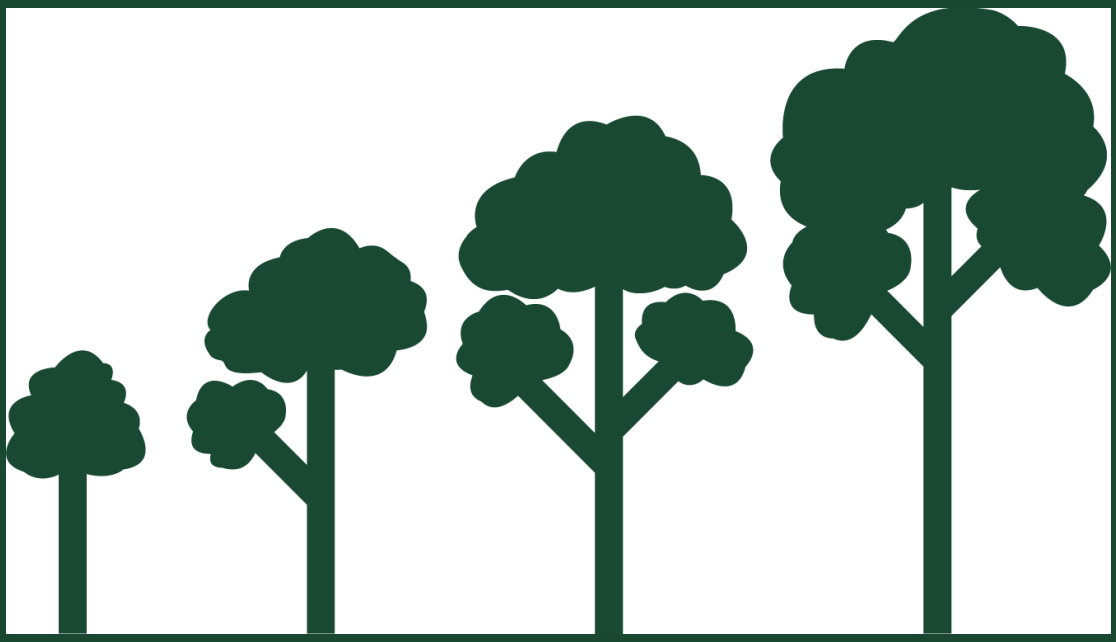
Temporal
TREE MANAGEMENT

Arboricultural Impact Assessment



31-33 Sturdee Lane, Elvina Bay
NSW, 2063
1/-/DP1180405 and 2/-/DP1180405
Ref: 250027

13/03/2025

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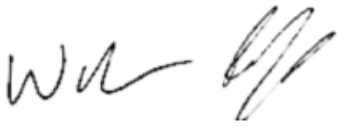
DISCLAIMER and LIMITATIONS

This report has been prepared for the Property Owners of 31 and 33 Sturdee Lane, Elvina Bay and the Project Architect (*Peter Downes Desings*) to assess the impact associated with a proposed development on five trees positioned within 10 metres of the proposed inclinator the subject site.

The author of this report is *Temporal Tree Management Pty Ltd.* This report is not designed for any other purpose. The author accepts no responsibility for the use of this report for purposes other than as an Arboricultural Impact Assessment or if used by any other person / party.

All observations, recommendations and advice expressed in this report are based on the measured tree dimensions and ground-based visual assessment data collected during the site inspection on 04/03/2025. Recommendations provided in this report are made in relation to *the Australian Standard for the Protection of Trees on Development Sites (AS 4970 2009).*

Trees are dynamically growing organisms that change over time. All recommendations are provided based on the ground-based data collected on the day of assessment. No root mapping was undertaken as part of this assessment to accurately determine the impact of proposed excavation within the eastern property boundary of the subject site. No guarantee is implied with respect to future tree condition or safety beyond the advice and recommendations within the report.



William Dunlop

Director of *Temporal Tree Management Pty Ltd.*

B. Sc (Adv.), Grad. Dip (Arb) (AQF Level 8), M. UrbHort.

13th March 2024

1. Executive Summary

The purpose of this report is to provide an Arboricultural Impact Assessment for the trees located within 10 metres of the proposed inclinator pathway along the shared boundary between 31 and 33 Sturdee Lane, Elvina Bay (1/-/DP1180405 and 2/-/DP1180405). Five trees were assessed by William Dunlop of *Temporal Tree Management Pty Ltd* on 04/03/2025.

The retention value of the assessed trees was determined using the Tree Retention Values Assessment Methodology (Morton 2011). Trees 1 and 5 were determined to be of High Retention Value. The retention of these two trees must be prioritised. Tree 2 was determined to be of Moderate Retention Value. This tree should be retained if feasible. Trees 3 and 4 were determined to be of Low Retention Value. These two smaller trees are suitable for removal and replacement if required.

Tree 3 will require removal to facilitate the installation and function of the proposed inclinator. This tree's stem is positioned 300mm from the proposed rail. Tree 3 was determined to be of Low retention within the subject site. The removal of this tree is therefore supported. Consent must be obtained from Northern Beaches Council prior to commencement of any recommended tree removal works for Tree 3.

Trees 1, 2, 4 and 5 are proposed for retention as part of the proposed development. The impact of the minor TPPZ encroachments sustained by Trees 1, 4 and 5 were determined to be acceptable in Section 6.3 of this report. Tree 2 will not be directly impacted under the proposed design. Protection fencing compliant with *Section 4.3 of AS4970 (2009)* will not be feasible within the inclinator corridor due to the steep slope and exposed bedrock. It is therefore recommended that trunk protection measures compliant with *Section 4.5.2 of AS4970 (2009)* are installed on Trees 1, 2, 4 and 5 prior to the commencement of practical works. Excavation required for all portions of the retaining wall for the southern landing, pier and footing holes and landscape works that are within the R_{TPZs} of retained trees must be undertaken using hand tools only. Hand excavation of the portions of the retaining wall for the southern landing that are within the R_{TPZs} of Trees 1 and 5 and for footing C3 must also be carried out under the supervision of the Project Arborist. The edge of the excavated slope for the new retaining wall, pier holes and footing holes must be inspected and certified by the Project Arborist prior to construction of the new piers and rail footings. Pier locations must be altered along the rail pathway where necessary to avoid any encountered major roots.

2. Location

2.1. Site Location

The subject site for this Arboricultural Impact Assessment is the shared boundary between 31 and 33 Sturdee Lane, Elvina Bay (1/-/DP1180405 and 2/-/DP1180405). This report has relied upon the following plans and documents:

- Level, Detail and Contour Survey Plan, prepared by Chadwick Cheng Consulting Surveyors (Reference: 43113/D1-MGA, Sheet: 1 of 1, Issue: B, Drawn: 02/05/2024).
- Architectural Plan Package, prepared by *Peter Downes Designs* (Project: Proposed Inclined Passenger Lift at 31-33 Sturdee Lane Elvina Bay, Reference: 2417, Revision: 00, Drawn: 11/07/2024).
- Site Plan, prepared by *Peter Downes Designs* (Reference: 2417, Drawing No: 01, Drawn: 11/07/2024).
- Rail Plan, prepared by *Peter Downes Designs* (Reference: 2417, Drawing No: 02, Drawn: 11/07/2024).
- Section 1, prepared by *Peter Downes Designs* (Reference: 2417, Drawing No: 03, Drawn: 11/07/2024).
- *Section B – General Controls, Chapter 4 – Controls Relating to the Natural Environment, Part 22 – Preservation of Trees and Bushland Vegetation* of the *Pittwater DCP (2021)* (Northern Beaches Council 2024).
- The Australian Standard for the Protection of Trees on Development Sites (*AS4970 – 2009*).

2.2. Relevant Legislation and Policy Controls

This property is located within the Central Coast Council local government area. The property is part of an C3 Environmental Living zone (Planning NSW 2024) (**Appendix A**). The environmental policy regulations relevant to the trees within the subject site are outlined in *the NSW State Environmental Planning Policy (SEPP) (Biodiversity and Conservation) 2021*. Policy controls governing the management of trees within the subject site are issued under the provisions of the provision of *the Environmental Planning and Assessment Regulations 2021, Division 2 Development control plans.*

The policy controls governing the management of the trees within this portion of the Northern Beaches Council LGA are outlined in *Section B – General Controls, Chapter 4 – Controls Relating to the Natural Environment, Part 22 – Preservation of Trees and Bushland Vegetation* of the *Pittwater DCP (2021)* (Northern Beaches Council 2025). This policy control aligns with and supports the policy controls outlined in the Pittwater Local Environmental Plan (PLEP 2014). These policy controls draw from *AS4970 (2009)* and *AS4373 (2007).*

The subject site forms a Cottage Heritage Item but is not within a Heritage Conservation Area (Planning NSW 2025) (**Appendix A**). The subject site is within an identified Pittwater and Wagstaffe Spotted Gum Forest (SEED 2025) (**Appendix A**). This forest type is listed as a Threatened Ecological Community under *the Biodiversity Conservation Act 2016* and under *the Environment Protection and Biodiversity Conservation Act 1999* of the Commonwealth (NSW Dept. of Planning and Environment 2021). The subject site also falls within land identified as Biodiversity Values Mapped Area and Terrestrial Biodiversity area (**Appendix A**). The indigenous trees within and adjacent to the subject site were therefore determined to be of increased Landscape Significance.

The subject site falls within a Bushfire Prone Land zone (Planning NSW 2024) (**Appendix A**). However, the Rural Fire Service 10/50 Vegetation Clearing Scheme and the *Planning for Bush Fire Protection Guide (2019*) does not apply to the management of vegetation within the subject site due to the significant overlay that apply to this property.

2.3. Tree Locations

An assessment of the trees positioned within 10 metres of the proposed works within the subject site was undertaken by William Dunlop of *Temporal Tree Management P/L* on 04/03/2025. All trees positioned within 10 metres of the proposed inclinator within the subject site were assessed. As stipulated *Section B4.22* of the *Pittwater DCP (2021)*, woody vegetation is prescribed as a 'tree' if it was measured to have a height of or greater than 5 metres (Northern Beaches Council 2025).

Five trees were included in this assessment (Figure 1 and Figure 2). Tree 1 is positioned outside the eastern boundary and is within the property of 15 Dorset Road. Trees 1-5 are positioned within the eastern boundary of the subject site (Figure 3 and Figure 4). Photographs of each tree are provided in **Appendix F.**

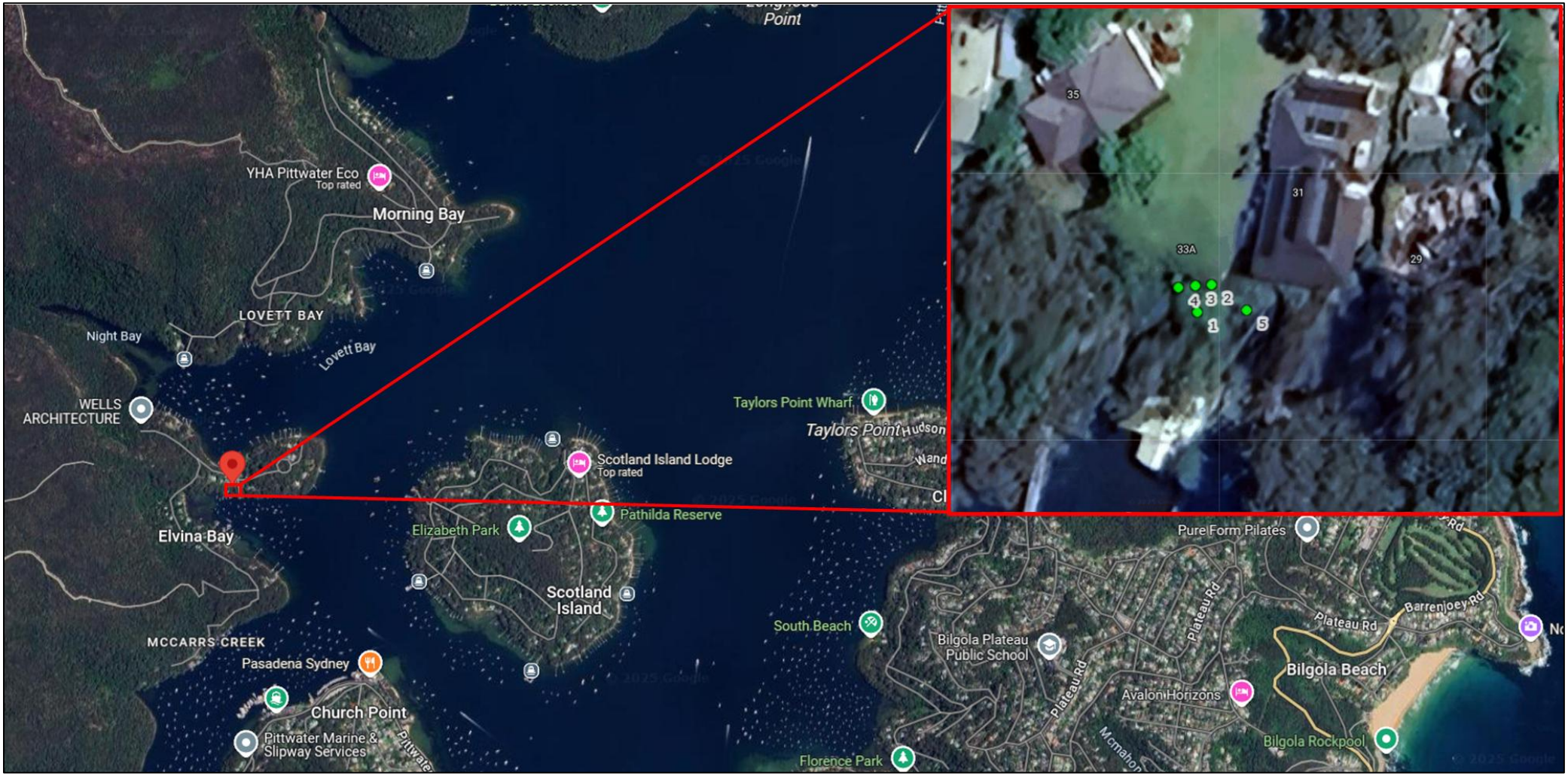


Figure 1. Subject site location and (INSET) position of five assessed trees adjacent to the shared boundary. Image sourced from Google (2025).

