"GROWING MY WAY"

Tree Consultancy

Established 1977

EXCELLENCE in ALL ASPECTS OF TREE MANAGEMENT

FULL INSURANCE PROTECTION

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ABN 97 965 355 200

Construction Impact & Management Statement

May 2020

Site: **Lot 15 in DP 13746**
87 Wallumatta Road
NEWPORT, NSW

Client: **Matt & Emma Smith**
c/ Marika Jarv
PO Box 489
AVALON BEACH, NSW 2107

Author: Kyle A Hill
Registered (Arb Aus #1884) Practising & Consulting Arborist
Post Graduate Certificate in Arboriculture, Uni of Melb
Diploma of Horticulture–Arboriculture TAFE, Grow SA
Certificate of Horticulture, TAFE
Certificate Advanced Tree Care TAFE
Founder -Growing My Way Tree Services (1977)
Member of International Society of Arboriculture
Member of Arboriculture Australia

1 Summary

Matt & Emma Smith (property owners) via Marika Jarv (Architect) commissioned the Growing My Way Tree Consultancy (GMW) to prepare a *Construction Impact & Management Statement* relative to the proposed *Alterations/Additions to the existing dwelling* within the property known as 87 Wallumatta Road, Newport, (from herein the subject site).

Two (2) individual trees & one (1) group of trees have been identified as being required to be discussed relative to the proposal for *Alterations/Additions to the existing dwelling.* Both discussed in detail 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.* The discussed trees are confirmed to be within the subject site. Multiple other trees are located within both the subject site & adjoining common boundary properties but are not discussed as they are well away from & therefore not impacted upon by the proposed works supported within this document.

Both of the discussed trees are proposed to be replaced.

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 Dress Wallumatta 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 DP Surveying, dated, 28 March 2018;*
- *Plans, Sections & Elevations, by Marika Jarv (Architect), Sheet FG01 thru FG16, dated, 5 June 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. *Provide list of suitable locally indigenous replacement tree species.*
3. *Confirm the Site–Specific 'Tree Plan of Management' for nearby trees to be retained, protected & managed is AS4970–2009 compliant.*

This document supports (relative to tree management) the proposal for *Alterations/Additions.*

Kyle A Hill (AQF level 5 & 8 *Practicing/Consulting Arborist* has prepared this report based on "*Visual Tree Assessment" (VTA).* Data was collected on Saturday, 11 April 2020.

Table of Contents

2 Introduction

This report contains observations & recommendations intended to assist in the management of the two (2) individual trees & one (1) group of trees identified as necessary to be discussed by virtue of their location & proposed works, i.e. *Alterations & Additions*.

Built form within the subject site is a single dwelling residence, with hard & soft landscaping & an offroad (road reserve) gravel parking area.

This document supports the proposed *Alterations/Additions* 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)*.

Of the two (2) individual trees & one (1) group of trees protected trees discussed, none are proposed to be replaced. Other trees both within the subject site & adjoining side common boundary properties nearby are assessed as able to be retained, managed without any formal specified protection.

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

A *Site Specific "Tree Plan of Management*" 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 Site Survey
- Appendix C 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 15 of DP 13746. The site is 486.90m^2 by Title in size. The site is linked to one (1) public road, one (1) Environment Conservation Area & two (2) residential lots.

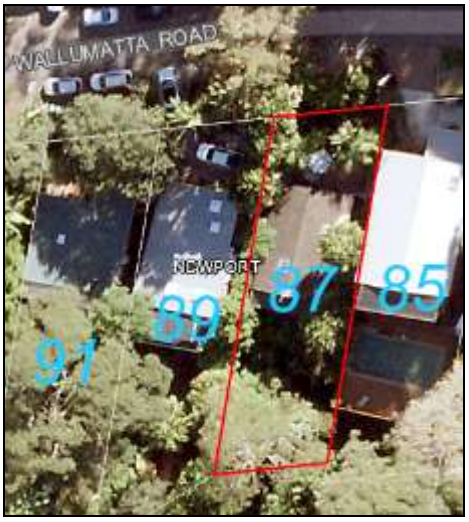
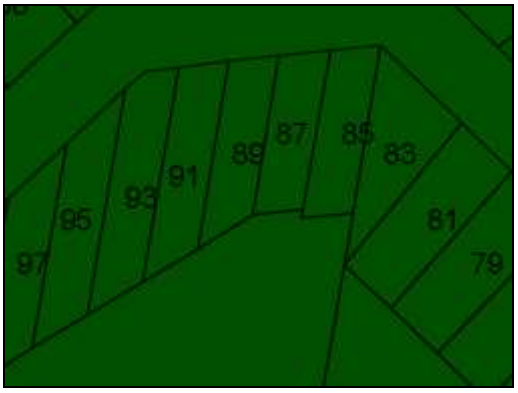


Figure 1: Aerial photograph with lot boundaries courtesy of NBC website tool.

The subject site is Land Zoned "E4" 'Environmental Living'.



