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Land West of Turners Hill Road and North of Huntsland Crawley Down

Flood Risk Assessment

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Land West of Turners Hill Road and North of Huntsland Crawley Down

Flood Risk Assessment

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Contents

Executive Summary **2**

1. Introduction **3**

1.1 Appointment and Brief 3

1.2 Scope and Objectives 3

1.3 General Limitations and Reliance 3

2. Site Description **5**

2.1 Site Location and Surroundings 5

2.2 Proposed Development 5

2.3 Site Topography 6

2.4 Existing Drainage 7

3. Policy Framework **8**

3.1 National Planning Policy Framework, 2024 8

3.2 Mid Sussex District Council, District Plan, 2018 8

3.3 Mid Sussex District Plan 2021 – 2039, Submission Draft (Regulation 19) 9

3.4 Crawley Down Neighbourhood Plan, January 2016 9

3.5 Mid Sussex District Council, Level 1 Strategic Flood Risk Assessment, 2024 9

3.6 Mid Sussex District Council, Level 2 Strategic Flood Risk Assessment, 2024 10

3.7 MSDC response to Action Point AP-020, November 2024 10

3.8 West Sussex County Council, Local Flood Risk Management Strategy, 2014 10

4. Review of Baseline Flood Risk Data **12**

4.1 Hydrological Setting 12

4.2 EA Flood Zone Designation (Fluvial and Tidal Flood Risk) 12

4.3 Surface Water and Surface Water Sewer Flood Risk 13

4.4 Geological and Hydrogeological Setting 14

4.5 Risks from Reservoirs, Canals, and Other Artificial Sources 15

4.6 Historic Flooding 15

4.7 Baseline Flood Risk Summary 16

5. Assessment of Flood Risk **17**

5.1 Fluvial 17

5.2 Surface Water 17

5.3 Groundwater 18

5.4 Flood Risk Vulnerability 18

5.5 Sequential Test 18

5.6 Further Mitigation/Assessment of Residual Risk 19

5.7 Summary 21

6. Conclusions **22**

Executive Summary

Ramboll UK Limited ('Ramboll') has been commissioned by Wates Developments Limited (Wates) to produce a Flood Risk Assessment for the site at 'Land West of Crawley Down', at Turners Hill Road, Crawley Down, Crawley. The site is located at approximate coordinates 533517E, 137794N, at postcode RH10 4HB. The Proposed Development is for a mixed residential scheme of up to 150 dwellings and a 65 bed care home.

A review of all available information relating to flood risk has been undertaken, and an assessment has been made of the existing baseline flood risk and potential future risk to the development. A summary of the flood risk from each source is as follows:

- Fluvial/Tidal – Site is located in Flood Zone 1, and as such there is a low risk from fluvial/tidal flooding;
- Surface Water – While there are areas considered to be at a High risk from surface water flooding present in the northwest and west of the site, approximately 80% of the site is located in an area considered to be at a Very Low risk from surface water flooding. No built development is located in areas considered to be at risk of flooding from surface water. Furthermore, the areas of the site designated at High to Low risk across the site were typically observed to be inaccurate during the March 2024 site visit. High risk areas are nevertheless expected to be managed as part of the surface water drainage strategy;
- Groundwater - A review of baseline site conditions indicates a moderate groundwater flood risk at the site but upon review of the proposed layout and the proposed surface water drainage strategy, the overall risk to the Proposed Development is considered to be low; and

The increase in impermeable area resulting from the Proposed Development over existing permeable surfaces will increase the surface water discharge generated at the site. In managing this risk, a surface water drainage strategy has been prepared and is presented in the Drainage Strategy report (RUK2021N00014-RAM-RP-00170). In addition, it is proposed to engineer site levels, where possible, so that external areas fall away from building entrances. Should this not be feasible, linear interceptor drains are proposed to be located at all building entrances towards which there is a positive gradient for surface water to flow.

Discharge rates for the proposed surface water drainage strategy will be limited to the 1 in 1 year greenfield runoff rate, thereby considerably reducing the peak flows presently emanating from the site area. The strategy will therefore improve upon the current situation with regard to surface water management and flood risk.

The site's location in Flood Zone 1 means it is considered to have passed the Sequential Test. An Exception Test is therefore not required.

Subject to inclusion of the proposed mitigation measures, and adherence to the proposed surface water drainage strategy, it is expected that flood risk at the site can be managed in a safe and sustainable manner.

1. Introduction

1.1 Appointment and Brief

1.1.1 Ramboll UK Limited ('Ramboll') has been commissioned by Wates Developments Limited (Wates) to produce a Flood Risk Assessment (FRA) for the site at 'Land West of Crawley Down', at Turners Hill Road, Crawley Down, Crawley. The site is located at approximate coordinates 533517E, 137794N, at postcode RH10 4HB.

1.1.2 The Proposed Development is for a mixed residential scheme of up to 150 dwellings and a 65 bed care home.

1.2 Scope and Objectives

1.2.1 This report considers the risks of various sources of flooding to the site and has been carried out in accordance with the National Planning Policy Framework (NPPF)[1]. It is to be used to assist the Local Planning Authority (LPA) and relevant statutory consultees when considering the flooding issues of the Proposed Development, as part of a planning application.

1.2.2 The report provides the following information:

1. A review of the flood risk to the site based upon flood data and the flood maps provided by the Environment Agency (EA) and the relevant Strategic Flood Risk Assessment (SFRA);
2. An assessment of flood risk from all sources including tidal, fluvial, pluvial, groundwater and other artificial sources;
3. An assessment of the potential for flood risk to arise as a result of the introduction of the Proposed Development including an assessment of whether the Proposed Development is likely to be affected by current or future flooding, and whether it will increase flood risk elsewhere; and
4. Proposals to mitigate any residual flood risks to the development.

1.3 General Limitations and Reliance

1.3.1 This report has been prepared by Ramboll exclusively for the intended use by the client in accordance with the agreement between Ramboll and the client defining, among others, the purpose, the scope and the terms and conditions for the services. No other warranty, expressed or implied, is made as to the professional advice included in this report or in respect of any matters outside the agreed scope of the services or the purpose for which the report and the associated agreed scope were intended, or any other services provided by Ramboll.

[1] GOV.UK, National Planning Policy Framework, 2024 [online]. Available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2. Accessed December 2024.

1.3.2 In preparation of the report and performance of any other services, Ramboll has relied upon publicly available information, information provided by the client and information provided by third parties. Accordingly, the conclusions in this report are valid only to the extent that the information provided to Ramboll was accurate, complete, and available to Ramboll within the reporting schedule.

1.3.3 Ramboll's services are not intended as legal advice, nor an exhaustive review of site conditions and/or compliance. This report and accompanying documents are intended solely for the use and benefit of the client for this purpose only and may not be used by or disclosed to, in whole or in part, any other person without the express written consent of Ramboll. Ramboll neither owes nor accepts any duty to any third party, unless formally agreed by Ramboll through that party entering into, at Ramboll's sole discretion, a written reliance agreement.

1.3.4 Unless otherwise stated in this report, the scope of services, assessment and conclusions made assume that the site will continue to be used for its proposed end-use without further significant changes onsite. Unless stated otherwise, the geological information provided is for general environmental interpretation and should not be used for geotechnical and/or design purposes.

2. Site Description

2.1 Site Location and Surroundings

2.1.1 The site is located on land to the west of Crawley Down, a village in the Mid Sussex district of West Sussex, England. The site is located at approximate coordinates 533517E, 137794N, at postcode RH10 4HB. The Proposed Development is for up to 150 dwellings and 65 bed care home. The development proposes a single access via Wychwood Place.

2.1.2 The site currently consists of undeveloped greenfield land, with adjacent and surrounding land uses as follows:

- North: Mature woodland, including Pescotts Wood and Wins Wood. Approximately 250 m further north is Westlands Wood. Woodland is denser to the northwest, with areas of greenspace more common to the north and northeast, on either side of Turners Hill Road (B2028). Hurst Farm, an allocated site within the emerging local plan, is located immediately northeast of the site;
- East: The existing estate on Wychwood Place, Turners Hill Road and immediately beyond the wider residential area of Crawley Down;
- South: Intermittent woodland and greenspace, and Huntsland (private road); and
- West: Intermittent woodland and a series of farms/smallholdings and cottages.

2.1.3 The wider residential area of Crawley is located approximately 3.1 km west of the site.

2.1.4 The Site Location Plan is presented in Figure 2.1 at the rear of the report. Fields 1 and 2 are labelled on the plan.

2.1.5 The Site Setting is presented in Figure 2.2 at the rear of the report.

2.2 Proposed Development

2.2.1 The Proposed Development is for an Outline planning application (appearance, landscaping, layout and scale reserved) for the erection of up to 150 dwellings, a 65 bed care home,; and associated infrastructure including new access points off of Wychwood with associated spine road and car and cycle parking; the provision of open space and associated play facilities; utilities infrastructure, surface water drainage features, and associated features, on land west of Turners Hill Road and north of Huntsland, Crawley Down, West Sussex.

2.2.2 The Site Illustrative Masterplan is presented in Appendix A at the rear of the report.

2.3 Site Topography

2.3.1 A site topographical survey[2] was previously undertaken at the site. A description of the topography is summarised as follows:

Field 1

2.3.2 Field 1 in the far north of the site is shown to fall from approximately 118.4 m Above Ordnance Datum (AOD) in the southeast to approximately 111.5 m AOD in the northwest. The survey indicates steadily falling levels from east to west along both the northern and southern boundaries of the field, and from south to north along both the western and eastern boundaries of the field. Levels in the central part of the field are typically between 115 and 116 m AOD.

Field 2

2.3.3 Field 2 is located to the immediate south of Field 1 and is separated from Field 1 by an existing ditch/hedgerow/wire fence. The levels within Field 2 are shown to fall in all directions from an approximately central point within the southern half of the field, shown to be at approximately 126.1 m AOD. The steepest falls are indicated to be toward the north and south, with minimum levels of approximately 115.4 m AOD and 118 m AOD indicated by the survey in the northwest and southwest corners of the field. Levels are also indicated to fall from east to west across the northern part of the field.

Summary and Surrounding Area

2.3.4 The site topographical survey is presented in Appendix B at the rear of the report.

2.3.5 A site visit was undertaken in March 2024 by representatives from both Ramboll and Wates. The topography was observed to be in line with that shown by the topographical survey. A series of photographs taken while onsite are presented in Appendix C at the rear of the report.

2.3.6 Light Detection and Ranging (LiDAR) data[3], is shown to broadly agree with the findings of both the topographical survey and the site visit. Outside the site boundary, the topography is as follows:

- North: Land is shown to fall steadily toward the north and northwest, with levels falling approximately 4 to 5 m AOD over approximately 200 m;
- East: Land is shown to rise steadily within residential areas of Crawley Down to the east of Field 5. Levels are indicated to rise approximately 3 m AOD over approximately 200 m;
- South: Land is shown to fall approximately 20 m AOD toward an existing watercourse over approximately 200 m; and

[2] CD Surveys Ltd, Topographical Survey Overall, W/2401010, February 2024.

[3] Department for Environment Food & Rural Affairs, Data Services Platform, LIDAR Composite Digital Terrain Model (DTM) – 1m [online]. Available at: https://environment.data.gov.uk/dataset/13787b9a-26a4-4775-8523-806d13af58fc. Accessed September 2024.

- West: Land is typically shown to fall toward the west, with falls of approximately 10 to 15 m AOD over approximately 200 m.

2.3.7 LiDAR Topography is presented in Figure 2.3 at the rear of the report.

2.4 Existing Drainage

2.4.1 At present, the site is comprised of undeveloped, greenfield land with no impermeable surfaces.

Surface Water

2.4.2 According to the LandIS soils map[4], the site is stated to drain to the 'stream network'. This statement is backed up by observations made during the site visit undertaken in March 2024, where saturated ground and pooling of water were observed in many places across the site, as well as the drainage of surface water to existing watercourses both on and offsite.

2.4.3 During the March 2024 site visit, surface water was observed to be draining toward the west. In Field 1, surface water was observed to flow toward the northwest of the field where it pooled significantly and then flowed away in a ditch which led into the wooded area to the west. A similar watercourse was observed to be flowing west into the woods in the northwest corner of Field 2 along the hedgerow that marked the boundary between Fields 1 and 2.

2.4.4 Thames Water sewer records are presented in Appendix D at the rear of the report.

Foul Water

2.4.5 The Thames Water sewer records indicate the presence of a 225 mm diameter wastewater sewer approximately 150 – 200 m south of the site. The sewer is gravity driven and is joined by another smaller 100 mm diameter sewer flowing north to south from Huntsland House.

[4] LandIS, Soilscapes Viewer [online]. Available at: https://www.landis.org.uk/soilscapes/. Accessed September 2024.

3. Policy Framework

3.1 National Planning Policy Framework, 2024

3.1.1 The NPPF[1] was most recently updated in December 2024, with flood risk remaining primarily regulated through planning policy. The NPPF requires that a site-specific FRA be provided for all development in Flood Zones 2 and 3; all development sites over 1 ha in area; land which has been identified by the EA as having critical drainage problems; land which has been identified in an SFRA as being at increased flood risk in the future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use.

