Land South of Holt Cottages, Ashford Hill

Flood Risk Assessment

For

JPP Land Limited/ Rosemary Pelham and Timothy Pyper

Project Number:

13692

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Campbell Reith Hill LLP
Raven House
29 Linkfield Lane
Redhill
Surrey RH1 1SS

T:+44 (0)1737 784500
F:+44 (0)1737 784501
E:surrey@campbellreith.com
W:www.campbellreith.com

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Author	R. Cossins and A. Higgins
Project Partner	S. Boots
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EXECUTIVE SUMMARY

CampbellReith has produced this Flood Risk Assessment (FRA) including the Drainage Strategy to support a planning application for the proposed residential development at land adjacent to Little Knowl Hill in Ashford. The development is for the erection of up to 50 residential dwellings with associated parking, play area, and landscaping together with a means of access from Little Knowl Hill.

The greenfield site is currently in Flood Zone 1 and is at medium risk of flooding from groundwater and surface water and at Low or Very Low risk of flooding from all other sources. An unnamed watercourse is present running along the south/southeastern boundary of the site and is a tributary of the Baughurst Brook.

The site has no previous history of development and available data suggests that the site exhibits a gentle slope to the east.

The British Geological Survey (BGS) Online Geology Viewer notes the underlain bedrock for the site as London Clay Formation and no superficial deposits are recorded. There may be potential for infiltration drainage subject to onsite testing and groundwater monitoring.

There are no recorded services present onsite and no existing connection to the local foul sewerage network from the site.

The proposed drainage strategy seeks to utilise permeable paving, filter drains and swales to provide water quality improvement and convey water towards the discharge point into the existing watercourse. A detention basin situated in the east of the site will provide attenuation and further treatment of runoff, prior to a controlled discharge to the watercourses at no more than Greenfield runoff rate.

Foul water is proposed to be treated onsite via a package treatment plant in the east of the site before controlled discharge of treated water into the existing watercourse to the east.

Thames Water and the Environment Agency have been consulted with regard to the proposed drainage strategy for the site.

The proposed strategy will not increase flood risk on or off the site for the lifetime of the development.

1.0 INTRODUCTION

1.1. Brief

1.1.1. CampbellReith has been commissioned by JPP Land Ltd, Rosemary Pelham and Timothy Pyper (the Applicants) to prepare a Flood Risk Assessment (FRA) to inform the residential development at Land South of Holt Cottages, Ashford Hill, Berkshire herein referred to as 'the site'. The site location is contained in Appendix A.

1.1.2. This assessment is a qualitative report and has been based on readily available information. Site photographs have been provided by Fabrik (the Architect) taken during previous site visits and are contained within Appendix B.

1.1.3. The FRA has been prepared in support of an Outline Planning Application for the above proposed development.

1.2. Project Overview

1.2.1. The proposed development seeks to provide up to 50 dwellings with gardens, garages a play area and off street car parking facilities on the site.

1.3. Aims and Objectives

1.3.1. This report has been prepared in accordance with the National Planning Policy Framework (NPPF)[1] and the accompanying Planning Practice Guidance (PPG)[2].

1.3.1. This FRA aims to identify the sources of flooding related to the site whilst demonstrating the feasibility of residential development and how residual risks, if any, could be managed.

1.3.2. The objectives of this FRA are to:

- Establish whether the site is likely to be affected by current or future flooding from any source;
- Establish whether proposed future development will increase flood risk elsewhere;
- Establish whether the measures proposed to deal with these effects and risks are appropriate;
- Ensure the evidence to satisfy the Local Planning Authority's (LPA) (if necessary) Sequential Test, and;
- Establish whether the Lead Local Flood Authority (LLFA) has records of flood risk on the site and within the surrounding area;
- Present the findings of the assessment through a site constraints plan;
- Demonstrate surface water can be managed on site by preparing an illustrative surface water drainage strategy.

[1] Ministry of Housing, Communities & Local Government (2021) National Planning Policy Framework. Ref: ISBN 978-1-5286-1033-9, CP 48.
[2] Department for Environment, Food & Rural Affairs and Environment Agency (2014) Planning Practice Guidance: Flooding and Coastal Change

2.0 PLANNING POLICY

2.1. National Planning Policy Framework (NPPF)

2.1.1. The NPPF as updated in July 2021 sets out the government's national planning policies to protect people and property from flooding from either now or in the future which all Local Planning Authorities (LPAs) are expected to follow. There are three main steps which should be followed to ensure that the risk of flooding from development is minimised; assess the flood risk, avoid flood risk and manage and mitigate the flood risk.

2.1.2. The NPPF recommends that new development adopts a sequential, flood risk-based approach to the location of development, taking into account climate change and its impact to or by current or future flood risk. Subject to the type of development proposed and the relative flood zone (Zone 1 being the least risk and Zone 3b the greatest risk) in which the development site is located, there can be a requirement for a sequential test and an exception test.

2.1.3. The aim of the sequential test is to steer development to areas considered to be at the lowest risk from sources of flooding. If this is not possible then the exception test would be required demonstrating that the development would provide wider sustainability benefits to the community that would outweigh the flood risk and that the development would be safe for its lifetime taking into account the vulnerability of the users without increasing flood risk elsewhere and where possible reducing the current risk of flooding.

2.1.4. The NPPF also states that major developments should incorporate sustainable drainage systems (SuDS) unless there is clear evidence that this would be inappropriate.

2.2. Flood Risk and Coastal Change Planning Practice Guidance (PPG)

2.2.1. A FRA is required when developments are:

- Located within a Flood Zone 2 or 3 including minor development and change of use;
- More than 1 hectare (ha) in a Flood Zone 1;
- Less than 1 ha in a Flood Zone 1, including a change of use in development type to a more vulnerable class (for example from commercial to residential), where they could be affected by sources of flooding other than rivers and sea (for example surface water, reservoirs); or
- In an area within a Flood Zone 1 which has critical drainage problems as notified by the Environment Agency (EA).

2.2.2. Paragraph 66 (Table 2) of the PPG defines the various flood risk vulnerability classification and identifies the different types of development within each category. Table 2.1 on the following page summarises the flood risk vulnerability and compatibility as extracted from Paragraph 67 of the PPG in relation to the above flood zones.

Table 2.1: Flood Vulnerability and Flood Zone Compatibility Table

Flood Zones	Flood Risk Vulnerability Classification				
	Essential Infrastructure	**Highly Vulnerable**	**More Vulnerable**	**Less Vulnerable**	**Water Compatible**
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test Required	✓	✓	✓
Zone 3a†	Exception Test required†	×	Exception Test Required	✓	✓
Zone 3b*	Exception Test required*	×	×	×	✓*

Key ✓Development is appropriate.

× Development should not be permitted.

† In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

* In Flood Zone 3b (functional floodplain) essential infrastructure that has to be there and has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.

2.3. Roles and Responsibilities

2.3.1. The EA is a statutory consultee for planning applications. The EA is responsible for managing the risk of flooding from main rivers, reservoirs, estuaries and the sea.

2.3.2. The roles of the LLFAs were established following the Flood Risk Regulations (2009) and the Flood and Water Management Act (2010). They are responsible for developing, maintaining and applying a strategy for local flood risk management in their areas and maintaining a register of flood risk assets. They also have lead responsibility for managing the risk of flooding from surface water, groundwater and ordinary watercourses.

2.4. Climate Change[3]

2.4.1. The NPPF sets out how the planning system should help minimise vulnerability and provide resilience to the impacts of climate change. The EA provide guidance on the climate change allowances which should be considered when assessing the future risk of flooding.

2.4.2. Climate change allowances should be applied to the peak rainfall intensities. Table 2.2 shows the anticipated change in extreme rainfall intensity in small and urban catchments. The central and upper allowances should be applied to assess the range of impact.

[3] EA Climate Change Allowances: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Table 2.2: EA Peak Rainfall Intensities

Applies Across All Of England	Total Potential Change Anticipated For The '2020s' (2015 to 2039)	Total Potential Change Anticipated For The '2050s' (2040 to 2069)	Total Potential Change Anticipated For The "2080s" (2070 to 2115)
Upper End	10%	20%	40%
Central	5%	10%	20%

3.0 LOCAL POLICIES AND GUIDANCE

3.1.1. The following documents have been reviewed to inform this assessment:

- Basingstoke and Deane Borough Council, Adopted Local Plan 2011-2029, May 2016
- Basingstoke and Deane Borough Council, Strategic Flood Risk Assessment (SFRA), January 2010
- Basingstoke and Deane Borough Council, Design and Sustainability Supplementary Planning Document, July 2018
- Hampshire County Council, Preliminary Flood Risk Assessment (PFRA), April 2011
- Hampshire County Council, Groundwater Management Plan, October 2013
- Hampshire County Council, Local Flood Risk Management Strategy (LFRMS), July 2013
- Hampshire County Council, Draft Local Flood and Water Management Strategy, 2020

3.1.2. A summary of some of the key policies, objectives and findings from these documents is summarised below.

3.2. Local Flood Risk Policy

3.2.1. The Basingstoke and Deane Local Plan covers the 2011-2029 timeframe and has a number of policies relating to flood risk and water, which guide planning and development decisions.

3.2.2. The following policies should be considered when assessing flood risk and surface water management of the site:

- Policy EM6 - Water Quality
- Policy EM7 - Managing Flood Risk
- Policy EM9 - Sustainable Water Use

3.3. Strategic Flood Risk Assessment (SFRA)

3.3.1. A Level 1 SFRA was prepared by Halcrow for Basingstoke and Deane Borough Council in January 2010. The following sources of flood risk were identified within the study area:

- Fluvial
- Tidal
- Surface Water
- Groundwater
- Sewer
- Artificial Sources

3.3.2. Applicable maps and extracts are contained within Appendix B.

3.4. Preliminary Flood Risk Assessment (PFRA)

3.4.1. Hampshire County Council (HCC) prepared a PFRA in 2011 to assist in meeting its duties as LLFA to manage local flood risk and deliver the requirements of the Flood Risk Regulations. The PFRA provides a high level overview of flood risk from a variety and combination of sources.

3.4.2. Although there are no nationally significant flood risk areas within Hampshire, this report and the data collected are to be used to identify local flood risk areas and areas where further information is required to better determine and understand local flood risk across Hampshire.

3.5. Local Flood Risk Management Strategy (LFRMS)

3.5.1. Hampshire County Council prepared a LFRMS in 2013 which identifies the extent of local flood risk in Hampshire, establishes priorities for managing local flood risk and identifies how HCC will work together with Risk Management Authorities (RMAs), other interested parties and local communities to manage local flood risk.

3.5.2. This document also sets out a series of objectives which will dictate how HCC intend to address flooding in the area. The LFRMS also includes a LFRMS Action Plan, outlining measures to achieve the Strategy's objectives.

4.0 SITE CONTEXT

4.1. Site Location

4.1.1. The site is a greenfield parcel of land occupying an area of approximately 3.14 ha, located to the east of Little Knowl Hill road in the locality of Ashford Hill, Wheat Hold, Basingstoke and Deane as illustrated in Figure 4.1 below. The nearest postcode for the site is RG19 8BJ and the National Grid Reference for the approximate centre of the site is 455564E, 161493N.

