

# GEOTECHNICAL REPORT

|               |                                                              |
|---------------|--------------------------------------------------------------|
| Site Address: | Ware Priory Lido, Priory Street, Ware, SG12 0DE              |
| Report Date:  | 28 <sup>th</sup> June 2024                                   |
| Project No.:  | 18980                                                        |
| Prepared for: | Ware Town Council<br>The Priory, High Street, Ware, SG12 9AL |



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## APPENDICES

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## SUMMARY

**ADDRESS:** Ware Priory Lido, Priory Street, Ware, SG12 0DE

### FOUNDATION OVERVIEW

| Location | Description                                       |
|----------|---------------------------------------------------|
| TP1      | Stepped concrete footing founded at 0.65m bgl     |
| TP2      | Stepped concrete footing founded beyond 0.70m bgl |

### SOILS PROFILE

| Location | Depths                | Made Ground                                                                 | Natural Soils                                |
|----------|-----------------------|-----------------------------------------------------------------------------|----------------------------------------------|
| TP1      | GL – 0.20m bgl        | Paving over Sand & Type 1 MOT                                               |                                              |
|          | 0.20m bgl – 0.80m bgl | Compact dark brown / black slightly silty claybound brick & gravel          |                                              |
| TP2      | GL – 0.20m bgl        | Paving over Sand & Type 1 MOT                                               |                                              |
|          | 0.25m bgl – 1.40m bgl | Compact dark brown / black slightly silty claybound brick & gravel          |                                              |
| BH1      | GL – 0.30m bgl        | Grass over a loose dark brown slightly claybound TOPSOIL                    |                                              |
|          | 0.30m bgl – 1.70m bgl | Compact dark brown / black slightly silty claybound brick, gravel & clinker |                                              |
|          | 1.70m bgl – 2.90m bgl |                                                                             | Soft dark brown silty CLAY with lens of PEAT |
|          | 2.40m bgl – 3.00m bgl |                                                                             | Medium dense orange, brown GRAVEL            |
| BH2      | GL – 1.20m bgl        | Grass over a loose dark brown slightly claybound TOPSOIL                    |                                              |
|          | 1.20m bgl – 2.90m bgl |                                                                             | Soft dark brown silty CLAY with lens of PEAT |
|          | 2.90m bgl – 3.60m bgl |                                                                             | Medium dense grey claybound SAND & GRAVEL    |
|          | 3.60m bgl – 5.00m bgl |                                                                             | Medium dense grey claybound SAND & GRAVEL    |

### ROOT SYSTEM OVERVIEW

| Location | Depth Recorded                             | Identification (If completed) |
|----------|--------------------------------------------|-------------------------------|
| TP1      | Roots encountered to the close (0.80m bgl) | -                             |
| TP2      | Roots encountered to the close (0.70m bgl) | -                             |
| BH1      | Roots encountered to 0.60m bgl)            | -                             |
| BH2      | Roots encountered to 2.70m bgl             | -                             |

### GROUNDWATER OVERVIEW

| Location | Depth Water Struck | Depth of Standing Water | Rate of Inflow |
|----------|--------------------|-------------------------|----------------|
| TP1      | DRY                | -                       | -              |
| TP2      | DRY                | -                       | -              |
| BH1      | 2.90m bgl          | 2.20m bgl               | Steady         |
| BH2      | 3.10m bgl          | 1.70m bgl               | Steady-        |

### SOIL ANALYSIS: Cohesive Soils

|                                       |                                                                                       |
|---------------------------------------|---------------------------------------------------------------------------------------|
| Casagrande Plasticity Classification: | High - Extremely High                                                                 |
| Plasticity Index:                     | 23 -74%                                                                               |
| NHBC Shrinkability Classification:    | Moderate - High                                                                       |
| Significant Desiccation:              | No significant desiccation was recorded within the samples tested from the site works |
| Sulphate Content:                     | DS-1/AC-1s                                                                            |

### SOIL ANALYSIS: Granular Soils

|                |                                   |
|----------------|-----------------------------------|
| Fines Content: | SAND & GRAVEL geology < 35% fines |
|----------------|-----------------------------------|

## 1. Introduction

- 1.1 All site investigation works have been undertaken in accordance with BS5930:2015+A1:2020, (Code of Practice for Ground Investigations).
- 1.2 In accordance with your instructions, we visited the above site on the 10<sup>th</sup> & 18<sup>th</sup> of June 2024.
- 1.3 The comments and opinions expressed are based purely on the soil and groundwater conditions identified within this report and the subsequent laboratory testing.
- 1.4 Some special condition may be present on site that, to date, has not been encountered within the scope of the site investigation works completed and therefore may not have been considered within the report. The findings of this report are based on the soil and groundwater sampling completed at the locations tested.
- 1.5 Unless otherwise stated, all groundwater recordings relate to short term observations and do not consider fluctuations in elevation due to seasonal, tidal, or other effects. It is possible that fluctuations in the groundwater elevation may have an impact on the proposed design and as such, it is recommended that long term monitoring is undertaken to obtain accurate information relevant to the proposed design in terms of the ground water elevation.

## 2. Description of Site

- 2.1 The site is formed by a single storey structure in use as reception area and changing rooms for the outdoor swimming pools surrounded soft and hard landscaped areas.
- 2.2 The site is shown within the British Geological Survey Online Geology Viewer (Scale 1:50 000, Solid & Drift), which shows that the site situated with an area of Kempton Park Gravel Member - Sand and gravel over Lewes Nodular Chalk Formation and Seaford Chalk Formation - Chalk.

## 3. Fieldwork

- 3.1 In order to assess the site, the following site investigation works were implemented.
  - 2 No. Dynamic Competitor Rig boreholes, along with Dynamic Probes were sunk to a maximum depth of 10.00 meters.
  - A groundwater monitoring well has been installed within a borehole undertaken upon the site for the purpose of groundwater monitoring. This was sunk in BH2.
  - 2 No. Hand excavated trial pits were undertaken to a maximum depth of 0.80m bgl.
  - 2 No. Concrete cores
  - Geotechnical Laboratory Testing
- 3.2 The location of these works is indicated on the site plan-forming Appendix 1.
- 3.3 The various strata encountered were noted and are recorded on the excavation logs forming Appendix 2.
- 3.4 Full ranges of samples were recovered as noted and retained for subsequent laboratory testing.

## 4. Laboratory Testing

- 4.1 Laboratory testing has been undertaken in accordance with BS 1377-2:2022, (Methods for Tests for Soils for Civil Engineering Purposes), the results of which are enclosed.

- 4.2 Selected samples were recovered to determine their Atterberg Limits, Particle Size Distribution Testing, Hand Penetrometer Testing, Soluble Sulphate value and pH.
- 4.3 The results of this laboratory testing are enclosed and form Appendix 3.

## 5. Fieldwork Results

- 5.1 The existing footing details have been recorded and detailed within the logs forming appendix 2 and summarised below.

