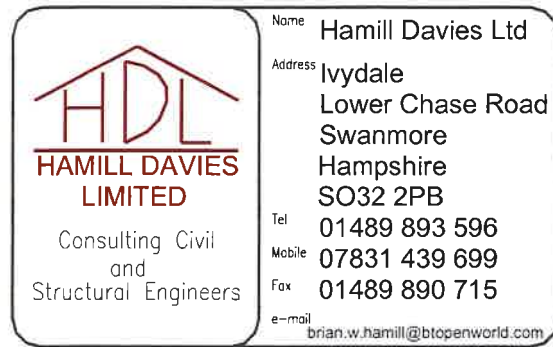




**Land east of St. Patrick's RC Church,
Hayling Island PO11 0QU**

Flood Risk Assessment dated August 2026

Land east of St. Patrick's RC Church, Hayling Island PO11 0QU

Flood Risk Assessment dated August 2026

1.0 Introduction

- 1.1 The site known as ' Land east of St. Patrick's RC Church, Hayling Island PO11 0QU ' is shown by the location plan & Google map image included within Appendix A.
- 1.2 The land within the site boundary currently consists of vacant land as shown by the google image included within Appendix A and the existing site layout plan within Appendix C.
- 1.3 Planning consent is being sought for the construction of 2 no. residential units and associated hardstanding areas; as shown by the architectural drawing included within Appendix D.
- 1.4 The Technical Guidance to the National Planning Policy Framework was published to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding with the requirement for a flood risk assessment which appraises, manages and reduces the risk of flooding.
- 1.5 This site specific flood risk assessment is required to meet the minimum requirements set out in the Technical Guidance to the National Planning Policy Framework.

2.0 Site Topography

- 2.1 The topographical survey, included within Appendix B, is generally flat with an average level of 5.50m AOD.
- 2.2 There is a slight depression on the site with the area of depression coinciding with the area shown on the 2070 flood map; included within Appendix F.
- 2.3 There is also a small bank to the northern boundary of the site; as shown by the topographical survey.

3.0 Flood Risk Assessment

Tidal Flood Risk

- 3.1 The site is located inland 1 kilometres from the sea and thus is not susceptible to Tidal Flood Risk.

Fluvial Flood Risk

- 3.2 The Environment Agency has been consulted to determine whether the site is at risk of fluvial and tidal flooding. The Floodplain Map, included within Appendix E, centred on the site shows that the site is currently outside the designated Flood Zone 3 (High Probability - flooding from a river with a 1 in 100 or greater chance of happening each year) or Flood Zone 2 (Medium Probability - flooding from rivers with up to a 1 in 1000 chance of occurring each year). The development site can therefore be designated as being within Flood Zone 1. Land within Flood Zone 1 is therefore appropriate for development for all uses.
- 3.3 The National flood map included within Appendix F (2070 – 2125) however identifies a part of the site as being at risk of surface water flooding in the future.

Groundwater Flood Risk

- 3.4 The site investigation report dated July 2026 included within Appendix G identifies the prevailing ground conditions as below:-
- Made Ground over River Terrace Deposits over London Clay Formation
- 3.5 The site investigation report states that groundwater was not encountered in any of the exploratory holes. It is however acknowledged that groundwater levels vary seasonally, typically rising from September's low to March high, with ground levels reported to be as high as 1m below existing ground levels.
- 3.6 A 50mm standpipe has been installed within the borehole for future monitoring of groundwater levels. There is however no record of ground water flooding on the site.

Other Sources of Flood Risk

- 3.7 The Southern Water sewer records included within Appendix G show that there are no Southern Water sewers within the boundary of the site.

- 3.8 There is however a 225mm diameter foul sewer adjacent to the site below Manor Road. This sewer will be used to discharge foul and surface water run off, via attenuation tanks and a hydrobreak, from the proposed development.
- 3.9 The new buildings will be set with finished ground floor levels a minimum of 150mm above proposed ground level. Proposed ground levels will be set to follow the natural contours of the site to ensure that flows through the site are redirected away from properties in the unlikely event of flooding taking place from other sources such as infrastructure failure.
- 3.10 There have been no events recorded of flooding due to failure of the existing drainage regime.

4.0 Proposed Drainage

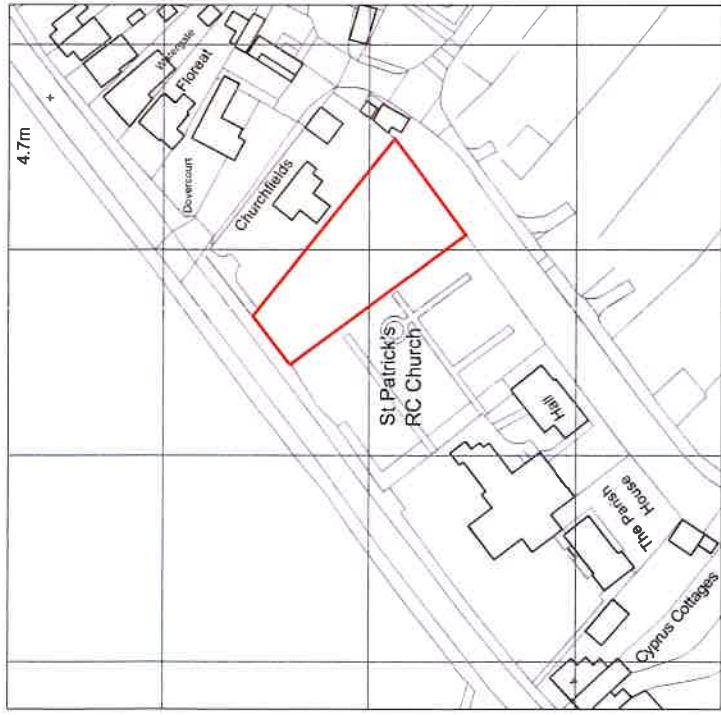
- 4.1 The planning policy consultation response from Havant District Council dated 4th July acknowledges that the starting point in national and local policy is that areas at risk of flooding should be avoided for development wherever possible and that a sequential test is a key tool to achieving this and that the sequential approach should be taken on site with the area at risk being avoided for built form wherever possible.
- 4.2 An inspection of the proposed site layout included within Appendix D demonstrates that this approach is not possible for this site.
- 4.3 The approach which is to be adopted for this site is to replace the current depression on the site, currently available to alleviate flooding in the future, located below the proposed buildings, with a similar depression in terms of water storage volume at similar levels within the areas of the site designated for gardens.

