Project: 49 Willow Road, London NW3 By: PK

Date: 8 January 2021 Ref : 2136 Structural Inspection210705A

Photo 1: 49 Willow Road

1. Introduction

1.1. PK & Partners was instructed by Mr. Dylan McNeil to undertake an inspection of the existing vaults beneath the pavement at 49 Willow Road the masonry which supports the public pavement and road may be unstable.

1.2. We were asked to provide an opinion on the condition of the structure and advise on the remedial works necessary to safeguard the structure.

1.3. Inspections were undertaken at various visits but principally on 8 January 2021 at 10:00 am at which time the vaults were specifically examined and the weather was dry and sunny.

1.4. Access to the vaults is gained from the lower ground floor front window and the inspection was undertaken with limited light.

1.5. This report is for the sole benefit of Mr. Dylan McNeil and no liability is extended to any third party.

2. Description of the site

2.1. 49 Willow Road is located in the London Borough of Camden at the intersection of Willow Road with the north end of Gayton Road. Access to the site is gained from Gayton Road which is connected to Rosslyn Hill or from Willow Road which is linked to Christchurch Hill (See figure 1).

Figure 1: Map showing location of 49 Willow Road.

2.2. The property is bounded by Willow Road to the north, Gayton Road to the east, adjoined by 36 Gayton Road to the south and a single storey garage at Flask Walk to the west (see figure 2).

2.3. With reference to the geological survey of London, the sub-soil for the formation of foundations is Claygate which has been confirmed by borehole investigations. The ground slopes significantly down towards the south east along Willow Road and south west along Gayton Road (see photo 1).

2.4. The building comprises load bearing masonry. The lower ground floor is constructed in concrete. The ground and upper floors are timber construction including the mansard roof.

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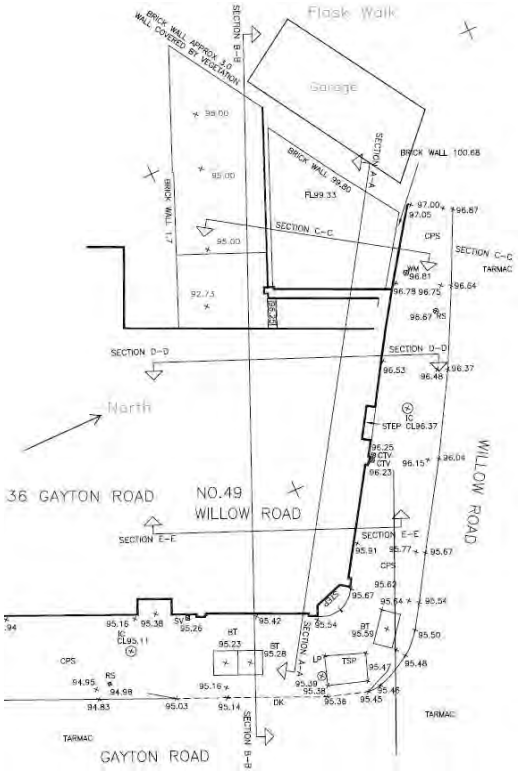

Figure 2: Topographical Plan.

