

Winiecki Associates
Consulting Structural Engineers

Structural Inspection Report

**42 Southwood Lane
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Document History

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1.0 Introduction and General Construction Description

- 1.1 This Structural Inspection has been requested as a precursor to the compilation of proposals for the extensive alterations and refurbishment of these premises.
- 1.2 Access was gained to view the external elevations of the property from ground level and internally throughout.
- 1.3 The weather on the occasion of the inspection was dry and sunny.
- 1.4 The building is an original terraced four storey house, including a basement / Lower ground floor apparently dating from the 1800s. The front elevation faces North and the it was built with the natural topography of the ground sloping down from North to South so that the ground level to the front elevation gives direct access to the Ground floor and the ground level of the garden at the rear is associated with the Basement / Lower Ground floor. At the rear there is a relatively modern single storey flat roofed extension and the original rear wall of the house has been structurally altered with a large opening to enjoin the extension with the house to form a large living room at this level.
- 1.5 The original building uses solid brickwork for the external and Party wall constructions.
- 1.6 The Lower Ground floor has a solid ground bearing floor structure.
- 1.7 The upper floor levels are of suspended timber joist construction.
- 1.8 The internal load bearing walls above Ground floor level are of traditional timber stud construction.
- 1.9 The roof is a traditional timber framed 'Butterfly' shallow front mono pitch and associated Hips behind a low height parapet. The roof weathering is of Slate with lead flashings and gutters.
- 1.10 The shallow pitch of the roof has not allowed the installation water storage tanks therein. These have been accommodated in a dedicated low height enclosure at high level First Floor with restricted access from the stair between the First and Second floor levels.

2.0 Structural Inspection

2.1 Internal

- 2.1.1** The Internal inspection of the Lower Ground floor indicated that the building construction and structural elements at this level are in reasonable condition with consideration given to the buildings age. There is some minor building distortion due to long term foundation differential settlement but that now appears to be stable.
- 2.1.2** The single storey rear extension at this level was noted to be in reasonable condition and is without distortion or any evidence of differential settlement nor any significant rain water ingress from the flat roof.
- 2.1.3** The rear glazed external wall of the single storey extension is timber framed and single glazed and as such would merit a modern upgrade.
- 2.1.4** The internal inspection of the Ground floor storey indicated that the building construction and structural elements at this level are in reasonable condition with consideration given to the buildings age. There is some minor building distortion due to long term foundation differential settlement but that now appears to be stable.
- 2.1.5** The internal inspection of the First floor storey indicated reasonable structural / construction performance around the rear room. However between the central load bearing wall and the front elevation the floor is deformed. This appears to be due to the non original construction of the storage tank service enclosure at high level in the First floor storey. The manner of this construction of this enclosure uses timber propping to from the First floor to support it and consequently the abnormal loading has created abnormal loading deflection. It should be noted that there are a couple of timber props to the edge of the stair well. These are important in maintaining support to the service tank enclosure.



First Floor Props at edge of stair
Supporting service tank enclosure

2.0 Structural Inspection (continued)

2.1 Internal – continued

2.1.6 The Internal inspection of the Second floor storey indicates significant deformations in the floor level and the original ceiling level due to non-original adverse loading conditions, construction inadequacies and/or decays condition.

2.1.7 There is a significant sag in the floor level. This appears to relate to the construction of the service tank enclosure beneath the floor. It was not possible to determine the specific inadequacies or defects that were caused or otherwise created by the supplementary construction of the service tank enclosure because much is hidden from view. Nevertheless the construction of the enclosure severely altered the structural support of the Second floor and it is currently impossible to determine if the inadequacies have achieved a reasonable state of stability.



**Second Floor Stairway Window
Floor Sag Left to Right**



**Second Floor Front Room Window
Floor Sag Right to Left**

2.1.8 The deformation of the Second floor is also reflected in the doorframe in the central wall. It is notable that the ceiling line appears to be level. However that ceiling is a modern false ceiling. The original ceiling is above and is the subject of comment in the next section.



