

28th January 2021

YEX3307

Shenton Group
Walworth Business Park
Walworth Road
Andover
SP10 5LH

Dear Sir/Madam,

Proposed Boiler House and 2no. Gas Generators at Innerspec, Oilsites Road, Ellesmere Port CH65 4AJ – Preliminary Geotechnical Assessment

YourEnvironment (YE) undertook intrusive investigations at the above site between 17th and 21th January 2022. A preliminary summary is provided of the pertinent findings and recommendations in advance of our formal report, due to be issued 14th February 2022.

Intrusive Works

A total of 3no. cable percussion boreholes (BH01 to BH03) were put down across the site to a maximum depth of 14.45m bgl. DRAFT exploratory hole records are attached. However, a borehole location plan is unavailable at present.

Ground Encountered

Hardstanding – Reinforced concrete was present at 0.45m below existing ground level (bgl) at a thickness of 400mm beneath a surface cover of loose gravel.

Made Ground – Underlying the concrete hardstanding, Made Ground was proved to depths of between 1.35 and 2.35mbgl comprising soft sandy clay.

Natural Soils (Tidal Flat Deposits)

Beneath the Made Ground, natural soft silty CLAY was confirmed to depths of between 3.8m and at least 5.6mbgl.

Significant interbeds of spongy pseudo-fibrous PEAT were present at depths of some 3.8mbgl and thicknesses of between 900mm and 1,200mm.

Underlying the CLAY and PEAT deposits, natural medium dense silty SAND was present to depths of between 6.1m and 6.2mbgl.

Natural Soils (Glacial Till)



Firm becoming stiff sandy gravelly CLAY was present beneath the overlying weaker Tidal Flat Deposits and proved to the maximum depth of the boreholes at 14.45mbgl.

Within the Made Ground, in situ SPT testing recorded uncorrected N values of between N=4 and N=6 at 1.2m depth. Within the upper clays N values of N=5 at 2.0m depth and N=5 at 3.0m depth were recorded. Within the peat, N values of N=4 at 4.0m depth were recorded. The underlying sand recorded an N value of N=11 at 5.0m depth. Within the deeper natural glacial clays, N values of N=19 were recorded at 6.5m depth, N=29 at 8.0m depth, N=34 at 9.5m depth, N=31 at 11.55m depth, N=30 at 12.5m depth and N=33 at 14.0m depth.

Groundwater

No free groundwater was encountered during the progress of the exploratory holes to a maximum depth of 14.45mbgl.

Contamination

Visual and olfactory evidence of surface hydrocarbon impact was noted within the surface gravel at all positions, however, this does not suggest gross or significant contamination of the soils. No visual evidence of suspected asbestos containing materials (ACM) was noted during the intrusive investigation.

Laboratory Testing

Selected representative samples have been scheduled for geotechnical laboratory testing comprising Atterberg limits determination, particle size distribution, triaxial strength testing, consolidation oedometer testing and pH and sulphate concentrations. In addition, selective samples have been scheduled for determination of a general suite odd potential contaminants. At present the results are awaited and will be included and discussed on issue of the final report.

Construction Consideration

Foundations

It is understood that it is proposed to construct a steel framed structure and 2no. gas generators on a shared ground slab.

The presence of weak Made Ground and natural soft clays interbedded with significant thicknesses of peat would preclude the use of conventional shallow foundations due to the potential for excessive total and differential settlements. Alternative foundation solutions should be adopted or techniques sought to improve the strength of these materials.

Consideration may be given to the use of piles to transfer the foundation loads through the weak Made Ground and natural soils to more competent natural soils at depth. For preliminary design purposes it is considered that either driven pre-cast concrete piles or bored CFA piles are likely to represent the most economical foundation solution with a preliminary total depth of some 10m considered appropriate. These should be designed to support a reinforced ground slab. In order to formulate a suitable design, it is recommended that the advice of specialist piling contractors be sought. In addition, the pile design should include provision for negative skin friction within any weaker overlying Made Ground and natural soils as these deposits may be subject to collapse compression if not treated.



It may be necessary to construct a working platform for the piling rig and any other plant required during the works. Such a design should be undertaken in accordance with the procedures given in the BRE publication: Working platforms for tracked plant.

An alternative solution may be to use a shallow reinforced ground slab supported by vibro-stone columns. However, the presence of peat may preclude this option. There are several techniques available, subject to the nature, composition, and thickness of Made Ground and natural soils and in order to fully assess the efficacy of this approach the advice of specialist contractors should be sought.

The chosen contractor will be required to provide design calculations, including settlement analysis, to demonstrate that the design meets the client's specification for the work. In addition, all works should be undertaken in accordance with the appropriate specifications, which should be provided.

Any remnant structures and foundations, from historic on-site development, should be removed and replaced with a suitable engineered granular backfill and compacted in layers.

Sulphates

Upon receipt of the results of the laboratory testing, recommendations as to the Design Sulphate Class in accordance with BRE Special Digest 1 will be presented.

We trust this is sufficient for your requirements in the interim and should you have any questions please do not hesitate to contact the undersigned.

Regards



Jonny Roberts

Principal Geoenvironmental Engineer

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