



DP NAME: DPO1 Development Plan - 28 Redbank Road, Stratford

DATE: 28 July 2025

SIGNED: Caragh Button

OFFICER TITLE: Strategic Planner

(21 pages)



Arboricultural Impact Assessment Report

Site: 28 Redbank Road, STRATFORD.

Prepared for: [REDACTED]

Prepared by: [REDACTED]

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14 February 2025: V1

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1. INTRODUCTION

1.1 BACKGROUND

1.1.1 This Arboricultural Impact Assessment Report was prepared for [REDACTED] in relation to a proposed drainage connection and a proposed crossover and associated earth works at the end of Bolden Court and at 26 Redbank Road entering off Redbank Road., STRATFORD.

1.1.2 In preparing this report, the writer is aware of and has considered the objectives of the Australian Standard *AS4970 Protection of Trees on Development Sites (2009)*.

1.1.3 The following documentation/plans were viewed in preparation of this report:

- Feature & Level Plan – Drawing Ref. 32209F1 Dated 23/09/2024 (**Appendix 2**).
- Proposed Subdivision Plan – Drawing Ref. 31982P2 Dated 23/10/2024. (**Appendix 3**).

1.2 AIMS

1.2.1 The aims of this report are to: -

- Review the supplied plans to determine the impact on any substantial trees that are protected under the **Wellington Planning Scheme**.
- Where appropriate, recommend the use of tree-sensitive construction methods to minimise the adverse impacts on the trees that are to be retained.
- Where appropriate, prepare site specific tree protection measures for the retained trees.

1.2.2 There is no warranty or guarantee, expressed or implied that problems or deficiencies regarding the subject trees or the subject site may not arise in the future. Information contained in this report covers only the subject trees assessed and reflects the condition of the subject trees at the time of inspection.

2. OUTCOMES

- Details of individual tree assessments can be found in **Appendix 1 Tree Assessment Table**.
- Details of the subject site and tree locations can be found in **Appendix 2 & 3**.
- Guidelines for Tree Protection Zone fencing can be found in **Appendix 5**.

2.1 THE PROPOSAL

- 2.1.1** The supplied plans show it is proposed for the construction of a new crossover and associated earth works off Redbank Road to access 28 Redbank Road as well as construction works for the installation of drainage services at the end of Bolden Street. (Refer **Appendix 2 & 3**).

2.2 THE TREES

- 2.2.1** An assessment of substantial trees (a substantial tree is defined as a tree that is greater than 3m in height) within the subject site that may be directly impacted on by the proposed crossover and drainage trenching works was undertaken on the 10th of February 2025. Refer **Appendix 1 Tree Data Table** in this report.
- 2.2.2** A total of **fifteen (15)** individual trees have been assessed. **Seven (7)** trees are within Road Reserve of Bolden Court and **eight (8)** trees are within the Road Reserve along Redbank Road.
- 2.2.3** All fifteen (15) trees are Council owned trees.
- 2.2.4** A total of 1 tree has been attributed a **Low Arboricultural Retention Value** and it is **Tree 9**.
- 2.2.5** A total of 4 trees have been attributed a **Moderate Arboricultural Retention Value** and they are **Trees 1, 8, 11 & 15**.
- 2.2.6** A total of 3 trees have been attributed a **High Arboricultural Retention Value** and they are **Trees 2, 3, 4, 5, 6, 7, 10, 12, 13 & 14**.

2.3 TREE PHOTOS



Figure 1: Showing Tree Group 1.



Figure 2: Showing Trees 2, 3 & 4.

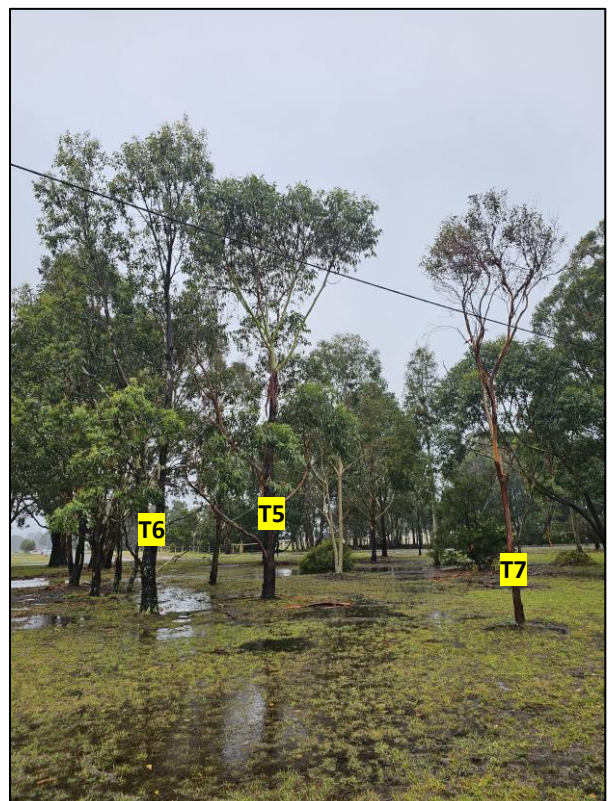


Figure 3: Showing Trees 5, 6 & 7.



