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ARBORICULTURAL IMPACT ASSESSMENT 3-31 WALTER STREET,& 462 WILLOUGHBY ROAD,WILLOUGHBY,

TREE INVENTORY 3-31 WALTER STREET, WILLOUGHBY

3-31WALTER STREET, WILLOUGHBY

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1.Introduction

On the 23rd January 2017 at the request of Walter projects P/L ATF Walter Developments Trust c/o Architecture Urbaneia P/L commissioned Lee Hancock Consulting Arborist to prepare an Arboricultural Impact Assessment of all trees on the proposed development sites of 3-13a;15-19;21-27+ 29-31 Walter Street Willoughby and 462 Willoughby road Willoughby.

In addition Lee Hancock Consulting Arborist was commissioned to prepare an Tree Inventory of all street trees located along the carriageway of Walter Street, Willoughby.

2. Aim

The purpose of this report is to detail the condition of the trees on the proposed development sites of 3-13a;15-19;21-27+ 29-31 Walter Street Willoughby and 462 Willoughby road Willoughby; with trees to be removed and identifies impacts on trees to be retained and includes recommendations to minimise any adverse impacts, that demolition, construction activities may have on the trees to be retained.
Secondly a Tree Inventory was implemented to assess the existing Street trees and includes recommendations of the trees suitability for the proposed developments.

The author is aware of and will comply with the determining authorities Willoughby Council Urban Tree Management Policy –Volume 1. WLEP 2012 Tree and Bushland Preservation and Clause 5.9 (2) and under the WDCP C9.

Figure 1. Documents Provided

Plan/Document	Prepared By	Drawing No	Dated
Architect	AU Architecture Urbaneia	Walter Street Master Plan design report	24.1.2017
Landscape Architect	John Locke Landscape Architect		

2.1 Soils and Geology

Soils in Willoughby are of two broad types. Firstly, clay and a clayey loam derived from shale, cover most of the shire above 90m. The other is sandy and derived from breakdown of the sandstone that underlies the shale and is exposed on the lower and more rugged west and east of the area. The extraction of clay, removal of sand, filling of gullies and building developments have changed the original soils. In general the shales produce deep fertile clayey loams, which retain water, nutrients and structure.

The City of Willoughby lies in the Sydney Basin and is made up of eroded Triassic sedimentary rocks. The two main rock surfaces of the area are Wiannamatta shale and Hawkesbury sandstone. The surface of the flatter areas of the city consist of Ashfield shales of the Wiannamatta group, while the steeper reaches of the harbour and Lane Cove River consist mainly of Hawkesbury sandstone

Tree Inventory

3. Site Map

Walter street, is a No Through Road carriageway sloping to the south east. The existing street trees are predominantly *Tristaniopsis laurina* with *Melaleuca citrina,* a small percentage of the remaining trees appear to have been planted by the residents of the street. The trees on the north side of the street are living in 6-metre-wide nature strips, while trees on the southern side of carriageway are living in 5.5metre nature strips.

4. Methodologies

4.0 Data Inventory Methodology

Data was collected in a walking survey and includes the following,

1. Tree Location: Locations were established primarily by property address.
2. Structural health and condition.
3. Percentage of deadwood ("Deadwood" refers to branches that are dead, dying, or diseased.)
4. Diameter at Breast Height (DBH)
5. Health of the trees leaves (its functional health)

4.1 Visual Tree Assessment (VTA)

A technique developed by (Mattheck & Breloer) was carried out on all trees from the ground. The technique involves, identification of the Genus and Species of trees on the site. The Diameter at Breast Height (DBH) 1.4m above ground level determined from the circumference of the trunk divided by *pi* (π).

Tree height (m) Diameter at Ground Level (DAGL), Canopy spread (m) in four cardinal points (north, south, east, west) Structural integrity, Amenity value, Indigenous/ Endemic value, Health and vigor of trees.

4.2 Useful Life Expectancy (ULE)

An assessment procedure has been developed by (Barrell, J.D.) 1993 'by which trees on a site are accurately recorded and designated according to their suitability for retention in the short, medium or long term'. This methodology is a measure of the "sustainability" of the remaining contribution in years that the tree can provide in the context of the site.

4.3 Landscape Significance

The significance of trees in the landscape is assessed in determining their retention values in 3 categories. Heritage Value reflects Historical significance, Ecological Value maintains biodiversity values and Amenity value contributes to the character of the landscape.

4.4 Tree Retention Values

A rating was given to each tree on site; the information gathered was then processed by evaluating the health and vigour, the remaining useful life expectancy (ULE), plus their significance in the landscape. A retention value for each tree was then evaluated ranging from High, Moderate, Low and Very Low.

Figure 2. Tree Retention Values – Assessment Methodology

	Landscape Significance Rating						
Estimated Life Expectancy	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Long - Greater than 40 Years	High Retention Value						
Medium- 15 to 40 Years			Moderate Retention Value				
Short - 5 to 15 years				Low Ret. Value			
Transient - Less than 5 Years				Very Low Retention Value			
Dead or Potentially Hazardous							

Figure 3. Retention Value Methodology

RETENTION VALUE	RECOMMENDED ACTION
"High"	1. These trees considered worthy of preservation; as such careful consideration should be given to their retention as a priority. 2. Proposed site design and placement of buildings and infrastructure should consider lessening any mitigating issues in relation to trees. 3. In addition, the extent of the canopy (canopy drip-line) should also be considered, particularly in relation to high rise developments. Significant pruning of the trees to accommodate the building envelope or temporary scaffolding is generally not acceptable.
"Moderate"	1. The retention of these trees is desirable. 2. These trees should be retained as part of any potential development if possible however they trees are considered less critical for retention. 3. If these trees must be removed, replacement planting should be considered in accordance with Council's Tree Replacement Policy to compensate for loss of amenity.
"Low"	4. These trees are not considered to be worthy of any special measures to ensure their preservation, due to current health, condition or suitability. They do not have any special ecological, heritage or amenity value, or these values are substantially diminished due to their ULE. 5. These trees should not be considered as a constraint to the potential development of the site.
"Very Low"	1. These trees are considered potentially hazardous or very poor specimens, or may be environmental or noxious weeds. 2. The removal of these trees is therefore recommended regardless of the implications of any proposed development.

