WHITE & LLOYD

CONSULTING ENGINEERS

Hunters Lodge,
Friars Lane,
Richmond Green,
TW9 1NX

Structural Engineering Report to Assist Planning Application

Report in Relation to the Adjacent Grade II Listed Wall

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INTRODUCTION

White and Lloyd Consulting Engineers have been appointed by 50 Degrees North Architects on behalf of Colin Deehan to provide a structural report evidencing that the proposal can be constructed without undermining the structural stability of the adjoining Grade II Listed Wall. The report is to assist with the planning application for the proposed development at Hunters Lodge, Friars Lane, Richmond Green, TW9 1NX.

It should be noted that this is a preliminary document and further detailed consideration to construction and structural engineering design will be carried out later in the process. It will also be a requirement of the selected contractors to provide a detailed construction method plan, sequence of works and temporary works design prior to construction.

SCOPE OF WORKS

Full details of the works can be seen in the following architectural drawings:

2561 – 002 – Proposed Floor Plans

2561 – 003 – Proposed Front & Rear Elevations

2561 – 004 – Proposed Side Elevations & Section

SOIL CONDITIONS

According to publicly available data from The British Geological Survey records the superficial deposits are Kempton Park Gravel member (sand & gravel) underlain by a bedrock of London Clay.

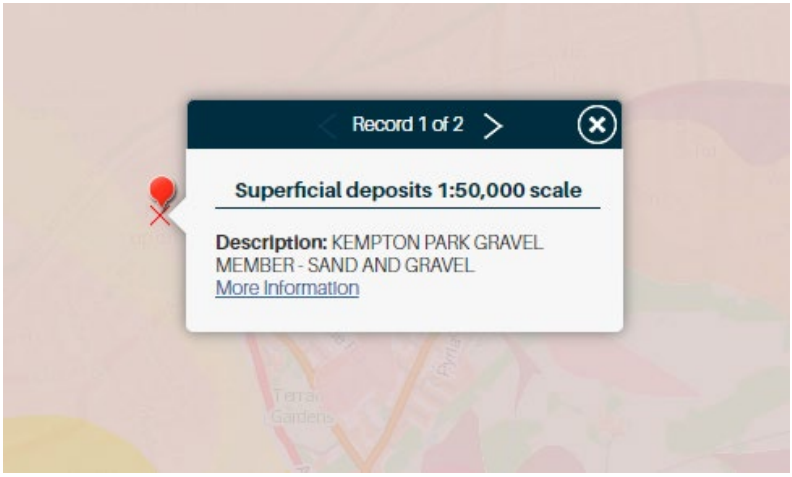

Image 1 -. Geological Map showing the superficial geology.

The British Geological Survey also holds records of previous boreholes that have been carried out, Image 2 below illustrates boreholes that have been recorded locally to Hunters Lodge.

Image 2 -. Map indicating existing boreholes near to Hunters Lodge

The boreholes show London Clay to begin at depths between 3m and 7m, with Ballast above this up to ground level. The Ballast is a mixture of sand and gravel, and this is thought to be a combination of the Kempton Park Gravel member and made up ground, as explained in the next paragraph.

There has also been a series of trial pits undertaken as part of the Archaeological Evaluation Report. These were excavated to depths between 1.62m – 2.0m. There were five trial pits carried out and natural geology was only recorded in one of the pits, at a depth of 2m below ground level. In all of the other pits, the excavations had not extended beyond the made ground. This suggests that the site is overlain by a deep layer of made up ground, approximately 2m deep.

Prior to undertaking any detailed design work, a site specific geotechnical investigation will be undertaken which will involve drilling a series of boreholes across the site in order to record the actual soil conditions and collect samples for laboratory analysis. The substructure will then be designed to suit the soil conditions recorded during the geotechnical investigation.

EXISTING FOUNDATIONS OF GRADE II LISTED WALL

Two of the trial pits that were undertaken as part of the Archaeological Evaluation Report exposed the existing foundations of the adjacent Grade II Listed Wall. For reference, these were trial pits TP4 and TP5 of the Archaeological Evaluation Report produced by MOLA.

Trial pit 4 was located on the north-west corner of the existing building, where it butts with the Grade II Listed Wall. The pit was excavated to a depth of 1.75m below ground level in order to assess the depth of the wall however, even at this depth, the underside of the foundation was not reached. It can therefore be said that the foundation depth of the Listed Wall here is in excess of 1.75m below ground level, and the face of the foundation protrudes approximately 0.5m from the face of the wall. The trial pit also exposed the foundations of the flank wall of the existing property however it is not clear within the Archaeological Evaluation Report as to what depth these foundations extend to, although it does state that the foundations for this wall cut through the foundations for the Listed Wall.

Figure 1 - TP4, Archaeological Evaluation Report, MOLA 2022

Trial pit 5 was located on the south-west corner of the site and was dug to a depth of 1.74m below ground level. As with trial pit 4, the underside of the existing foundations was not uncovered and therefore it can be said that the foundations here are in excess of 1.74m deep. The foundations protruded between 0.42m – 0.5m from the face of the wall.

Figure 2 - TP5, Archaeological Evaluation Report, MOLA 2022

PROPOSED FOUNDATIONS FOR REPLACEMENT DWELLING

Considering the trial pits, discussed in the previous section, have shown there to be a deep layer of made up ground it is thought that standard trench fill foundations would be uneconomic as they would need to be in excess of 2m deep in order to reach suitable strata. It is therefore proposed to construct the replacement property using piled foundations.

The piles will likely be no more than 300mm in diameter, and therefore classed as mini piles. The piles will be bored as opposed to driven, as bored piles result in minimal levels of vibration and therefore reduce the risk of damage to existing adjacent structures. Bored piles will also result in minimal disruption to the surrounding soils, once again, reducing risk to the existing adjacent wall. The piles will be located at roughly 3m centres, and a shallow trench will be excavated to allow construction of the reinforced ground beam, as shown on the section below.

