Barns Green
Horsham

Flood Risk Assessment
and Surface Water Drainage Statement

April 2026

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EXECUTIVE SUMMARY

Site Name	Land South of Smugglers' Lane
Location	Barns Green, Horsham
Grid Reference	TQ 12486 27023
Postcode	RH13 0PS
Site Area	3.28ha
Current Land Use	Greenfield
Proposed Development Type	Residential
Vulnerability Classification	More Vulnerable
Planning Authority	Horsham District Council
Lead Local Flood Authority	West Sussex County Council
Pre-app Discussions Held	Yes
Sewerage Authority	Southern Water
Critical Drainage Area	No
Coastal/Tidal Flood Risk	n/a
Fluvial Flood Risk	Very Low
Surface Water Flood Risk	Low
Groundwater Flood Risk	Very Low
Reservoir Flood Risk	Very Low
Infrastructure Flood Risk	Very Low
Sewer Flood Risk	Very Low
Sequential and Exception Tests	Not Required
Surface Water Drainage Strategy	TSWC-0018-B-401-D
Infiltration Rate	n/a
Groundwater Monitoring	n/a
NSfSuDS Compliant	Yes

This version of the Report (V02) has been produced to update the surface water drainage details and calculations following minor changes to the development layout and remove all references to Water Neutrality as this is no longer a requirement of HDC or NE.

The Report clearly demonstrates that the proposals are still in accordance with Local and National Policy in relation to SuDS.

All previous statements and conclusions relating to Flood Risk remain unchanged.

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1. INTRODUCTION

1.1 Background

1.1.1 This Flood Risk Assessment (FRA) and Surface Water Drainage Statement (DS) has been prepared by TS Wood Consulting (TSWC) on behalf of Miller Homes (Southern) Ltd and Miller Developments Ltd, hereafter referred to as the Applicants, to support a Full Application for a '*Proposed development of 68 dwellings with vehicular and pedestrian accesses, public open space, hard and soft landscaping and associated works including supporting foul and surface water drainage works, and works to existing culverted watercourse on site*'.

1.1.2 The Site is located on land to the South of Smugglers' Lane, Barns Green, Horsham.

1.1.3 This FRA has been conducted in accordance with guidance contained in the National Planning Policy Framework (NPPF), associated Planning Practice Guidance (PPG) on Flood Risk and Coastal Change and the PPG 'Site-specific flood risk assessment checklist' (para 068 Reference ID: 7-068-20140306.

1.1.4 This FRA identifies and assesses the risks from all sources of flooding to, and as a result of, development and demonstrates how any residual flood risks will be managed so that the development remains safe throughout its lifetime, considering the current and future impacts of climate change.

1.2 Requirements for a Flood Risk Assessment

1.2.1 It is a requirement for development applications to consider the potential risk of flooding from various sources to a proposed development over its expected lifetime and any potential impacts on flood risk elsewhere, as a result of the development.

1.2.2 Where appropriate, the following aspects of flood risk should be addressed in all planning applications within flood risk areas and for any proposed development site with an area greater than 1 ha or within Flood Zone 2 and/or 3, an area that has experienced localised or groundwater flooding, at risk of future surface water flooding, at risk of sewer flooding or a site within or upstream of a Critical Drainage Area:

- The area at risk of flooding, from all sources;
- The probability of flooding occurring now and in the future;
- The extent and standard of any existing flood defences and their continuing effectiveness;
- The depth of flooding for a range of return periods;
- The potential impact on areas, properties, and habitats in the wider catchment;
- The effects of climate change;
- The nature and life of the proposed development and the extent to which it is designed to deal with flood risk.

2. POLICY

2.1 National Planning Policy Framework (NPPF)

2.1.1 One of the key aims of the NPPF[1] is to ensure that flood risk is considered at all stages of the planning process; to avoid inappropriate development in areas at risk of flooding and to direct development away from areas of highest risk [para.170].

2.1.2 The NPPF also requires all development proposals to apply a sequential, risk-based approach to the location of development which considers all sources of flood risk and the current and future impacts of climate change, so as to avoid, where possible, flood risk to people and property [para.172].

2.1.3 A sequential risk-based approach should be taken to individual applications in areas known to be at risk now or in future from any form of flooding [para.173].

2.1.4 The sequential test should be used in areas known to be at risk now or in the future from any form of flooding, except in situations where a site-specific flood risk assessment demonstrates that no built development within the site boundary, including access or escape routes, land raising or other potentially vulnerable elements, would be located on an area that would be at risk of flooding from any source, now and in the future (having regard to potential changes in flood risk) [para 175].

2.1.5 Footnote (63) states "A site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use."

2.2 Planning Practice Guidance (PPG)

2.2.1 The NPPF is accompanied by the Planning Practice Guidance (PPG)[2] on Flood Risk and Coastal Change, which gives further information on the approaches to be adopted in the assessment of flood risk for new development. The PPG was updated in September 2025 with key changes to paragraphs 023, 027 and 028.

2.2.2 Paragraph: 023 Reference ID: 7-023-20220825, states:

> *'The approach is designed to ensure that areas at little or no risk of flooding from any source are developed in preference to areas at higher risk. This means avoiding, so far as possible, development in current and future medium and high flood risk areas considering all sources of flooding including areas at risk of surface water flooding.*
>
> *Other forms of flooding need to be treated consistently with river and tidal flooding in mapping probability and assessing vulnerability, so that the sequential approach can be applied across all areas of flood risk.'*

[1] NPPF 14. Meeting the challenge of climate change, flooding and coastal change - Guidance - GOV.UK

[2] PPG Flood-risk-and-coastal-change

2.2.3 Paragraph: 027 Reference ID: 7-027-20220825, states:

> *'Paragraphs 175, 176 and 180 set out exemptions from the sequential test.*
>
> *In applying paragraph 175 a proportionate approach should be taken. Where a site-specific flood risk assessment demonstrates clearly that the proposed layout, design, and mitigation measures would ensure that occupiers and users would remain safe from current and future surface water flood risk for the lifetime of the development (therefore addressing the risks identified e.g. by Environment Agency flood risk mapping), without increasing flood risk elsewhere, then the sequential test need not be applied.'*

2.2.4 This means that the Sequential Test is no longer required on sites effected by surface water flooding where a site-specific flood risk assessment clearly demonstrates that the proposed development and mitigation measures ensure that the users remain safe from the current and future surface water flood risk over the lifetime of the development and do not adversely affect flood risk elsewhere.

2.3 Local Flood Risk Management Strategy

2.3.1 As the Lead Local Flood Authority (LLFA), West Sussex County Council (WSCC) has a legal duty under The Flood and Water Management Act 2010 to develop, maintain, act, apply and monitor a Local Flood Risk Management Strategy.

2.3.2 In July 2025, WSCC updated its LFRMS[3], which sets the long-term direction to better manage flood risk in West Sussex, whilst also identifying specific actions for the next five years. The focus is on understanding flood risk at a strategic scale and considering interactions between the multiple sources of flooding, with the aim of identifying holistic solutions.

2.4 Strategic Flood Risk Assessment

2.4.1 A Strategic Flood Risk Assessment (SFRA) looks at the impact that proposed land development could have on flood risk. It is used as an evidence base for planning decisions and supports the development of the Local Plan. A SFRA was carried out in June 2007 and revised in 2010 to support the current Local Plan.

2.4.2 As part of the evidence base for the emerging Local Plan (eLP) a new SFRA was produced in January 2020.[4]

2.4.3 A Level 1 SFRA Update[5] was produced in September 2024 following a number of changes in planning policy and improvements in available flood mapping and modelling datasets and provide a useful starting point for the preparation of site-specific Flood Risk Assessments (FRAs) for individual development sites.

2.4.4 In addition to the Level 1 SFRA, a SFRA Update Sequential and Exception Test (September 2024) (SFRAuSET)was produced and relates to the allocations put forward in the eLP.[6]

[3] WSCC Local Flood Risk Management Strategy (2025)

[4] Strategic Flood Risk Assessment (January 2020)

[5] Horsham Level 1 SFRA Update (September 2024)

[6] SFRA Update Flood Risk Sequential and Exception Test (September 2024)

2.4.5 The Site (Land South of Smugglers' Lane) was included as an allocation to be assessed within the Sequential Test. Following the application of the Sequential Test the Site was identified as 1 of 8 allocated sites that require the Exceptions Test (para 4.26 and Table 3).

2.4.6 Appendix 3 of the SFRAuSET concluded that an Exceptions Test was not required.

2.5 Local Plan

2.5.1 The council's current Local Plan is called the Horsham District Planning Framework[7] (HDPF), is the overarching planning document for HDC outside the South Downs National Park (SDNP) and replaces the Core Strategy and General Development Control Policies documents which were adopted in 2007.

2.5.2 Policy 38 (Flooding) of the HDPF states:

> *"Development proposals will follow a sequential approach to flood risk management, giving priority to development sites with the lowest risk of flooding and making required development safe without increasing flood risk elsewhere.*
>
> *Where there is the potential to increase flood risk, proposals must incorporate the use of sustainable drainage systems (SuDS) where technically feasible or incorporate water management measures which reduce the risk of flooding and ensure flood risk is not increased elsewhere.*
>
> *Consider the vulnerability and importance of local ecological resources such as water quality and biodiversity when determining the suitability of SuDS.*
>
> *Be in accordance with the objective of the Water Framework Directive and accord with the findings of the Gatwick Sub Region Water Cycle Study in order to maintain water quality and water availability in rivers and wetlands and wastewater treatment requirements".*

2.5.3 The eLP (Horsham District Local Plan 2023-2040 Regulation 19, January 2024) Strategic Policy 10 states:

> *"Development proposals will only be supported where they follow a sequential approach to flood risk management, so that priority is given to development sites and areas with the lowest risk of flooding, where shown to be safe, and shown not to increase flood risk elsewhere.*
>
> *New development which incorporates SuDS will be supported where it considers amenity value, green infrastructure, local ecological resources including water quality and biodiversity, natural flood management methods, and contributes towards environmental net gain. An appropriately detailed assessment should be submitted to demonstrate an appropriate SuDS strategy."*

2.5.4 Although the adoption of the eLP has stalled and is likely to be withdrawn, a letter from the Head of Strategic Planning at HDC dated 03 June 2025 states:

> *"….Horsham District Council had identified Land South of Smugglers Lane as a site suitable for allocation….in the event that the plan is withdrawn, the evidence base*

[7] Horsham District Planning Framework 2015

supporting that plan (including the site assessment work which concluded the Smugglers' Lane site was suitable for development) would remain valid. This would therefore need to be taken into account as part of any consideration of any planning application submitted for the site."

2.6 West Sussex LLFA Culvert Policy

2.6.1 The WSCC LLFA Culvert Policy[8] sets out the agreed LLFA and Horsham District Council (HDC) policy regarding the culverting of ordinary watercourses and provides a guide to good practice and design principles.

2.6.2 Section 2 (Deculverting Policy) states:

'There are many benefits to deculverting, which include; the provision of valuable wetland habitat, increased storage capacity, educational opportunities, reduction of maintenance costs and ease of inspection'.

2.6.3 Deculverting requires consent as the removal of a culvert which previously constrained flow could increase the downstream flood risk; modelling should therefore be employed (where necessary) to ensure there is no adverse flood risk as a consequence of a particular activity.

2.7 National Standards for Sustainable Drainage Systems (SuDS)

2.7.1 The new National Standards for Sustainable Drainage Systems[9] (SuDS) (June 2025) replaces the 2015 guidance with a broader, multifunctional framework that introduces seven national standards that give greater weight to water quality, amenity, biodiversity, and long-term maintenance, reflecting the wider role SuDS provide in shaping sustainable, resilient places.

2.7.2 The seven 'Standards' are:

- Runoff destination (discharge must follow the hierarchy)
- Management of everyday rainfall (interception)
- Management of extreme rainfall and flooding
- Water quality
- Amenity
- Biodiversity
- Design of drainage for construction, operation, maintenance, decommissioning and structural integrity

2.7.3 At present, the new standards are non-statutory as they are not enforced via Schedule 3 of the Flood and Water Management Act 2010, which has yet to be enacted in England. However, paragraphs 181 and 182 of the NPPF expects Local Planning Authorities (LPAs) and Lead Local Flood Authorities (LLFAs) to promote sustainable drainage, and these new standards will form the basis for LPA requirements and planning approvals.

[8] WSCC LLFA Culvert Policy

[9] National standards for sustainable drainage systems (SuDS) - GOV.UK

2.8 WSCC LLFA SuDS Policy

2.8.1 WSCC LLFA, alongside partner authorities, produced guidance[10] (Water. People. Places. A guide for master planning sustainable drainage into developments) for developers relating to the consideration of SuDS at an early stage in the planning process.

2.9 HDC SuDS Policy

2.9.1 SuDS are a material consideration as part of planning permission for any major development. This means all major applications should be accompanied by a site-specific drainage strategy or statement that demonstrates that the drainage scheme proposed is in compliance with the National Planning Policy Framework (NPPF) and the Non-Statutory Technical Standards, replaced in June 2025 by the New National Standards.

[10] WSCC SuDS design guidance

3. DEVELOPMENT PROPOSALS

3.1 Application

3.1.1 This Flood Risk Assessment (FRA) has been provided to support a Detailed Major Application for a '*Proposed development of 68 dwellings with vehicular and pedestrian accesses, public open space, hard and soft landscaping and associated works including supporting foul and surface water drainage works and works to existing culverted watercourse on site*'.

3.1.2 A plan showing the development proposals along with a Schedule of Accommodation (SoA) is presented as **Appendix A**.

3.2 Vulnerability Classification

3.2.1 The NPPF Annex 3: Flood risk vulnerability classification, classifies the proposed development as '**More Vulnerable'**.

4. LOCATION AND SITE DESIGNATIONS

4.1 Site Location Summary

4.1.1 The location of the Site is summarised in **Table 1**.

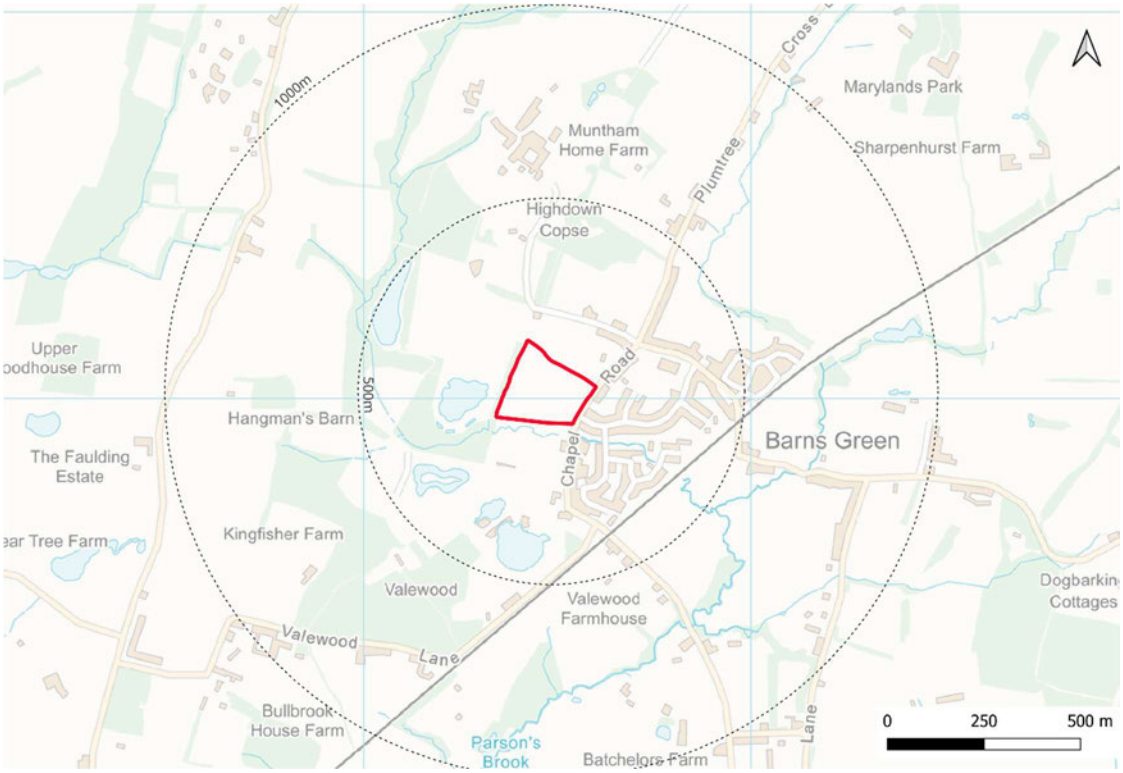
Table 1: *Site Summary*

Site Name	Land South of Smugglers' Lane
Location	Barns Green, Horsham
Grid Reference	TQ 12486 27023
Postcode	RH13 0PS
Site Area	3.28ha
Current Land Use	Greenfield
Proposed Development Type	Residential
Sewerage Authority	Southern Water
Planning Authority	Horsham District Council
Lead Local Flood Authority	West Sussex County Council

4.2 Site Location and Surrounding Area

4.2.1 The Site lies immediately to the south of Smugglers' Lane and to the west of Chapel Road on the western edge of Barns Green, a village in the parish of Itchingfield.

Figure 1: Site Location Plan



4.2.2 The Site is approximately 3.28ha and falls gradually from the northwestern corner to the south and east.

4.3 Topography

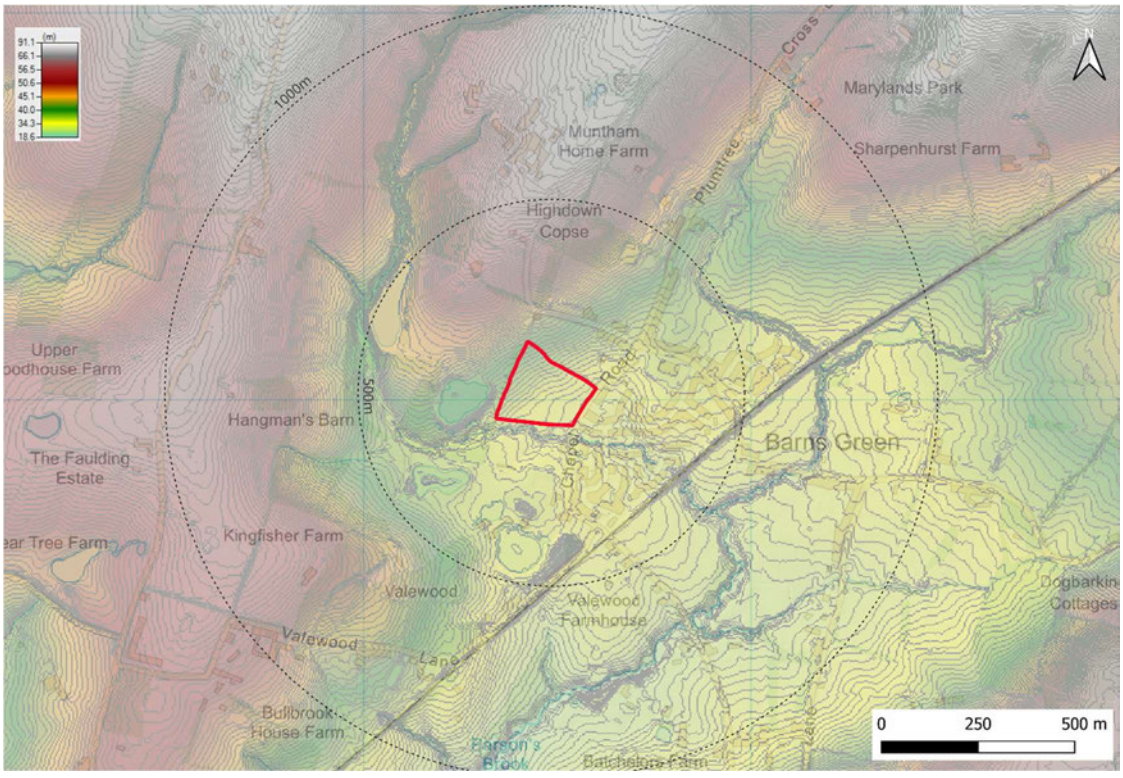
4.3.1 A full 3D topographical survey of the Site was undertaken by Cadmap Ltd in February 2025 which confirms that levels across the Site generally fall from a level of c.40.50mAOD in the northwestern corner to the eastern boundary with Chapel Road and low point of c.32.25mAOD in the southeastern corner.

4.3.2 The Site falls on the draw between the steeper higher ground to the north and the flatter valley bottom to the south. This change in topography presents between the southwestern and northeastern corners of the Site where the slopes north and south of this line are at gradients of 1 in 22 (4.4%) and 1 in 66 (1.4%) respectively.

4.3.3 A copy of the topographical survey is presented as **Appendix B**.

4.3.4 The EA's 1m LiDAR composite elevation digital terrain model (DTM), of the wider area, is presented in **Figure 2**.

Figure 2: *EA LiDAR composite DTM Histogram*



4.4 Geology, Hydrogeology and Hydrology

Geology

4.4.1 British Geological Survey (BGS) 1:50,000 scale mapping indicates that the Site is underlain by Mudstone of the Weald Clay formation and information held by the National Soils Reference Centre (NSRC) defines the soils of the catchment as 'Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils' (Soilscape 18) draining to a stream network with the

main risks, to water protection, associated with overland flow from compacted or poached fields.

4.4.2 Borehole records, obtained from the BGS, indicate only one borehole located within a 1km radius of Site. Borehole TQ12NW15 was drilled in October 2023 to a depth of 54m below ground level (bgl) and recorded 0.5m of topsoil over Clay and Stone to 54m. A copy of the borehole record is presented as **Appendix C**.

4.4.3 An intrusive ground investigation was undertaken at the Site in August 2024 and comprised the drilling of 5no sampler boreholes to depths between 3.50m and 5.00m bgl. The encountered ground conditions were recorded as 0.m to 0.6m of topsoil over Weald Clay. No groundwater strikes were recorded during the investigations.

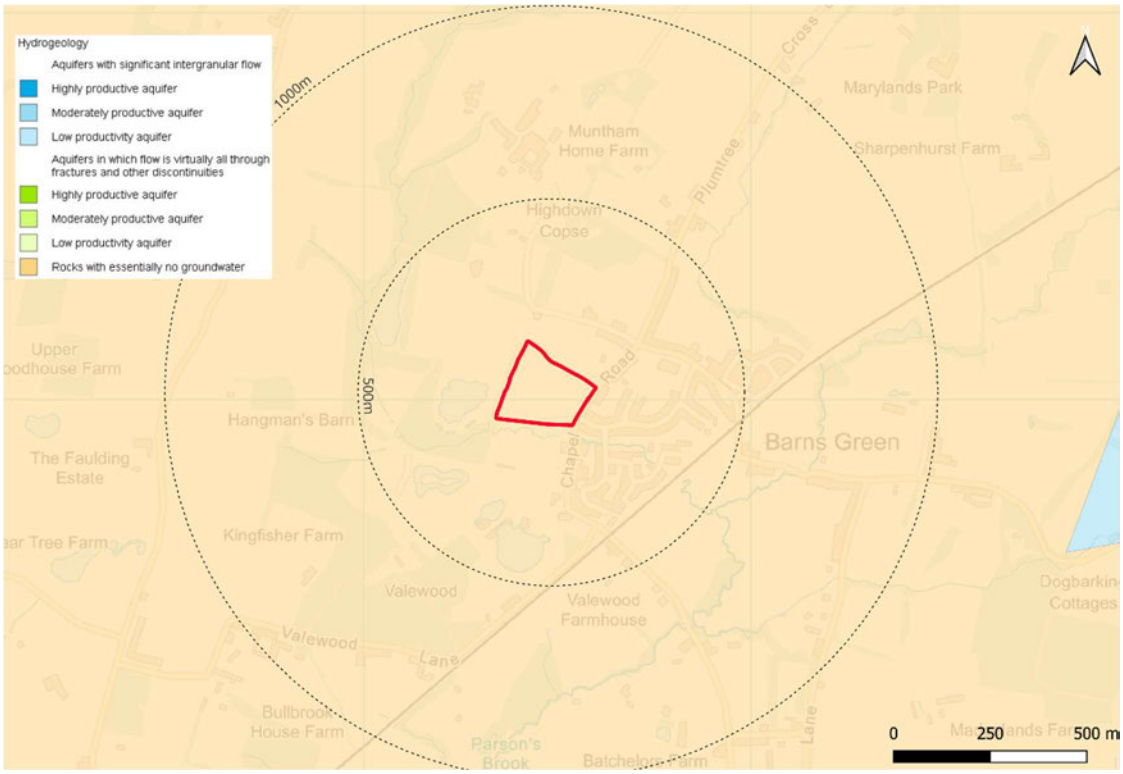
4.4.4 A copy of the ground investigation report (GWPR6192/GIR) is presented as **Appendix D**.

Hydrogeology

4.4.5 The southwestern corner of the Site is located within an isolated Source Protection Zone II – Outer Protection Zone associated with borehole TQ12NW15 described above.

4.4.6 The Bedrock Aquifer Designation Map describes the bedrock as 'Unproductive' rocks with essentially no groundwater. The Site is not located above a Superficial Drift Aquifer.

Figure 3: *Hydrogeology and Aquifer Designation*



Hydrology

4.4.7 The Site is located within the catchment area of the Muntham Gill, an Ordinary Watercourse and tributary of the Parsons Brook (ordinary watercourse) located within the Adur West Water Body catchment.

4.4.8 The Muntham Gill has a total catchment area of 1.91km^2 and falls from a level of 86.0m (AOD) in its headwaters to 26.0m (AOD) at its confluence with the Parson's Brook, approximately 430m downstream of the Site.

4.4.9 The catchment upstream of Barns Green is predominately rural presenting as a mosaic of open farmland with boundary hedgerows and dispersed woodland with a number of small footbridges and farm track crossings. Several man-made, off-line, lakes and ponds are located along the watercourse which are primarily fed by springs and have minimal impact on watercourse hydrology.

4.4.10 The Muntham Gill flows in an easterly direction approximately 20m south of the southern boundary of the Site where the bed levels of the watercourse are approximately 2.5m lower than the corresponding ground level on the site. At the southeastern corner of the Site the Muntham Gill passes under Chapel Road through a brick arch culvert (**Photograph 1**).

***Photograph 1**: Chapel Road Culvert (u/s)*



4.4.11 Downstream of the Chapel Road culvert, the Muntham Gill flows through the rear gardens of 'The Hordens' residential development where it passes through two further culverts beneath the residential roads of Finians Field and Smugglers Way.

4.4.12 On the eastern edge of Barns Green, the catchment is impounded by the embankment of the Arun Valley railway line. The crest of the embankment has an elevation of 34.10m AOD(N). The watercourse as it passes through the embankment has a bed level of 27.35m AOD(N).

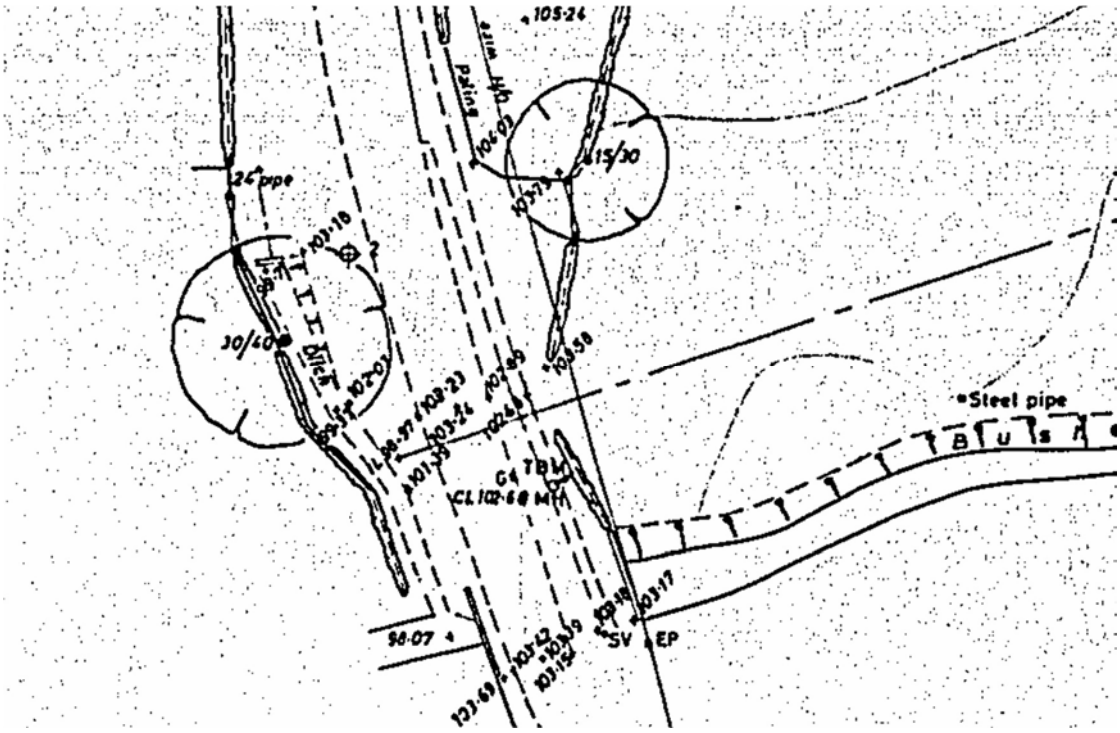
4.4.13 Downstream of the railway culvert, the Muntham Gill winds its way through open farmland to the confluence with the Parson's Brook.

4.4.14 A watercourse cross-section and structure survey was undertaken by Solum Surveys Ltd in July 2025. A copy of this survey along with associated reports and channel photographs is presented as **Appendix E**.

Chapel Road Culverted Watercourse

4.4.15 In addition to the Muntham Gill there is a culverted watercourse that flows along Chapel Road at the front of the site and discharges into the Muntham Gill upstream of the Chapel Road culvert (refer to Photograph 1 above). It has not been possible to determine when this 625mm diameter concrete culvert was built to replace the open watercourse but a historic topographical survey, provided by the planning department at Horsham District Council (HDC), shows the end of this watercourse as an open channel in August 1961. **Figure 4** shows an extract of the survey with the full drawing presented as **Appendix F**.

Figure 4: *Extract of 1961 Topographic Survey*



4.4.16 Two CCTV surveys of this culvert have been undertaken. The first survey was attempted in June 2025 which identified a defect in the Culvert approximately 15m upstream of the outfall into the Muntham Gill which the surveyors were unable to pass with the equipment to hand. Several incorrect assumptions on the route and communication with the highway drainage network beyond this defect where then made. A copy of this drain survey is attached as **Appendix G**.

4.4.17 In July 2025, a second CCTV survey was undertaken which managed to bypass the defect and with additional surveys from existing gullies and manholes the full length and route of the culvert was determined. A copy of this CCTV survey is attached as **Appendix H**.

4.4.18 The 625mm diameter culverted watercourse runs the entire length of the site frontage to two termination catchpit manholes at the junction of Smugglers' Lane (bridleway) and Chapel Road. Several gullies along Chapel Road all discharge into this culverted watercourse as identified in **Photograph 2** below. A 300mm diameter pipe within the termination manhole suggests that the highway drainage on the western side of Chapel Road beyond the site boundary (to the north) also discharges to this culvert.

Photograph 2: *Chapel Road Culvert Gullies*



Smugglers' Lane Ditch

4.4.19 Smugglers' Lane is a public bridleway that follows the northern boundary of the Site. There is an existing, c.0.4m deep, ditch along the entire northern edge of the bridleway that discharges into the culverted watercourse at the junction of the bridleway with Chapel Road.

4.4.20 The topographical survey (Appendix B) indicates that immediately upstream of the junction the watercourse is culverted under the bridleway to the southern side via a 225mm land drain before discharging into a small concrete headwall.

4.4.21 During the 2nd CCTV survey of the culverted watercourse a buried pipe was located at the end of the northern ditch which discharged directly into the first catchpit manhole (MH4) along the culverted watercourse. The small concrete headwall on the southern side of Smugglers' Lane discharges into the second catchpit manhole (MH3).

Chapel Road Highway Drainage

4.4.22 There are several road gullies and catchpit manholes along Chapel Road in front of the site. Correspondence with the West Sussex Highway Drainage Steward, attached as **Appendix I** states:

"….we only have a limited amount of info for this location….we have a mixture of wscc drainage assets detailed in the key [catchpits and gullies]….the black lines to the north represent a rough location of the pipe that was identified from a previous jet job…"

"In terms of the two culverts its possible one is related to this drainage system further to the north and id hazard a guess that the 300mm line would be the one linked however, I'm not overly sure on the 625mm line its possible it could be ours but linked with a water course rather than the surface water system or it could be serving drainage from adjacent land at smugglers lane/muntham drive…"

Sewer Records

4.4.23 Sewer records obtained from Southern Water indicate that there are no surface water sewers within Chapel Road. A copy of the sewer records is presented as **Appendix J**.

5. FLOOD RISK ASSESSMENT

5.1 Assessment Approach

5.1.1 This study assesses the risk of flooding from all sources to the proposed development, the risk of flooding elsewhere as a result of the development and indicates how any residual flood risks can be managed and/or mitigated.

5.2 Coastal or Tidal Flood Risk

5.2.1 The Site is inland, at an elevation in excess of 32.25m AOD(N) and is therefore at '**Very Low**' risk of coastal or tidal flooding.

5.3 Fluvial Flood Risk

5.3.1 Fluvial flood risk occurs when the capacity of a watercourse is exceeded due to prolonged or intense rainfall events.

Flood Zones

5.3.2 In March 2025 the Environment Agency (EA) published new national risk information for flooding and coastal erosion, which includes future scenarios accounting for climate change. The new NaFRA2 'Flood Zone' data on the 'Flood Map for Planning' (FMfP)[11] allows developers and planners to find the data they need to undertake flood risk assessments.

5.3.3 The EA categorises land based on its likelihood of flooding. Flood Zones represent an annual probability of flooding from rivers and the sea and do not take account of the presence and effect of flood defences, unless they increase the area potentially at risk of flooding.

5.3.4 EA Flood Zones shown on the FMfP are aimed at supporting planners and developers to make long-term decisions about the location and design of development and the use of land.

5.3.5 Flood Zone Definitions, presented in **Table 2:** Flood Zone Definitions, show how the flood zones are defined in terms of fluvial and tidal flood risk.

Table 2: *Flood Zone Definitions*

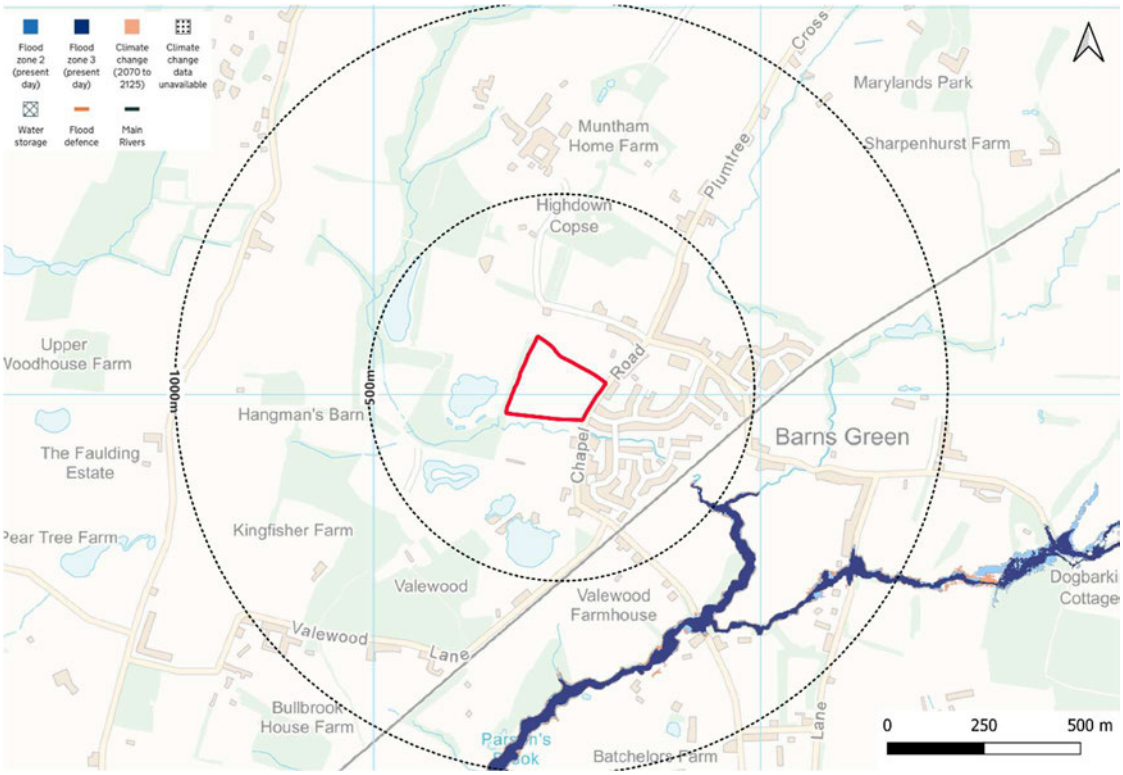
Zone 1: Low Probability
Land having a less than 0.1% (1 in 1000) annual probability of flooding.
Zone 2: Medium Probability
Land having between 0.1% - 1% (1 in 1000 and 1 in 100) annual probability of flooding from rivers or between 0.1% - 0.5% (1 in 1000 and 1 in 200) annual probability of flooding from the sea or accepted recorded flood outlines.
Zone 3a: High Probability
Areas shown to be at a 1% (1 in 100) or greater annual probability of flooding from rivers or 0.5% (1 in 200) or greater annual probability of flooding from the sea.
Zone 3b: Functional Floodplain
Flood Zone 3b represents the Functional Floodplain. This zone shows land where water has to flow or be stored in times of flood.

[11] https://flood-map-for-planning.service.gov.uk/

5.3.6 In August 2025, the EA made changes to the FMfP service which included the removal of the existing rivers/sea with and without defences layers and added a layer called 'Flood Zones plus climate change' which shows how the combined extent of Flood Zones 2 and 3 could increase with climate change over the next century.

5.3.7 An extract of the EA's FMfP is presented as **Figure 5**.

Figure 5: *EA Flood Zone mapping*



5.3.8 The Site is located entirely within Flood Zone 1 and at '**Very Low**' risk of fluvial flooding.

Flood Risk from Rivers or the Sea

5.3.9 Although no longer shown on the FMfP, several additional flood risk datasets are available from the Defra Services Data Platform (DSP) to support the use of Flood Zones in the planning process. As with the Flood Zones, the supporting datasets within the NaFRA2 present the extent of land at risk of flooding to a defined annual exceedance probability (AEP). These include datasets showing the risk of flooding from rivers and sea, for the following scenarios:

Present Day scenarios:

- Undefended: 0.1% AEP (1 in 1000) Rivers/Sea
- Undefended: 1% AEP (1 in 100) Rivers/ 0.5% (1 in 200) Sea
- Defended: 0.1% AEP (1 in 1000) Rivers/Sea
- Defended: 1% AEP (1 in 100) Rivers/ 0.5% (1 in 200) Sea
- Defended: 3.3% AEP (1 in 30) Rivers/Sea

5.3.10 The 'undefended' datasets show flood extents that ignore the presence and condition of flood defences, whereas the 'defended' datasets take into account the presence of flood defences

and assume that they operate in the way they were intended (or designed) to function. This dataset does not include any asset failure (or removal) scenarios.

Climate Change

5.3.11 Climate change scenarios have been produced to indicate the predicted impacts of climate change on future risk. The datasets shown on FMP are aimed at supporting planners and developers to make long-term decisions about the location and design of development and the use of land. Such decisions need to account for the full anticipated lifetime of the development being planned.

Climate Change scenarios:

- Undefended: 0.1% AEP (1 in 1000) Rivers/Sea
- Undefended: 1% AEP (1 in 100) Rivers/ 0.5% (1 in 200) Sea
- Defended: 0.1% AEP (1 in 1000) Rivers/Sea
- Defended: 1% AEP (1 in 100) Rivers/ 0.5% (1 in 200) Sea
- Defended: 3.3% AEP (1 in 30) Rivers/Sea

5.3.12 For risk of flooding from rivers, the FMP, shows the 'Central' allowance for the 2080s epoch (2070-2125).

5.3.13 The Site is at '**Very Low**' risk of flooding from rivers or the sea for both the present- and future-day scenarios.

Historic Fluvial Flooding

5.3.14 Historical fluvial flood data obtained from the DSP and the SFRA[2010] and SFRA[2020] indicate that neither the EA, HDC nor WSCC as LLFA hold any evidence of historical fluvial flooding at or within close proximity of the Site.

5.3.15 The WSCC LLFA LFRMS does not identify any recorded fluvial flooding incidents in Barns Green within the Horsham Historic Flood Map. A copy of this map from the LFRMS is presented as **Appendix L**.

5.3.16 Discussions with local residents at the Parish Council meeting on 08 August 2025 provided anecdotal evidence that the Muntham Gill does over top its banks, but it was unclear from these discussion where this overtopping occurs or its frequency. Subsequent discussions at the end of the meeting with residents, whose properties back onto the Muntham Gill immediately upstream of the railway embankment (300m east of and >5m lower than the Site) claim that the watercourse regularly surcharges the culvert under the railway, however both were adamant that their properties had never flooded.

5.4 Surface Water Flood Risk

5.4.1 In 2010 the Flood and Water Management Act (FWMA) defined 'surface runoff' as:

> "*The flooding that takes place from the 'surface runoff' generated by rainwater (including snow and other precipitation) which: (a) is on the surface of the ground (whether or not it is moving), and (b) has not yet entered a watercourse, drainage system or public sewer.*"

5.4.2 The EA's Risk of Flooding from Surface Water (RoFSW) mapping identifies areas that could be potentially susceptible to surface water flooding in an extreme rainfall event. It does not

represent flooding that occurs from ordinary watercourses, drainage systems or public sewers caused by catchment-wide rainfall events, rivers or groundwater.

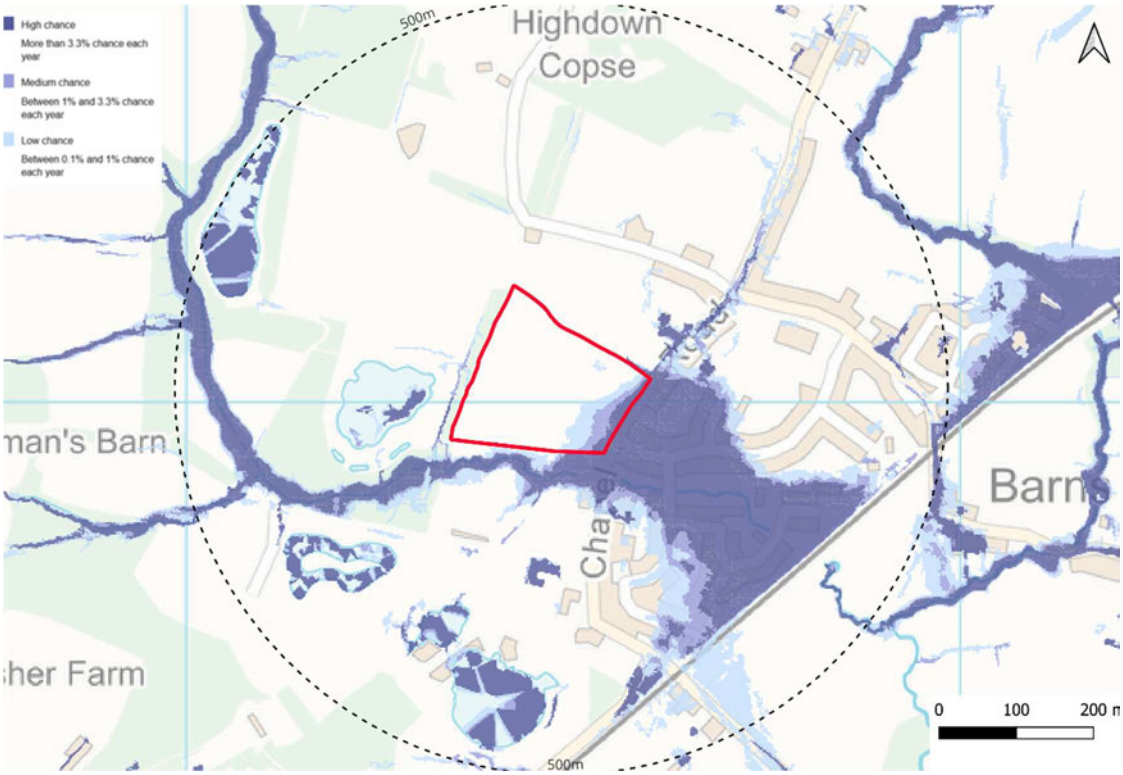
5.4.3 The likelihood of surface water flooding is split into four risk categories; 'Very Low' (land with an annual probability of flooding of less than 1 in 1000 (<0.1% AEP), 'Low' (land with an annual probability of flooding between 1 in 100 and 1 in 1000 (1.0% AEP and 0.1% AEP), 'Medium' (land with an annual probability of flooding between 1 in 30 and 1 in 100 (3.3% AEP and 1.0% AEP), and 'High' (land with an annual probability of flooding greater than 1 in 30 (>3.3% AEP).

5.4.4 The EA surface water flood maps show where areas could be potentially susceptible to surface water flooding in an extreme rainfall event. The EA released the latest data, produced as part of the NaFRA2 dataset, on 28th January 2025. This data uses information and input from LLFAs (where available) and assesses where surface water flooding may occur. The update also includes future flood risk data using climate change scenarios which are calculated using emission scenarios that describe potential future GHG emissions based on human activity.

5.4.5 An extract from the "present day" EA's surface water flood map[12] is presented as **Figure 6**.

5.4.6 The EA mapping indicates that the risk of flooding from surface water, for the present-day scenario, at the Site is '**High**'.

Figure 6: *Environment Agency present day surface water flood map.*



Climate Change

5.4.7 Currently, the EA surface water climate change scenario estimates are based on the Central Allowance projections up 2050, whereas the UK Government guidance "Flood risk assessments:

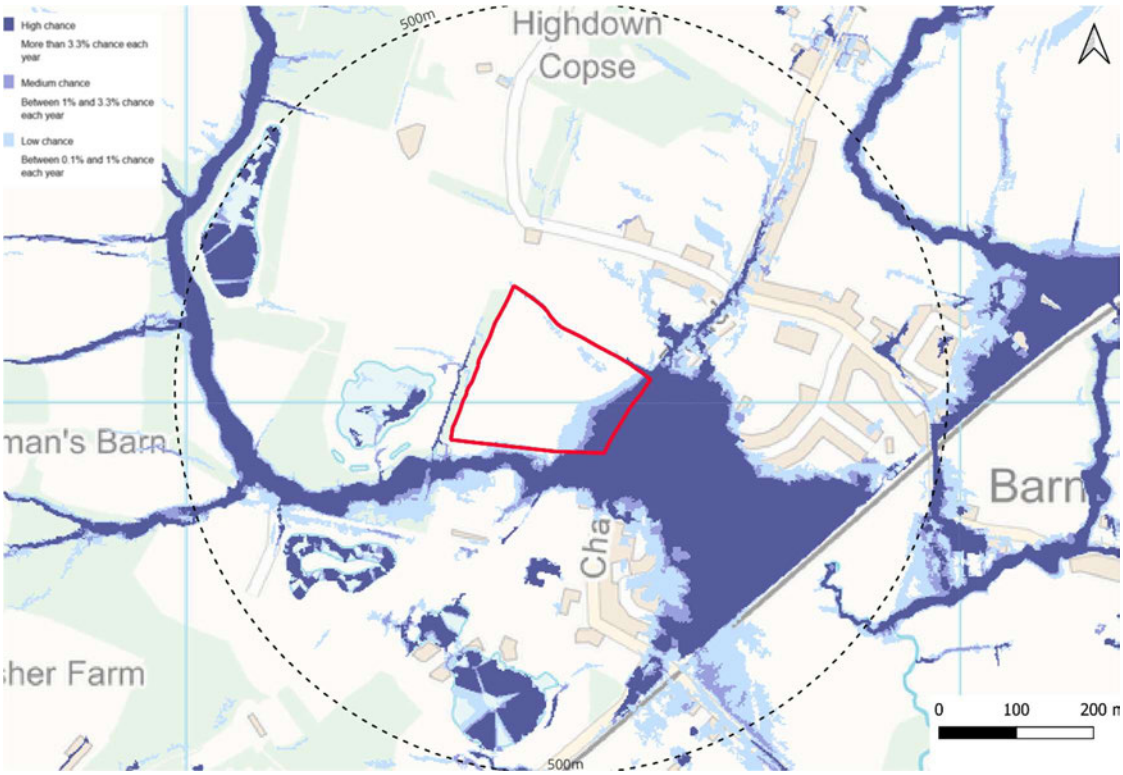
[12] https://www.gov.uk/check-long-term-flood-risk

climate change allowances (May 2022)[13] states; "*You should consider residential development to have a minimum lifetime of a 100 years*". For developments with a lifetime beyond 2100, the guidance states; "*For flood risk assessments and strategic flood risk assessments (with a lifetime beyond 2100) assess the Upper End allowances… for both the 1% and 3.3% annual exceedance probability events for the 2070s epoch (2061 to 2125)*".

5.4.8 An extract from the "future day" EA's RoFSW Map[14] is presented as **Figure 7**.

5.4.9 The EA mapping indicates that the risk of flooding from surface water, for the future-day scenario, at the Site is '**High**'.

Figure 7: *Environment Agency future day surface water flood map.*



Historic Flooding

5.4.10 Historical fluvial flood data obtained from the DSP and the SFRA[2010] and SFRA[2020] indicate that neither the EA, HDC nor WSCC as LLFA hold any evidence of historical surface water flooding at or within close proximity of the Site.

5.4.11 The WSCC LLFA LFRMS Horsham Historic Flood Map does not identify any recorded surface water flooding incidents in Barns Green.

5.4.12 Although there are no recorded flooding incidents in Barns Green, anecdotal evidence presented at the Parish Council meeting on 08 August 2025 from local residents suggests that flooding to existing properties along Chapel Road, notably the Post Office, after periods of intense or prolonged rainfall is an ongoing concern.

[13] https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

[14] https://www.gov.uk/check-long-term-flood-risk

Detailed Flood Modelling

5.4.13 The NaFRA2 New National Modelling (NNM) Methodology Statement sets out the methods and data used to define the new surface water model which are presented as "*an evolution of those used previously in the 2013 Updated Flood Map for Surface Water (RoFSW mapping)*".

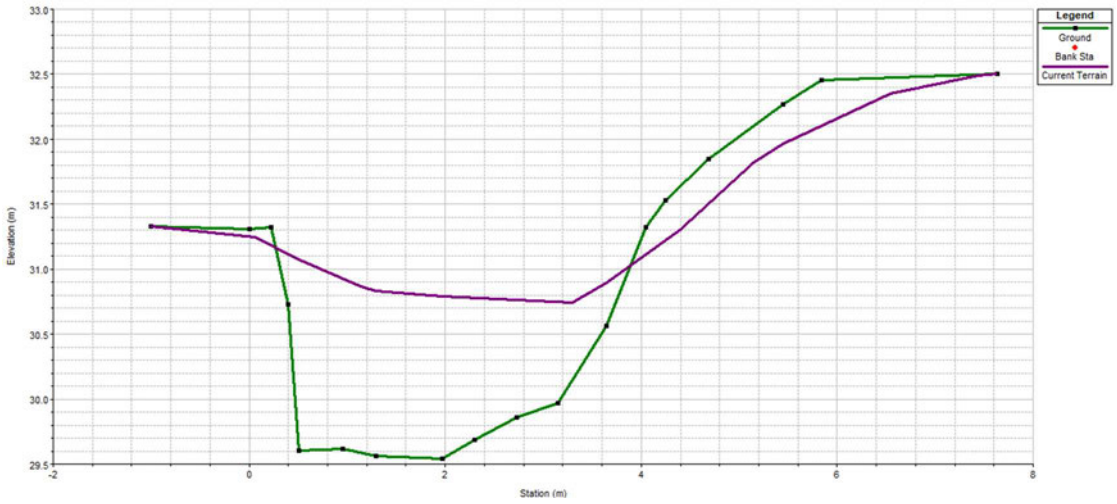
5.4.14 A key difference from the previous model setup is the addition of a 'drainage sump' along all significant watercourses modelled explicitly as part of the fluvial NNM. This sump drains water from the model domain during the simulation and is intended to reduce the overprediction of surface water flooding.

