240 Grays Inn Road, London, WC1X 8JR

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On Behalf of HLN Engineering

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APPENDICES

1.0 INTRODUCTION

1.1. In accordance with the instructions of Haresh Shah, the leaseholder of the shop unit and basement within 240 Grays Inn Road, London WC1X 8JR an above ground Structural Engineer's visual inspection of the property was carried out on 16 August 2018.

1.2. The purpose of the inspection was to make an above ground appraisal of the visible condition of the structure and current structural integrity with particular reference to the unusual support feature noted within the basement.

1.3. All directions are taken looking towards the front elevation from Grays Inn Road unless indicated otherwise. Internally directions are given when facing the item in question.

2.0 PROPERTY DESCRIPTION/BACKGROUND INFORMATION

2.1. 240 Grays Inn Road, London WC1X 8JR is a four storey end of terrace property, with a non-habitable basement.

2.2. We would assess the property to have been originally constructed around 1820.

2.3. We were advised by Ana Tam of Fuller Long Heritage Consultants that the freehold of the property was purchased from Camden Council in 1993. The leasehold of the shop unit located to the left of the front elevation at ground floor level, together with the basement immediately below was purchased recently by Mr Haresh Shah.

2.4. The remainder of the property is understood to be in residential use.

2.5. The property is Listed.

2.6. External and party walls to the property are of solid masonry construction, other internal walls in the areas available for inspection appear to be a combination of solid masonry and stud partition.

2.7. Inspection of the external masonry shows that some sections have been reconstructed, and additionally some concrete lintels have apparently replaced the original brick on edge lintels. It is understood that the building suffered due to enemy action during World War II and it is possible that the above works were undertaken in the process of making good such damage.

2.8. The roof of the property could not be inspected in any detail from street level.

2.9. The ground floor is of suspended timber construction. The basement floor is ground bearing concrete.

2.10. At the time of our inspection the left hand side of the ground floor was in use as a shop, with the basement being used for storage. We were advised that the remainder of the property is in residential use and tenanted, but access was not available.

2.11. The property appears generally to have been maintained to a fair standard both internally and externally, and was in fair decorative order at the time of our inspection, commensurate with its current usage.

2.12. Access to the basement is by means of a trapdoor located towards the rear of the shop.

2.13. A drainage downpipe was visible in the basement discharging to an open gulley. The route of the underground drainage was not apparent.

2.14. Within the basement there is a support feature consisting of a series of vertical columns supporting a beam, running from front to rear, which in turn offers support to a timber beam forming part of the ground floor structure. The columns derive

support from a steel beam which is partially embedded in the concrete floor structure.

2.15. Above this structure on the ground floor there is what appears to be a stud wall which separates the shop from the hall / stairway in the residential area.

2.16. Fuller Long Heritage have supplied us with photographic evidence of a row of Acrow supports along the line of the present support feature back in 2004. The current concern is whether the present support feature is providing structurally sufficient support, notwithstanding its unconventional form. The client, Haresh Shah, requires a structural engineering assessment with a view to obtaining retrospective Listed Building Consent for the support feature. Mr Haresh advised us that the support feature was in place when he purchased the leasehold and that he has made no structural changes.

2.17. The property is located on a level site.

2.18. We have studied the geological drift map of the area which indicates that the property is founded on the River Terrace Deposits (gravel, sandy and clayey in part). It is therefore likely that the subsoil on which the property was constructed has components both of shrinkable clay and granular material.

2.19. Clay is a material which exhibits marked volume fluctuations in sympathy with seasonal variations in moisture content. In general, shrinkage takes place as moisture is removed which often occurs during hot dry periods whilst in wet weather the reverse swelling process takes place.

2.20. Although most foundations can tolerate minor movements a point can be reached where the shrinkage gives rise to subsidence and cracking and disturbance of the structure. Under normal conditions the moisture variations occur to a depth of 1.0 to 1.5 metres below ground level depending on the type of clay.

2.21. Granular soils such as gravels and sands are not susceptible to shrinkage following reduction in moisture content, but can suffer from erosion due to leaking drains or water mains, or through the action of underground streams.