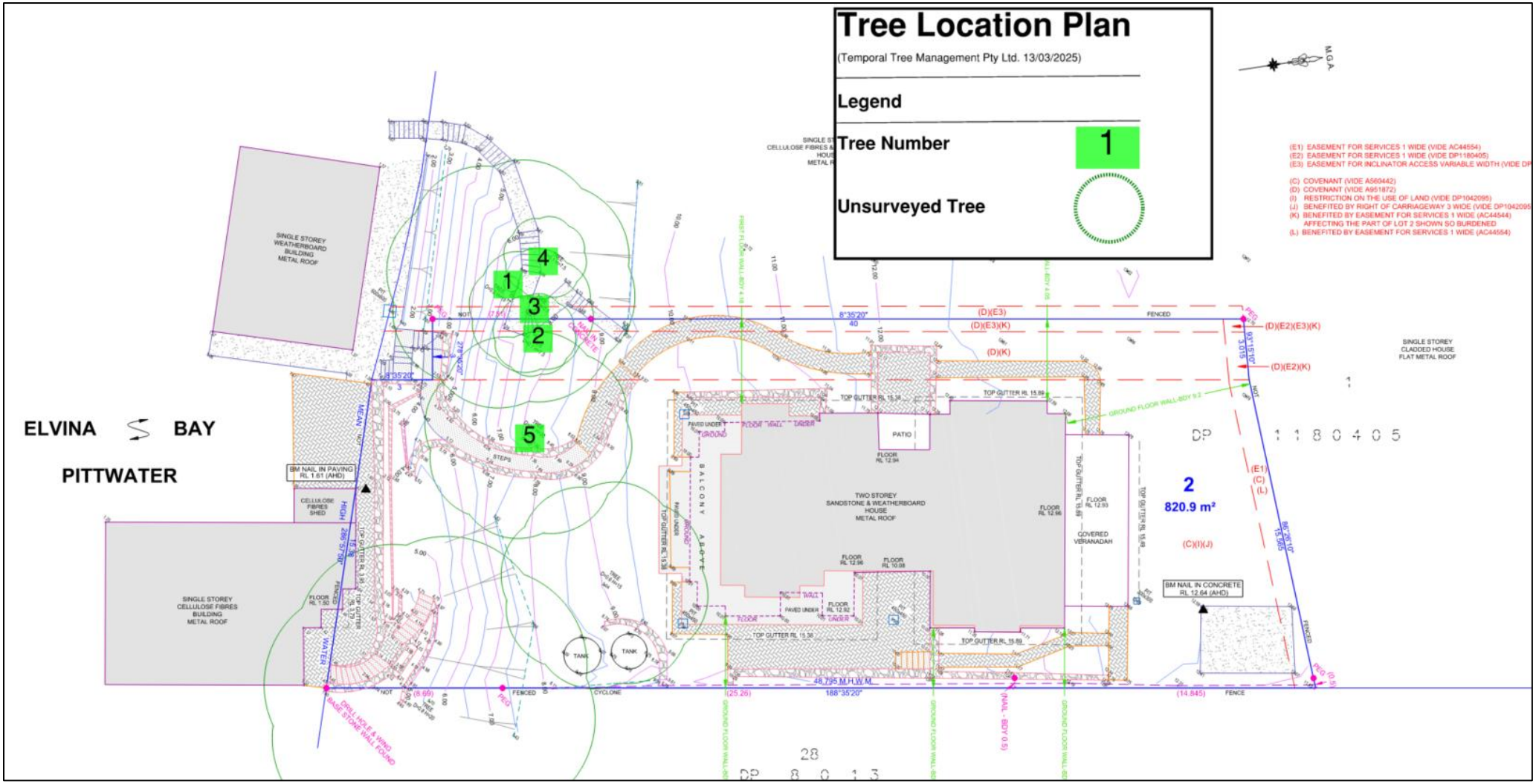


Figure 2. Level, Detail and Contour Survey Plan, prepared by Chadwick Cheng Consulting Surveyors (Reference: 43113/D1-MGA, Sheet: 1 of 1, Issue: B, Drawn: 02/05/2024). Annotated by *Temporal Tree Management Pty Ltd.* (13/03/20

Figure 3. Position of Trees 1-5 adjacent to the shared boundary between 31 and 33 Sturdee Lane, Elvina Bay. Photograph from northern view.

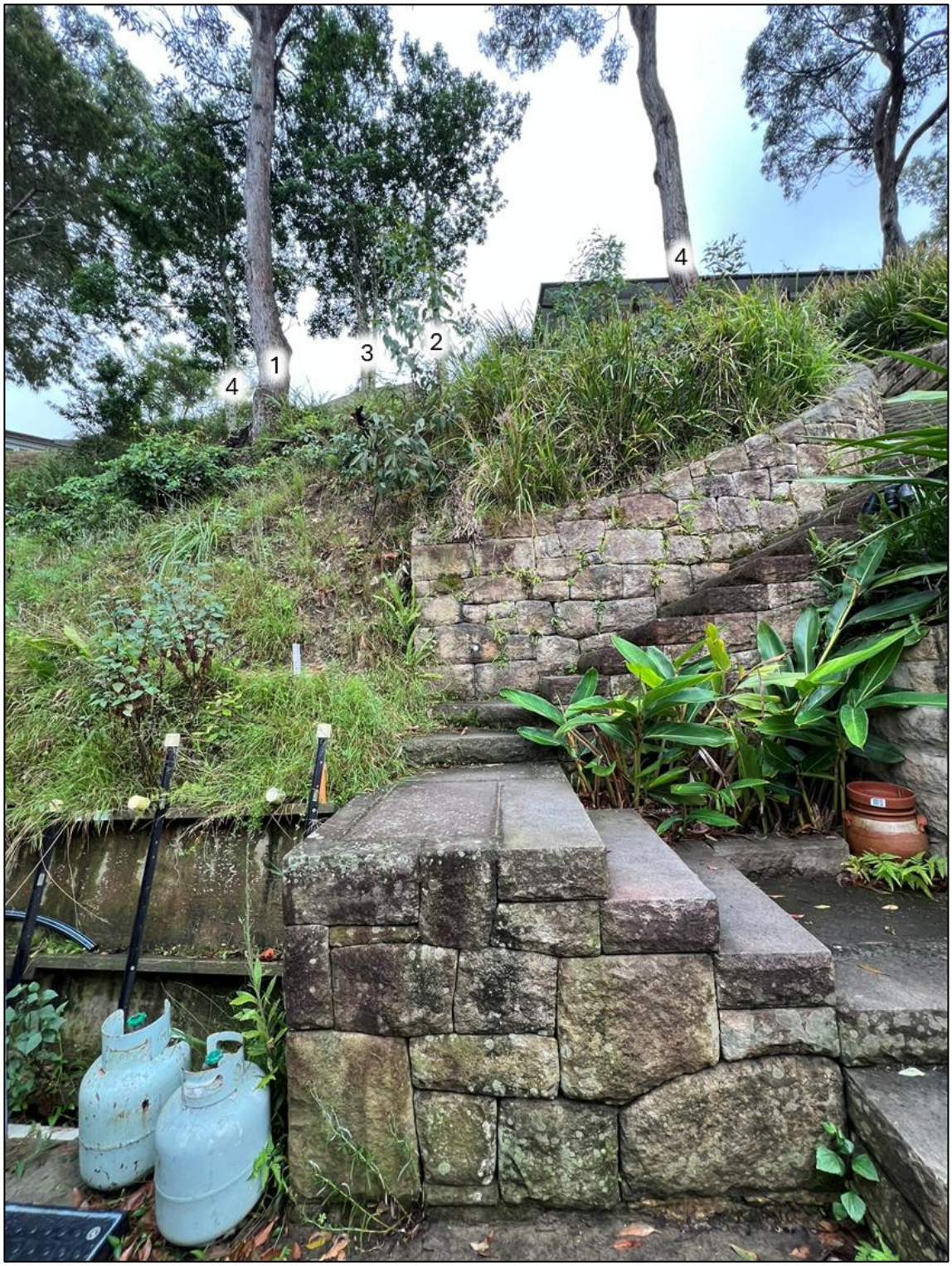


Figure 4. Position of Trees 1-5 adjacent to the shared boundary between 31 and 33 Sturdee Lane, Elvina Bay. Photograph from southern view.

3. Site Development Plans

The proposed development involves the construction of a new inclined passenger lift (inclinator) along the shared boundary between 31 and 33 Sturdee Lane, Elvina Bay (Figure 5). The southern landing is proposed to be positioned on adjacent to the existing sandstone stairway Excavation into the existing slope and construction of a new retaining wall will be required for the construction of this landing. The northern landing is proposed to be built adjacent to the northern entry to number 31. The landings and inclinator rail will be installed on pier footings (Figure 6). New steps are proposed to be built on the northern side of an existing stairway within number 33.

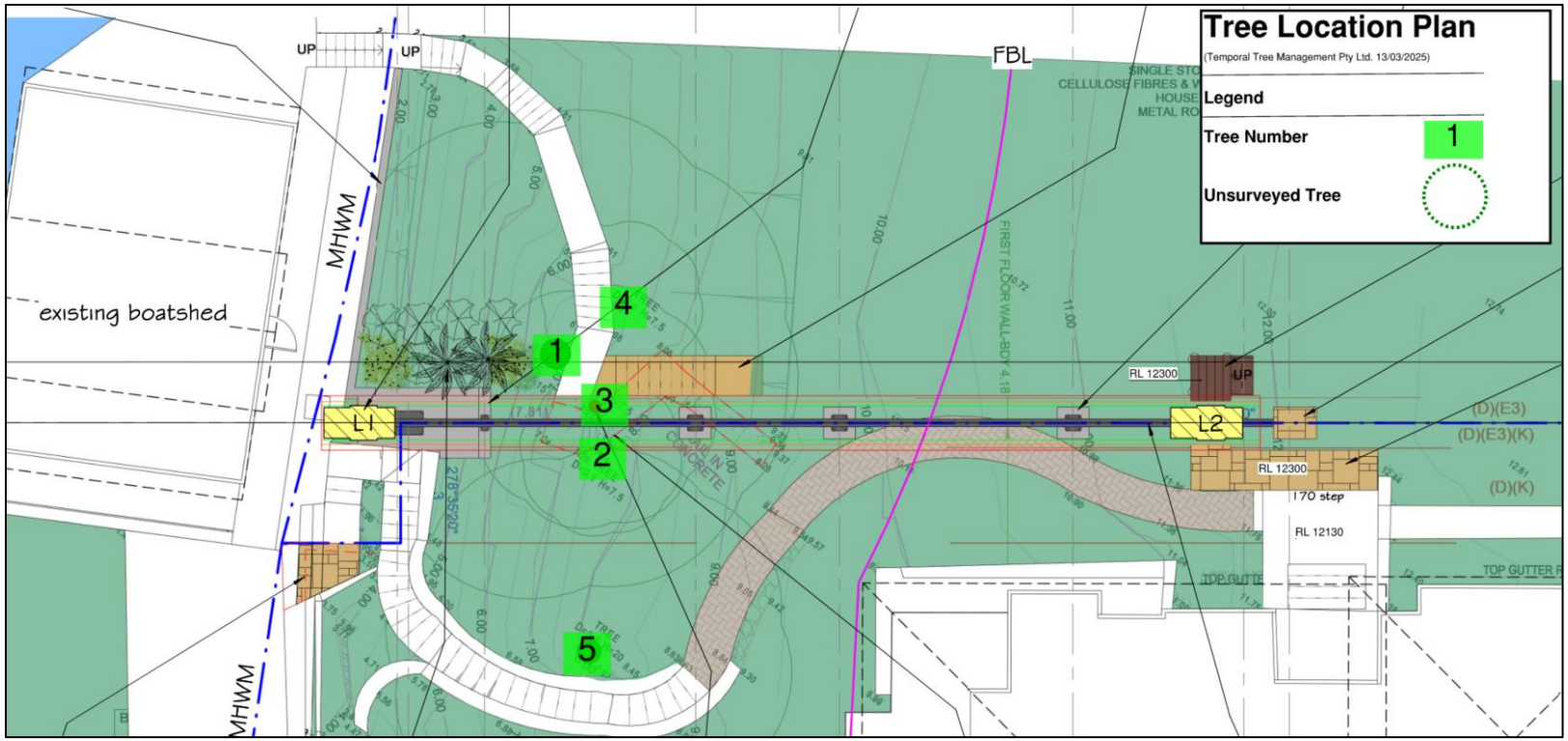


Figure 5. Rail Plan, prepared by *Peter Downes Designs* (Reference: 2417, Drawing No: 02, Drawn: 11/07/2024).

