

Construction Impact Assessment and Management Plan



Kincoppal School, Rose Bay.

Prepared For: Terry Mahady. Prepared By: George Palmer, BOTANICS P/L.

Site Address: New South Head Road, Rose Bay.

Dated: April, 2020.

Page 1 of 15 Botanics Tree Wise People Pty Ltd. Po Box 500, Potts Point 2011. Ph 0411193366 Construction Impact Assessment and Management Plan for Kincoppal School.



Table of Contents

1. SUMMARY		;
2. BACKGROUND		;
4. METHODOLOGY	۲ ۲	1
	·	
7. DISCUSSION		3
	ION PLAN	
	11	
10. DEFINITIONS		

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1. Summary

1.1 This report has been requested by Terry Mahady at Kincoppal School to better understand the arboricultural implications associated with the proposed reconfiguration of the site's southern boundary, and this portion of the site's vehicular and pedestrian access. The School is in the design stages of the reconfiguration that will focus on improving the way the school is accessed.

1.2 A total of twenty six (26) trees have been individually assessed for the purpose of this report. These are located within 15m of the proposed construction footprint. Additional trees over 20m from the proposed Construction Impact Zone (CIZ) have not been assessed.

1.3 There are four (4) High value and significant trees documented within this portion of the school grounds. These have been seen as a material constraint to this or any proposed development and will be preserved.

1.4 The proposed works will require the removal of four (4) well established and mature Kaffir Plum trees. These have been planted adjacent to the site's southern sandstone boundary wall.

1.5 The proposed development will require the removal of twelve (12) trees. Of these eight (8) have been considered as Low Value and would be recommended for removal irrespective of this or any proposed development. These include well recognised noxious weeds and exempt tree species. An additional four (4) trees have been seen as being of Moderate value and are required for removal to allow for the proposed construction. These include three (3) well established Kaffir Plums located on the upper edge of the site's southern boundary wall.

1.6 Although located outside the Construction Impact Zone of the proposed development, this report will recommend the removal of the Silky Oak tree located adjacent to the school's front entrance. The tree's foliage is a well known irritant that has and will continue to affect the students, staff and carers.

1.7 Preservation recommendations have been made based on *Australian Standard AS4970 for the Protection of Trees on Development Sites* and will be implemented accordingly. All tree pruning recommendations will be made based on *AS4373 for the Pruning of Amenity Trees* and will be undertaken where appropriate.

2. Background

2.1 The school has made an ongoing commitment to improve both the safety and efficiency of movements throughout the school grounds. A primary focus of this is vehicular access through the School's front gates and the parking of staff cars and school buses. The proposed works will better utilise this southern boundary space as detailed.

3. Aims

3.1 The aims of this report are to;

- Review Council Policies for applicable conditions regarding the site and documented trees;
- Conduct a visual assessment of the documented trees and their growing environment;
- Provide a detailed list of Tree Preservation Recommendations aimed at preserving those trees documented for preservation.

Page 3 of 15 Botanics Tree Wise People Pty Ltd. Po Box 500, Potts Point 2011. Ph 0411193366 Construction Impact Assessment and Management Plan for Kincoppal School.



3.2 There is no warranty or guarantee, expressed or implied that health, pests, disease, deficiencies, decay or any structural failures may occur at any time following documentation. Information contained in this report covers only the documented trees and reflects their health and condition at the time of inspection.

4. Methodology

4.1 A Visual Tree Assessment (VTA) was performed from ground level and consideration was given to the overall health of each tree, percentage of canopy, epicormic growth, deadwood and form for this species. The tree heights and canopy spreads have been estimated and where relevant the orientation of the canopy spread noted. The trunk diameters of each tree has been estimated at breast height of 1.4 meters (DBH) and measured with a diameter tape where required to calculate Tree Protection Zones. The site was inspected by consulting arborist George Palmer in March, 2020.

5. Observations

5.1 This report focuses on an area of the school grounds defined in **Figures 5** and **6**. This is the portion of the site's southern boundary that runs from the entrance gates on the corner of Vaucluse and New South Head Roads to the embankment that forms the site's south western corner.

5.2 The site's southern boundary wall and existing building footprints have affected the distribution of trees on site and have limited the arboricultural impacts of the proposed works. These include some well established and mature Kaffir Plum trees that provide a moderately significant amenity contribution.

