

Appendix Y

Arborists report



16 June 2015

Arboricultural Report

Papanui Parallel Major Cycleway Grassmere to Sawyers Arms Christchurch



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MERIVALE

CHRISTCHURCH

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1.0 Executive Summary

This report was commissioned by Brendan Bisley, Project Manager, Transport Rebuild Unit, Christchurch City Council. The report provides information relating to the removal of trees and shrubs and works within the vicinity of trees and shrubs required for the Grassmere Street section of the Papanui Parallel Major Cycleway.

Based upon the design (pan reference: 1037/10 – Sheets 07 to 13), the project involves the creation of a cycleway link along Grassmere Street between Rutland Reserve and Sawyers Arms Road. The project will involve works along the following route:

- The southern side of Sawyers Arms Road, into the western side of Main North Road;
- A road crossing, across Main North Road and into the northern side of Grassmere Street; and,
- Along the northern side of Grassmere Street to the intersection of Grants Road.

A tree survey was carried out (April 2015) along the route to quantify the potential effects of the proposed works on trees and shrubs (refer Appendix 1 of this report for tree and shrub details, and Appendix 2 for locations). The route was predetermined prior to the arboricultural assessment. The condition of trees and shrubs were evaluated using the Christchurch City Council tree assessment system. At the time of the survey and based upon the proposed design, the potential effects include the following:

- The removal of two (2) street trees located in central median islands;
- The removal of eighteen (18) trees within the road corridor, on a private property frontage;
- The purchasing of land, and the removal of twenty-eight (28) trees/shrubs within this land;
- The retention, protection and clearance pruning of eight (8) trees/shrubs located on private property.

The quantities listed above are based upon the initial concept design which may be subject to change. Also, it may not be possible to retain all of the trees that will be within the vicinity of the new cycleway (e.g. if significant changes to ground levels are required). Due to changes in levels and the close proximity of the proposed works to a *Cupressus macrocarpa* tree at 45 Grassmere Street, detailed design and tree protection measures may be required if the tree is to be retained. Also, it may be possible to retain more trees if the proposed alignment was changed or the width of the cycleway narrowed to provide more distance from trees, such as the trees on the frontage of 41 Grassmere Street.

Based upon the design, where the works are to occur within the root protection zone of trees and shrubs that are retained it is expected that the majority of these trees and shrubs can be successfully protected from construction related damage through the implementation of on site tree protection measures during the works, such as outlined in the Council's Construction Standard Specifications (CSS), Part 1, 19.0: protection of natural assets and habitats.

It is expected that replacement trees and landscape planting will occur as mitigation for the tree removals. Initial investigations indicate that it may be possible to plant fourteen (14) street trees in Grassmere Street as part of the cycleway project, including eleven (11) Field Maple (*Acer campestre*) and five (5) Small-leaved Lime (*Tilia cordata*). The final quantity of the street trees and planting locations will be subject to the requirements of the final design, utility service checks, resident consultation and consultation with the Council arborist responsible for managing the street tree asset.

2.0 Site and Tree Details

In the section of Grassmere Street between Main North Road and 29 Grassmere Street, the majority of cycleway is to be constructed within the existing road carriageway, and the *Acer palmatum* Senkaki street trees at the western end of the street will not be affected by the works.

A street garden will be modified; located in Grassmere Street outside 96 Main North Road.

The two (2) street trees in the median islands outside 29 Grassmere Street (shown in Figure 1) will require removal to allow for the carriageway to be widened on the southern side of the street and a road crossing to be constructed.



Figure 1: Median islands to be modified.

The cycleway will be constructed within the roadside berm area on the northern side of the street, which is expected to result in the removal of eighteen (18) trees on the frontage of 43 Grassmere Street. These trees appear to be on CCC land but resident planted (shown in Figure 2).



Figure 2: Trees on CCC land, 41 Grassmere St.

There is also one (1) tree located within 41 Grassmere Street that will require removal due to the close proximity to the works, and four (4) trees within 31, 41 and 43 Grassmere Street that will require works within their vicinity and clearance pruning.

Within 45 Grassmere Street there are twenty-eight (28) trees and shrubs that will to require removal, and four (4) trees and shrubs will require works within their vicinity (shown in Figure 3).

Due to changes in levels and the close proximity of the proposed works to a *Cupressus macrocarpa* tree at 45 Grassmere Street, detailed design and tree protection measures may be required if the tree is to be retained (such as retaining wall construction).

Clearance pruning of trees and shrubs that are retained within the vicinity of the cycleway will also be required.



Figure 3: Trees and shrubs, 45 Grassmere St.

3.0 Tree and Shrub Removals

3.1 Trees on CCC Land

Based upon the design, the following trees will be within the line of works, or within close proximity of the cycleway, and are expected to require removal; including two (2) street trees and a row of eighteen (18) trees that appear to be on CCC land and resident planted.

Tree ID	Address	Species	Condition
119104	29 Grassmere Street (median strip)	<i>Ulmus parvifolia</i>	Good
119103	29 Grassmere Street (median strip)	<i>Ulmus parvifolia</i>	Good
Nil	41 Grassmere Street	<i>Picea abies</i> (x 14 trees)	Fair
Nil	41 Grassmere Street	<i>Metasequoia glyptostroboides</i> (x 4 trees)	Fair

Note: it may be possible to retain more trees if the proposed alignment was changed or the width of the cycleway narrowed to provide more distance from trees, such as the trees on the frontage of 41 Grassmere Street.

3.2 Trees and Shrubs on Private Land

The following trees and shrubs are currently on private property. Based upon the design, these trees and shrubs will be within the line of works, or within close proximity of the cycleway and are expected to require removal.

