

9 July 2017

The Owners of sp 6749 c/o
Body Corporate Services
Level 13
12 Help St
CHATSWOOD NSW 2067

Attention: Ms Yvonne Garrett: Strata Manager

Dear Madam,

**RE: ENGINEER ASSESSMENT OF FAILED RETAINING WALL
PEDESTRIAN WALL ON SOUTH SIDE OF WALKWAY
TREE DAMAGE TO WALL
15 EAST ESPLANADE MANLY
FOR SP 6749**

We refer to your request for inspection and assessment of a failed concrete block retaining wall at the above property.

An inspection was carried out on the 24th June 2017.

Photographs were taken and these are enclosed with this report.

A location plan of the subject wall is enclosed.

The wall is leaning outwards by approximately 100mm and has sheared at the lower level course.

A tree approximately 10m in height has been planted in a small planter box which extends to the boundary of the adjoining unit which is approximately 2m wide.

The subject tree roots are visible from the opened joints in the wall adjacent to a an engaged pier located on the corner of the wall. The tree roots are visible directly up against the wall.

The length of wall failure is approximately 8.5m long. The wall height varies from 800mm to 1800mm in height.

Sydney Office:

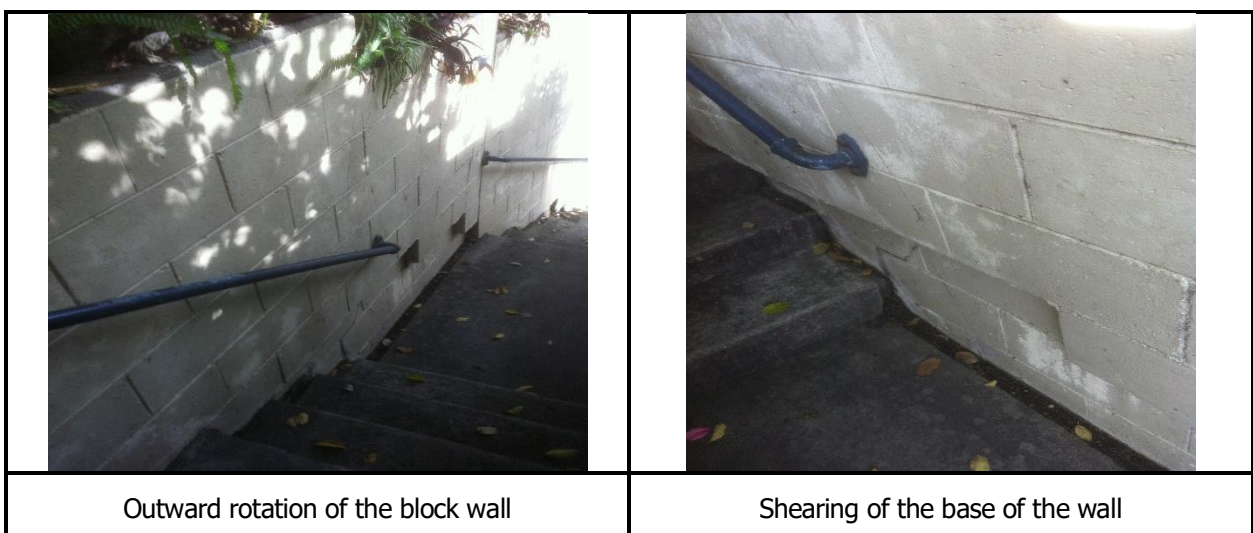
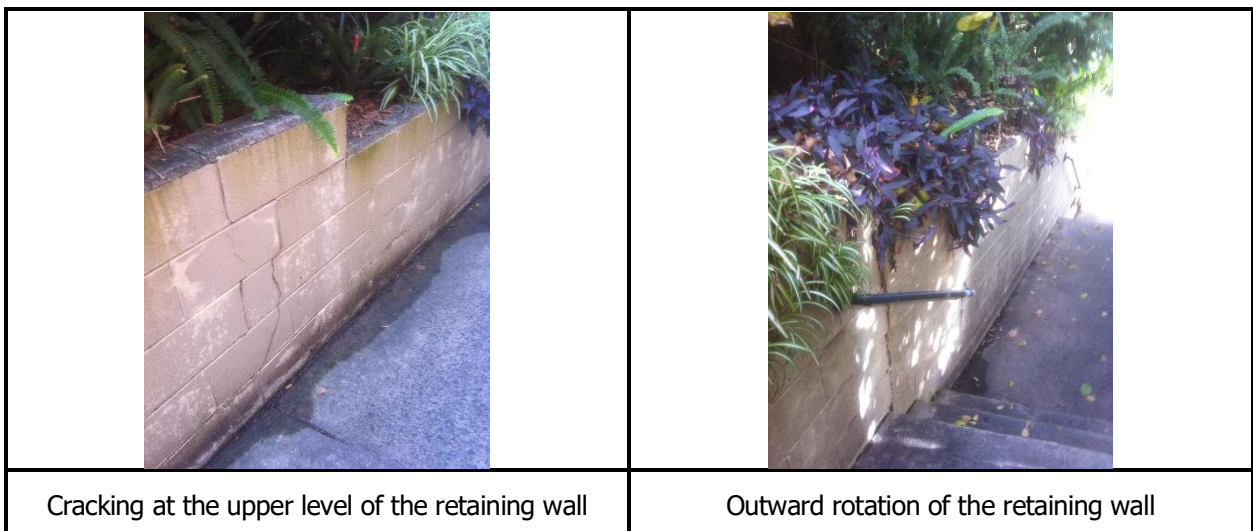
2 Mahratta Ave
WAHROONGA NSW 2076
TELEPHONE: (02) 9487 6800
FAX: (02) 9487 6799
MOBILE: 0419 246 231
EMAIL: gleesoncon@bigpond.com

