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INSTITUTE OF AUSTRALIAN



CONSULTING ARBORICULTURISTS

24th October, 2011

Joint Regional Planning Panel
(Sydney West Region)

573 – 585 Pacific Highway, Killara

JRPP (Sydney West Region) 13 October 2011 – 2010SYW099
Request for Additional Information on Tree 27 being Root Mapping and
Advise on Methods of Driveway Construction
for an Acceptable Impact on subject tree

Method Used

Tony Cusumano, Flamingo Landscapes conducted the root mapping exercise by manually digging a trench at the above address to identify the below ground root structure of the subject tree No. 27 as requested by the JRPP.

Discussion

Root Mapping

The excavation was conducted 3.604 metres from the trunk of the tree on eastern side and this was measured at 1.2 metres up the trunk.

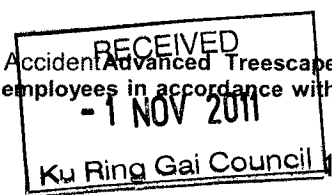
The trunk was 300mm wide and a minimum of 400mm deep. It clearly defined the 'A' and 'B' Horizons of the soil on the site. The 'A' Horizon was a dark sandy loam soil and the 'B' Horizon was a rich red loam soil which was heavily compacted.

The roots that were detected are clearly shown in the plan which is attached and there is a summary of the roots in trench No. 1.

The roots No. 2.9 and 2.4 – the root at 2.4 and 2.9 metres only partially entered the trench and both of these roots differentiated into third order roots at this point. They did not continue across the whole trench.

Principal: Russell Kingdom MIACA MAIH MAAL

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The most significant roots were at 2.050 metres and 4.160 metres. These 2 x large roots straddled the whole and they were second order roots being described as rope roots. They were not structural scaffold roots as they did not have any rapid taper on them. They were a continual size from one side of the trench to the other.

In view of this we are able to say, if a pier or the construction of the driveway was constructed at 3 metres in the general area to the east of the trench we could have a pier or a strip footing constructed in this area and there would be an acceptable impact on the roots of the tree. No structural roots or second order roots would be impacted by this and this would allow the bridging of the significant roots that are at 2.0 metres from the front of the fence and also the roots that are at 4 metres.

The northern end of the driveway would be constructed outside of the TPZ of this tree and therefore it would have an acceptable impact on it.

These works to ensure the least impact on the tree should be supervised or monitored by an AQF5 Consultant Arborist during the excavation of the trenches for the installation of either piers or a strip footing for the driveway so that the bridging of the significant roots can take place.

These works will have an acceptable impact on this tree and cause very low levels of impact on it.

The soils to the north and the south of the central support pier should be capped with a fine hard rock gravel, possibly a 20mm screen size and this will ensure that the ground conditions will remain constant under the concrete.

Although these works are not compliant with the specifications that are laid down in AS4970:2009 *Protection of trees on development sites* it has been clearly demonstrated by this root mapping that the necessary works to construct the driveway can occur within the SRZ of this tree with an acceptable impact and the tree's perceived SULE will not be impacted from these works.

Above Ground Impacts

There is a series of digital images showing the main scaffold branch that runs to the north-east of the trunk of the tree. This does not actually pass directly over the driveway but it is clear to be seen that the scaffold branch is at least 6 metres from ground level. It would clearly not require any crown management for the proposed driveway. The only crown that will need to be managed will probably be 2 metres on the northern dripline of the tree as this would touch the proposed building. We must take 2 metres from the proposed edge of the building back to accommodate the scaffolding for the construction of the building. The removal of these branches will be able to be conducted in compliance with AS4373:2007 *Pruning of amenity trees* as the small branches extend for at least 3 metres from the main scaffold branch. There will be an acceptable impact on the tree and the branches will regenerate very quickly from the pruning. The amenity provided by this tree will not be impacted by these works as they cannot be seen from the roadway and the regrowth will completely cover any wounds on the branches caused by the canopy reduction. The impact on the tree is acceptable and considered to be minimal.

Apart from the canopy reduction adjacent to the building the proposed driveway requires no crown works. The only works required are to accommodate the building and the scaffolding (see page 15)

Temporary Driveway

There will not be the need for crown management to accommodate the temporary driveway.