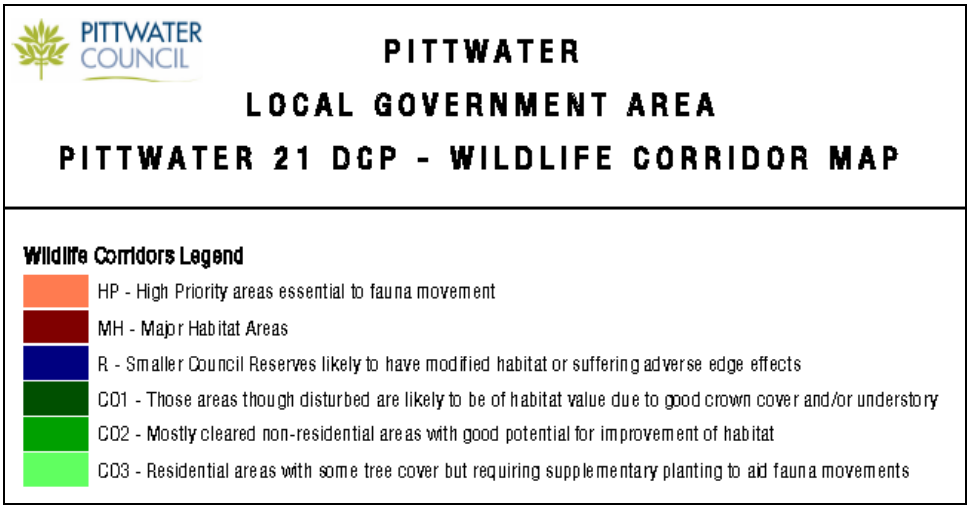
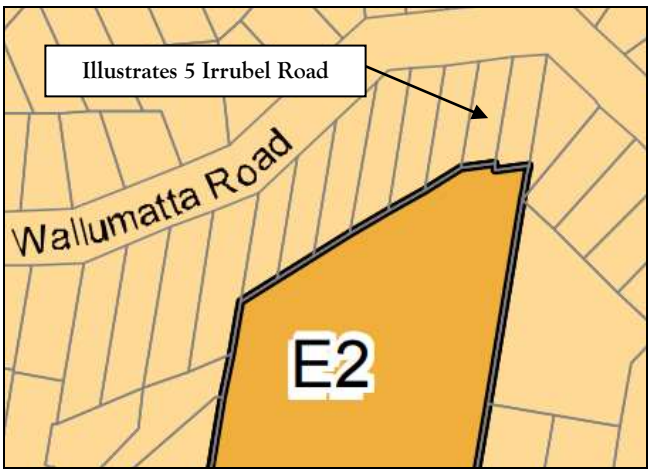


Figure 2: Confirms Pittwater 21 DCP-Wildlife Corridor Status.


PITTWATER COUNCIL
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)


Illustrates 5 Irrubel Road
Wallumatta Road
E2

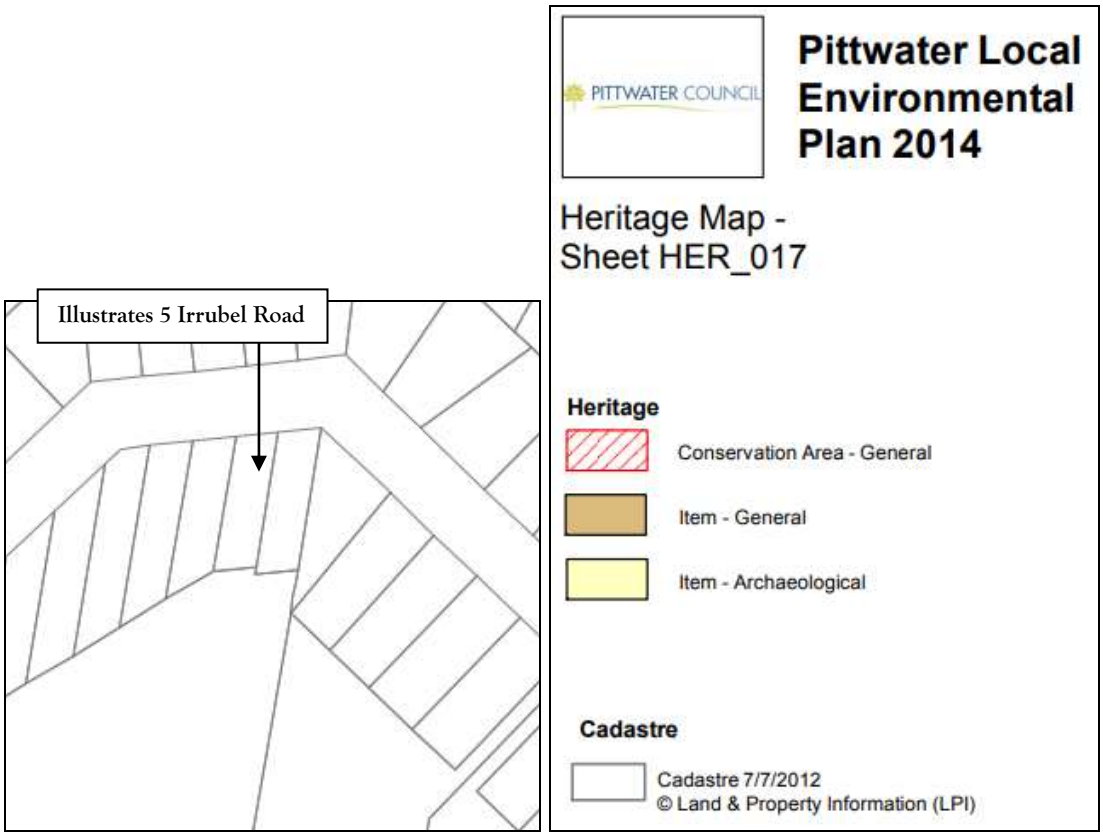


Figure 3: Above & previous page illustrates Land Zoning & Heritage Conservation Area status.

