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INSTITUTE OF AUSTRALIAN
CONSULTING ARBORICULTURISTS



REPORT:

ARBORICULTURAL IMPACT ASSESSMENT

**32 Moseley Street, Carlingford NSW
St Paul's Church
Ministry Centre**

Prepared 22 October 2021
Reference 24020

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SUMMARY and CONCLUSIONS

This report considers 3 trees (*the trees*), within the neighbouring property at 7 Trigg Street, Carlingford adjoining 32 Moseley Street, Carlingford NSW, St Paul's Church (*the site*) where a Ministry Centre is to be constructed. There are no trees within *the site* of dimensions requiring protection or in locations where they may be adversely impacted by the proposed works requiring protection per AS4970(2009) *Protection of trees on development sites*. The trees are exempt from protection per The Hills Development Control Plan 2012 but are on an adjoining property within 5 m of *the site* and require consideration for impact and protection for their retention.

Statutory Considerations

The site is located in the City of Parramatta Council (CPC) Local Government Area (LGA) and *the trees* require consideration for protection subject to development under the following legislation and planning instruments:

Environmental Planning and Assessment Act 1979, (EP&A Act) and amendments,

State Environmental Planning Policy (SEPP (Vegetation in Urban Areas) 2017, 5, (1) (a)

Parramatta (former The Hills) Local Environmental Plan 2012, Part 3, exempt and Complying Development

3.1 Exempt development

"(5) *To be exempt development, the development must—*

(b) not involve the removal, pruning or other clearing of vegetation that requires a permit, development consent or other approval unless it is undertaken in accordance with a permit, development consent or other approval.

Note—

See State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 and Part 5A of the Local Land Services Act 2013."

The Hills Development Control Plan 2012, as applies to the area which Parramatta (former The Hills) Local Environment Plan 2012 applies and incorporates all amendments adopted prior to 12 May 2016.

The Hills Development Control Plan 2012, PCS3, Part C Section 3 Landscaping, 2.4 Tree Management Provisions

Clause 5.9 Preservation of trees or vegetation of The Hills LEP 2012 applies to all trees within The Hills Shire.

"A 'tree' is a perennial plant with a self-supporting woody stem that has a spread of more than 3 metres or a height of more than 6 metres or has a trunk diameter of more than 300mm measured at the base (see Figure 1).

The following trees may be removed without Council approval:

- ▣ *Alnus jorullensis* (Evergreen Alder)
- ▣ *Populus nigra* "Italica" (Lombardy Poplar)
- ▣ *Pittosporum undulatum* (Sweet Pittosporum)
- ▣ *Schefflera actinophylla* (Umbrella Tree)
- ▣ *Ficus elastica* (Indian Rubber Tree)
- ▣ *Acer negundo* (Box Elder)
- ▣ *Salix babylonica* (Weeping Willow)
- ▣ *Gleditsia triacanthos* (Honey Locust)
- ▣ *Ligustrum lucidum* (Broad Leaved Privet)
- ▣ *Ligustrum sinense* (Small Leaved Privet)
- ▣ *Olea europaea* var. *africana* (Wild Olive/African Olive)
- ▣ *Robinia pseudoacacia* (False Acacia/Black Locust)
- ▣ *Syagrus romanzoffianum* (Cocos Palm)
- ▣ *Toxicodendron succedaneum* (Rhus Tree)
- ▣ *Cotoneaster* spp. (Cotoneaster)
- ▣ *Ficus benjamina* (Weeping Fig)

- ☐ *Lagunaria patersonii* (Norfolk Island Hibiscus)
- ☐ *Tamarix aphylla* (Athel Tree)
- ☐ *Nerium oleander* (Oleander)
- ☐ *x Cupressocyparis Leylandii* (Leyland Cypress)
- ☐ *Cupressus sempervirens* var. *stricta* (Pencil Pine)
- ☐ *Archontophoenix alexandrae* (Alexandra Palm)
- ☐ *Archontophoenix cunninghamiana* (Bangalow Palm)
- ☐ *Celtis australis* (Hackberry)
- ☐ *Ailanthus altissima* (Tree of Heaven)
- ☐ *Citharexylum spinosum* (Fiddlewood)
- ☐ *Harpephyllum caffrum* (Kaffir Plum)
- ☐ *Albizia lophantha* (Silk Tree)
- ☐ *Schinus terebinthifolius* (Brazilian Mastic, Broadleaf Pepper Tree)
- ☐ a fruit tree or tree grown for the purposes of fruit production, excluding naturally growing native fruiting species

The following trees may be removed without development consent if the height of the tree is less than 10 metres:

- ☐ *Melia azedarach* (White Cedar)
- ☐ *Liquidambar styraciflua* (Liquidambar)
- ☐ *Cinnamomum camphora* (Camphor Laurel)
- ☐ *Erythrina x sykesii* (Coral Tree)
- ☐ *Araucaria bidwillii* (Bunya Bunya Pine)
- ☐ *Araucaria heterophylla* (Norfolk Island Pine)
- ☐ *Araucaria cunninghamii* (Hoop Pine)
- ☐ *Pinus radiata* (Monterey Pine/ Radiata Pine)
- ☐ *Cupressus marocarpa* (Monterey Cypress)

Trees within 3 m an Existing Approved Dwelling or Ancillary Structure: Council approval is not required to prune or remove trees within 3 m of an existing dwelling or ancillary structure, which has been approved through a development application or complying development certificate, within the same lot as the tree. The distance is to be measured from the face of the tree trunk closest to the dwelling or structure to the external wall or roof line of the dwelling or structure, the definition of which may include a garage, carport, studio, shed, workshop, swimming pool, spa or retaining walls with a height greater than 600 mm.

The removal of trees in accordance with this clause must not be inconsistent with any applicable State or Federal legislation relating to the protection of threatened species.

Clause 5.9 of The Hills LEP 2012 applies to all vegetation within The Hills Shire.

'Vegetation' means bushland that is either a remainder of the natural vegetation on the land or, if altered, is representative of the structure and/or floristics of the natural vegetation."

Notes of Pre-DA Meeting Parramatta City Council), (provided by Derek Bebbington, Director, Australian Property Development Services Pty Ltd):

"Preliminary tree assessment and development design (refer to AS4970-2009 – Protection of Trees on Development Sites) Consideration must be given for opportunities to retain existing trees within the development site and road reserve (Particularly semi-mature and mature trees). Consideration of potential development impacts must be given to all trees located within adjoining properties where located within 3 m of the common boundary (Please note that the tree protection area for mature trees located within adjoining properties may be up to 15 m and may extend significantly within the site). Potential development impacts include all above and below ground structures, below ground services and changes to existing site gradients. Precautions must be undertaken to minimise impacts to existing trees located within adjoining properties. The arborist shall identify development constraints imposed by trees and provide recommendations for an appropriate developable area given these constraints. To ensure the arborist report is relevant and site specific they must be provided with all the relevant and most current documentation including but not limited to the site plan, stormwater plan, landscape plan, basement plans and elevation drawings. A proposed development which will result in a negative impact to trees or vegetation located within adjoining properties may not be supported."

The recommendations made in this report are subject to approval by the consent authority.

Tree Assessment

The trees assessed are numbered and their genus, species and common name included in Appendix F - Tree Assessment. Tree numbers are marked on Appendix G – Tree Location Plan. The 3 trees are of dimensions sufficient to be protected by the Clause 5.9 Preservation of trees or vegetation of The Hills LEP 2012. However, *Cupressus sempervirens* var. *stricta* (Pencil Pine), is exempt from protection and may be removed without the consent of the City of Parramatta Council (the Council), save that they are on an adjoining property and protected subject to the Parramatta (former The Hills) Local Environmental Plan 2012, Part 3, exempt and Complying Development, 3.1 Exempt development, (b) where consent is required to be sought for the proposed works.

Removal

No trees are to be removed from 7 Trigg Avenue, Carlingford, the premises containing the trees adjoining *the site*.

Retention

The 3 trees within 7 Trigg Avenue, Carlingford, adjoining *the site* are to be retained and protected, with (Appendix H – Tree Protection Plan). Root development into *the site* was blocked by an existing masonry wall along the common side boundary within 7 Trigg Avenue, a brick column at the front corner of the dwelling and the footings for the dwelling at 7 Trigg Avenue, up to 400 mm deep expected to have acted as a deflecting root barrier restricting the radial development of roots into *the site*. The setback of the proposed new building is outside of the radial Tree Protection Zone (TPZ) of Tree1. The TPZ for Trees 2 and 3 are contained within 7 Trigg Avenue and unaffected by the development.

No Encroachment

Trees 2 and 3 are contained within 7 Trigg Avenue and unaffected by the development. The crown of each tree was columnar and upright, with crown projection contained within 7 Trigg Avenue.

Minor or No Encroachment

Tree 1 – Is to be retained and the extent of encroachment is $\leq 10\%$ of the idealised radial area of the Tree Protection Zone. Where encroachment per AS4970 (2009) Section 3, 3.3.2 *Minor Encroachment* is from development works within $<10\%$ of the radial area of the Tree Protection Zone. Here the encroachment is negligible due an existing masonry wall along the common side boundary within 7 Trigg Avenue, a brick column at the front corner of the dwelling and the footings for the dwelling at 7 Trigg Avenue, up to 400 mm deep expected to have acted as a deflecting root barrier restricting the radial development of roots into *the site*. The idealized radial TPZ for Tree 1 places part of the TPZ within *the site*, but as stated, this is negated by the existing masonry footings within 7 Trigg Avenue acting as a deflecting root barrier to restrict the development of a radial root plate in this direction. While some roots may have developed beneath the masonry footings they would be less than 40 mm diameter and could be pruned with negligible impact to Tree 1. Further, the location of the proposed new structure within *the site* is in a position outside of the idealized radial TPZ for Tree 1.

The idealized radial Structural Root Zone (SRZ) for Tree 1 is truncated by the existing masonry acting as a deflecting root barrier as previously discussed, and the SRZ restricted and contained within 7 Trigg Avenue. There is no encroachment into the Structural Root Zone (SRZ) of Trees 2 and 3.

Major Encroachment

No tree is subject to a major encroachment per AS4970 (2009) Section 3, 3.3.3 *Major Encroachment* from development works within $>10\%$ of the radial area of the Tree Protection

Zone. The ideal radial TPZ encroachment for Tree 1 is approximately 10% after the permitted reduction by 10% per AS4970(2009), Sec. 3.3.3, is considered but as previously discussed the existing masonry boundary wall, pier footing at the front of the dwelling and concrete slab for the dwelling at 7 Trigg Avenue, have acted as deflecting root barriers to restrict the radial development of the root plate in the direction of *the site*, however a precautionary TPZ is recommended for Tree 1 (Appendix H - Tree Protection Plan).

Pruning

No pruning is required for any tree in its crown or roots.

Tree Significance

Determined by using the Tree Significance - Assessment Criteria of the *IACA Significance of a Tree, Assessment Rating System (STARS)*© (IACA, 2010), Appendix A. The trees are rated, High, Medium or Low. The number of trees in each category is summarised in Table 1.0. The STARS significance rating of each individual tree is shown in Appendix F – Tree Assessment.

Table 1.0 Tree Significance – summary of trees in different categories using the Significance of a Tree, Assessment Rating System (STARS)© (IACA, 2010) see Appendix D.

Significance Scale	High	Medium	Low
Number of trees in each category	0	3	0

Tree Retention Value

Determined by using the Retention Value – *Sustainable Retention Index Value (SRIV)*© (IACA, 2010) see Appendix D. The trees are rated, High, Medium, Low or Remove. The number of trees in each category is summarised in Table 2.0. The SRIV retention rating of each individual tree is shown in Appendix F – Tree Assessment.

Table 2.0 Retention Value - summary of trees in different categories using the Sustainable Retention Index Value (SRIV)© (IACA, 2010) see Appendix D.

Retention Value	High Priority for Retention	Medium Consider for Retention	Medium / Low Consider for Retention or Removal	Low Consider for Removal	Remove Priority for Removal
	(1)	(2)	(3)	(4)	(5)
Number of trees in each category	0	3	0	0	0

Tree Protection Setbacks

Where applied, Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) setbacks are based on Australian Standard AS4970 2009 Protection of trees on development sites, Section 3 Determining the protection zone of the selected trees, see Appendices B and D, respectively. Approved building works should be no closer, including excavation, than the dimensions stated above, save for AS4970(2009) sec. 3.3 Variations to the TPZ, 3.3.2 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; and sec 3.3.3 Major Encroachment - If the proposed encroachment is greater than 10% of the area 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.* The trees requiring TPZ and SRZ protection setbacks are shown in a table in the Tree Protection Plan.

