Barns Green
Horsham

Flood Risk Assessment
and Surface Water Drainage Statement

September 2025

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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-C
Infiltration Rate	n/a
Groundwater Monitoring	n/a
NSfSuDS Compliant	Yes

CONTENTS

1. INTRODUCTION 1
1.1 Background 1
1.2 Requirements for a Flood Risk Assessment 1
2. POLICY 2
2.1 National Planning Policy Framework (NPPF) 2
2.2 Planning Practice Guidance (PPG) 2
2.3 Local Flood Risk Management Strategy 3
2.4 Strategic Flood Risk Assessment 3
2.5 Local Plan 4
2.6 West Sussex LLFA Culvert Policy 5
2.7 National Standards for Sustainable Drainage Systems (SuDS) 5
2.8 WSCC LLFA SuDS Policy 6
2.9 HDC SuDS Policy 6
3. LOCATION AND SITE DESIGNATIONS 7
3.1 Site Location Summary 8
3.2 Site Location and Surrounding Area 8
3.3 Topography 9
3.4 Geology, Hydrogeology and Hydrology 9
Geology 9
Hydrogeology 10
Hydrology 10
Chapel Road Culverted Watercourse 12
Smugglers' Lane Ditch 13
Chapel Road Highway Drainage 13
Sewer Records 14
4. FLOOD RISK ASSESSMENT 15
4.1 Assessment Approach 15
4.2 Coastal or Tidal Flood Risk 15
4.3 Fluvial Flood Risk 15
Flood Zones 15
Flood Risk from Rivers or the Sea 16
Climate Change 17
Historic Fluvial Flooding 17

4.4 Surface Water Flood Risk 17
Climate Change 18
Historic Flooding 19
Detailed Flood Modelling 20
4.5 Groundwater Flood Risk 22
Historical Groundwater Flooding 22
4.6 Reservoir and Infrastructure Flood Risk 22
4.7 Sewer Flooding 22
4.8 Other Sources of Historical Flooding 23
4.9 Flood Risk Summary 23
4.10 Safe Access 23
4.11 Sequential and Exception Tests 26
4.12 Climate Change 27
5. SURFACE WATER DRAINAGE 28
5.1 National Policy 28
5.2 Surface Water Drainage Strategy 29
Source Control SuDS 29
Site Control SuDS 29
5.3 Standard 1: Runoff Destination 30
Drainage Hierarchy 30
Rainwater Harvesting 30
Infiltration 30
Watercourse 30
5.4 Standard 2: Interception 31
Requirement 31
Rainwater Harvesting (RWH) Systems 31
Permeable Paving Systems 31
Bio-retention Rain Garden (BRG) Systems 32
Detention Basin 32
5.5 Standard 3: Management of extreme rainfall and flooding 32
Requirement 32
Greenfield Runoff Rates 33
Greenfield Runoff Volume 33
Attenuation Storage Requirements 33
Development Runoff 34

Greenfield Runoff Volume 33
Attenuation Storage Requirements 33
Development Runoff 34
Surface Water Strategy and Design Calculations 34
Designing for Exceedance 34
6.6 Standard 4: Water Quality 35
Requirement 35
Management of Water Quality 36
6.7 Standard 5: Amenity 37
6.8 Standard 6: Bio-diversity 37
6.9 Standard 7: Design for Construction, Operation, Maintenance, Decommissioning and Structural Integrity. 37
Maintenance 37
7. CONCLUSION 38
7.1 Flood Risk 38
7.2 Surface Water Drainage and SuDS 38

FIGURES

Figure 1: Site Location Plan 8
Figure 2: EA LiDAR composite DTM Histogram 9
Figure 3: Hydrogeology and Aquifer Designation 10
Figure 4: Extract of 1961 Topographic Survey 12
Figure 5: EA Flood Zone mapping 16
Figure 6: Environment Agency present day surface water flood map 18
Figure 7: Environment Agency future day surface water flood map 19
Figure 8: Comparison of EA DTM and surveyed cross-section 20
Figure 9: TSWC Updated surface water flood map 21
Figure 10: TSWC Updated surface water flood map (Medium Chance) Climate Change 21
Figure 11: 1%AEP+cc Modelled Hazard Rating 24
Figure 12: 1%AEP+cc Modelled Hazard Rating 25
Figure 13: Causeway Flow 100-yr 360min ReFH2 calculation 33

TABLES

Table 1: Site Summary 8
Table 2: Flood Zone Definitions 15
Table 3: Risk of flooding from all sources 23
Table 4: Hazard Rating Thresholds 24
Table 5: Modelled Flood Hazard Rating at Nodes A,B,C and D 25
Table 6: FEH Statistical Greenfield Runoff Rates 33
Table 7: ReFH2 Greenfield Runoff Volume 33
Table 8: Pollution Hazard indices for different land use classifications 36
Table 9: SuDS Management Train 36
Table 10: SuDS Mitigation indices for discharge to surface waters 36

APPENDICIES

Appendix A: Scheme Layout and Schedule of Accommodation
Appendix B: Topographical Survey (CM25118_Chapel Road)
Appendix C: BGS Borehole Record
Appendix D: Preliminary Ground Investigation (GWPR6192/GIR)
Appendix E: Watercourse Survey (Drawings/Report/Photos)
Appendix F: 1961 Topographic Survey of Chapel Road
Appendix G: CCTV Culvert Survey (June 2025)
Appendix H: CCTV Culvert Survey (July 2025)
Appendix I: Email correspondence with WSCC HA
Appendix J: Southern Water Sewer Records
Appendix K: Surface Water Drainage Strategy (TSWC-0018-B-401-C)
Appendix L: Greenfield Runoff Calculations
Appendix M: Impermeable Site Areas (TSWC-0018-B-402)
Appendix N: Causeway Flow Drainage Calculations
Appendix O: Exceedance Flood Routing (TSWC-0018-B-403)
Appendix P: Indicative Maintenance Schedule
Appendix Q: HDC SuDS Pro-Forma

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**.

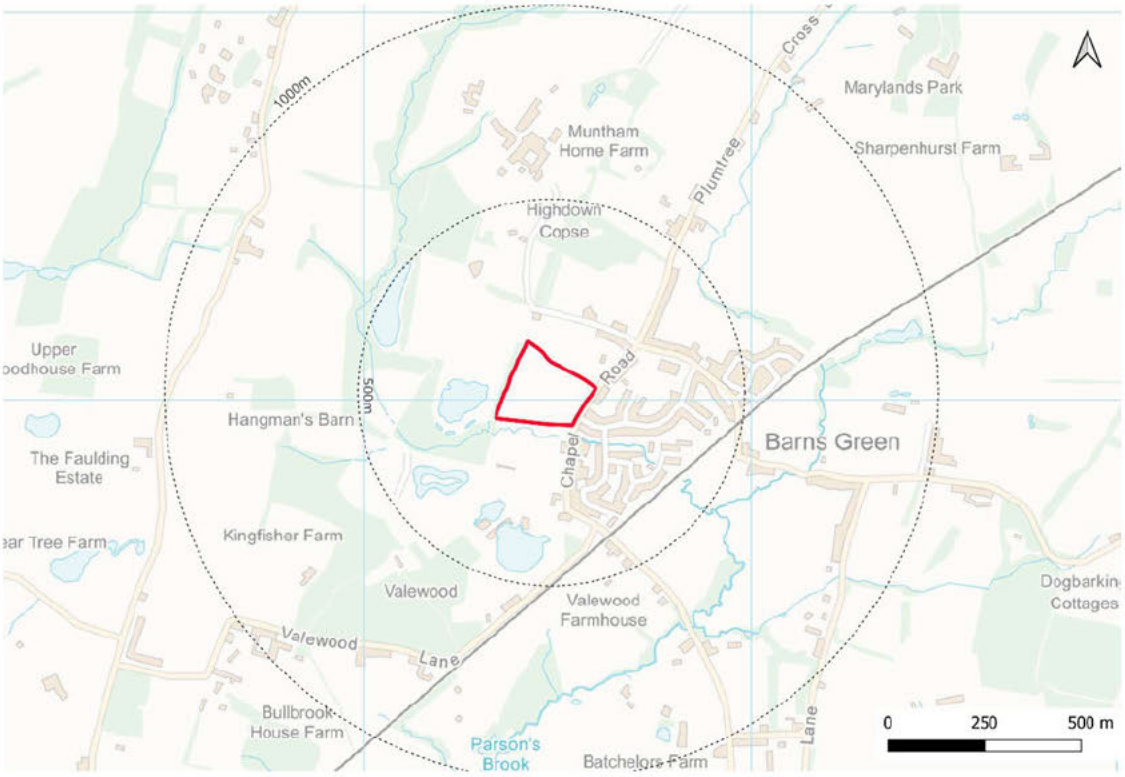
Table 1: *Site Summary*

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

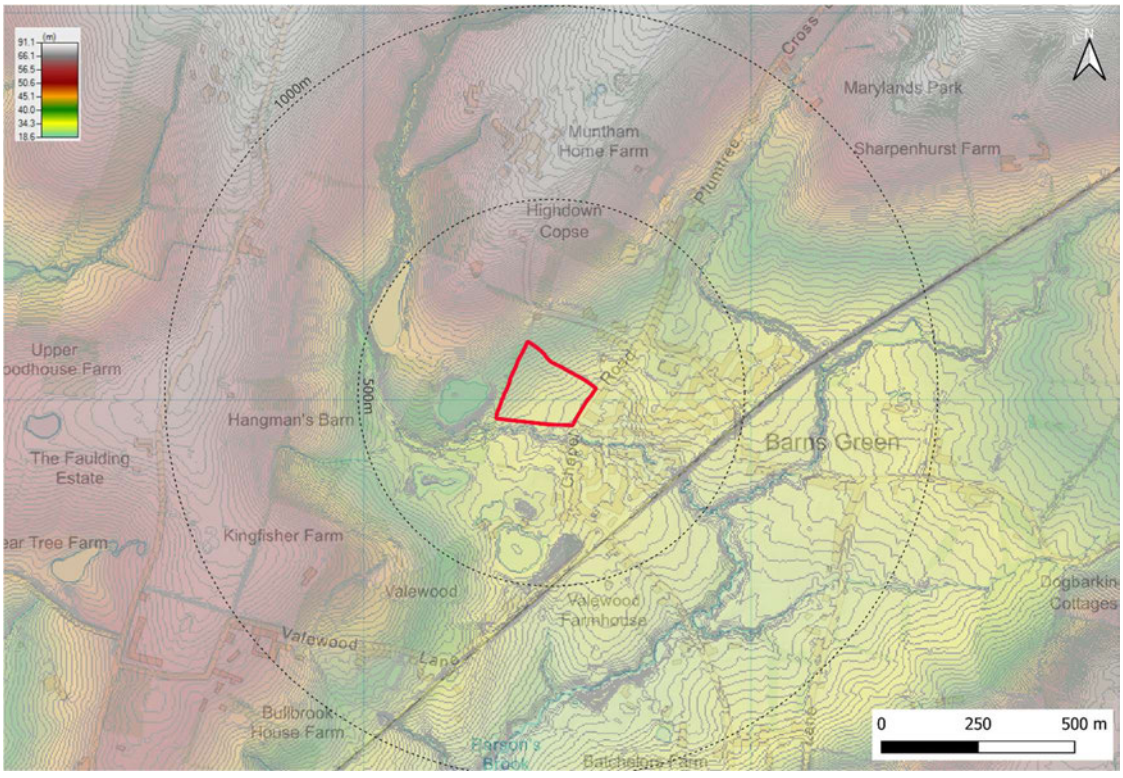
4.3.1 A full 3D topographical survey of the Site was undertaken by Cadmap Ltd in February 2025 which confirms that levels across the Site generally fall from a level of c.40.50mAOD in the northwestern corner to the eastern boundary with Chapel Road and low point of c.32.25mAOD in the southeastern corner.

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.

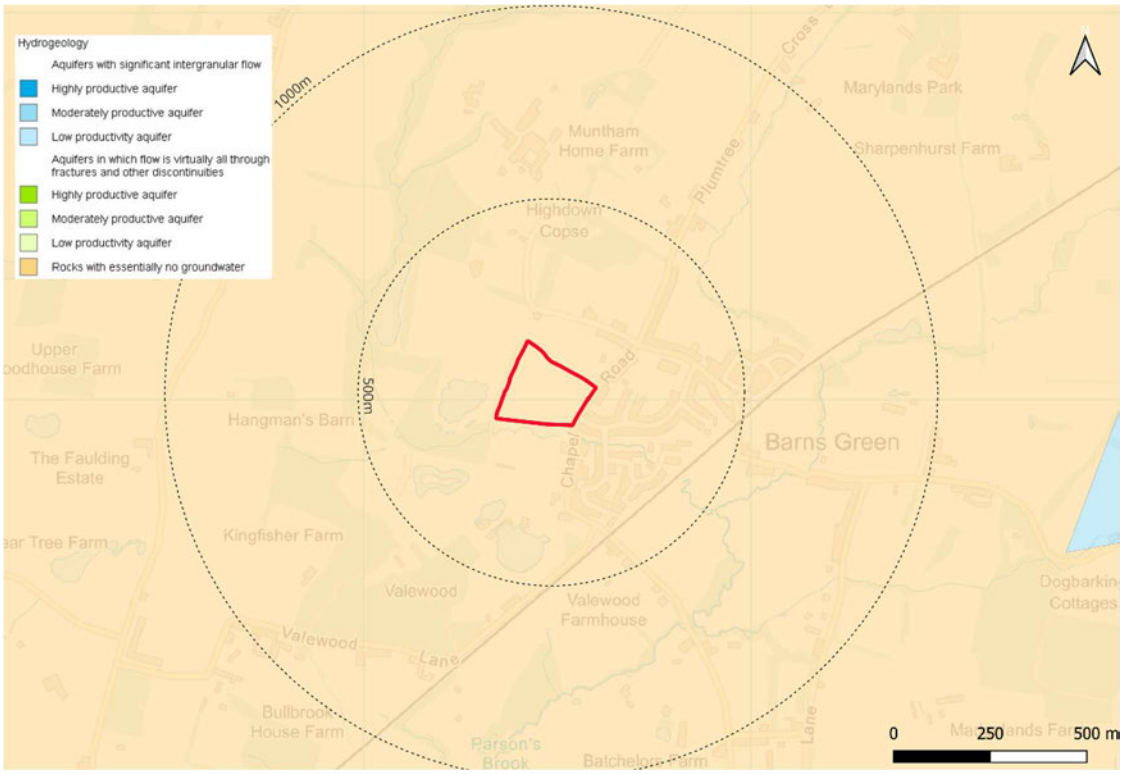
4.4.4 A copy of the ground investigation report (GWPR6192/GIR) is presented as **Appendix D**.

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).

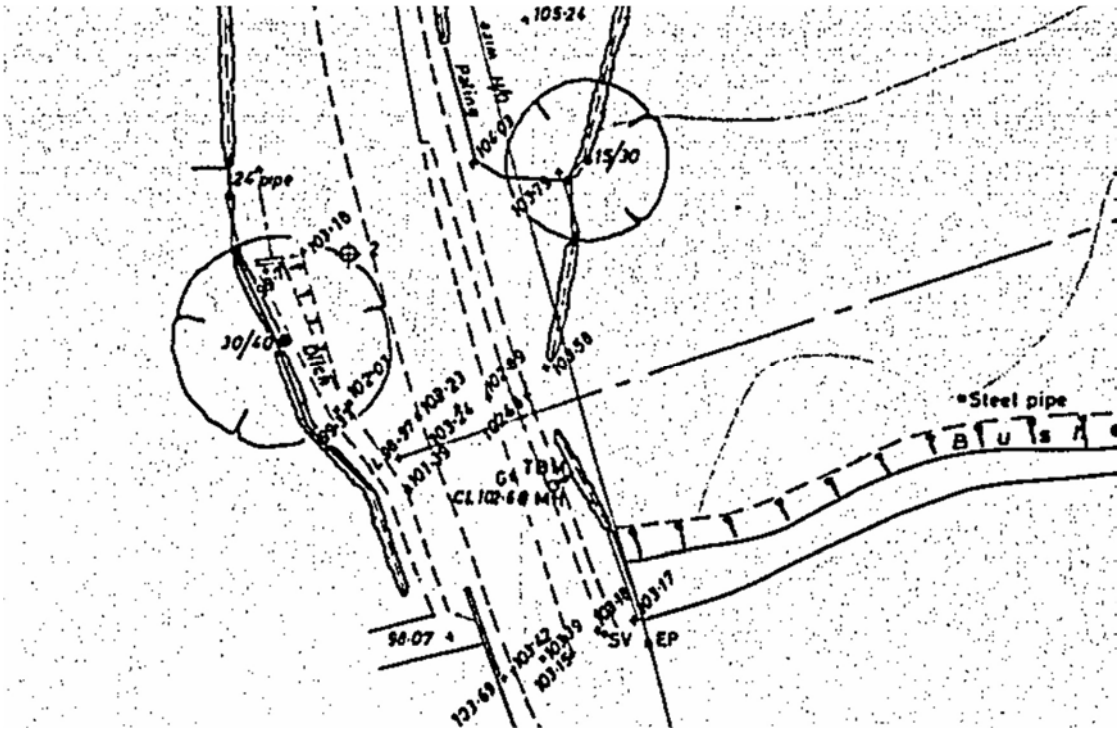
4.4.13 Downstream of the railway culvert, the Muntham Gill winds its way through open farmland to the confluence with the Parson's Brook.

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*

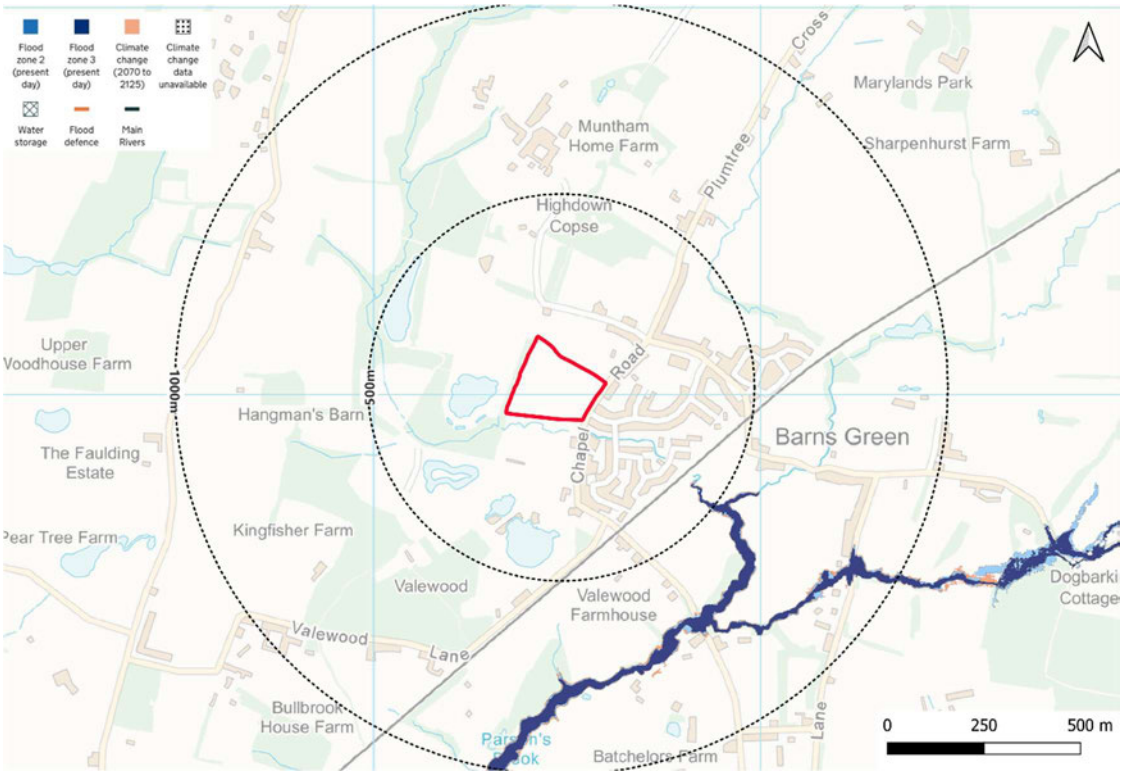
Zone 1: Low Probability
Land having a less than 0.1% (1 in 1000) annual probability of flooding.
Zone 2: Medium Probability
Land having between 0.1% - 1% (1 in 1000 and 1 in 100) annual probability of flooding from rivers or between 0.1% - 0.5% (1 in 1000 and 1 in 200) annual probability of flooding 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.

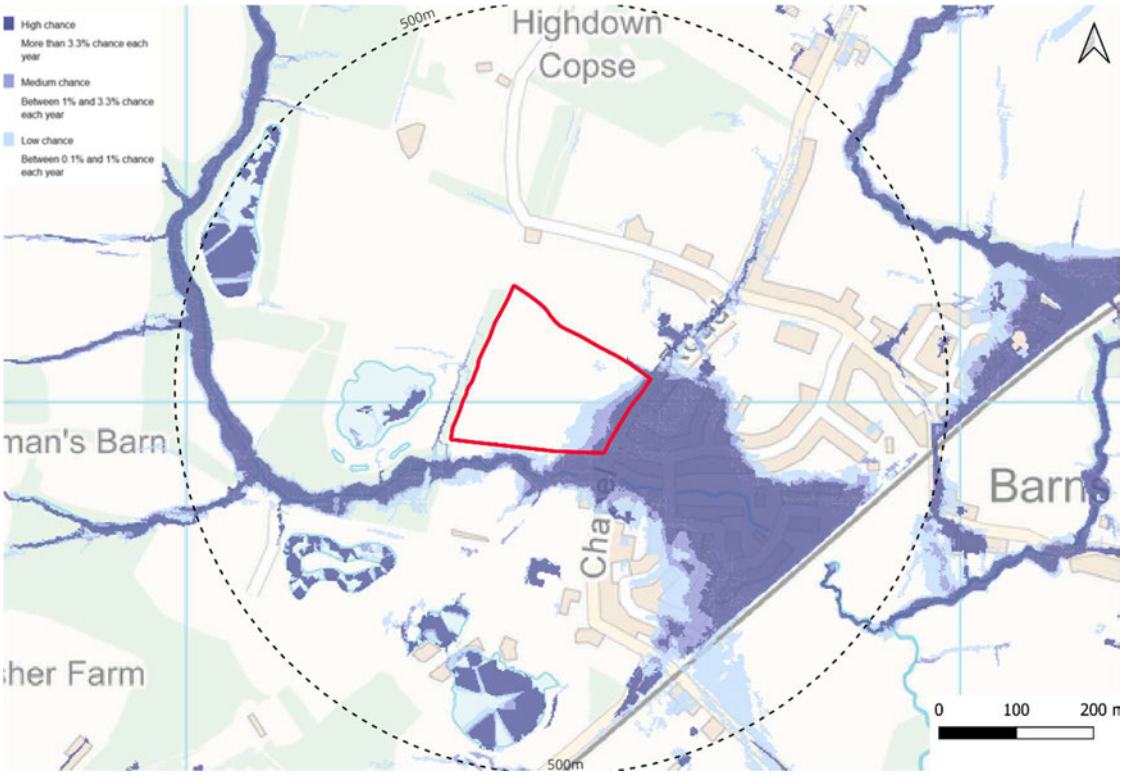
5.4.3 The likelihood of surface water flooding is split into four risk categories; 'Very Low' (land with an annual probability of flooding of less than 1 in 1000 (<0.1% AEP), 'Low' (land with an annual probability of flooding between 1 in 100 and 1 in 1000 (1.0% AEP and 0.1% AEP), 'Medium' (land with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

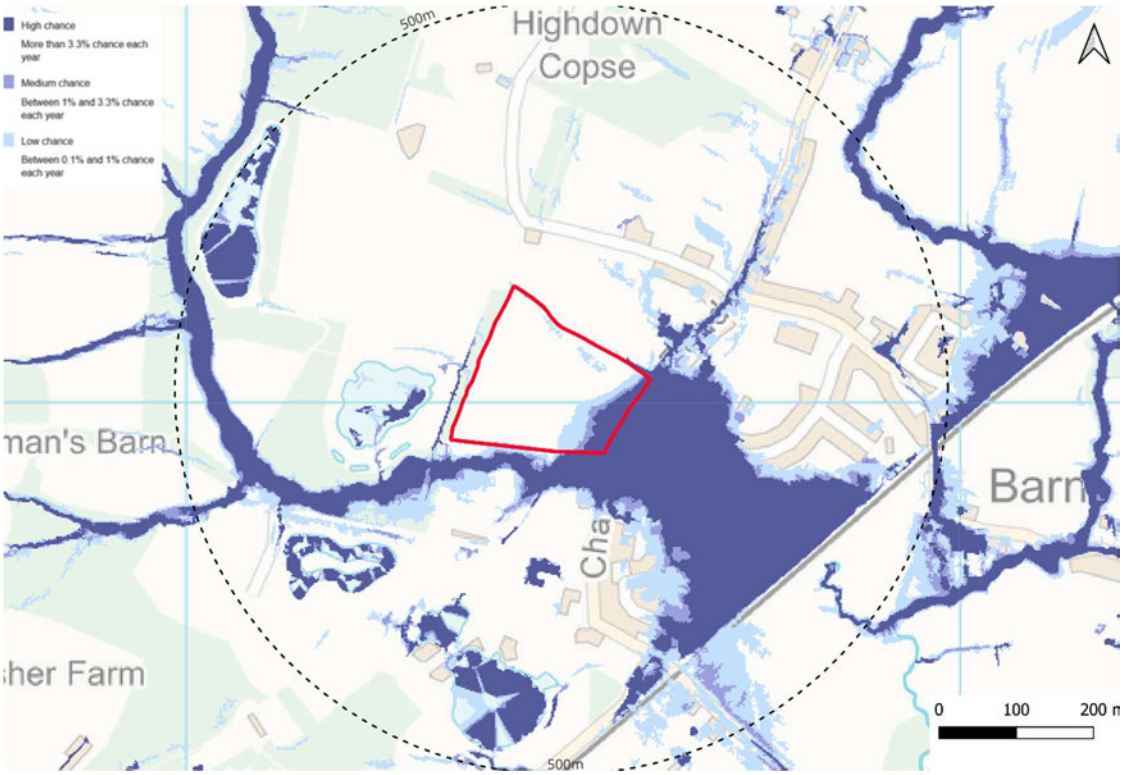
[12] https://www.gov.uk/check-long-term-flood-risk

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)*".

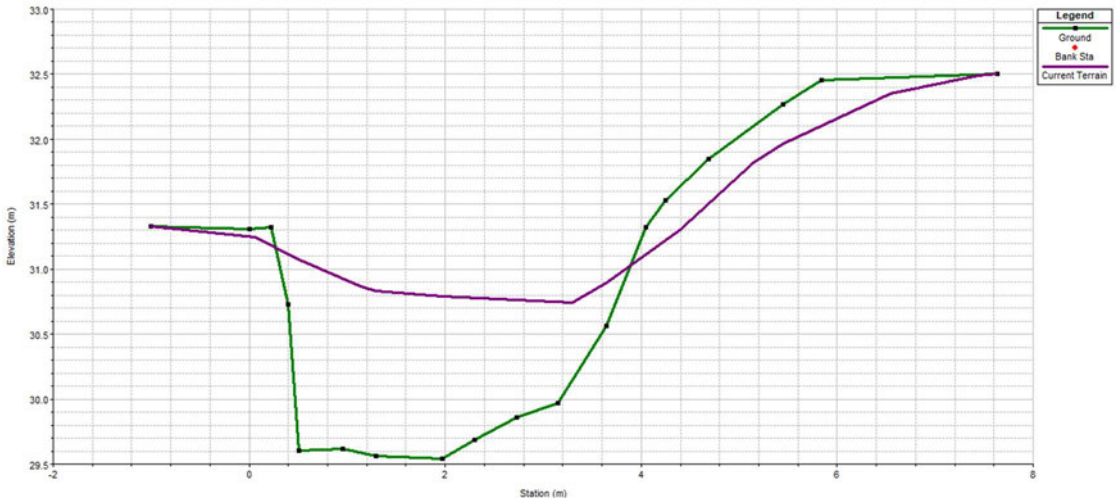
5.4.14 A key difference from the previous model setup is the addition of a 'drainage sump' along all significant watercourses modelled explicitly as part of the fluvial NNM. This sump drains water from the model domain during the simulation and is intended to reduce the overprediction of surface water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

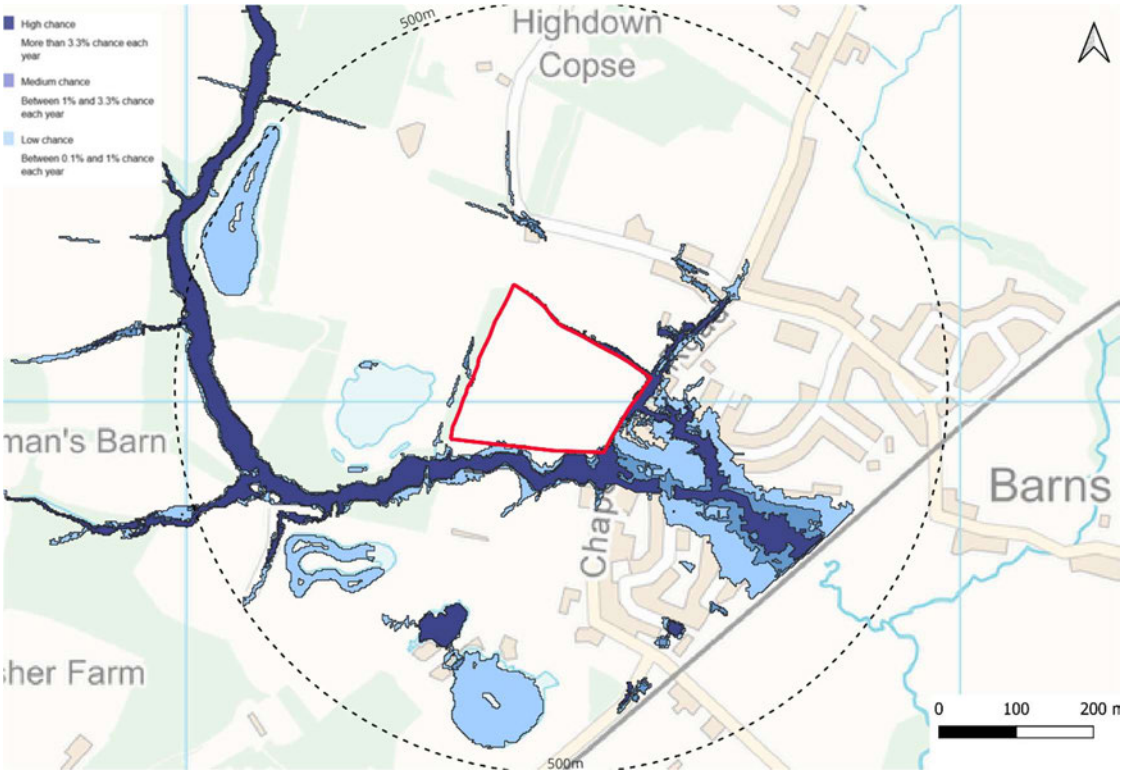
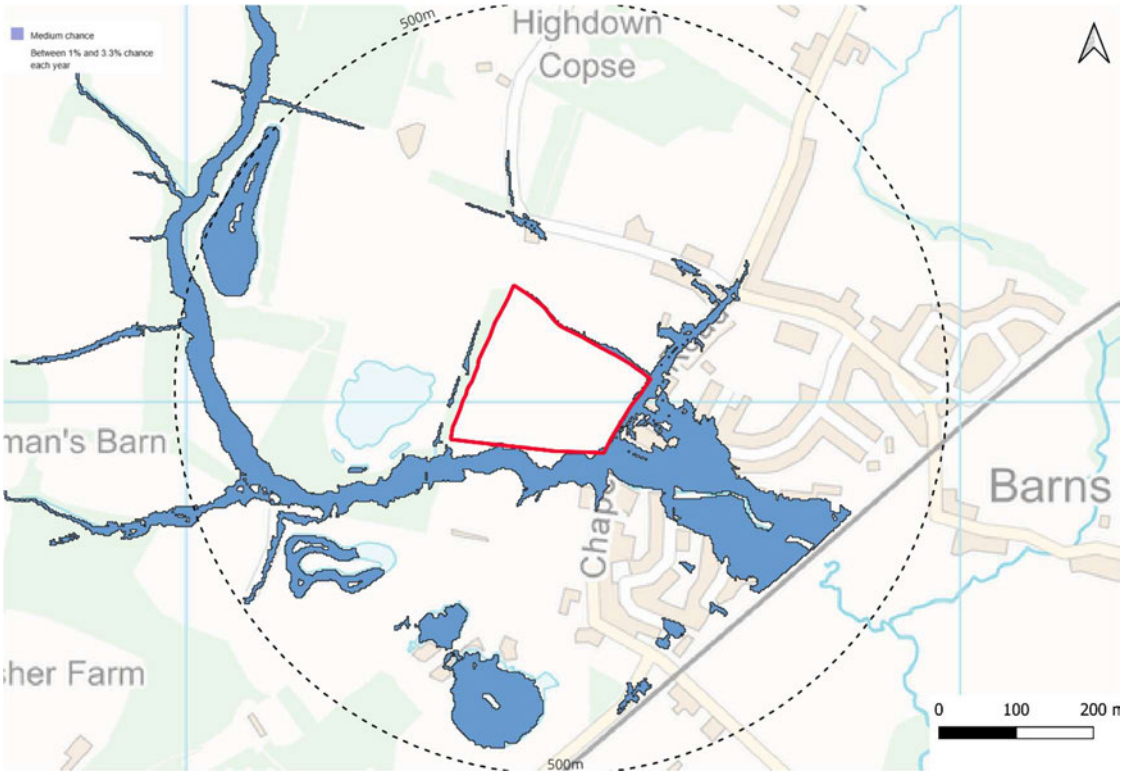


