



ARBORICULTURAL IMPACT ASSESSMENT

282 LOWER PLATEAU ROAD, BILGOLA PLATEAU 2107

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Prepared for: Bangalow Homes

13/04/2025

EXECUTIVE SUMMARY

Complete Arborcare has been commissioned to produce an Arboricultural Impact Assessment (AIA) regarding the proposed development at Lot 113/-/DP12838, No. 282 Lower Plateau Road Bilgola Plateau 2107.

Eleven (11) x trees upon and adjacent to the subject site were assessed to produce this report.

Following an assessment of construction impacts (detailed in section 7 of this report) the following recommendations (detailed in section 9 of this report) have been developed.

- 9.1 Non-destructive root investigation will be required for trees **T1, T6-T7**. If roots are discovered that can be pruned (which are to be ≤50mm Ø) pruning methods must be undertaken in accordance with Section 9 (Root Pruning) of AS 4373-2007. If roots >50mm Ø are uncounted, appropriate arboricultural advice will be provided. .
- 9.2 For the proposed development to be undertaken, tree **T2** must be removed (subject to council approval).
- 9.3 It is concluded that tree T8 is removed (subject to council approval). This tree has a Low Retention Value.
- 9.4 If the development of the proposed granny flat is undertaken in its current design, tree sensitive construction measures such as pier & beam, suspended slabs, cantilevered buildings sections or screw piles will be required for tree **T1**.
- 9.5 It is recommended that tree protection fencing is installed around tree **T1** before any of the proposed works commence. This protection must stay in place until the completion of all works & must be compliant with Section 4.3-4.4 (Protective Fencing & Signs) of AS 4970 (See Appendix C).
- 9.6 It is recommended that stem protection of trees **T9-T11** will be required. This protection is to be compliant with clause 4.5.2 (Trunk and branch protection) of the Australian Standard (AS) 4970-2009, Protection of Trees on Development Sites (see Appendix D).
- 9.7 To ensure that the biodiversity of the area is maintained, two (2) x trees must be replaced. Tree/s selected for replacement plantings should be endemic species that will attain a similar height & canopy spread of those removed. These trees are to be chosen in accordance with AS 2303-2015 (Tree Stock for Landscape Use) & planting is to be undertaken by a suitably qualified AQF person/s before the issuing of a Certificate of Occupancy.
- 9.8 It is recommended that an AQF¹ Level 5 Arborist is engaged to oversee/meet any arboricultural matters that may arise if the proposed works are approved.

¹ Australian Qualification Framework

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1. INTRODUCTION

- 1.1 Complete Arborcare has been commissioned to produce an Arboricultural Impact Assessment (AIA) regarding the proposed development at Lot 113/-/DP12838, No. 282 Lower Plateau Road Bilgola Plateau 2107 (hereafter mentioned as the subject site).
- 1.2 This AIA is to be part of a Development Application (DA). It has been prepared following the guidelines provided in Australian Standard (AS) 4970-2009, Protection of Trees on Development Sites and AS 4373-2007, Pruning of Amenity Trees.

2. LEGISLATION REQUIREMENTS

- 2.1 The subject site is zoned C4: Environmental Living (NSW Government - Planning & Environment 2019).
- 2.2 NBC (Northern Beaches Council, 2017) considers a tree to be:
 - (a) any palm or woody perennial plant greater than five (5) metres in height or any palm or woody perennial plant with a canopy greater than 10 m in width; or
 - (b) any native palm or native woody perennial plant at any stage of its lifecycle that is 0.5 metres or greater in height and is within any area mapped by Council as containing:
 - Threatened and High Conservation Habitat.
 - Wildlife Corridors .
 - Native Vegetation known or potential habitat for threatened species, populations or ecological communities
- 2.3 State Environmental Planning Policy (Biodiversity & Conservation) 2021 (NSW Government, 2021) has been considered in the preparation of this report. The aims of the policy are to;
 - (a) *to protect the biodiversity values of trees and other vegetation in non-rural areas of the State, and*
 - (b) *to preserve the amenity of non-rural areas of the State through the preservation of trees and other vegetation.*

3. THE SITE



Figure 1: The subject site outlined in red (SIX Maps).



Figure 2: The subject site outlined in red (SIX Maps).

4. METHOD

- 4.1 The subject site & trees were visually assessed from ground level on the 28th March 2025. The *Genus/species* of the subject trees were recorded as well as dimensions of Diameter at Breast Height (DBH) and Diameter at Base (DAB), along with crown and canopy width. Height and age of the trees were estimated as well as the percentage of deadwood. The subject trees were given a condition / vigour rating and signs and symptoms of pests and diseases were noted (if apparent). Structural defects were looked for and comments recorded.
- 4.2 Calculations have been made using guidelines supplied in AS 4970-2009, specifically in relation to:
- Tree Protection Zone (TPZ)
 - Structural Root Zone (SRZ)
 - Estimated Live Crown Size (ELCS)
- 4.3 The trees have been allocated a landscape significance rating of Low, Medium or High using the *IACA Significance of a Tree, Assessment Rating System (STARS)*© (IACA, 2010). Stars assessment criteria includes:
- Condition and Vigour
 - Form, species specific
 - Provenance, age and botanical significance
 - Heritage and Ecological significance
 - Size, shape, and local amenity value
 - Restrictions to tree growth
- Appendix B contains the assessment criteria in full.
- 4.4 The trees have been given a Useful Life Expectancy (ULE) rating, categorised as either:
- Long – 40+ years
 - Medium – 15-40 years
 - Short – 5-15 years
 - Consider for removal - <5 years
- 4.5 Any vegetation not mentioned in this report was either defined as not to be a prescribed tree (due to its dimensions), exempt species, within two (2) metres of an existing approved building and/or had no TPZ encroachments.
- 4.6 It must be noted that all TPZ/SRZ measures of neighbouring trees were estimated and averaged due to the inability to gain property access.

