Structural Appraisal Report

99 Kensington Church Street, London W8 7LN

May 2015

Prepared for:

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General View of Building
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1.0 Structural Inspection

1.1 Brief:

Following instructions received from Augustus Brown Architects, acting on behalf of the Client, Mr Gregg Baker of 99 Kensington Church Street, the property was visited on Monday 27th April 2015. The purpose of the visit was to undertake a visual, non-intrusive, inspection of the property to identify any significant structural defects and put forward recommendations for further investigations or remedial work that might be required.

This report concentrates specifically on structural engineering issues. Thus a number of matters which may be considered in reports on buildings are outside the scope of this report, such as historic, planning, legal, decoration, windows, doors, fences, contamination, asbestos, services (electrical, gas, water, phones, etc.) and party wall matters.

1.2 Inspection Date, Site Conditions and Limitations:

The property was visited on 27th April 2015 and the weather was hot and dry during the period of the visit.

The property is currently divided between retail units on the ground and lower ground floors and a single residential unit on the upper floors. Separate access is available to each from the street.

The exterior of the building was viewed from pavement level to the front and from the small courtyard garden at lower ground floor level to the rear.

Access was available to all internal areas of the building and internally to one half of the roof void only. Access was gained onto the roof externally via a roof hatch in the accessible half of the roof void.

For the purposes of the report, it has been taken that the front elevation faces approximately due east.

1.3 Brief Description of the Property

The property is a fairly traditional mid-terrace house, one of a matched pair with number 101 Kensington Church Street on its North side. The ground and lower ground levels to both properties are given over to retail outlets, with first and second floors to number 99 providing residential accommodation in a single unit. At street level original stairwells leading to the lower ground floor and undercroft accommodation have been capped and lower ground floor level accommodation extended into the original undercroft.

The properties appear to be Victorian, build in traditional brick and timber construction. A step on plan of approximately two metres exists between the main facades of numbers 101 and 103 to the North side and between 99 and 97 to the South, where those properties are of quite different, later architectural form.

The building is built beneath a concrete tile clad roof formed of two, shallow, duo-pitch roofs spanning front to back and separated by a central gutter spanning between party walls. Box gutters, draining the external roof slopes, sit behind raised parapets to the front and rear.
The structure of the roof comprises traditional timber rafters and a shallow internal truss arrangement spanning front to back, with ceiling joists spanning orthogonally between party walls and an intermediate timber beam support.

Intermediate floors are of traditional timber boarding and joist construction.

Solid brick walls, probably 9" thick, form the front and rear facades and party walls to numbers 97 and 101 Kensington Church Street. Brickwork visible from the street is, in the main, exposed to view with stucco finish to the retail outlets at ground level only.

Two cruciform anchors, indicating the presence of lateral wall restraints are visible on the front façade to number 99. There are none present to number 101. Differences in brick colouring are evident between that on the street (East) facade and that forming the return on the South Side.

The rear façade is a mixture of original brickwork, overpainted at courtyard level, and glazed brickwork to the closet wing extension. Above first floor window level the wall has been substantially rebuilt, probably as a result of bomb damage suffered during the Blitz.

1.4 Structural Observations

1.4.1 Rear Roof

1. There is a slight sag along the ridge line. A remedial timber prop and ties have been installed at mid span to arrest it. It is not clear how long these have been in place but it is probable that they were installed after the original roof cladding was changed from slate to (heavier) concrete tiles. There is no evidence that these remedial elements, although looking somewhat temporary in nature, are not adequate structurally. Photo 1.

2. Timber elements are generally sound, dry and in good condition but there is evidence of water ingress along the rear box gutter. This takes the form of heavy water staining to the ends of rafters and a timber wall plate running under the gutter and along the inside face of the rear wall. The ends of the rafters were not tested for moisture content or to determine the depth of rotting that exists, if any. Photo 2.

3. There is an accumulation of builder’s rubble along the line of the rafters at the rear gutter end and at the base of the chimney on the South Elevation. It was not possible to get closer to these to examine their content or possible source. Photo 3.

4. Externally, apart from cracked and spalled pointing along the lines of the flashings at the party wall lines, the roof appears to be in reasonable condition. Photo 4.

5. There is a significant lean in the chimney stack extending through the roof on the South Elevation. Chimney pots have been removed and the stack capped off with paving slabs. The lean starts at roof ceiling level approximately, is historical, and is likely to have been in existence at the time the roof was re-clad with concrete tiles. The stack has been extensively, but not particularly well, repointed probably coincident with the re-tiling works. There is no evidence to suggest that the stack has moved since those works were undertaken. Photos 5 and 6.
1.4.2 Front Roof

1. Access was not available to the roof void and inspection was limited to the external surface only.

2. The ridge line runs generally straight and sufficiently level to suggest that there are no obvious underlying structural issues contained within the roof structure itself.

