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Project No: MA/ME/10

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ARBORICULTURAL ASSESSMENT REPORT & TREE PROTECTION SPECIFICATION

Marrickville Metro

Prepared For:

Site Image Landscape Architects

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1.0 INTRODUCTION

1.1 Background

This Arboricultural Assessment Report/Tree Protection Specification was prepared for Site Image Landscape Architects. It is understood that this report is to accompany a Concept Plan Application under Part 3A of the *Environmental Planning and Assessment Act 1979* for the proposed redevelopment of the Marrickville Metro Shopping Centre (subject site).

In preparing this report the author is aware of and has taken into account the objectives of the Marrickville Council's *Tree Preservation Order 2007*. Refer to **Appendix 1:** Methodology.

NOTE: Reference should be made to any relevant legislation including Tree Preservation Orders i.e. permission to undertake tree pruning/removal should be sought from Council.

1.2 Aims

The aims of this report are to:

- Review Council's Policies for applicable conditions regarding the preparation of Arboricultural Reports;
- Conduct a visual assessment of the subject trees and their growing environment;
- Review the supplied plans to determine the impact on the subject trees;
- Where appropriate, recommend the use of sensitive construction methods to minimise the adverse impacts on the subject trees;
- Prepare site specific tree protection measures for the subject trees to be retained.

There is no warranty or guarantee, expressed or implied that the problems or deficiencies regarding the subject trees or the subject site may not arise in the future. Information contained in this report covers only the subject tree that was assessed and reflects the condition of the subject tree at the time of inspection.

2.0 RESULTS

2.1 Site Description

Marrickville Metro Shopping Centre is located at 34 Victoria Road, Marrickville. The existing shopping centre fronts Victoria Road to the north, Murray Street to the east and Smidmore Street to the south, and is adjoined by single storey residential dwellings to the west. The shopping centre is predominantly a single level retail building with car parking located at roof top level with existing vehicle ramp access via Smidmore Street and Murray Street.

Figure 1: *Showing site Location Plan*

The land at 13-55 Edinburgh Road is located to the south of Smidmore Street and is bounded by Edinburgh Road and Murray Street. This site is currently used as a warehouse with associated ground level car parking.

The shopping centre is located within an established residential and industrial precinct surrounded by small lot residential housing to the north and west, and predominantly industrial land comprising larger allotments and larger building scales to the south and east.

2.2 Existing Vegetation

Site vegetation consists predominantly of large canopy trees species such as *Lophestemon confertus* (Brush Box), *Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig), *Cinnamomum camphora* (Camphor Laurel) and *Celtis* spp. (Celtis).

Figure 2: *Showing site vegetation*

2.3 Tree Assessment

Eighty-seven (87) trees have been surveyed as part of this assessment. The surveyed trees were assessed as generally being in fair health and structure. Full results of the tree assessment are shown in **Appendix 2**: Tree Assessment Schedule. Tree numbers correlate with the Site Survey attached as **Appendix 3**.

2.4 Description of Proposed Works

The proposed development includes the construction of retail shops on the south side of Smidmore Street, car parking and docking areas on the northern side of Smidmore Street and remedial works to the masonry walls of the existing centre. Landscape treatment including rain gardens and replanting is also proposed.

Refer to **Appendix 4**: Landscape Master Plan

3.0 DISCUSSION

3.1 Trees and Development

In August 2009, *Australian Standard 4970-2009: Protection of Trees on Development Sites* was released. This document describes the best practices for the planning and protection of trees on development sites. It does not set out to put arguments for or against development, or for the removal or retention of trees (AS-4970, 2009).

Clause 3.2 of the Australian Standard outlines that the Tree Protection Zone (TPZ) should be calculated as a radial measurement based on twelve (12) times the Diameter at Breast Height (DBH). A TPZ should not be less than 2 m nor greater than 15 m (except where crown protection is required). The TPZ of palms, other monocots, cycads and tree ferns should not be less than 1 m outside the crown projection (AS-4970, 2009).

Furthermore, in some cases it may be possible to encroach into or make variations to the standard TPZ. If the proposed encroachment is less than 10% of the area of the TPZ and is outside the Structural Root Zone (SRZ) (Refer Appendix 5), detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. This is described as a *Minor Encroachment* within the Australian Standard (AS-4970, 2009).

An encroachment greater than 10% of the TPZ or inside the SRZ is described as a *Major Encroachment* within the Australian Standard. In this situation the project arborist must demonstrate that the tree(s) would remain viable. This may require root investigation by non-destructive methods. Root investigations provide information on the size and number of roots to be affected by the proposed development. The area lost to this encroachment should be compensated for elsewhere and contiguous within the TPZ (AS-4970, 2009).

In addition, variations to the TPZ must consider relevant factors such as (AS-4970, 2009):

(a) Location and distribution of the roots to be determined through non-destructive investigation methods
(b) The potential loss of root mass resulting from the encroachment: number and size of roots.
(c) Tree species and tolerance to root disturbance.
(d) Age, vigour and size of the tree.
(e) Lean and stability of the tree.
(f) Soil characteristics and volume, topography and drainage.
(g) The presence of existing or past structures or obstacles affecting root growth.
(h) Design factors such as sensitive construction techniques (pier and beam, suspended slabs, cantilevered building sections, screw piles and contiguous piling.

Further information on the *Australian Standard 4970-2009: Protection of Trees on Development Sites* is outlined in **Appendix 4**.

3.2 Trees Proposed for Removal

The supplied plans indicate that the proposed works will require the removal of thirty six (36) trees. Of these, twelve (12) trees are positioned within the proposed building/vehicular access footprint. A further twenty four (24) trees are proposed for removal as part of the landscape treatment.

Of these thirty six (36) trees;

- Trees 35, 77 and 81 have been allocated a Retention Value of *Priority for Retention.*
- Trees 32, 36, 43-47, 49-56, 58-67 and 78-80 have been allocated a Retention Value of *Consider for Retention.*
- Trees 37, 42, 48, 57 and 68 have been allocated a Retention Value of *Priority for Removal*

3.2.1 Tree 32 *Schinus molle* var. areira (Peppercorn Tree)

Tree 32 has been identified as *Schinus molle* var. areira (Peppercorn Tree). This tree has been assessed as being in fair structure due to the presence of basal decay and mature epicormic growth. This tree has high Landscape Significance, a Remaining Life Expectancy Range of 5-15 years and has been allocated a Retention Value of *Consider for Retention*.

The supplied plans indicate that this tree will need to be removed to accommodate the proposed landscape treatment (public art).

3.2.2 Trees 35, 36 and 37 (Mixed Species)

Trees 35, 36 and 37 are mixed species plantings which have been allocated Retention Values of *Priority for Retention, Consider for Retention and Priority for Removal* respectively.

The supplied plans indicate these trees will need to be removed to accommodate the proposed building extension.

3.2.3 Trees 42 *Celtis sinensis* (Celtis)

Tree 42 has been identified as *Celtis sinensis* (Celtis) which is located on the road reserve of Victoria Road and is a Council managed tree. This tree has been assessed as being in poor structure due to included junctions of co-dominant stems. Tree 42 has moderate Landscape Significance, a Remaining Life Expectancy Range of less than 5 years and has been allocated a Retention Value of *Priority for Removal.*

The supplied plans indicate this tree will need to be removed to accommodate the proposed landscape treatment.

3.2.4 Trees 43-64 *Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)

Trees 43-64 have been identified as *Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig) which are located on the outside of the Metro building on the Murray Street frontage.

These trees have been assessed as being in fair health due to the small diameter deadwood throughout their canopies and a reduced canopy cover of approximately 60-70% (comparative to the same species growing in ideal site and environmental conditions).

The structure of these trees has been assessed as being fair to poor due to the majority of first order branches being mature epicormic growth resultant from lopping. Wounds with possible decay were also noted at branch attachments on the main stem of several of these trees.

Figure 3: *Showing mature epicormic growth, a split branch and wounds with decay on Tree 48*

These trees have been planted within close proximity to the masonry walls surrounding the site. The root spread of these trees is likely to be limited due to the adjacent walls, concrete kerbing and planter boxes. The majority of the canopies of these trees extend over pedestrian paths and the adjacent road.

The supplied plans indicate these trees will need to be removed to accommodate the proposed landscape treatment. These works include the installation of rain gardens along the road reserve which capture stormwater from the street. Replacement tree planting (*Syncarpia glomulifera)* is also proposed as part of these works.

3.2.5 Trees 65, 66 & 67 *Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)

Trees 65, 66 and 67 are positioned on the northern side of Smidmore Street. These trees have high Landscape Significance, a Remaining life Expectancy Range of 5-15 years and have been allocated a Retention Value of *Consider for Retention.*

These trees have been assessed as being in fair health due to the small diameter deadwood throughout their canopies. The structure of these trees has also been assessed as fair due to the presence of co-dominant inclusions.

The supplied plans indicate these trees will need to be removed to accommodate the proposed building extension.

3.2.6 Tree 68 (Group of 7) *Acacia* spp. (Wattle)

Tree 68 is a group of seven (7) trees located on the northern side of Smidmore Street. They have been identified as *Acacia* spp. (Wattle). These trees have been assessed as being in fair health and structure.

Figure 4: *Showing Trees 68*

These trees have low Landscape Significance, a Remaining Life Expectance Range of less than 5 years and have been allocated a Retention Value of *Priority for Removal.*

The supplied plans indicate these trees will need to be removed to accommodate the proposed building extension.

3.2.7 Trees 77-81 *Corymbia citriodora* (Lemon-scented Gum) & *Eucalyptus* spp.

Trees 77-81 have been identified as *Corymbia citriodora* (Lemon-scented Gum) and *Eucalyptus* spp. (Gum Tree) which are Council-managed trees positioned on the road reserve on the southern side of Smidmore Street.

These trees have been assessed as being in good to fair health and good structure. However, recent storm damage was also noted in Tree 77.

Figure 5: *Showing Corymbia citriodora*

The supplied plans indicate that a retail shopping building is to be positioned in the land at 13-55 Edinburgh Road which is located to the south of Smidmore Street. Vehicular access from Smidmore Street is to be constructed in the southern and northern parts of the development. Trees 77-81 will need to be removed to accommodate the proposed vehicular access.

3.3 No Works within TPZ

The supplied plans indicate that no works are proposed within the Tree Protection Zone (TPZ) of twenty four (24) trees. These trees should not be impacted by the proposed works.

