Arboricultural Impact Assessment (AIA) report for Mono Constructions regarding 56 Beane St, Gosford, NSW

By David Shrimpton
Koala Arbor Consulting Arborists
e:david@koalaarbor.com
0418 117 313
26/02/2020
Office : 29 Evans St, Bronte, NSW 2024

Contents

1. Introduction

I was asked to complete an AIA report for the property at 56 Beane St, Gosford, NSW (also referred to hereafter as the site) by Mono Constructions (the developer) to provide an Arboricultural Impact Assessment Report (AIA) in relation to a proposed DA for the property. This report is intended for the use by the owner, Council and the Project Manager/Builder.

Nineteen trees where located and inspected by TreeIQ on the 28th January 2019 which could be potentially affected by the development at the above address.

2. Aim

The aim of this report is to identify all trees to be removed, retained and or transplanted. The report will note any incursions to tree protection zones (TPZ's) or to tree canopy spreads. If incursions are found, modifications will be outlined to mitigate or avoid the adverse impact to the trees in question. A tree protection plan will outline the measures to be implemented prior to and during the construction period. The exact location of the tree protection zone and fence positioning will be shown in a map. Any special tree protection measures will also be addressed. *AS4373-2007 Pruning of Amenity Trees* and *AS4970-2009 Protection of Trees on Development Sites* will be referenced in regard to all works. This report is designed to be used and relied upon by all persons working on the development site. It has also been designed so that council can directly reference the detail in the planning conditions. As such, allowing this report to be referred to directly and making the recommendations conditions of consent for the site.

3. Method

A preliminary arboricultural report completed by TreeIQ on the 28th January 2019 was used to form the basis of this arboricultural impact assessment (AIA). All the basic information including species, trunk diameter, retention values and health & structural ratings have been relied upon for this reports findings See Appendix B for the TreeIQ report results.

After reviewing the initial construction plans, the general impacts of the proposed works were fully understood. Due to the proposed development some trees will require removal.

Trees to be retained were given protective guidelines as per AS4970-2009 Protection of Trees on Development Sites to reduce any impact found. These specifications include tree protection measures and the use of hold points.

4. Table of Plans Relied Upon

Schedule of Plans, Documents and Drawings

Author	Title	Drawing Number / Revision	Date	Original Drawn / Author
TreeIQ	Preliminary Arboricultural Report	Revision B	28 January 2019	Anna Hopewood and Martin Peacock
Staton Dahl Architects	Site & External Works Plan	A0005 Rev 01	Not Listed	jok/at/mc/ef
Staton Dahl Architects	Floor Plan (Level LG - Car Park)	A007 Rev 01	Not Listed	jok/at/mc/ef

5. Impact Assessment Schedule

Tree No.	Common Name	Construction tolerance	TPZ - m R and total Sq	SRZ- mR	Proposed encrt. to TPZ or canopy m2 and %	Minor or Major impact as per AS4970	Likely impact	Recommendations
1	Eucalyptus nicholii (Narrow Leaf Peppermint)	N/A	N/A	N/A	N/A	N/A	Proposed building footprint is on top of tree's location.	Proposed development requires tree removal.
2	Eucalyptus saligna x botryoides	N/A	N/A	N/A	N/A		Proposed building footprint is on top of tree's location.	Proposed development requires tree removal.
3	Olea europaea subsp. cuspidata (African Olive)	N/A	N/A	N/A	N/A	N/A	Proposed building footprint is on top of tree's location.	Proposed development requires tree removal.
4	Pittosporum undulatum (Sweet Pittosporum)	N/A	N/A	N/A	N/A	N/A	Proposed building footprint is on top of tree's location.	Proposed development requires tree removal. Tree is located on council land. Additional council approval needed.
5	Glochidion ferdinandi (Cheese Tree)	N/A	N/A	N/A	N/A	N/A	Proposed building footprint is on top of tree's location.	Proposed development requires tree removal.
6	Pittosporum undulatum (Sweet Pittosporum)	N/A	N/A	N/A	N/A	N/A	Proposed building footprint is on top of tree's location.	Proposed development requires tree removal. Tree is located on council land. Additional council approval needed.
7	(Sweet Pittosporum)	N/A	N/A	N/A	N/A	N/A	Proposed building footprint is on top of tree's location.	Proposed development requires tree removal.
8	Glochidion ferdinandi (Cheese Tree)	N/A	N/A	N/A	N/A	N/A	Proposed building footprint is on top of tree's location.	Proposed development requires tree removal.
9	Casuarina cunninghamiana (River She-Oak)	High	6.6r or 136.8m2		32.1m2 or 23.4%	Major	Tree likely to enter heavy decline and or die due to loss of feeder roots.	Proposed development requires tree removal.
10	DEAD	N/A	N/A	N/A	N/A	N/A	Tree is dead.	Tree to be removed prior to commencement of works.
11	Casuarina cunninghamiana (River She-Oak)	High	6r or 113.1m2	2.5	11.2m2 or 9.9 %	Minor	Possible slight reduction in overall health. Species is tolerant of root disturbance.	Retain and protect.
12	Casuarina cunninghamiana (River She-Oak)	High	4.8r	2.3	N/A	N/A	No works in TPZ.	Retain and protect.
13	Casuarina cunninghamiana (River She-Oak)	High	6r or 113.1m2	2.5	0.8m2 or 0.7%	N/A	No works in TPZ.	Retain and protect.

14	Casuarina cunninghamiana (River She-Oak)	High	7.2r or 162.9m2	2.7	2.6m2 or 1.5%	Minor	No impact on tree expected due to such a low incursion.	Retain and protect.
15	Casuarina cunninghamiana (River She-Oak)	High	8.4r or 221.7m2	2.9	13.7m2 or 6.1%	Minor	Possible slight reduction in overall health. Species is tolerant of root disturbance.	Retain and protect.
16	XCupressocyparis leylandii (Leyland Cypress)	Medium	6	2.5	<0.1m2 or <0.1%	Minor	No impact on tree expected due to such a low incursion.	Retain and protect.
17	Leptospermum petersonii (Lemon Scented Teatree)	N/A	N/A	N/A	N/A	N/A	Proposed building footprint is on top of tree's location.	Proposed development requires tree removal.
18	Glochidion ferdinandi (Cheese Tree)	N/A	N/A	N/A	N/A	N/A	Proposed building footprint is on top of tree's location.	Proposed development requires tree removal.
19	Syagrus romanzoffiana (Cocos Palm)	N/A	N/A	N/A	N/A	N/A	Proposed building footprint is on top of tree's location.	Proposed development requires tree removal.

