engineersHRW

# 75 LAWN ROAD, LONDON
# NW3 2XB

## BASEMENT IMPACT ASSESSMENT ADDENDUM
MAY 2019

## 1.0 Introduction

This addendum to the Basement Impact Assessment for 75 Lawn Road has been prepared to consider the existing damage to No 76 Lawn Road and its potential impact on the construction of the basement at No 75.

The original Ground Movement Assessment submitted with application 2018/2136/P utilised standard modelling calculations to review the impact of excavation on adjacent structures. This indicated no areas of concern, as, bar one wall, all adjacent walls were deemed to fall within CIRIA C760 damage category 0 (Negligible). This would be equivalent to an estimated crack width of less than 0.1mm. The one exception to this was wall 'W8' (as indicated on Figure 1) which fell within CIRIA C760 Damage Category 1 (Very slight) which would equate to an estimated crack with of less than 1mm. Camden requires that the basement works do not forecast damage greater that Category 1.

However, following submission of application 2018/2136/P for No 75 Lawn Road on 8th May 2018, both No 75 and No 76 have suffered cracking to their external and internal walls. As the standard modelling calculations are based upon a sound structure basis, this addendum is provided as an assessment of the cracks and offers mitigation measures, to ensure that the adjacent property suffers no greater damage than the originally predicted acceptable damage.

The addendum references the following reports which give details of the current condition of the structures:

- *No 76 Lawn Road Report on the Cracking and Movement of the Structure* - Alan Baxter Associates;
- *Structural Survey of no 75* - EngineersHRW

## 2.0 Existing Structures

### No 75 Lawn Road

The existing house is a two-storey semi-detached loadbearing masonry structure with timber joist floors spanning side to side. A two-storey set-back portion of the property at the south west side houses the garage and a small first floor bedroom. This portion sits behind the paved driveway which slopes down to meet Lawn Road. This element is attached to No 76 Lawn Road and is considered to be a party wall.

EngineersHRW's condition survey of no. 75 identified large cracks at the junction of the set-back garage and the main body of the house. The damage is primarily around this junction however there are minor cracks throughout the rear of the house. The cause of the cracks is determined to be subsidence however the reasons are not clear. There is a mature tree in the rear garden that may contribute to shrinkage of the soil following a particularly dry summer. A simple analysis based on NHBC guidelines is not conclusive.

**No 76 Lawn Road**

The existing house is a two-storey detached loadbearing masonry structure with timber joist floors similar to No 75. It again has a two-storey set-back portion of the property that houses a converted garage and a small first floor room. This element is attached to No 75 Lawn Road, and as stated above is considered to be a party wall. This portion sits behind a more recent extension forming a garage and car port.

The Alan Baxter Report identified large cracks throughout the main body of the house and also at the attached two storey element. The crack at the junction of the single storey garage extension and the two-storey original structure is considered to be a movement joint between two separate walls, and not a crack in the structure. The cause of the cracks is determined to be subsidence however the reasons are not clear. A recent basement construction at No 77 or existing mature trees may be the cause. Further investigation would be required to establish this, however desiccation of the soil due to the trees through the unusually hot summer is the most likely.

## 3.0 Ground Movement Assessment

**Methodology**

In connection with the proposed basement construction, a ground movement and damage assessment has been undertaken at the site in accordance with Camden Planning Guidance, 'Basement and Lightwells' (CPG4). The purpose of this assessment is to determine the effects of the proposed basement excavation upon the existing building and the neighbouring structures.

Around the site, the construction activities that may result in ground movements during and after the works are mainly related to the excavation, which would induce a reduction of vertical and lateral stresses in the ground along the excavation boundaries. The magnitude and distribution of ground movements inside and outside the excavated area are a function of changes of load in the ground and also, critically, are a function of workmanship.

Ground movements of the proposed works at no.75 have been analysed using XDISP by Oasys, and a building damage assessment has been undertaken based on the results of the analysis. XDISP analysis considers both '*installation of contiguous bored pile wall in stiff clay'* (CIRIA 580 Fig. 2.8(b)) and *'excavation in front of a high stiffness wall in stiff clay'* (CIRIA C760 Fig. 6.15(a)) to simulate the effects from the underpinning, piling and excavation on neighbouring structures. The combined cumulative movements resulting from the wall installation (which includes the underpinning) and basement excavation have been used to carry out an assessment of the likely damage to adjacent properties.

**Damage Analysis**

Based on these predicted ground movements, the properties surrounding the site are expected to be predominantly within CIRIA C760 Damage Category 0 (Negligible) although as previously noted there is one instance where this is exceeded to a Damage Category 1 (Very Slight). It should be noted that CPG4 requires the basement works do not forecast damage greater that Category 1.