Address	Species	Condition
41 Grassmere Street	<i>Alnus rubra</i>	Fair
45 Grassmere Street	<i>Chamaecyparis sp.</i>	Poor
45 Grassmere Street	<i>Cordyline australis</i>	Good
45 Grassmere Street	<i>Viburnum sp.</i>	Fair
45 Grassmere Street	<i>Corokia sp.</i> (x 3 shrubs)	Fair
45 Grassmere Street	<i>Oleria sp.</i> (x 2 shrubs)	Fair
45 Grassmere Street	<i>Juniperus sp.</i>	Fair
45 Grassmere Street	<i>Griselinia littoralis</i>	Fair
45 Grassmere Street	<i>Sophora microphylla</i> (x 2 trees)	Fair
45 Grassmere Street	<i>Pittosporum eugenoides</i> (x 6 shrubs)	Fair
45 Grassmere Street	<i>Cordyline australis</i>	Good
45 Grassmere Street	<i>Oleria sp.</i> (x 2 shrubs)	Fair
45 Grassmere Street	<i>Betula pendula</i> (x 6 trees)	Fair
45 Grassmere Street	<i>Viburnum sp.</i>	Good

4.0 Trees and Shrubs to be Retained

Based upon the design, it is expected that the following trees and shrubs could be retained during the works.

Address	Species	Condition
31 Grassmere Street	<i>Pseudotsuga menziesii</i>	Fair
41 Grassmere Street	<i>Alnus rubra</i>	Good
43 Grassmere Street	<i>Acer saccharinum</i>	Fair
43 Grassmere Street	<i>Acer saccharinum</i>	Fair
45 Grassmere Street	<i>Cupressus macrocarpa</i> *	Fair
45 Grassmere Street	<i>Coprosma sp.</i>	Fair
45 Grassmere Street	<i>Oleria sp.</i> (x 1 shrub)	Fair
45 Grassmere Street	<i>Griselinia littoralis</i>	Fair

4.1 Protection of Trees and Shrubs

In most situations it is expected that the remaining trees can be adequately protected from potential damage if excavation is limited to the removal of turf within protection zone of the trees, and on site tree protection measures such as outlined in Council’s Construction Standard Specifications (CSS), Part 1, 19.0: protection of natural assets and habitats are implemented during the works. This will include a supervising arborist being appointed for the construction of the cycleway.

Note: Due to the changes in levels and close proximity of the proposed works to the *Cupressus macrocarpa** tree at 45 Grassmere Street, detailed design and tree protection measures may be required if the tree is to be retained (such as retaining wall construction).

Any tree pruning should only be carried out by suitably experienced and qualified arboricultural contractors, and to accepted modern arboricultural standards.

5.0 Replacement Planting

It is expected that replacement trees and landscape planting will occur as mitigation for the tree removals, and a landscape plan for the project has been developed.

It is proposed that fourteen (14) new street trees are planted in Grassmere Street as part of the cycleway project, which includes the following.

- 3 x Field Maple (*Acer campestre*) outside 96 Main North Road (in Grassmere Street).
- 4 x Field Maple (*Acer campestre*) within the vicinity of the road crossing, outside 27, 29 and 31 Grassmere Street.
- 2 x Field Maple (*Acer campestre*) within the vicinity of the road crossing, outside 41 Grassmere Street.
- 5 x Small-leaved Lime (*Tilia cordata*) within the vicinity of the Grants Road corner, outside 1 Taunton Green (in Grassmere Street).

The final quantity of replacement trees and planting locations will be subject to requirements of the final design, utility service checks, resident consultation and consultation with the Council arborist responsible for managing the street tree asset.


6.0 Recommendations

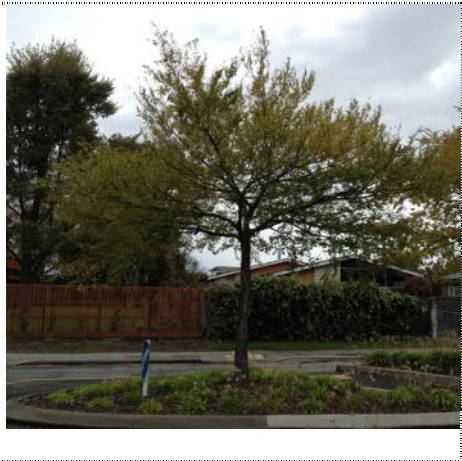
- 6.1 Further arboricultural input is recommended during the detailed design and construction stages of the project to ensure adequate protection occurs for all trees and shrubs that are to be retained within the vicinity of the works.
- 6.2 Where trees are to be retained and incorporated into the design, appropriate tree protection measures will be required during detailed design and construction. The CCC Construction Standard Specification (CSS), Part 1, Section 19.0: protection of natural assets and habitats outlines tree protection requirements and methodologies, and it is recommended that the CSS is complied with for the duration of the works. This will include a supervising arborist being appointed for the construction of the cycleway.
- 6.3 Where street trees are removed and replacement trees are planted and established as part of the project, this should occur in consultation with the Council arborist responsible for managing the street tree asset.
- 6.4 Tree removals, clearance pruning and replacement planting and should be carried out by suitably experienced and qualified arboricultural contractors.

Laurie Gordon
Arborist


Tree Assessment Results


Tree Assessment Results

Site Address:	Opposite 29 Grassmere Street	
Tree ID:	119104	
Tree Species:	Ulmus parvifolia	
Height:	5.0 metres	
Canopy Spread:	4.0 metres	
DBH:	0.23 metres	
Health:	2 (Good)	
Form:	2 (Good)	
Overall Condition:	2 (Good)	
<p>The works will include the realignment of the median blip in which the tree is currently situated.</p> <p>The proposed works are likely to affect the health and/or stability of the tree through damage to the root system, and extensive clearance pruning would be required if the tree was to be retained.</p>		
Requirements:	Tree to be removed.	