3.1.2 In terms of flood risk, the NPPF classifies land uses according to vulnerability as follows:

- Essential Infrastructure;
- Highly Vulnerable;
- More Vulnerable;
- Less Vulnerable; and
- Water-Compatible Development.

3.1.3 The Planning Practice Guidance[5] to the NPPF, advises on how to take account of and address the risks associated with flooding and coastal change in the planning process. This includes detail on when and how the Sequential and Exception Tests need be applied.

3.2 Mid Sussex District Council, District Plan, 2018

3.2.1 The Mid Sussex District Plan[6] sets out a vision for how Mid Sussex wants to evolve and a delivery strategy for how that will be achieved. It sets out broad guidance on the distribution and quality of development in the form of 'higher level' strategic policies.

3.2.2 Policy DP41 (Flood Risk and Drainage) states the following:

- Proposals for development will need to follow a sequential risk-based approach, ensure development is safe across its lifetime and not increasing the risk of flooding elsewhere. The District Council's SFRA should be used to identify areas at present and future flood risk from a range of sources including fluvial, surface water, groundwater, infrastructure, and reservoirs.

[5] GOV.UK, Guidance, Flood risk and coastal change [online]. Available at: https://www.gov.uk/guidance/flood-risk-and-coastal-change. Accessed December 2024.

[6] Mid Sussex District Council, Mid Sussex District Plan, 2018 [online]. Available at: https://www.midsussex.gov.uk/planning-building/mid-sussex-district-plan/. Accessed October 2024.

- Particular attention will be paid to those areas of the District that have experienced flooding in the past and proposals for development should seek to reduce the risk of flooding by achieving a reduction from existing runoff rates.
- Land that is considered to be required for current and future flood management will be safeguarded from development and proposals will have regard to relevant flood risk plans and strategies.

3.3 Mid Sussex District Plan 2021 – 2039, Submission Draft (Regulation 19)

3.3.1 The District Plan 2021 – 2039[7] comprises an updated vision and strategy, along new site allocations and policies and will supersede the 2018 District Plan upon its adoption. This emerging local plan details Policy DPS4 (Flood Risk and Sustainable Drainage) which includes the following:

- Proposals for development will need to follow a sequential risk-based approach directing development away from areas at highest (flood) risk.
- Development should consider flood risk in line with latest national guidance. The cumulative impacts of all sources of flooding should be considered.
- Surface water drainage schemes must be implemented in all new development.

3.3.2 The site forms part of a proposed allocation pursuant to Policy DPA9: Land to the west of Turners Hill Road, Crawley Down which provides a site plan and details of proposed onsite infrastructure.

3.4 Crawley Down Neighbourhood Plan, January 2016

3.4.1 The Neighbourhood Plan[8] sets out a number of policies which together with the NPPF and the Local Plan ensure that new development in the Crawley Down Neighbourhood Plan Area will be sustainable and in accordance with the vision.

3.5 Mid Sussex District Council, Level 1 Strategic Flood Risk Assessment, 2024

3.5.1 As set out in the emerging local plan[7], the Mid Sussex Level 1 SFRA[9] aims to provide the Council with a robust evidence base to inform the application of the Sequential and, if necessary, Exception Tests to inform the future development strategy for the district. The objectives of the Level 1 SFRA are as follows:

- Inform the sustainability appraisal of the Local Plan (Mid Sussex District Plan), so that flood risk is fully taken into account when considering allocation options and in the preparation of Plan policies;
- Apply the Sequential Test and, where necessary, the Exception Test when determining land use allocations;
- Inform the allocation of land to safeguard it for flood risk management infrastructure;

[7] Mid Sussex District Council, Mid Sussex District Plan 2021 – 2039, Submission Draft (Regulation 19), December 2023.
[8] Crawley Down Neighbourhood Plan, 2014 – 2031, January 2016, Worth Parish Council.
[9] Aegaea, Mid Sussex District Council, 2024 [online]. Available at: https://www.midsussex.gov.uk/media/sl2jhk0z/env11-strategic-flood-risk-assessment-level-1-2024.pdf. Accessed October 2024.

- Inform policies for change of use and reducing the causes and impacts of flooding;
- Identify the requirements for site-specific flood risk assessments in particular locations, including those at risk from sources other than river and sea flooding;
- Determine the acceptability of flood risk in relation to emergency planning capability; and
- Help demonstrate how the adaptation to climate change has been met.

3.6 Mid Sussex District Council, Level 2 Strategic Flood Risk Assessment, 2024

3.6.1 The Mid Sussex Level 2 SFRA[10] provides a Level 2 assessment of sites identified for proposed allocation within the Mid Sussex District Plan. The objectives of the Level 2 SFRA are as follows:

- Assess the flood risk to proposed sites using the latest available flood risk data and climate change uplifts where available;
- Provide information and mapping to show flood risk from all sources for each site option;
- Provide recommendations for making the site safe from flooding throughout its lifetime where the Exception Test is required; and
- Take into account, as far as practically possible the most recent policy and legislation in the NPPF, Planning Practice Guidance (PPG) and Lead Local Flood Authority (LLFA) SuDS guidance.

3.7 MSDC response to Action Point AP-020, November 2024[11]

3.7.1 In terms of flood risk the Council have set out a general note explaining the implications of the latest FRAs in the context of the Framework and the previous work which informed the submitted Plan. In commenting upon policy DPA9 this note advises that the site is Neutral in terms of combined fluvial and surface water flood risk

3.8 West Sussex County Council, Local Flood Risk Management Strategy, 2014

3.8.1 The Local Flood Risk Management Strategy[12] sets out how the Council intends to carry out its flood risk responsibilities as LLFA. The overall aim is to ensure the risk from flooding and erosion is properly managed by using the full range of options in a coordinated way. The aim is for local authorities, communities, individuals, and voluntary groups to work together to:

1. Manage the risk to people and their property;
2. Achieve environmental, social, and economic benefits, consistent with the principles of sustainable development; and

[10] Mid Sussex District Council, Mid Sussex District Council Level 2 Strategic Flood Risk Assessment, 2024 [online]. Available at: https://www.midsussex.gov.uk/media/xtgdydna/env15-strategic-flood-risk-assessment-level-2-main-report.pdf. Accessed October 2024.

[11] MSDC response to Action Point AP-020, November 2024.

[12] West Sussex County Council, Local Flood Risk Management Strategy, 2014 [online]. Available at: https://www.westsussex.gov.uk/media/1595/local_flood_risk_management_strategy.pdf. Accessed October 2024.

3. Facilitate decision-making and action at the appropriate level – individual, community, or local authority, river catchment, coastal cell or national.

3.8.2 To reflect national strategic objectives in the local context, the partners in West Sussex have agreed to guide local focus and progress. These are to:

- Understand the areas that flood;
- Manage the flood risk in West Sussex;
- Enable people, communities, business, and public bodies to work together more effectively; and
- Put communities at the heart of what we do and help West Sussex residents during flood events and recover as quickly as possible after incidents.

4. Review of Baseline Flood Risk Data

4.1 Hydrological Setting

4.1.1 A review of the EA Statutory Main River Map[13] indicates there are no EA Main Rivers located within the boundary of the site. The nearest is located approximately 1.9 km northwest of the site.

4.1.2 The site drains toward existing watercourses located approximately 200 to 250 m west of the site. These watercourses ultimately drain northwards and become tributaries of the River Mole. The Mole then flows northwest through Surrey for approximately 80 km (approximately 50 miles) to the River Thames at Hampton Court Palace.

4.1.3 The Hydrological Setting is presented in Figure 4.1 at the rear of the report.

4.1.4 Please see Appendix E for further information/figures.

March 2024 Site Visit - Observations

4.1.5 The headwaters of two watercourses that discharge from the site toward the west were observed to be present. These watercourses are identified in Appendix C at the rear of the report. One is located in the northwest of Field 1, whereas the other is located along the boundary of Fields 1 and 2. It is considered that these two watercourses join one of the existing watercourses located within Wins Wood, as identified in Figure 4.1.

4.1.6 Along the northern boundary of the site and to the immediate northeast, large areas of surface water flooding were observed to be present, with water flowing approximately east to west. This extended into the wooded areas to the north of the site.

4.1.7 Saturated ground and standing water were observed in lower lying areas in the east of Field 2, adjacent to the site boundary.

4.2 EA Flood Zone Designation (Fluvial and Tidal Flood Risk)

4.2.1 According to the EA Flood Map for Planning[14], the site is located within Flood Zone 1. The nearest area of Flood Zone 2 or 3 is located approximately 1 km west of the site. The Flood Zones are defined as follows:

- Flood Zone 1 – Land defined as having a less than 0.1% annual probability of river or sea flooding;

[13] Department for Environment Food & Rural Affiars, Data Services Platform, Statutory Main River Map [online]. Available at: https://environment.data.gov.uk/dataset/25dde009-ba7d-40de-8380-c5c3bb32ccdc. Accessed September 2024.

[14] GOV.UK, Flood map for planning, Get flood risk information for planning in England [online]. Available at: https://flood-map-for-planning.service.gov.uk. Accessed October 2024.

- Flood Zone 2 – Land defined as having between a 1% and 0.1% annual probability of river flooding; or land having between a 0.5% and 0.1% annual probability of sea flooding; and
- Flood Zone 3 – Land defined as having a 1% or greater annual probability of river flooding; or land having a 0.5% or greater annual probability of sea flooding.

4.2.2 The EA Flood Map for Planning is presented in Figure 4.2 at the rear of the report.

4.3 Surface Water and Surface Water Sewer Flood Risk

4.3.1 The topography of the site and surrounding area is detailed in Section 2.3. Levels across the site and in the surrounding area are suggestive of a typical east to west sloping pattern. The topography of the site and surrounds is therefore suggestive of the potential for overland flow paths leading onto the site from the east.

4.3.2 The EA publishes geo-spatial data[15] describing the suitability of the modelling for a range of types of assessment for given locations. At the site location it is confirmed that the mapping was produced by the JFlow National Surface Water model, which was run in March 2013 at a 2 m resolution. It is stated that the assumption at this location was that any drainage systems are at capacity. Therefore, the model does not allow for losses (departure) of surface water runoff during the modelled storm event via the natural drainage at the site and in the vicinity of the site.

4.3.3 The Suitability[16] of the results at this location are stated to be 'National to County'. This suggests that whilst suitable for identifying which parts of countries or counties are at risk, or which countries or counties have the most risk, the results at this location are *"Very unlikely to be reliable for a local area"* and *"Extremely unlikely to be reliable for identifying individual properties at risk"*.

4.3.4 According to the EA long term flood risk mapping[17], approximately 80% of the site is located in an area considered to be at a Very Low risk from surface water flooding. Areas at High risk are present in the northwest and west of the site and are surrounded by areas at Medium and Low risk. The different surface water risk categories are defined below:

- High – Greater than a 1 in 30 (3.3%) annual probability;
- Medium – Between a 1 in 30 and 1 in 100 (3.3% to 1%) annual probability;
- Low – Between a 1 in 100 and a 1 in 1,000 (1% to 0.1%) annual probability; and
- Very Low – Less than a 1 in 1,000 (0.1%) annual probability.

[15] Department for Environment Food & Rural Affairs, Data Services Platform, Risk of Flooding from Surface Water Input Model Details [online]. Available at: https://environment.data.gov.uk/dataset/926e600f-d465-11e4-95fe-f0def148f590. Accessed September 2024.
[16] Department for Environment Food & Rural Affairs, Data Services Platform, Risk of Flooding from Surface Water Suitability [online]. Available at: https://environment.data.gov.uk/dataset/92912a4f-d465-11e4-8687-f0def148f590. Accessed September 2024.
[17] GOV.UK, Check the long term flood risk for an area in England [online]. Available at: https://check-long-term-flood-risk.service.gov.uk. Accessed September 2024.

4.3.5 It is noted that the EA mapping indicates areas at risk of flooding from surface water in addition to flood risk from rivers or the sea. It does not however account for building removal, ground raising, or site levelling. In addition, it does not consider specific drainage assets such as sewers, drains or ditches when calculating extents.

4.3.6 Whilst the surface water mapping indicates where there could be heightened surface water flood risks in some surrounding areas, this does not account for public surface water drainage measures which would be expected to significantly reduce surface water flood risks from that assumed and presented by the mapping. The EA's data confirms that the mapping at this location should not be used for site-specific assessment of risk.

4.3.7 EA Surface Water Flood Risk is presented in Figure 4.3 at the rear of the report.

4.3.8 During the March 2024 site visit, surface water flooding was observed to be significant along the northern and western boundaries of Field 1, with adjacent woodland areas seeing notable flooding. In central areas of the field, the ground was observed to be saturated, but the significant depths of water remained in the lower lying areas adjacent to the northern and western site boundaries. The mapping in this area appears to exaggerate the risk in the centre of the field and under exaggerate it along the boundaries. Furthermore, a fallen tree was observed in the northwest of Field 1 to be obstructing surface water flow exiting the field, leading to surface water pooling just outside the site boundary where surface water was subsequently observed to be flowing away toward the west.

