

ARBORICULTURAL IMPACT REPORT

191 WHALE BEACH ROAD
WHALE BEACH NSW

ADDITIONAL REPORT
10TH NOVEMBER 2021

PREPARED FOR SARAH AND DAVID ROTHWELL



Prepared by:
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1. BACKGROUND

Landscape Matrix Pty Ltd has been engaged by Sarah and David Rothwell to prepare an Arboricultural Impact Report in respect to 4 trees proposed to be removed as part of an approved residential development at 191 Whale Beach Road Whale Beach (the site). The trees assessed for this report are located in the front and rear garden areas of the site.

This report has been prepared by Guy Paroissien a Director of Landscape Matrix Pty Ltd. The site was originally inspected on 4th May 2020 to collect data for 22 trees at the site for a previous report prepared in May 2020. A further inspection was undertaken on 30th August 2021 to collect the data for an additional tree that will require removal for construction access purposes (tree number 23).

The assessment of the trees is based upon a visual inspection of the trees from ground level using elements of the Visual Tree Assessment (VTA) method described by Mattheck & Breloer (1994). The Useful Life Expectancy (ULE) categories identified in the report follows Barrell (1996).

The inspection was limited to visual inspection of the trees without dissection, probing or coring. No aerial inspection of the trees was carried out and the assessment did not include any woody tissue testing or subterranean root investigation.

The tree heights and canopy spreads were estimated and are expressed in metres and the tree diameters at breast height (DBH) were measured using a standard metal tape and are expressed in millimetres.

Measurements from the trees are as measured from the centre of the trees' trunks.

2. TREES ASSESSED FOR THIS REPORT

Four mature trees have been assessed in preparing this report. The trees assessed for this report are located in the front and rear garden areas of the site. The context of the site's rear garden is illustrated in the photograph on the cover page of this report.

A summary of these trees, their dimensions, condition, Useful Life Expectancy (ULE) and landscape significance is attached in Appendix B. The ULE categories identified in Appendix B follow those of Barrell (1996).

The locations of the trees are shown on the attached Survey Plan prepared by Adam Clerke Surveyors Pty Ltd dated 5/4/2019 and identified as Reference Number 5907G. (Appendix C). The four trees are summarised in table 1 as follows:

Table 1: Summary of trees assessed at 191 Whale Beach Road Whale Beach

Tree Number	Species and Common Name	Summary
20	<i>Eucalyptus umbra</i> (Broad-leaved White Mahogany)	A mature, single trunked specimen approximately 8 metres in height with a canopy spread of 6 x 8 metres and a DBH of 460mm. In poor health and of moderate landscape significance. The tree displays signs of instability with a distinct trunk lean and canopy bias to the SW - in adverse weather conditions (e.g. under wind loading following high rainfall events) the tree will be at increased risk of failure. At the time of inspection the tree was of poor health and poor vigour and exhibited high levels of dieback and epicormic growth. <i>Strelitzia nicolai</i> growing at base of tree. Short ULE.
21	<i>Eucalyptus umbra</i> (Broad-leaved White Mahogany)	A mature, single trunked specimen approximately 9 metres in height with a canopy spread of 6 metres and a DBH of 340mm. In moderate health and of moderate landscape significance. At the time of inspection the tree was of moderate health and poor vigour and exhibited high levels of dieback. Short ULE.
22	<i>Eucalyptus umbra</i> (Broad-leaved White Mahogany)	A mature, twin trunked specimen approximately 8 metres in height with a canopy spread of 5 metres and DBH of 170mm and 400mm. In moderate health and of moderate landscape significance. The tree displays fair branch attachment with multiple regrowth following severe past reduction pruning. At the time of inspection the tree was of moderate health and fair vigour and exhibited moderate levels of dieback.
23	<i>Callistemon salignus</i> (Pink Tips, Willow Bottlebrush)	A mature, multi trunked specimen approximately 8 metres in height with a canopy spread of 11 metres and DBH of up to 320mm (600 x 660mm above the root flare). In declining health and of moderate landscape significance. The tree displays fair branch attachment with multiple leaders from near ground level with some evidence of poor attachment at the junction - not considered at risk of failure. At the time of inspection the tree was of moderate health and poor vigour and exhibited significantly reduced foliage size and density and moderate to high levels of dieback. The tree is located in a very small landscape area surrounded by a concrete driveway/parking area. Short ULE.