5. Discussion

The subject trees were assessed on 23rd January 2017, an assessment of each tree was made using the Visual Tree Assessment (VTA) procedure. The subject trees were assessed from the ground. No aerial inspection or diagnostic testing has been undertaken as part of this assessment.

House No. Tree	Genus Species	Height	Age Class	DBH	Canopy /Deadwood	Health	Structure	Pest /Disease	Useful life expectancy
1	*Tristaniopsis laurina* *Water Gum X2*	1m 1.5	Young	85mm 90mm	Good	Good	Good	Nil	Long greater than 40 Years
1A	*Melaleuca citrina* (Bottlebrush)	4m	Mature	Multi stem 350x230x340	Pruned for powerline clearance 20% Deadwood	Poor	Poor	Nil	Short 5-15 Years
2A	*Tristaniopsis laurina* *Water Gum*	5m	Mature	Multi stem 390X280X 300mm	Good 10% Deadwood	Good	Good	Nil	Medium 15-40 Years
3	*Tristaniopsis laurina* (Water Gum)	4m	Semi Mature	200mm	Good	Good	Good	Nil	Long greater than 40 Years
4	VACANT								
5	*Melaleuca citrina* (Bottlebrush)	5m	Mature	Multi stem 310x360mm	Pruned for powerline clearance	Good	Good	Nil	Medium 15-40 Years
6	*Gleditsia triacanthos* (Honey Locust)	3m	Semi mature	200mm	Good	Good	Good	Nil	Long greater than 40 Years
7	*Angophora costata* (Smooth Bark Apple)	3m	Mature	260mm	Good, Pruned for powerline clearance	Good	Pruned for powerline clearance	Nil	Medium 15-40 Years
8	*Tristaniopsis laurina* (Water Gum)	5m	Mature	540mm	Lopped in the past 5% Deadwood	Good	Fair	Nil	Medium 15-40 Years
9	*Tristaniopsis laurina* (Water Gum)	5m	Mature		Lopped in the past 10% Deadwood Pruned for powerline clearance	Good	Fair	NIL	Medium 15-40 Years

House No. Tree	Genus Species	Height	Age Class	DBH	Canopy / Deadwood	Health	Structure	Pest /Disease	Useful life Expectancy
11 & 11A	*Melaleuca citrina* (Bottlebrush)	4m	Mature	Multi stem 260x190 220x160	Pruned for powerline clearance Crack at base of junction between stems and base of trunk 10cm in width Removal is recommended	Fair	Poor	Nil	Short 5-15 Years
12	*Tristaniopsis laurina Water Gum*	9m	Mature	Multi stem 280 x 200	Good 20%	Good	Good	Nil	Medium 15 - 40 Years
13	Vacant								
13A	Vacant								
14	*Harpullia pendula* (Tulip Wood)	2m	Young	80mm	Fair	Fair	Good	Nil	Medium 15 - 40 Years
15	*Tristaniopsis laurina Water Gum*	4m	Mature	Multi stem 380 x 240 x220x 230	Good	Good	Good	Nil	Medium 15 - 40 Years
16	*Tristaniopsis laurina Water Gum*	3m	Young	Multi stem 380x240x 320x220	Good 10% Deadwood	Fair	Good	Nil	Long greater than 40 Years
17	*Melaleuca citrina* (Bottlebrush)	4m	Mature	230x240 x220	Fair Pruned for powerline clearance 20% Deadwood	Fair	Fair	Nil	Medium 15 - 40 Years
18 &18A	*Harpullia pendula* (Tulip Wood)	4m	Mature	350 x240	Good 5%	Fair	Good	Evidence of soft brown scale	Medium 15 - 40 Years
19	*Tristaniopsis laurina Water Gum*	4M	Mature	270x280x 180x220	Pruned for powerline clearance 10% Deadwood	Good	Pruned for powerline clearance	Nil	Medium 15 - 40 Years
20	*Tristaniopsis laurina Water Gum*	4m	Semi mature	180mm	Good	Good	Good	Nil	Medium 15 - 40 Years
21	*Melaleuca citrina* (Bottlebrush)	4m	Semi mature	Multi stem 180mmx150 x170	Good	Good	Good	Nil	Medium 15 - 40 Years
22	*Tristaniopsis laurina Water Gum*	2.5m	Young	170mm	Good	Good	Good	Nil	Long greater than 40 Years
23 &25 X3	*Tristaniopsis laurina Water Gum*	2.5m	Young	150mm	Good	Good	Good	Nil	Long greater than 40 Years

27A	*Tristaniopsis laurina Water Gum*	2.5m	Young	170	Good	Good	Good	Nil	Long greater than 40 Years
27B	*Tristaniopsis laurina Water Gum*	3m	Mature	Multi stem 180 x200	Fair Pruned for powerline clearance 40% Deadwood	Fair	Fair	Nil	Short 5-15 years
29	*Tristaniopsis laurina Water Gum*	4m	Mature	Multi stem 340x390	Good	Good	Good	Nil	Short 5-15 years
29A	VACANT								
31	*Tristaniopsis laurina Water Gum*	3m	Mature	220 x 280	Poor 50% Deadwood	Poor	Poor	Nil	Short 5-15 years

6. Conclusion

In concluding the Tree Inventory of Walter Street, Willoughby has collected all relevant data in assessing the condition of the trees. An assessment of their health and vigour, estimated life expectancy and their significance in the landscape and amenity value have been recorded.

7. Recommendations

The inventory of 31 trees in Walter street, indicate the trees are generally in good condition, a disproportionately high population of 17 *Tristaniopsis laurina* (Water Gum) x trees, *Melaleuca citrina* (Bottlebrush) x 5, are mature to over mature, but because of their size and age they provide the most benefits of amenity value to the streetscape.

At the same time, there must be a sufficient number of younger, smaller trees in the street tree population to account for the loss of trees over time and thereby maintain a sustainable urban forest.

