



# Hotops Cycle Path Alignment Options Assessment

Prepared for Queenstown Lakes District Council

22 November 2022

Reference: TOC 1 – Street Upgrades Package

Revision E

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# 1 Introduction

## 1.1 Overview

As part of the Street Upgrades design project, it was identified that a dedicated cycle path from the Frankton Track to the CBD was required, to meet the following objectives:

- To support safe and secure journeys for cycling.
- To facilitate a cycling commuter route from Park Street (Frankton Track) to connect with Camp Street, thereby support a community shift towards using more active travel options.
- To consider effects on the natural environment
- To provide a cost-effective and constructable route

During the design of the Street Upgrades project, various alignment options were considered, with the final option being a cycle path from Park Street and along Camp Street to Church Street, adjacent to the existing Hotops Path. Once the route of the cycle path was identified, an assessment of the bidirectional route, the gradient, visibility, and safety requirements influenced the width, surfacing, signage and overall design.

The final design of this cycle path (Original Design) was then given to Kā Huanui a Tāhuna to construct. During pre-construction activities it was identified that several trees (in addition to those identified during design) were required to be removed, which led to objections from some stakeholders. Following engagement with the community, two alternative route options were proposed to be assessed. These were considered to have a potential lessor impact on trees.

## 1.2 Purpose

The purpose of this memo is to provide an assessment of these other two options alongside the original design, and a “do-nothing option” for the proposed Hotops Cycle Path. The assessment has been undertaken using a multi-criteria analysis (MCA) methodology. The options for the assessment are summarised in the table below. It is important to note that these are high level assessments for use of comparison only, and detailed design has been completed for the original design only. A summary of cycleway design considerations is included in Appendix A. Layout and supporting information of the cycle path route options are included in Appendix B.

Table 1: Summary of Cycle Path Options

Cycle Path Options	Details	Width
Do Nothing (DN)	No cycle path improvements undertaken	None
Proposed Route (PR)	QLDC approved Issue for Construction (IFC) design	4m
Alternative Route 1 (AR1)	Alternative route proposed by Brian Fitzpatrick and supported by Queenstown Trails Trust (QTT) and Friends of the Garden	3m+/-0.5m
Alternative Route 2 (AR2)	Alternative route proposed by QTT CEO Mark Williams	Variable

## 1.3 MCA Methodology

### 1.3.1 Criterion for Assessment

The criteria used for the MCA assessment have been based upon the objectives, noted above. For some of the criteria, sub criteria have been included to support detailed analysis of the options and subsequent scoring.

Not all criteria have equal importance. In order to provide differentiation between sub criteria, weightings have been introduced, and the accumulated scores have been aggregated. The determination of the weightings has been guided by and in consultation with QLDC representatives from Property & Infrastructure and Parks & Reserves. The two highest accumulated weightings are attributable to cyclist’s safety (gradients, conflicts, and secure journeys which equal 40%) and impact on the gardens (removal of trees and supporting the Queenstown Gardens Development Plan which also equal 35%).

Details of the criteria, sub-criteria, weightings, and definitions are summarised in the following table:

Table 2: MCA Criteria and Weightings

Objective / Criteria	Sub Criteria	Weighting	Definition
<b>Objective 1:</b> To support safe and secure journeys for cycling	1.1 Gradients	15%	How do the gradients of the proposed options compare to Do-Nothing?
	1.2 Conflicts	20%	How do the proposed options decrease or increase the risk of collisions by cyclists with other bike users, pedestrians & other park users compared to Do-Nothing?
	1.3 Secure journeys	5%	Compared to Do-Nothing, what is the impact on personal safety/security of bike users? / Are there any CPTED issues?
<b>Objective 2:</b> To facilitate a cycling commuter route from Park Street (Frankton Track) to connect with Camp Street	2.1 Dedicated cycle route	10%	How do the proposed options facilitate a dedicated cycling commuter route from Park Street to Camp Street compared to Do-Nothing?
<b>Objective 3:</b> To consider effects on the natural environment	3.1 Impact on trees	20%	What impact do the proposed options have on existing trees?
	3.2 Te Kararo Gardens development plan	15%	How does the option align and/or support the planned Te Kararo Queenstown Gardens development plan?
<b>Objective 4:</b> To provide a cost-effective and constructable route	4.1 Capital Cost	15%	How does the cost of implementation of the proposed options compare to Do-Nothing?

### 1.3.2 “Do-Nothing” Base Case

For purposes of this Assessment, the Do-Nothing option is defined as the option that people currently take whilst commuting on bikes through the Gardens. A layout of the common routes is indicated in Figure 1 of this report. It is important to note that these are the routes that commuter cyclists rather than recreational cyclists take.

### 1.3.3 Scoring

All proposed options have been assessed against the “Do Nothing” option to determine positive, negative, or neutral impact and then scored appropriately. The type of scoring system that has been used is shown below in Table 3.

Table 3: MCA Scoring Table

MCA Rating	Colour	Score	Description
Strong Positive		5	Strong positive impact compared to Do Nothing
Moderate Positive		4	Moderate positive impact compared to Do Nothing
No Significant Impact		3	No significant positive or negative impact compared to Do Nothing
Moderate Negative		2	Moderate negative impact compared to Do Nothing
Strong Negative		1	Strong negative impact compared to Do Nothing

### 1.3.4 Sensitivity Testing

In order to understand the robustness of the MCA results, sensitivity testing has been undertaken. This testing has focused on criterion whose scoring is viewed to be more subjective than others. The testing has considered how a range of different scoring for that criterion could influence the overall score. The details of the sensitivity analysis have been included in Section 4.1 of this report.

## 1.4 Independent Reviews

Two independent reviews have been undertaken as follows:

- Road Safety Audit (RSA) of the proposed route by Stantec
- Peer Review of Revision D of this document by GHD

The outcomes of these reviews are summarised as follows:

### 1.4.1 Road Safety Audit

A Road Safety Audit of the Proposed Route only was undertaken by Stantec in October 2021. A safety audit for the other two routes was not possible due to the lack of design information.

Recommendations from the Road Safety Audit are as follows:

- Review how the westbound contraflow cycle lane will terminate at the Church Street roundabout.
- Review the need for painted dots on the corner of Camp Street and Earl Street where two-wheeled users will be braking and turning due to the potential hazard this will cause in wet conditions.
- Review the location of the pedestrian and cycle symbols along the route.
- Ensure that all signs are shown on the construction plans.
- Produce signs and markings plan to show how the shared path is to be treated across the replacement bridge over Horne Creek.
- The point where cyclists come off their dedicated path and join pedestrians on the shared path is a potential conflict point due to the high speed of cyclists. This area needs to be monitored to ensure the proposed speed threshold markings are sufficient. Signs should be considered to advise cyclists to slow down.
- Review use of directional tactile paving at the Park Street intersection with Coronation Drive.
- Relocate the existing Give Way sign on Park Street.
- Consider installing a Give Way sign on the new splitter island on Park Street.
- Review the location of the 30km/h speed limit signs.

The completed RSA, with Designer, Safety Engineer and Client Decisions for each recommendation has been included in Appendix C.

#### 1.4.2 Peer Review of Options Comparison

GHD finalised their peer review of Revision D of this report on 22 November 2021. The completed report has been included in Appendix D. A summary of their recommendations, along with the responses has been included in Appendix E.

## 2 Layout of Options

### 2.1 Do-Nothing Option

For purposes of this Assessment, the Do-Nothing option is defined as the option that people currently take whilst commuting on bikes through the Gardens. It is important to note that these are commuter cyclists' routes rather than routes that recreational cyclists use (such as around the Peninsula).

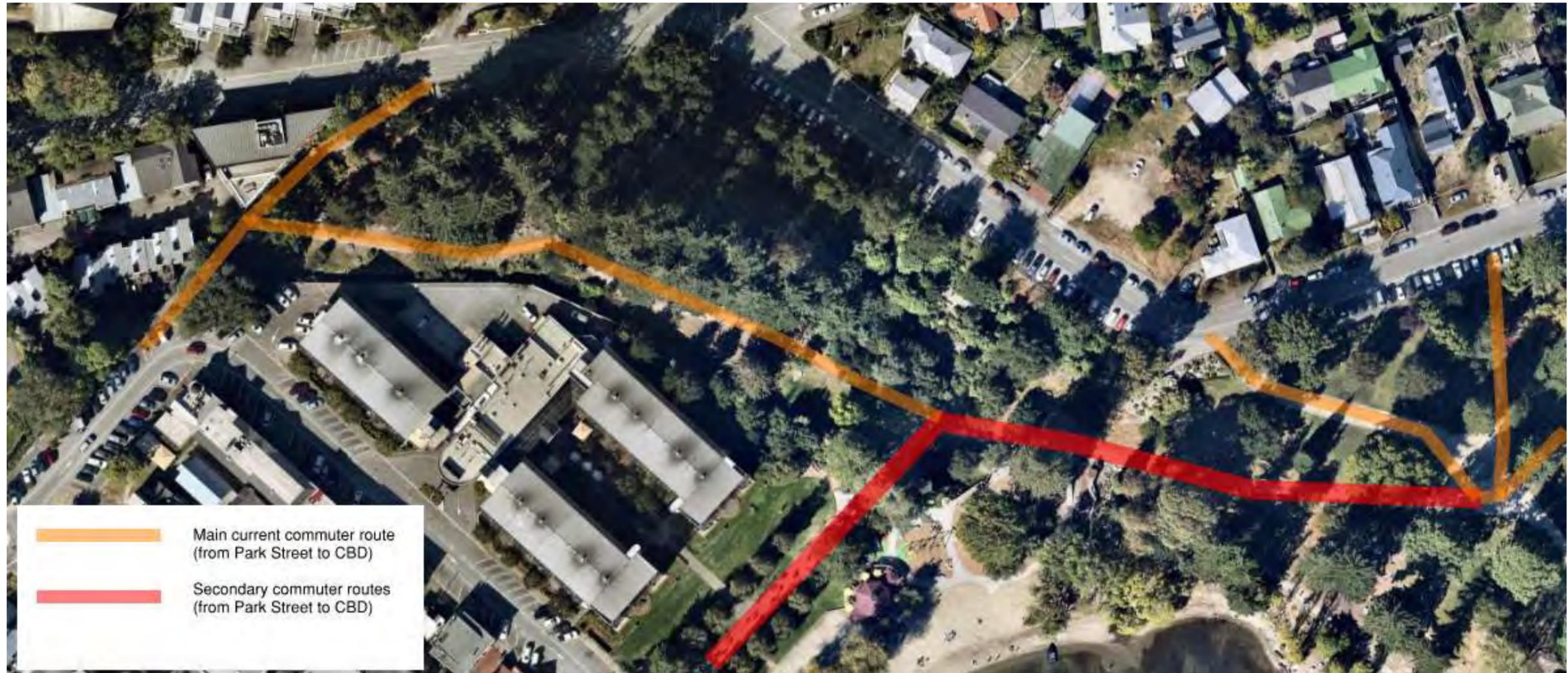


Figure 1: Current routes that cyclist take in the Gardens

## 2.2 Options

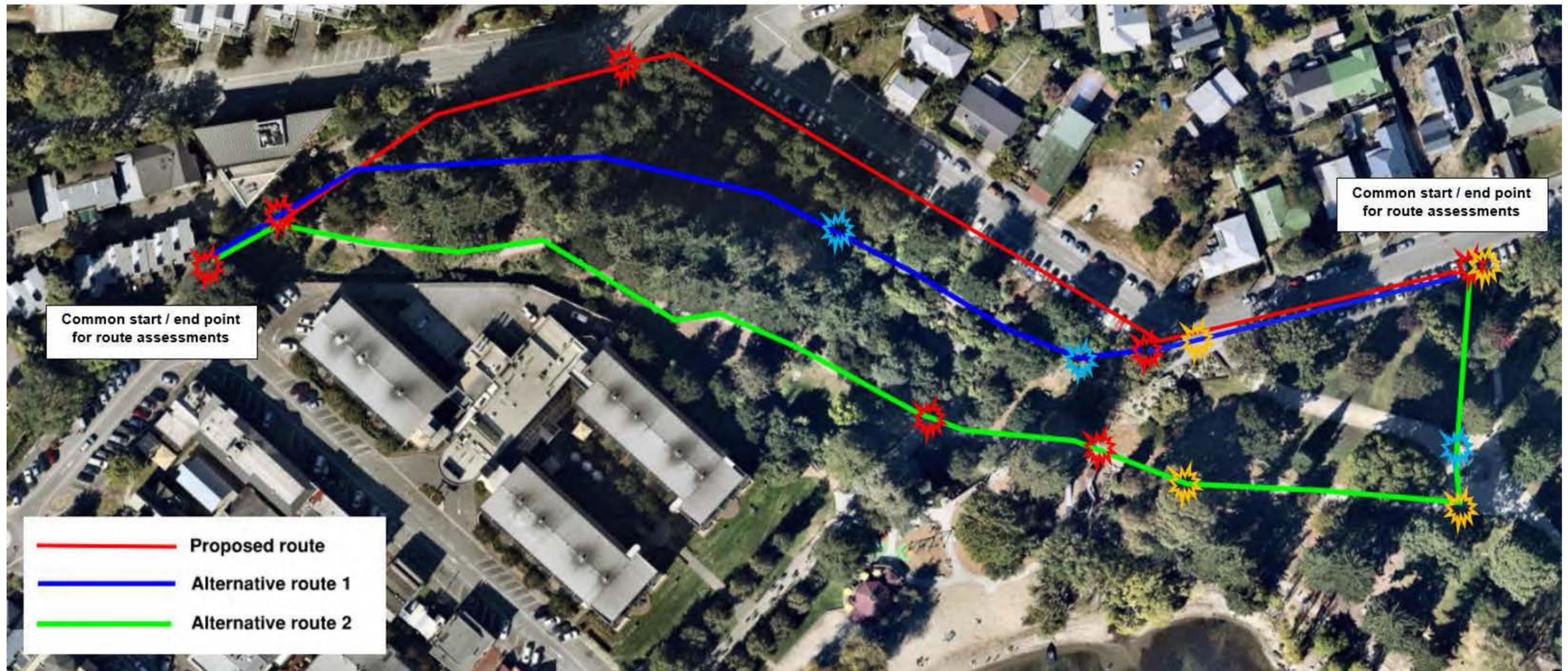


Figure 2: Layout of Options

	Conflict Type	Definition	Do-Nothing (DN)	Proposed Route (PR)	Alternative Route 1 (AR1)	Alternative Route 2 (AR2)
	Major	Significant risk of conflicts, ie. Where a cycleway merges with a significant shared path, either on a road, or at the bottom of a gradient	7	3	3	5
	Medium	Medium risk of conflict, ie. Where a cycleway merges with a shared path	3	2	1	2
	Minor	Minor risk of conflict, ie. Where a cycle route crosses other paths	3	0	2	1

### 3 Multi Criteria Analysis

#### 3.1 Summary of Multi Criteria Analysis

The below table is a summary of the multi criteria analysis. Where relevant, the recommendations of the GHD Peer Review Report have been implemented.

Scoring has been undertaken by a combined QLDC & Kā Huanui a Tāhuna team, including representatives from Property & Infrastructure and Parks & Reserves. A summary of the scoring has been included in Section 3.2.

A sensitivity analysis to review some scores which may be deemed to be subjective has been included in Section 4.1.

Table 4 – Assessment of Cycle Path Options

No.	Criteria	Consideration	Weighting	Do-Nothing (DN)	Proposed Route (PR)	Alternative Route 1 (AR1)	Alternative Route 2 (AR2)
<b>Objective 1: To support safe and secure journeys for cycling.</b>							
1.1	Gradients	How do the gradients of the proposed options compare against doing nothing?  [The current shared path has a maximum gradient of 13% for a length of approximately 50m].	15%	<ul style="list-style-type: none"> <li>The current shared path has a maximum gradient that is steep (13% for a length of approximately 50m) and falls outside the recommended range from Austroads for desirable uphill gradients for ease of cycling (refer to Figure 2 below).</li> <li>13% is a steep grade and outside the 5% recommended by Austroads, however they do fall just within the guidelines of less than 50m length for a gradient up to 12%.</li> </ul>	<ul style="list-style-type: none"> <li>Maximum gradient is steep (12% for a length of approximately 105m), is steeper than the current shared path and falls outside the recommended range from Austroads for desirable uphill gradients for ease of cycling (refer to Figure 2 below).</li> <li>12% is a steep grade and is outside the 5% recommended by Austroads.</li> </ul>	<ul style="list-style-type: none"> <li>Maximum gradient is steep (11% for a length of approximately 40m), is very similar to the current situation and falls outside the recommended range from Austroads for desirable uphill gradients for ease of cycling (refer to Figure 2 below).</li> <li>11% is a steep grade and is outside the 5% recommended by Austroads, however they do fall within the guidelines of less than 50m length for a gradient up to 12%.</li> </ul>	<ul style="list-style-type: none"> <li>The option is the current situation, with a maximum gradient that is steep (13% for a length of approximately 50m) and falls outside the recommended range from Austroads for desirable uphill gradients for ease of cycling (refer to Figure 2 below).</li> <li>13% is a steep grade and outside the 5% recommended by Austroads, however they do fall just within the guidelines of less than 50m length for a gradient up to 12%.</li> </ul>
		<b>Score</b>		<ul style="list-style-type: none"> <li>This option has scored <b>3</b> as it is the current shared path.</li> </ul>	<ul style="list-style-type: none"> <li>This option has scored <b>2</b> as it is of similar steepness to the current shared path, however for over twice the length. Therefore, it is deemed to be moderately negative compared to the current situation.</li> </ul>	<ul style="list-style-type: none"> <li>This option has scored <b>3</b> as it is very similar to the current shared path. Therefore, it is deemed to have no significant impact compared to the current situation.</li> </ul>	<ul style="list-style-type: none"> <li>This option has scored <b>3</b> as it is the current shared path.</li> </ul>
1.2	Conflicts	How do the proposed options decrease or increase the risk of collisions by cyclists with other bike users, pedestrians & other park users compared to Do Nothing?  [Refer to Figure 2 for locations of conflicts]	20%	<ul style="list-style-type: none"> <li>Several areas for conflicts in the current layout, particularly if no interventions are implemented.</li> </ul>	<ul style="list-style-type: none"> <li>Provides dedicated cycleway, with clear line of site.</li> <li>Conflicts at both ends (Camp and Park Streets), as well as with other gardens entrances when coming up the Park Street shared path.</li> <li>No intermediate conflicts with other paths and non-cycle users (dedicated cycleway)</li> </ul>	<ul style="list-style-type: none"> <li>Provides dedicated cycleway, with mostly clear line of site however some areas are obscured by thick side vegetation.</li> <li>Conflicts at both ends (Camp and Park Streets), as well as with other gardens entrances when coming up the Park Street shared path.</li> <li>Will be several intermediate conflicts with existing walking tracks that cross the proposed path.</li> </ul>	<ul style="list-style-type: none"> <li>Provides a combination of existing and new paths, ranging from 2m to 4m, however will not be a dedicated cycleway.</li> <li>The section of the proposed route, near Horne Creek Bridge, has several intersecting and competing recreation user spaces (playground, current commuters, sightseers, walkers, runners, events at Rotunda and in the Gardens near the Pond, such as Luma).</li> </ul>
		<b>Score</b>		<ul style="list-style-type: none"> <li>The Do-Nothing option should score 3, however it has been scored as 1. If no improvements are made for the current shared path, it is anticipated that there will be significant risk of increase of collisions in the future as the number of cyclists using the</li> </ul>	<ul style="list-style-type: none"> <li>This option has scored <b>5</b> because as a dedicated cycleway, it is a significant improvement in terms of managing collisions compared to Do-Nothing.</li> <li>There are two areas of major conflicts identified, however with</li> </ul>	<ul style="list-style-type: none"> <li>This option has scored <b>5</b> because as a dedicated cycleway, it is a significant improvement in terms of managing collisions compared to Do-Nothing.</li> <li>There are two areas of major conflicts identified, however with</li> </ul>	<ul style="list-style-type: none"> <li>This option has scored <b>4</b> because with the right interventions, the route can be an improvement in terms of managing collisions compared to Do-Nothing.</li> <li>However, it is not a dedicated cycleway and as a very busy shared</li> </ul>