*Table 1 Footing Details*

| Location   | Description                                       |
|------------|---------------------------------------------------|
| <b>TP1</b> | Stepped concrete footing founded at 0.65m bgl     |
| <b>TP2</b> | Stepped concrete footing founded beyond 0.70m bgl |

- 5.2 Based on the borehole logs which can be found forming Appendix 2 a reviewed of the geology within the site is as follows: -

*Table 2 Geological Profile*

| Location   | Depths                | Made Ground                                                                 | Natural Soils                                |
|------------|-----------------------|-----------------------------------------------------------------------------|----------------------------------------------|
| <b>TP1</b> | GL – 0.20m bgl        | Paving over Sand & Type 1 MOT                                               |                                              |
|            | 0.20m bgl – 0.80m bgl | Compact dark brown / black slightly silty claybound brick & gravel          |                                              |
| <b>TP2</b> | GL – 0.20m bgl        | Paving over Sand & Type 1 MOT                                               |                                              |
|            | 0.25m bgl – 1.40m bgl | Compact dark brown / black slightly silty claybound brick & gravel          |                                              |
| <b>BH1</b> | GL – 0.30m bgl        | Grass over a loose dark brown slightly claybound TOPSOIL                    |                                              |
|            | 0.30m bgl – 1.70m bgl | Compact dark brown / black slightly silty claybound brick, gravel & clinker |                                              |
|            | 1.70m bgl – 2.90m bgl |                                                                             | Soft dark brown silty CLAY with lens of PEAT |
|            | 2.40m bgl – 3.00m bgl |                                                                             | Medium dense orange, brown GRAVEL            |
| <b>BH2</b> | GL – 1.20m bgl        | Grass over a loose dark brown slightly claybound TOPSOIL                    |                                              |
|            | 1.20m bgl – 2.90m bgl |                                                                             | Soft dark brown silty CLAY with lens of PEAT |
|            | 2.90m bgl – 3.60m bgl |                                                                             | Medium dense grey claybound SAND & GRAVEL    |
|            | 3.60m bgl – 5.00m bgl |                                                                             | Medium dense grey claybound SAND & GRAVEL    |

**Table 3 Groundwater Overview**

| Location | Depth Water Struck | Depth of Standing Water                                                          | Rate of Inflow |
|----------|--------------------|----------------------------------------------------------------------------------|----------------|
| TP1      | DRY                | -                                                                                | -              |
| TP2      | DRY                | -                                                                                | -              |
| BH1      | 2.90m bgl          | 2.20m bgl                                                                        | Steady         |
| BH2      | 3.10m bgl          | 1.70m bgl (10 <sup>th</sup> June 2024)<br>1.49m bgl (18 <sup>th</sup> June 2024) | Steady-        |

- 5.3 Groundwater records, unless otherwise stated, are based on short-term observations, and do not allow for or consider seasonal or other fluctuations, global warming, or periods of excessive wet or dry weather. All groundwater records are noted at the time of the drilling works and any other subsequent groundwater readings taken which, if present, are shown. Should the development be reliant on groundwater impacting on either below ground excavations, basements or short- or long-term excavations, HESI would recommend the installation of standpipes to depths relevant to any proposed excavation works and a period of either short- or long-term monitoring. This can be completed on request.
- 5.4 Roots were encountered within the boreholes based on examination of the soil samples across the site as shown below and recorded within the attached sample logs in Appendix 2.

**Table 4 Root Depths**

| Location | Depth Recorded                             | Identification (If completed) |
|----------|--------------------------------------------|-------------------------------|
| TP1      | Roots encountered to the close (0.80m bgl) | -                             |
| TP2      | Roots encountered to the close (0.70m bgl) | -                             |
| BH1      | Roots encountered to 0.60m bgl)            | -                             |
| BH2      | Roots encountered to 2.70m bgl             | -                             |

- 5.5 In addition to above site works, two concrete core samples were undertaken through the internal floor in order to detail the existing construction. The results of this testing can be found within the attached appendices.

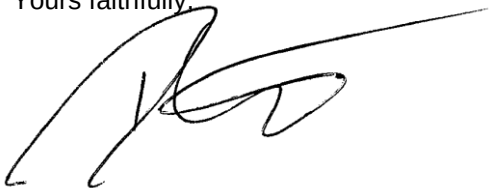
## 6. Results

- 6.1 By inspection of the borehole logs and from a visual assessment of the samples recovered, a scheme of laboratory testing has been undertaken. The results are enclosed within Appendix 3 and prove the following:
- 6.2 Hand Penetrometer tests have been undertaken disturbed samples recovered from the site works. From the information gathered, it is recorded that cohesion values of between 90 – 120 kN/m<sup>2</sup> were achieved.
- 6.3 Within the underlying SAND & GRAVEL geology, SPT 'N' values of between 1 – 28 were achieved. Therefore, the minimum safe bearing capacity of 10 kN/m<sup>2</sup> can be used within the design, although due to groundwater being present upon the site this value should be halved for use within the design.
- 6.4 Atterberg Limits tests proved the clay soils to be of High – Extremely High plasticity, (PI= 23 - 74 %), which indicates a Moderate - High susceptibility to movement associated with moisture content change.

- 6.5 A measurement of the potential desiccation has been completed using Driscoll's Method of Desiccation Analysis which uses a comparison of moisture content profiles measures against the liquid limit measured in the Atterberg Limits test. This assumes as to the state of the soil moisture content against the state of the soil in its liquid state to assess desiccation. Driscoll makes a comparison that the soils would likely be in a state of slight desiccation if the moisture content of the soil was less than 0.5 multiplied by the liquid limit state of the soil, (slight desiccation being a level of desiccation at which overburden pressure may influence), and significant desiccation if the moisture content of the soil was less than 0.4 multiplied by the liquid limit, (significant desiccation being a level which would be unnatural to reduce to and therefore influenced by surrounding trees or vegetation). This is a mathematical representation of the state of the clay and does not consider overburden pressure which may form a factor in this calculation.
- 6.6 If the state of desiccation is a driving factor to consider foundation design, HESI would recommend the use of soil suction analysis utilising a control borehole as a comparison against desiccation levels which will provide a more accurate depiction of tree influence at that time.
- 6.7 Utilizing Driscoll's method of assessment, no significant desiccation has been identified within the samples tested, which would indicate that the underlying clay has not been impacted by the presence of the surrounding trees and vegetation to such an extent as to excessively dry out the soil.
- 6.8 Included within the laboratory testing was sulphate analysis, which can determine the use of sulphate resisting cement within the foundation design for the development. The results are enclosed and prove the classification in accordance with ACEC to be DS- 1 /AC-1S.
- 6.9 Particle Size Distribution Testing has been completed on the made ground at the site in order to assess the granular content of the soils. Based on the information gained, we can confirm that the soils tested contained less than 35% fines and as such, can be considered non shrinkable when subjected to moisture content change.

I hope the foregoing is sufficient for your requirements, although please do not hesitate to contact us should require any further information regarding the above.

