

24 LANCASTER CRESCENT, COLLAROY, NSW 2097



ARBORICULTURAL IMPACT ASSESSMENT

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Client Mr Jon Garling

LGA Northern Beaches Council - Warringah

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PRELIMINARY TREE ASSESSMENT

1 SUMMARY

This report is a Preliminary Tree Assessment of trees growing at the site.

Development is proposed for the site and trees located within 5 metres of proposed works have been assessed.

Trees within the subject area are protected under Warringah Local Environmental Plan 2011 (WLEP2011).

A Visual Tree Assessment was undertaken of ten (10) trees within the subject area that are located near to proposed works. Trees were also assessed for Useful Life Expectancy and Landscape Significance, and rated with Retention Values so that planning decisions could be made regarding the retention of the highest number of most significant trees.

In summary it was found that:

No (0) trees have a High Retention Value.

Four (4) trees have a Medium Retention Value, being Trees 1, 7, 8 and 10.

Two (2) trees have a Low or Medium Retention Value, Trees 6 and 9, with further assessment recommended to determine.

Two (2) trees have a Low Retention Value, Trees 2 and 3. These trees are not considered worthy of any special measures to be retained, nor a constraint to development.

Two (2) trees, Trees 4 and 5, have defects that are considered detrimental to their retention and would be Removed in the short term.

One (1) tree was identified as Exempt, Tree 8.

2 INTRODUCTION

2.1 Reason for the report

This report has been commissioned by the site owner Mr Jon Garling, to accompany a Development Application to Northern Beaches Council - Warringah for proposed works on the site.

2.2 Aims of the report

The aims of this report are to:

- Provide relevant information to the client, architects and Northern Beaches Council – Warringah regarding trees located in areas of the site where development is proposed.
- Assess the dimensions, health, condition and other characteristics of site trees, including any obvious defective structures.
- From the collected data, determine retention values, useful life expectancies, and the contribution to the site in terms of significance and amenity, of site trees.
- Provide planning and design options to prevent unnecessary removal of trees and to minimise impacts on retained trees.
- Comply with the requirements of *Australian Standard Protection of Trees on Development Sites AS-4970-2009*.

2.3 The site, and relevant development controls

The site is located at 24 Lancaster Crescent, Collaroy, NSW, being Lot 3, Sec 10 DP11899 in the Northern Beaches Council – Warringah local government area.

The land is controlled by Warringah Local Environmental Plan 2011 (WLEP2011).

Warringah Council DCP (WDCP) Part A, Part E - E1 Private Property Tree Management, and Appendices 5, 6, 7, 8, 9, 10, 11, 12 have been referred to in the preparation of this report.

The definition of a Tree as per WDCP Part A is: “a palm or woody perennial plant greater than 6 metres in height or 7 metres in canopy width”.

The site is zoned Low Density Residential.

This list includes relevant Controls for information but is not intended to be a full list of requirements:

- Control E1 Private Property Tree Management:
- Council approval is not required before removing or pruning any tree listed in Appendix 5 (exempt tree species).

2.4 Qualifications of consulting arborist, author of report

The author of this report has AQF Level 5 qualification as required in WDCP.

Preliminary Tree Assessment

2.1 Site location and description - topography, wind and aspect

The site generally slopes steeply down from north to south, with an open aspect to Long Reef and Dee Why Beaches and Dee Why Lagoon. The northern, highest section of the site lies on a ridgeline, with exposure to winds from all directions, mainly to the south and west.

The area is described on the Tree Location Plan TP01 (Appendix D) of this report, based on the site survey.



Figure 1: Aerial view of site (courtesy of Property Search, Northern Beaches Council website)

2.2 Site vegetation and soils

Site trees are generally mature specimens of *Banksia integrifolia* (Coastal Banksia) a common, local, coastal tree species. Several of these trees are located at the top of an old sandstone retaining wall built on the edge of a stone cutting for an existing garage. Exotic tree and shrub species have been planted near the existing house, and all of these are exempt due to small size.

The site has been generally developed with a residence and concrete driveway.

Topsoil was observed to be sandy. Large sandstone rock outcrops extend across the site.

3 METHOD

3.1 Trees on development sites

This report refers to the Australian Standard *Protection of Trees on Development Sites AS4970-2009* for guidance on the principles for protecting trees on land subject to development.

3.2 Visual Tree Assessment (VTA)

Site inspection on 11 August 2016 was undertaken to assess the trees from ground level only. No aerial inspections were made. A Visual Tree Assessment (VTA) of the biological and mechanical characteristics of the tree was undertaken (Mattheck, Bethge and Weber 2015).

Observations from ground level included, but were not limited to:

- Species identification and tree characteristics.
- Dimensions - height estimated by eye, canopy spread with tape measure,
- Diameter of the stem at breast height of 1.4 metres above ground level at the base of tree (DBH), and diameter of the stem at the base, above the root flare, (DAB) were determined by measuring the circumference with tape at these points, then by calculation.
- Canopy health and condition - foliage density, size and colour; location, size and quantity of dieback; deadwood; epicormic growth; and signs of stress.
- Branches - signs of structural defects, insect and animal activity, and disease. Previous pruning was noted.
- Stem - the base of the stem and root crown area was inspected for signs of cavities, wounds, decay, basal flare, degree of lean, soil upheaval, root damage, surface roots and structural defects.
- Photographs were taken.

3.3 Soils

Soil profile investigation and testing were not undertaken.

3.4 Other site observations

- Proximity of trees to buildings and structures.
- Aspect and protection/exposure to prevailing winds.
- Overland flow path of water.
- Species, dimensions and location of other trees and vegetation in the trees' proximity.
- Signs of erosion, recent excavation, construction works, and level changes.
- Site usage by people and vehicles.

Preliminary Tree Assessment

3.5 Summary of assessment methodologies

Type of assessment	Description	Source	Appendix/Location
VTA	Visual Tree Assessment (VTA) of the biological and mechanical characteristics of trees was undertaken (Mattheck, Bethge and Weber)	Mattheck, Bethge and Weber (2015)	Appendix A
ULE	Useful Life Expectancy (ULE) categories (updated 01/04/01)	Barrell, Jeremy (2001)	Appendix B
Landscape Significance LS	IACA Significance of a Tree, Assessment Rating System (STARS)© based on tree condition and form; heritage, ecological and amenity values; was applied according to the assessment criteria.	IACA Significance of a Tree, Assessment Rating System (STARS)© Institute of Australian Consulting Arborists (IACA 2010)©	Appendix B
Retention Value RV	IACA Significance of a Tree, Assessment Rating System (STARS)© Table 1.0 Tree Retention Value – Priority Matrix combines the Landscape Significance rating with Estimated Life Expectancy, to determine Retention Value (RV),	IACA Significance of a Tree, Assessment Rating System (STARS)© Institute of Australian Consulting Arborists (IACA 2010)©	Appendix B
TPZ	Tree Protection Zones were calculated from the DBH of trees	AS4970-2009	Appendix A
SRZ	Structural Root Zones were calculated from the DAB of trees	AS4970-2009	Appendix A

3.6 Plans and diagrams

Assessed trees are shown and numbered on Tree Location Plan TP01 (Appendix D), based on the Survey provided.

The following plans and drawings were relied upon for this arboricultural assessment.

