

# Ground Investigation

# soils

L I M I T E D

**Geotechnical & Environmental Consultants**

## **Phase II Ground Investigation Report**

**At**

**Land South of Ranelagh Road, Havant,  
Hampshire, PO9 1NR**

**For**

**Jacobs Foreman Developments Limited**

**Soils Limited  
Newton House  
Cross Road  
Tadworth  
Surrey KT20 5SR  
☎ 01737 814221  
☎ 01737 812557**

***REPORT 14099/GIR/Rev 2.02***



The test results are given in Appendix B.

### 3.3 Grading Analysis Tests

2No. samples from the Head Deposits (HD) were submitted for grading analysis (particle size distribution tests). An interpretation of the results is provided in Table 3.5.

| Table 3.5<br>Grading Analyses Interpretation |                           |                        |                         |      |                              |
|----------------------------------------------|---------------------------|------------------------|-------------------------|------|------------------------------|
| Stratum                                      | Location/Depth<br>(m bgl) | Soil Description       | Volume Change Potential |      | Passing<br>63µm Sieve<br>(%) |
|                                              |                           |                        | BRE                     | NHBC |                              |
| HD                                           | WS10 at 2.00              | Silty CLAY with gravel | Yes                     | No   | 18.8                         |
| HD                                           | TP2 at 1.50               | Very sandy GRAVEL      | Yes                     | No   | 15.5                         |

(The Particle Size Distribution Tests were undertaken in accordance with BS 1377: Part 2: 1990 clause 9)

NB Volume Change Potential refers to BRE Digest 240 (based on Grading test results).

*Volume Change Potential – BRE 240 states that a soil has a volume change potential when the clay fraction exceeds 15%. Only the silt and clay combined fraction are determined by sieving therefore the volume change potential is estimated from the percentage passing the 63µm sieve. NHBC Standards Chapter 4.2 states that a soil is shrinkable if the percentage of silt and clay passing the 63µm sieve is greater than 35% and the Plasticity Index is greater than 10%.*

The two samples tested from the cohesive soils of the Head **possessed volume change potential** in accordance with BRE Digest 240 but expressed **no volume change potential** in accordance with NHBC Standards Chapter 4.2

The test results are given in Appendix B.

### 3.4 Infiltration Tests

Infiltration tests were undertaken in 26<sup>th</sup> October 2012, 4<sup>th</sup> March 2014 and 18<sup>th</sup> March 2014 and comprised the excavation of seventeen trial holes using an excavator to a maximum depth of 3.00m bgl with infiltration testing carried out following the principles of BRE Digest 365 Soakaway design: 1991.

The water for each test was piped into trial holes using a 4" diameter hose from a 10,000L water bowser to provide suitably rapid/volume discharge. The infiltration was measured from the side of each trial hole at ground level. The location of the trial holes was determined through discussion between the Soils Limited Engineer and the Client, targeting anticipated soakage areas.

#### 26<sup>th</sup> October 2012 (Ref: 13284)

Infiltration tests were undertaken within trial pits SA1, SA2 and SA3, within soils described as the Head Deposits.

#### 4<sup>th</sup> March 2014 (Ref: 14150/SoakRes/SL)

Infiltration tests were undertaken within trial pits S4, S5, S6, S8 and TP11, within soils described as the Head Deposits.

**18<sup>th</sup> March 2014 (Ref: 14186/SL)**

Infiltration tests were undertaken within trial pits S101-S109 within soils described as Head Deposits.

**Ground Conditions Encountered**

Ground conditions were consistent with those encountered during other phases of investigation and were found to comprise a covering of Topsoil or Made Ground over typically cohesive soils (sandy silty CLAY with occasional fine gravel) of the Head Deposits. The Lewes Nodular Chalk Formation was not encountered in any of the trial pits due to the limited depths to which the plant could operate; however it was encountered during the earlier phase of investigation (14099/GIR, February 2014) at depths of between 2.00m and 2.80m bgl.

