Bank Street Park
Blackwattle Bay / Tjerruing

SSD-53386706

# Appendix AO

## Arboricultural Impact Assessment Report (TreeiQ)

December 2023

Project No: BLACK/WATTLE/20 Report No: BANK/PARK/AIA/A

# ARBORICULTURAL IMPACT ASSESSMENT REPORT

## Bank Street Park
## Blackwattle Bay

Prepared for: INFRASTRUCTURE NSW

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Revision A – final for lodgement


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# Executive Summary

This Arboricultural Impact Assessment Report was prepared to support a State Significant Development Application (SSDA) for a new waterfront public park within Blackwattle Bay, to be known as Bank Street Park (SSD-53386706). Bank Street Park is located at 1A-19 Bank Street, Pyrmont on the shoreline of Tjerruing Blackwattle Bay and adjacent areas of Blackwattle Bay. It forms part of the Blackwattle Bay Precinct, which is an area of predominantly government-owned land located on the western edge of the Pyrmont Peninsula and adjoining the waters of Blackwattle Bay. The precinct was rezoned in December 2022 to facilitate a new mixed-use community. Updated planning and land use controls were incorporated into the *Sydney Local Environmental Plan (2012)*, along with site specific design guidance in the *Blackwattle Bay Design Guidelines.*

The proposed works subject to the SSDA include site preparation works, demolition of three (3) existing buildings, construction of new and adapted facilities, public domain works, harbour works and works to Bank Street road reserve. This Report has been prepared in response to the relevant requirements outlined within the *Planning Secretary's Environmental Assessments Requirements (SEARs)* issued on 11 May 2023 for application SSD-53386706.

Twenty-nine (29) trees are addressed within this Report and include a mix of locally indigenous, Australian native and exotic species. Trees 7, 78, 80 and 82 are not covered by the tree management controls within Section 3.5 Urban Ecology of the *Sydney Development Control Plan (2012)* due to their weed status.

The supplied plans show that twenty (20) trees (Trees 4-9, 11A, 11B, 11C, 12A, 12B, 12C, 15, 16, 78, 80-82, 84 & 85) are to be removed as part of the proposed works. Of these, ten (10) trees have been allocated a Retention Value of *Consider for Retention,* four (4) trees have been allocated a Retention Value of *Consider for Removal* and six (6) trees have been allocated a Retention Value of *Priority for Removal*. No trees with a Retention Value of *Priority for Retention* have been proposed for removal.

The supplied plans show that nine (9) trees (Trees 1-3, 19, 21, 22, 77, 79 & 83) are to be retained as part of the works. Of these, two (2) trees have been allocated a Retention Value of *Priority for Retention*, five (5) trees have been allocated a Retention Value of *Consider for Retention*, one (1) tree has been allocated a Retention Value of *Consider for Removal* and one (1) tree has been allocated a Retention Value of *Priority for Removal*.

The supplied plans show works are proposed within Tree Protection Zone (TPZ) areas of Trees 19, 21 and 22 and represent *Minor Encroachments* as defined by *Australian Standard 4970 Protection of Trees on Development Sites (2009).* The encroachments should be compensated for by extending the TPZ in areas not subject to encroachment. The trees should be protected in accordance with the Tree Protection Specification **(Appendix 5)** and Typical Tree Protection Details **(Appendix 6).**

The Landscape Plans shows a canopy cover of 30% (as required by the Blackwattle Bay Design Guidelines) which is considered feasible despite the site constraints (shading from Anzac Bridge) and limited capacity for canopy (major buildings, sports court and pylons) in some areas. The Landscape Plans show the required distribution of small (10%), medium (45%), large (35%) and extra-large (10%) tree species has also been achieved. The species selection has considered the Shadow Studies Analysis and solar access requirements of each species.



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# Contents





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## 1.0 INTRODUCTION

### 1.1 Background

1.1.1 This Arboricultural Impact Assessment Report was prepared to support a State Significant Development Application (SSDA) for a new waterfront public park within Blackwattle Bay, to be known as Bank Street Park (SSD-53386706). Bank Street Park is located at 1A-19 Bank Street, Pyrmont on the shoreline of Tjerruing Blackwattle Bay and adjacent areas of Blackwattle Bay.

1.1.2 The purpose of this Report is to undertake a Visual Tree Assessment[1] (VTA), determine the impact of the proposed works on the trees, and where appropriate, recommend the use of sensitive construction methods and tree protection measures to minimise adverse impacts. Reference should be made to the Urban Forest Strategy Report No. BLACK/WATTLE/UFS/D prepared for Precinct in May 2021.

1.1.3 In preparing this Report, the authors are aware of and have considered the objectives and provisions of the following:

- *Blackwattle Bay Design Guidelines (2022)*
- *Bank Street Parks SEARs (2023)*
- *Sydney Local Environmental Plan (2012)*
- *City of Sydney Urban Forest Strategy (2023)*
- *City of Sydney Street Tree Masterplan (2023)*
- *City of Sydney Register of Significant Trees (2013)*
- *City of Sydney Tree Guidelines for Pruning, Reporting and Using an Arborist (2020)*
- *Australian Standard 4970 Protection of Trees on Development Sites (2009)*
- *Australian Standard 4373 Pruning of Amenity Trees (2007)*
- *Australian Standard 2303 Tree Stock for Landscape Use (2015)*
- *Safe Work Australia Guide for Managing Risks of Tree Trimming and Removal Work (2016)*

Refer to Methodology **(Appendix 1)**

1.1.4 This impact assessment is based on an assessment of the following supplied documentation/plans only:

- Legend Sheet – dwg no. L001/6, dated 23.11.2023 – prepared by Oculus
- Planting Schedule – dwg no. L003/5, dated 13.10.2023 – prepared by Oculus
- Site Plan – dwg no. L004/5, dated 13.10.23 – prepared by Oculus
- Tree Canopy Cover – dwg no. L005/5, dated 13.10.2023 – prepared by Oculus
- Tree Retention & Demolition – dwg no. L101/5, dated 13.10.2023 – prepared by Oculus
- General Arrangement Plan 01-02 – dwg no. L201-202/7, dated 23.11.2023 – prepared by Oculus
- Planting Plan - dwg no. L501/7, dated 19.10.2023 – prepared by Oculus

Refer to Plans **(Appendix 2)**

[1] Mattheck & Breloer (2003)



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## 1.2 Blackwattle Bay Precinct

1.2.1 Bank Street Park forms part of the Blackwattle Bay Precinct, which is an area of predominantly government-owned land located on the western edge of the Pyrmont Peninsula and adjoining the waters of Blackwattle Bay. Refer to Blackwattle Bay Precinct **(Figure 1).**

1.2.2 The precinct was rezoned in December 2022 to facilitate a new mixed-use community, providing for around 2,000 new residents and 5,600 new jobs and creating a vibrant 24/7 economy. Updated planning and land use controls were incorporated into the *Sydney Local Environmental Plan (2012),* along with site specific design guidance in the *Blackwattle Bay Design Guidelines.* A critical part of the Blackwattle Bay Precinct is the high-quality public domain which includes a series of parks and open spaces connected by a foreshore promenade. Bank Street Park will bring new active and passive recreation uses into a unique park environment, catering for both existing and future communities in the vicinity.


**Figure 1**: Blackwattle Bay Precinct, Source: INSW

## 1.3 Planning Secretary's Environmental Assessments Requirements

1.3.1 This Report has been prepared in response to the relevant requirements outlined within the *Planning Secretary's Environmental Assessments Requirements (SEARs)* issued on 11 May 2023 for application SSD-53386706. **Table 1** addresses the relevant SEARs requirements and provides a project response.

1.3.2 **Table 1: Secretary's Environmental Assessments Requirements**

| Item | SEARs | Relevant report section(s) |
|---|---|---|
| 4 | Landscape Design and Public Domain<br><br>*Assess the number, location, condition and significance of trees to be removed and retained and note any existing canopy coverage to be retained on site.* | Section 3 |



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### 1.4 The Proposal

1.4.1 Development consent is being sought for a *recreation area* for the primary purpose of a *public park*, comprising:

- Site preparation works, including tree removal, earthworks and remediation to facilitate the proposed use;
- Demolition of three existing buildings at 1-3 Bank Street;
- New and adapted facilities for community use, including:
  - New single storey building to accommodate flexible community space, café, and marina office/store facilities, with green roof and photovoltaics;
  - Adaptive reuse of Building D for public amenities, bin and other storage;
  - Boat launching ramp and pontoon for passive watercraft, including dragon boats and kayaks;
  - Boat storage building with change facilities for dragon boat users with publicly accessible rooftop deck;
- Public domain works, including:
  - 'Interpretation Garden' in existing building 'ruins' at 1-3 Bank Street;
  - Split level foreshore promenade;
  - Multi-purpose court with edge seating and partial fence;
  - Nature-based inclusive playspace for ages 2-12;
  - Fitness equipment;
  - Public plaza and grassed open space areas;
  - New tree plantings and planter beds;
  - Public art, wayfinding and interpretative signage, lighting, bike parking and seating;
- Harbour works, including:
  - Overwater boardwalk;
  - Land/water interface works, including sandstone terracing into water and support structure, to improve marine habitat;
  - Demolition and construction of a new timber launching ramp for dragon boats;
  - Kayak/passive craft pontoon; and
  - Restoration, repair and alterations to the existing seawall for new stormwater outlets.
- Works to Bank Street road reserve, including:
  - Road space reallocation to provide separated cycleway;
  - Cycleway transition to Bank Street to continue south as part of future works;
  - Reinstatement of existing on-street parallel parking;
  - Tree planting;
  - Accessible parking space; and
  - Loading zone adjacent 1-3 Bank Street.

## 2.0 RESULTS

### 2.1 The Site

2.1.1 Bank Street Park is located at 1A-19 Bank Street, Pyrmont NSW within the City of Sydney local government area (LGA) and includes harbour development in Blackwattle Bay. It adjoins the foreshores of Glebe to the west and Pyrmont Bridge Road and Wentworth Park to the south. The site area is approximately 1.9 ha, which includes 1.1ha of park and 0.7ha of harbour. Refer to Site Context Map **(Figure 2)** and Site Location Map **(Figure 3). Table 2** shows the relevant lot and deposited plans and the respective ownership for the site.



