

“GROWING MY WAY”

Tree Consultancy

Established 1977

EXCELLENCE in ALL ASPECTS OF TREE MANAGEMENT

FULL INSURANCE PROTECTION

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Construction Impact & Management Statement

December 2020



1 Summary

Jacob Shanahan as the property owner commissioned the Growing My Way Tree Consultancy (GMW) to prepare a new *Construction Impact & Management Statement* relative to proposed *Construction of new dwelling with lower-level double garage* within the property known as 145A Crescent Road, Newport, (from herein the subject site).

The subject site has previously been discussed by the GMW practice relative to the determined DA2019/0792 for a similar development to the one proposed by the new DA, subject to this document.

Three (3) individual trees have been identified as being required to be discussed relative to the proposal for Construction of new dwelling with lower-level double garage. All discussed trees are subject to the tree management provisions as defined within the *Northern Beaches Council (from herein NBC) "Tree Management Provisions" plus the new SEPP "Vegetation in non-rural Areas, August 2017.* Additional to the discussed trees are trees within the subject site & adjoining common boundary sites determined to be either exempt species or not impacted by the DA submission as is proposed.

One (1) of the three (3) discussed/protected trees are proposed to be retained, managed & protected.

The proposal is able to satisfy compliance criteria with the *Australian Standard (AS4970-2009 Protection of trees on development sites).*

Motor vehicle & pedestrian access is via Crescent Road. The subject site shares a common driveway with the site known as 145 Crescent Road.

The sole consent authority is the NBC. The old *Pittwater Council Planning Instrument (Local Environment Plan, 2014)* applies at the time of writing.

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

- *Site Survey by Adam Clerke Surveyors Pty Ltd, dated December 2020;*
- *Plans, Sections & Elevations, by Midcoast Design, Rev 5, dated, 8 September 2020;*
- *Pittwater Council/NBC "Tree Management Provisions" &*
- *SEPP 'Vegetation in Non-Rural Areas, 25 August 2017.*

The aim of this report is:

1. *To confirm individual trees health, vigour & condition considering any impact foreseen by the proposed demolition & redevelopment.*
2. *Confirm the Site-Specific Tree Management Strategy for Tree #2 is AS4970-2009 to be compliant.*

This document supports (relative to tree management) the proposal for *Construction of new dwelling with lower-level double garage* as per the information provided by the client.

Kyle A Hill (AQF level 5 & 8 *Practicing/Consulting Arborist*) has prepared this report based on "Visual Tree Assessment" (VTA) most recently reassessed/undertaken on Saturday, 23 June & Thursday, 03 December, 2020.

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2 Introduction

This report contains observations & recommendations intended to assist in the management of the three (3) trees identified as necessary to be discussed by virtue of their location & proposed works.

The only built form within the subject site is a long term established driveway & hard landscaping features, i.e. retaining walls, stairs & multiple level garden beds.

This document supports the proposed *Construction of new dwelling with lower-level double garage* with respect to tree management issues.

We confirm to be familiar with both the old *Pittwater Council* & now *NBC "Tree Management Provisions" plus the new SEPP "Vegetation in non-rural Areas, August 2017"*.

The sole consent authority is *NBC*.

The subject site is NOT within a *NBC* designated "*Heritage Conservation Area*". The subject site is confirmed to NOT be a listed "*Heritage Item*" nor are any of the discussed trees known to be listed on any "*Significant Tree Register*". No trees discussed are captured as being subject to the protection provisions within the state legislated '*NSW Scientific Committee*'-*final determination, (Threatened Species Conservation Act)* which identifies & protects the '*Pittwater spotted gum forest-endangered ecological community listing*' under '*NSW legislation*'. The subject site is confirmed to be within a '*C01*', "*Wildlife Corridor*" as defined within the *Pittwater 21 DCP (see page 8)*.

One (1) discussed tree is within the subject site, one (1) is located within the common boundary of 145A/145 The Crescent & one (1) tree is located within the adjoining property, 145 The Crescent. Both sites referred to are owned by the same family. As such, no objections will be raised from the 145 The Crescent property.

Of the three (3) protected trees discussed one (1) is proposed to be retained, managed & protected as part of the post completion of built infrastructure new landscape concept.

A list of considered to be suitable replacement trees for the local environment is included within this document

The subject site is zoned "*E4*", '*Environmental Living*'.

A *Site Specific "Tree Management Strategy"* is included within this document.

3 Methodology

Assessment of the trees has been from ground level by eye, using *Visual Tree Assessment*^{*} (VTA) techniques developed by Claus Mattheck. The principles of VTA are explained in his widely-used reference book "*The Body Language of Trees (1994)*".

Assessment includes:

- Tree's current condition & likely future health. Species tolerance to root disturbance &/or development
- Likely future hazard potential to persons & property
- Tree's amenity value, such as significance, screening & habitat.

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

- Appendix A Glossary of Common Arboreal terms
- Appendix B Tree Protection & Management

^{*} **VTA–Visual Tree Assessment**, as referenced is a systematic inspection of a tree for indicators of structural defects that may pose a risk due to failure. Stage 1 is made from ground level (i.e. no aerial inspection is undertaken). An aerial inspection (Stage 2) is undertaken when there are easily identified visual indicators that suggest such an inspection is merited. Visual indicators are outlined within *The Body Language of Trees (Mattheck & Breloer, 1994)*. VTA is a broadly used relatively standardised approach. More complex (can be invasive) diagnostic fault detection equipment may be recommended once visual indicators of potential defects are confirmed.

4 Observations

4.1 The Site

The report discusses only trees within Lot 1 of DP 1229229. The site is 800.10m² by survey in size. The site is linked to one (1) public road & four (4) developed residential lots.

