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1.0 Introduction

- 1.1 This report has been completed by John Harrison MStructE, CEng) for Harrison Shortt Structural Engineers Ltd.
- 1.2 This report is solely focused on the foundations for the new conservatory and the effect on the historic brick vaults below.

2.0 Existing Building, Site and Ground Conditions

- 2.1 The original building was constructed in about 1720 and has been extended over time it now stands as a 4 storey detached house with associated outbuildings.
- 2.2 The building is constructed from bricks with timber floors spanning onto intermediate internal masonry partitions.
- 2.3 There is an existing lightweight conservatory at the rear.
- 2.4 Beyond the conservatory is a brick vaulted structure vault that may have been storage for coal or similar.
- 2.5 The British Geological Society borehole records confirm that the underlying ground conditions are sands with some gravel content overlaying the underlying London clay at approximately 9m below ground level. The building will have very shallow corbeled brick footings into the granular material.

3.0 Observations

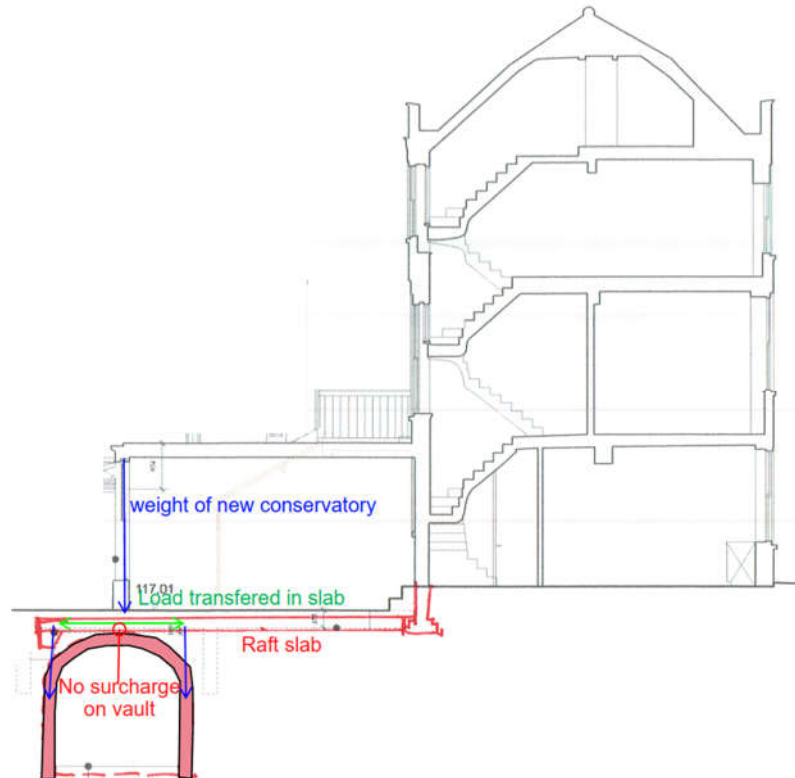
- 3.1 A trialpit has been excavated in the garden and confirmed that the existing vault structure has a brick crown 475mm below the existing ground level.

4.0 Proposed works

- 4.1 The proposal is to demolish the existing conservatory and construct a new light larger conservatory.
- 4.2 The new conservatory will over sail the vaults under.
- 4.3 To mitigate any pressure onto the crown of the vault, a new concrete slab will bridge over the vaults and load the ground beyond.

5.0 Discussions

- 5.1 Arched vaults are inherently very strong when loaded in compression and therefore although possible to place the foundations of the new conservatory directly ontop of the crown of the vault. Structurally it would be advisable to install a concrete slab to bridge over the whole vault and allow the slab to load the vertical walls of the vault in compression.



- 5.2 The foundations of the existing conservatory will be lightly surcharging the sides of the vaults laterally, the raft slab will distribute the weight of the building more evenly and therefore reduce the adverse lateral pressures.
- 5.3 Deep strip or piled foundations have been considered however this will create a conservatory with far stiffer foundations being founded at in excess of 4m below ground level and therefore could cause differential movement between the new conservatory and the existing house.

6.0 Conclusions

- 6.1 The raft slab will reduce the lateral pressures on the vault and not surcharge the existing vaults, provide shallow foundations of similar stiffness to the existing building and provide robust foundations for the new conservatory without adversely affecting the existing building or the vaults.