25 June 2025 Job Reference #: 10105

Tree Management Plan

11 Wentworth Avenue Kingston, ACT 2604. Section: 49, Block: 15.

Screenshot was sourced from ACTMapi on December 12th 2024.

Client Name:

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NH Architecture

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Summary

Canopy the Tree Experts will deliver a comprehensive Tree Management Plan (TMP) aimed at protecting the public and heritage trees during the development works at 11 Wentworth Ave, Kingston (Kingston Arts Precinct).

The Tree Protection Zone (TPZ) as stated in the *Urban Forest Act* (canopy +2m) has been deemed appropriate for this TMP and has been used to calculate the TPZs and Structural Root Zones (SRZ).
This results in an array of encroachments from major excavations for stormwater piping to minor encroachments from nearby surface scraping or replacement hardscape. Refer to *Tree Specifications* for further information on TPZ encroachments.

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Introduction

This TMP was prepared by AQF5 Arborist, Dominic Grey, working with Canopy the Tree Experts Pty Ltd. The PAR for this report was prepared by AQF 5 Arborist, Bruno Wright. The TMP was commissioned by Lucinda Arundel to best protect public and heritage trees during the following construction activities at the Kingston Arts Precinct:

- Removal of existing underground services
- Various areas to be cleared for parking spaced and driveways
- Removal of existing pavement
- Installation of new underground services
- Installation and modification of grass and concrete swales
- Existing verges to be upgraded and installation of three new verges along Eastlake Pde
- Bus stop on Wentworth Ave to be relocated
- Construction of new footpath along north face of Eastlake Pde
- Construction of three new buildings (Buildings 1-3)
- Construction of multi-storey carpark
- Construction of new carpark spaces and driveways

Background

The Preliminary Arboricultural Report listed below was used to determine the TPZ and SRZ for all trees.

Documents Referenced

Plan Name	Plan/Drawing No.	Date
Preliminary Arboricultural Report	Job Ref: 10105	12 September 2024
Tree Management Plan	LA-0-110-001 REV: 04	25 June 2025
Indicative Landscape Master Plan	LA-0-110-002 REV: 03	6 June 2025
Indicative Site Permeability Plan	LA-0-110-004 REV: 03	6 June 2025
Tree Canopy Coverage Site Permeability and Landscape Plan to Public Road Verge	LA-0-210-001 REV: 03	6 June 2025
Demolition Plan	CC-0-11-00 REV: 03	6 June 2025
Landscape Management and Protection Plan	CC-0-110-03 REV: 03	6 June 2025
Utility Services Plan	CC-0-113-01 REV: 03	6 June 2025
Stormwater Master Plan	CC-0-113-02 REV: 03	6 June 2025
Cut and Fill Plan	CC-0-101-001 REV: 03	6 June 2025

Method and limits

Dominic Grey has conducted a site visit with Katrina Keller, Philip Leeson Architects, on December 11, 2024. This was for a general overview of the site and no tree surveying was conducted at this time.

The Preliminary Arboricultural Report (Ref: 10105, dated September 12, 2024) supplied by Canopy The Tree Experts was used to compile this report.

Compliance

A copy of this Tree Management Plan (TMP) must be made available on-site and included in the site induction process. At any time, this TMP must be available for viewing by workers or contractors on site. All specified tree protection measures must be installed before any demolition or other works can commence.

Version History

Version	Reference:	Version Date	Author	Description
V1.0	10105	20 December 2024	Dominic Grey	Draft for PRE-APPLICATION ENTITY CIRCULATION submission.
V1.1	10105	17 April 2025	Dominic Grey	Draft for Issue for ACT Heritage Review.
V1.1.1	10105	19 May 2025	Dominic Grey	Powerhouse boundary removed from plans.
V1.2	10105	25 June 2025	Dominic Grey	Issue for SDA Submission.

Site Plans – Tree Management Plan

Tree Management Plan

Figure 1: Tree Management Plan site plan outlining the Tree Protection Fencing in PURPLE. The tree protection fencing outlined in this plan is for the demolition and proposed works. See Tree *Protection Measures* for trees with Trunk and Branch protection.

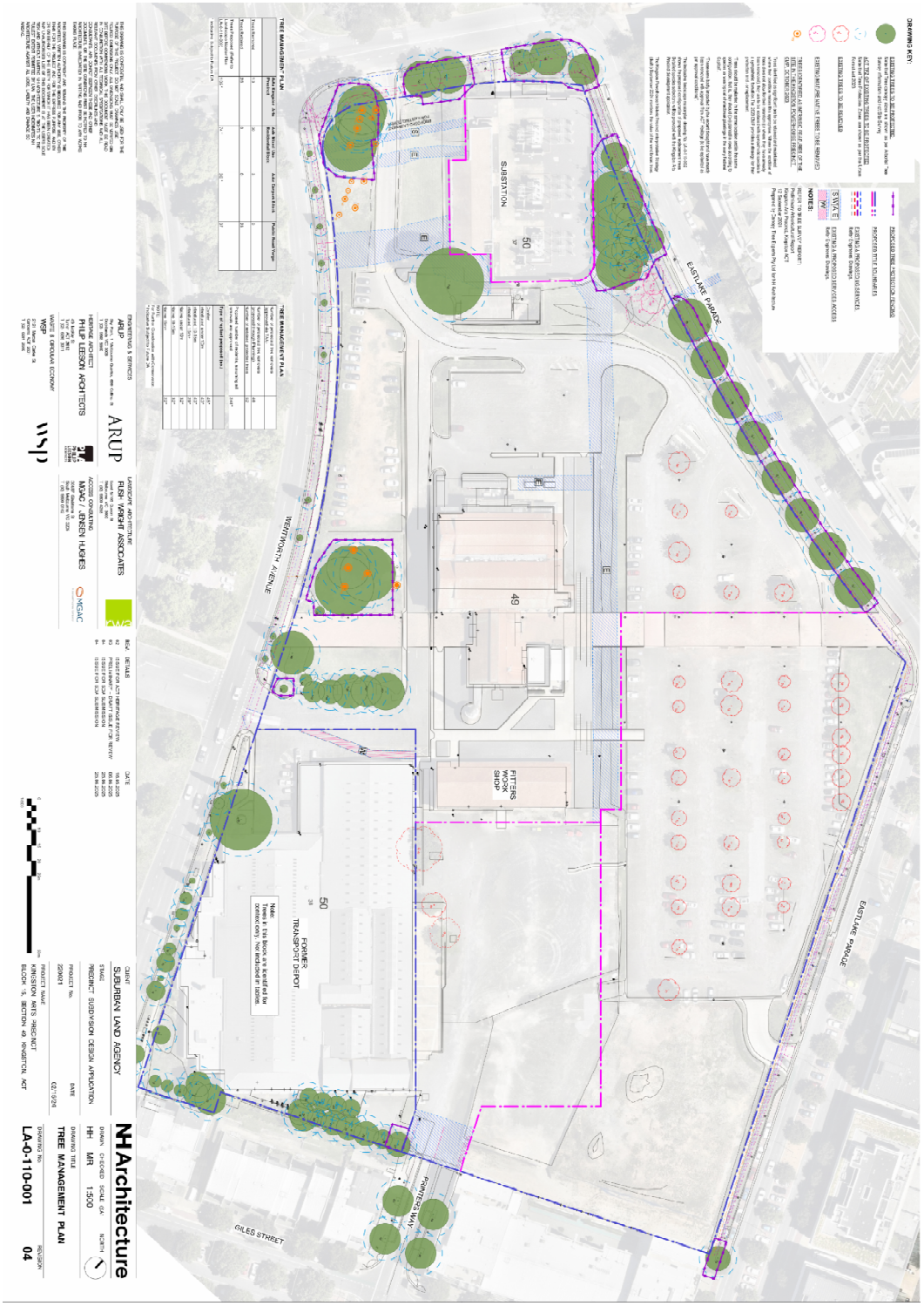


Figure 2: Snapshot of trees 149, 150, and 152 on the Tree Management Plan site plan outlining the Tree Protection Fencing in PURPLE.