Figure 4: Showing Trees 8, 9, 10 & 11.

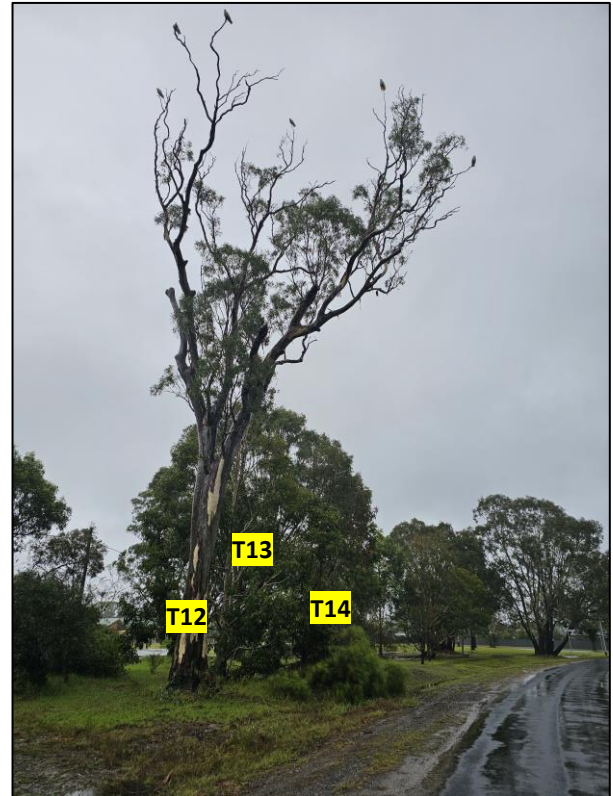


Figure 5: Showing Trees 12, 13 & 14.



Figure 6: Showing Tree 15.

3. CONSTRUCTION IMPACT ASSESSMENT

3.1 TREES PROPOSED TO BE REMOVED

3.1.1 Trees 8 & 9.

3.1.2 Trees 8 & 9 will need to be removed as they will be detrimentally impacted on by the proposed crossover excavation works which crosses through their relevant SRZ (Refer Figure 7).

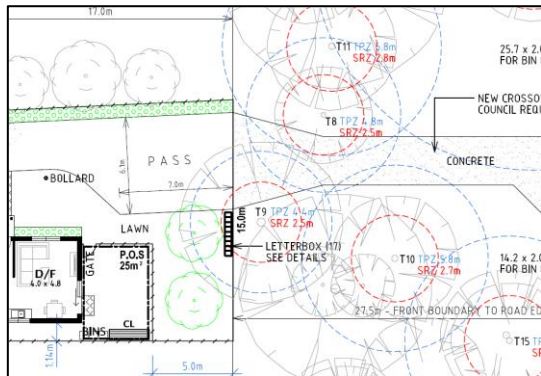


Figure 7: Showing crossover incursion of Trees 8 & 9.

3.2 TREES TO BE RETAINED.

3.2.1 Trees to be retained with no direct impact from any proposed construction works.

Trees 3, 4, 5, 6, 7, 13, 14, & 15.

3.2.2 Trees with a Minor (10% or less TPZ encroachment).

Trees 1, 2, 10, 11 & 12.

- Tree 1 – 0.0%.

The plans are showing the drainage trench is to be bored under the **Tree Group 1** and showing the entry and exit points will be outside of the 2.2m TPZ radius at a depth of greater than 800mm. **Therefore, there will be no direct impact on this group of trees.**

- Tree 2 – 0.5%.

The plans are showing the drainage trench is to be bored under the 12.5m TPZ radius of **Tree 2** and not under or within the SRZ. The plan is showing there is proposed to be two (2) pits for access to the connection points (which will need to be excavated within the TPZ although not within the SRZ). The proposed pits are to be no greater than 1.0m square in area therefore in total, this is an incursion of 2.0m² of the 489.3m² TPZ area or 0.5%.

- Tree 10 – 6.0% (proposed crossover)
- Tree 11 – 5.5% (proposed crossover)

The plans show that either the proposed crossover or drainage connection construction works will incur an encroachment of 10% or less and not within their SRZ therefore, with proper tree protection measures the proposal is unlikely to be detrimental to the long-term health or stability and these trees and they will remain viable post construction works.

3.2.3 Trees with a Major TPZ encroachment (Greater than 10% and/or within SRZ).

Tree 12.

- **Tree 12** – 12.1% (proposed crossover is 3.4% + Bin Collection Zone 8.7%)

The plans show the TPZ encroachment of the proposed crossover construction works will have a greater than 10% encroachment of the TPZ radius although not within the SRZ radius of **Tree 12**, although the proposed 51.4m² or 8.7% Bin Collection Zone area encroachment is to be “Sprayseal bitumen” which is laid directly above grade abutting the edge of Redbank Road therefore this will not require any below ground construction works and is expected to have little to no direct impact upon the root system of **Tree 12**.