Site Address:	Opposite 29 Grassmere Street	
Tree ID:	119103	
Tree Species:	Ulmus parvifolia	
Height:	5.0 metres	
Canopy Spread:	5.0 metres	
DBH:	0.20 metres	
Health:	2 (Good)	
Form:	2 (Good)	
Overall Condition:	2 (Good)	
<p>The works will include the realignment of the median blip in which the tree is currently situated.</p> <p>The proposed works are likely to affect the health and/or stability of the tree through damage to the root system, and extensive clearance pruning would be required if the tree was to be retained.</p>		
Requirements:	Tree to be removed.	


PAPANUI PARALLEL MAJOR CYCLEWAY – GRASSMERE STREET

Site Address:	31 Grassmere Street	
Tree ID:	N/A – Private Tree	
Tree Species:	<i>Pseudotsuga menziesii</i>	
Height:	9.0 metres	
Canopy Spread:	8.0 metres	
DBH:	0.38 metres	
Health:	2 (Good)	
Form:	3 (Fair)	
Overall Condition:	3 (Fair)	
<p>Tree is located approx. 3.0 metres from edge of proposed cycle way. Lower branches of tree are slightly overhanging proposed cycleway.</p> <p>The proposed works could possibly affect the health and/or stability of the tree through damage to the root system.</p>		
<p>Requirements: Tree to be retained and protected during works and clearance pruning over cycleway will be required.</p>		


Site Address:	41 Grassmere Street	
Tree ID:	N/A – Private Tree	
Tree Species:	<i>Alnus rubra</i>	
Height:	8.0 metres	
Canopy Spread:	10.0 metres	
DBH:	0.35 metres	
Health:	3 (Fair)	
Form:	3 (Fair)	
Overall Condition:	3 (Fair)	
<p>Tree is located approximately 2.0 metres from edge of proposed cycle way. Tree canopy has been suppressed by neighbouring tree and the majority of the canopy will be significantly overhanging the proposed cycleway.</p> <p>The proposed works are likely to affect the health and/or stability of the tree through damage to the root system, and extensive clearance pruning would be required if the tree was to be retained.</p>		
Requirements:	Tree to be removed.	


PAPANUI PARALLEL MAJOR CYCLEWAY – GRASSMERE STREET

Site Address:	41 Grassmere Street	
Tree ID:	N/A – Private Tree	
Tree Species:	<i>Alnus rubra</i>	
Height:	12.0 metres	
Canopy Spread:	10.0 metres	
DBH:	0.40 metres	
Health:	2 (Good)	
Form:	2 (Good)	
Overall Condition:	2 (Good)	
<p>Tree is located approximately 3.5 metres from edge of proposed cycle way.</p> <p>The proposed works could possibly affect the health and/or stability of the tree through damage to the root system.</p>		
<p>Requirements: Tree to be retained and protected during works and clearance pruning over cycleway may be required.</p>		


Site Address:	41 Grassmere Street	
Tree ID:	N/A – Street Trees – Group One	
Tree Species:	<i>Picea abies</i> x 14	
Height:	7.0 metres (average size)	
Canopy Spread:	4.5 metres (average size)	
DBH:	0.15 metres (average size)	
Health:	3 (Fair)	
Form:	3 (Fair)	
Overall Condition:	3 (Fair) – average condition	
<p>These trees are located less than 1.0 metre from edge of proposed cycle way. Three (3) of the trees in this group are dead.</p> <p>The proposed works are likely to affect the health and/or stability of the trees through damage to the root systems, and extensive clearance pruning would be required if the trees were to be retained.</p>		
Requirements:	Trees to be removed.	


PAPANUI PARALLEL MAJOR CYCLEWAY – GRASSMERE STREET

Site Address:	41 Grassmere Street	
Tree ID:	N/A – Street Trees – Group One	
Tree Species:	<i>Metasequoia glyptostroboides</i> x 4	
Height:	9.5 metres (average size)	
Canopy Spread:	6.0 metres (average size)	
DBH:	0.22 metres (average size)	
Health:	3 (Fair)	
Form:	3 (Fair)	
Overall Condition:	3 (Fair) – average condition	
<p>These trees are located less than 1.0 metre from edge of proposed cycle way.</p> <p>The proposed works are likely to affect the health and/or stability of the trees through damage to the root systems, and extensive clearance pruning would be required if the trees were to be retained.</p>		
Requirements:	Trees to be removed.	

Site Address:	43 Grassmere Street	
Tree ID:	N/A – Private Tree	
Tree Species:	<i>Acer saccharinum</i>	
Height:	10.0 metres	
Canopy Spread:	8.0 metres	
DBH:	0.30 metres	
Health:	2 (Good)	
Form:	3 (Fair)	
Overall Condition:	3 (Fair)	
<p>Tree is located approximately 2.0 metres from edge of proposed cycle way. The lower branches of the tree are overhanging proposed cycle way.</p> <p>The proposed works could possibly affect the health and/or stability of the tree through damage to the root system and the crown of the tree.</p>		
Requirements: Tree to be retained and protected during works and clearance pruning over cycleway will be required.		