Yours faithfully,



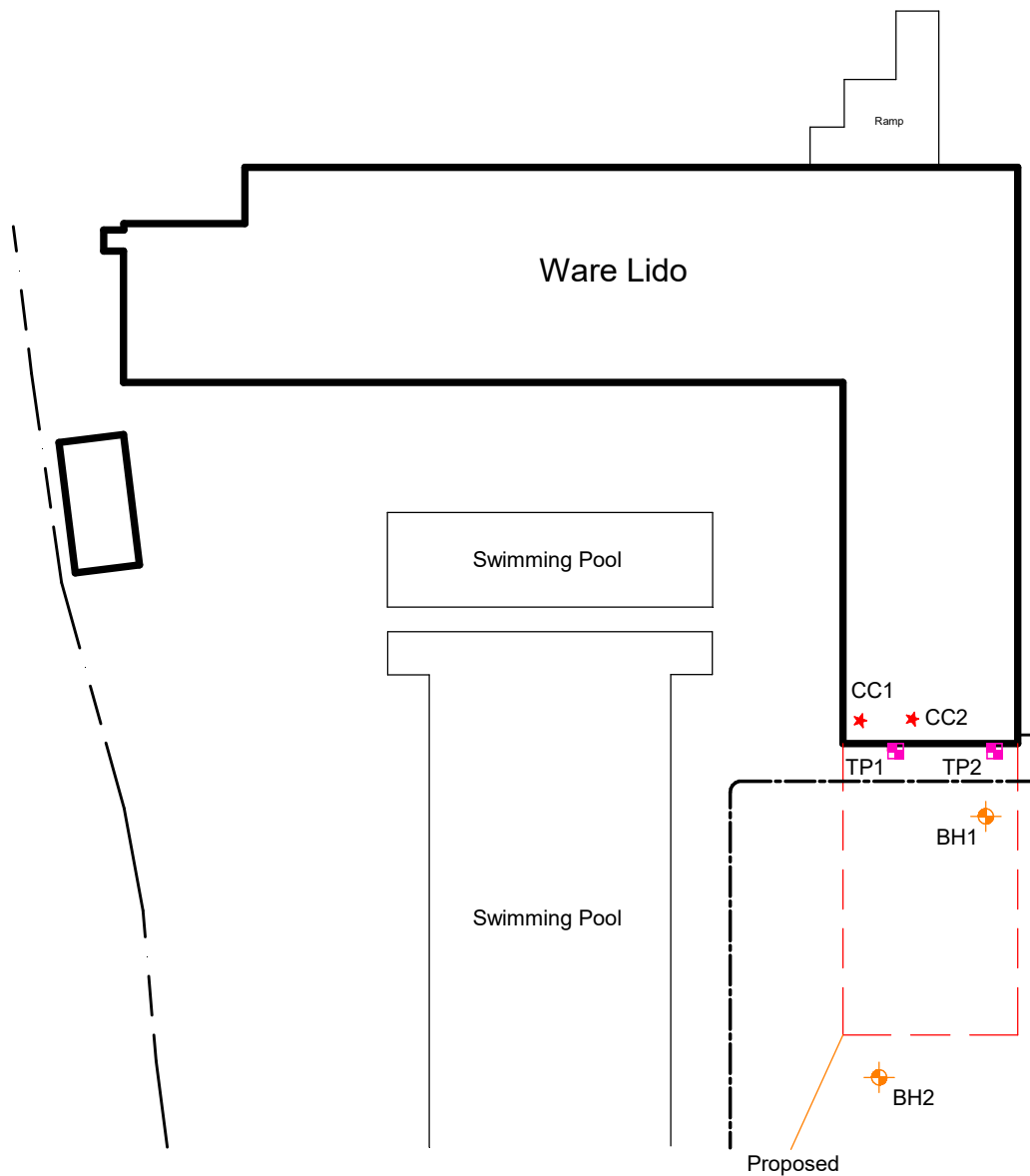
D A Hudd  
Senior Contract Engineer



C S Gray PG Dip, PG Cert, M.Sc  
Managing Director

## Ware Priory Lido, Priory Street, Ware, SG12 0DE

### Site Plan



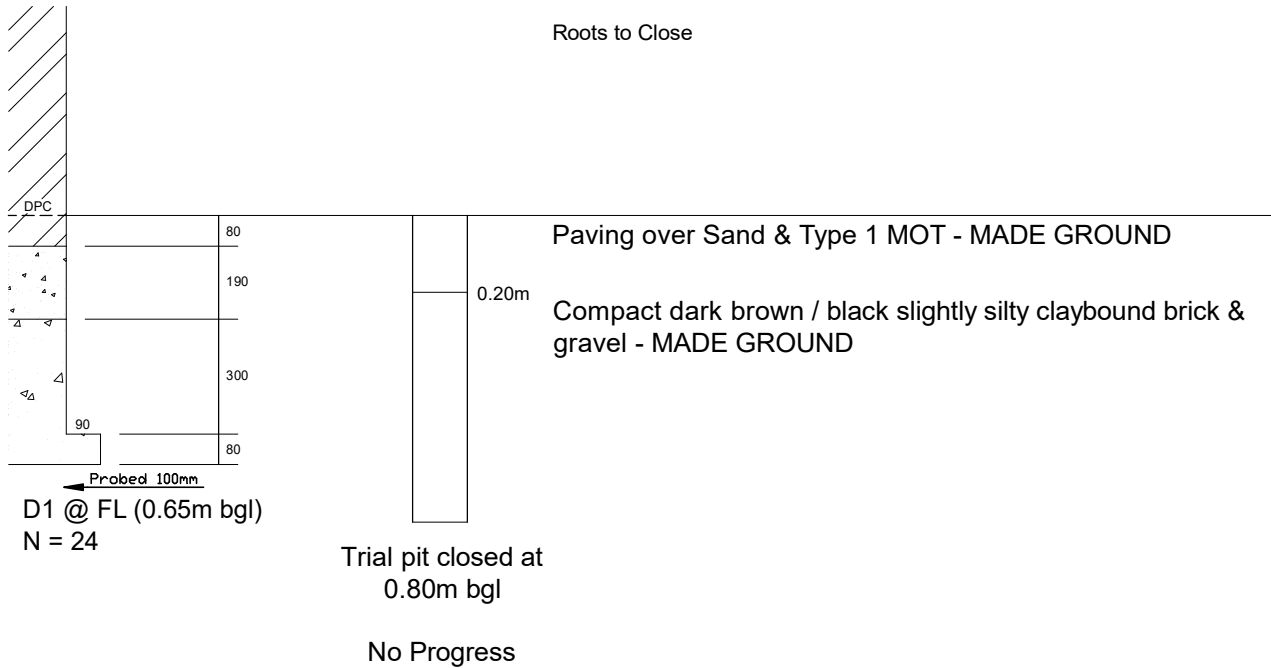
Not to Scale





Ware Priory Lido, Priory Street, Ware, SG12 0DE

Trial Pit No. One



Remarks

Scale 1 : 20

Key : U - Undisturbed Sample  
(100mm diameter)

B - Bulk Sample  
- Water Struck

D - Disturbed Sample  
- Water Standing

W - Water Sample  
T - Chemical Tub

N - SPT N-Value  
V - Vane Test, (kN.m<sup>2</sup>)



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Appendix No 2

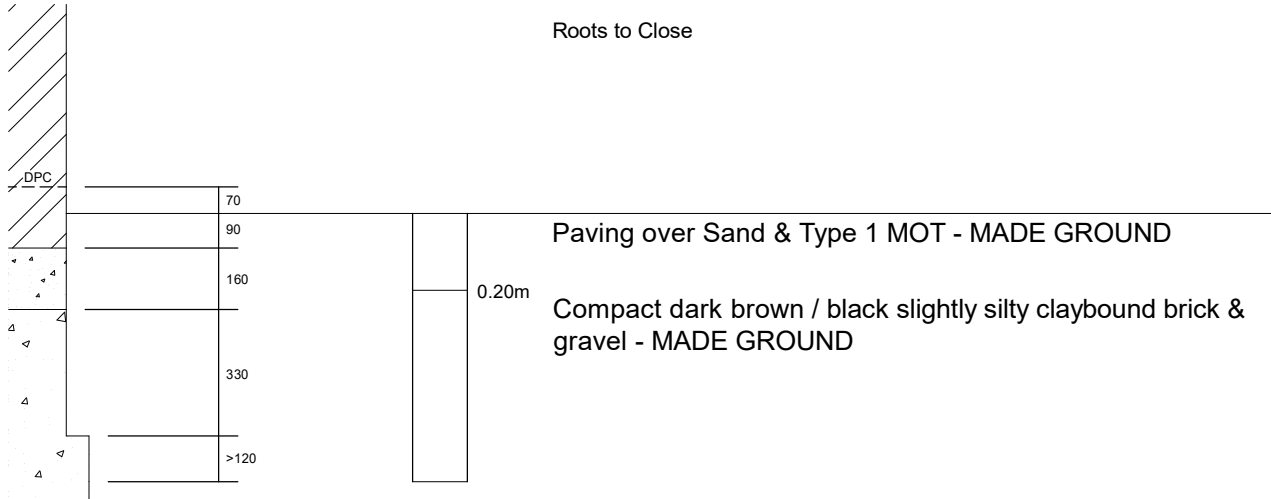
Sheet No 2

Job No 18980

Date June 2024

Ware Priory Lido, Priory Street, Ware, SG12 0DE

Trial Pit No. Two



Trial pit closed at  
0.70m bgl

No Progress

Remarks

Scale 1 : 20

Key : U - Undisturbed Sample  
(100mm diameter)