To minimise tree impacts the depth of the excavation works needs to be kept to a minimum, be undertaken under the supervision of a Project Arborist so that any tree roots exposed can be pruned and not severed. The proposed surfacing material to be laid at existing grade within minimal scraping.

4. RECOMMENDATIONS.

4.1 TREE PROTECTION MEASURES.

4.1.1 Prior to the commencement of any construction works (including demolition works), the following should be undertaken by the principal contractor.

- (a) A Project Arborist **should** be engaged to supervise all approved construction activity where within greater than 10% of the TPZ of **any of the retained trees**. The project arborist **must** hold a minimum qualification of AQF Certificate Level 5 in Arboriculture or equivalent to be appointed as the project arborist.
- (b) The Project Arborist **should** supervise the installation of the Tree Protection Zone fencing in accordance with **Appendix 5 Tree Protection Zone Guidelines for all retained trees**, where practicable, to ensure construction activity (other than the Council approved construction works) does not directly impact these trees. The site manager must ensure that TPZ Fencing is adhered to throughout the entire building process, including site demolition, levelling, and landscape works.

4.2.2 Prior to the commencement of any construction works, the following tree protection zone fencing should be installed to protect from construction activity.

Prior to the commencement of any building and or demolition works on the land, a Tree Protection Zone (TPZ) fencing must be established and maintained during and until completion of all buildings and works including landscaping, around the following trees in accordance with the distances and measures specified below:

- (a) **Tree protection zone distances.** Tree Protection Zone (TPZ) distance is the radius in meters from the centre of the tree base. **Refer to Appendix 1: Tree Assessment Table and the TPZ column for each retained trees relevant TPZ radius measurement.**
- (b) Tree protection zone measures are to be established in accordance with Australian Standard 4970-2009 and including the following:
 - i. Erection of solid chain mesh or similar type fencing at a minimum height of 1.8 metres held in place with concrete feet.
 - ii. Signage placed around the outer edge of perimeter fencing identifying the area as a TPZ. The signage should be visible from within the development, with the lettering complying with

AS 1319.

- iii. Mulch across the surface of the TPZ to a depth of 100mm and undertake supplementary watering in summer months as required.
- iv. No excavation, construction work or activities, grade changes, surface treatments or storage of materials of any kind are permitted within the TPZ unless otherwise approved in writing by the Responsible Authority.
- v. All supports, and bracing should be outside the TPZ and any excavation for supports, or bracing should avoid damaging roots where possible.
- vi. No trenching is allowed within the TPZ for the installation of utility services unless tree sensitive installation methods such as boring have been approved by the Responsible Authority.
- vii. Where construction is approved by the Responsible Authority within the TPZ, fencing and mulching should be placed at the outer point of the construction area.
- viii. Where there are approved works within the TPZ, it may only be reduced to the required amount by the project arborist only during approved construction within the TPZ and must be restored in accordance with the above requirements at all other times.

4.2.3 During the construction works, the following tree protection measures must be carried out.

- (a) There must be no grade change within the TPZ of any retained trees other than what is approved by the Relevant Authority and the approved and endorsed plans.
- (b) All construction activity or excavation works where within greater than 10% of the TPZ of **any of the retained trees** must be under the supervision of the Project Arborist and must be tree sensitive and will need to be either dug by hand or by hydro-excavation to minimise root damage and loss of any major roots that are greater than 25-30mm in diameter. Any root pruning within greater than 10% of the TPZ area of **any retained trees** must be approved by and undertaken by the Project Arborist and all roots must be cleanly pruned with sterilised, sharp pruning tools. There must be no major (greater than 25-30mm in diameter) root pruning within the SRZ of any retained tree.
- (c) Any canopy pruning will need to be undertaken by a suitably qualified arborist with a minimum qualification of AQF Certificate Level 3 in Arboriculture and performed in accordance with AS4373-2007 Pruning of amenity trees and/or MIS308 Tree Pruning (Industry guidance on tree pruning considerations, operations, and techniques).

Please feel free to contact me to discuss any questions you or a Council Representative may have arising from this report.

No part of this report should be reproduced unless in full.

Sincerely,

██████████ – *Dip. Arb. (Cert. V.); Cert. IV Hort. (Arb.) Melb. Uni.*

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APPENDIX 1: TREE ASSESSMENT TABLE

