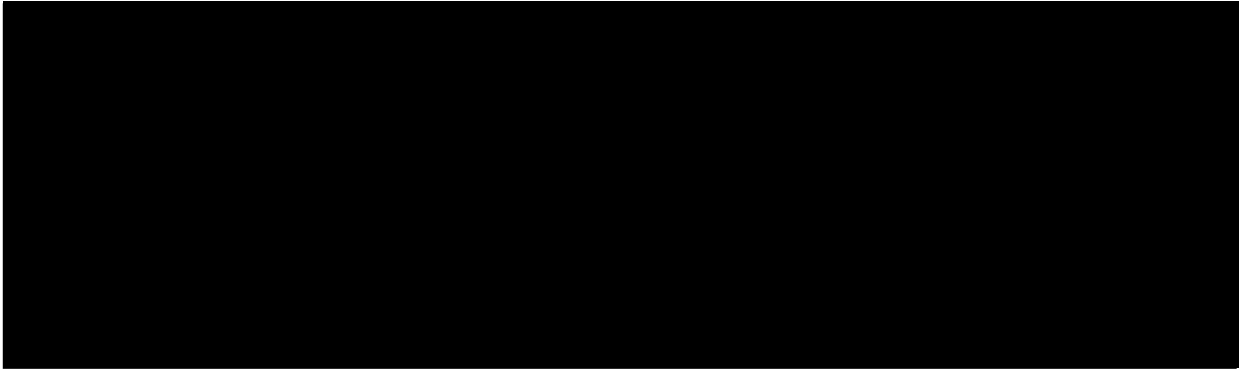


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Re: Snape Hill Road, Darfield
Discharge of Planning Condition 9 (parts b and c)

Dear Sir

We refer to the discharge of planning condition 9 (parts b and c), with respect to the disposal of surface water from the Darfield site, and the requirement for porosity tests to determine the viability of soakaways.

Porosity tests were undertaken on 15 September 2016 at three locations as shown on Figure 001. The findings of the soakaway tests are detailed below.

Fieldwork and Ground Conditions

Three trial holes were excavated using a JCB 3CX in order to undertake the soakaway tests at the positions shown on the attached plan, 1177-001. These positions are referred to as TP1, TP2 and TP3 and were located in accessible positions and away from site constraints (e.g. embankments, vegetation and live services).

Ground conditions encountered in the trial excavations comprised a thin layer of either dark brown slightly gravelly topsoil or made ground, consisting of gravelly clay and gravelly sand with occasional demolition wastes, to between 0.45m bgl and 1.7m bgl.

The underlying natural soils comprised weathered bedrock consisting grey-brown silty slightly sandy gravelly clay. These strata were consistent across the site in all three pits, although trial hole TP3 was observed to contain a higher proportion of cobble sized siltstone from a depth of approximately 2.0m bgl. No groundwater was encountered during the investigation.

The soil conditions encountered are consistent with the geology of the area, which is reported to comprise interbedded grey mudstone, siltstone and pale grey sandstone with marine fossil beds and common coal seams of the Pennine Middle Coal Measures Formation.

A copy of the trial hole logs is presented in Appendix A for reference.

Soakaway Test Results

The results of the test are presented as Figures 1177-002 to 1177-006 in Appendix B and summarised below in Table 1.

Table 1: Soakaway Test Results

Location	Soakage Area Dimension (m)	Test Depth (m bgl)	Duration of Test (mins)	Infiltration Rate (m/s)	Drainage Characteristics
TP1	2.5 x 0.6	2.1	120	None	Impermeable
TP2	2.2 x 0.7	2.14	120	None	Impermeable
TP3	2.2 x 0.7	2.3	37	5.4×10^{-5} to 7.2×10^{-5}	Fair

The results of the test in pits TP1 and TP2 indicate that water levels did not achieve a fall from 75% to 25% of the effective depth of the storage volume. This was because of the cohesive nature of the underlying soils, which was anticipated on the basis of geological records and historical ground investigation data for the site. As such, the tests could not be completed in accordance with the scope of method prescribed in BRE 365:1991.

With respect to TP3, an infiltration range was established after the completion of three tests within the pit. It should be noted, however, that the infiltration of water appears to have been assisted by the presence of tabular siltstone and sandstone

cobbles at the base of the pit, which is considered to be representative of a highly weathered (fractured) zone above more competent bedrock. Whilst good drainage characteristics were initially observed, it should be considered that the calculated infiltration rate may not be wholly representative of the underlying bedrock conditions, as water will have drained through the large void spaces between the siltstone cobbles and along the interface with the underlying solid bedrock. The underlying bedrock, which is silty, has poor drainage characteristics.

Conclusion

It is considered, on the basis of available site-based data, that soakaways for the discharge of surface water are unsuitable for use at the site. Two tests failed to achieve any meaningful infiltration, whilst the third test highlighted the potential for false-positive readings which may create uncontrolled off-site water discharge during the lifetime operation of the development. It is recommended that alternative surface water drainage solutions are considered.

Please do not hesitate to contact the undersigned on 07740 529639 should you need to discuss the above in more detail.

