



Arboricultural Impact Assessment Report

For

Lyden Builders – Sam Siggins

Site

**1179 Channel Hwy, Huntingfield,
TAS**

Prepared By

Tree Pioneers
ABN: 97 327 587 243
21 Victoria Road, Ranelagh,
Tasmania, 7109

Consulting Arborist

Joe Loorham
Diploma of Horticulture
(Arboriculture)
Ph: 0433 918 192
Email: treepioneers@outlook.com

1. Executive Summary

Commissioned by Sam Siggins of Lyden Builders, Tree Pioneers was engaged to provide an Arboricultural Impact Assessment Report. The report was to address the proposed installation of a fence at 1179 Channel Hwy, Huntingfield. The site is an old homestead in the process of being subdivided.

The fence is to be installed along the Eastern boundary of the property to separate private and council land.

The site has 13 trees and 4 hedges that are encroached by the development.

The fence at 1179 Channel Hwy, Huntingfield can be installed and retain all trees in the landscape with the implementation of the following:

- All encroachment is minor.
- Proposed fence post holes to be 300mm x 300mm. This total surface area represents less than 10% in any TPZ.
- Fence posts are proposed to be 3 meters apart.
- The total fence length is approximately 150m long.
- Approximately 50 post holes.
- Fence post holes inside the TPZ to be installed under the supervision of a suitable qualified arborist (diploma or higher).
- Post holes withing TPZ to be hand dug to 30cm to ensure no root damage first before mechanical aid is used. Harsh soil profile suggest it will be unlikely to find roots deeper then 300mm.
- Bog mats and ground protection to be used to protect roots if any mechanical aid is used.
- Any roots damage to be pruned square with a hand saw.
- Minor adjustment of post hole location to avoid any significant roots.

More specific details regarding the protection methods to implement are located within the document.

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2. Overview

Commissioned by Sam Siggins of Lyden Builders, Tree Pioneers were engaged to provide an impact assessment for the development of a fence at 1179 Channel Hwy, Huntingfield. The Kingborough council has issued an RFI to determine the impact of the installation of the fence to the trees on site.

3. Key Objectives

- Identify and record tree data.
- Assess tree retention of specific tree.
- Provide guidelines for tree retention, in light a proposed development.

4. Method

The trees were inspected from the ground on the 15th of January 2024 by Joe Loorham. The trees were assessed by Phillip Jackson and Alister Hodgman at varies times throughout the development process. Trees were assessed for the following;

- Species identification and origin
- Approximate age of the tree
- Stem diameter at 1.4 meters above ground level with DBH tape (multiple stem trees calculated with TreeTec calculator)
- An estimation of the height and width of the tree canopy with a clinometer
- The structure of the tree
- The health of the tree
- The significance of the tree to the site

The visual tree inspection was undertaken from the ground and recorded. No aerial assessment has taken place. An aerial inspection of the tree will be recommended if further assessment is required. Anything not visible from the ground cannot be accounted for. No underground investigation took place. The tree assessment relates to the data taken on the day of assessment and does not include any changes thereafter.

5. Site

The site is an old homestead property that is currently being subdivided. The original property is being retained with a reasonable allotment of land. The fence is being installed to separate council and private land. The site is mixed species varying in age.