Logs of the ground conditions encountered within each trial pit are presented within Appendix A.

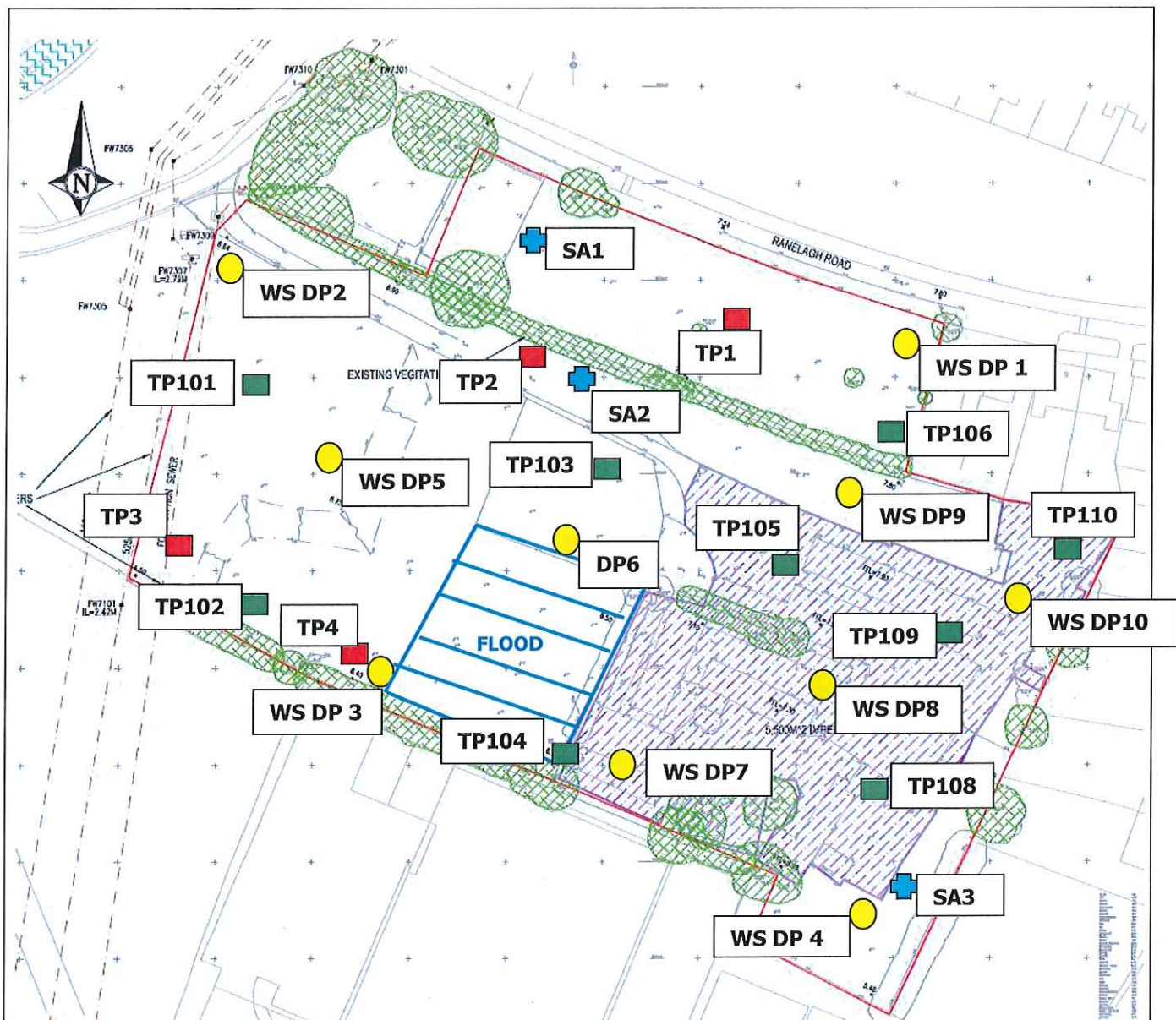
**Infiltration Tests**

Infiltration tests were undertaken within the trial pits (SA1-SA3, S1-6, TP11 and S101-109), within the Head Deposits, following the principles of BRE Digest 365 Soakaway design: 1991. BRE 365 states that for an accurate infiltration rate to be obtained a soakage pit needs to be filled three times in quick succession. Each test can only be ended once 75% of the water present has drained away. Infiltration tests were not repeated three times due to time restrictions.