Author	Title	Reference	Date	Drawing Number and Version
Stutchbury Jaques Pty Ltd	Level and Detail Survey	9296/16	20.04.2016	Sheet 1
Gartner Trovato	DA Plans, Elevations and Sections	1612	19.08.2016	DA-03 to DA-11 revision -
Selena Hannan Landscape Design	Landscape Plan	-	12.09.2016	LP01 Issue A

4 RESULTS AND OBSERVATIONS

4.1 Visual Tree Assessment (VTA)

Detailed results are shown on [Tree Assessment Schedule \(Appendix A\)](#).

4.2 Tree Significance Schedule

The following is a summary of assessed and determined values, as per the methodology outlined in 3.5.

Tree No.	Species Name	Common Name	ULE	Landscape Significance (LS)	Retention Value (RV)
1	Banksia integrifolia	Coastal Banksia	2B	2	M
2	Banksia integrifolia	Coastal Banksia	3B/4C?	2	L
3	Banksia integrifolia	Coastal Banksia	3B	2	L
4	Banksia integrifolia	Coastal Banksia	4C	2	L/R
5	Banksia integrifolia	Coastal Banksia	4C	2	L/R
6	Banksia integrifolia	Coastal Banksia	3B?	2	M/L?
7	Strelitzia nicholii	Giant Strelitzia	2B	2	M
8	Phoenix canariensis	Canary Island Date Palm	2B	3	M (Exempt)
9	Banksia integrifolia	Coastal Banksia	3B?	2	M/L?
10	Banksia integrifolia	Coastal Banksia	2B	2	M

H High Retention Value

M Medium Retention Value

L Low Retention Value

R Removal recommended

4.3 Exempt or weed species

Trees within the subject area are protected under WLEP2011. One (1) tree was identified as Exempt, being Tree 8.

4.4 Tree Protection Zones and Structural Root Zones

Refer to calculated values in [Tree Assessment Schedule \(Appendix A\)](#).

5 DISCUSSION

5.1 Age of trees and general description

The majority of site trees are mature and late mature *Banksia integrifolia* (Coastal Banksia), and are probably at least 40 years old. It is reasonable to assume that the trees are generally self-seeded, as this is common for the species in this location.

Trees 9 and 10, also *Banksia integrifolia*, are located on Council land and appear to be younger. The location of Tree 9 suggests it has self-seeded.

5.2 Landscape Significance rating (LS)

All site trees have a medium Landscape Significance Rating.

5.3 Useful Life Expectancy (ULE)

Trees 1, 7, 8 and 10 have a medium term life expectancy. All other trees would most likely be required to be removed in the short term due to identified defects, instability, advanced maturity, or extent of pruning wounds with resulting development of cavities.

5.4 Retention Values

To estimate the retention value of the trees, the ages discussed in 5.1 were assumed.

Tree 1 is a mature *Banksia integrifolia* which has developed a compact habit. It is located in the rear garden of the existing house. It has some decay present in a small cavity near the base, but is considered to be retainable for the medium term, although it will require monitoring for signs of development and extent of the decay. It has been allocated a Medium Retention Value.



Figure 2: Tree 1 in rear yard. Existing wall on boundary to be retained (where arrowed).

Preliminary Tree Assessment



Figure 3: Small cavity near base of Tree 1, to be monitored.

Trees 2, 3, 4 and 5 are a group of *Banksia integrifolia* growing above a sandstone wall on the top of a rock cutting over the garage. Tree 2 is leaning, with root plate uplift on southern, tension side, and recent branch tear-outs noted. Tree 3 is in the best condition of the group. Tree 4 is a number of stems arising from the sides of a decayed stump. Tree 5 has been pruned and appears to have internal cracking in one stem. Trees 3, 4 and 5 are ivy infested. The group of Trees 2 – 5 have been allocated Low Retention Value due to their maturity, reduced soil availability on the southern side, generally fair to poor condition, and it is considered likely that they would be required to be removed in the short to medium term for safety reasons. The removal of one or two trees in the group would further expose the remaining trees to wind forces.



Figure 4: Group of trees Trees 2, 3, 4 and 5. Note Tree 2 uphill, leaning, failed root plate to south side.

Preliminary Tree Assessment



Figure 5: Trees 4 and 5, located at top of old sandstone wall. Tree 4 are stems growing out of decayed stump.

Tree 6, a *Banksia integrifolia*, is growing in a rock cleft. It is not possible to assess the tree's stability due to the vegetation growing at the base. The tree has previously been heavily pruned and topped in the past for views.

Tree 9, a *Banksia integrifolia*, has suspect stability and has a large, developing wound located near the base of its stem. This is a Council-owned tree.



Figure 6: Tree 9, on Council land, has large wound with decay developing, and poor basal flare, stability suspect for medium term retention.

Preliminary Tree Assessment

No (0) trees have been assigned High Retention Value.

Four (4) trees have Medium Retention Value – Trees 1, 7, 8, and 10. Tree 8 is an exempt species. Tree 10 is a street tree.

Two (2) trees, Trees 6 and 9 would be allocated Low or Medium Retention Value, subject to further investigation, as discussed.

Two (2) trees have a Low Retention Value – Trees 2 and 3.

Two (2) trees have been allocated Low/Removal values due to structural defects – Trees 4 and 5.

5.5 Tree Protection Zones (TPZ) and (SRZ)

The Tree Assessment Schedule (Appendix A) lists the calculated TPZs and SRZs for site trees where relevant.

The Landscape Plan (Appendix E) shows the theoretical TPZ and SRZ for Tree 1 (Medium Retention Value).

6 CONCLUSIONS

6.1 Site trees

Trees with a High Retention Value are recommended to be retained as a priority. This may require design, placement of buildings and infrastructure so as to minimise any adverse impact with respect to the Tree Protection Zones. No trees are in this category.

Trees with a Medium Retention Value are desirable to retain, but are less critical for retention. Tree 1 is in this category. Tree 7 is an exotic species known to self-seed, and is considered to be a pest in bushland, Tree 8 is an exempt species, and Tree 10 is on Council land. Tree 6 may have Medium Retention Value but requires further investigation to determine this. Tree 9 is located on Council land and has suspect stability and is developing decay in a large cavity.

Trees with a Low Retention Value are not considered worthy of any special measures to be retained, and are not a constraint to development. Trees 2 and 3 are in this category.

Trees 4 and 5 have defects that are considered significantly detrimental to their long term survival and should be Removed.

Tree 8 is an Exempt Species and may be removed without Council permission.

7 RECOMMENDATIONS

7.1 Recommended development

Tree 1, with Medium Retention Value is recommended to be retained. Tree 6 could possibly be retained, although further investigation is required to inspect the basal condition and stability of the tree in order to determine this.

Trees 7 and 8 are not considered worthy of retention due to being exempt (Tree 8) or an environmental pest species (Tree 7).

Excavation that may be required within or near to the TPZ of any tree to be retained shall be required to be undertaken with care to prevent collapse of the topsoil, due to the sandy nature of site topsoils, where roots may be located.

The remainder of site trees, Trees 2, 3, 4 and 5, should not be considered a constraint to site development.

Trees 9 and 10 are Council trees.

DEVELOPMENT IMPACT ASSESSMENT

8 SUMMARY

8.1 Summary of tree removal and retention

Tree 1, with Medium Retention Value, is considered to be retainable, with recommended measures for restricting access and work within the TPZ to be adopted. Refer to Discussion 12.2, and to the Tree Protection Plan and Specification, for information regarding General and Specific Tree Protection measures to be adopted during construction.

The proposed development works will require that Trees 2, 3, 4, 5, 6, and 7 are removed as they are located within the building footprint, or because their canopies or roots will be impacted to such an extent that they could not be viably retained.

