance Category	Total potential change anticipated for 2015 to 2039	Total potential change anticipated for 2040 to 2059	Total potential change anticipated for 2060 to 2115
London Management Catchment	Upper End	26%	30%	54%
	Higher Central	14%	14%	27%
	Central	10%	7%	17%

Guidance^{Error! Bookmark not defined.} advises that the allowance category applied should relate to both the Flood Zone in which a given Site is located and the sensitivity of the development. As the Site is deemed to be a 'less vulnerable' development and is 'fully or partly' within Flood Zone 3, the central and higher central allowance should be applied.

In line with these uplifts in fluvial flows of both 27% and 17% have been considered within this assessment.

3.4.2 Rainfall Intensity

The EA climate change guidance acknowledges that there is uncertainty with respect to the absolute level of change that is likely to occur with respect to rainfall and that both the absolute level of change and the level uncertainty increase over time. As such the document provides estimates of possible changes that reflect two different time horizons and two different emission scenarios. These recommended allowances for rainfall depths are set out in Table 3-3.

Guidance states that flood risk assessments should assess both the '*central*' and '*upper end*' allowances to understand the range of impact. As detailed in Table 3-3, for development lifetimes of up to 100 years (2060 – 2115), these equate to uplifts of 25% and 40% respectively.

Table 3-3: Peak Rainfall Intensity Allowance by Management Catchment (Use 1961 to 1990 baseline)

Management Catchment	Allowance Category	Total potential change anticipated for '2050s'	Total potential change anticipated for '2070s'
London Management Catchment	Upper End	40%	40%
	Central	20%	25%

4.0 Potential Source of Flooding

4.1 Methodology & Best Practice

This report has been prepared in accordance with the advice and requirements prescribed in current best practice documents relating to management of flood risk in development published by the Construction Industry Research and Information Association (CIRIA)¹³ and BS85333**Error! Bookmark not defined.**

A screening study has been completed to identify whether there are any potential sources of flooding at the Site which may warrant further consideration. If required any potential flooding issues identified in the screening study would then be considered in subsequent sections of the assessment.

4.2 Screening Study

There are a number of potential sources of flooding, and these include:

- Flooding from the sea or tidal flooding;
- Flooding from rivers or fluvial flooding;
- Flooding from surface water and overland flow;
- Flooding from groundwater;
- Flooding from sewers;
- Flooding from reservoirs, canals, and other artificial sources; and
- Flood from infrastructure failure.
- The flood risk from each of these potential sources is discussed below.

4.2.1 Flooding from the Sea or Tidal Flooding

The Site is located remote from the sea and at elevations of more the 15m above sea level. Flooding from the sea will therefore not be of a concern in this location and is not considered further.

4.2.2 Flooding from Rivers or Fluvial Flooding

As discussed in Section 3.3.1 large parts of the Site are potentially located within the floodplain of the Hogsmill River. More detailed consideration of the risk associated with is therefore required and is included in Section 0.

4.2.3 Flooding from Surface Water

As discussed at Section 2.2, the Site sits within a valley and therefore the land to the north is elevated above Site levels. And this area could potentially provide a source for surface runoff to drain onto the Site. In addition, the raised embankments around the southern and eastern Site boundaries would prevent the onward flow of surface water allowing water to pond on the Site.

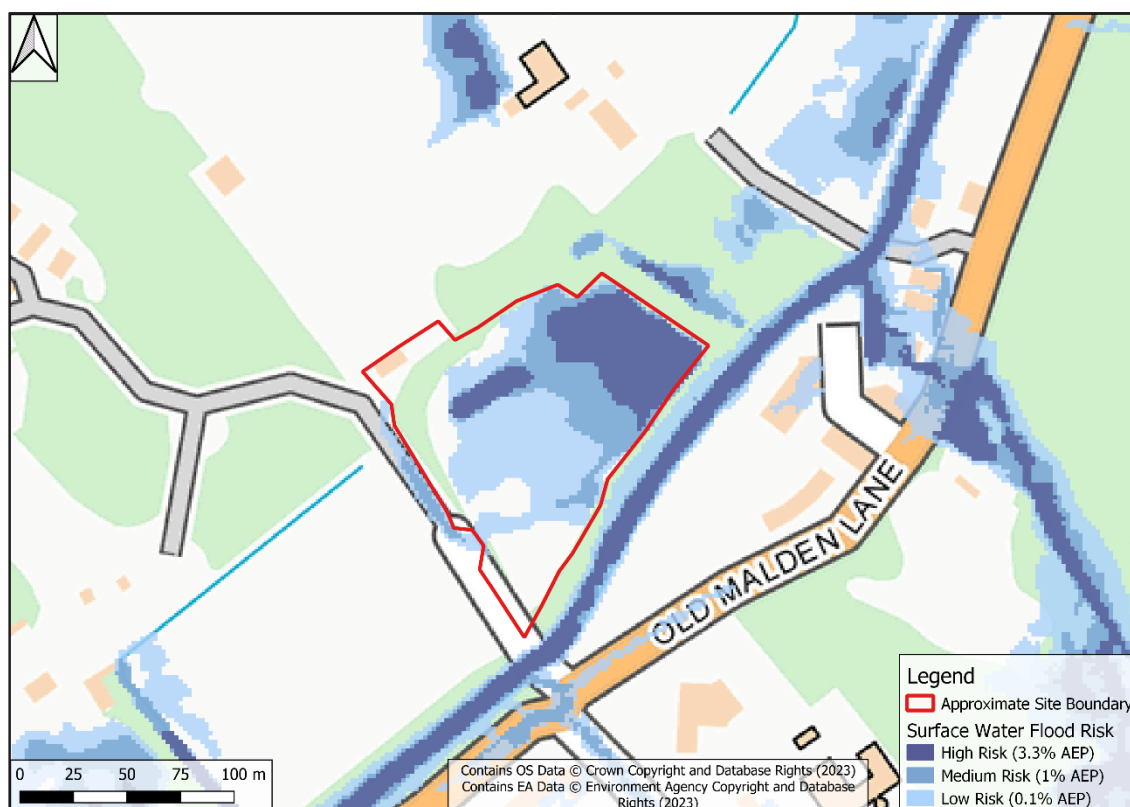
13 CIRIA Report C624, Development and flood risk: guidance for the construction industry

An extract from the EA *Long Term Flood Risk Information*¹⁴ mapping showing areas potentially at risk of flooding from surface water has been provided as **Figure 4-1**.

The surface water flood risk categories are defined as:

- **Very Low:** less than 1 in 1,000 (0.1% AEP) chance of flooding in any given year;
- **Low:** less than 1 in 100 (1% AEP) but greater than or equal to 1 in 1,000 (0.1% AEP) chance of flooding in any given year;
- **Medium:** between 1 in 100 (1% AEP) and 1 in 30 (3.3% AEP) chance of flooding in any given year; and
- **High:** greater than 1 in 30 (3.3% AEP) chance of flooding in any given year.

Figure 4-1: Extract of the EA Surface Water Flood Map



The mapping indicates that there is a potential surface water flow pathway from the elevated land in the north down the access track and onto the Site. It also indicates that the surface water flood risk to the east of the Site is high. This potential source of flooding is therefore considered further in Section 5.0.

4.2.4 Flooding from Groundwater

As noted in Section 2.3 the underlying geology of the Site comprises London Clay Formation (clay, sand and silt) which is generally impermeable in nature. However, this is overlain by more permeable superficial deposits of gravel and alluvium.

Groundwater is likely to be present in the superficial deposits perched on the low permeability clay. This groundwater in the drift deposits should however be able to flow

¹⁴ Environment Agency's Long term flood risk assessment for location in England, (Available at: [Check the long term flood risk for an area in England - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/674242/Check_the_long_term_flood_risk_for_an_area_in_England_-_GOV.UK.pdf))(Accessed August 2023)

freely down into Hogsmill River as the drift deposits extend down to the watercourse. This thereby provides a natural limit on groundwater elevations. However, the raised embankment between the Site and the Hogsmill River prevents the pathway of fluvial flood water onto the Site. As a result, when in-channel flood levels are raised and backed up, groundwater provides a potential pathway for water to enter the Site and flood the low lying areas that are below the in-channel flood level.

For these reasons, groundwater flooding is considered further at Section 5.3. .

4.2.5 Flooding from Sewers and Water Mains

Based on Thames Water asset plans (Appendix 04) there are no sewers present on or adjacent to the Site. A minor mains water pipe is present beneath the lane to the west of the Site; however, given its size it is unlikely to give rise to significant flooding. Thames Water have also confirmed that they do not have any record of sewer flooding having previously occurred at this Site.

For the stated reasons the risk of flooding from sewers and water mains is considered negligible and is not considered further.

4.2.6 Flooding from Reservoirs, Canals and other Artificial Sources

One large impounded waterbody, known as the Stew Pond, exists upstream of the Site within the catchment of the Hogsmill River. This Stew Pond is located around 3km to the south on Epsom Common. EA mapping Error! Bookmark not defined. shows that the majority of the Site does not lie within the flood extent of a breach of the retaining structure for this waterbody. The only area that potentially is at risk is the low-lying land along the eastern Site boundary.

No other artificial sources of flooding have been identified in the vicinity of the Site and therefore flooding from reservoirs, canals and other artificial sources is considered negligible. Flooding from this source is not considered further.

4.2.7 Flooding from Infrastructure Failure

The raised bunds present along the southern and eastern boundary of the Site act as an important flood defence to the Site by affording protection from fluvial flooding. Therefore, in the event of the failure of the embankments fluvial flood water could extend onto the Site during a storm.

Flooding from this source is therefore considered further at Section 5.5.

4.3 Flood Summary

A summary of the potential sources of flooding and the flood risk arising from them is presented in Table 4-1.

Table 4-1 : Potential Risk Posed by Flooding Sources

Potential Source	Potential Flood Risk at Site?
Sea or Tidal Flooding	No
Rivers or Fluvial Flooding	Yes
Surface Water and Overland Flow	Yes
Groundwater	Yes
Sewers and Water Mains	No
Reservoirs, Canals and other Artificial Sources	No
Infrastructure Failure	Yes

5.0 Detailed Flood Risk Review

5.1 Fluvial Flooding

5.1.1 Historic Flooding

Based on EA records¹⁵ there are no recorded flood events along the Hogsmill River that have resulted in flooding of the Site. This does not however mean that the Site has never flooded.

Flooding is known to have occurred locally during a flood event previously which affected areas upstream of the Site.

5.1.2 Flood Routing

Following a review of the Site context and available topographic data there are two possible flood mechanisms at the Site. These are as follows;

1. Flood water exceeding the capacity of the river upstream and flowing onto the Site across the football pitches and lane. For this to occur flood level in the channel upstream of the Site would need to exceed the height of the football pitches which are at an elevation of 19.60m aOD
2. Flood water exceeding the capacity of the river adjacent to the Site and over topping directly onto the Site. For this to happen flood levels in the channel adjacent to the Site would need to exceed the minimum crest height of the embankment which is at an elevation of 20.0m aOD.