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2.1.2 Table 2 Summary of Land Title Details

| Street Address | Lot and Deposited Plan details | Ownership |
|---|---|---|
| 1A Bank Street, Pyrmont NSW 2009 | Lot 1 DP 85206<br>Lot 1 DP 188671 | Transport for NSW |
| 1-3 Bank Street, Pyrmont NSW 2009 | Lots 1-2 DP 1089643<br>Lot 1 DP 439245 | Infrastructure NSW |
| 5 Bank Street, Pyrmont NSW 2009 | Lot 20 DP 803159 | Transport for NSW |
| 7 Bank Street, Pyrmont NSW 2009 | Lot 19 DP 803159 | Transport for NSW |
| 9 Bank Street, Pyrmont NSW 2009 | Lot 21 DP 803159 | Transport for NSW |
| 11 Bank Street, Pyrmont NSW 2009 | Lot 22 DP 803159 | Transport for NSW |
| 17-19 Bank Street, Pyrmont NSW 2009 | Lots 5-6 DP 803160 | Transport for NSW |
| Sydney Harbour | Lot 5 DP 1209992 | Roads and Maritime Services (Transport for NSW) |
| Sydney Harbour | Lot 107 in DP 1076596 | Transport for NSW |
| Part Bank Street road reserve | N/A | City of Sydney Council |

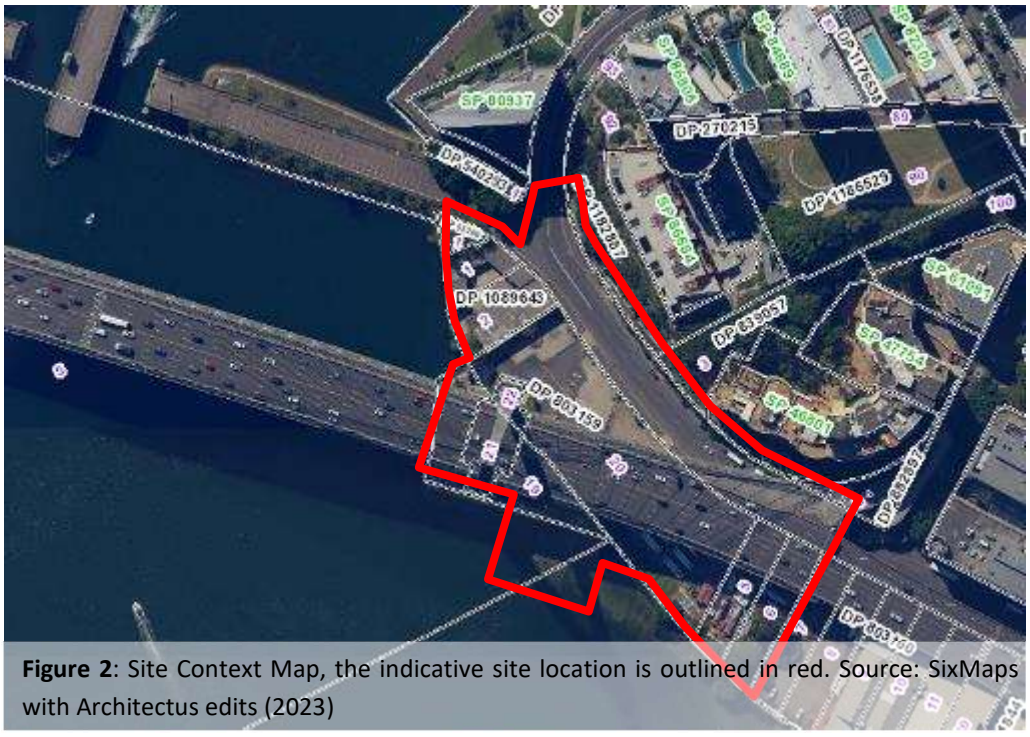


**Figure 2**: Site Context Map, the indicative site location is outlined in red. Source: SixMaps with Architectus edits (2023)

2.1.3 Bank Street Park is located on Gadigal Land, one of the twenty-nine (29) clans of the great Eora Nation.



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**Figure 3**: Site Location Map, the indicative site location is outlined in red.
Source: Blackwattle Bay Design Guidelines with Architectus edits (2023)

## 2.2 The Trees

2.2.1 A Visual Tree Assessment (VTA) was undertaken on trees growing within the site to determine their health and structural condition based on the methodology provided in **Appendix 1**. A total of thirty (30) trees were assessed as shown in the Tree Location Plan attached as **Appendix 2**.

2.2.2 The trees include a mix of locally indigenous, Australian native and exotic species. The trees listed in **Table 3** are not covered by the tree management controls within Section 3.5 Urban Ecology of the *Sydney Development Control Plan (2012)* due to their weed status.

**Table 3: Exempt Trees**

| Tree Number | Species/Condition |
|---|---|
| 80 & 82 | *Celtis sinensis* (Chinese Nettle Tree) |
| 78 | *Cotoneaster* sp. (Cotoneaster) |
| 7 | *Syagrus romanzoffanium* (Cocos Palm) |

2.2.3 None of the trees within the site are listed in the *City of Sydney Register of Significant Trees (2013)* based on their historical, cultural, social, ecological or outstanding visual and aesthetic appeal.[2] The trees are not visible in 1943 aerial images of the site, or listed in Schedule 5 (Environmental Heritage) of the *Sydney Local Environmental Plan (2012)*. The ecological significance and heritage value of the trees has not been assessed and is beyond the scope of this Report.

2.2.4 As required by Clause 2.3.2 of *Australian Standard 4970 Protection of Trees on Development Sites (2009),* each of the trees assessed has been allocated a Retention Value. Retention Value categories are based on a combination of Landscape Significance and Useful Life Expectancy (ULE). The assessment of Landscape Significance and ULE involves a degree of subjectivity and there will be a range of tree quality and value within each of the four Retention Value categories. The Retention Values do not consider the proposed development works and are not a schedule for tree retention or removal. The trees have been allocated one of the following Retention Values:

[2] City of Sydney (2013)



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- Priority for Retention
- Consider for Retention
- Consider for Removal
- Priority for Removal

Refer to Tree Assessment Schedule **(Appendix 3)**

## 3.0 ARBORICULTURAL IMPACT ASSESSMENT

### 3.1 Tree Removal & Retention

3.1.1 The supplied plans show that twenty (20) trees are to be removed and nine (9) trees are to be retained as part of the works as outlined within **Table 4**.

**Table 4: Summary of Tree Removal & Retention**

| Retention Value | Tree Removal | | Tree Retention | |
|---|---|---|---|---|
| | Tree Number | Species | Tree Number | Species |
| Priority for Retention | | | 1 & 2 | *Ficus microcarpa* var. 'hilli' (Hills Weeping Fig) |
| Consider for Retention | 5 | *Eucalyptus saligna* (Sydney Blue Gum) | 19, 21, 22, 77 & 79 | *Eucalyptus saligna* (Sydney Blue Gum) |
| | 9, 11A, 11B & 11C | *Casuarina glauca* (Swamp She Oak) | | |
| | 12A, 12B, 12C & 16 | *Ficus rubiginosa* (Port Jackson Fig) | | |
| | 15 | *Pittosporum undulatum* (Native Daphne) | | |
| Consider for Removal | 7 | *Syagrus romanzoffanium* (Cocos Palm) | 83 | *Pittosporum undulatum* (Native Daphne) |
| | 8 | *Livistonia australis* (Caggage Palm) | | |
| | 84 | *Callistemon viminalis* (Brush Box) | | |
| | 85 | *Malis domestica* (Apple Tree) | | |
| Priority for Removal | 4 | *Cupressus sempervirens* (Italian Cypress) | 3 | *Lophostemon confertus* (Brush Box) |
| | 6 | *Grevillea robusta* (Silky Oak) | | |
| | 78 | *Cotoneaster* sp. (Cotoneaster) | | |
| | 80 & 82 | Celtis sinensis (Chinese Hackberry) | | |
| | 81 | *Cupressus arizonica* (Arizona Cypress) | | |
| TOTAL = 29 | **20** | | **9** | |



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## 3.2 Tree Removal

### 3.2.1 Tree 4

Tree 4 was identified as *Cupressus sempervirens* (Italian Cypress) and is located near the southern boundary of 1 Bank Street. The tree is a partially suppressed specimen in fair health and fair structural condition. Its crown is in contact with the adjacent building. Tree 4 is of low Landscape Significance and has been allocated a Retention Value of *Priority for Removal.*

3.2.2 The supplied plans show Tree 4 is proposed for removal to accommodate the proposed community facilities. Replacement tree planting using a healthy, advanced-size specimen could replace the loss of amenity from tree removal within a short timeframe.

### 3.2.3 Tree 5

Tree 5 was identified as *Eucalyptus saligna* (Sydney Blue Gum) and is located near the southern boundary of 1 Bank Street. The tree is in fair health and fair structural condition with a reduced crown density. Tree 5 is of moderate Landscape Significance and has been allocated a Retention Value of *Consider for Retention.*

3.2.4 The supplied plans show Tree 5 is proposed for removal to accommodate the proposed community facilities.

### 3.2.5 Tree 6

Tree 6 was identified as *Grevillea robusta* (Silky Oak) and is located near the southern boundary of 1 Bank Street. The tree is in fair health with a reduced crown density. The trunk of the tree is in contact with the adjacent retaining wall. Tree 6 is of moderate Landscape Significance and has been allocated a Retention Value of *Priority for Removal.*

3.2.6 The supplied plans show Tree 6 is proposed for removal to accommodate the proposed community facilities.

### 3.2.7 Trees 7 & 8

Trees 7 and 8 were identified as *Syagrus romanzoffanium* (Cocos Palm) and *Livistonia australis* (Cabbage Palm) respectively and are located near the southern boundary of 1 Bank Street. The trees are of low Landscape Significance and have been allocated a Retention Value of *Consider for Removal.*

3.2.8 The supplied plans show Trees 7 and 8 are proposed for removal to accommodate the proposed community facilities. Replacement tree planting using healthy, advanced-size specimens could replace the loss of amenity from tree removal within a short timeframe.

### 3.2.9 Trees 9, 11A, 11B & 11C

Trees 9, 11A, 11B and 11C were identified as *Casuarina glauca* (Swamp She Oak) and are located near the existing marina. The trees are of moderate Landscape Significance and have been allocated a Retention Value of *Consider for Retention.*

3.2.10 The supplied plans show Trees 9, 11A, 11B and 11C are proposed for removal to accommodate the new marina and kayak rentals facilities.



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#### 3.2.11 Trees 12A, 12B, 12C & 16

Trees 12A, 12B, 12C and 16 were identified as *Ficus rubiginosa* (Port Jackson Fig) and are (assumed) self-sown specimens growing on top/out of the existing seawall. The trees are of moderate Landscape Significance and have been allocated a Retention Value of *Consider for Retention.* However, with consideration of the potential mature size of the trees and the likely long-term impacts of their root systems on the structural integrity of the seawall, these trees cannot be retained.

3.2.12 The supplied plans show Trees 12A, 12B, 12C and 16 are proposed for removal to allow for the upgrading of the seawall and new boardwalk.

#### 3.2.13 Tree 15

Tree 15 was identified as *Pittosporum undulatum* (Native Daphne) and is located at the eastern end of the site. The tree is in fair health with a reduced crown density. Tree 15 is of moderate Landscape Significance and has been allocated a Retention Value of *Consider for Retention.*

3.2.14 The supplied plans show Tree 15 is proposed for removal to accommodate the new promenade.

#### 3.2.15 Trees 78, 80, 81 & 82

Trees 78, 80, 81 and 82 are a mix of species including *Cotoneaster* sp., *Celtis sinensis* (Chinese Hackberry) and *Cupressus arizonica* (Arizona Cypress) located at the northern end of the site, near the entrance to Glebe Island Bridge. The trees are of low Landscape Significance and have been allocated a Retention Value of *Priority for Removal.*

3.2.16 The supplied plans show Trees 78, 80, 81 and 82 are proposed for removal to allow for the planting of more suitable species. Replacement tree planting using healthy, advanced-size specimens could replace the loss of amenity from tree removal within a short timeframe.

#### 3.2.17 Trees 84 & 85

Trees 84 and 85 were identified as *Callistemon viminalis* (Brush Box) and *Malis domestica* (Apple Tree) respectively and are located at the eastern end of the site. The trees are in fair health and fair structural condition with a reduced crown density and the presence of wounds in various stages of decay. The trees are of low Landscape Significance and have been allocated a Retention Value of *Consider for Removal.*

3.2.18 The supplied plans show Trees 84 and 85 are proposed for removal to accommodate the new promenade. Replacement tree planting using healthy, advanced-size specimens could replace the loss of amenity from tree removal within a short timeframe.