No.	Criteria	Consideration	Weighting	Do-Nothing (DN)	Proposed Route (PR)	Alternative Route 1 (AR1)	Alternative Route 2 (AR2)
<b>Objective 1: To support safe and secure journeys for cycling.</b>							
				gardens to access the town centre increases	proper interventions (as recommended by the Safety Audit), these are manageable.	proper interventions (as recommended by the Safety Audits which is applicable to this route as well), these are manageable.	path, there is more risk of conflicts, (particularly adjacent to the existing playground), than the other two options, hence it does not score 5.
1.3	Secure journeys	Compared to Do-Nothing, what is the impact on personal safety/security of bike users? / Are there any CPTED issues?	5%	<ul style="list-style-type: none"> <li>Will be areas of the path not visible from rest of the path and or adjacent buildings.</li> </ul>	<ul style="list-style-type: none"> <li>Direct route with clear line of sight and overlooked by existing Hotops path and adjacent to QRC</li> <li>No dark areas during poor daylight, or secluded areas not visible from the rest of the path or other paths or buildings. Light spill from road creates additional light and public visibility of route.</li> </ul>	<ul style="list-style-type: none"> <li>Will be areas of the path not visible from rest of the path and or adjacent buildings.</li> <li>Thicker surrounding vegetation increases shade in some areas. May require additional lighting.</li> </ul>	<ul style="list-style-type: none"> <li>Will be areas of the path not visible from rest of the path and or adjacent buildings.</li> <li>Horne Creek river route overlooked by the Novotel.</li> </ul>
		<b>Score</b>		<ul style="list-style-type: none"> <li>This option has scored <b>3</b> as it is the current shared path.</li> </ul>	<ul style="list-style-type: none"> <li>This option has been determined to be a moderate improvement on the Do-Nothing, with the pathway being overlooked by the existing Hotops path and QRC, and therefore scores <b>4</b>.</li> </ul>	<ul style="list-style-type: none"> <li>The option is the most secluded route and not shared by other users, ie. Pedestrians. It is determined to be moderately worse than Do-Nothing and therefore scores <b>2</b>.</li> </ul>	<ul style="list-style-type: none"> <li>This option has been determined to be a moderate improvement on the Do-Nothing as the pathway is either busy and shared with other users or will be a dedicated cycleway and overlooked by the Novotel. The option scores <b>4</b>.</li> </ul>
	<b>Weighted Score</b>		<b>40%</b>	<b>0.80</b>	<b>1.50</b>	<b>1.55</b>	<b>1.45</b>
<b>Objective 2: To facilitate a cycling commuter route from Park Street (Frankton Track) to connect with Camp Street</b>							
2.1	Dedicated cycle route	How do the proposed options facilitate a dedicated cycling commuter route from Park Street to Camp Street?	10%	<ul style="list-style-type: none"> <li>No, does not provide a dedicated and/or clear route for cyclists.</li> </ul>	<ul style="list-style-type: none"> <li>Yes, provides a cycling commuter route with clear wayfinding (signage and pavement markings/treatments) at both ends.</li> </ul>	<ul style="list-style-type: none"> <li>Yes, provides a cycling commuter route with clear wayfinding (signage and pavement markings/treatments) at both ends.</li> </ul>	<ul style="list-style-type: none"> <li>Yes, provides a cycling commuter route with clear wayfinding (signage and pavement markings/treatments) at both ends. This option is longer than the other options and crosses many paths, therefore reducing effectiveness of wayfinding, and scores less than the other options.</li> </ul>
		<b>Score</b>		<b>N/A (Fatal Flaw)</b>	<b>5</b>	<b>5</b>	<b>4</b>
	<b>Weighted Score</b>		<b>10%</b>	<b>0.00</b>	<b>0.50</b>	<b>0.50</b>	<b>0.40</b>
<b>Objective 3: To consider effects on the natural environment</b>							
3.1	Impact on trees	<p>What impact do the proposed options have on existing trees compared to do nothing?</p> <p><b>[There are no listed protected trees in any of the routes however there are several significant trees identified by the Council arborists].</b></p>	20%	<ul style="list-style-type: none"> <li>No trees will be removed under Do-Nothing</li> </ul>	<ul style="list-style-type: none"> <li>Removal of approximately 42 trees which comprise of: <ul style="list-style-type: none"> <li>16 x native species</li> <li>20 x mature Douglas Fir</li> <li>6 x exotic (other)</li> </ul> </li> <li>Removal of Douglas Firs eliminates a wilding seed source, and replacement with native species.</li> </ul>	<ul style="list-style-type: none"> <li>Impacts approximately 120 small to large bushes and trees including: <ul style="list-style-type: none"> <li>At least 60 native species including: <ul style="list-style-type: none"> <li>30 x Beech (various)</li> <li>15 x Broadleaf</li> <li>15 x Pittosporum</li> <li>Other natives including Kowhai, Southern Rata, etc</li> </ul> </li> <li>15 x mature Douglas Fir (removal of Douglas Firs eliminates a</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Impacts on some trees along Horne Creek for path widening</li> </ul>

No.	Criteria	Consideration	Weighting	Do-Nothing (DN)	Proposed Route (PR)	Alternative Route 1 (AR1)	Alternative Route 2 (AR2)
<b>Objective 1: To support safe and secure journeys for cycling.</b>							
						wilding seed source, and replacement with native species.	
		<b>Score</b>		<b>3</b>	<b>1</b>	<b>1</b>	<b>2</b>
3.2	Te Kararo Quensstown Gardens Development Plan	How does the option align with and/or support the planned Te Kararo Queenstown Gardens Development Plan?	15%	<ul style="list-style-type: none"> <li>Doesn't meet Development Plan requirements to gradually remove Douglas Firs and replant with native species.</li> <li>No native planting planned.</li> </ul>	<ul style="list-style-type: none"> <li>Meets Development Plan vision to reduce Douglas Firs</li> <li>Native planting plan has been developed and will be implemented.</li> </ul>	<ul style="list-style-type: none"> <li>Impact on native planting area and series of walkways</li> <li>Impacts on the opportunity to create a native reference planting area and series of walkways, and therefore has an impact on the passive recreational use for the future development of this area of the gardens.</li> </ul>	<ul style="list-style-type: none"> <li>Doesn't meet Development Plan requirements to gradually remove Douglas Firs and replant with native species.</li> <li>No native planting planned</li> <li>Stage 1 of the Development Plan is currently being built and is not designed to be a shared path for commuter cyclists.</li> </ul>
		<b>Score</b>		<b>3</b>	<b>5</b>	<b>2</b>	<b>1</b>
	<b>Weighted Score</b>		<b>35%</b>	<b>1.05</b>	<b>0.95</b>	<b>0.50</b>	<b>0.55</b>
	<b>Total Score (exc. price)</b>		<b>85%</b>	<b>1.85</b>	<b>2.95</b>	<b>2.55</b>	<b>2.40</b>
4.1	Capital cost	What is the likely capital cost in comparison to the other options?  [Following recommendations by the Peer reviewers, sunk costs, ie. costs for items already constructed have not been considered in this assessment]	15%	<ul style="list-style-type: none"> <li>No funding required</li> </ul>	<ul style="list-style-type: none"> <li>Second most expensive of the options.</li> <li>Cost of a similar scale to AR1</li> </ul>	<ul style="list-style-type: none"> <li>Most expensive of the options, more shared path, and more retaining walls.</li> <li>Cost of a similar scale to PR</li> </ul>	<ul style="list-style-type: none"> <li>Main cost will be upgrade of cycleway between Marine Parade and Hotops Bridge (at back of Novotel).</li> <li>Should be significantly less than PR and AR1.</li> </ul>
		<b>Score</b>		<b>3</b>	<b>1</b>	<b>1</b>	<b>2</b>
	<b>Weighted Score</b>		<b>15%</b>	<b>0.45</b>	<b>0.15</b>	<b>0.15</b>	<b>0.30</b>
	<b>Total Score (inc. price)</b>		<b>100%</b>	<b>2.30</b>	<b>3.10</b>	<b>2.70</b>	<b>2.70</b>
	<b>Total Score (without weighting)</b>			<b>16</b>	<b>23</b>	<b>19</b>	<b>20</b>

## 3.2 Scoring Summary

Table 5: Summary of Scoring

No.	Criteria	Weighting	Base Case - Do Nothing (DN)	Proposed Route (PR)	Alternative Route 1 (AR1)	Alternative Route 2 (AR2)
<b>1</b>	<b>Objective 1 – To support safe</b>					
1.1	Gradients	15%				
	Score		3	2	3	3
1.2	Conflicts	20%				
	Major conflicts (No)		3	2	2	3
	<b>Score (3)</b>	<b>3</b>	<b>9</b>	<b>6</b>	<b>6</b>	<b>9</b>
	Medium conflicts (No)		3	2	1	0
	<b>Score (2)</b>	<b>2</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>0</b>
	Minor conflicts (No)		1	0	2	4
	<b>Score (1)</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>4</b>
	<b>Conflict total score</b>		<b>16</b>	<b>10</b>	<b>10</b>	<b>13</b>
	Score		1	5	5	4
1.3	Secure journeys	5%				
	Score		3	4	2	4
	<b>Weighted score</b>	<b>40%</b>	<b>0.80</b>	<b>1.50</b>	<b>1.55</b>	<b>1.45</b>
<b>2</b>	<b>Objective 2 - To facilitate a dedicated cycling commuter route from Park Street (Frankton Track) to Camp Street</b>					
2.1	Dedicated cycle route	10%				
	Score		N/A (Fatal flaw)	5	5	4
	<b>Weighted score</b>	<b>10%</b>	<b>0.00</b>	<b>0.50</b>	<b>0.50</b>	<b>0.40</b>
<b>3</b>	<b>Objective 3 - Assessment of environmental impact</b>					
3.1	Removal of Trees	20%				
	Score		3	1	1	2
3.2	Contributes to the Gardens development plan objectives	15%				
	Score		3	5	2	1
	<b>Weighted score</b>	<b>35%</b>	<b>1.05</b>	<b>0.95</b>	<b>0.50</b>	<b>0.55</b>
	<b>Total Score (exc. Price)</b>	<b>85%</b>	<b>1.85</b>	<b>2.95</b>	<b>2.55</b>	<b>2.40</b>
<b>4</b>	<b>Objective 4 - To provide a cost-effective and constructable cycle lane</b>					
4.1	Capital cost	15%				
	Score		3	1	1	2
	<b>Weighted score</b>	<b>15%</b>	<b>0.45</b>	<b>0.15</b>	<b>0.15</b>	<b>0.30</b>
<b>5</b>	<b>Total Score (inc. Price)</b>	<b>100%</b>	<b>2.30</b>	<b>3.10</b>	<b>2.70</b>	<b>2.70</b>
<b>6</b>	<b>Total Score (without weighting)</b>		<b>16</b>	<b>23</b>	<b>19</b>	<b>20</b>

MCA Rating	Colour	Score	Description
Strong Positive	Green	5	Strong positive impact compared to the base case
Moderate Positive	Light Green	4	Moderate positive impact compared to the base case
No Significant Impact	Yellow	3	No significant positive or negative compared to the base case
Moderate Negative	Orange	2	Moderate negative impact compared to the base case
Strong Negative	Red	1	Strong negative impact compared to the base case

## 4 Summary

### 4.1 Sensitivity Testing

A sensitivity analysis to determine variability of scoring has been undertaken. This has focused weightings and scores which are more subjective, ie. Thought to have the most uncertainty. The analysis has focussed on the following:

- Different weighting scenarios
- Different scoring scenarios
- Ranking based on an unweighted analysis

#### 4.1.1 Review of Weightings

A sensitivity test on the weightings of the dedicated cycle route and capital cost sub-criterion has been undertaken, as both of these are considered to be variable.

Table 6: Weighting Scenarios

Sub-Criteria	Original Weighting	Alternative weighting	Comment for alternative
1.1 Gradients	15%	10%	
1.2 Conflicts	20%	15%	
1.3 Secure journeys	5%	5%	
2.1 Dedicated cycle route	10%	20%	Higher %age for dedicated cycle route
3.1 Removal of trees	20%	20%	
3.2 Contribution to Gardens Development Plan	15%	10%	
4.1 Capital Cost	15%	20%	Higher %age for capital cost
<b>Total</b>	<b>100%</b>	<b>100%</b>	

Table 7: Comparison of Total Scores under alternative weighting scenarios

Scenario	Total Scores			
	Base Case - Do Nothing (DN)	Proposed Route (PR)	Alternative Route 1 (AR1)	Alternative Route 2 (AR2)
Original weightings	<b>2.30</b>	<b>3.10</b>	<b>2.70</b>	<b>2.70</b>
Alternative weightings	<b>2.10</b>	<b>3.05</b>	<b>2.75</b>	<b>2.80</b>

#### 4.1.2 Review of Scoring

The scores for the routes below have been identified as those that are the most subjective. Most of the scores are focussed on AR2.

Table 8: Scoring Scenarios

Sub-Criteria	Route	Original Score	Alternative Score	Reason for Alternative
1.2 Conflicts	AR2	4	2	Significant risk of conflicts even if interventions (markings, signage) on a very busy path,

				not designed to be shared path for commuter cyclists and adjacent to playground.
2.1 Dedicated cycle route	AR2	4	3	No improvement on Do-Nothing, still a shared path. The new shared path is not designed to be a shared cycleway
3.1 Removal of trees	AR2	2	3	Little or no impact on trees. Should be scored as neutral
3.2 Contribution to Gardens Development Plan	PR	5	4	Does contribute to Gardens Development Plan, however ahead of planning. Moderate positive rather than strong positive.

Table 9: Comparison of Total Scores under alternative scoring scenarios

Scenario	Total Scores			
	Base Case - Do Nothing (DN)	Proposed Route (PR)	Alternative Route 1 (AR1)	Alternative Route 2 (AR2)
Original Scores	<b>2.30</b>	<b>3.10</b>	<b>2.70</b>	<b>2.70</b>
Alternative Scores	<b>2.30</b>	<b>2.95</b>	<b>2.70</b>	<b>2.40</b>
Alternative Scores and Alternative weighting	<b>2.10</b>	<b>2.95</b>	<b>2.75</b>	<b>2.50</b>

#### 4.1.3 Total Scores Based on Unweighted Analysis

A review of the total scores without weighting has been shown in Table 10 below. This is a useful exercise to determine if the weighting has a significant outcome on the total ranking or differentiation between scenarios.

Total Scores	Base Case - Do Nothing (DN)	Proposed Route (PR)	Alternative Route 1 (AR1)	Alternative Route 2 (AR2)
Unweighted (original) score	<b>16</b>	<b>23</b>	<b>19</b>	<b>20</b>

#### 4.1.4 Summary of Sensitivity Testing

Multi criteria analyses can be subjective. Sensitivity analysis is a useful tool to determine the impact of subjectivity on the total scoring or ranking. For all scenarios and options tested above the Do-Nothing scenario consistently had the lowest score, whilst the Proposed Route consistently had the highest score. The only variability was between AR 1 and AR2. Under all weighted scenarios, AR1 scored equal or higher than AR2, however the total unweighted score was less than AR2.

In summary, the sensitivity testing has demonstrated that even under different scoring or weighting scenarios, the Proposed Route has the highest score.

## 4.2 Summary of results

In summary, all scores are very close, however small changes to either the scoring or the weighting does not have an impact on the outcome. The proposed route scores the highest, even under different scenarios or weighting.

- The “Do Nothing” option does not meet the objective of provide a cycling commuter route between Park and Camp Streets. It also has many areas of user/pedestrian conflicts.
- The Proposed Route scores the highest overall. Whilst this option is the second most expensive, with established trees required to be removed, it is the one of the safest options and most direct route for providing a commuter cycle path into the town centre, as well as supporting the objectives for the Te Kararo Queenstown Gardens Development Plan.
- The Alternative Route 1 is very similar to the Proposed Route, with the major differences being the shorter length of steep cycleway and more expensive to construct. However more trees are required to be removed (albeit less established trees) and there are more conflict points. This option does not support the future development of this section of Hotops under the Te Kararo Queenstown Gardens Development Plan.
- The Alternative Route 2 has many areas for user/pedestrian conflict, particularly on a very busy path with some steep gradients in areas. This is considered a significant safety risk for both commuter cyclists and other path users. The current upgrade being constructed has not been designed to be a shared commuter route and is adjacent to the playground. This option, however, does not impact trees significantly and will be lower in cost to implement than the Proposed Route or Alternative Route 1.



