



# SUB SURFACE CONSULTANTS

## GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS



Your ref:

Our ref:

TP/7256

Reg. Office

**SUB SURFACE CONSULTANTS LTD.**  
**3 PEEL STREET**  
**PRESTON**  
**PR2 2QS**

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[www.subsurface.co.uk](http://www.subsurface.co.uk)

6<sup>th</sup> July 2021

Reid Jones Partnership  
 Preston Office  
 3 Cross Street  
 Preston  
 PR1 3LT

For the attention of Mr John Reid

Dear Sirs,

### **GROUND INVESTIGATION AT SHACKLETONS GARDEN CENTRE, CLITHEROE ROAD, CHATBURN, CLITHEROE, LANCASHIRE, BB7 4JY**

In accordance with instructions given with your email dated 12<sup>th</sup> May 2021, on behalf of the Client, Shackleton Home & Garden, we have carried out a ground investigation at the above site.

The brief as specified by the Client's Engineer was set out in our estimate, ref. E4975 dated 9<sup>th</sup> May 2021. This included:

- 4 No. cable percussive boreholes
- 4 No. falling head permeability tests
- Provision of an interpretive letter on the above.

The site is located at Shackletons Garden Centre, Clitheroe Road, Chatburn, Clitheroe, Lancashire, BB7 4Jy, as indicated on Figure 1. The approximate National Grid Reference of the centre of the site is 376600,443500.

As shown in Figure 2, the site forms an approximately rectangular shaped area of 2.5ha bound by Clitheroe Road to the north west, Worston Road to the south west and undeveloped farmland to the north east and south east. Approximately two thirds of the site is occupied by the existing garden centre with undeveloped farmland in the remaining area situated in the south east.

We understand that it is proposed to redevelop the garden centre extending the site into the undeveloped field to the south east, as indicated in Figure 3.

The purpose of the ground investigation is to assess the suitability of the ground conditions for the use of a soakaway drainage system in the area to be developed as indicated in Figure 4.

### Investigation

Four 150mm diameter boreholes were put down by cable percussive boring techniques at the positions determined by the Client and set out by Sub Surface North West Ltd, as shown on Figure 4. The boreholes were put down to depths of between 2.30m and 4.00m, samples taken were logged in accordance with BS EN ISO 14688-1: 2018 and BS EN ISO 14689-1: 2018 and the resulting Borehole Records are appended.

The boreholes encountered soft brown clayey topsoil to 0.30m underlain by cohesive drift deposits generally comprising firm to stiff brown to dark brownish grey slightly gravelly slightly sandy silty clay. Gravel consisted of subangular to subrounded fine to coarse limestone and mudstone.

At 2.00m, BH1 encountered probable bedrock comprising medium strong very thinly bedded fossiliferous grey moderately weathered limestone. BH2, BH3 and BH4 were terminated in probable bedrock at depths of 4.00m, 3.50m and 3.60m. No recovery of material was able to be made below these depths, however the British Geological Survey (BGS) indicates the underlying bedrock in the area of the site predominantly comprises calcareous mudstone (Hodder Mudstone Formation) locally interbedded with knoll-reef limestone (Clitheroe Limestone Formation).

On completion of the BH1, BH2, BH3 and BH4 Falling Head Tests were undertaken at or below rockhead at depths of 2.30m, 4.00m, 3.50m and 3.60m. To form a response zone within the natural strata, the casing was pulled up by 0.30m, 0.60m, 0.50m and 0.40m respectively. The 150mm diameter boreholes were filled with water and the water levels were monitored for time periods ranging from 120 to 270 minutes. One test was carried out for each borehole. The Coefficient of Permeability was determined for the results from BH1, however water levels were found to have fallen insufficiently in BH2, BH3 and BH4 to determine the "Basic Time Lag" and hence the permeability could not be determined. Details of the falling head permeability tests are appended and a summary of the results is given below.

On completion of the falling head tests test the boreholes were backfilled with arisings.

TABLE 1 SUMMARY OF FALLING HEAD TEST RESULTS

| Borehole No. | Depth of Borehole (m) | Response Zone (m) | Coefficient of Permeability (m/s) |
|--------------|-----------------------|-------------------|-----------------------------------|
| BH1          | 2.30                  | 2.00 - 2.30       | $1.13 \times 10^{-6}$             |
| BH2          | 4.00                  | 3.40 - 4.00       | N/A*                              |
| BH3          | 3.50                  | 3.00 – 3.50       | N/A*                              |
| BH4          | 3.60                  | 3.20 – 3.60       | N/A*                              |

\*Not possible to determine Coefficient of Permeability due to insufficient fall in water level.

## Assessment

The results of the permeability tests found variable rates of infiltration, with very low permeability observed in BH2, BH3 and BH4. This indicates the underlying natural strata is of variable permeability, which is likely to be due to the variable nature of the bedrock, anticipated to be calcareous mudstone, typically demonstrating low permeability, locally interbedded with limestone, typically demonstrating high permeability.

Given the above, in our opinion the findings of the ground investigation indicate the underlying natural strata in the area of the site is unsuitable for a soakaway drainage system.

We trust that this report fulfils your present requirements but if you have any queries or we can be of further assistance please contact the undersigned or Ms Anna Marsden at our Preston office.

Yours Faithfully

A handwritten signature in black ink, consisting of a stylized 'T' and 'P' followed by a horizontal line.

T. Plum BSc (Hons), MSc, FGS  
Senior Geoenvironmental Engineer  
For and on behalf of  
Sub Surface Consultants Limited.



# SUB SURFACE

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS  
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

## Insitu Test Results

Site: SHACKLETONS GARDEN CENTRE, CHATBURN, LANCASHIRE

Job Number  
7256

Client: SHACKLETONS HOME & GARDEN

Sheet:  
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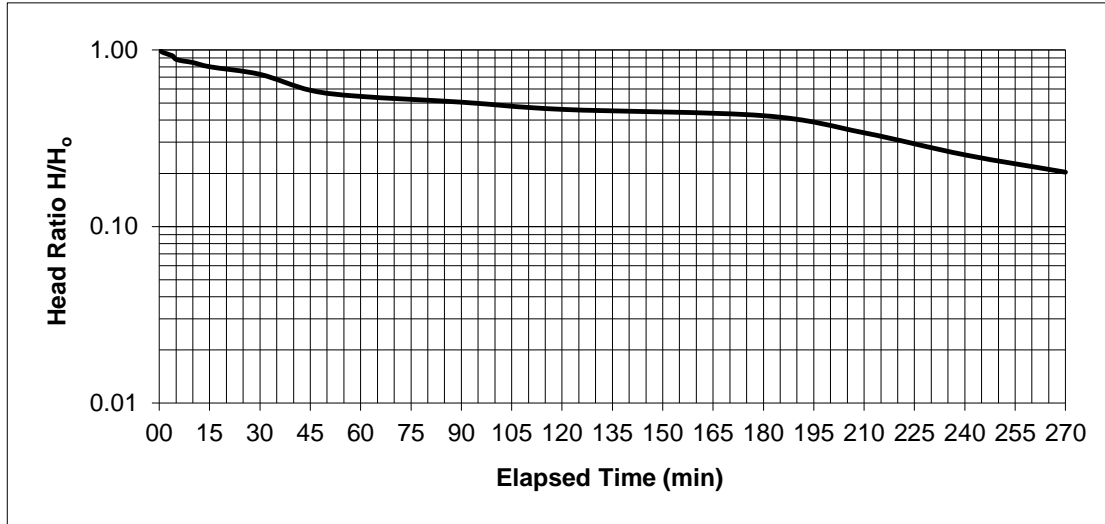
Engineer: REID JONES PARTNERSHIP

