



Ref 2277 – R1a

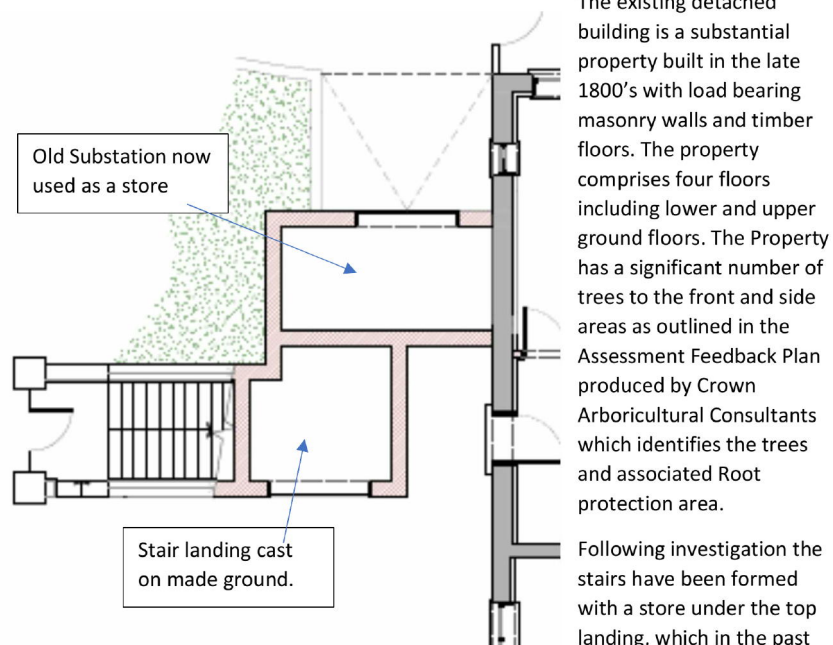
March 2023

Structural Report for the redevelopment of 26 Netherhall Gardens, NW3 Front Steps

Introduction

I am a Chartered Engineer with over 40 years' experience of structural design and review of residential and commercial properties. I am a fellow of both the Institution of Civil Engineers and the Institute of Building. I have been asked to report on the condition of the existing front steps to the main entrance to the Upper Ground Floor.

Description of Existing Stair





was used as a substation. The stair visible within the store are supported by steel beam placed below the stair section on the line of the riser. The remainder of the stair was built up with masonry walls on nominal foundations and back filled with clay and soil, probably obtained from the preparation of the house development. The Quarter landing was cast on the ground which has now dropped away leaving the slab suspended. The stairs are within this space also supported on steel beams and these beams have corroded excessively, to the point that there is minimal thickness of section left in place leaving the stairs unsupported. See photos below.

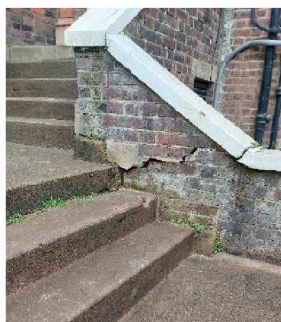


Fine roots on the surface of the soil in void.

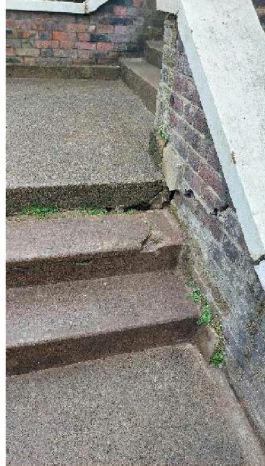
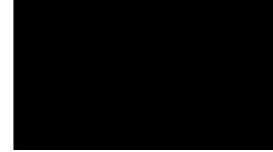


View of stair from within the store showing painted steel beams supporting the stair and cracking in the supporting wall as a result of corrosion of the steel where embedded in the wall. Also cracking around vent where it has corroded and cracked the masonry.

The external stairs forming the entrance to the front door of the property are in a very poor condition with the parapets badly cracked and moving away from the stair. There are also significant cracks between the earth filled sections of the stair and the old store room due to the earth pressure on these walls and minimal foundation. The wall movement is ongoing and propping is required to restrain the walls facing the car park area where the movement is creating an unsafe condition with the potential for the wall / parapet to fail and collapse into the space and steps to drop further. The steps have dropped significantly as can be seen below.



Line of weather sealing to tread left in place.



This movement is due to ground movement associated with the changes in subsoil moisture caused by the adjacent trees which are of a significant size. The foundation to the stairs has also been affected by the lowering of the ground to form a parking area which has exposed the original foundations.



The space below the stair was used in the past as an electrical substation with heavy slab provided to the side of

the stair accessed from the side path and under the stair in the proposed store which was used to locate the transformer and equipment associated with the substation which was removed sometime ago.

