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In Collaboration with

Michael Shaw
Consulting Arborist

Arboricultural Impact Assessment
For
Proposed development at 8 Bilkurra Ave Bilgola Plateau NSW
Metricon Job number 700938

Prepared for
Mrs Coffee & Mr Wilson

By
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Diploma Horticulture (Arboriculture) AQF5

29 April 2019

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1. Brief

1.1. I am requested by Mrs Coffee & Mr Wilson (property owners) to identify and assess all trees at or near 8 Bilkurra Ave Bilgola Plateau that will be potentially affected by the proposed development, and to provide an arboricultural impact assessment which discusses relevant aspects of the proposed development's impact on existing trees.

2. Scope

2.1. This report focuses on trees within and close to the subject site that may be affected by the proposed development.

2.2. All trees were assessed visually from ground level in accordance with Mattheck and Breloer's Visual Tree Assessment methodology.

2.3. No excavation or invasive testing was conducted as a part of the visual tree assessment.

3. The proposed development

3.1. The proposed development is for the demolition of an existing residential structure and the construction of a replacement residential structure.

3.2. The proposed development is located within the residential suburb of Bilgola Plateau in the Northern Beaches local government area.
Several existing trees at or near the site will be affected if the proposed development occurs as planned.

4. Site description

4.1. The subject site (8 Bilkurra Ave Bilgola Plateau) is a residential property.

4.2. Trees on the site are located mainly on the periphery and in neighbouring yards and consist of a mixture of native and non-native, planted and self-sown mature and immature trees.

5. Site visit details

5.1. One unaccompanied site visit was made by the author on 18 April 2019 for the purposes of data collection and tree assessment for this document.

5.2. During this visit, tree location and other data was collected and assessments undertaken for the subject trees in relation to the proposed development.

5.3. The weather at the time of the site visit was fine and the effect of wind was negligible.

Site location (Google maps)

6. Main documents utilised

6.1.1. The following documents were provided for the author's information by Vince Caccavo from Site Design Studios,

7.

- Job number 700938 Design drawings (12 sheets), by Metricon, dated 20/03/2019
- Site survey by Intrax, dated 4/03/2019

Other documents and information may have been provided however, the main ones used to assist the author with this assessment are listed above.

These documents were provided to the author in electronic format via email.

8. Methodology

8.1. All tree assessments were carried out utilising the following methods

- Visual Tree Assessment Method (VTA) (Mattheck and Breloer,)
- Tree AZ (Barrell)
- Significance and retention value was assessed using STARS (IACA 2010)
- No aerial inspections, root excavations or soil sampling were conducted as part of this assessment
- Tree identification was based on visual inspection of features available at the time of inspection. A complete taxonomical process of identification was not conducted; therefore, the identification of trees in this document represents the probable identity of the species.

8.2. Measurements and observations were taken using

- Positioning and data recording conducted using an Ashtech Mobile Mapper 10 GPS PDA device.
- Binoculars and naked eye
- Diameter at breast height (DBH) was measured using a diameter tape or estimated at approx. 1.4 metres above ground level.
- Tree height and canopy spread was estimated

8.3. Data collection and encroachment calculation

Where appropriate, all assessed and recorded trees were physically tagged with an aluminium tag and nail inscribed with the number corresponding on the tree survey data table at Appendix 3.

All assessed and recorded trees have been identified with a number which corresponds with the number on the tree survey data table at Appendix 3 and its location at the subject site may be viewed on the aerial image at Appendix 4 Images .

The author attempted to locate the trees as accurately as possible by using Google Earth in conjunction with plan drawings and provided professional survey images, which were overlaid using the tools available in the Google Earth application. These images were placed manually, as accurately as possible and cross referenced with the location point data collected by the author and displayed on the Google Earth interface screen.

Measurements to the nearest TPZ/SRZ disturbance was measured using tools available in the Google Earth application and encroachment percentages were calculated using the *"Proofdocs" TPZ Incursion Calculator* which is available online.

9. Trees potentially affected by the proposed development

Discussion

9.1. **Tree 1** is a mature scribbly gum which is located centrally within the backyard at the eastern end of the subject property.
9.2. This tree displays suppressed growth due to dominance by nearby and larger Tree one.
9.3. This tree will experience a major and unsustainable 31.5% encroachment from proposed soil level changes for the installation of the new building structure.
9.4. This tree is proposed to be removed to facilitate the development and it will require removal if the proposal proceeds as planned.