Tree 27

The shake down area and temporary drive is at least 5 metres from the trunk of the tree whose SRZ is 3.8 metres. The entry driveway (closest edge) is outside of the SRZ. AS4970:2009 *Protection of trees on development sites* states in 1.2.2 Figures 4.5.3 (see page 15) that temporary access to a site is acceptable in an SRZ if rumble boards are installed. The shake down mechanism can be located on top of the rumble boards and comply with AS4970.

In view of the surface roots on the north and western side of the trunk of the tree it is recommended that a Consultant Arborist (AQF 5) be present when the rumble board driveway is constructed. The rumble boards will be to the contour to accommodate the existing surface roots and this will have an acceptable impact on the trees as there will be compost or mulch placed between the geotextile material and the rumble boards ensuring minimal impact on the bark of the surface roots. With the Consultant Arborist on site the crew will comply with the Consultant Arborist's request and at the completion of these works the outcome can be reported to Kuring-gai Council to state that the works were carried out in accordance as specified in AS4970:2009 *Protection of trees on development sites*.

If the temporary entrance of the drive and shake down area are built in accordance with AS4970:2009 there will be an acceptable impact on Trees 27 and 30. Shake down soil will be parental 'B' and 'C' horizon soils of the site, not imported and this will have minimal impact on the subject trees.

Tree 30

The vehicle shakedown area enters the site 5.2 metres from the centre of the trunk of the tree. Table 5.5 on page 20 of my original report dated 2nd December, 2010 states that the SRZ and TPZ for this tree is 3.2 metres (SRZ) and 9.0 metres (TPZ). The entry driveway (closest edge) is outside of the SRZ. AS4970:2009 *Protection of trees on development sites* states in 1.2.2 Figures 4.5.3 (see page 15) that temporary access to a site is acceptable in an SRZ if rumble boards are installed. The shake down mechanism can be located on top of the rumble boards and comply with AS4970.

The Entry Portico

The entry portico and path into the site is 119.249 and 119.175 at the building. This entry and path are above the RL of ground level. There is an existing brick wall on strip footing closest to the footpath where the entry is to be constructed. When the brick wall and footings are removed there will a void where there will be no tree roots within this space. This area could be used for a foundation for the beginning of the

raised entry portico if needed. It is proposed that the entry portico and path to the building are raised above the existing ground level and are to be constructed on piers. The installation of piers is a tree friendly method as the pier holes can be moved to accommodate existing roots larger than 30mm. This will ensure the least possible impact on the surrounding trees and it will not impact any tree's TPZ.

OSD Tank

OSD tank is located in the proposed driveway. The position of the tank is shown on Mackenzie Architect Drawing No. A602 (see Page 8) nearly adjacent to the front of the proposed building between the 2 x support pier structures in the driveway. The root mapping shows that there will only be 3rd order (feeder) roots at this depth. Furthermore, the OSD tanks are 14 metres from Tree 27 (TPZ is 10.2m) and 11 metres from Tree 25 (street tree) with a TPZ of 3 metres. There will be no impact to the adjacent trees TPZ and therefore an acceptable impact on these trees.

Conclusion

The proposed works will have an acceptable impact on this tree and the tree's Safe & Useful Life Expectancy will not be impacted and will provide long term amenity for the users of the highway and residents.

I trust this meets with your requirements.