5. OBSERVATIONS

5.1 Listed in Table 1 below are observations from the subject tree relating to:

- Health and condition.
- Deadwood. An overall % has been estimated.
- Structural defects and comments.
- Any signs/symptoms of pest and disease attack.

Tree No.	Common Name <i>Genus/species</i>	Condition/ Vigour	Dead wood %	Structural Defects	Pests/ Disease
1	Red Bloodwood <i>Corymbia gummifera</i>	F/F	≤10	None observed	None observed
2	Red Bloodwood <i>Corymbia gummifera</i>	P/F	15-20	Stem inclusion	None observed
3	Sydney Red Gum <i>Angophora costata</i>	G/G	≤5	None observed	None observed
4	Red Bloodwood <i>Corymbia gummifera</i>	P/D	40-50	None observed	None observed
5	Sydney Red Gum <i>Angophora costata</i>	F/F	≤5	None observed	None observed
6	Sydney Red Gum <i>Angophora costata</i>	G/G	<5	None observed	None observed
7	Magnolia <i>Magnolia grandiflora</i> 'Little Gem'	G/G	<5	None observed	None observed
8	Sydney Red Gum <i>Angophora costata</i>	P/D	15-20	None observed	None observed
9	Red Bloodwood <i>Corymbia gummifera</i>				
10	Red Bloodwood <i>Corymbia gummifera</i>				
11	Sydney Red Gum <i>Angophora costata</i>				

N/A

Table 1: Tree Observations

5.2 Listed in Table 2 below are measurements from the subject tree relating to:

- Age
- Tree height
- Lowest scaffold branch
- Canopy spread – measured to the North, East, South and West (N,S,E,W)
- Diameter at breast height (DBH)
- Diameter above buttress (DAB)

Tree No.	Genus/species	Age	Height (m)	Spread (m)				DBH (cm)	DAB (cm)
				N	S	E	W		
1	<i>Corymbia gummifera</i>	M	18	8	7	6	7	98	105
2	<i>Corymbia gummifera</i>	M	10	2	2	2	2	31	35
3	<i>Angophora costata</i>	M	13	4	2	5	3	30	35
4	<i>Corymbia gummifera</i>	M	12	3	1	2	2	30	35
5	<i>Angophora costata</i>	M	10	3	0	2	2	30	35
6	<i>Angophora costata</i>	M	13	3	4	3	4	45	52
7	<i>Magnolia grandiflora</i> 'Little Gem'	M	6	2	2	2	2	20	25
8	<i>Angophora costata</i>	M	12	1	1	1	1	20	25
9	<i>Corymbia gummifera</i>								
10	<i>Corymbia gummifera</i>								
11	<i>Angophora costata</i>								

N/A

Table 2: Tree Measurements

5.3 Listed in Table 3 Below are calculations from the subject trees relating to:

- Tree Protection Zone (TPZ)
- Structural Root Zone (SRZ)
- Estimated Live Crown Size (ELCS)

Tree No.	Genus/species	SRZ (m)	TPZ (m)	Estimated Live Crown Size (m ²)
1	<i>Corymbia gummifera</i>	3.38	11.76	170
2	<i>Corymbia gummifera</i>	2.13	3.6	12
3	<i>Angophora costata</i>	2.13	3.6	40
4	<i>Corymbia gummifera</i>	2.13	3.6	12
5	<i>Angophora costata</i>	2.13	3.6	8
6	<i>Angophora costata</i>	2.51	5.4	40
7	<i>Magnolia grandiflora</i> 'Little Gem'	1.82	2.4	10
8	<i>Angophora costata</i>	1.85	2.4	4
9	<i>Corymbia gummifera</i>			
10	<i>Corymbia gummifera</i>			
11	<i>Angophora costata</i>			

N/A

Table 3: Tree Calculations

6. TREE RETENTION VALUES

6.1 Trees have been allocated a retention value using the priority Matrix in the *IACA Significance of a Tree, Assessment Rating System (STARS)*© (IACA, 2010). The Matrix uses the Landscape Significance rating combined with the Useful Life Expectancy (ULE) to determine a retention value of either;

- Priority for Retention (High) – All measures must be taken to retain and protect these trees. If the guidelines set out in AS4970-2009 Protection of trees on development sites cannot be used to protect the trees, design modification or re-location of the proposed development should be considered.
- Consider for Retention (Medium) – Retention of these trees should remain a priority. If the trees are adversely affecting the proposed development and all protection measures have been considered but are not viable, removal can be considered.
- Consider for Removal (Low) – Retention of these trees is not important. No modification to design should be considered for their retention.
- Priority for Removal – Trees in an irreversible decline, weed species or hazardous trees. These trees should be removed.

