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Arboriculture Impact Statement & Site-Specific Preliminary Plan of Management

December 2023

Prepared for: Northern Beaches Council
Attention: Barbara Slack (NBC Landscape Architect)

Thomas Stephens Reserve
2105 Pittwater Road, Church Point NSW 2105

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1. Summary

The Northern Beaches Council (as the project developer/manager) of Thomas Stephens Reserve, 2105 Pittwater Road, Church Point NSW 2105) commissioned the Growing My Way Tree Consultancy (GMW) to prepare a *Tree Assessment & Management Report* to be linked to an update works.

The site is Land Zoned for “RE1 Public Recreation”.

The document relates to the ‘public open space dining/ferry terminus area’ of the subject site, Thomas Stephens Reserve, 2105 Pittwater Road, Church Point NSW 2105 (from herein, the TSR).

A total number of seven (7) trees or groups of trees are discussed in this report.

In totality, the subject site shares common boundaries with five (5) different land zoning adjoining properties, one (1) public road (Pittwater Road). All common boundaries adjoining sites are developed to contain multiple forms of infrastructure.

Motor vehicle & pedestrian access to the subject site are via Pittwater Road. Additional pedestrian access can be via various Pittwater Ferry Services or Water Taxi Services.

The primary consent authorities are the NSW Maritime Services Board Northern Beaches Council. (*From herein, the NBC*).

Information related to the discussed trees was gathered by onsite data collection with cross referencing to:

- *NBC website, online property & environment information website tools.*
- *Site Survey by C.M.S. Surveyors Pty Limited, dated 20 April 2020.*
- *Proposed landscape Plans, Elevations Sections etc., by Black Beetle, dated 29 August 2023.*
- *NSW SEPP; 10/50 Vegetation Clearing ‘Code of Practice’*
- *NBC “Tree Management Provisions”*
- *NBC Heritage Conservation Area & Land Zoning LEP Maps*
- *NBC Wildlife Corridor Map.*

The aim of this report is:

1. *To confirm the viability of the discussed trees, relating to individual health, vigour & condition considering any impact foreseen by the proposed works.*
2. *Provide a Preliminary Site Specific ‘Tree Plan of Management’.*

NBC planning policies require, any tree supported to be removed to be replaced with suitable new replacement tree/s. New replacement tree/s at a minimum when mature must replicate or exceed the loss of ‘green footprint’ currently provided by the supported to be replaced tree/s.

The new concept plan confirms, ample room within the subject site to plant new, including potentially locally indigenous species.

A potentially suitable to the subject site/local environment list of replacement trees is provided within this document.

Kyle A Hill - AQF level 5, Diploma of Horticulture / Arboriculture, (TAFE NSW & other) & AQF level 8, Post Graduate Certificate in Arboriculture, (University of Melbourne) Practicing/Consulting Arborist) with the assistance of Ao Wang (Master of Protected Area, Governance & Management (University of Tasmania) & Bachelor of Environmental Biotechnology (University of Technology Sydney) has prepared this report based on "Visual Tree Assessment" (VTA) undertaken on Friday, 24 November 2023.

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2. Introduction

This report contains observations & recommendations intended to assist in the management of the seven (7) trees identified as necessary to be discussed.

This document only discusses trees within the 'public open space dining/ferry terminus area' of the subject site.

Tree Protection Zone (TPZ) & Structural Root Zone (SRZ) radial distances have been calculated for individual trees & used as the part of the criteria that has determined our recommendations

We acknowledge & confirm to be familiar with the NBC "Tree Management Provisions", specifically the documents; Pittwater Local Environment Plan, 2014, (from herein Pittwater LEP), the Pittwater 21 Development Control Plan (from herein Pittwater 21 DCP), Wildlife Corridor Map". Our focus is to be compliant with the PC 21 DCP clause B4.22 Preservation of Trees & Bushland Vegetation, parts B & C, starting on page 103, recent changes to the NBC DCP plus the new (August 2017) & the SEPP, Vegetation in Non-Rural Areas.

The primary consent authorities are the NSW Maritime Services Board Northern Beaches Council. (*From herein, the NBC*).

The subject site is NOT within an NBC designated "Conservation Area".

The Subject site is a Listed Heritage Item – ARCHAEOLOGICAL, listed as A2270336. The subject site western common boundary adjoining property is a listed 'Heritage Item' – General I2270010.

The discussed trees are presumed to be at least mostly planted specimens. Some are locally indigenous species. The subject & adjoining sites are within the *Pittwater Spotted Gum Forest in the Sydney Basin Bioregion, an endangered ecological community listing (See NSW Scientific Committee, established by the Threatened Species Conservation Act Final Determination Part 3 of Schedule 1 of the Listing of Endangered Ecological Communities is provided for by Part 2 of the Act.* The subject site is not within any listed wildlife corridor area (*Pittwater 21DCP*).

Information related to the discussed trees was gathered by onsite data collection with cross referencing to:

- *NBC website, online property & environment information website tools.*
- *Site Survey by C.M.S. Surveyors Pty Limited, dated 20 April 2020.*
- *Proposed landscape Plans, Elevations Sections etc., by Black Beetle, dated 29 August 2023.*
- *NSW SEPP; 10/50 Vegetation Clearing 'Code of Practice'*
- *NBC "Tree Management Provisions"*
- *NBC Heritage Conservation Area & Land Zoning LEP Maps*
- *NBC Wildlife Corridor Map.*

This document includes a Preliminary Site Specific "Tree Plan of Management".

3. Methodology

Assessment Methodology for the discussed trees has been from ground level by eye, using *Visual Tree Assessment (VTA Stage 1)*, techniques developed by Claus Mattheck. The principles of VTA are illustrated & explained in his widely used reference textbook "*The Body Language of Trees (1994)*".

