EVOLVING ARBOR

ARBORICULTURAL IMPACT ASSESSMENT (AIA) REPORT

Leichhardt Park Community Boatshed

Abstract

An AIA report prepared for the Community Rowing Club Inc. for a proposed development at Part Lot 120 DP 1279860 – 66-68 Mary Street LILYFIELD

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1. Introduction

1.1 This report was prepared for Community Rowing Club Inc. for a proposed development at Part Lot 120 DP 1279860 – 66-68 Mary Street LILYFIELD. The proposed development is the construction of a new two storey community rowing boatshed, public boat launching pontoon, kiosk and ancillary spaces to interface with Leichardt Park, Lilyfield.

1.2 The purpose of this report is to provide an Arboricultural Impact Assessment (AIA) of the proposed development and to develop a Tree Management Plan for the subject trees to be retained. The report will provide recommendations of suitable tree protection measures to ensure the preservation of the specified trees to be retained during construction.

1.3 A site survey was conducted at the job address on Wednesday 5th February 2025.

1.4 The report has been prepared in accordance with the Inner West LEP 2022 (NSW Government, 2022); Inner West DCP 2013 (Inner West Council, 2023) and Sections 4.1-5.52 of the *Australian Standard for Protection of Trees on Development Sites* (AS4970:2009).

2. The Site

The subject site will be located within Leichardt Park or Part Lot 120 DP 1279860 – 66-68 Mary Street LILYFIELD, see Figure 3. Leichardt Park is an area of multi-use public recreation including sports fields, an aquatic centre, skate park and the bay run. The specific location that the Community Rowing Club is located approximately 80m to the north of the Maliyawul Street public carpark and approximately 15m to the west of The Bay Run. The land adjacent to the proposed development is currently an open grassed area. There is a playground, an outdoor fitness station, amenity block (out of order at present) and sports field in proximity to the proposed development. Existing major facilities within Leichhardt Park include Leichhardt Park Aquatic Centre and Leichhardt Oval are located to the east.

2.1 The soil landscape of the area is originally Hawkesberry (9130ha) (Environment NSW, 2025).

3. Methodology

3.1 The subject trees were inspected by Ry Kehlet – AQF5 Consulting Arborist on Wednesday 5th February 2025. Photos were taken of all specified trees, see Appendix 1 Site photos and images

3.2 Health and Condition Assessment

An assessment of each tree was made from the ground using the Visual Tree Assessment (VTA) procedure (Matheck & Breloer, 1994). There were no aerial inspections conducted or diagnostic testing undertaken.

3.2.1 A number of plans were provided by the client by email on the 31st January 2025 which included a Site Survey Plan and a Section plan that can be seen in Appendix 4 Site Plans.

3.2.2 The following data has been collected from site and recorded in tabulated form, see Table 3 Tree audit for prescribed trees:

- Tree IDs were assigned
- Tree name (Botanical and Common)
- Approximate height (m)
- DBH (mm) measured at 1.4m above the ground
- DAB (mm)
- Canopy spread (m) either paced out or estimated
- TPZ (m)
- SRZ (m)
- Age class (relative to the height, canopy spread, location and species type)
- Structure (relative to the location and species type)
- Health and vigour (focusing on visual indicators such as foliage density and colour; canopy shape and size)
- Deadwood measurements (estimation from the ground on the diameter of deadwood and how much was present)
- Faults/Features present (any condition of the tree that is/will affect its health and longevity)
- Safe Useful Life Expectancy (S.U.L.E). Full methodology located in Appendix 5 - S.U.L.E, Tree Significance Rating and Retention Value methodologies
- Tree significance (IACA STARS)
- Tree retention value

3.2.3 Tree locations have been mapped to a satellite image of the site (Sixmaps, 2025), located in Figure 3.

3.2.4 The trees that have been identified and assessed are recorded in the tree audit schedule, see Table 3.

3.2.5 Photographs were taken at the site inspection of the specified trees, see Appendix 1 Site photos and images

3.3 Safe Use Life Expectancy (SULE)

The remaining Safe Use Life Expectancy of a tree is an estimate of the sustainability of the tree in the landscape, calculated based on an estimate of the average age of the species less its current estimated age. The estimated SULE of each tree can be found in the tree schedule table in Table 3. The following values have been allocated to each tree:

- Greater than 40 years (Long)
- Between 15 and 40 years (Medium)
- Between 5 and 15 years (Short)
- Less than 5 years (Transient)
- Dead or immediately hazardous (no remaining SULE)

3.4 Landscape Significance

3.4.1 The significance of a tree in the landscape is a combination of its environmental, heritage, cultural and amenity values. These values can at times be fairly subjective however an assessment of each of them needs to be made for each of the subject trees to assist in determining their overall retention value.

3.4.2 A rating has been applied to each tree to give an understanding of the relative significance of each tree:

1. Significant
2. Very High
3. High
4. Moderate
5. Low
6. Very Low
7. Insignificant

3.5 Environmental Significance

3.5.1 Tree Management Controls
Chapter C1.14: Tree Management from Inner West Council DCP 2013 (Inner West Council, 2023)

3.5.2 Threatened Species and Ecological Communities

None of the subject trees were listed under the endangered ecological species lists within the NSW Biodiversity Conservation Act 2016 or listed within IWC Local Government Area (LGA) as threatened/endangered.

3.6 Tree Retention Value

The tree retention values, shown in Table 3, have been determined on the estimated longevity of the trees and their landscape significance rating, in accordance with Table 1 and Table 2 below. This will help to preserve the health and longevity of the trees identified with adequate retention value. The full methodology is in Appendix 5 - S.U.L.E, Tree Significance Rating and Retention Value methodologies.

Table 1 Tree Retention Values Matrix

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

3.6.1 The following table describes the implications of the Retention Values on site layout and design:

Table 2 Tree Retention Priorities

RETENTION VALUE	RECOMMENDED ACTION
"High"	• These trees considered worthy of preservation; as such careful consideration should be given to their retention as a priority. • Proposed site design and placement of buildings and infrastructure should consider the Tree Protection Zones as discussed in the following section to minimise any adverse impact. • In addition to Tree Protection Zones, the extent of the canopy (canopy drip-line) should also be considered, particularly in relation to high rise developments. Significant pruning of the trees to accommodate the building envelope or temporary scaffolding is generally not acceptable.
"Moderate"	• The retention of these trees is desirable. • These trees should be retained as part of any proposed development if possible, however they trees are considered less critical for retention. • If these trees must be removed, replacement planting should be considered in accordance with Council's Tree Replacement Policy to compensate for loss of amenity.
"Low"	• These trees are not considered to worthy of any special measures to ensure their preservation, due to current health, condition or suitability. They do not have any special ecological, heritage or amenity value, or these values are substantially diminished due to their SULE. • These trees should not be considered as a constraint to the future development of the site.
"Very Low"	• These trees are considered potentially hazardous or very poor specimens, or may be environmental or noxious weeds. • The removal of these trees is therefore recommended regardless of the implications of any proposed development.

3.7 Protection Zones

3.7.1 The Tree Protection Zone (TPZ) is a radial distance measured from the centre of the trunk of the tree and which are calculated in accordance with Australian Standards AS4970-2009 Protection of Trees on Development Sites. The excerpts from the Australian Standards for protection zone calculations are located in Appendix 6 Tree Protection and SRZ Calculations (from AS4970-2009 + 2010 Amendment).

3.7.1.1 The purpose of a TPZ is to ensure that the tree's root system and canopy are protected against potential damage from the construction works. Incursions to the root zone may occur when excavation takes place, or changes to ground levels from grading or trenching. These activities can damage the root systems of a tree which can adversely impact on its health.

3.7.2 The Structural Root Zone (SRZ) is the area around the base of a tree required for the bulk of the tree's mechanical stability in the ground. This zone is nominally circular with the trunk at its centre and is expressed by its radius in metres.

3.7.2.1 Incursions within the SRZ are not recommended as it will likely damage or sever the woody roots that provide the majority of structural stability to a tree. This could lead to catastrophic failure at any given time.

3.7.3 Encroachments within a Tree Protection Zone (TPZ) when unavoidable can be made as long as it doesn't exceed 10% of the area of the TPZ and outside of the SRZ. Where incursions greater than TPZ are to be made the use of non-destructive exploratory methods should be utilised to map out the larger woody roots to prevent them from being severed.

3.7.4 Acceptable encroachment to the canopy

The reduction or removal of small portions of the crown (includes the branches and foliage) is generally tolerable provided that it is less than 10% of the total foliage volume of the tree and doesn't create large wounds or adversely disfigures the tree. All pruning work needs to be undertaken in accordance with Australian Standards AS4373-2007 Pruning of Amenity Trees. This will typically involve reducing the branch/es that are within the building works back to the nearest main stem. Extensive pruning of a tree prior to further disturbance such as construction works is generally recommended against as it creates stress to the tree which can lead to detrimental tree health.

3.7.4.1 Clearance between a tree's canopy and the current building line as well as the proposed building, line need to be considered when determining how much canopy to remove. Any equipment such as scaffolding should also be taken into consideration and where possible, alternative solutions such as cranes or scissor lifts should be used to minimise the impact to a tree's canopy.

4. Proposed Development

The proposed development will be the construction of a new two storey Community rowing boatshed in Leichardt Park. The specific location for this build is currently an open grassed area approximately 80m to the north of the Maliyawul Street public carpark and approximately 15m to the west of The Bay Run path. The proposed two storey building will sit on piles over the water in Iron Cove with a land interface and access via Leichhardt Park. There is a proposed change to the existing footpath and bay run, see Figure 10. The site is a 'green field' site which will require services such as water and electrical to be installed. A plan showing the proposed locations to connect to existing services can be seen in Figure 11 and Figure 12. An aerial image linking to observed locations at the site visit for possible water and electrical services can be seen in Figure 14.

4.1. Development on construction sites can create mechanical and/or chemical damage to trees, so appropriate controls should be used to mitigate them where possible.

4.1.1. **Excavation and trenching**

Works undertaken near a trees TPZ or SRZ can potentially cause damage to a tree's roots through root pruning or changes to soil levels and hydrology.

