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11 Fitzroy Square, W1T 6BU

Stage D Report

Structural Report and Schedule of Works

REVISIONS
Revisions are highlighted in the text

Rev	Date	By	Notes
P1	December 2012	KT/PB	
P2	12.12.17	PB	Updated to DP9 and CG comments
P3	19 Dec 12	PB	Updated title

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1. Introduction

This report accompanies the application for full planning and listed building consent for the proposed infill extension and refurbishment works at 11 Fitzroy Square. The building has been visually inspected on several occasions and a limited amount of intrusive investigation has been carried out. It is intended that more detailed and thorough investigation of the existing structure will be carried out as part of the design process.

2. Existing Building and the Site

The building is a Georgian terraced house with a unified façade including stone balconies at first floor level. The main entrance is from the side (Fitzroy Street) which has allowed the floor plans to include large rooms at the front of the property extending to the full width of the house. The main staircase is in stone from basement to the second floor and has half landings which give access to a non-original rear extension. There is a lightwell to the side of the rear extension with a glazed roof at the ground floor level. There are pavement vaults at the front and side of the building. The original pair of hipped roofs with a central valley gutter has been altered with the addition of a mansard roof extension behind the central partition line and a part mansard extension forward of the valley gutter.

The basic structure of the building is masonry perimeter walls with timber floors and either masonry or timber stud internal partition walls. The roofs are slate on timber rafters. The main central partition wall separating the principal front and rear rooms is in brickwork at the basement level but more lightweight construction above the ground floor. It is unclear whether there have been any alterations to openings in this central partition but the original cornices superficially look to be in tact. The stair side internal partition wall is brick up to the second floor, to match the extent of the cantilever stone stair, and in timber stud above this level. The overall impression is that the structure is generally sound and relatively free of defects at the lower ground and ground floor levels, but that there are an increasing number of relatively minor defects in the upper levels. The most significant defects are as follows:-

- Cracking in perimeter walls indicating slight lateral movements and lack of tying to the floors, particularly in the upper floors. This is probably linked with cracking in ceilings and cornices.
- Cracking and spreading of brick arch lintels over windows, especially in the lightwell.
- Bowing of cornices internally over door and window openings suggesting the degradation of embedded timber lintels.
- Cracking around the main central partition which may be due to shrinkage of timber or some defect in the structure around the openings in this wall.
- Uneven and unlevel floors particularly towards the top of the buildings.
- Deflection and bounciness in some floors, particularly at the fourth floor level.
- Cracking in the stone balcony at the first floor level, and external wall surfaces.
- Damp patches.

3. Proposed Structural Works

The principal proposed structural works are as follows:-

- Reconfiguration and partial rebuilding of the rear extension and lightwell.
- Introduction of a new lift and shaft within the envelope of the rear extension.
- Repairs to existing structure (Refer to Section 4).

3.1. Method Statement for Annexe Works

The existing structure of the annexe is a brick walled box with timber joist floors. As such it will be a relatively simple structure to make alterations to although this must be done with due care on account of the presence of Party walls. The introduction of a new lift and lift pit requires the underpinning of the main rear wall and annexe side wall. The creation of double height spaces will raise questions of the lateral stability of walls and requires the insertion of additional structure to suit. Assessment of possible construction sequences and associated temporary works requirements are likely to have some influence on the viability of various options for remodelling the rear of the building.

The reconfiguration of the annexe floor space and the introduction of a new lift will result in extensive temporary works if any of the existing floor joists are to be retained. This is shown indicatively in the diagrams below.