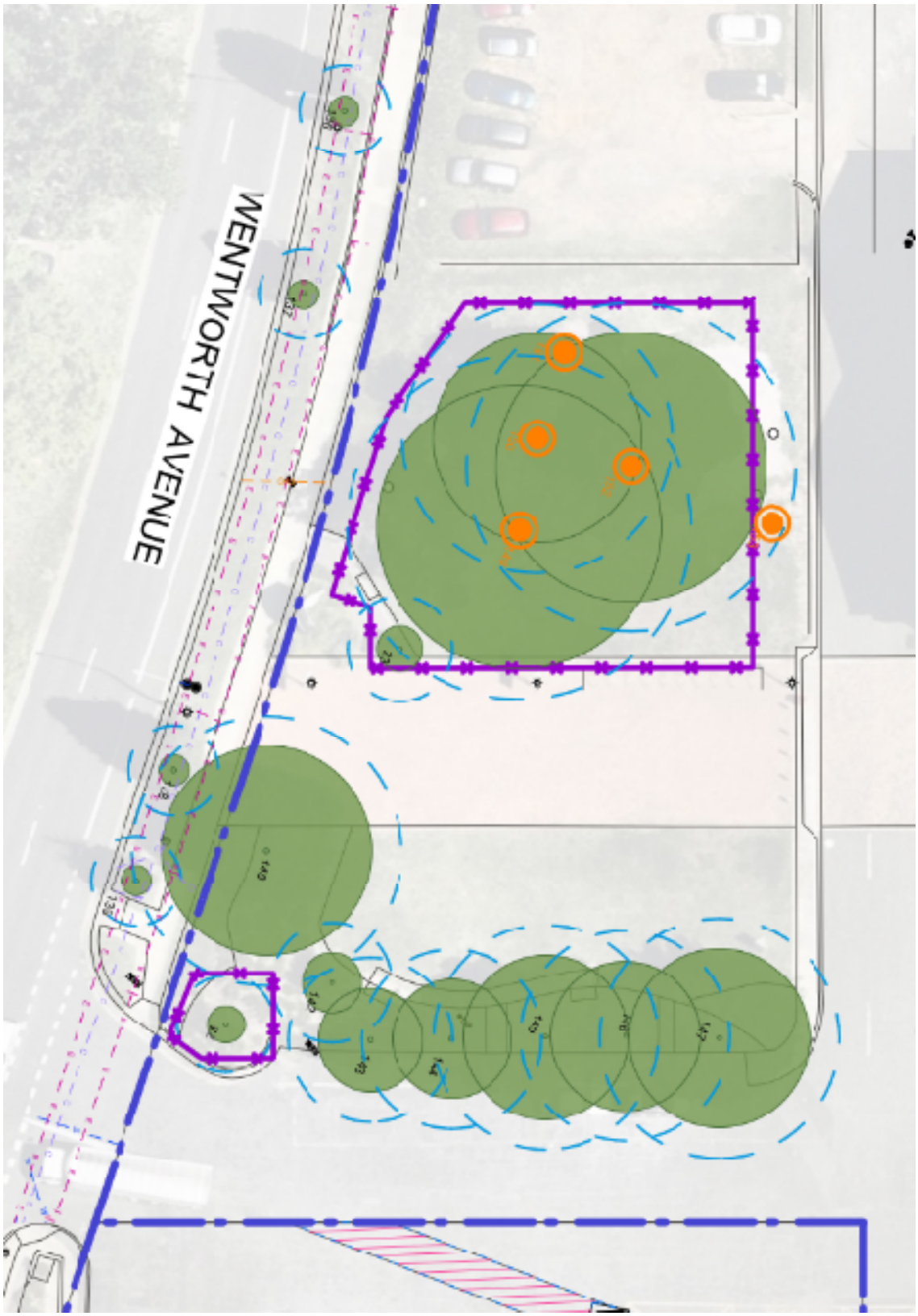


Figure 3: Snapshot of trees 120 – 123 on the Tree Management Plan site plan outlining the Tree Protection Fencing in PURPLE.

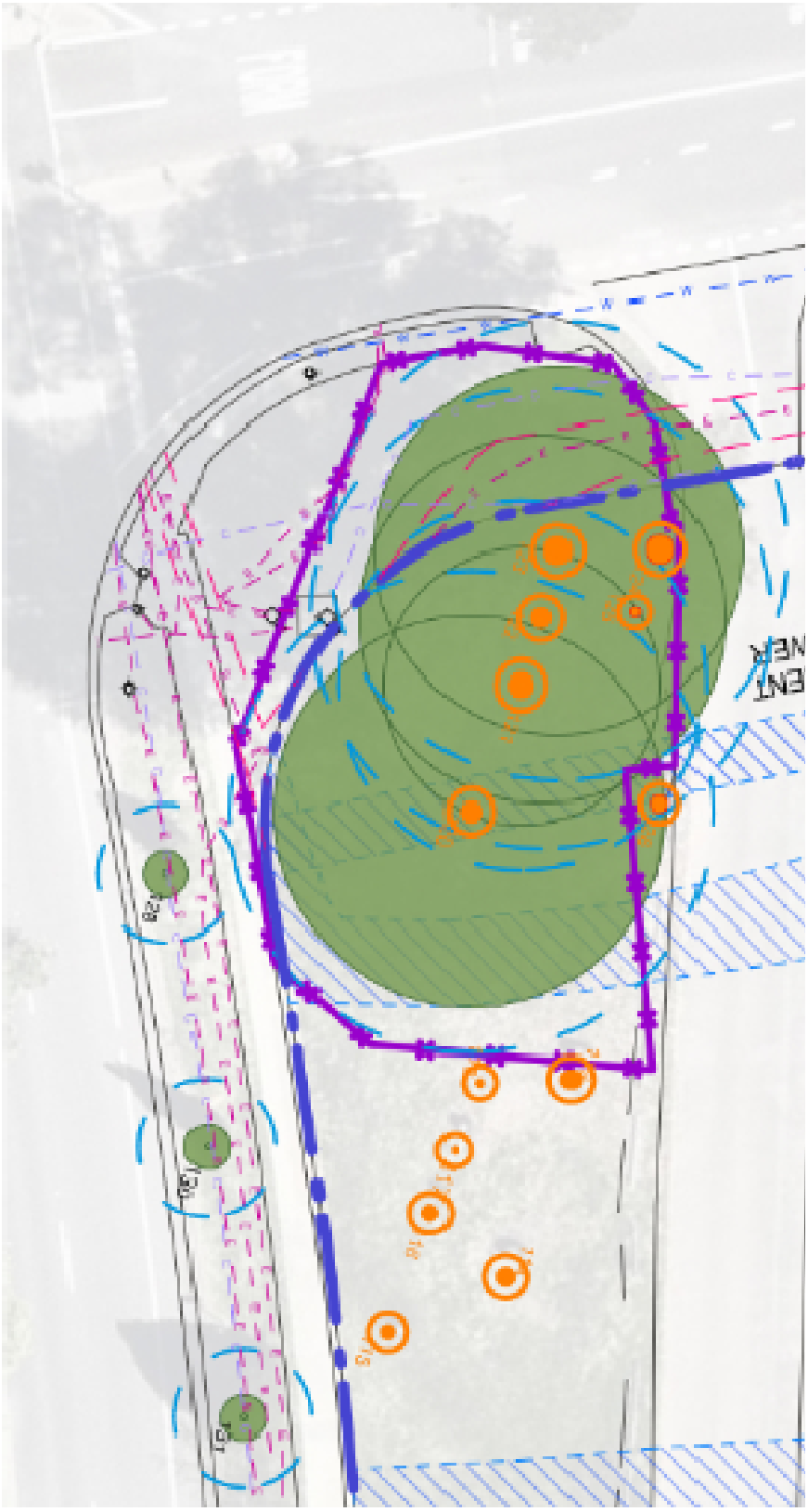


Figure 4: Snapshot of trees 42 and 127 on the Tree Management Plan site plan outlining the Tree Protection Fencing in PURPLE.

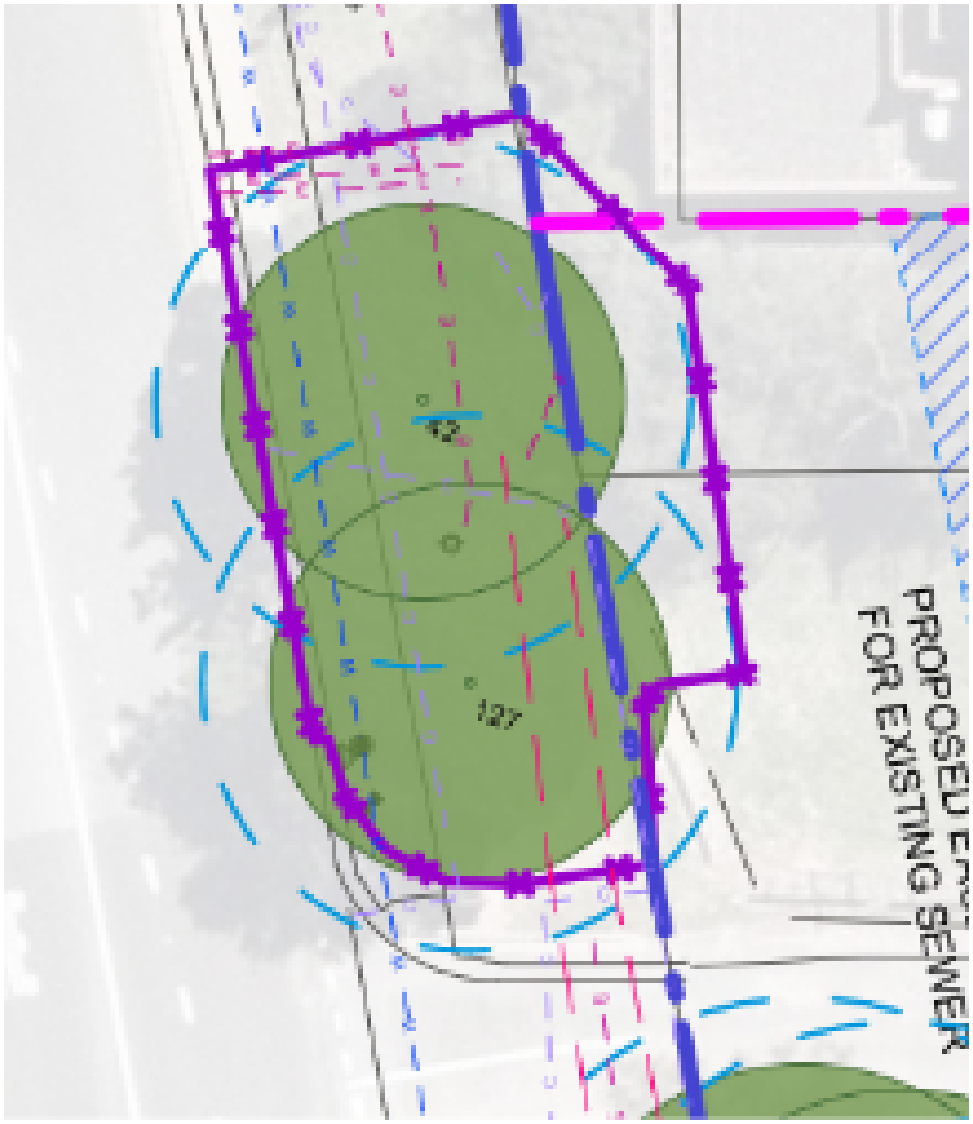


Figure 5: Snapshot of trees 40, 43, and 111 on the Tree Management Plan site plan outlining the Tree Protection Fencing in PURPLE.