### Falling Head Permeability Test

HOLE NO: BH1

TEST NO: 1

DATE: 27/05/2021



| Time Elapsed |       | Depth of Water [d <sub>t</sub> ] | Water Column Ht. [h <sub>t</sub> = d <sub>s</sub> - d <sub>t</sub> ] | Head Ratio [h <sub>t</sub> / h <sub>o</sub> ] |
|--------------|-------|----------------------------------|--|---|
| (min)        | (sec) | (m)                              | (m)  |   |
| 00           | 00    | 0.00                             | 3.30   | 1.00  |
| 00           | 30    | 0.05                             | 3.25   | 0.98  |
| 01           | 00    | 0.10                             | 3.20   | 0.97  |
| 02           | 00    | 0.15                             | 3.15   | 0.95  |
| 03           | 00    | 0.20                             | 3.10   | 0.94  |
| 04           | 00    | 0.25                             | 3.05   | 0.92  |
| 05           | 00    | 0.38                             | 2.92   | 0.88  |
| 07           | 30    | 0.45                             | 2.85   | 0.86  |
| 10           | 00    | 0.50                             | 2.80   | 0.85  |
| 15           | 00    | 0.65                             | 2.65   | 0.80  |
| 30           | 00    | 0.90                             | 2.40   | 0.73  |
| 45           | 00    | 1.35                             | 1.95   | 0.59  |
| 60           | 00    | 1.50                             | 1.80   | 0.55  |
| 90           | 00    | 1.63                             | 1.67   | 0.51  |
| 120          | 00    | 1.78                             | 1.52   | 0.46  |
| 180          | 00    | 1.90                             | 1.40   | 0.42  |
| 210          | 00    | 2.18                             | 1.12   | 0.34  |
| 240          | 00    | 2.46                             | 0.84   | 0.25  |
| 270          | 00    | 2.63                             | 0.67   | 0.20  |

Top of test section: 3.00 m  
 Bottom of test section: 3.30 m  
 Response Zone [L]: 0.30 m  
 Diameter [D]: 0.15 m  
 Cross Sectional Area [A]: 0.02 m<sup>2</sup>  
 Standing Water Depth [d<sub>s</sub>]: 3.30 m  
 Initial Water Column H<sub>i</sub> [h<sub>o</sub>]: 3.30 m  
 Basic Time Lag [T]: 12,000 s  
 Intake Factor [F]: 1.3057 m

where F =

$$\frac{2 \pi L}{\log_e [(L/D) + \sqrt{1 + (L/D)^2}]}$$

**COEFFICIENT OF PERMEABILITY**

$$k = \frac{A}{F \times T}$$

**k = 1.13E-06 m/s**

Test Strata:

2.00m Very thinly bedded grey moderately weathered LIMESTONE

Remarks:

Casing at start of test 1.00m above ground level. Measurements taken from top of casing. Basic Time Lag (T) is the elapsed time for a Head Ratio of 0.37.



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## Insitu Test Results

Site: SHACKLETONS GARDEN CENTRE, CHATBURN, LANCASHIRE  
Client: SHACKLETONS HOME & GARDEN  
Engineer: REID JONES PARTNERSHIP

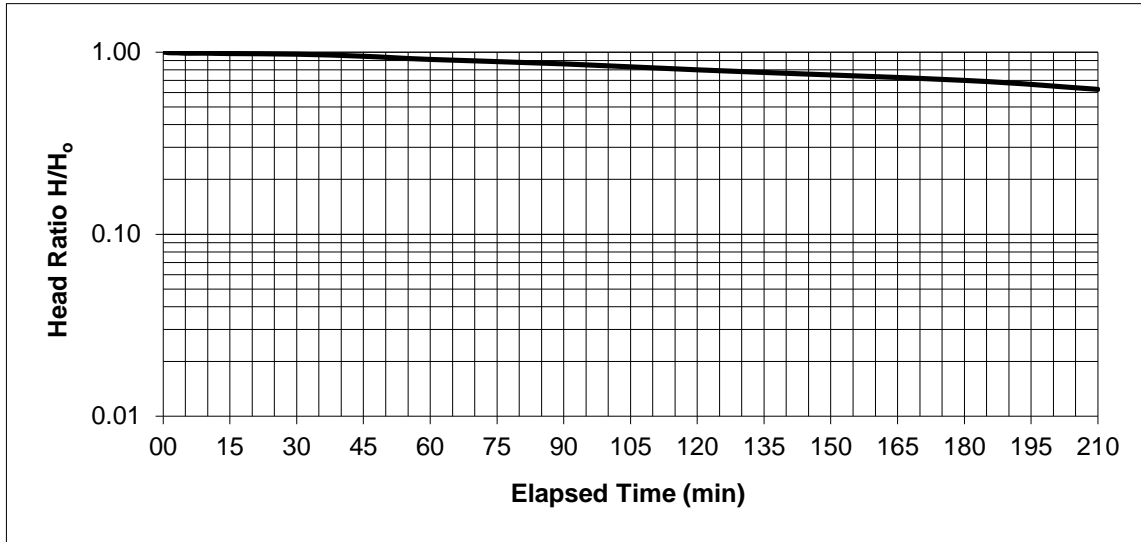
Job Number  
7256  
Sheet:  
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### Falling Head Permeability Test

