Impact Assessment

And

Root Mapping

Project Arborist Report

Prepared for; Mr & Mrs Meylakh.

Project address; 20 Wolli Avenue NSW 2206

Date; 25-04-2024

Prepared by;

Bellevue Tree Consultants

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1. Introduction.

1.1. Background.

Bellevue tree consultants has been appointed the project arborist for the proposed development application at 20 Wolli Road Earlwood, referred to within this report as the subject property.

1.2. Aim of this report.

The aim of this report is to assess the impact of a proposed driveway cross-over to access a new carport within the subject property.

1.3 Documents reviewed in preparation for this report.

- Proposed Site Plan prepared by DBB Design & Build. Issue DA-A. Dwg-02 dated 20-02-24
- Driveway construction detail- Standard Medium Duty Vehicular Footway Crossing (VFC) Canterbury - Bankstown Council- STD DWG No- S-008 Revision- Dated 10-01-19.
- Standard location of VFCs & Property Drainage Canterbury -Bankstown Council- STD DWG No- S-004 Revision- Dated 20-10-20.
- Australian Standard AS 4970-2009 'Protection of trees on Development sites
- Australian Standard AS 4373-2007 'Pruning of amenity trees'.

2.0. Methodology

- A Tree Evaluation was completed using the Visual Tree Assessment (VTA) method as described in The Body Language of Trees (Mattheck. & Breloer 1999).
- Canopy radius and tree height were estimated. Diameter at Breast Height (DBH) at 1.4m from ground level and Diameter at Base (DAB) were measured by diameter tape measure (MillionX10). DBH was rounded up in 5mm increments. Multi-trunks DBH inserted into AS4970-2009 Calculator Council Arboriculture Victoria (CAV) to determine combined measurement in millimetres.
- All trees inspected are numbered and are provided in the Tree Schedule (refer Appendix A)
- A tree retention value has been calculated using. Tree Retention Matrix Modified by Morton.A. from Couston,M and Howden.M (2001) Tree Retention Values Table Footprint Green Pty Ltd, Sydney Australia.(Refer Appendix B)
- The Useful Life Expectancy (U.L.E.) was estimated using U.L.E. categories and subgroups *(Pre –planning Tree surveys; Barrell.J:1993).* Explanatory notes U.L.E. categories and terminology (Refer appendix D).
- A tree location plan showing the position of the trees inspected has been included (refer Appendix G.1 Tree Location Plan).
- Soil Landscapes of NSW *(e-spade)* was consulted, no soil samples or Ph tests were performed.
- No sonic tomograph, resistograph, or aerial inspections were performed.

3.0. Site details

3.1. Site description.

The property is identified as Lot b/-/DP368348. The subject site is relatively level with a North-South orientation. The 461.2 sq metre site contains a well-maintained residential dwelling.

3.2. Figure 1. Site location. (Source Six maps)

Table 1. Site information

Local Government Area	Canterbury-Bankstown Council
Relevant Planning policies	Canterbury-Bankstown Development Control Plan (DCP) 2023. 5.3.4. Tree Management Manual. Canterbury-Bankstown Local Environment Plan (LEP) 2023- Current version November 2023. SEPP (Biodiversity & Conservation) 2021
Land zoning	R2- Low Density Residential.
Significant Tree Register	Nil result
Bush fire 10/50 search result	Nil result
Threatened species/Endangered ecological community - Biodiversity Values Map and Threshold Tool	Nil result.
Heritage Item LEP 2023	Nil result.

4. Subject trees

4.1. 1 prescribed tree (T1) was assessed and is a public street tree. Prescribed trees are protected by the Vegetation SEPP 2021 and Canterbury -Bankstown DCP 2023 Tree Management Manual. A tree is defined as a perennial plant that is ≥ 5metres in height.

4.2. T1 is a planted Australian native species (*Lophostemon confertus*). No other trees within the subject site have been assessed as part of this report.

4.3. All trees assessed have been allocated an identification number and correlate with Appendix A. Tree Assessment Schedule and Appendix G.1. Tree Location Plan.

