TREE WISE MEN®
AUSTRALIA PTY LTD

Arboricultural Impact Assessment
For
Proposed Development *(DA 226/2019)*
LEC Case # 2020/00361848
At
351-353 New South Head Road
DOUBLE BAY NSW

Prepared for:

Kingsford Property Developments Pty Ltd
2 Marian Street
SOUTH COOGEE NSW 2034

Ref: 2731(L)AIA

30 May 2021

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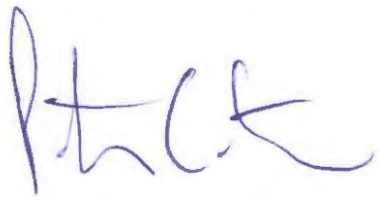
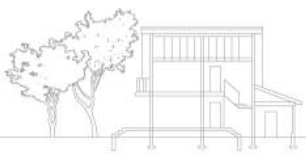


Peter Castor
Director

BSc (For.)
Member: IACA, AA, ISA, LGTRA, PIA, UDIA, MAE (UK)
30 May 2021



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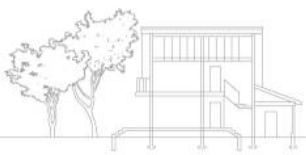


1. EXECUTIVE SUMMARY

1.1 THE PROPOSED DEVELOPMENT

1.1.1 This Arboricultural Impact Assessment (AIA) was prepared for property owner Kingsford Property Developments Pty Ltd in relation to the likely impact on existing trees of proposed development at 351-353 New South Head Road, Double Bay (the subject site).

1.1.2 This AIA supersedes that prepared by Botanics Tree Wise People Pty Ltd dated December, 2018 and only considers those trees to be retained.

1.1.3 The development is the subject of *NSW Land and Environment Court Proceedings # 2020/00361848: Kingsford Property Developments Pty Ltd V Woollahra Municipal Council.* The Applicant is appealing against the *Woollahra Local Planning Panel's Determination (30 November, 2020) of DA 226/2019*.

1.1.4 The Woollahra Council's Statement of Facts and Contentions in Reply filed 26 February, 2021 contains tree impact Contentions and a request for additional information. This AIA addresses both Contention 6 and the 2.3 Arborist Report of the SOFAC in Reply.

1.2 TREE IMPACTS

1.2.1 The following trees are recommended to be retained: Trees 1, 13, 15-18, 20, 30 and 31 (plus other palms Trees 8, 10, 11 and 12 located at 5 Manning Road). Note: Trees 4 and 29 shown on the Plans to be retained are recommended to be removed.

1.2.2 The remaining trees are recommended to be removed.

1.3 RESPONSE TO *CONTENTION 2 – INSUFFICIENT INFORMATION*

1.3.1 ***"2.1 The Landscape Plan and Arborist Report are inconsistent in regard the correct location of Tree 13."***

The location of Tree 13 has been confirmed by additional Survey. The *Tree Location Plan DA 2.012/A* and *Ground Floor Plan DA 2.102/E* are correct. The *Landscape Plan* has yet to be amended.

1.3.2 ***"2.2 Tree Protection Zones …are less than their correct radius..."***

The tree data has been verified. The Tree Schedule details the correct TPZs which are now indicated on *Tree Location Plan DA 2.012/A* and *Ground Floor Plan DA 2.102/E*.

1.3.3 ***"2.3 The application lacks any arboricultural impact assessment of the impact of the development on the trees proposed to be retained."***

"2.3.1 For example, Tree 1 has proposed excavation less than 1m south and 3m east of the SRZ. Walls are…"

Refer to *4.2 Trees to be retained* for detail of recommended design modifications to reduce TPZ encroachments and justification of the long-term viability of the tree. Tree 1 can be retained in the long-term.

"2.3.2 Trees 15, 16, 17 and 18 have level changes and structures proposed within the Structural Root Zones and Tree Protection Zones. No impact analysis…."

Refer to *4.2 Trees to be retained* for detail of recommended design modifications to reduce TPZ encroachments and justification of the long-term viability of the trees. Trees 15-18 can be retained in the long-term. *Section 2 on DA2.301/C* shows existing soil levels retained with pedestrian access via an elevated Boardwalk.

1.3.4 ***"2.4 A properly conducted and detailed AIA is required…"***

This document satisfies this requirement in relation to all retained trees.

1.3.5 ***"2.5 The Arboricultural Impact Assessment (AIA) is to include:***

"2.5.1 a detailed tree schedule."

A detailed Tree Schedule is enclosed at Attachment A.

"2.5.2 a Tree Location Plan…"

A *Tree Location Plan DA 2.012/A* is included in the Architectural package. It has been amended to match the verified tree data.

"2.5.3 assessment of all proposed works such as cut, compacted fill, trenching …approximate percentage and encroachment type."

All proposed works (construction) have been assessed. Refer to *4.2 Trees to be retained,* for detail of recommended design modifications to reduce TPZ encroachments and to justification of the long-term viability of the trees.

"2.5.4 major encroachments assessed against Clause 3.3.4 of Australian Standard 4970, 2009."

TPZs shown on the Tree Location Plan are notional circles only. Refer to *4.2 Trees to be retained,* for detail of recommended design modifications to reduce TPZ encroachments and to justification of the long-term viability of the trees.

"2.5.5 Where unacceptable impacts are identified, provision of recommendations for appropriate actions to ensure the retained trees will be viably retained."

Refer to *4.2 Trees to be retained,* for detail of recommended design modifications to reduce TPZ encroachments and justification of the long-term viability of the trees.