Second floor Deformed Doorway

2.0 Structural Inspection (continued)

2.1 Internal – continued

2.1.9 As a consequence of seeing the deformations in the Second floor story the false ceiling was removed to reveal the original ceiling and the roof framing.

2.1.10 The original ceiling is in very poor condition and very deformed.

2.1.11 The roof timber structure is in very poor condition and in particular the front pitch has suffered serious decay and the subsequent repairs were poorly and inadequately carried out. The associated deformation of the roof has had a secondary effect in enhancing a major defect with the external chimney stacks on the flank wall that is the subject of comment in **Section 2.4**.

2.2 External – Front Elevation

- 2.2.1 The front elevation is Stucco rendered on brickwork and is seen in the photo of the title page to this report.
- 2.2.2 Overall the elevation presents reasonable line and level indicating good historic structural performance particularly with consideration of the buildings age. There are some cracks in the Stucco render but these are considered not to be a significant importance.

2.3 External – Rear Elevation

- 2.3.1 The rear elevation is plain yellow Stock facing brickwork.
- 2.3.2 Overall this elevation presents reasonable line and level and reasonable structural performance since it was constructed.
- 2.3.3 There is a small degree of sloping deformation of the First Floor window arches indicting a small degree of historic differential downward movement of the wall section between the windows but this is not serious and is a common feature of buildings of this age and form.
- 2.3.4 There is some deterioration of the brickwork at parapet level above the window arch of the Second floor and in the arch itself. This decay should be repaired repointing and resetting bricks if necessary.



Rear Elevation



Rear Parapet Brickwork

2.4 External Flank Wall (East)

2.4.1 For the majority of the height of this wall it is a Party Wall with No 44 and it is reasonably true to vertical and level along with the incorporated chimney breasts.

2.4.2 However above a level generally corresponding to the second floor ceiling, the chimney stacks and top section of the wall starts to lean in to the house as the centre of gravity of the chimney and wall construction is offset in that direction. The angle of lean increases with height of the stacks and the total lean has become serious. It is my estimate that the effective centroid of the chimney stack's weight now falls outside the 'middle third' of the plan sectional the base of the stacks. As such I am of the opinion that there is a real potential that the stacks are close to a situation of instability and with the accompanying potential of falling into the building. There is some propping restraint from the roof timber that was real at the time of original construction. However the defects and downward deformation of the roof construction over time has relaxed that restraint but more importantly has probably enhanced the lean progression in the chimney stacks.



Leaning Chimney Stacks

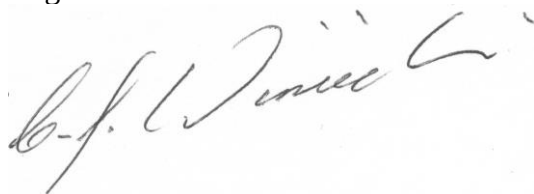
3.0 Conclusions and Recommendations

3.1.0 Conclusions

- 3.1.1** In general this building, from Lower Ground floor level up to First floor level, is in good structural condition in consideration of its age and form. There is nothing below first floor level that deserves negative comment other than the rear glazed wall of the rear single storey extension would significantly benefit from a modern upgrade.
- 3.1.2** Notwithstanding the general comment of **3.1.1**, the second floor construction is exhibiting significant deformation that appears to relate to the service storage tank enclosure construction at high level in the First floor storey. That supplementary construction appears to have adversely affected the support of the second floor but the detail of that inadequacy is currently hidden from view. It is recommended that an allowance be made to carry out any necessary strengthening to the floor of the second floor once the existing construction is exposed sufficiently.
- 3.1.3** The most serious defect is with the leaning chimney stacks on the East Flank / Party Wall. It is strongly recommended that the chimney stacks are rebuilt from second floor ceiling level. In conjunction with this it is also strongly recommended that the roof structure is reconstructed with engineering input in the form of steel beams as well as the typical timbering to establish permanent and effective horizontal restraint to the flank wall and chimney stacks.

End of Report

Signed



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