4.4 Geological and Hydrogeological Setting

4.4.1 Geology and ground conditions at the site were investigated by Geo-Environmental[18] in November 2023. The ground conditions typically encountered across the boreholes comprised a mantle of Topsoil overlying the Upper Tunbridge Wells Sand Formation.

4.4.2 Groundwater monitoring investigations were previously undertaken by Geo-Environmental[19] between November 2023 and April 2024. They indicate a site-wide groundwater level typically shallower than 2 m Below Ground Level (BGL). In many areas of the site the level is shallower than 1 m BGL.

4.4.3 According to the Cranfield University LandIS soils map[4], the soil at the site is described as 'slightly acid loamy and clayey soils with impeded drainage'.

[18] Geo-Environmental, Ground Appraisal Report, Land Off Turners Hill Road, Crawley Down, West Sussex, RH10 4HB, January 2024, GE21953-GAR-JAN24.

[19] Geo-Environmental, Land off Turners Hill Road, Crawley Down, West Sussex, RH10 4HB – Ground Gas Assessment & Winter Groundwater Monitoring, May 2024, GE21953 – LRv1AP240203.

4.4.4 According to British Geological Survey (BGS) GeoIndex Onshore data[20], the underlying rock unit beneath the site is defined as a moderately productive aquifer and is summarised as sandstones of the Ashdown Formation yielding up to 60 L/s and Tunbridge Wells Sand yielding up to 10 L/s; separated by Wadhurst Clay.

4.4.5 According to the BGS Geology Viewer[21], the underlying geology beneath the site is defined as the Upper Tunbridge Wells Sand. This is described as interbedded sandstone and siltstone. No superficial geology layers are recorded.

4.5 Risks from Reservoirs, Canals, and Other Artificial Sources

4.5.1 According to EA mapping[17], the site is not shown to be at risk of flooding following a reservoir failure.

4.5.2 Dams in England are regulated by the Reservoirs Act 1975[22] which sets out stringent conditions for the operation of reservoirs to ensure high levels of safety. The EA routinely visits reservoirs across the country to assess risk, monitor progress and serve enforcement notices requiring operators to complete specific actions.

4.5.3 No other artificial sources have been identified that presently pose a flooding risk to the site.

4.6 Historic Flooding

4.6.1 According to the EA's Recorded Flood Outlines dataset[23], there are no records of historical flooding at the site. The nearest of which, dated to 1968, is located approximately 2.8 km northeast of the site and was attributed to channel capacity exceedance.

[20] BGS British Geological Survey, GeoIndex Onshore [online]. Available at: https://mapapps2.bgs.ac.uk/geoindex/home.html. Accessed September 2024.

[21] BGS Geology Viewer [online]. Available at: https://geologyviewer.bgs.ac.uk. Accessed September 2024.

[22] Legislation.gov.uk, Reservoirs Act 1975 [online]. Available at: https://www.legislation.gov.uk/ukpga/1975/23/contents. Accessed September 2024.

[23] Department for Environment Food & Rural Affairs, Data Services Platform, Recorded Flood Outlines [online]. Available at: https://environment.data.gov.uk/dataset/8c75e700-d465-11e4-8b5b-f0def148f590. Accessed October 2024.

4.6.2 Historical Flooding is presented in Figure 4.4 at the rear of the report.

4.7 Baseline Flood Risk Summary

4.7.1 Table 4.1 should be considered in the assessment of flood risk for any proposed development at the site:

Table 4.1: Baseline Flood Risk Summary

Flood Risk	High	Medium	Low	Comment
Fluvial/Tidal			X	Site is located in Flood Zone 1.
Surface Water	X			Areas considered to be at a High risk from surface water flooding are present in the northwest and west of the site.
Groundwater		X		Shallow groundwater levels observed at the site, along with visibly poor infiltration, and a review of underlying geology, are suggestive of a moderate groundwater risk at the site, especially in low lying areas.
Reservoirs, Canals, and Other Artificial Sources			X	The site is not shown to be at risk following a reservoir failure.

5. Assessment of Flood Risk

5.1 Fluvial

5.1.1 The site is shown to be located in Flood Zone 1 and is therefore considered to be at a Low risk from fluvial (and tidal) flooding. The nearest area in Flood Zone 2 (Medium risk) is located approximately 1 km to the west of the site. The nearest area in Flood Zone 3 (High risk) is located approximately 1.5 km northeast of the site.

5.2 Surface Water

5.2.1 An area of High risk is indicated in the northwest corner of the site in Field 1. The reality observed onsite was significant surface water flooding along the northern and western boundaries and within the wooded areas outside the site boundary, but no significant flooding in the areas indicated by the EA mapping[17].

5.2.2 It is likely that there are a number of contributing factors as to why the risk indicated by the EA mapping did not align with observations made onsite. Firstly, as noted in Section 4.3, the surface water modelling employed by the EA does not account for building removal, ground raising, or site levelling and does not consider specific drainage assets such as sewers, drains or ditches when calculating extents, of which many are known to be present either at or adjacent to the site, such as the existing watercourses and ditches observed during the site visit. Furthermore, many of the watercourses present at the site were observed to be covered by dense woodland areas which likely meant that the surface water model was unable to accurately map the underlying channels. In some cases, it appears as if the woodland was so dense that it was ignored completely by the model, hence the flow paths shown to be running adjacent to these areas and the areas where watercourses were observed to be present while onsite but were not picked up by the modelling at all. The resolution of the EA model is unlikely to have been fine enough to accurately identify the different watercourses even if there were no tree cover and it is noted that the suitability of the results of the EA mapping at this location are considered to be *"Very unlikely to be reliable for a local area"* and *"Extremely unlikely to be reliable for identifying individual properties at risk"*.

5.2.3 A proposed surface water drainage strategy has been developed for the site. The strategy has proposed a network of surface water attenuation areas and swales across the site that have been sized sufficiently to accommodate additional surface water runoff under a 1 in 100-year flooding event with a 40% increase in flows to account for the potential impacts of climate change. Proposed swales and new surface water sewer connections (where required) have been strategically located within the drainage strategy plan to direct surface water runoff toward lower lying areas where the proposed surface water attenuation areas will collect and store additional runoff from the Proposed Development. The strategy will ensure the satisfactory management of surface water falling on the site. Further details/mitigation measures are detailed in Section 5.6.

5.2.4 In addition to the above reasoning as to the incorrect nature of the EA mapping, a series of long sections based on EA LiDAR data[3] have been taken at key locations within the site where surface water is identified as a risk. This has been done with the intention of making it clear that the areas of surface water risk as shown on the EA mapping, do not align with local topography. The sections, along with explanations, are presented in Appendix E at the rear of the report.

5.2.5 The overall risk to the Proposed Development is considered to be low.

5.3 Groundwater

5.3.1 While a moderate groundwater flood risk has been determined at the site, groundwater flooding is not considered to pose a significant risk to the Proposed Development.

5.3.2 No basement levels are being proposed as part of the Proposed Development. The risk therefore from groundwater to internal areas of the site is considered to be minimal. Furthermore, any groundwater emerging in external areas of the site would be expected to be managed by the proposed surface water drainage strategy.

5.3.3 The overall risk to the Proposed Development is considered to be low.

5.4 Flood Risk Vulnerability

5.4.1 According to Annex 3[24] (Flood risk vulnerability classification) in the Planning Practice Guidance[5] to the NPPF, buildings used for dwelling houses and residential care homes should be classified as 'More vulnerable'.

5.4.2 Table 2 (Flood risk vulnerability and flood zone 'incompatibility') in the Planning Practice Guidance states that a 'More vulnerable' use is appropriate in Flood Zone 1 and that an Exception Test is not required.

5.5 Sequential Test

5.5.1 The aim of the Sequential Test, as defined by the Technical Guidance to the NPPF[1], is to steer new development to areas with the lowest probability of flooding. Only where there are no reasonably available sites in Flood Zones 1 or 2 should the suitability of sites in Flood Zone 3 be considered.

[24] GOV.UK, National Planning Policy Framework, Annex 3: Flood risk vulnerability classification [online]. Available at: https://www.gov.uk/guidance/national-planning-policy-framework/annex-3-flood-risk-vulnerability-classification. Accessed October 2024.

5.5.2 As the Proposed Development is located entirely within Flood Zone 1, it is considered to have passed the Sequential Test.

5.6 Further Mitigation/Assessment of Residual Risk

5.6.1 As part of our development of mitigation options, and in consideration of future site development, Ramboll has considered climate change in the following ways:

- Consideration of climate change allowances when considering peak fluvial flood levels – this is also a policy requirement of the EA for all NPPF-compliant FRAs;
- Consideration of greater frequency and higher magnitude of surface water flooding events and overland flow, and assessing how a site and building layout can be designed to manage this risk; and
- Consideration of the likely increased risk of seasonal groundwater flooding as a result of wetter winters.

5.6.2 Each of the above will be considered when assessing the mitigation measures, which are summarised in the remainder of Section 5.6.

Fluvial Flooding

5.6.3 The site has not been identified as being at risk from fluvial (or tidal) flooding and therefore no mitigation against this type of flooding is proposed.

Surface Water Management

5.6.4 The increase in impermeable area resulting from the Proposed Development will increase the surface water discharge generated at the site. To mitigate this, a surface water drainage strategy has been prepared by Ramboll and is detailed within the Drainage Strategy report. The strategy is summarised as follows:

- The intention is for the site to discharge via a series of swales, surface water attenuation areas, and gravity driven surface water sewers to multiple locations within the boundaries of the site.
- The intention is for two separate discharges. For the development proposed in Field 1, it is intended to discharge to an existing watercourse located in the wooded area to the west of the field. During the March 2024 site visit, a fallen tree was observed in the northwest of Field 1 and to be obstructing surface water flow exiting the field. Maintenance works to reduce the risk of pooling are being undertaken with the intent of 'formalising' the exit route of surface water from the site. These works are to be regularly inspected and actioned as required in the future. Surface water attenuation areas are proposed in the northwest and northeast corners of Field 1 and are proposed to be connected via a network of swales and surface water sewers to attenuate and direct runoff to the intended exit location at a controlled rate. The same basic strategy is proposed for development in Field 2, with final discharge intended for the existing watercourse separating Fields 1 and 2.

- The total storage volume required for the proposed development area would be approximately 4,000 m^3. This is based on a calculation that the overall area will be required to discharge at the 1 in 1-year greenfield runoff rate of 73.2 L/s.

5.6.5 Climate change has the potential to increase the risk of flooding in the future. As such, an allowance of 40% has been made when considering runoff volumes and associated attenuation storage, as noted in the Drainage Strategy report. The residual risk is therefore considered to have been managed through design.

5.6.6 Full details regarding street, neighbourhood, and catchment level measures, and surface water mitigation, are presented in the Drainage Strategy report and the associated Indicative Drainage Strategy Plan. If followed, the strategy would be expected to prevent any potential increase in flood risk associated with surface water runoff, both onsite and elsewhere/downstream.

5.6.7 Further to the above the following mitigation measures are recommended:

- Finished Floor Levels (FFLs) – All FFLs and threshold levels should be at least 150 mm – 200 mm above the surrounding ground to manage future risk from surface water flooding and overland flow.
- Planning for Exceedance Events - This risk relates to the occurrence of intensive rainfall events (expected to become more frequent with the advent of climate change) which could cause overland flow and surface water flooding or cause the capacity of the site drainage system to be exceeded and result in flooding. To manage this risk, the development should consider exceedance overland flow routes during extreme flood events, adopting the principles set out in CIRIA C634, Designing for Exceedance in Urban Drainage[25]. The design of exceedance routes should correlate with the proposed swales/surface water attenuation areas, which will make highly suitable exceedance flow paths. The overall volumes for the various surface water attenuation features proposed across the site have been determined based on calculations where an allowance for the potential impacts of climate change was made.
- External Gradients - Along with the planning of exceedance routes, external gradients where possible, are to be designed to fall away from buildings, so that any overland flow resulting from extreme events would be channelled away from building entrances. Where this is not possible, linear interceptor drains should be located at all building entrances towards which there is a positive gradient for surface water to flow.
- Management of Flood Extents – Areas at risk from surface water were investigated during the March 2024 site visit and have been accounted for in the proposed surface water drainage strategy. Proposed surface water attenuation areas, connected by a network of proposed swales to convey surface water runoff, have been strategically located across the site.

[25] CIRIA, Management of accelerated low water corrosion in steel maritime structures (C634), 2005 [online]. Available at: https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductCode=C634&Category=BOOK.

Groundwater Flood Risk Management

5.6.8 In the event of groundwater emergence at the site, it is considered unlikely this would lead to flooding of the Proposed Development.

5.6.9 No basement levels are being proposed as part of the Proposed Development. This is considered to negate the groundwater flood risk to internal areas of the site.

5.6.10 Any groundwater emergence outside the site would be expected to follow existing overland flow routes observed during the March 2024 site visit. Where these are located within the site these would be expected to be managed by the proposed surface water drainage strategy.

5.7 Summary

5.7.1 In summary, the Proposed Development is considered to be appropriate development for the site and as such no specific mitigation measures beyond those already detailed are proposed.

