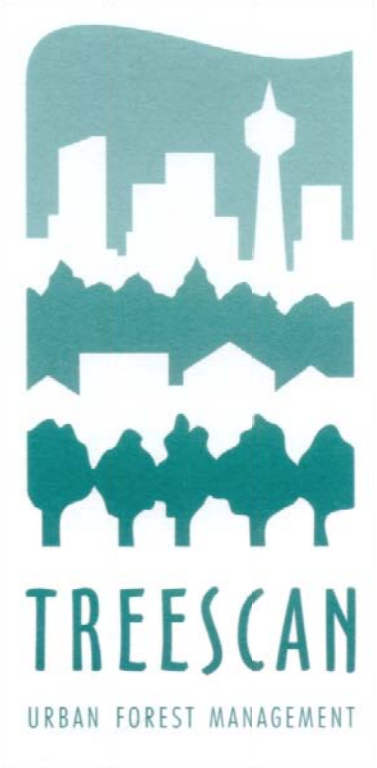

Tree Report

Redevelopment of Eastlakes Town Centre

Joint Venture between Prosha Pty Ltd and Crown International Holdings Group (Crown Prosha JV)

April 2012

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Summary

The site is predominantly covered by existing buildings, roads and hard surfaces with the tree population being consequently sparse other than as noted below. The proposed development would entail the removal of the trees within the north and south sections of the site while possibly leaving a few individuals along Evans Avenue. Trees are mainly semimature examples of commonly planted landscape species. Most of the trees proposed for removal are of large-growing species unsuitable for long-term retention within confined locations, including *Eucalyptus microcorys* (Tallowwood) and *Platanus* x *hybrida* (London Plane).

Trees along site boundaries are proposed for removal because the proposed development would extend to the boundaries, thus occupying the narrow strips currently planted with trees.

Some of the *Platanus* x *hybrida* (London Plane) specimens along Evans Avenue could be retained, other than those affected by the construction of entryways, if the design of awnings was amended. The species has well-documented problems regarding allergies in humans and the retention of these trees may not be advisable (see Appendix 1). A row of *Cupressus torulosa* (Bhutan Cypress) along Barber Avenue is proposed for removal, but the trees in the row are confined by existing structures; they have been underpruned and have lost the characteristic crown form of the species.

Trees in Eastlakes Reserve have been assessed. The presence of the existing buildings has excluded root systems from the site, thus ensuring that none are likely to be affected by the proposed development. However one large tree adjacent to a carpark near the southwest corner may be affected and root investigation would be required.

With one exception, street trees in Gardeners Road would not be affected by the proposed development, although the root systems of two large trees may intrude into the site and care would be required to avoid adverse impact.

Introduction

It is proposed to demolish the existing buildings on the site, comprising 193 Gardeners Road, Eastlakes Lots 3 & 5 DP 248832, Lots 41 & 42 DP 601517 and Lot 100 DP 700822, and to construct a Mixed Use Development:

- Ground floor development comprising approximately 15,300m^2 of gross retail floorspace and 12,500m^2 of net retail floorspace

- Two levels of basement car parking providing a total of approximately 1,000 car parking spaces

- 352 residential apartments and 82 serviced apartments (a total of 434 apartments) providing a mix of studio, 1, 2 and 3 bedroom units in buildings above the retail development. These buildings will be between 2 and 6 storeys in height, with one building of 7 storeys.

- Associated site, drainage and landscaping works

Many trees are located on and near the site and some would be affected by the proposed construction. This report assesses the trees and comments on the effects of the proposal.

The site

The subject site is a split site, being located to the north and south of Evans Avenue Eastlakes. The northern part of the site is bound by Gardeners Road to the north and Evans Avenue to the south. Residential development comprising three storey residential flat buildings is located to the east and west of the northern sector. Existing development on the northern sector of the site comprises a single storey group of shops located adjacent to the northern boundary with an open at-grade car park located between the shops and Evans Avenue.

The southern sector is bound by Evans Avenue to the north, Barber Avenue to the east and south and Eastlakes Reserve to the west. This part of the site is occupied by a single level retail development known as BKK Eastlakes shopping centre and a single level free standing building which was previously occupied by a McDonalds fast food outlet. Car parking is provided in an undercroft car parking area. Roof top car parking is also available.

The land is generally level and is within the local government area of Botany Bay City Council.

Soils are deep dune sands of the Tuggerah soil landscape (Chapman & Murphy 1989), but are likely to be highly disturbed by previous development. Site vegetation consists of scattered and grouped canopy trees, with an understorey of rough

turfgrass and shrubs. Surfaces in root zones are generally sealed and trees are often located in proximity to existing buildings.

Present state of the trees

The site trees are assessed in Table 1 below; tree numbers are noted on the plan attached. Trees were inspected from the ground only and no aerial or subterranean inspections were carried out. Most of the site trees are located in rows along Gardeners Road, Evans Avenue and Barber Avenue. Other trees assessed are located within Eastlakes Reserve to the west of the site. The trees are planted landscape specimens in semimature to mature age classes. Prominent elements include an avenue of *Platanus* x *hybrida* (London Plane) in Evans Avenue, other specimens of *Platanus* x *hybrida* (London Plane) in the carpark to the north of Evans Avenue and a row of *Cupressus torulosa* (Bhutan Cypress) in Barber Avenue. No trees are of species indigenous to the site with the possible exception of some mature specimens of *Eucalyptus botryoides* (Bangalay) in Eastlakes Reserve.

In general the trees are in fair to good health and condition although some of the trees along Gardeners Road have been severely lopped for power line clearance and are in poor structural condition. The root systems of some of the larger street and carpark trees are causing damage to kerbs and footpaths.

Discussion

Tree proposed for retention

The street trees along the Gardeners Road frontage, Trees 3 to 19, would remain unaffected by the proposed development of the site (Tree 2 *Callistemon viminalis* (Weeping Bottlebrush) would be removed to accommodate a new sign.) Trees 11 and 12 *Eucalyptus microcorys* (Tallowwood) (Plate 1) rely to some unknown extent on soil volume contained within the site and retained in a steep bank by a masonry retaining wall. The proposed building would not encroach on this area and the retaining wall should be left intact during demolition and construction.

Trees located near the site in Eastlakes Reserve, Trees 33 to 52, (Plate 6) would not be affected by the proposed development because there are already large buildings adjoining the boundary which would have confined the root systems. However it is noted that there is a raised soil mound in the vicinity of Tree 37 *Eucalyptus botryoides* (Bangalay) and this should be left undisturbed during demolition and construction.

Tree 48 *Eucalyptus microcorys* (Tallowwood) is currently close to a bitumen carpark and this may have confined the root system to some extent; however the new building would encroach well within the theoretical root zone and significant roots may be encountered during excavation. A root investigation by hand excavation would be required prior to the start of construction to ascertain whether root loss would occur, and if so whether there would be a significant impact on the tree.

Evans Avenue *Platanus* x *hybrida* (London Plane) considerations

The avenue of trees comprising Trees 20, 21, 22, 23, 24, 26, 27, 28 and 29 *Platanus* x *hybrida* (London Plane) in Evans Avenue could be mostly retained if this is considered desirable, noting that these are Botany Bay City Council street trees (Plates 2 and 3). However Trees 21 and 27 are within proposed entries and their retention may not be feasible. Tree 26 is close to a proposed drop-off zone which would need to be modified if the tree is retained.

The proposed awnings to the frontages of the buildings would need to be modified to provide clearance from the trunks and branches of retained trees. Clearances would need to conform to the spread of the branch scaffolds to avoid drastic pruning of major lower branches. The awnings are approximately 4m above ground level and many large branches extend towards the buildings within the envelopes (Plate 4). Trees 22 and 23 are within the awnings. Minor pruning of upper overhanging branches for building clearance would be acceptable.

The proposed buildings are unlikely to significantly impact on the root systems, given the adequate setbacks from the trunks and the presence of existing structures.

However the allergenic attributes of the species are undesirable. Research suggests that the species *Platanus* x *hybrida* (London Plane) makes a significant contribution to health problems, not only from production of pollen but as the result of the downy material shed from the new leaves in spring and from the irritant hairs contained in the fruit which is present all year. A search on the internet quickly reveals the extent of the Plane Tree problem in urban areas, including information from All Allergy as noted in the appendix below.

From my own experience I am aware of several instances of severe nuisance from this species, including Queen Street in St Marys where complaints from shopkeepers were made to Penrith City Council regarding the street trees; and Hyde Park South Reconstruction where workers were unable to complete the removal of several trees of this species until respirators and protective clothing were obtained. While undertaking the tree assessment in the Evans Avenue carpark in April 2012 I was approached by a shopkeeper who stated that the trees are a significant problem to his staff and customers due to their irritant qualities.

Therefore it may be appropriate for the avenue to be removed and replaced by the planting of more suitable tree species. From an arboricultural viewpoint most of the trees could be retained and protected during construction, and are thus noted for retention in Table 1 below. However the combination of current and future damage to structures, their large future growth and their allergenic properties, together with possible difficulties with design amendments, may render their retention unpopular or impracticable.

Trees proposed for removal

Trees proposed for removal are located around the boundaries and within the site, the new construction being proposed to extend to the east and west boundaries. In the northern part the affected trees include Trees 55, 56, 57, 58 59, 60, 70, 71 and 72 *Eucalyptus microcorys* (Tallowwood), all of which are located near the boundaries (Plates 7 and 9) ; and Trees 61, 62, 63, 64, 65, 66, 67, 74, 75, 76, 77, 78 and 79 *Platanus* x *hybrida* (London Plane) which are located in the existing carpark (Plates 7 and 8). All these trees are capable of growth to large sizes and are not suitable for long-term retention within the confines of the site.