The overall DBH distribution suggests that the overall population is aging and more trees need to be planted in order to sustain current stocking levels, much less increase them. Aging is especially evident in the DBH distribution of *Melaleuca citrina* (Bottlebrush).

Consideration should be given to the removal of the 31 trees proposed landscaping of the street included in the proposed development of houses 5-27 Walter Street, Willoughby.

Arboricultural Impact Assessment – 5 - 9 Walter Street, Willoughby

1. Introduction

On the 7th June at the request of Arcitecture Urbaneia on behalf of Walter Projects P/L ATF Walter Family trust P/L commissioned Lee Hancock Consulting Arborist to assess trees located at 3 (three) properties Numbers 5, 7and 9 Walter Street Willoughby. The 3 (three) residences are known as 1, 2, 3 DP150807. Number 5. 657.6m2, Number 7. 657.5m2, Number 9. 497.6m2.

1.1 The Proposal

The proposal is to demolish the existing 3 residences and construct 4 Storey Residential development, comprising of single level Basement parking for 34 car spaces; and 4 levels of residential accommodating 29 apartments.29 apartments: 1 x studios, 22 x 1 beds, 6 x 2 beds, apartments.

2. Aim

The purpose of this report is to detail the condition of the trees on site and on neighbouring properties and to make recommendations for their retention or removal.

2.1 The author is aware of and will comply with the determining authorities Willoughby Council Urban Tree Management Policy –Volume 1. WLEP 2012 Tree and Bushland Preservation and Clause 5.9 (2) and under the WDCP C9.

Figure 1. Documents Provided

Plan/Document	Prepared By	Drawing No	Dated
Architect	AU Architecture Urbaneia	Demolition and Waste Management Plan	3.6.2016
Survey Plan	Peak Surveying Services	16-798	17.4.2016
Landscape Architect	John Lock & Associates	2314 LP-01,02,03,04	5.5.2016

Table 1. Tree Health and Retention Value

Tree	Genus & Species	Height	Crown Spread	Maturity	Condition	Health and Vigour	Landscape Significance Rating	Useful Life Expectancy	Retention Value	Location
1	*Olea* Spp. (Olive Tree)	4m	2m2	Early mature	Good	Good	Low	Long	Low	No7. Walter Street, front yard
2	*Jacaranda mimosifolia* (Jacaranda)	6m	4m2	Mature	Poor	Poor	Very Low	Transient less than 5 years	Very Low	No7. Walter Street, rear yard.
3	*Allocasuarina* spp.	5m	4m2	Young	Good	Good	Low	Long	Low	No7. Walter Street, rear yard.
4	*Pittospurum undulatum* (Sweet Pittosporum)	----------	----------	----------	----------	----------	----------	----------	Very low	No7. Walter Street, rear yard. Noxious Weed Class 3.
5	*Magnolia soulangeana* (Magnolia)	5m	6m2	Mature	Good	Good	Low	Moderate	Low	No.9 Walter Street, Rear yard.
6.	*Olea* Spp. (Olive Tree)	5m	6m2	Early Mature	Good	Good	Low	Long	Low	No.9 Walter Street, Rear yard.

5. Discussion

An assessment of each tree was made using the Visual Tree Assessment (VTA) procedure. The Subject trees were assessed from the ground. No aerial inspection has been undertaken as part of this assessment. The initial point of reference in assessing the impacts of the proposed development is AS4970 (2009) *'Protection of trees on development sites'.*

5.1 Of the 3 (three) properties where trees were located No. 5 Walter Street vegetation was below 4m and therefore exempt from Council Tree Preservation Order.
This report will focus primarily on trees located in No 7 and 9 Walter Street, Willoughby. There are 3 Street trees that are afforded protection Section 138(c) of the *Roads Act* (NSW) 1993 and Section 629 of the *Local Government Act* (NSW) 1993.

Refer: Section 10 Street Tree Protection Specifications

Tree 1. *Olea* Spp.

Located No. 7 Walter Street, front yard of residence shrublike growth habit, not worthy of any consideration for retention.

Tree 2. *Jacaranda mimosifolia* (Jacaranda)

Located No. 7 Walter Street, rear yard bordering No. 5 Walter Street, tree is in decline, 80% deadwood with 20% epicormics growth along one branch.

Tree 3. *Allocasuarina* spp.

Located No. 7 Walter Street, rear yard bordering No. 5 Walter Street, tree was not able to be identified accurately as access was not available at time of assessment.

Tree 4. *Pittospurum undulatum* (Sweet Pittosporum)

Located No. 7 Walter Street, rear yard boundary of native reserve. This tree is a Class 3 Noxious weed and must be removed.

Tree 5. *Magnolia soulangiana* (Magnolia)

Located No 9. Walter Street, rear yard bordering No 7. Deciduous at time of assessment tree appears structurally sound, in good health and vigour, no sign of pest or disease. Not feasible to retain this tree in footprint of proposed development.

Tree 6. *Olea* Spp. (Olive Tree)

Located boundary of 7 and 9 Walter Street. Tree appears structurally sound, in good health and vigour. Not feasible to retain this tree in footprint of proposed development.

6. Conclusion

In concluding the Arboricultural Impact Assessment has collected all relevant data in assessing the condition of the trees. An assessment of their health and vigour, estimated life expectancy and their significance in the landscape and amenity value have been recorded.

7. Recommendations

The proposed development of will necessitate the removal of all 6 trees on both sites, Tree 4 is a declared Class 3 Noxious Weeds by the Noxious Weeds Act (1993).

7.1 The remaining trees have been rated as having low landscape significance, amenity value and are not considered to be worthy of any special measures to ensure their preservation, due to current health, condition or suitability. They do not have any special ecological, heritage or amenity value, or these values are substantially diminished due to their ULE.

The approval of Willoughby Council shall be obtained prior to the removal of the subject trees. Tree removal work shall be carried out by an experienced Certified AQF Level 3 Arborist in accordance with the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998).

7.2 To compensate for the loss of amenity value, replacement planting as specified by Landscape Architects, John Lock & Associates proposed design plan should be considered. The proposed landscape re -design is to improve the urban forest values of the site ensuring the new tree planting will provide sustainability into the foreseeable future.