B - Bulk Sample  
- Water Struck

D - Disturbed Sample  
- Water Standing

W - Water Sample  
T - Chemical Tub

N - SPT N-Value  
V - Vane Test, (kN.m<sup>2</sup>)

## Ware Priory Lido, Priory Street, Ware, SG12 0DE

## Borehole One

| Description of Stratum                                                                    | Legend | Depth | Thickness (m) | Water Level | Samples |      |             | S.P.T N-Value or Vane Strength | VOC's (ppm) | Installations | Casing Depth, (m) |
|-------------------------------------------------------------------------------------------|--------|-------|---------------|-------------|---------|------|-------------|--------------------------------|-------------|---------------|-------------------|
|                                                                                           |        |       |               |             | No      | Type | Depth (m)   |                                |             |               |                   |
| Grass over a loose dark brown slightly silty TOPSOIL - MADE GROUND                        |        | 0.30  | 0.30          |             | 1       | U    | G.L. - 1.00 |                                |             |               |                   |
| Compact dark brown / black slightly silty claybound brick, gravel & clinker - MADE GROUND |        |       | 1.40          |             | 2       | U    | 1.00 - 2.00 | N=5                            |             |               |                   |
|                                                                                           |        | 1.70  |               |             |         |      |             |                                |             |               |                   |
| Soft dark brown silty CLAY with lens of PEAT                                              |        |       | 1.20          |             | 3       | U    | 2.00 - 3.00 | N=6                            |             |               |                   |
|                                                                                           |        |       |               | ▽ 2.20      |         |      |             |                                |             |               |                   |
|                                                                                           |        | 2.90  |               | Steady ▼    |         |      |             |                                |             |               |                   |
| Medium dense orange brown GRAVEL                                                          |        | 3.00  |               | 2.90        |         |      |             |                                |             |               |                   |
| Borehole closed at 3.00m bgl                                                              |        |       |               |             |         |      |             |                                |             |               | 3.00              |
| The borehole was then continued by means of Dynamic Probe to a depth of 10.00m bgl        |        |       |               |             |         |      |             |                                |             |               |                   |

Remarks - Roots encountered to 0.60m bgl

Scale 1 : 25

Key : U - Undisturbed Sample  
(100mm diameter)

B - Bulk Sample  
▼ - Water Struck

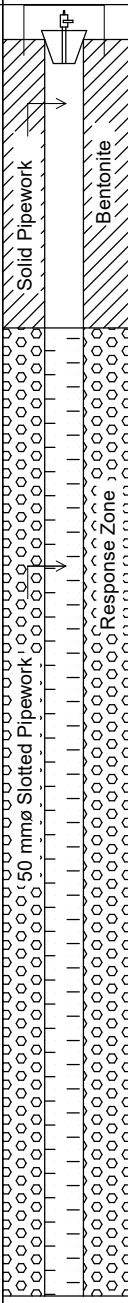
D - Disturbed Sample  
◊ - Water Standing

W - Water Sample  
T - Chemical Tub

N - SPT N-Value  
V - Vane Test, (kN.m²)

## Ware Priory Lido, Priory Street, Ware, SG12 0DE

## Borehole Two

| Description of Stratum                                             | Legend | Depth | Thickness (m) | Water Level    | Samples |      |             | S.P.T N-Value or Vane Strength | VOC's (ppm) | Installations                                                                        | Casing Depth, (m) |
|--------------------------------------------------------------------|--------|-------|---------------|----------------|---------|------|-------------|--------------------------------|-------------|--------------------------------------------------------------------------------------|-------------------|
|                                                                    |        |       |               |                | No      | Type | Depth (m)   |                                |             |                                                                                      |                   |
| Grass over a loose dark brown slightly silty TOPSOIL - MADE GROUND |        |       | 1.20          |                | 1       | U    | G.L. - 1.00 |                                |             |  |                   |
|                                                                    |        | 1.20  |               |                | 2       | U    | 1.00 - 2.00 | N=6                            |             |                                                                                      |                   |
| Soft dark brown silty CLAY with lens of PEAT                       |        |       | 1.70          | 1.70           | 3       | U    | 2.00 - 3.00 | N=1                            |             |                                                                                      |                   |
|                                                                    |        | 2.90  |               |                | 4       | U    | 3.00 - 4.00 | N=28                           |             |                                                                                      |                   |
| Medium dense grey claybound SAND & GRAVEL                          |        |       | 0.70          | Steady<br>3.10 |         |      |             |                                |             |                                                                                      | 3.00              |
|                                                                    |        | 3.60  |               |                | 5       | U    | 4.00 - 5.00 | N=13                           |             |                                                                                      |                   |
| Loose - medium dense orange brown GRAVEL                           |        |       |               |                |         |      |             |                                |             |                                                                                      |                   |
| Borehole closed at 5.00m bgl                                       |        | 5.00  |               |                | 5       | U    | 5.00        | N=10                           |             |                                                                                      |                   |

Remarks - The borehole was then continued by means of Dynamic Probe to a depth of 10.00m bgl  
Roots encountered to 2.70m bgl

Scale 1 : 25

Key : U - Undisturbed Sample  
(100mm diameter)

B - Bulk Sample  
- Water Struck

D - Disturbed Sample  
- Water Standing

W - Water Sample  
T - Chemical Tub

N - SPT N-Value  
V - Vane Test, (kN.m<sup>2</sup>)



## Ware Priory Lido, Priory Street, Ware, SG12 0DE

### Concrete Core One

| LEGEND | DEPTH<br>BELOW<br>G.L. | LEVEL<br>A.O.D | THICKNESS<br>OF<br>OF<br>STRATA | DESCRIPTION OF STRATA               | SAMPLES |      |       | WATER<br>LEVELS | CASING<br>LEVELS |
|--------|------------------------|----------------|---------------------------------|-------------------------------------|---------|------|-------|-----------------|------------------|
|        |                        |                |                                 |                                     | NO.     | TYPE | DEPTH |                 |                  |
|        | 0.13                   |                | 0.13                            | Dense concrete screed               |         |      |       | DRY             |                  |
|        | 0.20                   |                | 0.07                            | Dense concrete                      |         |      |       |                 |                  |
|        | 0.25                   |                | 0.05                            | Weak concrete with many VOIDS       |         |      |       |                 |                  |
|        | 0.46                   |                | 0.21                            | Dense concrete                      |         |      |       |                 |                  |
|        | 0.53                   |                | 0.07                            | Weak concrete with many VOIDS       |         |      |       |                 |                  |
|        |                        |                |                                 | Concrete core complete at 0.53m bgl |         |      |       |                 |                  |

## Concrete Core Two

| LEGEND | DEPTH<br>BELOW<br>G.L. | LEVEL<br>A.O.D | THICKNESS<br>OF<br>STRATA | DESCRIPTION OF STRATA                      | SAMPLES |      |       | WATER<br>LEVELS | CASING<br>LEVELS |
|--------|------------------------|----------------|---------------------------|--------------------------------------------|---------|------|-------|-----------------|------------------|
|        |                        |                |                           |                                            | NO.     | TYPE | DEPTH |                 |                  |
|        | 0.50                   |                | 0.50                      | 30mm Screed, over Weak Concrete with voids |         |      |       | DRY             |                  |
|        | 0.70                   |                | 0.20                      | Dense Concrete                             |         |      |       |                 |                  |
|        |                        |                |                           | Concrete core complete at 0.53m bgl        |         |      |       |                 |                  |