5. Impact Appraisal

5.1. The Tree Protection Zone (TPZ) is the area that protects the above and below ground parts of a tree. Structural Root Zone (SRZ) is the area required for tree stability. As described in the Australian Standard *Protection of trees on development sites* (AS 4970), encroachments less than 10% are considered to be minor and acceptable. No specifications are provided within the AS4970 for encroachments greater than 10% and it is the consulting arborist that must investigate if the tree will remain stable and viable.

5.2. A root mapping trench was dug where the new driveway crossover is to be located, 3.2m from the centre of T1. The depth of the trench (250mm) represents the depth required to install a Medium Duty Vehicular Footway Crossing (VFC) as outlined in STD DWG No- S-008. Dated 10-01-19. The location of new driveway crossover, at 3.2 m from the centre of T1, places it outside the SRZ of T1 in compliance with Standard location of VFCs & Property Drainage Canterbury - Bankstown Council- STD DWG No- S-004- Dated 20-10-20.

5.3. A summary of the tree roots found when the root mapping trench was dug can be found in Table 2.

Table 2 Root Mapping.

Root ID No.	Diameter (mm)	Depth (mm)	Quantity
1	≤10	50- 250	≤ 30
2	≥ 10-40	50-250	Nil
3 (woody root)	≥ 40	50-250	Nil

6. Conclusions and Recommendations.

6.1. The root mapping results demonstrate that no tree roots ≥10mm were found at the depth of the proposed driveway (250mm). No tree roots ≥40mm, considered vital for tree stability, were found and are more than likely at a depth >250mm. Provided the excavation for the proposed VFC does not exceed 250mm and is placed outside the SRZ, it is possible for T1 and the VFC to co-exist without causing injury to the tree or damage to the structure.

6.2.All care is to be taken to protect the trunk & branches of the tree (refer Section 7.3) and any exposed tree roots, only those tree roots ≤ 10mm necessary to be removed to accommodate new VFC are to be cleanly severed. Roots ≥ 40mm are not to b pruned or damaged (refer Section 7.5) ;The project arborist is to supervise all excavations within the TPZ.

6.3. The immediate impact on the retained tree will come from the demolition existing features (Kerb), and excavation works. All care is to be taken during the demolition/excavation stage, with the use of hand tools and machinery with a long

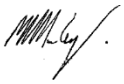
reach located outside the TPZ or supported by ground protection to prevent root damage. Impact to the canopy may arise from the operation (slewing) of cranes, excavators, or similar construction machinery. Under no circumstances are branches or foliage to be damaged by machinery, where there is a conflict between tree canopy and machinery or other elements, the project arborist shall provide advice and direction. All pruning is to be incompliance with AS-4373; Pruning of amenity trees and represent ≤10% of total canopy removed within a 12-month period.

Any additional excavation, level changes or design modifications are to be reviewed by the project arborist with a minimum AQF Level 5 qualification in Arboriculture.

6.4. It is recommended that the street verge be maintained with existing ground levels retained and new turf installed and irrigated deeply.

Regards

Michael Marley



Principle Arborist
Bellevue Tree Consultants
Dip Hort / Dip Arb
AQF level 5 (TAFE-2006-2911234)
Registered Quantified Tree Risk Assessment (QTRA) and Advanced registered licensee (QTRA4431).
Accredited member- Institute of Australian Consulting Arboriculturists (ACM0692019).

7. Arboricultural Method Statement

7.1 Prior to works commencing.

7.1.1 A project arborist is to be engaged prior to any demolition or constructions works. The Project Arborist shall have a minimum AQF level 5 qualification in Arboriculture.

7.1.2 The Project Arborist, in consultation with the Project Supervisor, are to review and augment the site contractor induction to ensure all tree protection measures and all relevant guidelines within this statement are included.

7.1.3 Details of requirements relating to Project Arborists are set out in section 7.9 Key hold points.

7.1.4 Principal contractor to implement all tree protection measures in compliance with the tree protection plan and tree protection guidelines.

7.2 Tree protection guidelines

All tree protection measures must be maintained in good condition during the construction works and kept in place until the completion of works or as otherwise advised by the Project Arborist.

