

Spencer Baylin

13A Pond Street

London, NW3

Structural Report and Basement Impact Assessment

Rev. 5

ENTUITIVE

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December 2017

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Appendix 1 – Chelmer BIA report

Appendix 2 – Structural drawings

2. INTRODUCTION

Entuitive have been asked to consider the structural issues surrounding the proposed refurbishment works at the address. This is in support of the planning application for the following development:

‘Part demolition of existing building and erection of a three-storey flat roofed building, including basement excavation, refurbishment of existing roof terrace, remodelling of the retained ground floor extension and associated landscaping’

A Soil Investigation (SI) has been carried by Chelmer Site Investigations and their analysis of the geological, contamination (if any), hydrogeological and hydrology aspects are addressed in their report included at **Appendix 1**.

The existing building at 13A Pond Street is a rear garden development behind 15 Pond Street (the Roebuck pub) and the site is accessed under the first floor of that building. It is a traditionally built house over two storeys and is likely to date originally from the early 20th century but has been extensively remodelled and extended around 1969, by the architect Norman Foster’s practice.

The proposals are to demolish the original house and a lean-to extension but to retain the larger and more prominent single-storey extension by Foster’s practice.

A new house will be built in place of the original house adjoining the Foster extension. The new house will be approximately over the same footprint as the original house but will include a basement level in addition to three storeys above ground.

This document focuses on the structural works involved in constructing the new basement while the geological, hydrogeological and hydrology aspects are addressed elsewhere.

3. GROUND CONDITIONS

Ground conditions have been confirmed in a full site investigation carried out by Chelmer. A full assessment of the geological, contamination (if any), hydrogeological and hydrology aspects are provided in their report included at **Appendix 1**.

The British Geological Survey maps for the area suggest the site is underlain by London Clay to depth and the results from the two boreholes undertaken in the SI confirm this, albeit with 1.2m and 2m of made ground above the clay. As the basement level is around 2.4m to 3.25m below external ground levels (the site slopes down from south to north and from west to east by up to 0.85m) and so the excavations will be approaching 4m depth the basement will therefore be well into the clay. No water was encountered in the boreholes but subsequent monitoring found standing water at 5m below ground to the front (south) of the property and as high as 1m below ground to the rear (north) of the property (although as noted above the ground level falls to the north and is around 0.6 or 0.7m higher at the south borehole than the north borehole).

The ground level beyond the west boundary is around 0.8m higher than the adjacent level at 13A. Beyond the north boundary the ground level steps down (a little way from the boundary)

by around 0.8m from the ground level on the 13A side. Beyond the east boundary the ground level is 0.2m or so lower than the 13A side and beyond the south boundary the pub garden is 1m or so above the 13A side for some of its length.

4. SITE ACCESS

Access to the site is along a narrow passage around 3m wide (assuming the gate is removed for access) and under the first floor of the Roebuck pub with around 3.8m headroom clearance. It should be noted that the passage under the pub first floor also goes over the pub cellar.

5. TREES

The trees on and near the site are discussed in depth in the arboricultural report by Tree Projects which should be read in conjunction with this report. We have liaised with Tree Projects with regard to tree protection requirements associated with the structural works and in summary these comprise tying back of tree canopies (as detailed further in Tree Projects' report) and avoiding over digging beyond the west boundary for the pile installation by means of a raised piling mat.

6. DETAILS OF PROPOSED DEVELOPMENT AND COMMENTS

6.1. Demolition and Retention of Extension

The construction works will begin with the demolition of the existing original house and sloped roof extension but retaining the flat-roof Foster extension works following the following sequence.