Trees 2 and 3 have Low Retention Value (RV), Trees 4 and 5 have Low/Removal RV. Tree 6 is either Low or Medium RV depending on further investigation. Tree 7 is not considered worthy of retention.

Trees 9 and 10 would not be directly impacted by the proposed building works (demolition or construction), although Council may require that the trees are fenced off with exclusion fencing to protect their root systems and canopies during construction works.

Tree 8 is to be removed, as it is defined as exempt under WDCP.

Replacement trees are shown on the Landscape Plan.

9 INTRODUCTION

9.1 Reason for the report

This report has been commissioned by the owners to accompany a Development Application for proposed works on the site. It forms the second stage of reporting and planning, and follows on from the first stage of tree assessment, analysis of significance, and determination of retention values of site trees, contained in the Preliminary Tree Assessment.

9.2 Aims of the report

The aims of this report are to:

- Review development plans and the impact on trees to be retained. Architectural and landscape plans have been designed so as to retain in the proposed development the greatest number of trees with most significance.
- Describe the site trees that are proposed to be retained and protected, and trees proposed to be removed, based on the plans for proposed development. These trees have been selected for retention or removal, as prioritised and discussed in the Preliminary Tree Assessment.
- Describe the requirement for tree protection measures. These will be further detailed in the next stage of reporting, the Tree Protection Plan and Specification.
- Comply with the requirements of *Australian Standard Protection of Trees on Development Sites AS 4970-2009*.

Development Impact Assessment

9.3 The proposed works

The proposed construction works include:

- Demolition of the existing house and driveway, and construction of a new house, swimming pool and associated landscape works.

10 METHOD

10.1 Schedule of plans

The plans and drawings as listed in 3.6 were relied upon for this assessment.

11 RESULTS AND OBSERVATIONS

11.1 Tree Retention Schedule

Tree removal and retention as shown in the following schedule have been determined from the impacts of proposed development, as shown on plans listed in 10.1.

? denotes SRZ unable to be calculated due to restricted access to base of trees.

Tree No.	Species Name	Common Name	TPZ (RADIUS FROM CENTRE OF TREE IN METRES)	SRZ (RADIUS FROM CENTRE OF TREE IN METRES)	Recommendation REMOVE/ RETAIN/ SPECIAL COMMENTS
1	Banksia integrifolia	Coastal Banksia	7.0	2.9	RETAIN
2	Banksia integrifolia	Coastal Banksia	5.0	2.9	REMOVE
3	Banksia integrifolia	Coastal Banksia	3.5	2.4	REMOVE
4	Banksia integrifolia	Coastal Banksia	3.4	?	REMOVE
5	Banksia integrifolia	Coastal Banksia	4.0	?	REMOVE
6	Banksia integrifolia	Coastal Banksia	3.6	?	REMOVE
7	Strelitzia nicholii	Giant Strelitzia	5	-	REMOVE
8	Phoenix canariensis	Canary Island Date Palm	8	-	REMOVE
9	Banksia integrifolia	Coastal Banksia	3.6	2.1	RETAIN
10	Banksia integrifolia	Coastal Banksia	3.6	2.3	RETAIN

12 DISCUSSION

12.1 Building works - trees to be removed and retained

The proposed development works will require that Trees 2, 3, 4, 5, 6, and 7 are removed as they are located within the building footprint, or their canopies or roots will be impacted to such an extent that they could not be viably retained.

Trees 2, 3, 4, 5 are located within the proposed building footprint. Tree 6 would require an excess of canopy removal to clear the building. Tree 7 is located within the area of the proposed swimming pool.

Trees 9 and 10 are located in areas where they would not be directly impacted by the proposed building works (demolition or construction), although Council may require that the trees are fenced off with exclusion fencing to protect their root systems and canopies during construction works.

Tree 1 is considered to be retainable, refer to further discussion in 12.2.

12.2 Building works in the rear setback - impacts on Tree 1 to be retained

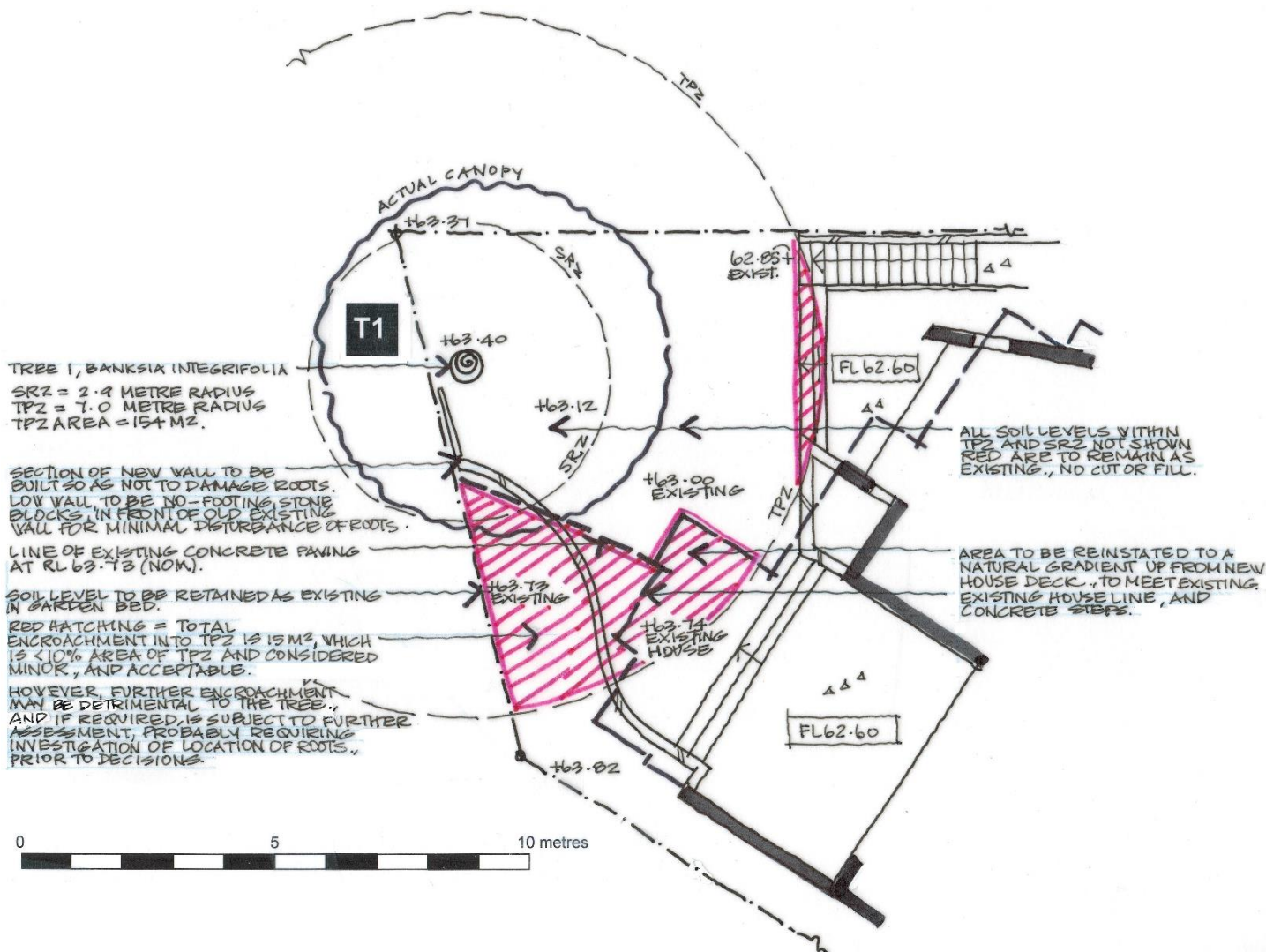


Figure 7: Tree 1, in rear yard, showing existing building footprint, proposed works, and impact in SRZ and TPZ

Canopy of Tree 1 will not be required to be pruned to clear the proposed new house.

