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Structural Impact Assessment: Waldegrave Suite, St Mary's University, Waldegrave Road, Twickenham, TW1 4SX

Project number: 2050

Structural engineering tailored for you

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Introduction

Modulus Structural Engineering Ltd has been appointed by St Mary's University to provide structural design services for the proposal alterations to the Waldegrave suite. This report advises on the impact to the structure of the proposed alterations and should be read in conjunction with the Design & Access and Heritage Statement, prepared by Michael Jones Architects, dated May 2022.

Structural details

As described in the Design & Access and Heritage Statement, the proposed alterations affect a building constructed in the late 18th Century and a mid-20th century extension. As will be discussed later the structural alterations to the later, non-listed, building are minimal and this section will focus on the structure of the listed building (see Table 1).

Table 1: Property details for late 18th century building

Number of storeys:	2
External wall construction:	Masonry, rendered externally
Internal structural wall construction:	Masonry.
Floor construction:	Timber floor joists; and where visible timber floorboards were noted
Roof construction:	Complex arrangement of pitched roofs, with flat valley areas, not inspected in detail but assumed to be timber rafters, props and ceiling joists

There are a number of internal non-structural partitions, some are masonry and the remainder are timber stud partitions.

Observations on proposed alterations

There are 4 locations where it is proposed to make alterations to the original structure of the buildings:

1. Opening for access to the lift at the south-west corner of the late 18th century building
2. Widened door at the west end of the access corridor
3. Widened door at the east end of the access corridor
4. New slab for the lift pit

Alterations 1 to 3 all require similar alterations to the original masonry walls. The new or widened openings can be formed by installing modern concrete lintels, as the openings are small the lintels will only need to be 140 mm deep (or 2 courses of bricks) to support the loads above. The original walls are thick (up to 450 mm) and so the stresses on the existing brickwork are minimal. It is therefore considered that the existing masonry walls are more than capable of supporting the loads, and that the potential for movement of the foundations due to the re-arranged load-paths is negligible.

At location 2, a new section of wall is to be installed where it is proposed to move the door to the centre of the corridor; the existing door opening was not original. It is considered that the new length of wall can use bricks removed for other openings. The new brickwork should be keyed into the existing using a mortar to match the existing. This will ensure that the loads are spread evenly between the restored brickwork and the unaltered masonry. It will restore some of the lateral stiffness to the external wall that was lost when the current door was installed.

In the 20th century building it may be necessary to cast a new ground bearing concrete slab to form a shallow pit for the lift. The existing floor appears to be concrete and would be broken out in the area required for the lift pit. It is not part of the foundations for either building and would not affect their load-bearing walls.

Conclusions

The improved access proposals require minor alterations to the load-bearing walls of the late 18th century building, the changes in stresses due to the alterations are minor and well within the bearing capacity of the masonry and the foundations.

A small lift pit in the 20th century building will not affect the structural elements of either building.

This report was checked by:

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