Riccarton Road Upgrade
Landscape Effects Assessment

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Prepared by

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Introduction

It is proposed that Riccarton Road is to be widened, and is to have a shared path developed to better provide for the existing use of the road and for it to be used as an arterial link. This report provides an assessment of the existing landscape character and values, and the effects of the proposed upgrading works on these. It is structured as follows:

- Landscape character
- Landscape values
- Landscape effects of the proposed works
- Landscape mitigation measures
- Amenity effects on adjacent properties
- Other road design options
- Public policy assessment
- Conclusion

Landscape character

Riccarton Road runs more or less north – south in a straight alignment along the western side of Mosgiel. It intersects with State Highway 87 in the north and State Highway 1 in the south. Its landscape context is the northern Taieri plain and the topography is flat. Figure 1 illustrates its location.

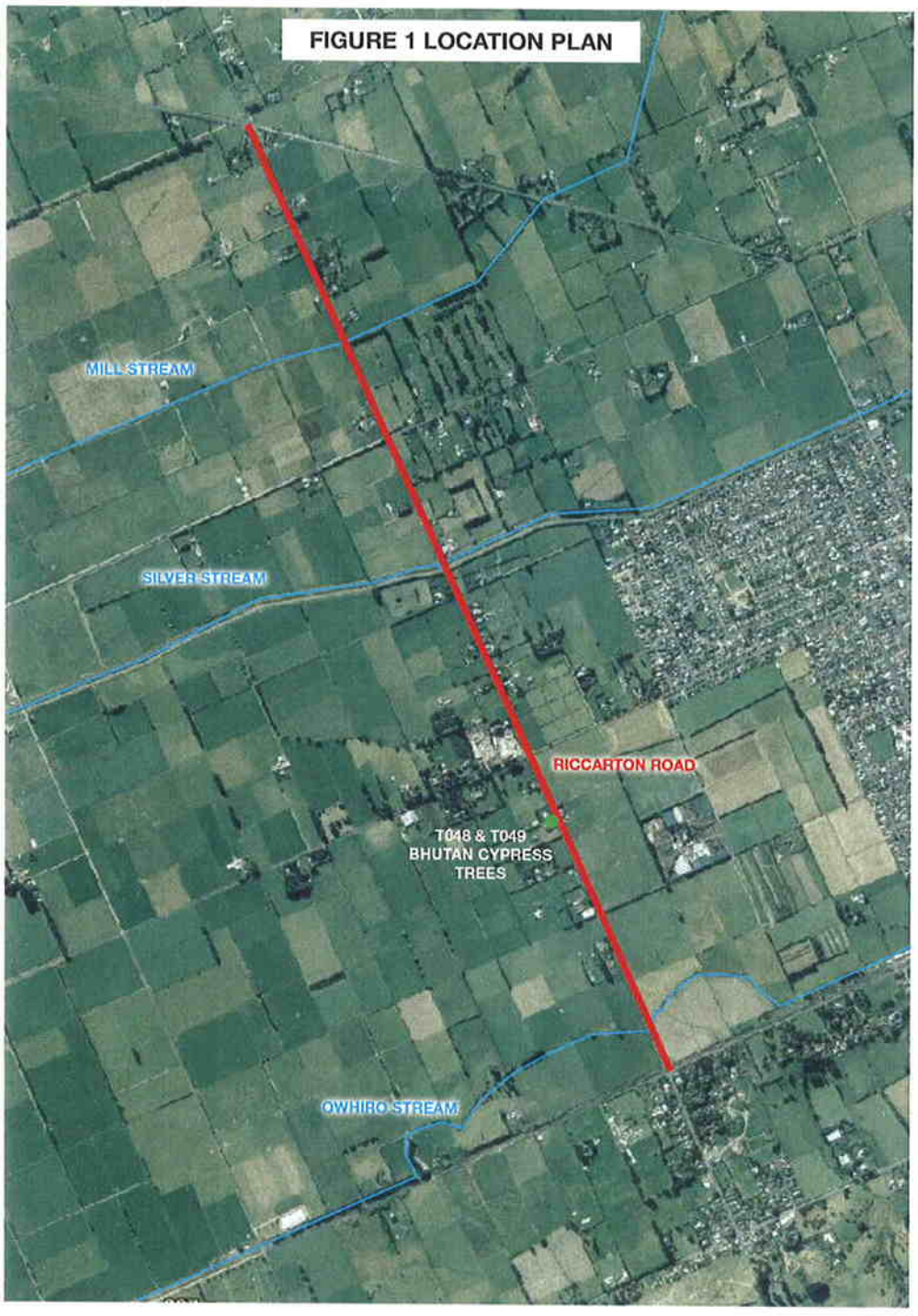
Riccarton Road crosses three streams along its route. These are Mill Stream, Silver Stream and Owhiro Stream. The natural character of all these waterways has been severely modified by channeling and the construction of stopbanks. The road rises to a crest at the Silver Stream bridge.