7.2 1 Each Tree Protection Zone shall:

- be enclosed by a 1.8m high fully supported chainmesh protective fencing.
- The fencing shall be secure and fastened to prevent movement.
- The fencing shall have a lockable opening for access.
- Roots greater than ≥40mm in diameter shall not be pruned, damaged, or destroyed during the installation or maintenance of the fencing.

7.2.2 The fencing shall not:

- be moved, altered or removed without the approval of the Project Arborist;
- have a minimum of two signs that include the words “Tree Protection Zone – Keep Out”. Each sign shall be a minimum size of 600mm x 500mm and state the name and contact details of the Project Arborist. Signs shall be attached facing outwards in prominent positions at 10 metre intervals or closer where the fence changes direction.
- The TPZ shall be kept free of weeds except where there is existing turf. The weeds shall be removed by hand; and unless the existing surface is turf, have mulch installed and maintained to a depth of 75mm. The mulch shall consist of mixed leaf and coarse woodchip in accordance with AS4454:2012 Composts, Soil Conditioners and Mulches.

7.3 Ground protection and trunk protection

7.3.1 Shall be installed when the Project Arborist determines protection fencing is not feasible, or the tree protection fencing is to be temporarily removed.

7.3.2 The stem and branches of retained trees shall be protected, as follows:

- install 65mm Drain coil Agg pipe around trunk at 1m intervals (refer Figure 4)
- install hardwood or treated pine timbers (100mm x 50mm) the same length as the stem or branch shall be positioned over the drain coil and next to each other around the stem or branch, secured together with galvanised wire or strapping. Boards shall not be nailed or screwed into the stem or branch.
- No part of the protection shall be secured to the tree.

7.3.3 The ground surface within the Tree Protection Zone shall be protected by placing geotextile fabric on the ground surface, covered with a layer of mulch to a depth of 75mm and then placing load bearing boarding (truck matts, steel plates or similar material) on top. The geotextile fabric and mulch shall be kept clear of tree stems by a least 50mm.

7.4 Activities prohibited within the Tree Protection Zone

- disposal of chemicals and liquids (including concrete and mortar slurry, solvents, paint, fuel or oil)
- stockpiling, storage or mixing of materials.
- refuelling, parking, storing, washing and repairing tools, equipment, machinery and vehicles
- disposal of building materials and waste
- increasing or decreasing soil levels (cut and fill).
- soil cultivation, excavation, or trenching.
- placing of offices or sheds.
- erection of scaffolding or hoardings; and/or
- any other act that may adversely affect the vitality or structural condition of the tree.

7.5 Excavation within the Tree Protection Zone

7.5.1 Shall be undertaken using non-destructive methods (e.g. an airspade, hydro-vac or by hand) to ensure no roots greater than ≥40mm in diameter are damaged, pruned or removed. All care shall be taken to preserve and avoid damaging roots; Where roots <40mm cannot be avoided, they are to be clean cut with sharp saw or secateurs. All exposed roots are to be covered immediately with mulch or dampened hessian or similar material.

7.5.2 Excavation shall not to occur within the Structural Root Zone

7.5.3 Any additional stormwater drainage, detention pits, rainwater tanks and/or absorption trenches must accommodate the TPZ's set out in Appendix A - Tree assessment schedule. All amended plans shall be reviewed, and the impact assessed by the Project Arborist.

7.6 Installation of underground services

7.6.1 The method for trenching within a TPZ shall either be by hand methods e.g. hand digging with a spade or trowel, hydro-vac or an air spade. Trenchless technology such as directional underground boring shall be considered where feasible.

The underground services shall be positioned below the network of protected roots without causing damage to roots ≥40mm in diameter.

7.6.2 Where feasible, all underground services shall be routed & installed beyond the identified TPZ's. Where it is impossible to divert services beyond the TPZ's, detailed plans showing the proposed routing shall be drawn in conjunction with advice from the Project Arborist.

7.6.3 Topsoil and subsoil excavated from the trench shall be deposited into separate piles and kept apart and covered until required for backfilling.