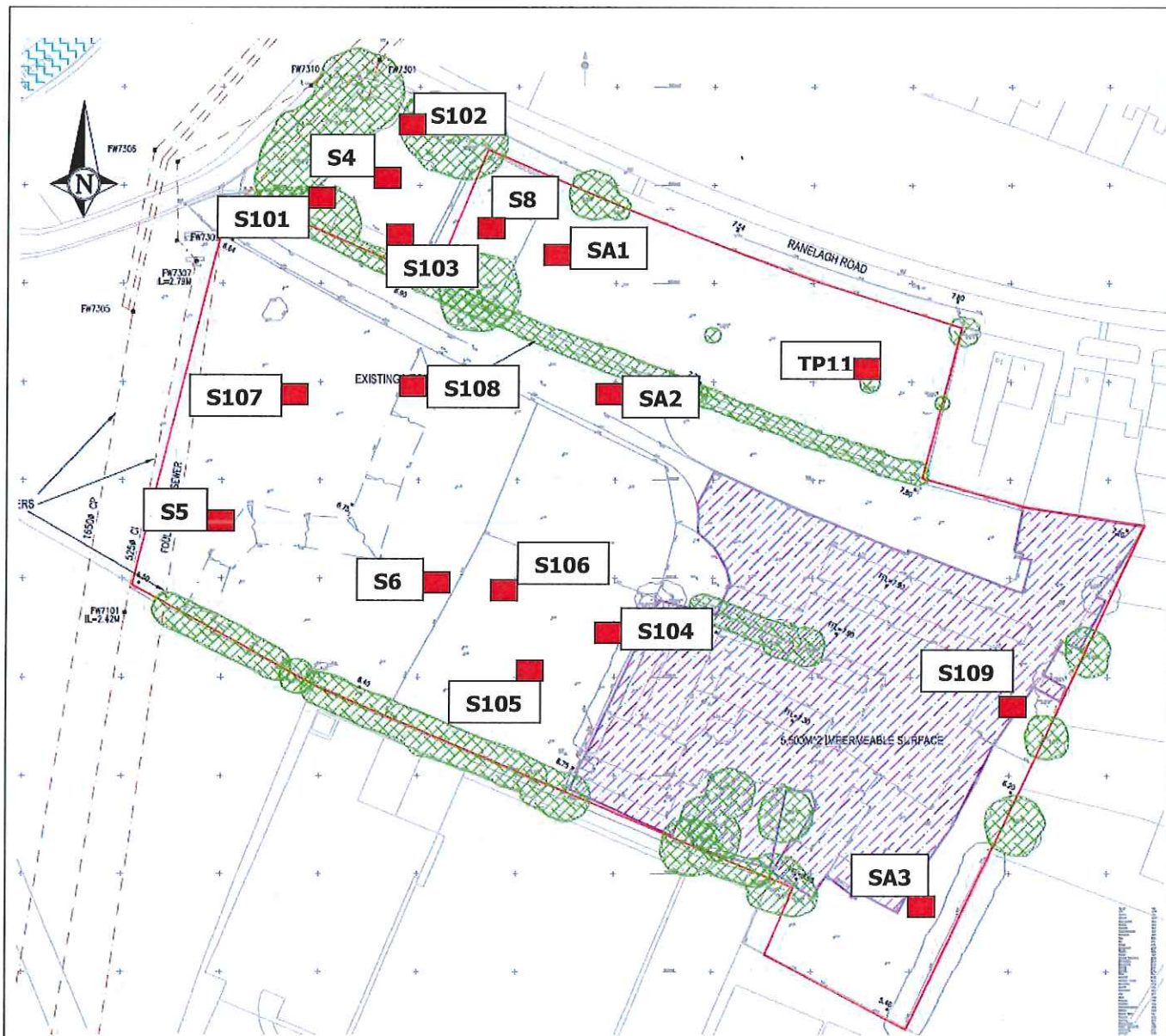
Table 3.6 shows a précis of the results.