3. Apart from cracked and spalled pointing along the lines of the flashings at the party walls the roof appears to be in otherwise reasonable condition.

1.4.3 Front Façade

1. There is evidence of historical movement, both in-plane and out-of-plane.

2. A diagonal crack runs through the brick transom above the first floor window on the left hand side, starting on the bottom left hand corner and terminating at the top right hand corner of the transom. The central pier, between windows, appears to have dropped slightly on its left hand side. Photo 7.

3. All brick arches over the first and second floor windows have had steel reinforcing plates installed to their underside. These are not recent. Photo 7.

4. Steel cruciform anchors, one at mid-height on the central pier and the other at high level adjacent the South gable, indicate the presence of façade retention ties. The parapet brickwork has been almost completely rebuilt to both this and that of 101 Kensington Church Street. Photo 8.

5. On the South façade, where the adjacent property (number 97) is substantially set back, the walls are butt jointed over most of their height and it is not possible to determine from a visual inspection what, if any, internal ties exist between them. Photo 9.

6. Just above the level of the top cruciform tie the front wall has separated from the return wall and a distinct bulge occurs on the front wall as a result. The separation extends over 15 courses of brickwork, or approximately 1100 mm, petering out just below the parapet capping piece. Safe access was not available to measure the crack but it is estimated, visually, to be in the region of 10 to 15 mm at its widest. Photo 10.

7. At ground level the shopfront to “My Favourite Thing” shows signs of distress. The timber post separating the entrance door from the shopfront window appears to have failed structurally, with an excessive bow/bend in the member towards the street. There is a distinct upward distortion of the kerb at the base of the shopfront assembly and in the transom at the head of the door. Photos 11 and 12.
1.4.2 Rear Façade

1. Inspection was limited to that area which could be viewed from lower ground floor level within the rear courtyard. Approximately 25% was not available for inspection as a result. For the purposes of identification, within the courtyard only, the main wall of the house will be referred to as the East wall, the party wall as the South and the remaining two sides as the North and West respectively.

2. The main (East) wall appears, generally, to be in good condition with no obvious signs of differential settlement around the windows. Brickwork above the top of the first floor windows has been substantially rebuilt, suggesting that this elevation sustained bomb damage during WW2. There are no steel reinforcement elements present under the brick arch lintels.

3. Localised vertical cracks are present at the bottom right hand side of the first floor window closest to number 97 and again adjacent to the corner with the South flank wall. The former extends over 20 brick courses (1500 mm approximately) and the latter over 7 brick courses (500 mm approximately). Photo 13.

4. The North wall is finished in a mixture of white painted bricks, from lower ground to ground floor level, and white glazed bricks from ground to first floor level where the wall terminates. There are no indications of structural problems with this wall.

5. The (North) inner courtyard wall extends for the most part from lower ground to ground floor level with a small single storey extension over approximately one third of the plan area where it meets the East wall. The small extension is finished in white glazed brickwork and the remainder in white painted brickwork matching the lower portion of the North wall. A fine diagonal crack exists in the top corner of the brickwork adjacent the glazed extension. The remainder of the wall appears, otherwise, to be in good condition.

6. The South wall forms a party garden wall with number 97 Kensington Church Street. Mature ivy and other vegetation, originating from 97 side, has migrated through joints within the upper section of wall and expanded to the point where the wall now has a pronounced bow, vertical cracks and spalling/loose brickwork within its upper body. Photo 14.

1.5 Internal Structure

1.5.1 Second Floor

1. In the rear room cracked plaster and heavy staining in the top right hand corner of the window coincide roughly with water staining to timbers within the roof void immediately over. Photo 15.

2. In the left hand corner of the front room minor horizontal and vertical cracks are evident from roughly mid height of the window upwards. The cracks appear to be limited to within the plaster. Photo 16.
3. Within the rear stairwell minor cracks and staining run down the junction between the rear wall and the party wall to number 101 and migrate along the party wall itself. Cracks appear to be limited to within the plaster. **Photo 17.**

4. Floors appear to be generally flat and free from bounce. Joists span front to back, supporting wide boarding throughout. Boards are straight sided and appear to be original but are laid in a number of locations with significant gaps between adjacent boards.

### 1.5.2 First Floor

1. Floor construction is identical to second, albeit with a change in the direction of joist to span between party walls. Construction appears to be sound, but with the same issue of excessive gaps between a number of boards.