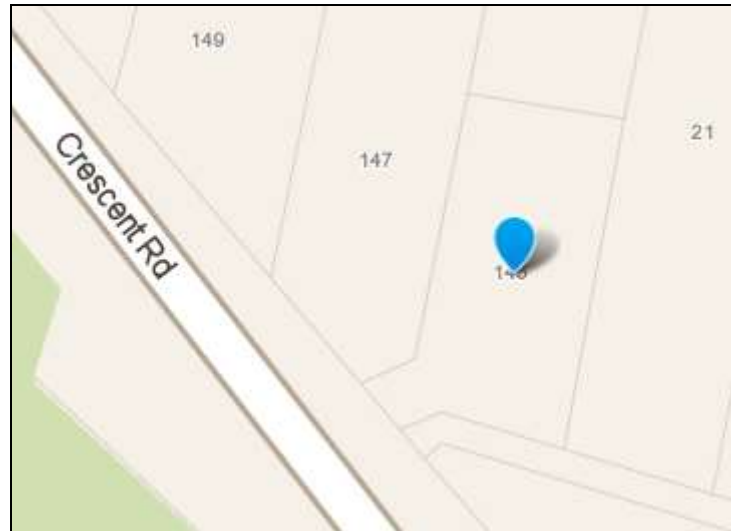
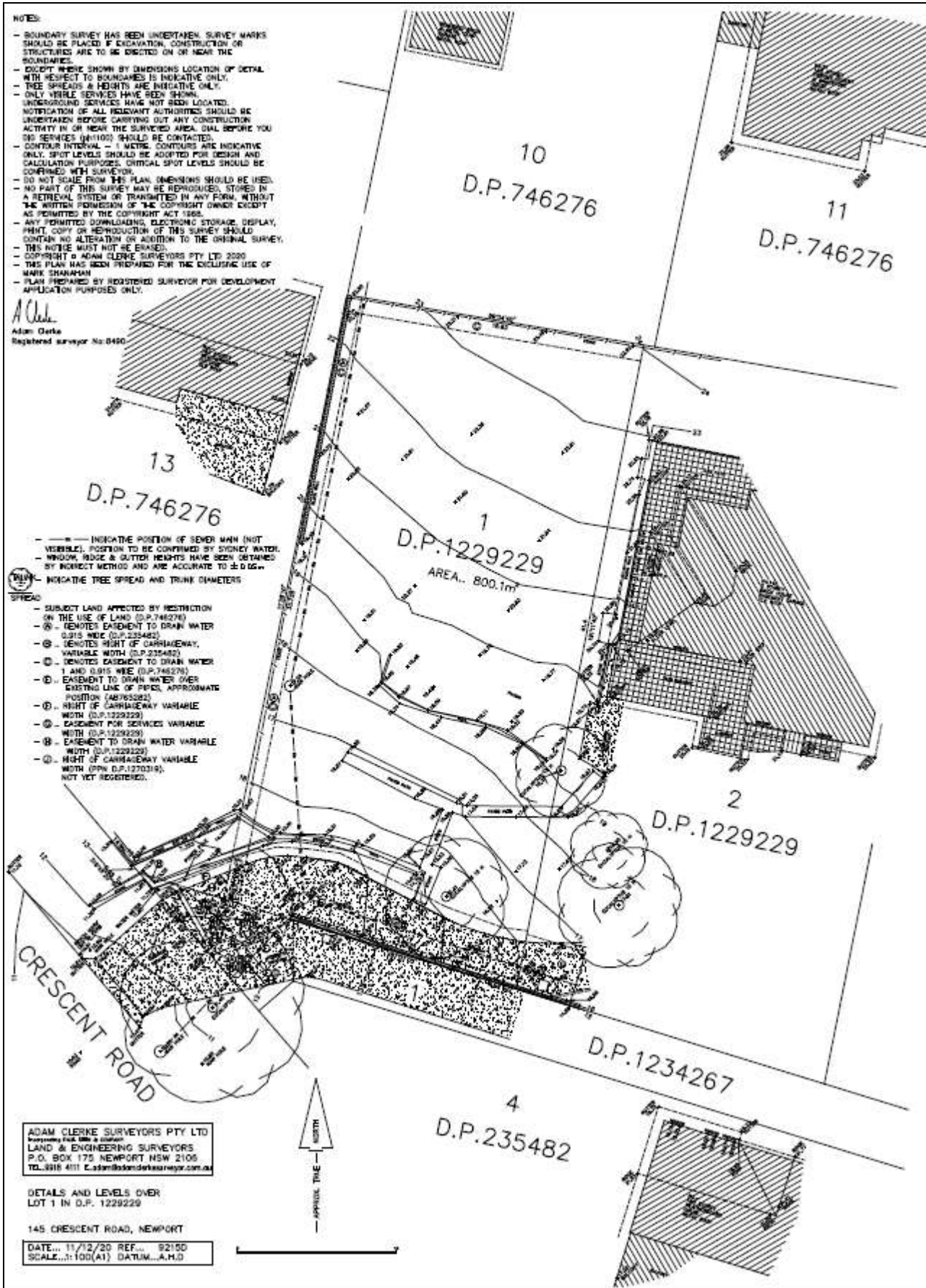


Figure 1: Aerial photograph with lot boundaries courtesy of NBC website tool.

The subject site is Land Zoned “E4” ‘Environmental Living’.





Pittwater Local Environmental Plan 2014

Land Zoning Map - Sheet LZN_017

Zone

B1	Neighbourhood Centre
B2	Local Centre
B4	Mixed Use
B6	Enterprise Corridor
B7	Business Park
E1	National Parks and Nature Reserves
E2	Environment Conservation
E3	Environmental Management
E4	Environmental Living
IN2	Light Industrial
IN4	Working Waterfront
R2	Low Density Residential
R3	Medium Density Residential
R5	Large Lot Residential
RE1	Public Recreation
RE2	Private Recreation
RU2	Rural Landscape
SP1	Special Activities
SP2	Infrastructure
SP3	Tourist
W1	Natural Waterways
W2	Recreational Waterways

Cadastre

	Cadastre 7/7/2012 © Land & Property Information (LPI)
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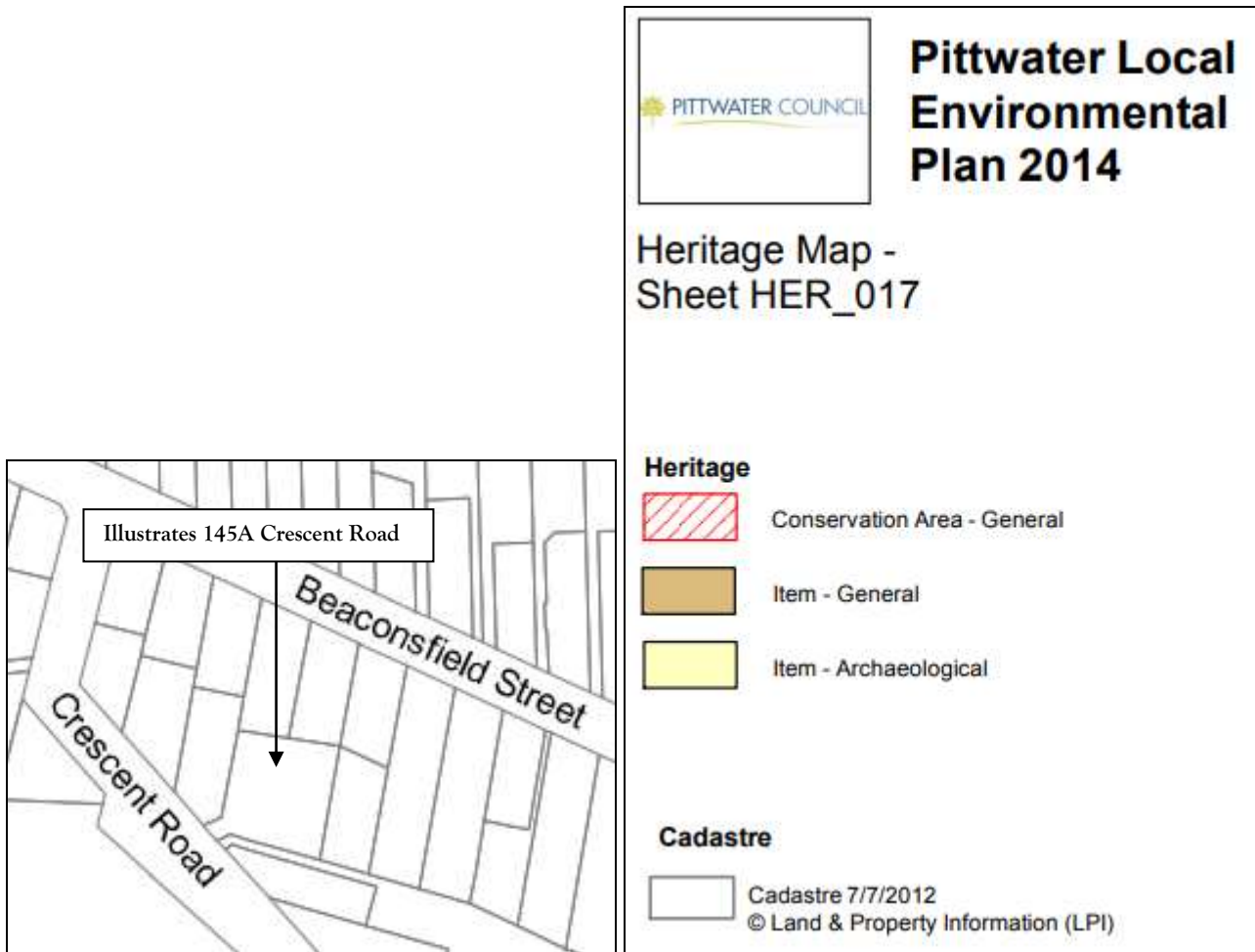









