JAMPEL DAVISON & BELL
CONSULTING ENGINEERS

Project Title
76 Lawn Road NW3

Report Title
Structural Appraisal of the stability of the front garden wall

Document Reference:
R11438-RO1

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CONTENTS

1 INTRODUCTION & BRIEF DESCRIPTION

Jampel Davison & Bell are engaged by Amy Gunning and Richard Lipsitz to provide structural engineering services for the re-development of 76 Lawn Road.

This is a structural appraisal of the stability of the front garden wall that has been a concern. The latest inspection of the wall was undertaken by George Pelentrides on 26 July 2021.

The garden wall varies slightly in height between 0.9m and 1m above the pavement. It retains a height of earth of about 0.8m and the garden slope which rises at an angle of about 15 degrees to the horizontal. A large tree is located in the front garden against this wall. The wall is severely distressed in the vicinity of the tree (photo 1).

The front garden wall is constructed in solid brickwork,215mm thick, in red facing bricks and cement mortar. The bricks are different to those to the building and to the return garden walls, indicating that the front wall was probably rebuilt at some point in the past.

2 INSPECTION

The wall is leaning outwards; maximum movement is severe at the location of the tree where the out of plumbness is of the order of 80mm to below the brick on edge coping. The coping itself has been forced further outwards by a further 30mm. The brick on edge coping has also lifted significantly in the vicinity of the tree forming a horizontal crack. The tree trunk is in contact with the wall (photo 2),

There is a large vertical crack at a distance of about 2.4m from the tree towards the drive that tapers from 12mm at the top to hairline at the bottom (photo 3). The wall on the tree side of the crack is leaning further out than that on the other side of the crack.

Another crack at a distance of about 2.3m on the other side of the tree tapers from 5mm to hairline at the bottom (photo 4).

A near vertical crack at the location of the crack varies in width between 2 and 5mm.

There is further cracking beyond the two tapering cracks.

3 DISCUSSION

The severe distress to the wall has been caused by the tree.

The outward movement appears to have been caused by the physical growth of the tree trunk.

The tapering cracks indicate uplift of the wall and this is likely to have been caused by the physical growth of tree roots beneath the wall.

Some further movements are likely, due to the tree roots extracting ground moisture and causing volumetric changes in the shrinkable clay. The major concern however appears to be the forces exerted on the wall by the physical growth of the tree trunk and the tree roots beneath the wall.

4 CONCLUSIONS & RECOMMENDATIONS

The severe outward movement of the wall has compromised its stability and the wall at the vicinity of the tree is at risk of collapse

Repair is not considered a viable option given the severity of the movement and damage and given the potential of the tree trunk and tree roots to cause further damage.

Rebuilding the wall is necessary and would also necessitate the removal of the tree since the tree would obstruct reconstruction.

It is therefore recommended that the tree is removed and the wall reconstructed

Our proposals for the reconstruction of the wall are shown on drawing R11438/EXT1.The wall would be reconstructed in reinforced concrete clad with brickwork and designed to span between pads located at some distance from the tree in order to reduce the impact of the tree roots on the new construction.