PAPANUI PARALLEL MAJOR CYCLEWAY – GRASSMERE STREET

Site Address:	43 Grassmere Street	
Tree ID:	N/A – Private Tree	
Tree Species:	<i>Acer saccharinum</i>	
Height:	10.0 metres	
Canopy Spread:	8.0 metres	
DBH:	0.30 metres	
Health:	2 (Good)	
Form:	3 (Fair)	
Overall Condition:	3 (Fair)	
<p>Tree is located approximately 2.0 metres from edge of proposed cycle way. The lower branches of the tree are overhanging proposed cycle way.</p> <p>The proposed works could possibly affect the health and/or stability of the tree through damage to the root system and the crown of the tree.</p>		
<p>Requirements: Tree to be retained and protected during works and clearance pruning over cycleway will be required.</p>		

Site Address:	45 Grassmere Street	
Tree ID:	N/A – Private Tree	
Tree Species:	<i>Cupressus macrocarpa</i>	
Height:	10.0 metres	
Canopy Spread:	8.0 metres	
DBH:	0.40 metres	
Health:	2 (Good)	
Form:	3 (Fair)	
Overall Condition:	3 (Fair)	
<p>Tree is located approx. 3m from edge of proposed cycle way. The ground level adjacent to the tree drops significantly from the level of the driveway and may need to be altered prior to installation of the cycle way.</p> <p>The proposed works could possibly affect the health and/or stability of the tree through damage to the root system, and a possible change in the adjacent ground level.</p>		
<p>Requirements: Tree to be retained and protected during the works.</p> <p>Possible requirement for a retaining wall to be installed if a significant change in soil level is required.</p> <p>Clearance pruning over cycleway will be required.</p>		

PAPANUI PARALLEL MAJOR CYCLEWAY – GRASSMERE STREET


Site Address:	45 Grassmere Street
Tree ID:	N/A – Private Tree – Group Two
Tree Species:	<i>Chamaecyparis sp.</i>
Height:	4.5 metres
Canopy Spread:	3.5 metres
DBH:	0.14 metres
Health:	3 (Fair)
Form:	4 (Poor)
Overall Condition:	4 (Poor)
Tree is located within footprint of proposed cycle way. Currently located on private land that will be purchased by CCC to allow completion of cycle way.	
Requirements:	Tree to be removed.




Site Address:	45 Grassmere Street
Tree ID:	N/A – Private Tree – Group Two
Tree Species:	<i>Cordyline australis</i>
Height:	6.5 metres
Canopy Spread:	2.0 metres
DBH:	0.15 metres
Health:	2 (Good)
Form:	2 (Good)
Overall Condition:	2 (Good)
Tree is located within footprint of proposed cycle way. Currently located on private land that will be purchased by CCC to allow completion of cycle way.	
Requirements:	Tree to be removed.





PAPANUI PARALLEL MAJOR CYCLEWAY – GRASSMERE STREET

Site Address:	45 Grassmere Street	
Tree ID:	N/A – Private Shrub – Group Two	
Tree Species:	<i>Viburnum sp.</i>	
Height:	2.0 metres	
Canopy Spread:	2.0 metres	
DBH:	N/A	
Health:	3 (Fair)	
Form:	3 (Fair)	
Overall Condition:	3 (Fair)	
Large shrub is located within footprint of proposed cycle way. Currently located on private land that will be purchased by CCC to allow completion of cycle way.		
Requirements:	Shrub to be removed.	


Site Address:	45 Grassmere Street	
Tree ID:	N/A – Private Shrubs – Group Two	
Tree Species:	<i>Corokia sp. X3</i>	
Height:	1.5 metres (average size)	
Canopy Spread:	2.0 metres (average size)	
DBH:	N/A	
Health:	3 (Fair)	
Form:	3 (Fair)	
Overall Condition:	3 (Fair)	
Large shrubs are located within footprint of proposed cycle way. All currently located on private land that will be purchased by CCC to allow completion of cycle way.		
Requirements:	Shrubs to be removed.	

PAPANUI PARALLEL MAJOR CYCLEWAY – GRASSMERE STREET

Site Address:	45 Grassmere Street	
Tree ID:	N/A – Private Shrubs – Group Two	
Tree Species:	<i>Oleria sp. X2</i>	
Height:	2.0 metres (average size)	
Canopy Spread:	1.8 metres (average size)	
DBH:	N/A	
Health:	2 (Good)	
Form:	3 (Fair)	
Overall Condition:	3 (Fair)	
Large shrubs are located within footprint of proposed cycle way. Both currently located on private land that will be purchased by CCC to allow completion of cycle way.		
Requirements:	Shrubs to be removed.	


Site Address:	45 Grassmere Street	
Tree ID:	N/A – Private Shrub – Group Two	
Tree Species:	<i>Coprosma sp.</i>	
Height:	2.0 metres	
Canopy Spread:	2.0 metres	
DBH:	N/A	
Health:	3 (Fair)	
Form:	3 (Fair)	
Overall Condition:	3 (Fair)	
Large shrub is located on the edge of the proposed new land boundary, approximately 5.0 meters from the edge of proposed cycle way.		
Requirements: Shrub to be retained if possible, and pruned for clearance from proposed cycle way.		


PAPANUI PARALLEL MAJOR CYCLEWAY – GRASSMERE STREET

Site Address:	45 Grassmere Street	
Tree ID:	N/A – Private Shrub – Group Two	
Tree Species:	<i>Juniperus sp.</i>	
Height:	1.0 metres	
Canopy Spread:	4.0 metres	
DBH:	N/A	
Health:	3 (Fair)	
Form:	3 (Fair)	
Overall Condition:	3 (Fair)	
<p>Large shrub is located within footprint of proposed cycle way.</p> <p>Currently located on private land that will be purchased by CCC to allow completion of cycle way.</p>		
Requirements:	Shrub to be removed.	