Yours sincerely,

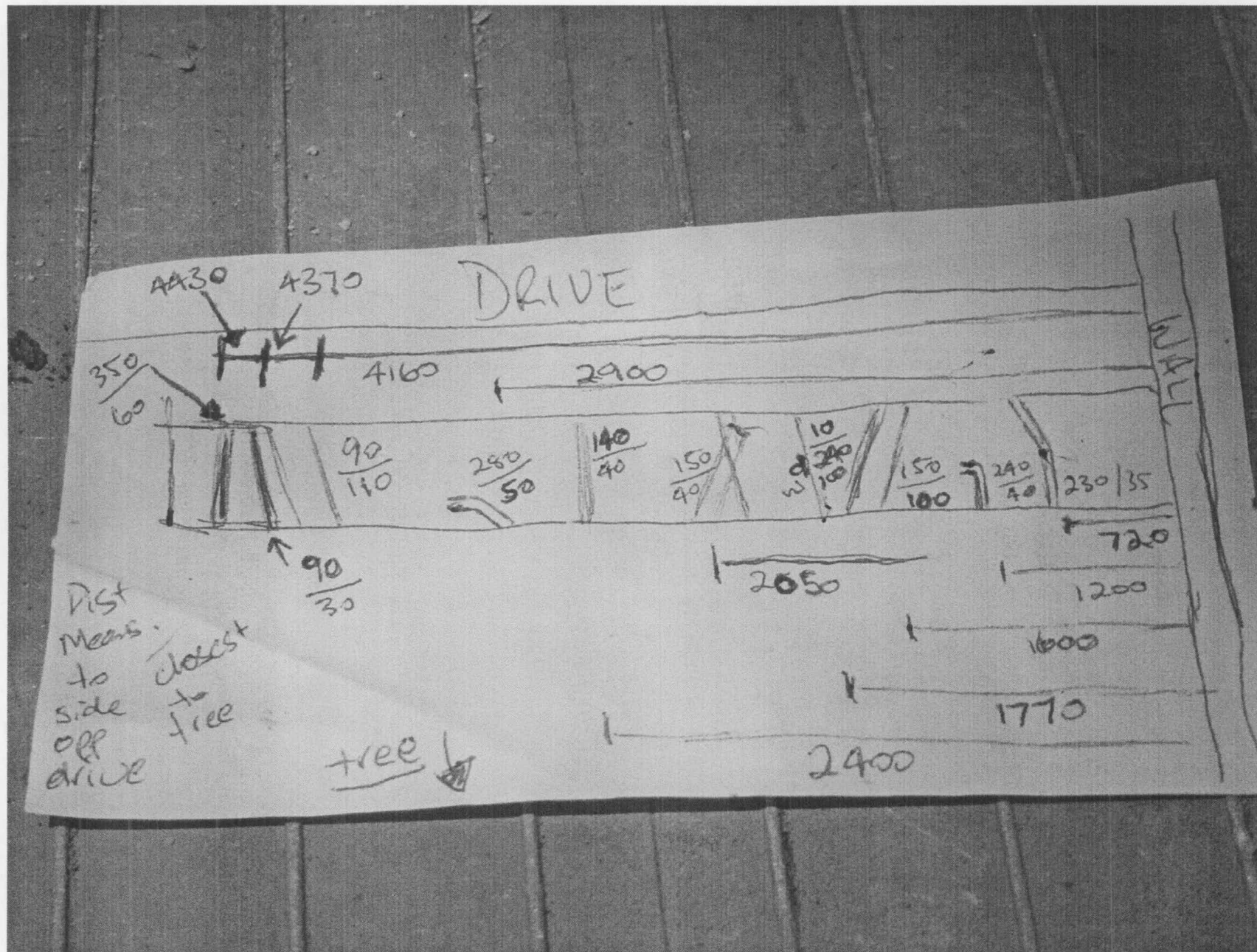
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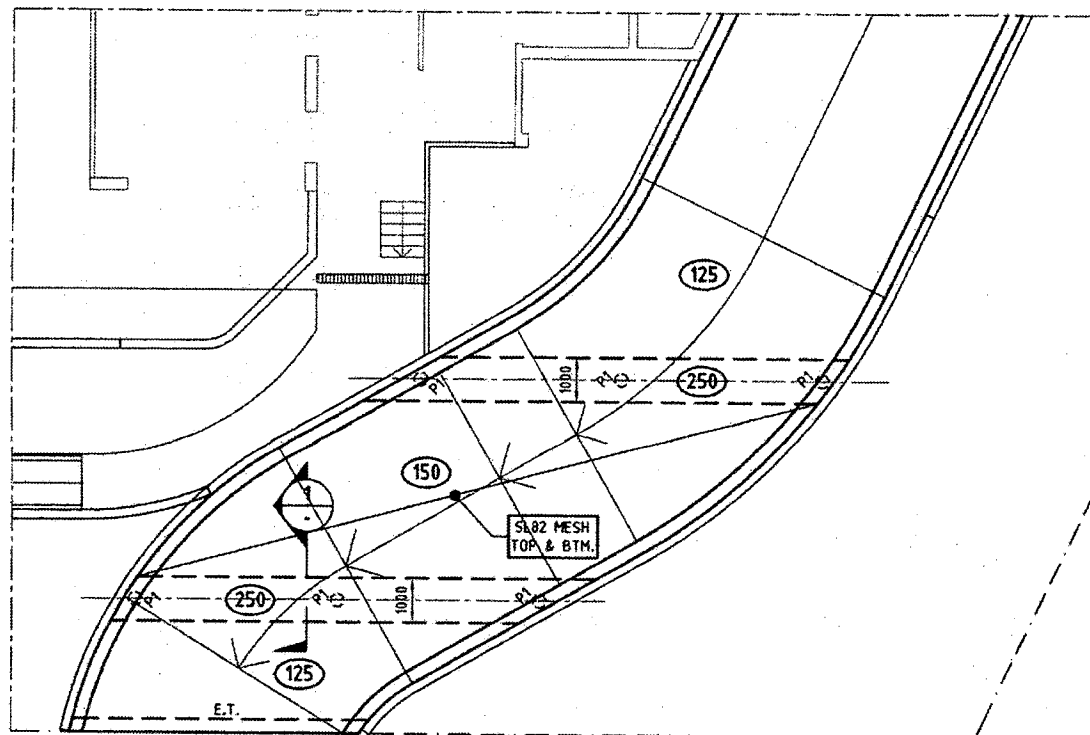
Root Mapping details for 573-585 Pacific Highway, Killara