Trees within Bolden Street															
Tree #	Botanical Name (Common Name)	Origin	Age	Height (m)	Spread (m)	DBH (cm)	TPZ (m)	TPZ area (m ²)	DaB (cm)	SRZ (m)	Health	Structure	ULE (years)	Retention Value	Comments
1	<i>Cupressus × leylandii</i> (Leyland Cypress)	Ex.	Semi-mature	7	4	18	2.2	14.7	20	1.7	Good	Good	Med.	Mod.	Group of approximately 7 trees in a row/hedge located within the Road Reserve left hand side of the driveway to 26 Redbank Road.
2	<i>Eucalyptus tereticornis subsp. mediana</i> (Gippsland Red Gum)	Indig.	Mature	14	12	104	12.5	489.3	110	3.4	Good	Good	Long	High	Within Road Reserve – Modified crown for powerline clearance.
3	<i>Eucalyptus tereticornis subsp. mediana</i> (Gippsland Red Gum)	Indig.	Mature	10	6	43	5.2	83.6	50	2.5	Good	Good	Long	High	Within Road Reserve – form suppressed by the larger Tree 2
4	<i>Eucalyptus botryoides</i> (Southern Mahogany)	Vic. Native	Semi-mature	7	3	25	3.0	28.3	30	2.0	Good	Good	Long	High	Within Road Reserve – Modified crown for powerline clearance.
5	<i>Eucalyptus botryoides</i> (Southern Mahogany)	Vic. Native	Semi-mature	10	5	29	3.5	38.0	30	2.0	Good	Good	Long	High	Within Road Reserve – Modified crown for powerline clearance.
6	<i>Eucalyptus tereticornis subsp. mediana</i> (Gippsland Red Gum)	Indig.	Semi-mature	9	5	26	3.1	30.6	30	2.0	Good	Good	Long	High	Within Road Reserve – Modified crown for powerline clearance.
7	<i>Eucalyptus tereticornis subsp. mediana</i> (Gippsland Red Gum)	Indig.	Young	7	2	12	2.0	12.6	14	1.5	Fair	Good	Long	High	Within Road Reserve – Modified crown for powerline clearance.

Trees within Redbank Road															
Tree #	Botanical Name (Common Name)	Origin	Age	Height (m)	Spread (m)	DBH (cm)	TPZ (m)	TPZ area (m²)	DaB (cm)	SRZ (m)	Health	Structure	ULE (years)	Retention Value	Comments
8	<i>Eucalyptus tereticornis subsp. mediana</i> (Gippsland Red Gum)	Indig.	Semi-mature	10	6	40	4.8	72.4	50	2.5	Fair	Fair	Med.	Mod.	Within the Road Reserve - has been lopped for powerline clearance, numerous upper canopy branches are epicormic regrowth. Subject tree is within proposed crossover footprint.
9	<i>Eucalyptus tereticornis subsp. mediana</i> (Gippsland Red Gum)	Indig.	Semi-mature	12	6	37	4.4	61.9	50	2.5	Poor	Fair	Short	Low	Within the Road Reserve – appears in decline, sparse canopy, high volume epicormic and moderate volume deadwood/dieback. Proposed crossover cuts through the SRZ???
10	<i>Eucalyptus tereticornis subsp. mediana</i> (Gippsland Red Gum)	Indig.	Mature	17	10	48	5.8	104.2	60	2.7	Fair/ Good	Good	Long	High	Within the Road Reserve
11	<i>Eucalyptus tereticornis subsp. mediana</i> (Gippsland Red Gum)	Indig.	Mature	13	8	57	6.8	147.0	70	2.8	Fair	Fair	Med.	Mod.	Within the Road Reserve - has been lopped for powerline clearance, numerous upper canopy branches are epicormic regrowth.
12	<i>Eucalyptus tereticornis subsp. mediana</i> (Gippsland Red Gum)	Indig.	Mature	24	16	114	13.7	587.9	130	3.7	Fair	Fair	Med.	High	Within the Road Reserve - significant sized tree. Crown has undergone moderate weight reduction possibly for remedial and or mitigation requirements. Medium volume large deadwood in upper canopy.
13	<i>Corymbia maculata</i> (Spotted Gum)	Vic. Native	Semi-mature	9	6	32	3.8	46.3	40	2.3	Good	Good	Long	High	Within the Road Reserve
14	<i>Eucalyptus radiata</i> (Narrow-leaf Peppermint)	Vic. Native	Semi-mature	8	5	23	2.8	23.9	30	2.0	Good	Good	Long	High	Within the Road Reserve
15	<i>Eucalyptus tereticornis subsp. mediana</i> (Gippsland Red Gum)	Indig.	Mature	12	7	50	6.0	113.1	70	2.8	Fair/ Good	Fair	Med.	Mod.	Within Road Reserve – multi-stemmed at ground level.

PLANNING PERMIT DRAWINGS
DATE - 13/02/2025

BOLDEN STREET

part site plan
1 : 250

REDBANK ROAD (BITUMEN)

UNDER BORE AREA

PIT

300 UPVC PIPE

TG1 TP2 2.0m SRZ 1.7m

T2 TP2 2.5m SRZ 3.4m

T3 TP2 2.5m SRZ 2.5m

T4 TP2 3.0m SRZ 2.0m

T5 TP2 2.5m SRZ 2.0m

T6 TP2 3.0m SRZ 2.0m

T7 TP2 2.0m SRZ 1.5m

T13 TP2 3.0m SRZ 2.8m

T14 TP2 2.8m SRZ 2.8m

POWER POLE

NEIGHBOURING SHED

LAWN

Kitch/Lndy

D/F

B2 3.8 x 3.8

Ba

B1 3.8 x 3.8

G 3.8 x 4.0

CL

P.O.S 25m²

70.92m 359°36'40"