HOLE NO: BH2

TEST NO: 1

DATE: 27/05/2021



| Time Elapsed |       | Depth of Water [d <sub>t</sub> ] | Water Column Ht. [h <sub>t</sub> = d <sub>s</sub> - d <sub>t</sub> ] | Head Ratio [h <sub>t</sub> / h <sub>0</sub> ] |
|--------------|-------|----------------------------------|--|---|
| (min)        | (sec) | (m)                              | (m)  |   |
| 00           | 00    | 0.00                             | 4.00   | 1.00  |
| 00           | 30    | 0.00                             | 4.00   | 1.00  |
| 01           | 00    | 0.02                             | 3.98   | 1.00  |
| 02           | 00    | 0.03                             | 3.97   | 0.99  |
| 03           | 00    | 0.03                             | 3.97   | 0.99  |
| 04           | 00    | 0.04                             | 3.96   | 0.99  |
| 05           | 00    | 0.05                             | 3.95   | 0.99  |
| 07           | 30    | 0.05                             | 3.95   | 0.99  |
| 10           | 00    | 0.05                             | 3.95   | 0.99  |
| 15           | 00    | 0.07                             | 3.93   | 0.98  |
| 30           | 00    | 0.10                             | 3.90   | 0.98  |
| 45           | 00    | 0.20                             | 3.80   | 0.95  |
| 60           | 00    | 0.35                             | 3.65   | 0.91  |
| 90           | 00    | 0.55                             | 3.45   | 0.86  |
| 120          | 00    | 0.80                             | 3.20   | 0.80  |
| 180          | 00    | 1.20                             | 2.80   | 0.70  |
| 210          | 00    | 1.50                             | 2.50   | 0.63  |

Top of test section: 3.40 m  
 Bottom of test section: 4.00 m  
 Response Zone [L]: 0.60 m  
 Diameter [D]: 0.15 m  
 Cross Sectional Area [A]: 0.02 m<sup>2</sup>  
 Standing Water Depth [d<sub>s</sub>]: 4.00 m  
 Initial Water Column H<sub>t</sub> [h<sub>0</sub>]: 4.00 m  
 Basic Time Lag [T]: N/A s  
 Intake Factor [F]: 1.7997 m

where F =

$$\frac{2 \pi L}{\log_e \left[ \left( \frac{L}{D} \right) + \left\{ 1 + \left( \frac{L}{D} \right)^2 \right\} \right]}$$

COEFFICIENT OF PERMEABILITY

$$k = \frac{A}{F \times T}$$

k = N/A m/s

Test Strata:

3.40m Dark brownish grey slightly gravelly slightly sandy silty CLAY  
 4.00m Probable bedrock

Remarks:

Basic Time Lag (T) is the elapsed time for a Head Ratio of 0.37.  
 Not possible to determine Coefficient of Permeability due to insufficient fall in water level.



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## Insitu Test Results

Site: SHACKLETONS GARDEN CENTRE, CHATBURN, LANCASHIRE

Job Number  
7256

Client: SHACKLETONS HOME & GARDEN

Sheet:

Engineer: REID JONES PARTNERSHIP

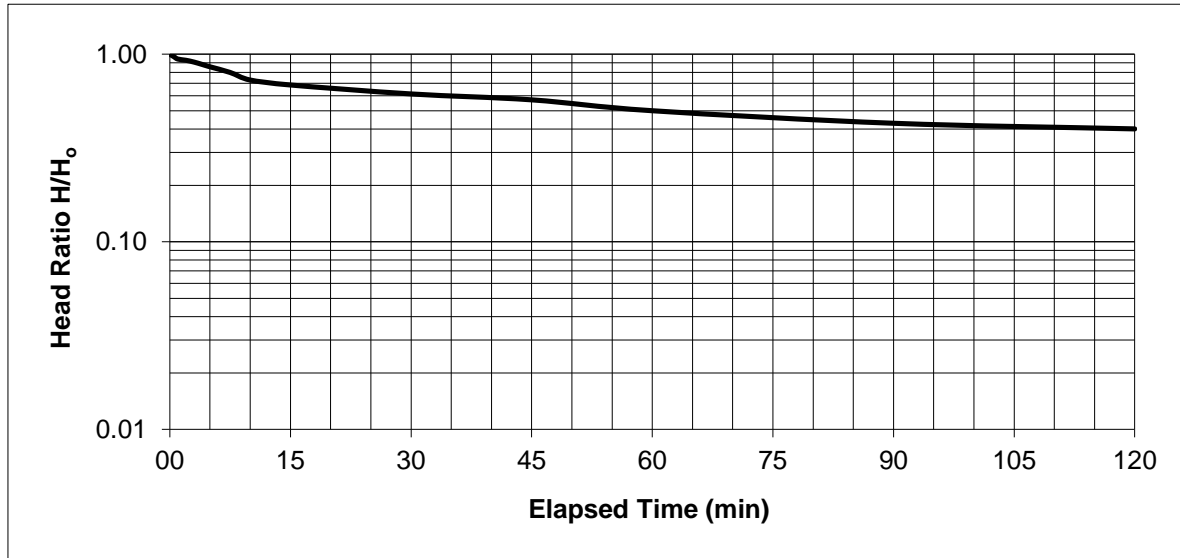
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### Falling Head Permeability Test

HOLE NO: BH3

TEST NO: 1

DATE: 27/05/2021



| Time Elapsed |       | Depth of Water [d <sub>i</sub> ] | Water Column Ht. [h <sub>t</sub> = d <sub>s</sub> - d <sub>i</sub> ] | Head Ratio [h <sub>t</sub> / h <sub>0</sub> ] |
|--------------|-------|----------------------------------|--|---|
| (min)        | (sec) | (m)                              | (m)  |   |
| 00           | 00    | 0.00                             | 3.50   | 1.00  |
| 00           | 30    | 0.10                             | 3.40   | 0.97  |
| 01           | 00    | 0.20                             | 3.30   | 0.94  |
| 02           | 00    | 0.25                             | 3.25   | 0.93  |
| 03           | 00    | 0.32                             | 3.18   | 0.91  |
| 04           | 00    | 0.41                             | 3.09   | 0.88  |
| 05           | 00    | 0.50                             | 3.00   | 0.86  |
| 07           | 30    | 0.70                             | 2.80   | 0.80  |
| 10           | 00    | 0.95                             | 2.55   | 0.73  |
| 15           | 00    | 1.10                             | 2.40   | 0.69  |
| 30           | 00    | 1.35                             | 2.15   | 0.61  |
| 45           | 00    | 1.50                             | 2.00   | 0.57  |
| 60           | 00    | 1.75                             | 1.75   | 0.50  |
| 90           | 00    | 2.00                             | 1.50   | 0.43  |
| 120          | 00    | 2.10                             | 1.40   | 0.40  |

Top of test section: 3.00 m

Bottom of test section: 3.50 m

Response Zone [L]: 0.50 m

Diameter [D]: 0.15 m

Cross Sectional Area [A]: 0.02 m<sup>2</sup>

Standing Water Depth [d<sub>s</sub>]: 3.50 m

Initial Water Column H<sub>t</sub> [h<sub>0</sub>]: 3.50 m

Basic Time Lag [T]: N/A s

Intake Factor [F]: 1.6372 m

where F =

$$\frac{2 \pi L}{\log_e [(L/D) + \{1 + (L/D)^2\}]}$$

**COEFFICIENT OF PERMEABILITY**

$$k = \frac{A}{F \times T}$$

**k = N/A m/s**

Test Strata:

3.00m Brown slightly gravelly slightly sandy silty CLAY

3.50m Probable bedrock

Remarks:

Basic Time Lag (T) is the elapsed time for a Head Ratio of 0.37.

