

8.30 MARBLE HILL HOUSE - STRUCTURAL REPORT

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**EXECUTIVE SUMMARY
STRUCTURAL STAGE 3 REPORT
FOR PROPOSED WORKS
AT
MARBLE HILL HOUSE, LONDON**



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Brooklands
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Executive Summary

We have worked closely with the design team to develop our structural designs to RIBA Stage 3 for the proposed works at Marble Hill House. This summary Structural Stage 3 report describes the design principles for the proposed structural interventions at Marble House, for the new café at the stables, for the landscape works, and for drainage at the Sports Complex.

In developing our designs for the structural engineering aspects of the project, there are a number of issues that we have been and will continue to consider at each stage. These primarily are as follows:

- To minimise the impact on the Grade I Listed fabric;
- To maintain the existing load paths through the building where possible;
- To provide practical design solutions that can be sequenced and constructed in a safe manner.

The structural input to the principal areas of work are summarised as follows:

- New Café to the Stables;

The structural proposals being developed assume rebuilding of the existing brick boundary wall and using this to support the new monopitch café roof. If this wall is to be retained, extensive repair and some partial rebuilding will be required; the roof would then be supported on posts set back from the wall. Alternatively the wall could be rebuilt, with the retained bricks on a new deeper foundation; rebuilding would allow for the wall to support the café roof. The principal structure of the café will be supported on softwood timber bow trusses with a steel bars forming the bottom chord. This truss will be a feature of the dining area. Concealed steel plate connections will fix the elements of the timber at the joints of the truss. For the kitchen area of the café, the structure will be concealed; the roof will have principal steel beams and softwood rafters. A movement joint will be formed at the junction of the café structure and the rear wall of the stables. Following the CCTV drainage survey, it is recommended to replace the below ground drain runs within the courtyard as well as improve the ventilation to the drainage system.

Ground investigations have revealed ground bearing soil at a depth of 1.25m, however roots from the adjacent trees were encountered in the boreholes up to a depth of 2.5m. Thus the depth of the foundation should extend to a minimum of 2.5m to avoid disturbance from the root network of the retained trees. A varied foundation depth is not recommended because of the different soil strata encountered above and below 2.3m. We have allowed for a piled raft to reach the foundation depth required.

- Proposed access lift to Marble Hill House;

Preliminary information on the proposed access lift has been developed, it assumes a platform lift supported on new support below the ground floor. The structural design will specify the trimming out of the first floor structure, the lateral restraint of the platform lift equipment and support for the platform lift at ground floor. Review of the layout of the house indicates that the basement does not continue below this area of the floor. We suggest forming a new concrete ground bearing slab to form the foundation for the lift. This slab will be 150mm to 200mm thick, reinforced with steel mesh, and formed over compacted hardcore. The platform lift will be set back from the adjacent walls to avoid any disturbance to the existing finishes. Lateral restraint is required within the depth of the first floor; this will be provided by resin anchoring to the masonry. A steel packer will be required to fill the gap between the new lift and the existing masonry; all of this support will be concealed within the floor void.

- Landscape works to Marble Hill Park;

Our input mainly relates to providing foundation design of new landscape features such as play structures, fencing and gates, and also the design of minor retaining walls and paving sub bases. Ground investigations revealed firm clay at a depth of 1.25m suitable as ground bearing soil. Additionally we will be providing design input into the ground drainage to the playing field near the Thames. The existing Flood Risk Assessment from 2005 and further drain investigation will inform this design. Principally the scheme will involve new ground drains running to the existing sewer and outlet. The penstock that controls the flow of this outlet is likely to require repair. The condition of the river embankment is poor and its remediation is necessary to improve the ground drainage in this area, we suggest pursuing its repair with the Council as they are responsible for the embankment; we can advise further on this area as

investigation progresses. Further investigations into the penstock and culvert conditions may be required as well as ground water monitoring.

- Sports Complex and Below Ground Drainage;

Investigation into the drainage for the Sports complex has commenced. Pressure jet cleaning of the drainage was also carried out. The majority of the below ground drainage is formed of cast iron pipes in good to fair condition. An allowance for replacement drainage should be allowed for where the drainage is disturbed near the nursery; at least 20m run is suggested. A number of manhole covers and manhole connections require replacement where they have corroded or been disturbed. Within the sports complex ventilation to waist drains is required, as well as replacement of the corroded drain covers.