The site is NOT within a *NBC* designated "*Heritage Conservation Area*" *(see above)*. 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 understory'.*

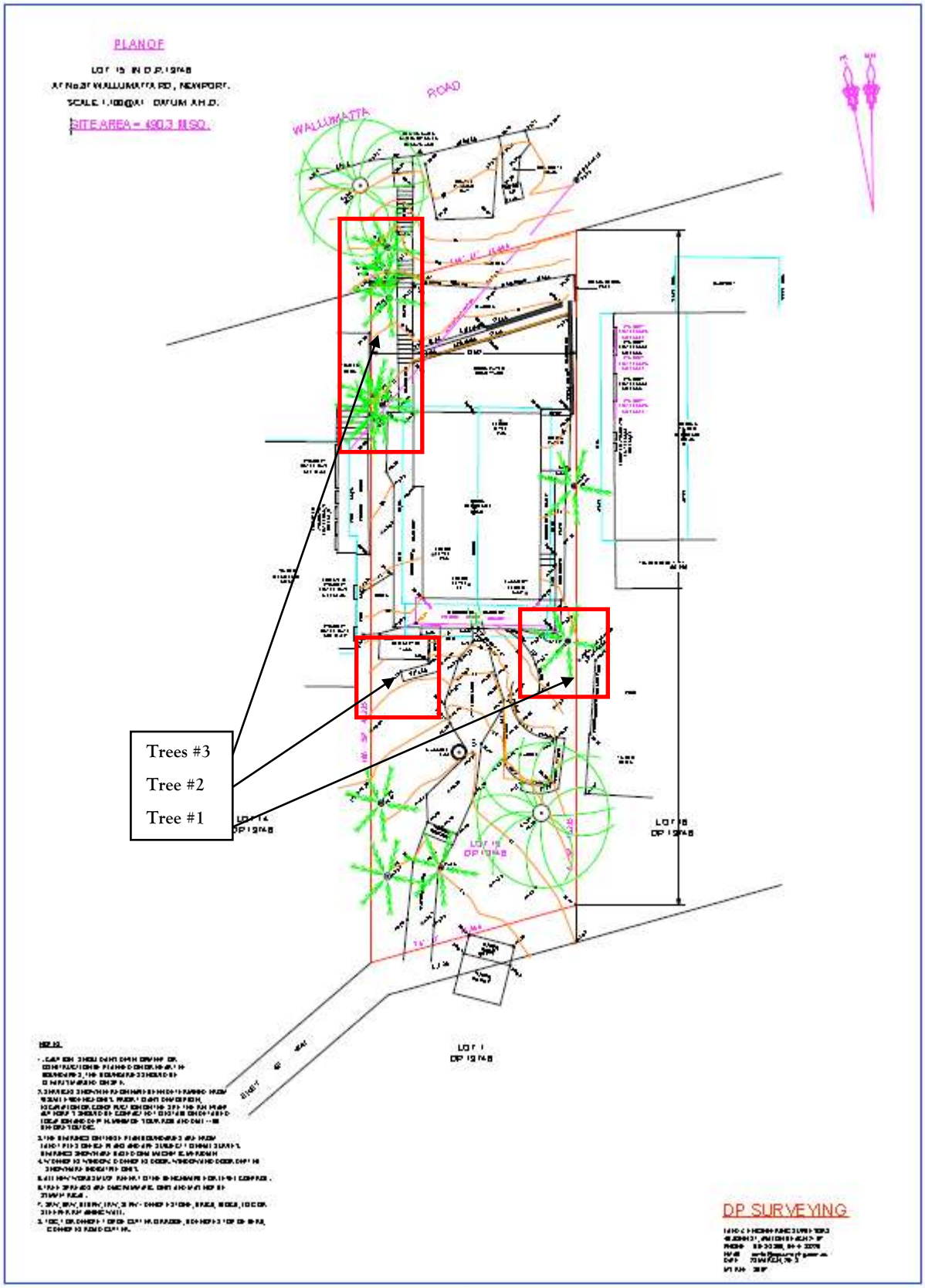