Of these twenty four (24) trees;

- Tree 28 has been allocated a Retention Value of *Priority for Retention.*
- Trees 1-19 and 85-87 have been allocated a Retention Value of *Consider for Retention.*
- Tree 29 has been allocated a Retention Value of *Priority for Removal.*

3.3.1 Trees 1 and 28 *Lophostemon confertus* (Brush Box)

Trees 1 and 28 have been identified as *Lophostemon confertus* (Brush Box) which are located on the road reserve of Victoria Road and are Council managed trees. Tree 1 has been assessed as being in fair health due to it being suppressed by adjacent trees. It has been assessed as being in good structure. This tree has been allocated a moderate Landscape Significance, a Remaining Life Expectancy Range of 5-15 years and a Retention Value of *Consider for Retention.*

Tree 28 has been assessed as being good health and fair structure due to the majority of first order branches being mature epicormic growth resultant from lopping. This tree has high Landscape Significance, a Remaining Life Expectancy Range of 15-40 years and has been allocated a Retention Value of *Priority for Retention*.

3.3.2 Trees 2-8 and 10-19 *Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)

Trees 2-8 and 10-18 have been identified as *Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig) which are located on the outside of the Metro building on the Victoria Road frontage.

Figure 6: *Showing Hills Weeping Figs along Victoria Road*

These trees have been planted within close proximity to the masonry walls surrounding the site. The root spread of these trees is likely to be limited due to the adjacent walls, concrete kerbing and planter boxes. The majority of the canopies of these trees extend over pedestrian paths and the adjacent road.

These trees have been assessed as being in fair health due to the small diameter deadwood throughout the canopies and a reduced canopy cover of approximately 60-70% (comparative to the same species growing in ideal site and environmental conditions).

The structure of these trees has been assessed as fair to poor due to the majority of first order branches being mature epicormic growth resultant from lopping. Wounds with possible decay were also noted at branch attachments on the main stem of several of these trees.

These trees have high Landscape Significance, a Remaining Life Expectancy Range of 5-15 years and have been allocated a Retention Value of *Consider for Retention*.

Some branches from these trees are in contact with or are in close proximity to the adjacent wall and roof. These branches should be removed by Selective Pruning. Canopy pruning may also be required to provide building clearance and for access during construction. All pruning work should be undertaken in accordance with *AS4373: Pruning of Amenity Trees* (2007) and the *Workcover Code of Practice for the Amenity Tree Industry* (1998).

Figure 7: *Showing contact of branch on wall*

All pruning should be carried out by an experienced and qualified Arborist. The Arborist should hold a minimum qualification equivalent (using the Australian Qualifications Framework) of NSW TAFE Certificate Level 3 or above, in Arboriculture and a NSW TAFE Tree Surgery Certificate or its recognised equivalent.

3.3.3 Tree 9 *Schinus molle* var.areira (Peppercorn Tree)

Tree 9 has been identified as *Schinus molle* var.areira (Peppercorn Tree) which is a Council-managed tree located on the road reserve of Victoria Road. This tree has been assessed as being in good health and structure with normal deadwood throughout the canopy. This tree has high Landscape Significance, a Remaining Life Expectancy Range of 5-15 years and has been allocated a Retention Value of *Consider for Retention*.

3.3.4 Tree 29 *Lophostemon confertus* (Brush Box)

Tree 29 has been identified as *Lophostemon confertus* (Brush Box). This tree has been assessed as being in poor structure due to mature epicormic growth and wounds with possible decay on first order branches.

This tree has high Landscape Significance, a Remaining Life Expectancy Range of less than 5 years and has been allocated a Retention Value of *Priority for Removal*.

Further investigation in the form of an internal diagnostic test should be undertaken if this tree is to be retained. There are a number of instruments used to assess wood defects in trees. All methods should be approached with caution and testing should only be carried out when necessary to establish the 'physical' size/ width of remaining supportive tissue to allow a calculable risk analysis of the tree's stability to be made. Both the testing and the interpretation of the resultant data should always be undertaken by an appropriately qualified consultant.

3.3.5 Tree 31 *Celtis sinensis* (Nettle Tree)

Tree 31 has been identified as *Celtis sinensis* (Nettle Tree). This tree has been assessed as being in poor structure due to restricted root volume and girdled roots. Tree 31 has low Landscape Significance, a Remaining Life Expectancy Range of less than 5 years and has been allocated a Retention Value of *Priority for Removal*.

3.3.6 Trees 85-87 *Callistemon viminalis* (Weeping Bottle Brush)

Trees 85-87 have been identified as *Callistemon viminalis* (Weeping Bottle Brush) located on the eastern side of Murray Street. These trees have moderate Landscape Significance, a Remaining Life Expectance Range of 5-15 years and have been allocated a Retention Value of *Consider for Retention.*

3.4 Major Encroachment

The supplied plans indicate that works are proposed within the TPZ of twenty seven (27) trees. The extent of these works is considered a *Major Encroachment* as defined by the Australian Standard. Of these:

- Trees 30, 33, 34, 38, 40, 41, 75, 76, 82 and 84 have been allocated a Retention Value of *Priority for Retention.*
- Trees 20, 25, 27, 69, 72 and 83 have been allocated a Retention Value of *Consider for Retention.*
- Trees 21- 24 and 26 have been allocated a Retention Value of *Consider for Removal.*
- Trees 31, 39, 70, 71, 73 and 74 have been allocated a Retention Value of *Priority for Removal.*

3.4.1 Trees 33, 34 and 38-41 *Lophostemon confertus* (Brush Box)

Trees 33-34 and 38-41 have been identified as *Lophostemon confertus* (Brush Box) which are positioned on the road reserve of Victoria Road. These are Council-managed trees which have been assessed as being in good health and fair structure. The majority of first order branches originating from the main stems are mature epicormic growth resultant from lopping.

Figure 8: *Showing lopped points of Brush Box*

These trees have high Landscape Significance and a Remaining Life Expectance Range of 15-40 years.

The supplied plans indicate works in the vicinity of these trees includes an addition to the existing building and the installation of rain gardens along the road reserve which capture stormwater from the street. The construction of the proposed rainwater garden is to be undertaken within the TPZ of Trees 33, 34 and 38-41. To minimize the impact on these trees, tree sensitive construction techniques and materials should be used for the construction of the rain gardens and installation of the stormwater capturing infrastructure.

3.4.2 Tree 20 *Ficus macrophylla* (Moreton Bay Fig)

Tree 20 has been identified as *Ficus macrophylla* (Moreton Bay Fig). This tree has been assessed as being in fair health due to the canopy being comprised predominately of epicormic growth and the presence of small and large diameter deadwood throughout its canopy. The structure of this tree has also been assessed as being poor evidenced by the wounds with possible decay on the main stem and first order branches. Mechanical damage likely the result of lawn mower equipment was also noted on several surface roots.

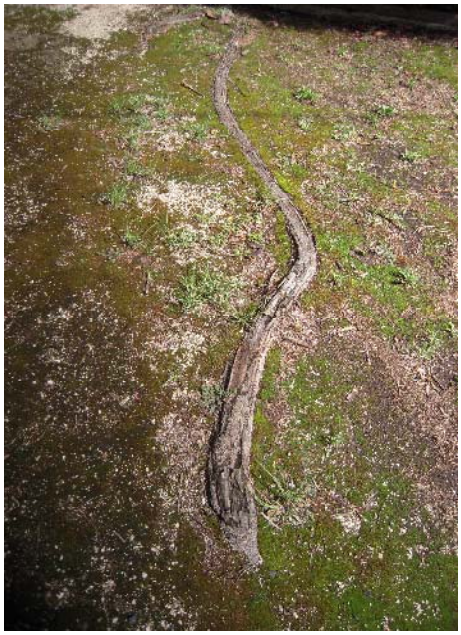

Figure 9: *Showing damage to exposed roots of Tree 20*

This tree has high Landscape Significance, a Remaining Life Expectancy Range of 5-15 years and has been allocated a Retention Value of *Consider for Retention*. It is understood that this is a heritage-listed tree. If this tree is to be retained, internal diagnostic testing should be undertaken to determine the presence and extent of decay (refer to Section 3.3.4).

The supplied plans indicate that the works adjacent to this tree include the re-alignment of the pedestrian path to the east of the tree as soft landscaping works. To minimize the impact on this tree, a semi-permeable pavement should be used within the TPZ of Tree 20. The pavement should also be placed above grade to minimize the need for excavation and the strength of the pavement should be selected to reduce the reliance on sub-base for strength. The sub-base material should be gap-graded and coarser than the existing soil texture. The sub-base material should not contain a high percentage of fines.

3.4.3 Trees 21-27 (Mixed Species)

This group of trees consists of a mixed species planting which is positioned in the northern area of the site, adjacent to the Victoria Road frontage. The supplied plans indicate that works adjacent to Trees 21-27 include the establishment of a level open seated area. To minimize the impact on these trees, tree sensitive construction techniques and materials such as timber decking should be used adjacent to these trees.

Trees 21, 23, 24, 26 and 27: These trees have been identified as *Celtis sinensis* (Nettle Tree). These trees have low Landscape Significance and have been allocated a Retention Value of *Consider for Removal.*

Tree 22: This tree has been identified as *Agonis flexuosa* (Willow Myrtle). This tree has poor structure due to a wound with possible decay and major branch inclusions. This tree has low Landscape Significance, a Remaining Life Expectancy Range of 5-15 years and has been allocated a Retention Value of *Consider for Removal*.

Tree 25: This tree has been identified as *Cinnamomum camphora* (Camphor Laurel). This tree has fair health evidenced by the small and large diameter deadwood throughout its canopy and a reduced canopy cover of approximately 70% (comparative to the same species growing in ideal site and environmental conditions). The structure of this tree has been assessed as poor due to wounds with decay at the base of the stem and throughout the tree.

This tree has high Landscape Significance, a Remaining Life Expectancy Range of less than 5 years and has been allocated a Retention Value of *Consider for Removal*. If this tree is to be retained, internal diagnostic testing should be undertaken to determine the presence and extent of decay (refer to Section 3.3.4).

Figure 10: *Showing Tree 25*

3.4.4 Trees 30

Tree 30 has been identified as *Washingtonia spp.* (Fan Palm) and has been assessed as being in good health and structure. The supplied plans indicate a pedestrian ramp is proposed near the base of this tree. Further investigation in the form of exploratory root trenching should be undertaken to determine the presence and extent of root spread, and the impact of the proposed development on this tree.