Although the specimens of *Eucalyptus microcorys* (Tallowwood) are currently in good health, they are likely to become overlarge and will cause damage to structures in the future. Many of the larger specimens of *Platanus* x *hybrida* (London Plane) are already causing damage; these which are currently of smaller stature may cause damage in the future, although those located within the bitumen carpark surface are severely confined and their growth is already stunted by poor conditions in the root zone.

Trees 31 and 32 *Eucalyptus microcorys* (Tallowwood) are Council street trees and are prominent in the Evans Avenue streetscape (Plate 5). They are within or very close to the proposed carpark entry and would be removed.

In Barber Avenue most of the trees, including Council street trees, would need to be removed. Most of the individuals in the row of small and insignificant *Callistemon viminalis* (Weeping Bottlebrush) street trees (Trees 84 to 90) in the north of the Avenue (Plate 10) would be beneath the proposed awning and would need to be removed. Modifications to the design in order to retain them are not warranted by their poor state. Trees 91 and 92 are two large specimens of *Acacia elata* (Cedar Wattle); these are prominent in the streetscape but would be within the building (Plates 10 and 11).

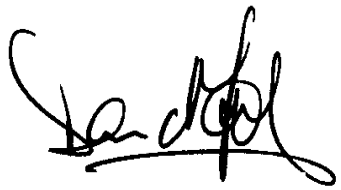
Tree group 105 is a closely spaced row of 22 specimens of *Cupressus torulosa* (Bhutan Cypress) located within the site near the corner of Barber Avenue (Plate 11). Most of these would be within the proposed building and would be removed. A few individuals could be retained on the corner, but this is not considered desirable: they are not good examples of the species, having lost the characteristic form due to the lower branches having been pruned.

Trees 93 to 104 are various specimens of She Oak, mostly *Casuarina glauca* (Swamp Sheoak) with a few *Allocasuarina torulosa* (Forest Sheoak) and *Allocasuarina littoralis* (Black Sheoak). These trees are prominent in the streetscape but have short life expectancy due to their root systems being confined within raised planter beds (Plate 12). They are within the building footprint and would be removed.

Conclusions

The proposed development would entail the removal of all trees within the site with the possible exception of several specimens of *Platanus* x *hybrida* (London Plane) along Evans Avenue. These could be retained with design amendments; however their retention may be undesirable due to the nuisance characteristics of the species. In general the trees proposed for removal are unsuitable for long-term retention.

Trees in Gardeners Road and in Eastlakes Reserve would be unaffected except for a few individuals as noted.



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Consulting Arborist

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Tree protection during construction

The following measures should be undertaken to reduce the possible effects of construction on the trees near demolition and construction, in particular trees along Evans Avenue, Gardeners Road and in Eastlakes Reserve.

Excavation in the vicinity of trees should be done initially by hand. Any roots encountered <50mm in diameter should be cut cleanly with a hand saw. Any roots encountered >50mm in diameter should retained intact and referred to the site arborist for advice.

Prior to the start of construction trees should be fenced to a radius of 5m from each trunk except where access is required for construction, to form tree protection zones. Fences should be chainlink 1.8m high supported by steel posts.

Where access is required within these radii for building purposes, the fence should be set back 1.5m from the building face and the soil surface between the fence and the building should be protected by plywood sheets or strapped planking.

Where not otherwise protected trunks should be armoured with 2m lengths of 50x100mm hardwood timbers spaced at 150mm centres and secured by 8 gauge wires or steel strapping at 300mm spacing. The trunk protection should be maintained intact until the completion of all work on the site.

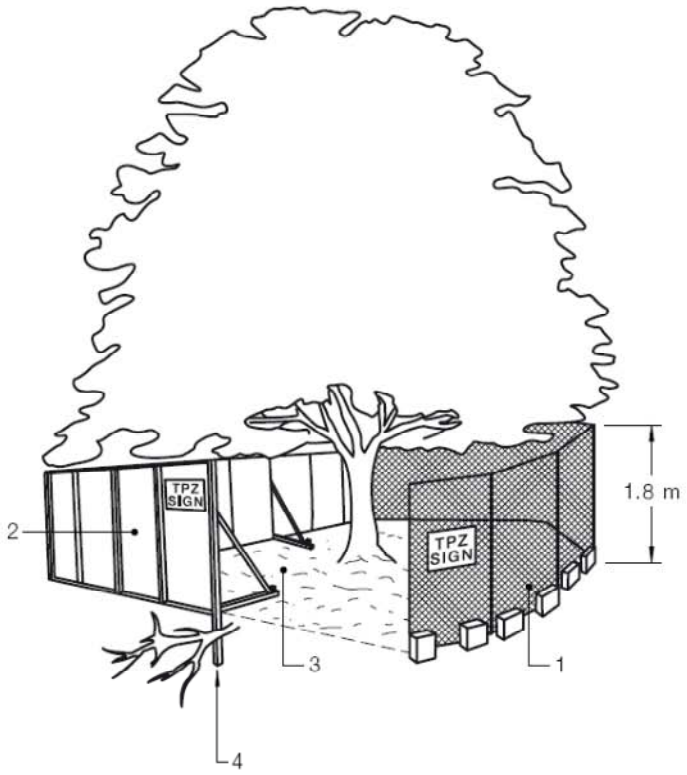
There should be no pedestrian or vehicular access to the tree protection zones. No building activities should take place within the tree protection zones, including storage or stockpiling. Runoff from the site should not be allowed to enter the tree protection zones.

A site arborist should be appointed to supervise any activities in the vicinity of trees, including fencing, excavation and root pruning, and make periodic visits and reports to monitor the state of the trees. Inspection should take place after installation of the fencing, at initial hand excavation and root pruning, during any works within the tree protection zones, at completion of the construction. A photographic record should be maintained of site inspections, including the state of the trees and any injury inflicted.

In the event of any tree to be retained becoming damaged during construction, the site arborist should be informed to inspect and provide advice on remedial action.

At the end of construction all retained trees should be pruned to remove deadwood and weak branches. All pruning should be done in accordance with Australian Standard AS4373- *Pruning of Amenity Trees*.

Guidelines for tree protection are noted in Australian Standard AS4970-2009 *Protection of Trees on Development Sites*. Figures below show fencing, ground protection and scaffold fencing details.



LEGEND:

1 Chain wire mesh panels with shade cloth (if required) attached, held in place with concrete feet.
2 Alternative plywood or wooden paling fence panels. This fencing material also prevents building materials or soil entering the TPZ.
3 Mulch installation across surface of TPZ (at the discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.
4 Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots.

FIGURE 3 PROTECTIVE FENCING

4.5.2 Trunk and branch protection

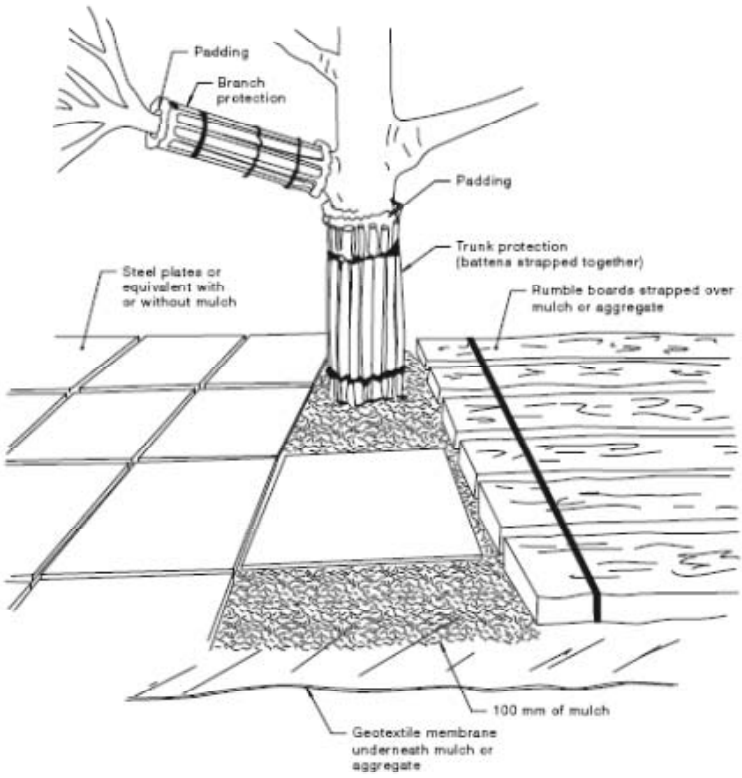
Where necessary, install protection to the trunk and branches of trees as shown in Figure 4. The materials and positioning of protection are to be specified by the project arborist. A minimum height of 2 m is recommended.

Do not attach temporary powerlines, stays, guys and the like to the tree. Do not drive nails into the trunks or branches.

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.