Figure 10: *TSWC Updated surface water flood map (Medium Chance) Climate Change*



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 Figures 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*

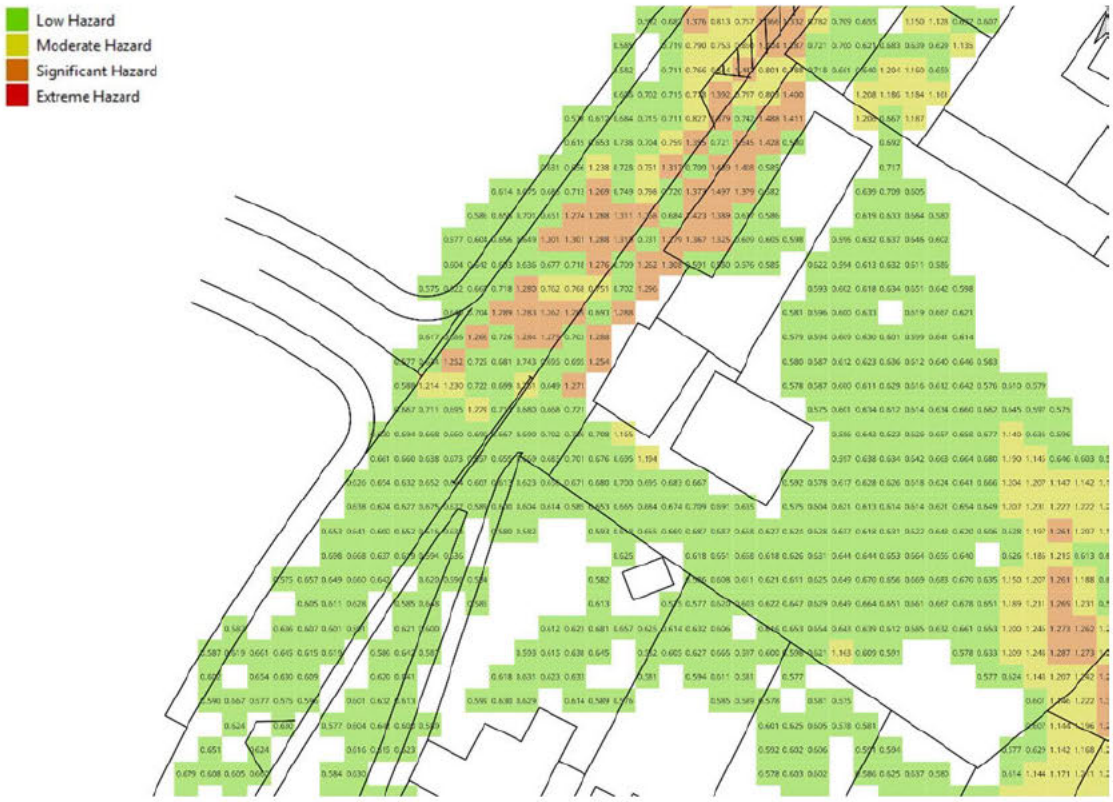
Node	Maximum Hazard Rating			
	3.33% AEP	1.00% AEP	1.00%+cc AEP	0.01% AEP
A	0.687	0.732	1.336	1.370
B	0.648	0.672	0.722	1.237
C	0.000	0.000	0.624	0.630
D	1.383	1.395	1.485	1.662

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 Arun and Western Stream 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 3.3% 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-C) 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 As the Site is located within the Sussex North Water Resource Zone, the proposed development is required to be water neutral. As a result, rainwater harvesting tanks will be provided for all new properties within the Site. The calculations and details confirming conformity with HDC Policy requirements is set out in the accompanying Water Neutrality Statement.

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 (see Water Neutrality Statement) for regular daily demand for non-potable water use, therefore runoff from these areas complies with 'Standard 2'.

RWH for roof areas contribute 33% (4,480m^2) of the impermeable area (13,840m^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% (1,431m²) of the impermeable area (13,840m²) 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% (2,239m²) of the impermeable area (13,840m²) of the Site.

In order to comply with Standard 2, 2,447m² (2,239m²/5) 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 11,072m² (13,840m² x 0.8) interception for an additional 2,922m² of the remaining 5,588m² impermeable area needs to be provided within the detention basin.

In order to comply with Standard 2, 585m² (2,922m²/5) minimum vegetated surface area within the base of the Detention Basin below the level of the outlet is required.

The Detention Basin provides 615m² 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*

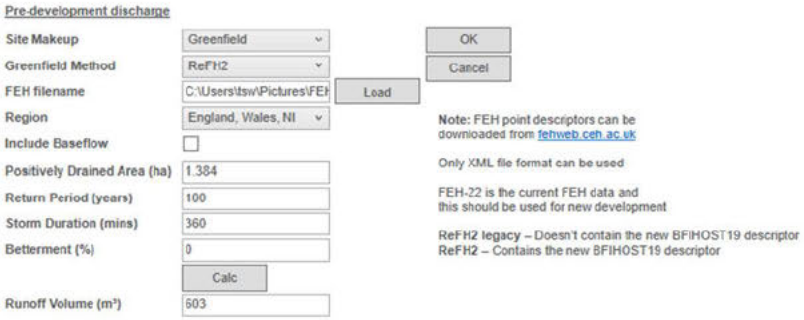
Greenfield Runoff Volume

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	603

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 1.384 ha and an allowable discharge rate of 10.4 l/s. The estimated storage volume was between **1,206m^3** and **1,585m^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-C) (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-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 32.541m 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 (3.44m^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-B-403) 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



N
W E
S

0 10m 20m

architecture

Coloured Site Layout
Barns Green, Horsham
24088 / C101

Scale 1:500 @ A1 September 2025

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schedule of accommodation
Rev R

Project Title: Barns Green, Horsham

Client: Miller Homes

Project Ref: 24088
Drawing Ref: P101L
Date: 02/09/25

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	4 Bed House	Beauwood	L467	D	Private	1,379	128.1	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	Briarwood	L470	D	Private	1,419	131.8	2.7
19	5 Bed House	Homesford	L552	D	Private	1,568	145.7	2.7
20	3 Bed House	Braxton	L361	D	Private	996	92.5	2.2
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	2 Bed Flat	-	-	-	Affordable	753	70.0	1.7
33	2 Bed Flat	-	-	-	Affordable	753	70.0	1.7
34	2 Bed Flat	-	-	-	Affordable	753	70.0	1.7
35	2 Bed Flat	-	-	-	Affordable	753	70.0	1.7
36	2 Bed Flat	-	-	-	Affordable	753	70.0	1.7
37	2 Bed Flat	-	-	-	Affordable	753	70.0	1.7
38	2 Bed House	Baymont	-	EOT	Affordable	850	79.0	1.7
39	2 Bed House	Baymont	-	MT	Affordable	850	79.0	1.7
40	2 Bed House	Baymont	-	EOT	Affordable	850	79.0	1.7
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 R

Project Title: Barns Green, Horsham

Client: Miller Homes

Project Ref: 24088
Drawing Ref: P101L
Date: 02/09/25

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	Affordable	850	79.0	1.7
52	2 Bed House	Baymont	-	SD	Affordable	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	Affordable	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	Sh Ownership	1,001	93.0	1.7
63	3 Bed House	Lockton	-	SD	Sh Ownership	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	3 Bed House	Braxton	L361	D	Private	996	92.5	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						70,665	6,460.0	142

Visitor parking	14
Total	156

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 R

Project Title: Barns Green, Horsham

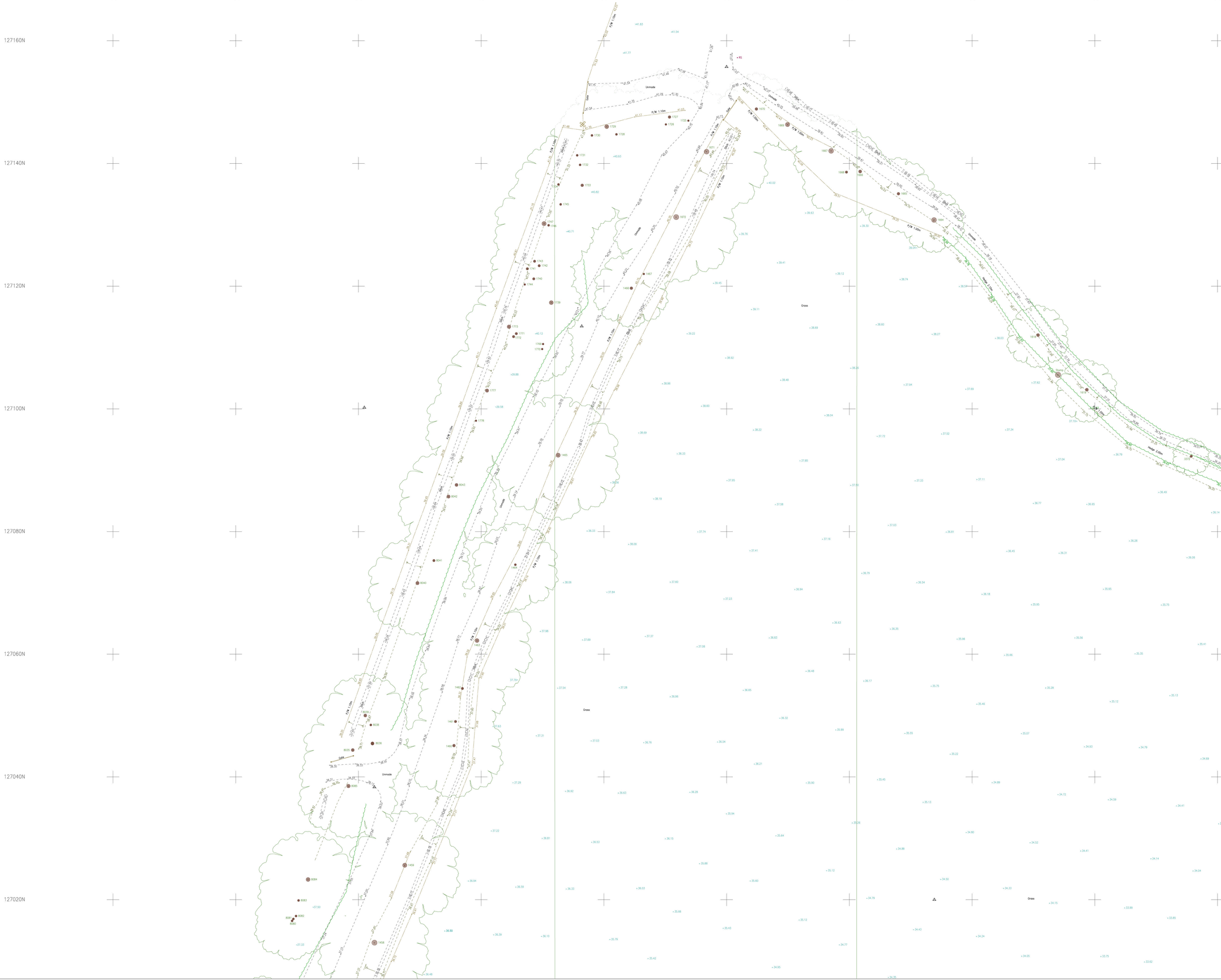
Client: Miller Homes

Project Ref: 24088
Drawing Ref: P101L
Date: 02/09/25

Affordable Summary					
House Type	House Name	Reference	Area ft²	No. units	Total Area ft²
2 Bed Flat	-	-	753	6	4,518
2 Bed House	Baymont	-	850	7	5,950
3 Bed House	Lockton	-	1,001	2	2,002
4 Bed House	Torwood	-	1,143	2	2,286
				17	14,756
Shared Ownership Sumary					
House Type	House Name	Reference	Area ft²	No. units	Total Area ft²
2 Bed House	Baymont	-	850	3	2,550
3 Bed House	Lockton	-	1001	4	4,004
				7	6,554
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	5	4,980
3 Bed House	Haywood	L459	1,130	6	6,780
4 Bed House	Beauwood	L467	1,379	2	2,758
4 Bed House	Briarwood	L470	1,419	5	7,095
5 Bed House	Homesford	L552	1,568	2	3,136
4 Bed House	Faverwood	L474	1,704	3	5,112
5 Bed House	Grayford	L554	1,780	1	1,780
				44	49,355
Total				68	70,665

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



Pt No.	Spread	Bole	Height	Feature
72	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	12.0	0.40	14.0	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	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	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	8.0	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	0.40	14.0	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	16.0	ASH
1746	14.0	0.35	18.0	ASH
1767	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
3216	8.0	0.50	12.0	ALDER
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	8.0	0.30	16.0	TREE UNKNOWN
3389	10.0	0.50	16.0	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	14.0	0.40	18.0	ASH
8075	16.0	0.40	18.0	ASH
8076	16.0	0.40	18.0	ASH
8077	16.0	0.40	16.0	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

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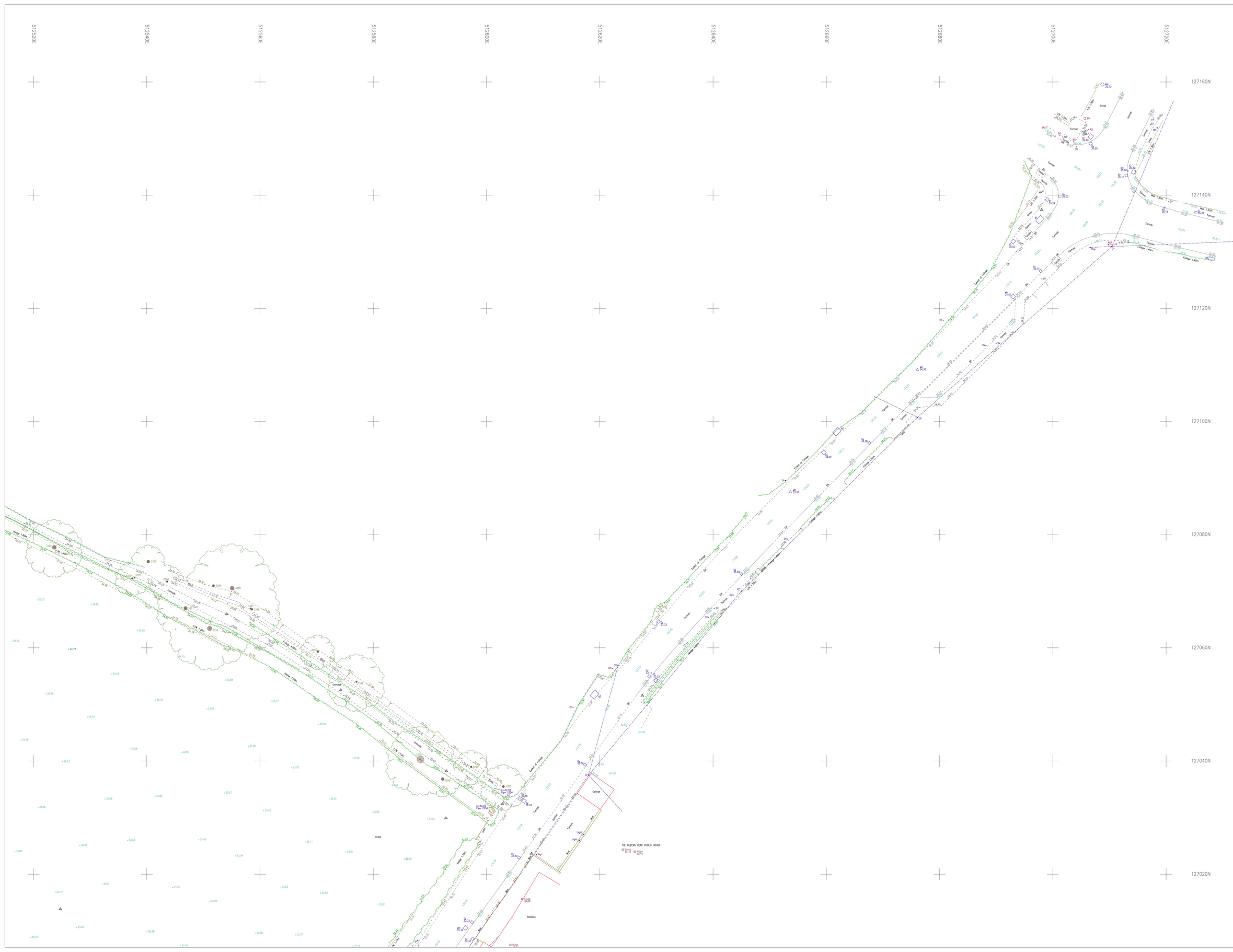
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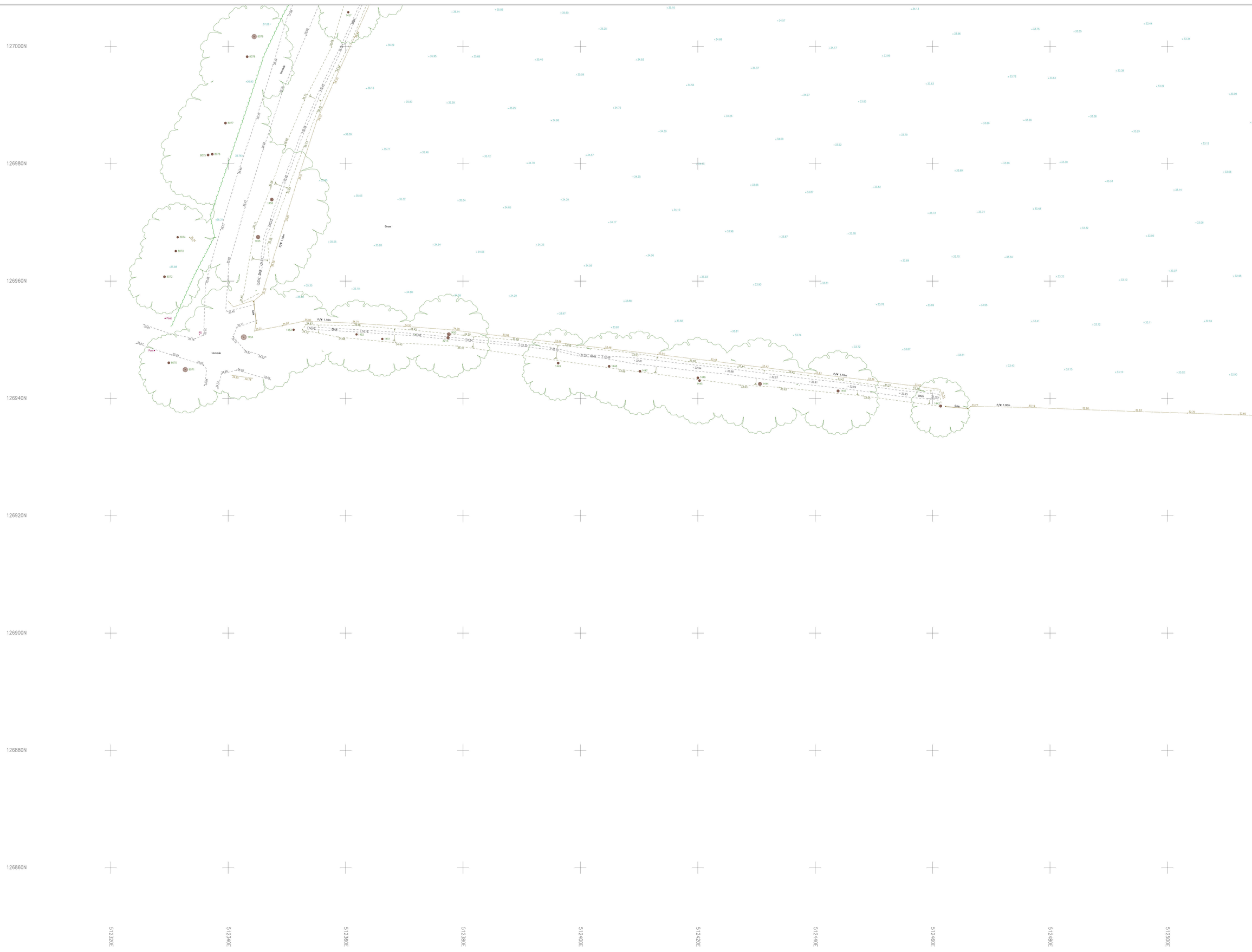
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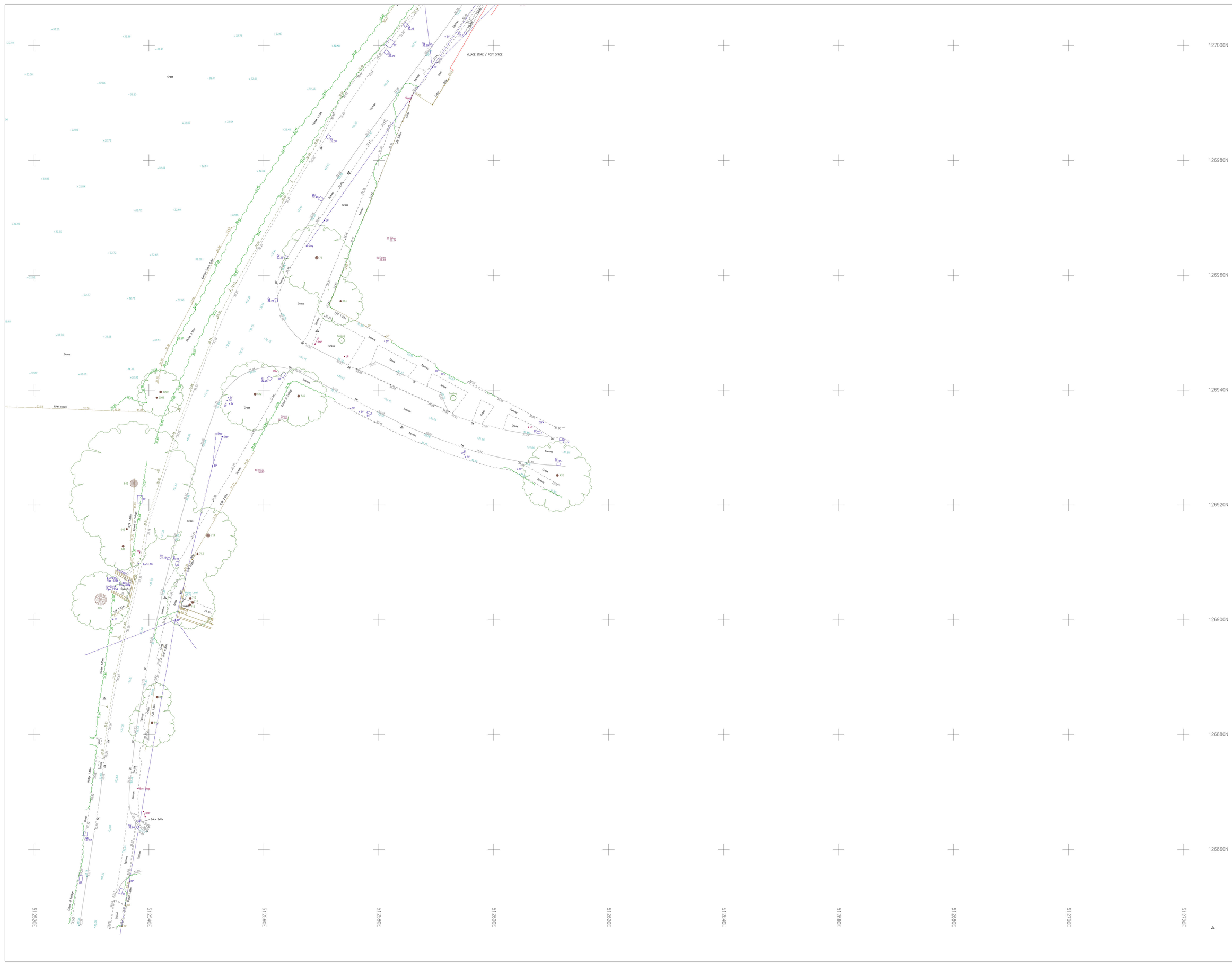
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Cadmap


512520E
512540E
512560E
512580E
512600E
512620E
512640E
512660E
512680E
512700E
512720E
127160N
127140N
127120N
127100N
127080N
127060N
127040N
127020N
THE QUEENS HEAD PUBLIC HOUSE
Garage
Building
Grass
Tarmac
Hedge 1.80m
Fence 1.80m
Wall 1.50m
Edge of Foliage
Ditch
Drain
Pipe 225mm
Pipe 225mm
Pipe 300mm
Pipe 375mm
Pipe 450mm
Pipe 600mm
Pipe 750mm
Pipe 900mm
Pipe 1050mm
Pipe 1200mm
Pipe 1350mm
Pipe 1500mm
Pipe 1650mm
Pipe 1800mm
Pipe 2100mm
Pipe 2400mm
Pipe 2700mm
Pipe 3000mm
Pipe 3300mm
Pipe 3600mm
Pipe 3900mm
Pipe 4200mm
Pipe 4500mm
Pipe 4800mm
Pipe 5100mm
Pipe 5400mm
Pipe 5700mm
Pipe 6000mm
Pipe 6300mm
Pipe 6600mm
Pipe 6900mm
Pipe 7200mm
Pipe 7500mm
Pipe


127000N
126980N
126960N
126940N
126920N
126900N
126880N
126860N
512320E
512340E
512360E
512380E
512400E
512420E
512440E
512460E
512480E
512500E
Unmade
Gate
Gate
Gate
Post
Post
Post
Gate
Gate
Gate



Pt No.	Spread	Bole	Height	Feature
72	12.0	0.55	14.0	MAPLE
432	12.0	0.40	12.0	MAPLE
543	8.0	0.30	7.0	TREE UNKNOWN
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	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	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	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	0.40	14.0	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	14.0	0.65	18.0	ASH
1731	12.0	0.40	16.0	ASH
1732	12.0	0.35	16.0	ASH
1733	14.0	0.45	16.0	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	0.70	18.0	ASH
1769	10.0	0.30	12.0	ASH
1771	14.0	0.40	14.0	ASH
1772	14.0	0.60	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	16.0	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	8.0	0.50	12.0	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	8.0	0.50	16.0	TREE UNKNOWN
8035	14.0	0.50	18.0	ASH
8036	6.0	0.30	10.0	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	16.0	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

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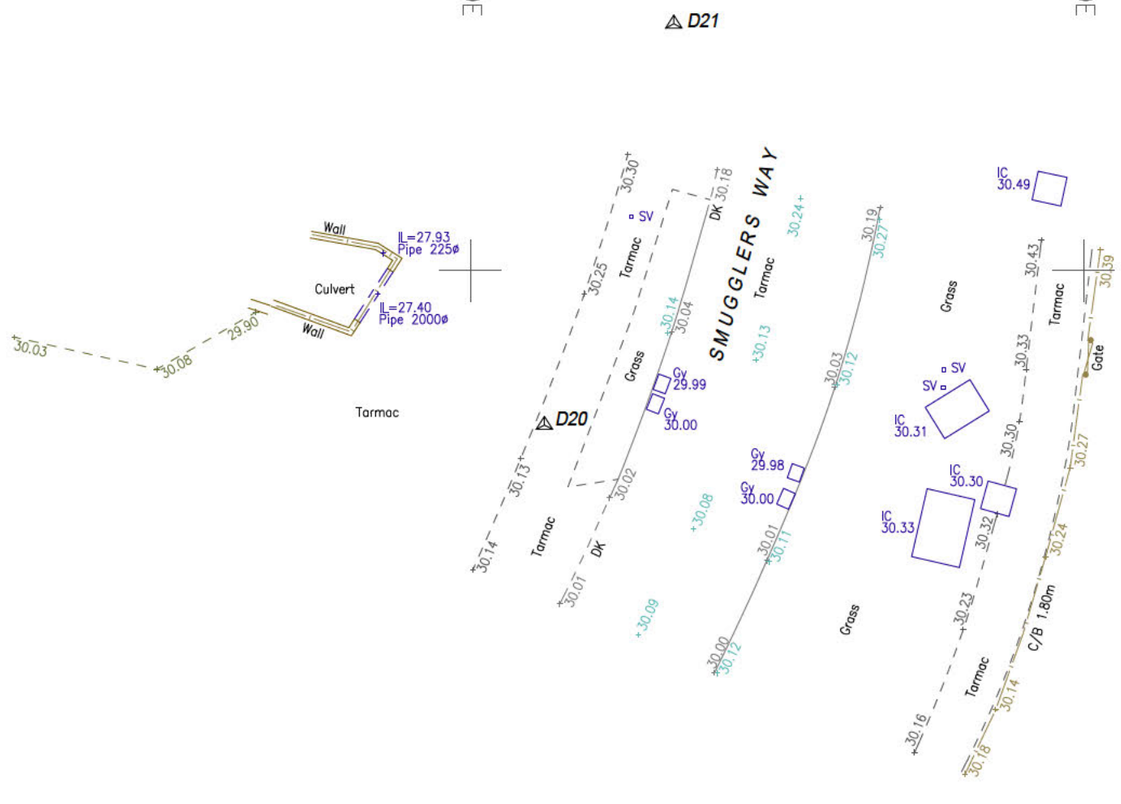
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Cadmap

512740E
512760E
512780E
512800E

126840N

126820N



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
Cadmap Ltd Unit 131 Dunsfold Park Cranleigh Surrey, GU6 8TB T: 01483 429385 E: info@cadmap.co.uk W: www.cadmap.co.uk			SITE ADDRESS: Site off Chapel Road, Barns Green, RH13 0PS					

smas worksafe consultant www.smasltd.com SSIP · CHAS Accredited Contractor www.chas.gov.uk · THE SURVEY ASSOCIATION · Constructionline A UK GOVERNMENT CERTIFICATION SERVICE

Appendix C

British Geological Survey

BGS ID: 21527266 : BGS Reference: TQ12NW15
British National Grid (27700) : 512140,126841

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. SOLID UPVC	125	mm from	0	to	10.4 m/depth
Casing material SLOTTED UPVC	125	mm from	10.4	to	50.3 m/depth
Casing material SOLID UPVC	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 _____ m³/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 ☐

Contact BGS: ngdc@bgs.ac.uk

British Geological Survey

BGS ID: 21527266 : BGS Reference: TQ12NW15
British National Grid (27700) : 512140,126841

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

Contact BGS: ngdc@bgs.ac.uk

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	[redacted]		
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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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Geotechnical Report

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.