- The trees should have a minimum 10m height at maturity to compensate for the loss of existing trees.
- The planting size shall be 75litres and compliant with Natspec guidelines.

- Planted by a qualified horticulturalist or arborist AQF Certificate 3.
- The replacement plantings must be planted in such a manner as to promote good health during the establishment period, and must be maintained, as far as practicable to ensure tree growth into maturity.

Arboricultural Impact Assessment –11-13A Walter Street, Willoughby

1.Introduction

On the 1st August 2016 at the request of Mr. T. Manly of Wellbe Pty Ltd. Lee Hancock Consulting Arborist was commissioned to prepare an Arboricultural Impact Assessment of 4 (four) properties known as 11 and 11A Walter Street D.P. 590018, No. 13 and 13A Walter Street known as D.P.1032203.

1.1 The Proposal

The proposed development is for the demolition of 11,11a,13,13A Walter Street, and the construction of a 4 Level apartment building consisting of 1 and 2 bedroom apartments including a basement car park.

Figure 1. Documents Provided

Plan/Document	Prepared By	Drawing No	Dated
Architect	AU Architecture Urbaneia	Demolition and Waste Management Plan Basement A099 Ground Floor A100 Level 1 A101, Level 2 A102, Level 3. A103, Roof Plan A104.	26.7.2016
Survey Plan	Peak Surveying Services	16-798	17.4.2016

3. Site Analysis

The sites are semi detached dwellings No. 11 and 11A are Federation era houses. While 13 – 13A is a modern dual occupancy building. Both buildings have long rear yards, the existing vegetation is predominantly native species.

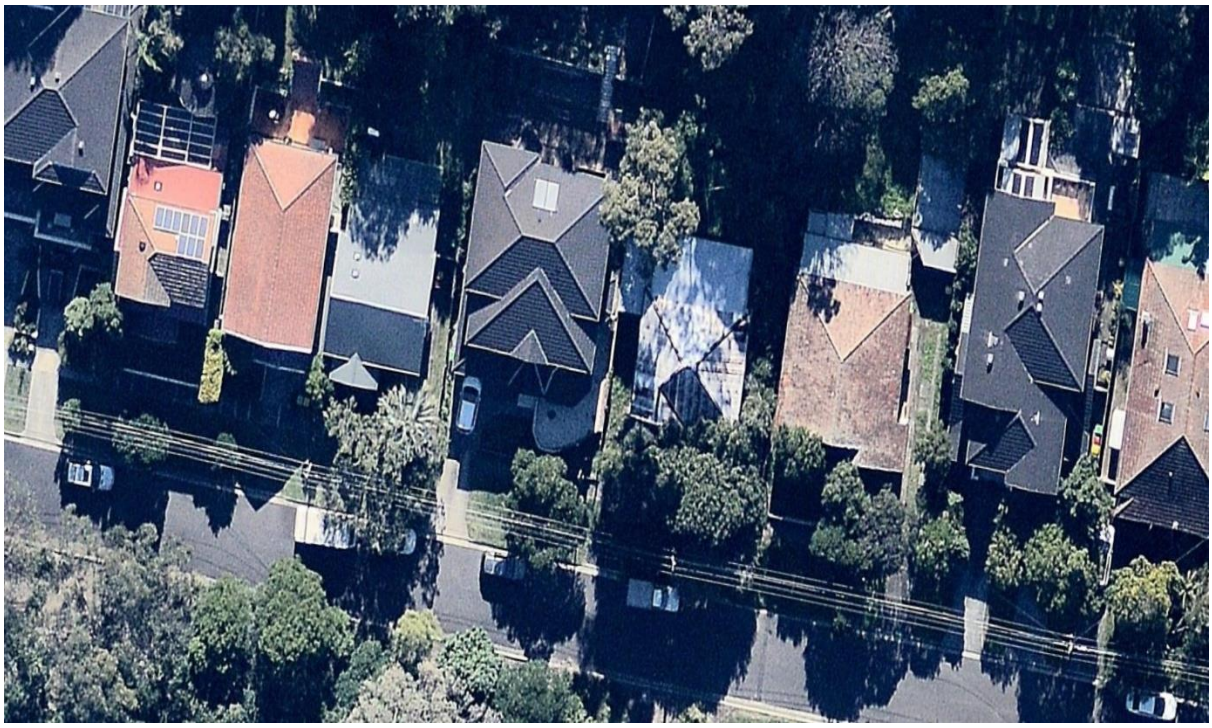

Table 1. Tree Health and Retention Value 13 Walter Street, Willoughby

Tree	Genus & Species	Height	Crown Spread	Maturity	Condition	Health and Vigour	Landscape Significance Rating	Useful Life Expectancy	Retention Value	Location
1	*Radermachera sinica* (China Doll)	5m	5m2	mature	Fair suckering growth habit	Fair	Low	Moderate	Low	Front of 13 Walter street.
1a	*Elaeocarpus reticulatus* (Blueberry Ash)	5m	4m2	Semi mature	Good	Good	Low	Moderate	Low	Front of 13 Walter street.
2	*Corymbia maculata* (Spotted Gum)	7m	10m2	Young	Fair	Fair	Low	Moderate	Low	Rear yard 13 Walter street.
3	*Corymbia maculata* (Spotted Gum)	10m	5m2	Young	Prominent lean 40 Degrees	Poor	Low	Moderate	Low	Rear yard 13 Walter street.
4	*Corymbia maculata* (Spotted Gum)	15m	10m2	Semi mature	Suppressed canopy	Fair	Low	Moderate	Low	Rear yard 13 Walter street.
5	*Corymbia maculata* (Spotted Gum)	14m	8m2	Semi mature	Poor	Fair large wound north side of trunk	Low	Moderate	Low	Rear yard 13 Walter street.
6	*Corymbia maculata* (Spotted Gum)	18m	20m2	Semi mature	Good	Good	High	Medium 15-40 years	High	Rear yard 13 Walter street.
7	*Corymbia maculata* (Spotted Gum)	20m	15m2	Mature	Good	Good	High	Medium 15-40 years	High	Rear yard 13 Walter street.