### 3.3 Tree Retention

#### 3.3.1 Trees 1 & 2

Trees 1 and 2 were identified as *Ficus microcarpa* var. *hilli* (Hills Weeping Fig) and are located near the entrance to Glebe Island Bridge and outside of the site. The trees are of high Landscape Significance and have been allocated a Retention Value of *Priority for Retention*.

3.3.2 The supplied plans show no works are proposed within the Tree Protection Zone (TPZ) areas of Trees 1 and 2.



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3.3.3 Recommendations

- No specific tree protection measures are required for these trees as they will be excluded from the development works by site fencing.

### 3.3.4 Tree 3

Tree 3 was identified as *Lophostemon confertus* (Brush Box) and is located near the entrance to Glebe Island Bridge and outside of the site. This tree is of low Landscape Significance and has been allocated a Retention Value of *Priority for Removal*.

3.3.5 The supplied plans show no works are proposed within the TPZ of Tree 3.

3.3.6 Recommendations

- No specific tree protection measures are required for this tree as it will be excluded from the development works by site fencing.

### 3.3.7 Trees 19, 21 & 22

Trees 19, 21 and 22 were identified as *Eucalyptus saligna* (Sydney Blue Gum) and are located at the eastern end of the site. The trees are of moderate Landscape Significance and have been allocated a Retention Value of *Consider for Retention*.

3.3.8 The supplied plans show new pavement areas and shade structure are proposed within TPZ areas of Trees 19, 21 and 22. As the encroachment into the individual TPZ is less than 10% and outside of the Structural Root Zone (SRZ), the extent of works represent *Minor Encroachments* as defined by AS-4970. A *Minor Encroachment* is considered acceptable by AS-4970 when it is compensated for elsewhere and contiguous within the TPZ. The encroachments into TPZ areas should be compensated for by extending the TPZ in areas not subject to encroachment.

3.3.9 It should be noted Trees 19, 21 and 22 have been subject to storm damage resulting in wounds with various stages of decay. The removal of deadwood, storm damaged branch stubs and aerial inspection of the trees' crowns should be undertaken as part of the development works. Any potentially significant structural defects identified by the aerial inspection should be reported to the Project Arborist to determine appropriate management recommendations.

3.3.10 Recommendations

- 1.8m steel mesh fencing should be established at the perimeter of their TPZ areas to protect the trees from the development works.
- Excavation for the footings and supports of the shade structure should be undertaken using tree sensitive methods and supervised by the Project Arborist. Roots (>25mmø) should be retained and protected as required by the Project Arborist.
- The shade structure should be designed so that sufficient clearance is provided to the trees. Any pruning for clearance or access during installation should minor (i.e <100mm branches approx., <5% of the total crown volume of each tree) and undertaken in accordance with *Australian Standard 4373 Pruning of Amenity Trees (2007).*
- The shade structure should be sufficiently strong to provide protection from branch failures.



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#### 3.3.11 Trees 77, 79 & 83

Trees 77 and 79 were identified as *Eucalyptus saligna* (Sydney Blue Gum) and Tree 83 was identified as *Pittosporum undulatum* (Native Daphne). They are located at the northern end of the site, near the entrance to Glebe Island Bridge. Trees 77 and 79 are of moderate Landscape Significance and have been allocated a Retention Value of *Consider for Retention*. Tree 83 is of low Landscape Significance and has been allocated a Retention Value of *Consider for Removal*.

3.3.12 The supplied plans show no works are proposed within the TPZ areas of Trees 77, 79 and 83.

3.3.13 Recommendations

Trunk protection should be installed to protect the trees from impact damage during the development works.

### 3.4 Other Works within TPZ

#### 3.4.1 Mulch, Turf & Vegetation Removal

The removal of small areas of mulch, turf and vegetation within TPZ areas should be undertaken using hand tools. Larger woody shrubs and small trees which cannot be removed without significant ground disturbance should either be cut to ground level and treated with herbicide to prevent regrowth (where required) or stump ground. Stump grinding should not be undertaken in the SRZ of existing trees to be retained.

#### 3.4.2 Demolition Works

Demolition works within TPZ areas should be supervised by the Project Arborist and utilise tree sensitive methods. Structures should be demolished in small sections ensuring demolition machinery/equipment does not contact with any part of the tree. Existing structures within the SRZ can contribute to tree stability by providing ballast to the rootplate or act as a stop to the overturning of the rootball and should be retained in-situ if possible.

#### 3.4.3 Remediation Works

No best practice guide exists for soil remediation works within TPZ areas however (in consultation with the Contaminated Land Consultant) the following specification has been developed to minimise advserse impacts to the trees:

- Rake back and remove approximately 50mm of existing organic material from the TPZ areas. This work should be supervised by the Project Arborist and cease if significant root growth is identified.
- Lay geogrid marker mesh (open celled) over the the existing natural ground. The geogrid marker mesh should be highly permeable to ensure water infiltration to the soil profile below the geotextile layer.
- The geogrid mesh can extend to tree bases however a minimum 20mm clearance should be maintained between the geotextile and geogrid mesh and root collars of the trees.
- Install a 100mm layer of suitable mulch (validated) over the marker mesh. The mulch will extend over the TPZ and SRZ areas and to any surface roots. The mulch is to be graded back from the existing tree bases so that the root collars of the trees are not buried.

#### 3.4.4 Underground Services

Underground services should be located outside of the TPZ areas. Where this is not possible, services should be installed using tree sensitive excavation (hand/hydrovac/air spade) methods with the services located around/below roots (>25mmø) as required by the Project Arborist. Excavation using compact machinery fitted with a flat bladed bucket is permissible where approved by the Project Arborist. Excavation using compact machinery should be undertaken in small increments, guided by a spotter who is to look for and prevent damage to roots (>25mmø).



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3.4.5 Alternatively, boring methods may be used for underground service installation where the obvert level (highest interior level of pipe) is greater than 1200mm below existing grade. Excavations for starting and receiving pits for boring equipment should be located outside of the TPZ areas or located to avoid roots (>25mmø) as deemed necessary by the Project Arborist.

**3.4.6 Soft Landscaping**

The installation of plants/turf within the TPZ should be undertaken using hand tools and roots (>25mmø) should be protected. No mechanical cultivation/ripping of soils should be undertaken within TPZ areas. Soil conditioners and turf underlay may be installed however should not increase existing soil levels within the TPZ by greater than 100mm and must not raise levels within 1m of the base of any tree.

## 4.0 CANOPY COVER & NEW TREE PLANTING

### 4.1 Canopy Cover

4.1.1 The Landscape Plans show the proposed canopy cover target of 30% in 10 years (as required by the *Blackwattle Bay Design Guidelines*) will be achieved with the proposed tree planting palette. At maturity, the park will achieve a 47% canopy cover (excluding the major buildings, sports court and pylons which have zero canopy capacity).

### 4.2 Species Selection & Diversity

4.2.1 The Landscape Plans show the required distribution of small (10%), medium (45%), large (35%) and extra-large (10%) tree species has been achieved. The species selection has considered the Shadow Studies Analysis and solar access requirements for each species.

### 4.3 Stock Selection

4.3.1 Selecting a healthy and structurally sound tree with traits appropriate to site constraints can help to prevent future problems. Poorly grown stock will greatly reduce a tree's potential and is likely to result in greater maintenance costs over its lifetime. New trees should be supplied in accordance with Section 4.7 of the Urban Forest Strategy for Blackwattle Bay State Significant Precinct Study Report No: BLACK/WATTLE/UFS/D.

4.3.2 The trees should be procured as soon as possible to ensure quality stock and species availability.

### 4.4 Tree Pit Design

4.4.1 A dual horizon soil profile which resembles that found in most natural environments should be used for areas of new tree planting. These soils should contain a low organic matter content below 300mm in depth to avoid the onset of anaerobic conditions and shrinkage of soil volumes over time due to the breakdown of organic matter which is likely to prevent the successful establishment of new trees. In addition, it is essential that as part of the installation of soils, that sufficient levels of soil consolidation are achieved to prevent settlement of the rootballs.



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4.4.2 Large areas of pavement can be a challenging growing environment for trees due to reduced oxygen levels in the underlying soil profile and reduced infiltration of rainfall. The Landscape Plans show the promenade trees are to be planted into a bioretention tree pit with an allowance of 35m3 for each tree (as required by the *Blackwattle Bay Design Guidelines)*.

4.4.3 Trees growing below the ANZAC Bridge will be subject to rain shadow therefore the provision of a permanent irrigation will be required for these trees. All trees will need to be irrigated during the establishment stage (first 12 months) and during periods of prolonged hot, dry weather conditions. During the initial plant establishment stage (first three months) irrigation should be provided every second day directly to each root ball to ensure the root ball remains moist. Irrigation frequency can be reduced during the remainder of the plant establishment stage, with an appropriate duration and frequency to be determined by the Project Arborist following a site/tree inspection. Beyond the establishment stage, irrigation should only be required during prolonged periods of extreme heat where symptoms of drought stress are noted.

### 4.5 Tree Installation

4.5.1 Correct tree installation is vital for both tree establishment and future maintenance costs. Incorrectly installed trees are usually impossible to correct later. After installation, the top of the rootball should sit at the same height as adjacent finished levels. Irrigation should be provided directly to the rootball surface, and in sufficient volumes that the entire rootball receives water and remains moist throughout the establishment period. New tree plantings should be supervised by Horticulturalists (AQF Level 3 or above in Horticulture) to ensure correct planting methods.

4.5.2 It is assumed that the site will be subject to period high winds and potential turbulent air from adjacent structures therefore an underground tree anchoring system such as Platipus D-Man (or similar approved product) should be installed for all advanced size trees (100 litre and above). The underground tree anchoring system should ensure the rootballs of new trees remain firm during the establishment period.

## 5.0 CONCLUSION

5.1 Twenty-nine (29) trees were addressed within this Report and include a mix of locally indigenous, Australian native and exotic species. Trees 7, 78, 80 and 82 are not covered by the tree management controls within Section 3.5 Urban Ecology of the *Sydney Development Control Plan (2012)* due to their weed status.

5.2 Development consent is being sought for a *recreation area* for the primary purpose of a *public park*, comprising site preparation works, demolition of three existing buildings, construction of new and adapted facilities, public domain works, harbour works and works to the Bank Street road reserve.

5.3 The supplied plans show that twenty (20) trees (Trees 4-9, 11A, 11B, 11C, 12A, 12B, 12C, 15, 16, 78, 80- 82, 84 & 85) are to be removed as part of the proposed works. Of these, ten (10) trees have been allocated a Retention Value of *Consider for Retention,* four (4) trees have been allocated a Retention Value of *Consider for Removal* and six (6) trees have been allocated a Retention Value of *Priority for Removal*. No trees with a Retention value of *Priority for Retention* are proposed for removal.



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5.4 The supplied plans show that nine (9) trees (Trees 1-3, 19, 21, 22, 77, 79 & 83) are to be retained as part of the works. Of these, two (2) trees have been allocated a Retention Value of *Priority for Retention*, five (5) trees have been allocated a Retention Value of *Consider for Retention*, one (1) tree have been allocated a Retention Value of *Consider for Removal* and one (1) tree has been allocated a Retention Value of *Priority for Removal*.

5.5 The supplied plans show new pavement areas and shade structure are proposed within TPZ areas of Trees 19, 21 and 22. As the encroachment into the individual TPZ is less than 10% and outside of the SRZ, the extent of works represent *Minor Encroachments* as defined by AS-4970. The encroachments into TPZ areas should be compensated for by extending the TPZ in areas not subject to encroachment. Tree protection measures and tree sensitive methods should be implemented to minimise adverse impacts. Refer to Section 3. The trees should be protected in accordance with the Tree Protection Specification **(Appendix 5)** and Typical Tree Protection Details **(Appendix 6).** A Tree Protection Plan should be prepared based on the Construction Certificate Plans and Conditions of Consent.