Trench No. 1			
Root No.	Distance from brick wall	Depth of root below ground level in mm	Diameter of root in trench in mm
1	720	230	35
2	1200	240	40
3	1600	150	100
4	1770	240	100
5	2050	150	40
6	2400	140	40
7	2900	280	50
8	4160	90	110
9	4370	90	30
10	4430	350	60

Showing Plan of Root Mapping (Not to Scale)



Showing Engineering Detail of proposed Driveway Slab Part Plan



GROUND FLOOR SLAB PLAN

1:100

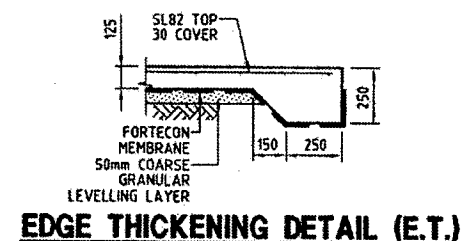
U.N.O. GROUND SLAB TO BE 125mm THICK WITH SL82 MESH TOP (20 COVER).
PLACED ON LOOSE FILL AS FORMWORK.

SLAB TO BE POURED ON MIN. 0.2mm FORTECON MEMBRANE OVER 50mm COARSE GRANULAR LEVELLING LAYER.

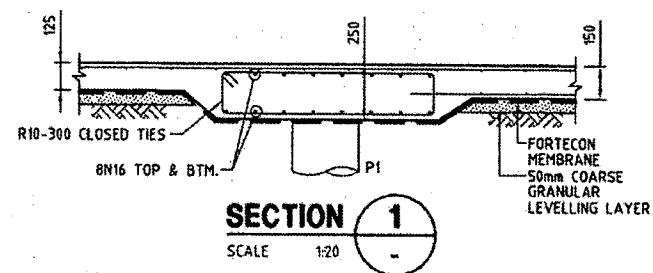
COMPACTED FILLING AS REQUIRED SHALL BE INERT (NON-REACTIVE) GRANULAR MATERIAL, WELL WATERED AND COMPACTED IN MAX. 150mm THICK LAYERS BY ROLLING IN ACCORDANCE WITH AS2870 RESIDENTIAL SLABS & FOOTINGS CODE.

LOOSE FREE DRAINING FILL IS NOT TO COMPRESS UNDER WET CONCRETE.