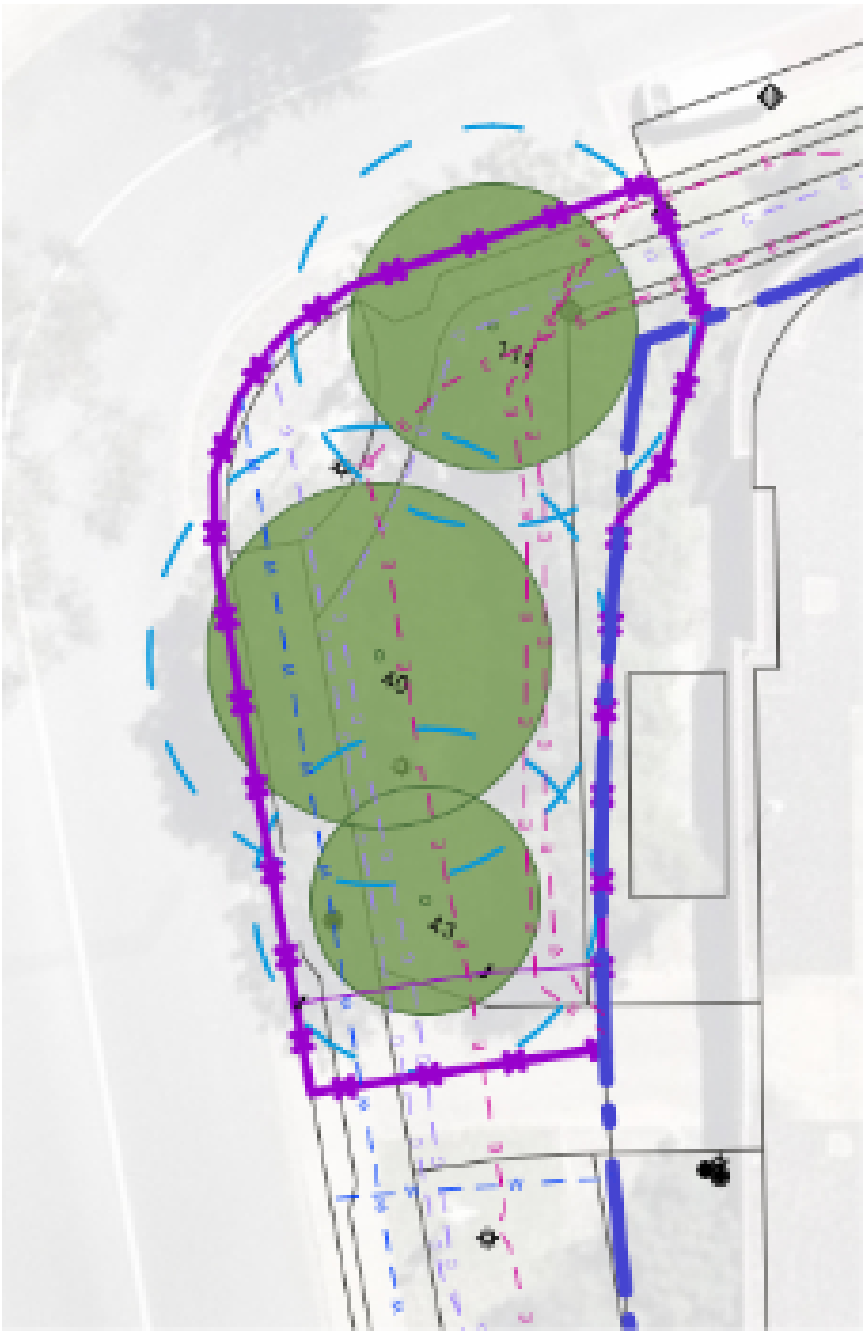


Figure 6: Snapshot of trees 39, 102 – 110, and 112 on the Tree Management Plan site plan outlining the Tree Protection Fencing in PURPLE.

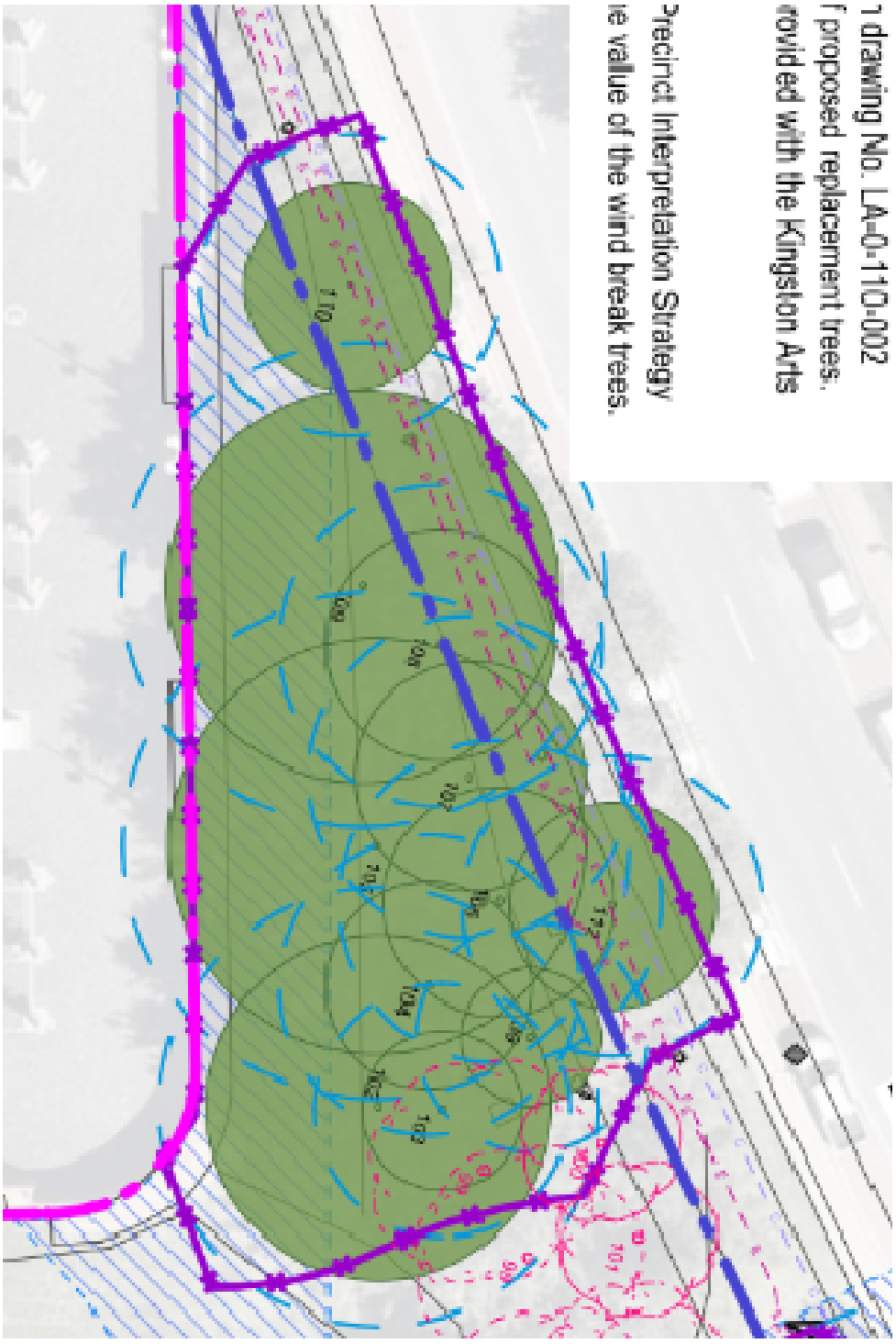


Figure 7: Snapshot of trees 41, 54 – 57, and 86 - 88 on the Tree Management Plan site plan outlining the Tree Protection Fencing in PURPLE.