As stated above the existing stair is in a very poor condition and remedial propping is required to restrain the enclosing walls and parapets. All as can be seen in the attached pictures Shoring to the walls should be provided as they wall condition is unsafe and temporary handrail barriers should be provided if this stair is going to remain in use during the construction phase of the project.

Discussion

The existing stair structure is in an extremely poor condition and in its current condition it is unsafe and liable to collapse in the short term as movement is ongoing. Major rebuilding is required to ensure that the stair is serviceable for the expected life of the main building which is undergoing major refurbishment. For the reasons outlined above the stair needs to be rebuilt.

The existing foundations have been undermined by both the trees near by and by works to the adjacent hardstanding area formed for parking that has undermined the existing footings. A gap has formed between the concrete slabs forming the treads / landings and the enclosing walls in addition to the gaps between one tread and the next due to movement of the supporting walls below the level of the treads / landings.

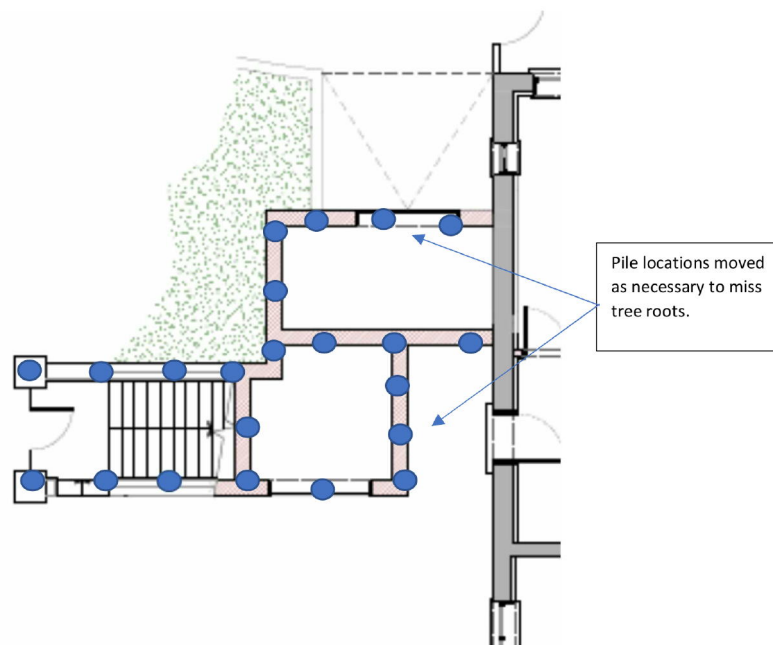
As the trees are causing significant distress to the foundations and consequently the existing stair, I believe that deeper foundations are required. To ensure that the tree roots are unaffected the foundation should take the form of screw piles (200mm diameter) supporting a 350 x 400mm high reinforced ground beam off which the staircase structure can be built. The ground beam will be cast on compressible void former at ground level so that the ground beam is above ground level. The



existing concrete slab under the stair would be taken up and reformed to its existing profile so that the roots are unaffected.

In the interim the walls facing the hard paving forming the parking area, downhill from the stair, should be propped using Acrow props with flexible heads and feet bolted to the concrete slab and wall using M10 chemical anchors. Props to be at 30 degrees to the horizontal and at 1.2m centres. Top of the prop to be at the stair level.

Layout of new foundations



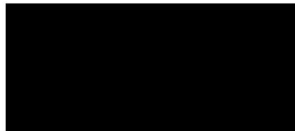
Sequence of construction

1. Demolish the existing stairs and clear the area carefully ensuring no excavation is undertaken.
2. Break out the existing foundations maintaining the existing earth face.
3. Set out for ideal pile locations and excavate to using hand tools to check for tree roots.

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4. Adjust pile locations so that tree roots are missed. Assumed piles will move say 150mm along length of support line.
5. Backfill the existing foundation with soil, maintaining pins indicating location for the piles adjusted to miss the foundations.
6. Construct screw piles and grout shaft in readiness for ground beam construction
7. Place 75mm of compressible board on the ground at the existing level, fix shuttering and place the reinforcement ready for the concreting.
8. Concrete the new ground beams and then strip the shutter and rake out the support board. Soil to be banked up to the side of the ground beam to mask any void under the ground beam.
9. Level the ground, place DPM and cast new slab to replace the existing ground bearing slab in the proposed storage areas..
10. Construct masonry support wall and integral stairs for the staircase.
11. Landings to be formed using permanent shuttering bearing on the enclosing masonry walls built off the new foundations.



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Part Section through Reconstructed Stair