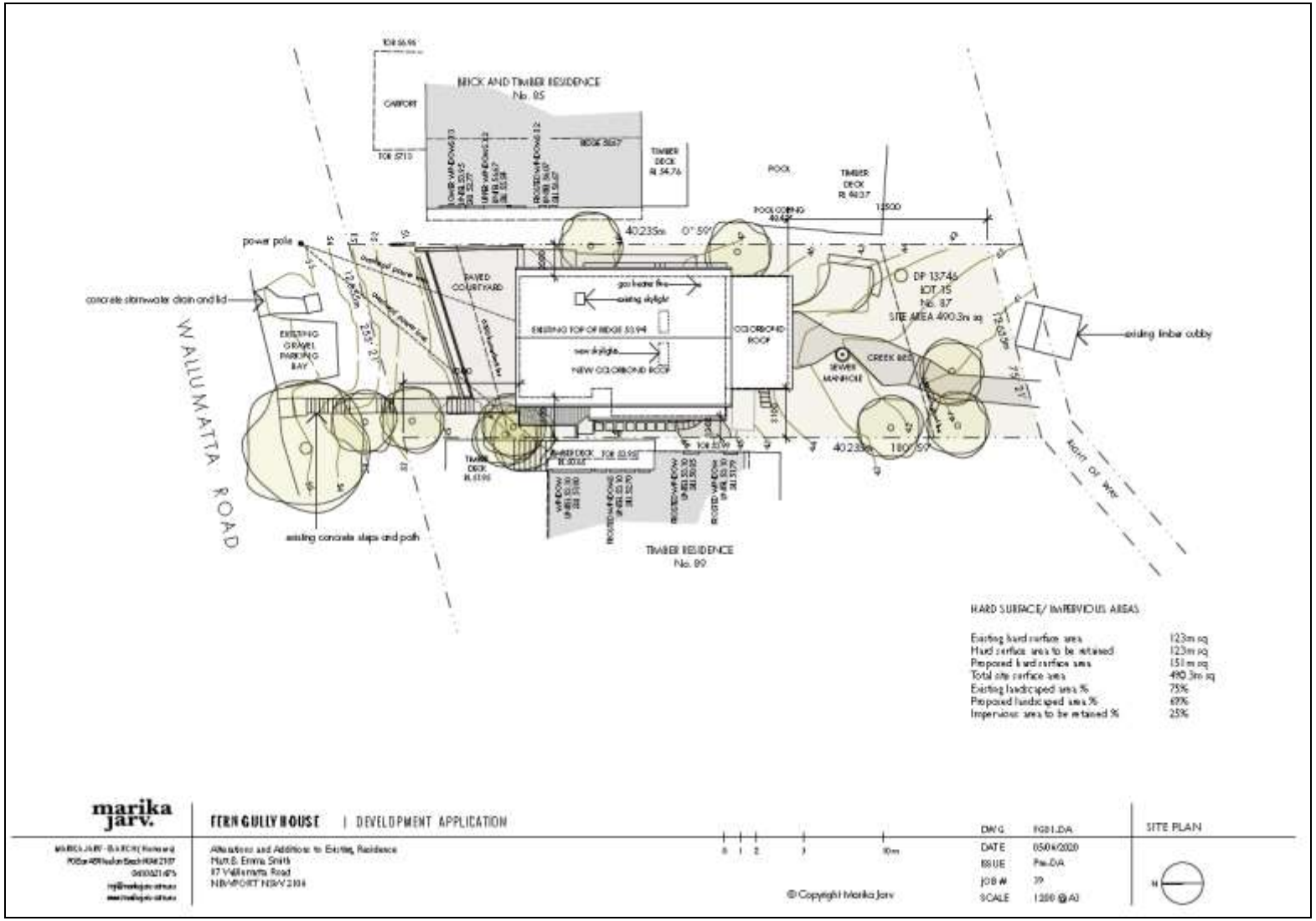
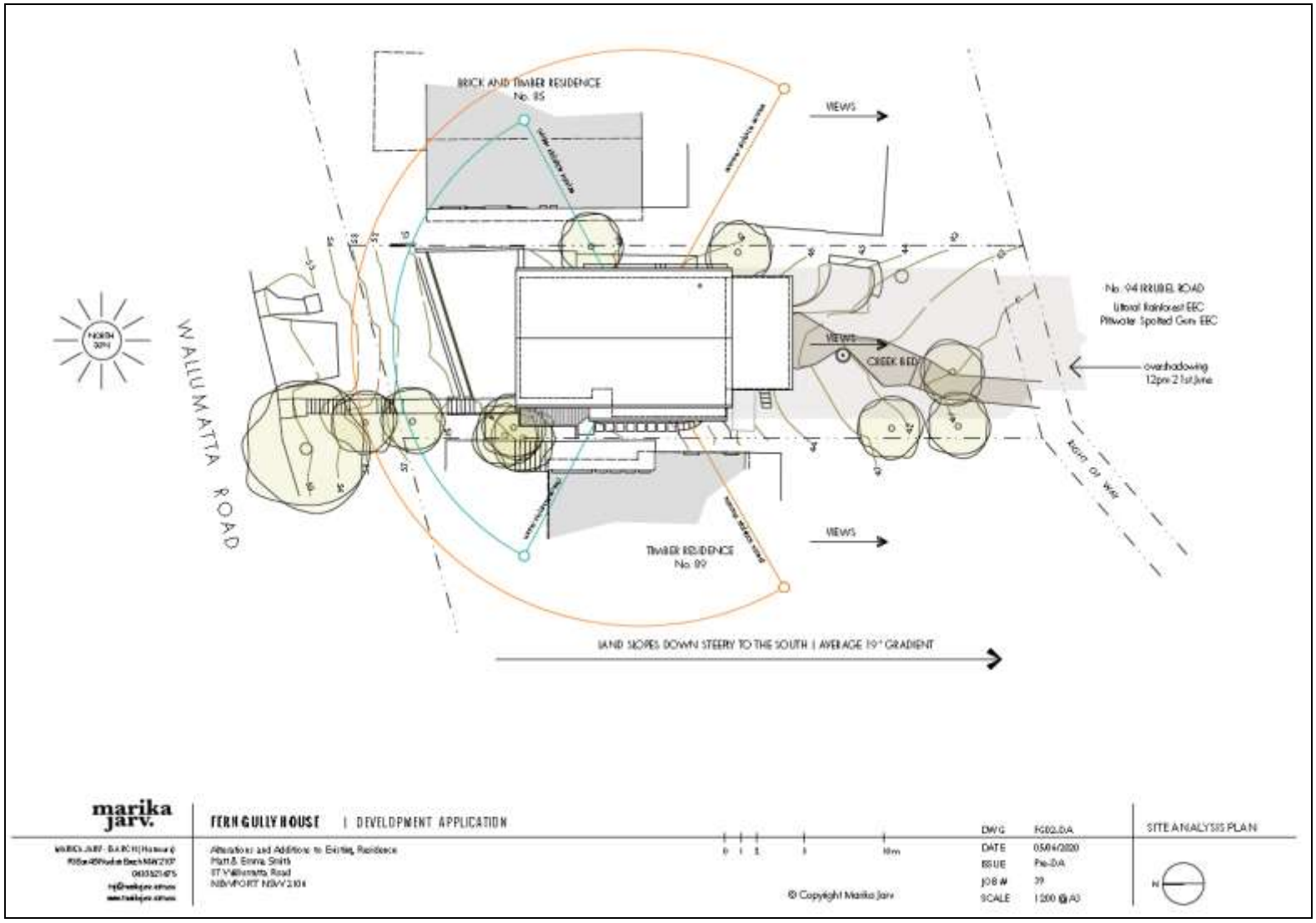
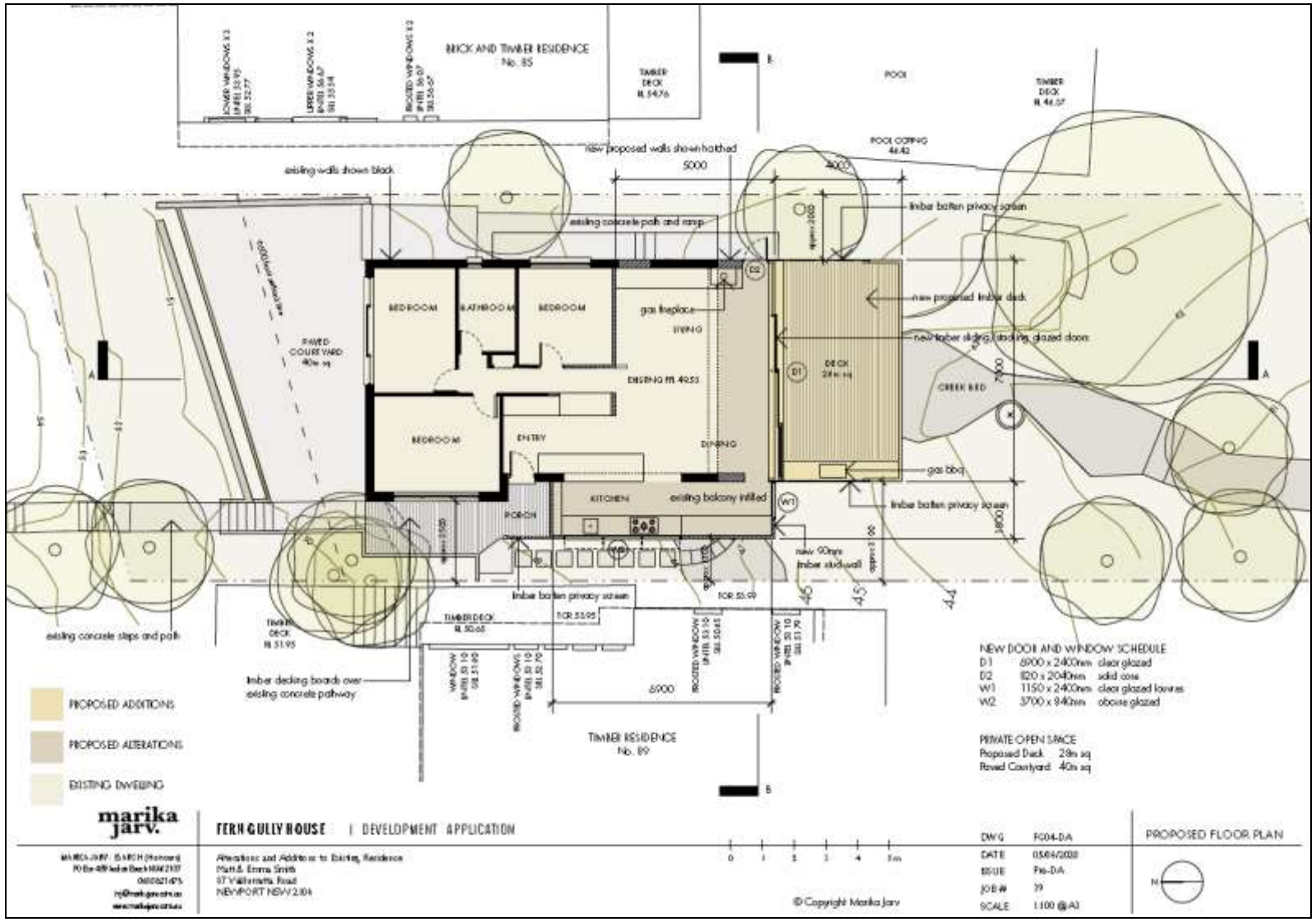