7.6.4 No roots ≥40mm in diameter are to be severed without prior agreement with the Project Arborist.

7.6.5 In cases of extreme heat or unless the trench is to be backfilled within the same day, all exposed roots > 40mm in diameter shall be wrapped with damp hessian to prevent drying out.

7.6.6 Where is it necessary to sever any woody roots, they shall be clean cut with secateurs or a pruning saw.

7.7 Demolition

7.7.1 To prevent root damage all demolition works within the TPZ are be performed with the use of hand tools and/or machinery with a long reach located outside the TPZ or supported by ground protection.

7.7.2 To ensure trees are not impacted by the movement of vehicles or machinery, a no-go zone area shall be established using protective fencing (refer A.G2 Tree Protection Plan). If protection fencing must be moved or is not practicable, then ground protection shall be installed and approved by the Project Arborist (refer section 7.3.3).

7.7.3 Impact to the canopy may arise from the operation (slewing) of cranes or similar construction machinery. Under no circumstances are branches or foliage to be damaged by construction machinery, where there is a conflict between tree canopy and construction machinery or other elements (e.g. scaffolding), the project arborist shall provide advice and direction.

7.8 Landscaping

7.8.1 Any new gardens and footpaths are to be installed on or slightly above existing levels.

7.8.2 No excavation within the TPZ or skimming within the SRZ shall occur.

7.8.3 For turfing, the existing ground levels shall be maintained within a minimum variation of depth or height of 50mm.

7.8.4 Excavation for new plant material shall be flexible in their location, if tree roots >40mm within the TPZ are encountered, the planting hole is to be moved to avoid roots.

7.8.5. Fencing posts shall be flexible in their location, if tree roots >40mm within the TPZ are encountered, the post hole is to be moved to avoid roots

7.8.6. Excavation for irrigation services (trenching) refer 7.5

7.8.7. Any additional retaining walls must accommodate the TPZ's set out in Appendix A - Tree assessment schedule. All amended plans shall be reviewed, and the impact assessed by the Project Arborist.

7.9 Key Hold Points (Table 4)

Hold point	Stage	Task	Responsibility	Certification
1	Prior to all work commencing.	Clearly mark trees approved for removal.	Principle contractor	Project arborist
2	Prior to demotion and site establishment	Implement all approved tree protection measures	Principle contractor	Project arborist
3	Construction	Supervision of excavations within the TPZ	Principle contractor	Project arborist
4	Monthly inspections or as required	Inspection of trees and tree protection and/or any works within the TPZ.	Principle contractor	Project arborist
5	Prior to issue of occupation certificate	Final inspection of trees	Principle contractor	Project arborist

8. Examples of tree protection.

Figure 3. Tree protective fencing and signage.

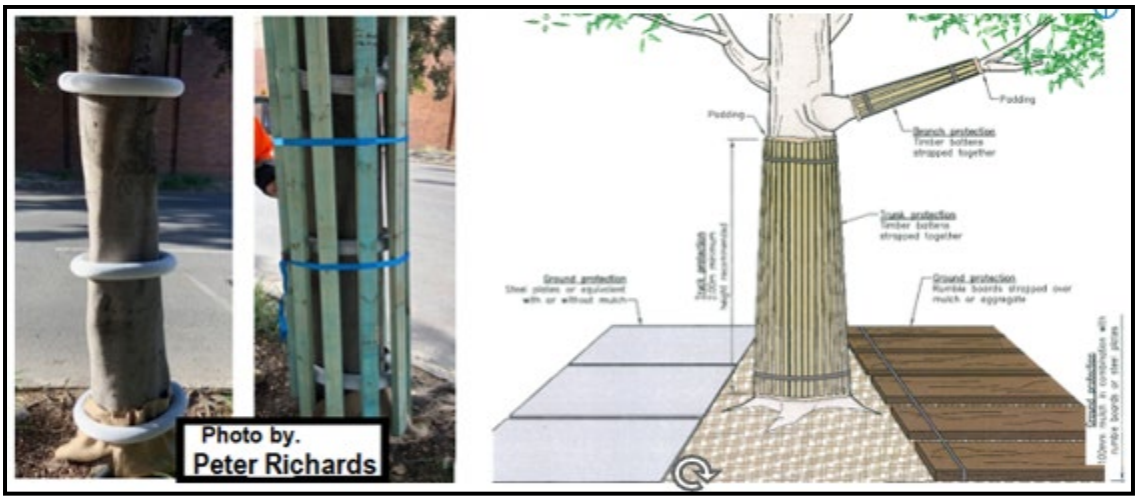


Figure 4. Trunk and branch protection.