1.0 INTRODUCTION

Urban Tree Management © has prepared this report for Derek Bebbington, Director, Australian Property Development Services Pty Ltd, PO Box 880 Five Dock NSW 2046 on behalf of St Paul's Church Carlingford. The land is located in Parramatta City Council (PCC) Local Government Area (LGA) and the trees are protected subject to the Parramatta (former The Hills) Local Environmental Plan 2012 and The Hills Development Control Plan 2012, other instruments and directions where appropriate.

It is proposed to demolish the structure and construct a new Ministry Centre. The 3 *Cupressus sempervirens* var. *stricta* – Mediterranean Cypress or Pencil Pine, located at the front of 7 Trigg Avenue are to be retained and protected. Root development into *the site* from 7 Trigg Avenue was blocked by an existing masonry wall along the common side boundary within 7 Trigg Avenue, a brick column at the front corner of the dwelling and the footings for the dwelling at 7 Trigg Avenue (Photographs 1.0 and 1.1), up to 400 mm deep and expected to have acted as a deflecting root barrier restricting the radial development of roots into *the site*.

Danny Draper (*the author*) attended St Paul's Church, 32 Moseley Street, Carlingford NSW (*the site*) on Monday 25/10/2021 and *the trees* and their growing environment were examined by a Visual Tree Assessment (VTA) (Mattheck & Breloer, 1994) conducted from the ground for the development works at *the site* (Appendix F – Tree Assessment).

The site is subject to a Development Application and this report and any works recommended herein, that require approval from the consenting authority are provided to form part of that development application and its consent conditions. The Tree Location Plan (Appendix G) and Tree Protection Plan (Appendix H) are to be included into and used in conjunction with the set of plans for the site.

The aims and objectives of this report are to detail and comply with the tree protection requirements specified in AS4970 (2009) *Protection of trees on development sites*, after the undertaking of the Preliminary Tree Assessment AS4970 sec. 2.3.2, and Preliminary Arboricultural Report AS4970 sec. 2.3.3 (which may be combined); Development Design and Review Report AS4970 sec. 2.3.4, prior to the undertaking of an Arboricultural Impact Assessment (AIA) Report AS4970 sec. 2.3.5. Where the other reports have not been undertaken the AIA Report will broadly endeavour to identify and assesses the condition of the subject tree/s; determine the impact of development on the subject tree/s; provide recommendations for retention or removal of the subject tree/s; provide specifications for protection of tree/s to be retained, and provide recommendations for replacement tree/s where appropriate. The information in this extensive report is intended to provided tree management and protection through all stages of development.

The tree/s are indicated in Appendix G – Tree Location Plan. This report has relied upon the following plan/s and documents:

Detail and Level Survey of Lot 34 in DP 251044, 32 Moseley Street, Carlingford NSW, File: 6880 St Paul's Church Moseley Street, Carlingford NSW, Reference 6880, Issue C, Survey Date: 22/09/2021, Scale 1:200, Sheet 1 of 1, prepared by SDG Pty Ltd, Suite 1, 3 Railway Street, Baulkham Hills, NSW 2153, tel. 9630 7955.

Proposed Lower Ground Floor Plan, Moseley Street and Vickery Avenue, Carlingford NSW, Scale 1:100 @ A1, Drawing No. JA2720 – SK – 107, Issue A, dated, 3/06/2021, prepare by Jakaan Architects, Registered Architect: Geoff Ferris-Smith #8834, info@jakaan.com.au // ABN 48 714 361 834.

Parramatta City Council, The Hills Local Environmental Plan 2012, Land Zoning Map – Sheet LNZ_004,

METHODOLOGY

Note: Individual methodologies applied as applicable.

- 2.1 The method of assessment of tree/s applied is adapted from the principles of Visual Tree Assessment (VTA) (Mattheck & Breloer, 1994), undertaken from the ground, which considers and includes:
1. Tree health and subsequent stability, both long and short term
 2. Sustainable Retention Index Value (SRIV) Version 4 (IACA, 2010) ©
 3. Hazard potential to people and property
 4. Amenity values
 5. Habitat values
 6. Significance – Significance of a Tree, Assessment Rating System (STARS) (IACA, 2010) ©
- 2.2 Tree Assessment - This assessment is undertaken using standard tree assessment criteria for each tree based on the values above and is implemented as a result of at least one comprehensive and detailed site inspection to undertake a visual tree assessment of each individual tree, or stand of trees, or a representative population sample. See Appendix F – Tree Assessment.
- 2.3 Any dimensions recorded as averages, or by approximation are noted accordingly.
- 2.4 This report adopts Australian Standard AS4970 (2009) *Protection of trees on development sites* as a point of reference and guide for the recommended minimum setbacks (Appendix B) from the center of a tree's trunk to development works and the distances may be increased or decreased by the author in accordance with AS4970 as a result of other factors providing mitigating circumstances or constraints as indicated by but not restricted to the following:
1. Condition of individual trees,
 2. Tolerance of individual species to disturbance,
 3. Geology e.g. physical barriers in soil, rock floaters, bedrock to surface
 4. Topography e.g. slope, drainage,
 5. Soil e.g. depth, drainage, fertility, structure,
 6. Microclimate e.g. due to landform, exposure to dominant wind,
 7. Engineering e.g. techniques to ameliorate impact on trees such as structural soil, gap graded fill, lateral boring,
 8. Construction e.g. techniques to ameliorate impact on trees such as pier and beam, bridge footings, suspended slabs,
 9. Root mapping,
 10. Physical limitations - existing modifications to the environment and any impact to tree/s by development e.g. property boundaries, built structures, houses, swimming pools, road reserves, utility services easements, previous impact by excavation, or construction in other directions, soil level changes by cutting or filling, existing landscaping works within close proximity, modified drainage patterns,
 11. Extraneous factors e.g. potential future impacts from development on adjoining land when the tree is located on or near to a property boundary.
- 2.5 Stands of Trees - Trees in groups may be referred to as stands and a stand may exclusively contain specimens to be either retained or removed or a combination of both. A stand may be used to discuss all the trees on a given site to expedite their assessment, or refer to trees growing proximate to one another or within a defined space. Stands may be comprised by mass boundary or screen plantings, to form a group of the same or a mixture of taxa. Each stand is considered as a single unit with each component tree assessed and expressed in tabular form, or indicated by a given percentage as a population sample of each stand. Where it is appropriate for a stand of trees to be retained in full or part, the location and setback of Tree Protection Zone fences or works, are prescribed to provide for the preservation of the stand or selected component trees, in a condition not less than that at the time of initial inspection for its incorporation into the existing landscape of the site, or in a reduced but sustainable condition due to the impact of the development but ameliorated through tree protection measures.

- 2.6 Tree Significance - The trees/s have been allocated a significance rating as determined by using the Tree Significance - Assessment Criteria of the IACA Significance of a Tree, Assessment Rating System (STARS)© (IACA, 2010), Appendix A.
- 2.7 The meanings for terminology used herein are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009. An extract from the IACA Dictionary forms a glossary of terms included as Appendix E.

3.0 PRUNING STANDARDS

- 3.1 Any pruning recommended in this report is to be to the Australian Standard® AS4373 *Pruning of amenity trees*, and conducted in accordance with the *Guide to Managing Risks of Tree Trimming and Removal Work*, July 2016, Safe Work Australia.
- 3.2 All pruning or removal works are to be in accordance with the appropriate Tree Management Policy where applicable, or Tree Management Order (TMO), or Tree Preservation Order (TPO).
- 3.3 Tree maintenance work is specialised and in order to be undertaken safely to ensure the works carried out are not detrimental to the survival of a tree being retained, and to assist in the safe removal of any tree, should be undertaken by a qualified Arboriculturist with appropriate competencies recognised within the Australian Qualification Framework, with a minimum of 5 years of continual experience within the industry of operational amenity arboriculture, and covered by appropriate and current types of insurance to undertake such works.

4.0 DISCUSSION

This section addresses the relevant parts of the planning instruments for tree protection from the Parramatta (former The Hills) Local Environmental Plan 2012 and The Hills Development Control Plan 2012, and other instruments and comments where appropriate.

Environmental Planning and Assessment Act 1979, (EP&A Act) and amendments,

Part 3 Exempt and Complying Development

3.1 Exempt Development

(5) To be exempt development, the development must—

(b) not involve the removal, pruning or other clearing of vegetation that requires a permit, development consent or other approval unless it is undertaken in accordance with a permit, development consent or other approval.

Note —

See [State Environmental Planning Policy \(Vegetation in Non-Rural Areas\) 2017](#) and Part 5A of the [Local Land Services Act 2013](#).

4.1 This is not Exempt and Complying Development as the proposed development requires the consent of the Council and the trees on a neighbouring property are to be retained and protected although *Cupressus sempervirens* var. *stricta* – Mediterranean Cypress or Pencil Pine are exempt species under the The Hills DCP 2012.

State Environmental Planning Policy (SEPP (Vegetation in Urban Areas) 2017, 5, (1) (a)

Part 1 Preliminary

(5) Land to which Policy applies

(1) This Policy applies to the following areas of the State (the non-rural areas of the State)—

(a) land in the following local government areas—

City of Parramatta.

4.2 The land is located within the City of Parramatta Council local government area and this SEPP Applies (Appendix G – Tree Location Plan, plans 1-3).

The Hills Development Control Plan 2012, PCS3, Part C Section 3 Landscaping, 2.4 Tree Management Provisions Clause 5.9 Preservation of trees or vegetation of The Hills LEP 2012 applies to all trees within The Hills Shire.

“A ‘tree’ is a perennial plant with a self-supporting woody stem that has a spread of more than 3 metres or a height of more than 6 metres or has a trunk diameter of more than 300mm measured at the base (see Figure 1).

The following trees may be removed without Council approval:

Cupressus sempervirens var. *stricta* (Pencil Pine)

4.3 The trees are exempt from consent for removal, but protected as trees on a neighbouring property to be retained by the application of AS4970(2009) *Protection of trees on development sites*.

Notes of Pre-DA Meeting Parramatta City Council), (provided by Derek Bebbington, Director, Australian Property Development Services Pty Ltd):

"Preliminary tree assessment and development design (refer to AS4970-2009 – Protection of Trees on Development Sites) Consideration must be given for opportunities to retain existing trees within the development site and road reserve (Particularly semi-mature and mature trees). Consideration of potential development impacts must be given to all trees located within adjoining properties where located within 3 m of the common boundary (Please note that the tree protection area for mature trees located within adjoining properties may be up to 15 m and may extend significantly within the site). Potential development impacts include all above and below ground structures, below ground services and changes to existing site gradients. Precautions must be undertaken to minimise impacts to existing trees located within adjoining properties. The arborist shall identify development constraints imposed by trees and provide recommendations for an appropriate developable area given these constraints. To ensure the arborist report is relevant and site specific they must be provided with all the relevant and most current documentation including but not limited to the site plan, stormwater plan, landscape plan, basement plans and elevation drawings. A proposed development which will result in a negative impact to trees or vegetation located within adjoining properties may not be supported."

- 4.4 The 3 *Cupressus sempervirens* var. *stricta* – Mediterranean Cypress or Pencil Pine, located at the front of 7 Trigg Avenue are to be retained and protected per AS4970(2009). Root development into *the site* from 7 Trigg Avenue was blocked by an existing masonry wall along the common side boundary within 7 Trigg Avenue, a brick column at the front corner of the dwelling and the footings for the dwelling at 7 Trigg Avenue (Photographs 1.0 and 1.1), up to 400 mm deep and expected to have acted as a deflecting root barrier restricting the radial development of roots into *the site*. The proposed building works is located 4 m from the boundary and outside of the ideal radial Tree Protection Zone for Tree 1, the only tree where the radial TPZ extends into the site (Appendix H – Tree Protection Plan).

Photograph 1.0 Taken 25/10/2021 by Danny Draper. View to South towards 7 Trigg Avenue, showing Trees 1-3 as numbered and a masonry wall along the common side boundary with footings up to 400 mm deep forming a deflecting root barrier restricting the development of a radial root plate into 32 Moseley Street.



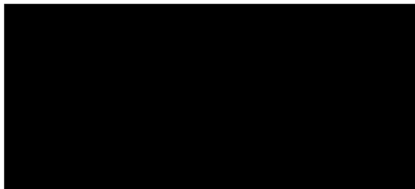
Photograph 2.0 Taken 25/10/2021 by Danny Draper. View to West towards the front of the dwelling at 7 Trigg Avenue, showing Tree 1 and numbered and a brick column and concrete house slab with masonry footings adjacent the common side boundary with footings up to 400 mm deep forming a deflecting root barrier restricting the development of a radial root plate into 32 Moseley Street in the direction of the proposed development. The form of each tree is upright and columnar with the crown projection of each contained within 7 Trigg Avenue.