5.7.2 The site is considered safe for the lifetime of the development.

6. Conclusions

6.1.1 Based on the findings of this Flood Risk Assessment, and in consideration of the recommendations made, it is concluded that any flood risk at the site would be appropriately managed by the development proposals over the lifetime of the development, taking climate change into account and fittingly for the vulnerability of proposed users.

6.1.2 No further flood risk assessment is deemed necessary.

Figures

Figure 2.1 – Site Location Plan

Figure 2.2 – Site Setting

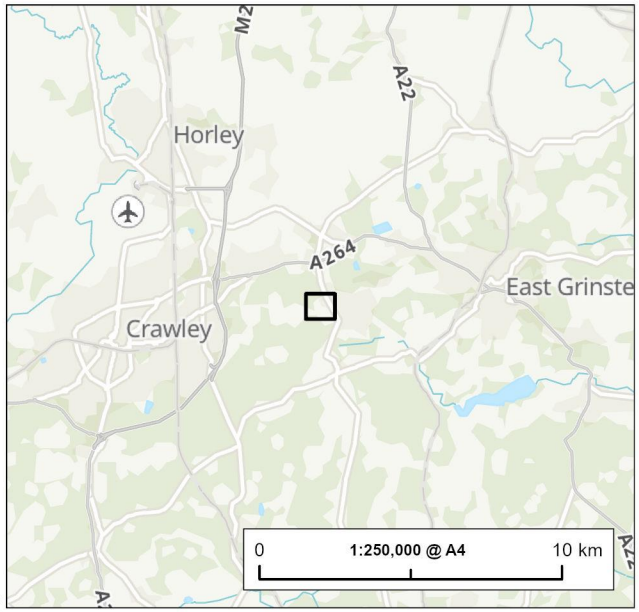
Figure 2.3 – LiDAR Topography

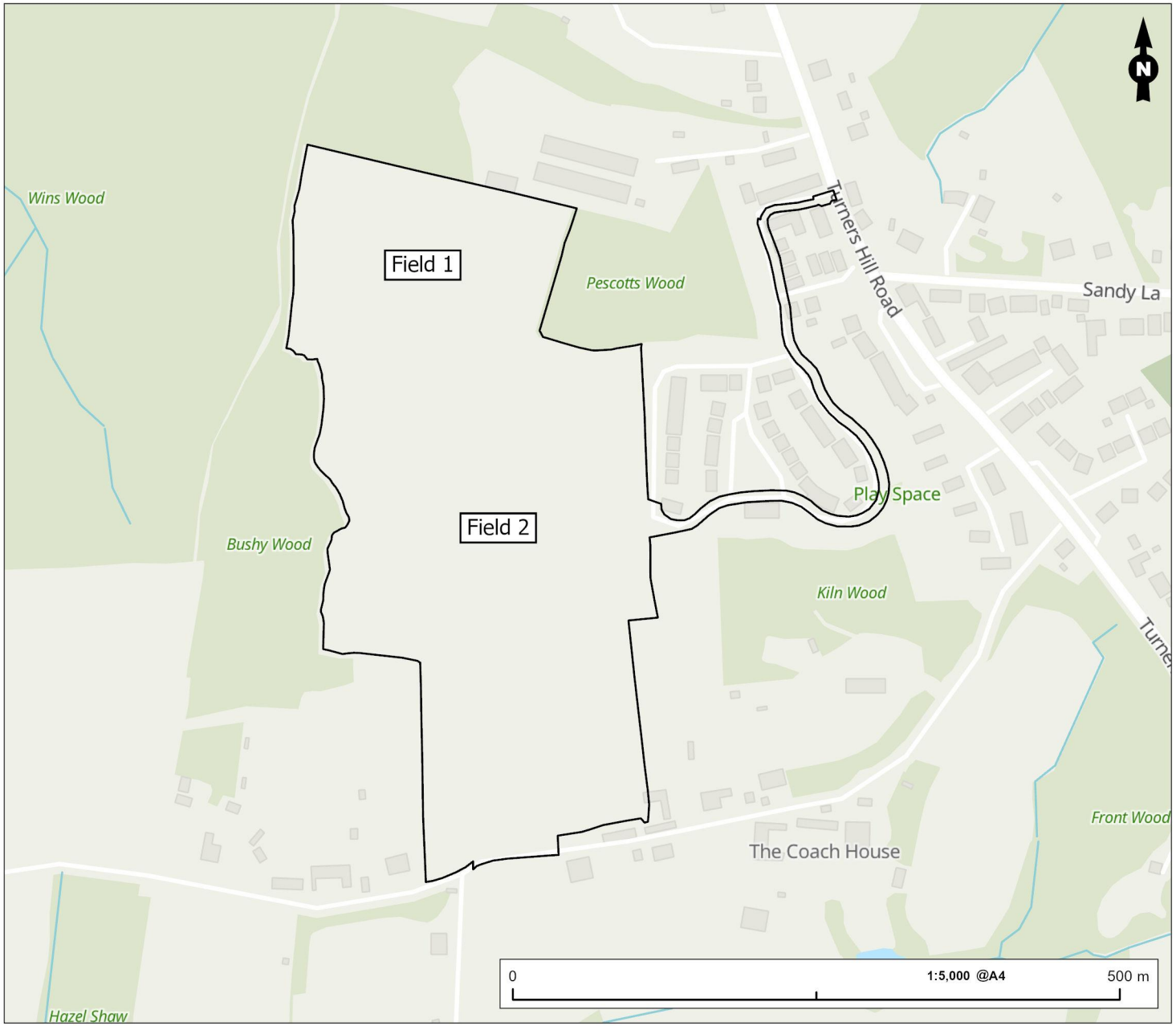
Figure 4.1 – Hydrological Setting

Figure 4.2 – EA Flood Map for Planning

Figure 4.3 – EA Surface Water Flood Risk

Figure 4.4 – Historical Flooding





RAMBOLL

Figure Title: Site Location Plan	Project Name: Land West of Crawley Down	Date: January 2025	
		Prepared By: DM	Figure No.: 2.1
Client: **Wates Developments Ltd**	Project No./Filery ID: 162001691-014 / RUK2021N00014	Scale: As Shown	Revision: 2.0

Fig2.1_SiteLocationPlan.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Legend