5.1.3 Flood Modelling

The 2D Hogsmill Flood Risk Mapping Study was completed in 2015 by JBA Consulting on behalf of the EA¹⁶. Detailed outputs from this study have been provided to inform this study. Summary outputs for the reach past the Site are included in Appendix 03.

Modelled Flood Levels

For the purpose of assessment design flood levels are taken at the upstream Site boundary as well as further upstream. Key data from the flood model at the upstream Site boundary is summarised in **Table 5-1**.

Table 5-1 : EA flood model data (model node: RH01_5901D)

Flood event (AEP*)	50%	5%	2%	1%	1% + CC	0.5%	0.1%
Flood flow (m ³ /s)	14.23	25.82	32.25	39.85	49.56	46.50	65.14
Flood level (m AOD)	17.93	18.33	18.49	18.63	18.78	18.74	19.04

* AEP – Annual Exceedance Probability

Key data from the flood model upstream of the Site is summarised at Table 5-2.

15 Environment Agency, Historic Flood Map, (Available at Historic Flood Map - data.gov.uk)

16 2D Hogsmill Flood Risk Mapping Study, JBA Consulting on behalf of the EA, 2015

Table 5-2: EA flood model data (model node: RH01_6000)

Flood event (AEP*)	50%	5%	2%	1%	1% + CC	0.5%	0.1%
Flood flow (m ³ /s)	14.17	25.7	32.13	39.69	48.95	46.30	62.90
Flood level (m AOD)	18.25	18.77	19.00	19.25	19.55	19.45	19.97

Interpolation to derive design flood level

For new development, a fluvial flood event with an annual exceedance probability of 1 in 100 is considered a standard design flood event. In line with the discussion in Section 3.4.1, increases in flood severity associated with climate change over the development’s lifetime also need to be considered.

A review of the EA flood modelling data indicates that it includes a model run that equates to the 1 in 100 annual probability flood with an allowance for climate change. Based on the flood flow data (Table 5-1) this climate change model run assesses for fluvial flows that are 24% higher than the current day 1 % annual probability flood.

Based on guidance it has been determined that assessment for development at this Site should consider a 27% uplift in fluvial flows. Additional assessment is therefore required in order to obtain a design flood level that complies with current climate change guidance.

Using the flood model data, the relationship between flood flow rates and flood levels has been plotted (Table 5-1). Based on this curve:

- A 17% uplift on a 1 in 100 flood flow rate would result in a flood flow rate of 46.62m³/s and a flood level adjacent to the Site 18.74m AOD. Upstream of the Site it would result in a flood flow rate of 46.43 m³/s and a flood level of 19.46 m AOD.
- A 27% uplift on a 1 in 100 flood flow rate would result in a flood flow rate of 50.61 m³/s adjacent to the Site and a flood level of 18.79 m AOD. Upstream of the Site, it would result in a flood flow rate of 50.41 m³/s and a flood level of 19.59 m AOD.

Figure 5-1: Interpolation for design flood level at Node RH01_5901D (Adjacent to Site)

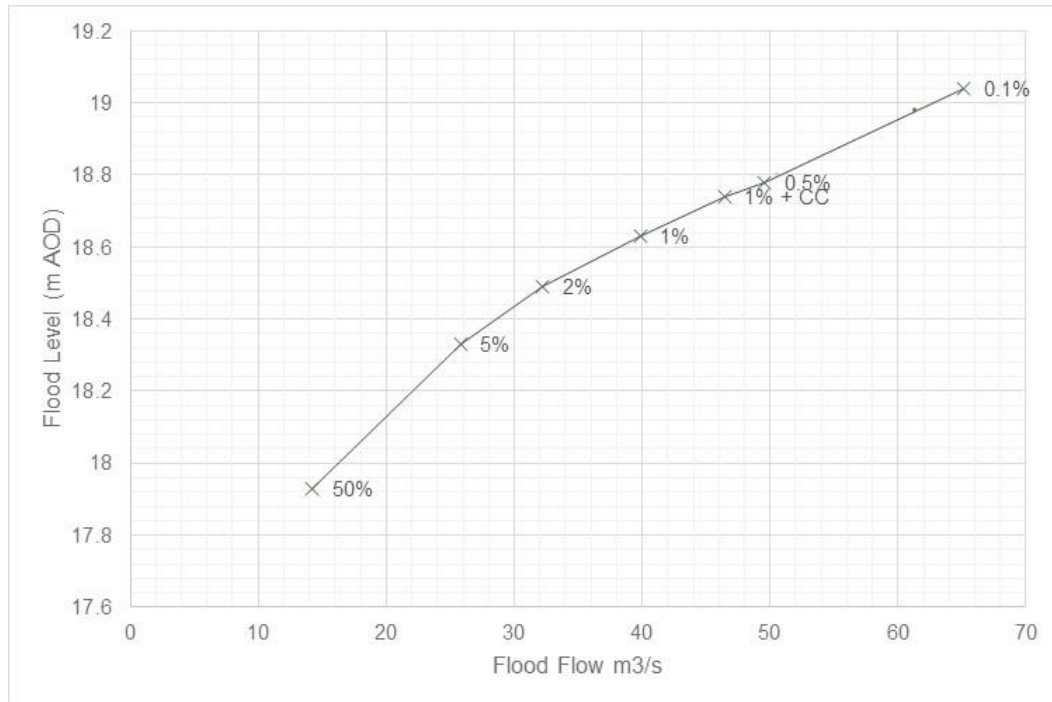
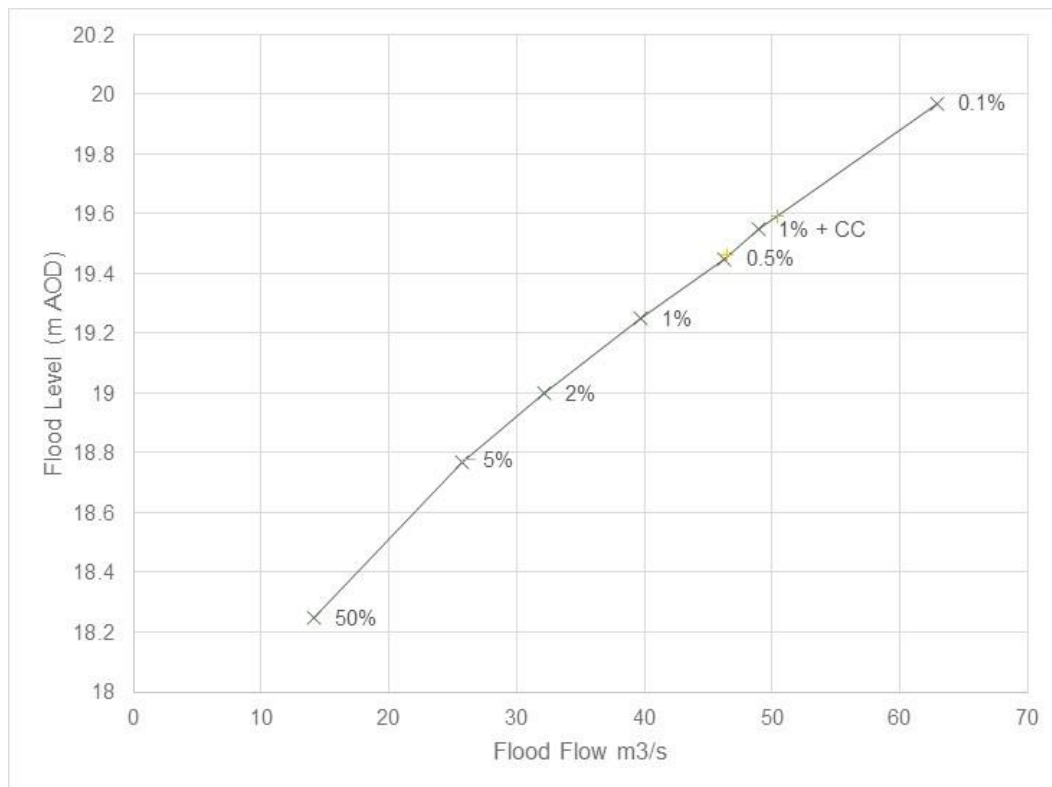


Figure 5-2: Interpolation for design flood level at Node: RH01_6000 (Upstream of Site)



5.1.4 Modelled Flood Outlines

The results of the hydraulic modelling indicate that during high flow event, peak water levels in the river will be higher than the lower parts of the Site. Given a minimum ground elevation on the Site of 17.6m aOD the flood level data contained in Table 5-1 suggests that this will occur even during fairly common events.

Regular flooding on the Site does not occur and is prevented by the high ground between the river and the Site. The mapped model outputs indicate that this high ground provides protection up to and including the 1 in 1000 annual exceedance probability flood event.

For more extreme event the mapped flood model extents suggests that flooding on the Site would occur becoming increasingly deep and extensive for more severe and rare events.

We would however caution that the flood mapping data does not correlate with the flood level data (see Section 0) and the heights required for onsite flooding to commence (see Section 5.1.2). As a result, the mapped flood extent directly output from the modelling are discounted.

5.2 On-Site Flood Probability and Severity

For onsite flooding to occur as a result of Flood Mechanism 2 (see Section 5.1.2), in channel flood level adjacent to the Site would need to exceed the low point in the embankment which is at 20.0m aOD. The flood model data indicates that even during the 1 in 100 + CC (27%) and the 1 in 1000 annual probability flood events in channel flood levels up the upstream boundary of the Site will be around 1m lower than this.

On this basis the probability of flooding via flood mechanism 2 is negligible and is not considered further.

For onsite flooding to occur as a result of Flood Mechanism 1 (see Section 5.1.2), in channel flood levels upstream of the Site would need to exceed the height of the elevated ground (football fields) to the west. This is at around 19.60 m aOD. The flood model data indicates that for all events up to and including the 1 in 100 + CC (27%) annual probability flood event water levels would not be high enough to over top this high ground,

For the 1 in 1000 annual probability event the data indicates that this high ground would be over topped and water would then overflow the lane and result in on Site flooding. In this event the embankments would act as a barrier to water returning to the channel and therefore water levels on the Site could rise to around 20.0m aOD (the low point along the embankment).

Flooding to this height would result in inundation across the majority of the Site and flood depth in the lower area to the east of the Site in excess of 2m deep. Such severe flooding would however only occur during rare extreme event and would not occur during the design flood.

5.2.1 Flood Storage and Conveyance

The analysis set out in this report has determined that fluvial flooding on the Site will not occur up to and including the design 1 in 100 annual probability event with a 27% uplift to account for climate change. On this basis, it is concluded that there will be no impact on fluvial flood conveyance and storage associated with the development that has been constructed on the Site.