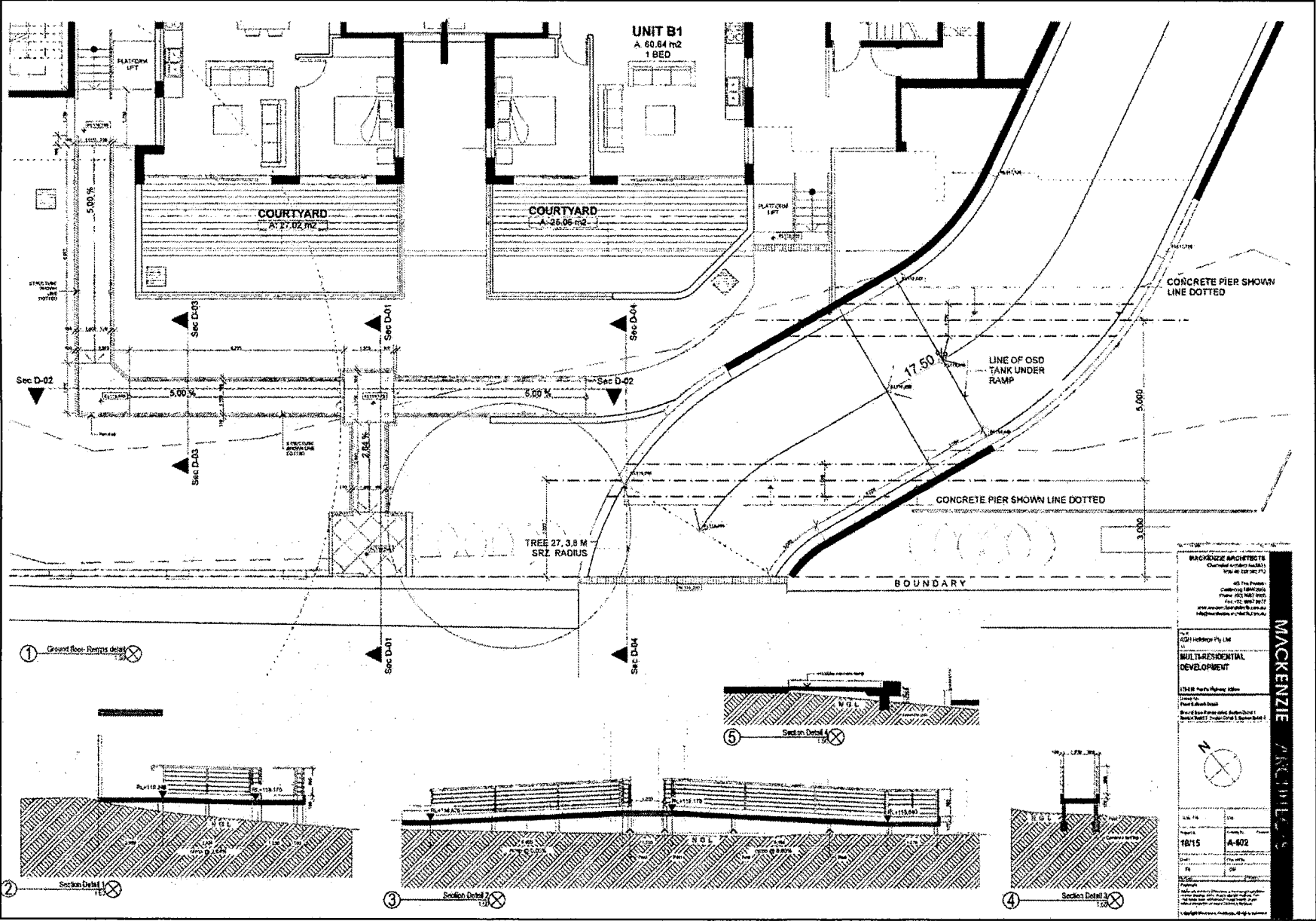
LEGEND	
	SLAB THICKNESS
	EDGE THICKENING
	300Ø MASS CONCRETE PIER



120



Showing the location of the Support Piers and the Entry Portico Design



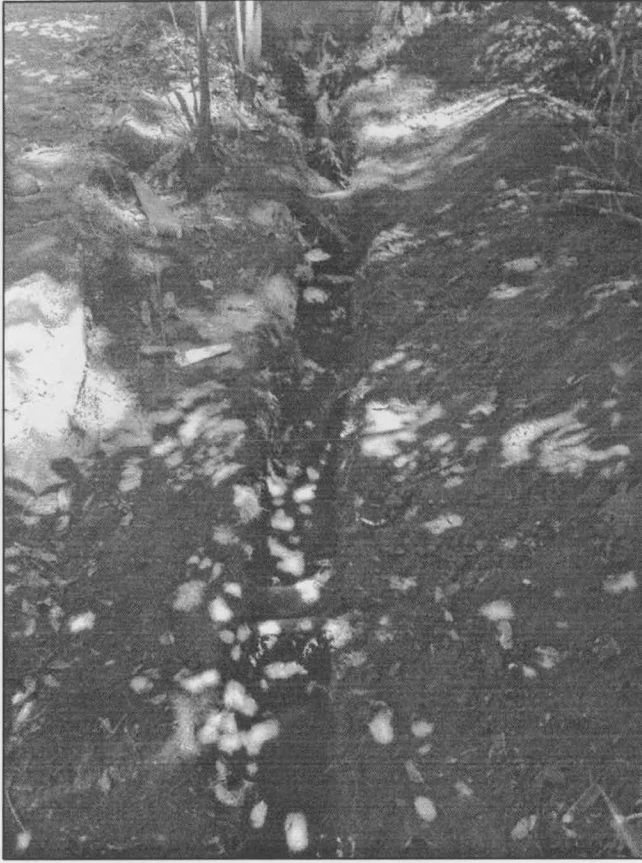


Figure 1 Showing root mapping trench



Figure 2 Another view of the root mapping trench



Figure 3 The front fence and trunk of Tree 27 to the north



Figure 4 Showing the existing front fence. There are 5 rows of bricks to ground level inside fence and grass clippings



Figure 5 Another view 2 metres from the existing drive



Figure 6 Root buttress of Tree 27 to south with existing fence in background



Figure 7 Showing root buttress of Tree 27 to the east, failed wooden fence in the foreground - only 1 root to the east which is supported by the root mapping



Figure 8 View of fall of existing drive. There is plenty of space for the concrete slab to bridge the root buttress



Figure 9 View from the road of footpath and crossover and then the existing drive dropping off to the north



Figure 10 Shows crown/branches over existing residence. This may need to be trimmed for the new building - minor tip pruning



Figure 11 Showing northern scaffold branch of Tree 27 from front yard of 585 Pacific Highway

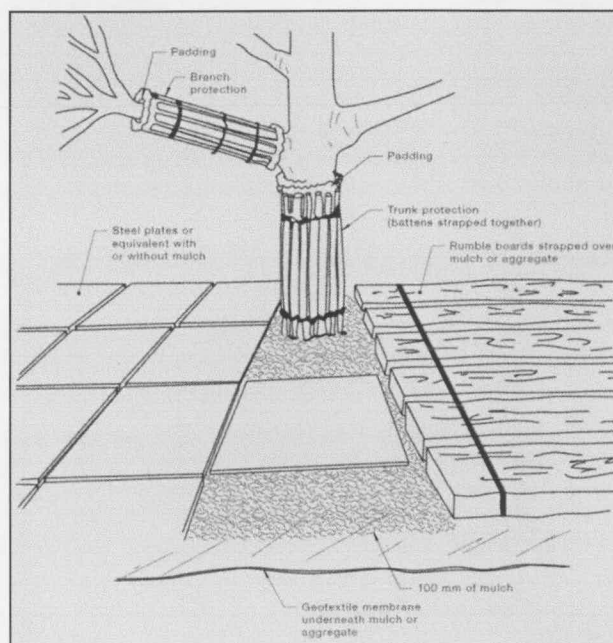
AS4970:2009 Protection of trees on development sites Clause 1.0 Tree Protection on Construction Sites

1.2.2 Precautions in Respect of Temporary Work

For Precautions in respect of temporary work, Australian Standard AS4970 2009 *Protection of trees on development sites*, Section 4, Tree protection measures, 4.5 Other tree protection measures, provides the following:

"4.5.3 Ground protection

If temporary access for machinery is required within the TPZ ground protection measures will be required. The purpose of ground protection is to prevent root damage and soil compaction within the TPZ. Measures may include a permeable membrane such as geotextile fabric beneath a layer of mulch or crushed rock below rumble boards as per Figure 4. These measures may be applied to root zones beyond the TPZ."



"4.5.6 Scaffolding

Where scaffolding is required it should be erected outside the TPZ. Where it is essential for scaffolding to be erected within the TPZ, branch removal should be minimized. This can be achieved by designing scaffolding to avoid branches or tying back branches. Ground below the scaffolding should be protected by boarding (e.g. scaffolding board or plywood sheeting) as shown in Figure 5. Where access is required, a board walk or other surface material should be installed to minimise soil compaction. Boarding should be placed over a layer of mulch and impervious sheeting to prevent soil contamination. The boarding should be left in place until the scaffolding is removed."

"Notes:

- 1 For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to trees, not nailed or screwed.
- 2 Rumble boards should be a suitable thickness to prevent soil compaction and root damage."

