

Elite Designers Structural Engineers

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Andrew Breathwick
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Friday 18th August 2022

Dear Mr. Breathwick,

Structural Defects to The Countess of Derby's Almshouses, Church Hill, Harefield, UB9 6DU

The Countess of Derby's Almshouses is a Grade II* listed building located on Church Hill in the village of Harefield. The building is in an "H" configuration and is comprised of two residential dwellings, with a single storey of residential dwelling and an unused roof void above, with a number of windowed gable-ended projections situated in various positions and large ornate chimneystacks. The building is constructed of masonry walls, timber roof structure and red clay tiles.

The western façade of the building consists of a large central door opening with a flat brick arch above and two-pane casement windows either side, each with flat brickwork above. Above each of these windows and the central door is an ornate stone plaque, set into purpose-built recesses in the wall. The plaque above the southernmost window has fallen out, revealing the substrate to be comprised of a single skin of brickwork to the internal skin, a skin of brickwork on edge in front of this and mortar dabs in front of this to set the plaque in place. There is evidence of the central and south plaques having been reset into place previously. There is evidence of previous repairs to the panel between the south window and plaque recess above, where the flat brick opening has deformed and the subsequent cracking repointed. The central door opening has experienced similar deformations, with the central brick arch having dropped and the panel above cracking at the corners of the door opening.



Figure 1 – North Plaque



Figure 2 – Central Plaque



Figure 3 – Site of South Plaque

Internally, there is a large timber truss forming the ridge of the gable to the façade in question – the truss bears onto a wall plate that forms the sill for a central four-pane casement window in the centre of the gable. This wall plate is in very poor condition and has completely rotted away in places. There is a low 9" wall below this wall plate which is comprised of the top section of the main façade wall above the door and window openings below. There is a full height crack in this wall to the south side of the truss location, and the brick wall has crushed and moved inwards directly below the truss. The wall either side of this region is generally plumb and free of significant defects.

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Figure 4 – Cracking at Location of Truss Bearing

The gable truss to the centre of the building is presently causing significant structural damage to the west façade. This deterioration of the wall plate has resulted in a substantial concentrated load being imposed directly onto the brickwork below, which has subsequently experienced a shear crack, localised crushed and lateral deformation of the wall panel in this area. This is likely to be the cause of the historic cracking in evidence and the dropping of the brick arch over the doorway. It is not clear whether this defect also resulted in the cracking to the south window opening – the most likely explanation is that the deformation of the wall panel generally has resulted in the flat brick reveal dropping in this area. It is recommended that the gable truss be supported in the temporary condition, the wall locally rebuilt over the door opening and a timber wall plate to match the existing dimensions reinstated to restore the capability of the brick panel to spread the load more evenly. It is recommended that a steel PFC150x90x24 spreader beam is also installed below the wall plate on the inner skin to avoid overloading the brick arch below, extending past the width of the door opening onto the panels of brickwork either side.

For the brick panels above the south window opening and the south plaque opening it is recommended that helibars are installed across the width of the openings and 500mm beyond each side of the window opening to manufacturer's specification to avoid further dropping of the arch and stabilise the plaque opening.

The plaque opening should have the brick-on-edge layer removed and the single brick skin behind checked for structural integrity. Any cracks across this rear brick skin should be repaired with helibar and made good generally. Once these stabilisation works are completed, the plaque can then be reset in consultation with the stonemason's fixing requirements (the void left by the removal of the brick on edge would require replacement with a suitable brick/render solution). This would apply to the plaque above the central door also. It is recommended that the north plaque opening is also subject to these remedial works, as the defects to the plaque fixings are inherent to all the openings and this will ensure the stability of the plaques for the foreseeable future.

I trust you find this report satisfactory. If you require any clarification or further information relating to these issues, please do not hesitate to contact me.

Regards

A handwritten signature in black ink, appearing to read "S. Masterson".

Stuart Masterson **BEng (Hons)**

Director - Elite Designers Ltd

A handwritten signature in black ink, appearing to read "John Fitzpatrick".

John Fitzpatrick **B (Struct) Eng, CEng, M.I.E.I., M.I.C.E**

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