Site Boundary

Figure Title
Site Setting

Project Name
Land West of Crawley Down

Project No./Filery ID
1620011691-014 / RUK2021N00014

Date	Figure No.	Revision
January 2025	2.2	2.0

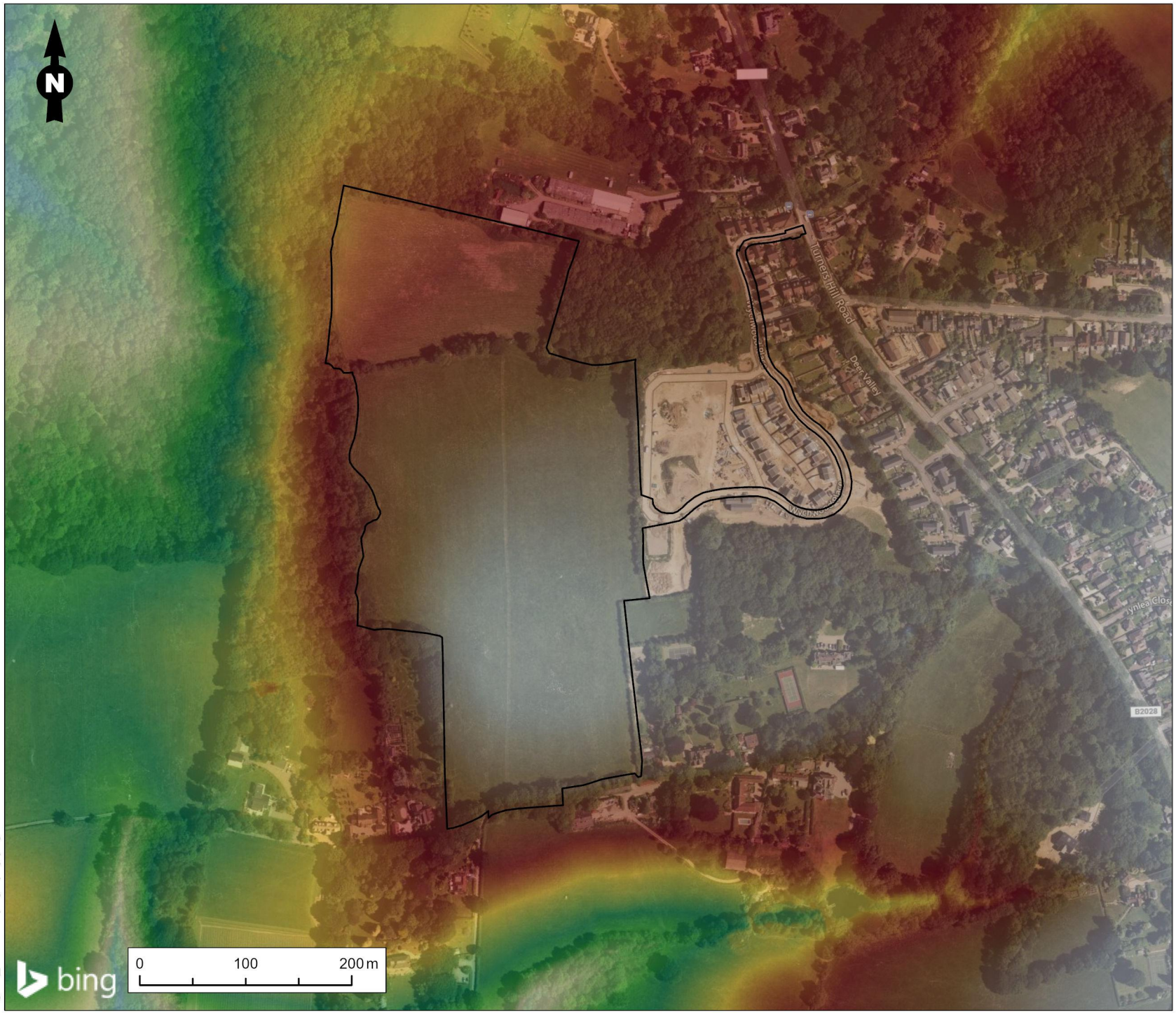
Prepared By	Scale
DM	1:4,000 @A4

Client
Wates Developments Ltd

RAMBOLL

Fig2.2_SiteSetting.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

Site Boundary

LiDAR 1m DTM / m AOD

130

95

Figure Title
LiDAR Topography

Project Name
Land West of Crawley Down

Project No./Filery ID
1620011691-014 / RUK2021N00014

Date	Figure No.	Revision
January 2025	2.3	2.0

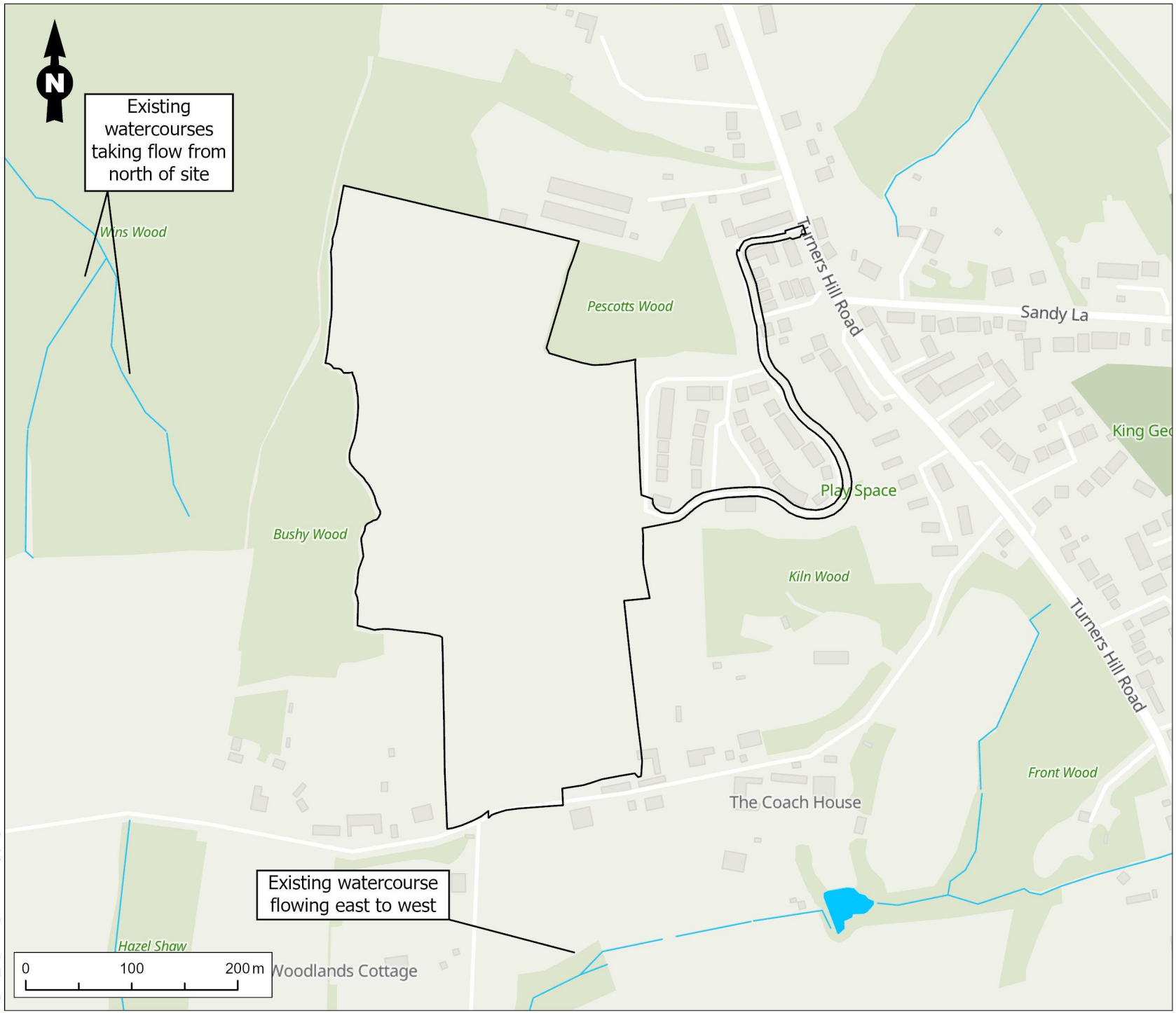
Prepared By	Scale
DM	1:5,000 @A4

Client
Wates Developments Ltd

RAMBOLL

Fig2.3_LiDAR Topography.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

- Site Boundary
- OS Watercourses
- OS Waterbodies

Figure Title
Hydrological Setting

Project Name
Land West of Crawley Down

Project No./Filery ID
1620011691-014 / RUK2021N00014

Date	Figure No.	Revision
January 2025	4.1	2.0

Prepared By	Scale
DM	1:5,000 @A4

Client
Wates Developments Ltd

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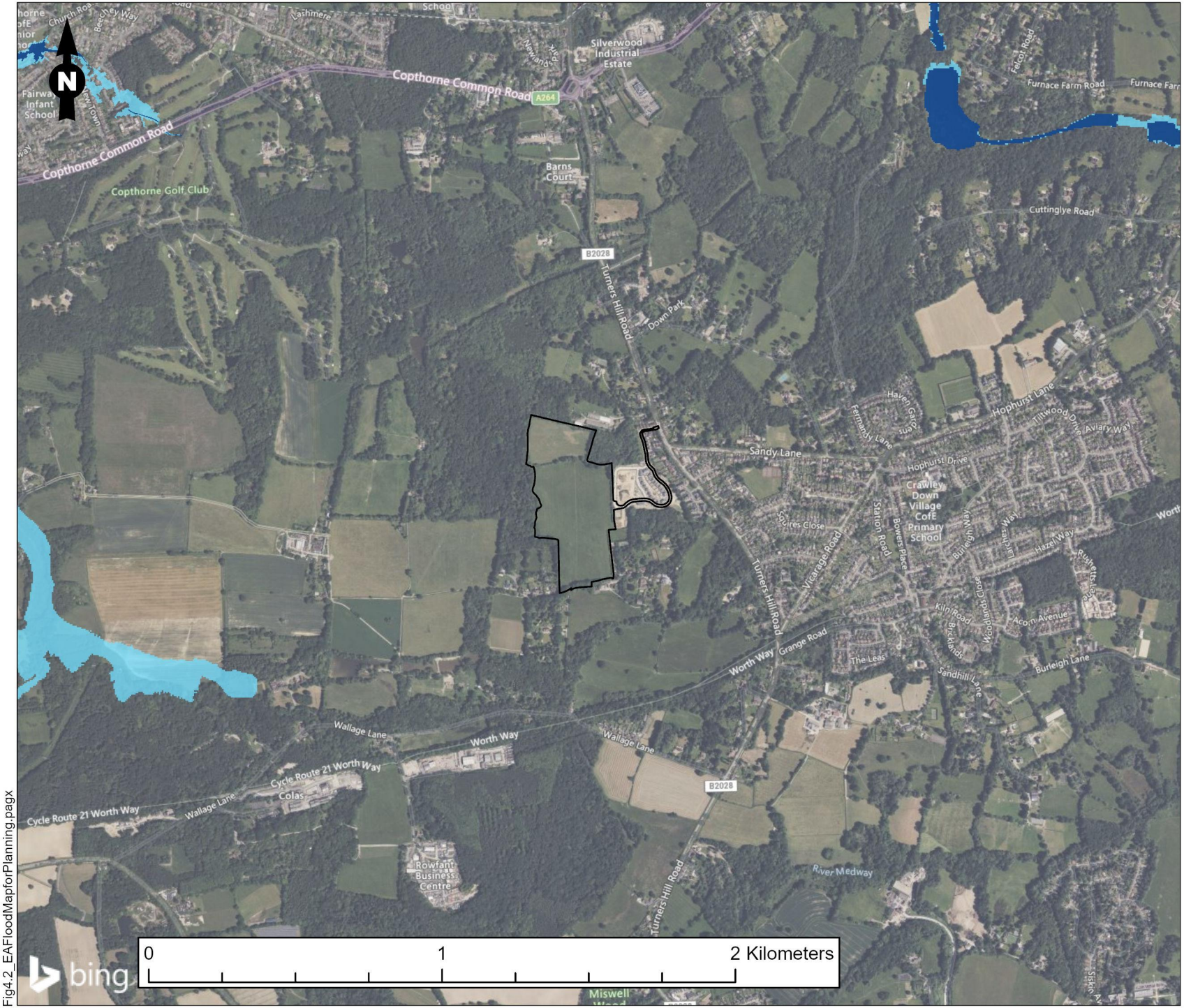
Fig4.1_HydrologicalSetting.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

- Site Boundary
- EA Flood Zone 3 (High Probability)
- EA Flood Zone 2 (Medium Probability)

Figure Title
EA Flood Map for Planning

Project Name
Land West of Crawley Down

Project No./Filery ID
1620011691-014 / RUK2021N00014

Date	Figure No.	Revision
January 2025	4.2	2.0

Prepared By	Scale
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Client
Wates Developments Ltd

RAMBOLL

Fig4.2_EAFloodMapforPlanning.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Legend

- Site Boundary
- High Surface Water Flood Risk (Greater than 3.3% Annual Exceedance Probability)
- Medium Surface Water Flood Risk (Between 1% and 3.3% Annual Exceedance Probability)
- Low Surface Water Flood Risk (Between 0.1% and 1% Annual Exceedance Probability)

Figure Title
EA Surface Water Flood Risk

Project Name
Land West of Crawley Down

Project No./Filery ID
1620011691-014 / RUK2021N00014

Date	Figure No.	Revision
January 2025	4.3	2.0

Prepared By	Scale
DM	1:4,000 @A4

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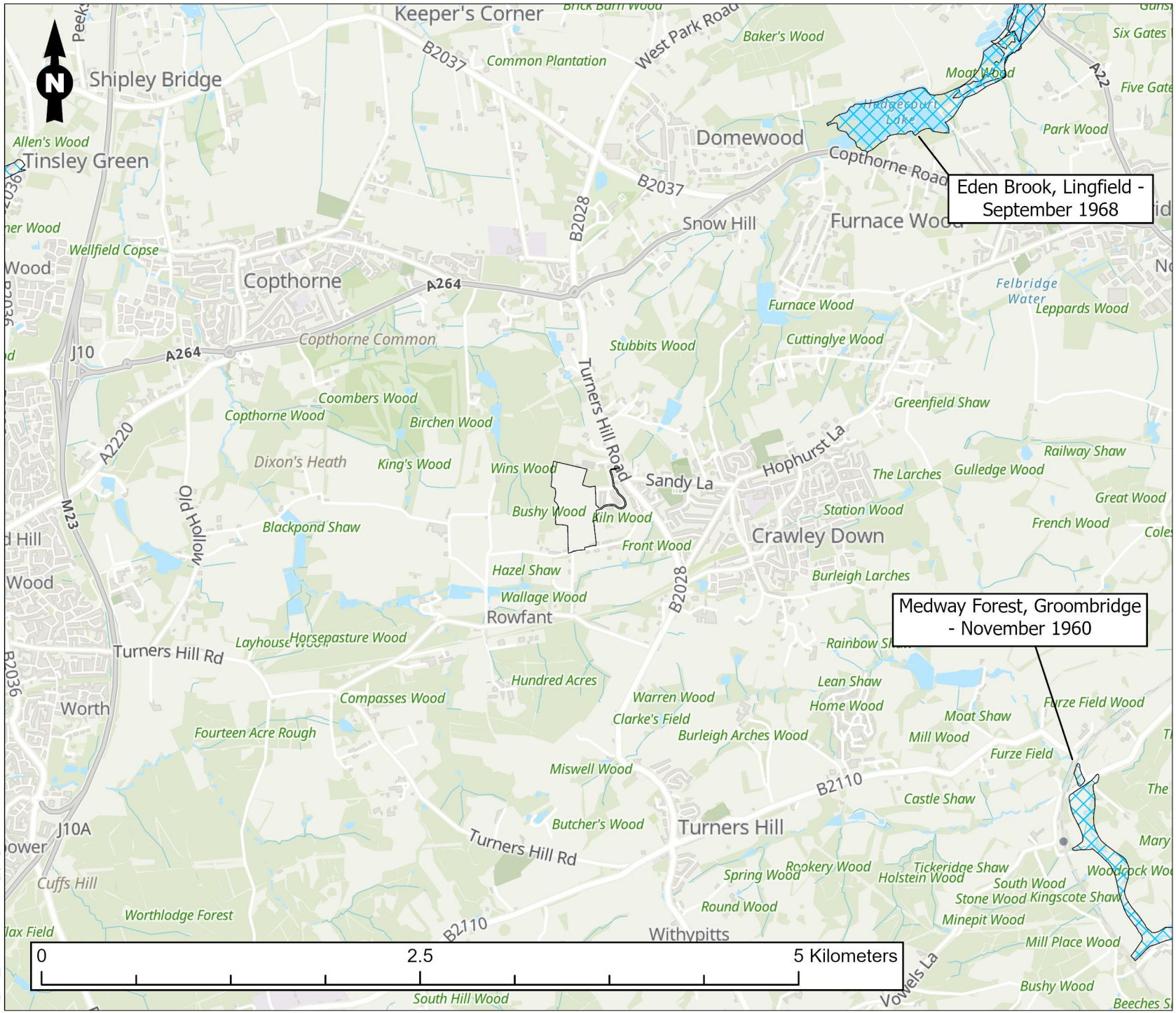
Fig4.3_EASurfaceWaterFloodRisk.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

- Site Boundary
- Historic Flooding

Figure Title
Historic Flooding

Project Name
Land West of Crawley Down

Project No./Filery ID
1620011691-014 / RUK2021N00014

Date	Figure No.	Revision
January 2025	4.4	2.0

Prepared By	Scale
DM	1:35,000 @A4

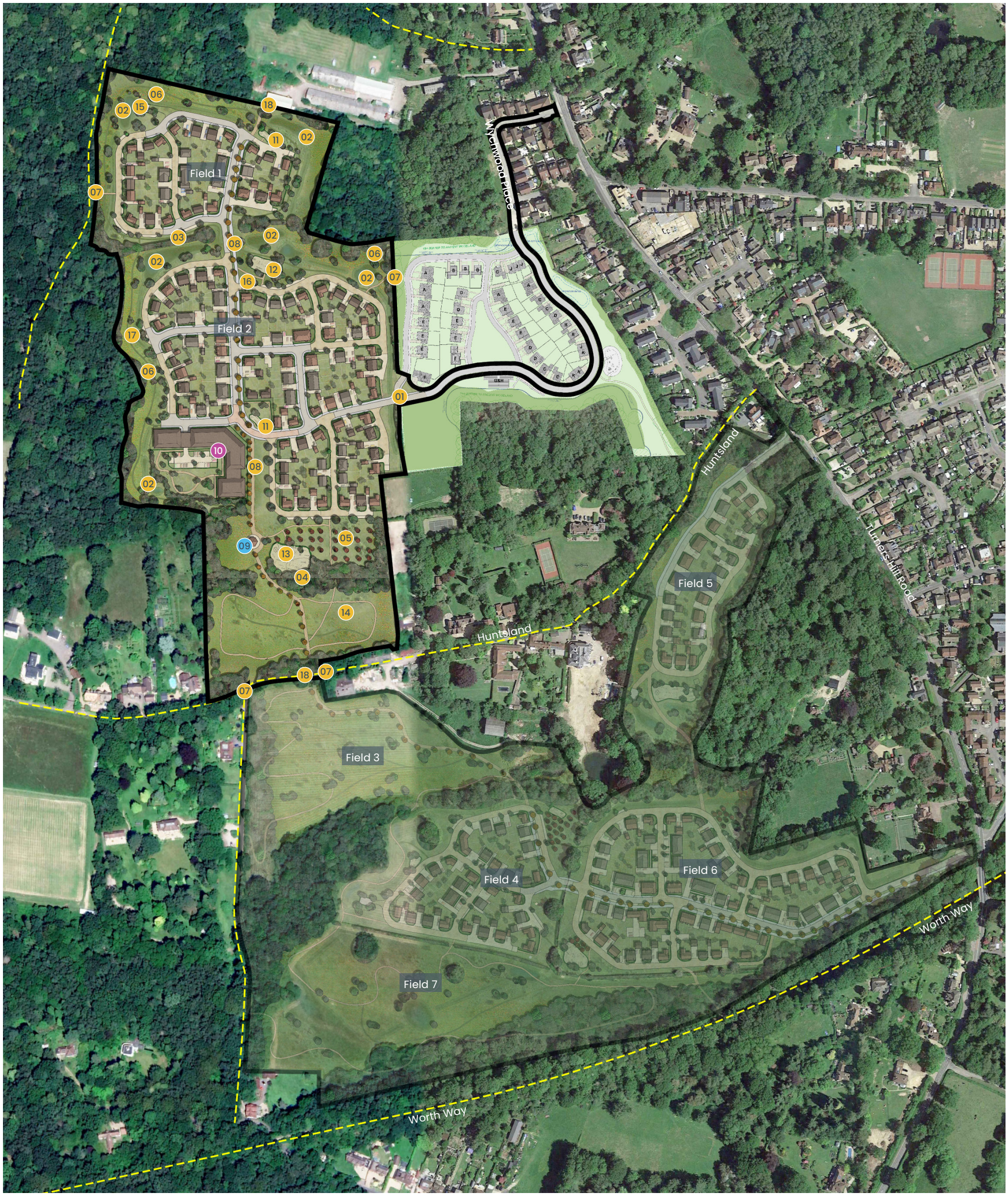
Client
Wates Developments Ltd

RAMBOLL

Fig4.4_HistoricFlooding.pagx

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Appendix A
Site Illustrative Masterplan