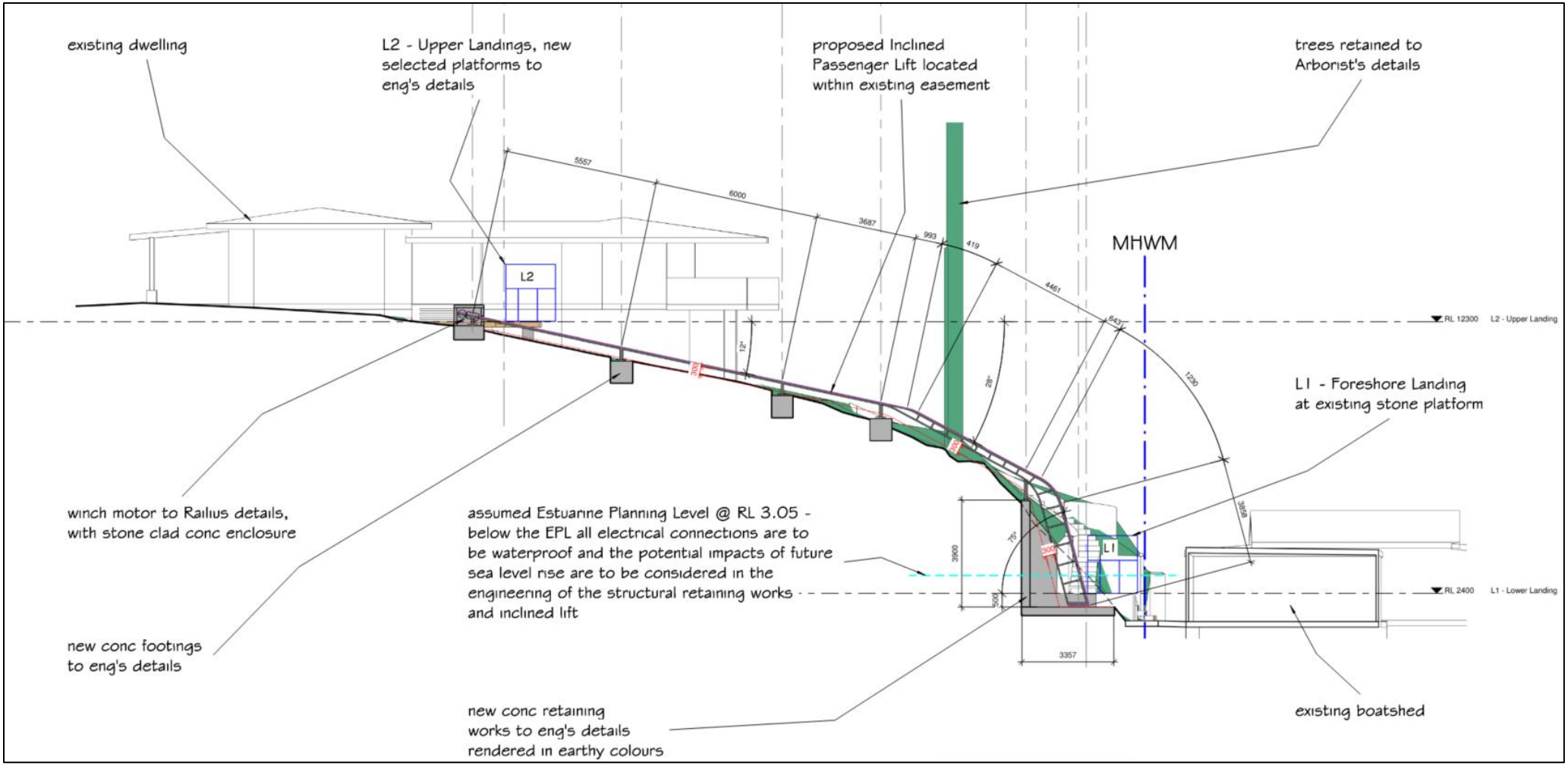


Figure 6. Section 1, prepared by *Peter Downes Designs* (Reference: 2417, Drawing No: 03, Drawn: 11/07/2024).

4. Preliminary Assessment

4.1 Assessment Methodology

A ground-based visual assessment of Trees 1-5 was undertaken by William Dunlop of *Temporal Tree Management Pty Ltd* on 04/03/2025. The data collected includes:

Ø Tree Number: Trees were numbered in order of assessment.

Ø Scientific Name:

Ø Common Name: One common is provided.

Ø Maturity: **Juvenile, Semi – mature, Mature or Over Mature**. Judgement on these four categories was determined by professional knowledge and research on the species present.

Ø Canopy Width: Diameter of canopy Estimated in **metres** as an average in metres of two directional planes (north-south and east-west).

Ø Height: Estimated in **metres**.

Ø Diameter at Breast Height (DBH): DBH was measured at 1.4 metres height in **centimetres** using a diameter tape at 1.4 metres height.

Ø Diameter at Root Flare (DRF): DRF was measured in **centimetres** using a diameter tape at the height of the trees' root flare and is described in centimetres.

Ø Health: **Dead, Poor, Fair, Good or Excellent**. Professional experience along with the visual vitality index established by Johnston et al. (2012) was used to underpin this category **(Appendix B).**

Ø Structure: **Failed, Very Poor, Poor, Fair, Good or Excellent**. Professional experience along with Visual Tree Assessment methodology established by Mattheck and Breloar (1994) was used.

Ø Useful Life Expectancy (ULE): This estimate provides an important estimate of a tree's remaining safe life span within a landscape (Barrell 1996). Estimates are based on species knowledge and an individual's structure, health and position within the landscape. ULE estimate categories used were: **Long** (>40 years), **Medium** (between 15 and 40 years), **Short** (between 5 and 15 years), **Negligible** (Less than 5 years) or **Dead** (less than 12 months). A framework for the ULE determination methodology is provided in **Appendix E** (Barrell 1996).

Ø Landscape Value: **Significant** (1), **Very High** (2), **High** (3), **Moderate** (4), **Low** (5), **Very Low** (6), **Insignificant** (7). These categories account for each tree's size, ecological significance as a food or habitat resource, structural integrity, visual prominence within the landscape and any additional heritage or protection controls that may be relevant to it. A framework for the Landscape Significance determination methodology is provided in **Appendix D** (Morton 2011).

Ø Retention Value: **High, Moderate, Low and Very Low**. ULE and Landscape Significance categories were used for each tree to determine their retention value (Figure 5). The retention and protection of trees determined to be of **High** retention value should be prioritised for any proposed development within the subject site. Trees determined to be of **Moderate** retention value should be retained and protected if feasible. The retention of trees determined to be of **Low** retention value should not obstruct any proposed development within the subject site. Tree determined to be of **Very Low** retention value should be removed as part of any development within the site. A framework and Matrix for the Retention Value priorities is provided in **Appendix C** (Morton 2011).

Ø Tree Protection Zone Radius (R_{TPZ}): This measure provides the principle means of protecting trees on construction sites. A TPZ radius (R_{TPZ}) may be calculated using the equation from the Australian Standard for the Protection of Trees on Development Sites (AS 4970 2009):

$$\mathbf{R_{(TPZ)} = DBH \times 12.}$$

A minimum R_{TPZ} measure of 2 metres and maximum R_{TPZ} measure of 15 metres were calculated for this assessment as per Section 3 of AS4970 (2009).

Ø Structural Root Zone Radius (R_{SRZ}): This measure provides an indication of the portion of a tree's root plate that is considered fundamentally important for the maintenance of basal anchorage. The volume of root plate estimated within an SRZ is not related to the physiological viability of a tree (Mattheck and Breloer 1994). It is important to note that SRZ area is not an absolute figure. Rather, it is an estimate based on a line of best fit drawn from research relating to observation of tree failures within forested areas. The SRZ area must therefore be viewed as an approximation that may be smaller or greater in size depending on site conditions and the vitality of individual assessed trees.

No SRZ radius was calculated for assessed palm specimens as per *AS470 (2009).* An SRZ radius (R_{SRZ}) may be calculated using the equation from the *Australian Standard for the Protection of Trees on Development Sites* (AS 4970 2009) (Figure 7):

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

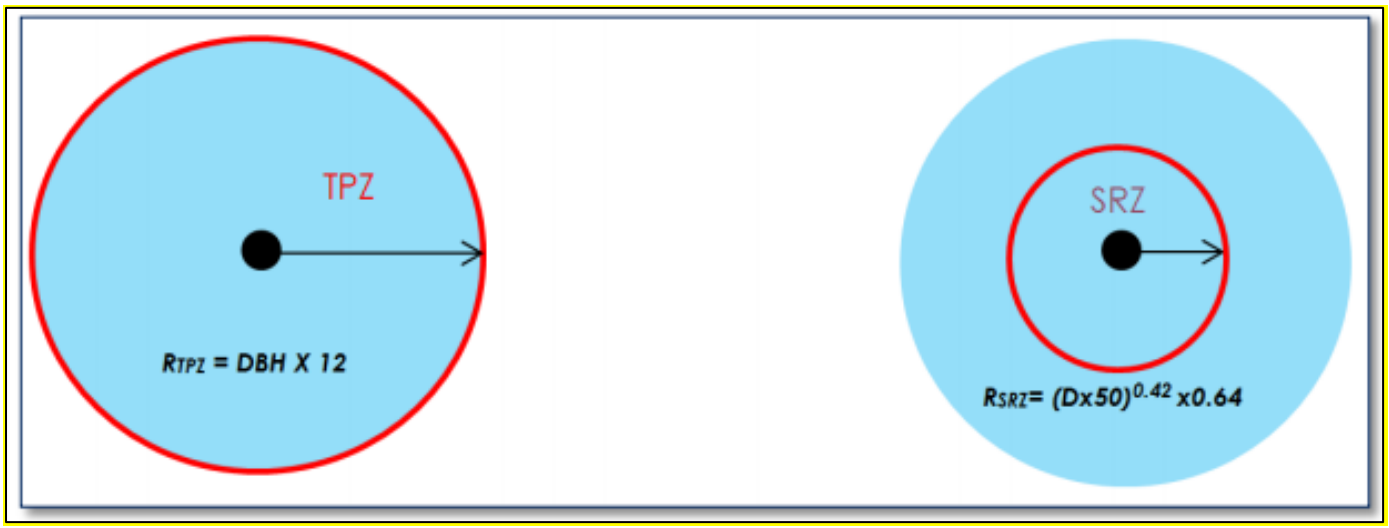


Figure 7. The tree protection zone radius (R_{TPZs}) and structural root zone radius (R_{SRZs}) were calculated as *per Section 3 of AS4970 (2009)*. TPZ and SRZ radii for Trees 1-5 are provided in Table 1 and Figure 8.

4.1 Tree Data

Table 1. Data collected on 04/03/2025 for five assessed trees.