- a) The Foster extension should have the edge of the roof adjacent to the original house propped with a series of adjustable props along the full width of the roof.
- b) Temporary hoarding should be erected within the Foster extension as close to the main house as possible in order to provide temporary protection once the house is demolished.
- c) The roof of the extension should be protected with a covering of 10mm plywood over 100mm expanded polystyrene planks extending at least 2.4m back from the wall of the main house. This will need to be ballasted or fixed down to the roof.
- d) The flashing from the extension to the original house should then be removed.
- e) The original house can now be demolished carefully and progressively from top down starting with a soft strip back to shell followed by taking down roof and walls one floor at a time.
- f) Once the house adjacent to the Foster extension is demolished, the Foster extension should be further protected from the elements with heavy duty tarpaulin or equivalent

6.2. Basement Excavation

The basement is to be formed by a secant pile wall whereby soft piles are installed with gap between them which is subsequently filled in each case by a hard pile that overlaps the soft pile to either side. This approach takes advantage of site conditions and will mean temporary works requirements are simplified compared to alternate basement construction techniques. The use of a secant pile wall rather than a contiguous pile wall also better controls ground water during construction. A piled wall also leads to a quicker construction programme than alternate options leading to benefits for the client and also a reduced period of disruption for neighbours.

In the final condition the piled wall be restrained by the reinforced concrete basement slab and reinforced concrete ground floor slab but in the temporary condition the piles will be restrained by a level of temporary works propping just under ground floor level and by the embedment into the clay below the basement level.

Once the ground floor slab has been cast then the superstructure will proceed directly off this slab although the detail of this is outside the remit of this report.

The piles have been assumed to require 800mm clearance from the centre of the pile to the face of any vertical obstructions and so have been kept away from the pub wall to the south by this at least this amount. Similarly where the west boundary wall currently retains 800mm or so of soil, then in liaison with Tree Projects we have agreed in order to protect the root systems of trees T2 and T3 (as designated in Tree Projects' report) that the piling should not require any over dig beyond the neighbours' face of the boundary wall. In order to achieve without the soil face obstructing the guarding it is proposed to install the piles within the root protection area of trees T2 and T3 from an elevated piling mat. Alternately, if a piling rig that complies with HSE safety requirements but requires no guarding to the front when against a soil bank (whether shored by trench sheeting or not) can be found then this may be used from a lower piling mat.

The plot is a back garden site and so in common with sites of this nature is fairly tight and shares boundaries with several neighbours.

The plot is bounded on all four sides by gardens to neighbouring houses (and on one side the garden to the Roebuck pub). The side wall of the existing house to the west along with short lengths of brick garden wall form part of the boundary with 33 Hampstead Hill Gardens (although the southern corner also overlaps the boundary with 13 Pond Street slightly). Along the north side the boundary with 29 Hampstead Hill Gardens is demarcated by a timber fence and on the east and south boundaries with 17 Pond Street and 15 Pond Street (the Roebuck pub) respectively are defined by brick walls.

The exact position of the boundary between the demise of 13A and its neighbours is shown on the attached scheme drawings. In summary however it is assumed that the original house was built entirely on its own land and therefore the west boundary is on the outside face of the flank wall of the existing house and on the neighbour's face of the garden wall to the south on the west boundary whereas the garden wall to the north on the west boundary appears to have been built astride the boundary and so the boundary steps in at this point. The existing walls on this boundary will be demolished piles installed up to the boundary position but wholly on the 13A side of the boundary. The garden walls will be rebuilt to either side of the new house.

To the north the boundary follows the existing fence and the piles will be installed in a straight line which at closest puts the piles up to the boundary, but wholly on the 13A side of the

boundary, but generally installs them a little way inboard of the boundary. It is envisaged the timber fence would be taken down and replaced.

To the south the pub wall is assumed to be built entirely on the pub's land and so the boundary is on the 13A face of the wall. As the wall will have to remain in place, the nearest piles to this wall will be at sufficient distance that a normal piling rig can safely operate.

The east boundary is some distance from the building works but the wall boundary is, like the pub wall, assumed to be on the 13A face of the wall.

7. METHOD STATEMENT FOR CONSTRUCTION OF BASEMENT

Please refer to drawings SK10 and SK11, and SK20 to 22 (included at **Appendix 2**) for plans and sections of the basement which should be read in conjunction with this report.

