ARBORICULTURAL IMPACT ASSESSMENT

42 BIX ROAD,CROMER 2099

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EXECUTIVE SUMMARY

Complete Arborcare has been commissioned by Stefania Sardano to produce an Arboricultural Impact Assessment (AIA) regarding the proposed development upon Lot 45/DP15318, No.42 Bix Rd,Cromer 2099.

Three (3) x trees upon and adjacent to the subject site were assessed to produce this report.

Following an assessment of construction impacts (detailed in section 7 of this report) the following recommendations (detailed in section 9 of this report) have been developed.

9.1 Non-destructive root investigation (according to clause 3.3.4 (a) of AS 4970, will be required upon tree **T1**. If roots >50mm ø are encountered ,the project arborist will assess if the tree can be retained. ***It must be noted that major mechanical excavation within the SRZ have recently been undertaken by NBC.***

9.2 Due to tree **T2** showing a low retention value, it is recommended that removal is undertaken (subject to council approval).

9.3 Whilst the cut upon **T3 (** to construct the proposed pool) has been assessed to be minor<10% ,to ensure the proposed decking does not create root impact, is recommended that tree sensitive construction measures (such as pier and beam) are employed. All excavations for the placement of footings should be undertaken in a non-destructive manner according to clause 3.3.4 (a) of AS 4970.If roots >50mm ø are encountered, relocation of footings will be required.

9.4 It is recommended that the tree **T1 & T3** have protection fencing installed before any of the proposed works commence. This protection must stay in place until the completion of all works & must be compliant with Section 4.3 (Protective Fencing) and Section 4.4 (Signs) of AS 4970 (See Appendix C

9.5 It is recommended that an AQF Level 5 Arborist is engaged to oversee/meet any arboricultural matters that may arise if the proposed works are approved.

CONTENTS

1. INTRODUCTION

1.1 Complete Arborcare has been commissioned by Stefania Sardano to produce an Arboricultural Impact Assessment (AIA) regarding the proposed development upon Lot 45/DP15318, No.42 Bix Rd,Cromer 2099. (here after mentioned as the subject site).

1.2 This AIA is to be part of a Development Application (DA). It has been prepared following the guidelines provided in Australian Standard (AS) 4970-2009, Protection of Trees on Development Sites and AS 4373-2007,Pruning of Amenity Trees.

2. LEGISLATION REQUIREMENTS

2.1 The subject site is zoned R2:Low Density Residential (NSW Government - Planning & Environment, 2019).

2.2 NBC (Northern Beaches Council, 2017) considers a tree to be:

(a) any palm or woody perennial plant greater than five (5) metres in height or any palm or woody perennial plant with a canopy greater than 10 m in width; or

(b) any native palm or native woody perennial plant at any stage of its lifecycle that is 0.5 metres or greater in height and is within any area mapped by Council as containing:

- Threatened and High Conservation Habitat
- Wildlife Corridors
- Native Vegetation known or potential habitat for threatened species, populations or ecological communities

2.3 State Environmental Planning Policy (Biodiversity & Conservation) 2021 (NSW Government, 2021) has been considered in the preparation of this report. The aims of the policy are to;

(a) to protect the biodiversity values of trees and other vegetation in non-rural areas of the State, and

(b) to preserve the amenity of non-rural areas of the State through the preservation of trees and other vegetation.

3. THE SITE

Figure 1: The subject site outlined in red (*metromap 2022*).

4. METHOD

4.1 The subject site and trees were visually assessed from ground level on the 14th May 2022.The *Genus/ species* of the subject trees were recorded as well as dimensions of Diameter at Breast Height (DBH) and Diameter at Base (DAB), along with crown and canopy width. Height and age of the trees were estimated as well as the percentage of deadwood. The subject trees were given a condition / vigour rating and signs and symptoms of pests and diseases were noted (if apparent). Structural defects were looked for and comments recorded.

4.2 Calculations have been made using guidelines supplied in AS 4970-2009, specifically in relation to:

- Tree Protection Zone (TPZ)
- Structural Root Zone (SRZ)
- Live Crown Size (LCS)

4.3 The trees have been allocated a landscape significance rating of Low, Medium or High using the *IACA Significance of a Tree, Assessment Rating System* (STARS)© (IACA, 2010). Stars assessment criteria includes:

- Condition and Vigour
- Form, species specific
- Provenance, age and botanical significance
- Heritage and Ecological significance
- Size, shape, and local amenity value
- Restrictions to tree growth

Appendix B contains the assessment criteria in full.