2.22. The guidance notes in appendix 2 should be read in conjunction with this report.

2.23. External access was carried out from ground level without the use of ladders or scaffolding. Access was only available to the elevations facing Grays Inn Road and Calthorpe Street. As noted previously internal access was confined to the commercial premises at ground floor and basement level contained within Mr Shah's leasehold.

2.24. During the course of our inspection localised exploratory work was undertaken by Horizon Contractors, in the form of partial removal of plasterboard cladding around the support feature in the basement.

3.0 SITE OBSERVATIONS

3.1. No significant cracking or distortion was noted to either of the visible external elevations consistent with recent significant structural movement.

3.2. Internally there was no cracking or damage within the shop premises which might reasonably be construed as relating to structural movement. However, the presence of shelving filled with stock prevented full examination of the walls behind.

3.3. Within the basement, the support feature which forms the principal subject of this report was inspected in detail. As noted above, there is a steel beam embedded within the concrete floor. The top flange is 205mm wide and approximately 80mm above floor level. The surface of the steel had been painted and there was no evidence of corrosion. Inspection of the floor did not reveal any obvious cracking which might be associated with settlement of the support structure.

3.4. The steel beam supports a total of four upright columns. Localised exposure established that the columns consist of 200 x 100mm timber sections, 2180mm high, clad with plasterboard. The centre of the first column from the rear is located approximately 610mm from the rear wall, and the columns are spaced an average of 1055mm apart. The column nearest the front is situated some 830mm from the front elevation of the main property. There is an ancient oven situated within a brick arch in line with the support structure.

3.5. The columns appeared to be free of any bowing which might result from severe overloading, no rot was visible where exposure took place, and no splitting of timber was apparent.

3.6. The columns support a timber beam also of 200 x 100mm section, extending from front to rear. This beam is also clad in plasterboard.

3.7. An original timber beam was visible in the trapdoor opening directly above the support feature. Interestingly the timber beam had been morticed horizontally, which could suggest that it had previously been used elsewhere in the structure. The horizontal mortices would reduce the strength of the timber in bending and deflection, and this might in turn have given cause for concern, resulting in the installation of a support structure, initially using Acrows, and subsequently in the current form. However, as we have not seen any records, the above explanation is conjecture only.

3.8. To the right of and roughly parallel to the support feature, there is a masonry wall in the basement area, although this does not extend the full depth of the property. This wall showed no signs of structural distress.

3.9. When walked upon the floor structure in the shop area did not deflect noticeably and no evidence of springiness was noted, even when several people were in the shop.

4.0 CONCLUSIONS AND RECOMMENDATIONS.

4.1. The property appears to be free of cracking or distortion which might reasonably be attributed to major recently active subsidence or other ground related movement.

4.2. As noted previously, the external façade displays evidence of significant historic repairs and reconstruction, possibly following damage due to enemy action, but the appearance of the façade gives no cause for concern regarding the adequacy of work undertaken.

4.3. The current support feature in the basement appears to have been installed between 2004 and 2017, replacing an earlier temporary structure consisting of Acrow props. We have not been informed of the dates when either the temporary or more recent supports were installed, or the reason for their construction. It is understood from Fuller Long that the support structure did not replace an earlier wall, based on inspection of previous Planning Drawings.

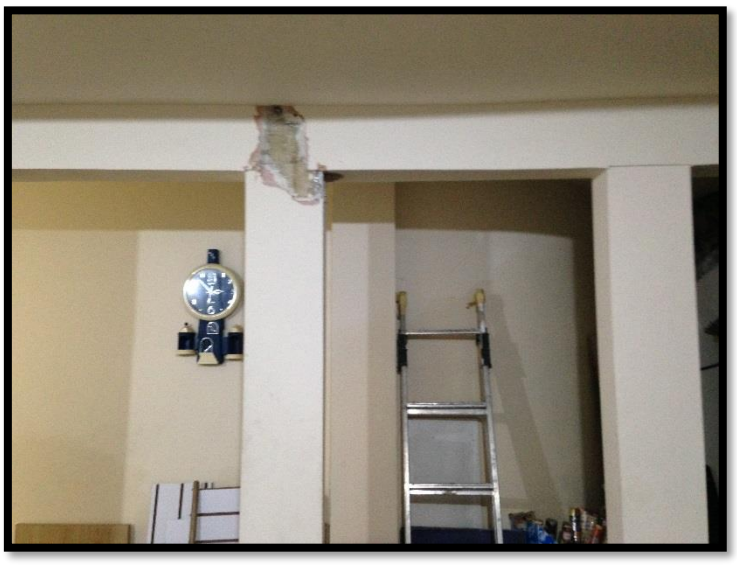
4.4. Inspection of those areas of the property to which we had access gave no indication to suggest that the support feature is not fit for purpose. There was no clear visible evidence to suggest that the loading imposed had either distorted the timbers or resulted in cracking within the floor structure of the basement.

