

**BEFORE AN INDEPENDENT HEARINGS PANEL
OF THE HAMILTON CITY COUNCIL**

IN THE MATTER of the Resource Management Act
1991 (**RMA**)

AND

IN THE MATTER of an application for resource
consent for the redevelopment of the
former Hamilton Hotel building at 170
Victoria Street, Hamilton CBD.

**STATEMENT OF EVIDENCE OF JONATHAN RAY REDFERN-HARDISTY
ON BEHALF OF THE APPLICANT**

**ARBORICULTURE
1 October 2019**

1. QUALIFICATIONS AND EXPERIENCE

1.1 My full name is Jonathan Ray Redfern-Hardisty. I am the principal consultant arborist at Arborlab Consultancy Services Limited.

1.2 I have a Diploma in Arboriculture (Level 6), from WINTEC. I am an International Society of Arboriculture (ISA) Certified Arborist. I have qualifications in the tree risk systems, VALID tree risk management system, Quantified Tree Risk Assessment (QTRA), and Tree Risk Assessment Qualification (TRAQ). I have been actively engaged in the arboricultural industry for 25 years: ten years as a contracting arborist, 13 years a consulting arborist, and two years combining both disciplines within my own company. I have previously been seconded to Auckland Council Parks Department and have had experience in assessing resource consent applications on behalf of the Auckland Council. I have undertaken several risk and health assessments for local authorities, private residential and corporations throughout New Zealand and have had a wealth of experience in all aspects of arboricultural consultancy.

1.3 I have been involved in the planning of many infrastructure projects. Some of which include Auckland's Quay Street seismic strengthening project, the Dominion Road Double Decker Bus Project, Hurstmere Road upgrade, assessing trees for Hamilton Council's River Plan and State Highway 16 widening project.

1.4 Arborlab Consultancy Limited was engaged in relation to the Waikato Regional Theatre (the **Theatre**) development in December 2017. Initially providing an assessment of the trees and then providing an assessment of affects with the proposed plans provided.

2. CODE OF CONDUCT

2.1 My qualifications as an expert are set out above. I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014 and have complied with it in preparing this evidence. I confirm that the issues addressed in this evidence are within my area of expertise and I have not omitted material facts known to me that might alter or detract from my evidence.

3. SUMMARY OF EVIDENCE

- 3.1** I have been asked to provide evidence in relation to the potential adverse effects that the Theatre may have on five notable trees growing within the site.
- 3.2** I prepared an arboricultural assessment report dated June 2018 that was lodged with the application – including a memorandum provided in response to section 92 requests. I have read the submissions received on the application and the Council Report.
- 3.3** My evidence will address the following aspects of the resource consent, which are within my area of expertise:
- a) Assessment of arboricultural effects;
 - b) Comments on the Hamilton City Council (**HCC**) Staff Report;
 - c) Consideration of submissions; and
 - d) Conclusion.
- 3.4** The trees in question have heritage status. Environmental values affected through the removal of the Norfolk Island Pine (HCC Ref:16.2) and the two Magnolia trees (HCC Ref:16.4 and 16.5), can be mitigated through appropriate replacement planting, however, the heritage values attributed to the trees will be lost. Provided the removal of these trees is undertaken by a suitable arboricultural contractor, the potential damage to trees being retained can be managed.
- 3.5** The incursion effects of the building into the trees' rootzones has been assessed in accordance with the Australian Standards to be minor and given the mitigation measures proposed, the likely adverse effects will be within the trees' tolerances.
- 3.6** The pruning of the trees is required to both assist with the installation of the deck and screen structure and to eliminate ongoing conflict. The pruning will be the minimal amount required to achieve the works and remove ongoing permanent conflict. At the time of this report, the full amount of pruning required is not accurately known, however, there will be trimming required to the Norfolk Island Pine's (HCC Ref:16.1) eastern canopy to eliminate conflict with the external screen. Given the robust nature of the trees

and the mitigation measures proposed, it is expected that the trimming will be within the trees' tolerances. However, notwithstanding, the trimming will alter the shape of the trees, in particular the Norfolk Island Pine (HCC Ref:16.1). The extent of the shape alterations will be minimised by removing only what is necessary. Given the nature of the theatre's screen, the shape alteration is likely only to be apparent within the Theatre's complex.

3.7 All work within the rootzone of the trees will adhere to:

- a) The proposed conditions of consent;
- b) Existing tree protection and mitigation measures; and
- c) The TPMP (which will be available to Council's arborist prior to the commencement of works).

The aim is to minimise potential adverse effects on the trees.