Similarly, the risk of debris (Christmas trees) being mobilised by fluvial flood water and to move down the river system is assessed to be very low.

5.3 Surface Water Flooding

The Environment Agency surface water flood mapping (Figure 4-1) indicates that there is a potential surface water flow pathway from the elevated land in the north down the access track and onto the Site.

The majority of the western part of the Site is classified as having a low to very low risk of surface water flooding. However, there is an area towards the centre of the Site that is associated with a high risk of surface water flooding. This area of elevated surface water flood risk corresponds to a linear depression that can be seen on the LiDAR elevation plot (**Figure 2-1**). A review of the topographic survey shows that this has been infilled as part of the development and therefore surface water ponding would no longer occur in this area.

The eastern part of the Site is entirely defined as having a medium to high risk of surface water flooding. The areas of high surface flood risk are largely confined to areas designated which the SFRA suggest is the functional floodplain. Based on the LiDAR, surface water flooding in this area reaches 19.65m aOD resulting in flood depths of up to 1.68m.

In reality there is no pattern of water draining to and ponding in this part of the Site and anecdotally storm flows derived from the Site are able to freely drain to the ground in this area. This indicates that away from the river (where there is alluvial cover) the River Terrace Gravels must be at or close to the surface. On this basis significant surface water flooding is unlikely.

Irrespective of this a residual risk of surface water flooding does likely exist to the east of the Site. No buildings, raised structures or sensitive infrastructure are however present in this area and the land is only used for storage of stock (Christmas trees) that are relatively insensitive to contact with shallow flooding.

On this basis the surface water flood risk at the Site is not considered of concern.

5.4 Groundwater Flooding

There is a theoretical risk of groundwater flooding in the lowest parts of the Site occurring during periods of high fluvial water levels in the channel adjacent to the Site. This would occur due to fluvial flood water seeped via the permeable superficial deposits and then being expressed at the surface on the Site.

Flooding via this mechanism would not be rapid due to the presence of Alluvial (low permeability) along the river corridor. The raised embankments are also constructed of low permeability material flow directly through raise bunds could therefore not occur.

Based on the fluvial flood model data water level in the channel adjacent to the Site exceeds the elevation of the lowest parts of the Site in all major high flow events. Despite this there are no anecdotal reports of flooding on the Site via this mechanism. Despite this, flooding via this route via rare extreme events cannot be fully discounted.

If flooding via this route did occur, it would result in upwelling of water in the lowest areas of the Site to the east. No development has occurred in this area and that part of the Site is only used for storage. This is considered an appropriate usage given the prevailing risk.

As discussed in Section 5.7 additional management of the risk will be implemented going forward to further manage risks.

5.5 Infrastructure Failure

Regular fluvial flooding on the Site is prevented by the raised embankments along the southeast and northeast boundaries of the Site. While not designed by the Environment Agency as a formal flood defence they do provide a flood protection to the Site.

There is extensive planning history that says the bunds around the Site were created in the early 2000's and these embankments have not been raised or amended any way by the current operators of the Site.

The embankments are around 8-10m wide and, along the riverbank, are raised to a height of around 2m above the general level of the Site behind. From a visual inspection no obvious damage, cracks or defects were determined. On this basis the potential for a breach or failure is considered low; however, such an event cannot be discounted.

In the event of a major failure during a major fluvial flood event the Site would be rapidly inundated until water levels on the Site were the same as in the channel.

While the probability of flooding of this nature is assessed to be low additional management of the residual risk will be implemented going forward. Details of this are set out in Section 5.7.

5.6 Flood Risk Management

Due to the flood risk discussed above, the following has been adopted into the development design by means of flood risk management:

1. The Site is being used for a less vulnerable development type and in reality the usage of most of the Site is very resilient to flooding and in the event of flooding the disruption would be minor and temporary.
2. No new development or raised structure has been constructed within 8m of the river bank¹⁷.
3. The office (developed building) has been set in the most elevated area of the Site in land that is designated as Flood Zone 1. This area is above the maximum estimated potential flood height of 20.0m AOD for extreme events.
4. Development has been avoided in the low-lying area to the east of the Site that is classified as Flood Zone 3b and where surface water and groundwater flooding are likely.

5.7 Additional Flood Management

In addition to the above further operational measures will be implemented on the Site to manage the prevailing flood risk.

5.7.1 Emergency Flood Response Plan

An emergency flood response plan should be developed and implemented for the Site. As a minimum this should include:

- Specification of certain triggers to mobilise actions in the event of flooding tailored to the Site, its operators, and its local context.
- Subscription to the free flood warning service provided by the Environment Agency for fluvial flooding to get early warning of periods of elevated risk.
- A targeted response to minimise risk to the Site from flooding including moving stock and any sensitive equipment from low lying areas to areas of the highest elevations.

17 Development and other works within 8m of the top of the riverbank will be subject to a permit from the Environment Agency under the 1991 Land Drainage Act. This is separate from planning and the Environment Agency will typically seek to maintain this area free of built structure such that access to the river channel is not limited and that riparian habitat is maintained and / or enhanced.

- The shutdown of operations and evacuation routes and procedures for staff from the Site to avoid entrapment and minimise risk to employees.

Implementation of this will help manage the residual risk posed by fluvial flooding, groundwater flooding (as this will only occur during periods of high fluvial water levels) and infrastructure failure.

5.7.2 Survey and Maintenance of Embankments

Following receipt of planning approval, the operators of the Site will arrange for a formal condition survey of the raised embankment by an appropriately qualified civil engineer. As deemed necessary by that survey and defects will be addressed and vegetation management will be undertaken to ensure that the structure of the embankment is not damaged by roots of trees.

Following this, appropriate measures will be incorporated into the Site maintenance and management plan to ensure that the embankments are maintained in good condition throughout the lifetime of operations on the Site. This will include further structural condition surveys at a frequency of no less than once every five years.

Implementation of this will help manage the residual risk posed by fluvial flooding and infrastructure failure.

6.0 Storm Water Drainage

Issues relating to storm water management within the Site are not formally considered in this report which is intended to assess the prevailing flood risk and the potential for the development on the Site to exacerbate flood risk.

It should however be noted that the development undertaken on the Site has not altered the drainage arrangement in any significant way. Storm water runoff continues to drain informally across the Site towards the low ground to the east from where it infiltrates to the ground. Due to the permeable nature of the gravels (where they are exposed) this does not result in any significant ponding or water logging.

There is no direct surface runoff from the Site and no potential for changes in runoff from the Site to have exacerbated fluvial flood risk along the Hogsmill River.

7.0 Conclusion

SLR Consulting Limited has been appointed by NSS (Worcester Park) LLP to prepare a Flood Assessment to support a retrospective planning application for a Christmas tree storage and distribution depot at Rivershill Yard, Old Maldon Lane in the Worcester Park area of Kingston upon Thames, London, KT4 7QS.

The flood risk at the Site has therefore been assessed in line with BS8533 and national policy and guidance and, in line with this, all potential sources of flooding to the Site have been considered.

This assessment has concluded that:

1. Hogsmill River runs along the southeastern Site boundary and naturally much of the Site would form part of the floodplain of that watercourse.
2. Raised embankments are present along the southeast and northeastern Site boundaries. In addition the lane to the west of the Site and the football pitches beyond have all been raised at some point. These features prevent regular flooding on the Site.
3. Based on a review of Environment Agency flood model data, the embankments on the Site boundaries are highly unlikely to be over topped by flood water. The annual probability of this occurring is assessed to be less than 1 in 1000.
4. Based on a review of Environment Agency flood model data the high ground to the west of the Site would only ever be over topped during rare and extreme events. Flooding via this route would not be possible during the design flood (1 in 100 annual probability event with a 27% uplift to account for potential changes in flood severity associated with climate change) but could occur during the 1 in 1000 annual probability event.
5. Based on mapping within the Strategic Flood Risk Assessment, the Site is spread across Flood Zones 1, 2, 3a and 3b; however, based on the discussion above no part of the Site floods regularly and the Site should not be considered as land or where floodwater has to flow or be stored in times of flood. On this basis the Site should correctly be designated as falling across Flood Zone 1, 2 and 3a and as benefiting from flood defences.
6. Due to the layout of development on the Site (building in Flood Zone 1 only) the development is considered to pass the Sequential Test. Consideration of the Exception Test is not required for less vulnerable development types such as the operations on the Site.
7. There is a risk of flooding in the eastern part of the Site from both groundwater and surface water sources. The former is associated with fluvial water being conveyed via groundwater pathways during periods when river levels are high. The latter is associated with storm water runoff draining onto the Site from the Lane. Both types of flooding will predominantly affect the low areas to the east of the Site where no building or raised structures are sited. The area at risk is only used for storage of stock which is resilient to contact with floodwater. This usage is considered to be appropriate and acceptable to the level of risk.
8. There is a residual risk of flooding at the Site associated with a failure of the raise embankments along the river during a fluvial flood event.

9. Post planning an emergency flood response plan will be developed and implemented for the Site. This will set out precautions and procedures that should be followed in the event that the Environment Agency issue a flood alert or flood warning.
10. Post planning the Site operators will ensure that the embankments are surveyed, and as necessary vegetation management will be implemented to ensure there is no long-term damage to the embankment from tree roots. Such surveys will then become a regular part of the ongoing Site management and maintenance plan.
11. The proposed additional flood management measures are considered sufficient to address the residual flood risk at the Site.

The technical assessment of flood risk presented within this FRA demonstrates that the fluvial flood risk on the Site is not as high as suggested by available flood mapping sources. In addition, despite flood risk from other sources being high in some areas of the Site the flood risks present are manageable. Development of the Site and its current operational usage has been undertaken in a way that reflect the prevailing risk and, post planning, further flood risk management measures will be put in place to ensure that Site operations remain 'safe' in flood risk terms throughout its lifetime without increasing flood risk elsewhere.



Appendix A Site Topographic Survey

Flood Risk Assessment

Rivershill Yard, Worcester Park

NSS (Worcester Park) LLP

SLR Project No.: 425.064793.00001

12 August 2023

- Notes:
1. TOPOGRAPHICAL SURVEY CARRIED OUT BY SLR CONSULTING 13th JULY 2023.
 2. THIS PLAN IS ORIENTATED TO ORDNANCE SURVEY NATIONAL GRID PLAN AND HEIGHT DATUM DERIVED FROM THE ORDNANCE SURVEY ACTIVE NETWORK: OSGB36(OSGM15/OSTN15).
 3. WHILE EVERY EFFORT HAS BEEN MADE TO INCLUDE ALL ACCESSIBLE DETAIL, SOME FEATURES MAY NOT BE SHOWN IF OBTAINED AT THE TIME OF SURVEY (e.g. PARKED VEHICLES/BOATS/OVERGROWN AREAS). ONLY MAJOR TREES SURVEYED IN WOODED/OVERGROWN AREAS.
 4. THE ACCURACY OF THIS SURVEY IS COMMENSURATE WITH THE DRAWING SCALE SPECIFIED WITHIN THE TITLE BLOCK. ALL CRUCIAL DIMENSIONS SHOULD BE CHECKED ON SITE.
 5. THIS PLAN IS TO OSGB36 DATUM.