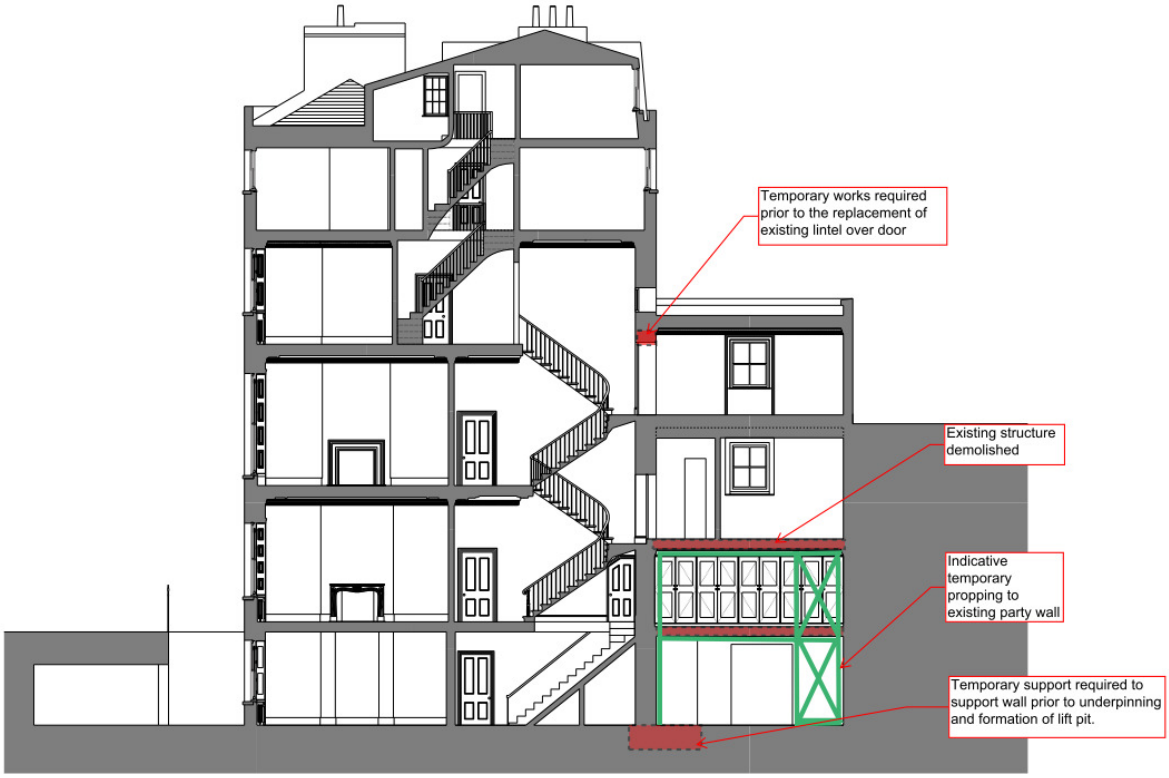

Figure 1: Long section showing indicative temporary works

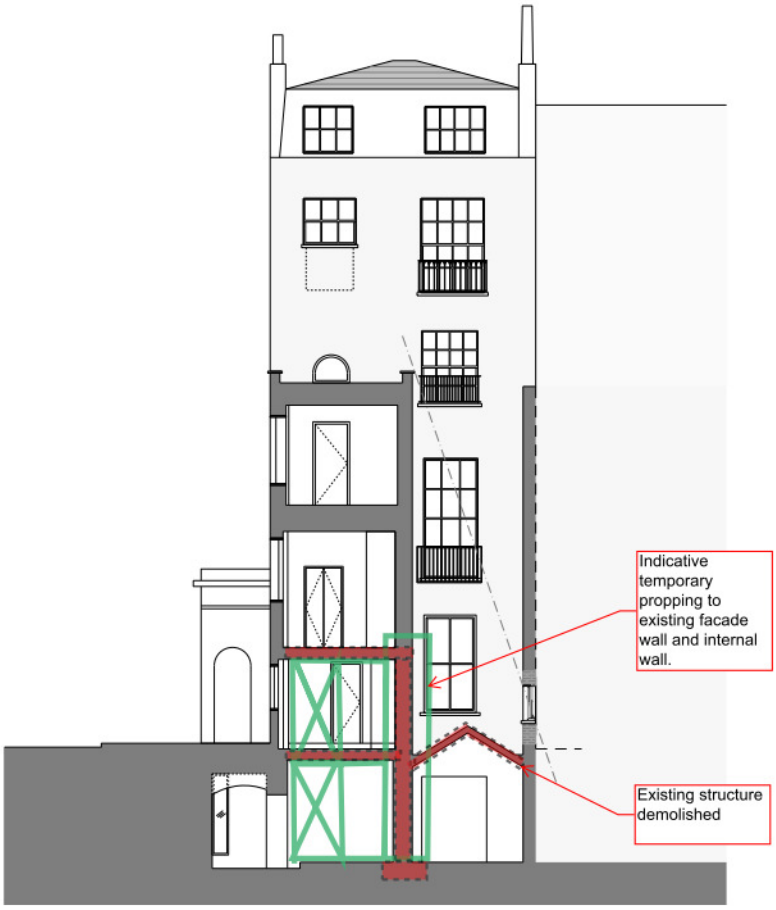

Figure 2: Short section showing indicative temporary works

The new lift shaft is to be steel framed with blockwork infill on two sides. The positioning of the lift next to the existing wall means that the new lift pit will undermine the main rear wall and annexe side wall which will require underpinning.

