



Peter Wade Consultancy
CONSULTING ENGINEERS

Peter Wade Consultancy

Percolation Testing

**Land off Birk Avenue
Kendray
Barnsley
S70 3AH**

PROPOSED RESIDENTIAL DEVELOPMENT

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1. **General Background**

1.1. Client:

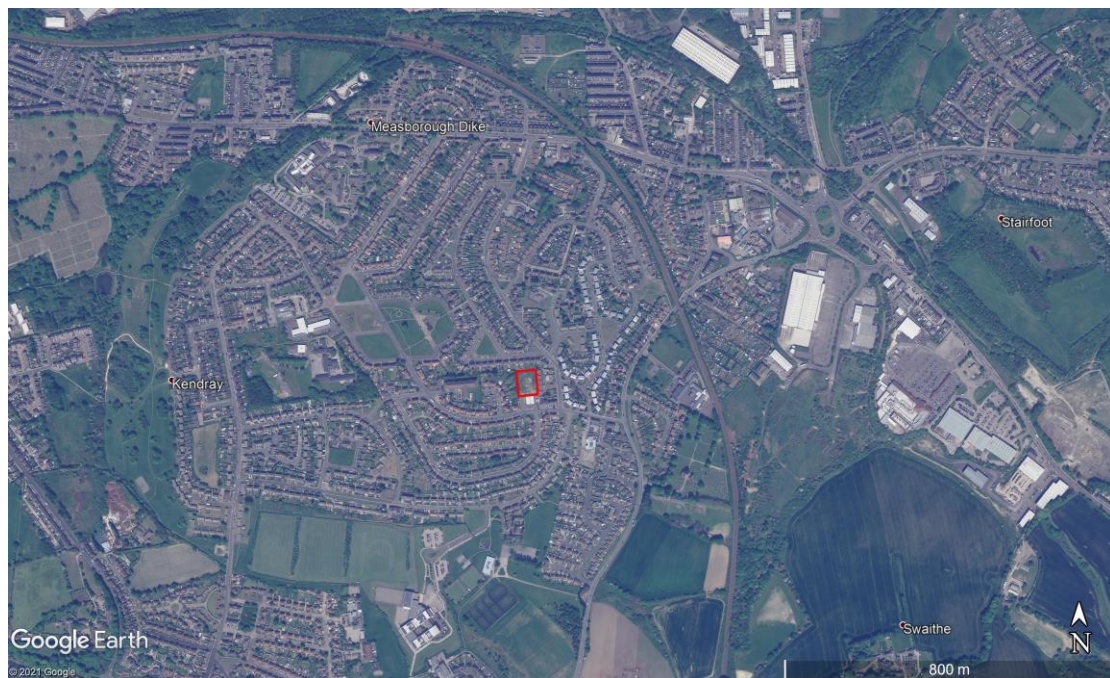
Kirsopp Building Contractors Limited

1.2. The site is located at:

Land off Birk Avenue
Kendray
Barnsley
S70 3AH
E436576 N405103

1.3. This report relates to soil percolation testing that has been undertaken at the site.

1.4. For reference, an aerial photo of the site is shown below with the outline of the site indicated in red:

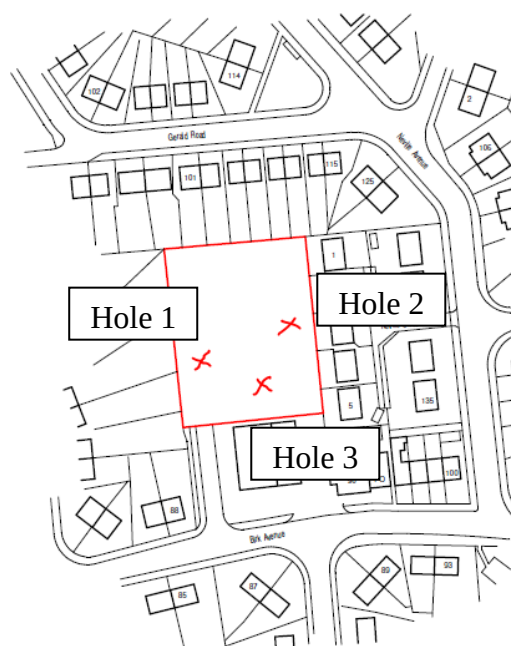


2. Observations

- 2.1. The site is currently vacant, located behind a relatively recent retail building. The main structure fronts on to Birk Avenue and is surrounded by hard standing of tarmac with a small area of concrete overlain by rubber type tiles, installed on the former children's play area.
- 2.2. The percolation testing was undertaken on the 19th of March 2020. The weather on the day of the testing was dry but overcast. The weather during the few weeks previous to the test was generally fair with little rainfall.
- 2.3. The British Geological Survey map data suggests the site is underlain by Oaks Rock Sandstone and does not have any record of superficial deposits in the area.