9.5. **Tree 2** is a mature scribbly gum which is located centrally within the backyard at the eastern end of the subject property.
9.6. This tree is larger and more dominant than Tree 1.
9.7. The section of proposed excavation as shown in the image at Appendix 4 (pink shaded polygon) that is within the TPZ for this tree will be eliminated and replaced by a retaining wall which aligns to the new house foundations.
9.8. This will mean that the tree will experience a sustainable 7.4% encroachment into its TPZ and may be retained if managed appropriately.
9.9. This tree may be protected and retained and a physical TPZ which complies with Section 4 of AS4970-2009 should be established to the dimensions specified at Appendix 3 Tree survey data table, and as indicated at Appendix 4 Images and must be certified before any demolition or construction commences and shall remain in place until completion of the project.
9.10. The canopy of this tree extends toward the proposed new structure and branch length reduction and canopy lifting pruning will be necessary to eliminate conflict with the new structure.
9.11. Pruning must be kept to the absolute minimum required to eliminate conflict with proposed new structures and must be conducted with appropriate consent from the relevant authority and in accordance with AS4373-2007 by a certificate 3 qualified arborist.

9.12. **Trees 3, 3A, 3B and 3C** are all semi mature and exempt bangalow palm trees and 3C is a stand of trees including a Hibiscus, a Cordyline and Golden cane palm.
9.13. All of these trees and shrubs are exempt due to their unprotected species and/or height being less than 5m and all may be removed without consent.
9.14. All of these trees and shrubs are proposed to be removed in order to facilitate the development.

9.15. **Tree 4** is a Frangipani which is located within the backyard area.

9.16. This tree is exempt from protection due to its height being less than 5m and requires no consent to remove.

9.17. This tree is located within the proposed construction footprint for the new house and will be removed to facilitate the development.

Any recommended tree protection measures must be installed before any phase of development related activity occurs.

If required, tree protection measures must be assessed and certified in writing by an AQF5 consulting arborist with a sufficient time allowance to make physical adjustments to protection measures in order to ensure efficacy of tree protection before any works commence.

Any soil disturbance in the form of trenching or fill placement or tunnelling for the installation of infrastructure including but not limited to pipes for communications, electrical, drainage, water or sewer must be considered in relation to retained trees and advice shall be sought from an AQF5 consulting arborist if any infrastructure as described above is proposed to be installed within the TPZ radius for any tree to be retained.

All other trees not listed specifically here will not be affected by the proposed development if protected in accordance with AS4970-2009.

10. Tree protection zone information

TPZ- (Tree protection zone) the tree protection zone (TPZ) is the principal means of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable.

SRZ- (Structural root zone) The SRZ is the area required for tree stability. A larger area is required to maintain a viable tree.

Any trees recorded within the scope of this assessment that are to be retained shall be protected by a physical TPZ exclusion zone to the radius from the trunk calculated in accordance with section 4 of AS 4970-2009 *Protection of Trees on Development Sites* (Provided at Appendix 3) Tree survey data table) and in consultation with the project arborist. It is strongly recommended that a copy of this standard is obtained by the project manager as a reference before any work commences on site.

Tree protection zones shall be established in accordance with Section 4 of AS 4970-2009 before commencement of any other demolition or construction work. This will include trunk, branch and ground protection if considered necessary by the project arborist and also placement of appropriate and compliant TPZ signage to the physical TPZ fence.

The TPZ shall remain until the completion of all demolition and construction related activity.

Any pruning and tree works recommended are to be conducted by a certificate 3 (minimum) qualified and experienced arborist and work is to be conducted according to AS4373: *Pruning of Amenity Trees*.

Consent to prune trees may be required from the tree owners and Council.

Establishment and erection of tree protection zone and signage should be inspected and certified by the project arborist to ensure compliance with the standard.

Unless approved by the project arborist beforehand, no activity as detailed in section 4.2 of AS 4970-2009 Protection Of Trees On Development Sites and Section 10 of this document is to occur within the TPZ.

11. Activities prohibited within the Tree Protection Zone

- 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
- Lighting fires
- Refuelling
- 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.