None of the trees assessed for this report is listed individually as a threatened species on the Schedules of the NSW *Biodiversity Conservation Act 2016* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

3. IDENTIFICATION OF SETBACKS FOR THE TREES

A number of methods to determine the likely extent of root zones and appropriate setbacks for tree root protection zones for trees on development sites have been developed in the past. The key criteria used in determining setbacks is the tree's trunk diameter at breast

height (DBH) in conjunction with other factors including the sensitivity of the species in question to environmental disturbance/change, the age of the tree and the tree's health and vigour at the time.

Harris et al (2004) provide formulae for calculating tree protection zones based on the above criteria and modified from the 1991 British Standard for protection of trees on construction sites (BS 5837:1991). The 2005 version of the British Standard (BS 5837:2005) recommends a radius of 12 times the tree's DBH. For multi trunked trees BS 5837:2005 recommends a setback of 10 times the basal trunk diameter.

The Australian Standard *AS 4970 Protection of trees on development sites* also identifies a 'Tree Protection Zone' of 12 times the tree's DBH. The Australian Standard also provides a formula for calculating the "Structural Root Zone" of trees on development sites. In regard to palms, other monocots, cycads and tree ferns the Standard identifies the Tree Protection Zone should not be less than 1 metre outside the crown projection. (Australian Standards Association 2009)

The tree protection zones identified below have been calculated using the Australian Standard *AS 4970 Protection of trees on development sites* and are the identified setback from the trees where disturbance (e.g. soil level changes, compaction, excavation etc.) should be minimised to reduce potential impacts on the long-term health of the trees.

Table 2: Tree Protection Zones - 191 Whale Beach Road Whale Beach

Tree Number	Species and Common Name	Tree Protection Zone*	Structural Root Zone*
20	<i>Eucalyptus umbra</i> (Broad-leaved White Mahogany)	5.5 metres	2.5 metres
21	<i>Eucalyptus umbra</i> (Broad-leaved White Mahogany)	4.1 metres	2.4 metres
22	<i>Eucalyptus umbra</i> (Broad-leaved White Mahogany)	5.2 metres	2.4 metres
23	<i>Callistemon salignus</i> (Pink Tips, Willow Bottlebrush)	7.6 metres	2.7 metres

* = Radial offset measured from centre of trunk.

Preferably, no more than 10% of the root protection zone should be disturbed with compensation made by extension of other areas of the TPZ to compensate for the area(s) disturbed. Where greater than 10% of the tree protection zone is potentially disturbed the tree's viability needs to be investigated and demonstrated by the project arborist. The structural root zone is the area required for stability and where disturbance of any sort should be avoided.

4. POTENTIAL IMPACTS ON THE TREES

The extent of impacts to the trees has been assessed using Tree Protection and Removal Plan prepared by 360° Landscape Architects in conjunction with advice provided by 360° Landscape Architects and Akin Atelier Architects and Interior Designers.

The 4 trees assessed for this report are proposed to be removed for the reasons outlined in Table 3 as follows:

Table 3: Summary of potential impacts on the trees – 191 Whale Beach Road Whale Beach

Tree Number	Species and Common Name	Summary
20	<i>Eucalyptus umbra</i> (Broad-leaved White Mahogany)	The tree is proposed to be removed and replaced due to moderate health, poor vigor and short ULE
21	<i>Eucalyptus umbra</i> (Broad-leaved White Mahogany)	The tree is proposed to be removed and replaced due to moderate health, poor vigor and short ULE
22	<i>Eucalyptus umbra</i> (Broad-leaved White Mahogany)	The tree is proposed to be removed and replaced due to the severe past reduction pruning that has impacted its form and structural integrity.
23	<i>Callistemon salignus</i> (Pink Tips, Willow Bottlebrush)	The tree will require removal to accommodate the proposed construction access requirements..