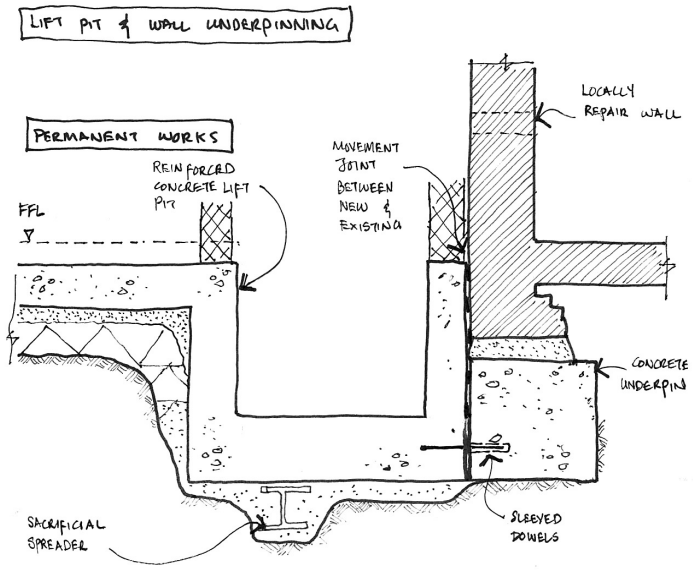

Figure 3: Indicative section through lift pit and underpinning

The annexe side wall, which is to be removed at the lowest two levels, is likely to contribute to the lateral stability of the annexe building. To maintain the structural stability while providing open plan spaces at the Lower Ground Floor and Ground Floor, two-storey steel box frames are to be provided in place of the existing walls. The box frames are also to support the existing masonry wall above. This is depicted in the diagram below.