- Application site
- 01 Vehicular/pedestrian and cycle access point
- 02 Sustainable drainage system including swales
- 03 Retained and enhanced vegetation
- 04 Tree belt planting
- 05 Community orchard/garden
- 06 Meadow planting and species-rich landscapes
- 07 Pedestrian connection points
- 08 Shared cycle/footpath
- 09 Community heart including gathering space/band stand area and St Leonards lookout
- 10 65 bed care home
- 11 Local Area for Play
- 12 Local Equipped Area for Play
- 13 Neighbourhood Equipped Area for Play
- 14 Countryside open space
- 15 Pumping station
- 16 Substation
- 17 Mown paths
- 18 Cycle and pedestrian connection point
- Public right of way: Footpath

N.

Not to scale

CLIENT: WATES DEVELOPMENTS

PROJECT: LAND WEST OF CRAWLEY DOWN

DRAWING: ILLUSTRATIVE MASTERPLAN NORTH 150 UNITS

PROJECT NUMBER: 1314

DRAWING NUMBER: SK001-02

REVISION: V14

DATE:15.01.2025

MOSAIC
Urban Design & Masterplanning

Appendix B
Site Topographical Survey

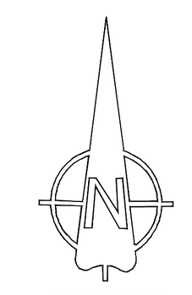
Notes:

Whilst every effort has been made to correctly identify species of trees on the site, we advise that an arborologist be consulted before any final decisions are made.

All information contained in this drawing (including digital data) should be checked and verified prior to any fabrication or construction.

Grid coordinates are based on an OS GNSS system.

Site survey completed in 2017 has not been checked or updated, only additional work has taken place on the surrounding roads.



Legend:

Fences
Walls
Hedges
Trees
Buildings
Overhead Electric
Overhead Phone
Gate

Fences:

Fence	Abbreviation
Barbed Wire Fence	B/W
Corrugated Iron Fence	C/I
Closed Board Fence	C/B
Chestnut Paling Fence	C/P
Iron Railing Fence	I/R
Post and Chain Fence	P/C
Post and Rail Fence	P/R
Post Wire Fence	P/W
Interwoven	I/W
Chain Link Fence	C/L
Larch Lap Fence	L/L
Wire Mesh Fence	W/M

Abbreviations:

BOLLARD	BO	MARKER	MK
BRITISH TELECOM IC	BT	PARKING METER	PM
CONCRETE PAVING SLABS	CPS	ROAD NAME PLATE	RNP
COVER LEVEL	CL	ROAD SIGN	RS
DROP KERB	DK	RODDING EYE	RE
ELECTRICITY POLE	EP	RETAINING WALL	Rtw
FIRE HYDRANT	FH	RAINWATER PIPE	RPW
FLOWER BED	F/B	SOIL VENT PIPE	SVP
FOOTPATH	FP	STOP VALVE	SV
GAS VALVE	GV	TELEGRAPH POLE	TP
GULLY	GY	TRAFFIC LIGHT	TL
INSPECTION COVER	IC	UNABLE TO LIFT	UTL
PIPE INVERT LEVEL	IL	VENT PIPE	VP
KERB OUTLET	KO	WATER METER	WM
MAN HOLE	MH		

Rev. Suffix	Date	Initial	Revision Details
A	26.04.24	TJH	Additonal information added

Surveyor	MB/LW	Verified By	MB/LW	CAD Operator	LW	Approved By	ARL	Date	27.09.17

Levelling GNSS Datum OSGB36

To an OS GNSS Datum

Client

Wates

Location

Land @ Crawley Down
Crawley Down

Drawing Title

Topographical Survey Overall

Job No. 2401010	Old Job No. 1702047
Drawing Number W/2401010	Revision Suffix A
Scale Not To Scale	Date February 2024

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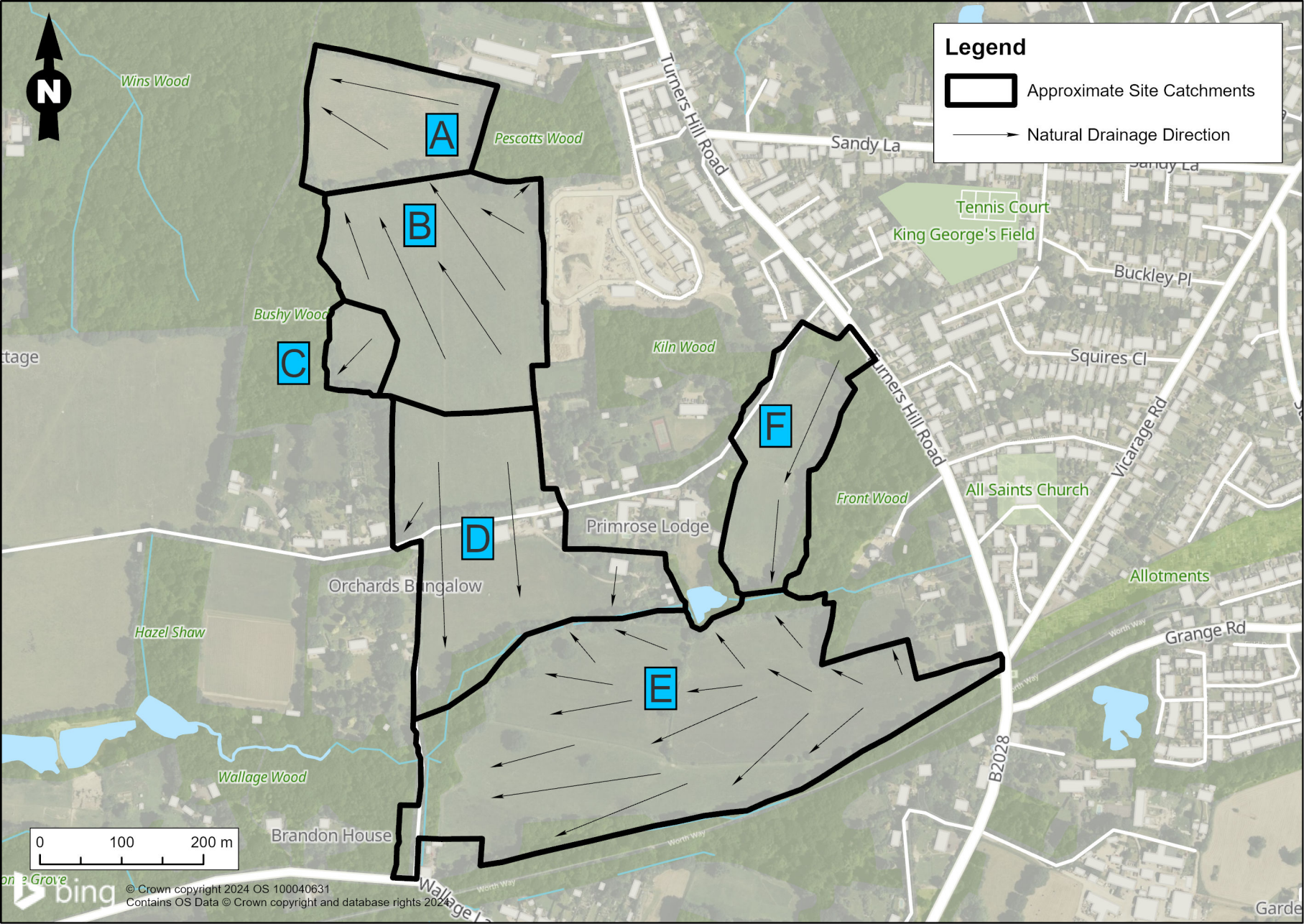
Appendix C
Site Visit Photographs and Accompanying Figures


Legend
Approximate Site Catchments
Natural Drainage Direction
A
B
C
D
E
F
Wins Wood
Pescotts Wood
Bushy Wood
Kiln Wood
Turners Hill Road
Sandy La
Tennis Court
King George's Field
Buckley Pl
Squires Cl
Vicarage Rd
All Saints Church
Front Wood
Primrose Lodge
Orchards Bungalow
Allotments
Grange Rd
Hazel Shaw
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Brandon House
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Contains OS Data © Crown copyright and database rights 2024

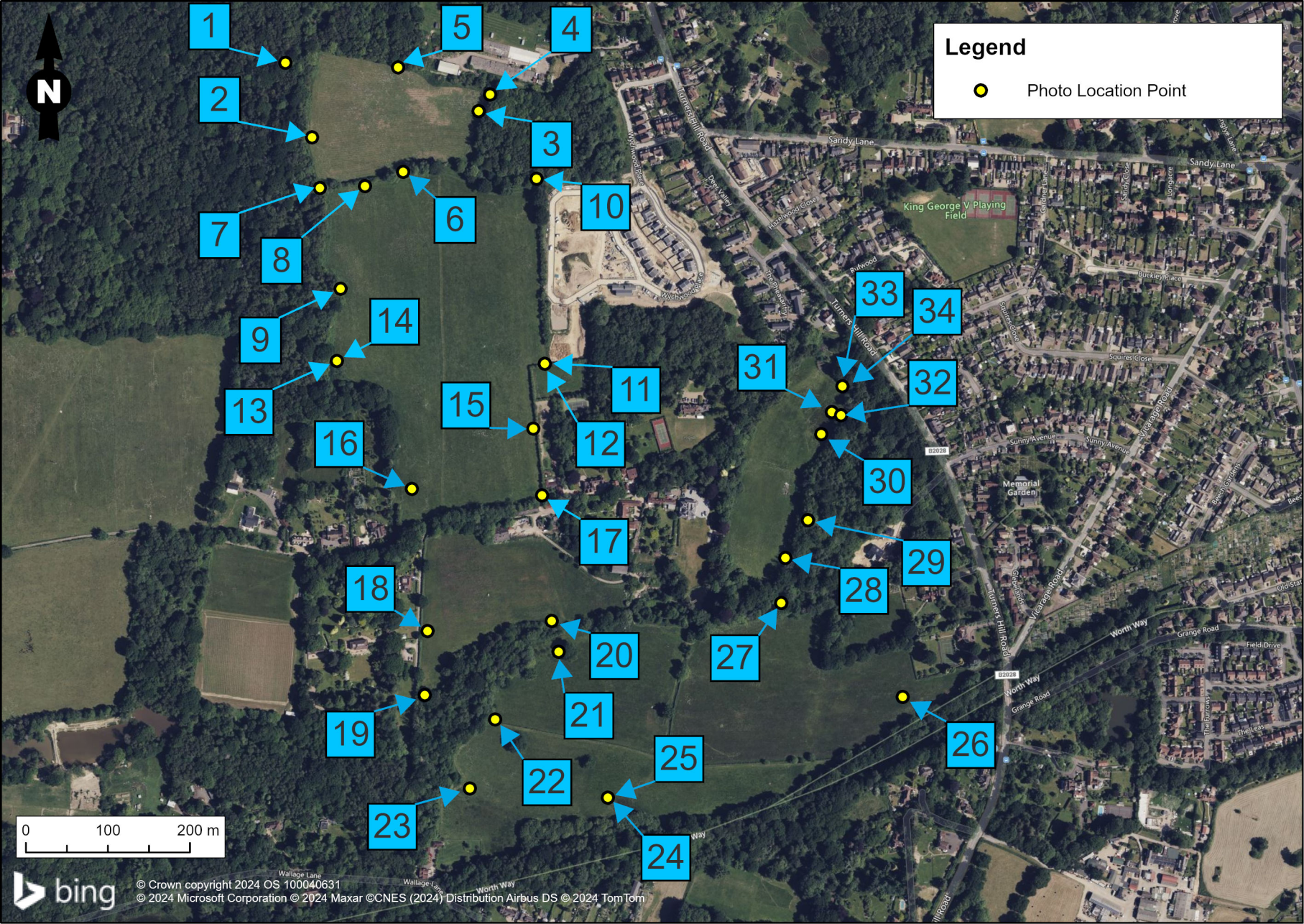
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Photo Location Point
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Sandy Lane
King George V Playing Field
Turners Hill Road
Squires Close
Buckley Place
Rufwood
Sunny Avenue
Vicarage Road
Memorial Garden
Worth Way
Grange Road
Field Drive
Wallage Lane
B2028
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200 m
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© 2024 Microsoft Corporation © 2024 Maxar ©CNES (2024) Distribution Airbus DS © 2024 TomTom

Catchment A

Photographs for Catchment A are presented in Table 3.1 below.