Key : U - Undisturbed Sample  
(100mm **diameter**)

B - Bulk Sample  
 - Water Struck

D - Disturbed Sample  
 - Water Standing

W - Water Sample  
T - Chemical Tub

N - SPT N-Value  
V - Vane Test, (kN.m<sup>2</sup>)



# HESI

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Geotechnical Assessments | Environmental Assessments | Desktop Studies | Contamination Analysis

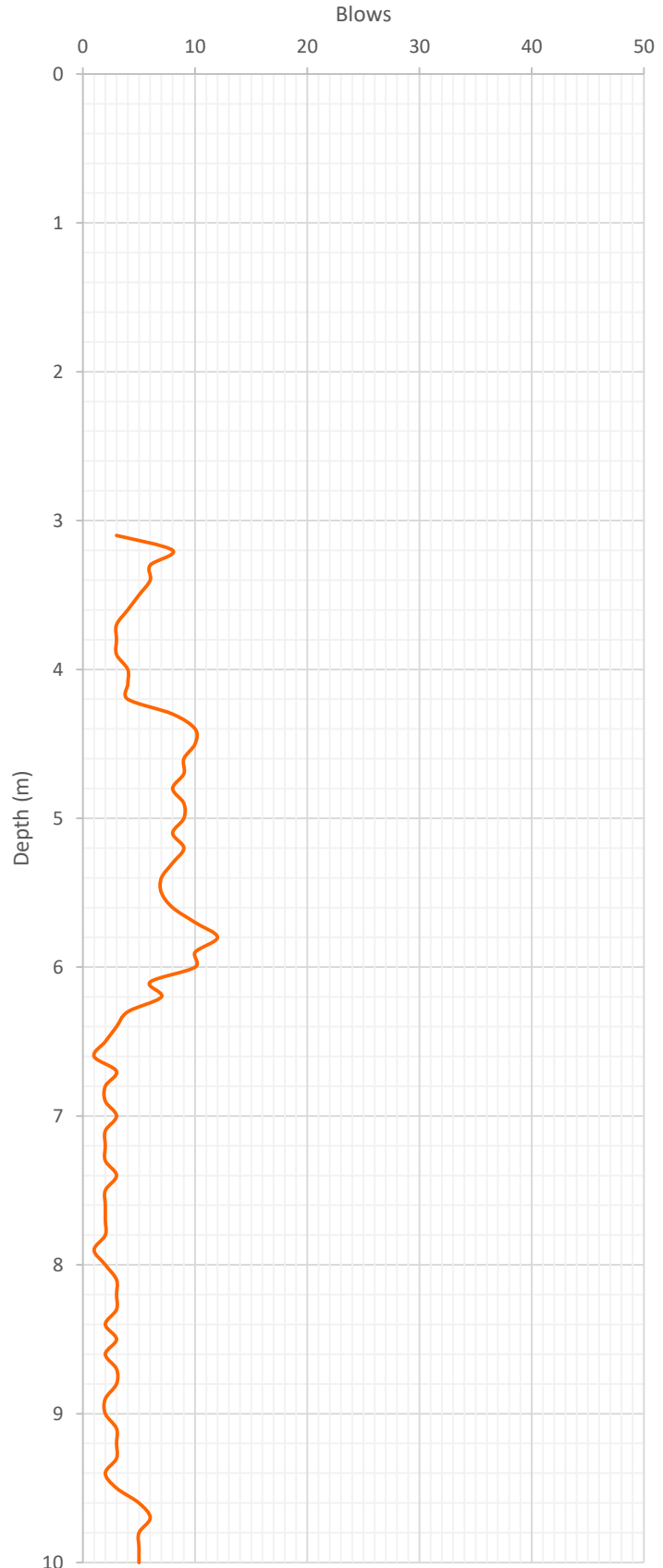
Appendix No. 2  
Sheet No. 6  
Job No. 18980  
Date Jun-24

## DYNAMIC PROBE TEST RESULTS

|                |                                                        |               |
|----------------|--------------------------------------------------------|---------------|
| Site Address : | Ware Priory Lido, Priory Street, Ware, Herts, SG12 0DE | Hammer Weight |
| Probe No. :    | BH1                                                    | 63.5 Kg       |

N.B. Standard Penetration test 'N' values can be calculated from the dynamic probe results by taking 3 consecutive blow counts for 100mm and adding them together. ie.  $N = DP/300$  (where water is encountered within a granular material, the bearing capacity should be halved)

| Depth (m) | DP Blows/100mm | Torque (N/m) |
|-----------|----------------|--------------|
| 0.00      | 0              |              |
| 0.50      | 0              |              |
| 1.00      | 0              | -            |
| 1.50      | 0              |              |
| 2.00      | 0              | -            |
| 2.50      | 0              |              |
| 3.00      | 0              | -            |
| 3.50      | 3 8 6 6 5      |              |
| 4.00      | 4 3 3 3 4      | -            |
| 4.50      | 4 4 8 10 10    |              |
| 5.00      | 9 9 8 9 9      | -            |
| 5.50      | 8 9 8 7 7      |              |
| 6.00      | 8 10 12 10 10  | -            |
| 6.50      | 6 7 4 3 2      |              |
| 7.00      | 1 3 2 2 3      | -            |
| 7.50      | 2 2 2 3 2      |              |
| 8.00      | 2 2 2 1 2      | -            |
| 8.50      | 3 3 3 2 3      |              |
| 9.00      | 2 3 3 2 2      | -            |
| 9.50      | 3 3 3 2 3      |              |
| 10.00     | 5 6 5 5 5      | -            |





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Geotechnical Assessments | Environmental Assessments | Desktop Studies | Contamination Analysis