Given the declining health, poor vigour, low landscape value or short life expectancy it is concluded that removal of the trees is warranted subject to replacement plantings to maintain the long-term landscape character of the site.

It is also noted that a group of approximately 10 existing Broad-leaved White Mahogany to the north of trees 20, 21 and 22 will significantly offset the loss of these trees whilst the replacement plantings establish.

5. TREE PROTECTION MEASURES

The following generic tree protection measures are recommended to assist in minimising potential impacts to trees proposed for retention.

A. Measures to be implemented prior to the commencement of any works on the site.

1. Tree to be retained are to be clearly identified by signage as protected trees.
2. The tree protection zones (TPZ) of trees to be retained are to be protected by fencing during the entire construction period except for specific areas directly required to achieve construction works.
3. The tree protection fence shall be constructed of galvanised pipe at 2.4 metre spacing and connected by securely attached chain mesh fencing to a minimum height of 1.8 metres and shall be installed prior to work commencing.
4. The tree protection fencing shall be installed as closely as possible to the alignment of the identified TPZ and shall be approved and certified by the site arborist prior to commencement of any construction or demolition works on the site.

B. Measures to be implemented and maintained during the life of construction works on the site.

5. Any excavation within the identified TPZ of trees to be retained shall be carried out by hand to minimize disturbance to tree roots. Roots greater than 25mm are not to be damaged or severed without prior assessment by an arborist to determine likely level of impact and the restorative actions required to minimise the impacts of root damage.
6. Tree roots between 10mm and 25mm diameter, severed during excavation, shall be cut cleanly by hand by an experienced Arborist/Horticulturist with a minimum qualification of the Horticulture Certificate or Tree Surgery Certificate.
7. The following activities/actions are prohibited from the tree protection zones:
 - Soil cut or fill including excavation and trenching
 - Soil cultivation, disturbance or compaction
 - Stockpiling storage or mixing of materials
 - The parking, storing, washing and repairing of tools, equipment and machinery
 - The disposal of liquids and refueling
 - The disposal of building materials
 - The sitting of offices or sheds
 - Any action leading to the impact on tree health or structure
8. Canopy pruning of trees identified for protection which is necessary to accommodate approved building works shall be undertaken in accordance with *Australian Standard 4373-2007 'Pruning of Amenity Trees'*.

6. CONCLUSION

Four mature trees have been assessed for this report. The trees assessed for this report are located in the front and rear garden areas of the site,.

The trees comprise planted Australian species (tree number 23) and remnant canopy trees (tree numbers 20, 21 and 22). The trees were mostly of declining health and poor vigor at the time of inspection but did not exhibit evidence of significant pest or disease.

Tree numbers 20, 21 and 23 have a short ULE and the form and structural integrity of tree 22 has been impacted by severe past reduction pruning.

The trees are proposed to be removed and replaced as part of the proposed works.

Given the declining health, poor vigour, low landscape value or short life expectancy it is concluded that removal of the trees is warranted subject to replacement plantings to maintain the long-term landscape character of the site.

It is also noted that a group of approximately 10 existing Broad-leaved White Mahogany to the north of trees 20, 21 and 22 will significantly offset the loss of these trees whilst the replacement plantings establish.



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Director
Landscape Matrix Pty Ltd
10th November 2021

BIBLIOGRAPHY/REFERENCES

360° Landscape Architects (2020) – Tree Protection and Removal Plan prepared by 360° Landscape Architects dated 14/9/2020.

Akin Atelier Architects and Interior Designers (2021) – Information provided by Akin Atelier Architects and Interior Designers in respect to proposed tree removals.