Table 2. Tree Health and Retention Value 13 A Walter Street, Willoughby

Tree	Genus & Species	Height	Crown Spread	Maturity	Condition	Health and Vigour	Landscape Significance Rating	Useful Life Expectancy	Retention Value	Location
1.	*Corymbia maculata* (Spotted Gum)	15m	15m2	Semi mature	Good	Good	High	Medium 15-40 years	High	Rear of 13 A Walter Street
2	*Corymbia maculata* (Spotted Gum)	10m	nil	Dead	Dead	Dead	Very Low	Dead	Very Low	Rear of 13 A Walter Street

Table 3. Tree Health and Retention Value 11 Walter Street, Willoughby

Tree	Genus & Species	Height	Crown Spread	Maturity	Condition	Health and Vigour	Landscape Significance Rating	Useful Life Expectancy	Retention Value	Location
1	*Melaleuca alternifolia* (Narrow – leaf Paperbark)	10m	3m2	Semi mature	Poor canopy suppressed	Poor	Low	Short 5-15 Years	Very Low	Rear boundary wall.

Table 4. Tree Health and Retention Value 11A Walter Street, Willoughby

Tree	Genus & Species	Height	Crown Spread	Maturity	Condition	Health and Vigour	Landscape Significance Rating	Useful Life Expectancy	Retention Value	Location
1	*Syzygium smithii* (Lilly pilly)	5m	5m2	Semi mature	Good	Good	Moderate	Medium 15-40 Years	Low	Front of residence
Group A and B	*Xylosma japonica* (Xylosma) x 15	6m	30m2 As hedge	Semi mature	Good	Good	Moderate	Medium 15-40 Years	Low	Rear of residence
Group C	*Acmena smithii (Lillypilly) x 4*	5m	10m2	Semi mature	Fair	Fair	Low	Medium 15-40 Years	Low	Rear of residence
2	*Ficus benjamina* (Hills Weeping Fig)	12m	30m2	Mature	Fair	Fair	Low	Medium 15-40 Years	Low	Rear of residence
3	*Ficus benjamina* (Hills Weeping Fig)	12m	20m2	Mature	Fair	Fair	Low	Medium 15-40 Years	Low	Rear of residence
4	*Ficus benjamina* (Hills Weeping Fig)	12m	15m2	Mature	Fair	Fair	Low	Medium 15-40 Years	Low	Rear of residence

5. Discussion

An assessment of each tree was made using the Visual Tree Assessment (VTA) procedure. The subject trees were assessed from the ground. No aerial inspection or diagnostic testing has been undertaken as part of this assessment.

5.1 Each tree has been provided with an identification number for reference purposes denoted on the Tree Location Plan. The subject trees have been tagged and should assist in locating trees to be impacted upon or removed.

The initial point of reference in assessing the impacts of the proposed development is AS4970 (2009) *'Protection of trees on development sites'.*

The discussion will focus primarily on the trees that will experience conflicts with the proposed development, careful consideration in reviewing plans for the development has raised the mitigating issues of the subject Trees

Trees located at 13 Walter Street.

Tree 1. *Radermachera sinica* (China Doll)

Located front yard of No. 13 small tree with a suckering growth habit, rated as low landscape significance, low amenity value, not worthy of any special measures to ensure its preservation.

Tree 1A *Elaeocarpus reticulatus* (Blueberry Ash)

Located front of residence, small tree appears in good health and vigour moderate landscape significance moderate amenity value, not worthy of any special measures to ensure its preservation.

Tree 2. *Corymbia maculata* (Spotted Gum)

Located rear yard young tree in fair health and vigour, appears structurally stable, suppressed growth from neighbouring trees, moderate landscape significance, amenity value, not worthy of any special measures to ensure its preservation.

Tree 3. *Corymbia maculata* (Spotted Gum)

Located boundary fence of no. 13 and 13A. rear yard, poor form and vigour, large cavity spiralling round lower structural branch north side. Co- dominant stems no inclusion observed, short useful life expectancy, low amenity value, low landscape significance.

Tree 4. *Corymbia maculata* (Spotted Gum)

Located opposite Tree 2 young tree suppressed canopy from neighbouring Ficus., poor form and vigour, deadwood in higher order branches, low landscape significance and amenity value.

Tree 5. *Corymbia maculata* (Spotted Gum)

Located raised garden bed adjoining boundary fence 13A young tree poor form and vigour, prominent lean to the east, low landscape significance and amenity value.

Tree 6. *Corymbia maculata* (Spotted Gum)

Semi mature tree located at base of retaining wall rear corner of yard adjoining 11A, in good form and vigour, canopy suppressed by *Ficus benjamina* , high landscape significance and amenity value.

Tree 7. *Corymbia maculata* (Spotted Gum)

Located boundary brick wall semi mature tree in good form and vigour, high landscape significance and amenity value.

Trees Located 13 A Walter Street.

Tree 1. *Corymbia maculata* (Spotted Gum)

Located adjoining rear boundary fence of No. 13 in good form and vigour, rated as having a high landscape significance and amenity value.

Tree 2. *Corymbia maculata* (Spotted Gum)

Tree is senescent. Removal is recommended.

Trees Located 11 Walter Street.

Tree 1. *Melaleuca alternifolia* (Narrow – leaf Paperbark)

Located rear boundary fence, poor form and vigour, suppressed by large *Monstera deliciosa* (Fruit Salad Plant) attached to trunk of tree. Rated as having a low landscape significance, low amenity value, not considered worthy of any special measures for retention.

Trees located 11A Walter Street

Tree 1 *Syzygium smithii* (Lilly pilly)

Located front of residence, in good form and vigour, moderate landscape significance and amenity value.

The rear of the property flanked on either side of its boundaries are an informal hedge of *Xylosma japonica* (Xylosma) for the purpose of this report they will be known and tagged as:

Group A *Xylosma japonica* (Xylosma)

Group B *Xylosma japonica* (Xylosma)

Group C *Acmena smithii (Lillypilly*)

Rear of property boundary of 11 Walter Street supports 4 *Acmena smithii* in poor form and vigour with a low landscape significance and amenity value rating, not worthy of any special measures to ensure their preservation.