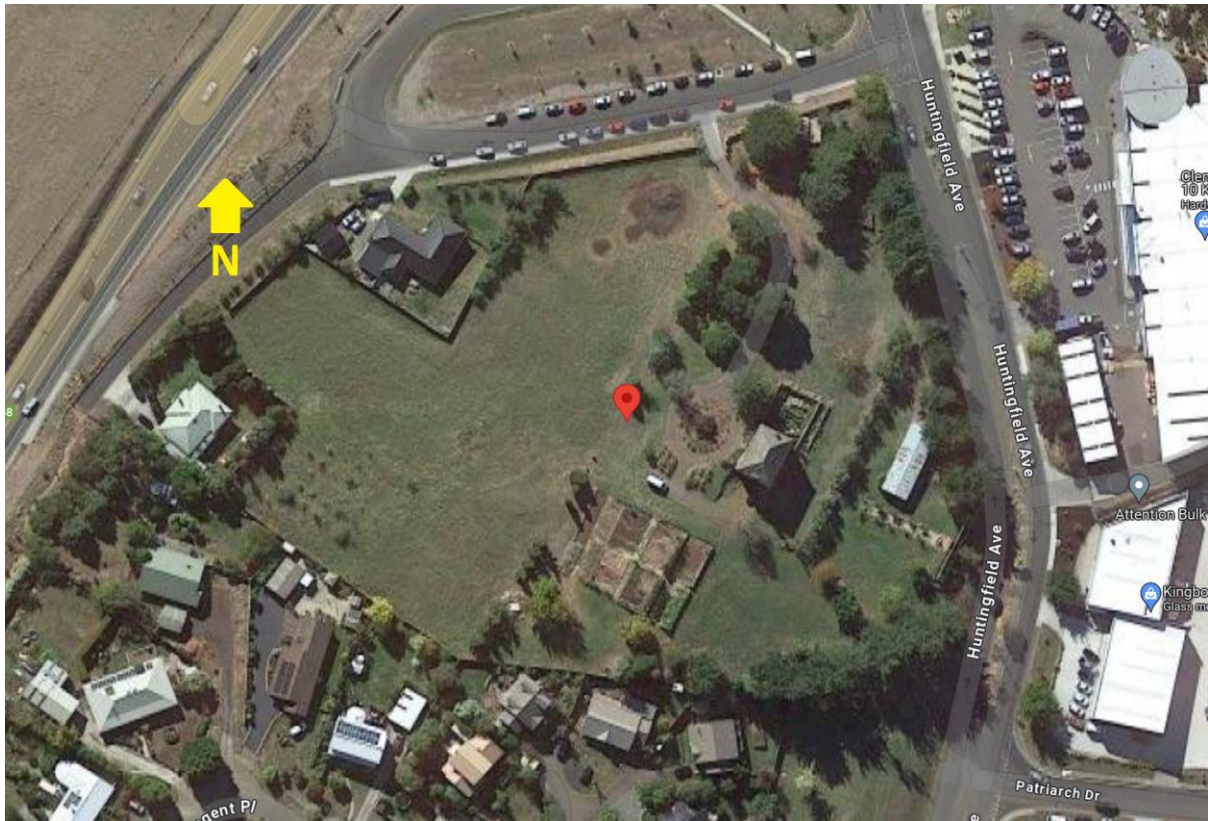


Figure 1. Aerial map of site pre subdivision. (Google maps)

6. Site Plan

The plan for 1179 Channel Hwy, Huntingfield shows multiple trees in close proximity to proposed fence. There are 13 trees, and 4 groups of trees (hedges) identified that will have varying levels of encroachment from the fence.



Figure 2. Drawing provided by Pinnacle showing the fence and trees. Also represented is the Tree Protection Zones (TPZ).



Figure 3. Drawing provided by Pinnacle showing the fence and construction design.

7. Observations/Discussion

The trees encroached on by installation of fence:

Trees
1, 2, 4, 5, 20, 31, 35, 36, 39, 40, 41, 42, 49
Groups
(9a, 9b, 9c, 9d, 9e) (10a, 10b, 10c, 10d, 10e, 10f, 10g) (28a, 28b, 28c, 28d, 28e, 28f, 28g, 28h, 28i, 28j, 28k, 28l) (48a, 48b, 48c, 48d, 48e)

- There are 12 individual trees that have varying levels of minor encroachment.
- There are 4 tree groups (9, 10, 28 and 48) which are multiple Cypress hedges (*Hesperocyparis macrocarpa*).
- All encroachment is minor.
- Proposed fence post holes to be 300mm x 300mm. This total surface area represents less than 10% in any TPZ.
- Fence posts to be 3 meters apart.
- The total fence length is approximately 150m long.
- Approximately 50 post holes.
- Fence post holes inside the TPZ to be installed under the supervision of a suitable qualified arborist (diploma or higher).
- Post holes withing TPZ to be hand dug to 30cm to ensure no root damage first before mechanical aid is used. Harsh soil profile suggest it will be unlikely to find roots deeper then 300mm.
- Bog mats and ground protection to be used to protect roots.
- Any roots damage to be pruned square with a hand saw.
- Minor adjustment of post hole location to avoid any significant roots.