Australian Standards Association (2007) AS 4373- 2007 - Australian Standard 4373-2007 'Pruning of Amenity Trees'.

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Barrell J (1996) - Pre-planning Tree Surveys: SULE is the Natural Progression. Arboricultural Journal 17, 33-46.

Harris et al (2004). Harris RW, Clark JR, Matheny NP: Arboriculture – Integrated Management of Landscape Trees Shrubs and Vines 4TH Edition. Prentice Hall, New Jersey 07458.

Mattheck & Breloer (1994) – The Body Language of Trees – a handbook for failure analysis - Research for Amenity Trees No. 4. Published by TSO (The Stationary Office) Norwich UK.

APPENDIX A



Photograph 1: Tree # 20 – Illustrating high levels of dieback.



Photograph 2: Tree # 21 - Illustrating high levels of dieback.



Photograph 3: Illustrating the location and context of tree numbers 16 to 22.



Photograph 4: Tree # 1 – Illustrating the broader context of the location of trees 20, 21 and 22.



Photograph 5: Tree # 23 - Illustrating the location in a very small landscape area within the driveway and parking area.



Photograph 6: Tree # 23 - Illustrating the multiple leaders from near ground level.



Photograph 7: Tree # 23 - Illustrating the significantly reduced foliage density.



Photograph 8: Tree # 23 - Illustrating the high levels of dieback.

APPENDIX B - TREE DATA SUMMARY - 191 WHALE BEACH ROAD WHALE BEACH - 2021 REPORT

Tree No.	Genus, Species (Common Name)	Height (m)	Canopy (m)	DBH (mm)	DBH for TPZ	DGL for SRZ	Foliage Condition	Age Class	Trunk	Trunk Lean	Crown balance	Past Pruning	Stability	Branch Attachment	Health	Vigour	Dead Wood	Pest or disease	ULE	Landscape Significance	Retention Value*	Comments
20	<i>Eucalyptus umbra</i> (Broad-leaved White Mahogany)	8	6 x 8	460	460	500	Fair foliage condition	Mature	Single trunk	Distinct trunk lean to the SW	All canopy to the SW	Lower limbs pruned in past to 2 metres in past	Displays signs of instability	Fair branch attachment	Poor health	Poor vigour	20%	No visual evidence of significant pest or disease	3 Short (5 to 15 years)	Moderate landscape significance	3	The tree displays signs of instability with a distinct trunk lean and canopy bias to the SW - in adverse weather conditions (e.g. under wind loading following high rainfall events) the tree will be at increased risk of failure. At the time of inspection the tree was of poor health and poor vigour and exhibited high levels of dieback and epicormic growth. <i>Streitzia nicolai</i> growing at base of tree. Short ULE.
21	<i>Eucalyptus umbra</i> (Broad-leaved White Mahogany)	9	6	340	340	450	Fair foliage condition	Mature	Single trunk	Upright trunk	Majority of canopy to the SW	Lower limbs pruned in past to 1.2 metres in past	Appears stable	Sound branch attachment	Moderate health	Poor vigour	15 to 20%	No visual evidence of significant pest or disease	3 Short (5 to 15 years)	Moderate landscape significance	3	At the time of inspection the tree was of moderate health and poor vigour and exhibited high levels of dieback. Short ULE.
22	<i>Eucalyptus umbra</i> (Broad-leaved White Mahogany)	8	5	170, 400	430	470	Fair foliage condition	Mature	Twin trunked	Upright trunk	Balanced canopy area	Lower limbs pruned in past to 3 metres in past, upper crown reduction pruned in past	Appears stable	Fair branch attachment	Moderate health	Fair vigour	5 to 10%	No visual evidence of significant pest or disease	2 Medium (15 to 40 years)	Moderate landscape significance	2	The tree displays fair branch attachment with multiple regrowth following severe past reduction pruning. At the time of inspection the tree was of moderate health and fair vigour and exhibited moderate levels of dieback.
23	<i>Callistemon salignus</i> (Pink Tips, Willow Bottlebrush)	8	11	Up to 320 (600 x 660 above the root flare)	630	630	Fair foliage condition	Mature	Multi trunked	Upright trunk	Balanced canopy area	Lower limbs pruned in past to 3 metres in past	Appears stable	Fair branch attachment	Moderate health	Poor vigour	20%	No visual evidence of significant pest or disease	3 Short (5 to 15 years)	Moderate landscape significance	3	The tree displays fair branch attachment with multiple leaders from near ground level with some evidence of poor attachment at the junction - not considered at risk of failure. At the time of inspection the tree was of moderate health and poor vigour and exhibited significantly reduced foliage size and density and moderate to high levels of dieback. The tree is located in a very small landscape area surrounded by a concrete driveway/parking area. Short ULE.

