Structural Engineers Report

in

Support of Planning Submission

for

Proposed Subterranean Works

at

Flat A, 15 Croftdown Road
London
NW5 1EL

February 2019

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1 INTRODUCTION

The scope of this Report is to provide a Structural Engineers Report in support of the Planning Application for proposed subterranean works to Flat A, 15 Croftdown Road, London, NW5 1EL.

Flat A is a Lower Ground and Ground Floor Flat within 15 Croftdown Road which is a three-storey semi-detached property adjoining 17 Croftdown Road. Nos 15 and 17 are of the same age and construction style and would have been constructed in unison.

This Report will focus on the appropriate structural engineering associated with the proposed subterranean works.

In the Pre-Application response from London Borough of Camden, ref 2018/5251/PRE, it was confirmed that Campbell Reith had responded to the Applicants request if "the next-door neighbours soil assessment report could be used as a supporting document for (the Applicants) BIA" as follows:

"Assuming the houses are in close proximity, building / ground levels are similar (i.e. they are not separated by a slope / retaining wall) and the previous investigation is appropriate to the proposed construction method (e.g. if piles are proposed, the investigation extends deep enough to allow sufficient outline design / assessment) then it may be possible to rely on the neighbouring investigation report. The applicant's engineer should be able to advise if there is any reason why they should not be able to do that (e.g. because of a mapped change in ground conditions, slopes, historical land use, proximity to historic rivers etc)'

Nos 15 and 17 Croftdown Road are in proximity (i.e. semi-detached) and the ground levels, proposed depth and proposed construction are identical to that to 17 Croftdown Road.

Given the above, we are satisfied this Report, and the design of the proposed subterranean works, can be based on the information contained in the "Basement Impact Assessment Report" by Soiltechnics Ltd for the adjacent property, 17 Croftdown Road, dated April 2016.

2 EXISTING BUILDING AND FOUNDATIONS

15 Croftdown Road is a three-storey semi-detached property, adjoined with number 17 Croftdown Road, both of which were constructed in the early 1900's as confirmed by historic Ordnance Survey Maps.

Flat A is at Lower Ground and Ground Floor Level and is accessed by a front door in the flank wall. Access to the rear garden is only available via Flat A.

The property is of traditional construction for its age with timber pitched roof, ceilings and floor joists supported by internal and external load bearing walls. The external walls, and party wall with No 17, are of 330mm thick solid masonry construction. The internal walls at Lower Ground Floor, Ground Floor and First Floor are of 105mm thick solid masonry with the internal walls at Second Floor being of timber stud construction.

The floor joists at Second, First and Ground Floor Levels span from front to back with intermediate support on the spine walls. It is anticipated that the Lower Ground and Ground Floors are of ground bearing concrete slab construction.

3 PROPOSED REDEVELOPMENT

The proposed subterranean works include:

a) Increase in depth of existing Lower Ground Floor at the rear of the property
b) Increase in depth of existing undercroft at the front of the property so as to provide habitable accommodation at Lower Ground Floor at the front of the property
c) Formation of front and rear lightwells
d) Demolition of existing single storey extension at the rear
e) Formation of new single storey extension at the rear

4 SOIL AND WATER LEVEL INVESTIGATION

As noted above the information obtained from a soil and water level investigation to the adjoining property is contained within the Basement Impact Assessment Report by Soiltechnics Ltd date April 2016.

The investigation carried out by Soiltechnics considered the two most important engineering factors when excavating a basement that ultimately drive the method of construction and associated structural design of the basement principally:

1. The type and nature of the sub-soil.
2. The water table level relative to the external ground level.

Given the above, the soil and water investigation at No 17 Croftdown Road carried out by Soiltechnics Ltd included:

- two boreholes at the rear of 17 Croftdown Road one to a depth of 3.7m below the level of the rear Garden and one to a depth of 3.1m below the level of the lowered terrace at the rear of the property.
- four trial pits to expose the foundations to the external walls of No 17 and the party wall between No 17 and 15.
- standpipes in each borehole.

4.1 Borehole Investigations

The bore holes confirmed the soil strata to be made ground to a depth of 1.0m overlaying firm to stiff medium to high strength (London) Clay throughout the depth of the boreholes giving a "presumed bearing value for underpinning" as 110kN/m2. At 2.7m to 2.85m below ground level a 0.15m thick band of "brown slightly silty slightly sandy clayey gravels of flint..." was encountered. Ground water was encountered in each of the boreholes at approx. 1.7m depth

The trial pits confirmed the foundations to the external walls and party wall to be of (three) brick corbel construction on a (approx.) 300mm thick "weak concrete with broken brick and concrete aggregate" strip foundation. The underside of the strip foundation is (approx.) 500mm below the level of the original "Basement floor level" with the underside of the strip foundations bearing onto the (London) Clay.

Six days after the boreholes were formed that water level in the standpipes was recorded as 0.57m and 1.78m below ground level.

4.2 Subterranean Tunnels

The existing Lower Ground Floor is relatively shallow and will not require deep foundations and, in this regard, would not constitute a problem to tunnels that would warrant a more detailed investigation.

4.3 Subterranean Services

There are no known services that would be impeded by the subterranean construction.

4.4 Site Topography & Potential for Slope Instability

The site is relatively flat therefore there are no slope stability concerns.