7.1. Demolish

The existing structures on site, including boundary walls to be demolished, should be demolished to site ground level. Along the west boundary the adjoining garden will need to be shored with trench sheets. These may be inserted behind the wall and pushed down as the wall is taken down in a progressive fashion working from the top down until the foundations can be grubbed out.

7.2. Install piles

The width and height and weight restrictions for access to site under the first floor and over the cellar of the Roebuck pub (15 Pond Street) should be noted in considering appropriate piling plant. See also below a regarding headroom under the roof of the Foster extension.

The tighter than usual tolerance on the position of the piles along the west boundary, as shown on the drawings, should be noted. The piles must be installed in some areas so the far face of the piles is on, but not beyond the boundary with a tolerance of 25mm on plan inboard of the boundary. The deviation from verticality of the piles in any secant wall should also be no more than 1: 150 over their length (eg: 33mm over 5m) wherever the 25mm tolerance is not more onerous.

A piling mat will be established across the site and elevated into the north-west and southwest corners in order for the piling rig guarding to be clear of the soil face to the neighbour's garden so the root protection areas of trees T2 and T3 are not disturbed. The raised piling mat will be constructed with a ramp from the lower level and any trench sheeting that was installed in this area will be removed.

The piles in these areas should then be installed and then the raised piling mat reduced in level to the general piling mat level so that the rest of the piles can be installed.

The piles in the south-west corner of the basement are under the tree canopy of tree T2 which should be tied back as detailed in the Tree Projects' report.

The piles on the eastern wall of the basement are more or less under the edge of the roof of the Foster extension and so a low headroom rig may be necessary. The exact

headroom available will depend on final piling mat level but is likely to be slightly in excess of 3m.

Finally in this stage the piles will be cut down to level. The piles that were install from the raised piling mat will over length compared to the other piles unless they were stopped short piling mat level on installation.

7.3. Cast capping beam

Once the piles are in, the reinforced capping beam should be cast over the piles. It may be pragmatic to partially withdraw the trench sheeting before casting the piles on the west boundary and fully withdrawing it after casting the capping beam. In areas the capping beam will be adjacent to the ground floor slab then either pull-out bars may be cast in to the capping beam, or the capping beam formwork cut around projecting slab starter bars

7.4. Temporary works

Before the bulk excavation continues in earnest, it is necessary to excavate just to the level of the top temporary works layer that will provide restraint to the top of the piles in the temporary condition. The temporary works (which will comprise a waling beam around the basement perimeter and horizontal props between waling beam on opposing basement walls) are then installed.

7.5. Bulk excavation

The bulk excavation can now begin and the arrangements for spoil removal from site will need to take into account the restricted access under the first floor of the Roebuck pub (15 Pond Street) which will inhibit skip delivery. Alternatives such as stockpiling spoil on site for wait and load disposal or conveyor transport to an on-road skip might be considered.

The piles are designed to obtain restraint from the clay at their base and from the temporary works at their head but if for any reason construction is halted for any prolonged period once the excavation has progressed to depth then it may be necessary, subject to review, to install further bracing.

Once the formation level has been reached it should be blinded immediately to protect it from the weather and form a firm surface to fix slab reinforcement off.

7.6. Ground water control

As one borehole showed water to a relatively high level, steps should be taken to control ground water ingress through the secant pile wall should it occur in significant volume submersible pumps may be placed in a sump for this purpose. The sump can be placed in the location of the proposed sump for the cavity drainage system.

7.7. Basement slab

The reinforced concrete basement slab is then cast and dowelled into the piles around the perimeter, with projecting starter bars for all walls.

7.8. Concrete lining walls

A reinforcing mesh will be fixed to the piles and a concrete lining wall will be cast against the piles and up against the underside of the capping beam in order to partly control any water that finds its way between the piles but also to provide a plane surface for the drainage cavity system.

7.9. Internal concrete walls

The load bearing internal concrete walls in the basement will be cast to underside of ground floor slab level.

7.10. Ground floor slab

The reinforced concrete ground floor slab can then be cast.

7.11. Further works

While all further works are outside the scope of this report, the basement waterproofing and superstructure can now commence.

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26th September 2017
Entuitive