Appendix A

# Cycleway Design Criteria

# Cycleway Design Criteria

The following section is a summary of cycleways design criteria:

- Widths
- Gradients
- Surfacing

## 1. Widths

There is various guidance for the widths of a dual direction cycleway.

From the active travel network standards (based on the QLDC trails guidelines), the following has been adopted:

- For Rural environment (Shotover/Lake Hayes) adopted the QLDC Trails guidelines – Grade 1, recreational user, dual direction though not high use – 2.5m wide
- For the Urban environment (Frankton Track, Park St, Robins Rd, Gorge Rd) adopted the Austroads standard – Higher use, mixed users – 3-4m wide

The Auckland Transport Design Manual (TDM) recommends the following minimum standards for an off-road cycle path:

- A path primarily for the use of people on bikes, on an alignment away from the street network.
- A cycle path will operate as two-way and are to be a minimum of 3m. If shared use by people on foot is expected, the width should be increased to 4m.

For the Proposed Route, an assessment of the width of the footpath, based upon the path being a bidirectional route, the gradient, visibility, and safety requirements, was undertaken. The result of this assessment was the recommendation to use an optimum width of 4m and make this a dedicated cycleway (ie. no pedestrians). This was primarily due to the steeper gradient, potential of pedestrians using the path, and fast bikes going downhill being able to overtake another bike, without impacting on users coming up the other way.

## 2. Gradients:

The QLDC trails gradient guidelines aren't directly applicable to a bidirectional commuter cycle facility. The language used are more suited to a trail. For the assessment of these options, Austroads has been used as a reference point. Austroads refers to the following requirements:

**Figure 7.4: Desirable uphill gradients for ease of cycling**

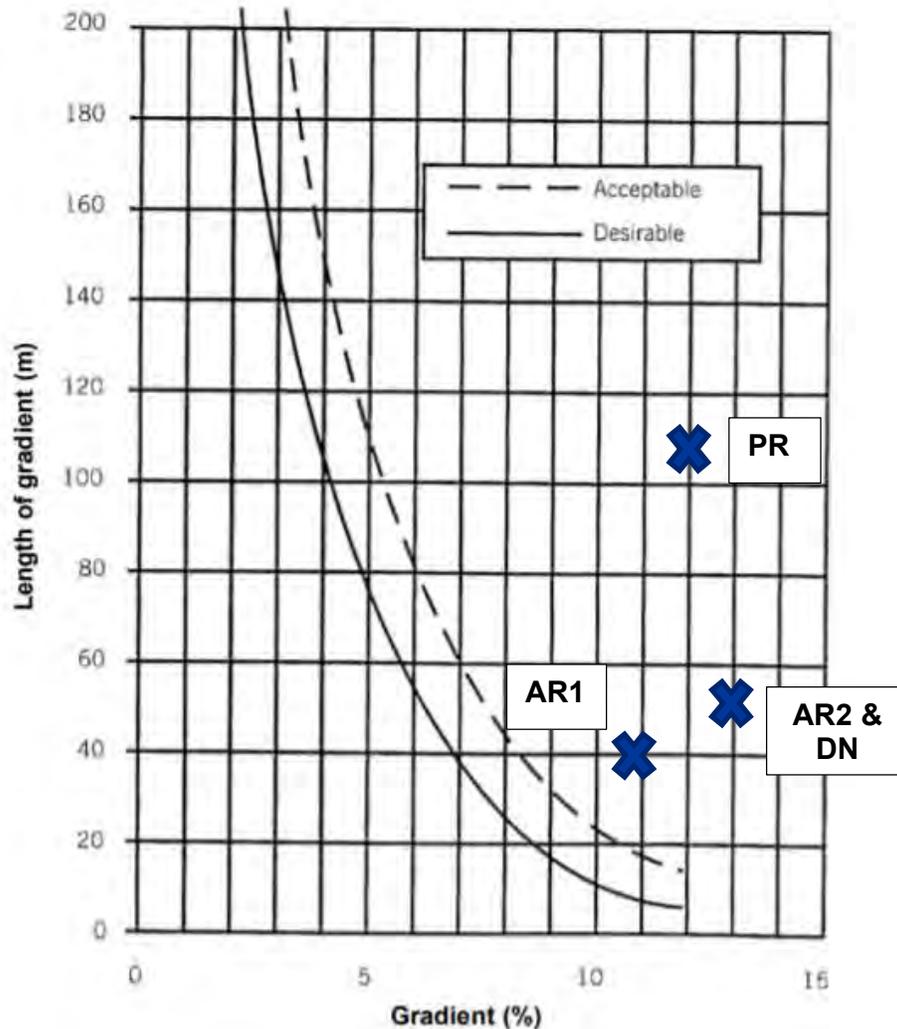


Figure 3: Austroads 2017 – Cycling Aspects of Austroads Guides. Figure 7.4: Desirable uphill gradients for ease of cycling

For the proposed route, the grade of 12% (6.84 degrees) at tie of the existing site (what would be physically achievable) – and lessening the existing grade of the Hotops walkway (a key driver).

Austroads refers to a 'preferred' maximum gradient of 12.0% up to lengths of 50m, hence this is what the design has aimed to achieve but across the 110m length. This is heavily constrained by existing topography. This longer length of 12% slope needs to be as constant, as straight, and as generous as possible, hence the recommendation to make it 4m wide.

### 3. Surfacing:

According to the TDM, the following surfaces discussed:

- Asphalt surfacing is the approved surface for cycleways and off-road paths. It provides a smooth ride with lower friction drag, but good slip resistance.

- Chip seal should never be used on cycleways cycle paths.
- Concrete may be used on shared paths – or via departure for cycleways and cycle paths. The design needs to ensure the concrete finish is sufficiently different in colour from any footpath, and have a smooth, skid resistant surface with 90degree edge saw cut joints.
- Other surfaces, such as boardwalks, must provide suitable slip resistance and durability and will require departure.

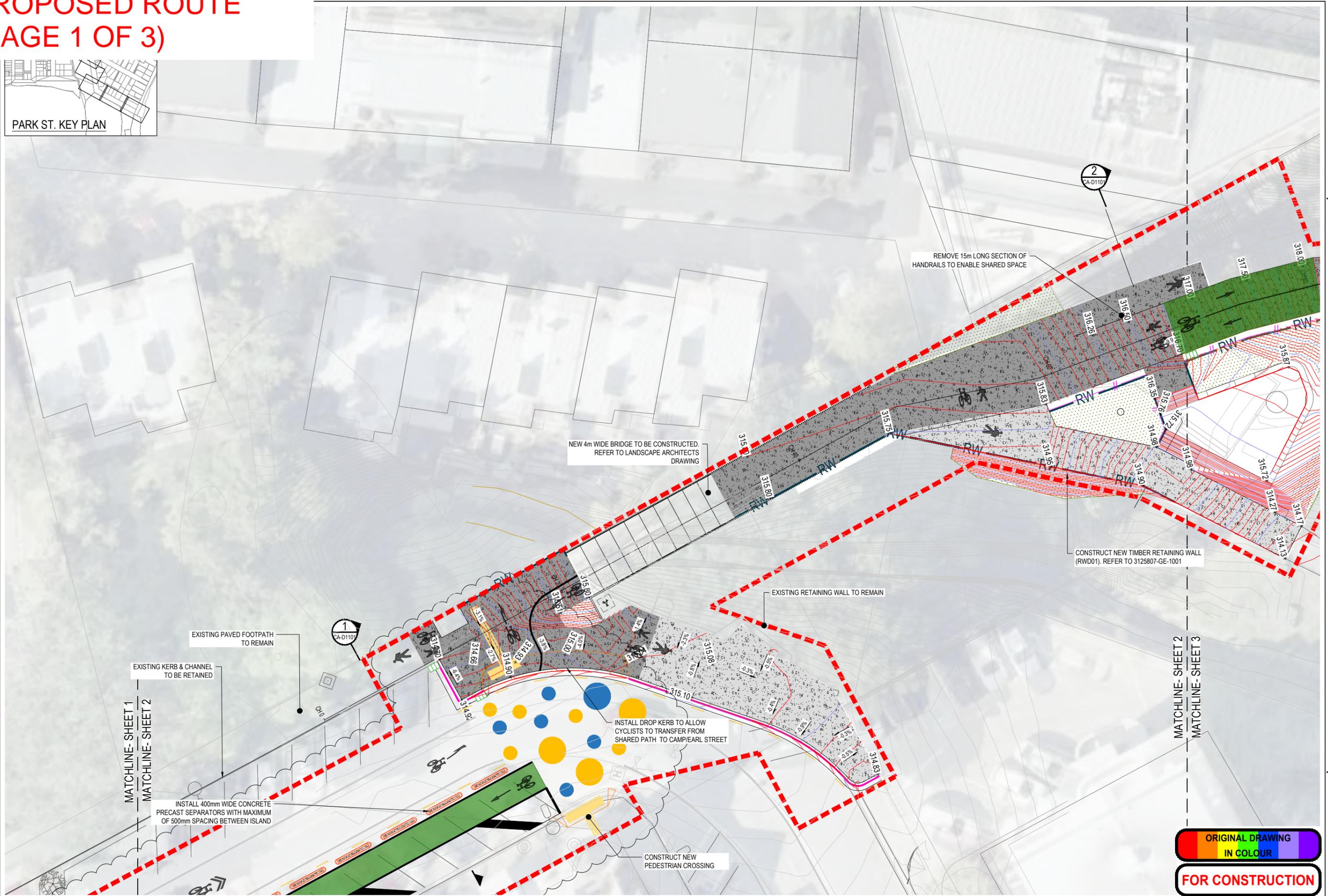
For the Proposed Route, concrete was selected as the preferred material due to the long-term durability of the material, particularly with regards to tree root intrusion, which does affect asphalt paths over a long period of time.



## Appendix B

# Layout Drawings

# PROPOSED ROUTE (PAGE 1 OF 3)



ORIGINAL DRAWING  
IN COLOUR

**FOR CONSTRUCTION**

No.	Revision	By	Chk.	Appd.	Date
1	FOR CONSTRUCTION	ES	RS	JR	29.01.21

Drawing Original:

Original Scale (A1)	Design	Drawn	Checked	Approved For Construction
1:125	B.SONG 08.02.19	B.SONG 08.02.19	J.RING 29.01.21	J.RING
Reduced Scale (A3)	Design Verifier	Day Check	Date	
1:250	R.SALAS 29.01.21	R.SALAS 29.01.21	29.01.21	

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Client:

Project:

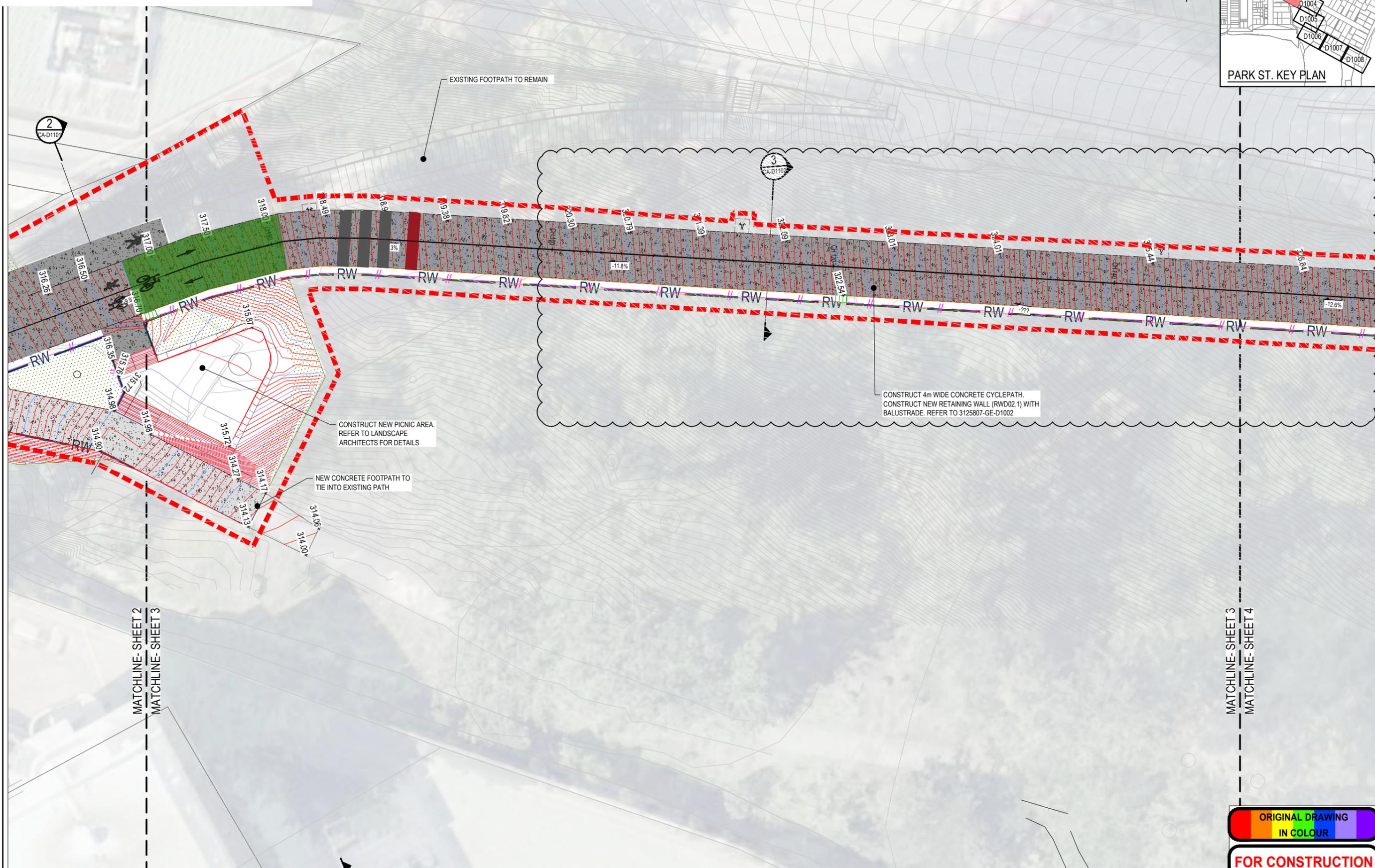
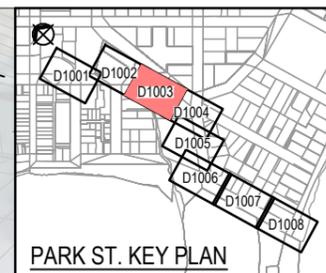
QUEENSTOWN STREETSCAPES

Title:

CIVIL WORKS PLAN  
PARK ST/ HOTOPS CYCLEWAY  
SHEET 2 OF 8

Discipline	Rev.
CIVIL ENGINEERING	1
Drawing No.	3125807-CA-D1002

# PROPOSED ROUTE (PAGE 2 OF 3)



No.	Revision	By	Chk.	Appd.	Date
1	FOR CONSTRUCTION	ES	RS	JR	29.01.21



Original Scale (A1)	1:125	Design	B.SONG	08.02.19	Approved For Construction*	J.RING
Reduced Scale (A3)	1:250	Drawn	B.SONG	08.02.19	Date	29.01.21
		Design Verifier	J.RING	29.01.21		
		Design Check	R.SALAS	29.01.21		

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Project: QUEENSTOWN STREETSCAPES

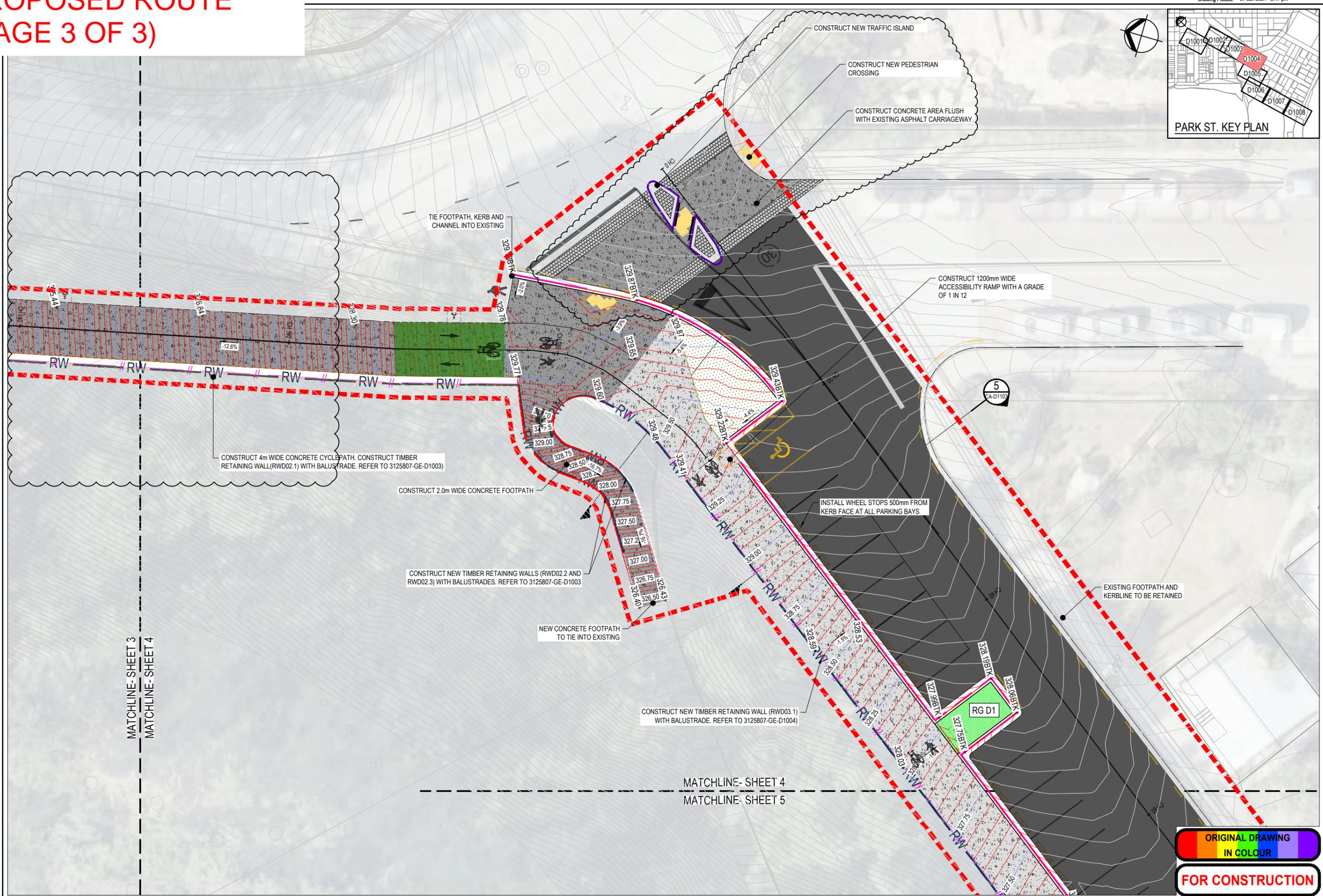
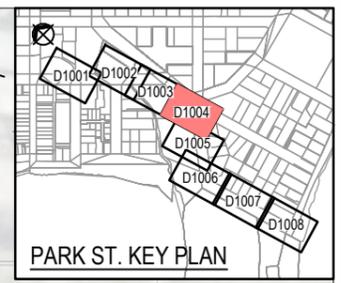
Title: CIVIL WORKS PLAN  
PARK ST/ HOTOPS CYCLEWAY  
SHEET 3 OF 8