The landscape through which the road traverses is rural in character and relatively densely settled. In general, houses are located in close proximity to the road with relatively large open areas beyond. Predominantly exotic shelter and amenity plantings of varying composition and character associated with the buildings have a significant visual impact on the road environment.

The landscape pattern is defined by a geometric grid of the roads and associated ditches, fences and shelter plantings. Hedges are important roadside elements along much of the length. Characteristic hedge species present include Macrocarpa, Gorse, Hawthorn and Holly. There are four crossroad intersections along the length of road in question.

The typical profile of the road is illustrated in Appendix A. This includes a sealed width of between 5.5 and 6.5m, consisting of two lanes and no sealed shoulders. There are typically drainage ditches on either side and in places these are of significant depth. A

power line runs along the eastern side of the road. Figures 2 - 4 illustrate the landscape character.



Landscape values

Road users perspective

The landscape that Riccarton Road traverses is an intensively modified working rural environment in which cultural elements predominate over natural. Aesthetic quality is variable along the road. In my assessment visual amenity is highest where the following elements are found:

- The presence of attractive trees of significant scale in various places along the road sides. The most important of these are identified in Schedule 25.3 in the Dunedin City District Plan and include:
  - Two Bhutan cypress trees at 119 Riccarton Road
  - One Willow at 193 Riccarton Road (not located close to the road)

- The presence of attractive houses and farm buildings.

- The presence of well maintained hedgerows along the road boundary that help to define the road space and reinforce the dominant landscape lineal grid pattern.

As a general comment, the level of enclosure created by the hedges is an important factor influencing landscape quality along the roads. In my assessment, amenity is greatest where there are moderate levels of enclosure created by hedges that are well maintained and not too high and dense.

Visual amenity is adversely affected where the following elements are present:

- Clutter created by poles and overhead wires
- Over-enclosure created by high dense hedges and shelter plantings close to the road boundary
- Insufficient screening, softening and setting for buildings close to the road by plantings.

Adjacent resident's perspective

People living along Riccarton Road enjoy the amenity benefits of the rural environment including plenty of open space. The roadside plantings play an important role in defining and enhancing the landscape as viewed from the road, but they also have important functions that are wider than just visual, for the residents living adjacent. These include the provision of shelter, privacy and setting.

Figure 2 : Riccarton Road crossing Owhiro Stream defined by gorse hedges.

Figure 3: The protected Bhutan Cypress trees at 119 Riccarton Road, the barn across the road and the well maintained hedges are elements that enhance the landscape

Figure 4 : Riccarton Rd looking south-east. The plantings on the left side provide strong separation between the road and houses whilst those on the right provide a much weaker buffer.

Landscape effects of the proposed works

Presently, Riccarton Road is characterized by an approximately 6.5m sealed carriageway with minimal berm areas and often deep ditches either side as illustrated in the typical cross sections included in Appendix A.

Various design options have been considered for the road upgrading works aimed at achieving the required operational and safety objectives as well as minimizing adverse environmental effects. The preferred option, now proposed, is Option 4B. This is shown in the engineering plans and typical cross sections are illustrated in Appendix A. Key elements of the proposed upgrade are as follows:

- An 8.5m wide carriageway including 0.75m sealed shoulders on both sides of the road.
- A gravel feathered edge of varying width on the eastern side as a buffer between the carriageway and the ditches
- A 1.25m gravel feathered edge on the western side as a buffer between the carriageway and a 3.0m wide gravel shared footpath

The current road reserve width varies from approximately 10 – 18.4m. Up to approximately 13m of additional width is required to be designated for roading purposes to create a legal road width of between 18 and 30m. This is mainly, though not entirely, on the western side of the road.