4.1.2. **Site stockpiling of building materials**

Can create a number of issues for tree health, including soil compaction, soil run off (also soil nutrient changes), and hydrology changes.

4.1.3. **Pruning**

Works should be undertaken to trees before construction materials and machinery arrives to minimise the possibility of branches being ripped or torn off. Considerations need to be made about the heights of tree branches along main access roads or near the current or proposed building/s are to be installed. All pruning works should follow the instructions/plan set out by a minimum qualified level 5 Consulting Arborist; be completed by someone with minimum arborist level 3 qualification and should comply with Australian Standards AS4373-2007.

4.1.4.**Scaffolding**

May impact on trees during their installation and use due the space that they require. There use should be limited to outside a tree's TPZ where possible, however if required within the TPZ then the tree's canopy should be pruned to reduce damage. The amount of pruning should be kept to a minimum and should be overseen by a minimum qualified level 5 Consulting Arborist. The installation of these structures should be completed by a licenced and qualified person, as per the guidelines set out in Figure 16 Indicative scaffolding within a TPZ.

4.1.5.**Site access**

Access to a construction zone needs to allow for the movement of large amounts of equipment, material, and machinery. The frequency, weight and size of the vehicles needs to be considered as well as the most appropriate locations for access to the building site throughout the construction period. Vehicles could cause a number of detrimental impacts to trees including compaction of the soil or mechanical damage to roots/tree trunks/branches or leaves. Where possible access routes should be used away from trees that are being retained on site, but when this is not possible then tree protection measures should be used.

4.1.6.**Compaction and soil grade/level changes**

Changes to the soil profile such as when heavy machinery is used on it or a trench is dug, affects the soil pore ratio which can limit water and oxygen to a tree's roots. This is known to affect the health and longevity of a tree and can cause immediate stress as it reduces the ability for a tree to absorb water and nutrients from the soil (Urban, 2008).

4.1.7. **Contaminants**

Air contaminants such as excessive dust and pollution can limit a tree's leaves from receiving sunlight which can reduce their ability to photosynthesis causing the tree to go into stress. Liquid contaminants such as paint, concrete slurry or fuel spills at construction sites need to be prevented as much as possible, especially around trees as they can poison them.

5. Results

5.1. The intention of this assessment is to understand what the possible incursions would be to the root zones and canopies from the approved development and to evaluate the likely impact of these

building works on the subject trees. All tree data results can be found in Appendix 2 Tree Audit Data Collection.

5.2. The client has provided a number of plans and documents by email on the 31st January 2025. These consist of a Site Plan, a Section Plan, Proposed pathway plan, and proposed plans for services that can be seen in Appendix 4 Site Plans. These plans have been used to assist in assessing the impact from the proposed development and to develop a Tree Protection Plan.

5.3. There was one (1) x Tree: *Ficus rubiginosa* (Port Jackson Fig) and seven (7) x groups of trees comprising of mostly *Casuarina spp.* (She Oak) and one *eucalyptus sp*. (Eucalyptus) (observed within Group 7) that have been assessed for potential impact from the proposed development. Their locations have been mapped, see Figure 3 and the tree data obtained from site can be seen in Table 3 Tree audit for prescribed trees.

5.4. A summary of the potential impact of Tree 1 within the proposed redevelopment zone is shown in Table 4 Impact assessment and recommended actions. The following criteria have been examined as part of the assessment:

- Structural Root Zone (SRZ)
- Tree Protection Zone (TPZ)
- Trees to be retained or removed
- Calculated encroachments into the subject trees TPZ and SRZ

5.5. The proposed development of the Community boatshed has no major calculated encroachments to any of the subject trees assessed. The Sections plan (see Figure 9) shows that most of the building will be constructed on piers over the water. There was one group of trees, Group 5: *Casuarina spp.* (She Oak) that will have minor incursions to two-three trees canopies located on the North side of this Group due to the proximity to the construction of the boatshed.

5.6. The pathway changes that have been proposed to accommodate the boat trailer movements can be seen in Figure 10. The pathway changes will require Tree 1 and most of Group 1 trees to be removed. It will also require trees located along the Western edge of Groups 2, 4 and 5 to be removed. These trees were assessed to be relatively young and a moderate retention value and can be replaced. A final assessment on which trees will require removal will need to be undertaken by the Project Arborist once the new pathway changes have been confirmed.

5.7. As this site is a Greenfield site, there are no existing service connections. As such there are a number of proposed plans which show connections to existing services some distance away, see Figure 11, Figure 12 and Figure 13.

5.8. The proposed electrical connection will require a trench nearby to trees located along Maliyawul Street, see Figure 13. If the trench can be dug approximately 3m away from these trees (not formally assessed) it will be outside their structural root zone and should minimise any potential impact to their roots. Alternative routes to other possible connection points are shown in Figure 14. The proposed locations for water connections are from Frazer Street, see Figure 11. Possible connection routes to these points can be seen in Figure 14. The site inspection located existing water services at Frazer Street that if connection here is possible it would avoid impacting the Fig trees near Mary Street. These connection points would require a trench to be dug however would

only potentially impact some of trees within Group 2, 3 and 5 depending on the route that was agreed upon.

5.9. The proposed sewer connection will have a major impact to Group 7 trees and any trees located on the next to the bay run on the west side. Recommendations have been provided to reduce some of the potential impacts in Section 6 below.

6. Recommended Tree Protection Measures

6.1. Tree Protection

6.1.1. The following Tree Protection Measures should be followed to ensure adequate tree protection to ensure the protection of trees within the subject site.

6.2. Prohibited Activities

6.2.1. The following activities should be avoided within the Tree Protection Zones:

- Mechanical removal of vegetation including the extraction of tree stumps.
- Soil disturbance, surface grading, compaction or ripping of the soil.
- Excavations and trenching (except approved remediation works for underground services, building foundations and pavements).
- Erection of site sheds, storage and/or stockpiling materials should only be located outside of retained tree's TPZ
- Disposal of waste or chemical materials (paint, solvents, building rubble etc).
- Affixing signage or placing any barriers or fences.
- Any activity that would likely damage the tree or the root zone.

6.3. Tree Removal

6.3.1. Tree 1 and some trees in Groups 1, 2, 4 and 5 along the proposed pathway changes will require removal (see Figure 10). This work should be undertaken before any construction work takes place and by a Practicing Arborist to AS4737-2007 with the approval of council. All work should be undertaken with the supervision of the project Arborist.

6.4. Tree Pruning

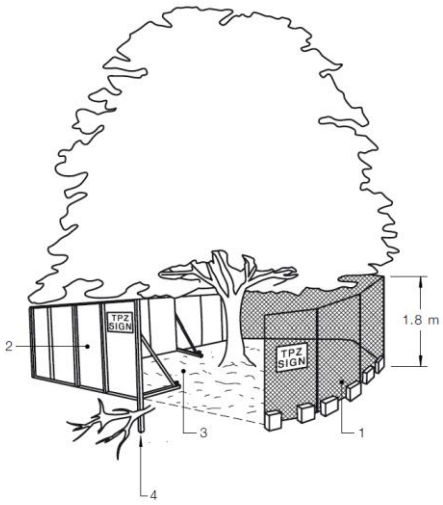
6.4.1. Groups 1, 2, 4 and 5 will require minor canopy lift pruning of small ~25-50mm diameter branches once the pathway changes proposed in Figure 10 have been completed. They should be pruned so that there is enough clearance to avoid accidental damage from construction related activities. This work should be undertaken by a Practicing Arborist to AS4737-2007 and with the approval of council. All work should be undertaken with the supervision of the project Arborist.

6.4.2. Under no circumstances should branches be torn off or damaged by construction equipment, and care must be taken when working with machinery near trees. Any potential conflict of a

tree's canopy with construction activities will require consultation with a minimum qualified level 3 Practicing Arborist.

6.5. Tree Protection Fence

6.5.1. Tree Protection Fences shall be used to protect all trees assessed, see Table 4 Impact assessment and recommended actions. The fence should consist of chain wire mesh/panels held in place by concrete feet (see Figure 1 below). The concrete feet should be anchored or pegged to the ground (where possible) to ensure that they are not moved during building works. The fencing should be placed along the edge of the footpath, bay run and informal field access track enclosing Groups 1, 2, 3, and 4. Fencing should be placed around Group 5 (and Group 6) such that there is minimum distance on any soft ground of ~2.5m to the closest tree.



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

FIGURE 3 PROTECTIVE FENCING

Figure 1 Examples of tree protection fencing. (Standards Australia, 2009)

6.6. Excavation works in or near Tree Protection Zones

6.6.1. If large woody roots (greater than 40mm diameter) are encountered the Project Arborist should be consulted to advise the most appropriate course of action.

6.7. Underground services

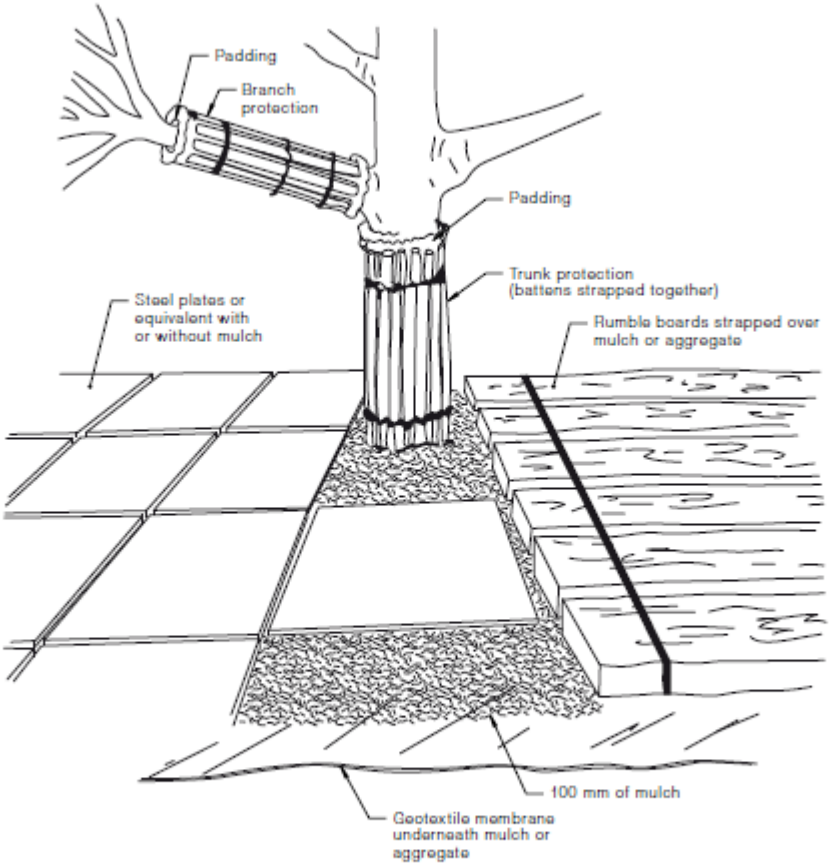
6.7.1. The proposed plans for electrical and water services show potential impact to trees within groups 2, 3, 4 and 5 depending on the final route. It is recommended that both these services are connected using Option 1 as it is the closest possible connection point with the least impact to assessed trees, see Figure 14. Other alternative routes for these two service connections can also be seen in Figure 14.