3.4.5 Tree 69-74 *Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)

Trees 69-74 have been identified as *Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig) and are located on the northern side of Smidmore Street. These trees have been assessed as being in good health and fair to poor structure due to the presence of co-dominant inclusions.

The supplied plans indicate that vehicular access is proposed within the TPZ of these trees. To minimize the impact on this tree, tree sensitive construction techniques and materials should be used within these trees' TPZ. These methods may include the use of an isolated pier and beam footing system or a cantilevered slab.

3.4.6 Trees 75-76 and 82-84 *Corymbia citriodora* (Lemon-scented Gum) & *Eucalyptus* spp.

Trees 75-76 and 82-84 have been identified as *Corymbia citriodora* (Lemon-scented Gum) and *Eucalyptus* spp. (Gum Tree) which are Council-managed trees positioned on the road reserve on the southern side of Smidmore Street. These trees have been assessed as being in good to fair health and good structure. The extent of root spread of these trees is difficult to predict due to the existing structures such as kerbing, paths and buildings.

Figure 11: *Showing Corymbia citriodora*

<u>Trees 75 and 76:</u> The supplied plans indicate that vehicular access is proposed within the TPZ of these trees.

To minimize the impact on this tree, tree sensitive construction techniques and materials should be used within these trees' TPZ.

<u>Trees 82, 83 and 84:</u> The supplied plans indicate that paving, raised turf pods and water features are proposed within the TPZ of these trees. Whilst an existing building is positioned approximately 3m south of these trees is likely to have impeded the spread of roots, further investigation in the form of exploratory root trenching should be undertaken to determine the presence and extent of root spread, and the impact of the proposed development on these trees.

Canopy pruning may also be required for Trees 75-76 and 82-84 to provide building clearance and for access during construction. All pruning work should be undertaken in accordance with *AS4373: Pruning of Amenity Trees* (2007) and the *Workcover Code of Practice for the Amenity Tree Industry* (1998).

All pruning should be carried out by an experienced and qualified Arborist. The Arborist shall hold a minimum qualification equivalent (using the Australian Qualifications Framework) of NSW TAFE Certificate Level 3 or above, in Arboriculture and a NSW TAFE Tree Surgery Certificate or its recognised equivalent.

4.0 CONCLUSIONS

4.1 Eighty-seven (87) trees have been surveyed as part of this assessment. The surveyed trees were assessed as generally having fair health and fair structure.

4.2 The proposed development includes the construction of retail shops on the south side of Smidmore Street, car parking and docking areas on the northern side of Smidmore Street and remedial works to the masonry walls of the existing centre. Landscape treatment including rain gardens and replanting is also proposed.

4.3 The supplied plans indicate that the proposed works will require the removal of thirty six (36) trees. Of these, twelve (12) trees are positioned within the proposed building/vehicular access footprint. A further twenty four (24) trees are proposed for removal as part of the landscape treatment.

4.4 The supplied plans indicate that no works are proposed within the Tree Protection Zone (TPZ) of twenty four (24) trees. These trees should not be impacted by the proposed works.

4.5 The supplied plans indicate that works are proposed within the TPZ of twenty seven (27) trees. The extent of these works is considered a *Major Encroachment* as defined by the Australian Standard. Further investigation in the form of exploratory root trenching should be undertaken to determine the extent of root spread and the impact of the proposed development on these trees. Alternatively, tree sensitive construction methods could be used within the TPZ of these trees.

4.6 Some branches from Trees 2-8 and 10-19 are in contact with or are in close proximity to the adjacent existing wall and roof. These branches should be removed by Selective Pruning. Canopy pruning may also be required to provide building clearance and for access during construction for Trees 2-8, 10-19, 75-76 and 82-84. All pruning work should be undertaken in accordance with *AS4373: Pruning of Amenity Trees* (2007), the *Workcover Code of Practice for the Amenity Tree Industry* (1998) and as outlined with Section 3.2.

4.7 Wounds with possible decay were noted on Trees 20, 25, 29. If these trees are to be retained, internal diagnostic testing should be undertaken to determine the presence and extent of decay.

4.8 Trees 48 and 57 have structural defects which require their immediate removal.

4.9 The trees to be retained should be protected in accordance with the Tree Protection Specifications outlined in **Appendix 6.**

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6.0 APPENDICES

Appendix 1: Methodology

- This report was determined as a result of a comprehensive site inspection during February 2010. The comments and recommendations in this report are based on findings from this site inspection.

- The subject trees were visually assessed from the ground using the standard visual tree assessment criteria and notes. The inspection was limited to a visual examination of the subject trees from ground level without dissection, probing or coring. No woody tissue testing was undertaken as part of this assessment. Trees outside the subject site were assessed from the property boundaries only.

- Tree height and canopy spread were estimated only.

- Diameter at Breast Height (DBH) was measured as outlined in the *Australian Standard 4970-2009 Protection of Trees on Development Sites*.

- The location of the subject trees was determined from the Site Survey (Ref: Ch4331.057) attached as **Appendix 3**. A number of trees were not shown on this plan. Their approximate location has been plotted on this plan.

- Details of the proposed development were determined from the Landscape Master Plan attached as **Appendix 4.**

- Tree Protection Measures, Tree Protection Zones and Sensitive Construction Methods for the subject trees were based on methods outlined in *Australian Standard 4970-2009 Protection of Trees on Development Sites*. **Refer to Appendix 5**.

- Tree health was determined by assessing:-
  I. Foliage size and colour
  II. Pest and disease infestation
  III. Extension growth
  IV. Canopy density
  V. Percentage of deadwood
  VI. Presence of epicormic growth

- Tree structure was assessed by: -
  I. Visible evidence of structural defects or instability
  II. Evidence of previous pruning or physical damage

- The Remaining Life Expectancy Range (RLER) is an estimate of the longevity of the subject trees in their existing growing conditions. This was calculated by estimating the expected lifespan of the species, less the subject trees' estimated current age. The trees have been allocated one of the following Remaining Life Expectancy Ranges:
  I. 40 years +
  II. 15-40 years
  III. 5-15 years
  IV. Less than 5 years
  V. Dead or Immediate Removal

- Landscape Significance was determined by assessing the combination of the cultural, environmental and aesthetic values of the subject trees. Whilst these values are subjective, a rating of high, moderate, low or insignificant has been allocated to the trees. This provides a relative value of the trees' Landscape Significance which may aid in determining their Retention Value.

Landscape Significance	Description
High	The subject tree is listed as a Heritage Item under the *Local Environmental Plan* with a local or state level of significance.
	The subject tree is listed as a Heritage Item under the *Local Environmental Plan* with a local or state level of significance.
	The subject tree forms part of the curtilage of a heritage item.
	The subject tree creates a 'sense of place' or is considered 'landmark' tree.
	The subject tree is of local, cultural or historical importance or is widely known.
	The subject tree is listed on Council's Significance Tree Register.
	The subject tree is scheduled as a Threatened Species or Threatened Plant Community under the *Threatened Species Conservation Act* (1995).
	The subject tree is a remnant tree.
	The subject tree is a locally indigenous species and is representative of the original vegetation of the area.
	The subject tree provides habitat to a threatened species.
	The subject tree is an excellent representative of the species in terms of aesthetic value.
Moderate	The subject tree makes a positive contribution to the visual character or amenity of the area.
	The subject tree provides a specific function such as screening or minimising the scale of a building.
	The subject tree has a known habitat value.
	The subject tree is a good representative of the species in terms of aesthetic value.
Low	The subject tree is an environmental pest species or is exempt under the provisions of the local Council's Tree Preservation Order.
	The subject tree makes little or no contribution to the amenity of the locality.
	The subject tree is a poor representative of the species in terms of aesthetic value.
Insignificant	The subject tree is declared a Noxious Weed under the Noxious Weeds Act

NOTE: If the tree can be categorised into more than one value, the higher value should be allocated.

- Retention Value was based on the subject tree's Remaining Life Expectancy Range and Landscape Significance. The Retention Value was modified where necessary to take in consideration the subject tree's health, structure and site suitability. The subject trees have been allocated one of the following Retention Values:-

  I. Priority for Retention
  II. Consider for Retention
  III. Consider for Removal
  IV. Priority for Removal

RLER	LANDSCAPE SIGNIFICANCE			
	High	Moderate	Low	Insignificant
40 years +	PRIORITY FOR RETENTION		CONSIDER FOR REMOVAL	PRIORITY FOR REMOVAL
15-40 years	PRIORITY FOR RETENTION	CONSIDER FOR RETENTION	CONSIDER FOR REMOVAL	
5-15 years	CONSIDER FOR RETENTION		CONSIDER FOR REMOVAL	
Less than 5 years	PRIORITY FOR REMOVAL			
Dead/Immediate Removal				

Appendix 2: Tree Assessment Schedule

Tree No	Botanical Name	DBH (mm)	Height (m)	Spread (m)	Health Rating	Structure Rating	Comments	L/Sign	R/L/E/R	Retention Value	TPZ (mm)	Implication
1	*Lophostemon confertus* (Brush Box)	300	8	5	Fair	Good	Suppressed. Phototrophic lean due to suppression.	Moderate	5-15	Consider for Retention	3600	No works within TPZ.
2	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	700	12	10	Fair	Fair	Previously lopped. Mature epicormic growth. Recent branch failure/s. Wound with possible decay. Small diameter deadwood. Reduced canopy cover 60%.	High	5-15	Consider for Retention	8400	No works within TPZ.
3	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	700	12	10	Fair	Fair	Previously lopped. Mature epicormic growth. Branches touching roof. Small diameter deadwood. Reduced canopy cover 60%.	High	5-15	Consider for Retention	8400	No works within TPZ.
4	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500	12	10	Fair	Fair	Previously lopped. Mature epicormic growth. Recent branch failure/s. Wound with possible decay. Small diameter deadwood. Reduced canopy cover 60%.	High	5-15	Consider for Retention	6000	No works within TPZ.

