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THE MORTON PARTNERSHIP LTD.

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STRUCTURAL STATEMENT
FOR
40 GREAT JAMES STREET
LONDON

Architect: Purcell
15 Bermondsey Square
Tower Bridge Road
London
SE1 3UN

Prepared by: The Morton Partnership Ltd
Old Timber Yard House
55 The Timber Yard
Drysdale Street
London N1 6ND

Date: May 2015

Reference: MC/16062~rep

Contents:

1.0 Introduction

1.1 40 Great James Street is a Grade II* Listed property in the London Borough of Camden. It is listed as part of a group, for its special Architectural or Historic interest along with No.s 26-37 & 39, along with the attached railings. An extract from the list description is as follows:

TQ3081NE GREAT JAMES STREET 798-1/101/662 (West side) 24/10/57 Nos.26-37 AND 39-40 (Consecutive) and attached railings (Formerly Listed as: GREAT JAMES STREET Nos.26-37, 38, 39 & 40 (Consecutive))

*GV II**

14 terraced houses. 1720-24. For J Metcalfe. Brown brick, upper storeys with some refacing in multi-coloured, yellow (Nos 28, 34 & 40) and brown stock brick (1st floor and above of No.30). 4 storeys and basements. 3 windows each. Nos 27-38 and 40, good wood architraved doorcases with enriched, carved brackets carrying hoods with panelled soffits, most with patterned fanlights and panelled doors. No.27, C20 hood with shaped brackets; No.39, architraved doorcase with pilasters, plain cornice, radial fanlight and panelled door. Red segmental arches and dressings to flush framed windows, No.35 upper storeys with glazing bars. Some frames reeded with roundels. Parapets. Some original lead rainwater heads with lion masks. INTERIORS: mostly having fine panelling. Staircases mostly with twisted balusters, column newels and carved brackets to treads. SUBSIDIARY FEATURES: attached cast-iron railings with urn or torch flambe finials to areas.

1.2 It is proposed that the property is refurbished for the mixed use of offices and residential accommodation. As is common for a property of this age, the floors have experienced some reasonable deflections and it is proposed that as part of the refurbishment works, the floors are enhanced to improve their stiffness and that the areas of particular deflection will be levelled out.

1.3 The following statement discusses the existing situation of each floor and their proposed uses. We will then discuss the repairs that are required and any strengthening that could be adopted to enhance the building's robustness.

2.0 Existing Structural Arrangement

2.1 No. 40 Great James Street is a 5 storey Georgian terraced property with attic. Its plan layout is typical of the period, with a hallway and stair to the north side of the property at ground floor level, with front and rear rooms to the south side. The upper storeys have a principal room to the front of the property, with smaller rooms to the rear adjacent to the staircase. The property has a closet wing rising up to third floor level and has also had a small extension to the rear of the stair case added at some time. At basement level brick vaults are located below the pavement at the front of the property and also at the rear of the property below the closet wing and rear extensions over.

2.2 The property is constructed with load bearing masonry walls, with timber floors and panelled partitions at each floor level. Careful opening up of the floors has been carried out at each floor level, which has enabled us to record the sizes and condition of the timber joists and main supporting beams. The joists predominantly span across the width of the property, and are supported by beams on the line of the stair partition wall at the rear of the property and a larger beam to the front of the property. These two beams are staggered in their position and in turn are both connected into the side of a timber beam spanning between the party walls, on the dividing partition line. The joists to the closet wing span across its width onto the adjacent masonry walls. A typical plan layout indicating the floor construction is appended.

2.3 Generally the floors are made up with timber boards, supported off the top face of the joists and lath and plaster ceilings supported directly off the bottom face. The boards have been scribed over the joists to allow for the variation in board thickness and have timber 'pins' recessed into their top face in some locations (refer to photo 1).

Photo 1: Timber pin recessed into top face of boards.

2.4 The panelled partitions appear to have minimal studs within them and the partitions between the front and rear rooms at each level appear to be simple panel sections, with individual posts located occasionally. The dividing partitions at basement level have been removed at some point and steel beams have been provided to support the floor and partitions over, which are in turn supported off a circular post.