Discipline	CIVIL ENGINEERING
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Rev.	1



# PROPOSED ROUTE (PAGE 3 OF 3)

Drawing Plotted: 27 Jan 2021 2:47 pm



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Discipline	Drawing No.	Rev.
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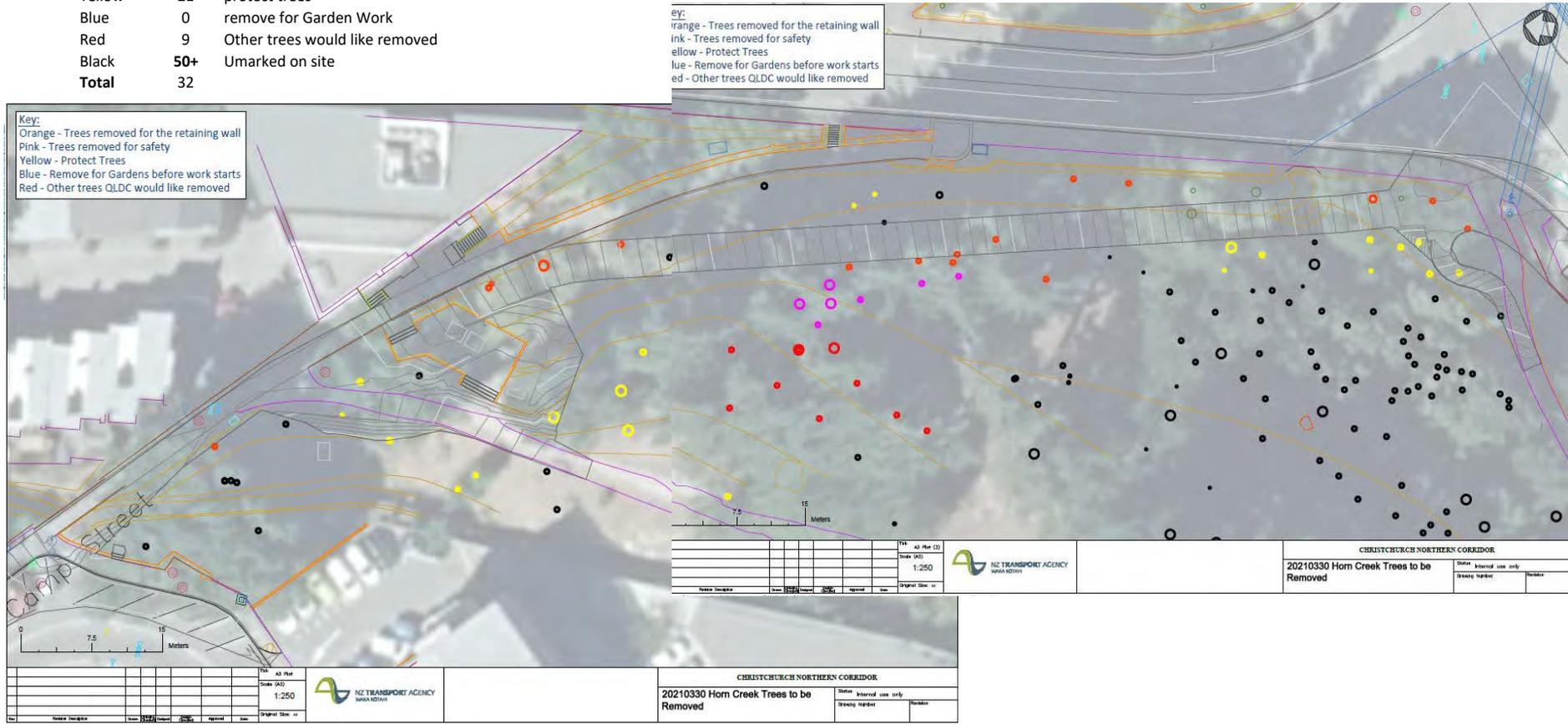
# PROPOSED ROUTE

## Tree Removal

Pink	7	removed (safety)
Yellow	21	protect trees
Blue	0	remove for Garden Work
Red	9	Other trees would like removed
Black	50+	Umarked on site
<b>Total</b>	<b>32</b>	

Key:  
 Orange - Trees removed for the retaining wall  
 Pink - Trees removed for safety  
 Yellow - Protect Trees  
 Blue - Remove for Gardens before work starts  
 Red - Other trees QLDC would like removed

Key:  
 Orange - Trees removed for the retaining wall  
 Pink - Trees removed for safety  
 Yellow - Protect Trees  
 Blue - Remove for Gardens before work starts  
 Red - Other trees QLDC would like removed



Date		Scale		Drawing No.		Project Name	



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20210330 Horn Creek Trees to be Removed	Sheet Internal use only
Sheet Number	Number

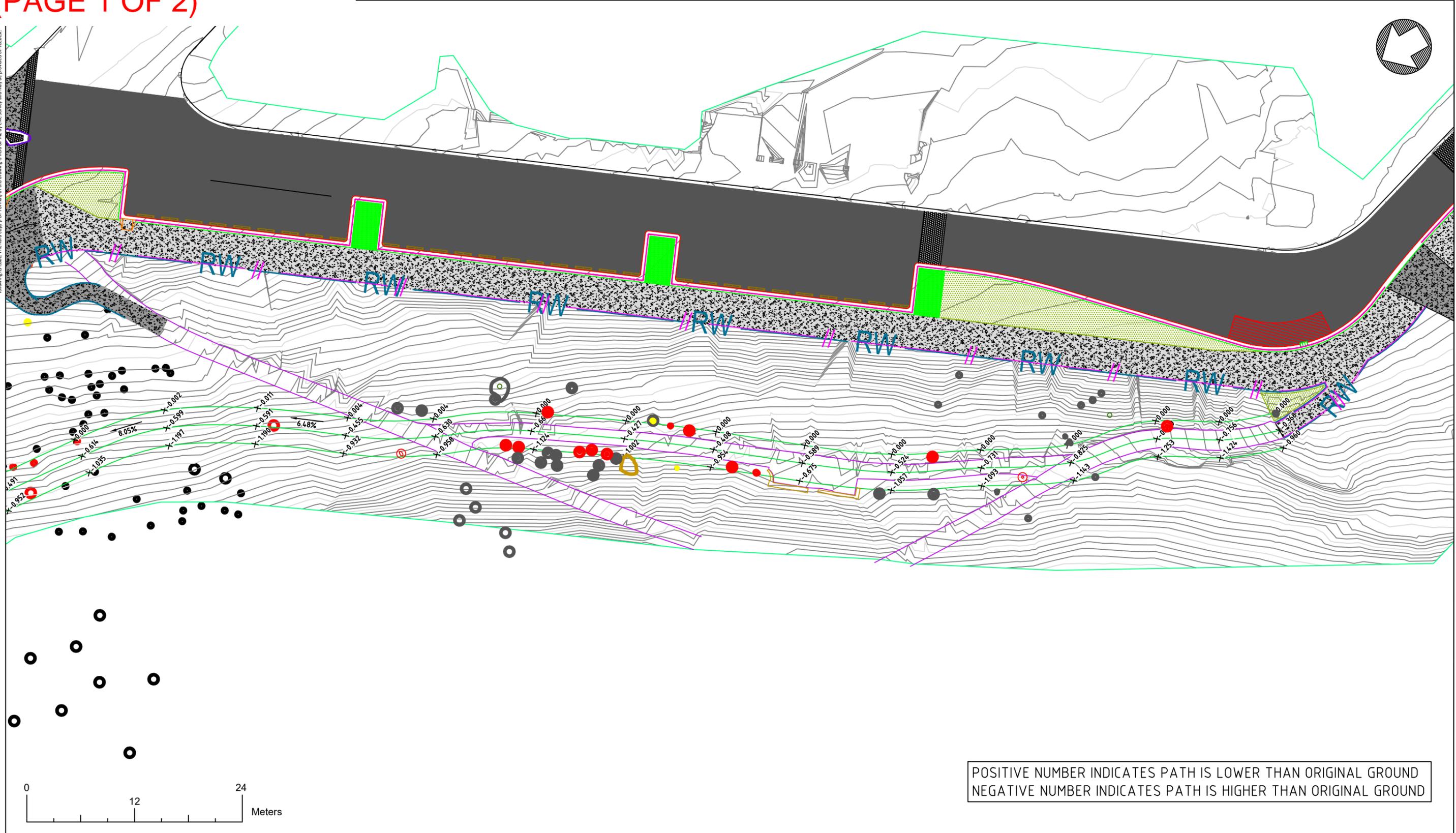
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CHRISTCHURCH NORTHERN CORRIDOR	
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# ALTERNATIVE ROUTE 1 (PAGE 1 OF 2)

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POSITIVE NUMBER INDICATES PATH IS LOWER THAN ORIGINAL GROUND  
NEGATIVE NUMBER INDICATES PATH IS HIGHER THAN ORIGINAL GROUND