Not possible to determine Coefficient of Permeability due to insufficient fall in water level.



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Insitu Test Results

Site: SHACKLETONS GARDEN CENTRE, CHATBURN, LANCASHIRE

Job Number  
7256

Client: SHACKLETONS HOME & GARDEN

Sheet:

Engineer: REID JONES PARTNERSHIP

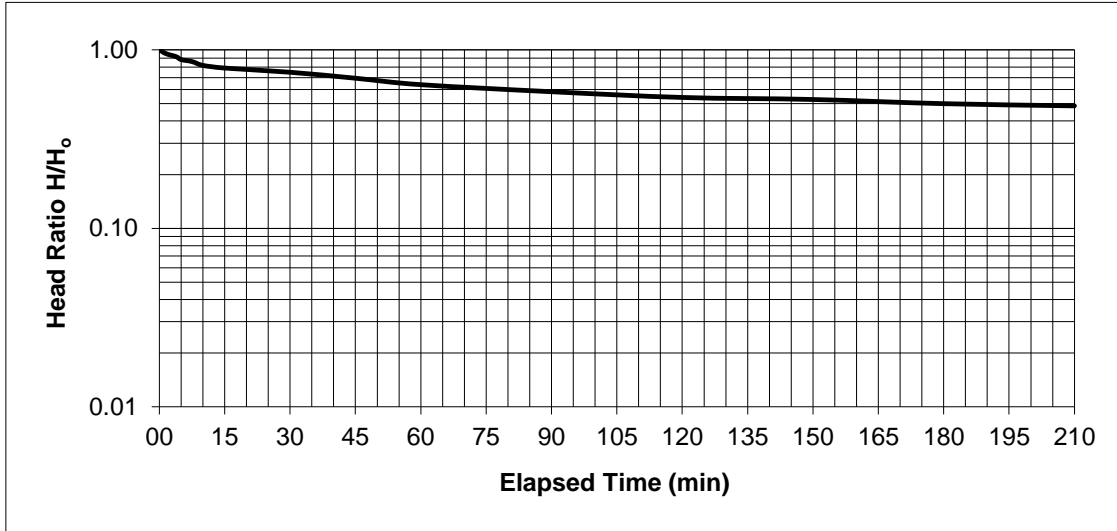
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## Falling Head Permeability Test

HOLE NO: BH4

TEST NO: 1

DATE: 27/05/2021



| Time Elapsed |       | Depth of Water [d <sub>i</sub> ] | Water Column Ht. [h <sub>t</sub> = d <sub>s</sub> - d <sub>i</sub> ] | Head Ratio [h <sub>t</sub> / h <sub>o</sub> ] |
|--------------|-------|----------------------------------|--|---|
| (min)        | (sec) | (m)                              | (m)  |   |
| 00           | 00    | 0.00                             | 3.60   | 1.00  |
| 00           | 30    | 0.05                             | 3.55   | 0.99  |
| 01           | 00    | 0.12                             | 3.48   | 0.97  |
| 02           | 00    | 0.20                             | 3.40   | 0.94  |
| 03           | 00    | 0.25                             | 3.35   | 0.93  |
| 04           | 00    | 0.31                             | 3.29   | 0.91  |
| 05           | 00    | 0.42                             | 3.18   | 0.88  |
| 07           | 30    | 0.50                             | 3.10   | 0.86  |
| 10           | 00    | 0.65                             | 2.95   | 0.82  |
| 15           | 00    | 0.75                             | 2.85   | 0.79  |
| 30           | 00    | 0.90                             | 2.70   | 0.75  |
| 45           | 00    | 1.10                             | 2.50   | 0.69  |
| 60           | 00    | 1.30                             | 2.30   | 0.64  |
| 90           | 00    | 1.50                             | 2.10   | 0.58  |
| 120          | 00    | 1.65                             | 1.95   | 0.54  |
| 150          | 00    | 1.70                             | 1.90   | 0.53  |
| 180          | 00    | 1.80                             | 1.80   | 0.50  |
| 210          | 00    | 1.85                             | 1.75   | 0.49  |

Top of test section: 3.20 m

Bottom of test section: 3.60 m

Response Zone [L]: 0.40 m

Diameter [D]: 0.15 m

Cross Sectional Area [A]: 0.02 m<sup>2</sup>

Standing Water Depth [d<sub>s</sub>]: 3.60 m

Initial Water Column H<sub>t</sub> [h<sub>o</sub>]: 3.60 m

Basic Time Lag [T]: N/A s

Intake Factor [F]: 1.4720 m

where F =

$$\frac{2 \pi L}{\log_e [(L/D) + \{1 + (L/D)^2\}]}$$

COEFFICIENT OF PERMEABILITY

$$k = \frac{A}{F \times T}$$

k = N/A

m/s


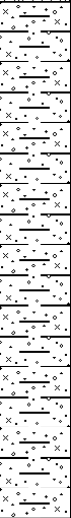

Test Strata:

3.20m Dark brownish grey slightly gravelly slightly sandy silty CLAY  
 3.60m Probable bedrock

Remarks:

Basic Time Lag (T) is the elapsed time for a Head Ratio of 0.37.  
 Not possible to determine Coefficient of Permeability due to insufficient fall in water level.


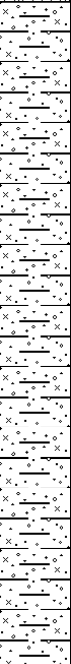
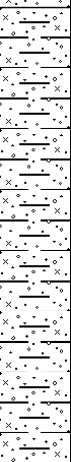

|  |  |                            |  |                           |
|--|--|----------------------------|--|---------------------------|
| <b>Boring Method</b><br>LIGHT CABLE PERCUSSIVE | <b>Casing Diameter</b><br>150mm to 2.00m | <b>Ground Level (mOD)</b>  | <b>Client</b><br>SHACKLETONS HOME AND GARDEN | <b>Job Number</b><br>7256 |
|  | <b>Location</b><br>AS PLAN               | <b>Dates</b><br>27/05/2021 | <b>Engineer</b><br>REID JONES PARTNERSHIP    | <b>Sheet</b><br>1/1       |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records   | Level (mOD) | Depth (m) (Thickness)  | Description  | Legend  | Water |
|-----------|----------------|------------------|-----------------|-----------------|-------------|------------------------|--|---|-------|
| 0.20      | B              |                  |                 |                 |             | (0.30)                 | TOPSOIL: soft brown slightly organic slightly gravelly sandy silty clay with some rootlets and occasional subangular fine to medium limestone and mudstone gravel. |    |       |
| 1.00      | D              |                  |                 |                 |             | (1.70)                 | Firm to stiff brown slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to coarse mudstone and limestone.                         |   |       |
| 2.00      | D              |                  |                 | 27/05/2021: DRY |             | 2.00<br>(0.30)<br>2.30 | Medium strong very thickly bedded fossiliferous grey moderately weathered LIMESTONE.   |  |       |
|           |                |                  |                 |                 |             |                        | Complete at 2.30m  |   |       |