Tree No.	Genus/Species	Landscape Significance Rating	Useful Life Expectancy	Retention Value
1	<i>Corymbia gummifera</i>	Medium	Medium	Medium
2	<i>Corymbia gummifera</i>	Low	Short	Low
3	<i>Angophora costata</i>	Medium	Medium	Medium
4	<i>Corymbia gummifera</i>	Low	Short	Low
5	<i>Angophora costata</i>	Medium	Medium	Medium
6	<i>Angophora costata</i>	Medium	Medium	Medium
7	<i>Magnolia grandiflora</i> 'Little Gem'	Low	Medium	Medium
8	<i>Angophora costata</i>	Low	Short	Low
9	<i>Corymbia gummifera</i>	N/A		
10	<i>Corymbia gummifera</i>			
11	<i>Angophora costata</i>			

Table 4: Tree Retention Values

7. CONSTRUCTION IMPACTS

7.1 Listed in table 5 below are likely impacts from the proposed construction upon the trees.

ø

Tree No.	Proposed encroachments into TPZ and/or canopy	Likely Impacts from the proposed construction (Discussion)
1	A major 35-40% TPZ encroachment. No canopy encroachment.	Possible loss of woody roots (<50mmø) which has the potential to result in tree decline.
2	100% TPZ encroachment.	Tree death.
3-5	Minor <10% TPZ encroachments. No canopy encroachments.	It has concluded that no long-term tree impacts will occur from the completed works.
6-7	Major 20-25% TPZ/SRZ encroachments. No canopy encroachments.	Possible loss of woody roots (<50mmø) which has the potential to result in tree decline.
8-11	No TPZ of canopy encroachments.	It has concluded that no long-term tree impacts will occur from the completed works.

Table 5: Construction Impacts

8. DOCUMENTS USED IN THE PREPARATION OF THIS REPORT

8.1 Listed in Table 6 below are documents used in the preparation of this report.

Document type	Source/ Author	Title	Date	Summary
Plan	Modular Engineering P/L	Stormwater Roof Plan	26/03/2025	Stormwater roof plan shown over the proposed development (Drawing No.STW002).Revision A.
Plan	Complete Arborcare	TPZ/SRZ Plans	9/04/2025	TPZ/SRZ plans shown over the proposed development.

Table 6: Documents used in the preparation of this report

9. RECOMMENDATIONS/CONCLUSIONS

- 9.1 Non-destructive root investigation will be required for trees **T1, T6-T7**. If roots are discovered that can be pruned (which are to be $\leq 50\text{mm } \varnothing$) pruning methods must be undertaken in accordance with Section 9 (Root Pruning) of AS 4373-2007. If roots $> 50\text{mm } \varnothing$ are uncounted, appropriate arboricultural advice will be provided. .
- 9.2 For the proposed development to be undertaken, tree **T2** must be removed (subject to council approval).
- 9.3 It is concluded that tree T8 is removed (subject to council approval). This tree has a Low Retention Value.
- 9.4 If the development of the proposed granny flat is undertaken in its current design, tree sensitive construction measures such as pier & beam, suspended slabs, cantilevered buildings sections or screw piles will be required for tree **T1**.
- 9.5 It is recommended that tree protection fencing is installed around tree **T1** before any of the proposed works commence. This protection must stay in place until the completion of all works & must be compliant with Section 4.3-4.4 (Protective Fencing & Signs) of AS 4970 (See Appendix C).
- 9.6 It is recommended that stem protection of trees **T9-T11** will be required. This protection is to be compliant with clause 4.5.2 (Trunk and branch protection) of the Australian Standard (AS) 4970-2009, Protection of Trees on Development Sites (see Appendix D).
- 9.7 To ensure that the biodiversity of the area is maintained, two (2) x trees must be replaced. Tree/s selected for replacement plantings should be endemic species that will attain a similar height & canopy spread of those removed. These trees are to be chosen in accordance with AS 2303-2015 (Tree Stock for Landscape Use) & planting is to be undertaken by a suitably qualified AQF person/s before the issuing of a Certificate of Occupancy.
- 9.8 It is recommended that an AQF Level 5 Arborist is engaged to oversee/meet any arboricultural matters that may arise if the proposed works are approved.

10. 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.

11. ASSUMPTIONS

Care has been taken to obtain information from reliable resources. All data has been verified insofar as possible; however, the author of this report 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.

This report does not represent or contain a tree risk assessment.

12. REFERENCES

IACA, 2010. *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, Australia. [Online] Available at: www.iaca.org.au [Accessed 19th June 2015].

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Council, W., 2015. *Trees & Developments*. [Online]
Available at: <http://www.warringah.nsw.gov.au/planning-and-development/trees-and-development>
[Accessed 24th of June 2017].

NSW Government, 2019. *NSW Planning Portal*. [Online]
Available at: <https://www.planningportal.nsw.gov.au/find-a-property>

Standards Australia, 2009. AS 4970-2009, Protection of trees on development sites. Sydney: Standards Australia.

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

RELEVANT APPENDICES - APPENDIX A: GLOSSARY OF TERMS

Photographs – all images have been taken from SIX Maps.