5.4.15 The EA's FMP does not show any fluvial flood risk associated with the Muntham Gill which demonstrates that the watercourse is not considered 'significant' within the NNM and as a result no 'drainage sump' is included in the surface water flood map to allow water to drain from the model domain during the simulation.

5.4.16 The watercourse channel survey conducted by Solum Surveys (July 2025) clearly identifies a deep (between 1.5m and 3.0m), well defined channel through the developed area of Barns Green known as 'The Hordens' with several large (1.9m diameter) circular culverts under existing residential roads and a 1.5m sprung arch culvert through the railway embankment.

5.4.17 When compared to the topographical survey, the 2m cell resolution DTM (2019 Integrated Height Model) used by the EA in the NNM surface water model poorly depicts the Muntham Gill through Barns Green which exacerbates the overprediction of the surface water flood extent. A representative comparison between the 2m DTM and a surveyed cross-section is shown in **Figure 9** (below).

Figure 8: *Comparison of EA DTM and surveyed cross-section.*



5.4.18 In order to better assess the risk of flooding at the site, TSWC were commissioned to undertake a detailed Surface Water Flood Modelling Study of the catchment to determine the extent, depth and hazard rating of flooding at the Site. The methodology and results of the modelling exercise are described in TSWC-0018-B-Surface Water Flooding – Baseline Modelling Report - Version 1 (Sept 2025).

5.4.19 The results of the local detailed hydraulic modelling exercise are presented in **Figure 9** (Present Day) and **Figure 10** (Medium Chance Climate Change).

Figure 9: *TSWC Updated surface water flood map.*

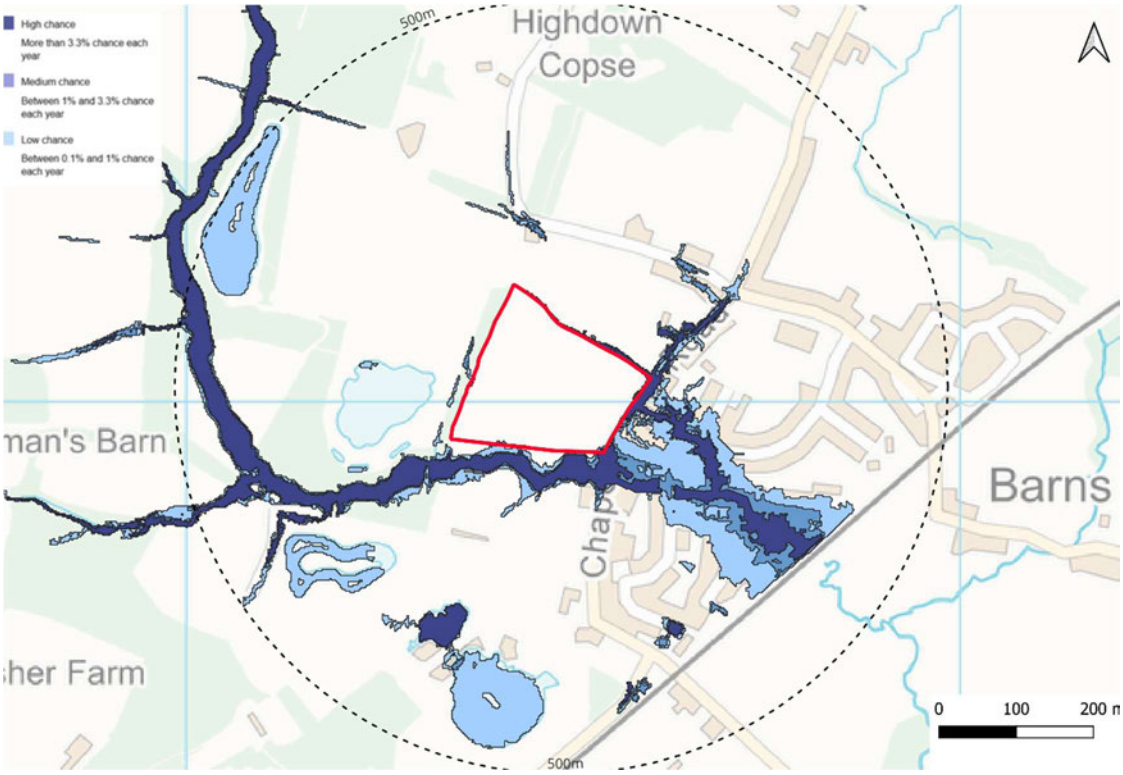
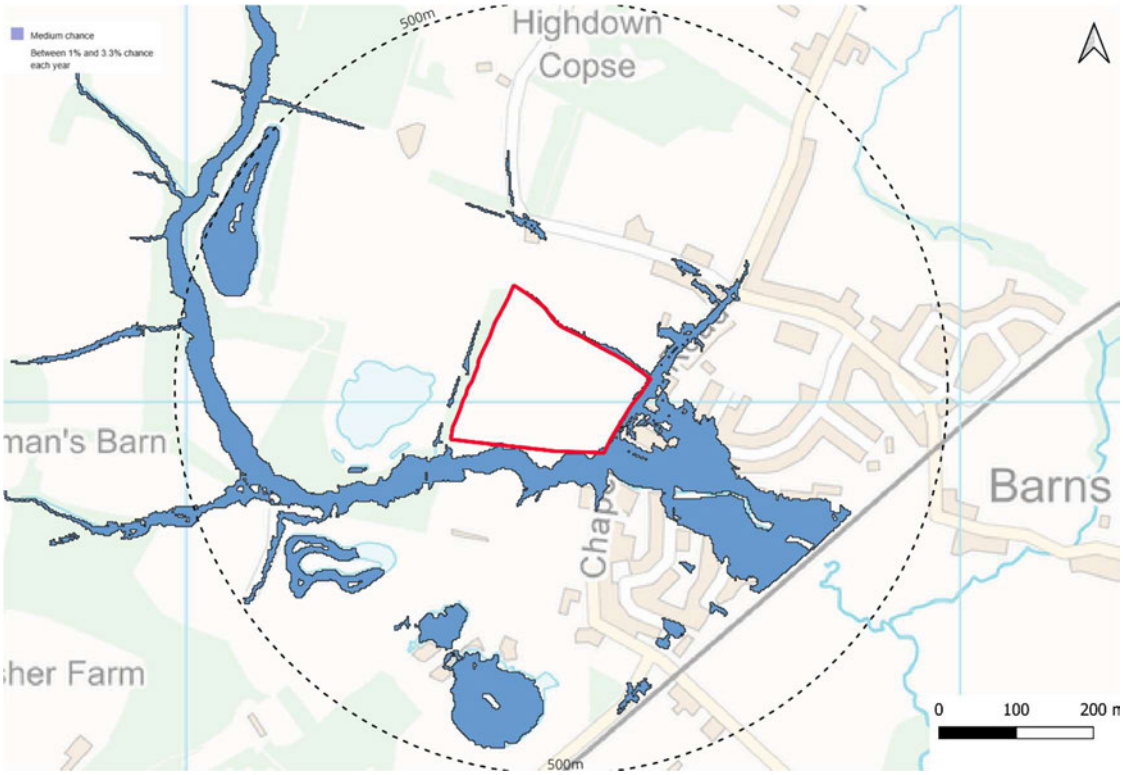


Figure 10: *TSWC Updated surface water flood map (Medium Chance) Climate Change*



5.4.20 The updated modelling indicates that the risk of flooding from surface water, for the present-day and climate change scenarios, at the Site is '**Low**'.

5.5 Groundwater Flood Risk

5.5.1 Section 3 of this Report identifies the Site sits on an unproductive bedrock with essentially no groundwater.

5.5.2 Appendix 1 Figure 3B of SFRA[2020] identifies areas within the District that are susceptible to groundwater flooding. This mapping identifies that the Site is **not** located within an area with potential for groundwater flooding to occur.

5.5.3 The potential risk of flooding from groundwater within the Site is '**Very Low**'.

Historical Groundwater Flooding

5.5.4 The WSCC LLFA LFRMS Horsham Historic Flood Map does not identify any recorded groundwater flooding incidents in Barns Green.

5.5.5 Groundwater flooding was not raised as a concern by local residents at the Parish Council meeting on 08 August 2025.

5.6 Reservoir and Infrastructure Flood Risk

5.6.1 There are no reservoirs in the vicinity where failure or overtopping could cause a potential flood risk to the Site.

5.6.2 The risk of flooding from reservoirs is '**Very Low**'.

5.6.3 The culverted watercourse that flows along the site frontage is fed via culvert inlets from the ditch on the northern side of Smugglers' Lane. Although there are several catchpits along the length of the culvert they are all sealed (no manhole entry) therefore the risk of flooding from surcharge is 'Low'. In addition, Chapel Road is lower than the Site along its entire length and at the southern corner of the Site Chape Road falls quickly towards the Muntham Gill.

5.6.4 The risk of flooding from the culverted watercourse is '**Low**'.

5.6.5 There is an existing highway drainage network within Chapel Road. During the Parish Council meeting, it was suggested that the main cause of this flooding to existing properties was a lack of ongoing maintenance to the existing highway drainage infrastructure with residents claiming that they had to clear the gully's and drains themselves. The properties that experience the most regular flooding are the Listed Building and the Post Office. The floor levels of these buildings are below the level of the adjacent highway therefore any failure (or lack of maintenance) of this network could have a significant impact on existing properties.

5.6.6 However as stated above, Chapel Road is lower than the Site, therefore the risk of flooding due to failing highway infrastructure to the proposed development is '**Low**'.

5.7 Sewer Flooding

5.7.1 There are no surface water sewers or foul water sewers within the Site or within Chapel Road.

5.7.2 Figure 11 (Historic incidents of sewer flooding by postcode)of the SFRA[2020] locates the proposed development in an area of 4no sewer flooding records from Southern Water.

5.7.3 The WSCC LLFA LFRMS Horsham Historic Flood Map does not identify any recorded groundwater flooding incidents in Barns Green.

5.7.4 The risk of sewer flooding is '**Very Low**'.

5.8 Other Sources of Historical Flooding

5.8.1 The WSCC LLFA LFRMS Horsham Historic Flood Map indicates a single unknown recorded flooding incidents in Barns Green. This is located downstream of the railway embankment and is therefore unlikely to have an effect of the proposed development.

5.9 Flood Risk Summary

5.9.1 The risk classification from all sources of flooding is summarised in **Table 5**.

Table 3: *Risk of flooding from all sources*

Source of Flooding	Risk Classification			
	High	Medium	Low	Very Low
Coastal				✓
Fluvial				✓
Surface Water			✓	
Groundwater Potential				✓
Reservoir & Infrastructure				✓
Sewers				✓

5.9.2 This flood risk assessment concludes that the proposed development Site is at '**Low**' to '**Very Low**' Risk of flooding from all sources.

5.10 Safe Access

5.10.1 The main access to the Site for vehicles and pedestrians will be via a new simple priority junction on to Chapel Road.

5.10.2 In its Level 2 pre-application advice, WSCC LLFA stated:

> *"Safe access and escape routes must be provided. This should include free movement of people during design flood (1 in 100 years plus climate change for surface water – the SFRA should include a map showing this, although it is likely to be based on the EA RoFSW mapping) and show there are access routes for occupants to safely access and leave houses in design flood. Vehicular access for emergency services will also be required (this is also referred to in Building Regs under B5(1) and B5(2). The access routes should be located above design flood levels and avoid flow paths. If this is not feasible, the Flood Hazard Rating will need to be provided and possibly an emergency plan (we'll confirm this once further work has been done)".*

4.1.1 As part of the updated modelling, the flood hazard rating for each 2m grid cell was calculated as a function of simultaneous depth and velocity using the following equation taken from Defra/EA R&D FD2321/TR2 – Flood Risk to People[15], where;

Hazard rating = depth x (velocity + 0.5) + debris factor

5.10.3 A varying conservative debris factors has been applied which is defined as 0.5 for depths less than 250mm and 1.0 for depths in excess of 250mm or velocities in excess of 2m/s.

5.10.4 The Hazard Rating thresholds are presented in **Table 4**.

5.10.5 A plan showing the 1 in 100-year plus climate change hazard rating for the existing situation is presented as **Figure 11**.

Table 4: *Hazard Rating Thresholds*

Hazard Rating			
0.5 – 0.75	**0.75 – 1.25**	**1.25 – 2.00**	**≥2.00**
Low Hazard	Moderate Hazard	Significant Hazard	Extreme Hazard

Figure 11: *1%AEP+cc Modelled Hazard Rating*



5.10.6 Representative hazard at 4 node locations which represent the FD2331 rating within the carriageway of Chapel Road at; [**A**] the proposed northern pedestrian crossing near the junction of Smugglers' Way and Chapel Road; [**B**] the location of the proposed access into the site; [**C**]

[15] Defra/EA R&D FD2321/TR2 – Flood Risk to People

the proposed northern pedestrian crossing; and, [**D**] immediately south of the junction of Chapel Road and The Hordens, are presented in **Table 5**.

Table 5: *Modelled Flood Hazard Rating at Nodes A,B,C and D*

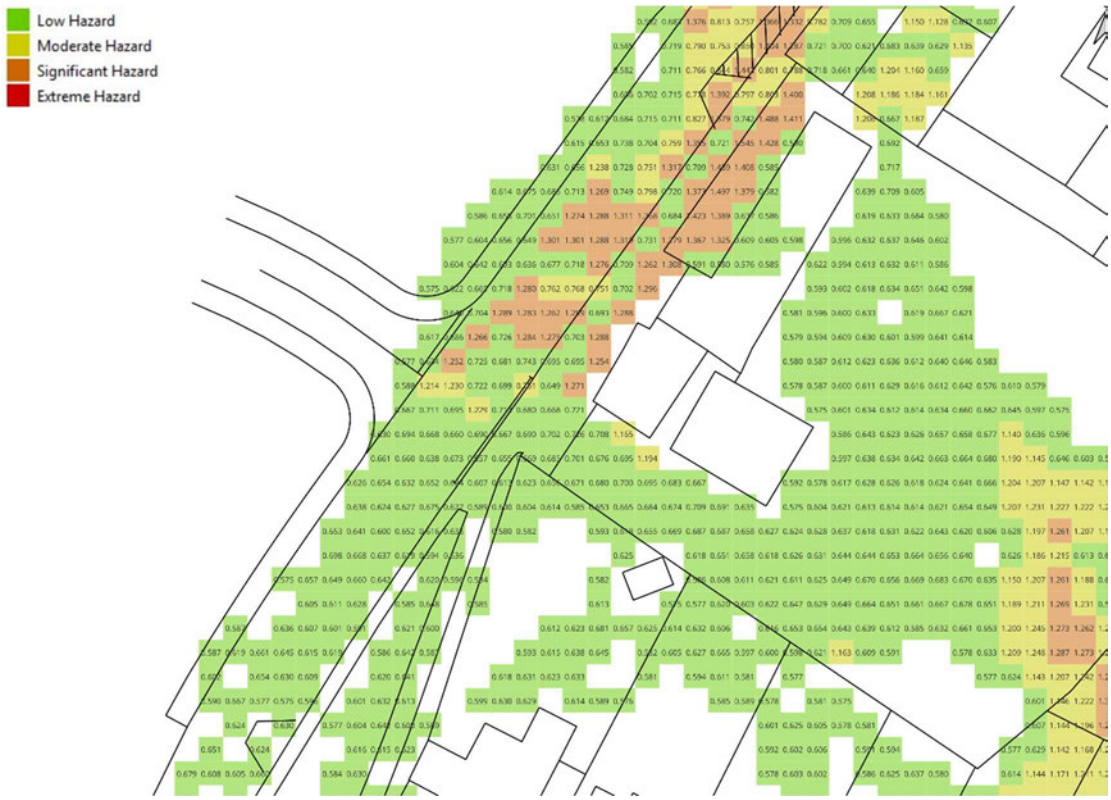
Node	Maximum Hazard Rating			
	3.33% AEP	1.00% AEP	1.00%+cc AEP	0.01% AEP
A	0.687	0.732	1.336	1.370
B	0.648	0.672	0.722	1.237
C	0.000	0.000	0.624	0.630
D	1.383	1.395	1.485	1.662

5.10.7 Figure 11 and Table 5 demonstrate that the hazard rating at Node [**B**], the location of the proposed access, for the 1 in 100-year plus climate change surface water hazard rating is 0.722 '**Low Hazard'**.

5.10.8 Table 3.2 in FD2321/TR1 describes 'Low Hazard' as:

"**Caution** – Flood Zone with shallow flowing water or deep standing water."

Figure 12: *1%AEP+cc Modelled Hazard Rating*



5.10.9 When overlaid with the proposed site access, and prior to any further mitigation, it is clear that the proposed access is located in an area of 'No Hazard' to 'Low Hazard' for the majority of Chapel Road with the new footways associated with the access being located entirely within the 'No Hazard' to 'Low Hazard' category. **Figure 12** refers.

5.10.10 Safe access can be maintained for both vehicles and pedestrians during the 1 in 100-year (plus climate change) design storm event.

5.11 Sequential and Exception Tests

5.11.1 The NPPF requires all development proposals to apply a sequential, risk-based approach to the location of development – taking into account all sources of flood risk and the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property. [NPPF para.172].

5.11.2 NPPF para. 174 states the aim of the sequential test is to steer new development to areas with the lowest risk of flooding from any source. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding.

5.11.3 The Site is allocated for residential development in the emerging Local Plan (eLP) and although adoption of the Plan has stalled and is likely to be withdrawn, a letter from the Head of Strategic Planning at HDC dated 03 June 2025 states:

> *"….Horsham District Council had identified Land South of Smugglers Lane as a site suitable for allocation….in the event that the plan is withdrawn, the evidence base supporting that plan (including the site assessment work which concluded the Smugglers' Lane site was suitable for development) would remain valid. This would therefore need to be taken into account as part of any consideration of any planning application submitted for the site."*

5.11.4 NPPF Para 180 states that planning applications that come forward on sites allocated in the development plan through the sequential test that there is no need for applicants to supply the sequential test again.

5.11.5 A SFRA Update Sequential and Exception Test (CC04b) was undertaken in September 2024 as part of the evidence base for the eLP in which the site at Smugglers' Lane was deemed suitable for development.

5.11.6 Furthermore, the PPG was updated in September 2025 with a key changes to paragraphs 027 Reference ID: 7-027-20220825 which states:

> *"In applying paragraph 175 a proportionate approach should be taken. Where a site-specific flood risk assessment demonstrates clearly that the proposed layout, design, and mitigation measures would ensure that occupiers and users would remain safe from current and future surface water flood risk for the lifetime of the development (therefore addressing the risks identified e.g. by Environment Agency flood risk mapping), without increasing flood risk elsewhere, then the sequential test need not be applied.'*

5.11.7 In accordance with the NPPF (para 175 and para 180) there is no requirement to undertake the sequential and exception test for the proposed development. For further information on the application of the Sequential Test refer to the Planning Statement by SLR Consulting (SLR Project No.: 433.000146.00001).

5.12 Climate Change

5.12.1 The NPPF, and supporting PPG, sets out how the planning system should help minimise vulnerability and provide resilience to the impacts of climate change. This includes demonstrating how flood risk will be managed now and over the lifetime of development, taking climate change into account.

5.12.2 The PPG advises that climate change allowances should be determined with reference to the guidance provided in the EA document 'Flood Risk Assessment: Climate Change Allowances' (May 2022)[16]. The guidance indicates that for residential developments a minimum lifetime of 100-years should be considered.

5.12.3 Assessment must be done for both the 1% and 3.3% annual exceedance probability (AEP) events for the 2080s epoch (2070 to 2125).

5.12.4 The proposed development falls within the Adur and Ouse Management Catchment for peak river flow and peak rainfall allowances.

5.12.5 According to the peak rainfall allowances map the upper end allowances for the 2070s epoch are 40% and 45% respectively for the 3.33% and 1.0% annual exceedance rainfall events.

5.12.6 Climate change is anticipated to increase the potential risk from surface water and sewer flooding as summer storms become more intense and winter storms more prolonged. This combination is likely to increase the pressure on the existing efficiency of sewer systems, thereby reducing their design standard and leading to more frequent localised flooding incidents. Any sewer flooding that may occur could be exacerbated as a result of surface water runoff during extreme rainfall events.

[16] https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

6. SURFACE WATER DRAINAGE

6.1 National Policy

6.1.1 New infrastructure, explicitly a site-specific surface water drainage system, will need to be constructed to serve the new development. It is a requirement of the NPPF and PPG that Sustainable Drainage Systems (SuDS) are implemented, where feasible, within all major developments.

6.1.2 On 19th June 2025, the Department for Environment, Food and Rural Affairs (DEFRA) released the new National Standards for Sustainable Drainage Systems[17](NSfSuDS). This marks a significant development in drainage policy, with far-reaching implications for developers, planners, architects, and consultants involved in land and property development.

6.1.3 The new 'Standards' replace the previous Non-Statutory Technical Standards for SuDS (2015) requirements centred around peak flow rates and volumes with a new seven national standards approach which give greater weight to water quality, amenity, biodiversity and long-term maintenance.

6.1.4 The new (seven) standards are:

- **Standard 1**: Runoff Destination
  (discharge must follow the drainage hierarchy);
- **Standard 2**: Interception
  (for the management of everyday rainfall);
- **Standard 3**: Management of extreme rainfall and flooding;
- **Standard 4**: Water Quality
  (proposals must include a robust water quality risk assessment);
- **Standard 5**: Amenity
  (SuDS must contribute positively to place making);
- **Standard 6**: Biodiversity
  (SuDS should contribute positively to BNG, Local Nature Recovery Strategies (LNRS) and habitat connectivity); and,
- **Standard 7**: Maintenance
  (SuDS must be designed with long-term operation in mind, including maintenance schedules, consideration of failure risks, minimal environmental harm, and assurance of structural resilience throughout the system's lifecycle).

6.1.5 The 'Standards' are currently not statutory as they are not enforced via Schedule 3 of the Flood and Water Management Act 2010, which has yet to be enacted in England. Without Schedule 3, SuDS remain non-statutory and potentially ambiguous, relying on interpretation.

6.1.6 However, the NPPF and PPG expect LPAs and LLFAs to promote sustainable drainage, and these new standards are likely to form the basis for LPA requirements and planning approvals.

[17] National standards for sustainable drainage systems - GOV.UK

6.2 Surface Water Drainage Strategy

6.2.1 CIRIA Report C753 ' The SuDS Manual' describes the various types of SuDS, their benefits, limitations and design considerations with each. Not all available SuDS components are appropriate for all developments due to factors such as ground conditions, available space, site levels and landscape/bio-diversity requirements which influence the different methods and approaches to drainage design for a particular development.

6.2.2 Given the specific constraints and ground conditions of the proposed development site the following surface water drainage strategy will be implemented across the Site.

Source Control SuDS

6.2.3 Water re-use through the use of **rainwater harvesting** will be utilised across the development.

6.2.4 **Permeable paving** with sub-base storage will be utilised for shared access drives and some parking areas across the Site. These SuDS structures provide additional attenuation at source, the management of everyday rainfall (interception) through evaporation and water quality treatment via biological processes in the sub-base. Furthermore, these structures slow the time of concentration into the downstream network.

6.2.5 Linear bio-retention areas or **rain-gardens** have become one of the most accepted forms of SuDS features in urban areas. Simple to design and install, these interventions significantly assist with reducing peak flows into the drainage network, treat run-off water to levels acceptable for discharge into groundwater or water courses and bring bio-diversity into the built form of new and existing developments.

Site Control SuDS

6.2.6 Site control and attenuation will be provided by a **detention basin** with incorporated **wetland** areas at the inlet and outlet.

6.2.7 The detention basin is located at the end of the SuDS management train at the lowest point of the site to facilitate at surface storage and provide flow control through the attenuation of stormwater runoff from the proposed development. The basin is mixture of dry and permanently wet areas for biodiversity enhancement, removal of particulate pollutants and the settling of silt before discharging to the de-culverted watercourse that will flow from north to south along the site frontage with Chapel Road.

6.2.8 The bed of the basin will be unlined and is set 200mm below the outlet pipe to provide the necessary interception storage.

6.2.9 The detention basin provides sufficient storage to attenuate all runoff from the proposed development for all storms up to and including the 1 in 100-year + climate change including a 10% allowance for urban creep.

6.2.10 A plan (TSWC-0018-B-401-D) showing the surface water drainage strategy for the Site is presented at **Appendix K**.

6.3 Standard 1: Runoff Destination

Drainage Hierarchy

6.3.1 Water is a valuable resource, and priority should be given to the collection of runoff for non-potable use and reuse on Site (rainwater harvesting) once it has been appropriately treated.

6.3.2 The destination of any surplus runoff should be prioritised in accordance with 'Requirement H3 Part 3' of the Building Regulations 2010 Approved Document H (2015 Edition), which states:

> "Rainwater from a system provided pursuant to sub-paragraphs (1) and (2) should discharge to one of the following listed in order of priority:
>
> - an adequate soakaway or some adequate infiltration system; or, where this is not reasonably practicable,
> - a watercourse; or, where that is not reasonably practicable,
> - a sewer".

6.3.3 This guidance is replicated in the PPG (Paragraph 080) which states:

> "Generally, the aim should be to discharge surface water runoff as high up the following hierarchy of drainage options as reasonably practicable".

6.3.4 The 'Standards' state that Runoff from the development shall be discharged to the following final destinations, to the maximum extent practicable, in accordance with the below hierarchy:

- priority 1: collected for non-potable use
- priority 2: infiltrated to ground
- priority 3: discharged to an above ground surface water body
- priority 4: discharged to a surface water sewer, or another piped surface water drainage system
- priority 5: discharged to a combined sewer

Rainwater Harvesting

6.3.5 Rainwater harvesting tanks will be provided for all new properties within the Site.

Infiltration

6.3.6 The Site is underlain by Weald Clay and infiltration to discharge surface water runoff will not be feasible at this Site.

Watercourse

6.3.7 There is a culverted watercourse that follows the eastern boundary of the Site that starts at the outlet of the Smugglers' Lane ditch and discharges in the Muntham Gill approximately 30m south of the Site. In accordance with HDC and WSCC Culvert Policy the development proposals include the deculverting of this watercourse and creating a new watercourse within the Site boundary.

6.3.8 Due to land ownership restrictions, it is only possible to de-culvert the watercourse within land owned by the Applicant so approximately 10m upstream and 30m downstream of the Site will remain culverted.

6.3.9 Following the collection of roof water runoff for non-potable use within the new properties, surface water discharge from the Site will be to the deculverted watercourse.

6.3.10 The proposals clearly follow the hierarchy and are therefore in compliance with ***Standard 1***.

6.4 Standard 2: Interception

Requirement

6.4.1 The management of everyday rainfall, or interception, requires a 'SuDS approach' to be applied so that at the very least, the first 5mm of rainfall is either collected for use, infiltrated into the ground, or else captured, conveyed and stored within SuDS features which then naturally absorb or retain runoff with no discharge off the site.

6.4.2 For the SuDS proposals to be considered compliant for zero runoff for the first 5mm of rainfall, 80% interception shall be achieved during the summer months and 50% during the winter months. This is delivered across the Site with the following systems.

Rainwater Harvesting (RWH) Systems

6.4.3 All roof areas across the Site shall drain to RWH systems design in accordance with BS EN 1694 for regular daily demand for non-potable water use, therefore runoff from these areas complies with 'Standard 2'.

RWH for roof areas contribute 32% (4,452m^2) of the impermeable area (14,091.5m^2) of the Site.

The RWH systems comply with Standard 2.

Permeable Paving Systems

6.4.4 The preliminary ground investigation concluded that the site is underlain by Weald Clay with limited infiltration potential but no groundwater strike. Therefore, all permeable surfaces, where proposed, will not be lined unless isolated springs or areas of perched water are discovered during construction.

6.4.5 In accordance with the 'Standards' "all permeable surfaces, whether lined or not, shall be assumed to comply provided there is no additional area drained to the permeable pavement. Where the permeable surface also drains an adjacent impermeable area, compliance shall be assumed for all soil types where the system is unlined if the additional impermeable area is no greater than the permeable area.

6.4.6 Where permeable surfaces are proposed throughout the development, they will also drain some additional surface area from hardstanding's such as paths and patios immediately adjacent to the surface. However, in all cases these areas will only be a small percentage of the permeable surface area.

6.4.7 Roof areas will also discharge through the permeable surface but only as an overflow for the RWH systems. Therefore, for first 5mm calculation purposes the roof area is deemed not to contribute to "additional surface area".

Permeable surfaces contribute 10% (1,438m^2) of the impermeable area (14,091.5m^2) of the Site.

The permeable surfaces comply with Standard 2.

Bio-retention Rain Garden (BRG) Systems

6.4.8 Areas of the development drained to unlined bioretention features shall be assumed to comply where the impermeable surface area is up to 5 times the vegetated surface area of the bioretention component receiving the runoff.

BRG (drainage area) contributes 17% (2,643m^2) of the impermeable area (14091.5m^2) of the Site.

In order to comply with Standard 2, 529m^2 (2,643m^2/5) of bio-retention rain garden will be provided throughout the development.

The BRG systems comply with Standard 2.

Detention Basin

6.4.9 The remaining impermeable areas of the development will drain directly to the detention basin. The detention basin has been designed with a flat unlined base with no provision for routing of low flows directly to the outlet (low flow channel). The detention basin shall be assumed to comply with the standard where the drained impermeable surface area is up to 5 times the vegetated detention basin surface area receiving the runoff for any soil type.

In order to achieve an 80% interception compliance of 11,273m^2 (14,091.5m^2 x 0.8), interception for an additional 2,740m^2 of the remaining 5,559m^2 impermeable area needs to be provided within the detention basin.

In order to comply with Standard 2, 548m^2 (2,740m^2/5) minimum vegetated surface area within the base of the Detention Basin below the level of the outlet is required.

The Detention Basin provides 615m^2 of flat vegetated surface area below the level of the outlet.

The Detention Basin complies with Standard 2

6.5 Standard 3: Management of extreme rainfall and flooding

Requirement

6.5.1 As set out in Section 5.2, a SuDS strategy is proposed to address the management of extreme rainfall which includes an allowance for climate change and urban creep.

6.5.2 As the strategy proposes to discharge to an above ground surface water body the surface water runoff (rate and volume) for the 1% annual exceedance probability (AEP) event including a 45% allowance for climate change and 10% allowance for urban creep shall be controlled to the 1 in 1-year greenfield runoff rate to ensure that runoff from the development does not increase flood risk elsewhere.

6.5.3 Furthermore, the system has been designed not to flood for all storms up to and including the 1% AEP event including a 45% allowance for climate change and 10% allowance for urban creep.

6.5.4 The risks (both on and off the development) associated with flooding from the surface water drainage system for exceedance events greater than the 1% AEP event shall be appropriately managed.

Greenfield Runoff Rates

6.5.5 Runoff rates for the existing greenfield site have been calculated using the FEH statistical method and are provided in **Table 6** below using the HR Wallingford UK SuDS Tool. A copy of the calculations is presented as **Appendix L**.

Table 6: *FEH Statistical Greenfield Runoff Rates*

Return Period (1 in X-years)	Greenfield Runoff Rate (l/s)	Greenfield Runoff Rate (l/s/ha)*
QBAR	24.6	7.5
1	20.9	6.4
30	56.6	17.2
100	78.5	23.9

**Based on a total site area of 3.285ha*

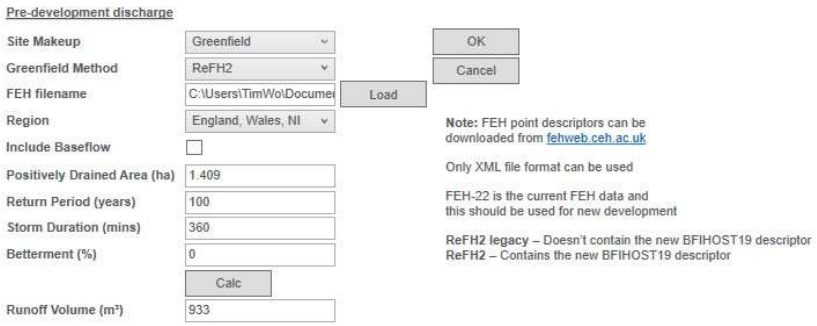
Greenfield Runoff Volume

6.5.6 The runoff volume for the existing greenfield site for the 1% AEP 6-hour event has been calculated using the latest version of the Revitalised Flood Hydrograph (ReFH2), **Table 7** and **Figure 13**.

Table 7: *ReFH2 Greenfield Runoff Volume*

Return Period (1 in X-years)	Storm Duration (mins)	Greenfield Runoff Volume (m^3)
100	360	933

Figure 13: *Causeway Flow 100-yr 360min ReFH2 calculation*



Attenuation Storage Requirements

6.5.7 The proposed detention basin has been designed to provide attenuation for surface water flows from the proposed development for design storms up to and including the 1 in 100yr + 45% climate change event with a 10% allowance for urban creep to ensure that there is no increase in flood risk to all existing and any proposed development.

6.5.8 Discharge from the attenuation basin will be to the deculverted watercourse and will be at the equivalent QBAR greenfield runoff rate controlled via a flow control chamber (Hydrobrake or similar approved proprietary device).

6.5.9 Causeway Flow v.15 was used to preliminary estimate the required storage volume for the whole site using FEH22 rainfall data, an impermeable area of 1.409 ha and an allowable discharge rate of 10.5 l/s. The estimated storage volume was between **1,231m^3** and **1,617m^3**.

6.5.10 In order to maintain an operational freeboard of 300mm, the attenuation basin shown on the drainage strategy drawing (TSWC-0018-B-401-D) (Appendix K) provides **1,233m^3** of storage with a freeboard of 300mm and a maximum storage volume ($STVOL_{max}$) of **1,586m^3**.

6.5.11 Additional storage is provided through the use of permeable pavements for driveways and parking courts dispersed throughout the development. Only the shared permeable surfaces have been used within the calculations as these areas will be operated and maintained by the appointed management company.

Development Runoff

6.5.12 To provide betterment and a reduction in flood risk to the downstream network it was agreed with WSCC LLFA, during initial pre-app discussions, that a development discharge rate restricted to the greenfield QBAR runoff rate (7.5l/s/ha) for all storms up to and including the 1 in 100-year event including a 45% allowance for climate change.

6.5.13 The total impermeable area of the proposed development is 1.384ha as illustrated on drawing TSWC-0018-402-A-Impermeable Site Areas, presented as **Appendix M**.

6.5.14 The maximum allowable discharge rate for all storm events is **10.5 l/s**.

Surface Water Strategy and Design Calculations

6.5.15 Detailed drainage calculations presented as **Appendix N** demonstrate that the proposed drainage strategy has been designed to safely manage the runoff from the development for all storms up to and including the 1%AEP climate change event plus an additional 10% allowance for urban creep.

6.5.16 The maximum water level in the attenuation basin for the 1%AEP climate change event (including 10% allowance for urban creep) is 32.565m AOD.

6.5.17 The attached calculations demonstrate that the surface water network has no flooding for the 3.33% AEP including a 40% allowance for climate change.

6.5.18 There is a small volume of flooding (4.27m^3)at manhole S50 for the 1% AEP climate change event. Any water that does spill from this manhole during an exceedance event will naturally flow towards the bio-retention rain garden immediately to the south.

Designing for Exceedance

6.5.19 Short high intensity rainfall events have the potential to overwhelm traditional pipe-based drainage systems for brief periods, whereas SuDS tend to have longer-duration critical storm events. In all cases, there will be rainfall that exceeds the design event and that have the potential to cause flooding at points within the drainage system.

6.5.20 Particular attention has been made to the location of at surface SuDS features, within the development so that any exceedance flows resulting from rainfall in excess of a 1% AEP plus 45% climate change event will be managed effectively by diverting these flows along exceedance routes through the development to minimise the risks to people and property.

6.5.21 For exceedance runoff greater than the design storm event, levels across the site have been designed to convey runoff across the surface towards the attenuation basin and deculverted watercourse adjacent to Chapel Road.

6.5.22 A plan (TSWC-0018-403-A) showing the proposed exceedance routing across the Site is presented at **Appendix O**.

6.5.23 Taking the foregoing into account, it has been clearly demonstrated that the proposals are in compliance with Standard 3.

6.6 Standard 4: Water Quality

Requirement

6.6.1 To protect the water quality of receiving surface water bodies, or in the case of this proposed development, groundwater (both now and in the future), runoff from new developments should be of an acceptable quality.

6.6.2 According to CIRIA C753: 'The SuDS Manual' (C753), the requirement for groundwater pollution risk management needs to be considered for all scales of runoff from the proposed development including the interception of runoff (storing runoff in the upper soil layers of SuDS components from where small amounts of water may infiltrate but where the component is designed as a storage or conveyance system rather than an infiltration system) and the infiltration of significant volumes of water into the ground.

6.6.3 In the UK the majority of all rainfall events are less than 5mm in depth, therefore preventing direct discharge to groundwater from these events is very significant in terms of both hydrogeological and pollution impact reduction to the receiving groundwater. According to C753 the first 5mm of rainfall is known as the 'first flush' and generally has a higher pollutant load than subsequent runoff. This flow should be contained within the site through provision of source control SuDS.

6.6.4 There is a large variability in the level of pollutants in urban runoff. Un-trafficked areas are usually the least contaminated, with levels of contamination tending to rise with traffic intensities and higher risk of spillages. The size and number of treatment stages required within the SuDS management train is based on the level of pollution entering the system.

6.6.5 Table 4.3 C753 indicates that residential roofs of small and medium residential developments have a 'Very Low' pollution hazard level, and the only requirement to discharge such flows to the surface waters is the removal of gross solids and sediments.

6.6.6 In the case of neighbourhood streets (individual property driveways, residential carparks, low traffic roads) the pollution hazard level is identified as 'Low'. Therefore, the Simple Index Approach to water quality management control should be applied.

6.6.7 The pollution hazard indices for the Site, as stated by C753, are presented in **Table 8**.

Table 8: *Pollution Hazard indices for different land use classifications*

Land Use Classification	Pollution Hazard	Total Suspended Solids	Metals	Hydrocarbons
Individual property driveways, residential car parks, low traffic roads and non-residential car parking with infrequent change	LOW	0.5	0.4	0.4
TOTAL		**0.5**	**0.4**	**0.4**

Management of Water Quality

6.6.8 SuDS can treat and clean surface water runoff from urban areas so that the receiving environment is protected, while at the same time conveying, storing and infiltrating surface water runoff to protect flood risk and water resources whilst at the same time delivering amenity and biodiversity value for the development.

6.6.9 The proposed SuDS management train presented in **Table 9** will provide appropriate levels of risk management to protect the receiving water body.

Table 9: *SuDS Management Train*

SuDS Component	Interception	Primary Treatment	Secondary Treatment	Tertiary Treatment
RWH	✓			
Permeable Pavements	✓	✓		
Bio-retention/Rain Gardens	✓	✓		
Detention Basin	✓	✓	✓	

6.6.10 To deliver adequate treatment, selected SuDS components must have a total pollution index (for each contaminant type) that equals or exceeds the pollution hazard index. Where two or more SuDS components are being used in combination, a factor of 0.5 is applied to account for the reduced performance of secondary or tertiary components associated with already reduced inflow concentrations.

$$\textit{Total SuDS mitigation index} = \textit{mitigation index}^{1} + 0.5\ (\textit{mitigation index}^{2})$$

6.6.11 The mitigation provided by each SuDS component is presented in **Table 10**.

Table 10: *SuDS Mitigation indices for discharge to surface waters*

SuDS Component	Total Suspended Solids	Metals	Hydrocarbons
Permeable Pavements	0.7	0.6	0.7
Bio-retention/Rain Gardens	0.8	0.8	0.8
Detention Basin	0.5	0.5	0.6

6.6.12 For this Site, the detention basin alone provides sufficient mitigation for any potential pollution hazards associated with the development. The inclusion of permeable paving and bio-retention areas helps to treat any pollution risk at source.

6.7 Standard 5: Amenity

6.7.1 In accordance with the new Standards, the designed SuDS system aims to have a positive visual impact on the proposed development aiming to enhance the Sites amenity value wherever possible. All vegetated SuDS should be located in public open spaces with specific attention given to their visual impact and public acceptability.

6.8 Standard 6: Bio-diversity

6.8.1 The SuDS strategy and deculverting of the watercourse has been designed and developed alongside input from Ecologist and Landscape Architects so that the proposals enhance existing, and provide new, habitats within the Site wherever possible.

6.9 Standard 7: Design for Construction, Operation, Maintenance, Decommissioning and Structural Integrity.

6.9.1 The surface water drainage and SuDS systems have been designed in accordance with C753 The SuDS Manual and any specific requirements of HDC, WSCC and Southern Water in order to comply with the Construction (Design and Management) Regulations 2015.

Maintenance

6.9.2 The long-term management of surface water drainage assets including SuDS, is essential to ensure they continue to function to the required design standard.

6.9.3 To ensure the designed systems continue to work effectively, a management and maintenance schedule (indicating with whom any responsibilities lie) is required, by HDC, as part of an application.

6.9.4 It is currently expected that all surface water and SuDS systems will remain private, albeit that the systems have been designed to adoptable standards should they be offered for adoption during the Reserved Matters stage.

6.9.5 A Management Company (Manco) will be appointed to manage all public spaces including the surface water drainage and SuDS components of the scheme in perpetuity.

6.9.6 Once the decision on adoption has been finalised a SuDS Operation Manual and Maintenance Schedule will be provided as part of the RM application and will be based on the maintenance requirements presented as **Appendix P**.

7. CONCLUSION

7.1 Flood Risk

7.1.1 This Flood Risk Assessment supports a Full Application for a '*Proposed development of 68 dwellings with vehicular and pedestrian accesses, public open space, hard and soft landscaping and associated works including supporting foul and surface water drainage works and works to existing culverted watercourse on site*'.

7.1.2 The Site is located on land to the South of Smugglers' Lane, Barns Green, Horsham.

7.1.3 The Site is located entirely located within in Flood Zone 1 and at 'Low' to 'Very Low' risk of flooding from all sources and therefore the Site is suitable for the proposed development.

7.1.4 The Site is allocated for residential development in the emerging Local Plan and although adoption of the Plan has stalled and is likely to be withdrawn, the Head of Strategic Planning at HDC has confirmed that in the event that the plan is withdrawn, the evidence base supporting that plan (including the site assessment work which concluded the Smugglers' Lane site was suitable for development) would remain valid.

7.1.5 Therefore, in accordance with the NPPF Para 180 there is no requirement to undertake the sequential and exception test again for the proposed development.

7.1.6 This site-specific flood risk assessment demonstrates clearly that the proposed layout, design, and mitigation measures would ensure that occupiers and users would remain safe from current and future surface water flood risk for the lifetime of the development without increasing flood risk elsewhere.

7.1.7 Therefore, in accordance with the NPPF Para 175 the sequential test need not be applied.

7.2 Surface Water Drainage and SuDS

7.2.1 To ensure that the development does not have any adverse impacts offsite and does not increase flood risk elsewhere surface water runoff will be sustainably managed and disposed of through a comprehensive SuDS drainage system that has been designed in accordance with the seven 'Standards' of the new National Standards for Sustainable Drainage Systems (SuDS).

7.2.2 Proposed development runoff rate is restricted to the equivalent QBAR rate for the greenfield site (10.5 l/s).

7.2.3 The proposed development runoff volume is less than the existing greenfield runoff volume for the 1 in 100-year 360min WP storm.

7.2.4 The proposals comply with all seven standards of the new National Standards for SuDS.

Appendix A

Appendix B

Appendix C

Appendix D

Appendix E

Appendix F

Appendix G

Appendix H

Appendix I

Appendix J

Appendix K

Appendix L

Appendix M

Appendix N

Appendix O

Appendix P

Appendix A



N
W E
S

0 10m 20m

architecture

Coloured Site Layout
Barns Green, Horsham

24088 / C101A

Scale 1:500 @ A1 March 2026

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schedule of accommodation
Rev U

Project Title: Barns Green, Horsham

Client: Miller Homes

Project Ref: 24088
Drawing Ref: P101AC
Date: 31/03/26

Plot No.	House Type	House Name	Ref	Type	Tenure	Area ft²	Area m²	Parking
1	4 Bed House	Faverwood	L474	D	Private	1,704	158.3	2.7
2	3 Bed House	Haywood	L454	D	Private	1,130	105.0	2.2
3	3 Bed House	Haywood	L454	D	Private	1,130	105.0	2.2
4	2 Bed House	Denton	L356	SD	Private	907	84.3	1.7
5	2 Bed House	Denton	L356	SD	Private	907	84.3	1.7
6	4 Bed House	Faverwood	L474	D	Private	1,704	158.3	2.7
7	3 Bed House	Braxton	L361	D	Private	996	92.5	2.2
8	3 Bed House	Chilton	L360	SD	Private	997	92.6	2.2
9	3 Bed House	Whitton	L358	SD	Private	947	88.0	2.2
10	2 Bed House	Denton	L356	EOT	Private	907	84.3	1.7
11	2 Bed House	Denton	L356	MT	Private	907	84.3	1.7
12	2 Bed House	Denton	L356	EOT	Private	907	84.3	1.7
13	3 Bed House	Whitton	L358	SD	Private	947	88.0	2.2
14	3 Bed House	Whitton	L358	SD	Private	947	88.0	2.2
15	1 Bed House	Richmont	L250	EOT	Private	625	58.1	1.7
16	1 Bed House	Richmont	L250	MT	Private	625	58.1	1.7
17	1 Bed House	Richmont	L250	EOT	Private	625	58.1	1.7
18	4 Bed House	Crosswood	L472	D	Private	1,500	139.4	2.7
19	4 Bed House	Crosswood	L472	D	Private	1,500	139.4	2.7
20	4 Bed House	Beauwood	L467	D	Private	1,379	128.1	2.7
21	4 Bed House	Briarwood	L470	D	Private	1,419	131.8	2.7
22	4 Bed House	Beauwood	L467	D	Private	1,379	128.1	2.7
23	2 Bed House	Baymont	-	EOT	Sh Ownership	850	79.0	1.7
24	2 Bed House	Baymont	-	MT	Sh Ownership	850	79.0	1.7
25	2 Bed House	Baymont	-	EOT	Sh Ownership	850	79.0	1.7
26	3 Bed House	Chilton	L360	SD	Private	997	92.6	2.2
27	3 Bed House	Whitton	L358	SD	Private	947	88.0	2.2
28	3 Bed House	Haywood	L454	D	Private	1,130	105.0	2.2
29	2 Bed House	Denton	L356	SD	Private	907	84.3	1.7
30	2 Bed House	Denton	L356	SD	Private	907	84.3	1.7
31	3 Bed House	Braxton	L361	D	Private	996	92.5	2.2
32	2b Maisonette	Maisonette	MAI1	-	Affordable	655	60.9	1.7
33	2b Maisonette	Maisonette	MAI1	-	Affordable	655	60.9	1.7
34	2b Maisonette	Maisonette	MAI2	-	Affordable	777	72.2	1.7
35	2b Maisonette	Maisonette	MAI2	-	Affordable	777	72.2	1.7
36	1 Bed House	Hasting	AL11	SD	Affordable	609	56.6	1.5
37	1 Bed House	Hasting	AL11	SD	Affordable	609	56.6	1.5
38	2 Bed House	Baymont	-	SD	Affordable	850	79.0	1.7
39	3 Bed House	Lockton	-	SD	Affordable	1,001	93.0	2.2
40	3 Bed House	Lockton	-	SD	Affordable	1,001	93.0	2.2
41	3 Bed House	Braxton	L361	D	Private	996	92.5	2.2
42	5 Bed House	Homesford	L552	D	Private	1,568	145.7	2.7
43	4 Bed House	Briarwood	L470	D	Private	1,419	131.8	2.7
44	4 Bed House	Briarwood	L470	D	Private	1,419	131.8	2.7

schedule of accommodation
Rev U

Project Title: Barns Green, Horsham

Client: Miller Homes

Project Ref: 24088
Drawing Ref: P101AC
Date: 31/03/26

Plot No.	House Type	House Name	Ref	Type	Tenure	Area ft²	Area m²	Parking
45	5 Bed House	Grayford	L554	D	Private	1,780	165.4	2.7
46	4 Bed House	Faverwood	L474	D	Private	1,704	158.3	2.7
47	2 Bed House	Denton	L356	SD	Private	907	84.3	1.7
48	2 Bed House	Denton	L356	SD	Private	907	84.3	1.7
49	3 Bed House	Lockton	-	SD	Affordable	1,001	93.0	2.2
50	3 Bed House	Lockton	-	SD	Affordable	1,001	93.0	2.2
51	2 Bed House	Baymont	-	SD	Sh Ownership	850	79.0	1.7
52	2 Bed House	Baymont	-	SD	Sh Ownership	850	79.0	1.7
53	4 Bed House	Briarwood	L470	D	Private	1,419	131.8	2.7
54	3 Bed House	Braxton	L361	D	Private	996	92.5	2.2
55	3 Bed House	Haywood	L454	D	Private	1,130	105.0	2.2
56	3 Bed House	Lockton	-	SD	Sh Ownership	1,001	93.0	2.2
57	3 Bed House	Lockton	-	SD	Sh Ownership	1,001	93.0	2.2
58	4 Bed House	Torwood	-	SD	Sh Ownership	1,143	106.2	2.7
59	4 Bed House	Torwood	-	SD	Affordable	1,143	106.2	2.7
60	2 Bed House	Baymont	-	EOT	Affordable	850	79.0	1.7
61	2 Bed House	Baymont	-	EOT	Affordable	850	79.0	1.7
62	3 Bed House	Lockton	-	SD	Affordable	1,001	93.0	1.7
63	3 Bed House	Lockton	-	SD	Affordable	1,001	93.0	1.7
64	3 Bed House	Whitton	L358	SD	Private	947	88.0	2.2
65	3 Bed House	Whitton	L358	SD	Private	947	88.0	2.2
66	4 Bed House	Beauwood	L467	D	Private	1,379	128.1	2.7
67	3 Bed House	Haywood	L454	D	Private	1,130	105.0	2.2
68	3 Bed House	Haywood	L454	D	Private	1,130	105.0	2.2
Total						70,927	6,484.3	143

Visitor parking	14
Total	157

All figures are approximate and have been calculated in accordance with the description of Net Sales Area (NSA) on page 32 of the RICS guidance note Code of Measuring Practice 6th Edition, May 2015 (republished January 2018). Figures relate to the current stage of the project and any development decisions to be made on the basis of this information should include due allowance for the increases and decreases inherent in the design and building processes.

schedule of accommodation
Rev U

Project Title: Barns Green, Horsham

Client: Miller Homes

Project Ref: 24088
Drawing Ref: P101AC
Date: 31/03/26

Affordable Summary					
House Type	House Name	Reference	Area ft²	No. units	Total Area ft²
1 Bed House	Hasting	AL11	609	2	1,218
2b Maisonette	Maisonette	MAI1	655	2	1,310
2b Maisonette	Maisonette	MAI2	777	2	1,554
2 Bed House	Baymont	-	850	3	2,550
3 Bed House	Lockton	-	1,001	6	6,006
4 Bed House	Torwood	-	1,143	1	1,143
				16	13,781
Shared Ownership Sumary					
House Type	House Name	Reference	Area ft²	No. units	Total Area ft²
2 Bed House	Baymont	-	850	5	4,250
3 Bed House	Lockton	-	1001	2	2,002
4 Bed House	Torwood	-	1,143	1	1,143
				8	7,395
Private Summary					
House Type	House Name	Reference	Area ft²	No. units	Total Area ft²
1 Bed House	Richmont	L250	625	3	1,875
2 Bed House	Denton	L356	907	9	8,163
3 Bed House	Whitton	L358	947	6	5,682
3 Bed House	Chilton	L360	997	2	1,994
3 Bed House	Braxton	L361	996	4	3,984
3 Bed House	Haywood	L459	1,130	6	6,780
4 Bed House	Beauwood	L467	1,379	3	4,137
4 Bed House	Briarwood	L470	1,419	4	5,676
4 Bed House	Crosswood	L472	1,500	2	3,000
5 Bed House	Homesford	L552	1,568	1	1,568
4 Bed House	Faverwood	L474	1,704	3	5,112
5 Bed House	Grayford	L554	1,780	1	1,780
				44	49,751
Total				68	70,927

All figures are approximate and have been calculated in accordance with the description of Net Sales Area (NSA) on page 32 of the RICS guidance note Code of Measuring Practice 6th Edition, May 2015 (republished January 2018). Figures relate to the current stage of the project and any development decisions to be made on the basis of this information should include due allowance for the increases and decreases inherent in the design and building processes.

