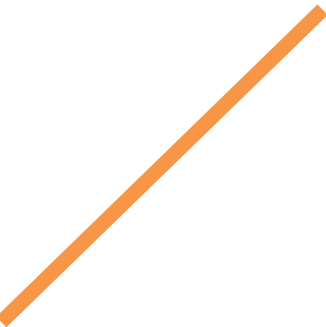




78 HAVANT ROAD,
EMSWORTH

FOUNDATION STRATEGY ASSESSMENT

AUGUST 23

BAYTREE SECURITIES LTD

FOUNDATION STRATEGY ASSESSMENT

CONTROLLED DOCUMENT

Document No:	020.7859/GIR/1A		
Status:	Original	Copy No:	1
	Name	Signature	Date
Prepared by:	Brian Morton		16/08/2023
Checked by:			
Approved by:			

Revision Record					
Rev.	Date	By	Summary of Changes	Chkd	Aprvd
A	17.08.23	BGM	Updated to suit client comments	BGM	

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FOUNDATION STRATEGY ASSESSMENT

1. INTRODUCTION

- 1.1. This Ground Investigation Review has been prepared by Paul Basham Associates on behalf of Baytree Securities Ltd to assist with the discharging of Planning condition 11 for Planning Application ref APP/22/00487
- 1.2. The site is located on the Havant Road, Emsworth, PO10 7LH on the Southern side of the road.
- 1.3. The site location is demonstrated within Figure 1, showing the approximate site boundary.
- 1.4. The current site is currently occupied by a 5 Bedroomed dwelling and associated outbuildings due for demolition.
- 1.5. This report will assess the site in respect of a foundation assessment.



Figure 1: Site Location (Source: Google Earth)

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2. INFORMATION USED AS PART OF REVIEW

2.1. The recommendation presented, in respect of the foundations for the site, are based on the following documents:

- HRP Architects Proposed Site Layout (8993_01/REV C)
- Geotechnical Design Report (J22-037-R01/July23)
- Bernie Harverson Arboricultural Consultants Arboricultural Impact Assessment & Method statement (1225.bjh.Apr22)
- Bernie Harverson Arboricultural Consultants Tree Constraints Plan BJH 01/02
- Bernie Harverson Arboricultural Consultants Tree Protection Plan BJH 03/04
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2.2. The British Geological Survey website indicates the following ground conditions on the site.

Bedrock Geology



Figure 2: Bedrock Geology (Source: British Geological Survey Website)

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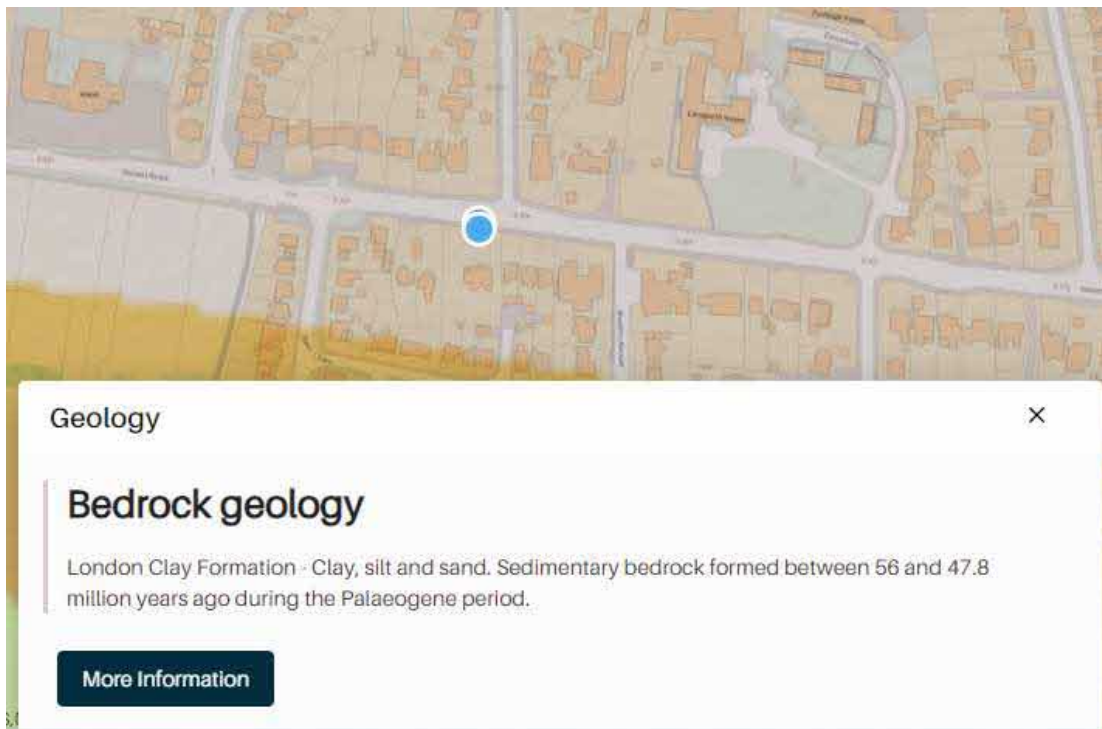