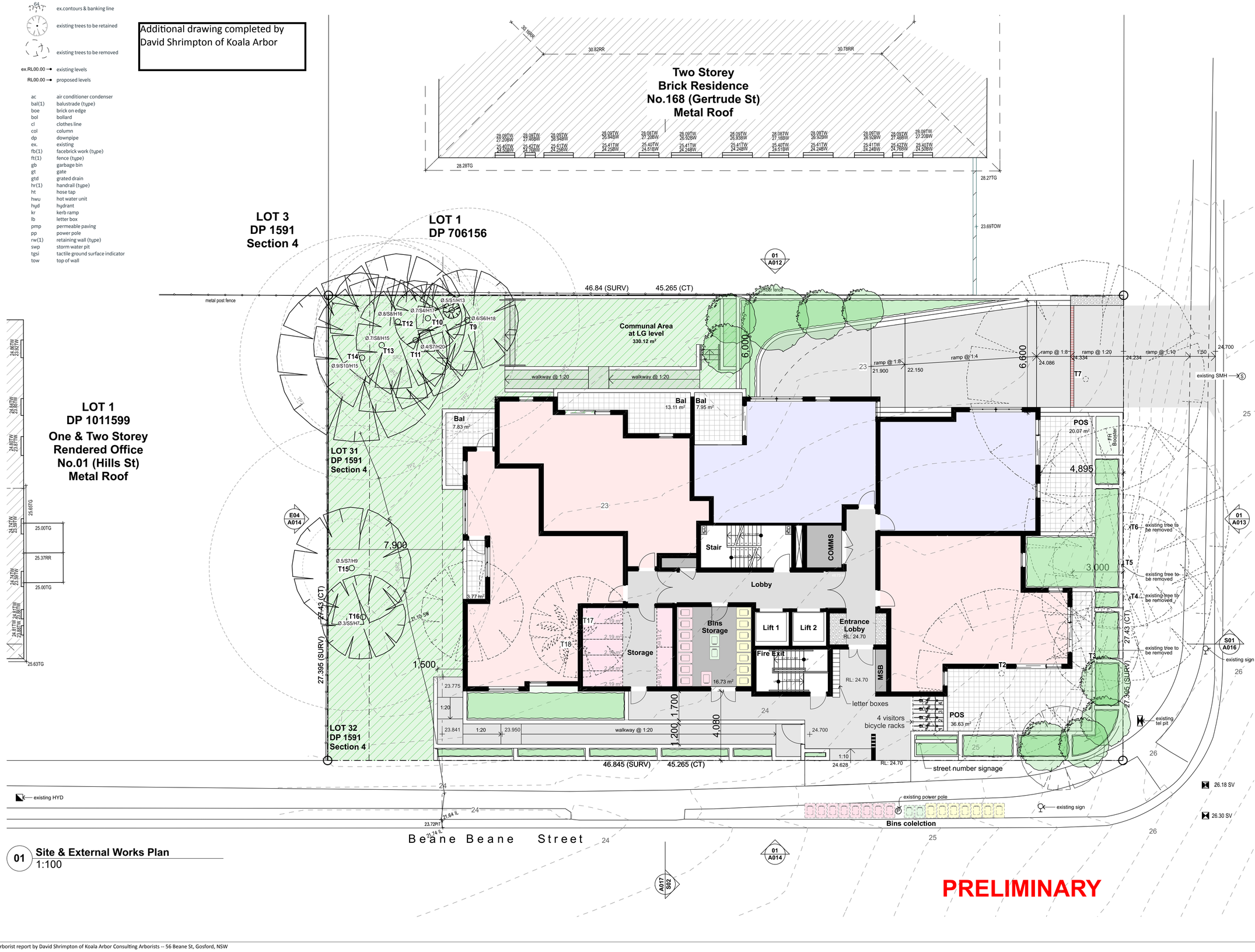
6. Tree Location Map

Legend (external work / site plan)
note: drawing may not contain all items listed below

- ex.contours & banking line
- existing trees to be retained
- existing trees to be removed
- ex.RL00.00 → existing levels
- RL00.00 → proposed levels

ac	air conditioner condenser
bal(1)	balustrade (type)
boe	brick on edge
bol	bollard
cl	clothes line
col	column
dp	downpipe
ex.	existing
fb(1)	facebrick work (type)
ft(1)	fence (type)
gb	garbage bin
gt	gate
gtd	grated drain
hr(1)	handrail (type)
ht	hose tap
hwu	hot water unit
hyd	hydrant
kr	kerb ramp
lb	letter box
pmp	permeable paving
pp	power pole
rw(1)	retaining wall (type)
swp	storm water pit
tgsi	tactile ground surface indicator
tow	top of wall

Additional drawing completed by David Shrimpton of Koala Arbor



01 Site & External Works Plan
1:100

Stanton Dahl Architects
PO Box 833, Epping, NSW 1710, Australia
Tel +61 2 8876 5300 Fax +61 2 9868 2624
www.stantondahl.com.au

All dimensions to be verified on site and any discrepancies referred to architect for determination. figured dimensions to take precedence over scaled dimensions.

Rev	Issue	Date
01	Revised Architectural Set	26/11/19

Architecture
Project management
Interior design

stanton dahl
architects

MONO

NSW GOVERNMENT Family & Community Services
Land & Housing Corporation

Mono Constructions

Residential Apartment Building

56 Beane Street,
Gosford, NSW

Drawn; jok/at/mc/ef
Checked; jok/ at
Plot date; 26/11/19

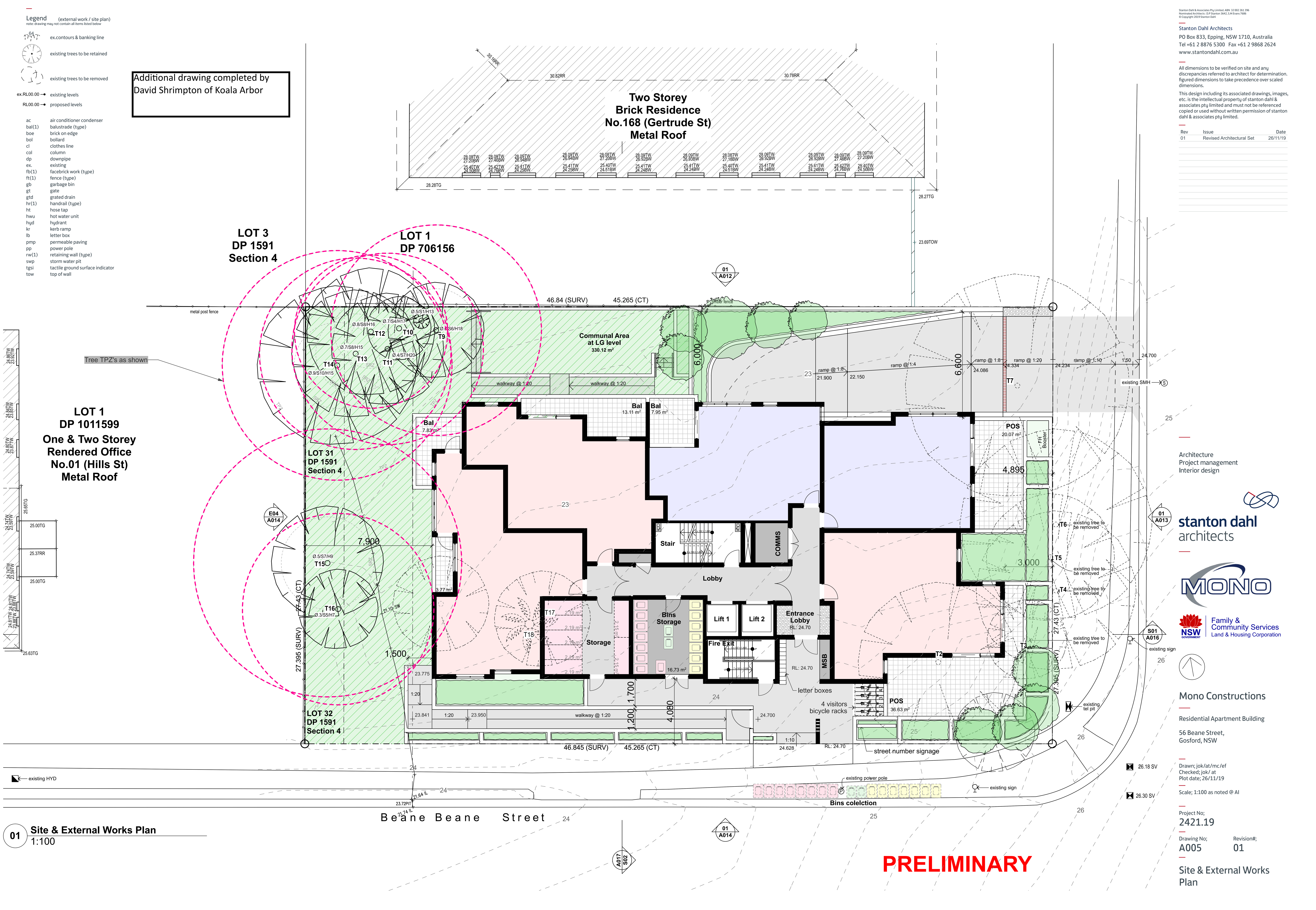
Scale; 1:100 as noted @ AI

Project No;
2421.19

Drawing No; A005
Revision#; 01

Site & External Works Plan

7. TPZ's Map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gt gate
gtd grated drain
hr(1) handrail (type)
ht hose tap
hwu hot water unit
hyd hydrant
kr kerb ramp
lb letter box
pmp permeable paving
pp power pole
rw(1) retaining wall (type)
swp storm water pit
tgsi tactile ground surface indicator
tow top of wall
Additional drawing completed by David Shrimpton of Koala Arbor
Two Storey Brick Residence No.168 (Gertrude St) Metal Roof
LOT 3 DP 1591 Section 4
LOT 1 DP 706156
LOT 1 DP 1011599
One & Two Storey Rendered Office No.01 (Hills St) Metal Roof
Tree TPZ's as shown
LOT 31 DP 1591 Section 4
LOT 32 DP 1591 Section 4
Communal Area at LG level 330.12 m²
46.84 (SURV) 45.265 (CT)
46.845 (SURV) 45.265 (CT)
27.395 (SURV) 27.43 (CT)
Stair
COMMS
Lobby
Storage
Bins Storage
Lift 1
Lift 2
Entrance Lobby RL: 24.70
Fire Exit
MSB
letter boxes
4 visitors bicycle racks
POS 36.63 m²
POS 20.07 m²
street number signage
existing power pole
Bins colelction
existing HYD
existing SMH
existing sign
existing tel pit
existing tree to be removed
Beane Beane Street
01 Site & External Works Plan 1:100
PRELIMINARY
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01 Revised Architectural Set 26/11/19
Architecture
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MONO
Family & Community Services
Land & Housing Corporation
Mono Constructions
Residential Apartment Building
56 Beane Street, Gosford, NSW
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Plot date; 26/11/19
Scale; 1:100 as noted @ A1
Project No; 2421.19
Drawing No; A005
Revision#; 01
Site & External Works Plan