5.6 The Landscape Plans shows a canopy cover of 30% (as required by the Blackwattle Bay Design Guidelines) which is considered feasible despite the site constraints (shading from Anzac Bridge) and limited capacity for canopy (major buildings, sports court and pylons) in some areas. The Landscape Plans show the required distribution of small (10%), medium (45%), large (35%) and extra-large (10%) tree species has also been achieved. The species selection has considered the Shadow Studies Analysis and solar access requirement for each species.

## 6.0 LIMITATIONS & DISCLAIMER

TreeiQ takes care to obtain information from reliable sources. However, TreeiQ can neither guarantee nor be responsible for the accuracy of information provided by others. Plans, diagrams, graphs and photographs in this Arboricultural Report are visual aids only and are not necessarily to scale. This Report provides recommendations relating to tree management only. Advice should be sought from appropriately qualified consultants regarding design/construction/ecological/heritage etc issues.

This Report has been prepared for exclusive use by the client. This Report shall not be used by others or for any other reason outside its intended target or without the prior written consent of TreeiQ. Unauthorised alteration or separate use of any section of the Report invalidates the Report.

Many factors may contribute to tree failure and cannot always be predicted. TreeiQ takes care to accurately assess tree health and structural condition. However, a tree's internal structural condition may not always correlate to visible external indicators. There is no warranty or guarantee, expressed or implied that problems or deficiencies regarding the trees or site may not arise in the future. Information contained in this Report covers only the trees assessed and reflects the condition of the trees at the time of inspection. Additional information regarding the methodology used in the preparation of this Report is attached as Appendix 1. A comprehensive tree risk assessment and management plan for the trees is beyond the scope of this Report.

Reference should be made to any relevant legislation including Tree Management Controls. All recommendations contained within this Report are subject to approval from the relevant Consent Authority.





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## 8.0 APPENDICES



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## Appendix 1: Methodology

**1.1** **Site Inspection**: This report was determined as a result of a site inspection during June 2023. The comments and recommendations in this report are based on findings from this site inspection.

**1.2** **Visual Tree Assessment (VTA)**: The subject tree(s)was assessed using the Visual Tree Assessment criteria and notes as described in *The Body Language of Trees – A Handbook for Failure Analysis.*[3]The inspection was limited to a visual examination of the subject tree(s)from ground level only. No internal diagnostic testing was undertaken as part of this assessment. Trees outside the subject site were assessed from the property boundaries only.

**1.3** **Tree Dimensions**: The dimensions of the subject tree(s) are approximate only.

**1.4** **Tree Locations:** The location of the subject tree(s) was determined from the supplied plans. Trees not shown on the supplied plans have been plotted in their approximate location only.

**1.5** **Trees & Development**: Tree Protection Zones, Tree Protection Measures and Sensitive Construction Methods for the subject tree were based on methods outlined in *Australian Standard 4970-2009 Protection of Trees on Development Sites*.

The *Tree Protection Zone* (TPZ) is described in AS-4970 as 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 *Structural Root Zone* (SRZ) is described in AS-4970 as the area around the base of a tree required for the tree's stability in the ground. Severance of structural roots within the SRZ is not recommended as it may lead to the destabilisation and/or demise of the tree.

In some cases it may be possible to encroach into or make variations to the theoretical TPZ. A *Minor Encroachment* is less than 10% of the area of the TPZ and is outside the SRZ. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. A *Major Encroachment* is greater than 10% of the TPZ or inside the SRZ. In this situation the Project Arborist must demonstrate that the tree would remain viable. This may require root investigation by non-destructive methods or the use of sensitive construction methods.

**1.6** **Tree Health**: The health of the subject tree(s) was determined by assessing:

I. Foliage size and colour
II. Pest and disease infestation
III. Extension growth
IV. Crown density
V. Deadwood size and volume
VI. Presence of epicormic growth

**1.7** **Tree Structural Condition**: The structural condition of the subject tree(s) was assessed by:

I. Assessment of branching structure
(i.e co-dominant/bark inclusions, crossing branches, branch taper, terminal loading, previous branch failures)
II. Visible evidence of structural defects or instability
(i.e root plate movement, wounds, decay, cavities, fungal brackets, adaptive growth)
III. Evidence of previous pruning or physical damage
(root severance/damage, lopping, flush-cutting, lions tailing, mechanical damage)

**1.8** **Useful Life Expectancy (ULE)**: The ULE is an estimate of the longevity of the subject tree(s) in its growing environment. The ULE is modified where necessary to take in consideration tree(s) health, structural condition and site suitability. The tree(s) has been allocated one of the following ULE categories (Modified from Barrell, 2001):

I. 40 years +
II. 15-40 years
III. 5-15 years
IV. Less than 5 years

[3]Mattheck&Breloer (2003)



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**1.9** **Landscape Significance**: Landscape Significance was determined by assessing the combination of the cultural, environmental and aesthetic values of the subject tree(s). Whilst these values are subjective, a rating of high, moderate, low or insignificant has been allocated to the tree(s). This provides a relative value of the tree's Landscape Significance which may aid in determining its Retention Value. If the tree(s) can be categorized into more than one value, the higher value has been allocated.

| Landscape Significance | Description |
|---|---|
| Very High | The subject tree is listed as a Heritage Item under the *Local Environmental Plan* with a local or state level of significance. |
| | The subject tree is listed on Council's Significant Tree Register or meets the criteria for significance assessment of trees and/or landscapes by a suitably qualified professional. The criteria are based on general principles outlines in the Burra Charter and on criteria from the Register of the National Estate. |
| High | The subject tree creates a 'sense of place' or is considered 'landmark' tree. |
| | The subject tree is of cultural or historical importance or is widely known. |
| | The subject tree is a prominent specimen which forms part of the curtilage of a heritage item with a known or documented association with that item. |
| | The subject tree has been identified by a suitably qualified professional as a species scheduled as a Threatened or Vulnerable Species for the site defined under the provisions of the NSW *Biodiversity Conservation Act (2016)* or the Commonwealth *Environmental Protection and Biodiversity Conservation Act* (1999). |
| | The subject tree is known to contain nesting hollows to a species scheduled as a Threatened or Vulnerable Species for the site as defined under the provisions of the NSW *Biodiversity Conservation Act (2016)* or the Commonwealth *Environmental Protection and Biodiversity Conservation Act* (1999). |
| | The subject tree is an excellent representative of the species in terms of aesthetic value. |
| | The subject tree is of significant size, scale or makes a significant contribution to the canopy cover of the locality. |
| Moderate | The subject tree makes a positive contribution to the visual character or amenity of the area. |
| | The subject tree provides a specific function such as screening or minimising the scale of a building. |
| | The subject tree is a good representative of the species in terms of aesthetic value. |
| Low | The subject tree is a known environmental weed species or is exempt under the provisions of the local Council's Tree Management Controls |
| | The subject tree makes little or no contribution to the amenity of the locality. |
| | The subject tree is a poor representative of the species in terms of aesthetic value. |

**1.10** **Retention Value**: Retention Value was based on the subject tree's Useful Life Expectancy and Landscape Significance. The Retention Value was modified where necessary to take in consideration the subject tree's health, structural condition and site suitability. The subject tree(s) has been allocated one of the following Retention Values:

I. Priority for Retention
II. Consider for Retention
III. Consider for Removal
IV. Priority for Removal

<table>
<tr><th>ULE</th><th></th><th colspan="3">Landscape Significance</th></tr>
<tr><td></td><td>Very High</td><td>High</td><td>Moderate</td><td>Low</td><td>Insignificant</td></tr>
<tr><td>40 years +</td><td rowspan="3">Priority for Retention</td><td colspan="2">Priority for Retention</td><td rowspan="3">Consider for Removal</td><td rowspan="3">Priority for Removal</td></tr>
<tr><td>15-40 years</td><td>Priority for Retention</td><td>Consider for Retention</td></tr>
<tr><td>5-15 years</td><td colspan="2">Consider for Retention</td></tr>
<tr><td>Less than 5 years</td><td>Consider for Removal</td><td colspan="3">Priority for Removal</td></tr>
</table>

The above table has been modified from the Footprint Green Tree Significance and Retention Value Matrix.



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**Appendix 2: Plans**



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NOTES

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KEY PLAN

| ISSUE | DATE | AMENDMENT | DRN | APRVD |
|---|---|---|---|---|
| 1 | 25/08/23 | Issue for Information | SL | SB |
| 2 | 11/09/23 | Issue for Draft SSDA | LA | SB |
| 3 | 15/09/23 | Issue for Draft SSDA | LA | SB |
| 4 | 29/09/23 | Issue for SSDA | LA | SB |
| 5 | 13/10/23 | Issue for SSDA | LA | SB |

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Melbourne - Wurundjeri Woi Wurrung Country
Canberra - Ngunnawal Country

PROJECT
BANK STREET PARK
BANK STREET, PYRMONT

CLIENT
INSW

ARCHITECT
COLLINS AND TURNER

STATUS
FOR SSDA

DRAWING SCALE
4 0 4 8 12 16 20
SCALE 1:400 m

NORTH POINT

DRAWING TITLE
SITE PLAN

PROJECT Nº
S22-026

SHEET SIZE
A1

DRAWING Nº
L004

ISSUE
5

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**CANOPY COVER 5 YRS**
**TOTAL SITE AREA: 11456M²**
**CANOPY: 1301M²**
**= 11% COVER**

**LEGEND**
- 5 YEAR CANOPY
- MATURE CANOPY


**CANOPY COVER 10 YRS**
**TOTAL SITE AREA: 11456M²**
**CANOPY: 3380M²**
**= 30% COVER**

**LEGEND**
- 10 YEAR CANOPY
- MATURE CANOPY


**CANOPY COVER AT MATURITY**
**TOTAL SITE AREA: 11456M²**
**CANOPY: 4608M²**
**= 40% COVER**

**LEGEND**
- MATURE CANOPY


**CANOPY COVER AT MATURITY TO CITY OF SYDNEY CALCULATIONS**
**TOTAL SITE AREA: 9709M²** *(EXCLUDES BUILDING, PYLON AND COURT FOOTPRINTS)*
**CANOPY: 4608M²**
**= 47% COVER**

**LEGEND**
- MATURE CANOPY
- AREA EXCLUDED FROM CoS CALCULATION

NOTES
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| ISSUE | DATE | AMENDMENT | DRN | APRVD |
|---|---|---|---|---|
| 1 | 11/09/23 | Issue for Draft SSDA | LA | SB |
| 2 | 15/09/23 | Issue for Draft SSDA | LA | SB |
| 3 | 29/09/23 | Issue for SSDA | LA | SB |
| 4 | 13/10/23 | Issue for SSDA | LA | SB |