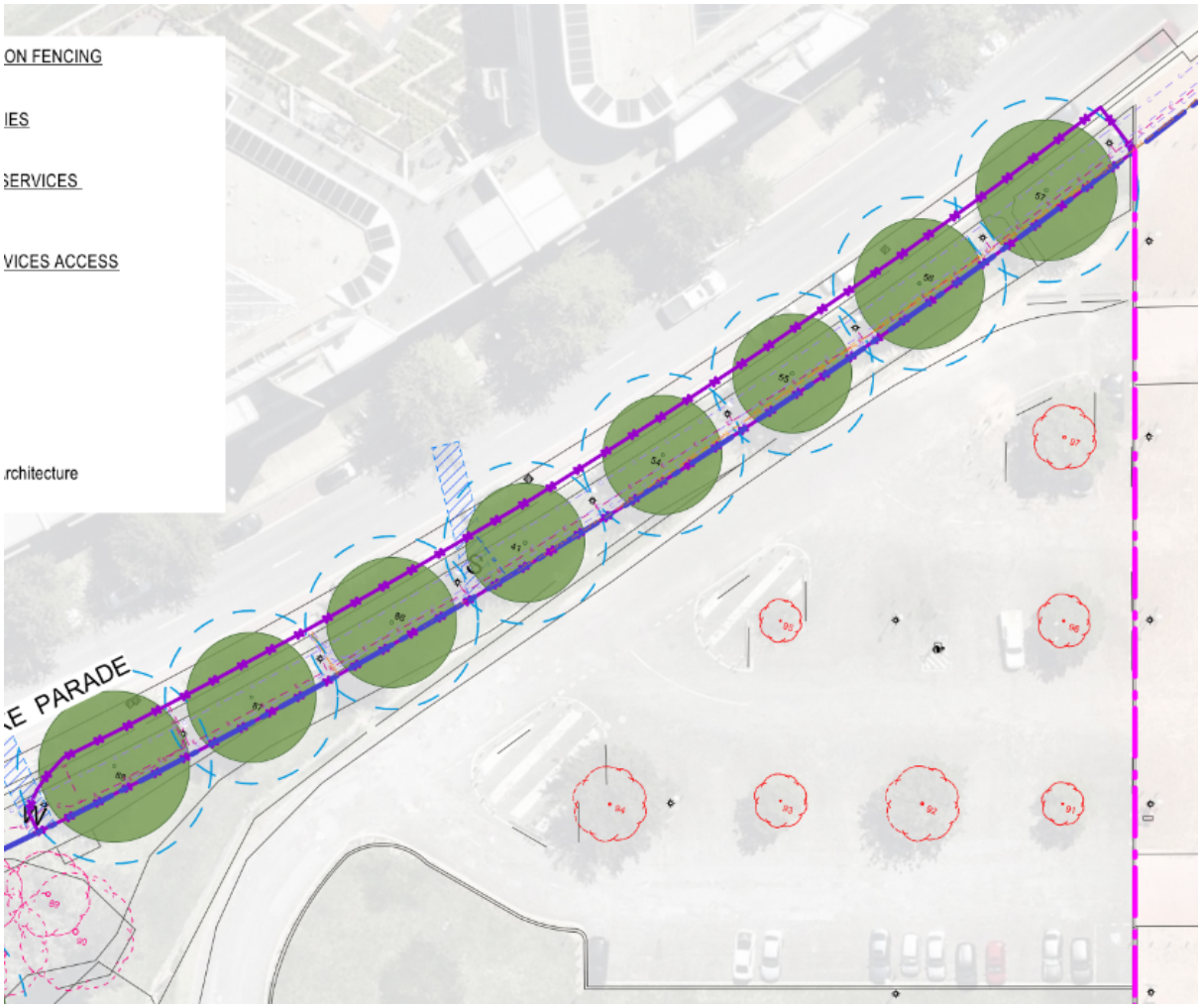


Figure 8: Snapshot of tree 78 on the Tree Management Plan site plan outlining the Tree Protection Fencing in PURPLE.