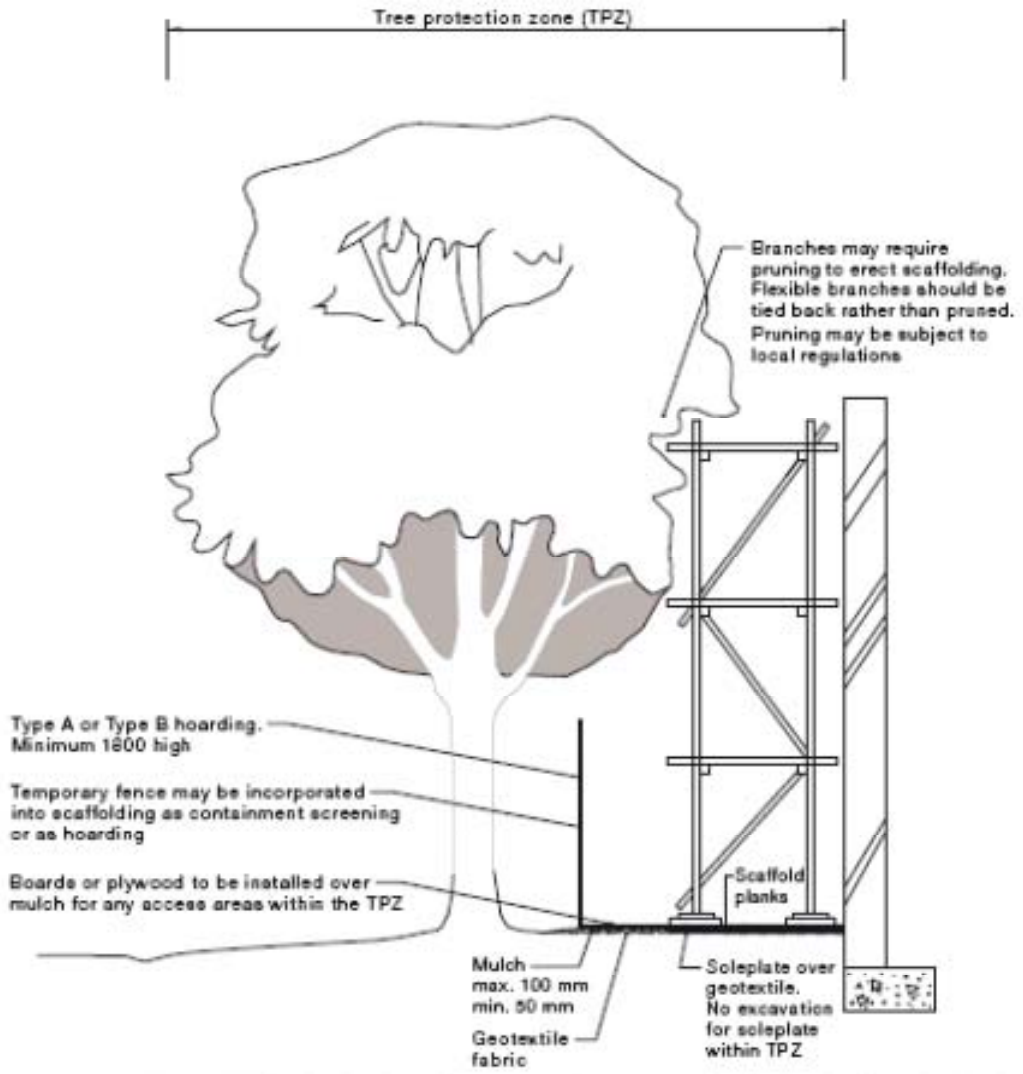


NOTES:

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 of a suitable thickness to prevent soil compaction and root damage.

FIGURE 4 EXAMPLES OF TRUNK, BRANCH AND GROUND PROTECTION



NOTE: Excavation required for the insertion of support posts for tree protection fencing should not involve the severance of any roots greater than 20 mm in diameter, without the prior approval of the project arborist.

FIGURE 5 INDICATIVE SCAFFOLDING WITHIN A TPZ

Table 1: Site trees

Tree no	Species	Approx trunk dbh mm	Approx height m	Approx crown spread m	Health	Condition	SULE	Comment	Effect of proposed development
1	*Melia azedarach* (White Cedar)	Multi	8	8	Good	Poor	4D	Subtrunks x 5 with weak junctions at base Leaning on retaining wall	Removal within building
2	*Callistemon viminalis* (Weeping Bottlebrush)	150	4	4	Good	Fair	3D	Suppressed Trunk wound	Removal for signage
3	*Casuarina glauca* (Swamp Sheoak)	150	5	4	Fair	Poor	3D	Sparse crown Lopped for power line clearance	Retention
4	*Callistemon viminalis* (Weeping Bottlebrush)	150 bf	4	4	Good	Fair	3D	Weak junctions at base	Retention
5	*Casuarina glauca* (Swamp Sheoak)	250	8	4	Good	Poor	4B	Lopped for power line clearance Severe trunk wound decayed	Retention
6	*Casuarina glauca* (Swamp Sheoak)	400 bf	6	5	Good	Poor	3B	Lopped for power line clearance	Retention
7	*Callistemon viminalis* (Weeping Bottlebrush)	150	5	4	Good	Fair	3A	Epicormic shoots on trunk Stub at base	Retention
8	*Callistemon viminalis* (Weeping Bottlebrush)	100	3	2	Good	Fair	3A	Trunk wounds	Retention
9	*Callistemon viminalis* (Weeping Bottlebrush)	100	3	2	Good	Fair	3A	Trunk wounds	Retention
10	*Prunus* sp. (Flowering Fruit Tree)	150	4	2	Good	Poor	4C	Root system in bank	Retention
11	*Eucalyptus microcorys* (Tallowwood)	300	10	8	Good	Poor	3B	Crown overhangs roof Lopped for power line clearance Root system confined by retaining wall Lifting footpath	Retention

Tree no	Species	Approx trunk dbh mm	Approx height m	Approx crown spread m	Health	Condition	SULE	Comment	Effect of proposed development
12	*Eucalyptus microcorys* (Tallowwood)	450	10	8	Good	Fair	3B	Root system confined by retaining wall and footpath Branches lopped for power line clearance	Retention
13	*Callistemon viminalis* (Weeping Bottlebrush)	75	4	1	Good	Poor	4A	Suppressed	Retention
14	*Callistemon viminalis* (Weeping Bottlebrush)	100	4	4	Fair	Fair	3D	Sparse upper crown Suppressed	Retention
15	*Casuarina glauca* (Swamp Sheoak)	250 bf	5	3	Fair	Poor	4C	Lopped for power line clearance	
16	*Eucalyptus globulus* (Southern Blue Gum)	200 bf	5	6	Poor	Poor	4A	Dying	Retention
17	*Callistemon viminalis* (Weeping Bottlebrush)	75	4	3	Fair	Poor	3B	Suppressed	Retention
18	*Callistemon viminalis* (Weeping Bottlebrush)	200 bf	4	5	Fair	Fair	3D	Weak junctions at base	Retention
19	*Callistemon viminalis* (Weeping Bottlebrush)	200 bf	4	5	Fair	Fair	3D	Weak junctions at base	Retention
20	*Platanus* x *hybrida* (London Plane)	400	10	12	Good	Fair	2B	Root system confined by footpath and carpark Footpath lifting	Retention near awning
21	*Platanus* x *hybrida* (London Plane)	300	10	8	Good	Fair	2B	Kerb cracked	Retention near entry and awning
22	*Platanus* x *hybrida* (London Plane)	450	12	12	Good	Fair	2B	Kerb cracked and footpath lifting	Retention near awning

Tree no	Species	Approx trunk dbh mm	Approx height m	Approx crown spread m	Health	Condition	SULE	Comment	Effect of proposed development
23	*Platanus* x *hybrida* (London Plane)	500	12	12	Good	Fair	3D	Kerb cracked and footpath lifting Anthracnose disease in lower trunk and major branch	Retention near awning
24	*Platanus* x *hybrida* (London Plane)	500	12	14	Fair	Fair	2B	Kerb cracked and footpath lifting	Retention near awning
25	*Alnus acuminata* ssp. *glabrata* (Evergreen Alder)	200	5	5	Good	Fair	4C	Lopped for power line clearance Root system confined by kerb and footpath	Removal within entry
26	*Platanus* x *hybrida* (London Plane)	500	12	12	Good	Fair	2B	Root damage to paving	Retention near awning
27	*Platanus* x *hybrida* (London Plane)	400	12	12	Good	Fair	2B	Root damage to paving	Retention near entry and awning
28	*Platanus* x *hybrida* (London Plane)	400	10	12	Good	Fair	2B	Root system lifting paving	Retention near awning
29	*Platanus* x *hybrida* (London Plane)	400	10	12	Good	Fair	2B	Root system lifting paving	Retention near awning
30	*Phoenix canariensis* (Canary Island Date Palm)		1m trunk height		Good	Fair	4C	Root system confined by retaining walls Sharp spines at eye level	Removal
31	*Eucalyptus microcorys* (Tallowwood)	530	14	8	Fair	Fair	3B	Dieback in upper crown Root system confined by kerb and stormwater Footpath lifting	Removal within entry