4.4.1 The 3 trees within 7 Trigg Avenue are isolated from the proposed development in their crown and roots and will not be impacted by the proposed development of the Saint Paul's Church Ministry Centre. To be precautionary a small Tree Protection Zone should be established within the site per the (Appendix H - Tree Protection Plan).

5.0 RECOMMENDATIONS

- 5.1 Trees 1-3 (3 trees) are proposed to be retained and protected on 7 Trigg Avenue adjacent the site with Tree 1 requiring minor protection as a precautionary measure only, as shown in Appendix G - Tree Location Plan and Appendix H – Tree Protection Plan.
- 5.2 Where Tree Protection Zone works are to be modified this must be undertaken in consultation with the Project Arborist to ensure that tree protection is maintained.
- 5.3 Trees 1-3 (3 trees) none of these are to be pruned in the crown or roots.
- 5.4 Where a situation arises where pruning is required it is to be conducted per Section 3.0 Pruning Standards and AS4373(2007) Pruning of amenity trees and may require additional consent from Council.



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The author and Urban Tree Management take no responsibility for actions taken and their consequences, contrary to those expert and professional instructions given as recommendations pertaining to safety by way of exercising our responsibility to our client and the public as our duty of care commitment, to mitigate or prevent hazards from arising or risks from being eliminated or mitigated or managed to reduce harm or damage, from a failure moment in full or part, from a structurally deficient or unsound tree or a tree likely to be rendered thus by its retention and subsequent deterioration from modification/s to its growing environment either existing or proposed, either above or below ground, either existing or proposed, either above or below ground, contrary to our advice.

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Appendix A

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



1. 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.

2. 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*.

3. 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 monocultural stand in its entirety e.g. hedge.

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



(1)	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.
(2)	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.
(3)	* Consider for Retention or Removal (Medium / Low) - These trees are considered to be of minor importance but may be retained and protected or removed. They are considered less important for retention, and may or may not require some special works or design modification to be implemented for their retention.
(4)	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.
(5)	Priority for Removal - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

* Modified by UTMA in 2021 to include (Medium / Low).

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Appendix B

Extract from Australian Standard AS4970 2009 Protection of trees on development sites

Section 3, Determining the tree protection zones of the selected trees

3.1 Tree protection zone (TPZ)

"The tree protection zone (TPZ) is the principal means of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable.

The TPZ incorporates the structural root zone (SRZ) (refer to Clause 3.3.5)."

3.2 Determining the TPZ

The radius of the TPZ is calculated for each tree by multiplying its DBH x 12.

$$\text{TPZ} = \text{DBH} \times 12$$

where

DBH = trunk diameter measured at 1.4 m above ground

Radius is measured from the centre of the stem at ground level.

Appendix C

Extract from Australian Standard AS4970 2009 Protection of trees on development sites

Section 3, Determining the protection zones of the selected trees

3.3.5 Structural root zone (SRZ)

"The SRZ is the area required for tree stability. A larger area is required to maintain a viable tree. The SRZ only needs to be calculated when a major encroachment into a TPZ is proposed. Root investigation may provide more information on the extent of these roots."

Determining the SRZ

The radius of the TPZ is calculated for each tree by multiplying its DBH x 12.

SRZ radius expressed by the curve is calculated by the following formula,

$$R_{SRZ} = (D \times 50)^{0.42} \times 0.64$$

where

D = trunk diameter, in metres measured immediately above the root buttress.

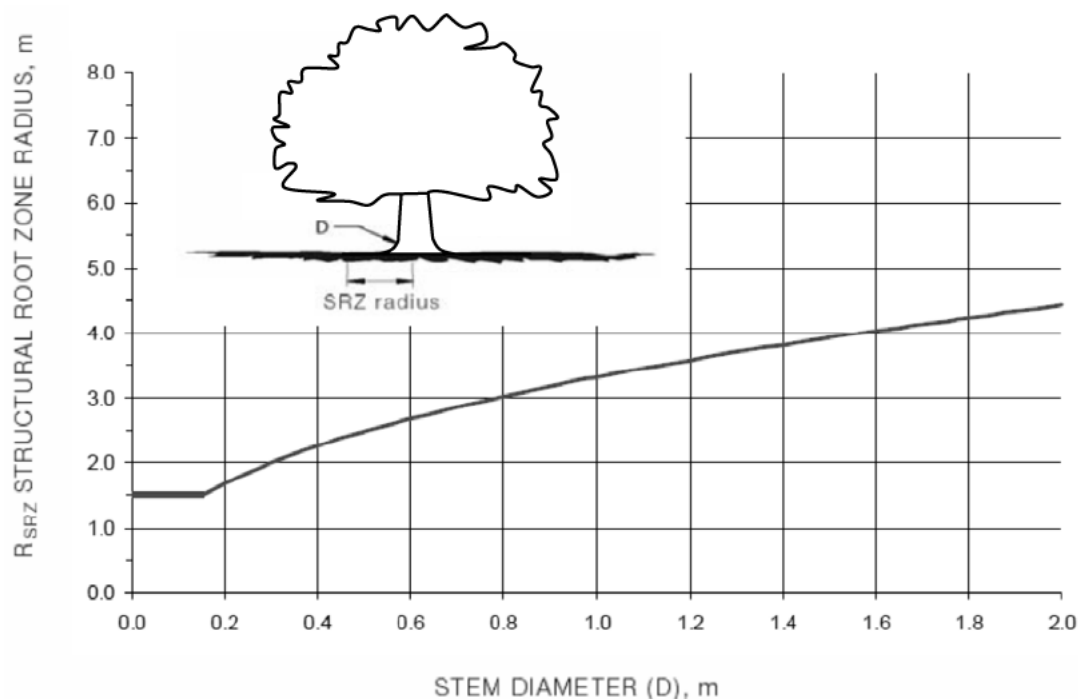


FIGURE 1 STRUCTURAL ROOT ZONE CALCULATION
 (AS 4970 – 2009, Amendment No. 1 March 2010)

NOTES:

- 1 R_{SRZ} is the calculated structural root zone radius (SRZ radius).
- 2 D is the stem diameter measured immediately above root buttress.
- 3 The R_{SRZ} for trees less than 0.15 m diameter is 1.5 m.
- 4 The R_{SRZ} formula and graph do not apply to palms, other monocots, cycads and tree ferns.
- 5 This does not apply to trees with an asymmetrical root plate.

Appendix D

Matrix - Sustainable Retention Index Value (SRIV) ©

Version 4, 2010

Developed by IACA – Institute of Australian Consulting Arboriculturists www.iaca.org.au

The matrix is to be used with the value classes defined in the Glossary for Age / Vigour / Condition.
 An index value is given to each category where ten (10) is the highest value.

Age Class	Vigour Class and Condition Class					
	Good Vigour & Good Condition (GVG)	Good Vigour & Fair Condition (GVF)	Good Vigour & Poor Condition (GVP)	Low Vigour & Good Condition (LVG)	Low Vigour & Fair Condition (LVF)	Low Vigour & Poor Condition (LVP)
	Able to be retained if sufficient space available above and below ground for future growth. No remedial work or improvement to growing environment required. May be subject to high vigour. Retention potential - Medium – Long Term.	Able to be retained if sufficient space available above and below ground for future growth. Remedial work may be required or improvement to growing environment may assist. Retention potential - Medium Term. Potential for longer with remediation or favourable environmental conditions.	Able to be retained if sufficient space available above and below ground for future growth. Remedial work unlikely to assist condition, improvement to growing environment may assist. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	May be able to be retained if sufficient space available above and below ground for future growth. No remedial work required, but improvement to growing environment may assist vigour. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	May be able to be retained if sufficient space available above and below ground for future growth. Remedial work or improvement to growing environment may assist condition and vigour. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	Unlikely to be able to be retained if sufficient space available above and below ground for future growth. Remedial work or improvement to growing environment unlikely to assist condition or vigour. Retention potential - Likely to be removed immediately or retained for Short Term. Potential for longer with remediation or favourable environmental conditions.
(Y) Young	YGVG - 9 Index Value 9 Retention potential - Long Term. Likely to provide minimal contribution to local amenity if height <5 m. High potential for future growth and adaptability. Retain, move or replace.	YGVF - 8 Index Value 8 Retention potential - Short – Medium Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Medium-high potential for future growth and adaptability. Retain, move or replace.	YGVP - 5 Index Value 5 Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Low-medium potential for future growth and adaptability. Retain, move or replace.	YLVG - 4 Index Value 4 Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Medium potential for future growth and adaptability. Retain, move or replace.	YLVF - 3 Index Value 3 Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5m. Low-medium potential for future growth and adaptability. Retain, move or replace.	YLVP - 1 Index Value 1 Retention potential - Likely to be removed immediately or retained for Short Term. Likely to provide minimal contribution to local amenity if height <5 m. Low potential for future growth and adaptability.
(M) Mature	MGVG - 10 Index Value 10 Retention potential - Medium - Long Term.	MGVF - 9 Index Value 9 Retention potential - Medium Term. Potential for longer with improved growing conditions.	MGVP - 6 Index Value 6 Retention potential - Short Term. Potential for longer with improved growing conditions.	MLVG - 5 Index Value 5 Retention potential - Short Term. Potential for longer with improved growing conditions.	MLVF - 4 Index Value 4 Retention potential - Short Term. Potential for longer with improved growing conditions.	MLVP - 2 Index Value 2 Retention potential - Likely to be removed immediately or retained for Short Term.
(O) Over-mature	OGVG - 6 Index Value 6 Retention potential - Medium - Long Term.	OGVF - 5 Index Value 5 Retention potential - Medium Term.	OGVP - 4 Index Value 4 Retention potential - Short Term.	OLVG - 3 Index Value 3 Retention potential - Short Term. Potential for longer with improved growing conditions.	OLVF - 2 Index Value 2 Retention potential - Short Term.	OLVP - 0 Index Value 0 Retention potential - Likely to be removed immediately or retained for Short Term.

Appendix E

Glossary

From
Dictionary for Managing Trees in Urban Environments
Institute of Australian Consulting Arboriculturists (IACA) 2009.

Vigour

Vigour Ability of a tree to sustain its life processes. This is independent of the *condition* of a tree but may impact upon it. Vigour can appear to alter rapidly with change of seasons (seasonality) e.g. *dormant*, deciduous or semi-deciduous trees. Vigour can be categorized as *Normal Vigour*, *High Vigour*, *Low Vigour* and *Dormant Tree Vigour*.

Normal Vigour Ability of a tree to maintain and sustain its life processes. This may be evident by the *typical* growth of leaves, *crown cover* and *crown density*, branches, roots and trunk and *resistance to predation*. This is independent of the *condition* of a tree but may impact upon it, and especially the ability of a tree to sustain itself against predation.

High Vigour *Accelerated growth* of a tree due to incidental or deliberate artificial changes to its growing *environment* that are seemingly beneficial, but may result in *premature aging* or failure if the favourable conditions cease, or promote *prolonged senescence* if the favourable conditions remain, e.g. water from a leaking pipe; water and nutrients from a leaking or disrupted sewer pipe; nutrients from animal waste, a tree growing next to a chicken coop, or a stock feed lot, or a regularly used stockyard; a tree subject to a stringent watering and fertilising program; or some trees may achieve an extended lifespan from continuous *pollarding* practices over the life of the tree.

Low Vigour Reduced ability of a tree to sustain its life processes. This may be evident by the *atypical* growth of leaves, reduced *crown cover* and reduced *crown density*, branches, roots and trunk, and a deterioration of their functions with reduced *resistance to predation*. This is independent of the *condition* of a tree but may impact upon it, and especially the ability of a tree to sustain itself against predation.

Dormant Tree Vigour Determined by existing turgidity in lowest order branches in the outer extremity of the crown, with good bud set and formation, and where the last *extension growth* is distinct from those most recently preceding it, evident by bud scale scars. Normal vigour during dormancy is achieved when such growth is evident on a majority of branches throughout the crown.

Age of Trees

Age Most trees have a stable biomass for the major proportion of their life. The estimation of the age of a tree is based on the knowledge of the expected lifespan of the taxa *in situ* divided into three distinct stages of measurable biomass, when the exact age of the tree from its date of cultivation or planting is unknown and can be categorized as *Young*, *Mature* and *Over-mature* (British Standards 1991, p. 13, Harris *et al*, 2004, p. 262).

Young Tree aged less than <20% of life expectancy, *in situ*.

Mature Tree aged 20-80% of life expectancy, *in situ*.

Over-mature Tree aged greater than >80% of life expectancy, *in situ*, or *senescent* with or without reduced *vigour*, and declining gradually or rapidly but irreversibly to death.