Site Address:	45 Grassmere Street	
Tree ID:	N/A – Private Tree – Group Two	
Tree Species:	<i>Griselinia littoralis</i>	
Height:	4.5 metres	
Canopy Spread:	6.0 metres	
DBH:	0.06 metres	
Health:	2 (Good)	
Form:	3 (Fair)	
Overall Condition:	3 (Fair)	
<p>Tree is located within footprint of proposed cycle way.</p> <p>Currently located on private land that will be purchased by CCC to allow completion of cycle way.</p>		
Requirements:	Tree to be removed.	


PAPANUI PARALLEL MAJOR CYCLEWAY – GRASSMERE STREET

Site Address:	45 Grassmere Street	
Tree ID:	N/A – Private Trees – Group Three	
Tree Species:	<i>Sophora microphylla</i> x2	
Height:	7.0 metres (average size)	
Canopy Spread:	5.0 metres (average size)	
DBH:	0.12 metres (average size)	
Health:	2 (Good)	
Form:	3 (Fair)	
Overall Condition:	3 (Fair)	
<p>Trees are located within footprint of proposed cycle way. Currently located on private land that will be purchased by CCC to allow completion of cycle way.</p>		
Requirements:	Trees to be removed.	


Site Address:	45 Grassmere Street	
Tree ID:	N/A – Private Trees – Group Three	
Tree Species:	<i>Pittosporum eugenioides</i> x6	
Height:	6.0 metres (average size)	
Canopy Spread:	4.0 metres (average size)	
DBH:	0.08 metres (average size)	
Health:	2 (Good)	
Form:	3 (Fair)	
Overall Condition:	3 (Fair) – average condition	
<p>Trees are located within footprint of proposed cycle way. One tree is dead/dying. All currently located on private land that will be purchased by CCC to allow completion of cycle way.</p>		
Requirements:	Trees to be removed.	


PAPANUI PARALLEL MAJOR CYCLEWAY – GRASSMERE STREET

Site Address:	45 Grassmere Street	
Tree ID:	N/A – Private Tree – Group Three	
Tree Species:	<i>Cordyline australis</i>	
Height:	6.0 metres	
Canopy Spread:	2.5 metres	
DBH:	0.10 metres	
Health:	1 (Very Good)	
Form:	2 (Good)	
Overall Condition:	2 (Good)	
<p>Tree is located within footprint of proposed cycle way. Currently located on private land that will be purchased by CCC to allow completion of cycle way.</p>		
Requirements:	Tree to be removed.	


Site Address:	45 Grassmere Street	
Tree ID:	N/A – Private Shrubs – Group Three	
Tree Species:	<i>Oleria Sp. X3</i>	
Height:	4.0 metres (average size)	
Canopy Spread:	4.0 metres (average size)	
DBH:	0.05 metres (average size)	
Health:	3 (Fair)	
Form:	3 (Fair)	
Overall Condition:	3 (Fair)	
<p>Two large shrubs are located within footprint of proposed cycle way, and currently located on private land that will be purchased by CCC to allow completion of cycle way. One large shrub is located down driveway approx. 0.5m back from new boundary.</p>		
<p>Requirements: 2x shrubs to be removed. 1x shrub to be retained and pruned back to clear proposed cycle way.</p>		

PAPANUI PARALLEL MAJOR CYCLEWAY – GRASSMERE STREET

Site Address:	45 Grassmere Street	
Tree ID:	N/A – Private Trees – Group Three	
Tree Species:	<i>Betula pendula</i> x6	
Height:	10.0 metres (average size)	
Canopy Spread:	5.0 metres (average size)	
DBH:	0.25 metres (average size)	
Health:	2 (Good)	
Form:	3 (Fair)	
Overall Condition:	3 (Fair)	
Trees are located within footprint of proposed cycle way. Currently located on private land that will be purchased by CCC to allow completion of cycle way.		
Requirements:	Trees to be removed.	

Site Address:	45 Grassmere Street	
Tree ID:	N/A – Private Shrub – Group Three	
Tree Species:	<i>Viburnum Sp.</i>	
Height:	2.0 metres	
Canopy Spread:	2.0 metres	
DBH:	N/A	
Health:	2 (Good)	
Form:	2 (Good)	
Overall Condition:	2 (Good)	
Large shrub is located within footprint of proposed cycle way. Currently located on private land that will be purchased by CCC to allow completion of cycle way.		
Requirements:	Shrub to be removed.	

