Tree Management Strategies

Arboricultural Impact Assessment

22 MARMORA STREET,
FRESHWATER, NSW
13-5-21

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Tree Management Strategies

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Contents

Summary

Tree Management Strategies have been commissioned by David + Lizzie Armstrong to provide an Arboricultural Impact Assessment for twenty trees at 22 Marmora Street, Freshwater, NSW, refer to (Figure 1).

This report aims to:

- Assess the health, condition and retention value of twenty trees.
- Calculate the impact the proposed development will have on twenty trees.
- Suggest sensitive construction or tree protection methods to retain high to medium value trees on the subject site or neighbouring site.
- Recommend the retention or removal of subject trees.

The Health, Condition and Retention values of twenty trees are recorded in the Tree Data Schedule (Appendix 1) and shown in the Tree Impact Plan (Appendix 2).

The developmental Impacts are explored in Developmental Impact and Observations (Section 2) of this report.

Conclusion

The minor incursion to Tree 1 will have a minimal impact with no adverse health effects expected.

Tree 2 will remain healthy and viable into the future with the Tree Sensitive Construction methods adhered to.

Tree 14 will remain healthy and viable into the future with the Tree Sensitive Construction methods adhered to.

Trees 3, 4, 9, 10, 11 and 20 are unaffected by the development.

Trees 5, 6, 7, 8, 15, 16 and 18 are suitable for removal without consent under the Northern Beaches Councils Exempt Tree Species list and have major incursions to their SRZ and TPZ that requires their removal.

Trees 12, 13, 17 and 19 are given are given a low retention value and have total incursions to their SRZ and TPZ that requires their removal, refer to the Tree Impact Plan (Appendix 2).

Recommendations

- Remove Tree 5, 6, 7, 8, 12, 13, 15, 16, 17, 18 and 19. Tree removal work to be undertaken in accordance with AS 4373 Pruning of Amenity Trees, using a qualified Arborist (minimum Australian Qualification Framework (AQF3) Level Arborist).
- Trees 3, 4, 9, 10, 11 and 20 are unaffected by the development and shall be retained.
- Retain Tree 2 and 14 adhering to the Tree Sensitive Construction methods outlined in Section 2.1 and 2.2 of this report.

1. Introduction

Tree Management Strategies have been commissioned by David + Lizzie Armstrong to provide an Arboricultural Impact Assessment for twenty trees at 22 Marmora Street, Freshwater, NSW, refer to (Figure 1).
The proposed development consists of the partial demolition of existing dwelling + studio, and new alterations, additions and associated Landscaping.

This report aims to:

- Assess the health, condition and retention value of twenty trees.
- Calculate the impact the proposed development will have on twenty trees.
- Suggest sensitive construction or tree protection methods to retain high to medium value trees on the subject site or neighbouring site.
- Recommend the retention or removal of subject trees.

Figure 1: Subject Site

Figure 1: Locality map of the subject site, highlighted in red.

2. Developmental Impacts and Observations

The Health, Condition, Retention values and photographs of twenty trees are recorded in the Tree Data Schedule (Appendix 1) and shown in the Tree Impact Plan (Appendix 2).

The method for this report is outlined in (Appendix 3) Method.

All tree values are in accordance with IACA Significance of a Tree, Assessment Rating System (STARS) © (IACA 2010) ©.

Tree 1 is given a medium retention value and has a minor incursion to its TPZ by the proposed Storm Water Design. The minor incursion will have a minimal impact to Tree 1 with no adverse health effects expected, refer to the Tree Impact Plan (Appendix 2).

Trees 3, 4, 9, 10, 11 and 20 are unaffected by the development, refer to the Tree Impact Plan (Appendix 2).

Trees 5, 6, 15, 16 and 18 are suitable for removal without consent under the Northern Beaches Councils Exempt Tree Species list and have total incursions to their SRZ and TPZ that requires their removal, refer to the Tree Impact Plan (Appendix 2).

Trees 7 and 8 are suitable for removal without consent under the Northern Beaches Councils Exempt Tree Species list and have major incursions to their TPZ's that require their removal, refer to the Tree Impact Plan (Appendix 2).

Trees 12, 13, 17 and 19 are given are given a low retention value and have total incursions to their SRZ and TPZ that requires their removal, refer to the Tree Impact Plan (Appendix 2).

The incursions to the theoretical Tree Preservation Zones (TPZ) and Structural Root Zones (SRZ) potentially affecting the remaining trees 2 and 14 assessed on the subject site are explored below.

2.2. Tree 2

Tree 2 located in the neighbouring property is given a medium retention value and has a minor incursion to its SRZ by the boundary fence footing and a major incursion of 13.92% to its TPZ by the proposed Storm Water Design, refer to the Tree Impact Plan (Appendix 2). The incursion to the TPZ by the storm design although deemed major is considered acceptable considering the species with no adverse health effects expected. The incursion to the SRZ by the boundary fence footing will require remediation and is explored below.