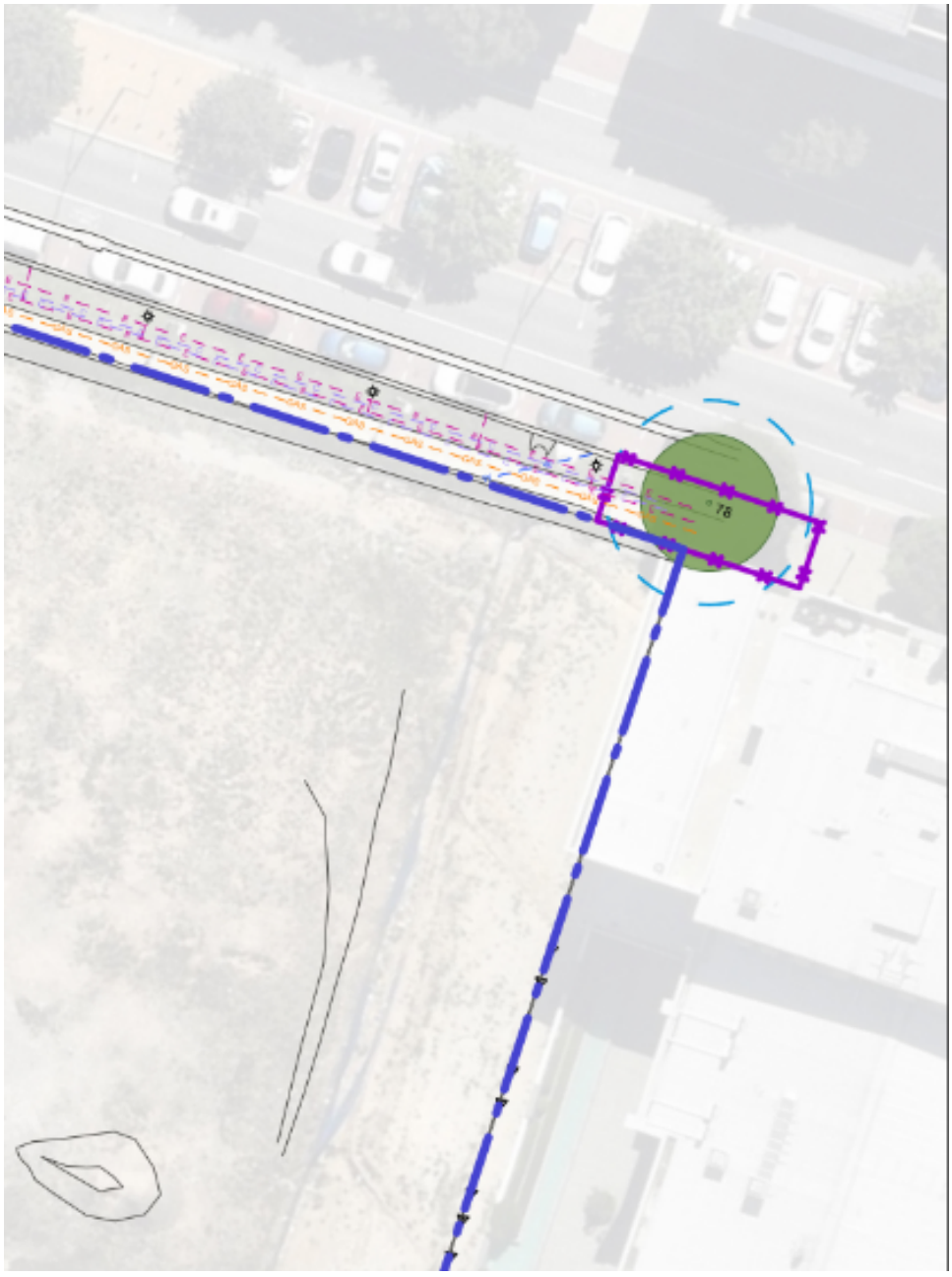
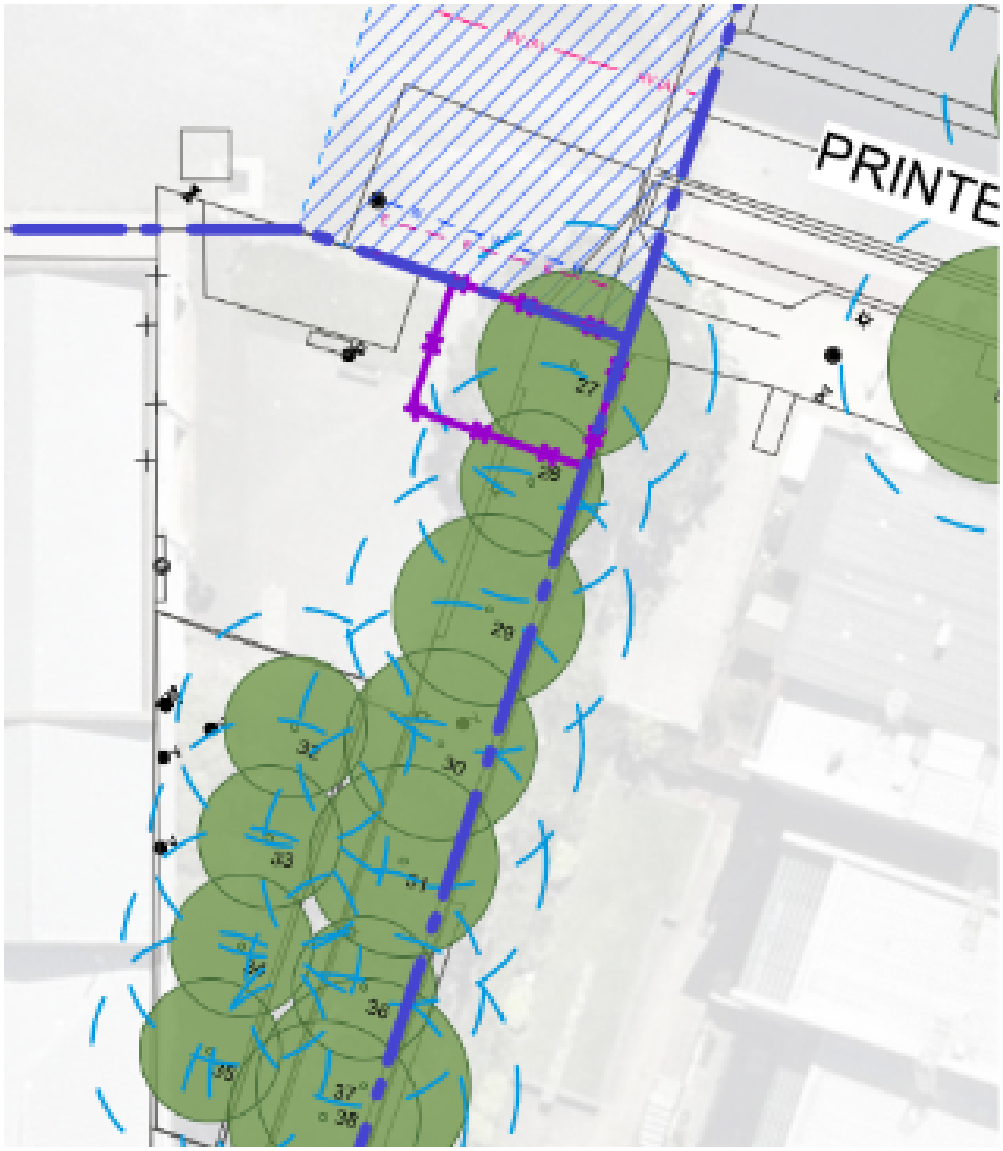
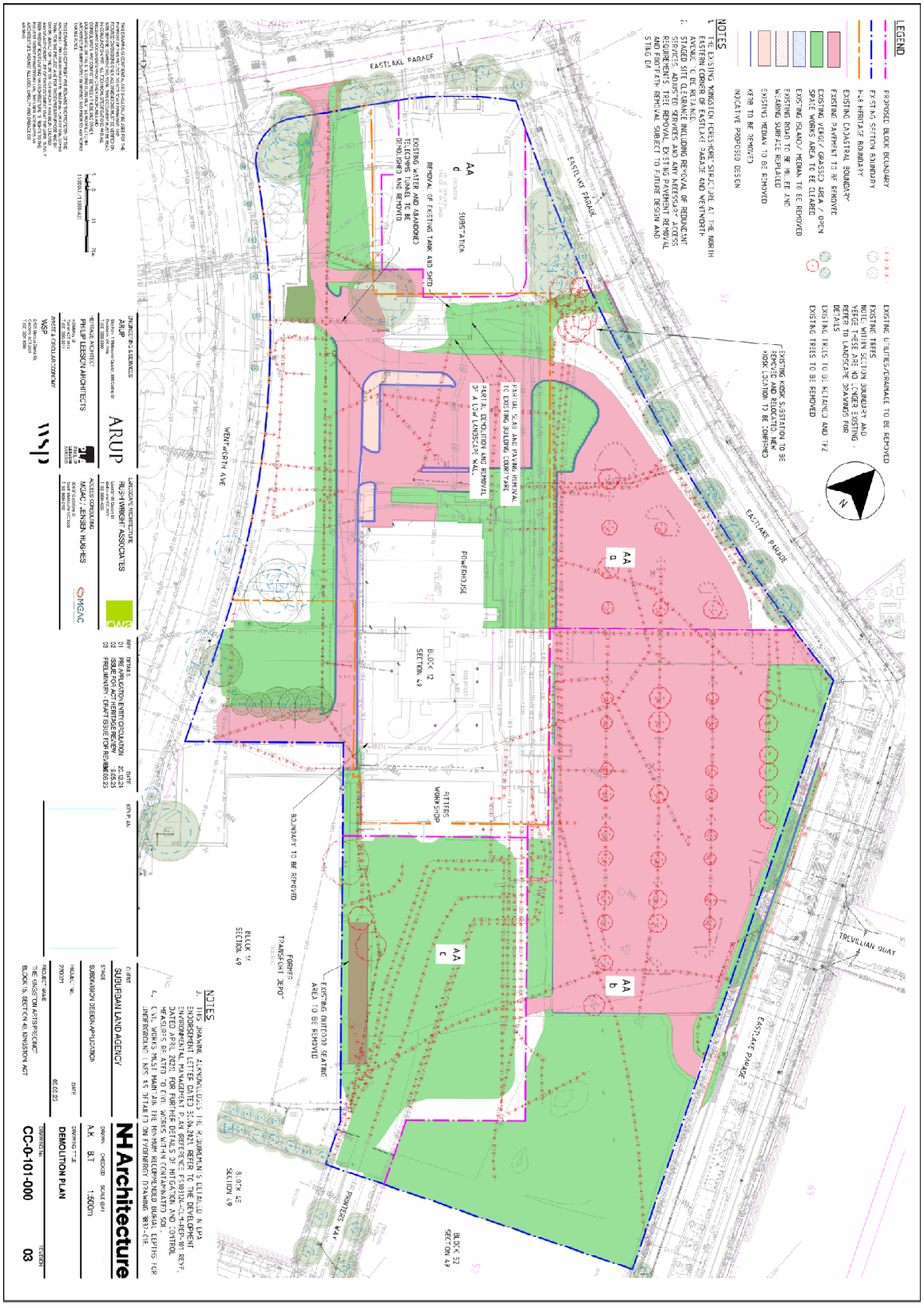


Figure 9: Snapshot of tree 27 on the Tree Management Plan site plan outlining the Tree Protection Fencing in PURPLE.



Demolition Plan

Figure 10: Demolition Plan



Proposed Development

Figure 11: Indicative Landscape Master Plan showing proposed development works.

Tree Schedule

Refer to *Preliminary Arboricultural Report, Job ref: 10105, dated 12 September 2024* for the tee schedule.

ACT TPZ (Canopy +2m) – Under the *Urban Forest Act 2023*, the Tree Protection Zone of a tree is extended 2m past the vertical projection of the dripline and no less than 4m from the trunk. Where tree protecting fencing is specified, it is to be placed in accordance to the Demolition, and Proposed Development site plans.

**ACT TPZ radius (m) = Canopy Diameter/2 + 2*

Tree Specifications

For further information about each tree, refer to *Preliminary Arboricultural Report, Job ref: 10105, dated 12 September 2024*.

Tree Specification summary table

Encroachment extent	Tree number
Major	39, 56, 86, 106, 127, 143 – 148
Moderate	41, 42, 54, 55, 82, 83, 87, 88, 105, 112, 113, 120 – 123, 142, 149, 152
Minor	23, 27, 40, 43, 57, 102 – 104, 107, 134
Unaffected	1 – 22, 28 – 38, 78, 84, 85, 128, 108 – 110, 130 – 133, 135 – 139, 140, 141, 150
Not there	24 – 26, 114 – 119, 124 – 126, 129, 151, 153

Significant heritage trees are 120 – 123, 149, 150, 152, and are highlighted in Orange.

***Natural Ground Level (NGL)**

Trees to be removed

- Trees 44 – 53, 58 – 77, on the eastern side of the site, are required for removal to sell a portion of the block for future private development.
- Trees 79–81 are proposed for removal to accommodate the southern road extending from the Printers Way entrance, as their current location lies directly within the road's path.
- Trees 89, 90 and 98 – 101 are proposed for removal to accommodate the Eastlake Parade vehicular crossover between the Substation building and Building 1.
- Trees 91 – 97 are proposed for removal to increased development footprint required for Building 1 and surrounding landscape development.

Trees to be retained

Trees 1 – 21, 27 – 38, 78, 140 and 141. Southern corner of site.

Trees 1 – 21, 28 – 38, 78, 140 and 141.

There is no expected encroachment into the TPZ of these trees.

Tree 27

There is an overall expected minor encroachment to this tree from the below works:

- Printers way driveway entrance being replaced to TCCS standards, 1.8m east of tree.
- Underground services to be removed, 3.6m NE of tree.
- Installation of underground fibre optic cables and sewer services, 3.2 and 4.6m, respectively, NE of tree.

Trees 82 to 85. Printers way entrance.

Trees 82 & 83

There is an overall expected moderate encroachment to these trees from the below works:

- Installation of underground optical fibre cable, 2.5m west of the trees.

Trees 84 & 85

There is no expected encroachment into the TPZ of these trees.

Trees 22, 142 to 148. Southwest of glassworks building.

Tree 22

There is no expected encroachment into the TPZ of this tree.