References

- Northern Beaches Council (Pittwater) Tree protection policies
- Standards Australia (2009) “AS4970: Protection of trees on development sites”
- Standards Australia (2007) “AS4373: Pruning of Amenity Trees”
- http://www.treetec.net.au/TPZ_SRZ_DBH_calculator.php
- http://www.proofdocs.com/arborist_report_template/tpz_incursion_calculator/
- Mattheck, C.,Breloer, H (1994) The Body Language of Trees- A handbook for failure analysis . HMSO, London.

Sitedesign Studios contact details

For all matters regarding Trees please contact;

Vince Caccavo (Project Manager / Senior Landscape Architect)

Telephone 0421 575 888

Email Vince@sdstudios.com.au

Note: Vince manages Landscape Design & Arboriculture Services for all Metricon Projects. Please contact Vince for any questions regarding this report.

Qualifications and experience (Michael Shaw)

Practising consulting arborist from 2009- present

AQF level 5 Diploma of Horticulture (Arboriculture)

Licensed QTRA practitioner (quantitative tree risk assessment)

Senior Tree Risk Assessment Officer (Central Coast Council) Sep 2015- Dec 2017

ISA conference Canberra 2017

Tree Assessment And Vegetation Management Officer Port Stephens Council from September 2009 – Dec 2011

ISA Tree risk assessment qualification (TRAQ) October 2013

VTA (visual tree assessment) workshop March 2011 and March 2013

ISA 87th annual Conference delegate, Parramatta NSW July 2011.

Matheny & Clark “Arboriculture” Seminar. Melbourne November 2009

Specialising in arboriculture and tree assessment from Feb 2008

Certificate 3 Horticulture (Parks and gardens)

Working in horticultural industry from April 2004

Appendix 1 Tree AZ

Category Z: Unimportant trees not worthy of being a material constraint

Local policy exemptions: Trees that are unsuitable for legal protection for local policy reasons including size, proximity and species

Z1	Young or insignificant small trees, i.e. below the local size threshold for legal protection, etc
Z2	Too close to a building, i.e. exempt from legal protection because of proximity, etc
Z3	Species that cannot be protected for other reasons, i.e. scheduled noxious weeds, out of character in a setting of acknowledged importance, etc

High risk of death or failure: Trees that are likely to be removed within 10 years because of acute health issues or severe structural failure

Z4	Dead, dying, diseased or declining
Z5	Severe damage and/or structural defects where a high risk of failure cannot be satisfactorily reduced by reasonable remedial care, i.e. cavities, decay, included bark, wounds, excessive imbalance, overgrown and vulnerable to adverse weather conditions, etc
Z6	Instability, i.e. poor anchorage, increased exposure, etc

Excessive nuisance: Trees that are likely to be removed within 10 years because of unacceptable impact on people

Z7	Excessive, severe and intolerable inconvenience to the extent that a locally recognised court or tribunal would be likely to authorise removal, i.e. dominance, debris, interference, etc
Z8	Excessive, severe and intolerable damage to property to the extent that a locally recognised court or tribunal would be likely to authorise removal, i.e. severe structural damage to surfacing and buildings, etc

Good management: Trees that are likely to be removed within 10 years through responsible management of the tree population

Z9	Severe damage and/or structural defects where a high risk of failure can be temporarily reduced by reasonable remedial care, i.e. cavities, decay, included bark, wounds, excessive imbalance, vulnerable to adverse weather conditions, etc
Z10	Poor condition or location with a low potential for recovery or improvement, i.e. dominated by adjacent trees or buildings, poor architectural framework, etc
Z11	Removal would benefit better adjacent trees, i.e. relieve physical interference, suppression, etc
Z12	Unacceptably expensive to retain, i.e. severe defects requiring excessive levels of maintenance, etc

NOTE: Z trees with a high risk of death/failure (Z4, Z5 & Z6) or causing severe inconvenience (Z7 & Z8) at the time of assessment and need an urgent risk assessment can be designated as ZZ. ZZ trees are likely to be unsuitable for retention and at the bottom of the categorisation hierarchy. In contrast, although Z trees are not worthy of influencing new designs, urgent removal is not essential and they could be retained in the short term, if appropriate.

A

Category A: Important trees suitable for retention for more than 10 years and worthy of being a material constraint

A1	No significant defects and could be retained with minimal remedial care
A2	Minor defects that could be addressed by remedial care and/or work to adjacent trees
A3	Special significance for historical, cultural, commemorative or rarity reasons that would warrant extraordinary efforts to retain for more than 10 years
A4	Trees that may be worthy of legal protection for ecological reasons (Advisory requiring specialist assessment)

NOTE: Category A1 trees that are already large and exceptional or have the potential to become so with minimal maintenance, can be designated as AA at the discretion of the assessor. Although all A and AA trees are sufficiently important to be material constraints, AA trees are at the top of the categorisation hierarchy and should be given the most weight in any selection process.