8. TPZ's and Incursion's Map

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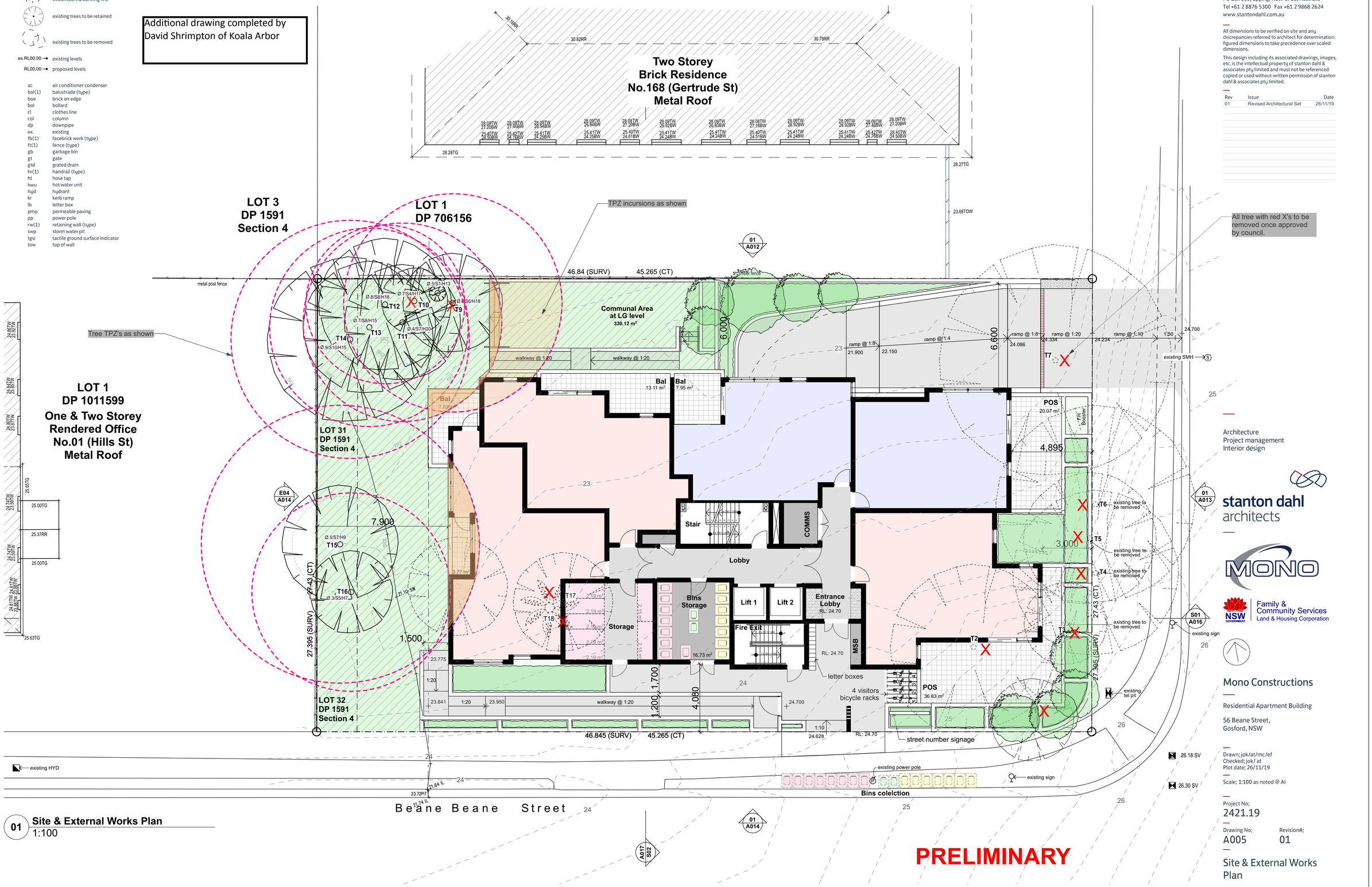

01 Site & External Works Plan
1:100

PRELIMINARY

Stanton Dahl & Associates Pty Limited. ABN: 32 002 261 396
Nominated Architects: DJP Stanton 3642, S.M Evans 7686

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9. Discussion

A seven story apartment including a lower ground floor basement is proposed to be built on the site. Also proposed on the eastern boundary is a section of the site to be excavated to the level of the lower ground floor level to provided communal open outdoor space.

10. The Trees On Site And Impacts From The Proposed Works

Applying the findings regarding the retention value and landscape significance provided in the report by TreeIQ, Trees 1, 3, 4, 5, 8, 10, 17, 18 and 19 were all low landscape significance and considered for removal. The proposed design will require the removal of these trees.

Trees 2, 6, 7 and 9 were listed as considered for retention and also of being moderate landscape value however these trees will also require removal due to the proposed plan.

Tree 4 and 6 are council assets and require councils consent for them to be removed (as do all tree removals on-site).

Trees 11, 12, 13, 14, 15 and 16 can be retained and protected during the proposed works. All these trees (except 16) are listed as moderate retention value and to be considered for retention. Tree 16 is a low landscape significance.

Any area of the collective TPZ's (1.5 metres wide) has been included in the work site to allow for scaffolding or hoarding. The area needs to remain protected with the use of truck mats or another product that will stop any compaction of the ground. This area must be considered as part of the TPZ despite not being inside the fenced area.

10.1 Pruning

No pruning has been noted in relation to the canopy spreads when considering the proposed plans.

10.2 Works Beyond The Current Scope - Please Be Aware

Any yet to be finalised plumbing or electrical work that overlaps with the TPZ as shown on page 9 "TPZ's and Incursions Map" will need to be considered and or avoided. It is noted an existing storm water pipe is located in the stand of trees to be retained. It's

current location terminates without further notation on the survey and plans provided. Consideration should be given to any works that intend to renew this pipe (if needed) as the structural root zone of several trees could be impacted by works to this area.

Often trees are significantly damaged by things such as the above or other services like irrigation. The installation of new plants should be achieved with smaller pot sizes if possible to reduce the impact on the TPZ.

11. Conclusion

Thirteen trees (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 17, 18 and 19) will require removal to allow the proposed plan to be undertaken. Four of these trees (2, 6, 7 and 9) are of moderate landscape significance. Two trees (4 and 6) are council trees.

Six trees can be retained as the proposed plans will have either a minor or no impact on the them. Five of these trees (11, 12, 13, 14, and 15) are considered to be of moderate landscape significance.

Any area of the collect TPZ's (1.5 metres wide) must be protected against compaction and not have excavation carried out inside this zone. Significant damage to trees can occur from yet to be specified services. The project arborist will need to be aware of any proposed changes or yet to be specified locations of services. This may include plumbing, electrical works and landscaping.

12. Recommendations

Six trees (11, 12, 13, 14, 15 and 16) should be retained and protected during the construction period as per *AS4970-2009 Protection of Trees on Development Sites*. This should include a sign on the trees of the project arborist details as well as at the front of the property.

Any works undertaken around the trees to be retained should be as per the Tree Protection Plan included in this report. Hold points and compliance letters should be obtained at critical stages of the construction to ensure the trees are not impacted by the proposed works.

With council permission, the trees marked for removal (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 17, 18

and 19) should completed before building works commence at the site. Trees 2 and 4 are council assets. The removal of these trees should be compensated by the planting (and establishment) of as many new trees along the street verge where they are located by the developer. Approximately (5) five trees, pending species and estimated mature canopy size may be appropriate.

Appendix A has a quick site reference for the recommendations and other hold points as per *AS4970-2009* from stage 3 of this report.

13. Tree Protection Plan / Specifications

14. Specifications for Tree Protection Measures

A pre-construction meeting should be attended by the site manager, the project arborist and contractors to introduce the Tree Protection Plan and its requirements as found in this report. These measures are listed below. A copy of this section of the report should be kept on site and all contractors inducted to upon starting at this site.

1. Once approved, trees marked for removal or needing to have deadwood removed should also be completed. All the works should be only be undertaken by a minimum AQF Level 3 Arborist with the necessary insurances being valid and up to date.
2. A protective fence should be installed as indicated on the Tree Removal, Retention and Protection Map found on Page 14. The fence should be a 1.8m high chain-link fence with concrete feet (see Fig 1.1). The fence must be locked at all times and access is only to be granted with approval from the Project Arborist. The fence must be maintained for the entirety of the project. Appropriate signs must be displayed on the fence with the words TPZ clearly shown (see Fig 1.2).
3. Ground protection should be added to the ground as shown in the Tree Removal, Retention and Protection Map found on Page 14 to assist in the protection of Tree 3. The material must remain in place for the length of the project. It also must not be a trip hazard. 20mm thick marine ply or truck mats such as the Envirex product, Versadeck (www.envirex.com.au) should be considered.
4. No storage of materials (OR WORKS) of any kind can be carried out within the TPZ without the strict agreement of the project arborist. Despite no TPZ fence being in place inside the site in many places, the Project Arborist should explain where the TPZ

is and the effect various actions can have on the tree to the principle contractor. Items such as designated cutting/refuelling area should be selected and agreed. These should not be in the TPZ.