Tree	Scientific Name	Common Name	Maturity	Height (m)	Width (m)	DBH (cm)	DRF (cm)	Health	Structure	ULE	Landscape Significance	Retention Value	R_{TPZ} (m)	R_{SRZ} (m)	Comments
1	*Eucalyptus capitellata*	Brown Stringybark	Mature	14	8	47	52	Fair	Fair	Long	Very High	High	5.6	2.5	Larger tree of indigenous species significance. Canopy with minor signs of dieback. Deadwood throughout. Positioned adjacent to existing concrete pathway in steep slope. Bulge on southern side of stem. Root growth has caused minor displacement of adjacent pathway.
2	*Stenocarpus sinuatus*	Firewheel Tree	Mature	6	4	13	14	Good	Fair	Medium	Moderate	Moderate	2.0	1.4	Smaller tree in suppressed position. Canopy shows signs of high vitality. Tree suitably structured.
3	*Stenocarpus sinuatus*	Firewheel Tree	Mature	6	4	16	27	Good	Poor	Short	Moderate	Low	2.0	1.9	Small tree in suppressed position. Poorly positioned adjacent to existing stairs. Stem trifurcates at ground level. Advanced decay in lower stems.
4	*Stenocarpus sinuatus*	Firewheel Tree	Mature	6	4	18	23	Good	Poor	Short	Moderate	Low	2.2	1.8	Small tree in suppressed position. Tree poorly positioned in steep slope adjacent to existing stairway. Advanced decay in lower stem.
5	*Eucalyptus capitellata*	Brown Stringybark	Mature	14	7	53	56	Good	Good	Long	Very High	High	6.4	2.6	Larger tree of indigenous species significance observed to be in mostly good condition. Canopy with a small amount of deadwood. No major structural concerns.

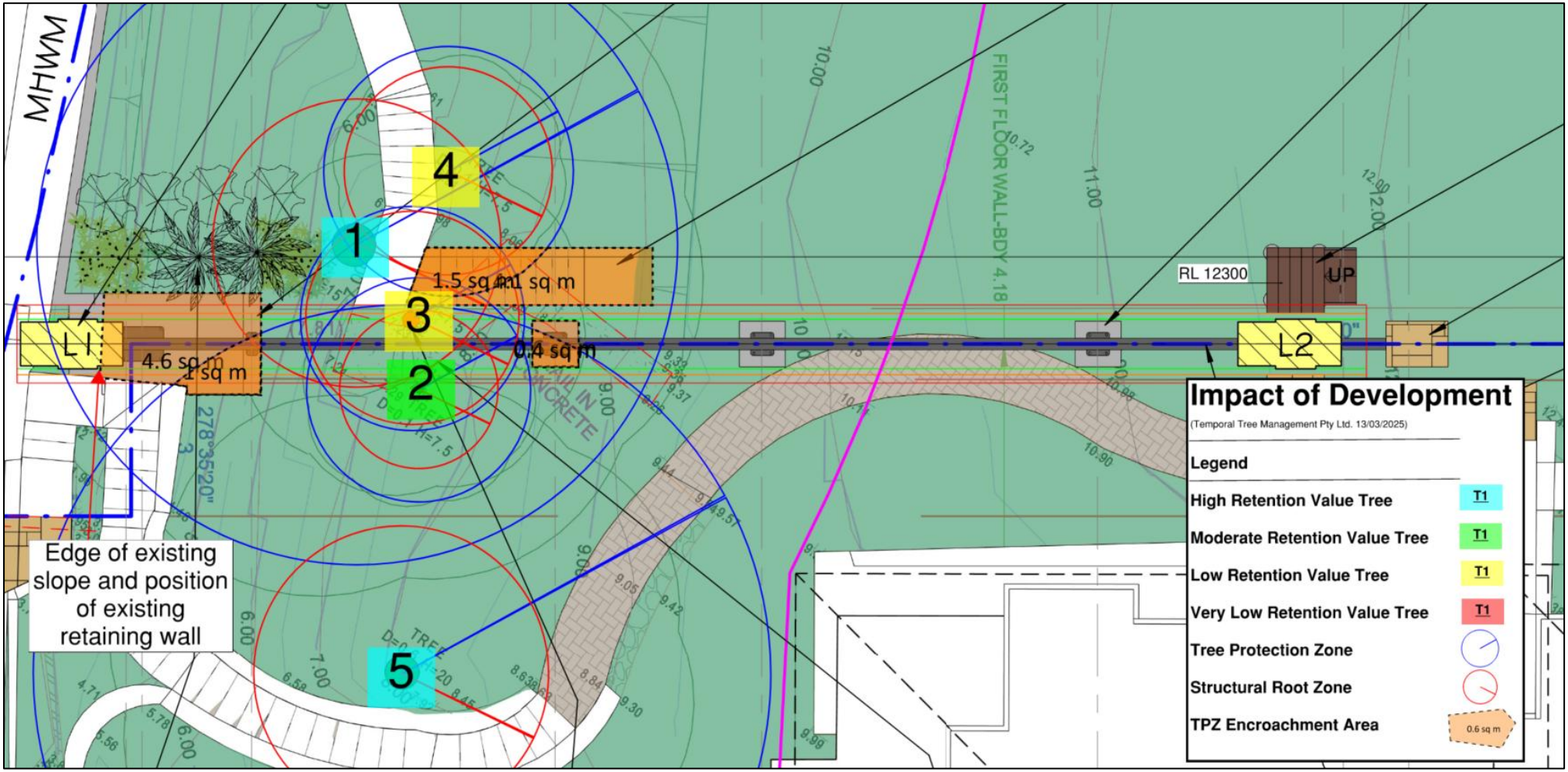


Figure 8. Retention values, TPZs, SRZs and Encroachments for five trees positioned within the subject site. Rail Plan, prepared by *Peter Downes Designs* (Reference: 2417, Drawing No: 02, Drawn: 11/07/2024). Annotated by Temporal Tree Management Pty Ltd (13/03/2025).

5. Tree Retention Values

Table 2. Summarised retention value data for five trees assessed on 04/03/2025 within the subject site.

Retention Values Determined for Five Assessed Trees			
Very Low	Low	Moderate	High
N/A	Trees 3 and 4	Tree 2	Trees 1 and 5

Of the five assessed trees, two were determined to be of High Retention Value within the surrounding landscape, one was determined to be of Moderate Retention Value, two was determined to be of Low Retention Value, and none were of Very Low Retention Value.

Trees 1 and 5 were determined to be of High Retention Value within the surrounding landscape (Table 1). These two specimens are canopy trees of indigenous species that comprise the *Pittwater Wagstaffe Spotted Gum Forest.* Their larger size and species significance within the surrounding area underpinned the Very High Landscape Value determined for the majority of them. Their mostly good condition underpinned the Long ULE estimates determined for them. The retention of Trees 1 and 5 must be prioritised as part of the proposed development within the subject site.

Tree 2 was determined to be of Moderate Retention Value. This smaller tree is of a non-indigenous native species that is likely to have been planted. Tree 2 was determined to be of Moderate Landscape Significance due to its smaller size. Its suppressed positioned underpinned the Medium Landscape Significance determined for this tree. Tree 2 should be retained as part of a proposed development within this site if feasible.

Trees 3 and 4 were determined to be of Low Retention Value within the surrounding landscape. Both trees were determined to be of Moderate Landscape Significance due to their native species value. However, observation of advanced decay at the base of both trees' stems underpinned the Short ULE estimates and Low Retention Value ratings determined for them. The retention of this tree should not obstruct or require alteration of the proposed development. Trees 3 and 4 are suitable for removal if required as part of the proposed development.

6. Tree Protection Zones (TPZs)

6.1. TPZ Encroachments

A TPZ encroachment is the proportional area of a tree's TPZ that will be absorbed, disturbed or exposed as part of a development. As defined in *Sections 3.3.2 and 3.3.3 of AS4970 (2009),* minor TPZ encroachments absorb less than 10% of a trees' TPZ area while major TPZ encroachments exceed 10%.

Minor encroachments of less than 10% of the total TPZ area may occur without the site presence of the Project Arborist providing there is an equal compensation of protected area elsewhere adjacent to the TPZ. The potential impact on the viability of tree with a TPZ encroachment that is less than 10% is unlikely to impact the viability of a tree and is defined as Low in this assessment.

Major encroachments of more than 10% of the total TPZ area may occur if it can be demonstrated that the impact of the encroachment is mitigated or won't impact the viability of the affected tree. The impact of a major TPZ encroachment that is between 10-20% is defined as Moderate in this

assessment and is generally considered to be acceptable providing the tree's condition is shown to be Good/Fair, it can be shown that the affected tree will remain viable. The impact on the viability of tree

with a major TPZ encroachment that is between 20-30% is defined as High in this assessment. The impact of a major encroachment within this range may compromise the viability of an impacted tree. Retention under a High impact major TPZ encroachment must demonstrate mitigation of impact from existing infrastructure and / or demonstrate it by through a Root Mapping Assessment to show that the affected tree will remain viable. Modification of the design plan may be required to mitigate the impact of the encroaching structure. There must also be an equal compensation of protected area elsewhere adjacent to the TPZ.

The impact on the viability of tree with a major TPZ encroachment that is greater than 30% is defined as Severe in this assessment. Major encroachments of this magnitude are likely to impact a tree's health and may impact the structural integrity of their root plate. Retention under such encroachments is unacceptable unless there will be significant mitigation of impact from existing infrastructure and / or it can be shown through a Root Mapping Assessment and significant mitigation of the impact. Modification of the design plan may be required to mitigate the impact of the

encroaching structure. There must also be an equal compensation of protected area elsewhere adjacent to the TPZ.

Instances where a tree's stem is positioned within the footprint of a proposed structure is in this assessment determined to be a 100% TPZ encroachment that will have a Severe impact. Existing structural features that will remain unchanged were not included in the encroachments calculated for the seven assessed trees.

6.2. Impact of Proposed Works on Assessed Trees

Table 3. Summarized impacts of TPZ encroachments associated with the proposed development calculated for Trees 1-5.

Tree	SRZ Encroachment	Encroachment (%)	Impact	Mitigation	Proposed Management
1	Yes	9	Low	Exising southern edge of slope and retaining wall will mitigate the impact of excavation for the proposed southern landing and associated retaining wall. Small, pier foundation of proposed stairway on northern side of pathway will significantly mitigate the impact of this feature. The undisturbed area adjacent to the western portion of this tree's TPZ will suitably compensate for the encroached area.	**Retain**. Install trunk protection measures in accorance with Section 4.5.2 of AS4970 (2009). All excavation within the TPZ of Tree 1 must be undertaken using hand tools only and under the supervision of the Project Arborist. Position of Footing C3 for rail must be dynamic to avoid damage or disturbance to any encountered major roots.
2	N/A	0	N/A	Tree will not be directly impacted by proposed works.	**Retain**. Undertake Root Mapping Assessment compliant with Section 3.3.4 of AS4970 (2009). Findings of Root Mapping Assessment must be used to guide suitability of retention of tree and / or required desing amendment(s).
3	N/A	0	N/A	Tree will not be directly impacted by proposed excavation. However, stem will be positioned 300mm from the proposed rail. Installation and function of the proposed inclinator will therefor require the removal of this small tree.	**Remove**. Tree will require removal to facilitate development.
4	Yes	10	Moderate	Tree will sustain a major encroachment during construction of the proposed stairway. Small, pier foundation of proposed stairway on will significantly mitigate the impact of this feature.	**Retain**. Install trunk protection measures in accorance with Section 4.5.2 of AS4970 (2009). All excavation within the TPZ of Tree 1 must be undertaken using hand tools only.
5	No	1	Low	Tree will sustain a minor encroachment within western portion of TPZ during excavation for the southern landing and Rail Footing C3. Exising southern edge of slope and retaining wall will mitigate the impact of excavation for the proposed southern landing and associated retaining wall. The undisturbed area adjacent to the western portion of this tree's TPZ will suitably compensate for the encroached area.	**Retain**. Install trunk protection measures in accorance with Section 4.5.2 of AS4970 (2009). All excavation within the TPZ of Tree 5 must be undertaken using hand tools only and under the supervision of the Project Arborist. Position of Footing C3 for rail must be dynamic to avoid damage or disturbance to any encountered major roots.

Figure 9. Existing slope, retaining wall and stairway will mitigate the impact of excavation required for the southern landing on Trees 1 and 5

Figure 10. Observation of advanced decay at the base of trees 3 and 4 underpinned the Low Retention Value ratings determined for them.

7. Tree Protection / Removal Plan

7.1. Proposed Tree Removal / Pruning

One assessed tree (Tree 3) will require removal to facilitate the installation and function of the proposed inclinator. This tree's stem is positioned 300mm from the proposed rail. Tree 3 was determined to be of Low retention within the subject site. The removal of this tree is therefore supported.

Tree 3 falls under the protection controls outlined in *Section B – General Controls, Chapter 4 – Controls Relating to the Natural Environment, Part 22 – Preservation of Trees and Bushland Vegetation* of the *Pittwater DCP (2021)* (Northern Beaches Council 2025). Consent must be obtained from Northern Beaches Council prior to commencement of any recommended tree removal works for Tree 3.

If approved, proposed tree removal works should be undertaken by a suitably qualified arborist (minimum AQF Level 3) and in compliance with the *Work Safe Guide to Managing Risks of Tree Trimming and Removal Work (2016).* No hollows or stick nests were observed within the canopy of this tree.