PAPANUI PARALLEL MAJOR CYCLEWAY – GRASSMERE STREET

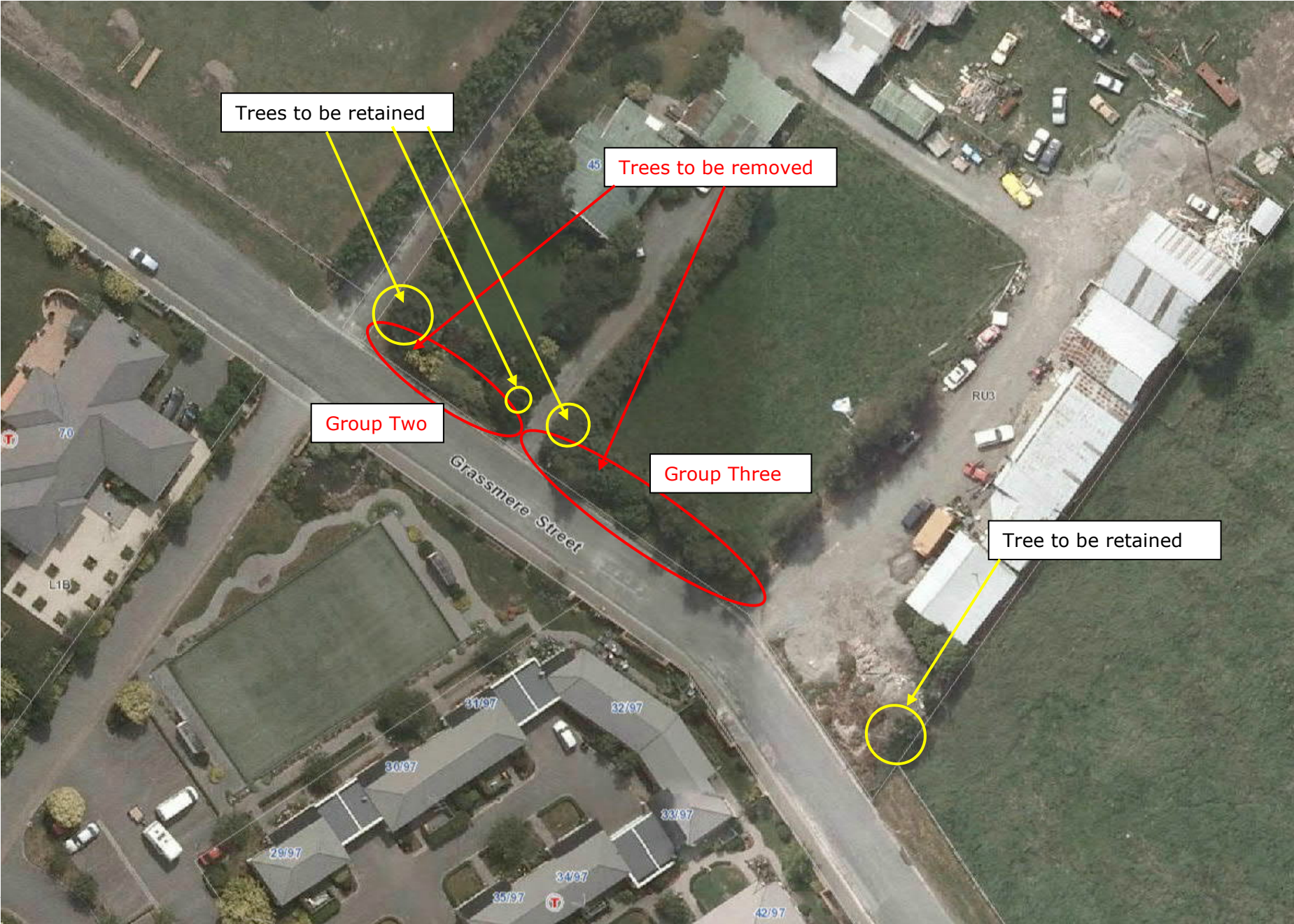
Site Address:	45 Grassmere Street	
Tree ID:	N/A – Private Tree	
Tree Species:	<i>Griselinia littoralis</i>	
Height:	4.0 metres	
Canopy Spread:	3.5 metres	
DBH:	0.05 metres	
Health:	1 (Very Good)	
Form:	2 (Good)	
Overall Condition:	2 (Good)	
<p>Tree is located on edge of the proposed new land boundary, and approximately 2.5 metres from the edge of proposed cycle way.</p>		
<p>Requirements: Tree to be retained and protected during works, and clearance pruning for cycleway will be required.</p>		

PAPANUI PARALLEL MAJOR CYCLEWAY – GRASSMERE STREET





PAPANUI PARALLEL MAJOR CYCLEWAY – GRASSMERE STREET



Appendix Z

Lighting report – Northern Section



ROAD LIGHTING ASSESSMENT



Road Lighting Assessment

Papanui Cycleway – Grassmere Street to
Sawyers Arms Road
Christchurch

Design + Engineering
Connetics Ltd
11 Lock Crescent
Woolston
Christchurch
Ph (03) 353 7200

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2 February 2015

May Wong
Technical Services & Design Team
Transport OP
Asset and Networks Unit
Christchurch City Council

DESIGN+ENGINEERING

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Attention May

1.0 DESIGN BRIEF

RE: **Papanui parallel major cycleway – Grassmere Street to Sawyers Arms Road**
Lighting Assessment (Ref: 16-012807)

Thank you for inviting us to assess the lighting requirements for the above project.

A site visit was made on the 13th of January 2015.

Lighting Design category for these Roads are classified in accordance with AS/NZS 1158 as;

- Sawyers Arms Road - Northcote rd to Sissons rd is classified under the CCC City Plan as Collector, Cat V3.
- Sawyers Arms Road – Sissons rd to Railway Crossing is classified under the CCC City Plan as Collector, Cat V4.
- Grassmere Street is classified under the CCC City Plan as Local, Subcategory P3/P3R.

We have assumed the poles are suitable to have new light fittings installed as required.

No allowance is included in this estimate for any Orion pole replacement costs.

Provision of an official works order to carry out design work is deemed to be confirmation of your acceptance that the above design assumptions meet your requirements of this project.

If you would like us to proceed with the design, please confirm and forward a purchase order to enable the design for this upgrade to be completed.

Please note: - That due to the advances in Luminaire development, a Lighting Design – when requested, may only be current for 6 months after completion. Any Lighting Designs sent for construction after this period, may need to be checked against the latest technologies in order to provide the most effective and efficient Lighting design solution for Christchurch City Council.