- Legend:
- SPOT LEVEL
 - SURVEY CONTROL STATION WITH ID
 - KERB BOTTOM
 - KERB TOP
 - CHANGE IN SURFACE
 - WALL BOTTOM
 - FENCE
 - GATE
 - BUILDING HATCH

- Legend:
- | | | | |
|------|---------------------------|-----|----------------------|
| BB | Belina Beacon | LR | Life Ring |
| BC | Building Canopy | MH | Manhole |
| BM | Bench Mark | MOR | Marker |
| BM | Bench Mark | PO | Post |
| BO | Boundary | PTH | Door Threshold Level |
| BSL | Boundary | PI | Pipe Invert |
| BT | British Telecom Manhole | RE | Rodding Eye |
| CCTV | Closed Circuit Television | RL | Ridge Level |
| CP | Chamber Pit | RNP | Road Name Plate |
| CTV | Cable Television Manhole | RSP | Sign Post |
| CUL | Culvert | SL | Spot Light |
| DK | Drain Man | SO | Soft Level |
| DP | Drain Pipe | ST | Stop Tap |
| DP | Damp Proof Course | SUP | Stump (Tree) |
| DWB | Dog Waste Bin | SV | Stop Valve |
| EB | Electricity Box | SW | Storm Water |
| EL | Eaves Level | SY | Stop Inlet Pipe (TI) |
| ER | Earthing Rod | TAP | Tap |
| ER | External Floor Level | TCS | Telephone Call Box |
| FE | Flag Post | TCL | Tackle |
| FE | Flag Post | TFL | Threshold Level |
| FA | Fire Alarm | TL | Traffic Light |
| GB | Gas Bin | TW | Top of Wall |
| GV | Gas Valve | TP | Telegraph Pole |
| GP | Gate Post | TPT | Trail Post |
| GRIT | Grit Bin | ULS | Under Beam |
| G | Gully | UTL | Under Level |
| FH | Hydrant | VP | Vent Pipe |
| IT | Inspection Chamber | WLS | Window Sill Level |
| IS | Isolacom | WRL | Window Road Level |
| KO | Kerb Outlet | WL | Water Level |
| LB | Life Buoy | WM | Water Meter |
| LP | Lamp Post | WO | Wash Out |



0	14/07/23	JL	NS	QJH
Rev	Amendments	Date	By	Chk Auth

SLR
www.slrconsulting.com

Client: **PINES AND NEEDLES**

Project: **RIVERHILL NURSERIES
WORCESTER PARK
KT4 7QB**

Drawing Title: **TOPOGRAPHICAL SURVEY**

Scale:	1:250	SLR Project No:	425.064793.00001
Drawn:	JL	Checked:	NS
Date:	14/07/23	Date:	14/07/23

Drawing No: **425.064793.00001.009.1**

Scale: 1:250

0 5 10 15 20 25m



Appendix B Site Layout

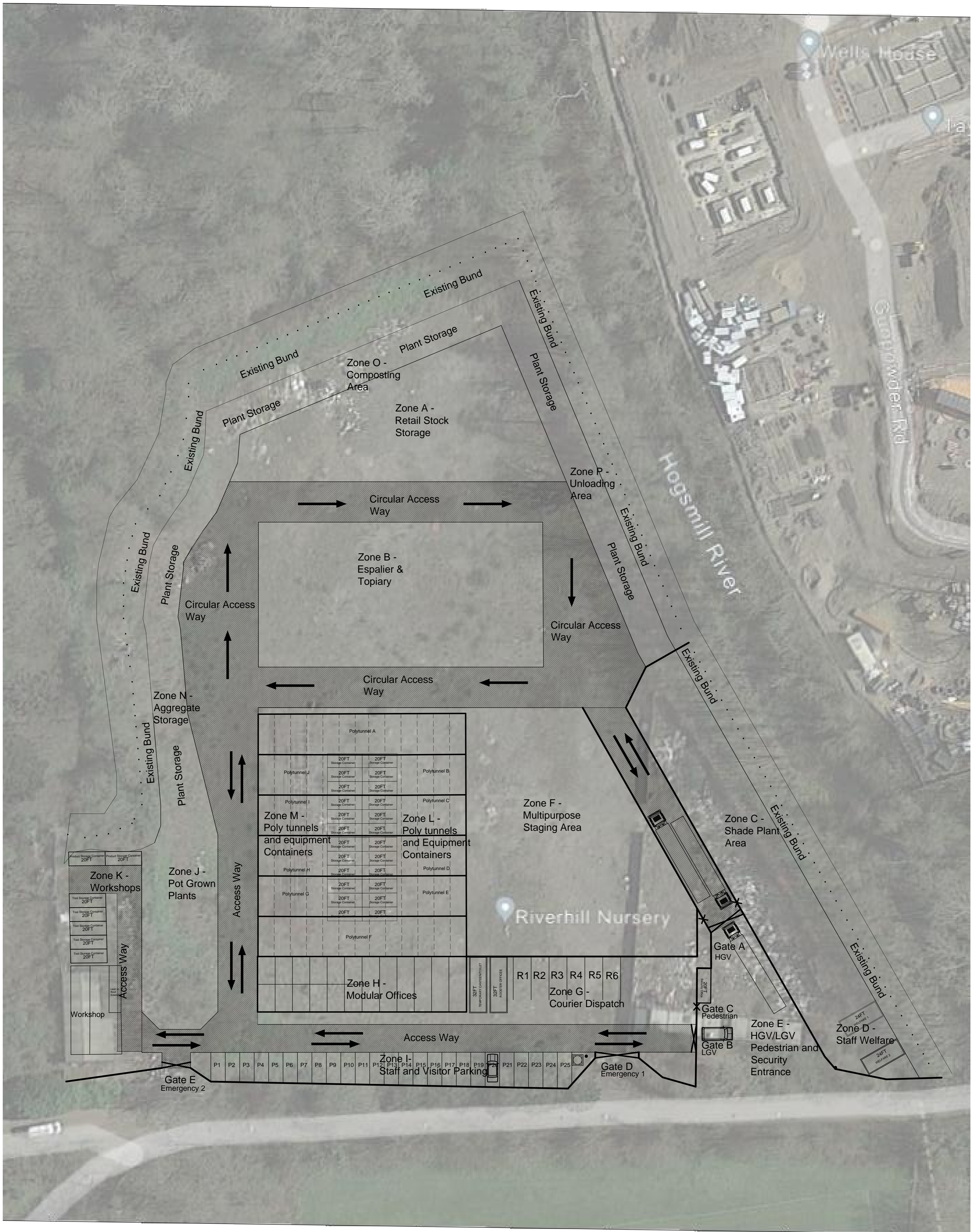
Flood Risk Assessment

Rivershill Yard, Worcester Park

NSS (Worcester Park) LLP

SLR Project No.: 425.064793.00001

12 August 2023





Appendix C EA Flood Product 4: Data Request Response

Flood Risk Assessment

Rivershill Yard, Worcester Park

NSS (Worcester Park) LLP

SLR Project No.: 425.064793.00001

12 August 2023

Product 4 (Detailed Flood Risk) for: Worcester Park, KT4 7QS

Requested by: Connie Fuller/SLR Consulting

Reference: KSL 315798 AC

Date: 27/07/2023

Contents

- Flood Risk Assessments: Climate Change Allowances
- Flood Map for Planning Confirmation
- Flood Map for Planning Extract
- Model Output Data
- Data Point Location Map
- Modelled Flood Outlines Map
- Defence Details
- Historic Flood Events Data
- Historic Flood Events Data Map
- Additional Data
- Surface Water
- Open Government Licence

The information provided is based on the best data 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 to the data for this location. 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.

Please note. Due to the location of your site you may also need to obtain the Lower Thames Flood Modelling Study. This can be done by contacting enquiries_THM@environment-agency.gov.uk .

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.

Customer services line: 020 8474 6848

Email: kslenquiries@environment-agency.gov.uk

Website: <https://www.gov.uk/government/organisations/environment-agency>

Flood Risk Assessments: Climate Change Allowances

On 20/07/2021 the 'Flood risk assessments: climate change allowances' were updated and published on gov.uk. You can view the updated allowances at ['Flood risk assessments: climate change allowances'](#).

You will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding.

It remains the applicant's responsibility to demonstrate through their proposals and flood risk assessments that a new development will be safe in flood risk terms for its lifetime.

Flood Map for Planning Confirmation

The Flood Map for Planning (Rivers & Sea)

Our Flood Map shows the natural floodplain for areas at risk from river and tidal flooding. The floodplain is specifically mapped ignoring the presence and effect of defences. Although flood defences reduce the risk of flooding they cannot completely remove that risk as they may be over topped or breached during a flood event.

The Flood Map indicates areas with a 1% (0.5% in tidal areas), Annual Exceedance Probability (AEP) - the probability of a flood of a particular magnitude, or greater, occurring in any given year, and a 0.1% AEP of flooding from rivers and/or the sea in any given year. The map also shows the location of some flood defences.

The Flood Map is intended to act as a guide to indicate the potential risk of flooding. When producing it we use the best data available to us at the time, taking into account historic flooding and local knowledge. The Flood Map is updated on a quarterly basis to account for any amendments required. These amendments are then displayed on the internet at www.environment-agency.gov.uk.