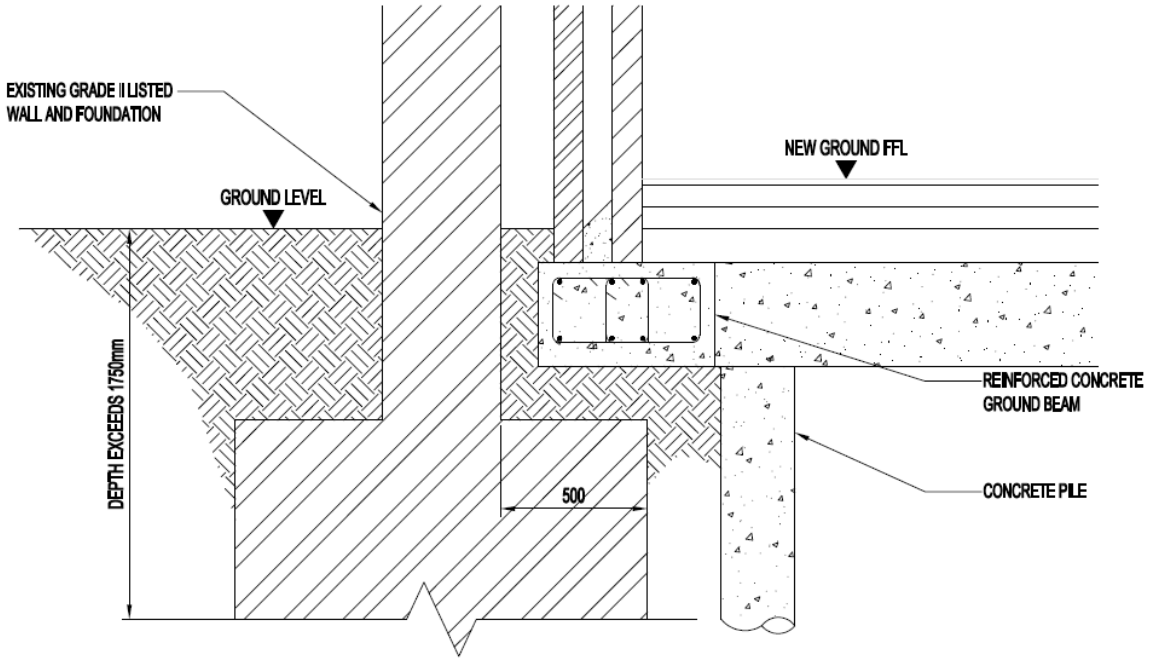

Figure 3 - Section Showing New Piles Adjacent to Grade II Listed Wall

RISK ANALYSIS OF THE PROPOSAL ON THE EXISTING LISTED WALL

As discussed in the previous section, the substructure for the replacement property will be constructed using concrete piles. This method will minimise any potential risk to the existing wall. This construction reduces the amount of potential ground movement and so minimises the effects of any settlement on the adjacent structures.

If the proposed sequence of construction is carried in accordance with the Structural Engineer's details and specifications, it will have no significant impact on the structural stability of the Grade II Listed Wall.

Using the Classification of Damage to Visible Walls, Table 2.5 Ciria C580, see below, the expected damage category to the existing structures due to the proposed development, and assuming a good standard of workmanship, is not expected to exceed 'Category 1' corresponding to very slight damage.

Category	Description
0 (Negligible)	Negligible – hairline cracks
1 (Very slight)	Fine cracks that can easily be treated during normal decoration (crack width <1mm)
2 (Slight)	Cracks easily filled, redecoration probably required. Some repointing may be required externally (crack width <5mm).
3 (Moderate)	The cracks require some opening up and can be patched by a mason. Recurrent cracks can be masked by suitable linings. Repointing of external brickwork and possibly a small amount of brickwork to be replaced (crack width 5 to 15mm or a number of cracks > 3mm).
4 (Severe)	Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows (crack width 15mm to 25mm but also depends on number of cracks).
5 (Very Severe)	This requires a major repair involving partial or complete re-building (crack width usually >25mm but depends on number of cracks).

RISK ANALYSIS ON EXISTING AND SURROUNDING UTILITIES, INFRASTRUCTURE AND MAN – MADE CAVITIES

Any local services discovered on site during construction are to be kept, protected, and re-routed where necessary and practicable. Although some initial investigations will be carried out before hand, the exact location and invert levels of any underground services will not be known until the works commence. However, if it is necessary to

relocate or divert any utilities, the Contractor and Design Team will be under a statutory obligation to notify the utility owner prior to any works. This will be so that they can assess the impact of the works and grant or refuse their approval. There are no known man-made cavities (e.g., tunnels) near the proposed works.

PROTECTION TO GRADE II LISTED WALL DURING WORKS

To ensure any damage to the wall is limited as far as possible, it is recommended that it is covered in hessian sheeting for the duration of the works on site. Furthermore, Harris fencing will be erected around the whole perimeter of the wall to provide a physical barrier between the site works and the wall.

CONCLUSIONS

This report has been prepared in order to provide evidence that the proposal can be constructed without undermining the structural stability of the adjoining Grade II Listed Wall.

It is of our opinion that, providing the works are carried out by a skilled contractor experienced in such operations, the proposals can be built safely and without significant structural impact on the existing wall in question.

The proposed development can be achieved using standard construction techniques and materials, and can be constructed in a controlled and predetermined sequence.

It is worth noting that the proposed development will in no way interact with the Grade II Listed Wall, that includes both the bin and bike stores. All elements of the development will be kept separate from the listed wall.

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