Tree no	Species	Approx trunk dbh mm	Approx height m	Approx crown spread m	Health	Condition	SULE	Comment	Effect of proposed development
32	*Eucalyptus botryoides* (Bangalay)	480	10	8	Good	Fair	3B	Root system confined by kerb Footpath lifting	Removal within entry
33	*Eucalyptus botryoides* (Bangalay)	630	12	10	Good	Good	1A	Lean to east	Retention
34	*Eucalyptus grandis* (Flooded Gum)	700	16	15	Good	Good	1A	One-sided crown	Retention
35	*Casuarina cunninghamiana* (River Sheoak)	650	15	12	Good	Fair	2D	Codominant crown Weak junction at 3m height	Retention
36	*Allocasuarina torulosa* (Forest Sheoak)	200	6	5	Fair	Fair	3B	Suppressed and one-sided crown Branch dieback	Retention
37	*Eucalyptus botryoides* (Bangalay)	580	16	12	Good	Good	1B	Timber retaining wall and fill in root zone	Retention
38	*Allocasuarina torulosa* (Forest Sheoak)	200	5	5	Fair	Poor	3C	Suppressed one-sided crown	Retention
39	*Allocasuarina torulosa* (Forest Sheoak)	300	8	6	Fair	Fair	2D	Sparse crown	Retention
40	*Allocasuarina torulosa* (Forest Sheoak)	250	10	5	Good	Poor	3C	Lopped	Retention
41	*Allocasuarina torulosa* (Forest Sheoak)	250	10	6	Fair	Poor	3C	Lopped	Retention
42	*Eucalyptus botryoides* (Bangalay)	500	15	8	Good	Good	1A	Lean to northeast	Retention
43	*Eucalyptus botryoides* (Bangalay)	650	15	15	Fair	Fair	2D	Codominant crown Ribs on subtrunks Epicormic shoots along major branches	Retention

Tree no	Species	Approx trunk dbh mm	Approx height m	Approx crown spread m	Health	Condition	SULE	Comment	Effect of proposed development
44	*Tristaniopsis laurina* (Water Gum)	400 bf	5	6	Good	Fair	2D	Weak junctions near base	Retention
45	*Tristaniopsis laurina* (Water Gum)	400 bf	5	6	Good	Fair	2D	Weak junctions near base	Retention
46	*Tristaniopsis laurina* (Water Gum)	400 bf	5	6	Good	Fair	2D	Weak junctions near base	Retention
47	*Eucalyptus botryoides* (Bangalay)	400	10	8	Good	Fair	2D	Codominant crown No trunk flare: possible fill in root zone	Retention
47a	*Tristaniopsis laurina* (Water Gum)	400	6	7	Good	Fair	2	Leaning	Retention
47b	*Tristaniopsis laurina* (Water Gum)	400	6	7	Good	Fair	2D	Leaning	Retention
48	*Eucalyptus microcorys* (Tallowwood)	650	16	12	Good	Fair	2D	Root system confined by carpark	Retention
49	*Sapium sebiferum* (Chinese Tallow)	200	6	6	Good	Poor	3A	Suppressed	Retention
50	*Eucalyptus microcorys* (Tallowwood)	200	10	5	Good	Fair	3C	Suppressed Etiolated form	Retention
51	*Eucalyptus microcorys* (Tallowwood)	900	16	15	Good	Good	1B	Paving and fill in root zone	Retention
52	*Eucalyptus botryoides* (Bangalay)	300	10	8	Good	Fair	3D	Leaning Suppressed One-sided crown No trunk flare: possible fill in root zone	Retention

Tree no	Species	Approx trunk dbh mm	Approx height m	Approx crown spread m	Health	Condition	SULE	Comment	Effect of proposed development
53	*Melaleuca* sp. (a Paperbark)	100	4	1	Poor	Poor	4A	Declining	Removal within building
54	*Hibiscus rosa-sinensis* (Hibiscus)	Multi	4	4	Fair	Poor	4C	Overgrown shrub species	Removal within building
55	*Eucalyptus microcorys* (Tallowwood)	250	10	8	Good	Poor	3D	One-sided crown Suppressed	Removal within building
56	*Eucalyptus microcorys* (Tallowwood)	500	10	12	Fair	Fair	3B	One-sided crown Root system confined by carpark	Removal within building
57	*Eucalyptus microcorys* (Tallowwood)	300 x 2	10	12	Good	Fair	3B	Codominant crown Weak junction near base	Removal within building
58	*Eucalyptus microcorys* (Tallowwood)	500	12	12	Good	Fair	2D	Lateral stem in crown	Removal within building
59	*Eucalyptus microcorys* (Tallowwood)	300	12	10	Good	Fair	2D	Root system confined by carpark	Removal within building
60	*Eucalyptus microcorys* (Tallowwood)	300	10	8	Good	Fair	3B	One-sided crown Root system confined by carpark	Removal within building
61	*Platanus* x *hybrida* (London Plane)	400	8	8	Good	Fair	3B	Damage to footpath/kerb planter bed	Removal within building
62	*Platanus* x *hybrida* (London Plane)	400	8	8	Good	Fair	3B	Damage to footpath/kerb planter bed	Removal within building
63	*Platanus* x *hybrida* (London Plane)	400	10	12	Good	Fair	2B	Open soil in root zone	Removal within building

Tree no	Species	Approx trunk dbh mm	Approx height m	Approx crown spread m	Health	Condition	SULE	Comment	Effect of proposed development
64	*Platanus* x *hybrida* (London Plane)	300	8	8	Good	Fair	3B	Root system confined within carpark	Removal within building
65	*Platanus* x *hybrida* (London Plane)	300	8	8	Good	Fair	3B	Root system confined within carpark	Removal within building
66	*Platanus* x *hybrida* (London Plane)	300	8	8	Good	Fair	3B	Root system confined within carpark	Removal within building
67	*Platanus* x *hybrida* (London Plane)	300	8	8	Good	Fair	2B	Open soil in root zone	Removal within building
68	*Schefflera actinophylla* (Umbrella Tree)	Multi	8	6	Good	Fair	4C	Nuisance species exempt from Tree Preservation Order	Removal within building
69	*Schefflera actinophylla* (Umbrella Tree)	Multi	8	6	Good	Fair	4C	Nuisance species exempt from Tree Preservation Order	Removal within building
70	*Eucalyptus microcorys* (Tallowwood)	500	20	10	Good	Fair	3B	Root system confined by carpark and footpath on neighbouring property	Removal within building
71	*Eucalyptus microcorys* (Tallowwood)	500	20	10	Good	Fair	3B	Root system confined by carpark and footpath on neighbouring property	Removal within building
72	*Eucalyptus microcorys* (Tallowwood)	500	20	10	Good	Fair	3B	Root system confined by carpark and footpath on neighbouring property	Removal within building
73	*Eucalyptus haemostoma* (Scribbly Gum)	250	4	6	Good	Fair	3D	Trunk wound Poor specimen	Removal within building
74	*Platanus* x *hybrida* (London Plane)	400	10	12	Good	Fair	2B	Good specimen Open soil in root zone	Removal within building

Tree no	Species	Approx trunk dbh mm	Approx height m	Approx crown spread m	Health	Condition	SULE	Comment	Effect of proposed development
75	*Platanus* x *hybrida* (London Plane)	250	6	4	Fair	Fair	3B	Confined root system within carpark	Removal within building
76	*Platanus* x *hybrida* (London Plane)	250	6	4	Fair	Fair	3B	Confined root system within carpark	Removal within building
77	*Platanus* x *hybrida* (London Plane)	250	6	4	Fair	Fair	3B	Confined root system within carpark	Removal within building
78	*Platanus* x *hybrida* (London Plane)	250	6	4	Fair	Fair	3B	Confined root system within carpark	Removal within building
79	*Platanus* x *hybrida* (London Plane)	300	10	8	Good	Fair	2B	Open soil in root zone	Removal within building
80	*Callistemon viminalis* (Weeping Bottlebrush)	200	4	4	Fair	Poor	4A	Branch breakages	Retention
81	*Eucalyptus botryoides* (Bangalay)	300	10	10	Good	Poor	3D	Lopped for power line clearance	Retention
82	*Agonis flexuosa* (Willow Peppermint)	300 bf	5	6	Good	Poor	3D	Weak trunk junction	Retention
83	*Acacia binervia* (Coast Myall)	400	6	10	Good	Fair	3D	Root system confined by kerb and footpath Weak junction near base	Retention