The proposed design option has adopted an alignment that meanders subtly to minimize disruption to adjacent residential amenity values and rural shelter as much as possible. It is unavoidable however that there will be substantial change to the road landscape and in some areas significant effects on the landscape of adjoining properties. The key implications are as follows:

- In places, hedges and other plantings will have to be removed and fences relocated. This will open up the landscape; at least until replacement vegetation is well established.

- An altered landscape character from within the road reserve due to the wider road space and carriageway. The current narrow country lane character will be less strongly expressed.

- In some places the distance from the road boundary to dwellings will be reduced and trees and shrubs that provide the garden setting, shelter and privacy for these dwellings will be removed or reduced. This has implications for the amenity of these properties. These effects are discussed in more detail bellow.

Two significant Bhutan Cypress trees listed in Schedule 25.3 in the Dunedin City district Plan, located at 119 Riccarton Rd will be retained by weaving the shared path around their western side. This provides for two important landscape elements to remain whilst avoiding adversely affecting an attractive barn and associated plantings on the opposite side of the road. It does mean however that additional designated road width is required at this point with the associated impacts on the private properties at 119 and 117 Riccarton Rd.

An arborists report (by David Glenn) is attached to this report in Appendix B confirming that the proposed path is compatible with the continued health and vitality of the trees as long as it is appropriately designed and constructed. This will involve constructing the path largely on the surface to avoid major root damage, and the use of permeable materials.

Landscape mitigation measures

As discussed, the design approach adopted has sought to avoid creating adverse effects but there will still be adverse impacts on the landscape associated with the development that should be mitigated wherever possible. These are primarily to do with loss of existing vegetation that create enclosure and define the road environment, and create setting, buffer, shelter and privacy for dwellings on adjacent properties.

The trees and hedges to be affected are almost entirely within private properties now, and maintained and controlled by the adjacent landowners. It is appropriate that this situation continues and to this end, Council intends to provide for reasonable replacement

plantings according to the wishes of the affected landowners. Consultation has already commenced and agreements in principle regarding landscape mitigation have been reached with some landowners. It is intended that this consultation continues, to address the concerns of all property owners affected.

Ideally, planting of hedges and trees to replace those that will have to be removed should be undertaken as soon as possible to provide for maximum growth and impact before the effects of removal of the existing vegetation is felt. Where appropriate, relocation of existing plants is also an option to consider. In general however, replanting rather than transplanting of hedges is likely to be the most practicable approach.

The species to be replanted will be the landowner's choice but Table 1 lists species that are either characteristic in the area now or promoted as suitable hedging / hedgerow options in terms of ecological function (i.e. bird food sources, or appropriateness to indigenous biodiversity). Indicative growth rates are also given. Replanting provides an opportunity to enhance the landscape both visually and ecologically by the use of locally appropriate species and to replace pest species such as gorse.

Table 1: Possible hedging species

Species	Bird food source	Indigenous local biodiversity function	Appropriate to existing cultural landscape character	Indicative growth rate / yr
Aristotelia serrata hybrid (Wineberry)	√			500mm
Coprosma lucida (Karamu)	√	√		300mm
Coprosma rugosa		√		400mm
Coprosma virescens		√		400mm
Cortaderia richardii (Toetoe)		√	√	1m
Crataegus monogyna (Hawthorn)	√		√	500mm
Cupressocyparis leylandii (Leyland Cypress)			√	800mm
Cupressus macrocarpa (Macrocarpa)			√	600mm
Griselinia littoralis (Broadleaf)	√	√		300mm
Ilex sp (Holly)	√		√	200mm
Kunzea ericoides (Kanuka)		√		400mm
Olearia dartonii				800mm
Olearia paniculata (Akiraho)				500mm
Phormium tenax (Flax)	√	√		500mm
Pittosporum eugenioides (Lemonwood)	√	√		400mm
Pittosporum tenuifolium (Kohuhu)	√	√		400mm

Amenity effects on adjacent residential environments

The significance of impacts on the residential environments within private properties adjacent to the road will depend on the values and expectations of their owners and residents, and is best commented on by them. It is possible however, to describe the

changes that will be required and to comment on possible mitigation measures including how effective these might be in terms of restoring setting, shelter and privacy. Table 2, provides a brief assessment on a property by property basis. Only those properties where dwellings are located within 200m of the road have been included in this assessment as beyond this, any prospect of adverse effects is considered remote.