6.7.2. The proposed sewer connection will have a major impact to Group 7 trees and any trees located on the next to the bay run on the west side.

6.7.3. Once the route for the services is finalised that the project arborist be engaged to determine if and where exploratory root mapping is required.

6.8. Ground Protection

6.8.1. Ground protection to be installed on the East side of Group 2 and South side of Group 3 to prevent unnecessary damage to the tree roots during construction activities. An example of these can be seen in Figure 2 below.



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.

Figure 2 Examples of trunk, branch and ground protection. (Standards Australia, 2009)

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Glossary of Terms

Cavity: an open wound characterised by the presence of decay resulting in a hollow

Codominant stem: two or more main stems or 'leaders' that emerge from the same location on the main trunk

Compaction: a process of force/stress that is applied to a soil that causes densification as air is displaced from between pores

Crown: the above ground parts of a tree including the trunk

Decay: Process of degradation of woody tissues by fungi or bacteria through decomposition of cellulose and lignin

DAB: Diameter at Base (of tree)

DBH: Diameter at Breast Height

Dripline: the outermost circumference of a tree's crown

Fault: an observable indicator of deterioration of a tree's natural health and structure, e.g. a crack or split that has separated wood.

Feature: an observable indicator of a tree's structure that may not be normal but is not necessarily a risk, e.g. a hollow for habitat

Foliage: Collective name for plant leaves

Helical/Spiral/Torsion crack: A separation of fibres caused by transverse tension of wood grains under a turning force.

Included Bark: Bark that grows around the branching stem attachment into the union between two stems

QTRA: Quantified Tree Risk Assessment is a certified tree risk assessment method

STARS: Significance of a Tree, Assessment Rating System

SRZ: The area around the base of a tree required for the tree's stability in the ground

SULE: Safe Use Life Expectancy

TPZ: Tree Protection Zone – the area calculated under a tree's canopy that has its important root systems

TRAQ: Tree Risk Assessment Qualification is an ISA certified form that is used by qualified arborists to identify risk in a tree and propose remediation steps to mitigate that risk

VALID: Tree Risk Assessment method

VTA: Visual Tree Assessment is a method of evaluating the structural defects and stability in tree

Wound: Any injury that induces a compartmentalisation response

Appendix 1 Site photos and images

Figure 3 Aerial photo showing the approximate location of the proposed new Community rowing boatshed and location of nearby trees and groups of trees.

Figure 4 Photo showing Tree 1 and Group 1. The gate is the entrance to Leichardt Oval No.3

Figure 5 Photo of Group 2. Maliyawul St is to the left of frame

Figure 6 Photo of Group's 4, 5 (part of) and 6 looking South along the bay run. Group 6 was observed to be in poor, declining health.

Figure 7 Photo showing Group 5 and 6 (marked yellow) and the approximate position of the boatshed

Appendix 2 Tree Audit Data Collection

Table 3 Tree audit for prescribed trees

TREE ID	TREE NAME	HEIGHT (M)	SPREAD (M)	DBH (mm)	DAB (mm)	TPZ (M)	SRZ (M)	AGE RANGE (Years)	STRUCTURE	HEALTH	DEADWOOD (Diameter (mm))	FAULTS/FEATURES	S.U.L.E	LANDSCAPE SIGNFICANCE RATING	RETENTION VALUE	NOTES
Tree 1	Ficus macrophylla (Moreton Bay Fig)	3	5	200	320	1.80	1.50	5-15	Good	Good	Small (1-25)	No major faults observed warranting pruning or removal	Long (>40 years)	4	Moderate	DBH, DAB and height est.
Group 1	Casuarina spp (She Oak)	4-6	4	50-300	50-350	3.60	2.13	15-30	Good	Good	Minor (25-50)	No major faults observed	Medium (15-40)	4	Moderate	Group of approx 12 x Casuarina trees located on the left hand side of the bay run path near Maliyawul St. Trees are located between footpath and rockwall. DBH, DAB and height est.
Group 2	Casuarina spp (She Oak)	4-15	4	50-300	50-400	3.60	2.25	15-30	Good	Fair	Minor (25-50)	No major faults observed	Medium (15-40)	4	Moderate	Group of approx 30 x Casuarina trees located on the right hand side of the bay run path from Maliyawul St. Trees range from young juveniles to semi-mature. DBH, DAB and height est.
Group 3	Casuarina spp (She Oak)	5-15	4-5	100-300	300	3.60	2.00	15-30	Good	Good	Minor (25-50)	No major faults observed	Medium (15-40)	4	Moderate	Group of approx 7 trees located on the South side of the toilet block (under renovation due to vandalism). DBH, DAB and height est.
Group 4	Casuarina spp (She Oak)	15	6	400	400	4.80	2.25	15-30	Good	Good	Minor (25-50)	Some long branches extending out over the footpaths.	Medium (15-40)	4	Moderate	Group of 6 trees located on the West side of the toilet block between the bay run and shoreline footpaths. DBH, DAB and height est.
Group 5	Casuarina spp (She Oak)	5-15	4-5	100-300	300	3.60	2.00	15-30	Good	Good	Minor (25-50)	No major faults observed	Medium (15-40)	4	Moderate	DBH, DAB and height est.
Group 6	Casuarina spp (She Oak)	5-15	2-6	50-300	50-350	3.60	2.13	15-30	Fair	Poor	Minor (25-50)	Group of Casuarina trees in poor health and decline. Very sparse canopy with little green leaf	Short (5-15)	5	Low	Group of ~9 trees located West of Blue Hippo Playground between the bay run and shoreline footpath. DBH, DAB and height est.
Group 7	Casuarina spp (She Oak)	6	2-4	50-300	50-350	3.60	2.13	15-30	Fair	Poor	Minor (25-50)	No major faults observed	Medium (15-40)	4	Moderate	Group of trees located on the South of Giovinazzo grove and west of the bay run. One Eucalyptus sp. Included in the group with similar size and spread. DBH, DAB and height est.

Table 4 Impact assessment and recommended actions

TREE ID	TREE NAME	DBH (mm)	DAB (mm)	TPZ (M)	SRZ (M)	INCURSIONS TO ROOT ZONE and/or CANOPY	LIKELY IMPACT	RETAINABLE?	RECOMMENDATIONS
Tree 1	Ficus macrophylla (Moreton Bay Fig)	200	320	1.8	1.50	None calculated	Minor to none	Yes	1. Install tree protecion fencing prior to construction work. 2. Monitor health and condition throughout development works
Group 1	Casuarina spp (She Oak)	50-300	50-350	3.6	2.13	None calculated	Minor	Yes	1. Impact from development works specifically for the Boatshed are calculated to be none however there is the traffic of materials to site from Maliyawul St that need to be considered. It is suggested that the shoreline path be used to traffic any materials where/when possible to avoid the bay run. 2. Install tree protection fencing around this group of trees prior to construction work. 3. Monitor health and condition throughout development works 4. IWC Engineers plan provided meeting 20/11/2024 show two optional changes to the shoreline path and the bay run path which will result in some tree loss. The trees that would be required to be removed as part of the proposed pathway changes are low to moderate retention value. There are other areas in the park that tree replacements could be completed to compensate for any tree loss.
Group 2	Casuarina spp (She Oak)	50-300	50-400	3.6	2.25	None calculated	Minor	Yes	1. Impact from development works specifically for the Boatshed are calculated to be none however there is the traffic of materials to site from Maliyawul St that need to be considered. It is suggested that the informal path between Maliyawul St and the toilet block be used to traffic any materials. 2. Install ground protection between the gate entrance at Maliyawul and the toilet block closest to the bay run. Install tree protection fencing around this group of trees prior to construction work. 3. Monitor health and condition throughout development works 4. IWC Engineers plan provided meeting 20/11/2024 show two optional changes to the shoreline path and the bay run path which will result in some tree loss. The trees that would be required to be removed as part of the proposed pathway changes are low to moderate retention value. There are other areas in the park that tree replacements could be completed to compensate for any tree loss.
Group 3	Casuarina spp (She Oak)	100-300	300	3.6	2.00	None calculated	Minor	Yes	1. Impact from development works specifically for the Boatshed are calculated to be none however there is the traffic of materials to site from Maliyawul St that need to be considered. It is suggested that the shoreline path be used to traffic any materials where/when possible to avoid the bay run. 2. Install tree protection fencing around this group of trees prior to construction work. 3. Monitor health and condition throughout development works 4. IWC Engineers plan provided meeting 20/11/2024 show two optional changes to the shoreline path and the bay run path which will result in some tree loss. The trees that would be required to be removed as part of the proposed pathway changes are low to moderate retention value. There are other areas in the park that tree replacements could be completed to compensate for any tree loss.
Group 4	Casuarina spp (She Oak)	400	400	4.8	2.25	None calculated	Minor	Yes	1. Impact from development works specifically for the Boatshed are calculated to be none however there is the traffic of materials to site from Maliyawul St that need to be considered. It is suggested that the shoreline path be used to traffic any materials where/when possible to avoid the bay run. 2. Install tree protection fencing around this group of trees prior to construction work. 3. Monitor health and condition throughout development works 4. IWC Engineers plan provided meeting 20/11/2024 show two optional changes to the shoreline path and the bay run path which will result in some tree loss. The trees that would be required to be removed as part of the proposed pathway changes are low to moderate retention value. There are other areas in the park that tree replacements could be completed to compensate for any tree loss.
Group 5	Casuarina spp (She Oak)	100-300	300	3.6	2.00	Both	Minor	Yes	1. Impact from development works specifically for the Boatshed are calculated to be Minor (overall <10%) however there are ~2 trees closest to the building that might be impacted due to the proximity to construction activities. It is suggested that the shoreline path be used to traffic any materials where/when possible to avoid the bay run. 2. Install tree protection fencing around this group of trees prior to construction work. 3. Monitor health and condition throughout development works
Group 6	Casuarina spp (She Oak)	50-300	50-350	3.6	2.13	None calculated	Minor to none	Yes	1. Impact from development works specifically for the Boatshed are calculated to be Minor to none. 2. This group of trees was observed at the time of site inspection to be in serious decline of health and condition and may not survive. 3. Tree protection fencing has been recommended around this group as part of the larger Group 5 recommendations 3. Monitor health and condition throughout development works
Group 7	Casuarina spp (She Oak)	50-300	50-350	3.6	2.13	None calculated	Minor to none	Yes	1. Impact from development works specifically for the Boatshed are calculated to be none however there is the traffic of materials to site from Maliyawul St that need to be considered. It is suggested that the shoreline path be used to traffic any materials where/when possible to avoid the bay run. 2. Install tree protection fencing around this group of trees prior to construction work. 3. Monitor health and condition throughout development works