At this Site:

The Flood Map shows that this property/site;

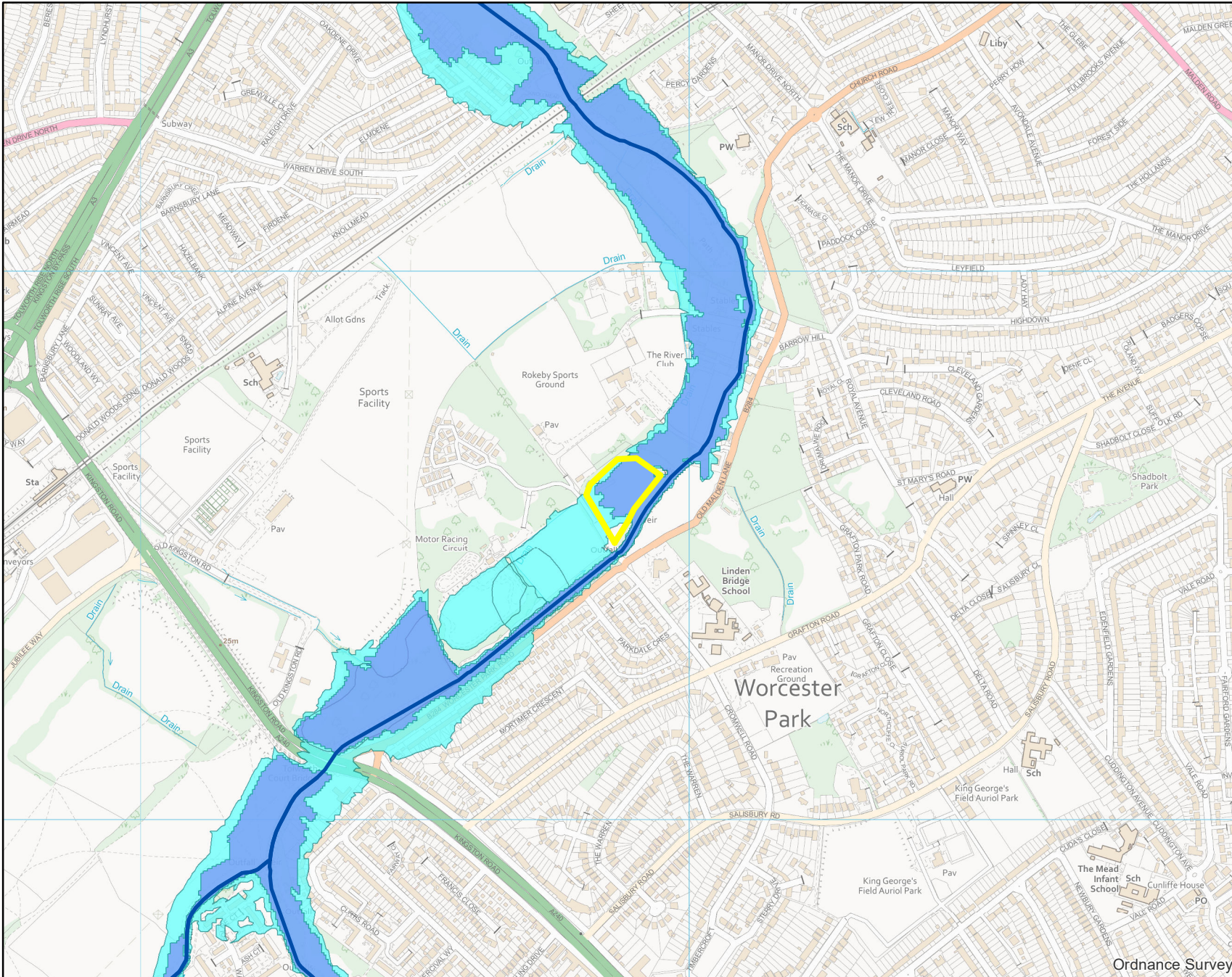
lies within the outline of Flood Zone 3, this zone comprises land assessed as having a 1% chance of flooding from rivers in any given year.


Enclosed is an extract of our Flood Map which shows this information for your area.


Method of production

The Flood Map at this location has been derived using our detailed fluvial model the of Hogsmill Flood Risk Mapping Study, completed in 2015 by JBA Consulting

Detailed FRA Map centred on KT4 7QS created 27/07/2023 (Ref: KSL 315798 AC)




Environment Agency



Legend

- Site
- Main River
- Flood Defences
- Water Storage Area
- Flood Zone 3
- Flood Zone 2

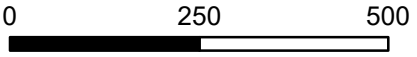
Flood Map for Planning (assuming no defences)

Flood Zone 3 shows the area that could be affected by flooding:

- from the sea with a 0.5% or greater chance of occurring each year
- or from a river with a 1% or greater chance of occurring each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 0.1% chance of occurring each year.

Scale 1:10,000



0 250 500
Meters

Ordnance Survey

Model Output Data

You have requested flood levels for various return periods at this location.

2D

The modelled flood levels for the closest most appropriate model grid cells, any additional information you may need to know about the modelling from which they are derived and/or any specific use or health warning for their use are set out below.

Using a 2D ISIS - TUFLOW model the floodplain has been represented as a grid. The flood water levels have been calculated for each grid cell.

A map showing the location of the points from which the data is taken is enclosed. Please note you should read the notice enclosed for your specific use rights.

Table 1: Modelled Node Levels excluding climate change allowances

			Modelled Flood Level for Annual Exceedance Probability, Shown in Metres AOD									
Node ID	Easting	Northing	50% AEP	20% AEP	10% AEP	5% AEP	3.33 % AEP	2% AEP	1.33 % AEP	1% AEP	0.5% AEP	0.1% AEP
434320	520895	165676	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	18.38
434972	520935	165660	Nil Return	Nil Return	Nil Return	17.60	17.65	17.79	17.88	17.95	18.05	18.34
435921	520845	165636	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	18.60
436329	520959	165626	Nil Return	Nil Return	Nil Return	17.81	17.86	17.97	18.04	18.09	18.17	18.44
437242	520877	165600	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	18.15	18.20	18.29	18.60
437565	520805	165590	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	19.07
438144	520919	165576	Nil Return	Nil Return	17.83	17.97	18.02	18.12	18.18	18.24	18.33	18.62

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.

Customer services line: 020 8474 6848

Email: kslenquiries@environment-agency.gov.uk

Website: <https://www.gov.uk/government/organisations/environment-agency>

439120	520823	165552	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	19.15
440504	520885	165518	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	18.83
441816	520861	165488	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	Nil Return	19.42

Data taken from our Hogsmill Flood Risk Mapping Study, completed in 2015 by JBA Consulting

Table 2: Modelled Node Levels including climate change allowances

Node ID	Easting	Northing	Modelled Flood Level for Annual Exceedance Probability (mAOD)		
			1% AEP +25% CC	1% AEP +35% CC	1% AEP +70% CC
434320	520895	165676	Nil Return	Nil Return	18.32
434972	520935	165660	18.09	18.13	18.27
435921	520845	165636	Nil Return	0.00	0.00
436329	520959	165626	18.21	18.24	18.37
437242	520877	165600	18.33	18.37	18.52
437565	520805	165590	Nil Return	Nil Return	19.03
438144	520919	165576	18.37	18.41	18.55
439120	520823	165552	Nil Return	Nil Return	19.12
440504	520885	165518	Nil Return	Nil Return	18.79
441816	520861	165488	Nil Return	19.12	19.33

Data taken from our Hogsmill Flood Risk Mapping Study, completed in 2015 by JBA Consulting

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.

Customer services line: 020 8474 6848

Email: kslenquiries@environment-agency.gov.uk

Website: <https://www.gov.uk/government/organisations/environment-agency>

1D

The modelled flood levels for the most appropriate cross sections taken from our 2D modelling of the Hogsmill River, any additional information you may need to know about the modelling from which they are derived and/or any specific use or health warning for their use are set out below.

Table 1: Modelled Node Levels

Node ID	Easting	Northing	Modelled Flood Level for Annual Exceedance Probability, Shown in Metres AOD									
			50% AEP	20% AEP	10% AEP	5% AEP	3.33 % AEP	2% AEP	1.33 % AEP	1% AEP	0.5% AEP	0.1% AEP
RH01_6085	520729	165374	18.37	18.51	18.73	18.89	18.95	19.11	19.23	19.35	19.54	19.96
RH01_6000	520800	165430	18.25	18.39	18.61	18.77	18.84	19.00	19.13	19.25	19.45	19.97
RH01_5901D	520872	165485	17.93	18.04	18.21	18.33	18.38	18.49	18.56	18.63	18.74	19.04
RH01_5852	520903	165531	17.59	17.74	17.95	18.08	18.13	18.23	18.29	18.33	18.42	18.67
RH01_5772	520943	165596	17.31	17.50	17.75	17.90	17.95	18.05	18.12	18.17	18.27	18.58
RH01_5695D	521001	165653	17.10	17.29	17.53	17.67	17.72	17.84	17.92	17.97	18.03	18.22
RH01_5593	521034	165687	16.91	17.08	17.30	17.44	17.49	17.64	17.74	17.81	17.92	18.18
RH01_5516	521055	165746	16.77	16.95	17.21	17.40	17.45	17.61	17.72	17.79	17.89	18.14

Data taken from our Hogsmill Flood Risk Mapping Study, completed in 2015 by JBA Consulting

There are no health warnings or additional information for these levels or the model from which they were produced.

Table 2: Modelled Node Levels including climate change allowances

Node ID	Easting	Northing	Modelled Flood Level for Annual Exceedance Probability (mAOD)		
			1% AEP +25% CC	1% AEP +35% CC	1% AEP +70% CC
RH01_6085	520729	165374	19.63	19.71	19.90
RH01_6000	520800	165430	19.55	19.64	19.88
RH01_5901D	520872	165485	18.78	18.82	18.97
RH01_5852	520903	165531	18.46	18.50	18.62
RH01_5772	520943	165596	18.31	18.35	18.50
RH01_5695D	521001	165653	18.06	18.08	18.17
RH01_5593	521034	165687	17.95	17.99	18.12
RH01_5516	521055	165746	17.92	17.96	18.08

Table 3: Modelled Node Flows

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.

Customer services line: 020 8474 6848

Email: kslenquiries@environment-agency.gov.uk

Website: <https://www.gov.uk/government/organisations/environment-agency>

Modelled Discharge for Annual Exceedance Probability, Shown in m³/s

Node ID	Easting	Northing	50% AEP	20% AEP	10% AEP	5% AEP	3.33 % AEP	2% AEP	1.33 % AEP	1% AEP	0.5% AEP	0.1% AEP
RH01_6085	520729	165374	14.12	16.99	21.83	25.64	27.34	32.06	35.85	39.60	45.79	67.61
RH01_6000	520800	165430	14.16	17.04	21.88	25.70	27.41	32.13	35.93	39.69	46.30	62.90
RH01_5901D	520872	165485	14.23	17.13	21.98	25.82	27.53	32.25	36.08	39.85	46.50	65.14
RH01_5852	520903	165531	14.23	17.13	21.98	25.82	27.53	32.25	36.07	39.85	46.50	65.14
RH01_5772	520943	165596	14.23	17.13	21.75	25.00	26.38	29.95	32.63	35.11	39.04	47.85
RH01_5695D	521001	165653	14.27	17.18	22.03	25.22	26.39	28.51	30.14	32.01	35.56	47.32
RH01_5593	521034	165687	14.34	17.28	22.13	25.13	26.18	27.56	27.97	28.16	28.44	31.02
RH01_5516	521055	165746	14.37	17.32	19.84	20.03	20.47	21.35	22.00	22.72	23.95	27.64

Data taken from our Hogsmill Flood Risk Mapping Study, completed in 2015 by JBA Consulting

There are no health warnings or additional information for these levels or the model from which they were produced.

Table 4: Modelled Node Flows including climate change allowances

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.