5. Large grade hardwood mulch should be added across the inside of the entire fenced area (TPZ) to a depth of 75mm. The mulch should not be placed around the trunk or hard up against the trunk itself.
6. During the excavation of the site, an assessment must be made and the Project Arborist notified if any roots greater than 30mmø are found (unless sheet piling is intended). Any roots to be pruned that are >30mm must be done so only by the project arborist as per *AS4970-2009 Protection of Trees on Development Sites,* Clause 4.5.4.

G. Hold points will be agreed to prior to the commencement of works. A minimum of four (4) will be required unless the project arborist considers more to be needed due to the construction process. The minimum hold points should consist of the following:

1. Prior to commencement of construction to ensure the correct tree protection (fencing) is in place, all approved tree works are completed and all the correct signs are in place. Ground protection around the outside of the TPZ and mulch (to the correct depth) has also been installed. All deadwood >30mmø should be removed prior to work commencing on the site.
2. At the completion of the site excavation to inspect the profile for any tree roots greater than 30mm in diameter that may need a final pruning as per *AS4970-2009 Protection of Trees on Development Sites,* Clause 4.5.4. Roots may need to be chased back into the profile to find undamaged material to prune cleanly.
3. On a bi-monthly basis to monitor the trees being retained. Any signs of a change in health or condition general shall require the project arborist to provide a remediation plan which the principle contractor must undertake. The plan must provide guidance and specific detail on how to best ameliorate any problems found that have resulted in the decline of the trees health. Each bi monthly visit should also check that all tree protection is still in place.
4. For final sign off on the completion of works. Please see the quick reference guide (Appendix A).

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(external work / site plan)
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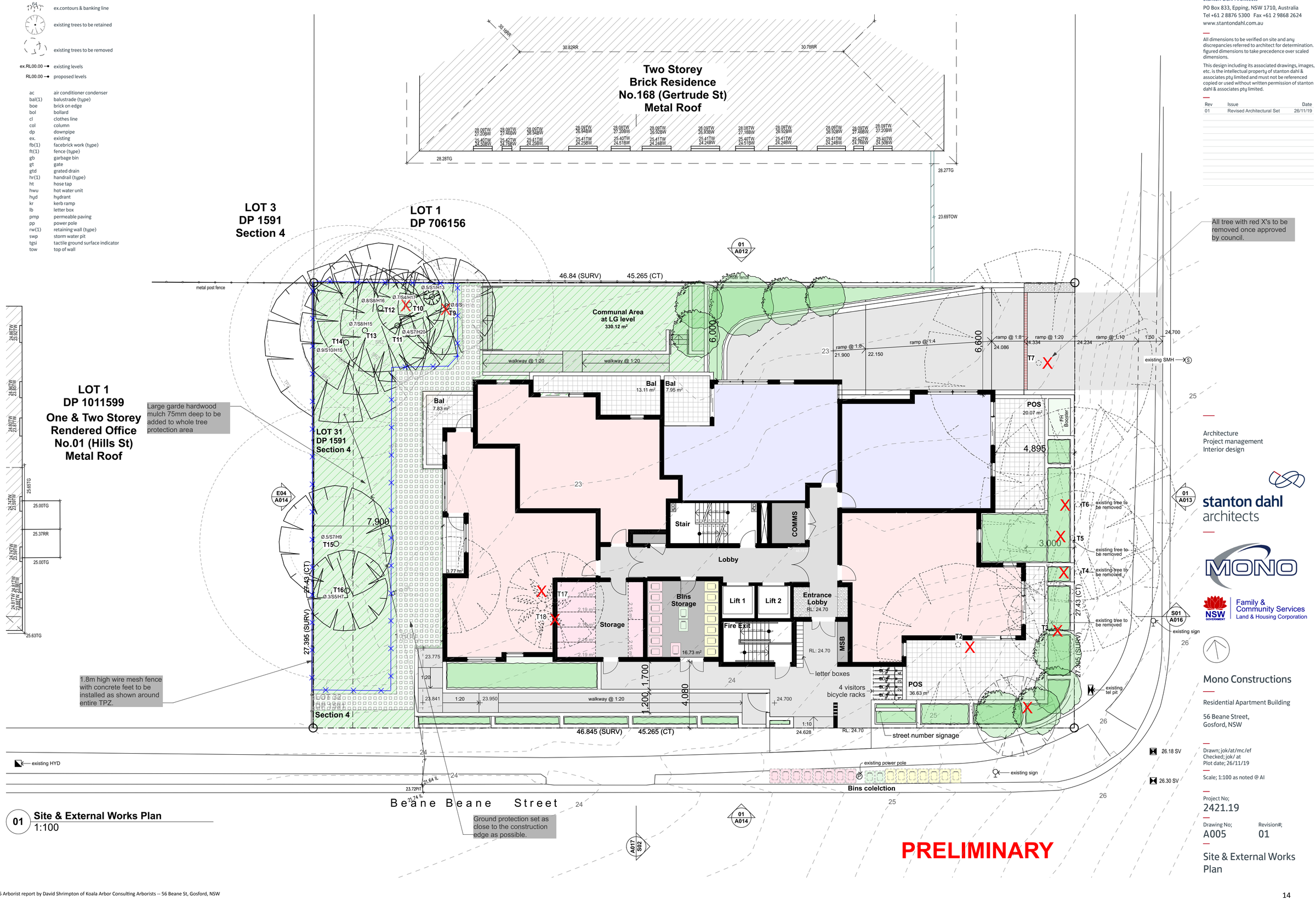

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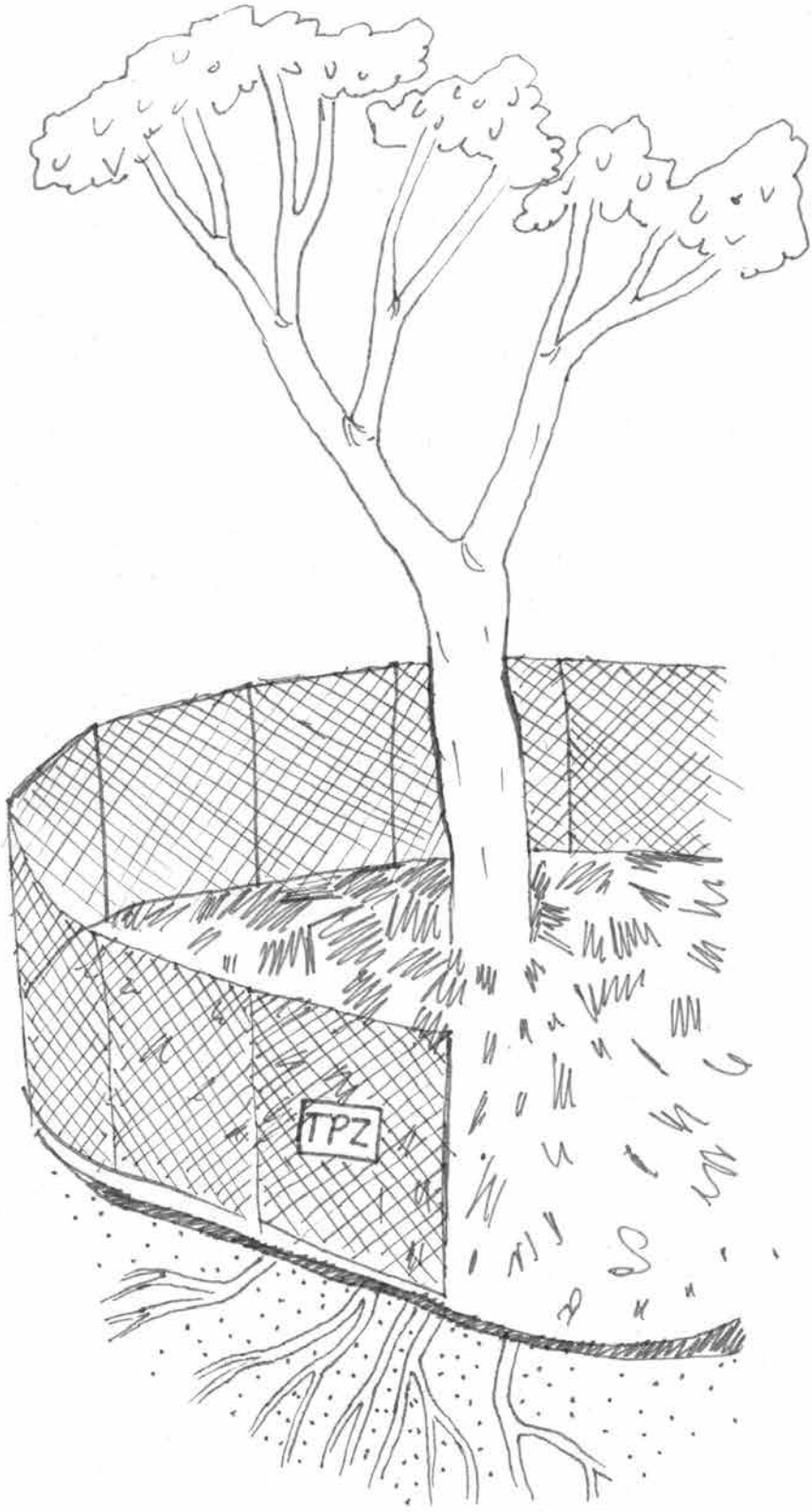
Revision#; 01

Site & External Works Plan

Signed

David Shrimpton
Koala Arbor Consulting Arborists
David Shrimpton Qualifications (AQF's) from Ryde TAFE and private courses:
AQF Level 3 Arborist (Credit)
AQF Level 3 Parks and Gardens (Distinction)
AQF Level 5 Arborist (Distinction)
Advanced QTRA registration number: 4193
TRAQ Certified
VALID Certified



TPZ fence to be 1.8 meters high chain link fence with concrete feet

Fig 1.1 Examples of sufficient TPZ fencing.