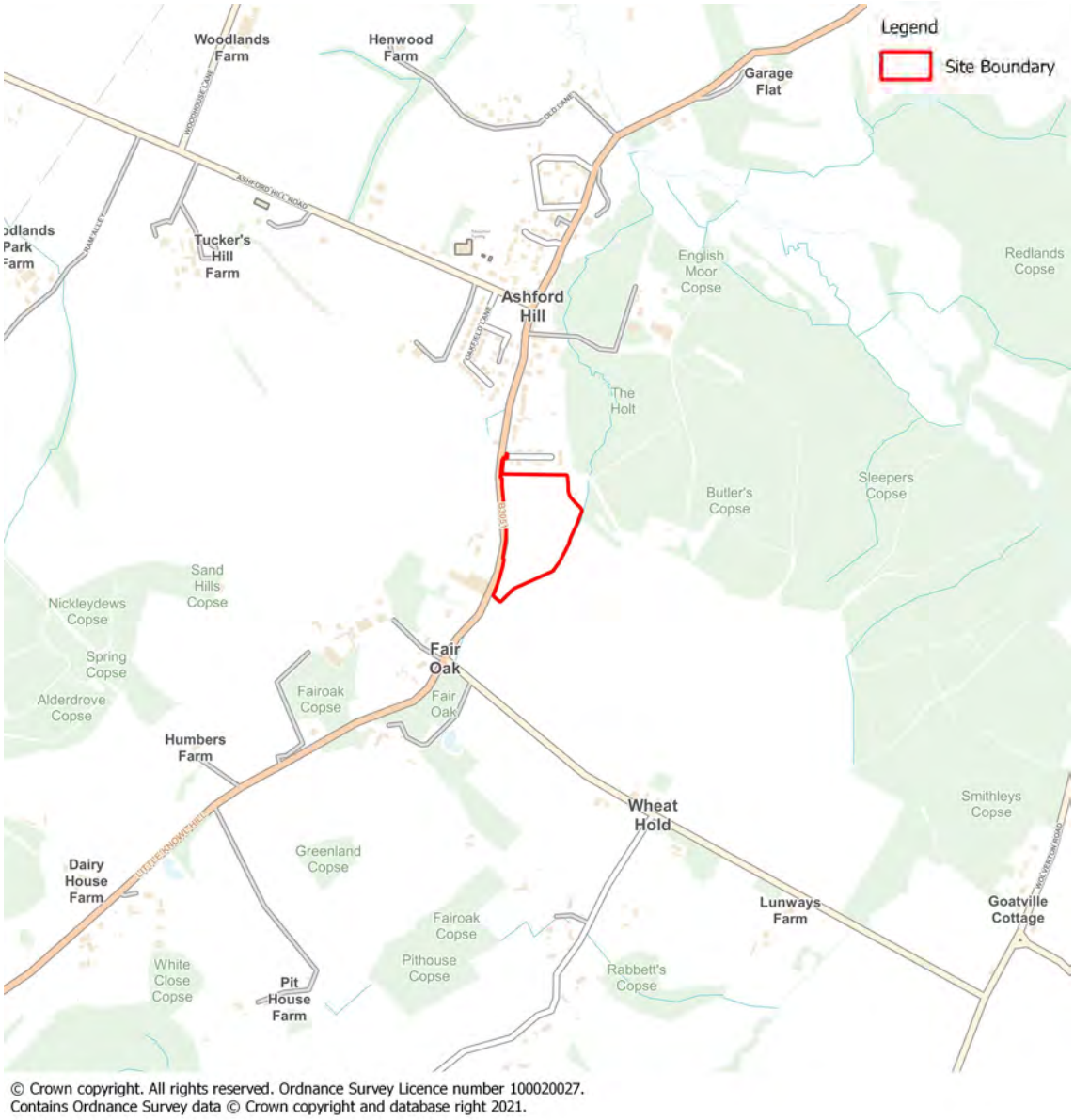


Figure 4.1: Site Boundary

4.1.2. Basingstoke and Dean Borough Council is the Local Planning Authority (LPA) for the site and Hampshire County Council acts as the Lead Local Flood Authority (LLFA) for the area.

4.1.3. The existing site sits in a rural setting south of Ashford Hill Village and is a single grassland field. The site is bound to the north and west by hedgerows with a public right of way (PRoW) to the north of the site running parallel to Holt Cottages. The site is bound to the west by Little Knowl

Hill (B3051), and by mature trees and an unnamed surface water course (a tributary of the Baughurst Brook) to the east and south of the site.

4.1.4. Adjacent land uses to the north comprises residential development and open green space and farmland. To the north lies Ashford Hill village and associated residential development, to the east lies open green space and Ashford Hill National Nature Reserve, and to the south and west lies open greenspace and pockets of woodland. The centre of Newbury is approximately 9.6km to the north west, and the centre of Baughurst approximately 3.8km east and junction 13 of the M4 lies approximately 13km to the north of the site.

4.1.5. A constraints plan identifying sensitive features which may present a constraint to development is contained within Appendix C. The site does not lie within any sensitive designations however is within close proximity to Ashford Hill Woods and Meadows Site of Special Scientific Interest (SSSI) (located approximately 55 metres to the east at its closest point to the site) and Ashford Hill National Nature Reserve (located approximately 600 metres to the east at its closest point).

4.2. Site History

4.2.1. Earliest available historic mapping from 1873 indicates that the site was undeveloped and comprises open land. Historic mapping indicates that the site has not previously been developed to the present day. Sometime between 1956 and 1970 the field boundaries crossing site were removed, the footpath was redirected around the north of site and, a ditch created to redirect the small stream along the south/southeast boundary.

4.3. Topography

4.3.1. Lidar data has been obtained as part of this assessment and is shown in Figure 4.2 below.

4.3.2. A topographical survey was undertaken by Compass Surveys Limited in May 2021 (ref: 1087) and is contained in Appendix D.

4.3.3. Available data indicates the site exhibits a gradual slope from west to east towards the surface water course from 82.50m Above Ordnance Datum (AOD) along Little Knowl Hill with a decline in levels to approximately 77.25m AOD at the eastern boundary/watercourse. Off-site levels are higher to the west and east as the watercourse sits within a valley setting, levels to the west reach 90m AOD and to the east 89m AOD. Levels to the north are commensurate with those on the site, levels to the south incline to a high point of 100m AOD.

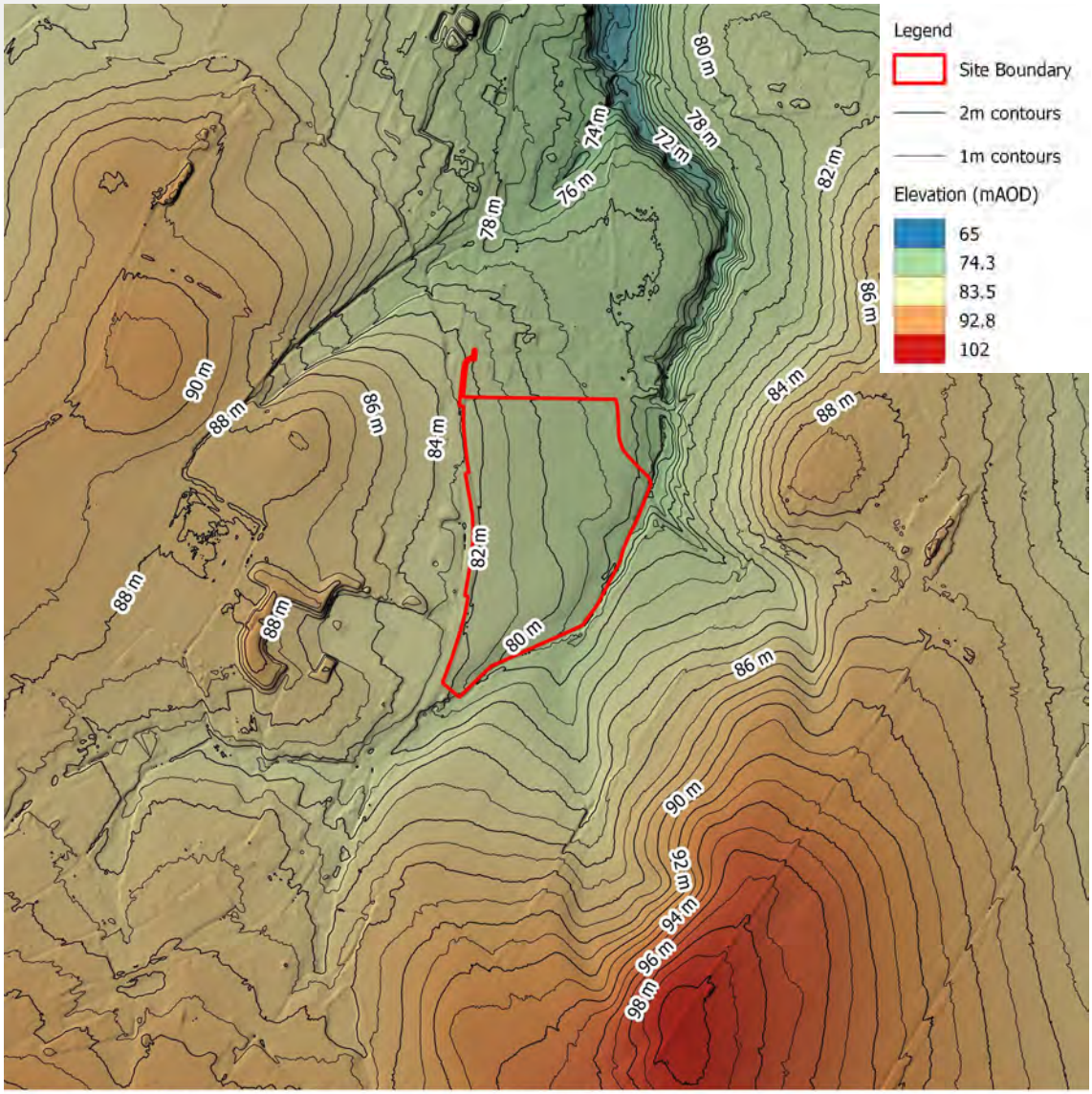


Figure 4.2: Lidar Data

4.4. Geology

4.4.1. The British Geological Survey (BGS) Online Geology Viewer[4] and the Groundsure Report[5], note the underlain bedrock for the site as London Clay Formation. No superficial deposits are mapped across the site.

4.4.2. A Geotechnical and Geo-environmental Desktop Study (August 2021) has been prepared to accompany this planning application and should be referred to for more details.

4.4.3. The Desktop Study notes that there is potential for high groundwater or perched groundwater due to the geology of the site, although the nearest available borehole data indicate groundwater was recorded at 5.5m below ground level (m bgl).

4.4.4. The Study further notes potential for poor infiltration rates due to the anticipated geology.

[4] British Geological Survey (BGS) Online Geology http://mapapps.bgs.ac.uk/geologyofbritain/home.html
[5] Groundsure Location Intelligence, *9, Holt Cottages, Ashford Hill, RG19 8BH*, June 2021

4.4.5. Further ground investigations are required to confirm the on-site geology and support the drainage strategy for progression towards detailed design.

4.5. Hydrology

4.5.1. A desk-study review of ordnance survey mapping notes no surface water bodies on-site, however an unnamed stream is present running along the south/southeastern boundary of the site. This surface water course is a tributary of the Baughurst Brook, also noted as an EA Main River, which flows north and joins the River Enbourne which is located approximately 1.6km to the north of the site. In the surrounding area of the site, particularly to the west, a number of drains and fords scatter the landscape which also drain into the Baughurst Brook and eventually into the River Enbourne to the north.

4.6. Hydrogeology

4.6.1. The site is not located within a Source Protection Zone (SPZ) Zone as designated by the EA, and does not lie within a Nitrate Vulnerable Zone.

4.6.2. The bedrock of London Clay is classified as unproductive stratum. The groundwater vulnerability for the site is noted as 'Unproductive' (areas comprised of rocks that have negligible significance for water supply or base-flow to rivers, lakes and wetlands. They consist of bedrock or superficial deposits with a low permeability that naturally offer protection to any aquifers that may be present beneath).

4.6.3. The groundwater levels beneath the site are currently unknown and are subject to confirmation from winter groundwater monitoring.

4.7. Existing Site Drainage and Services

4.7.1. Thames Water is the incumbent sewerage utility provider for the area. A review of the Thames Waters asset records, contained in Appendix E, confirms there are no foul or surface water sewers on or adjacent to the site. There is an existing foul public sewer with an unknown diameter located approximately 50 metres to the north of the site serving the residential properties of Holt Cottages. Holt Cottages are believed to be served by a package treatment plant (PTP) before discharging into the unnamed stream to the east.

4.7.2. There are no other private sewers or services identified on site.

4.8. Existing Runoff Characteristics

4.8.1. The natural surface water flow paths have been devised from reviewing the available Lidar and topographical data and are shown on Figure 4.3.