Assessment includes:

- *Revision of Documentation provided by the NBC*
- *Revision of previous GMW prepared information*
- *Tree's current condition & likely future health*
- *Species tolerance to root disturbance &/or development*
- *Likely present & future risk to persons & property*
- *Tree's (public & private landscape) amenity value, considering habitat potential.*

No root analysis, soil testing, 'Resistograph'® drilling or aerial canopy inspection was undertaken. See the following Appendices for further information:

- *Appendix A Glossary of Common Arboreal term*
- *Attachment A Tree Protection/Management Prior to & During Construction*

4. Observations

4.1 The Site

The report discusses trees within the subject site. The subject site is 752.1 m² in size (*Site Survey by C.M.S. Surveyors Pty Limited, dated 20 April 2020*). The subject site is linked to one (1) public road & five (5) common boundary properties developed to contain multiple forms of infrastructure.

We believe, some geotechnical issues are linked to this proposal relative to tree management.



FIGURE 1: ABOVE ILLUSTRATES THE DISCUSSED TREES RELATIVE TO THE SITE THOMAS STEPHENS RESERVE, 2105 PITTWATER ROAD, CHURCH POINT NSW 2105 (AERIAL PHOTOGRAPH ON SATURDAY 21 OCTOBER 2023, MAP DATA COURTESY OF NEARMAP™)

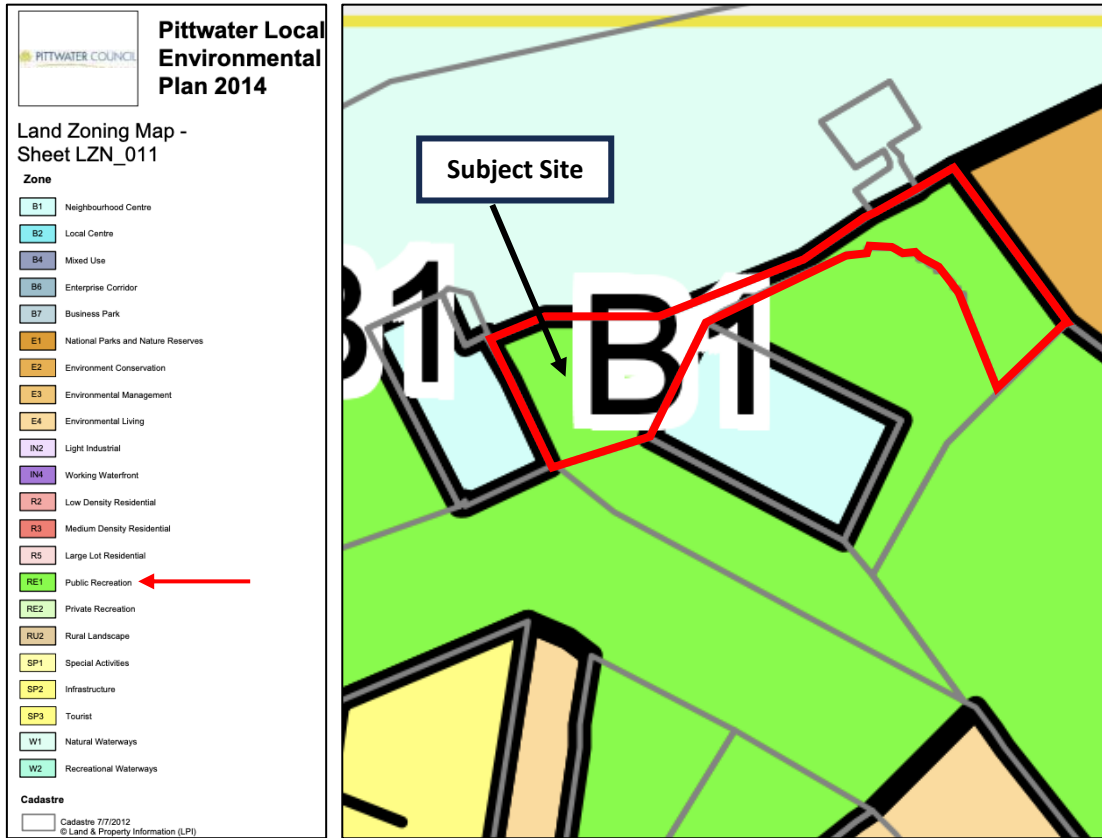


FIGURE 2: CONFIRMS STATUS OF THE SUBJECT SITE RELATIVE RE1 PUBLIC RECREATION. (PITTWATER LOCAL ENVIRONMENTAL PLAN 2014, LAND ZONING MAP - SHEET LZN_011).

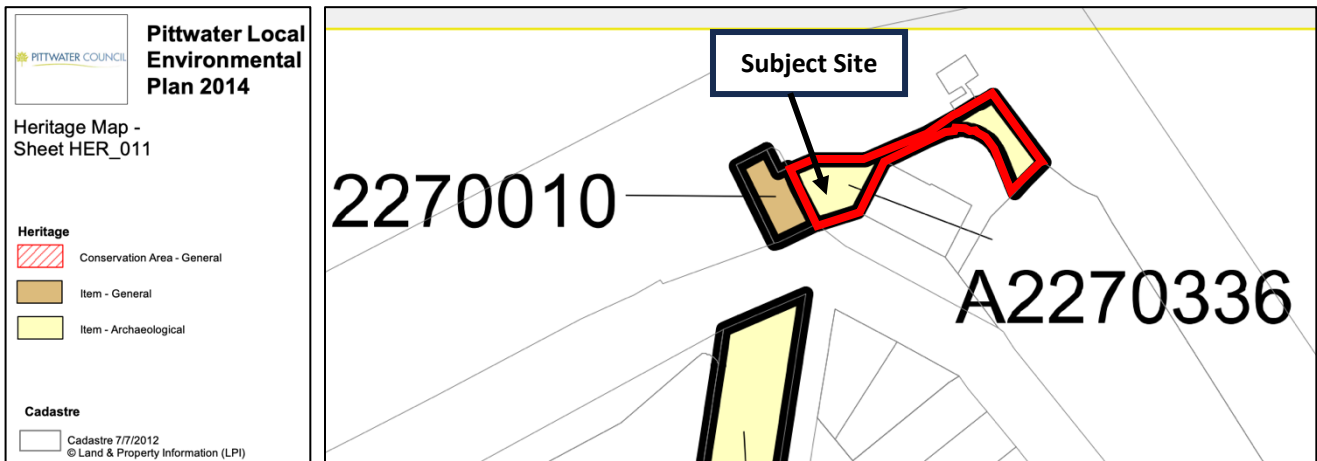


FIGURE 3: CONFIRMS STATUS OF THE SUBJECT SITE RELATIVE TO ITEM - ARCHAEOLOGICAL LISTED AS A2270336(PITTWATER LOCAL ENVIRONMENTAL PLAN 2014, HERITAGE MAP SHEET HER_011).

