



NZ-0016

ASPLUNDH

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165564

20 May 2009

Anna Collins
RESERVES PLANNER
New Plymouth District Council
Liardet Street
New Plymouth

Dear Anna

SUBJECT: ARBORIST ASSESSMENT OF IMPACT ON TREES BY PROPOSED CARRIAGE WAY DEVELOPMENT CONSTRUCTION, BROOKLANDS PARK, RACECOURSE ENTRANCE.

On 19 May 2009 Asplundh arborist Bruce MacDonald assessed a group of native trees growing in the vicinity of the existing racecourse access road to Brooklands Park, New Plymouth. The purpose of the assessment is to determine what adverse effects may occur to individual and group trees should a proposed new road be constructed (option A) or the existing road be realigned (option B).

Both options involve significant disturbance to the surrounding vegetation and topography. According to the supplied plans drafted by Bland and Howarth, both options involve the contouring of surrounding ground and major ground level changes within the proximity of some large trees. The proposed designs of the two options also involve the removal of several large and ecologically important trees. Knowing that both options involve removal of large scale trees and ground level changes affecting the root zones of certain trees, emphasis of this assessment was placed on the less damaging option of the more valuable trees in the area of development. This included consideration towards health and stability of effected trees retained onsite, and possible exposure to increased wind loading.

This report is based on observations made at the time of inspection and follows recognised Visual Tree Assessment (VTA) guidelines endorsed by the International Society of Arboriculture.

Please contact me direct if you have any queries regarding this report.

Kind regards

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Site Description

The area of the proposed development is located within the eastern fringe of Brooklands Park near the Taranaki Jockey Club stables. The site consists of native trees of varying ages and size growing on a sloping hillside that is west facing. The dominant trees within this area are;

- Kohekohe, *Dysoxylum spectabile*
- Puriri, *Vitex lucens*
- Kamahi, *Weinmannia racemosa*
- Puketea, *Laurelia novae-zelandiae*
- Kauri, *Agathis australis*

There is a healthy population of varying under-storey species typical of native bush. The upper canopy of the large specimens contain an abundance of epiphytes including *Astelia sp.* *Griselinia sp.* *Asplenium sp.* It is likely there are orchid species, among other inconspicuous perching plants found within these trees.

The prevailing wind direction in this part of New Plymouth is from the west-south-west. This is not only evident from meteorological records, but can also be seen physically by the sculpting effects of tree canopies, particularly the sloping canopy of beech trees and the 'stag horn' look on the windward side of puriri.

- ***The impact of removing identified trees as part of option 1, including any possible wind effect on the puriri and other remaining trees.***

The removal of the trees identified in the Bland and Howarth plan Option 1 will have an impact on the trees that are to be retained. The degree of impact on the affected trees is considered minimal due to the uncommon easterly winds (non-prevailing). However, strong gusty winds from an easterly direction may result in wind damage to the retained trees. Generally, strong winds from the east will cause more tree failures (structural or root plate failure) than an equivalent strength wind from the west (prevailing quarter) due to trees not optimising to wind loading on the east side. Trees will strengthen by creating extra reaction wood to stresses caused by the likes of wind and gravitational forces. Trees sense structural stress and attempt to minimise failures through reactive growth by growing extra wood to strengthen weak areas. Trees modify their structure over time as they are challenged by wind (*Coder*). Trees are biologically designed to withstand average wind loads, however it is widely accepted in arboriculture, that failure is most likely when wind speeds exceed 4 ½ times the average annual wind speed. Strong easterly winds are not common but can be expected a couple of times a year.



Image 1. View of trees growing on the east side of proposed roads. Most of these trees are identified for removal in Option 1. Looking west from racecourse near pony club building

- *The impact of removing identified trees as part of option 2, particularly to create the batter to the south, and again any possible wind impact on the puriri and others as mentioned in the Bland and Howarth letter dated 30 April 2009 (appendices).*

The removal of trees identified in the Bland and Howarth plan Option 2 will have a moderate affect on the large puriri and surrounding trees. According to the plan drafted in Option 2, the existing road will require realignment and ground contouring within the drip line of the puriri and a bottom fill batter that is approximately 15 meters (horizontal) from the existing top edge of the road. This fill and batter will result in the removal of a large portion of very tall kamahi that is growing down hill from the puriri. This stand of kamahi has developed a large canopy that absorbs much of the loading forces from the prevailing wind. Although the kamahi canopy is 2 - 6 meters below the puriri canopy, it is a significant buffer that deflects and absorbs much of the winds energy lessening the winds effects on the puriri.

Removing this stand of kamahi will expose the puriri to greater wind force. The effects of the greater wind forces on the puriri are not likely to result in large part failure, however a detrimental effect on the health and enhanced defoliation on the prevailing wind side of the tree is likely.



Image 2. This image shows the close proximity of the kamahi canopies growing near the single puriri canopy. Looking south from racecourse announcers box.



Image 3. The top of the puriri is clearly dominant above neighbouring trees. Looking south from Scanlon lookout.

With reference to my earlier report dated 21 April 2009, it must be emphasised that any disturbance to the current ground level within the drip line of the large puriri will result in health decline of this tree. Puriri are known to have very sensitive root systems and any damage to the roots maybe irreversible, especially if the existing road material is to be uplifted and ground level lowered and/or compacted.

- ***The potential to relocate the rimu and the kauri marked on option 1.***

The young rimu and kauri that are approximately ten years old, could survive relocation if the transplant operation is carried out in-line with best practice. To achieve highest likelihood of survival, the operation will require excavation and lifting machinery along with supervision from persons with qualified arboricultural expertise in transplanting large trees.

Conclusion

Both options 1 and 2 are not without ecological impact to the area of development. Damage to trees is unavoidable by construction of both the proposed new or realigned roads, and by later environmental effects such as exposure to wind damage. Having explored the advantages and disadvantages of both options from an arboricultural view, I consider option 1 to be the best alternative to achieve the desired outcome of enabling large vehicle access to the Bowl of Brooklands with the least damage to, and potential removal of significant trees.

Option 1 involves the removal of several large native species above the large puriri and the relocation of juvenile kauri and rimu. The removal of a large kohekohe will also be necessary to construct the road cutting down to the existing road. The sacrifice of these trees is less significant than the potential loss of a very old and iconic puriri, and the removal of the large stand of tall kamahi to cater for the batter and fill as outlined in Option 2.