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PROJECT
BANK STREET PARK
BANK STREET, PYRMONT

CLIENT
INSW

ARCHITECT
COLLINS AND TURNER

STATUS
FOR SSDA

DRAWING SCALE
5 0 5 10 15 20 25
SCALE 1:500 m

NORTH POINT

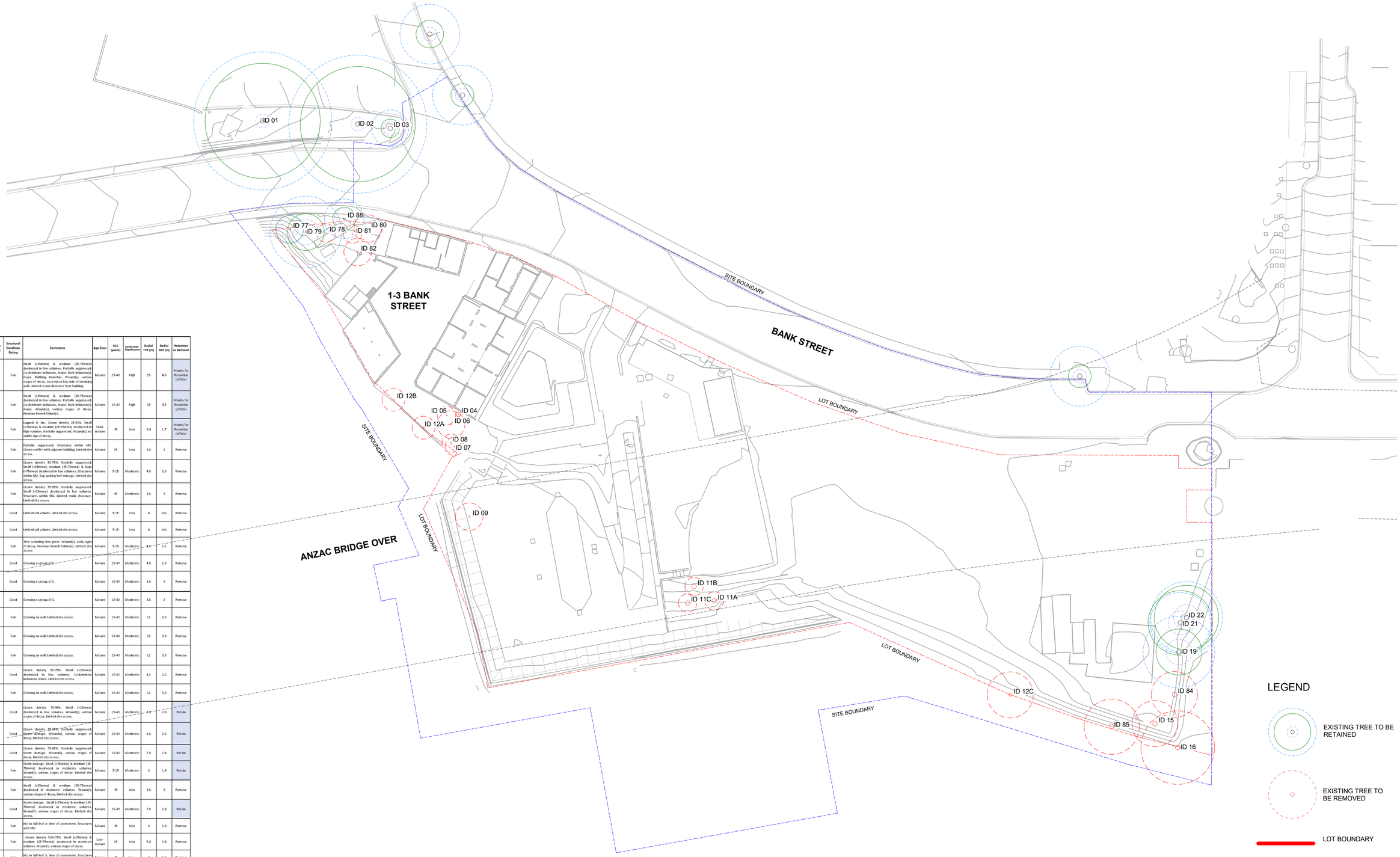
DRAWING TITLE
TREE CANOPY COVER

PROJECT N°
S22-026

SHEET SIZE
A1

DRAWING N°
L005

ISSUE
4




| Tree No. | Species | Height (m) | Radial Crown Spread (m) | DBH (mm) | Health Rating | Structural Condition Rating | Comments | Age Class | ULE (years) | Landscape Significance | Radial TPZ (m) | Radial SRZ (m) | Retention or Removal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | *Ficus microcarpa* var. *hillii* (Hills Weeping Fig) | 17 | 12 | 1800 | Good | Fair | Small (<25mm⌀) & medium (25-75mm⌀) deadwood in low volumes. Partially suppressed. Co-dominant inclusions, major. Bark inclusion(s), major. Rubbing branches. Wound(s), various stages of decay. Located on low side of retaining wall. Limited crown clearance from building. | Mature | 15-40 | High | 15 | 4.3 | Priority for Retention (offsite) |
| 2 | *Ficus microcarpa* var *hillii* (Hills Weeping Fig) | 17 | 15 | 2000 | Good | Fair | Small (<25mm⌀) & medium (25-75mm⌀) deadwood in low volumes. Partially suppressed. Co-dominant inclusions, major. Bark inclusion(s), major. Wound(s), various stages of decay. Previous branch failure(s). | Mature | 15-40 | High | 15 | 4.5 | Priority for Retention (offsite) |
| 3 | *Lophostemon confertus* (Brush Box) | 6 | 4 | 200 | Fair | Fair | Lopped at 3m. Crown density 25-50%. Small (<25mm⌀) & medium (25-75mm⌀) deadwood in high volumes. Partially suppressed. Wound(s), no visible sign of decay. | Semi-mature | <5 | Low | 2.4 | 1.7 | Priority for Retention (offsite) |
| 4 | *Cupressus sempervirens* (Italian Cypress) | 8 | 2 | 300 | Fair | Fair | Partially suppressed. Structures within SRZ. Crown conflict with adjacent building. Limited site access. | Mature | <5 | Low | 3.6 | 2 | Remove |
| 5 | *Eucalyptus saligna* (Sydney Blue Gum) | 9 | 7 | 400 | Fair | Fair | Crown density 50-75%. Partially suppressed. Small (<25mm⌀), medium (25-75mm⌀) & large (>75mm⌀) deadwood in low volumes. Structures within SRZ. Sap sucking leaf damage. Limited site access. | Mature | 5-15 | Moderate | 4.8 | 2.3 | Remove |
| 6 | *Grevillea robusta* (Silky Oak) | 10 | 6 | 300 | Fair | Fair | Crown density 75-95%. Partially suppressed. Small (<25mm⌀) deadwood in low volumes. Structures within SRZ. Limited trunk clearance. Limited site access. | Mature | <5 | Moderate | 3.6 | 2 | Remove |
| 7 | *Syagrus romanzoffianum* (Cocos Palm) | 7 | 3 | 300 | Good | Good | Limited soil volume. Limited site access. | Mature | 5-15 | Low | 4 | n/a | Remove |
| 8 | *Archontophoenix alexandrae* (Alexandra Palm) | 8 | 3 | 350 | Good | Good | Limited soil volume. Limited site access. | Mature | 5-15 | Low | 4 | n/a | Remove |
| 9 | *Casuarina glauca* (Swamp She-Oak) | 7 | 5 | 350 | Good | Fair | Tree occluding tree grate. Wound(s), early signs of decay. Previous branch failure(s). Limited site access. | Mature | 5-15 | Moderate | 4.2 | 2.2 | Remove |
| 11A | *Casuarina glauca* (Swamp She-Oak) | 8 | 4 | 400 | Good | Good | Growing as group of 3. | Mature | 15-40 | Moderate | 4.8 | 2.3 | Remove |
| 11B | *Casuarina glauca* (Swamp She-Oak) | 8 | 4 | 300 | Good | Good | Growing as group of 3. | Mature | 15-40 | Moderate | 3.6 | 2 | Remove |
| 11C | *Casuarina glauca* (Swamp She-Oak) | 8 | 4 | 300 | Good | Good | Growing as group of 3. | Mature | 15-40 | Moderate | 3.6 | 2 | Remove |
| 12A | *Ficus rubiginosa* (Port Jackson Fig) | 5 | 10 | 1000 | Good | Fair | Growing on wall. Limited site access. | Mature | 15-40 | Moderate | 12 | 3.3 | Remove |
| 12B | *Ficus rubiginosa* (Port Jackson Fig) | 5 | 10 | 1000 | Good | Fair | Growing on wall. Limited site access. | Mature | 15-40 | Moderate | 12 | 3.3 | Remove |
| 12C | *Ficus rubiginosa* (Port Jackson Fig) | 5 | 10 | 1000 | Good | Fair | Growing on wall. Limited site access. | Mature | 15-40 | Moderate | 12 | 3.3 | Remove |
| 15 | *Pittosporum undulatum* (Native Daphne) | 7 | 6 | 350 | Good | Good | Crown density 50-75%. Small (<25mm⌀) deadwood in low volumes. Co-dominant inclusions, minor. Limited site access. | Mature | 15-40 | Moderate | 4.2 | 2.2 | Remove |
| 16 | *Ficus rubiginosa* (Port Jackson Fig) | 7 | 8 | 1000 | Good | Fair | Growing on wall. Limited site access. | Mature | 15-40 | Moderate | 12 | 3.3 | Remove |
| 19 | *Eucalyptus saligna* (Sydney Blue Gum) | 13 | 10 | 650 | Good | Good | Crown density 75-95%. Small (<25mm⌀) deadwood in low volumes. Wound(s), various stages of decay. Limited site access. | Mature | 15-40 | Moderate | 7.8 | 2.8 | Retain |
| 21 | *Eucalyptus saligna* (Sydney Blue Gum) | 16 | 10 | 550 | Good | Good | Crown density 25-66%. Partially suppressed. Storm damage. Wound(s), various stages of decay. Limited site access. | Mature | 15-40 | Moderate | 6.6 | 2.6 | Retain |
| 22 | *Eucalyptus saligna* (Sydney Blue Gum) | 17 | 10 | 650 | Good | Good | Crown density 75-95%. Partially suppressed. Storm damage. Wound(s), various stages of decay. Limited site access. | Mature | 15-40 | Moderate | 7.8 | 2.8 | Retain |
| 77 | *Eucalyptus saligna* (Sydney Blue Gum) | 12 | 6 | 250 | Fair | Fair | Storm damage. Small (<25mm⌀) & medium (25-75mm⌀) deadwood in moderate volumes. Wound/s, various stages of decay. Limited site access. | Mature | 5-15 | Moderate | 3 | 1.9 | Retain |
| 78 | *Cotoneaster* sp. | 5 | 5 | 300@ base | Fair | Fair | Small (<25mm⌀) & medium (25-75mm⌀) deadwood in moderate volumes. Wound/s, various stages of decay. Limited site access. | Mature | <5 | Low | 3.6 | 2 | Remove |
| 79 | *Eucalyptus saligna* (Sydney Blue Gum) | 12 | 6 | 650 | Good | Good | Storm damage. Small (<25mm⌀) & medium (25-75mm⌀) deadwood in moderate volumes. Wound/s, various stages of decay. Limited site access. | Mature | 15-40 | Moderate | 7.8 | 2.8 | Retain |
| 80 | *Celtis sinensis* (Chinese Hackberry) | 8 | 4 | 250 | Good | Fair | Not in full leaf at time of assessment. Structures with SRZ. | Mature | <5 | Low | 3 | 1.9 | Remove |
| 81 | *Cupressus arizonica* (Arizona Cypress) | 12 | 6 | 450 | Fair | Fair | Crown density 50%-75%. Small (<25mm⌀) & medium (25-75mm⌀) deadwood in moderate volumes. Wound/s, various stages of decay. | Late-mature | <5 | Low | 5.4 | 2.4 | Remove |
| 82 | *Celtis sinensis* (Chinese Hackberry) | 8 | 4 | 250 | Good | Fair | Not in full leaf at time of assessment. Structures with SRZ. | Mature | <5 | Low | 3 | 1.9 | Remove |
| 83 | *Pittosporum undulatum* (Native Daphne) | 10 | 5 | 250 250 | Good | Fair | Co-dominant inclusion. Small (<25mm⌀) & medium (25-75mm⌀) deadwood in moderate volumes. Wound/s, various stages of decay. | Mature | 5-15 | Low | 4.3 | 2.2 | Retain |
| 84 | *Callistemin viminalis* (Bush Box) | 7 | 6 | 400 | Fair | Fair | Crown density 75-95%. Small (<25mm⌀) & medium (25-75mm⌀) deadwood in moderate volumes. Wound/s, various stages of decay. | Mature | 5-15 | Low | 4.8 | 2.3 | Remove |
| 85 | *Malls domestic a* (Apple tree) | 5 | 4 | 300 | Fair | Fair | Lopped. Wound/s, various stages of decay. | Mature | 5-15 | Low | 3.6 | 2 | Remove |