Development Impact Assessment

The proposed house footprint is generally at the limit of the TPZ of the tree. There is minor work proposed within the SRZ but this should not impact the tree, as the existing low wall and soil levels within the SRZ shall be retained. The section of wall within the SRZ wall shall remain but can be buried or disguised with planting, so as not disturb roots. The extent of works proposed in the TPZ is approximately 10% and is considered to be minor.

Care will be required during demolition and excavation so as to prevent soil slippage in the TPZ. The area within the TPZ that is NOT shown hatched, as shown in *Figure 7*, shall be fenced off with Tree Protection Fencing, and access shall be generally restricted, with arborists' supervision if any minor changes are required to the fence location (for instance, for additional access or to build the steps up from the deck on the east side of the house). Refer to Tree Protection Plan and Specification.

13 CONCLUSIONS

13.1 Development impacts on site trees

Tree 1, with Medium Retention Value, is considered to be retainable. Refer to discussion in 12.2 and to the Tree Protection Plan and Specification for information regarding General and Specific Tree Protection measures to be adopted during construction.

The proposed development works will require that Trees 2, 3, 4, 5, 6, and 7 are removed as they are located within the building footprint, or their canopies or roots will be impacted to such an extent that they could not be viably retained.

Trees 9 and 10 are not located in areas where they would be directly impacted by the proposed building works (demolition or construction), although Council may require that the trees are fenced off with exclusion fencing to protect their root systems and canopies during construction works.

Tree 8 is to be removed, as it is defined as exempt under WDCP.

Should any additional drainage or service lines be required to be installed with the TPZs of trees to be retained, this should also be supervised by site arborist. No excavation should occur within the Structural Root Zones of any tree without prior consultation with site arborist, and may not be approved.

14 RECOMMENDATIONS

14.1 Tree protection and specification

- Tree Protection Fencing to be erected, to exclude building workers from entering the TPZs of trees to be retained, to a practical extent.
- Work in the vicinity of Tree 1 will require additional care by site construction (building and landscape) managers and workers, and supervision by project arborist, so as not to damage the roots during excavation and construction, or during the minor landscape works that are proposed.

TREE PROTECTION PLAN AND SPECIFICATION

15 SUMMARY

This report provides general Tree Protection Plan and Specification measure for tree protection works to be implemented at the proposed development, as detailed in the previous Preliminary Tree Assessment and Development Impact Assessment prepared by this author.

16 INTRODUCTION AND SCOPE OF WORKS

16.1 Reason for the report

This report has been commissioned by the owners to accompany a Development Application for proposed works on the site.

It forms the third stage of reporting and planning, and follows on from the first stage (tree assessment, analysis of significance, and determination of retention values of site trees) contained in the Preliminary Tree Assessment.

The second stage, the Development Impact Assessment, examined the impact on trees to be retained and removed, and made recommendation as to how the site may be managed in order to minimise any negative impacts by construction on site trees to be retained.

This third stage in planning, the Tree Protection Plan and Specification, will provide specifications for the required Tree Protection measures to be implemented, as recommended in the Development Impact Assessment.

All works are to comply with the requirements of *Australian Standard Protection of Trees on Development Sites AS 4970-2009*.

16.2 Aims

The aims of this Tree Protection Plan and Specification are to:

- identify the responsibilities of the project arborist for site developers and managers, and to
- recommend general tree protection works required to protect trees retained on the proposed development site.

16.3 The role of the project arborist

An AQF5-qualified consulting arborist (hereafter referred to as 'the project arborist') will be required to:

- inspect and assess and supervise works within the TPZ of trees,
- specify and supervise any pruning works,
- specify and monitor compliance of tree protection measures,
- specify and certify remediation works, and to
- provide written statement of compliance at specific milestones in accordance with AS4970- 2009.

16.4 Scope of works for the project arborist

PRE-CONSTRUCTION

The project arborist is to:

- Mark trees for pruning, retention, removal or transplanting, with reference to approved plans and documentation.
- Specify all pruning works.
- Certify all pruning, removal and transplanting on completion of these works.
- Tree Protection: the Project arborist shall certify that all tree protection measures have been installed in compliance with the Tree Protection Plan and Specification.

THROUGHOUT THE CONSTRUCTION PROCESS.

The project arborist may be required to provide reports and/or certification to Council at the following specific hold-points/milestones:

- Completion of site establishment.
- Installation of services.
- Installation of footings or slabs.
- Erection of scaffolding, if required, near trees.
- Works within Tree Protection Zones.

POST- CONSTRUCTION CERTIFICATION

At completion of the defects liability period, the project arborist may be required to certify that all tree protection measures throughout the construction and landscaping works have complied with all plans, specifications, and reports prepared by the project arborist and with the Conditions as specified in Development Application approval/Notification of Determination Conditions of Consent.

17 TREE PROTECTION PLANS AND DETAILS

17.1 Site specific information and reasons for them

- Erection of Tree Protection Fencing to enclose a practical TPZ exclusion area for Trees 1, 9 and 10 is recommended.
- Work in the vicinity of Tree 1 will require additional care and supervision by project arborist so as not to damage the roots within the TPZ during demolition and excavation. Soil slippage may be required to be prevented by shoring or contiguous piling.

18 SPECIFICATION FOR TREE PROTECTION

18.1 Refer to Landscape Plan LP01 (Appendix E) for:

- location of trees to be removed,
- location of trees to be retained and protected,
- extent of actual canopies of trees to be retained.

18.2 Pre-construction scope of works

- Prior to any construction works, the project arborist is to:
- Mark trees for pruning, retention, removal or transplanting, with reference to approved plans and documentation.
- Specify (and supervise, if required) pruning works.
- Certify all pruning and tree removal on completion of these works.

- Supervise installation of tree protection measures, and certify that all tree protection measures have been installed in compliance with the Tree Protection Plan and Specification.

PRUNING AND TREE REMOVAL

- Approved tree removal and pruning works are to be carried out before the installation of TPF and other protection measures such as may be required when scaffolding is to be installed within the TPZ.
- The project arborist shall mark trees for pruning, retention, removal or transplanting, with reference to approved plans and documentation.
- The project arborist shall supervise any pruning required and tree removal works.
- Pruning works are to be carried out as per AS4373-2007.
- Tree removal work shall not damage trees to be retained.
- Vehicles used for tree removal works may require limited movement within TPZs. The arborist is to supervise.
- Stumps to be removed within a TPZ must be removed so as to not damage or disturb roots of trees to be retained. The arborist is to supervise.

INSTALLATION OF TREE PROTECTION FENCING

- Refer to Diagrams 1 to 3 for types of fencing and other protection measures.
- The TPZ is a restricted area and TPF is to be installed prior to site establishment.
- The TPF is to be retained intact until works are completed.
- Permission for works within the TPZ must be sought and approved by Northern Beaches/Pittwater Council.
- These works are to be supervised by the project arborist, and any additional works that may arise during the progress of site works must be reviewed by the project arborist and be acceptable to Council before the works are carried out. Failure to do this proactively may result in the arborist being unable to certify the works.