Periods of Time

Periods of Time The life span of a tree in the urban environment may often be reduced by the influences of encroachment and the dynamics of the environment and can be categorized as *Immediate*, *Short Term*, *Medium Term* and *Long Term*.

Immediate An *episode* or occurrence, likely to happen within a twenty-four (24) hour period, e.g. tree failure or collapse in full or part posing an imminent danger.

Short Term A period of time less than <1 – 15 years.

Medium Term A period of time 15 – 40 years.

Long Term A period of time greater than >40 years.

Trunk

Trunk A single stem extending from the *root crown* to support or elevate the *crown*, terminating where it divides into separate *stems* forming *first order branches*. A trunk may be evident at or near ground or be absent in *acaulescent* trees of *deliquescent* habit, or may be continuous in trees of *excurrent* habit. The trunk of any *caulescent* tree can be divided vertically into three (3) sections and can be categorized as *Lower Trunk*, *Mid Trunk* and *Upper Trunk*. For a *leaning* tree these may be divided evenly into sections of one third along the trunk.

Acaulescent A *trunkless* tree or tree growth forming a very short *trunk*. See also *Caulescent*.

Caulescent Tree grows to form a *trunk*. See also *Acaulescent*.

Condition of Trees

Condition A tree's *crown form* and growth habit, as modified by its *environment* (aspect, suppression by other trees, soils), the *stability* and *viability* of the *root plate*, trunk and structural branches (first (1st) and possibly second (2nd) order branches), including structural defects such as wounds, cavities or hollows, *crooked* trunk or weak trunk/branch junctions and the effects of predation by pests and diseases. These may not be directly connected with *vigour* and it is possible for a tree to be of *normal vigour* but in *poor condition*. Condition can be categorized as *Good Condition*, *Fair Condition*, *Poor Condition* and *Dead*.

Good Condition Tree is of good habit, with *crown form* not severely restricted for space and light, physically free from the adverse effects of *predation* by pests and diseases, obvious instability or structural weaknesses, fungal, bacterial or insect infestation and is expected to continue to live in much the same condition as at the time of inspection provided conditions around it for its basic survival do not alter greatly. This may be independent from, or contributed to by *vigour*.

Fair Condition Tree is of good habit or *misshapen*, a form not severely restricted for space and light, has some physical indication of *decline* due to the early effects of *predation* by pests and diseases, fungal, bacterial, or insect infestation, or has suffered physical injury to itself that may be contributing to instability or structural weaknesses, or is faltering due to the modification of the *environment* essential for its basic survival. Such a tree may recover with remedial works where appropriate, or without intervention may stabilise or improve over time, or in response to the implementation of beneficial changes to its local environment. This may be independent from, or contributed to by *vigour*.

Poor Condition Tree is of good habit or *misshapen*, a form that may be severely restricted for space and light, exhibits symptoms of advanced and *irreversible decline* such as fungal, or bacterial infestation, major die-back in the branch and *foliage crown*, *structural deterioration* from insect damage e.g. termite infestation, or storm damage or lightning strike, ring barking from borer activity in the trunk, root damage or instability of the tree, or damage from physical wounding impacts or abrasion, or from altered local environmental conditions and has been unable to adapt to such changes and may decline further to death regardless of remedial works or other modifications to the local *environment* that would normally be sufficient to provide for its basic survival if in *good* to *fair* condition. Deterioration physically, often characterised by a gradual and continuous reduction in *vigour* but may be independent of a change in *vigour*, but characterised by a proportionate increase in susceptibility to, and *predation* by pests and diseases against which the tree cannot be sustained. Such conditions may also be evident in trees of advanced senescence due to normal phenological processes, without modifications to the growing environment or physical damage having been inflicted upon the tree. This may be independent from, or contributed to by *vigour*.

Dead Tree is no longer capable of performing any of the following processes or is exhibiting any of the following symptoms;

Processes

Photosynthesis via its foliage crown (as indicated by the presence of moist, green or other coloured leaves);

Osmosis (the ability of the root system to take up water);

Turgidity (the ability of the plant to sustain moisture pressure in its cells);

Epicormic shoots or *epicormic strands* in Eucalypts (the production of new shoots as a response to stress, generated from latent or adventitious buds or from a *lignotuber*);

Symptoms

Permanent leaf loss;

Permanent wilting (the loss of turgidity which is marked by desiccation of stems leaves and roots);

Abscission of the *epidermis* (bark desiccates and peels off to the beginning of the sapwood).

Removed No longer present, or tree not able to be located or having been cut down and retained on a site, or having been taken away from a site prior to site inspection.

Leaning Trees

Leaning A tree where the *trunk* grows or moves away from upright. A lean may occur anywhere along the *trunk* influenced by a number of contributing factors e.g. genetically predetermined characteristics, competition for space or light, prevailing winds, aspect, slope, or other factors. A *leaning* tree may maintain a *static lean* or display an increasingly *progressive lean* over time and may be hazardous and prone to *failure* and *collapse*. The degrees of leaning can be categorized as *Slightly Leaning*, *Moderately Leaning*, *Severely Leaning* and *Critically Leaning*.

Slightly Leaning A leaning tree where the trunk is growing at an angle within 0°-15° from upright.

Moderately Leaning A leaning tree where the trunk is growing at an angle within 15°-30° from upright.

Severely Leaning A leaning tree where the trunk is growing at an angle within 30°-45° from upright.

Critically Leaning A leaning tree where the trunk is growing at an angle greater than >45° from upright.

Progressively Leaning A tree where the degree of *leaning* appears to be increasing over time.

Static Leaning A leaning tree whose lean appears to have stabilized over time.

Form of Trees

Crown Form The shape of the crown of a tree as influenced by the availability or restriction of space and light, or other contributing factors within its growing environment. Crown Form may be determined for tree shape and habit generally as *Dominant, Codominant, Intermediate, Emergent, Forest* and *Suppressed*. The habit and shape of a *crown* may also be considered qualitatively and can be categorized as *Good Form* or *Poor Form*.

Good Form Tree of *typical* crown shape and habit with proportions representative of the taxa considering constraints such as origin e.g. indigenous or exotic, but does not appear to have been adversely influenced in its development by environmental factors in situ such as *soil water* availability, prevailing wind, or cultural practices such as lopping and competition for space and light.

Poor Form Tree of *atypical* crown shape and habit with proportions not representative of the species considering constraints and appears to have been adversely influenced in its development by environmental factors in situ such as *soil water* availability, prevailing wind, cultural practices such as lopping and competition for space and light; causing it to be *misshapen* or disfigured by disease or vandalism.

Crown Form Codominant Crowns of trees restricted for space and light on one or more sides and receiving light primarily from above e.g. constrained by another tree/s or a building.

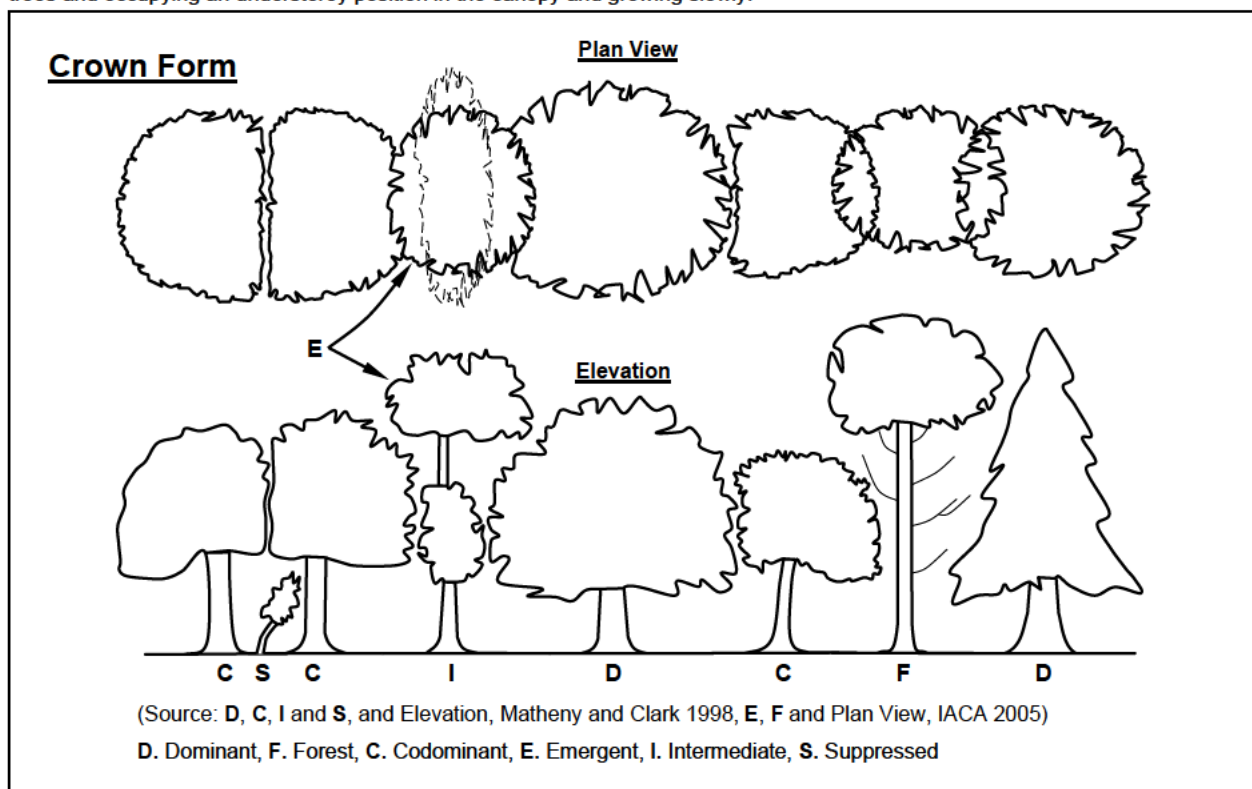
Crown Form Dominant Crowns of trees generally not restricted for space and light receiving light from above and all sides.

Crown Form Emergent Crowns of trees restricted for space on most sides receiving most light from above until the *upper crown* grows to protrude above the canopy in a stand or forest environment. Such trees may be *crown form dominant* or transitional from *crown form intermediate* to *crown form forest* asserting both *apical dominance* and *axillary dominance* once free of constraints for space and light.

Crown Form Forest Crowns of trees restricted for space and light except from above forming tall trees with narrow spreading crowns with foliage restricted generally to the top of the tree. The trunk is usually erect, straight and continuous, tapering gradually, crown often excurrent, with first order branches becoming structural, supporting the live crown concentrated towards the top of the tree, and below this point other first order branches arising radially with each *inferior* and usually temporary, divergent and ranging from horizontal to ascending, often with internodes exaggerated due to competition for space and light in the *lower crown*.

Crown Form Intermediate Crowns of trees restricted for space on most sides with light primarily from above and on some sides only.

Crown Form Suppressed Crowns of trees generally not restricted for space but restricted for light by being *overtopped* by other trees and occupying an understorey position in the canopy and growing slowly.



Symmetry

Symmetry Balance within a *crown*, or *root plate*, above or below the *axis* of the trunk of branch and foliage, and root distribution respectively and can be categorized as *Asymmetrical* and *Symmetrical*.

Asymmetrical Imbalance within a crown, where there is an uneven distribution of branches and the foliage *crown* or *root plate* around the vertical *axis* of the trunk. This may be due to *Crown Form Codominant* or *Crown Form Suppressed* as a result of natural restrictions e.g. from buildings, or from competition for space and light with other trees, or from exposure to wind, or artificially caused by pruning for clearance of roads, buildings or power lines. An example of an expression of this may be, crown asymmetrical, bias to west.

Symmetrical Balance within a crown, where there is an even distribution of branches and the *foliage crown* around the vertical *axis* of the trunk. This usually applies to trees of *Crown Form Dominant* or *Crown Form Forest*. An example of an expression of this may be crown symmetrical.

Crown Spread Orientation Direction of the *axis* of *crown spread* which can be categorized as *Orientation Radial* and *Orientation Non-radial*.

Crown Spread Orientation Non-radial Where the crown extent is longer than it is wide, e.g. east/west or E/W. Further examples, north/south or N/S, and may be *Crown Form Codominant*, e.g. **A** or **B**, *Crown Form Intermediate* e.g. **A**, or *Crown Form Suppressed* e.g. **B**, and crown symmetry is *symmetrical* e.g. **A**, or *asymmetrical* e.g. **B**.

Crown Spread Orientation Radial Where the *crown spread* is generally an even distance in all directions from the trunk and often where a tree has *Crown Form Dominant* and is *symmetrical*.

Significant Important, weighty or more than ordinary.