LEGEND

- EXISTING TREE TO BE RETAINED
- EXISTING TREE TO BE REMOVED
- LOT BOUNDARY
- SITE BOUNDARY

NOTES

THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL LANDSCAPE SCHEDULES AND TECHNICAL SPECIFICATION AND OTHER CONSULTANTS DRAWINGS. CHECK AND VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO THE COMMENCEMENT OF ANY WORK. DO NOT SCALE DRAWINGS - REFER TO FIGURED DIMENSIONS ONLY. INFORM OCULUS OF ANY DISCREPANCIES FOR CLARIFICATION BEFORE PROCEEDING. UNLESS NOTED OTHERWISE THIS DRAWING IS NOT FOR CONSTRUCTION.



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SERVICES SHOWN ON THIS DRAWING ARE APPROXIMATELY ONLY. THE EXACT LOCATION IS TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO COMMENCEMENT WORK.

| ISSUE | DATE | AMENDMENT | DRN | APRVD |
|---|---|---|---|---|
| 1 | 25/08/23 | Issue for Information | SL | SB |
| 2 | 11/09/23 | Issue for Draft SSDA | LA | SB |
| 3 | 15/09/23 | Issue for Draft SSDA | LA | SB |
| 4 | 29/09/23 | Issue for SSDA | LA | SB |
| 5 | 13/10/23 | Issue for SSDA | LA | SB |

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**Sydney - Gadigal Country**
Melbourne - Wurundjeri Woi Wurrung Country
Canberra - Ngunnawal Country

PROJECT
BANK STREET PARK
BANK STREET, PYRMONT

CLIENT
INSW

ARCHITECT
COLLINS AND TURNER

STATUS
FOR SSDA

DRAWING SCALE
SCALE 1:400
4 0 4 8 12 16 20 m

NORTH POINT

DRAWING TITLE
TREE RETENTION AND DEMOLITION

PROJECT Nº
S22-026

SHEET SIZE
A1

DRAWING Nº
L101

ISSUE
5

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**Appendix 3: Tree Assessment Schedule**

| Tree No. | Species | Height (m) | Radial Crown Spread (m) | DBH (mm) | Health Rating | Structural Condition Rating | Comments | Age Class | ULE (years) | L/Sign | Retention Value | Radial TPZ (m) | Radial SRZ (m) | Implication |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | *Ficus microcarpa* var. *'hilli'* (Hills Weeping Fig) | 17 | 12 | 1800 | Good | Fair | Small (<25mmø) & medium (25-75mmø) deadwood in low volumes. Partially suppressed. Co-dominant inclusions, major. Bark inclusion(s), major. Rubbing branches. Wound(s), various stages of decay. Located on low side of retaining wall. Limited crown clearance from building. | Mature | 15-40 | High | Priority for Retention | 15 | 4.3 | Retain. |
| 2 | *Ficus microcarpa* var. *'hilli'* (Hills Weeping Fig) | 17 | 15 | 2000 | Good | Fair | Small (<25mmø) & medium (25-75mmø) deadwood in low volumes. Partially suppressed. Co-dominant inclusions, major. Bark inclusion(s), major. Wound(s), various stages of decay. Previous branch failure(s). | Mature | 15-40 | High | Priority for Retention | 15 | 4.5 | Retain. |
| 3 | *Lophostemon confertus* (Brush Box) | 6 | 4 | 200 | Fair | Fair | Lopped at 3m. Crown density 25-50%. Small (<25mmø) & medium (25-75mmø) deadwood in high volumes. Partially suppressed. Wound(s), no visible sign of decay. | Semi-mature | <5 | Low | Priority for Removal | 2.4 | 1.7 | Retain. |
| 4 | *Cupressus sempervirens* (Italian Cypress) | 8 | 2 | 300 | Fair | Fair | Partially suppressed. Structures within SRZ. Crown conflict with adjacent building. Limited site access. | Mature | <5 | Low | Priority for Removal | 3.6 | 2 | Remove. |
| 5 | *Eucalyptus saligna* (Sydney Blue Gum) | 9 | 7 | 400 | Fair | Fair | Crown density 50-75%. Partially suppressed. Small (<25mmø), medium (25-75mmø) & large (>75mmø) deadwood in low volumes. Structures within SRZ. Sap sucking leaf damage. Limited site access. | Mature | 5-15 | Moderate | Consider for Retention | 4.8 | 2.3 | Remove. |

| Tree No. | Species | Height (m) | Radial Crown Spread (m) | DBH (mm) | Health Rating | Structural Condition Rating | Comments | Age Class | ULE (years) | L/Sign | Retention Value | Radial TPZ (m) | Radial SRZ (m) | Implication |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | *Grevillea robusta* (Silky Oak) | 10 | 6 | 300 | Fair | Fair | Crown density 75-95%. Partially suppressed. Small (<25mmø) deadwood in low volumes. Structures within SRZ. Trunk in contact with wall. Limited site access. | Mature | <5 | Moderate | Priority for Removal | 3.6 | 2 | Remove. |
| 7 | *Syagrus romanzoffanium* (Cocos Palm) | 7 | 3 | 300 | Good | Good | Limited soil volume. Limited site access. | Mature | 5-15 | Low | Consider for Removal | 4 | n/a | Remove. |
| 8 | *Livistonia australis* (Caggage Palm) | 8 | 3 | 350 | Good | Good | Limited soil volume. Limited site access. | Mature | 5-15 | Low | Consider for Removal | 4 | n/a | Remove. |
| 9 | *Casuarina glauca* (Swamp She Oak) | 7 | 5 | 350 | Good | Fair | Tree occluding tree grate. Wound(s), early signs of decay. Previous branch failure(s). Limited site access. | Mature | 5-15 | Moderate | Consider for Retention | 4.2 | 2.2 | Remove. |
| 11A | *Casuarina glauca* (Swamp She Oak) | 8 | 4 | 400 | Good | Good | Growing as group of 3. | Mature | 15-40 | Moderate | Consider for Retention | 4.8 | 2.3 | Remove. |
| 11B | *Casuarina glauca* (Swamp She Oak) | 8 | 4 | 300 | Good | Good | Growing as group of 3. | Mature | 15-40 | Moderate | Consider for Retention | 3.6 | 2 | Remove. |
| 11C | *Casuarina glauca* (Swamp She Oak) | 8 | 4 | 300 | Good | Good | Growing as group of 3. | Mature | 15-40 | Moderate | Consider for Retention | 3.6 | 2 | Remove. |
| 12A | *Ficus rubiginosa* (Port Jackson Fig) | 5 | 10 | 1000 | Good | Fair | Growing on wall. Limited site access. | Mature | 5-15 | Moderate | Consider for Retention | 12 | 3.3 | Remove. |
| 12B | *Ficus rubiginosa* (Port Jackson Fig) | 5 | 10 | 1000 | Good | Fair | Growing on wall. Limited site access. | Mature | 5-15 | Moderate | Consider for Retention | 12 | 3.3 | Remove. |

| Tree No. | Species | Height (m) | Radial Crown Spread (m) | DBH (mm) | Health Rating | Structural Condition Rating | Comments | Age Class | ULE (years) | L/Sign | Retention Value | Radial TPZ (m) | Radial SRZ (m) | Implication |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12C | *Ficus rubiginosa* (Port Jackson Fig) | 5 | 10 | 1000 | Good | Fair | Growing on wall. Limited site access. | Mature | 5-15 | Moderate | Consider for Retention | 12 | 3.3 | Remove. |
| 15 | *Pittosporum undulatum* (Native Daphne) | 7 | 6 | 350 | Fair | Good | Crown density 50-75%. Small (<25mmø) deadwood in low volumes. Co-dominant inclusions, minor. Limited site access. | Mature | 15-40 | Moderate | Consider for Retention | 4.2 | 2.2 | Remove. |
| 16 | *Ficus rubiginosa* (Port Jackson Fig) | 7 | 8 | 1000 | Good | Fair | Growing on wall. Limited site access. | Mature | 5-15 | Moderate | Consider for Retention | 12 | 3.3 | Remove. |
| 19 | *Eucalyptus saligna* (Sydney Blue Gum) | 13 | 10 | 650 | Good | Good | Crown density 75-95%. Small (<25mmø) deadwood in low volumes. Wound(s), various stages of decay. Limited site access. | Mature | 15-40 | Moderate | Consider for Retention | 7.8 | 2.8 | Retain. |
| 21 | *Eucalyptus saligna* (Sydney Blue Gum) | 16 | 10 | 550 | Good | Good | Crown density 75-95%. Partially suppressed. Storm damage. Wound(s), various stages of decay. Limited site access. | Mature | 15-40 | Moderate | Consider for Retention | 6.6 | 2.6 | Retain. |
| 22 | *Eucalyptus saligna* (Sydney Blue Gum) | 17 | 10 | 650 | Good | Good | Crown density 75-95%. Partially suppressed. Storm damage. Wound(s), various stages of decay. Limited site access. | Mature | 15-40 | Moderate | Consider for Retention | 7.8 | 2.8 | Retain. |
| 77 | *Eucalyptus saligna* (Sydney Blue Gum) | 12 | 6 | 250 | Fair | Fair | Storm damage. Small (<25mmø) & medium (25-75mmø) deadwood in moderate volumes. Wound/s, various stages of decay. Limited site access. | Mature | 5-15 | Moderate | Consider for Retention | 3 | 1.9 | Retain. |
| 78 | *Cotoneaster* sp. | 5 | 5 | 300@ base | Fair | Fair | Small (<25mmø) & medium (25-75mmø) deadwood in moderate volumes. Wound/s, various stages of decay. Limited site access. | Mature | <5 | Low | Priority for Removal | 3.6 | 2 | Remove. |
| 79 | *Eucalyptus saligna* (Sydney Blue Gum) | 12 | 6 | 650 | Good | Good | Storm damage. Small (<25mmø) & medium (25-75mmø) deadwood in moderate volumes. Wound/s, various stages of decay. Limited site access. | Mature | 15-40 | Moderate | Consider for Retention | 7.8 | 2.8 | Retain. |

| Tree No. | Species | Height (m) | Radial Crown Spread (m) | DBH (mm) | Health Rating | Structural Condition Rating | Comments | Age Class | ULE (years) | L/Sign | Retention Value | Radial TPZ (m) | Radial SRZ (m) | Implication |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 80 | *Celtis sinensis* (Chinese Hackberry) | 8 | 4 | 250 | Good | Fair | Not in full leaf at time of assessment. Structures with SRZ. | Mature | <5 | Low | Priority for Removal | 3 | 1.9 | Remove. |
| 81 | *Cupressus arizonica* (Arizona Cypress) | 12 | 6 | 450 | Fair | Fair | Crown density 50%-75%. Small (<25mmø) & medium (25-75mmø) deadwood in moderate volumes. Wound/s, various stages of decay. | Late-mature | <5 | Low | Priority for Removal | 5.4 | 2.4 | Remove. |
| 82 | *Celtis sinensis* (Chinese Hackberry) | 8 | 4 | 250 | Good | Fair | Not in full leaf at time of assessment. Structures with SRZ. | Mature | <5 | Low | Priority for Removal | 3 | 1.9 | Remove. |
| 83 | *Pittosporum undulatum* (Native Daphne) | 10 | 5 | 250 250 | Good | Fair | Co-dominant inclusion. Small (<25mmø) & medium (25-75mmø) deadwood in moderate volumes. Wound/s, various stages of decay. | Mature | 5-15 | Low | Consider for Removal | 4.3 | 2.2 | Retain. |
| 84 | *Callistemon viminalis* (Brush Box) | 7 | 6 | 400 | Fair | Fair | Crown denisty 75-95%. Small (<25mmø) & medium (25-75mmø) deadwood in moderate volumes. Wound/s, various stages of decay. | Mature | 5-15 | Low | Consider for Removal | 4.8 | 2.3 | Remove. |
| 85 | *Malis domestica* (Apple Tree) | 5 | 4 | 300 | Fair | Fair | Crown denisty 75-95%. Lopped. Wound/s, various stages of decay. | Mature | 5-15 | Low | Consider for Removal | 3.6 | 2 | Remove. |