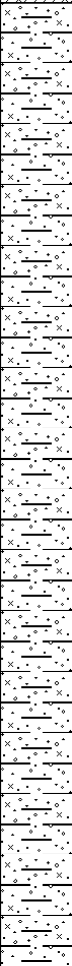
|  |                               |                  |
|--|-------------------------------|------------------|
| <b>Remarks</b><br>Hand dug inspection pit from GL to 1.20m to check for services - 1hr.<br>On completion Falling Head Permeability Test undertaken prior to backfilling with arisings. | <b>Scale (approx)</b>         | <b>Logged By</b> |
|  | 1:25                          | TP/MJE           |
|  | <b>Figure No.</b><br>7256.BH1 |                  |




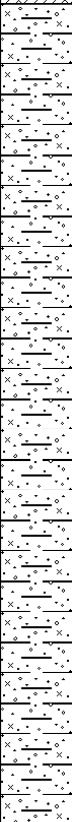
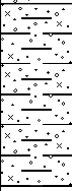


|  |  |                            |  |                           |
|--|--|----------------------------|--|---------------------------|
| <b>Boring Method</b><br>LIGHT CABLE PERCUSSIVE | <b>Casing Diameter</b><br>150mm to 3.40m | <b>Ground Level (mOD)</b>  | <b>Client</b><br>SHACKLETONS HOME AND GARDEN | <b>Job Number</b><br>7256 |
|  | <b>Location</b><br>AS PLAN               | <b>Dates</b><br>27/05/2021 | <b>Engineer</b><br>REID JONES PARTNERSHIP    | <b>Sheet</b><br>1/1       |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records   | Level (mOD) | Depth (m) (Thickness) | Description  | Legend  | Water |
|-----------|----------------|------------------|-----------------|-----------------|-------------|-----------------------|--|---|-------|
| 0.20      | D              |                  |                 |                 |             | (0.30)                | TOPSOIL: soft brown slightly organic slightly gravelly sandy silty clay with some rootlets and occasional subangular fine to medium limestone and mudstone gravel. |    |       |
| 1.00      | D              |                  |                 |                 |             | 0.30                  | Firm to stiff brown slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to coarse mudstone and limestone.                         |   |       |
| 2.00      | D              |                  |                 |                 |             | (2.20)                |  |   |       |
| 3.00      | D              |                  |                 |                 |             | 2.50                  | Stiff dark brownish grey slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to coarse mudstone and limestone.                    |  |       |
|           |                |                  |                 |                 |             | (1.50)                |  |   |       |
|           |                |                  |                 |                 |             | 4.00                  | .... at 4.00m: probable bedrock.   |  |       |
|           |                |                  |                 | 27/05/2021: DRY |             | 4.00                  | Complete at 4.00m  |   |       |

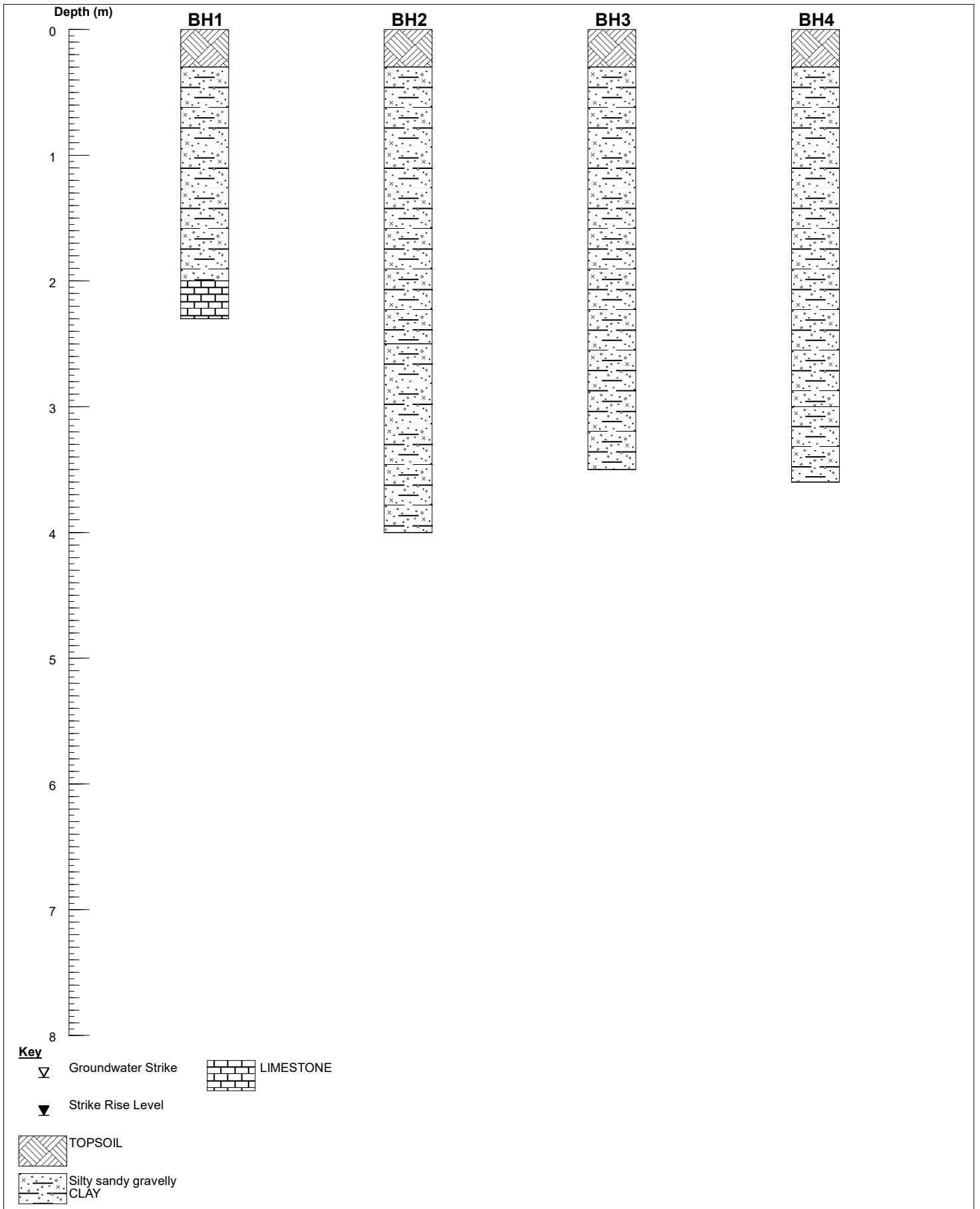
|  |                               |                  |
|--|-------------------------------|------------------|
| <b>Remarks</b><br>Hand dug inspection pit from GL to 1.20m to check for services - 1hr.<br>On completion Falling Head Permeability Test undertaken prior to backfilling with arisings. | <b>Scale (approx)</b>         | <b>Logged By</b> |
|  | 1:25                          | TP/MJE           |
|  | <b>Figure No.</b><br>7256.BH2 |                  |