Appendix B

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

Survey Legend

FENCES

BARBED WIRE FENCE	BWF	
CORRUGATED IRON FENCE	CI	
CLOSE BOARD FENCE	CB	
CHESTNUT PALING FENCE	CP	
IRON RAILING FENCE	IR	
POST AND CHAIN FENCE	PC	
POST AND RAIL FENCE	PR	
POST AND WIRE FENCE	PW	
CHAIN LINK FENCE	CL	
LARCH LAP FENCE	LL	
INTERWOVEN FENCE	IW	
WIRE MESH FENCE	WM	

Trees

Hedges — Hedge 1.00m

Walls — Wall 0.50m (Stone) (Brick or Stone)

Fences — C/B 1.80m

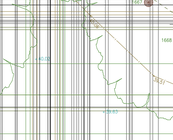
ABBREVIATIONS

AIR CON UNIT	AC	JUNCTION BOX	JB
AIR VALVE	AV	KERB OUTLET	KO
BELISHA BEACON	BB	LAMP POST	LP
BOLLARD	BO	MAN HOLE	MH
BRITISH TELECOM IC	BT	MARKER	MR
CABLE TELEVISION	CATV	PARKING METER	PM
CEILING LEVEL	CL	RODDING EYE	RE
COVER LEVEL	CL	ROAD NAME PLATE	RNP
CONCRETE PAVING SLABS	CPS	ROAD SIGN	RS
DRAINAGE CHANNEL	DC	RETAINING WALL	RTW
DOOR HEAD	DH	STOP COCK	SC
DROP KERB	DK	STONE PAVING SLABS	SPS
DOWN PIPE	DP	STOP VALVE	SV
ELECTRIC INSPECTION COVER	EIC	TRAFFIC LIGHT	TL
ELECTRICITY POLE	EP	TELEGRAPH POLE	TP
EARTH ROD	ERod	UNDERSIDE OF BEAM	UB
FLOWER BED	FB	UNABLE TO LIFT	UTL
FIRE HYDRANT	FH	VENT PIPE	VP
FLOOR LEVEL	FL	WINDOW HEAD	WH
GAS VALVE	GV	WATER METER	WM
GULLY	Gy	WATER OUTLET	WO
INSPECTION COVER	IC	WINDOW SILL	WS
PIPE INVERT LEVEL	IL	DIAMETER	Ø

Tree Schedule

Pt. No.	Spread	Bole	Height	Feature
12	12.0	0.55	14.0	MAPLE
432	12.0	0.40	12.0	MAPLE
433	12.0	0.40	12.0	MAPLE
544	8.0	0.30	7.0	TREE UNKNOWN
545	10.0	0.40	10.0	TREE UNKNOWN
642	22.0	1.30	22.0	OAK
643	8.0	0.30	14.0	OAK
644	8.0	0.40	14.0	OAK
645	10.0	2.00	10.0	HAZEL
710	8.0	0.40	10.0	WILLOW
711	8.0	0.40	10.0	WILLOW
712	8.0	0.40	10.0	WILLOW
713	9.0	0.30	8.0	YEW
714	10.0	0.60	16.0	MAPLE
841	5.0	0.40	12.0	TREE UNKNOWN
842	8.0	0.40	8.0	YEW
1442	10.0	0.45	12.0	TREE UNKNOWN
1443	16.0	0.60	18.0	OAK
1444	16.0	0.60	18.0	OAK
1445	14.0	0.40	18.0	ASH
1446	14.0	0.40	18.0	ASH
1447	14.0	0.40	18.0	ASH
1448	12.0	0.40	14.0	ASH
1449	12.0	0.40	14.0	ASH
1450	14.0	0.60	14.0	ASH
1451	12.0	0.35	10.0	ALDER
1452	12.0	0.35	10.0	ALDER
1453	14.0	0.35	14.0	ASH
1454	20.0	0.90	18.0	OAK
1455	18.0	0.65	20.0	OAK
1456	18.0	0.65	20.0	OAK
1457	10.0	0.35	14.0	OAK
1458	18.0	0.85	20.0	OAK
1459	18.0	0.70	20.0	OAK
1460	16.0	0.45	18.0	OAK
1461	10.0	0.40	16.0	OAK
1462	14.0	0.40	14.0	OAK
1463	18.0	0.65	16.0	OAK
1464	14.0	0.35	18.0	ASH
1465	20.0	0.70	20.0	ASH
1466	12.0	0.45	20.0	ASH
1467	6.0	0.30	16.0	ASH
1618	10.0	0.50	14.0	ALDER
1619	10.0	0.50	14.0	ALDER
1664	10.0	0.60	14.0	ALDER
1665	12.0	0.80	12.0	ALDER
1666	10.0	0.50	12.0	ALDER
1667	12.0	0.80	16.0	ALDER
1668	14.0	0.40	16.0	ALDER
1669	8.0	0.70	14.0	ALDER
1670	12.0	0.45	16.0	ASH
1671	20.0	0.80	18.0	OAK
1672	20.0	0.85	20.0	OAK
1725	8.0	0.30	12.0	ALDER
1726	8.0	0.30	12.0	ALDER
1727	16.0	0.45	18.0	ASH
1728	10.0	0.35	16.0	ALDER
1729	14.0	0.65	18.0	ASH
1730	12.0	0.35	16.0	ASH
1731	12.0	0.35	16.0	ASH
1732	12.0	0.35	16.0	ASH
1733	14.0	0.45	18.0	ASH
1734	14.0	0.35	16.0	ASH
1739	10.0	0.65	14.0	ASH
1740	12.0	0.40	16.0	ASH
1741	12.0	0.40	16.0	ASH
1742	12.0	0.40	16.0	ASH
1743	12.0	0.40	16.0	ASH
1744	10.0	0.30	12.0	OAK
1745	14.0	0.35	18.0	ASH
1746	14.0	0.35	18.0	ASH
1767	16.0	0.35	18.0	ASH
1769	10.0	0.30	12.0	ASH
1770	12.0	0.30	12.0	ASH
1771	14.0	0.40	14.0	ASH
1772	14.0	0.40	14.0	ASH
1773	14.0	0.60	16.0	ALDER
1777	16.0	0.55	20.0	OAK
1778	16.0	0.30	16.0	ALDER
3089	4.0	0.30	10.0	HAWTHORN
3090	8.0	0.40	10.0	TREE UNKNOWN
3125	10.0	0.70	12.0	TREE UNKNOWN
3126	14.0	0.80	18.0	OAK
3215	10.0	0.50	12.0	OAK
3280	8.0	0.40	12.0	OAK
3298	6.0	0.50	12.0	TREE UNKNOWN
3299	6.0	0.30	14.0	OAK
3300	12.0	1.20	18.0	TREE UNKNOWN
3342	10.0	0.30	14.0	OAK
3346	6.0	0.36	8.0	OAK
3368	6.0	0.30	16.0	TREE UNKNOWN
3369	6.0	0.30	15.0	TREE UNKNOWN
3370	4.0	0.24	14.0	TREE UNKNOWN
3371	10.0	0.60	17.0	TREE UNKNOWN
3372	6.0	0.40	4.0	TREE UNKNOWN
3385	8.0	0.40	15.0	TREE UNKNOWN
3386	16.0	0.50	18.0	ASH
3387	10.0	0.30	16.0	TREE UNKNOWN
3388	10.0	0.30	16.0	TREE UNKNOWN
3393	6.0	0.50	18.0	TREE UNKNOWN
8035	16.0	0.50	16.0	ASH
8036	12.0	0.50	12.0	HAWTHORN
8038	12.0	0.35	16.0	ASH
8039	14.0	0.50	14.0	OAK
8040	16.0	0.55	18.0	ASH
8041	12.0	0.40	16.0	ASH
8042	16.0	0.55	16.0	ASH
8043	12.0	0.50	18.0	ALDER
8070	10.0	0.40	18.0	ASH
8071	14.0	0.80	18.0	ASH
8072	12.0	0.35	14.0	ASH
8073	12.0	0.35	14.0	ASH
8074	12.0	0.35	14.0	ASH
8075	16.0	0.40	18.0	ASH
8076	16.0	0.40	18.0	ASH
8077	16.0	0.40	18.0	ASH
8078	16.0	0.40	18.0	ASH
8079	12.0	0.80	14.0	ALDER
8080	12.0	0.35	16.0	ALDER
8081	12.0	0.35	16.0	ALDER
8082	12.0	0.35	16.0	ALDER
8083	12.0	0.35	16.0	ALDER
8084	16.0	0.65	16.0	ALDER
8085	16.0	0.60	18.0	ASH

Sheet Layout



North:

Grid: OS GPS

Levelling: OS GPS

Drawing Title: Topographical Survey Sheet 1

Site Address: Site off Chapel Road, Barns Green, RH13 0PS

Client: Miller Homes

Surveyor	MB	Drawn By	HF	Verified By	AF	Date	19.02.25

CM No: CM/25118/1 Rev:

Scale: 1:200m @ A0 Date: February 2025

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SSIP
CHAS Accredited Contractor www.chas.co.uk
THE SURVEY ASSOCIATION
Constructionline

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

Survey Legend

FENCES

BARBED WIRE FENCE	BWF	Trees	
CORRUGATED IRON FENCE	CI		
CLOSE BOARD FENCE	CB		
CHESTNUT PALING FENCE	CP	Hedges	Hedge 1.00m
IRON RAILING FENCE	IR		
POST AND CHAIN FENCE	PC		
POST AND RAIL FENCE	PR	Walls	Wall 2.00m (Stone or Brick)
POST AND WIRE FENCE	PW		
CHAIN LINK FENCE	CL		
LARCH LAP FENCE	LL	Fences	C/B 1.80m
INTERWOVEN FENCE	IW		
WIRE MESH FENCE	WM		

ABBREVIATIONS

AIR CON UNIT	AC	JUNCTION BOX	JB
AIR VALVE	AV	KERB OUTLET	KO
BELISHA BEACON	BB	LAMP POST	LP
BOLLARD	BO	MAN HOLE	MH
BRITISH TELECOM IC	BT	MARKER	MR
CABLE TELEVISION	CATV	PARKING METER	PM
CEILING LEVEL	CL	RODDING EYE	RE
COVER LEVEL	CL	ROAD NAME PLATE	RNP
CONCRETE PAVING SLABS	CPS	ROAD SIGN	RS
DRAINAGE CHANNEL	DC	RETAINING WALL	RTW
DOOR HEAD	DH	STOP COCK	SC
DROP KERB	DK	STONE PAVING SLABS	SPS
DOWN PIPE	DP	STOP VALVE	SV
ELECTRIC INSPECTION COVER	EIC	TRAFFIC LIGHT	TL
ELECTRICITY POLE	EP	TELEGRAPH POLE	TP
EARTH ROD	ERod	UNDERSIDE OF BEAM	UB
FLOWER BED	FB	UNABLE TO LIFT	UTL
FIRE HYDRANT	FH	VENT PIPE	VP
FLOOR LEVEL	FL	WINDOW HEAD	WH
GAS VALVE	GV	WATER METER	WM
GULLY	Gy	WATER OUTLET	WO
INSPECTION COVER	IC	WINDOW SILL	WS
PIPE INVERT LEVEL	IL	DIAMETER	Ø

Tree Schedule

Pt. No.	Spread	Bole	Height	Feature
12	12.0	0.55	14.0	MAPLE
432	12.0	0.40	12.0	MAPLE
433	12.0	0.40	12.0	MAPLE
544	8.0	0.30	7.0	TREE UNKNOWN
545	10.0	0.40	10.0	TREE UNKNOWN
642	22.0	1.30	22.0	OAK
643	8.0	0.30	14.0	OAK
644	8.0	0.40	14.0	OAK
645	10.0	2.00	10.0	HAZEL
710	8.0	0.40	10.0	WILLOW
711	8.0	0.40	10.0	WILLOW
712	8.0	0.40	10.0	WILLOW
713	9.0	0.30	8.0	YEW
714	10.0	0.60	16.0	MAPLE
841	5.0	0.40	12.0	TREE UNKNOWN
842	8.0	0.40	8.0	YEW
1442	10.0	0.45	12.0	TREE UNKNOWN
1443	14.0	0.40	18.0	ASH
1444	16.0	0.60	18.0	OAK
1445	14.0	0.40	18.0	ASH
1446	14.0	0.40	18.0	ASH
1447	14.0	0.40	18.0	ASH
1448	12.0	0.40	14.0	ASH
1449	12.0	0.40	14.0	ASH
1450	14.0	0.60	14.0	ASH
1451	12.0	0.35	10.0	ALDER
1452	12.0	0.35	10.0	ALDER
1453	14.0	0.35	14.0	ASH
1454	20.0	0.90	18.0	OAK
1455	18.0	0.65	20.0	OAK
1456	18.0	0.65	20.0	OAK
1457	10.0	0.35	14.0	OAK
1458	18.0	0.85	20.0	OAK
1459	18.0	0.70	20.0	OAK
1460	16.0	0.45	18.0	OAK
1461	10.0	0.40	16.0	OAK
1462	14.0	0.40	14.0	OAK
1463	18.0	0.65	16.0	OAK
1464	14.0	0.35	18.0	ASH
1465	20.0	0.70	20.0	OAK
1466	12.0	0.45	20.0	ASH
1467	6.0	0.30	16.0	ASH
1618	10.0	0.50	14.0	ALDER
1619	10.0	0.50	14.0	ALDER
1664	10.0	0.60	14.0	ALDER
1665	10.0	0.50	12.0	ALDER
1666	10.0	0.50	12.0	ALDER
1667	12.0	0.80	16.0	ALDER
1668	14.0	0.40	16.0	ALDER
1669	8.0	0.70	14.0	ALDER
1670	12.0	0.45	16.0	ASH
1671	20.0	0.80	18.0	OAK
1672	20.0	0.85	20.0	OAK
1725	8.0	0.30	12.0	ALDER
1726	8.0	0.30	12.0	ALDER
1727	16.0	0.45	18.0	ASH
1728	10.0	0.35	16.0	ALDER
1729	14.0	0.65	18.0	ASH
1730	14.0	0.55	18.0	ASH
1731	12.0	0.35	16.0	ASH
1732	12.0	0.35	16.0	ASH
1733	14.0	0.45	18.0	ASH
1734	14.0	0.35	16.0	ASH
1739	10.0	0.65	14.0	ASH
1740	12.0	0.40	16.0	ASH
1741	12.0	0.40	16.0	ASH
1742	12.0	0.40	16.0	ASH
1743	12.0	0.40	16.0	ASH
1744	10.0	0.30	12.0	OAK
1745	14.0	0.35	18.0	ASH
1746	14.0	0.35	18.0	ASH
1747	16.0	0.35	18.0	ASH
1769	10.0	0.30	12.0	ASH
1770	12.0	0.30	14.0	ASH
1771	14.0	0.40	14.0	ASH
1772	14.0	0.40	14.0	ASH
1773	14.0	0.60	16.0	ALDER
1777	16.0	0.55	20.0	OAK
1778	16.0	0.30	16.0	ALDER
3089	4.0	0.30	10.0	HAWTHORN
3090	8.0	0.40	10.0	TREE UNKNOWN
3125	10.0	0.70	12.0	TREE UNKNOWN
3126	14.0	0.80	18.0	OAK
3215	10.0	0.50	12.0	OAK
3280	8.0	0.40	12.0	OAK
3298	6.0	0.30	12.0	TREE UNKNOWN
3299	6.0	0.30	14.0	OAK
3300	12.0	1.20	16.0	TREE UNKNOWN
3301	8.0	0.30	14.0	OAK
3346	6.0	0.36	8.0	OAK
3368	6.0	0.30	16.0	TREE UNKNOWN
3369	6.0	0.30	15.0	TREE UNKNOWN
3370	4.0	0.24	14.0	TREE UNKNOWN
3371	10.0	0.60	17.0	TREE UNKNOWN
3372	6.0	0.40	4.0	TREE UNKNOWN
3385	8.0	0.40	15.0	TREE UNKNOWN
3386	16.0	0.70	18.0	OAK
3387	10.0	0.30	16.0	TREE UNKNOWN
3388	10.0	0.30	16.0	TREE UNKNOWN
3393	6.0	0.50	18.0	TREE UNKNOWN
8035	16.0	0.50	16.0	ASH
8036	12.0	0.50	12.0	HAWTHORN
8037	12.0	0.50	12.0	ASH
8039	14.0	0.50	14.0	OAK
8040	16.0	0.55	18.0	ASH
8041	12.0	0.40	16.0	ASH
8042	16.0	0.55	16.0	ASH
8043	12.0	0.50	18.0	ALDER
8070	10.0	0.40	18.0	ASH
8071	14.0	0.80	18.0	ASH
8072	12.0	0.40	12.0	ALDER
8073	12.0	0.35	14.0	ASH
8074	12.0	0.35	14.0	ASH
8075	16.0	0.40	18.0	ASH
8076	16.0	0.40	18.0	ASH
8077	16.0	0.40	18.0	ASH
8078	16.0	0.40	18.0	ASH
8079	14.0	0.40	14.0	ALDER
8080	12.0	0.35	16.0	ALDER
8081	12.0	0.35	16.0	ALDER
8082	12.0	0.35	16.0	ALDER
8083	12.0	0.35	16.0	ALDER
8084	16.0	0.65	16.0	ALDER
8085	16.0	0.60	18.0	ASH

Sheet Layout

North:

Grid: OS GPS

Levelling: OS GPS

Drawing Title: Topographical Survey Sheet 2

Site Address: Site off Chapel Road, Barns Green, RH13 0PS

Client: Miller Homes

Surveyor	MB	Drawn By	HF	Verified By	AF	Date	19.02.25

CM No: CM/25118/2

Rev:

Scale: 1:200m @ A0

Date: February 2025

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THE SURVEY ASSOCIATION
Constructionline

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

Survey Legend

FENCES

BARBED WIRE FENCE	BWF	Trees	
CORRUGATED IRON FENCE	CI		
CLOSE BOARD FENCE	CB		
CHESTNUT PALING FENCE	CP	Hedges	Hedge 0.5m / Hedge 1.00m
IRON RAILING FENCE	IR		
POST AND CHAIN FENCE	PC		
POST AND RAIL FENCE	PR	Walls	Wall 0.50m / 0.60m to Brick
POST AND WIRE FENCE	PW		
CHAIN LINK FENCE	CL	Fences	C/B 1.80m
LARCH LAP FENCE	LL		
INTERWOVEN FENCE	IW		
WIRE MESH FENCE	WM		

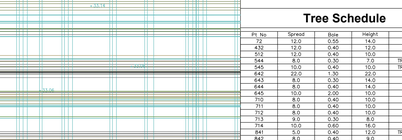
ABBREVIATIONS

AIR CON UNIT	AC	JUNCTION BOX	JB
AIR VALVE	AV	KERB OUTLET	KO
BELISHA BEACON	BB	LAMP POST	LP
BOLLARD	BO	MAN HOLE	MH
BRITISH TELECOM IC	BT	MARKER	MR
CABLE TELEVISION	CATV	PARKING METER	PM
CEILING LEVEL	CL	RODDING EYE	RE
COVER LEVEL	CL	ROAD NAME PLATE	RNP
CONCRETE PAVING SLABS	CPS	ROAD SIGN	RS
DRAINAGE CHANNEL	DC	RETAINING WALL	RTW
DOOR HEAD	DH	STOP COCK	SC
DROP KERB	DK	STONE PAVING SLABS	SPS
DOWN PIPE	DP	STOP VALVE	SV
ELECTRIC INSPECTION COVER	EIC	TRAFFIC LIGHT	TL
ELECTRICITY POLE	EP	TELEGRAPH POLE	TP
EARTH ROD	ERod	UNDERSIDE OF BEAM	UB
FLOWER BED	FB	UNABLE TO LIFT	UTL
FIRE HYDRANT	FH	VENT PIPE	VP
FLOOR LEVEL	FL	WINDOW HEAD	WH
GAS VALVE	GV	WATER METER	WM
GULLY	Gy	WATER OUTLET	WO
INSPECTION COVER	IC	WINDOW SILL	WS
PIPE INVERT LEVEL	IL	DIAMETER	Ø

Tree Schedule

Pt No.	Spread	Bole	Height	Feature
12	12.0	0.55	14.0	MAPLE
432	12.0	0.40	12.0	MAPLE
433	12.0	0.40	12.0	MAPLE
544	8.0	0.30	7.0	TREE UNKNOWN
545	10.0	0.40	10.0	TREE UNKNOWN
642	22.0	1.30	22.0	OAK
643	8.0	0.30	14.0	OAK
644	8.0	0.40	14.0	OAK
645	10.0	2.00	10.0	HAZEL
710	8.0	0.40	10.0	WILLOW
711	8.0	0.40	10.0	WILLOW
712	8.0	0.40	10.0	WILLOW
713	9.0	0.30	8.0	YEW
714	10.0	0.40	16.0	MAPLE
841	5.0	0.40	12.0	TREE UNKNOWN
842	8.0	0.40	8.0	YEW
1442	10.0	0.45	12.0	TREE UNKNOWN
1443	16.0	0.65	18.0	OAK
1444	16.0	0.60	18.0	OAK
1445	14.0	0.40	18.0	ASH
1446	14.0	0.40	16.0	ASH
1447	14.0	0.40	16.0	ASH
1448	12.0	0.40	14.0	ASH
1449	12.0	0.40	14.0	ASH
1450	14.0	0.60	16.0	ASH
1451	12.0	0.35	10.0	ALDER
1452	12.0	0.35	10.0	ALDER
1453	14.0	0.35	14.0	ASH
1454	20.0	0.90	18.0	OAK
1455	18.0	0.65	20.0	OAK
1456	18.0	0.65	20.0	OAK
1457	10.0	0.35	16.0	OAK
1458	18.0	0.85	20.0	OAK
1459	18.0	0.70	20.0	OAK
1460	16.0	0.45	18.0	OAK
1461	10.0	0.40	16.0	OAK
1462	14.0	0.40	14.0	OAK
1463	18.0	0.65	16.0	OAK
1464	14.0	0.35	18.0	ASH
1465	20.0	0.70	20.0	ASH
1466	12.0	0.45	20.0	ASH
1467	6.0	0.30	16.0	ASH
1618	10.0	0.50	14.0	ALDER
1619	10.0	0.50	14.0	ALDER
1664	10.0	0.60	14.0	ALDER
1665	10.0	0.60	14.0	ALDER
1666	10.0	0.55	12.0	ALDER
1667	12.0	0.80	16.0	ALDER
1668	14.0	0.40	16.0	ALDER
1669	8.0	0.70	14.0	ALDER
1670	12.0	0.45	16.0	ASH
1671	20.0	0.80	18.0	OAK
1672	20.0	0.85	20.0	OAK
1725	8.0	0.30	12.0	ALDER
1726	8.0	0.30	12.0	ALDER
1727	16.0	0.45	18.0	ASH
1728	10.0	0.35	16.0	ALDER
1729	14.0	0.65	18.0	ASH
1730	14.0	0.65	18.0	ASH
1731	12.0	0.35	16.0	ASH
1732	12.0	0.35	16.0	ASH
1733	14.0	0.45	18.0	ASH
1734	14.0	0.35	16.0	ASH
1739	10.0	0.65	14.0	ASH
1740	12.0	0.40	16.0	ASH
1741	12.0	0.40	16.0	ASH
1742	12.0	0.40	16.0	ASH
1743	12.0	0.40	16.0	ASH
1744	10.0	0.30	12.0	OAK
1745	14.0	0.35	18.0	ASH
1746	14.0	0.35	18.0	ASH
1747	16.0	0.35	18.0	ASH
1769	10.0	0.30	12.0	ASH
1770	12.0	0.30	12.0	ASH
1771	14.0	0.40	14.0	ASH
1772	14.0	0.40	14.0	ASH
1773	14.0	0.60	16.0	ALDER
1777	16.0	0.55	20.0	OAK
1778	16.0	0.30	16.0	ALDER
3089	4.0	0.30	10.0	HAWTHORN
3090	8.0	0.40	10.0	TREE UNKNOWN
3125	10.0	0.70	12.0	TREE UNKNOWN
3126	14.0	0.80	18.0	OAK
3215	10.0	0.50	12.0	OAK
3280	8.0	0.40	12.0	OAK
3298	8.0	0.50	12.0	TREE UNKNOWN
3300	12.0	1.20	16.0	TREE UNKNOWN
3342	10.0	0.30	14.0	OAK
3346	6.0	0.36	8.0	OAK
3368	6.0	0.30	16.0	TREE UNKNOWN
3369	6.0	0.30	15.0	TREE UNKNOWN
3370	4.0	0.24	14.0	TREE UNKNOWN
3371	10.0	0.60	17.0	TREE UNKNOWN
3372	8.0	0.40	4.0	TREE UNKNOWN
3385	8.0	0.40	15.0	TREE UNKNOWN
3386	16.0	0.70	18.0	OAK
3387	10.0	0.30	16.0	TREE UNKNOWN
3388	10.0	0.30	16.0	TREE UNKNOWN
3393	8.0	0.50	18.0	TREE UNKNOWN
8035	16.0	0.50	16.0	ASH
8036	12.0	0.50	12.0	HAWTHORN
8038	12.0	0.35	16.0	ASH
8039	14.0	0.50	14.0	OAK
8040	16.0	0.55	18.0	ASH
8041	12.0	0.40	16.0	ASH
8042	16.0	0.55	16.0	ASH
8043	12.0	0.50	18.0	ALDER
8070	10.0	0.40	18.0	ASH
8071	14.0	0.80	18.0	ASH
8072	12.0	0.40	12.0	ALDER
8073	12.0	0.35	14.0	ASH
8074	12.0	0.35	14.0	ASH
8075	16.0	0.40	18.0	ASH
8076	16.0	0.40	18.0	ASH
8077	16.0	0.40	18.0	ASH
8078	16.0	0.40	16.0	ASH
8079	12.0	0.80	14.0	ALDER
8080	12.0	0.35	16.0	ALDER
8081	12.0	0.35	16.0	ALDER
8082	12.0	0.35	16.0	ALDER
8083	12.0	0.35	16.0	ALDER
8084	16.0	0.65	16.0	ALDER
8085	18.0	0.80	18.0	ASH

Sheet Layout



North:

Grid: OS GPS

Levelling: OS GPS

Drawing Title: Topographical Survey Sheet 3

Site Address: Site off Chapel Road, Barns Green, RH13 0PS

Client: Miller Homes

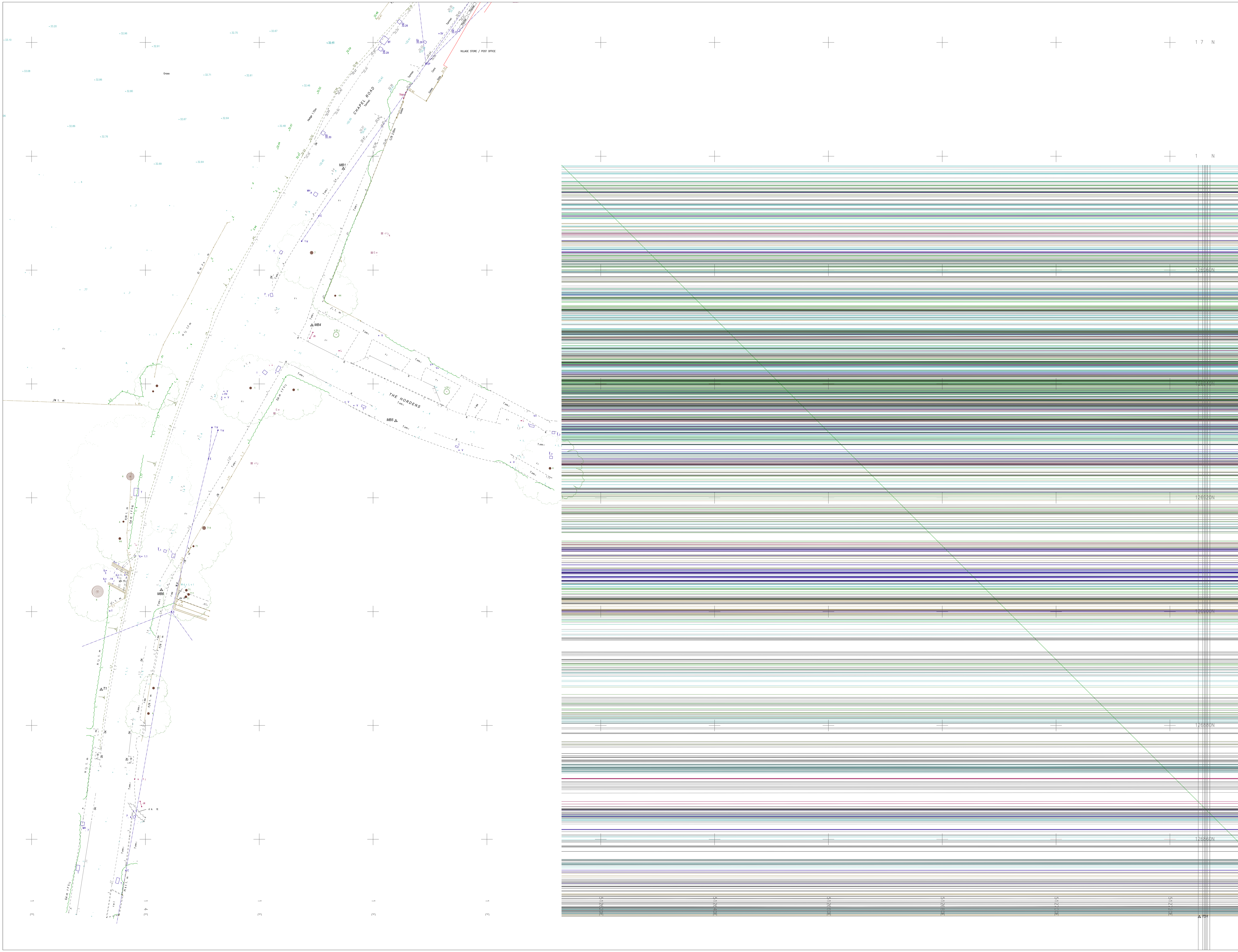
Surveyor	MB	Drawn By	HF	Verified By	AF	Date	19.02.25

CM No: CM2511B/3 Rev:

Scale: 1:200m @ A0 Date: February 2025

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worksafe consultant
SSIP
CHAS Accredited Contractor www.chas.co.uk
THE SURVEY ASSOCIATION
Constructionline



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

Survey Legend

FENCES

Fence	Code
BARBED WIRE FENCE	B/W
CORRUGATED IRON FENCE	C/I
CLOSE 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 AND WIRE FENCE	P/W
CHAIN LINK FENCE	C/L
LARCH LAP FENCE	L/L
INTERWOVEN FENCE	I/W
WIRE MESH FENCE	W/M

Trees • Hedges (Hedge 1.20m) Walls (Wall 2.00m (Width to Scale)) Fences (C/B 1.80m)

ABBREVIATIONS

AIR CON UNIT	AC	JUNCTION BOX	JB
AIR VALVE	AV	KERB OUTLET	KO
BELISHA BEACON	BB	LAMP POST	LP
BOLLARD	BO	MAN HOLE	MH
BRITISH TELECOM IC	BT	MARKER	MK
CABLE TELEVISION	CATV	PARKING METER	PM
CEILING LEVEL	CL	RODDING EYE	RE
COVER LEVEL	CL	ROAD NAME PLATE	RNP
CONCRETE PAVING SLABS	CPS	ROAD SIGN	RS
DRAINAGE CHANNEL	DC	RETAINING WALL	RTW
DOOR HEAD	DH	STOP COCK	SC
DROP KERB	DK	STONE PAVING SLABS	SPS
DOWN PIPE	DP	STOP VALVE	SV
ELECTRIC INSPECTION COVER	EIC	TRAFFIC LIGHT	TL
ELECTRICITY POLE	EP	TELEGRAPH POLE	TP
EARTH ROD	ERod	UNDERSIDE OF BEAM	UB
FLOWER BED	FB	UNABLE TO LIFT	UTL
FIRE HYDRANT	FH	VENT PIPE	VP
FLOOR LEVEL	FL	WINDOW HEAD	WH
GAS VALVE	GV	WATER METER	WM
GULLY	Gy	WATER OUTLET	WO
INSPECTION COVER	IC	WINDOW SILL	WS
PIPE INVERT LEVEL	IL	DIAMETER	Ø

Tree Schedule

Pt No	Spread	Bole	Height	Feature
72	12.0	0.55	14.0	MAPLE
432	12.0	0.40	12.0	MAPLE
512	12.0	0.40	10.0	MAPLE
544	8.0	0.30	7.0	TREE UNKNOWN
545	10.0	0.40	10.0	TREE UNKNOWN
642	22.0	1.30	22.0	OAK
643	8.0	0.30	14.0	OAK
644	8.0	0.40	14.0	OAK
645	10.0	2.00	10.0	HAZEL
710	8.0	0.40	10.0	WILLOW
711	8.0	0.40	10.0	WILLOW
712	8.0	0.40	10.0	WILLOW
713	9.0	0.30	8.0	YEW
714	10.0	0.60	16.0	MAPLE
841	5.0	0.40	12.0	TREE UNKNOWN
842	8.0	0.40	9.0	YEW
1442	10.0	0.45	12.0	TREE UNKNOWN
1443	14.0	0.45	14.0	ASH
1444	16.0	0.60	18.0	OAK
1445	14.0	0.40	18.0	ASH
1446	14.0	0.40	18.0	ASH
1447	14.0	0.40	16.0	ASH
1448	12.0	0.40	14.0	ASH
1449	12.0	0.40	14.0	ASH
1450	14.0	0.60	14.0	ASH
1451	12.0	0.35	10.0	ALDER
1452	12.0	0.35	10.0	ALDER
1453	14.0	0.35	14.0	ASH
1454	20.0	0.90	18.0	OAK
1455	18.0	0.65	20.0	OAK
1456	20.0	0.55	18.0	OAK
1457	10.0	0.35	14.0	OAK
1458	18.0	0.85	20.0	OAK
1459	18.0	0.70	20.0	OAK
1460	16.0	0.45	18.0	OAK
1461	10.0	0.40	16.0	OAK
1462	14.0	0.40	14.0	OAK
1463	18.0	0.65	16.0	OAK
1464	14.0	0.35	18.0	ASH
1465	20.0	0.70	20.0	OAK
1466	12.0	0.45	20.0	ASH
1467	6.0	0.30	16.0	ASH
1618	10.0	0.50	14.0	ALDER
1619	10.0	0.50	14.0	ALDER
1664	10.0	0.80	14.0	ALDER
1665	12.0	0.45	16.0	ASH
1666	10.0	0.50	12.0	ALDER
1667	12.0	0.80	16.0	ALDER
1668	14.0	0.40	16.0	ALDER
1669	8.0	0.70	14.0	ALDER
1670	12.0	0.45	16.0	ASH
1671	20.0	0.80	18.0	OAK
1672	20.0	0.85	20.0	OAK
1725	8.0	0.30	12.0	ALDER
1726	8.0	0.30	12.0	ALDER
1727	16.0	0.45	18.0	ASH
1728	10.0	0.35	16.0	ALDER
1729	14.0	0.65	18.0	ASH
1730	12.0	0.35	16.0	ASH
1731	12.0	0.35	16.0	ASH
1732	12.0	0.35	16.0	ASH
1733	14.0	0.45	18.0	ASH
1734	14.0	0.35	16.0	ASH
1739	10.0	0.65	14.0	ASH
1740	12.0	0.40	16.0	ASH
1741	12.0	0.40	16.0	ASH
1742	12.0	0.40	16.0	ASH
1743	12.0	0.40	16.0	ASH
1744	10.0	0.30	12.0	OAK
1745	14.0	0.35	18.0	ASH
1746	14.0	0.35	18.0	ASH
1747	16.0	0.70	18.0	ASH
1769	10.0	0.30	12.0	ASH
1770	10.0	0.30	12.0	ASH
1771	14.0	0.40	14.0	ASH
1772	14.0	0.40	14.0	ASH
1773	14.0	0.60	16.0	ALDER
1777	16.0	0.55	20.0	OAK
1778	16.0	0.30	16.0	ALDER
3089	4.0	0.30	10.0	HAWTHORN
3090	8.0	0.40	10.0	TREE UNKNOWN
3125	10.0	0.70	12.0	TREE UNKNOWN
3126	14.0	0.80	18.0	OAK
3215	10.0	0.50	12.0	OAK
3280	8.0	0.40	12.0	OAK
3298	6.0	0.50	12.0	TREE UNKNOWN
3299	6.0	0.30	14.0	OAK
3300	12.0	1.20	16.0	TREE UNKNOWN
3342	10.0	0.30	14.0	OAK
3346	6.0	0.36	8.0	OAK
3368	6.0	0.30	16.0	TREE UNKNOWN
3369	6.0	0.30	15.0	TREE UNKNOWN
3370	4.0	0.24	14.0	TREE UNKNOWN
3371	10.0	0.60	17.0	TREE UNKNOWN
3372	6.0	0.40	4.0	TREE UNKNOWN
3385	8.0	0.40	15.0	TREE UNKNOWN
3386	16.0	0.70	18.0	OAK
3387	10.0	0.30	16.0	TREE UNKNOWN
3388	10.0	0.30	16.0	TREE UNKNOWN
3393	6.0	0.50	18.0	TREE UNKNOWN
8035	16.0	0.50	16.0	ASH
8036	12.0	0.50	12.0	HAWTHORN
8038	12.0	0.35	16.0	ASH
8039	14.0	0.50	14.0	OAK
8040	16.0	0.55	18.0	ASH
8041	12.0	0.40	16.0	ASH
8042	16.0	0.55	16.0	ASH
8043	12.0	0.50	18.0	ALDER
8070	10.0	0.40	18.0	ASH
8071	14.0	0.80	18.0	ASH
8072	12.0	0.40	12.0	ALDER
8073	12.0	0.35	14.0	ASH
8074	12.0	0.35	14.0	ASH
8075	16.0	0.40	18.0	ASH
8076	16.0	0.40	18.0	ASH
8077	16.0	0.40	18.0	ASH
8078	16.0	0.40	18.0	ASH
8079	12.0	0.80	14.0	ALDER
8080	12.0	0.35	16.0	ALDER
8081	12.0	0.35	16.0	ALDER
8082	12.0	0.35	16.0	ALDER
8083	12.0	0.35	16.0	ALDER
8084	16.0	0.65	16.0	ALDER
8085	16.0	0.60	18.0	ASH

Sheet Layout

1 2
3 4
5

North: (indicative)

Grid: OS GPS

Levelling: OS GPS

Drawing Title: Topographical Survey Sheet 4

Site Address: Site off Chapel Road, Barns Green, RH13 0PS

Client: Miller Homes

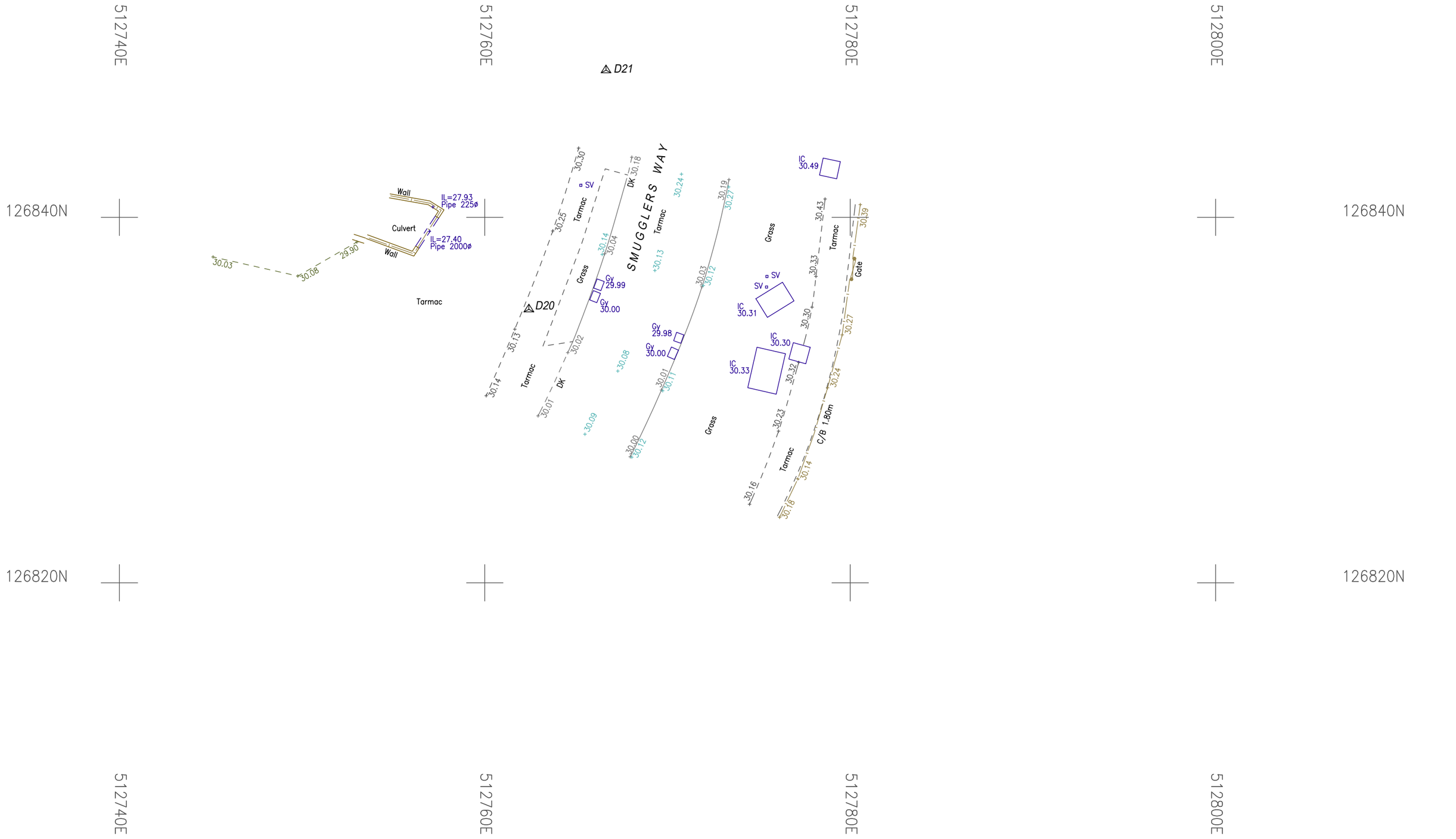
Surveyor	MB	Drawn By	HF	Verified By	AF	Date	19.02.25

CM No: CM/25118/4 Rev:

Scale: 1:200m @ A0 Date: February 2025

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JOB NO: CM/25118/5	SCALE: 1:200m @ A3	DRAWN: HF	DATE: February 2025	SHEET: 1 of 1	**Sheet Layout**	NOTES:	NORTH:	CLIENT:
REVISION:	LEVELLING: OS GPS		PROJECT TITLE: Topographical Survey Sheet 5		1 2 3 4 ⑤	All information contained in this drawing (including digital data) should be checked and verified prior to any fabrication or construction.	Indicative	Miller Homes

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E: info@cadmap.co.uk
W: www.cadmap.co.uk

SITE ADDRESS: Site off Chapel Road, Barns Green, RH13 0PS

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SSIP
CHAS Accredited Contractor www.chas.gov.uk
THE SURVEY ASSOCIATION
Constructionline A UK GOVERNMENT CERTIFICATION SERVICE

Appendix C

Borehole record form

NICHOLLS BOREHOLES & GROUND SOURCE

British Geological Survey NATURAL ENVIRONMENT RESEARCH COUNCIL

Environment Agency

Water Resources Act 1991 (as amended by the Water Act 2003)

A Site details

Borehole drilled for: SUMNERS POND

Location: CHAPEL ROAD, BARNS GREEN, HORSHAM, RH13 0AR

NGR (ten digits): TQ12140 26841 Please attach site plan

Ground level (if known): _____ metres Above Ordnance Datum

Drilling company: NICHOLLS BOREHOLES

Date drilling commenced: 02-10-2023 (DD/MM/YYYY) Completed: 05-10-2023 (DD/MM/YYYY)

B Construction details

Borehole datum (if not ground level) _____ metres (m). Please tick if this is above ☐ or below ☐ ground level.
(point from which all measurements of depth are taken, for example, flange, edge of chamber)

Borehole drilled diameter: 250 mm from 0 to 54 m/depth

_____ mm from _____ to _____ m/depth

_____ mm from _____ to _____ m/depth

_____ mm from _____ to _____ m/depth

Casing material and type (for example, if plain steel, plastic slotted). Please record permanent casing details, not temporary casing.

Casing material: SOLID UPVC diameter 125 mm from 0 to 10.4 m/depth

Casing material: SLOTTED UPVC diameter 125 mm from 10.4 to 50.3 m/depth

Casing material: SOLID UPVC diameter 125 mm from 50.3 to 53.15 m/depth

Casing material: _____ diameter _____ mm from _____ to _____ m/depth

Grouting details: 117 BAGS OF SHINGLE, 24 BAGS OF MIKOLIT

Water struck at 1. N/A - DRILLED m (depth below datum - mbd) 2. _____ m (mbd)

3. WITH MUD m (mbd) 4. _____ m (mbd)

C Test pumping summary (Please supply full details on form WR39)

Test pumping datum (if different from borehole datum) _____ m. Please tick if this is above ☐ or below ☐ ground level.

Pump suction depth _____ mbd

Water level (start of test) _____ mbd

Water level (end of test) _____ mbd

Type of test (for example, bailer, step, constant rate)

_____

Pumping rate _____ m^3/hour ☐ or litres/second ☐. Please tick as appropriate.

for _____ days, _____ hours, _____ mins

Recovery to _____ mbd in _____ days, _____ hours, _____ mins
(from end of pumping)

Date(s) of measurements Pump started _____ (DD/MM/YYYY)

Pump stopped _____ (DD/MM/YYYY)

Please supply chemical analysis if available. If you have included this please tick this box ☐

WR38: Borehole record form

D Strata log

Geological classification (BGS only)	Description of strata	Thickness m	Depth (to base of strata) m
	TOP SOIL	0.5	0.5
	YELLOW CLAY + STONE	4	4.5
	GREY CLAY WITH HARD BANDS OF MUDSTONE	30.5	35
	HORSHAM STONE - VERY HARD	5	40
	STIFF PALE GREY CLAY	4	44
	STIFF GREY CLAY WITH SOME RED CLAY AND STONE THROUGHOUT	8	52
	GREY CLAY	2	54
	(continue on separate page if necessary)		
	Other comments (for example, gas encountered, saline water intercepted)		

E Completing this form

How long did it take you to fill in this form? _____

For Official use only

Date received (DD/MM/YYYY)	File	Consent number	BGS reference number
Accession number	Wellmaster number	SOBI number	NGR
LIC NO	Purpose		EA reference number
Copy number	Entered by		

The British Geological Survey will use the information you

Appendix D

geotechnical and environmental consultants

ground&water

Ground Investigation Report

Land south-west of Smugglers Lane, Barn Green, West Sussex RH13 0PS

On behalf of Miller Homes Limited

Report Reference: GWPR6192/GIR/September 2024			Status: Final
Issue	Prepared By	Checked By	Verified By
V1.01			
	Rob Terrell BSc (Hons) MSc FGS Senior Engineer	Miltiadis Mellios MSc(Eng) FGS GMICE MIEnvSc CGeol Principal Engineer	Francis Williams MGeol (Hons) FGS CEnv CGeol Director

Site Investigations | Environmental Consultants | Geotechnical Engineers

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0333 600 1221 enquiries@groundandwater.co.uk **groundandwater.co.uk**

Registered Office: Kineton House, 31 Horse Fair, Banbury, Oxfordshire OX16 0AE Registered in England No. 07032001

2 The Long Barn,
Norton Farm, Selborne Road,
Alton, Hampshire GU34 3NB

0333 600 1221
enquiries@groundandwater.co.uk

groundandwater.co.uk

Geotechnical Report	
REPORT REFERENCE	GWPR6192/GIR/September 2024. The conditions and limitations of this geotechnical report can be viewed within Appendix A. A technical glossary has also been provided within Appendix B. The investigation was to be undertaken to provide parameters for the design of foundations by means of in-situ and laboratory geotechnical testing undertaken on soil samples recovered from trial holes. The techniques adopted for the investigation were chosen considering the requirements of the client, anticipated ground conditions, and bearing in mind the nature of the site, limitations to site access and other logistical limitations. An Environmental Desk Study and Contamination Assessment including a soil, gas, vapour, radon or groundwater risk assessment were not part of the remit of this report.
SITE DETAILS	The site comprised a 3.285ha plot of land, immediately south-west of Smugglers Lane and north-west of Chapel Road. The site was located in Horsham, a mainly residential town within the West Sussex Local Authority of Horsham. A site location plan has been provided within Figure 1. The site comprised an undeveloped field. A view of the site development area has been provided within Figure 2, with an aerial view of the site provided in Figure 3.
PROPOSED DEVELOPMENT	The proposed development was understood to comprise the development of multiple residential dwellings. The properties are to have private soft landscaped gardens. Other areas across the site include proposed access routes, roads and a SUDS basin in the south of the site. Information on the proposed development is provided within Appendix C.
HISTORICAL MAPPING	The site has been undeveloped since the earliest historical map, dated 1876. Development mainly happened to the east of the site throughout the 1900s and 2000s. Historical maps, obtained from GroundSure, can be viewed within Appendix D.
ANTICIPATED GEOLOGY AND HYDROGEOLOGY	The site was anticipated to be located on the Weald Clay Formation, classified as Unproductive Bedrock Strata. Based on this, groundwater was anticipated at depth, below the aquifer; however, perched water may be encountered at shallower depths, within silty/sandy bands, or within the shallow surface soils (i.e. Topsoil, Made Ground etc.), especially after periods of prolonged or intense rainfall. A Hydrogeological Assessment was undertaken for the adjacent site to the south, referred to as “Summers Pond Development”. No superficial deposits are recorded on the Summers Pond site. The bedrock geology is dominated by the Weald Clay Formation, estimated to be up to 200m thick.
SITE WORKS	Site works were undertaken on 30th August 2024 and comprised the drilling of 5No. Dynamic (Windowless) Sampler Borehole (WS1 – WS5) to depths between 3.50 – 5.00m bgl, with in-situ strength testing (SPTs) was undertaken at 1.00m intervals. WS2, WS3 and WS5 refused between 3.50 – 4.00 where drilling reached technical refusal due to claystone. Super Heavy Dynamic Probing (DP2, DP3 and DP5) was then undertaken from the base of these boreholes, before later reaching technical refusal at deeper depths. A trial hole location plan has been provided within Figure 4.

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GROUND CONDITIONS ENCOUNTERED

A summary of the ground conditions encountered can be viewed within the following table. The trial hole logs can be seen within Appendix E.