ACTIVITIES THAT ARE RESTRICTED FROM WITHIN THE TPZ (AS PER AS4970-2009)

- Machine excavation including trenching
- Excavation for silt fencing
- Cultivation
- Storage
- Preparation of chemicals, including preparation of cement products
- Parking of vehicles and plant
- Re-fueling
- Dumping of waste
- Wash-down and cleaning of equipment
- Lighting of fires
- Soil level changes
- Temporary or permanent installation of utilities and signs, and
- Physical damage to the tree.

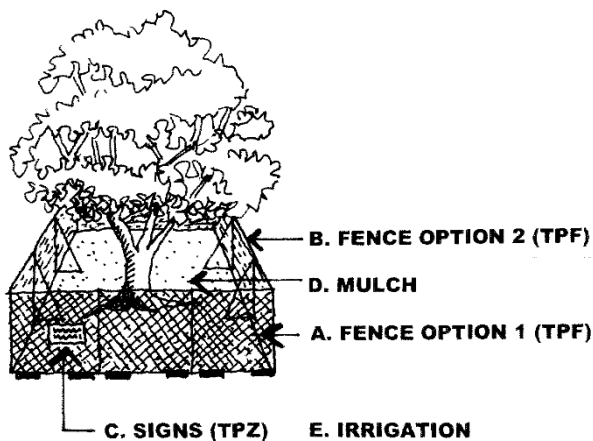


Diagram 1 TREE PROTECTIVE FENCING (TPF)

A. Fence Option 1 (TPF)

1.8 metre high chain wire mesh panels with shade cloth attached if required, to be held in place with concrete blocks.

B. Fence Option 2 (TPF)

1.8 metre high plywood or wooden panel/paling fence (prevents soil or building contaminants from coming under fence when panels are laid flush to ground).

C. Signs (TPZ)

Tree Protection Zone Signs

D. Mulch

50mm to 100mm thick layer of organic mulch, or aggregate, installed across surface area of TPZ.

E. Irrigation

Irrigation to arborist's advice.

TREE PROTECTION MEASURES TO BE INSTALLED WHEN TPF REQUIRED TEMPORARY REMOVAL, OR WHEN FENCING MUST BE LOCATED WITHIN THE TPZ – TRUNK AND BRANCH PROTECTION

The materials and positioning of protection as shown in [Diagrams 2 and 3](#) are to be specified by the project arborist on site. A minimum of 2 metres in height is recommended. Temporary powerlines, guys and stays are not to be attached to the tree. Nails are not to be driven into the trunks or branches.

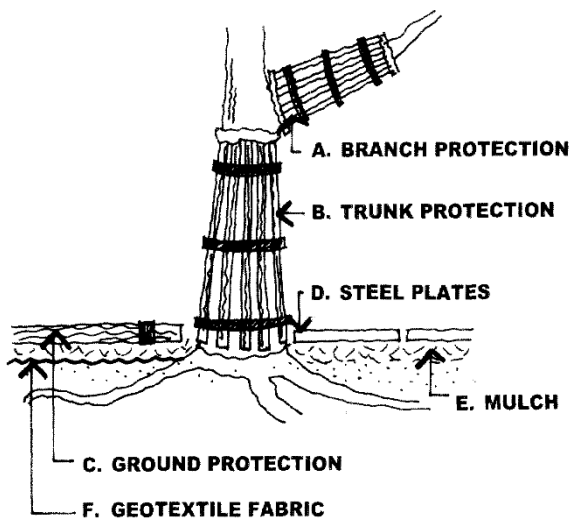


Diagram 2 TYPES OF BRANCH, TRUNK AND GROUND PROTECTION

A. Branch Protection

Prevent bark damage by use of timber boards and padding strapped to branch. (Do not use nails or screws).

B. Trunk Protection

Prevent bark damage by use of timber boards and padding for at least 2 metres above ground level. (Do not use nails or screws). [Also refer to Detail Diagram 3.](#)

C. Ground Protection

Install a suitable device eg timber rumble boards strapped together, above mulch or aggregate. The device shall be thick enough to prevent soil compaction and also to prevent compression or damage to roots.

D. Steel Plates

Steel plates (or similar, as approved by arborist) may be laid with, or without, mulch or aggregate under.

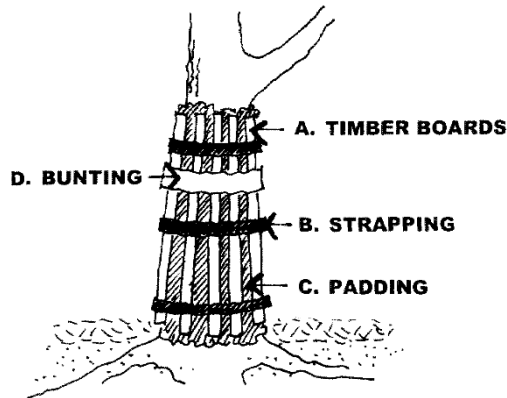
E. Mulch

Minimum 50mm thick, maximum 100mm thick, organic mulch or aggregate.

F. Geotextile fabric

Geotextile fabric laid under mulch or aggregate layer.

Diagram 3 DETAIL TRUNK PROTECTION



A. TIMBER BOARDS

Pine timber 3 metres x 50mm x 50mm at 150mm centres.

B. STRAPPING

Secure timber at no less than 3 locations with galvanised hoop strapping (or similar). Do not use nails or screws.

C. PADDING

Insert expansion joint padding at minimum of three points to prevent timber from touching trunk.

D. BUNTING

Secure high visibility bunting at around 2 metres above ground level for visual reinforcement.

18.3 Scope of works for tree protection during construction

GENERAL

During construction the following situations will require the arborist's input and on-site supervision. (These may be in addition to the predetermined number of site inspections that shall be agreed upon).

- Demolition, bulk earthworks, installation of sediment control works and drainage works near the TPZ.
- Installation of services, footings and slabs near the TPZ.
- Temporary construction work required within TPZs – ground protection, scaffolding (erection and moving).
- Hand excavation of roots at perimeter of TPZs.
- Changes arising from building works that are different to approved plans.
- Landscaping, including installation of landscape structures such as paths, walls, soil topdressing and cultivation, planting, lighting and irrigation.

GROUND PROTECTION

If temporary access for machinery is required into the TPZ, additional ground protection measures will be required (ie. in addition to mulching). Refer to [Diagram 2](#). This is to prevent root damage and soil compaction within the TPZ.

HAND EXCAVATION AND ROOT PROTECTION DURING EXCAVATION

Proposed works where inside Tree Protection Zones, must have minimal impact on root systems. Without prior investigation it is unknown if any large diameter roots are present.

Wounds shall not be treated with dressings or with paints.

Temporary protection of exposed roots may be required, to prevent drying out, by use of jute mesh or hessian sheeting laid in multiple layers over the exposed roots and soil profile, to the full depth of the root zone. This is to be pegged in place and kept moist for the duration of root zone exposure.

INSTALLING UNDERGROUND SERVICES WITHIN THE TPZ

Proposed works have been designed to reduce impacts on root systems. However without prior investigation it is unknown if any large diameter roots are present at the perimeter of, or extend past the TPZ of trees nominated for retention.

Should any large roots be found in locations where proposed services are to be laid then the work methods outlined above are to be adopted. The project arborist must be consulted.