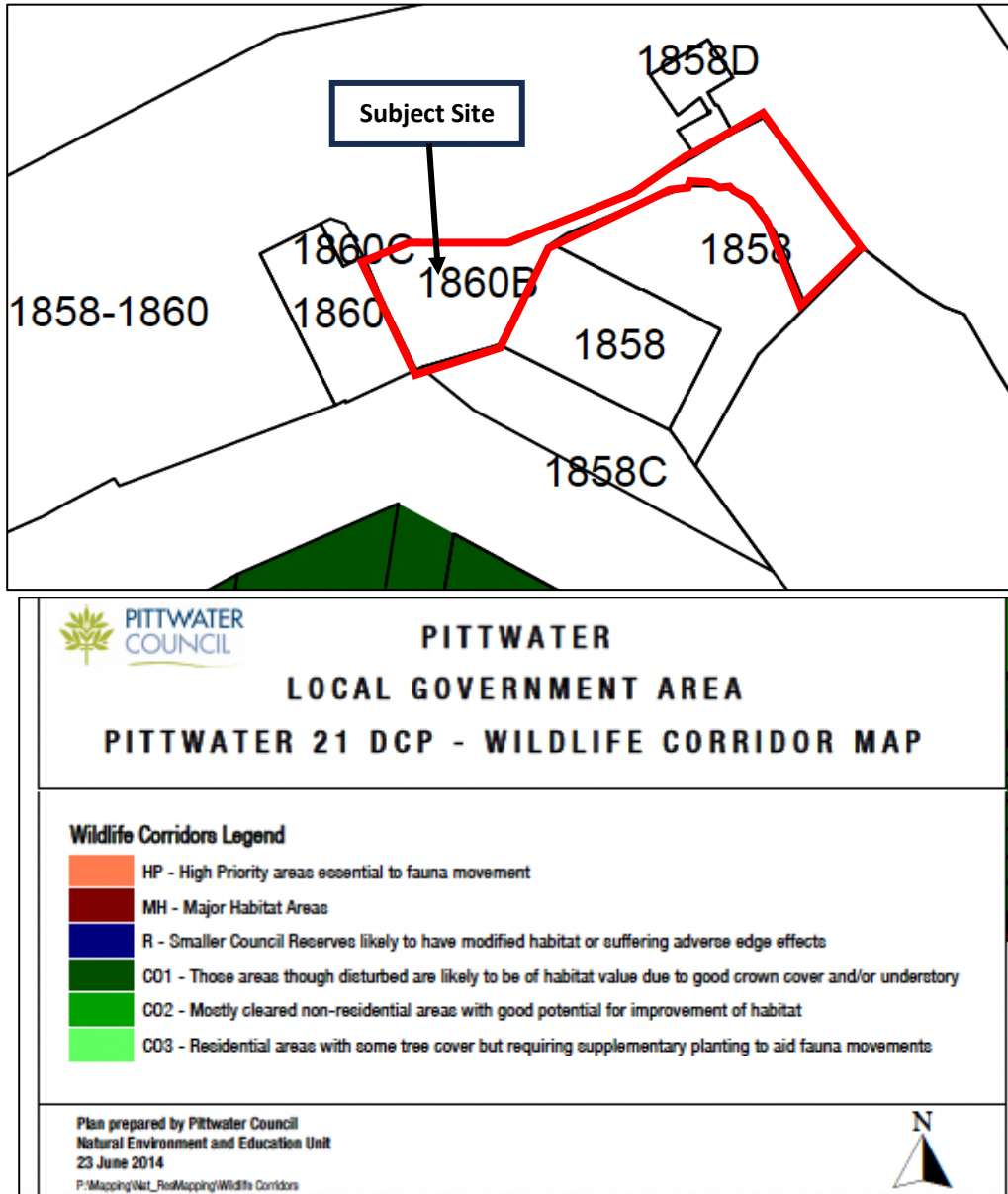


FIGURE 4: SUBJECT SITE IS NOT WITHIN ANY OF WILDLIFE CORRIDOR AREA (PITTWATER LOCAL GOVERNMENT AREA PITTWATER 21DCP – WILDLIFE CORRIDOR MAP)