Appendix 2 Landscape significance and tree retention determination

Tree Significance - Assessment Criteria

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.

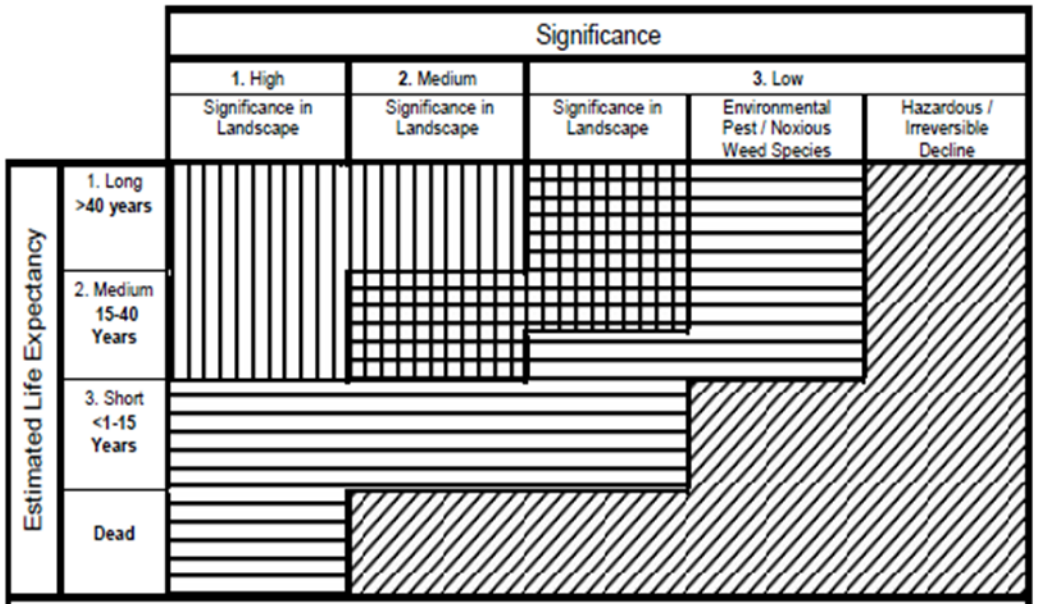
Hazardous/Irreversible Decline

- 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.

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.

Table 1.0 Tree Retention Value - Priority Matrix.



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 *Protection of trees on development sites*. 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.