Design modifications:

N/A

Tree Sensitive construction:

The footings for the boundary fence within the SRZ of Tree 2 must be hand dug under the supervision of the Project Arborist. Manual excavation needs to be carried out under the supervision of the Project Arborist to identify roots critical to tree stability. Relocation or redesign of works may be required. Where the Project Arborist identifies roots to be pruned within or at the outer edge of the TPZ, they should be pruned with a final cut to undamaged wood. Pruning cuts should be made with sharp tools such as secateurs, pruners, handsaws or chainsaws. Pruning wounds should not be treated with dressings or paints. It is not acceptable for roots within the TPZ to be ‘pruned’ with machinery such as backhoes or excavators (CSA 2009).

Tree Protection measures:

To ensure the protection of tree 2 affected by the proposed development Trunk Protection is required as per the detail outline in (Figure 2).

The Project Arborist must certify the protection measures are installed to the required specifications prior to commencement of construction. The trunk protection should remain in place for the duration of construction.

Figure 2

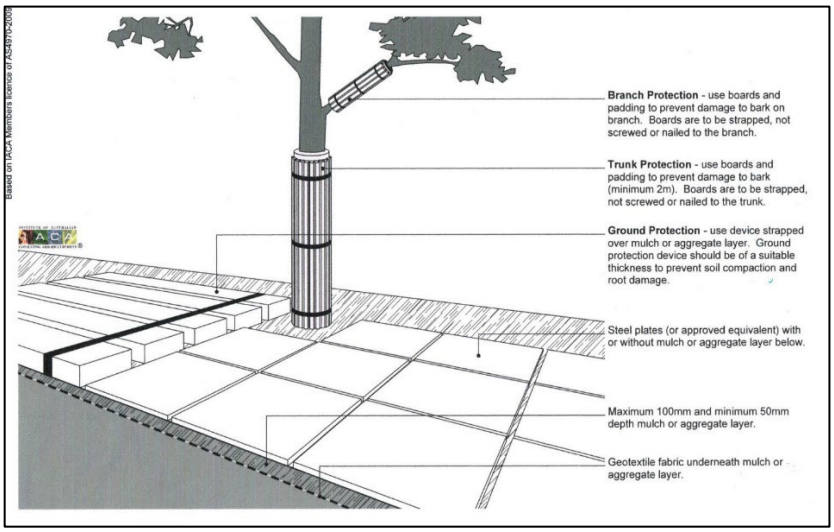


Figure 2: Example of Trunk Protection (CSA 2009).

Conclusion:

Tree 2 will remain healthy and viable into the future with the Tree Sensitive Construction methods adhered to.

Recommendations:

Retain Tree 2.

2.3. Tree 14

Tree 14 located in the neighbouring property is given a medium retention value. In the initial design phase, a pier and beam type sensitive construction method that ensured minimal excavation within the root system of Tree 14 was decided on with the footings to be hand dug.

Design modifications:

N/A

Tree Sensitive construction:

The footings for the pier and beam type construction within the SRZ and TPZ of Tree 14 must be hand dug under the supervision of the Project Arborist. Manual excavation needs to be carried out under the supervision of the Project Arborist to identify roots critical to tree stability. Relocation or redesign of works may be required. Where the Project Arborist identifies roots to be pruned within or at the outer edge of the TPZ, they should be pruned with a final cut to undamaged wood. Pruning cuts should be made with sharp tools such as secateurs, pruners, handsaws or chainsaws. Pruning wounds should not be treated with dressings or paints. It is not acceptable for roots within the TPZ to be 'pruned' with machinery such as backhoes or excavators (CSA 2009).

Tree Protection measures:

N/A

Conclusion:

Tree 14 will remain healthy and viable into the future with the Tree Sensitive Construction methods adhered to.

Recommendations:

Retain Tree 14.

3. Referenced Documents

Plans that were referred to for this report include:

Plan Title	Drawing Number	Consultant	Revision	Job/ Number
Tree Impact Plan	Fre.TIP.01	Tree Management Strategies	4-5-21	
Site and Roof Plan	DA-01	Sarah Blaker	12-4-21	
Stormwater Plan	SW-1	Michal Korecky	30-4-21	21042

4. Conclusions & Recommendations

Conclusion

The minor incursion to Tree 1 will have a minimal impact with no adverse health effects expected.

Tree 2 will remain healthy and viable into the future with the Tree Sensitive Construction methods adhered to.

Tree 14 will remain healthy and viable into the future with the Tree Sensitive Construction methods adhered to.

Trees 3, 4, 9, 10, 11 and 20 are unaffected by the development.

Trees 5, 6, 7, 8, 15, 16 and 18 are suitable for removal without consent under the Northern Beaches Councils Exempt Tree Species list and have major incursions to their SRZ and TPZ that requires their removal.

Trees 12, 13, 17 and 19 are given are given a low retention value and have total incursions to their SRZ and TPZ that requires their removal, refer to the Tree Impact Plan (Appendix 2).

Recommendations

- Remove Tree 5, 6, 7, 8, 12, 13, 15, 16, 17, 18 and 19. Tree removal work to be undertaken in accordance with AS 4373 Pruning of Amenity Trees, using a qualified Arborist (minimum Australian Qualification Framework (AQF3) Level Arborist).
- Trees 3, 4, 9, 10, 11 and 20 are unaffected by the development and shall be retained.
- Retain Tree 2 and 14 adhering to the Tree Sensitive Construction methods outlined in Section 2.1 and 2.2 of this report.