8. Tree Protection

Tree Protection Zones (TPZ)

The specific area set aside above ground at a given distance from the trunk set aside for the protection of the tree's roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development.

Structural Root Zones (SRZ)

The area around the base of a tree required for the tree's stability in the ground. The woody root growth and soil cohesion in this area are necessary to hold the tree upright. The SRZ is nominally circular with the trunk at its centre and is expressed by its radius in meters. This zone considers the trees structural stability only, not the root zone required for a tree's vigour and long-term viability, which will usually be much larger area.

Development sites

Development sites incorporating trees need to implement protection measures to ensure the tree remains viable in the future landscape. Damage to trees during development can occur directly to the tree and indirectly to it through its environment;

- Direct damage includes mechanical injury to the trunk, severing roots, or alterations to the soil environment in the immediate vicinity of the roots. This included compactions or loss of organic matter.
- Indirect damage includes soil moisture alterations, changes in water tables and drainage patterns.

On development site, the protection of trees is achieved with a TPZ (Tree Protection Zone). TPZ are calculated according to *AS 4970-2009 Protections of amenity trees on development sites*. TPZ are 12 times the trunk diameter at 1.4m above ground level. Once the TPZ has been calculated, at TPZ fence is erected to protect the tree and its environment. This Fences must be erected before any work takes place.

Guidelines for TPZ's (Tree Protection Zones):

- No building structures or hard landscape features.
- No building material storage.
- No excavation or soil disturbance work
- No placing of fill.
- No lighting of fire or preparing of chemicals.
- No vehicles or pedestrian access.

TPZ requirements:

- Erect signs along the entire length of the protective fence.
- Construct TPZ to prevent pedestrian and vehicle access.
- Mulch TPZ area to a depth of 150mm with wood chips.
- Irrigate the TPZ periodically, as determined by the arborist.

TPZ Guidelines and requirements need to be adhere to at all stages of the design and development process.

Encroachment

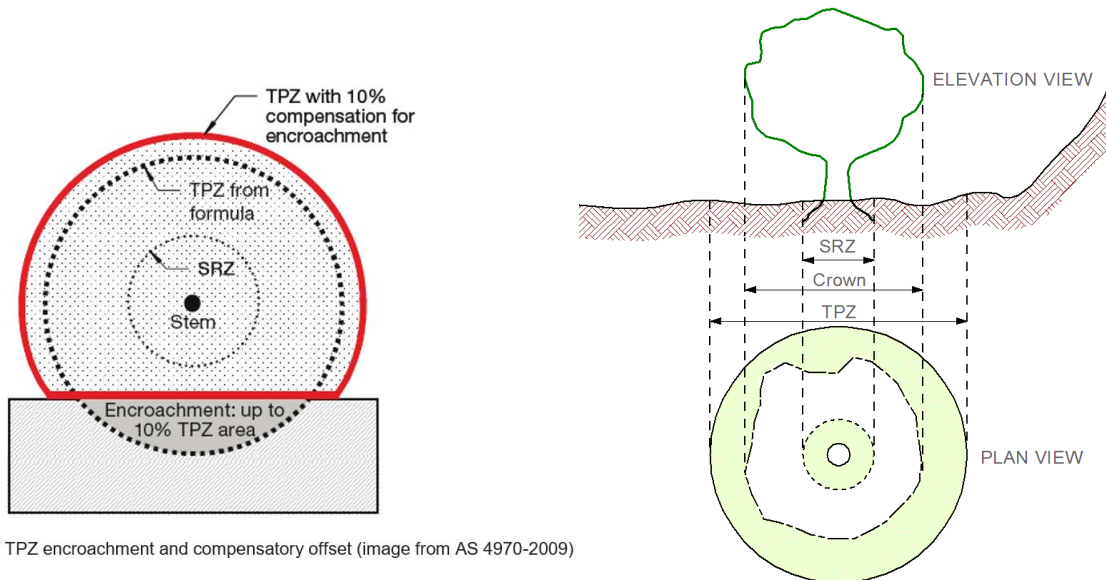
In some case, encroachment into the TPZ is necessary. By working within the Australian standards framework, there are provisions for encroachment. Encroachment is categories as minor or major.