5.0 Conclusions

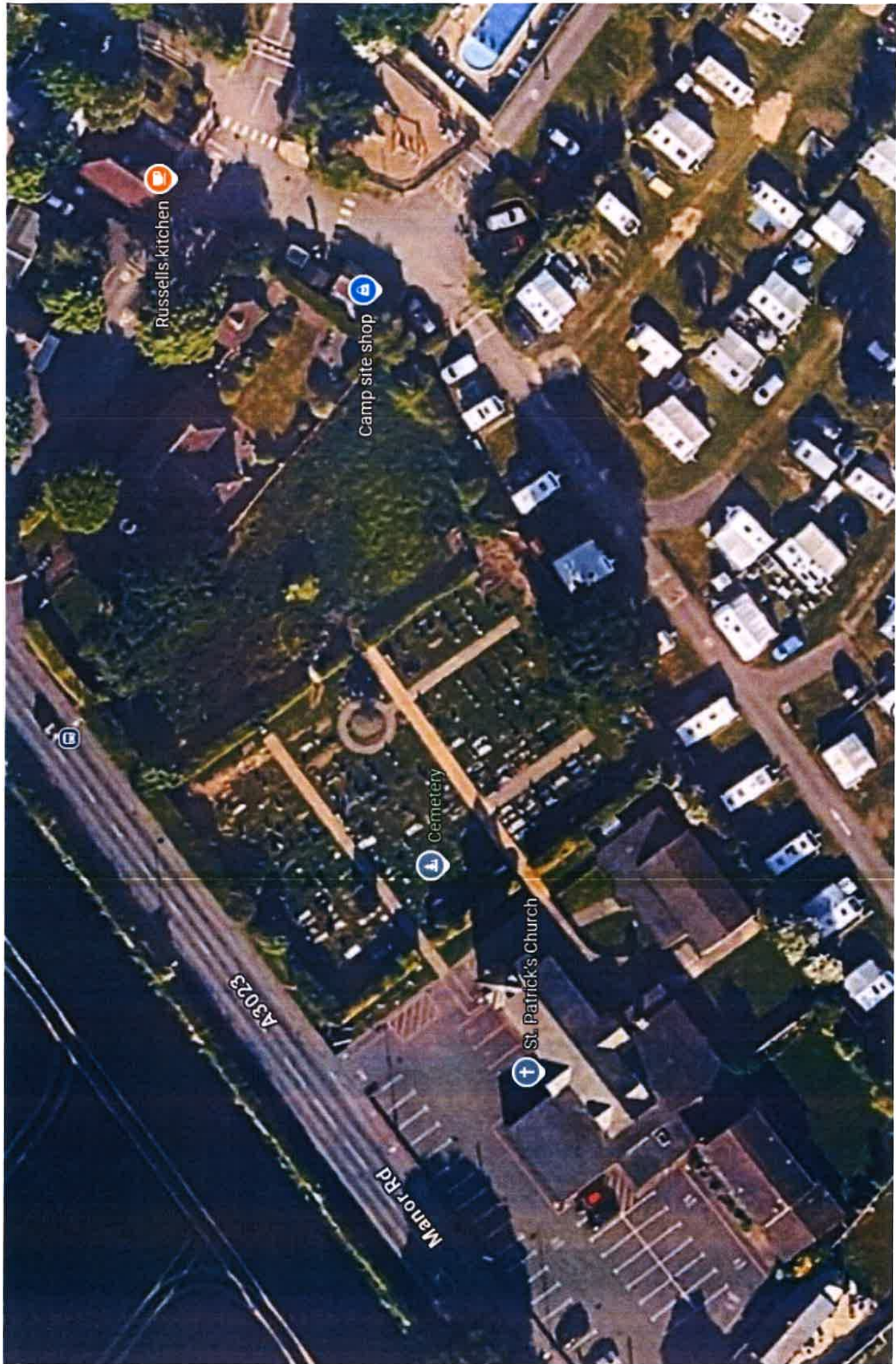
- 5.1 The flood risk assessment indicates that the proposed development is susceptible to flooding in the future.
- 5.2 Proposals to replicate the depression on site, currently available for surface water storage in the future, within the garden areas to alleviate the risk of flooding on the site in the future.