6. Tree Data

6.1 A total of twenty six (26) trees have been assessed for the purpose of this report. These range in significance from early, or original plantings of Magnolia grandiflora and Ficus rubiginosa, to Olive and Hackberry trees that would be recommended for removal irrespective of the proposed development. A total of twenty (20) trees have been assessed using Visual Tree Assessment (VTA) criteria and notes. As required under Clause 2.3.2 of the *Australian Standard 4970 (2009) for the Protection of Trees on Development Sites*, each tree has been allocated a Retention Value based on the tree's Useful Life Expectancy and Landscape Significance with consideration to its health, structure, condition and site suitability. The Retention Value does not take into account any proposed development. All trees have been allocated 1 of 4 Retention Values;

- High Value Priority for Retention.
- Moderate Value Consider for Retention.
- Low Value Consider for Removal.
- Remove Recommended for Removal Irrespective of works.

Refer to Tree Table and Tree Assessment Schedule.



6.2 The site's most arboriculturally significant trees have been seen as essential for retention and the proposed construction set back to allow for this. These include Tree 1, this is a mature *Magnolia grandiflora*, or Bull Bay Magnolia. It has a canopy height and spread of over 12m and is supported on a trunk of over 1m in diameter. This tree will have been planted here over one hundred (100) years ago as part of the early or original landscape works on site. Considered as High value and documented for preservation.

6.3 Tree 2 is a semi mature to early mature *Grevillea robusta*, or Silky Oak. This tree has been planted directly adjacent to the front entrance of the school. The tree has been planted too high in the soil profile and has exposed structural roots. Several of these sit above the soil surface with visible surface decay noted. The tree's canopy has grown to a height of over 12m and is supported on a co dominate trunk that forks at approximately 2.8m above ground level. The tree appears to have had a number of upper canopy limbs fail.

6.4 Tree 3 is a well established *Erythrina x sykesii*, or Coral tree. This tree has grown to a height of approximately 8m and is supported on a co dominate trunk that forks at 40cm above ground level. The tree is on Woollahra Council's noxious and exempt tree species list and can be removed without seeking formal approval.

6.5 Trees 4, 5 and 6 are all semi mature *Podocarpus elatus* or Plum Pines. These are a well suited native tree species that have established here. The largest of these (Tree 6) is supported on a trunk of over 90cm in diameter and all can be described as mature examples of this native tree species. All are required for removal to allow for the proposed.

6.6 Tree 7 is a juvenile *Celtis sinensis*, or Hackberry. These are another well recognise invasive tree species that is exempt from Woollahra Council's tree preservation legislation and should be removed irrespective of this, or any proposed development.

6.7 Tree 8 is a semi mature *Howea forsteriana*, of Kentia Palm located directly adjacent to the site's southern boundary. These are a native (Norfolk Island) palm species that will have been planted as part of earlier landscape works. English Ivy has been allowed to grow over the tree's lower trunk limiting its visual amenity. Required for removal.

6.8 Tree 9 is a clump of *Nerium oleander*, or Oleander that will have been planted on the lower embankment and directly adjacent to the site's southern boundary. Another noxious and exempt tree species recommended for removal irrespective of the proposed development.

6.9 Tree 10 is one of the smaller *Harpephyllum caffrum*, or Kaffir Plum trees on site. This one is again located on the lower embankment adjacent to the site's southern boundary. This tree has grown over the neighbouring boundary due to partial suppression. Although located outside the CIZ of the proposed works this tree has been recommended for removal.

6.10 Trees 11,12 and 13 are all *Harpephyllum caffrum* species. All are well established and mature examples of this exotic tree species. Tree 12 is the largest and will likely have been the first planted. All have grown to over 10m and remain a fraction of their biological potential. All are within 1.5m of the sandstone retaining wall that supports this elevated parking area. Moderate significance but required for removal.

6.11 Trees 14 and 15 are both *Populus alba*, or Silver Poplars. Tree 14 has declined and died, while Tree 15 continues to grow here. This tree supports three (3) leaders and has developed a broad canopy rather that the tall conical structure of unpruned trees. The tree is poorly suited for this location and is largely out of context. Low value and recommended for removal irrespective of the proposed.