If you have any queries regarding this assessment please call me on (03) 353 7323 or email me on Wilson@connetics.co.nz

Yours Sincerely,

Stuart Wilson
Lighting Design Engineer



2.0 SCOPE OF WORK

The scope of the services to be provided is based on Connetics Lighting Design and Consultancy Services as outlined in the Street Light Maintenance and Renewal Services contract (Work Package 3- Design Services); Agreement number 4600001186.

Based on the scheme provided the lighting will need to be designed and verified to meet the applicable lighting standard.

We have identified the following changes, which may impact on existing lighting compliance;

- A new 3.8m wide Cycleway to be located on the west side of Sawyers Arms Road, throughout the extent of this section;
- Modifications to existing kerb alignment and traffic devices (e.g. medians) & Pedestrian crossings

3.0 DESIGN OBSERVATIONS

3.1 Existing Lighting

3.1.1 Grassmere Street

The existing lighting throughout this section consists of the following types:

- Type A – 7.4m Steel “Subdivisional” column c/w 70W HPS luminaires.
- Type B - 70W HPS luminaires, installed on existing O/H SLN

Type ‘A’ lights consist of eight (8) Sylvania Urban 70W HPS luminaire installed on a “Subdivisional” sectional steel column with a 1.5m curved outreach arm. Luminaire mounting height, 7.4m. The columns are installed in a single sided arrangement. Based on a visual inspection the columns appear to be in good condition. (refer section 4.1)

Recommendation

The luminaires can remain if the overall lighting scheme retains the existing HPS types. If it is desirable for the lighting scheme to be upgrade to ‘White Light’ then the luminaires will be upgraded with new LED luminaires. The existing columns can also remain.

Type ‘B’ lights consist of Three (3) G500 70W HPS luminaires installed on a concrete ‘T’ columns c/w ‘S12’ steel outreach arms. Luminaire mounting height, 9.15m, Two (2) G500 70W HPS luminaires installed on a concrete ‘T’ poles c/w ‘S02’ steel outreach arms. Luminaire mounting height, 6.7m and One (1) Sylvania Roadster 250W HPS luminaire installed on a wooden distribution pole c/w ‘S20’ steel outreach arms. Luminiare mounting height, 9.45m. The poles are installed in a single sided arrangement. Based on a visual inspection the columns appear to be in good condition.

Recommendation

The luminaires can remain if the overall lighting scheme retains the existing HPS types. If it is desirable for the lighting scheme to be upgrade to ‘White Light’ then the luminaires will be upgraded with new LED luminaires. The existing poles can also remain. (refer section 4.1)

3.1.2 Main North Road – Grassmere Street to Northcote Road Intersection (inclusive)

The existing lighting throughout this section consists of the following types:

- Type C – 10.5m concrete column c/w 150W HPS luminaire.

Type ‘C’ lights consist of Six (6) Betacom G700 250W HPS luminaires installed on concrete ‘Highway’ column c/w a 2m ‘H20’ steel outreach arm. Luminaire mounting height, 10.5m. The columns are located back on the boundary. Based on a visual inspection the columns appear to be in good condition.

Recommendation

The luminaires can remain if the overall lighting scheme retains the existing HPS types. If it is desirable for the lighting scheme to be upgrade to ‘White Light’ then the luminaires will be upgraded with new LED luminaires. The existing columns can also remain.

3.1.3 Sawyers Arms Road

The existing lighting throughout this section consists of the following types:

- Type D - 150W HPS luminaires, installed on existing O/H SLN
- Type E - 250W HPS luminaires, installed on existing O/H SLN
- Type F – 10.6m Steel “Subdivisional” column c/w 250W & 150W HPS luminaires.

Type ‘D’ lights consist of Six (5) Sylvania Roadster 150W HPS luminaires installed on a mix of wooden and concrete poles c/w ‘S20’ steel outreach arms. Luminaire mounting height range from 9.15m to 10.6m, Also Four (4) Betacom G600 150W HPS luminaires installed on a mix of wooden and concrete poles c/w ‘S20’ steel outreach arms. Luminaire mounting height range from 9.15m to 10.6m The poles are installed in a single sided arrangement. Based on a visual inspection the poles appear to be in good condition

Recommendation

The luminaires can remain if the overall lighting scheme retains the existing HPS types. If it is desirable for the lighting scheme to be upgrade to ‘White Light’ then the luminaires will be upgraded with new LED luminaires. The existing columns can also remain. (refer section 4.3)

Type ‘E’ lights consist of Two (2) Betacom G600 250W HPS luminaires installed on a mix of wooden and concrete poles c/w ‘S20’ steel outreach arms. Luminaire mounting height range from 10.6m to 11m The poles are installed in a single sided arrangement. Based on a visual inspection the poles appear to be in good condition

Recommendation

The luminaires can remain if the overall lighting scheme retains the existing HPS types. If it is desirable for the lighting scheme to be upgrade to ‘White Light’ then the luminaires will be upgraded with new LED luminaires. The existing poles can also remain. (refer section 4.3)

Type 'F' lights consist of Two (2) Sylvania Roadster 250W HPS luminaires installed on a sectional steel columns c/w a 3m mitred outreach arm. Luminaire mounting height, 10.6m and Three (3) Sylvania Roadster 150W HPS luminaires installed on a sectional steel columns c/w a 3m mitred outreach arm. Luminaire mounting height, 10.6m. Based on a visual inspection the columns appear to be in good condition.

Recommendation

The luminaires can remain if the overall lighting scheme retains the existing HPS types. If it is desirable for the lighting scheme to be upgrade to 'White Light' then the luminaires will be upgraded with new LED luminaires. The existing columns can also remain. (refer section 4.3)

Overview

Based on preliminary calculations, the existing lighting throughout this section complies with the current standard and meets the Illuminance requirements for the proposed new 3.8m cycleway for both horizontal and Vertical Illuminance.

