WEBB YATES ENGINEERS

Hydrogeological Regime Evaluation

15 Great James Street

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1. INTRODUCTION

The following technical note has been produced to outline the evaluation of the hydrogeological regime at the 15 Great James Street site and the intended methodology for managing ground water during the excavation and underpinning process. The site location is 15 Great James Street, London, WC1N 3DP.

This report should be read alongside all relevant submitted documentation, including the Basement Impact Assessment, the Ground Movement Assessment, the Site Investigation report and the proposed construction method statement. The information contained in this report has been produced and reviewed by A-Squared Studio Engineers Ltd (A-squared).

The current development / property comprises a four-storey residential building with an existing lower ground floor / basement level. The rear of the property comprises a single storey brick structure with no lower ground floor level. The property shares party walls with 14 & 16 Great James Street, respectively. The proposed development works comprise the renovation of the existing building and extension of the lower ground floor / basement level to the rear of the property.

The new basement will be retained by a combination of mass concrete underpins and RC L-sections, cast in sequence in bays. It is understood that the bulk excavation works, and construction of permanent works elements will be facilitated utilising a *bottom-up* methodology.

Temporary propping / shoring measures are likely to be required at ground level, prior to proceeding with bulk excavation works. The props will increase the *system stiffness* of the embedded retaining wall during construction and reduce the risk of adversely affecting neighbouring structures and/or third-party assets, due to excessive ground movement.

2. EXPECTED HYDROGEOLOGICAL CONDITIONS

An evaluation of the expected hydrogeological conditions has been undertaken based on the site-specific ground investigation interpretative report, produced by Jomas Associates Ltd, dated 1 November 2019. Document reference: P2342J1771/AMM.

Below is a summary of the groundwater encountered as part of the GI works performed to date:

- BH1 – No water strike during drilling. Water level recorded at +20.16mOD and +20.14mOD during the two monitoring visits.
- WS01 – Water strike at +18.29mOD during drilling.
- TP01, TP02, TP03, TP05 and TP06 – No water strikes during excavation. Maximum excavation depth 1.09m or minimum elevation of +19.70mOD.
- TP04 – Water encountered at +19.77mOD.

The available information does not necessarily suggest a consistent water table (or phreatic surface) representative of an upper perched water table or aquifer as such. It is considered that the water encountered locally at BH1 and other positions is likely to correspond to perched bodies of water and/or finite volumes contained within the horizons transitioning from the Made Ground to the Lynch Hill Gravels. The upper materials forming the Lynch Hill Gravels suggest the presence of some limited cohesive material at the top of the stratum, which support this evaluation.

The Contractor will confirm the conditions as part of proposed enabling works operations by means of further trial pitting. This will ensure that any seasonal variation is understood and mitigated, and that an appropriate method statement is adopted at the time of mobilisation and execution of the proposed works.

3. MANAGEMENT OF GROUNDWATER DURING EXCAVATION

In the event that finite bodies of water are encountered at discrete locations during trial pitting (as sustained by the ground conditions and infiltration pathways), these will be managed by finite evacuation of trapped groundwater during the excavation process. This would not result in any significant requirements for groundwater control and as such would have no adverse impact on surrounding assets.

In the event of perched groundwater (phreatic surface) being intercepted in the trial pits above the elevation of the base of the proposed underpins, localised pumping at discrete proposed underpin positions would be performed in a controlled fashion. Pumps would be placed within shallow lined sumps with a view of eliminating any potential loss of fine particles within the soil mass. If this would be required, then considering the limited drawdown would not exceed 0.5m and be confined within the localised underpin footprint, the impact of the finite change in stress within the surrounding ground (and associated impact on surrounding assets) is considered to be very limited. Further to the controls and measures adopted as part of the pumping process, any groundwater would be diverted into an attenuation tank, which would be subject to continuous inspection to confirm volumes of water and any soil/particle content.

The works will be sequenced in a hit and miss fashion, with any potential measures being implemented in areas away from existing/neighbouring structures in the first instance, in order to enable the monitoring of the impact of any proposed excavation works and evaluation of the effectiveness of the construction methods adopted. Furthermore, the existing and neighbouring structures will be monitored throughout the duration of the proposed works, with enhanced frequency and scrutiny during any below ground works.