6.12 Tree 16 is a well established *Olea europea,* or Wild Olive. This is a hardy and long lived tree species that will have established here over twenty (20) years ago from a bird or bat dropping. The tree has been cut to ground level and allowed to regrow, a practice formally known as coppicing. The tree is on Woollahra Council's noxious and exempt tree species list and can be removed without seeking formal approval. The tree is however located well outside the site's CIZ and may be retained.

6.13 Trees 17 and 18 are both *Banksia integrifolia*, or Coastal Banksia. Both will have been planted at the base of the sandstone retaining wall over fifteen (15) years ago and both have established well. Both are over 8m in height and are supported on well structured trunks of over 35cm. They remain semi mature examples of this locally native tree species that are of moderate significance and documented for preservation.

6.14 Trees 19 and 20 are both mature and well established *Washingtonia robusta*, or Californian Fan Palms. These have both grown to over 18m in height and will likely have been part of the site's original or early plantings and provide an important link to the site's horticultural past. Both have been considered as High value and documented for preservation.

6.15 Trees 21, 22, 23 and 24 are all well established *Phoenix canariensis,* or Canary Island Date Palms. These may have been part of the early site plantings, but are just as likely to have established from a bird or bat dropping. All now stand over 8m tall and provide a Moderate to High arboricultural contribution to this portion of the site. All are located outside the CIZ and documented for preservation.

6.16 Arguably this reports most significant tree is a well established *Ficus rubiginosa*, or Port Jackson Fig tree documented as Tree 25. This tree has self seeded into the sandstone retaining wall and has produced a network of surface feeder roots that spread throughout this. This is an important locally native tree species that has been considered as High value.

6.17 The final tree documented is another semi mature *Harpephyllum caffrum*, or Kaffir plum. This has been documented as Tree 26 and is located on the site's south western corner. This is a semi mature example of the species that has grown to a height of less than 12m. This is a small fraction of its full biological potential and given its current good health it can be expected to continue to grow towards this in time. This will effectively block visual access to the harbour and foreshore. Low value and recommended for removal.

7. Discussion

7.1 The proposed works recommend the removal of a number of trees that are located outside the CIZ. The first of these is the *Grevillea robusta*, or Silky Oak tree at the front entrance. The tree is a semi mature example of the species that has a poorly structured basal root plate. This will have developed following it being planted too high in the soil profile. Surface erosion may have also contributed to this. The result is that the tree has a structural root network that is shallow rooted and partially exposed. This and the visible surface decay noted (See **Figure 1**) have compromised the tree's structural integrity.

7.2 The *G. robusta* species is better suited for riverside gullies and wet forests. This location is high in the local topography and set within an area providing limited access to appropriate soil moisture and nutrient requirements. The tree will continue to struggle to form a well structured canopy and will be prone to both canopy and total basal failure.

7.3 The foliage and fruit of *G. robusta* also contain hydrogen cyanide and is know to be responsible for contact dermatitis. https://en.wikipedia.org/wiki/Grevillea_robusta. The location of the tree, adjacent to the front entrance increases exposure to a larger target, it is of limited amenity and Low Value. Recommended for removal irrespective of the proposed development.



7.4 The adjacent *E. sykesii*, or Coral tree is an exempt tree species under Woollahra Councils Tree Preservation Legislation and can be removed without seeking formal approval. The tree is however a well structured example of the species and is a cultivar that is less vigorous.

7.5 Trees 4, 5 and 6 are well established examples of their species located on the upper edge of the boundary wall. The proposed works will require their removal. The arboricultural amenity of these should be considered and replacement trees installed to maintain this over time.

7.6 Trees 7 is a *Celtis sinensis*, or Hackberry tree. This is another exempt tree species and should be removed. Trees 9 and 10 are also located outside the CIZ but documented for removal. Tree 9 is an African Olive and again on the exempt tree species list. The neighbouring *H. caffrum*, or African Plum (T10) has a poorly structured canopy and a biological potential that will see it continue to grow over the neighbouring property. This will require ongoing and difficult management and should be removed to eliminate this.