5. References

Shigo, A., 1986, A New Tree Biology and Dictionary: facts, photos, and philosophies on trees and their problems and proper care, Snohomish, WA

Council of Standards Australia (August 2009)
The Australian Standard for the Protection of Trees on Development Sites (AS 4970 – 2009).

Harris, R., Clark, J., Matheny, N., 2003, Integrated Management of Landscape Trees, Shrubs, and Vines, fourth edition, Prentice Hall, Australia

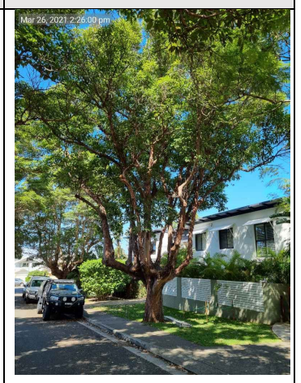
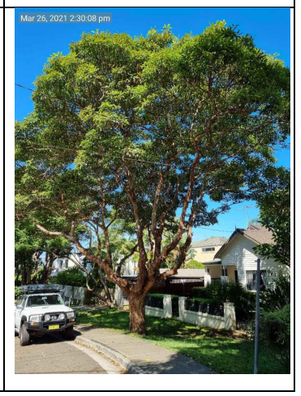
IACA, 2010, IACA Significance of a Tree, Assessment Rating System (STARS), Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au

6. Appendices

Appendix 1: Tree Data Schedule

Tree Management Strategies

APPENDIX 1 – TREE DATA SCHEDULE

No	Genus-species	Common Name	DAB metres (radius) Above Buttress	DBH metres (radius) Breast Ht	SRZ (radius) Metres	TPZ (radius) Metres	Height Metres	Age Young, Semi-Mature, Mature Over Mature	Canopy Spread (Metres) (radius)	Health Good Fair Fair/Poor Poor Failed	Condition Fair Fair/Poor Poor Failed	Useful Life Expectancy High Medium Low	Landscape significance High Medium Low	Retention value High Medium Low	Notes	Photo
1	Lophostemon confertus	Brush Box	0.90	0.80	3.2	9.60	14.00	Mature	6.00	Fair/Poor	Fair/Poor	Medium	Medium	Medium	Street Tree	
2	Jacaranda mimosifolia	Jacaranda	0.40	0.33	2.2	4	12.00	Mature	10.00	Fair/Poor	Poor	Medium	Medium	Medium	Tree has a large lean to the North	
3	Lophostemon confertus	Brush Box	0.56	0.49	2.6	5.9	12.00	Mature	8.00	Fair	Fair/Poor	Medium	Medium	Medium	Street Tree	

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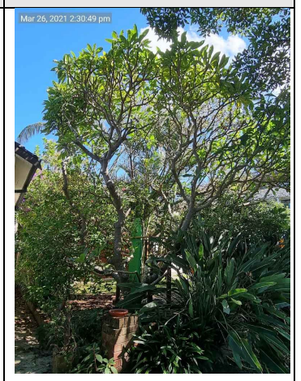
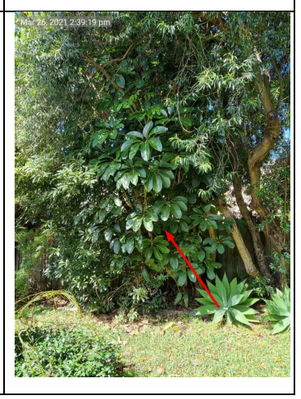
4	Plumeria species	Frangipani	0.22	0.2	1.7	2.2	6.00	Mature	3.00	Fair	Fair	Medium	Low	Low	Tree in neighbouring property, TPZ estimated.	
5	Lagerstroemia x indica	Crepe Myrtle	0.42	0.35	2.30	4.20	6.00	Mature	2.00	Fair	Fair	Medium	Low	Low	Exempt Tree Species	
6	Schefflera species	Umbrella Tree	0.32	0.22	2	2.6	7.00	Mature	2.00	Fair	Fair/Poor	Low	Low	Low	Exempt Tree Species	

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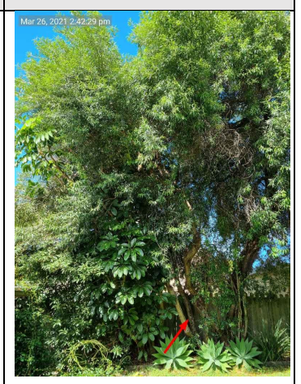
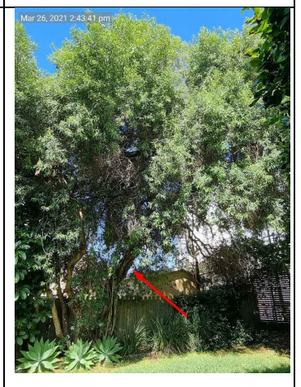
7	Olea 'Africana'	African Olive	0.20	0.17	1.7	2	8.00	Mature	2.00	Fair/Poor	Poor	Low	Low	Low	Exempt species	
8	Olea 'Africana'	African Olive	0.40	0.35	2.2	4.20	8.00	Mature	4.00	Fair/Poor	Fair/Poor	Low	Low	Low	Exempt species	
9	Plumeria species	Frangipani	0.18	0.15	1.6	1.80	5.00	Young	2.00	Fair	Fair/Poor	Medium	Low	Low		