1.679m

3.539m

2.5m

2.1m

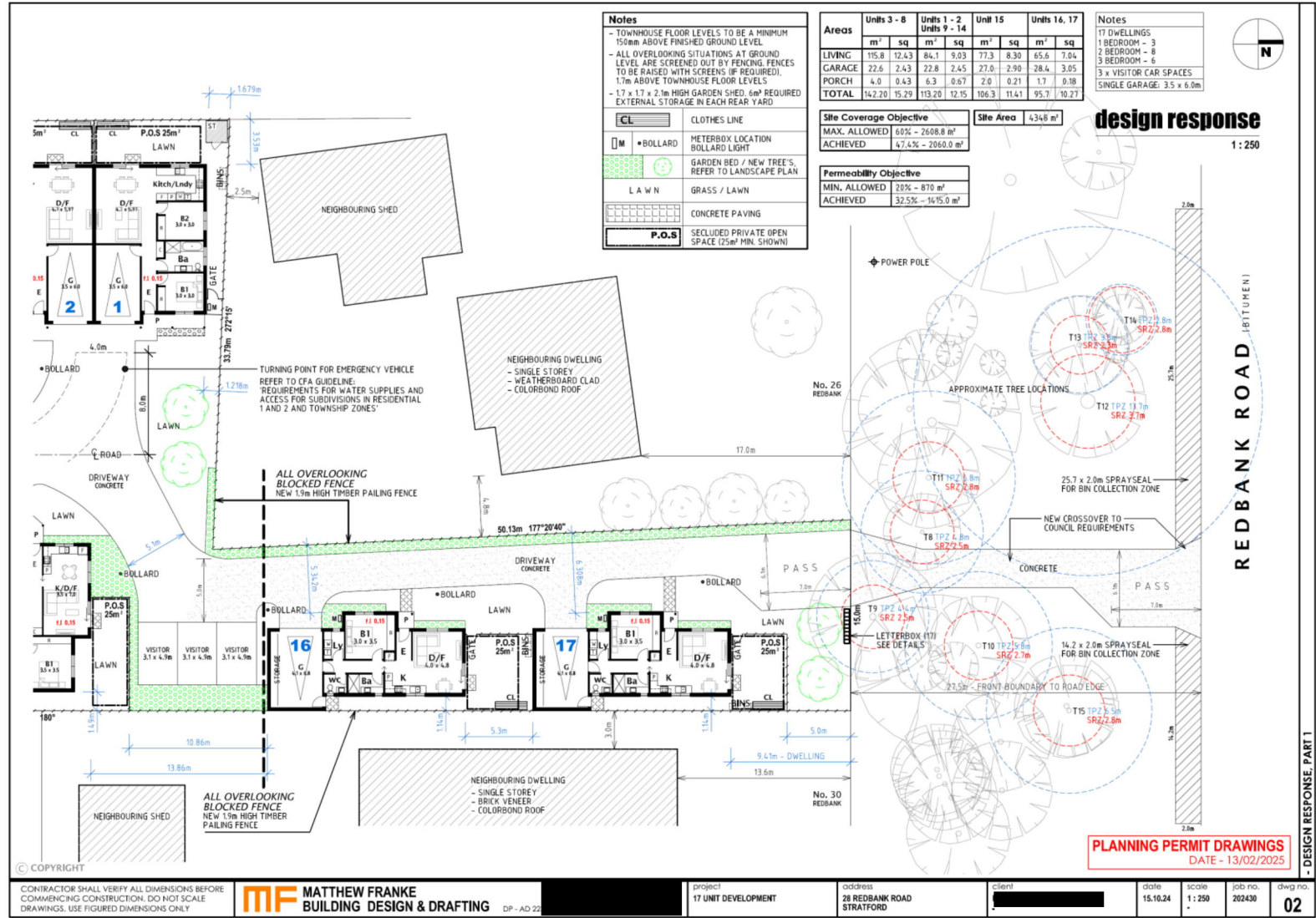
ST 2.2m

2.0m

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CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE COMMENCING CONSTRUCTION. DO NOT SCALE DRAWINGS. USE FIGURED DIMENSIONS ONLY	MF MATTHEW FRANKE BUILDING DESIGN & DRAFTING DP - AD Z	project 17 UNIT DEVELOPMENT	address 28 REDBANK ROAD STRATFORD	client [REDACTED]	date 14.10.24	scale 1 : 250	job no. 202430	dwg no. 11
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APPENDIX 3: PROPOSED CROSSOVER PLAN – 26 REDBANK ROAD



APPENDIX 4: ASSESSMENT TERMS & DEFINITIONS

TREE ASSESSMENT DESCRIPTORS:

Age

Young:	Juvenile tree recently planted.
Semi-mature:	Tree still growing
Maturing:	Specimen is reaching expected size in current situation
Senescent:	Tree is over mature and appears in decline
Dead:	Tree is dead

Form

Symmetric:	Canopy full and symmetrical
Asymmetric:	Minor asymmetry or suppression. Considered typical for species in situation.
Modified:	Canopy suppressed, major asymmetry. Stump re-growth. Hedged, pollarded, pruned for powerline clearance, etc.