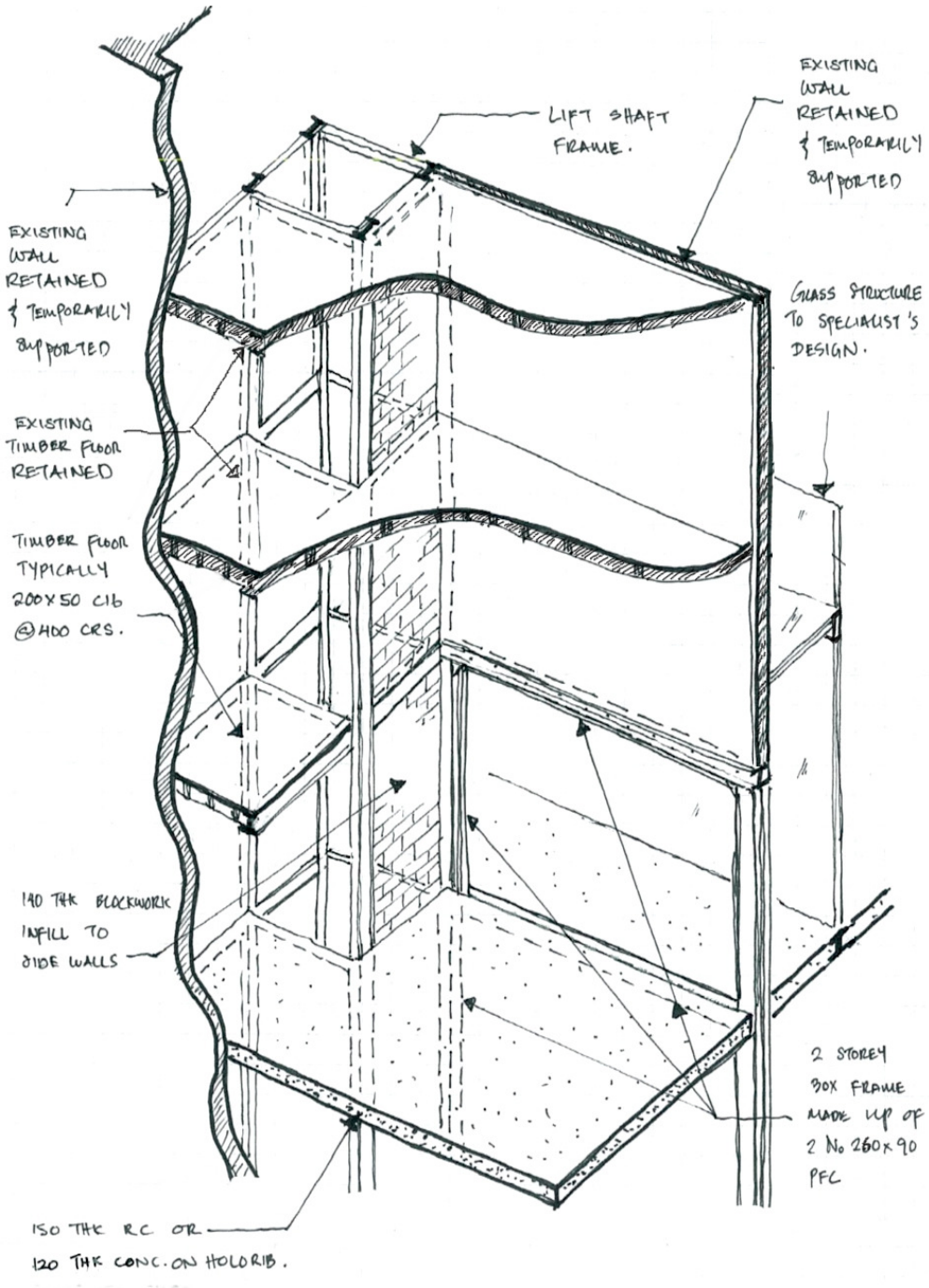

Figure 4: Annexe structure

The Ground floor slab will be constructed from reinforced concrete to give a solid feel and provide a base for underfloor heating. Insitu reinforced concrete or concrete on metal deck are options for the construction of these floors, as shown in the diagram below.

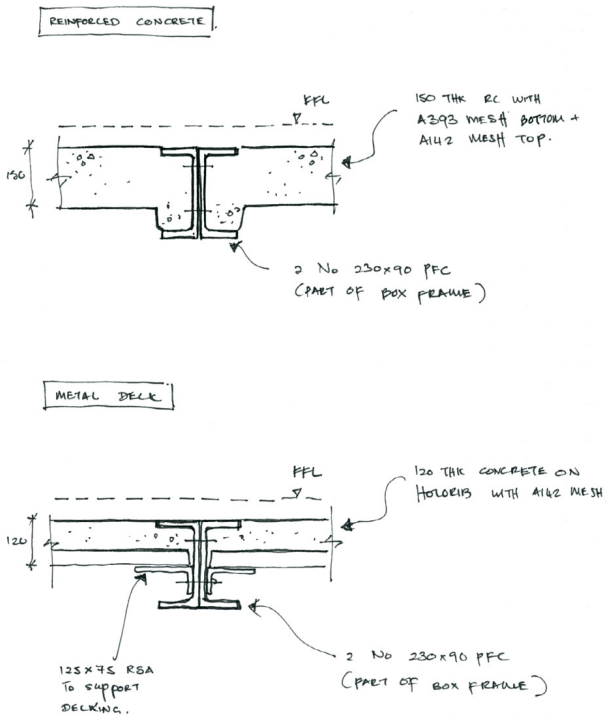

Figure 5: Possible slab buildup for Ground Floor

At the upper floors of the rear wing, new floor infills are to be constructed from timber joists spanning onto new steel beams, the new walls and the existing walls. Care will be taken to limit the weight of the new construction so that the existing walls are not overloaded.

Alterations and additions elsewhere within the building

In addition to the Annexe works, which include a glazed extension at the side of the existing annexe, there are a few structural interventions proposed elsewhere:-

- Infill of the opening in the main rear elevation at the rear main room at basement level. This may have a minor benefit in increasing lateral stability at the basement level but is otherwise neutral.
- Repositioning of the doorway at ground floor level between the stair well and rear extension. This opening is immediately beneath the stone stair but will not affect the stair, provided that due care and attention is taken, and the stair is locally continuously propped during the works.
- Minor internal modifications at the 4th floor subject to further investigation of the existing structure.
- New window openings and repairs to an existing opening in the Fitzroy Street façade.

4. Remedial works to redress defects in the existing construction

There will inevitably be a number of repairs needed around the existing building. The exact extent of repair will not be known until more comprehensive opening up works are undertaken on site. This section of the report sets out what could potentially be required.

4.1 Tying of Floors

It is assumed that the basic structure is largely as originally built with few, if any, modern interventions to tie the floors and walls together. A detailed site inspection is to be carried out to check for cracks, bulges and leaning sections of wall to confirm the extent of tying required.

The works to tie the floors and walls are relatively simple. The possible methods of tying the floors and walls are set out in the diagrams below.