4.4 The trees have been given a Useful Life Expectancy (ULE) rating, categorised as either:

- Long – 40+ years
- Medium – 15-40 years
- Short – 5-15 years
- Consider for removal - <5 years

4.5 Any vegetation not mentioned in this report was either defined as not to be a prescribed tree, exempt species and/or had no TPZ encroachment.

5. OBSERVATIONS

5.1 Listed in Table 1 below are observations from the subject tree relating to:

- Health and condition.
- Deadwood. An overall % has been estimated.
- Structural defects and comments.
- Any signs/symptoms of pest and disease attack.

Tree No.	Common Name *Genus/species*	Vigour/ Condition	Dead wood %	Structural Defects	Pests/ Disease	Comments
1	Cadaghi *Corymbia torelliana*	F/F	<5	None observed	None observed	
2	Tea Tree *Melaleuca alternifolia*	G/P	<5	Multi stemmed	None observed	Extensive historical stem/limb removal (of up ≥500mmø) has been undertaken.
3	Spotted Gum *Corymbia maculata*	F/F	**<5**	None observed		A recent major SRZ enchroachment for the installation of a public pathway has been undertaken on the eastern face of the root plate. These works were conducted by mechanical means.

Table 1: Tree Observations

5.2 Listed in Table 2 below are measurements from the subject tree relating to:

- Age.
- Tree height.
- Lowest scaffold branch.
- Canopy spread – measured to the North, East, South and West (N,S,E,W).
- Diameter at breast height (DBH).
- Diameter above buttress (DAB).

Tree No.	*Genus/species*	Age	Height (m)	Lowest Scaffold (m)	Spread (m)				DBH (cm)	DAB (cm)
					N	S	E	W		
1	*Corymbia torelliana*	M	12	2	7	5	5	9	100	110
2	*Melaleuca alternifolia*	M	10	3	7	6	8	5	52	90
3	*Corymbia maculata*	M	12	1.2	6	3	4	5	55	66

Table 2: Tree Measurements

5.3 Listed in Table 3 Below are calculations from the subject trees relating to:

- Tree Protection Zone (TPZ)
- Structural Root Zone (SRZ)
- Live Crown Size (LCS)

Tree No.	*Genus/species*	SRZ (m)	TPZ (m)	Estimated Live Crown Size (m^2)
1	*Corymbia torelliana*	3.44	12	130
2	*Melaleuca alternifolia*	2.51	10.8	90
3	*Corymbia maculata*	2.78	6.6	60

Table 3: Tree Calculations

6. TREE RETENTION VALUES

6.1 Trees have been allocated a retention value using the priority Matrix in the *IACA Significance of a Tree, Assessment Rating System* (STARS)© (IACA, 2010). The Matrix uses the Landscape Significance rating combined with the Useful Life Expectancy (ULE) to determine a retention value of either;

- Priority for Retention (High) – All measures must be taken to retain and protect these trees. If the guidelines set out in AS4970-2009 Protection of trees on development sites cannot be used to protect the trees, design modification or re-location of the proposed development should be considered.
- Consider for Retention (Medium) – Retention of these trees should remain a priority. If the trees are adversely affecting the proposed development and all protection measures have been considered but are not viable, removal can be considered.
- Consider for Removal (Low) – Retention of these trees is not important. No modification to design should be considered for their retention.
- Priority for Removal – Trees in an irreversible decline, weed species or hazardous trees. These trees should be removed.