Customer services line: 020 8474 6848

Email: kslenquiries@environment-agency.gov.uk

Website: <https://www.gov.uk/government/organisations/environment-agency>

Node ID	Easting	Northing	Modelled Flood Flows for Annual Exceedance Probability (m3/s)		
			1% AEP +25% CC	1% AEP +35% CC	1% AEP +70% CC
RH01_6085	520729	165374	48.05	51.14	61.68
RH01_6000	520800	165430	48.95	51.81	59.52
RH01_5901D	520872	165485	49.56	52.71	61.44
RH01_5852	520903	165531	49.56	52.71	61.45
RH01_5772	520943	165596	40.54	41.93	45.88
RH01_5695D	521001	165653	37.12	38.72	44.36
RH01_5593	521034	165687	28.69	28.92	30.19
RH01_5516	521055	165746	24.54	25.08	26.93

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.

Customer services line: 020 8474 6848

Email: kslenquiries@environment-agency.gov.uk

Website: <https://www.gov.uk/government/organisations/environment-agency>

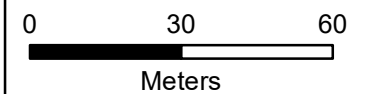
2D Node Map centred on KT4 7QS created 27/07/2023 (Ref: KSL 315798 AC)



Legend

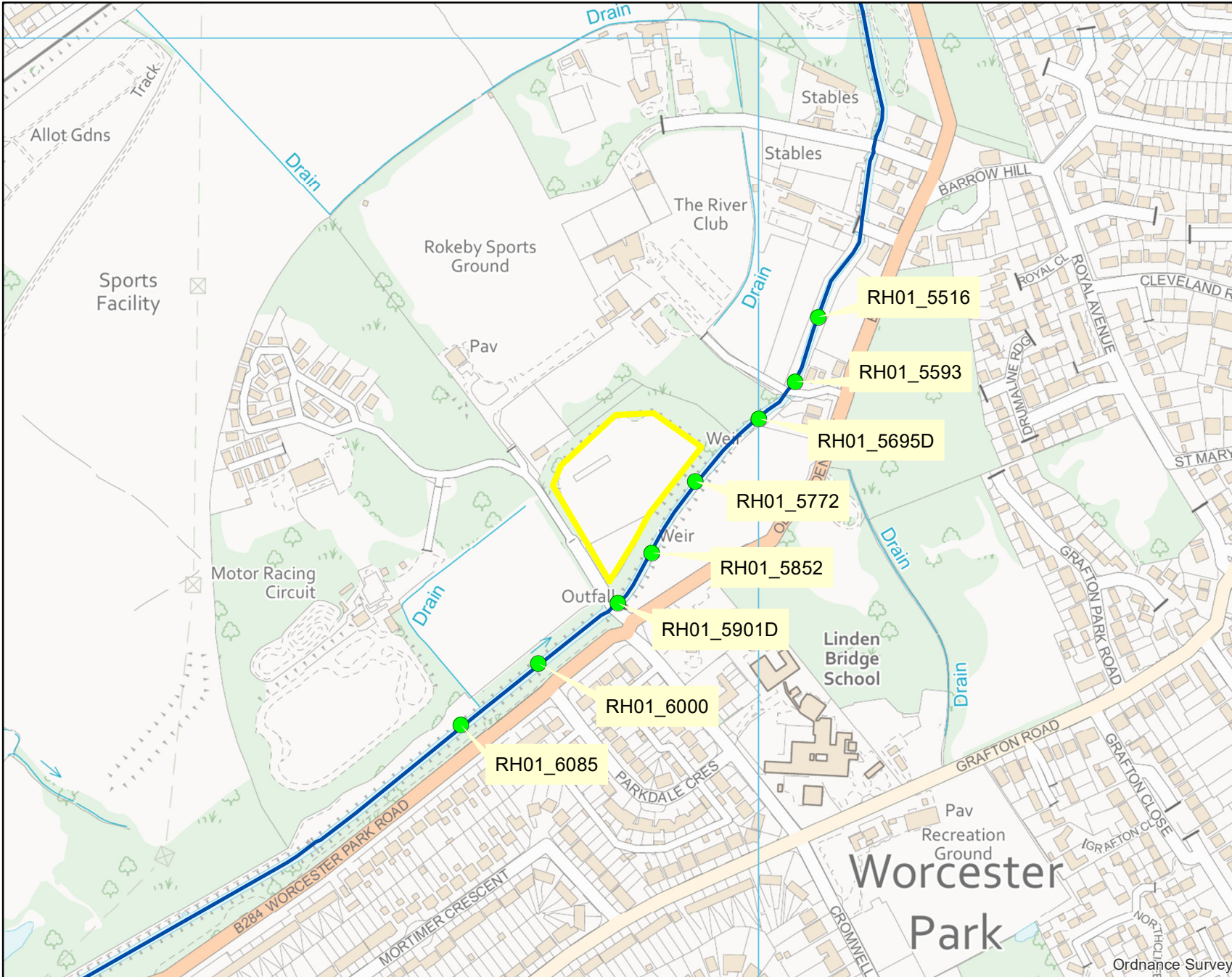
- 2D_Nodes
- Site
- Main River


Scale 1:1,500






Ordnance Survey

1D Node Map centred on KT4 7QS created 27/07/2023 (Ref: KSL 315798 AC)



 Environment Agency

Legend

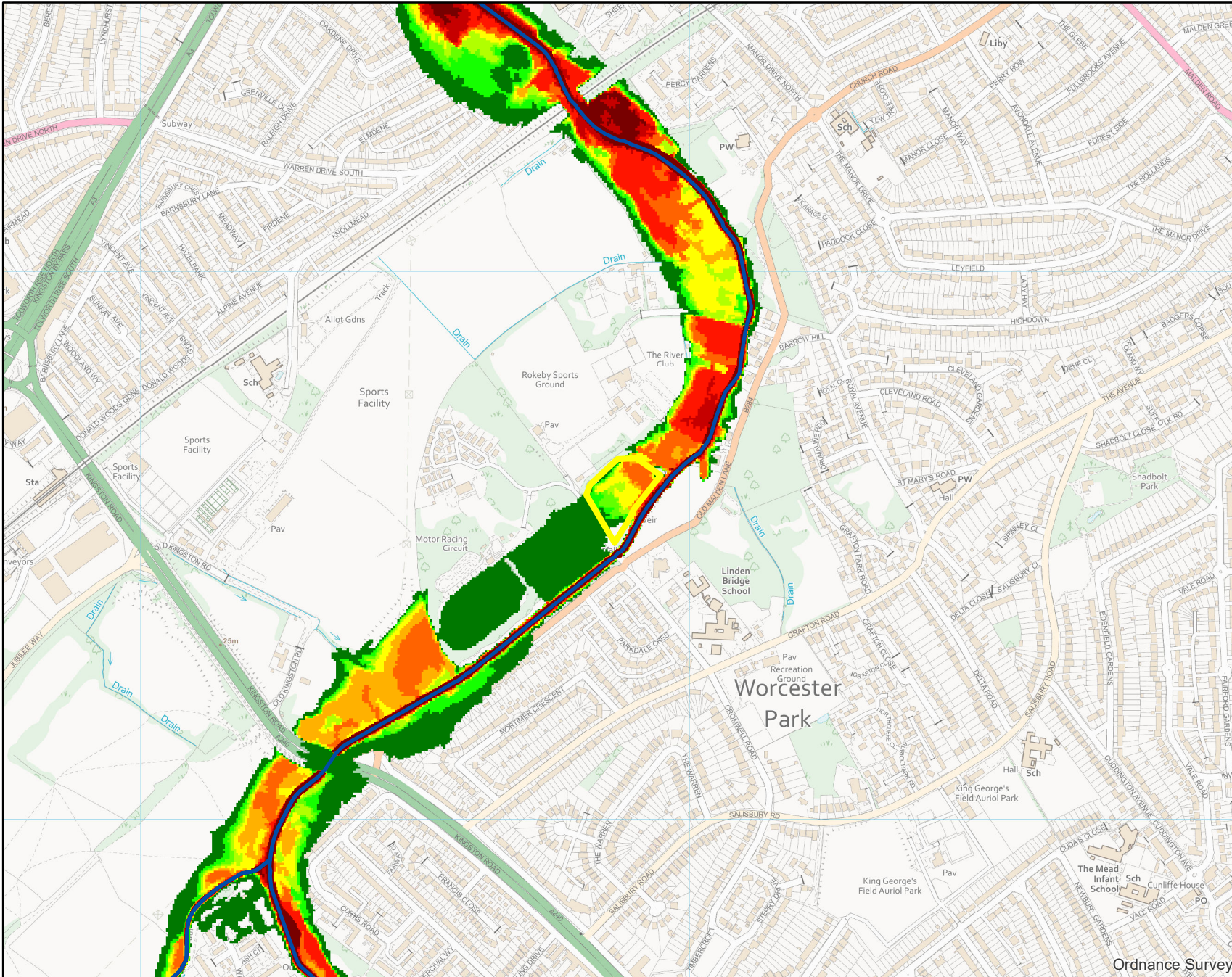
-  1D_Nodes
-  Site
-  Main River



Scale 1:5,000

0 125 250
Meters

Ordnance Survey

Modelled Flood Extent Map centred on KT4 7QS created 27/07/2023 (Ref: KSL 315798 AC)