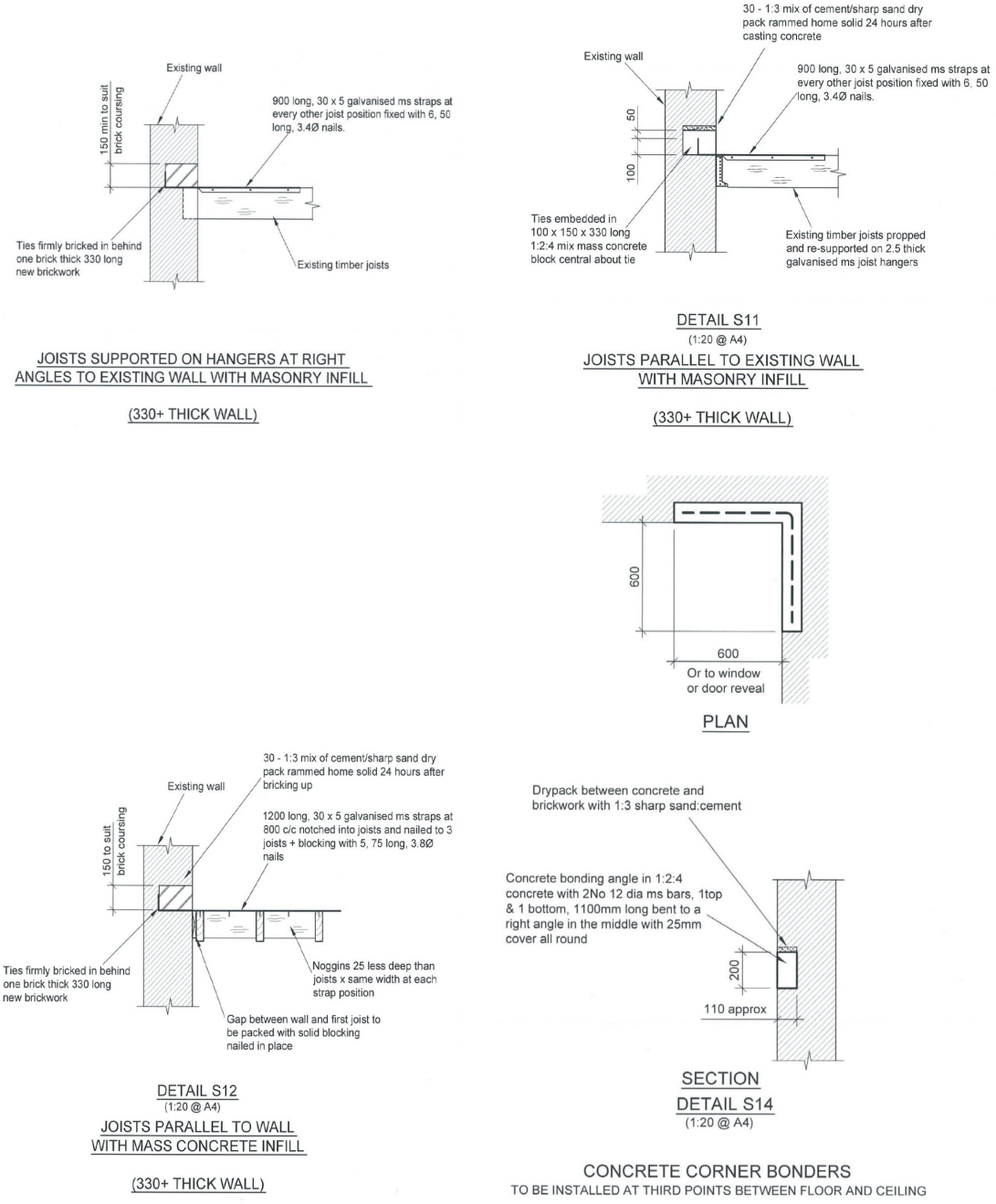

Figure 6 : Typical details for remedial works to existing building

4.2 Possible Replacement of Existing Lintels

Buildings of this age typically have timber lintels set behind the flat brick arches in the external face. These timber lintels are often found to be rotten, beetle attacked or simply eaten away with the brickwork arching over what is left and everything held together by the plaster. The same is often true of embedded bonding timbers. There are deformations in the finishes over many of the windows which may indicate decay of the timber lintels. Consideration should be given to investigating the condition of these lintels, starting with examples where cornices will not be affected. If replacement is needed, we would recommend that these are in the form of precast concrete units immediately behind the facing brick arch with a 100mm wide oak lintel used on the internal face.