Tree 3 should be suitably replaced as part of the proposed development. One replacement tree should be selected of a suitable indigenous species that is capable of reaching a mature height equal to or greater than that of Tree 2. The replacement specimen must be positioned within the subject site to ensure its ULE is entirely fulfilled. The replacement trees must come in a 45L pot and in compliance with *the Australian Standard for Tree Stock for Landscape Use (AS 2303 2015).*

7.2. Tree Protection Measures

Fenced protection zones must be established where possible to delineate construction activities from the TPZs and SRZs of retained trees. Fenced protection zones must be enclosed by 1.8 metre steel fencing that is securely fixed to the ground as stated in *Section 4.3 of AS4970 (2009)* (Figure 11). Shade cloth must be securely fastened to the steel fencing to reduce transport of dust and debris into tree protection areas. Plywood may be used as an alternative if steel fencing cannot be suitably installed. Signage stating the purpose of these exclusion zones should be fixed to the fencing so that it is visible from all points within the site. Coarse-grained wood-chip mulch may be required within a fenced protection zone if specified. Bracing is permissible within the fenced protection zone providing supports avoid any damage to surface roots.

As per *Section 4.2 of AS4970 (2009),* the following activities are not permitted inside delineated protection zones:

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

Once installed, fenced tree protection zones must remain undisturbed for the duration of proposed development works. No services either temporary or permanent are to be located within a specified fenced protection zone. If services are to be located within a Tree Protection Zone, special details will need to be provided by the Project Arborist for tree protection regarding the location of services.

Figure 11. Protection fencing should be erected around the specified perimeter of TPZs in accordance with Section 4.3 of *AS4970 (2009).* Figure 11 a. depicts correctly installed steel or plywood fence panelling (1 and 2) with mulch inside the protection area (3). Figure 11 b. shows protection fencing signage.

Where specified, stem protection measures must be installed on retained trees in situations where the establishment of protection fencing is not feasible. Stem protection measures compliant with *Section 4.5.2 of AS4970 (2009)* may be installed using hessian or carpet underlay padding wrapped around the trees' stems and fixed in place using duct tape. Timber battens (20mm x 100mm) must then be spaced no greater than 150 mm around the stems and fixed to one another using steel strapping. Timber battens must not be fixed directly to the trees' stems (Figure 12).

Temporary access within a fenced protection zone may only occur under the supervision of the Project Arborist. The installation of ground protection measures compliant with *Section 4.5.3 of AS4970 (2009*) is required if any vehicles or machinery is required to temporarily access a specified fenced protection zone. In such cases, a geotextile membrane must be installed over the specified ground protection area. Coarse-grained wood-chip mulch must be installed to a depth of no less than

70mm and no more than 100 mm over the geotextile membrane. Timber rumble boards or heavy vehicle protection plates/mats must then be installed over the mulch (Figure 12). Ground protection measures must remain in place for the entire duration of required vehicle or machinery access within a fenced protection zone. Protection fencing must be reinstalled to its original shape immediately after the completion of required works within the fenced protection zone.

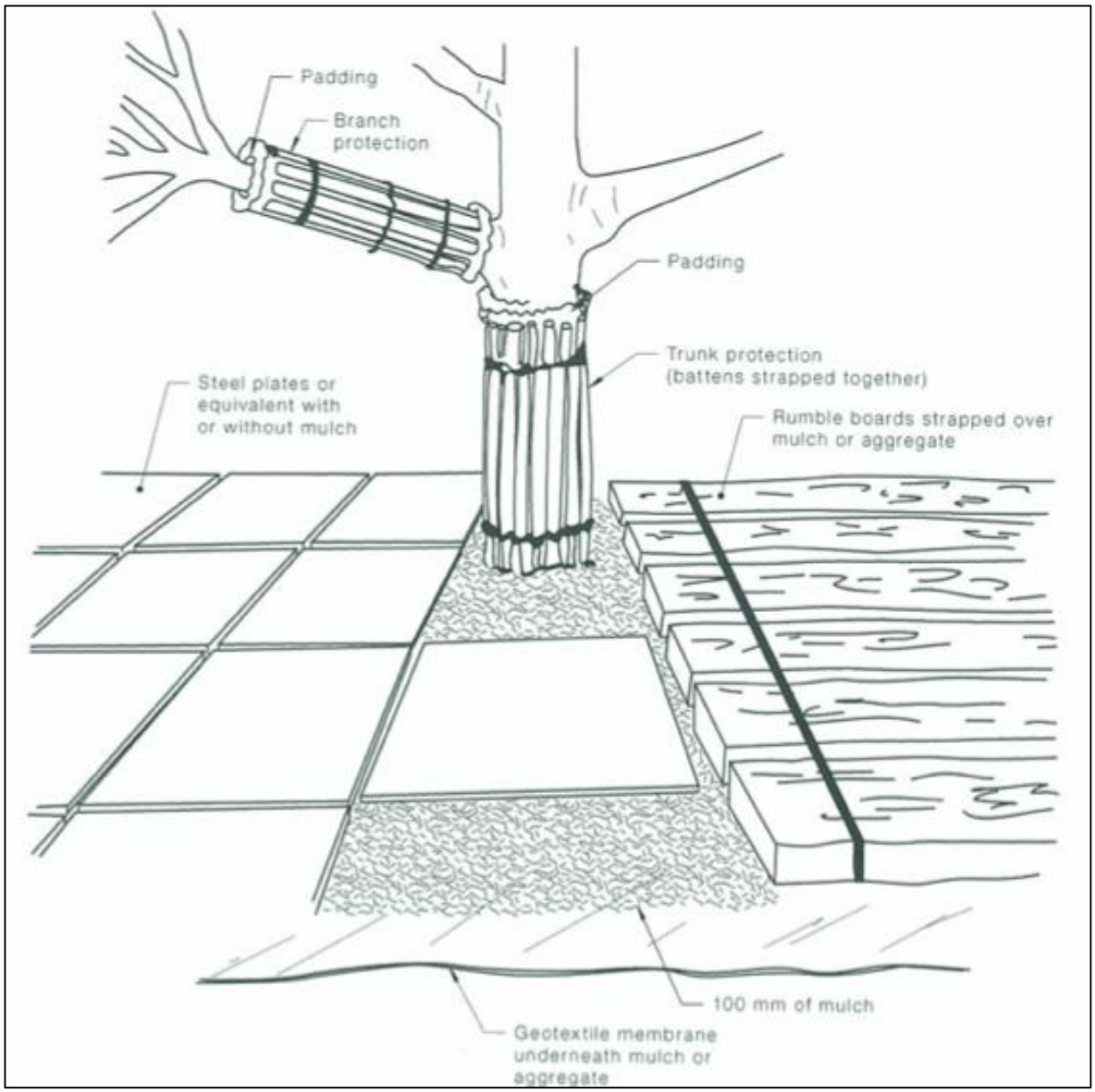


Figure 12. Stem and ground protection measures specified in Section 4.5.3 of *AS4970 (2009)* for temporary access within a fenced protection zone. Steel plates or rumble boards are shown to be suitable for ground protection over mulch and geotextile fabric.

7.3. Tree Protection Plan

Trees 1, 2, 4 and 5 are proposed for retention as part of the proposed development. The impact of the minor TPPZ encroachments sustained by Trees 1, 4 and 5 were determined to be acceptable in Section 6.3 of this report. Tree 2 will not be directly impacted under the proposed design. The following protection measures must be in place at the specified stages of construction to ensure the viability of the nine retained trees is not impacted (Figure 13):

7.3.1. Prior to Commencement of Practical Works

- A Project Arborist must be engaged prior to the commencement of practical works and remain in place for the duration of this development to ensure ongoing compliance with the requirements outlined in Section 8 of this report.
- Protection fencing compliant with *Section 4.3 of AS4970 (2009)* will not be feasible within the inclinator corridor due to the steep slope and exposed bedrock.
- Trunk protection measures compliant with *Section 4.5.2 of AS4970 (2009)* must therefore be installed on Trees 1, 2, 4 and 5 to ensure they are suitably protected (Figure 12, Figure 13 and Figure 14).
- TPZ signage compliant with *Section 4.4 of AS4970 (2009)* must be installed on the stem protection measures for these four trees (Figure 11).

7.3.2. During Construction Works

- Trunk protection measures must be installed prior to the commencement of practical works and remain in place for the duration of the development.
- Excavation required for <u>all</u> portions of the retaining wall for the southern landing, pier and footing holes and landscape works that are within the R_{TPZs} of retained trees <u>must</u> be undertaken using hand tools only.
- Hand excavation of the portions of the retaining wall for the southern landing that are within the R_{TPZs} of Trees 1 and 5 and for footing C3 <u>must</u> be carried out under the supervision of the Project Arborist (Figure 13).
- Hand-held mechanical tools may be used for the preparation of piers and footings on exposed bedrock within the R_{TPZs} of retained trees.
- There must be no major root (diameter of 40mm or greater) pruning, damage or disturbance during the hand excavation within the R_{TPZs} of retained trees.

- The edge of the excavated slope for the new retaining wall, pier holes and footing holes must be inspected and certified by the Project Arborist prior to construction of the new piers and rail footings. Pier locations must be altered along the rail pathway where necessary to avoid any encountered major roots.
- Any additional excavation required for service installation within a retained tree's R_{TPZ} must be assessed and certified by the Project Arborist.

7.3.3. Post Construction - Landscaping

- Where required, excavation for landscape planting that is within a retained tree's TPZ must be undertaken using hand tools only. Existing soil grades should be maintained where possible.

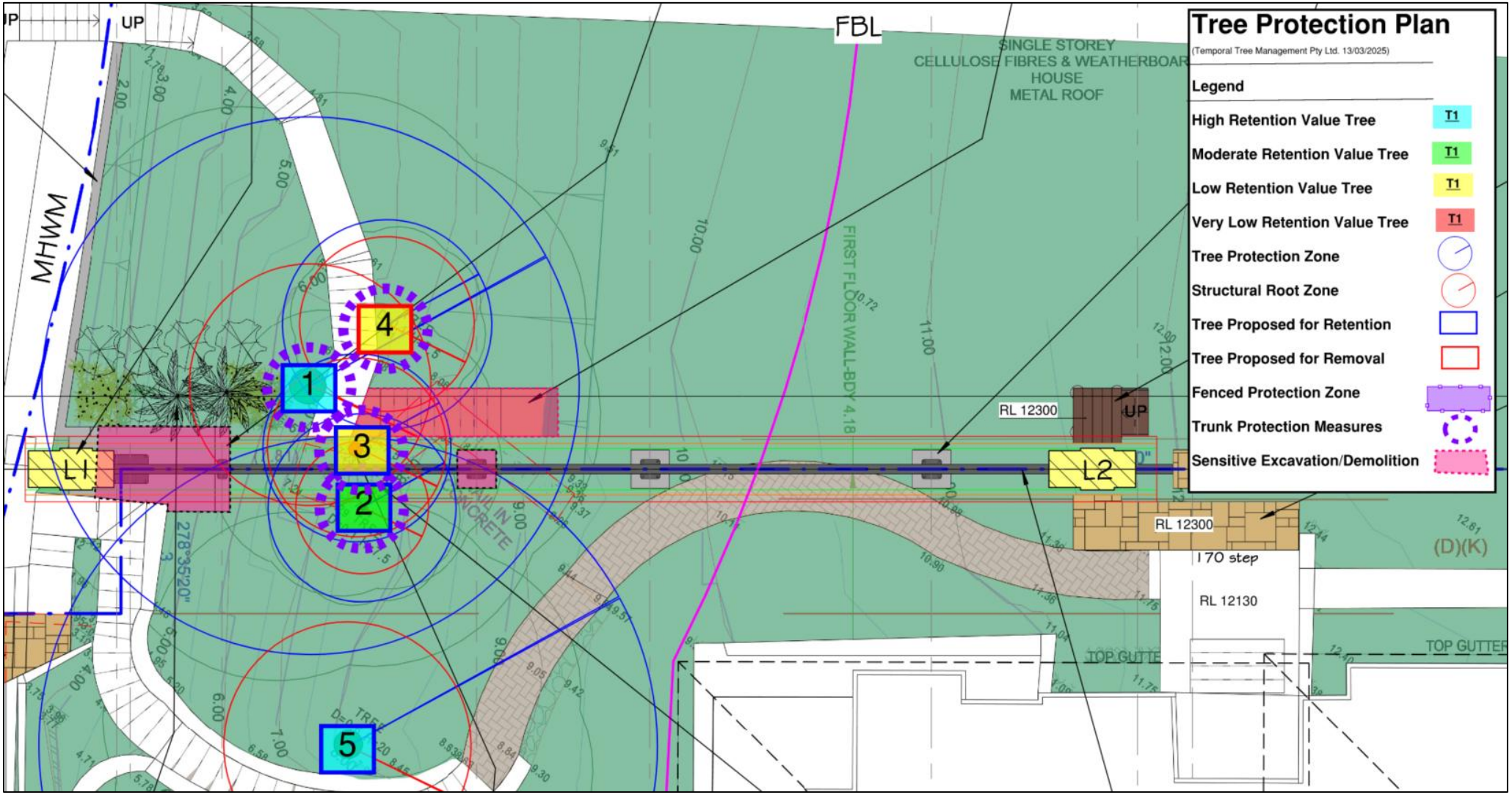


Figure 13. Tree Protection / Removal Plan for proposed development. Rail Plan, prepared by *Peter Downes Designs* (Reference: 2417, Drawing No: 02, Drawn: 11/07/2024). Annotated by Temporal Tree Management Pty Ltd (13/03/2025).