7.7 Trees 11,12 and 13 are the largest trees recommended for removal. As noted, these are all *Harpephyllum caffrum*. This is an exotic tree species and they remain a fraction of their full biological potential and will continue to grow beyond the size suitable for this location. This has affected the historic sandstone boundary and retaining wall and will force it out further in time.

7.8 Tree 12 has developed with a partially included base. This is a structural fault that can lead to the failure of the sub dominant leader. This is a large diameter portion of the tree and will impact on a neighbouring residence. All trees have been considered as being of Moderate value and are required for removal to allow for the proposed development.

7.9 Trees 14 and 15 are *Poplar alba*, or Silver Poplars. These are a poor tree species for this location. Tree 14 has declined and died while Tree 15 has forked into three (3) with a short and broad canopy. This remaining tree is a poor example of the species and it should be removed to both eliminate the multiple hazards associated with retention and to enable alternative plantings to be considered.

7.10 The final tree recommended for removal is a semi mature *Harpephyllum caffrum* located on the lower embankment adjacent to the site's southern boundary. This tree remains a small fraction of its full biological potential and the nature of the canopy will block all visual access to the harbour and foreshore for this area. As noted, this is an exotic tree species that is out of context in this portion of the site that currently supports several well established and significant palm species forming a grove that will allow visual access to the harbour, as they continue to grow towards full maturity.



Retention Value 1 High- Essential		Retention Value 2 Moderate		Retention Value 3 Low		Retention Value 4 Remove	
Retain	Remove	Retain	Remove	Retain	Remove	Retain	Remove
1, 19, 20, 25		17, 18, 21, 22, 23, 24	2, 4,5,6, 8, 11, 12, 13		3, 10, 15, 26		7, 9, 14, 16
Total: 4	Total: 0	Total: 6	Total: 8	Total: 0	Total: 4	Total: 0	Total: 4

8. Tree Protection Plan

8.1 This report will recommend the retention of Trees1, 17, 18, 19, 20, 21, 22, 23, 24 and 25. These will be retained via the implementation of the following list of recommendations. These have been based on our national standard for the *Protection of Trees on Development Sites AS4970.*

8.2 Removal recommendations have been made for Trees 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 and 26 for the following trees based on their location in relation to the construction. Additional removal recommendations have been made based on poor species characteristics and structure. These include Trees 3, 7, 9, 10, 14, 15, 16 and 26.

8.3 All construction works should be done from within the construction impact zone to limit the indirect impacts of the development process. No works are to be undertaken outside those detailed here. All Tree Protection Zones will be fenced off, marked as a Tree Protection Zone (TPZ) and mulched in accordance with the following conditions.

8.4 All documented trees have been assessed to identify construction impacts on adjacent and affected trees to assess both the health and condition, determine landscape significance and life expectancy. A determination for preservation, removal or transplantation will then be made based on sustainability and suitability within the setting. For the purpose of this report *Botanics* has assessed the likely impacts that the proposed development will have on the subject trees. This report has then provided recommendations in relation to the management of these, in accordance with Australian Standard (*AS*) 4970 for the Protection of Trees on Development Sites. Pruning and removal works will be based on *AS4373 for the Pruning* of *Amenity trees* where applicable.

8.15 All other trees documented for removal has been done to allow both the proposed works to occur and provide the opportunity for more appropriate replanting.

8.6 Any roots located in the excavation process will be cut cleanly at the edge of the proposed construction to limit the spread of decay and their exposure to the air and atmosphere.



8.7 All trees documented for preservation will be preserved with the implementation of the following list of *Tree Preservation Recommendations.* These have been based on our *National Standard for the Protection of Trees on Development Sites AS4970* and should be implemented during the construction process, where applicable.

8.8 Appointment of Site Arborist

A site arborist shall be appointed prior to the commencement of work on site. The Site Arborist shall clearly mark out all trees to be removed and ensure that all trees documented for retention are preserved with the implementation of the following tree protection measures. The Site Arborist shall have a minimum qualification equivalent to a NSW TAFE Certificate Level 5 or above in Arboriculture.

8.9 Inspection Points

Give 5 working days notice to allow inspections to be undertaken at the following stages;

Inspection Point	Inspection Personnel
Installation of Tree Protection Zones including Tree Protection Fencing, Silt Fencing and Signage	Site Arborist
Modification of the Tree Protection Zone	Site Arborist
Works within the Tree Protection Zone	Site Arborist
Completion of Construction Works	Site Arborist Site Supervisor.