Tree 142

There is an overall expected moderate encroachment to this tree from the below works:

- Removal of underground services, 1.7m southwest of tree.
- Area all around tree to be cleared for parking spaces.
- NGL to be reduced by 0.2m all around tree.
- Grass swale to be installed on two sides, 0.75m south of tree. (extent of change to natural ground level to be confirmed.)

Tree 143

There is an overall expected major encroachment to this tree from the below works:

- Removal of underground services, 4.8m southwest of tree.
- Existing pavement being replaced, 0.9m southeast of tree.
- Area up to and around, north of, tree to be cleared for parking spaces.
- NGL to be reduced by 0.2m past 1.6m north of tree, and 1.1m south of tree.
- Installation of underground stormwater services, a type QS single pit, 1.5m east of tree with a 300mm diameter pipe heading northeast from pit.
- Grass swale to be installed 2.5m northwest of tree.

Tree 144

There is an overall expected major encroachment to this tree from the below works:

- Existing pavement being replaced, 0.9m southeast of tree.
- Area up to and around, north of, tree to be cleared for parking spaces.
- NGL to be reduced by 0.2m past 1.2m radius from tree.
- Installation of underground stormwater services, 300mm diameter pipe 1.1m southeast of tree and a type QS sump single pit 4.1m south of tree.
- Grass swale to be installed 2.4m northwest of tree.

Tree 145

There is an overall expected major encroachment to this tree from the below works:

- Removal of underground services, 6.0m east of tree.
- Existing pavement being replaced, 0.9m southeast of tree.
- NGL to be reduced by 0.2m all around tree, down to 0.6m, 2.9m north of tree.
- Area up to and around, north of, tree to be cleared for parking spaces.
- Installation of underground stormwater services, 300mm diameter pipe 1.5m southeast of tree and a type QS sump single pit 5.5m east of tree.
- Grass swale to be installed 2.0m north of tree.

Tree 146

There is an overall expected major encroachment to this tree from the below works:

- Removal of underground services, 2.3m southeast of tree.
- Existing pavement being replaced, 0.9m southeast of tree.
- Area up to and around, north of, tree to be cleared for parking spaces.
- NGL to be reduced 0.2m all around tree, down to 0.6m, 1.9m NW of tree.
- Installation of underground stormwater services, 300mm diameter pipe 1.3m southeast of tree and a type QS sump single pit 1.0m southeast of tree with a 225mm diameter pipe heading southeast from the pit.
- Grass swale to be installed 2.2m northeast of tree.

Tree 147

There is an overall expected major encroachment to this tree from the below works:

- Removal of underground services on northeast and southeast face of tree, 1.5m from tree at the closest point.
- Existing pavement being replaced, 0.9m southeast of tree.
- NGL to be reduced 0.2m all around the tree, down to 0.8m, past 3.4m north of tree.
- Area up to and around, north of, tree to be cleared for parking spaces.
- Installation of underground stormwater services, 225mm diameter pipe 1.2m southeast of tree, 300mm diameter pipe 0.9m north of tree, 375mm diameter pipe 2.6m northeast of tree and a type grated sump single pit 3.0m west of tree with a grass swale heading southwest from the pit. There is a junction of four pipes meeting 2.8m east of tree.
- Grass swale to be installed 2.2m northeast of tree.

Tree 148

There is an overall expected major encroachment to this tree from the below works:

- Removal of underground services, 3.5m west of tree.
- Area up to and around, northeast of, tree to be cleared for parking spaces.
- NGL to be reduced by 0.2m around the trunk down to 0.6m, 1.6m NE of tree.
- Grass swale to be installed 3.5m northeast of tree.

Trees 23, 149 – 152. Southwest of glassworks building.

Tree 150 - Significant heritage tree

There is no expected encroachment into the TPZ of this tree.

Tree 23

There is an overall expected minor encroachment to this tree from the below works:

- Area up to and around, southeast of, tree to be cleared for parking spaces.
- Grass swale to be installed 1.3m southeast of tree.

Tree 149 - Significant heritage tree

There is an overall expected moderate encroachment to this tree from the below works:

- Area 7.6m southeast of tree to be cleared for parking spaces.
- NGL to be reduced by 0.2m from 7.5m SE of tree, down to 0.6m from 9.0m SE of tree.
- Grass swale to be installed 9.4m southeast of tree.

Tree 151 & 153

Not there.

Tree 152 - Significant heritage tree

There is an overall expected moderate encroachment to this tree from the below works:

- Removal of underground services, 8.9m northeast of tree.
- Area 4.3m northeast of tree to be cleared for parking spaces.
- NGL to be reduced by 0.2m from 5.5m NE of tree, down to 0.6m from 7.3m NE of tree.
- Installation of underground stormwater services, 375mm diameter pipe 7.1m northeast of tree and a type grated sump single pit 7.6m east of tree, and a grated drain 10.7m northeast of tree.
- Grass swale to be installed 7.2m northeast of tree.

Trees 128 to 139. Western tree stand along Wentworth Ave.

Trees 128, 130 to 133, 135 to 139

Unaffected

Tree 129

Not there

Tree 132

Tree dead

Tree 134

There is an overall expected minor encroachment to this tree from the below works:

- Installation of underground watermain services, (unsure)mm diameter pipe 3.6m northeast of tree.

Trees 114 to 126. Western corner of site.

Tree 114 to 119 and 124 to 126

Not there

Tree 120 - Significant heritage tree

There is an overall expected moderate encroachment to this tree from the below works:

- Existing pavement being replaced, 9.0m northeast of tree.
- Area 5m northeast of tree to be cleared for parking spaces.
- NGL to be reduced by 0.2m from 5.5m NE of tree, down to 0.4m from 6.3m to 8.8m NE of tree.
- Installation of underground stormwater services, 375mm diameter pipe 9.0m northeast of tree and a type grated sump single pit, 9.2m east of tree.
- Small grass swale to be installed 5.8m northeast of tree.

Tree 121 - Significant heritage tree

There is an overall expected moderate encroachment to this tree from the below works:

- Existing pavement being replaced, 6.8m northeast of tree.
- Area 2.2m to 6.8m northeast of tree to be cleared for parking spaces.
- NGL to be reduced by 0.2m from 4.9m east of tree, down to 0.4m from 5.5m to 8.2m east of tree.
- Installation of underground stormwater services, 375mm diameter pipe 9.1m east of tree and a type grated sump single pit, 8.7m northeast of tree.
- Small grass swale to be installed 5.1m east of tree.

Tree 122 - Significant heritage tree

There is an overall expected moderate encroachment to this tree from the below works:

- Existing pavement being replaced, 6.2m northeast of tree.
- Area 2.0m to 6.0m east of tree to be cleared for parking spaces.
- NGL to be reduced by 0.2m from 6.6m east of tree, down to 0.4m from 7.2m east of tree. Also reduced by 0.2m from 8.0m NE of tree.
- Installation of underground stormwater services, 375mm diameter pipe 7.1m northeast of tree and a type grated sump single pit, 9.0m east of tree.
- Grass swales to be installed, 6.8m east and 10.7m (just outside TPZ) north of tree.

Tree 123 - Significant heritage tree

There is an overall expected moderate encroachment to this tree from the below works:

- Existing pavement being replaced, 5.5m northeast of tree.
- Area 3.5m east of tree to be cleared for parking spaces.
- NGL to be reduced by 0.2m from 6.9m NE of tree, and 8.9m SE of tree.
- Installation of underground stormwater services, 375mm diameter pipe 6.1m northeast of tree and two type grated sump single pit, 7.6m north and 10.2m east (just outside TPZ) of tree.
- Grass swale to be installed, 8.0m north of tree.

Trees 24 to 26, 113. South of substation.

Trees 24 to 26

Not there.

Tree 113

There is an overall expected moderate encroachment to this tree from the below works:

- Removal of underground services, 11.4m southeast and 10.6m west of tree.
- Removal of existing water and telecoms tunnel, 8.5m southeast of tree. (size of tunnel unknown at this point).
- Existing pavement being partially replaced, 1.6m southeast and 4.8m north of tree.
- Area 10.0m west of tree to be cleared for parking spaces.
- NGL to be raised 0.2m from 4.4m NE of tree and from 9.0m SE of tree, up to 0.4m from 9.9m to 11.4m SE of the tree.
- Installation of underground stormwater services, 225mm diameter pipe 5.4m south of tree, 375mm diameter pipe 4.5m southwest of tree and a type grated sump single pit, 5.2m south of tree.

Trees 40, 42, 43, 111, 127. Northwest side of substation.

Tree 111

There is no expected encroachment into the TPZ of this tree.

Tree 40

There is an overall expected minor encroachment to this tree from the below works:

- Installation of underground stormwater services, 375mm diameter pipe to tie into existing pit, 8.0m southwest of tree.

Tree 42

There is an overall expected moderate encroachment to this tree from the below works:

- Installation of underground stormwater services, 375mm diameter pipe 2.9m northwest of tree.

Tree 43

There is an overall expected minor encroachment to this tree from the below works:

- Installation of underground stormwater services, 375mm diameter pipe to tie into existing pit, 4.3m west of tree.