Figure 13. Trunk protection measures correctly installed in compliance with Sections 4.5.2 of AS4970 (2009).

7.4. Certifications

To ensure the proposed development meets the objectives of the Tree Removal/Protection Plan, monitoring and certification process will be undertaken at the following hold points in line with *AS4970 (2009).*

· Installation of Tree Protection Measures – Inspection and certification by the Project Arborist of the trunk protection for Trees 1, 2, 4 and 5 as specified in the Tree Protection Plan (Section 7.3 of this report) (Figure 13). This hold point must be undertaken prior to the commencement of practical works.

· Certification of Supervised Hand Excavation – Supervision by the Project Arborist of hand excavation required for the southern landing, footing location C3 and piers for the proposed stairway (Figure 13). This hold point must certify that no major tree roots (diameter of 40mm or more) are disturbed or damaged during this hand excavation.

· Inspection of Pier and Footing Holes– Inspection by the Project Arborist of pier holes. This inspection must be undertaken prior to the construction of piers / footings and must certify that no major root damage has occurred.

· Monitoring of Retained Trees– Regular inspection and certification by the Project Arborist of tree protection measures and condition of retained trees. Any required maintenance of the tree protection measures or retained trees must be undertaken by the Project Arborist.

· Final Project Arborist Inspection– Final inspection by Project Arborist and certification of compliance with the Tree Protection Plan as specified in Section 7.3 of this report. All specified protection measures outlined in Section 7.3. must remain in place until this final inspection. Suitable replacement of Tree 3 in accordance with the recommendations provided in Section 7.1 of this report should also be inspected at this final stage.

References:

Australian Standard AS 4970 (2009) Protection of trees on development sites. Standards Australia.

Barrell, J. (1996) Pre-Development Tree Assessment. Proceedings of the International Conference on Trees and Building Sites. ISA, Illinois.

Day, S. D., Watson, G., Wiseman, E. and Harris, R. (2009) Causes and consequences of deep structural roots in urban trees: from nursery production to landscape establishment. *Arboriculture and Urban Forestry.* 35(4):182-191.

Day, S. D., Wiseman, P. E., Dickinson, S. B. and Harris, J. R. (2010) Contemporary concepts of root system architecture of urban trees. *Arboriculture and Urban Forestry.* 36(4): 149-156.

Johnstone, D., Tausz, M., Moore, G. and Nicolas, M. (2012) Chlorophyll florescence of the trunk rather than leaves indicates visual vitality in *Eucalyptus saligna.* Published online via Springer; Trees.

Morton, A. (2011) Tree Retention Values Assessment Methodolgy. Accessed via: file:///C:/Users/WD/Downloads/Tree%20Management%20Technical%20Manual.pdf. (13/03/2025).

Northern Beaches Council (2025) Section B – General Controls, Chapter 4 – Controls Relating to the Natural Environment, Part 22 – Preservation of Trees and Bushland Vegetation of the Pittwater DCP (2021). Accessed via: https://www.northernbeaches.nsw.gov.au/planning-and-development/building-and-renovations/planning-controls (13/03/2025).

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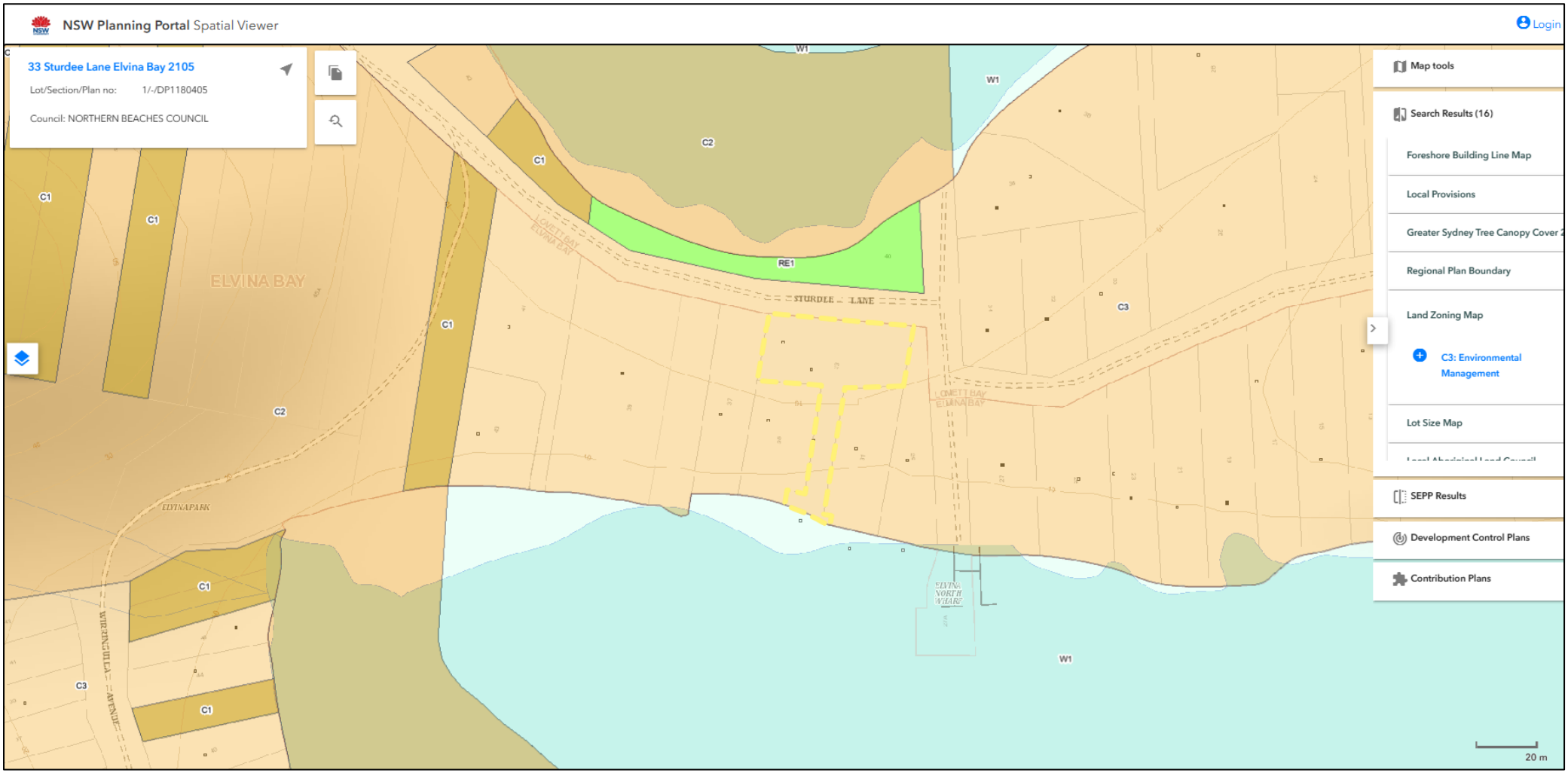
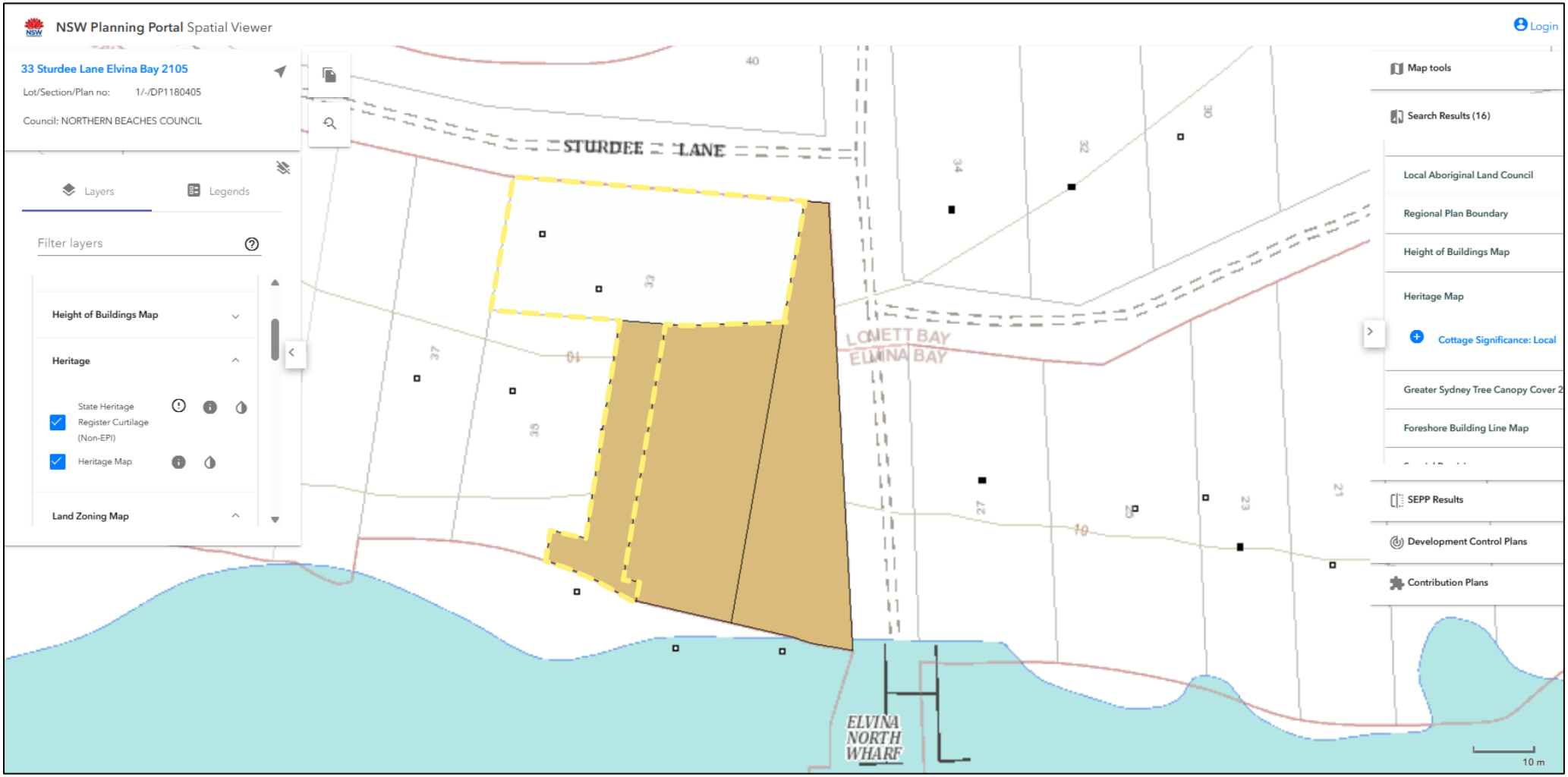
Planning New South Wales (2024). Property Portal. Accessed from https://www.planningportal.nsw.gov.au/find-a-https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address (13/03/2025).