8.10 Education

Contractors and site workers shall receive a copy of these specifications prior to the commencement of work. Contractors and site workers undertaking any works within a TPZ shall sign the site log to confirm that they have read and understand these specifications prior to their undertaking.

8.11 Tree Protection Zones

Where applicable, all trees to be retained through the construction process shall be protected from mechanical damage and the indirect impacts of the construction process with the installation of Tree Protection Zones. Unless otherwise stated, the following activities must not be carried out within a TPZ;

- modification of existing soil levels
- excavation or trenching
- cultivation of soil
- mechanical removal of vegetation
- movement of natural rock
- storage of materials, plant or equipment
- erection of site sheds
- affixing signage or hoarding to trees
- disposal of chemical waste or construction material
- any activity that may directly or indirectly affect the health of these or surrounding trees.

Page 9 of 15 Botanics Tree Wise People Pty Ltd. Po Box 500, Potts Point 2011. Ph 0411193366 Construction Impact Assessment and Management Plan for Kincoppal School.



Note: If access to a TPZ is required as part of the approved development, prior authorisation is required by the Site Arborist.

8.12 Tree Protection Fencing

Tree Protection Fencing shall be installed at the perimeter of the TPZ. As a minimum the Tree Protection Fencing shall be 1.8 meters high temporary chain supported by steel stakes. This shall be fastened and supported to prevent sideways movement. The trees woody roots shall not be damaged during the installation of this Tree Protection Fencing. This Tree Protection Fencing shall be erected prior to the commencement of works on site and shall be maintained for the duration of the construction process.

8.13 Signage

Tree Protection Signage shall be attached the the PTZ and displayed in a prominent location. These signs shall be repeated in 10m intervals or closer where the fence changes direction. These shall be a minimum of a 72 font size and each sign at-least 600 x 500mm.

8.14 Mulching

The area within the TPZ shall be mulched and maintained with 80mm of leaf litter mulch for the duration of the construction process. This mulch shall be spread by hand to limit the impact on underlying roots and shall be installed prior to the commencement of works on site.

8.15 The Site Arborist shall inspect and approve the TPZ including mulching. signage, Tree ProtectionFencing, Silt fencing and Signage prior to the commencement of works on site.

8.16 Site Management

Materials and waste storage, site sheds and temporary services shall not be located within the TPZ unless specified. Storage points shall be covered when not in use and be no greater than 2m in height.

8.17 Works within the TPZ

The TPZ may need to be modified during the works to allow access between the protected tree and the proposed construction. The TPZ shall remain as specified and only those works detailed in the proposed construction undertaken.

8.18 Completion of Works within specified TPZ

Upon the completion of works within a TPZ the protective fencing shall be reinstated as specified. Where the construction of new structures does not allow for the reinstallation of fencing the TPZ shall be modified by the Site Arborist.

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Disclaimer

All care has been taken to assess potential hazards, but trees are inherently dangerous. This assessment was carried out from the ground, and covers what was reasonable to be assessed at the time of inspection. No aerial or underground inspections were carried suability is accepted for damage or injury caused by trees and no responsibility is accept if the recommendations in this report are not adhered to. Limitations on the use of this report. This report is to be utilised in its entirety only. Any written or verbal submission that includes statements taken from this report may only be used where the whole report is referenced. Assumptions Care has been taken to obtain accurate information from reliable sources. Botanics can neither guarantee nor be responsible for the accuracy of information provided by others.

Page 10 of 15 Botanics Tree Wise People Pty Ltd. Po Box 500, Potts Point 2011. Ph 0411193366 Construction Impact Assessment and Management Plan for Kincoppal School.





Figure 1 Shows the poor basal development of the Silky Oak documented as Tree 2.

Figure 2 Shows the Podocarpus and Coral trees documented as Trees 3, 4 and 5.





Page 11 of 15 Botanics Tree Wise People Pty Ltd. Po Box 500, Potts Point 2011. Ph 0411193366 Construction Impact Assessment and Management Plan for Kincoppal School.

Figure 3 Shows the African Plum trees documented as Trees 11,12 and 13 required for removal.