4.8.2. The existing surface water flows generally head towards the east of the site towards the unnamed watercourse.

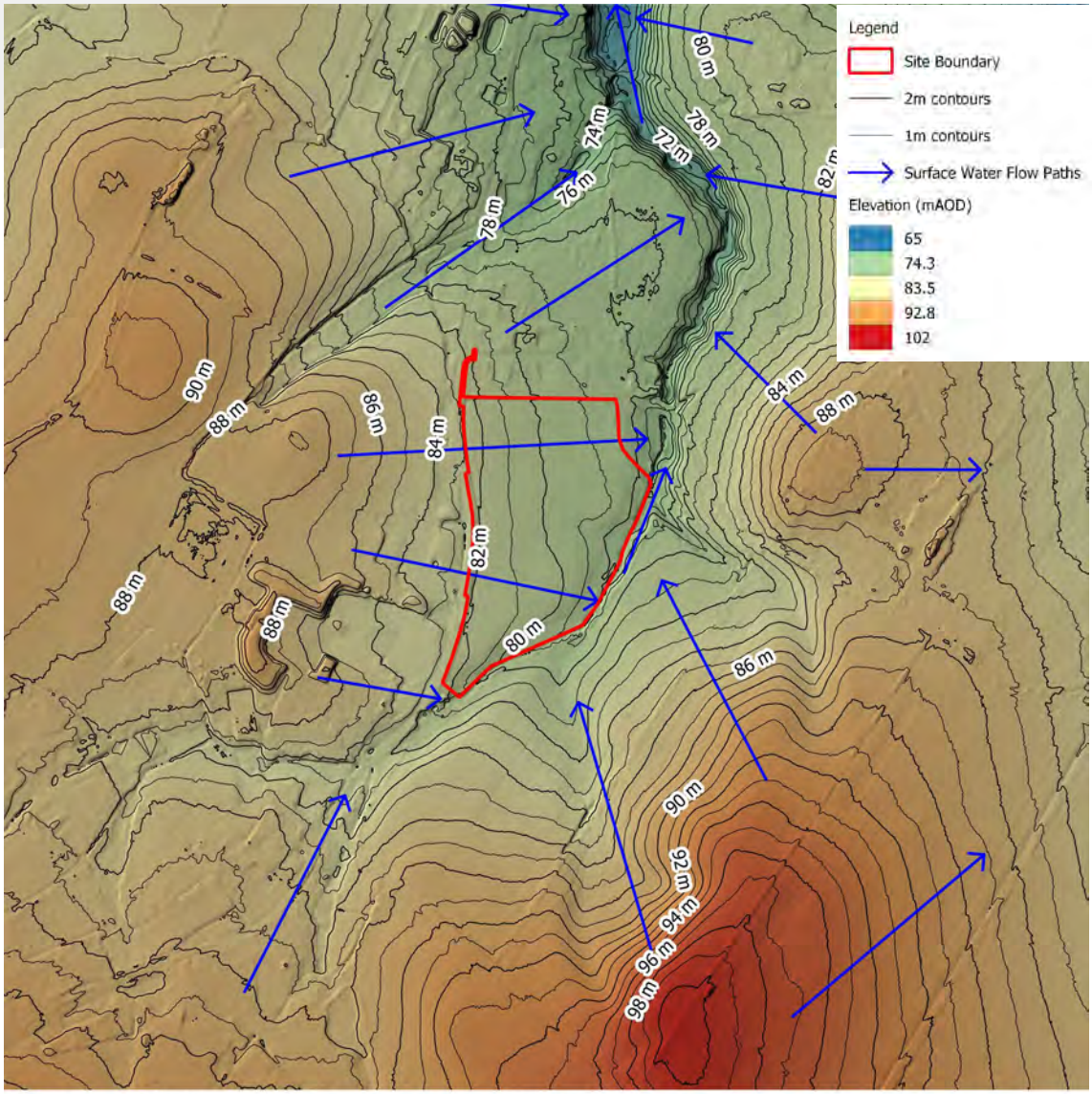


Figure 4.3: Surface Water Flow Paths

4.8.3. The greenfield runoff rates for the site were calculated using the IH124 method and are summarised in Table 4.1.

Table 4.1: Greenfield runoff rates

Storm Event	Greenfield Runoff Rate (litres/sec/ha)
Qbar	3.11
1 in 1 Year	2.6
1 in 30 Year	7.2
1 in 100 Year	9.9

5.0 EXISTING FLOOD RISK TO THE SITE

5.1. Fluvial Flood Risk

5.1.1. The EA Flood Zone Map shows the site is located within a Flood Zone 1 as shown in Figure 5.1 and contained within Appendix F. The EA defines[6] Flood Zones from rivers or the sea for Flood Zone 1 as:

- Flood Zone 1 (Low Probability): Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3).

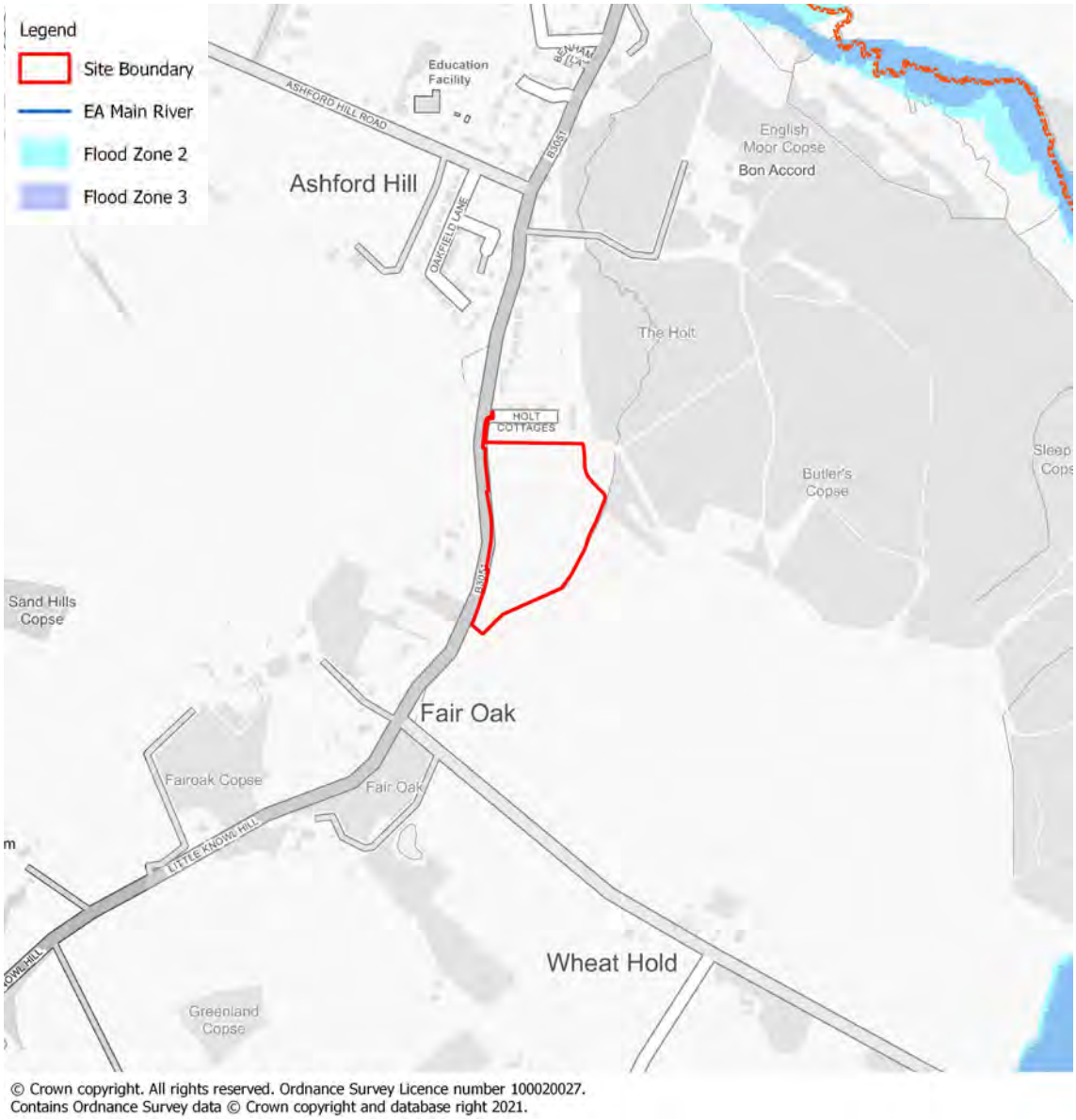


Figure 5.1: Environment Agency Flood Zones

5.1.2. The risk of fluvial flooding is deemed Low.

[6] Environment Agency & DEFRA (2014) Flood Zone Definition: https://www.gov.uk/guidance/flood-risk-and-coastal-change#flood-zone-and-flood-risk-tables

5.2. Tidal Flood Risk

5.2.1. The site is located within a Flood Zone 1 and is not situated in proximity to any tidal sources.

5.2.2. The risk of tidal flooding is therefore considered Very Low.

5.3. Flood Alert Area

5.3.1. The site does not fall within a flood alert or flood warning area.

5.4. Surface Water Flood Risk

5.4.1. The EA classify surface water flood risk as follows:

- VERY LOW – the area has a chance of surface water flooding of less than 0.1%
- LOW – the area has a chance of surface water flooding of between 0.1% and 1%
- MEDIUM – the area has a chance of surface water flooding of between 1% and 3.3%
- HIGH - the area has a chance of surface water flooding of greater than 3.3%

5.4.2. The EA's Risk of Flooding from Surface Water (RoFSW) map is presented in Figure 5.2 and contained within Appendix F. The RoFSW maps do not indicate historic or future flood risk, but instead identify low-lying areas, which are susceptible to surface water accumulations, which can follow either period of heavy or prolonged rainfall.

5.4.3. The site is primarily shown to be at Very Low risk from surface water flooding, with areas of High, Medium and Low either side of the watercourse along the south/southeastern boundary extending marginally into the site. In addition, there are areas of Low risk in the north eastern corner of the site and the centre of the site associated with a localised low points and falls in levels at these points.

5.4.4. The surrounding roads adjacent to the site are noted to be at varying levels of surface water flood risk (low, medium and high).

5.4.5. It should be noted that while surface water flooding does not require a formal drainage solution involving storage (attenuation) and flow restriction, it must nonetheless be managed as part of the development.

5.4.6. The risk of surface water flooding is therefore considered to be Low.

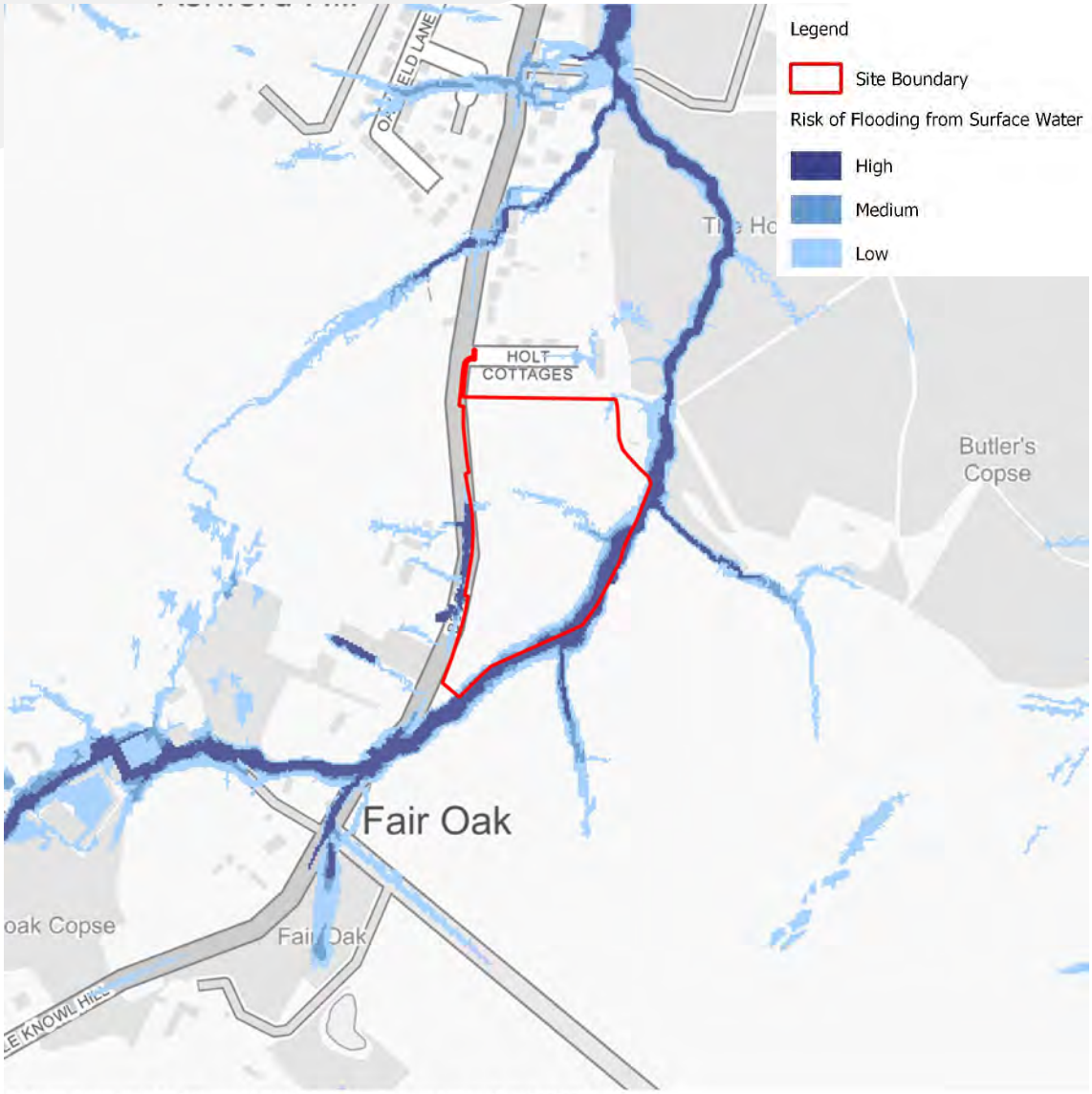


Figure 5.2: Extract of EA Risk of Flooding from Surface Water map

5.5. Groundwater Flood Risk

5.5.1. A review of the SFRA confirms that groundwater flooding has occurred in the Borough in the past in the upper parts of the Loddon catchment as a result of high groundwater levels around North Warnborough, in the River Whitewater sub-catchment, at Basingstoke town centre and in the upper reaches of the River Lyde and the Upper Loddon, with similar problems also affecting the River Test.