Tree 127

There is an overall expected major encroachment to this tree from the below works:

- Area 3.4m southwest of tree to be cleared for parking spaces.
- NGL to be reduced by 0.2m from 5.3m of tree, south to west.
- Installation of underground stormwater services, 375mm diameter pipe 2.5m (SRZ 2.2m) south of tree, potential area for onsite detention (dimensions to be developed in future design stages) 3.9m west of tree and a type grated single put 7.0m east of the tree.

Trees 39, 102 to 110, 112. Northeast side of substation.

Tree 108 to 110

There is no expected encroachment in the TPZ of these trees.

Tree 39

There is an overall expected major encroachment to this tree from the following works:

- Removal of underground services, 1.5m (SRZ 1.75m) northeast of tree.
- Installation of underground stormwater services outside, but within 1m, of TPZ. 300mm diameter pipe southeast of tree.

Tree 102

There is an overall expected minor encroachment to this tree from the following works:

- Removal of underground services, 5.6m south and 8.4m northeast of tree.
- Area 5.0m southeast of tree to be cleared for crossover and driveway.
- NGL to be raised by 0.2m from 5.1m SE of tree, and reduced by 0.2m from 8.4m south of tree, rapidly getting deeper.
- Installation of underground stormwater services, 300mm diameter pipe 4.4m southeast of tree.
- Existing concrete swale 5.0m from tree to be realigned.

Tree 103

There is an overall expected minor encroachment to this tree from the following works:

- Removal of underground services 1m outside TPZ, 6.5m south of tree.
- Area 3.9m southeast of tree to be cleared for crossover and driveway.
- NGL to be raised by 0.2m from 3.9m SE of tree.
- Installation of underground stormwater services, 300mm diameter pipe 3.3m east of tree.

Tree 104

There is an overall expected minor encroachment to this tree from the following works:

- Removal of underground services, 5.8m northeast of tree.

Tree 105

There is an overall expected moderate encroachment to this tree from the following works:

- Removal of underground services, 8.8m northeast of tree.

Tree 106

There is an overall expected major encroachment to this tree from the following works:

- Removal of underground services, 2.8m (SRZ 2.5m) east of tree.

Tree 107

There is an overall expected minor encroachment to this tree from the following works:

- Removal of underground services less than 1m outside TPZ, 7.7m east of tree.

Tree 112

There is an overall expected moderate encroachment to this tree from the following works:

- Removal of underground services, 2.6m (SRZ 1.78m) southwest of tree.

Trees 41, 54 to 57, 86 to 88. Northern verge along Eastlake Parade.

Tree 41

There is an overall expected moderate encroachment to this tree from the below works:

- 4.7m SW of tree has an area of removal of underground services.
- Area past 7.3m SW of tree to be cleared of pavement for landscape and Building 1 development.
- NGL to be raised 0.6m from 5.5m SW of tree.
- Installation of underground sewer mains services, 5.0m NW and 4.0m west of tree.
- Installation of underground sewer mains tie in, 6.7m NW of tree.
- Installation of underground stormwater pipe, 300mm diameter, 4.4m SW of tree.
- Installation of grass swale, 5.9m south of tree.

Tree 54

There is an overall expected moderate encroachment to this tree from the below works:

- Removal of underground services, 4.2m and 5.4m SW of tree.
- Area past 6.7m SW of tree to be cleared of pavement for landscape and Building 1 development.
- NGL to be raised 0.6m from 5.7m SW of tree.
- Installation of grass swale, 4.4m SW of tree.

Tree 55

There is an overall expected moderate encroachment to this tree from the below works:

- Removal of underground services, 3.1m and 4.9m SW of tree.
- Area past 6.1m SW of tree to be cleared of pavement for landscape and Building 1 development.
- NGL to be raised 0.6m from 5.9m SW of tree.
- Installation of grass swale, 4.0m SW of tree.
- Installation of type plantation sump single pit, 8.1m (within 1m of TPZ boundary) south of tree.

Tree 56

There is an overall expected major encroachment to this tree from the below works:

- Removal of underground services, 2.9m and 5.2m SW of tree.
- Area past 7.2m SW of tree to be cleared of pavement for landscape and Building 1 development.
- Installation of stormwater pipe, 300mm diameter, 2.0m (SRZ 2.34m) north of tree.
- Installation of type plantation sump single pit, 7.9m west of tree.
- Installation of grass swale, 1.8m (SRZ 2.34m) SW of tree.

Tree 57

There is an overall expected minor encroachment to this tree from the below works:

- Removal of underground services, 3.0m and 5.5m SW of tree.
- Area past 8.2m south of tree to be cleared of pavement for landscape development.
- NGL to be raised 0.2m from 7.8m south of tree.
- Installation of grass swale, 2.3m SW of tree.

Tree 86

There is an overall expected major encroachment to this tree from the below works:

- Removal of underground services, 5.1m SW of tree.
- Area past 8.4m SW of tree to be cleared of pavement for landscape and Building 1 development.
- NGL to be raised 0.6m from 5.6m SW of tree, tapering down to 0.4m, 8.0m from tree.
- Installation of underground sewer mains services, 2.1m (SRZ 2.08m) SW of tree.
- Installation of underground sewer mains tie in, 7.9m south of tree.
- Installation of type plantation sump single pit, 5.1m SW of tree.
- Installation of grass swale, 4.9m SW of tree.
- Installation of underground stormwater pipe, 300mm diameter, 5.5m south of tree.

Tree 87

There is an overall expected moderate encroachment to this tree from the below works:

- Removal of underground services, 4.8m SW of tree.
- NGL to be raised 0.4m from 6.3m SW of tree, tapering down to 0.2m below NGL 9.0m from tree.
- Installation of underground sewer mains services, 2.7m SW of tree.
- Installation of a grass swale, 4.7m SW of tree.

Tree 88

There is an overall expected moderate encroachment to this tree from the below works:

- Removal of underground services, 8.2m south of tree.
- Removal of existing kiosk substation, 8.3m west of tree.
- Area past 6.3m NW of tree to be cleared for proposed verge crossover.
- NGL to be raised 0.6m from 7.6m SW of tree, tapering down. NGL to be changed between +0.2m and -0.2m west of tree.
- Installation of underground water mains services, 8.4m NW of tree.
- Installation of underground sewer mains services, 2.8m SW (SRZ 2.2m) of tree.
- Installation of a grass swale, 6.4m SW of tree.

Tree Protection Measures

Prior to the commencement of any works on this site, the Tree Protection Fencing (TPF) and Trunk and Branch Protection (TBP) must be installed as per the Demolition site plan and the below protection measures.

After the completion of demolition works, the TPF must be adjusted to reflect the layout of TPF in the Proposed site plan.

Trees requiring TPF	**Trees requiring Trunk and branch protection**	**Stage of development to be implemented**
22, 27, 39 – 43, 54 – 57, 78, 86 – 88, 102 – 112, 120 – 123, 127, 149, 150, 152	23, 113, 142 - 148	Prior to Demolition

Trees 1 – 5, 10 – 21, 28 – 38, 82 – 85, 128, 130, 131, 133 – 139, 140 and 141, are distanced far enough from the development works that they are deemed outside the scope and do not require protection. Should the scope of works change and/or nearby works are proposed, the Project Arborist must be consulted, ad approval from TCCS may be required.

1. **Compliance to the TMP**

Once this TMP is approved, all requirements stated must be met as required throughout the development process.

All workers, including contractors, must be inducted into the TMP to understand the requirements and their duties to best protect the trees before commencing work. A copy of this TMP must be made available at all times on site for reference.

No changes are to be made to this TMP without consulting the site arborist and approval from TCCS.

2. **Conditions for Project Arborist input**

The project arborist must be contacted when:

- Accidental mechanical damage to trunk, branches and/or roots occurs
- Prior to excavation within a TPZ not already specified in this TMP
- Advice on branch or root pruning not already specified in this TMP
- Prior to temporary movement of tree protection fencing
- Prior to machinery or vehicles moving through a fenced TPZ

3. Tree Protection Fencing

Tree protection fencing must be erected in accordance to *Site Plans* prior to beginning any works and must remain in place until the completion of development works. Tree protection fencing is to be a sturdy 1.8m tall steel mesh fence with base supports. Signs, similar to *Figure 12*, are to be fixed to the fencing and visible from all sides.

During the demolition stage, dust cover sheets must be attached to the fencing to stop the spread of debris and contamination of the soil.

Where the TPF needs to be moved, temporarily or permanently, to make way for work, the project arborist must first be consulted.

Figure 12: Example sign to be shown on TPF

4. Trunk and Branch Protection

This is to be in place where the tree protection fencing is not being used at all, or being removed permanently or temporarily, exposing the tree. Trunk and Branch Protection (see *Appendices* for diagram) consistently covers all the bark and protects the tree from impacts, protecting the bark and tree tissue underneath. Trunk and Branch Protection is to consist of a thick foam padding or similar wrapped around the branch and then covered with pine palings or similar which are then strapped firmly in place. This is to be installed to a minimum height of 3m due to the expected operation of large machines nearby.

5. Canopy Protection

Where machinery or trucks are operating/travelling near tree canopies (within the TPZ) or where a component of the truck or machinery will protrude into the TPZ, a spotter must be in place to ensure that no part of the truck or machinery hit any branches. This is unnecessary where the canopy of the tree is significantly higher than the maximum height/reach of the truck or machinery.