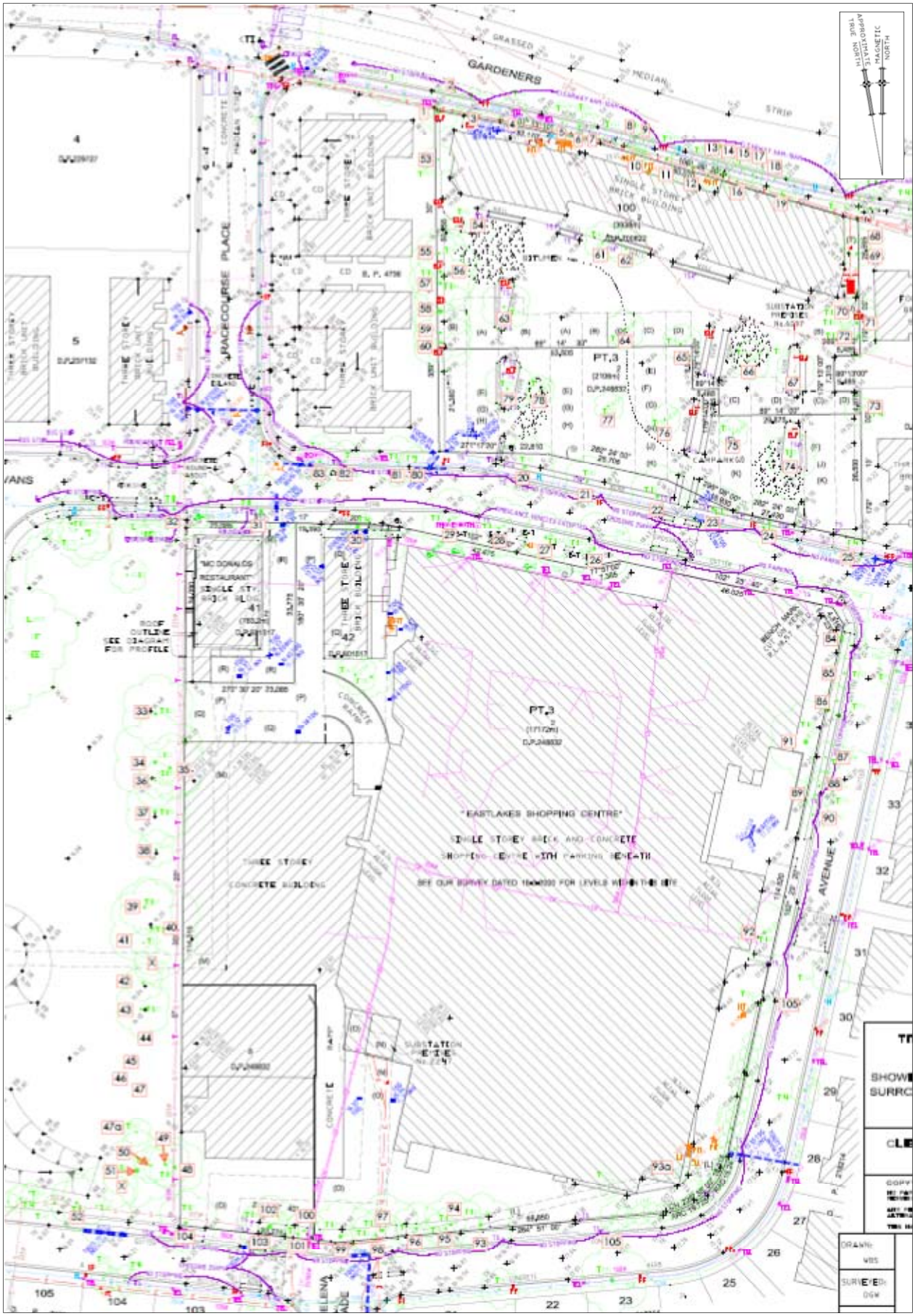
Tree no	Species	Approx trunk dbh mm	Approx height m	Approx crown spread m	Health	Condition	SULE	Comment	Effect of proposed development
84	*Callistemon viminalis* (Weeping Bottlebrush)	250	5	4	Fair	Fair	3D	Poor form	Removal roadworks
85	*Callistemon viminalis* (Weeping Bottlebrush)	250	5	4	Fair	Fair	3D	Poor form	Removal roadworks
86	*Callistemon viminalis* (Weeping Bottlebrush)	250	5	4	Fair	Fair	3D	Poor form	Removal near awning
87	*Callistemon viminalis* (Weeping Bottlebrush)	250	5	4	Fair	Fair	3D	Poor form	Removal under awning
88	*Callistemon viminalis* (Weeping Bottlebrush)	250	5	4	Fair	Fair	3D	Poor form	Removal under awning
89	*Callistemon viminalis* (Weeping Bottlebrush)	100	3	2	Good	Fair	3D	Trunk wounds branch failure	Removal under awning
89	*Callistemon viminalis* (Weeping Bottlebrush)	250	5	4	Fair	Fair	3D	Poor form	Removal under awning
90	*Callistemon viminalis* (Weeping Bottlebrush)	250	5	4	Fair	Fair	3D	Poor form	Removal under awning
91	*Acacia elata* (Cedar Wattle)	740	15	14	Good	Fair	2B	Minor deadwood Root system confined by building to tension side	Removal within building
92	*Acacia elata* (Cedar Wattle)	570	12	10	Good	Fair	2B	Root system confined by building to tension side	Removal within building
93	*Casuarina glauca* (Swamp Sheoak)	500	12	12	Good	Fair	2B	Root system confined by carpark and footpath	Removal within building

Tree no	Species	Approx trunk dbh mm	Approx height m	Approx crown spread m	Health	Condition	SULE	Comment	Effect of proposed development
93a	*Casuarina glauca* (Swamp Sheoak)	100	10	3	Good	Poor	4B	Decay in trunk base Near building	Removal within building
94	*Casuarina glauca* (Swamp Sheoak)	400	12	8	Good	Fair	3B	Confined root system in planter	Removal within building
95	*Casuarina glauca* (Swamp Sheoak)	400	12	8	Good	Fair	3B	Confined root system in planter	Removal within building
96	*Allocasuarina torulosa* (Forest Sheoak)	300	8	6	Good	Poor	3D	Suppressed	Removal within building
97	*Casuarina glauca* (Swamp Sheoak)	500	12	10	Good	Fair	3B	Near retaining wall and carpark	Removal within building
98	*Casuarina glauca* (Swamp Sheoak)	300	8	6	Good	Fair	3B	Suppressed Near retaining wall	Removal within building
99	*Allocasuarina littoralis* (Black Sheoak)	400	8	6	Good	Fair	3B	Suppressed	Removal within building
100	*Allocasuarina torulosa* (Forest Sheoak)	300	6	5	Poor	Poor	4C	Confined root system in planter	Removal within building
101	*Allocasuarina torulosa* (Forest Sheoak)	300	6	5	Poor	Poor	4A	Confined root system in planter Fungal fruit bodies in trunk	Removal within building
102	*Casuarina glauca* (Swamp Sheoak)	400 x 2	10	10	Good	Fair	4B	Failed codominant junction at 6m height Weak junction near base	Removal within driveway
103	*Casuarina glauca* (Swamp Sheoak)	300	10	6	Good	Fair	2B	Confined root system in planter	Removal within building
104	*Casuarina glauca* (Swamp Sheoak)	400	12	10	Good	Fair	2B	Lopped or failed trunk at 6m height	Removal within building
105	*Cupressus torulosa* (Bhutan Cypress) x 22 specs	250	8	3	Good	Fair	3B	Row of similar specimens Lower foliage removed Root systems confined by footpath and carpark	Removal within or close to building

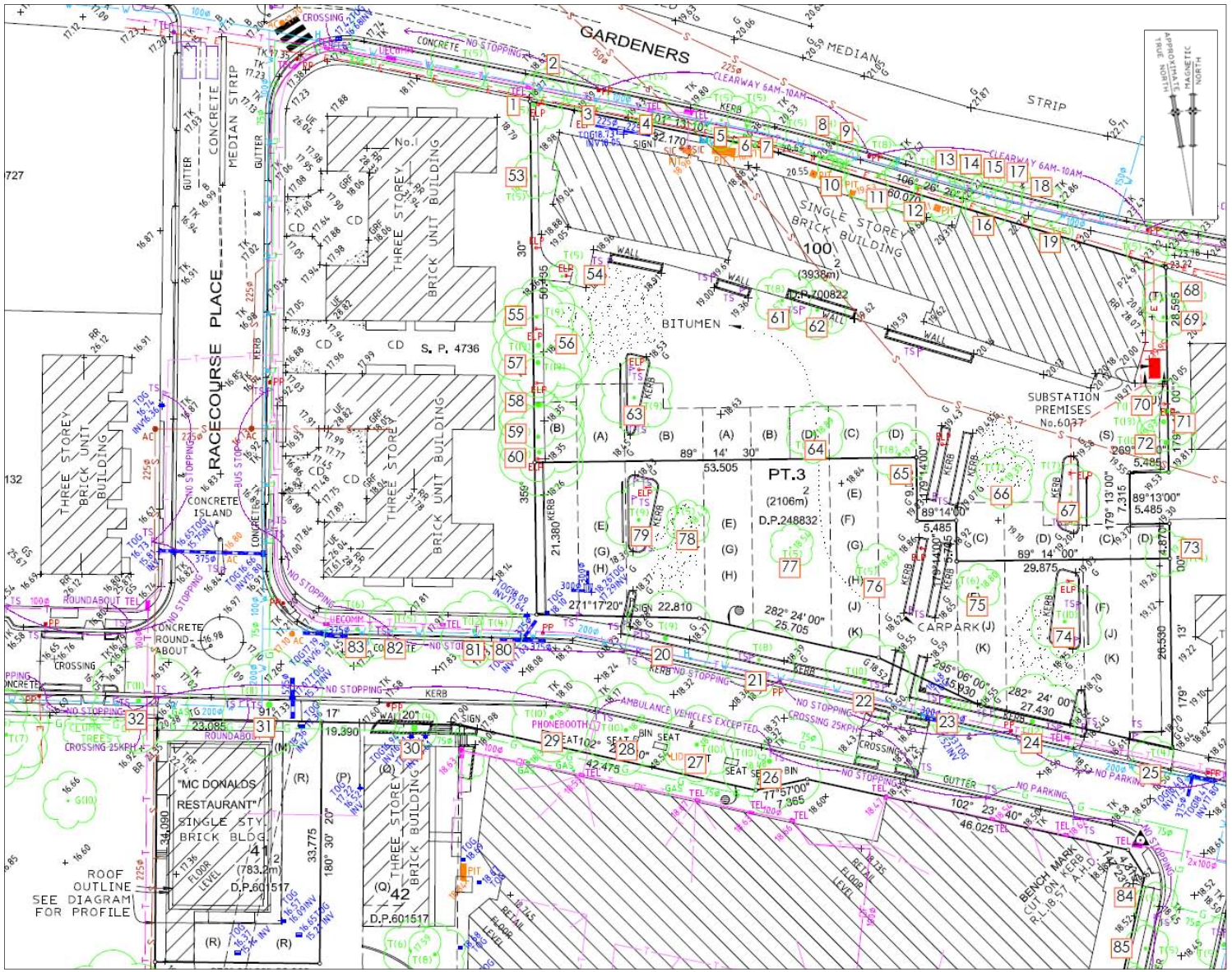
Table 2: SULE categories (after Barrell 1995)