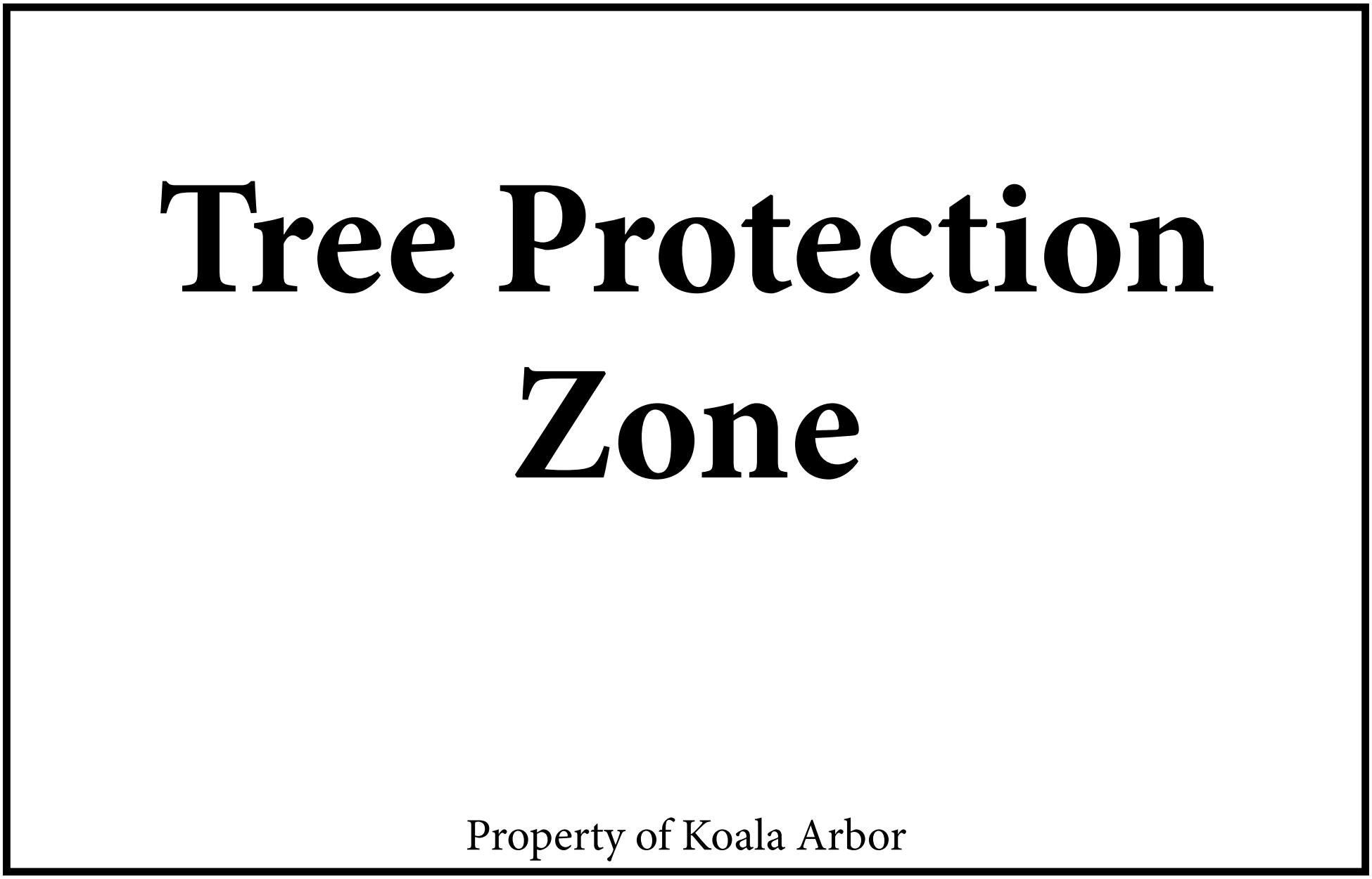


Fig 1.2 Example of TPZ sign.

Appendix A - Schedule Of Works And Responsibilities

Schedule of works and responsibilities

Hold Point	Task	Responsibility	Certification	Timing of inspection
1	Prior to commencement of construction to ensure the correct tree protection and signs are in place and all approved trees and pruning works are completed. Also that tree area has been mulched.	Principal Contractor	Project Arborist	Prior to demolition and site establishment.
2	At the completion of the site excavation to inspect tree roots greater than 30mm in diameter that may need a final pruning. Roots may need to be chased back into the profile to find undamaged material to prune cleanly.	Principal Contractor / Project Arborist	Project Arborist	After the excavation of the site is complete.
3	On a bi monthly basis to monitor the trees being retained. Any signs of a change in health or condition general shall require the project arborist to provide a remediation plan which the principle contractor must undertake.	Project Arborist	Project Arborist	During general works at the site.
4	For final sign off on the completion of works.	Project Arborist	Project Arborist	At the completion of all works.
5				
6				
7				
8				

Additional hold points - add here if needed

tree iQ

Project No: 56-58/BEA/19 Report No: 56-58/BEA/PAR/B

PRELIMINARY ARBORICULTURAL REPORT

56-58 Beane Street
Gosford

Prepared for: ROOT PARTNERSHIPS

28th January 2019
Revision B

Authors:

Anna Hopwood
Grad. Cert (Arboriculture)
Dip. Horticulture (Arboriculture)
Dip. Horticulture (Landscape Design)

Martin Peacock
BSc (hons.) Arboriculture
Dip. Horticulture (Landscape Design)
N Dip. Horticulture

p. 0404 424 264 | f. 02 9012 0924
po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au

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Contents

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info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au

1.0 INTRODUCTION

1.1 Background

1.1.1 This Preliminary Arboricultural Report was prepared for the Root Partnerships in relation to 56-58 Beane Street, Gosford. The purpose of this Preliminary Arboricultural Report is to provide an overview of the quality and value of the trees on site, and provide arboricultural advice early in the planning stages of the project.

1.1.2 In preparing this Report, the author is aware of and has considered the objectives of *State Environmental Planning Policy Vegetation in Non-Rural Areas (2017*), *Central Coast Development Control Plan Chapter 3.6 Preservation of Trees or Vegetation*, *Central Coast Council Significant Tree Register, Australian Standard 4970 Protection of Trees on Development Sites (2009), Australian Standard 4373 Pruning of Amenity Trees (2007)* and *Australian Standard 2303 Tree Stock for Landscape Use (2015).*

Refer to Methodology **(Appendix 1)**

1.2 Aims

1.2.1 The aims of this Report are to:

- Undertake a visual assessment of the trees
- Determine the trees' approximate height, canopy spread and trunk diameter
- Estimate the trees' Useful Life Expectancy
- Determine the trees' Landscape Significance
- Outline the trees' Retention Value
- Determine the trees' Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) in accordance with *Australian Standard 4970 Protection of Trees on Development Sites (2009)*
- Prepare a Preliminary Arboricultural Report summarizing site conditions, tree assessment, findings and recommendations

2.0 RESULTS

2.1 The Site

2.1.1 The site is a rectangular-shaped allotment located on the corner of Beane and Gertrude Streets and is bound by a residential unit building to the north, the footpath and carriageway of Beane and Gertrude Streets to the south and east, and the Hills Street Sports Medicine Building and carpark to the west.

2.1.2 The site has a gentle slope with a north-westerly aspect and comprises predominantly of an open area of hardstand and rough grass/weeds which is currently used as a carpark.