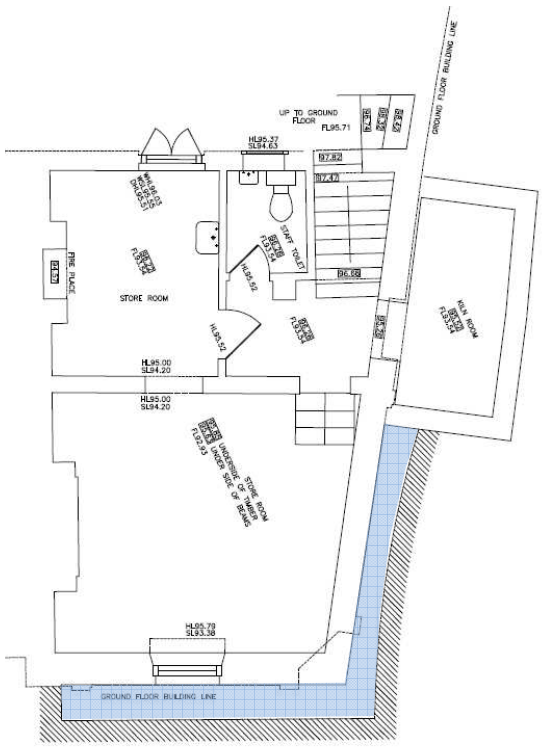

Figure 3: Lower ground plan showing Location of vaults shaded blue

2.5. The vaults are located below the pavement and extend from the party wall at 36 Gayton Road to the kiln room along Willow Road (see figure 3). The vaults are offset from the building façade and the space between the front wall of the building and the vault walls is approximately 550mm clear.

2.6. The vaults are constructed in masonry with a brick arch built bonded to the façade at the top, near the surface; and there is approximately 300 to 500 millimetres of earth covering overhead. The height of the wall is approximately 3.3m high (see figure 4).

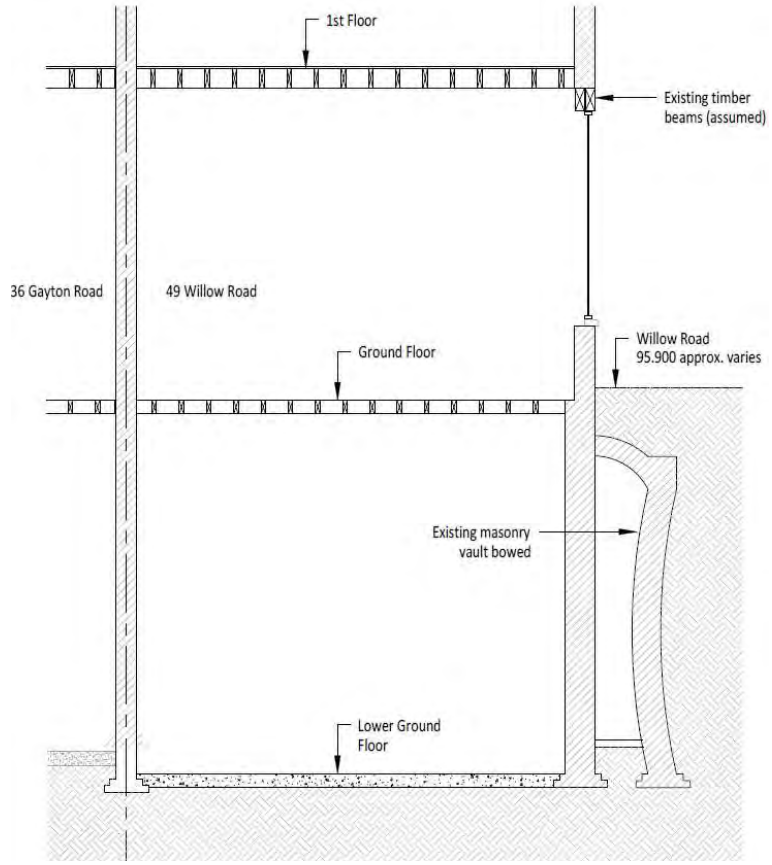

Figure 4: Section showing vault construction

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3. Observations on site

Vault along Willow Road

3.1. There is a significant bulge in the vault wall along Willow Road and a measured survey confirms this to be some 150mm out of vertical. Open bed joints are present in the brickwork indicating that there is no bonding between the bricks and mortar (See photos 2-4).

Photo 2: Severe bulge in vault wall

Photo 3: Severe bulger in vault wall

Photo 4: Vault looking south

Vault along Gayton Road

3.2. The vault along Gayton Road is in a better condition although there is a slight bulge in the wall which is not as severe as that along Willow Road (see photos 5 & 6).