	1	2	3	4
	Long: Appeared to be retainable at the time of assessment for over 40 years with an acceptable degree of risk, assuming reasonable maintenance.	Medium: appeared to be retainable at the time of assessment for 15 to 40 years with an acceptable degree of risk, assuming reasonable maintenance.	Short: appeared to be retainable at the time of assessment for 5 to 15 years with an acceptable degree of risk, assuming reasonable maintenance.	Transient: trees which should be removed within the next 5 years.
A	Structurally sound trees located in positions that can accommodate future growth.	Trees which may only live between 15 and 40 years.	Trees which may only live between 5 and 15 years.	Dead, dying, suppressed or declining trees.
B	Trees which could be made suitable for long-term retention by remedial care.	Trees which may live for more than 40 years but would be removed for safety or nuisance reasons.	Trees which may live for more than 15 years but would be removed for safety or nuisance reasons.	Dangerous trees through damage, structural defect, instability or recent loss of adjacent trees. Urgent removal may be required if near assets.
C	Trees of special significance which would warrant extraordinary efforts to secure their long-term retention.	Trees which may live for more than 40 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting.	Trees which may live for more than 15 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting.	Trees which may live for more than 5 years but should be removed to prevent interference with more suitable individuals or to provide space for new planting.
D		Trees which could be made suitable for retention in the medium term by remedial care.	Trees which require substantial remediation and are only suitable for retention in the short term.	Trees which are damaging or may cause damage to existing structures within the next 5 years.

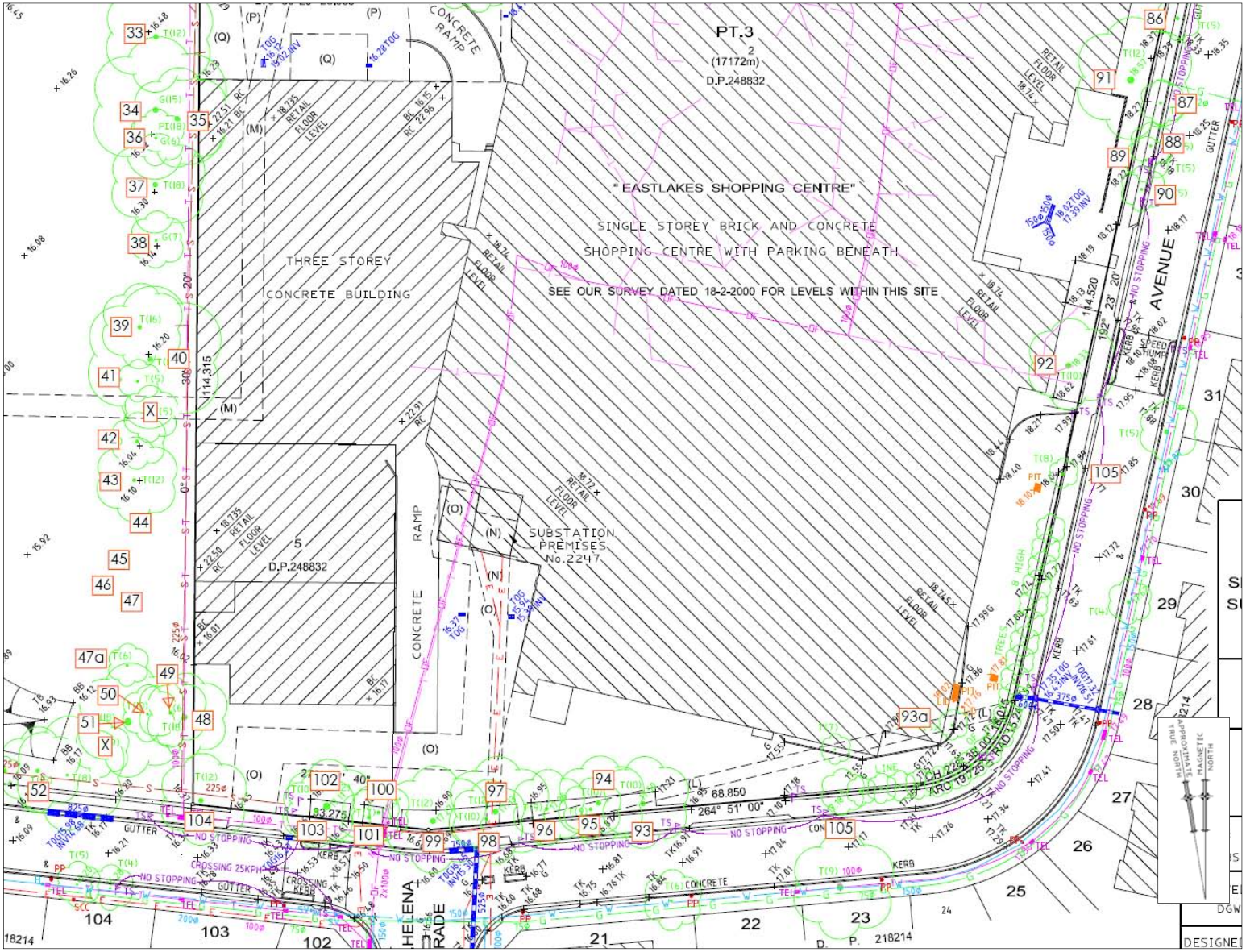
Tree location plan



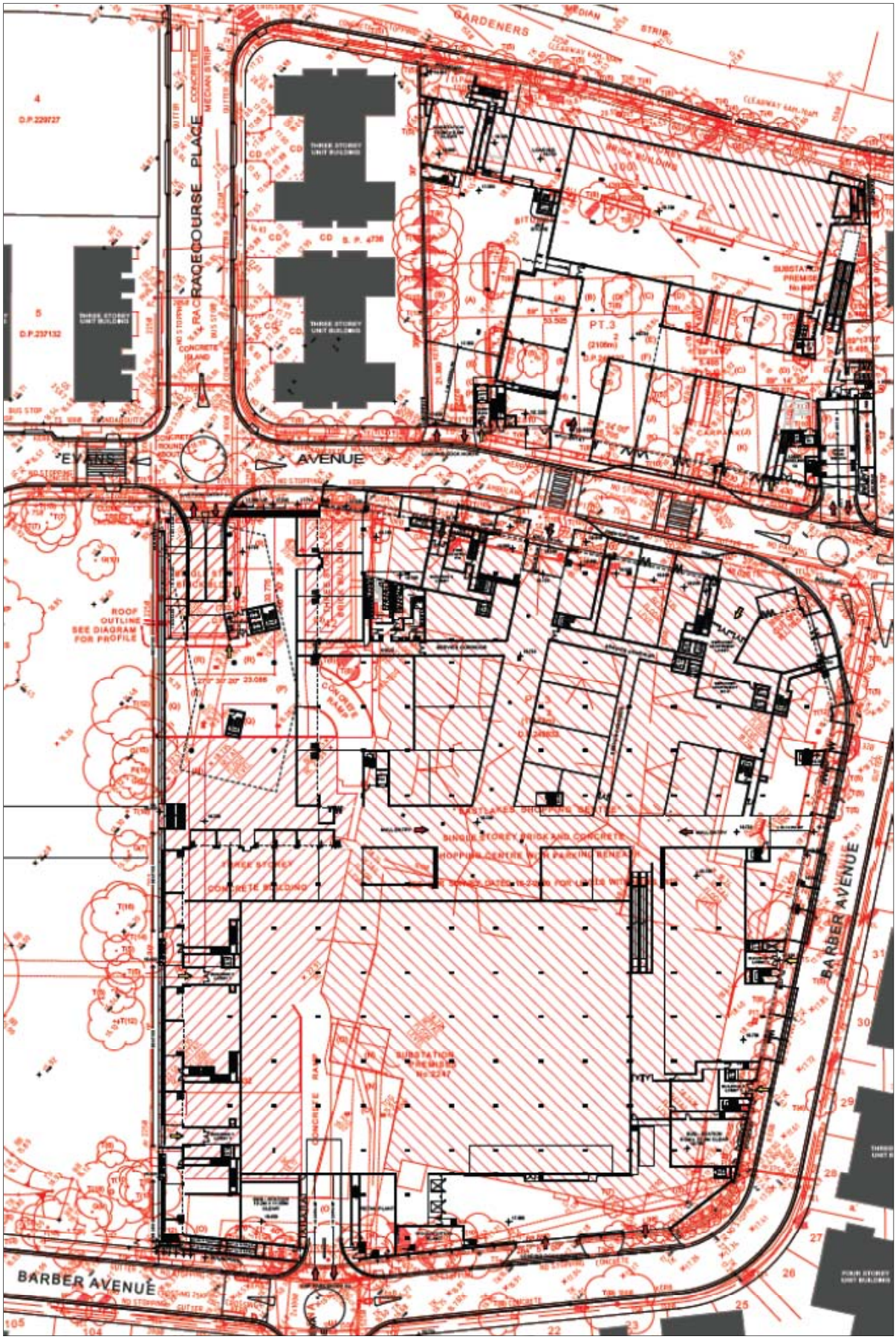
Tree location plan north



Tree location plan south



Site plan


GARDENERS
RACECOURSE PLACE
AVENUE
ROOF OUTLINE SEE DIAGRAM FOR PROFILE
BARBER AVENUE
BARBER AVENUE

Plates

Plate 1: Gardeners Road frontage viewed from the northeast showing Trees 16 and 19 *Eucalyptus microcorys* (Tallowwood) left