Tree 2 ,3 and 4 *Ficus benjamina* (Hills Weeping Fig)

Located rear boundary of property their large canopies reach over 13 Walter Street and 11 A Walter street, rear yards suppressing existing trees.

Trees appear in good health and vigour, rated as low landscape significance, low amenity value and considered not worthy of retention.

6. Conclusion

In concluding the Arboricultural Impact Assessment has collected all relevant data in assessing the condition of the trees. An assessment of their health and vigour, estimated life expectancy and their significance in the landscape and amenity value have been recorded.

7. Recommendations

The proposed development will necessitate the removal of 6 Trees at 13 Walter Street, 1 Tree on 13A Walter Street, 1 Tree on 11 Walter Street. 4 Individual trees and 3 groups of hedging trees on 11A Walter Street.

7.1 These trees have been rated as having low landscape significance, amenity value and are not considered to be worthy of any special measures to ensure their preservation, due to current health, condition or suitability. They do not have any special ecological, heritage or amenity value, or these values are substantially diminished due to their ULE.

The approval of Willoughby Council shall be obtained prior to the removal of the subject trees. Tree removal work shall be carried out by an experienced Certified AQF Level 3 Arborist in accordance with the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998).

7.2 Trees to be retained are located on 13 Walter Street are Trees 6 and 7 and Tree 1 on 13A Walter Street. They are considered to be worthy of preservation and as such careful consideration should be given to their retention as a priority.

Refer: Section 9. Tree Protection Specifications

Arboricultural Impact Assessment – 21-27B

1.Introduction

On the 5th November 2016 at the request of Mr. T. Manly of Wellbe Pty Ltd. Lee Hancock Consulting Arborist was commissioned to prepare an Arboricultural Impact Assessment of 4 (Four) residences known as 21-27 Walter Street, Willoughby. No's 21 &23 are D.P.166910 measuring 542m2. No.25 known as D.P.168467 measuring 542m2. No. 27A & 27B know as D.P.977055. NOTE 27A& 27B share a rear yard.

1.1 The Proposal

It is proposed that the existing dwellings be demolished and a 3-5 storey residential apartment building including basement car parking be constructed.

2. Aim

The purpose of this report includes trees to be removed and identifies impacts on trees to be retained. This report will then guide the site layout and design process showing the spatial requirements and constraints the trees have imposed on the site.

2.1 Measures necessary to protect the trees throughout all demolition and construction phases have been recommended and methodologies to minimise impacts on retained trees Where there is encroachment into the TPZ (Tree Protection Zone) and SRZ (Structural Root Zone) have also been included.

2.2 The author is aware of and will comply with the determining authorities Willoughby Council Urban Tree Management Policy –Volume 1. WLEP 2012 Tree and Bushland Preservation and Clause 5.9 (2) and under the WDCP C9.

Table 1. Documents Provided

Plan/Document	Prepared By	Drawing No	Dated
Architect	AU Architecture Urbaneia	Site Analysis Ground Floor, Basement 1.	26.10 .2016
Survey Plan	Peak Surveying Services	16 -798	23.7.2016 and 20.10.2016

3. Site Analysis

The sites face south at the base of a steep rock face which has necessitated in terracing all the rear yards of the properties. The existing vegetation of all properties are a mixture of native and exotic vegetation.