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Original Size: A3



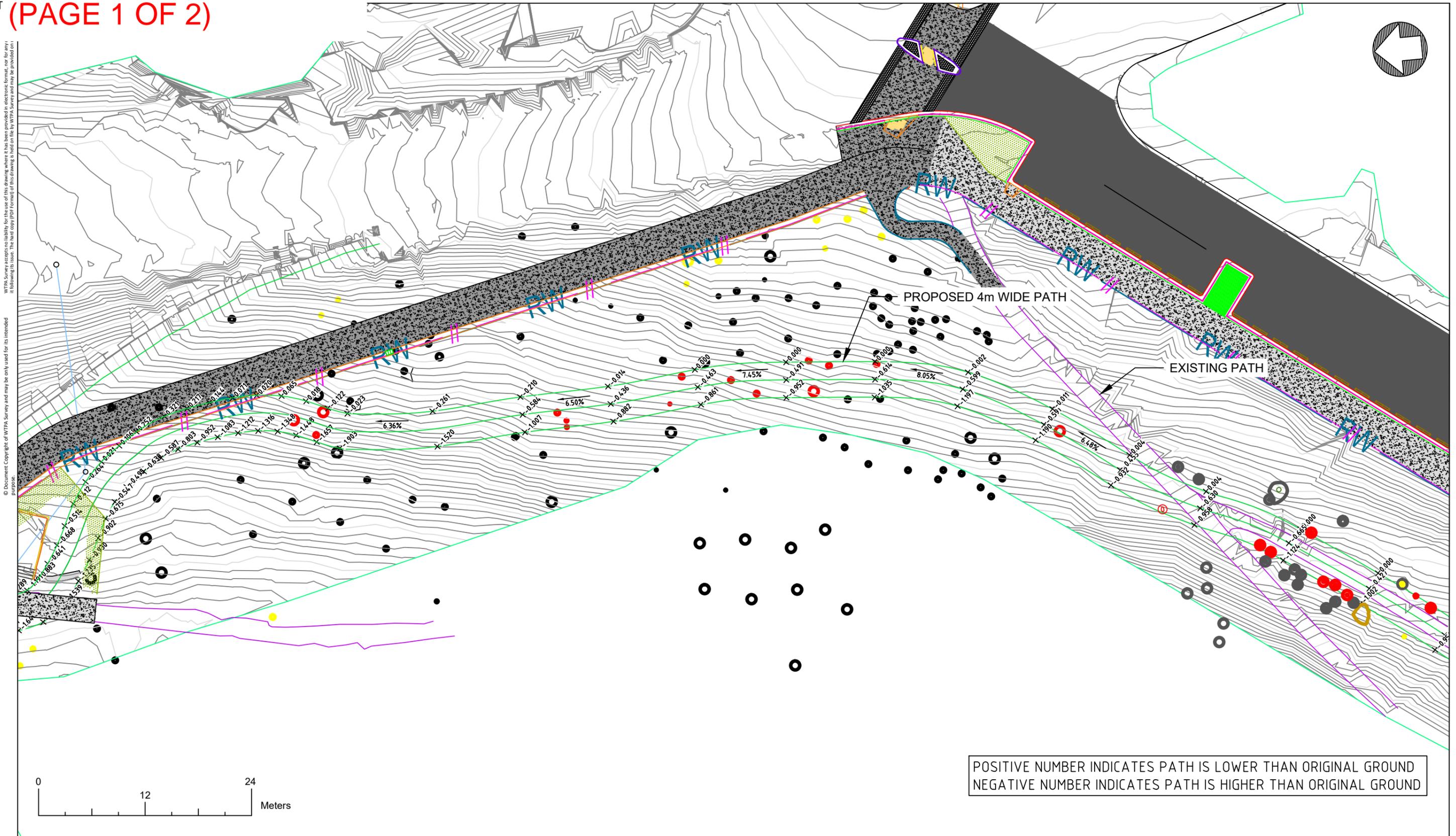
**CHRISTCHURCH NORTHERN CORRIDOR**

**20210907 Hotops Path Proposed Alignment vs. Original Ground Levels**

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Drawing Number	Revision

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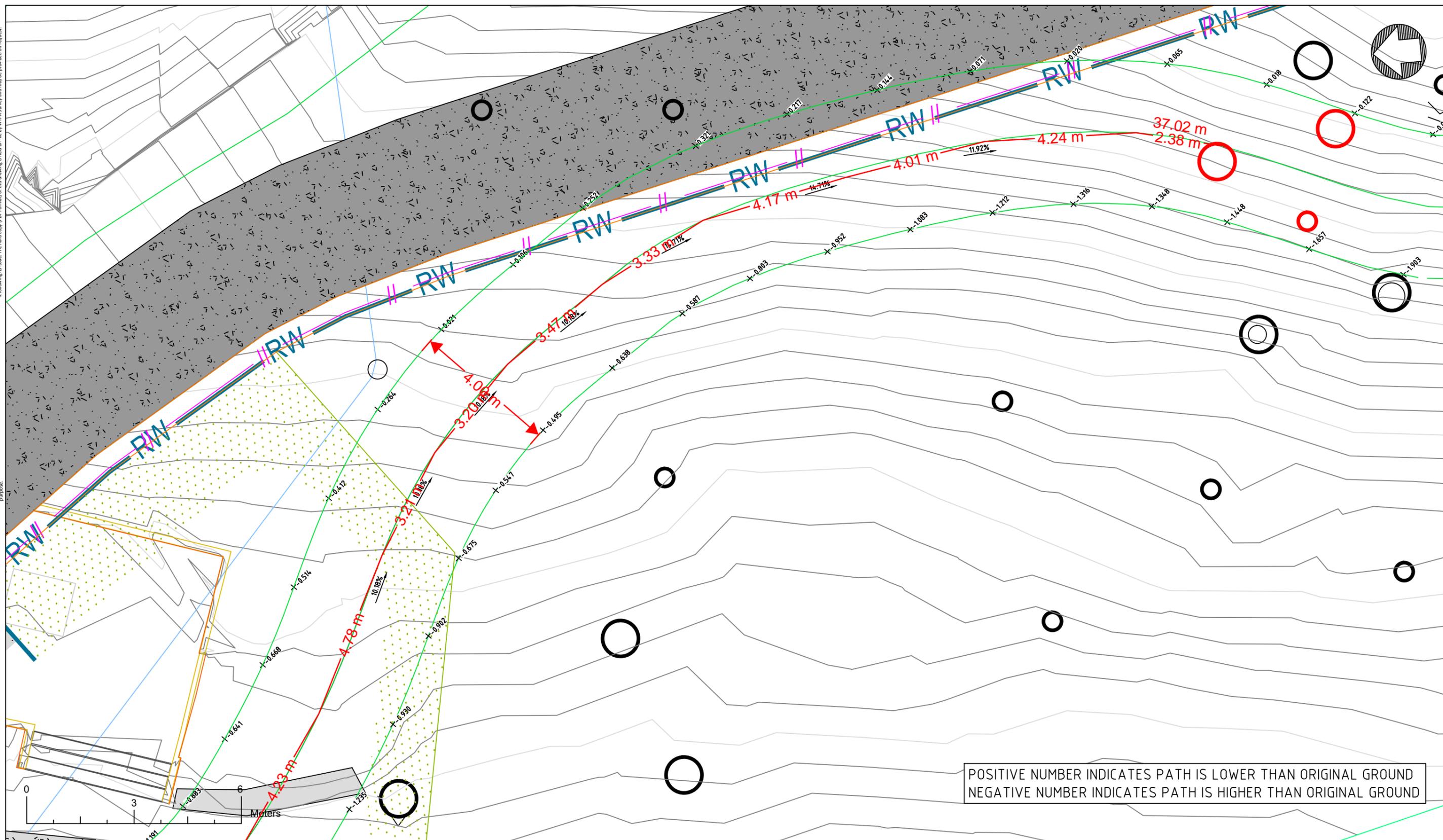
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<b>WHAKATIPU TRANSPORT PROGRAMME ALLIANCE</b>	
<b>20210907 Hotops Path Proposed Alignment vs. Original Ground Levels</b>	
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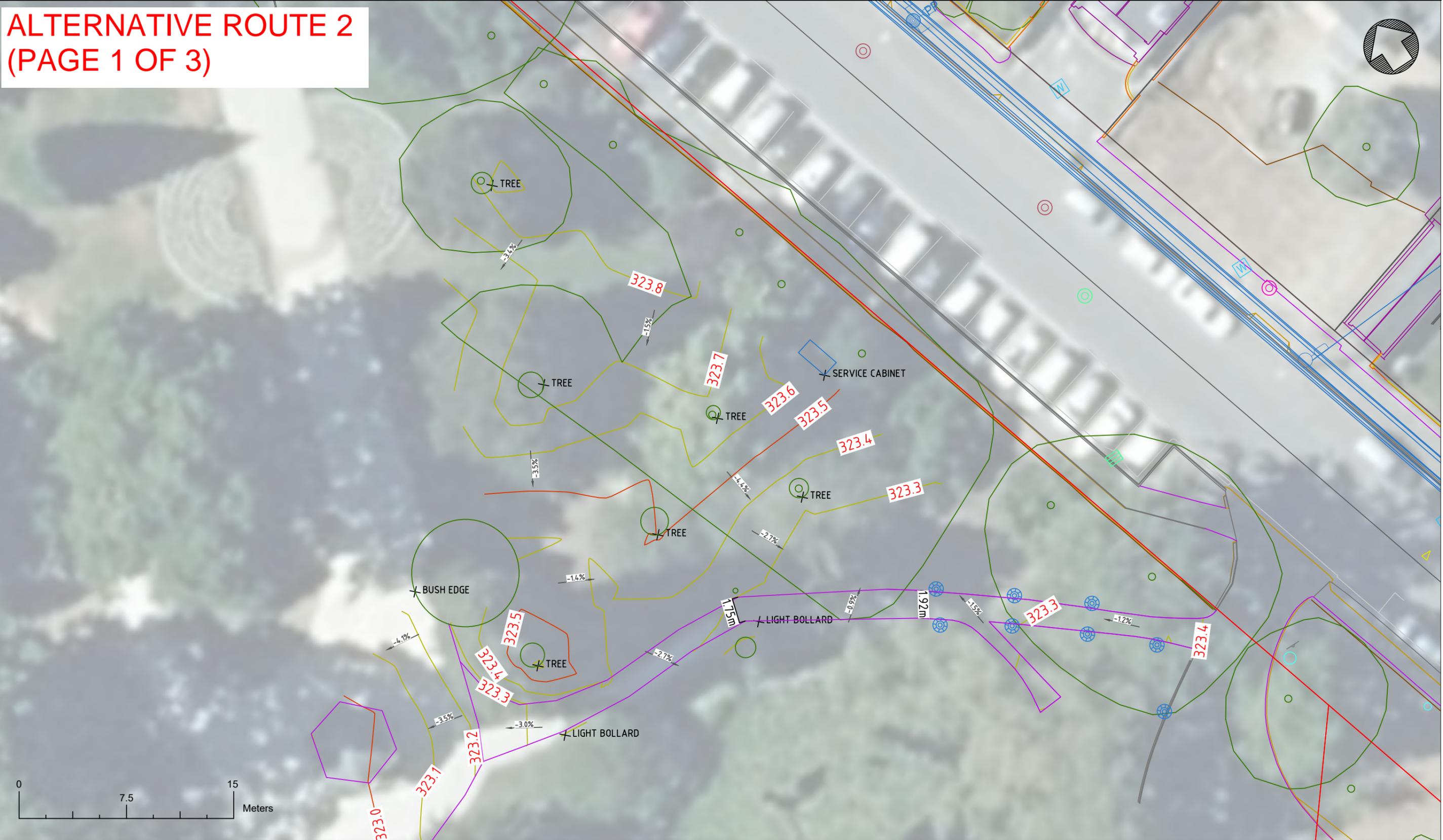
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20210921 Hotops Path Grades	
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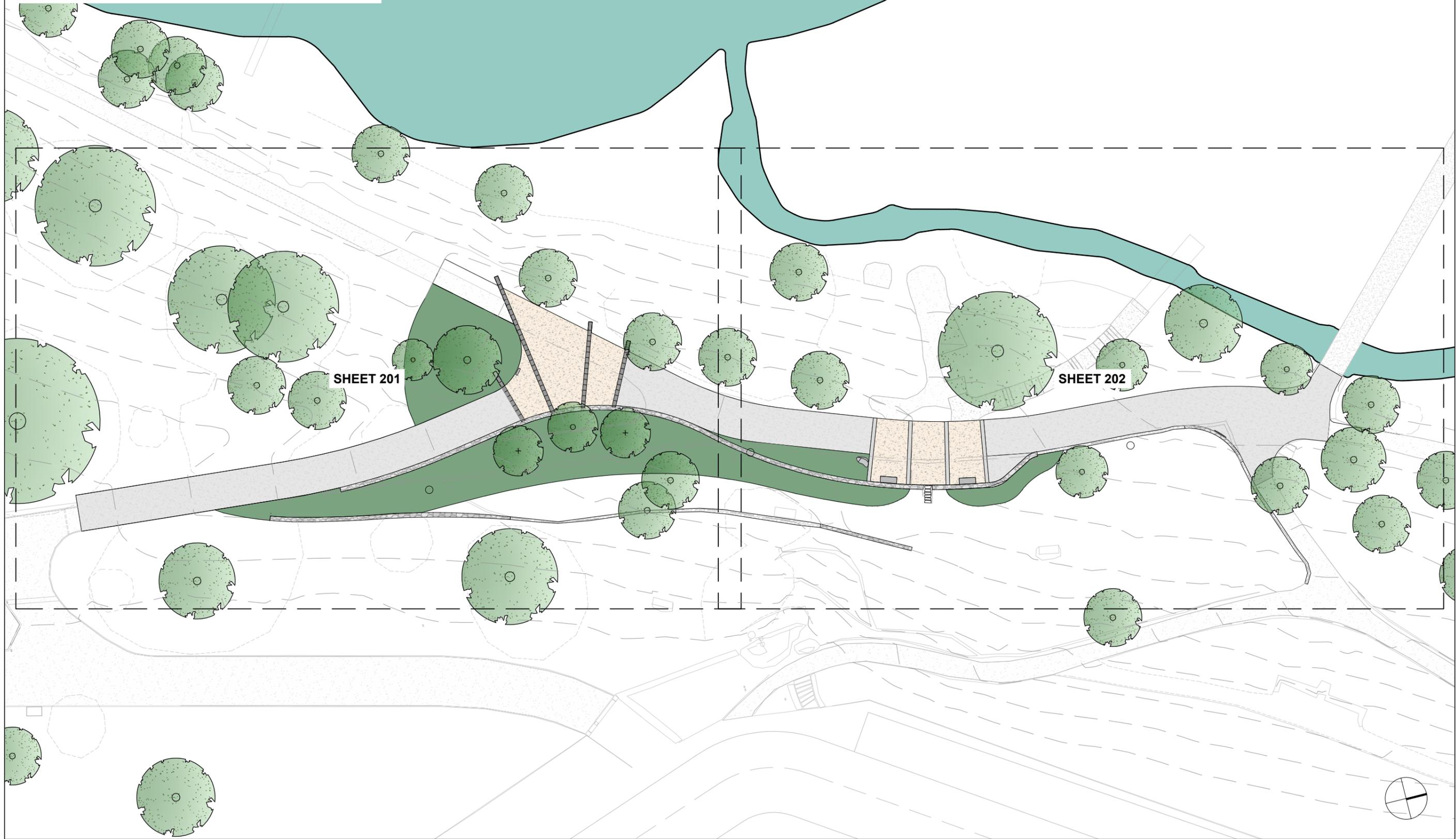
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Original Size:	A3

<b>WAKATIPU TRANSPORT PROJECT ALLIANCE</b>	
<b>20210915 Queenstown Gardens Existing Path Topo</b>	
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Drawing Number	Revision

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### KEY

REV	DATE	DESCRIPTION
-	06.11.20	Detailed Design
A	17.12.20	Planting Areas Updated

### APPRVD

CLIENT  
Queenstown Lakes District Council

CONSULTANTS  
Aukaha

Te Kararo / Queenstown  
Gardens

GENERAL ARRANGEMENT LOCATION

Design	MAs	Scale	Date
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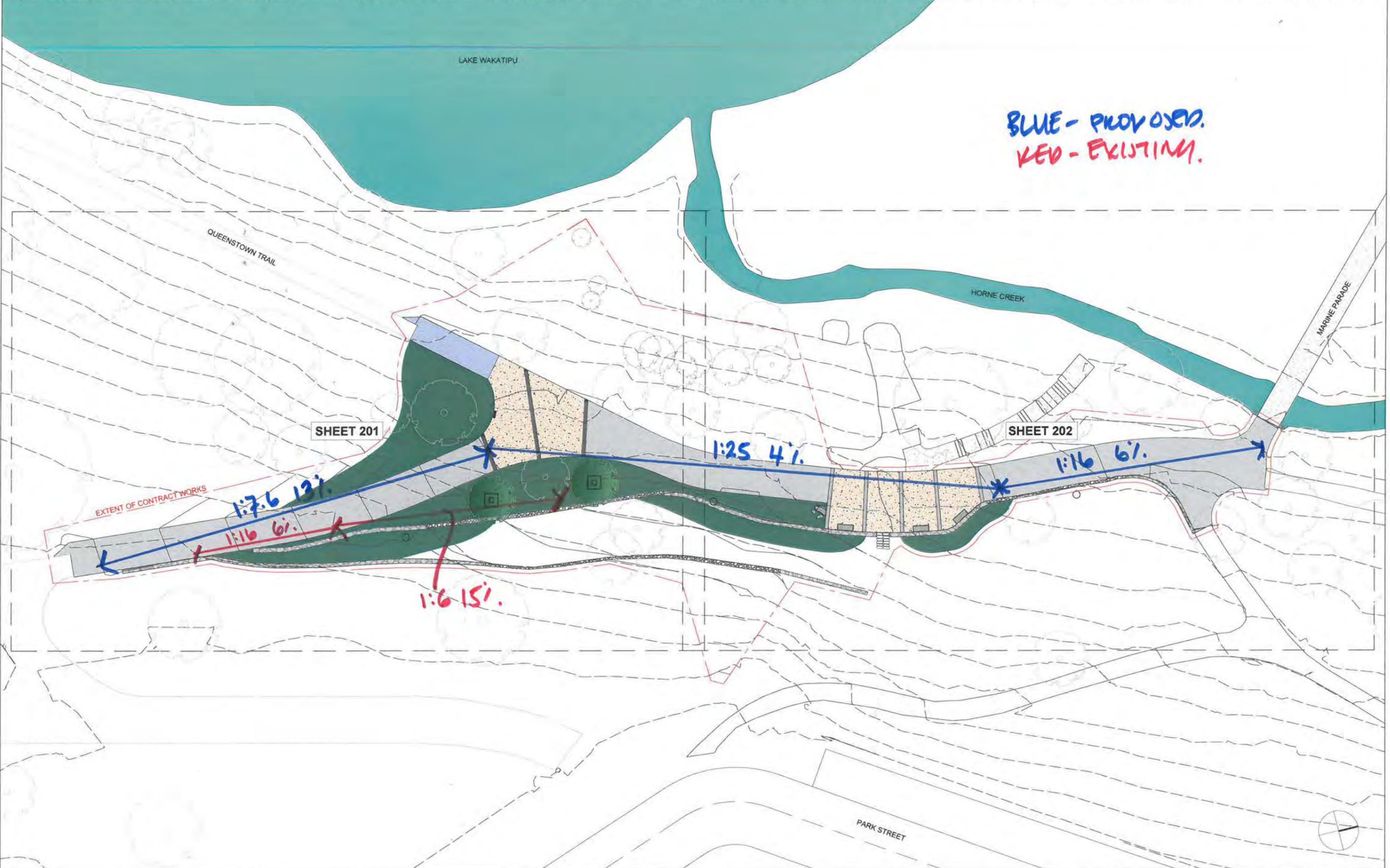
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200 (A)

**DETAILED DESIGN**

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**KEY**

REV	DATE	DESCRIPTION
C	18.04.21	FOR TENDER
D	28.05.21	FOR TENDER
E	31.05.21	FOR TENDER
F	04.06.21	FOR CONSTRUCTION

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Te Kararo / Queenstown Gardens

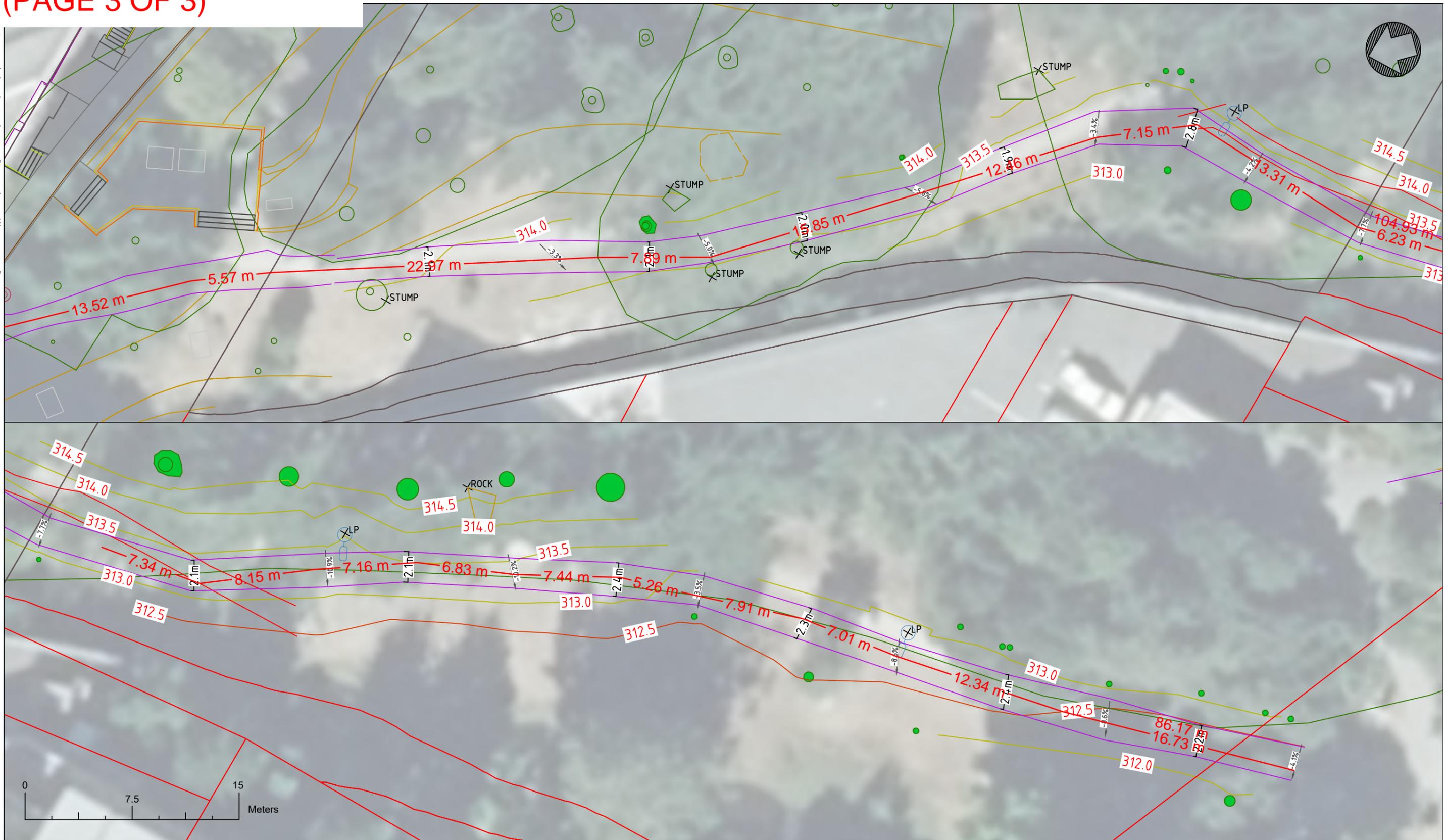
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Scale (A3)	1:250
Original Size:	A3

<b>WAKATIPU TRANSPORT PROJECT ALLIANCE</b>	
<b>20210915 Hotops to Park Existing Path</b>	
Status Internal use only	
Drawing Number	Revision



## Appendix C

# Road Safety Audit (by Stantec) of Proposed Design

# HOTOPS RISE CYCLE PATH ROAD SAFETY AUDIT

PREPARED FOR QUEENSTOWN LAKES DISTRICT COUNCIL

OCTOBER 2021



# Queenstown Lakes District Council

## Hotops Rise Cycle Path Road Safety Audit

### CONTENTS

- 1. Introduction ..... 1
- 2. Hotops Rise Revised Designs 2021 ..... 1
  - 2.1 Camp Street, Church Street Roundabout ..... 1
  - 2.2 Camp Street/Earl Street intersection ..... 2
  - 2.3 Horne Creek Bridge ..... 4
  - 2.4 Hotops Cycleway ..... 4
  - 2.5 Park Street ..... 6
  - 2.6 Retaining walls and edge protection ..... 8

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- Figure 2-2: Cycle symbol in front of service box ..... 3
- Figure 2-3: Future conflict point where cycle path and footpath will meet ..... 5
- Figure 2-4: Potential conflict point on Park Street ..... 6

# 1. Introduction

The 2019 Queenstown Streetscape Design Stage Road Safety Audit included a review of the proposed shared path and cycle way connection between Camp Street/Earl Street and Park Street via Hotops Rise. In October 2021 we were provided with a revised design for this work and asked to provide additional commentary.

We note some minor changes in the design but also one more significant change which is the location of the cycle lane on Camp Street between Earl Street and Church Street.

This short report should be considered as an addendum to the full 2019 report.

# 2. Hotops Rise Revised Designs 2021

## 2.1 Camp Street, Church Street Roundabout

The 2019 design had a two way cycle lane on the north side of Camp Street separated from the traffic lane by physical dividers as shown below. The most significant change is that eastbound cyclists will share the carriageway with general traffic while westbound cyclists will have a separated cycle path on the south side of the road. To do this parking on the south side is removed while parking on the north side is retained, the reverse of what was proposed earlier.