1.3.6 ***"2.6 No pruning analysis is provided that specifically addresses the extent and suitability of pruning of :***

2.6.1 Tree 1 (Port Jackson Fig).

Refer to *4.2.2* for a description of the required pruning of Tree 1. One southern-most branch requires pruning to allow for the building (Photo A).

2.6.2 Tree 9 [31] (Weeping Lillypilly)…; the crown appears to extend north...

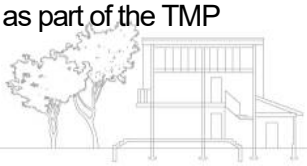
The lowest branch appears to be well above the proposed roofline. No crown pruning is likely to be required to Tree 31. Refer to *4.2.10* and Photo D for description of the likely impacts on Tree 31.

2.6.3 Tree 13 (Magnolia)…crown appears to extend at least 6m east into the site…"

A crown spread of 5m was recorded. The crown is suppressed upwards due to competition from surrounding trees with an overall height of 18m. The building is offset 5.5m from the centre of trunk. Minor pruning only is likely.

1.3.7 ***"2.7 Pruning specifications must be provided in accordance with AS4373, 2007 Pruning of Amenity Trees."***

Refer to *4.2 Trees to be retained,* for detail of required crown pruning. All pruning is to comply with *AS4373-2007* and is to be undertaken by Arborists with minimum AQF Level 3 Qualifications. The pruning specifications are to be updated as part of the TMP at CC documentation.



1.3.8 ***"2.8 Where unacceptable impacts are identified, the arborist recommendations for appropriate actions…"***

Refer to *4.2 Trees to be retained,* for detail of recommended design modifications to reduce TPZ encroachments and to justification of the long-term viability of the trees. There should be no unacceptable impacts if the recommendations are implemented and a detailed TMP is prepared for CC.

1.4 RESPONSE TO *CONTENTION 6 ARBORICULTURAL IMPACTS OF PROPOSED EXCAVATION*

1.4.1 The amended layout in the latest Architecturals (dated 24 and 28 May, 2021) and design changes recommended above have addressed all items under Contention 6.

2. BACKGROUND

2.1 INTRODUCTION

2.1.1 This Arboricultural Impact Assessment (AIA) was prepared for property owner Kingsford Property Developments Pty Ltd in relation to the likely impact on existing trees of proposed development at 351-353 New South Head Road Double Bay (the subject site).

2.1.2 This AIA supersedes that prepared by Botanics Tree Wise People Pty Ltd dated December, 2018 and only considers those trees to be retained.

2.1.3 The purpose of this AIA is to describe and categorise the existing trees on and adjacent to the subject site and to assess the impact of the proposed development on these trees.

2.1.4 The development is the subject of *NSW Land and Environment Court Proceedings # 2020/00361848: Kingsford Property Developments Pty Ltd V Woollahra Municipal Council.* The Applicant is appealing against the Woollahra Local Planning Panel's Determination (30 November, 2020) of *DA 226/2019*.

2.1.5 The Statement of Facts and Contentions in Reply (by Council) filed 26 February, 2021 contained tree impact Contentions and a request for additional information. This AIA addresses both *Contention 6* and the *2.3 Arborist Report* of the *SOFAC in Reply*.

2.1.6 The tree data for Trees 1, 13, 14, 15, 16, 17, 18, 20, 29, 30 and 31 contained in the Botanics Tree Wise People Report has been verified.

2.1.7 Australian Standard *AS4970-2009 Protection of trees on development sites* has been used as the tree impact assessment benchmark in the preparation of this Report.

2.1.8 Tree Protection Zones (TPZs) and Structural Root Zones (SRZs) as indicated on the Architecturals are notional circles only and do not represent the actual location of roots. The TPZ represents the area generally required for long-term retention of a tree of this trunk diameter and the SRZ represents where woody structural roots are likely to be found pending review of existing constraints to root spread.

This tree impact assessment has considered the existing context when determining the likely impacts of the proposed works.

2.2 THE SUBJECT SITE

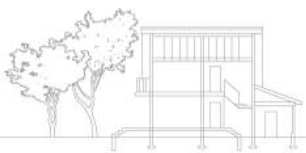
2.2.1 Refer to the *Site* at page 1 of the Applicant's SOFAC filed 27 January, 2021 for a description of the existing site features. The Site adjoins Heritage Items #205 (No. 5 Manning Road) and #207 (Overthorpe 349 New South Head Rd).

2.3 THE SUBJECT TREES

2.3.1 This AIA is restricted to trees being retained or otherwise referenced in Council's SOFAC in Reply or Determination of DA 2019 / 226 / 1.

2.3.2 The retained trees are described in the attached Tree Schedule (Attachment A).

2.3.3 The tree data for Trees 1, 13, 14, 15, 16, 17, 18, 20, 29, 30 and 31 contained in the Botanics Tree Wise People Report has been verified.



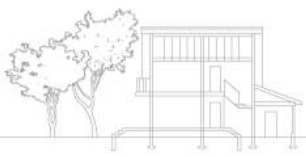
2.3.4 Additional Survey of trees in contention has been undertaken and is contained in *Detail and Levels Survey Rev A* (13.5.21) prepared by ESA Survey.

2.3.5 The assessed trees (excluding Tree 14) are protected under the *WDCP Chapter E.3 – Tree Management.*

2.4 THE PROPOSAL

2.4.1 The proposed development is for demolition of existing structures and construction of a part 4 and part 5 Storey, 17 Residential Apartment development with Basement Carparking as described at page 4 of the Applicant's SOFAC. The current *Architectural Plans* are those dated 24.5.2021 prepared by Hill Thalis.