Significant Tree A tree considered important, weighty or more than ordinary. Example: due to prominence of location, or *in situ*, or contribution as a component of the overall landscape for *amenity* or aesthetic qualities, or *curtilage* to structures, or importance due to uniqueness of taxa for species, subspecies, variety, *crown form*, or as an historical or cultural planting, or for age, or substantial dimensions, or habit, or as *remnant vegetation*, or habitat potential, or a rare or threatened species, or uncommon in cultivation, or of aboriginal cultural importance, or is a commemorative planting.

Substantial A tree with large dimensions or proportions in relation to its place in the landscape.

Sustainable Retention Index Value (SRIV) A visual tree assessment method to determine a qualitative and numerical rating for the viability of urban trees for development sites and management purposes, based on general tree and landscape assessment criteria using classes of *age*, *condition* and *vigour*. SRIV is for the professional manager of urban trees to consider the tree *in situ* with an assumed knowledge of the *taxon* and its growing environment. It is based on the physical attributes of the tree and its response to its environment considering its position in a matrix for age class, vigour class, condition class and its sustainable retention with regard to the safety of people or damage to property. This also factors the ability to retain the tree with remedial work or beneficial modifications to its growing environment or removal and replacement. SRIV is supplementary to the decision made by a tree management professional as to whether a tree is retained or removed (IACA - Institute of Australian Consulting Arboriculturists 2005).

Diameter at Breast Height (DBH) Measurement of trunk width calculated at a given distance above ground from the base of the tree often measured at 1.4 m. The trunk of a tree is usually not a circle when viewed in cross section, due to the presence of *reaction wood* or *adaptive wood*, therefore an average diameter is determined with a *diameter tape* or by recording the trunk along its narrowest and widest axes, adding the two dimensions together and dividing them by 2 to record an average and allowing the orientation of the longest axis of the trunk to also be recorded. Where a tree is growing on a lean the distance along the top of the trunk is measured to 1.4m and the diameter then recorded from that point perpendicular to the edge of the trunk. Where a *leaning* trunk is *crooked* a vertical distance of 1.4m is measured from the ground. Where a tree branches from a trunk that is less than 1.4m above ground, the trunk diameter is recorded perpendicular to the length of the *trunk* from the point immediately below the base of the flange of the *branch collar* extending the furthest down the trunk, and the distance of this point above ground recorded as *trunk* length. Where a tree is located on sloping ground the DBH should be measured at half way along the side of the tree to average out the angle of slope. Where a tree is *acaulescent* or *trunkless* branching at or near ground an average diameter is determined by recording the radial extent of the trunk at or near ground and noting where the measurement was recorded e.g. at ground.

Crown Projection (CP) Area within the *dripline* or beneath the lateral extent of the *crown* (Geiger 2004, p. 2). See also *Crown spread* and *Dripline*.

Dripline A line formed around the edge of a tree by the lateral extent of the *crown*. Such a line may be evident on the ground with some trees when exposed soil is displaced by rain shed from the crown. See also *Crown Projection*.

Tree Protection Zone (TPZ) Area around a tree set aside to protect the trunk, roots and crown during development works. This is to protect the tree physically and a sufficient proportion of its growing environment above and below ground to assist *stability* and prolong viability. The TPZ is often delineated by an enclosed fence and established prior to demolition or construction and maintained until the completion of works. The fenced-off area around the tree is usually located at a specific distance from the trunk determined as multiples of the trunk diameter, usually *Diameter at breast height* (DBH). Special protection or construction works may provide a TPZ without a fence having been erected, e.g. a barrier formed by site sheds located on piers. Such a protection area may form an exclusion zone for all works including the temporary or permanent location of utility services. Note: Any *encroachment* into the area would require additional tree protection specifications or works in consultation with the *Project arborist*.

Encroachment 1. The growth of branches, trunk or roots onto another property. 2. Any work within a *Tree Protection Zone* other than for the maintenance of the Tree Protection Zone.

Deadwood

Deadwood Dead branches within a tree's crown and considered quantitatively as separate to *crown cover* and can be categorised as *Small Deadwood* and *Large Deadwood* according to diameter, length and subsequent *risk* potential. The amount of dead branches on a tree can be categorized as *Low Volume Deadwood*, *Medium Volume Deadwood* and *High Volume Deadwood*. See also *Dieback*.

Deadwooding Removing of dead branches by *pruning*. Such pruning may assist in the prevention of the spread of *decay* from *dieback* or for reasons of safety near an identifiable target.

Small Deadwood A dead branch up to 10mm diameter and usually <2 metres long, generally considered of low *risk* potential.

Large Deadwood A dead branch >10mm diameter and usually >2 metres long, generally considered of high *risk* potential.

Low Volume Deadwood Where <5 dead branches occur that may require *removal*.

Medium Volume Deadwood Where 5-10 dead branches occur that may require *removal*.

High Volume Deadwood Where >10 dead branches occur that may require *removal*.

Dieback

Dieback The death of some areas of the *crown*. Symptoms are leaf drop, bare twigs, dead branches and tree death, respectively. This can be caused by root damage, root disease, bacterial or fungal canker, severe bark damage, intensive grazing by insects, *abrupt changes* in growth conditions, drought, water-logging or over-maturity. Dieback often implies reduced *resistance*, *stress* or *decline* which may be temporary. Dieback can be categorized as *Low Volume Dieback*, *Medium Volume Dieback* and *High Volume Dieback*.

Low Volume Dieback Where <10% of the *crown cover* has died. See also *Dieback*, *High Volume Dieback* and *Medium Volume Dieback*.

Medium Volume Dieback Where 10-50% of the *crown cover* has died.

High Volume Dieback Where >50% of the *crown cover* has died.

Epicormic shoots

Epicormic Shoots Juvenile shoots produced at branches or trunk from *epicormic strands* in some Eucalypts (Burrows 2002, pp. 111-131) or sprouts produced from dormant or latent buds concealed beneath the bark in some trees. Production can be triggered by fire, pruning, wounding, or root damage but may also be as a result of *stress* or *decline*. Epicormic shoots can be categorized as *Low Volume Epicormic Shoots*, *Medium Volume Epicormic Shoots* and *High Volume Epicormic Shoots*.

Low Volume Epicormic Shoots Where <10% of the *crown cover* is comprised of live *epicormic shoots*.

Medium Volume Epicormic Shoots Where 10-50% of the *crown cover* is comprised of live *epicormic shoots*.

High Volume Epicormic Shoots Where >50% of the *crown cover* is comprised of live *epicormic shoots*.

Roots

First Order Roots (FOR) Initial woody roots arising from the *root crown* at the base of the *trunk*, or as an *adventitious root mass* for structural support and *stability*. Woody roots may be buttressed and divided as a marked gradation, gradually tapering and continuous or tapering rapidly at a short distance from the root crown. Depending on soil type these roots may descend initially and not be evident at the root crown, or become buried by changes in soil levels. Trees may develop 4-11 (Perry 1982, pp. 197-221), or more first order roots which may radiate from the trunk with a relatively even distribution, or be prominent on a particular aspect, dependent upon physical characteristics e.g. leaning trunk, *asymmetrical crown*; and constraints within the growing *environment* from topography e.g. slope, soil depth, rocky outcrops, exposure to predominant wind, soil moisture, depth of *water table* etc.

Orders of Roots The marked divisions between woody roots, commencing at the initial division from the base of the trunk, at the *root crown* where successive branching is generally characterised by a gradual reduction in root diameters and each gradation from the trunk and can be categorized numerically, e.g. *first order roots*, second order roots, third order roots etc. Roots may not always be evident at the *root crown* and this may be dependent on species, age class and the growing environment. Palms at maturity may form an adventitious root mass.

Root Plate The entire root system of a tree generally occupying the top 300-600mm of soil including roots at or above ground and may extend laterally for distances exceeding twice the height of the tree (Perry 1982, pp. 197-221). Development and extent is dependent on water availability, soil type, *soil depth* and the physical characteristics of the surrounding landscape.

Root Crown Roots arising at the base of a trunk.

Zone of Rapid Taper The area in the *root plate* where the diameter of *structural roots* reduces substantially over a short distance from the *trunk*. Considered to be the minimum radial distance to provide structural support and *root plate* stability. See also *Structural Root Zone (SRZ)*.

Structural Roots Roots supporting the infrastructure of the *root plate* providing strength and *stability* to the tree. Such roots may taper rapidly at short distances from the *root crown* or become large and woody as with gymnosperms and dicotyledonous angiosperms and are usually 1st and 2nd order roots, or form an *adventitious root mass* in monocotyledonous angiosperms (palms). Such roots may be crossed and grafted and are usually contained within the area of *crown projection* or extend just beyond the *dripline*.

APPENDIX F – Tree Assessment

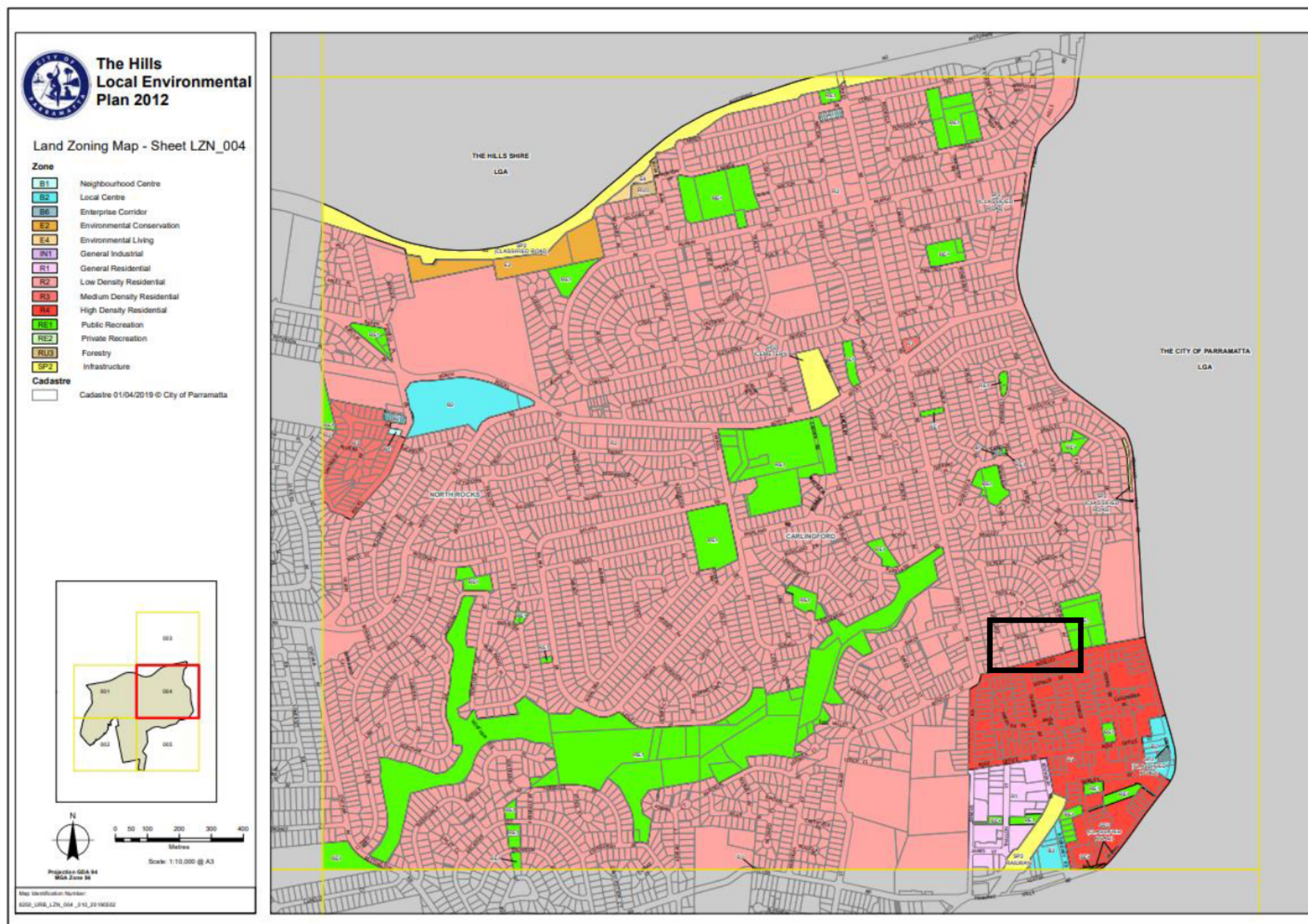
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Appendix G – Tree Location Plan, Land Zoning Map, 1 of 2 32 Moseley Street, Carlingford NSW, Ref: 24040, 22/10/2021.