Health

Good:	Crown full, good density, foliage entire, with good colour, minimal or no pathogen damage. Good growth indicators, e.g. extension growth. No or minimal canopy dieback. Good wound-wood and callus formation.
Fair:	Tree is exhibiting one or more of the following symptoms: Tree has <30% deadwood. Or can have minor canopy dieback. Foliage generally with good colour, some discolouration may be present, minor pathogen damage present. Typical growth indicators, e.g. extension growth, leaf size, canopy density for species in location may be slightly abnormal.
Poor:	Tree has >30% deadwood. Canopy dieback present. Discoloured or distorted leaves and/or excessive epicormic re-growth. Pathogen is present and/or stress symptoms that could lead to or are contributing to the decline of tree.
Dead:	Tree is dead.

Structure

Good:	Good Branch attachment and/or no minor structural defects. Trunk and scaffold branches sound or only minor damage. Good trunk and scaffold branch taper. No branch or over extension. No damage to structural roots and/or good buttressing present. No obvious root pests or diseases.
Fair:	History of minor (second and/or third order) branch failures. Some minor structural defects and/or minimal damage to trunk. Bark missing. Cavities could be present. Minimal or no damage to structural roots. Typical structure for species. Minor bark included unions.
Poor:	Major structural defects and/or trunk damaged and/or missing bark. Large cavities and/or girdling or damaged roots that are problematic. History of major (first order) branch failures. Significant included bark unions.
Hazardous:	Tree poses immediate hazard potential that should be rectified as soon as possible.

USEFUL LIFE EXPECTANCY

Useful Life Expectancy (ULE) means that in a planning context the length of time a tree can be maintained as a useful amenity and not a liability is by far the most important long-term consideration. ULE is contingent on many obvious management assumptions and the fundamental principles of public safety and usefulness in the landscape. Trees are a renewable resource. Weed species are generally assigned a lower ULE regardless of their condition and the replacement of such trees is preferable.

Exceeded/Hazardous	Tree maybe dead or very advanced stage of decline. Tree may exhibit major structural faults. Tree maybe in a stage of imminent failure with high risk potential that cannot be remedied.
Short (<10 years)	Tree appears in an advanced stage of decline. Crown is likely to be less than 50% typical density. Crown may be mostly epicormic growth. Dieback of large limbs is common. Tree maybe over-mature and senescing. Heightened risk potential. Tree has outgrown or at maturity will most likely become too large within the site constraints. Maybe a species of low material constraint that can be readily replaced with an advanced nursery stock. Maybe a weed species. Consider tree removal and replacement tree/s should be planted.
Medium (10-40 years)	Tree appears in early decline. Crown density is less than typical and epicormic growth is likely to be present. The crown may still be mostly entire, but some dieback is likely to be evident. Dieback may include large limbs. Over-maturing and senescing or early decline symptoms may be present in short-lived species.
Long (40+ years)	Tree displaying normal growth characteristics. Generally juvenile and semi-mature trees exhibiting normal growth characteristics, could also be maturing, long lived species. Tree well suited to the site.

ARBORICULTURAL RETENTION VALUE

The Retention Value is determined as a result of the collation of the data set (species, size, health, structure, form and site conditions etc.) in relation to the following retention descriptors:

<u>High</u> – Retain & Protect	A tree in good overall condition that has the potential to positively contribute to the landscape in the mid to long term if appropriately managed. Species is suited to its existing site conditions. Ideally, trees with a high retention value should be retained and incorporated into the development. The tree is worthy of material constraint.
<u>Moderate</u> - Retain if possible	A tree with beneficial attributes and suited to the site and, if practical, designs should be altered to accommodate this tree. The tree is likely to tolerate changes in its environment. Remedial works may be required but tree should remain viable within reasonable limits. The tree may tolerate being transplanted.
<u>Low</u> – Not worth retraining	<p>The tree is not worthy of material constraint and can be readily replaced.</p> <p>The tree may be in poor to fair health and/or structure, dead, diseased, in an advanced stage of decline and unlikely to recover, senescent or just not suitable for this site. The tree has outgrown or at maturity will become too large within the site constraints and become problematic. Trees that have a “Low” retention value are likely to require removal prior to any development works.</p>
<u>NIL</u> – Hazardous and/or Weed Species	<p>A tree with severe health and/or structural defects that cannot be rectified through reasonably practicable arboricultural works and therefore potentially hazardous to nearby structures or people.</p> <p>The tree is classed as a noxious or environmental weed species and is detrimental to the environment. Trees that have “No” retention value are likely to require immediate removal.</p> <p>Tree may be inter-dependent with surrounding trees and will be unable to be retained once adjacent shelter trees are removed.</p>
<u>Third Party</u> – Retain & Protect	The tree is located outside the subject site. It may be owned by a private entity or a public body. The tree has been assessed on the assumption that its owner requires retention of the tree. Discussions with the relevant owner, ideally prior to any development works, may result in the removal of the subject tree.