Common Name/*Genus species* - the common name and genus/ species of the tree.

Age Class- assessment of the trees current age.

Immature (IM) - refers to a tree at growth stages between immaturity and full size.

Semi-mature (SM) - refers to a full-sized tree with some capacity for further growth.

Mature (M) - refers to a full-sized tree with some capacity for further growth.

Over-mature (OM) - a mature tree has reached a near stable size (biomass) above and below the ground. Trees can have a Mature Age Class for > 90% of their life span. Over-mature (**OM**) trees show symptoms of irreversible decline and decreasing biomass.

Live Stag (LS) - refers to a tree in a significant state of decline. This is the last stage of a tree prior to death.

Height - estimated overall height of the tree.

Diameter at Breast Height (DBH) - the trunk diameter at breast height (in metres) of the tree, 1.4 meters above ground level.

Diameter above the Buttress (DAB) - refers to the tree trunk diameter measured above the root buttress and is used to calculate the radius of the SRZ.

Tree Protection Zone (TPZ) - is a “No Go Zone” surrounding a tree to aid in its ability to cope with disturbances associated with construction works. 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.

Structural Root Zone (SRZ) – the structural root zone is the area required for the tree’s stability. A larger area is required to maintain a viable tree. The SRZ is only needed to be calculated when a major encroachment into the TPZ is proposed. There are many factors that affect the size of the SRZ (e.g. tree height, crown area, soil type, soil moisture). The SRZ may also be influenced by natural or built structures, such as rock and footings.

Vigour - Good (G), Fair (F) or Poor (P) – this refers to the trees vigour as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion and the degree of dieback.

Condition – Excellent (E), Very Good (VG), Good (G), Fair (F), Declining (D), Poor (P), Very Poor (VP).this refers to the tree’s form & growth habit, as modified by its environment (aspect suppression by other tree/s, soils,) & the state of the scaffold (i.e. 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.

Deadwood – this refers to any whole limb that no longer contains living issues (i.e. living leaves & /or bark).Some dead wood is common in a number of species.

Crown Spread - the greatest width from drip line to drip line of a branch across the trees crown.

Estimated Live Crown Size (ELCS) - the area of the crown as viewed from one aspect.

Significance of a Tree, Assessment Rating System* (IACA 2010) – S.T.A.R.S. ©

The landscape significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree. To assist this process all definitions for terms used in the *Tree Significance - Assessment Criteria* and *Tree Retention Value - Priority Matrix*, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of *High*, *Medium* and *Low* significance in the landscape. Once the landscape significance of an individual tree has been defined, the retention value can be determined. An example of its use in an Arboricultural report is shown as Appendix A.



Tree Significance - Assessment Criteria

High Significance in landscape

- The tree is in Good condition and Good vigour.
- The tree has a form typical for the species;
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age;
- The tree is listed as a Heritage Item, Threatened Species or part of an endangered ecological community or listed on Councils Significant Tree Register;
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity;
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values;
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa *in situ* - tree is appropriate to the site conditions.

Medium Significance in landscape

- The tree is in Fair-Good condition and Good or Low vigour;
- The tree has form typical or atypical of the species;
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street,
- The tree provides a fair contribution to the visual character and amenity of the local area,
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa *in situ*.

Low Significance in landscape

- The tree is in fair-poor condition and good or low vigour;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings,
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area,
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen,
- The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa *in situ* - tree is inappropriate to the site conditions,
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms,
- The tree has a wound or defect that has potential to become structurally unsound.

Environmental Pest / Noxious Weed Species

- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties,
- The tree is a declared noxious weed by legislation.

Hazardous/Irreversible Decline

- The tree is structurally unsound and/or unstable and is considered potentially dangerous,
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

The tree is to have a minimum of three (3) criteria in a category to be classified in that group.

Note: The assessment criteria are for individual trees only, however, can be applied to a monoculture stand in its entirety e.g. hedge.

Institute of Australian Consulting Arboriculturists (IACA 2010), *IACA Significance of a Tree, Assessment Rating System (STARS)*, www.iaca.org.au

Table 1.0 Tree Retention Value - Priority Matrix.

		Significance				
		1. High	2. Medium	3. Low		
		Significance in Landscape	Significance in Landscape	Significance in Landscape	Environmental Pest / Noxious Weed Species	Hazardous / Irreversible Decline
Estimated Life Expectancy	1. Long >40 years					
	2. Medium 15-40 Years					
	3. Short <1-15 Years					
	Dead					
Legend for Matrix Assessment						
		INSTITUTE OF AUSTRALIAN IACA CONSULTING ARBORICULTURISTS				
		Priority for Retention (High) - These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 <i>Protection of trees on development sites</i> . Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone.				
		Consider for Retention (Medium) - These trees may be retained and protected. These are considered less critical; however their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.				
		Consider for Removal (Low) - These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.				
		Priority for Removal - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.				