Appendix A

**Location Plan
Google Image**



LOCATION PLAN 1:1250

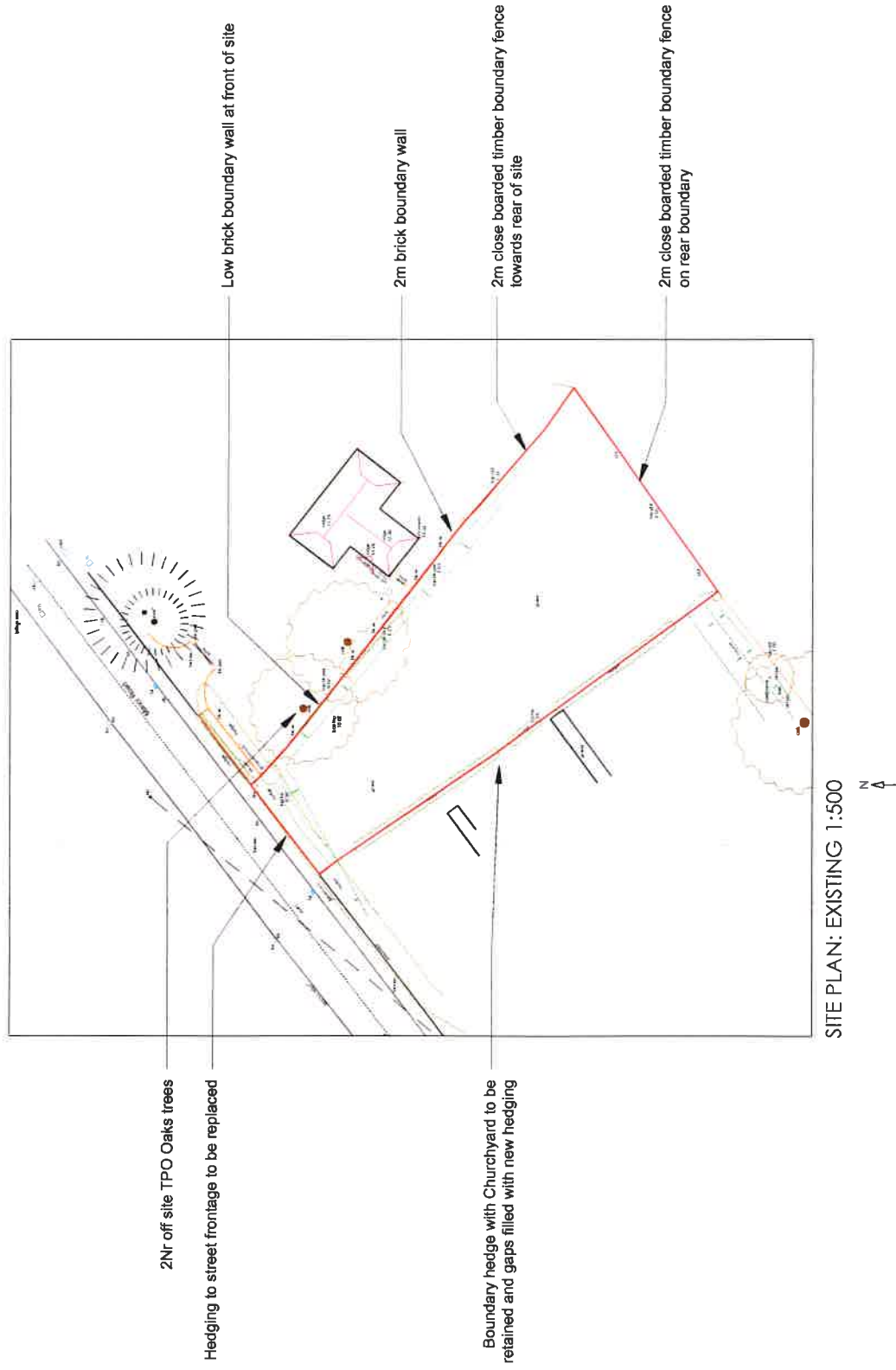


Appendix B

Topographical Survey

Appendix C

Existing Site Layout Plan



Note:
Drawing to be read in conjunction with
Proposed Site Plan, Tree Report by
Arboriculturalist and BGN Report

DRAWING REFERENCE
608 PL02

REVISION
A

SCALE
@A3

DRAWING
SITE PLAN: EXISTING

PROJECT
Land to East of St Patricks RC Church, Manor Road

212, Southwell Road, Loughborough, Leicestershire LE11 9XQ
01530 465974 01154 897674 mail@lilleyarchitecture.com

Appendix D

Proposed Site Layout Plan



Schedule of Accommodation:

- Bungalow 1. 3 bedroom GIA 128m²
- Bungalow 2. 3 bedroom GIA 118m²

Note:
 Drawing to be read in conjunction with:
 Proposed Site Plan
 Tree Report
 BGN Report
 Flood Risk Assessment