**Appendix 4: Plates**

**Plate 1:** Showing Trees 1 & 2

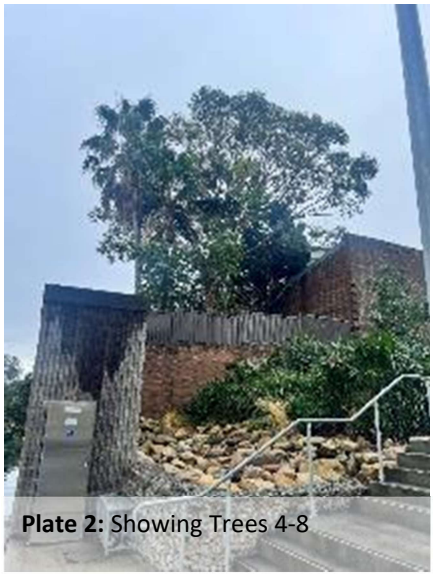

**Plate 2:** Showing Trees 4-8

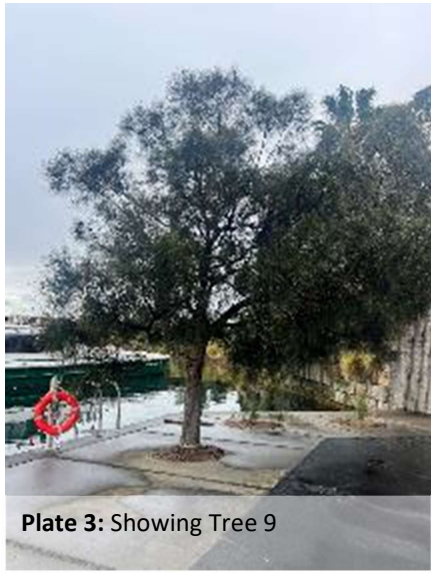

**Plate 3:** Showing Tree 9

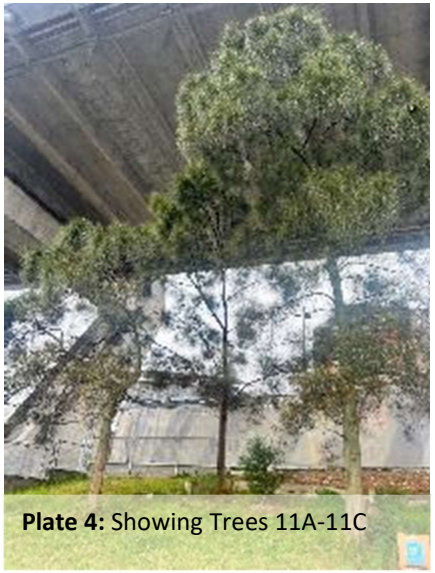

**Plate 4:** Showing Trees 11A-11C

**Plate 5:** Showing Trees 12C, 15, 16, 19 & 85

**Plate 6:** Showing Trees 19, 21 & 22

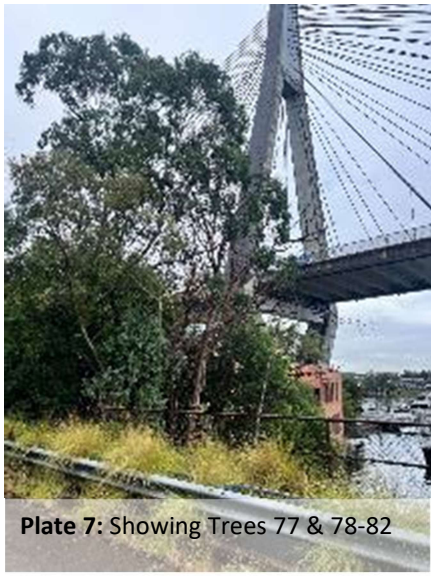

**Plate 7:** Showing Trees 77 & 78-82

**Appendix 5: Tree Protection Specification**

### 1.0 Appointment of Project Arborist

A Project Arborist shall be engaged prior the commencement of work on-site and monitor compliance with the protection measures. The Project Arborist shall inspect the tree protection measures and Compliance Certification shall be prepared by the Project Arborist for review by the Principal Certifying Authority prior to the release of the Compliance Certificate.

The Project Arborist shall have a minimum qualification equivalent (using the Australian Qualifications Framework) of NSW TAFE Certificate Level 5 or above in Arboriculture.

### 1.1 Tree Protection Zone

The trees to be retained shall be protected prior and during construction from activities that may result in an adverse effect on their health or structural condition. The area within the Tree Protection Zone (TPZ) shall exclude the following activities, unless otherwise stated: -

- Modification of existing soil levels, excavations and trenching
- Mechanical removal of vegetation
- Movement of natural rock
- Storage of materials, plant or equipment or erection of site sheds
- Affixing of signage or hoarding to the trees
- Preparation of building materials, refueling or disposal of waste materials and chemicals
- Lighting fires
- Movement of pedestrian or vehicular traffic
- Temporary or permanent location of services, or the works required for their installation
- Any other activities that may cause damage to the tree

NOTE: If access, encroachment or incursion into the TPZ is deemed essential, prior authorisation is required by the Project Arborist.

### 1.2 Tree & Vegetation Removal & Pruning

Tree pruning and removal works shall be undertaken in accordance with the *Safe Work Australia Guide for Managing Risks of Tree Trimming and Removal Work (2016)* and other applicable codes and legislation. Tree pruning and removal shall not damage the trees to be retained. Other vegetation to be removed within a TPZ shall be carefully lifted by hand/hand tools to avoid damaging roots (>25mmø) within the surrounding soil profile. Larger woody shrubs and small trees which cannot be removed without significant ground disturbance shall either be cut to ground level and treated with herbicide to prevent regrowth (where required) or stump ground. Stump grinding shall not be undertaken in the SRZ of existing trees to be retained.

### 1.3 Tree Protection Fencing

TPZ fencing shall be installed at the perimeter of the TPZ **(Appendix 3)** of Trees 19, 21 and 22. The exact location of the fencing shall be confirmed through consultation between the Head Contractor/Project Manager and the Project Arborist prior to the commencement of works. Fencing may be setback to allow for demolition/construction access and for the installation of pavements only where appropriate ground protection is installed and approved by the Project Arborist.

As a minimum, the Tree Protection Fence shall consist of 1.8m high wire mesh panels supported by concrete feet. Panels shall be fastened together and supported to prevent sideways movement. The tree shall not be damaged during the installation of the Tree Protection Fencing. Refer to Typical Tree Protection Details (3) **(Appendix 6)**.

### 1.4 Signage

Signs identifying the TPZ should be placed around the edge of the TPZ and be visible from within the development site. The lettering on the sign should comply with *Australian Standard - 1319 (1994) Safety signs for the occupational environment*. The signage shall be installed prior to the commencement of works on-site and shall be maintained in good condition for the duration of the development period.



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### 1.5 Site Management

Materials, waste storage, and temporary services shall not be located within the TPZ.

### 1.6 Works within the Tree Protection Zones

In some cases works within the TPZ may be authorized by the determining authority. **These works shall be supervised by the Project Arborist**. When undertaking works within the TPZ, care should be taken to avoid damage to the tree's root system, trunks and lower branches.

### 1.7 Ground Protection

Ground protection shall be installed to any unfenced areas of the TPZ as required by the Project Arborist. Vehicular and machinery access shall be restricted to areas of existing pavement or from areas of temporary ground protection such as ground mats or steel road plates. Refer to Typical Tree Protection Details (3) **(Appendix 4).**

### 1.8 Trunk Protection

Trunk protection shall be installed on Trees 77, 79 and 83 by wrapping padding (either carpet underlay or 10mm thick jute geotextile mat) around the trunk and first order branches to a minimum height of 2m. Timber battens (90 x 45mm) spaced at 150mm centres shall be strapped together and placed over the padding. Timber battens must not be fixed to the trees. Refer to Typical Tree Protection Details (3) **(Appendix 4)**. Branch protection shall be installed as deemed necessary by the Project Arborist.

### 1.9 Structure & Pavement Demolition

Demolition of existing structures/pavement within the TPZ shall be supervised by the Project Arborist. Machinery is to be excluded from the TPZ unless operating from the existing slabs, pavements or areas of ground protection (refer to Section 1.6). Machinery should not contact the tree's roots, trunk, branches and crown.

The existing pavements/slabs shall be carefully lifted to minimise damage to the underlying soil profile (or sub-base materials) and to prevent damage to tree roots. Wherever possible, existing sub-base materials shall remain in-situ. When removing slab sections within TPZ, machinery shall work backwards out of the TPZ to ensure machinery remains on un-demolished sections of slab at all times. Wherever possible, footings or elements below grade shall be retained to minimise disturbance to the tree's roots.

Where deemed necessary by the Project Arborist, the structures shall be shattered prior to removal with a hand-operated pneumatic/electric breaker.

If roots (>25mmø) are encountered during the demolition works, these roots must be retained in an undamaged condition and advice sought from the Project Arborist. Exposed roots shall be protected from direct sunlight, drying out and extremes of temperature by covering with a 10mm thick jute geotextile fabric. The geotextile fabric shall be kept in a damp condition at all times. Where the Project Arborist determines that the tree is using underground elements (i.e footings, pipes, rocks etc.) for support, these elements shall be left in-situ.

### 1.10 Remediation Works

Remediation works within TPZ areas shall be undertaken as outlined below:

- Rake back and remove approximately 50mm of existing organic material from the TPZ areas. This work shall be supervised by the Project Arborist and cease if significant root growth is identified.
- Lay geogrid marker mesh (minimum 4cm grid size) over the top of the geotextile fabric layer. the existing natural ground (and contaminated fill). The geotextile fabric shall be highly permeable to ensure water infiltration to the soil profile below the geotextile layer. The geogrid mesh can extend to tree bases however a minimum 20mm clearance shall be maintained between the geotextile and geogrid mesh and root collars of the trees. \
- Install a 100mm layer of suitable mulch (validated) over the soil mix. The mulch will extend over the TPZ and SRZ areas and to any surface roots. The mulch is to be graded back from the existing tree bases so that the root collars of the trees are not buried.



