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Baildon
SHIPLEY
BD17 5BN

Our Ref: MGeo 2103 BD17 5BN

Ref: Soakaway

Date: 9th March 2021

Dear Sirs,

RE: Soakaway Test on Land at 2 Prod Lane Baildon BD17 5BN

This letter report provides a summary of a 'soakaway' test undertaken at the above site as part of a new residential building.

Site Setting

The site was located on sloping land at 2 Prod Lane within an upper moorland setting. As seen in the site photos the initial excavations and site clearance have exposed sandstone bedrock at formation level and quarry backfill in the north and extending to the fields north of the site.

Geology

The British Geological Survey (BGS) 1:50,000 scale map solid & drift edition Sheet 69 indicated the site is underlain by Rough Rock of the Millstone Grit Group with no drift deposits identified.

The Rough Rock sandstone is a coarse-grained feldspathic sandstone, cross-bedded. The weathered profile that develops is normally found to comprise sandy gravelly clay and clayey sand and gravel in the near surface.

Regional Setting

The area is part of the elevated moorland plateaux of Carboniferous rocks that form the central part of Britain and comprise thick sequences of sediments which have been incised by glacial and alluvial valleys.



Figure 1 – Site Location Plan

The bedrock geology of the District is predominantly sandstone, siltstone, mudstone with subordinate coal, seatearth and ironstone of the Millstone Grit and lower Coal Measures. These sedimentary rocks were deposited about 310-315 million years ago during the Carboniferous period. In the late Carboniferous a phase of deformation, part of the Variscan Orogeny, resulted in the development of a complex network of faults across the district.

The moors of the area are typically mantled by strong sandstones such as the cross-bedded Elland Flags which have been extensively quarried for building stone. Interbedded weak shales, mudstones and siltstones crop out on the valley floor, lower slopes and middle slopes.

The present day topography was historically influenced and formed by numerous landslips which occurred across the Pennines following the Devensian glacial period approximately 10,000 years ago. These landslips occurred along valley sides oversteepened by glaciers; the slopes failing once the glaciers retreated and lateral pressures reduced. The abundance of mapped landslips in the district indicate the prevalence of past slope failures.

Investigation

The investigation works were undertaken by the client's tracked excavator. One trial pit was excavated for soakaway testing relevant to the planned development and where it was safe to do so.

The trial pit was excavated to approximately 1.

A water bowser had been filled with water and this was discharged to the pit. The water initially drained away faster than the pit could be filled and could not be filled higher than 0.5m above the base of the pit. Upon shutting the water off (after discharging 500L of water) the remaining water in the pit drained away completely within approximately 9 minutes. A selection of photos showing the site condition is included as appendix A.

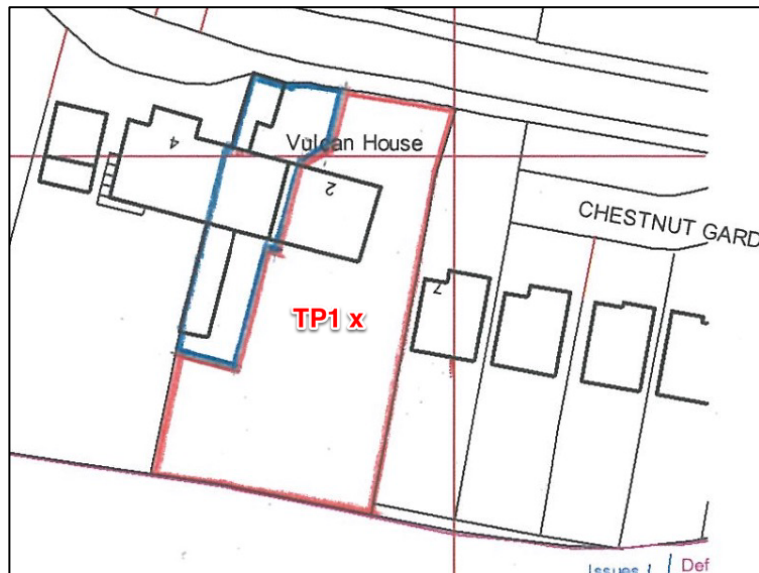


Figure 2 – Trial pit location plan

Conclusions and Recommendations

It is considered the investigations have been able to confirm that the geology of the site is such that constructed soakaways should be suitable as positioned when excavated into the encountered weathered sandstone strata.