|  <b>SUB SURFACE</b><br>SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS<br>3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907 |                |  |                 |                            |             | <b>Site</b><br>SHACKLETONS GARDEN CENTRE, CHATBURN,<br>LANCASHIRE |  | <b>Borehole Number</b><br><b>BH3</b>   |                            |
|--|----------------|--|-----------------|----------------------------|-------------|---|--|--|----------------------------|
| <b>Boring Method</b><br>LIGHT CABLE PERCUSSIVE   |                | <b>Casing Diameter</b><br>150mm to 3.00m |                 | <b>Ground Level (mOD)</b>  |             | <b>Client</b><br>SHACKLETONS HOME AND GARDEN                      |  | <b>Job Number</b><br>7256  |                            |
|  |                | <b>Location</b><br>AS PLAN               |                 | <b>Dates</b><br>28/05/2021 |             | <b>Engineer</b><br>REID JONES PARTNERSHIP                         |  | <b>Sheet</b><br>1/1  |                            |
| Depth (m)  | Sample / Tests | Casing Depth (m)                         | Water Depth (m) | Field Records              | Level (mOD) | Depth (m) (Thickness)   | Description  | Legend   | Water                      |
| 0.20   | D              |  |                 |                            |             | (0.30)  | TOPSOIL: soft brown slightly organic slightly gravelly sandy silty clay with some rootlets and occasional subangular fine to medium limestone and mudstone gravel. |   |                            |
| 1.00   | D              |  |                 |                            |             | 0.30  | Firm to stiff brown slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to coarse mudstone and limestone.                         |  |                            |
| 2.00   | D              |  |                 |                            |             | (3.20)  |  |  |                            |
| 3.00   | D              |  |                 |                            |             | 3.50  | .... at 3.50m: probable bedrock.   |  |                            |
|  |                |  |                 | 28/05/2021: DRY            |             |   | Complete at 3.50m  |  |                            |
| <b>Remarks</b><br>Hand dug inspection pit from GL to 1.20m to check for services - 1hr.<br>Chiselling at 3.50m - 0.5hr - no further progress possible.<br>On completion Falling Head Permeability Test undertaken prior to backfilling with arisings.                  |                |  |                 |                            |             |   |  | <b>Scale (approx)</b><br>1:25  | <b>Logged By</b><br>TP/MJE |
|  |                |  |                 |                            |             |   |  | <b>Figure No.</b><br>7256.BH3  |                            |