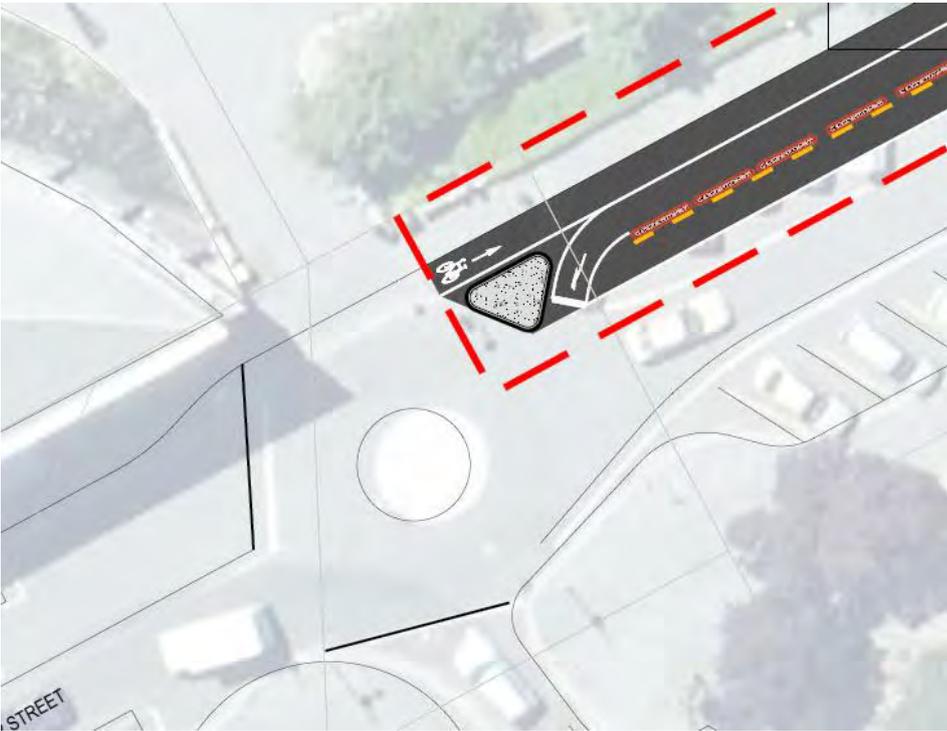


Figure 2-1: Previous design at Camp Street roundabout

The supplied plans do not show the above intersection therefore it is not clear how cyclists will enter the existing roundabout. Church Street users do not currently have to give way to much traffic, just that from the Police station and those cars doing u-turns. Cyclists coming out of the one way section of Camp Street will have the right of way at a roundabout however there is the potential for drivers not to appreciate this due to them travelling against the normal flow of traffic and thus failing to give way.

**Recommendation** **Moderate**

1. Review how the westbound contraflow cycle lane will terminate at the Church Street roundabout.

Crashes are likely to be infrequent	Death or serious injury is likely	The safety concern is moderate
Designer response	The updated design as agreed with QLDC has westbound cyclist on Camp Street approaching the Church Street intersection on the southern side. It is believed that drivers approaching Camp Street from Church Street will see and give way to cyclists on their right as per the standard give way rules.	
Safety Engineer comment	Agree with Designer's response.	
Client decision	Agree with Safety Engineer's comment.	
Action taken	No action to be taken.	

## 2.2 Camp Street/Earl Street Intersection

The transition between a fully off-road cycle facility and the on-road section of Camp Street occurs at the Earl Street intersection.

### 2.2.1 Road markings

'Traffic calming dots' are shown on the corner where Camp Street becomes Earl Street. These are located in an area where cyclists and motorcyclists on Camp Street will be braking and turning and if simply painted they will be a hazard to these users in the wet. With vehicles forced to slow down due to the sharp curve it is not clear what safety benefits these dots will bring.

The painted dots are inconsistent with other markings in the district and may lead to confusion for both cyclists and motorists. This could also lead to a public attraction and introduce safety issues with pedestrians in the road.

#### Recommendation

**Minor**

- Review the need for painted dots on the corner of Camp Street and Earl Street where two-wheeled users will be braking and turning due to the potential hazard this will cause in wet conditions.

Crashes are likely to be infrequent	Death or serious injury is unlikely	The safety concern is minor
Designer response	We note the Safety Auditors comments. It was initially recommended that either a raised table or speed humps be installed in this area, but this will significantly increase the cost of the project. The purpose of the painted dots is to highlight a change in the road environment to road users. It is recommended that painted dots are installed using non-slip paint or similar material. This design is part of the innovating streets solution toolbox and is to make all road users aware of a change in the road environment and therefore slow down. This design has been installed in a number of locations across New Zealand including Shortland Street, Auckland to great success as a low-cost solution where pedestrian/cyclist and vehicles interact, but in a shared space.	
Safety Engineer comment	Agree with Designer's response. Also note that there is a path through the dots so cyclists and motorcyclists can avoid riding over them.	
Client decision	Agree with Safety Engineer's comment.	
Action taken	Painted dots to be installed using non-slip paint or similar product.	

The Civil Works Plan shows a cycle symbol and left turn arrow on Camp Street which is not shown on the Road Markings and Signs Plan. As road users are required to comply with any arrows in their lane, this left turn arrow will only cause confusion for people wanting to follow the road into Earl Street. Signs will be required to inform cyclists of the new path on their left.

The SAT found that the various pedestrian and cyclist symbols on Sheet 2 of 8 were confusing and need to be complemented by wayfinding signs to direct both pedestrians and cyclists to the areas dedicated for them, whether crossing points or the actual track where it diverges on Hotops Rise. The location of the symbol markings also need to be reviewed, with one cycle symbol being shown placed in front of a service box as shown below.

The Road Markings and Signs Plans do not actually show any signs at this end of the cycle path. The SAT believe that signs will be critical to the correct use of the paths that are to be provided.

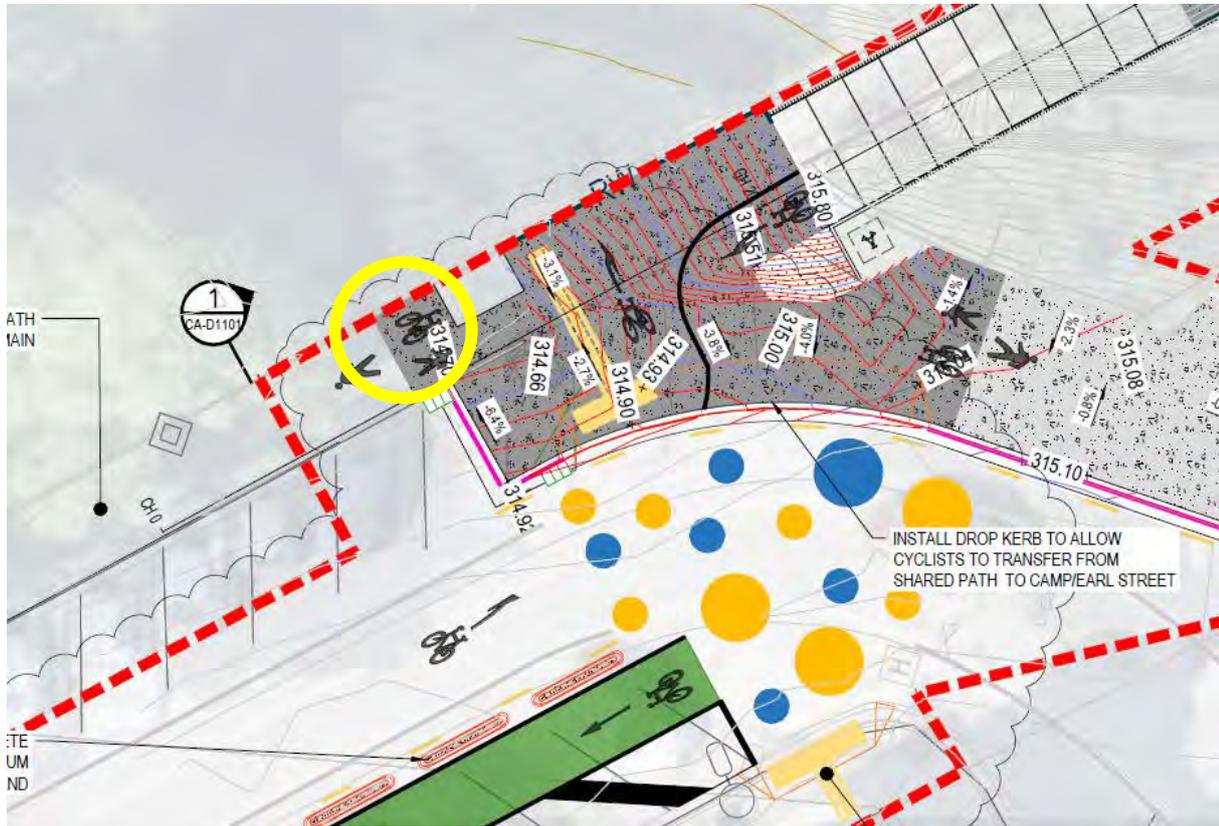


Figure 2-2: Cycle symbol in front of service box

**Recommendations**

**Minor**

- 3. Review the location of the pedestrian and cycle symbols along the route.
- 4. Ensure that all signs are shown on the construction plans.

Crashes are likely to be infrequent	Death or serious injury is unlikely	The safety concern is minor
Designer response	We note the Safety Audit comments. The large square shown on the design drawing are actually the Telecommunication pit covers and does not provide a restriction to the existing footpath and proposed shared path. The pavement markings within the share space have been agreed with QLDC especially the markings for cyclists to guide them between the Horne Creek Bridge and Camp Street and Earl Street intersection.	
Safety Engineer comment	Additional signage at the ped & cyclist shared space/ped only spaces needed. An additional vertical element to indicate change, and clearly show pedestrians they are entering an area with cyclists, and for cyclists to clearly see they can no longer travel on the footpath.  Additional right turn arrow to be included with the left turn arrow above the Camp Street cycle sharrow to show that cyclist could also turning into Earl Street.	

	Agree with Designer's other comments about the cover.
Client decision	Agree with Safety Engineer's comment.
Action taken	Design to be updated to include: <ul style="list-style-type: none"> <li>• Addition signage at the transition between shared space and footpath to inform both pedestrians and cyclist the start and end of the shared space.</li> <li>• Right turn arrow on Camp Street cycle sharrow.</li> </ul>

### 2.3 Horne Creek Bridge

Our comments for the replacement bridge in the previous report are still valid. With dedicated cycle lanes on both approaches, the lack of any delineation for cyclists or pedestrians over the replacement bridge at Horne Creek is noticeable and leads to a number of possible conflict points. Neither set of plans show the shared path will be delineated across the bridge, with a centre line shown on one side and no markings at all on the other.

**Recommendation**

**Minor**

5. Produce signs and markings plan to show how the shared path is to be treated across the replacement bridge over Horne Creek.

Crashes are likely to be occasional	Death or serious injury is unlikely	The safety concern is minor
Designer response	We do not believe that additional signage is required. Cyclist and pedestrians will interact at slow speeds and there is sufficient width and space either side of the Horne Creek bridge.	
Safety Engineer comment	Agree with Designer's comments.	
Client decision	Agree with Safety Engineer's comments.	
Action taken	No action required.	

### 2.4 Hotops Cycleway

The main part of this section of the overall project is the new dedicated cycle path alongside the existing walkway.

The gradient of the new cycleway is generally 8 to 11 percent, however, where it meets the shared path the cycleway comes off a 13 percent slope so cyclists are likely to be travelling at some speed down towards the shared path. We note that speed threshold markings are proposed however the simple change in texture may not be sufficient to restrain the speed of cyclists coming down the hill. While relatively little can be done about the grade of the path the speed of users will need to be monitored to ensure that there is not an issue where the cycle track meets the footpath. Warning signs may be required and if an issue does develop a chicane type facility may need to be introduced to constrain downhill cycle speeds.

It is assumed that the wooden post and metal fence between the new cycle path and the existing footpath will remain, however at the end of that fence there will be a conflict area between pedestrians and cyclists.



Figure 2-3: Future conflict point where cycle path and footpath will meet

**Recommendation**

**Moderate**

- 6. The point where cyclists come off their dedicated path and join pedestrians on the shared path is a potential conflict point due to the high speed of cyclists. This area needs to be monitored to ensure the proposed speed threshold markings are sufficient. Signs should be considered to advise cyclists to slow down.

Crashes are likely to be infrequent	Death or serious injury is likely	The safety concern is moderate
Designer response	<p>The Safety Audit has commented that the path is not too steep and does not need to be changed but have concerns that the gradient will result in high(er) speeds where the cyclists meet the pedestrians using the shared areas. This issue would be present on any downhill gradient of the cycleway. The emphasis is on the point where pedestrians and cyclists meet and how this risk of conflict can be reduced.</p> <p>Based on the current design, approaching cyclist will have a clear sight-line of the shared space area as they approach from the cycle path.</p> <p>We support the Road Safety Audit- recommendation to install signage to inform cyclist to slow down and that the speed of cyclist through the shared space be monitored.</p> <p>It is recommended that an additional red threshold marking be installed 6m uphill of the current design and mark "Slow Down" on the cycle path between the two red threshold markings. The marking should be installed using high friction material or paint. In addition, gateway signage informing cyclists to slow down is to be installed either side of the "Slow Down" pavement marking.</p>	
Safety Engineer comment	Agree with Designer's comments.	
Client decision	Agree with Safety Engineer's comments.	
Action taken	Additional red threshold marking be installed 6m uphill of the current design and mark "Slow Down" on the cycle path between the two red	

Crashes are likely to be infrequent	Death or serious injury is likely	The safety concern is moderate
	threshold markings. The marking should be installed using high friction material or paint. In addition, gateway signage informing cyclists to slow down is to be installed either side of the "Slow Down" pavement marking.	

## 2.5 Park Street

It is not clear how pedestrians are to be discouraged from using the new cycle facility, cycle symbols and a coloured surface alone will not deter this and with the potential speed of cyclists there is a real risk of injury if they meet a pedestrian. The Road Markings and Signs Plan sheet 4 of 8 shows regulatory and parking signs but none at all for the cycle way. The SAT believe that signs will be required at the start of the cycle track to inform pedestrian that they are not to use it. Recommendations 3 and 4 cover the need for a signage plan for the cycle track.

Our 2019 report raised an issue where the existing footpath that links Coronation Drive to the Gardens is realigned at the Coronation Drive/Park Street corner to allow for the intersection of the new cycleway. The new footpath meets the Hotops cycleway at right angles and on an incline. Cyclists and pedestrians may not be aware of each other at this potential conflict point.

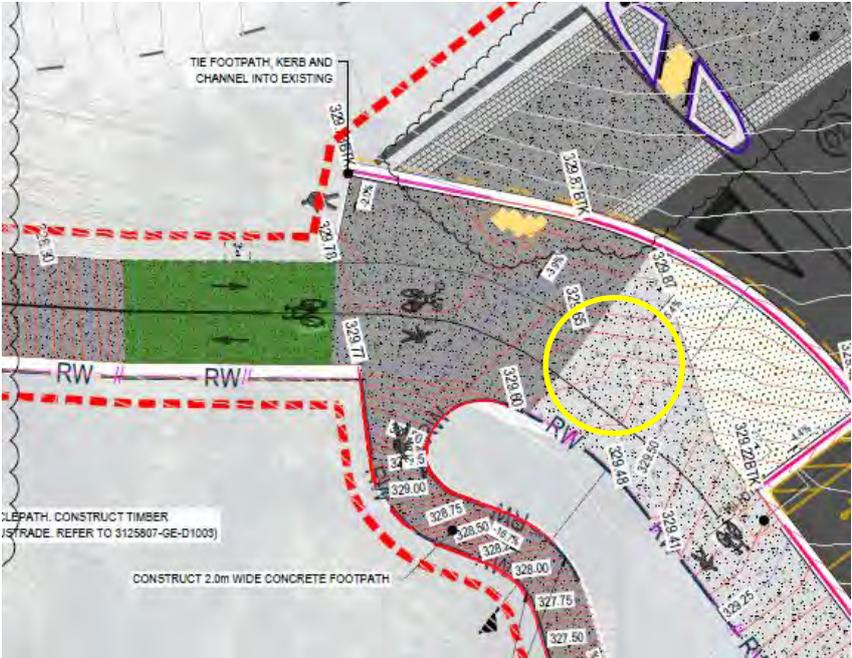


Figure 2-4: Potential conflict point on Park Street

A number of safety issues are raised relating to this conflict point. Pedestrians may continue walking along the path without realising that they are crossing the path of cyclists. It is assumed that pedestrians are not likely to be looking out for hazards because they are on an off-road footpath. Prams/strollers being pushed by pedestrians may protrude into the cycleway before the user realises that they have reached a cycleway. The route for pedestrians is not clear when they reach this conflict point traveling from the Gardens. Pedestrians may turn left into the cycleway instead of using the footpath on Coronation Drive. This again supports the need for a clear wayfinding signage plan.

Figure 2-4 also shows an inconsistent treatment for the tactile paving. At Camp Street/Earl Street directional paving is used to intercept any footpath users. At the top of Park Street directional pavers are not used. Whilst this is a large area consideration does need to be given to guide visually impaired footpath users to the new crossing point that is being provided.

**Recommendation**

**Moderate**

- 7. Review use of directional tactile paving at the Park Street intersection with Coronation Drive.

Crashes are likely to be infrequent	Death or serious injury is likely	The safety concern is moderate
Designer response	Support the recommendation by the Road Safety Audit. Directional tactile paving to be included. IFC drawings to be updated to reflect this change.	
Safety Engineer comment	Agree with Designer's comments. Additional issue not addressed with recommendation regarding pedestrians turning onto cycle path. Add additional sign between the separate cycle path and pedestrian path with stacked on left [cycle symbol "ONLY" left arrow]; vertical separation line; [stacked on right [pedestrian symbol "ONLY" right arrow] – similar to sign RLU4.	
Client decision	Agree with Safety Engineer's comments.	
Action taken	Design to be updated to include: <ul style="list-style-type: none"> <li>• Directional tactile paving to be included on Park Street.</li> <li>• Add additional sign between the separate cycle path and pedestrian path with stacked on left [cycle symbol "ONLY" left arrow]; vertical separation line; [stacked on right [pedestrian symbol "ONLY" right arrow] – similar to sign RLU4.</li> </ul>	

### 2.5.1 Park Street Signage

Whilst we stress the importance of a signage plan for pedestrian and cyclists we note that signs have been shown for motorists on Park Street. The existing Give Way sign on Park Street is poorly located. This should be relocated to the grassed area adjacent to the triangle marked on the road. Consideration should also be given to providing a secondary Give Way sign on the new splitter island.