Refer to Tree Location Plan **(Appendix 2)**

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abn 62 139 088 832

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2.2 The Trees

2.2.1 Nineteen (19) trees were assessed using the VTA[1] criteria and notes, and comprise a mix of locally indigenous, Australian native and exotic species. In general, the trees are of low to moderate quality and value. In this regard, nine (9) trees (50%) were allocated a Retention Value of either *Priority for Removal* or *Consider for Removal*. Nine (9) trees (50%) were allocated a Retention Value of *Consider for Retention*. No trees were allocated a Retention Value of *Priority for Retention.* None of the trees are listed in the *Central Coast Council Significant Tree Register*.[2]

2.2.2 Tree 1 *Eucalyptus nicholii* (Narrow Leaf Peppermint) is listed as a *Vulnerable Species* under the NSW *Biodiversity Conservation Act (2016)* and the Commonwealth *Environment Protection and Biodiversity Conservation Act (1999)* within BioNet Atlas of NSW Wildlife Database.[3] However, this tree is a planted specimen and is not a component of a locally indigenous vegetation community. No other individual threatened tree species that were listed within this database for the area were identified during the current field investigations of the site.

2.2.3 Tree 3 *Olea europaea* subsp. *cuspidata* (African Olive) is subject to a *General Biosecurity Duty* and a *Regional Recommended Measure* by the Department of Primary Industries.[4] *This species must not be traded, carried, grown or released into the environment.*

2.2.4 Tree 19 *Syagrus romanzoffiana* (Cocos Palm) is listed as an *Undesirable Species in the Central Coast Council LGA* and consent is not required for its removal.[5]

2.2.5 As required by Clause 2.3.2 of *Australian Standard 4970 Protection of Trees on Development Sites (2009)*, each of the trees assessed has been allocated a Retention Value. The Retention Value is based on the tree's Useful Life Expectancy and Landscape Significance with consideration to its health, structural condition and site suitability. The Retention Values do not consider any proposed development works and are not a schedule for tree retention or removal. The trees have been allocated one of the following Retention Values:

- Priority for Retention
- Consider for Retention
- Consider for Removal
- Priority for Removal

2.2.6 Tree 1

Tree 1 was identified as *Eucalyptus nicholii* (Narrow Leaf Peppermint) and is located adjacent to the Beane Street road reserve. The tree has a short (5-15 years) estimated Useful Life Expectancy (ULE), is of low Landscape Significance and has been allocated a Retention Value of *Consider for Removal.* The tree has developed a poor form from repeated lopping from powerline clearance works.

2.2.7 Tree 1 is small in size, and if removed, replacement planting using healthy, advanced-size specimens could replace the loss of amenity within a short timeframe.

[1] Mattheck & Breloer (2003)
[2] Central Coast Council (2019)
[3] NSW Office of Environment and Heritage (2011)
[4] Department of Primary Industries (2017)
[5] Central Coast Council (2019)

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2.2.8 Tree 2

Tree 2 was identified as *Eucalyptus saligna* x *botryoides* and is located near the corner of Beane and Gertrude Streets. The tree has a medium (15-40 years) estimated ULE, is of moderate Landscape Significance and has been allocated a Retention Value of *Consider for Retention.*

2.2.9 Tree 3

Tree 3 has been identified as *Olea europaea* subsp. *cuspidata* (African Olive) and is located adjacent to the Gertrude Street frontage. The tree has a transient (<5 years) ULE, is of low Landscape Significance and has been allocated a Retention Value of *Priority for Removal.*

2.2.10 *Olea europaea* subsp. *cuspidata* (African Olive) is an environmental weed species and this tree should be removed irrespective of future developments works.

2.2.11 Tree 4

Tree 4 was identified as *Pittosporum undulatum* (Sweet Pittosporum) and is located adjacent to the Gertrude Street frontage. The tree has a short (5-15 years) estimated ULE, is of low Landscape Significance and has been allocated a Retention Value of *Consider for Removal.* The tree is a heavily suppressed specimen and contains a number of wounds with advanced stages of decay.

2.2.12 Tree 4 is small in size, and if removed, replacement planting using healthy, advanced-size specimens could replace the loss of amenity within a short timeframe.

2.2.13 Tree 5

Tree 5 was identified as *Glochidion ferdinandi* (Cheese Tree) and is located adjacent to the Gertrude Street frontage. The tree has a short (5-15 years) estimated ULE, is of low Landscape Significance and has been allocated a Retention Value of *Consider for Removal.* The tree is a heavily suppressed specimen and has developed an etiolated form.

2.2.14 Tree 5 is small in size, and if removed, replacement planting using healthy, advanced-size specimens could replace the loss of amenity within a short timeframe.

2.2.15 Tree 6

Tree 6 has been identified as *Glochidion ferdinandi* (Cheese Tree) and is located adjacent to the Gertrude Street frontage. The tree has a short (5-15 years) estimated ULE, is of moderate Landscape Significance and has been allocated a Retention Value of *Consider for Retention.* Included bark has developed between the junctions of co-dominant, first-order branches on Tree 6. The inclusion is likely to become a significant structural defect in the medium term as the branches increase in weight and diameter. Major inclusions have an increased risk of branch failure, particularly during severe weather events.

2.2.16 Tree 7

Tree 7 was identified as *Glochidion ferdinandi* (Cheese Tree) and is located adjacent to the Gertrude Street frontage. The tree has a medium (15-40 years) estimated ULE, is of moderate Landscape Significance and has been allocated a Retention Value of *Consider for Retention.*

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2.2.17 Tree 8

Tree 8 was identified as *Glochidion ferdinandi* (Cheese Tree) and is located adjacent to the northern boundary. The tree has a medium (15-40 years) estimated ULE, is of low Landscape Significance and has been allocated a Retention Value of *Consider for Removal.*

2.2.18 Tree 8 is small in size, and if removed, replacement planting using healthy, advanced-size specimens could replace the loss of amenity within a short timeframe.

2.2.19 Trees 9-15

Trees 9-15 were identified as *Casuarina cunninghamiana* (River She-Oak) and are a group of trees located in the north-western corner of the site. The trees have medium (15-40 years) estimated ULEs, are of moderate Landscape Significance and have been allocated a Retention Value of *Consider for Retention.* The trees provide a good screening function to the neighbouring property to the north. Tree 10 is dead.

2.2.20 Trees 9 and 11-15 should be managed as a group. The removal of individual trees from groups of trees which have been closely planted can open up the remaining canopy and alter the wind-loading forces, potentially increasing the risk of branch failures.

2.2.21 Trees 16, 17 & 19

Trees 16, 17 and 19 are a mix of species including X*Cupressocyparis leylandii* (Leyland Cypress), *Leptospermum petersonii* (Lemon Scented Teatree) and *Syagrus romanzoffiana* (Cocos Palm). The trees have a short (5-15 years) estimated ULEs, are of low Landscape Significance and have been allocated a Retention Value of *Consider for Removal.*

2.2.22 Trees 16, 17 and 19 are small in size, and if removed, replacement planting using healthy, advanced-size specimens could replace the loss of amenity within a short timeframe.

2.2.23 Tree 18

Tree 18 was identified as *Glochidion ferdinandi* (Cheese Tree) and is located centrally within the site. The tree has a short (5-15 years) estimated ULE, is of low Landscape Significance and has been allocated a Retention Value of *Consider for Removal.* A large wound is present on the trunk from the removal of a co-dominant stem.

2.2.24 Tree 18 is small in size, and if removed, replacement planting using healthy, advanced-size specimens could replace the loss of amenity within a short timeframe.

3.0 DEVELOPMENT WORKS

3.1 Australian Standard 4970 (2009) Protection of Trees on Development Sites

3.1.1 *Australian Standard 4970 (2009) Protection of Trees on Development Sites (AS-4970)* outlines that a TPZ is the principal means of protecting trees on development sites. It is an area isolated from construction disturbance so that the tree remains viable.[6]

3.1.2 The TPZ is calculated as a radial measurement based on twelve (12) times the tree's Diameter at Breast Height (DBH).[7] For palms, other monocots, cycads and tree ferns, the TPZ should not be less than 1m outside the crown projection.[8] These formulas are based on extensive research and are generally accepted within the arboricultural industry as being suitable for calculating areas designed to maintain the long-term viability of trees on development sites. `

[7] Standards Australia (2009)
[8] Standards Australia (2009)

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info@treeiQ.com.au
abn 62 139 088 832

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3.1.3 AS-4970 also provides calculations to determine a tree's Structural Root Zone (SRZ). The SRZ is described in AS-4970 as the area around the base of a tree required for the tree's stability in the ground. This zone considers a tree's structural stability only, not the root zone required for its vigor and long-term viability, which will usually be a much larger area. Severance of structural roots (>25mmØ) within the SRZ is generally not recommended as it may lead to the destabilisation and/or decline of the tree.

Refer to Tree Assessment Schedule **(Appendix 3)**

3.1.4 Ideally, works should be avoided within the TPZ. A *Minor Encroachment* is less than 10% of the TPZ and is outside the SRZ. A *Minor Encroachment* is considered acceptable by AS-4970 when it is compensated for elsewhere and contiguous within the TPZ. A *Major Encroachment* is greater than 10% of the TPZ or inside the SRZ. *Major Encroachments* generally require root investigations undertaken by non-destructive methods or the use of tree sensitive construction methods.