2. Hairline cracks are present in the plaster over windows on the front elevation. No cracks of significance have been observed on the rear elevation or party walls.

### 1.5.3 Ground Floor

1. This level is given over to retail, with separate street access also referred to in item 1.4.3.7 above.

2. Internal plaster has been removed exposing original brickwork to all original walls. The external and party walls are traditional, solid brick construction with occasional horizontal timber inserts visible where not obscured by shop display. One internal partition comprises of timber posts and brick infill, consistent with building details from the period.

3. Occasional cracks, neither significant in size or scope, are visible on all main walls. The only crack that is of significance structurally appears on the chimney breast over the open fireplace on the party wall to number 97 Kensington Church Street. Here the supporting brick arch over the fireplace opening has dropped slightly and a vertical crack runs through this and up the centre of the chimney breast to peter out at ceiling level. **Photo 18.**

### 1.5.4 Lower Ground Floor Level

1. Access to this level is via a narrow internal stairway leading down from the ground floor retail unit. Use is given over to retail clothing storage in the front part and a hairdressing salon to the rear.

2. This level has been, relatively recently, refurbished such that original walling is substantially hidden behind dry lining.

3. Where accommodation has, following capping of the front stairwell opening at street level, extended into the front undercroft, the area appears to be dry and in good condition. An internal drainage cavity system has been installed to the floor and walls. Consequently brickwork was not available for visual inspection but there was nothing to indicate anything untoward structurally.

4. The same dry lining extended into the rear salon, where no matters of structural significance were noted.
2.0 Discussion and Recommendations

2.1 Front Elevation

This appears, in the main, structurally sound but there are three items of structural significance that warrant further investigation/attention.

(a) The first relates to the façade which is not fully bonded to the return wall on the South elevation. The detail over the full height is that of a butt, rather than a normal, fully toothed joint. Details within the joint are unknown but it is inconceivable that no form of tie exists between the two. Whatever the detail it appears to have failed at the top, where a distinct bulge, coupled with a significant opening of the vertical joint between the two walls, indicates that the connection has failed.

Some further investigation is warranted to understand the nature of the failure. This will require chasing out defective mortar to examine what lies within the body of the wall. Subsequent remedial works could involve the installation of threaded studs drilled through the front façade and anchored into the body of the South wall. The design and specification for these can be developed with specialists in the field, such as Cintec and Helefix.

(b) The second issue relates to the crack in the brickwork over the first floor window on the left hand side. This is historical but closer examination may reveal that remedial reinforcement, such as Helefix bars, are required to reinstate its integrity. Installation of such reinforcement would give the panel a greater capacity to span across the width of the window and relieve the brick arch of (some of) its load.

(c) The final issue relates to the shopfront. The bow in the post to the side of the door, coupled with a general distortion of the framing around the door, suggests that vertical movement of some kind has taken place and the shopfront has been inadvertently loaded as a result of this. The nature of the distortion suggests that relative vertical movement has taken place at the bottom of the opening but it is not possible to analyse this without further investigation. There is no immediate cause for concern but it is recommended that, during the proposed refurbishment, this assembly be carefully dismantled for inspection and assessment.

2.1 Rear Elevation and Courtyard

Overall there is little of structural significance.

(a) Vertical cracks to the right hand side of the first floor window on the main elevation are historical. There is no obvious structural distress elsewhere within the panel that gives a clue as to why the cracks have formed. Subject to closer investigation during the forthcoming refurbishment it is recommended that broken/cracked bricks be simply cut out and replaced.

(b) There is some concern over the stability of the upper portion of the garden wall separating 97 and 99 Kensington Church Street. Heavy ivy growth, emanating from the remote face has penetrated the bed joints and expanded to the point where the upper part of the wall is beginning to disassemble. A significant lean, into number 99
courtyard, is apparent. The upper part of the wall needs to be cleared of vegetation, dismantled and rebuilt. The limit of the rebuild will only become clear once the vegetation has been removed.

2.2 Roof

Two separate pitched roofs exist, spanning front to back and separated by a central gutter. Access to the rear roof void was possible but not the front. The original slates have been replaced with heavy concrete tiles and a slight sag exists along both ridge lines, probably as a result of an increase in loading. This sag has been arrested within the rear roof by the installation of a central prop and cross tie. It is possible that similar elements have been installed to the front roof but this has not been established.

Timbers are generally in good condition but there is evidence of water ingress along the rear gutter, with heavy staining of the ends of rafters and a timber wall plate. In the course of gutter repairs these elements need to be checked for wet rot damage and an assessment made of their structural integrity following loss, if any, of effective section.