The signs indicate that Park Street will be subject to a 30km/h speed limit while Brisbane Street and Coronation Drive are 40km/h. With the signs located as shown a driver turning right out of Brisbane Street will not see that they have left the 30km/h speed limit and a driver turning left from Coronation Drive will not see that they have entered it. To reduce the clutter around the intersection and ensure that the signs can be clearly seen by motorists the 30km/h speed limit should start south of Brisbane Street.

#### Recommendations

Minor

8. Relocate the existing Give Way sign on Park Street.
9. Consider installing a Give Way sign on the new splitter island on Park Street.
10. Review the location of the 30km/h speed limit signs.

Crashes are likely to be infrequent	Death or serious injury is unlikely	The safety concern is minor
Designer response	<p>We support the recommendation from the Road Safety Audit to relocate the 30km/h speed limit sign southern corner of Frankton Road and Park Street to the southern corner of Brisbane Street and Park Street and remove the 40km/h and 30km/h speed signs on the east and west side of Brisbane Street respectively. Relocate "30" pavement symbol to new 30km/h speed location.</p> <p>We support the recommendation from the Road Safety Audit to install a secondary RG-6 Give Way sign on the new splitter island but not the relocation of the Give Way sign to the grassed area adjacent to the triangle marked on the road as this would be beyond the 9m to the edge of the main roadway as required under MOTSAM Part 1 and Traffic Device rules.</p> <p>IFC drawings to be updated to reflect these changes.</p>	

Control Safety Engineer comment	Agree with Designer's comments.
Client decision	Agree with Safety Engineer's comments.
Action taken	<p>Design to be updated to include:</p> <ul style="list-style-type: none"> <li>Relocation of 30km/h speed limit sign southern corner of Frankton Road and Park Street to the southern corner of Brisbane Street and Park Street and remove the 40km/h and 30km/h speed signs on the east and west side of Brisbane Street respectively. Relocate "30" pavement symbol to new 30km/h speed location.</li> <li>Install a secondary RG-6 Give Way sign on the new splitter island</li> </ul>

### 2.6 Retaining walls and edge protection

The supplied plans show the design for the 1.2m high side protection on the Horne Creek Bridge. No details were supplied for the treatment where new retaining walls are provided to prevent pedestrians or cyclists falling from their respective pathways.

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## Appendix D

# Peer Review Report – by GHD



# Hotops Cycleway Options Assessment

## Peer Review

Queenstown Lakes District Council

22 November 2021

→ **The Power of Commitment**



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# 1. Introduction

## 1.1 Purpose of this report

This report has been prepared in response to the Queenstown Lakes District Council's (QLDC) request to peer review the proposed Hotops Cycle Path Alignment Options Assessment (the Assessment).

The Assessment is a part of the Street Upgrades design project which identified that a dedicated cycle path from the Frankton Track to the CBD was required. The **key objectives** of the cycle path were identified as:

1. To support safe and secure journeys for cycling.
2. To facilitate a cycling commuter route from Park Street (Frankton Track) to connect with Camp Street
3. To consider effects on the natural environment
4. To provide a cost-effective and constructable route

The original proposal that was selected for construction was found to conflict with various trees with various stakeholders opposed to their removal. As a result, the purpose of the Assessment was to consider alternative options for the cycle path against the original proposed option and a 'Do Nothing' option.

It is the intent that the feedback and comments made within this Peer Review will assist QLDC with their investigation for the most suitable option for the Hotops Cycle Path.

## 1.2 Scope and Limitations

The scope is to review the documents provided, and complement this with a walkover of the three options. The Review is limited to the information received.

The findings and recommendations in this Report are based on an examination of available relevant plans, the specified route options and their environment and the opinion of the reviewers.

## 1.3 Review Process

### 1.3.1 Options Reviewed

The options within the Assessment are documented as a "high level assessment for the use of comparison only". As such the GHD Review includes a comparative assessment between each option for the criteria provided. Where applicable, recommendations have been provided.

The below table indicates the Cycle Path options that were assessed.

Table 1 Summary of cycle way route options (Source: Hotops Cycleway Options Assessment Report)

Cycle Path Options	Details	Width
Proposed Route (PR)	QLDC approved Issue for Construction (IFC) design	4m
Alternative Route 1 (AR1)	Alternative route proposed by Brian Fitzpatrick and supported by Queenstown Trails Trust (QTT) and Friends of the Garden	3m+/-0.5m
Alternative Route 2 (AR2)	Alternative route proposed by QTT CEO Mark Williams	Variable
Do Nothing (DN)	No cycle path improvements undertaken	None

Figure 1 below illustrates the routes assessed, while also identifying the areas where a path conflict exists.



Figure 1 - Routes



Figure 1 Map of cycle way route option (Source: Hotops Cycleway Options Assessment Report)

## 1.3.2 Reviewers

The GHD Review team was as follows:

- Andrew Fergus – Technical Director
- Graham Robinson – Senior Civil Engineer

The documents provided to the reviewers include:

- Hotops Cycle Path Alignment Options Assessment (Rev D)
- Report Appendix A – Cycleway Design Criteria
- Report Appendix B – Proposed Route Design Drawings
- Report Appendix C – Proposed Design Independent Safety Audit
- MCA Excel Document of the Assessment scoring

The Te Kararo Queenstown Gardens concept masterplan was referenced in the Assessment, however was not included in review documentation.

Appendix C of the Assessment Memo was not provided with the initial documents for review. It was received and reviewed following the draft submission. Upon review, the Safety Audit did not alter any of GHD’s Review comments and can be taken as fully considered within our Review.

A site walk over was completed on Wednesday 10 November with guidance provided by Brendon Mills and Jim Washbrooke, from the Kā Huanui a Tāhuna.

## 2. Peer Review

### 2.1 General Comments

A list of higher-level comments is provided below that the Peer Review has considered may be useful in the assessment of the options.

## 2.1.1 Assessment Length

From the options assessed, the location of the southern end is not common for all options (see Figure 1 above). There is a risk that the shorter routes may not consider the risk / issues associated with the unassessed sections. For example, for cyclists to access the Preferred Route (PR) they need to travel along Park Street on the new shared path - this may present additional conflict points and it is unclear if they have been included in the Assessment.

**Recommendation – Review route extents to include for a common southern start / end point.**

## 2.1.2 Cycleway Users

It is acknowledged that the primary purpose of the cycle way is to facilitate a cycle commuter route to connect the Frankton Track with Camp Street, with the Assessment scored to reflect this primary purpose. However, this Assessment has not made clear its considerations for alternative user groups and how they have been considered. The Review has identified the following:

- Recreational cycle users - how will each route consider recreational cyclists. The Gardens has several amenity features which are likely to be accessed by those on a bike. Similarly, the Peninsula / Gardens area has recreational tracks which are used by cyclists. Each route Option will facilitate access into the Gardens to different degrees e.g. AR2 provides an improved facility into the Gardens from Park Street and the Waterfront (via Horne Creek), whereas PR is unlikely to attract these users and existing tracks will be utilised.

Although the purpose of the facility is to provide for commuter trips, the ability to attract and be utilised by recreational users could be a consideration.

**Recommendation – Consider how the routes may cater to recreational cycle users.**

- Pedestrians – within each route are sections of shared and dedicated cycle paths. Although less clear for AR1 and AR2, where dedicated cycle paths are proposed, these may be more attractive (more direct, more cohesive, less steep etc) for pedestrians and they may choose to use these in preference to the pedestrian only paths. Conflicts have been addressed as part of the Assessment, however this appears to only consider intersecting path conflicts, and not on-path (i.e. midblock) conflicts.

**Recommendation – Consider pedestrian use on paths and how conflicts will be managed.**

## 2.1.3 CBD Destination

The Assessment has been completed based on tying into a cycle facility on Camp Street. However, it needs to be acknowledged that not all cyclists will consider Camp Street their destination and the waterfront is a key attractor which provides a more direct route to the western part of the CBD and beyond. The split of users to / from this part of the CBD needs consideration as these users will likely use a route through the southern part of the Gardens (i.e., via Horn Creek Bridge) to access Park Street.

**Recommendation – Consider the demand to / from the waterfront within the route assessments.**

## 2.1.4 Sensitivity Testing

The memo acknowledges within its summary “*that the scores are close and small changes to either the scoring or weighting can change the outcome*”. It could be considered worthwhile to undertake sensitivity testing to understand the robustness of the results.

**Recommendation – Consider undertaking sensitivity testing**

## 2.1.5 Weighting and MCA Scoring

The Review has identified that no additional information of the scoring or weighting for the MCA has been provided or clarified in the provided report. It is acknowledged that the weighting has been determined by the Alliance and the QLDC team, however consideration should be given to providing some qualitative assessment as to how these weightings were determined. Without such, there may be perceived bias in the weighting for each criterion.

Similarly, the scoring is based on a worst (1) to best (4) scoring system. No definition has been provided to what these terms refer to for each criterion and subsequently are open to interpretation.

**Recommendation – Consider undertaking quantitative assessment of the weighting & consider providing additional definitions for the scores for each criterion.**

## 2.1.6 Constructability

During the walkover, it was apparent that the construction of new paths or widening of the existing presents several challenges. The assessment of tree removal has been included, however it is unclear how the preservation of tree health and constructability with respect to tree root systems has been considered. Due to the dense area, steep terrain and existing trees, the constructability may need further consideration. It is unclear how costs for this may have been considered. It is surmised that the widening of existing tracks is likely to be a simpler construction activity, noting that this isn't without its challenges due to adjacent vegetation and tree root systems.

**Recommendation – Consider if constructability is a worthy criterion for assessment within each route option.**

## 2.2 Specific MCA comments

Reviews were undertaken on each of the criteria scored within the MCA. The sections below provide peer review commentary on the objectives and sub criteria scoring for each option, commenting on its validity and areas of additional clarification/consideration.

### 2.2.1 Objective 1

This criterion captures the need **to support safe and secure journeys for cycling** and was separated into three sub criteria as shown in Table 2, along with peer review commentary and any recommendations (bolded).

Table 2 Objective 1 Sub Criteria Peer Review Comments

Objective	Weighting	Reviewer Comments
1.1 Gradients	15%	<p>The PR option recommends that additional measures such as clear sight distances, wide cycleway, delineation, and warning signs are included to reduce effects of gradient due to “unavoidable topography”– whereas all other options are silent on this. It is unclear the other options would have these treatments applied and if not, how this may have affected the scoring.</p> <p><b>Provide consistency in consideration of sight lines and delineation.</b></p> <p>During the site visit, it was observed that the path within the Gardens (AR2) is currently being reconstructed. Observations were that the brow of the hill has been lowered to improve the grade. Within the documents reviewed, on the AR2 Page 3 of 3, gradients have been calculated. As the path is currently under construction, these calculations could be confirmed on site, to provide an ‘as built’ grade.</p> <p><b>Review as built plans to confirm calculated grades are correct.</b></p> <p><u>In summary, the Review agrees with scores across all the options in that the PR route is likely to be the least attractive due to longer steep grades.</u></p>
1.2 Conflicts	15%	<p>The assessment length impacts this element therefore <b>it is recommended to capture assessment length in this section or as a separate sub section.</b></p> <p>It is unclear if conflicts on Park Street have been considered. This is related to the lack of a consistent end point at the southern end (noted above). Of note, AR2 is within the Gardens and contains several additional conflict points, however the entrance to the Queenstown Gardens on Park Street would also present a conflict to the PR and AR1 route as users need to travel past this point.</p> <p><b>Consider if additional conflict points need including for assessment.</b></p>

Objective	Weighting	Reviewer Comments
		<p>The PR route presents an attractive route from the Park Street parking area to Camp Street. It is noted that there is the adjacent Hotops pedestrian path, however this path is longer, steeper, and narrower, and likely to be less attractive to pedestrians. It is unclear how mid-block (i.e., away from intersecting paths) conflicts have been considered, and how the number / density of pedestrians using the paths has been considered within the scoring. The Hotops walkway, as well as the Horn Creek Bridge are high pedestrian demand areas.</p> <p><b>Consider how pedestrian exposure at conflict points and on the path have been applied to the scoring.</b></p> <p>The scoring for PR provides the commentary ‘no intermediate conflicts’ due to it being a dedicated cycleway, however the ‘Consideration’ makes note that there is a high probability of pedestrians using the dedicated path. It is unclear how the Assessment has considered these contradicting statements.</p> <p><b>It is suggested that the use of ‘no intermediate conflicts’ needs reconsideration.</b></p> <p>Criteria 1.1 and 1.2 are dependant, in that steeper grades are likely to result in higher severity conflicts. However, steeper grades away from conflict points are likely to present less risk. Similarly, a rider’s ability to observe a potential collision and respond (brake, swerve etc.) accordingly is an important consideration. For example, on AR2, the path between Park Street and west of the Rotunda is on flat open terrain and could be considered lower risk than the midway conflict point along AR1.</p> <p><b>Consider a risk assessment or weighting for each conflict location.</b></p> <p>The DN option would retain the current route with mixing of cyclist and path users. This scored the lowest with a 1, however it is unknown what evidence there is of conflicts, reported crashes or near misses. This should be considered as the base line for what benefits (i.e., reduced conflicts) would be attained from the other options. The review surmises that AR2 would be an improvement on the do nothing, however it scores the same.</p> <p><b>Reconsider the scoring for the AR2 and the DN option.</b></p> <p><u>In summary, the Review considers that the scoring presented is weighted too heavily in favour of PR.</u></p>
1.3 Secure journeys	5%	<p>The Review notes the ‘Consideration’ of the question ‘Are there any CPTED Issues?’. It is unclear how the principles of CPTED have been considered outside of passive surveillance and lighting. E.g., what active security measures are being considered, are escape routes available, etc.</p> <p><b>Consider how CPTED will be applied within all options.</b></p> <p>The Queenstown Resort College oversees PR which does provide a degree of passive surveillance, which is a positive. Similarly, AR2 may have passive surveillance from the Novotel Hotel on the western side of the creek, however it is unclear if this has been considered. Similarly, a large length of AR2 is within open terrain within the Gardens.</p> <p>The Review found it difficult to understand how the DN option scored higher than AR2, considering that AR2 generally utilises existing routes, with AR2 having some upgrades.</p> <p><b>Review AR2 scoring.</b></p> <p>The presence of the retaining wall within the PR option and the presumed steep upslope does limit the escape routes available to users and that this may present an entrapment risk.</p> <p><b>Consider how the entrapment risk was considered for the PR option.</b></p>

Objective	Weighting	Reviewer Comments
		<p>When considering the CPTED assessment, it is unclear as to how tree removal, and the opening up of the surrounding area (i.e., removal of concealed locations) has been assessed as part of this criteria for each route. Improving visibility and opening up of the area would affect the CPTED elements.</p> <p><b>Confirm how tree removal and improvement of sight lines has been considered within scoring.</b></p> <p><u>In summary, the Review supports the scoring that AR1 is the poorest scoring option. However, AR2 may warrant rescoring in consideration of DN scores.</u></p>

## 2.2.2 Objective 2

This criterion captures the need **to facilitate a dedicated cycling commuter route from Park Street (Frankton Track) to Camp Street**, and was assessed as one sub criteria as shown in Table 3, along with peer review commentary and recommendations

Table 3 Objective 2 Sub Criteria Peer Review Comments

Objective	Weighting	Reviewer Comments
2.1 Dedicated cycle route	10%	<p>The Review agrees with the Assessment scoring, noting that DN is fatally flawed for this criterion.</p> <p>It is noted above that Section 2.1.3 relates to the waterfront as needing consideration.</p> <p>Directness is a key element of a cycle route that should be considered and it is not clear that this has been explicitly captured in this objective. The review notes that AR2 is the shortest route between Park Street and Camp Street, however a high-level check suggests AR2 is longer than PR (when considering common start / end points).</p> <p><b>Consider if “directness” is a criterion to assess &amp; check length of routes</b></p> <p><u>In summary, the Review supports the scoring against the criteria, however question if AR2 justifies a higher score.</u></p>

## 2.2.3 Objective 3

This criterion captures the need **to consider effects on the natural environment** and was separated into two sub criteria as shown in Table 4, along with peer review commentary and recommendations. It is noted that the Review has not undertaken a detailed review of the tree removal requirements for each option and the comments within the Assessment are taken as read.

Table 4 Objective 3 Sub Criteria Peer Review Comments

Objective	Weighting	Reviewer Comments
3.1 Trees	25%	<p>AR2 does not have any trees detailed for removal, therefore it has been assumed that zero trees are to be removed.</p> <p><u>In summary, the Review agrees that AR2 and DN have less impact on existing trees and agree with scoring for all options.</u></p>

<p>3.2 Other environmental factors</p>	<p>15%</p>	<p>The 'Consideration' notes Visual, Climatic and Masterplan alignment as the criteria. Not all options are documented with these considerations and it is unclear how each option has been assessed. These could be considered discrete criteria and as such scored independently with individual weighting assigned (if desired). This would provide additional transparency for this Criteria.</p> <p>The Review has surmised that the scoring alignment with the Masterplan has a higher weighting for this sub criteria, as two options (AR2 and DN) do not align and have scored the lowest.</p> <p><b>Consider that this sub criteria be separated out into the individual elements. If not, provide additional commentary to justify scoring.</b></p> <p>AR2 has scored the equal lowest out of all options, however this utilises most of the existing paths (except a short section through the grass on Park Street), acknowledging these will be widened and may have impacted score as a result. Also, the severance of the grass area could be minimised with the path located close to the existing gravel path. The Review had difficulty in aligning the commentary with the scoring for this option.</p> <p>The PR option notes that Douglas Fir removal will impact the wind effects and visual amenity. For option AR2 it is presumed that the Douglass Fir will remain (as detailed in Criteria 3.1). Under this assumption AR2 would retain these features, therefore provide a positive outcome for this criterion as this aligns with the Masterplan intentions of replacing the Douglass Firs with native species.</p> <p><b>Review wind effects and visual amenity for all options.</b></p> <p><u>In summary, the scores presented were difficult to reconcile and suggest these be reviewed.</u></p>
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## 2.2.4 Objective 4

This criterion captures the need **to provide a cost-effective cycle lane** and was assessed as one sub criteria as shown in Table 5, along with peer review commentary and recommendations. No cost information was provided, therefore the Assessment has considered the path length and a high-level understanding of the interventions required.