Figure 2: Above & previous page illustrates Land Zoning & Heritage Conservation Area status.

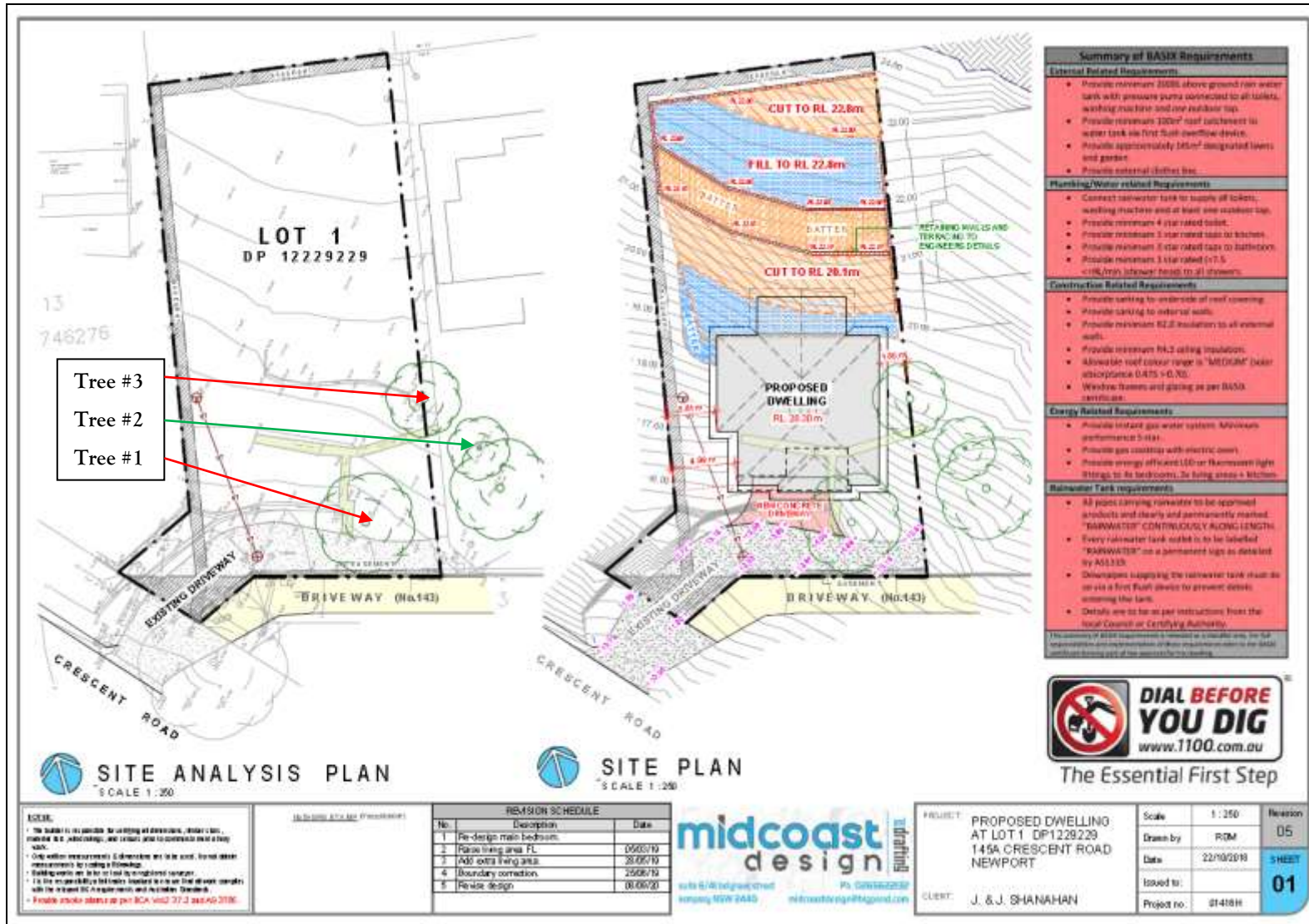
The site is NOT within a NBC designated “Heritage Conservation Area” (see page 6). The site is also confirmed to NOT be a listed “Heritage Item” nor is it near any listed “Heritage Item”. The discussed trees are NOT known to be on any ‘significant tree register’. The subject site & local environs are located within a designated ‘Wildlife Corridor’ CO1 – “those areas though disturbed are likely to be of habitat value due to good crown cover &/ or understorey’.