Summary of Strata Encountered			
Strata	**Top Depth (m bgl)**	**Base Depth (m bgl)**	**Thickness (m)**
TOPSOIL: Brown sandy gravelly silty CLAY. Sand was fine. Gravel was fine to coarse, sub-angular to sub-rounded flint.	GL	0.20 – 0.60	0.20 – 0.60
WEALD CLAY FORMATION: Brown/orange/grey silty CLAY.	0.20 – 0.60	2.40 – 3.90	2.10 – >3.30
WEALD CLAY FORMATION: Brown/orange/grey mottled CLAYSTONE. ***(WS1, WS2, WS4 and WS5)***	2.40 – 3.90	>4.00 – >5.00	>1.10 – >1.60

GROUNDWATER

No groundwater strikes were noted during the site investigation. It should be noted that groundwater strikes may have been obscured by the drilling process. Changes in groundwater level occur for a number of reasons including seasonal effects and variations in drainage. The investigation was undertaken in August 2024 when groundwater levels are likely to be at their annual lowest elevation. Exact groundwater levels may only be determined through long term measurements from monitoring wells installed on-site.

ROOTS

Fresh roots were noted within all trial holes to 0.80 – 1.00m bgl. It should be noted that the accuracy of determining the depth of root penetration through narrow diameter boreholes is considered low. It should be noted that roots may be found to greater depths at other locations on the site, particularly close to trees and/or trees that have been removed both within the site and its close environs.

IN-SITU STRENGTH TESTING

A summary of the in-situ strength testing (SPTs and SHDP) conducted within WS1 – WS5 and DP2, DP3 and DP5 has been summarised in the following table.

Interpretation of In-situ Geotechnical Testing Results				
Strata	**Strata**	**SPT/SHDP "N" Value**	**Equivalent Undrained Shear Strength**	**Cohesive Soil Type (Cu Classification)**
Cohesive Weald Clay Formation	WS1/0.60 – 3.90m bgl WS2/0.30 – 2.40m bgl WS3/0.20 – 3.50m bgl WS4/0.40 – 3.50m bgl WS5/0.30 – 3.60m bgl	10 – 24 15 – 20 8 – >48 9 – 22 10 – >57	50 – 120 75 – 20 40 – >240 45 – 110 10 – >285	Medium to Extremely High
Weald Clay Formation Claystone	WS1/3.90 – 5.00m bgl WS2/2.40 – 4.00m bgl WS4/3.50 – 5.00m bgl	29 – 56 22 – >46 33 – 98	145 – 280 110 – >220 165 – 490	High to Extremely High
Inferred Weald Clay Formation Claystone*	DP2/4.00 – 5.00m bgl DP3/3.50 – 4.10m bgl DP5/4.00 – 4.90m bgl	29 – 60 81 – 156 69 – 152	145 – 300 405 – 780 345 – 760	High to Extremely High

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***It should be noted that super heavy dynamic probing may underestimate the strength of shallow surface soils. No samples are obtained during super heavy dynamic probing, so the soil texture was also assumed/inferred.**

VOLUME CHANGE POTENTIAL AND MOISTURE DEFICITS

Atterberg Testing

A précis of Atterberg limit testing undertaken can be seen in the following table. The test results are presented within Appendix F.

Atterberg Limit Tests Results Summary

Stratum	Moisture Content (%)	Passing 425 µm sieve (%)	Modified PI (%)	Soil Class	Consistency Index (Ic)	Volume Change Potential	
						BRE	NHBC
Weald Clay Formation	14 – 31	100	17.00 – 35.00	CL, CI, CH	Stiff, Very Stiff	Low – Medium	Low – Medium

- **NP – Non-plastic**
- **BRE Volume Change Potential refers to BRE Digest 240 (based on Atterberg results)**
- **Soil Classification based on British Soil Classification System.**
- **Consistency Index (Ic) based on BS EN ISO 14688-2:2018.**

Moisture Deficits

The results of the Atterberg Limit tests were analysed to determine the Liquidity Index of the samples, to give an indication as to whether the samples recovered showed a moisture deficit as well assessing their degree of consolidation. Liquid Limit analyses was undertaken to assess whether there were any potentially significant moisture deficits within the samples tested. A potential moisture deficit, caused by a combination of root uptake and lithology was noted within WS2/1.00m bgl. Another potential moisture deficit, caused by lithology was noted within WS4 at 5.00m bgl.

FOUNDATION RECOMMENDATIONS

A summary of the findings from the site investigation, relevant to foundation recommendations, can be seen below:

- Foundations should be taken through any Made Ground/Topsoil and constructed either into, or onto a suitable underlying natural stratum of adequate bearing characteristics.
- Foundations should be designed in accordance with soils of medium volume change potential.
- Given the presence of cohesive soils at shallow depth, special foundation precautions may be required to prevent possible future shrinkage/swelling of the soils affecting the integrity of the faces of foundations (underfloor void diameter/compressible material/void formers etc). A compressible layer must be provided to accommodate potential seasonal movement, based on NHBC guidance.
- Due to the shallow soils having volume change potential, a suspended slab is required.
- The loads of proposed foundations should not exceed the allowable bearing capacity of the soils they are founding upon.
- Foundations must not be placed within fresh root penetrated and/or desiccated soils with volume change potential. It is recommended that foundations are taken at least 300mm into non-fresh root penetrated strata if the soils have volume change potential, or into soils of no volume change potential.

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- The influence of trees on or surrounding the site will need to be taken into account in final design (NHBC Standards Chapter 4. 2) (tree rings).
- Any water ingress must be prevented from entering foundation trenches and excavations must be kept dry and either concreted or blinded as soon after excavation as possible. If water were allowed to accumulate within the excavation for even a short period of time, an increase in heave occur. The shear strength will also be reduced, resulting in lower bearing capacities, resulting in increased settlements. Instability issues may arise within the foundation trenches, in case of perched water being present.

FOUNDATION DESIGN

Foundations should be taken through any Topsoil/Made Ground before founding onto competent, moisture stable soils. Should soils have volume change potential, foundations must also extent 300mm below the proven depth of roots (max proven root depth of 0.80 – 1.00m bgl). In the absence of roots, foundations should be placed at 0.90m bgl, the minimum recommended depth for soils of medium volume change potential.

Therefore, foundations are recommended to be founded at a minimum depth of 1.10 – 1.30m bgl and onto competent, moisture stable soils of the Weald Clay Formation. The minimum foundation depth for each borehole has been referenced below.

Summary of Minimum Foundation Depths

Trial Hole	Minimum Foundation Depth (m bgl)	Founding Geological Formation	Reason
WS1	1.10	Weald Clay Formation	Bypass Topsoil and extend 300mm below the proven depth of fresh roots.
WS2	1.30	Weald Clay Formation	Bypass Topsoil and extend 300mm below the proven depth of fresh roots.
WS3	1.10	Weald Clay Formation	Bypass Topsoil and extend 300mm below the proven depth of fresh roots.
WS4	1.10	Weald Clay Formation	Bypass Topsoil and extend 300mm below the proven depth of fresh roots.
WS5	1.30	Weald Clay Formation	Bypass Topsoil and extend 300mm below the proven depth of fresh roots.

Allowable bearing capacities, based on various boreholes and foundation depths across the site, can be viewed in the following table. This is based on trial hole records, the results of in-situ testing, inspection of samples recovered, and referral to BS 8004:2015, Code of Practice for Foundations, and was assessed using Geo5 geotechnical software.

Allowable Bearing Capacities Calculated

Foundation Depth (m bgl)	Foundation Type	Limit State	Serviceability State	
		Allowable Bearing Capacity (kN/m²)	Load (kN/m²)	Settlement (mm)
0.90m bgl (WS2)	5.00m long by 0.70m wide strip foundation	153.42	150	6.70
	5.00m long by 1.00m wide strip foundation	157.38	150	5.50

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		1.50m square pad foundation	186.30	180	14.70
	1.30m bgl (WS2)	5.00m long by 0.70m wide strip foundation	169.15	160	6.60
		5.00m long by 1.00m wide strip foundation	171.27	170	5.80
		1.50m square pad foundation	207.05	200	14.90
	1.80m bgl (WS2)	5.00m long by 0.70m wide strip foundation	193.67	190	7.00
		5.00m long by 1.00m wide strip foundation	195.47	190	5.80
		1.50m square pad foundation	227.86	220	14.20
	0.90m bgl (WS3)	5.00m long by 0.70m wide strip foundation	84.62	80	4.70
		5.00m long by 1.00m wide strip foundation	91.76	90	4.40
		1.50m square pad foundation	116.87	110	11.60
	1.10m bgl (WS3)	5.00m long by 0.70m wide strip foundation	94.21	90	4.90
		5.00m long by 1.00m wide strip foundation	103.66	100	4.50
		1.50m square pad foundation	134.99	130	12.70
	1.60m bgl (WS3)	5.00m long by 0.70m wide strip foundation	135.85	130	5.00
		5.00m long by 1.00m wide strip foundation	147.55	140	4.40
		1.50m square pad foundation	190.97	190	12.90

PILED FOUNDATIONS	Based on the results of the intrusive investigation, a piled foundation scheme was unlikely to be required (subject to any trees).
EXCAVATIONS AND INSTABILITY	Shallow excavations in any encountered Made Ground are likely to be marginally stable at best. Made Ground however is not expected to be present on site. Long, deep excavations, through the underlying natural ground are likely to become unstable. Unsupported earth faces formed during excavation may be liable to collapse without warning and suitable safety precautions should therefore be taken to ensure that such earth faces are adequately supported before excavations are entered by personnel.
SUB-SURFACE CONCRETE DESIGN	Concrete to be placed in contact with soil or groundwater must be designed in accordance with the recommendations of Building Research Establishment Special Digest 1, 2005, 'Concrete in Aggressive Ground' considering the pH of the soils. For the classification given below, the "mobile" and "natural" case was adopted given the geology encountered and the previous use of the site. This assessment was based on the results of chemical laboratory testing displayed within Appendix G, specifically relating to sulphates, pH and other water soluble chemicals. According to Box C6 of BRE Special Digest 1, 2005, 'Concrete in Aggressive Ground' the Weald Clay Formation fell within a list of UK geological formations known to contain pyrite. It was therefore required to consider the levels of total potential sulphate in the classification process. The water-soluble sulphates in the Weald Clay Formation was noted to be 25.3 – 572mg/l, with a pH of 7.9 – 8.3, from chemical laboratory testing. The total potential sulphate (3x total sulphur) was <0.045 – 0.924%, from chemical laboratory testing. Therefore, sulphate concentrations measured in 2:1 water/soil extracts taken from the Weald Clay Formation and total potential sulphate concentrations, fell into Class **DS-3** of the BRE Special Digest 1,

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	2005, 'Concrete in Aggressive Ground'. Table C1 of the Digest indicated an ACEC (Aggressive Chemical Environment for Concrete) classification of **AC-3**.
SURFACE WATER DISPOSAL	Soakage testing was beyond the scope of this investigation. The principles of sustainable urban drainage system (SUDS) should be applied to reduce the risk of flooding from surface water ponding and collection associated with the construction of the foundations. Consultation with the Environment Agency must be sought regarding any use that may have an impact on groundwater resources, abstractions and surface water features/watercourses.
ROADS AND HARDSTANDING	This section provides information relating to the construction of roads and hardstanding, for each strata encountered. **Topsoil** Roads and hardstanding should bypass Topsoil given the likely low strength, high compressibility and general variability. **Weald Clay Formation (cohesive)** Roads and hardstanding constructed on the cohesive Weald Clay Formation should be designed based on a CBR value of 2.5%. This is based on reference to Table C1 of TRL1132 and average construction conditions. Based on wet conditions a CBR of 2.0% should be adopted, with dry conditions a CBR of 2.5% being applicable. These clay-based soils (poorly drained) with plasticity indexes generally greater than 20% are likely to be non-frost susceptible. All formation levels for roads and hardstanding should be proof rolled to highlight any soft areas which should then be dug out and replaced with selected granular material compacted in thin layers to a suitable specification.
WASTE CLASSIFICATION	The excavation of foundations and other soils is likely to produce waste which will require classification and then recycling or removal from site. Under the Landfill (England and Wales) Regulations 2002 (as amended), prior to disposal all waste must be classified as; • Inert; • Non-hazardous, or; • Hazardous. The Environment Agency's Hazardous Waste Technical Guidance (WM3) document outlines the methodology for classifying wastes. Once classified the waste can be removed to the appropriately licensed facilities, with some waste requiring pre-treatments prior to disposal.

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	Hazardous waste requires pre-treatment prior to removal. The site may need to be registered as a Hazardous waste producer should such waste be removed from the site.
DUTY OF CARE	Groundworkers must maintain a good standard of personal hygiene including the wearing of overalls, boots, gloves and eye protectors and the use of dust masks during periods of dry weather. To prevent exposure to airborne dust by both the general public and construction personnel the site should be kept damp during dry weather and at other times when dust is generated as a result of construction activities. The site should be securely fenced at all times to prevent unauthorised access. Washing facilities should be provided and eating restricted to mess huts.

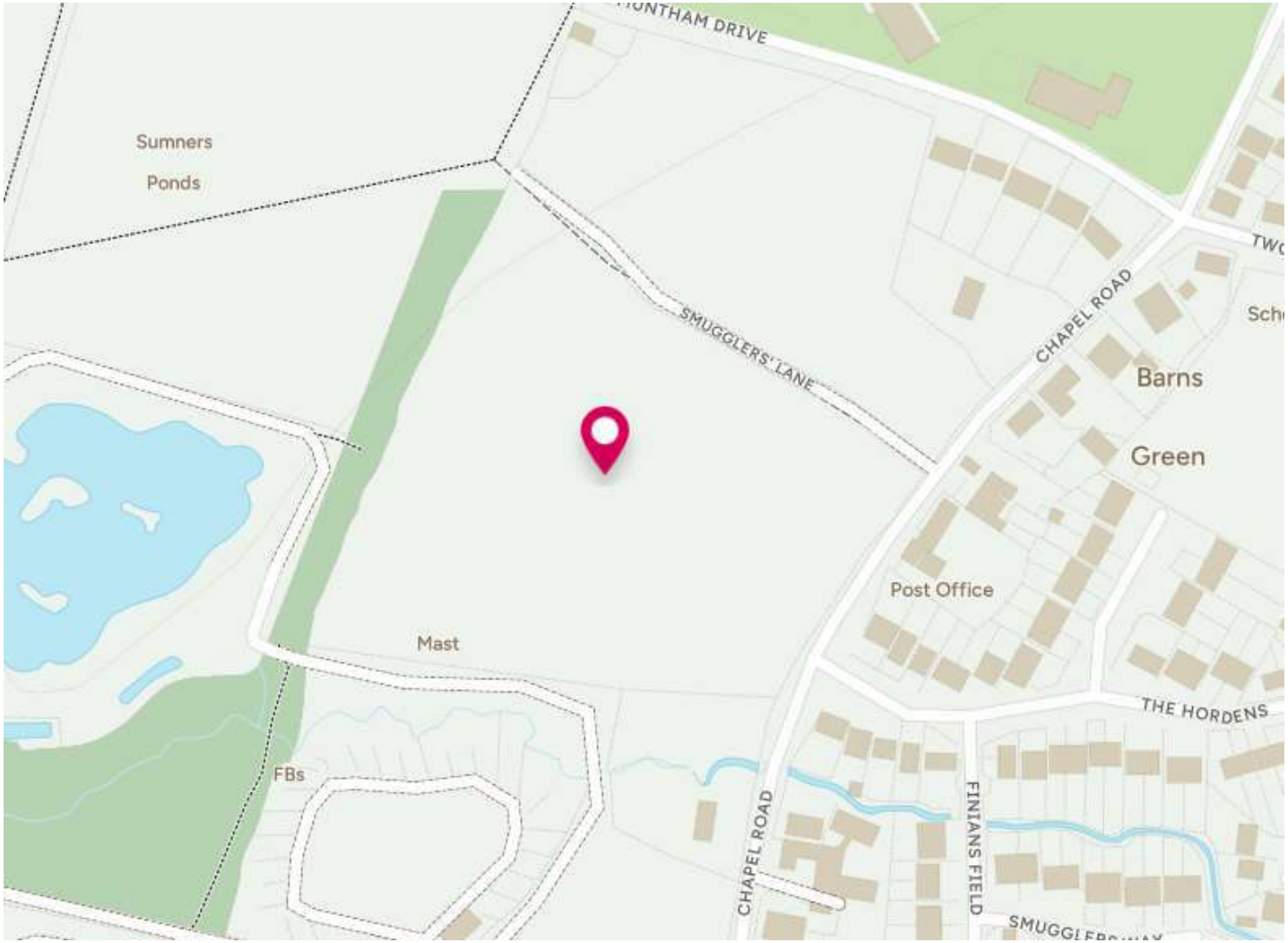
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FIGURES



Site Location

Not to Scale

Land south-west of Smugglers Lane, Barn Green, West Sussex RH13 0PS	
Nigel Grace c/o Mass Studio	**September 2024**
Figure 1: Site Location Plan	**GWPR6192**

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Site boundary

Not to Scale

Land south-west of Smugglers Lane, Barn Green, West Sussex RH13 0PS	
Nigel Grace c/o Mass Studio	**September 2024**
Figure 2: Site Development Area	**GWPR6192**

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Site boundary

Not to Scale

Land south-west of Smugglers Lane, Barn Green, West Sussex RH13 0PS	
Nigel Grace c/o Mass Studio	**September 2024**
Figure 3: Aerial View of the Site	**GWPR6192**

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Not to Scale

Land south-west of Smugglers Lane, Barn Green, West Sussex RH13 0PS	
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Figure 4: Existing Plan View – Ground Floor	**GWPR6192**

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APPENDIX A: Conditions and Limitations

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The ground is a product of continuing natural and artificial processes. As a result, the ground will exhibit a variety of characteristics that vary from place to place across a site, and also with time. Whilst a ground investigation will mitigate to a greater or lesser degree against the resulting risk from variation, the risks cannot be eliminated.

The report has been prepared on the basis of information, data and materials which were available at the time of writing. Accordingly any conclusions, opinions or judgements made in the report should not be regarded as definitive or relied upon to the exclusion of other information, opinions and judgements.

The investigation, interpretations, and recommendations given in this report were prepared for the sole benefit of the client in accordance with their brief; as such these do not necessarily address all aspects of ground behaviour at the site. No liability is accepted for any reliance placed on it by others unless specifically agreed in writing.

Any decisions made by you, or by any organisation, agency or person who has read, received or been provided with information contained in the report ("you" or "the Recipient") are decisions of the Recipient and we will not make, or be deemed to make, any decisions on behalf of any Recipient. We will not be liable for the consequences of any such decisions.

Current regulations and good practice were used in the preparation of this report. An appropriately qualified person must review the recommendations given in this report at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.

Any Recipient must take into account any other factors apart from the Report of which they and their experts and advisers are or should be aware. The information, data, conclusions, opinions and judgements set out in the report may relate to certain contexts and may not be suitable in other contexts. It is your responsibility to ensure that you do not use the information we provide in the wrong context.

This report is based on readily available geological records, the recorded physical investigation, the strata observed in the works, together with the results of completed site and laboratory tests. Whilst skill and care has been taken to interpret these conditions likely between or below investigation points, the possibility of other characteristics not revealed cannot be discounted, for which no liability can be accepted. The impact of our assessment on other aspects of the development required evaluation by other involved parties.

The opinions expressed cannot be absolute due to the limitations of time and resources within the context of the agreed brief and the possibility of unrecorded previous in ground activities. The ground conditions have been sampled or monitored in recorded locations and tests for some of the more common chemicals generally expected. Other concentrations of types of chemicals may exist. It was not part of the scope of this report to comment on environment/contaminated land considerations.

The conclusions and recommendations relate to Land south-west of Smugglers Lane, Barn Green, West Sussex RH13 0PS.

Trial hole is a generic term used to describe a method of direct investigation. The term trial pit, borehole or window sampler borehole implies the specific technique used to produce a trial hole.

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The depth to roots and/or of desiccation may vary from that found during the investigation. The client is responsible for establishing the depth to roots and/or of desiccation on a plot-by-plot basis prior to the construction of foundations. Where trees are mentioned in the text this means existing trees, recently removed trees (approximately 15 years to full recovery on cohesive soils) and those planned as part of the site landscaping.

Ownership of copyright of all printed material including reports, laboratory test results, trial pit and borehole log sheets, including drillers log sheets, remain with Ground and Water Limited. Licence is for the sole use of the client and may not be assigned, transferred or given to a third party.

Only our client may rely on this report and should this report or any information contained in it be provided to any third party we accept no responsibility to the third party for the contents of this report save to the extent expressly outlined by us in writing in a reliance letter addressed from us to the third party.

Recipients are not permitted to publish this report outside of their organisation without our express written consent.

The aim of the investigation was understood to be to supply the client and their designers with information regarding the ground conditions underlying the site to assist them in preparing an appropriate scheme for development.

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APPENDIX B: Technical Glossary

TECHNICAL GLOSSARY

The list of possible definitions within the report may be seen below. Please note that some definitions may not be relevant to this report.

HYDROGEOLOGY:

A **Principal Aquifer** is a layer of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

Secondary (A) Aquifers consist of deposits with permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as Minor Aquifers.

Secondary (B) Aquifers consist of deposits with predominantly lower permeability layers with may stoke and yield limited amounts of groundwater due to localised features such as fissures, think permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.

Secondary Aquifers (Undifferentiated) are assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both a minor aquifer and non-aquifer in different locations due to the variable characteristics of the rock type.

Unproductive Strata are rock layers with low permeability that have negligible significance for water supply or river base flow. These were formerly classified as non-aquifers.

FLOOD ZONES:

Environment Agency Flood Zone 2, defined as; land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding.

Environment Agency Flood Zone 3 shows the extent of a river flood with a 1 in 100 (1%0 or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year.

Environment Agency Flood Zone 3 area that benefits from flood defences, defined as; land and property in this flood zone would have a high probability of flooding without the local flood defences. These protect the area against a river flood with a 1% chance of happening each year, or a flood from the sea with a 0.5% chance of happening each year.

GROUNDWATER SOURCE PROTECTION ZONES (SPZS):

Inner Zone (SPZ1): This zone is 50 day travel time of pollutant to source with a 50 metres default minimum radius.

Outer Zone (SPZ2): This zone is 400 day travel time of pollutant to source. This has a 250 or 500 metres minimum radius around the source depending on the amount of water taken.

Total Catchment (SPZ3): This is the area around a supply source within which all the groundwater ends up at the abstraction point. This is the point from where the water is taken. This could extend some distance from the source point.

Zone of Special Interest (SPZ4): This zone is where local conditions require additional protection.

IN-SITU STRENGTH GEOTECHNICAL TESTING:

Windowless Sample and/or Cable Percussion and/or Rotary Boreholes provide samples of the ground for assessment but they do not give any engineering data. The standard penetration test (SPT) is an in-situ dynamic penetration test designed to provide information on the geotechnical engineering properties of soil. The test uses a thick-walled sample tube, with an outside diameter of 50mm and an inside diameter of 35mm, and a length of around 650mm. This is driven into the ground at the bottom of a borehole by blows from a slide hammer with a weight of 63.5kg falling through a distance of 760mm. The sample tube is driven 150mm into the ground and then the number of blows needed for the tube to penetrate each 75mm up to a depth of 450mm is recorded. The sum of the number of blows is termed the "standard penetration resistance" or the "N-value".

Dynamic Probing involves the driving of a metal cone into the ground via a series of steel rods. These rods are driven from the surface by a hammer system that lifts and drops a 63.5kg (SHDP) hammer onto the top of the rods through a set height, thus ensuring a consistent energy input. The number of hammer blows that are required to drive the cone down by each 100mm increment are recorded. These blow counts then provide a comparative assessment from which correlations have been published, based on dynamic energy, which permits engineering parameters to be generated. (The Dynamic Probe 'Super Heavy' (SHDP) Tests were conducted in accordance with BS 1377; 1990; Part 9, Clause 3.2).

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APPENDIX C: Proposed Development Information

MUNTHAM DRIVE

SMUGGLERS' LANE

Path (um)

Ancient Woodland buffer

Track

Open Space/
SuDS Basin

Little
Slaughterford

Applemead

El Sub Sta

32.1m

31.3m

Chapel
House

North
Cottage

South
Cottage

FARM CL

Herc
Reac

PO

N
W
E
S

0 10m 20m

Proposed Sketch Layout Plan
Barns Green, Horsham

24088 / SK01

Scale 1:500 @ A1 July 2024

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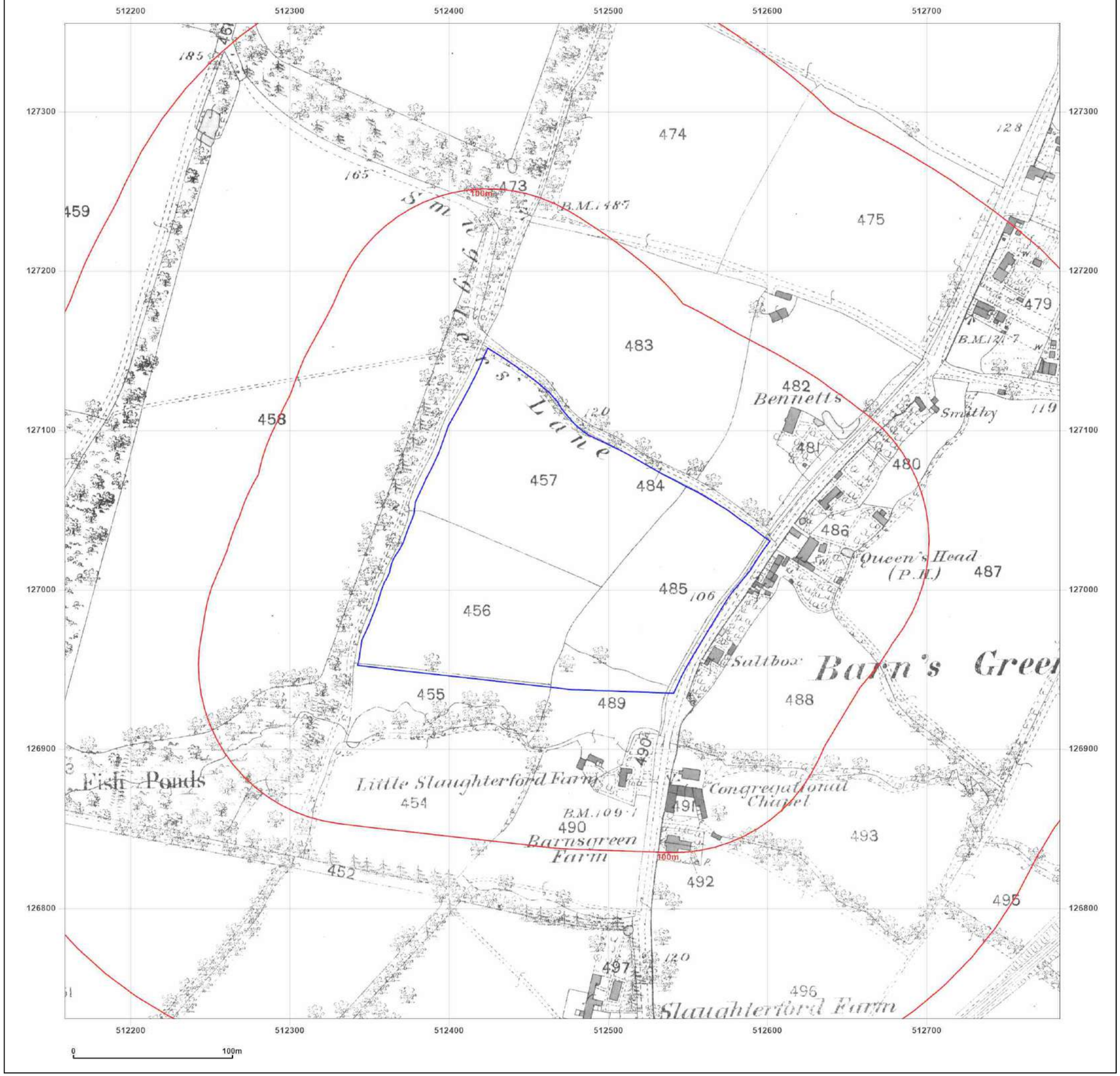
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APPENDIX D: GroundSure Historical Mapping



Groundsure INSIGHTS

Site Details:

Land south-west of Smugglers Lane Barn Green Horsham, West Sussex RH13 0PS, RH13 0PS

Client Ref: GWPR6192
Report Ref: GS-88F-LRD-1UJ-5T7
Grid Ref: 512471, 127043

Map Name: County Series
Map date: **1876**
Scale: 1:2,500
Printed at: 1:2,500

N
W E
S

Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

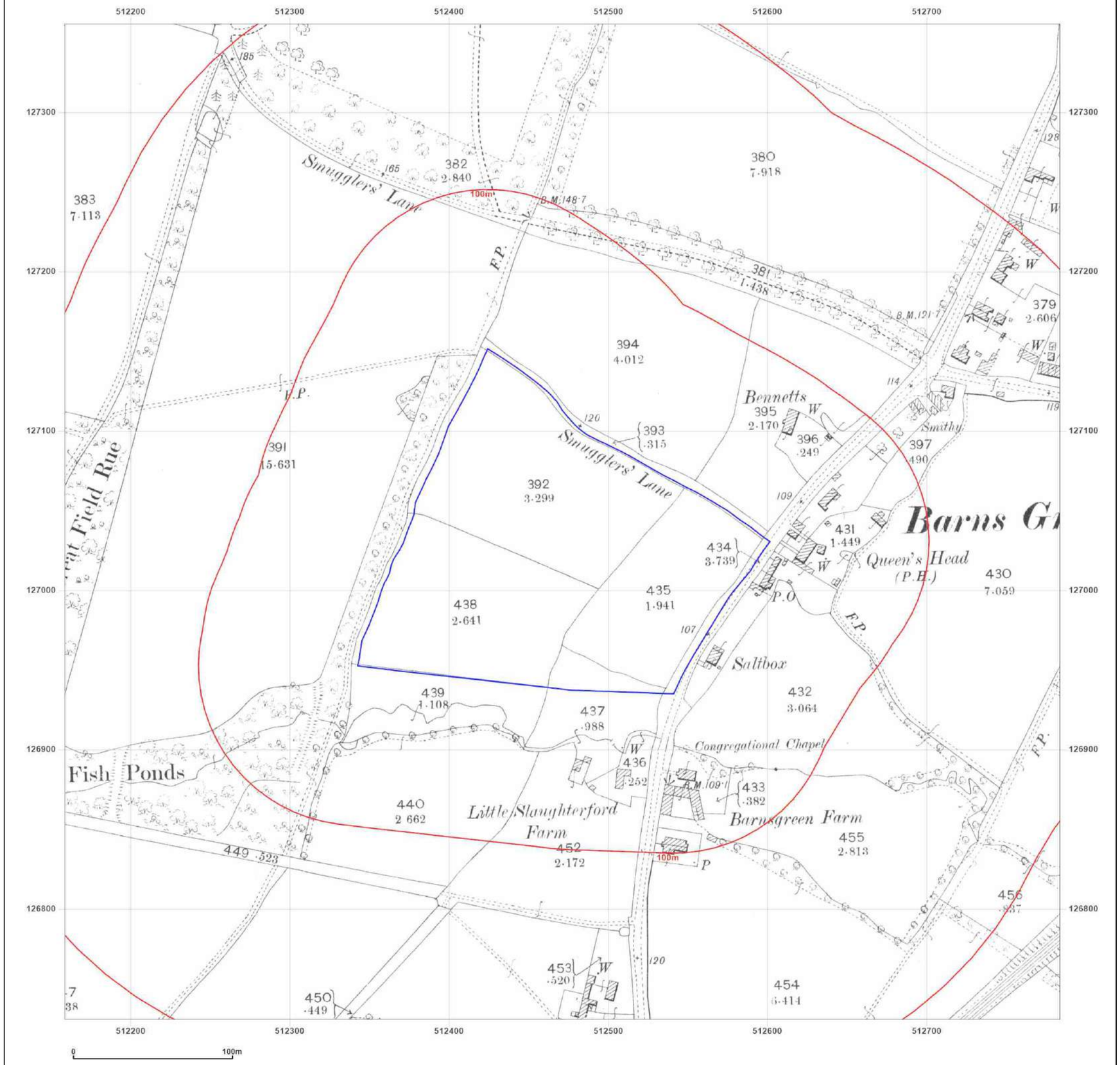
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Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

Land south-west of Smugglers Lane Barn Green Horsham, West Sussex RH13 0PS, RH13 0PS

Client Ref: GWPR6192
Report Ref: GS-88F-LRD-1UJ-5T7
Grid Ref: 512471, 127043

Map Name: County Series
Map date: **1897**
Scale: 1:2,500
Printed at: 1:2,500

N
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Surveyed 1897
Revised 1897
Edition N/A
Copyright N/A
Levelled N/A

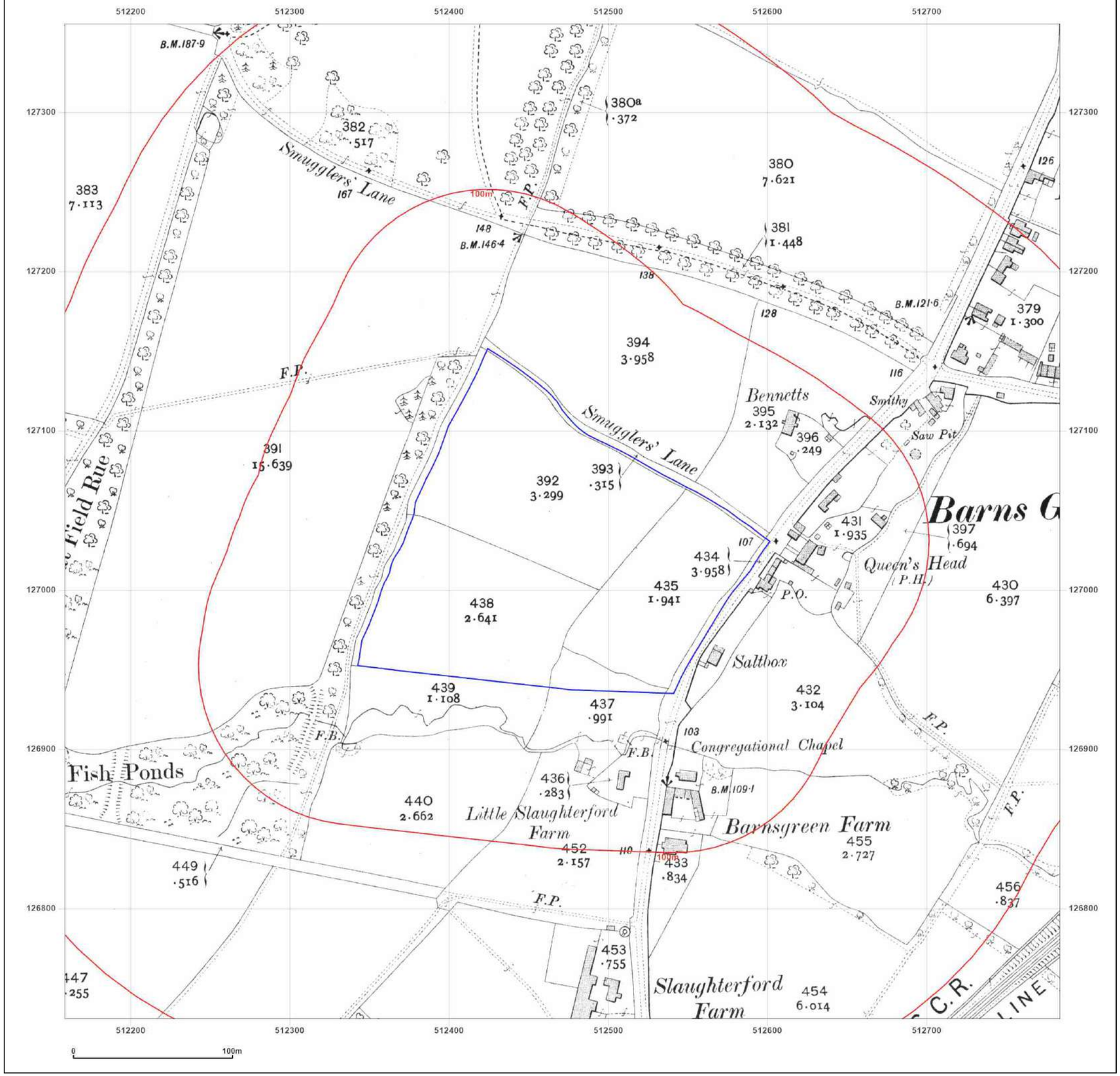
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Production date: 22 August 2024

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Site Details:

Land south-west of Smugglers Lane Barn Green Horsham, West Sussex RH13 0PS, RH13 0PS

Client Ref: GWPR6192
Report Ref: GS-88F-LRD-1UJ-5T7
Grid Ref: 512471, 127043

Map Name: County Series
Map date: **1911**
Scale: 1:2,500
Printed at: 1:2,500

N
W E
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Surveyed 1911
Revised 1911
Edition N/A
Copyright N/A
Levelled N/A

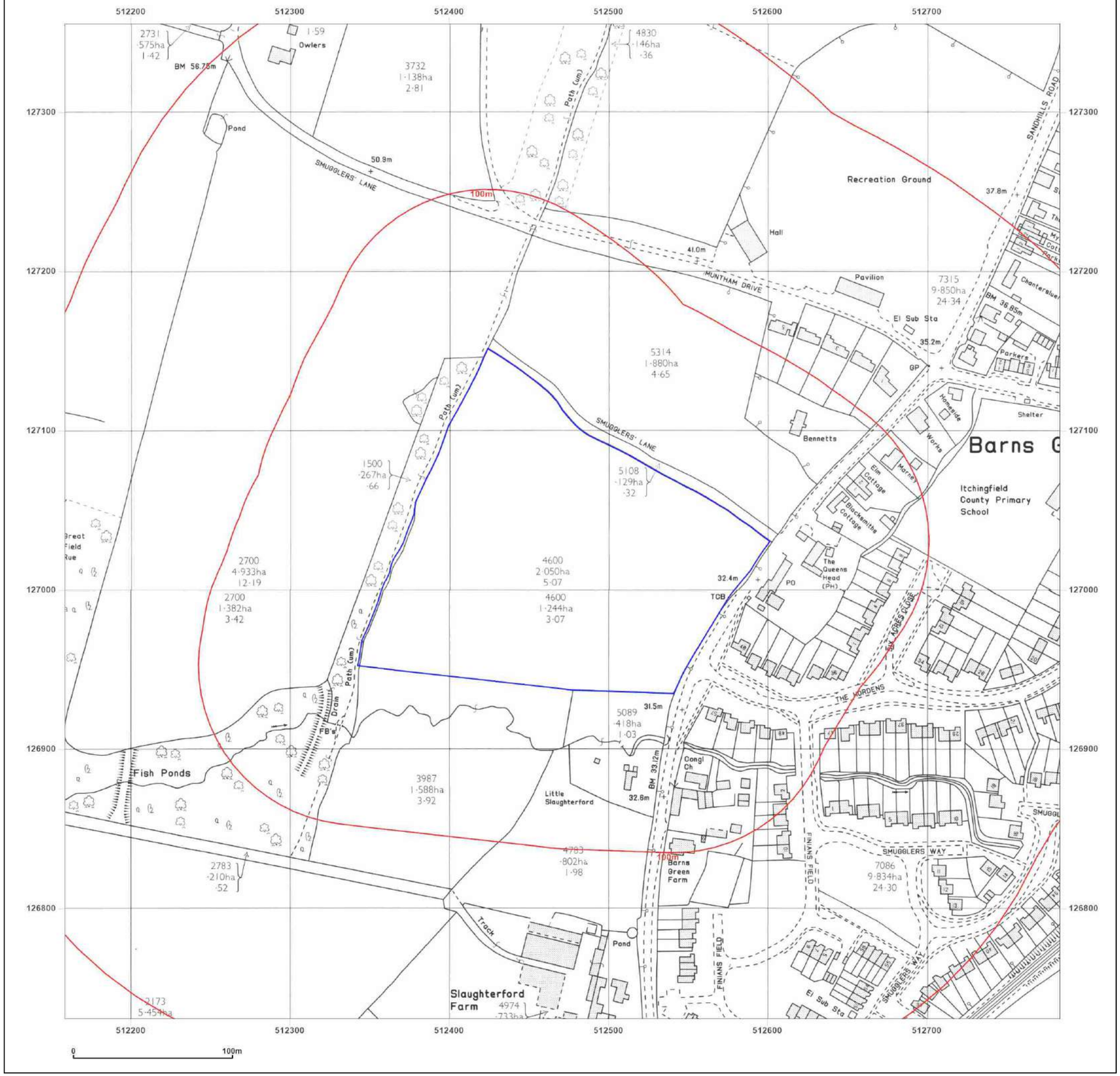
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Groundsure INSIGHTS

Site Details:

Land south-west of Smugglers Lane Barn Green Horsham, West Sussex RH13 0PS, RH13 0PS

Client Ref: GWPR6192
Report Ref: GS-88F-LRD-1UJ-5T7
Grid Ref: 512471, 127043

Map Name: National Grid

Map date: **1977**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1975
Revised 1975
Edition N/A
Copyright 1977
Levelled 1952

Surveyed 1975
Revised 1975
Edition N/A
Copyright 1977
Levelled 1952

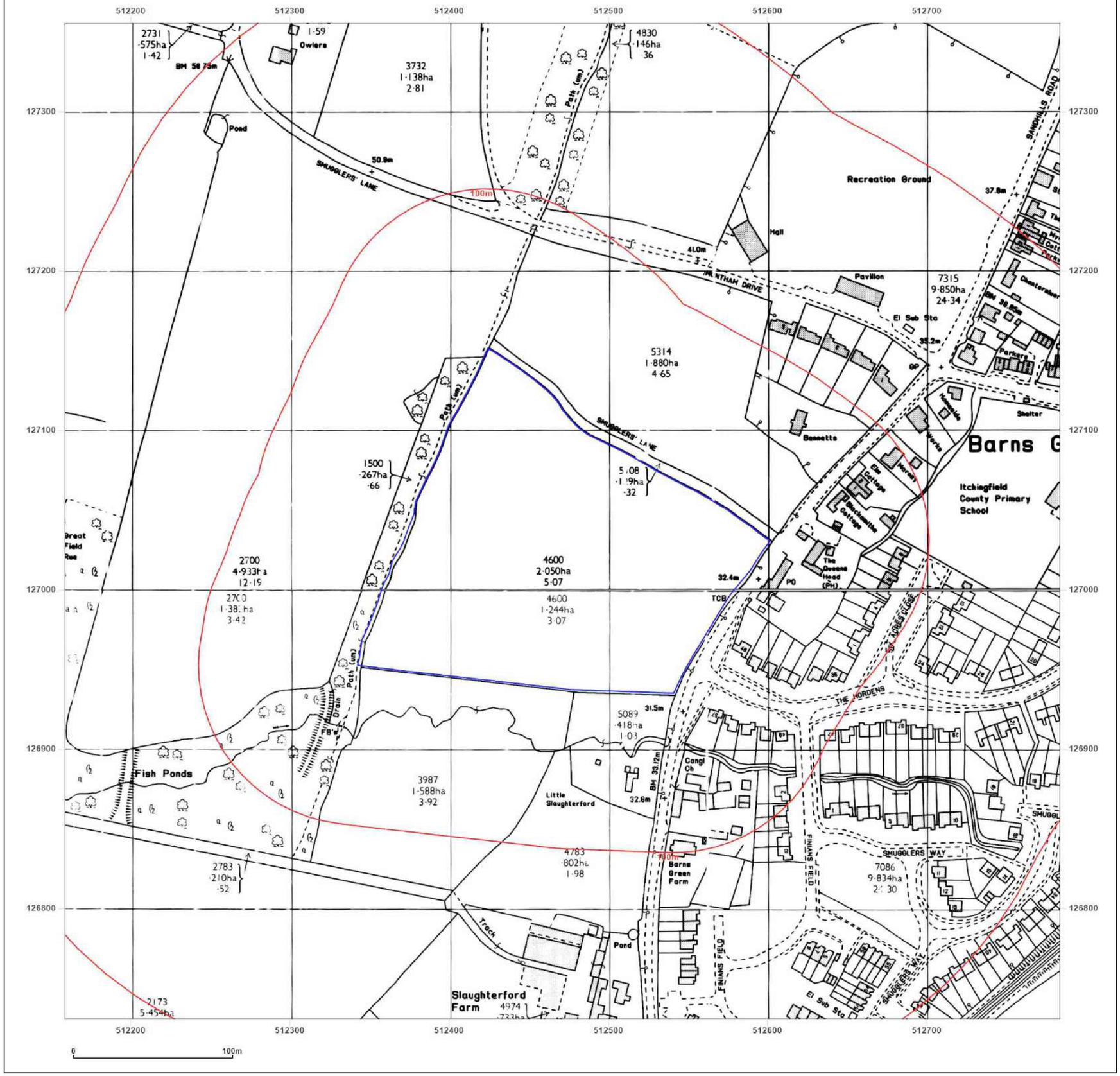
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Site Details:

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Client Ref: GWPR6192
Report Ref: GS-88F-LRD-1UJ-5T7
Grid Ref: 512471, 127043

Map Name: National Grid

Map date: **1977**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

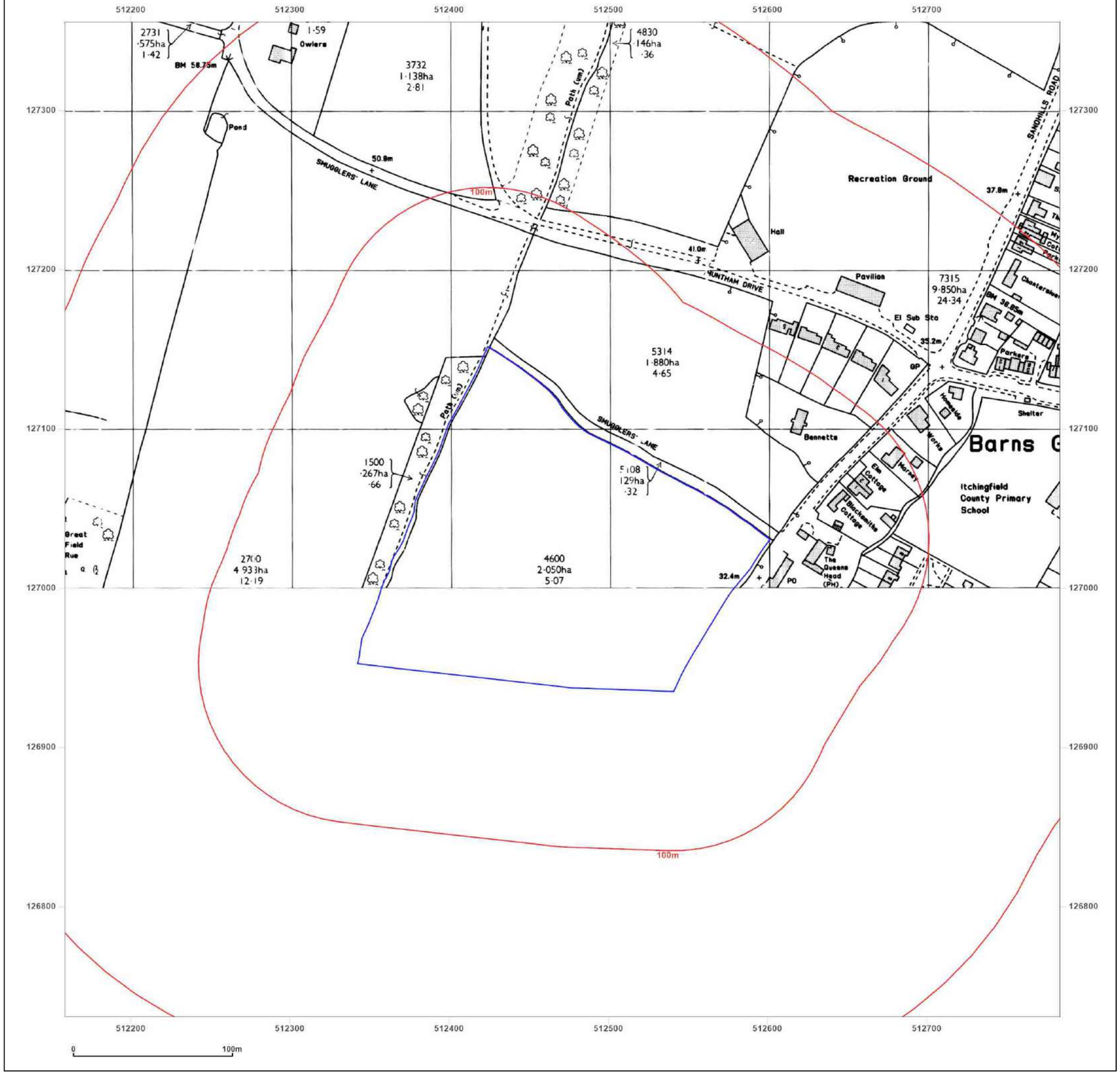
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Site Details:

Land south-west of Smugglers Lane Barn Green Horsham, West Sussex RH13 0PS, RH13 0PS

Client Ref: GWPR6192
Report Ref: GS-88F-LRD-1UJ-5T7
Grid Ref: 512471, 127043

Map Name: National Grid

Map date: **1977**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

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Groundsure INSIGHTS

Site Details:

Land south-west of Smugglers Lane Barn Green Horsham, West Sussex RH13 0PS, RH13 0PS

Client Ref: GWPR6192
Report Ref: GS-88F-LRD-1UJ-5T7
Grid Ref: 512471, 127043

Map Name: National Grid

Map date: **1984**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1976
Revised 1984
Edition N/A
Copyright 1984
Levelled 1976

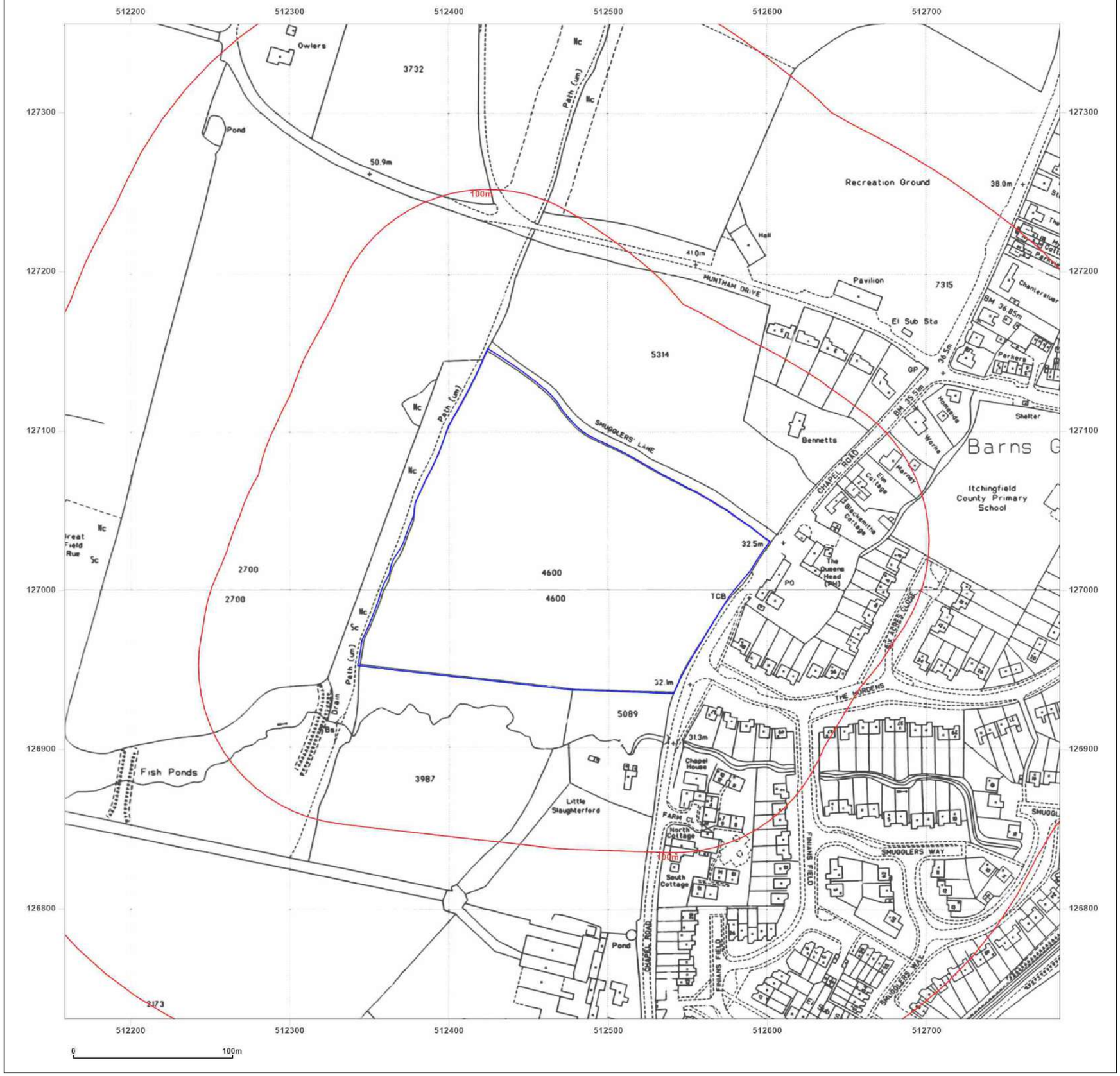
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Groundsure INSIGHTS