Tree No.	*Genus/Species*	Landscape Significance Rating	Useful Life Expectancy	Retention Value
1	*Corymbia torelliana*	Medium	Low	Low
2	*Melaleuca alternifolia*	Low	Short	Low
3	*Corymbia maculata*	Medium	Medium	Medium

Table 4: Tree Retention Values

7. CONSTRUCTION IMPACTS

7.1 Listed in table 5 below are likely impacts from the proposed construction upon the trees.

Tree No.	Proposed encroachments into TPZ and/or canopy	Likely Impacts from the proposed construction (Discussion)
1	A major SRZ enchroachment. No canopy encroachment.	Possible loss of woody roots which could compromise tree health and stability.
2	A major approximate 35-45% TPZ/SRZ enchroachment. Required canopy removal will be between 15-25%.	A high likelihood of tree decline and or failure.
3	A major approximate 25-35% TPZ/SRZ enchroachment. No canopy encroachment has been calculated to take place.	Possible loss of woody roots which could compromise tree health and stability.

Table 5: Construction Impacts

8. DOCUMENTS USED IN THE PREPARATION OF THIS REPORT

8.1 Listed in Table 6 below are documents used in the preparation of this report.

Document type	Source/ Author	Title	Date	Summary
Plan	Peter Zavaglia Design Studio	Site Plans	March 2022	Site plans shown over the proposed development (DRW No:DA 04-09).
Plan	Complete Arborcare	TPZ/SRZ Plan	25/05/2022	TPZ/SRZ plan shown over the proposed development.

Table 6: Documents used in the preparation of this report

9. RECOMMENDATIONS/CONCLUSIONS

9.1 Non-destructive root investigation (according to clause 3.3.4 (a) of AS 4970, will be required upon tree **T1**. If roots >50mm ø are encountered ,the project arborist will assess if the tree can be retained.
It must be noted that major mechanical excavation within the SRZ have recently been undertaken by NBC.

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9.5 It is recommended that an AQF Level 5 Arborist is engaged to oversee/meet any arboricultural matters that may arise if the proposed works are approved.

10. LIMITATIONS ON THE USE OF THIS REPORT

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

11. ASSUMPTIONS

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

Unless stated otherwise:

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

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

This report does not represent or contain a tree risk assessment.

12. REFERENCES

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RELEVANT APPENDICES - APPENDIX A: GLOSSARY OF TERMS

Photographs – all images have been taken from *metromap*.

Common Name/*Genus species* - the common name and *genus/ species* of the tree.

Age Class- assessment of the trees current age.

Immature (IM) - refers to a tree at growth stages between immaturity and full size**.**

Semi-mature (SM) - refers to a full-sized tree with some capacity for further growth.

Mature (M)-refers to a full-sized tree with some capacity for further growth.

Over-mature (OM) - a mature tree has reached a near stable size (biomass) above and below the ground. Trees can have a Mature Age Class for > 90% of their life span. Over-mature (**OM**) trees show symptoms of irreversible decline and decreasing biomass.

Live Stag (LS) - refers to a tree in a significant state of decline. This is the last stage of a tree prior to death.

Height -estimated overall height of the tree.

Diameter at Breast Height (DBH) - the trunk diameter at breast height (in metres) of the tree, 1.4 meters above ground level.

Diameter above the Buttress (**DAB) -** refers to the tree trunk diameter measured above the root buttress and is used to calculate the radius of the SRZ.

Tree Protection Zone (TPZ) - is a "No Go Zone" surrounding a tree to aid in its ability to cope with disturbances associated with construction works. Tree protection involves minimising root damage that is caused by activities such as construction. Tree protection also reduces the chance of a tree's decline in health or death & the possibly damage to structural stability of the tree from root damage.

Structural Root Zone (SRZ) – the structural root zone is the area required for the tree's stability. A larger area is required to maintain a viable tree. The SRZ is only needed to be calculated when a major encroachment into the 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 rock and footings.

Vigour - **Good (G), Fair (F) or Poor (P) –** this refers to the trees vigour as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion and the degree of dieback.

Condition – **Excellent (E), Very Good (VG), Good (G), Fair (F), Declining (D), Poor (P),Very Poor (VP).**this refers to the tree's form & growth habit, as modified by its environment (aspect suppression by other tree/s, soils,) & the state of the scaffold (i.e. trunk & major branches),including structural defects such as cavities, crooked trunks or weak trunk/branch junctions. These are not directly connected with health & it is possible for a tree to be healthy but in poor condition/vigour.

Deadwood – this refers to any whole limb that no longer contains living issues (i.e. living leaves & /or bark).Some dead wood is common in a number of species.