4.2 The Proposal

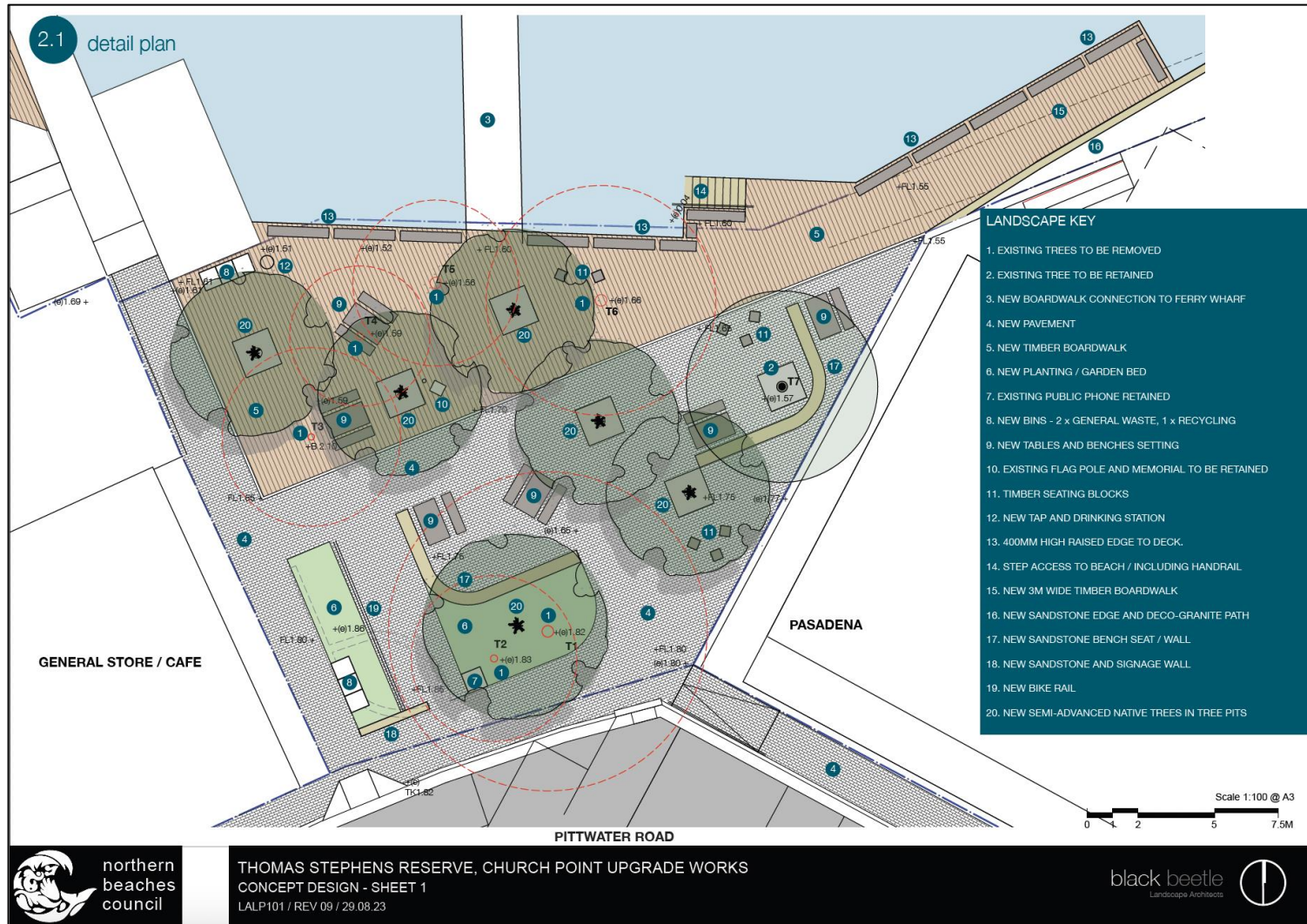


FIGURE 6: ILLUSTRATES PROPOSED SITE PLAN

4.3 The Trees – Summary Table

Read this table in conjunction with Appendix A– Common Arboreal Terms

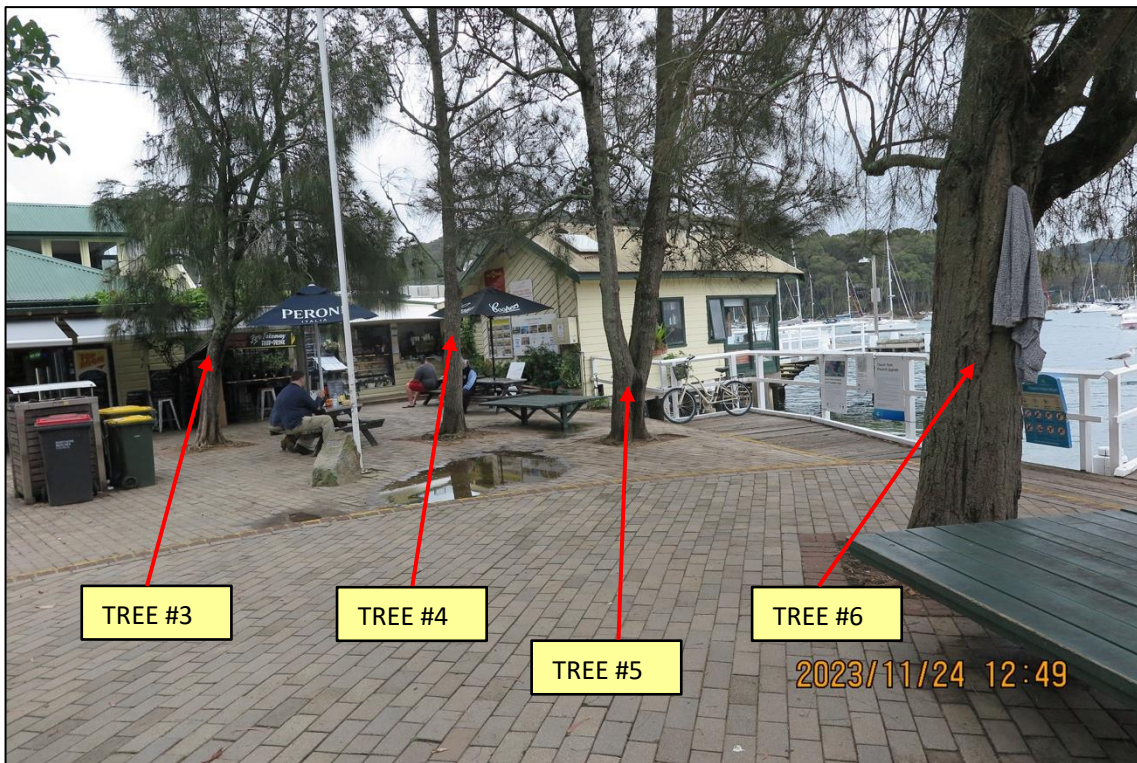
Trees Recommended for removal							Trees Recommended for retention				
Exempt or Weed species							Trees retainable but of low amenity/significance				
	Identification	Height (m)	Crown (m)	DBH (m)	TPZ (m)	SRZ (m)	Age	Health/ Vigour	Retention & Significance Value	Structure /Form	Comments
1	<i>Eucalyptus scoparia</i> (Wallangarra Willow Gum)	<14.00	<12.50	0.53	6.36	2.87	M	Fair to Good & Fair to Good	Moderate/ Moderate (This is not locally indigenous species)	Fair to Good / Fair to Good	<u>REPLACE:</u> The Total TPZ surface area encroachment presents as an unable to be supported disturbance to the total TPZ surface area.
2	<i>Corymbia maculata</i> (Spotted Gum)	<14.00	<7.00	0.27	3.24	2.18	SM	Good & Good	High/High	Good / Good	<u>REPLACE:</u> The Total TPZ surface area encroachment presents as an unable to be supported disturbance to the total TPZ surface area.
3	<i>Casuarina glauca</i> (Swamp She-Oak)	<10.00	<7.00	0.30	3.60	2.45	M	Good & Good	High/High	Good / Good	<u>REPLACE:</u> The Total TPZ surface area encroachment presents as an unable to be supported disturbance to the total TPZ surface area.