5 PHOTOS

Photo 1 -View of front garden wall and tree

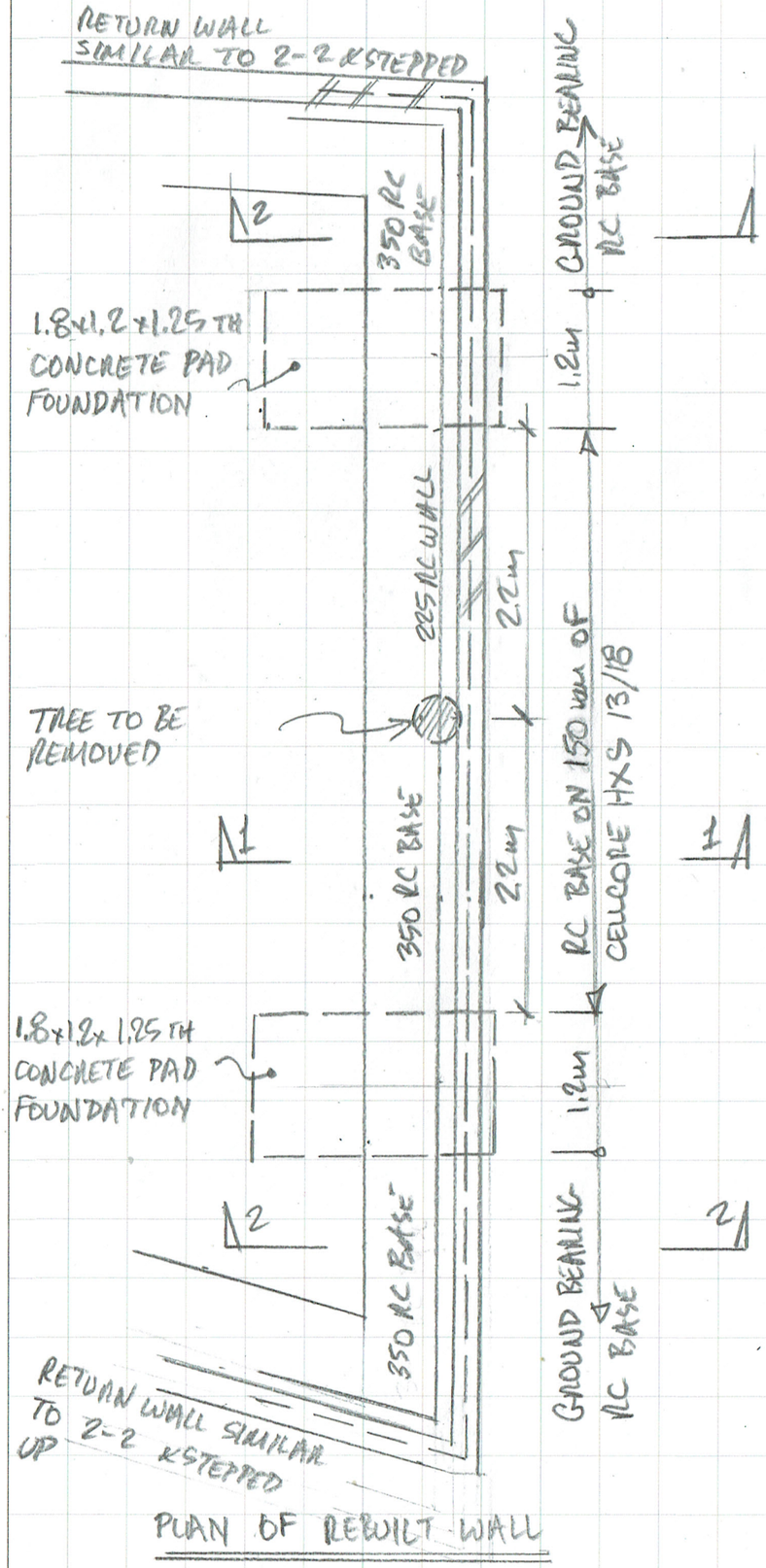
Photo 2 - Leaning wall at tree location

Photo 3 – Vertical tapering crack at approximately 2.4m from the tree towards the driveway

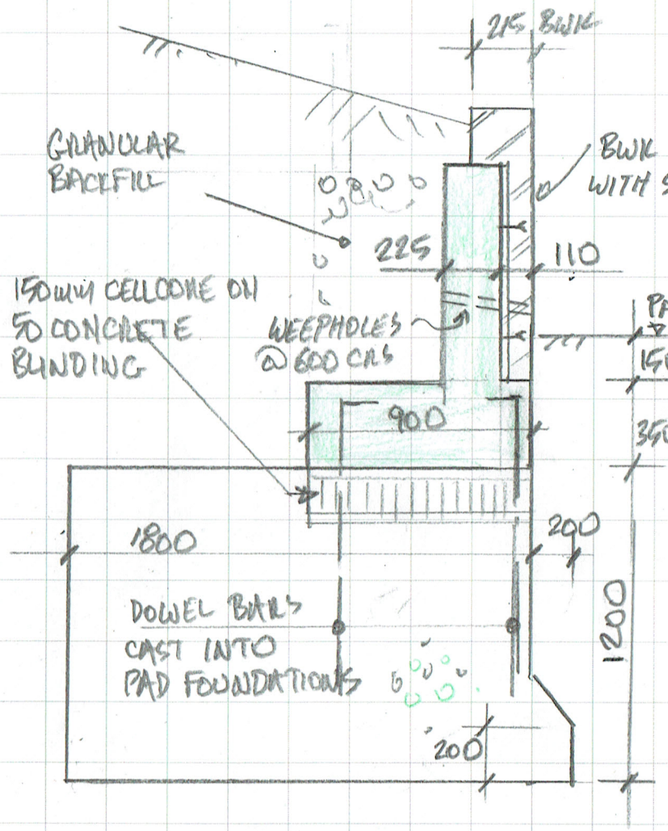
Photo 4 – Tapering vertical crack at about 2.3m the other side of the tree

Photo 5 – Cracking at the tree location

G. PELENTRIDES BSc CEng MICE

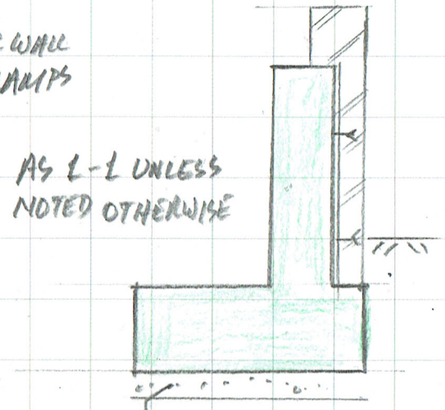


PLAN OF REBUILT WALL



SECTION 1-1

SUSPENDED WALL SPANNING BETWEEN CONCRETE PAD FOUNDATIONS



SECTION 2-2

GROUND BEARING WALL

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S, ENGINEER'S, SPECIALIST'S DRAWINGS & SPECIFICATIONS.

BY / DATE:	REVISIONS:	LETTER:

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ARCHITECT: COUSINS & COUSINS

PROJECT: 76 LAWN RD NW3

TITLE: PROPOSED RECONSTRUCTION OF FRONT GARDEN WALL

SCALES: 1:50, 1:25

BY:	CHECKED:
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R11438	EXT 1	