Appendix 4 Site Plans

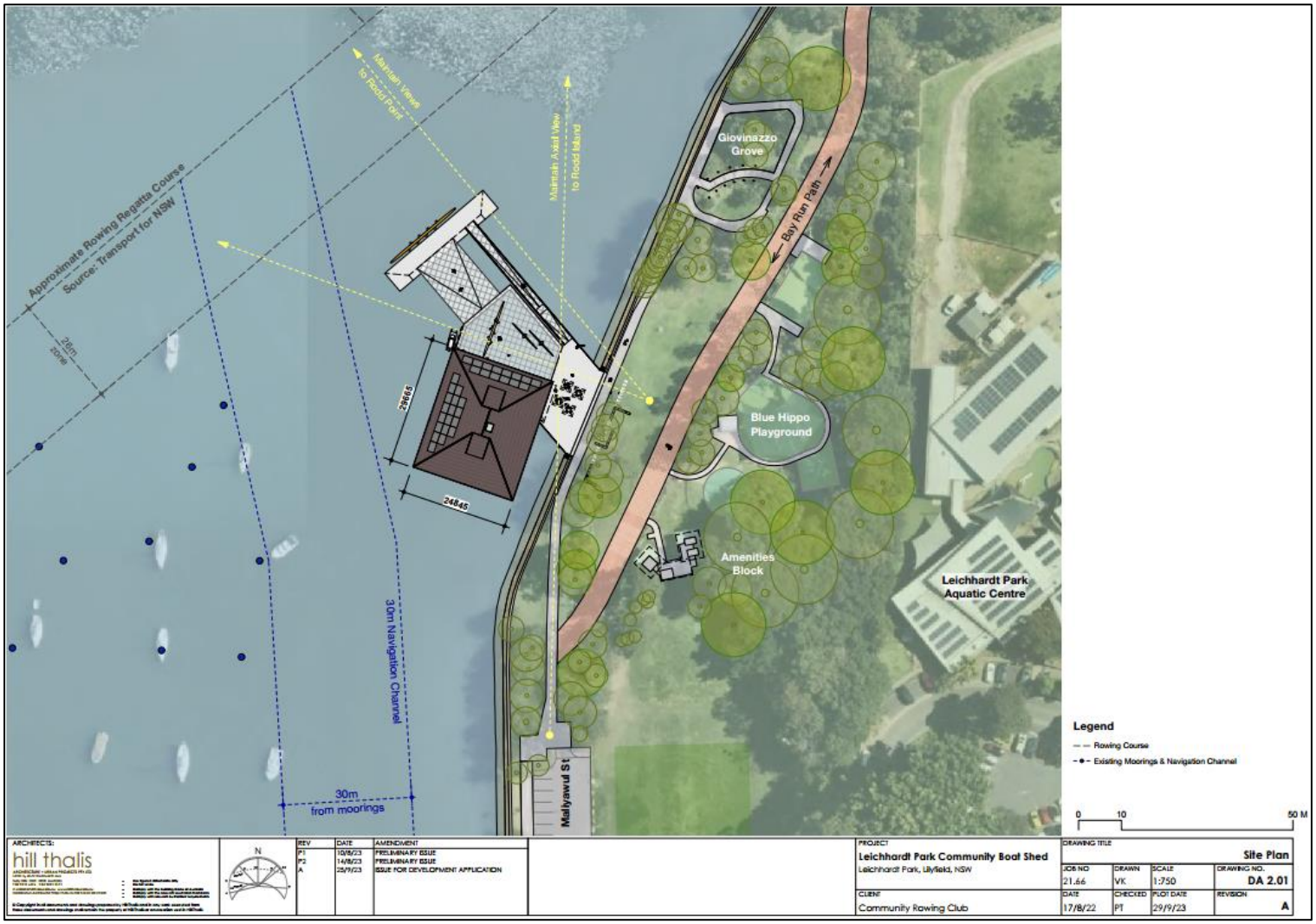


Figure 8 Proposed site plan provided by the Client by email on the 31/1/2025

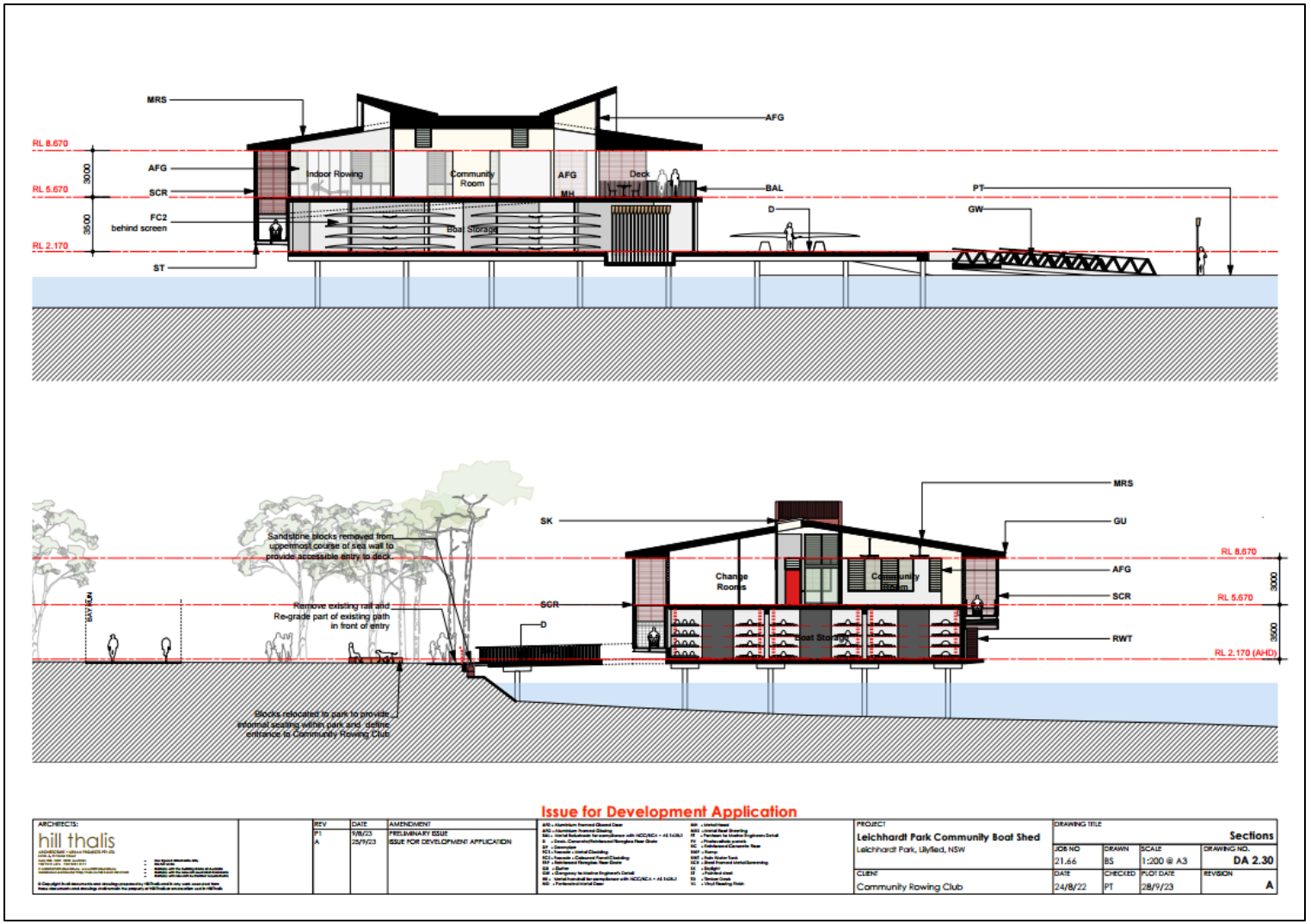


Figure 9 Site Sections Plan provided by the client by email on the 31/1/2025

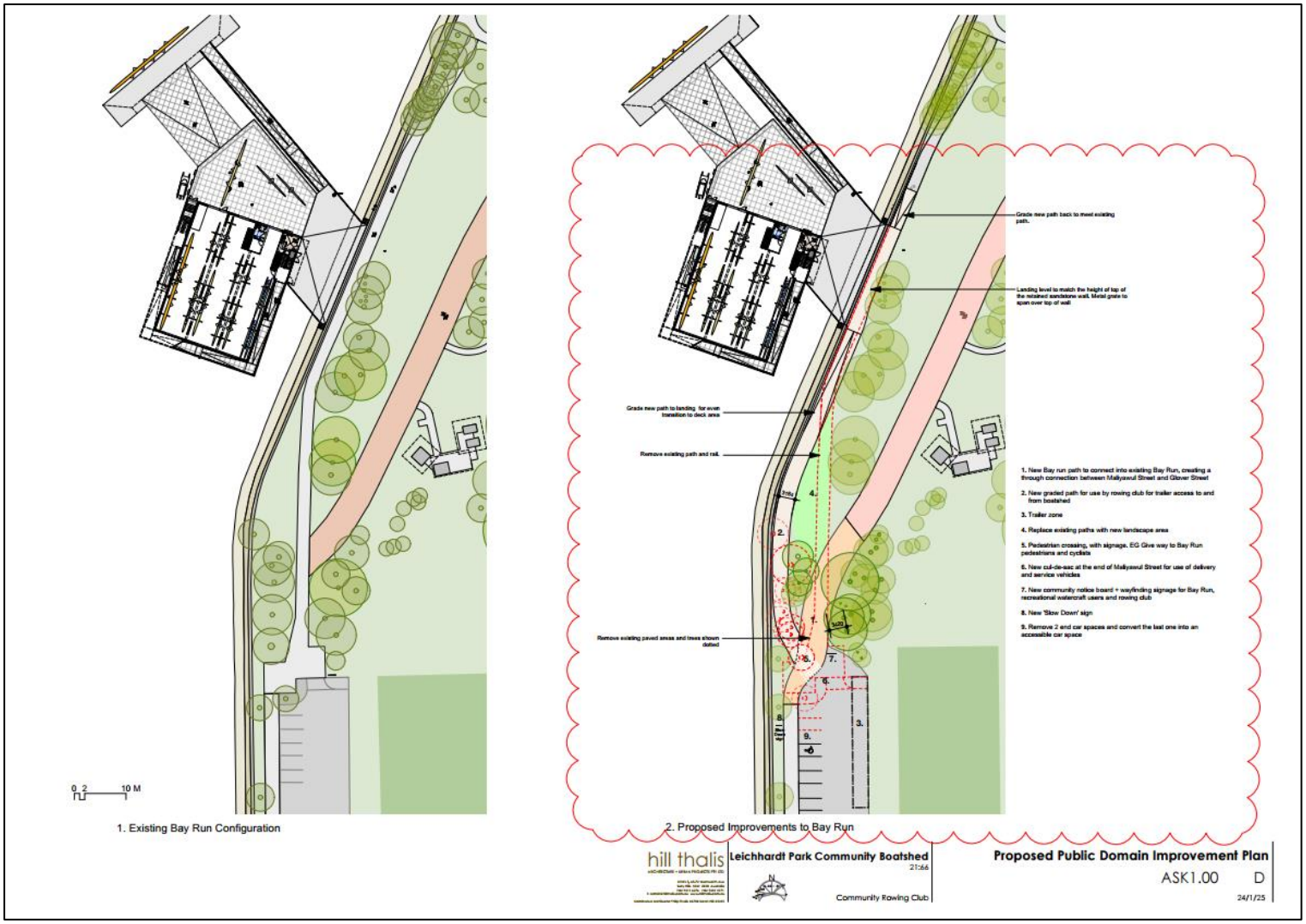


Figure 10 Proposed Public Domain Improvements Plan provided by the Client by email Thursday 13/2/2025