4. RELEVANT FACTS AND CONTEXT

4.1 I have relied on plans and a description of the Project set out in the evidence of David Pugh and Tristan Howard. Through the course of the Project development, details have been defined which modify the assessment of potential effects outlined in the initial arboricultural report dated June 2018 that was submitted with the application. Examples of these details include the pile locations and the extent pruning. In terms of my evidence the key aspects of the Project are:

- a) The potential effects on five heritage trees as a result of the Project, which will result in the removal of three trees and retention of two trees; and
- b) The potential effects on the two retained trees as a result of construction activities attributed to the building, deck and external screen structure.

5. ASSESSMENT OF ARBORICULTURAL EFFECTS

5.1 Tree removal

- a) It is proposed to remove two magnolia trees (HCC Ref:16.4 and 16.5) and one Norfolk Island pine (HCC Ref:16.2). The removal of the two magnolia trees is due to the trees growing within the footprint of the proposed building. Without alterations to the building design, these trees will be compromised. Notwithstanding the environmental benefits that the Norfolk Island pine provides in its growing location, it would not be suitable to be retained and incorporated into the development in its current poor, declining condition. Its removal prior to the construction of the building is considered to be appropriate from a health, safety and practical point of view.
- b) All tree removals and works within the site will need to be carried out in a sensitive manner that avoids damage to the trees being retained. The use of specialised equipment to remove the trees, such as a crane, can ensure this outcome. The removals will need to be carried out by a qualified and experienced contractor.
- c) To minimise adverse effects of tree removal, replacement planting of 3 large grade specimens is proposed to be undertaken. The replacement trees will be of a species type that will eventually offset the benefits provided by the trees at the time of their removal. The planting will not replace the heritage values of the trees. However, over time, if the trees are planted in a location that allows them to reach their potential, the environmental benefits will be achieved.

5.2 Root zone alterations for the Theatre building

- a) It is proposed to retain and incorporate a Norfolk Island pine tree (HCC Ref:16.1) and a Bunya bunya tree (HCC Ref:16.3). In accordance with the HCC definition of the protected rootzone, which is calculated by $9 \times \text{Diameter at Breast Height (DBH)}$, the works will encroach into the Root Protection Zone of the two trees, requiring resource consent.
- b) Given the lack of standard guidelines for works near trees in New Zealand, the adoption of the Australian Standard; Protection of trees on development sites

(AS4970) is considered appropriate. The Australian Standard states that incursions into the Tree Protection Zone (TPZ)¹ that are less than 10% are minor. Using a web-based calculator², the incursion of the building, including a 500mm works area, is 7.8% for the Bunya bunya (attached as **Appendix A**) and 9.0% for the Norfolk Island pine (attached as **Appendix B**). Diagrams showing the workings for the TPZ are attached as **Appendix C** in my evidence.

- c) Given the incursion measurement of the building and the mitigating factors, adverse effects on the trees' health and condition, as a result of the encroachment of the theatre into the trees' rootzones, will be minimised and adequately managed.

5.3 Root zone alterations and pruning for the deck and external screen

- a) Aspects of the proposed deck and screen have potential to adversely affect the retained heritage trees. The conflicts include the following:
 - i. Pile locations in proximity to the trees, with at least three being within the trees' driplines and eight being within the trees' rootzones;
 - ii. The excavation method required to achieve the pile holes within the driplines of the trees;
 - iii. The methods required to install the piles when within or near the trees' canopies;
 - iv. The installation of the screen's steel framework and glass;
 - v. The installation of the horizontal struts/beams within the trees' canopies; and
 - vi. The pruning necessary to assist with the structures' installation requirements and the pruning required to avoid ongoing conflict between the structures, in particular the pruning required to the Norfolk Island

¹ The TPZ is calculated by multiplying stem diameter at breast height (DBH) by 12, which in accordance with the Standards is capped at 15m. In this case, the Bunya bunya TPZ has been measured to be 21m (182cm x 12 = 2,184cm) and 16m for the Norfolk Island pine (134cm x 12 = 1,608cm), however in accordance with the Standards their TPZ is capped at 15m.

² <http://www.councilarboriculturevictoria.com.au/incursion-calculator/>

Pine's eastern canopy where there is potential to conflict with the external screen and canopy raising above the deck.

- b) At the time of writing this evidence, the final construction methodology for works within the root zone of the trees has not be finalised, however, a number of methods are available to minimise the impact on the trees as highlighted in Mr Tristan Howard's evidence. In addition, the works will adhere to the recommended conditions of consent (Nos.124-130), the Tree Protection Management Plan (**TPMP**), which is to be produced as part of the conditions of consent and the tree protection and mitigation measures outlined in the initial arborist report that was submitted with the application will also assist to manage the potential effects
- c) My recommended pruning methods and protocols are as follows:
 - i. All pruning will be carried out by a qualified, experienced arborist, in a manner that avoids damage to other heritage trees being retained. The expectation is that all pruning will be the minimal amount required to achieve the works and will only be required within or below the extent of the external screen.
 - ii. A precommencement meeting with the arborist contracted to undertake the pruning, the project manager, works contractors and the appointed arborist will be carried out so that the pruning can be identified prior to the works.
 - iii. It is envisioned that the pruning will be undertaken concurrently with the works so that only branches directly in conflict with the installation of the structure or could contact the structure once installed are removed. Pruning will only be undertaken where all other alternatives have been exhausted. Where possible, the branch will be pruned back to the next sustainable branch union. All trimming will adhere to correct, modern practices.