Table 5 Objective 4 Sub Criteria Peer Review Comments

Objective	Weighting	Reviewer Comments
<p>4.1 Capital Cost</p>	<p>15%</p>	<p>The PR option has included the Park Street shared path within its cost assessment commentary, however this path is under construction and could be considered a sunk cost for all options. However as detailed above in Section 2.1.1, common start / end points should be applied for costing assessments.</p> <p>Similarly, AR1 should have a portion of the Park Street shared path included to allow for the common start / end point comparison.</p> <p><b>Consider if sunk costs (i.e., Park Street shared path and Shared path in Gardens) are appropriate for consideration.</b></p> <p><b>Costing assessments should have common start / end points.</b></p>

### **3. Summary**

A Peer Review was undertaken on the Hotops Cycle Path Alignment Options Assessment memorandum. From the Review, there are several areas considered worthy of further consideration / review in the MCA assessment. We note that due to the closeness in the currently scored outcomes, consideration of the above could result in a change in scores for the options. That is not to say that the ranking outcomes from the assessment would change, more so that some further consideration may be required.

At a high level, the lack of quantitative assessment of the weightings (or visibility of this) and definition relating to the scoring does open the opportunity for a perception of bias into the Assessment. Similarly, several of the Criteria have multiple items within the 'Consideration' assessed, and it was unclear how each option scored against each of these sub criteria. Clarity around this (e.g., presenting these as sub criteria) would have assisted in understanding the scores provided.

It is recommended that the Assessment author consider the above and determine if changes are needed to the Assessment.

### **3.1 Additional limitations**

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## Appendix E

# Response to Peer Review Report

	GHD Comments – 15 November (with updates from 22 November)	Kā Huanui a Tāhuna Response	Kā Huanui a Tāhuna Actions
2.1.1	<p><b>Assessment Length</b></p> <p>From the three options assessed, the location of the southern end is not common for all options (see Figure 1 above). There is a risk that the shorter routes may not consider the risk / issues associated with the unassessed sections. For example, for cyclists to access the Preferred Route (PR) they need to travel along Park Street on the new shared path - this may present additional conflict points which is unclear if they have been included in the assessment.</p> <p><b>Recommendation – Review route extents to include for a common southern start / end point.</b></p>	<p>Agreed with defining route extent for purposes of assessing conflicts.</p> <p>Conflict points for the Preferred route have been considered on Park Street, up until the Gardens are entered.</p>	<p>Plan layout has been updated to include conflict points on new Park Street shared path and common start / end points.</p>
2.1.2	<p><b>Cycleway Users</b></p> <p>It is acknowledged that the primary purpose of the cycle way is to facilitate a cycle commuter route to connect the Frankton Track with Camp Street, with the Assessment scored to reflect this primary purpose. However, this Assessment has not made clear its considerations for alternative user groups and how they have been considered. The Review has identified the following:</p> <ul style="list-style-type: none"> <li>Recreational cycle users - how will each route consider recreational cyclists. The Gardens has several amenity features which are likely to be accessed by those on a bike. Similarly, the Peninsula / Gardens area has recreational tracks which are used by cyclists. Each route Option will facilitate access into the Gardens to different degrees e.g. AR2 provides an improved facility into the Gardens from Park Street and the Waterfront (via Horne Creek), whereas PR is unlikely to attract these users and existing tracks will be utilised.</li> </ul> <p>Although the purpose of the facility is to provide for commuter trips, the ability to attract and be utilised by recreational users could be a consideration.</p> <p><b>Recommendation – Consider how the routes may cater to recreational cycle users.</b></p> <ul style="list-style-type: none"> <li>Pedestrians – within each route are sections of shared and dedicated cycle paths. Although less clear for AR1 and AR2, where dedicated cycle paths are proposed, these may be more attractive (more direct, more cohesive, less steep etc) for pedestrians and they may choose to use these in preference to the pedestrian only paths. Conflicts have been addressed as part of the Assessment; however, this appears to only consider intersecting path conflicts, and not on-path (i.e. midblock) conflicts.</li> </ul> <p><b>Recommendation – Consider pedestrian use on paths and how conflicts will be managed.</b></p>	<p>We disagree with this recommendation. The purpose of the design has been to provide a route for commuter cyclists. Recreational cyclists will typically use the paths that they want, in and around the gardens, of which there are many variables and options.</p> <p>Pedestrian (mid-block) conflicts have been considered as part of the scoring for conflicts.</p>	<p>No action.</p> <p>No action.</p>
2.1.3	<p><b>CBD Destination</b></p> <p>The assessment has been completed based on tying into a cycle facility on Camp Street. However, it needs to be acknowledged that not all cyclists will consider Camp Street their destination and the waterfront is a key attractor which provides a more direct route of the western part of the CBD and beyond. The split of users to / from this part of the CBD needs consideration as these users will likely use a route through the south part of the Gardens (i.e., via Horn Creek Bridge) to access Park Street.</p> <p><b>Recommendation – Consider the demand to / from the Waterfront within the route assessments.</b></p>	<p>The cycleway route is designed to be a commuter cycleway to connect Park Street to Camp Street, thereby aiding commuters into the CBD, and diverting commuter cyclists away from Marine Parade. It should be recognised, however, that there will be cyclists who still use other routes into and out of the CBD.</p>	<p>No action.</p>
2.1.4	<p><b>Sensitivity Testing</b></p> <p>The memo acknowledges within its summary “that the scores are close and small changes to either the scoring or weighting can change the outcome”. It could be considered worthwhile to undertake sensitivity testing to understand the robustness of the results.</p> <p><b>Recommendation – Consider undertaking sensitivity testing</b></p>	<p>Agreed that sensitivity is a useful action.</p>	<p>Undertake sensitivity testing and include in report</p>

	GHD Comments – 15 November (with updates from 22 November)	Kā Huanui a Tāhuna Response	Kā Huanui a Tāhuna Actions
2.1.5	<p><b>Weighting and MCA Scoring</b></p> <p>The Review has identified that no additional information of the scoring or weighting for the MCA has been provided or clarified in the provided report. It is acknowledged that the weighting has been determined by the Alliance and the QLDC team, however consideration should be given to providing some qualitative assessment as to how these weightings were determined. Without such, there may be perceived bias in the weighting for each criterion. Similarly, the scoring is based on a worst (1) to best (4) scoring system. No definition has been provided to what these terms refer to for each criterion and subsequently are open to interpretation.</p> <p><b>Recommendation – Consider undertaking quantitative assessment of the weighting &amp; consider providing additional definitions for the scores for each criterion.</b></p>	<p>The weightings have been determined through a combined QLDC and Kā Huanui a Tāhuna process. Sensitivity testing of the weighting has also been undertaken to check impact on final scores. This is considered sufficient to offset perceptions of bias.</p> <p>Definition of scoring will be included in report</p>	<p>Report to include update on how weightings have been determined.</p> <p>Report to be updated</p>
2.1.6	<p><b>Constructability</b></p> <p>During the walkover, it was apparent that the construction of new paths or widening of the existing presents several challenges. The assessment of tree removal has been included; however, it is unclear how the preservation of tree health and constructability with respect to tree root systems has been considered. Due to the dense area, steep terrain and existing trees, the constructability may need further consideration. It is unclear how costs for this may have been considered. It is surmised that the widening of existing tracks is likely to be a simpler construction activity, noting that this isn't without its challenges due to adjacent vegetation and tree root systems.</p> <p><b>Recommendation – Consider if constructability is a worthy criterion for assessment within each route option</b></p>	<p>The impact of constructability on the trees has been addressed in the tree section. Additional constructability has been addressed in the cost scoring. Whilst the construction challenges of the different routes are variable, it is considered that recognition of this through the costing is sufficient for this assessment, to avoid double dipping.</p>	<p>No further action required.</p>
1.1	<p><b>Gradients</b></p> <p>The PR option recommends that additional measures such as clear sight distances, wide cycleway, delineation, and warning signs are included to reduce effects of gradient due to “unavoidable topography”– whereas all other options are silent on this. It is unclear the other options would have these treatments applied and if not, how this may have affected the scoring.</p> <p><b>Provide consistency in consideration of sight lines and delineation.</b></p> <p>During the site visit, it was observed that the path within the Gardens (AR2) is 15% currently being reconstructed. Observations were that the brow of the hill has been lowered to improve the grade. Within the documents reviewed, on the AR2 Page 3 or 3, gradients have been calculated. As the path is currently under construction, these calculations could be confirmed on site, to provide an ‘as built’ grade.</p> <p><b>Review as built plans to confirm calculated grades are correct.</b></p> <p><u>In summary, the review agrees with score across all the options in that the PR route is likely to be the least attractive due to longer grades.</u></p>	<p>The wording has been updated to be more consistent across the options.</p> <p>As-built plans are not available (as they haven't finished building the path yet). It should be noted that the construction of this path is being undertaken outside of Kā Huanui a Tāhuna.</p>	<p>Report to be updated</p> <p>No further action required.</p>
1.2	<p><b>Conflicts</b></p> <p>The assessment length impacts this element therefore <b>it is recommended to capture assessment length in this section or as a separate sub section.</b></p> <p>It is unclear if conflicts on Park Street have been considered. This is related to the lack of consistent end point at the southern end (noted above). Of note, AR2 is within the garden and contains several additional conflict points, however the entrance to the Queenstown Gardens would also present a conflict to the PR and AR1 route as users need to travel past this point.</p>		

	GHD Comments – 15 November (with updates from 22 November)	Kā Huanui a Tāhuna Response	Kā Huanui a Tāhuna Actions
	<p><b>Consider if additional conflict points need including for assessment.</b></p> <p>The PR route presents an attractive route from the Park Street parking area to Camp Street. It is noted that there is the adjacent Hotops pedestrian path, however this path is longer, steeper, and narrower, and likely to be less attractive. It is unclear how midblock (i.e., away from intersecting paths) conflicts have been considered, and how the number / density of pedestrians has been considered within the scoring. The Hotops walkway, as well as the Horn Creek Bridge as high pedestrian areas.</p> <p><b>Consider how pedestrian exposure at conflict points and on the path may has been applied to the scoring.</b></p> <p>The scoring for PR provides commentary 'no intermediate conflicts' due to it being a dedicated cycleway, however the Consideration makes note that there are a high probability of pedestrians using the dedicated path. It is unclear how the assessment has considered these contradicting statements.</p> <p><b>It is suggested that the use of 'no intermediate conflicts' needs reconsideration.</b></p> <p>Criteria 1.1 and 1.2 are dependant, in that steeper grades are likely to result in higher severity conflicts. However, steeper grades away from conflict points are likely to present less risk. Similarly, a rider's ability to observe a potential collision and respond (brake, swerve etc) accordingly is an important consideration. For example, on AR2, the path between Park Street and west of the Rotunda is on flat open terrain and could be considered lower risk that the midway conflict points along AR1.</p> <p><b>Consider a risk assessment or weighting for each conflict location.</b></p> <p>The DN option would retain the current route with mixing of cyclist and path users. This scored the lowest with a 1, however it is unknown what evidence there is of conflicts, reported crashes or near misses. This should be considered as the base line for what benefits (i.e., reduced conflicts) would be attained from the other options. The review surmises that AR2 would be an improvement on the do nothing, however it scores the same.</p> <p><b>Reconsider the scoring for the AR2 and the DN option.</b></p> <p><u>In summary, the review considers that the scoring spread is weighted too heavily in favour of PR.</u></p>	<p>Agreed. Additional conflict points have been included for assessment.</p> <p>Pedestrian exposure has been included within the different levels of conflict. High scoring conflicts (eg. 3) have a high level of pedestrian exposure</p> <p>Wording has been amended to be more consistent</p> <p>Agreed. This has been implemented</p> <p>The base line used for scoring has been the Do-Nothing option. All proposed options score higher than Do-Nothing, however it should be noted that AR2 is subjective to sensitivity checking for this criterion, and scores lower than PR or AR1 due to more conflicts.</p>	<p>Report has been updated.</p> <p>Report has been updated.</p> <p>Report has been updated.</p> <p>Report has been updated.</p> <p>The report has been updated to detail methodology considered to assess conflicts.</p>
1.3	<p><b>Secure journeys</b></p> <p>The review notes the Consideration of 'Are there any CPTED Issues?'. It is unclear how the principles of CPTED have been considered outside of passive surveillance and lighting. E.g., what active security measures are being considered, are escape route available, etc.</p> <p><b>Consider how CPTED will be applied within all options.</b></p> <p>The Queenstown Resort College oversees PR which does provide a degree of passive surveillance, which is a positive. Similarly, AR2 may have passive surveillance from the Novatel on the western side of the creek, however it is unclear if this has been considered. Similarly, a large length of AR2 is within open terrain within the Gardens.</p> <p>The review found it difficult to understand how the DN option scored more than AR2, considering that AR2 generally utilises existing routes, with AR2 having some upgrades.</p> <p><b>Review AR2 scoring.</b></p>	<p>CPTED has been considered from a passive surveillance and lighting perspective.</p>	<p>No further action required.</p> <p>Report has been updated.</p>

	GHD Comments – 15 November (with updates from 22 November)	Kā Huanui a Tāhuna Response	Kā Huanui a Tāhuna Actions
	<p>The presence of the retaining wall within the PR option and the presumed steep upslope, does limit the escape routes available to users and that this may present an entrapment risk.</p> <p><b>Consider how the entrapment risk was considered for the PR option.</b></p> <p>When considering the CPTED assessment, it is unclear how has tree removal, and the opening of the surrounding area (i.e., removal of concealed locations) been assessed as part of this criteria for each route seeing as this would lend to affecting the CPTED elements.</p> <p><b>Confirm tree removal and improvement of sight lines has been considered within scoring.</b></p> <p><u>In summary, the review supports the scoring that AR1 is the poorest scoring option. However, AR2 may warrant rescoring in consideration of DN scores.</u></p>	<p>Agreed, the scoring of AR2 has been updated to consider this.</p> <p>Yes, tree removal and line of sight has been considered in the evaluation.</p> <p>Agreed, the scoring has been to reflect this.</p>	<p>No further action required.</p> <p>Report has been updated.</p>
2.1	<p><b>Dedicated cycle route</b></p> <p>The review agrees with assessment scoring, noting that DN is a fatal flaw for this criterion.</p> <p>It is noted above in Section 2.1.3 relating to the waterfront as needing consideration.</p> <p>Directness is a key element of a cycle route that should be considered, and it is not clear that this has been explicitly captured in this objective. The review notes AR2 is the shortest route between Park Street and Camp Street, however a check on Google suggest AR2 is longer than PR (when considering common start / end points).</p> <p><b>Consider if “directness” is a criterion to assess &amp; check length of routes</b></p> <p><u>In summary, the review supports the scoring against the criteria, however question if AR2 justifies a higher score.</u></p>	<p>Agreed, the scoring of AR2 has been amended to reflect less direct route and non-dedicated cycle route</p>	<p>Report has been updated.</p>
3.1	<p><b>Trees</b></p> <p>AR2 does not have any trees detailed for removal, therefore it has been assumed that zero trees are to be removed.</p> <p><u>In summary, the Review agree that AR2 and DN have less impact on existing trees and agree with scoring for all options.</u></p>	<p>Noted.</p>	<p>No further action required.</p>
3.2	<p><b>Other environmental factors</b></p> <p>The Consideration notes Visual, Climatic and Masterplan alignment as the criteria. Not all options are documented with these considerations and unclear how each option has been assessed. These could be considered discrete criteria and as such scored independently with weighting assigned (if desired). This would provide additional transparency for this Criteria.</p> <p>The scoring suggests that’s the alignment with the masterplan is higher weighted for this sub criteria as two options (PR and DN) do not align and have scored the lowest.</p> <p><b>Consider that this sub criteria be separated out into the individual elements. If not, provide additional commentary.</b></p> <p>AR2 has scored the lowest out of all options, however this utilises most of the existing paths (except a short section through the grass on Park Street), acknowledging these will be widened so there are effects. Also, the severance of the grass area could be minimised and located close to the existing gravel path. The review has difficulty in aligning the scoring for this option.</p>	<p>Following the review of the GHD comments, it was decided that visual and climatic assessments should not form part of the assessment criteria. Visualisation was considered too subjective, some people would see the removal of trees as negative, whilst</p>	<p>Report has been updated.</p>

	<b>GHD Comments – 15 November (with updates from 22 November)</b>	<b>Kā Huanui a Tāhuna Response</b>	<b>Kā Huanui a Tāhuna Actions</b>
	<p>The PR option notes that Douglas Fir removal will impact the wind effects and visual amenity. For option AR2 it is presumed that the Douglass Fir will remain (as detailed in Criteria 3.1). Under this assumption AR2 would retain these features, therefore provide a positive outcome for this criterion.</p> <p><b>Review wind effects and visual amenity for all options.</b></p> <p><u>In summary, the scores presented were difficult to reconcile and suggest these be reviewed.</u></p>	<p>others would see it as positive. Climatic impact was also quite meaningless to the overall assessment. Therefore, the decision was made to focus on impacts to the proposed Gardens development plan, which is a key long-term objective of the QLDC Parks and Reserves team.</p>	
4.1	<p>Capital Cost</p> <p>The PR option has included the Park Street shared path within its cost assessment commentary; however, this path is under construction and could be consider a sunk cost for all options. However as detailed above in Section 2.1.1, common start / end points should be applied for costing assessments.</p> <p><b>Similarly, AR1 should have a portion of the Park Street shared path included to allow for the common start / end point comparison.</b></p> <p><b>Consider if sunk costs (i.e., Park Street shared path and Shared path in Gardens) are appropriate for consideration.</b></p> <p><b>Costing assessments should have common start / end points.</b></p>	<p>Agreed, sunk costs have removed from the assessment. This means that AR2 scores higher than PR or AR1</p>	<p>The Report has been updated.</p>