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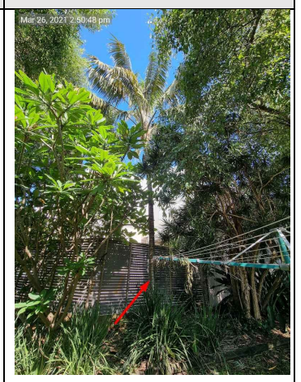
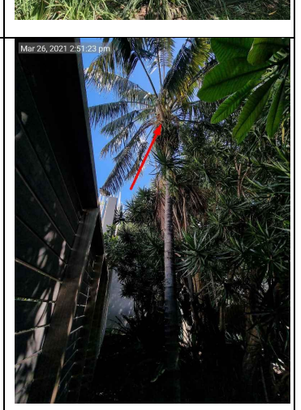
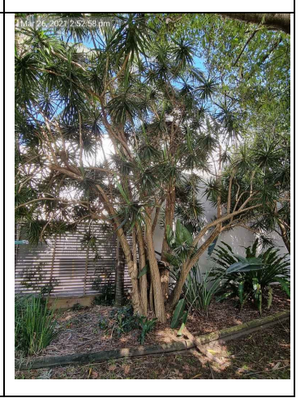
10	Howea forsteriana	Kentia Palm	0.10	0.10	1.3	1.20	10.00	Mature	1.00	Fair	Fair	Medium	Low	Low	Exempt Tree Species	
11	Howea forsteriana	Kentia Palm	0.10	0.10	1.3	1.20	10.00	Mature	1.00	Fair	Fair	Medium	Low	Low	Exempt Tree Species	
12	Dracena marginata	Dragon Tree	0.10	0.10	1.3	1.20	6.00	Mature	3.00	Fair	Fair	Medium	Low	Low		

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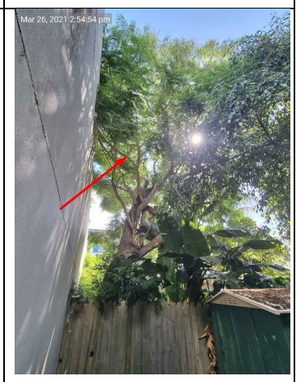
13	Dracena marginata	Dragon Tree	0.10	0.10	1.3	1.20	6.00	Mature	2.00	Fair	Fair	Medium	Low	Low		
14	Jacaranda mimosifolia	Jacaranda	0.45	0.35	2.4	4.20	12.00	Mature	6.00	Fair	Fair/Poor	Medium	Low	Low	Tree in neighbouring property, tpz estimated.	
15	Alnus jorullensis	Mexican Alder	0.38	0.32	2.20	3.8	14.00	Mature	5.00	Fair/Poor	Fair/Poor	Medium	Low	Low	Exempt Tree Species	

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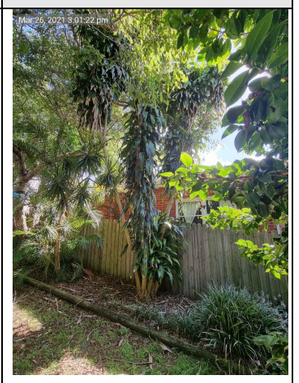
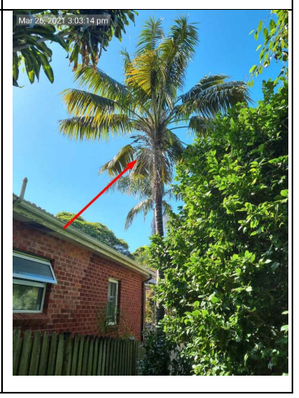
16	Dracena marginata	Dragon Tree	0.10	0.10	1.3	1.20	6.00	Mature	2.00	Fair/Poor	Fair/Poor	Low	Low	Low	Exempt species	
17	Camelia sasenqua	Camelia	0.30	0.25	2.00	3.00	6.00	Mature	2.00	Fair	Fair/Poor	Medium	Low	Low		
18	Howea forsteriana	Kentia Palm	0.10	0.10	1.3	1.20	8.00	Mature	1.00	Fair	Fair	Medium	Low	Low	Exempt species	