Figure 1 has the cracks within the proximity of the works identified in the Alan Baxter Report added for information. This shows that one wall, W11, now has an existing crack that may be subject to additional movement due to the basement works. The predicted movement is however negligible i.e. less than 0.1mm. The crack at the junction of the two-storey attached section of the buildings is not considered as part of the analysis is as it is at the junction of what appears to be two different walls (W9 and PW2).

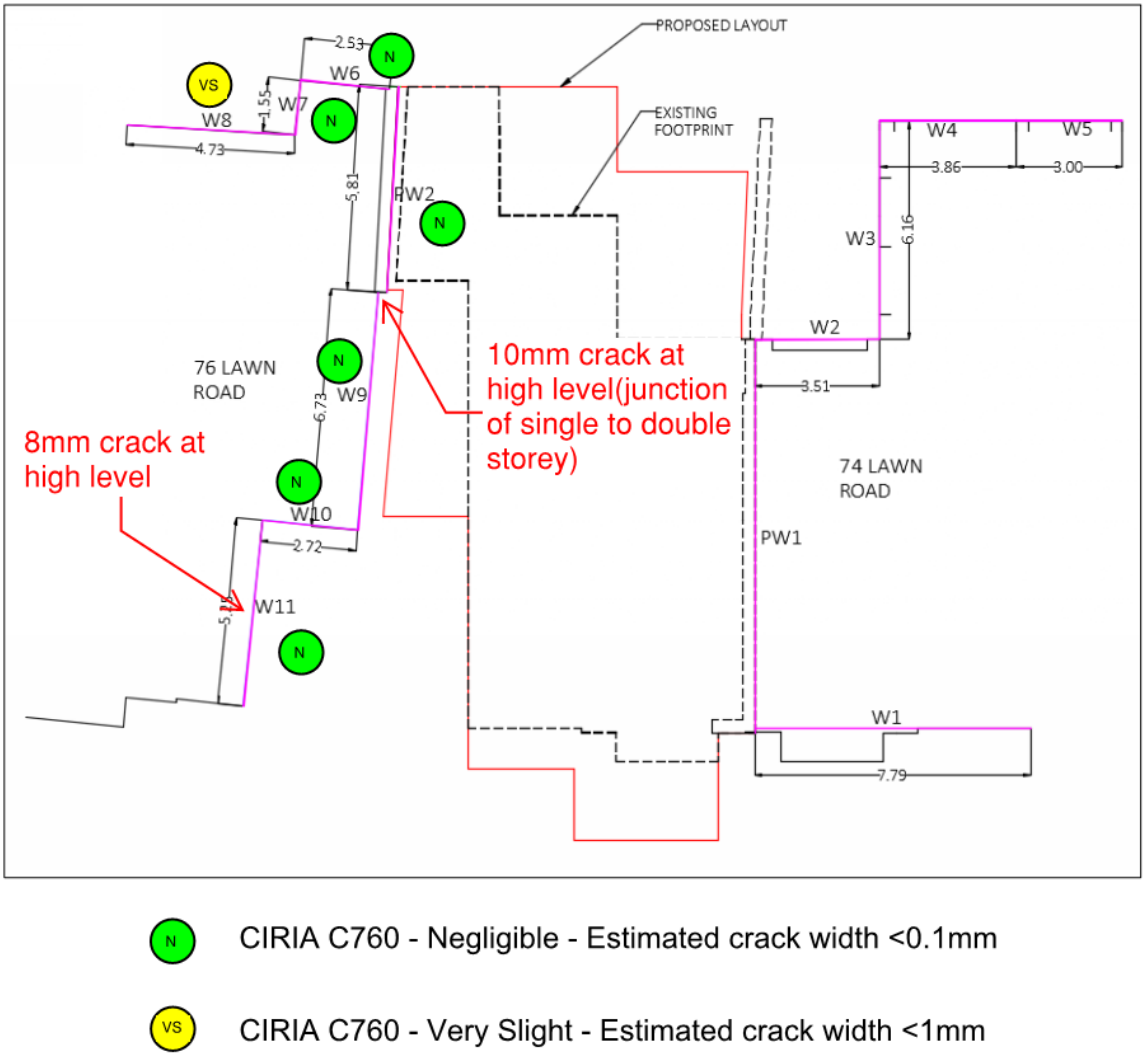


**Figure 1: Ground Movement Assessment Wall Location Plan**
(with Alan Baxter Report text added in red)

## 4.0 Mitigation Measures

Based on the damage analysis above we believe the proposed basement at No 75 can be constructed without risk to the structural stability of No 76. However, at Camden's request, this addendum offers to undertake additional mitigation measures prior to work commencing to ensure predicted movements will be in line with the original ground movement modelling. As such we propose the following changes to the initial construction sequence:

- Helifix repair to W11 of No 76 (horizontal steel reinforcement bars inserted into existing wall)
- Underpin the assumed party wall (refer to Figure 2)
- Following this the sequence will remain as given in the BIA.