Table 3.1: Catchment A Photographs

 **1.** View of watercourse to the northwest of the site looking west. Watercourse shown to take flows from north of site and direct them westward. Topography visibly sloping from east to west.	 **2.** View of Catchment A looking north along western boundary. Standing water visible in west of site. Topography visibly sloping from east to west.
 **3.** View of Catchment A in the northeast of the site looking west. Topography typically sloping from east to	 **4.** Surface water flooding in the northeast corner of the site.

west although another low point is present in the northeast corner of the catchment.	
 **5.** Surface water flooding in the north of the site. Looking west. Flow observed to be east to west.	 **6.** View of Catchment A looking northwest from the south of the catchment. Land shown to be sloping from southeast to northwest.

Catchment B

Photographs for Catchment B are presented in Table 3.2 below.

Table 3.2: Catchment B Photographs

	
7. View of watercourse flowing from east to west. View looking west. Watercourse shown to take flows from ditch separating Catchments A and B. Topography sloping from east to west.	**8.** View looking south from north of catchment. Topography visibly sloping from south to north.

9. View of Catchment B looking north from the west of the catchment. Topography visibly sloping from south to north and east to west.

10. View of Catchment B looking west from the northeast of the catchment. Topography visibly sloping from south to north leaving localised low point in northeast of catchment.

11. View of Catchment B looking west from southeast of catchment. Topography visibly sloping from west to east in the east of the catchment.

12. View of Catchment B looking north from southeast of catchment. Topography sloping from west to east in the east of the catchment.

Catchment C

Photographs for Catchment C are presented in Table 3.3 below.

Table 3.3: Catchment C Photographs

	
13. View of Catchment C looking north along western boundary of site. Topography sloping from east to west and northeast to southwest.	**14.** View of Catchment C looking east. Topography sloping from east to west. Likelihood is that any potential swale will need to be placed further from the site boundary to ensure a massive depth is not needed.

Catchment D

Photographs for Catchment D are presented in Table 3.4 below.

Table 3.4: Catchment D Photographs

15. View of Catchment D looking west from northeast of catchment. Topography visibly sloping from west to east.

16. View of Catchment D looking north from northwest of catchment. Topography visibly sloping from north to south.

17. View of Catchment D looking northwest from the east of the catchment. Topography visibly sloping from north to south.

18. View of Catchment D looking south along the western boundary. Topography visibly sloping from

	north to south down toward existing watercourse that separates Catchments D and E.
 **19.** View of Catchment D looking east from the southwest of the catchment. Topography visibly sloping from north to south.	 **20.** View of Catchment D looking east from the south of the catchment. Bridge over watercourse visible in top right of image. EA Surface Water Flood Risk mapping suggests a surface water flow path is present to the south of this watercourse in Catchment E. The EA mapping does not account for culverts (like the one beneath this bridge) and the indication therefore is that the surface water flow path shown to the south of the existing watercourse is the result of the EA model assuming a blockage in the watercourse at this location.

Catchment E

Photographs for Catchment E are presented in Table 3.5 below.

Table 3.5: Catchment E Photographs

	
21. View of Catchment E looking northwest from north of catchment, towards existing watercourse. Topography sloping down toward watercourse. Marshy ground ideally suited for an attenuation feature.	**22.** View of Catchment E looking southeast from west of catchment. Topography sloping from east to west and south to north, toward the existing watercourse.

23. Overland surface water flow path flowing from north to south toward the existing watercourse. View looking west.

24. View of Catchment E looking northwest from the south of the site. Topography sloping from east to west and southeast to northwest toward existing watercourse.

	
25. View of Catchment E looking east from the south of the site. Topography sloping from north to south toward the south of the site.	**26.** View of Catchment E looking west from the southeast of the site. Topography shown to be sloping from east to west but is gentle at location photograph was taken.

Catchment F

Photographs for Catchment F are presented in Table 3.6 below.

Table 3.6: Catchment F Photographs

	
27. View of watercourse between Catchments E and F flowing from east to west. View looking west from atop existing footbridge.	**28.** View of Catchment F looking south from the south of the catchment. View looking toward existing watercourse. Steeply sloping toward existing watercourse apparent.

29. Existing tributary watercourse flowing from north to south along eastern boundary of site. View looking north/upstream from atop existing footbridge.

30. View of tributary watercourse flowing from northeast to southwest along eastern boundary of site. Adjacent ground very saturated. View looking south.

31. View of Catchment F looking northwest from east of catchment. Ground very saturated. Topography gently sloping from north to south.

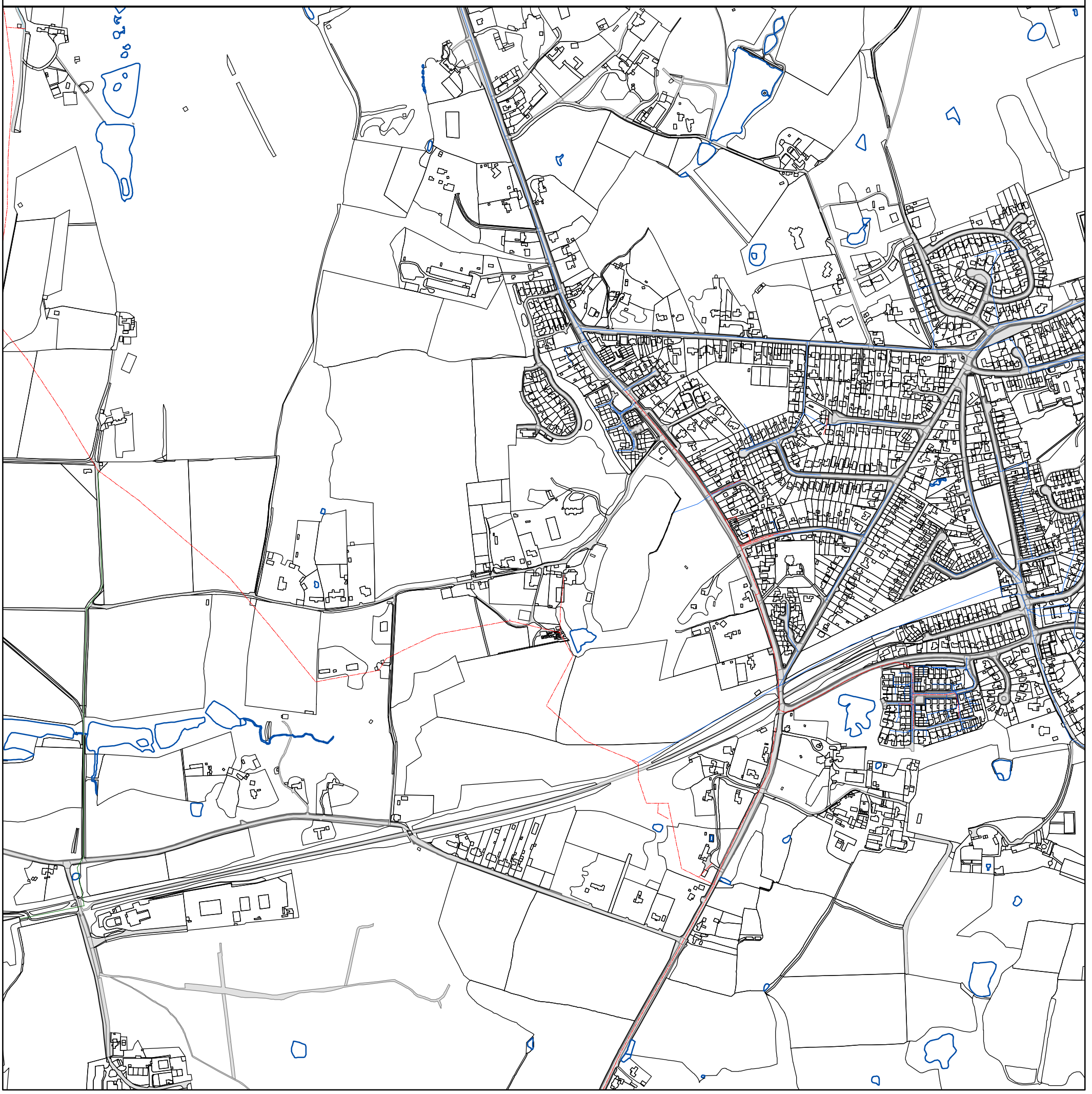
32. View of headwall and culvert along tributary watercourse flowing from northeast to southwest along

	eastern boundary of site. Further tributary ditch visible in top of image.
 **33.** View of Catchment F looking approximately west from the northeast of the catchment. Ground very saturated and topography indicative of potential surface water flow path in part due to lowered edge of small ditch ("tributary watercourse"). See Photo 34 for source of overland flow.	 **34.** View of the tributary watercourse in the northeast of the catchment, beneath tree cover. Backing up and overspill of watercourse onto main catchment area visible. Local land management and potential localised ground raising required to ensure flow remains in the tributary watercourse and is not directed through centre of catchment.

Appendix D
Thames Water Sewer Records

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

ALS/ALS Standard/2024_4944402



0 45 90 180 270 360
Meters

Scale:	1:7161
Width:	2000m
Printed By:	TSOMASUN
Print Date:	26/02/2024
Map Centre:	533768,137565
Grid Reference:	TQ3337NE

Comments:

Appendix E
Long Sections and Additional Information/Figures

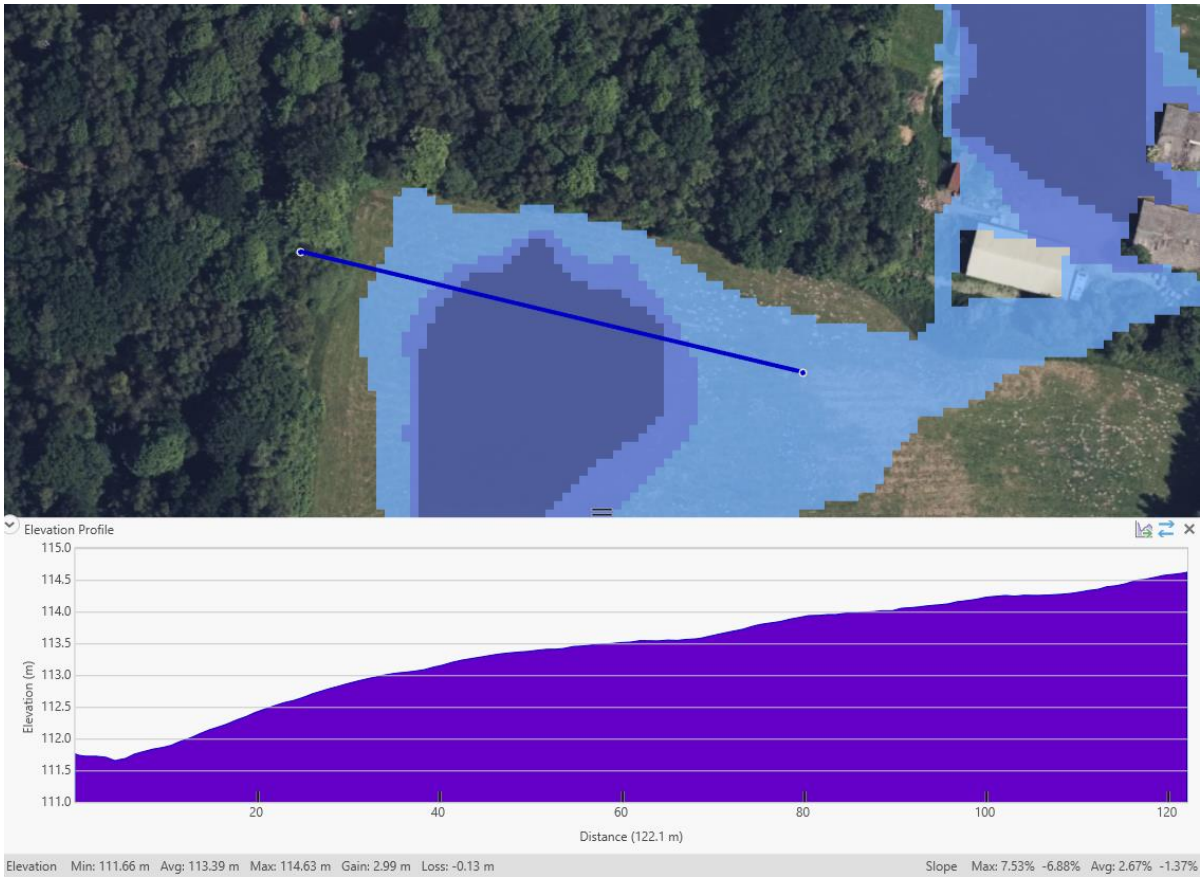


Figure AE.1: Field 1 Long Section

The cross section profile presented in Figure AE.1 shows the topography of the dark blue line drawn in the above related image, as it moves across the land from approximately west to east.