5.5.2. The bedrock geology of the site is recorded as London Clay and is likely impermeable in nature.

5.5.3. The groundsure report notes the site is at Moderate – High risk of groundwater flooding.

5.5.4. Further ground investigations and winter monitoring are recommended to confirm the groundwater level beneath the site.

5.5.5. The risk of groundwater flooding is Medium.

5.6. Sewer Flood Risk

5.6.1. A review of available information indicates that sewer flooding is recognised as an important local issue within the borough and several areas within the borough are known to be susceptible to flooding from sewers. The site does not lie within any of these areas susceptible to sewer flooding.

5.6.2. The SFRA notes an area of 'HCC recorded flooding' approximately 950 metres to the north of the site, and indicates a critical drainage area located approximately 2km to the north east of the site. Relevant mapping is contained within Appendix B.

5.6.3. As noted previously, there are no existing sewers on site.

5.6.4. The risk of sewer flooding for the proposed development is deemed to be Low.

5.7. Artificial Flood Risk

5.7.1. Information available from the EA for risk of inundation from reservoirs indicates that the site is not at risk from this source.

5.7.2. An area further afield to the north east of the site is at risk of inundation from reservoirs associated with the Baughurst Brook. The maximum modelled extent of flooding reaches approximately 667m at its closest point to the north east of the site.

5.7.3. The risk of artificial flooding for the proposed development is considered Very Low.

5.8. Historic Flooding

5.8.1. The BDBC SFRA notes no areas of historic flooding onsite, with the nearest area of historic localised flooding located approximately 400 metres to the north at the convergence of Ashford Hill Road and Little Knowl Hill (B3051), as shown on the on the Historic Flooding Map – Area 2 contained within Appendix B.

5.9. Flood Risk Summary

Table 5.1: Summary of existing flood risk

Flood Risk	Level of Risk
Fluvial	Low
Tidal	Very Low
Surface Water	Low
Groundwater	Medium
Sewer	Low
Artificial	Very Low

5.10. Climate Change Impact

5.10.1. Climate change must be considered as an integral part of any site specific FRA in order to minimise the impact of future flooding and allow adequate consideration for resilience to alleviate the burden on potential future users of the proposed development.

5.10.2. Climate change allowances should be applied to the peak rainfall intensities. Table 5.2 shows the anticipated change in extreme rainfall intensity in small and urban catchments. The central and upper allowances should be applied to assess the range of impact.

Table 5.2: EA Peak Rainfall Intensities

Applies Across All Of England	Total Potential Change Anticipated For The '2020s' (2015 to 2039)	Total Potential Change Anticipated For The '2050s' (2040 to 2069)	Total Potential Change Anticipated For The "2080s" (2070 to 2115)
Upper End	10%	20%	40%
Central	5%	10%	20%

6.0 DEVELOPMENT PROPOSALS

6.1. Proposed Development Description

6.1.1. The proposed development seeks to provide up to 50 residential dwellings with gardens, garages and off street car parking facilities on the site.

6.1.2. The proposed development masterplan is contained in Appendix G.

6.1.3. The expected lifetime of the development is 100 years.

6.2. Vulnerability of Development

6.2.1. Paragraph 66 of the PPG defines the different categories of development in terms of flood risk vulnerability. Residential development is classified as 'more vulnerable' in terms of flood risk.

6.2.2. Based on the EA Flood Map for Planning, the site is located within a Flood Zone 1 'Low Risk'; and the proposed development is therefore suitable for the site.

6.3. Urban Creep Allowance

6.3.1. New developments should factor in the effect urban creep. This is the increase in impermeable area on developments including conservatories/extensions/driveways.

6.3.2. For new housing, an additional increase of 10% to the proposed impermeable areas is considered the minimum allowance for urban creep where development density is less than 25 dwellings per hectare.

6.4. Sequential Test

6.4.1. The site lies within a Flood Zone 1 and therefore passes the Sequential test in accordance with the NPPF.

6.5. Exception Test

6.5.1. The site has passed the Sequential Test and therefore an exception test is not required.

7.0 SURFACE WATER MANAGEMENT

7.1. Overview

7.1.1. The surface water drainage system has been designed in accordance with the NPPF and the accompanying Guidance and Technical Standards for SuDS. It also complies with the requirements under Building Regulations Part H.

7.1.2. In line with the SuDS hierarchy under paragraph 80 of the PPG, surface water should be managed by:

1.) Infiltration to the maximum extent that is practical – where it is safe and acceptable to do so

2.) Discharge to watercourses

3.) Discharge to surface water sewer, highway drain or another drainage system

4.) Discharge to combined sewers (last resort)

7.2. Site Constraints

7.2.1. A review of the site characteristics has informed the following site constraints:

- Infiltration may be possible subject to onsite infiltration testing;
- A connection to the watercourse to the east should be sought if infiltration is not viable;
- There is no possible connection to the Thames Water foul sewer network due to unknown pipe sizes and potential capacity issues so the foul water will need to be treated onsite prior to discharge into the adjacent watercourse to the east;
- There is an area of surface water flood risk in the centre and eastern sections of the site to be managed.

7.3. Existing and Proposed Impermeable and Permeable Areas

7.3.1. The existing site is almost exclusively grassed with no significant areas of hardstanding. The existing and proposed impermeable and permeable areas are presented in Table 7.1.

Table 7.1: Existing and Proposed Impermeable and Permeable Areas

	Permeable (ha)	Impermeable (ha)
Existing	3.14ha	0.00ha
Proposed	2.26ha	0.88ha

7.4. Proposed Surface Water Discharge Rates

7.4.1. Following the SuDS hierarchy, infiltration is the preferred method of discharge for surface water. Based upon the anticipated site geology, and in the absence of site-specific infiltration testing to BRE365, it has been assumed that infiltration will not be viable.

7.4.2. Should future testing suggest that infiltration is indeed viable, then the full or partial use of infiltration should be pursed using permeable paving, swales and infiltration basins.

7.4.3. As previously mentioned in Section 4.8, the surface water catchment has been analysed and the Greenfield runoff rate (Qbar) calculated. In this instance, the proposed discharge rates for the development should be restricted to Qbar at 3.11 l/s/ha in all storms up to and including the 1 in 100 year storm +40% climate change. For the proposed impermeable area of 0.88ha, this translates to approximately 2.73 l/s flow restriction for the site. Calculations are contained in Appendix H.

7.5. Surface Water Volume

7.5.1. Calculations suggest that a storage volume of 1,081m^3/ha would be required to contain the 1 in 100 year storm volumes plus a 40% allowance for climate change when limited to QBar. Over the proposed impermeable area of 0.88ha, this translates to approximately 950m^3 attenuation requirement for the site. Calculations are contained in Appendix H.

7.6. SuDS Strategy

7.6.1. The proposed drainage strategy layout presented in Appendix H, illustrates the SuDS features proposed to manage the surface water runoff from the site.

7.6.2. The surface water drainage strategy aims to control runoff from impermeable areas at source and attenuate through SuDS features. The following SuDS features have been considered within the proposed surface water drainage strategy:

- Permeable Paving
- Filter drains
- Swales
- Attenuation Basin

7.6.3. Permeable paving over the parking bays and communal driveways can drain runoff from properties and hardstanding. The filtration process within the top layers of permeable paving would provide treatment to runoff whilst the sub-base would provide attenuation prior to discharge. In addition, runoff from rooftops could be routed into water butts to promote the reuse of water. Alternatively, raised planters and rain gardens could be used to attenuate runoff prior to connection into the permeable sub-base.

7.6.4. Three main arterial swales are proposed which can capture surface water onsite from the permeable paving, roads and other areas of the site and these can drain directly into the detention basin in the east. Timber check dams can be placed at regular intervals in the swales to restrict flow of water through steeper gradients and maximise upstream storage. Two filter drains are proposed in the east of the site to intercept runoff directly from the carriageway surface via sheet flow.

7.6.1. Additional storage in the form of detention basins would also be required. These larger surface water features can hold back large volumes of water subject to flow control and discharge offsite whilst also providing amenity and biodiversity benefits. The detention basin proposed could be situated in the east of the site corresponding with low lying levels onsite, and could store water running from the permeable paving and swales onsite before discharging via an outfall into the existing watercourse. A vortex flow control manhole would be required to limit discharge from the detention basin to the watercourse to no more than QBar in all storms up to and including the 1 in 100 year return (plus 40% climate change allowance).

7.6.2. The site is subject to some surface water flood risk in low lying land, mainly in the centre and east of the site (Appendix F). In order protect the site from surface water flooding, swales are to be located such that existing overland flow routes are maintained.

7.6.3. The proposed surface water drainage system can effectively control all runoff generated within the site and maintain pre-development Greenfield runoff, without increasing flood risk elsewhere.

7.7. Surface Water Quality

7.7.1. The SuDS components within the surface water drainage strategy have been designed in accordance with the guidance set-out in the SuDS Manual.

7.7.2. Treatment within SuDS components is essential for frequent low intensity and duration rainfall events, where urban contaminants are being mobilised and washed off urban surfaces and the aggregated contribution to the total pollutant load to the receiving surface water body is potentially high. For rainfall events greater than the 1 in 1 return period, the pollutants become diluted and the environmental risks will be reduced which means that the SuDS treatment process becomes less crucial. Treatment effectiveness is strongly linked to the hydraulic control of runoff, in particular velocity control and retention time.

7.7.3. Table 26.2 of the CIRIA SuDS Manual provides the pollution hazard indices for different land use classifications as shown in Table 7.2 below.

Table 7.2: CIRIA Pollution hazard indices for different land use classifications

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydro-carbons
Residential Roofs	Very Low	0.2	0.2	0.05
Individual property driveways, residential car parks, low traffic roads, car parks with infrequent change	Low	0.5	0.4	0.4

7.7.4. As shown above, the pollution hazard from the site is Low or Very Low.

7.7.5. Where multiple drainage features are used, the efficiency of the secondary system to treat water is reduced. By using a swale discharging into a detention basin the combined mitigation indices is as follows:

Table 7.3: Mitigation Indices for Proposed Combined Drainage System

	Mitigation Indices	Total Mitigation
TSS	0.5 + 0.5(0.5)	0.75
Metals	0.6 + 0.5(0.5)	0.85
Hydrocarbons	0.6 + 0.5(0.6)	0.90

7.7.6. The maintenance of SuDS is vital ensuring that they work as efficiently as they set out to do and is discussed in Chapter 9.

7.8. Foul Water Strategy

7.8.1. Foul water is to be collected from properties using traditional pipes and inspection chambers/manholes. As there are no existing sewers on site or within the main road, the closest available foul water sewer is within Holt Cottages to the north. Due to levels constraints, flow would have to be pumped to make a feasible connection.

7.8.2. Following guidance within the Sewerage Sector Design and Construction Guidance (DCG), a daily peak load of 4,000 L/prop/day can be used to calculate a total peak foul flow rate for 50 houses of 2.31 l/s.

7.8.3. Thames Water have been approached for comments on the proposed drainage strategy via a pre-development enquiry (contained in Appendix I). A response was received in June 2021 in which Thames Water stated that they could not guarantee that their network had sufficient capacity for the proposed development. Of particular concern was the capacity of the PTP serving Holt Cottages which was only designed for a small collection of properties and would not likely have excess capacity for a further 50 homes. Thames Water were also not forthcoming with any alternative locations or routes to nearby sewers which could be achieved under a Section 98 Sewer Requisition.

7.8.4. As an alternative, foul water is proposed to be routed via gravity to a new onsite PTP providing onsite treatment prior to discharging to the watercourse to the east. The PTP would be largely underground allowing the space above to be utilised for grassland/planting without the need for significant screening of above-ground features. An onsite PTP would not risk exacerbating the existing limited sewerage capacity and would ensure that suitable levels of treatment are achieved to protect the wider environment. Specialist PTP suppliers have been engaged to inform potential costs and spatial requirements. Details are contained in Appendix I.