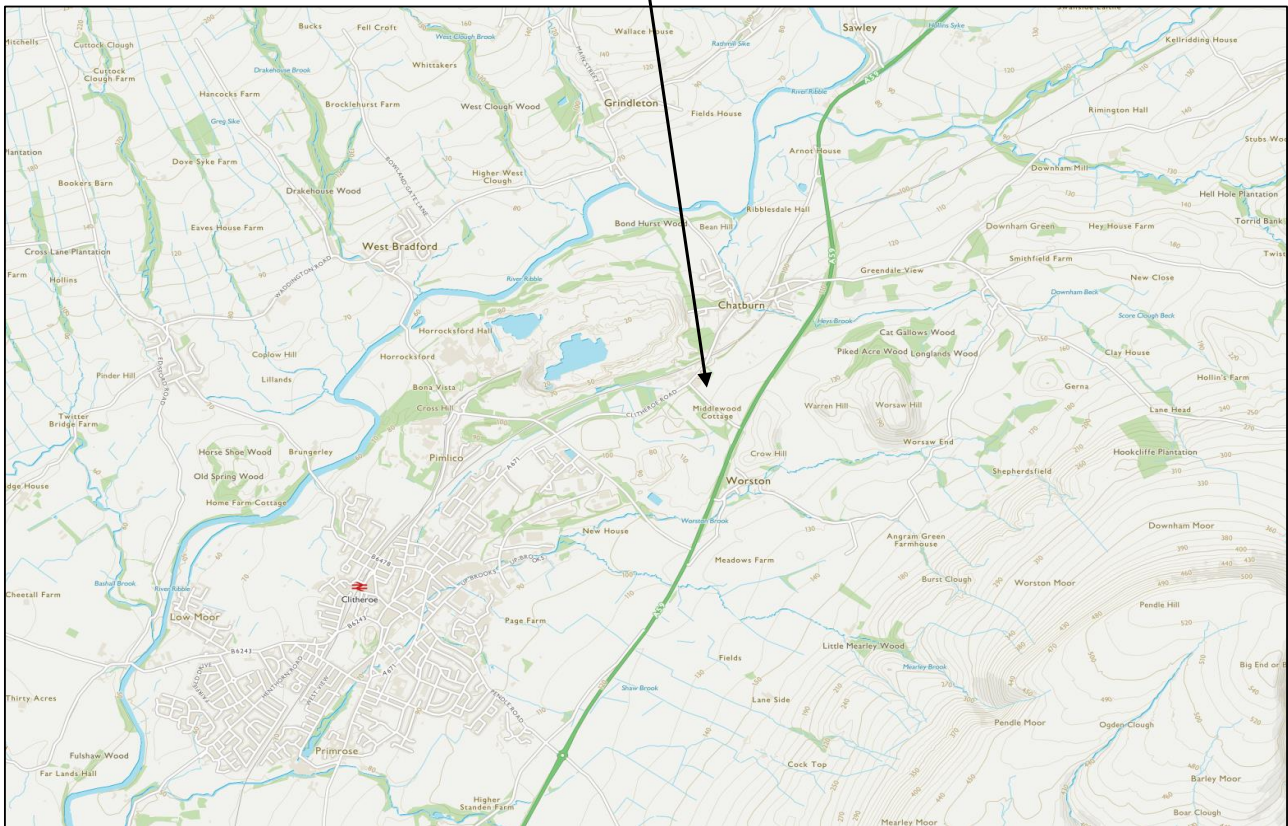
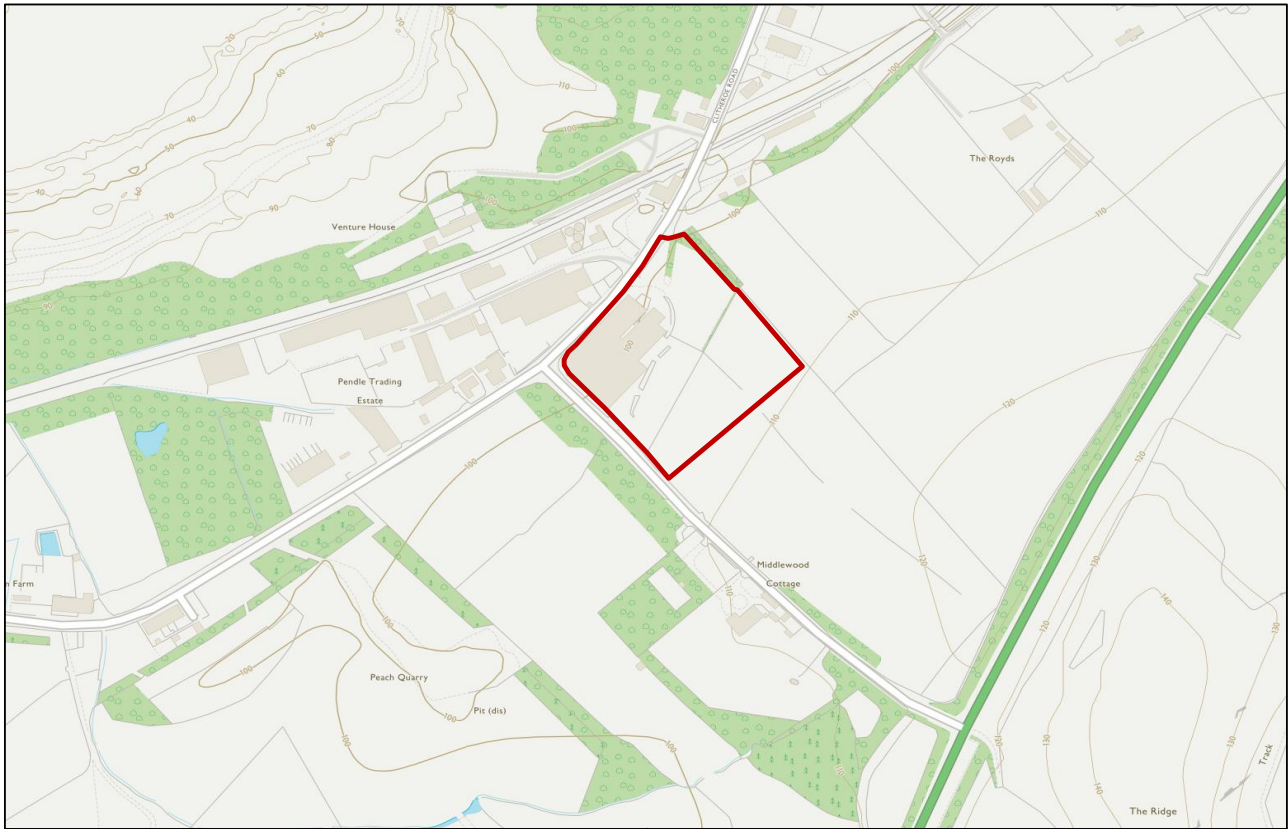
|  |  |                            |  |                           |
|--|--|----------------------------|--|---------------------------|
| <b>Boring Method</b><br>LIGHT CABLE PERCUSSIVE | <b>Casing Diameter</b><br>150mm to 3.20m | <b>Ground Level (mOD)</b>  | <b>Client</b><br>SHACKLETONS HOME AND GARDEN | <b>Job Number</b><br>7256 |
|  | <b>Location</b><br>AS PLAN               | <b>Dates</b><br>28/05/2021 | <b>Engineer</b><br>REID JONES PARTNERSHIP    | <b>Sheet</b><br>1/1       |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records   | Level (mOD) | Depth (m) (Thickness) | Description  | Legend  | Water |
|-----------|----------------|------------------|-----------------|-----------------|-------------|-----------------------|--|---|-------|
| 0.20      | D              |                  |                 |                 |             | (0.30)                | TOPSOIL: soft brown slightly organic slightly gravelly sandy silty clay with some rootlets and occasional subangular fine to medium limestone and mudstone gravel. |    |       |
| 1.00      | D              |                  |                 |                 |             | 0.30                  | Firm to stiff brown slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to coarse mudstone and limestone.                         |   |       |
| 2.00      | D              |                  |                 |                 |             | (2.70)                | .... from 2.50m: gravelly.   |  |       |
| 3.00      | D              |                  |                 |                 |             | 3.00                  | Stiff dark brownish grey slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to coarse mudstone and limestone.                    |  |       |
|           |                |                  |                 |                 |             | (0.60)                | .... at 3.60m: probable bedrock.   |  |       |
|           |                |                  |                 | 28/05/2021: DRY |             | 3.60                  | Complete at 3.60m  |   |       |

|   |                               |                  |
|---|-------------------------------|------------------|
| <b>Remarks</b><br>Hand dug inspection pit from GL to 1.20m to check for services - 1hr.<br>Chiselling at 3.60m - 0.5hr - no further progress possible.<br>On completion Falling Head Permeability Test undertaken prior to backfilling with arisings. | <b>Scale (approx)</b>         | <b>Logged By</b> |
|   | 1:25                          | TP/MJE           |
|   | <b>Figure No.</b><br>7256.BH4 |                  |



|   |                                 |                     |                         |                             |
|---|---------------------------------|---------------------|-------------------------|-----------------------------|
| <b>SS SUB SURFACE</b><br>SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS<br>3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907 | <b>Nominal Section</b>          |                     |                         |                             |
|   | <b>Date Drawn</b><br>06/07/2021 | <b>Date Checked</b> | <b>Sheet</b><br>1/1     | <b>Job Number</b><br>7256   |
| <b>Site</b><br>SHACKLETONS GARDEN CENTRE, CHATBURN, LANCASHIRE  | <b>Drawn By</b>                 | <b>Checked By</b>   | <b>Scale</b><br>1:40[V] | <b>Figure No.</b><br>7256.1 |
| <b>Client</b><br>SHACKLETONS HOME AND GARDEN  |                                 |                     |                         |                             |



## SUB SURFACE

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS  
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

## General Site Location

Site  
**SHACKLETONS GARDEN CENTRE, CLITHEROE ROAD,  
CHATBURN, LANCASHIRE**

Client  
**SHACKLETONS HOME & GARDEN**

Date Drawn  
**05-Jul-21**

Drawn By  
**TP**

Date Checked

Checked By

Orientation



Scale

—



Job No.

**7256**

Figure No.