3. Percolation Testing

- 3.1. Percolation testing was undertaken in accordance with the recommendations of BRE 365. 300x300x300mm trial holes were excavated at invert depth and filled with water, the time taken for the water to drain away was recorded.
- 3.2. The trial hole dimensions result in a storage volume, V_{p75-25} , of $0.15\text{m} \times 0.3\text{m} \times 0.3\text{m} = 0.0135\text{m}^3$, and a wetted area to 50% depth, a_{p50} , of $0.3\text{m} \times 0.3\text{m} + 4 \times 0.3\text{m} \times 0.3\text{m} = 0.27\text{m}^2$.
- 3.3. 3No. trial holes were excavated at different locations on the site. A sketch of the approximate locations is shown below.



4. **Trial Hole 1**

- 4.1. Trial hole 1 was located to the generally to the west of the centre of the site.
- 4.2. The strata found at this location comprised of a wet sandy soil, which also had traces of gravel and rocks within it. When squeezed with the hand it has the same consistency as clay but then crumbled when rolled in hand.
- 4.3. A photograph of the trial hole is shown below.



- 4.4. The time taken for the water level to fall from 75% to 25% depth was 18:00 minutes.
- 4.5. Based on the time taken for the water level to fall and the dimensions of the hole, the percolation rate for this hole was $f = V_{p75-25} / (a_{p50} * 18:00) = 46.3 \times 10^{-6} \text{ m/s}$.

5. **Trial Hole 2**

- 5.1. Trial hole 2 was located to the generally to the east of the centre of the site.
- 5.2. The strata found at this location comprised of a wet sandy soil, which also had traces of gravel and rocks within it. When squeezed with the hand it has the same consistency as clay but then crumbled when rolled in hand.
- 5.3. A photograph of the trial hole is shown below.



- 5.4. The time taken for the water level to fall from 75% to 25% depth was 4:21 minutes.
- 5.5. Based on the time taken for the water level to fall and the dimensions of the hole, the percolation rate for this hole was $f = V_{p75-25} / (a_{p50} * 4:21) = 192 \times 10^{-6} \text{ m/s}$

6. Trial Hole 3

- 6.1. Trial hole 3 was located to the generally to the south of the centre of the site.
- 6.2. The strata found at this location comprised of a wet sandy soil, which also had traces of gravel and rocks within it. When squeezed with the hand it has the same consistency as clay but then crumbled when rolled in hand.
- 6.3. A photograph of the trial hole is shown below.



- 6.4. The time taken for the water level to fall from 75% to 25% depth was 5:00 minutes.
- 6.5. Based on the time taken for the water level to fall and the dimensions of the hole, the percolation rate for this hole was $f = V_{p75-25} / (a_{p50} * 4:21) = 167 \times 10^{-6} \text{ m/s}$

7. Discussion

- 7.1. The infiltration rate at one hole, number 1, located to the west side of the site, was significantly worse than the other two. The strata that were present at this hole are significantly less suitable for infiltration.
- 7.2. Basic ground investigation works were undertaken in 2014 by Roberts Environmental Ltd. 5No. trial holes and a borehole were undertaken within the area of site in question.
- 7.3. The investigation found the site is generally covered by made ground to a depth of around 0.4 to 0.6m below ground level. Below this layer, sand and gravel is generally present to a depth of around two meters. However, to the north west the trial pit found sandy gravelly clay at a depth of 1.2-2.1m, and other trial pits noted some slightly clayey deposits.
- 7.4. The strata found in the ground investigation and the inconsistent infiltration results suggest that the site is generally underlain by suitable infiltration media, but pockets of poorer clayey media are also present.

8. Recommendations

- 8.1. The worse of the two better infiltration rates should be used for the design of soakaways to the south east side of the site, $f = 167 \times 10^{-6}$ m/s.
- 8.2. The siting of soakaways should be steered away from the known areas of poorer infiltration media where possible, away from the north west.
- 8.3. Soakaways sited away from the south east of the site should be designed with the worst infiltration rate recorded, $f = 46.3 \times 10^{-6}$ m/s.
- 8.4. During excavation of any proposed soakaways, the strata found should be referred back to the designer of the soakaways, especially if clay is found, and if necessary, further infiltration testing can be conducted to confirm suitability in the particular location.



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