7.8.5. EA have been approached with regard to the proposals and a response was received in July 2021, recommending a bespoke permit application will be required for the discharge of treated foul water via a PTP to the watercourse. A bespoke permit application has subsequently been prepared for submission to the EA and was ongoing at the time of writing this report.

7.8.6. A recent residential development located at *Land South of Ashford Hill Road* (see planning reference *15_01224_FUL*), approximately 450 m to the north-west of the site have successfully implemented a similar PTP system that which is proposed on site.

7.8.7. If required for additional treatment of effluent prior to discharge, reed beds could be constructed at the outfall of the PTP. The PTP could also be routed to the attenuation basin prior to discharge into the watercourse for additional water quality benefit.

7.8.8. The foul water strategy and calculations are presented in the Proposed Drainage Strategy and is contained in Appendix H.

8.0 FLOOD RISK FROM THE PROPOSED DEVELOPMENT

8.1. Fluvial Flood Risk

8.1.1. The site is currently within Flood Zone 1 and will remain in Flood Zone 1 in the future. The current fluvial flood risk is Low.

8.1.2. The proposed development will not increase the fluvial flood risk to the site.

8.2. Tidal Flood Risk

8.2.1. The site is currently within Flood Zone 1 and will remain in Flood Zone 1 in the future. The current fluvial flood risk is Very Low.

8.2.2. The proposed development will not increase the tidal flood risk to the site.

8.3. Surface Water Flood Risk

8.3.1. The Proposed Development will increase the impermeable area of the site compared with existing and will therefore also increase runoff. However, the proposed SuDS strategy seeks to control runoff at source and infiltrate or discharge to local surface watercourses.

8.3.2. The drainage strategy has been devised to best mimic natural flow paths across the site and to suit the existing topography. Overland flow routes are to be maintained towards the east of the site in the instance of exceedance events or drainage blockage. The existing low areas to the east of the site will correspond with the position of the proposed SuDS and open space features and will therefore not affect the more vulnerable areas of the development.

8.3.3. Current surface water flood risk is Low. The proposed development is not considered likely to increase the surface water flood risk either on or off site.

8.4. Groundwater Flood Risk

8.4.1. The proposed development is unlikely to increase the groundwater flood risk to the site.

8.5. Sewer Flood Risk

8.5.1. The proposed development is unlikely to increase the sewer flood risk to the site.

8.6. Artificial Flood Risk

8.6.1. The proposed development will not increase the artificial flood risk to the site.

8.7. Climate Change Impact

8.7.1. The impact of climate change has been adequately factored into the proposed drainage design in line with all current best practice and guidance.

9.0 SCHEDULE OF MAINTENANCE

9.1. Introduction

9.1.1. The maintenance of SuDS features is vital ensuring that they work as efficiently as they set out to do. Maintenance activities can be broadly defined as:

- Regular maintenance – basic tasks carried out regularly;
- Occasional maintenance – tasks that are required periodically but on a much less frequent basis; and
- Remedial maintenance – tasks required when a fault needs rectifying and often includes unforeseen events.

9.1.2. The proposed drainage system is to remain private and maintained by a third party management company to be set up post-construction.

9.1.3. Maintenance requirements for each SuDS feature has been outlined below.

9.2. Permeable Paving

Construction

9.2.1. Construction vehicles and equipment not directly involved in the construction of the pervious pavements will be kept away from these areas. Silt fences, staged excavation works and temporary drainage swales/bunds to divert runoff away from exposed areas will be utilised, as appropriate, to manage the risks associated with, and to intercept the discharge of sediment laden runoff. Landscaping activities will be carefully designed and carried out to prevent deposition of topsoil, turf and other materials on the surface of the pavement. Infiltration surfaces will not be compacted and will be protected at all times. Excavations for the pervious pavement installation should aim to be undertaken in times of dry weather, when possible, to prevent mobilisation of sediments from exposed surfaces during rainfall events. Surfaces exposed as part of the pervious paving installation works should be stabilised as soon as possible. Perimeter controls should be installed prior to construction to protect watercourses.

Maintenance Schedule

9.2.2. The table below shows the operation and maintenance requirements for the pervious pavements which are in accordance with the CIRIA C753 SuDS Manual.

Table 9.1: Operation and maintenance requirements for pervious pavements (CIRIA C753, 2015)

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations - pay particular attention to areas where water runs onto pervious surfaces from adjacent impervious areas as these areas are most likely to collect the most sediment

Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using Glyphosate applied directly onto the weeds by an applicator rather than spraying	As required - once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth - if required, take remedial action	Three-monthly, 48 hrs after large storms in first six months
	Assess silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

9.3. Filter Drains

Construction

9.3.1. During construction it is important to prevent muddy water from flowing into the system. Where possible, construction should be undertaken during dry periods. The filter drains should be constructed with adequate fall to ensure the area drains efficiently. During construction the contractor must ensure the designed width and depth are correct and the geotextile has the specified porosity.

Maintenance Schedule

9.3.2. The table below shows the operation and maintenance requirements for filter drains, taken from the CIRIA C753 SuDS Manual.

Table 9.2: Operation and maintenance requirements for filter drains (CIRIA C753, 2015)

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove litter (including leaf litter) and debris from filter drain surface, access chambers and pre-treatment	Monthly (or as required)

	devices	
	Inspect filter drain surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage.	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies	Six monthly
	Remove sediment from pre-treatment devices	Six monthly, or as required
Occasional maintenance	Remove or control tree roots when they are encroaching the sides of the filter drain, using recommended methods (eg NJUG, 2007 or BS 3998:2010)	As required
	Clear perforate pipework or blockages	As required

9.4. Swales

Construction

9.4.1. Construction vehicles and equipment not directly involved in the construction of the rills and swales should be kept away from these areas. Excavations for the swales should aim to be undertaken in times of dry weather, when possible, to prevent mobilisation of sediments from exposed surfaces. Exposed surfaces after rill or swale excavations should be stabilised as soon as possible with grass seed and straw mulch. Perimeter controls should be installed prior to construction to protect watercourses.

Maintenance Schedule

9.4.2. Table 9.3 below shows the operation and maintenance requirements for the swale, taken from the CIRIA C753 SuDS Manual.

Table 9.3: Operation and maintenance requirements for swales (CIRIA C753, 2015)

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove litter and debris	Monthly, or as required
	Cut grass - to retain grass height within specified design range	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect inlets for silt accumulation, establish appropriate silt removal frequencies	Half yearly

	Inspect check dams for blockages and failure.	Half yearly
Occasional maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required or if bare soil is exposed over 10% or more of the swale treatment area
Remedial actions	Repair erosion or other damage by re-turfing or reseeding	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

9.5. Detention Basins

Construction

9.5.1. Construction vehicles and equipment not directly involved in the construction of the detention basin will be kept away from these areas. Silt fences, staged excavation works and temporary drainage swales/bunds to divert runoff away from exposed areas will be utilised, as appropriate, to manage the risks associated with, and to intercept the discharge of, sediment laden runoff prior to its discharge to nearby watercourses. Excavations for the detention basin should aim to be undertaken in times of dry weather when possible, to prevent mobilisation of sediments, during rainfall events. Surfaces exposed as part of the detention basin construction should be stabilised as soon as possible, by the use of hydroseeding or an alternative approved approach. Perimeter controls should be installed prior to construction to protect watercourses. Perimeter controls should be installed prior to construction to protect watercourses.

Maintenance Schedule

9.5.2. Table 9.4 shows the operation and maintenance requirements for the detention basins, taken from the CIRIA C753 SuDS Manual.

Table 9.4: Operation and maintenance requirements for detention basins (CIRIA C753, 2015)

Maintenance Schedule	Required Action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass - public areas	Monthly (during growing season)
	Cut the meadow grass	Half yearly (spring, before nesting season, and autumn)
	Inspect marginal and bankside vegetation and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Inspect inlets, outlets, banksides, structures, pipework etc. for evidence of blockage and/or physical damage	Monthly

	Inspect silt accumulation rates in the detention basin and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options	Half yearly
	Check any mechanical devices, e.g. penstocks	Half yearly
	Tidy all dead growth (scrub clearance) before start of growing season (Note: tree maintenance is usually part of overall landscape management contract)	Annually
	Remove sediment from any forebay.	Every 1-5 years, or as required
	Remove sediment and planting from one quadrant of the main body of detention basins without sediment forebays.	Every 5 years, or as required
Occasional maintenance	Remove sediment from the main body of big detention basins when pool volume is reduced by 20%	With effective pre-treatment, this will only be required rarely, e.g. every 25-50 years
Remedial actions	Repair erosion or other damage	As required
	Replant, where necessary	As required
	Aerate detention basin when signs of eutrophication are detected	As required
	Realign rip-rap or repair other damage	As required
	Repair/rehabilitate inlets, outlets and overflows.	As required

10.0 CONCLUSION

10.1.1. CampbellReith has been commissioned to prepare a Flood Risk Assessment and Drainage Strategy in accordance with the National Planning Policy Framework to inform the proposed development located adjacent to Little Knowl Hill, Ashford Hill.

10.1.2. The site is currently in Flood Zone 1 and is at medium risk of flooding from groundwater and at Low or Very Low risk of flooding from all other sources. An unnamed stream is present running along the south/southeastern boundary of the site and is a tributary of the Baughurst Brook.

10.1.3. The proposals are for up to 50 residential dwellings with associated parking, play area, access and landscaping.

10.1.4. Available information suggests that the site is underlain by London Clay. No site-specific ground investigation works have been undertaken on the site. It is not anticipated that infiltration drainage will be viable, subject to onsite testing and groundwater monitoring.

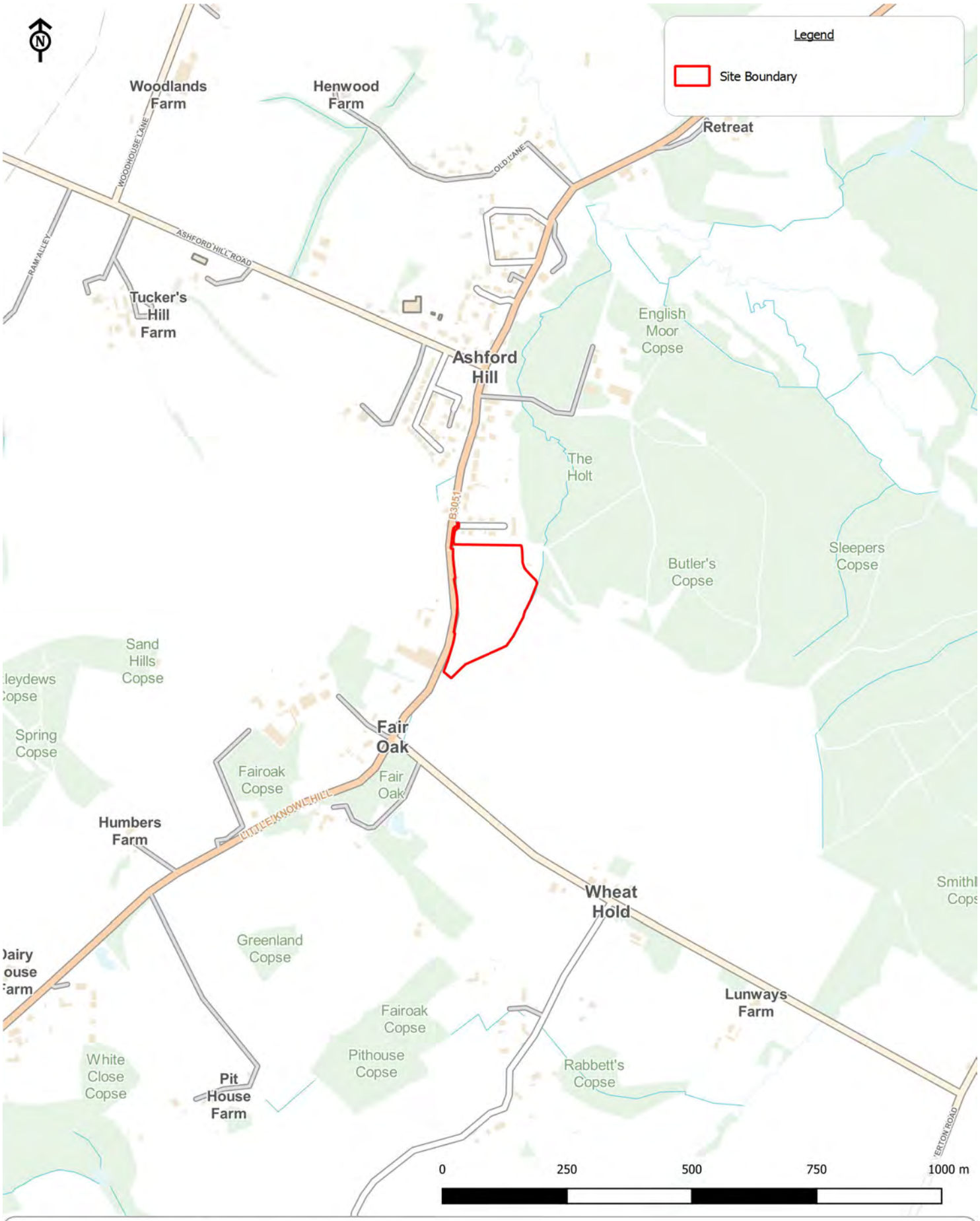
10.1.5. The proposed SuDS strategy involves the use of swales, permeable paving, filter drains and detention basin to manage surface water runoff generated from the site. Surface water will be captured via the aforementioned SuDS features and conveyed towards the detention basin in the east of the site where it will be stored prior to controlled discharge at no more than greenfield rate to the watercourse.