Site Details:

Land south-west of Smugglers Lane Barn Green Horsham, West Sussex RH13 0PS, RH13 0PS

Client Ref: GWPR6192
Report Ref: GS-88F-LRD-1UJ-5T7
Grid Ref: 512471, 127043

Map Name: National Grid

Map date: **1993**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1993
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed 1993
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

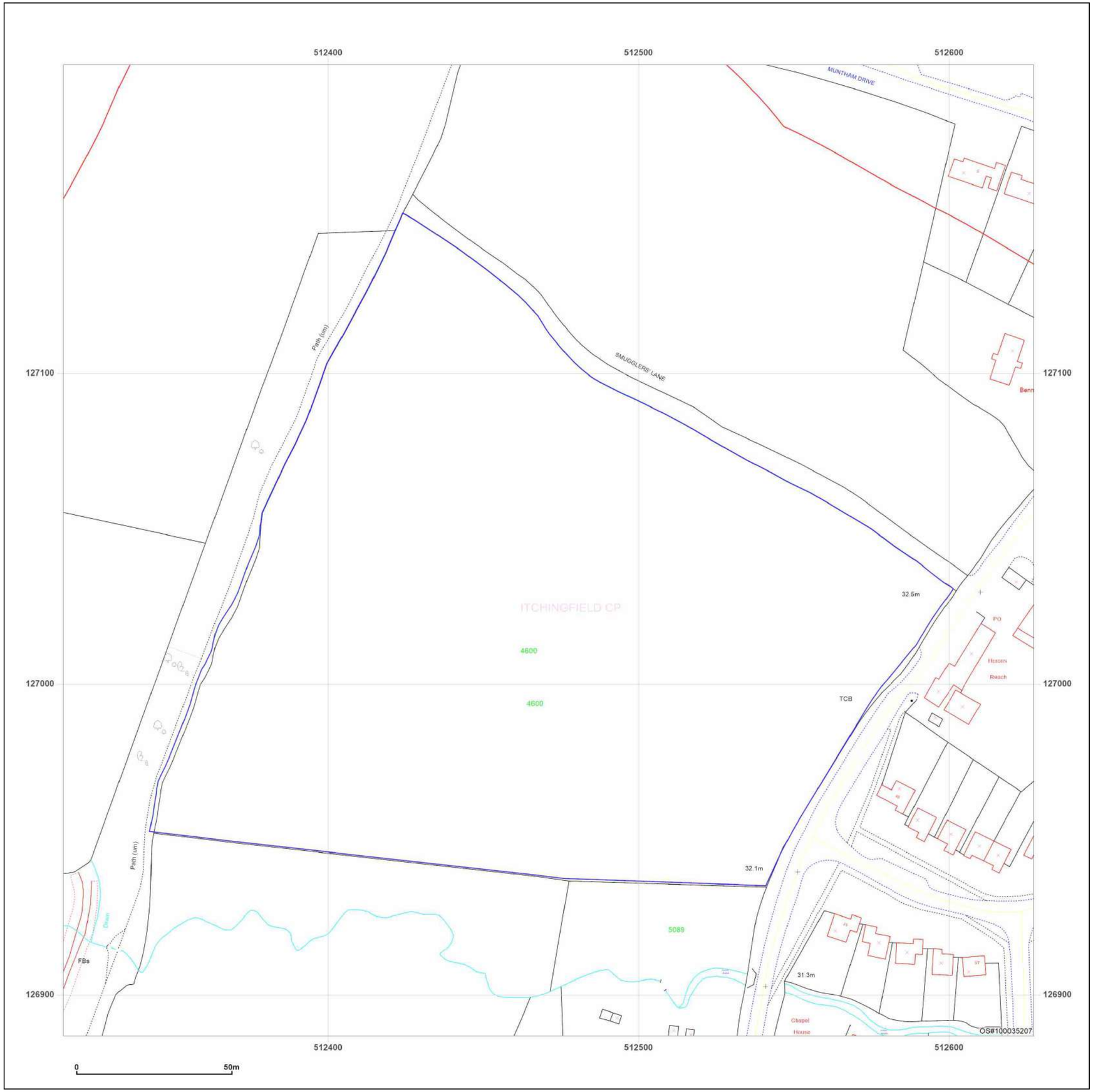
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Production date: 22 August 2024

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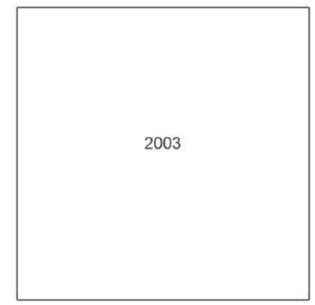
Site Details:

Land south-west of Smugglers Lane Barn Green Horsham, West Sussex RH13 0PS, RH13 0PS

Client Ref: GWPR6192
Report Ref: GS-88F-LRD-1UJ-5T7
Grid Ref: 512471, 127043

Map Name: LandLine
Map date: **2003**
Scale: 1:1,250
Printed at: 1:1,250

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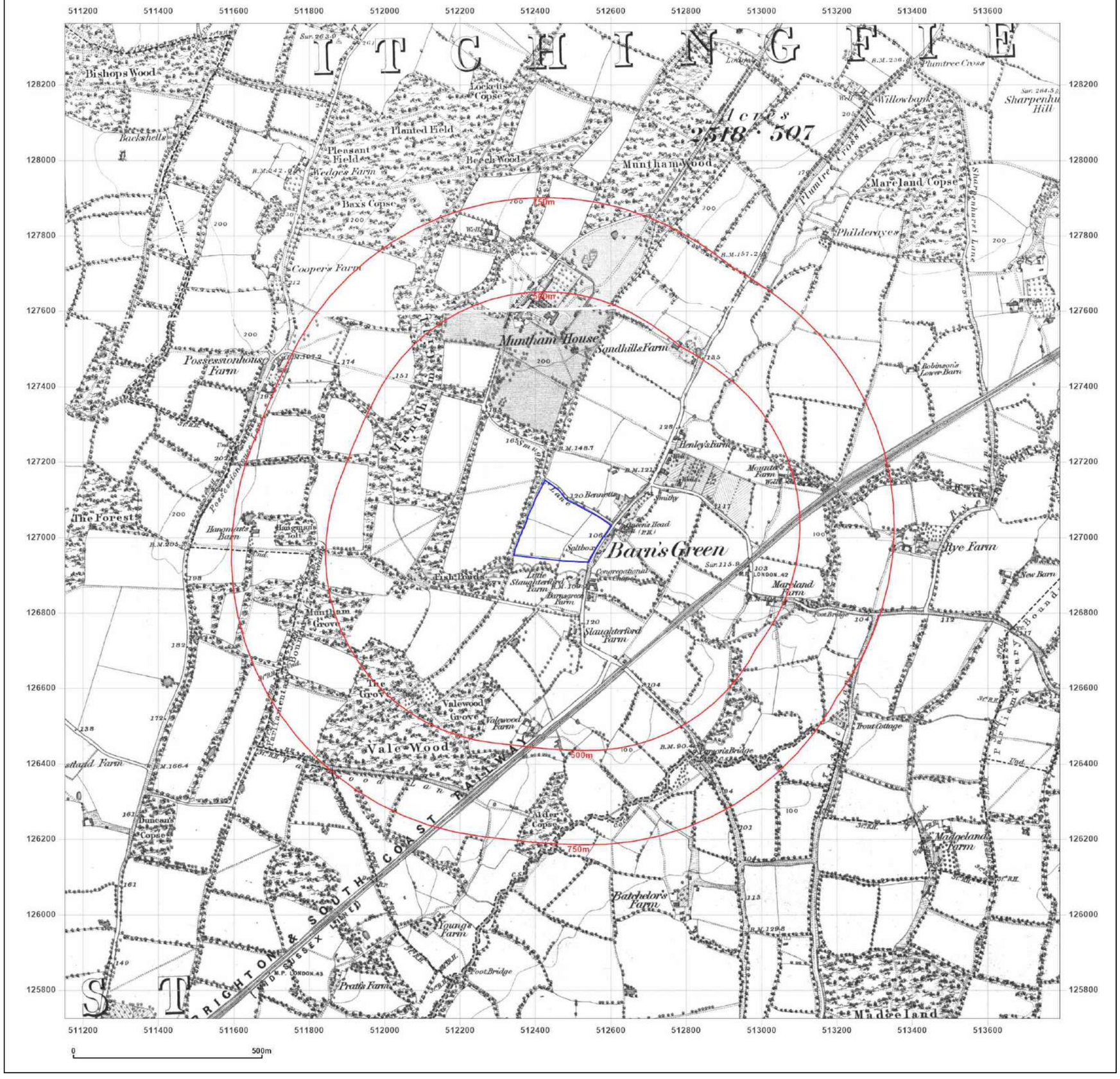
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Production date: 22 August 2024

Map legend available at:
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Site Details:

Land south-west of Smugglers Lane Barn Green Horsham, West Sussex RH13 0PS, RH13 0PS

Client Ref: GWPR6192
Report Ref: GS-88F-LRD-1UJ-5T7
Grid Ref: 512471, 127043

Map Name: County Series

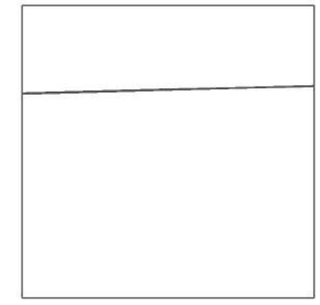
Map date: **1876**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

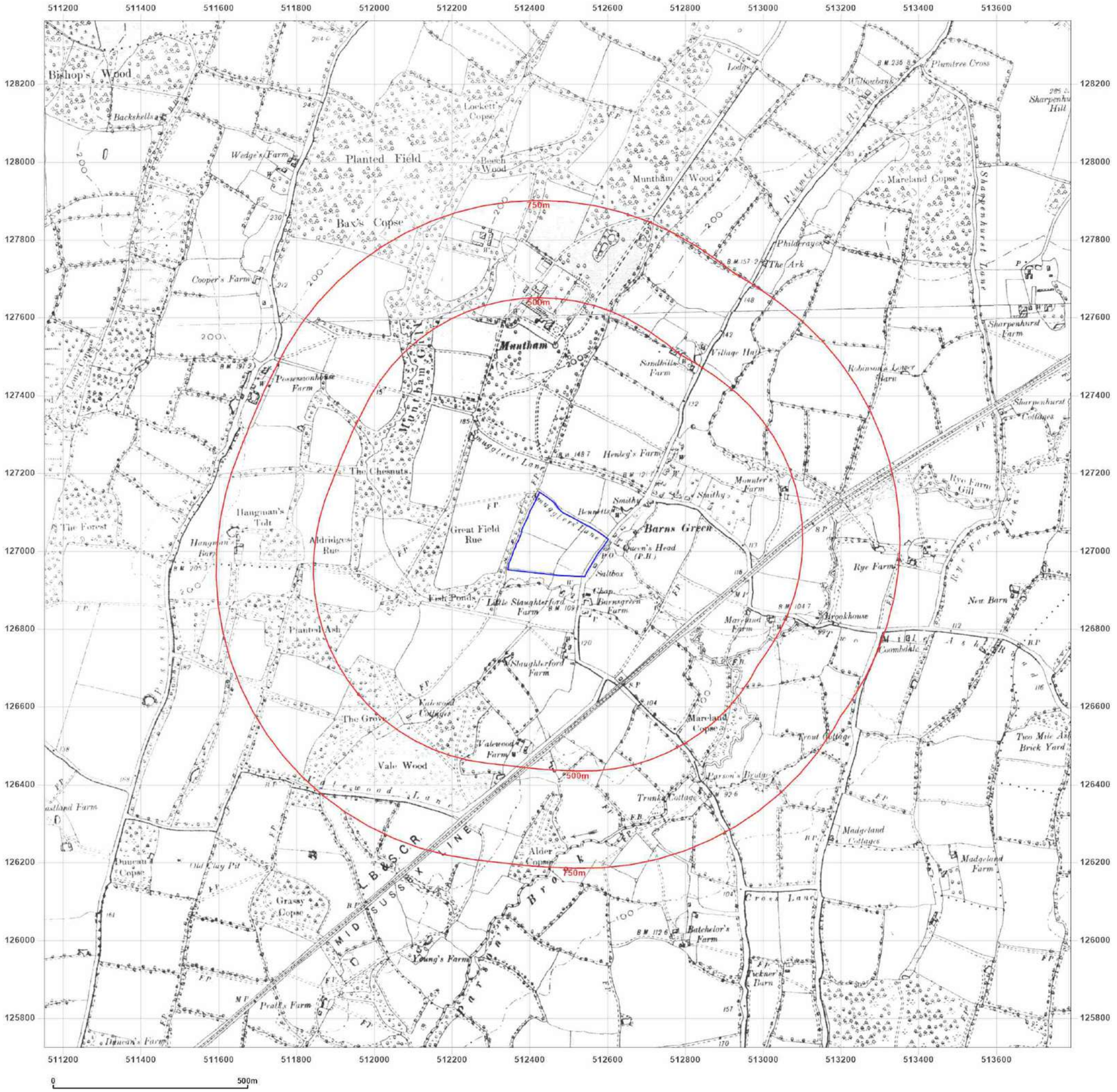
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Groundsure INSIGHTS

Site Details:

Land south-west of Smugglers Lane Barn Green Horsham, West Sussex RH13 0PS, RH13 0PS

Client Ref: GWPR6192
Report Ref: GS-88F-LRD-1UJ-5T7
Grid Ref: 512471, 127043

Map Name: County Series

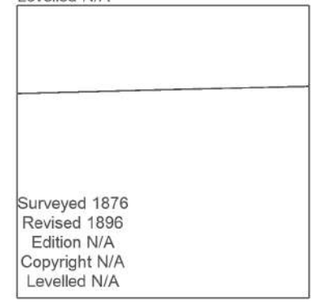
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Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1876
Revised 1896
Edition N/A
Copyright N/A
Levelled N/A



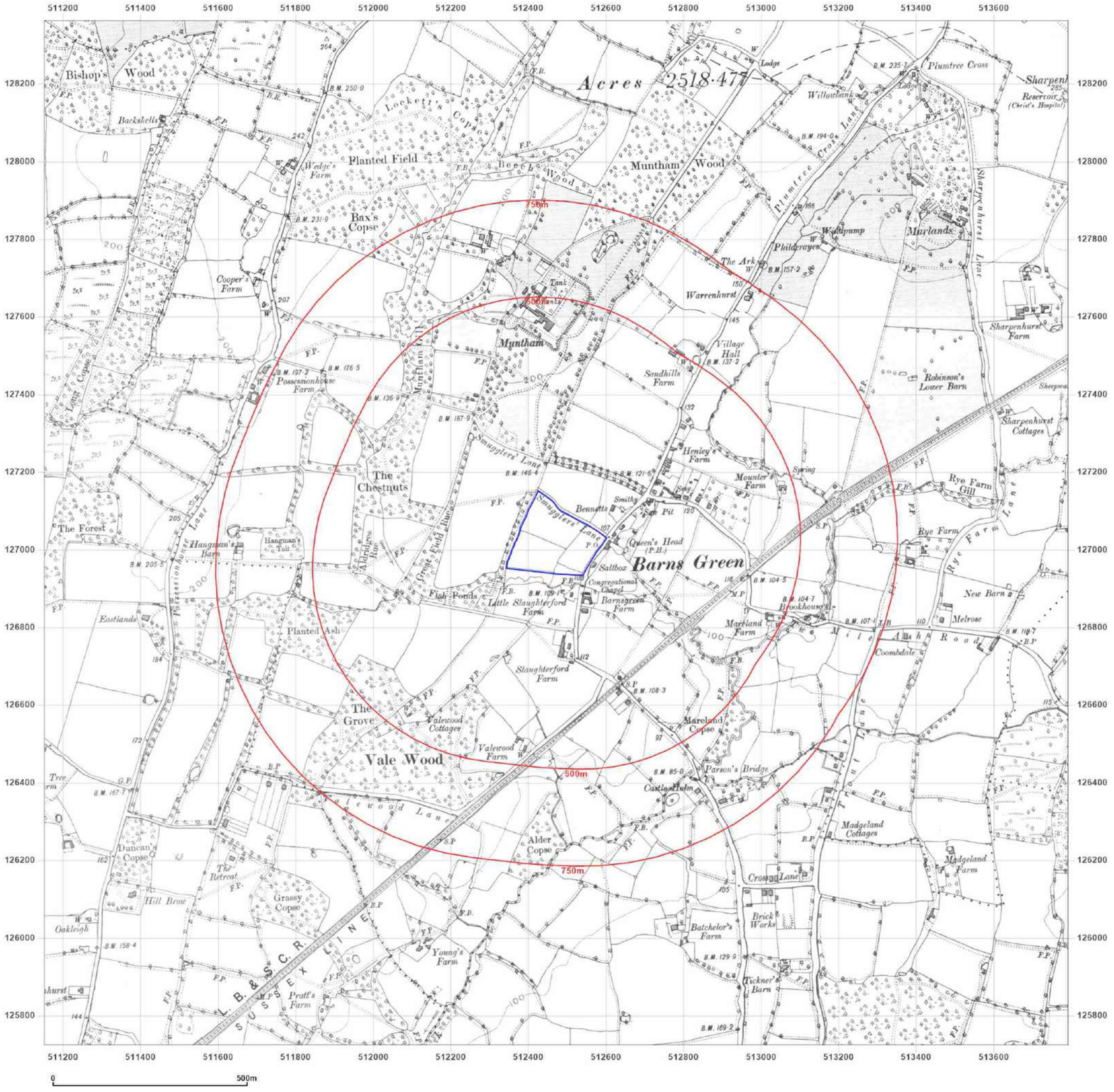
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Groundsure INSIGHTS

Site Details:

Land south-west of Smugglers Lane Barn Green Horsham, West Sussex RH13 0PS, RH13 0PS

Client Ref: GWPR6192
Report Ref: GS-88F-LRD-1UJ-5T7
Grid Ref: 512471, 127043

Map Name: County Series

Map date: **1913**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1874
Revised 1913
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1875
Revised 1913
Edition N/A
Copyright N/A
Levelled N/A

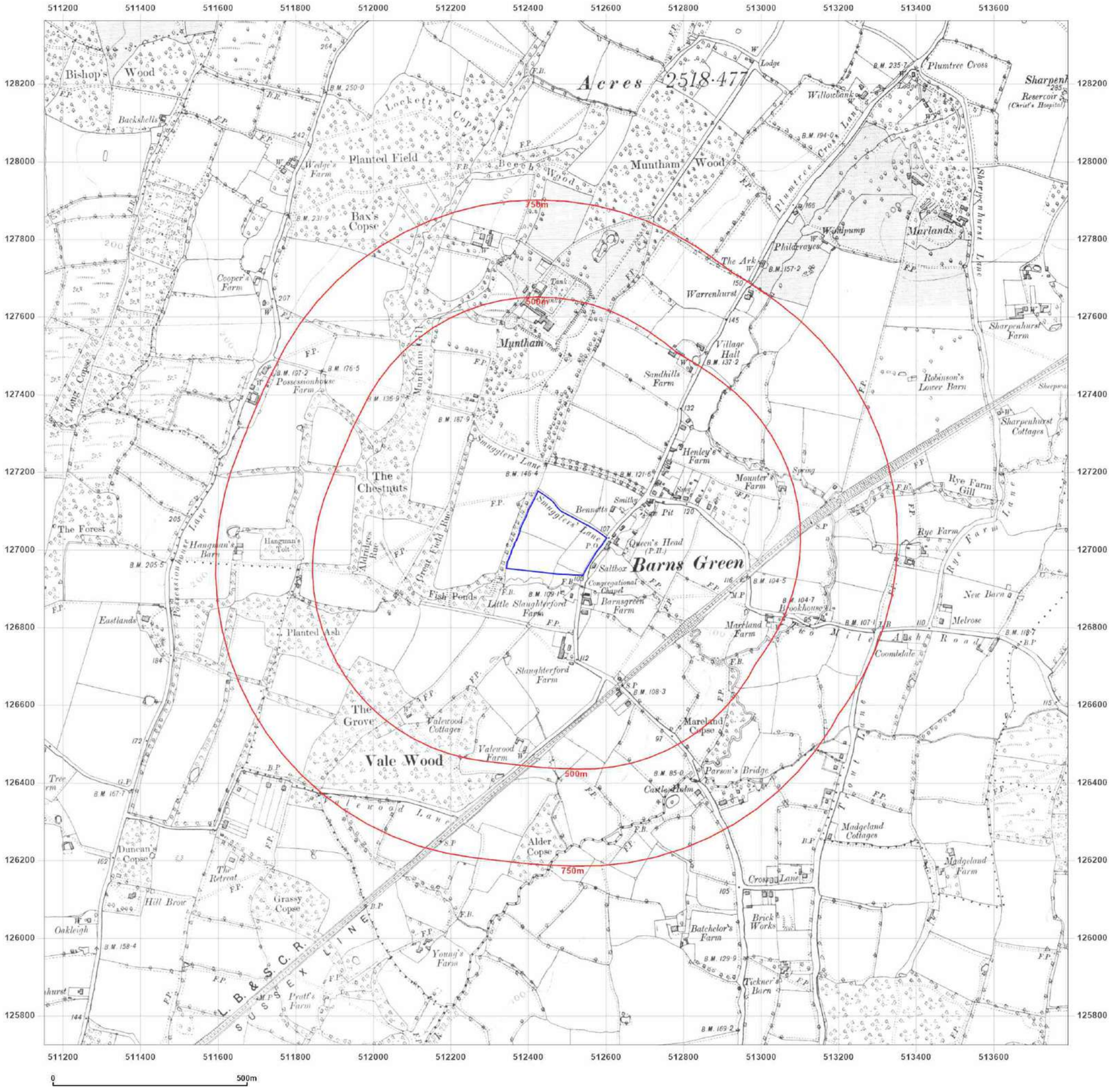
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Groundsure INSIGHTS

Site Details:

Land south-west of Smugglers Lane Barn Green Horsham, West Sussex RH13 0PS, RH13 0PS

Client Ref: GWPR6192
Report Ref: GS-88F-LRD-1UJ-5T7
Grid Ref: 512471, 127043

Map Name: County Series

Map date: **1913**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1874
Revised 1913
Edition 1913
Copyright N/A
Levelled N/A

Surveyed 1875
Revised 1913
Edition 1913
Copyright N/A
Levelled N/A

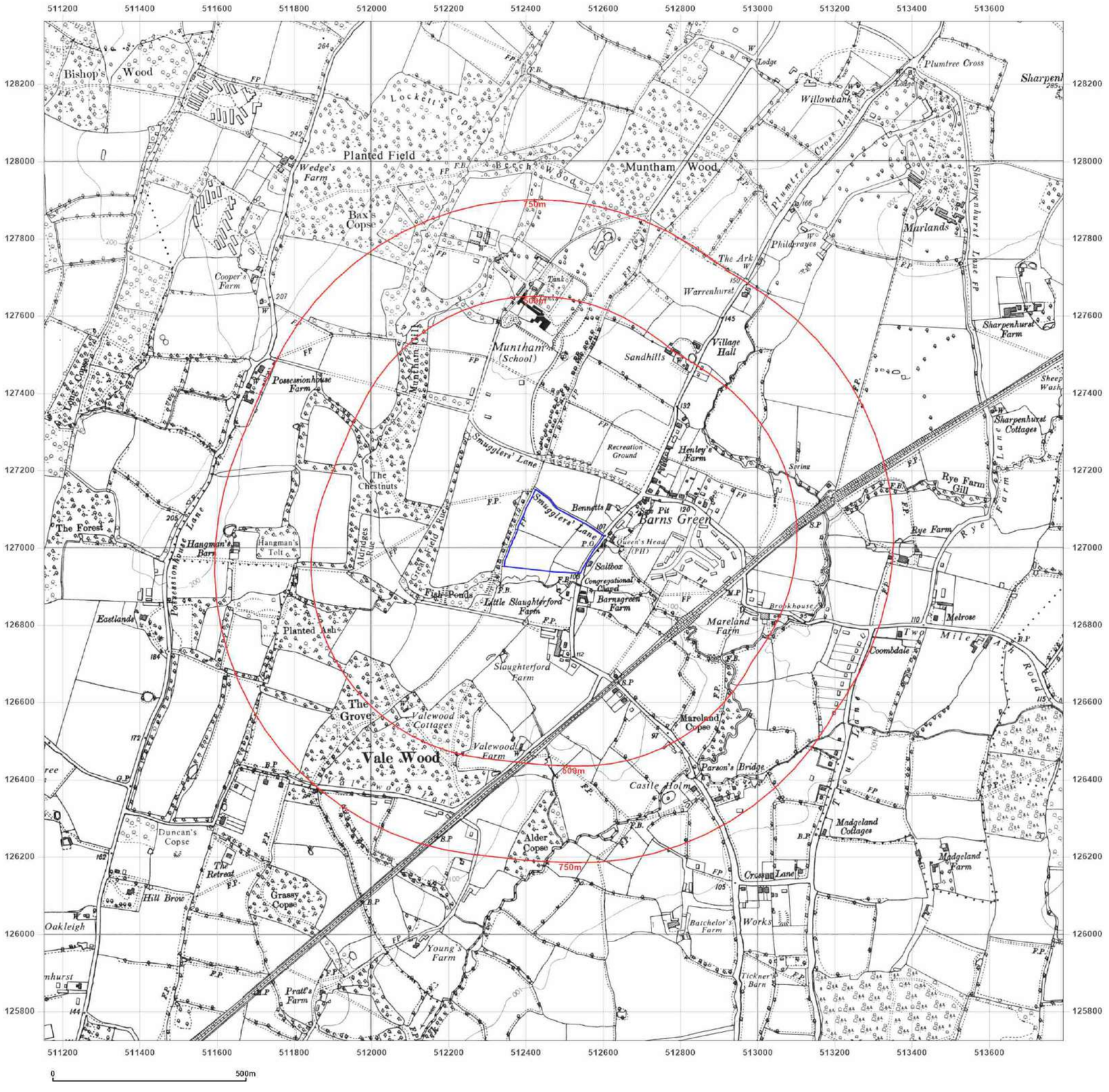
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Groundsure INSIGHTS

Site Details:

Land south-west of Smugglers Lane Barn Green Horsham, West Sussex RH13 0PS, RH13 0PS

Client Ref: GWPR6192
Report Ref: GS-88F-LRD-1UJ-5T7
Grid Ref: 512471, 127043

Map Name: Provisional

Map date: **1956**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1956
Revised 1956
Edition N/A
Copyright N/A
Levelled N/A

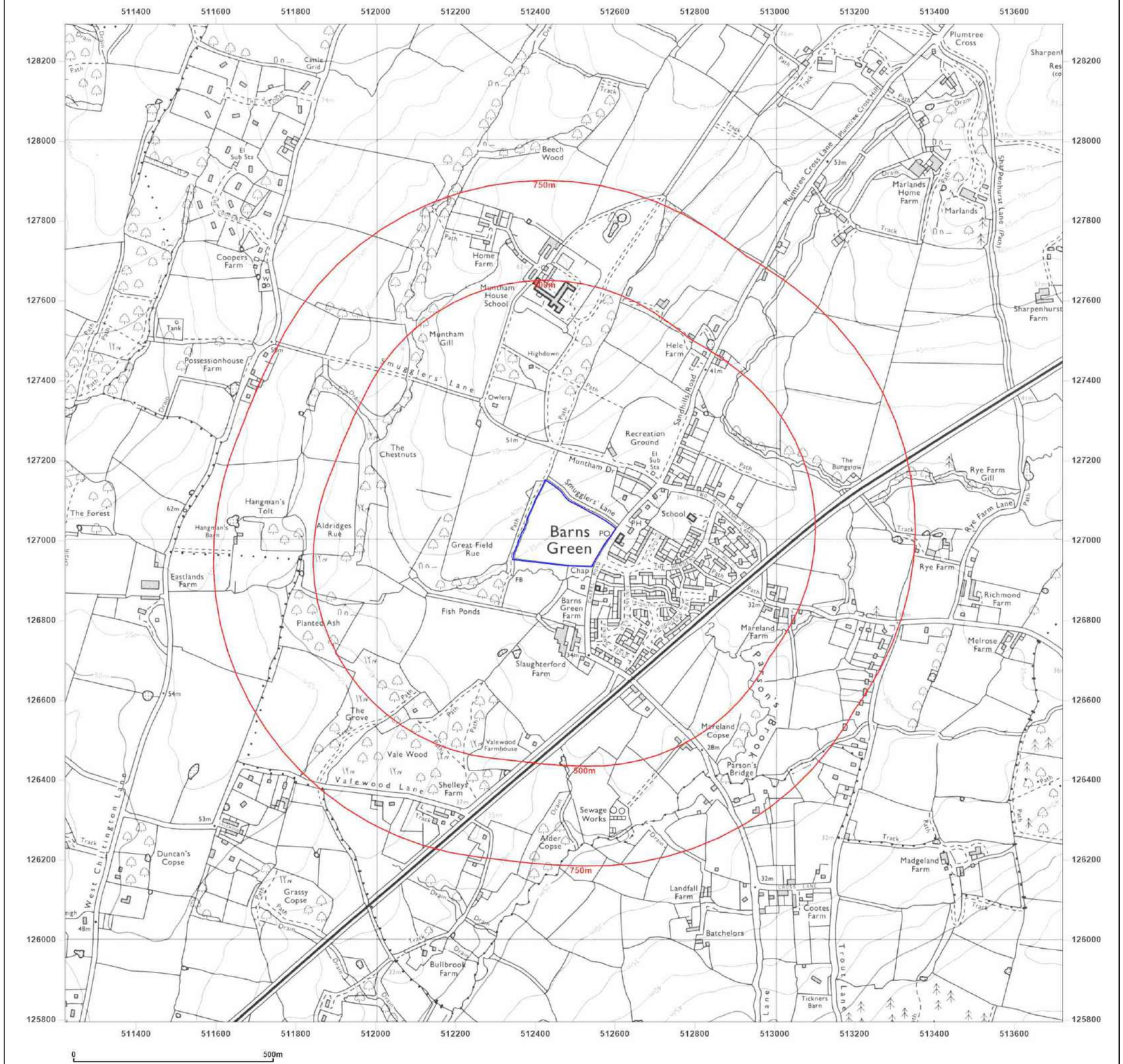
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Groundsure INSIGHTS

Site Details:

Land south-west of Smugglers Lane Barn Green Horsham, West Sussex RH13 0PS, RH13 0PS

Client Ref: GWPR6192
Report Ref: GS-88F-LRD-1UJ-5T7
Grid Ref: 512471, 127043

Map Name: National Grid

Map date: **1981**

Scale: 1:10,000

Printed at: 1:10,000

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Surveyed 1975
Revised 1981
Edition N/A
Copyright N/A
Levelled N/A

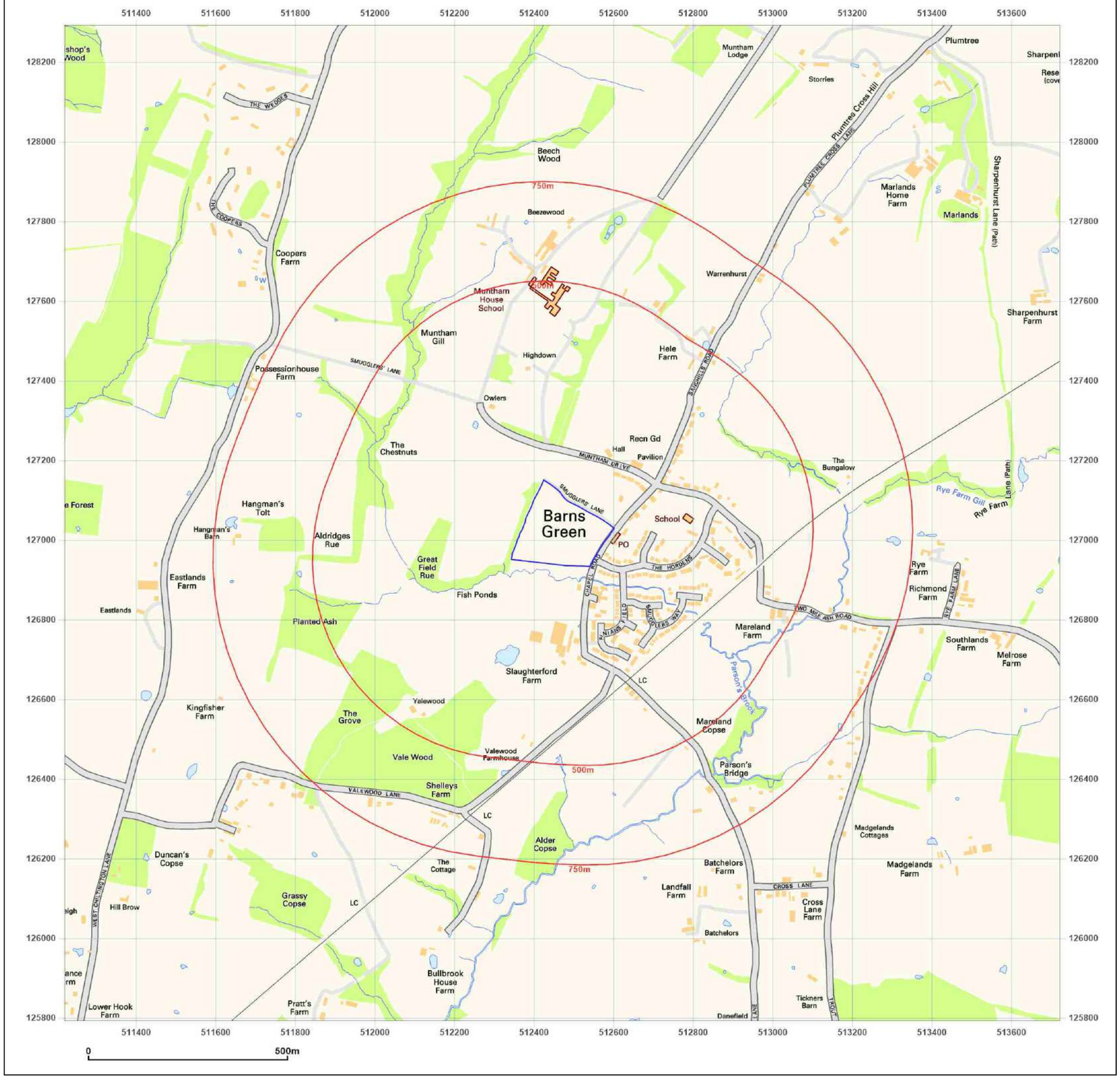
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Groundsure INSIGHTS

Site Details:

Land south-west of Smugglers Lane Barn Green Horsham, West Sussex RH13 0PS, RH13 0PS

Client Ref: GWPR6192
Report Ref: GS-88F-LRD-1UJ-5T7
Grid Ref: 512471, 127043

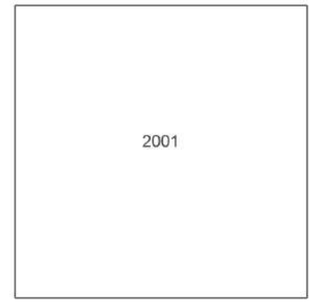
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Map date: **2001**

Scale: 1:10,000

Printed at: 1:10,000

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Groundsure INSIGHTS

Site Details:

Land south-west of Smugglers Lane Barn Green Horsham, West Sussex RH13 0PS, RH13 0PS

Client Ref: GWPR6192
Report Ref: GS-88F-LRD-1UJ-5T7
Grid Ref: 512471, 127043

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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2010

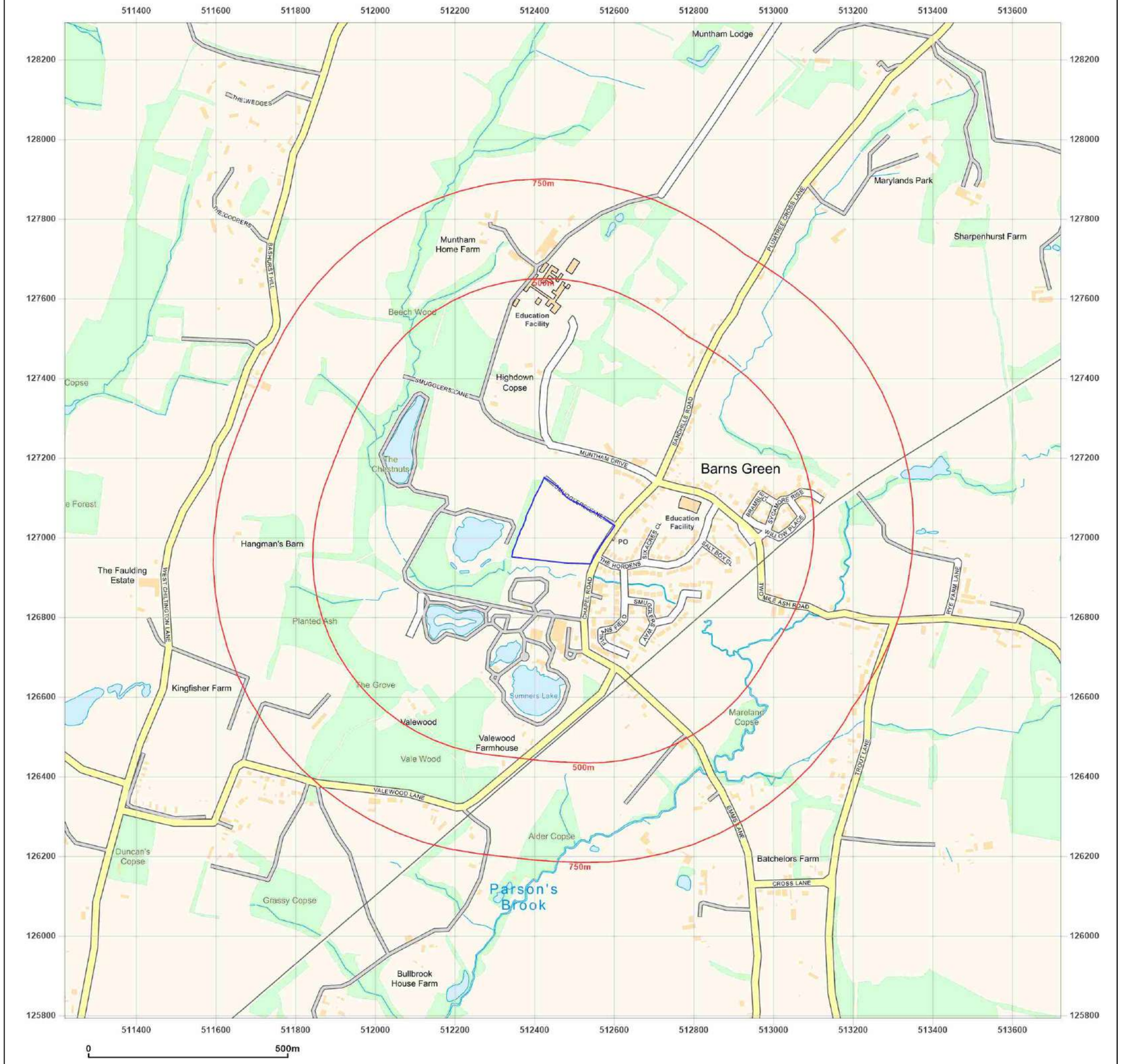
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Groundsure INSIGHTS

Site Details:

Land south-west of Smugglers Lane Barn Green Horsham, West Sussex RH13 0PS, RH13 0PS

Client Ref: GWPR6192
Report Ref: GS-88F-LRD-1UJ-5T7
Grid Ref: 512471, 127043

Map Name: National Grid

Map date: **2024**

Scale: 1:10,000

Printed at: 1:10,000

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2024

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2 The Long Barn,
Norton Farm, Selborne Road,
Alton, Hampshire GU34 3NB

0333 600 1221
enquiries@groundandwater.co.uk

groundandwater.co.uk

APPENDIX E: Trial Hole Logs

Percussion Drilling Log

Project Name: Land south-west of Smugglers Lane, Barn Green	Client: Miller Homes Limited	Date: 30/08/2024
Location: Horsham, West Sussex RH13 0PS	Contractor:	
Project No. : GWPR6192	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS1	WLS			1:50	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.60			TOPSOIL: Brown sandy gravelly silty CLAY. Sand was fine. Gravel was fine to coarse, sub-angular to sub-rounded flint.
		1.00	SPT	N=10 (2,2/2,3,2,3)				WEALD CLAY FORMATION: Brown/orange/grey silty CLAY.
		2.00	SPT	N=13 (3,3/3,3,3,4)				
		3.00	SPT	N=24 (3,4/7,7,5,5)				
		4.00	SPT	N=29 (6,5/6,6,8,9)	3.90			WEALD CLAY FORMATION: Brown/orange/grey mottled CLAYSTONE. Desiccated
		5.00	SPT	N=56 (9,9/13,14,14,15)	5.00			End of Borehole at 5.000m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Fresh roots noted to 0.80m bgl. No groundwater encountered.

Percussion Drilling Log

Project Name: Land south-west of Smugglers Lane, Barn Green	Client: Miller Homes Limited	Date: 30/08/2024
Location: Horsham, West Sussex RH13 0PS	Contractor:	
Project No. : GWPR6192	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS2	WLS			1:50	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30			TOPSOIL: Brown sandy gravelly silty CLAY. Sand was fine. Gravel was fine to coarse, sub-angular to sub-rounded flint.
		1.00	SPT	N=15 (1,2/3,4,4,4)				WEALD CLAY FORMATION: Brown/orange/grey silty CLAY.
		2.00	SPT	N=20 (4,5/5,4,5,6)				
					2.40			WEALD CLAY FORMATION: Brown/orange/grey mottled CLAYSTONE. Desiccated
		3.00	SPT	N=22 (5,5/5,5,6,6)				
		4.00	SPT	46 (10,14/46 for 150mm)	4.00			End of Borehole at 4.000m

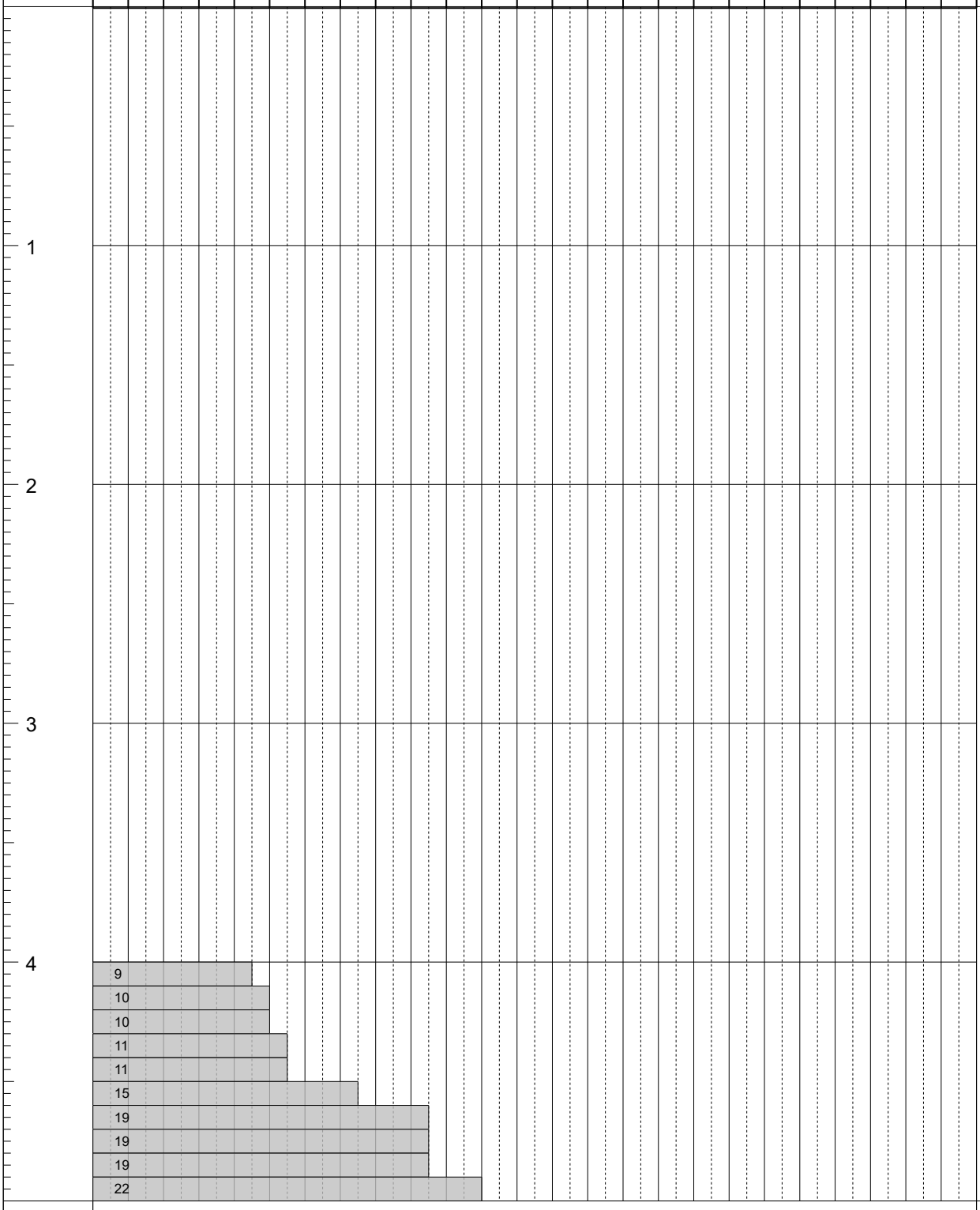
Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Fresh roots noted to 1.00m bgl. No groundwater encountered. Refused on claystone. Dynamic probing (DP2) was undertaken from 4.00m bgl.

Probe Log

			Probe No DP2 Sheet 1 of 1
Project Name: Land south-west of Smugglers Lane, Barn Green	Project No. GWPR6192	Co-ords:	Hole Type DP
Location: Horsham, West Sussex RH13 0PS		Level:	Scale 1:25
Client: Miller Homes Limited		Dates:	Logged By



Remarks:	Fall Height	Cone Base Diameter
	Hammer Wt	Final Depth
	Probe Type DPSH-B	

Percussion Drilling Log

Project Name: Land south-west of Smugglers Lane, Barn Green	Client: Miller Homes Limited	Date: 30/08/2024
Location: Horsham, West Sussex RH13 0PS	Contractor:	
Project No. : GWPR6192	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS3	WLS			1:50	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20			TOPSOIL: Brown sandy gravelly silty CLAY. Sand was fine. Gravel was fine to coarse, sub-angular to sub-rounded flint.
		1.00	SPT	N=8 (1,0/2,2,2,2)				WEALD CLAY FORMATION: Brown/orange/grey silty CLAY.
		2.00	SPT	N=17 (1,2/4,4,4,5)				
		3.00	SPT	N=31 (4,6/6,8,8,9)				
		3.50	SPT	48 (14,14/48 for 150mm)	3.50			End of Borehole at 3.500m

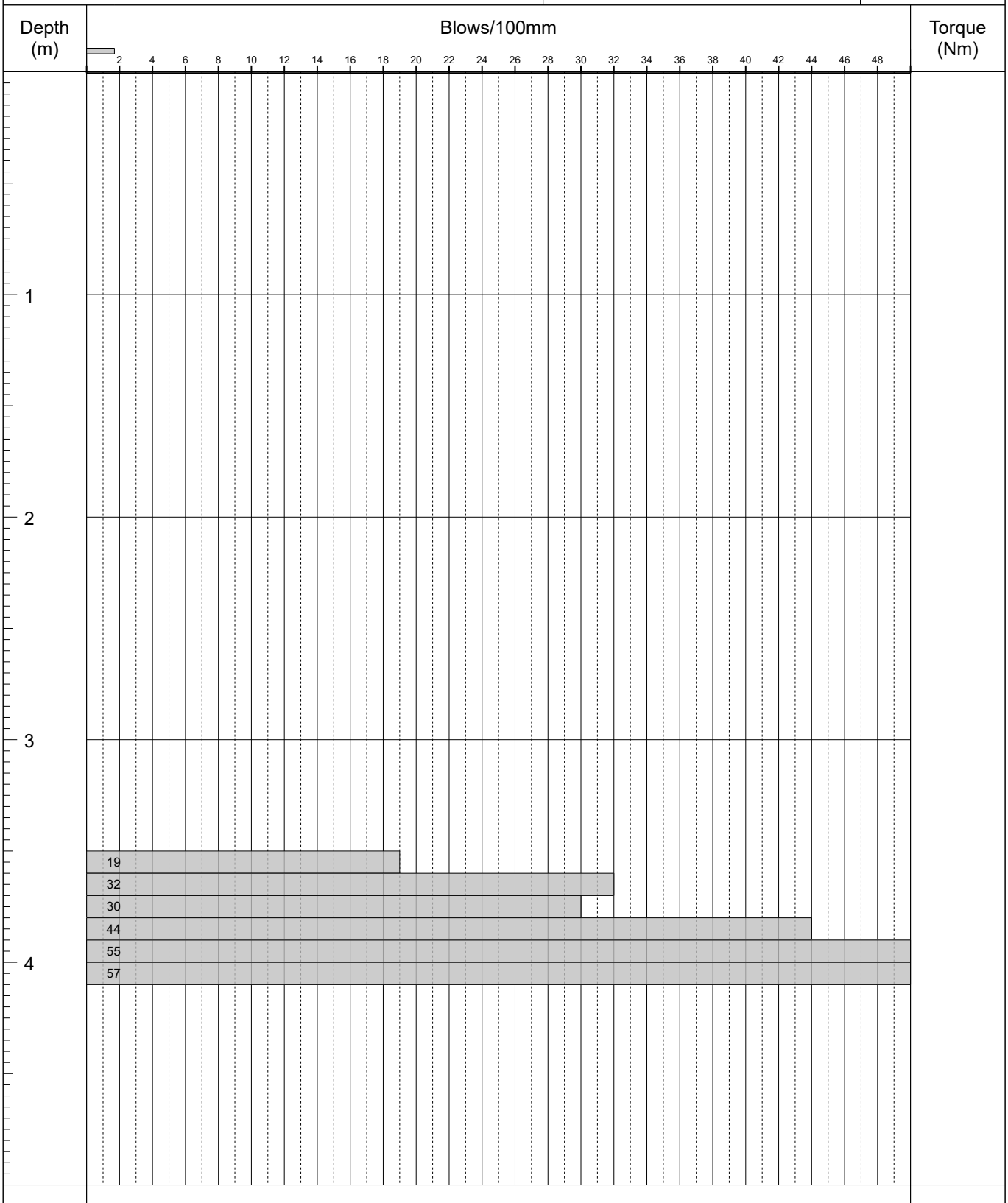
Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Fresh roots noted to 0.80m bgl. No groundwater encountered. Refused on claystone. Dynamic probing (DP3) was undertaken from 3.50m bgl.