Figure 5. Ground protection.

9.Site Photos.

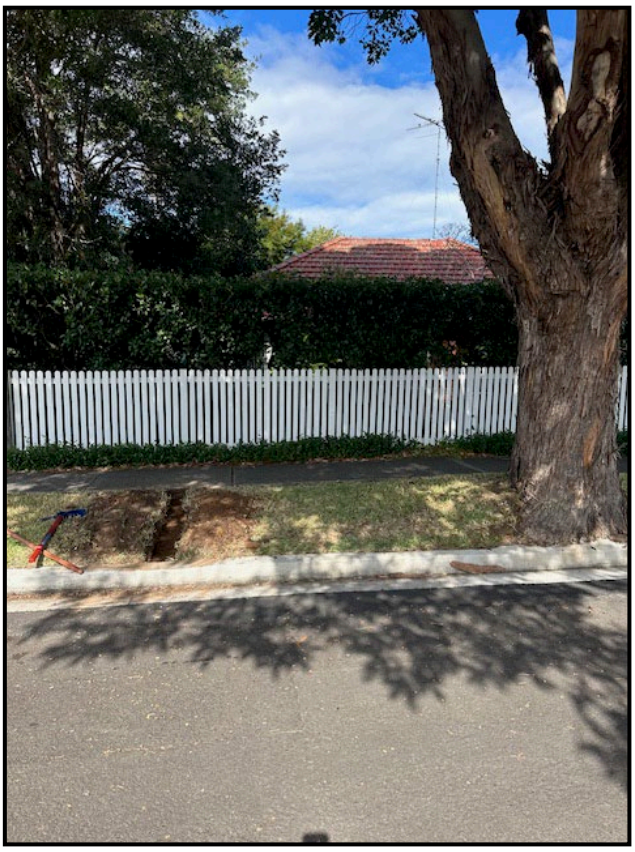


Photo 1.

Root mapping trench @ 3.2m from centre of tree 1.

Photo 2.

Trench @ 250mm deep.

Photo 3.

Only Tree roots ≤ 10mm exposed.

Image 4.

No tree roots at back of kerb.

Appendix A. Tree assessment schedule.

Tree No	Genus Species	Age	Height (m)	DBH & DAB (mm)	TPZ & SRZ (m)	Canopy Radius (m)	ULE	Condition	Vigour	Retention Value	Crown Class	Live crown Ratio (%)	Landscape significance	Comment
1	*Lophostemon confertus* (QLD Brush Box)	M	18	850 900	10.2 3.1	7.0	15-40 2.c	Fair	Good	High	Dom	60	3	Poor pruning history. Lopped @ 1.2m. multi-trunked with sound unions (Slater 2006). <10% Dead wood / stubs.

Appendix B. Tree Retention Matrix

Estimated Life Expectancy	Landscape Significance Rating 1	2	3	4	5	6	7
Long - Greater than 40 Years	High Retention Value						
Medium- 15 to 40 Years			Moderate Value	Retention			
Short - 5 to 15 years				Low Ret. Value			
Transient - Less than 5 Years				Very Low Retention Value			
Dead or Potentially Hazardous							

Modified by Morton .A. from Couston,M and Howden.M (2001) Tree Retention Values Table Footprint Green Pty Ltd, Sydney Australia.

Appendix C. Explanation of terms

Height – Provided in Tree Schedule as metres.

U.L.E. - Useful Life Expectancy.

D.B.H - Diameter at Breast Height (*measured at 1.4 meters from base*)

D.A.B - Diameter at base.