10.1.6. Foul water from the site is proposed to be treated onsite via a package treatment plant before controlled discharge of treated water into the watercourse to the east. Further water quality improvements could be obtained utilising filter beds.

10.1.7. The proposed strategy will not increase flood risk on or off the site.

10.1.8. The maintenance of SuDS is vital to ensuring that they work as efficiently as they are intended to.

Appendix A: Site Location



Land South of Holt Cottages, Ashford Hill

Client: JPP Land Ltd / Rosemary Pelham and Timothy Pyper

Site Location

Scale: 1:10000@A4

Job Number: 13692

Drawn by - Checked by: RLF/RP - RC/AH

Drg No - Status/Revision: 13692-CRH-XX-XX-FG-G-7006 - P3

File location: N:\13500 - 13749\13692 R - Ashford Hill Residential Development\Project_Workspaces\FRA (pdf in Outputs)

Date (Revision History): 06/08/2021 (P1, First Issue, 05/07/21, RLF; P2, Site Boundary, 02/08/21, RLF; P3, Site Boundary, 06/08/21, RP)

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consulting engineers
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REDHILL 01737 784 500 ☒ ☐ BIRMINGHAM 01675 467 484
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Appendix B: SFRA Map Extracts

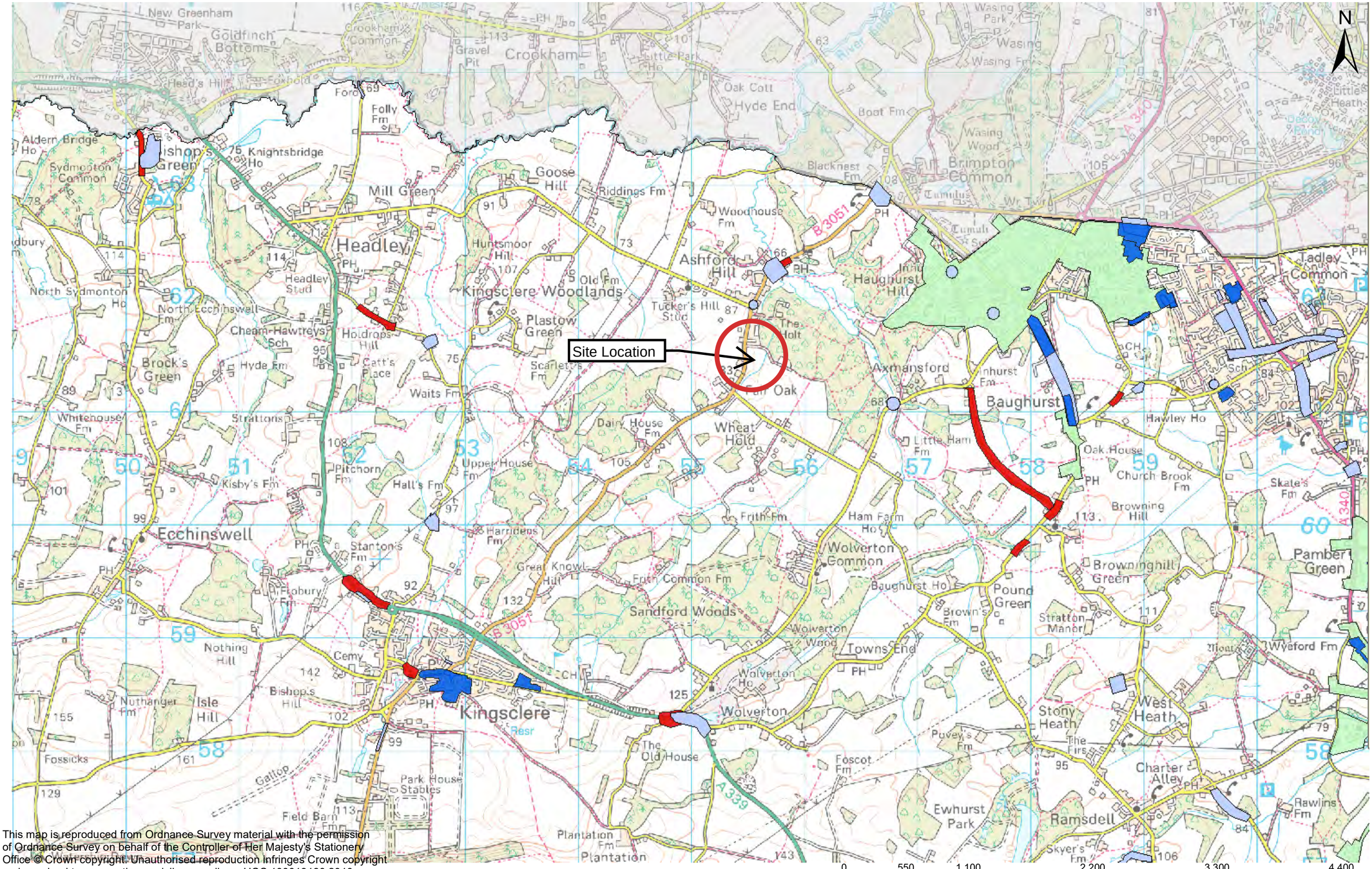
Hampshire County Council

Basingstoke and Deane

Strategic Flood Risk Assessment Update May 2012
Basingstoke and Deane Historic Flooding - Area 2

Refer to area location plan for key

Environment Agency

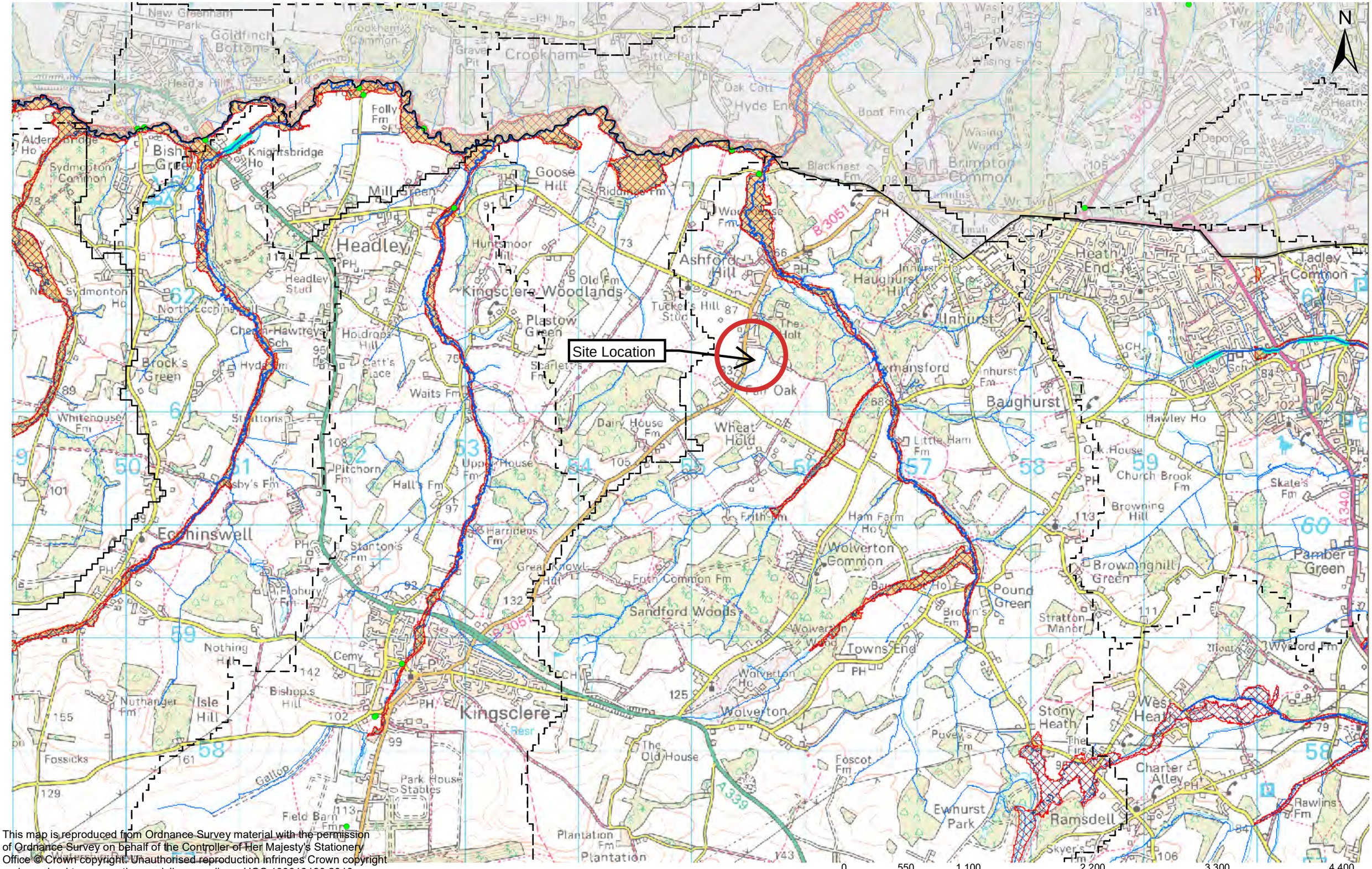


Hampshire County Council | Basingstoke and Deane

Strategic Flood Risk Assessment Update May 2012
Basingstoke and Deane Potential Risk from Watercourses - Area 2