Appendix G

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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.

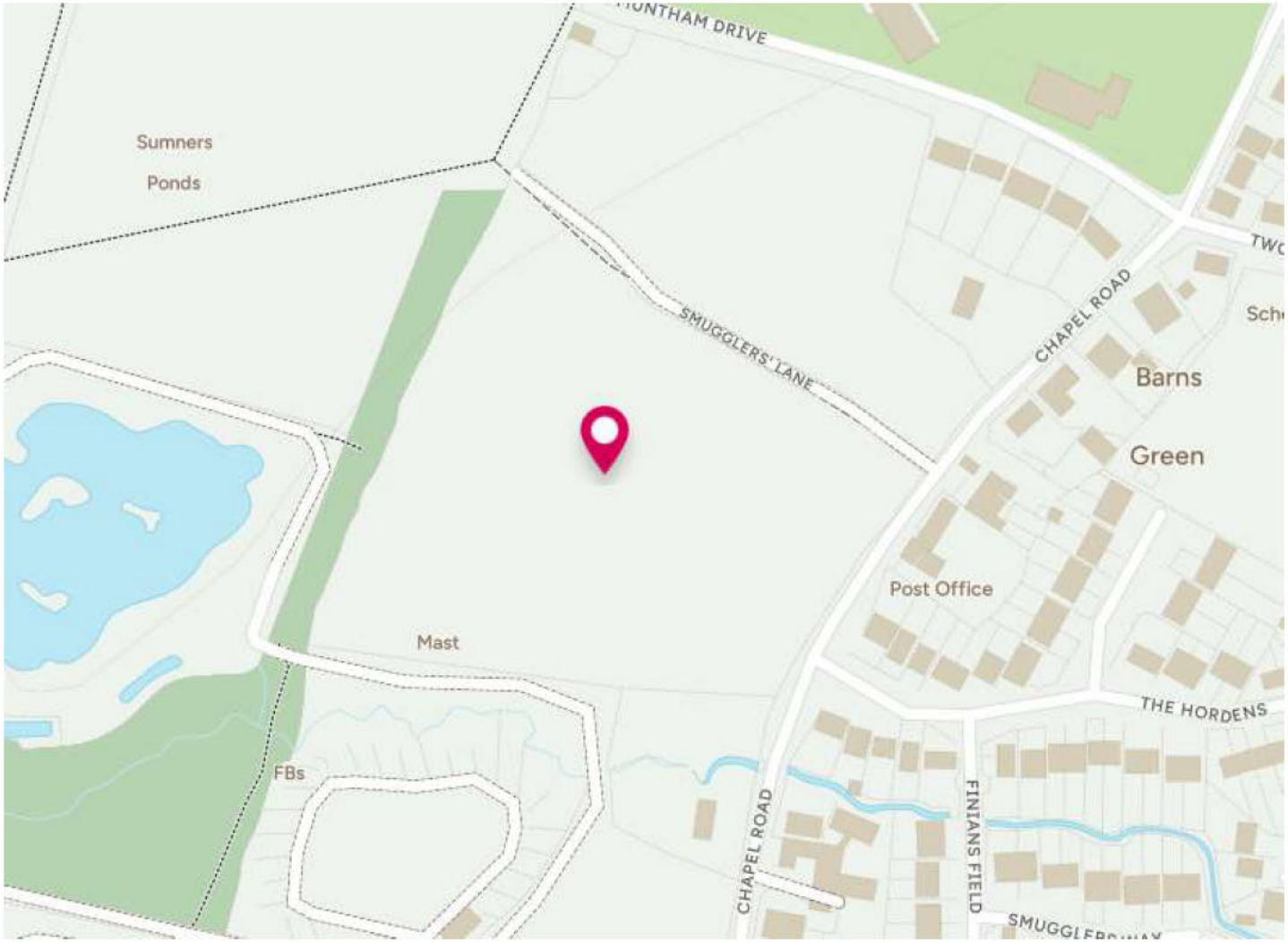
FIGURES **9**
APPENDIX A: Conditions and Limitations **10**
APPENDIX B: Technical Glossary **13**
APPENDIX C: Proposed Development Information **14**
APPENDIX D: GroundSure Historical Mapping **15**
APPENDIX E: Trial Hole Logs **16**
APPENDIX F: Geotechnical Laboratory Testing **17**
APPENDIX G: Chemical Laboratory Testing **18**

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FIGURES

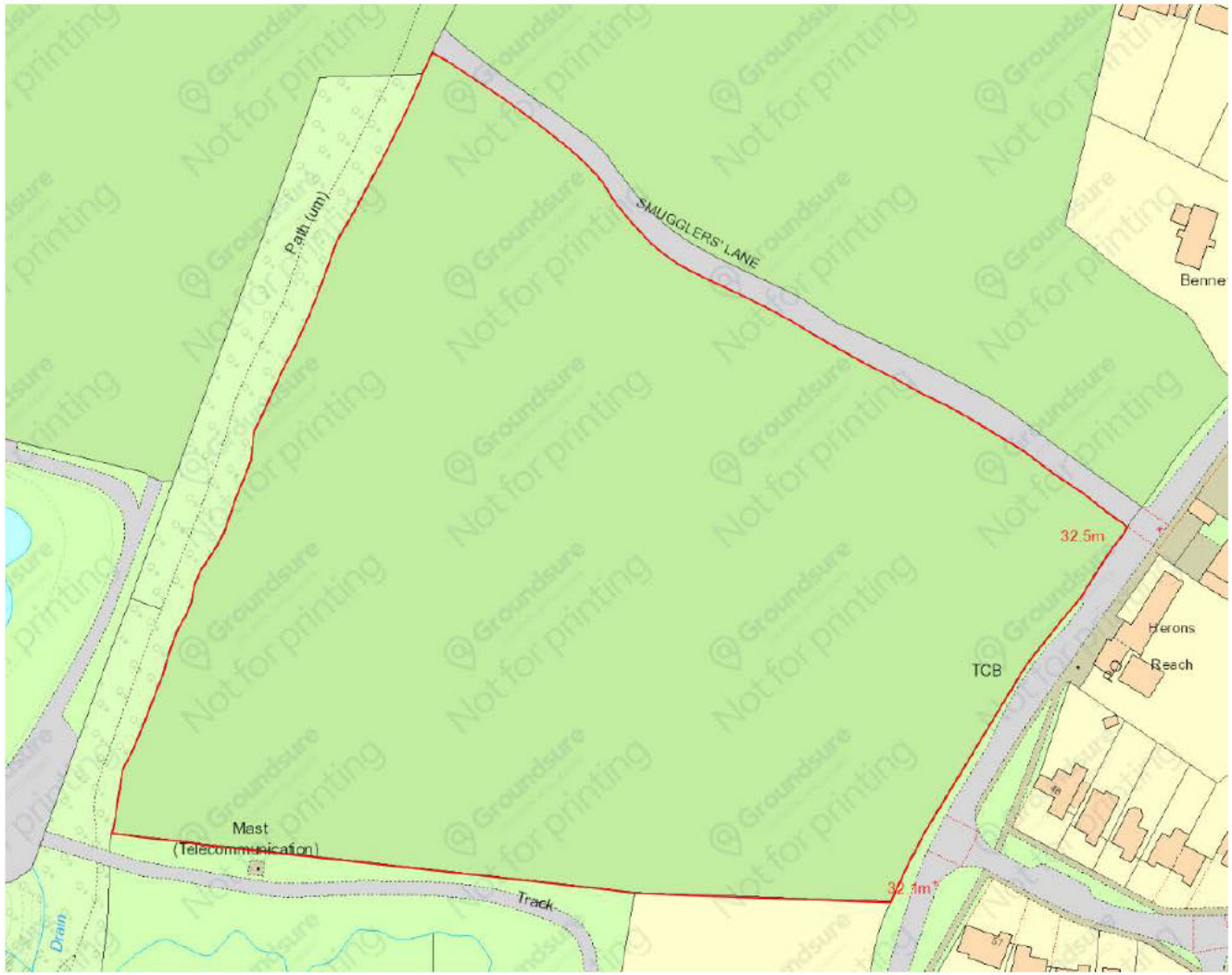


Site Location

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".

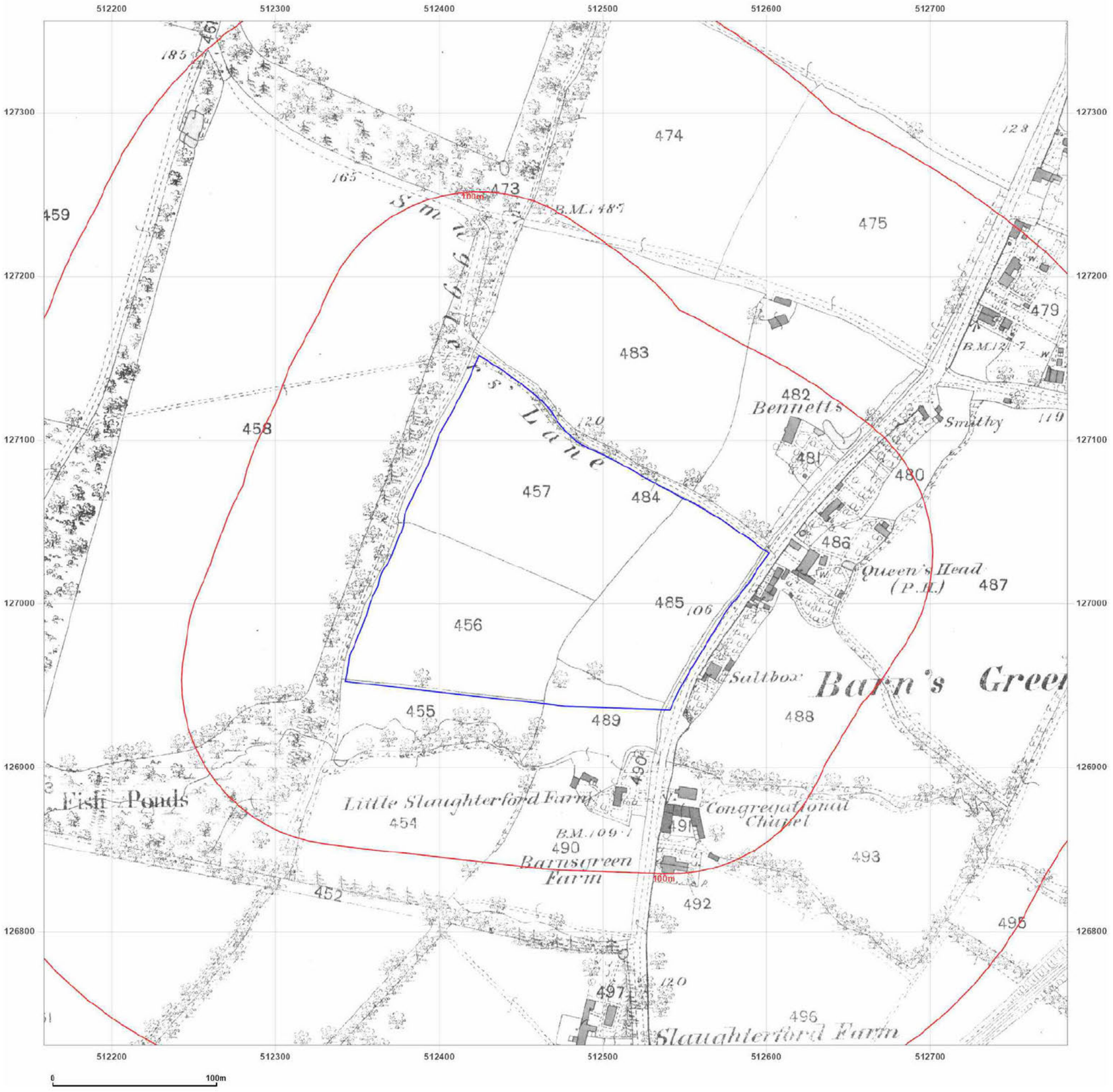
Dynamic Probing involves the driving of a metal cone into the ground via a series of steel rods. These rods are driven from the surface by a hammer system that lifts and drops a 63.5kg (SHDP) hammer onto the top of the rods through a set height, thus ensuring a consistent energy input. The number of 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 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
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Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

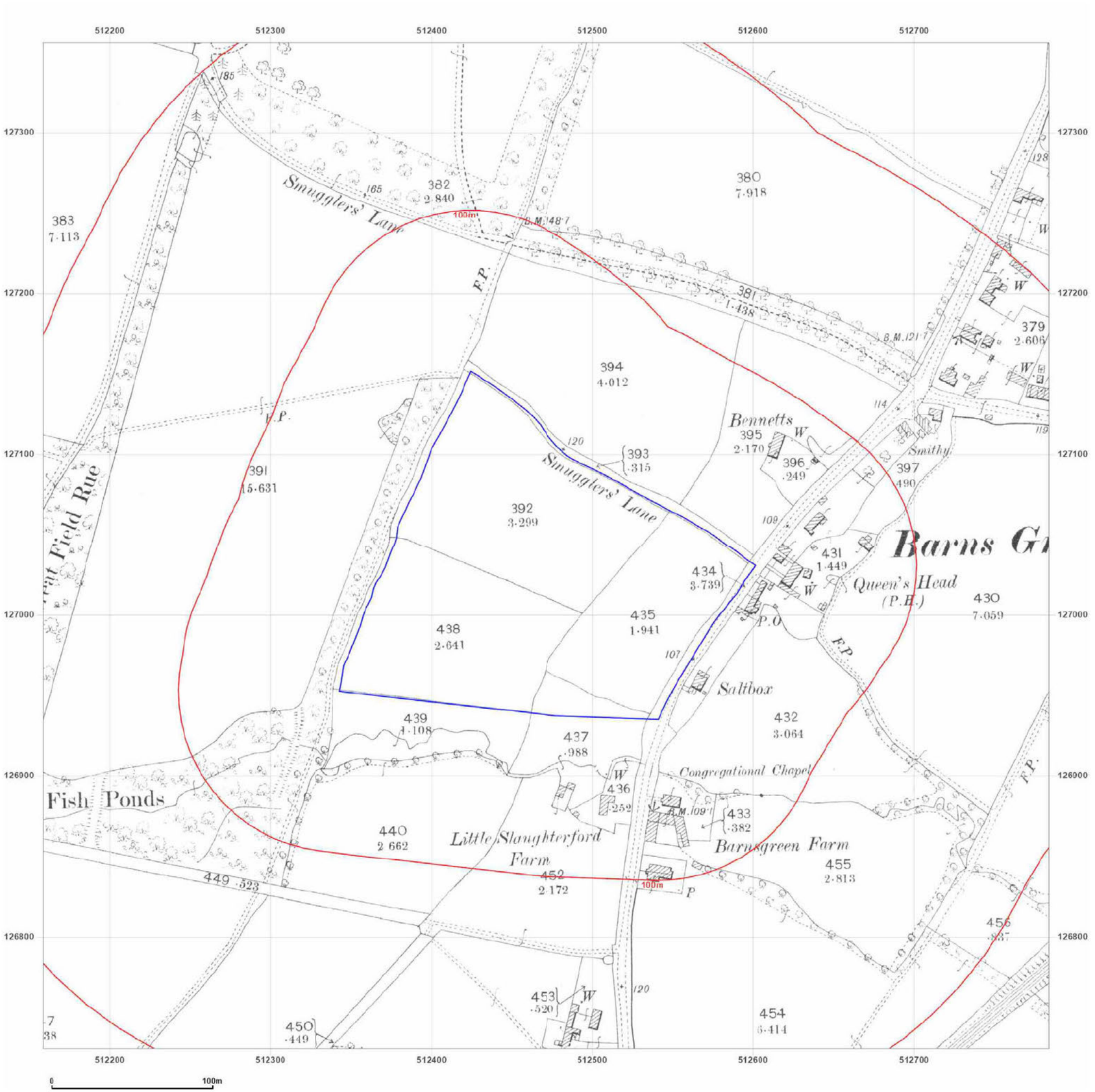
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Site Details:

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

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

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

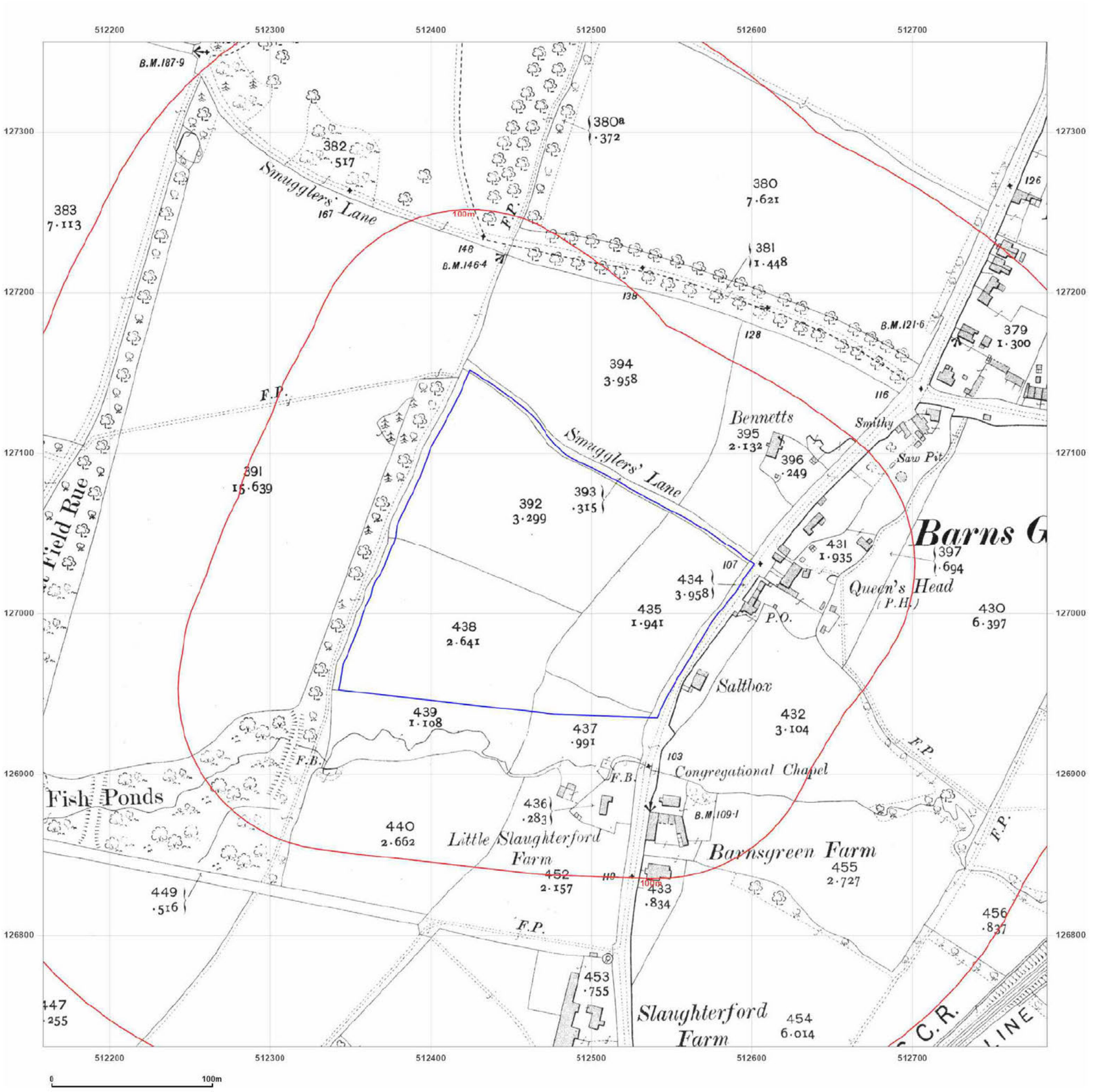
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Site Details:

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

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

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

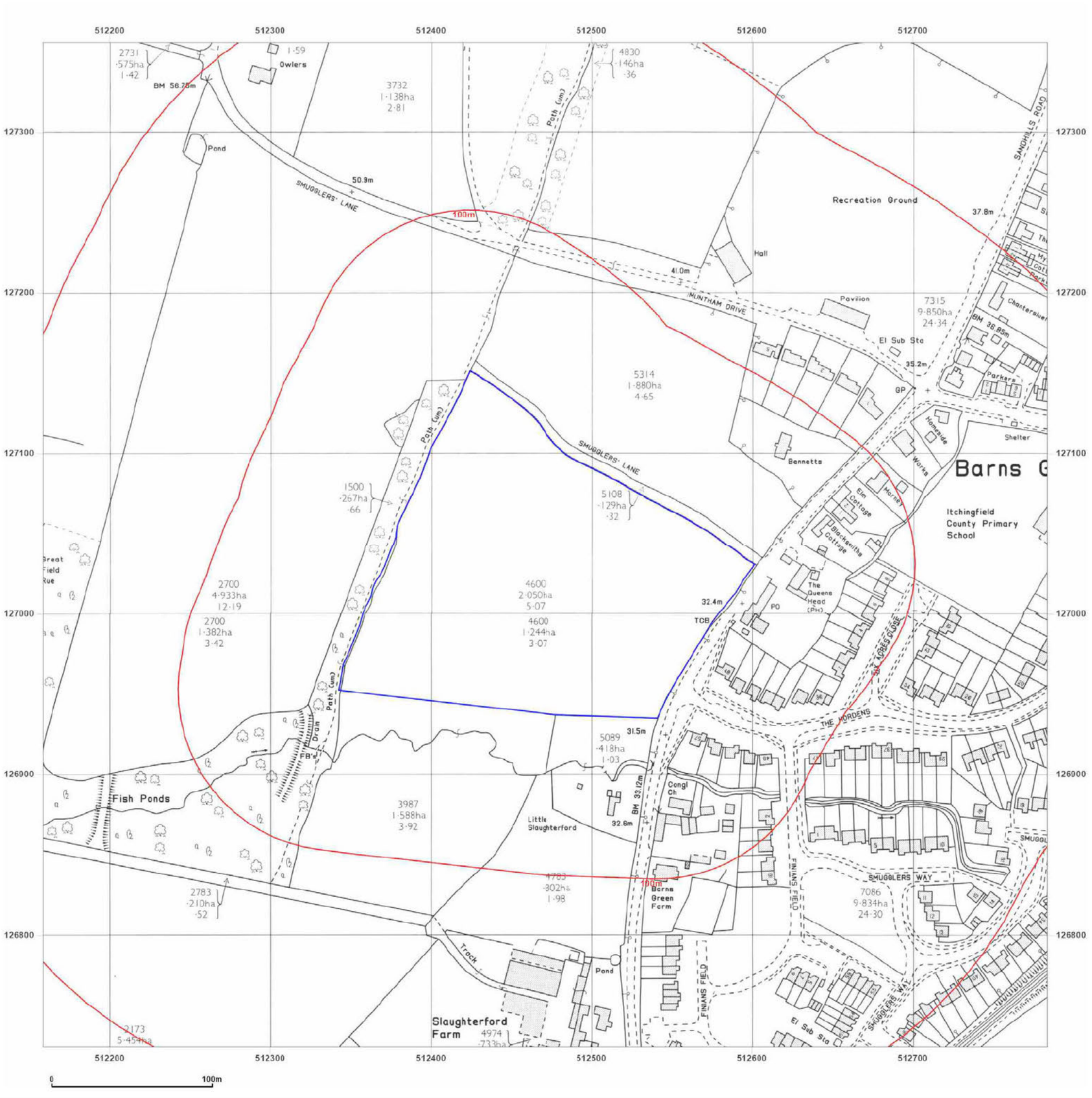
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Site Details:

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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 1975
Revised 1975
Edition N/A
Copyright 1977
Levelled 1952

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

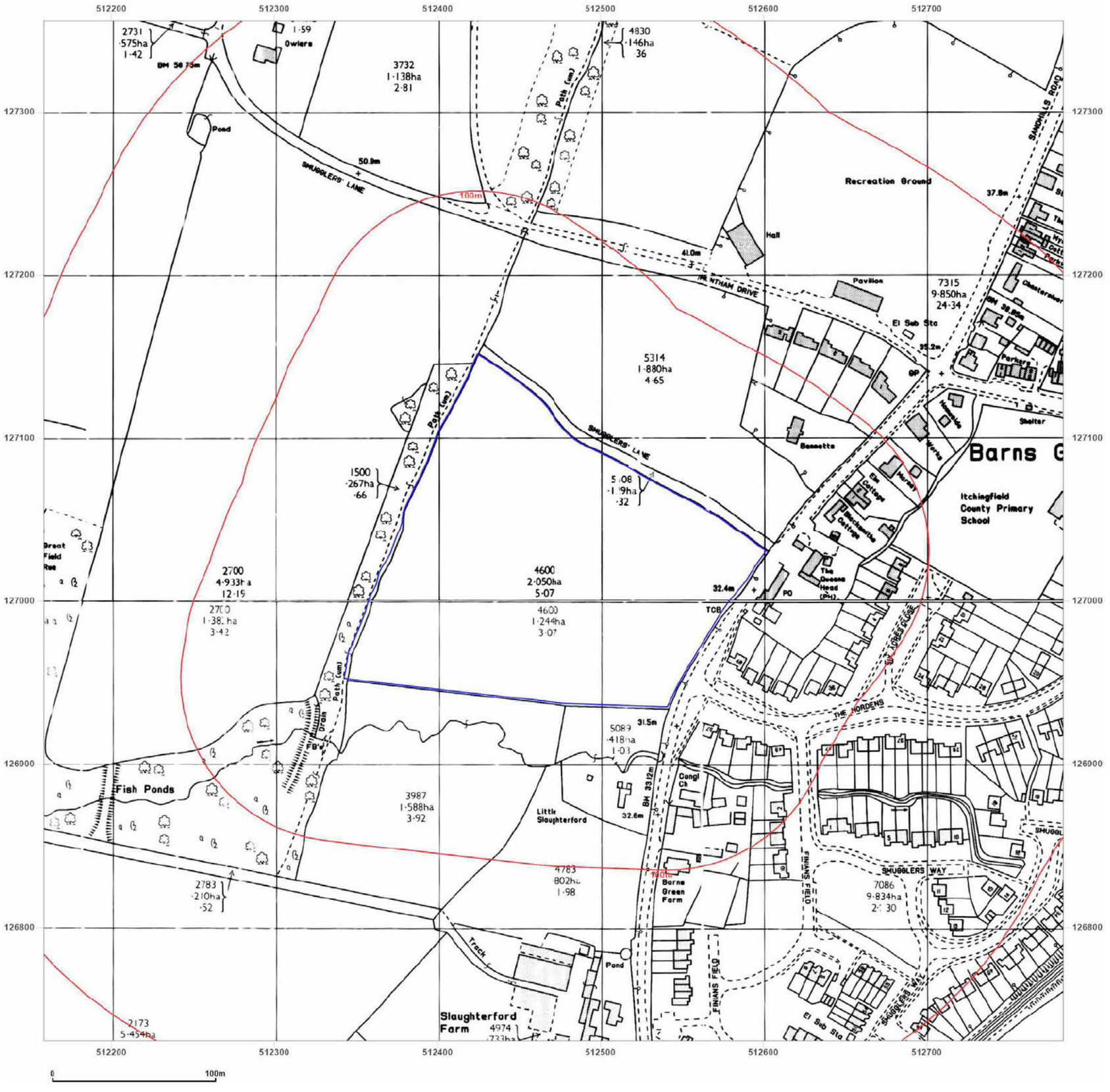
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Site Details:

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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

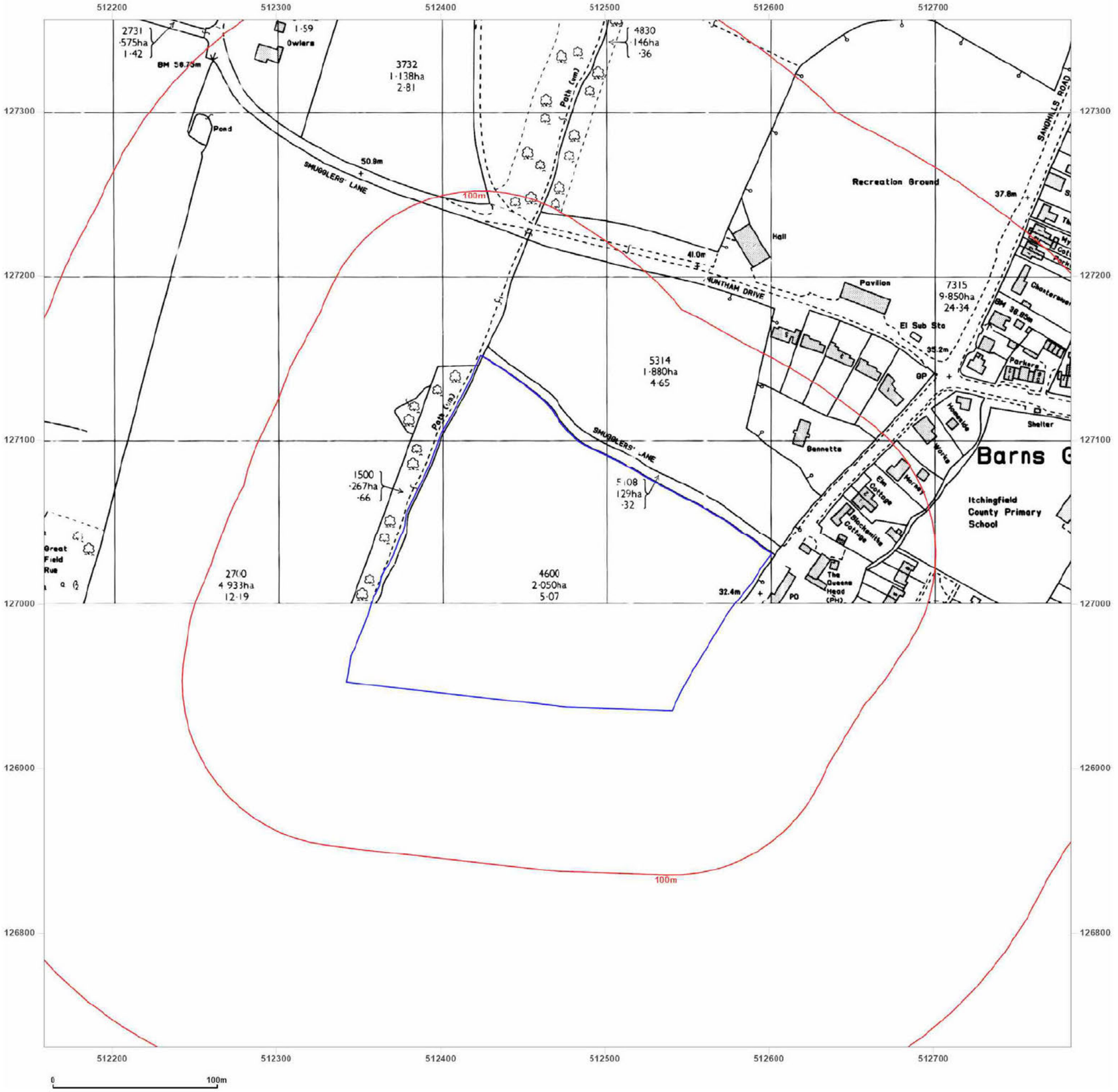
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Site Details:

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:

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

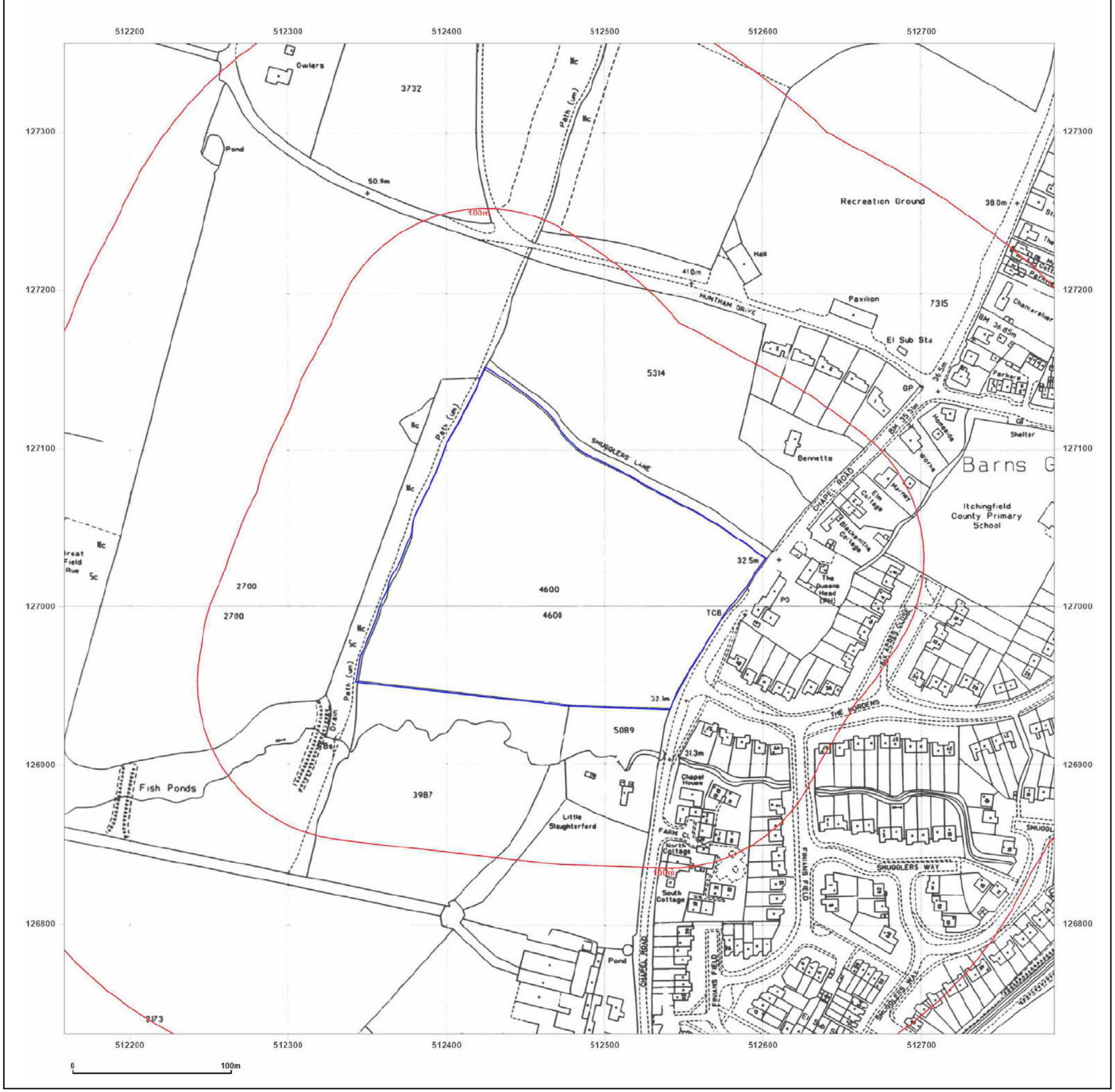
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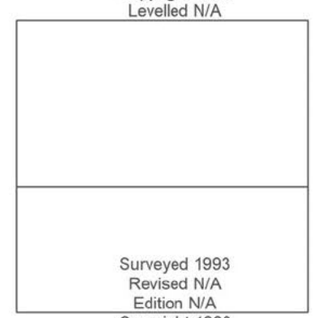
Land south-west of Smugglers Lane Barn Green Horsham, West Sussex RH13 0PS, RH13 0PS

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
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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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Site Details:

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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

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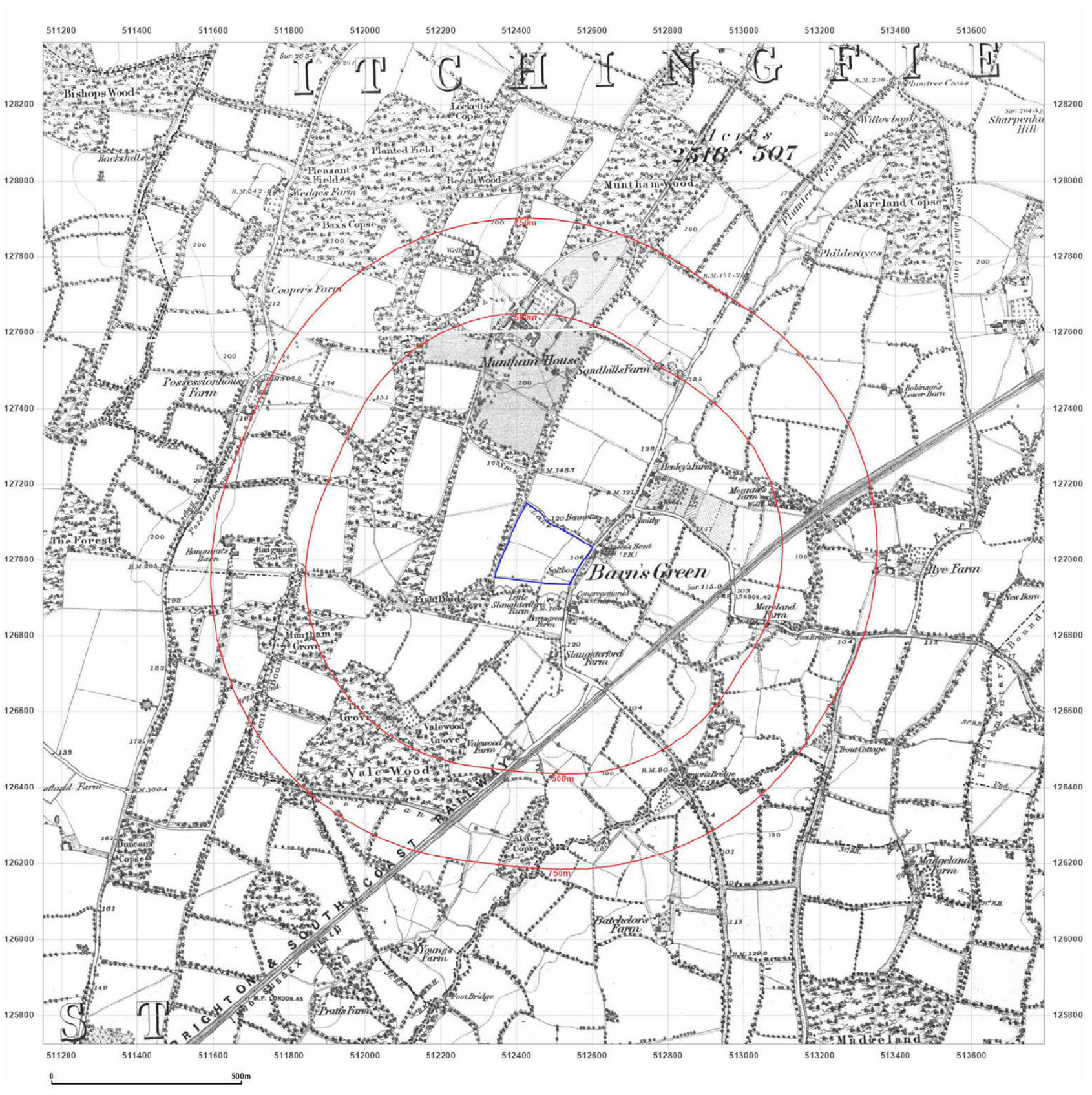
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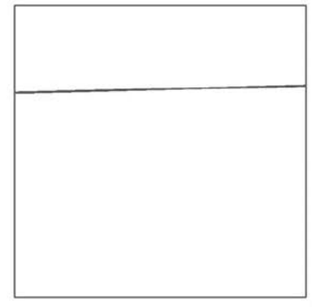
Land south-west of Smugglers Lane Barn Green Horsham, West Sussex RH13 0PS, RH13 0PS

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
W E
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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

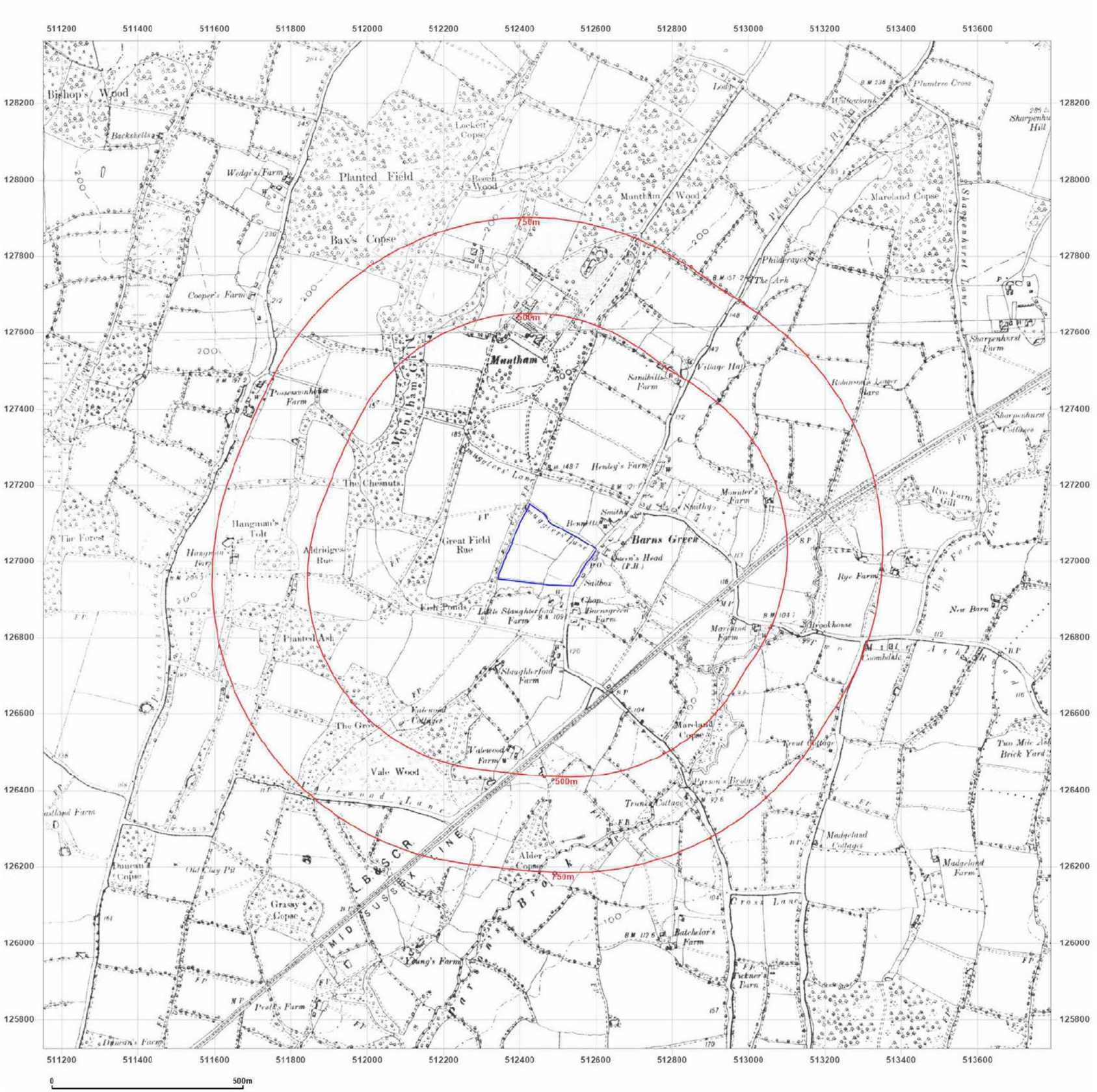
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Site Details:

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: **1896**
Scale: 1:10,560
Printed at: 1:10,560

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

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

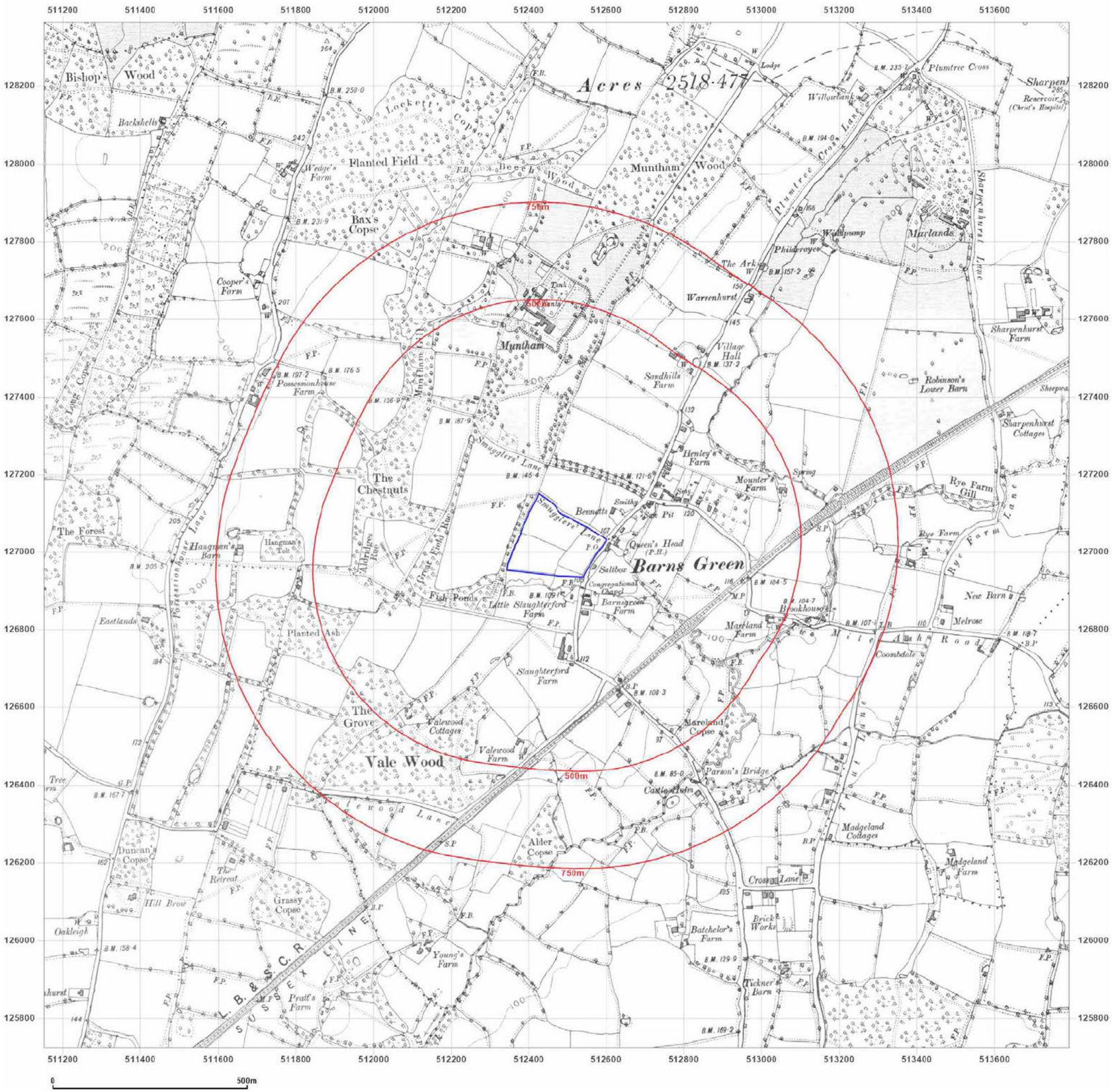
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Site Details:

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: County Series
Map date: **1913**
Scale: 1:10,560
Printed at: 1:10,560

N
W E
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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

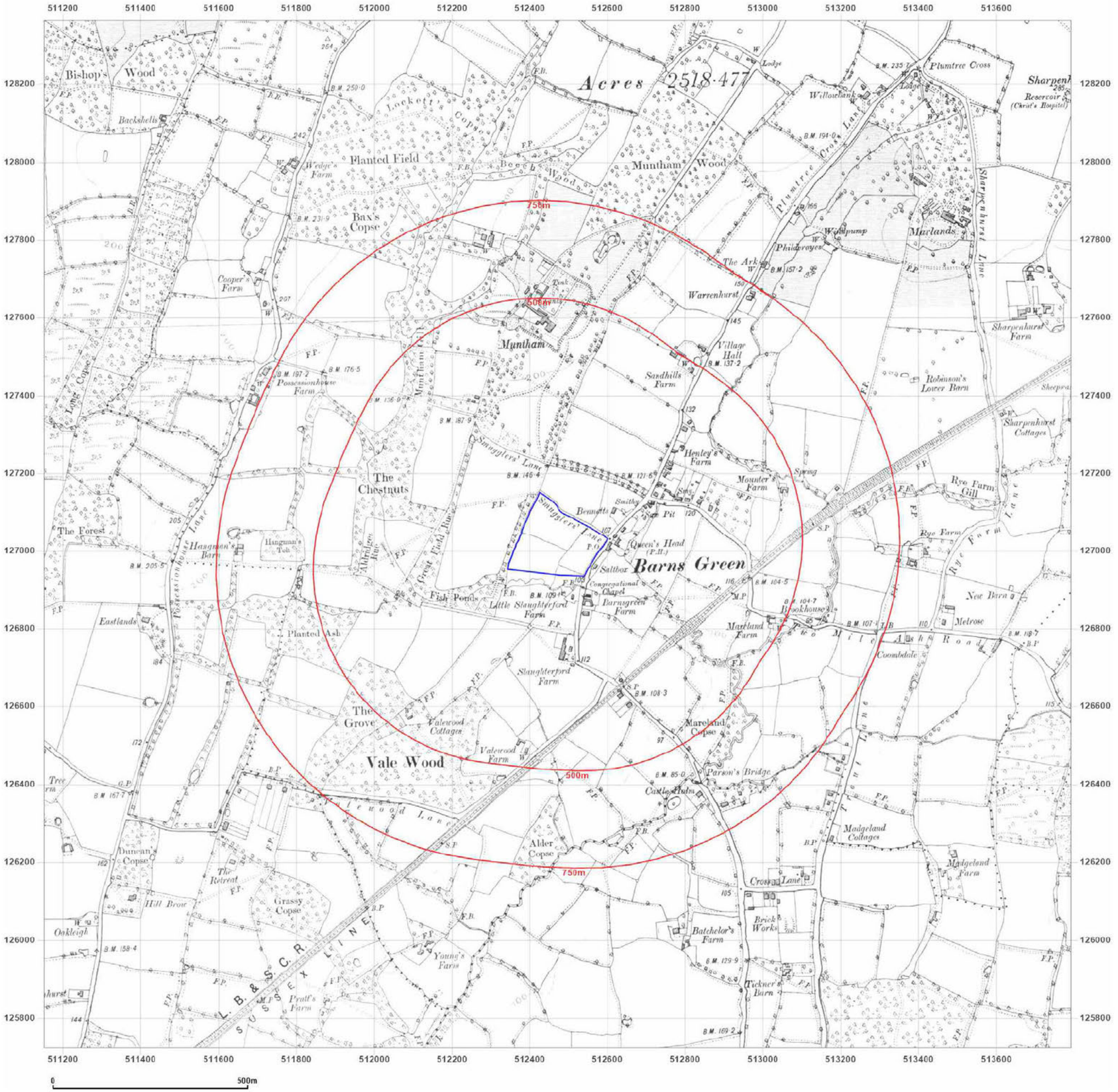
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Site Details:

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

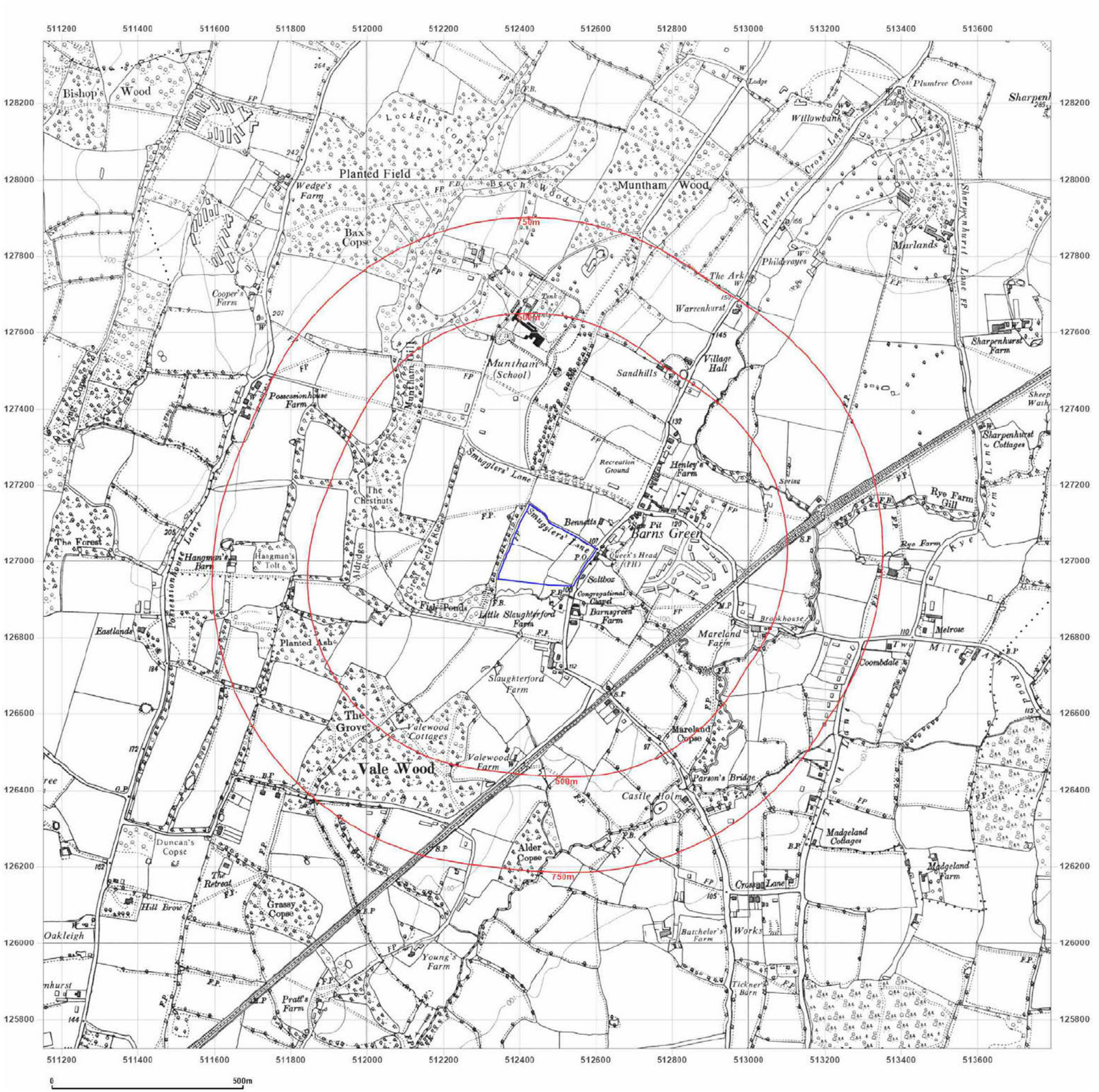
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Groundsure INSIGHTS

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

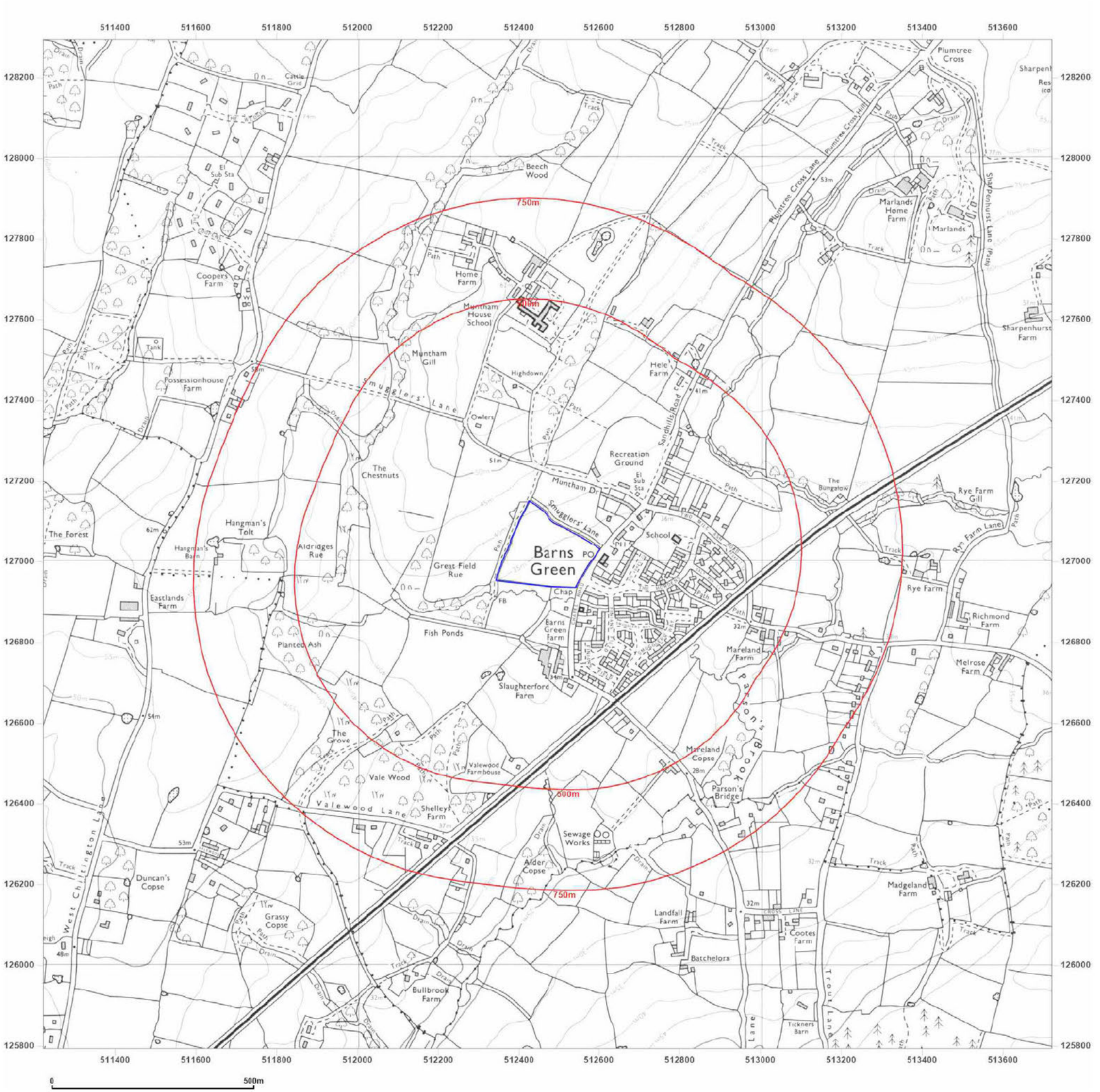
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Site Details:

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

Map Name: National Grid
Map date: **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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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: 2001
Scale: 1:10,000
Printed at: 1:10,000

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2001

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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: **2010**
Scale: 1:10,000
Printed at: 1:10,000

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2010

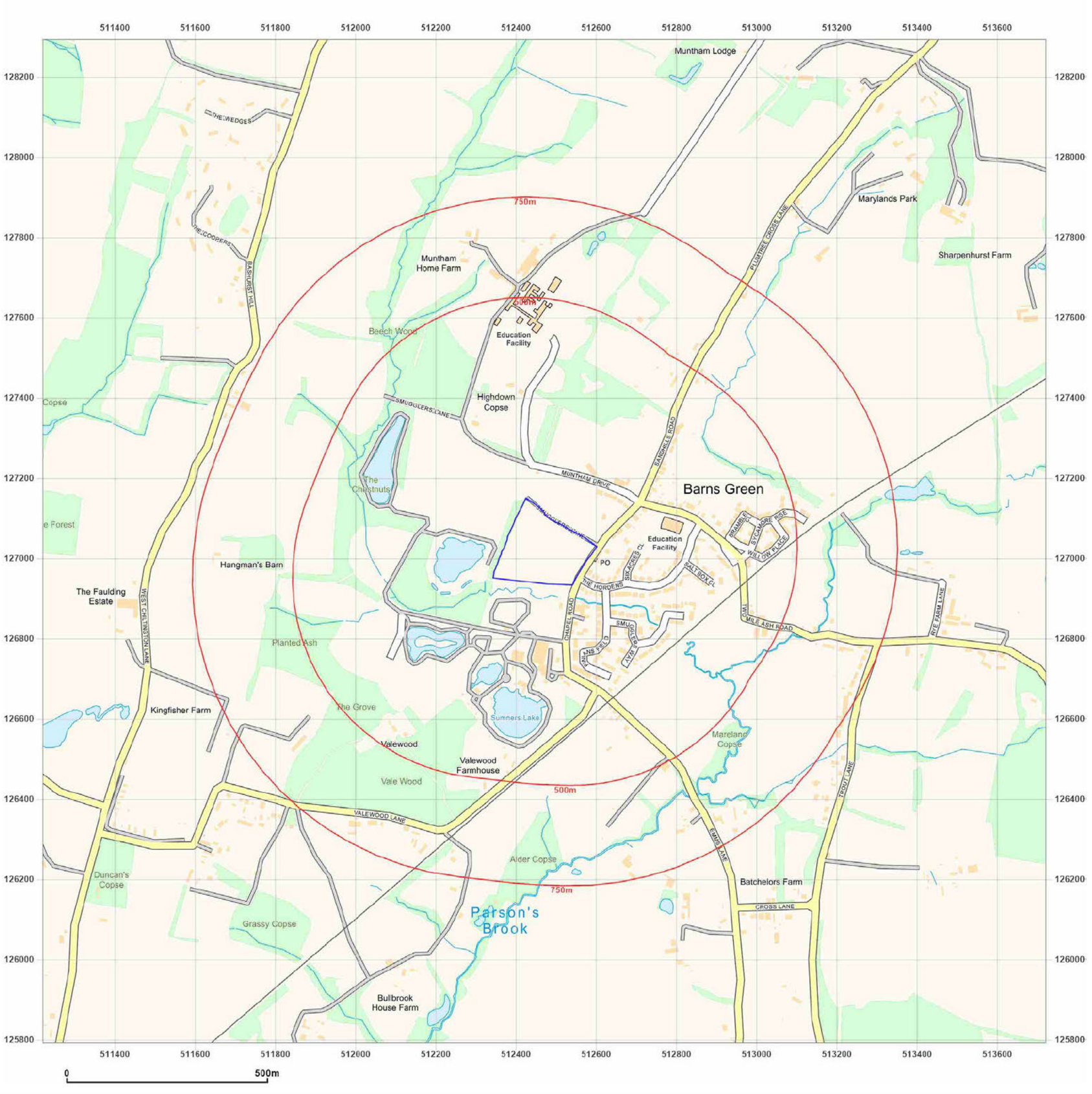
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Site Details:

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: **2024**
Scale: 1:10,000
Printed at: 1:10,000