Probe Log

			Probe No DP3 Sheet 1 of 1
Project Name: Land south-west of Smugglers Lane, Barn Green	Project No. GWPR6192	Co-ords:	Hole Type DP
Location: Horsham, West Sussex RH13 0PS		Level:	Scale 1:25
Client: Miller Homes Limited		Dates:	Logged By



Remarks:	Fall Height	Cone Base Diameter
	Hammer Wt	Final Depth
	Probe Type DPSH-B	

Percussion Drilling Log

Project Name: Land south-west of Smugglers Lane, Barn Green	Client: Miller Homes Limited	Date: 30/08/2024
Location: Horsham, West Sussex RH13 0PS	Contractor:	
Project No. : GWPR6192	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS4	WLS			1:50	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.40			TOPSOIL: Brown sandy gravelly silty CLAY. Sand was fine. Gravel was fine to coarse, sub-angular to sub-rounded flint.
		1.00	SPT	N=9 (2,2/2,2,2,3)				WEALD CLAY FORMATION: Brown/orange/grey silty CLAY.
		2.00	SPT	N=14 (2,3/3,3,4,4)				
		3.00	SPT	N=22 (5,6/5,5,6,6)				
					3.50			WEALD CLAY FORMATION: Brown/orange/grey mottled CLAYSTONE. Desiccated
		4.00	SPT	N=33 (5,6/6,7,9,11)				
		5.00	SPT	N=98 (10,16/20,20,29,29)	5.00			End of Borehole at 5.000m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Fresh roots noted to 0.80m bgl. No groundwater encountered.

Percussion Drilling Log

Project Name: Land south-west of Smugglers Lane, Barn Green	Client: Miller Homes Limited	Date: 30/08/2024
Location: Horsham, West Sussex RH13 0PS	Contractor:	
Project No. : GWPR6192	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS5	WLS			1:50	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30			TOPSOIL: Brown sandy gravelly silty CLAY. Sand was fine. Gravel was fine to coarse, sub-angular to sub-rounded flint.
		1.00	SPT	N=10 (2,2/2,2,3,3)				WEALD CLAY FORMATION: Brown/orange/grey silty CLAY.
		2.00	SPT	N=14 (2,3/3,4,3,4)				
		3.00	SPT	57 (10,10/57 for 225mm)				
					3.60			WEALD CLAY FORMATION: Brown/orange/grey mottled CLAYSTONE. Desiccated
					4.00			End of Borehole at 4.000m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

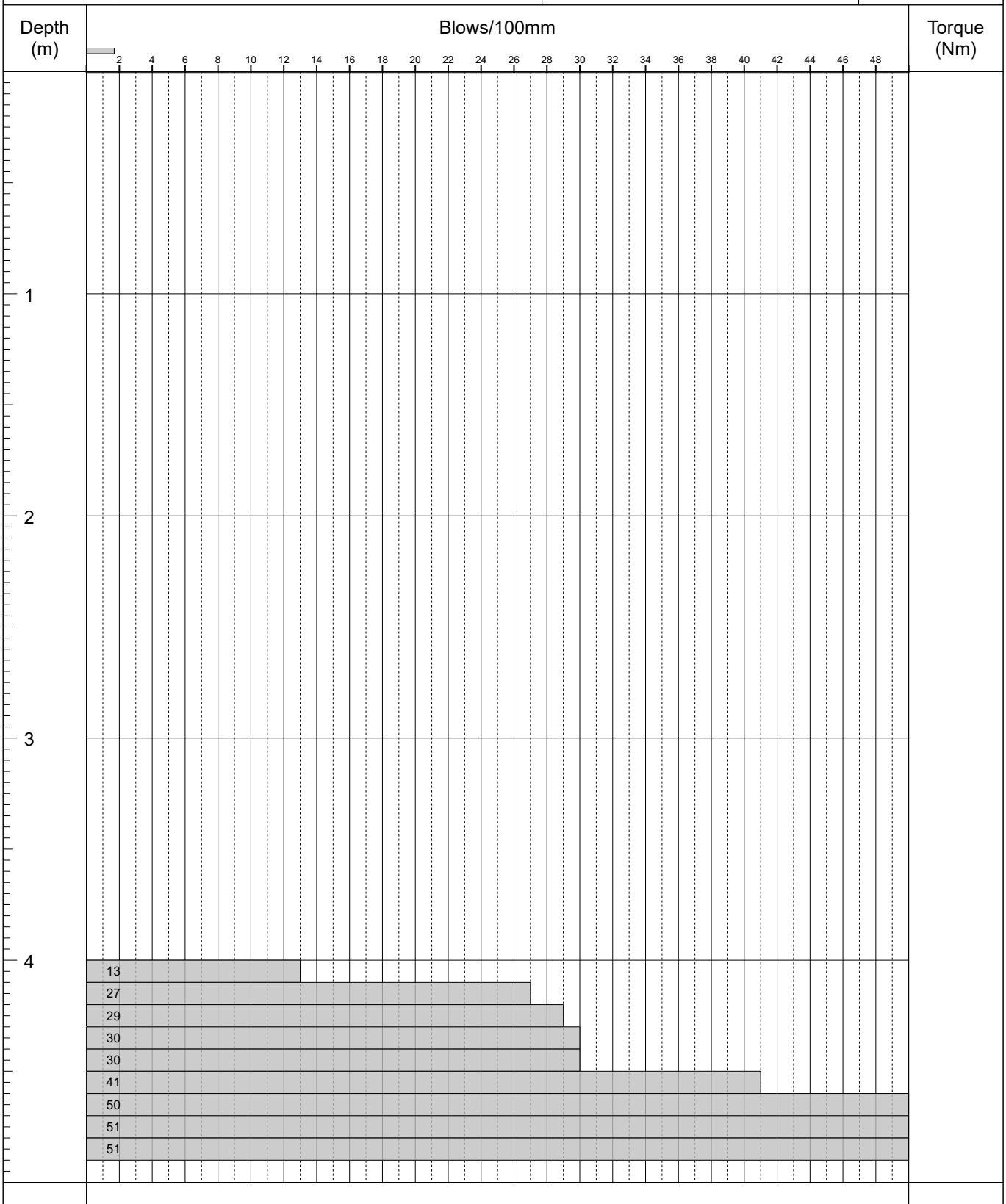
Remarks

Fresh roots noted to 1.00m bgl. No groundwater encountered. Refused on claystone. Dynamic probing (DP5) was undertaken from 4.00m bgl.

Probe Log

Probe No
DP5
Sheet 1 of 1

Project Name: Land south-west of Smugglers Lane, Barn Green	Project No. GWPR6192	Co-ords:	Hole Type DP
Location: Horsham, West Sussex RH13 0PS		Level:	Scale 1:25
Client: Miller Homes Limited		Dates:	Logged By



Remarks:	Fall Height	Cone Base Diameter
	Hammer Wt	Final Depth
	Probe Type DPSH-B	

2 The Long Barn,
Norton Farm, Selborne Road,
Alton, Hampshire GU34 3NB

0333 600 1221
enquiries@groundandwater.co.uk

groundandwater.co.uk

APPENDIX F: Geotechnical Laboratory Testing

Laboratory Report

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES A PHENNA GROUP COMPANY

Contract Number: 74715

Client Ref: **GWPR6192**
Client PO: **GWPR6192**

Date Received: **13-09-2024**
Date Completed: **18-09-2024**
Report Date: **18-09-2024**

Client: **Ground and Water Limited**

This report has been checked and approved by:

Contract Title: **Land Souht-West of Smugglers Lane, Barn Green Horsham, West Sussex RH13 0PS**
For the attention of: **Robert Terrell**

[redacted]

Brendan Evans
Office Administrator

Description	Qty
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	4
1 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.4 & 5.3 - * UKAS	4
Disposal of samples for job	1

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
- denotes test carried out by approved contractor
@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

Approved Signatories:
Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (HR & HSE Manager)

GEO Site & Testing Services Ltd
Unit 3-4 Heol Aur, Dafen Ind Est, Llanelli, Carmarthenshire SA14 8QN
Tel: 01554 784 040 Fax: 01554 784 040 info@gstl.co.uk https://gstl.co.uk

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377:1990 - Part 2 : 4.4 & 5.3)	
Contract Number	74715	
Project Name	d Souht-West of Smugglers Lane, Barn Green Horsham, West Sussex RH13 (	
Date Tested	16/09/2024	
	DESCRIPTIONS	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
WS2		D	1.00	-		Brown silty CLAY
WS5		D	2.50	-		Brown silty CLAY
WS1		D	3.00	-		Brown silty CLAY
WS4		D	5.00	-		Grey silty CLAY
				-		
				-		
				-		
				-		
				-		
				-		
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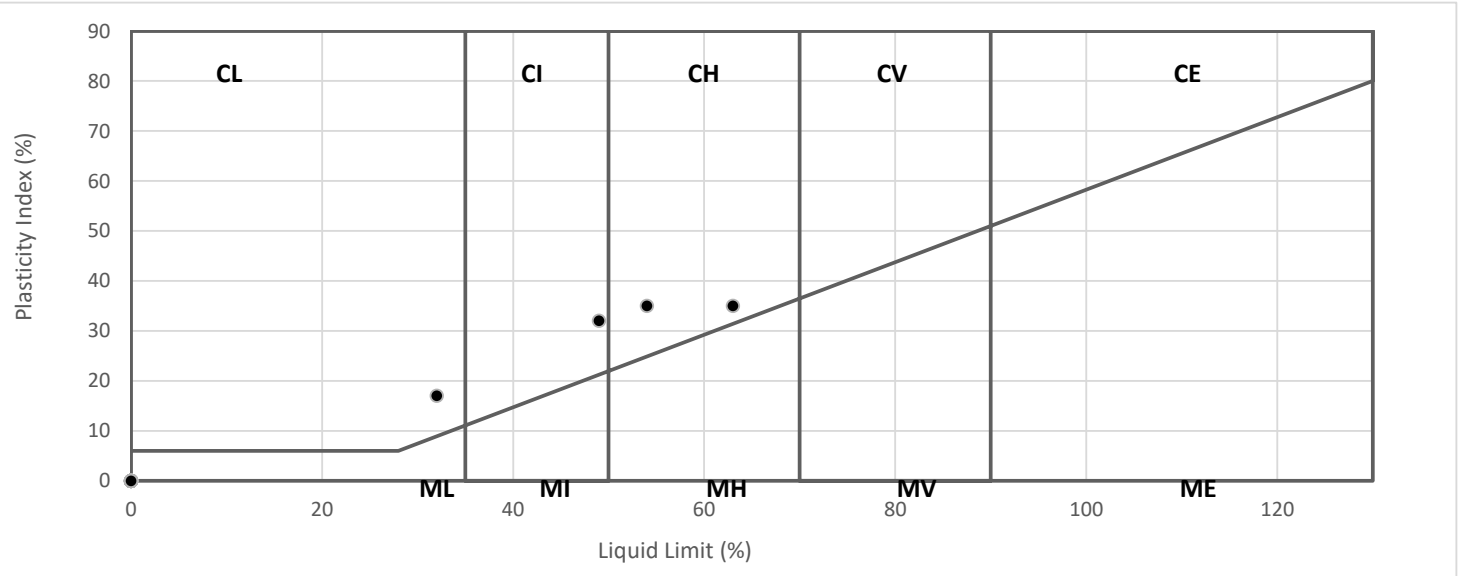
Operator
Clayton Jenkins

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377:1990 - Part 2 : 4.4 & 5.3)	
Contract Number	74715	
Project Name	d Souht-West of Smugglers Lane, Barn Green Horsham, West Sussex RH13 (	
Date Tested	16/09/2024	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
WS2		D	1.00	-		21	54	19	35	100	CH High Plasticity
WS5		D	2.50	-		20	49	17	32	100	CI Intermediate Plasticity
WS1		D	3.00	-		31	63	28	35	100	CH High Plasticity
WS4		D	5.00	-		14	32	15	17	100	CL Low Plasticity
				-							
				-							
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Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:2015+A1:2020



Operator
Clayton Jenkins

UKAS TESTING 2788

2 The Long Barn,
Norton Farm, Selborne Road,
Alton, Hampshire GU34 3NB

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enquiries@groundandwater.co.uk

groundandwater.co.uk

APPENDIX G: Chemical Laboratory Testing

Appendix E

Solum Surveying Ltd

Miller Homes & Miller Developments

REPORT OF SURVEY

Project:	Barns Green Channel Survey
Watercourses:	Muntham Gill
Type of Survey:	Channel Survey
Solum Job No:	14639
Client Name Job No:	Unknown
Date of Survey:	July 2025

Solum Surveying Ltd

To: Miller Homes
Unit 3
Faraday Office Park
Rankine Road
Basingstoke
RG24 8QB

From: Solum Surveying Ltd
The Old Stables,
Pines Courtyard,
Stone,
Berkeley,
GL13 9LE

Date of Survey: July 2025

Solum Surveying Ltd

Contents

1.0 Scope

2.0 Survey Control

3.0 Survey

4.0 Presentation

5.0 Health & Safety

6.0 Comments

Appendix I Control Processing Information

Appendix II Self Certification Checklist

Solum Surveying Ltd

Report of Survey

1.0 Scope

1.1 Solum Surveying was instructed by Miller Homes to undertake the survey of thirteen open channel cross sections and 8 structure cross sections (U/S & D/S face of each structure) of the Muntham Gill in Barns Green, Horsham. Open channel cross sections are to be surveyed from fence to fence, or from crest to crest where access is an issue. Structure cross sections will extend 5m out of bank on each side. Deliverables will be cross sections, long section and location plan drawings as well as flood modeller and a photo schedule. The cross sections are to be surveyed at the locations on the plan (shown below) but may be moved depending on access.

1.2 The survey areas are shown below in Figure 1 .



Fig.1 – Cross section survey locations on Muntham Gill, Barns Green.

1.3 All survey works were carried out in accordance with the Environment Agency Specification V5.0 for channel surveys.

2.0 Survey Control

2.1 One new E6 grade control station, E6-1, has been installed for future reference. The control was established using dual frequency Global Navigation Satellite System (GNSS) survey grade equipment to the latest Environment Agency (EA) specification V5.00. All processing has been undertaken using the OSTN15 and OSGM15 transformation and geoid models. Processing details of all control data can be found in Appendix I of this report.

2.1.1 Table showing the names and coordinates of the newly installed control stations:

Point ID	Eastings	Northings	Height
E6-1	512774.886	126841.835	30.325

2.2 The survey of each cross section was accomplished using a Trimble S5 total station and Spectra GNSS configuration.

3.0 Topography

3.1 All files relating to detail survey observations and computations are held on Solum Surveying in N4ce.

3.2 The detail has been surveyed using a Spectra GNSS receiver and Trimble S5 Total Station. The following self checks were made:

- Daily Checks of the Measurement Pole
- Checks to known control as detailed in the table below:

Date	Station ID	EASTINGS	NORTHINGS	HEIGHT
14/07/2025 AM	E6-2	512762.401	126834.954	30.202
14/07/2025 PM	E6-2	512762.401	126834.946	30.202
15/07/2025 AM	E6-2	512762.395	126834.963	30.181
15/07/2025 PM	E6-2	512762.391	126834.972	30.175
16/07/2025 AM	E6-2	512762.411	126834.946	30.220
16/07/2025 PM	E6-2	512762.409	126834.960	30.189
	Differences	0.020	0.026	0.045

4.0 Presentation

4.1 Files relating to survey deliverables are submitted within the folders of the digital data.

5.0 Health and Safety

5.1 There were no incidents to report. All members of the site team were briefed at each location by the senior surveyor as to the hazards on site and the method of work.

6.0 Channel Sections Comments

6.1 No Non-Native Invasive Species) were identified within the area surveyed.

6.2 Access at cross section MUNT01_00046 was limited due to the railway embankment, therefore levels have been surveyed to the top of the wing walls only.

6.3 A crossing fence (shown below) was found upstream of the culvert face at cross section MUNT01_00046, this was measured as a full structure cross section (MUNT01_00049) to show the full channel and levels on the bank as close to the culvert entrance as possible, as access to the bank at the culvert entrance was not possible.



Fig.2 - Crossing fence cross section MUNT01_00049 upstream of MUNT01_00046.

6.4 There was no access to the garden on the left bank at cross section MUNT01_00080, therefore levels were only able to be surveyed just beyond the wingwall.

6.5 A crossing pipe was found upstream of cross section MUNT01_00151 (shown below). Long sections points have been surveyed on the pipe only.



Fig.3 – Crossing pipe upstream of cross section MUNT01_00151.

6.6 We have been informed by a resident that the only recent flooding to have occurred in the area was due to water flowing back up a large incoming pipe (shown below) found on the left bank upstream of cross section MUNT01_00216. The pipe has been surveyed with long section points and highlighted on the long section.



Fig.4 – Large left bank incoming pipe upstream of cross section MUNT01_00216.

6.7 Points were unable to be surveyed to the fence/garden boundary on the left bank at cross section MUNT01_00257 due to dense vegetation on the left bank preventing access.

6.8 A crossing pipe was found near to the structure face at cross section MUNT01_00365 (shown below). Due to the proximity to the structure face the pipe has been shown within the cross section drawing as well as on the long section.



Fig.5 – Crossing pipe on structure face at cross section MUNT01_000365.

6.9 A crossing pipe was found upstream of cross section MUNT01_00365 (shown below). Long section points have been surveyed on the pipe only.



Fig.6 – Crossing pipe upstream of cross section MUNT01_00365.

Signed: ……. Date: 18/07/2025

Name: Dominic Eley

Position in Company: Topographical Surveyor

Solum Surveying Ltd

Appendix I

Control Processing Information

Solum Surveying Ltd

Appendix II

Self Certification Checklist

Notes :

- GRID AND LEVELS BASED ON OSGB36 NATIONAL DATUM, DERIVED FROM THE NATIONAL GPS NETWORK.

KEY

HARD BED
SOFT BED
CHANNEL STRUCTURE
LEFT BANK
RIGHT BANK
WATER LEVEL

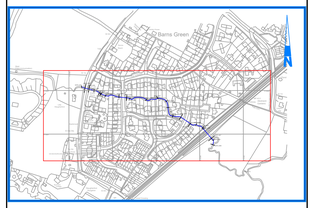
FENCE ABBREVIATIONS

ARMCO BARRIER	ARM
BARBED WIRE	B/W
CHAIN LINK	C/L
CLOSE BOARD	C/B
HAND RAIL	H/R
HERAS	HERAS
IRON RAILING	I/R
PALISADE	PAL
PICKET	P/C
POST AND CHAIN	P/C
POST AND RAIL	P/R
POST AND WIRE	P/W
WROUGHT IRON	W/I

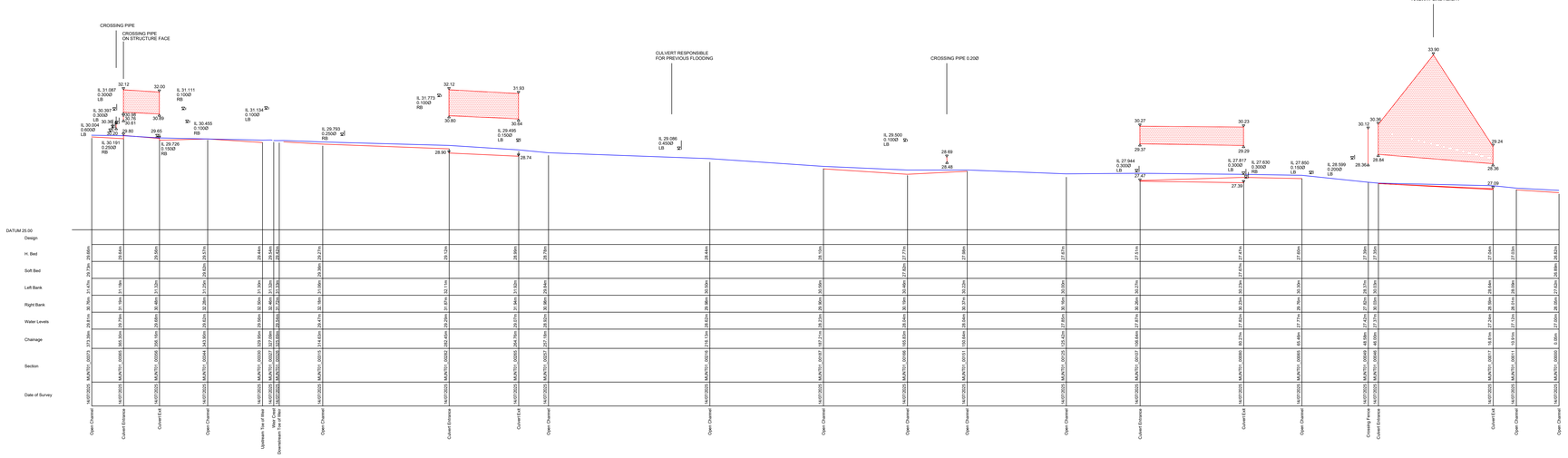
Coordinate Table

Station	Description	Easting	Northing	Level
E6-1	ROAD NAIL	512774.886	126641.835	30.325

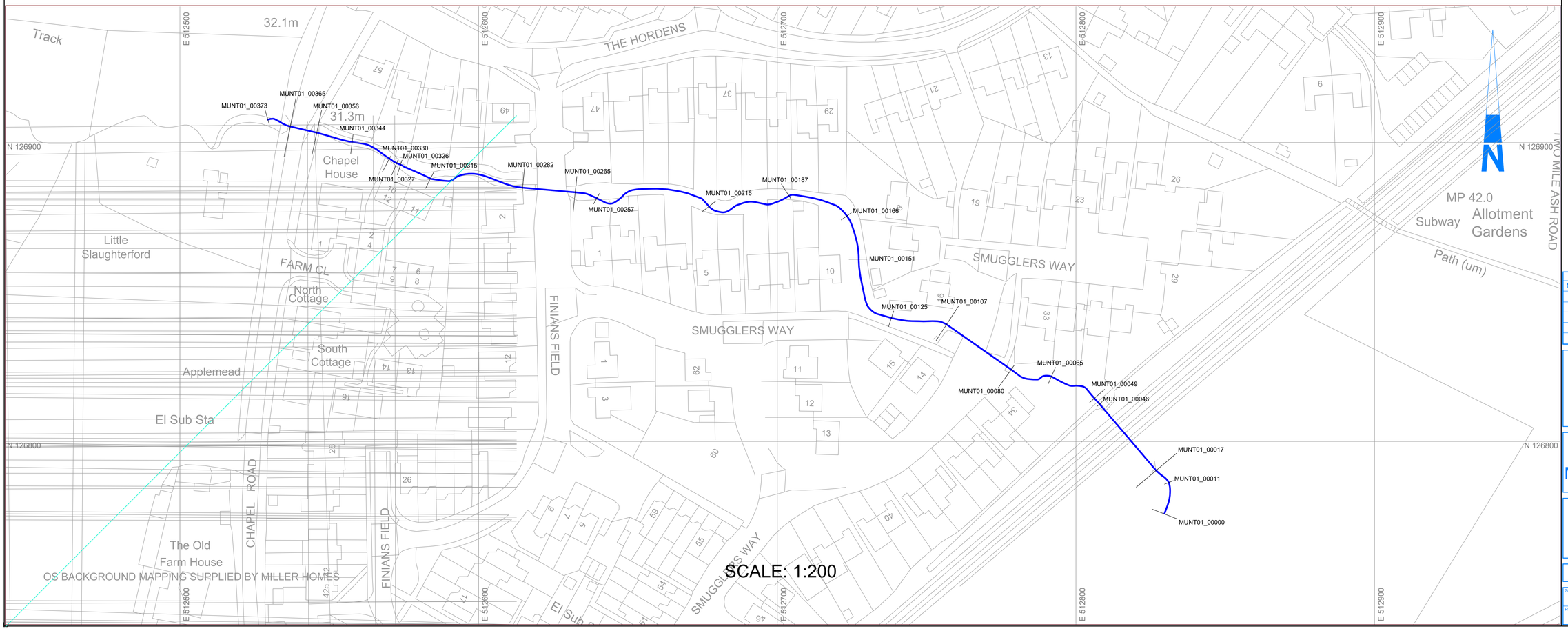
SHEET LAYOUT



(NOT TO SCALE)



SCALE: 1:500Hz 1:100V



OS BACKGROUND MAPPING SUPPLIED BY MILLER HOMES

SCALE: 1:200

Drawing Revision

No	Date	Description
R0	14/07/25	Channel Survey Complete
R1		
R2		
R3		
R4		

Solum Surveying Ltd
www.solumsurveying.com
tel: 01454 413592
email: info@solumsurveying.com
The Old Stables
Pines Courtyard
Stone
Berkeley
GL13 9LE

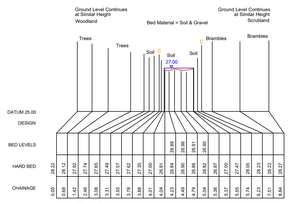
MILLER HOMES & MILLER DEVELOPMENTS

Barns Green
Horsham
RH13 0PS

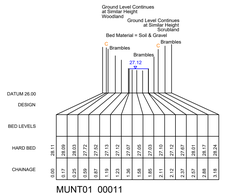
Channel Survey - MUNT01 Long Section and Location Plan

Scale: As Shown	Sheet Size: A0	Sheet: 1 of 1	Also See: XS
		Drawing Date: 18/07/25	
Project Number: 14638	Rev: R0	Surveyed By: DE	Checked By: SD
		Drawn By: DE	

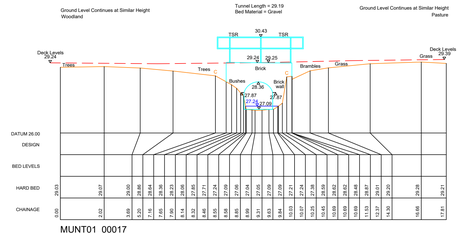
OHC
39.49



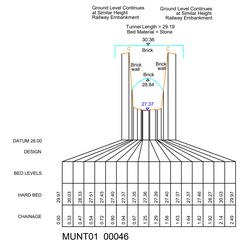
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CHAINAGE_0.051
512833.69E 126774.13N BEARING 291
Open Channel
14/07/2025



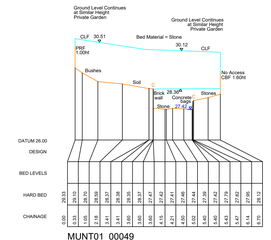
MUNT01_00011
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512832.60E 126786.86N BEARING 248
Open Channel
14/07/2025



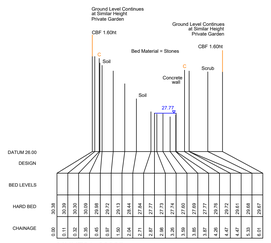
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Culvert Exit
14/07/2025



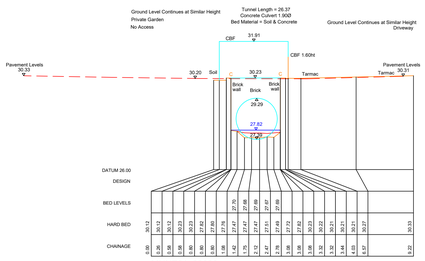
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Culvert Entrance
14/07/2025



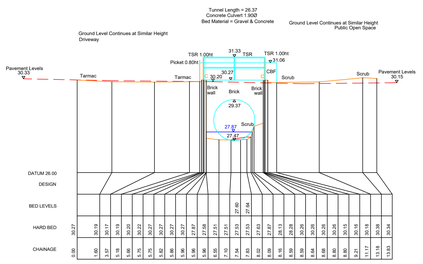
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CHAINAGE_48.578
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Crossing Fence
14/07/2025



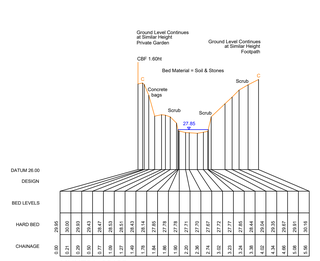
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Open Channel
14/07/2025



MUNT01_00080
CHAINAGE_80.273
512779.37E 126825.54N BEARING 215
Culvert Exit
14/07/2025

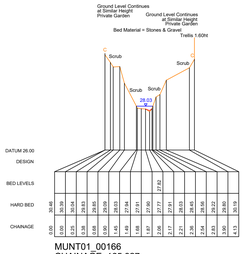


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Culvert Entrance
14/07/2025

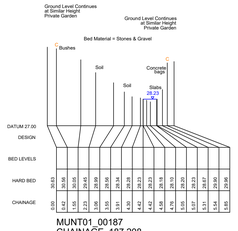


MUNT01_00125
CHAINAGE_125.415
512738.99E 126843.68N BEARING 198
Open Channel
14/07/2025

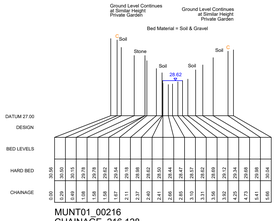
MUNT01_00151
CHAINAGE_150.643
512730.05E 126861.02N BEARING 270
Open Channel
14/07/2025



MUNT01_00166
CHAINAGE_165.827
512724.79E 126876.50N BEARING 235
Open Channel
14/07/2025



MUNT01_00187
CHAINAGE_187.208
512701.36E 126886.14N BEARING 147
Open Channel
14/07/2025



MUNT01_00216
CHAINAGE_216.128
512679.41E 126880.41N BEARING 232
Open Channel
14/07/2025

Notes :

- GRID AND LEVELS BASED ON OSGB36 NATIONAL DATUM, DERIVED FROM THE NATIONAL GPS NETWORK.

KEY

HARD BED
SOFT BED
CHANNEL STRUCTURE
HIGH CHORD
WATER LEVEL
FENCE

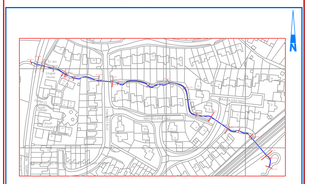
FENCE ABBREVIATIONS

ARMCO BARRIER	ARM	POST AND CHAIN	PAC
BARBED WIRE	B/W	POST AND RAIL	PAR
CHAIN LINK	C/L	POST AND WIRE	P/W
CLOSE BOARD	C/B	WROUGHT IRON	W/I
HAND RAIL	H/R		
HERAS	HERAS		
IRON RAILING	I/R		
PALISADE	PAL		
PICKET	PIC		
PVC	PVC		
RAIL	RAIL		

Coordinate Table

Station	Description	Easting	Northing	Level
E6-1	ROAD NAIL	512774.886	126841.835	30.325

SHEET LAYOUT



(NOT TO SCALE)

Drawing Revision

No	Date	Description
R0	14/07/25	Channel Survey Complete
R1		
R2		
R3		
R4		

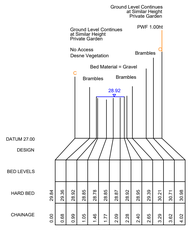
Solum Surveying Ltd
www.solumsurveying.com
tel: 01454 413592
email: info@solumsurveying.com
The Old Stables
Pines Courtyard
Stone
Berkeley
GL13 9LE

MILLER HOMES &
MILLER DEVELOPMENTS

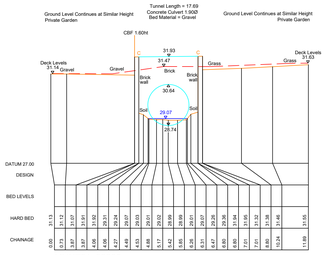
Barns Green
Horsham
RH13 0PS

Channel Survey - MUNT01 Cross Sections (MUNT01_00000 TO MUNT01_00216)

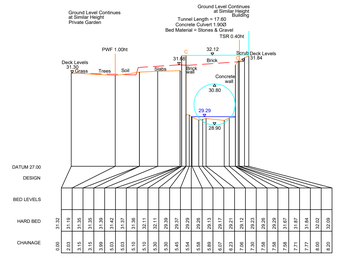
1:100	Sheet Size: A0	Sheet: 1 of 2	Also See: LS&LP	
		Drawing Date: 18/07/25		
Project Number: 14638	Rev: R1	Surveyed By: DE	Checked By: SD	
		Drawn By: DE		



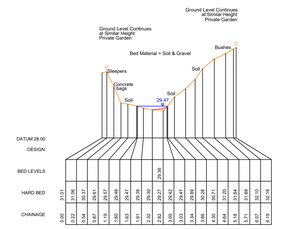
MUNT01_00257
CHAINAGE_257.177
512640.49E 126882.98N BEARING 210
Open Channel
14/07/2025



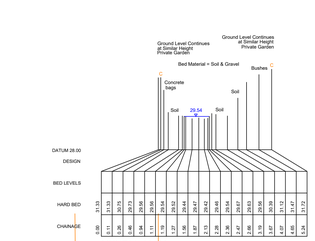
MUNT01_00265
CHAINAGE_264.759
512632.90E 126888.67N BEARING 186
Culvert Exit
14/07/2025



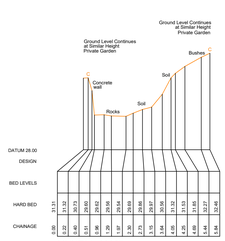
MUNT01_00282
CHAINAGE_282.451
512615.38E 126891.33N BEARING 186
Culvert Entrance
14/07/2025



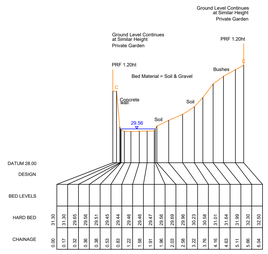
MUNT01_00315
CHAINAGE_314.627
512585.05E 126890.23N BEARING 207
Open Channel
14/07/2025



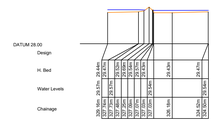
MUNT01_00326
CHAINAGE_325.692
512574.37E 126894.15N BEARING 198
Downstream Toe of Weir
14/07/2025



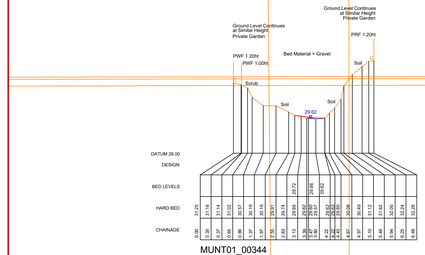
MUNT01_00327
CHAINAGE_327.092
512573.16E 126894.55N BEARING 202
Weir Crest
14/07/2025



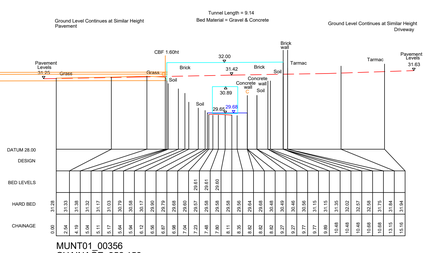
MUNT01_00330
CHAINAGE_329.946
512570.67E 126895.58N BEARING 208
Upstream Toe of Weir
14/07/2025



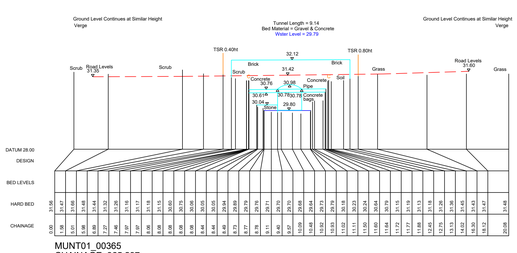
MUNT01_00330
THROUGH SECTION



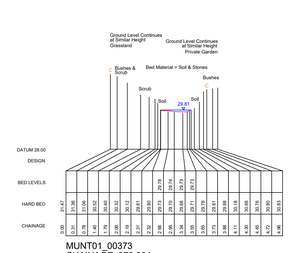
MUNT01_00344
CHAINAGE_343.901
512557.98E 126902.72N BEARING 187
Open Channel
14/07/2025



MUNT01_00356
CHAINAGE_356.158
512547.45E 126910.80N BEARING 192
Culvert Exit
14/07/2025



MUNT01_00365
CHAINAGE_365.297
512538.85E 126914.88N BEARING 191
Culvert Entrance
14/07/2025



MUNT01_00373
CHAINAGE_373.394
512528.52E 126910.89N BEARING 164
Open Channel
14/07/2025

Notes :

- GRID AND LEVELS BASED ON OSGB36 NATIONAL DATUM, DERIVED FROM THE NATIONAL GPS NETWORK.

KEY

HARD BED
SOFT BED
CHANNEL STRUCTURE
HIGH CHORD
WATER LEVEL
FENCE

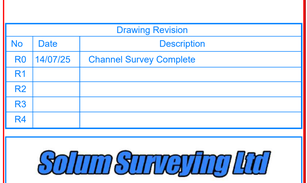
FENCE ABBREVIATIONS

ARMCO BARRIER	ARM	POST AND CHAIN	PAC
BARBED WIRE	BW	POST AND RAIL	PAR
CHAIN LINK	C/L	POST AND WIRE	PAW
CLOSE BOARD	C/B	PICKET	PIC
HAND RAIL	H/R	PVC	PVC
HERAS	HERAS	RAILINGS	R/R
IRON RAILING	I/R	STONE	STN
PALISADE	PAL	WROUGHT IRON	W/I

Coordinate Table

Station	Description	Easting	Northing	Level
E6-1	ROAD NAIL	512774.886	126841.835	30.325

SHEET LAYOUT



(NOT TO SCALE)

Drawing Revision

No	Date	Description
R0	14/07/25	Channel Survey Complete
R1		
R2		
R3		
R4		

Solum Surveying Ltd
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Berkeley
GL13 9LE
chartered IICES
Regulated by RICS

MILLER HOMES &
MILLER DEVELOPMENTS

Barns Green
Horsham
RH13 0PS

Channel Survey - MUNT01 Cross Sections (MUNT01_00257 - MUNT01_00373)

1:100	Sheet Size: A0	Sheet: 2 of 2	Drawing Date: 18/07/25	Also See: LS&LP
Project Number: 14638	Rev: R1	Surveyed By: DE	Drawn By: DE	Checked By: SD

Chainage	Photo Description	Easting	Northing	Bearing	Date	Filename
0	Open Channel	512830	126776	196	16/07/2025 09:55	14639_PGE_MUNT01_00000.jpg
0	Open Channel	512830	126776	20	16/07/2025 09:55	14639_PGE_MUNT01_00000_US.jpg
11	Open Channel	512831	126786	160	16/07/2025 09:17	14639_PGE_MUNT01_00011.jpg
11	Open Channel	512831	126786	336	16/07/2025 09:18	14639_PGE_MUNT01_00011_US.jpg
17	Culvert Exit	512827	126791	141	16/07/2025 09:07	14639_PGE_MUNT01_00017.jpg
17	Culvert Exit	512827	126790	318	16/07/2025 09:07	14639_PGE_MUNT01_00017_US.jpg
46	Culvert Entrance	512808	126813	139	16/07/2025 12:14	14639_PGE_MUNT01_00046.jpg
46	Culvert Entrance	512808	126812	319	16/07/2025 12:14	14639_PGE_MUNT01_00046_US.jpg
49	Left Bank Pipe	512804	126817	62	16/07/2025 12:12	14639_PGE_MUNT01_00049a.jpg
49	Crossing Fence	512806	126814	138	16/07/2025 12:13	14639_PGE_MUNT01_00049b.jpg
49	Crossing Fence	512806	126814	318	16/07/2025 12:13	14639_PGE_MUNT01_00049_US.jpg
65	Open Channel	512792	126822	115	16/07/2025 12:10	14639_PGE_MUNT01_00065a.jpg
65	Open Channel	512792	126822	295	16/07/2025 12:10	14639_PGE_MUNT01_00065_US.jpg
65	Left Bank Pipe	512794	126820	36	16/07/2025 12:11	14639_PGE_MUNT01_00065b.jpg
80	Culvert Exit	512778	126824	127	16/07/2025 12:07	14639_PGE_MUNT01_00080a.jpg
80	Culvert Exit	512778	126824	305	16/07/2025 12:07	14639_PGE_MUNT01_00080_US.jpg
80	Left Bank Pipe	512779	126824	52	16/07/2025 12:07	14639_PGE_MUNT01_00080b.jpg
80	Right Bank Pipe	512779	126824	172	16/07/2025 12:08	14639_PGE_MUNT01_00080c.jpg
107	Culvert Entrance	512756	126839	117	14/07/2025 16:15	14639_PGE_MUNT01_00107a.jpg
107	Culvert Entrance	512757	126839	307	14/07/2025 16:15	14639_PGE_MUNT01_00107_US.jpg
107	Left Bank Pipe	512756	126839	49	14/07/2025 16:15	14639_PGE_MUNT01_00107b.jpg
125	Open Channel	512737	126842	109	14/07/2025 11:46	14639_PGE_MUNT01_00125.jpg
125	Open Channel	512739	126841	288	14/07/2025 11:46	14639_PGE_MUNT01_00125_US.jpg
151	Open Channel	512727	126861	179	14/07/2025 12:35	14639_PGE_MUNT01_00151a.jpg
151	Open Channel	512727	126861	1	14/07/2025 12:35	14639_PGE_MUNT01_00151_USa.jpg
151	Crossing Pipe	512727	126866	7	14/07/2025 12:36	14639_PGE_MUNT01_00151_USb.jpg
151	Crossing Pipe	512727	126866	155	14/07/2025 13:00	14639_PGE_MUNT01_00151b.jpg
166	Open Channel	512723	126876	142	14/07/2025 13:00	14639_PGE_MUNT01_00166a.jpg
166	Open Channel	512724	126875	324	14/07/2025 13:01	14639_PGE_MUNT01_00166_US.jpg
166	Left Bank Pipe	512723	126876	89	14/07/2025 13:01	14639_PGE_MUNT01_00166b.jpg
187	Open Channel	512704	126882	61	15/07/2025 16:09	14639_PGE_MUNT01_00187.jpg
187	Open Channel	512704	126882	242	15/07/2025 16:09	14639_PGE_MUNT01_00187_US.jpg
216	Left Bank Pipe	512671	126883	32	14/07/2025 13:38	14639_PGE_MUNT01_00216a.jpg
216	Left Bank Pipe	512671	126883	27	14/07/2025 13:38	14639_PGE_MUNT01_00216b.jpg
216	Open Channel	512677	126879	142	14/07/2025 13:39	14639_PGE_MUNT01_00216c.jpg
216	Open Channel	512678	126878	314	14/07/2025 13:39	14639_PGE_MUNT01_00216_US.jpg
257	Open Channel	512639	126881	121	14/07/2025 14:49	14639_PGE_MUNT01_00257.jpg
257	Open Channel	512640	126881	304	14/07/2025 14:50	14639_PGE_MUNT01_00257_US.jpg
265	Culvert Exit	512632	126883	97	14/07/2025 14:46	14639_PGE_MUNT01_00265a.jpg
265	Culvert Exit	512633	126883	280	14/07/2025 14:47	14639_PGE_MUNT01_00265_US.jpg
265	Left Bank Pipe	512633	126883	13	14/07/2025 14:47	14639_PGE_MUNT01_00265b.jpg
282	Culvert Entrance	512615	126885	96	15/07/2025 14:44	14639_PGE_MUNT01_00282a.jpg
282	Culvert Entrance	512615	126885	144	15/07/2025 14:44	14639_PGE_MUNT01_00282b.jpg
282	Culvert Entrance	512615	126885	38	15/07/2025 14:44	14639_PGE_MUNT01_00282c.jpg
282	Culvert Entrance	512615	126885	273	15/07/2025 14:44	14639_PGE_MUNT01_00282_US.jpg
282	Culvert Entrance	512615	126885	233	15/07/2025 14:44	14639_PGE_MUNT01_00282d.jpg
315	Right Bank Pipe	512589	126887	167	15/07/2025 13:10	14639_PGE_MUNT01_00315a.jpg
315	Open Channel	512584	126888	120	15/07/2025 13:10	14639_PGE_MUNT01_00315b.jpg
315	Open Channel	512584	126888	286	15/07/2025 13:10	14639_PGE_MUNT01_00315_US.jpg
326	Downstream Toe of Weir	512574	126893	109	15/07/2025 13:13	14639_PGE_MUNT01_00326.jpg
326	Downstream Toe of Weir	512574	126893	289	15/07/2025 13:13	14639_PGE_MUNT01_00326_US.jpg
327	Weir Crest	512572	126893	115	15/07/2025 13:14	14639_PGE_MUNT01_00327a.jpg
327	Weir Crest	512573	126893	291	15/07/2025 13:14	14639_PGE_MUNT01_00327_US.jpg
327	Left Bank Pipe	512571	126894	34	15/07/2025 13:14	14639_PGE_MUNT01_00327b.jpg
330	Upstream Toe of Weir	512570	126895	129	15/07/2025 13:15	14639_PGE_MUNT01_00330.jpg
330	Upstream Toe of Weir	512570	126895	302	15/07/2025 13:15	14639_PGE_MUNT01_00330_US.jpg
344	Open Channel	512558	126900	99	15/07/2025 11:29	14639_PGE_MUNT01_00344a.jpg
344	Open Channel	512558	126900	280	15/07/2025 11:29	14639_PGE_MUNT01_00344_US.jpg
344	Right Bank Pipe	512553	126901	178	15/07/2025 11:30	14639_PGE_MUNT01_00344b.jpg
356	Culvert Exit	512546	126903	103	15/07/2025 10:26	14639_PGE_MUNT01_00356a.jpg
356	Culvert Exit	512547	126903	284	15/07/2025 10:26	14639_PGE_MUNT01_00356_USa.jpg
356	Culvert Exit	512547	126903	285	15/07/2025 10:26	14639_PGE_MUNT01_00356_USb.jpg
356	Right Bank Pipe	512546	126903	221	15/07/2025 11:31	14639_PGE_MUNT01_00356b.jpg
365	Left Bank Pipe	512535	126906	27	15/07/2025 11:02	14639_PGE_MUNT01_00365a.jpg
365	Right Bank Pipe	512535	126906	200	15/07/2025 11:03	14639_PGE_MUNT01_00365b.jpg
365	Culvert Entrance	512537	126906	38	15/07/2025 11:04	14639_PGE_MUNT01_00365c.jpg
365	Culvert Entrance	512536	126906	155	15/07/2025 11:04	14639_PGE_MUNT01_00365d.jpg
365	Culvert Entrance	512537	126905	287	15/07/2025 11:04	14639_PGE_MUNT01_00365_US.jpg
365	Crossing Pipe	512535	126906	115	15/07/2025 11:05	14639_PGE_MUNT01_00365e.jpg
373	Open Channel	512529	126908	74	15/07/2025 11:01	14639_PGE_MUNT01_00373.jpg
373	Open Channel	512530	126908	255	15/07/2025 11:01	14639_PGE_MUNT01_00373_US.jpg


14639_PGE_MUNT01_00000


639_PGE_MUNT01_00000_U


14639_PGE_MUNT01_00011


639_PGE_MUNT01_00011_U


14639_PGE_MUNT01_00017


639_PGE_MUNT01_00017_U


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4639_PGE_MUNT01_00166b


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639_PGE_MUNT01_00216_U


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4639_PGE_MUNT01_00216b


4639_PGE_MUNT01_00216c


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639_PGE_MUNT01_00265_U


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639_PGE_MUNT01_00326_U


639_PGE_MUNT01_00327_U


4639_PGE_MUNT01_00327a


4639_PGE_MUNT01_00327b


14639_PGE_MUNT01_00330


639_PGE_MUNT01_00330_U


639_PGE_MUNT01_00344_U


4639_PGE_MUNT01_00344a


4639_PGE_MUNT01_00344b


639_PGE_MUNT01_00356_U


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4639_PGE_MUNT01_00365a


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4639_PGE_MUNT01_00365c


4639_PGE_MUNT01_00365c


4639_PGE_MUNT01_00365e

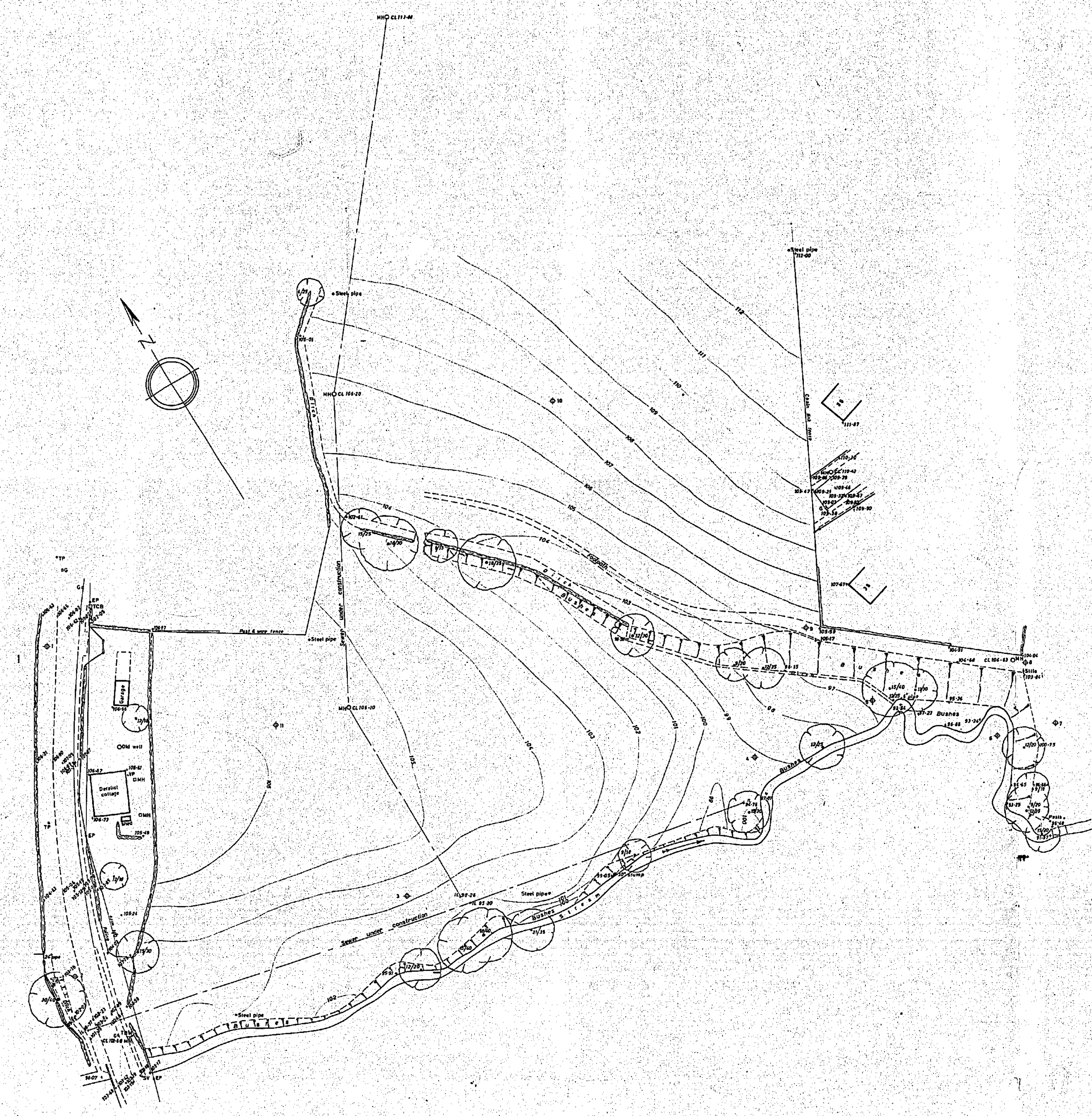

14639_PGE_MUNT01_00373



639_PGE_MUNT01_00373_L

Appendix F

I /3/67



LEGEND	
BL... Basement Level	Hedge.
BS... Bus Stop	Gate.
CL... Cover Level	Direction of flow.
ElCP. Electricity Cable Pit	Overhead cables.
ElP... Electricity Pillar	Ordnance Survey Bench Mark.
EP... Electricity Post	Temporary Bench Mark
EPy... Electricity Pylon	Contours
FAP... Fire Alarm Pillar	Marsh
FH... Fire Hydrant	Archway
FL... Floor Level	Glass
G.... Gulley	Trees. Figures alongside trees show diameter of bole in inches and height in feet thus :- 14|31. Deciduous thus:- ●. Coniferous thus:- ○
GPO.. GPO Cable Pit	Fence line
GV... Gas Valve	Building line
IC... Inspection Cover	
IL... Invert Level	
LB... Letter Box	
LP.... Lamp Post	
M.... Marker	
MH... Manhole	
MS... Mile Stone	
RS... Road Sign	
SP... Sign Post	
SV.... Sluice Valve	
TCB... Telephone Call Box	
TP... Telegraph Post	
VP... Vent Pipe	
WM... Water Meter	
○... Survey Station	
11°01'10".. Directional Bearing	

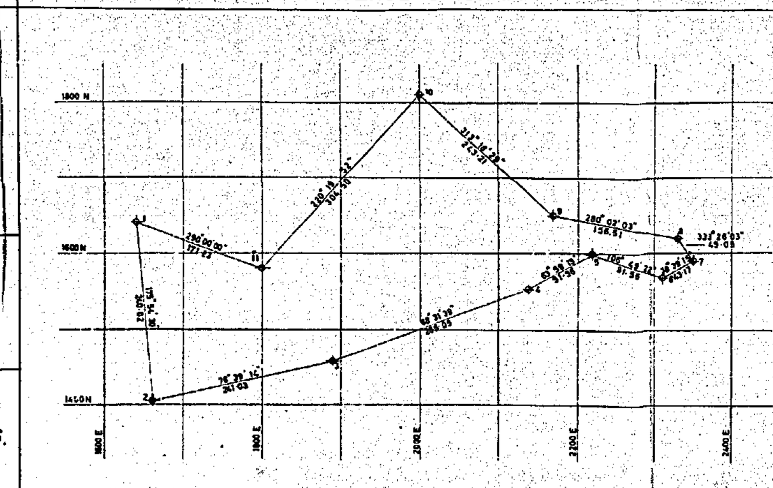
LEVELLING

All levels are based on TBM value 102·60 as shown.