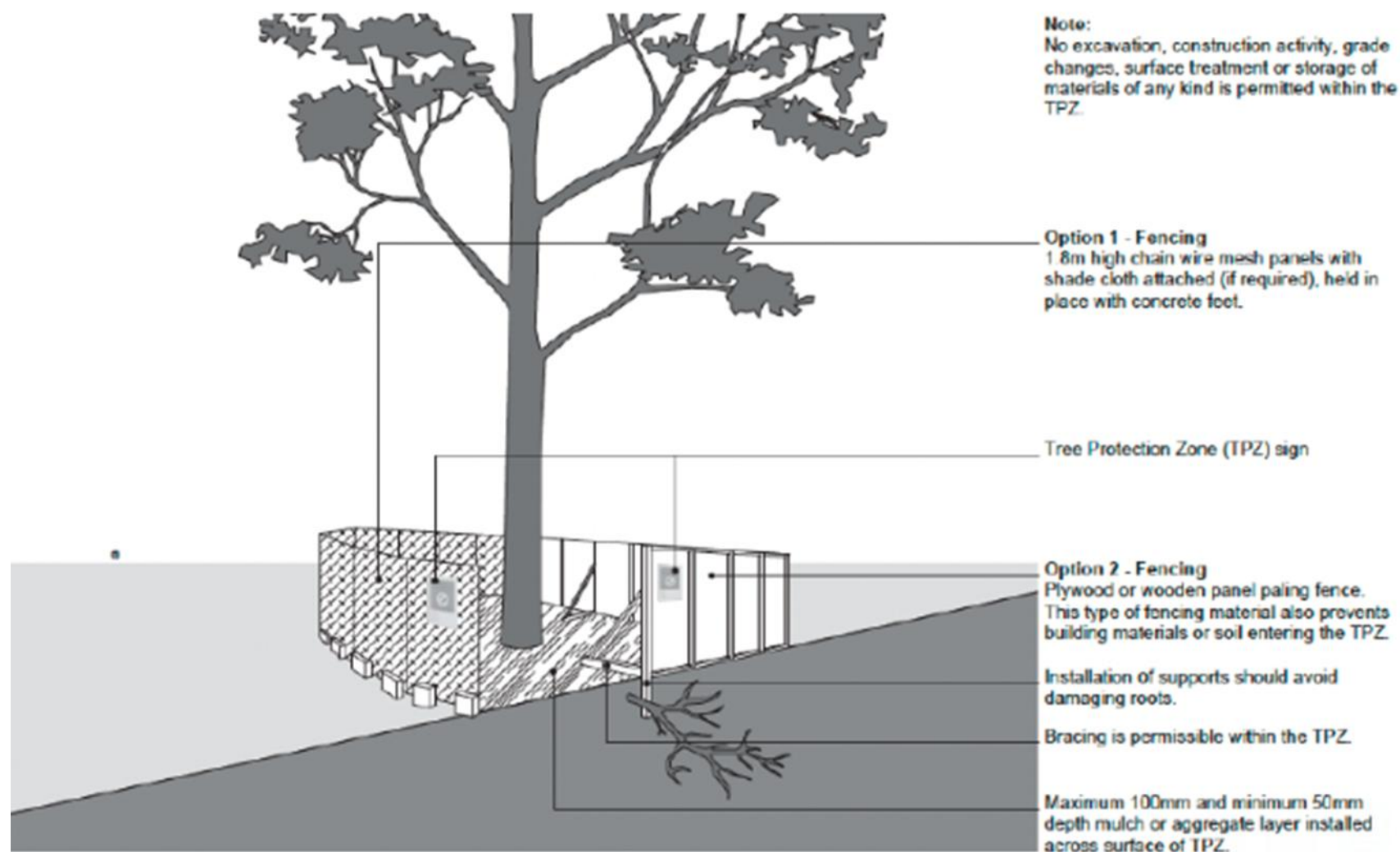
USE OF THIS DOCUMENT AND REFERENCING The IACA Significance of a Tree, Assessment Rating System (STARS) is free to use, but only in its entirety and must be cited as follows', 2010, *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au

REFERENCES Australia ICOMOS Inc. 1999, *The Burra Charter –The Australian ICOMOS Charter for Places of Cultural Significance*, International Council of Monuments and Sites, www.icomos.org/australia Draper BD and Richards PA 2009, *Dictionary for Managing Trees in Urban Environments*, Institute of Australian Consulting Arboriculturists(IACA), CSIRO Publishing, Collingwood, Victoria, Australia. Footprint Green Pty Ltd 2001, *Footprint Green Tree Significance & Retention Value Matrix*, Avalon, NSW Australia, www.footprintgreen.com.au IACA 2010, *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, www.iaca.org.au