ca = approximate diameter at breast height (DBH) estimated from nearest property boundary or fence where trees were located on adjoining properties

* Retention Values: 1 - High (Priority for retention); 2 - Moderate (Consider for retention); 3 - Low or short ULE (Not warranting specific design consideration) and 4 - Remove (very short ULE, structurally unsound, weed species etc.)

2
D.P.10782

2
D.P.205959

1
D.P.228203

D.P.1191396

30.48

RESERVATION

12
D.P.10782

113
D.P.10782

3
D.P.233266

WHALE

BEACH

ROAD

NOTES:

- BOUNDARY SURVEY HAS BEEN UNDERTAKEN. SURVEY MARKS SHOULD BE PLACED IF EXCAVATION, CONSTRUCTION OR STRUCTURES ARE TO BE ERECTED ON OR NEAR THE BOUNDARIES.
- EXCEPT WHERE SHOWN BY DIMENSIONS LOCATION OF DETAIL WITH RESPECT TO BOUNDARIES IS INDICATIVE ONLY.
- TREE SPREADS & HEIGHTS ARE INDICATIVE ONLY.
- WINDOW HAVE BEEN OBTAINED BY INDIRECT METHOD AND ARE ACCURATE TO $\pm 0.05m$.
- ONLY VISIBLE SERVICES HAVE BEEN SHOWN. UNDERGROUND SERVICES HAVE NOT BEEN LOCATED. NOTIFICATION OF ALL RELEVANT AUTHORITIES SHOULD BE UNDERTAKEN BEFORE CARRYING OUT ANY CONSTRUCTION ACTIVITY IN OR NEAR THE SURVEYED AREA. DIAL BEFORE YOU DIG SERVICES (ph1100) SHOULD BE CONTACTED.
- CONTOUR INTERVAL - 1 METRE. CONTOURS ARE INDICATIVE ONLY. SPOT LEVELS SHOULD BE ADOPTED FOR DESIGN AND CALCULATION PURPOSES. CRITICAL SPOT LEVELS SHOULD BE CONFIRMED WITH SURVEYOR.
- DO NOT SCALE FROM THIS PLAN. DIMENSIONS SHOULD BE USED.
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- PLAN PREPARED BY REGISTERED SURVEYOR FOR DEVELOPMENT APPLICATION PURPOSES ONLY.

NOTES:

- (A) ... RIGHT OF FOOTWAY 1.22 WIDE (D.P.228203)
- (B) ... RIGHT OF CARRIAGEWAY 4.57 WIDE (D.P.228203)
- (C) ... RIGHT OF CARRIAGEWAY VARIABLE WIDTH (D.P.228203)
- BS ... DENOTES BASEMENT
- BW ... DENOTES BOTTOM OF WINDOW (GENERALLY SILL)
- TW ... DENOTES TOP OF WINDOW

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191 WHALE BEACH ROAD, WHALE BEACH
11/09/2020
SCALE: 1:100 (A1) DATUM: A.H.D.
Registered surveyor No: 8490

T20, T21 etc = tree numbers as per 2021 report by Landscape Matrix Pty Ltd