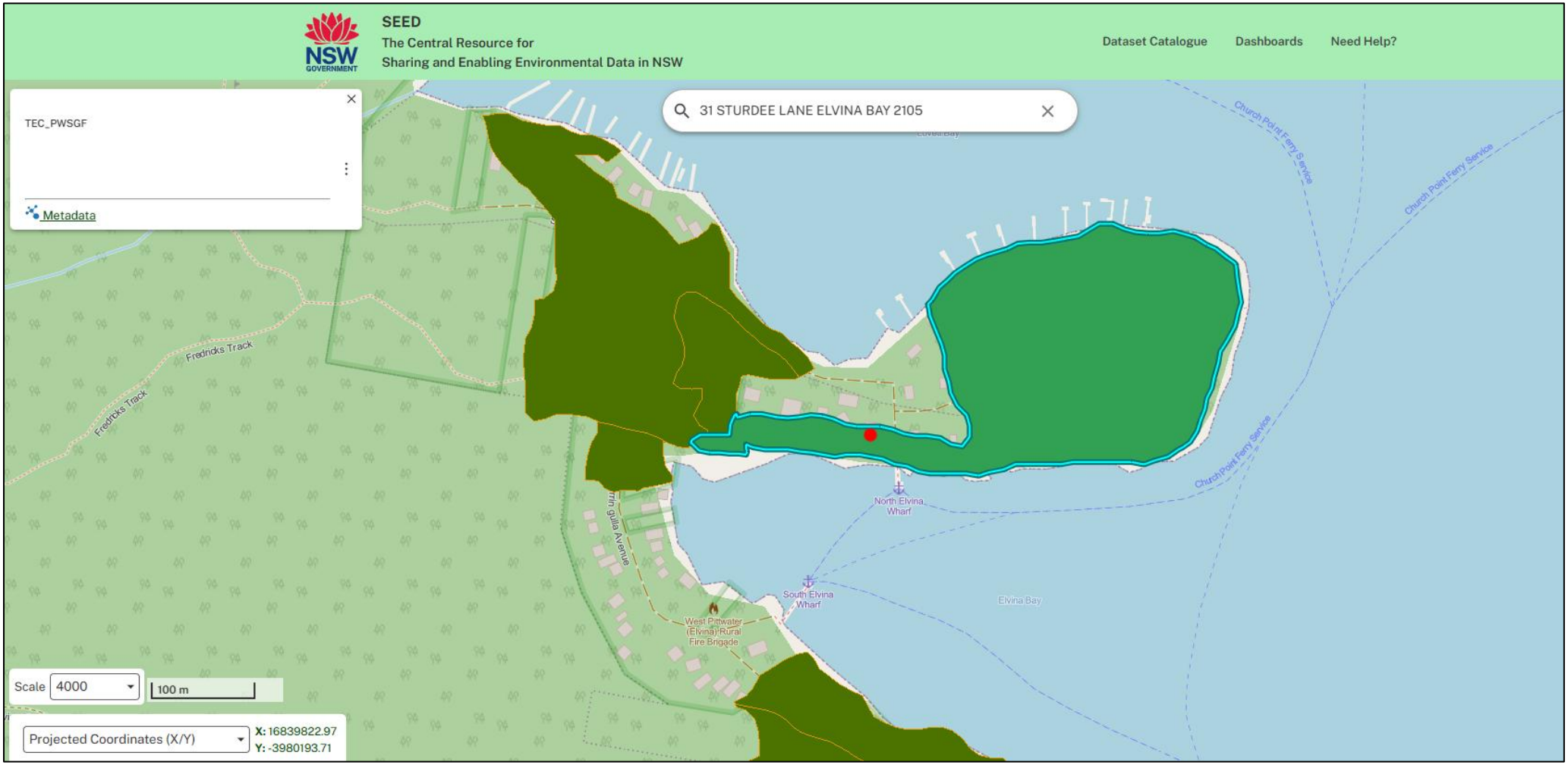
Appendix A: Site Location Maps



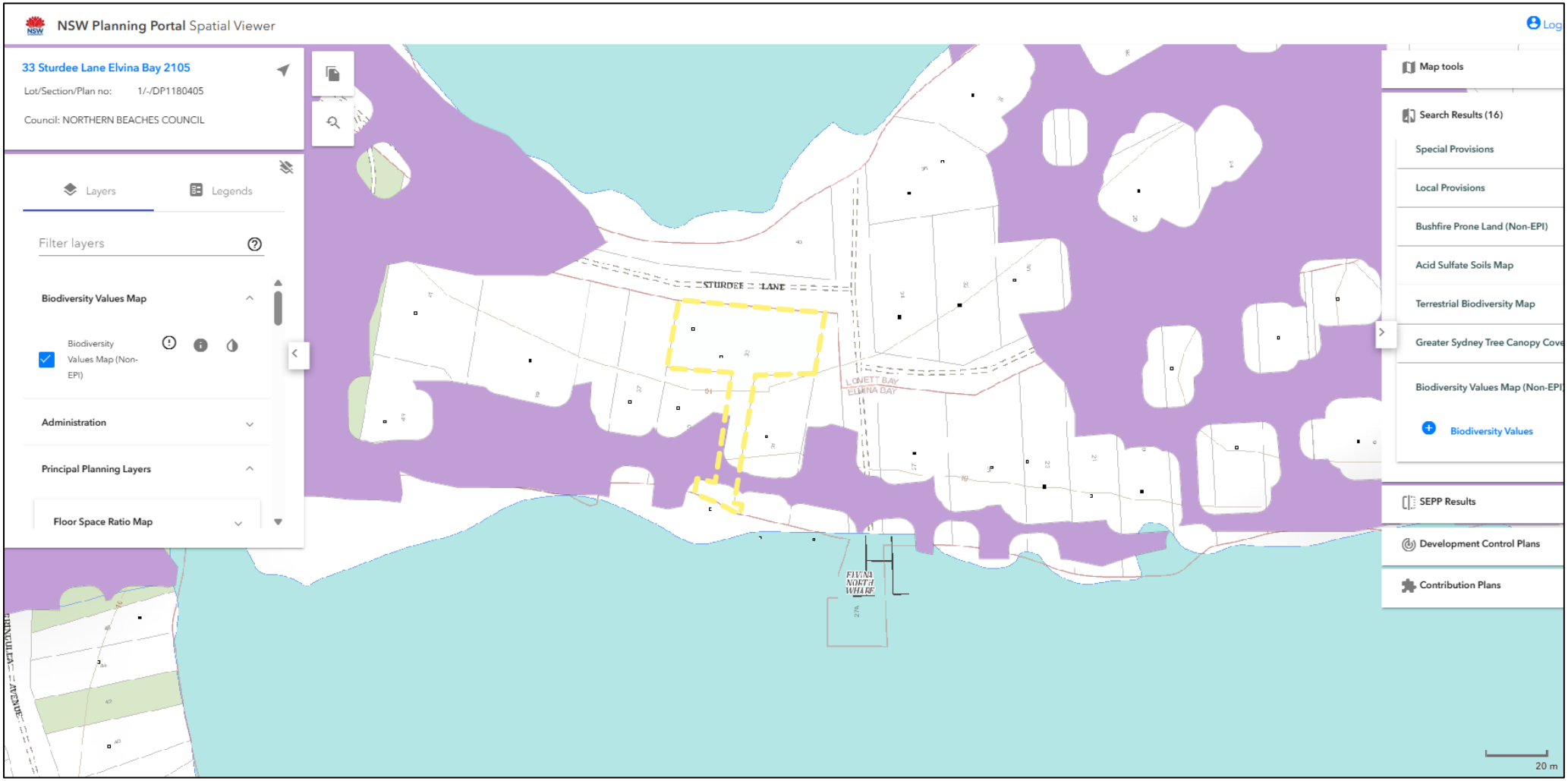
Subject site (Yellow boundary) positioned within a C4-Environmental Living zone. Image sourced from Planning NSW (2025).



Subject site (Yellow boundary) does not contain any identified Heritage Items (BROWN polygon) and is not within a Heritage Conservation zone (RED hashed polygon). Image sourced from Planning NSW (2025).

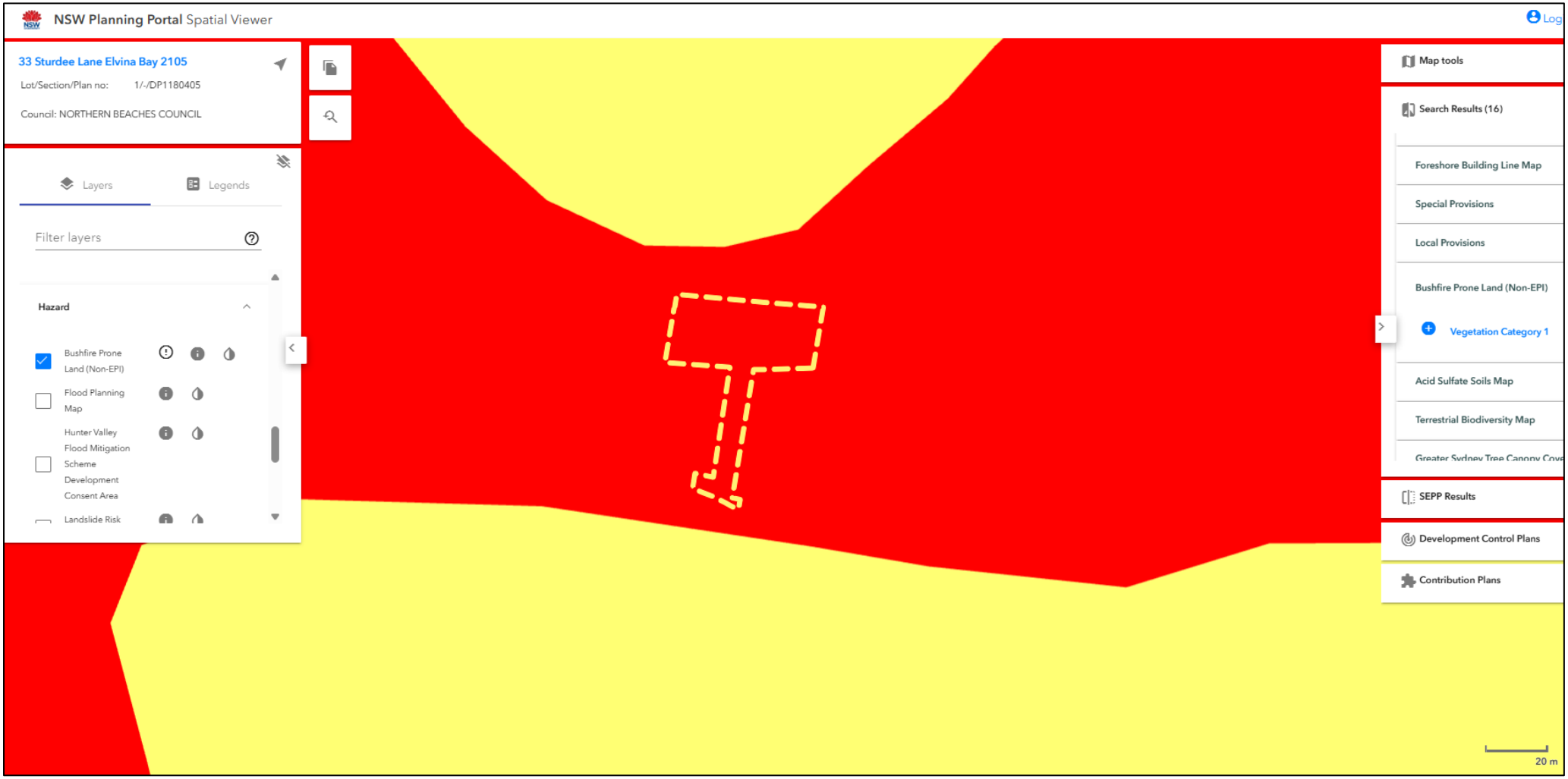


Subject site (RED dot) contains an identified TEC (annotated as a GREEN polygon). Image from NSW SEED Mapping (2025).



Subject site (boundaries annotated in Yellow) does contain Biodiversity Values Mapped Area (PURPLE polygon). Image sourced from Planning NSW (2025).

Subject site (boundaries annotated in Yellow) is positioned within Biodiversity Values land (Green polygon). Image sourced from Planning NSW (2025).

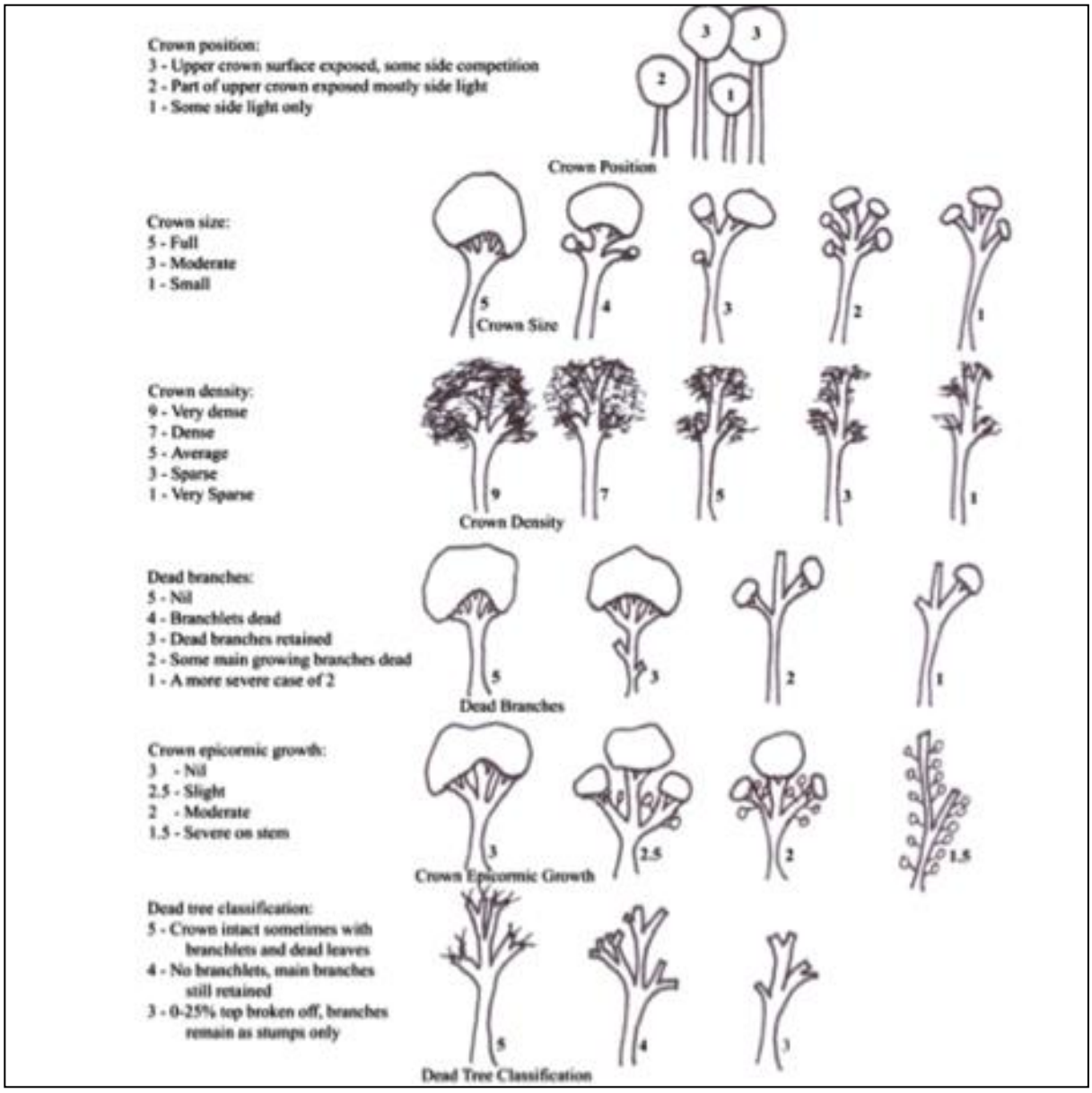


Subject site (YELLOW boundary) positioned within a Bushfire Prone Land Zone (annotated as a YELLOW and RED polygons). Image from Planning NSW (2025).