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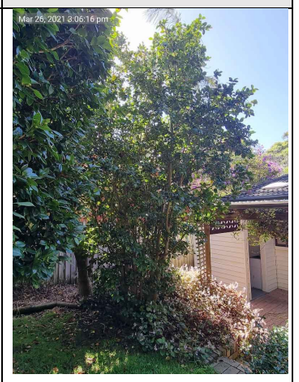
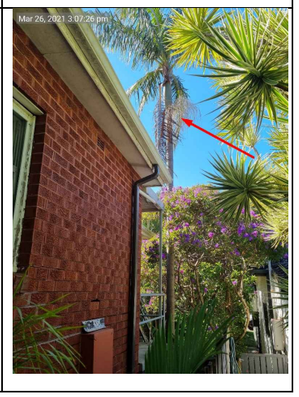
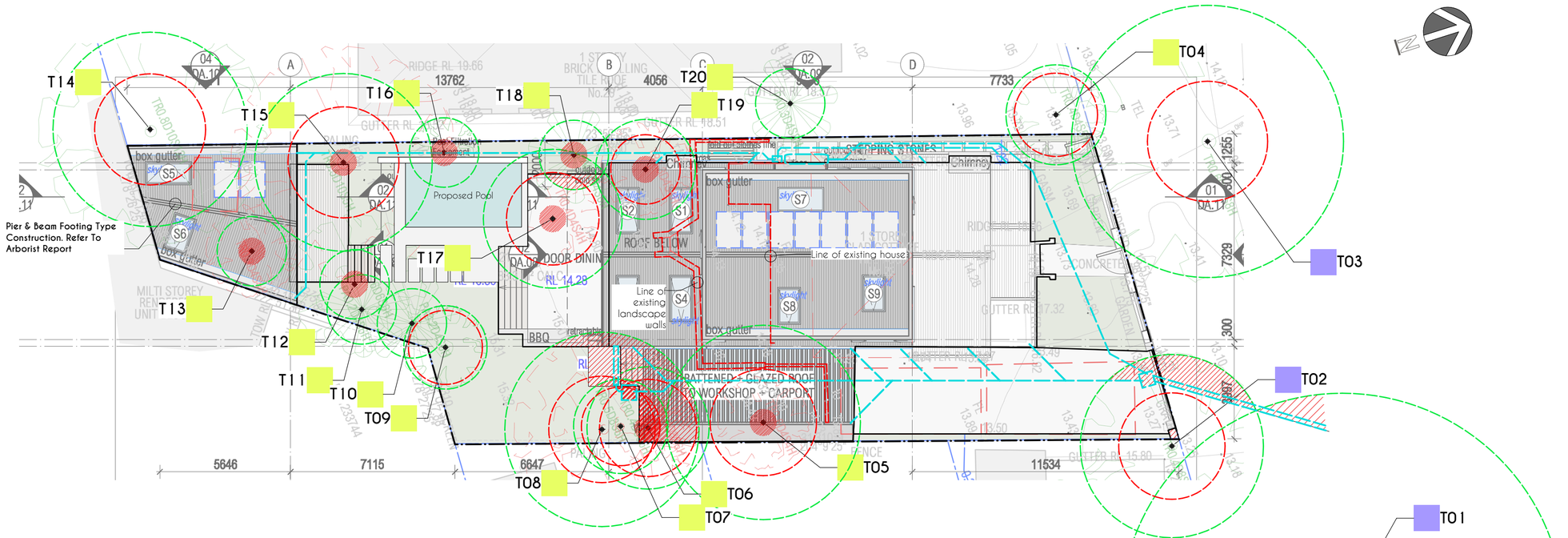
19	Camelia sasenqua	Camelia	0.15	0.18	1.5	2.2	5.00	Mature	2.00	Fair	Fair/Poor	Medium	Low	Low		
20	Archontophoenix cunninghamiana	Bangalow Palm	0.10	0.10	1.3	1.20	15.00	Mature	2.00	Fair	Fair	Medium	Low	Low	Neighbouring Tree	

Appendix 2: Tree Impact Plan



Legend

TPZ - Tree Protection Zone

SRZ - Structural Root Zone

Incursion Zone

Retention Value

Medium

Low

Incursion

Trunk Impact - Full Incursion

T05, T06, T12, T13, T15, T16, T17, T18, T19

T01

SRZ = No Incursion
TPZ = 289.53sqm
Incursion Zone 2.54sqm
Incursion = 0.88%

T02

SRZ = 16.62sqm
Incursion Zone 0.16sqm
Incursion = 0.96%
TPZ = 49.27sqm
Incursion Zone 6.87sqm
Incursion = 13.92%

T07

SRZ = 9.08sqm
Incursion Zone 1.94sqm
Incursion = 21.04%
TPZ = 13.09sqm
Incursion Zone 3.37sqm
Incursion = 25.78%

T08

SRZ = 16.62sqm
Incursion Zone 2.21sqm
Incursion = 13.3%
TPZ = 55.42sqm
Incursion Zone 14.61sqm
Incursion = 26.36%

Tree Management Strategies

DATE: 4/5/2021 | DWG: Fre.TP.01 | REVISION: 00 | SCALE @ A2 1:150 | DRAWN Mark Hill

CLIENT 22 Marmora Street

ADDRESS Freshwater

PLAN TITLE Tree Impact Plan

Tree Management Strategies Sydney, Central Coast, Newcastle
W: www.treemanagementstrategies.com.au. **T:** 0447 356059 **E:** leigh@treemanagementstrategies.com.au

Appendix 3: Method

Site Assessment

From the ground, the following information was recorded and displayed in the Tree Data Schedule (Appendix 1).