Minor Encroachment AS 4970-2009

Minor encroachment is less than 10% of the TPZ and doesn't enter the SRZ (Structural Root Zone). Root investigation is required and the 10% must be compensated with an extension to the TPZ elsewhere. These TPZ encroachments must be supervised by the project arborist.

Major Encroachments AS 4970-2009

Major encroachment is more than 10% of the TPZ and into the SRZ. These encroachments must be supervised by the project arborist. The project arborist must demonstrate that the trees will remain viable. The area lost to encroachment must be compensated with an extension to the TPA elsewhere.



: Example of TPZ encroachment and compensatory offset (image from AS 4970-2009)

It is recommended that:

- All trees represented on future designs and feature surveys with respective TPZ.
- The design team maintains contact with the arborist to ensure the trees remain viable by providing suitable space above and below ground.
- Following the development of a final design, it is reviewed by the arborist to produce a construction impact statement detailing which tree are to be removed or retained as part of the proposal.
- A tree management plan is to be produced following approval, detailing how the retain trees will be protected during the demolition and construction process.

9. Conclusion/Recommendation

Development of the fence at 1179 Channel Hwy, Huntingfield will have encroachment into the Tree Protection Zones of 13 trees and 4 hedges (groups of trees). The encroachment is minor, and the trees will remain viable in the future landscape.

- There are 12 individual trees that have varying levels of minor encroachment.
- There are 4 tree groups (9, 10, 28 and 48) which are multiple Cypress hedges (*Hesperocyparis macrocarpa*).
- All encroachment is minor.
- Proposed fence post holes to be 300mm x 300mm. This total surface area represents less than 10% in any TPZ.
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- Bog mats and ground protection to be used to protect roots.
- Any roots damage to be pruned square with a hand saw.
- Minor adjustment of post hole location to avoid any significant roots.
- No building materials to be stored inside TPZ.
- No machines inside TPZ.

10. References

Australian Standards – AS 4970-2009 Protection of trees on development site.

Australian Standards – AS 4373-2007 Pruning of Amenity trees.

Alex L. Shigo – *Modern Arboriculture: A Systems Approach to the care of trees and their associates*, 1st edition, published January 1991

Alex L. Shigo – *New tree Biology: Facts, Photos and Philosophies on trees and their problems and proper care*, 2nd edition, published June 1989

Mattheck, C. & Breleor, H. 1994, *The Body Language of Trees*, The Stationary Office, London, UK.

11. Glossary

Arboricultural terms used throughout the document.

Term	Meaning
Bifurcated	A tree or limb divides at a union into two main sections which is reasonable equal. Similar meaning as co-dominant stems.
Codominant stems	Two or more stems which are competing in size. They do not have branch collars but may form a bark ridge. In many cases this leads to included bark. Similar meaning to bifurcation.
Canker	A localized lesion; a dead spot. Canker doesn't allow the tree to callus over the wound.
Compartmentalization (CODIT)	Compartmentalization is the tree's defence process where boundaries form that resist spread of infections and that defend the liquid transport, energy storage and mechanical support systems. As trees compartmentalize infected wood, storage space for energy reserves is reduced. Strong compartmentalization "keeps" the lost space to a minimum. Wounded wood is compartmentalized inside the trees structure.
Dieback	A tree dying back at the extremity's either the roots or shoots to survive. Reducing distance of translocation
Epicormic Epicormic bud Epicormic branch	Located along trunk and branches. They are carried in the cambium and are dormant for years. They are suppressed by hormones by active shoots further up the tree. They're suppressed until specific conditions are triggered like damage, pruning or increase light. They have a weak attachment point.
Included bark	Include bark forms when the branch bark ridge turns inward. This is common with codominant stems. Included bark is a condition where the tree has grown around the bark which leaves it included.
Primary disorder	The first disorder, most prevalent diagnosed condition.
Secondary disorder	the secondary disorder, a disease that follows the and results from an earlier disease.
Brown rot	Brown rot or brittle rot is the decay of heart wood, the cellulose is digested, and the lignin is altered. Very brittle.
White rot	White rot or white decay is the decay of heart wood, lignin is digested, and cellulose remains altered.