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### 1.11 Underground Services

Underground service installation within the TPZ shall be supervised by the Project Arborist.

The installation of underground services shall be located outside of the TPZ. Where this is not possible, they shall be installed using tree sensitive excavation methods (hand/hydrovac/airspade) with the services installed around/below roots (>25mmø, or as determined by the Project Arborist). Excavation using compact machinery fitted with a flat bladed bucket is permissible where approved by the Project Arborist. Excavation using compact machinery should be undertaken in small increments, guided by a spotter who is to look for and prevent damage to roots (>25mmø).

Alternatively, boring methods may be used for underground service installation where the obvert level (highest interior level of pipe) is greater than 1200mm below existing grade. Excavations for starting and receiving pits for boring equipment shall be located outside of the TPZ areas or located to avoid roots (>25mmø) as deemed necessary by the Project Arborist. OSD tanks (where required) should be located outside of the TPZ areas.

### 1.12 Excavations, Root Protection & Root Pruning

Excavations and root pruning within the TPZ shall be supervised by the Project Arborist. Excavations within the TPZ shall be avoided wherever possible.

Excavations within the TPZ shall be undertaken by hand or using hydro vacuum excavation methods (or similar approved device) to protect tree roots. If there is any delay between excavation works and backfilling, exposed roots shall be protected from direct sunlight, drying out and extremes of temperature by covering with a 10mm thick jute mat. The mat shall be kept in a damp condition at all times.

No over-excavation, battering or benching shall be undertaken beyond the footprint of any structure unless approved by the Project Arborist. Hand excavation and root pruning shall be undertaken along the excavation line prior to the commencement of mechanical excavation to prevent tearing and shattering damage to the roots from excavation equipment.

Roots (>25mmø) shall be pruned by the Project Arborist only. Roots (<25mmø) may be pruned by the Principal Contractor. Root pruning shall be undertaken with clean, sharp secateurs or a pruning saw to ensure a smooth wound face, free from tears.

Damaged roots shall be pruned behind the damaged tissues with the final cut made to an undamaged part of the root.

### 1.13 Landscape Planting

Planting of new trees, shrubs and ground covers and the installation of turf within the TPZ areas shall be undertaken using hand tools and roots (>25mmø) shall be protected. No mechanical cultivation/ripping of soils shall be undertaken within TPZ areas.

Landscape planting shall be completed in the final stage of the development works and tree protection fencing and trunk protection shall remain in place until these works are due to commence.



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**Appendix 6: Typical Tree Protection Details**



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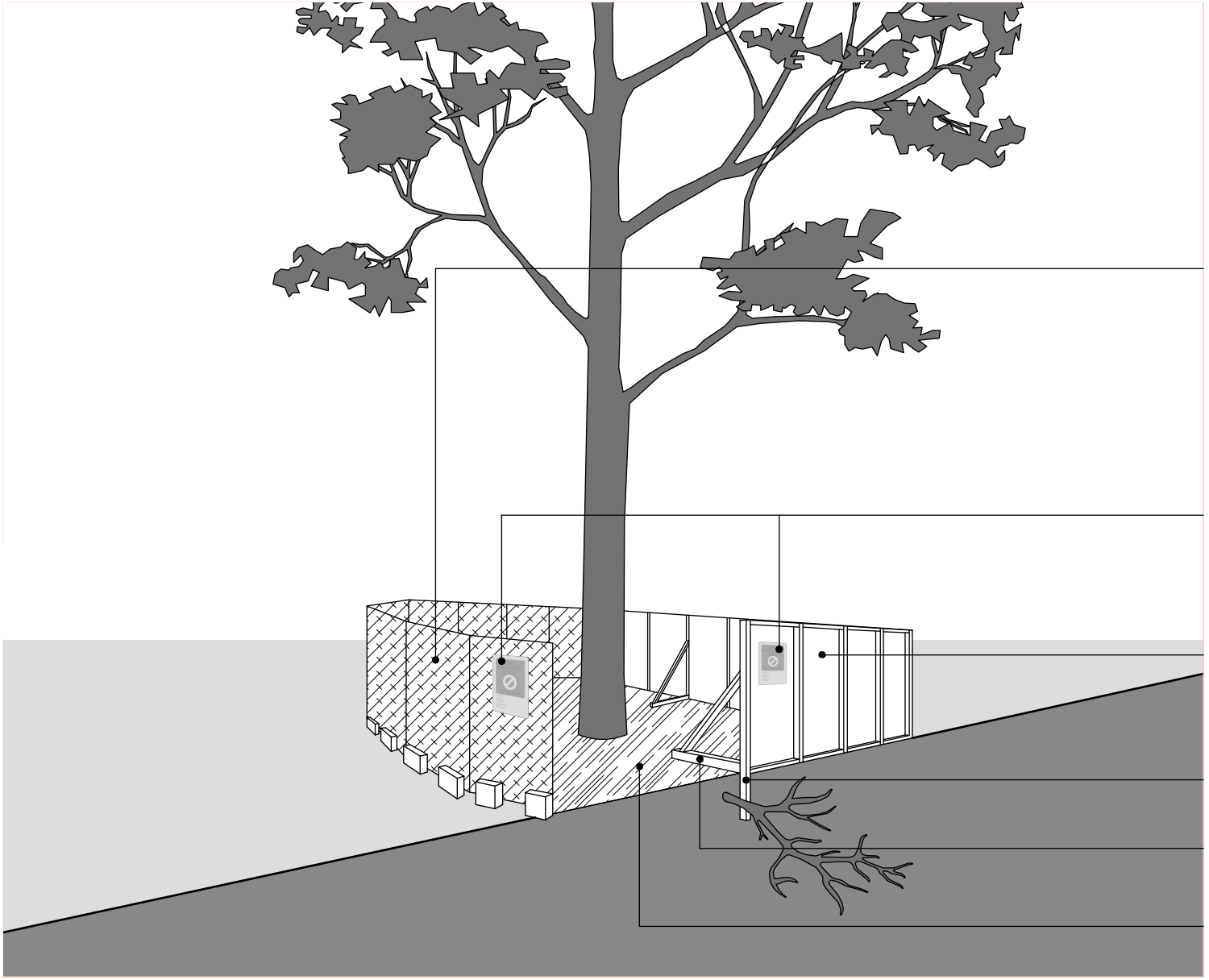


**Note:**
No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.

**Option 1 - Fencing**
1.8m high chain wire mesh panels with shade cloth attached (if required), held in place with concrete feet.

Tree Protection Zone (TPZ) sign

**Option 2 - Fencing**
Plywood or wooden panel paling fence. This type of fencing material also prevents building materials or soil entering the TPZ.

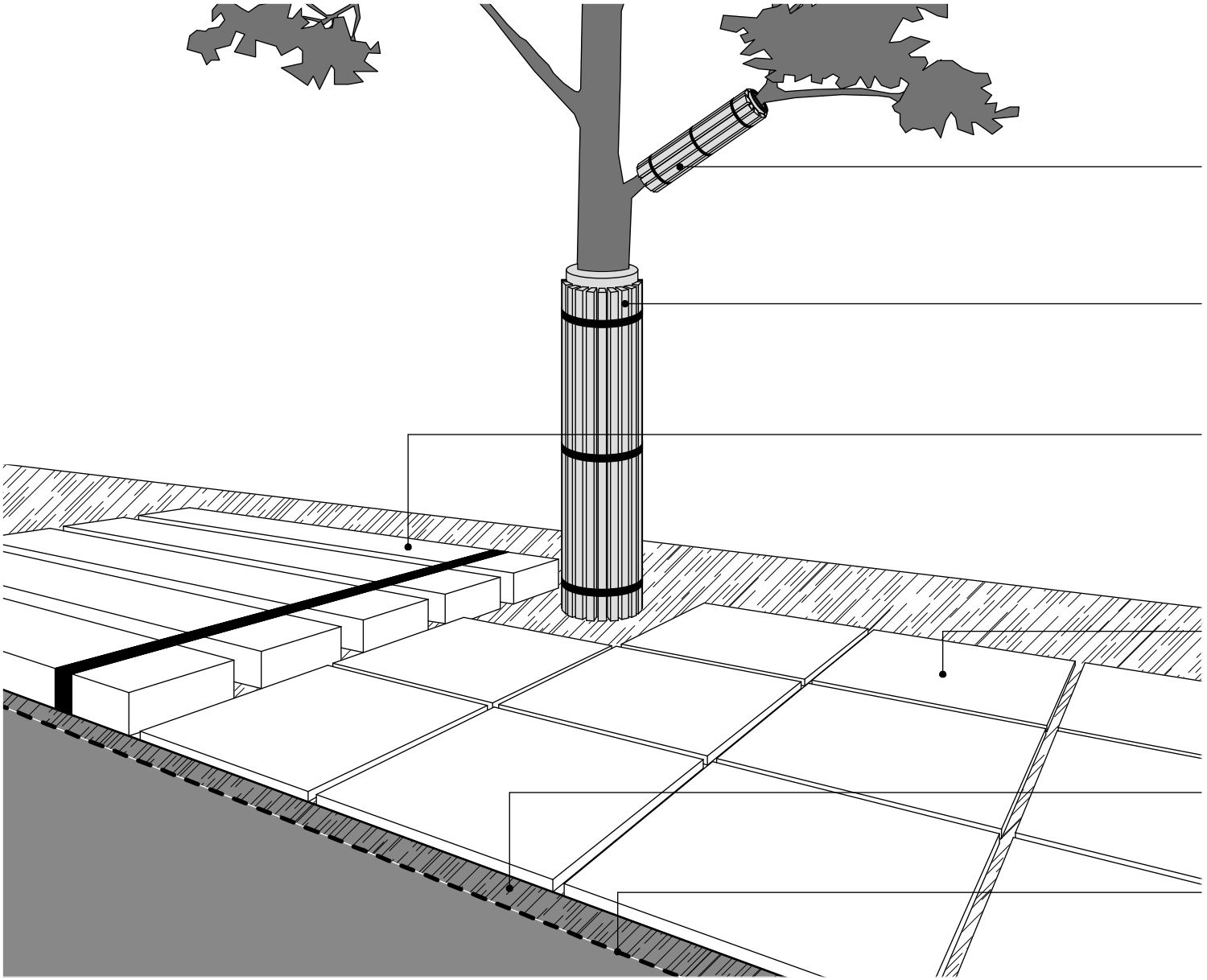
Installation of supports should avoid damaging roots.

Bracing is permissible within the TPZ.

Maximum 100mm and minimum 50mm depth mulch or aggregate layer installed across surface of TPZ.

03 Tree Protection Fencing

Not to Scale



**Branch Protection** - use boards and padding to prevent damage to bark on branch. Boards are to be strapped, not screwed or nailed to the branch.

**Trunk Protection** - use boards and padding to prevent damage to bark (minimum 2m). Boards are to be strapped, not screwed or nailed to the trunk.

**Ground Protection** - use device strapped over mulch or aggregate layer. Ground protection device should be of a suitable thickness to prevent soil compaction and root damage.

Steel plates (or approved equivalent) with or without mulch or aggregate layer below.

Maximum 100mm and minimum 50mm depth mulch or aggregate layer.

Geotextile fabric underneath mulch or aggregate layer.

04 Examples of Branch, Trunk and Ground Protection

Not to Scale