2.4.2 The *Tree Location Plan DA 2.012/A* has been prepared in response to *2.5.2* of the *SOFAC in Reply*. The Tree Location Plan has been used to create a Tree Protection Plan which notes some of the tree protection comments.



3. METHODOLOGY

3.1 DATA COLLECTION

3.1.1 In preparation of this Report a ground level, visual tree assessment (VTA)[1] was undertaken on 6 May, 2021. No aerial (climbing) inspections, woody tissue testing or tree root mapping were undertaken as part of this assessment.

3.1.2 All tree offsets mentioned in this Report are to centre of trunk unless otherwise stated.

3.2 DOCUMENTS AND PLANS REFERENCED

3.2.1 The conclusions and recommendations in this Report are based on the findings from the site inspection, discussions with the Architect and analysis of the following Plans and documents:

- *Construction Impact Assessment and Management Plan* dated December, 2018 prepared by Botanics Tree Wise People Pty Ltd
- *Architecturals Job No. 18.41* dated 24.5.21 or 28.5.21, prepared by Hill Thalis.
- *Detail and Level Survey, Ref: 3545/A* dated 13.5.21, prepared by ESA Survey
- *Concept Stormwater Drainage Plan, Project No. P1806950 Rev* A dated 21.5.21, prepared by Martens & Associates
- *Chapter E.3 Tree Management of the WDCP*
- *Woollahra Local Planning Panel Assessment Report* dated 30 November, 2020
- *Applicant's SOFAC* filed 27 January, 2021
- *Council's SOFAC in Reply* dated 26 February, 2021.

3.3 AUSTRALIAN STANDARD AS4970-2009

3.3.1 The Australian Standard *AS4970–2009 Protection of trees on development sites* has been used as a benchmark in the preparation of this Report and the terminology and impact assessment methodology have been adopted from this document. This AIA complies with *2.3.5 Arboricultural Impact Assessment* of *AS4970-2009.*

3.3.2 Recommendations have been based on tree ©Retention Value, Vigour, Condition, ULE and construction offsets (refer to Attachment B). Trees with ©Retention Value "A" should be given greater priority for retention than trees with ©Retention Value "B" or "C". Trees with *Long* (40 years +) ULE should be given greater priority for retention than trees with *Short* (5-15 years) ULE (refer to Attachment B).

3.3.3 Tree Protection Zones (TPZ) and Structural Root Zones (SRZ) are as per *Section 3* of *AS4970-2009* and are defined at Attachment B of this Report.

3.3.4 "Construction" for the purpose of this AIA means excavation (greater than 100mm), compacted fill or machine trenching[2]. "Excavation" includes cut batters, boxing–out for the various pavement types, trenching for utilities and footings for Retaining Walls.

[1] VTA – Visual Tree Assessment, undertaken by tree professionals, is a recognised (International Society of Arboriculture, Journal of Arboriculture, Vol. 22 No. 6, Nov. 1996) systematic method of identifying tree characteristics and hazard potential. VTA is also an assessment method described by Claus Mattheck in *The Body Language of Trees – A handbook for failure analysis*. The Stationery Office, London (1994)

[2] "Construction" is equivalent to "works" as defined at 1.4.9 of AS4970-2009.

3.3.5 Trees within proposed construction footprints are recommended for removal (**Rm**).

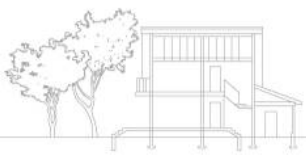
3.3.6 Where construction is proposed within Structural Root Zone (SRZ) offsets, those trees have been similarly recommended for removal (**Rm**). Fully elevated, pier and beam type construction or hand dug services trenches (or horizontal boring) is however possible within a SRZ.

3.3.7 Trees with greater than 25% of the Tree Protection Zone (TPZ) impacted by construction are generally recommended for removal (**Rm**). There are however different types of construction incursions proposed (e.g. fill, cut, services, pavement type, Retaining Walls) with varying tree impacts likely. Existing constraints to root development also vary the TPZ. Compacted fill can be equally as damaging to tree longevity: root development is restricted within heavily compacted soils.

3.3.8 Trees to be retained with construction impacting less than 25% of the TPZ area were rated as Retain Plus (**R+**). Specific construction monitoring will be required for the Retain (**R+**) trees (refer to Recommendations).

3.3.9 TPZ encroachments of >10% are defined (3.3.3 of *AS4970*) as '*major'*. This does not mean that the tree will be fatally injured, but that '*the project arborist must demonstrate that the tree(s) would remain viable'* following review of TPZ encroachment considerations as listed at 3.3.4 of the AS4970. Refer to Section 5.3 of this Report for explanation of tree retention recommendations.

3.3.10 Where construction is proposed beyond the TPZ, those trees are rated as Retain (**R**) with no specific tree protection design or tree protection monitoring required (refer to Attachment D).



4. TREE IMPACTS

4.1 SUMMARY

4.1.1 The trees to be retained are indicated on *DA 2.102/E* and *DA 2.012/A*. Tree 14 is shown to be retained but is now recommended for removal.

4.1.2 Tree 14 is a large-leaved Privet which straddles the boundary. It is an Exempt tree species under the WDCP. Tree 14 was approved for removal under *A.7 (b)* of the *Consent of DA2019/226/1.* For these reasons we recommend removal of Tree 14.

4.1.3 Tree 29, Frangipani located in the north-eastern corner was also approved for removal under A.7 (b). The original Survey failed to locate Tree 29. Tree 29 has been indicated on the revised *Rev A Survey*. Given its location immediately adjacent to the boundary, trunk skew across the boundary and proximity to the proposed OSD we recommend its removal.