- Tree genus and species.
- Approximate height spread if deemed applicable.
- Trunk diameter at breast height and above the buttress.
- Age class: young, semi mature, mature, over mature.
- Health.
- Condition.

Observations were recorded and photographed.

Research

The following legislation, documents or websites were reviewed:

- The Australian Standard for the Protection of Trees on Development Sites (AS 4970 – 2009).
- Northern Beaches Council Development Control Plan 2000.
- Northern Beaches Council Local Environmental Plan 2011.

Tree Data Schedule Method

The Health and Condition of Trees one to twenty are shown in the Tree Data Schedule (**Appendix 1**) with the methods explained below:

Tree Health

Overall Health (Vigour/Vitality)	Tree vigour is exhibited by crown density, crown cover, leaf colour, leaf size, leaf texture, presence of epicormic growth, ability to withstand predation by pest and disease, resistance and degree of dieback.
Good (Excellent)	Good tree vigour exhibited by no decline in overall health and vigour, height and shape. The specimen is observed to be of excellent condition displaying characteristics that is known for that particular species (what would be the expected condition for that particular species of that age in that location), 0% dieback, full crown density, leaf health, no pest or disease present.
Fair	Fair tree vigour exhibited by moderate decline in overall health and vigour, height and shape. The specimen is observed to be of moderate condition by not displaying characteristics adequately that is known for that particular species (what would be expected for that particular species of that age in that location), less than 10% dieback, 90% of crown foliage density, more than 90% leaf health, acceptable level of pest or disease is evident for the assessing arborist (where it is considered the tree's overall health or condition will not be affected or lead to irreversible decline from pest or disease).
Fair/Poor	Fair to poor tree vigour exhibited by considerable decline in overall health and vigour, height and shape. The specimen is observed to be of less than acceptable condition by not displaying characteristics adequately that is known for that particular species (what would be expected for that particular species of that age in that location), 10-20% dieback, considerable foliage deficiencies, 70-90% foliage density, 70-90% leaf health, pest or disease infestation at acceptable thresholds for the assessing arborist (where it is considered the tree's overall health or condition will not be affected or lead to irreversible decline from pest or disease).
Poor	Poor vigour exhibited by substantial decline in overall health and vigour, height and shape. The specimen is observed to be of poor condition by not displaying characteristics adequately that is known for that particular species (what would be

	expected for that particular species of that age in that location), 20-30% dieback, considerable foliage deficiencies, 50-70% leaf health, pest or disease infestation at unacceptable infestation level that exceeds thresholds for the assessing arborist (where it is considered the tree's overall health or condition will be affected or lead to irreversible decline from pest or disease).
Very Poor	Very poor vigour exhibited by irreversible decline in overall health and vigour, height and shape. The specimen is observed to be of less than acceptable condition by not displaying characteristics adequately that is known for that particular species (what would be expected for that particular species of that age in that location), 15-50% dieback; severe foliage deficiencies; 30-50% density; 30-50% leaf health; pest or disease infestation at severe infestation level that exceeds thresholds for the assessing arborist (where it is considered the tree's overall health or condition will be affected or lead to irreversible decline from pest or disease).
Dead	Dead tree vigour exhibited by complete decline in overall health and vigour, height and shape. The specimen is observed to be dead by not displaying any characteristics adequately that is known for that particular species (what would be expected for that particular species of that age in that location), tree holds less than 15% foliage; branching is dead throughout canopy, pest or disease infestation at severe infestation level that exceeds thresholds for the assessing arborist (where it is considered the tree's overall health or condition will be affected or lead to irreversible decline from pest or disease).

Tree Condition

Overall Condition (Structure/Stability)	The tree condition as identified by the arborist in regard to defects in structure and stability.
Good (Exceptional specimen)	No damage or decay observed to the root plate, visible basal and /or root flare, stable in ground, well tapered branches with sound open unions. All characteristics within thresholds for the assessing arborist.
Fair (Standard tree – no observable major defects to suggest that there is an increased likelihood of tree or part of tree failure)	Minor damage or decay observed to root plate, trunk or primary branches or branch unions (1st or 2nd branch order or scaffolding branch), well-formed branch unions, minor branch end weight or over-extensions within thresholds for the assessing arborist.
Fair/Poor	Moderate damage or decay observed to root plate, trunk or primary branches or branch unions (1st or 2nd branch order or scaffolding branch); minimal basal/root flare; acute branch; past branch failure(s); moderate branch end-weight or over-extension approaching thresholds for the assessing arborist.
Poor	Major damage or decay observed to root plate, trunk or primary branches or branch unions (1st or 2nd branch order or scaffolding branch) no observable basal and /or root flare; acute branch unions starting to include bark; major branch end-weight or over-extension at or exceeds thresholds for the assessing arborist.
Very Poor	Excessive damage or decay observed to root plate, trunk, primary branch or branch unions (1st or 2nd branch order or scaffolding branch), excessive decay or hollows compromising the structural integrity, unstable in ground, excessive branch end-weight, included-bark unions, exceeding thresholds for assessing arborist. Failure probable.
Failed	Failure of root plate or trunk or primary branch or branch unions (1st or 2nd branch order or scaffolding branch) or active split between branch unions or severe damage to primary tree structure.