Figure 4: Site Survey with discussed Tree Locations plotted

4.2 The Proposal




BRICK AND TIMBER RESIDENCE
No. 85
VIEWS
No. 94 RIRUBEL ROAD
Littoral Rainforest EEC
Pittwater Spotted Gum EEC
VIEWS
CREEK BED
overshadowing
12pm 21st June
WALLUMATTA ROAD
Right of Way
TIMBER RESIDENCE
No. 89
VIEWS
LAND SLOPES DOWN STEEPLY TO THE SOUTH | AVERAGE 19° GRADIENT
marika jarv.
FERN GULLY HOUSE | DEVELOPMENT APPLICATION
Alterations and Additions to Existing Residence
Matt & Emma Smith
87 Wallumatta Road
NEWPORT NSW 2106
© Copyright Marika Jarv
DWG FG02.DA
DATE 05/04/2020
ISSUE Pre-DA
JOB # 19
SCALE 1:200 @ A3
SITE ANALYSIS PLAN


BRICK AND TIMBER RESIDENCE
No. 85
TIMBER DECK
POOL
TIMBER DECK
POOL COPING
new proposed walls shown hatched
existing walls shown black
5000
4000
timber batten privacy screen
existing concrete path and ramp
BEDROOM
BATHROOM
BEDROOM
gas fireplace
LIVING
new proposed timber deck
new timber sliding / stacking glazed doors
PAVED COURTYARD
DECK
CREEK BED
EXISTING RL 49.53
BEDROOM
ENTRY
DINING
gas bbq
KITCHEN
existing balcony infilled
PORCH
timber batten privacy screen
new 90mm timber stud wall
timber batten privacy screen
existing concrete steps and path
TIMBER DECK
TIMBER DECK
timber decking boards over existing concrete pathway
6000
TIMBER RESIDENCE
No. 89
PROPOSED ADDITIONS
PROPOSED ALTERATIONS
EXISTING DWELLING
NEW DOOR AND WINDOW SCHEDULE
D1 8900 x 2400mm clear glazed
D2 820 x 2040mm solid core
W1 1150 x 2400mm clear glazed louvres
W2 3700 x 840mm obscure glazed
PRIVATE OPEN SPACE
Proposed Deck 28m sq
Paved Courtyard 40m sq
marika jarv.
FERN GULLY HOUSE | DEVELOPMENT APPLICATION
Alterations and Additions to Existing Residence
Mark & Emma Smith
87 Wallumatta Road
NEWPORT NSW 2106
© Copyright Marika Jarv
DWG FG04-DA
DATE 05/04/2020
ISSUE Pre-DA
JOB # 19
SCALE 1:100 @ A3
PROPOSED FLOOR PLAN

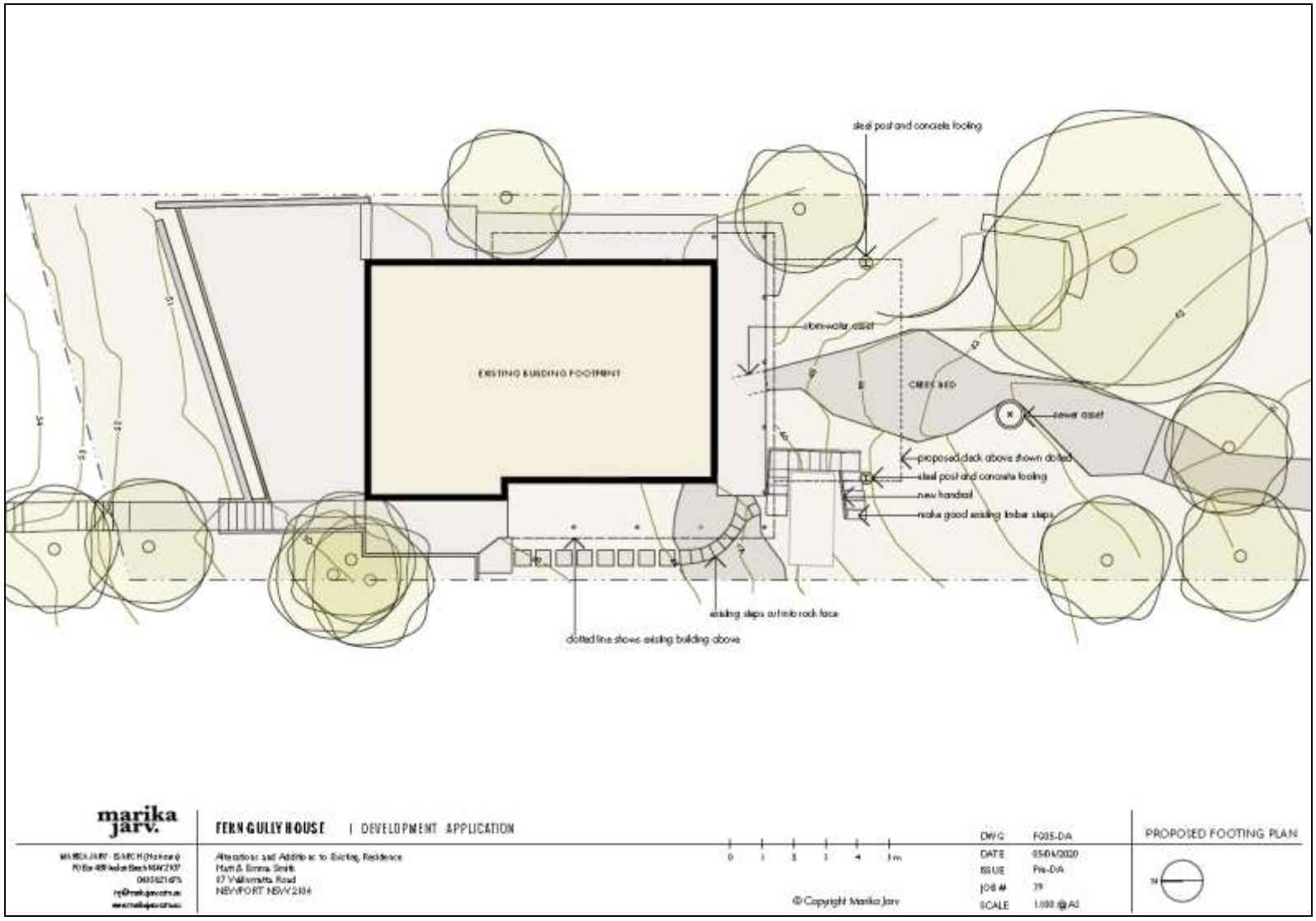

steel post and concrete footing
EXISTING BUILDING FOOTPRINT
stormwater asset
CREEK BED
sewer asset
proposed deck above shown dotted
steel post and concrete footing
new handrail
make good existing timber steps
existing steps cut into rock face
dotted line shows existing building above
marika jarv.
FERN GULLY HOUSE | DEVELOPMENT APPLICATION
Alterations and Additions to Existing Residence
Mark & Emma Smith
87 Wallumatta Road
NEWPORT NSW 2106
0 1 2 3 4 5m
© Copyright Marika Jarv
DWG F035-DA
DATE 05/04/2020
ISSUE Pre-DA
JOB # 19
SCALE 1:100 @ A3
PROPOSED FOOTING PLAN
N

Figure 5: Pages 10 thru 14 illustrates the proposed Plans, Elevations etc.