APPENDIX C: EXAMPLE OF TREE FENCING PROTECTION

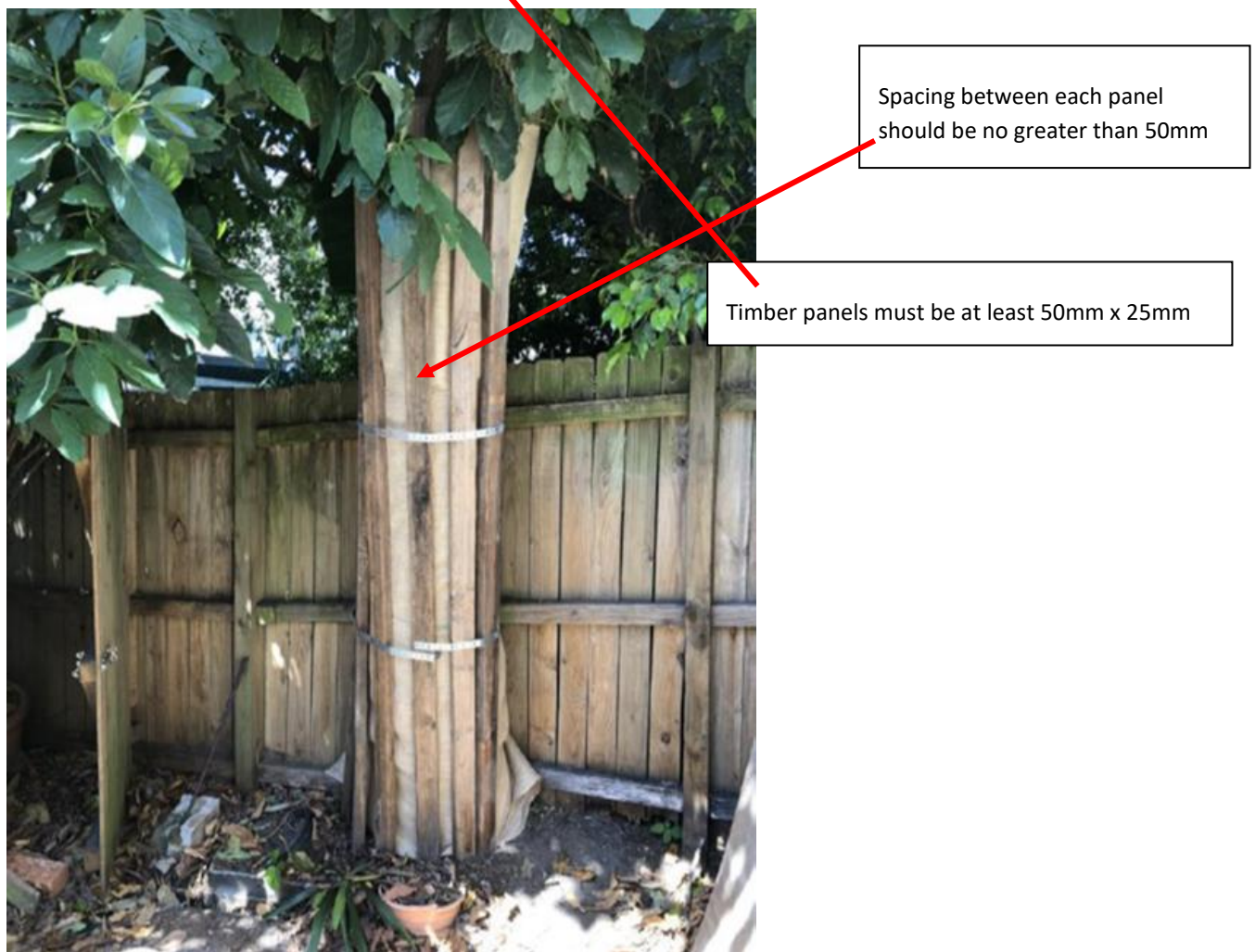
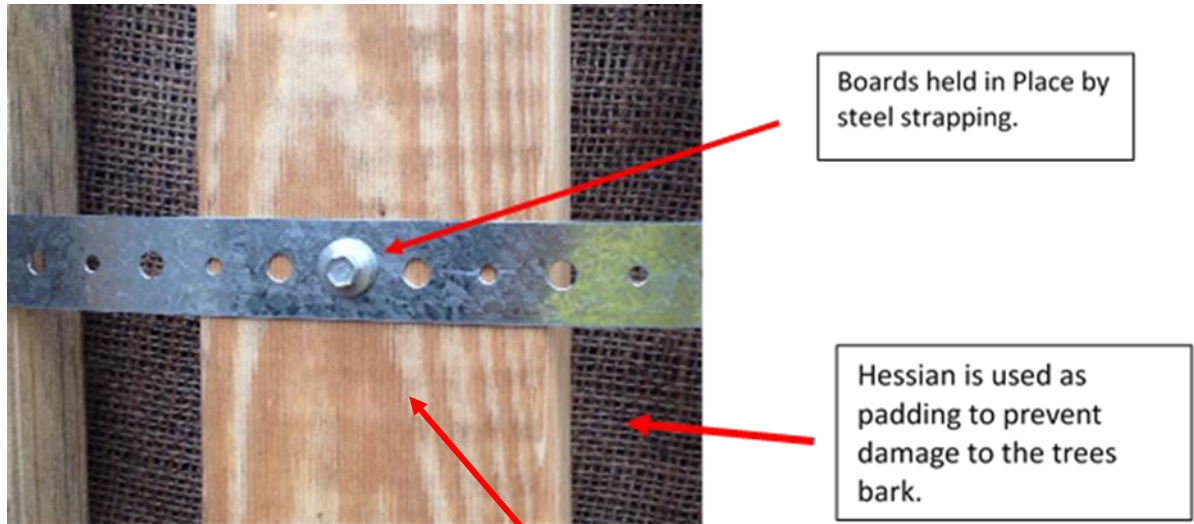
Tree protection Fencing must be a minimum of 1.8 metres in height and be held in place with locking clamps and concrete feet footings (an example of protective fencing and signage is shown below).