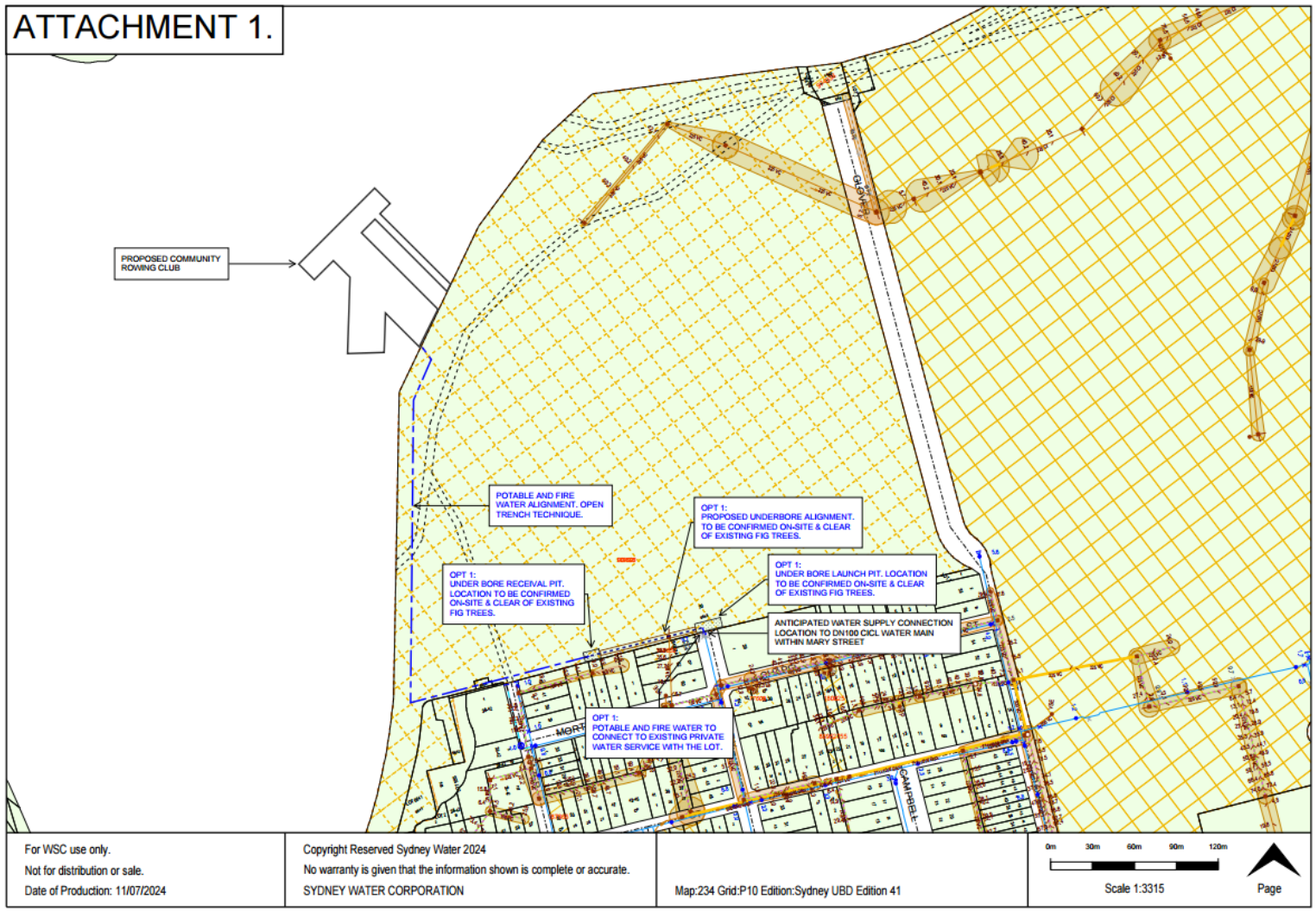


Figure 11 Proposed water connections provided by Client by email 13/2/2025

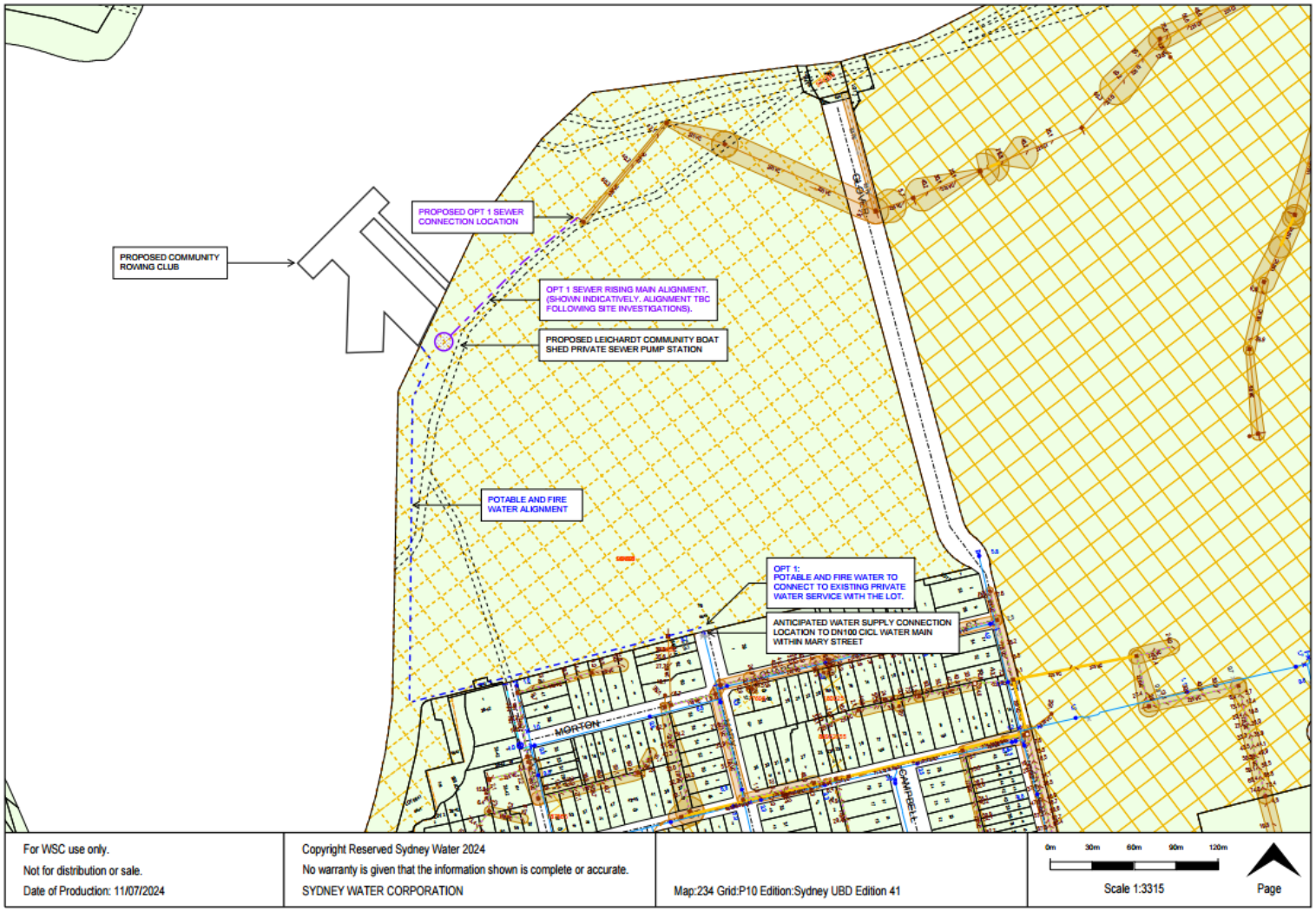


Figure 12 Proposed sewer connection provided by email by Client 13/2/2025

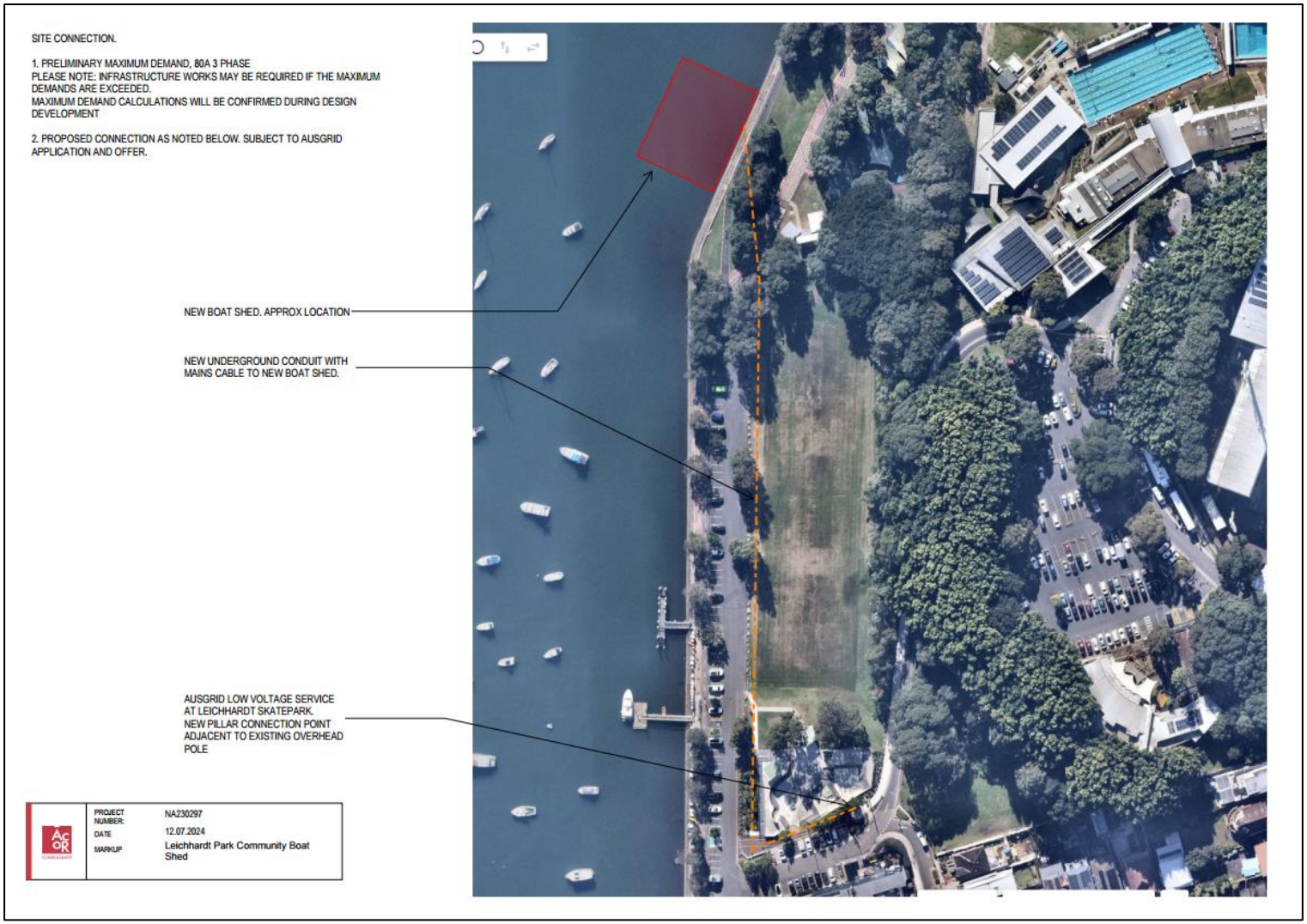


Figure 13 Proposed Electrical connection provided by email by Client 13/2/2025

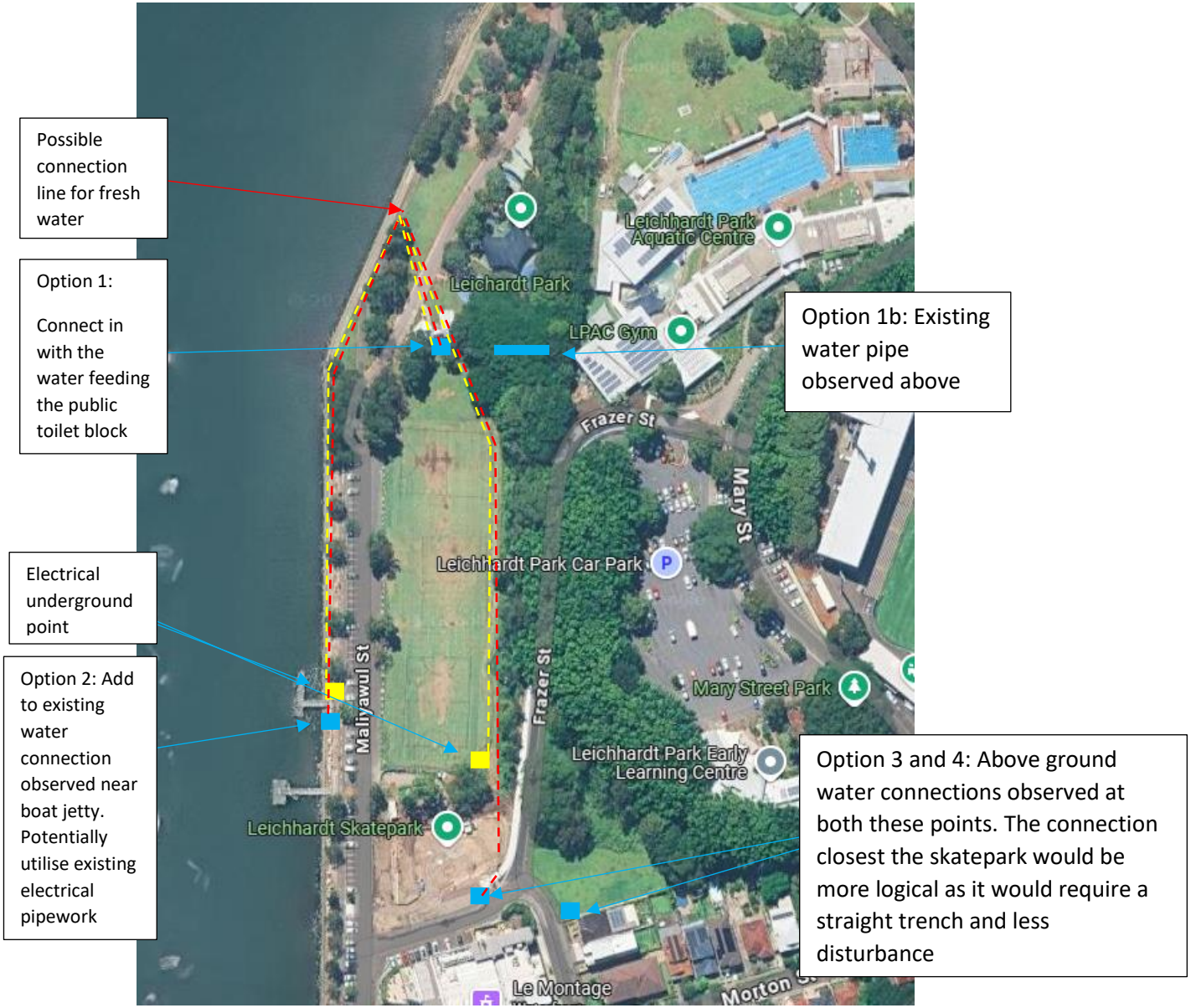


Figure 14 Possible service connection points and routes

Appendix 5 - S.U.L.E, Tree Significance Rating and Retention Value methodologies

The aim of this process is to determine the relative value of each tree for retention (i.e. its Retention Value) in the context of new development. This methodology assists in the decision making process by using a systematic approach. The key objective of this process is to ensure the retention of good quality trees that make a positive contribution to these values and ensure that adequate space is provided for their long term preservation. The Retention Value of a tree is a balance between its sustainability in the setting in which it is located (the 'landscape') and its significance within that setting (landscape significance).

Step 1: Determining the Landscape Significance Rating

The 'landscape significance' of a tree is a measure of its contribution to amenity, heritage and ecological values. Whilst these values are fairly subjective and difficult to assess consistently, some measure is necessary to assist in determining the Retention Value of each tree. To ensure in a consistent approach, the assessment criterion shown in **Table** 3 should be used. A tree may be considered 'significant' for one or more reasons. A tree may meet one or more of the criteria in any value category (heritage, ecology or amenity) shown in **Table** 3 to achieve the specified rating. For example, a tree may be considered 'significant' and given a rating of 1, even if it is only significant based on the amenity criteria.