5.4 Risk of Harm

- a) The installation of the building complex and in particular the deck structure within the dripline of the trees, introduces targets, primarily people in this case, and therefore risks, which will need to be managed. Prior to the opening of the

theatre to the public, the tree owner will need to undertake a risk assessment of the trees and implement risk management strategies, examples such as; regular inspections, cone removal when required, closing areas during extreme weather events, potential overhead fall arrest systems and possible features that discourage people remaining within the target area.

5.5 Post works monitoring

- a) Ongoing monitoring of the trees will need to be undertaken on an annual occurrence by a qualified arborist and routinely by management. The monitoring will ensure that the risk and health of the trees are adequately managed.

6. COMMENTS ON THE COUNCIL STAFF REPORT

- 6.1** In regards to paragraph 236 of the Section 42A Report, council's representative arborist, Mr Grant Sirl, had concerns regarding the dewatering of the site and the potential effects to the trees. On advice from Mr Dan Mills of CMW, which stated:

“any dewatering required will likely be localised and only affect the western portion of the building where the proposed cuts may intercept the perched ground water table. Given the distance from the western edge of the building to the tree in question and considering that only shallow dewatering would be required, we consider the risk to the tree to be low”.

Mr Mills continues:

“...in the permanent case it is acknowledged that any drainage behind the permanent basement walls may cut off a portion of the water supply to the tree. We also note that any surface water that drained towards the tree will be reduced and that direct rainfall to the tree roots will be reduced by the deck area. We

therefore consider a contingency for reduction in water to the tree is recommended for the permanent case”.

The potential adverse effect that Mr Mills has highlighted is proposed to be minimised and mitigated the installation of a bespoke irrigation system that allows rainwater to be distributed within the rootzone of the two trees.

- 6.2** In regards to paragraphs 219 and 220 of the Section 42A Report, Mr Sirl says that the retention of the Norfolk Island Pine (HCC Ref:16.2) would be difficult to justify with the likely excavation work and the introduction of built structures. In addition, the removal of trees Magnolia trees (HCC Ref:16.4 and 16.5) will need to be based on the requirement to achieve a suitable building footprint as there are no arboricultural reasons that warrant their removal. This is also the position of the theatre’s design team.
- 6.3** With reference to paragraph 227 of the Section 42A Report, Mr Sirl stated that the Norfolk Island Pine (HCC Ref:16.1) and bunya bunya (HCC Ref:16.3), are both considered significant examples of the species, worthy of their scheduled status and subsequently the upmost protection. This is also the position of the theatre’s design team. Mr Sirl expressed concern (paragraph 240 Section 42a Report) that there needs to be greater transparency regarding the full scope of works that will occur in the proximity to the trees and also greater engineering details. At the time of writing this evidence, the design plans provide a ‘baseline’ detail on the proposed theatre and deck and screen. However, additional design modifications, such as the relocation of piles to be outside the dripline of the trees, are being developed to further reduce impact on the trees. These design features will be included into the TPMP detailed in the recommended conditions of consent (No.127). It is envisioned that any design changes will further minimise any potential adverse effects as shown in the assessed design.
- 6.4** With regard to paragraph 234 of the Section 42A Report, Mr Sirl states that modifying the structure of a scheduled tree could be detrimental to the visual amenity value of that tree and subsequently a reason why it was scheduled. In response, the pruning will be as minimal as required to accommodate the structures, which is only likely to effect

viewership within the Theatre complex. I agree however that this is likely to affect the form and one of the reasons why the tree has been scheduled.

- 6.5** The recommended conditions of consent appended to the Section 42A Report are acceptable and consistent with modern arboricultural practises.

7. CONSIDERATION OF SUBMISSIONS

- 7.1** Regarding submissions 12, 19, 24 and 25. It is considered that there will be an adverse effect to the heritage values of the site with the removal of the trees. However, notwithstanding these heritage effects, from an arboricultural point of view, as discussed in section 5.1(c), if the replacement trees are chosen for a commensurate mature size and are planted in a location that allows them to reach their potential, the potential adverse effects can be offset.

- 7.2** Submitter 19 has concerns relating to the 'STEM' system for scheduling trees, noting that this system is problematic in terms of protecting trees based on their heritage values. The system used by HCC to evaluate the heritage trees is the Royal New Zealand Institute of Horticulture (**RNZIH**) not the Standard Tree Evaluation Method (**STEM**).