2.5 We have reviewed the condition of each of the floors and there is a significant amount of undulation in them as you rise up through the building, particularly within the rear room. This appears to be due to a combination of factors; Firstly, there has been some water ingress to the rear of the property which has caused rot to beam ends and embedded timbers in the rear wall. This is particularly the case at first floor level (refer to photo 2) and to a lesser degree at ground floor level. Secondly, the joists at third floor level have had a significant number of notches cut out of them in the rear room, to allow for services to be installed (refer to photo 3). This has led to weakening of the joists and some significant deflections across the floor. Further to these external factors, the timber beams themselves are inherently relatively small for their spans, with little propping provided by the panelled partitions.

Photo 2: Rot to first floor beam end (beam A).

Photo 3: Notches to third floor rear room joists.

2.6 The principal beams and joist ends are built into the masonry walls (refer to photo 4). The bearings generally appear to be sound, with no pulling of the joists noted. We have not however been able to ascertain the length of the bearings into the walls.

Photo 4: View of joists built into party wall.

2.7 At basement level, the vaults to the rear of the property have been inspected and are considered to be generally in good condition. They also appear to be reasonably dry. We have not carried out a detailed inspection of the front vaults at this time.

2.8 Externally there is evidence of some historic movement within the front façade, however this does not appear to be ongoing and is not of concern at this time. To the rear of the property, there has been some movement to the parapet wall at high level. We will carry out detailed inspections of the external fabric during the proposed works when access permits.

3.0 Proposals (Refer to Purcell Drawings and accompanying sketches)

3.1 It is proposed that 40 Great James Street is refurbished and that it will provide both office and residential accommodation as set out below:

Third Floor level and attic store:	Residential accommodation
Second floor level:	Residential accommodation
First floor level:	Office use
Ground floor level:	Office use
Basement level:	Residential Accommodation

3.2 In light of our surveys and particularly in relation to the undulation of the floors, we have carried out an analysis of the floor structure from ground to third floor levels. Whilst modern design codes define imposed loading for offices of 2.5kN/m^2, studies have shown that this is rarely reached. It has therefore been agreed that the floors designated for office use should be checked for a domestic imposed loading of 1.5kN/m^2 with an uplift to 2.5kN/m^2 for a 1m strip adjacent to the party walls and stair partition wall. It is proposed that the main file storage would be located in the basement vaults at the rear of the property.

3.3 Taking the above as the basis for the proposed loadings, at each floor level the joists are within permissible stress limits, however the three principal beams would theoretically be overstressed and would theoretically deflect in excess of what is recommended to prevent damage to plaster finishes. Having discussed the analysis in detail with the Architect, we propose that the timber floor beams are strengthened at each floor level.

3.4 In order to stiffen the beams adequately, we propose that flat steel flitch plates are used, either recessed into the centre of the beam (as in the case of the front room beam) or added to the sides of the beams, all through bolted. The connections between each of the beams and also where they bear into the masonry walls could also be enhanced to ensure that the loads are transferred adequately.

3.5 The sketches appended to this statement indicate the type of strengthening that is proposed at ground, first, second and third floor levels. The proposals have been made to minimise any damage to the panelling and also to reduce the amount of damage caused to the plaster finishes during installation.

3.6 Where water ingress has occurred at the rear of the property, we propose that additional timbers are bolted alongside the strengthened floor beams and that the bearings are enhanced to reinstate the load path back to the load bearing masonry of the external wall.

3.7 Should any further structural members be found to be suffering from rot and/or damage when they are uncovered during the works, we will recommend that traditional repairs are carried out to reinstate the structural behaviour of the affected member.

3.10 The contractor would need to give careful consideration to the methodology for introducing the floor beam strengthening with propping provided during the works as necessary. We would review the methodology with them carefully prior to any works taking place.

4.0 Conclusion

4.1 It is proposed that No. 40 Great James Street is refurbished and brought back into use as a combination of both residential and office use. The building is structurally sound, however has suffered from some significant deflections to the floors between ground and third floor levels. In our view, this has occurred due to a number of factors.

