CONSTRUCTION METHOD STATEMENT

4 Langland Gardens, NW3 6PY

Project Number: 2385

Revision B

David Coles BEng (Hons) CEng MIStructE
Partner at Blue Engineering
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Blue Structural Engineering LLP
Third Floor 16–28 Tabernacle St London EC2A 4DD
T +44 (0) 20 7247 3811 E info@blueengineering.co.uk
www.blueengineering.co.uk

Registered Office: 911 Green Lanes London N21 2QP United Kingdom
Partnership No: OC366872 – Registered in England | VAT No: 119 413 233

BLUE ENGINEERING

1.0 GENERAL:

This document is to be read in conjunction with all other planning documents submitted, including drawings 2385-200, 2385-201, 2385-202, 2385-203 & 2385-204.

It is proposed to remodel and refurbish 4 Langland Gardens. As part of the redevelopment it is proposed to excavate underneath the main body to increase the floor to ceiling height in the existing lower ground floor. The new lower ground floor will extend underneath the proposed extension and beyond to create a sunken external terrace area.

4 Langland Gardens is situated in the London Borough of Camden. As part of the process of validating the proposed subterranean development, it is required to submit a 'Construction Method Statement', which must demonstrate how the subterranean proposals are to be built and their potential impact on the surrounding environment.

The property, constructed circa 1890 is a three storey semi-detached dwelling with partial height lower ground floor. The external shell comprises of Flemish bond, fletton brick, solid wall brickwork capped with hipped, clay tiled cold roof. The internal structure is an arrangement of masonry and studwork walls with timber joists spanning between side façade and internal load bearing wall. Sometime in the past the property was split into six residential units.

No.2 Langland Gardens have previously undertaken the construction of a basement. Planning drawings indicate that the basement extends underneath the full footprint of property.

2.0 GROUND CONDITIONS:

Non-site specific data

A desk study was undertaken using the BGS geological maps which indicate that the ground under the property is London Clay. This was corroborated with the BGS Borehole Logs TQ28NE-7. The assumed allowable bearing pressure for the scheme design of the foundations has been taken as 100 kN/m^2 at ground level and 150 kN/m^2 at the founding level of the new lower ground floor. This is considered conservative for the ground type. The property is in good condition there is slight cracking to the front façade, this can be described as Category 1 (slight) in Ciria report 580.

Site specific data

As part of the Basement Impact Assessment undertaken by Soiltechnics several trial holes were dug with accompanying borehole. From which site specific data was obtained, providing an accurate understanding of the geology which will form a base for the structural design. The trial pits confirmed that the top layer of soil is made ground, which is approximately 650mm deep. Results from the borehole confirm that below this top strata, the ground is London Clay changing from firm, medium strength to stiff, high strength at an approximate depth of 4m. The N values of the clay at the proposed founding level of the basement indicates the bearing capacity of the soil is between 120 kN/m^2 and 180 kN/m^2.

Prevailing groundwater, drainage conditions and flooding risk

No ground water was encountered in the trial hole or the borehole. No ground water was noted on the borehole data local to the site.

The property is not located in a flood zone according to the Environmental Agency's website. The construction of the basement will have an unremarkable effect on the risk to flooding.

The rain water drainage from the site is via a combined sewer. All external areas are formed of hard standing and drain into gulleys which discharge into the combined sewer. The construction of the basement will not significantly increase the load on the existing drainage system.

3.0 BASEMENT CONSTRUCTION & THE PROPOSED TEMPORARY WORKS:

To form the lower ground floor underneath the main body it is proposed to underpin all external walls using reinforced concrete L shape pins. Lateral forces from the ground will be resisted by a 325mm thick reinforced concrete retaining wall. The head of the retaining wall will be restrained by the ground floor via the existing masonry walls. The restraint the floor can provide will be limited to conservative values of the dead load on the wall factored down taking the coefficient of fiction between masonry and concrete. The internal load bearing spine wall that spans from the front to the rear of the property will be temporarily supported underneath the ground floor on steel beams that will clamp the wall. In turn the steel beams will be supported by reinforced concrete underpins, located at third positions underneath the wall. Once these works have completed this will enable the pouring of the ground bearing slab in one go.

The location of the adjacent buildings and sequencing the underpinning under the existing property, permits the ground within the footprint of the external terrace area to be reduced and excavated. The ground at the edge of the excavated area will be battered back at an angle determined based on the assessment of laboratory testing by Soiltechnics. Guidance suggests that the firm clay should be expected to stand at approximately 20^{o} (angle of repose) and this should be a minimum.

Once excavated a blinding layer will be poured to create a level surface for the new ground bearing slab. The slab and stem will be cast in a two stage sequence with reinforcement lapped up and kicker formed to ensure both elements are tied together. Reinforcement in the kicker should extend a minimum 600mm past the top of concrete to form laps for the adjoining steelwork.

The head of the retaining wall will be restrained via a transverse reinforced concrete ring beam. Compacted hardcore should be used to backfill the void to minimise the potential for movement to the above ground construction.

28.07.15[It is proposed to enlarge the existing lightwell to the left hand side of the property and construct a new lightwell to the right hand side of the property. In both locations the retaining wall has been designed to have a reinforced concrete heel which will provide restraint against global instabilities. To form the heel will require open excavations of the external face. The slope stability of these batters will be based on evaluation of soil strengths using the findings of the laboratory testing. The ground water table has been proven to be well below the level of excavation, in this instance a dewatering system can be ignored. **]**

The concrete retaining structure will be formed in an underpinning style sequence to minimise ground movements. Additionally, steel props will be installed between the front façade of the property or where applicable the existing lightwell ensuring slope stability of the battered back ground during the construction phase. Once the lightwell has been completed the void behind the external face will be backfilled with well compacted ground.