Tree No	Botanical Name	DBH (mm)	Height (m)	Spread (m)	Health Rating	Structure Rating	Comments	L/Sign	R/L/E/R	Retention Value	TPZ (mm)	Implication
5	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	700	12	10	Fair	Fair	Previously lopped. Mature epicormic growth. Recent branch failure/s. Wound with possible decay. Small diameter deadwood. Reduced canopy cover 60%.	High	5-15	Consider for Retention	8400	No works within TPZ.
6	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	700	12	10	Fair	Fair	Previously lopped. Mature epicormic growth. Recent branch failure/s. Wound with possible decay. Small diameter deadwood. Reduced canopy cover 60%.	High	5-15	Consider for Retention	8400	No works within TPZ.
7	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	700	12	10	Fair	Fair	Previously lopped. Mature epicormic growth. Recent branch failure/s. Wound with possible decay. Small diameter deadwood. Reduced canopy cover 60%.	High	5-15	Consider for Retention	8400	No works within TPZ.
8	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500	12	10	Fair	Fair	Previously lopped. Mature epicormic growth. Recent branch failure/s. Wound with possible decay. Small diameter deadwood. Reduced canopy cover 60%.	High	5-15	Consider for Retention	6000	No works within TPZ.
9	*Schinus molle* var.areira (Peppercorn Tree)	400	9	8	Good	Good	Normal deadwood.	High	5-15	Consider for Retention	4800	No works within TPZ.

Tree No	Botanical Name	DBH (mm)	Height (m)	Spread (m)	Health Rating	Structure Rating	Comments	L/Sign	R/L/E/R	Retention Value	TPZ (mm)	Implication
10	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500 (Co dominant @ 800)	12	10	Fair	Fair	Co-dominant inclusion. Small diameter deadwood. Reduced canopy cover 60%.	High	5-15	Consider for Retention	6000	No works within TPZ.
11	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500 (Co dominant @ 800)	12	10	Fair	Fair	Co-dominant inclusion. Small diameter deadwood. Reduced canopy cover 60%.	High	5-15	Consider for Retention	6000	No works within TPZ.
12	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	600 (Co dominant @ 800)	12	10	Fair	Fair	Co-dominant inclusion. Small diameter deadwood. Reduced canopy cover 60%.	High	5-15	Consider for Retention	7200	No works within TPZ.
13	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	700	12	10	Fair	Fair	Previously lopped. Mature epicormic growth. Recent branch failure/s. Wound with possible decay. Small diameter deadwood. Reduced canopy cover 60%.	High	5-15	Consider for Retention	8400	No works within TPZ.
14	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	400	12	10	Fair	Fair	Previously lopped. Mature epicormic growth. Recent branch failure/s. Wound with possible decay. Small diameter deadwood. Reduced canopy cover 60%.	High	5-15	Consider for Retention	4800	No works within TPZ.

Tree No	Botanical Name	DBH (mm)	Height (m)	Spread (m)	Health Rating	Structure Rating	Comments	L/Sign	R/L/E/R	Retention Value	TPZ (mm)	Implication
15	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	300 (Co dominant @ 1.5)	12	10	Fair	Fair	Co-dominant inclusion. Small diameter deadwood. Reduced canopy cover 60%. Celtis at base.	High	5-15	Consider for Retention	3600	No works within TPZ.
16	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	300	12	10	Fair	Fair	Previously lopped. Mature epicormic growth. Recent branch failure/s. Wound with possible decay. Small diameter deadwood. Reduced canopy cover 60%.	High	5-15	Consider for Retention	3600	No works within TPZ.
17	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500	12	10	Fair	Fair	Previously lopped. Mature epicormic growth. Recent branch failure/s. Wound with possible decay. Small diameter deadwood. Reduced canopy cover 60%.	High	5-15	Consider for Retention	6000	No works within TPZ.
18	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500	12	10	Fair	Fair	Previously lopped. Mature epicormic growth. Recent branch failure/s. Wound with possible decay. Small diameter deadwood. Reduced canopy cover 60%.	High	5-15	Consider for Retention	6000	No works within TPZ.

Tree No	Botanical Name	DBH (mm)	Height (m)	Spread (m)	Health Rating	Structure Rating	Comments	L/Sign	R/L/E/R	Retention Value	TPZ (mm)	Implication
19	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	800	12	10	Fair	Fair	Previously lopped. Mature epicormic growth. Recent branch failure/s. Wound with possible decay. Small diameter deadwood. Reduced canopy cover 60%.	High	5-15	Consider for Retention	9600	No works within TPZ.
20	*Ficus macrophylla* (Moreton Bay Fig)	2500	13	20	Fair	Fair	Heritage tree. Canopy comprises mainly of epicormic growth. Small and large diameter deadwood. Wounds with possible decay. Mechanical damage to roots.	High	5-15	Consider for Retention	15000	Major encroachment. Proposed for retention.
21	*Celtis* sp. (Celtis)	100	7	4	Fair	Good	Suppressed.	Low	15-40	Consider for removal	1200	Major encroachment. Proposed for retention.
22	*Agonis flexuosa* (Willow Myrtle)	200	7	5	Good	Poor	Wound with possible decay. Major trunk/branch inclusions.	Low	5-15	Consider for removal	2400	Major encroachment. Proposed for retention.
23	*Celtis* sp. (Celtis)	100	7	4	Fair	Good	Suppressed.	Low	15-40	Consider for removal	1200	Major encroachment. Proposed for retention.
24	*Celtis* sp. (Celtis)	100	7	4	Fair	Good	Suppressed.	Low	15-40	Consider for removal	1200	Major encroachment. Proposed for retention.

Tree No	Botanical Name	DBH (mm)	Height (m)	Spread (m)	Health Rating	Structure Rating	Comments	L/Sign	R/L/E/R	Retention Value	TPZ (mm)	Implication
25	*Cinnamomum camphora* (Camphor Laurel)	1800	15	12	Fair	Poor	Wound with possible decay. Mature epicormic growth. Small and large diameter deadwood. Reduced canopy cover 70% Ficus elastic in stem	High	5-15	Consider for Retention	21600	Major encroachment. Proposed for retention.
26	*Celtis* sp. (Celtis)	150	7	4	Fair	Good	Suppressed.	Low	15-40	Consider for removal	1800	Major encroachment. Proposed for retention.
27	*Celtis* sp. (Celtis)	1000 (Multi x 3 @ grade)	15	15	Good	Poor	Co-dominant inclusion. Wound with possible decay.	Moderate	5-15	Consider for Retention	12000	Major encroachment. Proposed for retention.
28	*Lophostemon confertus* (Brush Box)	400	9	8	Good	Fair	Previously lopped. Mature epicormic growth. Sign in stem.	High	15-40	Priority for Retention	4800	No works within TPZ.
29	*Lophostemon confertus* (Brush Box)	600	10	8	Fair	Fair	Wounds with possible decay. Mature epicormic growth. Small diameter deadwood. Undertake internal diagnostic test if retained.	High	< 5	Priority for Removal	7200	No works within TPZ.
30	Washingtonia spp. (Fan Palm)	600	12	6	Good	Good	Superficial Wound.	High	15-40	Priority for Retention	7200	Major encroachment. Proposed for retention.
31	*Celtis* sp. (Celtis)	400	10	10	Good	Good	Girdled roots. Restricted soil volume.	Low	< 5	Priority for Removal	4800	Major encroachment. Proposed for retention.

Tree No	Botanical Name	DBH (mm)	Height (m)	Spread (m)	Health Rating	Structure Rating	Comments	L/Sign	R/L/E/R	Retention Value	TPZ (mm)	Implication
32	*Schinus molle* var.areira (Peppercorn Tree)	600 (Co dominant @ grade)	6	10	Good	Good	Mature epicormic growth. Previous failure. Normal deadwood.	High	5-15	Consider for Retention	7200	Landscape treatment. Remove.
33	*Lophostemon confertus* (Brush Box)	400	9	8	Good	Fair	Previously lopped. Mature epicormic growth.	High	15-40	Priority for Retention	4800	Major encroachment. Proposed for retention.
34	*Lophostemon confertus* (Brush Box)	400	9	8	Good	Fair	Previously lopped. Mature epicormic growth.	High	15-40	Priority for Retention	4800	Major encroachment. Proposed for retention.
35	*Lophostemon confertus* (Brush Box)	700	15	15	Good	Good		High	15-40	Priority for Retention	8400	Within footprint (building). Remove.
36	*Cinnamomum camphora* (Camphor Laurel)	1200 (Multi x 5+ @ 1000)	15	15	Good	Fair	Multiple branch attachments. Mature epicormic growth. Small diameter deadwood.	High	5-15	Consider for Retention	14400	Within footprint (building). Remove.
37	*Celtis* sp. (Celtis)	600 (Multi x 4 @ grade)	10	10	Good	Poor	Co-dominant inclusion. Multiple branch attachments.	Moderate	< 5	Priority for Removal	7200	Within footprint (building). Remove.
38	*Lophostemon confertus* (Brush Box)	800	12	12	Good	Fair	Mature epicormic growth. Previously lopped.	High	15-40	Priority for Retention	9600	Major encroachment. Proposed for retention.

Tree No	Botanical Name	DBH (mm)	Height (m)	Spread (m)	Health Rating	Structure Rating	Comments	L/Sign	R/L/E/R	Retention Value	TPZ (mm)	Implication
39	*Celtis sinensis* (Celtis)	700 (Multi x 4 @ grade)	10	10	Good	Poor	Co-dominant inclusion. Multiple branch attachments.	Moderate	< 5	Priority for Removal	8400	Major encroachment. Proposed for retention.
40	*Lophostemon confertus* (Brush Box)	600	12	12	Good	Fair	Mature epicormic growth. Previously lopped.	High	15-40	Priority for Retention	7200	Major encroachment. Proposed for retention.
41	*Lophostemon confertus* (Brush Box)	600	12	12	Good	Fair	Mature epicormic growth. Previously lopped.	High	15-40	Priority for Retention	7200	Major encroachment. Proposed for retention.
42	*Celtis sinensis* (Celtis)	700 (Multi x 4 @ grade)	10	10	Good	Poor	Co-dominant inclusion. Multiple branch attachments.	Moderate	< 5	Priority for Removal	8400	Landscape treatment. Remove.
43	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	900	15	15	Good	Fair	Co-dominant inclusion. Wound with possible decay.	High	5-15	Consider for Retention	10800	Landscape treatment. Remove.
44	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500	15	10	Fair	Fair	Co-dominant inclusion. Wound with possible decay. Reduced canopy cover 70%. Small diameter deadwood.	High	5-15	Consider for Retention	6000	Landscape treatment. Remove.
45	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500	15	10	Fair	Fair	Co-dominant inclusion. Wound with possible decay. Reduced canopy cover 70%. Small diameter deadwood.	High	5-15	Consider for Retention	6000	Landscape treatment. Remove.