Appendix No. 2

Sheet No. 7

Job No. 18980

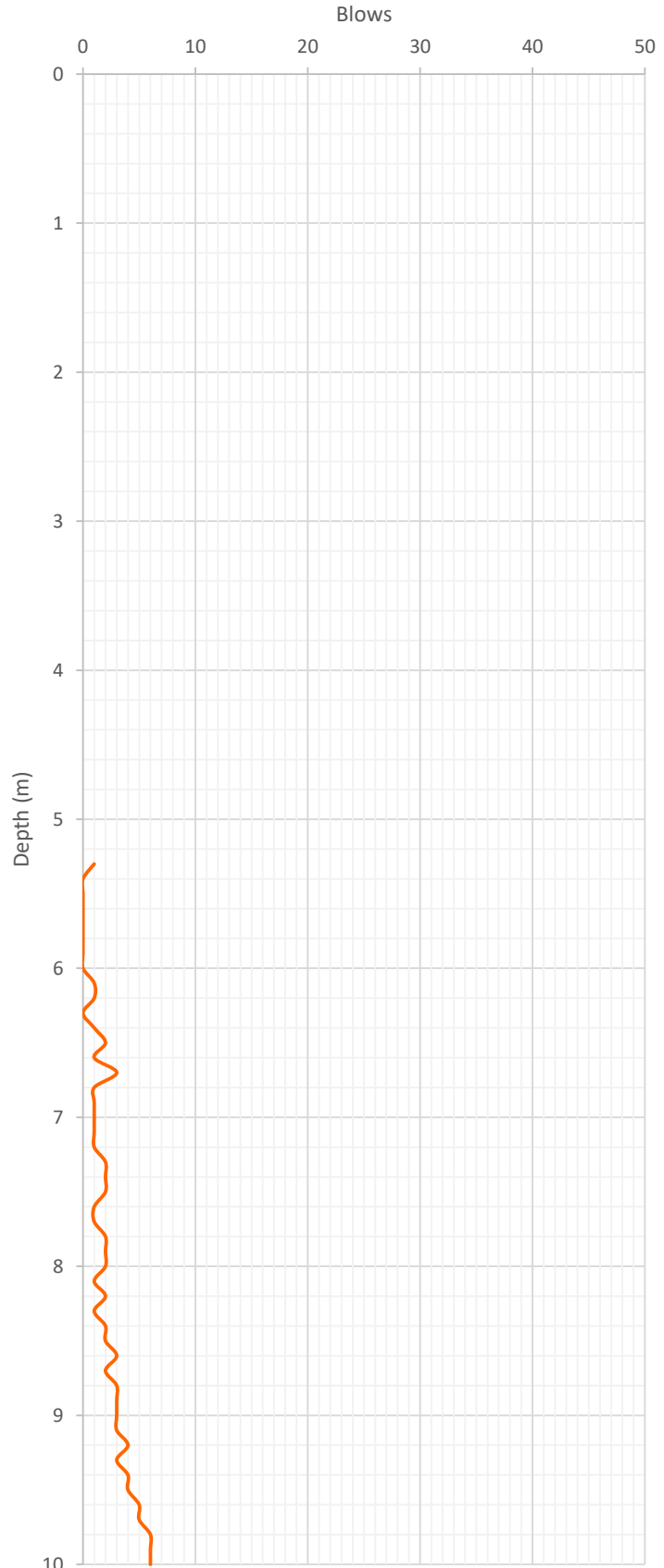
Date Jun-24

## DYNAMIC PROBE TEST RESULTS

|                |                                                        |               |
|----------------|--------------------------------------------------------|---------------|
| Site Address : | Ware Priory Lido, Priory Street, Ware, Herts, SG12 0DE | Hammer Weight |
| Probe No. :    | BH2                                                    | 63.5 Kg       |

N.B. Standard Penetration Test 'N' values can be calculated from the dynamic probe results by taking 3 consecutive blow counts for 100mm and adding them together. ie.  $N = DP/300$  (where water is encountered within a granular material, the bearing capacity should be halved)

| Depth (m) | DP Blows/100mm | Torque (N/m) |
|-----------|----------------|--------------|
| 0.00      | 0              |              |
| 0.50      | 0              |              |
| 1.00      | 0              | -            |
| 1.50      | 0              |              |
| 2.00      | 0              | -            |
| 2.50      | 0              |              |
| 3.00      | 0              | -            |
| 3.50      | 0              |              |
| 4.00      | 0              | -            |
| 4.50      | 0              |              |
| 5.00      | 0              | -            |
| 5.50      | 0              |              |
| 6.00      | 0              | -            |
| 6.50      | 1              |              |
| 7.00      | 1              | -            |
| 7.50      | 1              |              |
| 8.00      | 1              | -            |
| 8.50      | 1              |              |
| 9.00      | 3              | -            |
| 9.50      | 3              |              |
| 10.00     | 5              | -            |





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APPENDIX 3  
SHEET 1  
JOB NUMBER 18980  
DATE Jun-24

**LOCATION** Ware Priory Lido, Priory Street, Ware, Herts, SG12 0DE

### ATTERBERG LIMITS TEST DATA

| Excavation<br>Location<br>Number | Depth<br>(m) | Sample | Natural<br>Moisture<br>Content<br>(%) | Liquid<br>Limit<br>(%) | Plastic<br>Limit<br>(%) | Plasticity<br>Index<br>(%) | Group<br>Symbol | Ammended<br>Plasticity<br>Index<br>(%) | Desiccation<br>Profile | Percentage<br>Retained on<br>425 Micron<br>Sieve<br>(%) |
|----------------------------------|--------------|--------|---------------------------------------|------------------------|-------------------------|----------------------------|-----------------|----------------------------------------|------------------------|---------------------------------------------------------|
| BH1                              | 1.00         | U2     |                                       |                        |                         |                            |                 |                                        |                        |                                                         |
| BH1                              | 1.50         | U2     | 30                                    |                        |                         |                            |                 |                                        |                        |                                                         |
| BH1                              | 2.00         | U3     | 28                                    | 52                     | 22                      | 30                         | MH              | 23                                     | No                     | 25                                                      |
| BH1                              | 2.50         | U3     |                                       |                        |                         |                            |                 |                                        |                        |                                                         |
| BH1                              | 3.00         | U3     |                                       |                        |                         |                            |                 |                                        |                        |                                                         |
| BH2                              | 1.00         | U2     | 39                                    |                        |                         |                            |                 |                                        |                        |                                                         |
| BH2                              | 1.50         | U2     | 69                                    | 116                    | 32                      | 84                         | CE              | 74                                     | No                     | 12                                                      |
| BH2                              | 2.00         | U3     | 176                                   |                        |                         |                            |                 |                                        |                        |                                                         |
| BH2                              | 2.50         | U3     | 278                                   |                        |                         |                            |                 |                                        |                        |                                                         |
| BH2                              | 3.00         | U4     |                                       |                        |                         |                            |                 |                                        |                        |                                                         |
| BH2                              | 3.50         | U4     |                                       |                        |                         |                            |                 |                                        |                        |                                                         |
| BH2                              | 4.00         | U4     |                                       |                        |                         |                            |                 |                                        |                        |                                                         |





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APPENDIX

SHEET

JOB NUMBER

DATE

3

2

18980

Jun-24

**LOCATION** Ware Priory Lido, Priory Street, Ware, Herts, SG12 0DE

## HAND PENETROMETER STRENGTH TEST RESULTS

| Excavation<br>Location<br>Number | Depth<br><br>(m) | Sample | Natural<br>Moisture<br>Content<br><br>(%) | Hand<br>Penotrometer<br><br>(Undrained) | Estimated<br>Allowable Bearing<br>Capacity<br><br>(kN/m <sup>2</sup> ) | Notes |
|----------------------------------|------------------|--------|-------------------------------------------|-----------------------------------------|------------------------------------------------------------------------|-------|
| BH1                              | 1.00             | U2     |                                           |                                         |                                                                        |       |
| BH1                              | 1.50             | U2     | 30                                        |                                         |                                                                        |       |
| BH1                              | 2.00             | U3     | 28                                        | 45                                      | 90                                                                     |       |
| BH1                              | 2.50             | U3     |                                           |                                         |                                                                        |       |
| BH1                              | 3.00             | U3     |                                           |                                         |                                                                        |       |
| BH2                              | 1.00             | U2     | 39                                        | 60                                      | 120                                                                    |       |
| BH2                              | 1.50             | U2     | 69                                        | 45                                      | 90                                                                     |       |
| BH2                              | 2.00             | U3     | 176                                       |                                         |                                                                        |       |
| BH2                              | 2.50             | U3     | 278                                       |                                         |                                                                        |       |
| BH2                              | 3.00             | U4     |                                           |                                         |                                                                        |       |
| BH2                              | 3.50             | U4     |                                           |                                         |                                                                        |       |
| BH2                              | 4.00             | U4     |                                           |                                         |                                                                        |       |

|            |        |
|------------|--------|
| APPENDIX   | 3      |
| SHEET      | 3      |
| JOB NUMBER | 18980  |
| DATE       | Jun-24 |

**LOCATION** Ware Priory Lido, Priory Street, Ware, Herts, SG12 0DE

## SULPHATE ANALYSIS

| Excavation Location Number | Depth (m) | Sample | Concentrations of Soluble Sulphate |                             |             | Classification | pH   |
|----------------------------|-----------|--------|------------------------------------|-----------------------------|-------------|----------------|------|
|                            |           |        | Soil                               |                             | Groundwater |                |      |
|                            |           |        | Total SO4 (%)                      | SO4 in 2:1 Water:soil (g/l) |             |                |      |
| BH1                        | 2.00      | U3     |                                    | 0.48                        |             | DS-1 / AC-1s   | 7.57 |
| BH2                        | 1.50      | U2     |                                    | 0.02                        |             | DS-1 / AC-1s   | 7.25 |
| BH2                        | 2.50      | U3     |                                    | 0.04                        |             | DS-1 / AC-1s   | 7.16 |