Crown Spread - the greatest width from drip line to drip line of a branch across the trees crown.

Crown Form -the density of foliage (expressed as a percentage), that would be expected to be displayed in a tree of its genus/species. Many factors such as the presence of pests and/or diseases, drought and other associated environmental conditions contribute to crown form.

Live Crown Size (LCS) - the area of the crown as viewed from one aspect.

APPENDIX B: SIGNIFICANCE OF A TREE, ASSESSMENT RATING SYSTEM* (IACA 2010) – S.T.A.R.S. ©

Significance of a Tree, Assessment Rating System* (IACA 2010) – S.T.A.R.S. ©

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. An example of its use in an Arboricultural report is shown as Appendix A.

Tree Significance - Assessment Criteria

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.

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*.

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.

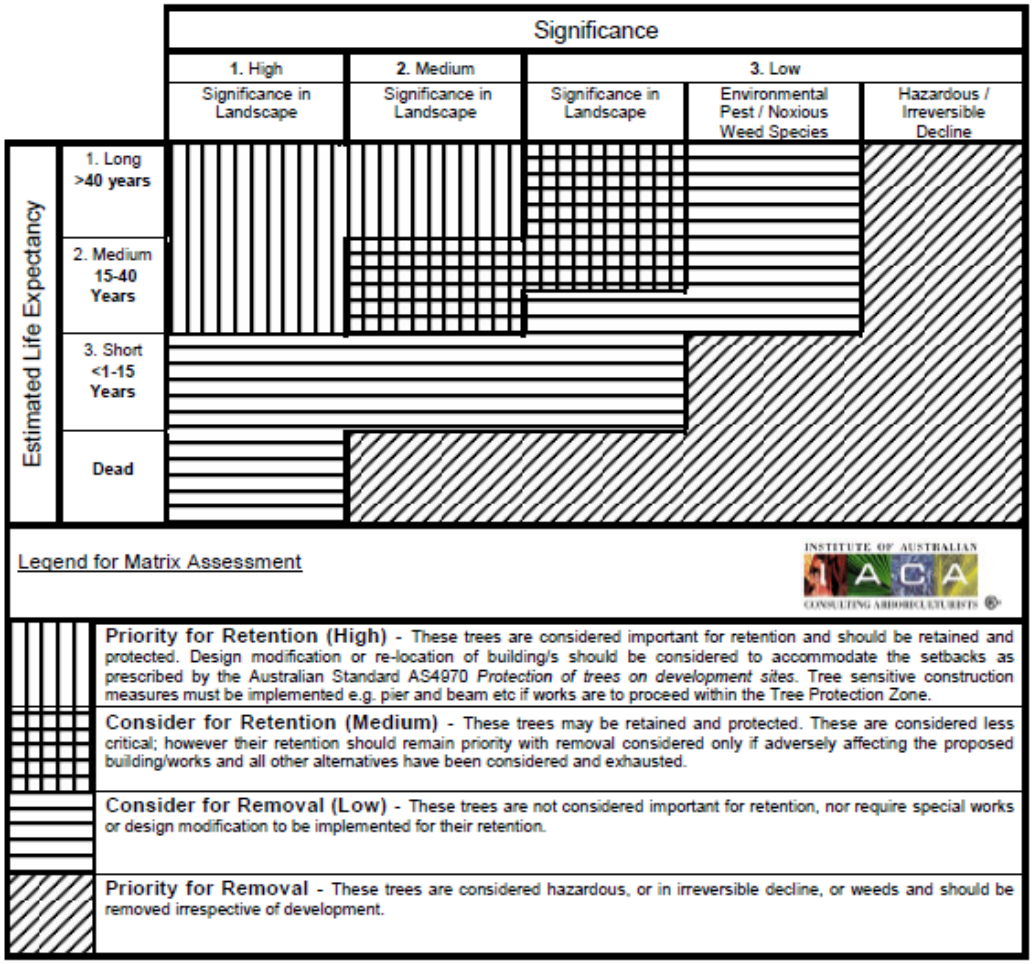
Hazardous/Irreversible Decline
- The tree is structurally unsound and/or unstable and is considered potentially dangerous,
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

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 monoculture stand in its entirety e.g. hedge.