Plate 2: Evans Avenue viewed from the west showing Trees 22, 23 and 24 *Platanus* x *hybrida* (London Plane)

Plate 3: Evans Avenue viewed from the east showing Trees 26, 27, 28 and 29 *Platanus* x *hybrida* (London Plane)

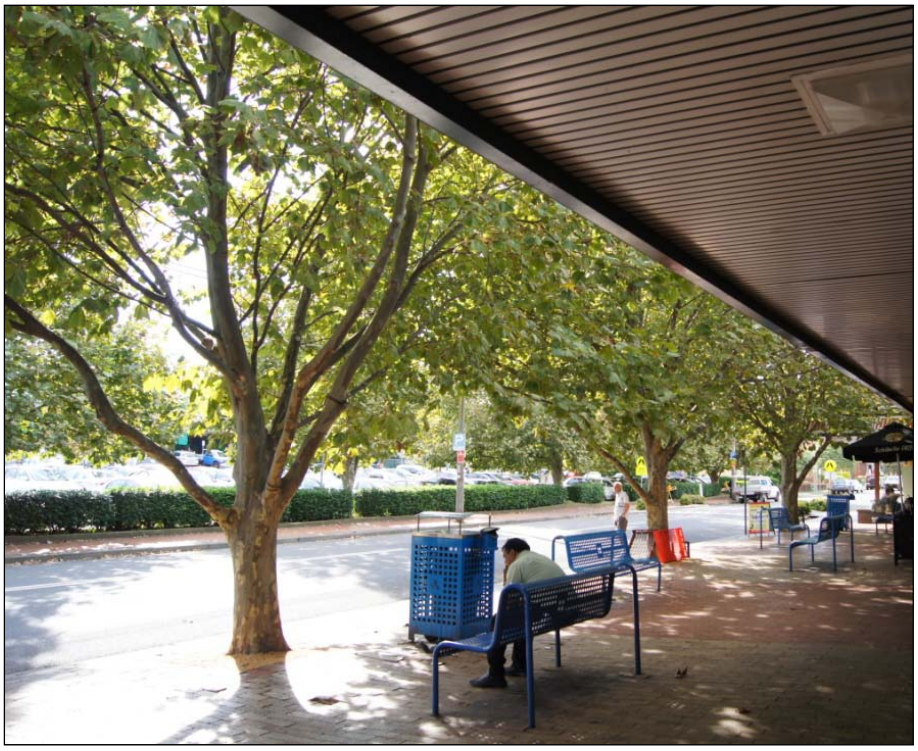


Plate 4: Trees 28, 27 and 26 *Platanus* x *hybrida* (London Plane) showing lower branches within line of awning (ie approximately 1m from trunk centre)

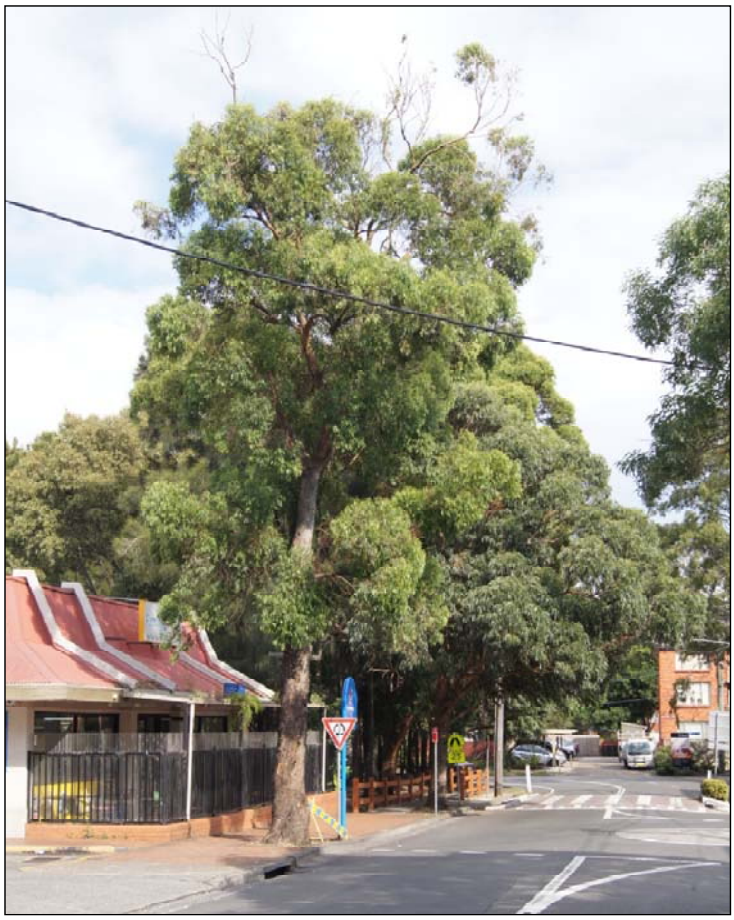


Plate 5: Tree 30 *Eucalyptus microcorys* (Tallowwood) showing branch dieback in upper crown

Plate 6: Eastlakes Reserve viewed from the northwest showing left to right Tree 33 *Eucalyptus botryoides* (Bangalay), Tree 34 *Eucalyptus grandis* (Flooded Gum) and Tree 35 *Casuarina cunninghamiana* (River Sheoak)

Plate 7: Evans Avenue carpark viewed from the northeast showing Tree 63 *Platanus* x *hybrida* (London Plane) left; Trees 55 to 60 *Eucalyptus microcorys* (Tallowwood) to the rear

Plate 8: Evans Avenue carpark viewed from the northeast showing Trees 74 to 79 *Platanus* x *hybrida* (London Plane)

Plate 9: Trees 70, 71 and 72 *Eucalyptus microcorys* (Tallowwood)

Plate 10: Barber Avenue viewed from the north showing Trees 89 to 90 *Callistemon viminalis* (Weeping Bottlebrush) and Tree 91 *Acacia elata* (Cedar Wattle)

Plate 11: Barber Avenue viewed from the northeast showing Tree 92 *Acacia elata* (Cedar Wattle) and Tree group 105 *Cupressus torulosa* (Bhutan Cypress)

Plate 12: Barber Avenue viewed from the south showing right to left: Trees 93, 94 and 95 *Casuarina cunninghamiana* (River Sheoak) and Tree 96 *Allocasuarina torulosa* (Forest Sheoak)

Terminology used in the report

Age classes (I) *Immature* refers to a well-established but juvenile tree. (S) *Semimature* refers to a tree at growth stages between immaturity and full size. (M) *Mature* refers to a full sized tree with some capacity for further growth. (O) *Overmature* refers to a tree about to enter decline or already declining.

Health refers to the tree's vigour as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion and the degree of dieback.

Condition refers to the tree's form and growth habit, as modified by its environment (aspect, suppression by other trees, soils), and the state of the scaffold (ie trunk and major branches), including structural defects such as cavities, crooked trunks or weak trunk/branch junctions. These are not directly connected with health and it is possible for a tree to be healthy but in poor condition.

Health	
Good	In good vigour with full leaf coverage of the crown; deadwood if present is internal and a normal feature of the species
Fair	Generally vigorous but shows symptoms of stress or decline, leaf coverage thinner than normal for the species; deadwood of smaller diameter may be present
Poor	Shows symptoms of advanced stress or decline including sparse crown with twig and branch dieback, lack of response to pests or disease
Structural condition	
Good	Has well-spaced branches and strong branch collars; form and habit typical of the species; good example of the species with low probability of significant failure
Fair	Has structural defects of moderate severity with low propensity for failure which could be remediated by pruning or modification of its environment
Poor	Has structural defects which have already failed and/or have a high propensity for failing in the future

Safe Useful Life Expectancy (SULE). In a planning context, the time a tree can expect to be usefully retained is the most important long-term consideration. SULE is a system designed to classify trees into a number of defined categories so that information regarding tree retention can be concisely communicated in a non-technical manner. SULE categories are easily verifiable by experienced personnel without great disparity. A tree's SULE category is the life expectancy of the tree modified first by its age, health, condition, safety and location (to give safe life expectancy), then by economics (ie cost of maintenance; retaining trees at an excessive management cost is not normally acceptable), effects on better trees, and sustained amenity (ie establishing a range of age classes in a local population). SULE assessments are not static but may be modified as dictated by changes in tree health and environment. Trees with short SULE may at present be making a contribution to the landscape but their value to the local amenity will decrease rapidly towards the end of this period, prior to their being removed for safety or aesthetic reasons. For details of SULE categories see Table 2, adapted from Barrell (1993 and 1995).

Decay is the result of invasion by fungal diseases through a wound.

Decline is the response of the tree to a reduction of energy levels resulting from **stress**. Recovery from a decline is difficult and slow; is usually irreversible.

Epicormic shoots are sprouts produced from dormant buds in the bark. Production can be triggered by fire, pruning or root damage but may also be as a result of stress or decline.

Sparse crown refers to reduced leaf density, often a precursor to dieback and may imply stress or decline. Also possibly a response to drought or root damage.

Weak junctions are points of possible failure in the scaffold. They are usually caused by the trunk or branch bark being squeezed within the junction so that the necessary interlocking of the wood fibres does not occur and the junction is forced open by the annual increments in growth. This is often a genetic problem.

Weed species are plants which are known to invade native remnant bushland. The species concerned may be exotic or may be native species from other parts of Australia.