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	Identification	Height (m)	Crown (m)	DBH (m)	TPZ (m)	SRZ (m)	Age	Health/Vigour	Significance/Retention Value	Structure/Form	Comments
4	<i>Casuarina glauca</i> (Swamp She-Oak)	<14.00	<6.00	0.28	3.36	2.37	M	Good & Good	High/High	Good / Good	REPLACE: The Total TPZ surface area encroachment presents as an unable to be supported disturbance to the total TPZ surface area.
5	<i>Casuarina glauca</i> (Swamp She-Oak)	<14.50	<7.00	0.43	5.16	2.51	M	Good & Good	High/High	Good / Good	REPLACE: The Total TPZ surface area encroachment presents as an unable to be supported disturbance to the total TPZ surface area.
6	<i>Casuarina glauca</i> (Swamp She-Oak)	<14.00	<9.00	0.46	5.52	2.65	M	Good & Good	High/High	Good / Good	REPLACE: The Total TPZ surface area encroachment presents as an unable to be supported disturbance to the total TPZ surface area.
7	<i>Melaleuca quinquenervia</i> (Broad-leaved Paperbark)	<7.50	<7.50	0.31	3.72	2.15	M	Good & Good	High/High	Good / Good	RETAIN, PROTECT & MANAGE: Standard Temporary Tree Trunk Guard is specified. Intensive management is specified

4.4 Tree & Site Images

(Photographs taken on Friday, 24 November 2023 (Canon G1X MkII digital camera))





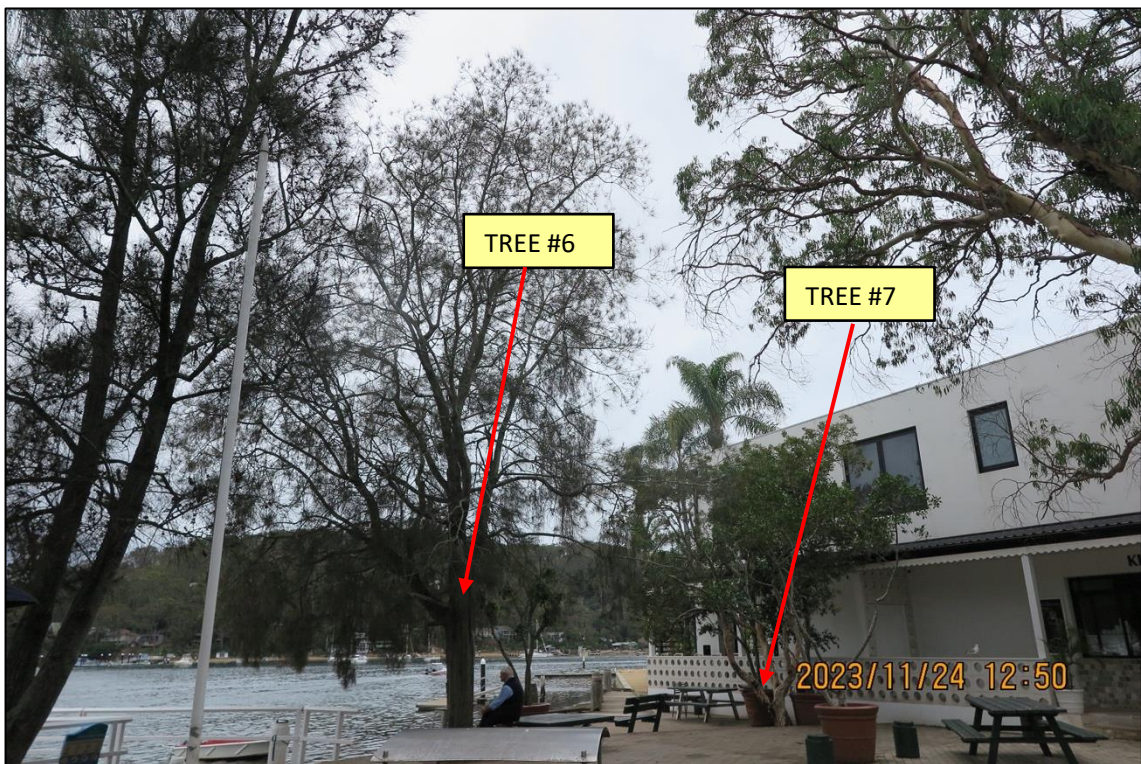
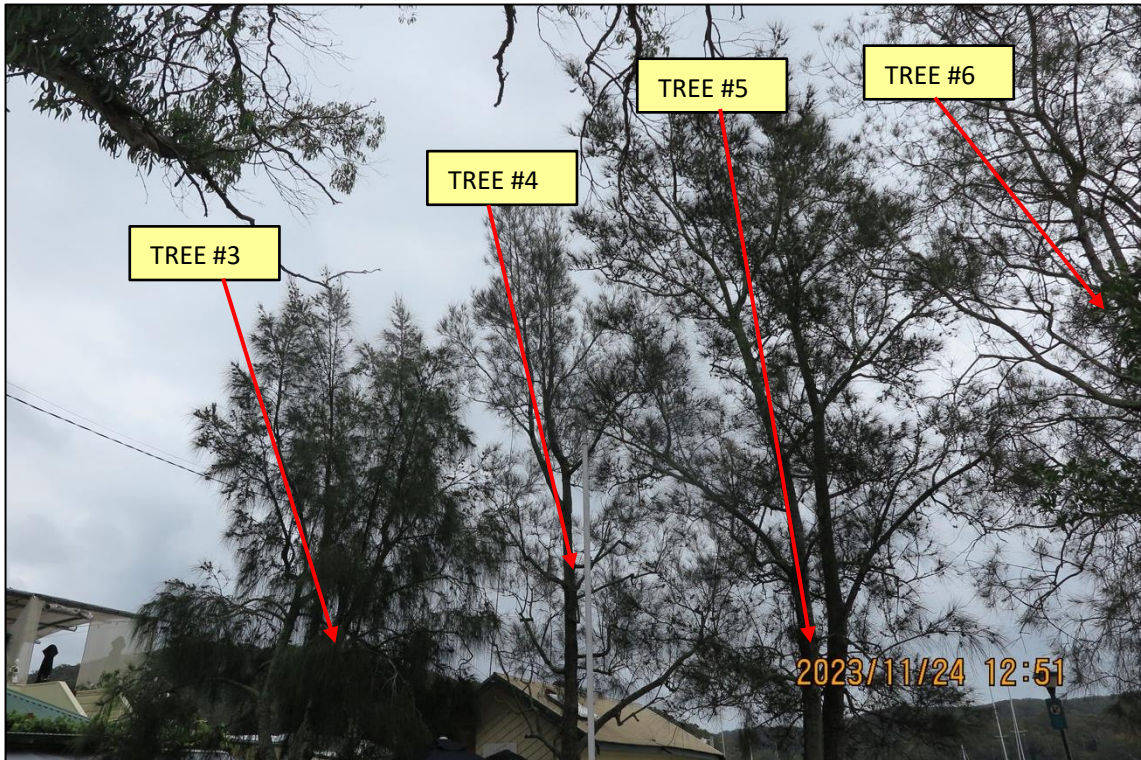