12. Tree Descriptors

AGE

The notation of age is based on the following categories.

Category	Description
Young	Less than 20% of the life expectancy of the tree.
Mature	20 – 80% of the life expectancy of the tree.
Over Mature	>80% of the life expectancy for the tree.
Dead	Tree is no longer alive.

HEALTH

Pertains to the health and growth potential of the tree. The notation of 'health' is based on the following categories.

Category	Description
Good	Full canopy, good foliage density, average leaf colour for species. Average growth indicators such as good extension of growth per growing season, typical leaf size. Little to no dieback in the canopy, minimal deadwood. Good wound wood development. Tree exhibits above average health and minimal to no work is required.
Fair	Tree has <25% deadwood and may have minor canopy dieback. Foliage density and colour may be slightly below average for species. Imperfections in canopy present, pathogen signs present. Average growth indicators such as good extension of growth per growing season, typical leaf size and canopy density. Moderate wound wood development. Tree exhibits below average health and remedial works may be employed to improve tree health.
Poor	Tree has >25% deadwood and has canopy die back. Foliage density and colour is below average for species. Leaf size distorted and discoloured. Epicormic growth is present throughout the canopy. Canopy is incomplete and has pathogen damage present. Poor wound wood development. Tree exhibits low health and remedial work or removal <u>may</u> be required.
Very Poor	Tree has more than 50% deadwood and extensive canopy dieback. Foliage density is sparse and leaf and colour is atypical for species. Epicormic shoots can make up large sections of canopy. Pathogen and stress agent is present are leading to decline. Very poor wound wood development. Tree exhibits low health and remedial work or removal <u>are</u> required.
Dead	Tree is no longer living.

RETENTION VALUE

Retention Value is rated into three levels: LOW, MEDIUM and HIGH.

Category	Description
Low	Trees that offer little in terms of contributing to the future landscape. Should be considered for removal.
Medium	Trees with some beneficial attributes that may benefit the site. Could be considered for retention if possible.
High	Trees with the potential to positively contribute to the site. Should be considered for retention if possible.

STRUCTURE

Pertains to the physical structure of the tree including main scaffold branches and roots. Structure includes those attributes that may influence the probability of major, trunk, root or limb failure.

Category	Description
Good	Tree has well-defined and balance canopy. Branch unions appear strong and without defects evident. Trunk and branches have nice taper. Tree is unlikely to suffer trunk or branch failure under normal conditions. The tree is considered a good example of the species with well-developed form.
Fair	Tree has some minor problems in the structure of the crown. The crown may slightly out on balance and some branch unions may exhibit structural faults. Tree may have a slight lean. Tree may have slight root damage. There defects are not likely to result in catastrophic trunk or branch failure, although some branch failure may occur under normal conditions.
Poor	Tree may have significant problems in structural scaffold limbs and trunk. Canopy may be lopped sided and have gaps. Limbs crossing in canopy. Branch unions may be poor with faults present. Tree may have substantial lean. Tree may have suffered significant root damage. Tree may have basal or trunk damage. Tree may have co-dominate stems. Tree may have bifurcated unions. These defects <u>may</u> predispose the tree to major truck and branch failure.
Hazardous	Tree has very significant problems in structural scaffold limbs and trunk. Canopy is lopped sided and has gaps. Limbs crossing in canopy causing rubbing and damage. Branch unions are poor with faults at the point of attachment. Tree has substantial lean. Tree has suffered significant root damage. Tree has basal or trunk damage. Tree has co-dominate stems. Tree has bifurcated unions. There defects <u>are</u> likely to predispose the tree to trunk and scaffold limb failure

USEFUL LIFE EXPECTANCY (ULE)