Figure 3: Bedrock Geology Descriptions (Source: British Geological Survey Website)

Superficial Geology

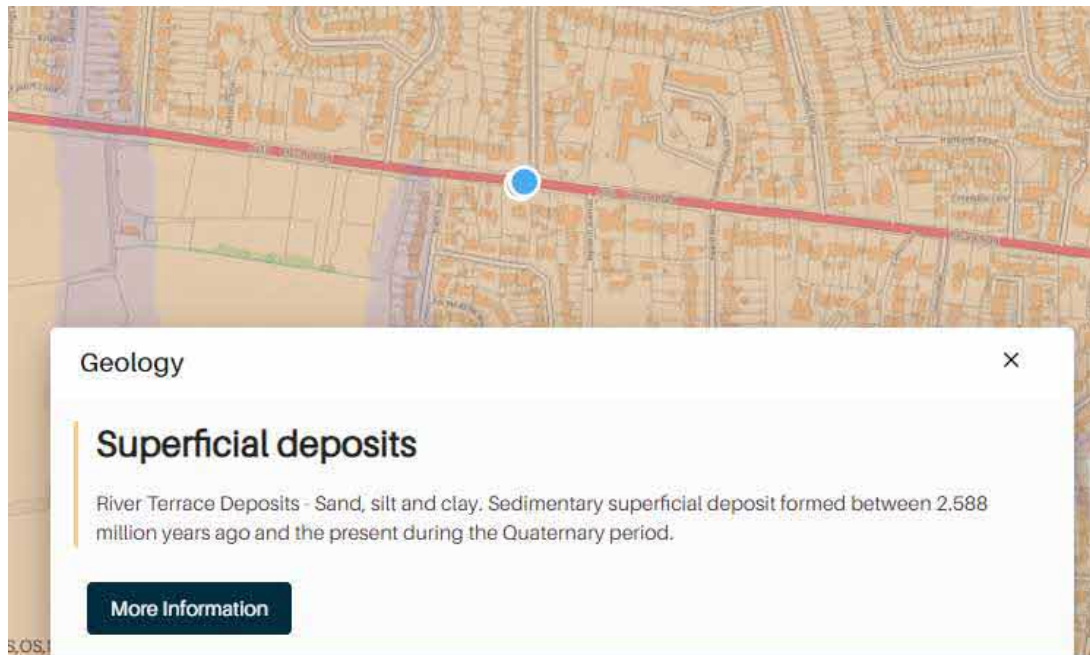


Figure 4: Superficial Deposits (Source: British Geological Survey Website)

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3. REVIEW OF PROPOSED SITE PLAN

- 3.1. The proposed site plan indicates the arrangement of the 9no. assisted living apartments contained within a single structure.
- 3.2. The site occupies approximately 0.4 hectares (ha) and is located approximately 1Km from the centre of Emsworth.
- 3.3. Assuming that the buildings will be of traditional construction, we would anticipate a maximum foundation line load of 90-120 kN/m. Although, this will vary depending on the developed structural arrangements.
- 3.4. There are a number of proposed trees shown on the site plan. Tree species and location will need to be considered when determining the final foundation depths, in accordance with NHBC Chapter 4.2.