FIGURE 7 ABOVE & PREVIOUS PAGE PHOTOGRAPHS ILLUSTRATES THE SEVEN (7) TREES OR GROUPS OF TREES DISCUSSED TREE'S LOCATIONS & SITE FEATURES

5. Discussion

5.1 General Discussion /Tree Environments:

The total number of trees discussed is seven (7) trees or groups of trees.

TREE #1, TREE #2, TREE #3, TREE #4, TREE #5 and TREE #6

The proposed works significantly breaches individual tree TPZ total surface areas for TREE #1, TREE #2, TREE #3, TREE #4, TREE #5 and TREE #6. (By our calculations, all discussed trees TPZ total surface areas are breached by more than twenty percent i.e., 20%).

TREE #1 displays a significant number of dead branch tips. By our interpretation, experience & review of literature, 'dead branch tips' are very often an indicator of 'live root' dysfunction. Taking this into account, as well as acknowledging this species of tree does not naturally occur near 'salt laden' winds, our opinion is this tree regardless of any proposal for development has at best only a short Useful Life Expectancy

TREE#2 TPZ total surface area is mathematically very significantly impacted by the as proposed upgrade of the subject site.

TREE #3, TREE #4, TREE #5 and TREE #6 are the most impacted.

TREE #3, TREE #4, TREE #5 and TREE #6 are described as the most impacted upon (below ground level) on the basis their 'live root' systems will be damaged when rebuilding the existing sandstone seawall.

On this basis, we support replacing TREE #1, TREE #2, TREE #3, TREE #4, TREE #5, and TREE #6.

Replacement tree/s be planted as far from any permanent infrastructure as possible. The replacement tree/s must be sourced from a grower/supplier whose stock is certified to meet the production benchmarks as described within the *Australian Standard (AS2303- 2015 Tree stock for landscape use)*.

The new replacement tree/s are to be professionally planted & and maintained for a minimum full Sydney active growing season. defined as being from mid-August through late May.

TREE #7

TREE #7 has been assessed, relative to the proposed works as able to be viably retained, managed & protected. (By virtue of way less below ground level disturbance, i.e., less than ten percent (10%) of TPZ total surface area being breached.)

Any 'live roots' from TREE #7 exposed by manual excavation less than fifty millimetres (50mm) in diameter can be cleanly pruned without any external input from the retained project arborist.

In the event significant diameter 'live root/s' (greater than 50mm in diameter), are exposed the direct input & documentation with supporting evidence photographs from the retained project arborist is essential to confirm as close as possible to best Arboriculture Practice being applied.