4.2 Our surveys of the intrusive opening up have enabled us to review the existing structural arrangement of the floors and allowed us to record their condition. We have also carried out an analysis of the floor structure and we recommend that some local strengthening is carried out to the timber floor beams. In general we have considered the floors to be designed for residential loading, with some local uplift adjacent to the party walls and stair partition wall. When considering the proposed layout of each of the rooms and their individual uses, we do not consider it likely that the imposed load for offices as set in the codes would be achieved.

4.3 With careful repair and local strengthening of the floors the structural integrity of 40 Great James Street would be enhanced and the building helped into the future. We would work closely with the design team to develop the details for repair in a careful and sympathetic manner. We would also review the contractor's method statements in due course and expect them to have given careful consideration to any temporary works necessary to carry out the works in a safe manner.

Appendix - Sketches

☒ Old Timber Yard House, 55 The Timber Yard
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DETAILS 16062 /SK 01

TYPICAL FLOOR LAYOUT KEY PLAN

JOB TITLE 40 GREAT JAMES STREET

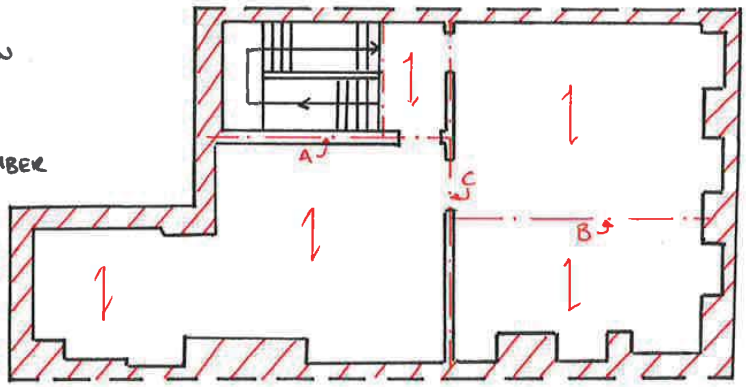
JOB No. 16062 **DATE** MAY 2015

KEY:

DENOTES SPAN OF TIMBER JOISTS

DENOTES TIMBER BEAMS

DENOTES LOAD BEARING MASONRY



TYPICAL STRUCTURAL ARRANGEMENT GND. TO 3RD FLOORS

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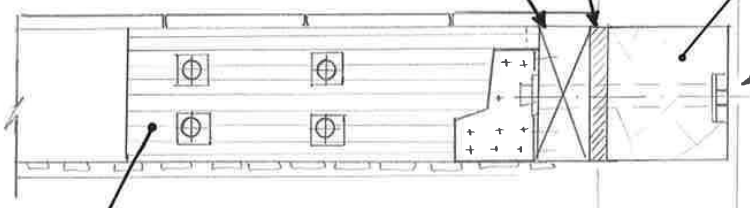
DETAILS 16062 / SK02

PROPOSED STRENGTHENING TO BEAM A

JOB TITLE 40 GT. JAMES STREET

JOB No. 16062 **DATE** MAY '15



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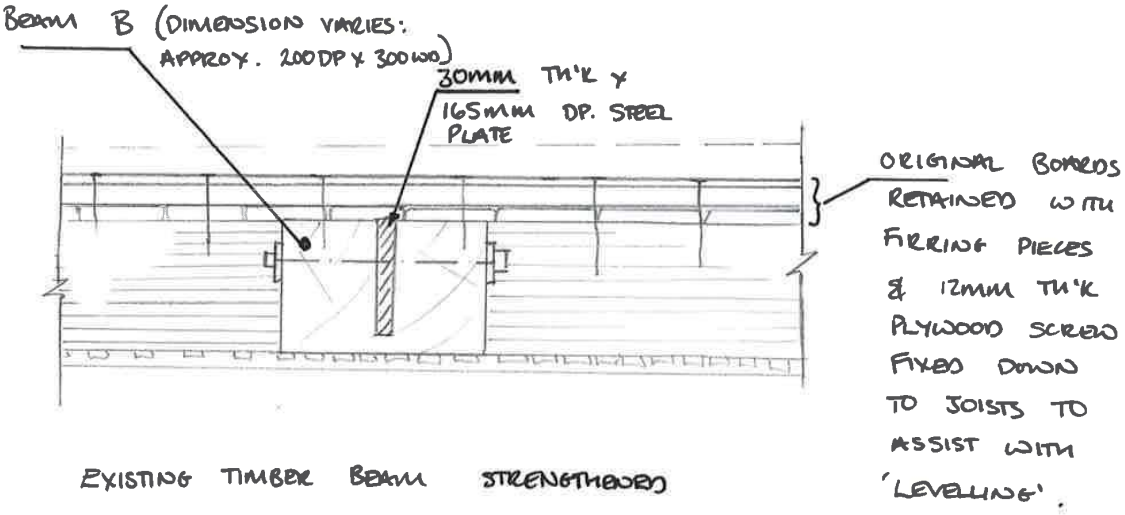
DETAILS 16062 /SK03