Table 2: Assessment of impacts on residential environments

Impact is assessed in terms of the following terms

- Minimal – no mitigation required
- Minor - adverse effects able to effectively mitigated in the medium term (approx 5 years) – assuming early replanting of hedges etc.
- Significant – adverse effects unable to be mitigated entirely. Long term impacts on amenity.

Property #	**Description of impact**	**Possible mitigation measures / effectiveness**
51 Riccarton Rd	Minimal impacts. No encroachment into property. Existing buffering vegetation remains.	None required
57 Riccarton Rd	Minimal impacts. No encroachment into property. Existing buffering vegetation remains.	None required
77 Riccarton Rd	Minimal impacts, Very minor encroachment into property. Existing buffering vegetation remains.	None required
89 Riccarton Rd	Minimal impacts, No encroachment into property. Existing buffering vegetation remains.	None required
95 Riccarton Rd	Minor impacts. No encroachment into property. Dwelling approx 120m from road. Loss of hedge along approx half of frontage.	Replacement hedge planting as early as possible will provide for effective mitigation.
114 Riccarton Rd	Minimal impacts and no encroachment in the immediate vicinity of dwelling. Existing buffering vegetation and barn remains. Hedging either side of dwelling will be removed.	Replacement hedge planting as early as possible will provide for effective mitigation.
117 Riccarton Rd	Minor impacts. Dwelling approx 100m from road. Loss of hedge along frontage. Encroachment of shared path into farm yard area. Realignment of driveway access required.	Replacement hedge planting as early as possible and tree planting as discussed with owners will provide for effective mitigation.
119 Riccarton Rd	Significant impacts. Shared path encroaches significantly into front garden. Loss of some buffering	Replacement hedge or other garden plantings as early as possible will effectively mitigate privacy effects. Garden spaciousness will be

	vegetation to accommodate retention of Bhutan Cypress trees.	permanently reduced but the large trees providing setting will remain.
199 Bush Rd	Minor impacts. No encroachment into property. Loss of hedge on frontage as currently shown. Other garden buffering planting remains	Additional screening garden shrubs or hedging, planted as early as possible will provide for effective mitigation.
157 Riccarton Rd	Significant impacts. Shared path and drain encroaches significantly into property and front garden. Loss of some buffering vegetation including trees that enhance setting.	Replacement hedge or other garden plantings as early as possible will effectively mitigate privacy effects. Garden spaciousness, including room for larger trees, will be permanently reduced.
164 Riccarton Rd	Minor impacts. Realignment of driveway access required. Encroachment into property and loss of some trees on frontage.	Hedge, tree and shrub planting as early as possible will provide for effective mitigation and enhanced buffering of the dwelling and garden.
170 Riccarton Rd	Minor impacts. New driveway access, including replacement hedging agreed in principle with Council.	Replacement hedging associated with relocated driveway planted as early as possible will provide for effective mitigation.
177 Riccarton Rd	Significant Impacts. Significant encroachment into property and front garden. Loss of some buffering vegetation including mature trees providing setting.	Replacement hedge or other garden plantings as early as possible will effectively mitigate privacy effects. Garden spaciousness, including room for larger trees, will be permanently reduced.
178 Riccarton Rd	Minimal impacts, No encroachment into property. Existing buffering vegetation remains.	None required
182 Riccarton Rd	Minimal impacts. No encroachment into property. Existing buffering vegetation remains.	None required
186 Riccarton Rd	Minimal impacts. No encroachment into property. Existing buffering vegetation remains.	None required
192 Riccarton Rd	Minimal impacts. No encroachment into property. Existing buffering vegetation remains.	None required
193 Riccarton Rd	Significant impacts. Significant encroachment into property and front garden. Loss of some buffering vegetation including mature trees providing setting.	Replacement garden plantings or establishment of hedging as early as possible will effectively mitigate privacy effects. Garden spaciousness, including room for larger trees, will be permanently reduced.
204 Riccarton Rd	Minimal impacts. No encroachment into property. Existing buffering vegetation remains.	None required
208	Minimal impacts. No encroachment into	None required