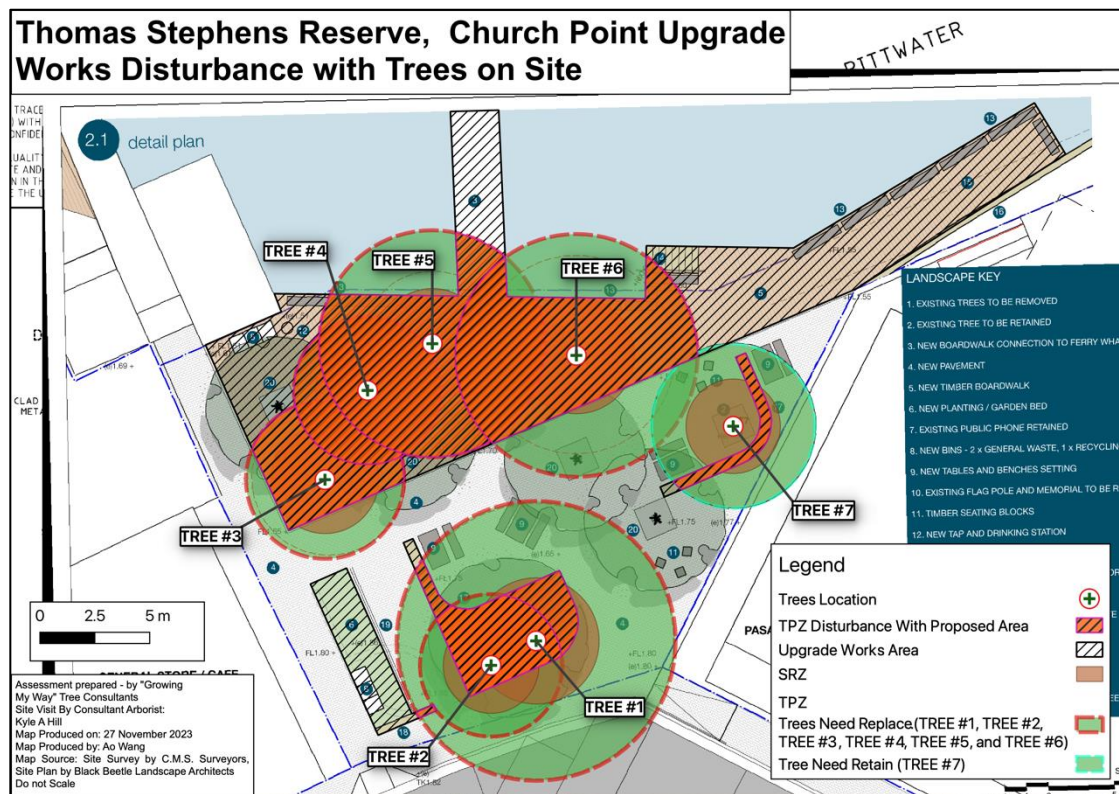
Prior to the commencement the commencement of any works including demolition & the construction works TREE #7 require installation of TPZ temporary 'temporary Tree Trunk Guard.

5.2 Potential replacement tree species list

See the below potentially suitable to the subject site tree species list is provided within this document. (The list includes both Exotic & Australian Native species. It is not necessarily the only species potentially chosen/specified for the subject site. We additionally, acknowledge that species availability may have an impact on the preferred chosen species.)

- *Alloxylon flammeum* (Tree Waratah)
- *Backhousia citriodora* (Lemon Scent Myrtle)
- *Banksia integrifolia* (Coast Banksia)
- *Banksia serrata* (Old Man Banksia)
- *Melaleuca linariifolia* (Snow in Summer)
- *Tristanopsis laurina* 'Luscious'[™] (Watergum Cultivated Variety)
- *Waterhousea floribunda* 'Green Avenue'[™] (Weeping Lilly Pilly)

TPZ / SRZ TREE DISTURBANCE DIAGRAMS



5.3 Preliminary Site Specific "Tree Plan of Management"

Pre-Commencement of Works

- TREE #7 is specified to have individual temporary Tree Trunk Guards installed so to isolate them from driveway works & use when built.
- TPZ installation must be 'signed off' as being AS4970-2009 compliant, evidence is to be in writing with supporting photographic evidence. Document must be provided to the appointed Principle Certifying Authority.

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Commencement of and During Works

- *Remove TREE #1, TREE #2, TREE #3, TREE #4, TREE #5 and TREE #6 as part of the demolition phase*
- *Any tree supported for removal must be removed by persons that always abide to the "WorkCover NSW Industry Code of Practice, (1998)".*
- *Confirm TPZ installation for TREE #7 is intact thru all works phases.*
- *TPZ installations must be 'signed off' as continuing to be being AS4970-2009 compliant, evidence is to be in writing with supporting photographic evidence. Document must be provided to the appointed Principle Certifying Authority.*
- *Demolition of any existing infrastructure within any retained, managed & protected tree is to be completed manually, especially when 'live roots' of a significant diameter belonging to any retained trees may be exposed. Any exposed 'live root' must be covered until the required input & documentation from the retained Project Arborist can be obtained. Preferably, any 'live root' exposed would be covered in subject site topsoil. If this is not practicable, hessian or geotextile matting kept moist can be used until able to be covered & isolated from the proposed works.*
- *Any excavation (completed manually) that exposes a 'live root' of a significant diameter can only be managed & documented relative to the management strategy applied by the retained Project Arborist.*

Post Completion of Works

- *The above is to be certified in writing with supporting photographic evidence as AS4970-2009 provisions compliant relative to all required to be retained trees.*
- *All documentation from each stage of works must be provided to the appointed Principle Certifying Authority as soon as is reasonably possible post each stage of works being completed.*

New Tree Generic Specifications:

- *Replacement trees are to be sourced from growers/suppliers whose stock meets the production benchmarks of the Australian Standard (AS2303.2015 Tree stock for landscape use) or NATSPEC specification to produce quality container produced trees.*
- *New tree specimens are to be professionally planted & maintained for a minimum period of six (6) months once installed.*
- *New tree specimens are to be 45 litre container stock as the local environment has only shallow topsoil on top of sandstone bedrock. (A lack of natural topsoil depth may dictate smaller container replacement trees to be more appropriate.*

6. Conclusions

- This submission in its present format can be submitted to the NBC for review by council officers.
- Trees supported to be replaced are easily accommodated within the subject site.

If you have any questions relating to this report or implementation of recommendations, please contact Kyle Hill on 0412-221-962.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'K. Hill'.

Kyle A. Hill (AQF level 5 & 8 Practicing & Consulting Arborist)

7. 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.

8. Assumptions

Care has been taken to obtain information from reliable resources. All data has been verified insofar as possible; however, Growing My Way Tree Services, 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.

9. Recommended References

Barrell, J. 1993. '*Preplanning Tree Surveys: Safe Useful Life Expectancy (SULE) is the Natural Progression*', *Arboricultural Journal* 17:1, February 1993, pp.