Scale :- 1:500

Date of survey:- August 1967.

TRAVERSE DIAGRAM



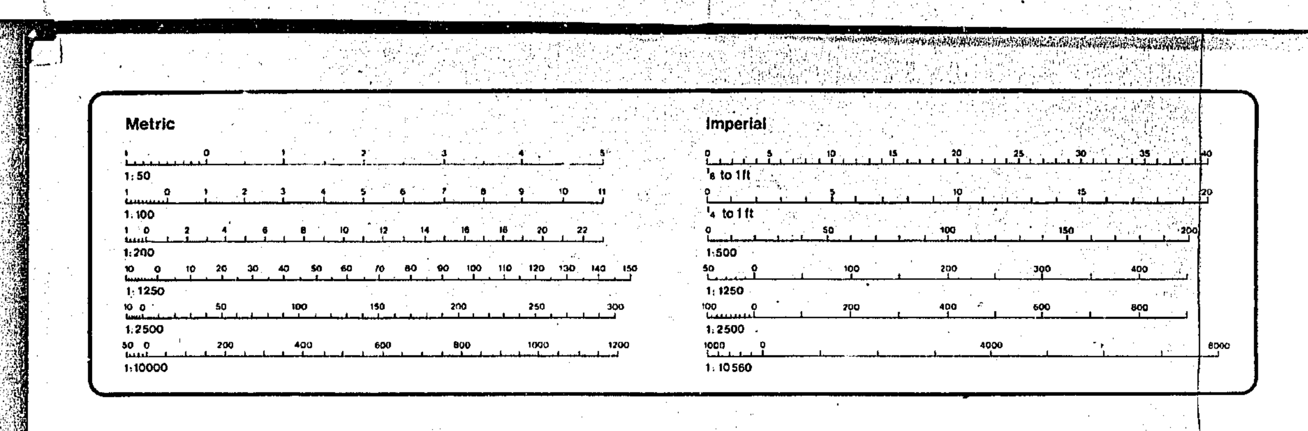
CO-ORDINATES

	Eastings	Northings	Station Level	Station Description
1	1640·42	1640·42	107·28	Steel pin
2	1617·54	1401·01	103·84	" "
3	1892·09	1456·86	102·94	Peg
4	2138·77	1553·70	99·16	"
5	2221·42	1594·02	97·09	"
6	2309·08	1567·51	97·08	"
7	2351·40	1578·01	100·14	"
8	2329·46	1619·88	104·05	"
9	2175·35	1647·14	106·22	"
10	1958·39	1813·97	107·83	"
11	1801·31	1551·85	106·14	"

BARNS GREEN.

Surveyed by:-
AWORTH LAND SURVEYS LTD.,
23A, Abbotsbury Road,
Morden,
Surrey.

Surveyed for:-
CROUDACE LTD.
97, Godstone Road,
Caterham,
Surrey.



Appendix G

LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING

SURVEY SOLUTIONS
0845 040 5969
survey-solutions.co.uk

IPSWICH BRENTWOOD COVENTRY GLASGOW NORWICH NOTTINGHAM YEOVIL

CCTV Report



Project

Chapel Road, Barns Green,
Horsham, RG13.

Survey Date

09/05/2025

Client

TS Wood Consulting

Surveyor

SD

Checked By

MJS

Job Number

77224CCTV-01

Revision

Issue Date

09/05/2025

chartered ices
QMS ISO 9001 : 2008 REGISTERED
THE SURVEY ASSOCIATION FULL MEMBER
RICS

High Pressure Jetting & Resurvey

Maintenance Visits

Following the initial investigations completed on site we would recommend a quarterly re-survey of the drainage network inorder to monitor the ongoing pipework condition, especially within the areas of historic damage & deterioration that this report identifies.

System Maintenance Survey:

Quarterly Assessment of Existing Defects Due – 09/08/2025
Annual Full System Re-survey Due – 09/05.2026

High Pressure Jetting Required:

(5% - 30%) – MH1 X

(35 % - 60%) -

(65% - 95%) -

SURVEY SOLUTIONS

Sam Dulieu
Brentwood
Essex
Tel: , Fax:

Project-information

Project name:	Contract number:	Contact:	Date:
Chapel Road	**77224**		**14/05/2025**

Client	**TS Wood Consulting**
Contact:	**Timothy Wood**
Position:	**Owner**
Road	**122 Jameston Birch Hill**
Town	**Bracknell**
County	**Berkshire, RG12 7ZA**
Telephone:	**07362 276031**
Fax:	
Mobile:	[redacted]
E-Mail:	[redacted]

Site	**Chapel Road in Barns Green**
Contact:	
Position:	
Road	**Chapel Road**
Town	**Barns Green, Horsham**
County	**Sussex, RG13**
Telephone:	
Fax:	
Mobile:	
E-Mail:	

Contractor	**Sam Dulieu**
Contact:	
Position:	**Surveyor**
Road	**Codham Hall Estates**
Town	**Brentwood**
County	**Essex**
Telephone:	
Fax:	
Mobile:	[redacted]
E-Mail:	[redacted]

SURVEY SOLUTIONS

Sam Dulieu
Brentwood
Essex
Tel: , Fax:

Defect Grade Description

Project name:	Contract number:	Contact:	Date:
Chapel Road	**77224**		**14/05/2025**

1:

Brick: No Structural Defects
Pipe: No Structural Defects

Acceptable Structural Condition

2:

Brick: Minor cracking, Surface mortar loss, Spalling slight, wear slight
Pipe: Circumfrential crack, Moderate joint defects, Spalling slight, Wear slight

Minor collapse risk in short term but potential for further deterioration

3:

Brick: Total mortorloss without other defects, single brick displaced, Deformation up to 5%, Spalling medium, Wear medium
Pipe: Fractures with deformation up tp 5%, Longitudinal cracking or mulitlpe cracking, Minor loss of level, More severe joint defects, Spalling medium, Wear medium

! Collapse unlikely in near future but future deterioration likely !

4:

Brick: Total mortorloss with deformation greater than 10%, Deformation up to 10% and fractured, Displaced/hanging brickwork, Small number of missing bricks
Pipe: Broken, Deformation up to 10% and broken,, Fractured with deformation 5 - 10%, Multiple fractures, Serious loss of level, spalling large, wear large

!! Collapse likely in foreseeable future !!

5:

Brick: Already Collapsed, Missing invert, Deformation over 10% and fractured, Displaced/hanging brickwork and deformation over 10%, Extensive missing bricks
Pipe: Already collapsed, Deformation over 10% and broken, Extensive areas of fabric missing, Fractured with deformation over 10%

!!! Collapsed or collapse imminent !!!

SURVEY SOLUTIONS

Sam Dulieu
Brentwood
Essex
Tel: , Fax:

Inspection report

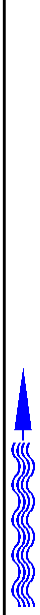
Date:	Job N°:	Weather:	Operator:	section number:	PLR:
14/05/2025	**77274**	**Dry**	**SD**	**1**	**? X**
Present:	Vehicle:	Camera:	Preset:	Cleaned: **No**	Grade:

Road: **Chapel Road**	Division:	start MH: **Pipe 1**
Place: **Chapel Road**	District:	end MH:
Location:	Tape No.:	Total length: **34.6 m**

Purpose:	Shape/Size: **Circular 225**
Use: **Surface water**	Material: **Vitrified clay** Pipe length:
Catchment:	Lining:
	Category:

Comment:

Location details:



1:275 position	code	observation	counter	photo	grade
Pipe 1 0.00	MH	Manhole Remark: Pipe 1	00:00:00		(Constr) 0
0.00	ST	Start of Survey	00:00:00		(Misc) 0
1.60	GP	General Condition photograph	00:00:00	3_3a	(Misc) 0
3.20	OB	Obstruction, 15 % height/diameter loss	00:00:00	4_4a	(Serv) 2
6.60	GP	General Condition photograph	00:00:00	5_5a	(Misc) 0
11.80	GP	General Condition photograph	00:00:00	6_6a	(Misc) 0
15.40	GP	General Condition photograph	00:00:00	7_7a	(Misc) 0
20.30	GP	General Condition photograph	00:00:00	8_8a	(Misc) 0
25.45	GP	General Condition photograph	00:00:00	9_9a	(Misc) 0
29.00	LR	Line of Sewer deviates right	00:00:00		(Serv) 0
30.35	GP	General Condition photograph	00:00:00	1_11a	(Misc) 0
34.00	GP	General Condition photograph	00:00:00	1_12a	(Misc) 0
34.60	SA	Survey abandoned, Remark: Restricted leverage	00:00:00		(Misc) 0

Structural Defects	**Constructional Features**
Service Defects	**Miscellaneous Features**

SURVEY SOLUTIONS

Sam Dulieu
Brentwood
Essex
Tel: , Fax:

Inspection photos

Place:	Road:	Date:	section number:	PLR:
Chapel Road	**Chapel Road**	**14/05/2025**	**1**	**? X**



Photo: 3_3a, 00:00:00
1.6m, General Condition photograph



Photo: 4_4a, 00:00:00
3.2m, Obstruction, 15 % height/diameter loss



Photo: 5_5a, 00:00:00
6.6m, General Condition photograph



Photo: 6_6a, 00:00:00
11.8m, General Condition photograph

SURVEY SOLUTIONS

Sam Dulieu
Brentwood
Essex
Tel: , Fax:

Inspection photos

Place:	Road:	Date:	section number:	PLR:
Chapel Road	**Chapel Road**	**14/05/2025**	**1**	**? X**



Photo: 7_7a, 00:00:00
15.4m, General Condition photograph



Photo: 8_8a, 00:00:00
20.3m, General Condition photograph



Photo: 9_9a, 00:00:00
25.45m, General Condition photograph



Photo: 1_11a, 00:00:00
30.35m, General Condition photograph

SURVEY SOLUTIONS

Sam Dulieu
Brentwood
Essex
Tel: , Fax:

Inspection photos

Place:	Road:	Date:	section number:	PLR:
Chapel Road	**Chapel Road**	**14/05/2025**	**1**	**? X**



Photo: 1_12a, 00:00:00
34m, General Condition photograph

SURVEY SOLUTIONS

Sam Dulieu
Brentwood
Essex
Tel: , Fax:

Inspection report

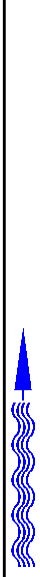
Date:	Job N°:	Weather:	Operator:	section number:	PLR:
14/05/2025	**77274**	**Dry**	**SD**	**2**	**? X**
Present:	Vehicle:	Camera:	Preset:	Cleaned: **No**	Grade:

Road:	**Chapel Road**	Division:		start MH:	**Pipe2**
Place:	**Chapel Road**	District:		end MH:	
Location:		Tape No.:		Total length:	**17.3 m**

Purpose:		Shape/Size:	**Circular 625**
Use:	**Surface water**	Material:	**Vitrified clay** Pipe length:
Catchment:		Lining:	
		Category:	

Comment:

Location details:



1:150 position	code	observation	counter	photo	grade
Pipe2 0.00	MH	Manhole Remark: Pipe2	00:00:00		(Constr) 0
0.00	ST	Start of Survey	00:00:00		(Misc) 0
0.10	GP	General Condition photograph	00:00:00	16_3a	(Misc) 0
0.10	WL	Water level, 5 % height/diameter	00:00:00		(Serv) 0
0.40	JDM	Joint displaced. Medium	00:00:00	2_5a	(Struct) 1
4.00	GP	General Condition photograph	00:00:00	2_6a	(Misc) 0
6.00	LL	Line of Sewer deviates left	00:00:00		(Serv) 0
7.10	JDM	Joint displaced. Medium	00:00:00	2_8a	(Struct) 1
10.30	GP	General Condition photograph	00:00:00	2_9a	(Misc) 0
13.30	GP	General Condition photograph	00:00:00	2_10a	(Misc) 0
13.50	LR	Line of Sewer deviates right	00:00:00		(Serv) 0
13.60	JDM	Joint displaced. Medium	00:00:00	26_12a	(Struct) 1
17.25	CC	Circumferential Crack, from 06 to 11 o´clock	00:00:00	28_13a, b	(Struct) 2
17.30	SA	Survey abandoned, Remark: Unable to survey beyond crack	00:00:00		(Misc) 0

Structural Defects	**Constructional Features**
Service Defects	**Miscellaneous Features**

SURVEY SOLUTIONS

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Essex
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Inspection photos

Place:	Road:	Date:	section number:	PLR:
Chapel Road	**Chapel Road**	**14/05/2025**	**2**	**? X**



Photo: 16_3a, 00:00:00
0.1m, General Condition photograph



Photo: 2_5a, 00:00:00
0.4m, Joint displaced. Medium



Photo: 2_6a, 00:00:00
4m, General Condition photograph



Photo: 2_8a, 00:00:00
7.1m, Joint displaced. Medium

SURVEY SOLUTIONS

Sam Dulieu
Brentwood
Essex
Tel: , Fax:

Inspection photos

Place:	Road:	Date:	section number:	PLR:
Chapel Road	**Chapel Road**	**14/05/2025**	**2**	**? X**



Photo: 2_9a, 00:00:00
10.3m, General Condition photograph



Photo: 2_10a, 00:00:00
13.3m, General Condition photograph



Photo: 26_12a, 00:00:00
13.6m, Joint displaced. Medium



Photo: 28_13a, 00:00:00
17.25m, Circumferential Crack, from 06 to 11 o´clock

SURVEY SOLUTIONS

Sam Dulieu
Brentwood
Essex
Tel: , Fax:

Inspection photos

Place:	Road:	Date:	section number:	PLR:
Chapel Road	**Chapel Road**	**14/05/2025**	**2**	**? X**



Photo: 28_13b, 00:00:00
17.25m, Circumferential Crack, from 06 to 11 o´clock

SURVEY SOLUTIONS

Sam Dulieu
Brentwood
Essex
Tel: , Fax:

Inspection report

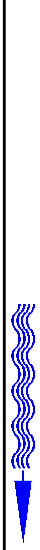
Date:	Job N°:	Weather:	Operator:	section number:	PLR:
14/05/2025	**77274**	**Dry**	**SD**	**3**	**MH1 X X**
Present:	Vehicle:	Camera:	Preset:	Cleaned: **No**	Grade:

Road:	**Chapel Road**	Division:		start MH:	**MH1 X**
Place:	**Chapel Road**	District:		end MH:	**MH**
Location:		Tape No.:		Total length:	**5.5 m**

Purpose:		Shape/Size:	**Circular 300**
Use:	**Surface water**	Material:	**Vitrified clay** Pipe length:
Catchment:		Lining:	
		Category:	

Comment:

Location details:



1:50 position	code	observation	counter	photo	grade
MH1 X 0.00	MH	Manhole Remark: MH1 X	00:00:00		(Constr) 0
0.00	ST	Start of Survey	00:00:00		(Misc) 0
0.20	LL	Line of Sewer deviates left	00:00:00		(Serv) 0
0.30	GP	General Condition photograph	00:00:00	32_4a	(Misc) 0
3.00	DES	Debris silt, 10 % cross-sectional area loss	00:00:00	33_5a	(Serv) 1
5.00	LR	Line of Sewer deviates right	00:00:00		(Serv) 0
5.10	DES	Debris silt, 25 % cross-sectional area loss	00:00:00	35_7a	(Serv) 1
MH 5.50	FH	Finish Survey, Remark: MH visible	00:00:00	36_8a, b	(Misc) 0

Structural Defects	**Constructional Features**
Service Defects	**Miscellaneous Features**

SURVEY SOLUTIONS

Sam Dulieu
Brentwood
Essex
Tel: , Fax:

Inspection photos

Place:	Road:	Date:	section number:	PLR:
Chapel Road	**Chapel Road**	**14/05/2025**	**3**	**MH1 X X**



Photo: 32_4a, 00:00:00
0.3m, General Condition photograph



Photo: 33_5a, 00:00:00
3m, Debris silt, 10 % cross-sectional area loss



Photo: 35_7a, 00:00:00
5.1m, Debris silt, 25 % cross-sectional area loss



Photo: 36_8a, 00:00:00
5.5m, Finish Survey, Remark: MH visible

SURVEY SOLUTIONS

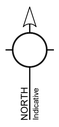
Sam Dulieu
Brentwood
Essex
Tel: , Fax:

Inspection photos

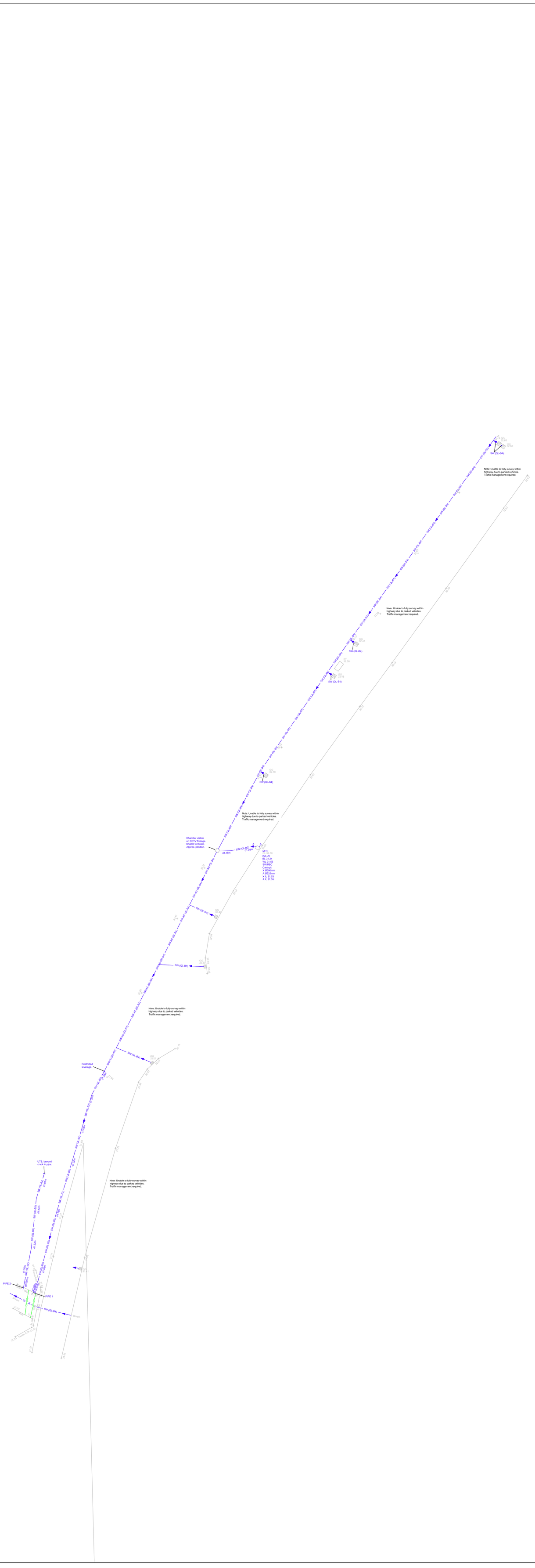
Place:	Road:	Date:	section number:	PLR:
Chapel Road	**Chapel Road**	**14/05/2025**	**3**	**MH1 X X**



Photo: 36_8b, 00:00:00
5.5m, Finish Survey, Remark: MH visible







UTILITIES & UNDERGROUND INVESTIGATIONS

ABBREVIATIONS & SYMBOLS

1D 5C	1 Duct 5 Cables	DCr	Depth To Crown	RBC	Rectangular Brick Chamber
Ø	Diameter	DI	Depth To Invert	RCC	Rectangular Conc Chamber
AC	Audible Connection	DS	Depth To Silt	RE	Rodding Eye
AG	Above Ground	DTB	Depth To Base	SA	Survey Abandoned
AR	Assumed Route	DTW	Depth To Water	SL	Silt Level
BL	Base Level	DTS	Depth To Surcharge	SuL	Surcharge Level
CB	Concrete Benching	EBD	External Backdrop	TFR	Taken From Records
CBC	Circular Brick Chamber	EOT	End Of Trace →	UTC	Unable To CCTV
CCC	Circular Conc Chamber	IBD	Internal Backdrop	UTDO	Unable To Determine Outfall
CL	Cover Level	IL	Invert Level	UTL	Unable To Lift
CPC	Circ Plastic Chamber	OH	Overhead	UTS	Unable To Survey
CrL	Crown Level	PDR	Poor Depth Response	UTT	Unable To Trace
CU	Camera Under Water →	RB ●	Rest Bend	WL	Water Level

BT — BT CABLE(S)
OHBT — OVERHEAD BT CABLE(S)
COM — COMMUNICATIONS CABLE(S)
CTV — CABLE TV CABLE(S)
DUCT — EMPTY DUCT
E — ELECTRIC CABLE(S)
OHE — OVERHEAD ELECTRIC CABLE(S)
FO — FIBREOPTIC CABLE(S)
FUEL — FUEL PIPE(S)
GAS — GAS MAIN
GS — GAS SERVICE
GPR — GROUND PENETRATING RADAR (GPR) TRACE
HW — HOT WATER PIPE
LC — LIGHTING CIRCUIT
OIL — OIL PIPE(S)
SCAR — VISIBLE SCARRING
SEC — SECURITY CABLING
TC — TELECOM CABLE(S)
TS — TRAFFIC SIGNAL
UIS — UNIDENTIFIED SERVICE
UIT — UNIDENTIFIED TRACE
WM — WATER MAIN
WS — WATER SERVICE
CW — COMBINED SEWER
CW RM — COMBINED WATER RISING MAIN
EW — EFFLUENT WATER
FW — FOUL SEWER
FW RM — FOUL WATER RISING MAIN
RISING MAIN
SW — SURFACE WATER SEWER
SW RM — SURFACE WATER RISING MAIN
INVESTIGATION EXTENTS

Note:
Ø0.37m — DEPTH TO SERVICE

UTILITIES COMMENT BOX (GENERAL NOTES)
TFJAC — AUDIBLE CONNECTION
TFAG — SERVICE ABOVE GROUND
TFUC — CAMERA UNDER WATER
TFOH — SERVICE OVERHEAD

NORTH Indicative

DRAWING NOTES

All below ground details shown have been identified from above ground without excavation. Survey Solution use electro-magnetic and/or ground penetrating radar (GPR) methods to investigate for underground utilities, services and features. Results using these methods are not infallible and we recommend trial excavations are carried out for verification of positions, depths and identification.

Any areas on the drawing where services or features have not been shown are not necessarily clear of services or features but are an indication that no items have been identified during our investigations. All reasonable care and normal good practice should still be employed during design and construction processes.

Certain types of services such as plastic or concrete pipes, some conduit and ducting where direct access can not be achieved for tracing may not be shown and alternative locating methods should be used.

Survey Solutions has used all reasonable care to research available service records but the completeness or use of the service records supplied to or by Survey Solutions cannot be guaranteed. Therefore Survey Solutions cannot be held responsible for any features annotated as 'taken from records' (TFR).

Depths obtained using electro-magnetic or GPR are effected by ground conditions and should be treated as indicative only. Electro-magnetic depths to utilities and services are generally taken to the centre of a feature, GPR depths to the top of a feature and drainage depth shown to inverts, unless otherwise indicated.

Drainage pipe sizes will be obtained without entering the chamber and therefore should be treated as approximate. Pipe dimensions which have not been obtained visually will be taken from records when available.

All services, drainage and utilities routes are assumed straight between access points, unless otherwise stated. The numbers of cables in runs will not be shown unless specifically requested. All services are below ground unless indicated.

Services, utilities and features may not have been surveyed if obstructed or not reasonably visible or accessible at the time of survey.

Survey Solutions accept no responsibility for the completeness or accuracy of either the topographical survey or base mapping on this project.

All critical dimensions and measurements should be checked and verified with any errors or discrepancies notified to Survey Solutions immediately. The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work.

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This drawing should only be scaled using digital methods.

PAS 128: 2022 QUALITY LEVEL GUIDE

Q-LEVEL	DESCRIPTION	ACC.	Q-LEVEL	DESCRIPTION
QL-D	Service positions taken from records.	Undefined	QL-B2	Horizontal & vertical location using only one geophysical technique.
QL-C	Visual evidence of service existence but undetectable by geophysical technique.	Undefined	QL-B1	Horizontal & vertical location using multiple geophysical techniques.
QL-B4	Undetectable service present shown as an assumed route. (AR)	+/- 500mm	QL-A	Horizontal & vertical position verification by open excavation, manholes and/or inspection chambers.
QL-B3	Service located by one geophysical technique but only some of it has been detectable.			

DETECTION METHOD

IN ACCORDANCE WITH PAS 128: 2022 SURVEY TYPE B

DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/types and service data recorded from ground level. All connections from DPs, Gullies, Drains, VP's, RE's and lampholes have been proven wherever possible using audible connections (AC) and/or sonde instrumentation where applicable. Where these methods have proved unsuccessful then assumed (AR) straight line connections will be shown.

CCTV DRAINAGE SURVEY
All accessible Manholes and Inspection chambers have had their respective covers lifted with pipe sizes, inverts, chamber sizes/type and service data recorded from ground level. Pipework has been traced, accessed and collected for post processing. Drainage layout, including manhole covers not located by topographical survey, may be taken from CCTV chainage and will be shown as indicative only.

Electricity
Elec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

British Telecoms
BT cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Due to current laws and legislation protecting all BT apparatus, cabling can only be located remotely. We therefore compare all our telecom findings against record information to produce the final service layout. In some instances, where high amount of cable ducts are present, we may only be able to identify a linear centre peak signal rather than identifying all the individual duct positions. For further information regarding Telecoms apparatus, please contact Openreach directly.

Cable TV & Communications
CTV and/or Com cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Fibre Optic
FO cables will have been predominantly located using GPR methodology. This is due to the materials used within fibre optic cabling. In some rare instances, tracer cabling or conductible non fibre optic cabling will be present within some or all ducting. When this is the case, both EML and GPR methodology will be combined to identify service network and achieve greater quality levels.

Lighting, Traffic Signal & Security Cables
LC, TS and/or Sec cables will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required.

Gas & Water Inc. Fuel Pipes and Hot Water Pipes
GM/GS and/or WM/WS pipe work will have been attempted and located using both EML & GPR methodology with electronically derived depths shown for the former and depths to crown levels shown for the latter.
When the Gas/Water pipe work is constructed using conductible materials, then we are able to to employ multiple geophysical techniques to identify service network and achieve greater quality levels. When a non conductible material is used, GPR methodology will be employed to locate and plot the final service layout.

Ground Penetrating Radar
GPR methodology is used to identify and locate all non metallic, non conductible piping and cabling. We also employ GPR to obtain a greater accuracy levels on EML located services. The GPR has a greater success rate on pipe or service diameter upward of Ø63mm,C63mm, as size increments increase, so does the chance of detection. The GPR can produces varying results and as such, wouldn't be used as an independent utility surveying instrument.

Unidentified Traces
All UITs will have been predominantly located using EML methodology with electronically derived depths shown. GPR techniques will be employed to achieve greater quality levels as required. Every effort has been made to identify the service but in this instance, is not achievable. We recommend excavation work to determine identity and depth where applicable.

Scarring (QL-C)
Scarring has been identified on site with a potential of an undetectable service present.

Assumed Routes & Taken from Records (QL-B4/D)
Assumed routes (AR) are shown if there is evidence that a service exists but we are unable to trace it whilst on site. The surveyor will attempt to locate various risers/ics/valves/meters (service evidence) etc. around site area to successfully determine an assumed route between these points. If there is little evidence on site but they believe a service is still present, then a common sense approach to an assumed route shall be employed.

Taken from records (TFR) are service routes that are taken from STAT record plans or previous survey information and overlaid onto our drawings.

GENERAL SYNOPSIS

This survey has been carried out in accordance with PAS 128: 2014 & our version of the Royal Institution of Chartered Surveyors (RICS) specification for Measured Surveys of Land, Buildings and Utilities. Our survey extents have been agreed and confirmed with formal acceptance of 77224BWUG from TS WOOD CONSULTING. If you have any queries regarding the final services layout, please may we ask you to carefully read all the information within this title block in its entirety before continuing to do so.

TOPOGRAPHICAL/.DWG DRAWING INFORMATION

TOPOGRAPHICAL SURVEY DATE 09/05/2025

SURVEY TYPE	DESCRIPTION	EFFECT ON SURVEY RESULTS
TOPO	SURVEY SOLUTIONS	
OUTDATED		
OS		
NTS		

GENERAL SITE CONDITIONS

AVERAGE

ADDITIONAL INFORMATION	EFFECT ON SURVEY RESULTS
VEHICLES OBSTRUCTING	UNABLE TO FULLY SURVEY ROAD.

SURVEY RECOMMENDATIONS

An up to date topographical survey drawing to overlay PAS utility information onto.

We recommend a PAS utility survey of the entire site to establish the position of underground services.

To undertake a CCTV drainage survey of the entire site area to establish a more comprehensive drainage network, and asset condition of the pipework.

The sewers with high levels of silt or blockages to be jetted to extend the CCTV drainage survey, if any of these areas are deemed critical or of high importance.

We recommend full statutory record information be obtained to confirm site findings and to position undetectable which may be present.

Due to the geophysical nature of subsurface technology, we always recommend excavation works to be carried out within critical areas for verification and to eliminate the possibility of undetectable services present.

DESKTOP UTILITY RECORDS (PAS 128: 2014 SURVEY TYPE D)
PREREQUISITE FOR PAS 128: 2014 SURVEY TYPE B
COMMISSIONED: NO

UTILITY	AVAILABILITY	UTILITY COMPANY PROVIDER
SEWER	NO	N/A
WATER MAIN	NO	N/A
GAS MAIN	NO	N/A
TELECOM	NO	N/A
CABLE TV	NO	N/A
ELECTRICITY	NO	N/A
OIL PIPES	NO	N/A
OTHER	NO	N/A

REV	DESCRIPTION	DRAWN	CHECKED	APPR	SURVEY DATE

SURVEY SOLUTIONS
LAND SURVEYING
BUILDING SURVEYING
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0845 040 5969
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IPSWICH / BEDFORD / BIRMINGHAM / COVENTRY / CRAWLEY / GLASGOW / LEEDS / LONDON-CENTRAL / LONDON-EAST / MANCHESTER / NEWCASTLE / NORWICH / NOTTINGHAM / THAMES VALLEY

PROJECT TITLE: CHAPEL ROAD, BARNS GREEN HORSHAM, RG13.				
DRAWING DETAIL: LINE AND LEVEL DRAINAGE SURVEY. SHEET 1 OF 1				
CLIENT: TS WOOD CONSULTING				SCALE: 1:200
SURVEYOR: SD	SURVEY DATE: 09/05/2025	CHECKED BY: MJS	APPROVED BY: DA	DWG STATUS: FINAL
DRAWING NUMBER: 77224BWUG-01			REVISION:	ISSUE DATE: 09/05/2025

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Original Sheet Size A0V

Appendix H

Solum Surveying Ltd
The Old Stables, Pines Courtyard, Stone
[redacted]

Project Information

Project Name	Project Number	Project Date
14639-A Barns Green Report	14639-A	29/07/2025

Client

Company: Miller Construction
Contact: Aiden Robson
Street: 10 Portis Fields
Town or City: Portishead
County: Bristol
Post Code: BS20 6PN

Site

Street: Chapel Road
Town or City: Barns Green
County: Horsham
Post Code: RH130PR

Contractor

Company: Solum Surveying Ltd
Contact: Steve Holbrook
Department: Director
Street: The Old Stables, Pines Courtyard
Town or City: Stone
County: Berkeley
Post Code: GL13 9LE
Phone: [redacted]
Email: [redacted]

Solum Surveying Ltd
The Old Stables, Pines Courtyard, Stone
[redacted]

Scoring Summary

Project Name	Project Number	Project Date
14639-A Barns Green Report	14639-A	29/07/2025

Structural Defects

Grade 3: Best practice suggests consideration should be given to repairs in the medium term.

Grade 4: Best practice suggests consideration should be given to repairs to avoid a potential collapse.

Grade 5: Best practice suggests that this pipe is at risk of collapse at any time. Urgent consideration should be given to repairs to avoid total failure.

Item No.	PLR	Grade	Description
9	MH1X	5	Deformed sewer or drain, 30%, finish

Service / Operational Condition

Grade 3: Best practice suggests consideration should be given to maintenance activities in the medium term.

Grade 4: Best practice suggests consideration should be given to maintenance activity to avoid potential blockages.

Grade 5: Best practice suggests that this pipe is at a high risk of backing up or causing flooding.

Item No.	PLR	Grade	Description
1	GY1X	3	Settled deposits, fine, 5% cross-sectional area loss, finish
2	GY2X	2	Roots, fine at joint
5	GY5X	3	Multiple defects
6	INLET1X	3	Settled deposits, other, 10% cross-sectional area loss, finish
7	INLET2X	4	Settled deposits, other, 50% cross-sectional area loss, finish
8	INLET3X	3	Settled deposits, other, 5% cross-sectional area loss
9	MH1X	4	Deformed sewer or drain, 30%, finish

Abandoned Surveys

Item No.	PLR	Description
7	INLET2X	Survey abandoned

Information

These scoring summaries are based on the SRM grading from the WRc.

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[redacted]

Project Pictures

Project Name	Project Number	Project Date
14639-A Barns Green Report	14639-A	29/07/2025



GY3 LOCATION



GY4 LOCATION



GY5 LOCATION



INLET 1 LOCATION



INLET 2 LOCATION



INLET 3 LOCATION

Solum Surveying Ltd
The Old Stables, Pines Courtyard, Stone
[redacted]

Project Pictures

Project Name	Project Number	Project Date
14639-A Barns Green Report	14639-A	29/07/2025



MH1 LOCATION



MH2, GY2, GY1 LOCATION



MH3 LOCATION



OUTFALL 1 LOCATION



OUTFALL 2 LOCATION

Solum Surveying Ltd
The Old Stables, Pines Courtyard, Stone
[redacted]

Project Summary

Project Name	Project Number	Project Date
14639-A Barns Green Report	14639-A	29/07/2025

Pipe Summary

No.	Type	PLR	Upstream Node	Downstream Node	Road	Town	Use	Mat.	Profile	Length
1	SEC	GY1X	GY1	GY2	Chapel Road	Horsham	S	PVC	Circular 150mm	0.30 m
2	SEC	GY2X	GY2	MH2	Chapel Road	Horsham	S	PVC	Circular 150mm	0.63 m
3	SEC	GY3X	GY3	ML	Chapel Road	Horsham	S	CO	Circular 150mm	0.69 m
4	SEC	GY4X	GY4	ML	Chapel Road	Horsham	S	CO	Circular 150mm	0.67 m
5	SEC	GY5X	GY5	MH4	Chapel Road	Horsham	S	PVC	Circular 150mm	9.22 m
6	SEC	INLET1X	INLET1	OUTFALL2	Chapel Road	Horsham	S	PVC	Circular 300mm	2.49 m
7	SEC	INLET2X	INLET2	MH2	Chapel Road	Horsham	S	CO	Circular 300mm	1.20 m
8	SEC	INLET3X	INLET3	MH3	Chapel Road	Horsham	S	PVC	Circular	0.12 m
9	SEC	MH1X	MH1	OUTFALL1	Chapel Road	Horsham	S	CO	Circular 625mm	30.10 m
									Total:	**45.42 m**

Pipe Levels

No.	PLR	Upstream Node	Upstream C.L.	Upstream I.L.	Upstream I.D.	Downstream Node	Downstream C.L.	Downstream I.L.	Downstream I.D.
1	GY1X	GY1			0.000 m	GY2			0.000 m
2	GY2X	GY2			0.000 m	MH2			0.000 m
3	GY3X	GY3			0.000 m	ML			0.000 m
4	GY4X	GY4			0.000 m	ML			0.000 m
5	GY5X	GY5			0.000 m	MH4			0.000 m
6	INLET1X	INLET1			0.000 m	OUTFALL2			0.000 m
7	INLET2X	INLET2			0.000 m	MH2			0.000 m
8	INLET3X	INLET3			0.000 m	MH3			0.000 m
9	MH1X	MH1			0.000 m	OUTFALL1			0.000 m

Solum Surveying Ltd
The Old Stables, Pines Courtyard, Stone
[redacted]

Project Summary

Project Name	Project Number	Project Date
14639-A Barns Green Report	14639-A	29/07/2025

Pipe Summary by Profile

Profile		Total Length	No. Pipes
Circular		0.12 m	
Circular	=	0.12 m	1
Circular 150mm		0.30 m	
Circular 150mm		0.63 m	
Circular 150mm		0.69 m	
Circular 150mm		0.67 m	
Circular 150mm		9.22 m	
Circular 150mm	=	11.51 m	5
Circular 300mm		2.49 m	
Circular 300mm		1.20 m	
Circular 300mm	=	3.69 m	2
Circular 625mm		30.10 m	
Circular 625mm	=	30.10 m	1
Total	**=**	**45.42 m**	**9**

Inspection Summary

Pipe No.	Insp. No.	Upstream Node	Downstream Node	Dir.	Operator	Insp. Date	Insp. Time	Str	Ser	Final Observation	Length
1	1	GY1	GY2	DS	Js	28/07/2025	10:51	1	5	GYF	0.30 m
2	1	GY2	MH2	DS	Js	28/07/2025	10:51	1	3	MHF, BURIED	0.63 m
3	1	GY3	ML	DS	Js	28/07/2025	10:52	1	1	BRF, MAINLINE	0.69 m
4	1	GY4	ML	DS	Js	28/07/2025	10:52	1	1	BRF, MAINLINE	0.67 m
5	1	GY5	MH4	DS	Js	28/07/2025	10:53	1	3	MHF, BURIED	9.22 m
6	1	INLET1	OUTFALL2	DS	Js	28/07/2025	10:51	1	3	OFF	2.49 m
7	**1**	**INLET2**	**MH2**	**DS**	**Js**	**28/07/2025**	**10:52**	**1**	**5**	**SA, UNABLE TO PUSH PAST MASS DEPOSITS**	**1.20 m**
8	1	INLET3	MH3	DS	Js	28/07/2025	10:52	1	5	MHF, BURIED	0.12 m
9	1	MH1	OUTFALL1	US	Js	28/07/2025	10:53	5	4	CPF, BURIED	30.10 m
										Total:	**45.42 m**

Solum Surveying Ltd
The Old Stables, Pines Courtyard, Stone
[redacted]

Project Summary

Project Name	Project Number	Project Date
14639-A Barns Green Report	14639-A	29/07/2025

Inspection Summary by Profile

Profile		Total Length	No. Inspections
Circular		0.12 m	
Circular	=	0.12 m	1
Circular 150mm Circular 150mm Circular 150mm Circular 150mm Circular 150mm		0.30 m 0.63 m 0.69 m 0.67 m 9.22 m	
Circular 150mm	=	11.51 m	5
Circular 300mm Circular 300mm		2.49 m 1.20 m	
Circular 300mm	=	3.69 m	2
Circular 625mm		30.10 m	
Circular 625mm	=	30.10 m	1
Total	**=**	**45.42 m**	**9**

Defect Summary

				CCTV Drainage Survey Observation Count																				
				General				Structural Condition									Service Condition						Misc	
Sect. No.	Insp. No.	Upstream Node	Downstream Node	Insp. Length (m)	No. Grade 4/5 Obs.	Survey Abandoned	Camera Under Water	Cracks	Fractures	Broken	Deformed	Collapsed	Holes	Surface Damage	Displaced Joints	Open Joints	Roots	Infiltration	Encrustation	Silt	Grease	Obstruction	Water Level	Line Deviates
1	1	GY1	GY2	0.3																2			1	
2	1	GY2	MH2	0.6												1	1						1	
3	1	GY3	ML	0.7																			1	
4	1	GY4	ML	0.7																			1	
5	1	GY5	MH4	9.2																5			4	2
6	1	INLET1	OUTFALL2	2.5																			1	
7	**1**	**INLET2**	**MH2**	**1.2**	**1**	**1**											**2**						**1**	
8	1	INLET3	MH3	0.1																			1	
9	1	MH1	OUTFALL1	30.1	3					2	2					3	4						1	5

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Project Summary

Project Name	Project Number	Project Date
14639-A Barns Green Report	14639-A	29/07/2025

Sect. No.	Insp. No.	Upstream Node	Downstream Node	Insp. Length (m)	No. Grade 4/5 Obs.	Survey Abandoned	Camera Under Water	Cracks	Fractures	Broken	Deformed	Collapsed	Holes	Surface Damage	Displaced Joints	Open Joints	Roots	Infiltration	Encrustation	Silt	Grease	Obstruction	Water Level	Line Deviates
			Total:	**45.4**	**4**	**1**											**7**			**7**			**12**	**7**

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Section Inspection - 28/07/2025 - GY1X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
1	1	28/07/25	10:51	14639-A	No Rain Or Snow	Yes	GY1X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JS	Ford Transit	Solo Pro / Crawler	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Downstream	**Upstream Node:**	GY1
Road:	Chapel Road	**Inspected Length:**	0.30 m	**Upstream Pipe Depth:**	
Location:	Fields, farmland etc	**Total Length:**	0.30 m	**Downstream Node:**	GY2
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50



Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		GY	Start node, gully, reference: GY1	00:00:00		
0.00		WL	Water level, 0% of the vertical dimension	00:00:02		
0.02	S01	DES	Settled deposits, fine, 5% cross-sectional area loss, start	00:00:02		
0.29	F01	DES	Settled deposits, fine, 5% cross-sectional area loss, finish	00:00:06		3
0.30		GYF	Finish node, gully, reference: GY2	00:00:01		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	1	2.0	6.7	2.0	5.0

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The Old Stables, Pines Courtyard, Stone
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Section Inspection - 28/07/2025 - GY2X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
2	1	28/07/25	10:51	14639-A	No Rain Or Snow	Yes	GY2X

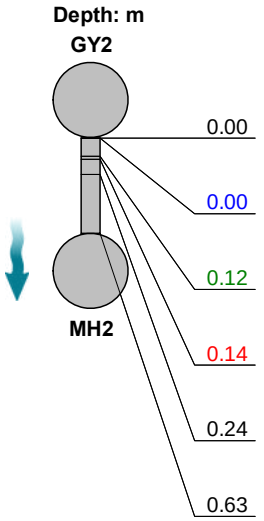
Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JS	Ford Transit	Solo Pro / Crawler	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Downstream	**Upstream Node:**	GY2
Road:	Chapel Road	**Inspected Length:**	0.63 m	**Upstream Pipe Depth:**	
Location:	Fields, farmland etc	**Total Length:**	0.63 m	**Downstream Node:**	MH2
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	GY	Start node, gully, reference: GY2	00:00:00		
0.00	WL	Water level, 0% of the vertical dimension	00:00:01		
0.12	RFJ	Roots, fine at joint	00:00:04	1	2
0.14	OJL	Open joint, large	00:00:04	2	1
0.24	MCCO	Pipe material changes to concrete at this point	00:00:04		
0.63	MHF	Finish node, manhole, reference: MH2: BURIED	00:00:47		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
1	2.0	3.2	2.0	1.0	1	1.0	1.6	1.0	3.0

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The Old Stables, Pines Courtyard, Stone
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Section Pictures - 28/07/2025 - GY2X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
2	Downstream	GY2X	14639-A	14639-A



1, 00:00:04, 0.12 m
Roots, fine at joint



2, 00:00:04, 0.14 m
Open joint, large

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Section Inspection - 28/07/2025 - GY3X

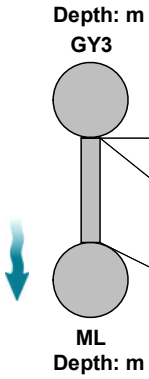
Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
3	1	28/07/25	10:52	14639-A	No Rain Or Snow	Yes	GY3X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JS	Ford Transit	Solo Pro / Crawler	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Downstream	**Upstream Node:**	GY3
Road:	Chapel Road	**Inspected Length:**	0.69 m	**Upstream Pipe Depth:**	
Location:	Fields, farmland etc	**Total Length:**	0.69 m	**Downstream Node:**	ML
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Concrete
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:



Scale: 1:50 Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	GY	Start node, gully, reference: GY3	00:00:00		
0.00	WL	Water level, 0% of the vertical dimension	00:00:00		
0.69	BRF	Finish node, major connection without manhole, reference: ML: MAINLINE	00:00:16		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

Solum Surveying Ltd
The Old Stables, Pines Courtyard, Stone
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Section Inspection - 28/07/2025 - GY4X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
4	1	28/07/25	10:52	14639-A	No Rain Or Snow	Yes	GY4X

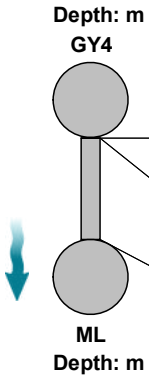
Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JS	Ford Transit	Solo Pro / Crawler	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Downstream	**Upstream Node:**	GY4
Road:	Chapel Road	**Inspected Length:**	0.67 m	**Upstream Pipe Depth:**	
Location:	Fields, farmland etc	**Total Length:**	0.67 m	**Downstream Node:**	ML
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Concrete
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	GY	Start node, gully, reference: GY4	00:00:00		
0.00	WL	Water level, 0% of the vertical dimension	00:00:06		
0.67	BRF	Finish node, major connection without manhole, reference: ML: MAINLINE	00:00:13		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Section Inspection - 28/07/2025 - GY5X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
5	1	28/07/25	10:53	14639-A	No Rain Or Snow	Yes	GY5X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JS	Ford Transit	Solo Pro / Crawler	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Downstream	**Upstream Node:**	GY5
Road:	Chapel Road	**Inspected Length:**	9.22 m	**Upstream Pipe Depth:**	
Location:	Fields, farmland etc	**Total Length:**	9.22 m	**Downstream Node:**	MH4
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:80



Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		GY	Start node, gully, reference: GY5	00:00:00		
0.00		WL	Water level, 10% of the vertical dimension	00:00:01		
0.02	S01	DES	Settled deposits, fine, 10% cross-sectional area loss, start	00:00:01		
0.81	C01	DES	Settled deposits, fine, 15% cross-sectional area loss, change	00:00:06		
1.70	F01	DES	Settled deposits, fine, 15% cross-sectional area loss, finish	00:00:09		3
4.54	S02	DES	Settled deposits, fine, 5% cross-sectional area loss, start	00:00:22		
4.62		WL	Water level, 15% of the vertical dimension	00:00:23		
7.31		LR	Line deviates right	00:00:41		
7.58	F02	DES	Settled deposits, fine, 5% cross-sectional area loss, finish	00:00:44		3
7.90		WL	Water level, 10% of the vertical dimension	00:00:47		
8.38		LR	Line deviates right	00:00:52		
8.46		WL	Water level, 5% of the vertical dimension	00:00:53		
9.22		MHF	Finish node, manhole, reference: MH4: BURIED	00:01:17		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	2	2.0	1.3	12.0	3.0

Solum Surveying Ltd
The Old Stables, Pines Courtyard, Stone [redacted]

Section Inspection - 28/07/2025 - INLET1X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
6	1	28/07/25	10:51	14639-A	No Rain Or Snow	Yes	INLET1X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JS	Ford Transit	Solo Pro / Crawler	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Downstream	**Upstream Node:**	INLET1
Road:	Chapel Road	**Inspected Length:**	2.49 m	**Upstream Pipe Depth:**	
Location:	Fields, farmland etc	**Total Length:**	2.49 m	**Downstream Node:**	OUTFALL2
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	300 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:



Scale: 1:50 Position [m]		Code	Observation	MPEG	Photo	Grade
Depth: m INLET1						
0.00		BR	Start node, major connection without manhole, reference: INLET1	00:00:00		
0.00		WL	Water level, 0% of the vertical dimension	00:00:14		
0.02	S01	DEX	Settled deposits, other, 10% cross-sectional area loss, start	00:00:01		
2.48	F01	DEX	Settled deposits, other, 10% cross-sectional area loss, finish	00:00:22		3
2.49		OFF	Finish node, outfall, reference: OUTFALL2	00:00:22		
OUTFALL2 Depth: m						

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	1	2.0	2.4	6.0	3.0

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Section Inspection - 28/07/2025 - INLET2X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
7	1	28/07/25	10:52	14639-A	No Rain Or Snow	Yes	INLET2X

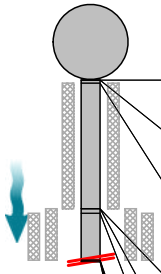
Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JS	Ford Transit	Solo Pro / Crawler	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Downstream	**Upstream Node:**	INLET2
Road:	Chapel Road	**Inspected Length:**	1.20 m	**Upstream Pipe Depth:**	
Location:	Fields, farmland etc	**Total Length:**	1.20 m	**Downstream Node:**	MH2
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	300 mm
Flow Control:	No flow control	**Material:**	Concrete
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50



Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		BR	Start node, major connection without manhole, reference: INLET2	00:00:00		
0.00		WL	Water level, 0% of the vertical dimension	00:00:00		
0.02	S01	DEZ	Attached deposits, other from 4 o'clock to 8 o'clock, 5% cross-sectional area loss, start	00:00:00		
0.85	S02	RF	Roots, fine, start	00:00:13		
0.85	F01	DEZ	Attached deposits, other from 4 o'clock to 8 o'clock, 5% cross-sectional area loss, finish	00:00:14		3
0.88	S03	DEX	Settled deposits, other, 25% cross-sectional area loss, start	00:00:14		
1.19	F02	RF	Roots, fine, finish	00:00:22		2
1.19	F03	DEX	Settled deposits, other, 50% cross-sectional area loss, finish	00:00:22	1	4
1.20		SA	Survey abandoned: UNABLE TO PUSH PAST MASS DEPOSITS	00:00:23		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	3	8.0	6.7	8.0	5.0