Refer to area location plan for key

Environment Agency

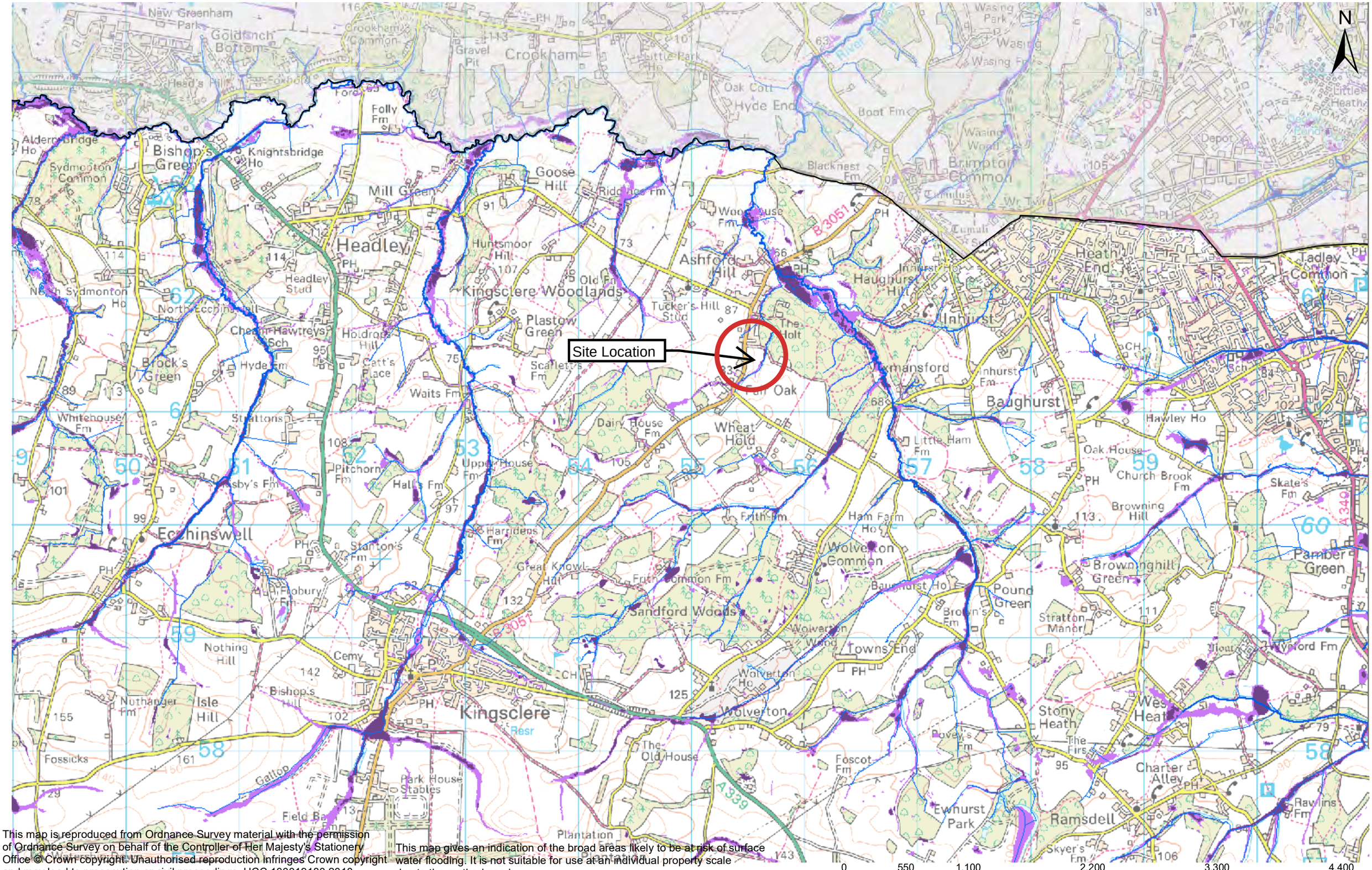


Hampshire County Council | Basingstoke and Deane

Strategic Flood Risk Assessment Update May 2012
Basingstoke and Deane Potential Surface Water Flood Risk (1:30) - Area 2

Refer to area location plan for key and notes

Environment Agency



This map gives an indication of the broad areas likely to be at risk of surface water flooding. It is not suitable for use at an individual property scale due to the method used

0 550 1,100 2,200 3,300 4,400 Meters

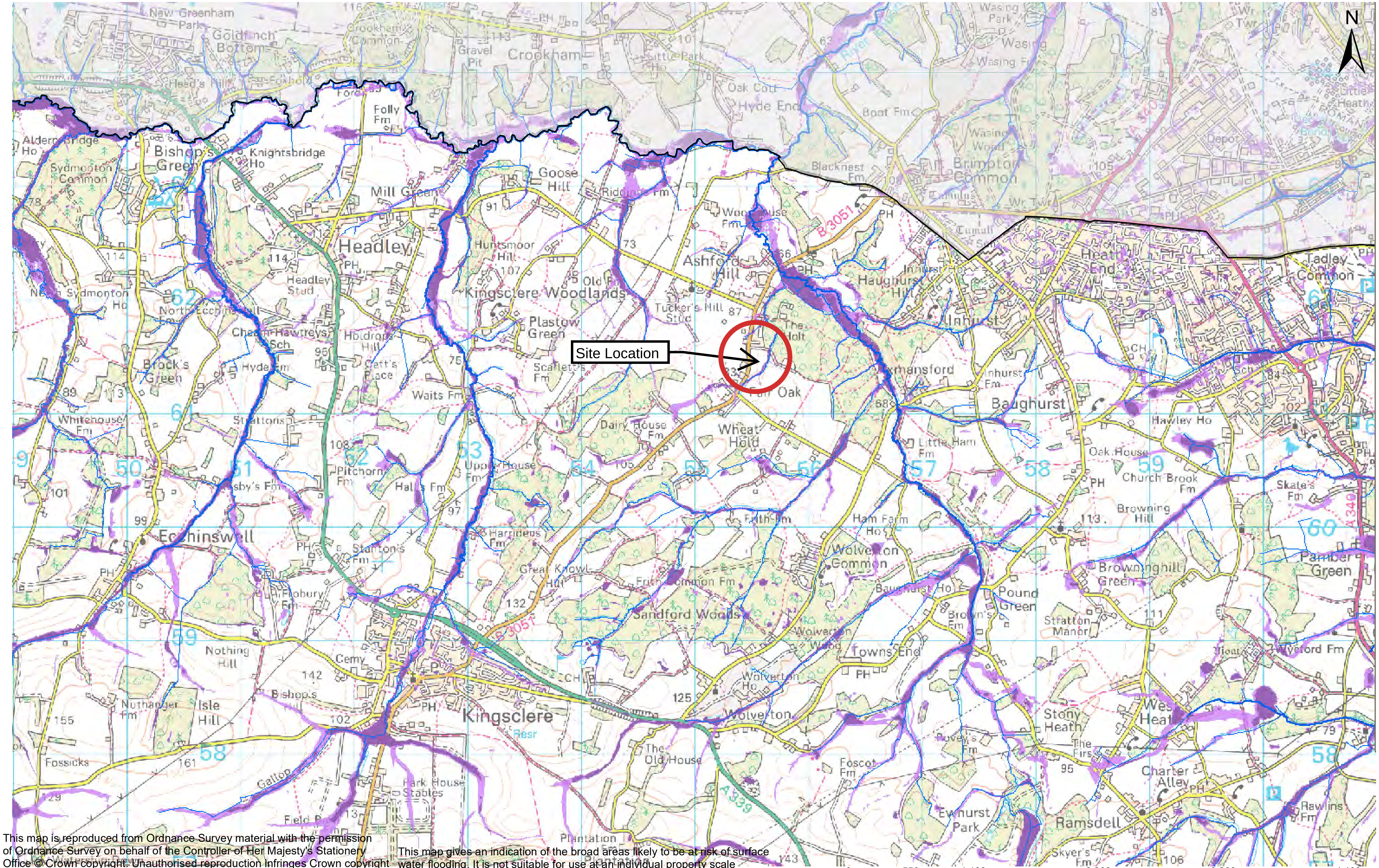
Hampshire County Council

Basingstoke and Deane

Strategic Flood Risk Assessment Update May 2012
Basingstoke and Deane Potential Surface Water Flood Risk (1:200) - Area 2

Refer to area location plan for key and notes

Environment Agency



0 550 1,100 2,200 3,300 4,400 Meters

This map gives an indication of the broad areas likely to be at risk of surface water flooding. It is not suitable for use at an individual property scale due to the method used

Flood Notes

1:30 Flood notes:

The SW_30_300 relates to the approximate extent of flooding under a 1:30 year storm scenario with depths in excess of 300mm.

The SW_30_100 relates to the approximate extent of flooding under a 1:30 year storm scenario with depths in excess of 100mm.

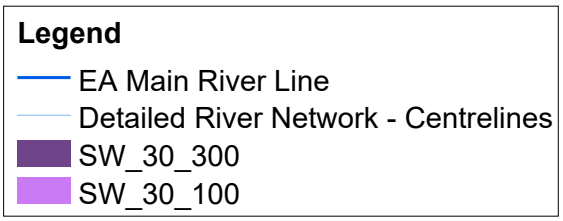
1:200 Flood notes:

The SW_200_300 relates to the approximate extent of flooding under a 1:200 year storm scenario with depths in excess of 300mm.

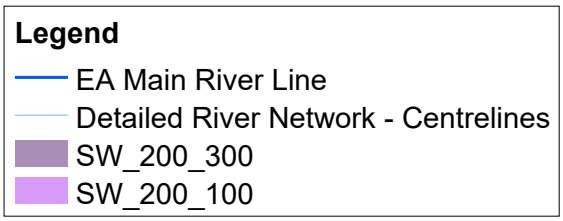
The SW_200_100 relates to the approximate extent of flooding under a 1:200 year storm scenario with depths in excess of 100mm.

General Keys

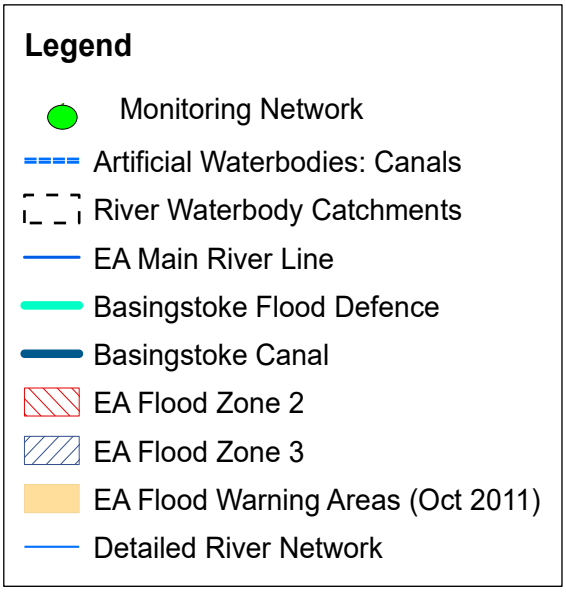
1:30 Flood Key:



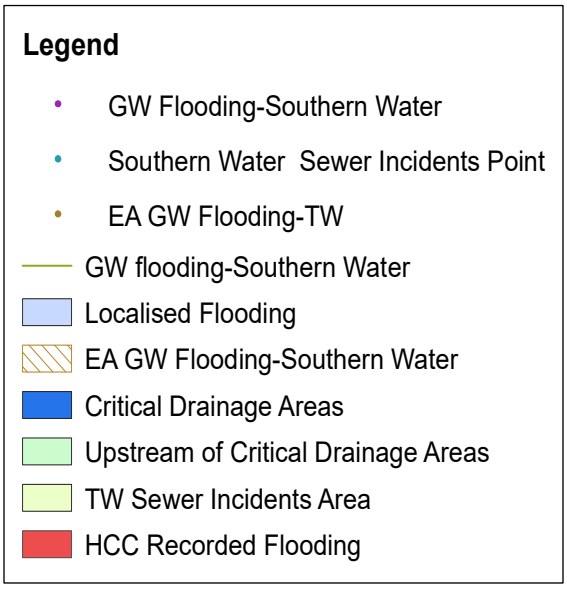
1:200 Flood Key:



Potential Risk from Watercourses Key:



Historic Flood Risk Key:



Acronyms:

EA – Environment Agency
SW – Surface Water
GW – Ground Water
TW – Thames Water
HCC – Hampshire County Council

Appendix C: Constraints Plan and Site Photographs

Legend

- Site Boundary
- 1km buffer of Site Boundary
- Listed Buildings
- Scheduled Monuments
- Site of Special Scientific Interest (SSSI)
- National Nature Reserve (NNR)
- Ancient & Semi-Natural Woodland
- Ancient Replanted Woodland
- EA Historic Landfill Sites
- EA Main River
- Flood Zone 2
- Flood Zone 3

Source Protection Zone

- Zone III - Total Catchment

Public Rights of Way

- Footpath
- Bridleway

0 200 400 600 800 m

Land South of Holt Cottages, Ashford Hill

Client: JPP Land Ltd / Rosemary Pelham and Timothy Pyper

Constraints

Scale: 1:10000@A3

Job Number: 13692

Drawn by - Checked by: RP/RLF - BS/AH

Drg No - Status/Revision: 13692-CRH-XX-XX-FG-G-7000 - P3

File location: N:\13500 - 13749\13692 R - Ashford Hill Residential Development\Project_Workspaces (pdf in Outputs)

Date (Revision History): 06/08/2021 (P1, First Issue, 13/07/21, RP; P2, Site Boundary, 02/08/21, RLF; P3, Site Boundary, 06/08/21, RP)

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Site Photographs

Image 1: Stood at NE corner of site looking at access gate

Image 2: Looking west along track adjacent to north boundary of site

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Image 3: Area of woodland adjacent to NE corner of site

Image 4: drain/stream in forefront, looking SE at field just south of site

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Image 5: Looking N/NE along east boundary of site.

Image 6: Looking SW along site S/SE boundary marked with tree line and ditch/stream.

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Image 7: Stood on S boundary looking N across site

Image 8: Stood on S boundary looking N/NE across site with woodlands beyond

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Image 9: Stood on E boundary looking N towards NE corner of site.

Image 10: Stood on E boundary looking S towards the tree lines S boundary

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Image 11: Stood near centre of site looking SE at slight valley feature

Image 12: Stood in NW corner of site looking E.