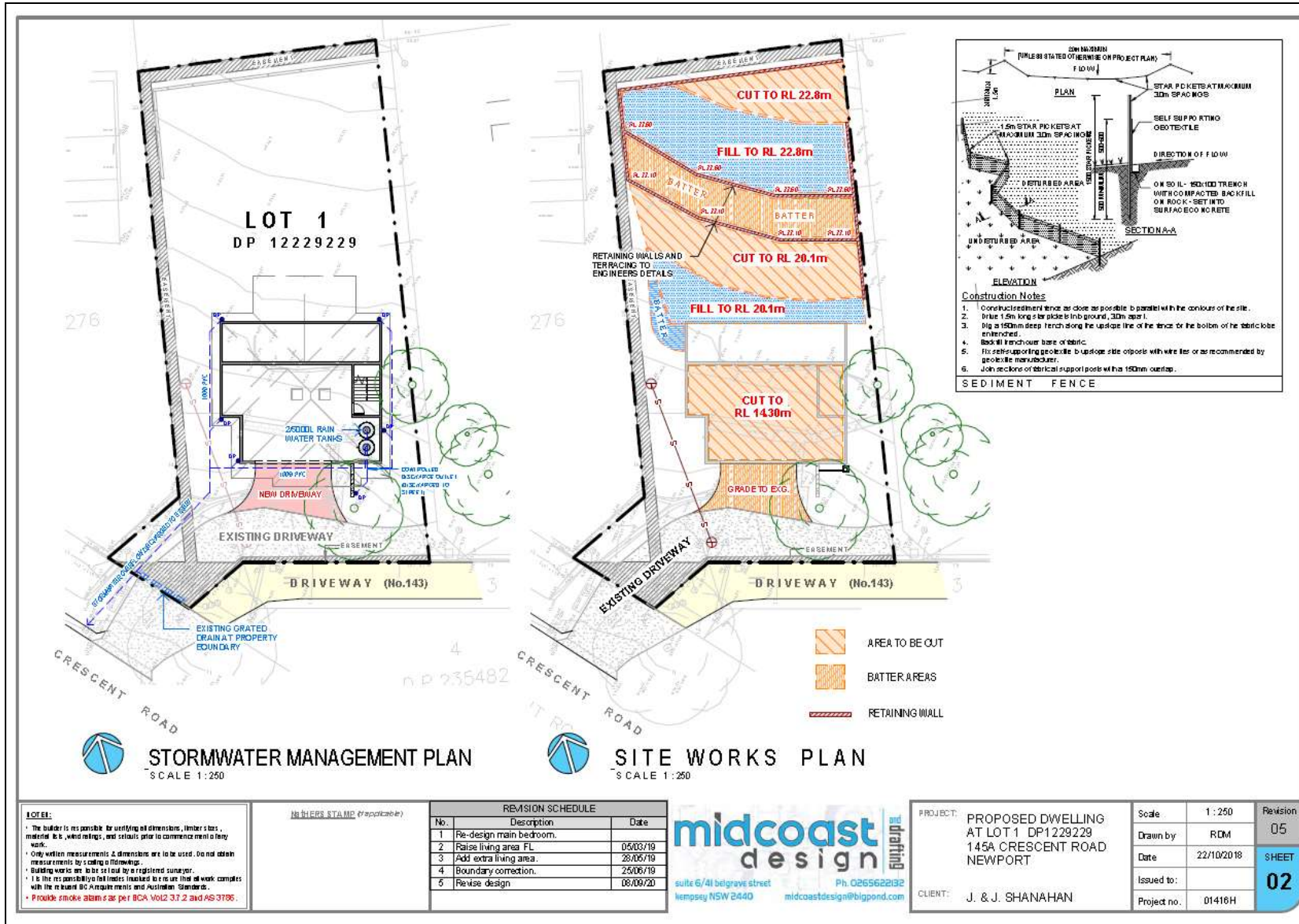


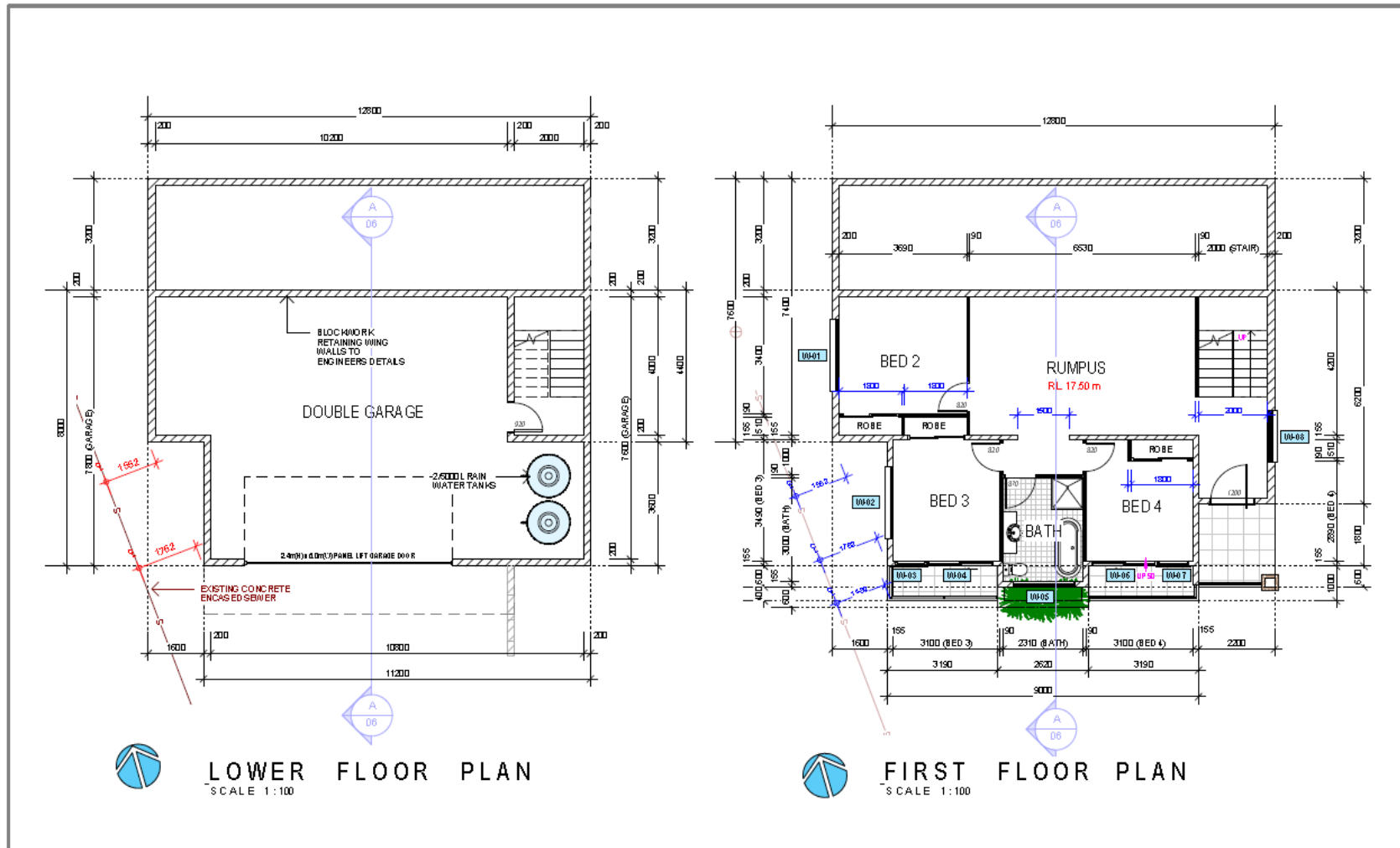
Figure 3: Confirms “Wildlife Corridor” status.