Riccarton Rd	property. Existing buffering vegetation remains.	
214 Riccarton Rd	Minor impacts. Hedge adjacent to road to be removed but effects will be minimal as significant buffering vegetation remains. Dwelling approx 90m from road.	Replacement hedge planting as early as possible will effectively mitigate any adverse effects.
215 Riccarton Rd	Minor impacts. Encroachment into property and front yard but dwelling is over 50m from the road. The hedge providing the primary buffer will be removed. Significant plantings and garden space still remain.	Replacement hedge or other garden plantings planting as early as possible will effectively mitigate any adverse effects.
240 Riccarton Rd	Minimal impacts. No encroachment into property. Existing buffering vegetation.	None required
248 Riccarton Rd	Minimal impacts. No encroachment into property. Existing buffering vegetation.	None required
255 Riccarton Rd	Minor impacts. Boundary encroachment has minor impact on plantings by road. Garden framework remains largely intact.	Replacement plantings as required will effectively mitigate any adverse effects.
264 Riccarton Rd	Minor impact. No property encroachment in the vicinity of the dwelling. Buffer plantings adjacent to dwelling remain unaffected. Boundary plantings to the north will be removed.	Replacement plantings as early as possible will effectively mitigate any adverse effects.
169 Dukes Rd South	Minimal impact. No frontage to Riccarton Rd. No loss of primary buffering vegetation.	None required.
162 Dukes Rd South	Minor impact. Dwelling over 100m from Riccarton Rd. Hedge adjacent to Riccarton Rd removed but no loss of primary buffering vegetation around house	Replacement hedge plantings as early as possible will effectively mitigate any adverse effects.
293 Riccarton Rd	Significant impacts. Significant property encroachment affects front garden. Loss of some generally low buffering vegetation.	Replacement plantings as early as possible will effectively mitigate any adverse effects but garden spaciousness will be permanently reduced.
293 (second house) Riccarton Rd	Minor impacts. Property encroachment but this second dwelling on the property already has planting establishing behind the proposed boundary.	None required.
334 Riccarton Rd	Minimal impacts. No property encroachment. Existing buffering vegetation remains.	None required

328 Riccarton Rd West	Minimal impacts. No property encroachment. No boundary vegetation affected.	None required
345 Riccarton Rd West	Minor impacts. Encroachment by road, path and drain will require modifications to the existing driveway but plantings are yet established.	Plantings can be established as required to tie in with the new driveway layout.
350 Riccarton Rd	Minimal impacts. No property encroachment. Existing buffering vegetation remains.	None required
356 Riccarton Rd	Minimal impacts. No property encroachment. Existing buffering vegetation remains.	None required
362 Riccarton Rd	Minimal impacts. No property encroachment. Existing buffering vegetation remains.	None required
371 Riccarton Rd	Minor impacts. Property encroachment with the loss of a few trees. Primary buffer planting however is nearer the house and unaffected.	Replacement plantings as required will effectively mitigate any adverse effects.
389 Riccarton Rd	Minor impacts. Property encroachment with the loss of a low hedge. Primary buffer planting however is nearer the house and unaffected.	Replacement hedge plantings as required will effectively mitigate any adverse effects.
413 Riccarton Rd	Minimal impacts. Property encroachment but the dwelling is approx 95m from the road and buffer plantings are unaffected.	None required.
219 Outram – Mosgiel Rd	Minimal impacts. No property encroachment. Existing buffering vegetation remains.	None required
424 Riccarton Rd	Minimal impacts. No property encroachment. Existing sheds and hedges remain.	None required.

Other road design options

A number of road upgrading options have been developed and considered. Those for which concept plans were prepared are Options 3, 4B, 4C, 5 and 6.