Tree No	Botanical Name	DBH (mm)	Height (m)	Spread (m)	Health Rating	Structure Rating	Comments	L/Sign	R/L/E/R	Retention Value	TPZ (mm)	Implication
46	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500	15	10	Fair	Fair	Co-dominant inclusion. Wound with possible decay. Reduced canopy cover 70%. Small diameter deadwood.	High	5-15	Consider for Retention	6000	Landscape treatment. Remove.
47	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500	15	10	Fair	Fair	Co-dominant inclusion. Wound with possible decay. Reduced canopy cover 70%. Small diameter deadwood.	High	5-15	Consider for Retention	6000	Landscape treatment. Remove.
48	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500	15	10	Fair	Poor	Immediate remove. Wound with possible decay. Splits. Reduced canopy cover 70%. Small diameter deadwood.	High	< 5	Priority for Removal	6000	Landscape treatment. Remove.
49	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500	15	10	Fair	Fair	Co-dominant inclusion. Wound with possible decay. Reduced canopy cover 70%. Small diameter deadwood.	High	5-15	Consider for Retention	6000	Landscape treatment. Remove.
50	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	800	15	10	Fair	Fair	Co-dominant inclusion. Reduced canopy cover 70%. Small diameter deadwood.	High	5-15	Consider for Retention	9600	Landscape treatment. Remove.
51	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500	11	10	Fair	Fair	Co-dominant inclusion. Reduced canopy cover 70%. Small diameter deadwood.	High	5-15	Consider for Retention	6000	Landscape treatment. Remove.

Tree No	Botanical Name	DBH (mm)	Height (m)	Spread (m)	Health Rating	Structure Rating	Comments	L/Sign	R/L/E/R	Retention Value	TPZ (mm)	Implication
52	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500	11	10	Fair	Fair	Co-dominant inclusion. Wound with possible decay. Reduced canopy cover 70%. Small diameter deadwood.	High	5-15	Consider for Retention	6000	Landscape treatment. Remove.
53	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500	11	10	Fair	Fair	Co-dominant inclusion. Reduced canopy cover 70%. Small diameter deadwood.	High	5-15	Consider for Retention	6000	Landscape treatment. Remove.
54	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500	11	10	Fair	Fair	Co-dominant inclusion. Reduced canopy cover 70%. Small diameter deadwood.	High	5-15	Consider for Retention	6000	Landscape treatment. Remove.
55	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500	11	10	Fair	Fair	Co-dominant inclusion. Reduced canopy cover 70%. Small diameter deadwood.	High	5-15	Consider for Retention	6000	Landscape treatment. Remove.
56	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500	11	10	Fair	Fair	Co-dominant inclusion. Reduced canopy cover 70%. Small diameter deadwood.	High	5-15	Consider for Retention	6000	Landscape treatment. Remove.
57	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	700	15	12	Good	Poor	Immediate Removal. Co-dominant inclusion. Major trunk/branch inclusions. Wound with possible decay.	High	< 5	Priority for Removal	8400	Landscape treatment. Remove.
58	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500	11	10	Fair	Fair	Co-dominant inclusion. Reduced canopy cover 70%. Small diameter deadwood.	High	5-15	Consider for Retention	6000	Landscape treatment. Remove.

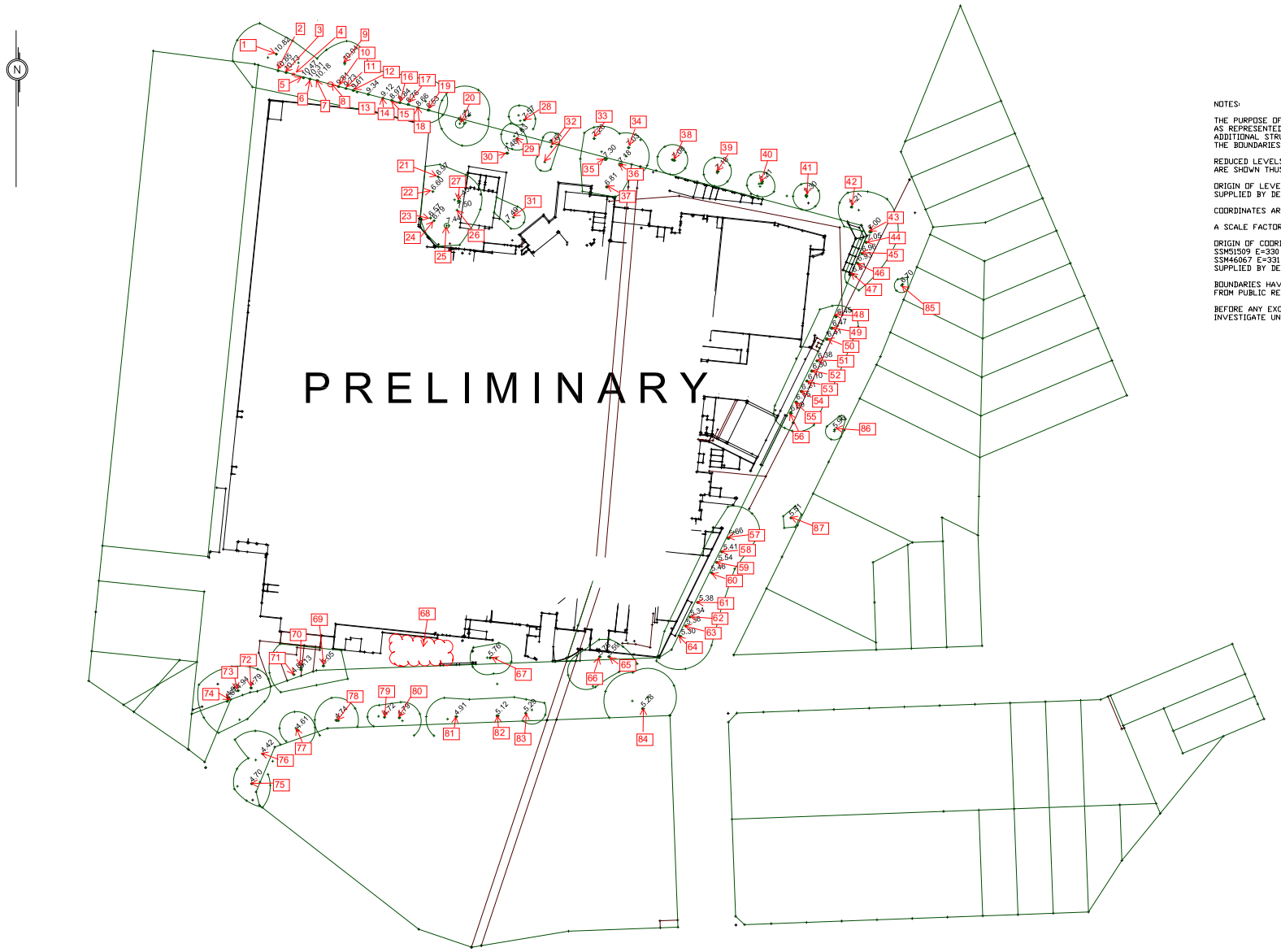
Tree No	Botanical Name	DBH (mm)	Height (m)	Spread (m)	Health Rating	Structure Rating	Comments	L/Sign	R/L/E/R	Retention Value	TPZ (mm)	Implication
59	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500	11	10	Fair	Fair	Co-dominant inclusion. Reduced canopy cover 70%. Small diameter deadwood.	High	5-15	Consider for Retention	6000	Landscape treatment. Remove.
60	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500	11	10	Fair	Fair	Co-dominant inclusion. Reduced canopy cover 70%. Small diameter deadwood.	High	5-15	Consider for Retention	6000	Landscape treatment. Remove.
61	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	800	12	12	Fair	Fair	Co-dominant inclusion. Small diameter deadwood.	High	5-15	Consider for Retention	9600	Landscape treatment. Remove.
62	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	500	11	10	Fair	Fair	Co-dominant inclusion. Reduced canopy cover 70%. Small diameter deadwood.	High	5-15	Consider for Retention	6000	Landscape treatment. Remove.
63	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	800	12	12	Fair	Fair	Co-dominant inclusion. Small diameter deadwood.	High	5-15	Consider for Retention	9600	Landscape treatment. Remove.
64	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	800	12	12	Fair	Fair	Co-dominant inclusion. Small diameter deadwood.	High	5-15	Consider for Retention	9600	Landscape treatment. Remove.
65	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	800	12	12	Fair	Fair	Restricted soil volume. Small diameter deadwood. Co-dominant inclusion.	High	5-15	Consider for Retention	9600	Within footprint (building). Remove.
66	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	800	12	12	Fair	Fair	Co-dominant inclusion. Small diameter deadwood.	High	5-15	Consider for Retention	9600	Within footprint (building). Remove.
67	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	800	12	12	Fair	Fair	Co-dominant inclusion. Small diameter deadwood.	High	5-15	Consider for Retention	9600	Within footprint (building). Remove.

Tree No	Botanical Name	DBH (mm)	Height (m)	Spread (m)	Health Rating	Structure Rating	Comments	L/Sign	R/L/E/R	Retention Value	TPZ (mm)	Implication
68	Acacia sp	75	4	3	Fair	Fair	Major trunk/branch inclusions. Small diameter deadwood.	Low	< 5	Priority for Removal	900	Within footprint (vehicular entry). Remove.
69	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	700	12	10	Good	Fair	Splits. Superficial Wound.	High	5-15	Consider for Retention	8400	Major encroachment. Proposed for retention.
70	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	800 (Co dominant @ grade)	13	12	Good	Poor	Co-dominant inclusion.	High	< 5	Priority for Removal	9600	Major encroachment. Proposed for retention.
71	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	800 (Co dominant @ grade)	13	12	Good	Poor	Co-dominant inclusion.	High	< 5	Priority for Removal	9600	Major encroachment. Proposed for retention.
72	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	900 (Multi x 5+ @ grade)	9	6	Good	Fair	Multiple branch attachments.	Moderate	5-15	Consider for Retention	10800	Major encroachment. Proposed for retention.
73	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	800 (Co dominant @ grade)	13	12	Good	Poor	Co-dominant inclusion.	High	< 5	Priority for Removal	9600	Major encroachment. Proposed for retention.
74	*Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig)	1200	13	12	Good	Poor	Co-dominant inclusion.	High	< 5	Priority for Removal	14400	Major encroachment. Proposed for retention.