The prop and tie do not appear to have been “engineered” and, whilst effective in arresting the sag under the weight of the tiles, a design check is recommended of their capacity under full loading conditions. Reroofing, in slate, could reduce loads considerably.

It is recommended that access is formed in due course to enable inspection of the front roof void.

Externally, apart from the rear gutter, repairs are required to flashings along the party wall lines to both roof sections.

The Southern chimney stack to the rear roof has a pronounced, historical, lean inwards towards number 99. This lean is not an immediate cause for concern, as the stack does not extend significantly above the ridge line and is restrained laterally, in the direction of the lean, by the rear roof structure. Some raking out and repointing is likely to be required during general repairs to the flashings.

2.3 Internal Levels

2.3.1 Second Floor

Cracking and staining of plaster above the rear bedroom window relates directly to the leaking gutter above. There are no cracks visible externally. Following repairs to the gutter this plaster needs to be removed and made good.

Elsewhere cracking of plaster is evident within the stairwell, with attendant staining most likely resulting from rainwater penetration via the failed flashing details, and in the front room. None of the cracks are considered to be structurally significant but loose plaster should be removed for inspection of the brickwork beneath to determine if there are any underlying problems. For the present cosmetic repairs are all that is considered necessary.

Floors appear to be solid and free from excessive bounce. The gaps between boards is, in some instances, excessive and reduces the capacity of the floors to function fully as plan diaphragms to restrain the external walls.
2.3.2 First Floor

Minor cracking of plaster is evident above the windows to the front elevation. No other defects of structural significance have been observed.

2.3.3 Ground Floor

Brickwork is substantially exposed to view, with plaster having been removed for aesthetic reasons. The general condition is acceptable for a building of this age, with some cracking, none structurally significant, at odd locations.

The only crack of significance appears on the chimney breast, where a vertical crack runs for most of its height above the arch to the fireplace opening. This has been caused by the arch dropping. It is recommended that the breast be strengthened, either with Helefix reinforcement or by cutting out and replacing broken/defective bricks. It may be prudent to rebuild the arch in the process.

The unit shopfront, noted in 2.1(c) above requires further investigation to determine the reason for the general distortion and the distress suffered by the doorpost.

2.3.4 Lower Ground Floor

This level has received a cursory inspection only as relatively recent refurbishment works have covered up the structure of the walls and floor throughout. No obvious defects were observed.

Photographs referred to above are included in the appendix.

TSC Consulting Ltd.

Trevor Scott
Director
Appendix 1

Photographs
**Photo 1**
Remedial prop and tie within the rear roof void. Prop sits directly on top of the roof beam without a fixing to hold it in place.

**Photo 2**
Head of prop is notched around the rafters.
Photo 3
Building rubble accumulated at base of chimney to rear roof.

Photo 4
Failure of mortar protection to flashing. Typical throughout roof.
Photo 5
Chimney stack adjacent no. 97 leans into roof.

Photo 6
Same stack viewed from neighbour’s roof. Lean starts approximately at roof ceiling level.
Photo 7

Diagonal crack runs from bottom left to top right of transom. Right hand side of windows has dropped slightly. Steel plates are just visible under the arch lintel (detail typical at all windows on this elevation).

Photo 8

Cruciform anchors indicate presence of façade retention ties. Note bulge in top left hand corner.
Photo 9

Stepped butt joint between front façade and the side return.

Photo 10 (below) shows separation at the top.
Photo 11

Distortion to shopfront infill.
Note camber at pavement level and distortion above door.

Photo 12

View of doorpost from side showing excessive out-of-plane displacement.
Photo 13 (a) – General view of rear wall.

Photo 13(b)
Crack in brickwork to the bottom of the first floor window.

Photo 13(c)
Cracking on edge approximately level with the top of the first floor window.
Photo 14  Damage to top of courtyard garden wall caused by intrusive vegetation, mainly ivy, from the remote face. The top of the wall bows significantly into the courtyard as roots force bricks apart.

Photo 15  Cracked and stained plaster resulting from water penetration through the leaking rear gutter at roof level.
Photos 16 a (general view) and b (close up in corner) at second floor level on the front wall. Cracking appears to be limited to the plaster and, whilst unsightly, is not considered to be of great structural significance.
Photo 17 Minor cracking and water staining of plasterwork within the stairwell at second floor level. Water penetration likely from a combination of the leaking roof gutter and unsealed roof flashings along the party wall line.

Photo 20 Large vertical crack through ground floor chimney breast within the shop unit. The arch lintel appears to have dropped slightly (view obscured by display items).