 PITTWATER COUNCIL	PITTWATER LOCAL GOVERNMENT AREA
PITTWATER 21 DGP - WILDLIFE CORRIDOR MAP	
Wildlife Corridors Legend	
	HP - High Priority areas essential to fauna movement
	MH - Major Habitat Areas
	R - Smaller Council Reserves likely to have modified habitat or suffering adverse edge effects
	CD1 - Those areas though disturbed are likely to be of habitat value due to good crown cover and/or understory
	CD2 - Mostly cleared non-residential areas with good potential for improvement of habitat
	CD3 - Residential areas with some tree cover but requiring supplementary planting to aid fauna movements

4.2 The Proposal







LOWER FLOOR PLAN
SCALE 1:100

FIRST FLOOR PLAN
SCALE 1:100

- NOTES:**
- The builder is responsible for verifying all dimensions, timber sizes, material (e.g. wind ratings, and seals) prior to commencement of any work.
 - Only written measurements & dimensions are to be used. Do not obtain measurements by scaling a drawing.
 - Building works are to be set out by a registered surveyor.
 - It is the responsibility of the client to ensure that all work complies with the relevant BCA requirements and Australian Standards.
 - Provide smoke alarm as per BCA Vol2 317.2 and AS 3195.

ARCHITECT'S STAMP (if applicable)

REVISION SCHEDULE		
No.	Description	Date
1	Re-design main bedroom.	
2	Raise living area FL.	05/03/19
3	Add extra living area.	28/05/19
4	Boundary correction.	25/06/19
5	Revise design	08/09/20

midcoast design *architects*

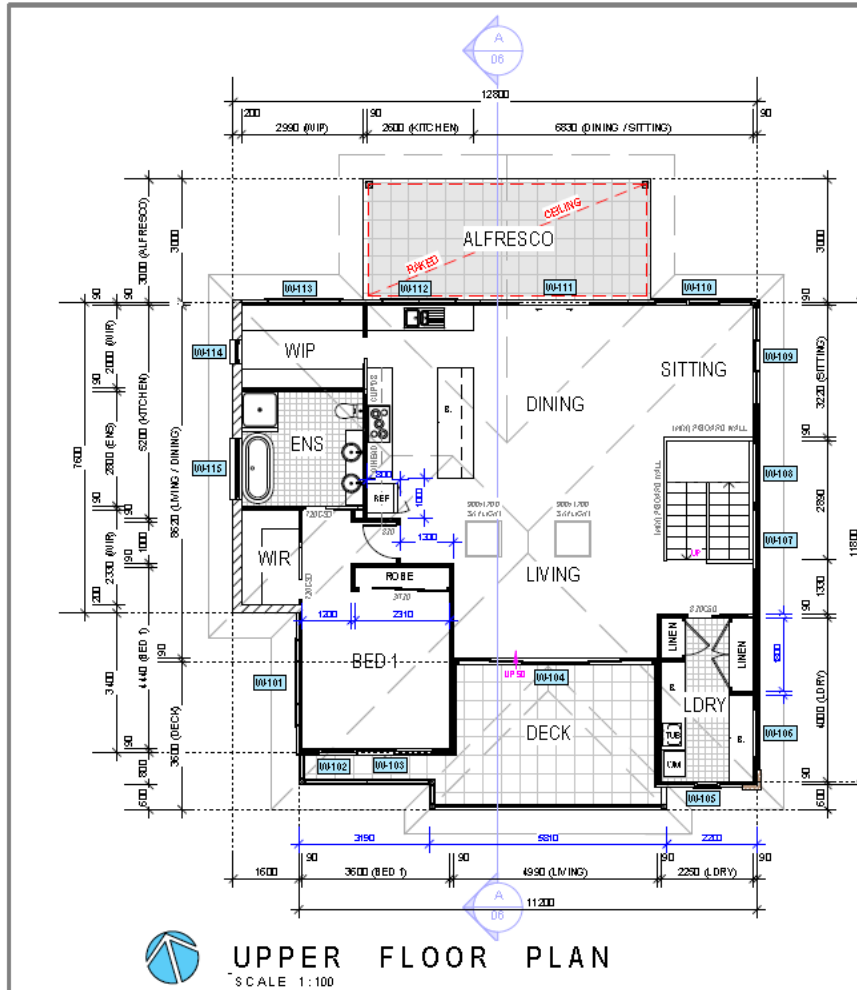
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kempsey NSW 2440

Ph. 0265622192
midcoastdesign@bigpond.com

PROJECT: PROPOSED DWELLING
AT LOT 1 DP1229229
145A CRESCENT ROAD
NEWPORT

CLIENT: J. & J. SHANAHAN

Scale	1 : 100	Revision	05
Drawn by	RDM	SHEET	03
Date	22/10/2018		
Issued to:			
Project no.	01416H		



WINDOW SCHEDULE								
No.	Location	Height	Width	Hd Height	Description	Frame Material	Glazing	Area
01	BED2	1200	2100	2100	SLIDING WINDOW	ALUMINIUM	CLEAR - SINGLE	2.52
02	BED3	600	2100	2100	SLIDING WINDOW	ALUMINIUM	CLEAR - SINGLE	1.26
03	BED3	2000	900	2100	LOUVER WINDOW	ALUMINIUM	CLEAR - SAFETY	1.80
04	BED3	2100	1800	2100	SLIDING GLASS DOOR	ALUMINIUM	CLEAR - SAFETY	3.78
05	BATH	600	1800	2100	SLIDING WINDOW	ALUMINIUM	OBSCURE - SAFETY	1.08
06	BED4	2100	1800	2100	SLIDING GLASS DOOR	ALUMINIUM	CLEAR - SAFETY	3.78
07	BED4	2000	900	2100	LOUVER WINDOW	ALUMINIUM	CLEAR - SAFETY	1.80
08	ENTRY	1000	1500	2400	SLIDING WINDOW	ALUMINIUM	CLEAR - SINGLE	1.50
101	BED1	600	2100	2100	SLIDING WINDOW	ALUMINIUM	CLEAR - SINGLE	1.26
102	BED1	2100	900	2190	LOUVER WINDOW	ALUMINIUM	CLEAR - SAFETY	1.89
103	BED1	2100	1800	2200	SLIDING GLASS DOOR	ALUMINIUM	CLEAR - SAFETY	3.78
104	LIVING	2100	4800	2100	STACKING SLIDING DOOR	ALUMINIUM	CLEAR - SAFETY	10.08
105	LDRY	1800	600	2100	LOUVER WINDOW	ALUMINIUM	CLEAR - SAFETY	1.08
106	LDRY	600	1200	2100	SLIDING WINDOW	ALUMINIUM	CLEAR - SINGLE	0.72
107	STAIRS	1000	1500	2100	SLIDING WINDOW	ALUMINIUM	CLEAR - SINGLE	1.50
108	STAIRS	1000	1500	2100	SLIDING WINDOW	ALUMINIUM	CLEAR - SINGLE	1.50
109	SITTING	1200	2400	2100	SLIDING WINDOW	ALUMINIUM	CLEAR - SINGLE	2.88
110	SITTING	1200	2400	2100	SLIDING WINDOW	ALUMINIUM	CLEAR - SINGLE	2.88
111	DINING	2100	3600	2100	DOUBLE SLIDING GLASS DOOR	ALUMINIUM	CLEAR - SAFETY	7.56
112	KITCHEN	1200	1800	2100	SLIDING WINDOW	ALUMINIUM	CLEAR - SINGLE	2.16
113	WIP	1200	1800	2100	SLIDING WINDOW	ALUMINIUM	CLEAR - SINGLE	2.16
114	WIP	2000	600	2100	LOUVER WINDOW	ALUMINIUM	CLEAR - SAFETY	1.20
115	ENS	600	1500	2100	AWNING WINDOW	ALUMINIUM	OBSCURE - SAFETY	0.90