IACA Significance of a Tree, Assessment Rating System (STARS) © (IACA 2010) ©

In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd in June 2001.

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.

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 a council's 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 to 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 to 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 and or 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 mono-cultural stand in entirety.

Useful Life Expectancy (ULE)

Useful life expectancy (ULE) is a measure of a trees remaining lifespan regarding its health, condition and locality ULE categories were measured as:

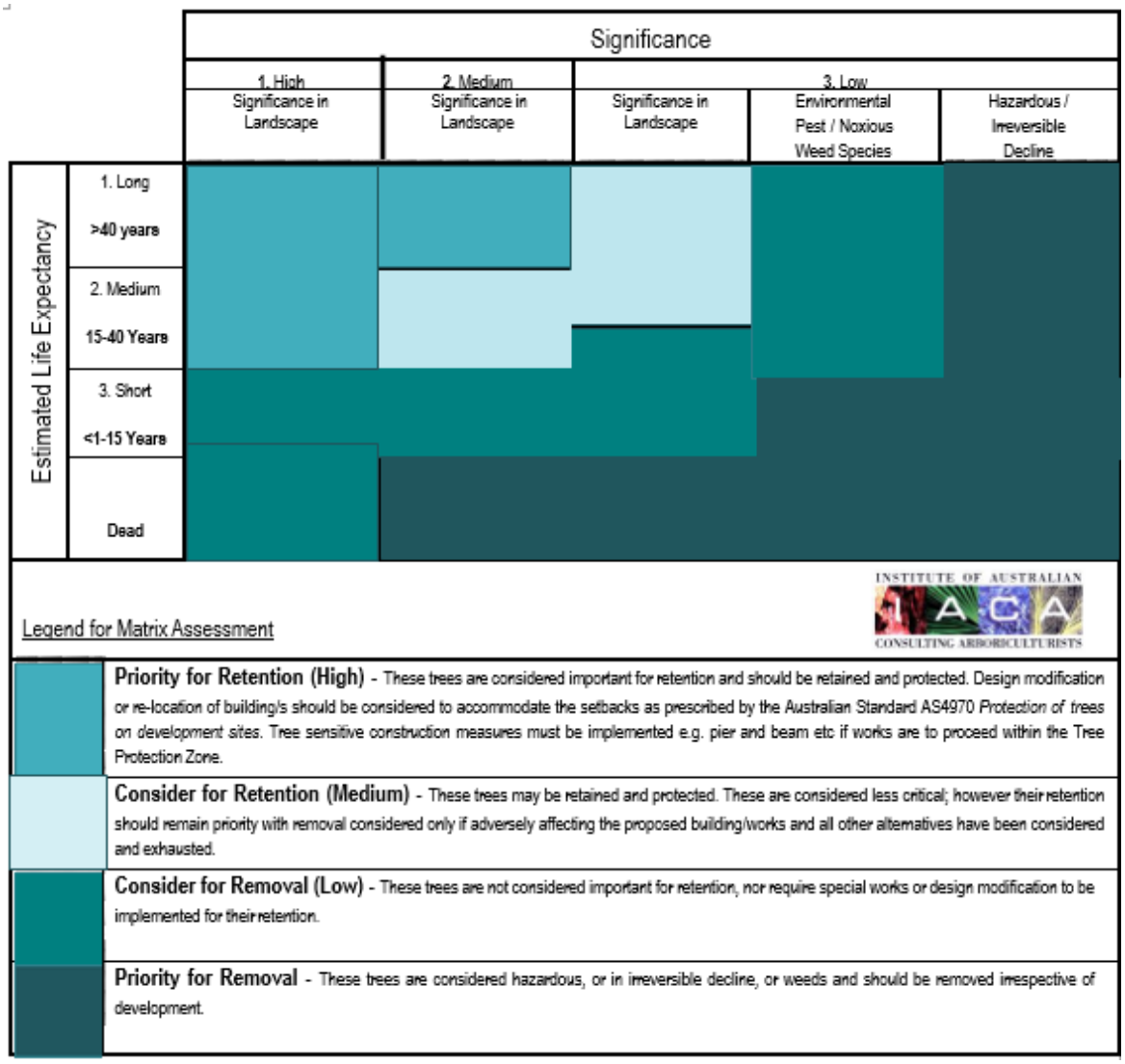
a) Long (greater than 40 years)

b) Medium (between 15 and 40 years)

c) Short (between 1 and 15 years)

d) Dead

Tree Retention Value - Priority Matrix



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Draper BD and Richards PA 2009, *Dictionary for Managing Trees in Urban Environments*, Institute of Australian Consulting Arboriculturist (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

Tree Protection Zone and Structural Root Zone Method

Following the VTA, The Tree Preservation Zones and Structural Root zones were calculated and added to the Tree Data Schedule (Appendix 1) and the Tree Impact Plan (Appendix 2) with the methods explained below:

The Structural Root Zone (SRZ) is the area around the base of a tree required for its stability. The woody root growth and soil cohesion in this area are necessary to hold the tree upright; therefore, there are no variations to its size. The SRZ is normally circular with the trunk at its centre and is expressed by its radius in metres (AS – 4970). Due to the potential of causing instability of a tree, it is highly recommended that no roots within its SRZ are pruned or removed. SRZ, which is the area required for tree stability, was calculated as follows: SRZ radius = (D x 50) 0.42 x 0.64.