The above works would form part of the approved BIA, and as such be a condition of planning. However, the Helifix repair to No76 would be subject to agreement with the owner, and as such it is reasonable that only the offer to undertake these repairs at the applicant's cost should be conditioned. The underpinning would be carried out in accordance with the provisions of the Party Wall Etc Act, which is yet to be secured with no. 76. The walls of all adjacent properties would be monitored throughout the works, and any other cracking which falls outside of acceptable CIRIA C760 levels would also be addressed under the terms of the Act.

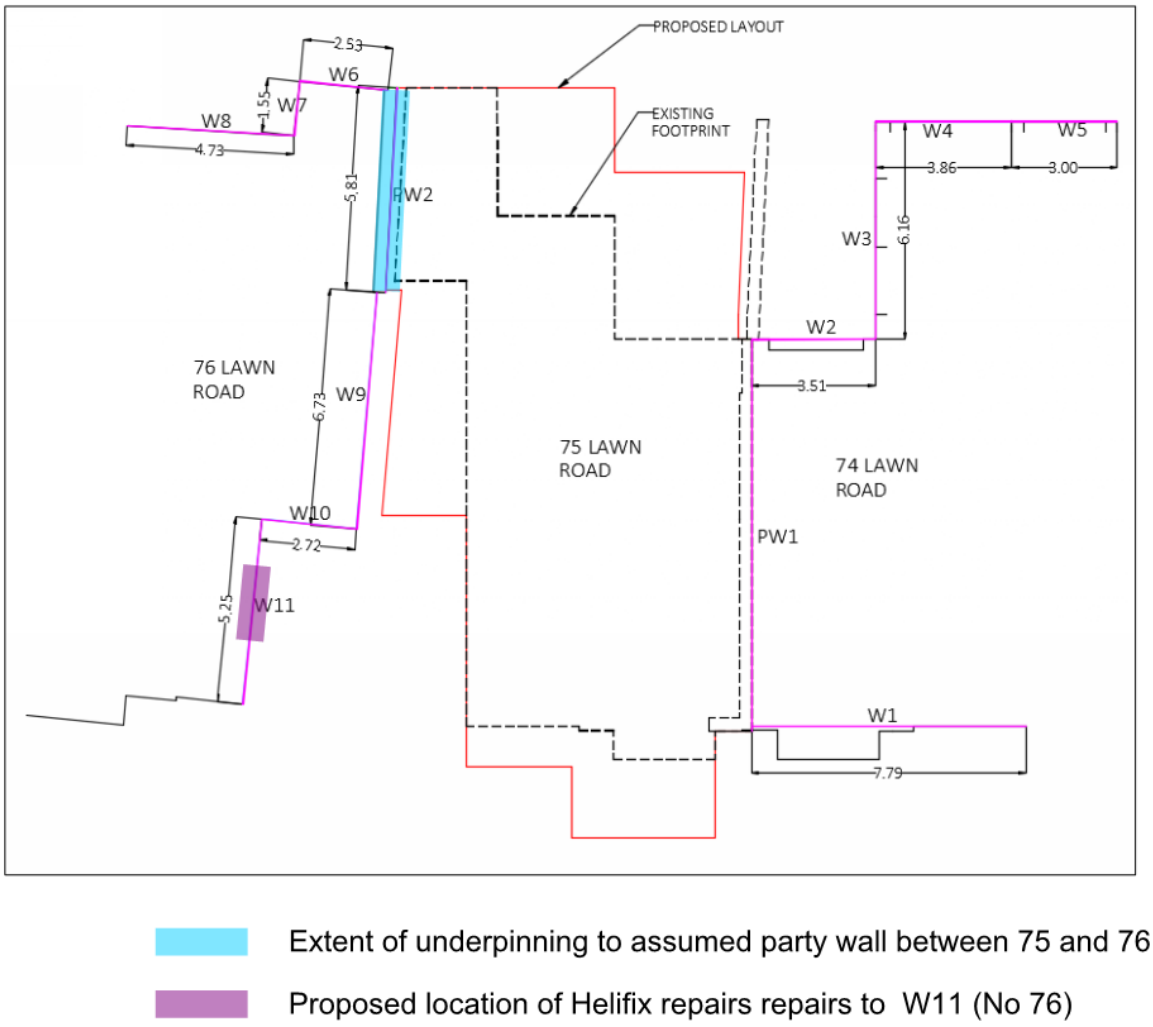


**Figure 2: Proposed location of structural enabling works**

## 5.0 Conclusion

Providing that appropriate consideration is given to the detailed design of party wall and return wall junctions to limit future movement, that good workmanship and construction sequences are used with appropriate support during excavations then the proposed basement construction is unlikely to cause significant damage to the surrounding structures. Based on the predicted ground movements, the adjacent structures are expected to be within the CIRIA C760 Damage Category 1 (Very Slight). With the additional measures in the construction sequence above we believe it is possible to construct the basement at No 75 without risk to the structural stability of No 76.