DWELLING AREAS	
Name	Area
Garage Floor Area	96.64 m ²
First Floor Area	94.25 m ²
First Floor Balconies	6.38 m ²
Entry Porch	5.14 m ²
Upper Floor Area	119.97 m ²
Upper Verandah Area	21.48 m ²
Rear Alfresco Area	21.00 m ²
Grand total	364.86 m²

AREAS (BASIX)	
Name	Area
Conditioned Floor Area	174.44 m ²
Unconditioned Floor Area	14.14 m ²
Garage Floor Area	79.24 m ²
Total Roof Area	205.64 m²
Total Site Area	843.20 m²

- NOTES:**
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 - Only written measurements & dimensions are to be used. Do not obtain measurements by scaling a drawing.
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 - It is the responsibility of the builder to ensure that all work complies with the relevant BCA requirements and Australian Standards.
 - Prohibit smoke alarm s as per BCA Vol2 3.7.2 and AS 3795.

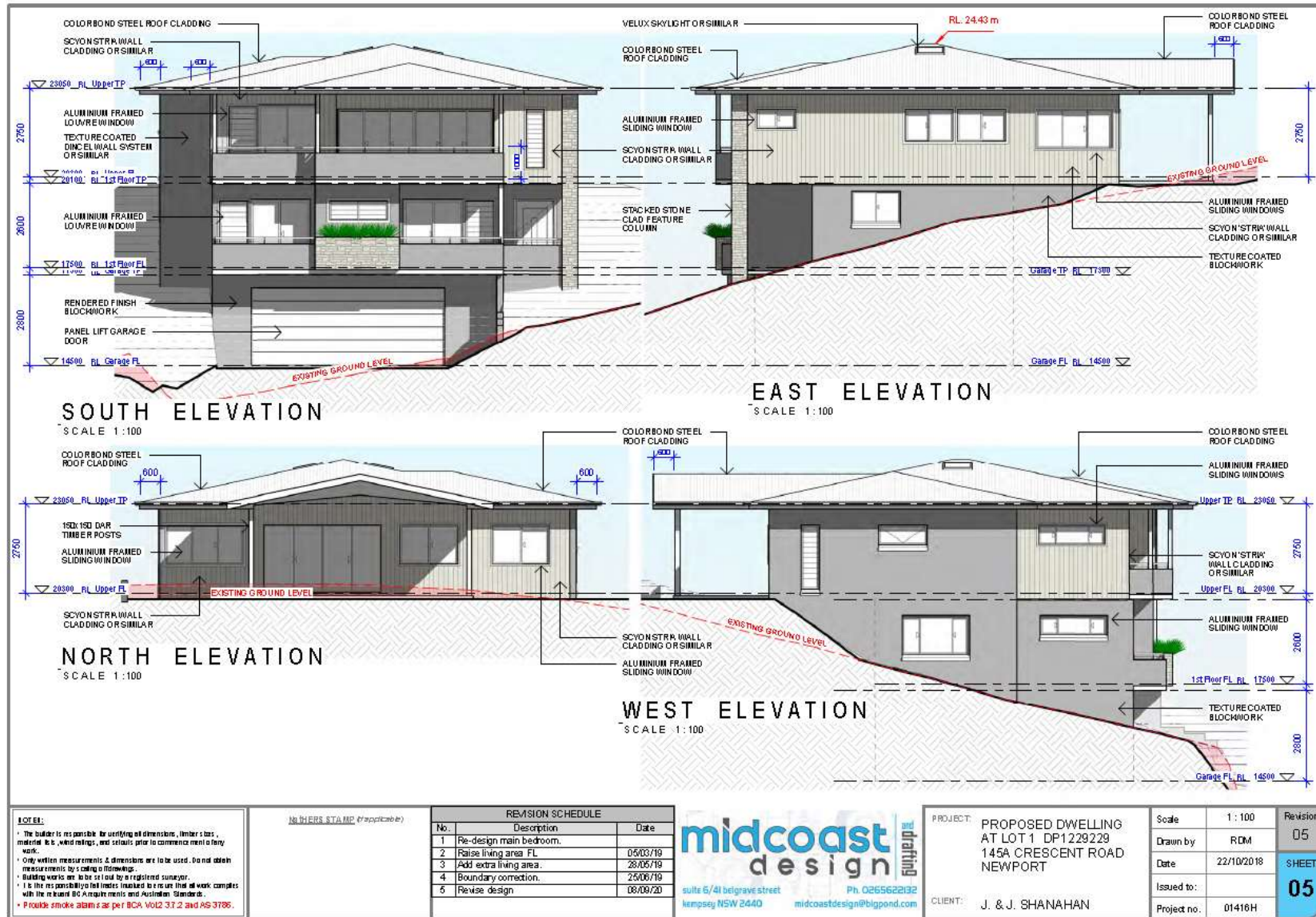
Architects STAMP (if applicable)

REVISION SCHEDULE		
No.	Description	Date
1	Re-design main bedroom.	
2	Raise living area FL	05/03/19
3	Add extra living area.	28/05/19
4	Boundary correction.	25/06/19
5	Revise design	08/09/20

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PROJECT: PROPOSED DWELLING AT LOT 1 DP1229229 145A CRESCENT ROAD NEWPORT
 CLIENT: J. & J. SHANAHAN

Scale	1:100	Revision	05
Drawn by	RDM	Date	22/10/2018
Issued to:			
Project no.	01416H	SHEET 04	



- NOTES:**
- The builder is responsible for verifying all dimensions, timber sizes, material, fixings, and details prior to commencement of any work.
 - Only written measurements & dimensions are to be used. Do not obtain measurements by scaling a drawing.
 - Building works are to be carried out by a registered surveyor.
 - It is the responsibility of the builder to ensure that all work complies with the relevant BC requirements and Australian Standards.
 - Provide smoke alarms as per BCA Vol 2 3.7.2 and AS 3786.