Where the canopy can not be avoided, the Project Arborist is to be contacted and branch tying may be used. Pruning is a last resort and requires TCCS approval.

6. Operating within the ACT TPZ

Conducting approved works (in this TMP) within the TPZ is permissible when the tree protection fencing is set out according to the *Site Plans*, and the works are outside the tree protection fencing.

When performing excavation within the TPZ, the project arborist must be notified and present when roots of 40mm diameter or large are exposed or damaged.

Compacting of raised soil levels within TPZs must be kept to a minimum to reduce the impact of permeability to the tree root zone.

7. Ground Protection

Where machinery, vehicles or repeated foot traffic need to travel through /across a TPZ or government verge, ground protection must be used to minimise soil compaction and the Project Arborist is to be notified. Where the surface is exposed natural ground, a 100mm thick layer of coarse mulch needs to be placed underneath cojoined compaction mats or similar. Where the surface is pavers or similar, mulch is no longer necessary.
For vehicles/machinery above 4.5ton, the project arborist must be notified.

8. Prohibited Activities

These activities are strictly prohibited within the TPZ, unless otherwise specified in this TMP.

- Storage of materials and chemicals
- Preparation of chemicals, including cement products
- Erection of site sheds or structures
- Parking of vehicles and machinery
- Refuelling
- Dumping of waste
- Wash down and cleaning of equipment
- Placement of fill
- Lighting of fires
- Change in natural ground level, including excavation
- Installation of utilities and signs
- Damage to tree
- Unnecessary traffic, foot traffic or otherwise

9. Irrigation

Throughout the duration of the development work, the trees will need to be watered fortnightly. Apply water within the TPF of the trees to 50% field capacity (when puddles just begin to pool). This can be can be achieved with a calibrated irrigation system or watering by hose (low pressure).
The program may be changed on the advice of the project arborist. Should a period of unusually wet or dry weather occur, the project arborist should be contact to assess the trees and site, and recommend changes to the watering program, if necessary.
Where there is work occurring within the TPZ, it is recommended to water the trees on Friday afternoon to avoid working in wet/soft soil.

10. Mulch

Natural ground within the tree protection fencing of the trees that is exposed (dirt, soil etc) is to be covered with coarse mulch, to a thickness of 100mm and left in place for the duration of the development work.

11. Pruning

There is to be no pruning of any tree, beyond what is approved in this TMP, without advice from the project arborist and a pruning plan approved by TCCS. Any pruning required must comply with the below criteria:

- All cuts made are to be within the scope and according to the pruning plan
- Pruning is undertaken by, at least, an AQF 3 level arborist
- The pruning complies with *AS4373-2007 Pruning of Amenity Trees*.

12. **Root Protection**

Where there is any excavation within the TPZ, any exposed tree roots that are to be retained must be protected:

- Pavers within a TPZ are to be removed by hand, in a manner that will not damage tree roots
- Any tree root pruning required, that is not already specified in this TMP requires advice from the Project Arborist and TCCS approval. Any damaged roots, 40mm diameter or larger, will need to be pruned to an appropriate union. With TCCS approval, an AQF 5 Arborist may conduct tree root pruning.
- Exposed tree roots must covered immediately and kept moist until the excavation is back filled. We recommend using hessian to cover the roots and wetted daily. On a hot sunny day, 2 or more layers of hessian must be used and wetted twice daily.
- Back filling must be carried out as soon as possible. Where this can not occur within 3 days of excavation, the project arborist must be notified.

13. Government Verge

There is to be no parking, site sheds, storage of materials or waste on the council verge. TPF is to be installed according to *Site Plans* before demolition and kept in place through to the completion of the development works.

14. Builder's waste

There must be a wash bay/bin for all builder's waste on site. Wash areas, waste bins and hand transportation used for the storage/transportation of liquid or semi liquid waste must be in a water tight container to prevent leaks and contamination to the soil.

There is to be no storage of materials or preparation of chemicals within the TPZ.

Excavation Methods within Tree Protection Zone

There are two acceptable methods for the installation of underground services, hydrovaccing with an eco lance and tunnel boring. These methods are particularly helpful in ensuring the tree roots are not damaged. The eco lance tip used in hydrovaccing ensures the water pressure is low enough not to damage the epidermis/bark on the roots while still wetting and breaking apart the soil. Hydrovaccing with an eco lance is an open trench installation. For further details on this, please see *Appendices*.

We recommend the use of tunnel boring, at least, where the encroachment is considered major or within the SRZ, and, where possible, for the replacement of existing piping as it can be broken, and the new piping installed in situ. Where the encroachment is considered moderate or lower and outside the SRZ, hydrovaccing with an eco lance is an acceptable method, but may require the supervision of the Project Arborist.

Should hydrovaccing with an eco lance be required and the encroachment is major or within the SRZ, the Project Arborist must be present for supervision. This may occur when the underground services regulatory authority specifies that an open trench installation method must be used.

Appendices

Hydrovac Excavation Methodology

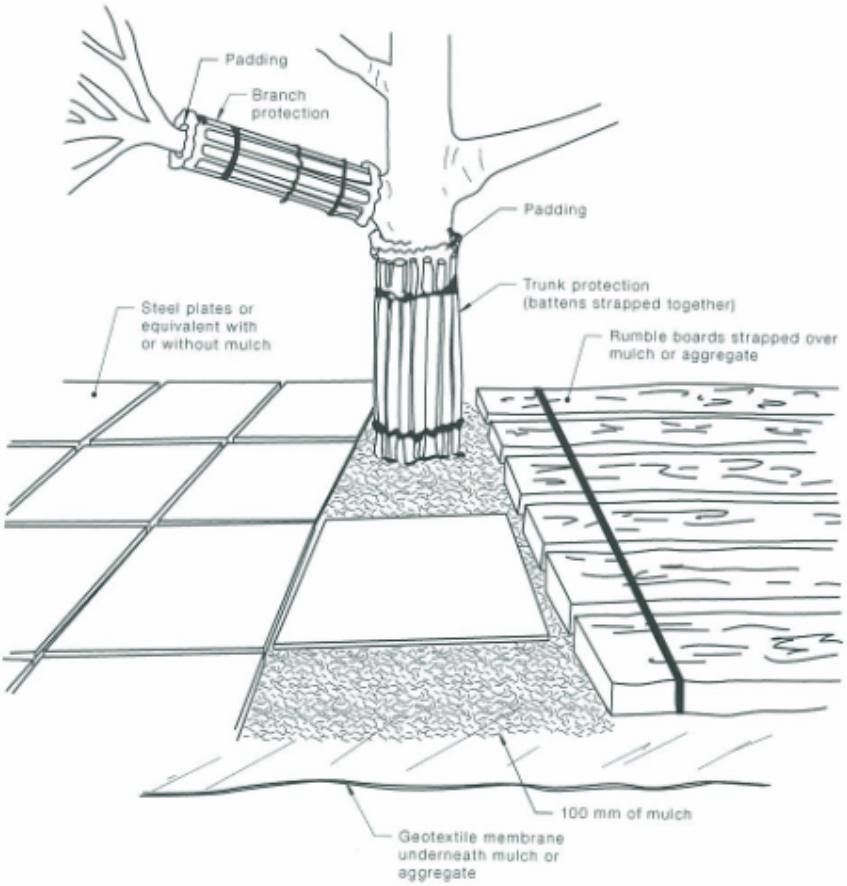
Hydrovaccing must be used for excavations within the TPZ and the tree root zone, however once past the tree root zone (typically a depth of 600mm) and no more roots are visible, full power and a more aggressive lance tip may be used to accelerate the process.

When Hydrovaccing is applied, the exposed roots are to be keep moist with wetted until soaking hessian sheets. The exposed roots must be covered with native soil within 72 hours. Only an experienced and competent hydro excavation operator (the Operator) shall operate Hydrovac excavation equipment.
Due to suction pressure of a wider hose, a hose less than 6 inches in diameter is recommended within the TPZ.

The Operator is required to use a 45° flat fan nozzle. A flat fan nozzle is of short length, single orifice fitting, called eco lance that is inserted into the digging end of the wand and as such there is a single concentrated jet of water exiting from the tip of nozzle which then sprays water evenly. The spray is wide and reduces the pressure impact on the roots.
The maximum water pressure to be used at any time with a flat fan straight tip nozzle during hydro excavation within a TPZ shall be 2,000 psi.
The pressurised blast wand should never remain motionless.
A minimum distance of 100mm shall always be maintained between the end of the pressure wand nozzle and the subsoil.
If major damage to roots over 40mm diameter occurs while undertaking hydro excavation, the Operator must stop the operation immediately and call site arborist.
Backfill and restoration of disturbed areas is to be undertaken within 72 hours.

Compliance with Arboricultural Standards: Utilizing eco lances demonstrates a commitment to Arboricultural best practices and compliance with regulations aimed at protecting trees and their root systems during construction activities (International Society of Arboriculture, 2020).

Trunk and branch protection & Ground protection



NOTES:

1 For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to trees, not nailed or screwed.

2 Rumble boards should be of a suitable thickness to prevent soil compaction and root damage.

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