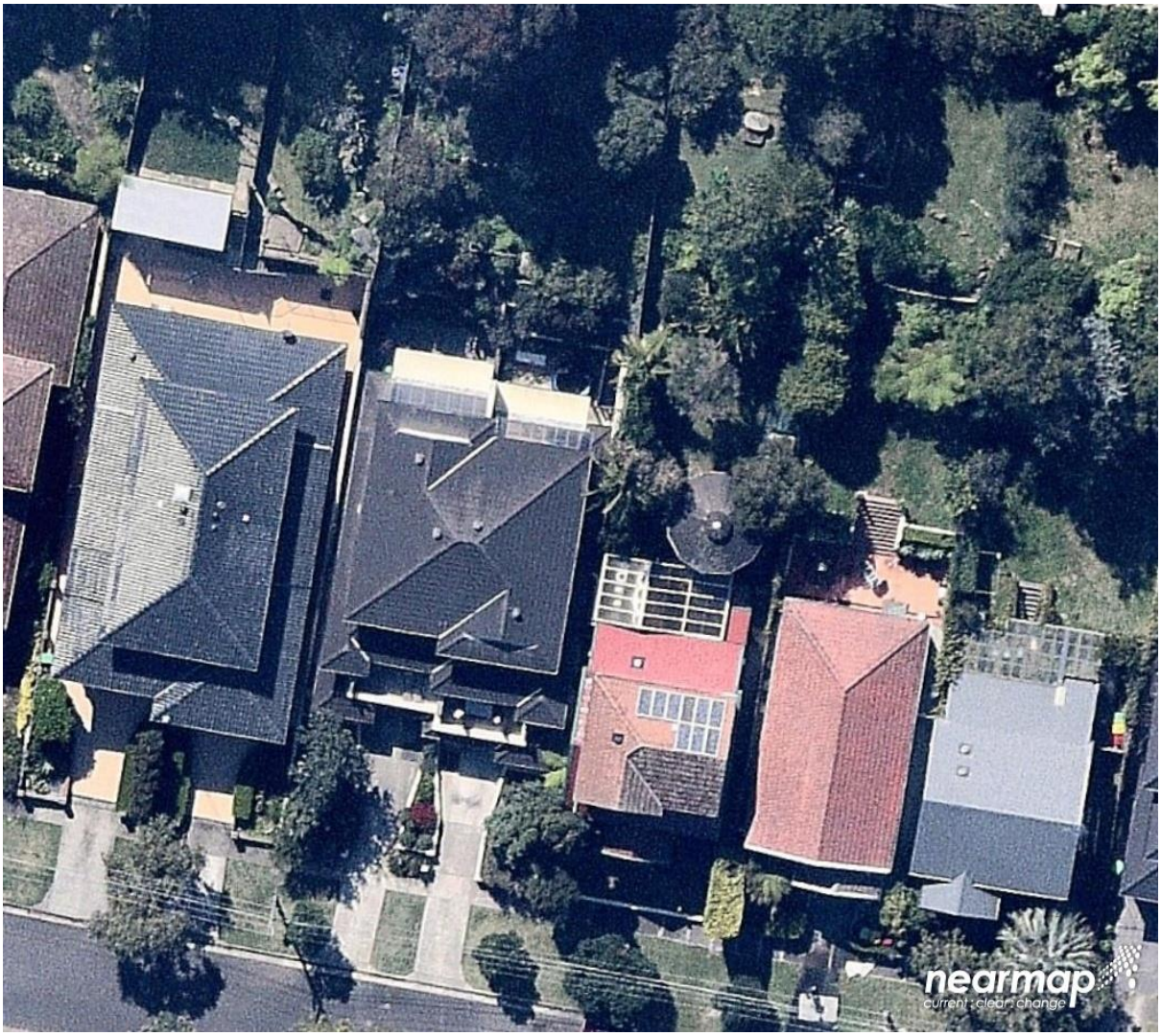

Table 4. Tree Health and Retention Value 21 Walter Street, Willoughby

Tree		Genus & Species	Height	Crown Spread	Maturity	Condition	Health and Vigour	Landscape Significance Rating	Useful Life Expectancy	Retention Value	Location
1		*Michelia figo* (Port Wine Magnolia)	5m	5m2	Mature	Good	Good	Moderate	Long	Low	Western corner front of residence
2		*Pittosporum undulatum* (Sweet Pittosporum)x2	4m	9m2	Mature	Good	Good	Low	Long	Low	North aspect
3		*Acacia baileyana* (Cootamundra wattle)	4m	10m2	Mature	Fair	Fair	Low	Short 5-15 Years	Low	North aspect
4		Banksia integrifolia (Coast Banksia) x3	5m	15m2	Mature	Good	Good	Moderate	Medium 15-40 years	Low	North aspect

Table 5. Tree Health and Retention Value 23 Walter Street, Willoughby

Tree	Genus & Species	Height	Crown Spread	Maturity	Condition	Health and Vigour	Landscape Significance Rating	Useful Life Expectancy	Retention Value	Location
5	X Cupressyparis leylandii (Leyland Cypress) Hedge	5mm	30m2	Semi mature	Good	Good	Moderate	Long greater than 40 Years	Low	Rear Boundary of 23 and 25 Walter Street.
5a	Cupressus sempervirens “Swanes Golden”	5m	30m2	Semi mature	Good	Good	Moderate	Long greater than 40 Years	Low	Front of residence as screening 25 Walter Street.

Table 6. Tree Health and Retention Value 25 Walter Street, Willoughby

Tree	Genus & Species	Height	Crown Spread	Maturity	Condition	Health and Vigour	Landscape Significance Rating	Useful Life Expectancy	Retention Value	Location
6	*Acmena smithii* spp. (Lily Pilly)	5m	10m2	Mature	Good	Good	Moderate	Long greater than 40 Years	Low	Front of residence
7	*Melaleuca citrina* (Bottlebrush)	6m	15m2	Mature	Fair	Fair	Moderate	Medium 15-40 years	Low	Rear of residence
8	*Melaleuca citrina* (Bottlebrush)	6m	15m2	Mature	Fair	Fair	Moderate	Medium 15-40 years	Low	Rear of residence
9	*Melaleuca linarifolia* (Snow in Summer)	5m	10m2	Mature	Fair	Fair	Moderate	Medium 15-40 years	Low	Rear of residence
10	*Grevillea robusta* (Silky Oak)	6m	15m2	Young	Good	Good	Moderate	Medium 15-40 years	Low	Rear of residence
11	*Aracaria heterophylla* (Norfolk Island Pine)	7m	10m2	Young	Good	Good	Moderate	Medium 15-40 years	Low	Rear of residence
12	*Allocasuarina cunninghamiana*	6m	8m2	Young	Poor	Poor	Moderate	Short 5-15 Years	Low	Adjacent boundary to 23 Walter rear of property
13	*Acacia elata* (Cedar Wattle) x2	8m	15m2	Young	Good	Good	High	Long greater than 40 Years	High	Rear boundary of residence

Table 7. Tree Health and Retention Value 27 A & B Walter Street, Willoughby

Tree	Genus & Species	Height	Crown Spread	Maturity	Condition	Health and Vigour	Landscape Significance Rating	Useful Life Expectancy	Retention Value	Location
14	Elaeocarpus reticulatus (Blueberry Ash) x2	4m	8m2	Young	Good	Good	Moderate	Long greater than 40 years.	Low	Front of residence in raised garden bed.
15	*Melaleuca linariifolia* (Snow in Summer)	4m	10m2	Mature	Fair	Fair	Moderate	Medium 15-40 years	Low	Combined Rear yard of 27 A & 27B
15A.	*Melaleuca linariifolia* (Snow in Summer)	4m	10m2	Mature	Fair	Fair	Moderate	Medium 15-40 years	Low	Combined Rear yard of 27 A & 27B
16	*Corymbia maculata* (Spotted Gum)	7m	20m2	Young	Good	Fair	HIgh	Long greater than 40 years	High	Combined Rear yard of 27 A & 27B

5. Discussion

An assessment of each tree was made using the Visual Tree Assessment (VTA) procedure. The subject trees were assessed from the ground. No aerial inspection or diagnostic testing has been undertaken as part of this assessment.
Each tree has been provided with an identification number for reference purposes denoted on the Tree Location Plan.

5.1 The initial point of reference in assessing the impacts of the proposed development is AS4970 (2009) *'Protection of trees on development sites'.*
This discussion will focus primarily on the trees that will experience conflicts with the proposed development, careful consideration in reviewing plans for the development has raised the mitigating issues of the subject Trees 13 and 19.

Trees located at 21 Walter Street, Willoughby.