Wounds are areas where the bark has been damaged by branch breakage, impact or insect attack. Some wounds decay and cause structural defects or weakness. Healthy trees are able to resist and contain infection by walling off areas within the wood. Tree wounds are often eventually covered over by new bark but the walled off or infected areas still remain internally and may lead to weakness of the heartwood.

Disclaimer

This is not a hazard assessment report and it should be noted that trees are always inherently dangerous. This assessment was carried out from the ground, and covers what was reasonably able to be assessed and available to the assessor at the time of inspection. No aerial or subterranean inspections were carried out and structural weakness may exist within roots, trunk or branches.

Any protection or preservation methods recommended are not a guarantee of tree survival or safety but are designed to improve vigour and reduce risk. Timely inspections and reports are necessary to monitor the trees' condition. No responsibility is accepted for damage or injury caused by the trees and no responsibility is accepted if the recommendations in this report are not followed.

Limitations on the use of this report

This report is to be utilised in its entirety only. Any written or verbal submission, report or presentation that includes statements taken from the findings, discussions, conclusions or recommendations made in this report, may only be used where the whole of the original report (or a copy) is referenced in, and directly attached to that submission, report or presentation.

Assumptions

Care has been taken to obtain information from reliable resources. All data have been verified insofar as possible; however, Treescan Urban Forest Management can neither guarantee nor be responsible for the accuracy of information provided by others.

Unless stated otherwise:

Information contained in this report covers only the trees that were examined and reflects the condition of the trees at the time of inspection: and

The inspection was limited to visual examination of the subject trees without dissection, excavation, probing or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject trees may not arise in the future.

Appendix 1: Plane Tree allergy information

AllAllergy

http://www.allallergy.net/fapaidfind.cfm?cdeoc=888

Adverse Reactions:

IGE AND IMMUNE:
Allergic reactions: hayfever, asthma, erythema, pruritis, urticaria.
Contact phytodermatitis. (Poljacki 1993 ref.1055 8)

Asthma, allergic rhinitis, allergic conjunctivitis (Bousquet 1991 ref.4826 8) and systemic reactions have occurred during immunotherapy. (Hejjaoui 1992 ref.4825 6)

The different species within the plane tree genus are expected to be highly cross-reactive to each other. (Yman 1982 ref.1241 2) An allergenic glycoprotein compound has been isolated from the pollen extract of London plane.

In a study in Madrid, Spain, in 187 patients with a history of rhinitis and/or seasonal asthma, a prevalence of positive skin-prick tests to Platanus of 56% was found, surpassed only by pollen from the grasses Dactylis glomerata and/or Trisetum paniceum (92%) and Olive tree (63%). Aerobiological sampling of the pollen content of the air in Madrid revealed that 14.9% consisted of Platanus. Specific IgE confirmed sensitisation to this allergen. (Subiza 1994 ref.4824 3)

In an earlier study in Madrid, in 47 patients with spring-summer pollinosis symptoms seen at an allergy centre, skin-prick tests to Platanus were positive in 33 of the 39 patients first seen with seasonal symptoms during Platanus pollen season and only in three of the eight patients without symptoms during Platanus exposure. Twenty-two of the 33 Platanus-positive skin-test patients also had a positive ELISA result. The average 24-hour rhinitis symptom scores of the 39 patients first seen with seasonal symptoms from March through April showed significant correlation with Platanus pollen counts. (Varela 1997 ref.4823 6) The authors concluded that Platanus pollen was an important cause of pollinosis in this area.

High levels or this aeroallergen and its clinical importance have also been demonstrated in studies from Cape Town, South Africa, where Platanus pollen is high in September, (Potter 1991 ref.4437 6) from Zurich, Switzerland, (Helbling 1985 ref.4405 7) Balikesir, Turkey, (Bicakci 2000 ref.4816 3) and Salamanca, Spain. (Hernandez Prieto 1998 ref.4568 1) Pollen from this tree was also demonstrated to be an important aeroallergen in Montpellier, in southern France, where the highest prevalence of allergy was to grass pollen, followed by Plantain, Parietaria, Oleaceae, London Plane and Cupressaceae pollen; the prevalence of sensitisation among the entire group ranged from 13% to 36% of pollen-allergic patients. (Bousquet 1984 ref.4396 6)

Platanus hybrida has also been shown to result in a high prevalence of atopic sensitisation. In a study in Madrid, Spain, the second-highest airborne allergen presence in the air, after Quercus spp., was pollen from the Platanus spp. (15%). In skin-prick tests the prevalence of positive reactions to Platanus hybrida was 52%. (Subiza 1995 ref.4585 3) This pollen was also found to be important in Seville, Spain. (Gonzalez Minero 1998 ref.4821 7)

In Bilboa, Spain, 8.48% of 720 patients were sensitized to this pollen. (Enrique 2002 ref.5663 2)

This study reports that from the 720 patients evaluated at this clinic, 61 patients (8.48%) were sensitised to Platanus pollen. Rhinitis and conjunctivitis were the most frequent symptoms, and only a 22% of them referred asthma. Almost the 25% of these patients were monosensitised to Platanus pollen. Food allergy was observed in 32 (52.45%) of the 61 patients sensitised to Platanus. The symptoms related were anaphylaxis in a 24%, oral allergy syndrome(OAS)in 35%, and urticaria-angioedema in a 19%, being the rest unspecific symptoms. (Enrique 2002 ref.5663 2)

Gardening Australia website
http://www.abc.net.au/gardening/stories/s1215645.htm

The London Plane Tree Platanus x hispanica [syn *Platanus* x *hybrida* London Plane] is one of the most widely planted trees in Australia. It tolerates pollution, neglect, vandalism and poor soils and in return it provides plenty of summer shade and in winter a deciduous canopy that allows the sun through. Most southern Australian cities have avenues of Plane Trees lining many of their streets, complementing seasonal change to many suburbs and inner city areas.

Some people that live or work in close proximity to stands of these trees have a less agreeable relationship with them. Pollen and hairs from the leaves and seed capsules can cause both physical and allergic reactions and can include headaches, migraines and fluctuating body temperatures and combined can result in a total lack of concentration. The reaction to the Plane tree has a dramatic effect on the daily life of some people, and can also lead to infections. Breathing in the pollen and hairs and getting them in the eyes causes extreme irritation and makes it impossible to go out on the street without having close protection on the eyes and over the nose and mouth. There is also no opportunity to have open windows for fresh air or to use indoor electric fans. Even car vents become clogged with pollen and hairs.

According to Allergist Dr. Connie Katelaris [MBBS PhD FRACP, Senior Consultant Clinical Immunology and Allergy at Westmead Hospital] the symptoms of Hay Fever or allergic reactions are very similar to the common cold and it is very difficult to distinguish the difference between them. A running nose, streaming eyes, itching and sneezing are symptoms common to both, although allergies exhibit more predominant symptoms of itching. Many people do not recognise that they have an allergy, until they become aware that the symptoms follow a repetitive pattern at a similar time each year. People living and working around Plane trees in Spain and Turkey are experiencing the same symptoms as people do in Australia. The World Health Organisation has studied these effects on health, and other worldwide studies have been published in international medical journals.

There has been a significant increase in the prevalence of allergic diseases like hay fever, asthma and eczema over one or two generations, and there is unlikely to be a genetic reason for it. It appears that the westernisation of our lifestyle is linked with an increase in a prevalence of allergic disorders.

Plane tree pollen
The London Plane Tree pollinates during and around the month of September in Sydney, and at this time high levels of Plane tree pollen can be measured in the atmosphere, and even higher levels where there are dense plantings of Plane trees. Some people suffer an allergic reaction called pollinosis when they are exposed to Plane tree pollen during this time, especially if they have been sensitised previously to the proteins in the Plane Tree pollen. Like other plants, people become exposed to

the pollen and other elements of their daily environment. Contact with pollen grains can through the lining in the eyes or by breathing them in.

Plane tree pollinosis sufferers can also develop food allergies. Once the immune system is activated by Plane tree pollen it will recognise similar plant proteins in foodstuffs. Hazelnuts and celery have similar proteins in them, and so eating these foods can also cause an allergic response but can happen at any time of the year.

Plane tree hairs
Spring is often regarded as the start of the hay fever season and anyone exposed to the irritating hairs can suffer. Many spring flowering plants are wind pollinated. This is a relatively ineffective reproduction method, requiring large amounts of pollen for seed set. The maturing pods can be held on the tree for about a year or more, and as they begin to break up the mass of seeds covered in irritating hairs are released. The leaves too are covered in highly irritating hairs that are gradually shed, and combined are a source of intense irritation if they come into contact with skin. As well if they are inhaled they induce a dry barking cough and irritate the mucous membrane of the eyes.

If you aren't allergic to Plane tree hairs and pollen but just live near them is enough increase your exposure. The outdoor activities of sweeping and raking up fallen Plane tree leaves from paths and beds, pruning and climbing the trees when they are in leaf, or even playing in them all contribute to increasing the chances of developing physical reactions. It is advisable to wear long sleeves, trousers, gloves and a dust mask when sweeping up leaves and seed heads at home in the garden, making sure to shower and wash your clothes after gardening as the hairs attach to clothes. These hairs can also get onto laundry hanging on the line.

There becomes only a short comfort zone where Plane Trees are unlikely to cause adverse reactions.

The City of Sydney has developed a Street Tree master plan, which identifies using the right tree for the right location. They are trying to identify places where native trees can be planted as a first preference and then after this to identify the trees that can best tolerate the harsh urban environment. The Plane Tree is one of the toughest trees for urban street planting and is the reason that it has so often been used in inner city areas in the past.