Option 3 adopted a completely straight alignment with widening on the western side. Whilst it largely avoided impacts on the eastern side of the road, it had significant impacts on the western side with large encroachments into private properties close to

dwellings and substantial removal of trees and hedges, including the listed Bhutan Cypress trees. It was therefore discounted at an early stage.

Options 4B, 4C, 5 and 6 adopted a more sophisticated approach and all provide for a subtly meandering alignment to avoid effects on adjacent residences as much as possible. The key difference in terms of their landscape implications is that Options 5 and 6 require the removal of the two listed Bhutan Cypress trees. Given the visual and horticultural significance of these trees, Options 5 and 6 have major disadvantages from the point of view of visual / landscape effects.

Public policy assessment

The area is zoned Rural in the Dunedin City District Plan. There is no Landscape Management Area overlay but two significant trees listed in Schedule 25.3 are located close to the road. These are T048 and T049 – both Bhutan Cypresses (Cupressus corneyana).

Landscape relevant objectives and policies in the District Plan are Objective 6.2.2, and Policies 6.3.5 and 20.3.1. Essentially these seek to maintain or enhance the amenity values associated with rural character. Key elements of rural character are listed and include:

(a) a predominance of natural features over human made features
(b) high ratio of open space relative to the built environment
(g) generally unsealed roads
(h) absence of urban infrastructure

Road upgrading involving widening of the sealed carriageway and removal of hedges and other plantings will adversely affect the naturalness and landscape amenity values in the rural environment to some extent. It is my assessment however that in general these adverse effects are not particularly significant for the following reasons:

- The identified significant trees are protected in the design.

- In terms of the public environment, whilst the existing landscape character is pleasant enough, it has no values of recognized significance (with the exception of the listed trees).

- Hedges and trees removed for the works can be replaced and the existing character in terms of the amount of impact provided by trees and hedges is likely to recover in the medium term.

- Rural environments include arterial roads of significant width and the upgraded road will still be compatible with rural character i.e. no kerb and channel and gravel surfacing to the shared path.

Effects on the rural amenity values as experienced from the residential environments adjacent to the road resulting from the upgrading works will vary from minimal to significant depending on the location and the degree of change involved. Of the 41 properties with dwellings within 200m of the road, I have assessed the impacts associated with road upgrading as likely to be minimal in 22 cases, minor (as long as mitigation plantings are established well in advance of road works commencing) in 14 cases, and significant (i.e. unable to be fully mitigated) in 5 cases.

Conclusion

In general, the landscape values along Riccarton Road are not of particular or recognized significance. The area is a pleasant, but highly modified rural environment, relatively densely settled, and enhanced by garden and shelter plantings. The exception to this is the two trees listed as 'Significant Trees' in Schedule 25.3 of the Dunedin City District Plan.

The proposed upgrading has been designed to avoid adverse effects on the plantings and living environments of the adjacent properties as much as possible by gently meandering the alignment along the length of the road. The design also provides for the retention and protection of the two listed Bhutan Cypress trees.

Despite this, there will unavoidably be adverse effects on visual amenity and rural landscape character. From the perspective of the road user these will be largely associated with loss of enclosing vegetation in the short term, and the narrow country lane character. These effects are likely to be quite significant initially, unless replacement planting is established early and allowed time to mature to some extent prior to works proceeding. In the medium – long term new boundary plantings will establish and a new landscape structure will evolve that is likely to be similar to the existing, but with a less intimate scale.

The level of adverse impact on the landscape amenity of the residential environments within adjacent properties will generally be low, as long as replacement plantings for those that will be affected by the road works, acceptable to the landowners, are planted as early as possible. This will provide for establishment and growth before the road works commence. In a small number of cases adverse impacts will not be able to be fully mitigated.

Mike Moore
NZILA Registered Landscape Architect

Appendix A : Arborists Report – Bhutan Cypress Trees

Mike Moore
P O Box 5076
Dunedin
20.06.08

Dear Mike,

Re Bhutan Cypress trees, Riccarton Road Mosgiel.

Executive summary

Both of these mature Cypress trees are excellent specimens of similar age and similar condition and should be protected from the road development pressure.