Throughout the underpinning process the ground conditions will be continuously assessed by a competent person to determine the means and method of supporting any face of excavation. Battering back, stepping and benching will all be used to ensure that the ground is stable. Where this is not possible due to site restraints the introduction of sacrificial plywood sheets/concrete boards supported by steel props will be used to retain the ground.

The sequence of the underpinning is to be confirmed by the contractor although possible sequencing will be given as part of the structural drawings. The sequencing will be such that any underpin will be completed, dry packed and a minimum period of 48 hours lapsed before adjacent excavation works are undertaken.

The walls have sections excavated in a "hit and miss" sequence to a founding depth below the existing foundation. The toe then the stem will be cast in a two stage sequence with reinforcement lapped up in the toe to ensure that both elements are tied in together. Horizontal steel dowels are to be cast into the toe and stem and left a minimum 400mm proud to tie adjacent pins together.

The maximum width of any pin is to be 1.0m to minimise the risk of undermining the structure over. This method is carried out until all of the walls have been underpinned.

Drawing 2385-200 & 2385-201 shows a plan of the basement and gives the likely underpinning sequence to be carried out by the contractor, underpinning bays will not exceed one metre in width. Drawing 2385-202 & 2385-203 shows the sequence in which the basement will be excavated and constructed and the different type of retaining walls used.

Where required all temporary shoring of both the ground and the concrete pins will be carried out using appropriate props installed to current standards and as per manufacturer's instructions.

4.0 IMPACT OF THE WORKS:

The proposed method of construction is well tested and is considered to be low technology. The contractor undertaking the works will have suitable experience and all necessary insurances and will follow current standards and good building guides. Providing the works are carried out correctly, movement to the existing surrounding structures should be no greater than described as 'aesthetic' under BRE guidelines. Procedures should any movement occur will be covered by party wall agreements between the relevant parties. We would expect no visible change to the adjacent pavement or road. Given the founding depth and bearing strata anticipated, any settlement would be considered immediate and no long term movement is expected.

28.07.15[The proposed method for movement monitoring is by means of fixed target points with cross-hair stadia lines, to be read from pre-established station points using total station instrument for line and level. The targets would be secured to the existing walls at the locations (to be agreed) just above Lower Ground and just below 1st floor level internally, plus a vertical external array on the front wall in order to check for any horizontal or vertical movement at basement level and above, during the structural works. They would be read from pre-established station points.

A "traffic light" system to be operated with "Amber" being set at 8mm horizontal or vertical movement and "Red" set at 12mm. At Amber, the monitoring to be increased to twice weekly and reports sent out within 4 days, allowing for weekends. At Red, the works are to stop and the Contractor is to make the site safe, with reports to be submitted to the Party Wall Surveyors. Immediate reporting in event of Red.**]**

The proposed permanent and temporary works will not initiate site instability.

Trees are present on the periphery of the grounds. These trees will be protected during the works in accordance with the guidance given in BS 5837 & BS 3998. We do not anticipate any long term impact on the existing trees.

5.0 UNDERPINNING SPECIFICATION:

Calculations for the retaining walls can be found in the appendix.

The underpinning legs are to be constructed in the stages indicated on the drawing. Should the contractor wish to undertake the works in different stages this must be agreed with the Structural Engineer prior to undertaking the works.

The excavation works are to be undertaken carefully so that the existing footings are not disturbed. Excavations are to be temporarily supported as necessary.

When excavating for an underpinning leg, if any deviation is found in the nature of the bearing strata, or if obstacles or obstructions are encountered, the facts are to be reported to the Engineer.

All underpinning legs should have keys formed in them for bonding into succeeding legs as indicated on the Engineer's drawing.

A minimum of 48 hours after concreting a leg of underpinning, the footings above may be pinned up.

The pinning concrete is to be driven into place using hand held hammer and a 75 mm square hardwood drift against a substantial timber, secured on far side of footing.

Concreting and pinning-up must be completed before starting to excavate the next section of underpinning in the sequence.

Underpinning legs should preferably be concreted on the same day as they are excavated. If it is necessary to leave them open overnight temporary works and timbering are to be used to ensure that all is secure. On no account are underpinning legs to be left open over the weekend.

Pinning concrete shall be approximately 75 mm thick pea-shingle concrete 1:1:5:3 mixing using 5 mm - 10 mm coarse aggregate and "Cebex 100" expanding admixture by Messrs Fosroc UK Ltd in accordance with their instructions.

The water content in the pinning concrete is to be the minimum necessary to ensure hydration of the cement and the consistency should be such that the wetted mix will just bind under strong hand pressure.

Materials and Workmanship are to comply with BS 8110.

Concrete for reinforced concrete structures, including ground bearing slabs, is to be designated mix RC35 to BS 5328, unless noted otherwise on the drawings.

Ready mix concrete is to be used unless otherwise allowed by the Structural Engineer. This must be obtained from a plant which holds a current Certificate of Accreditation under the Quality Scheme for Ready Mix Concrete. Details of cement type, aggregate grading and sources, with chloride and sulphate content of mixes to be submitted to the Structural Engineer for their approval prior to ordering any concrete.

Do not place concrete when the ambient air temperature is less than 5°C.