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[redacted]

Section Pictures - 28/07/2025 - INLET2X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
7	Downstream	INLET2X	14639-A	14639-A



1, 00:00:22, 1.19 m
Settled deposits, other, 50% cross-sectional area loss, finish

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Section Inspection - 28/07/2025 - INLET3X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
8	1	28/07/25	10:52	14639-A	No Rain Or Snow	Yes	INLET3X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JS	Ford Transit	Solo Pro / Crawler	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Downstream	**Upstream Node:**	INLET3
Road:	Chapel Road	**Inspected Length:**	0.12 m	**Upstream Pipe Depth:**	
Location:	Fields, farmland etc	**Total Length:**	0.12 m	**Downstream Node:**	MH3
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50 Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: m INLET3					
0.00	BR	Start node, major connection without manhole, reference: INLET3	00:00:00		
0.00	WL	Water level, 0% of the vertical dimension			
MH3 0.01	REM	General remark: NO PIPE			
0.02	DEX	Settled deposits, other, 5% cross-sectional area loss	00:00:06		3
0.12	MHF	Finish node, manhole, reference: MH3: BURIED	00:00:19		
Depth: m					

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	1	2.0	16.7	2.0	5.0

Solum Surveying Ltd
The Old Stables, Pines Courtyard, Stone
[redacted]

Section Inspection - 28/07/2025 - MH1X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
9	1	28/07/25	10:53	14639-A	No Rain Or Snow	Yes	MH1X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JS	Ford Transit	Solo Pro / Crawler	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Upstream	**Upstream Node:**	MH1
Road:	Chapel Road	**Inspected Length:**	30.10 m	**Upstream Pipe Depth:**	
Location:	Fields, farmland etc	**Total Length:**	30.10 m	**Downstream Node:**	OUTFALL1
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	625 mm
Flow Control:	No flow control	**Material:**	Concrete
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:146



Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		BR	Start node, major connection without manhole, reference: OUTFALL1 (a)	00:00:00		
0.00		WL	Water level, 5% of the vertical dimension	00:00:02		
4.60		RFJ	Roots, fine at joint	00:00:30	1	2
5.39		OJM	Open joint, medium	00:00:35	2	1
6.03		LL	Line deviates left: SLIGHT	00:00:38		
7.38		RFJ	Roots, fine at joint	00:00:44	3	2
9.22		RFJ	Roots, fine at joint	00:00:54	4	2
9.22		OJM	Open joint, medium	00:00:54	5	1
10.11	S01	LR	Line deviates right, start: SLIGHT	00:01:05		
11.16		RFJ	Roots, fine at joint	00:01:13	6	2
11.16		OJM	Open joint, medium	00:01:13	7	1
13.74	F01	LR	Line deviates right, finish: SLIGHT	00:01:33		
15.00	S03	D	Deformed sewer or drain, 30%, start	00:01:49		
15.00	S02	B	Broken pipe from 12 o'clock to 12 o'clock, start	00:01:49	8	

Solum Surveying Ltd
The Old Stables, Pines Courtyard, Stone
[redacted]

Section Inspection - 28/07/2025 - MH1X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
9	1	28/07/25	10:53	14639-A	No Rain Or Snow	Yes	MH1X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JS	Ford Transit	Solo Pro / Crawler	Not Specified	Not Specified	Not Specified



Scale: 1:146	Position [m]	Code	Observation	MPEG	Photo	Grade
	18.66	F02 B	Broken pipe from 12 o'clock to 12 o'clock, finish	00:03:20		4
	18.66	F03 D	Deformed sewer or drain, 30%, finish	00:03:20		5 / 4
	20.18	S04 LR	Line deviates right, start: SLIGHT	00:03:34		
	27.22	F04 LR	Line deviates right, finish: SLIGHT	00:04:22		
	30.10	CPF	Finish node, catchpit, reference: MH1: BURIED	00:05:37		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
5	245.0	32.7	983.0	5.0	5	5.0	0.8	24.0	4.0

Section Pictures - 28/07/2025 - MH1X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
9	Upstream	MH1X	14639-A	14639-A



1, 00:00:30, 4.60 m
Roots, fine at joint



2, 00:00:35, 5.39 m
Open joint, medium



3, 00:00:44, 7.38 m
Roots, fine at joint



4, 00:00:54, 9.22 m
Roots, fine at joint

Section Pictures - 28/07/2025 - MH1X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
9	Upstream	MH1X	14639-A	14639-A



5, 00:00:54, 9.22 m
Open joint, medium



6, 00:01:13, 11.16 m
Roots, fine at joint



7, 00:01:13, 11.16 m
Open joint, medium



8, 00:01:49, 15.00 m
Broken pipe from 12 o'clock to 12 o'clock, start

Appendix I

Timothy Wood

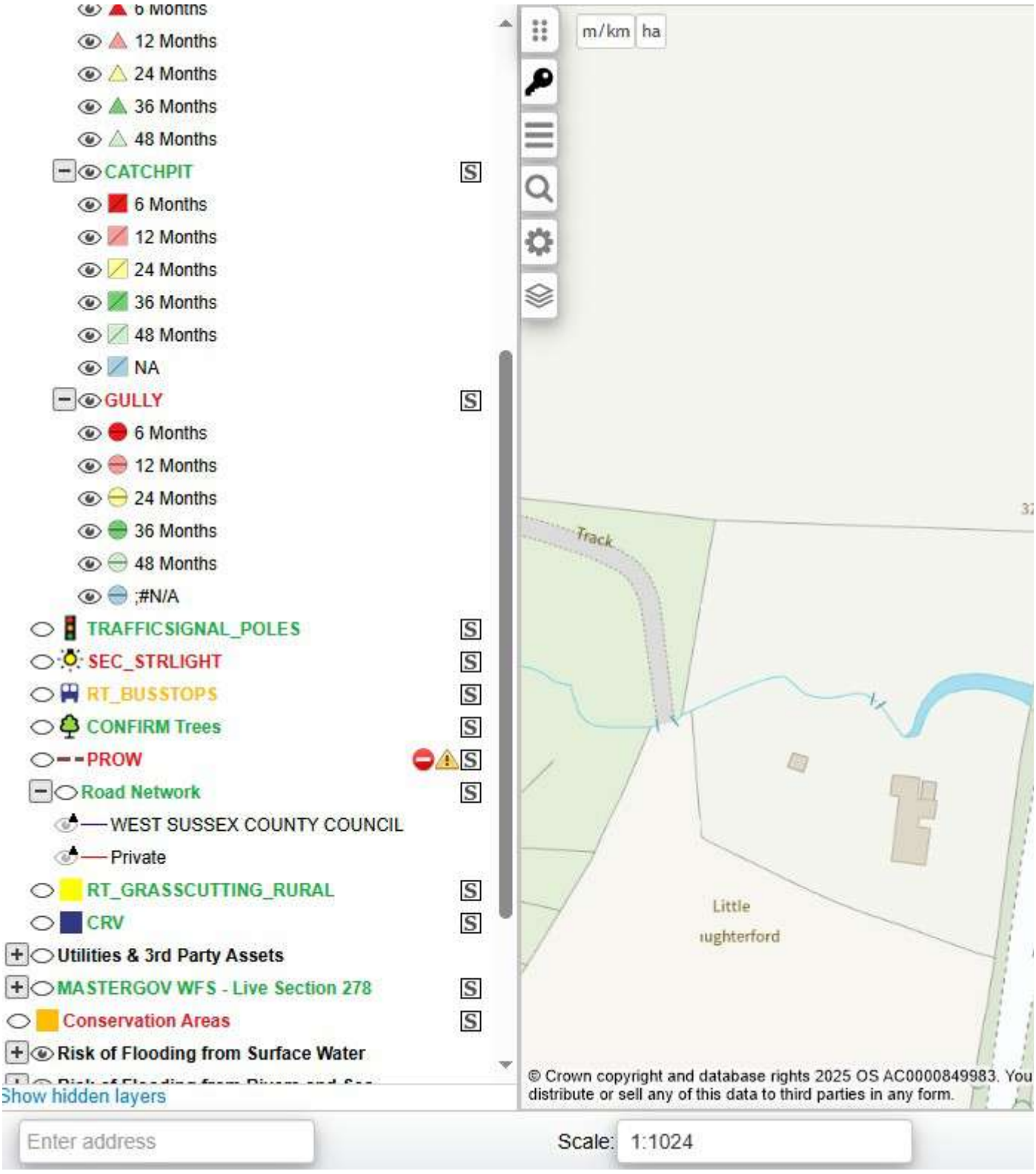
From: Lee Newham [redacted]
Sent: 09 April 2025 07:52
To: Adam Bazley; Liam Nally
Cc: Ian Gledhill
Subject: RE: Chapel Road, Barns Green

Hi Adam,

Please see attached, unfortunately we only have a limited amount of info for this location, in the below screen grab we have the yellow and green icons which are a mixture of wscc drainage assets, detailed in the key (ignore the month durations as this has now changed), the black lines to the north represent a rough location of the pipe that was identified from a previous jet job and that is as far as that jet job went (I assume it was free and flowing after this point).

In terms of the two culverts its possible one is related to this drainage system further to the north and id hazard a guess that the 300mm line would be the one linked however, I'm not overly sure on the 625mm line its possible it could be ours but linked with a water course rather than the surface water system or it could be serving drainage from adjacent land at smugglers lane/muntham drive, without jetting or camera survey this is only my guess.

Hope this helps.

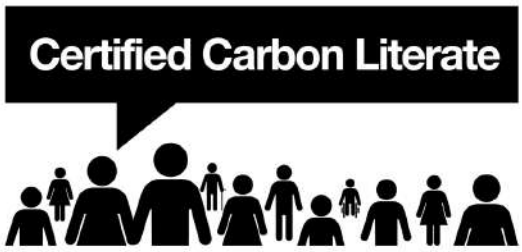


Many thanks.

Lee Newham
Principal Highway Steward (drainage)
Place Services
Highways, Transport & Planning
West Sussex County Council
Location: Southern Area Office, Clapham Depot, Clapham Common, Clapham, West Sussex, BN13 3UR
Contact: Internal: [redacted] **External:** +44 (0)330 222 8284 | **Mobile:** [redacted] | **E-mail:** [redacted]

Report a problem with a road or pavement or raise a highways related enquiry

Did you know you can follow West Sussex Highways on Twitter? @WSHighways



Advance Leave notice:

From: Adam Bazley [redacted]>
Sent: 08 April 2025 15:54
To: Liam Nally [redacted]; Lee Newham [redacted]
Cc: Ian Gledhill [redacted]
Subject: FW: Chapel Road, Barns Green

Hi Guys

Are you happy to assist.

Many thanks

Adam

Mr Adam Bazley
Area Highway Manager – Central Area (Adur, Worthing, Horsham District)
Economy, Infrastructure & Environment – Highways, Transport and Planning
West Sussex County Council

Location: Southern Area Office, Clapham Depot, Clapham Common, Clapham, West Sussex, BN13 3UR
Contact: Internal: [redacted] | **External:** +44 (0)330 222 3861 | **Mobile:** [redacted] | **E-mail:** [redacted]

From: Ian Gledhill [redacted]
Sent: 08 April 2025 08:37
To: Adam Bazley [redacted]
Subject: FW: Chapel Road, Barns Green

Morning, apologies, I know you'll have a million emails in your inbox.

I don't know where to direct this enquiry onto; it's a request for highway drainage information in Barns Green. Is there someone in your team that might be able to assist?

Thanks

Ian

Ian Gledhill BSc MCIHT| Principal Planner – County Highways (Development Management) - Planning Services, West Sussex County Council | Location: Ground Floor Northleigh, County Hall, Chichester, PO19 1RH
Internal: [redacted] | External: 0330 222 5717
E-mail: [redacted]k

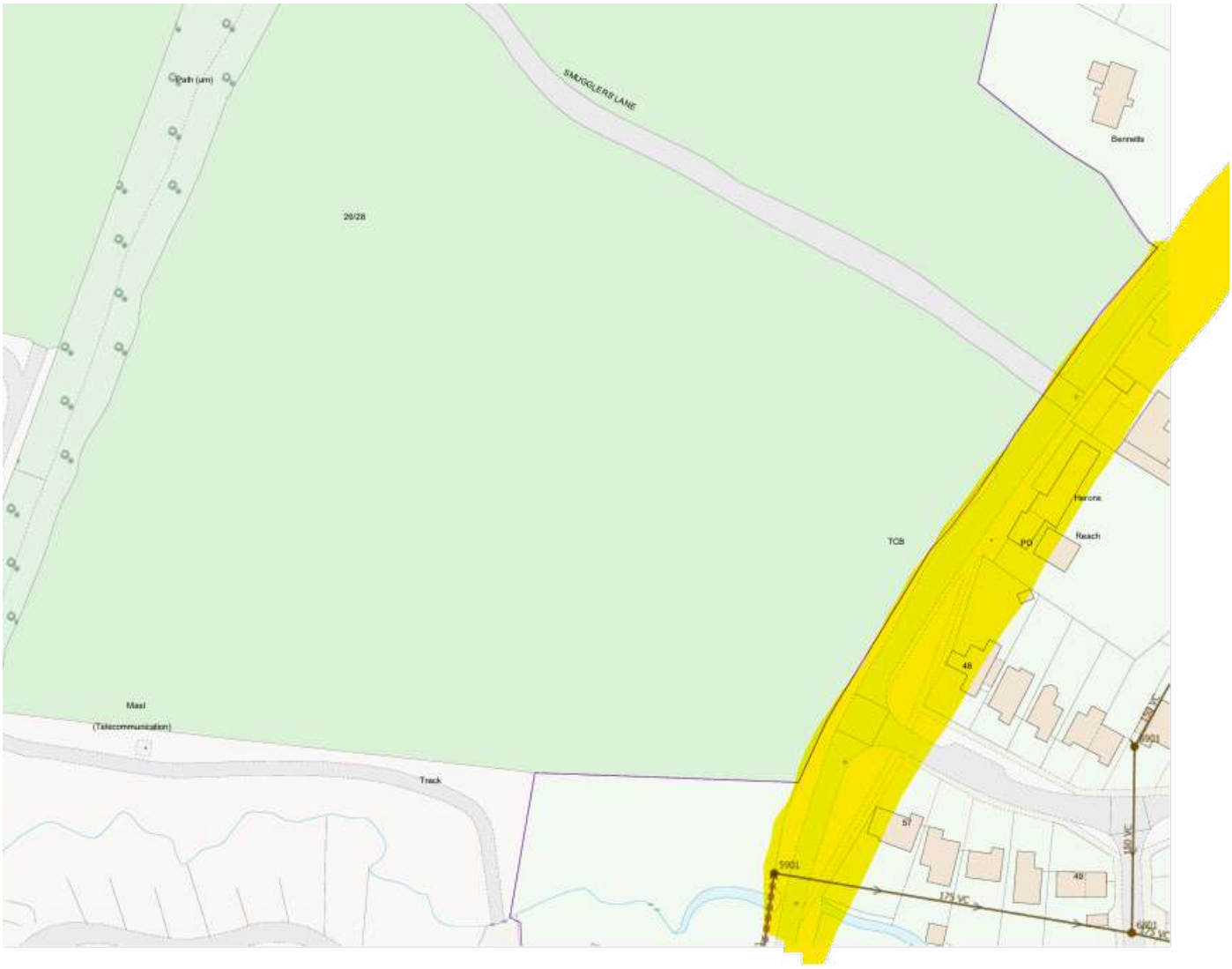
From: Timothy Wood [redacted]
Sent: 07 April 2025 09:02
To: Ian Gledhill [redacted]
Subject: Chapel Road, Barns Green

****EXTERNAL****

Good Morning Ian

Sorry to contact you out of the blue. I have been passed your details as a possible contact for obtaining some information on the existing highway drainage infrastructure within Chapel Road, Barns Green.

Southern Water sewer records indicate that there are no surface water or foul water sewers in Chapel Road between the Smugglers Lane Bridleway and the Muntham Gill (Ordinary watercourse) to the south (Plan A below) yet there are two culverts (one a 625mm culvert, the second a 300mm culvert) discharging into the watercourse within the wing walls of the headwall as it passes beneath Chapel Road (Photo below). I was wondering whether you would be able to confirm or pass me on to someone that might be able to confirm, that these are (or are not) highway drains and if so whether you hold any details to their depth, size, condition and/or alignment.



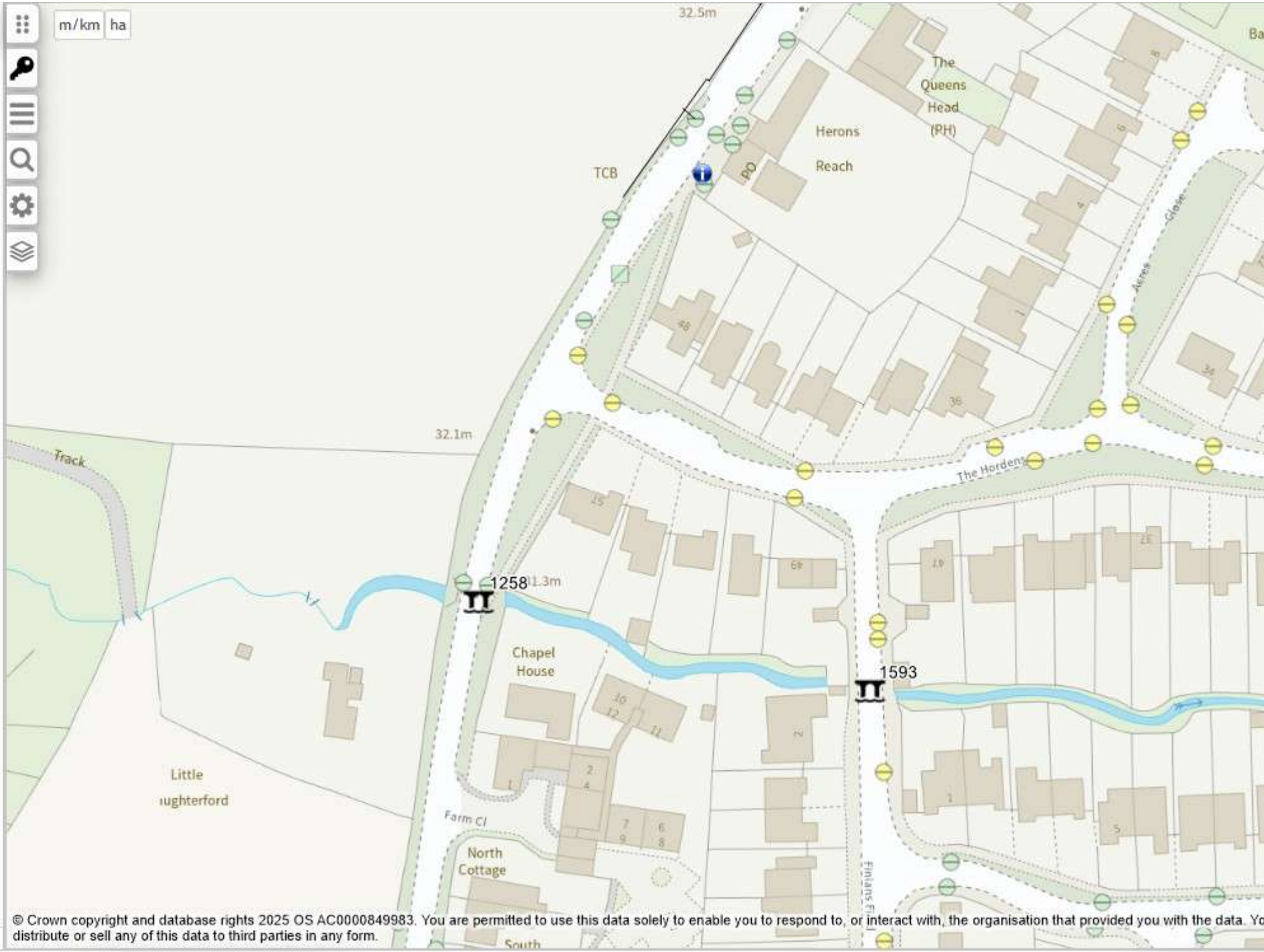


I look forward to your response

Best Regards

Tim Wood BEng(Hons) MCIWEM C.WEM
Owner of
TS Wood Consulting
M: [redacted]
E: [redacted]
W: www.tswoodconsulting.co.uk (*coming soon*)

CAUTION: This email originated from outside of the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.



COUNCIL

Water

Scale: 1:1024

Back

Forward

X,Y: 512447.734,

Appendix J



Inlet-Outfall

Inlet | Outfall

Manhole

Manhole

Pumping Station

Pumping Station

Treatment Works

Treatment Works

Wastewater Pipe

- Culverted Water Course
- Drain
- Outfall
- Overflow
- Rising Main
- Sewer
- Syphon
- Tank Sewer
- Trunk Sewer
- Vacuum Main
- Decommissioned Pipe

Wastewater Use

- Foul
- Combined
- Sludge
- Treated Effluent
- Surface Water

Developer Services

Build Over Agreement | Section 104

Wastewater Area

Catchment

Map Title: Land on the west side of Smugglers Lane

Date Printed: 08/08/2024

Map Scale: 750 OS Grid: TQ5972SW

Easting: 559237 Northing: 172042

This map is in British National Grid projection.

The information provided is believed to be correct but is provided on an 'as is' basis and without any warranty or condition express or implied, statutory or otherwise as to its quality or fitness for purpose. Actual positions of assets should always be determined on site.

There may be features in the map that do not appear in the Legend.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.
WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

CON29DW COMMERCIAL DRAINAGE & WATER SEARCH

WATER for LIFE from Southern Water

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Sewer Records Page 1 of 1

NODE	COVER	INVERT	DEPTH	SIZE	MATERIAL	SHAPE
5901	31.4	29.97	1.43	175	VC	CIRC
6801	31.41	28.91	2.5	175	VC	CIRC
6901	31.79	30.1	1.69	150	VC	CIRC

Date Exported: 08/08/2024

Material

AK	Alkathene
BAC	Bonded Asbestos Cement
BL	Bitumen Lined
BRC	Brick (Common)
BRE	Brick (Engineering)
CC	Concrete Box Culvert
CI	Cast Iron
CO	Concrete (In-Situ)
CP	Concrete (Pre-Cast)
CSB	Concrete Segments (Bolted)
CSU	Concrete Segments (Unbolted)
DI	Ductile Iron
GRC	Glass Reinforced Concrete
GRP	Glass Reinforced Plastic
MAC	Masonry In Regular Courses
OTHER	Other
PE	Polyethylene
PF	Pitch Fibre
PL	Plastic Lined
PP	Polypropylene
PSC	Plastic Steel Composite
PVC	Polyvinyl Chloride
RL	Resin Lined
RPM	Reinforced Plastic Matrix
SI	Spun Iron
ST	Steel
UNK	Unknown
VC	Vitrified Clay

Shape

ARCH	Arch
CIRC	Circular
EGG	Egg
HORS	Horseshoe
OVAL	Oval
RECT	Rectangular
UNK	Unknown

Node Referencing System

1st Digit:	hundred metre Easting identifier
2nd Digit:	hundred metre Northing identifier sewer type identifier
3rd Digit:	0-4 = Foul/Combined 5-9 = Surface Water
4th Digit:	next sequential node

This information is believed to be correct but is provided on an 'as is' basis without warranty or condition of any kind, statutory or otherwise. Actual information must be determined on site.

CON29DW COMMERCIAL DRAINAGE & WATER SEARCH

WATER for LIFE from Southern Water



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Hydrant

- Emptying Plug
- Fire Hydrant
- WOH Washout Hydrant

Water Pipe

- Communication
- Distribution
- Non-Potable
- Raw
- Trunk
- Decommissioned

Map Title: Land on the west side of Smugglers Lane

Date Printed: 08/08/2024

Map Scale: 750 OS Grid: TQ5972SW

Easting: 559237 Northing: 172042

This map is in British National Grid projection.

The information provided is believed to be correct but is provided on an 'as is' basis and without any warranty or condition express or implied, statutory or otherwise as to its quality or fitness for purpose. Actual positions of assets should always be determined on site.

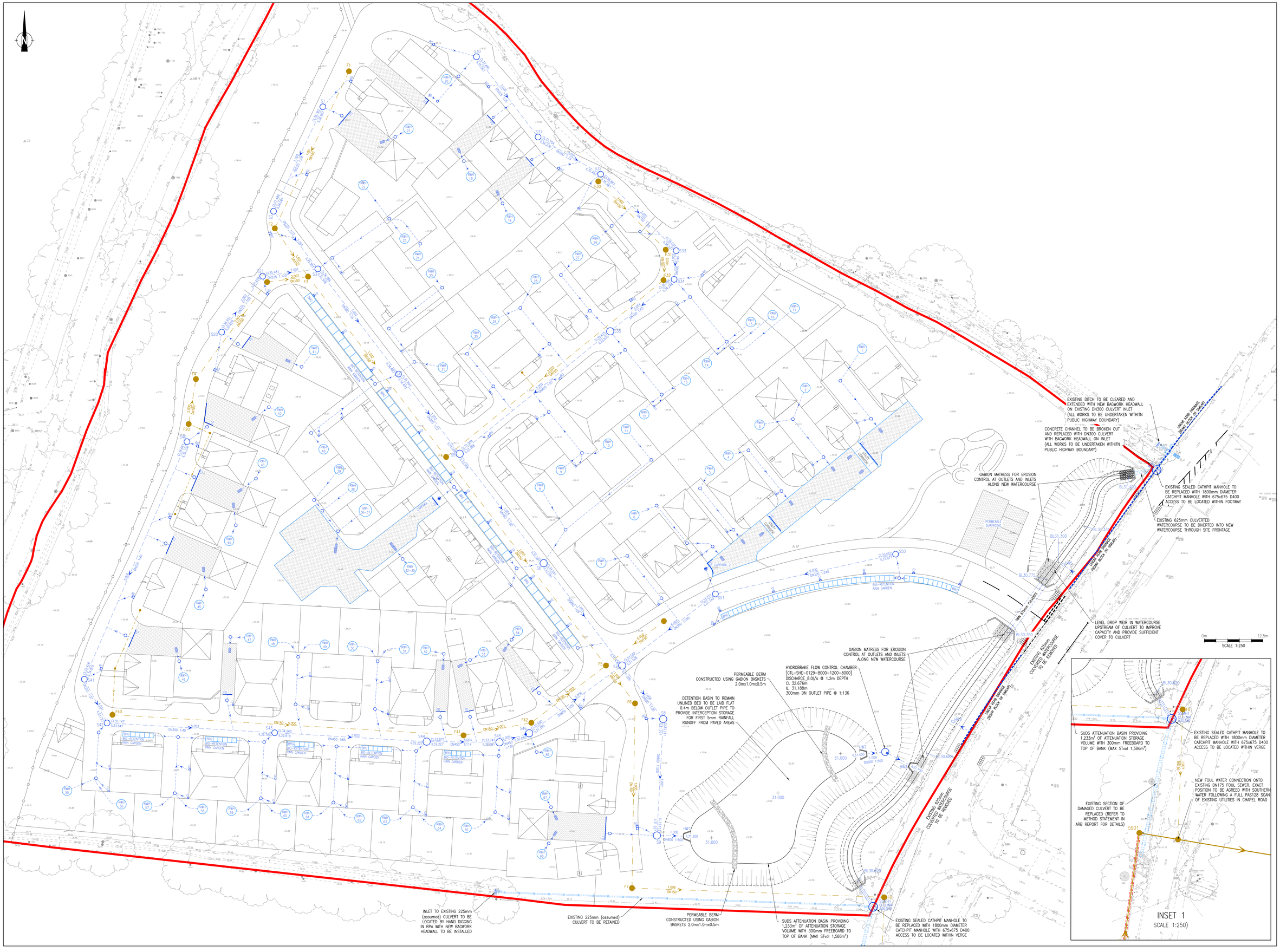
There may be features in the map that do not appear in the Legend.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.
WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

CON29DW COMMERCIAL DRAINAGE & WATER SEARCH

WATER for LIFE from Southern Water

Appendix K



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Cadmap Ltd
Unit 133 Dunsfold Park
Stovolds Hill
Surrey, GU8 6TB
T: 01483 429285
E: info@cadmap.co.uk
W: www.cadmap.co.uk

4. CULVERTED WATERCOURSE SURVEY UNDERTAKEN BY:

Solum Surveying Ltd
www.solumsurveying.com
tel: 01454 413592
email: info@solumsurveying.com
The Old Stables
Pines Courtyard
Stone
Berkeley
GL13 9LE

5. DO NOT SCALE FROM THIS DRAWING.
6. ALL DIMENSIONS ARE IN METRES (m), UNLESS STATED OTHERWISE.
7. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT SCHEME DRAWINGS AND SPECIFICATIONS.
8. FOR INDIVIDUAL RAINWATER HARVESTING TANK SPECIFICATIONS PLEASE REFER TO WATER NEUTRALITY STATEMENT.
9. A FULL PAS128 UTILITY SCAN SHOULD BE UNDERTAKEN PRIOR TO ANY EXCAVATIONS WITHIN THE CARRIAGEWAY OR VERGE OF CHAPEL ROAD.
10. ALIGNMENT OF EXISTING FOUL SEWER TAKEN FROM SOUTHERN WATER SEWER RECORDS THE EXACT ALIGNMENT AND DEPTH SHALL BE DETERMINED PRIOR TO CONSTRUCTION.
11. ANY WORKS WITHIN ROOT PROTECTION AREAS SHALL BE APPROVED WITH ARBORICULURIST PRIOR TO EXCAVATION.

KEY

- SHARED POROUS PAVING STORAGE VOLUME USED IN ATTENUATION CALCULATIONS
- PRIVATE POROUS PAVING STORAGE VOLUME NOT USED IN ATTENUATION CALCULATIONS
- BIO-RETENTION RAIN GARDEN
- RAINWATER HARVESTING TANK
- SURFACE WATER MANHOLE
- FLOW CONTROL CHAMBER
- SURFACE WATER SEWER WITH PIPE CODE DIAMETER AND GRADIENT
- HEADWALL
- GULLY OR ROAD GULLY
- GABION BASKET/MATRESS

REV	DESCRIPTION	DRN	CHK	DATE
	REVISIONS			
D	STRATEGY UPDATED TO ALIGN WITH SCHEME LAYOUT CHANGES	TSW	TSW	01.04.26
C	STORAGE VOLUMES UPDATED	TSW	TSW	23.09.25
B	FOUL DRAINAGE NETWORK AND CONNECTION ADDED	TSW	TSW	23.09.25
A	MINOR AMENDMENTS TO NEW WATERCOURSE SUDS UPDATED TO INCLUDE ADDITIONAL BRG	TSW	TSW	22.09.25

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miller homes

USR TITLE: BARNS GREEN HORSHAM

DRAWING TITLE: SURFACE WATER AND SUDS DRAINAGE STRATEGY

DATE	DRWN	CHECKED	ISSUE CHECKED
SEPT 2025	TSW	TSW	

DRAWING No.	REV	SCALE	
0018.401	D	1:250	@ A0

Appendix L

Greenfield runoff rate estimation tool

www.uksuds.com | Greenfield runoff rate estimation tool (https://www.uksuds.com/)

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	31/03/2025
Calculated by	Tim Wood
Reference	0018-A
Model version	0.6.5

Location

Site name	Land South of Smugglers Lane
Site location	Barns Green



Site easting	512485
Site northing	127009

Site details

Total site area (ha)	3.285 ha

Greenfield runoff

Method

Method	FEH statistical

FEH statistical

	My value		Map value
SAAR (mm)	773 mm		773
BFIHOST	0.263		
QMed-QBar conversion	1.136		1.136
QMed (l/s)	21.7 l/s		
QBar (FEH statistical) (l/s)	24.6 l/s		

Growth curve factors

	My value		Map value
Hydrological region	7		7
1 year growth factor	0.85		
2 year growth factor	0.88		
10 year growth factor	1.62		
30 year growth factor	2.3		
100 year growth factor	3.19		
200 year growth factor	3.74		

Results

Method	FEH statistical
Flow rate 1 year (l/s)	20.9 l/s
Flow rate 2 year (l/s)	21.7 l/s
Flow rate 10 years (l/s)	39.9 l/s
Flow rate 30 years (l/s)	56.6 l/s
Flow rate 100 years (l/s)	78.5 l/s
Flow rate 200 years (l/s)	92 l/s

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (0.6.5) developed by HR Wallingford and available at uksuds.com (https://www.uksuds.com/). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (https://www.uksuds.com/terms-conditions). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Appendix M



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KEY

SITE BOUNDARY

IMPERMEABLE SITE AREAS

- ROOF AREA (RWH) 4,452.3m²
- PERMEABLE PAVING 1,437.9m²
- BIO-RETENTION (RAIN GARDEN) 2,643.1m²
- PRIVATE DRIVES/HARDSTANDING 2,260.7m²
- MAIN ACCESS ROADS 2,215.4m²
- SUDS BASIN 1,082.1m²

TOTAL IMPERMEABLE AREA = 14,091.5m² (1.409ha)

0m 25m
SCALE 1:500

REV	DESCRIPTION	DRN	CHK	DATE
A	STRATEGY UPDATED TO ALIGN WITH SCHEME LAYOUT CHANGES	TSW	WST	01.04.26

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JOB TITLE
BARNS GREEN
HORSHAM

DRAWING TITLE
SURFACE WATER AND SUDS DRAINAGE STRATEGY IMPERMEABLE AREAS

DATE	DRAWN	CHECKED	ISSUE CHECKED
SEPT 2025	TSW	TSW	

DRAWING No.	REV	SCALE	
0018.402	A	1:500	@ A1

Appendix N

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.000
CV	1.000	Preferred Cover Depth (m)	0.900
Time of Entry (mins)	5.00	Include Intermediate Ground	x
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	150.0		

Node HW-Outlet Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	40.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	31.000	Main Channel Slope (1:X)	1000.0
Safety Factor	2.0	Time to half empty (mins)		Main Channel n	0.030

Inlets

HW-Inlet

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	572.6	572.6	0.500	743.6	749.5	1.000	930.3	943.1	1.500	1132.5	1153.2
0.100	605.4	606.5	0.600	779.7	786.9	1.100	969.4	983.7	1.600	1174.8	1197.1
0.200	639.1	641.3	0.700	816.3	824.9	1.200	1009.3	1025.1	1.700	1222.1	1246.0
0.300	673.3	676.7	0.800	853.7	863.6	1.300	1049.7	1067.1			
0.400	708.2	712.9	0.900	891.7	903.1	1.400	1090.8	1109.8			

Node Carpark 1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	34.000	Slope (1:X)	500.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	
Safety Factor	2.0	Width (m)	20.000	Inf Depth (m)	
Porosity	0.35	Length (m)	16.000		

Node Carpark 2 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	32.500	Slope (1:X)	500.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	51	Depth (m)	
Safety Factor	2.0	Width (m)	6.000	Inf Depth (m)	
Porosity	0.35	Length (m)	46.500		

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Results for 30 year +10% A Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)
15 minute summer	1	10	37.013	0.076	22.9	0.1344
15 minute summer	2	10	36.137	0.076	24.3	0.0892
15 minute summer	20	10	35.683	0.054	6.6	0.0715
15 minute summer	21	10	35.591	0.110	20.2	0.1641
15 minute summer	3	10	35.425	0.117	60.4	0.1782
15 minute summer	4	10	34.640	0.147	101.6	0.3309
15 minute summer	30	10	37.232	0.074	24.0	0.1337
15 minute summer	31	10	36.361	0.082	30.4	0.1073
15 minute summer	32	10	35.486	0.099	52.0	0.1708
15 minute summer	33	10	34.667	0.136	51.8	0.1538
15 minute summer	34	10	34.389	0.145	78.2	0.3024
15 minute summer	35	10	34.163	0.188	139.5	0.5517
15 minute summer	5	10	33.599	0.241	253.8	0.4317
15 minute summer	6	11	32.848	0.257	293.8	0.6252
15 minute summer	40	10	35.366	0.130	53.0	0.3414
15 minute summer	41	10	34.157	0.154	56.9	0.1928
15 minute summer	42	11	33.789	0.142	74.7	0.2321
15 minute summer	43	10	32.821	0.211	138.6	0.6374
15 minute summer	44	11	32.529	0.302	173.0	0.6989
15 minute summer	45	11	32.415	0.324	193.0	0.6271
15 minute summer	46	11	32.315	0.960	208.4	1.9767
15 minute summer	7	11	32.283	0.977	550.7	1.7263
15 minute summer	8	11	32.094	0.817	557.7	1.6204
360 minute winter	9	352	31.895	0.668	83.5	1.5474
360 minute winter	HW-Inlet	352	31.895	0.855	82.3	0.0000

US Node	Discharge Vol (m³)
1	
2	
20	
21	
3	
4	
30	
31	
32	
33	
34	
35	
5	
6	
40	
41	
42	
43	
44	
45	
46	
7	
8	
9	
HW-Inlet	

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Results for 30 year +10% A Critical Storm Duration. Lowest mass balance: 99.78%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)
15 minute summer	50	11	32.329	0.458	41.9	0.8843
15 minute summer	51	11	32.381	0.641	46.3	0.9820
360 minute winter	HW-Outlet	352	31.895	0.895	42.9	0.0000
360 minute winter	Flow-Control	352	31.895	0.907	10.9	2.8809
180 minute winter	13	100	31.042	0.076	10.5	0.0000
480 minute winter	Carpark 1	464	34.412	0.412	5.1	45.1276
60 minute summer	Carpark 2	43	32.862	0.362	50.8	31.9182

US Node	Discharge Vol (m³)
50	
51	
HW-Outlet	
Flow-Control	303.0
Carpark 1	
Carpark 2	

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Results for 30 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)
15 minute summer	1	10	37.028	0.091	32.1	0.1620
15 minute summer	2	10	36.153	0.092	34.2	0.1081
15 minute summer	20	10	35.692	0.063	9.2	0.0846
15 minute summer	21	10	35.617	0.136	28.2	0.2025
15 minute summer	3	10	35.451	0.143	84.6	0.2173
15 minute summer	4	10	34.677	0.184	142.3	0.4133
15 minute summer	30	10	37.247	0.089	33.6	0.1610
15 minute summer	31	10	36.378	0.099	42.6	0.1304
15 minute summer	32	10	35.507	0.120	72.9	0.2068
15 minute summer	33	10	34.700	0.169	72.6	0.1907
15 minute summer	34	10	34.423	0.179	109.6	0.3742
15 minute summer	35	10	34.208	0.233	195.5	0.6837
15 minute summer	5	11	33.703	0.345	355.8	0.6186
15 minute summer	6	11	33.280	0.689	407.6	1.6748
15 minute summer	40	10	35.401	0.165	74.2	0.4347
15 minute summer	41	11	34.236	0.233	79.6	0.2924
15 minute summer	42	10	33.822	0.175	103.5	0.2850
15 minute summer	43	12	33.115	0.505	193.2	1.5229
15 minute summer	44	12	32.985	0.758	219.5	1.7521
15 minute summer	45	12	32.862	0.771	244.8	1.4940
15 minute summer	46	12	32.761	1.406	266.1	2.8942
15 minute summer	7	12	32.701	1.395	706.3	2.4646
15 minute summer	8	12	32.390	1.113	719.8	2.2074
480 minute winter	9	472	32.247	1.020	91.1	2.3624
480 minute winter	HW-Inlet	472	32.247	1.207	90.1	0.0000

US Node	Discharge Vol (m³)
1	
2	
20	
21	
3	
4	
30	
31	
32	
33	
34	
35	
5	
6	
40	
41	
42	
43	
44	
45	
46	
7	
8	
9	
HW-Inlet	

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Results for 30 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)
15 minute summer	50	12	32.813	0.942	76.6	1.8192
15 minute summer	51	12	32.789	1.049	51.4	1.6076
480 minute winter	HW-Outlet	472	32.247	1.247	46.0	0.0000
480 minute winter	Flow-Control	472	32.247	1.259	10.9	3.9988
30 minute summer	13	21	31.042	0.076	10.5	0.0000
480 minute winter	Carpark 1	464	34.593	0.593	7.1	65.7998
60 minute summer	Carpark 2	45	33.013	0.513	71.1	47.1034

US Node	Discharge Vol (m³)
50	
51	
HW-Outlet	
Flow-Control	345.3
Carpark 1	
Carpark 2	

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Results for 100 year +10% A Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)
15 minute summer	1	10	37.023	0.086	29.0	0.1530
15 minute summer	2	10	36.148	0.087	30.9	0.1020
15 minute summer	20	10	35.689	0.060	8.3	0.0802
15 minute summer	21	10	35.608	0.127	25.5	0.1896
15 minute summer	3	10	35.442	0.134	76.5	0.2044
15 minute summer	4	10	34.665	0.172	128.6	0.3854
15 minute summer	30	10	37.242	0.084	30.4	0.1522
15 minute summer	31	10	36.372	0.093	38.5	0.1228
15 minute summer	32	10	35.500	0.113	65.8	0.1949
15 minute summer	33	10	34.689	0.158	65.5	0.1784
15 minute summer	34	10	34.412	0.168	99.0	0.3502
15 minute summer	35	10	34.193	0.218	176.6	0.6396
15 minute summer	5	10	33.637	0.279	321.6	0.4998
15 minute summer	6	11	32.984	0.393	371.2	0.9549
15 minute summer	40	10	35.389	0.153	67.0	0.4012
15 minute summer	41	10	34.191	0.188	71.9	0.2352
15 minute summer	42	11	33.812	0.165	94.2	0.2686
15 minute summer	43	11	32.886	0.276	175.1	0.8338
15 minute summer	44	11	32.819	0.592	221.5	1.3683
15 minute summer	45	11	32.710	0.619	227.8	1.2001
15 minute summer	46	11	32.624	1.269	247.2	2.6134
15 minute summer	7	11	32.575	1.269	658.1	2.2430
15 minute summer	8	11	32.306	1.029	670.0	2.0402
480 minute winter	9	472	32.125	0.898	81.9	2.0779
480 minute winter	HW-Inlet	472	32.125	1.085	80.8	0.0000

US Node	Discharge Vol (m³)
1	
2	
20	
21	
3	
4	
30	
31	
32	
33	
34	
35	
5	
6	
40	
41	
42	
43	
44	
45	
46	
7	
8	
9	
HW-Inlet	

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Results for 100 year +10% A Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)
15 minute summer	50	11	32.686	0.815	31.0	1.5751
15 minute summer	51	11	32.655	0.915	71.5	1.4023
480 minute winter	HW-Outlet	472	32.125	1.125	41.9	0.0000
480 minute winter	Flow-Control	472	32.125	1.137	10.9	3.6086
30 minute summer	13	22	31.042	0.076	10.5	0.0000
480 minute winter	Carpark 1	464	34.522	0.522	6.3	57.7251
60 minute summer	Carpark 2	44	32.968	0.468	65.1	42.5469

US Node	Discharge Vol (m³)
50	
51	
HW-Outlet	
Flow-Control	333.8
Carpark 1	
Carpark 2	

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Results for 100 year +45% CC +10% A Critical Storm Duration. Lowest mass balance: 99.82%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)
15 minute summer	1	10	37.044	0.107	42.1	0.1895
15 minute summer	2	10	36.169	0.108	44.8	0.1271
15 minute summer	20	10	35.702	0.073	12.0	0.0971
15 minute summer	21	10	35.645	0.164	36.9	0.2447
15 minute summer	3	11	35.494	0.186	110.9	0.2839
15 minute summer	4	12	35.126	0.633	187.0	1.4209
15 minute summer	30	10	37.262	0.104	44.1	0.1885
15 minute summer	31	10	36.396	0.117	55.8	0.1541
15 minute summer	32	10	35.529	0.142	95.5	0.2436
15 minute summer	33	12	34.856	0.325	95.1	0.3670
15 minute summer	34	12	34.785	0.541	143.5	1.1275
15 minute summer	35	12	34.740	0.765	257.5	2.2470
15 minute summer	5	12	34.497	1.139	423.5	2.0406
15 minute summer	6	12	33.857	1.266	465.5	3.0786
15 minute summer	40	12	36.108	0.872	97.1	2.2929
15 minute summer	41	12	34.701	0.698	91.2	0.8751
15 minute summer	42	12	34.227	0.580	123.8	0.9458
15 minute summer	43	11	33.742	1.132	232.8	3.4170
15 minute summer	44	11	33.532	1.305	285.4	3.0163
15 minute summer	45	11	33.328	1.237	318.0	2.3977
15 minute summer	46	11	33.161	1.806	345.4	3.7181
15 minute summer	7	11	33.058	1.752	825.3	3.0956
15 minute summer	8	11	32.634	1.356	841.9	2.6899
720 minute winter	9	705	32.565	1.338	87.1	3.0981
720 minute winter	HW-Inlet	705	32.565	1.525	86.9	0.0000

US Node	Discharge Vol (m³)
1	
2	
20	
21	
3	
4	
30	
31	
32	
33	
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35	
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6	
40	
41	
42	
43	
44	
45	
46	
7	
8	
9	
HW-Inlet	

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Results for 100 year +45% CC +10% A Critical Storm Duration. Lowest mass balance: 99.82%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)
15 minute summer	50	11	33.052	1.181	43.1	2.2817
15 minute summer	51	11	33.065	1.325	80.0	2.0317
720 minute winter	HW-Outlet	705	32.565	1.565	44.3	0.0000
720 minute winter	Flow-Control	705	32.565	1.577	10.8	5.0077
60 minute summer	13	32	31.042	0.076	10.5	0.0000
480 minute winter	Carpark 1	464	34.780	0.780	9.2	87.0556
60 minute summer	Carpark 2	46	33.202	0.702	94.4	66.1446

US Node	Discharge Vol (m³)
50	
51	
HW-Outlet	
Flow-Control	497.8
Carpark 1	
Carpark 2	

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Appendix O



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GL13 9LE

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KEY

- SITE BOUNDARY
- OVERLAND EXCEEDANCE ROUTING
- PROPOSED SITE CONTOURS

0m 25m
SCALE 1:500

REV	DESCRIPTION	DRN	CHK	DATE
A	STRATEGY UPDATED TO ALIGN WITH SCHEME LAYOUT CHANGES	TSW	WST	01.04.26

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JOB TITLE
BARNS GREEN
HORSHAM

DRAWING TITLE
SURFACE WATER AND SUDS
DRAINAGE STRATEGY
EXCEEDANCE ROUTING

DATE	DRAWN	CHECKED	ISSUE CHECKED
SEPT 2025	TSW	TSW	

DRAWING No.	REV	SCALE	@
0018.403	A	1:500	A1

Appendix P

TABLE 18.3 Operation and maintenance requirements for bioretention systems

Maintenance schedule	Required action	Typical frequency
Regular inspections	Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrain (if appropriate) to determine if maintenance is necessary	Quarterly
	Check operation of underdrains by inspection of flows after rain	Annually
	Assess plants for disease infection, poor growth, invasive species etc and replace as necessary	Quarterly
	Inspect inlets and outlets for blockage	Quarterly
Regular maintenance	Remove litter and surface debris and weeds	Quarterly (or more frequently for tidiness or aesthetic reasons)
	Replace any plants, to maintain planting density	As required
	Remove sediment, litter and debris build-up from around inlets or from forebays	Quarterly to biannually
Occasional maintenance	Infill any holes or scour in the filter medium, improve erosion protection if required	As required
	Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch	As required
Remedial actions	Remove and replace filter medium and vegetation above	As required but likely to be > 20 years

▶ Generic health and safety guidance is presented in **Chapter 36**.

TABLE 22.1 Operation and maintenance requirements for detention basins

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required
	Cut grass – meadow grass in and around basin	Half yearly (spring – before nesting season, and autumn)
	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 banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (for first year), then annually or as required
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets, outlet and forebay	Annually (or as required)
	Manage wetland plants in outlet pool – where provided	Annually (as set out in Chapter 23)
Occasional maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every 2 years, or as required
	Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required

22.13 REFERENCE

KENNARD, M F, HOSKINS, C G and FLETCHER, M (1996) *Small embankment reservoirs*, R161, CIRIA, London, UK (ISBN: 978-0-86017-461-5). Go to: **www.ciria.org**

Statutes

Reservoir Act 1975 (c.23)

Health and Safety at Work (etc) Act 1974 (c.37)

Building Act 1984 (c.55)

Flood and Water Management Act 2010 (c.29)

Construction (Design and Management) Regulations (CDM) 2015

TABLE 20.15 Operation and maintenance requirements for pervious pavements

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 surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into 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 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Many of the specific maintenance activities for pervious pavements can be undertaken as part of a general site cleaning contract (many car parks or roads are swept to remove litter and for visual reasons to keep them tidy) and therefore, if litter management is already required at site, this should have marginal cost implications.

Generally, pervious pavements require less frequent gritting in winter to prevent ice formation. There is also less risk of ice formation after snow melt, as the melt water drains directly into the underlying sub-base and does not have chance to refreeze. A slight frost may occur more frequently on the surface of pervious pavements compared to adjacent impermeable surfaces, but this is only likely to last for a few hours. It does not happen in all installations and, if necessary, this can be dealt with by application of salt. It is not likely to pose a hazard to vehicle movements.

▶ Generic health and safety guidance is presented in Chapter 36.

CDM 2015 requires designers to ensure that all maintenance risks have been identified, eliminated, reduced and/or controlled where appropriate. This information will be required as part of the health and safety file.

TABLE 23.1 Operation and maintenance requirements for ponds and wetlands

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 water body for signs of poor water quality	Monthly (May – October)
	Inspect silt accumulation rates in any forebay and in main body of the pond 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 eg penstocks	Half yearly
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1 m above pond base; include max 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to a minimum of 1 m above water level	Annually
	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 ponds without sediment forebays.	Every 5 years, or as required
Occasional maintenance	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	With effective pre-treatment, this will only be required rarely, eg every 25–50 years
Remedial actions	Repair erosion or other damage	As required
	Replant, where necessary	As required
	Aerate pond 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

TABLE 13.1 Operation and maintenance requirements for soakaways

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect for sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	Annually
	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages	Annually (or as required)
Occasional maintenance	Remove sediment and debris from pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	As required, based on inspections
Remedial actions	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs	As required
	Replacement of clogged geotextile (will require reconstruction of soakaway)	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually
	Check soakaway to ensure emptying is occurring	Annually

Maintenance will usually be carried out manually, although a suction tanker can be used for sediment/debris removal for large systems. If maintenance is not undertaken for long periods, deposits can become hard-packed and require considerable effort to remove.

Replacement of the aggregate or geocellular units will be necessary if the system becomes blocked with silt. Effective monitoring will give information on changes in infiltration rate and provide a warning of potential failure in the long term.

Roads and/or parking areas draining to infiltration components should be regularly swept to prevent silt being washed off the surface. This will minimise the need for maintenance.

Maintenance responsibility should be placed with an appropriate organisation, and maintenance schedules should be developed during the design phase.

- Generic health and safety guidance is presented in **Chapter 36**.

CDM 2015 requires designers to ensure that all maintenance risks have been identified and eliminated/reduced and/or controlled where appropriate. This information will be required as part of the health and safety file.

13.12.2 Infiltration basins

Regular inspection and maintenance is important for the effective operation of infiltration basins as designed. Maintenance responsibility for an infiltration basin and its surrounding area should be placed with a responsible organisation.

Regular mowing in and around infiltration basins is only required along maintenance access routes, amenity areas (eg footpaths), across embankments and across the main storage area. The remaining areas can be managed as "meadow" or other appropriate vegetation, unless additional management is required for landscaping purposes. Grass cutting may need to accommodate specific sward mixes and specialist seed or turf supplier recommendations. As described earlier in this chapter, deep-rooting vegetation can maintain infiltration rates and minimise the need for remedial maintenance. All vegetation management activities should take account of the need to maximise biosecurity and prevent the spread of invasive species.

TABLE 17.1 Operation and maintenance requirements for swales

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 infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly, or when required
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	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
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required