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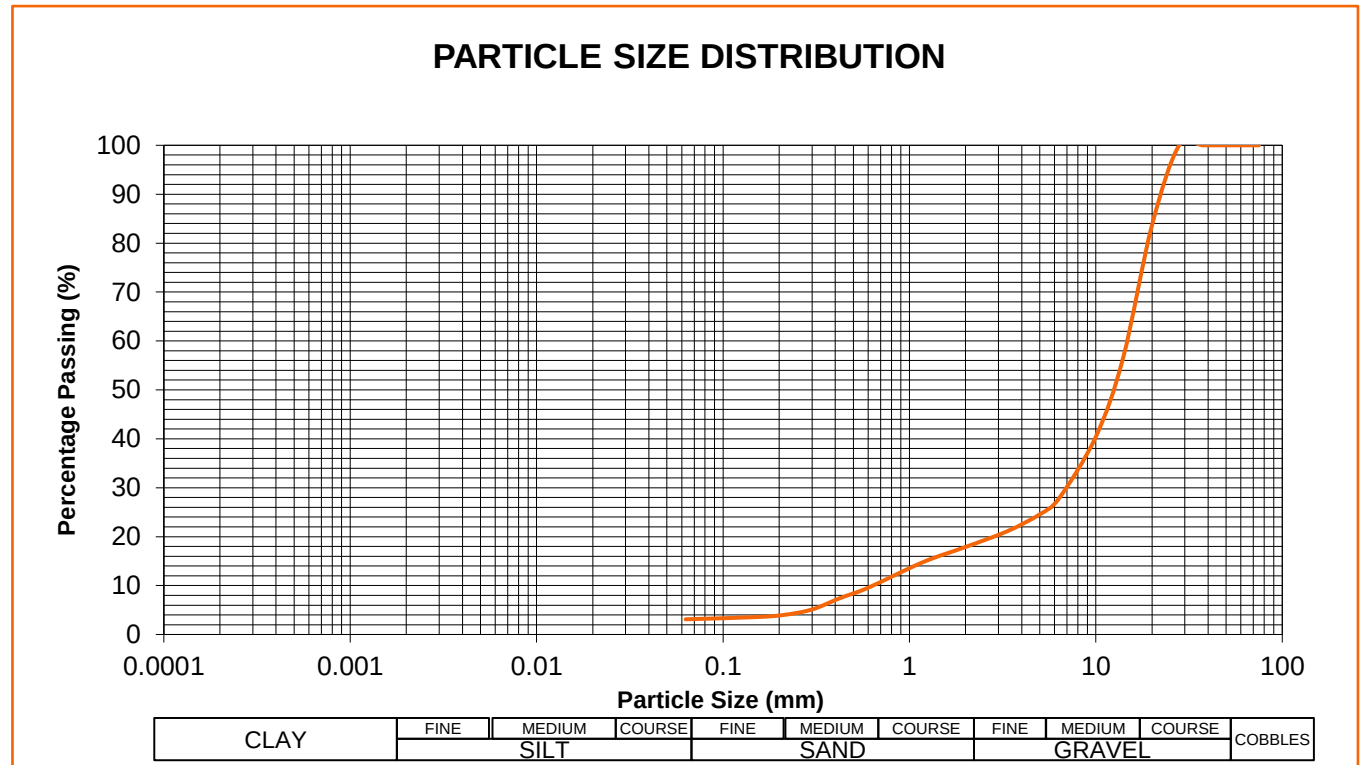
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Appendix No. 3  
Sheet No. 4  
Job No. 18980  
Date Jun-24

## LOCATION Ware Priory Lido, Priory Street, Ware, Herts, SG12 0DE

Location : **BH1** Depth : **3.00 m** Sample No: **U3** Initial Mass: **900 g**

| Sieve Size (mm) | Weight Retained (g) | Percent Retained (%) | Total Passing (%) |
|-----------------|---------------------|----------------------|-------------------|
| 75              |                     | 0                    | 100               |
| 63              |                     | 0                    | 100               |
| 50              |                     | 0                    | 100               |
| 37.50           |                     | 0                    | 100               |
| 28.00           |                     | 0                    | 100               |
| 20.00           | 147                 | 16                   | 84                |
| 14.00           | 244                 | 27                   | 57                |
| 10.00           | 145                 | 16                   | 40                |
| 6.30            | 115                 | 13                   | 28                |
| 5.00            | 28                  | 3                    | 25                |
| 3.35            | 31                  | 3                    | 21                |
| 2.00            | 29                  | 3                    | 18                |
| 1.180           | 28                  | 3                    | 15                |
| 0.600           | 47                  | 5                    | 10                |
| 0.425           | 19                  | 2                    | 7                 |
| 0.300           | 21                  | 2                    | 5                 |
| 0.212           | 10                  | 1                    | 4                 |
| 0.150           | 4                   | 0                    | 4                 |
| 0.063           | 4                   | 0                    | 3                 |



Fines (%) = **3** Sands (%) = **15** Gravels (%) = **82** Cobbles (%) = **0**

British Standard Sieve Test 5930:2015 as Per Test 7a



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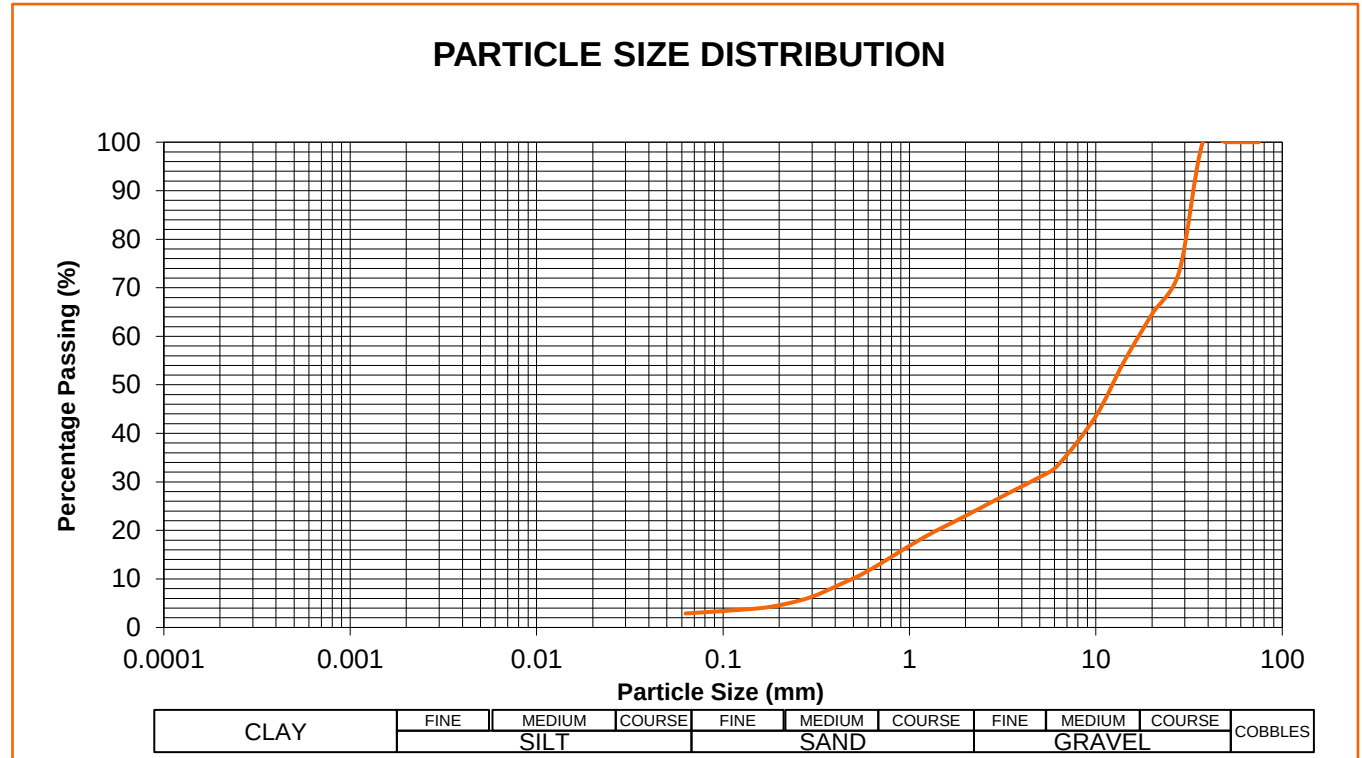
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Appendix No. 3  
Sheet No. 5  
Job No. 18980  
Date Jun-24