4. REVIEW OF TOPOGRAPHICAL SURVEY DRAWING

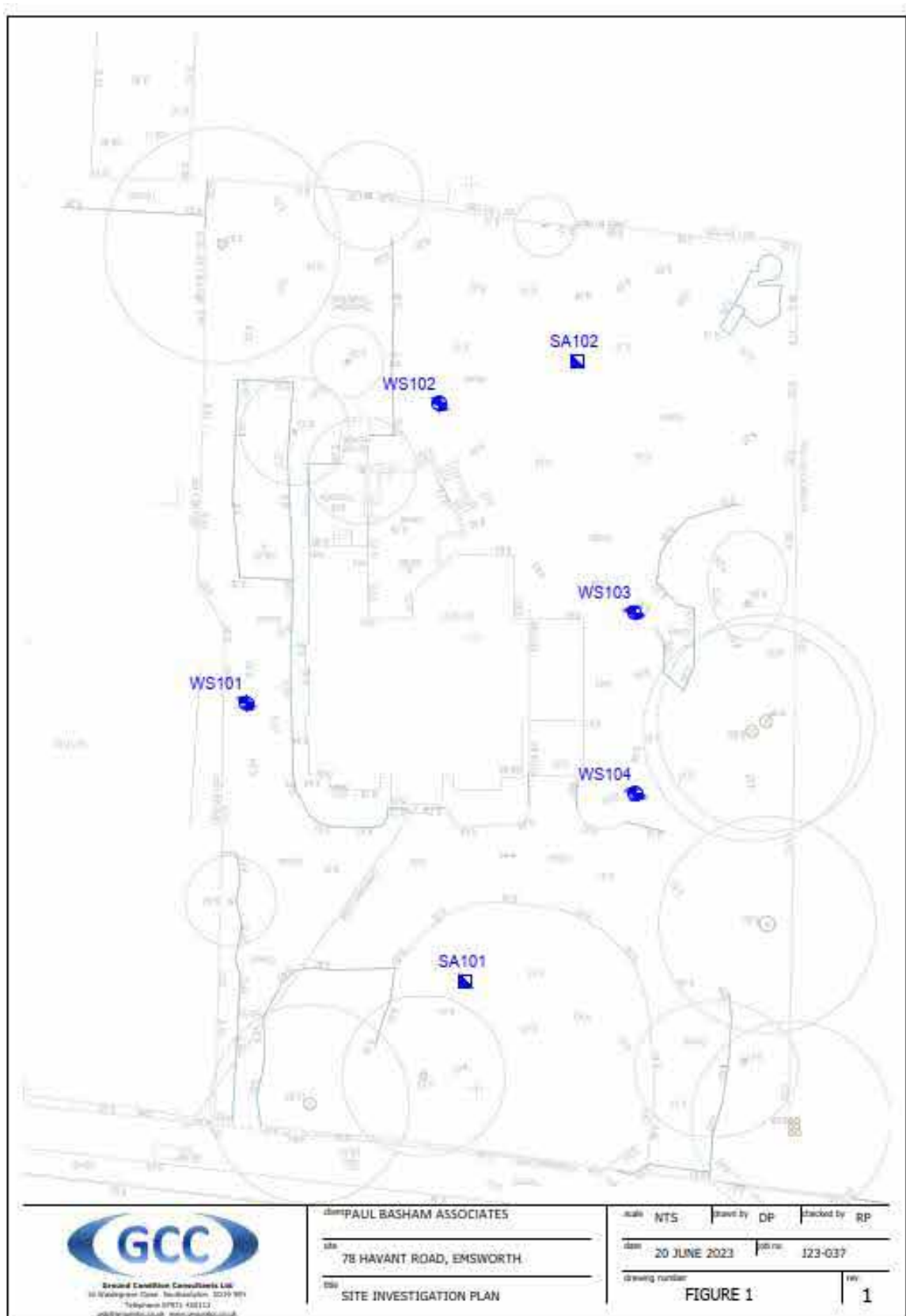
- 4.1. The site is noted as generally flat and level.
- 4.2. There is an existing residential property and associated outbuildings due to be demolished to facilitate the scheme on site.
- 4.3. The site is bounded by residential housing to the East, West and South. The Northern Boundary is formed by Havant Road (A259).