Environment Agency


Legend

- Site
- Main River

Hogsmill Outlines

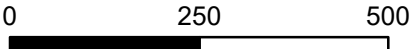
RP_Yrs

- 50% AEP
- 20% AEP
- 10% AEP
- 5% AEP
- 3.33% & AEP
- 2% AEP
- 1.33% AEP
- 1% AEP
- 0.5% AEP
- 0.1% AEP

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

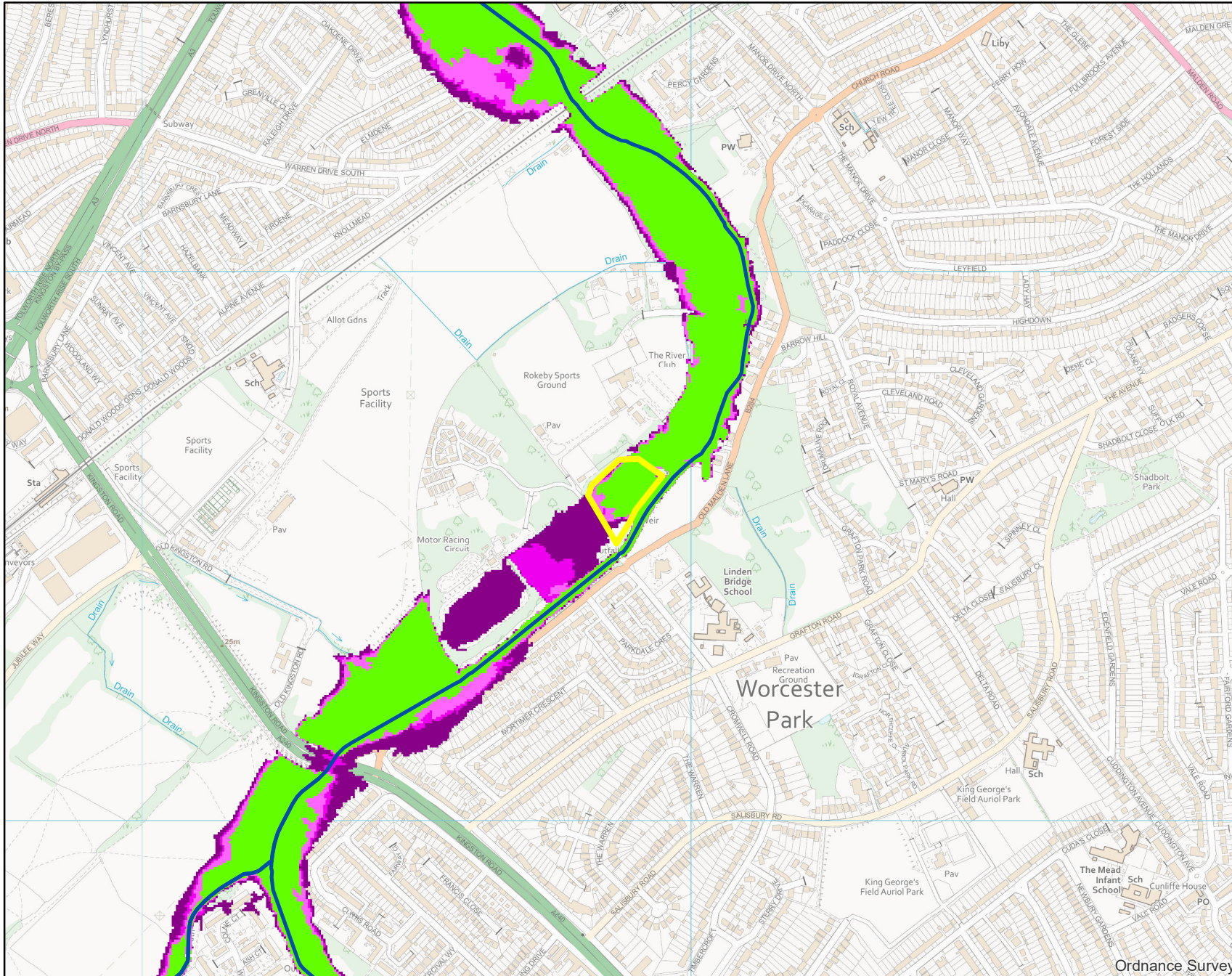
Climate Change (CC) extent based on an increase of 20% in river flows.

Scale 1:10,000



0 250 500
Meters

Modelled Flood Extent Map with Climate Change Allowance centred on KT4 7QS created 27/07/2023 (Ref: KSL 315798 AC)



Legend

 Site

 Main River

Hogsmill Climate Change RP

 1% AEP

 1% AEP + 25% CC

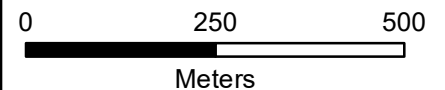
 1% AEP + 35% CC

 1% AEP + 70% CC

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Climate Change (CC) extent based on an increase of 20% in river flows.

Scale 1:10,000



Defence Details

There are no formal flood defences owned or maintained by the Environment Agency in the area of this site.

Areas Benefiting from Flood Defences

The Environment Agency has taken the decision to retire this dataset and remove it from the Flood Map for Planning portal. This is because we have determined that it no longer meets the customer needs and creates a false sense of security for users.

To understand the long-term risk of flooding to an area, you can use the [Check Your Long Term Flood Risk portal](#): this will provide an understanding of flood risk from rivers and sea, taking into account the presence and condition of defences, and other sources of flood risk such as from surface water and reservoirs.

Historic Flood Events Data

We hold records of historic flood events from rivers. Information on the floods that may have affected the area local to your site are provided below and in the enclosed map (if relevant).

Flood Event Data

We do not hold records of historic flood events from rivers affecting the area local to this property. However, please be aware that this does not necessarily mean that flooding has not occurred here in the past, as our records are not comprehensive.

Please note that our records are not comprehensive. We would therefore advise that you make further enquiries locally with specific reference to flooding at this location. You should consider contacting the relevant Local Planning Authority and/or water/sewerage undertaker for the area.

We map flooding to land, not individual properties. Our historic flood event record outlines are an indication of the geographical extent of an observed flood event. Our historic flood event outlines do not give any indication of flood levels for individual properties. They also do not imply that any property within the outline has flooded internally.

Please be aware that flooding can come from different sources. Examples of these are:

- from rivers or the sea;
- surface water (i.e. rainwater flowing over or accumulating on the ground before it is able to enter rivers or the drainage system);
- overflowing or backing up of sewer or drainage systems which have been overwhelmed,
- groundwater rising up from underground aquifers

Currently the Environment Agency can only supply flood risk data relating to the chance of flooding from rivers or the sea. However you should be aware that in recent years, there has been an increase in flood damage caused by surface water flooding or drainage systems that have been overwhelmed.

Additional Information

Information Warning - OS background mapping

The mapping of features provided as a background in this product is © Ordnance Survey. It is provided to give context to this product. The Open Government Licence does not apply to this background mapping. You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which the Environment Agency makes it available. You are not permitted to copy, sub-license, distribute, sell or otherwise make available the Licensed Data to third parties in any form. Third party rights to enforce the terms of this licence shall be reserved to OS.

Planning advice and guidance

The Environment Agency are keen to work with partners to enable development which is resilient to flooding for its lifetime and provides wider benefits to communities. If you have requested this information to help inform a development proposal, then we recommend engaging with us as early as possible by using the pre-application form available from our website:

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

Complete the form in the link and email back to kslplanning@environment-agency.gov.uk

We recognise the value of early engagement in development planning decisions. This allows complex issues to be discussed, innovative solutions to be developed that both enables new development and protects existing communities. Such engagement can often avoid delays in the planning process following planning application submission, by reaching agreements up-front. We offer a charged pre-application advice service for applicants who wish to discuss a development proposal.

We can also provide a preliminary opinion for free which will identify environmental constraints related to our responsibilities including flooding, waste, land contamination, water quality, biodiversity, navigation, pollution, water resources, foul drainage or Environmental Impact Assessment.

Flood Risk Assessments guidance

Flood risk standing advice for applicants

In preparing your planning application submission, you should refer to the Environment Agency's Flood Risk Standing Advice and the Planning Practice Guidance for information about what flood risk assessment is needed for new development in the different Flood Zones. This information can be accessed via:

<https://www.gov.uk/flood-risk-assessment-standing-advice>

<http://planningguidance.planningportal.gov.uk/>

<https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications>

<https://www.gov.uk/guidance/flood-risk-and-coastal-change>

You should also consult the Strategic Flood Risk Assessment and flood risk local plan policies produced by your local planning authority.

You should note that:

1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk Assessment where one is required, but does not constitute such an assessment on its own.
2. This information covers flood risk from main rivers and the sea, and you will need to consider other potential sources of flooding, such as groundwater or overland runoff. You should discuss surface water management with your Lead Local Flood Authority.
3. Where a planning application requires a FRA and this is not submitted or deficient, the Environment Agency may well raise an objection due to insufficient information

Surface Water

We have provided two national Surface Water maps, under our Strategic Overview for flooding, to your Lead Local Flood Authority who are responsible for local flood risk (i.e. surface runoff, ground water and ordinary watercourse), which alongside their existing local information will help them in determining what best represents surface water flood risk in your area.

Your Lead Local Flood Authority have reviewed these and determined what it believes best represents surface water flood risk. You should therefore contact this authority so they can provide you with the most up to date information about surface water flood risk in your area.

You may also wish to consider contacting the appropriate relevant Local Planning Authority and/or water/sewerage undertaker for the area. They may be able to provide some knowledge on the risk of flooding from other sources. We are working with these organisations to improve knowledge and understanding of surface water flooding.

Open Government Licence

Please refer to the [Open Government Licence](#) which explains the permitted use of this information.



Appendix D Thames Water Asset Plans

Flood Risk Assessment

Rivershill Yard, Worcester Park

NSS (Worcester Park) LLP

SLR Project No.: 425.064793.00001

12 August 2023

Asset location search



Property Searches

SLR Consulting
83 Victoria Street
LONDON
SW1H 0HW

Search address supplied Rivershill Yard
Old Malden Lane

Your reference 425.07464.00001

Our reference ALS/ALS/24/2017_3708313

Search date 13 December 2017

Keeping you up-to-date

Knowledge of features below the surface is essential in every development. The benefits of this not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility for any commercial or residential project.

An asset location search provides information on the location of known Thames Water clean and/or wastewater assets, including details of pipe sizes, direction of flow and depth. Please note that information on cover and invert levels will only be provided where the data is available.



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



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



0845 070 9148



Search address supplied: Rivershill Yard, Old Malden Lane,

Dear Sir / Madam

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

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

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

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

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

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

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0845 070 9148, or use the address below:

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

Email: searches@thameswater.co.uk

Web: www.thameswater-propertysearches.co.uk

Waste Water Services

Please provide a copy extract from the public sewer map.

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

Clean Water Services

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

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

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

Asset location search



Property Searches

For your guidance:

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

Payment for this Search

A charge will be added to your suppliers account.