Tree No	Botanical Name	DBH (mm)	Height (m)	Spread (m)	Health Rating	Structure Rating	Comments	L/Sign	R/L/E/R	Retention Value	TPZ (mm)	Implication
75	*Corymbia citriodora* (Lemon-scented Gum)	700	15	12	Good	Good		High	15-40	Priority for Retention	8400	Major encroachment. Proposed for retention.
76	*Corymbia citriodora* (Lemon-scented Gum)	700	15	12	Good	Good		High	15-40	Priority for Retention	8400	Major encroachment. Proposed for retention.
77	*Corymbia citriodora* (Lemon-scented Gum)	700	15	12	Good	Good	Large diameter deadwood.	High	15-40	Priority for Retention	8400	Within footprint (vehicular entry). Remove.
78	*Corymbia citriodora* (Lemon-scented Gum)	700	15	12	Fair	Good	Reduced canopy cover 70%.	High	5-15	Consider for Retention	8400	Within footprint (vehicular entry). Remove.
79	*Eucalyptus* spp. (Gum Tree)	800 (Co dominant @ 400)	9	8	Good	Good	Normal deadwood.	High	5-15	Consider for Retention	9600	Within footprint (vehicular entry). Remove.
80	*Corymbia citriodora* (Lemon-scented Gum)	700	15	12	Fair	Good	Reduced canopy cover 70%.	High	5-15	Consider for Retention	8400	Within footprint (vehicular entry). Remove.
81	*Corymbia citriodora* (Lemon-scented Gum)	700	15	12	Good	Good		High	15-40	Priority for Retention	8400	Within footprint (vehicular entry). Remove.
82	*Corymbia citriodora* (Lemon-scented Gum)	1000	15	12	Good	Good		High	15-40	Priority for Retention	12000	Major encroachment. Proposed for retention.

Tree No	Botanical Name	DBH (mm)	Height (m)	Spread (m)	Health Rating	Structure Rating	Comments	L/Sign	R/L/E/R	Retention Value	TPZ (mm)	Implication
83	*Eucalyptus* spp. (Gum Tree)	800 (Co dominant @ 400)	9	8	Good	Good	Normal deadwood.	High	5-15	Consider for Retention	9600	Major encroachment. Proposed for retention.
84	*Corymbia citriodora* (Lemon-scented Gum)	700	15	12	Good	Good		High	15-40	Priority for Retention	8400	Major encroachment. Proposed for retention.
85	*Callistemon* spp. (Bottle Brush)	300 (Co dominant @ 200)	4	4	Good	Fair	Previously lopped. Co-dominant inclusion.	Moderate	5-15	Consider for Retention	3600	No works within TPZ.
86	*Callistemon* spp. (Bottle Brush)	300 (Co dominant @ 200)	4	4	Good	Fair	Previously lopped. Co-dominant inclusion.	Moderate	5-15	Consider for Retention	3600	No works within TPZ.
87	*Callistemon* spp. (Bottle Brush)	300 (Co dominant @ 200)	4	4	Good	Fair	Previously lopped. Co-dominant inclusion.	Moderate	5-15	Consider for Retention	3600	No works within TPZ.

Appendix 3: Site Survey



NOTES:

THE PURPOSE OF THIS SURVEY WAS TO OBTAIN TREE DETAIL AS REPRESENTED ON THIS PLAN. IF IT IS INTENDED TO ERECT ADDITIONAL STRUCTURES OR FENCING ON THE SUBJECT PROPERTY, THEN THE BOUNDARIES SHOULD BE MARKED.

REDUCED LEVELS ARE BASED ON AUSTRALIAN HEIGHT DATUM (AHD) AND ARE SHOWN THUS +55.55.

ORIGIN OF LEVELS IS SSM51510, RL4.451, VERTICAL ACCURACY LB,L2 AS SUPPLIED BY DEPARTMENT OF LANDS DATED 21.09.2005.

COORDINATES ARE BASED ON THE MAP GRID OF AUSTRALIA (MGA).

A SCALE FACTOR OF 1.0000 HAS BEEN USED FOR COORDINATE CALCULATIONS.

ORIGIN OF COORDINATES IS
SSM51509 E=330 931.695 N=6 246 472.456 HORIZONTAL ACCURACY B,2, AND
SSM46067 E=331 239.755 N=6 246 591.483 HORIZONTAL ACCURACY B,2 AS AS
SUPPLIED BY DEPARTMENT OF LANDS DATED 21.09.2005.

BOUNDARIES HAVE NOT BEEN DEFINED OR MARKED AND HAVE BEEN COMPILED FROM PUBLIC RECORDS. ALL DIMENSIONS ARE SUBJECT TO A BOUNDARY SURVEY.

BEFORE ANY EXCAVATION COMMENCES ON SITE, THE CONTRACTOR/DESIGNER MUST INVESTIGATE UNDERGROUND UTILITY SERVICES.

TREE SURVEY
MARRICKVILLE METRO SHOPPING CENTRE
SMIDMORE AND MURRAY STREETS, AND
EDINBURGH AND VICTORIA ROADS,
MARRICKVILLE
IN THE LOCAL GOVERNMENT AREA OF
MARRICKVILLE
RE: AMP CAPITAL INVESTORS

RATIO 1:750 @ A1 (5 0 5 10 15 20 25)	SURVEYED IL
LEVEL DATUM AHD	DRAWN RB
DATE 11.02.2010	CAD FILE CH4265H3
SHEET 1 OF 1	REFERENCE CH4331.057

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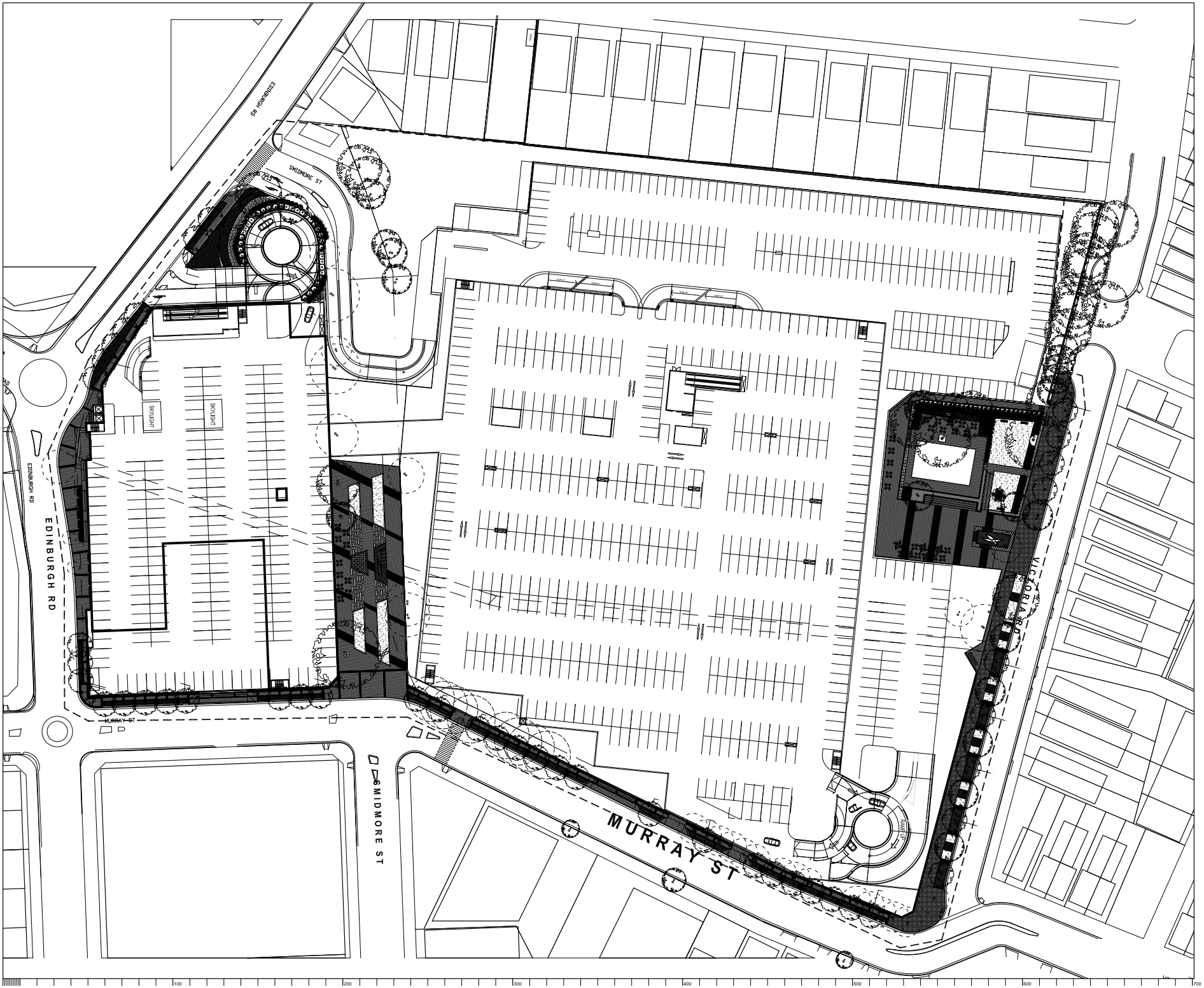
Appendix 4: Landscape Master Plan



The contractor shall check and verify all work on site (including work by others) before commencing the landscape installation. Any discrepancies are to be reported to the Project Manager or Landscape Architect prior to commencing work. Do not scale this drawing. Any required dimensions not shown shall be referred to the Landscape Architect for confirmation.