| Table 3.6<br>Summary of Soakage Results |                  |             |                     |                                |
|-----------------------------------------|------------------|-------------|---------------------|--------------------------------|
| Test Location                           | Geology Targeted | Time (mins) | Water Loss (metres) | Infiltration rate (m/sec)      |
| SA1, Soak 1                             | Head Deposits    | 350         | 0.10                | Insufficient Infiltration Rate |
| SA2, Soak 1                             | Head Deposits    | 295         | 0.00                | Insufficient Infiltration Rate |
| SA3, Soak 1                             | Head Deposits    | 147         | 0.00                | Insufficient Infiltration Rate |
| S4, Soak 1                              | Head Deposits    | 360         | 0.18                | $1.014 \times 10^{-5}$         |
| S5, Soak 1                              | Head Deposits    | 230         | 0.61                | $1.879 \times 10^{-5}$         |
| S6, Soak 1                              | Head Deposits    | 265         | 0.39                | $1.2096 \times 10^{-5}$        |
| S8, Soak 1                              | Head Deposits    | 120         | 0.08                | Insufficient Infiltration Rate |
| TP11, Soak 1                            | Head Deposits    | 260         | 0.04                | Insufficient Infiltration Rate |
| S101, Soak 1                            | Head Deposits    | 248         | 0.00                | Insufficient Infiltration Rate |
| S102, Soak 1                            | Head Deposits    | 331         | 0.01                | Insufficient Infiltration Rate |
| S103, Soak 1                            | Made Ground      | 101         | 0.43                | $2.918 \times 10^{-5}$         |
| S103, Soak 2                            | Made Ground      | 112         | 0.09                | $1.042 \times 10^{-5}$         |
| S104, Soak 1                            | Head Deposits    | 125         | 0.18                | $1.782 \times 10^{-5}$         |
| S104, Soak 2                            | Head Deposits    | 143         | 0.30                | $2.813 \times 10^{-5}$         |
| S107, Soak 1                            | Head Deposits    | 250         | 0.07                | $1.016 \times 10^{-5}$         |
| S108, Soak 1                            | Head Deposits    | 223         | 0.10                | $5.484 \times 10^{-5}$         |
| S109, Soak 1                            | Head Deposits    | 52          | 0.25                | $4.263 \times 10^{-5}$         |
| S109, Soak 2                            | Head Deposits    | 115         | 0.25                | $1.476 \times 10^{-5}$         |

The test showed that head loss was insufficient to calculate an infiltration rate within SA1-3, S8, TP11 and SA101-102 to comply with the requirements of BRE365.



|                                                                                                    |                                                                          |                                                                                                                                              |
|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Project:</b> Land south of Ranelagh Road, Havant, Hampshire                                     |                                                                          | <br><i>Geotechnical &amp; Environmental Consultants</i> |
| <b>Client:</b> Jacobs Foreman Developments Limited                                                 | <b>Date:</b><br>November 2012 (Ref:13284/GI)<br>December 2014 (14099/GI) |                                                                                                                                              |
| <b>Figure 2:</b><br>Trial Hole Layout Plan – Inclusive of Phase II Investigations 13824 and 14099. | <b>Job Number:</b><br>13248 and 14099                                    |                                                                                                                                              |



**Key:**

■ Soakaway tests

**Project:** Land south of Ranelagh Road, Havant, Hampshire

**Client:** Foreman Homes

**Date:**  
December 2014

**Figure 3:**  
Trial Hole Layout Plan – Soakage Locations

**Job Number:**  
14099

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