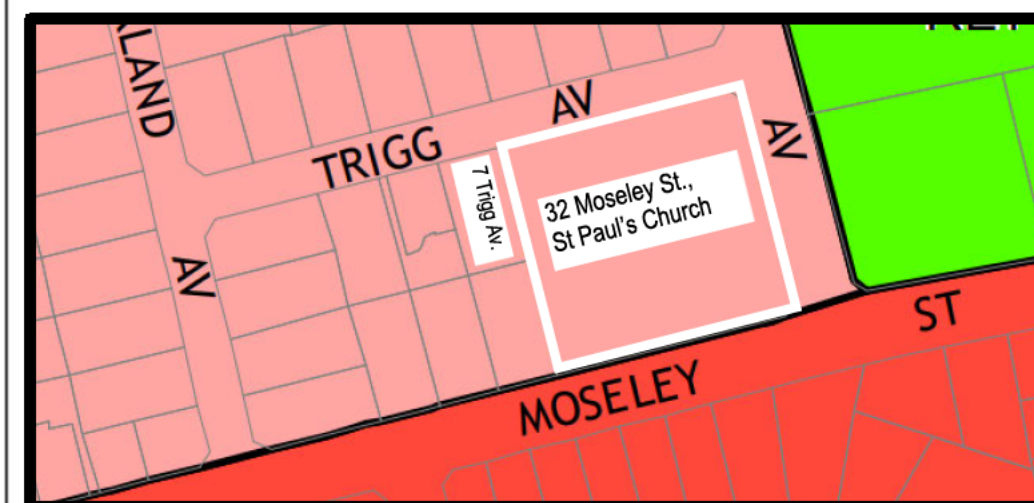
Prepared by Urban Tree Management Australia P/L, 65 Excelsior Street, Merrylands NSW 2160, tel. 02 9760 1389.

From NSW Government, Parramatta (former The Hills) Local Environmental Plan 2012, Land Zoning Map – Sheet LNZ_004,



Legend

Zone	
B1	Neighbourhood Centre
B2	Local Centre
B6	Enterprise Corridor
E2	Environmental Conservation
E4	Environmental Living
IN1	General Industrial
R1	General Residential
R2	Low Density Residential
R3	Medium Density Residential
R4	High Density Residential
RE1	Public Recreation
RE2	Private Recreation
RU3	Forestry
SP2	Infrastructure
Cadastre	
	Cadastre 01/04/2019 © City of Parramatta



Inset - Land Zoning Map – white outlined area showing location of subject trees on the road reserve

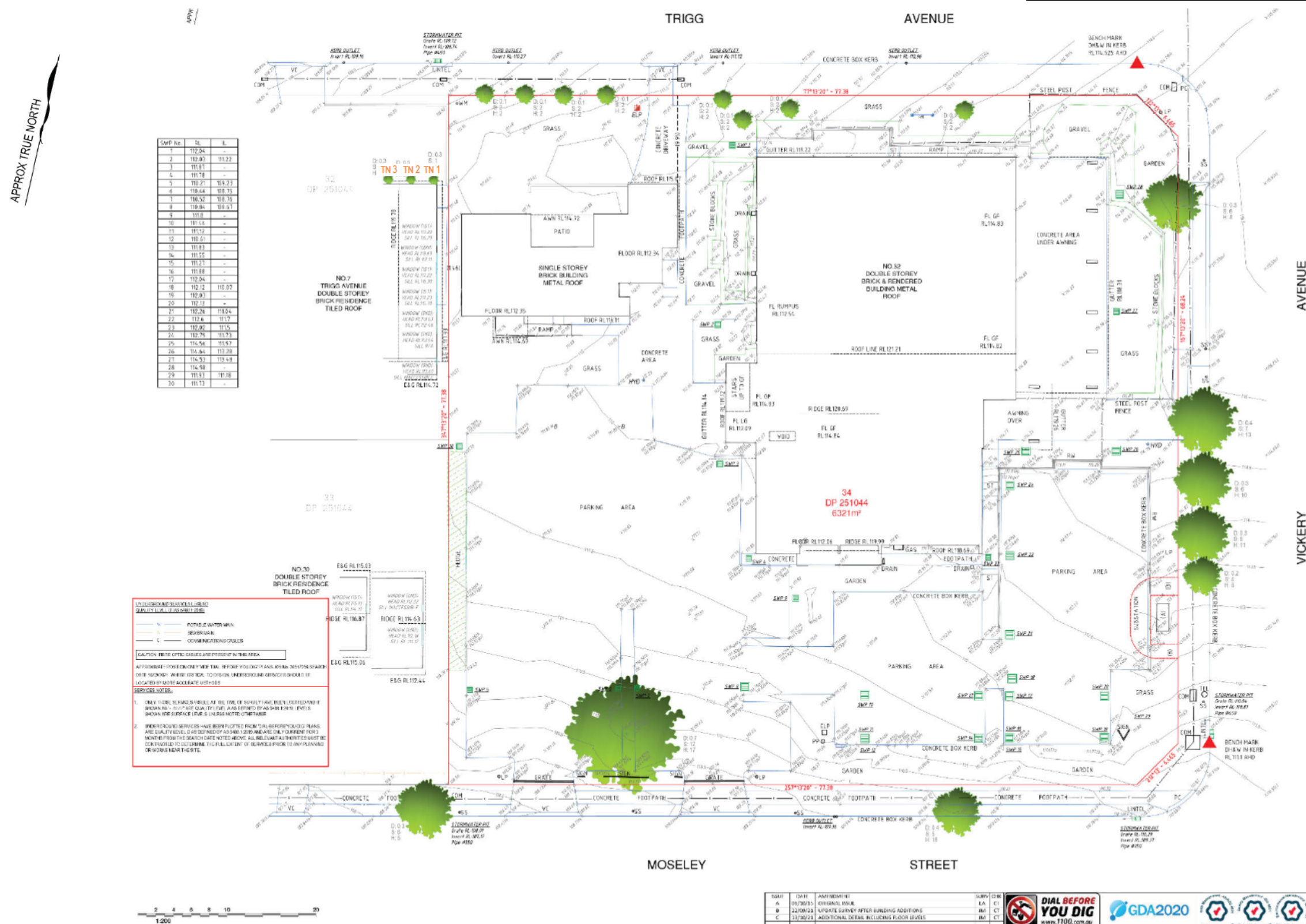
Land Zoning Map – Highlighted black section showing location of subject trees (see Inset Plan)

32 Moseley Street, Carlingford NSW, Ref: 24040, 22/10/2021.

From Detail and Level Survey of Lot 34 in DP 251044, 32 Moseley Street, Carlingford NSW, File: 6880 St Pauls Church Moseley Street, Carlingford NSW, Reference 6880, Issue C, Survey Date: 22/09/2021, Scale 1:200, Sheet 1 of 1, prepared by SDG Pty Ltd, Suite 1, 3 Railway Street, Bau kham Hills, NSW 2153, tel. 9630 7955.



Note: trees indicated, unnumbered are either shrubs, or trees of species, or dimensions, or condition class not protected by the Tree Preservation Order or trees not affected by the proposed works or were already removed.



APPENDIX H – TREE PROTECTION PLAN, Tree Protection Zones - Standard Procedure, plan 1 of 4



The Protective fencing where required may delineate the TPZ and should be located as determined by the project arborist in accordance with AS4970 *Protection of trees on development sites*, Section 4, 4.3. "Fencing should be erected before any machinery or materials are brought onto the site and before the commencement of works including demolition. Once erected, protective fencing must not be removed or altered without approval by the project arborist. The TPZ must be secured to restrict access. AS4687 *Temporary fencing and hoardings* specifies applicable fencing requirements. Shade cloth or similar should be attached to reduce the transport of dust, other particulate matter and liquids into the protected area. Fence posts and supports should have a diameter greater than 20 mm and be located clear of roots. Existing perimeter fencing and other structures may be suitable as part of the protective fencing."

AS4970 Section 4, Tree protection measures, Figure 3 Protective fencing shows examples of such fencing.

"Legend:

- 1 Chain wire mesh panels with shade cloth (if required) attached, held in place with concrete feet.
- 2 Alternative plywood or wooden paling fence panels. The fencing material also prevents building materials or soil entering the TPZ.
- 3 Mulch installation across surface of TPZ (at the discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.
- 4 Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots. "

AS4970 Section 4, Tree protection measures, 4.2 Activities restricted within the TPZ

"Activities generally excluded from the TPZ included but are not limited to-

- (a) Machine excavation including trenching;
- (b) Excavation for silt fencing;
- (c) cultivation;
- (d) storage;
- (e) preparation of chemicals, including preparation of cement products;
- (f) parking of vehicles and plant;
- (g) refuelling;
- (h) dumping of waste;
- (i) wash down and cleaning of equipment;
- (j) placement of fill;
- (k) lighting of fires;
- (l) soil level changes;
- (m) temporary or permanent installation of utilities and signs, and
- (n) physical damage to the tree."

Tree Protection signage is to be attached to each **Tree Protection Zone** and displayed from within the development site in accordance with AS4970 2009 *Protection of trees on development sites*, Section 4.4 and example Figure C1 (as shown) and lettering to comply with AS1319.

Where a tree is to be retained and a **Tree Protection Zone** cannot be adequately established due to restricted access e.g. tree located along side an access way, the trunk and branches in the lower crown will be protected by wrapping 2 layers of hessian or carpet underfelt around the trunk and branches for a minimum of 2 m or as lower branches permit, then wire or rope secures 75x50x2000 mm hardwood battens together around the trunk (do not nail or screw to the trunk or branches). The number of battens to be used is as required to encircle the trunk and the battens are to extend to the base of the tree (AS4970 2009 *Protection of trees on development sites*, Figure 4 Examples of Trunk, Branch and ground protection).

Trunk/Branch and root protection If a tree is growing down slope from an excavation, a silt fence located along the contours of the site in the area immediately above the **Tree Protection Zone** fencing may need to be installed and regularly maintained to prevent burial and asphyxiation of the roots of the tree. To allow for the maintenance of both fences, the silt fence must be constructed separately to the tree protection fence and the 2 fences must be constructed independently of each other and standalone. To reduce competition with the tree the area within the **Tree Protection Zone** is to be kept free of weeds. These are best removed by the application of foliar herbicide with Glyphosate as the active constituent. This is the preferred method rather than removal by cultivation of the soil within the dripline, to minimise root disturbance to the tree. The removal of woody weeds such as Privet should use the cut and paint method of herbicide application. Weeds to be controlled within the **Tree Protection Zone**, for the duration of the project.

The area of the Tree Protection Zone to be mulched to a depth of 100 mm with organic material being 75% leaf litter and 25% wood, and this being composted material preferably from the same genus and species of tree as that to where the mulch is to be applied, i.e. species specific mulch. The depth of mulch and type as indicated, to be maintained for the duration of the project. Where deep excavation will expose the soil profile to drying out the root plate is to be protected by pegging jute matting across the ground surface 2 m back from the edge of the profile and 2 m down the face of the profile and is to be in one continuous sheet or layers up to 5 mm thick and overlapped 300 mm and pegged. Pegs are to be a minimum length of 200 mm and spaced at 500 mm increments in a grid pattern. Once installed mulch is to be placed on top of the jute matting previously described.

No services either temporary or permanent are to be located within the **Tree Protection Zone**. If services are to be located within the **Tree Protection Zone**, special details will need to be provided by the Project Arborist for the protection of the tree regarding the location of the services.

A tree will not be fertilised during its protection within the **Tree Protection Zone**, as this may hasten its decline if it were to decline. If a tree is to be fertilised this should be in consultation with the Project Arborist as per AS4970 (2009).

In the event of prolonged dry periods, or where a tree has been transplanted, or where excavation nearby, especially up slope, leads to drying out of a soil profile, or modification to ground water flow, or flows across an existing ground surface to the tree and its growing environment; deep root watering thoroughly at least twice a week is to be undertaken to irrigate the tree. The need for such watering is determined readily by observing the dryness of the soil surface within the dripline of the tree by scraping back some mulch. Mulch is to be reinstated afterwards. In the event of disrupted ground or surface water flows to the tree due to excavation, filling or construction, a reticulated irrigation system may be required to be installed within the **Tree Protection Zone**. If an irrigation system is to be installed, consideration must be given to volume, frequency, and drainage of water delivered, and this should be in consultation with the Project Arborist as per AS4970 (2009).