Tree 1. *Michelia figo* (Port Wine Magnolia)

Located at front of residence, in good health and vigour, moderate landscape significance and amenity value, not feasible to retain this tree for the proposed development

Tree 2. *Pittosporum undulatum* (Sweet Pittosporum) x2

Located rear terraced garden two specimens planted for screening and native garden theme. Moderate landscape significance and amenity value.

Tree 3. *Acacia baileyana* (Cootamundra wattle)

Located first level terrace garden in poor form and vigour, short useful life expectancy less than 5 years, removal is recommended.

Tree 4. *Banksia integrifolia* (Coast Banksia) x3

Tree/shrub form specimens in good form and vigour, moderate landscape significance and amenity value.

All of the above trees are not considered worthy of any special measures to ensure their preservation. In footprint of the proposed development.

Refer: Section 7 Recommendations

Trees located 23 Walter Street, Willoughby.

Tree 5 *Cupressus sempervirens* 'Swanes Golden'

Located as screening hedge front of residence, in good form and vigour, not considered worthy of any special measures to ensure their preservation. In footprint of the proposed development.

Tree 5A X *Cupressyparis leylandii* (Leyland Cypress)

Located rear garden of the above property 6 trees forming a screening hedge. In good form and vigour, not considered worthy of any special measures to ensure their preservation. In footprint of the proposed development.

Refer: Section 7 Recommendations

Trees located 25 Walter Street, Willoughby

Tree 6. *Acmena smithii* (Lilly pilly)

Located at entrance to residence in good form and vigour, moderate landscape significance, amenity value, not considered worthy of any special measures to ensure their preservation. In footprint of the proposed development.

Tree 7 & 8 *Melaleuca citrina* (Bottlebrush) x2

Located rear terraced area in fair form and vigour, moderate landscape significance, amenity value, not considered worthy of any special measures to ensure their preservation. In footprint of the proposed development.

Tree 9. *Melaleuca linarifolia* (Snow in Summer)

Located rear terraced area in fair form and vigour, moderate landscape significance, amenity value, not considered worthy of any special measures to ensure their preservation. In footprint of the proposed development.

Tree 10. *Grevillea robusta* (Silky Oak)

Young tree located upper terrace level, in good form and vigour, moderate landscape significance, amenity value, not considered worthy of any special measures to ensure their preservation. In footprint of the proposed development.

Tree 11. *Araucaria heterophylla* (Norfolk Island Pine)

Young tree located upper terrace level, in good form and vigour, moderate landscape significance, amenity value, not considered worthy of any special measures to ensure their preservation. In footprint of the proposed development.

Tree 12. *Allocasuarina* spp.

Young tree located boundary fence in poor form and vigour, sparse foliage, low landscape significance and amenity value, consideration should be given to its removal.

Tree 13 *Acacia elata* (Cedar Wattle) x2

Young trees in good form and vigour located on rear boundary fence, high landscape significance and amenity value, trees should be retained and protected throughout all stages of the proposed development.

Refer: Section 10. Tree Protection Specifications & Section 7 Recommendations

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Trees Located 27A & 27 B Walter Street, Willoughby.

Tree 14. *Elaeocarpus reticulatus* (Blueberry Ash) x2

Located in raised garden bed on front entrances of 27A and B trees are in good form and vigour, moderate landscape significance and amenity value, not considered worthy of any special measures to ensure their preservation. In footprint of the proposed development.

Tree 15. & 15A *Melaleuca linariifolia* (Snow in Summer)

Located rear terrace in a native garden area, in good form and vigour, moderate landscape significance and amenity value, not considered worthy of any special measures to ensure their preservation. In footprint of the proposed development.

Tree 16 *Corymbia maculata* (Spotted Gum)

Young tree in good form and vigour, located within the 6m setback, high landscape significance, amenity value, tree displays vigorous growth rate, with a long useful life expectancy.

Tree is to be protected throughout all stages of the proposed development.

Refer: Section 10. Tree Protection Specifications & Section 7 Recommendations

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7. Recommendations

The proposed development will necessitate the removal of Trees 1,2,3,4,5,6,7,8, 9,10,11,12, ,14,15 & 15A , These trees should not be considered as a constraint to the potential development of the site. Approval shall be obtained from Willoughby Council prior to their removal.

Tree removal work shall be carried out by an experienced Certified AQF Level 3 Arborist in accordance with the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998).

7.1
Trees 13 *Acacia elata* (Cedar Wattle) x2 and Tree 16 *Corymbia maculata* (Spotted Gum) are to be retained and protected throughout all stages of the proposed development.

Refer Section 10. Tree Protection Specifications

7.2 To compensate for the loss of amenity value, replacement planting should be considered. The proposed tree replacement species are to improve the urban forest values of the site ensuring the new tree planting will provide sustainability into the foreseeable future.

- The trees should have a minimum 10m height at maturity to compensate for the loss of existing trees.
- The planting size shall be 75litres and compliant with Natspec guidelines.
- Planted by a qualified horticulturalist or arborist AQF Certificate 3.
- The replacement plantings must be planted in such a manner as to promote good health during the establishment period, and must be maintained, as far as practicable to ensure tree growth into maturity.

8. References.

AS 4970 *'Protection of trees on development sites'.* (2009)

Harris, R.W., Clark, J.R and Matheny, N.P. (2004), *Arboriculture: Integrated Management of Landscape Trees, Shrubs, and Vines.* 4th Edition, Prentice Hall, New Jersey.

Mattheck, C. & Breloer, H. (1994) *The Body Language of Trees.*

Morton, A. Earthscape Horticultural Services -Tree Retention Values

www.nearmap.com.au

www.willoughbycouncil.nsw.gov.au

Willoughby Library Services (May 2013) *History of Willoughby*

Disclaimer

The author, Lee Hancock Consulting Arborist takes no responsibility for actions taken and their consequences, contrary to those expert and professional instructions given as recommendations pertaining to safety by way of exercising our responsibility to our client and the public as our duty of care commitment to mitigate or prevent hazards from arising, from a failure moment in full or part, from a structurally deficient or unsound tree or a tree likely to be rendered thus by its retention and subsequent modifications to its growing environment either above or below ground contrary to our advice.

This report is a recommendation only. In no way does it guarantee any particular actions by the determining authorities.