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2024

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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

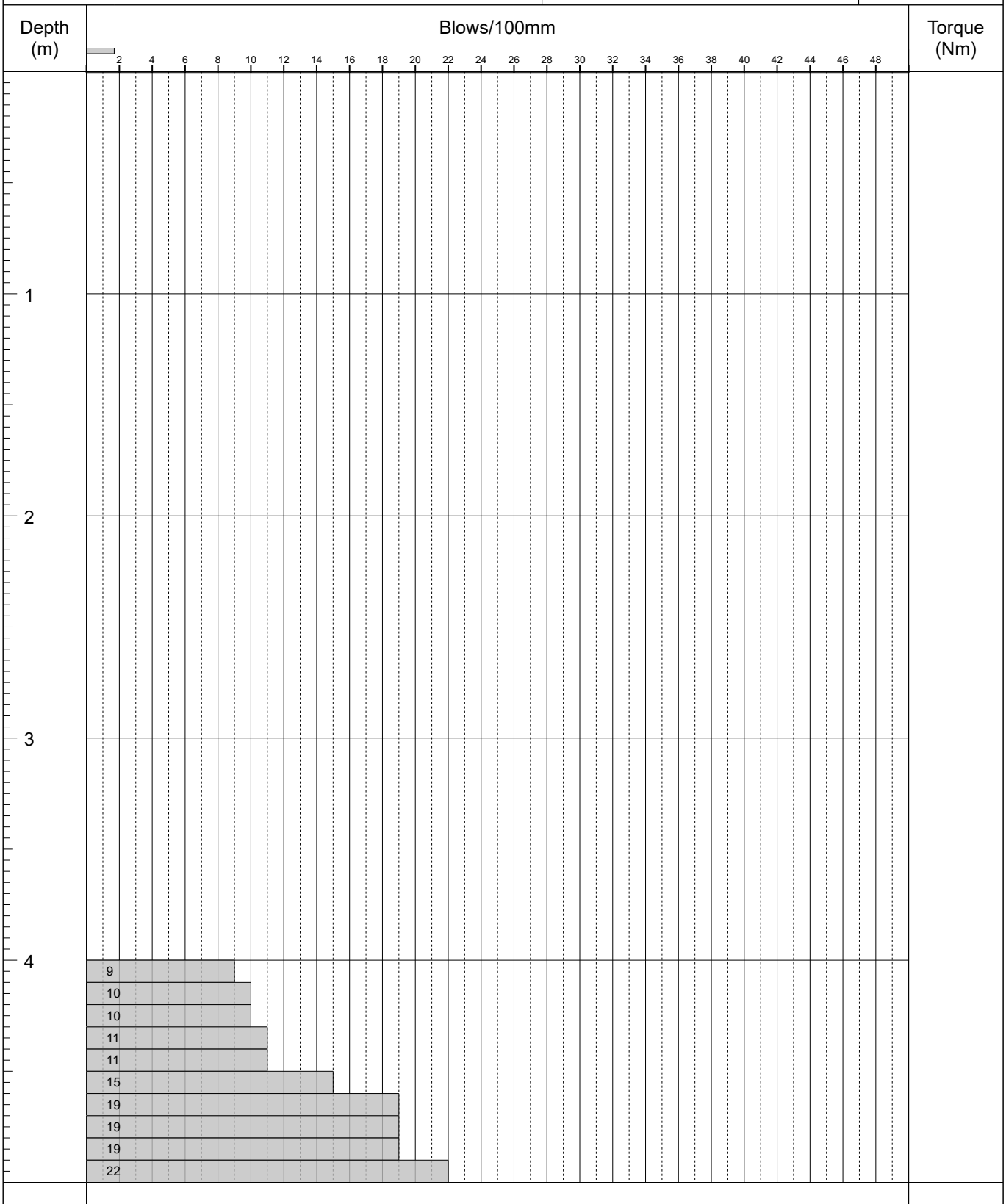
Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

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

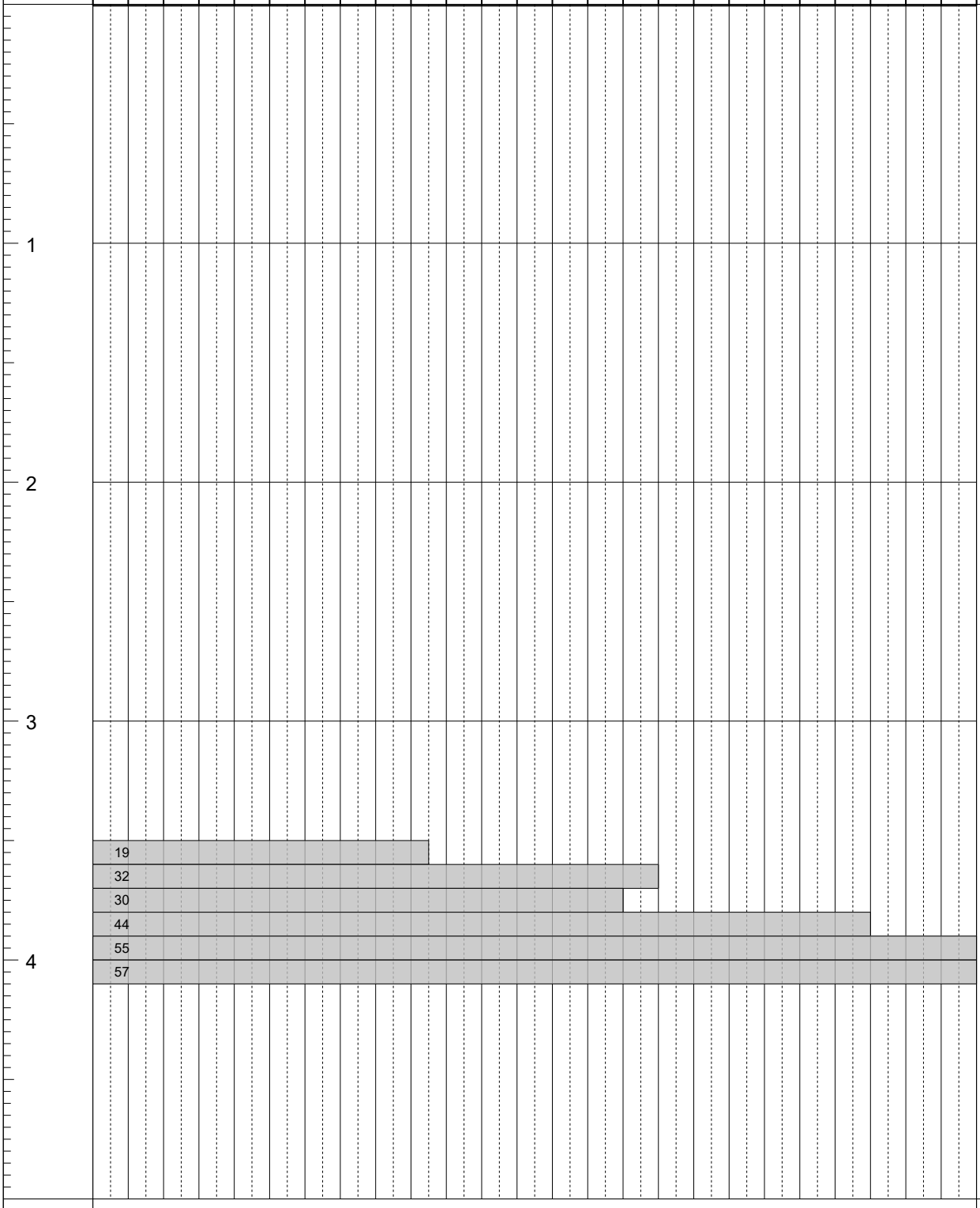
Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

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

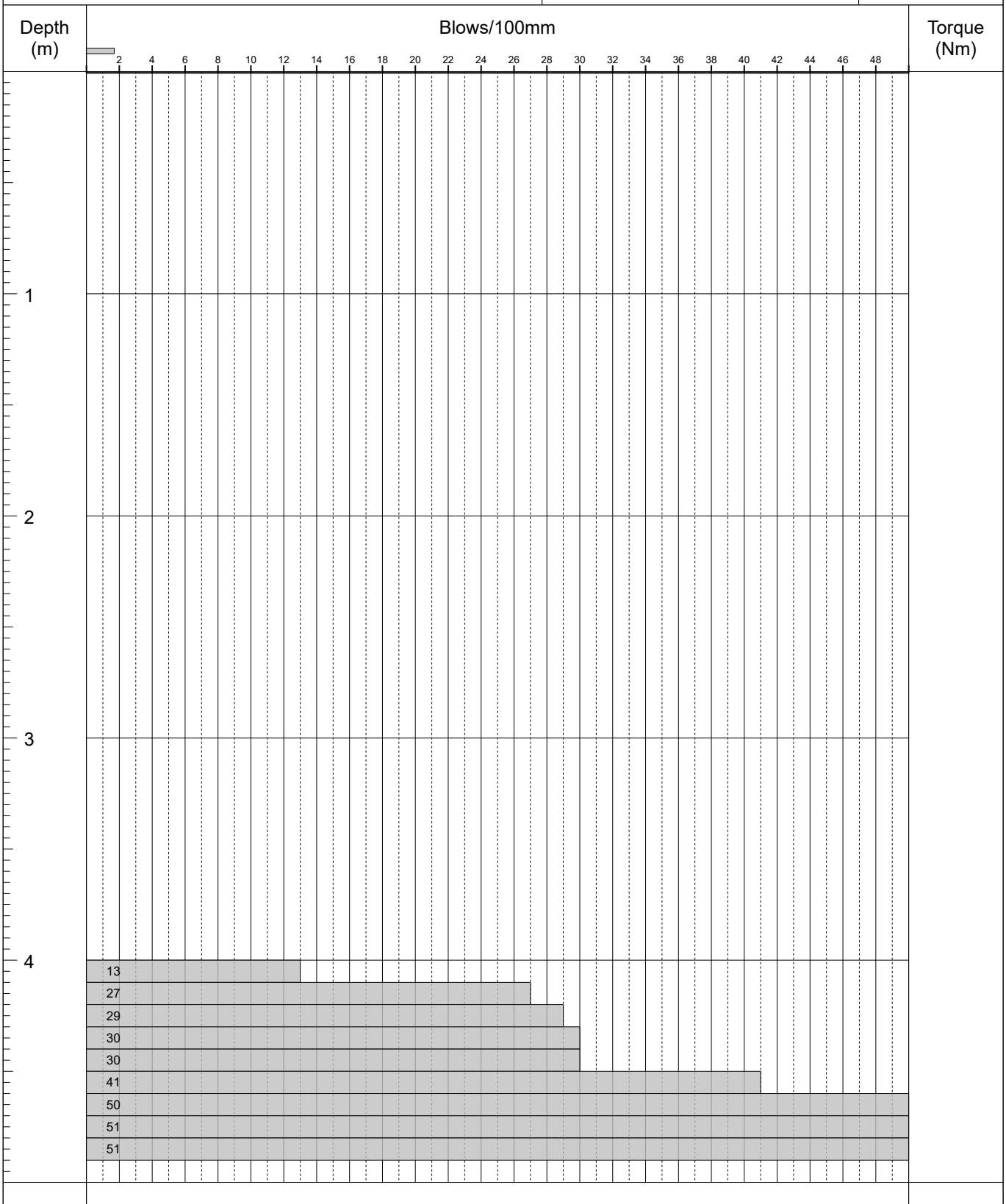
Remarks

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

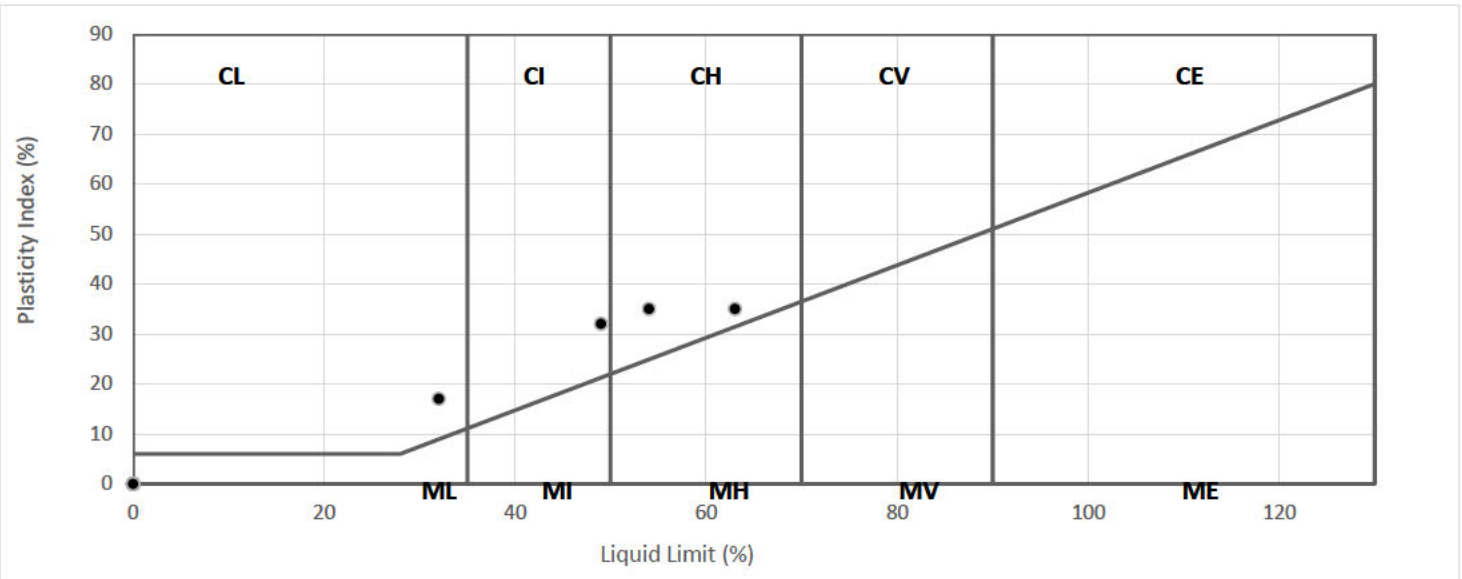
NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.4 & 5.3)

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

Appendix E

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

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

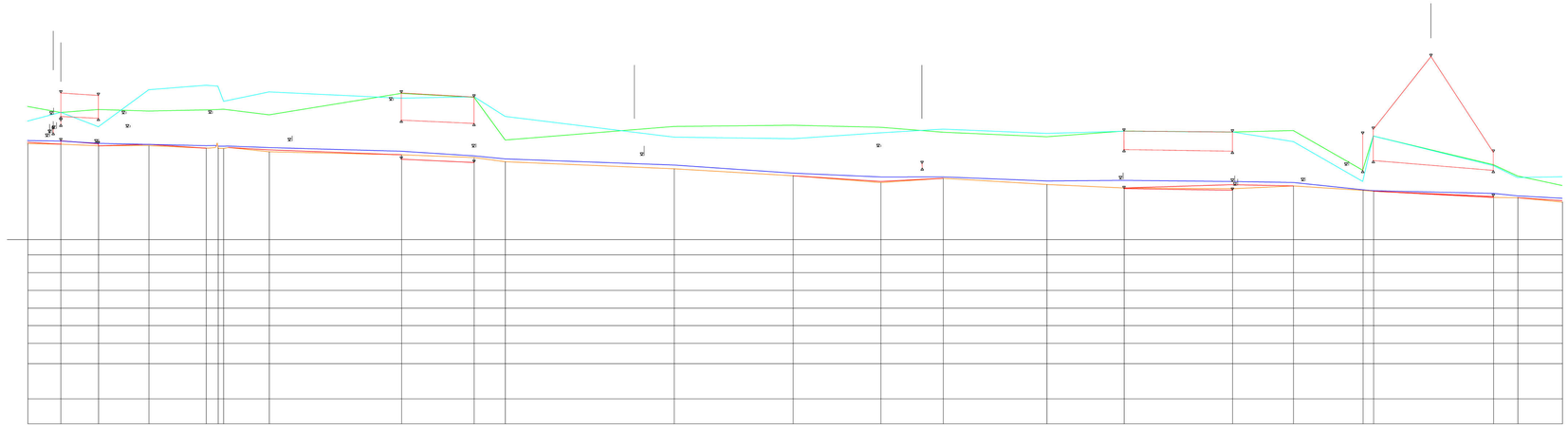
Appendix I

Control Processing Information

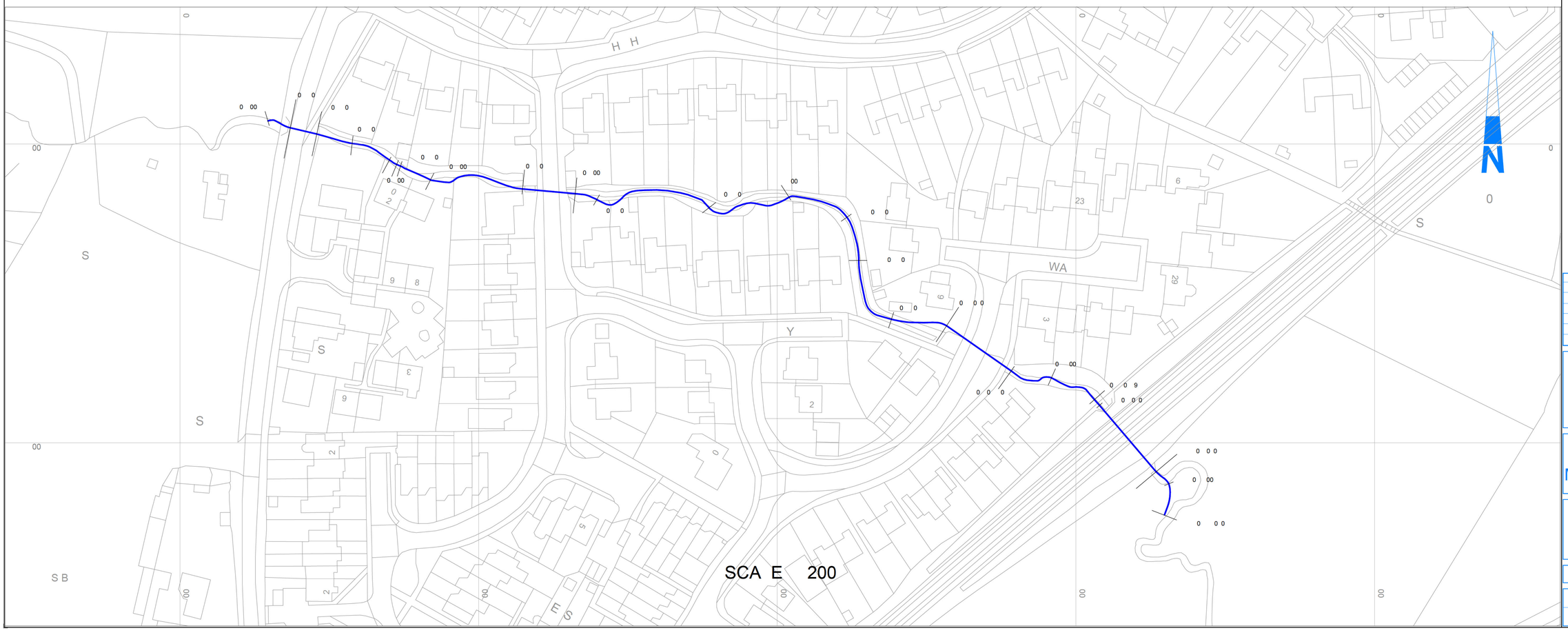
Solum Surveying Ltd

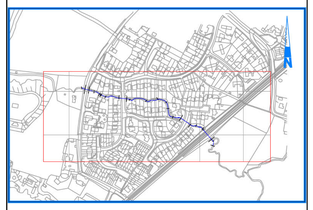
Appendix II

Self Certification Checklist



SCA E 00Hz 00V





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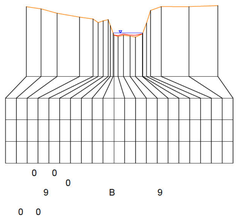
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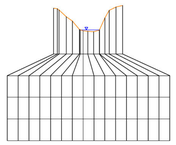
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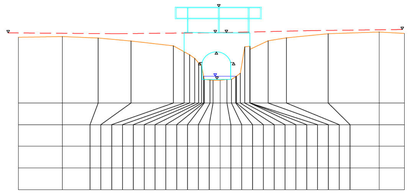
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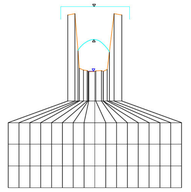
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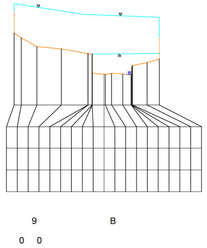
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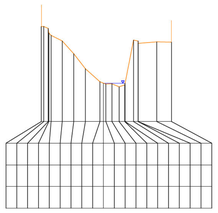
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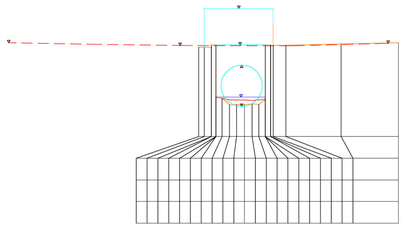
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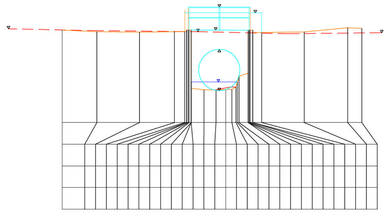
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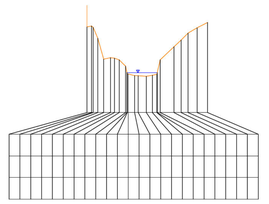
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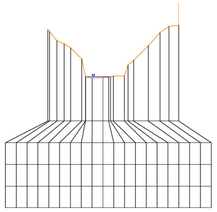
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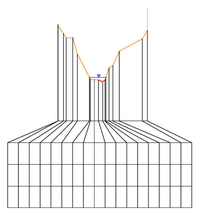
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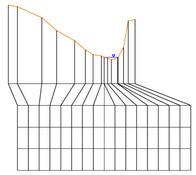
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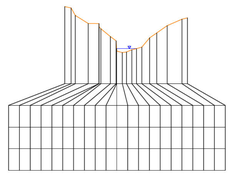
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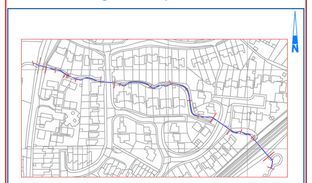


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Solum Surveying Ltd

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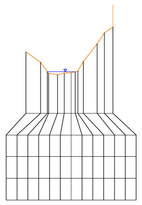
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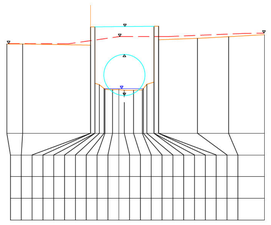
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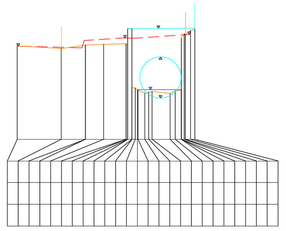
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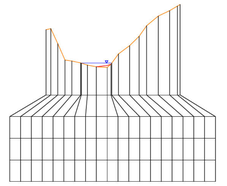
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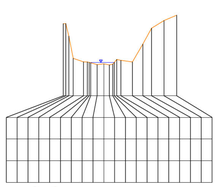


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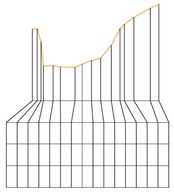
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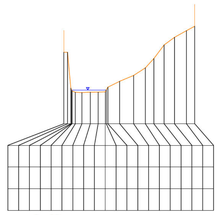
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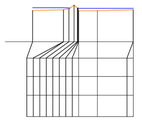
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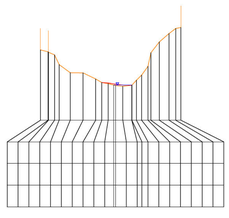
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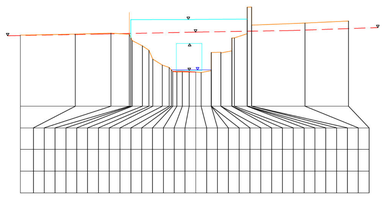
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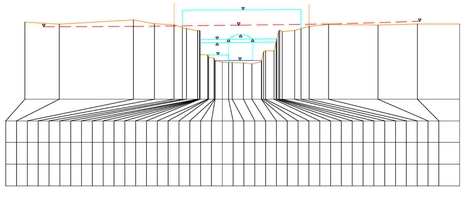
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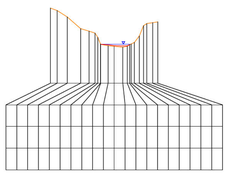
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Solum Surveying Ltd

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Regulated by RICS

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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
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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
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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
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344	Open Channel	512558	126900	99	15/07/2025 11 29	14639_PGE_MUNT01_00344a jpg
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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_L


14639_PGE_MUNT01_00011


639_PGE_MUNT01_00011_L


14639_PGE_MUNT01_00017


639_PGE_MUNT01_00017_L


14639_PGE_MUNT01_00046


639_PGE_MUNT01_00046_L


639_PGE_MUNT01_00049_L


4639_PGE_MUNT01_00049a


4639_PGE_MUNT01_00049b


639_PGE_MUNT01_00065_L


4639_PGE_MUNT01_00065a


4639_PGE_MUNT01_00065b


639_PGE_MUNT01_00080_L


4639_PGE_MUNT01_00080a


4639_PGE_MUNT01_00080b


4639_PGE_MUNT01_00080c

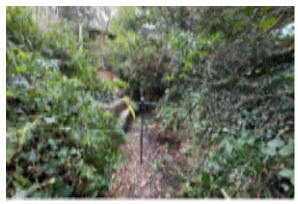

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14639_PGE_MUNT01_00125


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639_PGE_MUNT01_00151_U


4639_PGE_MUNT01_00151a


4639_PGE_MUNT01_00151b


639_PGE_MUNT01_00166_L


4639_PGE_MUNT01_00166a


4639_PGE_MUNT01_00166b

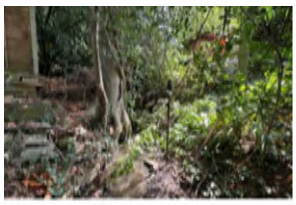

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639_PGE_MUNT01_00216_L


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4639_PGE_MUNT01_00216b


4639_PGE_MUNT01_00216(


14639_PGE_MUNT01_00257


639_PGE_MUNT01_00257_U


639_PGE_MUNT01_00265_U


4639_PGE_MUNT01_00265a


4639_PGE_MUNT01_00265b


639_PGE_MUNT01_00282_U


4639_PGE_MUNT01_00282a


4639_PGE_MUNT01_00282b


4639_PGE_MUNT01_00282c


4639_PGE_MUNT01_00282c


639_PGE_MUNT01_00315_U


4639_PGE_MUNT01_00315a


4639_PGE_MUNT01_00315b


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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


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4639_PGE_MUNT01_00344b


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639_PGE_MUNT01_00365_U


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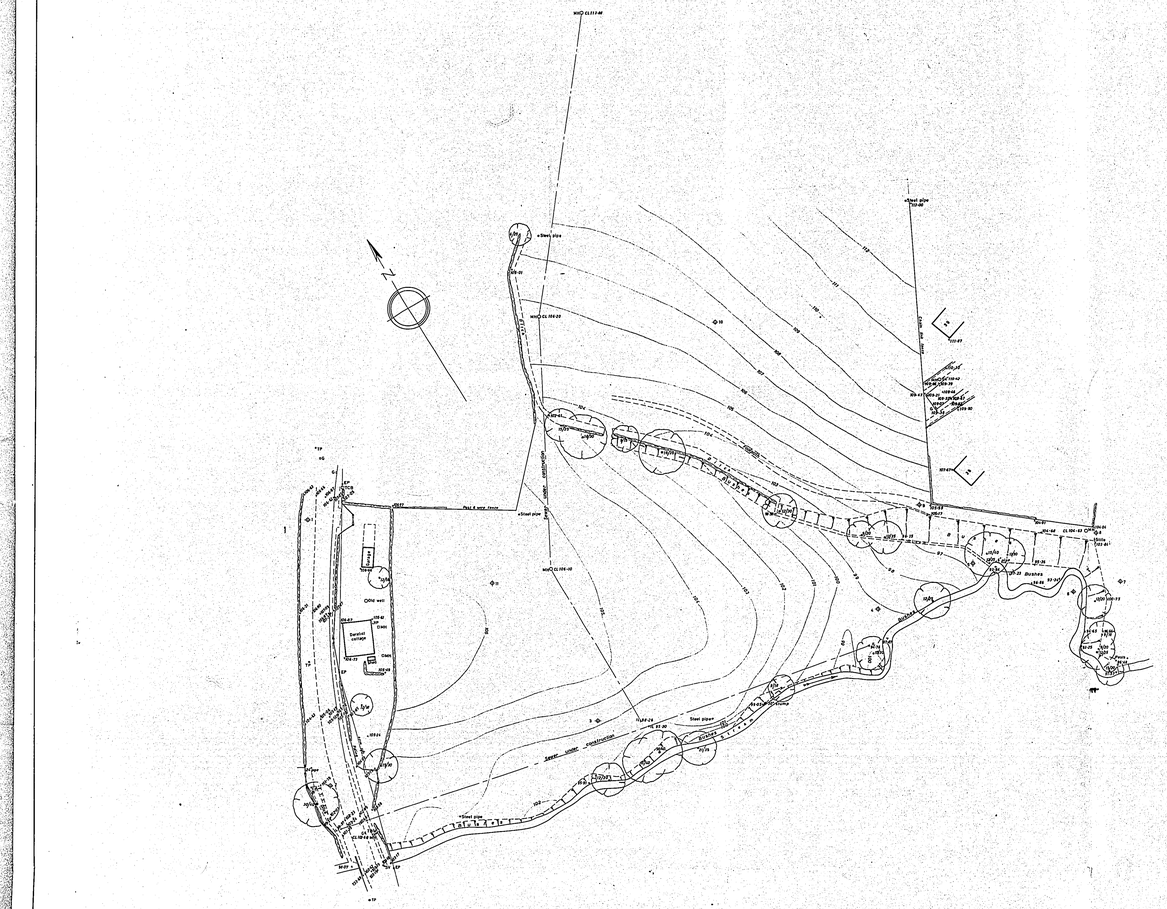

14639_PGE_MUNT01_00373



639_PGE_MUNT01_00373_L

Appendix F

I /3/67


N
Steel pipe
Hedge
Fence
Ditch
Path & wood fence
Steel pipe
Steel pipe
Steel pipe

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:	**07362 276031**
E-Mail:	**TimWood@tswoodconsulting.co.uk**

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:	**07399662124**
E-Mail:	**dennis.avramov@survey-solutions.co.uk**

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:
Use: **Surface water**
Catchment:

Shape/Size: **Circular 225**
Material: **Vitrified clay** Pipe length:
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

Sam Dulieu
Brentwood
Essex
Tel: , Fax:

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:

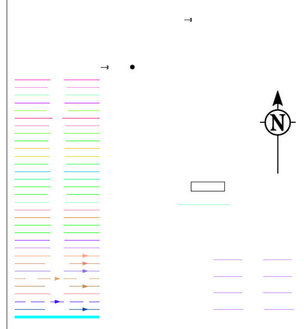
Inspection photos

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





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Appendix H

Solum Surveying Ltd
The Old Stables, Pines Courtyard, Stone
Tel. 07730620143
sholbrook@solumsurveying.com

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: 07730620143
Email: sholbrook@solumsurveying.com

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sholbrook@solumsurveying.com