Barrell, J. 1995, '*Pre-development Tree Assessments*', in *Trees & Building Sites, Proceedings of an International Conference Held in the Interest of Developing a Scientific Basis for Managing Trees in Proximity to Buildings*, International Society of Arboriculture, Illinois

Dr. G. Watson & Dr. D. Neely, '*Trees & Building Sites*', LSA Illinois USA 1995

Dr. N. Matheny & Dr. J.R. Clark, '*Trees & Development*', ISA Illinois USA 1998

Phillip J. Craul, '*Urban Soil in Landscape Design*', J. Wiley & Sons, New York USA 1992

10. Selected Bibliography

Hitchmough, J.D. 1994. '*Urban Landscape Management*', Inkata Press, Sydney.

Mattheck, C. & Breloar, H. 1994 '*Body Language of Trees*', The Stationery Office, London.

AS 4373:2007, '*Pruning of Amenity Trees*', Standards Australia.

AS 4970:2009, '*Protection of Trees on Development Sites*', Standards Australia.

BS 5837:2005, '*Guide for Trees in Relation to Construction*', Standards Board, UK.

11. Appendix A – Glossary

Glossary of common Arboreal terms

Age:	I	<i>Immature</i> refers to a refers to a well-established but juvenile tree
	SM	<i>Semi-mature</i> refers to a tree at growth stages between immaturity & full size
	M	<i>Mature</i> refers to a full-sized tree with some capacity for further growth
	LM	<i>Late Mature</i> refers to a full-sized tree with little capacity for growth that is not yet about to enter decline
	OM	<i>Over-mature</i> refers to a tree about to enter decline or already declining
	LS	<i>Live Stag</i> refers to a tree in a significant state of decline. This is the last life stage of a tree prior to death

Hth & Vig Health & Vigour

Health refers to the tree's form & growth habit, as modified by its environment (aspect, suppression by other tree, soils) & the state of the scaffold (ie. 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. **Classes are:**

Excellent (E), V. Good (VG), Good (G), Fair (F), Declining (D), Poor (P), Very Poor (VP)

Vigour refers to the tree's growth rate/condition as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion & the degree of dieback. **Classes are:**

Excellent (E), V. Good (VG), Good (G), Fair (F), Declining (D), Poor (P), Very Poor (VP)

Useful Life Expectancy (ULE) refers to any individual tree specimen's potential life

expectancy (viability) based on VTA assessment, three groups are described,

Short = Less than Five years

Medium = Five–Fifteen years

Long = more than Fifteen years

Significant diameter roots are defined as those being greater than 0.05m/50mm in diameter.

Diameter at Breast Height (DBH) refers to the tree trunk diameter at breast height (1.4 metres above ground level)

Structural Root Zone (SRZ) refers to a radial offset which relates to tree stability. This zone is presumed to be main location of the tree's structural support roots. It is calculated using the formula $SRZ\ radius = (D \times 50)^{0.42} \times 0.64$.

Primary Root Zone (PRZ) refers to a radial offset of ten (10) times the trunk DBH measured from the centre of the trunk. This zone often contains a significant amount of (but by no means all a tree's) fine, non-woody roots required for uptake of nutrients,

oxygen & water.

Tree Protection Zone (TPZ) is ideally a “No Go Zone” surrounding a tree to aid in its ability to cope with disturbances associated with construction works. **TPZ = DBH x 12**. 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.

To limit damage to the tree, protection within a specified distance of the tree’s trunk must be maintained throughout the proposed development works. No excavation, stockpiling of building materials or the use of machinery is permitted within the TPZ.

A TPZ is required for each tree or group of trees within five metres (unless otherwise specified) of building envelopes.

Stem/bark inclusion refers to a genetic fault in the tree’s structure. This fault is located at the point where the stems/branches meet. In the case of an inclusion this point of attachment is potentially weak due to bark obstructing healthy tissue from joining together to strengthen the joint.

Decay refers to the break down tissues within the tree. There are numerous types of decay that affect different types of tissues, spread at different rates & have different effect on both the tree’s health & structural integrity.

Point of Attachment refers to the point at which a stem/branch etc join.

Dead wood refers to any whole limb that no longer contains living tissues (eg live leaves &/or bark). Some dead wood is common in a number of tree species.

Die back refers to the death of growth tips/shoots & partial limbs. Die back is often an indicator of stress & tree health.

One dimensional crown refers to branching habits & leaves that extend/grow in One direction only. There are many causes for this growth habit such as competition & pruning.

Crown Foliage Density of Potential (CFDP) refers to the density of a tree’s crown in relation to the expected density of a healthy specimen of the same species. CFDP is measured as a percentage.

Epicormic growth/shoots refers to growth/shoots that are/have sprouted from axillary buds within the bark. Epicormic growth/shoots are a survival mechanism that often indicates the presence of a current or past stress even such as fire, pruning, drought etc.

Over Head Powerlines (OHP) Overhead electricity wiring.

LVOHP Low Voltage Overhead Powerlines

HVOHP High Voltage Overhead Powerlines

ABC Aerial Bundled Cable

Attachment A: Tree Protection/Management Prior to & During Construction

The installation of Tree Protection Zone (TPZ) fencing is to be carried out prior to commencement of all works. The most suitable fencing material is 1.8m tall chain link mesh with 50mm metal pole supports, see **detail 1: tree protection fencing**.

A mulch layer of composted leaf & woodchip to a depth of 75mm is required within the TPZ to aid in retention of soil moisture & to protect soil from contaminants. Water is to be applied by hand held or soaker/leaky hose within TPZ as required & in Accordance with Stage 3 Water Restrictions. Watering is to be carried out by either an Arborist or is to form part of the Builder's/Contractor's contract, with recommended monthly checks by an Arborist.

There is to be no stock piling of building material (including waste), machinery or any other item within TPZ of any retained tree. Access to personnel & machinery, & storage of fuel, chemicals, cement or site sheds is prohibited

Regular monitoring of protected trees during development works for unforeseen changes or decline, will aid in the success & longevity of the retained trees.