TREE ASSESSMENT DEFINITIONS:

Aerial inspection:	Where the subject tree is climbed by a professional tree worker or arborist specifically to inspect and assess the upper stem and crown of the tree for signs or symptoms of defects, disease, etc.
Amenity:	Amenity relates to the trees biological, functional and aesthetic characteristics within an urban environment. (Hitchmough, 1994)
Co-dominant:	Refers to stems or branches equal in size and relative importance.
Compression wood:	Type of reaction wood produced by conifers on the underside of branches and leaning trunks.
Condition:	Refers to the tree’s form and growth habit, as modified by its environment (aspect, suppression by other trees, soils) and the state of the scaffold (i.e. trunk and major branches), including structural defects such as cavities, crooked trunks or weak trunk/branch junctions. These are not directly connected with health and it is possible for a tree to be healthy but in poor condition.

Dead wood:	Refers to any whole limb that no longer contains living tissues (e.g. live leaves and/or bark). Some dead wood is common in a number of tree species.
Decay:	Process of degradation of woody tissues by fungi or bacteria through decomposition of cellulose and lignin. There are numerous types of decay that affect different types of tissues, spread at different rates and have different effect on both the tree's health and structural integrity.
Diameter at Breast Height (DBH):	Refers to the tree trunk diameter at breast height (1.4 meters above ground level)
Dieback:	Death of growth tips/shoots and partial limbs, generally from tip to base. Die back is often an indicator of stress and tree health.
Epicormic Shoots:	Which arise from adventitious or latent buds. These shoots often have a weak point of attachment. They are often a response to stress in the tree. Epicormic growth/shoots are generally a survival mechanism, often indicating the presence of a current or past stress event such as fire, pruning, drought, etc.
Hazard:	Refers to anything with the potential to harm health, life or property.
Health:	Refers to the tree's vigour as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion, and the degree of dieback.
Included bark:	Refers the pattern of development at branch or stem junctions where bark is turned inward rather than pushed out. This fault is located at the point where the stems/branches meet. This is normally a genetic fault and potentially a weak point of attachment as the bark obstructs healthy tissue from joining together to strengthen the joint.
Retention Value:	Relates to the combination of the tree condition factors (Form, Health, Structure)
Scaffold branch/root:	A primary structural branch of the crown or primary structural root of the tree.
Structural Root Zone (SRZ):	This zone is often the location of the tree's structural support roots. The SRZ is the area required for tree stability. Excavation within this area may seriously destabilize the tree. The SRZ only needs to be calculated when encroachment into the TPZ is proposed. Fully elevated construction within this area is possible with specific root zone assessment. The minimum SRZ given will never be less than 1.5 metres for a tree with a stem diameter less than 150mm.
Suppressed:	In crown class, trees which have been overtopped and whose crown development is restricted from above.

- Tension wood:** Type of reaction wood produced by broad-leaved tree species which forms on the upper side of branches, stems and leaning trunks.
- Topping or heading:** Refers to a non-acceptable pruning practice that results in the removal of terminal growth leaving a cut stub end. Topping causes serious damage to the tree.
- Tree Protection Zone (TPZ):** Generally, the minimum distance from the center of the tree trunk where protective fencing or barriers are to be installed to create an exclusion zone. **The TPZ** surrounding a tree aids the tree's ability to cope with disturbances associated with construction works. Tree protection involves minimising root damage that is caused by activities such as construction. Tree protection also reduces the chance of a tree's decline in health or death and the possibly damage to structural stability of the tree from root damage. To limit damage to the tree, protection within a specified distance of the tree's trunk must be maintained throughout the proposed development works. No excavation, stockpiling of building materials or the use of machinery is permitted within the Tree Protection Zone (TPZ).
- Visual Tree Assessment (VTA):** A procedure of defect analysis developed by Mattheck and Breloer (1994) that uses the growth response and form of trees to detect defects.

APPENDIX 5: TREE PROTECTION GUIDELINES

Tree Protection Background

Each tree is assessed individually for their tree protection requirements based upon the Australian Standard AS4970-2009 Protection of trees on development sites. The protection requirements are calculated based upon trunk diameter of the tree measured at breast height (1.4m above ground). These calculations produce what is referred to in this report as the Tree Protection Zone (TPZ) and is provided as a measurement in meters in a radius of the trunk.

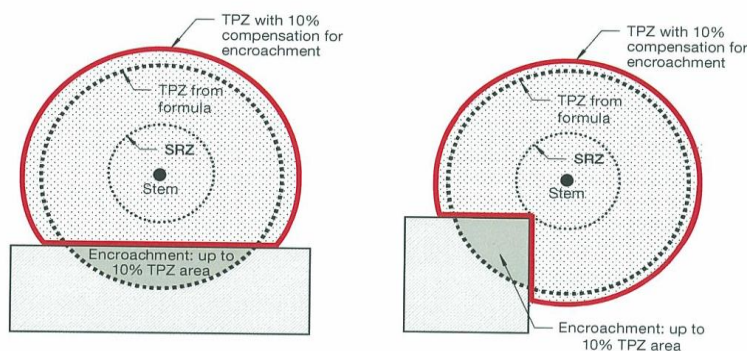
The TPZ is the zone in which protective measures should be applied in order to protect the tree/s whilst maintaining the current levels of health and vigour.