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

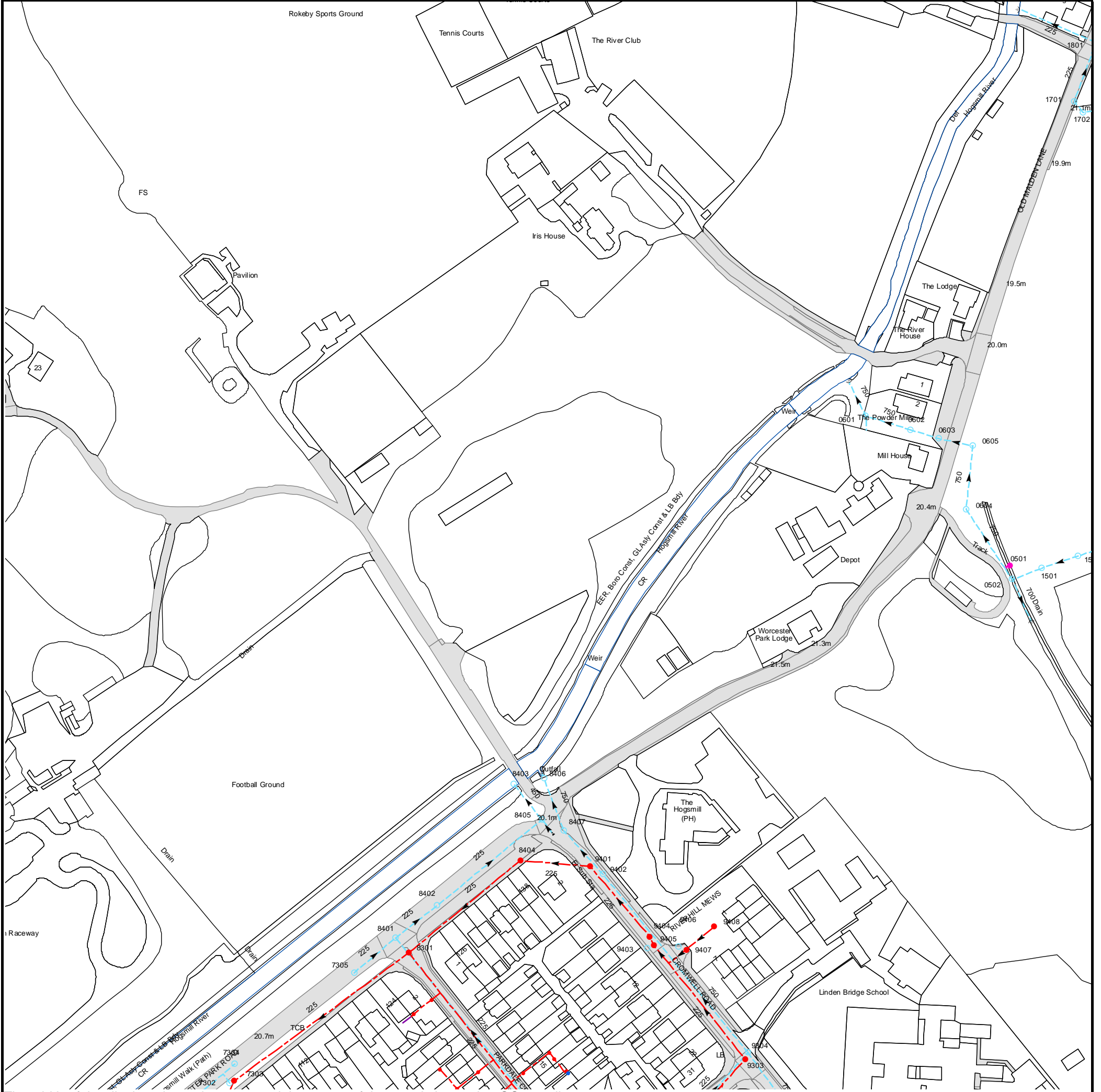
Clean Water queries

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

Asset Location Search Sewer Map - ALS/ALS/24/2017_3708313



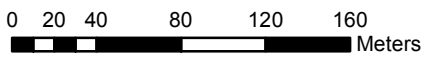
The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 520882,165587
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. 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 and established on site before any works are undertaken.

Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
0605	20.25	17.95
0603	19.59	16.94
0602	18.3	16.14
0601	17.44	16.04
1702	21.98	20.4
1701	21.2	20.08
7302	20.54	19.7
7303	20.58	18.6
7304	20.43	18.51
7305	20.5	18.73
8401	20.41	18.51
8301	20.75	18.98
831J	n/a	n/a
831K	n/a	n/a
8402	20.31	18.35
831H	n/a	n/a
831F	n/a	n/a
8403	17.04	17.38
8404	20.44	19.11
831E	n/a	n/a
8405	20.1	17.38
8406	20.12	18.67
831D	n/a	n/a
831C	n/a	n/a
8407	20.28	19.18
831B	n/a	n/a
831A	n/a	n/a
9401	20.87	19.2
9402	21.06	19.26
9403	21.88	18.67
9404	21.84	19.38
9405	21.92	19.38
9406	22.07	18.67
9407	22.1	19.87
9408	22.3	20.12
9303	23.02	20.48
9304	23.04	20.79
0604	19.68	18.28
0501	20.66	16.14
0502	21.39	20.24
1501	21.84	20.71
1502	22.29	21.14

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 and established on site before any works are undertaken.



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: 1:3579
Width: 1000m
Printed By: dshivaji
Print Date: 13/12/2017
Map Centre: 520882,165586
Grid Reference: TQ2065NE

Comments:








ALS Sewer Map Key

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
-  Vent Pipe
-  Bio-solids (Sludge)
-  Proposed Thames Surface Water Sewer
-  Proposed Thames Water Foul Sewer
-  Gallery
-  Foul Rising Main
-  Surface Water Rising Main
-  Combined Rising Main
-  Sludge Rising Main
-  Proposed Thames Water Rising Main
-  Vacuum





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






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

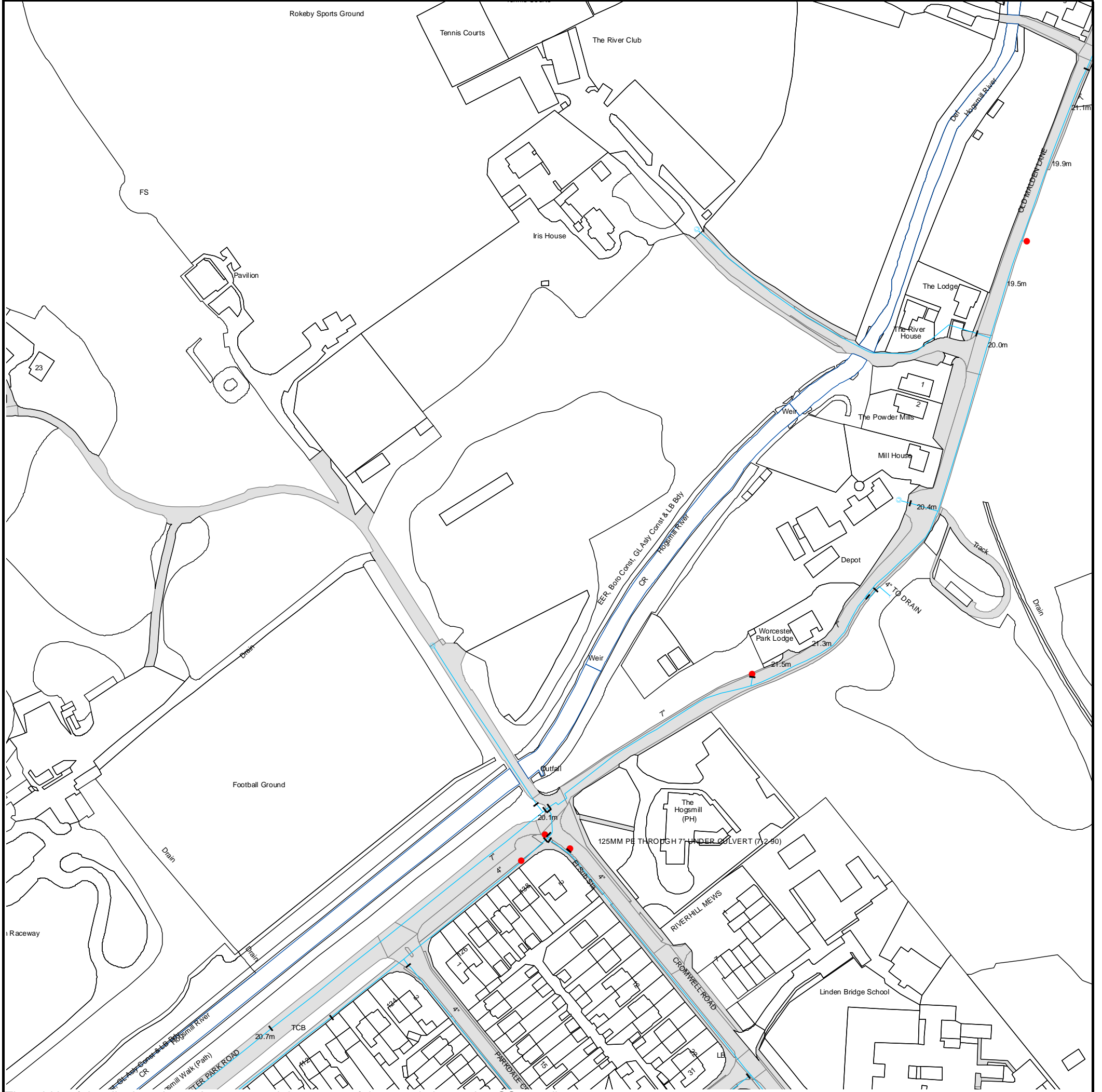
Other Sewer Types (Not Operated or Maintained by Thames Water)

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

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.
- 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.

Asset Location Search Water Map - ALS/ALS/24/2017_3708313



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 520882, 165587.








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 and established on site before any works are undertaken.

Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.







ALS Water Map Key

Water Pipes (Operated & Maintained by Thames Water)


- 
Distribution Main: The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.
- 
Trunk Main: A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.
- 
Supply Main: A supply main indicates that the water main is used as a supply for a single property or group of properties.
- 
Fire Main: Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.
- 
Metered Pipe: A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.
- 
Transmission Tunnel: A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.
- 
Proposed Main: A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

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

Valves

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

Hydrants








-  Single Hydrant

Meters










-  Meter

End Items

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

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



Operational Sites

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

Other Symbols

-  Data Logger

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

-  **Other Water Company Main:** Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.
-  **Private Main:** Indicates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

Terms and Conditions

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

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

Sewer Flooding

History Enquiry



Property Searches

SLR Consulting

Victoria Street

Search address supplied Rivershill Yard
Old Malden Lane

Your reference 425.07464.00001

Our reference SFH/SFH Standard/2017_3708314

Received date 13 December 2017

Search date 13 December 2017



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



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



0845 070 9148

Sewer Flooding

History Enquiry



Property Searches

Search address supplied: Rivershill Yard, Old Malden Lane

This search is recommended to check for any sewer flooding in a specific address or area

TWUL, trading as Property Searches, are responsible in respect of the following:-

- (i) any negligent or incorrect entry in the records searched;
- (ii) any negligent or incorrect interpretation of the records searched;
- (iii) and any negligent or incorrect recording of that interpretation in the search report
- (iv) compensation payments



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History of Sewer Flooding

Is the requested address or area at risk of flooding due to overloaded public sewers?

The flooding records held by Thames Water indicate that there have been no incidents of flooding in the requested area as a result of surcharging public sewers.

For your guidance:

- A sewer is “overloaded” when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.
- “Internal flooding” from public sewers is defined as flooding, which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
- “At Risk” properties are those that the water company is required to include in the Regulatory Register that is presented annually to the Director General of Water Services. These are defined as properties that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company’s reporting procedure.
- Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk Register.
- Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company.
- Public Sewers are defined as those for which the Company holds statutory responsibility under the Water Industry Act 1991.
- It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company. This report excludes flooding from private sewers and drains and the Company makes no comment upon this matter.
- For further information please contact Thames Water on Tel: 0800 316 9800 or website www.thameswater.co.uk



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