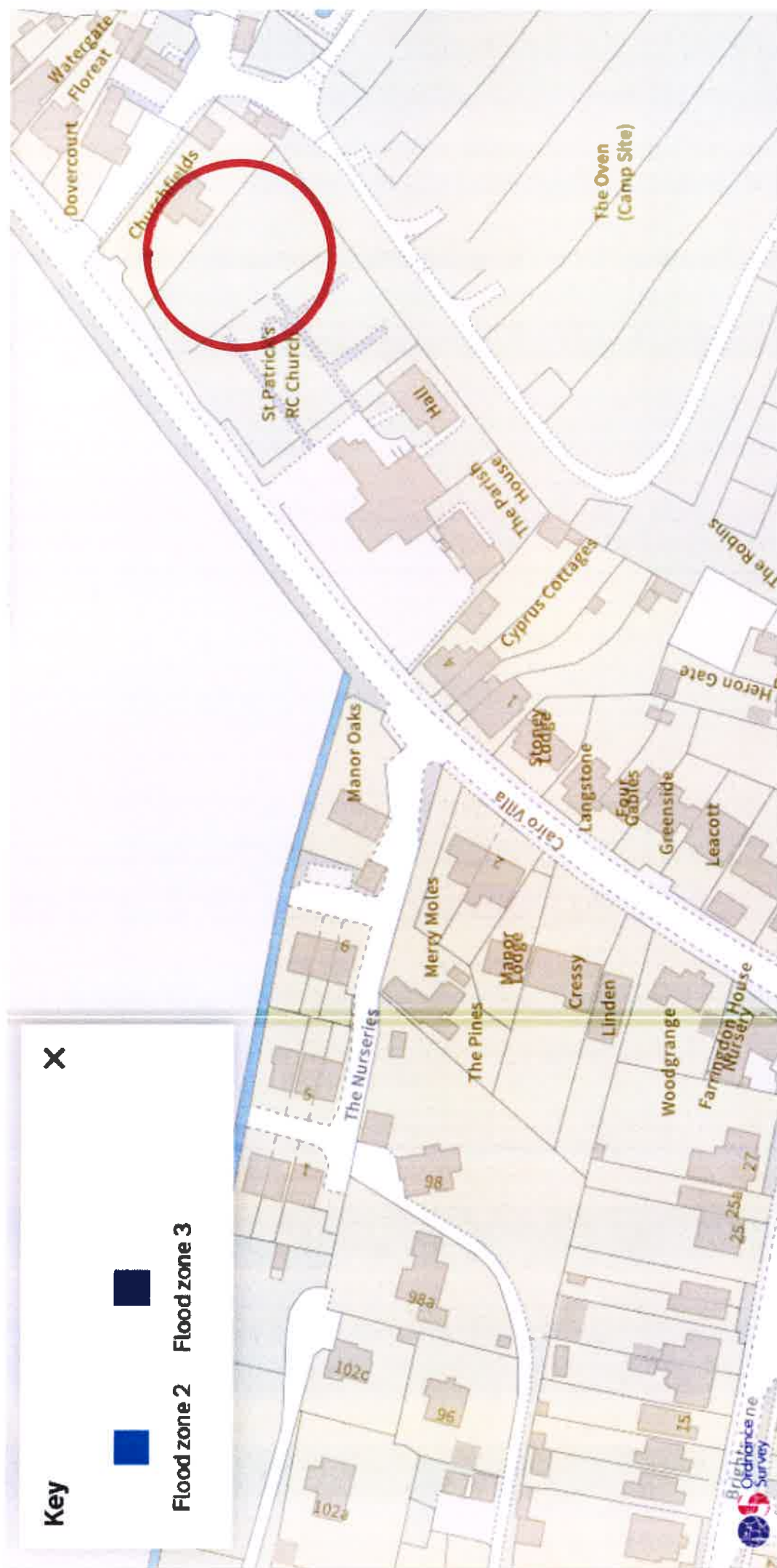
DRAWING REFERENCE	REVISION	SCALE
608 PL03	C	a/A3

PROJECT
 Land to East of St Patricks RC Church, Monor Road
SITE PLAN: PROPOSED

242, Ashford Road, Lough Island, Ballymonee, CO.11, P.40
 01552 462914 01714 372733 mobile 0874346154 www.lilley.com

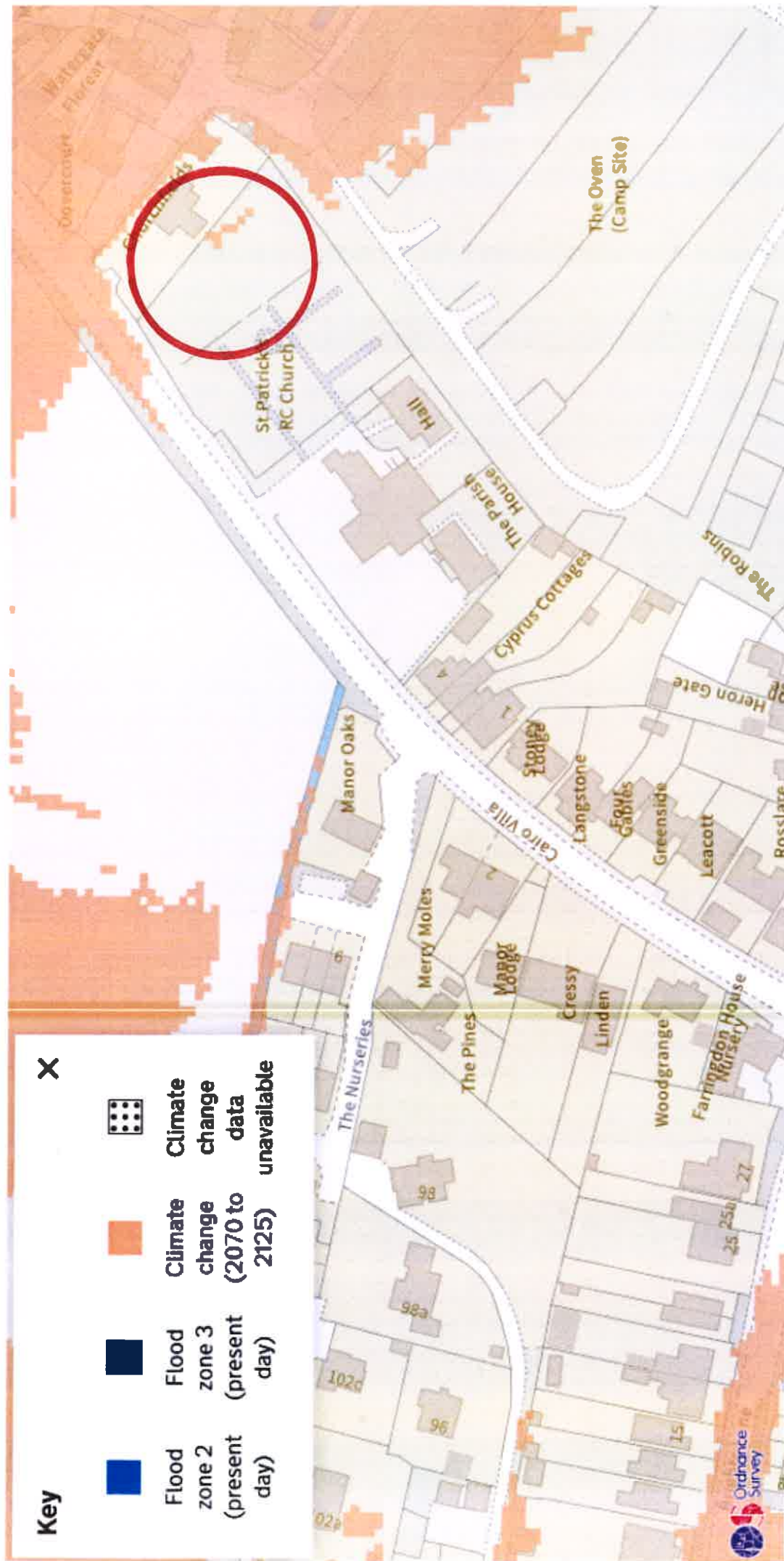
Appendix E

Environment Agency Flood Map (2026)