Based on the criterion in this table, each tree should be assigned a landscape significance rating as follows:-

1 **Significant**
2 **Very High**
3 **High**
4 **Moderate**
5 **Low**
6 **Very Low**
7 **Insignificant**

Step 2: Determining Safe Useful Life Expectancy (SULE)

The sustainability of a tree in the landscape is a measure of its remaining lifespan in consideration of its current health, condition and suitability to the locality and site conditions. The assessment of the remaining lifespan of a tree is a fairly objective assessment when carried out by a qualified Consulting Arborist. Once a visual assessment of each tree is completed (using the Visual Tree Assessment criteria), the arborist can make an informed judgement about the quality and remaining lifespan of each tree. The Safe Useful Life Expectancy (SULE) methodology (refer **Appendix** 3) can be used to categorise trees as follows:-

- **Long (Greater than 40 years)**
- **Medium (Between 15 and 40 years)**
- **Short (Between 5 and 15 years)**
- **Transient (Less than 5 years)**
- **Dead or hazardous (no remaining SULE)**

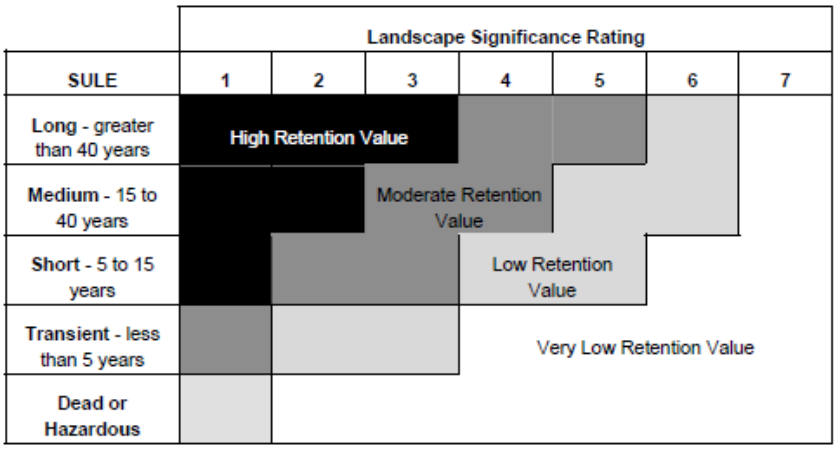
The SULE of a tree is calculated based on an estimate of the average lifespan of the species in an urban area, less its estimated current age and then further modified where necessary in consideration of its current health, condition (structural integrity) and suitability to the site.

Step 3: Determining the Retention Value

The Retention Value of a tree is increased or diminished based on its sustainability in the landscape, which is expressed as its SULE. A tree that has a high Landscape Significance Rating, but low remaining SULE, has a diminished value for retention and therefore has an appropriate Retention Value assigned. Conversely a tree with a low Landscape Significance Rating even with a long remaining SULE, is also considered of low Retention Value. This logic is reflected in the matrix shown in **Table 1**.

Once the landscape Significance Rating and SULE category have been determined, the following matrix can be used to determine a relative value (or priority) for retention:-

TABLE 1 – DETERMINING TREE RETENTION VALUES



Ref:- Modified from
Couston, Mark & Howden, Melanie (2001)
Tree Retention Values Table
Footprint Green Pty Ltd, Sydney Australia

Step 4:- Transfer Retention Values to the Tree Constraints Plan

The Retention Value of each tree should be transcribed on a scale site plan and colour coded. Together with Tree Protection Zones, this information assists in identifying the constraints imposed by trees to site layout and design (referred to as a "Tree Constraints Plan"). The Tree Constraints Plan forms a critical part of the site analysis.

Step 5: Analysing the Implications for Proposed Development

The following table describes the implications of the Retention Values on site layout and design:-

TABLE 2 – TREE RETENTION PRIORITES.

RETENTION VALUE	RECOMMENDED ACTION
"High"	• These trees considered worthy of preservation; as such careful consideration should be given to their retention as a priority. • Proposed site design and placement of buildings and infrastructure should consider the Tree Protection Zones as discussed in the following section to minimise any adverse impact. • In addition to Tree Protection Zones, the extent of the canopy (canopy drip-line) should also be considered, particularly in relation to high rise developments. Significant pruning of the trees to accommodate the building envelope or temporary scaffolding is generally not acceptable.
"Moderate"	• The retention of these trees is desirable. • These trees should be retained as part of any proposed development if possible, however they trees are considered less critical for retention. • If these trees must be removed, replacement planting should be considered in accordance with Council's Tree Replacement Policy to compensate for loss of amenity.
"Low"	• These trees are not considered to worthy of any special measures to ensure their preservation, due to current health, condition or suitability. They do not have any special ecological, heritage or amenity value, or these values are substantially diminished due to their SULE. • These trees should not be considered as a constraint to the future development of the site.
"Very Low"	• These trees are considered potentially hazardous or very poor specimens, or may be environmental or noxious weeds. • The removal of these trees is therefore recommended regardless of the implications of any proposed development.

Appendix 6 Tree Protection and SRZ Calculations (from AS4970-2009 + 2010 Amendment)

3.1 TREE PROTECTION ZONE (TPZ)

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

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

3.2 DETERMINING THE TPZ

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

$$TPZ = DBH \times 12$$

where

DBH = trunk diameter measured at 1.4 m above ground

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

A TPZ should not be less than 2 m nor greater than 15 m (except where crown protection is required). Clause 3.3 covers variations to the TPZ.

The TPZ of palms, other monocots, cycads and tree ferns should not be less than 1 m outside the crown projection.

3.3 VARIATIONS TO THE TPZ

3.3.1 General

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

3.3.2 Minor encroachment

If the proposed encroachment is less than 10% of the area of the TPZ and is outside the SRZ (see Clause 3.3.5), detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. Variations must be made by the project arborist considering relevant factors listed in Clause 3.3.4. The figures in Appendix D demonstrate some examples of possible encroachment into the TPZ up to 10% of the area.

3.3.3 Major encroachment

If the proposed encroachment is greater than 10% of the TPZ or inside the SRZ (see Clause 3.3.5), the project arborist must demonstrate that the tree(s) would remain viable. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. This may require root investigation by non-destructive methods and consideration of relevant factors listed in Clause 3.3.4.

3.3.5 Structural root zone (SRZ)

The SRZ is the area required for tree stability. A larger area is required to maintain a viable tree.

The SRZ only needs to be calculated when major encroachment into a TPZ is proposed.

There are many factors that affect the size of the SRZ (e.g. tree height, crown area, soil type, soil moisture). The SRZ may also be influenced by natural or built structures, such as rocks and footings. An indicative SRZ radius can be determined from the trunk diameter measured immediately above the root buttress using the following formula or Figure 1. Root investigation may provide more information on the extent of these roots.

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

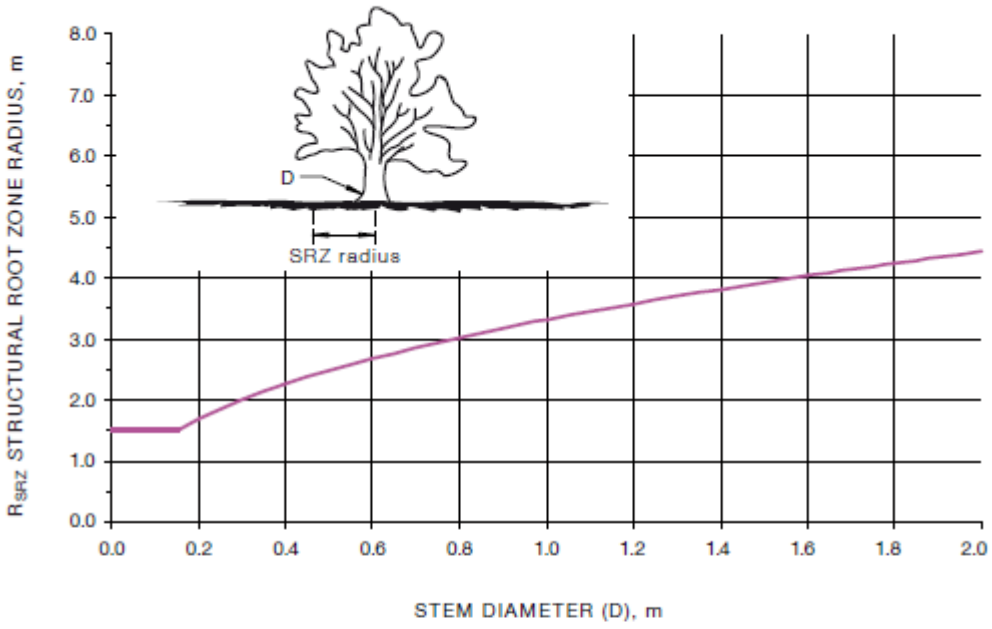
where

D = trunk diameter, in m, measured above the root buttress

NOTE: The SRZ for trees with trunk diameters less than 0.15 m will be 1.5 m (see Figure 1).