PROPOSED STRENGTHENING TO BEAM B

JOB TITLE 40 ST. JAMES STREET

JOB No. 16062 **DATE** MAY '15



EXISTING TIMBER BEAM STRENGTHENED WITH CENTRAL STEEL FLITCH PLATE & THROUGH BOLTED AT JOIST CENTRES.

FLOOR TO BE FULLY PROPPED TO BASEMENT LEVEL PRIOR TO STARTING WORKS.

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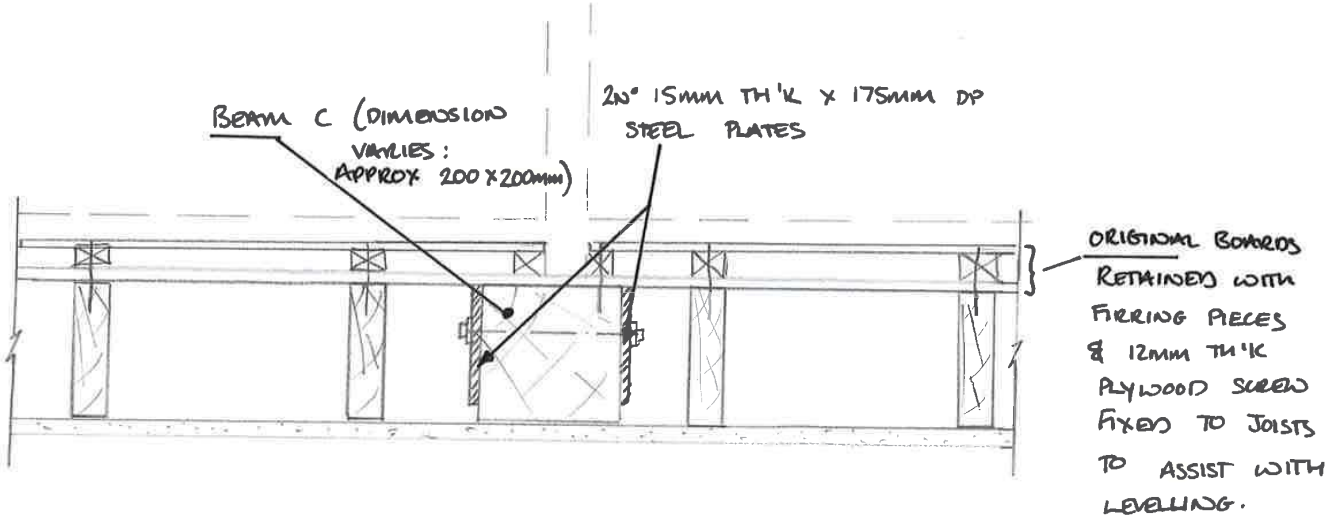
DETAILS 16062 /SK04

PROPOSED STRENGTHENING TO BEAM C

JOB TITLE 40 ST. JAMES STREET

JOB No. 16062 **DATE** MAY '15



EXISTING TIMBER BEAM STRENGTHENED WITH STEEL PLATES (ONE PER FACE) ALL THROUGH BOLTED AT 300mm CRS.

ADDITIONAL BOLTS AT MID SPAN BETWEEN POSITIONS OF BEAMS A & B.

FLOOR TO BE FULLY PROPPED TO BASEMENT LEVEL PRIOR TO STARTING WORKS.