Determination of the structural root zone is provided as the Structural Root Zone (SRZ). The structural root zone calculations of the tree, based upon the Australian Standard AS4970-2009. The SRZ determines the minimum distance around the tree in which the structural stability of the tree can be maintained.

It's important to note that the SRZ only determines the root plate area or the zone of rapid taper. Excavation within this area will not only cause decline in tree vigour but may also cause catastrophic tree failure (Coder 1996).

Often it is difficult to protect the entire TPZ due to site constraints. In such events it is imperative that condition and species tolerance to disturbance are evaluated in conjunction with the site characteristics. Helliwell (1985) and Harris (1999) identified that a healthy tree may tolerate removal of up to one-third of its roots and possibly up to 50% in some cases, although stability may be compromised at this level of root loss.

In situations where the TPZ of a tree to be retained will be in close proximity to a proposed development or where there will be encroachment into the TPZ of a tree, a specific tree protection management plan should be developed. This plan provides prescriptive measures to protect trees on development sites.



Tree Protection Measures

The following requirements are only provided for basic guidance with the design phase for a project. These guidelines do not constitute a specific **Tree Management Plan (TMP)**.

1. A tree protective fence should be installed at the recommend distance allocated for each tree that is to be retained. The fence should ideally be located, as a minimum, at the TPZ distance provided (**Refer Appendix 8 TPZ Fencing Plan**).
2. The protection fence must be rigid (i.e. chainmesh temporary fencing panel) and must be a minimum of 1.8 meters high. Fencing should be firmly attached to a removable concrete or similar base.
3. In cases where the TPZ cannot be entirely fenced, it is recommended that ground protection is used. Specific ground protection requirements will form part of a tree protection management plan that should be developed for each tree to be retained.
4. No soil levels must be altered within the fenced TPZ area, no heavy machinery can pass within this area and no spoil, chemicals, building materials or refuse should be stored within this area. Nothing whatsoever should be attached to the tree (except tape to identify the tree to be protected).
5. The area within the tree protection fence should be covered with a layer of organic composted mulch to a depth of 50-100mm prior to the commencement of the project.
6. The tree protective fencing should be installed prior to any works (including demolition) commencing on site and should remain in place until all development work is completed. The protective fencing should be located at the prescribed distances and clearly signed with **"TREE PROTECTION ZONE- Keep Out"** and fixed to the TPZ fencing.
7. An area should be designated on site, which is at least a distance of 10 meters away from any tree protection zones of any tree to be retained, where all building materials, chemicals etc. can be stored throughout the proposed development.
8. Open trenching for underground services located within the recommended TPZ must be avoided. Should there be no alternative for service location; the services must be bored underneath the TPZ with the use of non-destructive boring methods to the satisfaction of the Relevant Authority.
9. Soil moisture during construction should be maintained. Water is to be applied at a volume and frequency required to maintain turgor and leaf retention and encourage healthy root development.
10. If pruning works are recommended the pruning must be carried out in accordance with the Australian Standard AS4373-2007 – Pruning of amenity trees and should be performed by a qualified practicing Arborist (Min. Cert 3 Arb.). If pruning works are to be undertaken, then these works should be carried out prior to any construction works beginning on site.

APPENDIX 6: CONSTRAINTS

- **Tree Assessment** is based on external visual examination from ground level only. No internal decay diagnostic equipment was used, no excavation of the root plate undertaken, and no samples removed for further analysis unless otherwise stated.
- **Risk Assessment** is provided only as an estimation of the potential of the tree(s) listed in this report as to their probability to cause damage to people and / or property and cannot be considered to constitute a prediction of future events.
- Recommendations contained in this report are based on the measurements and observations prevalent at the time of inspection. Future changes or site development may render this report and recommendation invalid.
- Care has been taken to obtain all information from reliable sources. All data has been verified in so far as possible, however, *Arb Inspect Tree Risk Management Services Pty Ltd* can neither guarantee nor be responsible for the accuracy of the information provided by third parties.
- Any legal description, titles and ownership of any property provided to the *Consulting Arborist* are assumed to be correct. No responsibility is assumed for matters legal in character.
- Maps, diagrams and photographs in this report are included as visual aids. They cannot be considered to be to scale and are not intended to be used to locate trees or in the place of structural and / or architectural plans.
- Loss or alteration of any part of this report invalidates the entire report.
- Possession of this report or a copy thereof does not imply right of publication or use for any purpose by anyone but the person to whom it was commissioned by, without the prior written consent of *Arb Inspect Tree Risk Management Services Pty Ltd*
- Neither all nor any part of the contents of this report, nor any copy thereof, shall be used for any purpose by anyone but the person to whom it is addressed, without the written consent of *Arb Inspect Tree Risk Management Services Pty Ltd*. Nor shall it be conveyed by anyone, including the client, to the public through advertising, public relations, news, sales or other media, without the written consent of the consultant *Arb Inspect Tree Risk Management Services Pty Ltd* shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services.