3.1.5 AS-4970 outlines that the TPZ may need to be modified (extended) to provide additional protection to the above ground parts of the tree. Where conflict between branches and structures/machinery could occur, branches may be protected with padding and timber battens, temporarily tied back or in some cases pruned, only where pruning would not impact the tree's health, structural condition, long-term viability or form.

3.2 Replacement Planting

3.2.1 Replacement tree planting should be provided where trees are to be removed. Replacement trees should be supplied as advanced-size stock to help offset the loss of amenity resultant from the tree removals. Replacement planting should be supplied in accordance with *Australian Standard 2303 (2015) Tree Stock for Landscape Use.*

4.0 SUMMARY & CONCLUSION

4.1 Nineteen (19) trees were assessed and comprise a mix of locally indigenous, Australian native and exotic species. Tree 10 is dead. The trees are of low to moderate quality and value, with:

- nine (9) trees allocated a Retention Value of *Consider for Retention*
- eight (8) trees allocated a Retention Value of *Consider for Removal*
- one (1) tree allocated a Retention value of *Priority for Removal*

4.2 An Arboricultural Impact Assessment and Tree Protection Plan should be prepared to examine the potential impact of any proposed works on the trees to be retained. The report should also detail the proposed design and construction methods, and tree protection measures to minimise impacts on the trees.

4.3 Replacement tree planting should be provided where trees are to be removed. Replacement planting should be supplied in accordance with *Australian Standard 2303 (2015) Tree Stock for Landscape Use.*

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po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

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5.0 LIMITATIONS & DISCLAIMER

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This Report has been prepared for exclusive use by the client. This Report shall not be used by others or for any other reason outside its intended target or without the prior written consent of TreeiQ. Unauthorised alteration or separate use of any section of the Report invalidates the Report.

Many factors may contribute to tree failure and cannot always be predicted. TreeiQ takes care to accurately assess tree health and structural condition. However, a tree's internal structural condition may not always correlate to visible external indicators. There is no warranty or guarantee, expressed or implied that problems or deficiencies regarding the trees or site may not arise in the future. Information contained in this report covers only the trees assessed and reflects the condition of the trees at the time of inspection. Additional information regarding the methodology used in the preparation of this Report is attached as Appendix 1. A comprehensive tree risk assessment and management plan for the trees is beyond the scope of this Report.

Reference should be made to any relevant legislation including Tree Management Controls. All recommendations contained within this Report are subject to approval from the relevant Consent Authority.

6.0 BIBLIOGRAPHY & REFERENCES

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po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

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7.0 APPENDICES

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po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

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Appendix 1: Methodology

1.1 **Site Inspection**: This report was determined as a result of a comprehensive site during January 2019.

1.2 **Visual Tree Assessment (VTA)**: The subject tree(s) was assessed using the Visual Tree Assessment criteria and notes as described in *The Body Language of Trees – A Handbook for Failure Analysis.*[9] The inspection was limited to a visual examination of the subject tree(s) from ground level only. No internal diagnostic or tissue testing was undertaken as part of this assessment. Trees outside the subject site were assessed from the property boundaries only.

1.3 **Tree Dimensions**: The dimensions of the subject tree(s) are approximate only.

1.4 **Tree Locations:** The location of the subject tree(s) was determined from the supplied plans.

1.5 **Tree Health**: The health of the subject tree(s) was determined by assessing:

I. Foliage size and colour
II. Pest and disease infestation
III. Extension growth
IV. Crown density
V. Deadwood size and volume
VI. Presence of epicormic growth

1.6 **Tree Structural Condition**: The structural condition of the subject tree(s) was assessed by:

I. Assessment of branching structure
(i.e co-dominant/bark inclusions, crossing branches, branch taper, terminal loading, previous branch failures)
II. Visible evidence of structural defects or instability
(i.e root plate movement, wounds, decay, cavities, fungal brackets, adaptive growth)
III. Evidence of previous pruning or physical damage
(root severance/damage, lopping, flush-cutting, lions tailing, mechanical damage)

1.7 **Useful Life Expectancy (ULE)**: The ULE is an estimate of the longevity of the subject tree(s) in its growing environment. The ULE is modified where necessary to take in consideration tree(s) health, structural condition and site suitability. The tree(s) has been allocated one of the following ULE categories (Modified from Barrell, 2001):

I. 40 years +
II. 15-40 years
III. 5-15 years
IV. Less than 5 years

1.8 **Landscape Significance**: Landscape Significance was determined by assessing the combination of the cultural, environmental and aesthetic values of the subject tree(s). Whilst these values are subjective, a rating of high, moderate, low or insignificant has been allocated to the tree(s). This provides a relative value of the tree's Landscape Significance which may aid in determining its Retention Value. If the tree(s) can be categorized into more than one value, the higher value has been allocated.

[9] Mattheck & Breloer (2003)

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info@treeiQ.com.au
abn 62 139 088 832

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Landscape Significance	Description
Very High	The subject tree is listed as a Heritage Item under the *Local Environmental Plan* with a local or state level of significance.
	The subject tree is listed on Council's Significant Tree Register or is considered to meet the criteria for significance assessment of trees and/or landscapes by a suitably qualified professional. The criteria are based on general principles outlines in the Burra Charter and on criteria from the Register of the National Estate.
	The subject tree is a remnant tree.
High	The subject tree creates a 'sense of place' or is considered 'landmark' tree.
	The subject tree is of local, cultural or historical importance or is widely known.
	The subject tree has been identified by a suitably qualified professional as a species scheduled as a Threatened or Vulnerable Species or forms part of an Endangered Ecological Community associated with the site, as defined under the provisions of the NSW *Biodiversity Conservation Act (2016)* or the Commonwealth *Environmental Protection and Biodiversity Conservation Act* (1999).
	The subject tree is known to provide habitat to a threatened species.
	The subject tree is an excellent representative of the species in terms of aesthetic value.
	The subject tree is of significant size, scale or makes a significant contribution to the canopy cover of the locality.
	The subject tree forms part of the curtilage of a heritage item with a known or documented association with that item.
Moderate	The subject tree makes a positive contribution to the visual character or amenity of the area.
	The subject tree provides a specific function such as screening or minimising the scale of a building.
	The subject tree has a known habitat value.
	The subject tree is a good representative of the species in terms of aesthetic value.
Low	The subject tree is an environmental pest species or is exempt under the provisions of the local Council's Tree Management Controls
	The subject tree makes little or no contribution to the amenity of the locality.
	The subject tree is a poor representative of the species in terms of aesthetic value.
	The subject tree is a recognised environmental weed species for the area.

1.10 **Retention Value**: Retention Value was based on the subject tree's Useful Life Expectancy and Landscape Significance. The Retention Value was modified where necessary to take in consideration the subject tree's health, structural condition and site suitability. The subject tree(s) has been allocated one of the following Retention Values:

I. Priority for Retention
II. Consider for Retention
III. Consider for Removal
IV. Priority for Removal

<table>
<tr><th>ULE</th><th></th><th colspan="4">Landscape Significance</th></tr>
<tr><td></td><td>Very High</td><td>High</td><td>Moderate</td><td>Low</td><td>Insignificant</td></tr>
<tr><td>40 years +</td><td rowspan="3">Priority for Retention</td><td colspan="2">Priority for Retention</td><td rowspan="3">Consider for Removal</td><td rowspan="3">Priority for Removal</td></tr>
<tr><td>15-40 years</td><td>Priority for Retention</td><td>Consider for Retention</td></tr>
<tr><td>5-15 years</td><td colspan="2">Consider for Retention</td></tr>
<tr><td>Less than 5 years</td><td>Consider for Removal</td><td colspan="4">Priority for Removal</td></tr>
</table>

The above table has been modified from the Footprint Green Tree Significance and Retention Value Matrix.