Brisbane Office:

Level 1, 241 Adelaide St
BRISBANE QLD 4000
TELEPHONE (07) 3041 4081
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EMAIL: gleesoncon@bigpond.com



Photographs are provided as follows:

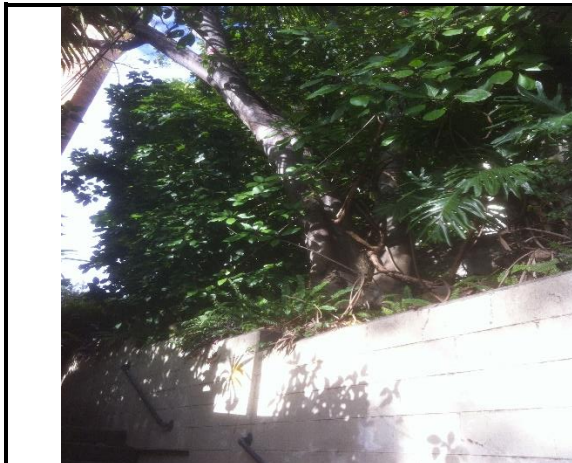




The engaged pier whereby roots are visible at the construction joint



Tree and electrical wires overhead



Close proximity of tree and roots to the retaining wall



Electrical wires overhead

Comments and Cause of the Damage

The cause of the damage is in our view as a result of inappropriate tree location to the retaining wall structure and limited space in the planter box. This being that the tree is planted too close to the retaining wall.

The wall is unsafe and it is imminent complete collapse will eventually occur unless the tree is removed and replaced with suitable shrubs.

In theory, this pedestrian access should be blocked off immediately due to safety concerns should collapse occur.

The Australian Standard AS 2870 "Residential Footings and Slabs Code" provides engineering guidelines with respect to distances of planting from structures as follows:

Extract:

- (c) *Restrictions on trees and shrubs* Planting of trees should be avoided near the foundation of a house or neighbouring house on reactive sites as they can cause damage due to drying of the clay at substantial distances. To reduce, but not eliminate, the possibility of damage, tree planting should be restricted to a distance from the house of:

- (i) $1\frac{1}{2} \times$ mature height for Class E sites.
- (ii) $1 \times$ mature height for Class H sites.
- (iii) $\frac{3}{4} \times$ mature height for Class M sites.

Where rows or groups of trees are involved, the distance from the building should be increased. Removal of trees from the site can also cause similar problems.

As the subject tree is around 9m in height the planting distance to any structure would need to be around 6m from the wall. The tree is planted around 0.5m from the retaining wall and therefore has compromised the structural integrity of the retaining wall.

The section of failed wall will need to be demolished and replaced which is around 8.5 m in length.

It is not possible to simply demolish the wall as the adjacent tree would simply collapse due to the removal of support.

In order to remove the tree, the overhead electrical wires will need to be "tiger tagged" for safety reasons.

A new retaining because of its height would require Council approval in the form of a Development Application.