4.1.4 There is a group of palms located at 5 Manning Road which are also to be retained with no TPZ encroachments. These palms were indicated at Figure 3 of the earlier Arborist Report as Trees 8, 10, 11 and 12.

4.1.5 The confirmed locations of Trees 13, 30 and 31(9) are indicated on the current Architecturals.

4.2 TREES TO BE RETAINED

4.2.1 The following trees are recommended to be retained: Trees 1, 13, 15-18, 20, 30 and 31 (plus other palms,Trees 8, 10, 11 and 12 located at 5 Manning Road). Note: Trees 4 and 29 shown on the Plans to be retained but are to be removed.

4.2.2 **Tree 1 - Port Jackson Fig,** ***Ficus rubiginosa.*** There is existing hardscape areas within the TPZ which may have confined root spread. The proposed Pedestrian Path (*DA 2.102*) should be realigned to be as far from the tree as possible to reduce any TPZ encroachment. The excavation for the new Driveway is to be hand dug with particular monitoring during construction by the Project Arborist. The demolition of the existing hardscape areas at #351 New South Head Road will allow for long-term retention. Proposed stormwater to be hand dug within TPZ. Crown pruning (approx..10% as indicated on Photo A) will allow for the proposed northern façade. No long-term impacts are expected. The hardy characteristics of the *Ficus* genus (transplant tolerance) will assist the long-term viability of Tree 1.

4.2.3 **Tree 13 – Bull Bay Magnolia,** ***Magnolia grandiflora.*** The existing Retaining Wall and hardstand areas have restricted root spread onto the site. The proposed building is a minor TPZ encroachment. No long-term impacts are expected. Minor (<10%) crown pruning may be required.

4.2.4 **Tree 15 – Bangalow Palm,** ***Archontophoenix cunninghamiana.*** Proposed stormwater to be hand dug within TPZ. Existing soil levels to be retained within TPZ. *Section 2* on *DA2.301/C* shows existing soil levels retained with pedestrian access via an elevated Boardwalk.

4.2.5 **Tree 16 – Frangipani,** ***Plumeria acutifolia.*** Proposed stormwater to be hand dug within TPZ. Existing soil levels to be retained within TPZ. Minor crown pruning (<10%) may be required.

4.2.6 **Tree 17 – Avocado,** ***Persea americana.*** Proposed stormwater to be hand dug within TPZ. Existing soil levels to be retained within TPZ. Minor crown pruning (<10%) will be required. Minor TPZ encroachment will be acceptable given demolition of existing hardstand (Photo C).

4.2.7 **Tree 18 – Avocado,** ***Persea americana.*** Proposed stormwater to be hand dug within TPZ. Existing soil levels to be retained within TPZ. Minor crown pruning (<10%) will be required. Minor TPZ encroachment will be acceptable given demolition of existing hardstand (Photo C).

4.2.8 **Tree 20 - Frangipani,** ***Plumeria acutifolia.*** Earthworks for the Basement are to be shored vertically without any soil batters or benching toward the tree. Particular certification to be provided by the Project Arborist.

4.2.9 **Tree 30 – Norfolk Island Pine,** ***Araucaria heterophylla.*** Revised Survey location and revised TPZ confirm a minor TPZ encroachment only. The other retained palms and Giant Bamboo between the tree and the proposed works will have restricted actual root spread onto the subject site. No crown pruning required.

4.2.10 **Tree 31 – Weeping Lilly Pilly,** ***Waterhousea floribunda.*** This tree was described as Tree 9 in some earlier assessments. Tree 31 is located at 5 Manning Road. The TPZ encroachment is minor (<10%). The likely impact of this minor encroachment will be reduced further given the other palms between the tree and the works and the existing hardscapes and existing building will have restricted actual root spread. No crown pruning is likely to be required given the considerable height to the lowest overhanging branch (Photo C).

4.3 LANDSCAPE PLAN

4.3.1 The *Ground Floor Plan DA 2.102/E* we understand is based on the *Landscape Plan* by Melissa Wilson.

4.3.2 The proposed Pedestrian Path to the front boundary is to be realigned to be beyond the TPZ of Tree 1.

4.3.3 All proposed pedestrian paving and stairs within the TPZs of Trees 15-18 is to be at or above existing ground lines.

4.3.4 Trees 4 and 29 are to be shown to be removed as described above.

4.4 STORMWATER PLANS

4.4.1 *Concept Stormwater Drainage Plan Project No. P1806950,* dated 21.5.21 by Martens and Associates have been reviewed.

4.4.2 As described above, all piping and pits within the TPZs of Trees 1, 15-18 are to be dug by hand with roots greater than 50mmØ retained above or below pipes. The OSD excavation is to be shored vertically as with the Basement earthworks.

The Project Arborist is to certify the stormwater installation.

5. RECOMMENDATIONS FOR TREE MANAGEMENT

5.1 ARBORIST INVOLVEMENT

5.1.1 An Arborist (the Project Arborist) experienced in tree protection on construction sites should be engaged prior to the commencement of construction work on the site. The Project Arborist shall monitor and report regularly to the Principal Certifying Authority (PCA) and the Applicant on the condition and protection of the retained trees during the construction works. The Project Arborist is to monitor any demolition, excavation, machine trenching or compacted fill placed within the TPZ of all retained trees.

5.1.2 The schedule of works for the development must acknowledge the role of the Project Arborist and the need to protect the retained trees. Sufficient notice must be given to the Arborist where his/her attendance is required. Should the proposed design change from that reviewed, additional arboricultural assessment will be required.

5.1.3 The Project Arborist should certify tree protection measures at key stages of the construction. Copies of the Certification should be sent to PCA.