- 7.3** Two submitters have raised concerns with the variances between the HCC evaluation of the three scheduled trees proposed to be removed and the Arborlab Arboricultural Assessment. These submitters also noted that the illuminated screen would affect the normal day / night cycle for birds and wildlife in the area including ruru. In regards to the variances between the tree evaluations, differences in 'scores' can be attributed to the experience and opinion of the assessor and the interpretation of the RNZIH criteria. For example, HCC had the tree size of the Norfolk Island Pines recorded as 4 where the Arborlab assessment had the tree size recorded as a 2. Another example, the HCC evaluation had the occurrence of species for the bunya bunya scored at 4 (rare nationally) whereas the Arborlab assessment has the score at 3 (rare locally). Such subtle differences can have a significant impact on the way RNZIH method is calculated.

In regards to the potential effects on the birds and wildlife as a result of the illuminated screen, I cannot comment as this is outside my field of expertise.

8. CONCLUSION

8.1 In my view, if the conditions of consent, the TPMP, which is to be produced as part of the conditions of consent, mitigation measures previously outlined are adhered to, and that any further changes to the design are based on reducing impacts on the trees then:

- a) Adverse effects on the trees to be retained will be adequately managed – both in terms of the construction effects and the operation of the Theatre facility;
- b) Adverse effects associated with the tree removal will be adequately offset.

Overall, therefore, the effects on trees will be minor, in my opinion.

Jonathan Ray Redfern-Hardisty

1 October 2019

APPENDIX A

Bunya Bunya incursion calculation worksheet Taken from the web-based calculator: (<http://www.councilarboriculturevictoria.com.au/incursion-calculator/>).

Calculate TPZ incursions according to AS4970 (2009) (V.1.0 2012)

See DBH Info See Measurements

Step 1

Enter DBH (cm) at 1.4m above ground level: For SRZ, enter diameter at base (cm), above root flare:

TPZ radius (m)	TPZ Area	Structural Root Zone (m)	SRZ Area (Sq m)
15.0	706.9	4.4	61.8

Step 2

Enter distance from tree to works (m)

Distance from tree to works

A	B
<input type="text" value="8.2"/>	<input type="text" value="10.2"/>

TPZ radius (m)	15.0
TPZ area (Sq m)	706.9
Structural root zone (m)	4.4
% of TPZ lost	78

Change to Incursion Type 1

APPENDIX B

Norfolk Island Pine incursion calculation worksheet. Taken from the web-based calculator: (<http://www.councilarboriculturevictoria.com.au/incursion-calculator/>).

The Norfolk Island Pine requires two forms of incursion calculation, which is added together to make the incursion percentage.

Calculate TPZ incursions according to AS4970 (2009) (V.1.0 2012)

See DBH Info See Measurements

Step 1

Enter DBH (cm) at 1.4m above ground level:

For SRZ, enter diameter at base (cm), above root flare:

TPZ radius (m)	TPZ Area	Structural Root Zone (m)	SRZ Area (Sq m)
15.0	706.9	3.9	48.6

Step 2

Enter distance from tree to works (m):

Distance from tree to works:

TPZ radius (m)	15.0
TPZ area (Sq m)	706.9
Structural root zone (m)	3.9
Distance (m) required from tree to make incursion 10%	10.3
% of TPZ lost	6.0

Calculate TPZ incursions according to AS4970 (2009) (V.1.0 2012)

See DBH Info

See Measurements

Step 1

Enter DBH (cm) at 1.4m above ground level

131

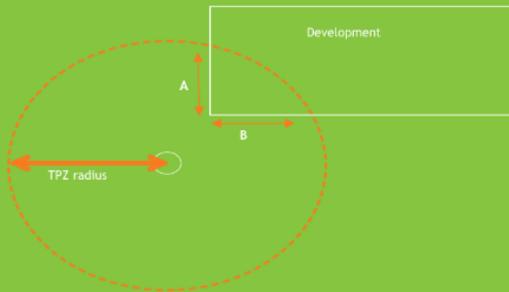
For SRZ, enter diameter at base (cm), above root flare.

151

TPZ radius (m)	TPZ Area	Structural Root Zone (m)	SRZ Area (Sq m)
15.0	706.9	3.9	48.6

Step 2

Enter distance from tree to works (m)



Distance from tree to works

8.4

41

A	B
8.4	41

TPZ radius (m)	15.0
TPZ area (Sq m)	706.9
Structural root zone (m)	3.9
% of TPZ lost	3.0

Change to Incursion Type 1

APPENDIX C

Diagram showing the workings for the TPZ.

Outer ring outlines the 15m TPZ. The inner ring indicates the Structural Root Zone area.

Ref: Screenshot of Jasmx Plan – Overall Floor Plan – Level B2 – Substage, Drawing Number A1-121 Revision J, dated 14/06/2019.