**1**



|   |   |                                |              |  |
|---|---|--------------------------------|--------------|--|
|  <b>SUB SURFACE</b><br>SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS<br>3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907 | <b>Site Location</b>  |                                |              |  |
|   | Site<br><b>SHACKLETONS GARDEN CENTRE, CLITHEROE ROAD,<br/>         CHATBURN, LANCASHIRE</b> | Date Drawn<br><b>05-Jul-21</b> | Date Checked | Orientation<br> |
| Client<br><b>SHACKLETONS HOME &amp; GARDEN</b>  | Drawn By<br><b>TP</b>   | Checked By                     | Scale<br>-   | Figure No.<br><b>2</b>   |



broken red line surrounding the garden centre buildings indicates extent of existing arrangement (including polytunnels)

staff and servicing/delivery access moved along worston road (broken red line indicates existing) to suit proposed extensions to garden centre

service yard to incorporate delivery bay to maintain possibility of two-way traffic

turning head sized to accommodate articulated vehicles (indicative vehicle tracking illustrated in grey) - turning head to operate as a holding area should it be necessary at busy periods

hatched area to service yard indicates storage area for goods delivered to site. broken lines indicate pallets/containers

existing hedge previously separating site (broken blue line) to be grubbed up and replanted along new boundary

customer vehicular access moved along clitheroe road (broken red line indicates existing) providing regularised parking arrangement and additional forecourt to sales area

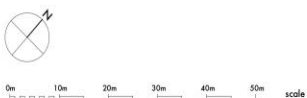
site entrance landscaped to provide 'green' buffer whilst maintaining existing gas tank

parking arrangement reconfigured and orientated to face the garden centre - tree lined parking runs breaking up the hard surfacing - see drg.no.1859/PL10-11

arrows indicate principal entrance to garden centre along proposed 'market street' - entrance largely as existing (re-presented).

car parking beyond original hedge line (broken blue line) arranged to avoid disruption to existing tree root protection areas (broken magenta lines) - see drg.no.1859/PL11

tree canopy profile labelled 'tree removed' indicates low quality ash tree to be removed to suit proposed development - see arboricultural assessment

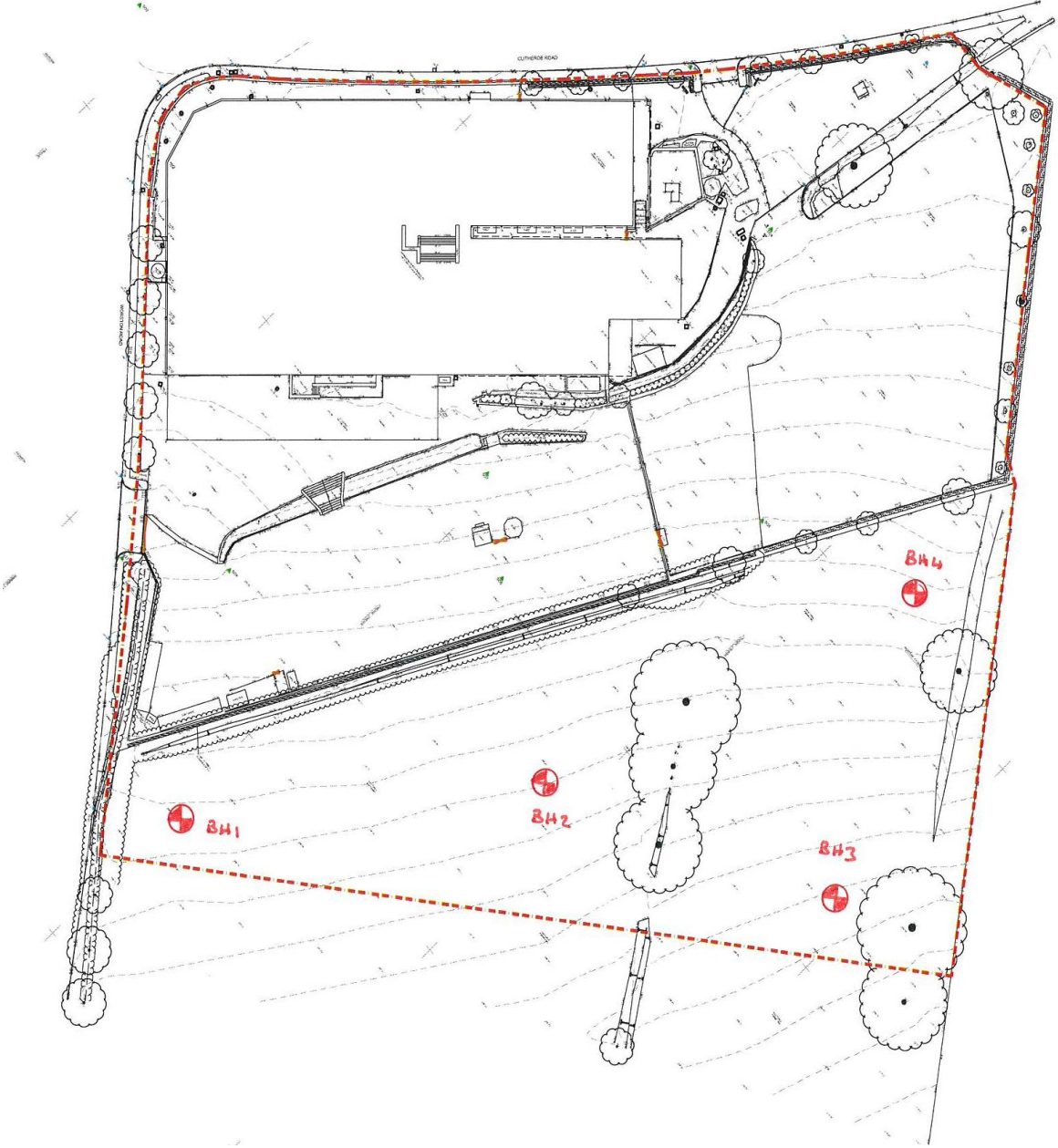


# SUB SURFACE

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS  
3 Peel Street, Preston, PR2 2OS. Tel. (01772) 561135. Fax (01772) 204907

## Proposed Development Plan

|             |   |              |   |
|-------------|---|--------------|---|
| Site        | SHACKLETONS GARDEN CENTRE, CLITHEROE ROAD, CHATBURN, LANCASHIRE |              |   |
| Client      | SHACKLETONS HOME & GARDEN                                       |              |   |
| Date Drawn  | 05-Jul-21   | Date Checked |   |
| Drawn By    | TP  | Checked By   |   |
| Orientation |   | Scale        | — |
| Job No.     | 7256  | Figure No.   | 3 |



INDICATES PROPOSED BOREHOLE

SITE PLAN SHOWING PROPOSED BOREHOLE POSITIONS

MAY 2021



**SUB SURFACE**

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS  
3 Peel Street, Preston, PR2 2OS. Tel. (01772) 561135 Fax (01772) 204907

**Borehole Location Plan**

|             |   |              |   |
|-------------|---|--------------|---|
| Site        | SHACKLETONS GARDEN CENTRE, CLITHEROE ROAD, CHATBURN, LANCASHIRE |              |   |
| Client      | SHACKLETONS HOME & GARDEN                                       |              |   |
| Date Drawn  | 05-Jul-21   | Date Checked |   |
| Drawn By    | TP  | Checked By   |   |
| Orientation |   | Scale        | - |
| Job No.     | 7256  | Figure No.   | 4 |