The dark blue line measures approximately 122 m in length. At the western edge of Field 1, at a chainage of approximately 12 m, the elevation stands at approximately 112 m AOD. At a chainage of approximately 38 m, where the area at a High risk of surface water flooding is met, the elevation stands at approximately 113 m AOD.

As is clear from the long section profile presented in Figure AE.1, the topography continues to rise along the entire length of the chainage as it moves from west to east. Hence, it is not possible for the area along the middle part of the chainage to be at a higher surface water flood risk than that further west.

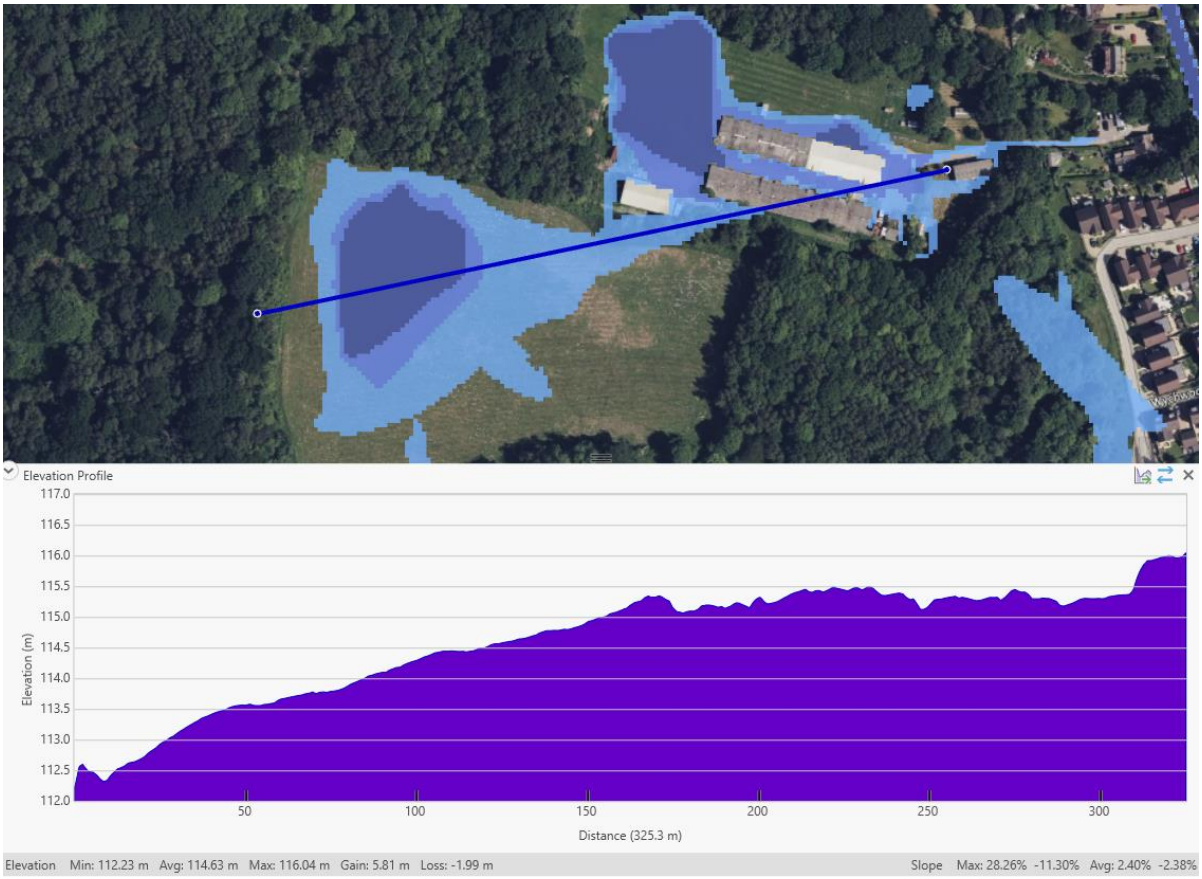


Figure AE.2: Field 1 Long Section 2

The cross section profile presented in Figure AE.2 shows the topography of the dark blue line drawn in the above related image, as it moves across the land from approximately west to east.

The dark blue line measures approximately 325 m in length. At the western edge of Field 1, at a chainage of approximately 9 m, the elevation stands at approximately 112 m AOD. At a chainage of approximately 40 m, where the area at a High risk of surface water flooding is met, the elevation stands at approximately 113 m AOD.

As is clear from the long section profile presented in Figure AE.2, the topography typically continues to rise along the length of the chainage as it moves from west to east. Hence, it is not possible for the area along the middle part of the chainage to be at a higher surface water flood risk than that further west.

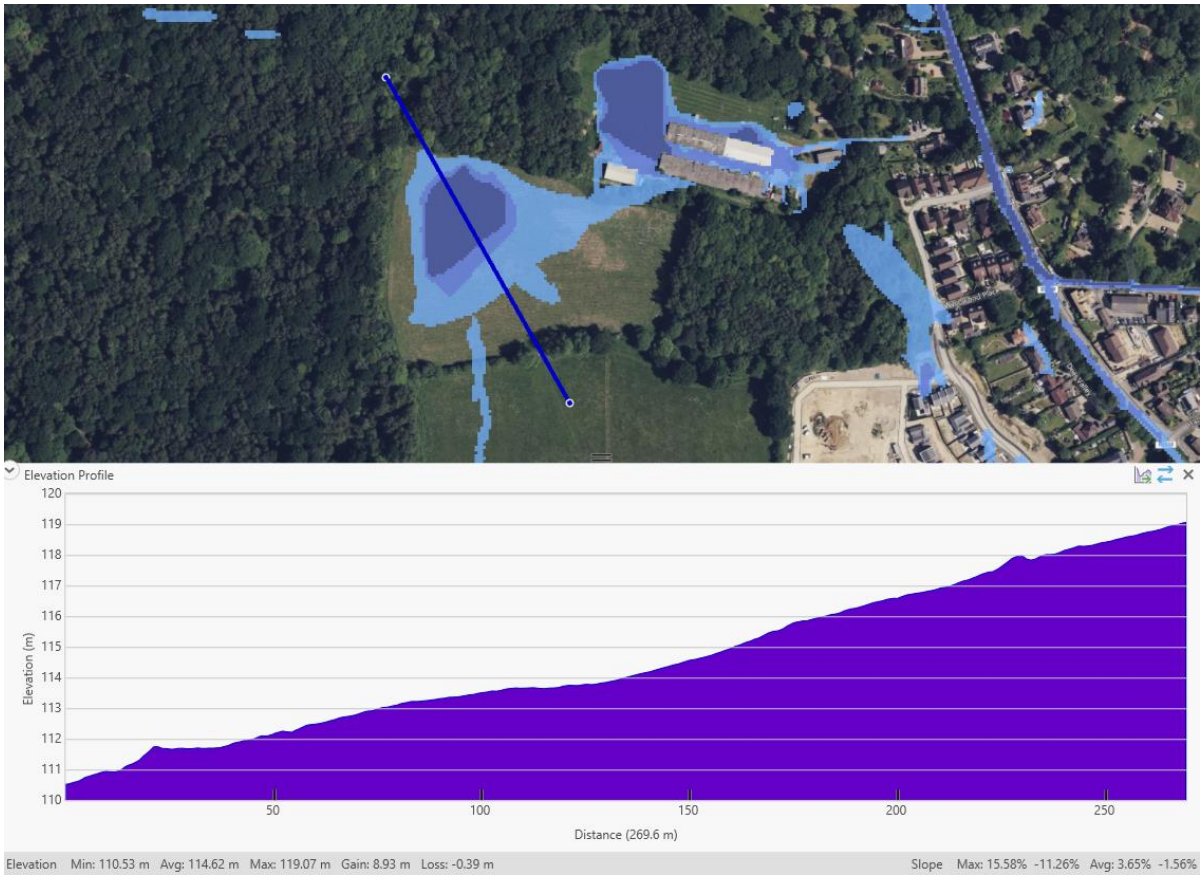


Figure AE.3: Field 1 Long Section 3

The cross section profile presented in Figure AE.3 shows the topography of the dark blue line drawn in the above related image, as it moves across the land from approximately northwest to southeast.

The dark blue line measures approximately 270 m in length. At the northwestern point of the line, at a chainage of 0 m, the elevation stands at approximately 110.5 m AOD. At a chainage of approximately 86 m, where the area at a High risk of surface water flooding is met, the elevation stands at approximately 113 m AOD.

As is clear from the long section profile presented in Figure AE.3, the topography continues to rise along the length of the chainage as it moves from northwest to southeast. Hence, it is not possible for the area along the middle part of the chainage to be at a higher surface water flood risk than that further northwest.

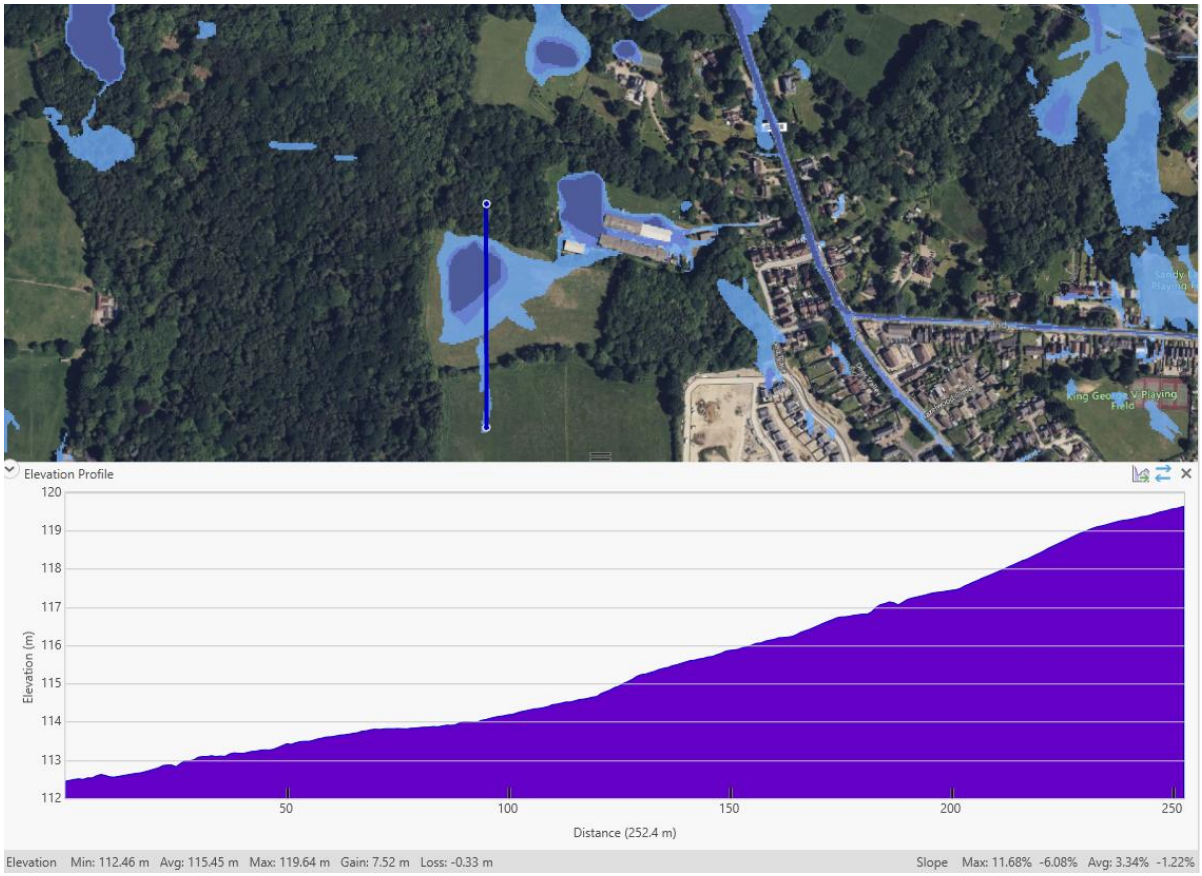


Figure AE.4: Field 1 Long Section 4

The cross section profile presented in Figure AE.4 shows the topography of the dark blue line drawn in the above related image, as it moves across the land from approximately north to south.

The dark blue line measures approximately 252 m in length. At the northern end of the line, at a chainage of 0 m, the elevation stands at approximately 112.5 m AOD. At a chainage of approximately 56 m, where the area at a High risk of surface water flooding is met, the elevation stands at approximately 113.5 m AOD.

As is clear from the long section profile presented in Figure AE.4, the topography continues to rise along the length of the chainage as it moves from north to south. Hence, it is not possible for the area along the middle part of the chainage to be at a higher surface water flood risk than that further north.

Figure AE.5: Existing Watercourses