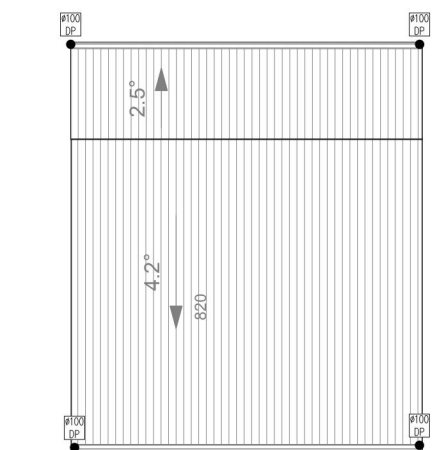


APPENDIX D: EXAMPLE OF STEM PROTECTION

Wherever stems and branches are to be protected, timber boards are to be used with padding underneath that will protect damage to the tree bark. All stem and branch protection timbers are to be strapped to the subject tree.



STORMWATER ROOF PLAN
SCALE: 1:200



STORMWATER FLOOR PLAN
SCALE: 1:200

SIZE: A3 0 10 20 30 40 50 60 70 80 90 100 110 120

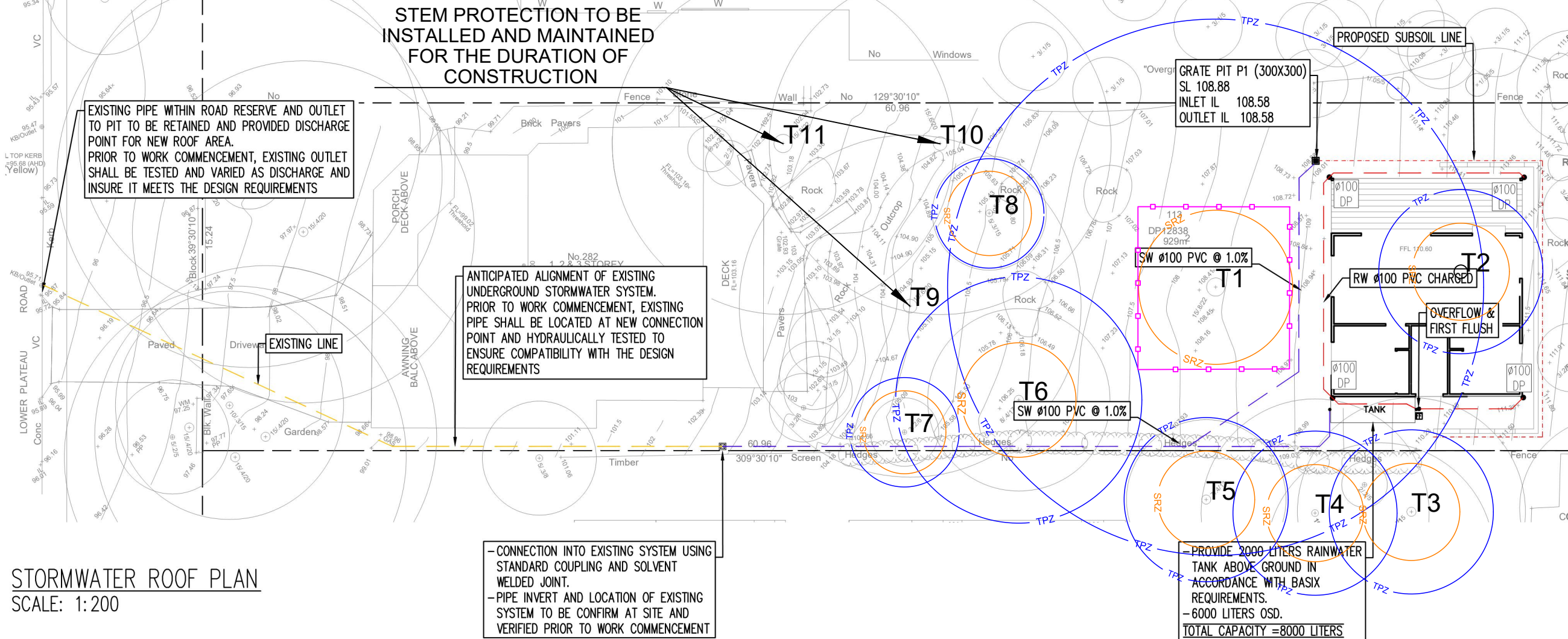
REVISIONS					APPROVED BY	
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A	26-03-2025	ISSUED FOR CDC	S.R.	S.R.	MSc, BSc, MIEAust, CPEng, NER, NPER (No: 5358554), RPEQ(28316), PE(Victoria)No.0007689, PDP0000072, PRE0000191, DEP0000203	



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PROJECT TITLE :	PROPOSED CONSTRUCTION OF A SECONDARY DWELLING
PROJECT ADDRESS :	282 LOWER PLATEAU ROAD BILGOLA PLATEAU
PROJECT NO. :	STW080-2025
DRAWING TITLE :	STORMWATER DESIGN PLANS
DRAWING NO. :	STW002
ISSUE DATE :	26-03-2025






TPZ & SRZ PLAN WITH TREE PROTECTION ZONES AND STRUCTURAL ROOT ZONES SHOWN TO SCALE.
PLAN HAS BEEN OVERLAYED ON THE STORMWATER ROOF PLAN PREPARED BY MODULAR ENGINEERS PTY LTD (26/03/2025).