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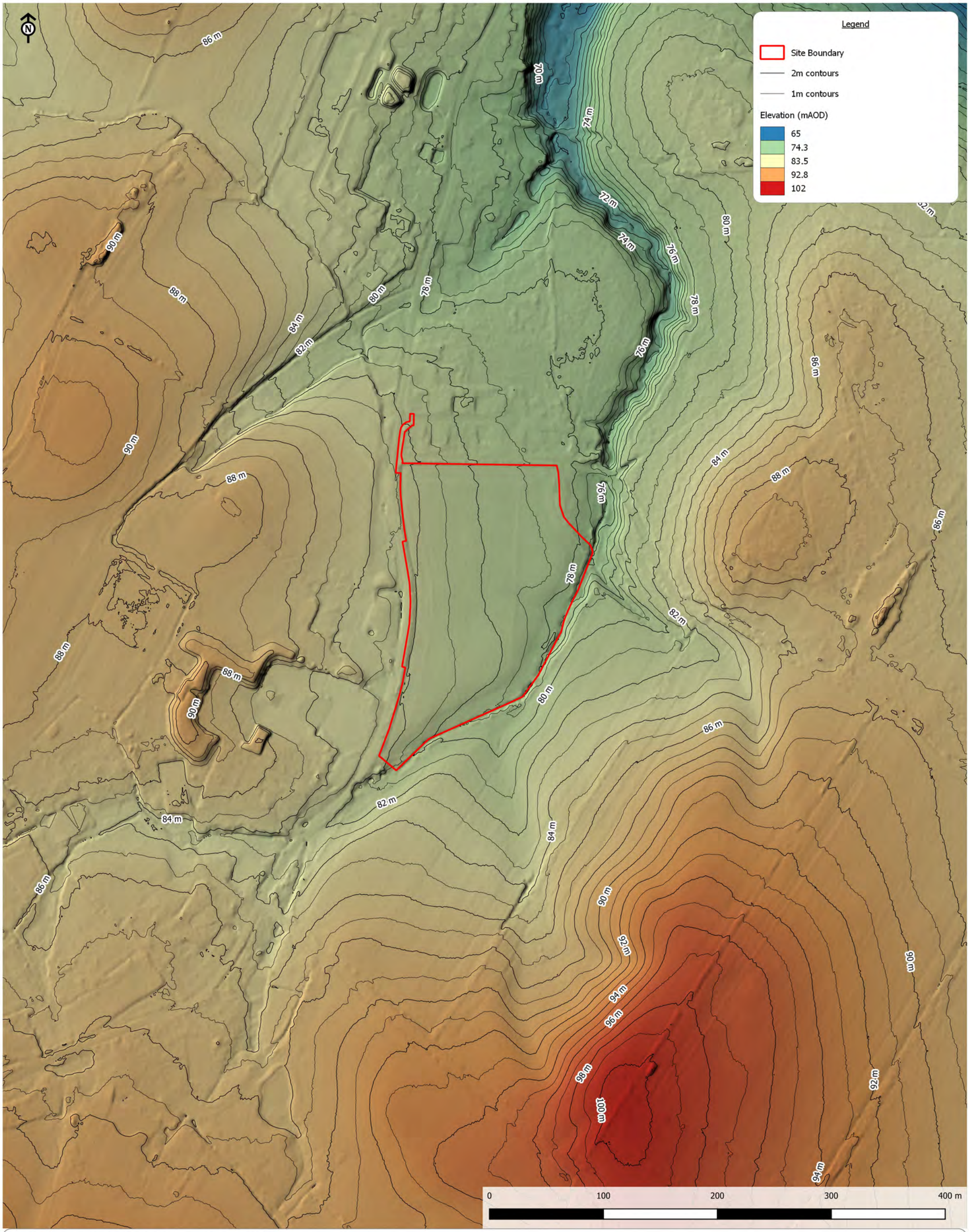
Appendix D: Lidar Data and Topographical Survey



Land South of Holt Cottages, Ashford Hill

Client: JPP Land Ltd / Rosemary Pelham and Timothy Pyper

LiDAR Elevation

Scale:	1:3000@A3
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Job Number:	13692
Drawn by - Checked by:	RLF/RP - RC/AH
Drg No - Status/Revision:	13692-CRH-XX-XX-FG-G-7009 - P3
File location:	N:\13500 - 13749\13692 R - Ashford Hill Residential Development\Project_Workspaces\FRA (pdf in Outputs)
Date (Revision History):	06/08/2021 (P1, First Issue, 05/07/21, RLF; P2, Site Boundary, 02/08/21, RLF; P3, Site Boundary, 06/08/21, RP)

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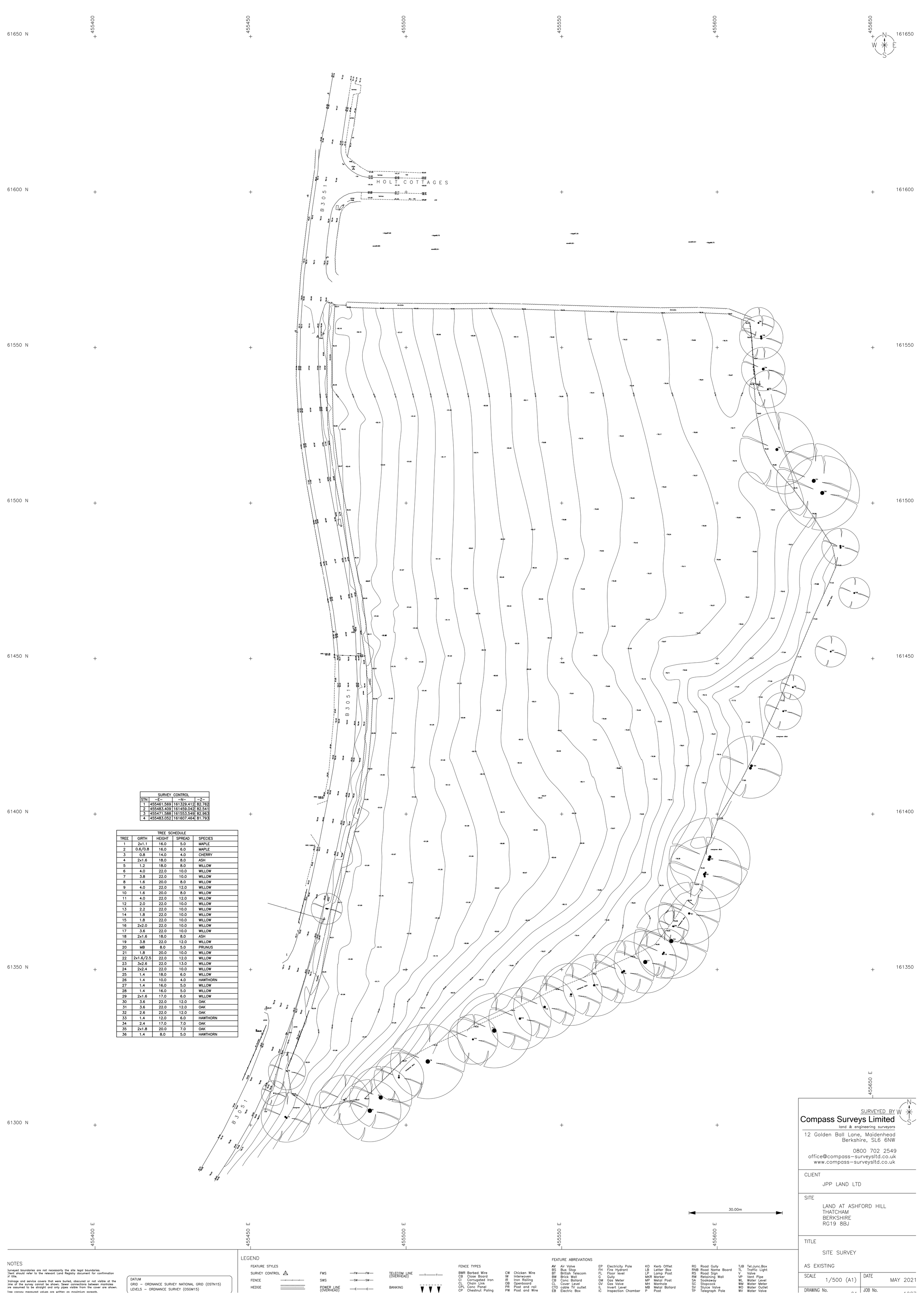

SURVEY CONTROL			
STN	-E-	-N-	-Z-
1	455461.569	161329.412	82.762
2	455483.409	161459.042	82.541
3	455471.588	161553.549	82.963
4	455483.052	161607.464	81.793

TREE SCHEDULE				
TREE	GIRTH	HEIGHT	SPREAD	SPECIES
1	2x1.1	16.0	5.0	MAPLE
2	0.6/0.8	16.0	6.0	MAPLE
3	0.8	14.0	4.0	CHERRY
4	2x1.6	18.0	8.0	ASH
5	1.2	18.0	8.0	WILLOW
6	4.0	22.0	10.0	WILLOW
7	3.8	22.0	10.0	WILLOW
8	1.6	20.0	8.0	WILLOW
9	4.0	22.0	12.0	WILLOW
10	1.6	20.0	8.0	WILLOW
11	4.0	22.0	12.0	WILLOW
12	2.0	22.0	10.0	WILLOW
13	2.2	22.0	10.0	WILLOW
14	1.8	22.0	10.0	WILLOW
15	1.8	22.0	10.0	WILLOW
16	2x2.0	22.0	10.0	WILLOW
17	3.6	22.0	10.0	WILLOW
18	2x1.6	18.0	8.0	ASH
19	3.8	22.0	12.0	WILLOW
20	MB	8.0	5.0	PRUNUS
21	1.8	20.0	10.0	WILLOW
22	2x1.6/2.5	22.0	12.0	WILLOW
23	3x2.6	22.0	13.0	WILLOW
24	2x2.4	22.0	10.0	WILLOW
25	1.4	18.0	6.0	WILLOW
26	1.4	10.0	4.0	HAWTHORN
27	1.4	16.0	5.0	WILLOW
28	1.4	16.0	5.0	WILLOW
29	2x1.6	17.0	6.0	WILLOW
30	3.6	22.0	12.0	OAK
31	3.6	22.0	12.0	OAK
32	2.6	22.0	12.0	OAK
33	1.4	12.0	6.0	HAWTHORN
34	2.4	17.0	7.0	OAK
35	2x1.8	20.0	7.0	OAK
36	1.4	8.0	5.0	HAWTHORN

NOTES

Surveyed boundaries are not necessarily the site legal boundaries. Client should refer to the relevant Land Registry document for confirmation of title.

Drainage and service covers that were buried, obscured or not visible at the time of the survey cannot be shown. Sewer connections between manholes are assumed to be straight and only pipes visible from the cover are shown.

Tree canopy measured values are written as maximum spreads.

DATUM
GRID – ORDNANCE SURVEY NATIONAL GRID (OSTN15)
LEVELS – ORDNANCE SURVEY (OSGM15)

LEGEND

FEATURE STYLES

SURVEY CONTROL
FENCE
HEDGE
FWS
SWS
POWER LINE (OVERHEAD)
TELECOM LINE (OVERHEAD)
BANKING

FENCE TYPES

BWR Barbed Wire
CB Close Board
CI Corrugated Iron
CL Chain Link
CPL Conc Panel
CP Chestnut Paling
CW Chicken Wire
IW Interwoven
IR Iron Railing
OB Openboard
PR Post and rail
PW Post and Wire

FEATURE ABREVIATIONS

AV Air Valve
BS Bus Stop
BT British Telecom
BW Brick Wall
CB Conc Bollard
CL Cover Level
CTO cable TV outlet
EB Electric Box
EP Electricity Pole
FH Fire Hydrant
FL Floor level
G Gully
GM Gas Meter
GV Gas Valve
IL Invert Level
IC Inspection Chamber
KO Kerb Offlet
LB Letter Box
LP Lamp Post
MKR Marker
MP Metal Post
MH Manhole
MB Metal Bollard
P Post
RG Road Gully
RNB Road Name Board
RS Road Sign
RW Retaining Wall
SA Soakaway
SC Stopcock
SV Sluice Valve
TP Telegraph Pole
TJB Tel.Junc.Box
TL Traffic Light
V Valve
VP Vent Pipe
WL Water Level
WM Water Meter
WO Water Outlet
WV Water Valve

SURVEYED BY
Compass Surveys Limited
land & engineering surveyors
12 Golden Ball Lane, Maidenhead
Berkshire, SL6 6NW
0800 702 2549
office@compass-surveysltd.co.uk
www.compass-surveysltd.co.uk

CLIENT
JPP LAND LTD

SITE
LAND AT ASHFORD HILL
THATCHAM
BERKSHIRE
RG19 8BJ

TITLE
SITE SURVEY
AS EXISTING

SCALE	DATE
1/500 (A1)	MAY 2021
DRAWING No.	JOB No.