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

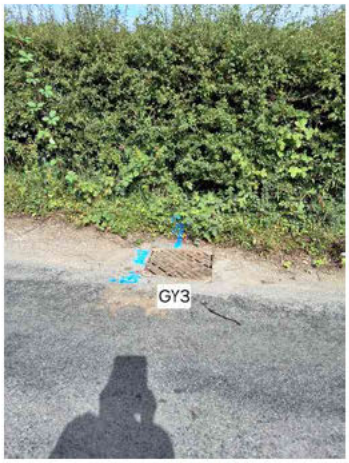
Information

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

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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

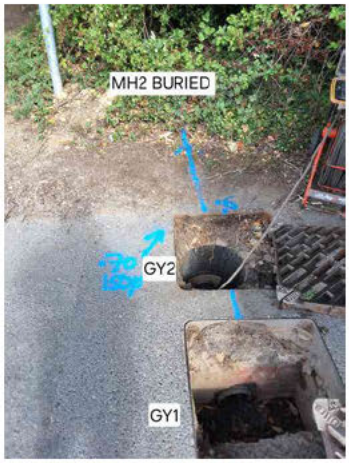
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Project Pictures

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

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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

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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**

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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		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**

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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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

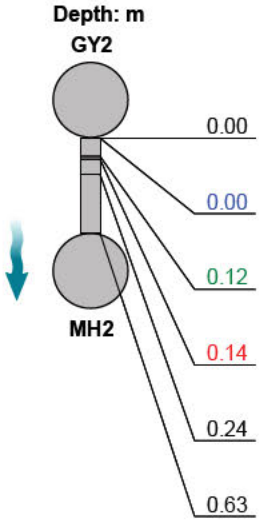
Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JS	Ford Transit	Solo Pro / Crawler	Not Specified	Not Specified	Not Specified

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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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
Depth: m GY3						
	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		
ML 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	0	0.0	0.0	0.0	1.0

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sholbrook@solumsurveying.com

Section Inspection - 28/07/2025 - GY4X

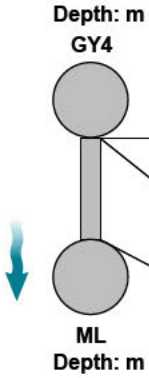
Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
4	1	28/07/25	10:52	14639-A	No Rain Or Snow	Yes	GY4X

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

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Section Inspection - 28/07/2025 - INLET1X

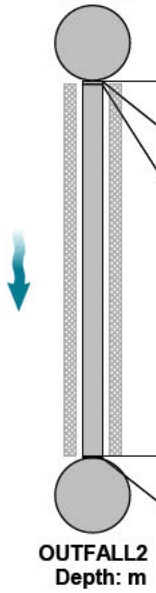
Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
6	1	28/07/25	10:51	14639-A	No Rain Or Snow	Yes	INLET1X

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
	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		

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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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

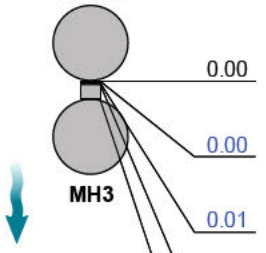
Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
8	1	28/07/25	10:52	14639-A	No Rain Or Snow	Yes	INLET3X

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
0.00	BR	Start node, major connection without manhole, reference: INLET3	00:00:00		
0.00	WL	Water level, 0% of the vertical dimension			
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		

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

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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	

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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

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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

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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

N

9 0

9 0

0 0

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chartered ices

Regulated by RICS

M le Co st uc ion

B

0

0 0

9

Appendix I

Timothy Wood

[redacted]

[redacted]

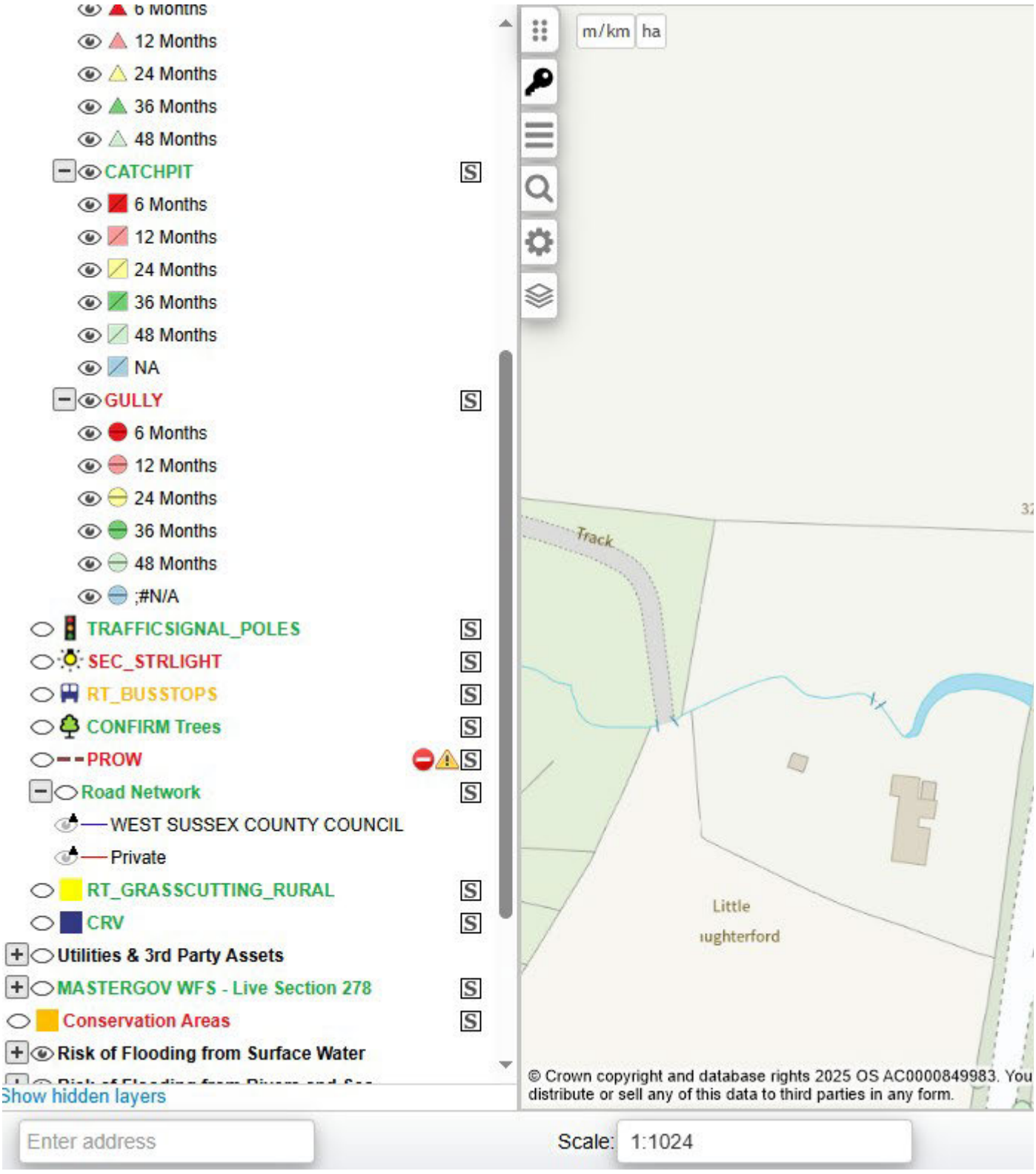
Subject: RE: Chapel Road, Barns Green

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.

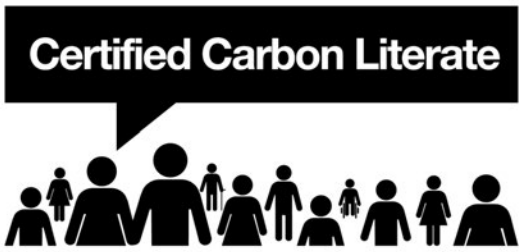


Many thanks.

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: 28284 | **External:** +[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:

[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: 23861 | **External:** +44 (0)330 222 3861 | **Mobile:** +44 (0)7702 444049 | **E-mail:** [redacted]

[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
[redacted]

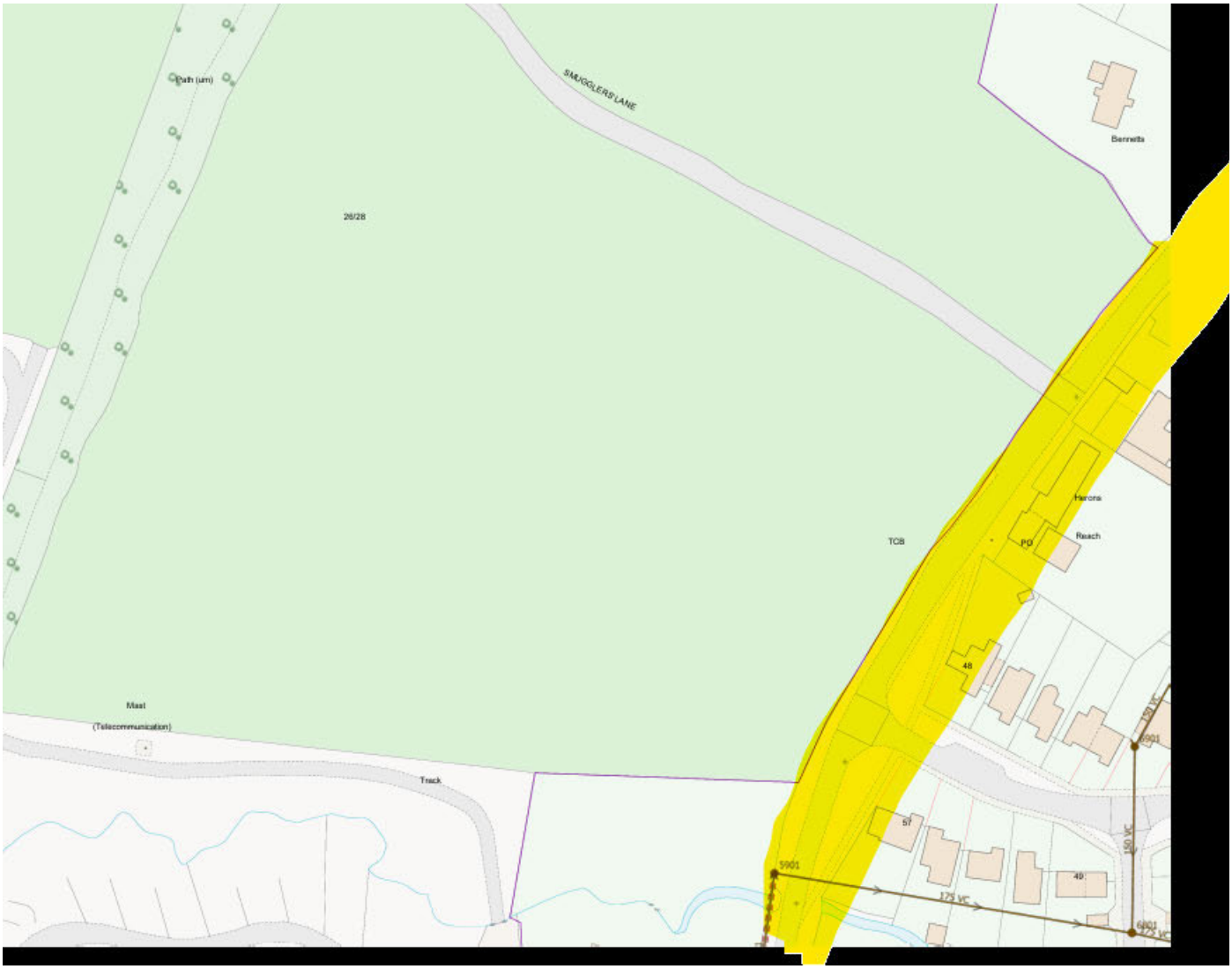
From: [redacted]
Sent: 07 April 2025 09:02
[redacted]
Subject: Chapel Road, Barns Green

****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.



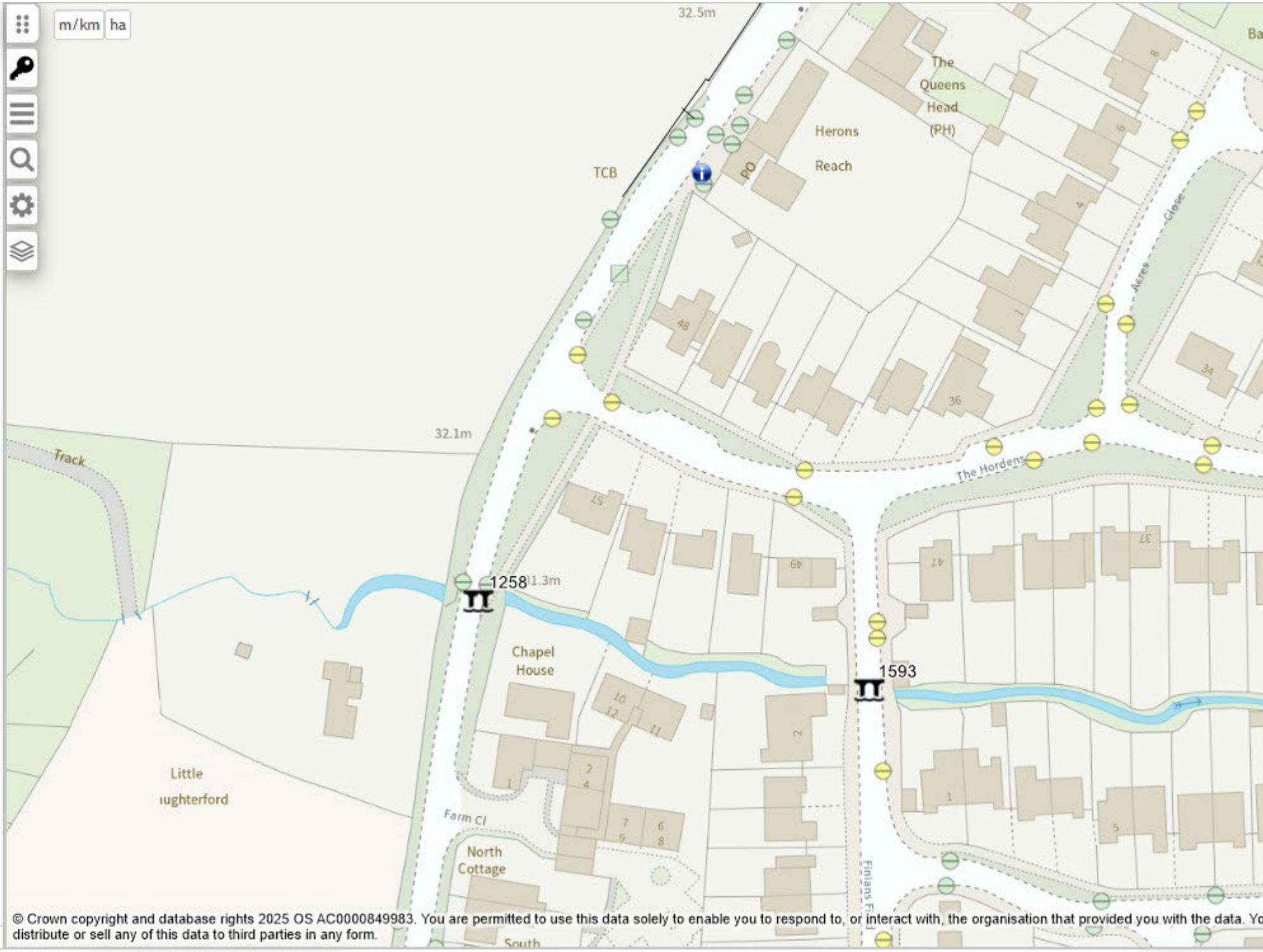


I look forward to your response

Best Regards

Tim Wood BEng(Hons) MCIWEM C.WEM
Owner of
TS Wood Consulting
[redacted]

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.



Scale: 1:1024

Back

Forward

X,Y: 512447.734,

Appendix J

Order received: 5 August 2024
Order completed: 8 August 2024

Drainage and water enquiry

CON29DW Commercial

Order reference: LS/U1811298
Your reference: SF33055403000 SWL/M6396.140

Search address:

Land on the west side of Smugglers Lane
Barns Green
West Sussex
RH13

Ordered by:

Searchflow
42 Kings Hill Avenue
West Malling
Kent
ME19 4AJ

For enquiries regarding the information provided in this report, please contact the LandSearch team:

Email: searches@southernwater.co.uk

Web: www.southernwater.co.uk

LandSearch
Southern Water Services
Southern House
Yeoman Road
Worthing
West Sussex
BN13 3NX

What you need to know about...

Private sewer transfer

On 1 October 2011, ownership of private sewers and lateral drains changed in accordance with The Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011. The contents of this search may not reflect these changes.

For further information please visit our website: www.southernwater.co.uk/sewer-ownership-changes.

Records searched

The following records were searched in compiling this report: the Map of Public Sewers, the Map of Waterworks, water and sewerage records, the Register of Properties subject to Internal Foul Flooding, the Register of Properties subject to Poor Water Pressure and the Drinking Water Register. Should the property not fall entirely within Southern Water's region, a copy of the records held by the relevant water company was searched.

Competition in the non-household retail market

From April 2017 non-household customers in England can choose their retailer. 'Retail' refers to the way in which customers are billed for their water and sewerage as well as customer services including meter reading.

The 'wholesale' part of the water industry was not opened for competition in April 2017. This means Southern Water continues to look after the pipes and infrastructure for all its customers across Kent, Sussex, Hampshire and the Isle of Wight.

Moving

There can be a lot to do and remember when you're moving. Whether you are moving within our area, moving into our area or moving out of the area please let your retailer know.

Your order summary

	Maps	
1.1	Where relevant, please include a copy of an extract from the public sewer map.	Map provided
1.2	Where relevant, please include a copy of an extract from the map of waterworks	Map provided
	Drainage	
2.1	Does foul water from the property drain to a public sewer?	No
2.2	Does surface water from the property drain to a public sewer?	No
2.3	Is a surface water drainage charge payable?	No
2.4	Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundaries of the property?	No
2.4.1	Does the public sewer map indicate any public pumping station or any other ancillary apparatus within the boundaries of the property?	No
2.5	Does the public sewer map indicate any public sewer within 30.48 metres (100 feet) of any buildings within the property?	No
2.5.1	Does the public sewer map indicate any public pumping station or any other ancillary apparatus within 50 metres of any buildings within the property?	No
2.6	Are any sewers or lateral drains serving, or which are proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?	No
2.7	Has any sewerage undertaker approved or been consulted about any plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain?	No
2.8	Is the building which is or forms part of the property at risk of internal flooding due to overloaded public sewers?	No
2.9	Please state the distance from the property to the nearest boundary of the nearest sewage treatment works.	See answer
	Water	
3.1	Is the property connected to mains water supply?	No
3.2	Are there any water mains, resource mains or discharge pipes within the boundaries of the property?	No
3.3	Is any water main or service pipe serving, or which is proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?	No
3.4	Is the property at risk of receiving low water pressure or flow?	No
3.5	What is the classification of the water supply for the property?	See answer
3.6	Is there a meter installed at this property?	No
3.7	Please include details of the location of any water meter serving the property.	See answer
	Charging	
4.1.1	Who is responsible for providing the sewerage services for the property?	Southern Water
4.1.2	Who is responsible for providing the water services for the property?	Southern Water
4.2	Who bills the property for sewerage services?	See answer
4.3	Who bills the property for water services?	See answer

Your order summary continued

	Other Information	
5.1	Is there a consent on this property to discharge trade effluent under Section 118 of the Water Industry Act (1991) into the public sewerage system?	No
	Supplementary questions	
6.1	Is there a wayleave / easement agreement giving the Water and/or Sewerage Undertaker the right to lay or maintain assets or right of access to pass through private land in order to reach the Company's assets?	Information unavailable
6.2	On the copy extract from the public sewer map, please show manhole covers, depth and invert levels where information is available.	Map provided

Maps

Public sewer map

Q. 1.1: Where relevant, please include a copy of an extract from the public sewer map.

A.: A copy of an extract from the public sewer map is provided.

Guidance Notes:

The Water Industry Act 1991 defines public sewers as those which the Company has responsibility for. Other assets and rivers, watercourses, ponds, culverts or highway drains may be shown for information purpose only.

Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an “as constructed” record. It is recommended these details be checked with the developer.

Map of waterworks

Q. 1.2: Where relevant, please include a copy of an extract from the map of waterworks.

A.: A copy of an extract of the map of waterworks is provided.

Guidance Notes:

Assets other than vested water mains may be shown on the plan for information only.

The Company is not responsible for private supply pipes connecting the property to the public water main and does not hold details of these. These may pass through land outside of the control of the seller, or may be shared with adjacent properties. The buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.

If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Drainage

Foul water

Q. 2.1: Does foul water from the property drain to a public sewer?

A.: The Company's records indicate that foul water from the property does not drain to the public sewerage system.

Guidance Notes:

The Company is not responsible for private drains and sewers that connect the property to the public sewerage system and does not hold details of these.

The property owner will normally have sole responsibility for private drains serving the property and may have shared responsibility, with other users, if the property is served by a private sewer which also serves other properties. These may pass through land outside of the control of the seller and the buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.

The copy extract will show known public sewers in the vicinity of the property. It should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system.

If foul water does not drain to the public sewerage system the property may have private facilities in the form of a cesspit, septic tank or other type of treatment plant.

Surface water

Q. 2.2: Does surface water from the property drain to a public sewer?

A.: The Company's records indicate that surface water from the property does not drain to the public sewerage system. If the property was constructed after 6 April 2015 the surface water drainage may be served by a Sustainable Drainage System. Further information may be available from the developer.

Guidance Notes:

The Company is not responsible for private drains and sewers that connect the property to the public sewerage system and does not hold details of these.

The property owner will normally have sole responsibility for private drains serving the property and may have shared responsibility, with other users, if the property is served by a private sewer which also serves other properties. These may pass through land outside of the control of the seller and the buyer may wish to investigate whether separate rights or easements are needed for their inspection, repair or renewal.

The copy extract will show known public sewers in the vicinity of the property. It should be possible to estimate the likely length and route of any private drains and/or sewers connecting the property to the public sewerage system.

In some cases company records do not distinguish between foul and surface water connections to the public sewerage system. If on inspection the buyer finds that the property is not connected for surface water drainage, the property may be eligible for a rebate of the surface water drainage charge. Details can be obtained from the Company.

If surface water does not drain to the public sewerage system the property may have private facilities in the form of a soakaway or private connection to a watercourse.

Surface water drainage charge

Q. 2.3: Is a surface water drainage charge payable?

A.: Records confirm that a surface water drainage charge is not applicable at this property. If the property was constructed after 6 April 2015 the surface water drainage may be served by a Sustainable Drainage System. Further information may be available from the developer.

Guidance Notes:

Where surface water from a property does not drain to the public sewerage system no surface water drainage charges are applicable.

If on inspection the buyer finds that the property is not connected for surface water drainage, the buyer should contact their retailer.

Public sewers within the boundary of the property

Q. 2.4: Does the public sewer map indicate any public sewer, disposal main or lateral drain within the boundaries of the property?

A.: The public sewer map indicates that there are no public sewers, disposal mains or lateral drains within the boundaries of the property. However, from 1 October 2011 there may be additional public sewers, disposal mains or lateral drains which are not recorded on the public sewer map but which may further prevent or restrict development of the property. It is therefore recommended that investigations are made into the drainage arrangements of the property as the owner may be liable for repairs to the drainage system.

Guidance Notes:

The approximate boundary of the property has been determined by reference to the Ordnance Survey record or the map supplied.

The presence of a public sewer within the boundary of the property may restrict further development within it.

Southern Water Services has a statutory right of access to carry out work on their assets, subject to notice. This may result in employees of Southern Water Services or its contractors needing to enter the property to carry out work.

Please note if the property was constructed after 1 July 2011 any sewers and/or lateral drain within the boundary of the property are the responsibility of the householder.

Public pumping station within the boundary of the property

Q. 2.4.1: Does the public sewer map indicate any public pumping station or any other ancillary apparatus within the boundaries of the property?

A.: The public sewer map included indicates that there is no public pumping station within the boundaries of the property. Any other ancillary apparatus is shown on the public sewer map and referenced on the legend.

Guidance Notes:

The approximate boundary of the property has been determined by reference to the Ordnance Survey record or the map supplied.

The presence of a pumping station within the boundary of the property may restrict further development within it.

Southern Water Services has a statutory right of access to carry out work on their assets, subject to notice. This may result in employees of Southern Water Services or its contractors needing to enter the property to carry out work.

It should be noted that only private pumping stations installed before 1 July 2011 will be transferred into the ownership of Southern Water Services.

Public sewers near to the property

Q. 2.5: Does the public sewer map indicate any public sewer within 30.48 metres (100 feet) of any buildings within the property?

A.: The public sewer map indicates that there are no public sewers within 30.48 metres (100 feet) of a building within the property.

Guidance Notes:

From 1 October 2011 there may be additional lateral drains and/or public sewers which are not recorded on the public sewer map but are also within 30.48 metres (100 feet) of a building within the property.

The presence of a public sewer within 30.48 metres (100 feet) of a building within the property can result in the local authority requiring a property to be connected to the public sewer.

The measure is estimated from the Ordnance Survey record, between a building within the boundary of the property and the nearest public sewer.

Public pumping station near to the property

Q. 2.5.1: Does the public sewer map indicate any public pumping station or any other ancillary apparatus within 50 metres of any buildings within the property?

A.: The public sewer map included indicates that there is no public pumping station within 50 metres of any buildings within the property. Any other ancillary apparatus is shown on the public sewer map and referenced on the legend.

Guidance Notes:

The measure is estimated from the Ordnance Survey record, between a building within the boundary of the property and the nearest pumping station.

It should be noted that only private pumping stations installed before 1 July 2011 will be transferred into the ownership of Southern Water Services.

Public adoption of sewers and lateral drains

Q. 2.6: Are any sewers or lateral drains serving, or which are proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?

A.: Records indicate that the sewers serving the development, of which this property forms part, are not the subject of an application for adoption under Section 104 of the Water Industry Act 1991. Where the property is part of an established development it would not normally be subject to an adoption agreement under Section 104 of the Water Industry Act 1991.

Guidance Notes:

This enquiry is of interest to purchasers of new homes who will want to know whether or not the property will be linked to a public sewer.

Where the property is part of a very recent or ongoing development and the sewers are not the subject of an adoption application, buyers should consult with the developer to ascertain the extent of private drains and sewers for which they will hold maintenance and renewal liabilities.

Final adoption is subject to the developer complying with the terms of the adoption agreement under Section 104 of the Water Industry Act 1991.

Any sewers and/or lateral drains within the boundary of the property are not the subject of an adoption agreement and remain the responsibility of the householder. Adoptable sewers are normally those situated in the public highway.

Building over a public sewer, disposal main or drain

Q. 2.7: Has the sewerage undertaker approved or been consulted about any plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain?

A.: There are no records in relation to any approval or consultation about any plans to erect a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain. However, the sewerage undertaker might not be aware of a building or extension on the property over or in the vicinity of a public sewer, disposal main or drain.

Guidance Notes:

Buildings or extensions erected over a sewer in contravention of Building Control may have to be removed or altered.

From 1 October 2011 private sewers, disposal mains and lateral drains were transferred into public ownership and the sewerage undertaker may not have approved or been consulted about any plans to erect a building or extension on the property or in the vicinity of these.

Risk of flooding due to overloading public sewers

Q. 2.8: Is the building which is or forms part of the property at risk of internal flooding due to overloaded public sewers?

A.: The building is not recorded as being at risk of internal flooding due to overloaded public sewers. From 1 October 2011 private sewers, disposal mains and lateral drains were transferred into public ownership. It is therefore possible that a building may be at risk of internal flooding due to an overloaded public sewer which the sewerage undertaker is not aware of. For further information it is recommended that enquiries are made of the vendor.

Guidance Notes:

A sewer is “overloaded” when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.

“Internal flooding” from the public sewers is defined as flooding, which enters a building or passes below a suspended floor.

For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.

“At Risk” properties are defined as properties that have suffered or are likely to suffer internal flooding from the public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the sewerage undertaker’s reporting procedure.

Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included.

Buildings may be at risk of flooding but not identified where flooding incidents have not been reported to the sewerage undertaker.

Public sewers are defined as those for which the sewerage undertaker holds statutory responsibility under the Water Industry Act 1991.

It should be noted that flooding can occur from private sewers and drains which are not the respons bility of the sewerage undertaker. This report excludes flooding from the private sewers and drains and the sewerage undertaker makes no comment upon this matter.

Sewage treatment works

Q. 2.9: Please state the distance from the property to the nearest boundary of the nearest sewage treatment works.

A.: The nearest sewage treatment works is 0.74 kilometres South of the property. The name of the sewage treatment works is BARNS GREEN WTW, which is the responsibility of Southern Water Services, Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX.

Guidance Notes:

The nearest sewage treatment works will not always be the sewage treatment works serving the catchment within which the property is situated.

The sewerage undertaker's records were inspected to determine the nearest sewage treatment works.

It should be noted that there may be a private sewage treatment works closer than the one detailed above that have not been identified.

Water

Connection to mains water supply

Q. 3.1: Is the property connected to mains water supply?

A.: Records indicate that the property is not connected to mains water supply and water is therefore likely to be provided by virtue of a private supply.

Guidance Notes:

The situation should be checked with the current owner of the property.

Details of private supplies are not kept by the water undertaker.

Water mains, resource mains or discharge pipes

Q. 3.2: Are there any water mains, resource mains or discharge pipes within the boundaries of the property?

A.: The map of waterworks does not indicate any water mains, resource mains or discharge pipes within the boundaries of the property.

Guidance Notes:

The boundary of the property has been determined by reference to the Ordnance Survey record or the map supplied.

The presence of a public water main within the boundary of the property may restrict further development within it.

Water undertakers have a statutory right of access to carry out work on their assets, subject to notice. This may result in employees of the water undertaker or its contractors needing to enter the property to carry out work.

Adoption of water mains and services pipes

Q. 3.3: Is any water main or service pipe serving, or which is proposed to serve the property, the subject of an existing adoption agreement or an application for such an agreement?

A.: Records confirm that water mains or service pipes serving the property are not the subject of an existing adoption agreement or an application for such an agreement.

Guidance Notes:

This enquiry is of interest to purchasers of new homes who will want to know whether or not the property will be linked to the mains water supply.

Risk of low water pressure or flow

Q. 3.4: Is the property at risk of receiving low water pressure or flow?

A.: Records confirm that the property is not recorded by the water undertaker as being at risk of receiving low water pressure or flow.

Guidance Notes:

“Low water pressure” means water pressure below the regulatory reference level which is the minimum pressure when demand on the system is not abnormal.

The reference level of service is a flow of 9 litres/minute at a pressure of 10 metres head on the customer’s side of the main stop tap (mst). The reference level of service must be applied on the customer’s side of a meter or any other company fittings that are on the customer’s side of the main stop tap.

The reference level applies to a single property. Where more than one property is served by a common service pipe, the flow assumed in the reference level must be appropriately increased to take account of the total number of properties served.

For two properties, a flow of 18 litres/minute at a pressure of 10 metres head on the customers side of the mst is appropriate. For three or more properties the appropriate flow should be calculated from the standard loadings provided in BS6700 or Institute of Plumbing handbook.

Water companies include properties receiving pressure below the reference level, provided that allowable exclusions do not apply (i.e. events which can cause pressure to temporarily fall below the reference level). Refer to list below:

Abnormal demand: This exclusion is intended to cover abnormal peaks in demand and not the daily, weekly or monthly peaks in demand which are normally expected. Companies exclude properties which are affected by low pressure only on those days with the highest peak demands. During the year companies may exclude, for each property, up to five days of low pressure caused by peak demand.

Planned maintenance: Companies exclude low pressures caused by planned maintenance. It is not intended that companies identify the number of properties affected in each instance. However, companies must maintain sufficiently accurate records to verify that low pressure incidents that are excluded because of planned maintenance are actually caused by maintenance.