Appendix F

Environment Agency Flood Map (2070 - 2125)



Appendix G

Site Investigation Report



Ground Investigation Report

at

**Land east of St Patrick's RC Church, Hayling Island, Hampshire,
PO11 0QU**

for

Billet Homes Ltd

**Reference: 22440/GIR Rev1.0
July 2026**

Control Document

Project

Land east of St Patrick's RC Church, Hayling Island, Hampshire PO11 0QU

Document Type

Ground Investigation Report

Document Reference

22440/GIR Rev 1.0

Document Status

Final

Date

July 2026

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This is not a valid document for use in the design of the project unless it is titled Final in the document status box.

Current regulations and good practice were used in the preparation of this report. The recommendations given in this report must be reviewed by an appropriately qualified person 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.



Commission

This document comprises the Ground Investigation Report (GIR) and incorporates the results, discussion, and conclusions to intrusive works and laboratory testing.

Commission Record	
Client	Billet Homes Ltd
Site Name	Land east of St Patrick's RC Church, Hayling Island, Hampshire PO11 0QU
Grid Reference	SU 718 005
Soils Limited Quotation Ref	Q31302rev3, dated 13 th May 2026
Signed Order Form	Q31302rev3, dated 14 th May 2026

The record of revision to this document is presented below:

Record Of Revisions		
Revision	Date	Reason
1.0	July 2026	Original to the Client

Note(s): The latest revised document supersedes all previous revisions of the GIR produced by Soils Limited.

Documents associated with this development that must be referred to are given below.

Record Of Associated Documents			
Reference	Type	Date	Creator
608 PLO3	Site Plan -Proposed	July 2026	Lilley Architecture

Limitations and Disclaimers

The report was prepared solely for the brief described in our quotation and Section 1.1 of this report. We disclaim any responsibility to the Client and others in respect of any matters outside the scope of our engagement.

We have exercised all reasonable skill, care and diligence within the terms of the Contract with the Client, incorporation of our General Conditions of Contract of Business and considering the resources devoted to us by agreement with the Client.

This report is a snapshot of the site and conditions taken only at the time of our investigation works and described in our reporting. The ground is a product of continuing natural and artificial processes and has variation by depth and location that cannot be determined absolutely. While a ground investigation will aim to understand and mitigate, risk cannot be eliminated.

Current regulations and good practice were used in the preparation of this report. Consideration of any subsequent changes to regulations or practice that may have occurred following issue of this report is the responsibility of the user.

If the term "competent person" is used in this report or any Soils Limited document, it means an engineering geologist or civil engineer with a minimum of three years post graduate experience in the understanding and application of the appropriate codes of practice.

Unless the site investigation works have been designed and specified in accordance with EC7, this report is not a Ground Investigation Report as defined by Eurocode 7.

Any reference to ground level relates to the site level at the time of the investigation, unless otherwise stated. Ground elevations and coordinates are only provided when this forms part of our engagement.

A survey of the possible presence or absence of invasive species including Japanese Knotweed is outside the scope of this investigation.

Copyright of all printed material including reports, survey data, drawings, laboratory test results, trial pit and borehole log sheets remains with Soils Limited.

Unless specifically granted, in writing, by Soils Limited, no parties other than the named client hold reliance or license over this report. The Client may not assign the benefit of the report or any part to any third party without the written consent of Soils Limited. Use of this report by others is wholly at their own risk.

License for and reliance on this report is only valid once we have been paid in full for this engagement. In the event of non-payment, we reserve the right to notify parties other than the client of failure to pay and our cancellation of license and reliance.

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Appendix D Preliminary Pile Design

Appendix E Information Provided by the Client

Section I Introduction

1.1 Objective of Investigation

The Client commissioned Soils Limited to undertake an intrusive ground investigation and to prepare a Ground Investigation Report to supply the Client and their designers with information regarding ground conditions, to assist in preparing a foundation scheme for development that was appropriate to the settings present on the site.

The investigation was to be made by means of in-situ, geotechnical laboratory testing undertaken on soil samples taken from the exploratory holes.

No preliminary investigation or contamination testing was part of the scope of this investigation.

1.2 Site Description

At the time of investigation in June 2026, the site was an unused land located to the south of Manor Road, predominantly covered in gravel and grass and with no structures.

Two trees were located just beyond the north-eastern boundary of the site. The site was relatively flat and was bounded by a cemetery to the west, Manor Road to the north, residential buildings to the east, and a campsite to the south.

A site location plan is given in Figure 1. An aerial photograph of the site and its close environs has been included in Figure 2.

1.3 Proposed Development

The development proposals comprise the construction of two new bungalows with private gardens, a driveway with hard landscaping, and a new access road via Manor Road.

This report relies on the items listed in the Record Of Associated Documents and recommendations apply only to this scheme. Any changes require consultation with Soils Limited. Development plans are in Appendix E.

1.4 Anticipated Geology

The 1:50,000 BGS map showed the site to be located on the bedrock London Clay Formation with overlying superficial deposits of River Terrace Deposits.