Figure 4 Shows the Banksia and African Plum on the site's southern boundary.

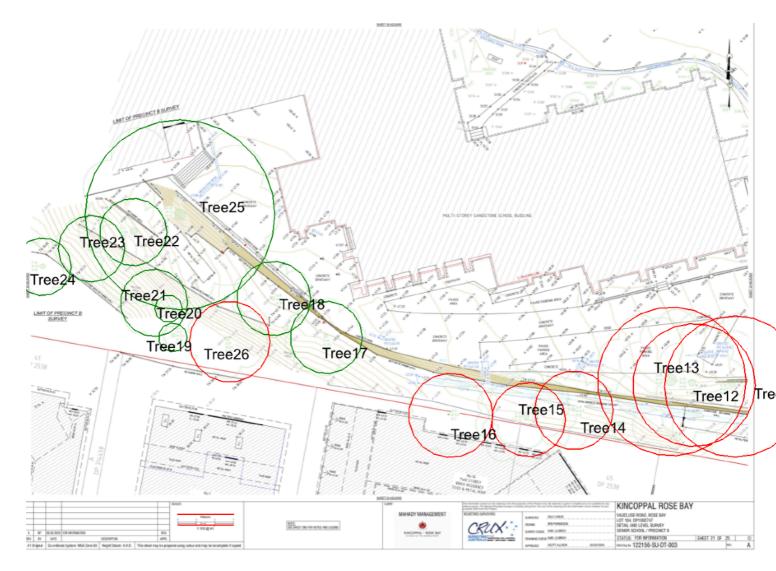


Figure 5 Shows the locations of the documented trees in relation to existing driveway.

Page 12 of 15 Botanics Tree Wise People Pty Ltd. Po Box 500, Potts Point 2011. Ph 0411193366 Construction Impact Assessment and Management Plan for Kincoppal School.



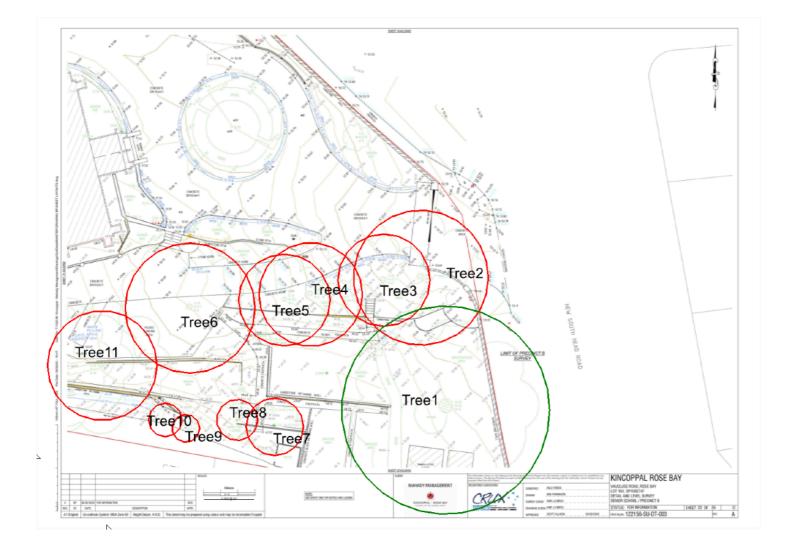


Figure 6 Shows the remainder of the trees documented in relation to the existing structures and topography.