The trees have adapted to having the road on one side of them and if no deep disturbance of the sub-base is undertaken then any impact on the trees should be minimal. Likewise, the installation of the bridal path should be able to be completed with minimal impact on the trees.

Report

Both of these mature Cypress trees are of similar age and similar condition. The Trees botanical name is Cupressus cashmeriana or Kashmir Cypress. Buhtan cypress are a species native to the eastern Himalayas in Bhutan and adjacent areas of Arunachal Pradesh in northeastern India. They commonly grow at moderately high altitudes of 1250-2800 m. They are a medium-sized - large coniferous tree growing to 20-45 m tall, rarely much more, with a trunk up to 3 m diameter. The foliage grows in strongly pendulous sprays of blue-green, very slender, flattened shoots. Bhutan Cypress is a relatively uncommon exotic tree in New Zealand.

The two trees in Riccarton Road, Mosgiel are in very good condition given their evident lack of maintenance over the years. Both Trees are on the district plan as notable features of the landscape and both trees rightly deserve to be there.

I have evaluated the trees using STEM, and both trees score 267 as they are almost identical in size shape and condition. They maybe entitled to a higher score depending on any historical features that may be attributed to them, that I am not currently aware of.

The critical area required for the protection of the trees extends to at least the drip line of the crown of the trees.

The crowns of the trees have considerable amounts of dead wood within them, which has accumulated over time, and is completely normal.
Ideally, the trees should receive some overdue remedial pruning at the time of any root disturbance, in the form of minor thinning of the crown and removal of dead and diseased wood.

Cypress of this kind are not noted for a deep root structure and generally have a spreading surface root system. The road predates the trees and therefore the roots have adapted to this in their spread. Excavating the road sub base or excavating between the road and the tree base would directly impact the root system and subsequently the health of the trees.

If the proposed bridal path is put on the opposite side of the trees from the road, care will need to be taken to avoid excavating as this side will be the most vulnerable to any disturbance. The bridal path would need to be installed by the careful removal of the top 100mm (max) of topsoil prior to the base of the path being installed. Essentially the path should be constructed on top of the ground rather than dug in.

The trees across the road (a Willow and a Eucalyptus) also form part of the larger landscape setting of the area. There is room for the road to be extended towards these trees, as they have considerably more robust root systems than the Bhutan cypress and would subsequently be able to withstand the development pressure better.

If I can be of any further assistance please contact me.

Yours Sincerely

D. Glenn

David Glenn.

Mike Moore
PO Box 5076
Dunedin
29.06.08

Dear Mike

Re Bhutan Cypress trees, Riccarton Road, Mosgiel - Additional questions.

There is almost no possibility of successfully moving these trees. The main reason being their sheer size coupled with their age. Although in a purely technical sense moving them could be attempted, the reality is that this would almost certainly be a fatal option for the trees. Cypress are known to have a root system that is easily affected by disturbance of the kind caused by relocating and although I have not seen Bhutan Cypress moved before, I have every reason to suspect that they will not survive if they are moved.

With regard to excavating, I have noted that the critical area is the drip line of the trees. This is the area up to and including, the fullest extent (reach) of the branches (see appendix 1).

Due to the compaction caused by the road, the root activity on the road side will be the least affected. This does not mean that there are no roots there, but rather that the roots will be driven down by the existing road. The safe excavating depth will be directly related to the existing road construction depth. No excavation should go beyond a depth were sizable roots (over 25mm) are being broken. This I suspect will occur beyond 300 - 500mm.

For the bridal path, my preference would be for a formed path over a boardwalk. The side of the trees furthest from the road has the area of most vulnerable roots and also contains the largest root area. I would suggest a disturbance of no more than 100mm on this side and the use of geo fabric as suggested. If the pathway is constructed in gravel or similar, then the moisture will move through the material. Again, if during excavation, roots are being disturbed over 25mm, then excavation should cease and the path should be raised. On the property side of the tree, the track should be at least two meters from the trunk.

If I can be of any further assistance please contact me.

Yours Sincerely

D. Glenn

David Glenn.

Appendix I: Traffic Assessment