

March 2016

## **DESIGN & ACCESS STATEMENT.**

**Location: 44 Downshire Hill, London NW3 1NU**

### **Design Brief.**

To repair the existing failed foundations under part of the property.

### **History & Current Situation.**

The building is Grade II listed traditionally constructed early 19C 4 storey attached dwelling located in a Conservation Area. The existing property has been owned and occupied by the same family since 1983 and has been monitored for known structural inadequacies over those 33 years.

Since 1983 adjacent properties, part of #43, part of #45 and St John's Church have also been the subject of extensive subsidence and structural failure and have either had part new foundations or have been underpinned.

#44 is the last building in the attached group not to be structurally repaired. The underpinning and stabilisation of the adjacent buildings has in consequence amplified the effects of the continued subsidence taking place in #44. In effect #44 is acting as a "hinge" between the adjacent stabilised buildings.

Historically this gradual subsidence had been absorbed by the flexibility of the building fabric with cracks appearing at weak points in the building walls, windows and door openings.

Due to the original poor layout and structural design of the original building this settlement is now most evident along the line of the front to rear inner spine wall which has inadequate shallow foundations with stacked door openings around the stairwell through the spine wall. This area has always been overloaded and slow, intermittent subsidence of two wall sections adjacent the stairs has led to a drop in upper floor levels in the left rear corner relative to the front right of the building of approximately 170mm over its history. A drop of some 25mm has been observed over the last 30 years.

After a period of relatively stability and minor movement for some 4 years since 2010 there has been an increasing rate of settlement and fresh cracking in this centre left area.

This pattern of cracking in the lower spine walls correlates with the door and other openings in the same walls above, reflecting the weak points in the building and is a function of the increased upper spine wall loadings carried down and concentrated around those openings at ground floor level. That concentration of differential loads down on to the Garden floor spine walls has led to concentrated overloading on some sections of those spine walls and their breakup into sections. Those sections are now acting as independent columns settling at different rates. Because of that the rate of subsidence in some locations has increased over the last 6 months.

This is not cyclical movement or slow subsidence as has been the case previously but with the break up of the lower wall it is irreversible failure because of the sectional separation of the lower spine walls. Basically the front to rear spine wall at garden floor level instead of being a single contiguous plate with only one small opening in it evenly distributing the upper wall loads down on to the subsoil is breaking up.

This accelerated differential subsidence has led to increased subsidence, cracking and delamination of finishes in the upper parts of the building with a consequent impact on the heritage asset value of the building finishes, especially the historic mouldings, plasterwork and timber components.

The stabilisation of the structure is an absolute necessity and should be carried out as quickly as possible to prevent further damage to and degradation of the heritage asset.

The Owners of the building have moved out of the building for 6 months while the essential emergency structural works are carried out.

### **Recent Findings.**

Detailed investigations, including test pits, only possible after the building was vacated were carried out in January and February of this year. There were two major findings.

First, the test pits have confirmed that the existing foundations are very shallow, at some points only 150mm below existing FFL. The maximum depths of the original splayed brick footings under the main house are 340mm below FFL. They are bedded on moist plastic surface clays that are unstable. There are some areas of made up ground clays in the lower hall area with bits of other rubble, presumably clay backfill with contaminants laid when mains combined drainage system was installed in the late 19<sup>th</sup> century under the lower hall floor from rear to front. This backfill has a consistency similar to the original shallow clays.

Deeper test pits have found consistent virgin London clays at 1.3m deep front and rear. These clays are moist but firm with bearing capacities in excess of 20,000kg/m<sup>2</sup>.

The main house footings consist of poor quality soft London stock bricks. Some of the walls have no stepped bricks at their base but rest directly on the clays at just wall widths. The front and rear house walls are 4 storeys tall solid brick some 500mm thick. The front to rear spine wall is only 1 brick thick @ 290mm but is also 4 storey solid masonry. The general and point overloadings of that wall on the shallow clays underneath are explored in the structural calculations accompanying this application.

Secondly, it has been established that extensive parts of the lower building fabric are not original but that substantial alterations had been made pre 1983 but post WWII. From their appearance and composition it looks like they were made in the 20 years prior to the current owners purchase. It should be noted separately that the rear single storey addition was built by the current owners under planning permission.

In summary, those newer components are, the front garden walls, bin store, main entrance steps, stone step treads, side parapets, lobby sub-structure and floor and foundations under the front porch. The main house foundations and lower brick walls are original with lime mortar bedding but covered in modern cement renders. The floors are of relatively modern construction throughout and composed of concrete and screeds over polythene DPM's with contemporary services buried in them. The family room brick fireplace surround and mantel is contemporary. All skirtings, architraves, secondary woodwork, windows and doors at

garden floor level are, with two exceptions, also of similar age. The exceptions are the original main staircase, handrails, associated wood trims and door under the stairs as well as the door from the hall into the family room.

### **Proposed Design and Works.**

The only works that form part of this application are those required to stabilise the structure, allow access to do so and allow reinstatement of those areas afterwards. For ease of reference these are called the 1<sup>st</sup> Stage works.

Further substantial repair works will be required, taking into account the specialist schedule of condition prepared in October 2015 that has assessed the damage to the exterior front and rear and the upper floors structure and finishes. These will be called the 2<sup>nd</sup> Stage works. An application for those more general, non-emergency works is currently being prepared and that will be submitted as soon as is practicable.

The 1<sup>st</sup> Stage works are limited in scope and apart from upper floor protections are being carried out at Garden floor area level only.

The works are the minimum necessary to stabilise the core of the building and are designed to achieve 3 goals:

1. Increase the load bearing capacity of the existing footings by inserting additional width footings under the existing brick footings. This will lessen the loads on the subsoil for increased stability and stop the subsidence.
2. Increase the longitudinal strength of the existing footings to more uniformly distribute the differential upper building loads down on to the subsoil.
3. Increase the depth of the existing footings to take them below the variable moist surface clays for greater seasonal stability.

The best way to do this with minimum impact on the existing fabric is to install segmented concrete footings using traditional underpinning techniques, hand digging and hand soil removal to minimise any risk of further damage to the existing historic fabric through vibration.

Because the existing footings are very shallow, the new footings can be installed under without having to cut away or remove any of the existing brick footings, thus preserving entirely the existing historic brick walls of the heritage asset.

The new footings will comply with the requirements of Building regulations but will be made as shallow as possible to minimise depth differentials with adjacent building foundations.

### **Sustainability.**

The proposed development will stabilise the building structure and conserve the integrity of the building fabric.

It is considered that these necessary remedial works adhere to the principles of sustainable development and promote environmental sustainability.

**Impact on adjacent properties.**

There will be some impact on the adjacent fabric of #45 during the works as the party wall on that side will be underpinned. #45 is also in the ownership of the Applicants. There will be little impact on #43 as the party wall on that side has already been underpinned. Any vibration will be minimised during construction as most of the works are hand works with only small plant used to minimise vibration and minimise consequent damage to the existing fabric of #44. The works have to be carried out as gently as possible.

After the works are completed there will be no visible changes to the property.

**Access.**

Access will be the same as previously down to the lower lobby door. The main upper front door access will also be unchanged.

**Conclusions.**

The proposed works have been planned for some time and the recent measured movements, together with have the building able to be vacated for 6 months means this is the best time to carry out the works before further damage occurs.

Full Building Regulations approvals will be obtained and the works will be carried out by Claymore Design and Build Ltd.