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info@treeiQ.com.au
abn 62 139 088 832

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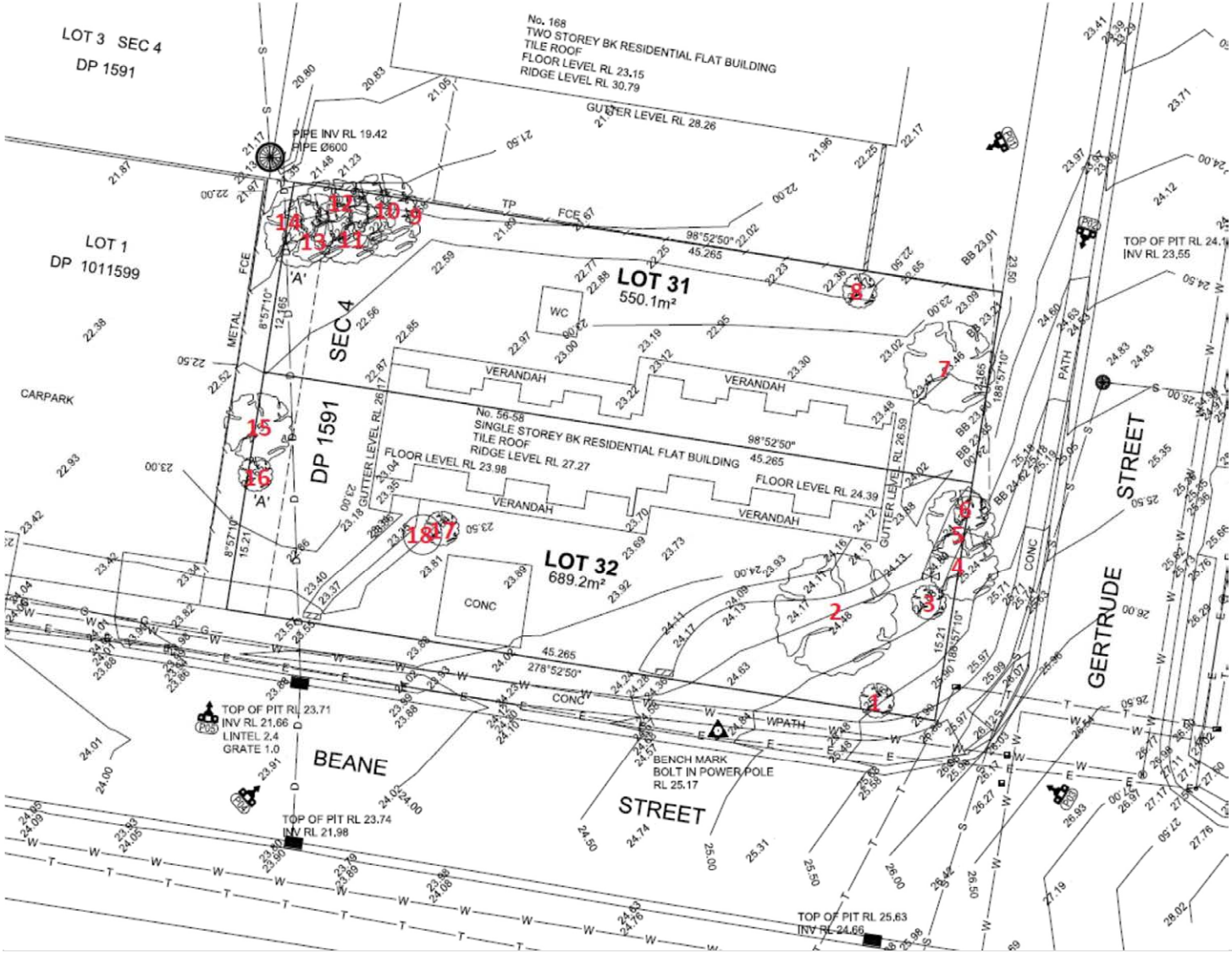
Appendix 2: Tree Location Plan



Appendix 3: Tree Assessment Schedule

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	Radial TPZ (m)	Radial SRZ (m)
1	*Eucalyptus nicholii* (Narrow Leaf Peppermint)	350	8	8	Fair	Poor	Crown density 75-100%. Pruned for powerline clearance. Lopped. Wound/s, advanced stages of decay. Branch inclusions, minor.	5-15	Low	Consider for Removal	4.2	2.2
2	*Eucalyptus saligna x botryoides*	650	17	10	Fair	Good	Crown density 75-100%. Small (<25mm), medium (25-75mm) & large (75mm+) diameter deadwood in moderate volumes.	15-40	Moderate	Consider for Retention	7.8	2.8
3	*Olea europaea* subsp. *cuspidata* (African Olive)	100 100 100 100	5	4	Good	Good	Weed species.	<5	Low	Priority for Removal	2.4	1.7
4	*Pittosporum undulatum* (Sweet Pittosporum)	600	8	5	Fair	Fair	Heavily suppressed. Small (<25mm) & medium (25-75mm) diameter deadwood in moderate volumes. Small (<25mm) diameter epicormic growth in moderate volumes. Wound/s, advanced stages of decay.	5-15	Low	Consider for Removal	7.2	2.7
5	*Glochidion ferdinandi* (Cheese Tree)	400	9	4	Fair	Fair	Crown density 50-75%. Heavily suppressed with etiolated form. Wound/s, advanced stages of decay. Branch inclusions, typical of species.	5-15	Low	Consider for Removal	4.8	2.3
6	*Glochidion ferdinandi* (Cheese Tree)	300 450	10	6	Good	Poor	Co-dominant inclusion, major. Wound/s, advanced stages of decay. Branch inclusions, typical of species.	5-15	Moderate	Consider for Retention	6	2.5
7	*Glochidion ferdinandi* (Cheese Tree)	700	15	12	Good	Good	Wound/s, various stages of decay. Branch inclusions, typical of species. Cavities.	15-40	Moderate	Consider for Retention	8.4	2.9

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	Radial TPZ (m)	Radial SRZ (m)
8	*Glochidion ferdinandi* (Cheese Tree)	100 100 100	6	5	Good	n/a	No access to base.	15-40	Low	Consider for Removal	2.2	1.7
9	*Casuarina cunninghamiana* (River She-Oak)	550	18	7	Good	Good	Partially suppressed. Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes.	15-40	Moderate	Consider for Retention	6.6	2.6
10	DEAD											
11	*Casuarina cunninghamiana* (River She-Oak)	500	20	8	Good	Good	Partially suppressed. Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes.	15-40	Moderate	Consider for Retention	6	2.5
12	*Casuarina cunninghamiana* (River She-Oak)	400	20	7	Good	Good	Partially suppressed. Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes. Hanger.	15-40	Moderate	Consider for Retention	4.8	2.3
13	*Casuarina cunninghamiana* (River She-Oak)	500	20	8	Good	Good	Partially suppressed. Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes.	15-40	Moderate	Consider for Retention	6	2.5
14	*Casuarina cunninghamiana* (River She-Oak)	600	15	15	Good	Good	Heavily suppressed. Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes.	5-15	Moderate	Consider for Retention	7.2	2.7
15	*Casuarina cunninghamiana* (River She-Oak)	700	20	8	Good	Good	Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes.	15-40	Moderate	Consider for Retention	8.4	2.9

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	Radial TPZ (m)	Radial SRZ (m)
16	X*Cupressocyparis leylandii* (Leyland Cypress)	500	8	5	Fair	Fair	Crown density 75-95%. Small (<25mm) diameter deadwood in low volumes. Wound/s, advanced stages of decay. Branch inclusions, minor	5-15	Low	Consider for Removal	6	2.5
17	*Leptospermum petersonii* (Lemon Scented Teatree)	300	6	4	Fair	Good	Crown density 75-95%. Partially suppressed. Small (<25mm) diameter deadwood in low volumes. Lopped. Branch inclusions, minor	5-15	Low	Consider for Removal	3.6	2
18	*Glochidion ferdinandi* (Cheese Tree)	400	8	6	Good	Fair	Removed co-dominant stem. Wound/s, advanced stages of decay. Branch inclusions, typical of species.	5-15	Low	Consider for Removal	4.8	2.3
19	*Syagrus romanzoffiana* (Cocos Palm)	300	8	3	Good	Good		5-15	Low	Consider for Removal	4	n/a

Appendix 4: Plates

Plate 1: Showing Trees 1 & 2

Plate 2: Showing Trees 3-7

Plate 3: Showing Tree 8

Plate 4: Showing Trees 9-15

Plate 5: Showing Trees 16 & 17

Plate 6: Showing Trees 18 & 19

Disclaimer by Koala Arbor Consulting Arborists ('the Arborist')

The limits of this report: The Arborist has inspected the trees referred to in this report ('report trees') for the purposes set out in this report. Information contained in this report covers only the report trees as documented and reflects their condition at the time of inspection only. Whilst the Arborist has used all reasonable endeavours to assess the report trees, the report is not evidence that no other issues exist in respect of those report trees. The limits of observations made: This assessment was carried out from the ground, and covers what was reasonable to be assessed at the time of inspection. Unless stated otherwise no aerial or underground inspections were carried out and unseen structural weakness may exist within roots, trunk or branches. There are many factors that contribute to limb and tree failure and not all symptoms are visible.

Arborist not liable or responsible: The Arborist is not liable for damage to any property or injury or death to any person caused by the report trees and no liability or responsibility is accepted regardless of whether or not any recommendations in this report are carried out.

No warranties or guarantees by the Arborist: Any protection or preservation methods recommended are not a warranty or guarantee of tree survival or safety. The Arborist gives or makes no warranty or guarantee expressed or implied that problems or deficiencies in respect of the report trees will not arise in the future. The Arborist recommends annual inspection of report trees to assess continuing status.

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