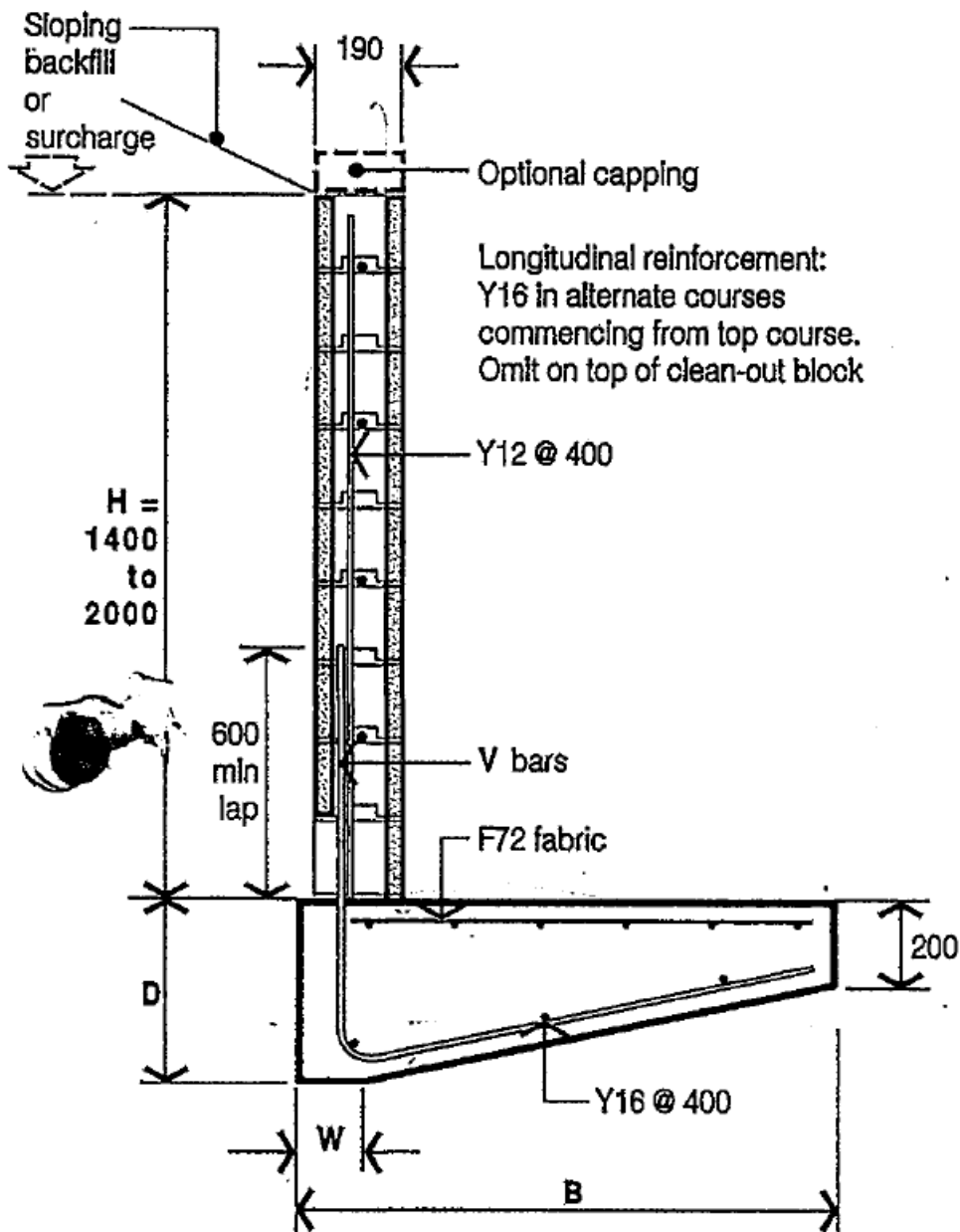
The application would need to contain a survey plan with an overlay of the new wall's alignment. It is suggested that the tree removal be included in the DA application as distinct to a separate application for tree removal works.

The footing for the wall would be part of the concrete steps hence the existing steps would be required to be demolished and replaced incorporating the footing.

An environmental impact statement would also need to be submitted with application prepared by a Town Planner which we can arrange.

The new wall would need to be constructed using concrete blocks reinforced with grout infill.

A retaining wall configuration would be proposed as follows:



Note: The generic drawing above is also for a lower height wall 1200-1800.

Currently the wall is unstable and may fail at any time particularly under storm conditions.

At this time, we await further instructions for preparation of suitable documentation for a Development Application.

Yours Faithfully

G. Gleeson

Geoff Gleeson
BE(Hons), MIE Aust, CPENG, NPER3, LicBld.RPEQ
Chartered Engineer and Building Consultant
DIRECTOR