Page 13, Figure 1

Delete Figure 1and *insert* the following figure:



The curve can be expressed by the following formula:

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

NOTES:

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

FIGURE 1 STRUCTURAL ROOT ZONE CALCULATION

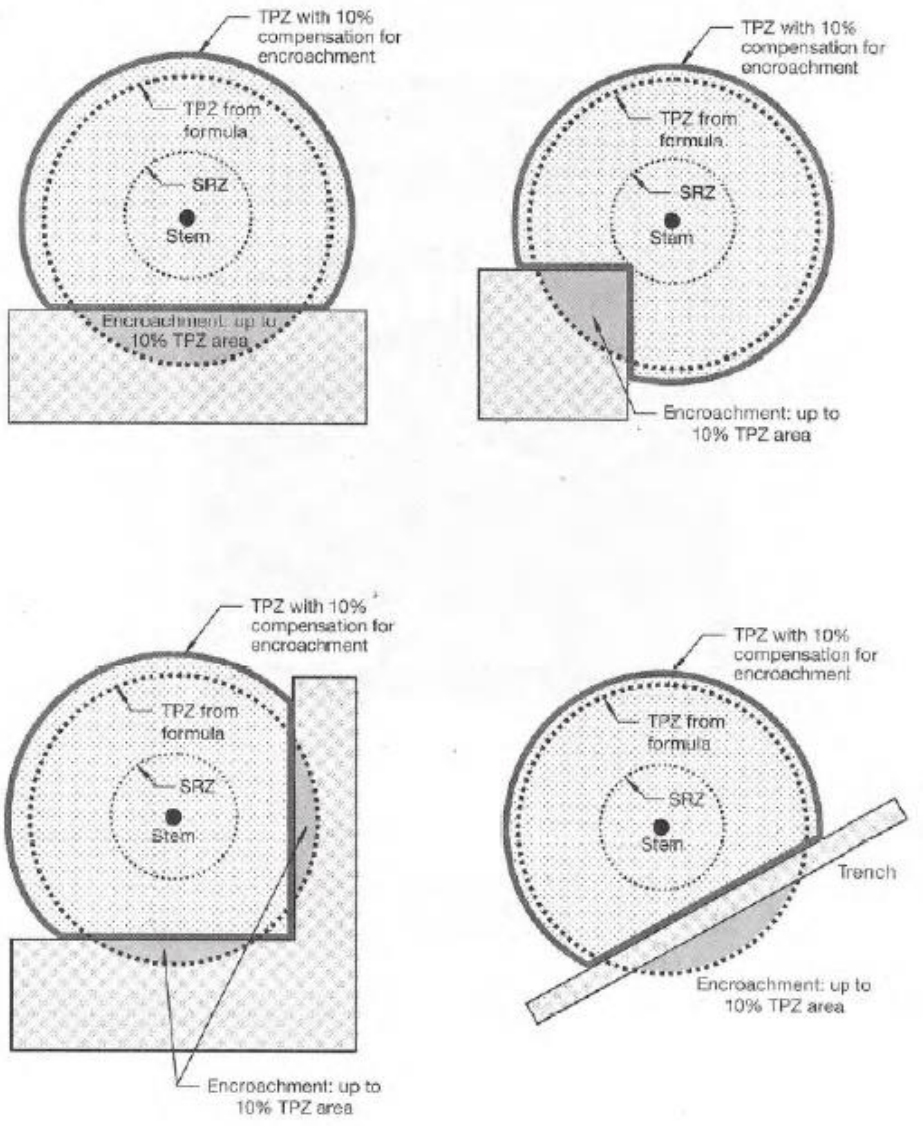
3.3.6 Crown protection

Tree crowns may be injured by machinery such as excavators, drilling rigs, cranes, trucks, hoarding installation and scaffolding. The TPZ may need to include additional protection of the above ground parts of the tree.

Where crown protection is required, it will usually be located at least one metre outside the perimeter of the crown (see Figure 2). The erection of scaffolding may require an additional setback from the edge of the crown.

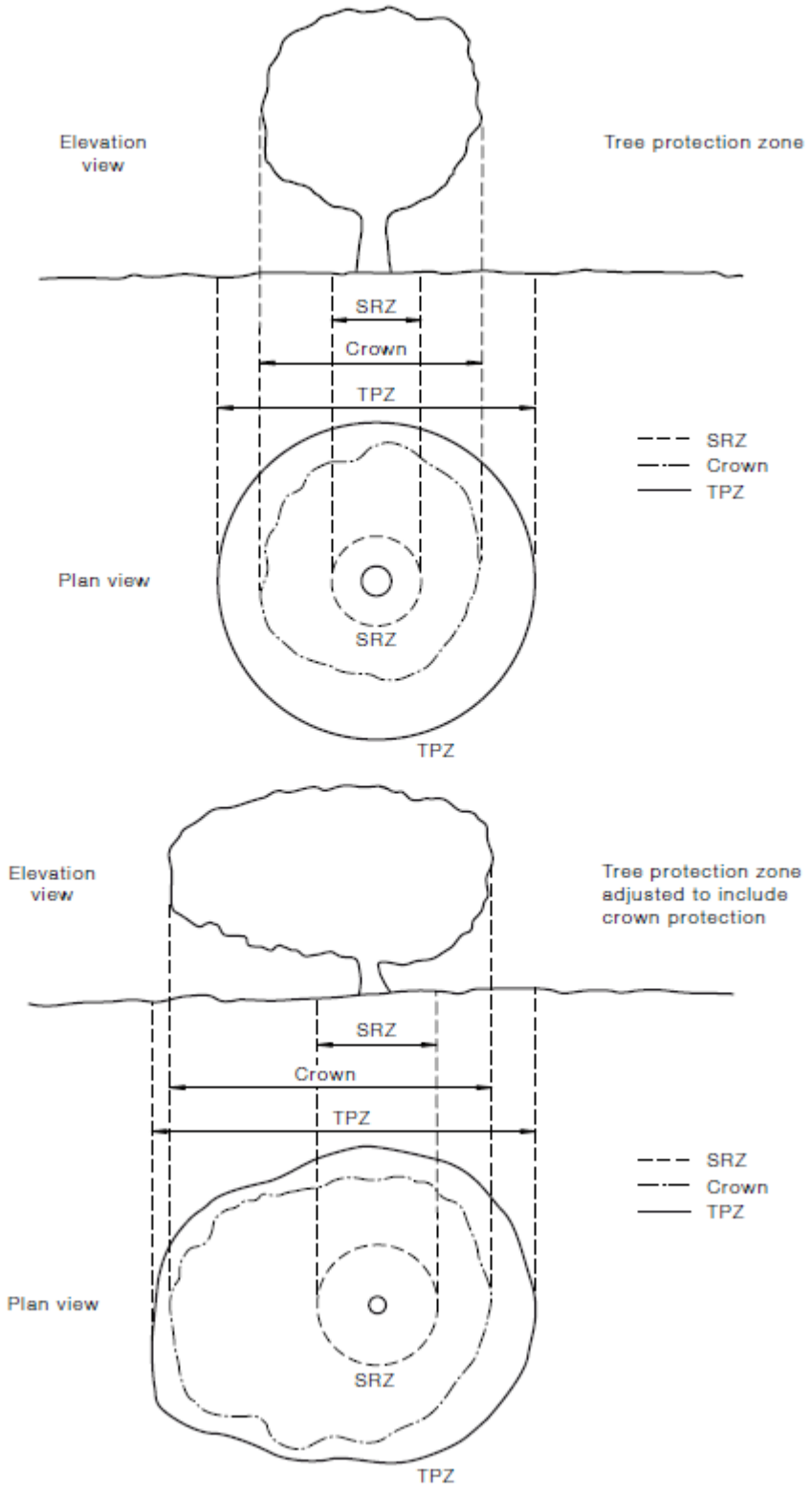
Crown protection may include pruning, tying-back of branches or other measures. If pruning is required, requirements are specified in AS 4373 and should be undertaken before the establishment of the TPZ.

NOTE: Pruning may require approval from the determining authority.



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

Figure 15 Acceptable incursions to TPZ. (Standards Australia, 2009)



NOTE: Refer to Clause 3.2 for calculation of TPZ.

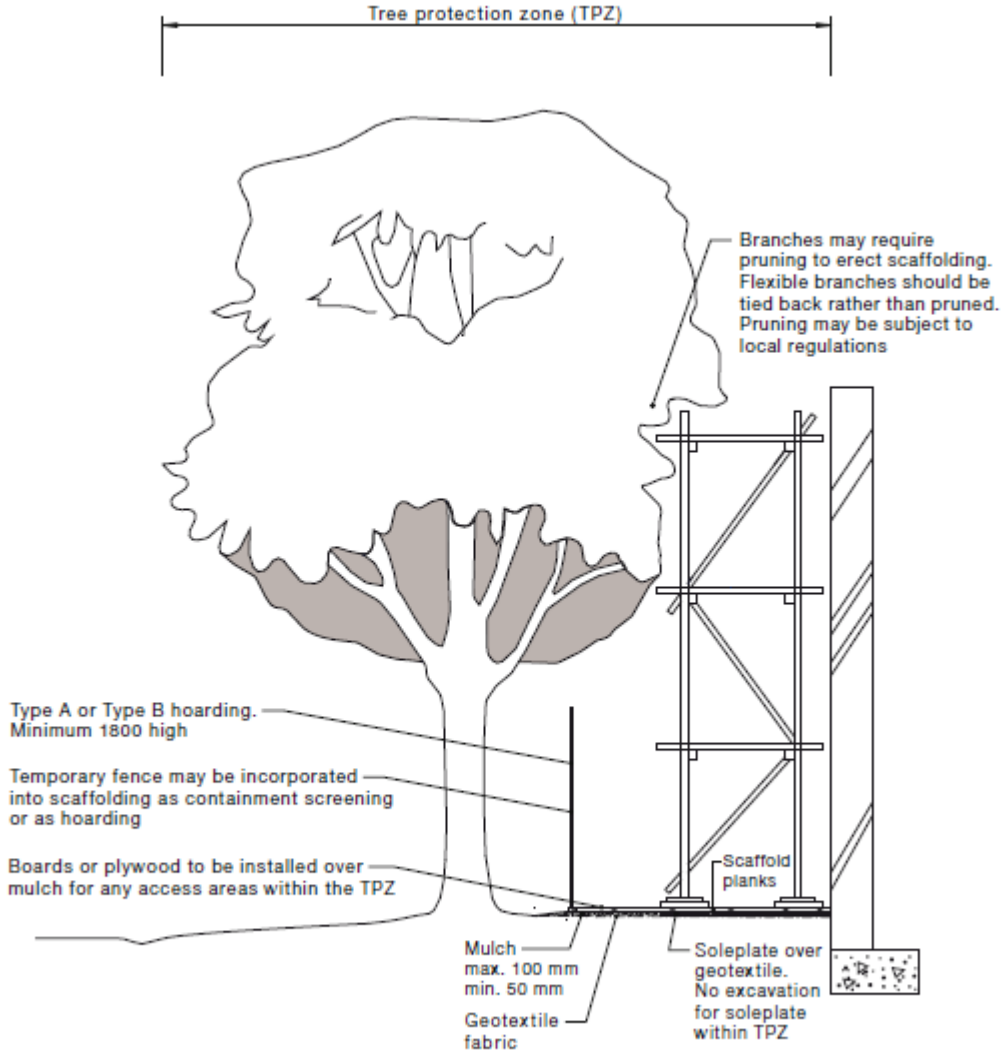


Figure 16 Indicative scaffolding within a TPZ