As stated, the lamp source used in the lights is HPS, which is yellow/orange in appearance and not 'white light', which is preferred in the Major Cycleway Design Guide.

3.2 New Lighting - Overview

The new lighting will be in accordance with AS/NZS 1158 and the Christchurch City Council IDS, with consideration given to CPTED requirements. For this we use independent design software which enables any manufactures luminaires to be assessed.

Based on current lighting design trends, a lamp source which is acceptable to CCC with respect to performance and maintenance is tending towards Light Emitting Diode (LED).

All luminaires and lamp sources must have CCC approval before being installed.

LED has advantages over most other types of lamps sources such as:

- Instant Start
- Long life – minimal maintenance
- Dimming capabilities
- Good colour rendering
- Improved efficiency, both operational and economic



Fig.1 Indicative LED Luminaire Option

The selection of the lighting product will have a strong focus on quality, efficiency and reliability and be suited specifically for the required function.

4.0 DESIGN ASSUMPTIONS

The following recommendations apply to upgrading the existing HPS luminaires to new LED (white light) luminaires.

The service provider Orion (Mike Miles) should be contacted direct, for advice on and approval of new pole location and for a quote. No allowance has been made in this estimate for this work.

Also of note is that the existing S20 outreach arms along Sawyers Arms Road are mounted on steel extensions. Orion may decide that these now do not meet their requirements and any new installation on these may require Orion pole replacements. The cost of potential pole replacements has not been included in this assessment.

4.1 Grassmere Street

- Upgrade all HPS luminaires to new LED luminaires for compliance with AS/NZS 1158 P3/P3R.

4.1.2 RECOMMENDATIONS

- Disconnect and remove Eight (8) existing HPS luminaires mounted on 7.4m sectional steel columns with 1.5m outreach arms.
- Supply and install Eight (8) new LED luminaires onto existing Sectional Steel Columns.
- Connect to Underground Street light network (U/G SLN)
- Disconnect and remove Three (3) existing HPS luminaires mounted on S12 (2m) outreach arms on both wooden and concrete poles.
- Supply and install Three (3) new LED luminaires onto new outreach arms.
- Disconnect and remove Two (2) existing HPS luminaires mounted on outreach arms on both wooden and concrete poles.
- Supply and install Two (2) new LED luminaires onto new outreach arms.
- Connect to Overhead Street Light Network (O/H SLN)

4.2 Northcote Road Intersection

- Upgrade all HPS luminaires to new LED luminaires for compliance with AS/NZS 1158 Cat V3.

4.2.1 RECOMMENDATIONS

- Disconnect and remove Six (6) existing HPS luminaires mounted on 10.6m Concrete Highway columns with 3m outreach arms..
- Supply and install Six (6) new LED luminaires onto existing Columns.
- Connect to Underground Street light network (U/G SLN)

4.3 Sawyers Arms Road

- Upgrade all HPS luminaires to new LED luminaires for compliance with AS/NZS 1158 Cat V4.

4.3.1 RECOMMENDATIONS

- Disconnect and remove Eleven (11) existing HPS luminaires mounted on Concrete and wooden poles with 3m outreach arms.
- Supply and install Eleven (11) new LED luminaires onto new outreach arms.
- Connect to Overhead Street Light Network (O/H SLN)
- Disconnect and remove Four (4) existing HPS luminaires mounted on sectional steel columns with 3m outreach arms.
- Supply and install Four (4) new LED luminaires onto existing sectional steel columns
- Disconnect and remove One (1) existing HPS luminaire and sectional steel columns with 3m outreach arms.
- Move Column to new location and Supply and install One (1) new LED luminaires onto existing sectional steel columns.
- Connect to Underground Street light network (U/G SLN)

5.0 COSTS

5.1 Assessment

Estimated fee to carry out this project assessment based on time engaged will be:
\$3,220.00+GST

5.1.2 Design

Our basic fee to carry out design, documentation, and supervision pre/post construction, in accordance with the above will be:
\$7,300.00+GST

5.1.3 Construction

Total estimated cost of installation work for related to Road Lighting Upgrade:
\$77,000.00+GST

5.2 Total Costs

Total estimated cost, including fees, and contingency:
\$87,500.00+GST

8.0 APPENDIX 1 – EXISTING COLUMN TYPES

Type A



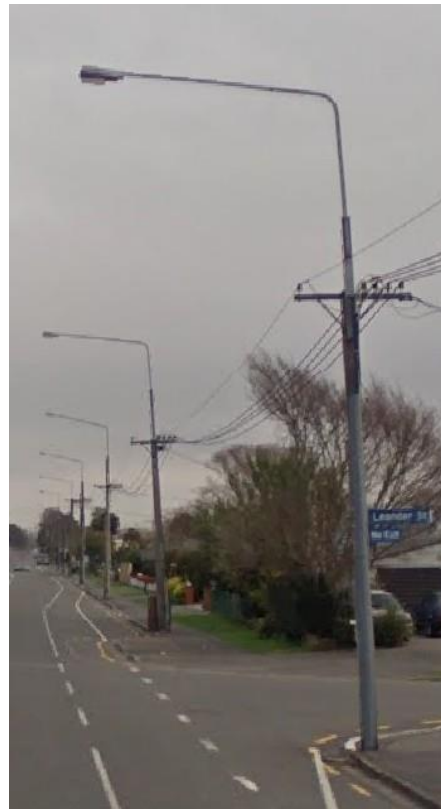
Type B



Type C



Type D & E



Type F