18.4 Maintaining the TPZ

MULCHING

The area within the TPZ shall be mulched. The mulch shall be maintained to a depth of 50-100mm using material that complies with AS4454. However, the arborist may determine if mulch is required in areas where there is existing turf, gardens or mulch, and additional mulching may not be required.

WATERING

Temporary irrigation will be required in the TPZ of all site trees. This is to be maintained for the duration of construction works until final certification. The project arborist shall monitor soil water and adjust if necessary.

WEED REMOVAL

All weeds within the TPZ shall be removed by hand without soil disturbance, or shall be removed by use of species-appropriate herbicides by qualified operators.

18.5 Scope of works post-construction

REMOVAL OF TREE PROTECTION FENCING

TPF shall not be removed until all construction and landscaping works have been completed at Practical Completion.

DEFECTS LIABILITY PERIOD

Should any works be required during the defects liability period, such works shall not injure trees.

REFERENCES

BOOKS AND JOURNALS

Mattheck, C, Bethge, K & Weber, K 2015, *The Body Language of Trees*, Karlsruhe Institute of Technology, Germany.
Standards Australia 2009, *Protection of Trees on Development Sites*, AS 4970-2009, Standards Australia, Sydney.
Standards Australia 2007, *Pruning of Amenity Trees*, AS 4373-2007, Standards Australia, Sydney.

WEBSITES

www.warringah.nsw.gov.au

APPENDICES

Appendix A	Tree Assessment Schedule – including explanation of categories
Appendix B	Useful Life Expectancy (ULE) Categories
Appendix C	Methodology for Determining Tree Retention Values (STARS®)
Appendix D	Tree Location Plan TP01
Appendix E	Landscape Plan LP01

APPENDIX A TREE ASSESSMENT SCHEDULE

Site address: 24 Lancaster Crescent, Collaroy, NSW

Date of assessment: 11 August 2016

Assessed by: Selena Hannan

SITE-SPECIFIC NOTES

Trees over six (6) metres high or seven (7) metres wide were assessed for this report. One palm was also included, although by definition it is exempt species.

Indicated restricted access due to vegetation or dangerous location on top of rock cutting, not able to take measurement. An assessment of condition and ULE may not be possible for these trees.

Tree No.	Species Common Name	Height (m)	Canopy spread (m) (NESW)	DBH or multi (mm)	DAB (mm)	Age	Health	Condition	Comments	ULE	LSR	RV	TPZ (m) radius	SRZ (m) radius
1	<i>Banksia integrifolia</i> Coastal Banksia	6	2,4,4,3	500, 300	700	M	G	F	Local indigenous species. Compact habit. Two stems from 500mm AGL. Good vigour, dense canopy. Minor borer activity. Reaction wood developing below included branch unions throughout canopy. Previous pruning to stubs. Decay present in small cavity in larger stem at site of old stub, on southeast at 500mm AGL – monitor for development of cavity. No sign of root plate uplift, appears stable. Old concrete retaining wall close to tree, under fence on boundary, would leave wall in place so as not to disturb roots.	2B	2	M	7.0	2.9
2	<i>Banksia integrifolia</i> Coastal Banksia	8	5,4,1,3	3x20 0,180 , 150	730	LM	F-G	F	Local indigenous species. Multi-stemmed from 500mm AGL. Exposed root plate with some soil uplift on south side. Leaning tree, canopy is somewhat protected by tree grouping. Two recent medium diameter branch tear-outs. Epicormics <10%. Included stem junctions.	3B/4G	2	L	5.0	2.9

3	<i>Banksia integrifolia</i> Coastal Banksia	7	3,2,1,1,	200, 180, 100	480	LM	G	F-G	Local indigenous species. Ivy infested. Appears stable. Epicormics <10%. Located at top of rock cutting, with minimal soil area available to south side.	3B	2	L	3.5	2.4
4	<i>Banksia integrifolia</i> Coastal Banksia	6	2,4,3,2	3x15 0, 2x80	#	LM	F	P	Local indigenous species. Ivy infested. Located at top of rock cutting, with minimal soil area to south side. Remnant/regrowth stems from sides of old decayed stump. Could not access root crown due to trees' location on top of edge of rock cutting. Limited soil area available.	4C	2	L/R	3.4	-
5	<i>Banksia integrifolia</i> Coastal Banksia	8	2,3,3,3	2x18 0, 2x15 0	#	LM	F	P	Local indigenous species. Severely ivy infested. Could not access root crown due to trees' location on top of edge of rock cutting. Limited soil area available to south side. Sparse canopy – at ends of stems only. One stem pruned to stub, tree 'creaks' in wind (internal stem cracks?)	4C	2	L/R	4.0	-
6	<i>Banksia integrifolia</i> Coastal Banksia	5	3,1,4,4	2x15 0,2x1 30, 2x10 0	#	LM	F-G	# F?	Local indigenous species. Located in cleft in large rock outcrop, extensive Asparagus Fern growing at base, unable to see base of stem of tree. Has been heavily pruned/topped in past (for views). Decay present in old wounds at site of stubs. Congested canopy growth. Some borer activity.	3B?	2	M (L?)	3.6	-
7	<i>Strelitzia nicholii</i> Giant Strelitzia	6 (1 stem), mostly 4	3 metre clump	multi	-	M	G	G	Exotic plant. Heavily pruned for views, one stem at 7 metres high, remainder cut back. Growing on top of rock outcrop.	2B	2	M/L		
8	<i>Phoenix canariensis</i> Canary Island Date Palm	2 metre trunk, plus canopy	6	600	#	M	F	F	Growing at base of large rock outcrop. Probably self-seeded plant. Leaves infested with scale insect. EXEMPT due to size of plant, trunk <2 metres high.	2B	2	M		

9	<i>Banksia integrifolia</i> Coastal Banksia	8	3,6,1,0	300	350	SM	G	F-P?	Local indigenous species. Appears to be located on Council land. Growing next to Phoenix, tree 8, with loose soil/rock at base. Tree leaning towards east, has self-corrected in upper canopy, although stability long term is suspect. No stem taper on underside at base. Wound on underside of stem at about 1 metre AGL, with decay and insect activity in cavity. Dieback 10% canopy, one side. Further investigation regarding stability of root plate required.	3B	2	M/L?	3.6	2.1
10	<i>Banksia integrifolia</i> Coastal Banksia	6	3,3,3,3	200, 160, 150	410	SM	F-G	F	Local indigenous species. Located in nature strip. Roots exposed at root crown. Some decay in south side at root crown. 15% dieback in canopy. Old lean in stem towards west, stem and canopy has self-corrected.	2B	2	M	3.6	2.3

Key and explanation of table categories, and common abbreviations

Height is the approximate height of the tree in metres, from base of stem to top of crown.

Canopy Spread is the approximate length in metres of the branches/canopy of the tree, measured from the stem/trunk to North, South, East and West.

DBH (in millimetres) is the approximate Diameter of tree stem/s (trunk) measured at Breast Height ie. at 1.4 metres above ground level, unless noted otherwise.

DAB (in millimetres) is the approximate Diameter at the Base of the tree, measured just above the root buttress.

Age classes: I is immature, EM is Early Mature, SM is Semi Mature, LM is Late Mature, OM is Over Mature, D is Dead.

Health is classed as P Poor, F Fair, G Good. Tree vigour is an indication of health. Assessment includes crown density, leaf colour, pest and disease presence/resilience, dieback amount and type.