NUMBERS STAMP (if applicable)

REVISION SCHEDULE		
No.	Description	Date
1	Re-design main bedroom.	05/03/19
2	Raise living area FL.	28/05/19
3	Add extra living area.	25/06/19
4	Boundary correction.	08/09/20
5	Revise design	

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PROJECT: PROPOSED DWELLING AT LOT 1 DP1229229 145A CRESCENT ROAD NEWPORT

CLIENT: J. & J. SHANAHAN

Scale	1 : 100	Revision	05
Drawn by	RDM		
Date	22/10/2018		
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Project no.	01416H		

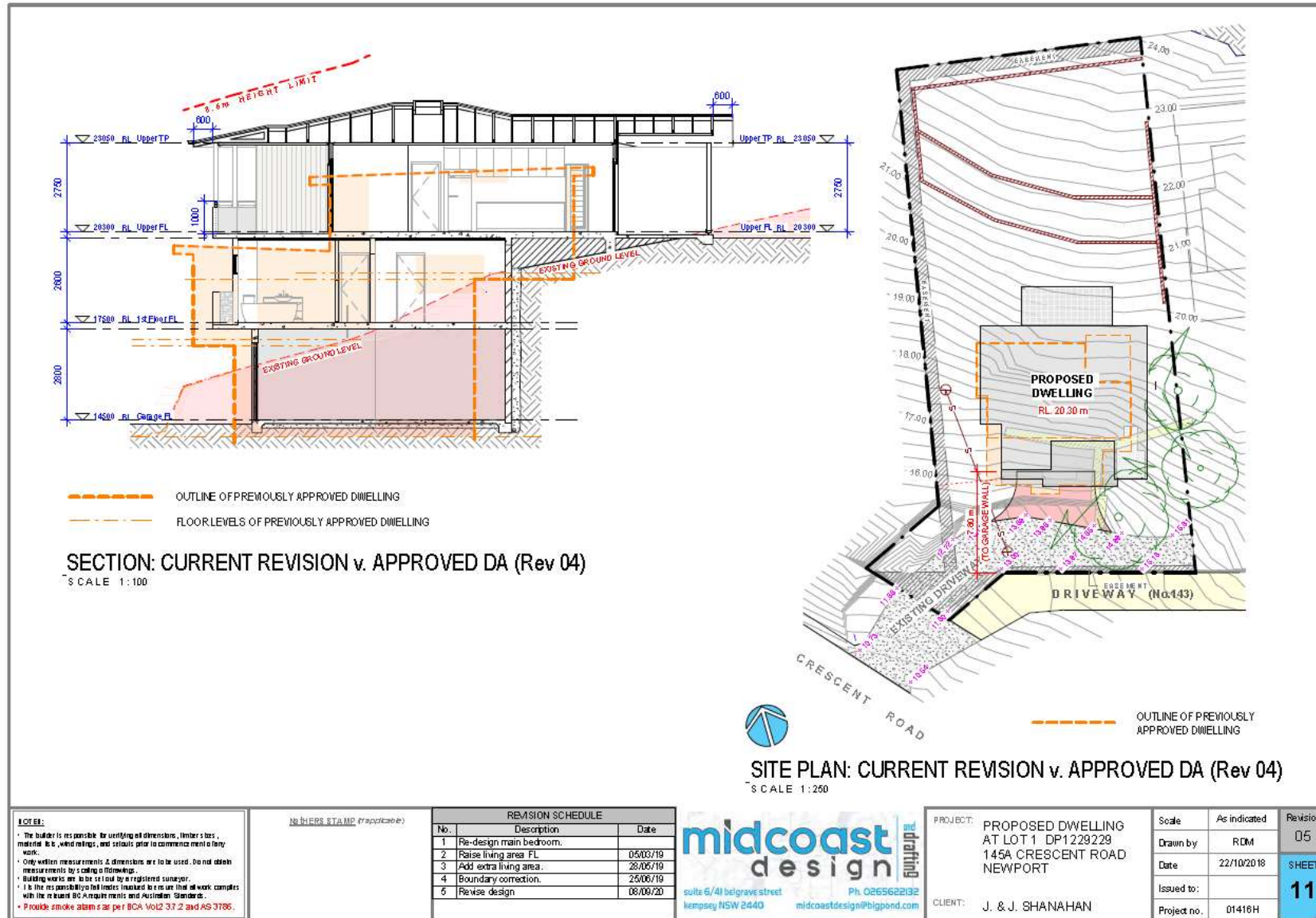




Figure 4: Illustrates the proposed new dwelling Elevations, Section & Perspective images.

4.3 Tree Locations & Site Images



Figure 5: Above illustrates the locations of Tree #1.



Figure 6: Above & previous pages illustrates the location of the three (3) discussed trees.

4.4 The Tree – Summary Table

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

Trees Recommended for removal	Trees Recommended for retention
Exempt species	Trees retainable but of low amenity

	Identification	Height (m)	Crown (m)	DBH (m)	TPZ (m)	SRZ (m)	Age	Health/Vigour	Structure	Significance/Retention Values	Comments
1	<i>Syncarpia glomulifra</i> Turpentine Tree	<15.50	<9.50	0.52	6.30	2.50	Established	Good & Good	Typical	High & High	<u>Replace:</u>
2	<i>Syncarpia glomulifra</i> Turpentine Tree	<12.00	<8.00	0.29	3.60	2.00	Established	Good & Good	Canopy linked to T3/ Typical	High & High	<u>Retain, Manage & Protect:</u>
3	<i>Syncarpia glomulifra</i> Turpentine Tree	<14.50	<8.50	0.50	6.00	2.50	Established	Fair & Good	Tree displays >2.50m vertical open wound. Canopy linked to T2/ Typical	High & High	<u>Replace:</u>

5 Discussion

The *Australian Standard (AS4970–2009 Protection of trees on development sites)* is the guideline required to be addressed relative to best practice ‘*Tree Management Principles*’. See Chapters 3, 4 & 5 of this document.

Discussed Tree #1 is confirmed to be within the lot known as 145A Crescent Road.

Discussed Tree #2 is within the adjoining property, 145 The Crescent.

Discussed Tree #3 is within the common boundary shared by 145A & 145 The Crescent.

Tree #1 acknowledged as being of High Significance & High Retention value by size, species, condition or presence. The previous DA based on existing site disturbances supported the retention of this tree. As the latest DA proposal driveway footprint has crept somewhat closer to its base this tree is now supported to be replaced.

Ample room exists within the subject site for multiple new trees. The DA submission proposed new ‘Landscape Concept’ plan has multiple new canopy trees proposed. One (1) new tree as proposed could easily be replaced with a same species as Tree 31 new tree.