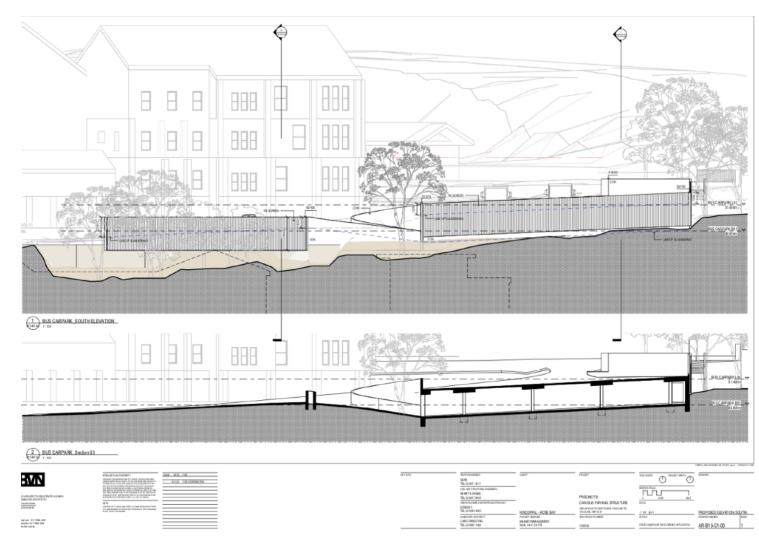


Figure 7 Shows the contour level changes proposed.



DEFINITIONS

COMMON NAME/GENUS SPECIES CULTIVAR – Common names can vary with selected texts. Where species is unknown, "sp." indicated after genus. Where cultivar is unknown "cv" indicated after species. The number in brackets e.g. (x9) after the species indicates the number of trees in this tree group.

DBH – Diameter at Breast Height. Tree trunk diameter measured at breast height (1.4 metres above ground level). Fabric diameter tape is used which assumes a circular cross section. Multiple measurements indicate multiple trunks. More than three trunks are indicated as "multi". Where DBH measurement cannot be taken at 1.4m the height at which it has been taken is indicated in the Comments column.

CANOPY SPREAD RADIUS – Average canopy radius (widest + narrowest 2). Circular canopy depictions on Tree Plan/ Survey are indicative only. Where canopy spread was significantly skewed, all four cardinal point measurements were recorded.

AGE CLASS – Immature (IM), Semi-mature (SM), Mature (M), Over-mature (OM). Assessment of the tree's current Age. A Mature (M) tree has reached a near stable size (biomass) above and below ground. Trees can have a Mature age class for >90% of life span. Over-mature (OM) trees show symptoms of irreversible decline and decreasing biomass.

VIGOUR–Good(G), Fair(F)orPoor(P). The general appearance of the canopy/foliage of the tree at the time of inspection. Vigour can vary with the season and rainfall frequency. A tree can have Good vigour but be hazardous due to Poor condition. A tree in Good vigour has the ability to sustain its life processes. Vigour is synonymous with health.

CONDITION – Good (G), Fair (F) or Poor (P). The general form and structure of the trunk/s and branching. Trunk lean, trunk/branch structural defects, canopy skewness or other hazard features are considered.

SRZ RADIUS – Structural Root Zone. The area around a tree required for tree stability. Earthworks should be prohibited within the SRZ. The area is calculated from the formula and graph at Figure 1 of AS4970-2009. The SRZ graph has been adapted from the work of Claus Mattheck (1994). DBH has been used instead of stem diameter above root buttress in the calculation of SRZ. 0.1m has been added to SRZ to allow for minor increases in stem diameter.

TPZ RADIUS – Tree Protection Zone. Radial offset (m) of twelve times (12X) trunk DBH measured from centre of trunk (for trees less than 0.3 metre DBH minimum TPZ is 2.0 metres). To satisfactorily retain the tree construction activity (both soil cut and fill) must be restricted within this offset. TPZ offsets are rounded to the nearest 0.1 metre. Existing constraints to root spread can vary TPZ. Generally an area equivalent to the TPZ should be available to the tree post development. Encroachment occupying up to 10% of the TPZ area is acceptable without detailed root zone assessment. Encroachments greater than 10% require specific arboricultural assessment.

SULE – Safe Useful Life Expectancy. A systematic pre-development tree assessment procedure developed by Jeremy Barrell, Hampshire, England. The SULE method used in this assessment has been adapted forsimplified use within the field. It gives a length of time that the Arborist feels a particular tree can be retained with an acceptable level of risk based on the information available at the time of the inspection. SULE ratings are Long (retainable for 40 years or more



with an acceptable level of risk), Medium (retainable for 16-39 years), Short (retainable for 5-15 years) and Removal (tree requiring immediate removal due to imminent hazard or absolute unsuitability).

RECOMMENDATIONS – Retain (R), Retain Plus (R+), Transplant (T) or Remove (Rm).

COMMENTS – Comments relating to the location, surroundings and hazard potential of the trees at the time of inspection and where applicable the reason for removal.