Condition is classed as P Poor, F Fair, G Good. A tree may be in good health but have poor condition due to structural defects such as weak branch/stem junctions, cavities, cracks, signs of root plate failure etc. The tree's environment (proximity to other trees, soil types and profiles, water supply, aspect and topography) may modify its form and growth habit, and its condition.

ULE Useful Life Expectancy – Barrell etc refer to Appendix B for detail of categories.

LSR Landscape Significance Rating, of High, Medium and Low, based on IACA SIGNIFICANCE OF A TREE - ASSESSMENT RATING SYSTEM (STARS)© (IACA2010) ©. This rating system utilises structured qualitative criteria to assist in determining the retention value for a tree.

RV Retention Value, of High, Medium, Low, or Removal, is based on Useful Life Expectancy and Landscape Significance, as derived from the matrix of IACA SIGNIFICANCE OF A TREE - ASSESSMENT RATING SYSTEM (STARS)© (IACA2010) ©

TPZ Tree Protection Zone, expressed as a radial distance in metres, measured from the centre of the tree. It is defined in the Australian Standard *Protection of Trees on Development Sites*, AS 4970-2009 as 'a specified area above and below ground and at a given distance from the trunk set aside for the protection of a tree's roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development'.

SRZ Structural Root Zone, expressed as a radial distance in metres, measured from the centre of the tree. It is defined in the Australian Standard *Protection of Trees on Development Sites*, AS 4970-2009 as 'the area around the base of a tree required for a tree's stability in the ground. The woody growth and soil cohesion in this area are necessary to hold the tree upright. The SRZ is nominally circular with the trunk at its centre and is expressed by its radius in metres. This zone considers a tree's structural stability only, not the root zone required for a tree's vigour and long-term viability, which will usually be a much larger area'.

AGL Above Ground Level (distance)

LGA Local Government Area

APPENDIX B ULE

USEFUL LIFE EXPECTANCY (ULE) CATEGORIES (after Barrell, updated 01/04/01)

- 1 Long ULE:** Trees that appeared to be retainable at the time of assessment for **more than 40 years** with an acceptable level of risk, assuming reasonable maintenance:
 - A** Structurally sound trees located in positions that can accommodate future growth.
 - B** Trees that could be made suitable for retention in the long term by remedial tree care.
 - C** Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention.

- 2 Medium ULE:** Trees that appeared to be retainable at the time of assessment for **15–40 years** with an acceptable level of risk, assuming reasonable maintenance:
 - A** Trees that may only live between 15 and 40 more years.
 - B** Trees that could live for more than 40 years but may be removed for safety or nuisance reasons.
 - C** Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
 - D** Trees that could be made suitable for retention in the medium term by remedial tree care.

- 3 Short ULE:** Trees that appeared to be retainable at the time of assessment for **5–15 years** with an acceptable level of risk, assuming reasonable maintenance:
 - A** Trees that may only live between 5 and 15 more years.
 - B** Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.
 - C** Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
 - D** Trees that require substantial remedial tree care and are only suitable for retention in the short term.

- 4 Remove:** Trees that should be removed **within the next 5 years**.
 - A** Dead, dying, suppressed or declining trees because of disease or inhospitable conditions.
 - B** Dangerous trees because of instability or recent loss of adjacent trees.
 - C** Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form.
 - D** Damaged trees that are clearly not safe to retain.
 - E** Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
 - F** Trees that are damaging or may cause damage to existing structures within 5 years.
 - G** Trees that will become dangerous after removal of other trees for the reasons given in A to F.
 - H** Trees in categories (a) to (g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review.

- 5 Small, young or regularly pruned:** Trees that can be reliably moved or replaced.
 - A** Small trees less than 5m in height.
 - B** Young trees less than 15 years old but over 5m in height.
 - C** Formal hedges and trees intended for regular pruning to artificially control growth.

APPENDIX C METHODOLOGY FOR DETERMINING TREE RETENTION VALUES

IACA SIGNIFICANCE OF A TREE - ASSESSMENT RATING SYSTEM (STARS)© (IACA2010) ©

In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd in June 2001.

The landscape significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree. To assist this process all definitions for terms used in the *Tree Significance - Assessment Criteria* and *Tree Retention Value - Priority Matrix*, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of *High, Medium and Low significance* in the landscape. Once the landscape significance of an individual tree has been defined, the retention value can be determined.

TREE SIGNIFICANCE - ASSESSMENT CRITERIA

The tree is to have a minimum of three (3) criteria in a category to be classified in that group. Note: The assessment criteria are for individual trees only, however, can be applied to a monocultural stand in its entirety e.g. hedge.

1. HIGH SIGNIFICANCE IN LANDSCAPE

- The tree is in good condition and good vigour;
- The tree has a form typical for the species;
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age;
- The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on Councils significant Tree Register;
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity;
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values;
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa in situ - tree is appropriate to the site conditions.

2. MEDIUM SIGNIFICANCE IN LANDSCAPE

- The tree is in fair-good condition and good or low vigour;
- The tree has form typical or atypical of the species;
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street,
- The tree provides a fair contribution to the visual character and amenity of the local area,
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa in situ.

3. LOW SIGNIFICANCE IN LANDSCAPE

- The tree is in fair-poor condition and good or low vigour;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings,
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area,
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen,
- The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa in situ - tree is inappropriate to the site conditions,
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms,
- The tree has a wound or defect that has potential to become structurally unsound.

Environmental Pest / Noxious Weed Species

- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties,
- The tree is a declared noxious weed by legislation.

Hazardous/Irreversible Decline

- The tree is structurally unsound and/or unstable and is considered potentially dangerous, - The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

TABLE 1.0 TREE RETENTION VALUE - PRIORITY MATRIX

		Significance				
		1. High	2. Medium	3. Low		
		Significance in Landscape	Significance in Landscape	Significance in Landscape	Environmental Pest / Noxious Weed Species	Hazardous / Irreversible Decline
Estimated Life Expectancy	1. Long >40 years					
	2. Medium 15-40 Years					
	3. Short <1-15 Years					
	Dead					
Legend for Matrix Assessment 						
	Priority for Retention (High) - These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 <i>Protection of trees on development sites</i> . Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone.					
	Consider for Retention (Medium) - These trees may be retained and protected. These are considered less critical; however their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.					
	Consider for Removal (Low) - These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.					
	Priority for Removal - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.					

USE OF THIS DOCUMENT AND REFERENCING

The IACA Significance of a Tree, Assessment Rating System (STARS) is free to use, but only in its entirety and must be cited as follows:

IACA, 2010, IACA Significance of a Tree, Assessment Rating System (STARS), Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au