Age Class - J juvenile **SM** semi mature **M** mature **OM** over mature

Crown Class - D Dominant **CO** Co-dominant **I** Intermediate **S** Suppressed

Live Crown Ratio - Is the ratio of the foliage canopy to the total height of the tree.

Canopy Spread - N north **S south** **E** east **W** west

T.P.Z. Tree Protection Zone means an area above and below ground calculated in accordance with AS 4970-2009 Protection of trees on development sites. It is a radial distance from the stem set aside for the protection of a tree's roots and crown to provide for the viability and stability of the tree. The extent of potential impacts to the trees is summarised as:
0% of root zone impacted – no impact of significance
0 to 10% of TPZ impacted – low level of impact
10 to 15% of TPZ impacted – low to marginal level of impact
15 to 20% of TPZ impacted – marginal level of impact
20 to 25% of TPZ impacted – marginal to high level of impact
25 to 35% of TPZ impacted – high level of impact
>35% of TPZ impacted – significant level of impact *(Sourced from Guy Paroissien Landscape Matrix Pty Ltd)*

S.R.Z. Structural Root Zone is the area root zone area required to maintain a stable tree. The tree's woody roots and soil cohesion in this area are necessary to hold the tree upright. It is a radial distance from the stem calculated in accordance with AS 4970 -2009 Protection of trees on development sites. A greater area is required to maintain a trees vigour and longevity.

Vigour. The general appearance of the canopy/foliage of the tree at the time of inspection. Vigour can vary with the season and rainfall frequency. A tree can have 'Good' vigour but be hazardous due to 'Poor' condition. A tree in good vigour has the ability to sustain its life processes. Vigour is synonymous with health **G** Good **F** Fair **P** Poor

Wound wood Development - **G** Good **F** Fair **P** Poor

Structural Condition The general form and structure of the trunk/s and branching. Trunk lean, trunk/branch structural defects, canopy skewness or other hazards are considered. - **G** Good **F** Fair **P** Poor

Appendix D. U.L.E

Useful Life Expectancy (U.L.E) Categories and Subgroups (J Barrell 1996)

1. Long ULE > 40 Years

a) Structurally sound trees located in positions that can accommodate future growth

b) Trees which could be made suitable for long term retention by remedial care

c) Trees of special significance which would warrant extraordinary efforts to secure their long-term retention

2. Medium ULE of 15 – 40 Years

a) Trees which may only live from 15 to 40 years

b) Trees which may live for more than 40 years but would be removed for safety or nuisance reasons

c) Trees which may live for more than 15 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting

d) Trees which could be made suitable for retention in the medium term by remedial care

3. Short ULE of 5 – 15 Years

a) Trees which may only live from 5 to 15 years

b) Trees which may live for more than 15 years but would be removed for safety or nuisance reasons

c) Trees which may live for more than 15 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting

d) Trees which require substantial remediation and are only suitable for retention in the short term.

4. Remove tree within 5 years.

a) Dead, dying, suppressed or declining trees because of disease or inhospitable conditions

b) dangerous trees through instability or recent loss of adjacent trees

c) Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form

d) Damaged trees that are clearly not safe to retain

e) Trees which may live for more than 5 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting

f) Trees which are damaging or may cause damage to existing structures within the next 5 years

5.Trees suitable for transplanting.