One-off incidents: This exclusion covers a number of causes of low pressure; mains bursts; failures of company equipment (such as PRVs or booster pumps); firefighting; and action by a third party. However, if problems of this type affect a property frequently, they cannot be classed as one-off events and further investigation will be required before they can be excluded.

Low pressure incidents of short duration: Properties affected by low pressures which only occur for a short period, and for which there is evidence that incidents of a longer duration would not occur during the course of the year, may be excluded.

Water hardness

Q. 3.5: What is the classification of the water supply for the property?

A.: The water supplied to the property has an average water hardness of 161 mg/l calcium carbonate which is defined as "Hard" by Southern Water.

Guidance Notes:

The hardness of water depends on the amount of calcium in it – the more it contains, the harder the water is.

There is no UK or European standard set for the hardness of drinking water. More information on water hardness can be found on the Drinking Water Inspectorates' website: http://www.dwi.gov.uk/

Water hardness can be expressed in various indices for example the hardness settings for dishwashers are commonly expressed in Clark's degrees, but check with the manufacturer as there are also other units. The following table explains how to convert mg/l calcium and mg/l calcium carbonate classifications.

To convert from:	to Clark degrees	to French degrees	to German degrees
mg/l calcium	multiply by 0.18	multiply by 0.25	multiply by 0.14
mg/l calcium carbonate	multiply by 0.07	multiply by 0.10	multiply by 0.056

Water meters

Q. 3.6: Is there a meter installed at this property?

A.: According to our records there is no meter installed at the property.

Guidance notes:

From April 2017 non-household customers in England can choose their retailer.

'Retail' refers to the way in which customers are billed for their water and sewerage as well as customer services including water meter reading.

Where the property is not served by a water meter and the customer wishes to consider this method of charging they should contact their water retailer.

Water meter location

Q. 3.7: Please include details of the location of any water meter serving the property.

A.: Records indicate that the property is not served by a water meter.

Additional meter information

No further information.

Guidance Notes:

From April 2017 non-household customers in England can choose their retailer.

'Retail' refers to the way in which customers are billed for their water and sewerage as well as customer services including water meter reading.

Where the property is not served by a water meter and the customer wishes to consider this method of charging they should contact their water retailer.

Charging

Sewerage undertakers

Q. 4.1.1: Who is responsible for providing the sewerage services for the property?

A.: Southern Water is responsible for providing the sewerage services for the property.

Guidance Notes:

The ‘wholesale’ part of the water industry did not open for competition in April 2017. This means that Southern Water continues to operate the network of pipes, mains and treatment works.

As a wholesaler, Southern Water sells sewerage services to the companies who enter the retail market. In some instances, wholesalers will still need to interact directly with customers. For example, customers will still contact Southern Water to report internal sewer flooding.

Water undertakers

Q. 4.1.2: Who is responsible for providing the water services for the property?

A.: Southern Water is responsible for providing the water services for the property.

Guidance Notes:

The ‘wholesale’ part of the water industry did not open for competition in April 2017. This means that water undertakers continue to operate the network of pipes, mains and treatment works.

As a wholesaler, water undertakers sell water services to the companies who enter the retail market. In some instances, wholesalers will still need to interact directly with customers. For example, customers will still contact water undertakers to report leaks.

Sewerage bills

Q. 4.2: Who bills the property for sewerage services?

A.: If you wish to know who bills the sewerage services for this property then you will need to contact the current owner. For a list of all potential retailers of sewerage services for the property please visit www.open-water.org.uk.

Guidance Notes:

From April 2017 non-household customers in England can choose their retailer.

'Retail' refers to the way in which customers are billed for their water and sewerage as well as customer services including meter reading.

Water bills

Q. 4.3: Who bills the property for water services?

A.: If you wish to know who bills the water services for this property then you will need to contact the current owner. For a list of all potential retailers of water services for the property please visit www.open-water.org.uk.

Guidance Notes:

From April 2017 non-household customers in England can choose their retailer.

'Retail' refers to the way in which customers are billed for their water and sewerage as well as customer services including meter reading.

Other information

Trade effluent consents

Q. 5.1: Is there a consent on this property to discharge trade effluent under Section 118 of the Water Industry Act (1991) into the public sewerage system?

A.: The trader operating at this commercial property does not hold either a Trade Effluent Consent, or an acknowledgement of a trade effluent discharge, as issued by Southern Water.

Guidance Notes:

Please note, any existing consent is dependent on the business being carried out at the property and will not transfer automatically upon change of ownership.

Any change of ownership from the current incumbent of a property will require the negotiation of a new trade effluent consent or a new acknowledgement between the new incumbent and Southern Water.

Supplementary questions

Wayleaves and easements

Q. 6.1: Is there a wayleave / easement agreement giving the Water and/or Sewerage Undertaker the right to lay or maintain assets or right of access to pass through private land in order to reach the Company's assets?

A.: Records relating to wayleaves / easements are not available for inclusion in this report.

Guidance notes:

This question relates only to private agreements between Southern Water acting in a private capacity and a landowner. Such contracts may often be part of a conveyance or land transfer, or a deed of grant of easement.

If there is no formal easement, then a sewer or water main may have been constructed following the service of notice under the provisions of the Public Health Act 1936, Water Act 1945, Water Act 1989 or Water Industry Act 1991 as applicable. The Company does not hold copies of these notices. However, in the absence of evidence to the contrary there is a legal presumption that all matters were properly dealt with. All rights and obligations relating to sewers and water mains are now covered by the Water Industry Act 1991.

Where rights exist at the boundary of the property, but we are not sure of the exact correlation, we will answer “Yes” to this question.

A documentary right can exist even if the physical asset itself has not yet been laid, or has been moved, or removed. Likewise the position of the right and of the asset may differ. You may also find that an asset is protected both with contractual rights and statutory rights. Please consult your solicitor as to why this may happen, and its effects.

We refer to “defined” assets for the following reasons: Often a contract may give Southern Water an express right to install and maintain assets within an area but without stating the exact position or route of such assets. Also, the law may imply rights where none have been mentioned specifically in a related contract, such as a conveyance. Finally, rights may come into being through long use. In any of these cases the rights are undefined, and although Southern Water may need to rely on them from time to time, as we cannot map the rights accurately, we will answer “No” to this question.

Information obtainable from physical inspection (including Trial Bore Holes) overrides information contained in the report.

Any error in answering this question is not to be regarded as a waiver of Southern Water’s rights or title, or an agreement or representation that Southern Water is prepared to vary or discharge any of its rights or title.

Manholes

Q. 6.2: On the copy extract from the public sewer map, please show manhole covers, depth and invert levels where information is available.

A.: A copy of an extract from the public sewer map is included which shows manhole cover, depth and invert levels where the information is available.

Guidance Notes:

The Water Industry Act 1991 defines public sewers as those which the Company has responsibility for. Other assets and rivers, watercourses, ponds, culverts or highway drains may be shown for information purpose only.

Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an “as constructed” record. It is recommended these details be checked with the developer.

The Company is not responsible for private drains and sewers that connect the property to the public sewerage system and does not hold details of these.

The copy extract will show known public sewers in the vicinity of the property.

DISCLAIMER: These replies and information, including that shown on the enclosed plan(s), are given on the distinct understanding that neither the Company nor any of its representatives is legally liable for its accuracy or for any action or omission to act whatsoever by anyone on the strength of that information, save as to obvious error. In particular, any person proposing to construct or excavate on land on the basis of information hereby provided should carry out all necessary on-site investigations.

Appendix one: Terms and expressions

"the 1991 Act" means the Water Industry Act 1991**(i)**;
"the 2000 Regulations" means the Water Supply (Water Quality) Regulations 2000**(ii)**;
“the 2001 Regulations" means the Water Supply (Water Quality) Regulations 2001**(iii)**;
"adoption agreement" means an agreement made or to be made under Section 51A(1) or 104(1) of the 1991 Act**(iv)**;
"bond" means a surety granted by a developer who is a party to an adoption agreement;
"bond waiver" means an agreement with a developer for the provision of a form of financial security as a substitute for a bond;
"calendar year" means the twelve months ending with 31 December;
"discharge pipe" means a pipe from which discharges are made or are to be made under Section 165(1) of the 1991 Act;
"disposal main" means (subject to Section 219(2) of the 1991 Act) any outfall pipe or other pipe which:
(a) is a pipe for the conveyance of effluent to or from any sewage disposal works, whether of a sewerage undertaker or of any other person; and
(b) is not a public sewer;
"drain" means (subject to Section 219(2) of the 1991 Act) a drain used for the drainage of one building or any buildings or yards appurtenant to buildings within the same curtilage;
"effluent" means any liquid, including particles of matter and other substances in suspension in the liquid;
"financial year" means the twelve months ending with 31 March;
"lateral drain" means:
(a) that part of a drain which runs from the curtilage of a building (or buildings or yards within the same curtilage) to the sewer with which the drain communicates or is to communicate; or
(b) (if different and the context so requires) the part of a drain identified in a declaration of vesting made under Section 102 of the 1991 Act or in an agreement made under Section 104 of that Act**(v)**;
"licensed water supplier" means a company which is the holder for the time being of a water supply licence under Section 17A(1) of the 1991 Act**(vi)**;
"maintenance period" means the period so specified in an adoption agreement as a period of time:
(a) from the date of issue of a certificate by a sewerage undertaker to the effect that a developer has built (or substantially built) a private sewer or lateral drain to that undertaker's satisfaction; and
(b) until the date that private sewer or lateral drain is vested in the sewerage undertaker;
"map of waterworks" means the map made available under section 198(3) of the 1991 Act**(vii)** in relation to the information specified in subsection (1A);
"private sewer" means a pipe or pipes which drain foul or surface water, or both, from premises, and are not vested in a sewerage undertaker;
"public sewer" means, subject to Section 106(1A) of the 1991 Act**(viii)**, a sewer for the time being vested in a sewerage undertaker in its capacity as such, whether vested in that undertaker:
(a) by virtue of a scheme under Schedule 2 to the Water Act 1989**(ix)**;
(b) by virtue of a scheme under Schedule 2 to the 1991 Act**(x)**;
(c) under Section 179 of the 1991 Act**(xi)**; or
(d) otherwise;
"public sewer map" means the map made available under Section 199(5) of the 1991 Act**(xii)**;
"resource main" means (subject to Section 219(2) of the 1991 Act) any pipe, not being a trunk main, which is or is to be used for the purpose of:
(a) conveying water from one source of supply to another, from a source of supply to a regulating reservoir or from a regulating reservoir to a source of supply; or
(b) giving or taking a supply of water in bulk;
"sewerage services" includes the collection and disposal of foul and surface water and any other services which are required to be provided by a sewerage undertaker for the purpose of carrying out its functions;
"sewerage undertaker" means the company appointed to be the sewerage undertaker under Section 6(1) of the 1991 Act for the area in which the property is or will be situated;
"surface water" includes water from roofs and other impermeable surfaces within the curtilage of the property;
"water main" means (subject to Section 219(2) of the 1991 Act) any pipe, not being a pipe for the time being vested in a person other than the water undertaker, which is used or to be used by a water undertaker or licensed water supplier for the purpose of making a general supply of water available to customers or potential customers of the undertaker or supplier, as distinct from for the purpose of providing a supply to particular customers;
"water meter" means any apparatus for measuring or showing the volume of water supplied to, or of effluent discharged from any premises;
"water supplier" means the company supplying water in the water supply zone, whether a water undertaker or licensed water supplier;
"water supply zone" means the names and areas designated by a water undertaker within its area of supply that are to be its water supply zones for that year; and
"Water undertaker" means the company appointed to be the water undertaker under Section 6(1) of the 1991 Act for the area in which the property is or will be situated.

In this report, references to a pipe, including references to a main, a drain or a sewer, shall include references to a tunnel or conduit which serves or is to serve as the pipe in question and to any accessories for the pipe.

(i) 1991 c.56.
(ii) S.I. 2000/3184. These Regulations apply in relation to England.
(iii) S.I. 2001/3911. These Regulations apply in relation to Wales.
(iv) Section 51A was inserted by Section 92(2) of the Water Act 2003 (c. 37). Section 104(1) was amended by Section 96(4) of that Act.
(v) Various amendments have been made to Sections 102 and 104 by section 96 of the Water Act 2003.
(vi) Inserted by Section 56 of and Schedule 4 to the Water Act 2003.
(vii) Subsection (1A) was inserted by Section 92(5) of the Water Act 2003.
(viii) Section 106(1A) was inserted by Section 99 of the Water Act 2003.
(ix) 1989 c.15.
(x) To which there are various amendments made by Section 101(1) of and Schedule 8 to the Water Act 2003.
(xi) To which there are various amendments made by Section 101(1) of and Schedule 8 to the Water Act 2003.
(xii) Section 199 was amended by Section 97(1) and (8) of the Water Act 2003.

Appendix two: A guide to new development

The information contained below is for general guidance only. It is recommended that Southern Water's Developer Services department be contacted for further details concerning new infrastructure development.

Wastewater information

Sewer requisitions

It may be necessary for a developer to request that Southern Water provides a public sewer to connect a development site to the existing public system. The developer is responsible for the cost of the work, although a discount will be applied based on the future predicted income from the development served by the new sewer.

Sewer diversions

If a public sewer crosses private land, it may be possible for the landowner/developer to request the sewer be diverted. In the majority of cases Southern Water will allow the developer to undertake this work under close supervision. Whether Southern Water or the developer undertakes the diversionary works the costs are the responsibility of the developer.

Building-over sewers

Public sewers are afforded statutory protection and consequently there is no right to build over or in close proximity to a public sewer. If an existing public sewer either crosses a development site or is located in close proximity to a development site it is essential that a developer contact Southern Water.

Sewer connections

A developer can serve notice on Southern Water that it wishes to make a connection to the public sewerage system. The developer must provide 21 days' notice and the work will be supervised by Southern Water.

Water information

Water requisitions

It may be necessary for a developer to request that Southern Water provides both:

(a) A public water main to connect a development site to the existing public system and,
(b) On-site public water mains to serve the individual properties.

In both cases the developer is responsible for the cost of the work, although a discount will be applied based on the future predicted income from the development.

It is possible for the developer to lay the on-site mains themselves under a Self-Lay Agreement. Further details are available from Southern Water.

Water main diversions

The building over or in close proximity to public water mains is not permitted. A developer must request that Southern Water undertakes a diversion of a water main that is affected by a development.

Water connections

A developer can request a new connection to a public water main. This work will be undertaken by Southern Water.

Contact us

For specific information on Southern Water's Developer Services service, including details on how to contact the right person, please visit our website: www.southernwater.co.uk/developers-and-builders-overview.

Appendix three: CON29DW Commercial Terms and Conditions

1 Introduction

1.1 These Terms set out the terms which will apply in respect of any Orders You place with us for a
(i) Report (as defined in clause 2.1 below) and/or (ii).

1.2 These Terms may need to be amended from time to time and have a publication date which will be updated when any changes are made. Every time You wish to place an Order, please check these Terms to ensure You understand the terms which apply at that time, as they may have changed since any earlier order You may have placed.

1.3 If You do not accept these Terms You must not place any Orders with us.

1.4 If You are trading as a business, it is also Your responsibility to ensure that prior to placing an Order on behalf of a Client, that You make Your Client aware of the Terms, and that they accept them.

2 Interpretations & Definitions

2.1 In addition to any defined terms, the following words shall have the following meanings:

a. "Commercial Property" means the address(es) or location(s) of a commercial property provided by You when You place an Order.
b. "Report" means the report known as the "Commercial CON29DW" prepared by us providing drainage and water information in relation to a Commercial Property.
c. "Client" means the person, company or body (including where required, their mortgage lender) for whom You have agreed to supply one or more Reports in the normal course of Your business.
d. "Map" means any Ordnance Survey map (and any data contained therein) provided as part of the Services.
e. "Order" means any request for a Report made by You to us.
f. "Terms" means these terms and conditions for Commercial CON29DW enquiries and General Terms means any general commercial terms in effect between the parties.
g. 'You' and ''Your' means the person, firm or company requesting the provision of property-related and company search information and reports from us.
h. 'We', 'Our' and 'Us' means Southern Water Services Limited, being a company registered in England and Wales with company number 2366670, and whose registered office address is at Southern Water Services LTD, Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX, and whose principle place of trading is at Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX**.**
i. 'Website' means https://www.southernwater.co.uk/
j. 'Services' means the provision of a Report.

3 Placing Orders and our Agreement

3.1 Your Order constitutes an offer by You to purchase Report(s) from us.

3.2 When You place an Order, You will receive an e-mail from us acknowledging that we have received Your Order but this does not mean we have accepted Your Order.

3.3 We may choose not to accept Your Order, but on the rare occasion that this may occur, we will aim to notify You within 24 hours. For the avoidance of doubt, no contract will exist between Us until we have expressly accepted Your Order.

4 Cancellation rights As a consumer

4.1 Where You are an individual consumer (and not acting for purposes wholly or mainly relating to Your trade, business, craft or profession), You have specific legal rights relating to cancellation of any Order You may place. You may cancel Your Order at any time within 14 days after the day on which the contract is entered into ("Cancellation Period")

4.2 To exercise the right to cancel, You must tell us of Your decision to cancel this contract by a clear statement.

4.3 Where You are ordering a Report as a consumer, due to Your cancellation rights, we will not process Your Order or provide the Report to You before the end of the Cancellation Period unless You provide Your express consent and You acknowledge that You will lose the right to cancel the contract under regulation 29(1) of the Consumer Contracts (Information, Cancellation, and Additional Charges) Regulation 2013.

4.4 In addition to these rights, where we are able to, we will cancel any Order in accordance with our cancellation policy, which can be found on our Website.

As a Business

4.5 The Cancellation Period does not apply to Your Order if You are placing the Order wholly or mainly for purposes relating to Your trade, business, craft or profession.

4.6 If You cancel Your Order other than in accordance with this clause You may be liable for fees as detailed in our cancellation policy at: Drainage and water searches (southernwater.co.uk)

5 The Report

5.1 We will prepare the Report using the Commercial Property details You provide at the time You place Your Order. The Report You receive will rely on the accuracy, completeness, and legibility of the address and/or plans You supply with Your Order.

5.2 The Report is produced only for use in relation to Commercial Properties, development or land which require the provision of drainage and water information and cannot be used for residential properties, development of land or any property to be developed as a single, residential, domestic property. Where You require a report for a residential property, You can order a different report from us, and different terms shall apply.

5.3 The Report provides information as to the indicative location and connection status of existing services and other information relating to drainage and water enquiries and should not be relied on for any other purpose (including the potential and/or suitability for any other connections to be made to existing services).

5.4 As You may expect, the information contained in the Report can change on a regular basis so we cannot be responsible to You or if You are trading as a business to Your Client for any change in the information contained in the Report after the date on which the Report was produced (as shown in the Report).

5.5 The Report does not give details about the actual state or condition of the Commercial Property nor should it be used or taken to indicate or exclude actual suitability or unsuitability of the Commercial Property for any particular purpose, or be relied upon for determining saleability or value, or used as a substitute for any physical investigation or inspection. Further advice and information from appropriate experts and professionals should always be obtained.

5.6 We will send the Report to the address You have provided in Your Order, including email address for online Orders.

5.7 You agree only to use the Report for the purpose for which it is supplied in accordance with these Terms.

5.8 Where we accept Your Order:

- a we will provide the Services with reasonable skill and care; and
- b Your Order will be fulfilled within a reasonable period.

5.9 In providing the Report, we will comply with all laws and regulations which apply to the provision of the Report including ensuring that we have all the necessary licences and permissions, including intellectual property rights to provide the Report.

5.10 It is Your responsibility to ensure that Your Order, and the Report meet Your requirements if You are trading as a business the requirements of Your Client.

5.11 In providing You with this Report, we will comply with the Drainage & Water Searches Network (DWSN) Standards.

6 Disclaimers with regard to the Reports

6.1 The position and depth of apparatus shown on any maps attached to the Report are approximate, and are furnished as a general guide only, and no warranty as to its correctness is given or implied. The exact positions and depths should be obtained by excavation trial holes and the maps must not be relied on in the event of excavation or other works made in the vicinity of The Company's apparatus. Please be aware of specific disclaimers included in the Maps.

7 Intellectual Property Rights

7.1 The Report You receive is confidential and is intended for (a) Your own internal or personal purposes and/or (b) where You are trading as a business, the personal use of Your Client. The Report shall not be used or copied (in whole or in part) for any other use whatsoever, whether for commercial gain or otherwise.

7.2 We grant You a non-exclusive and non-transferable licence:

- a to make copies of the Reports (except the Map) for Your own internal purposes;
- b to incorporate the Reports (other than the Map) into any written advice You provide in the normal course of Your business; and
- c to disclose the Reports, where You are trading as a business, in the normal course of Your business to:
  - i Your Client; and or
  - ii anyone who is acquiring or considering acquiring an interest in or charge over the property to which the Report relates, and their professional advisers.

7.3 You must not alter any part of the Report including altering, removing or obscuring any logos and/or branding which is contained in a Report.

7.4 All intellectual property rights, including trademarks, domain names and copyright in the Reports are owned by us and/or our licensors.

7.5 Any Maps contained in any Report are protected by Crown Copyright. The Maps must not be used for any purpose other than as part of the Report. Neither You nor anyone You provide the Report to may reproduce the Maps without paying for a separate licence from Ordnance Survey.

7.6 No intellectual or other property rights are transferred or licensed to You or where You are trading as a business to Your Client or any other person except to the extent set out in these terms.

7.7 You agree to compensate us against any losses, costs, claims, damages and/or expenses which we incur and/or suffer as a result of any breach of any intellectual property rights or obligations (set out in any of the Terms) by You, or where You are trading as a business to Your Client or any party to whom You provide a copy of the Report.

8 Additional Intellectual Property Right Provisions

8.1 The enquiries in the Report are protected by copyright by the Law Society of 113 Chancery Lane, London WC2A 1PL and must not be used for any purpose which is not expressly set out in these Terms.

8.2 The answers and information in the Report are protected by copyright by Southern Water Services.

9 Liability

9.1 This paragraph sets out the exclusions to and limitations on our liability to You and if You are trading as a business to Your Client.

9.2 We will not be liable to You (and/or if You are trading as a business to Your Client) in contract, tort, negligence, breach of statutory duty, misrepresentation or otherwise:

a if we do not accept Your Order,

b for any inaccuracies, mistakes or omissions in the Reports unless any such liability arises as a direct consequence of our negligence.

9.3 Notwithstanding the above, nothing affects any party's liability for (a) death or personal injury arising from its negligence, (b) liability for fraud or fraudulent misrepresentation and / or (c) any other liability which cannot be excluded or limited under applicable law.

9.4 In addition to the TPO redress scheme covering consumers, TPO will also provide redress for small businesses (including Charities and Trusts) that meet the following criteria:

- a small business (or group of companies) with an annual turnover of less than £3 million;
- a charity with an annual income of less than £3 million;
- a Trust with a net asset value of less than £3 million

10 Additional Provision relating to our Liability to You for the Report

10.1 Subject to clause 9.3, our total liability to You and/or if You are trading as a business to Your Client, whether for breach of contract, tort, negligence, breach of statutory duty, misrepresentation or otherwise, arising under or in connection with these Terms and/or the provision of a Report limited to £10 million pounds in aggregate.

11 Customer Complaints Procedure

11.1 Southern Water Services offer a robust complaints procedure which can be found on our Website or here**.**
https://www.southernwater.co.uk/media/default/PDFs/CON29DW-complaints-procedure1.pdf

11.2 If Your complaint has gone through our complaints procedure and You are dissatisfied with the response or it has exceeded our response timescales, You may refer Your complaint for consideration under The Property Ombudsman Scheme (TPOs). You can obtain further information by visiting www.tpos.co.uk or email admin@tpos.co.uk

12 General

12.1 These Terms (and any General Terms or other documents referred to herein) are the only terms and conditions that shall apply to any Order and the provision of a Report by us to You and shall constitute the entire agreement between You and us and supersede, replace, and extinguish any previous arrangement, understanding or agreement between us relating to such Report.

12.2 Any dispute or claim arising out of or in connection with these terms and or their subject matter or formation (including non-contractual disputes or claims) shall be governed by the laws of England and Wales. Any dispute (including any non-contractual disputes or claims) shall be subject to the exclusive jurisdiction of the courts of England and Wales.

12.3 If there is any conflict or inconsistency between the provisions of these Terms and any other General Terms, the provisions of these Terms shall prevail.

12.4 In the event of any conflict of inconsistency between any information on the Website describing the features of the Report and these Terms, then these Terms shall prevail.

12.5 Where You are acting wholly or mainly in the normal course of Your trade, business, craft or profession Your Client is entitled to the benefit of these Terms. Save as provided in this clause

12.6 It is not intended that any other person who is not a party to these Terms has any right to enforce any term of these Terms under the Contracts (Rights of Third Parties) Act 1999.

These Terms and conditions are available in larger print for those with impaired vision.

Appendix four: Complaints procedure

When we get it wrong
You deserve the highest standard of service from us, but sometimes we make mistakes. If we do, please let us know and we will investigate and review your concerns.

Whilst we always try to resolve all complaints straight away, if this is not possible and you are not happy with the course of action taken by us, you can ask us to escalate the issue internally or take your complaint to an independent third party.

How you contact us
Firstly please email us at searches@southernwater.co.uk

Write to us at LandSearch, Southern Water Services, Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX.

What you can expect
You will receive a full, fair and courteous response from someone who can effectively deal with your problem.

If we can remedy the problem straight away we will do it but if we cannot immediately resolve your problem we will keep you informed of actions being taken.

The process
We will respond to written complaints within 5 working days of the date received, but we will always aim to respond more quickly. Depending on the scale of investigation required, we will keep you informed of the progress and update you with new timescales if necessary.

If you are still not satisfied with our response or action we will refer the matter to a Senior Manager for resolution. At your request we will liaise with a third party representative acting on your behalf.

Our commitment to you
If we find your complaint to be justified, or we have made any errors that substantially change the outcome in your search result, we will refund the search fee. We will also provide you with a revised search and undertake the necessary action to put things right as soon as practically possible. You will be kept informed of the progress of any action required.

If you remain dissatisfied
While we aim to resolve your complaint first time, in the event that we are unable to resolve the issue to your satisfaction, ultimately you can contact a third party. Please make sure that you have followed the process above first, if not, your complaint will be passed back to us.

If you are not satisfied with our final response, or if we exceed the response timescales, you may refer the complaint to The Property Ombudsman Scheme (TPOS):
The Property Ombudsman scheme, Milford House, 43-55 Milford Street, Salisbury SP1 2BP
Telephone: 01722 333306
Fax: 01722 332296
Website: www.tpos.co.uk
Email: admin@tpos.co.uk



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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

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.

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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



NOTES

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2. THIS DRAWING IS BASED ON ORDNANCE SURVEY MAPPING UNDER LICENCE (c) CROWN COPYRIGHT AND DATABASE RIGHTS 2024, OS AC0000813445.
3. TOPOGRAPHIC SURVEY UNDERTAKEN BY:
4. CULVERTED WATERCOURSE SURVEY UNDERTAKEN BY:
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
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 UPDAED TO INCLUDE ADDITIONAL BRG	TSW	TSW	22.09.25

REVISIONS

TS WOOD CONSULTING
Civil & Environmental Engineer
T: 07362 276031
E: tswwood@tswoodconsulting.co.uk
W: www.tswoodconsulting.co.uk

miller homes

JOB TITLE: BARNS GREEN HORSHAM

DRAWING TITLE: SURFACE WATER AND SUDS DRAINAGE STRATEGY

DATE	DRAWN	CHECKED	ISSUE / VERSION
SEPT 2025	TSW	TSW	
DRAWING NO. 0018.401	REV C	SCALE 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 Wal ingford and available at uksuds.com (https://www.uksuds.com/). The use of this tool is subject to the UK SuDS terms and conditions and icence 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



NOTES

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3. TOPOGRAPHIC SURVEY UNDERTAKEN BY:

Cadmap Ltd
Unit 131 Dunsfold Park
Cranleigh
Surrey, GU6 8TB
T: 01483 429385
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.