4.5. Since there is no indication that the support feature is unfit for purpose, it is not considered that further exploratory investigation is justified at the present time. Indeed, breaking out of the concrete basement slab could well impair its structural integrity and would therefore be counterproductive.

4.6. The support feature is therefore deemed fit for purpose, based on the inspection undertaken to date.

APPENDIX 1
PHOTOGRAPHS

General view of front and right-hand elevations



General view of support feature showing exposure at high level

Support feature close to front wall and arch

Original beam above support feature – note horizontal mortice

Steel beam embedded in basement floor

Exposure of timber members forming the support feature

APPENDIX 2
GUIDANCE NOTES

GUIDANCE NOTES FOR STRUCTURAL ENGINEER'S INSPECTIONS OF DOMESTIC PROPERTIES

These notes are to be read in conjunction with any report to which they are appended.

1. A Structural Engineer's inspection of a property is intended to provide the information set out in either paragraphs (a) or (b) below. Our reports will indicate the exact nature of our brief.

   (a) Specific advice on any structural problems which have been brought to the attention of the Engineer and which may be the sole basis for commissioning the report. Examples of this are fractures to walls, previous repairs etc.

   or

   (b) To provide a general overview of the condition of the principal structural elements of the property with a view to advising whether the property is suffering from deficiencies such as subsidence, heave, landslip, structural instability or failure of structural components.

2. The inspection is not a full "Building Survey" as defined by the Royal Institution of Chartered Surveyors, this type of survey deals with many of the non-structural aspects of property condition. Other than general comments, the inspection has not included the testing of any services to the property. Neither will it consider the presence of any hazardous or deleterious materials such as asbestos nor any invasive vegetation such as Japanese knotweed etc.

3. Inspections can only be made of those areas which are freely accessible. Unless arrangements have been made beforehand no inspection can be made of foundations or areas buried beneath the structure or behind cladding, neither can any comment be made upon areas that are obscured by fitted carpets or fixed coverings. If such further inspection is advisable then this will be referred to in the report. However, there is always the possibility that there are hidden defects which cannot reasonably be established from a standard Structural Engineer's inspection.

4. The contents and information in the report are for the use of the person in direct contract with HLN Engineering. Unless specified to the contrary this is the person who pays our account. Any third party to whom the report is passed should take their own steps to ensure the accuracy of its contents. Acceptance of our report will imply an acceptance and understanding of these notes.

5. The report should not be construed as an implied warranty in relation to the structure. HLN Engineering will not be liable to any third parties for any loss, consequential or otherwise, because of information given in the report.

6. Clients should always obtain legal advice on matters involving the sale or purchase of property, our reports do not address legal issues.

7. It must be remembered that the condition of any property is a constantly changing variable, with the passage of time new defects can arise and existing ones worsen. The report should only be taken as a record of the condition of the property at the time of the inspection. As a general rule it is recommended that a re-inspection is undertaken every two years, in this way the early warning signs of any recurrence of a problem or the onset of new problems can be given. Advice given as a result should in general terms lead to an overall cost saving providing the remedial works or maintenance items recommended are carried out.