a) small trees less than 5m in height

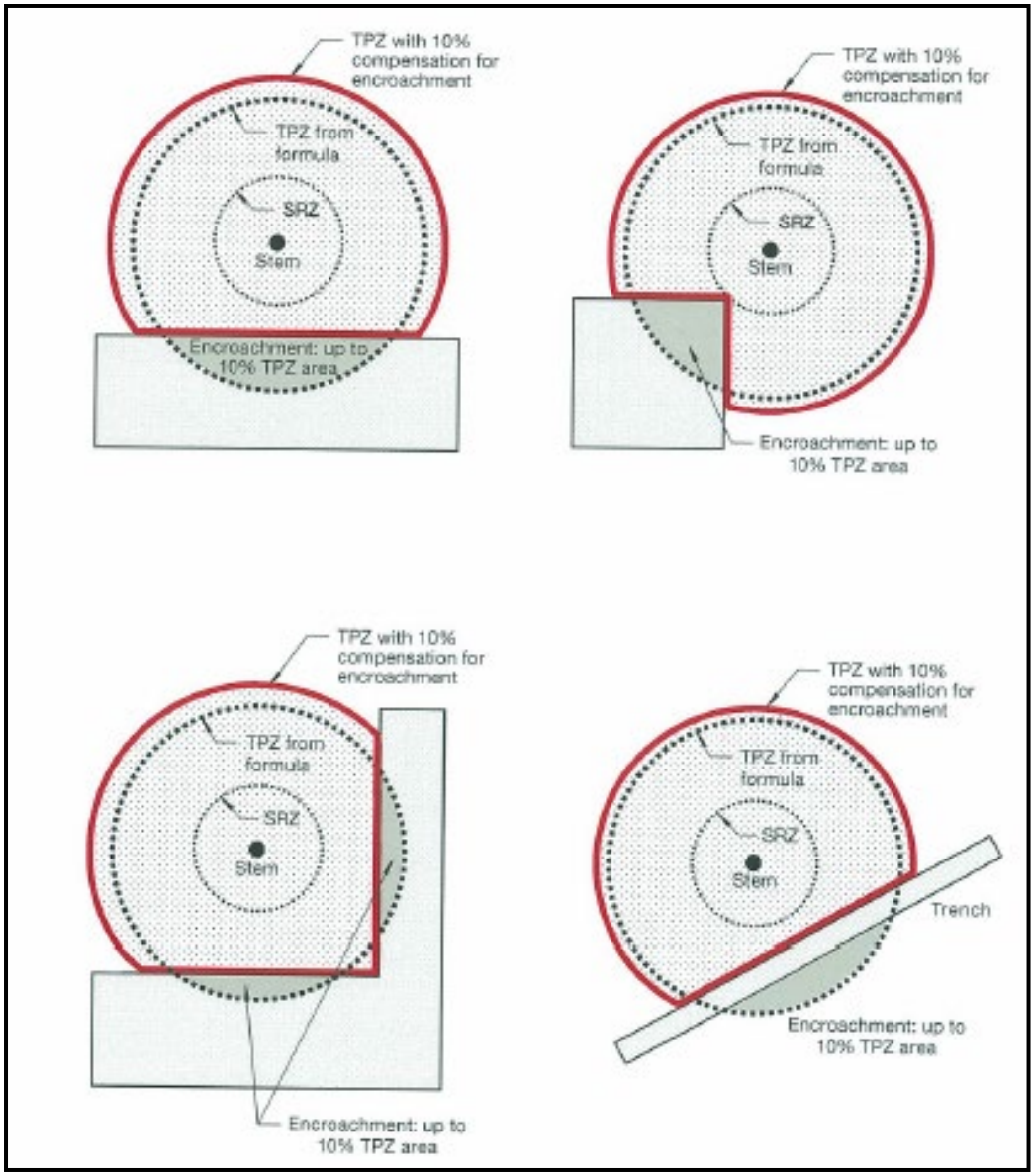
b) young trees less than 15 years old but over 5m in height

c) formal hedges and trees intended for regular pruning to control growth.

d) palms, monocots, cycads and tree ferns.

Appendix E. Examples of minor encroachment into the TPZ

Sourced from AS4970 Protection of trees on development sites-2009.



Appendix F. References

- Mattheck C & Breloer H (1999) The Body Language of Trees – A handbook for failure analysis 5th ed., London: The Stationery Office, U.K
- Slater D (2016) Assessment of Tree Forks: Junctions in Trees: Assessment of Junctions for Risk Management 2016.Romsey United Kingdom.
- Draper. D. Richards P (2009). Dictionary for managing trees in urban environments. CSIRO publishing
- Australian Standard AS 4970-2009 'Protection of trees on Development sites.
- Australian Standard AS 4373-2007 'Pruning of Amenity Trees'.
- Appendix C. TPZ potential impacts. Sourced from Guy Paroissien Landscape Matrix Pty Ltd