Jamestown Road
Structural Engineering Statement for Planning

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Rev 01

Expedition
Structural and Civil Engineering

T +44 (0) 20 7307 1000
F +44 (0) 20 7307 1001
E info@expedition.uk.com
W www.expedition.uk.com

Morley House
320 Regent St
London
W1B 3BB

Changes made	Date	By
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1 Structural Engineering Statement for Planning

1.1 Overview

The proposed refurbishment of Bewlay House involves two main areas of structural works:

1. The strengthening and alteration of the existing structural frame; and
2. the additional of new levels on the top of the existing frame;

These are detailed individually below.

1.2 Reuse of existing structure

The existing structure comprises of reinforced concrete frame, with concrete flat slabs at every level, including the roof. The single story of basement is encased by reinforced concrete retaining walls, with a separation between the building retaining wall and the canal wall. Stability to the building is provided by a series of reinforced concrete cores.

The existing frame will be strengthened to accommodate the additional levels above, and altered to suit the revised usage.

The new levels will be relatively lightweight, and their supports will be arranged such that load follows existing column lines. Initial investigations show that the original structure was designed to accommodate an additional story. It is therefore anticipated that only minimal strengthening works will be required to accommodate the additional story – most likely to the upper levels columns.

The new layouts will be managed to obviate the need for foundation strengthening.

The area most likely in need of strengthening will be the lateral stability system. All of the existing structural stability cores are being retained. If necessary and practical these cores will be strengthened, or alternatively additional bracing lines will be created internally.

The existing central atrium that runs the full height of the building will be rearranged to suit the new layouts. Portions of the existing atrium will be infilled, while other portions of slab will be removed. Some parts of the slab will need to be strengthened as a result, and this be undertaken using either new beams or externally bonded reinforcing – possibly carbon fibre.

1.3 New build structure

As the additional levels are being erected on an existing building, the structure of these new levels will focus on lightweight materials and construction. It is however intended that concrete floors will be used to offer robust separation between levels. Ease of construction on a confined site also an important consideration.

It is therefore anticipated that the new levels will be formed of a structural steel frame with concrete floors on metal decking. The column grid for these floors will be arranged to match the grid of the existing building below.

2 Structural Sustainability Statement

2.1 Overview

This structural sustainability statement considers the project in broad terms. It touches on the requirements of BREAAM but as this standard is focussed more on in-use requirements, we consider here the areas where the structure has the greatest impact – most notably on embodied carbon.

2.2 Reuse of existing structure

By far the most important factor regarding the sustainability of the structure is the decision to re-use the existing concrete frame. For a typical new build concrete frame building, about 50% of the embodied carbon may be in the concrete frame. It is expected that roughly 80% of the structure for the new refurbishment will be re-used existing frame.

The decision to reuse the existing frame therefore results in a reduction in the embodied carbon of approximately 40% compared to a new-build. This far out-weights all other conventional methods to improve the sustainability of the structure.

2.3 New build structure

The new build structure must, as outlined above, be made from lightweight materials. With regards to sustainability, this naturally lends itself to an approach of material efficiency (and resulting embodied carbon minimisation), rather than an approach of utilising thermal mass (to improve in-use efficiency).

As part of the design process, it is intended to synergise the structural requirements for minimum weight with the opportunity to reduce embodied carbon. This is likely to occur through the use of integrated detailing (for instance, organising the floor system such that an additional screed is not required), and thoughtful material choices (such as encouraging the use of lightweight and/or recycled aggregates.

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