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

Table 1.0 Tree Retention Value - Priority Matrix.



USE OF THIS DOCUMENTAND 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', 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 Ltd2001, *Footprint Green Tree Significance & Retention Value Matrix*, Avalon, NSW Australia, www.footprintgreen.com.auIACA 2010, *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, www.iaca.org.au

APPENDIX C: EXAMPLE OF TREE PROTECTION FENCING & SIGNAGE

Tree protection Fencing must be a minimum of 1.8 metres in height and be held in place with locking clamps and concrete feet footing (an example of protective fencing and signage is shown below).

APPENDIX D:TREE PROTECTION STAGES

Tree Protection will be undertaken in the three stages listed below. Certification from the project arborist is required at/during each stage.

PRE-DEVELOPMENT STAGE

- Prior to any tree removal an AQF level 5 arborist must be engaged as site arborist to oversee all arboricultural aspects of the project including tagging all trees and identifying trees for removal.
- Tree protection should be installed by a minimum AQF level 3 arborist and be supervised by an AQF level 5 arborist in accordance with the guidelines from AS4970-2009 Protection of trees on development sites (Standards Australia, 2009), and the information provided in this report.
- All trees to be retained must be visually assessed and their current health and condition recorded. Tree protection measures must be inspected. The minimum assessment categories are provided below.

Visual assessment benchmark

Tree No	Botanical Name	Vitality	Leaf Damage	Pests / Diseases	Deadwood (%)	Dieback (%)	Mechanical Damage	Recent Pruning

- Certifying of Pre-Construction Tree Protection by the site arborist will conclude the pre-construction phase of development. Construction must not commence until Pre-Construction tree protection has been certified by the site arborist.
- The project manager is to be made aware of Tree Protection requirements for the duration of the project.

Pre-development Arboricultural Certification

	Pre-Development requirement met. (Y/N)	Project Arborist Signature	Date
All trees tagged. Trees for removal identified by project arborist.			
All tree protection measures have been correctly installed.			
A pre-development visual inspection of all trees to be retained has been undertaken by the project arborist			
The project manager has been made aware of all tree protection measures required for the duration of the project.			

DEVELOPMENT STAGE

- Tree protection measures must remain in place during this stage. They cannot be removed intermittently for access and any modifications to Tree Protection Fencing Locations as shown in the tree protection plan, must be authorised, recorded and carried out by the site arborist.
- The project arborist is to be present for all arboricultural supervision within TPZ's of retained trees, as recommended by the arboricultural impact assessment (AIA) and tree protection plan.
- The site arborist will conduct regular visits in accordance with AS4970-2009 to visually assess and record the health and condition of the trees being retained.
- Tree protection measures will also be assessed regularly to ensure they are functioning correctly. Any maintenance required for Tree Protection measures will be performed.
- A stop work notice will be issued to the project manager if any Tree Protection Measures are not found to be complying with the Tree Protection Plan.
- Any incidents relating to retained trees must be reported immediately to the site arborist to be documented and a plan for remediation put in place.

Development Stage Arboricultural Certification.

	Development requirement met. (Y/N)	Project Arborist Signature	Date
Tree protection measures have remained in place for the duration of the development.			
Tree Health and vitality has not deteriorated during the development.			
Arboricultural supervision has been undertaken as required by the AIA and Tree Protection Plan			
Incidents relating to retained trees have been reported to the project arborist.			
Remediation has been implemented as necessary for the successful retention of retained trees.			

CONCLUSION OF DEVELOPMENT

- Final visit from the site arborist to report on the health and condition of the trees that have been retained and the removal of tree protection. Incidents documented during the development stage will be included in this report.
- Any remedial work necessary upon the completion of development will be recommended in the final report.
- Replacement trees are to be planted before the project arborists final inspection.

Conclusion of Development Arboricultural Certification.

	Development requirement met. (Y/N)	Project Arborist Signature	Date
Tree protection measures have remained in place for the duration of the development.			
Tree Health and vitality has not deteriorated during the development.			
All documentation from site inspections/supervision has been compiled.			
Remediation has been implemented as necessary for the successful retention of retained trees. Any remediation to be continued has been recommended in the final report.			
Replacement tree planting has been undertaken and all replacement trees have been planted correctly.			