1.4.1 River Terrace Deposits

The rivers Test and Itchen have deposited extensive spreads of River Terrace Deposits in the Southampton area, representative of ancient floodplains. In total, eleven terraces have been recorded. The River Terrace Deposits consist predominantly of gravels made up of subangular to subrounded flints with a significant sand component locally with lenses of silt, clay or peat.

The five highest terraces have appreciable clay content. Poorly sorted, clayey and sandy silts and silty clays overlie the 1st, 3rd, 5th and 6th terraces and locally at above terrace gravels

1.4.2 London Clay Formation

The London Clay Formation in the Hampshire region comprises silty and sandy clay, clayey and sandy silt, silty sand; sporadic claystones and thin beds of flint pebbles. The formation includes the Bognor Sand, Whitecliff Sand, Durley Sand, Portsmouth Sand and Nursling Sand Members. Crystals of gypsum (Selenite) are often found within the weathered part of the London Clay, and precautions against sulphate attack to concrete are sometimes required.

The lowest part of the London Clay Formation rests on the Reading Formation (Lambeth Group).

Section 2 Site Works

2.1 Project Works

The project works were undertaken on 1st and 2nd June 2026, with subsequent sample logging, laboratory testing, and reporting. The works comprised:

- Scanning exploratory holes with a cable avoidance tool (CAT & Genny)
- 3No machine-excavated trial pits to depths ranging between 1.00m and 2.05m bgl
- 2No infiltration tests in TPSK1 and TSPK2 in accordance with BRE DG:2016
- 1No 15.00m deep cable percussive borehole with SPTs at every 1.00m to 5.00m and every 1.50m thereafter
- 10.00m deep groundwater monitoring standpipe
- Geotechnical laboratory testing

Figure 2 shows exploratory hole locations.

Soil cores were logged and sub-sampled for laboratory analysis.

The cable percussive borehole BH1 was backfilled using gravel and bentonite following the installation, and trial pits were backfilled using arisings, compacted in layers and any excess left mounded for future settlement.

2.2 Ground Conditions

The maximum depths of exploratory holes are given in Table 2.1. The depths presented were measured from ground level at the time of the investigation.

Table 2.1 Final Depth of Exploratory Holes

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
TPSK1	1.00	TP3	2.00
TPSK2	2.05	BH1 ^W	15.00

Note(s): ^W - well installation. The depths given taken from the ground level adjacent to each exploratory hole the time of investigation.

Soils are classified as Topsoil if they contain organic material or result from natural weathering. Where soils have been altered by human activity or contain over 5% non-natural material, they are labelled as Made Ground.

For full details, see Appendix B. For discussion, the soil conditions found in the exploratory holes, from top to bottom, are summarised as follows:

Made Ground/Topsoil (MG/TS)
River Terrace Deposits (RTD)
London Clay Formation (LCF)

The ground conditions are summarised in Table 2.2.

Table 2.2 Ground Conditions

Strata	Depth Encountered (m bgl)		Typical Thickness (m)	Typical Description
	Top	Bottom		
MG	0.00	0.30-0.35	0.33	Yellowish brown sandy gravelly SILT with flint and occasional brick
RTD	0.30-0.35	1.00 ¹ -4.00	3.70	Firm yellowish brown /Orangish brown sandy gravelly CLAY
LCF	4.00	15.00 ¹ +	Not proven	Stiff dark grey CLAY

Note(s): ¹ Final depth of exploratory hole. ² Base of strata not encountered. The depths given were taken from the ground level adjacent to each exploratory hole at the time of investigation.

2.3 Established Ground Conditions

The Made ground was found to generally extend to 0.30-0.35m bgl followed by River Terrace Deposits to a maximum depth of 4.00m bgl, which was encountered within BH1. The high blow counts obtained within the River Terrace Deposits were due to the presence of flint gravels while undertaking the SPTs. The London Clay Formation was only encountered within BH1 from a depth of 4.00m bgl and persisted to the maximum investigatory depth of 15.00m bgl.

2.4 Roots

Roots (including rootlets) were noted in the recovered samples to the depths shown in Table 2.3.

Table 2.3 Established Depth of Root Penetration

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
TPSK1	1.00	TP3	1.10
TPSK2	1.10	BH1	4.00

Note(s): The depths given taken from the ground level adjacent to each exploratory hole the time of investigation.

Roots were recorded on cable percussive borehole logs, based on observations from the soil cores. Cable percussive borehole sampling can identify the presence of roots at depth but provides localised information only. Trial pits allow broader visual assessment of root distribution, orientation and condition. Logging the faces of a supported excavation would give more information than can be obtained from arisings.

Google Earth analysis indicates that two trees have been present along the north-eastern boundary of the site since 1999. These trees were located within the neighbouring residential property and were present at the time of the investigation.

2.5 Groundwater

Groundwater was not encountered in any exploratory holes. Groundwater levels vary seasonally, typically rising from September's low to March's high. Determining equilibrium conditions requires multiple observations via groundwater monitoring wells over an extended period of time.

A 50mm standpipe was installed within BH1 to allow for future monitoring of groundwater levels, should this be required. However, groundwater monitoring was not included within the scope of this investigation, and no monitoring visits have been undertaken to date.

Section 3 In-Situ and Laboratory Testing

3.1 Standard Penetration Tests

Standard Penetration Tests (SPTs) were undertaken in BH1. The results were interpreted based on the classifications outlined in **Error! Reference source not found.**

Table 3.1 Hammer Efficiency

SPT Hammer Ref	Energy Ratio Er (%)
AR 3552	67

Table 3.2 Standard Penetration Tests (SPT) Interpretation

Strata	Depth Range (m bgl)	N60 Range	Soil Classification	Inferred Cu (kPa)
RTD	0.00-4.00	9-49	Medium to Very High	45-245
LCF	4.00-15.00+	11-35	Medium to High	55 – 155

A full interpretation of the SPT results is outlined in **Error! Reference source not found.**

3.2 Infiltration Tests

Infiltration testing was undertaken in TPSK1 and TPSK2 within the River Terrace Deposits following the principles of BRE Digest 365 Soakaway design: 2016

The water level within TPSK1 decreased by only 24 cm during the 432-minute testing period. In contrast, the water level within TPSK2 remained unchanged throughout the 409-minute testing period. BRE 365 compliance was not achieved within any of the pits.