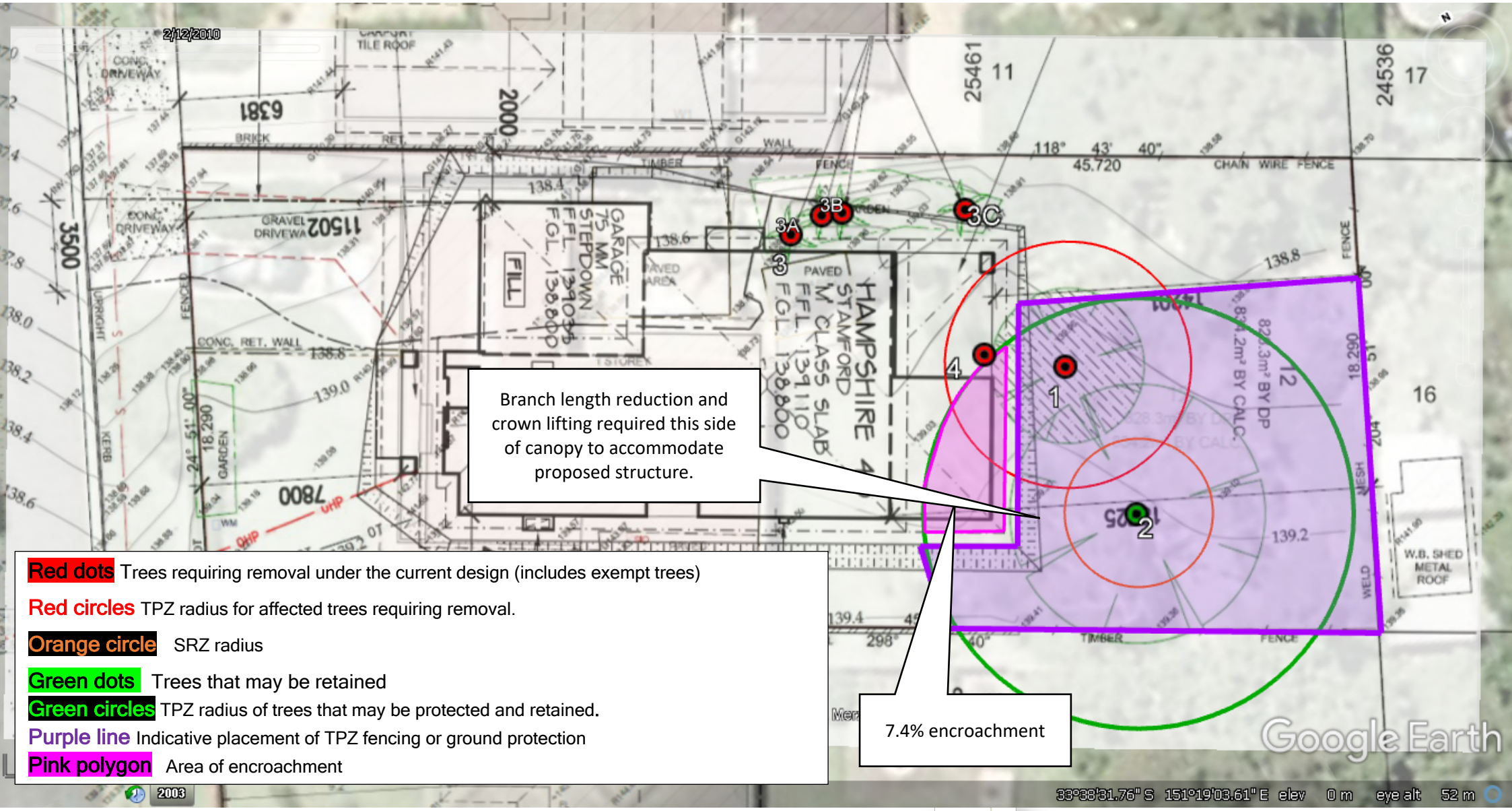
Appendix 3 Tree survey data table

Significantly affected trees requiring removal or trees proposed for removal in red text

Tree#	Botanical Name	Common Name	DBH	TPZ/SRZ	Height x radial canopy spread	Age	Estimated life expectancy	Significance	Retention value	TreeAZ	Overall Vigour/health. % live canopy	Comments
1	*Eucalyptus haemostoma*	Scribbly gum	42	4.8/2.4	8x6	M	Short 5-15 years	Medium	Low	Z4	70	Mistletoe. Deadwood. Epicormic growth. Suppressed
2	*Eucalyptus haemostoma*	Scribbly gum	72	8.4/2.9	10x14	M	Long >40 years	Medium	High	A2	80	Protect and retain. Deadwood. Epicormics. Crossing branches. Crown maintenance and canopy lifting required. Canopy extends 10m towards existing house. Obtain appropriate consent before pruning.
3	*Archontophoenix cunninghamiana*	Bangalow palm	20 20	5/2.0	8x4	M	Medium 15-40 years	Medium	High	A1	80	2 trunks
3A	*Archontophoenix cunninghamiana*	Bangalow palm	20	5/2.0	8x4	SM	Medium 15-40 years	Medium	Low	A1		

Tree#	Botanical Name	Common Name	DBH	TPZ/SRZ	Height x radial canopy spread	Age	Estimated life expectancy	Significance	Retention value	TreeAZ	Overall Vigour/health. % live canopy	Comments
3B	*Archontophoenix cunninghamiana*	Bangalow palm	20	5/2.0	8x4	SM	Medium 15-40 years	Medium	Low	A1		
3C	*Miscellaneous stand*	Cordyline. Hibiscus. Golden cane palm	Multiple small leaders	2.0/2.0	Up to 4m high	SM	Medium 15-40 years	Low	Low	Z1	80	Not worthy of being a constraint to development
4	*Plumeria rubra*	Frangipani	15 15 15	3.0/2.0	4x5	SM	Long >40 years	Low	Low	Z1	50	

Appendix 4 **Images** (Google Earth Image with plans and trees overlaid)



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