Photo 5: Vault along Gayton Road looking east towards Willow Road

Photo 6: Vault along Gayton Road looking west.

3.3. Although the bricks appear to be satisfactory, the lime mortar has little strength and some areas are friable and soft to the touch.

4. Conclusions

4.1. The vaults were constructed in 1880s and are therefore some 140 years old. They have deteriorated much over this time and are now past their serviceable life.

4.2. The lime mortar is providing little to no bonding to the masonry. The vaults are acting as a gravity structure retaining the footpath and road using self-weight to provide stability.

4.3. Owing to the extensive bowing in the wall along Willow Road, stability cannot be assured. The bulges in the walls are likely to increase over time leading to collapse. This is therefore a safety concern for the occupiers, pedestrians and the motorists.

4.4. The time frame for this is not predictable but it could be imminent along Willow Road side. It is therefore imperative that the remedial works to reconstruct the vaults are undertaken at the earliest opportunity.

4.5. In order to avoid the disruption to the pavement, remedial works could be undertaken from within the building at lower ground floor level.

4.6. The masonry arch is in compression and not subject to adverse bending moments so this could be retained to avoid digging up the pavement. The soffit could be strengthened with sprayed concrete (shotcrete).

4.7. The remaining wall and foundations could be rebuilt with reinforced concrete design to sustain footway and traffic loads constructed in sequence from within the lower ground floor of the building.

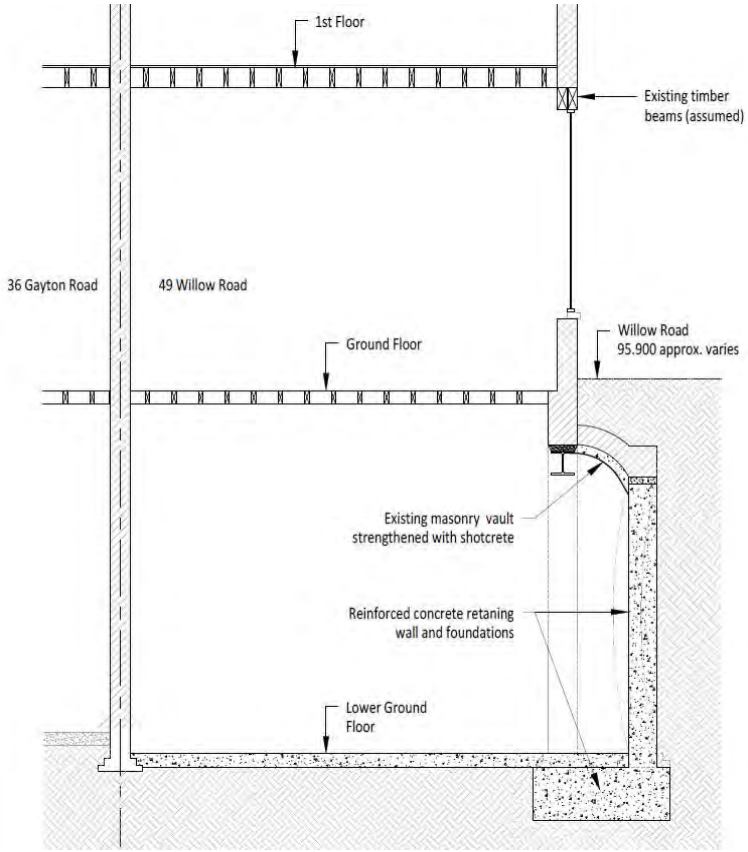

Figure 5: Suggested propping arrangement

4.8. Figure 5 shows a section of the proposed remedial work which could be undertaken wholly from within the property without disturbing the pavement above. The reinforced concrete wall and foundations would be constructed in underpinning sequence in sections of approximately 900mm wide.

4.9. In order to meet the rigours of modern design standards, the foundations will be larger and deeper than the existing.

4.10. Temporary works designed by a specialist should be provided to support the building prior to commencing the works.