Table 3.3 Infiltration Rates

Exploratory Hole	Test No.	Infiltration Rate (m/s)	Comment
TPSK1	I	NA	Insufficient head loss to calculate an infiltration rate
TPSK2	I	NA	

3.3 Atterberg Limit Tests and Moisture Content Determinations

A summary is given in Table 3.3 of the Atterberg Limit tests and Moisture Content determinations made on three samples, one obtained from the River Terrace Deposits and the remaining two from the London Clay Formation. The results were classified for volume change potential in accordance with BRE Digest 240 and NHBC Standards Chapter 4.2.

Table 3.4 Atterberg Limit Results Classification

Stratum	M/C (%)	PI (%)	>425µm (%)	Mod PI (%)	Class	VCP NHBC	BRE
RTD	20-21	28-38	79-100	25-38	CI – CH	Medium	Medium
LCF	25-29	37-53	100	37-53	CH-CV	Medium to High	Medium to High

Note(s): BRE Volume Change Potential refers to BRE Digest 240 (based on Atterberg results). VCP=Volume Change Potential. Modified PI corrected for % retained on 425µm sieve. NHBC Volume Change Potential refers to NHBC Standards Chapter 4.2 Soils Classification based on British Soil Classification System. The Atterberg Limit Tests were undertaken in accordance with BS 1377:Part 2:1990 Clauses 3.2, 4.3 and 5

Laboratory test certificates are presented in Appendix C.1.

3.4 Sulphate and pH Tests

Water soluble sulphate (2:1) and pH testing in accordance with Building Research Establishment Special Digest 1, 2005, 'Concrete in Aggressive Ground' was undertaken on two soil samples obtained from the River Terrace Deposits and the remaining one from the London Clay Formation.

Table 3.5 Sulphate and pH Test Results

Strata	Depth (m bgl)	Sulphate Concentration (mg/l)	pH
RTD	1.50-3.00	50-150	8.2-8.4
LCF	6.00	340	8.3

The significance of the sulphate and pH test results are discussed in Section 4.3 and the laboratory test certificated presented in Appendix C.1.

3.5 Radon

Radon is a naturally occurring radioactive gas that comes from the decay of uranium in rocks and soil. In the UK, radon levels vary by region, with higher concentrations typically found in areas with granite or other uranium-rich geology, such as parts of Cornwall, Devon, the Peak District, and some areas of Wales and Scotland, however Radon Affected Areas are present in wide areas across the UK.

The UKHSA-BGS digital Indicative Atlas of Radon in the United Kingdom shows the site was situated within a 1km grid square where 3-5% of properties are above the action level for radon. This **indicates** that basic radon protective measures will likely be required within the proposed development.

The designer must obtain a site-specific Radon report from UKRadon.org and follow the guidance obtained from both the report, the Building Regulations Approved Document C and the Local Authority. Occupied basement and cellar areas are at additional risk from radon even if outside a radon affected area so further advice must be sought where these are proposed.

Section 4 Foundation Scheme

4.1 Foundation Recommendations

Foundations **must not** be constructed within any Made Ground and due to the likely variability and potential for large load-induced settlements both total and differential.

According to NHBC Standards Chapter 4.2 'Building near trees', soils of the River Terrace Deposits were classified as being of MEDIUM volume change potential (VCP) and the soils of the London Clay Formation were classified as Medium to High volume change potential.

It is understood that the client is considering a piled foundation solution, which is considered appropriate given the ground conditions encountered.

4.2 Piled Foundations

The piled foundations must be taken through any Made Ground and River Terrace Deposits into suitable strength soils of the London Clay Formation.

The construction of a piled foundation is a specialist job with the actual pile working load depending on the pile type and installation method. Prior to finalising the foundation design the advice from a reputable contractor who is familiar with the ground and groundwater conditions present at the site must be sought.

The vertical load capacities are provided for varying diameters and lengths of bored piles taken into the London Clay Formation, based on geotechnical laboratory testing and in-situ test and must only be used for preliminary design purposes.

A factor of safety of 3 was applied to the characteristic line derived from testing undertaken, for both the shaft and base load capacities.

The bearing values given in Appendix D., are applicable to single vertically loaded piles. Where piles are to be constructed in groups the bearing value of each individual pile should be reduced by a factor of about 0.8 and a calculation made to check the factor of safety against block failure.

An adhesion value (α) of 0.45 was used to calculate the skin friction and a bearing capacity factor (N_c) of 9 was adopted for the cohesive bands of the London Clay Formation.

From ground level the upper 4m of the pile shaft has been ignored in the preliminary pile design given.

To prevent necking of the green concrete, temporary casing may be required where the pile passes through the Made Ground, River Terrace Deposits or London Clay Formation and below the groundwater table (if encountered). To achieve the full bearing value a pile should penetrate the bearing stratum by at least five times the pile diameter.

No allowance has been made for negative skin friction that could be generated where piles pass through Made Ground and very soft cohesive and / or organic soils deposits underlying the site. The negative skin friction must be applied to the pile working load and must not be factored.

Guidance on the design of a working platform for piling rigs can be provided by Soils Limited in accordance with the BRE "Working platform for tracked plant, 2004" documentation.

If a piled foundation scheme is to be adopted for the proposed development, to prevent any downward migration of contaminants into the underlying groundwater/aquifers or create preferential vertical pathways between aquifers, specific piling techniques should be employed in accordance with The National Groundwater and Contaminated Land Centre Report NC/99/73: Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention published by the EA, which presents guidance on piling on contaminated sites.