THIS PLAN SHOULD BE READ IN CONJUNCTION WITH THE ARBORICULTURAL IMPACT ASSESSMENT PREPARED FOR 282 LOWER PLATEAU RD, BILGOLA PLATEAU NSW 2107

PREPARED BY COMPLETE ARBORCARE
09/04/2025

LEGEND:

TREE PROTECTION ZONE STRUCTURAL ROOT ZONE
 
TREE PROTECTION FENCING




PIPE SCHEDULE				
TAG	SIZE	MATERIAL	GRADE	TYPE
A	DAI.100	P.V.C.	MIN. 1%	GRAVITY
B	DAI.150	P.V.C.	MIN. 1%	GRAVITY
X	DAI.100	P.V.C.	CHARGE	TO RWT/PIT
D	200X100	GALV. STEEL	MIN. 1%	TO KERB
E	EXISTING	EXISTING	EXISTING	EXISTING

- NOTES:**
DRAINAGE
- ALL PIPES TO BE LAID ON 75mm SAND BED WITH THE BARRELS FULLY SUPPORTED
 - 100mm AND 150mm DIAMETER PIPES TO BE LAID ON MINIMUM 1% GRADE
 - MINIMUM DEPTH OF COVER FOR PIPES NOT SUBJECT TO VEHICULAR LOADING TO BE 300mm
 - ALL DRAINAGE PIPES LAID UNDER PAVEMENT SHALL BE REINFORCED CONCRETE WITH RUBBER RING JOINTS
 - BACKFILL TRENCHES WITH COMPACTED SAND OR APPROVED AGGREGATE MATERIAL
 - ALL PITS TO HAVE 600x600mm INTERNAL DIMENSIONS (U.N.O.)
 - SILT ARRESTORS TO HAVE 900x900mm INTERNAL DIMENSIONS
 - HEAVY DUTY GALV. STEEL GRATES AND COVERS ARE TO BE PROVIDED IN TRAFFICABLE AREAS
 - HEEL & WHEELCHAIR SAFE GRATE COVERS ARE TO BE PROVIDED IN PEDESTRIAN AREAS
 - PIT GRATE TO BE TYPE WELDLOK OR APPROVED EQUIVALENT
 - ALL PITS GREATER THAN 900mm DEEP SHALL BE PROVIDED WITH A CHILD-PROOF LOCKING CLIP
 - ALL PITS SHALL BE MAINTAINED REGULARLY
 - ALL PITS TO BE BENCHED MIN. 20mm TO INVERT OF OUTLET
 - Ø100 SUBSOIL DRAINAGE PIPE WRAPPED IN FABRIC SOCK TO BE PROVIDED IN ALL LANDSCAPED AREAS & BEHIND RETAINING WALLS AND CONNECTED TO THE NEAREST STORMWATER PIT.
 - COMPRESSIVE STRENGTH f_c FOR CAST IN SITU CONCRETE TO BE A MINIMUM OF 20MPa AT 28 DAYS
 - PROVIDE CLEANING EYES TO ALL DOWNPIPES NOT DIRECTLY CONNECTED TO PITS
 - ISOLATED JOINTS TO BE PROVIDED TO ISOLATE CONCRETE PAVEMENTS FROM PITS
 - ALL TRENCH GRATES PROVIDED SHALL HAVE A MINIMUM CLEAR WIDTH OF 200mm
 - STORMWATER DRAINAGE CONNECTIONS TO THE MAIN SYSTEM SHALL BE TO THE REQUIREMENTS AND THE SATISFACTION OF LOCAL COUNCIL

UPPER LEVEL

- INSTALL Ø65mm uPVC SPITTER PIPES 20mm ABOVE SURFACE LEVEL FOR BALCONY AND CONCRETE ROOF AREAS TO ALLOW FOR EMERGENCY OVERFLOW INCASE OF BLOCKAGES DURING HEAVY STORMS. PLUMBER TO CONFIRM LOCATION DURING CONSTRUCTION.
- BALCONY, TERRACE & CONCRETE ROOF AREAS TO BE FITTED WITH RAINWATER OUTLETS AND CONNECTED TO NEAREST DOWNPIPE WHERE REQUIRED (TYP).
- DOWNPIPES (DP) SHOWN ON PLAN ARE TO BE Ø100mm uPVC OR 100x75 U.N.O. (TYP).
- CHARGED DOWNPIPES SHOWN ON PLAN MUST BE SEWER GRADE Ø100mm uPVC WITH ALL JOINTS SOLVENT WELDED TO A LEVEL 1200mm ABOVE THE RAINWATER TANK INLET R.L. (TYP).
- PROPOSED DOWNPIPE LOCATIONS ARE NOMINAL AND TO BE CONFIRMED DURING CONSTRUCTION (TYP).
- INSTALL DOWNPIPE WITH SPREADER PIPE (SP) (IF REQUIRED) TO DISPERSE STORMWATER ONTO LOWER ROOF AREAS EFFECTIVELY.