Issue	Revision Description	Drawn	Check	Date
A	PART 3A	MS	AL	06.05.2010

LEGEND

- Extent of Works
- Building Outline
- Existing Trees Removed
- Existing Trees Retained (refer to plant schedule)
- Proposed Tree Planting (refer to plant schedule for detail)
- Proposed Shrub Planting (refer to plant schedule for detail)
- Proposed groundcover / Grass Planting (refer to plant schedule for detail)
- Proposed Accent Planting (refer to plant schedule for detail)
- Proposed Turf Planting
- Herringbone Brick Paving
- Unit Paver Banding
- Insitu Concrete Paving
- Steel Edge
- Rendered Blockwork Wall/Bench Seat
- Feature Sculpture
- WF Proposed Water Feature

Key Plan:

north

Client:

Bovis Lend Lease

AMP capital INVESTORS

Project:

MARRICKVILLE METRO

Metro Underground Close MARRICKVILLE

SITE IMAGE
28 Bowden Street
Alexandria NSW 2015
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Site Image (NSW) Pty Ltd
ABN 44 801 262 380

Landscape Architects

PART 3A

Drawing Name:

LANDSCAPE MASTERPLAN

Scale: 1:500 @ A1

0 2 5 10 15 25m

Job Number:	Drawing Number:	Issue:
SS10-2128	100	A

A1 100 200 300 400 500 600 700

Appendix 5: Notes on AS: 4970 (2009)

In August 2009, *Australian Standard 4970-2009: Protection of Trees on Development Sites* was released. This document describes the best practices for the planning and protection of trees on development sites. It does not set out to put arguments for or against development, or for the removal or retention of trees (AS-4970, 2009).

Tree Protection Zone

Clause 3.2 of the Australian Standard outlines that the Tree Protection Zone (TPZ) should be calculated as a radial measurement based on twelve (12) times the Diameter at Breast Height (DBH). A TPZ should not be less than 2 m nor greater than 15 m (except where crown protection is required). The TPZ of palms, other monocots, cycads and tree ferns should not be less than 1 m outside the crown projection (AS-4970, 2009).

Structural Root Zone (SRZ)

The SRZ is the area required for tree stability. A larger area is required to maintain a viable tree. The SRZ only needs to be calculated when major encroachment into a TPZ is proposed. There are many factors that affect the size of the SRZ (e.g. tree height, crown area, soil type, soil moisture). The SRZ may also be influenced by natural or built structures, such as rocks and footings. An indicative SRZ radius can be determined from the trunk diameter measured immediately above the root buttress using the following formula. Root investigation may provide more information on the extent of these roots (AS-4970, 2009).

SRZ radius = $(D \times 50)^{0.42} \times 0.64$

where
D = trunk diameter, in m, measured above the root buttress

NOTE: The SRZ for trees with trunk diameters less than 0.15 m will be 1.5 m

Crown Protection

Tree crowns may be injured by machinery such as excavators, drilling rigs, cranes, trucks, hoarding installation and scaffolding. The TPZ may need to include additional protection of the above ground parts of the tree. Where crown protection is required, it will usually be located at least one metre outside the perimeter of the crown. The erection of scaffolding may require an additional setback from the edge of the crown.

Crown protection may include pruning, tying-back of branches or other measures. If pruning is required, requirements are specified in AS 4373 and should be undertaken before the establishment of the TPZ.

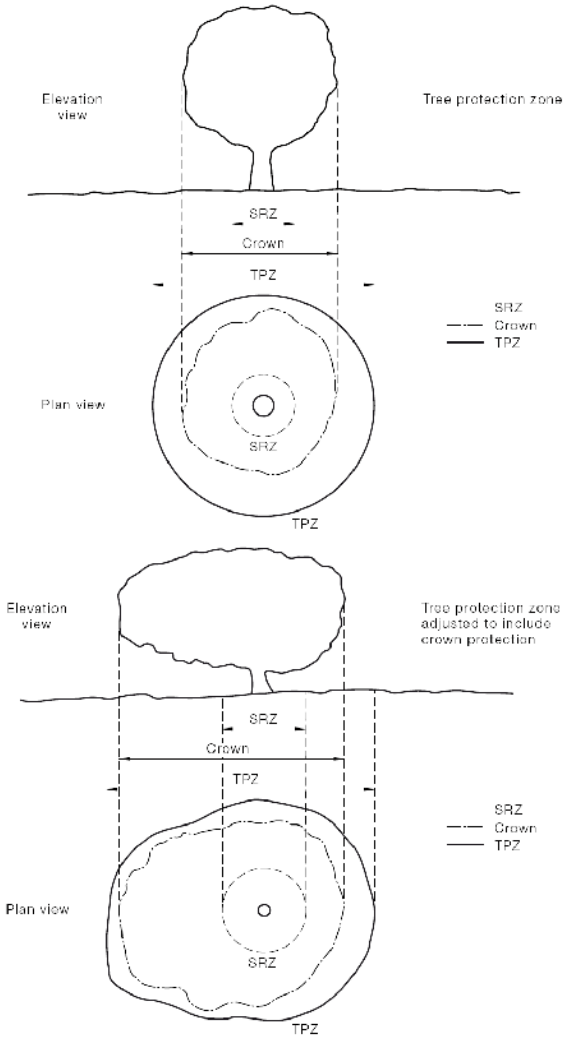
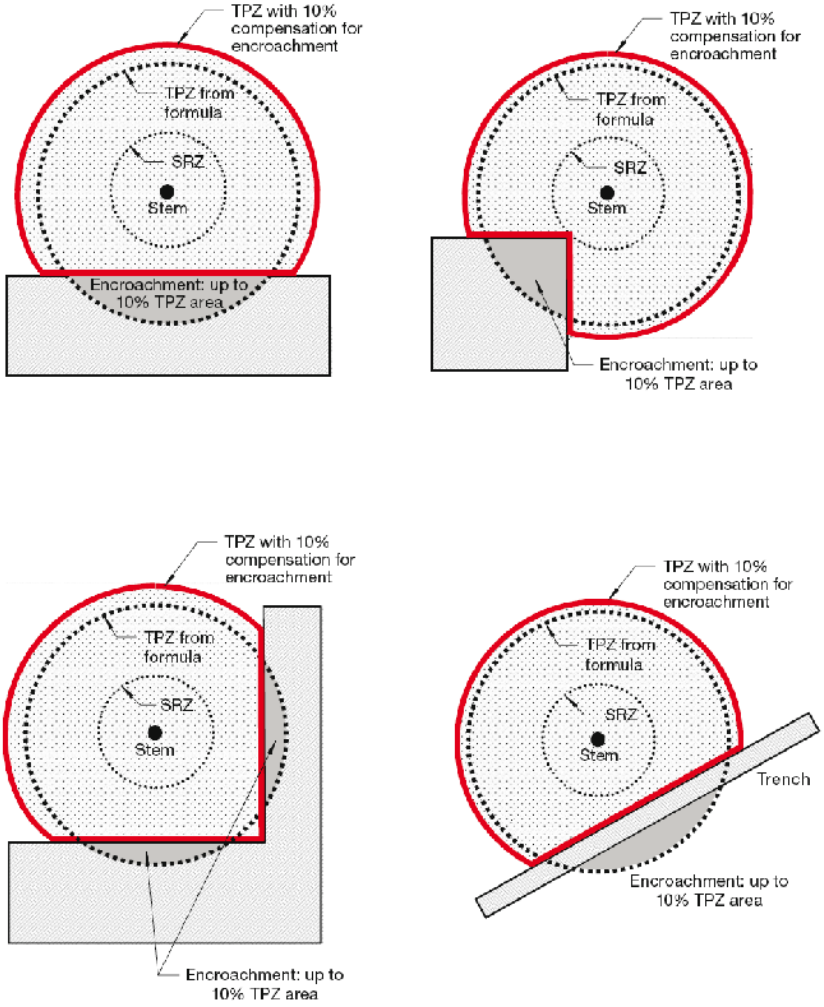


Figure A: EXAMPLE TPZ, SRZ & CROWN (SOURCE: AS-4970, 2009)

Minor Encroachment

In some cases it may be possible to encroach into or make variations to the standard TPZ. If the proposed encroachment is less than 10% of the area of the TPZ and is outside the SRZ, detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ.



NOTE: Less than 10% TPZ area and outside SRZ. Any loss of TPZ compensated for elsewhere.

Figure B: EXAMPLES OF MINOR ENCROACHMENT INTO TPZ (SOURCE: AS-4970, 2009)

Major Encroachment

An encroachment is greater than 10% of the TPZ or inside the SRZ is described as a Major Encroachment within the Australian Standard. In this situation the project arborist must demonstrate that the tree(s) would remain viable. This may require root investigation by non-destructive methods. Root investigations provide information on the size and number of roots to be affected by the proposed development (AS-4970, 2009).

The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ.

Appendix 6: General Tree Protection Specification

1.0 Appointment of Site Arborist

A Site Arborist shall be appointed prior the commencement of works on- site. The Site Arborist shall monitor the tree to be retained and supervise the tree protection measures. The Site Arborist shall have a minimum qualification equivalent (using the Australian Qualifications Framework) of NSW TAFE Certificate Level 5 or above in Arboriculture.

1.1 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 Zone including Tree Protection Fencing, Silt Fencing and signage	Site Arborist
Modification of the Tree Protection Zone	Site Arborist
Works with the Tree Protection Zone	Site Arborist
Completion of the construction works	Site Supervisor Site Arborist

1.2 Education

Contractors and site workers shall receive a copy of these specifications a minimum of 3 working days prior to commencing work on-site. Contractors and site workers undertaking works within the Tree Protection Zones shall sign the site log confirming they have read and understand these specifications, prior to undertaking works on-site.

1.3 Tree Protection Zone

The tree to be retained shall be protected prior and during construction from activities that may result in an adverse effect on its health or structure. The area within the Tree Protection Zone shall exclude the following activities, unless otherwise stated:-

- Modification of existing soil levels
- Excavations and trenching
- Cultivation of the soil
- Mechanical removal of vegetation
- Soil disturbance
- Movement of natural rock
- Storage of materials, plant or equipment
- Erection of site sheds
- Affixing of signage or hoarding to the trees
- Preparation of building materials
- Disposal of waste materials and chemicals
- Movement of pedestrian or vehicular traffic
- Temporary or permanent location of services, or the works required for their installation
- Any other activities that may cause damage to the tree

NOTE: If access, encroachment or incursion into the Tree Protection Zone is deemed essential, prior authorisation is required by the Site Arborist.

1.4 Tree Protection Fencing

Tree Protection Fencing shall be installed at the perimeter of the Tree Protection Zone. As a minimum, the Tree Protection Fence shall consist of 1.8m high temporary chain wire panels supported by steel stakes. They shall be fastened together and supported to prevent sideways movement. The fence must have a lockable opening for access. The tree's woody roots shall not be damaged during the installation of the Tree Protection Fencing.