The soakaway test undertaken was not entirely compliant with Soakaway Design BRE Digest 365 (BRE 365) which provides the most recognised guidance and recommendations for testing methods. This was due to a number of site constraints, however, the inspection was considered sufficient to confirm, with consideration of the overall site setting, that the infiltration rate within the underlying sandstone strata is more than adequate.

A soil infiltration rate (f) has not been calculated, however, for design purposes a conservative infiltration rate can be assumed as 1×10^{-4} m/s although in practice the secondary permeability controlled by fracture flow is likely to be closer to 1×10^{-3} m/s within sandstone strata. It is considered that further investigation is not necessary or cost effective. It is understood that the soakaway will be constructed at the rear of the property and is likely to be excavated at least 1.2m below formation level. It is recommended that the soakaway is extended parallel to the slope and set back from the site boundary with the woodland to avoid creating any slope instability (it is noted that existing land drainage discharged via a pipe into the wood previously).



The quality of soakaway system and drainage construction will have a significant bearing on the systems performance. Adequate gradients should be provided for all drains so as not to create backfalls should any future ground movements take place.

It should be noted that soakaways should be positioned at least 5m away from the foundations of any permanent structures.

If, at any stage during the construction any significant changes from the assumed ground conditions are found, this should be brought to the attention of Mugen Geo Ltd and appropriate advice sought.

I trust the above information is sufficient for your requirements. However, if you have any comments or queries please do not hesitate to contact me.

Yours sincerely

Stuart Proudlock - MSc DIC FGS AGS

Senior Engineering Geologist



Appendix A
Site Photographs



General view to the north looking up towards Prod Lne



General view to the south west across the site down towards woodland



View of soil arisings from TP1 – note weathered sandstone gravel and cobbles



View of TP1 pit



Initial filling operations



Soakaway test



Test after approximately 8 minutes



View of southern boundary showing slope condition

General Terms & Conditions Mugen Geo Phase II Investigations

The proposal above describes a ground investigation to be undertaken on behalf of The Client and owner of the site) referenced above. The investigation proposed is been designed based upon information supplied by the client to assess the suitability of the site for sustainable drainage.

The Client is to ensure services have been identified prior to any excavation or provide full utilities plans.

This report will be produced on behalf of The Client and no responsibility is accepted to any Third Party for all or any part. The final report should not be relied upon or transferred to any other parties without the express written authorisation of Mugen Geo Ltd. If any unauthorised Third Party comes into possession of this report, they rely on it at their own risk and the authors owe them no duty of care or skill.

Whilst the prepared report may express an opinion on the possible configuration of strata, contaminants or gases between or beyond exploratory hole positions or on the possible presence of features based on either visual, verbal or published evidence, this is for guidance only, and no liability can be accepted for its accuracy.

The comments on groundwater and ground gas conditions will be based on observations made at the time of the investigation. It should be noted, however, that groundwater and ground gas levels may vary from those reported due to seasonal or other effects.

It must be understood that any ground investigation only samples a small percentage of the ground. As a result changes in ground conditions and soil properties can occur between any two exploratory points, for example local features such as soft ground, pockets of contamination and faults. Unrecorded bell pits and shafts can also exist between exploratory points. The proposed ground investigation is designed to minimize such risks. Conclusions and recommendations are based on the information presented in this report, but unforeseen features may exist. Therefore, the actual ground conditions should be noted during construction and further advice sought if they differ significantly from those predicted.

Further investigation can be carried out to further reduce uncertainty and risk but ultimately these risks cannot be eliminated. In commissioning further research or investigation the costs, and the assumed benefit of doing so, must be considered.

Where information has been obtained from Third Parties, no liability can be accepted for the accuracy or completeness of this information. Where anecdotal evidence or speculations are presented, they must be treated as such and cannot be relied upon.