4.3 Subsurface Concrete

The sulphate and pH tests carried out in accordance with BRE Special Digest 1, 2005, 'Concrete in Aggressive Ground', established the site concrete classifications for each stratum as presented in Table 4.1.

Table 4.1 Concrete Classification

Stratum	Design Sulphate Class	ACEC Class
RTD	DS-I	AC-Is
LCF	DS-I	AC-Is

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 any possible exposure of potentially pyrite bearing natural ground and the pH of the soils.

4.4 Excavations

Shallow excavations in the Made Ground/Topsoil and River Terrace Deposits are likely to be at best marginally stable in both the short and long term.

Deeper excavations and those taken below the groundwater table into the London Clay Formation are likely to be unstable and require support. Unsupported earth faces formed during excavation may be liable to collapse without warning and suitable safety precautions must therefore be taken to ensure that such earth faces are adequately supported or battered back to a safe angle of repose.

Excavations beneath the groundwater table are likely to be unstable and allowance made for shoring and dewatering of both foundation and utilities trenches.

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Appendix D Preliminary Pile Design

Appendix E Information Provided by the Client



Figure 1 – Site Location Map

Job Number
22440

Project
Land east of St Patrick's RC Church, Hayling Island,
Hampshire, PO11 0QU

Client
Billett Homes Ltd

Date
July 2026

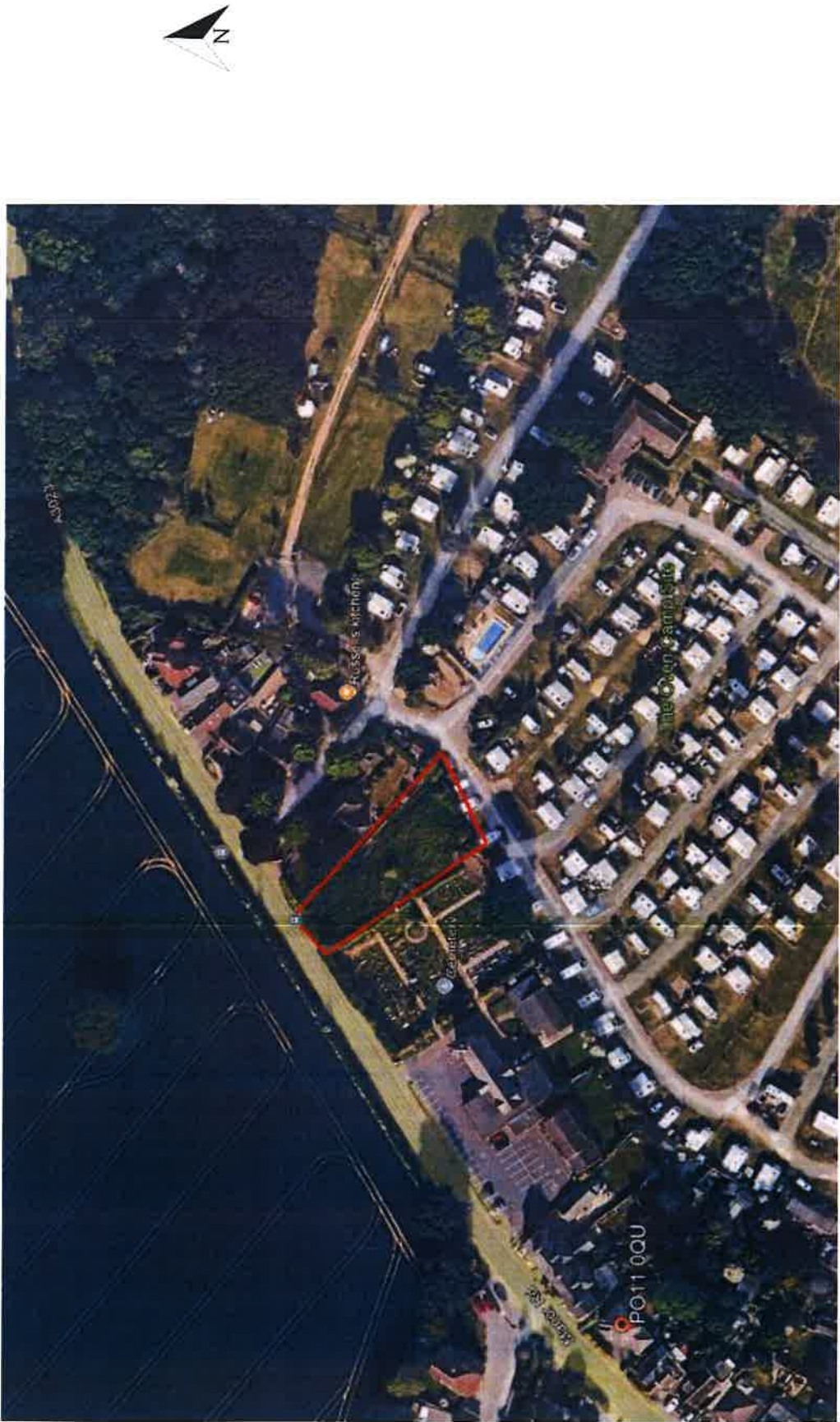


Figure 2 – Aerial Photograph

Job Number
22440

Project
Land east of St Patrick's RC Church, Hayling Island, Hampshire, PO11 0QU

Client
Billett Homes Ltd

Date
July 2026



Figure 3 – Exploratory Hole Plan

Job Number
22440

Project
Land east of St Patrick's RC Church, Hayling Island, Hampshire, PO11 0QU

Client
Billett Homes Ltd

Date
July 2026

Appendix G

Southern Water Sewer Records