5. REVIEW OF GROUND APPRAISAL

- 5.1. The investigation involved undertaking an intrusive geotechnical and geo-environmental ground investigation and included laboratory testing to inform geotechnical and geo-environmental assessments for the proposed development. In addition, soakage tests were carried out to understand the permeability characteristics of the ground to assess if Soakaways could be used.
- 5.2. An intrusive ground investigation was undertaken on 13th June 2023 comprising:
 - 4No. Windowless sample boreholes (WS101-WS104) to depths of up to 5.45m bgl.
 - 2No. Soakage Tests (SA1 & SA2) in general accordance with BRE Digest 365 over a single day test period.

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Figure 6: Trial Hole Location Plan (Source: Geo-Environmental Ground Appraisal Report)

5.3. Strata Description

The ground conditions encountered comprised a mantle of Topsoil overlying fine to coarse grained River Terraced Deposits overlying Silty Clay of the London Clay Formation.

Location	Made Ground/Topsoil		River Terrace Deposits		London Clay Formation	
	From (mbgl)	Thickness (m)	From (mbgl)	Thickness (m)	From (mbgl)	Thickness (m)
WS101	GL	0.25	0.25	2.65	2.90	>2.55
WS102	GL	0.40	0.40	2.50	2.90	>2.55
WS103	GL	0.35	0.35	2.85	3.20	>2.25
WS104	GL	0.30	0.30	3.10	3.40	>2.05

Figure 5: Summary of encountered ground conditions (GCC Report)

5.4. Groundwater

- Groundwater was recorded at depths of between 2.0m and 2.50m bgl and a secondary water strike at 4.00m bgl in WS102. The secondary water strike is assumed to be a confined to a fracture or sandy horizon in the London Clay although neither was noted in the arisings.
- Return groundwater monitoring was carried out on 20th June indicated the natural equilibrium for Ground water was between 2.00 and 2.5m bgl during this time.

5.5. Ground Gas

- No gas protection measures were considered to be required.

5.6. Concrete in Aggressive Soils

- Buried concrete for shallow foundations should be designed to Class DS-1 of BRE Special Digest 1, with an ACEC class of AC-1.

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5.7. Ground Stability/Excavations

- Shallow excavations up to 1.50m deep which do not encounter groundwater may remain stable in the short term only, however, allowance for trench support, sacrificial shuttering or battering of excavations should be made along with dewatering.
- Large scale excavations (i.e. longer and/or deeper) and those left unsupported for long time periods are likely to be unstable and require support or battering.
- Deeper excavations are more likely to encounter groundwater and require dewatering.
- The stability of all excavations will also be reduced where exposed to surface water, perched water or groundwater, which is also likely to result in softening of the clays and running sands where encountered.
- It should be noted that groundwater varies seasonally and in response to precipitation events such as that even shallow excavations may encounter groundwater depending on the season and preceding weather conditions.