Appendix B: Vitality using Visual Vitality Index (Johnstone et al. 2012).

VVI = 3/3 (Upper crown exposed) + 5/5 (Good crown size) + 8/9 (Good crown density) + 4/5 (Very little deadwood) + 2/3 (Moderate epicormic growth) + 5/5 (Crown in tact).

=26/30.



Appendix C: Tree Retention Values Priority Requirements

From Morton (2011). Accessed via the Leichardt Council Tree Technical Manual.

Retention value	Recommended action
"High"	• These trees are 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 sections 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 these 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 C: Tree Retention Values Methodology

From Morton (2011)

	Landscape Significance Reading						
Tree Sustainability	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Greater than 40 years	**High Retention Value**						
15 to 40 years			**Moderate**				
5 to 15 years				**Low**			
Less than 5 years					**Very Low Retention Value**		
Dead or hazardous							

Appendix D: Landscape Significance Definitions

From Morton (2011). Accessed via the Leichardt Council Tree Technical Manual.

Rating	Heritage value	Ecological value	Amenity value
1. SIGNIFICANT	The subject site is listed as a Heritage Item under the Local Environment Plan (LEP) with a local, state or national level of significance or is listed as a Significant Tree.	The subject tree is scheduled as a Threatened Species as defined under the *Threatened Species Conservation Act 1995 (NSW)* or the *Environmental Protection and Biodiversity Conservation Act 1999.*	The subject tree has a very large live crown size exceeding 100m² with normal to dense foliage cover, is located in a visually prominent position in the landscape, exhibits very good form and habit typical of the species.
	The subject tree forms part of the curtilage of a Heritage Item (building /structure /artefact as defined under the LEP) and has important association with that item.	The tree is a locally indigenous species, representative of the original vegetation of the area and is known as an important food, shelter or nesting tree for endangered or threatened fauna species.	The subject tree makes a significant contribution to the amenity and visual character of the area by creating a sense of place or creating a sense of identity.
	The subject tree is a Commemorative Planting having been planted by an important historical person (s) or to commemorate an important historical event.	The subject tree is a Remnant Tree, being a tree in existence prior to development of the area.	The tree is visually prominent in view from surrounding areas, being a landmark or visible from a considerable distance.
2. VERY HIGH	The tree has a strong historical association with a Heritage Item (building/structure/artefact/garden etc) within or adjacent the property and/or exemplifies a particular era or style of landscape design associated with the original development of the site.	The tree is a locally-indigenous species, representative of the original vegetation of the area and is a dominant or associated canopy species of an Endangered Ecological Community (EEC) formerly occurring in the area occupied by the site.	The subject tree has a very large live crown size exceeding 60m²; a crown density exceeding 70% (normal-dense), is a very good representative of the species in terms of its form and branching habit or is aesthetically distinctive and makes a positive contribution to the visual character and the amenity of the area.

Rating	Heritage value	Ecological value	Amenity value
3. HIGH	The tree has a suspected historical association with a heritage item or landscape supported by anecdotal or visual evidence.	The tree is a locally-indigenous species and representative of the original vegetation of the area and the tree is located within a defined Vegetation Link / Wildlife Corridor or has known wildlife habitat value.	The tree is a good representative of the species in terms of its form and branching habit with minor deviations from normal (e.g. crown distortion/suppression) with a crown density of at least 70% (normal); the subject tree is visible from the street and/or surrounding properties and makes a positive contribution to the visual character and the amenity of the area.
4. MODERATE	The tree has no known or suspected historical association, but does not detract or diminish the value of the item and is sympathetic to the original era of planting.	The subject tree is a non-local native or exotic species that is protected under the provisions of this Development Control Plan.	The subject tree has a medium live crown size exceeding 25m²; the tree is a fair representative of the species, exhibiting moderate deviations from typical form (distortion/suppression etc) with a crown density of more than 50% (thinning to normal); and The tree is visible from surrounding properties, but is not visually prominent – view may be partially obscured by other vegetation or built forms. The tree makes a fair contribution to the visual character and amenity of the area.
5. LOW	The subject tree detracts from heritage values or diminishes the value of a Heritage Item.	The subject tree is scheduled as exempt (not protected) under the provisions of this Development Control Plan due to its species, nuisance or position relative to buildings or other structures.	The subject tree has a small live crown size of less than 25m² and can be replaced within the short term (5-10 years) with new tree planting.
6. VERY LOW	The subject tree is causing damage to a Heritage Item.	The subject tree is listed as an Environment Weed Species in the Leichhardt Local Government Area, being invasive, or is a known nuisance species.	The subject tree is not visible from surrounding properties (visibility obscured) and makes a negligible contribution or has a negative impact on the amenity and visual character of the area. The tree is a poor representative of the species, showing significant deviations from the typical form and branching habit with a crown density of less than 50% (sparse).

Appendix E: Useful Life Expectancy Definitions

From Barrell (1996). Accessed via the Leichardt Council Tree Technical Manual.

	1. Long	2. Medium	3. Short	4. Removal	5. Moved or replaced
	Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 15 - 40 years with an acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 5 - 15 years with an acceptable level of risk.	Trees that should be removed within the next 5 years	Trees which can be reliably moved or replaced.
A	Structurally sound trees located in positions that can accommodate future growth.	Trees that may only live between 15 and 40 years.	Trees that may only live between 5 and 15 more years.	Dead, dying, suppressed or declining trees through disease or inhospitable conditions.	Small trees less than 5m in height.
B	Trees that could be made suitable for retention in the long term by remedial tree care.	Trees that may live for more than 40 years but would be removed for safety or nuisance reasons.	Trees that may live for more than 15 years but would be removed for safety or nuisance reasons.	Dangerous trees through instability or recent loss of adjacent trees.	Young trees less than 15 years old but over 5m in height.
C	Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention.	Trees that may live for more than 40 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting.	Trees that may live for more than 15 years but should be removed to prevent interference with more suitable individuals or to provide space for new planting.	Damaged trees through structural defects including cavities, decay, included bark, wounds or poor form.	Trees that have been pruned to artificially control growth.
D		Trees that could be made suitable for retention in the medium term by remedial tree care.	Trees that require substantial remedial tree care and are only suitable for retention in the short term.	Damaged trees that are clearly not safe to retain.	
				Trees that may live for more than 5 years but should be	

Appendix F: Tree Data Sheets and Photographs for Trees 1-5

*********(See Over)**********

Temporal Tree Management Pty Ltd.
William Dunlop: Consulting Arborist
(M. UrbHort, Grad. Dip(Arb), B.Sc).

Brown Stringybark Primary ID #1071573

33A Sturdee Lane

Tree Details

Tree Id:	1
Scientific Name:	Eucalyptus capitellata
Common Name:	Brown Stringybark
Health:	Fair
Status:	Alive
DBH [cm]:	47
Tree Height (Estimated) [m]:	14
Risk Rating:	
Priority:	None
Canopy Width (m):	8
Useful Life Expectancy:	40+ years
Maturity:	Mature
Structure:	Fair
Retention Value:	High
Tree Work:	
Last Modified:	03/03/2025
Observations:	
Tree Comments:	Larger tree of indigenous species significance. Canopy with minor signs of dieback. Deadwood throughout. Positioned adjacent to existing concrete pathway in steep slope. Bulge on southern side of stem. Root growth has caused minor displacement of adjacent pathway.

Tree Location

Longitude:	151.278707
Latitude:	-33.637926
Address:	33A Sturdee Lane
City:	Elvina Bay

Photos Street View Map View

image.jpg
03/03/2025

Firewheel Tree Primary ID #1071574

31 Sturdee Lane

Tree Details

Tree Id:	2
Scientific Name:	Stenocarpus sinuatus
Common Name:	Firewheel Tree
Health:	Good
Status:	Alive
DBH [cm]:	13
Tree Height (Estimated) [m]:	6
Risk Rating:	
Priority:	None
Canopy Width (m):	4
Useful Life Expectancy:	9-20 years
Maturity:	Mature
Structure:	Fair
Retention Value:	Medium
Tree Work:	
Last Modified:	12/03/2025
Observations:	
Tree Comments:	Smaller tree in suppressed position. Canopy shows signs of high vitality. Tree suitably structured.

Tree Location

Longitude:	151.278755
Latitude:	-33.637923
Address:	31 Sturdee Lane
City:	Elvina Bay

Photos Street View Map View

image.jpg
03/03/2025

Firewheel Tree Primary ID #1071575

31 Sturdee Lane

Tree Details

Tree Id:	3
Scientific Name:	Stenocarpus sinuatus
Common Name:	Firewheel Tree
Health:	Good
Status:	Alive
DBH [cm]:	16.43
Tree Height (Estimated) [m]:	6
Risk Rating:	
Priority:	None
Canopy Width (m):	4
Useful Life Expectancy:	6-10 years
Maturity:	Mature
Structure:	Poor
Retention Value:	Low
Tree Work:	
Last Modified:	12/03/2025
Observations:	
Tree Comments:	Small tree in suppressed position. Poorly positioned adjacent to existing stairs. Stem trifurcates at ground level. Advanced decay in lower stems.

Tree Location

Longitude:	151.278739
Latitude:	-33.637914
Address:	31 Sturdee Lane
City:	Elvina Bay

Photos Street View Map View

image.jpg
03/03/2025

Firewheel Tree Primary ID #1071576

31 Sturdee Lane

Tree Details

Tree Id:	4
Scientific Name:	Stenocarpus sinuatus
Common Name:	Firewheel Tree
Health:	Good
Status:	Alive
DBH [cm]:	18
Tree Height (Estimated) [m]:	6
Risk Rating:	
Priority:	None
Canopy Width (m):	4
Useful Life Expectancy:	6-10 years
Maturity:	Mature
Structure:	Poor
Retention Value:	Low
Tree Work:	
Last Modified:	12/03/2025
Observations:	
Tree Comments:	Small tree in suppressed position. Tree poorly positioned in steep slope adjacent to existing stairway. Advanced decay in lower stem.

Tree Location

Longitude:	151.278712
Latitude:	-33.637907
Address:	31 Sturdee Lane
City:	Elvina Bay

Photos Street View Map View

image.jpg
03/03/2025

Brown Stringybark Primary ID #1071577

29 Sturdee Lane

Tree Details

Tree Id:	5
Scientific Name:	Eucalyptus capitellata
Common Name:	Brown Stringybark
Health:	Good
Status:	Alive
DBH [cm]:	53
Tree Height (Estimated) [m]:	14
Risk Rating:	
Priority:	None
Canopy Width (m):	7
Useful Life Expectancy:	40+ years
Maturity:	Mature
Structure:	Good
Retention Value:	High
Tree Work:	
Last Modified:	03/03/2025
Observations:	
Tree Comments:	Larger tree of indigenous species significance observed to be in mostly good condition. Canopy with a small amount of deadwood. No major structural concerns.

Tree Location

Longitude:	151.278766
Latitude:	-33.637946
Address:	29 Sturdee Lane
City:	Elvina Bay

Photos Street View Map View

image.jpg
03/03/2025