4.5 Hydrogeological Considerations

The ground (perched) water encountered is thought to have originated from the 0.15m thick band of water bearing soil (gravels) encountered at approximately 2.7m below ground level. In the Design and Access Statement submitted as part of the Pre-Application it was confirmed that the existing Lower Ground Floor Level suffers from damp and water can be observed in an existing sump pit located at Lower Ground Floor Level.

Given the above consideration will need to be given to de-watering (pumping) during the construction, uplift forces in the design of the new structure and waterproofing of the new structure.

5 STRUCTURAL DESIGN OF SUBSTRUCTURE

The proposed structural design of the subterranean works are shown on Wyatt Carruthers Jebb Ltd's drawings no. 17660/01, 02, 03, 04, 05 and 06.

To facilitate the increase in the depth of the existing Lower Ground Floor and undercroft the external walls and party wall will be underpinned by means of 'L' shaped reinforced concrete retaining walls excavated and formed in an underpinning sequence with continuity reinforcement between adjacent pins.

A reinforced concrete basement slab will be formed between the toes of the 'L' shaped underpinning to provide restraint against sliding and to distribute vertical loads from the underpinned walls over the plan area of the property.

'L' shaped reinforced concrete walls will be formed as the retaining walls to the front and rear lightwells at Lower Ground Floor level. Reinforced concrete slabs will be formed between the toes of the 'L' shaped walls to provide restraint against sliding and to distribute lateral loads from the reinforced concrete walls over the plan area of the lightwells.

6 CONSTRUCTION SEQEUNCE

The actual Construction Sequence will be produced by the Contractor appointed to carry out the works for the review and approval by Wyatt Carruthers Jebb Ltd. In order to produce a suitable Construction Sequence the Contractor will be provided with a copy of this Report, a copy of all Wyatt Carruthers Jebb Ltd's drawings and copy of the Basement Impact Assessment Report produced by Soiltechnics Ltd

However, for the purpose of this Report below is Wyatt Carruthers Jebb Ltd's anticipation of the construction sequence that the Contractor will use.

It is anticipated that the existing Ground Floor structure will be supported by propping in order to allow for the removal of the existing internal load bearing walls at Lower Ground Floor and the insertion of new steel beam/s to provide permanent support to the existing Ground Floor.

It is anticipated that excavation for the front lightwell will be carried out in order to enable excavation of the undercroft, existing Lower Ground Floor and rear lightwell. Following these excavation works it is anticipated the underpinning of the external walls and party wall will be carried out as shown on Wyatt Carruthers Jebb Ltd's Anticipated Construction Sequence drawing no. 17660/07 with the actual underpinning bay sequence, and details of all temporary lateral bracing, submitted by the Contractor to Wyatt Carruthers Jebb Ltd to ensure compliance with Wyatt Carruthers Jebb Ltd's design of the subterranean structure and adequate support to the adjoining building and retained land at the front and rear of Nos 15 and 17 Croftdown Road.

Following the underpinning it is anticipated that the Contractor will form the reinforced concrete Lower Ground Floor slab followed by the reinforced concrete retaining walls and slabs to the rear and front lightwells.

As noted above the Contractor will be provided with a copy of the Basement Impact Assessment Report in order that the Contractor is aware of the advice given in this document regarding the required pumping of ground (perched) water and the support required to the sides of excavations.

7 WATERPROOFING STRATEGY

From the boreholes formed in the rear Garden the thin band of water bearing soil (gravels) were encountered at approximately 2.7m below rear Garden level. The underside of the proposed Lower Ground Floor structure will be (as per No 17) approximately 1.7m below the rear Garden level. To this extent the underside of the new Lower Ground Floor structure will be at approximately 1.0m above the thin band of water bearing soil (gravels).

The Contractor will be required to confirm the above levels upon commencement of the works and notify Wyatt Carruthers Jebb Ltd of any discrepancies.

Whilst the groundwater level may be perched at approximately 1.0m below the underside of any excavations the observation of water in the existing sump confirms this perched water can rise to a higher level and thus an appropriate system to protect against the ingress of water from the ground in accordance with BS 8102 must be provided.

The details of this system will form part of the Architects scope of work.

8 IMPACT OF THE SUBTERRANEAN DESIGN AND CONSTRUCTION TO ADJOINING OWNERS PROPERTY

The philosophy of the design and construction sequence for the subterranean works is to mitigate and limit the consequences of ground movement to adjoining properties.

The basis to mitigating movement comes down to an integrated structural design and sequence of temporary and permanent works co-ordinated so as to mitigate the effects of any possible movement.

This can be achieved by the employment of known experienced specialist groundwork Contractors with a proven technical competence, working to an integrated design incorporating all temporary loading and sequencing criteria.

By employing an approved Construction Sequence the anticipated extent of any (possible) movement to Nos 15 and 17 Croftdown Road is considered to be within the "very slight" category as defined by Burland et al (1977) in Table 6.4 CIRIA C760.

The proposals made in this Report have been prepared recognising the requirements of the Party Wall etc Act 1996. At the appropriate time Notices will be served to enable Party Wall Surveyors to be appointed and the requirements of The Party Wall etc Act 1996 adhered to.

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For and on behalf of Wyatt Carruthers Jebb Limited

February 2019.

9 APPENDICES

9.1 Basement Impact Assessment by Soiltechnics Ltd

9.2 Wyatt Carruthers Jebb Ltd's drawings no. 17660/01, 02, 03, 04, 05 and 06.

9.3 Wyatt Carruthers Jebb Ltd's drawing no. 17660/07