4.3 Tree Locations & Site Images

Figure 6: Above & previous page illustrates the location & condition of the discussed Tree #1.


2020/04/11 10:46


2020/04/11 10:47

Figure 7: Above & previous page confirms 6 x Cabbage Tree Palms locations plus canopy condition as observed onsite, 11 April 2020.

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	***Livistona australis*** *Cabbage Tree Palm*	<8.00	<4.00	0.38	4.70	N/A	Mature	Good & Good	Typical with single stem. Head leans looking for solar access	High/ High	**Retain, Protect & Manage: Tree is specified to have temporary 'Tree Trunk Guard to a minimum height of 6.00m installed prior to the issue of a 'Construction certificate'. Footing/Pier sites must be manually excavated in 'flexible locations' so as to avoid damage to 'live supporting roots. No storage of building materials within TPZ radial distance of 4.70m.**
2	***Ficus coronata*** *Sandpaper Fig*	<4.00	<5.00	0.20	2.40	1.70	Juvenile	Good & Good	Typical but suppressed by competing flora	High/ High	**Retain, Protect & Manage: Tree is specified to have temporary 'Metal Mesh Fencing Panels with above ground supports' installed prior to the issue of a 'Construction certificate'. Footing/Pier sites must be manually excavated in 'flexible locations' so as to avoid damage to 'live supporting structural roots. No storage of building materials within TPZ radial distance of 1.70m.**

	Identification	Height (m)	Crown (m)	DBH (m)	TPZ (m)	SRZ (m)	Age	Health/ Vigour	Structure	Significance/ Retention Values	Comments
3	***6 X Livistona australis*** *Cabbage Tree Palm*	<9.00	<5.00	<0.40	4.80	N/A	Mature	Good & Good	Typical with single stem.	High/ High	**Retain, Protect & Manage: Tree is specified to have temporary 'Tree Trunk Guard to a minimum height of 2.00m installed prior to the issue of a 'Construction certificate'. Footing/Pier sites must be manually excavated in 'flexible locations' so as to avoid damage to 'live supporting roots. No storage of building materials within TPZ radial distance of 4.70m.**

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 & Tree #2 are confirmed to be very close to the proposed *Alterations & Additions,* both are likely to require foliage to be pruned. Trees #3 are not exposed to any risk other than Builders Materials so have only been specified to have low height 'Tree Trunk Guards' installed as insurance against any bark tissue damage.

Tree #1 is acknowledged as being of High Significance & High Retention value by size, species, condition &/or presence. This tree displays a top of trunk/canopy leaning towards the west. This is a consequence of the tree searching for solar access for optimum photosynthesis.

The tree canopy will require some pruning so as to create separation between the new rear deck & the tree canopy. Pruning is to be compliant with the Australian Standard (AS4373-2007 Pruning of amenity trees), see Chapter & Pruning Classes, section 7.2 Crown maintenance, sub clause 7.2.4 Selective pruning (S).

This tree is considered as easily retained without out any compromise to its Useful Life Expectancy with implementation of the *Site Specific 'Tree Plan of Management'* which will include installation of a temporary 'Tree Trunk Guard flexible footing/pier locations. Ideally footing/pier sites should be no closer than one (1.00m) metre to the tree trunk centre.

The 4.70m TPZ total surface area radial distance (within the subject site) is specified to be managed by installing a 'native tree mulch' with a maintained thickness of between 50 & 75mm prior to commencement & throughout the works process.

Excavation required for the installation of footings/piers within the TPZ (4.70m) radial distance must be completed manually with photographic evidence to be provided to the retained Principle Certifying Authority confirming minimal 'live supporting roots' have been damaged.

Tree #2 is acknowledged as being of High Significance & High Retention value by species & presence. This tree is assessed as being in a suppressed state due to competition with other more established flora. Very minor pruning of its canopy is assessed as being necessary to again create built form canopy separation. Pruning is to be compliant with the Australian Standard (AS4373-2007 Pruning of amenity trees), see Chapter & Pruning Classes, section 7.2 Crown maintenance, sub clause 7.2.4 Selective pruning (S).

It is considered as easily retained without out any compromise to its Useful Life Expectancy with implementation of the *Site Specific 'Tree Plan of Management'* which will include installation of temporary 'metal mesh fencing panels so as to isolate its woody root system from the as proposed works as close to its 1.70m TPZ radial distance.

Excavation required for the installation of footings/piers within the TPZ (m)/SRZ (3.15m) radial distance must be completed manually with photographic evidence to be provided to the retained Principle Certifying Authority confirming NO Significant Diameter (in this situ defined as being >50mm Ø) 'live supporting root' has been damaged.

Should significant diameter 'live supporting root' be exposed & deemed as not able to be worked around (relative to footing or services) the sites retained Practicing/consulting Arborist must be summonsed to manage & document with supporting photographic evidence the strategy adopted that results in the least disturbance to any significant diameter 'live supporting root'.

Trees #3 (x6) are acknowledged as being of High Significance & High Retention values by size, species, condition &/or presence. These trees create an upper canopy line of linking tree canopies which contributes to their value by presence.

None of these trees require any pruning as a consequence of the proposed works.

These trees are considered as easily retained without out any compromise to individual Useful Life Expectancy with implementation of the *Site Specific 'Tree Plan of Management'* which will include installation of six (6) temporary 'Tree Trunk Guards' to a minimum height of two (2.00m) metres.