Refer to **Appendix 7**: Typical Tree Protection Fencing Detail

Where deemed necessary by the Site Arborist, shade cloth material shall be attached to the outer surface of the Tree Protection Fence. The shade cloth material shall be transparent to provide visibility into the Tree Protection Zone.

The Tree Protection Fence shall be erected prior to the commencement of works on-site and shall be maintained in good condition for the duration of the development period. The Tree Protection Fence shall only be removed, altered, or relocated with the authorization from the Site Arborist.

1.5 Signage

Tree Protection Signage shall be attached to the Tree Protection Zone and displayed in a prominent position. The signs shall be repeated at 10m intervals or closer where the fence changes direction. The signage shall be installed prior to the commencement of works on-site and shall be maintained in good condition for the duration of the development period.

The lettering for each sign shall be a minimum 72 point font size. The signs shall be a minimum size of 600 x 500mm. Each sign shall advise the following details:-

- This fence has been installed to prevent damage to the tree and its growing environment. **Access is restricted.**
- If access, encroachment or incursion into this Tree Protection Zone is deemed essential, prior authorisation is required by the Site Arborist.
- *Name, address*, and *telephone number* of the developer

1.6 Mulching

The area within the Tree Protection Zone shall be mulched with Horticultural Grade Pine Bark as certified to *AS4454: Composts, Soil Conditioners and Mulches* (1997) and shall be maintained at a depth of 70mm for the duration of the project. The mulch shall be spread by hand to avoid soil disturbance and compaction within the root zone. The mulch shall be installed prior to the commencement of works on-site. Mulch shall not be stock piled within the Tree Protection Zone.

The Site Arborist shall inspect and approve the Tree Protection Zone including mulching, Tree Protection Fencing, Silt Fencing and signage prior to works commencing on site.

1.7 Site Management

Materials and waste storage, site sheds and temporary services shall not be located within the specified Tree Protection Zone. Where deemed necessary by the Site Arborist, a silt fence shall be installed down slope from the storage points. Storage points shall be covered when not in use. The height of the storage points shall be less than 2m.

1.8 Access

Pedestrian and vehicular movement shall not occur within the specified Tree Protection Zone.

1.9 Works within the Tree Protection Zone

The Tree Protection Zone may need to be modified during the construction phase to allow access between the tree to be retained and the construction works. The Tree Protection Zone shall remain intact as specified in Section 1.4 until these works are due to commence. If access, encroachment or incursion into the Tree Protection Zone is deemed essential, prior authorization is required by the Site Arborist.

The modification of the Tree Protection Zones may necessitate the dismantling of sections of the Tree Protection Fencing. The Tree Protection Fence shall only be removed, altered, or relocated with the authorization from the Site Arborist.

1.10 Trunk & Branch Protection

Where deemed necessary by the Site Arborist, trunk and branch protection shall be provided. Trunk protection shall be installed by wrapping 2 layers of carpet underlay around the trunk to a minimum height of 2m or as the lower branches permit. The trunk shall further be protected with 2m lengths of timbers (75 x 50 x 200mm) spaced at 100mm centres, secured by wire rope. Branch protection shall be installed by wrapping 2 layers of carpet underlay around the branch, secured by wire rope. The wire rope shall not be fixed to the tree in any way.

1.12 Scaffolding

Scaffolding shall not be located within the specified Tree Protection Zone. Where it is essential for scaffolding to be erected within the Tree Protection Zone, branch removal should be minimized. This shall be achieved by designing scaffolding to avoid branches or tying back branches. Where pruning is unavoidable it shall be specified by the Site Arborist in accordance with AS 4373 (consent may be required).

Ground below the scaffolding should be protected by scaffold board or plywood sheeting. Where access is required, a board walk or other surface material should be installed to minimize soil compaction. Boarding shall be placed over a layer of mulch and impervious sheeting to prevent soil contamination. The boarding shall be left in place until the scaffolding is removed.

1.11 Soil Protection

Where deemed necessary by the Site Arborist, the ground surface within the Tree Protection Zone shall be protected by laying geo-textile over the existing mulch cover. Large diameter (up to 70mm) recycled railway ballast (true basalt) shall be placed over the geo-textile material to a depth of 100mm. Where deemed necessary by the Site Arborist, rumble boards shall be used.

1.12 Completion of Works within the Tree Protection Zone

Upon completion of the works within the Tree Protection Zone, the Tree Protection Fencing shall be reinstated as specified in Section 1.4. Where the construction of new structures does not provide sufficient area for the specified Tree Protection Zone, the Tree Protection Zone shall be modified by the Site Arborist.

1.13 Irrigation

In the event of prolonged dry periods, the tree to be retained shall be deep-watered at least once a week. The need for such watering shall be determined by the Site Arborist. In the event of disrupted ground or surface water flows, an irrigation system may be installed within the Tree Protection Zone. The need, type, volume, frequency of such an irrigation system shall be determined by the Site Arborist.

1.14 Root Pruning & Excavations

Minor roots (less than 40mmø) to be pruned shall be cleanly severed with sharp pruning implements. Hessian material shall be placed over the face of the excavation. Exposed roots shall be kept in a moist condition during the construction phase.

Where major roots (greater than 40mm ø) are encountered during excavations, further advice from the Site Arborist shall be sought prior to severance.

1.15 Landscape Plantings

Planting locations with the Tree Protection Zone shall remain flexible to avoid damage to woody roots. In some cases, tubestock container size may be the only suitable size for planting within the Tree Protection Zone. Planting holes shall be hand dug with a garden trowel or similar approved tool.

1.16 Tree Damage

In the event of the tree to be retained becoming damaged during the development period, the Site Arborist shall be informed to inspect and provide advice on remedial action.

1.17 Monitoring

The Site Arborist shall monitor the site fortnightly throughout the development period to ensure these specifications are maintained. A site log shall record the details of the site inspections for review by the Principal Certifying Authority prior to the release of the Compliance Certificate.

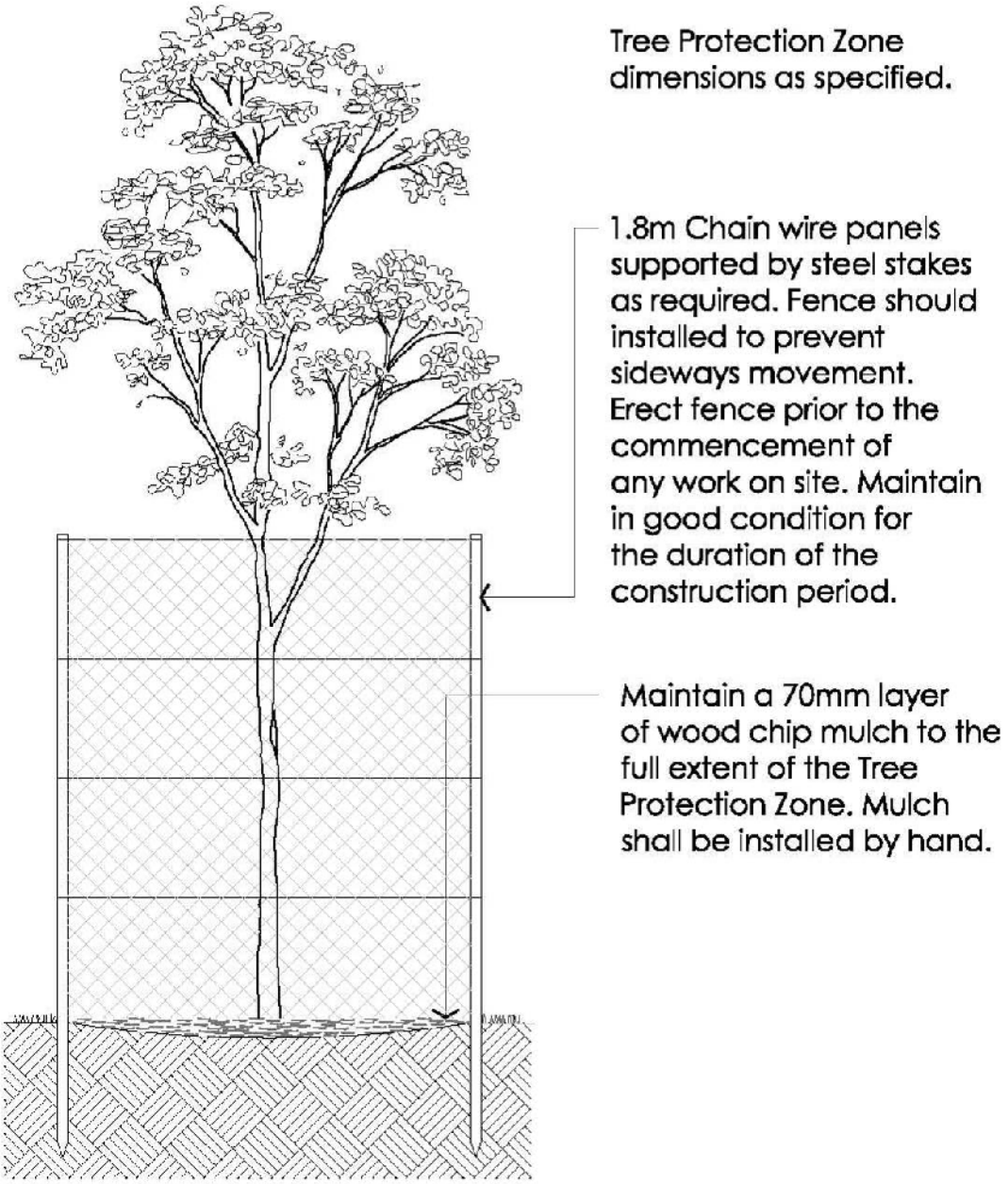
Any changes to the design will require additional arboricultural assessment.

1.18 Post Construction Maintenance

Upon the completion of construction works, a final assessment of the tree shall be undertaken by the Site Arborist. Inspection items shall include:-

- Damage to the tree's root system
- Damage to the tree's trunk, branches or canopy
- Changes in levels, soil structure, erosion, or loss of organic matter
- Changes to wind loading in the crown and effects of new structures
- Pest and disease infestation
- Drought stress
- Requirement for decompaction works
- Requirement for pruning works
- Requirement for ongoing maintenance such as watering

Appendix 7: Typical Tree Protection Fencing Detail



NOT TO SCALE