Key stages for Certification are:

- Prior to demolition and bulk earthworks
- Prior to Basement floor slab construction
- Prior to stormwater installation
- Prior to landscape installation
- Prior to Practical Completion.

5.2 TREE RETENTION

5.2.1 The following trees are to be retained: Trees 1, 13, 15-18, 20, 30 and 31 (plus other palms Trees 8, 10, 11 and 12 located at 5 Manning Road). Note: Trees 4 and 29 shown on the plans to be retained are to be removed.

5.3 TREE RETENTION RECOMMENDATIONS

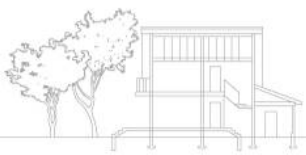
5.3.1 ***Tree Location Plan***

The Tree Location Plan (Attachment E) should be updated to a *Tree Management Plan* (TMP) for CC documentation to reflect any layout or level changes. The amended TMP should be kept in the Site Office during the construction period to guide tree protection procedures. The recommendations contained in this AIA should be incorporated into the *Construction Management Plan* and *Sediment Control Plan*. All Consent Conditions relating to tree protection are to be included.

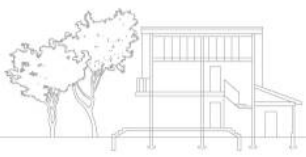
5.4 TREE REMOVAL

5.4.1 The following trees are to be removed: Trees 2-7, 14 and Trees 21-29. There are no Contentions in relation to the removal of these trees.

5.4.2 Tree removal is to comply with *Safe Work Australia "Guide to Managing Risks of Tree Trimming and Removal Work" July, 2016*.



Attachment A: Tree Schedule



TREE No.	COMMON NAME/ GENUS SPECIES	DBH (cm)	HEIGHT (m)	CANOPY RADIUS (m)	AGE CLASS	VIGOUR	CONDITION	SRZ RADIUS (m)	TPZ RADIUS (m)	% TPZ ENCROACHMENT	ULE	©SIG RATING	©RETENTION INDEX	RECOMMENDATION	COMMENTS
1	Port Jackson Fig, *Ficus rubiginosa*	90 @g	16	7	M	F	F	3.2	10.8	20%	M	2	A	R+	*Retain. Crown pruning (10%) required S side. OSD Wall adjacent tree to be hand dug. Pedestrian path to be realigned beyond TPZ. Basement earthworks to be shored vertically within TPZ. TPZ encroachment is acceptable given most of the area is currently occupied by building or hardstand. Hardy tree species. New root growth possible to west following demolition of existing hardscape.*
13	Bull Bay Magnolia, *Magnolia grandiflora*	48	18	5	OM	F	F	2.5	5.8	3%	M	3	B	R+	*Retain. Located on # 349 New South Head Road. Crown skew over subject site. Minor (<10%) crown pruning required. Existing Retaining Wall at base has confined root spread. TPZ encroachment minor & acceptable.*
14	Broad-leaved Privet, *Ligustrum lucidum*	25	5	3	M	F	F	1.9	3.0	0%	S	4	D	Rm	*Remove. Trunk straddles boundary with #349 New South Head Rd. WDCP Exempt species. Seek Owner's consent to remove. Previously approved for removal.*
15	Bangalow Palm, *Archontophoenix cunninghamiana*	20	17	3	M	G	G	1.0	4.0	10%	M	3	B	R+	*Retain. Existing hardstand likely to have restricted actual root spread. No crown pruning required. Stormwater to be hand dug within TPZ.*
16	Frangipani, *Plumeria acutifolia*	16, 20	6	5	M	F	F	2.0	3.6	18%	M	4	C	R+	*Retain. Skew to N. Existing hardstand likely to have restricted actual root spread. Minor (<10%) crown pruning required. Stormwater to be hand dug within TPZ.*
17	Avocado Tree, *Persea americana*	40	16	6	M	G	G	2.3	4.8	8%	M	3	B	R+	*Retain. Existing hardstand likely to have restricted actual root spread. Crown pruning required. Stormwater to be hand dug within TPZ.*
18	Avocado Tree, *Persea americana*	43	16	6	M	G	G	2.4	5.2	2%	M	3	B	R+	*Retain. Twin trunks from 2m. Existing hardstand likely to have restricted actual root spread. Crown pruning required. Stormwater to be hand dug within TPZ.*
20	Frangipani, *Plumeria acutifolia*	20	4	3	SM	G	G	1.8	2.4	10%	M	4	C	R+	*Retain. Basement excavation to be shored vertically within TPZ.*
29	Frangipani, *Plumeria acutifolia*	25	4	4	M	G	F	1.9	3.0	20%	S	3	C	Rm	*Remove. Heavy crown skew to NE. Trunk growing under fence. OSD within SRZ.*

TREE No.	COMMON NAME/ GENUS SPECIES	DBH (cm)	HEIGHT (m)	CANOPY RADIUS (m)	AGE CLASS	VIGOUR	CONDITION	SRZ RADIUS (m)	TPZ RADIUS (m)	% TPZ ENCROACHMENT	ULE	©SIG RATING	©RETENTION INDEX	RECOMMENDATION	COMMENTS
30	Norfolk Island Pine, *Araucaria heterophylla*	96	28	5	M	G	G	3.4	11.5	0%	L	1	A	R+	*Retain. Located on # 349 New South Head Road. Heritage Listed. No crown pruning required.*
31	Weeping Lilly Pilly, *Waterhousea floribunda*	130	30	12	M	G	G	3.8	15.0	8%	L	1	A	R+	*Retain. Also referred to as Tree # 9. Located on #5 Manning Road (Lot 6 DP15038). Heritage Listed. No crown pruning required.*
11															

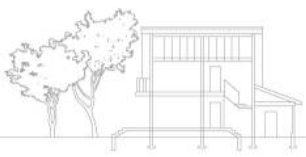
Summary Data

©RETENTION INDEX	NO. OF TREES
A	3
B	4
C	3
D	1
Total	11

RECOMMENDATION	NO. OF TREES
R	0
R+	9
T	0
Rm	2
Total	11

©RETENTION INDEX	RECOMMENDATION			
	R	R+	T	Rm
A	0	3	0	0
B	0	4	0	0
C	0	2	0	1
D	0	0	0	1

Attachment B: Definition of Terms



COMMON NAME/GENUS SPECIES CULTIVAR – Common names can vary with selected texts. Where species is unknown, "*sp*." indicated after genus. Where cultivar is unknown "*cv*" indicated after species.