The Tree Protection Zone (TPZ) is the principle means of protecting trees on development sites. The TPZ is a combination of the root area and crown area that requires protection. It is an area isolated from construction disturbance, so that the tree remains viable (AS – 4970). The radius of the TPZ is calculated for each tree by multiplying its DBH x 12. TPZ = DBH x 12 (DBH = trunk diameter measured at 1.4m above ground level). The radius of the TPZ is measured from COT (Centre of the trunk).

Variations to the Tree Protection Zone (TPZ)

General
It may be possible to encroach into or make variations to the standard TPZ. Encroachment Includes excavation, compacted fill and machine trenching.

Minor encroachment
If the proposed encroachment is less than 10% of the area of the TPZ and is outside the SRZ, detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. Variations must be made by the project arborist considering relevant factors. (Figure 3) demonstrates some examples of possible encroachment into the TPZ up to 10% of the area.

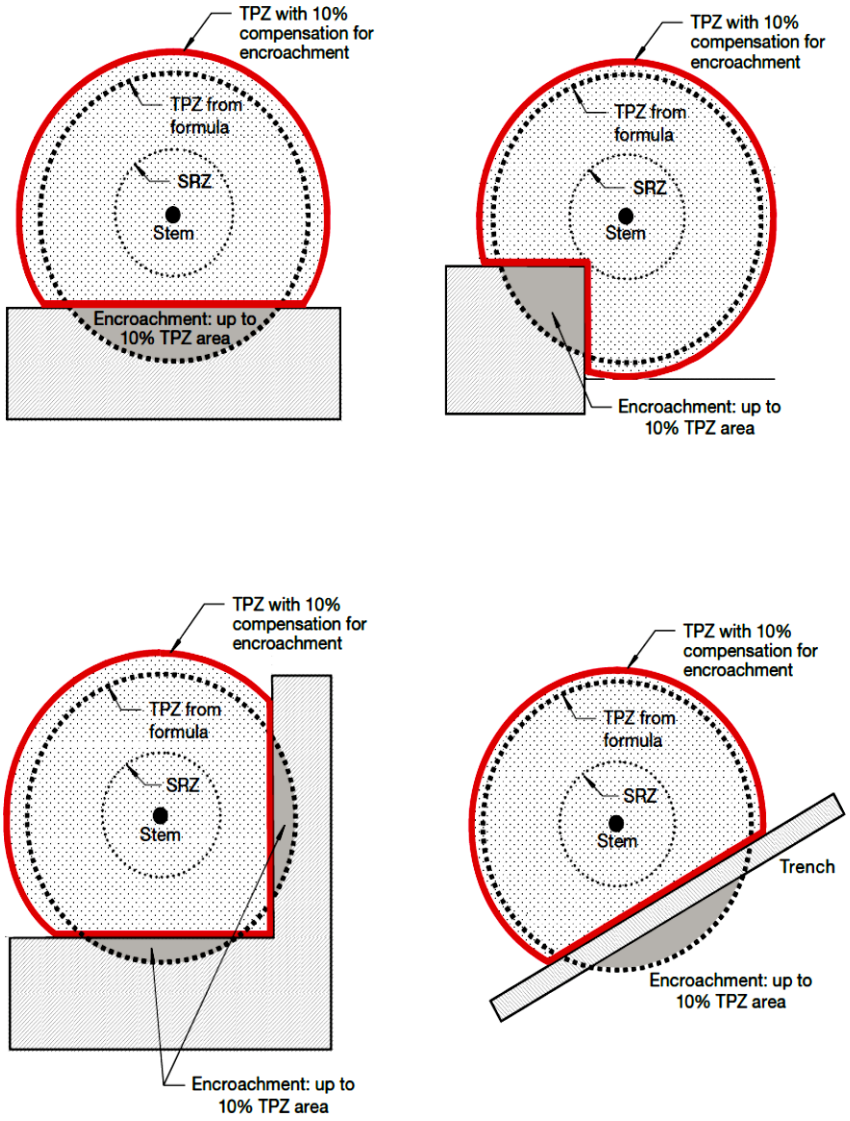
Major encroachment
If the proposed encroachment is greater than 10% of the TPZ or inside the SRZ the project arborist must demonstrate that the tree(s) would remain viable. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. This may require root investigation by non-destructive methods and consideration of relevant factors listed in the Clause.

Figure 3

ENCROACHMENT INTO TREE PROTECTION ZONE

(Informative)

Encroachment into the tree protection zone (TPZ) is sometimes unavoidable. Figure D1 provides examples of TPZ encroachment by area, to assist in reducing the impact of such incursions.



NOTE: Less than 10% TPZ area and outside SRZ. Any loss of TPZ compensated for elsewhere.