REFERENCES

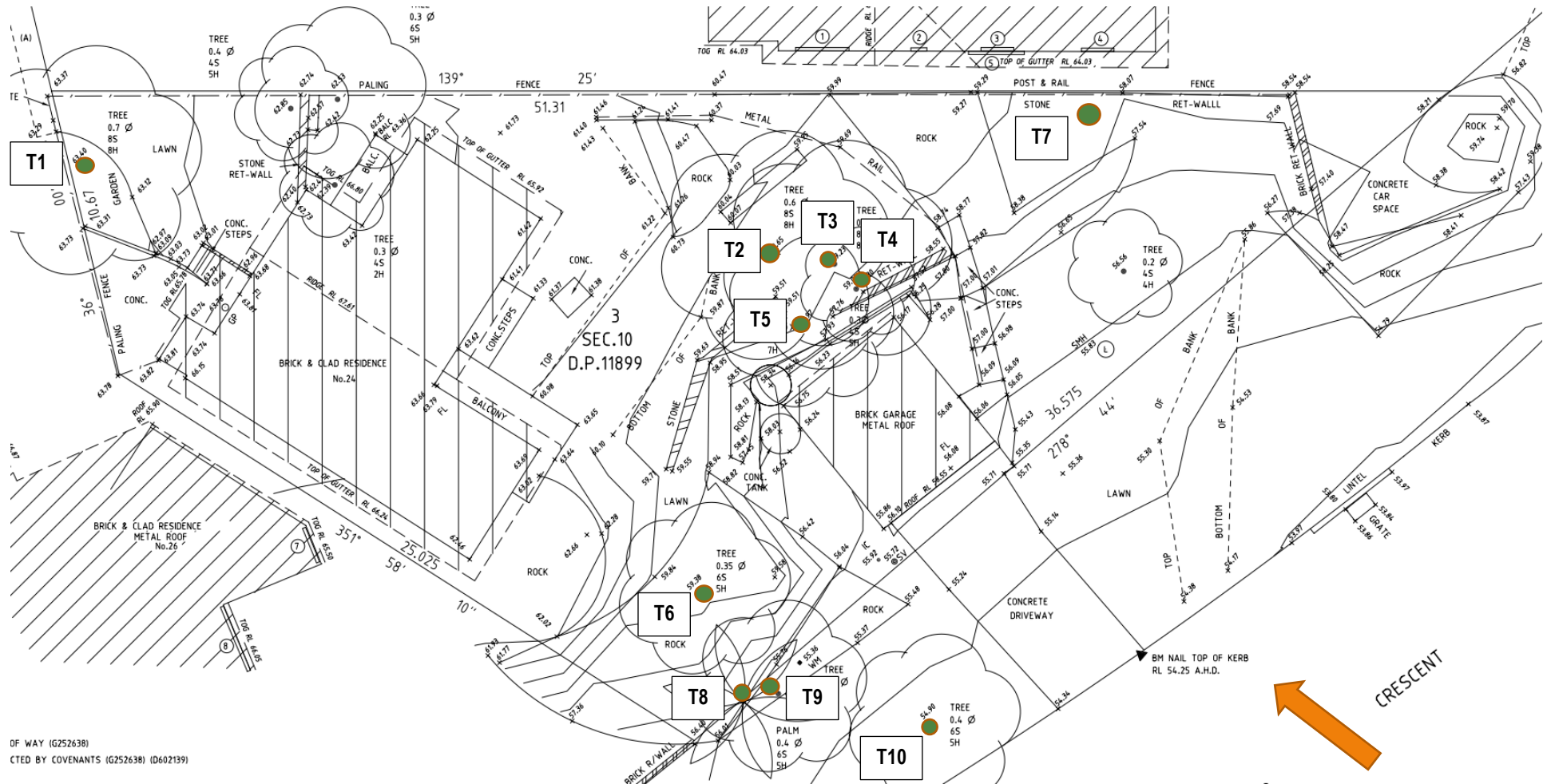
Australia ICOMOS Inc. 1999, The Burra Charter - The Australian ICOMOS Charter for Places of Cultural Significance, International Council of Monuments and Sites, www.icomos.org/australia

Draper BD and Richards PA 2009, Dictionary for Managing Trees in Urban Environments, Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia.

Footprint Green Pty Ltd 2001, Footprint Green Tree Significance & Retention Value Matrix, Avalon, NSW Australia, www.footprintgreen.com.au

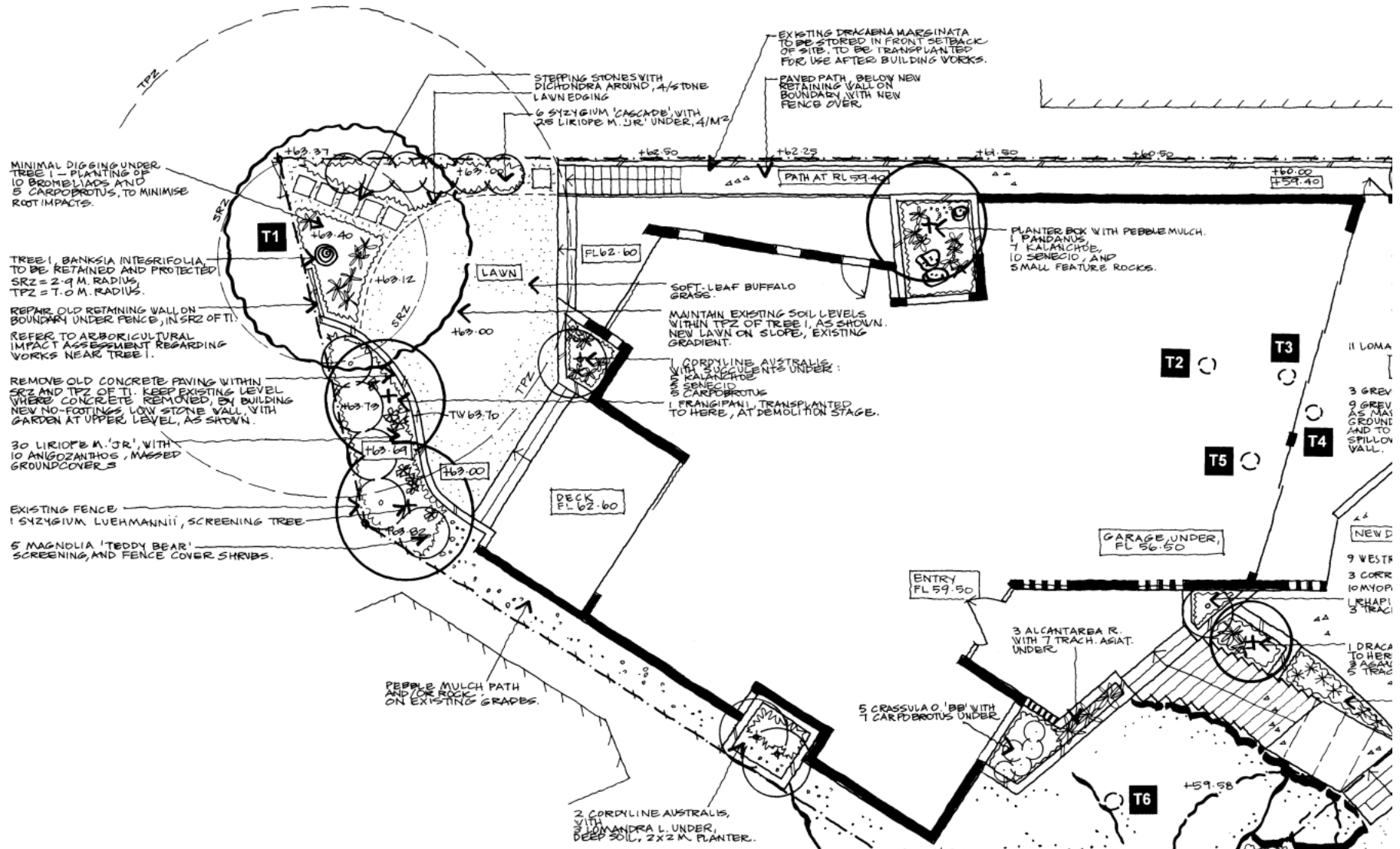
APPENDIX D TREE LOCATION PLAN TP-01

NOT TO SCALE



APPENDIX E LANDSCAPE PLAN LP01-A (PART - BACK)

NOT TO SCALE



NOT TO SCALE