Tree replacement (see *Australian Standard (AS2303–2015 ‘Tree Stock for landscape Use’)*), planting & establishment specifications are provided within the Site Specific “Tree Management Strategy” section of the report.

Tree #2 is acknowledged to be in a ‘state of good health & vigour’. As such it has been given High Significance & Retention values.

Tree #2 as can be seen on page 10 (Figure 4) is some 6.50m away from any proposed works. It is also noted as support for the new DA that this tree has been long term subjected to fairly significant change in soil levels. On this basis it is very unlikely the new DA as proposed will compromise its Useful Life Expectancy (believed to be at least medium term).



Figure 7: Illustrates very long term established change of natural ground levels around Tree #2.

Tree #3 as can be seen on page 10 (Figure 4) is some 2.20m, taking into account the required additional excavation for new retaining wall & its drainage system. As such,

the DA as proposed will compromise its Useful Life Expectancy. Simply, on the basis ample room exists elsewhere (uphill) for new trees to be planted that can actually enhance the total canopy footprint for up to the very long term it is supported for this tree to be replaced.



Figure 8: Illustrates the vertical trunk wound plus very long term established change of natural ground levels around Tree #3.

For any retained tree:

- Any greater than 50mm 'live woody tree root' exposed but not able to be avoided requires the immediate input of the sites *Retained Practising/Consulting Arborist*. It is this person's responsibility to create, implement/manage & then provide written documentation supported by photographic evidence as to the strategy adopted & considered to be the most appropriate for that individual 'live woody tree root'.
- No builder's material of any description at any time is allowed to be stored within any TPZ calculated radial distance.

General Comments:

- Tree Removal must be undertaken by suitably experienced & qualified tree removal practitioners in compliance with the abide at all times to the "*WorkCover NSW Industry Code of Practice, (1998)*".
- New tree specimens are to be sourced from growers/suppliers whose stock meets the production benchmarks of the *Australian Standard (AS2303.2015 Tree stock for landscape use)*.
- New tree specimens are to be professionally planted & maintained for a minimum period of six (6) months once installed.

Below is a list of suggested suitable new tree species compatible with the local environment & likely the subject site.

- *Acacia binervia* (Coast Myall)
- *Angophora floribunda* (Rough bark Angophora)
- *Angophora costata* (Sydney Red Gum)

- *Banksia integrifolia* (Coast Banksia)
- *Corymbia maculata* (Spotted Gum)
- *Corymbia gummifera* (Red Bloodwood Gum)
- *Eucalyptus paniculate* (Northern Grey Ironbark Gum)
- *Eucalyptus punctata* (Grey Gum)
- *Glochidion ferdinandi* (Cheese Tree)
- *Syncarpia glomulifera* (Turpentine Tree)

“Site Specific Tree Management Strategy”

TREE # & IDENTIFICATION	RETAIN	MANAGE	PROTECT	REMOVE	REPLACE	METHODOLOGY/ SPECIFICATION
<i>Tree #1: Syncarpia glomulifera</i> Turpentine Tree						
<i>Tree #2: Syncarpia glomulifera</i> Turpentine Tree						Standard TPZ temporary metal mesh fencing is specified.
<i>Tree #3: Syncarpia glomulifera</i> Turpentine Tree						

6 Conclusions / Recommendations

- Relative to the information as presented the GMW consultancy supports the proposed works as presented in the latest documentation provided & reviewed.
- Any tree approved for removal must be removed by persons that abide at all times to the “WorkCover NSW Industry Code of Practice, (1998)”.
- The DA submission is lodged for determination by council officers as per plans referenced considering the specified site specific “Tree Management Strategy”.
- Replacement tree/s specimen are to be sourced from growers/suppliers whose stock meets the production benchmarks of the *Australian Standard (AS2303.2015 Tree stock for landscape use)* or *NATSPEC* specification for the production of quality container produced trees.
- New tree specimens are to be professionally planted & maintained for a minimum period of up to ten (10) months once installed.

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

Yours faithfully,

A handwritten signature in black ink, appearing to read 'K. Hill', is written above the printed name.

Kyle A. Hill

[AQF level 5 & AQF level 8 Registered with Arboriculture Australia (Reg #1884)
Practicing & Consulting Arborist]

7 Limitations on the use of this report

This report is to be utilised in its entirety only. Any written or verbal submission, report or presentation that includes statements taken from the findings, discussions, conclusions or recommendations made in this report, may only be used where the whole of the original report (or a copy) is referenced in, & directly attached to that submission, report or presentation.

8 Assumptions

Care has been taken to obtain information from reliable resources. All data has been verified insofar as possible; however, Growing My Way Tree Services, can neither guarantee nor be responsible for the accuracy of information provided by others.

Unless stated otherwise:

Information contained in this report covers only the trees that were examined & reflects the condition of the trees at the time of inspection.

The inspection was limited to visual examination of the subject trees without dissection, excavation, probing or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject trees may not arise in the future.

9 Recommended References

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

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

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

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

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

10 Selected Bibliography

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

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

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

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

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

Appendix A – Glossary

Glossary of common Arboreal terms

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

Hth & Vig Health & Vigour

Health refers to the tree's form & growth habit, as modified by its environment (aspect, suppression by other tree, soils) & the state of the scaffold (ie. trunk & major branches), including structural defects such as cavities, crooked trunks or weak trunk/branch junctions. These are not directly connected with health & it is possible for a tree to be healthy but in poor condition/vigour.
Classes are:

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

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

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

Useful Life Expectancy (ULE) refers to any individual tree specimen's potential life expectancy (viability) based on VTA assessment, three groups are described,

Short = Less than Fifteen years

Medium = Fifteen – Twenty-five years

Long = more than Twenty-five years

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

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

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

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

Tree Protection Zone (TPZ) is ideally a "No Go Zone" surrounding a tree to aid in its ability to cope with disturbances associated with construction works. $TPZ = DBH \times 12$. Tree protection involves minimising root damage that is caused by activities such as construction. Tree protection also reduces the chance of a tree's decline in health or death & the possibly damage to structural stability of the tree from root damage.

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

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

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

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

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

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

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

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

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

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

Over Head Powerlines (OHP) Over head electricity wiring.

LVOHP	Low Voltage Over head Powerlines
HVOHP	High Voltage Over head Powerlines
ABC	Aerial Bundled Cable

Appendix B – Tree Protection & Management

Tree Protection & Management Prior to Excavation & During Construction

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

Trunk protection “Tree Guards” are detailed (below) by generic diagram.

A mulch layer of composted leaf & woodchip to a depth of 75mm is required within the TPZ to aid in retention of soil moisture & to protect soil from contaminants. Water is to be applied by handheld or soaker/leaky hose within TPZ as required & in Accordance with Stage 3 Water

Restrictions. Watering is to be carried out by either an Arborist or is to form part of the Builder’s/Contractor’s contract, with recommended fortnightly checks by an Arborist.

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

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