DBH – Diameter at Breast Height. Tree trunk diameter measured at breast height (1.4 metres above ground level). Fabric diameter tape is used which assumes a circular cross section. Multiple measurements indicate multiple trunks. Where DBH measurement cannot be taken at 1.4m the height at which it has been taken is indicated.

CANOPY SPREAD RADIUS – Average canopy radius (widest + narrowest ÷ 2). Circular canopy depictions on Tree Plan/Survey are indicative only. Where canopy spread was significantly skewed, all four cardinal point measurements were recorded.

AGE CLASS – Immature (IM), Semi-mature (SM), Mature (M), Over-mature (OM). Assessment of the tree's current Age. A **Mature (M)** tree has reached a near stable size (biomass) above and below ground. Trees can have a *Mature* age class for >90% of life span. **Over-mature (OM)** trees show symptoms of irreversible decline and decreasing biomass.

VIGOUR – Good (G), Fair (F) or Poor (P). The general appearance of the canopy/foliage of the tree at the time of inspection. Vigour can vary with the season and rainfall frequency. A tree can have *Good* vigour but be hazardous due to *Poor* condition. A tree in *Good* vigour has the ability to sustain its life processes. Vigour is synonymous with health.

CONDITION – Good (G), Fair (F) or Poor (P). The general form and structure of the trunk/s and branching. Trunk lean, trunk/branch structural defects, canopy skewness or other hazard features are considered.

SRZ RADIUS – Structural Root Zone. The area around a tree required for tree stability. Earthworks should be prohibited within the SRZ. The area is calculated from the formula and graph at Figure 1 of *AS4970-2009.* The SRZ graph has been adapted from the work of Claus Mattheck (1994). DBH + 10% has been used for the calculation of SRZ. Where DBH is measured at grade or at a height other than 1.4m above grade, 10% has not been added.

TPZ RADIUS – Tree Protection Zone. Radial offset (m) of twelve times (12x) trunk DBH measured from centre of trunk (for trees less than 0.3 metre DBH minimum TPZ is 2.0 metres). To satisfactorily retain the tree, construction activity (both soil cut and fill) must be restricted within this offset. TPZ offsets are rounded to the nearest 0.1 metre. Existing constraints to root spread can vary. Generally an area equivalent to the TPZ should be available to the tree post development. Encroachment occupying up to 10% of the TPZ area is acceptable without detailed rootzone assessment. Encroachments greater than 10% require specific arboricultural assessment as per 3.3.3 and 3.3.4 of Australian Standard *AS4970-2009 Protection of trees on development sites.*

TPZ ENCROACHMENT – The cut or compacted fill encroachment within the notional TPZ. The Tree Protection Zone is X12 trunk diameter (DBH) as per *3.2 of AS4970-2009*. Refer to the Tree Retention section of the AIA for methods/design used to minimise encroachments.

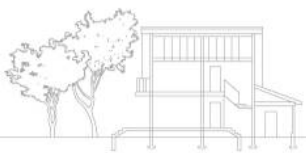
ULE – Useful Life Expectancy. The length of time from the date of inspection that the Arborist estimates the tree will live and provide a useful positive contribution to the landscape amenity of the site. ULE ratings are **Long** (retainable for 40 years or more), **Medium** (retainable for 16-39 years), **Short** (retainable for 5-15 years) and **Removal** (tree requiring immediate removal due to imminent risk or absolute unsuitability).

©SIG. RATING – ©Significance Rating Scale (see notes over)

©RETENTION INDEX (see notes over)

RECOMMENDATIONS – ***Retain (R) No TPZ encroachments***; ***Retain Plus (R+) Acceptable levels of TPZ encroachment***; ***Transplant (T)*** or ***Remove (Rm)***.

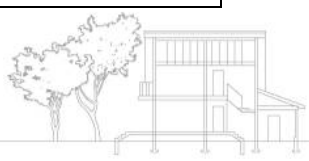
COMMENTS – Comments relating to the location, surroundings and hazard potential of the trees at the time of inspection and where applicable the reason for removal.



©SIG. RATING – ©Significance Rating Scale. A site specific qualitative evaluation of a tree relative to the existing land use developed by Tree Wise Men® Australia Pty Ltd. Takes into consideration the impact of the tree on the surrounding landscape, streetscape and bushland. Rarity, habitat value, historical/cultural value and structural form of the tree are considered in this rating system. It is possible for a tree to have a *Short* ULE and a ©Significance Rating of 1. Likewise it is possible for a tree to be given a *Long* ULE and a ©Significance Rating of 4 (e.g. weed species). The ©Significance Ratings used in this Report are as outlined in Table 1.