"Site Specific Tree Plan of Management"

TREE # & IDENTIFICATION	RETAIN MANAGE PROTECT	MANUAL EXCAVATION (for footings)	Install TPZ Fencing Install Tree Trunk Guard	Excavation Signoff	CC Signoff	OC Signoff
1 *Livistona australis*	Yes	Yes	No Yes	Yes	Yes	Yes
2 *Eucalyptus robusta*	Yes	Yes	Yes No	Yes	Yes	Yes
3 (6 X) *Livistona australis*	Yes	No	No Yes	No	Yes	Yes

6 Conclusions

- **Relative to the information as presented the** *GMW consultancy* **supports the proposed works as presented in documentation reviewed.**
- **The** *DA submission* **is lodged for determination by council officers as per plans referenced considering the specified Site Specific "***Tree Plan of Management***".**

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

Kyle A. Hill
[AQF level 5 & AQF level 8 Registered 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 n 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** *Immature* refers to a refers to a well-established but juvenile tree

SM *Semi-mature* refers to a tree at growth stages between immaturity & full size

M *Mature* refers to a full sized tree with some capacity for further growth

LM *Late Mature* refers to a full sized tree with little capacity for growth that is not yet about to enter decline

OM *Over-mature* refers to a tree about to enter decline or already declining

LS *Live Stag* 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 x 50)$^{0.42}$ x 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 x 12**. Tree protection involves minimising root damage that is caused by activities such as construction. Tree protection also reduces the chance of a tree's decline in health or death & the possibly damage to structural stability of the tree from root damage.

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

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

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

Decay refers to the break down tissues within the tree. There are numerous types of decay that affect different types of tissues, spread at different rates & have different 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.

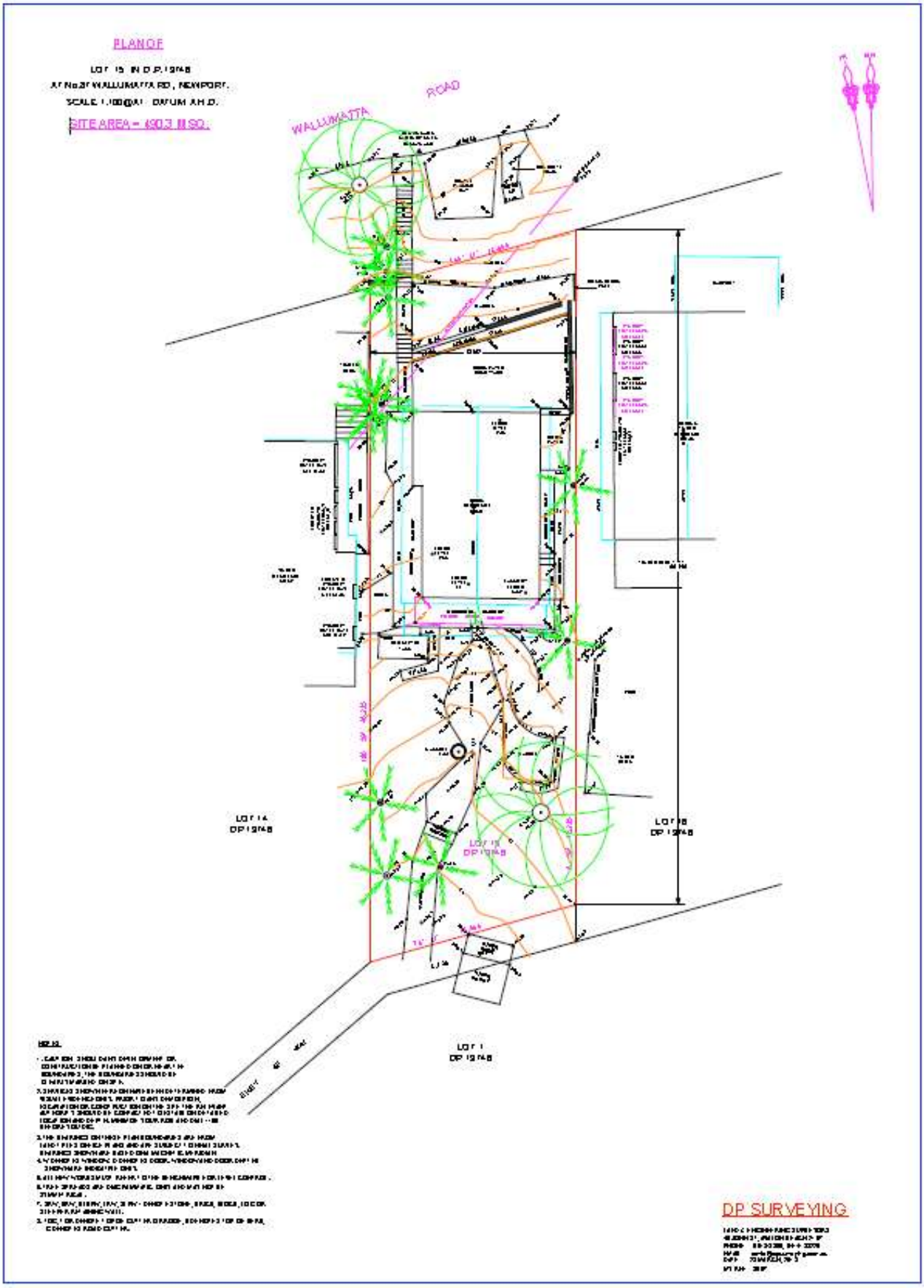
Crown Foliage Density of Potential (CFDP) refers to the density of a tree's crown in relation to the expected density of a healthy specimen of the same species. CFDP is measured as a percentage.

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 – Site Survey



Appendix C – 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.