Scaffolding "Where scaffolding is required it should be erected outside the TPZ. Where it is essential for scaffolding to be erected within the TPZ, branch removal should be minimized. This can be achieved by designing scaffolding to avoid branches or tying back branches. Where pruning is unavoidable it must be specified by the project arborist in accordance with AS4373. Ground below the scaffolding should be protected by boarding (e.g. scaffolding board or plywood sheeting) as shown in Figure 5. Where access is required, a board walk or other surface material should be installed to minimise soil compaction. Boarding should be placed over a layer of mulch and impervious sheeting to prevent soil contamination. The boarding should be left in place until the scaffolding is removed." (Standards Australia 2009, p. 18).

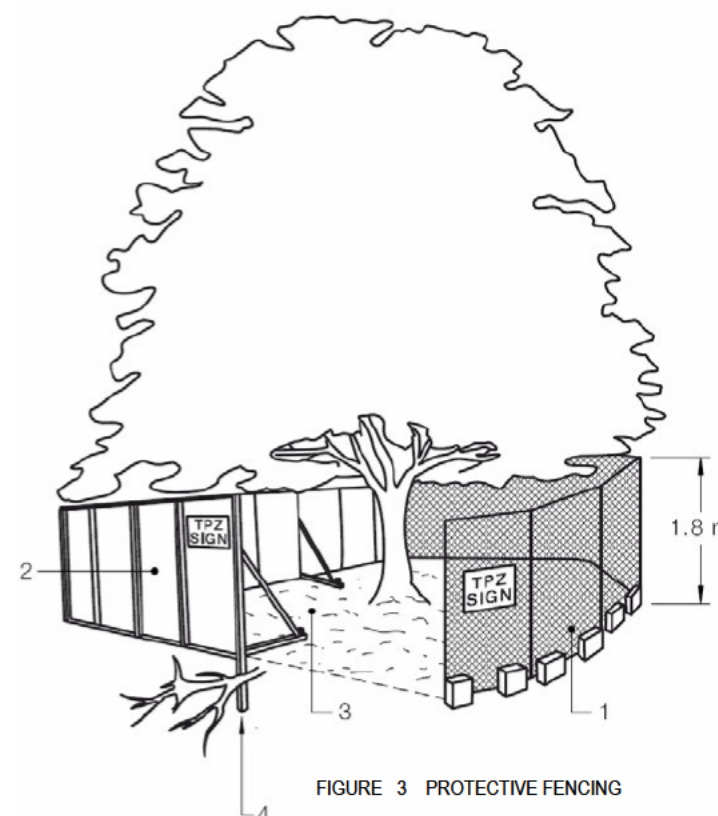


FIGURE 3 PROTECTIVE FENCING



FIGURE C1 TREE PROTECTION ZONE SIGN

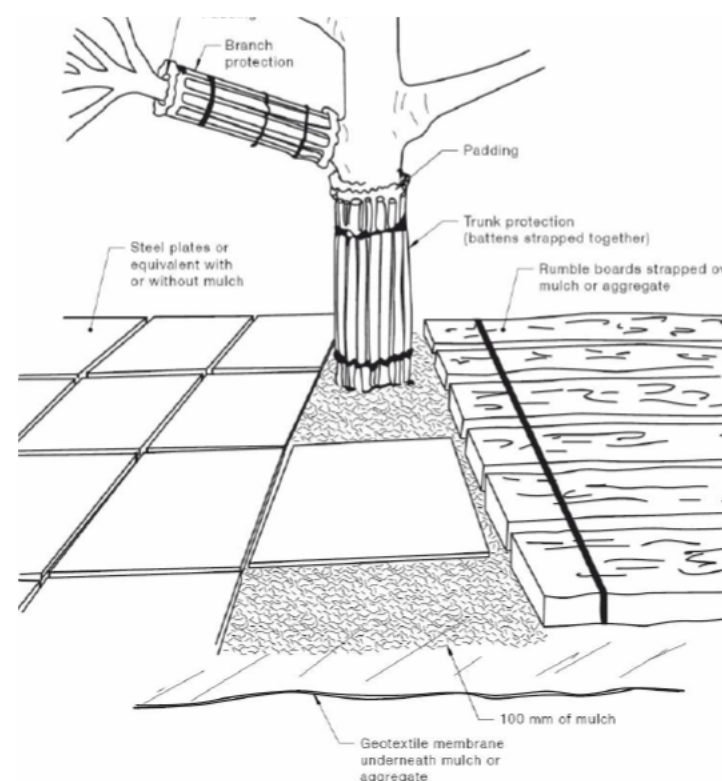
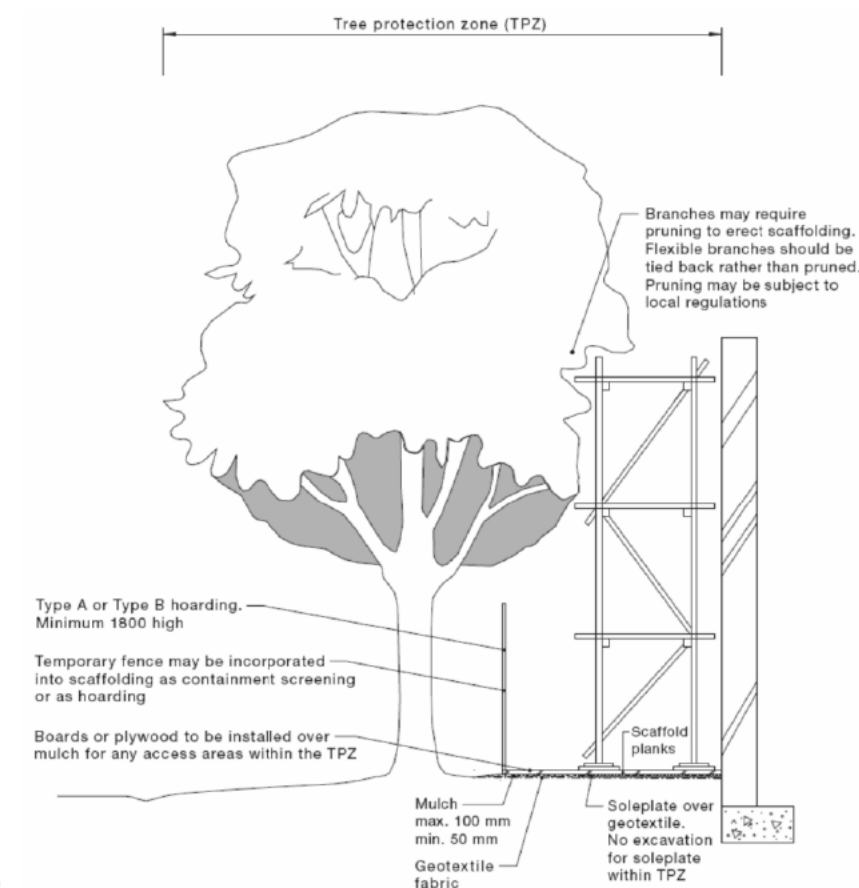


FIGURE 4 EXAMPLES OF TRUNK, BRANCH AND GROUND PROTECTION



NOTE: Excavation required for the insertion of support posts for tree protection fencing should not involve the severance of any roots greater than 20 mm in diameter, without the prior approval of the project arborist.

FIGURE 5 INDICATIVE SCAFFOLDING WITHIN A TPZ

APPENDIX H – Tree Protection Plan, 2 of 4
(trees numbered per Appendix F - Tree Assessment)
32 Moseley Street, Carlingford NSW, Ref: 24040,
22/10/2021.

Prepared by Urban Tree Management Australia P/L, 65 Excelsior Street, Merrylands NSW 2160, tel. 02 9760 1389.

All retained tree/s Existing levels are to be preserved and no excavation except by hand to protect structural roots is to be undertaken within the Tree Protection Zone/s. No cutting or filling is to be undertaken within any TPZ unless specified by the Project Arborist.

Induction for Tree Protection All workers entering the site involved in construction must be advised of the tree protection measures and specifications outlined within this report during the site induction. This is to be verbally acknowledged and signed off before commencement of work.

Tree Protection Works - Specific

Prior to Demolition – Before construction



Crown Pruning – Trees 1-3 No pruning is required.

Selective Pruning No pruning required.

TPZ Fencing or works Tree 1 The tree Protection Zone fenced area is shown on plan 4 of 4. TPZ fences and works are to be maintained and retained until the completion of all building works. This is to be installed as shown in Appendix H – Tree Protection Plan – Tree Protection Zones - Standard Procedure, Plan 1 of 4. Tree Protection Zone signage is to be applied to the fences per Plan 1 of 4 Figure C1.

Demolition of shrubs or build structures within the TPZ fenced area – Trees 1 and 2 Demolition is to be undertaken manually with no plant equipment permitted within the TPZ. The TPZ fence is to be enclosed post the completion of these demolition works.

Trunk and Branch protection Trees 1 - 3 Not required.

Remedial works to stimulate root growth and vigour – Trees 1 - 3. – Not required.

Scaffolding within the Tree Protection Zone or any protected tree Not required.

Mulching Tree/s all retained trees Not required.

Movement of Plant Equipment within the TPZ – Tree 1 Any plant equipment is to work from outside of the TPZ reaching into the TPZ to minimise damage to overhanging branches and to protect roots.

All exiting soil levels within the TPZ fenced area are to be retained unaltered to protect tree roots save for the driveway after hand excavation along its edge.

During Demolition and Earth Works

Crown Protection – Tree 1 Plant equipment is to be kept away from the crown and work is to be conducted from outside of the TPZ reaching into the TPZ to minimise soil disturbance and compaction and branch and trunk damage.

Root Protection – Tree 1 No work is to be undertaken within the TPZ of this tree.

Root Protection – Tree 1 Where access is required within the TPZ, roots are to be protected from soil compaction by the application of ground protection as per AS4970 (2009) section 4, 4.5.3 Ground Protection, where a permeable membrane such as geotextile fabric is to be located at existing ground level beneath a layer of mulch or crushed rock with no fines 100 mm deep and covered with rumble boards or steel plates as per AS4970 (2009) Figure 4, (Appendix H, plan 1 of 4). Plant equipment is to work from outside of the TPZ reaching into the TPZ to minimise soil disturbance and soil compaction.

Root Pruning – Tree 1 If required within the fenced area of the TPZ, a slit trench is to be hand excavated with non-motorised tools, 200 mm wide and 600 mm deep to expose roots requiring pruning adjacent Tree 1. Were required, root pruning is to be conducted in accordance with (AS4373, 2007, p. 18) sec. 9 Root Pruning, Cuts are to be made with clean sharp tools with final cuts made to undamaged tissue. Final cuts should be made perpendicular to the length of the root with a final cut to undamaged tissue to remove injured or crushed tissues allowing the tree to develop strong internal boundaries and generate new roots. After root pruning in the slit trench to 600 mm deep the broader excavation from the slit trench leading away from the tree can be conducted with plant equipment past 600 mm deep.

TPZ Fencing or works Tree 1 Tree Protection Zone fences and works are to remain in place during this part of the project.

Existing soil levels – Trees 1 The existing soil levels within the TPZ of each this tree (no topsoil stripping to 300 mm) are to be retained at extant grade.

APPENDIX H – Tree Protection Plan, 3 of 4
(trees numbered per Appendix F - Tree Assessment)
32 Moseley Street, Carlingford NSW, Ref: 24040,
22/10/2021.

Prepared by Urban Tree Management Australia P/L, 65 Excelsior Street, Merrylands NSW 2160, tel. 02 9760 1389.



TPZ Fencing or works Tree 1 Tree Protection Zone fences and works are to remain in place during this part of the project.

Root Protection from Soil Profile Desiccation - utility trenches – Tree 1 Where an excavation profile is to be open for 1 day or more within or adjoining the TPZ, the exposed structural roots (roots >400 mm diameter) and those within the soil profile are to be protected from drying out. The exposed structural roots are to be wrapped with a triple layer of hessian which is to be fastened to itself with hessian to prevent unravelling. The soil profile to 2 m deep (or to the base of the excavation if less than 2 m) is to be achieved by applying a double layer of hessian fabric to cover the exposed soil profile from grade within the Tree Protection Zone of these trees and fixed into place by metal pegs at the bottom, and the fabric is to overlap the ground at surface by 300 mm and be pegged into place with metal pegs. The soil profile protection is to remain in place and be maintained until backfilling is completed.

Location of underground utilities within a Tree Protection Zone – Tree 1 All underground utilities are to be installed by under boring or into trenches previously investigated by Root Mapping. The minimum top of bore is to be 700 mm below extant grade to protect the root plate. The Sending and Receiving trenches for the under bore are to be located outside of the TPZ of each tree. Works are to be monitored and certified by the Project Arborist.