5.8. Tree Influence on Foundations

- The River Terrace Deposits were assessed to be of medium volume change potential based on laboratory testing. The clay soils of the London Clay Formation were assessed to be of high volume change potential.
- For the purposes of this report we are basing our recommendations on Medium Volume Change Potential with the foundations located in the River Terrace deposits
- Based on the volume change potential, proprietary suspended ground floor slabs are to be designed with a minimum 300mm void.
- Based on NHBC guidelines, the minimum foundation depth to account for volume change potential would be 1.00mbgl, however, deep foundations would be required to account for suitable formation levels and the impact of trees in accordance with NHBC chapter 4.2 guidelines.
- Void formers would be required where foundation depths a greater than 1.50mbgl due to the impact of existing trees.

5.9. Bearing Capacity at Formation

- An Ultimate bearing capacity of 120kPa for the granular soils of the River Terrace Deposits is recommended.
- Where foundations span varying geology or differing strata such as a mix of clay and gravel identified within the River Terrace Deposits, reinforcement may be required.

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6. TREE RING ASSESSMENT

Final depths to be calculated in accordance with NHBC chapter 4.2 guidelines, allowing for Medium Volume Change Potential.

6.1. Impact of Existing Trees

- An assessment of the existing trees has been carried out. On the Western elevation foundations will need to be a minimum of 2.1m below ground level taking into account the existing Hawthorn tree

6.2. Impact of Proposed Trees

- For the purposes of this report, we have ignored the impact of proposed trees, however, proposed planting will need to be considered as part of the design and calculation of final foundation depths. It is considered based on the Arboricultural report that the proposed planting will not have any impact on the proposed scheme.

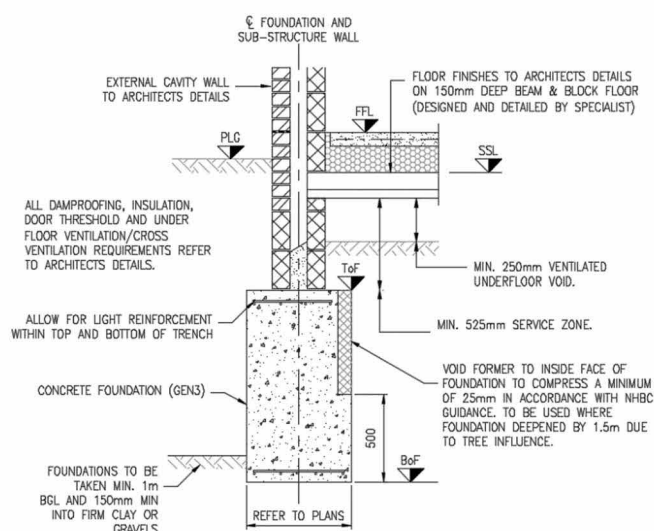
7. CONCLUSIONS

Based on the information presented in this report and the information provided in the GCC Geotechnical report referred to, piled foundations will not be necessary for this project. The very nature of the underlying strata and the proposed scheme negate the use of piles as a foundation solution.

We would anticipate traditional trench fill mass concrete foundations bearing at a minimum bearing depth 1m bgl being suitable throughout for this site.

Where foundations encroach into the 1.5m tree influence zone, heave precautions will be required to provide a void former to the inside face of external foundations to compress a minimum of 25mm.

We would anticipate the following form of construction, however, please note this would be subject to change as part of the design process.



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Risks Affecting Foundations

- Groundwater levels across the site, potentially resulting in a requirement for temporary dewatering or pumping when excavating foundations around deeper excavations.
- Unstable ground, potentially resulting in need for temporary works to ensure trench stability when excavating foundations, particularly where foundations are into the groundwater.
- Medium / High volume change potential soil recorded and proximity of trees to the proposed building particularly on the Western elevation of the site resulting in heave protection measures in accordance with NHBC chapter 4.2 requirements. Proposed trees may have an impact on final foundation depths.
- Any soakaways should be located a sufficient distance away from buildings and infrastructure, in order to prevent undermining of foundations.