Table 1: ©Significance Rating Characteristics

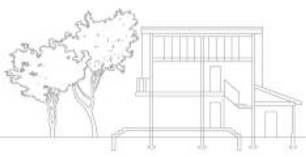
Rating	Significance	Characteristics (some or all)
©Sig. Rating 1	**Exceptional**	▪ Major contribution to site amenity ▪ Remnant specimen ▪ Heritage Listed ▪ Listed on Significant Tree Register ▪ Threatened Species ▪ *Good* vigour and condition ▪ Cultural significance ▪ Possible habitat tree for threatened fauna ▪ Excellent, well formed specimen ▪ Rare or unusual species ▪ Large above ground biomass ▪ Unique within the site and surrounds
©Sig. Rating 2	**High**	▪ Considerable contribution to site amenity ▪ Remnant specimen ▪ *Good* vigour and condition ▪ Threatened Species ▪ Cultural significance ▪ Possible habitat tree for threatened fauna ▪ Well formed specimen ▪ Rare or unusual species ▪ Large or moderate above ground biomass ▪ Other specimens with similar characteristics within the site and surrounds
©Sig. Rating 3	**Moderate**	▪ Minor contribution to site amenity ▪ Remnant or planted ▪ *Fair* or *Poor* vigour and condition ▪ Potential for growth ▪ Well formed or asymmetrical form ▪ Other specimens with similar characteristics within the site and surrounds
©Sig. Rating 4	**Low**	▪ Small/poor specimen ▪ *Poor* vigour and condition ▪ Inappropriate for the location ▪ Minor contribution to landscape amenity ▪ Easily replaced ▪ Weed species or TPO Exempt ▪ Hazardous ▪ Previously ©Sig. Rating 5 tree



©RETENTION INDEX. A site specific assessment of an individual tree's retention value developed by Tree Wise Men® Australia Pty Ltd. Incorporating ULE and ©Significance Rating each tree is allocated a ©Retention Value of A, B, C or D. The ©Retention Index values can be described as follows:

©Retention Value A	**Should be retained**	▪ Major redesign may be required (e.g. movement of building footprint, re-alignment of roadway).
©Retention Value B	**Could be retained**	▪ Minor redesign may be required (e.g. level changes, pavement detail).
©Retention Value C	**Could be removed**	▪ Should not constrain proposed development.
©Retention Value D	**Should be removed (irrespective of development layout**.)	▪ Should not constrain proposed development. ▪ **Remove ULE** should be removed irrespective of development layout.
	Should be removed or permanently fenced off	▪ Should not constrain proposed development ▪ **Short ULE** could be retained pending landscape proposal.

©Retention Index		**©Significance Rating**			
		1	**2**	**3**	**4**
ULE Rating	**Long (40+ years)**	**A**		**B**	**C**
	Medium (15-40 years)				
	Short (5-15 years)	**B**		**C**	**D**
	Remove (< 5 years)	**D**			



Attachment C: Site Photographs

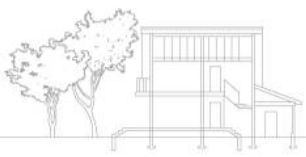


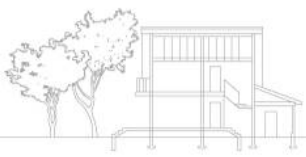
Photo A: Tree 1 (Port Jackson Fig) to be retained. Crown pruning indicated - final pruning cut at branch collar.

Photo B: Trees 16-18 adjacent to the existing building will require variable but acceptable crown pruning.

Photo C: Minor crown pruning will be required to Trees 17 and 18 to allow for the proposed eastern façade.

Photo D: The crown of Tree 31 overhangs the rear boundary at a considerable height. No pruning is required.

Attachment D: Tree Protection Requirements (Generic)



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TREE PROTECTION REQUIREMENTS (GENERIC)

The following generic tree protection requirements (1-12) should be implemented to minimise the impact of the proposed development on the retained trees. These requirements shall be implemented during the construction period in the event that no site-specific requirements are detailed in this document. Tree Protection Requirements should comply with *Section 4 Tree Protection Measures* of *AS4970-2009 Protection of trees on development sites* and the Tree Protection Plan (TPP) attached to this document.

1. Arborist Involvement – An Arborist (the project Arborist) with minimum AQF Level 5 qualifications, experienced in tree protection on construction sites shall be engaged prior to the commencement of work on the site. The Arborist's tasks will be to monitor and report regularly to the PCA and the Applicant on the condition of the retained trees for the duration of works on site. The Project Arborist shall be present to certify tree protection measures and to supervise any excavation, trenching or tunnelling within the TPZ of any retained trees.

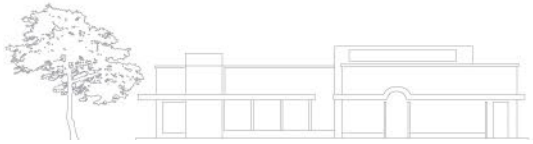
The schedule of works for the development shall acknowledge the role of the Project Arborist and the need to protect the retained trees. Sufficient notice shall be given to the Project Arborist where his/her attendance is required. Should the proposed design change from that reviewed, additional arboricultural assessment will be required.

2. Tree Pruning and Removal – All tree pruning (including root pruning) and tree removal shall be carried out by a qualified and experienced Arborist (minimum AQF Level 3 qualification) to Australian Standard *AS4373-2007 Pruning of amenity trees* and the Safe Work Australia "*Guide to Managing Risks of Tree Trimming and Removal Work*" July, 2016.

When tree stumps are within the TPZ of retained trees, stump grinding of rootballs shall be performed rather than complete "grubbing". This will minimise unnecessary root damage to the retained trees. Unnecessary damage often occurs to retained trees when undertaken by earthmoving machinery.