Precautions in respect to temporary work – Tree 1 If pedestrian or vehicular access is required within a Tree Protection Zone fenced area the roots of the tree are to be protected from soil compaction by the application of ground protection as per AS4970 (2009) Figure 4, (see Appendix H, plan 1 of 4), where a permeable membrane such as geotextile fabric is to be located at existing ground level beneath a layer of mulch or crushed rock with no fines 100 mm deep and covered with rumble boards or steel plates. Such works are to be monitored and certified by the Project Arborist. Any plant equipment is to work from outside of the TPZ reaching into the TPZ to minimise soil disturbance and compaction. Ground Protection Work is to remain in place until building works are completed. Maintain tree protection, waste material is to be kept clear of the TPZ.

Backfilling within a Tree Protection Zone Not to be undertaken within the Tree Protection Zone.

Any plant equipment is to work from outside of the TPZ reaching into the TPZ to minimise damage to overhanging branches and to protect roots.

All exiting soil levels within the TPZ fenced area are to be retained unaltered to protect tree roots.

Root Pruning Were required within the fenced area of the TPZ, root pruning is to be conducted in accordance with (AS4373, 2007, p. 18) sec. 9 Root Pruning, Cuts are to be made with clean sharp tools with final cuts made to undamaged tissue. Final cuts should be made perpendicular to the length of the root with a final cut to undamaged tissue to remove injured or crushed tissues allowing the tree to develop strong internal boundaries and generate new roots.

Post Construction

Remove Tree Protection Zone works.

Remedial pruning to crown of tree/s as required to be conducted per AS4373 (2007), to be determined by the Project Arborist.

During Construction

Crown Protection – Tree 1 Plant equipment is to be kept away from the crown of this tree and work is to be conducted from outside of the TPZ, and where required, by reaching into the TPZ to minimise soil disturbance and compaction and branch and trunk damage.

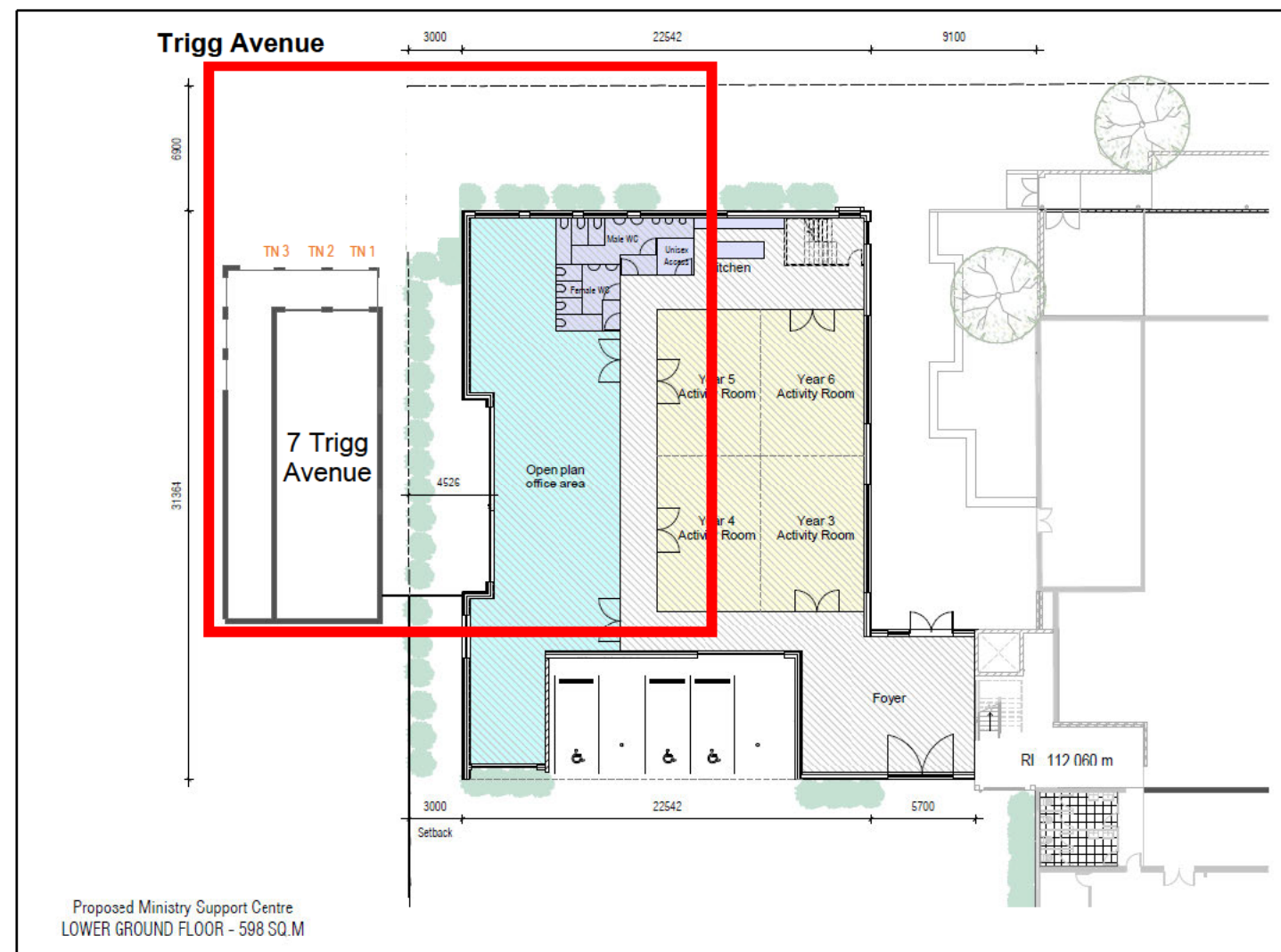
Root Protection – Tree 1 No work is to be undertaken within the TPZ fenced area.

Root Protection – Tree 1 Where access is required within the TPZ, roots are to be protected from soil compaction by the application of ground protection as per AS4970 (2009) section 4, 4.5.3 Ground Protection, where a permeable membrane such as geotextile fabric is to be located at existing ground level beneath a layer of mulch or crushed rock with no fines 100 mm deep and covered with rumble boards or steel plates as per AS4970 (2009) Figure 4, (Appendix H, plan 1 of 4). Plant equipment is to work from outside of the TPZ reaching into the TPZ to minimise soil disturbance and soil compaction.

APPENDIX – H, Tree Protection Plan, showing Tree Protection Zones, plan 4 of 4 (trees numbered per Appendix F - Tree Assessment) 32 Moseley Street, Carlingford NSW, Ref: 24040, 22/10/2021.

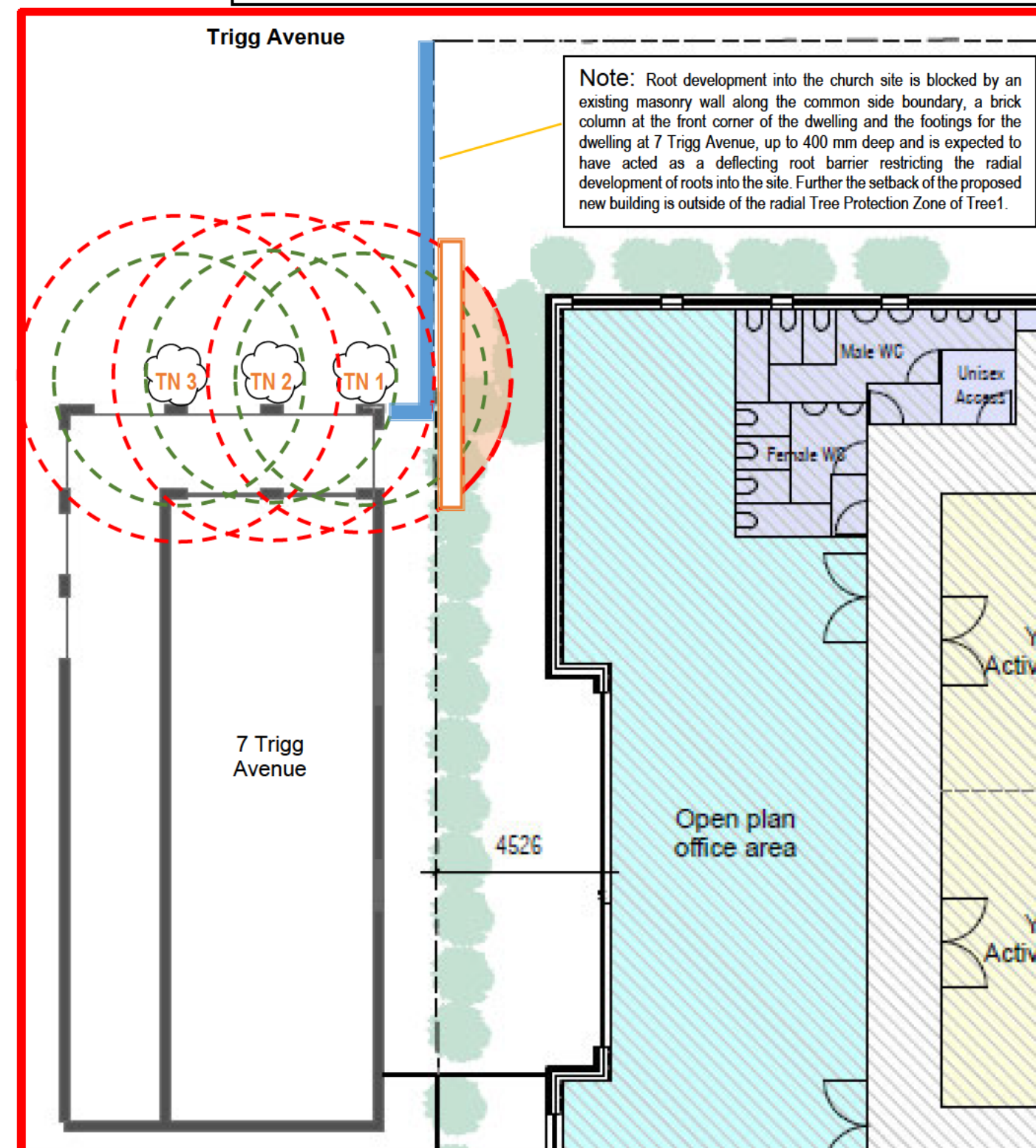
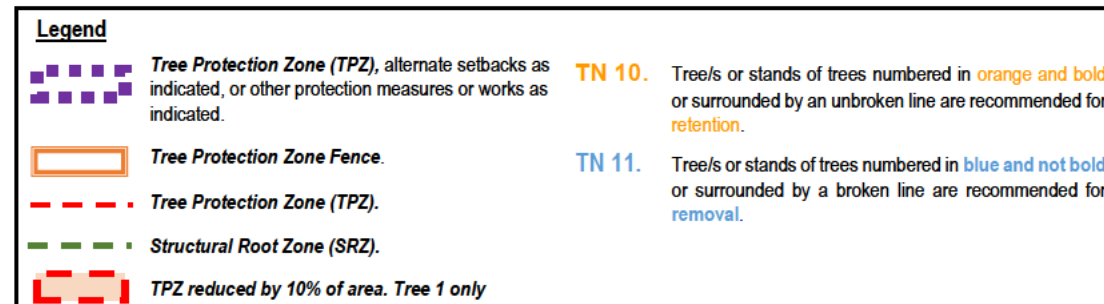
Prepared by Urban Tree Management Australia P/L, 65 Excelsior Street, Merrylands NSW 2160, tel. 02 9760 1389.

From Proposed Lower Ground Floor Plan, Moseley Street and Vickery Avenue, Carlingford NSW, Scale 1:100 @ A1, Drawing No. JA2720 – SK – 107, Issue A, dated, 3/06/2021, prepare by Jakaan Architects, Registered Architect: Geoff Ferris-Smith #8834, info@jakaan.com.au // ABN 48 714 361 834.



Proposed Lower Ground Floor Plan – Highlighted red section showing location of subject trees (see Inset Plan)

Tree Protection Zone setbacks				
1. UTM Tree No. / UTM Stand No.	2. Tree Protection Zone (TPZ) = 12 x DBH (m) From center of trunk (COT) in metres AS4970 (2009) Section 3	3. Structural Root Zone SRZ From center of trunk (COT), trunk diameter above root buttress (DARB) AS4970 (2009) Section 3, 3.3.5 where applicable (m)	4. Distance of fence with TPZ setback reduced by 10% of area on one side of tree only, in metres equating to approx. 0.3 radius as per AS4970 (2009) Section 3, 3.3 (mm)	5. Proposed distance of works on the side closest to excavation / building construction in metres From center of trunk (COT), (m) 1.Trunk and first order branch protection in narrow road reserve.
1	3	1.9	2.1	2.1
2	3.12	1.9	N/A	3.12
3	3.12	1.9	N/A	3.12



Inset - Proposed Lower Ground Floor Plan – red outlined area showing location of subject trees at 7 Trigg Avenue.