APPENDIX 3
TABLES 1 & 2

TABLE 1 - DESCRIPTION OF DAMAGE

Class of crack (sizes in mm)	Description of damage and remarks
P0 (< 0.1)	Hairline cracks which are difficult to see unless walls are smooth plastered
P1 (0.1 - 0.3)	Fine cracks which require close observation of brick block or stone masonry to detect them. Typically found as crazing patterns in plastered or rendered walls. Easily obscured by wallpaper.
P2 (0.3 - 1.0)	Noticeable cracks, generally not seen by householder/property owner unless they have been made aware of a possible personal loss, or the cracks are in a conspicuous position. Often difficult to date first appearance of cracks for this reason. May be associated with wrinkling of wallpaper but easily masked by embossed or heavy patterns. Typically found at ends of lintels, junctions between walls and ceilings, and between drylining or ceiling boards. Also, at junctions of differing materials, e.g. where wall plate at eaves is below ceiling line in upper rooms, and over doors in slender brick or block partitions whether the door framing continues up to ceiling level.
P3 (1.0 - 2.0)	Cracks more easily observed when approaching 2mm in width. At this size cracks can usually be detected by touch as wallpaper is likely to stretch, wrinkle or tear. In clear light, may be seen at a distance of a few metres. Thus, may be detected by careful visual inspection from ground level when investigating upper elevations of two and possibly three storey buildings. May fracture building components such as bricks, blocks, cills or lintels.
P4 (2 - 5)	Cracks will be conspicuous on most structures, and at upper limit very conspicuous whether the building is well maintained or not. Usually cause property owners to become alarmed, especially if they develop within a few months. At upper limit, draughts may occur through outer walls; doors and windows may "stick" or fail to close; brick arches may loosen. Likely to be associated with a pattern of cracking in which a mechanism of movement* can be discerned originating at support level. Diagonal cracks may develop in ceilings.
P5 (5 - 15)	Cracks of this size are associated with severe damage, especially in the upper range of the class. Doors and windows may jam; glass splits or shatters; walls crack right through; draughts develop; plaster may fall; severe shear patterns may develop including diagonal cracking in ceilings. Cracks may be split into two or more parallel fractures leading to shattering of a panel of brickwork. At the upper limit, masonry arches may fall; service pipes distort or fracture; noticeable gaps will appear in expansion joints, roof tiling or similar finishes that would accommodate or mask smaller movements. Weather-tightness is likely to be impaired. Services may be damaged. Likely to be associated with a mechanism of movement* clearly following from differential movement of supports. Support is usually the foundation but could be sagging floor or beam.
P6 (15 - 25)	Cracks likely to develop in groups with a clear pattern in which a mechanism of movement* can be recognised. In older structures there is an increasing risk of falling plaster and masonry. Distortion obvious to the naked eye, even at a distance; walls may bulge, especially in older properties. Horizontal movements at bearings and/or DPC level often develop. Unless the damage is caused by sudden and severe removal of support, (e.g. mining subsidence, swallow hole, sewer or trench collapse) cracks of this size may have been partially filled in during earlier "making good" operations, thus masking the total distortion.
P7 (> 25)	As for Classes P5 and P6 but damage greater and usually more widespread. The risk of the structure becoming dangerous increases rapidly with advancing maximum crack size and is greater in older brick or stone masonry buildings. Bearings may be dangerously weakened.

P.T.O. for Table 2

TABLE 2 - CLASSIFICATION OF DEGREE OF DAMAGE IN MASONRY WALLS

	Degree of damage			
Class of Crack	**Dwelling**	**Commercial or public**	**Industrial**	**Effect on structure and building use**
P0	Insignificant	Insignificant	Insignificant	None
P1	Very slight	Very slight	Insignificant	None
P2	Slight	Slight	Very slight	Aesthetic only. Accelerated weathering to external features.
P3	Slight to moderate	Slight to moderate	Slight	
P4	Moderate	Moderate	Slight to moderate	The serviceability of the building will be affected, and towards the upper bound stability may also be at risk.
P5	Moderate to severe	Moderate to severe	Moderate	
P6	Severe to very severe	Moderate to severe	Moderate to severe	
P7	Very severe to dangerous	Severe to dangerous	Severe to dangerous	Increasing risk of structure becoming dangerous.

Class of crack	P0	P1	P2	P3	P4	P5	P6	P7
Crack size mm.	0.1	0.3	1.0	2	5	15	25	