KEY

SITE BOUNDARY

IMPERMEABLE SITE AREAS

- ROOF AREA (RWH) 4,480m²
- PERMEABLE PAVING 1,431m²
- BIO-RETENTION (RAIN GARDEN) 472m²
- PRIVATE DRIVES/HARDSTANDING 2,454m²
- MAIN ACCESS ROADS 2,239m²
- SUDS BASIN 1,082m²

TOTAL IMPERMEABLE AREA = 13,840m² (1.384ha)

0m 25m
SCALE 1:500

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miller homes

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	–	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		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.042	5.00	38.362	1200	512424.433	127107.557	1.425
2	0.003	5.00	37.486	1200	512413.935	127085.300	1.425
20	0.012	5.00	37.054	1200	512403.273	127058.870	1.425
3	0.030	5.00	36.986	1200	512423.359	127073.013	1.678
4	0.076	5.00	35.993	1200	512440.549	127050.601	1.500
30	0.044	5.00	38.583	1200	512457.157	127118.224	1.425
31	0.012	5.00	37.704	1200	512470.277	127101.116	1.425
32	0.040	5.00	36.887	1200	512483.600	127093.202	1.500
33	0.000	5.00	36.031	1200	512499.696	127076.896	1.500
34	0.049	5.00	35.894	1350	512499.253	127070.786	1.650
35	0.113	5.00	35.625	1350	512485.643	127059.710	1.650
5	0.027	5.00	35.008	1350	512453.577	127033.615	1.650
6	0.075	5.00	34.241	1350	512471.455	127010.306	1.650
40	0.097	5.00	36.661	1200	512392.988	127030.409	1.425
41	0.008	5.00	35.428	1200	512373.640	126985.582	1.425
42	0.034	5.00	35.147	1200	512378.473	126976.268	1.500
43	0.119	5.00	34.260	1350	512414.180	126974.175	1.650
44	0.066	5.00	33.877	1350	512446.549	126972.278	1.650
45	0.038	5.00	33.741	1350	512462.056	126972.149	1.650
46	0.031	5.00	33.690	1500	512468.387	126974.065	2.335
7	0.000	5.00	33.502	1500	512488.181	126988.498	2.196
8	0.019	5.00	33.211	1500	512496.934	126977.087	1.934
9	0.047	5.00	33.113	1500	512495.597	126952.278	1.886
HW-Inlet	0.000		33.002		512502.621	126952.011	1.962
50	0.043	5.00	33.052	1200	512546.427	127012.229	1.181
51	0.028	5.00	33.271	1200	512515.637	127005.418	1.531
HW-Outlet	0.000	5.00	32.702		512538.258	126969.456	1.702
Flow-Control	0.108	5.00	32.676	1500	512544.225	126970.085	1.688
13	0.000		32.500		512548.874	126967.850	1.534
Carpark 1	0.088	5.00	35.000		512446.754	127029.086	1.000
Carpark 2	0.135	5.00	33.500		512520.083	127012.117	1.000

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Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	2	24.609	0.600	36.937	36.061	0.876	28.1	225	5.17	57.0
1.001	2	3	15.485	0.600	36.061	35.383	0.678	22.8	225	5.26	56.6
2.000	20	3	24.566	0.600	35.629	35.383	0.246	100.0	225	5.31	56.4
1.002	3	4	28.245	0.600	35.308	34.493	0.815	34.7	300	5.49	55.7
1.003	4	5	21.407	0.600	34.493	33.508	0.985	21.7	300	5.59	55.3
3.000	30	31	21.560	0.600	37.158	36.279	0.879	24.5	225	5.14	57.1
3.001	31	32	15.496	0.600	36.279	35.462	0.817	19.0	225	5.22	56.8
3.002	32	33	22.912	0.600	35.387	34.531	0.856	26.8	300	5.35	56.3
3.003	33	34	6.126	0.600	34.531	34.394	0.137	44.7	300	5.39	56.1
3.004	34	35	17.547	0.600	34.244	33.975	0.269	65.2	450	5.51	55.7
3.005	35	5	41.342	0.600	33.975	33.358	0.617	67.0	450	5.78	54.6
4.000	Carpark 1	5	8.189	0.600	34.000	33.658	0.342	23.9	150	5.07	57.3
1.004	5	6	29.376	0.600	33.358	32.591	0.767	38.3	450	5.93	54.0
1.005	6	7	27.484	0.600	32.591	31.458	1.133	24.3	450	6.04	53.6
5.000	40	41	48.824	0.600	35.236	34.003	1.233	39.6	225	5.39	56.1
5.001	41	42	10.493	0.600	34.003	33.722	0.281	37.3	225	5.47	55.8
5.002	42	43	35.768	0.600	33.647	32.760	0.887	40.3	300	5.71	54.9
5.003	43	44	32.425	0.600	32.610	32.227	0.383	84.7	450	5.96	53.9
5.004	44	45	15.508	0.600	32.227	32.091	0.136	114.0	450	6.09	53.4
5.005	45	46	6.615	0.600	32.091	32.040	0.051	129.7	450	6.15	53.2
5.006	46	7	24.497	0.600	31.355	31.306	0.049	500.0	600	6.53	51.9
6.000	50	51	31.534	0.600	31.871	31.740	0.131	240.0	300	5.52	55.6
7.000	Carpark 2	51	8.040	0.600	32.500	32.000	0.500	16.1	150	5.05	57.4
6.001	51	7	32.251	0.600	31.740	31.606	0.134	240.7	300	6.05	53.6

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	2.478	98.5	8.6	1.200	1.200	0.042	0.0	44	1.530
1.001	2.749	109.3	9.2	1.200	1.378	0.045	0.0	44	1.678
2.000	1.307	52.0	2.4	1.200	1.378	0.012	0.0	33	0.672
1.002	2.679	189.4	17.5	1.378	1.200	0.087	0.0	61	1.695
1.003	3.387	239.4	32.6	1.200	1.200	0.163	0.0	74	2.390
3.000	2.652	105.5	9.1	1.200	1.200	0.044	0.0	44	1.638
3.001	3.018	120.0	11.5	1.200	1.200	0.056	0.0	47	1.929
3.002	3.050	215.6	19.5	1.200	1.200	0.096	0.0	61	1.920
3.003	2.357	166.6	19.5	1.200	1.200	0.096	0.0	69	1.595
3.004	2.520	400.8	29.2	1.200	1.200	0.145	0.0	81	1.494
3.005	2.486	395.4	50.9	1.200	1.200	0.258	0.0	108	1.730
4.000	2.066	36.5	18.2	0.850	1.200	0.088	0.0	75	2.063
1.004	3.293	523.7	104.7	1.200	1.200	0.536	0.0	136	2.597
1.005	4.141	658.5	118.4	1.200	1.594	0.611	0.0	128	3.165
5.000	2.085	82.9	19.7	1.200	1.200	0.097	0.0	74	1.715
5.001	2.147	85.4	21.2	1.200	1.200	0.105	0.0	76	1.788
5.002	2.483	175.5	27.6	1.200	1.200	0.139	0.0	80	1.827
5.003	2.210	351.5	50.3	1.200	1.200	0.258	0.0	114	1.585
5.004	1.903	302.6	62.6	1.200	1.200	0.324	0.0	138	1.515
5.005	1.783	283.6	69.6	1.200	1.200	0.362	0.0	151	1.483
5.006	1.082	305.9	73.6	1.735	1.596	0.393	0.0	200	0.897
6.000	1.010	71.4	8.6	0.881	1.231	0.043	0.0	70	0.688
7.000	2.524	44.6	28.0	0.850	1.121	0.135	0.0	86	2.665
6.001	1.009	71.3	39.9	1.231	1.596	0.206	0.0	160	1.035

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Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.006	7	8	14.381	0.600	31.306	31.277	0.029	500.0	600	6.75	51.1
1.007	8	9	24.845	0.600	31.277	31.227	0.050	500.0	600	7.14	49.7
1.008	9	HW-Inlet	7.029	0.600	31.227	31.213	0.014	500.0	600	7.24	49.4
1.010	HW-Outlet	Flow-Control	6.000	0.600	31.000	30.988	0.012	500.0	600	5.09	57.2
1.011	Flow-Control	13	5.158	0.600	30.988	30.966	0.022	234.5	300	5.18	56.9

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.006	1.082	305.9	223.3	1.596	1.334	1.210	0.0	382	1.176
1.007	1.082	305.9	220.9	1.334	1.286	1.229	0.0	379	1.173
1.008	1.082	305.9	227.8	1.286	1.189	1.276	0.0	387	1.180
1.010	1.082	305.9	0.0	1.102	1.088	0.000	0.0	0	0.000
1.011	1.022	72.3	22.2	1.388	1.234	0.108	0.0	114	0.903

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1	512424.433	127107.557	38.362	1.425	1200	0	1.000	36.937	225
2	512413.935	127085.300	37.486	1.425	1200	1	1.000	36.061	225
						0	1.001	36.061	225
20	512403.273	127058.870	37.054	1.425	1200	0	2.000	35.629	225
3	512423.359	127073.013	36.986	1.678	1200	1	2.000	35.383	225
						2	1.001	35.383	225
						0	1.002	35.308	300
4	512440.549	127050.601	35.993	1.500	1200	1	1.002	34.493	300
						0	1.003	34.493	300
30	512457.157	127118.224	38.583	1.425	1200	0	3.000	37.158	225
31	512470.277	127101.116	37.704	1.425	1200	1	3.000	36.279	225
						0	3.001	36.279	225
32	512483.600	127093.202	36.887	1.500	1200	1	3.001	35.462	225
						0	3.002	35.387	300

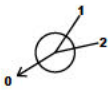
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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
33	512499.696	127076.896	36.031	1.500	1200	1	3.002	34.531	300
						0	3.003	34.531	300
34	512499.253	127070.786	35.894	1.650	1350	1	3.003	34.394	300
						0	3.004	34.244	450
35	512485.643	127059.710	35.625	1.650	1350	1	3.004	33.975	450
						0	3.005	33.975	450
5	512453.577	127033.615	35.008	1.650	1350	1	4.000	33.658	150
						2	1.003	33.508	300
						3	3.005	33.358	450
						0	1.004	33.358	450
6	512471.455	127010.306	34.241	1.650	1350	1	1.004	32.591	450
						0	1.005	32.591	450
40	512392.988	127030.409	36.661	1.425	1200	0	5.000	35.236	225
41	512373.640	126985.582	35.428	1.425	1200	1	5.000	34.003	225
						0	5.001	34.003	225
42	512378.473	126976.268	35.147	1.500	1200	1	5.001	33.722	225
						0	5.002	33.647	300
43	512414.180	126974.175	34.260	1.650	1350	1	5.002	32.760	300
						0	5.003	32.610	450
44	512446.549	126972.278	33.877	1.650	1350	1	5.003	32.227	450
						0	5.004	32.227	450
45	512462.056	126972.149	33.741	1.650	1350	1	5.004	32.091	450
						0	5.005	32.091	450
46	512468.387	126974.065	33.690	2.335	1500	1	5.005	32.040	450
						0	5.006	31.355	600
7	512488.181	126988.498	33.502	2.196	1500	1	6.001	31.606	300
						2	5.006	31.306	600
						3	1.005	31.458	450
						0	1.006	31.306	600

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
8	512496.934	126977.087	33.211	1.934	1500	 1	1.006	31.277	600
						0	1.007	31.277	600
9	512495.597	126952.278	33.113	1.886	1500	 1	1.007	31.227	600
						0	1.008	31.227	600
HW-Inlet	512502.621	126952.011	33.002	1.962		1	1.008	31.213	600
50	512546.427	127012.229	33.052	1.181	1200				
						0	6.000	31.871	300
51	512515.637	127005.418	33.271	1.531	1200	 1	7.000	32.000	150
						2	6.000	31.740	300
						0	6.001	31.740	300
HW-Outlet	512538.258	126969.456	32.702	1.702					
						0	1.010	31.000	600
Flow-Control	512544.225	126970.085	32.676	1.688	1500	 1	1.010	30.988	600
						0	1.011	30.988	300
13	512548.874	126967.850	32.500	1.534		 1	1.011	30.966	300
Carpark 1	512446.754	127029.086	35.000	1.000					
						0	4.000	34.000	150
Carpark 2	512520.083	127012.117	33.500	1.000					
						0	7.000	32.500	150

Node Flow-Control Online Hydro-Brake® Control

Flap Valve	✓	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	30.988	Product Number	CTL-SHE-0139-1050-1700-1050
Design Depth (m)	1.700	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	10.5	Min Node Diameter (mm)	1500

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Node Carpark 1 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.800	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		
Invert Level (m)	34.000	Diameter (m)	0.023		

Node Carpark 2 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.800	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.5		
Invert Level (m)	31.500	Diameter (m)	0.100		

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)	22.000	Inf Depth (m)	
Porosity	0.35	Length (m)	22.000		

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)	53	Depth (m)	
Safety Factor	2.0	Width (m)	5.000	Inf Depth (m)	
Porosity	0.35	Length (m)	50.000		

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Results for 30 year +10% A Critical Storm Duration. Lowest mass balance: 99.77%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	37.013	0.076	22.9	0.1344	0.0000	OK
15 minute summer	2	10	36.137	0.076	24.3	0.0892	0.0000	OK
15 minute summer	20	10	35.684	0.055	6.6	0.0718	0.0000	OK
15 minute summer	3	10	35.409	0.101	47.0	0.1535	0.0000	OK
15 minute summer	4	10	34.628	0.135	88.2	0.3033	0.0000	OK
15 minute summer	30	10	37.232	0.074	24.0	0.1337	0.0000	OK
15 minute summer	31	10	36.361	0.082	30.4	0.1073	0.0000	OK
15 minute summer	32	10	35.486	0.099	52.0	0.1708	0.0000	OK
15 minute summer	33	10	34.667	0.136	51.8	0.1538	0.0000	OK
15 minute summer	34	10	34.389	0.145	78.2	0.3025	0.0000	OK
15 minute summer	35	10	34.163	0.188	139.4	0.5532	0.0000	OK
15 minute summer	5	10	33.591	0.233	240.5	0.4174	0.0000	OK
15 minute summer	6	11	32.834	0.243	280.2	0.5909	0.0000	OK
15 minute summer	40	10	35.366	0.130	52.9	0.3413	0.0000	OK
15 minute summer	41	10	34.157	0.154	56.9	0.1928	0.0000	OK
15 minute summer	42	11	33.789	0.142	74.6	0.2321	0.0000	OK
15 minute summer	43	10	32.821	0.211	138.6	0.6374	0.0000	OK
15 minute summer	44	11	32.529	0.302	173.0	0.6983	0.0000	OK
15 minute summer	45	11	32.413	0.322	193.2	0.6235	0.0000	OK
15 minute summer	46	11	32.284	0.929	210.0	1.9121	0.0000	SURCHARGED
15 minute summer	7	11	32.251	0.945	536.4	1.6691	0.0000	SURCHARGED
15 minute summer	8	11	32.071	0.794	544.4	1.5744	0.0000	SURCHARGED
360 minute winter	9	352	31.876	0.649	81.9	1.5034	0.0000	SURCHARGED
360 minute winter	HW-Inlet	352	31.876	0.836	80.8	0.0000	0.0000	OK
15 minute summer	50	11	32.307	0.436	51.4	0.8426	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	22.7	1.943	0.231	0.2881	
15 minute summer	2	1.001	3	24.1	2.141	0.221	0.1747	
15 minute summer	20	2.000	3	6.4	0.887	0.124	0.1788	
15 minute summer	3	1.002	4	46.7	1.820	0.247	0.7272	
15 minute summer	4	1.003	5	87.4	2.998	0.365	0.6240	
15 minute summer	30	3.000	31	23.9	1.965	0.226	0.2618	
15 minute summer	31	3.001	32	30.2	2.429	0.252	0.1927	
15 minute summer	32	3.002	33	51.8	2.021	0.240	0.5887	
15 minute summer	33	3.003	34	51.4	1.859	0.308	0.1696	
15 minute summer	34	3.004	35	77.8	1.467	0.194	0.9384	
15 minute summer	35	3.005	5	138.1	1.916	0.349	3.0117	
15 minute summer	5	1.004	6	241.1	3.003	0.460	2.4815	
15 minute summer	6	1.005	7	279.6	2.468	0.425	3.3775	
15 minute summer	40	5.000	41	52.5	1.992	0.633	1.2846	
15 minute summer	41	5.001	42	56.1	2.115	0.657	0.2786	
15 minute summer	42	5.002	43	74.5	2.339	0.425	1.1398	
15 minute summer	43	5.003	44	137.6	1.479	0.391	3.0067	
15 minute summer	44	5.004	45	173.4	1.479	0.573	1.8178	
15 minute summer	45	5.005	46	193.9	1.765	0.684	0.7252	
15 minute summer	46	5.006	7	208.1	0.739	0.680	6.9002	
15 minute summer	7	1.006	8	534.5	1.898	1.747	4.0508	
15 minute summer	8	1.007	9	544.2	1.932	1.779	6.9954	
15 minute summer	9	1.008	HW-Inlet	569.1	2.116	1.860	1.8577	
15 minute summer	HW-Inlet	Flow through Pond	HW-Outlet	319.5	0.197	0.008	265.3131	
15 minute winter	50	6.000	51	29.8	0.657	0.417	2.2206	

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Results for 30 year +10% A Critical Storm Duration. Lowest mass balance: 99.77%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	51	11	32.364	0.624	49.5	0.9559	0.0000	SURCHARGED
360 minute winter	HW-Outlet	352	31.876	0.876	42.3	0.0000	0.0000	SURCHARGED
360 minute winter	Flow-Control	352	31.876	0.888	10.9	2.8206	0.0000	SURCHARGED
60 minute winter	13	250	31.042	0.076	10.5	0.0000	0.0000	OK
480 minute winter	Carpark 1	464	34.296	0.296	5.1	46.9229	0.0000	SURCHARGED
60 minute summer	Carpark 2	43	32.892	0.392	50.8	31.1219	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	51	6.001	7	53.3	0.891	0.748	2.2711	
15 minute summer	HW-Outlet	1.010	Flow-Control	-50.4	-1.502	-0.165	1.3294	
60 minute winter	Flow-Control	1.011	13	10.5	0.721	0.145	0.0752	174.2
480 minute winter	Carpark 1	4.000	5	0.6	0.764	0.016	0.0063	
60 minute summer	Carpark 2	7.000	51	12.1	2.098	0.272	0.0464	

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Results for 30 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 99.79%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	37.028	0.091	32.1	0.1620	0.0000	OK
15 minute summer	2	10	36.153	0.092	34.2	0.1081	0.0000	OK
15 minute summer	20	10	35.694	0.065	9.2	0.0856	0.0000	OK
15 minute summer	3	10	35.429	0.121	65.8	0.1849	0.0000	OK
15 minute summer	4	10	34.660	0.167	123.6	0.3753	0.0000	OK
15 minute summer	30	10	37.247	0.089	33.6	0.1610	0.0000	OK
15 minute summer	31	10	36.378	0.099	42.6	0.1304	0.0000	OK
15 minute summer	32	10	35.507	0.120	72.9	0.2068	0.0000	OK
15 minute summer	33	10	34.700	0.169	72.6	0.1907	0.0000	OK
15 minute summer	34	10	34.424	0.180	109.6	0.3743	0.0000	OK
15 minute summer	35	10	34.208	0.233	195.5	0.6846	0.0000	OK
15 minute summer	5	11	33.670	0.312	337.2	0.5593	0.0000	OK
15 minute summer	6	11	33.196	0.605	391.3	1.4701	0.0000	SURCHARGED
15 minute summer	40	10	35.401	0.165	74.2	0.4347	0.0000	OK
15 minute summer	41	11	34.236	0.233	79.6	0.2924	0.0000	SURCHARGED
15 minute summer	42	10	33.822	0.175	103.5	0.2850	0.0000	OK
15 minute summer	43	12	33.074	0.464	193.2	1.3995	0.0000	SURCHARGED
15 minute summer	44	12	32.946	0.719	222.6	1.6608	0.0000	SURCHARGED
15 minute summer	45	12	32.822	0.731	244.7	1.4168	0.0000	SURCHARGED
15 minute summer	46	11	32.726	1.371	266.3	2.8221	0.0000	SURCHARGED
15 minute summer	7	11	32.665	1.359	691.3	2.4016	0.0000	SURCHARGED
15 minute summer	8	11	32.367	1.090	704.8	2.1612	0.0000	SURCHARGED
480 minute winter	9	472	32.226	0.999	89.3	2.3116	0.0000	SURCHARGED
480 minute winter	HW-Inlet	472	32.226	1.186	88.3	0.0000	0.0000	OK
15 minute summer	50	12	32.779	0.908	77.3	1.7551	0.0000	FLOOD RISK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	31.9	2.109	0.324	0.3724	
15 minute summer	2	1.001	3	33.9	2.333	0.310	0.2250	
15 minute summer	20	2.000	3	9.0	0.973	0.174	0.2281	
15 minute summer	3	1.002	4	65.5	1.973	0.346	0.9463	
15 minute summer	4	1.003	5	122.5	3.235	0.512	0.8348	
15 minute summer	30	3.000	31	33.4	2.128	0.317	0.3387	
15 minute summer	31	3.001	32	42.3	2.641	0.353	0.2483	
15 minute summer	32	3.002	33	72.6	2.163	0.337	0.7696	
15 minute summer	33	3.003	34	72.1	2.004	0.433	0.2205	
15 minute summer	34	3.004	35	109.1	1.555	0.272	1.2440	
15 minute summer	35	3.005	5	193.8	2.034	0.490	4.1027	
15 minute summer	5	1.004	6	334.0	2.939	0.638	4.0518	
15 minute summer	6	1.005	7	379.1	2.550	0.576	4.3547	
15 minute summer	40	5.000	41	73.5	2.088	0.887	1.7121	
15 minute summer	41	5.001	42	77.5	2.210	0.908	0.3720	
15 minute summer	42	5.002	43	102.2	2.505	0.583	1.9256	
15 minute winter	43	5.003	44	191.8	1.510	0.546	4.4397	
15 minute summer	44	5.004	45	221.9	1.524	0.733	2.4571	
15 minute summer	45	5.005	46	247.6	1.815	0.873	1.0481	
15 minute summer	46	5.006	7	269.2	0.956	0.880	6.9002	
15 minute summer	7	1.006	8	693.4	2.462	2.267	4.0508	
15 minute summer	8	1.007	9	706.7	2.509	2.310	6.9983	
15 minute summer	9	1.008	HW-Inlet	735.7	2.614	2.405	1.9315	
15 minute winter	HW-Inlet	Flow through Pond	HW-Outlet	369.3	0.209	0.009	369.3421	
15 minute summer	50	6.000	51	-46.0	0.712	-0.644	2.2206	

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Results for 30 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 99.79%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	51	12	32.755	1.015	53.9	1.5566	0.0000	SURCHARGED
480 minute winter	HW-Outlet	472	32.226	1.226	45.2	0.0000	0.0000	SURCHARGED
480 minute winter	Flow-Control	472	32.225	1.237	10.9	3.9290	0.0000	SURCHARGED
60 minute winter	13	36	31.042	0.076	10.5	0.0000	0.0000	OK
480 minute winter	Carpark 1	464	34.419	0.419	7.1	68.0878	0.0000	SURCHARGED
60 minute summer	Carpark 2	44	33.058	0.558	71.1	46.0944	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	51	6.001	7	67.8	1.034	0.950	2.2711	
15 minute summer	HW-Outlet	1.010	Flow-Control	-69.8	-1.548	-0.228	1.6729	
60 minute winter	Flow-Control	1.011	13	10.5	0.721	0.145	0.0752	169.4
480 minute winter	Carpark 1	4.000	5	0.7	0.805	0.019	0.0071	
60 minute summer	Carpark 2	7.000	51	14.7	2.206	0.330	0.0947	

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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)	Flood (m³)	Status
15 minute summer	1	10	37.023	0.086	29.0	0.1530	0.0000	OK
15 minute summer	2	10	36.148	0.087	30.9	0.1020	0.0000	OK
15 minute summer	20	10	35.691	0.062	8.3	0.0810	0.0000	OK
15 minute summer	3	10	35.422	0.114	59.4	0.1744	0.0000	OK
15 minute summer	4	10	34.649	0.156	111.6	0.3513	0.0000	OK
15 minute summer	30	10	37.242	0.084	30.4	0.1522	0.0000	OK
15 minute summer	31	10	36.372	0.093	38.5	0.1228	0.0000	OK
15 minute summer	32	10	35.500	0.113	65.8	0.1949	0.0000	OK
15 minute summer	33	10	34.689	0.158	65.5	0.1784	0.0000	OK
15 minute summer	34	10	34.412	0.168	99.0	0.3503	0.0000	OK
15 minute summer	35	10	34.193	0.218	176.6	0.6409	0.0000	OK
15 minute summer	5	10	33.626	0.268	304.7	0.4808	0.0000	OK
15 minute summer	6	11	32.949	0.358	354.7	0.8709	0.0000	OK
15 minute summer	40	10	35.389	0.153	67.0	0.4012	0.0000	OK
15 minute summer	41	10	34.191	0.188	71.9	0.2352	0.0000	OK
15 minute summer	42	11	33.812	0.165	94.2	0.2686	0.0000	OK
15 minute summer	43	11	32.866	0.256	175.1	0.7738	0.0000	OK
15 minute summer	44	11	32.796	0.569	220.2	1.3157	0.0000	SURCHARGED
15 minute summer	45	11	32.689	0.598	229.2	1.1599	0.0000	SURCHARGED
15 minute summer	46	11	32.602	1.247	249.0	2.5684	0.0000	SURCHARGED
15 minute summer	7	11	32.551	1.245	648.5	2.2004	0.0000	SURCHARGED
15 minute summer	8	11	32.289	1.012	660.6	2.0072	0.0000	SURCHARGED
480 minute winter	9	472	32.100	0.873	80.2	2.0219	0.0000	SURCHARGED
480 minute winter	HW-Inlet	472	32.100	1.060	79.2	0.0000	0.0000	OK
15 minute summer	50	11	32.658	0.787	29.7	1.5212	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	28.8	2.058	0.293	0.3446	
15 minute summer	2	1.001	3	30.6	2.275	0.280	0.2086	
15 minute summer	20	2.000	3	8.1	0.945	0.156	0.2113	
15 minute summer	3	1.002	4	59.2	1.918	0.312	0.8728	
15 minute summer	4	1.003	5	110.6	3.165	0.462	0.7486	
15 minute summer	30	3.000	31	30.2	2.081	0.287	0.3134	
15 minute summer	31	3.001	32	38.2	2.577	0.318	0.2299	
15 minute summer	32	3.002	33	65.5	2.120	0.304	0.7094	
15 minute summer	33	3.003	34	65.1	1.960	0.391	0.2036	
15 minute summer	34	3.004	35	98.5	1.528	0.246	1.1411	
15 minute summer	35	3.005	5	175.1	2.016	0.443	3.6123	
15 minute summer	5	1.004	6	304.2	2.974	0.581	3.4210	
15 minute summer	6	1.005	7	352.1	2.505	0.535	4.0369	
15 minute summer	40	5.000	41	66.4	2.061	0.801	1.5632	
15 minute summer	41	5.001	42	71.0	2.189	0.832	0.3387	
15 minute summer	42	5.002	43	94.2	2.470	0.537	1.3648	
15 minute summer	43	5.003	44	174.7	1.513	0.497	4.0809	
15 minute summer	44	5.004	45	207.8	1.489	0.687	2.4571	
15 minute summer	45	5.005	46	231.8	1.770	0.817	1.0481	
15 minute summer	46	5.006	7	252.2	0.895	0.824	6.9002	
15 minute summer	7	1.006	8	648.1	2.301	2.118	4.0508	
15 minute summer	8	1.007	9	660.1	2.344	2.158	6.9983	
15 minute summer	9	1.008	HW-Inlet	690.8	2.455	2.258	1.9180	
15 minute summer	HW-Inlet	Flow through Pond	HW-Outlet	350.9	0.201	0.009	333.6841	
15 minute winter	50	6.000	51	34.6	0.690	0.484	2.2206	

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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)	Flood (m³)	Status
15 minute summer	51	11	32.621	0.881	67.2	1.3507	0.0000	SURCHARGED
480 minute winter	HW-Outlet	472	32.100	1.100	41.2	0.0000	0.0000	SURCHARGED
480 minute winter	Flow-Control	472	32.100	1.112	10.9	3.5318	0.0000	SURCHARGED
120 minute winter	13	66	31.042	0.076	10.5	0.0000	0.0000	OK
600 minute winter	Carpark 1	585	34.372	0.372	5.2	59.9802	0.0000	SURCHARGED
60 minute summer	Carpark 2	44	33.008	0.508	65.1	41.5945	0.0000	SURCHARGED

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	51	6.001	7	64.5	0.979	0.904	2.2711	
15 minute summer	HW-Outlet	1.010	Flow-Control	-63.3	-1.547	-0.207	1.5860	
120 minute winter	Flow-Control	1.011	13	10.5	0.721	0.145	0.0752	193.8
600 minute winter	Carpark 1	4.000	5	0.7	0.791	0.018	0.0068	
15 minute summer	Carpark 2	7.000	51	14.2	2.107	0.319	0.1415	

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Results for 100 year +45% CC +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)	Flood (m³)	Status
15 minute summer	1	10	37.044	0.107	42.1	0.1895	0.0000	OK
15 minute summer	2	10	36.169	0.108	44.8	0.1271	0.0000	OK
15 minute summer	20	10	35.704	0.075	12.0	0.0988	0.0000	OK
15 minute summer	3	10	35.450	0.142	86.3	0.2168	0.0000	OK
15 minute summer	4	12	34.812	0.319	162.7	0.7159	0.0000	SURCHARGED
15 minute summer	30	10	37.262	0.104	44.1	0.1885	0.0000	OK
15 minute summer	31	10	36.396	0.117	55.8	0.1541	0.0000	OK
15 minute summer	32	10	35.529	0.142	95.5	0.2436	0.0000	OK
15 minute summer	33	12	34.739	0.208	95.1	0.2347	0.0000	OK
15 minute summer	34	12	34.647	0.403	143.5	0.8402	0.0000	OK
15 minute summer	35	12	34.602	0.627	254.1	1.8433	0.0000	SURCHARGED
15 minute summer	5	12	34.356	0.998	402.0	1.7879	0.0000	SURCHARGED
15 minute summer	6	11	33.783	1.192	449.0	2.8987	0.0000	SURCHARGED
15 minute summer	40	12	36.094	0.858	97.1	2.2564	0.0000	SURCHARGED
15 minute summer	41	12	34.683	0.680	91.5	0.8533	0.0000	SURCHARGED
15 minute summer	42	12	34.207	0.560	123.8	0.9132	0.0000	SURCHARGED
15 minute summer	43	11	33.724	1.114	233.2	3.3609	0.0000	SURCHARGED
15 minute summer	44	11	33.512	1.285	285.0	2.9701	0.0000	SURCHARGED
15 minute summer	45	11	33.309	1.218	317.5	2.3610	0.0000	SURCHARGED
15 minute summer	46	11	33.144	1.789	344.3	3.6828	0.0000	SURCHARGED
15 minute summer	7	11	33.043	1.737	820.5	3.0700	0.0000	SURCHARGED
15 minute summer	8	11	32.624	1.347	837.0	2.6711	0.0000	SURCHARGED
720 minute winter	9	705	32.541	1.314	85.2	3.0429	0.0000	SURCHARGED
720 minute winter	HW-Inlet	705	32.541	1.501	85.0	0.0000	0.0000	OK
15 minute summer	50	11	33.052	1.181	43.1	2.2817	3.4357	FLOOD

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	41.8	2.241	0.425	0.4592	
15 minute summer	2	1.001	3	44.4	2.490	0.407	0.2765	
15 minute summer	20	2.000	3	11.8	1.045	0.227	0.2774	
15 minute summer	3	1.002	4	86.7	2.007	0.458	1.3985	
15 minute summer	4	1.003	5	151.6	3.239	0.633	1.5075	
15 minute summer	30	3.000	31	43.8	2.259	0.416	0.4186	
15 minute summer	31	3.001	32	55.4	2.811	0.462	0.3055	
15 minute summer	32	3.002	33	95.1	2.273	0.441	0.9556	
15 minute summer	33	3.003	34	94.4	2.121	0.567	0.3534	
15 minute summer	34	3.004	35	141.0	1.548	0.352	2.7035	
15 minute winter	35	3.005	5	241.3	2.039	0.610	6.3728	
15 minute summer	5	1.004	6	388.3	2.956	0.741	4.6544	
15 minute summer	6	1.005	7	451.3	2.849	0.685	4.3547	
15 minute summer	40	5.000	41	83.9	2.119	1.012	1.9418	
15 minute summer	41	5.001	42	92.1	2.316	1.079	0.4173	
15 minute summer	42	5.002	43	125.4	2.534	0.715	2.5188	
15 minute summer	43	5.003	44	223.5	1.513	0.636	5.1375	
15 minute summer	44	5.004	45	281.1	1.774	0.929	2.4571	
15 minute summer	45	5.005	46	314.6	1.986	1.109	1.0481	
15 minute summer	46	5.006	7	341.8	1.214	1.117	6.9002	
15 minute summer	7	1.006	8	818.7	2.907	2.676	4.0508	
15 minute summer	8	1.007	9	835.5	2.966	2.731	6.9983	
15 minute summer	9	1.008	HW-Inlet	880.0	3.124	2.877	1.9576	
15 minute winter	HW-Inlet	Flow through Pond	HW-Outlet	403.5	0.220	0.010	482.2695	
30 minute summer	50	6.000	51	37.4	0.665	0.524	2.2206	

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Results for 100 year +45% CC +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)	Flood (m³)	Status
15 minute summer	51	11	33.061	1.321	78.6	2.0247	0.0000	FLOOD RISK
720 minute winter	HW-Outlet	705	32.541	1.541	43.6	0.0000	0.0000	FLOOD RISK
720 minute winter	Flow-Control	705	32.541	1.553	10.8	4.9320	0.0000	FLOOD RISK
15 minute summer	13	14	31.042	0.076	10.5	0.0000	0.0000	OK
720 minute winter	Carpark 1	690	34.552	0.552	6.6	90.7701	0.0000	SURCHARGED
60 minute summer	Carpark 2	45	33.264	0.764	94.4	64.7250	0.0000	FLOOD RISK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	51	6.001	7	72.1	1.098	1.011	2.2711	
15 minute summer	HW-Outlet	1.010	Flow-Control	-93.4	-1.529	-0.305	1.6901	
15 minute summer	Flow-Control	1.011	13	10.5	0.721	0.145	0.0752	155.2
15 minute summer	Carpark 1	4.000	5	7.7	0.741	0.210	0.1442	
30 minute winter	Carpark 2	7.000	51	18.0	2.279	0.404	0.1415	

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Appendix O



NOTES

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3. TOPOGRAPHIC SURVEY UNDERTAKEN BY:

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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.

KEY

- SITE BOUNDARY
- OVERLAND EXCEEDANCE ROUTING
- PROPOSED SITE CONTOURS

0m 25m
SCALE 1:500

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miller homes

JOB TITLE
BARNS GREEN
HORSHAM

DRAWING TITLE
SURFACE WATER AND SUDS
DRAINAGE STRATEGY
EXCEEDANCE ROUTING

DATE	DRAWN	CHECKED	ISSUE CHECKBOX
SEPT 2025	TSW	TSW	

DRAWING No.	REV	SCALE	@ A1
0018.403	–	1:500	

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