## LOCATION Ware Priory Lido, Priory Street, Ware, Herts, SG12 0DE

Location : **BH2** Depth : **3.50 m** Sample No: **U4** Initial Mass: **900 g**

| Sieve Size (mm) | Weight Retained (g) | Percent Retained (%) | Total Passing (%) |
|-----------------|---------------------|----------------------|-------------------|
| 75              |                     | 0                    | 100               |
| 63              |                     | 0                    | 100               |
| 50              |                     | 0                    | 100               |
| 37.50           |                     | 0                    | 100               |
| 28.00           | 240                 | 27                   | 73                |
| 20.00           | 79                  | 9                    | 65                |
| 14.00           | 91                  | 10                   | 54                |
| 10.00           | 98                  | 11                   | 44                |
| 6.30            | 90                  | 10                   | 34                |
| 5.00            | 23                  | 3                    | 31                |
| 3.35            | 31                  | 3                    | 28                |
| 2.00            | 41                  | 5                    | 23                |
| 1.180           | 41                  | 5                    | 18                |
| 0.600           | 61                  | 7                    | 12                |
| 0.425           | 25                  | 3                    | 9                 |
| 0.300           | 23                  | 3                    | 6                 |
| 0.212           | 14                  | 2                    | 5                 |
| 0.150           | 8                   | 1                    | 4                 |
| 0.063           | 9                   | 1                    | 3                 |



Fines (%) = **3** Sands (%) = **20** Gravels (%) = **77** Cobbles (%) = **0**

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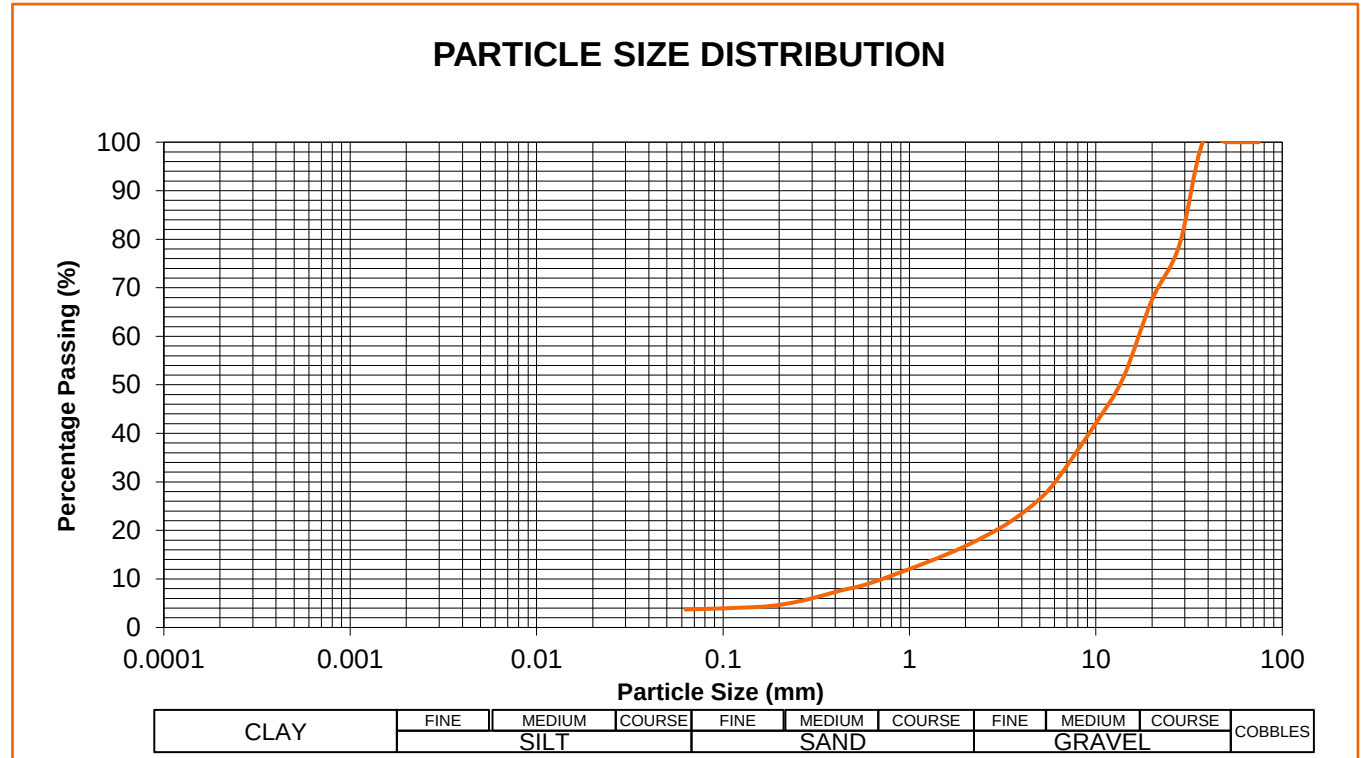
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Appendix No. 3  
Sheet No. 6  
Job No. 18980  
Date Jun-24

## LOCATION Ware Priory Lido, Priory Street, Ware, Herts, SG12 0DE

Location : **BH2** Depth : **4.00 m** Sample No: **U4** Initial Mass: 1000 g

| Sieve Size (mm) | Weight Retained (g) | Percent Retained (%) | Total Passing (%) |
|-----------------|---------------------|----------------------|-------------------|
| 75              |                     | 0                    | 100               |
| 63              |                     | 0                    | 100               |
| 50              |                     | 0                    | 100               |
| 37.50           |                     | 0                    | 100               |
| 28.00           | 213                 | 21                   | 79                |
| 20.00           | 112                 | 11                   | 68                |
| 14.00           | 161                 | 16                   | 51                |
| 10.00           | 93                  | 9                    | 42                |
| 6.30            | 112                 | 11                   | 31                |
| 5.00            | 44                  | 4                    | 27                |
| 3.35            | 51                  | 5                    | 21                |
| 2.00            | 46                  | 5                    | 17                |
| 1.180           | 37                  | 4                    | 13                |
| 0.600           | 41                  | 4                    | 9                 |
| 0.425           | 14                  | 1                    | 8                 |
| 0.300           | 16                  | 2                    | 6                 |
| 0.212           | 12                  | 1                    | 5                 |
| 0.150           | 6                   | 1                    | 4                 |
| 0.063           | 5                   | 1                    | 4                 |



Fines (%) = 4 Sands (%) = 13 Gravels (%) = 83 Cobbles (%) = 0

British Standard Sieve Test 5930:2015 as Per Test 7a