3. Mulching – If construction activity is proposed within TPZ offsets mulching is required. Mulch to a depth of 100 millimetres using partially composted green waste mulch. The mulch should be free of weed seeds and other contaminants. Should constant access be required within the trees' TPZs, outside the protective fencing, heavier mulch should be spread to a depth no greater than 100 millimetres to reduce soil compaction.

4. Temporary Irrigation – Where construction related activity or root cutting is proposed within the TPZ of retained trees, temporary irrigation or water cart access may need to be provided to the remaining unimpacted TPZ areas to maintain adequate soil moisture levels. Delivery volumes are to allow for mulch layer and recent rainfall. The Project Arborist is to monitor soil moisture levels.



5. Tree Protection Fencing – The retained trees shall be protected by means of fencing as per Figure 3 of *AS4970-2009* or as detailed in the TPP prior to commencement of demolition or bulk earthworks.

It should be constructed from 1.8 metre high chain link wire or welded mesh suspended by galvanised steel pipe or equivalent and enclose as much of the TPZ as practicable allowing for building alignments.

The location of the fence may need to be altered from that indicated on the Tree Protection Plan at a project meeting between the Civil Contractor and the Project Arborist. The area enclosed shall be mulched (**3**) and irrigated (**4**) and kept free from all building materials, contaminants and other debris and shall not be used for storage of any building materials or parking of vehicles or plant. If scaffolding (**8**) is required within a tree protection zone, the ground is to be mulched prior to erection of scaffolding.

6. Trunk Protection – Trunk and branch protection is to comply with *Figure 4* of *AS4970-2009* or as detailed in the TPP. Lengths of timber (75mm x 50mm x 2000mm) shall be used to protect a tree's trunk if construction or traffic is proposed within its SRZ and the tree cannot be fenced. The lengths of timber should be fastened around the trunk at 200 millimetre centres with hoop iron strapping or similar.

7. Signs – Signs complying with *Figure C1* of *AS4970-2009* should be placed at regular intervals (min. 1 per 15 metres) on tree protection fencing.

8. Scaffolding – If scaffolding or hoarding is required within the TPZ, install as per *Figure 5* of *AS4970-2009* or as detailed in the TPP. Installation is to be prior to demolition or bulk earthworks.

9. Bulk Earthworks – To prevent unnecessary root damage, walk machinery within defined haul routes beyond TPZs wherever possible. The excavation shall be carried out under the supervision of the Project Arborist. All roots within TPZ of retained trees are to be hand cut prior to machine cutting. Immediately following excavation, the face of the cut within the TPZ shall be draped and maintained moist until backfilled. This should be done using a 10mm thick jute matting or equivalent, pinned at ground level and allowed to cover the full depth of the rootzone excavation.

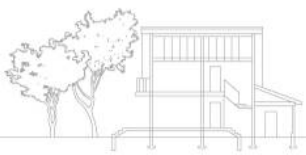
There is to be no soil battering or unnecessary over excavation within TPZ offsets. Topsoil stripping should be prohibited within TPZ offsets unless approved by the Project Arborist.

10. Prevention of Soil Compaction – During the construction period there may be considerable traffic movement associated with general building activities. The resultant soil compaction and possible contamination of the soil can have an equally detrimental impact on the tree as the severing of roots during excavation.

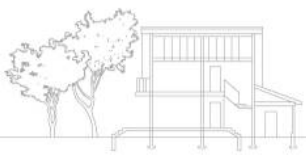
Specific machinery access tracks should be determined through consultation between the Civil Contractor and the project Arborist. Should heavy vehicle movement be required within a retained tree's TPZ, a track should be formed at grade using large diameter (up to 100mm) aggregate over geofabric or a corduroy of heavy timbers.

11. Prevention of Soil Inversion – Care shall be taken to avoid inversion of the soil layers on the site and particularly within TPZs. Clays placed over coarse textured soils reduces water infiltration, creating a perched water table, resulting in decline and/or death of underlying tree roots due to moisture stress.

12. Services – Trenching for services is to be regarded as "construction". Trenching within TPZ offsets should be avoided wherever possible to ensure <25% root loss (of TPZ) occurs on retained trees. Directional ("trenchless") boring or suspension of services should be used wherever possible. Where trenching is to occur within TPZ offsets, it is to be undertaken by hand to rock with no roots >50mm to be cut, under supervision of the Project Arborist.



Attachment E: Tree Location Plan *(DA 2.2.012/A)*



Legend:
- Proposed building footprint
- Proposed basement
- TPZ
- SRZ
- Canopy
- Existing building/ hardscaped area
- Existing deep soil area

BOUNDARY 13815 from survey
BOUNDARY 14315 from survey
BOUNDARY 43045 from survey
BOUNDARY 30920 from survey
BOUNDARY40410 from survey
existing building outline shown dashed
existing hardscaped area
existing hardscaped area
existing building outline shown dashed
Proposed building footprint
T1
T2
T3
T4
T5
T6
T9/31
T10
T11
T12
T13
T14
T17
T18
T19
T20
T21-28
T29
T30

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Nominated Architects: Philip Thalis #6780 Sarah Hill #5285

- Use figured dimensions only
- Do not scale
- Comply with the Building Code of Australia
- Comply with the relevant Australian Standards
- Comply with relevant Authorities' requirements

REV	DATE	AMENDMENT
A	21/5/21	Issued for information

PROJECT
351-53 New South Head Rd
Double Bay NSW 2028

CLIENT
Kingsford Property Developments

DRAWING TITLE
Tree location plan

JOB NO	DRAWN	SCALE	DRAWING NO.
18.41	AR/ BD	1:200 @ A3	**DA 2.012**
DATE	CHECKED	PLOT DATE	REVISION
Date	PT	21/5/21	**A**