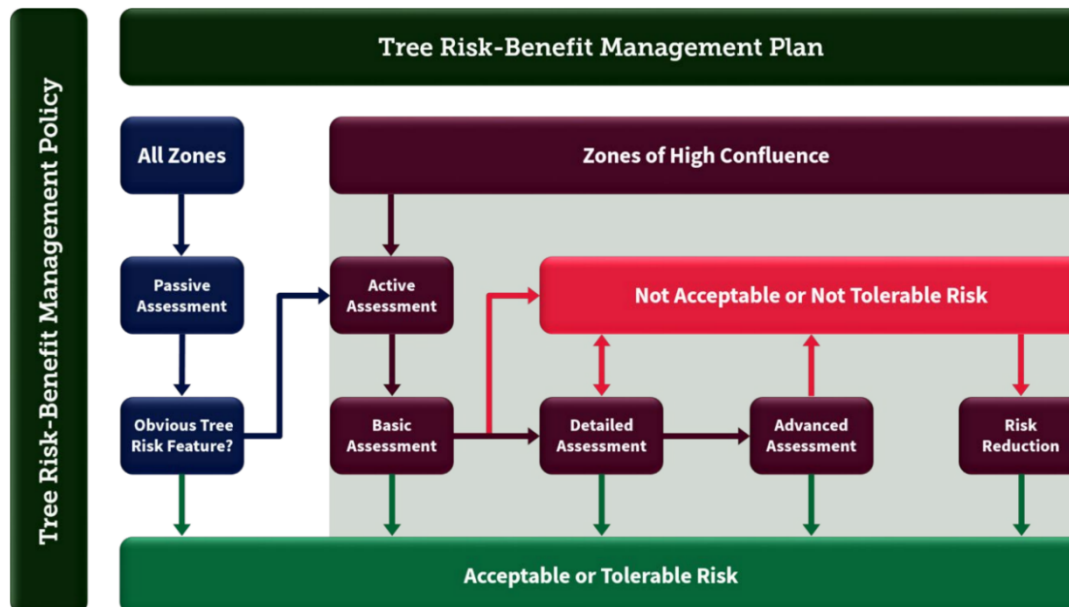
U.L.E. pertains to the span of time that the tree might reasonably be expected to provide useful amenity value with an acceptable level of safety at an acceptable cost. Trees with have varying U.L.E. according to the environment, economical and other factors. **(Note: Useful life expectancy is relevant to the tree if it is maintained and nothing significantly in the environment changes)**

The notation of U.L.E. is based on the following categories.

Category	Description
Short	The tree appears to be retainable with an acceptable level of risk for 5 to 15 years.
Medium	The tree appears to be retainable with an acceptable level of risk for 15 to 40 years.
Long	The tree appears to be retainable with an acceptable level of risk for more than 40 years.
Remove	The tree presents with a high level of risk that would need removal within the next 5 years

RISK

Risk is calculated using the following chart.



Passive Assessment - is simply picking up on Obvious Tree Risk Features you can't help but notice as you go about your daily routine. We carry it out in all zones of use. Passive Assessment is our most valuable risk management asset because it can be done by anyone and it's going on day in day out.

Active Assessment - is where we have trained assessors looking for risks that might not be Acceptable or Tolerable. Or where Passive Assessment has picked up an Obvious Tree Risk Feature that needs a closer look. Active Assessment has three levels to it that increase in depth of investigation from Basic, to Detailed, up to Advanced. We'll carry out Active Assessment in zones of high confluence every 5 years.

Risk Ratings - VALID has applied ISO 31000: Risk Management and the Tolerability of Risk Framework to tree risk-benefit assessment and management, which we've adopted. We're going to manage the risk from our trees and branches falling using four easy-to-understand traffic light signal coloured risk ratings. Red Not Acceptable risks will be reduced to an Acceptable level Amber Not Tolerable risks will be reduced to an Acceptable level, but with a lower priority than red Not Acceptable risks Amber Tolerable risks will not be reduced but may require an increased frequency of assessment than green Acceptable risks Green Acceptable risks will not be reduced.

More documentation is attached.

TREE PROTECTION ZONES

The T.P.Z. applied is AS 4970-2009 'Protection of trees on development site'. AS 4970-2009 uses a multiplication method to determine the T.P.Z. based on T.P.Z. radius being 12 times stem diameter measured 1.4 metres above ground.

$$\text{T.P.Z. radius} = \text{DBH} \times 12$$

STRUCTURAL ROOT ZONE

The S.R.Z. applied is AS 4970-2009 'Protection of trees on development site'. The SRZ is the area required for tree stability. A larger area is required to maintain a viable tree.

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